

## Regional Optical Communications Sector

### Initiation: head for the leading lights

- We identify optical communications as a key beneficiary of the rising Big Data/IoT cycle
- We flag 2 demand drivers: 1) the continued expansion of global FTTX coverage, and 2) bandwidth upgrades at global datacentres
- Food chain value proposition centres on epiwafer-growing — LandMark Opto (Buy [1]); WinSemi (Buy [1]) should also benefit

Negative

Neutral

Positive

**Positive**  
(initiation)**Rick Hsu**

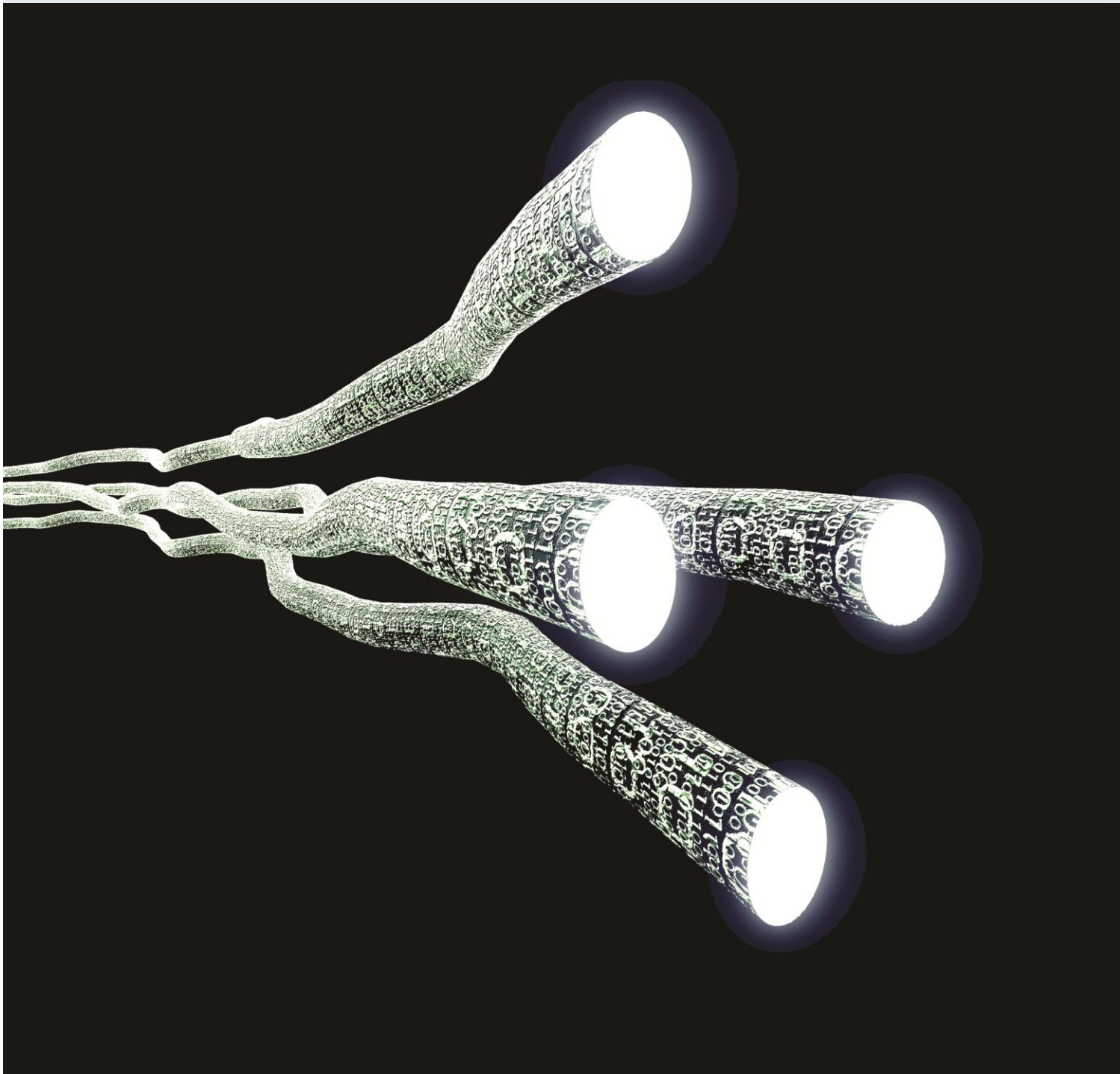
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Please also see:

<p><b>Asia ex-Japan Tech Sector Big Data: the next big thing 2 January 2015</b></p>	<p><b>2016 Global Technology Outlook: Heading for the light 9 December 2015</b></p>
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**Investment case:** Following on from our call that the Big Data/IoT cycle will replace the mobile computing demand cycle as the next big thing (see [Big Data: the next big thing](#), 2 January 2015), we highlight optical communications (OC) as a key beneficiary of the bandwidth upgrades at datacentres and fibre-to-the-x (FTTX) needed to handle the proliferation of IoT devices. We see LandMark Opto (3081 TT) and WinSemi (3105 TT) as 2 beneficiaries in the epiwafer and foundry segments of the OC food chain. Other names to watch in Asia include Accelink (Not rated; IDM), TrueLight (Not rated; IDM), VPEC (Not rated; epiwafer) and ShunSin (Not rated; SiP).

**Catalysts: OC – expanding at the speed of light.** Following the rise of FTTX coverage and 4G infrastructure build to support the OC market, the rising Big Data/IoT cycle should spur further bandwidth upgrades, helping to sustain robust OC demand growth in the next 3-5 years. We see pockets of strength from broadband fibre-optic connectivity replacing low-bandwidth counterparts and copper wires, on the back of 2 demand growth drivers:

**Driver No.1: FTTX.** We expect the global FTTX market to see a c.20% CAGR over 2015-20, reaching USD54bn in 2020, driven by the rise of fibre-optic (FO) coverage in households globally, including in China, where GPON is replacing EPON in tier-1 cities and EPON is shifting to rural areas. We see this “last mile” FTTX deployment as a multi-year demand cycle that will benefit the OC food chain players.

**Driver No.2: datacentres.** Broadband FO connectivity is our focus for growth in datacentre bandwidth upgrades. With the trend of high-bandwidth FO replacing low-bandwidth FO and copper wires, we forecast the global high-bandwidth FO connectivity (10/40/100Gbps) market to see a 12% CAGR over 2015-20, reaching USD10bn by 2020. Datacentre heavyweights like Intel are actively pushing Silicon-Photonics (SiPhotonics) solutions to replace their compound-semiconductor-based counterparts, with the goal of gaining share in the broadband FO connectivity market.

**Valuation:** We see the value proposition as biased towards the epiwafer segment, and thus highlight LandMark Opto which dominates global OC epiwafer supply. We initiate coverage of the stock with a Buy (1) call and 12-month TP of TWD666. Meanwhile, as the compound-semi foundry leader, WinSemi stands to benefit from its business scalability into the OC domain, in our view; we reaffirm our Buy (1) rating and 12-month TP of TWD63.5.

**Risks:** 1) FTTX coverage misses expectations, 2) datacentre bandwidth upgrades fall short of expectations, and 3) substitute competition between silicon and compound-semiconductors.

### Key stock calls

	New	Prev.
<b>LandMark Optoelectronics</b> (3081 TT)		
Rating	Buy	
Target	666.00	
Upside	▲ 32.7%	
<b>Win Semiconductors</b> (3105 TT)		
Rating	Buy	Buy
Target	63.50	63.50
Upside	▲ 15.5%	

Source: Daiwa forecasts

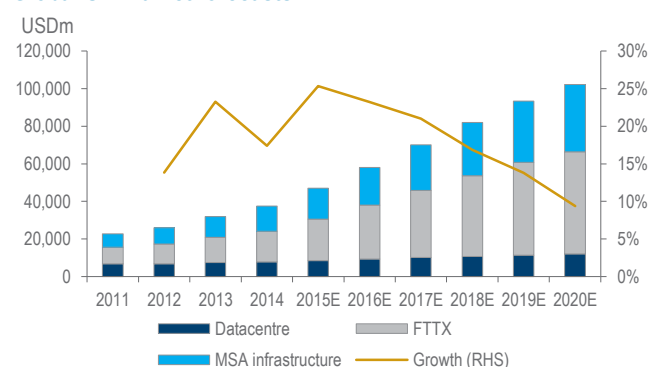
## Sector stocks: key indicators

### Global OC supply-chain valuation comparison

Stock	Ticker	Price (LC)*	MktCap (USDm)	PER (x)			PBR (x)			ROE (%)			Earnings growth (%)		
				2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E
<b>Compound-semi substrate</b>															
AXT	AXTI US	2.63	86	nm	nm	na	0.6	0.6	na	na	0.3	na	nm	nm	na
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
Average				11.4	9.3	8.5	0.7	0.6	0.7	6.9	4.1	8.0	-18.1	20.2	7.7
<b>Epiwafer growing</b>															
LandMark Opto	3081 TT	502.00	1,058	35.9	24.0	16.0	9.8	7.8	6.0	38.6	36.2	42.5	59.4	49.4	50.2
IQE	IQE LN	0.18	171	7.2	6.4	5.8	0.9	0.8	0.7	12.9	12.6	11.4	966.2	11.5	5.2
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
VPEC	2455 TT	50.50	375	20.5	17.4	17.2	3.5	3.2	3.3	17.2	17.9	18.8	29.8	12.8	5.4
IntelliEPI	4971 TT	131.50	136	31.6	25.0	na	4.1	na	na	12.0	13.2	na	-19.8	27.4	na
Average				21.3	16.4	11.9	3.8	3.1	2.7	17.5	17.6	20.2	203.5	24.3	17.1
<b>Epiwafer foundry</b>															
WinSemi	3105 TT	55.00	989	12.2	10.4	9.0	2.0	1.8	1.6	16.5	17.8	18.6	37.2	16.8	16.2
<b>Dedicated SiP</b>															
ASE	2311 TT	34.30	8,497	14.7	12.6	9.8	1.7	1.6	1.5	12.1	13.1	15.9	-18.7	16.6	28.6
Amkor	AMKR US	4.36	1,035	18.2	10.4	8.2	0.9	0.8	na	7.0	8.6	na	-42.4	37.1	na
Venture	VMS SP	7.95	1,565	14.2	13.0	11.8	1.2	1.2	1.2	8.2	8.9	9.9	9.7	9.4	12.0
Inari Amertron	INRI MK	3.13	710	15.0	12.3	11.1	4.4	3.6	3.0	32.4	31.7	30.1	29.5	21.1	14.9
ShunSin	6451 TT	93.40	296	9.5	9.5	na	2.2	2.1	na	22.0	21.0	na	9.3	2.2	na
eLASER	3450 TT	134.00	371	11.3	11.7	11.3	3.7	2.9	1.9	30.1	26.8	21.4	45.4	-3.3	3.5
PCL Tech	4977 TT	57.60	89	11.9	11.1	10.1	2.1	1.4	1.3	17.3	16.4	13.3	1.1	7.0	7.2
Average				13.5	11.5	10.4	2.3	1.9	1.8	18.4	18.1	18.1	4.9	12.9	13.2
<b>Subassembly (semi-IDM)</b>															
AcceLink	002281 CH	56.41	1,817	57.1	37.0	27.6	4.5	4.2	3.5	8.3	10.9	12.8	44.0	48.2	39.8
TrueLight	3234 TT	87.00	272	12.2	8.1	7.8	4.0	2.8	na	37.8	41.6	40.6	143.2	39.0	18.8
LuxNet	4979 TT	73.00	163	11.3	9.9	na	3.0	2.6	na	23.9	29.2	na	138.7	25.9	na
Sercomm	5388 TT	81.50	592	14.9	12.2	10.9	2.8	2.6	2.3	18.4	20.5	22.5	38.0	20.8	13.8
MACOM	6503 JP	1,074.00	20,247	10.4	10.0	9.1	1.2	1.1	1.0	11.5	11.1	11.2	-5.3	4.0	9.8
MELCO	MTSI US	36.96	1,962	19.4	14.1	13.1	5.3	na	na	25.4	26.0	na	114.7	32.4	-0.8
Average				20.9	15.2	13.7	3.5	2.6	2.3	20.9	23.2	21.8	78.9	28.4	16.3
<b>Full IDM</b>															
Avago	AVGO US	126.24	51,937	13.0	12.2	12.1	5.6	4.3	3.4	43.7	36.1	35.5	109.5	9.3	0.7
Finisar	FNSR US	13.37	1,430	14.7	11.6	9.2	1.3	1.2	na	7.9	12.2	na	724.2	30.0	27.2
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
Lumentum	LITE US	23.81	1,407	21.3	16.9	14.0	2.8	2.5	na	14.1	14.8	15.7	nm	26.6	-5.0
Average				15.1	12.5	11.0	2.6	2.2	2.0	18.1	17.7	19.7	271.9	21.5	7.7
<b>MOCVD</b>															
Aixtron	AIXA GY	3.17	398	nm	nm	75.5	0.9	0.9	0.9	-7.9	-3.6	0.8	nm	nm	nm
Veeco	VECO US	18.77	769	38.6	25.8	16.1	1.0	1.1	1.1	-0.9	-0.5	2.5	nm	18.0	108.3
Average				38.6	25.8	45.8	1.0	1.0	1.0	-4.4	-2.0	1.7	na	18.0	108.3

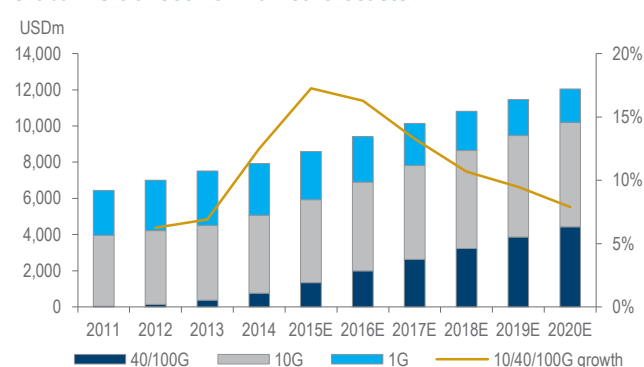
Source: Bloomberg (for NR companies), Daiwa forecasts (for rated companies); Note: \*local currency based on share prices as of 16 February 2016; March year-end for Sumitomo Electric and MELCO, April year-end for Finisar, June year-end for Lumentum (JDSU), September year-end for MACOM, October year-end for Avago; 2015E=FY16E, 2016E=FY17E, 2017E=FY18E

### Global OC market forecasts



Source: Photonics Technology & Industry Development Association (PTIDA), Daiwa forecasts

### Global FO transceiver market forecasts



Source: Daiwa estimates and forecasts

## Daiwa's OC investment picks

### We identify OC as one of the next big things to benefit from the rise of Big Data

In our thematic Big Data report published in January 2015 (see [Big Data: the next big thing](#)), we argued that the current demand cycle of mobile computing devices (MCD) and the rise of the next demand cycle for the Internet of Things (IoT) would spur mobile data consumption and trigger bandwidth upgrades at the cloud-end of datacentres. While we see a number of sectors benefiting by tapping into the right demand segments in the Big Data/IoT cycle, in this report we identify optical communications (OC) as a key beneficiary of this Big Data trend, with demand stemming from what we see as the transformation of wireline communication architecture in both datacentres (datacom) and FTTX (telecom). This makes fibre-optic (FO) solutions, especially broad-bandwidth ones, the key focus for the replacement cycle, where we expect high-bandwidth FO to replace its low-bandwidth counterparts and traditional copper (Cu) wire solutions.

### Our key calls: LandMark Opto and WinSemi

With FO transceiver modules the key focus of their end-products, LandMark Opto and WinSemi are, in our view, 2 beneficiaries in the epiwafer and foundry segments of the OC food chain, respectively. We initiate coverage of LandMark Opto with a Buy (1) rating and 12-month TP of TWD666 as we expect the company, the largest global OC epiwafer supplier by revenue, to enjoy strong earnings growth in the next 3 years on the back of 2 major demand drivers: 1) continued FTTX coverage expansion globally, and 2) hefty growth of SiPhotonics solutions at datacentres. We forecast LandMark Opto to deliver 45%/43% revenue/net profit CAGRs over 2015-18E, with ROEs of 33-38% per year (single year, not 2-year average) in the same period (see our accompanying initiation report for details).

We have been buyers of Win Semiconductor (WinSemi) since our initiation in January 2015 (see [Big Data traffic builder](#), 2 January 2015), as we see multiple business drivers for this stock: 4G migration followed by WiFi upgrades, with OC potentially another long-term driver since we believe WinSemi can parlay its know-how of compound-semiconductor technologies into the OC space. We reiterate our Buy (1) call on WinSemi and 12-month TP of TWD63.5, and forecast its revenue/net profit to see 14%/15% CAGRs over 2015-18E, with ROEs of 16-18% per year over the same period.

Other names to watch in the OC food chain in Asia include VPEC (Not rated; epiwafers), ShunSin (Not rated; SiP), Accelink (Not rated; IDM) and TrueLight (Not rated; IDM).

### Investment ratings and valuation summary

Please also see the global OC sector valuation table on page 4 for a detailed breakdown by segment of the food chain. Below we highlight the names to watch in this fast-emerging theme.

#### Key metrics: Daiwa's OC valuation panel

Stock	Ticker	Price (LC)*	Rating	PER (x)			PBR (x)			ROE (%)			Earnings growth (%)		
				2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E
<b>Daiwa actively covers</b>															
LandMark Opto	3081 TT	502.00	Buy	35.9	24.0	16.0	9.8	7.8	6.0	38.6	36.2	42.5	59.4	49.4	50.2
WinSemi	3105 TT	55.00	Buy	12.2	10.4	9.0	2.0	1.8	1.6	16.5	17.8	18.6	37.2	16.8	16.2
<b>Daiwa actively follows**</b>															
VPEC	2455 TT	50.50	NR	20.5	17.4	17.2	3.5	3.2	3.3	17.2	17.9	18.8	29.8	12.8	5.4
ShunSin	6451 TT	93.40	NR	9.5	9.5	na	2.2	2.1	na	22.0	21.0	na	9.3	2.2	na
TrueLight	3234 TT	87.00	NR	12.2	8.1	7.8	4.0	2.8	na	37.8	41.6	40.6	143.2	39.0	18.8
Accelink	002281 CH	56.41	NR	57.1	37.0	27.6	4.5	4.2	3.5	8.3	10.9	12.8	44.0	48.2	39.8
Sercomm	5388 TT	81.50	NR	14.9	12.2	10.9	2.8	2.6	2.3	18.4	20.5	22.5	38.0	20.8	13.8

Source: Bloomberg (for NR companies), Daiwa forecasts (for rated companies)

Note: \*local currency, based on closing prices as of 16 February 2016; \*\*stocks that Daiwa actively follows but do not carry a rating



## OC: Head for the leading lights

In our Big Data/IoT report, we addressed a paradigm shift in the global IT industry in which the current MCD demand cycle, led by smartphones, was about to end its fast-growth journey due to market saturation. But we believe Big Data is rising to replace MCDs and emerge into the next secular demand cycle, driven by the proliferation of IoT devices with cross-platform/multiple form-factors not only for consumer applications, but also covering other new demand verticals including smart homes, smart cars, healthcare and industrial automation (see chart, next page).

**Bandwidth upgrades should make FO the most viable solution to support the Big Data ecosystem**

The mushrooming of IoT demand should increase data consumption and in turn spur bandwidth upgrades (ie, increasing data transmission rates), from wireless to wireline, from telecom to datacom, and from access points at the terminal device level to datacentres at the cloud computing level, in order to ensure efficient data flows within the Big Data ecosystem. We see bottlenecks for data transmission at the wireline infrastructure end, including telecoms and datacentres. This makes fibre optics (FO) perhaps the most viable solution to overcome potential “traffic jams” caused by a combination of rising data flows and limited bandwidth, and leads to our focus in this report on the OC industry, with bandwidth upgrades from FTTX and datacentres the key demand drivers.

**OC is seeing a revival of growth, spurred by the rise of Big Data**

### Expanding at lightning pace

OC is not revolutionary technology. The basic forms of OC date back several hundred years, with the earliest electrical device created for OC being named the photo-phone. We refer to today's OC as a form of evolutionary communication technology using light to communicate data among various nodes of a telecommunication network (or optical networking), or within a datacentre, through FO cable as a carrier (or backbone) of the light (see Appendix 1 for an elaboration). Although OC has long existed, it is the rise of the Big Data ecosystem that is spurring OC to evolve at scale and pace, as a result of bandwidth upgrades in wireline communication infrastructure.

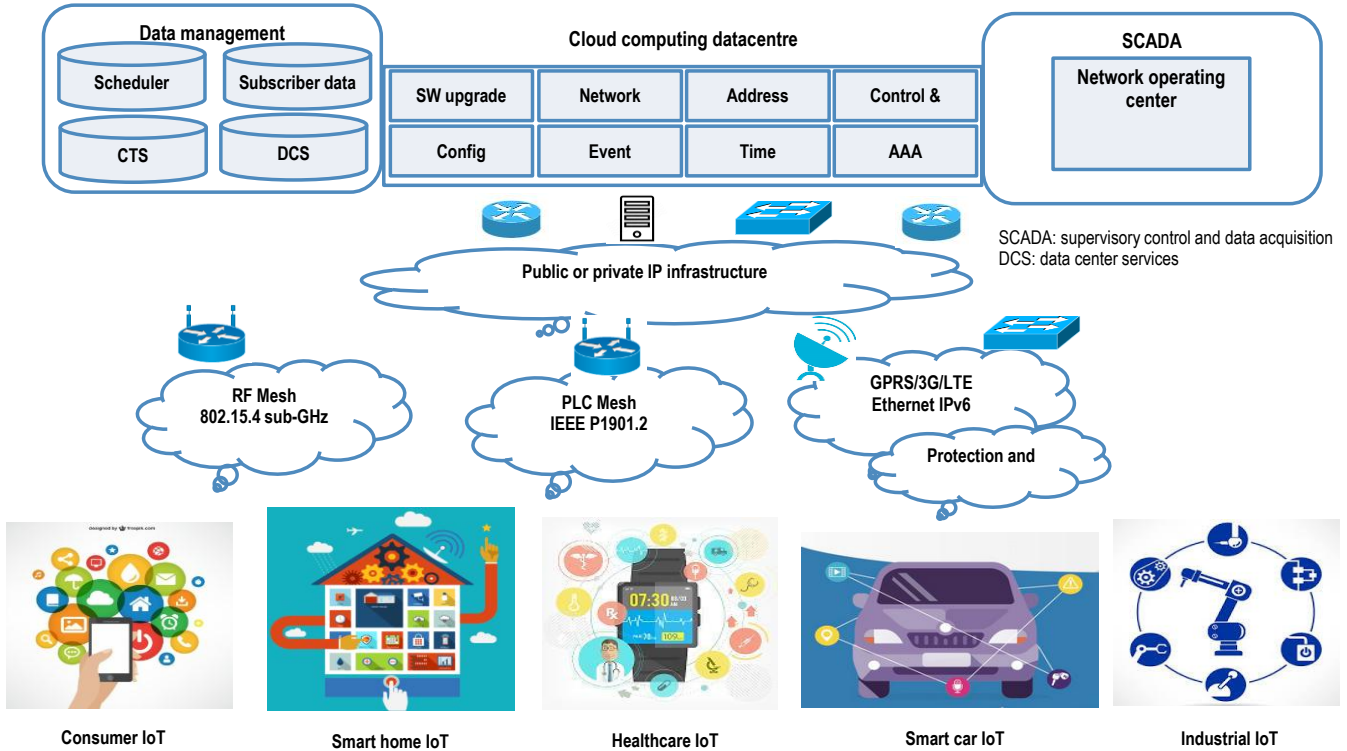
**PON vs. AON**

There are 2 types of optical networking technologies: passive optical network (PON) and active optical network (AON), both being commercialised in the wireline communication industry to overcome bandwidth bottlenecks created by the traditional backbones of copper-wire cables for data transmission. While PON finds its demand primarily in “last mile” applications of FTTX, or telecom infrastructure builds, AON is mainly employed in telecom central communications which are powered by active components such as multiplexers, amplifiers and repeaters to facilitate long-distance data transmission, and in datacom applications such as datacentres powered by the likes of switches and routers to distribute signals.

**WAN, MAN, SAN, LAN, FTTX, cellular and datacentre**

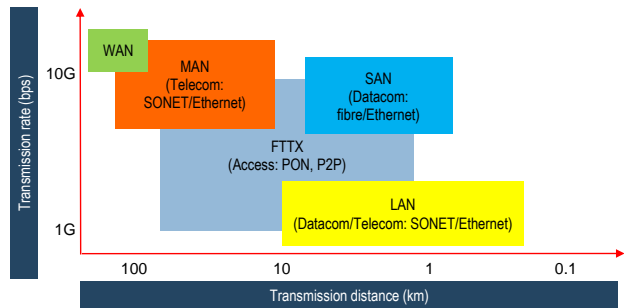
Depending on different data transmission distances and rates (bits per second [bps]), the OC application markets can be segmented into: wide area network (WAN, transmission distance:  $\geq 100\text{km}$ ), metro area network (MAN, distance:  $10\text{-}100\text{km}$ ), storage area network (SAN, distance:  $1\text{-}10\text{km}$ ), local area network (LAN:  $0.5\text{-}10\text{km}$ ), FTTX ( $1\text{-}100\text{km}$ ), cellular infrastructure ( $\leq 1\text{km}$ ) and datacentre ( $\leq 1\text{km}$ ). The datacentre applications can be further segmented into across datacentre ( $0.1\text{-}1.5\text{km}$ ), inter rack ( $1\text{-}10\text{m}$ ), inter board ( $1\text{-}10\text{cm}$ ) and inter chip ( $\leq 0.1\text{cm}$ ) (see charts, next page).

**The Big Data/IoT ecosystem**



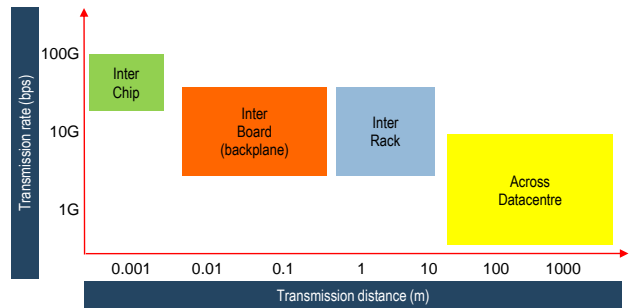
Source: Daiwa

**OC application by market segmentation at telecom**



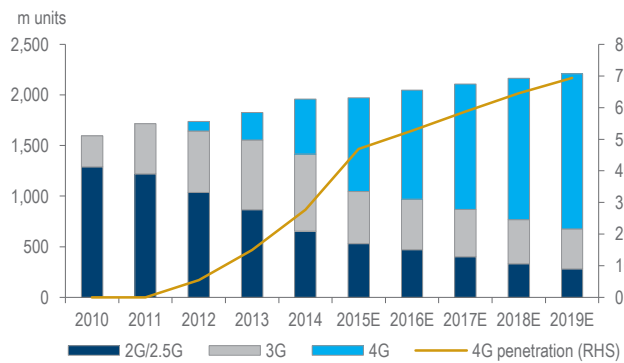
Source: Daiwa

**OC application in datacentre deployment (datacom)**



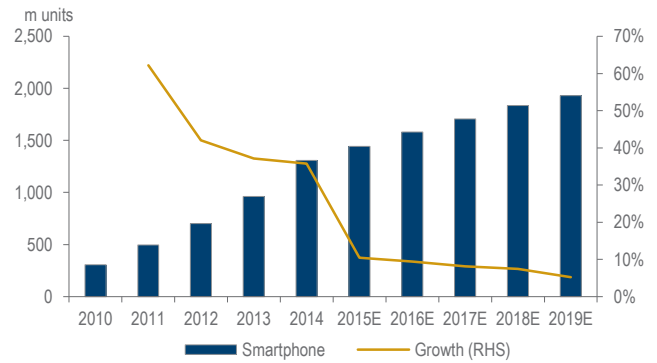
Source: Daiwa

**Global 4G smartphone penetration**



Source: IDC

**Global smartphone growth forecasts\***



Source: IDC  
Note: \* Including 3G and 4G configurations:

**4G penetration may slow after 2016 ...**

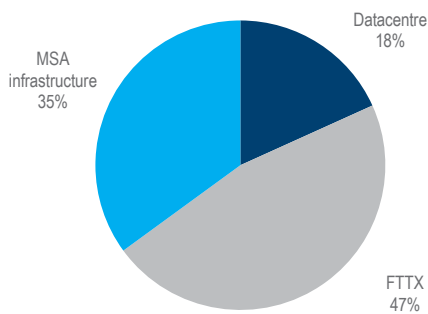
Despite muted demand post the Y2K bubble, OC market growth picked up again in 2007-08 driven by telecom vendors starting to deploy 4G cellular infrastructure ahead of the 4G smartphone cycle, as well as governments' push of fibre-to-the-home (FTTH) deployments to increase broadband access to households, especially in China. In our opinion, 4G infrastructure builds will slow beyond 2016 in terms of their growth trajectory due to decelerating smartphone demand growth (see charts the previous page).

**... but we see FTTX and datacentres as key growth drivers**

According to IDC, global 4G smartphone penetration started accelerating 2 years after the GFC (in 2012), to reach 47% in 2015, 53% in 2016E, 59% in 2017E and then decelerate to 65-70% afterwards. But FTTX deployments, including that for FTTH, should enjoy longer life cycles of demand growth than the 4G infrastructure build in our view, as there is still room for growth in global coverage. Excitingly, we see demand from datacentres driven by the Big Data cycle as growing as comparably fast as FTTX in the next 3-5 years. Such infrastructure insufficiency owing to the mounting data flow and limited bandwidth imply 2 growth drivers for the OC market: 1) FTTX for long-wave solutions with lower frequencies, and 2) datacentres for short-wave solutions with higher frequencies.

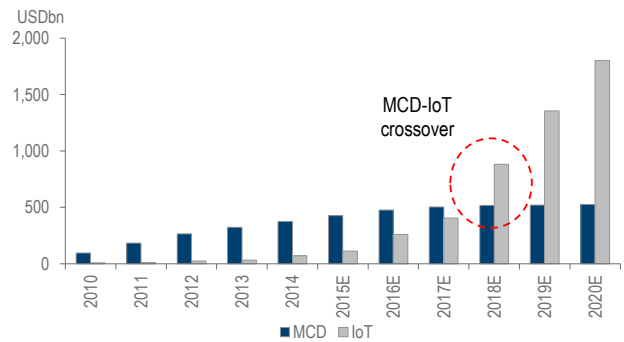
These 2 growth drivers, together with the traditional multi-source agreement (MSA) infrastructure segment that covers LAN, SAN, MAN and WAN, form the global OC market with a size of around USD47bn in 2015 (breakdown per the chart below), according to our estimates. Note: we include FO demand from cellular infrastructure builds such as 4G base stations at the telecom vendors in the MSA infrastructure segment.

**2015E global OC market breakdown by value**



Source: Daiwa estimates

**Market forecasts: IoT vs. MCD**



Source: Daiwa estimates and forecasts

**Driver No.1: FTTX**

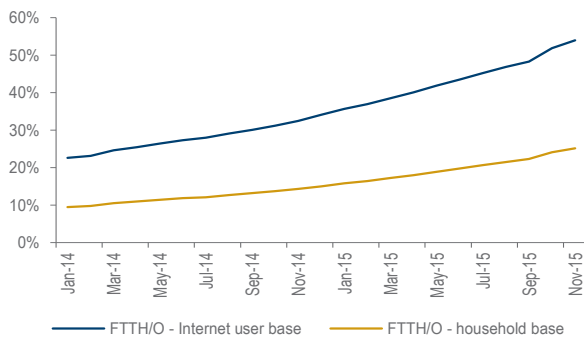
**We forecast the FTTX market to see a 20% CAGR over 2015-20, with GPON/EPON replacement and continued coverage expansion flagged as key focuses for growth**

In our opinion, the global FTTX market has witnessed robust growth in market value over the past 3 years, thanks to governments' push on FTTH to facilitate rising demand for broadband access from households as a result of increasing demand for video data, which has significantly driven bandwidth upgrades for faster data transmissions. The expanding FTTH market has also driven bandwidth upgrades from enterprises in order to help facilitate infrastructure builds in the form of fibre-to-the-building (FTTB) or fibre-to-the-node (FTTN). The key focuses in terms of OC technologies for the FTTX market are: 1) Gigabit PON (GPON) to replace Ethernet PON (EPON) in tier-1 cities of emerging markets (EM) like China and in developed countries owing to GPON's faster bandwidth of 2.5 gigabits per second (Gbps) scalable up to 40Gbps, compared with EPON's 1.25Gbps, and 2) the scaling back of EPON from tier-1 cities but shift of penetration to rural counties of EMs owing to governments' push to expand FTTX coverage nationwide.

This GPON/EPON replacement trend, together with the still multi-year growth cycle of the FTTX market demand, is a key story supporting our positive view on LandMark Opto (see our accompanying initiation report for more details), and related food chain players, with varying degrees of benefits depending on their food chain positions, where we see epiwafer-growing segment as capturing the highest value proposition (see the next section for an elaboration).

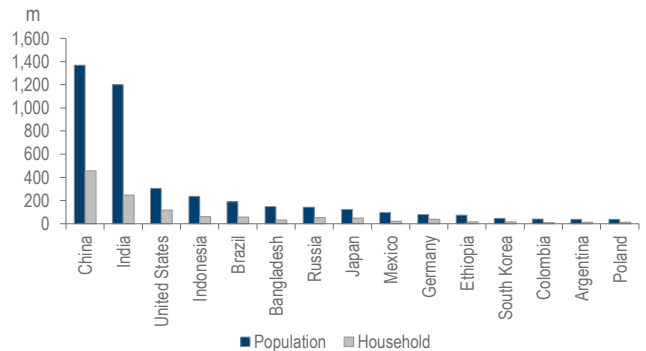


### FTTH/FTTO penetration in China



Source: MIIT

### Top-15 countries in terms of population and number of households



Source: Wikipedia

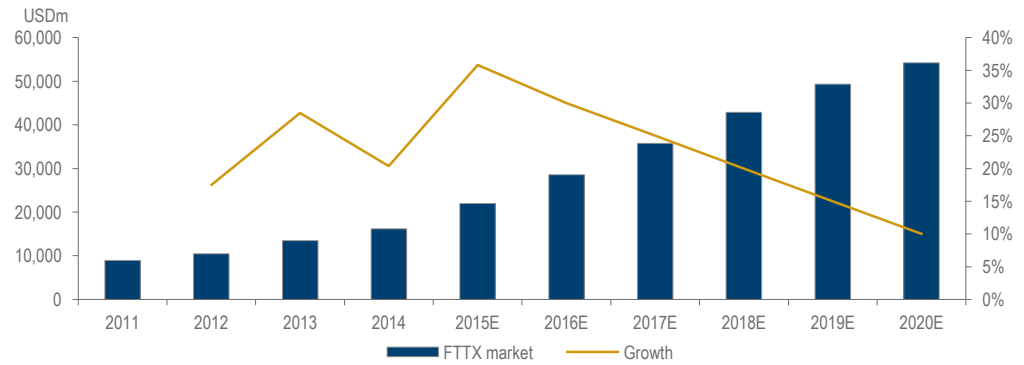
Although some investors may be concerned about FTTX penetration in some large countries like China tapering off, we see multi-year growth continuing, evidenced by still-low penetration across many countries in the world. According to Institut de L'audiovisuel et Des Télécommunications en Europe (IDATE), FTTH/FTTB penetration in the largest population, China, was 12.7% in 2014 on a household-base, and should have nearly doubled to some 23% in 2015E when coverage reached 100m households (see charts on next page). The progress appears to have been even faster on linearity of monthly builds, per data released by official site of China's Ministry of Industry & Information Technology (MIIT), in which penetration had already reached 25% in November 2015, or 114m households.

### Still room for FTTX penetration in global populations

As experienced by the tech-savvy countries with decent population sizes, such as South Korea (64% penetration in 2014) and Japan (54% in 2014), there is still room for further FTTX growth in China in our view, and this is not to mention that the penetration in many other countries with high populations is still low; for example, the US (c. 300m population/ 12% penetration in 2014), Russia (143m/27%), India (1.2bn/nil) and Indonesia (c. 240m/nil). Further FTTX growth potential worldwide is supported by China's push of its "One belt, one road" strategy, which aims to cement and expand political and economic co-operation on a national level across Asia, Europe and Africa following the ancient Silk Road (the belt) and the 21<sup>st</sup> century Maritime Silk Road (the road). This push may help expand China telecom vendors' FTTX coverage geographically through co-operation on infrastructure builds for countries in the "One belt, one road" loop. Indeed per our recent field surveys in the Photonics Valley of Wuhan, China, telecom majors such as Huawei and FiberHome are currently exporting over 50% of their FO transceiver sales.

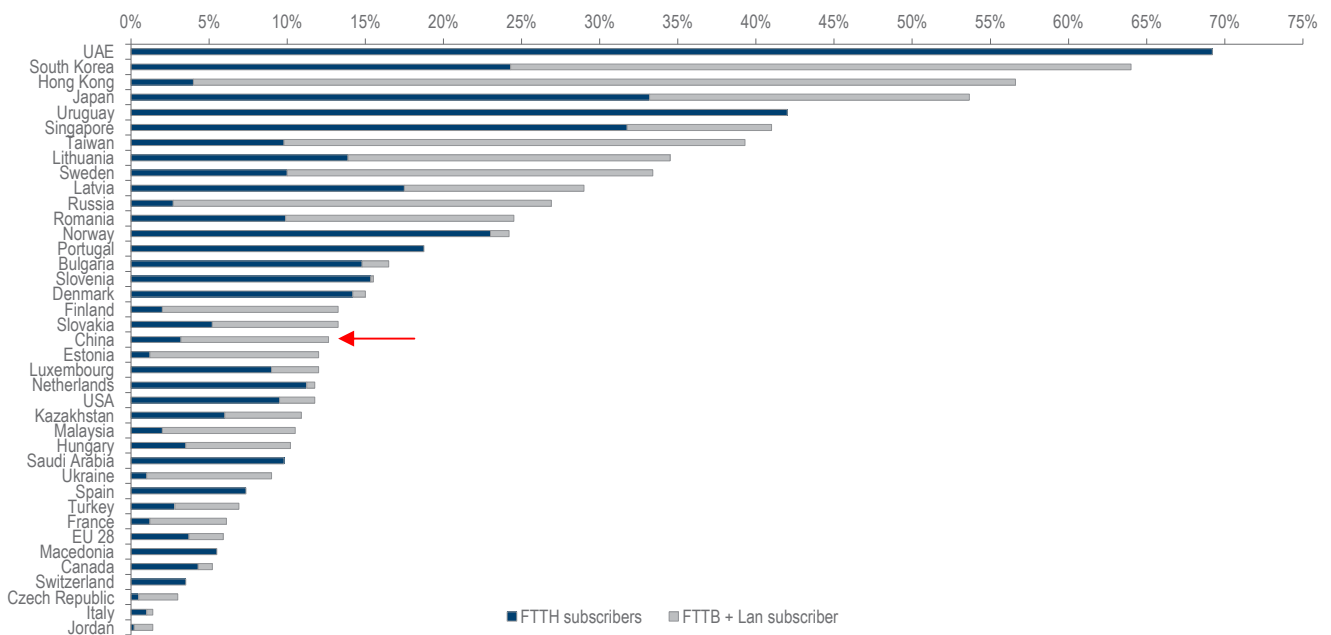
Based on our simple calculation, assuming China's penetration reaches 50% by 2020, the increase of household coverage from this country alone would help increase the global coverage by some 15% per year on an incremental basis from 2015 to 2020. Accordingly, we expect the global FTTX market to enjoy fast growth, expanding by a 20% CAGR over 2015-20. We estimate the market size was c.USD22bn in 2015 (+37% YoY), and should reach USD29bn in 2016E and USD54bn in 2020E. This should benefit related food chain players. Names to watch include Huawei, ZTE and FiberHome at the telecom-system end, Accelink and TrueLight at the transceiver module end, LandMark Opto and IQE at the epiwafer end, and AXT and Sumitomo at the substrate end (see the next section on the value proposition for more details).

**Global FTTX market forecasts**



Source: Photonics Technology & Industry Development Association (PTIDA), Daiwa forecasts

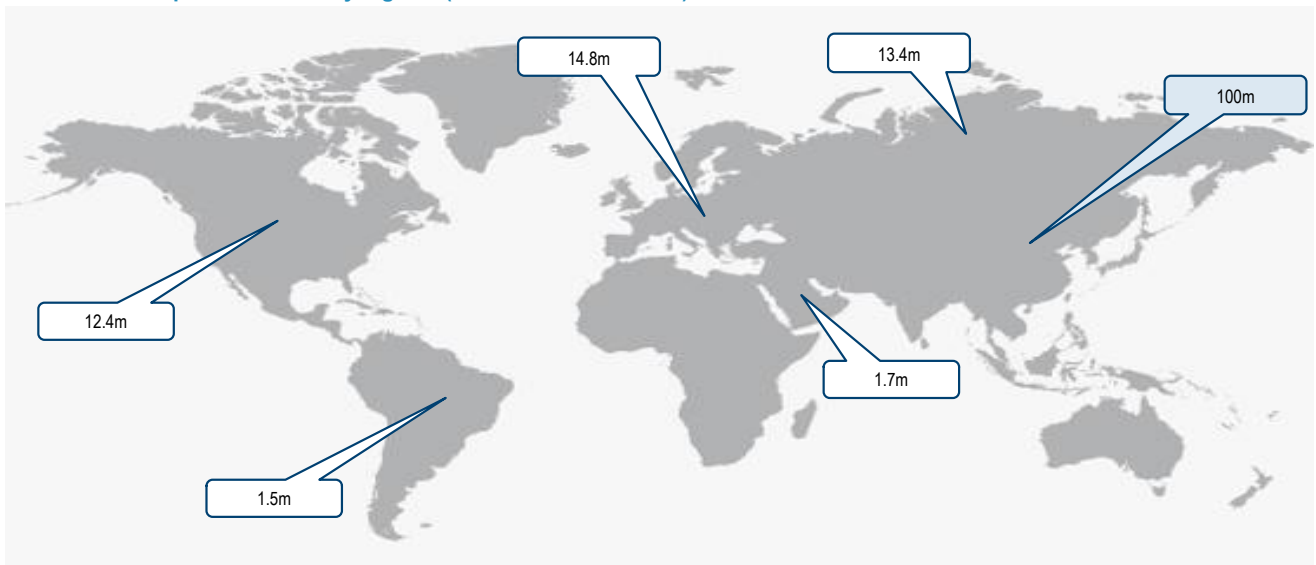
**2014 global ranking of FTTH/FTTB penetration**



Source: IDATE

Note: calculated on household basis rather than population

**2015E FTTH/FTTB penetration in key regions (number of households)**



Source: IDATE

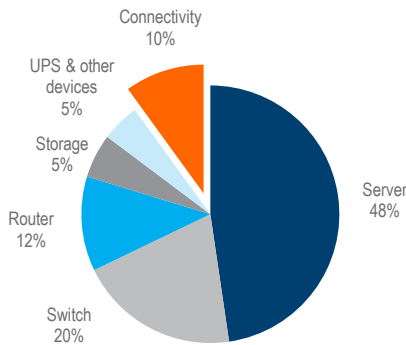
**Driver No.2: datacentres**

**2 fast-growing segments in the datacentre market: broadband FO and data storage**

Valued at c.USD115bn in terms of 2014 market size on our estimates, the global datacentre market consists of 6 demand segments in terms of product technologies: servers, switches, routers, storage, uninterruptible power supply (UPS) and other devices like cooling systems, and backbone connectivity (including transceiver modules and cables, see Appendix 1 for more details; the breakdown by value is depicted in the chart below). Although the outlook for total market growth looks mediocre, at only a low single-digit CAGR over 2015-20, we see data storage and broadband FO connectivity (10/40/100Gbps) for data transmission as the 2 fastest-growing segments. Both demand strengths should emerge against the backdrop of a rising Big Data ecosystem to spur storage capacity expansion and bandwidth upgrades at datacentres, where high-bandwidth FO cables are replacing low-bandwidth FO cables and traditional copper-wire cables, on our observations.

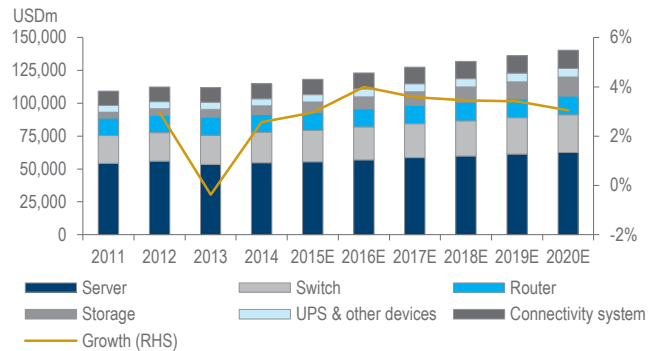
Accounting for only 10% of the datacentre deployment, on our estimates, backbone connectivity should see FO solutions with high-bandwidths ( $\geq 10\text{Gbps}$ ) as the fastest-growing item, among all others. We forecast revenue generated by 10/40/100Gbps FO connectivity to rise by 17% YoY for 2015 to USD5.9bn, 16% YoY for 2016 (USD6.9bn) and a 12% CAGR over 2015-20. Food chain players with businesses geared towards broadband FO solutions should benefit from this replacement demand, including Avago and TriQuint at the transceiver module end, ShunSin at the system-in-package (SiP) end, WinSemi at the foundry end and LandMark Opto and IQE at the epiwafer end. In addition, Intel should benefit the most from this trend since it aims to gain share in the FO transceiver market with its alternative, silicon-based solution, on top of the fast demand growth for the overall market.

**Datacentre breakdown by application (2014)**



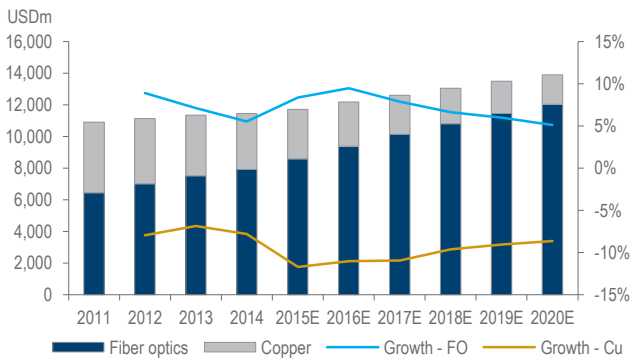
Source: IDC, Daiwa estimates

**Global datacentre market forecasts**



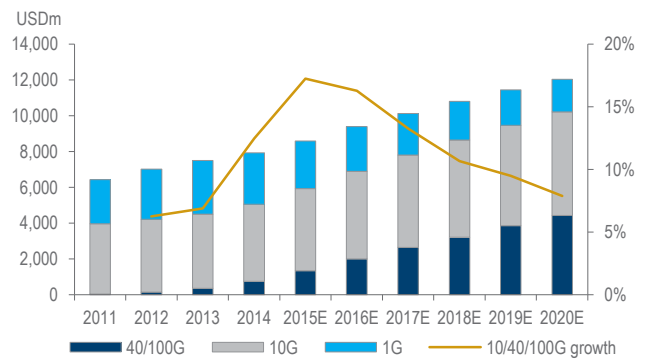
Source: IDC, Daiwa forecasts

**Backbone connectivity market forecasts**



Source: Daiwa estimates and forecasts

**FO transceiver market forecasts by bandwidth**



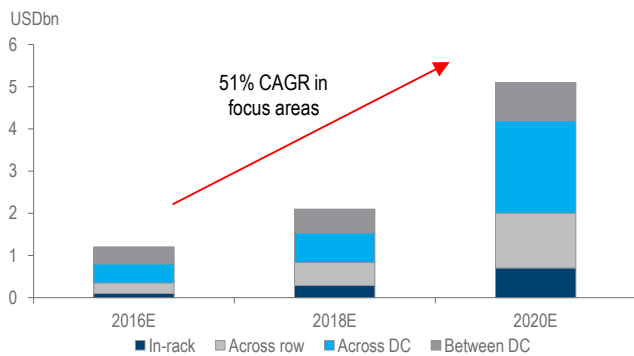
Source: Daiwa estimates and forecasts

### SiPhotonics the high-flier

#### SiPhotonics has double-whopping growth potential

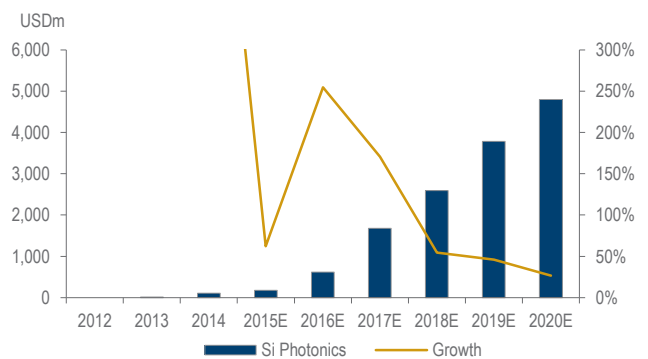
In light of the promising business outlook for the FO market from datacentre transformation (ie, bandwidth upgrades), Intel appears to be keen to push its SiPhotonics project, which aims to use silicon-based solutions fabricated with complementary metal oxide semiconductor (CMOS) process technologies to replace the mainstay FO transceiver modules which are produced based on the compound-semiconductor process technologies, such as gallium-arsenide (GaAs) or indium-phosphide (InP) (see Appendix 2 for more details on Intel's SiPhotonics project). This indicates the potential for SiPhotonics demand growth to double should Intel successfully gain market share from its compound-semi counterparts, such as Avago and TriQuint, in this already fast-growing broadband (>=10Gbps) FO market.

Intel: forecasts for datacentre connectivity TAM



Source: Intel forecasts  
Note: \* TAM = total addressable market; DC = datacentre

Daiwa's market forecasts for SiPhotonics



Source: Daiwa estimates and forecasts

#### We forecast the SiPhotonics market to increase at a 67% CAGR over 2016-20

Intel forecasts the total addressable market (TAM) for SiPhotonics to increase from USD1.2bn in 2016 to USD5.1bn in 2020, in terms of the optical module products (ie, FO transceiver modules) it offers, which represents a strong 51% CAGR in its focused areas of in-rack, across-row and across-datacentre depending on transmission distances. Intel's forecasts echo our bullish view on the SiPhotonics market, as we are eyeing a similar TAM by 2020, although we are more conservative for 2015-17 owing to our view of yield issues and customer qualifications in the initial ramp-up, given that SiPhotonics appears to be a premature substitute solution in the FO market relative to the long-existing compound-semi-based counterparts.

#### SiPhotonics vs. compound-semiconductors

Nevertheless, in our opinion, SiPhotonics solutions offer several advantages over their compound-semi counterparts as illustrated in the table below. In addition to lower costs when yields reach commercial levels, a SiPhotonics optical module offers high CMOS integration capability in which it can integrate with other silicon, like CPU, to handle inter-chip, or even intra-chip data transmissions in the long run on a motherboard to further enhance datacentres' performance. With the transmission rate scalable to even 400Gbps, a SiPhotonics optical module is capable of handling longer transmission distance than its compound-semi counterparts at a comparable transmission rate. For example, noise rises at a vertical cavity surface emitting laser (VCSEL) solution when speed goes to 25Gbps with distance over 30m (see our accompanying LandMark Opto initiation report for more on the types of LD: VCSEL, FP and DFB). Last but not least, SiPhotonics solutions consume less power.

**Comparison of SiPhotonics and compound-semi optical solutions**

Optical transceiver	Pros	Cons
Compound-semi	Long-proven solutions with high credibility Long-proven data transmission efficiency Better production yields	Cost higher Lower CMOS integration Shorter transmission distance Higher power consumption
SiPhotonics	Low cost High CMOS integration Longer transmission distance High transmission rate scalability Lower power consumption	Less proven credibility Yield issues at initial stages

Source: Daiwa

Net of these comparisons, we see a fair chance of SiPhotonics solutions claiming a significant share of the FO transceiver market, especially in the high-bandwidth segments. We forecast the SiPhotonics market to grow from USD0.2bn in 2015 to USD0.6bn in 2016 and USD4.8bn in 2020, yielding a CAGR of 67% over 2016-20. Despite coming off a low base, this should lead to SiPhotonics being the highest flier among other solutions in the FO transceiver module market. We see 2 implications of Intel's SiPhotonics development.

**Negative for compound-semi players**

We see the cannibalisation effect from SiPhotonics as a substitute dwarfing growth of the mainstay compound-semi solutions, with the extent of the impact depending on how successful Intel ramps up its market share. We assume Intel will ramp up its share from 1.4% in 2014 to 2% in 2015, 7% in 2016 and up to 40% in 2020, of the total FO connectivity market, or from 2% in 2014 to 3% in 2015, 9% in 2016 and up to 45% in 2020, in the broadband segment of 10/40/100Gbps or above. The compound-semi players, on the other hand, will likely see their market shares decline over the same period as a result of Intel's cannibalisation, yet still growing at a high single-digit percentage per year in 2016-17 thanks to the overall datacentres' bandwidth upgrades.

On the flip side, we believe this cannibalisation could speed up outsourcing from these compound-semi players which would benefit dedicated foundries like WinSemi, in the form of integrated device manufacturing (IDM) outsourcing for cost reductions.

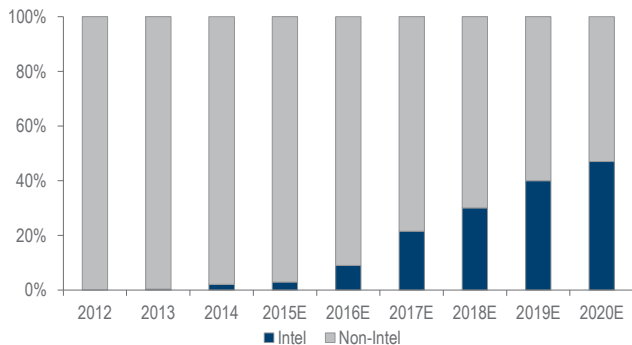
**Positive for Intel's food chain players**

As opposed to the existing compound-semi players, Intel's food chain suppliers helping facilitate the SiPhotonics ramp-up stand to benefit, in our opinion, especially those in the epiwafer segment as this is Intel's key focus of outsourcing due to the high technological barriers for this segment. We believe LandMark Opto is an exclusive supplier for Intel in this space, making Intel likely its biggest growth contributor in the next few years. As such, we forecast Intel's revenue contribution to LandMark Opto to rise from c.15% in 2015 to 25% in 2016 and over 40% in 2018 (see our accompanying initiation report).

**IDM outsourcing could happen, which would benefit WinSemi**

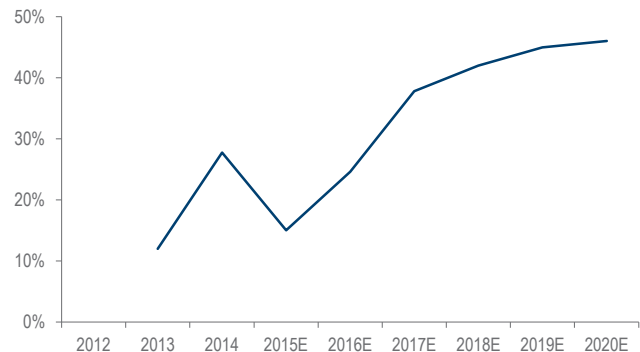
**LandMark Opto stands to benefit from SiPhotonics, in our view**

**Broadband FO (10/40/100G) market forecasts: Intel vs. non-Intel**



Source: Daiwa estimates and forecasts

**LandMark Opto: Intel's contribution to total revenue**



Source: Daiwa estimates and forecasts



**Other demand drivers include ADAS, IA, and longer term, 5G**

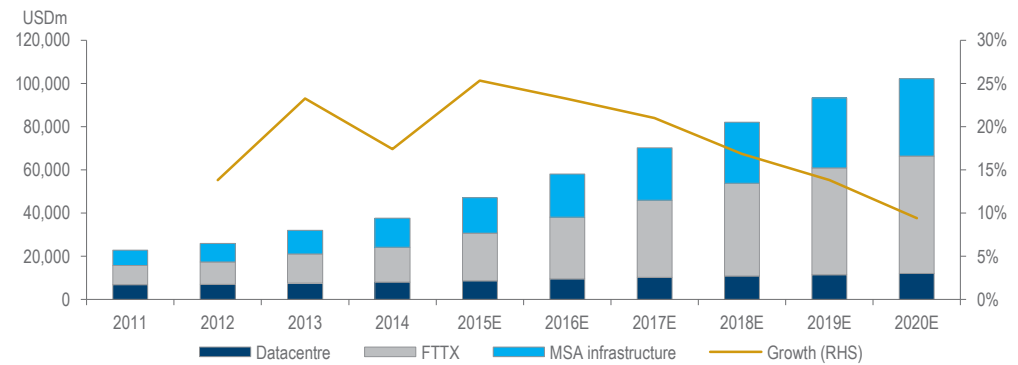
**Other demand drivers**

In addition to FTTX and SiPhotonics, cellular infrastructure has been another key driver for OC demand since 2010, based on our observations, thanks to the ramp-up of 4G base station builds as a result of the accelerated demand for 4G smartphones. However, as mentioned earlier, the 4G smartphone cycle is tapering off in growth terms, which should in turn lead to a contraction in demand growth for 4G cellular infrastructure going forward, while other emerging new demand segments should see robust growth. We expect the cellular infrastructure segment to pick up steam again only when the next cellular communication standard (ie, 5G) is deployed and ramps up volume which may not be seen before 2018, in our view.

Nevertheless, we see new demand emerging from the industrial & consumer segment to spur extra growth for OC, thanks to the high scalability of optical technologies. These new demand applications include laser detectors for the rising trend of advanced driver assistance systems (ADAS) in the smart-car IoT vertical under our Big Data/IoT theme, laser cutting/sensing for a variety of industrial automation (IA) applications such as semiconductor production equipment (SPE) and robotic arms, as well as 3D sensors for consumer electronics devices (game consoles for example).

We see demand growth from these areas as no worse than that for FTTX or SiPhotonics, but too fragmented to contribute any sizeable scale from each individual segment. We classify these new demand segments into the MSA infrastructure; overall we forecast the global OC market to grow by 23% YoY in 2016 to USD58bn, 21% in 2017 to USD70bn, and a CAGR of 17% over 2015-20 with the strength of growth led by FTTX and high-bandwidth FO connectivity in the datacentres.

**Global OC market forecasts**

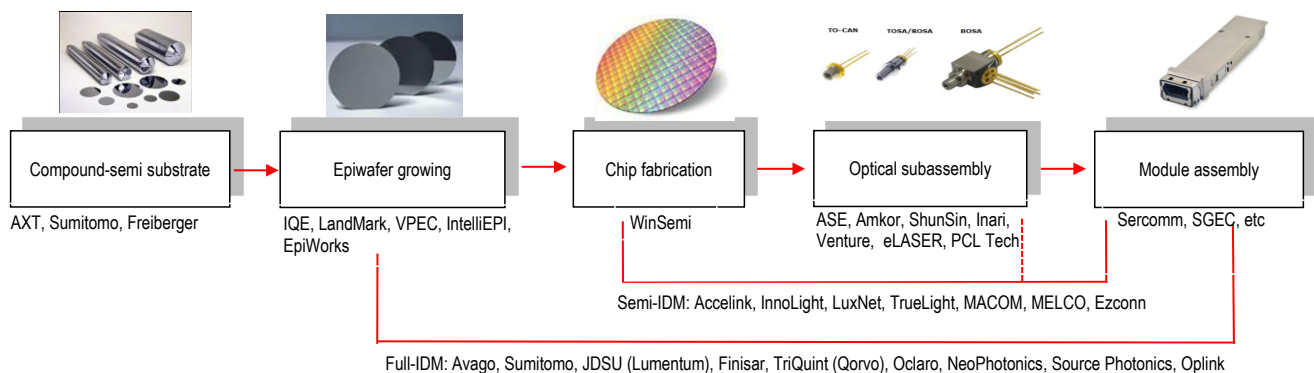


Source: Photonics Technology & Industry Development Association (PTIDA), Daiwa forecasts

## Value proposition: prefer upstream and IDM

We categorise the OC food chain into 5 segments: compound-semi substrates, epiwafer growing, chip fabrication (foundry), optical subassembly and module assembly. The chart below illustrates the food chain flows and major players in every segment of the chain. Per our analysis of the value proposition across the chain, the upstream epiwafer-growing segment and subassembly look to be enjoying the highest value in terms of profitability, followed by foundry, module and substrate. We therefore prefer the upstream and selective vertically integrated device manufacturers (IDM) when it comes to OC investment, and recommend investors buy LandMark Opto (epiwafer) and WinSemi (foundry). Despite us having no rating on them, other names to watch at the food chain in Asia, including VPEC (epiwafer), ShunSin (SiP), Accelink (IDM) and TrueLight (IDM) (see our company section for more details).

### The optical communication food chain



Source: Daiwa

## Food chain analysis

The production of an OC transceiver module typically starts from:

- Procuring a compound-semiconductor substrate from the likes of AXT or Sumitomo, which grow a compound-semi ingot and slice it into pieces of substrates.
- Growing epitaxial layers onto the substrate to form an epiwafer, done by the likes of LandMark Opto or IQE, or IDM in-house epiwafer-growing divisions such as Avago or Sumitomo.
- Fabricating the epiwafer into a finished wafer with thousands of dies on it depending on wafer size (typically 2" and 3"), and testing the chips by foundries such as WinSemi or IDM in-house divisions like Avago, Finisar, Lumentum, Accelink or TrueLight.
- Assembling the chips into an optical subassembly module that receives and transmits FO signals (ie, TOSA, ROSA and BOSA [see Appendix 1 for elaboration]) through system-in-package (SiP) technologies by the likes of ShunSin or ASE, or IDM in-house. The subassembly process can be further divided into transistor outline canister (TO-Can) manufacture and optical subassembly (OSA).
- Integrating the OSA with electronic subassembly (ESA), housing and other components into a FO transceiver module by the likes of Accelink, MACOM or Sercomm, or IDM in-house system integration, and finally selling to end-users in the OC infrastructure of telecom companies like Huawei, ZTE or FiberHome, or other enterprises that operate public or private datacentres.

## Value proposition across the chain

**Epiwafer > OSA > foundry > module > substrate**

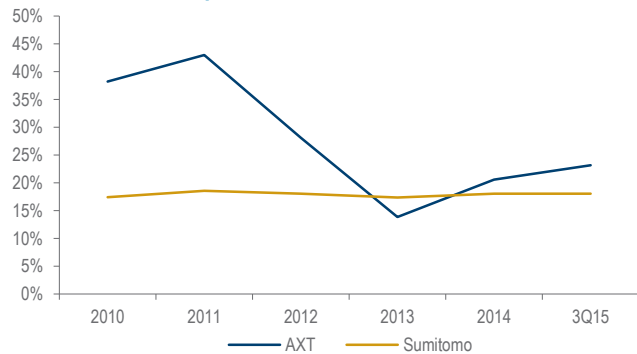
The price mark-ups across the OC food chain are roughly 3-25x per segment, from the substrate, epiwafer to the transceiver module, based on our market research. In terms of value proposition across the food chain, the upstream epiwafer-growing and OSA segments seem to enjoy the highest profitability, followed by the foundry and transceiver module segments on a selective basis, while the substrate segment looks the lowest. We note, however, this comparison could be somewhat biased since some companies like Sumitomo and Avago operate a fully-integrated IDM model while others like Accelink and TrueLight operate a semi-integrated IDM model. These IDM setups indeed increase the complexity of how to get the OC food chain profitability right, in our opinion.

**High entry barriers to epiwafer-growing**

We attribute the epiwafer's high value proposition across the OC food chain to: 1) the strong technological barriers for this segment (for example, proprietary epitaxial-growing know-how to build the right atomic structures to ensure light travels effectively at the right angles), and 2) less price-sensitive end users (ie, enterprise users), which operate in the infrastructure markets, where there is more emphasis on quality and reliability than price and fashion, relating to their corresponding consumer markets (for example, smartphone vendors).

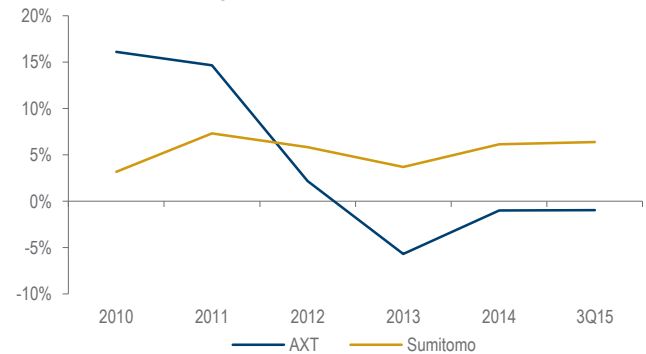
As the charts below depict, the epiwafer segment delivered mid- to high-teens percentage ROE per year on a 35% gross margin (GM) on average over 2010-3Q15, compared with around 20% ROE/22% GM for the OSA, 14% ROE/33% GM for the foundries, 11% ROE/26% GM for the module assembly and single-digit ROE/23% GM for the substrate segment. Note: our sample of comparison includes listed companies only.

**Substrate: GM comparison**



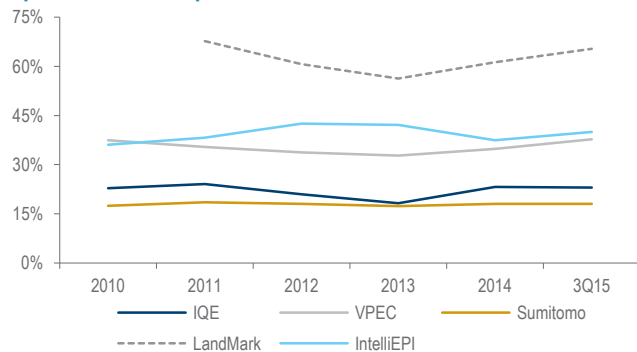
Source: Companies

**Substrate: ROE comparison**



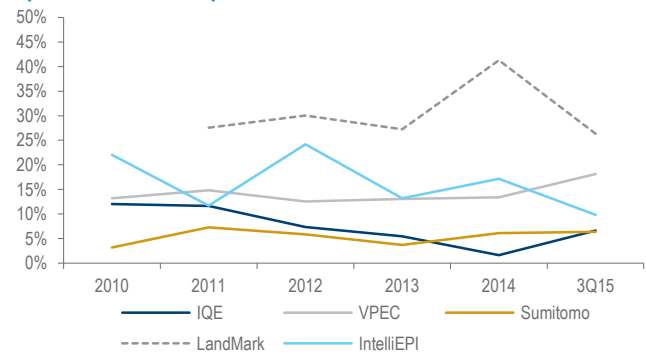
Source: Companies

**Epiwafer: GM comparison**



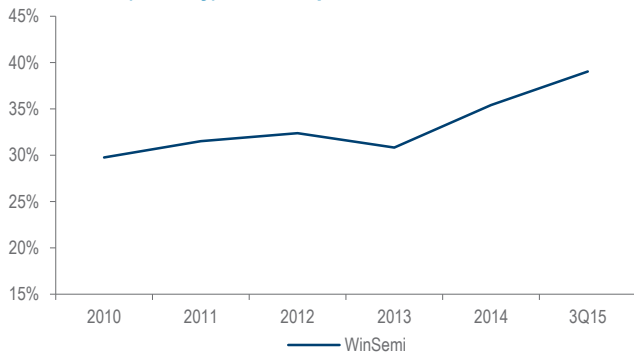
Source: Companies

**Epiwafer: ROE comparison**



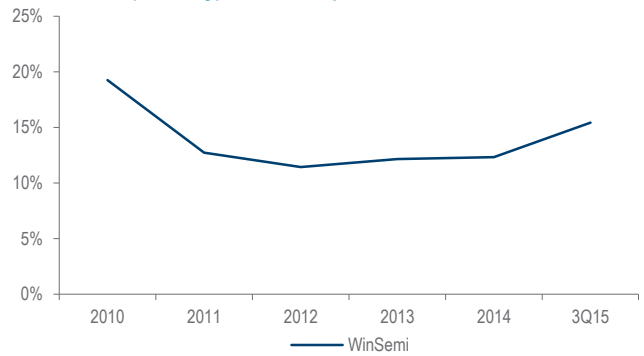
Source: Companies

**Fabrication (foundry): GM comparison**



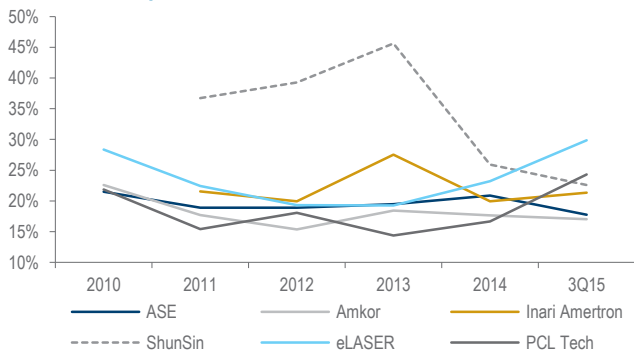
Source: Company

**Fabrication (foundry): ROE comparison**



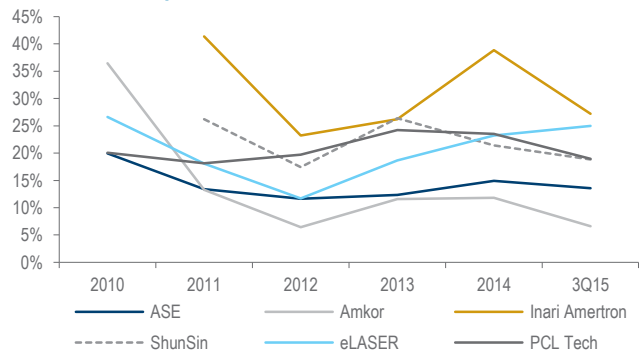
Source: Company

**OSA: GM comparison**



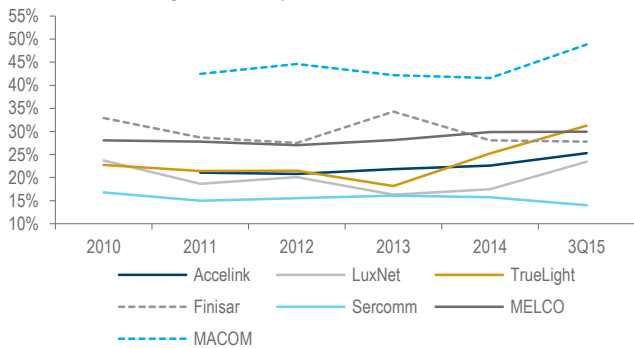
Source: Companies

**OSA: ROE comparison**



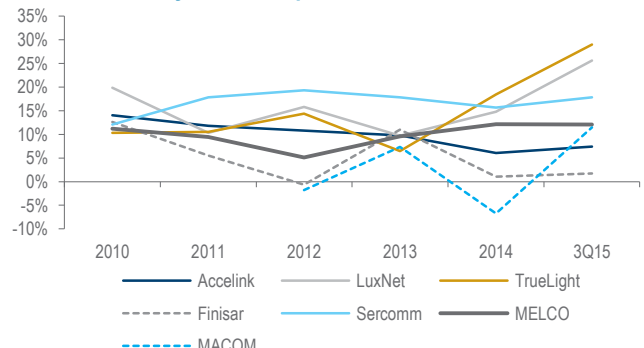
Source: Companies

**Module assembly: GM comparison**



Source: Companies

**Module assembly: ROE comparison**



Source: Companies

**Daiwa's stock ideas**

**Daiwa's OC picks:  
LandMark and WinSemi**

We prefer the upstream and selective IDM to the downstream segments in the OC food chain and recommend LandMark Opto in the epiwafer space and WinSemi in the dedicated foundry space. Though currently without ratings, Accelink (IDM), TrueLight (IDM), VPEC (epiwafer) and ShunSin (SiP) are names to watch in Asia, among others in the food chain.

**LandMark Opto**

**Initiating with Buy (1)  
call and 12-month TP of  
TWD666**

We initiate coverage of LandMark Opto with a Buy (1) rating and 12-month TP of TWD666, which is based on our ROE-adjusted PBR of 9x. As opposed to most epiwafer makers operating a hybrid model growing epiwafers for both OC and microwave communication (MC), LandMark Opto is a pure player growing only epiwafers for OC applications.

We see LandMark Opto, the largest OC epiwafer vendor in the world by revenue, as the most profitable OC player in the supply chain, in terms of profitability and ROE, across the

OC food chain, thanks to its participation in the high-flying SiPhotonics project, on top of the fast-growing demand for FTTX and 4G infrastructure builds, which have been driving its business growth. In addition to its 2 key growth drivers of FTTX and SiPhotonics going forward, other pockets of potential growth include laser solutions for consumer, automotive and industrial applications (see our accompanying initiation report for more details).

### WinSemi

**Reiterating Buy (1) call and 12-month TP of TWD63.5**

Since our initiation, we have been a buyer of WinSemi for its multiple demand drivers, which should last for multiple years. Our 12-month TP is TWD63.5, which is based on a 2.1x PBR. Unlike LandMark Opto's pure OC exposure, WinSemi operates a hybrid foundry model with business exposure to both OC and MC, with the latter currently accounting for over 90% of revenue with focused products including radio frequency (RF) power amplifiers (PA) for cellular and WiFi wireless communication architecture based on compound-semi process technologies (see [Big Data traffic builder](#), 2 January 2015).

**Current business drivers: 4G and WiFi upgrades**

WinSemi has enjoyed a strong business recovery on the back of accelerating 4G smartphone penetration and WiFi upgrades. We expect such strength to continue on the back of: 1) the continued rise of 4G penetration to support demand for its cellular PAs in the near term, from both smartphones in the end-market and base stations in the infrastructure market, and 2) continued WiFi upgrades to 802.11ac dual-band and multi-input, multi-output (MIMO) solutions in the longer term, driven by the increased adoption in smartphones and the rise of smart-home applications to spur home-gateway upgrades, thanks to the Big Data/IoT cycle that requires bandwidth upgrades for household mobile data transmission.

**Long-term business driver: OC**

Currently an insignificant revenue contributor, OC should be WinSemi's potential long-term growth driver, in our view. A typical OC transceiver module consists of OSA which includes optical receivers (pin diode) and transmitters (laser diode), and ESA which includes modulators, waveguide, multiplexer/de-multiplexer, IC controllers and passive components. WinSemi currently mass-produces modulator chips of ESA for its customers and has been in the process of developing the foundry works for pin diodes for OSA, which we believe it will commercialise sometime in 2016.

Please see our company section for more details at the company level.

## Risks to our sector stance

We identify 3 key risks to our Positive stance on the OC sector:

- **FTTX coverage below expectation.** Our positive FTTX market forecasts are premised on the still-ample room for global FTTX household coverage to rise, especially in China. Should coverage ramp up slower than we expect, FTTX demand could turn out to be weaker than expected.
- **Datacentre bandwidth upgrade below expectation.** Our positive forecasts for the broadband FO connectivity market are premised on fast bandwidth upgrades from the global datacentre transformation spurred by the expansion of the Big Data/IoT ecosystem to drive a replacement cycle between the high-bandwidth FO and low-bandwidth FO/copper-wire cables. Should the Big Data demand fail to grow as rapidly as we expect, FO connectivity replacement demand could turn out to be weaker than expected.
- **Substitute competition between silicon and compound-semi.** Intel's active push of the SiPhotonics solution appears to be a wild-card in the broadband FO connectivity market, in our view, as it may introduce price competition from the incumbents of the compound-semi-based solution providers to defend market shares. Should the price competition become harsher than we expect, the total size of the FO connectivity market could turn out to be below our forecast in dollar value.



## Global OC supply-chain valuation comparison

Stock	Ticker	Price (LC)*	MktCap (USDm)	PER (x)			PBR (x)			ROE (%)			Earnings growth YoY (%)		
				2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E
<b>Compound-semi substrate</b>															
AXT	AXTI US	2.63	86	nm	nm	na	0.6	0.6	na	na	0.3	na	nm	nm	na
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
Average				11.4	9.3	8.5	0.7	0.6	0.7	6.9	4.1	8.0	-18.1	20.2	7.7
<b>Epiwafer growing</b>															
LandMark Opto	3081 TT	502.00	1,058	35.9	24.0	16.0	9.8	7.8	6.0	38.6	36.2	42.5	59.4	49.4	50.2
IQE	IQE LN	0.18	171	7.2	6.4	5.8	0.9	0.8	0.7	12.9	12.6	11.4	966.2	11.5	5.2
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
VPEC	2455 TT	50.50	375	20.5	17.4	17.2	3.5	3.2	3.3	17.2	17.9	18.8	29.8	12.8	5.4
IntelliEPI	4971 TT	131.50	136	31.6	25.0	na	4.1	na	na	12.0	13.2	na	-19.8	27.4	na
Average				21.3	16.4	11.9	3.8	3.1	2.7	17.5	17.6	20.2	203.5	24.3	17.1
<b>Epiwafer foundry</b>															
WinSemi	3105 TT	55.00	989	12.2	10.4	9.0	2.0	1.8	1.6	16.5	17.8	18.6	37.2	16.8	16.2
<b>Dedicated SiP</b>															
ASE	2311 TT	34.30	8,497	14.7	12.6	9.8	1.7	1.6	1.5	12.1	13.1	15.9	-18.7	16.6	28.6
Amkor	AMKR US	4.36	1,035	18.2	10.4	8.2	0.9	0.8	na	7.0	8.6	na	-42.4	37.1	na
Venture	VMS SP	7.95	1,565	14.2	13.0	11.8	1.2	1.2	1.2	8.2	8.9	9.9	9.7	9.4	12.0
Inari Amertron	INRI MK	3.13	710	15.0	12.3	11.1	4.4	3.6	3.0	32.4	31.7	30.1	29.5	21.1	14.9
ShunSin	6451 TT	93.40	296	9.5	9.5	na	2.2	2.1	na	22.0	21.0	na	9.3	2.2	na
eLASER	3450 TT	134.00	371	11.3	11.7	11.3	3.7	2.9	1.9	30.1	26.8	21.4	45.4	-3.3	3.5
PCL Tech	4977 TT	57.60	89	11.9	11.1	10.1	2.1	1.4	1.3	17.3	16.4	13.3	1.1	7.0	7.2
Average				13.5	11.5	10.4	2.3	1.9	1.8	18.4	18.1	18.1	4.9	12.9	13.2
<b>Subassembly (semi-IDM)</b>															
AcceLink	002281 CH	56.41	1,817	57.1	37.0	27.6	4.5	4.2	3.5	8.3	10.9	12.8	44.0	48.2	39.8
TrueLight	3234 TT	87.00	272	8.2	8.1	7.8	4.0	2.8	na	37.8	41.6	40.6	143.2	39.0	18.8
LuxNet	4979 TT	73.00	163	11.3	9.9	na	3.0	2.6	na	23.9	29.2	na	138.7	25.9	na
Sercomm	5388 TT	81.50	592	14.9	12.2	10.9	2.8	2.6	2.3	18.4	20.5	22.5	38.0	20.8	13.8
MACOM	6503 JP	1,074.00	20,247	10.4	10.0	9.1	1.2	1.1	1.0	11.5	11.1	11.2	-5.3	4.0	9.8
MELCO	MTSI US	36.96	1,962	19.4	14.1	13.1	5.3	na	na	25.4	26.0	na	114.7	32.4	-0.8
Average				20.9	15.2	13.7	3.5	2.6	2.3	20.9	23.2	21.8	78.9	28.4	16.3
<b>Full IDM</b>															
Avago	AVGO US	126.24	51,937	13.0	12.2	12.1	5.6	4.3	3.4	43.7	36.1	35.5	109.5	9.3	0.7
Finisar	FNSR US	13.37	1,430	14.7	11.6	9.2	1.3	1.2	na	7.9	12.2	na	724.2	30.0	27.2
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
Lumentum	LITE US	23.81	1,407	21.3	16.9	14.0	2.8	2.5	na	14.1	14.8	15.7	nm	26.6	-5.0
Average				15.1	12.5	11.0	2.6	2.2	2.0	18.1	17.7	19.7	271.9	21.5	7.7
<b>MOCVD</b>															
Aixtron	AIXA GY	3.17	398	nm	nm	75.5	0.9	0.9	0.9	-7.9	-3.6	0.8	nm	nm	nm
Veeco	VECO US	18.77	769	38.6	25.8	16.1	1.0	1.1	1.1	-0.9	-0.5	2.5	nm	18.0	108.3
Average				38.6	25.8	45.8	1.0	1.0	1.0	-4.4	-2.0	1.7	na	18.0	108.3

Source: Bloomberg (for NR companies), Daiwa forecasts (for rated companies)

Note: \*local currency based on share prices as of 16 February 2016; March year-end for Sumitomo Electric and MELCO, April year-end for Finisar, June year-end for Lumentum (JDSU), September year-end for MACOM, October year-end for Avago; 2015E=FY16E, 2016E=FY17E, 2017E=FY18E

## Appendix 1: glossary of terms

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**Optical-communication system.** Also known as an optical-network system, an optical-communication (OC) system uses a transmitter (laser diode) that encodes a message in the form of light into an optical-signal channel (ie, a fibre-optic cable), which then carries the signal to its destination and a receiver (photo diode) which reproduces the message from the received optical signal. There are 2 types of optical network (ON): passive ON (PON) and active (AON). As opposed to PON, an AON offers fibre-optic transmission combined with electrically powered switches or routers to distribute signals.

**PON.** Passive Optical Network (PON) is a fibre-optical network that uses fibre and passive components like splitters and combiners, rather than active components like amplifiers, repeaters or shaping circuits. Structured as a point to multi-point (P2MP) network, a PON consists of an **optical line terminal (OLT)** at the service provider's central office and a number of **optical network terminals (ONT)**, which are near end-users. Popular variants are GPON and EPON.

**EPON.** Developed by the Institute of Electrical and Electronic Engineers (IEEE), an Ethernet passive optical network (EPON) is based on the Ethernet standard 802.3 and assumes that data starts and ends in the form of an Ethernet. EPON provides symmetrical data rates in the direction of both downstream and upstream, at 1.25 gigabits per second (Gbps).

**GPON.** Ratified by the International Telecommunication Union (ITU) as a master communications standard, a gigabit passive optical network (GPON) is the most current fibre-optic network allowing a scalable bit rate, but the industry has converged on the standard, at a downstream rate of 2.5Gbps and 1.25Gbps for upstream.

**FTTX.** Fibre-to-the-x (FTTX) is a generic term that represents forms of broadband network architecture using optical access to provide all or any part of the local loop for the last mile telecommunication. Commonly known variants include fibre-to-the-home (FTTH), fibre-to-the-office (FTTO), fibre-to-the-building (FTTB), fibre-to-the-node (FTTN), etc.

**MSA.** The evolution of today's optical transceivers and transponders is driven by multi-source agreements (MSA), which have established standards for optical and electrical characteristics, module form factors and the pin functions of optical transmitters and receivers. In more recent years, emerging MSAs have stipulated that optical system designers incorporate various diagnostic functions into transceivers, as well as the traditional monitoring and control functions. These requirements are in addition to an overall drive to continue to minimize the size and cost of the optical transceiver design.

**SAN.** A storage area network (SAN) is a high-performance network that enables connectivity between servers and storage devices by removing the storage that is originally connected to each server to form a shared pool of storage devices and allow multiple servers to access data.

**MAN.** A metropolitan area network (MAN) is a network that interconnects users with computer resources in a geographic area. The set-up is similar to a local area network (LAN) but spans an entire city and even surrounding areas. MANs are formed by connecting multiple LANs, and the connection of multiple MANs creates a WAN.

**WAN.** A wide area network (WAN) is a type of computer network that covers a relatively large geographical area to transmit data between different LANs, MANs and other localised computer network architecture.

**SONET.** Synchronous optical networking (SONET) is a standardised digital communication protocol that is used to transmit a large volume of data over relatively long distances via an

optical intermediary. SONET is a product developed by the American National Standards Institute (ANSI), whereas the international equivalent is synchronous digital hierarchy (SDH).

Illustration of backbone connectivity for datacentres



Source: SoFla Networking

Illustration of a fibre-optic transceiver module



Source: Ingellen

**Backbone connectivity.** A backbone connectivity for a datacentre consists of one transceiver module and one data transmission cable. While the transceiver receives and transmits signals (data), the cable carries signals. The signals can be electrical or in the form of light, while the cable can be made of copper wire or fibre-optics. The connectivity offers a backbone solution for data transmission by physically connecting machines (ie, server-to-switch, switch-to-switch, switch-to-router and even server-to-server machines). Depending on the transmission distance, the connectivity can be in-rack, rack-to-rack, row-to-row within a datacentre and for datacentre-to-datacentre.

**Transmission cables.** There are 2 types of cable commonly used for data transmission in the wireline communication industry: copper wire and FO, with the key difference being the transmission rate (or bandwidth) that they each offer, and the other difference being stability. Copper-wire cables deliver a bandwidth ranging from 100 megabit per second (Mbps) at a spec of Cat.5e, up to 1 gigabit per second (Gbps) at Cat.6. At the high end, Cat.7 copper-wire cables can offer bandwidth of up to 10Gbps. FO cables, on the other hand, deliver bandwidth ranging from 1Gbps to 100Gbps, and can reach as high as 400Gbps.

**TOSA.** A transmitter optical sub-assembly (TOSA) comprises a laser diode, optical interface, monitor photodiode, metal and/or plastic housing, and electrical interface. Other components may be included such as filter elements and isolators, depending on the required functionality and application.

**ROSA.** A receiver optical sub-assembly (ROSA) consists of a photodiode (pin diode), optical interface, metal and/or plastic housing, and electrical interface. Depending on the required functionality and application, other components may be included such as amplifiers.

**BOSA.** A bidirectional optical sub-assembly (BOSA) consists of a TOSA, a ROSA and a wavelength division multiplexing (WDM) filter.

**TO-Can.** A transistor outline canister (TO-Can) is the most popular type of package for the laser diode. A TO-Can has 3 pins: 2 are a cathode and anode for the laser diode chip, and the other is a cathode for output monitoring. The top of the silver cylinder is the output window, from where the laser light emitted from (see an example below).

### An example of TO-Can



Source: Photontics.com

### An example of TOSA/ROSA



Source: California Eastern Laboratories

**CMOS.** A complementary metal oxide semiconductor (CMOS) is a type of transistor that produces either a positive MOS (PMOS) or negative MOS (NMOS) charge at any given time. As 1 of the circuit types is always turned off, CMOS chips only draw power when switching between the on and off mode. Thus, CMOS runs efficiently, using much less power than chips using just 1 type of transistor. The CMOS process technology is widely used for a variety of logic and mixed-signal integrated circuits (IC) production. Intel, TSMC, SEC and Toshiba, to name a few, are the leading players in the global CMOS space.

**Compound-semiconductors.** Compound-semiconductors (compound-semi) refer to a semiconductor consisting of 2 or more chemical elements on top of a silicon substrate. The compound-semi can form binary (2 elements such as gallium arsenide [GaAs]), ternary (3 elements, such as indium gallium arsenide [InGaAs]), and quaternary (4 elements such as aluminium gallium indium phosphide [AlInGaP]) chemical elements. In terms of technological applications, the compound-semi is commonly used in LEDs, microwave communications, optical communications and solar panels.

**LED.** A light emitting diode (LED) is a two-lead, positive-negative (p-n) junction diode semiconductor light source that releases energy in the form of photons, when a suitable voltage is applied to it. The colour of the light emitted is determined by the energy band gap of the semiconductor. LEDs are often small in area/size (less than 1mm<sup>2</sup>) and are used in a wide range of applications, such as light sensors, general lighting, aviation lighting or are packaged to form images on a jumbo television screen, traffic signals and automotive headlamps.

## Appendix 2: Silicon Photonics

The Silicon Photonics (SiPhotonics) segment is likely to be the high-flyer from 2016, in terms of demand and market size growth, among the other players in the global FO connectivity market, driven by the push from Intel. The total addressable market (TAM) for SiPhotonics will grow to USD5.1bn for 2020, from USD1.2bn for 2016, according to Intel's forecasts, yielding a strong 51% CAGR in its focus areas of in-rack, across-row and across-datacentre, depending on the data transmission distances within a datacentre.

### What is SiPhotonics?

**A SiPhotonics solution is a silicon-based substitute for the compound-semi-based optical transceiver**

Gaining popularity as a substitute for compound-semiconductor (compound-semi) optical modules in datacentres, SiPhotonics is a silicon-based solution that places an epiwafer on the top of a silicon wafer to offer light reception and transmission (ie, a photo-transceiver). A typical optical module (ie, an FO transceiver module) consists of a transceiver, modulator, waveguide, multiplexer/de-multiplexer, IC controller and other passive components, where the transceiver is the most important part of the optical module, and offers the highest margin. Most of the components in the transceiver are made using compound-semi technologies, such as indium phosphide (InP), which perform better than the gallium arsenide (GaAs).

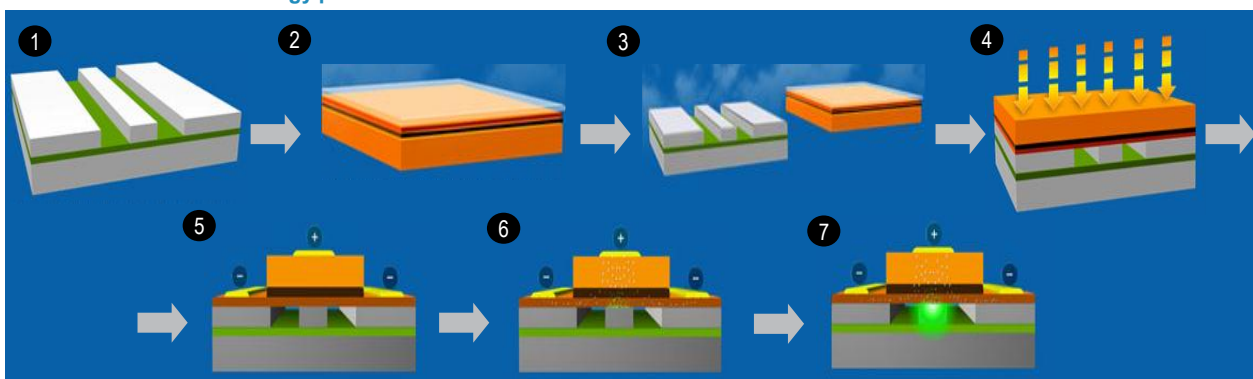
A SiPhotonics solution, however, offers a cheaper substitute that is able to cover long transmission distances with comparable bandwidths, if not higher in the long run. An optical transceiver consists of a pair of lasers: a photo diode (or pin diode) that receives light and a laser diode that transmits light, also known as an optical subassembly (OSA).

### How do SiPhotonics work?

Illustrated in the following chart, a SiPhotonics optical transceiver starts with a traditional silicon wafer (usually 12" or 300mm in size) where:

1. A waveguide is etched onto it first
2. An indium-phosphide (InP) epiwafer is processed to act as a light emitter (Intel outsources this process to an epiwafer maker, which we believe is LandMark Opto)
3. Both the silicon wafer and epiwafer are exposed to oxygen plasma to form a glass glue
4. The 2 wafers are bonded together using heat
5. The InP epiwafer is etched and electrical contacts are added to it
6. Photons are emitted from the InP epiwafer when a voltage is applied to it
7. The light is coupled into the silicon waveguide, which forms a laser cavity, allowing the laser light to emanate from the device. A SiPhotonics transceiver is formed

SiPhotonics transceiver technology process



Source: Intel

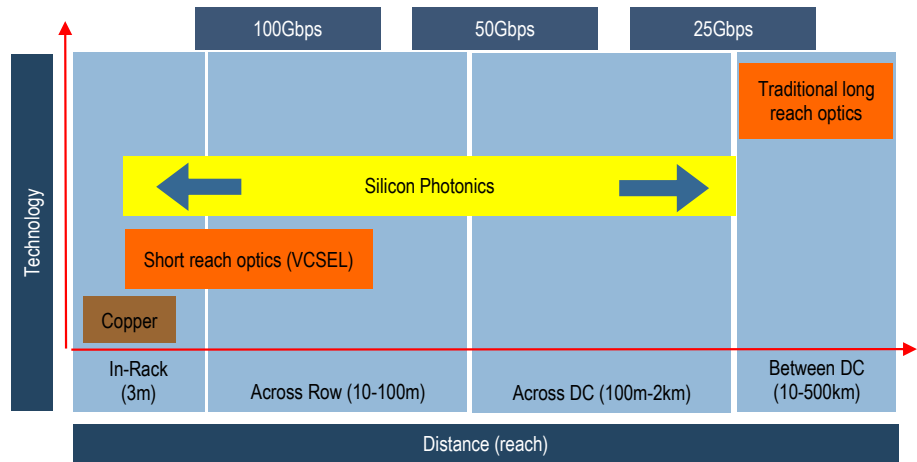


## What is the target market?

**Target market includes virtually all the data transmission distances within a datacentre, except the long-haul segment**

As said, a SiPhotonics transceiver targets the backbone connectivity segment of the datacentre market, serving as a substitute solution for the compound- semi optical transceiver module, to ride on the rising demand for bandwidth upgrades at datacentres. According to Intel, the datacentre connectivity landscape can be presented by technology (copper, compound-semi, SiPhotonics) on the vertical and by data transmission distance on the horizontal, as the following chart depicts, where Intel aims to use its SiPhotonics solution to tap into across-row segments (distance: 10-100 metres) and across datacentres (100m to 2km) first, and then expand its footprint into the in-rack area (less than or equal to 3m), which could even include the very short distances of chip-to-chip or in-chip segments to expand the TAM in the long run.

Datacentre connectivity landscape



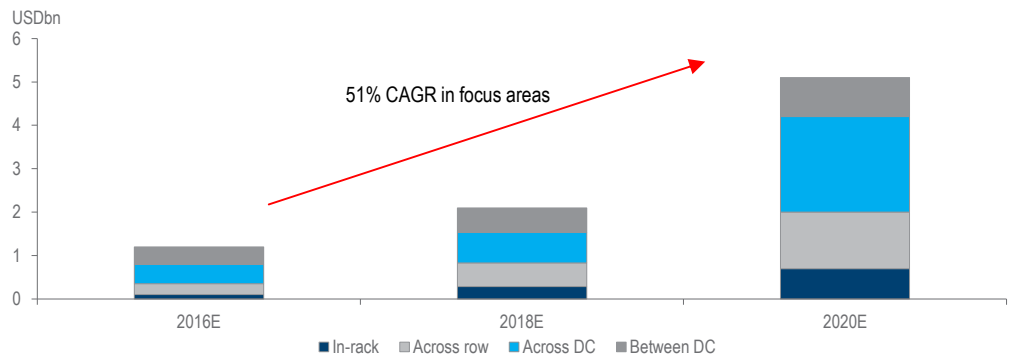
Source: Intel, Daiwa  
Note: \* DC = datacentre

## How big is the total addressable market?

**Market likely to reach USD5bn in 2020**

Intel forecasts its SiPhotonics TAM to be around USD1.2bn for 2016, growing to USD5.1bn for 2020, representing a strong 51% CAGR over the 2016-20E for its focus areas of in-rack, across-row and across-datacentre, depending on the data transmission distance within a datacentre (covering virtually all distances except for the long haul). This growth is apparently stronger than that for mainstay solutions, comprising compound-semi-based FO, the total addressable market for which could decline by a CAGR of 4-5% over 2016-20 due to Intel’s cannibalisation, in our view.

Intel: forecast of datacentre connectivity TAM



Source: Intel forecasts

# LandMark Optoelectronics (3081 TT)

 Target price: **TWD666.00**

 Share price (16 Feb): **TWD502.00** | Up/downside: **+32.7%**

5 4 3 2 1


**Buy**  
 (initiation)

## Initiation: moving ahead at light speed

- The largest pure OC epiwafer supplier in the world
- Two significant business growth engines: FTTX and SiPhotonics
- Initiating with a Buy (1) call and 12-month TP of TWD666

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**Investment case:** We initiate on LandMark Optoelectronics with a Buy (1) call and 12-month TP of TWD666. As the world's largest pure optical communications (OC) epiwafer supplier, LandMark Opto has captured the most value proposition in the OC food chain, in our view, thanks to the high entry barriers it has created with its proprietary recipe for epiwafer-growing technology for optical transceivers. Its key business growth drivers are FTTX for "last mile" broadband infrastructure builds and Silicon Photonics (SiPhotonics) for datacentre transmission bandwidth upgrades.

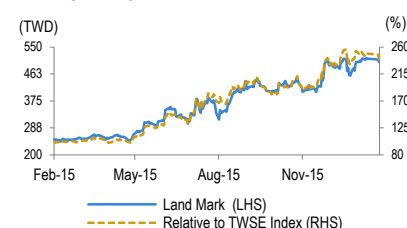
**Catalysts: FTTX the strong cash cow.** Currently accounting for most of its business (around two-thirds of 2015 revenue), fibre-to-the-x (FTTX) broadband communication deployment looks likely to be a multi-year demand driver and serve as LandMark Opto's cash cow. On the back of still ample room for global household coverage to grow, especially in China, we forecast FTTX market in dollar terms to see a CAGR of some 20% over 2015-20. With nearly 30% of the market in 2015E after the food-chain value mark-ups, LandMark Opto stands to benefit from this multi-year growth trend, in our view (see our accompanying OC sector report for details).

**SiPhotonics the high-flier.** Based on our observations, datacentres are witnessing bandwidth upgrades with high-bandwidth fibre-optic (FO) connectivity solutions replacing low-bandwidth FO and copper wires, thanks to the rise of the Big Data/IoT cycle. Intel's push of SiPhotonics solutions marks an attempt to gain share at the expense of the mainstay compound-semi solutions in this fast-growing FO connectivity market, which we believe could see SiPhotonics become a second business growth engine for LandMark Opto in addition to FTTX. LandMark Opto stands to benefit from strong SiPhotonics demand, as we believe it is one of the exclusive epiwafer suppliers to Intel. We forecast LandMark Opto's SiPhotonics revenue to rise by a CAGR of around 100% over 2015-18.

**Valuation:** We forecast LandMark Opto's net profit to see a 43% CAGR over 2015-18 and its ROE (single year) to reach the highest level of 33-38% in the OC food chain, with constant positive free cash flow. We rate the stock a Buy (1) given what we regard as its significant earnings growth potential, sustainable high margin/ROE and strong balance sheet, against the backdrop of the robust outlook for the OC industry. We set our 12-month TP at TWD666 based on a 9x ROE-adjusted PBR applied to 2016-17E average book value.

**Risks:** The key downside risks to our call are: 1) FTTX penetration below expectations, 2) substitute competition between silicon and compound semiconductor, and 3) foundry/IDM insourcing.

## Share price performance



12-month range	243.47-515.00
Market cap (USDbn)	1.05
3m avg daily turnover (USDm)	14.14
Shares outstanding (m)	70
Major shareholder	Plenticom Asia Limited (12.3%)

## Financial summary (TWD)

Year to 31 Dec	15E	16E	17E
Revenue (m)	2,028	3,093	4,755
Operating profit (m)	1,163	1,783	2,694
Net profit (m)	978	1,462	2,196
Core EPS (fully-diluted)	13.996	20.913	31.413
EPS change (%)	48.3	49.4	50.2
Daiwa vs Cons. EPS (%)	0.7	14.7	26.9
PER (x)	35.9	24.0	16.0
Dividend yield (%)	1.6	2.4	3.2
DPS	8.0	12.0	16.0
PBR (x)	9.8	7.8	6.0
EV/EBITDA (x)	25.2	16.3	10.5
ROE (%)	38.6	36.2	42.5

Source: FactSet, Daiwa forecasts

5 4 3 2 **1**

# How do we justify our view?

**Buy**  
(initiation)

Growth outlook



Valuation



Earnings revisions



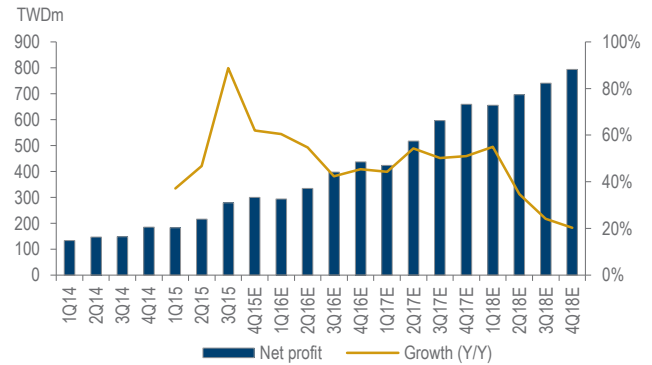
## Growth outlook



After posting a strong rise of almost 60% YoY on average for 2015, based on our estimates, LandMark Opto's net profit should continue to see strong growth on a quarterly basis over our forecast horizon, thanks to the robust demand from the FTTX coverage expansion and significant growth potential from SiPhotonics.

We forecast LandMark Opto's net profit to grow by roughly 50% YoY per quarter over 2016-17, before decelerating to 20-30% YoY in 2018, or from TWD300m in 4Q15 to TWD660m in 4Q17, translating into EPS from TWD4.3 to TWD9.4, respectively.

## LandMark Opto: quarterly net profit growth forecasts



Source: Company, Daiwa forecasts

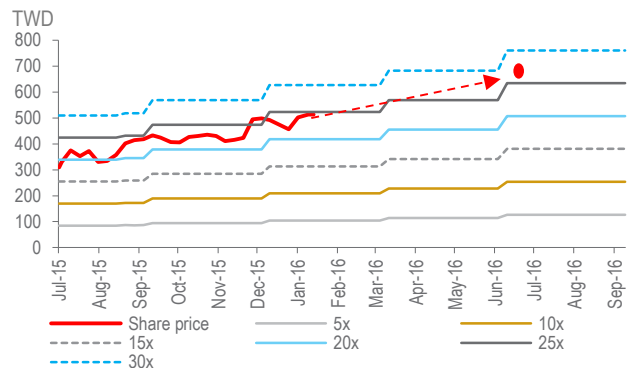
## Valuation



Trading in a 12-month forward PER band range of 20-25x most of the time since its IPO (relisted on the OTC market in July 2015), LandMark Opto should deliver a strong earnings CAGR of 43% over 2015-18 in terms of net profit, according to our forecast. While this suggests the stock should theoretically trade up to a 40x PER based on a 1x PEG (PER vs. earnings growth) proposition which could be too aggressive, we see it as fundamentally feasible for LandMark Opto to rerate to the 25-30x range.

Our TP of TWD666 is equivalent to PERs of 32x and 21x for 2016E and 2017E, respectively, which we see as undemanding from a 1x PEG perspective.

## LandMark Opto: 12-month forward PER bands



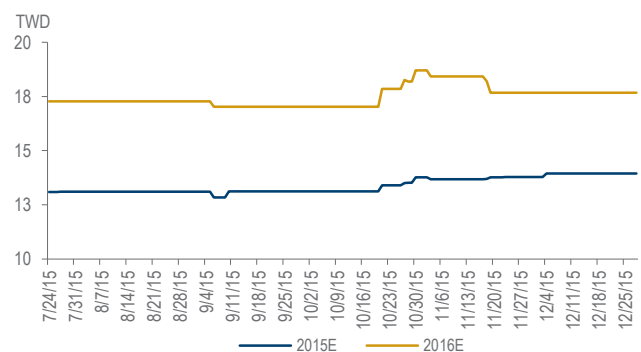
Source: Company, TEJ, Daiwa forecasts

## Earnings revision



While the consensus 2015 EPS estimate is in line with ours, we believe the street has underestimated LandMark Opto's profitability for 2016 and beyond, perhaps because the stock is under-covered. Per Bloomberg data, there are only 7 foreign brokers covering this name including Daiwa, therefore we flag that the consensus earnings forecast may be a good source of reference, but not representative enough due to the limited statistics sample.

## LandMark Opto: consensus EPS forecast revisions



Source: Bloomberg

## Financial summary

### Key assumptions

Year to 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Shipment Utilisation (%)	n.a.	n.a.	n.a.	n.a.	100	99	98	99
Wafer Shipment ('000)	n.a.	n.a.	n.a.	n.a.	34	41	58	89
Blended ASP (USD)	n.a.	n.a.	n.a.	n.a.	1,263	1,546	1,649	1,642

### Profit and loss (TWDm)

Year to 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Optical communication	n.a.	n.a.	n.a.	n.a.	1,213	1,669	2,615	4,196
Cellular infrastructure	n.a.	n.a.	n.a.	n.a.	65	176	238	247
Other Revenue	n.a.	n.a.	n.a.	n.a.	29	182	239	313
<b>Total Revenue</b>	<b>n.a.</b>	<b>470</b>	<b>601</b>	<b>715</b>	<b>1,307</b>	<b>2,028</b>	<b>3,093</b>	<b>4,755</b>
Other income	n.a.	0	0	0	0	0	0	0
COGS	n.a.	(152)	(236)	(312)	(507)	(693)	(1,053)	(1,678)
SG&A	n.a.	(54)	(57)	(59)	(66)	(100)	(149)	(217)
Other op.expenses	n.a.	(46)	(24)	(17)	(26)	(71)	(108)	(166)
<b>Operating profit</b>	<b>n.a.</b>	<b>219</b>	<b>284</b>	<b>326</b>	<b>708</b>	<b>1,163</b>	<b>1,783</b>	<b>2,694</b>
Net-interest inc./.(exp.)	n.a.	2	3	3	4	9	11	12
Assoc/forex/extraord./others	n.a.	(14)	(3)	3	29	16	0	0
<b>Pre-tax profit</b>	<b>n.a.</b>	<b>206</b>	<b>283</b>	<b>332</b>	<b>741</b>	<b>1,187</b>	<b>1,794</b>	<b>2,706</b>
Tax	n.a.	(39)	(53)	(62)	(127)	(209)	(332)	(510)
Min. int./pref. div./others	n.a.	0	0	0	0	0	0	0
<b>Net profit (reported)</b>	<b>n.a.</b>	<b>167</b>	<b>230</b>	<b>270</b>	<b>614</b>	<b>978</b>	<b>1,462</b>	<b>2,196</b>
<b>Net profit (adjusted)</b>	<b>n.a.</b>	<b>167</b>	<b>230</b>	<b>270</b>	<b>614</b>	<b>978</b>	<b>1,462</b>	<b>2,196</b>
<b>EPS (reported)(TWD)</b>	<b>n.a.</b>	<b>4.970</b>	<b>6.348</b>	<b>6.022</b>	<b>11.189</b>	<b>13.996</b>	<b>20.913</b>	<b>31.413</b>
<b>EPS (adjusted)(TWD)</b>	<b>n.a.</b>	<b>4.970</b>	<b>6.348</b>	<b>6.022</b>	<b>11.189</b>	<b>13.996</b>	<b>20.913</b>	<b>31.413</b>
<b>EPS (adjusted fully-diluted)(TWD)</b>	<b>n.a.</b>	<b>4.268</b>	<b>5.462</b>	<b>5.188</b>	<b>9.440</b>	<b>13.996</b>	<b>20.913</b>	<b>31.413</b>
<b>DPS (TWD)</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>3.000</b>	<b>7.000</b>	<b>8.005</b>	<b>12.025</b>	<b>16.020</b>
<b>EBIT</b>	<b>n.a.</b>	<b>219</b>	<b>284</b>	<b>326</b>	<b>708</b>	<b>1,163</b>	<b>1,783</b>	<b>2,694</b>
<b>EBITDA</b>	<b>n.a.</b>	<b>236</b>	<b>317</b>	<b>378</b>	<b>788</b>	<b>1,300</b>	<b>1,984</b>	<b>3,063</b>

### Cash flow (TWDm)

Year to 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Profit before tax	n.a.	206	283	332	741	1,187	1,794	2,706
Depreciation and amortisation	n.a.	17	33	52	80	137	201	369
Tax paid	n.a.	(39)	(53)	(62)	(127)	(209)	(332)	(510)
Change in working capital	n.a.	0	(71)	(12)	(126)	(168)	(300)	(450)
Other operational CF items	n.a.	2	31	20	74	0	0	0
<b>Cash flow from operations</b>	<b>n.a.</b>	<b>187</b>	<b>224</b>	<b>330</b>	<b>643</b>	<b>948</b>	<b>1,363</b>	<b>2,115</b>
Capex	n.a.	(205)	(58)	(225)	(239)	(380)	(343)	(1,056)
Net (acquisitions)/disposals	n.a.	0	0	0	0	0	0	0
Other investing CF items	n.a.	119	6	1	(2)	0	0	0
<b>Cash flow from investing</b>	<b>n.a.</b>	<b>(86)</b>	<b>(52)</b>	<b>(224)</b>	<b>(241)</b>	<b>(380)</b>	<b>(343)</b>	<b>(1,056)</b>
Change in debt	n.a.	0	0	0	0	0	0	0
Net share issues/(repurchases)	n.a.	0	0	0	0	55	0	0
Dividends paid	n.a.	(63)	(85)	(73)	(136)	(455)	(560)	(841)
Other financing CF items	n.a.	0	0	0	0	1,486	0	0
<b>Cash flow from financing</b>	<b>n.a.</b>	<b>(63)</b>	<b>(85)</b>	<b>(73)</b>	<b>(136)</b>	<b>1,085</b>	<b>(560)</b>	<b>(841)</b>
Forex effect/others	n.a.	0	0	0	2	0	0	0
<b>Change in cash</b>	<b>n.a.</b>	<b>37</b>	<b>87</b>	<b>33</b>	<b>269</b>	<b>1,653</b>	<b>461</b>	<b>218</b>
Free cash flow	n.a.	(18)	166	106	404	568	1,021	1,059

Source: FactSet, Daiwa forecasts

## Financial summary continued ...

### Balance sheet (TWDm)

As at 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Cash & short-term investment	n.a.	225	313	346	614	2,267	2,728	2,947
Inventory	n.a.	58	80	97	117	175	270	440
Accounts receivable	n.a.	123	167	168	326	426	726	1,056
Other current assets	n.a.	8	9	49	55	55	55	55
<b>Total current assets</b>	<b>n.a.</b>	<b>415</b>	<b>569</b>	<b>660</b>	<b>1,111</b>	<b>2,923</b>	<b>3,779</b>	<b>4,497</b>
Fixed assets	n.a.	289	306	474	660	965	1,177	1,916
Goodwill & intangibles	n.a.	0	0	0	0	0	0	0
Other non-current assets	n.a.	19	11	9	12	12	12	12
<b>Total assets</b>	<b>n.a.</b>	<b>723</b>	<b>886</b>	<b>1,143</b>	<b>1,784</b>	<b>3,900</b>	<b>4,967</b>	<b>6,425</b>
Short-term debt	n.a.	0	0	0	0	0	0	0
Accounts payable	n.a.	33	28	34	86	76	171	221
Other current liabilities	n.a.	80	90	118	207	225	285	320
<b>Total current liabilities</b>	<b>n.a.</b>	<b>114</b>	<b>118</b>	<b>152</b>	<b>293</b>	<b>301</b>	<b>456</b>	<b>541</b>
Long-term debt	n.a.	0	0	0	0	0	0	0
Other non-current liabilities	n.a.	3	1	1	5	15	25	42
<b>Total liabilities</b>	<b>n.a.</b>	<b>117</b>	<b>120</b>	<b>153</b>	<b>298</b>	<b>316</b>	<b>481</b>	<b>584</b>
Share capital	n.a.	341	366	452	553	642	642	642
Reserves/R.E./others	n.a.	266	400	537	933	2,941	3,844	5,199
<b>Shareholders' equity</b>	<b>n.a.</b>	<b>606</b>	<b>766</b>	<b>990</b>	<b>1,486</b>	<b>3,584</b>	<b>4,486</b>	<b>5,841</b>
Minority interests	n.a.	0	0	0	0	0	0	0
<b>Total equity &amp; liabilities</b>	<b>n.a.</b>	<b>723</b>	<b>886</b>	<b>1,143</b>	<b>1,784</b>	<b>3,900</b>	<b>4,967</b>	<b>6,425</b>
EV	n.a.	34,869	34,782	34,749	34,481	32,827	32,367	32,148
<b>Net debt/(cash)</b>	<b>n.a.</b>	<b>(225)</b>	<b>(313)</b>	<b>(346)</b>	<b>(614)</b>	<b>(2,267)</b>	<b>(2,728)</b>	<b>(2,947)</b>
<b>BVPS (TWD)</b>	<b>n.a.</b>	<b>18.014</b>	<b>21.135</b>	<b>22.085</b>	<b>27.088</b>	<b>51.261</b>	<b>64.168</b>	<b>83.556</b>

### Key ratios (%)

Year to 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Sales (YoY)	n.a.	n.a.	27.8	19.0	82.9	55.1	52.5	53.8
EBITDA (YoY)	n.a.	n.a.	34.7	19.0	108.7	65.0	52.6	54.4
Operating profit (YoY)	n.a.	n.a.	29.8	14.9	117.1	64.4	53.3	51.1
Net profit (YoY)	n.a.	n.a.	37.6	17.3	127.4	59.4	49.4	50.2
Core EPS (fully-diluted) (YoY)	n.a.	n.a.	28.0	(5.0)	82.0	48.3	49.4	50.2
Gross-profit margin	n.a.	67.7	60.7	56.3	61.2	65.8	66.0	64.7
EBITDA margin	n.a.	50.1	52.8	52.8	60.3	64.1	64.2	64.4
Operating-profit margin	n.a.	46.5	47.2	45.6	54.1	57.4	57.6	56.7
Net profit margin	n.a.	35.6	38.3	37.8	47.0	48.3	47.3	46.2
ROAE	n.a.	55.2	33.5	30.7	49.6	38.6	36.2	42.5
ROAA	n.a.	46.3	28.6	26.6	41.9	34.4	33.0	38.6
ROCE	n.a.	72.1	41.4	37.1	57.2	45.9	44.2	52.2
ROIC	n.a.	46.6	55.3	48.3	77.4	87.6	94.5	94.0
Net debt to equity	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Effective tax rate	n.a.	18.8	18.8	18.8	17.1	17.6	18.5	18.8
Accounts receivable (days)	n.a.	47.8	88.1	85.4	68.9	67.6	67.9	68.4
Current ratio (x)	n.a.	3.7	4.8	4.3	3.8	9.7	8.3	8.3
Net interest cover (x)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net dividend payout	n.a.	n.a.	n.a.	57.8	74.2	57.2	57.5	51.0
Free cash flow yield	n.a.	n.a.	0.5	0.3	1.2	1.6	2.9	3.0

Source: FactSet, Daiwa forecasts

## Company profile

Founded in June 1997, LandMark Optoelectronics Corporation (LandMark Opto) is a dedicated compound semiconductor epiwafer supplier for optical communication (OC), with end-applications focusing on passive optical network (PON), datacentre, cellular infrastructure, industrial and consumer electronics. LandMark Opto is the largest pure OC epiwafer supplier globally by revenue.

## Moving ahead at light speed

**Initiating with a Buy rating and 12-month target price of TWD666**

We initiate coverage of LandMark Optoelectronics (LandMark Opto) with a Buy (1) rating and 12-month target price of TWD666, based on an ROE-adjusted PBR of 9x on the back of its strong profitability of 33-38% ROE per year in 2015-18 with hefty 43%/45% CAGRs for net profit/revenue, per our forecasts. LandMark Opto is the largest pure optical communication (OC) epiwafer supplier in the world with a market share of nearly 50% by 2015 revenue (ex-IDM), on our estimates. We believe it has captured the most value proposition in the OC food chain, thanks to the high entry barriers it has created through its proprietary recipe for epiwafer-growing technologies, and joint development efforts with customers to develop optical data transceiver solutions.

We see 2 key growth drivers for LandMark Opto: 1) FTTX deployment for “last mile”, or “long wave” broadband communication infrastructure builds, and 2) SiPhotonics for “short wave” datacentre bandwidth upgrades, both under our big theme of the rise of the Big Data/IoT ecosystem, which is spurring demand for bandwidth upgrades in the global wireline telecommunication (telecom) and data-communication (datacom) infrastructures in order to facilitate fast broadband data transmissions (see our accompanying OC sector report for more details of our market analysis).

### Company analysis

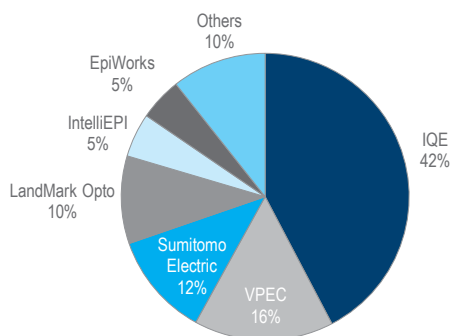
**The largest pure OC epiwafer supplier globally**

Founded in June 1997, LandMark Opto is a dedicated compound-semiconductor (compound-semi) epiwafer supplier ranked No.4 in terms of revenue in the global epiwafer market in 2014, behind IQE, VPEC and Sumitomo (see chart below, communication uses only). Whereas epiwafers find a variety of applications such as OC, microwave communication (MC) and light emitting diodes (LED), LandMark Opto grows epiwafers purely for OC applications. Therefore, in the pure OC epiwafer market, it is the largest supplier in the world controlling over 20% of the market in 2014 in terms of revenue, followed by IQE and Avago, or over 40% excluding the integrated device manufacturer (IDM) captive supply (see Appendix 1 – epiwafer market analysis for more details).

### Business operation

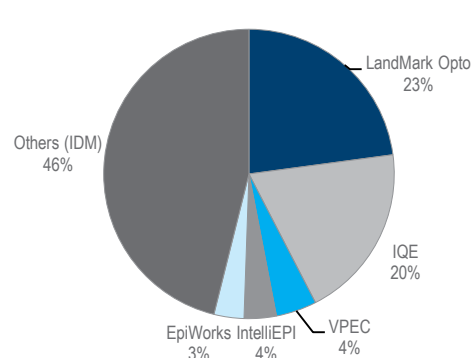
Located in Tainan Science Park, LandMark Opto operates a factory with an average of 14 sets of metal organic chemical vapour deposition (MOCVD) reactors as of 4Q15 capable of producing around 1,200 wafers per month (wpm) on our estimates, including 2” and 3” in wafer size, with capacity scalable to a total of 22-23 MOCVDs if the current factory space is fully utilised. With a further 4 MOCVDs on hand ready to contribute output in 2016, LandMark Opto will operate 22-23 MOCVDs by end-2016, over 30 by 2017 and over 40 by 2018, meaning that it would need a total of around TWD2bn in capex to construct another factory and purchase enough MOCVDs to accommodate the fast-growing demand from its OC-related customers during the period of 2016-18E.

Global epiwafer market share (2014)\*



Source: Company, Daiwa estimates  
Note: \*communication applications only, ex-optoelectronics like LED

Global OC epiwafer market share (2014)\*



Source: Company, Daiwa estimates  
Note: \*including both pure epiwafer suppliers and IDM captive



**LandMark Opto: capacity build (# of MOCVD)**



Source: Company, Daiwa estimates

**LandMark Opto: capital intensity\***



Source: Company, Daiwa estimates  
Note: \*capital intensity = capex / revenue

**Self-funded aggressive expansion**

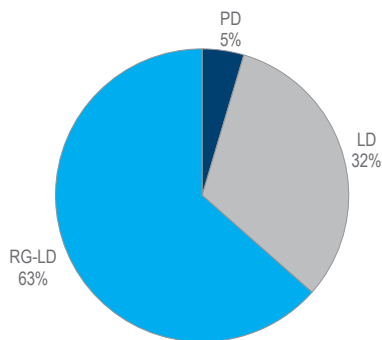
We forecast around 10-20% capital intensity for LandMark Opto over 2015-18, with all required capex self-funded without external financing, thanks to its strong operating cash flows as a result of the strong profitability. Note that the epiwafer-growing business is less capital-intensive than the mainstream complementary metal oxide semiconductor (CMOS) manufacturing business, with machine depreciation accounting for around 20% of COGS – a level similar to that of outsourced semiconductor assembly & test (OSAT) makers. A brand-new MOCVD reactor costs USD2-3m, while a used one costs 30%+ less, and it is not difficult to get a used MOCVD given the oversupply a few years ago in the global LED industry which uses the same MOCVD reactors as the OC industry.

**RG-LD accounts for most of the revenue**

**Sales mix**

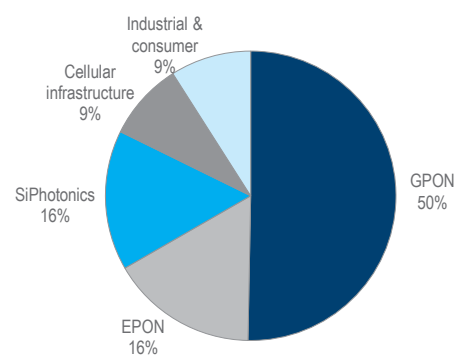
The epiwafers LandMark Opto grows can be processed into photo diodes or pin diodes (PD), or laser diodes (LD). Relative to PD, which is used to receive light signals and typically uses a gallium-arsenide (GaAs) compound-semi epiwafer, LD is structurally more complicated as it is used to transmit light signals, thus it is more difficult to make and so adds more value than PD. Most LDs use indium-phosphide (InP) epiwafers. Further, due to: 1) the bandwidth upgrades in the FTTX market where higher-bandwidth gigabit passive optical network (GPON) solutions are replacing lower-bandwidth ethernet passive optical network (EPON), and 2) the bandwidth upgrades in the datacentre market where higher-bandwidth fibre-optic (FO) solutions (10/40/100Gbps) are replacing lower-bandwidth FO (1Gbps and lower) and copper-wire cables, a re-growing (RG) epiwafer is rising to become the mainstream material. Thus, in terms of the epiwafer structure and FO technology, LandMark Opto's revenue can be divided into PD, LD and RG-LD, with mix illustrated in a chart below, on our estimates.

**LandMark Opto: 2015E revenue mix by device**



Source: Daiwa estimates

**LandMark Opto: 2015E revenue mix by application**



Source: Daiwa estimates

**RG-LD adds the most value**

Note that a re-growing epiwafer is referred to as an epiwafer which, after the first epitaxial-layer growing process, further goes through a grating process on selective areas (also referred to as selective area growth, or SAG) which can be replicated multiple times

depending on treatment requirements. The epiwafer re-growing aims to “metalize” the walls of a channel inside the wafer when light travels at speeds of 10Gbps or higher in order to overcome interferences when the speed gets high, making RG-LD suitable for GPON or datacentre applications. Therefore, a re-growing epiwafer enjoys the highest average selling price (ASP) (nearly 1x a regular OC epiwafer ASP), thus the highest margins, yet at the expense of lower throughput than a regular OC epiwafer. LandMark derived over 60% of its revenue from RG-LD in 2015, on our estimates.

**SiPhotonics to grow faster than FTTX**

In terms of system application, LandMark Opto’s revenue can be broken into FTTX (EPON and GPON), datacentre (SiPhotonics), cellular infrastructure and industrial & consumer. Whereas FTTX accounts for most of the sales (c. 2/3 of 2015 revenue) thus representing LandMark Opto’s cash cow business, the datacentre, driven by the SiPhotonics’s significant growth potential, will be the key growth driver in the next 3-5 years. We forecast the revenue contribution from SiPhotonics to rise to almost 40% in 2017, pushing down that from FTTX to around one half (refer to the key assumption tables on page 34 for more details).

**Key PON customers are Accelink, LuxNet and TrueLight**

**Customer mix**

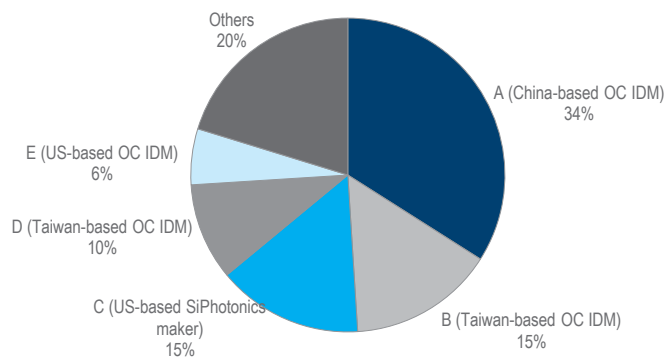
In the cash cow FTTX business, we believe LandMark Opto mainly sells its epiwafers to OC IDMs in Taiwan/China which have limited or no in-house epiwafer-growing capability, and these OC IDMs then supply either FO transceiver modules or sub-systems to the end-customers of telecom vendors such as Huawei, ZTE, FiberHome and Alcatel-Lucent. These OC IDMs include the likes of Accelink and LuxNet. Some OC IDM customers like TrueLight and Ezconn supply only optical sub-assembly (OSA) components to box assemblers like Sercomm as a middle man between them and the telecom vendors. On our estimates, Accelink, LuxNet and TrueLight together accounted for some 60% of LandMark Opto’s 2015 revenue and were its top-3 customers in the PON space in 2015 (refer to the accompanying OC sector report for more on the supply-chain analysis).

**China and the US are 2 key markets in terms of global geography**

In terms of derivative customer exposure, Huawei and ZTE combined accounted for over 60% of LandMark Opto’s 2015 revenue, while China contributed 50-60% in terms of final-sale geography, followed by the US (25-30%). The difference of c.10-15% between revenue exposure in China and overseas implies LandMark Opto’s sales to the export market through telecom vendors in China. Given our understanding from market research that key telecom vendors like Huawei and FiberHome already have c.50% export sales, we see room for LandMark Opto to increase PON-related epiwafers indirectly to China’s telecom companies, since its supply share in the export market outside China still appears low.

In the fast-growing business of datacentres (ie, SiPhotonics), we believe Intel is LandMark’s key customer accounting for some 15% of 2015 revenue, with this contribution set to rise to over 20% in 2016 and to around 45% in 2020, on our forecasts.

**LandMark Opto: 2015E revenue mix by key customers**



Source: Daiwa, Company  
Note: letters denote individual major customers

### Cost structure

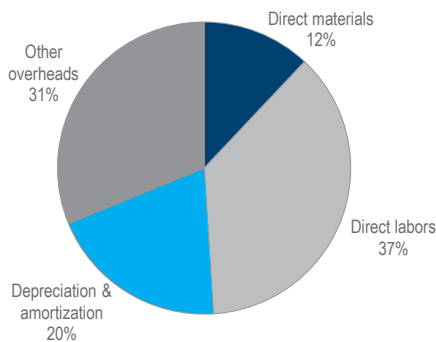
#### 2 ways to reduce costs: D&A and MOH

In light of LandMark Opto’s epi-wafer-growing model, direct labour (DL), manufacturing overheads (MOH) and depreciation & amortisation (D&A) are 3 key cost components accounting for 37%, 31% and 20%, respectively, of total 2015E COGS, on our estimates. In our opinion, depreciation is one source of cost reduction for LandMark Opto through procuring second-hand MOCVDs and leveraging the company’s know-how of equipment configuration to enhance throughput. Currently around half of its MOCVD reactors are second-hand and a quarter are fully depreciated, contributing to the cost reduction (LandMark uses the 4-6-year straight-line depreciation method depending on the type of machine). Consisting of mainly electricity, metals, gas and other chemicals, MOH represents another source of cost-cutting, in our view, especially when its scale increases, thereby improving its procurement power and reduce unit costs. Nevertheless, as mentioned, we believe the biggest driver of LandMark Opto’s margin expansion over the past 2 years has been blended ASP hikes as a result of:

- The shift in product mix to high value-added re-growing (grating process) epiwafers.
- A supply shortage of epiwafers, especially LD type, though this should ease going forward.

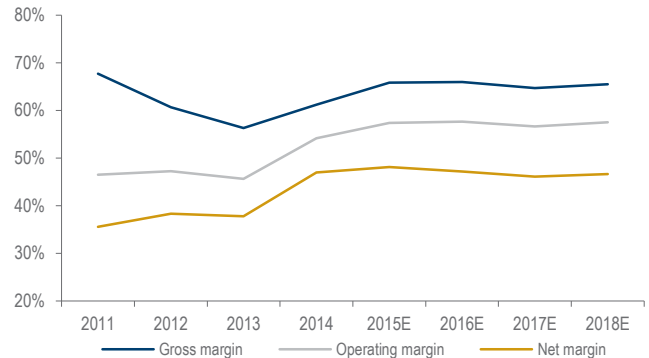
As a result, LandMark Opto’s gross margin (GM) rose significantly to 66% in 2015 from 56% in 2013, while its operating margin (OPM) increased to 57% from 46% over the same period. Going forward, we forecast the GM/OPM to stay around the 65-66%/57-58% levels through our forecasting period, as we expect a gradual easing of the tight epiwafer supply to rebalance the supply-chain bargaining power.

#### LandMark Opto: 2015E COGS breakdown



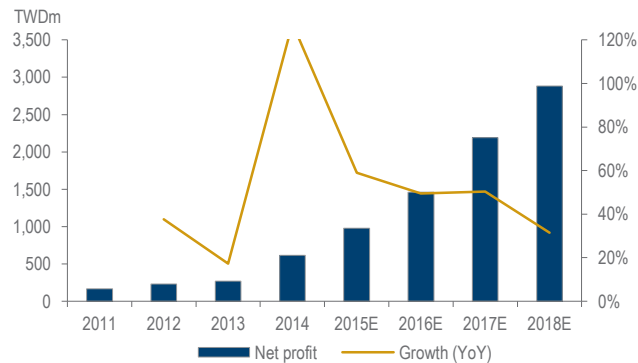
Source: Daiwa estimates

#### LandMark Opto: margin trend



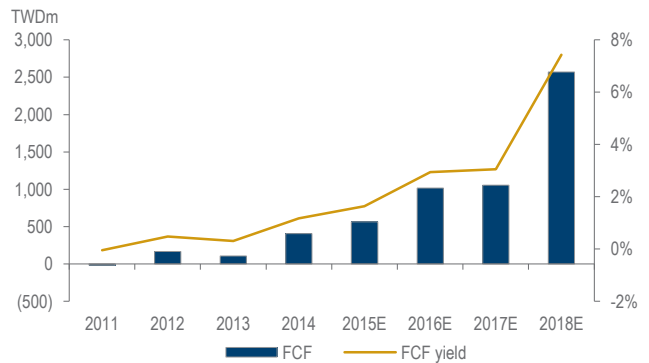
Source: Company, Daiwa forecasts

#### LandMark Opto: earnings growth trend



Source: Company, Daiwa forecasts

#### LandMark Opto: FCF & yield



Source: Company, Daiwa forecasts

### Financial performance

Against the backdrop of the fast business growth driven by FTTX and datacentres, combined with the favourable margin trend driven by technology remix and cost controls,

LandMark Opto's net profit should approach TWD1.5bn in 2016E, up 49% YoY, and reach TWD2.9bn in 2018, yielding a strong CAGR of 43% over 2015-18, on our forecasts. Thanks to the strong profitability resulting in strong cash-generating power, free cash flow (FCF) should stay at around TWD1bn per year in 2016 and 2017, and more than double a year afterwards, leading its FCF yield (FCF/market cap) to rise to more than 7% in 2018, from around 3% per year over 2016-17, per our forecasts (1.6% in 2015). This should augur well for a favourable dividend policy for shareholders as LandMark Opto has a strong balance sheet, with net cash operations. Accordingly, we forecast its ROE (single year, not 2-year average) to rise to 33-38% per year over 2016-18, compared with 27% in 2015 and 41% for 2014.

Note: the significant drop in 2015E ROE (see also chart, page 37) was due to LandMark Opto's 10% rights issue of 5.5m new shares at TWD280/share when the stock was relisted on the OTC market which boosted the paid-in capital. This equity dilution, however, should not be a concern given the company's strong profitability over our forecast period which should quickly help recover its ROE trajectory.

**Dividend policy**

LandMark Opto paid a total of TWD8.5/share in dividends in 2015, including TWD7.0 in cash and TWD1.5 in stock (or a 15% stock dividend based on a TWD10 face value). This roughly equalled a 75% payout ratio against its 2014 P&L, or a 1.7% dividend yield based on the latest stock price vs. its 2015 FCF yield of 1.6%. Management aims to keep a similar pay-out with a cash vs. stock structure and 80:20 ratio. Against its 2015E EPS of nearly TWD14 (fully diluted), we expect the company to pay a total of TWD10 dividend/share, including TWD8 in cash and TWD2 in stock. This means a total dividend yield of 2%, or a cash dividend yield of 1.6%, based on the current stock price, in comparison with its FCF yield of 3% for 2016, based on our forecasts.

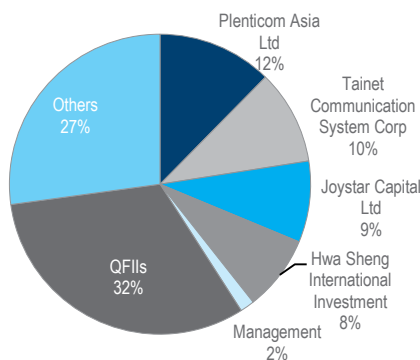
**Shareholder structure**

The key shareholders of LandMark Opto are Plenticom Asia, Tainet Communication System Corp (TCSC), Joystar Capital and Hwa Sheng International Investment (HSII), aggregately owning a c.40% stake as of December 2015. QFIIs held 32% at end-2015, up from 24% on 22 July 2015 – the date the stock ceased trading on the emerging market board and was relisted on the OTC board. It is noteworthy that management owns an aggregate 2% stake, where Chairman Chien-Jen Chen (陳建任), despite owning 0.2%, is the representative of TCSC, which owns 10% of LandMark Opto (refer to the table on the next page for a management description). HSII, with its 8% stake, is 100%-owned by the CID Group (華威集團), which specialises in venture capital investments in the technology space, with a focus on start-up companies with differentiated tech know-how. Others include local investment trusts (c. 5% stake), life insurance, individuals and other investment companies. Hence, our analysis suggests a free float of around 60% for LandMark Opto, whose current outstanding shares amount to 69.9m.

**We expect a total of TWD10/share dividends in 2016, including TWD8 in cash and 20% stock**

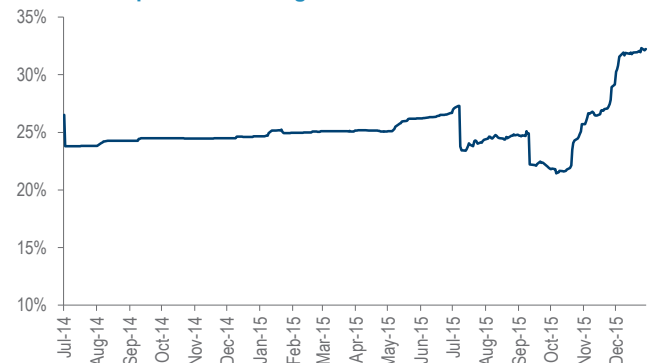
**We estimate a free float of round 60%**

LandMark Opto: shareholder structure\*



Source: Bloomberg  
Note: \*as of December 2015

LandMark Opto: QFII holding trend



Source: Bloomberg

### LandMark Opto: key management description

Title	Name	Description
Chairman	Chien Jen Chen (陳建仁)	Representative of Tainet Communication System Corp
General Manager	Wei Lin (林蔚)	Ph.D., Electrical Engineering, Cheng Kung University Project Principal, Chungghwa Telecom Optoelectronics Research Lab More than 20 years of experience in OMVPE field
Vice President, Sales	Yu-Hui Wu (伍育輝)	Ph.D., Electrical Engineering, Cheng Kung University AVP, Manufacturing Department, South Epitaxy Corporation More than 15 years of experience in OMVPE field
Vice President, Manufacturing	Jong-Tai Hsu (許榮泰)	Ph.D., Electrical Engineering, Cheng Kung University Manager, Research & Development, South Epitaxy Corporation More than 15 years of experience in OMVPE field
Vice President, R&D	Komatsu Keiro (小松啟郎)	Electrical Engineering, Yokohama National University Manager, Compound Semiconductor Component Department, NEC Corporation Senior Researcher, Compound Semiconductor Department, Renesas Electronics Corporation
Chief Finance Officer	Jerry Chi-Yu Yang (楊吉裕)	MBA, National Cheng Chi University CFO, CMOX Technology Co., Ltd. Holder of CFA and Taiwan CPA

Source: Company

### LandMark Opto: key business assumption summary

	1Q15	2Q15	3Q15	4Q15	1Q16E	2Q16E	3Q16E	4Q16E	1Q17E	2Q17E	3Q17E	4Q17E
<b>Capacity (quarter end)</b>												
# MOCVD in production	13	13	14	15	16	18	21	23	23	28	33	36
Utilization	95%	101%	100%	101%	97%	98%	99%	99%	99%	99%	99%	99%
<b>Shipment (wafers/qtr)</b>												
PD	1,070	964	998	1,079	1,280	1,257	1,481	1,622	1,622	1,975	2,328	2,539
LD*	8,198	9,186	9,503	10,283	10,360	11,973	14,111	15,455	15,455	18,815	22,175	24,191
Total shipment	9,268	10,151	10,500	11,363	11,640	13,230	15,593	17,078	17,078	20,790	24,503	26,730
Growth (QoQ)	1%	10%	3%	8%	2%	14%	18%	10%	0%	22%	18%	9%
<b>ASP (USD)</b>												
PD	680	700	730	745	735	735	735	735	730	730	730	730
LD*	1,418	1,578	1,738	1,774	1,741	1,750	1,750	1,750	1,738	1,738	1,738	1,738
Blended ASP	1,333	1,495	1,642	1,676	1,630	1,653	1,653	1,653	1,642	1,642	1,642	1,642
Growth (QoQ)	3%	12%	10%	2%	-3%	1%	0%	0%	-1%	0%	0%	0%
<b>Revenue (USD000)</b>												
PD	728	675	728	804	941	924	1,089	1,192	1,184	1,442	1,699	1,854
LD*	11,624	14,495	16,514	18,238	18,035	20,950	24,692	27,043	26,859	32,698	38,537	42,041
Total revenue	12,352	15,170	17,242	19,042	18,976	21,874	25,780	28,236	28,044	34,140	40,236	43,894
<b>Revenue (TWDm)</b>												
PD	23	21	23	26	31	30	35	39	38	47	55	60
LD*	366	446	528	595	595	681	802	879	873	1,063	1,252	1,366
Total revenue	389	467	552	621	626	711	838	918	911	1,110	1,308	1,427
Growth (QoQ)	6%	20%	18%	13%	1%	14%	18%	10%	-1%	22%	18%	9%
<b>Mix by application</b>												
PON	67%	68%	66%	66%	63%	61%	59%	58%	56%	52%	49%	47%
SiPhotonics	15%	14%	16%	17%	21%	23%	26%	27%	30%	35%	41%	42%
Cellular infrastructure	9%	9%	9%	8%	8%	8%	8%	7%	6%	5%	5%	5%
Industrial & consumer	9%	9%	9%	9%	8%	8%	7%	8%	8%	8%	5%	6%
<b>Cost analysis (USD000)</b>												
Direct material	528	609	630	682	698	794	936	1,025	1,025	1,247	1,470	1,604
Director labor	1,492	2,132	2,205	2,386	2,444	2,778	3,430	3,757	3,757	4,366	5,146	5,613
Depreciation & amortization	956	958	1,114	1,289	1,539	1,659	1,534	1,441	1,955	2,550	3,450	3,400
Other overhead	1,419	1,702	1,777	1,932	1,956	2,249	2,807	3,245	3,074	3,742	4,410	4,811
Total COGS	4,396	5,401	5,726	6,288	6,637	7,481	8,707	9,468	9,811	11,906	14,476	15,428
<b>Mix by component</b>												
Direct material	12%	11%	11%	11%	11%	11%	11%	11%	10%	10%	10%	10%
Director labor	34%	39%	39%	38%	37%	37%	39%	40%	38%	37%	36%	36%
Depreciation & amortization	22%	18%	19%	20%	23%	22%	18%	15%	20%	21%	24%	22%
Other overhead	32%	32%	31%	31%	29%	30%	32%	34%	31%	31%	30%	31%
<b>Gross margin</b>	<b>64%</b>	<b>64%</b>	<b>67%</b>	<b>67%</b>	<b>65%</b>	<b>66%</b>	<b>66%</b>	<b>66%</b>	<b>65%</b>	<b>65%</b>	<b>64%</b>	<b>65%</b>

Source: Daiwa forecasts

Note: \*Including re-growing LD epiwafer type

## Business drivers

### Driver No.1: FTTX the strong cash cow

**We forecast LandMark Opto's FTTX revenue to rise at a CAGR of nearly 30% over 2015-18**

Currently accounting for most of its business (c. 2/3 revenue for 2015 on our estimate), FTTX broadband communication deployment should be a multi-year demand driver serving as LandMark Opto's cash cow, in our view. With still ample room for global household coverage to expand, in addition to China, we forecast FTTX market revenue to rise at a CAGR of some 20% CAGR over 2015-20. Controlling around 30% of the 2015

global FTTX market after the food-chain value mark-ups, on our estimates, LandMark Opto stands to benefit from this secular rise in global FTTX penetration (see our OC sector report for more details of our market analysis). We forecast its market share to expand to 33% in 2017 and over 35% by 2020, translating into a FTTX revenue CAGR of nearly 30% over 2015-18 (charts below). Note: our market-share calculation assumes a c.150x mark-up in the food-chain value, from the epiwafers LandMark Opto produces to the transceiver modules its customers offer.

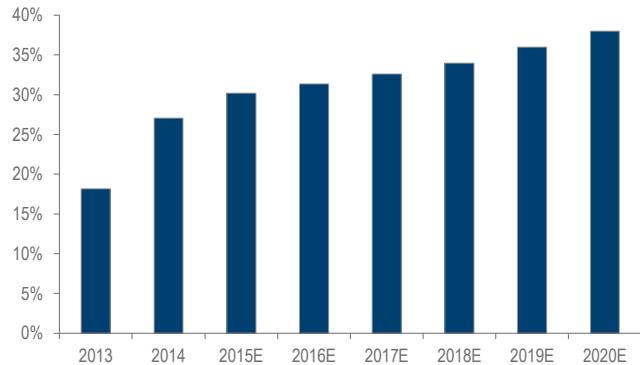
**Driver No.2: SiPhotonics the high-flier**

**We expect LandMark Opto's SiPhotonics revenue to grow nearly 1-fold pa over 2015-18**

Datacentres are witnessing bandwidth upgrades with high-bandwidth FO connectivity solutions replacing low-bandwidth FO and copper wire cables, thanks to the rise of the Big Data/IoT demand cycle. Intel's push of SiPhotonics solutions represents an attempt by the company to gain share against the mainstay compound-semi solutions in this fast-growing FO connectivity market, which could double the overall growth for SiPhotonics in the global datacentre space, in our view. Per our OC industry analysis, we forecast the value of the SiPhotonics market to expand by 250% YoY in 2016 to USD620m, 170% in 2017 to USD1.7bn, with a strong 94% CAGR over 2015-20 to hit USD4.8bn in 2020.

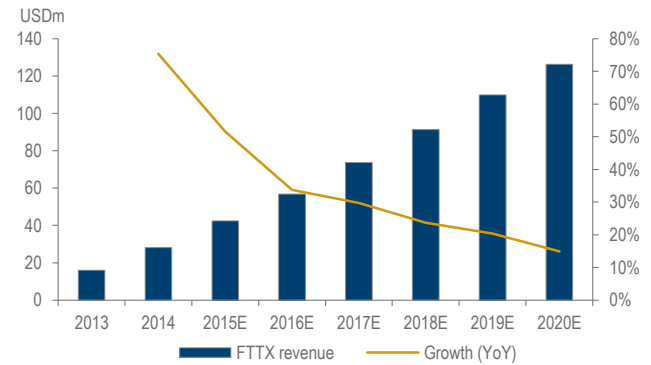
We believe LandMark Opto stands to benefit from this high-flying SiPhotonics demand since we believe it is one of the exclusive epiwafer suppliers to Intel at the moment. Contributing around 16% of revenue in 2015 with Intel accounting for the majority, SiPhotonics will likely contribute 25% of LandMark Opto's revenue in 2016, 38% in 2017 and potentially surpass 45% by 2020, on our forecasts. This would translate into a revenue CAGR of nearly 100% over 2015-18.

**LandMark Opto: FTTX market share trend\***



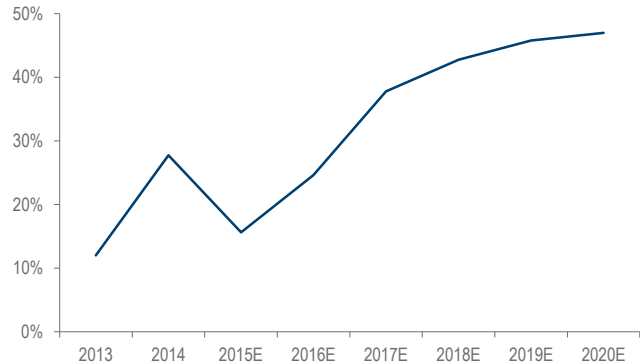
Source: PDIA, Daiwa forecasts  
Note: \*assuming 150x supply-chain markup

**LandMark Opto: FTTX revenue growth forecast**



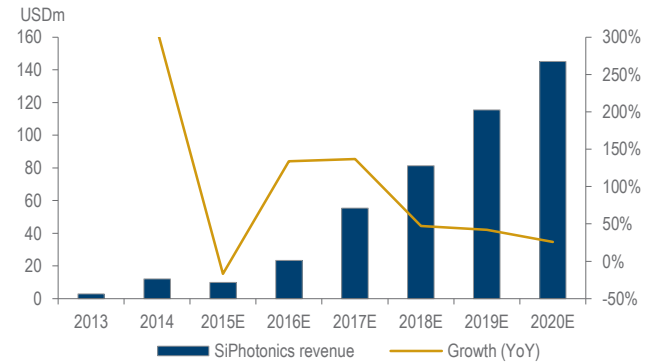
Source: Daiwa forecasts

**LandMark Opto: SiPhotonics revenue contribution**



Source: Company, Daiwa forecasts

**LandMark Opto: SiPhotonics revenue growth forecast**



Source: Company, Daiwa forecasts



**Other demand drivers include ADAS, IA and longer term, 5G**

### Other demand drivers

In addition to FTTX and SiPhotonics, LandMark Opto benefits from demand from cellular infrastructure and industrial & consumer applications, which combined contributed a high-teen percentage of revenue for 2015, on our estimates. Cellular infrastructure was one key driver for revenue growth over 2010-14, on our observation, thanks to the ramp-up of 4G base-station builds as a result of the accelerated demand for 4G smartphones. LandMark Opto supplies epiwafers to its FO transceiver customers who help facilitate the fast data transmission requirements of the 4G base stations. However, as we address in the main section of this report, the 4G smartphone cycle is tapering off in growth terms, which should lead to a contraction in demand growth for 4G cellular infrastructure going forward, while other emerging new demand segments should see robust growth. We expect this segment to pick up in steam again only when the next cellular communication standard of 5G is deployed and ramps up in volume, which is unlikely to occur before 2018, in our view.

Nevertheless, we expect new demand to emerge, spurring more earnings growth for LandMark Opto's industrial & consumer segment, thanks to the significant scalability of OC technologies. These new demand applications include laser detectors for the rising trend for advanced driver assistance systems (ADAS) in the smart-car IoT vertical under our Big Data/IoT theme, laser cutting/sensing for a variety of industrial automation (IA) applications such as semiconductor production equipment (SPE) and robotic arms, as well as 3D sensors for consumer electronics devices (game consoles for example). We see demand growth from these areas as no worse than that for FTTX or SiPhotonics, but too fragmented to contribute any sizeable scale from each individual segment.

**We set a TP of TWD666, based on a target PBR of 9x**

### Valuation and risks

We forecast LandMark Opto to grow its net profit by a CAGR of 43% over 2015-18 and enjoy perhaps the highest ROE of 33-38% pa in the OC food chain, given its positive FCF and net-cash position. This makes LandMark Opto a quality name in the OC space, in our view. We initiate coverage on the stock with a Buy (1) rating, backed by its significant earnings growth profile, sustainable high margins/ROE and strong balance sheet, against the backdrop of what we see as a promising OC industry outlook. We set our 12-month target price at TWD666, based on an ROE-adjusted target PBR of 9x.

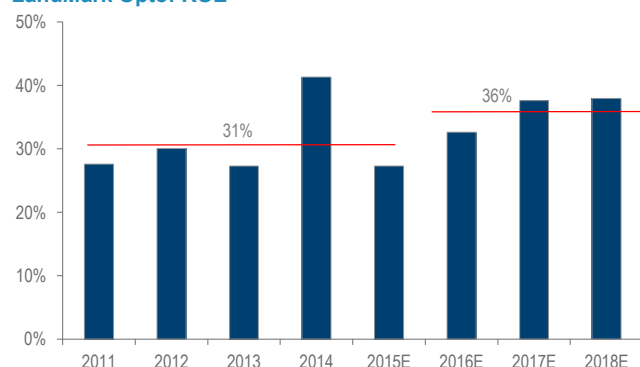
Despite its significant earnings growth profile, which means that some investors may consider using a PER valuation, we employ an ROE-adjusted PBR valuation method to determine LandMark Opto's fair value – a method that we have broadly employed for stocks under Daiwa coverage in both the CMOS and compound-semi space. LandMark Opto's ROE averaged at 31% pa (single-year, not 2-year average) over 2010-15, on our estimates, and we forecast its ROE to expand to 36% on average, from 2016 to 2018.

Comparing the company's historical ROE during 2010-15 and our ROE forecast for 2016-2018E, we find a 16% premium. Applying that premium to the stock's historical PBR of 7.8x (since its July 2015 IPO), we arrive at an ROE-adjusted target PBR of 9x. Therefore, our 12-month TP of TWD666 is derived by multiplying our 2016-17E average book value forecast and our ROE-adjusted PBR of 9x. Note: we include half of the 2017E book value in order to reasonably capture our forecast for high earnings growth.

**Our TP does not look demanding from a PEG perspective**

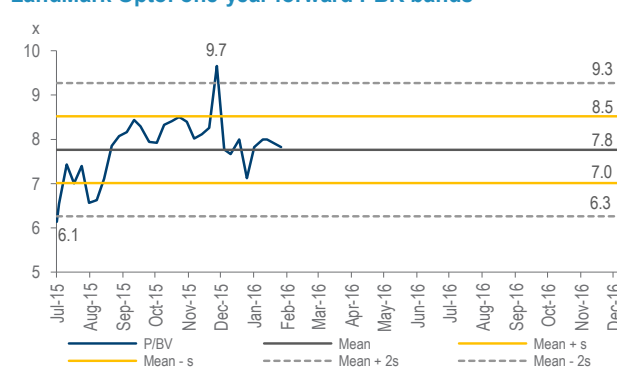
We believe our 12-month target price of TWD666 is undemanding from a growth-stock valuation perspective, as it would translate into PERs of 32x/21x, based on our 2016/17 EPS forecasts, yet its fair PER multiple would be 43x from a 1x PEG-proposition perspective (PER vs. earnings growth). Besides, the global epi-wafer group is trading currently at an average 2016E PER of 16.4x on Bloomberg forecasts, while delivering 24.3% YoY EPS growth for 2016E (see table, page 38). Given the significant earnings growth of 49% YoY for 2016E, which is more than double its peers' average, LandMark Opto would be worth TWD690 on 2016E PER of 33x, a multiple that is double the group's average.

LandMark Opto: ROE



Source: Company, Daiwa forecasts

LandMark Opto: one-year forward PBR bands



Source: TEJ, Company, Daiwa forecasts

### Risks to our call

The key risk to our call would be penetration of FTTX falling short of our expectations, especially in China

- **If FTTX penetration is below expectation.** Our positive FTTX market forecasts in terms of market value are premised upon the still-ample room that we see for global FTTX household coverage to rise, especially in China. Should the coverage penetration be slower than we expect, FTTX demand could turn out to be weaker than we expect, which would put our earnings forecasts at risk. This is the main risk to our call.
- **Substitute competition between silicon and compound-semi.** Intel's move to push its SiPhotonics solution appears to be a wild-card in the broadband FO connectivity market, as it may spur price competition among the compound-semi-based solution providers as they seek to defend their market shares. Should the price competition become harsher than we expect in the FO datacom space, Intel could put pressure on its epiwafer suppliers for lower pricing.
- **Foundry/IDM insourcing.** Our conversations with the OC food-chain players, including the upstream foundries and the downstream module IDMs, indicate a possibility of them building/increasing their in-house capabilities/facilities for epiwafer growing, due to the high margins/ROE that the epiwafer vendors enjoy. This foundry/IDM insourcing could potentially dilute the business opportunities that we see for the pure epiwafer suppliers.

LandMark Opto: quarterly P&amp;L forecasts

TWDm	1Q15	2Q15	3Q15	4Q15E	1Q16E	2Q16E	3Q16E	4Q16E	2014	2015E	2016E	2017E	2018E
Revenue	389	467	552	621	626	711	838	918	1,307	2,028	3,093	4,755	6,182
COGS	138	166	183	205	219	243	283	308	507	693	1,053	1,678	2,131
Gross profit	250	300	368	416	407	468	555	610	801	1,335	2,040	3,078	4,051
Opex	31	39	48	54	53	60	70	75	93	172	257	383	495
Operating profit	220	262	320	362	355	408	485	535	708	1,163	1,783	2,694	3,556
Pretax profit	221	264	336	366	358	411	488	537	741	1,187	1,794	2,706	3,574
Net profit	183	217	279	300	293	335	397	437	614	978	1,462	2,196	2,886
EPS (TWD, basic)	3.30	3.92	4.23	4.30	4.19	4.79	5.68	6.25	11.19	14.00	20.91	31.41	41.29
EPS (TWD, fully diluted)	2.81	3.33	3.99	4.30	4.19	4.79	5.68	6.25	9.44	14.00	20.91	31.41	41.29
Margin													
Gross	64%	64%	67%	67%	65%	66%	66%	66%	61%	66%	66%	65%	66%
Operating	56%	56%	58%	58%	57%	57%	58%	58%	54%	57%	58%	57%	58%
Net	47%	46%	51%	48%	47%	47%	47%	48%	47%	48%	47%	46%	47%
Growth (QoQ)													
Revenue	6%	20%	18%	13%	1%	14%	18%	10%					
Gross profit	14%	20%	23%	13%	-2%	15%	19%	10%					
Operating profit	14%	19%	22%	13%	-2%	15%	19%	10%					
Net profit	-2%	19%	29%	8%	-2%	14%	19%	10%					
EPS (basic)	-2%	19%	8%	1%	-2%	14%	19%	10%					
EPS (FD)	-2%	19%	20%	8%	-2%	14%	19%	10%					
Growth (YoY)													
Revenue	37%	40%	70%	70%	61%	52%	52%	48%	83%	55%	53%	54%	30%
Gross profit	40%	48%	84%	90%	63%	56%	51%	47%	99%	67%	53%	51%	32%
Operating profit	39%	45%	80%	88%	62%	56%	52%	48%	117%	64%	53%	51%	32%
Net profit	37%	47%	89%	62%	61%	55%	42%	45%	127%	59%	49%	50%	31%
EPS (basic)	36%	46%	57%	27%	27%	22%	34%	45%	86%	25%	49%	50%	31%
EPS (FD)	35%	47%	76%	51%	49%	44%	42%	45%	82%	48%	49%	50%	31%

Source: Company, Daiwa forecasts

**OC food-chain: valuation comparison**

Stock	Ticker	Price (LC)*	MktCap (USDm)	PER (x)			PBR (x)			ROE (%)			Earnings growth (%)		
				2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E
<b>Compound-semi substrate</b>															
AXT	AXTI US	2.63	86	nm	nm	na	0.6	0.6	na	na	0.3	na	nm	nm	na
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
Average				11.4	9.3	8.5	0.7	0.6	0.7	6.9	4.1	8.0	-18.1	20.2	7.7
<b>Epiwafer growing</b>															
LandMark Opto	3081 TT	502.00	1,058	35.9	24.0	16.0	9.8	7.8	6.0	38.6	36.2	42.5	59.4	49.4	50.2
IQE	IQE LN	0.18	171	7.2	6.4	5.8	0.9	0.8	0.7	12.9	12.6	11.4	966.2	11.5	5.2
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
VPEC	2455 TT	50.50	375	20.5	17.4	17.2	3.5	3.2	3.3	17.2	17.9	18.8	29.8	12.8	5.4
IntelliEPI	4971 TT	131.50	136	31.6	25.0	na	4.1	na	na	12.0	13.2	na	-19.8	27.4	na
Average				21.3	16.4	11.9	3.8	3.1	2.7	17.5	17.6	20.2	203.5	24.3	17.1
<b>Epiwafer foundry</b>															
WinSemi	3105 TT	55.00	989	12.2	10.4	9.0	2.0	1.8	1.6	16.5	17.8	18.6	37.2	16.8	16.2
<b>Dedicated SiP</b>															
ASE	2311 TT	34.30	8,497	14.7	12.6	9.8	1.7	1.6	1.5	12.1	13.1	15.9	-18.7	16.6	28.6
Amkor	AMKR US	4.36	1,035	18.2	10.4	8.2	0.9	0.8	na	7.0	8.6	na	-42.4	37.1	na
Venture	VMS SP	7.95	1,565	14.2	13.0	11.8	1.2	1.2	1.2	8.2	8.9	9.9	9.7	9.4	12.0
Inari Amertron	INRI MK	3.13	710	15.0	12.3	11.1	4.4	3.6	3.0	32.4	31.7	30.1	29.5	21.1	14.9
ShunSin	6451 TT	93.40	296	9.5	9.5	na	2.2	2.1	na	22.0	21.0	na	9.3	2.2	na
eLASER	3450 TT	134.00	371	11.3	11.7	11.3	3.7	2.9	1.9	30.1	26.8	21.4	45.4	-3.3	3.5
PCL Tech	4977 TT	57.60	89	11.9	11.1	10.1	2.1	1.4	1.3	17.3	16.4	13.3	1.1	7.0	7.2
Average				13.5	11.5	10.4	2.3	1.9	1.8	18.4	18.1	18.1	4.9	12.9	13.2
<b>Subassembly (semi-IDM)</b>															
AcceLink	002281 CH	56.41	1,817	57.1	37.0	27.6	4.5	4.2	3.5	8.3	10.9	12.8	44.0	48.2	39.8
TrueLight	3234 TT	87.00	272	12.2	8.1	7.8	4.0	2.8	na	37.8	41.6	40.6	143.2	39.0	18.8
LuxNet	4979 TT	73.00	163	11.3	9.9	na	3.0	2.6	na	23.9	29.2	na	138.7	25.9	na
Sercomm	5388 TT	81.50	592	14.9	12.2	10.9	2.8	2.6	2.3	18.4	20.5	22.5	38.0	20.8	13.8
MACOM	6503 JP	1,074.00	20,247	10.4	10.0	9.1	1.2	1.1	1.0	11.5	11.1	11.2	-5.3	4.0	9.8
MELCO	MTSI US	36.96	1,962	19.4	14.1	13.1	5.3	na	na	25.4	26.0	na	114.7	32.4	-0.8
Average				20.9	15.2	13.7	3.5	2.6	2.3	20.9	23.2	21.8	78.9	28.4	16.3
<b>Full IDM</b>															
Avago	AVGO US	126.24	51,937	13.0	12.2	12.1	5.6	4.3	3.4	43.7	36.1	35.5	109.5	9.3	0.7
Finisar	FNSR US	13.37	1,430	14.7	11.6	9.2	1.3	1.2	na	7.9	12.2	na	724.2	30.0	27.2
Sumitomo Electric	5802 JP	1,370.00	9,550	11.4	9.3	8.5	0.8	0.7	0.7	6.9	7.8	8.0	-18.1	20.2	7.7
Lumentum	LITE US	23.81	1,407	21.3	16.9	14.0	2.8	2.5	na	14.1	14.8	15.7	nm	26.6	-5.0
Average				15.1	12.5	11.0	2.6	2.2	2.0	18.1	17.7	19.7	271.9	21.5	7.7
<b>MOCVD</b>															
Aixtron	AIXA GY	3.17	398	nm	nm	75.5	0.9	0.9	0.9	-7.9	-3.6	0.8	nm	nm	nm
Veeco	VECO US	18.77	769	38.6	25.8	16.1	1.0	1.1	1.1	-0.9	-0.5	2.5	nm	18.0	108.3
Average				38.6	25.8	45.8	1.0	1.0	1.0	-4.4	-2.0	1.7	na	18.0	108.3

Source: Bloomberg (for NR companies), Daiwa forecasts (for rated companies)

Note: \*local currency based on share prices as at 16 February 2016; March-year-end for Sumitomo Electric and MELCO, April-year-end for Finisar, June-year-end for Lumentum (JDSU), September-year-end for MACOM, October-year-end for Avago; 2015E=FY16E, 2016E=FY17E, 2017E=FY18E

## Appendix: epi-wafer market analysis

As we highlighted in our WinSemi initiation report (see [Big Data traffic builder](#), published 2 January 2015), the global semiconductor market comprises the mainstream complementary metal oxide semiconductor (CMOS) players, with a market size of around USD255bn, and the niche compound semiconductor players, with a market size of USD13-15bn (c. 5% of the CMOS) as of 2015, on our estimates. Whereas the CMOS chipmakers use CMOS wafers, usually made of silicon (Si) or silicon mixed with germanium (SiGe), to fabricate them into semiconductor chips that are used in a wide variety of applications across the 4C (computers, communications, consumers and cars) and industrial & medical, as illustrated in the following chart, the compound-semi chipmakers use compound wafers to fabricate them into specialty chips that accommodate generic semiconductor chips by handling the microwave or optical communications.

### What is an epi-wafer?

**An epi-wafer is a compound wafer mixed with III-V chemicals**

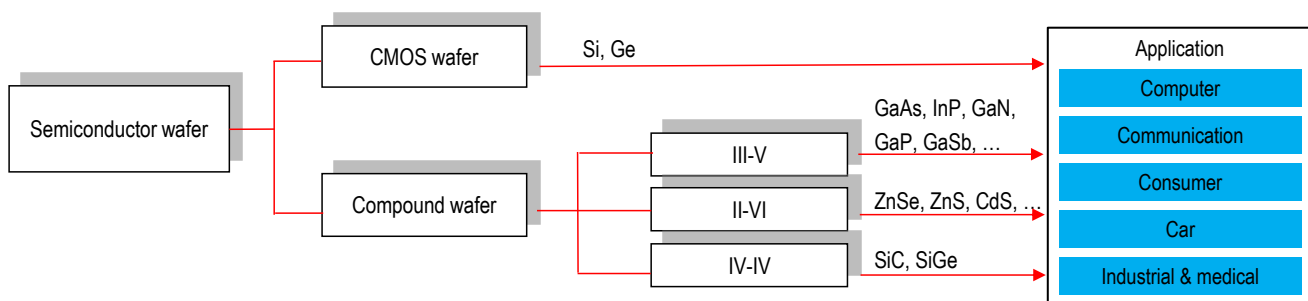
Unlike CMOS wafers, which are mostly pulled and sliced following the purification & separation processes of silicon in a furnace (hence the name, silicon wafers), compound wafers are processed by an epi-wafer maker, which procures a silicon substrate from a substrate vendor and uses a MOCVD or MBE reactor to grow (deposit) an epitaxial layer onto the substrate. The layer is typically formed with a mix of the III-V chemical family, such as gallium (Ga), arsenide (As), indium (In), nitride (N) and phosphide (P) to establish a binary (GaAs, InP, GaN, etc) or ternary structure (InGaAs, InGaP, etc). Thus, a compound wafer is an epiwafer.

### What is the MOCVD process?

**MOCVD vs. MBE**

The metal organic chemical vapour deposition (MOCVD) process is a chemical vapour deposition method used to produce single- or poly-crystalline thin-films during the gas phase at moderate pressure at a high temperature. It is a highly complex process for growing crystalline layers to create complex semiconductor multilayer structures by chemical reaction by using a MOCVD reactor, as opposed to an alternative method of molecular beam epitaxy (MBE), which uses physical deposition. Applying the MOCVD process, an epiwafer maker is able to deposit (or “grow”) different chemical combinations, such as Ga, As, In, P, onto a silicon substrate through chemical reactions involving these materials to form an epitaxial layer on the substrate, or an epiwafer. The combination of chemical materials is chosen depending on the different end-product applications, of communications, optoelectronics or industrials (see chart, following page).

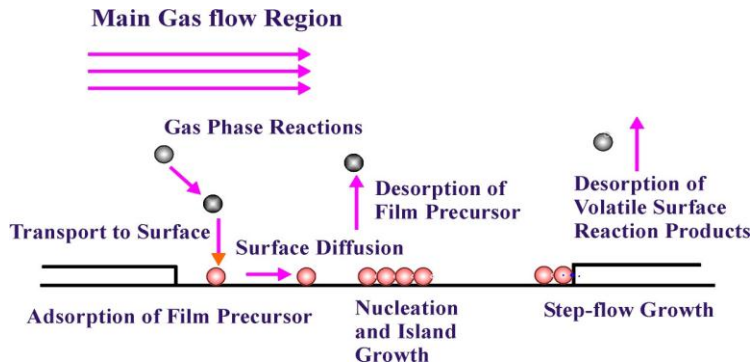
Type of semiconductor wafer by material structure\*



Source: Daiwa

Note: \*Binary: GaAs, InP, GaP, GaN, etc; Ternary: InGaAs, InGaP, AlGaAs, etc; Quaternary: AlGaInP, InGaAsP, etc; Pentanary: AlGaInAsN, etc.

**Illustration of the MOCVD process**



Source: Daiwa

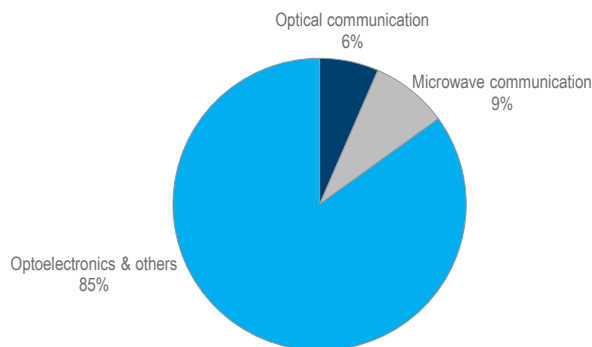
**Market application**

With a total market size of roughly USD2.9bn for 2014, on our estimates, epi-wafers are usually used in 3 market applications, with revenue shares as illustrated in the following chart:

- Optical communications (OC) products such as pin diodes or photo diodes (PD) that receive light signals and laser diodes (LD) that transmit light signals.
- Microwave communications (MC) products such as radio frequency (RF) power amplifiers (PA) and switches.
- Optoelectronics & others products, such as LED, solar, consumer, medical and industrial equipment.

Our focus in this report is the OC epi-wafers, which accounted for 6% of the 2014 global epiwafer market (in terms of revenue), or around USD190m, which can be fabricated into PD or LD to combine with other components and form a fibre-optic (FO) transceiver.

**2014 global epi-wafer market value breakdown by application**



Source: Strategy Analytics, Daiwa

**LD is more difficult to produce than PD**

**LD the key source of value**

While epi-wafers for PD are easy to grow relative to LD, as the former’s growing process shares common ground with the MC players’ GaAs epiwafer-growing know-how, epiwafers for use in LD require a different set of knowledge. LD, based on an InP epi-structure, determines the quality of light transmission due to control over the realignment of atomic structures, which ensures stability in the angles at which light is emitted.

The quality-leading OC epiwafer makers like LandMark Opto tend to develop proprietary formulas for epi-growing for LD on their own or jointly with their customers, which is how they split value in the food chain. LD essentially offers the greatest value proposition in the epi-wafer industry, in our opinion.

There are basically 3 types of LD in terms of light-emitting structure, transmission speed and distance: vertical cavity surface emitting lasers (VCSEL), fabry perot lasers (FP) and distributed feedback lasers (DFB) (see the following table for the comparison). While VCSEL is known as a “short-wave” solution suitable for Datacom purposes, such as datacentres that demand high bandwidth within a short distance, FP and DFB are both edge-emitting, “long-wave” solutions, focusing on telecoms purposes, for PON for example.

**Types of laser diode (LD)\***

	VCSEL	FP	DFB
Light-emitting structure	surface-emitting laser	edge-emitting laser	edge-emitting laser
Wavelength	650-1300nm	1300-2000nm	1300-2000nm
Transmission rate	1-10Gbps	1.25-2.5Gbps	2.5-10Gbps
Transmission distance	<=30m	up to 1km	over 1km
Epi-wafer structure	GaAs, InP	InP	InP

Source: Daiwa

Note: \*nm = nanometre, Gbps = gigabit per second

**Market size and competition**

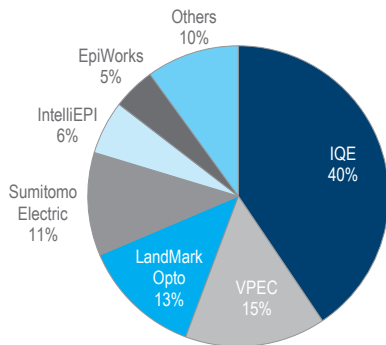
We estimate the global epi-wafer market generated revenues of around USD3bn for 2015, compared with some USD8bn for the mainstream silicon wafer market. OC and MC epi-wafers combined form what we refer to as the communications epi-wafer market, which reached around USD490m for 2015, on our estimates, or c. 6% of the silicon wafer market globally. The major players and market shares are depicted in the following chart.

Controlling some 40% share of the 2015 communications epi-wafer market, UK-based IQE is the global leader in this space, after it acquired Kopin’s III-V assets in 2013 (Kopin was ranked No.3 in 2012). This was followed by Taiwan-based VPEC and LandMark Opto, and Japan-based Sumitomo Chemical, all in revenue terms. Ranked No.3, LandMark Opto had a 13% market share in 2015, as it is a pure supplier for OC epi-wafers whereas other players have a broad exposure to other applications. Therefore, in the pure OC epi-wafer market, LandMark Opto is indeed the global leader, beating IQE in 2014 and controlling 29% of the market in 2015, on our estimates, followed by the IDM captive supply players such as Avago and Lumentum (spun-off from JDSU).

**LandMark Opto dominates the pure OC epi-wafer market, with a nearly 50% share**

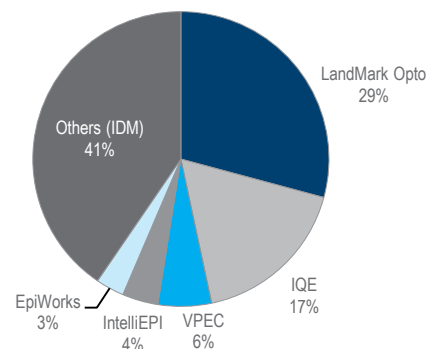
Further, excluding IDM, the dedicated OC epi-wafer market is dominated by LandMark Opto and IQE, with 2015 market shares of nearly 50% and 30%, respectively, while the remainder is controlled by the likes of VPEC and Taiwan-based IntelliePI, which acquired the GaAs epi-wafer business from Soitec in 2014. This suggests to us that there is an oligopolistic structure in the global OC market due to the high entry barriers posed by self-developed or co-developed formulas for epitaxial-layer-growing.

**2015E communications epi-wafer market shares**



Source: Company, Daiwa estimates

**2015E OC epi-wafer market shares**



Source: Company, Daiwa estimates



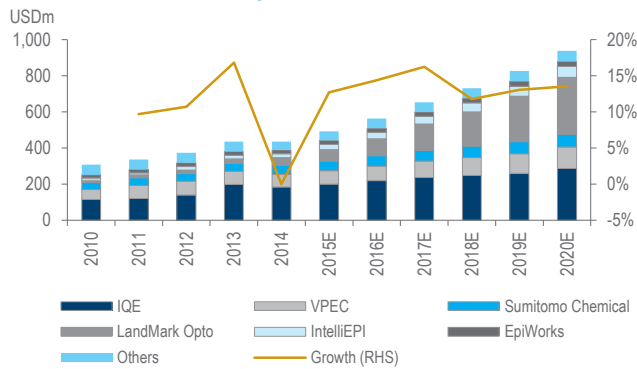
## Growth outlook

**We forecast the global OC epi-wafer market to see a 20% revenue CAGR over 2015-20**

We forecast total revenue in the global communication epi-wafer (OC + MC) market to grow by 14% YoY to around USD560m for 2016, or by a CAGR of 14% for 2015-20, led by the OC epi-wafer players, while the MC epi-wafer players are likely see a CAGR of only 7% due to the slowdown in smartphone demand growth and saturation of 4G penetration.

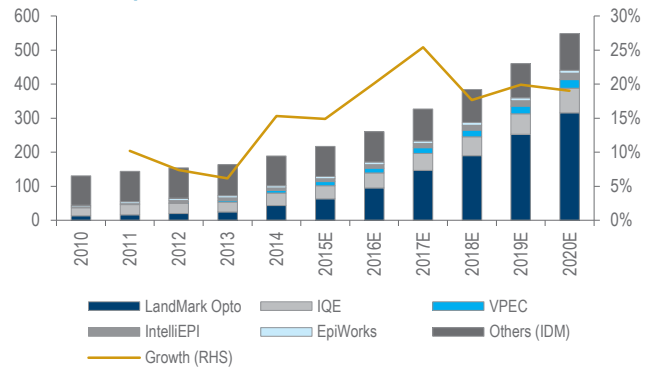
In the OC epi-wafer market, on the other hand, we forecast 20% YoY growth in revenue in 2016 to USD260m, with a CAGR of 20% over 2015-20, driven primarily by global FTTX demand penetration and datacentre bandwidth upgrades, as mentioned in the sector portion of this report. We expect LandMark Opto to retain its market leadership in the OC space in 2016, with its market share rising to 36% if we take into account both dedicated and IDM, and further to more than 50% by 2020 due to additional growth drivers from the ongoing SiPhotonics projects.

**Global communication epi-wafer market forecasts**



Source: Company, Daiwa forecasts

**Global OC epi-wafer market forecasts**



Source: Company, Daiwa forecasts

# Win Semiconductors (3105 TT)

 Target price: **TWD63.50** (from TWD63.50)

 Share price (16 Feb): **TWD55.00** | Up/downside: **+15.5%**

 5 4 3 2 **1**  
**Buy**  
 (unchanged)

## Bridging the gap with fibre optics

- Microwave applications have been driving business growth
- But WinSemi's tech know-how scalable for optical communication
- Reiterate Buy (1) with unchanged TP of TWD63.5

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**What's new:** While deriving more than 90% of its revenue from microwave communication (MC) applications, WinSemi is leveraging its compound semiconductor know-how to extend its business into optical communication (OC). We expect fibre-optic (FO) transceivers to become an earnings-growth driver for WinSemi, after cellular and WiFi power amplifiers (PA).

**What's the impact: Microwave technology driving growth.** Focusing on the compound-semi technologies of gallium-arsenide (GaAs) epiwafer-growing, fabrication, packaging & testing, WinSemi offers PA foundry work for a variety of radio frequency (RF) customers in MC applications, including Avago and Qorvo in the cellular PA space and Murata in WiFi PA. WinSemi controls over half of the GaAs foundry market, and therefore enjoyed strong earnings-growth by capitalising on 4G smartphone penetration which spurred cellular PA demand in 2013-15. The next wave looks likely to be the WiFi upgrade cycle, which should extend the company's earnings-growth momentum to 2015-17E. But there's more.

**Fibre optics could be next.** In the past we have flagged a number of demand drivers that we see sustaining multiple years of business growth for WinSemi (see [Counter-seasonal 1Q16 confirmed](#)), namely 4G and WiFi followed by FO which we see as potential drivers. An FO transceiver module consists of an optical subassembly (OSA), electrical subassembly (ESA) and the housing, where OSA and ESA are an extension of WinSemi's compound-semi tech know-how, with different chemical compositions for epiwafers. We understand WinSemi is now able to commercialise modulators for ESAs on a ternary-structure InGaAs epiwafer, and is developing process know-how for OSAs, which may start to contribute revenue in 2H16 (likely pin diodes). FO could provide the 3rd wave of growth after the WiFi upgrade cycle tapers off. (Note: an OSA consists of a pair of pin diode [or a receiver OSA, also known as a ROSA] and a laser diode [or transmitter OSA, also known as a TOSA]. An ESA consists of a set of electronic components that facilitate the OSA, including a modulator, waveguide, multiplexer, controlling IC and other passive components.)

**What we recommend:** We forecast WinSemi's net profit to rise at a CAGR of 15% over 2015-18 on the back of 2 growth engines, 4G and WiFi, with the potential for FO to provide earnings upside. We reaffirm our Buy (1) call and 12-month TP of TWD63.5 based on an unchanged 2016E PBR of 2.1x. Key risk: a prolonged inventory correction on macro uncertainties.

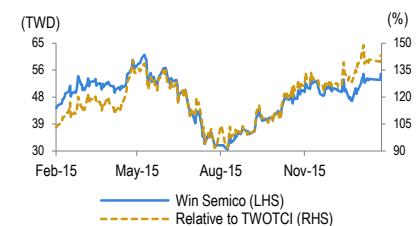
**How we differ:** We are ahead of the consensus on 2016-17 EPS forecasts as we are more bullish on the WiFi upgrade cycle.

### Forecast revisions (%)

Year to 31 Dec	15E	16E	17E
Revenue change	-	-	-
Net profit change	-	-	-
Core EPS (FD) change	-	-	-

Source: Daiwa forecasts

### Share price performance



12-month range	30.40-61.23
Market cap (USDbn)	0.98
3m avg daily turnover (USDm)	12.72
Shares outstanding (m)	597
Major shareholder	Fubon life insurance (4.4%)

### Financial summary (TWD)

Year to 31 Dec	15E	16E	17E
Revenue (m)	12,016	13,470	15,823
Operating profit (m)	3,471	3,889	4,520
Net profit (m)	2,693	3,145	3,653
Core EPS (fully-diluted)	4.514	5.273	6.124
EPS change (%)	72.1	16.8	16.2
Daiwa vs Cons. EPS (%)	(0.5)	4.5	n.a.
PER (x)	12.2	10.4	9.0
Dividend yield (%)	4.2	4.7	3.6
DPS	2.3	2.6	2.0
PBR (x)	2.0	1.8	1.6
EV/EBITDA (x)	5.9	5.2	4.4
ROE (%)	16.5	17.8	18.6

Source: FactSet, Daiwa forecasts

## Financial summary

### Key assumptions

Year to 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Wafer Shipment (wpy)	n.a.	n.a.	211,659	206,078	207,166	248,904	286,650	360,420
Utilisation Rate (%)	n.a.	n.a.	82	73	72	86	91	89
ASP (USD)	n.a.	n.a.	1,797	1,705	1,578	1,519	1,441	1,351

### Profit and loss (TWDm)

Year to 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Cellular	n.a.	n.a.	6,005	5,669	4,962	5,553	5,633	5,828
Infrastructure	n.a.	n.a.	1,528	1,610	2,108	2,063	2,177	3,182
Other Revenue	n.a.	n.a.	3,705	3,202	2,840	4,400	5,660	6,813
<b>Total Revenue</b>	<b>6,982</b>	<b>8,901</b>	<b>11,238</b>	<b>10,481</b>	<b>9,910</b>	<b>12,016</b>	<b>13,470</b>	<b>15,823</b>
Other income	0	0	0	0	0	0	0	0
COGS	(4,903)	(6,097)	(7,598)	(7,249)	(6,400)	(7,282)	(8,144)	(9,634)
SG&A	(467)	(577)	(652)	(627)	(633)	(690)	(764)	(878)
Other op. expenses	(415)	(450)	(530)	(495)	(562)	(573)	(674)	(791)
<b>Operating profit</b>	<b>1,197</b>	<b>1,777</b>	<b>2,457</b>	<b>2,110</b>	<b>2,315</b>	<b>3,471</b>	<b>3,889</b>	<b>4,520</b>
Net-interest inc./ (exp.)	(42)	(58)	(98)	(64)	(31)	(13)	(17)	(8)
Assoc/forex/extraord./others	554	(550)	(431)	167	145	(10)	60	55
<b>Pre-tax profit</b>	<b>1,709</b>	<b>1,170</b>	<b>1,928</b>	<b>2,212</b>	<b>2,429</b>	<b>3,448</b>	<b>3,932</b>	<b>4,567</b>
Tax	(0)	109	(281)	(401)	(465)	(755)	(786)	(913)
Min. int./pref. div./others	0	0	0	0	0	0	0	0
<b>Net profit (reported)</b>	<b>1,709</b>	<b>1,279</b>	<b>1,648</b>	<b>1,812</b>	<b>1,963</b>	<b>2,693</b>	<b>3,145</b>	<b>3,653</b>
<b>Net profit (adjusted)</b>	<b>1,709</b>	<b>1,279</b>	<b>1,648</b>	<b>1,812</b>	<b>1,963</b>	<b>2,693</b>	<b>3,145</b>	<b>3,653</b>
<b>EPS (reported)(TWD)</b>	<b>2.839</b>	<b>2.045</b>	<b>2.448</b>	<b>2.402</b>	<b>2.649</b>	<b>4.514</b>	<b>5.273</b>	<b>6.124</b>
<b>EPS (adjusted)(TWD)</b>	<b>2.839</b>	<b>2.045</b>	<b>2.448</b>	<b>2.402</b>	<b>2.649</b>	<b>4.514</b>	<b>5.273</b>	<b>6.124</b>
<b>EPS (adjusted fully-diluted)(TWD)</b>	<b>2.768</b>	<b>1.971</b>	<b>2.404</b>	<b>2.369</b>	<b>2.623</b>	<b>4.514</b>	<b>5.273</b>	<b>6.124</b>
<b>DPS (TWD)</b>	<b>0.853</b>	<b>0.830</b>	<b>1.688</b>	<b>1.472</b>	<b>0.201</b>	<b>2.300</b>	<b>2.600</b>	<b>2.000</b>
<b>EBIT</b>	<b>1,197</b>	<b>1,777</b>	<b>2,457</b>	<b>2,110</b>	<b>2,315</b>	<b>3,471</b>	<b>3,889</b>	<b>4,520</b>
<b>EBITDA</b>	<b>2,176</b>	<b>2,811</b>	<b>3,764</b>	<b>3,932</b>	<b>4,196</b>	<b>5,395</b>	<b>6,005</b>	<b>6,966</b>

### Cash flow (TWDm)

Year to 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Profit before tax	1,709	1,170	1,928	2,212	2,429	3,448	3,932	4,567
Depreciation and amortisation	979	1,034	1,307	1,822	1,882	1,925	2,116	2,447
Tax paid	(0)	109	(281)	(401)	(465)	(755)	(786)	(913)
Change in working capital	(261)	(478)	(572)	887	(118)	(320)	0	(650)
Other operational CF items	210	31	508	478	103	0	0	0
<b>Cash flow from operations</b>	<b>2,638</b>	<b>1,865</b>	<b>2,890</b>	<b>4,998</b>	<b>3,830</b>	<b>4,298</b>	<b>5,261</b>	<b>5,450</b>
Capex	(2,378)	(3,336)	(3,317)	(2,815)	(738)	(3,493)	(3,350)	(3,500)
Net (acquisitions)/disposals	0	0	0	0	0	0	0	0
Other investing CF items	(1,448)	(172)	(639)	1,233	(535)	0	0	0
<b>Cash flow from investing</b>	<b>(3,826)</b>	<b>(3,508)</b>	<b>(3,956)</b>	<b>(1,583)</b>	<b>(1,272)</b>	<b>(3,493)</b>	<b>(3,350)</b>	<b>(3,500)</b>
Change in debt	909	2,076	718	(2,942)	(783)	(588)	(470)	(188)
Net share issues/(repurchases)	0	304	3,029	(515)	0	0	0	0
Dividends paid	0	(513)	(519)	(1,136)	(1,110)	(149)	(1,372)	(1,551)
Other financing CF items	219	164	51	112	25	(1,480)	100	100
<b>Cash flow from financing</b>	<b>1,128</b>	<b>2,030</b>	<b>3,279</b>	<b>(4,481)</b>	<b>(1,867)</b>	<b>(2,216)</b>	<b>(1,742)</b>	<b>(1,639)</b>
Forex effect/others	0	0	0	0	0	0	0	0
<b>Change in cash</b>	<b>(60)</b>	<b>388</b>	<b>2,213</b>	<b>(1,065)</b>	<b>690</b>	<b>(1,412)</b>	<b>169</b>	<b>311</b>
Free cash flow	260	(1,470)	(427)	2,183	3,092	805	1,911	1,950

Source: FactSet, Daiwa forecasts

## Financial summary continued ...

### Balance sheet (TWDm)

As at 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Cash & short-term investment	2,010	2,399	5,039	3,714	4,676	3,264	3,433	3,744
Inventory	1,369	1,894	2,101	1,127	1,500	1,490	1,840	2,140
Accounts receivable	481	653	1,049	650	690	940	890	1,290
Other current assets	243	620	675	198	259	200	200	200
<b>Total current assets</b>	<b>4,104</b>	<b>5,566</b>	<b>8,865</b>	<b>5,689</b>	<b>7,125</b>	<b>5,894</b>	<b>6,363</b>	<b>7,374</b>
Fixed assets	8,685	11,267	13,228	12,636	11,653	12,971	14,211	15,087
Goodwill & intangibles	338	250	128	624	345	340	300	265
Other non-current assets	1,762	1,516	1,370	2,162	2,694	2,694	2,694	2,694
<b>Total assets</b>	<b>14,889</b>	<b>18,599</b>	<b>23,591</b>	<b>21,112</b>	<b>21,816</b>	<b>21,900</b>	<b>23,569</b>	<b>25,420</b>
Short-term debt	365	0	0	0	0	0	0	0
Accounts payable	871	1,090	1,122	635	930	850	1,150	1,200
Other current liabilities	2,114	1,976	2,464	1,692	1,819	1,713	1,770	1,608
<b>Total current liabilities</b>	<b>3,351</b>	<b>3,066</b>	<b>3,586</b>	<b>2,327</b>	<b>2,749</b>	<b>2,562</b>	<b>2,920</b>	<b>2,808</b>
Long-term debt	2,662	5,484	5,559	3,721	2,938	2,351	1,881	1,692
Other non-current liabilities	2	4	21	171	189	191	200	249
<b>Total liabilities</b>	<b>6,015</b>	<b>8,554</b>	<b>9,166</b>	<b>6,220</b>	<b>5,876</b>	<b>5,104</b>	<b>5,000</b>	<b>4,749</b>
Share capital	6,176	6,486	7,542	7,393	7,422	5,955	5,955	5,955
Reserves/R.E./others	2,698	3,559	6,883	7,499	8,517	10,841	12,614	14,716
<b>Shareholders' equity</b>	<b>8,874</b>	<b>10,045</b>	<b>14,425</b>	<b>14,892</b>	<b>15,940</b>	<b>16,795</b>	<b>18,569</b>	<b>20,671</b>
Minority interests	0	0	0	0	0	0	0	0
<b>Total equity &amp; liabilities</b>	<b>14,889</b>	<b>18,599</b>	<b>23,591</b>	<b>21,112</b>	<b>21,816</b>	<b>21,900</b>	<b>23,569</b>	<b>25,420</b>
EV	33,827	35,895	33,330	32,818	31,073	31,897	31,257	30,758
<b>Net debt/(cash)</b>	<b>1,017</b>	<b>3,084</b>	<b>520</b>	<b>8</b>	<b>(1,737)</b>	<b>(913)</b>	<b>(1,553)</b>	<b>(2,052)</b>
<b>BVPS (TWD)</b>	<b>14.741</b>	<b>16.063</b>	<b>21.434</b>	<b>19.746</b>	<b>21.508</b>	<b>28.154</b>	<b>31.127</b>	<b>34.651</b>

### Key ratios (%)

Year to 31 Dec	2010	2011	2012	2013	2014	2015E	2016E	2017E
Sales (YoY)	45.8	27.5	26.3	(6.7)	(5.5)	21.3	12.1	17.5
EBITDA (YoY)	63.3	29.2	33.9	4.4	6.7	28.6	11.3	16.0
Operating profit (YoY)	89.2	48.5	38.3	(14.1)	9.7	49.9	12.0	16.2
Net profit (YoY)	205.5	(25.2)	28.9	10.0	8.4	37.2	16.8	16.2
Core EPS (fully-diluted) (YoY)	195.8	(28.8)	21.9	(1.4)	10.7	72.1	16.8	16.2
Gross-profit margin	29.8	31.5	32.4	30.8	35.4	39.4	39.5	39.1
EBITDA margin	31.2	31.6	33.5	37.5	42.3	44.9	44.6	44.0
Operating-profit margin	17.1	20.0	21.9	20.1	23.4	28.9	28.9	28.6
Net profit margin	24.5	14.4	14.7	17.3	19.8	22.4	23.4	23.1
ROAE	21.7	13.5	13.5	12.4	12.7	16.5	17.8	18.6
ROAA	12.9	7.6	7.8	8.1	9.1	12.3	13.8	14.9
ROCE	11.0	13.0	13.8	10.9	12.3	18.3	19.6	21.1
ROIC	12.8	15.4	15.0	11.6	12.9	18.0	18.9	20.3
Net debt to equity	11.5	30.7	3.6	0.1	n.a.	n.a.	n.a.	n.a.
Effective tax rate	0.0	n.a.	14.6	18.1	19.2	21.9	20.0	20.0
Accounts receivable (days)	28.7	23.2	27.6	29.6	24.7	24.8	24.8	25.1
Current ratio (x)	1.2	1.8	2.5	2.4	2.6	2.3	2.2	2.6
Net interest cover (x)	28.7	30.9	25.0	33.0	74.3	267.0	228.7	565.0
Net dividend payout	30.0	40.6	69.0	61.3	7.6	50.9	49.3	32.7
Free cash flow yield	0.8	n.a.	n.a.	6.7	9.4	2.5	5.8	5.9

Source: FactSet, Daiwa forecasts

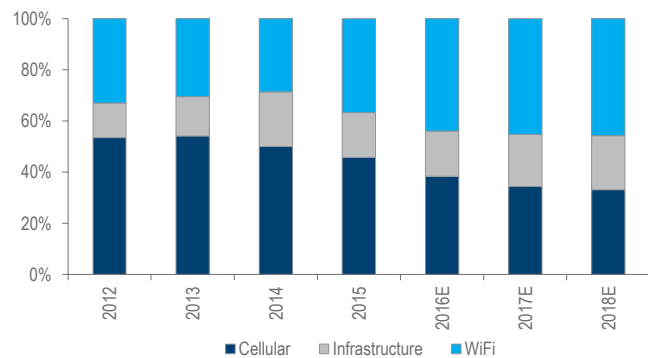
## Company profile

Founded in 1999, Win Semiconductors Corp (WinSemi) is the world's largest compound semiconductor foundry, focusing on gallium-arsenide (GaAs) foundry services for customers in both wireless and fixed-line communication markets and infrastructure applications. It has a diverse technology portfolio of processes that supports microwave frequency requirements from 50MHz to 100GHz. End-market applications for its products encompass smartphones, tablet PCs, infrastructure base-stations, very small aperture terminal (VSAT) hubs, fibre optics, cable televisions (CATV) and the automotive industry.

**WinSemi: quarterly P&L forecasts**

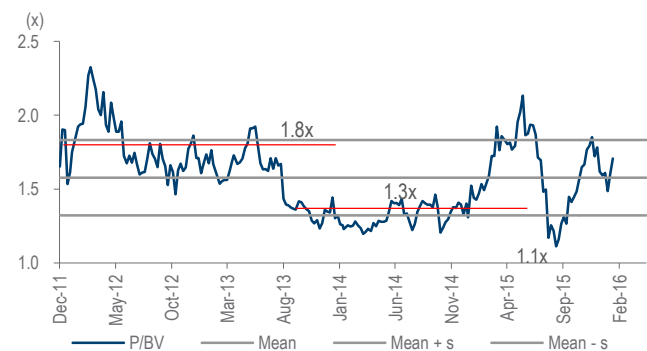
TWDm	1Q15	2Q15	3Q15	4Q15	1Q16E	2Q16E	3Q16E	4Q16E	2015	2016E	2017E	2018E
Cellular	1,403	1,580	1,194	1,375	1,320	1,386	1,524	1,403	5,553	5,633	5,828	6,358
Infrastructure	561	527	495	479	456	512	600	609	2,062	2,177	3,182	3,689
WiFi	842	992	1,223	1,343	1,262	1,389	1,527	1,482	4,399	5,660	6,813	7,787
<b>Total revenue</b>	<b>2,807</b>	<b>3,099</b>	<b>2,913</b>	<b>3,197</b>	<b>3,039</b>	<b>3,287</b>	<b>3,652</b>	<b>3,493</b>	<b>12,016</b>	<b>13,470</b>	<b>15,823</b>	<b>17,834</b>
COGS	-1,744	-1,898	-1,735	-1,905	-1,856	-2,001	-2,181	-2,106	-7,282	-8,144	-9,634	-10,854
Gross profit	1,063	1,201	1,178	1,292	1,182	1,286	1,471	1,387	4,734	5,326	6,189	6,979
Opex	-288	-300	-350	-325	-328	-352	-387	-370	-1,264	-1,437	-1,669	-1,879
Operating profit	774	902	827	967	854	934	1,083	1,017	3,471	3,889	4,520	5,100
EBITDA	1,247	1,376	1,310	1,462	1,381	1,478	1,605	1,541	5,395	6,005	6,966	7,867
Pretax profit	742	843	964	899	862	944	1,095	1,030	3,448	3,932	4,567	5,163
Income taxes	-124	-306	-159	-166	-172	-189	-219	-206	-755	-786	-913	-1,033
<b>Net profit</b>	<b>618</b>	<b>537</b>	<b>805</b>	<b>733</b>	<b>690</b>	<b>755</b>	<b>876</b>	<b>824</b>	<b>2,693</b>	<b>3,145</b>	<b>3,653</b>	<b>4,130</b>
FD O/S (m)	744	744	595	597	597	597	597	597	597	597	597	597
<b>FD EPS (TWD)</b>	<b>0.83</b>	<b>0.72</b>	<b>1.35</b>	<b>1.23</b>	<b>1.16</b>	<b>1.27</b>	<b>1.47</b>	<b>1.38</b>	<b>4.51</b>	<b>5.27</b>	<b>6.12</b>	<b>6.92</b>
<b>Margin</b>												
Gross	38%	39%	40%	40%	39%	39%	40%	40%	39%	40%	39%	39%
Operating	28%	29%	28%	30%	28%	28%	30%	29%	29%	29%	29%	29%
EBITDA	44%	44%	45%	46%	45%	45%	44%	44%	45%	45%	44%	44%
Net	22%	17%	28%	23%	23%	23%	24%	24%	22%	23%	23%	23%
<b>Growth (QoQ)</b>												
Cellular revenue	3%	13%	-24%	15%	-4%	5%	10%	-8%				
Infrastructure revenue	9%	-6%	-6%	-3%	-5%	12%	17%	2%				
WiFi revenue	0%	18%	23%	10%	-6%	10%	10%	-3%				
<b>Total revenue</b>	<b>3%</b>	<b>10%</b>	<b>-6%</b>	<b>10%</b>	<b>-5%</b>	<b>8%</b>	<b>11%</b>	<b>-4%</b>				
Gross profit	5%	13%	-2%	10%	-9%	9%	14%	-6%				
Operating profit	14%	16%	-8%	17%	-12%	9%	16%	-6%				
EBITDA	9%	10%	-5%	12%	-6%	7%	9%	-4%				
Net profit	11%	-13%	50%	-9%	-6%	10%	16%	-6%				
<b>FD EPS</b>	<b>12%</b>	<b>-13%</b>	<b>87%</b>	<b>-9%</b>	<b>-6%</b>	<b>10%</b>	<b>16%</b>	<b>-6%</b>				
<b>Growth (YoY)</b>												
Cellular revenue	79%	26%	-24%	1%	-6%	-12%	28%	2%	12%	1%	3%	9%
Infrastructure revenue	25%	-11%	-10%	-7%	-19%	-3%	21%	27%	-2%	6%	46%	16%
WiFi revenue	94%	61%	29%	60%	50%	40%	25%	10%	55%	29%	20%	14%
<b>Total revenue</b>	<b>68%</b>	<b>26%</b>	<b>-5%</b>	<b>18%</b>	<b>8%</b>	<b>6%</b>	<b>25%</b>	<b>9%</b>	<b>21%</b>	<b>12%</b>	<b>17%</b>	<b>13%</b>
Gross profit	113%	39%	4%	28%	11%	7%	25%	7%	35%	12%	16%	13%
Operating profit	281%	58%	-4%	43%	10%	4%	31%	5%	50%	12%	16%	13%
EBITDA	86%	32%	-2%	27%	11%	7%	23%	5%	29%	11%	16%	13%
Net profit	190%	22%	7%	32%	12%	41%	9%	12%	37%	17%	16%	13%
<b>FD EPS</b>	<b>191%</b>	<b>23%</b>	<b>34%</b>	<b>65%</b>	<b>39%</b>	<b>76%</b>	<b>9%</b>	<b>12%</b>	<b>72%</b>	<b>17%</b>	<b>16%</b>	<b>13%</b>

Source: Company, Daiwa forecasts

**WinSemi: revenue mix trend by application\***


Source: Company, Daiwa forecasts

Note: \*OC is likely to be included in the infrastructure segment

**WinSemi: PBR trend**


Source: TEJ, Company, Daiwa forecasts

# Visual Photonics Epitaxy (2455 TT)

 Target price: **n.a.**

 Share price (16 Feb): **TWD50.50** | Up/downside: -

No Rating

## Diversifying into optical communication adds to growth

- The No.2 communication epiwafer vendor in the world
- Microwave communication is the company's cash cow
- Management sees optical communication as the next growth driver

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**Background:** Founded in 1996, Visual Photonics Epitaxy (VPEC) is a veteran epiwafer maker in Taiwan. The company originally focused on epiwafer-growing for light emitting diode (LED), but divested this business in 2009 to focus on microwave communication (MC). In 2014, VPEC was ranked 2<sup>nd</sup>-largest communication epiwafer supplier in the world by revenue (see next page chart), with key customers WinSemi, SWKS, AVGO, AWSC and TriQuint. VPEC has further tapped into the optical communication (OC) epiwafer business by growing epiwafers for pin diode (PD). VPEC has 40 MOCVD reactors of which 4 are dedicated to OC epiwafer-growing.

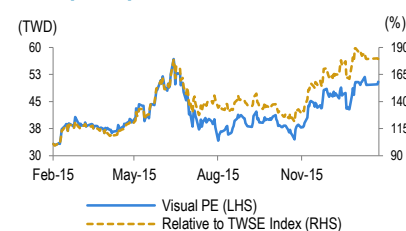
**Highlights: MC the cash cow.** VPEC derived 85% of its revenue from MC epiwafers and 15% from OC epiwafers in 2015, where, according to management, OC could be the next business driver, while MC represents its cash cow. Riding on the 4G penetration followed by WiFi upgrades in the smartphone space, VPEC enjoys a similar level of demand to that of WinSemi in the MC space, as the epiwafers it offers in the food chain are processed by foundries into power amplifiers (PA) for cellular, WiFi or infrastructure applications. Therefore, what has benefited WinSemi as a multi-year demand driver should also continue to benefit VPEC, though to a different extent, as WinSemi procurs epiwafers not only from VPEC, but also IQE, Sumitomo and Freiberger. WinSemi is VPEC's largest customer.

**OC the next driver.** As a late-comer to the OC space, VPEC ramped up its revenue contribution of OC epiwafers from 6.6% in 2013, to 12.5% in 2014 and to 16.5% in 4Q15, focusing on PD. With a gross margin nearly 1.5x that for MC epiwafers, OC could well be VPEC's next growth driver, according to management, on top of the multi-year MC demand driver. The company said its next focus is to grow epiwafers for use in laser diode (LD) which are tougher to grow than PD and thus enjoy even higher margins. VPEC sent out samples of its LD epiwafers in December and is waiting for customer qualification, although this may take time. For comparison, the global OC epiwafer leader, LandMark Opto, derived over 90% of its revenue from LD epiwafers (single-digit revenue % from PD) for 9M15, and recorded a blended gross margin of 65%, compared with VPEC's 38%.

**Financials.** For 9M15, VPEC's revenue rose by 17% YoY but its net profit surged by 50% YoY, thanks to margin expansion as a result of its OC business ramping up. It paid a TWD2.0/share cash dividend in 2015, or some 4% yield.

**Valuation:** VPEC is trading at 3.2x/17.4x 2016E PBR/PER per Bloomberg forecasts, in the mid- to high-bands of its ranges of 2.8-3.8x/15-20x post the GFC (see page 16 of the sector report for a peer comparison).

## Share price performance



12-month range	32.90-56.80
Market cap (USDbn)	0.37
3m avg daily turnover (USDm)	12.10

Source: FactSet, Daiwa forecasts



## Financial summary

### VPEC: profit & loss (TWDm)

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Revenue	534	915	999	1,170	1,559	1,773	2,153	2,249	2,150	2,073
COGS	(447)	(593)	(705)	(883)	(994)	(1,108)	(1,390)	(1,490)	(1,446)	(1,352)
<b>Gross profit</b>	<b>88</b>	<b>323</b>	<b>294</b>	<b>287</b>	<b>565</b>	<b>665</b>	<b>762</b>	<b>758</b>	<b>704</b>	<b>721</b>
SG&A	(51)	(71)	(95)	(84)	(78)	(71)	(91)	(88)	(88)	(93)
R&D	(81)	(62)	(112)	(131)	(113)	(79)	(80)	(102)	(95)	(103)
<b>Operating profit</b>	<b>(44)</b>	<b>190</b>	<b>87</b>	<b>72</b>	<b>374</b>	<b>514</b>	<b>592</b>	<b>568</b>	<b>521</b>	<b>524</b>
Net interest income (expense)	(14)	(8)	(6)	(1)	(5)	(2)	1	6	0	0
Other non-op gains (losses)	(102)	(6)	62	(82)	(1)	(57)	(17)	(15)	32	40
<b>Pretax profit</b>	<b>(160)</b>	<b>176</b>	<b>142</b>	<b>(11)</b>	<b>368</b>	<b>456</b>	<b>576</b>	<b>560</b>	<b>553</b>	<b>565</b>
Income tax	0	0	24	4	(29)	(42)	(63)	(98)	(92)	(96)
Minority interest & others	0	0	0	(6)	0	0	0	0	0	0
<b>Net profit</b>	<b>(160)</b>	<b>176</b>	<b>167</b>	<b>(13)</b>	<b>339</b>	<b>413</b>	<b>513</b>	<b>462</b>	<b>461</b>	<b>468</b>
<b>EPS (weighted average)</b>	<b>(1.73)</b>	<b>1.78</b>	<b>1.65</b>	<b>(0.10)</b>	<b>2.72</b>	<b>2.37</b>	<b>2.33</b>	<b>1.88</b>	<b>1.87</b>	<b>1.90</b>
<b>EPS (fully diluted)</b>	<b>(1.64)</b>	<b>1.74</b>	<b>1.46</b>	<b>(0.10)</b>	<b>2.46</b>	<b>2.35</b>	<b>2.30</b>	<b>1.87</b>	<b>1.87</b>	<b>1.90</b>
DPS (TWD)	0.00	0.00	0.00	0.00	0.00	0.50	0.50	2.00	2.50	2.00
EBITDA	87	275	195	206	525	678	788	795	735	740

Source: Company; note: dividend paid out based on previous year EPS

### VPEC: cash flow (TWDm)

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Pretax profit	(160)	176	142	(11)	368	456	576	560	553	565
Depreciation & amortization	131	84	109	134	150	164	196	226	215	215
Changes in working capital	11	0	(76)	119	(42)	(49)	(220)	108	106	(91)
Other operating CF items	97	(116)	(35)	(51)	54	(14)	0	(52)	(53)	(92)
<b>Cash flow from operations</b>	<b>79</b>	<b>145</b>	<b>141</b>	<b>192</b>	<b>530</b>	<b>557</b>	<b>553</b>	<b>842</b>	<b>821</b>	<b>596</b>
Capex	(2)	(201)	(180)	(430)	(350)	(484)	(489)	(280)	(125)	(86)
Net disposals (acquisitions)	0	0	0	0	0	0	0	0	(59)	0
Other investing CF items	2	(173)	110	59	88	4	0	0	(38)	(2)
<b>Cash flow from investing</b>	<b>(1)</b>	<b>(374)</b>	<b>(70)</b>	<b>(371)</b>	<b>(262)</b>	<b>(480)</b>	<b>(488)</b>	<b>(280)</b>	<b>(222)</b>	<b>(88)</b>
Changes in debts	(172)	300	(116)	287	(123)	(82)	(282)	(126)	0	0
Net share issues (purchases)	62	0	334	(65)	794	0	(169)	170	0	0
Dividends paid	0	0	0	0	0	(70)	(89)	(447)	(616)	(493)
Other financing CF items	0	(4)	34	9	20	110	82	38	0	0
<b>Cash flow from financing</b>	<b>(110)</b>	<b>296</b>	<b>252</b>	<b>231</b>	<b>690</b>	<b>(42)</b>	<b>(458)</b>	<b>(365)</b>	<b>(616)</b>	<b>(493)</b>
Forex effects & other adjustments	0	0	0	0	0	0	0	0	1	4
Change in cash	(31)	67	323	51	958	35	(393)	196	(17)	19
<b>Free cash flow</b>	<b>77</b>	<b>(56)</b>	<b>(39)</b>	<b>(238)</b>	<b>180</b>	<b>73</b>	<b>64</b>	<b>561</b>	<b>696</b>	<b>510</b>

Source: Company

**Financial summary continued ...**
**VPEC: balance sheet (TWDm)**

As at 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cash & ST investment	72	139	462	514	1,471	1,506	1,113	1,309	1,292	1,312
Inventory	140	268	302	183	135	207	374	302	285	356
Accounts receivable	131	186	255	168	391	401	418	339	256	374
Other current assets	20	217	135	142	77	48	83	46	37	35
<b>Total current assets</b>	<b>364</b>	<b>810</b>	<b>1,154</b>	<b>1,006</b>	<b>2,075</b>	<b>2,162</b>	<b>1,989</b>	<b>1,996</b>	<b>1,870</b>	<b>2,077</b>
Fixed assets	605	728	863	1,156	1,340	1,640	1,973	1,999	1,851	1,774
Goodwill & intangibles	1	3	3	1	2	1	1	0	0	1
Other non-current assets	157	120	109	84	55	102	55	47	178	95
<b>Total assets</b>	<b>1,126</b>	<b>1,661</b>	<b>2,129</b>	<b>2,247</b>	<b>3,471</b>	<b>3,906</b>	<b>4,017</b>	<b>4,043</b>	<b>3,899</b>	<b>3,947</b>
Short-term debt	302	291	175	143	0	0	0	0	0	0
Accounts payable	97	138	166	78	212	244	209	166	172	269
Other current liabilities	147	71	84	71	157	200	292	192	202	171
<b>Total current liabilities</b>	<b>420</b>	<b>487</b>	<b>425</b>	<b>293</b>	<b>369</b>	<b>444</b>	<b>501</b>	<b>358</b>	<b>374</b>	<b>441</b>
Long-term debt	66	300	162	450	430	336	54	0	0	0
Other non-current liabilities	2	2	1	0	0	0	0	0	0	0
<b>Total liabilities</b>	<b>489</b>	<b>789</b>	<b>588</b>	<b>743</b>	<b>799</b>	<b>780</b>	<b>555</b>	<b>358</b>	<b>374</b>	<b>441</b>
Share capital	979	1,010	1,141	1,272	1,378	1,756	2,226	2,465	2,465	2,465
Reserves, R/E and others	-342	-138	399	232	1,294	1,370	1,237	1,219	1,059	1,040
<b>Shareholders' equity</b>	<b>637</b>	<b>872</b>	<b>1,541</b>	<b>1,504</b>	<b>2,672</b>	<b>3,126</b>	<b>3,463</b>	<b>3,685</b>	<b>3,525</b>	<b>3,506</b>
Minority interest	0	0	0	0	0	0	0	0	0	0
<b>Total equity &amp; liabilities</b>	<b>1,126</b>	<b>1,661</b>	<b>2,129</b>	<b>2,247</b>	<b>3,471</b>	<b>3,906</b>	<b>4,017</b>	<b>4,043</b>	<b>3,899</b>	<b>3,947</b>
Net debt (cash)	296	452	-125	80	-1,041	-1,170	-1,059	-1,309	-1,292	-1,312
BVPS (TWD)	6.51	8.64	13.50	11.83	19.39	17.80	15.55	14.95	14.30	14.22

Source: Company

**VPEC: key ratio analysis**

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>Growth</b>										
Revenue	na	71%	9%	17%	33%	14%	21%	4%	-4%	-4%
Operating profit	na	-528%	-54%	-17%	420%	37%	15%	-4%	-8%	1%
Net profit	na	-210%	-5%	-108%	-2786%	22%	24%	-10%	0%	2%
EPS (fully diluted)	na	-207%	-16%	-107%	-2579%	-4%	-2%	-19%	0%	2%
EBITDA	na	216%	-29%	5%	155%	29%	16%	1%	-7%	1%
<b>Margin</b>										
Gross profit	16.4%	35.3%	29.4%	24.5%	36.3%	37.5%	35.4%	33.7%	32.7%	34.8%
Operating profit	-8.3%	20.8%	8.7%	6.2%	24.0%	29.0%	27.5%	25.3%	24.2%	25.3%
Net profit	-30.0%	19.2%	16.7%	-1.1%	21.7%	23.3%	23.8%	20.5%	21.4%	22.6%
EBITDA	16.3%	30.0%	19.5%	17.6%	33.6%	38.3%	36.6%	35.3%	34.2%	35.7%
<b>Profitability</b>										
ROA	-14%	11%	8%	-1%	10%	11%	13%	11%	12%	12%
ROE	-25%	20%	11%	-1%	13%	13%	15%	13%	13%	13%
ROCE	-17%	13%	12%	-1%	20%	20%	21%	19%	21%	21%
<b>Leverage</b>										
Debt to equity	77%	90%	38%	49%	30%	25%	16%	10%	11%	13%
Interest-bearing debt to equity	58%	68%	23%	41%	18%	13%	4%	0%	0%	0%
Net debt to equity	46%	52%	-7%	7%	-37%	-35%	-29%	-36%	-37%	-37%
<b>Efficiency</b>										
Days receivable	45	63	81	66	65	82	69	61	51	55
Days inventory	57	126	148	100	58	56	76	83	74	86
Days payable	39	72	79	50	53	75	59	46	43	60
Cash cycle	63	117	149	116	70	63	86	98	82	82

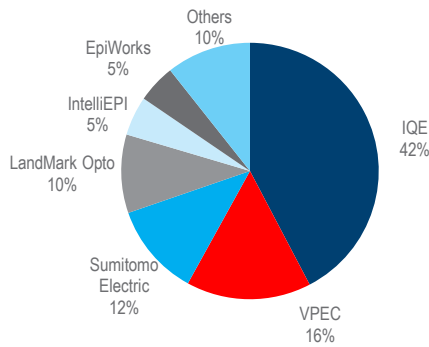
Source: Company

**VPEC: quarterly P&L**

TWDm	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	2012	2013	2014	9M15
Revenue	408	376	527	605	565	525	650	590	2,249	2,150	2,073	1,765
COGS	290	256	349	390	357	320	399	379	1,490	1,446	1,352	1,098
Gross profit	118	120	178	215	208	205	251	211	758	704	721	667
Opex	51	44	48	48	57	51	54	55	190	183	196	160
Operating profit	67	76	130	168	151	154	197	156	568	521	524	507
Pretax profit	72	85	127	178	174	153	201	198	560	553	565	552
Income taxes	10	11	40	22	23	20	28	28	98	92	96	75
Net profit	62	74	88	155	151	133	173	171	462	461	468	476
EPS (TWD, basic)	0.25	0.30	0.36	0.63	0.61	0.54	0.70	0.69	1.88	1.87	1.90	1.93
EPS (TWD, fully diluted)	0.25	0.30	0.36	0.63	0.61	0.54	0.70	0.69	1.87	1.87	1.90	1.93
<b>Margin</b>												
Gross	29%	32%	34%	36%	37%	39%	39%	36%	34%	33%	35%	38%
Operating	16%	20%	25%	28%	27%	29%	30%	26%	25%	24%	25%	29%
Net	15%	20%	17%	26%	27%	25%	27%	29%	21%	21%	23%	27%
<b>Growth (QoQ)</b>												
Revenue	-16%	-8%	40%	15%	-7%	-7%	24%	-9%				
Gross profit	-23%	2%	48%	21%	-3%	-1%	22%	-16%				
Operating profit	-37%	13%	71%	29%	-10%	2%	28%	-21%				
Net profit	-22%	20%	18%	77%	-3%	-12%	30%	-1%				
EPS (basic)	-22%	20%	18%	77%	-3%	-12%	30%	-1%				
EPS (FD)	-22%	20%	18%	77%	-3%	-12%	30%	-1%				
<b>Growth (YoY)</b>												
Revenue	-6%	-30%	-27%	25%	39%	40%	23%	-3%	4%	-4%	-4%	17%
Gross profit	-7%	-31%	-31%	40%	76%	70%	41%	-2%	-1%	-7%	2%	30%
Operating profit	-14%	-44%	-39%	57%	125%	103%	51%	-7%	-4%	-8%	1%	36%
Net profit	-9%	-44%	-53%	94%	144%	79%	97%	10%	-10%	0%	2%	50%
EPS (basic)	-9%	-44%	-53%	94%	144%	79%	97%	10%	-19%	-1%	2%	50%
EPS (FD)	-9%	-44%	-53%	94%	144%	79%	97%	10%	-19%	0%	2%	50%

Source: Company

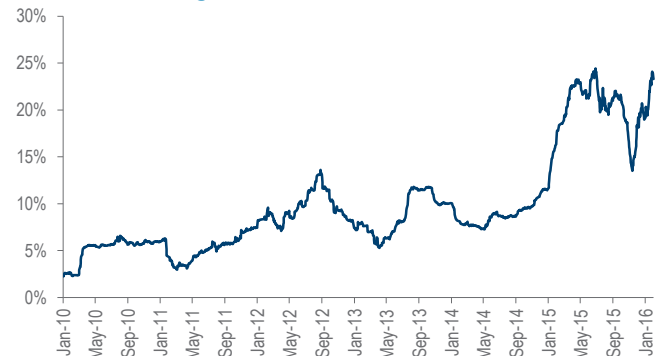
**2014 global epiwafer market share\***



Source: Company, Daiwa estimates

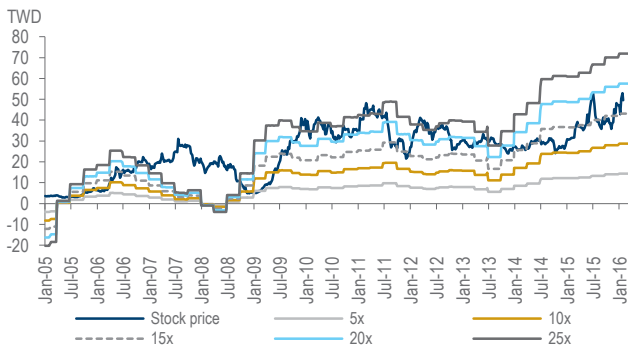
Note: \*communication applications only, ex-optoelectronics like LED

**VPEC: QFI holding trend**



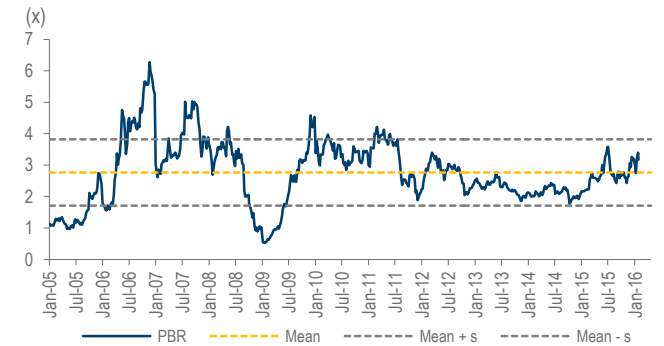
Source: TEJ

**VPEC: PER bands**



Source: Bloomberg, Company

**VPEC: PBR trend**



Source: Bloomberg, Company

# ShunSin Technology (6451 TT)

 Target price: **n.a.**

 Share price (16 Feb): **TWD93.40** | Up/downside: -

No Rating

## Riding on bandwidth upgrades

- A dedicated OSAT maker focusing on system-in-package (SiP)
- Enhanced products to cover both microwave/optical communications
- Datacentre bandwidth upgrades to drive business growth

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**Background:** Founded in 2008, ShunSin is an outsourced semiconductor assembly & test (OSAT) maker specialising in SiP for front-end RF connectivity solutions (c.85% of 2015 revenue), with AVGO, SWKS and QRVO as key customers targeting smartphones as the key application. In terms of RF revenue exposure, ShuSin said revenue is split roughly 50:50 between Apple and Android which has resulted in high seasonality and business volatility. To reduce such high single-application risk, ShunSin is diversifying into optical communication (OC) and other Big Data/IoT demand verticals, such as MEMS and fingerprint technology, by leveraging its SiP knowhow in its incumbent microwave communication (MC) area.

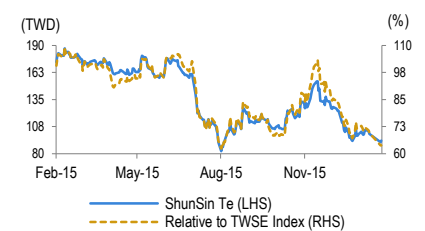
**Highlights: Cellular upgrades to continue.** Riding on a similar demand trend as WinSemi, ShunSin saw significant top-line expansion in 2013-15 spurred by the cellular standard migration to 4G in smartphones which has lifted PA content per device associated with rising frequency band coverage. Even though smartphone demand is likely to taper off, ShunSin believes the MC segment will remain its bread and butter going forward as incremental upgrades should continue within the smartphone space, with 4G continuously replacing 2G/3G. However, customers in-sourcing could potentially dilute this incremental strength, per the company, since most of its customers operate an integrated device manufacturing (IDM) model.

**Robust OC demand.** To overcome the potential demand slowdown in the cellular RF PA market, ShunSin is leveraging its MC technology knowhow to tap into the OC market to capitalise on the bandwidth upgrades at datacentres to accommodate the mounting data traffic within the ecosystem of the Big Data/IoT cycle. As a dedicated SiP assembler, ShunSin procures chips and assembles them into TOSA and ROSA modules for short-wave solutions with high frequencies (ie, 10/40/100G) which we expect to post robust growth in the next 3-5 years (see charts on page 54). ShunSin sees the OC as a multi-year demand driver and aims to double its OC revenue in 2016. Note: its OC revenue tripled in 2015, reaching 10% of total revenue (5% in 2014).

**Financial update.** For 9M15, ShunSin's revenue rose by 27% YoY but its gross margin fell to 23% from 29% in 9M14 owing to dilution from OC products which carry higher ASPs but lower margins than MC products due to a consigned business model. ShunSin targets 1Q16 revenue to contract by more than 30% QoQ due to the recent iPhone demand weakness.

**Valuation:** ShunSin stock is trading currently near the low-bounds of its historical valuation bands in both PER and PBR terms. It paid a cash dividend of TWD7.5/share in 2015, or an 8% dividend yield.

## Share price performance



12-month range	82.40-187.00
Market cap (USDbn)	0.29
3m avg daily turnover (USDm)	3.50

Source: FactSet, Daiwa forecasts

## Financial summary

### ShunSin: profit and loss (TWDm)

Year to 31 Dec	2011	2012	2013	2014
Revenue	5,458	3,833	3,715	5,376
COGS	(3,453)	(2,326)	(2,020)	(3,984)
<b>Gross profit</b>	<b>2,005</b>	<b>1,507</b>	<b>1,695</b>	<b>1,392</b>
SG&A	(191)	(214)	(288)	(234)
R&D	(238)	(216)	(203)	(252)
<b>Operating profit</b>	<b>1,576</b>	<b>1,076</b>	<b>1,203</b>	<b>906</b>
Net interest income (expense)	21	44	12	27
Other non-op gains (losses)	(83)	6	(78)	9
<b>Pretax profit</b>	<b>1,514</b>	<b>1,126</b>	<b>1,136</b>	<b>942</b>
Income tax	(314)	(269)	(287)	(18)
Minority interest & others	0	0	0	0
<b>Net profit</b>	<b>1,200</b>	<b>856</b>	<b>850</b>	<b>924</b>
<b>EPS (weighted average)</b>	<b>18.52</b>	<b>13.21</b>	<b>12.52</b>	<b>10.16</b>
<b>EPS (fully diluted)</b>	<b>18.52</b>	<b>13.21</b>	<b>11.21</b>	<b>10.16</b>
DPS (TWD)	0.00	0.00	0.00	0.00
EBITDA	1,887	1,425	1,514	1,270

Source: Company; note: dividend paid out based on previous year EPS

### ShunSin: cash flow (TWDm)

Year to 31 Dec	2011	2012	2013	2014
Pretax profit	1,514	1,126	1,136	942
Depreciation & amortization	311	349	311	364
Changes in working capital	0	259	25	(317)
Other operating CF items	(283)	(142)	(460)	(188)
<b>Cash flow from operations</b>	<b>1,542</b>	<b>1,591</b>	<b>1,012</b>	<b>801</b>
Capex	(377)	(64)	(362)	(587)
Net disposals (acquisitions)	0	0	0	0
Other investing CF items	(269)	2,156	(40)	3
<b>Cash flow from investing</b>	<b>(646)</b>	<b>2,092</b>	<b>(403)</b>	<b>(584)</b>
Changes in debts	0	0	0	1,044
Net share issues (purchases)	0	0	568	308
Dividends paid	(1,210)	(294)	(2,508)	(1,143)
Other financing CF items	0	(0)	5	(3)
<b>Cash flow from financing</b>	<b>(1,210)</b>	<b>(294)</b>	<b>(1,935)</b>	<b>206</b>
Forex effects & other adjustments	306	(210)	192	127
Change in cash	(8)	3,179	(1,134)	551
<b>Free cash flow</b>	<b>1,165</b>	<b>1,527</b>	<b>649</b>	<b>215</b>

Source: Company

## Financial summary continued ...

### ShunSin: balance sheet (TWDm)

As at 31 Dec	2011	2012	2013	2014
Cash & ST investment	1,073	4,252	3,118	3,669
Inventory	448	247	254	523
Accounts receivable	640	372	352	803
Other current assets	2,184	35	55	186
<b>Total current assets</b>	<b>4,345</b>	<b>4,906</b>	<b>3,779</b>	<b>5,180</b>
Fixed assets	1,145	815	965	1,273
Goodwill & intangibles	2	2	3	7
Other non-current assets	137	140	160	162
<b>Total assets</b>	<b>5,628</b>	<b>5,862</b>	<b>4,907</b>	<b>6,623</b>
Short-term debt	0	0	0	1,044
Accounts payable	507	297	309	711
Other current liabilities	287	319	1,176	491
<b>Total current liabilities</b>	<b>793</b>	<b>616</b>	<b>1,485</b>	<b>2,246</b>
Long-term debt	0	0	0	0
Other non-current liabilities	252	337	200	57
<b>Total liabilities</b>	<b>1,045</b>	<b>953</b>	<b>1,686</b>	<b>2,304</b>
Share capital	1,131	1,131	1,348	909
Reserves, R/E and others	3,452	3,777	1,873	3,410
<b>Shareholders' equity</b>	<b>4,583</b>	<b>4,909</b>	<b>3,221</b>	<b>4,319</b>
Minority interest	0	0	0	0
<b>Total equity &amp; liabilities</b>	<b>5,628</b>	<b>5,862</b>	<b>4,907</b>	<b>6,623</b>
Net debt (cash)	-1,073	-4,252	-3,118	-2,624
BVPS (TWD)	70.73	75.75	42.49	47.49

Source: Company

### ShunSin: key ratio analysis

Year to 31 Dec	2011	2012	2013	2014
<b>Growth</b>				
Revenue	na	-30%	-3%	45%
Operating profit	na	-32%	12%	-25%
Net profit	na	-29%	-1%	9%
EPS (fully diluted)	na	-29%	-15%	-9%
EBITDA	na	-24%	6%	-16%
<b>Margin</b>				
Gross profit	36.7%	39.3%	45.6%	25.9%
Operating profit	28.9%	28.1%	32.4%	16.8%
Net profit	22.0%	22.3%	22.9%	17.2%
EBITDA	34.6%	37.2%	40.8%	23.6%
<b>Profitability</b>				
ROA	21%	15%	17%	14%
ROE	26%	17%	26%	21%
ROCE	34%	130%	824%	55%
<b>Leverage</b>				
Debt to equity	23%	19%	52%	53%
Interest-bearing debt to equity	0%	0%	0%	24%
Net debt to equity	-23%	-87%	-97%	-61%
<b>Efficiency</b>				
Days receivable	21	48	36	39
Days inventory	24	54	45	36
Days payable	27	63	55	47
Cash cycle	18	40	26	28

Source: Company

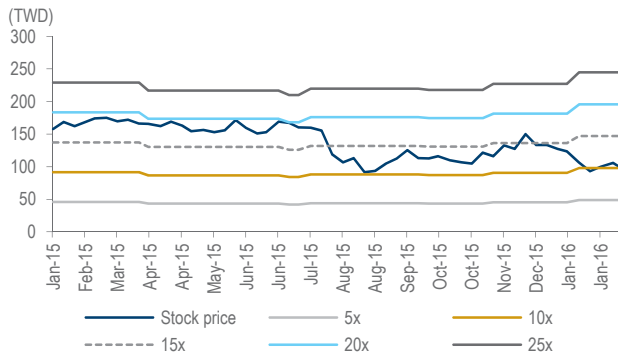


**ShunSin: quarterly P&L**

TWDM	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	2012	2013	2014	9M15
Revenue	759	1,009	1,649	1,959	1,695	1,330	1,316	3,833	3,715	5,376	4,341
COGS	484	690	1,255	1,554	1,318	1,080	963	2,326	2,020	3,984	3,360
Gross profit	275	319	393	405	377	250	354	1,507	1,695	1,392	981
Opex	110	89	117	170	93	91	111	431	492	487	294
Operating profit	164	230	276	235	284	160	242	1,076	1,203	906	686
Pretax profit	189	262	276	215	313	199	393	1,126	1,136	942	905
Income taxes	56	57	43	-138	81	13	38	269	287	18	132
Net profit	133	205	233	353	232	186	355	856	850	924	773
EPS (TWD, basic)	1.46	2.25	2.56	3.88	2.20	1.77	3.37	13.21	12.52	10.16	7.33
EPS (TWD, fully diluted)	1.46	2.25	2.56	3.88	2.20	1.77	3.37	13.21	11.21	10.16	7.33
<b>Margin</b>											
Gross	36%	32%	24%	21%	22%	19%	27%	39%	46%	26%	23%
Operating	22%	23%	17%	12%	17%	12%	18%	28%	32%	17%	16%
Net	17%	20%	14%	18%	14%	14%	27%	22%	23%	17%	18%
<b>Growth (QoQ)</b>											
Revenue	na	33%	63%	19%	-14%	-22%	-1%				
Gross profit	na	16%	23%	3%	-7%	-34%	41%				
Operating profit	na	40%	20%	-15%	21%	-44%	52%				
Net profit	na	55%	14%	51%	-34%	-20%	91%				
EPS (basic)	na	55%	14%	51%	-43%	-20%	91%				
EPS (FD)	na	55%	14%	51%	-43%	-20%	91%				
<b>Growth (YoY)</b>											
Revenue					123%	32%	-20%	-30%	-3%	45%	27%
Gross profit					37%	-22%	-10%	-25%	12%	-18%	-1%
Operating profit					73%	-30%	-12%	-32%	12%	-25%	2%
Net profit					75%	-9%	52%	-29%	-1%	9%	35%
EPS (basic)					51%	-22%	31%	-29%	-5%	-19%	17%
EPS (FD)					51%	-22%	31%	-29%	-15%	-9%	17%

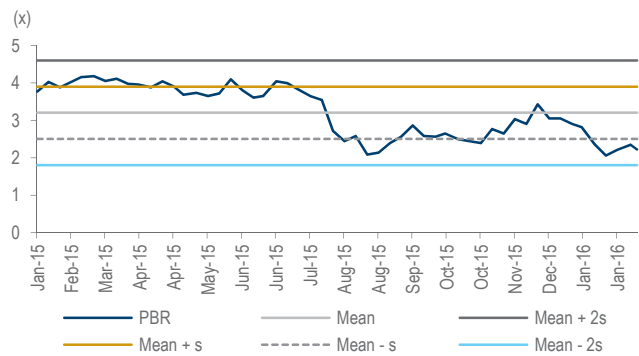
Source: Company

**ShunSin: PER bands**



Source: Company, Bloomberg

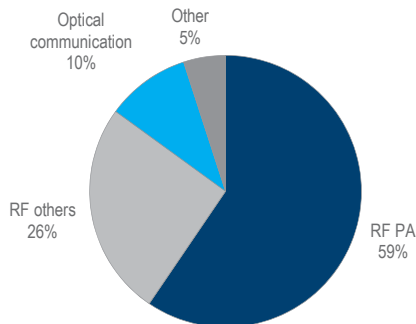
**ShunSin: PBR bands**



Source: Company, Bloomberg

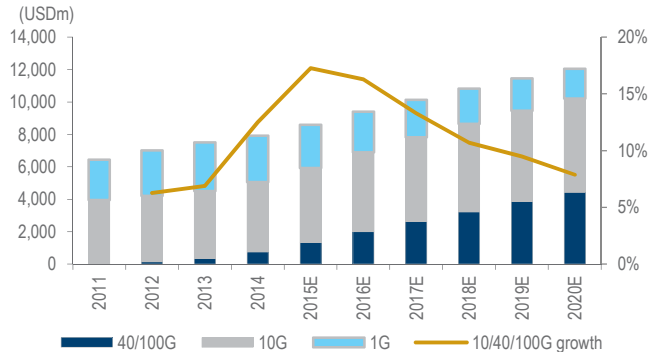
Note: Mean and standard deviation calculation period: IPO (Jan 2015) to present

**ShunSin: revenue breakdown by product (2015)**



Source: Company

**FO transceiver market forecasts by bandwidth**



Source: Daiwa forecasts

# TrueLight Corp (3234 TT)

 Target price: **n.a.**

 Share price (16 Feb): **TWD87.00** | Up/downside: -

No Rating

## Fast-growing optical communication semi-IDM in Asia

- Derives 80%+ of revenue from passive optical network
- Earnings hit a record high in 2015 due to demand from China's FTTH
- Management upbeat on 2016 outlook; trading at a mid-cycle valuation

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**Background:** Founded in 1997, TrueLight specialises in the production of optical communication (OC) products, from chip fabrication and packaging to transceiver outline canister (TO-Can) assembly. It provides fibre-optic (FO) solutions that are commonly used in passive optical network (PON) applications, with the telecoms vendors being the end-customers. As of 3Q15, TrueLight derived over 80% of revenue from PON, including GPON (gigabit, 66%) and EPON (ethernet, 15%+), while the rest came from local area network (LAN) and storage area network (SAN) FO solutions. Riding on the fast-growing fibre-to-the-home (FTTH) builds in China, TrueLight saw strong demand for its PON solutions in 2015, with revenue rising by 88% YoY and margins expanding to all-time highs at the operating level. Its key epiwafer suppliers are LandMark Opto, IQE and VPEC.

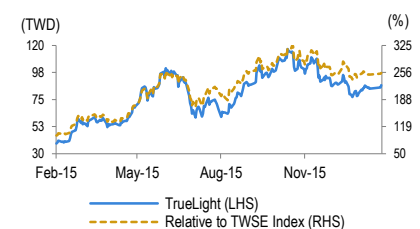
**Highlights: FTTH the key driver.** FTTH has been the main demand driver for TrueLight's fast-growing business, thanks to the PRC Government's push for FTTH coverage post the GFC, starting with the tier-1 cities and expanding into tier-2 and inland. Daiwa forecasts an FTTH market value CAGR of 20% over 2015-20, driven by ongoing expansion of household coverage in China and into other countries through China's "One belt, One road" policy. Besides the FTTH market, TrueLight is diversifying into other segments of the OC market, such as "short-wave", vertical cavity surface emitting laser (VCSEL) FO solutions for datacentres and consumer applications.

**Share gains benefit margins.** TrueLight claims share gains (starting in 2H15) for the FTTH market through its flexible production switch between GPON and EPON. Since GPON enjoys a higher gross margin than EPON at current volume levels, TrueLight posted record-high margins at the operating level in 2015 through its product remix. In 2016, as incremental FTTH penetration is likely to be driven by rural counties, which don't require bandwidths as broad as the tier-1 cities ( $\leq 1.25\text{Gbps}$  vs.  $10\text{Gbps}$ ), according to management, demand for EPON may outgrow that for GPON, implying that further margin expansion looks unlikely. Management sees pricing risk due to rising competition in 2016, but still expects to see robust growth in the bottom-line due to still fast top-line expansion.

**2016 outlook implies strong top line.** Management targets for 2016 average revenue/month to be comparable to 4Q15 levels (ie, TWD525m), implying c.40% YoY revenue growth for the full year. Even assuming no margin expansion, the top-line run rate suggests robust bottom-line growth.

**Valuation:** TrueLight is trading at 2016 PBR/PER of 2.8x/8.1x based on consensus forecasts, in the middle of its valuation range despite management's optimistic earnings growth expectations for the OC industry.

## Share price performance



12-month range	38.50-117.00
Market cap (USDbn)	0.27
3m avg daily turnover (USDm)	18.38

Source: FactSet, Daiwa forecasts

## Financial summary

### TrueLight: profit and loss (TWDm)

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Revenue	458	685	924	929	945	1,318	1,570	2,184	2,014	2,406
COGS	(393)	(502)	(619)	(694)	(725)	(1,019)	(1,234)	(1,715)	(1,649)	(1,798)
<b>Gross profit</b>	<b>65</b>	<b>182</b>	<b>305</b>	<b>235</b>	<b>220</b>	<b>299</b>	<b>336</b>	<b>469</b>	<b>365</b>	<b>607</b>
SG&A	(84)	(88)	(76)	(85)	(90)	(104)	(116)	(141)	(147)	(166)
R&D	(69)	(59)	(59)	(76)	(85)	(82)	(76)	(92)	(101)	(108)
<b>Operating profit</b>	<b>(88)</b>	<b>35</b>	<b>170</b>	<b>74</b>	<b>45</b>	<b>113</b>	<b>144</b>	<b>236</b>	<b>116</b>	<b>334</b>
Net interest income (expense)	(8)	(8)	(4)	(4)	(7)	(8)	(4)	(12)	(17)	(7)
Other non-op gains (losses)	10	(17)	21	13	12	(19)	17	11	18	23
<b>Pretax profit</b>	<b>(87)</b>	<b>10</b>	<b>187</b>	<b>83</b>	<b>50</b>	<b>87</b>	<b>157</b>	<b>234</b>	<b>117</b>	<b>349</b>
Income tax	0	0	0	(3)	(3)	9	(21)	(41)	(20)	(59)
Minority interest & others	0	0	0	0	0	0	0	0	0	0
<b>Net profit</b>	<b>(87)</b>	<b>10</b>	<b>187</b>	<b>80</b>	<b>47</b>	<b>96</b>	<b>136</b>	<b>193</b>	<b>97</b>	<b>290</b>
<b>EPS (weighted average)</b>	<b>(1.45)</b>	<b>0.17</b>	<b>2.88</b>	<b>1.10</b>	<b>0.65</b>	<b>1.31</b>	<b>1.53</b>	<b>2.10</b>	<b>0.98</b>	<b>2.93</b>
<b>EPS (fully diluted)</b>	<b>(1.45)</b>	<b>0.17</b>	<b>2.66</b>	<b>1.10</b>	<b>0.65</b>	<b>1.31</b>	<b>1.46</b>	<b>2.07</b>	<b>0.96</b>	<b>2.87</b>
DPS (TWD)	0.00	0.00	0.00	0.00	0.00	0.51	1.00	0.20	0.10	0.95
EBITDA	3	121	227	124	116	198	250	355	259	486

Source: Company; note: dividend paid out based on previous year EPS

### TrueLight: Cash flow (TWDm)

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Pretax profit	(87)	10	187	83	50	87	157	234	117	349
Depreciation & amortisation	91	85	57	50	71	85	106	119	142	152
Changes in working capital	0	(37)	(55)	(66)	(12)	(116)	(71)	(100)	30	(261)
Other operating CF items	(9)	4	(40)	(5)	(47)	81	(48)	121	(76)	26
<b>Cash flow from operations</b>	<b>(4)</b>	<b>62</b>	<b>149</b>	<b>62</b>	<b>62</b>	<b>136</b>	<b>144</b>	<b>375</b>	<b>214</b>	<b>267</b>
Capex	(37)	(10)	(39)	(149)	(89)	(183)	(52)	(177)	(279)	(85)
Net disposals (acquisitions)	0	0	0	0	0	0	0	0	0	0
Other investing CF items	56	(6)	12	0	(7)	(6)	(63)	1	(26)	0
<b>Cash flow from investing</b>	<b>20</b>	<b>(16)</b>	<b>(28)</b>	<b>(149)</b>	<b>(96)</b>	<b>(189)</b>	<b>(115)</b>	<b>(176)</b>	<b>(305)</b>	<b>(85)</b>
Changes in debt	0	(40)	(82)	186	38	(38)	(68)	27	111	84
Net share issues (purchases)	0	0	0	0	0	0	197	0	27	(139)
Dividends paid	0	0	0	(64)	0	(38)	(93)	(137)	(9)	(96)
Other financing CF items	(45)	2	116	(17)	0	6	1	6	7	(2)
<b>Cash flow from financing</b>	<b>(45)</b>	<b>(38)</b>	<b>34</b>	<b>106</b>	<b>38</b>	<b>(70)</b>	<b>37</b>	<b>(105)</b>	<b>135</b>	<b>(153)</b>
Forex effects & other adjustments	0	(0)	(0)	0	(1)	(2)	1	(8)	2	(1)
Change in cash	(29)	8	156	18	2	(124)	66	86	46	29
<b>Free cash flow</b>	<b>(41)</b>	<b>52</b>	<b>110</b>	<b>(88)</b>	<b>(27)</b>	<b>(47)</b>	<b>91</b>	<b>197</b>	<b>(65)</b>	<b>182</b>

Source: Company

## Financial summary continued ...

## TrueLight: Balance sheet (TWDm)

As at 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cash & ST investment	56	76	266	311	319	155	266	314	400	429
Inventory	155	187	210	307	286	334	409	399	375	531
Accounts receivable	65	91	128	122	143	206	382	491	464	616
Other current assets	15	8	6	14	44	31	54	36	28	27
<b>Total current assets</b>	<b>291</b>	<b>362</b>	<b>610</b>	<b>754</b>	<b>793</b>	<b>726</b>	<b>1,111</b>	<b>1,239</b>	<b>1,267</b>	<b>1,604</b>
Fixed assets	528	457	435	551	569	666	654	709	805	736
Goodwill & intangibles	0	0	0	0	2	2	5	3	1	0
Other non-current assets	9	11	9	7	7	10	41	39	93	93
<b>Total assets</b>	<b>828</b>	<b>829</b>	<b>1,054</b>	<b>1,312</b>	<b>1,370</b>	<b>1,404</b>	<b>1,810</b>	<b>1,990</b>	<b>2,167</b>	<b>2,434</b>
Short-term debt	139	152	20	119	78	108	88	121	242	295
Accounts payable	38	59	65	90	78	73	252	251	231	278
Other current liabilities	104	116	63	139	156	147	137	241	152	218
<b>Total current liabilities</b>	<b>208</b>	<b>251</b>	<b>148</b>	<b>347</b>	<b>312</b>	<b>327</b>	<b>477</b>	<b>612</b>	<b>625</b>	<b>791</b>
Long-term debt	102	49	83	137	183	141	34	25	19	50
Other non-current liabilities	5	7	7	7	10	10	9	9	20	20
<b>Total liabilities</b>	<b>315</b>	<b>307</b>	<b>238</b>	<b>491</b>	<b>505</b>	<b>477</b>	<b>520</b>	<b>646</b>	<b>663</b>	<b>861</b>
Share capital	600	600	706	727	727	732	931	936	1,012	1,010
Reserves, R/E and others	-87	-77	110	95	139	194	359	408	491	563
<b>Shareholders' equity</b>	<b>513</b>	<b>523</b>	<b>816</b>	<b>821</b>	<b>865</b>	<b>927</b>	<b>1,290</b>	<b>1,344</b>	<b>1,503</b>	<b>1,573</b>
Minority interest	0	0	0	0	0	0	0	0	0	0
<b>Total equity &amp; liabilities</b>	<b>828</b>	<b>829</b>	<b>1,054</b>	<b>1,312</b>	<b>1,370</b>	<b>1,404</b>	<b>1,810</b>	<b>1,990</b>	<b>2,167</b>	<b>2,434</b>
Net debt (cash)	185	125	-162	-55	-57	94	-144	-168	-139	-84
BVPS (TWD)	8.55	8.72	11.56	11.30	11.91	12.65	13.85	14.36	14.86	15.57

Source: Company

## TrueLight: key ratio analysis

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>Growth</b>										
Revenue	na	49%	35%	1%	2%	39%	19%	39%	-8%	19%
Operating profit	na	-140%	381%	-57%	-39%	150%	27%	64%	-51%	187%
Net profit	na	-112%	1750%	-57%	-41%	104%	42%	42%	-50%	200%
EPS (fully diluted)	na	-112%	1473%	-59%	-41%	103%	12%	41%	-54%	200%
EBITDA	na	3418%	88%	-45%	-7%	71%	26%	42%	-27%	88%
<b>Margin</b>										
Gross profit	14.3%	26.6%	33.0%	25.3%	23.3%	22.7%	21.4%	21.5%	18.1%	25.3%
Operating profit	-19.2%	5.2%	18.4%	7.9%	4.8%	8.6%	9.2%	10.8%	5.8%	13.9%
Net profit	-18.9%	1.5%	20.3%	8.6%	5.0%	7.3%	8.7%	8.9%	4.8%	12.0%
EBITDA	0.7%	17.6%	24.6%	13.4%	12.3%	15.0%	15.9%	16.2%	12.8%	20.2%
<b>Profitability</b>										
ROA	-10%	1%	18%	6%	3%	7%	8%	10%	4%	12%
ROE	-17%	2%	23%	10%	5%	10%	11%	14%	6%	18%
ROCE	-12%	2%	27%	9%	5%	9%	11%	16%	7%	18%
<b>Leverage</b>										
Debt to equity	61%	59%	29%	60%	58%	52%	40%	48%	44%	55%
Interest-bearing debt to equity	47%	38%	15%	37%	38%	32%	11%	12%	18%	23%
Net debt to equity	36%	24%	-14%	7%	9%	18%	-4%	-9%	-3%	0%
<b>Efficiency</b>										
Days receivable	26	42	43	49	51	48	68	73	87	82
Days inventory	72	124	117	136	149	111	110	86	86	82
Days payable	18	35	37	41	42	27	48	53	53	52
Cash cycle	80	130	124	145	158	133	130	105	119	122

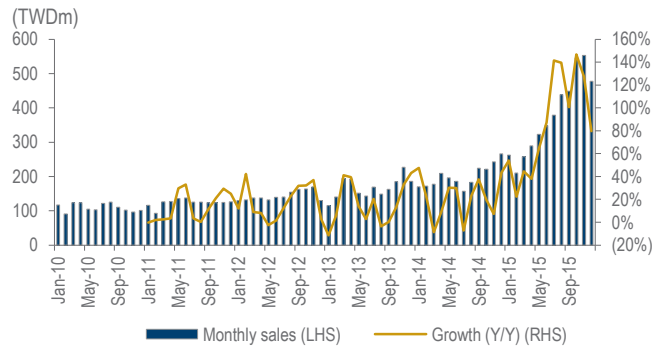
Source: Company

**TrueLight: quarterly P&L**

TWDm	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	2012	2013	2014	9M15
Revenue	597	520	592	564	730	729	960	1,266	2,184	2,014	2,406	2,956
COGS	491	411	435	421	532	543	695	796	1,715	1,649	1,798	2,033
Gross profit	106	109	157	143	198	186	266	471	469	365	607	923
Opex	63	60	68	74	73	75	194	133	233	249	274	401
Operating profit	43	49	90	69	125	112	72	338	236	116	334	521
Pretax profit	39	56	86	78	129	110	79	350	234	117	349	539
Income taxes	11	10	15	13	22	16	3	57	41	20	59	76
Net profit	28	47	71	65	107	94	75	293	193	97	290	463
EPS (TWD, basic)	0.28	0.47	0.71	0.65	1.08	0.99	0.78	3.03	2.10	0.98	2.93	4.58
EPS (TWD, fully diluted)	0.28	0.46	0.70	0.64	1.06	0.93	0.75	2.90	2.07	0.96	2.87	4.58
<b>Margin</b>												
Gross	18%	21%	27%	25%	27%	26%	28%	37%	21%	18%	25%	31%
Operating	7%	10%	15%	12%	17%	15%	7%	27%	11%	6%	14%	18%
Net	5%	9%	12%	12%	15%	13%	8%	23%	9%	5%	12%	16%
<b>Growth (QoQ)</b>												
Revenue	24%	-13%	14%	-5%	30%	0%	32%	32%				
Gross profit	93%	3%	45%	-9%	39%	-6%	42%	77%				
Operating profit	nm	16%	82%	-23%	81%	-11%	-36%	370%				
Net profit	nm	67%	52%	-8%	65%	-12%	-20%	289%				
EPS (basic)	nm	65%	52%	-8%	67%	-9%	-21%	287%				
EPS (FD)	nm	67%	52%	-8%	65%	-12%	-20%	289%				
<b>Growth (YoY)</b>												
Revenue	1%	16%	22%	17%	22%	40%	62%	125%	39%	-8%	19%	76%
Gross profit	-6%	12%	48%	160%	87%	71%	69%	229%	40%	-22%	66%	125%
Operating profit	-14%	40%	91%	nm	194%	126%	-20%	389%	64%	-51%	187%	150%
Net profit	-36%	44%	50%	nm	285%	102%	7%	351%	42%	-50%	200%	154%
EPS (basic)	-40%	34%	39%	nm	284%	112%	10%	365%	37%	-53%	199%	148%
EPS (FD)	-41%	45%	50%	nm	286%	102%	6%	351%	41%	-54%	200%	153%

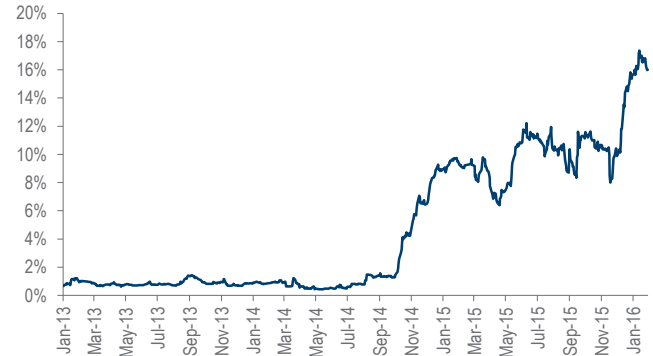
Source: Company

**TrueLight: monthly sales trend**



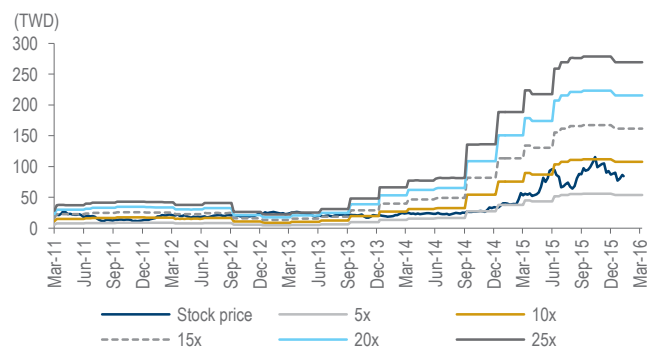
Source: Company

**TrueLight: QFII holding trend**



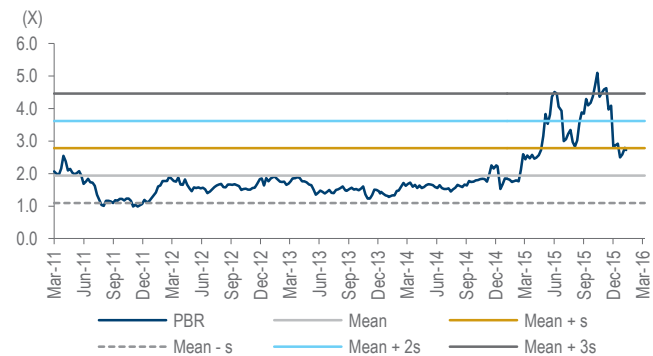
Source: TEJ

**TrueLight: PER bands**



Source: TEJ, Company, Bloomberg

**TrueLight: PBR trend**



Source: TEJ, Company, Bloomberg

# Accelink Technologies (002281 CH)

 Target price: **n.a.**

 Share price (16 Feb): **CNY56.41** | Up/downside: -

No Rating

## The Moore's Law for optical communications

- Likely the largest optical transceiver maker in the Greater China
- FTTH is the key demand driver from both China and overseas
- Datacom adds to upside potential such as SiPhotonics

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**Background:** Founded in 2001, Accelink is perhaps the largest fibre-optic (FO) transceiver supplier in Greater China by revenue, operating a semi-IDM model encompassing chip fabrication to the assembly of transceiver modules and even FO subsystems. Located in Photonics Valley, Wuhan, China and 45%-owned by FiberHome, Accelink saw revenue of CNY2.3bn for 9M15, 3.8x that of TrueLight, the largest FO transceiver supplier in Taiwan. Accelink has seen demand for optical bandwidth double every 10 months in recent years, referred to as the Moore's Law for optical communications (OC).

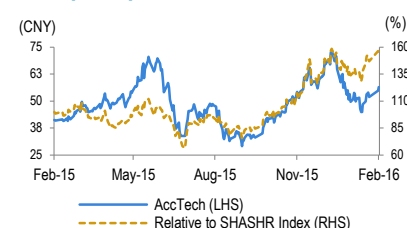
**Highlights: Business strategy.** Contributing over 85% of revenue, FTTH such as FTTH is Accelink's demand driver with end-markets in China and overseas with its key customers being telecom majors, such as Huawei, ZTE, FiberHome and Alcatel. With robust FTTH demand serving as a cash cow, Accelink aims to leverage its FO transceiver design and technology know-how in the telecom space to penetrate the datacom space, by offering SiPhotonics solutions with broader bandwidths but lower power consumption than its compound-semi-based counterparts serving the datacentre markets. So far, SiPhotonics solutions account for just 5% of revenue, but Accelink aims for this segment's contribution to almost double per year in dollar terms. With penetration into datacom as its 3-5 year goal, Accelink further targets the non-comm markets, such as IoT applications, for its long-term (next 5+ years) business diversification and growth.

**Financial goals.** Accelink aims for c.20% top-line growth per year and a high-20% gross margin with room for upside through product management efficiency improvements and more subcontracting to reduce costs, though no timeframe was given. Its revenue for 9M15 rose by 20% YoY with a gross margin of 25.3%, versus 23.1% for 9M14. Due to its equity financing in past years, which has built up its cash on hand, Accelink is unusual among China tech firms with its net-cash balance sheet, and is thus able to pay a cash dividend (CNY0.5/share in 2015), similar to Taiwan tech firms.

**Peer comparison.** Despite Accelink's scale advantage, it trails its Taiwan counterparts on margins and ROE. TrueLight and LuxNet had 9M15 gross margins of 31% and 23%, respectively (see chart page 62); meanwhile Accelink reported an annualised ROE of 7.5% for 9M15, while TrueLight/LuxNet's were 29%/26%. Management attributes the gap to its inefficient use of capital due to the cash it raised. As it has no intention of raising new funds, Accelink sees room for ROE improvement in the future.

**Valuation:** Despite its lower ROE and margin trajectory, Accelink trades at 4.2x/37x 2016E PBR/PER per Bloomberg vs. TrueLight's 2.8x/8.1x.

## Share price performance



12-month range	29.16-73.67
Market cap (USDbn)	1.82
3m avg daily turnover (USDm)	66.10

Source: FactSet, Daiwa forecasts



## Financial summary

### Accelink: profit and loss (CNYm)

Year to 31 Dec	2011	2012	2013	2014
Revenue	2,072	2,104	2,133	2,433
COGS	(1,636)	(1,667)	(1,667)	(1,883)
<b>Gross profit</b>	<b>436</b>	<b>437</b>	<b>465</b>	<b>550</b>
SG&A	(297)	(315)	(370)	(395)
R&D	0	0	0	0
<b>Operating profit</b>	<b>139</b>	<b>121</b>	<b>96</b>	<b>155</b>
Net interest income (expense)	5	(2)	5	4
Other non-op gains (losses)	39	56	80	(6)
<b>Pretax profit</b>	<b>183</b>	<b>176</b>	<b>180</b>	<b>152</b>
Income tax	(20)	(16)	(17)	(8)
Minority interest & others	(0)	0	0	0
<b>Net profit</b>	<b>163</b>	<b>160</b>	<b>164</b>	<b>144</b>
<b>EPS (weighted average)</b>	<b>1.02</b>	<b>0.87</b>	<b>0.88</b>	<b>0.71</b>
<b>EPS (fully diluted)</b>	<b>1.02</b>	<b>0.87</b>	<b>0.88</b>	<b>0.71</b>
DPS (TWD, against pre. year)	0.00	0.00	0.00	0.00
EBITDA	182	188	172	238

Source: Company

### Accelink: cash flow (CNYm)

Year to 31 Dec	2011	2012	2013	2014
Pretax profit	183	176	180	152
Depreciation & amortization	43	66	77	83
Changes in working capital	(89)	(63)	(32)	(134)
Other operating CF items	(14)	1	(16)	24
<b>Cash flow from operations</b>	<b>124</b>	<b>179</b>	<b>209</b>	<b>126</b>
Capex	0	(121)	(149)	(101)
Net disposals (acquisitions)	0	0	0	0
Other investing CF items	(261)	31	(26)	(440)
<b>Cash flow from investing</b>	<b>(261)</b>	<b>(90)</b>	<b>(175)</b>	<b>(541)</b>
Changes in debts	0	0	0	(31)
Net share issues (purchases)	0	0	0	701
Dividends paid	0	0	0	(49)
Other financing CF items	(14)	(68)	15	(4)
<b>Cash flow from financing</b>	<b>(14)</b>	<b>(68)</b>	<b>15</b>	<b>618</b>
Forex effects & other adjustments	(1)	0	0	(2)
Change in cash	(152)	22	49	200
<b>Free cash flow</b>	<b>124</b>	<b>58</b>	<b>60</b>	<b>25</b>

Source: Company

## Financial summary continued ...

### Accelink: balance sheet (CNYm)

As at 31 Dec	2011	2012	2013	2014
Cash & ST investment	448	470	519	719
Inventory	569	569	609	773
Accounts receivable	738	860	784	897
Other current assets	114	41	52	518
<b>Total current assets</b>	<b>1,869</b>	<b>1,939</b>	<b>1,964</b>	<b>2,906</b>
Fixed assets	492	519	608	610
Goodwill & intangibles	39	37	44	40
Other non-current assets	14	21	19	21
<b>Total assets</b>	<b>2,414</b>	<b>2,516</b>	<b>2,644</b>	<b>3,586</b>
Short-term debt	150	128	86	60
Accounts payable	784	777	745	991
Other current liabilities	102	63	75	84
<b>Total current liabilities</b>	<b>1,036</b>	<b>967</b>	<b>906</b>	<b>1,136</b>
Long-term debt	0	0	0	0
Other non-current liabilities	0	65	67	73
<b>Total liabilities</b>	<b>1,036</b>	<b>1,032</b>	<b>972</b>	<b>1,209</b>
Share capital	160	183	186	203
Reserves, R/E and others	1,218	1,301	1,486	2,173
<b>Shareholders' equity</b>	<b>1,378</b>	<b>1,484</b>	<b>1,672</b>	<b>2,377</b>
Minority interest	0	0	0	0
<b>Total equity &amp; liabilities</b>	<b>2,414</b>	<b>2,516</b>	<b>2,644</b>	<b>3,586</b>
Net debt (cash)	-299	-342	-433	-658
BVPS (TWD)	8.61	8.09	8.98	11.68

Source: Company

### Accelink: key ratio analysis

Year to 31 Dec	2011	2012	2013	2014
<b>Growth</b>				
Revenue	21%	2%	1%	14%
Operating profit	0%	-12%	-21%	62%
Net profit	-8%	-2%	2%	-12%
EPS (fully diluted)	-8%	-14%	0%	-19%
EBITDA	0%	3%	-8%	38%
<b>Margin</b>				
Gross profit	21.0%	20.8%	21.8%	22.6%
Operating profit	6.7%	5.8%	4.5%	6.4%
Net profit	7.9%	7.6%	7.7%	5.9%
EBITDA	8.8%	8.9%	8.1%	9.8%
<b>Profitability</b>				
ROA	7%	6%	6%	4%
ROE	12%	11%	10%	6%
ROCE	15%	14%	13%	8%
<b>Leverage</b>				
Debt to equity	75%	70%	58%	51%
Interest-bearing debt to equity	11%	9%	5%	3%
Net debt to equity	-22%	-23%	-26%	-28%
<b>Efficiency</b>				
Days receivable	130	139	141	126
Days inventory	127	125	129	134
Days payable	175	171	167	168
Cash cycle	82	92	103	92

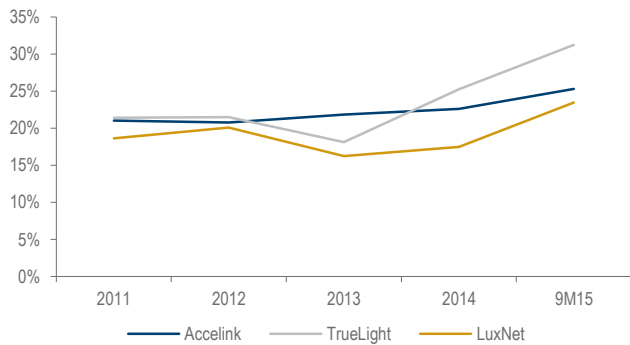
Source: Company

**Accelink: quarterly P&L**

CNYm	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	2011	2012	2013	2014
Revenue	539	574	654	645	560	719	743	794	2,072	2,104	2,133	2,433
COGS	404	458	503	479	443	532	557	596	1,636	1,667	1,667	1,883
Gross profit	135	115	151	167	117	187	186	198	436	437	465	550
Opex	137	79	78	122	116	131	107	115	297	315	370	395
Operating profit	-3	36	73	45	0	56	80	82	139	121	96	155
Pretax profit	34	39	67	38	7	49	81	78	183	176	180	152
Income taxes	2	6	4	4	-7	7	8	15	20	16	17	8
Net profit	32	33	64	34	14	42	73	63	163	160	164	144
EPS (TWD, basic)	0.17	0.18	0.34	0.18	0.07	0.20	0.35	0.30	1.02	0.87	0.88	0.71
EPS (TWD, fully diluted)	0.17	0.18	0.34	0.17	0.07	0.20	0.35	0.30	1.02	0.87	0.88	0.71
<b>Margin</b>												
Gross	25%	20%	23%	26%	21%	26%	25%	25%	21%	21%	22%	23%
Operating	0%	6%	11%	7%	0%	8%	11%	10%	7%	6%	4%	6%
Net	6%	6%	10%	5%	2%	6%	10%	8%	8%	8%	8%	6%
<b>Growth (QoQ)</b>												
Revenue	1%	6%	14%	-1%	-13%	28%	3%	7%				
Gross profit	8%	-15%	31%	10%	-30%	60%	0%	6%				
Operating profit	-106%	nm	101%	-38%	-99%	nm	42%	4%				
Net profit	-17%	2%	94%	-47%	-59%	200%	75%	-14%				
EPS (basic)	-17%	2%	94%	-47%	-63%	191%	75%	-14%				
EPS (FD)	-17%	2%	94%	-49%	-61%	196%	73%	-14%				
<b>Growth (YoY)</b>												
Revenue	-2%	11%	20%	21%	4%	25%	14%	23%	21%	2%	1%	14%
Gross profit	3%	17%	41%	33%	-13%	62%	23%	19%	na	0%	7%	18%
Operating profit	-112%	18%	220%	1%	nm	55%	9%	83%	na	-12%	-21%	62%
Net profit	-9%	-47%	113%	-13%	-57%	26%	15%	86%	-8%	-2%	2%	-12%
EPS (basic)	-10%	-48%	109%	-13%	-61%	12%	2%	65%	-8%	-14%	0%	-19%
EPS (FD)	-10%	-48%	109%	-17%	-61%	14%	2%	72%	-8%	-14%	0%	-19%

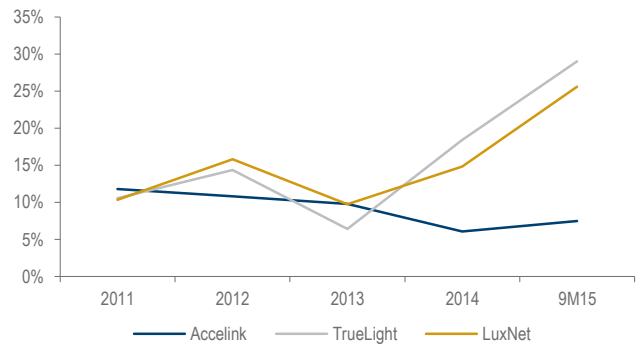
Source: Company

**Gross margin comparison**



Source: Company

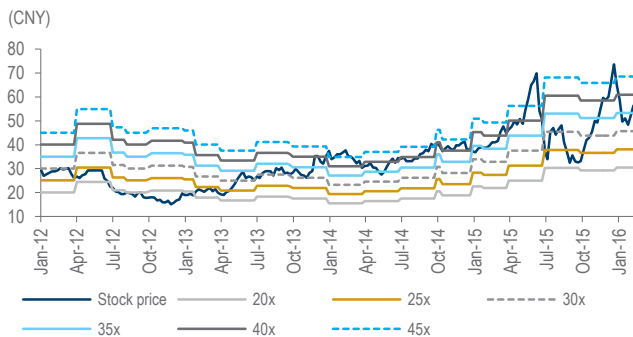
**ROE comparison\***



Source: Company

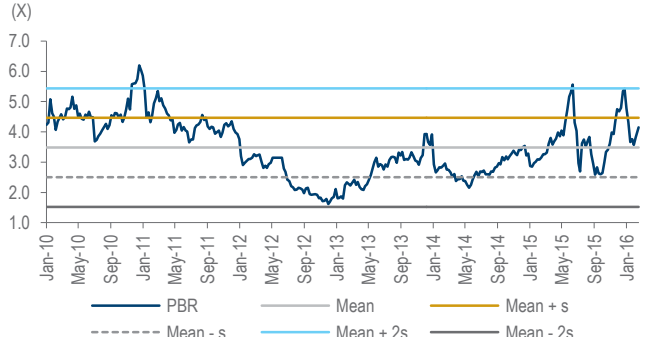
Note: \*Single year, not 2-year average ROE

**Accelink: PER bands**



Source: Bloomberg, Company

**Accelink: PBR trend**



Source: Bloomberg, Company

# Sercomm Corp (5388 TT)

Target price: **n.a.**Share price (16 Feb): **TWD81.50** | Up/downside: -
 5 4 3 2 1  
**No Rating**

## A model IoT play

- Capturing the shift in demand in the telecom business model
- Diversified broadband products, with around 25% OC exposure
- IoT the key growth driver, but strength fragmented

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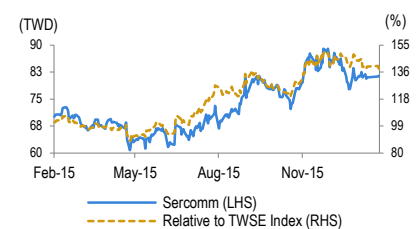
**Background:** Founded in 1992, Sercomm Corp transformed its business model in 2005 from pure product design to the manufacture of networking & communication products, such as switches and routers, by building its first factory to meet customers' need for one-stop shopping. Further capturing the business-model changes from networking branders to telecom vendors dealing directly with end-users for recurrent service charges through hardware subsidies, Sercomm now offers ODM/OEM services for these vendors, which together accounted for 77% of its 2015 revenue (see [Positive tone for 2016](#)).

**Highlights: Broadband upgrades driving growth.** Sercomm's revenue rose by 51% YoY to TWD35bn for 2015, driven by: 1) fibre-to-the-home (FTTH) products such as GPON and EPON integrated access devices (IAD), with China the key market (~25% of 2015 revenue), 2) cable modem products, with North America the key market, where cable operators such as Comcast and Time Warner are upgrading cable bandwidth from 10/100Mbps (Docsis 2.0) to gigabit (Docsis 3.0) to accommodate rising data flows (~25% revenue), and 3) IP cameras for smart-home IoT, which has seen 30-40% pa revenue growth in recent years. According to management, Sercomm is the No.1 distributor for telecom vendors in North America by market share (~15% revenue). These 3 segments together form the home-gateway product group shown in the chart on page 66, enjoying high volumes but low margins due to their commodity status relative to the other 2, smart home control & surveillance (SHCS) and small & medium business (SMB), which are customised solutions for customers specialising in fragmented IoT applications.

**IoT the next focus, but growth fragmented.** Sercomm does not expect the hefty revenue growth of 2015 to be replicated in 2016 due to uncertain price competition in China's FTTH market as a result of telecom operators' price bids; but it does see room for FTTH household coverage to rise in China, likely by over 35% in 2016. Therefore, Sercomm plans to slow its home-gateway product expansion and focus more on the other 2 customised product groups to broaden its footprint in a range of IoT applications. Among the 5+1 Big Data/IoT verticals we have defined (see our accompanying OC sector report), Sercomm has established a solid foothold in smart home IoT by commercialising products like IP cams, broadband routers and small cells, and its scale is set to expand further into the smart community, building, city and eventually country segments.

**Valuation:** Sercomm is trading at PBR/PERs of 2.6x/12.2x per the Bloomberg 2016 forecasts, at the mid- to high-end of its past-3-year ranges (charts, page 66). It paid out TWD3.0/share cash in 2015, a 76% payout.

## Share price performance



12-month range	60.80-89.00
Market cap (USDbn)	0.59
3m avg daily turnover (USDm)	6.64

Source: FactSet, Daiwa forecasts

## Financial summary

### Sercomm: profit and loss (TWDm)

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Revenue	5,670	9,133	10,255	8,535	7,089	8,640	13,242	19,268	19,077	23,193
COGS	(4,772)	(7,982)	(8,729)	(7,196)	(5,897)	(7,193)	(11,262)	(16,282)	(16,008)	(19,538)
<b>Gross profit</b>	<b>898</b>	<b>1,150</b>	<b>1,526</b>	<b>1,338</b>	<b>1,191</b>	<b>1,447</b>	<b>1,980</b>	<b>2,986</b>	<b>3,069</b>	<b>3,655</b>
SG&A	(309)	(391)	(514)	(508)	(495)	(640)	(853)	(1,144)	(1,228)	(1,348)
R&D	(232)	(332)	(399)	(458)	(434)	(454)	(565)	(809)	(970)	(1,127)
<b>Operating profit</b>	<b>357</b>	<b>427</b>	<b>612</b>	<b>372</b>	<b>263</b>	<b>352</b>	<b>562</b>	<b>1,033</b>	<b>871</b>	<b>1,181</b>
Net interest income (expense)	(1)	0	9	(5)	(10)	(20)	(42)	(50)	(22)	(16)
Other non-op gains (losses)	(33)	(18)	17	37	5	54	181	(59)	174	24
<b>Pretax profit</b>	<b>323</b>	<b>410</b>	<b>638</b>	<b>404</b>	<b>258</b>	<b>387</b>	<b>701</b>	<b>924</b>	<b>1,023</b>	<b>1,189</b>
Income tax	2	(56)	(99)	(74)	(52)	(72)	(118)	(180)	(179)	(240)
Minority interest & others	0	1	1	(0)	0	0	0	0	0	0
<b>Net profit</b>	<b>326</b>	<b>355</b>	<b>539</b>	<b>329</b>	<b>205</b>	<b>314</b>	<b>583</b>	<b>744</b>	<b>844</b>	<b>949</b>
<b>EPS (weighted average)</b>	<b>2.76</b>	<b>2.68</b>	<b>3.65</b>	<b>1.88</b>	<b>1.24</b>	<b>1.88</b>	<b>3.29</b>	<b>3.85</b>	<b>4.18</b>	<b>4.21</b>
<b>EPS (fully diluted)</b>	<b>2.69</b>	<b>2.57</b>	<b>3.45</b>	<b>1.93</b>	<b>1.20</b>	<b>1.80</b>	<b>3.19</b>	<b>3.80</b>	<b>4.11</b>	<b>4.14</b>
DPS (TWD, against pre. year)	0.00	0.00	0.00	0.00	0.00	0.00	1.47	2.40	2.70	2.70
EBITDA	473	575	778	555	460	553	826	1,348	1,247	1,585

Source: Company

### Sercomm: cash flow (TWDm)

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Pretax profit	323	410	638	404	258	387	701	924	1,023	1,189
Depreciation & amortization	115	147	165	184	198	200	264	315	376	405
Changes in working capital	0	44	(101)	(134)	311	(747)	(214)	1,153	(613)	(829)
Other operating CF items	157	(7)	12	(102)	63	132	(31)	60	146	16
<b>Cash flow from operations</b>	<b>596</b>	<b>595</b>	<b>714</b>	<b>351</b>	<b>829</b>	<b>(28)</b>	<b>720</b>	<b>2,451</b>	<b>931</b>	<b>780</b>
Capex	(445)	(171)	(181)	(173)	(195)	(719)	(516)	(825)	(448)	(478)
Net disposals (acquisitions)	0	0	0	0	0	0	0	0	(6)	4
Other investing CF items	(24)	(54)	(46)	(181)	18	(212)	(112)	(80)	79	92
<b>Cash flow from investing</b>	<b>(469)</b>	<b>(225)</b>	<b>(227)</b>	<b>(354)</b>	<b>(177)</b>	<b>(931)</b>	<b>(629)</b>	<b>(905)</b>	<b>(375)</b>	<b>(381)</b>
Changes in debts	0	268	99	329	271	1,199	1,916	(338)	(1,068)	1,542
Net share issues (purchases)	(62)	(128)	75	25	0	13	53	0	0	0
Dividends paid	(73)	(124)	(130)	(315)	(249)	(166)	(268)	(469)	(544)	(606)
Other financing CF items	(30)	0	(167)	4	2	22	14	38	147	14
<b>Cash flow from financing</b>	<b>(166)</b>	<b>15</b>	<b>(122)</b>	<b>43</b>	<b>24</b>	<b>1,068</b>	<b>1,716</b>	<b>(769)</b>	<b>(1,465)</b>	<b>950</b>
Forex effects & other adjustments	33	5	4	24	(10)	(48)	16	14	61	63
Change in cash	(7)	390	369	63	665	60	1,824	792	(848)	1,411
<b>Free cash flow</b>	<b>151</b>	<b>424</b>	<b>533</b>	<b>178</b>	<b>634</b>	<b>(748)</b>	<b>204</b>	<b>1,626</b>	<b>483</b>	<b>302</b>

Source: Company

## Financial summary continued ...

## Sercomm: balance sheet (TWDm)

As at 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cash & ST investment	398	887	1,256	1,320	1,987	2,055	3,899	4,683	3,813	5,324
Inventory	740	1,204	802	796	794	1,317	1,908	2,276	2,634	3,629
Accounts receivable	940	1,379	1,360	1,316	1,042	1,790	2,624	1,815	2,626	4,412
Other current assets	191	152	200	241	207	341	546	556	399	548
<b>Total current assets</b>	<b>2,269</b>	<b>3,623</b>	<b>3,619</b>	<b>3,673</b>	<b>4,030</b>	<b>5,503</b>	<b>8,977</b>	<b>9,330</b>	<b>9,471</b>	<b>13,913</b>
Fixed assets	1,095	1,137	1,301	1,405	1,442	1,977	2,497	3,027	3,245	3,321
Goodwill & intangibles	129	125	130	208	120	231	247	252	139	132
Other non-current assets	109	116	174	256	228	269	304	295	534	622
<b>Total assets</b>	<b>3,610</b>	<b>5,008</b>	<b>5,231</b>	<b>5,542</b>	<b>5,819</b>	<b>7,980</b>	<b>12,024</b>	<b>12,903</b>	<b>13,393</b>	<b>17,988</b>
Short-term debt	8	287	227	579	864	1,483	2,820	1,904	987	2,542
Accounts payable	1,345	2,292	1,770	1,586	1,620	2,144	3,354	4,067	4,622	6,573
Other current liabilities	255	322	444	490	532	867	1,598	1,466	2,279	2,537
<b>Total current liabilities</b>	<b>1,600</b>	<b>2,891</b>	<b>2,442</b>	<b>2,654</b>	<b>3,016</b>	<b>4,494</b>	<b>7,772</b>	<b>7,437</b>	<b>7,887</b>	<b>11,652</b>
Long-term debt	269	259	400	377	362	874	874	1,600	727	196
Other non-current liabilities	8	6	7	5	6	15	106	15	51	82
<b>Total liabilities</b>	<b>1,878</b>	<b>3,156</b>	<b>2,849</b>	<b>3,036</b>	<b>3,384</b>	<b>5,382</b>	<b>8,752</b>	<b>9,052</b>	<b>8,665</b>	<b>11,929</b>
Share capital	1,211	1,384	1,563	1,707	1,709	1,747	1,826	1,956	2,052	2,292
Reserves, R/E and others	517	465	816	798	726	850	1,446	1,895	2,675	3,761
<b>Shareholders' equity</b>	<b>1,728</b>	<b>1,849</b>	<b>2,379</b>	<b>2,505</b>	<b>2,436</b>	<b>2,597</b>	<b>3,273</b>	<b>3,851</b>	<b>4,728</b>	<b>6,053</b>
Minority interest	5	3	3	0	0	0	0	0	0	6
<b>Total equity &amp; liabilities</b>	<b>3,610</b>	<b>5,008</b>	<b>5,231</b>	<b>5,542</b>	<b>5,819</b>	<b>7,980</b>	<b>12,024</b>	<b>12,903</b>	<b>13,393</b>	<b>17,988</b>
Net debt (cash)	-121	-342	-629	-364	-761	302	-206	-1,179	-2,099	-2,586
BVPS (TWD)	14.31	13.39	15.24	14.68	14.25	14.86	17.92	19.69	23.03	26.43

Source: Company

## Sercomm: key ratio analysis

Year to 31 Dec	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>Growth</b>										
Revenue	na	61%	12%	-17%	-17%	22%	53%	46%	-1%	22%
Operating profit	na	20%	43%	-39%	-29%	34%	59%	84%	-16%	36%
Net profit	na	9%	52%	-39%	-38%	53%	85%	28%	13%	12%
EPS (fully diluted)	na	-5%	34%	-44%	-38%	50%	77%	19%	8%	1%
EBITDA	na	22%	35%	-29%	-17%	20%	49%	63%	-7%	27%
<b>Margin</b>										
Gross profit	15.8%	12.6%	14.9%	15.7%	16.8%	16.7%	14.9%	15.5%	16.1%	15.8%
Operating profit	6.3%	4.7%	6.0%	4.4%	3.7%	4.1%	4.2%	5.4%	4.6%	5.1%
Net profit	5.7%	3.9%	5.3%	3.9%	2.9%	3.6%	4.4%	3.9%	4.4%	4.1%
EBITDA	8.3%	6.3%	7.6%	6.5%	6.5%	6.4%	6.2%	7.0%	6.5%	6.8%
<b>Profitability</b>										
ROA	9%	7%	10%	6%	4%	4%	5%	6%	6%	5%
ROE	19%	19%	23%	13%	8%	12%	18%	19%	18%	16%
ROCE	20%	24%	30%	15%	12%	11%	16%	27%	27%	25%
<b>Leverage</b>										
Debt to equity	108%	170%	120%	121%	139%	207%	267%	235%	183%	197%
Interest-bearing debt to equity	16%	29%	27%	39%	51%	91%	126%	92%	46%	50%
Net debt to equity	-7%	-18%	-26%	-14%	-30%	13%	8%	-30%	-35%	-37%
<b>Efficiency</b>										
Days receivable	30	46	49	57	61	60	61	42	42	55
Days inventory	28	44	42	41	49	54	52	47	56	59
Days payable	51	83	85	85	99	96	89	83	99	105
Cash cycle	7	8	6	13	11	18	24	6	-1	9

Source: Company

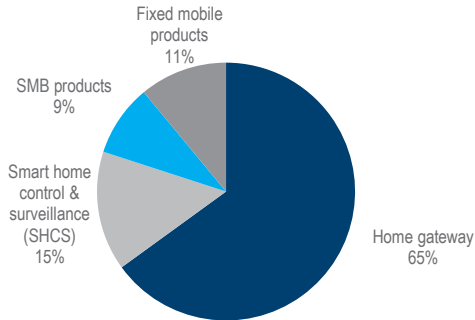


**Sercomm: quarterly P&L**

TWDm	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	2012	2013	2014	9M15
Revenue	4,802	4,671	6,021	6,147	6,354	6,347	8,562	10,415	19,268	19,077	23,193	25,324
COGS	3,941	3,880	5,032	5,222	5,403	5,483	7,429	8,862	16,282	16,008	19,538	21,775
Gross profit	861	790	989	925	951	864	1,132	1,553	2,986	3,069	3,655	3,550
Opex	590	557	662	611	644	677	764	929	1,953	2,198	2,475	2,369
Operating profit	271	233	326	314	307	187	369	625	1,033	871	1,181	1,180
Pretax profit	268	221	328	289	351	202	404	537	924	1,023	1,189	1,142
Income taxes	46	37	56	50	96	35	76	97	180	179	240	207
Net profit	222	184	272	239	255	168	329	442	744	844	949	939
EPS (TWD, basic)	1.10	0.84	1.22	1.07	1.13	0.73	1.43	1.89	3.85	4.18	4.21	3.90
EPS (TWD, fully diluted)	1.08	0.80	1.19	1.04	1.11	0.73	1.43	1.83	3.80	4.11	4.14	3.90
<b>Margin</b>												
Gross	18%	17%	16%	15%	15%	14%	13%	15%	15%	16%	16%	14%
Operating	6%	5%	5%	5%	5%	3%	4%	6%	5%	5%	5%	5%
Net	5%	4%	5%	4%	4%	3%	4%	4%	4%	4%	4%	4%
<b>Growth (QoQ)</b>												
Revenue	-5%	-3%	29%	2%	3%	0%	35%	22%				
Gross profit	4%	-8%	25%	-6%	3%	-9%	31%	37%				
Operating profit	-2%	-14%	40%	-4%	-2%	-39%	97%	69%				
Net profit	-3%	-17%	48%	-12%	6%	-34%	96%	34%				
EPS (basic)	-4%	-24%	46%	-13%	6%	-35%	96%	32%				
EPS (FD)	-3%	-26%	48%	-12%	6%	-35%	96%	29%				
<b>Growth (YoY)</b>												
Revenue	12%	14%	18%	21%	32%	36%	42%	69%	46%	-1%	22%	50%
Gross profit	29%	37%	23%	11%	10%	9%	15%	68%	51%	3%	19%	31%
Operating profit	32%	191%	33%	14%	13%	-20%	13%	99%	84%	-16%	36%	35%
Net profit	85%	55%	-1%	5%	15%	-9%	21%	85%	28%	13%	12%	35%
EPS (basic)	40%	40%	-12%	-7%	2%	-13%	17%	77%	17%	9%	1%	26%
EPS (FD)	76%	39%	-12%	-6%	3%	-9%	20%	76%	19%	8%	1%	29%

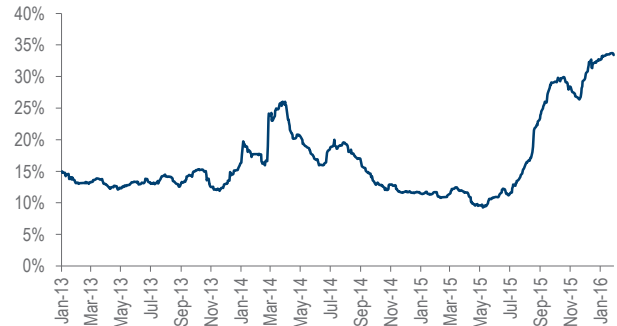
Source: Company

**Sercomm: revenue mix (1Q-3Q15)**



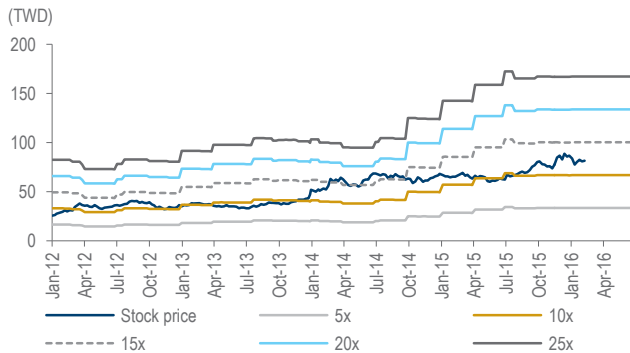
Source: Company

**Sercomm: QFII holding trend**



Source: TEJ

**Sercomm: PER bands**



Source: TEJ, Bloomberg, Company

**Sercomm: PBR trend**



Source: TEJ, Bloomberg, Company





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