中性

中际旭创 (300308.SZ)

等待曙光；首次覆盖评为中性以体现关税不确定因素 (摘要)

300308.SZ	12个月目标价格: Rmb46.00	股价: Rmb42.06	上涨空间: 9.4%

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把握云/5G资本开支机遇的光通信收发模块龙头企业 ...

中际旭创是领先的光通信收发模块（可令数据通过光缆传输的设备）企业，2017年在全球拥有约5%的市场份额。目前公司已成为谷歌、亚马逊、阿里巴巴和腾讯等云方案提供商的主要供应商，并将于2019年率先推出下一代400G产品。同时，公司还将积极参与5G移动通信市场，其产品已经获得华为和中兴通讯的认可。我们预计云和5G双重资本开支引擎将推动行业增长，而中际旭创将凭借强大的研发能力、领先的封装技术以及产品的快速更新继续扩大市场份额。

...但关税不确定因素令我们将该股评为中性

由于美国客户对中际旭创总收入的贡献为60%左右，我们认为如果美国加征关税，则公司盈利将受到重大影响。尽管我们的预测中尚未计入任何关税因素，但根据我们的情景分析（其中对中际旭创主要供应商进行了压力测试），我们估算:

- 关税加征10%将令公司2018/19/20年每股盈利减少12%/16%/2%;
- 关税加征25%将令公司2018/19/20年每股盈利减少18%/30%/12%;

12个月目标价人民币46元，体现了关税不确定因素

鉴于关税不确定性，我们以中际旭创历史谷底估值倍数20倍乘以2019年预期每股盈利人民币2.29元，得出12个月目标价人民币为46元。我们还进行了不同的情景分析，包括根据高盛美国宏观经济团队的预测，对加征25%关税的情景赋予70%的概率，并对不加征关税的情景赋予30%的概率，这一方法得出的估值为人民币43元。

* 全文翻译随后提供

主要数据

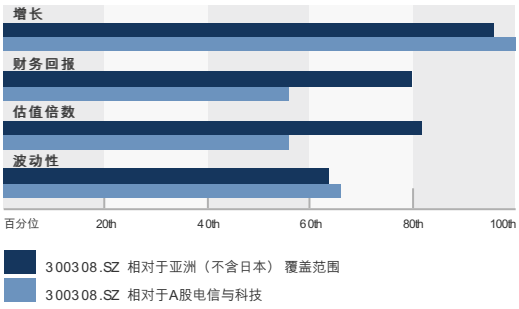
市值: Rmb19.9bn / $2.9bn
企业价值: Rmb20.1bn / $2.9bn
3个月日均成交量: Rmb229.8mn / $33.9mn
中国
A股电信与科技
并购概率: 3

预测

	12/17	12/18 E	12/19 E	12/20E
主营业务收入 (Rmb mn)	2,357.1	6,055.0	8,044.6	10,876.3
EBITDA (Rmb mn)	464.7	1,131.3	1,607.8	2,160.2
每股盈利 (Rmb)	0.47	1.50	2.29	3.23
市盈率 (X)	81.5	28.1	18.3	13.0
市净率 (X)	4.6	4.2	3.4	2.7
股息收益率 (%)	0.0	0.0	0.0	0.0
净负债/EBITDA (X)	0.1	0.1	(0.2)	(0.4)
CROCI (%)	16.1	18.6	22.3	25.5
自由现金流收益率 (%)	(2.9)	(0.3)	2.1	2.7

	3/18	6/18	9/18 E	12/18 E
每股盈利 (Rmb)	0.31	0.36	0.39	0.44

要素概要



资料来源：公司数据、高盛研究预测

中性

中际旭创 (300308.SZ)

评级自2018年9月13日

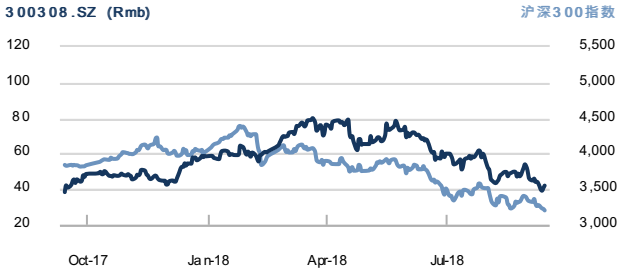
比率和估值

	12/17	12/18 E	12/19 E	12/20E
市盈率 (X)	81.5	28.1	18.3	13.0
市净率 (X)	4.6	4.2	3.4	2.7
自由现金流收益率 (%)	(2.9)	(0.3)	2.1	2.7
EV/EBITDA (X)	43.0	17.7	12.2	8.8
CROCI (%)	16.1	18.6	22.3	25.5
净资产回报率 (%)	6.7	16.3	20.7	23.3
净负债/股东权益 (%)	1.6	2.6	(5.1)	(11.4)
利息保障倍数 (X)	9.8	10.4	13.5	18.6
存货销售天数	204.0	128.3	120.4	118.8
应收账款周转天数	135.1	71.5	66.8	66.3
应付账款周转天数	293.2	169.6	151.2	150.0
杜邦净资产回报率 (%)	4.1	15.1	18.7	20.9
周转率 (X)	0.3	0.7	0.8	0.8
杠杆比率 (X)	1.9	1.9	1.8	1.8

增长率和利润率 (%)

	12/17	12/18 E	12/19 E	12/20E
主营业务收入增长率	20.3	156.9	32.9	35.2
EBITDA增长率	41.0	143.5	42.1	34.4
每股盈利增长	(64.4)	216.5	53.1	40.9
每股股息增速	NM	NM	NM	NM
EBIT利润率	15.4	15.3	17.2	17.5
EBITDA利润率	19.7	18.7	20.0	19.9
净利润率	6.9	11.7	13.5	14.1

股价走势图



	3个月	6个月	12个月
绝对	(38.8)%	(45.7)%	7.6%
相对于沪深300指数	(26.9)%	(30.0)%	28.9%

资料来源：公司数据、高盛研究预测、FactSet（股价为2018年9月12日收盘价）

损益表 (Rmb mn)

	12/17	12/18 E	12/19 E	12/20E
主营业务收入	2,357.1	6,055.0	8,044.6	10,876.3
主营业务成本	(1,725.5)	(4,492.0)	(5,930.2)	(7,974.9)
销售、一般及管理费用	(117.0)	(196.3)	(140.2)	(189.5)
研发费用	(167.4)	(459.0)	(609.8)	(824.5)
其它营业收入/(费用)	16.1	16.1	16.1	16.1
EBITDA	**464.7**	**1,131.3**	**1,607.8**	**2,160.2**
折旧和摊销	(101.4)	(207.5)	(227.2)	(256.6)
EBIT	**363.3**	**923.8**	**1,380.6**	**1,903.6**
净利息收入/（支出）	(37.1)	(88.7)	(102.4)	(102.4)
联营公司损益	–	–	–	–
税前利润	**207.7**	**835.1**	**1,278.2**	**1,801.2**
税项拨备	(44.4)	(125.3)	(191.7)	(270.2)
少数股东损益	–	–	–	–
优先股息	–	–	–	–
非经常性项目前净利润	**163.3**	**709.8**	**1,086.5**	**1,531.0**
税后非经常性损益	–	–	–	–
非经常性项目后净利润	**163.3**	**709.8**	**1,086.5**	**1,531.0**
EPS（基本，扣非前）(Rmb)	**0.47**	**1.50**	**2.29**	**3.23**
EPS（摊薄，扣非前）(Rmb)	**0.47**	**1.50**	**2.29**	**3.23**
EPS（基本，扣非后）(Rmb)	**0.47**	**1.50**	**2.29**	**3.23**
EPS（摊薄，扣非后）(Rmb)	**0.47**	**1.50**	**2.29**	**3.23**
每股股息 (Rmb)	–	–	–	–
股息支付率 (%)	0.0	0.0	0.0	0.0

资产负债表 (Rmb mn)

	12/17	12/18 E	12/19 E	12/20E
现金及等价物	957.2	1,273.6	1,691.9	2,235.7
应收账款	1,109.7	1,264.1	1,679.5	2,270.7
存货	1,969.0	2,287.7	3,020.2	4,061.5
其它流动资产	271.8	271.8	271.8	271.8
流动资产	**4,307.8**	**5,097.3**	**6,663.4**	**8,839.7**
固定资产净额	1,271.6	1,694.2	1,958.0	2,340.1
无形资产净额	2,173.0	2,105.2	2,039.4	1,975.7
投资总额	28.6	28.6	28.6	28.6
其它长期资产	29.0	29.0	29.0	29.0
资产合计	**7,810.0**	**8,954.3**	**10,718.5**	**13,213.1**
应付账款	2,056.9	2,116.9	2,794.6	3,758.2
短期债务	780.6	1,097.0	1,097.0	1,097.0
其它流动负债	109.6	109.6	109.6	109.6
流动负债	**2,947.1**	**3,323.5**	**4,001.3**	**4,964.9**
长期债务	241.3	299.3	299.3	299.3
其它长期负债	615.8	615.8	615.8	615.8
长期负债	**857.0**	**915.1**	**915.1**	**915.1**
负债合计	**3,804.2**	**4,238.6**	**4,916.3**	**5,879.9**
优先股	–	–	–	–
普通股权益	4,005.9	4,715.7	5,802.2	7,333.2
少数股东损益	**--**	**--**	**--**	**--**
负债及股东权益合计	**7,810.0**	**8,954.3**	**10,718.5**	**13,213.1**
总现金投资，名义（剔除现金）	4,858.8	5,834.2	6,729.6	7,973.4
调整后净负债	64.7	122.7	(295.6)	(839.4)
平均已动用资本	2,686.9	4,454.4	5,172.4	6,000.2
每股净资产 (Rmb)	8.45	9.95	12.24	15.48

现金流量表 (Rmb mn)

	12/17	12/18 E	12/19 E	12/20E
净利润	163.3	709.8	1,086.5	1,531.0
折旧及摊销加回	101.4	207.5	227.2	256.6
少数股东权益加回	–	–	–	–
运营资本增减净额	(435.6)	(413.1)	(470.1)	(668.9)
其它经营性现金流	212.4	–	–	–
经营活动产生的现金流	**41.4**	**504.3**	**843.6**	**1,118.7**
资本开支	(420.8)	(562.3)	(425.3)	(574.9)
收购	(1.5)	–	–	–
剥离	–	–	–	–
其它	276.0	–	–	–
投资活动产生的现金流	**(146.4)**	**(562.3)**	**(425.3)**	**(574.9)**
支付的股息（普通股和优先股）	(20.8)	–	–	–
借款增减	259.7	374.4	–	–
其它融资性现金流	305.3	0.0	0.0	0.0
筹资活动产生的现金流	**544.2**	**374.4**	**0.0**	**0.0**
总现金流	**439.2**	**316.4**	**418.3**	**543.7**
自由现金流	(379.4)	(58.0)	418.3	543.7

资料来源：公司数据、高盛研究预测

目录

PM Summary: Waiting for the light

Company Overview

Founded and headquartered in Suzhou in 2008, Innolight researches, designs, builds and markets high-speed optical transceiver modules - devices that enable the transmission of data via optical fiber cable. With c.5% global market share as of 2017, Innolight is already a top supplier to cloud providers like Google, Amazon, Alibaba and Tencent and will be one of the first to provide next generation 400G products in 2019. At the same time, it is set to supply to the 5G mobile communications market with its products already qualified by Huawei and ZTE.

Scenario Analysis

With US exports accounting for c.60% of current total revenue, and all of its manufacturing facilities in China, we believe potential US tariffs would have a material impact on earnings. While we don't incorporate any tariffs into our estimates, based on our scenario analysis that includes stress-testing Innolight's top suppliers, we see:

- a 10% tariff to reduce EPS by 12%/16%/2%(18E/19E/20E);
- a 25% tariff to reduce EPS by 18%/30%/12%(18E/19E/20E).

Competitive Advantages

#1: Superior R&D strength

- Stable management team with rich experience in R&D
- Strong commitment in R&D
- Industry-leading packaging technologies

#2: Fast decision making and product refresh cycle

- Concentrated R&D focus on packaging technology
- Industry-leading manufacturing facilities and experienced production personnel
- Strategic relationship with upstream chip makers and sub-module suppliers
- Trust building with key customers

#3: Best-in-class operational efficiency

- Lower R&D and SG&A costs vs. overseas peers
- Higher gross profit margin vs. domestic peers

Industry

The optical transceiver module market can be divided into two main sectors, Telecom and Datacom (i.e. datacenters/cloud). The Telecom market can be further divided into fixed-line network, transport network and access network (FTTH) and wireless network (e.g., 4G, 5G).

Datacom: We forecast that the optical transceiver module market size of the global Datacom sector growing at 20% CAGR between 2018 and 2022, reaching $5.8 billion. The main drivers of the growth are (1) increasing demand for data center services, (2) continued penetration of fiber used in new-built data centers and (3) optical transceiver data rate upgrade in the newly built data centers.

Telecom: According to our estimate, Innolight's addressable Telecom market will grow at a 39% CAGR from 2018 to 2022, arriving at $1.7 billion. (1) We forecast that the global 5G base station will reach around 12 million units in 2027 (the end of the 5G cycle), double the number of the total 4G base stations due to shorter coverage area. (2) 25G and 100G optical transceiver modules will be the mainstream choice for the 5G fronthaul transmission network vs. 10G modules for 4G network.

Financials

We believe Innolight's 100G and 400G transceiver modules will be the key growth avenue for the company. With the constantly growing demand for data from end users, both Datacom and Telecom players are upgrading their current network with higher data rate transceiver modules. Going forward, 100G and 400G transceiver modules will be the mainstream choice in our view for the data center access/core layer networks and 5G fronthaul/backhaul networks.

Innolight also has superior ROE than the majority of its global peers, below industry average cash conversion cycle, with low and stable financial leverage. We see healthy and growing free cash flow over the next three years.

Valuation

Given uncertainty around tariffs, we apply Innolight's trough multiple of 20X to 2019E EPS of Rmb2.29 to arrive at 12-month target price of Rmb46, implying 9% upside and therefore we initiate at Neutral. We also explore different scenarios with the potential tariff, and different multiples (detailed further inside), and a probability weighted theoretical value. Scenarios:

- No tariff: Rmb69 (based on 30X P/E on 2019E EPS of Rmb2.29), 64% upside
- 10% tariff: Rmb48 (based on 25X P/E on 2019E EPS of Rmb1.93), 14% upside
- 25% tariff: Rmb32 (based on 20X P/E on 2019E EPS of Rmb1.61), 24% downside

Our US macro team assigns a 70% chance of tariff implementation, with 25% on non-consumer products, and an eventual "deal" to be reached in 12 months' time. Based on this, for one scenario we apply a 70% probability to a 25% tariff scenario (20X P/E) + a 30% probability to no tariff scenario (30X P/E), to derive an implied value of Rmb43.

Key risks

1. Stronger or weaker demand from cloud and 5G capex
2. Uncertainties around tariff implementation
3. Competition from Silicon Photonics

Company Overview: Leading optical module maker benefiting from cloud and 5G demand

A leading player in the global optical transceiver module industry

Founded and headquartered in Suzhou in 2008, Innolight researches, designs, builds and markets high-speed optical transceiver modules - devices that enable the transmission of data via optical fiber cable - used in a range of applications, including cloud computing/data centers, long distance transmission and wireless access. The transceiver modules work by converting a server's electrical signals into optical signals, then transporting those optical signals by fiber-optic cables to a different server, and then converting them back into electrical signals.

Innolight is a pure-play optical transceiver module manufacturer and its key investors include CapitalG, the venture-capital fund of Google's parent Alphabet Inc, and was acquired in July 2017 by Zhongji Equipment, an A-share listed electrical equipment manufacturer based in Shandong Province. After the acquisition, Innolight accounted for 96.57% of the combined company's 2H17 revenue.

图表 1: Innolight company key facts

Key facts	Description
Year founded:	2008
Company headquarter:	Suzhou, China
Product portfolio:	10G/25G/40G/100G/200G/400G optical transceiver module
Top management:	Liu Sheng (CEO); Osa Mok (CMO); Wei-long William Lee (CTO); Charles X. Wang (VP, R&D)
Key investors:	CapitalG (Google's VC), Lightspeed, Oriza Holdings, Cowin Venture
Market share:	~ 5% of the global optical component market share in 2017
Date of listing:	In July 2017, Innolight was acquired by Zhongji Equipment, an A-share listed electrical equipment manufacturer. Post acquisition, Innolight accounted for 96.57% of the combined company's 2H17 revenue.

资料来源：Company data, Gao Hua Securities Research

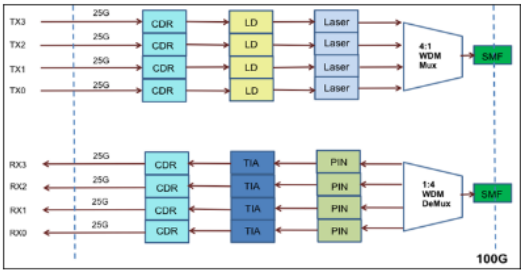
What is an optical transceiver module in layman's terms?

Optical transceiver modules are devices that enable the transmission of data via optical fiber cables by converting electrical signals from servers into optical signals, and vice versa.

Optical transceiver modules are applied in many scenarios - from cloud operators like Amazon to communications equipment manufacturers - and can operate at different transmission speeds and distances. The device is made up of a transmitter and receiver with one side of the module plugged into the server/switch, and the other side is connected to an optical fiber cable, thus achieving the conversion and transmission of data traffic. Simply put, whenever this is an optical fiber, an optical transceiver is needed at each end to "activate" the network.

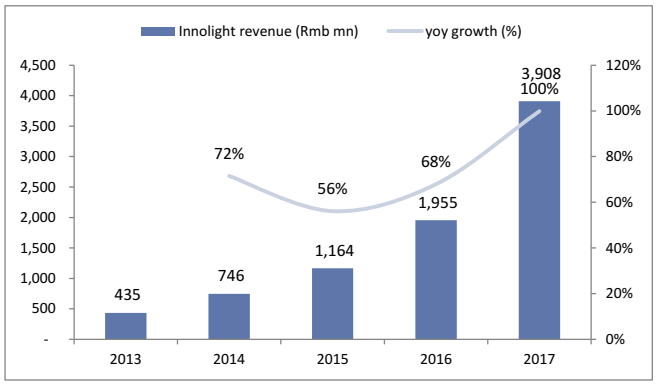
Innolight 100G QSFP28 optical transceiver module

100G QSFP28 CWDM4 transceiver using 4 25G lasers to achieve 100G speed



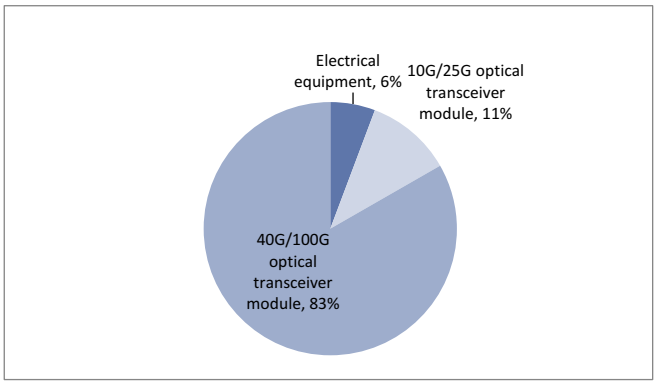
Source: Company Data

图表 2: Innolight revenue growth (2013-2017)



资料来源：Company data

图表 3: Innolight revenue breakdown by product type (2017)



资料来源：Company data

The increase in data traffic from around the world, especially with the growing penetration of cloud services and as the next generation of wireless networks looms, is boosting demand for optical fiber connections which can transmit data at a higher speed and between longer distances as compared to copper cables.

Innolight's R&D strength is demonstrated in the company's leading market position in 100G/400G transceivers. Innolight was among the first to develop products for the 100G market in the industry and its products were widely used among global tier one Datacom players. Currently, Innolight is the No.1 100G transceiver supplier for Google, Amazon, Alibaba, Tencent, and Huawei, and No.2 for Facebook, according to Innolight management.

Innolight is also among the first to demonstrate the next generation 400G OSFP and QSFP-DD product in 2017, and has already started shipping these in small volumes to Google and Amazon in 2018. The company expects volume shipment in 2019.

图表 4: Innolight in numbers (as of June 2018)

Key facts and numbers	Description
True global player	
75%	c.75% of Innolight's FY17 revenue was generated overseas
Global sales network	Innolight has sales branches and distribution partners in North America, Europe, Japan, Korea, Russia, Israel and China
Prestigious global client base	Innolight is the No.1 100G transceiver supplier to leading Datacom players including Amazon, Google, Alibaba and Tencent and is among top suppliers to Facebook
Stable management with rich industry experience	All five top executives of the company previously held key positions in leading global optical communication companies like Agere System (Alcatel-Lucent's predecessor), Opnext, Oplink and Intel.
R&D commitment	
8%	Innolight invested c.8% of its FY2016 revenue in R&D
397	Innolight has 397 dedicated R&D personnel
3	Innolight has 3 R&D centers in mainland China, Taiwan and Silicon Valley in the US
54	Innolight has been granted 54 domestic patents, of which 26 are invention patents
12	Innolight has filed for 12 overseas patents and obtained 2 overseas patents
Manufacturing capability	
450,000	Innolight has planned to invest Rmb 440 million in the new 400G production lines in Suzhou. The new capacity is expected to produce 450,000 400G transceiver modules upon completion
1,990,000	Innolight produced 1,990,000 optical transceivers in 2H17
1,600,000 & 1,400,000	Innolight has planned to invest Rmb 1.13 billion in a new industrial park in Tongling, Anhui. Upon completion, the new facility is expected to produce 1,600,000 100G transceiver modules and 1,400,000 transceiver modules for 5G wireless network

资料来源：Company data, Gao Hua Securities Research

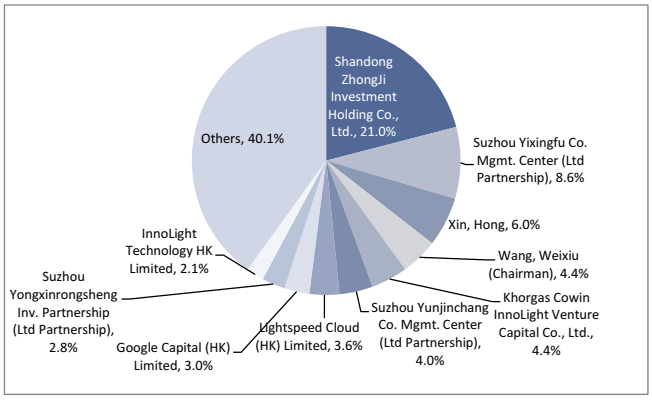
Shareholding structure

Innolight’s major shareholders are a mixture of Zhongji Equipment management, Innolight management, and institutional investors.

- Weixiu Wang - Chairman and ex general manager of Zhongji Equipment, is the largest shareholder, holding a 15.3% stake as of June 2018, through direct holding (4.4% stake) and Shandong ZhongJi Investment Holding Co., Ltd.
- Sheng Liu - CEO of Innolight, holds 6% stake through Suzhou Yixingfu Co. Mgmt. Center and Suzhou Yunjinchang Co. Mgmt. Center.
- Hong Xin - ex Vice Chairman of Zhongji Equipment in 2012 and now holds 6% stake directly.
- Xiaodong Wang - Chariman’s son serves as vice general manager and has 3.8% stake through Shandong ZhongJi Investment Holding Co., Ltd.

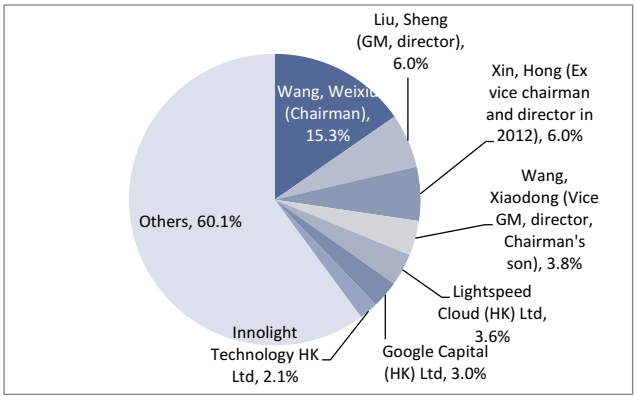
- Google Capital - holds a 3.0% stake in Innolight as an institutional investor.

图表 5: Innolight shareholding structure (2Q18 reported)



资料来源：Company data

图表 6: Innolight Shareholding structure (2Q18 underlying)



资料来源：Company data, Gao Hua Securities Research

Scenario Analysis: Potential US tariff impact and stress-testing the supply chain

With US exports accounting for around 60% of Innolight's current total revenue, and all of its manufacturing facilities located in China, we believe potential tariffs on US imports from China as proposed by the White House would have a material impact on earnings if enacted, as optical transceiver modules are subject to the proposed tariff. Therefore we conduct a scenario analysis and stress-testing on Innolight's top suppliers to better understand the potential change in estimates should the White House move forward with tariffs, although note we do not incorporate any tariffs into our actual estimates given tariffs have not been implemented.

1. We conduct one scenario assuming tariffs are 25%, in line with our US macro team which assigns a 70% chance of tariff implementation, with 25% on non-consumer products, and an eventual "deal" to be reached in 12 months' time.
2. We also conduct a scenario assuming tariffs are 10% given this was the original proposed tariff before the White House lifted the proposal to 25%.

图表 7: Financial impact from potential 10% and 25% tariff

Innolight tariff sensitivity analysis	No tariff			10% tariff			25% tariff		
Income statements (Rmb mn)	**2018E**	**2019E**	**2020E**	**2018E**	**2019E**	**2020E**	**2018E**	**2019E**	**2020E**
Total sales/revenues	**6,055**	**8,045**	**10,876**	**5,927**	**7,737**	**10,703**	**6,055**	**8,045**	**10,876**
				-2%	***-4%***	***-2%***	***0%***	***0%***	***0%***
Total COGS	**(4,492)**	**(5,930)**	**(7,975)**	**(4,466)**	**(5,826)**	**(7,835)**	**(4,645)**	**(6,311)**	**(8,197)**
				-1%	***-2%***	***-2%***	***3%***	***6%***	***3%***
Gross profit	**1,563**	**2,114**	**2,901**	**1,461**	**1,911**	**2,868**	**1,410**	**1,733**	**2,679**
% change				***-7%***	***-10%***	***-1%***	***-10%***	***-18%***	***-8%***
SG&A	(655)	(750)	(1,014)	(655)	(750)	(1,014)	(655)	(750)	(1,014)
Other operating income/(expense)	16	16	16	16	16	16	16	16	16
Total operating expense	(639)	(734)	(998)	(639)	(734)	(998)	(639)	(734)	(998)
EBITDA	**1,131**	**1,608**	**2,160**	**1,029**	**1,404**	**2,127**	**979**	**1,227**	**1,938**
% change				***-9%***	***-13%***	***-2%***	***-14%***	***-24%***	***-10%***
Depreciation	(140)	(161)	(193)	(140)	(161)	(193)	(140)	(161)	(193)
Amortization	(68)	(66)	(64)	(68)	(66)	(64)	(68)	(66)	(64)
EBIT	**924**	**1,381**	**1,904**	**822**	**1,177**	**1,870**	**771**	**999**	**1,681**
% change				***-11%***	***-15%***	***-2%***	***-17%***	***-28%***	***-12%***
Net interest income/expense	(89)	(102)	(102)	(89)	(102)	(102)	(89)	(102)	(102)
Profit/loss on disposal of assets (pre-tax)	-	-	-	-	-	-	-	-	-
Foreign exchange gain/(loss)	-	-	-	-	-	-	-	-	-
Net income from associates	-	-	-	-	-	-	-	-	-
Share of results in jointly controlled entities	-	-	-	-	-	-	-	-	-
Other non-operating income/expense	-	-	-	-	-	-	-	-	-
Non-operating income/(loss)	**(89)**	**(102)**	**(102)**	**(89)**	**(102)**	**(102)**	**(89)**	**(102)**	**(102)**
Pre-tax profit	**835**	**1,278**	**1,801**	**733**	**1,075**	**1,768**	**682**	**897**	**1,579**
% change				***-12%***	***-16%***	***-2%***	***-18%***	***-30%***	***-12%***
Income taxes	(125)	(192)	(270)	(110)	(161)	(265)	(102)	(135)	(237)
Minority interest	-	-	-	-	-	-	-	-	-
Preferred dividends	-	-	-	-	-	-	-	-	-
Extraordinary gain/(loss)	-	-	-	-	-	-	-	-	-
Net income	**710**	**1,086**	**1,531**	**623**	**914**	**1,503**	**580**	**762**	**1,342**
% change				***-12%***	***-16%***	***-2%***	***-18%***	***-30%***	***-12%***
EPS - basic (Rmb)	**1.50**	**2.29**	**3.23**	**1.31**	**1.93**	**3.17**	**1.22**	**1.61**	**2.83**
% change				***-12%***	***-16%***	***-2%***	***-18%***	***-30%***	***-12%***

资料来源：Company data, Gao Hua Securities Research

Scenario 1: 10% tariff

- We estimate 2%/4%/2% lower revenue and 12%/16%/2% lower net income in 2018E/2019E/2020E.
- Our supply chain stress-testing result on Innolight’s top 5 suppliers show 3 out of 5 of these suppliers can sustain a 5%-10% price cut. See our analysis below.
- Assumptions:
  - Revenue

    1. Assuming 70%/60%/50% of revenue is from overseas in 2018E/19E/20E

    2. For data center demand of US customers outside of US, Innolight can ship directly to the end market

    3. According to Jones Lang LaSalle, 34% of overseas data center capacity under construction now is from US

    4. We assume for overseas demand outside US, Innolight can directly ship 0%/50%/100% to end market

  - COGS

1. Among COGS, 65% of the value is for optical and electrical chips, which are hard to find alternative suppliers

2. We assume for the other non-critical components, Innolight can transfer half of its tariff to its suppliers

3. We analyzed Innolight's top 5 suppliers in 2014-2016, and estimate 3 out of 5 are able to sustain a 5%-10% price cut.

Scenario 2: 25% tariff

- In this case because it would be more severe, we believe Innolight would need to use a non-China OEM to manufacture their US shipments to avoid the tariffs, similar to some of its global peers.
- Revenue therefore won't be impacted, but net income will be 18%/30%/12% lower in 2018E/2019E/2020E due to the costs of outsourcing.
- Assumptions:
  - Revenue

    1. Revenue will be unchanged since Innolight would use a non-China OEM to manufacture their US shipments
  - COGS

    1. Innolight's US demand are mostly 100G modules with c.28% gross margin currently

    2. Assume OEM produced gross margin will be 5% lower (i.e. 23%), and OEM will add a 10% cost margin

    3. Gross margin for 100G modules will be lowered to 15% when outsourced

Stress-testing Innolight's top suppliers

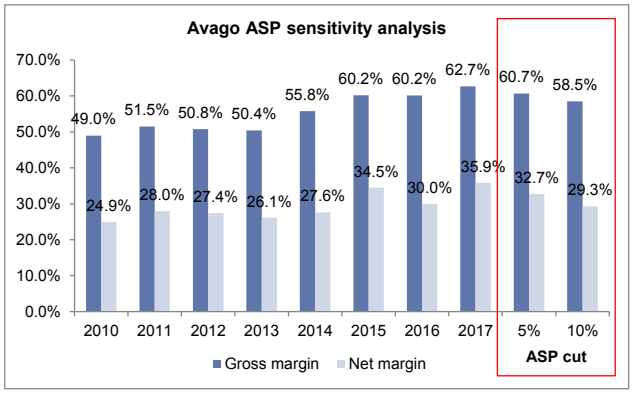
- We analyzed the gross margin and net margin sensitivity for Innolight's top 5 suppliers over 2014-2016 (supplier names for 2017 not disclosed by Innolight) to estimate if Innolight could theoretically pass on some of the tariff pressure to its suppliers, namely Avago (now known as Broadcom, covered by Toshiya Hari), Mitsubishi Electric (covered by Ikuo Matsuhashi), Suzhou Agix (838112.OC, traded on China OTC market, Not Covered), LuxNet (4979.TW, Not Covered), and Macom (covered by Mark Delaney). Using this historical data, we believe 3 out of 5 of these suppliers in theory could sustain a 5%-10% price cut based on our sensitivity analysis below meaning Innolight could past on tariff pressure to those in our view.
- By using simple maths and historical data and holding everything else steady, we estimate Avago/Agix/Macom could still have a historical 40%-60% gross margin and a 15%-35% net margin, even after a 5% price cut, and those margins would still be relatively high compared to historical trough levels. Mitsubishi/LuxNet on the other hand have relatively thin/negative margins, and thus would probably be less likely to be able to take price cuts.

图表 8: Innolight’s top 5 suppliers

2014 top 5 suppliers		2015 top 5 suppliers		2016 top 5 suppliers	
Avago	17.26%	Avago	13.19%	Avago	7.79%
M/A-COM	6.52%	Suzhou Suteng	6.98%	Google	7.06%
Suzhou Suteng	6.08%	Suzhou Goolight	4.83%	Mitsubishi Electric	6.03%
LuxNet	5.75%	LuxNet	4.81%	Suzhou Agix	4.92%
Sichuan Sunstar	5.47%	Mitsubishi Electric	3.92%	Suzhou Suteng	4.49%
Total	**41.08%**	**Total**	**33.73%**	**Total**	**30.29%**

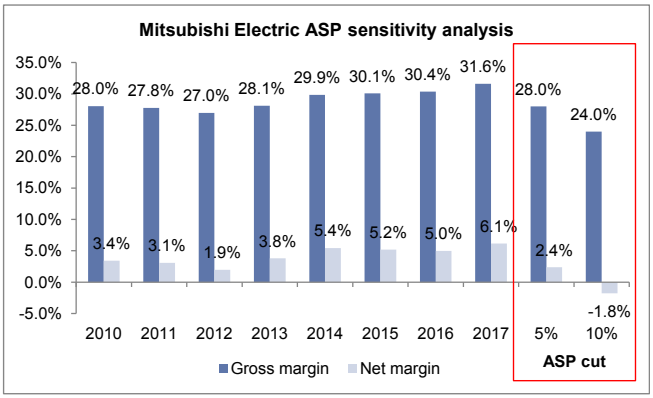
资料来源：Company data

图表 9: Our calculations using simple maths show a 5%-10% additional ASP cut would likely bring down Avago’s 2017 net margin to c.30% in our view



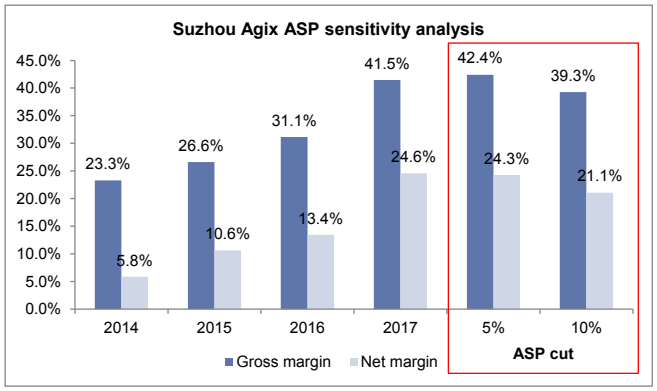
资料来源：Company data, Gao Hua Securities Research

图表 10: A 5% additional ASP cut would likely bring Mitsubishi Electric’s 2017 net margin down to 2.4%, while a 10% could result in negative margin in our view, based on historical data



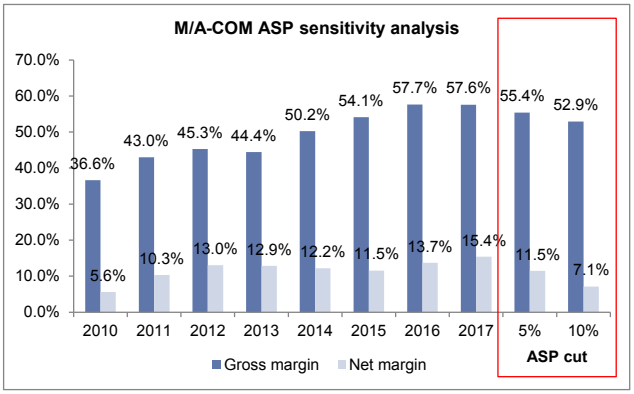
资料来源：Company data, Gao Hua Securities Research

图表 11: Agix would likely have held 2017 net margin above above 20% even with an additional 5%-10% ASP cut in our view



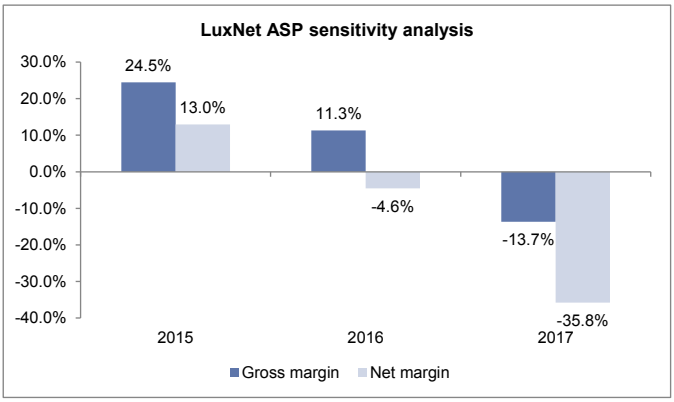
资料来源：Company data, Gao Hua Securities Research

图表 12: M/A-COM’s 2017 net margin would likely have been above 10% even with an extra 5% ASP cut, but fall to 7.1% with a 10% cut in our view



资料来源：Company data, Gao Hua Securities Research

图表 13: LuxNet has been making a loss making for two years



资料来源：Company data

Competitive Advantages: Strong R&D, superior packaging technology, and fast product refresh cycle

#1: Superior R&D strength

- Stable management team with rich experience in R&D

  The global optical transceiver module industry has experienced accelerated product iteration in recent years due to increasing demand for data from end users. The trend requires R&D personnel to be both experienced and commercially agile in order to capture the growth opportunities.

  Innolight’s top management team has extensive experience in the global optical communication industry and has been with the company for around 10 years. All members in the company’s R&D leadership team are US-educated PhDs and have held significant R&D related positions in established industry giants like Pine Photonics, Opnext, Oplink, Intel and Agere Systems (former Alcatel Lucent). By the end of 2017, Innolight had built a full-spectrum 400-person R&D team with specialized expertise in optical, electronic, mechanical, software, testing and manufacturing procedures.

图表 14: Research-focused key management team with rich industry experience

Name	Position	Tenure	Gender	Previous Experience
Dr. Sheng Liu	CEO	10 years	M	**Education experience:** Tsinghua University (Bachelor); Chinese Science Academy (M.S.); Georgia Institute of Technology (Ph.D.) **Previous work experience:** Served in Agere System (former Alcatel Lucent) 2001-2003: China R&D center principal at Pine Photonics Communications 2003-2008: Senior manager, R&D department at Opnext Inc. **Major achievements** 'Thousand Talent Program' Expert by Special Appointment
Mr. Osa Mok	CMO	10 years	M	**Education experience:** Texas A&M University (M.S.); University of Santa Clara, USA (MBA) **Previous work experience:** 1979-1985: Research analyst at Hambrecht & Quist 1985-1992: Director at GTE 1993-1999: Business development executives at Sunnyvale 2000-2003: Cofounder & VP at Pine Photonics 2004-2008: CEO/CMO at Uniwave Inc.
Dr. Wei-long William Lee	CTO	9 years	M	**Education experience:** Tsinghua University of Taiwan (B.S.); University of Illinois, Urbana, USA (Ph.D.) **Previous work** Founder and CEO at Optical Instrumentation Corp 2000-2003: Senior optical engineer at Pine Photonics Communications 2004-2006: COO at Space Shuttle 2006-2006: Chief Engineer at WaveSplitter Tech Inc. 2008-2009: General Manager at Oplink Communications
Dr. Charlie X. Wang	VP R&D	6 years	M	**Education experience:** University of Science & Technology of China (Ph.D.); UC Santa Cruz (Post-doctoral research) **Previous work experience:** R&D team leader at Silicon Valley-based Hi-Tech companies R&D director at Opnext **Major achievements:** Completed the research and development of the CWDM 10G/40G optical transceiver module based on Fuse coupler, Free space and PLC technologies
Dr. Hsing Kung	Strategy Advisor	10 years	M	**Education experience:** National Cheng Kung University (Bachelor); University of Texas at Austin; University of California, Berkeley (Ph.D.) **Previous work experience:** 1974-1983: Project manager at Hewlett-Packard 1983-1995: Co-founder & VP of manufacturing at SDL 1996-1998: Senior VP of business development at American Xtal Technology 1998-2000: CEO & Founder at Luxnet Corp 2000-2005: Cofounder of Pine Photonics Communications Since 2006: Managing partner of Acorn Campus Ventures

资料来源：Company data, Gao Hua Securities Research

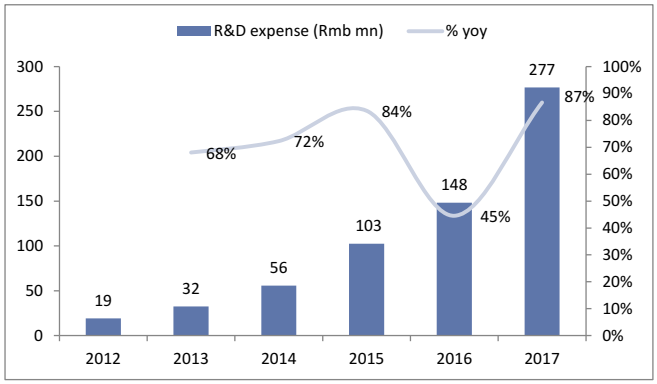
- Strong commitment in R&D

Innolight has three Research Centers located in mainland China, Taiwan and the US, enabling it to attract a global talent pool in the industry. At the end of 2017, the company has 397 dedicated R&D personnel and 366 employees have a Bachelor or above degree. Innolight's R&D spending accounted for ~ 8% of their total sales in 2017, which translates into around Rmb 375,000 per person. Innolight also partners with its clients to design products that are tailored to their specific needs. For example, Innolight partnered with Google to develop its 100G product, which was later deployed in Google's new data centers.

Innolight has historically invested heavily in R&D. According to management, Innolight spent 20% - 30% of their total sales in R&D when the company first started.

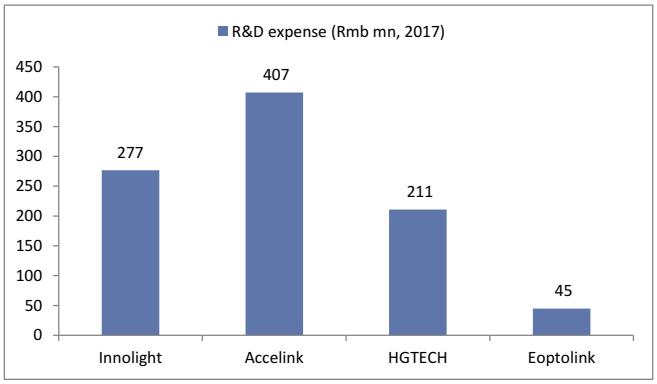
It allowed the company to quickly ramp up their product portfolio. From 2012 to 2017, the company's R&D spending grew at 71% CAGR thanks to its fast topline growth, reaching Rmb 277 mn in 2017. Innolight had an R&D/sales ratio of 7% in 2017, trailing that of its global peers thanks to lower personnel costs in Mainland China. Innolight's R&D/sales ratio was in line with its domestic peers in 2017, but was ahead most of them in terms of absolute values (only Accelink spent more in R&D than Innolight among domestic firms, as Accelink is vertically integrated.).

图表 15: Innolight grew its R&D spending by a CAGR of 70% over 2012-2017



资料来源：Company data, Gao Hua Securities Research

图表 16: Innolight focuses its R&D on packaging technology



资料来源：Company data, Gao Hua Securities Research

- Industry-leading packaging technologies

According to the management, Innolight is the first in the industry to introduce non-hermetic packaging technology (COB) in data center optical transceiver modules. Compared with hermetic packaging, non-hermetic packaging enables cost reduction, lower production precision requirement and less physical space, which is ideal for data center applications.

Another core technology of the company is its single mode parallel optical design and specifically its free space coupling technology. According to a patent filed in China by the company, Innolight has developed a technology that enables it to increase its coupling error tolerance from <0.2um to around 1um, significantly improving the company's coupling efficiency and production yield. These leading-edge solutions require expertise and intellectual property across numerous disciplines including active and passive optical device design, systems-level analog and mixed-signal integrated circuit design, and optical device integration and packaging, much of which is developed over time and cannot be easily replicated.

图表 17: COB packaging

What is COB packaging:

- A bare chip that is mounted directly onto the printed circuit board (PCB) instead of being socketed to it

Advantages of COB packaging:

- Enable fully automated production process
- Increase production precision
- Reduce packaging cost
- Require little physical space

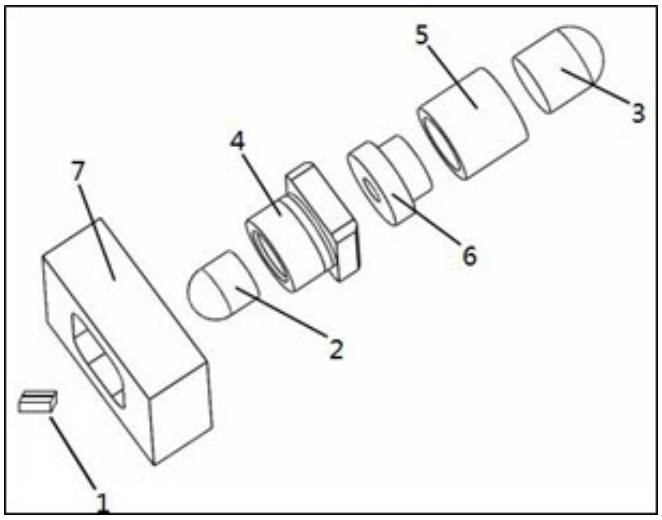
资料来源：Company data, Gao Hua Securities Research

图表 18: Best-in-class free-space coupling technology

Key R&D achievement in free-space coupling	
Name of the patent	Lens for single mode laser coupling
Patent no.	ZL201310312904.3
Grant date	7/24/2013
Applicants	Wei-long William Lee (CTO), Charlie X. Wang (VP R&D), Liu Sheng (CEO), Hong Li, Dengqun Yu, Yuzhou Sun
Technology advantage	The technology allows the coupling error tolerance to increase from <0.2 um (industry norm) to 1 um, greatly improving the coupling efficiency
Implications	The improved coupling efficiency directly leads to production yield and productivity improvement

资料来源：Company data, Gao Hua Securities Research

图表 19: Single mode laser coupling patent



资料来源：Company data

图表 20: Detailed explanation

Key sub components:
1) Laser； 2) No.1 lens; 3) No.1 lens connected ring;
4) No.2 lens; 5) No.2 lens connected ring;
6) Hollow shaft slip ring; 7) Substrate

How it works:

- Traditional single mode laser coupling uses a single lens to conduct active coupling. However, this method requires high production precision (<0.2um coupling error)
- Innolight uses two coaxial lenses to enlarge the light spot, enabling high coupling efficiency even the coupling error is relatively high (~1um)

Benefits:

- Improve production yield and productivity

资料来源：Company data, Gao Hua Securities Research

#2: Fast decision making and product refresh cycle

- Concentrated R&D focus on packaging technology

  Most of Innolight’s global competitors are vertically integrated players, who cover all segments in the value chain, from chip design to module packaging. Chip design and scale production is very capital intensive and time consuming. Plus, there are many different types of optical chips, so it is very difficult for one company to be the best at everything. In comparison, Innolight focuses only on the transceiver module packaging technology and chooses to work with industry leading suppliers for their electrical/optical chips and other components. By doing so, we believe Innolight is able to better leverage its own expertise in packaging technologies and maintain the flexibility in choosing a supplier that enables the quickest product launch.

- Industry-leading manufacturing facilities and experienced production personnel

  Innolight’s NPI (New Product Introduction) team has c.10 years of new product launch experiences and the manufacturing management team has on average more

than 8 years of experience and over 5 years' experience in the optical communication industry. The experienced production team enables smooth production management and efficiency. Innolight has also invested heavily in automated production and testing lines. Currently, Innolight has 16 production lines and 160 fully automated testing systems. Combining its main R&D and manufacturing facilities at a single location with company headquarters facilitates active cooperation between departments and also helps the company to respond quickly to market changes.

- Strategic relationship with upstream chip makers and sub-module suppliers

  To ensure a stable supply of key components, Innolight has built multiple strategic partnerships with major upstream chip and sub-module suppliers in various locations including North America, Japan and mainland China. In addition, Innolight has a joint-design-manufacture collaboration with Google for 100G data center optical transceiver modules. As part of the collaboration, Google purchases customized chips from a third party supplier and sells the chips to Innolight. The collaboration will also help to stabilize chip supply as Google has an aligned interest with Innolight and much higher bargaining power in the industry.

- Trust building with key customers

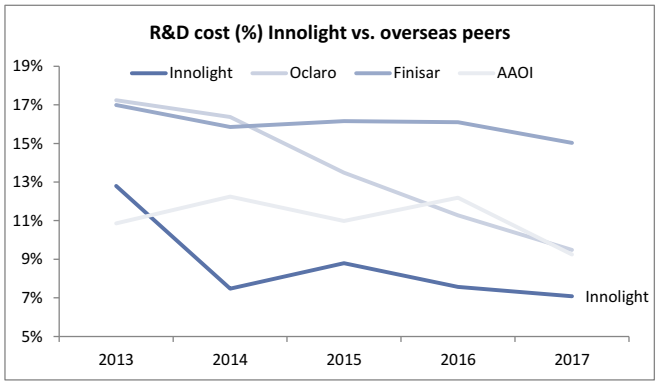
  Innolight has overseas branches and distribution partners in multiple worldwide locations including US, EU, Japan, South Korea, Russia and Israel. The local presence helps Innolight to better understand its customer needs and thus allows the company to offer tailored products. Currently, Innolight is the largest 100G transceiver module supplier to Google, Amazon, Alibaba, Huawei and Tencent and is among the top suppliers for Facebook. Its telecom products have already been tested and certified by Huawei and ZTE, enabling Innolight to tap into the 5G mobile technology market once the construction cycle starts.

#3: Best-in-class operational efficiency

- Lower R&D and SG&A costs vs. overseas peers

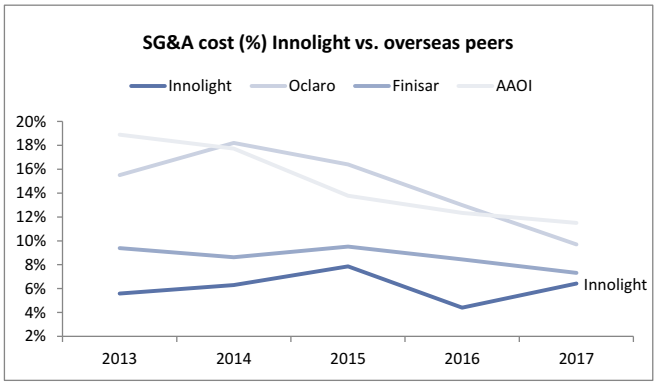
  Compared to most of its overseas competitors, Innolight has a much lower SG&A (ex. R&D) and R&D cost ratios. From 2013 2017, Innolight's R&D cost ratio and its SG&A (ex. R&D) cost ratio is cc. 8% and cc. 5% lower than its overseas peers. This is largely attributable to much lower personnel cost in China vs. US. Based on our channel checks, a senior engineer level hire for major competitor Finisar will cost around Rmb 850,000 per annum based in the US, while it will only cost around Rmb 500,000 for Innolight.

图表 21: Lower R&D vs. overseas peers on packaging focused R&D and lower personnel cost in China



资料来源：Company data

图表 22: Lower SG&A vs. overseas peers thanks to lower personnel cost in China

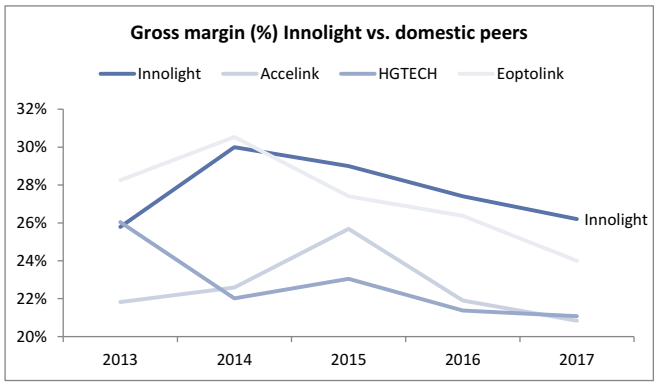


资料来源：Company data

- Higher gross profit margin vs. domestic peers

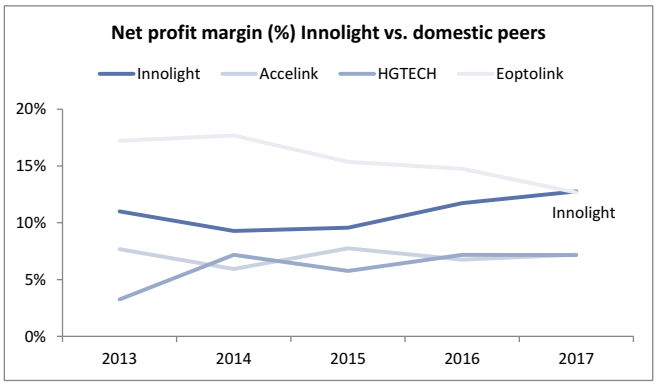
  Unlike most of its domestic peers, Innolight's product portfolio is relatively high-end, with 40G/100G optical transceiver module products accounting for 89% of the company's total 2H2017 sales (vs. 15% for Accelink). The low-end optical transceiver module market is highly competitive with both global and domestic players. Therefore, the pricing pressure on the low end is relatively high, putting pressure on the GP margin. Due to technology barriers, most of Innolight's domestic peers do not have the mass production capability for 100G transceiver modules with a high yield rate as Innolight does, enabling Innolight to achieve a higher gross profit margin as competition in the high-end module market is less intense. As Innolight's SG&A level is in line with its domestic peers, its net profit margin, outperforms most of its peers.

图表 23: Innolight has higher gross margin and net margin than domestic peers...



资料来源：Company data

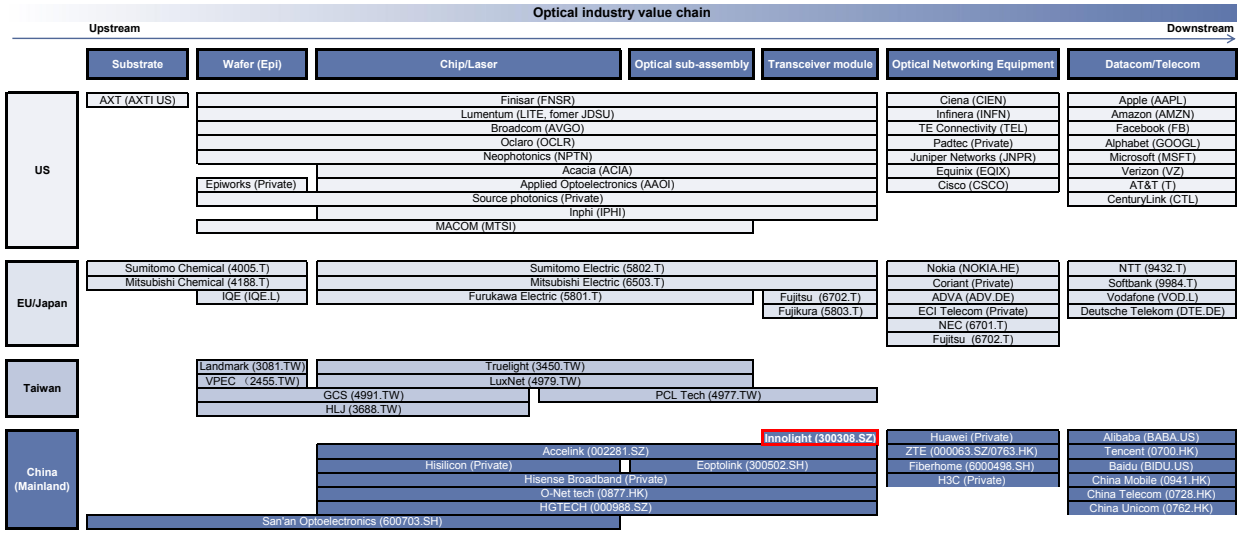
图表 24: ... due to its high-end product mix and operational effeciency



资料来源：Company data

Industry: Dual capex engines from cloud and 5G driving industry growth

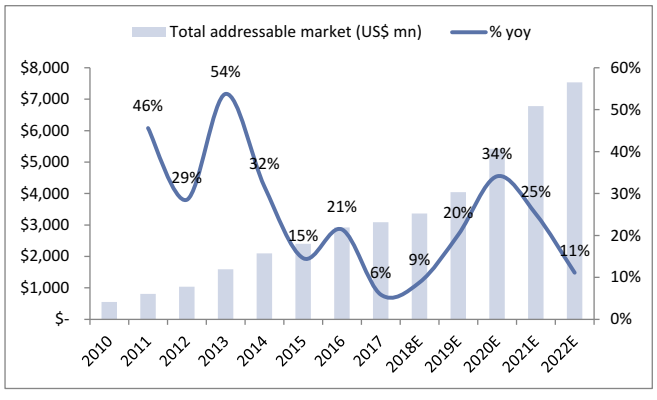
图表 25: Global optical industry value chain map



资料来源：Company data, Goldman Sachs Global Investment Research, Gao Hua Securities Research

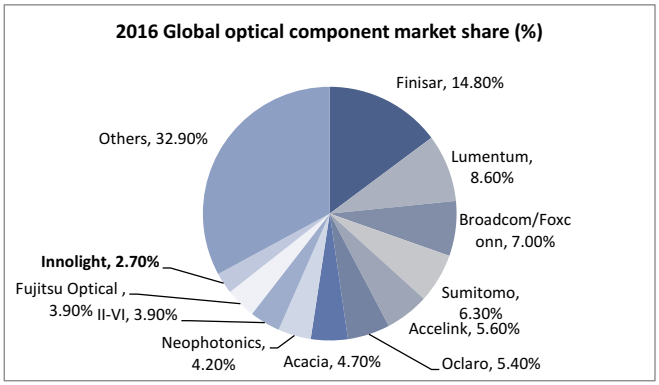
The optical transceiver module market can be divided into two main sectors, Telecom and Datacom (i.e. datacenters/cloud). The Telecom market can be further divided into fixed-line network, transport network and access network (FTTH) and wireless network (e.g., 4G, 5G).

图表 26: We expect Innolight’s TAM to grow at a CAGR of 22% over 2018E-2020E driven by cloud and 5G demand



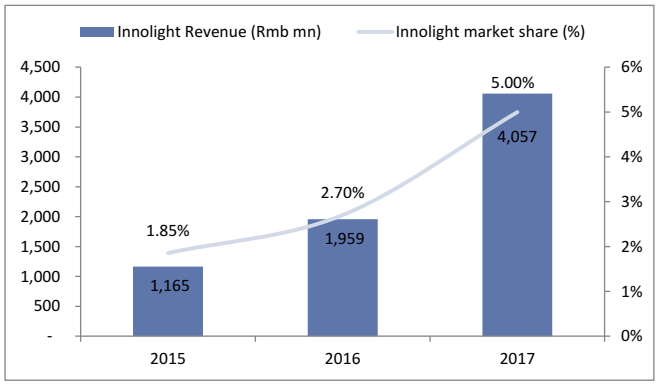
资料来源：Company data, Gao Hua Securities Research

图表 27: 2016 Global optical component market share



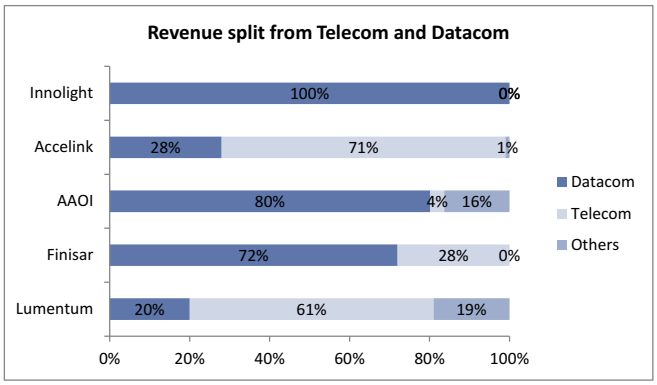
资料来源：Ovum, Company data

图表 28: Innolight has almost tripled its market share in the past three years



资料来源：Ovum, Company data

图表 29: Revenue split from Telecom and Datacom (2017)

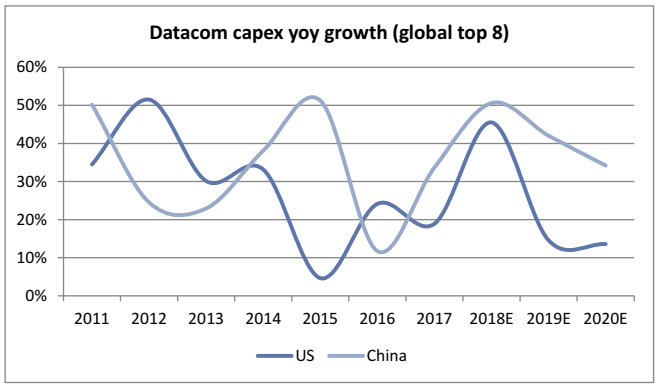


资料来源：Company data

Datacom sector

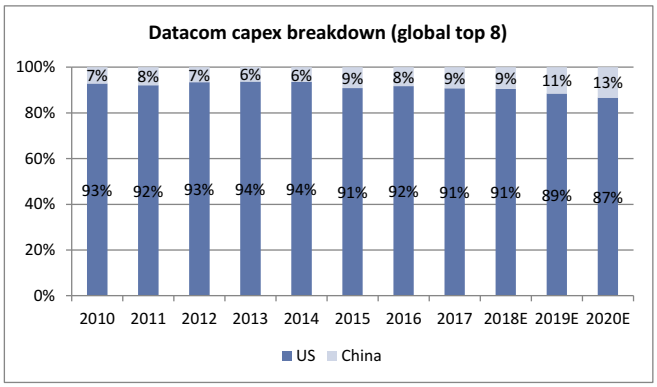
We forecast that the optical transceiver module market size of the global Datacom sector to grow at 20% CAGR between 2018 and 2022, reaching $5.8 billion. The main drivers of the growth are (1) increasing demand for data center services, (2) continued penetration of fiber used in new-built data centers and (3) optical transceiver data rate upgrade in the newly built data centers.

图表 30: Datacom capex yoy growth (global top 8)



资料来源：Bloomberg

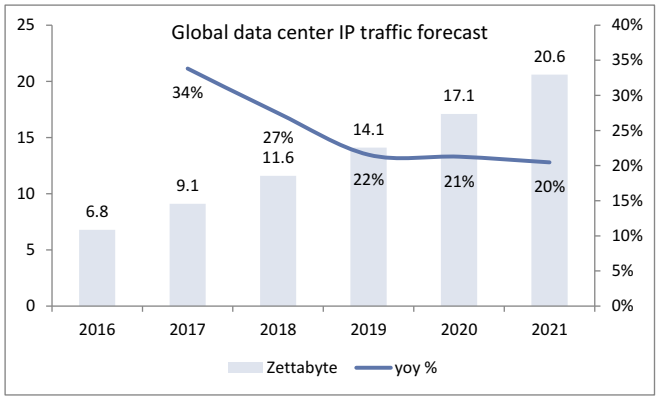
图表 31: Datacom capex breakdown (global top 8)



资料来源：Bloomberg

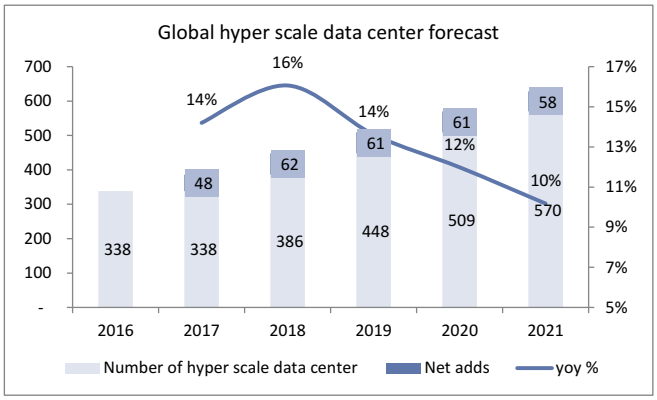
(1) According to the Cisco Global Cloud Index, the global data center traffic will reach 20.6 Zettabytes by 2021, representing a 25% CAGR from 2016 to 2021. The trend is mainly driven by new applications such as 4K/8K streaming, AR/VR and autonomous driving, which have high bandwidth requirements. The increase of data traffic triggers a higher demand for optical fiber connections which can transmit data at a higher speed and between longer distances as compared to copper cables.

图表 32: Global data center IP traffic growth



资料来源：Cisco Global Cloud Index

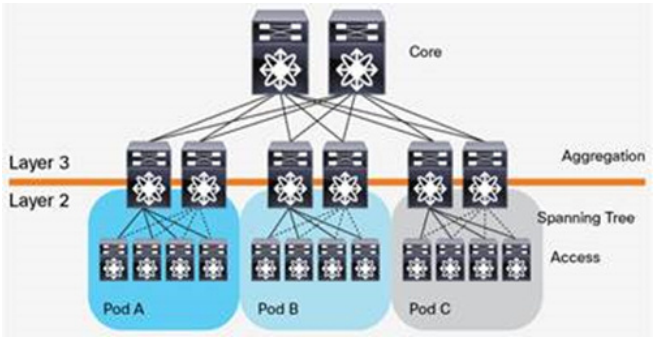
图表 33: Global hyper scale data center forecast



资料来源：Cisco Global Cloud Index

(2) In 2016, around 90% of the DCs in China used the traditional three-layer structure, which hardly requires fiber connections at the access layer (between servers and top-of-rack switches). However, starting in 2013, with the advent of the two-layer spin-and-leaf architecture data centers, which is designed to accommodate the increasing ‘west to east’ (between-server) traffic within data centers, will start to use all-fiber connections in the access layers, significantly boosting data center optical transceiver usage (4 vs. 0 per server). To cope with the increasing demand, data center service providers like Google, Amazon, Apple, Facebook, Microsoft, and Alibaba are also steadily increasing their investment in hyperscale data centers. According to Cisco, the number of global hyperscale data centers will increase from 338 in 2016 to 628 in 2021.

图表 34: Traditional 3-layer data center



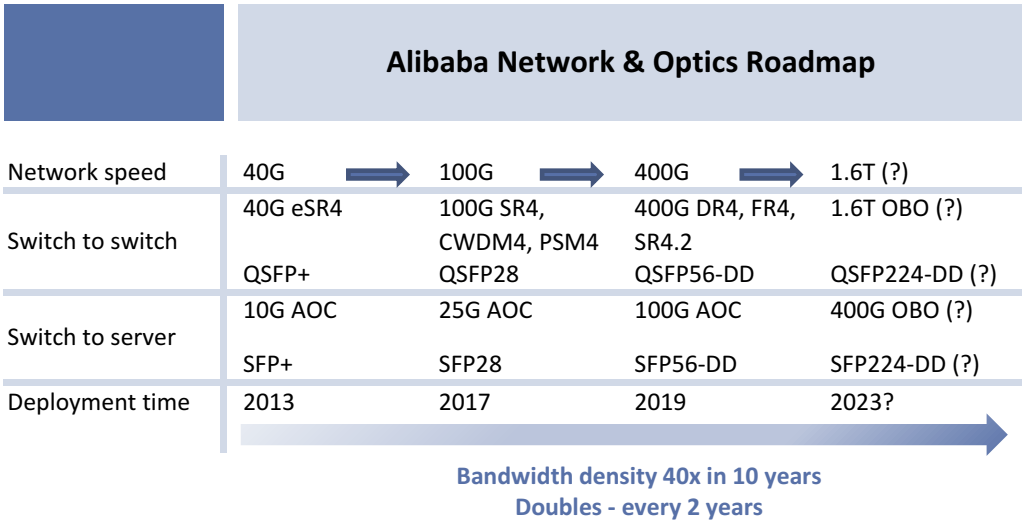
资料来源：Cisco

图表 35: Two-layer data center

资料来源：Cisco

(3) Lastly, we noticed that in new generation data centers, 10G/25G/40G transceivers are replacing 1.25G transceivers that were used between servers and switches, and 40G/100G transceivers are becoming the mainstream choice for switch-to-switch connections. In the future, data centers are planning to adopt 400G and even higher data rate optical transceivers, driving the ASP growth.

图表 36: Alibaba Network & Optics Roadmap



资料来源：Alibaba, compiled by Goldman Sachs Global Investment Research.

图表 37: Data center construction pipeline (as of Sep 2018)

	# of regions	# of availability zones	# of data centers	New projects	Location of new projects	Recent news report
Amazon (AWS)	18*	55	55*	4 new regions/ 12 more availability zones announced	Bahrain, HK, Sweden, a second AWS GovCloud region in US	Amazon Data center under construction in Virginia - 2017 Nov First Amazon Data center in middle East - 2017 Sep AWS coming to China - 2017 Dec
Microsoft (Azure)	54	3*	100+	10 new regions annouced; plans to offer preview to additional regions in the US, Europe, and Asia before the end of the year	Switzerland, Norway, Korea, Africa, United Arab Emirates	Azure launches availability GA - 2018 Mar Two new data center in Australia - 2017 Aug
Google cloud*	20	45	100+	5 new regions announced, 3 new undersea cables under construction	North America	Google to build data center near Dallas - 2018 Aug Data center come online in LA - 2018 Jul Google building cloud data center close to Swiss banks - 2018 May
Facebook			8	2 new regions announced	Denmark (expected to open in 2020), Singapore	Facebook to build data center in Singapore - 2018 Sep Facebook to build data center in Alabama - 2018 June Facebook investment in Sweden - 2018 May
IBM	6		60+	4 new network PoP announced, 18 availability zones to be launched	New availability zones will be located in the US, Germany, UK, Japan and Australia	
Alibaba Cloud	18	49				Athub announced in May that it has secured orders from Alibaba to build data centers with an estimated scale ~15000 cabinets (~170k servers) Kehua Hensheng also received Alibaba's intention letter to build JN12 data center
Tencent	23	42				Tencent kicks off data center expansion with new sites in US, India, HK - 2018 Mar

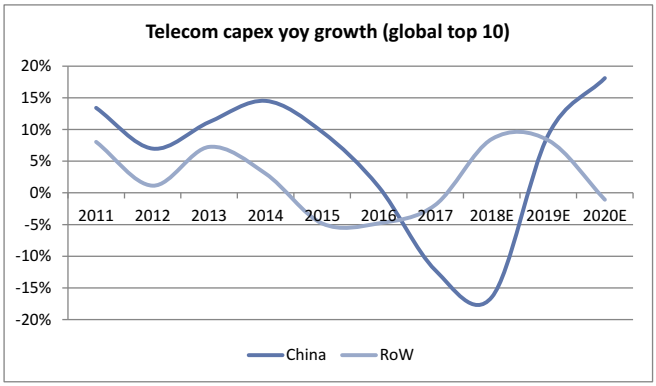
* In Amazon AWS platform, availability zones are individual data centers scattered around the world
* The service operator and provider for AWS China (Beijing) Region based out of Beijing and adjacent areas is Beijing Sinnet Technology Co., Ltd. (Sinnet), and the service operator and provider for AWS (Ningxia) Region based out of Ningxia is Ningxia Western Cloud Data Technology Co., Ltd. (NWCD)
* Microsoft introduced availability zone GA in Mar 2018, while it offers availability sets before
* Google is also building its own undersea fiber projects

资料来源：Company data

Telecom sector

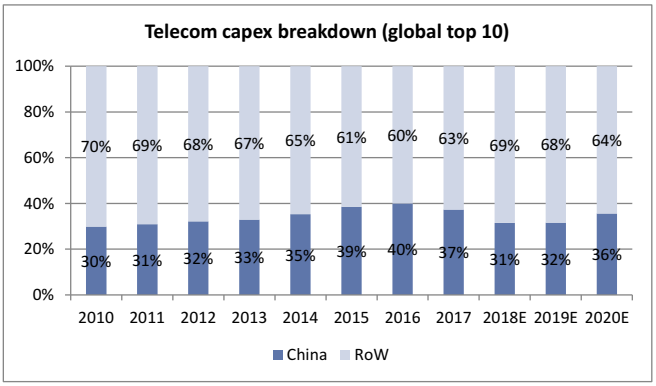
Telecom market can be further divided into fixed-line network, transport network, access network (FTTH) and wireless network (e.g., 4G, 5G). Given that Innolight does not and is not expected to have exposure to the first three subsectors, we only include the wireless network market in our framework.

图表 38: Telecom capex yoy growth (global top 10)



资料来源：Bloomberg

图表 39: Telecom capex breakdown (global top 10)



资料来源：Bloomberg

According to our estimate, Innolight’s addressable telecom market will grow at a 39% CAGR from 2018 to 2022, arriving at $1.7 billion. The growth is mainly driven by the rollout of global 5G network, which is expected by telcos to be available for commercial use in 2020 in China. We forecast that the global 5G base station will reach around 12 million units in 2027 (the end of the 5G cycle), double the number of the total 4G base stations due to shorter coverage area. This will significantly push up the volume demand for optical transceiver modules, as it is a key component for the 5G optical network.

In the 5G era, data transmission speed will be greatly increased. According to China Mobile, 5G data transmission speed will reach 1.5Gbps, 10X that of 4G. The data rate increase is achieved by using higher speed transceiver modules. 25G and 100G optical transceiver modules will be the mainstream choice for the 5G fronthaul transmission network vs. 10G modules for 4G network, while 100G, 200G, and 400G will be widely used in the midhaul and backhaul transmission network.

图表 40: Global Optical Transceiver Module Market Size

Global Optical Transceiver Module Market Size (US$ mn)	2010	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E
Total addressable market (US$ mn)	**554**	**806**	**1,036**	**1,593**	**2,097**	**2,403**	**2,918**	**3,090**	**3,362**	**4,041**	**5,419**	**6,780**	**7,534**
% yoy		46%	29%	54%	32%	15%	21%	6%	9%	20%	34%	25%	11%
Telecom wireless market													
Total revenue	**8**	**73**	**239**	**467**	**735**	**798**	**586**	**333**	**95**	**107**	**781**	**1,508**	**1,725**
% yoy		800%	229%	95%	58%	9%	-27%	-43%	-71%	13%	628%	93%	14%
Sales volume (unit)	83,879	838,788	3,064,461	6,638,497	11,514,630	14,264,170	12,176,545	8,318,424	2,483,588	1,927,233	3,828,268	8,878,325	12,217,878
% yoy		900%	265%	117%	73%	24%	-15%	-32%	-70%	-22%	99%	132%	38%
Revenue from 6G	**8**	**73**	**239**	**467**	**499**	**302**	**155**	**-**	**-**	**-**	**-**	**-**	**-**
% yoy		800%	229%	95%	7%	-40%	-48%	-100%					
Sales volume (unit)	83,879	838,788	3,064,461	6,638,497	7,895,266	5,296,929	3,033,303	-	-	-	-	-	-
% yoy		900%	265%	117%	19%	-33%	-43%	-100%					
Revenue from 10G	-	-	-	-	**236**	**496**	**430**	**333**	**84**	**49**	**-**	**-**	-
% yoy						111%	-13%	-23%	-75%	-41%			
Sales volume (unit)	-	-	-	-	3,619,365	8,967,241	9,143,242	8,318,424	2,456,938	1,711,029	-	-	-
% yoy													
Revenue from 25G	-	-	-	-	-	-	-	-	**4**	**31**	**476**	**844**	**822**
% yoy										637%	1437%	77%	-3%
Sales volume (unit)	-	-	-	-	-	-	-	-	18,268	158,319	2,861,924	5,973,505	6,850,350
% yoy										767%	1708%	109%	15%
Revenue from 100G	-	-	-	-	-	-	-	-	**1**	**7**	**105**	**278**	**450**
% yoy										621%	1426%	165%	62%
Sales volume (unit)	-	-	-	-	-	-	-	-	5,439	46,113	828,024	2,584,035	4,926,081
% yoy										748%	1696%	212%	91%
Revenue from 200G	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7**	**18**	**153**	**270**	**316**
% yoy										161%	772%	76%	17%
Sales volume (unit)	-	-	-	-	-	-	-	-	2,943	10,980	119,717	263,837	363,079
% yoy										273%	990%	120%	38%
Revenue from 400G	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**48**	**117**	**136**
% yoy											1780%	145%	17%
Sales volume (unit)	-	-	-	-	-	-	-	-	-	792	18,603	56,947	78,368
% yoy											2250%	206%	38%
Datacom market													
Total revenue	**546**	**733**	**797**	**1,126**	**1,362**	**1,605**	**2,332**	**2,757**	**3,267**	**3,934**	**4,638**	**5,272**	**5,809**
% yoy		34%	9%	41%	21%	18%	45%	18%	18%	20%	18%	14%	10%
Sales volume (unit)	3,554,839	6,068,236	7,779,426	12,125,814	15,953,083	17,386,910	19,398,198	24,900,431	29,434,778	33,021,318	38,672,766	41,614,717	44,439,394
% yoy		71%	28%	56%	32%	9%	12%	28%	18%	12%	17%	8%	7%
Revenue from 10G	**452**	**535**	**543**	**620**	**621**	**522**	**507**	**516**	**436**	**355**	**279**	**204**	**110**
% yoy		18%	2%	14%	0%	-16%	-3%	2%	-16%	-19%	-21%	-27%	-46%
Sales volume (unit)	3,546,139	6,045,618	7,680,044	11,368,265	14,406,553	15,036,924	15,063,116	16,950,097	16,164,064	14,846,032	13,869,374	12,091,255	7,826,428
% yoy		70%	27%	48%	27%	4%	0%	13%	-5%	-8%	-7%	-13%	-35%
Revenue from 25G	**-**	**-**	**-**	**-**	**-**	**-**	**68**	**307**	**904**	**1,066**	**1,278**	**1,224**	**1,246**
% yoy								350%	194%	18%	20%	-4%	2%
Sales volume (unit)	-	-	-	-	-	-	451,080	2,390,179	8,278,574	11,482,823	16,193,325	18,251,724	21,863,272
% yoy								430%	246%	39%	41%	13%	20%
Revenue from 40G	**73**	**122**	**99**	**223**	**405**	**628**	**829**	**778**	**503**	**462**	**363**	**216**	**167**
% yoy		68%	-19%	126%	81%	55%	32%	-6%	-35%	-8%	-21%	-41%	-22%
Sales volume (unit)	7,317	15,805	79,412	702,090	1,481,010	2,229,682	3,393,234	4,132,568	2,876,472	2,807,963	2,347,007	1,480,975	1,231,017
% yoy		116%	402%	784%	111%	51%	52%	22%	-30%	-2%	-16%	-37%	-17%
Revenue from 100G	**21**	**76**	**154**	**283**	**336**	**456**	**928**	**1,156**	**1,424**	**1,533**	**1,749**	**2,345**	**2,814**
% yoy		103%	83%	19%	36%	104%	25%	23%	8%	14%	34%	20%	
Sales volume (unit)	1,383	6,813	19,970	55,459	65,520	120,304	490,768	1,427,587	2,115,668	3,707,142	5,808,618	9,062,024	12,532,482
% yoy		193%	178%	18%	84%	308%	191%	48%	75%	57%	56%	38%	
Revenue from 200G	-	-	-	-	-	-	-	-	-	**49**	**194**	**209**	**245**
% yoy											294%	8%	17%
Sales volume (unit)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	30,781	151,481	204,047	281,770
% yoy											392%	35%	38%
Revenue from 400G	-	-	-	-	-	-	-	-	-	**469**	**776**	**1,075**	**1,226**
% yoy											65%	39%	14%
Sales volume (unit)	-	-	-	-	-	-	-	-	-	146,576	302,962	524,692	704,425
% yoy											107%	73%	34%

资料来源：Gao Hua Securities Research

Financials: Industry leading growth with superior ROE

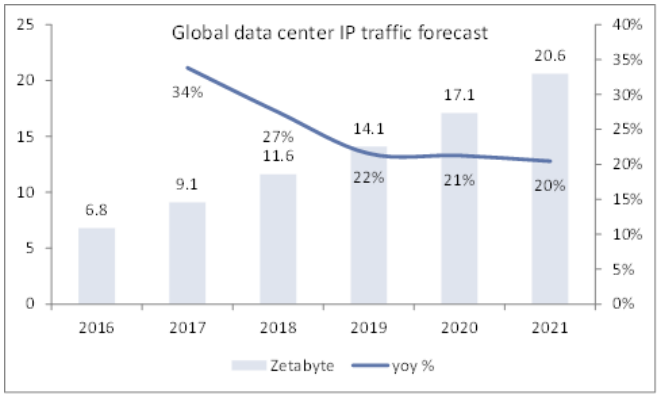
Revenue drivers

- Datacom

Innolight has experienced cc.100% topline growth in the past five years vs. c.20% for its global peers due to a continuous market share gain. The company has a good track record of launching new products early in the product’s life cycle. In the recent 400G product cycle, Innolight launched its 400G offering at the same time as its integrated global peers and 6 months earlier than its domestic peers. The first-to-market strategy enables the company to continuously gain market share in a less competitive market in early cycle of a new product. According to the

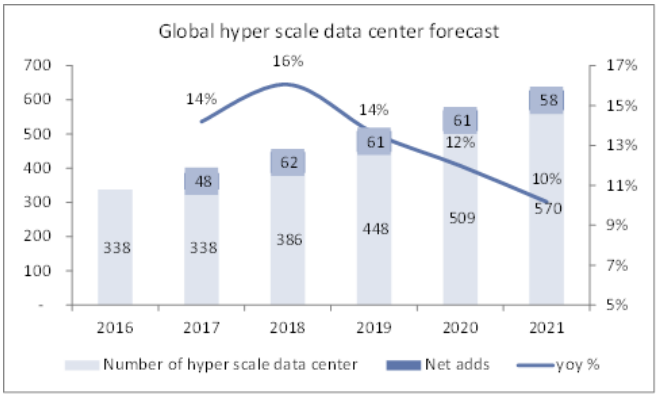
management, Innolight has a 20% to 30% market share in the global Datacom transceiver module market. Especially in the mainstream 100G market, the company is the top 100G supplier to top-tier cloud service providers like Google, Amazon, Baidu, Alibaba and Tencent, and is among the top suppliers to Facebook (expects to become No.2 supplier in 2H18). The leading position of Innolight in the Datacom market positions it well to capture the next round of data center upgrade from 100G to 400G transceiver modules.

图表 41: Global data center IP traffic forecast



资料来源：Company data, Gao Hua Securities Research

图表 42: Global hyper scale data center forecast

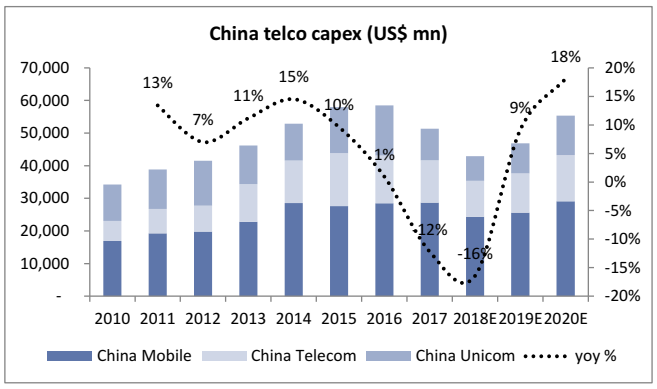


资料来源：Company data, Gao Hua Securities Research

- Telecom

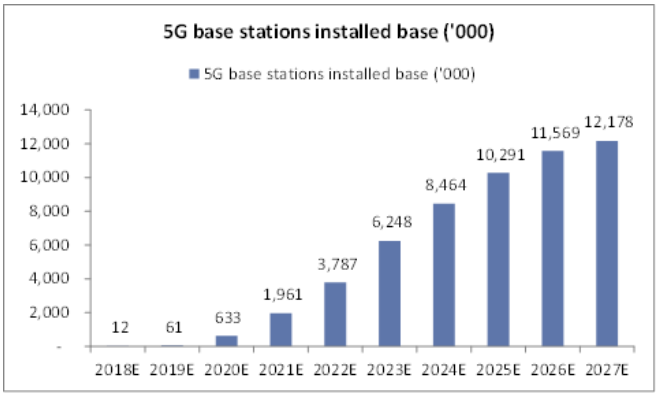
Innolight’s strong revenue growth also benefited from the telecom 3G and 4G construction cycles in China. According to the company, its 6G LTE SFP+ optical transceiver module was adopted by China Mobile in their 3G network rollout, while its 10G products were also widely deployed in the 4G network construction in China. Since China’s 4G capex peak in 2015, demand from telecom customers have retreated. We believe the upcoming 5G construction cycle will be another major boost for the Innolight’s topline performance. We forecast that the total number of the global 5G base stations will double that in the 4G era, leading to significant volume demand increase for optical transceiver modules. Innolight targets to take around 30% of the total 5G market share in China.

图表 43: China telco capex expected to inflect in 2019



资料来源：Bloomberg, Company data

图表 44: Global 5G base stations installed base forecast



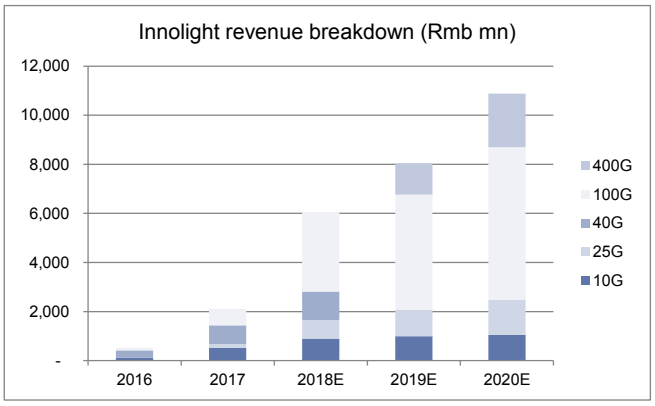
资料来源：Gao Hua Securities Research

- Forecast

Looking into the future, we believe Innolight's 100G and 400G transceiver modules will be the key growth avenue for the company. With the constantly growing demand for data from end users, both Datacom and Telecom players are upgrading their current network with higher data rate transceiver modules. Going forward, 100G and 400G transceiver modules will be the mainstream choice in our view for the data center access/core layer networks and 5G fronthaul/backhaul networks.

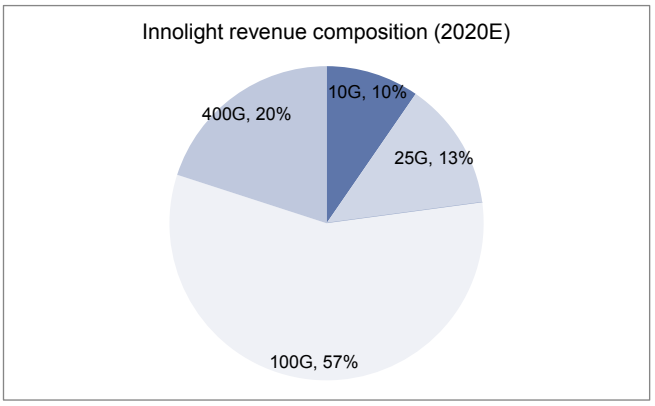
Innolight has planned to invest Rmb 1.13 billion in a new industrial park in Tongling, Anhui. Upon completion, the new facility is expected to produce 1,600,000 100G transceiver modules annually and 1,400,000 transceiver modules for 5G wireless network. Since first launching 400G products in 1Q2017, Innolight has already shipped a small batch of samples to Amazon and Google for their newly built data centers, on par with its global integrated peers. In addition, the company has planned to invest Rmb 440 million to fund a new 400G optical transceiver module manufacturing facility. Upon completion, the facility is expected to produce 450,000 400G optical transceiver modules per year, significantly increasing the current manufacturing capacity.

图表 45: We expect 100G and 400G products to be the main revenue driver



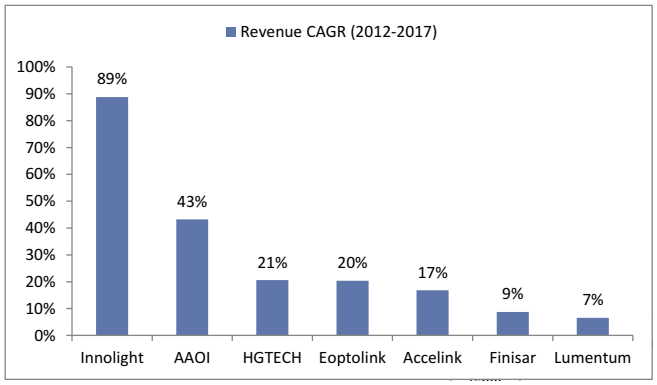
资料来源：Company data, Gao Hua Securities Research

图表 46: By 2020E, We expect 100G/40G to account for 57%/20% of total revenue



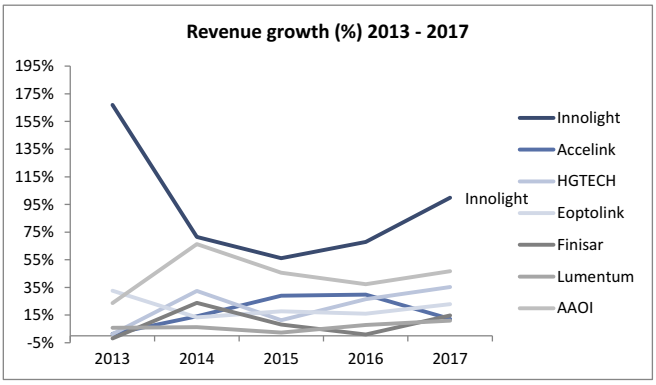
资料来源：Company data, Gao Hua Securities Research

图表 47: Innolight achieved the highest revenue CAGR over 2012-2017...



资料来源：Company data

图表 48: ... and outperformed its global peers each year



资料来源：Company data

Cost structure

- COGS and Suppliers

Innolight is a pure-play optical transceiver module manufacturer, while most of its peers have different levels of vertical integration, especially its global competitors. As a result, its gross margin trails behind its global peers (cc. 10%), as it needs to import key optical components, especially laser chips (90% of high end chips for optical transceiver module are manufactured outside of China) from overseas suppliers. In 2016, Avago and Google Inc. are the top two suppliers of Innolight, who accounted for 14.85% of Innolight’s total purchase. Japanese optical component suppliers Mitsubishi and Sumitomo are also the two important chip suppliers for the company.

图表 49: Innolight COGS breakdown

(Rmb mn)	2016	As % of COGS
Optical chips and components	719	50.65%
Integrated circuit chips	217	15.32%
Structure components	153	10.75%
Electricity	17	1.20%
Raw materals & utility	**1,106**	**77.92%**

资料来源：Company data, Gao Hua Securities Research

- R&D

The company has a strong commitment to R&D. According to the management, Innolight historically spent 20% - 30% of their annual revenue in R&D when they first started the business. This enabled them to quickly build up their product portfolio. From 2013, Innolight’s R&D spending started to see a decrease from 13% to 6% in 2017. This is largely thanks to the company’s fast topline growth and lower R&D personnel cost in China. The R&D figure is now in line with its domestic competitors and cc. 6% lower than its global peers, improving the company’s operating leverage. In the future, it can be expected that Innolight’s R&D spending will fluctuate with the product cycle of their new products (e.g. new 400G products ramp up).

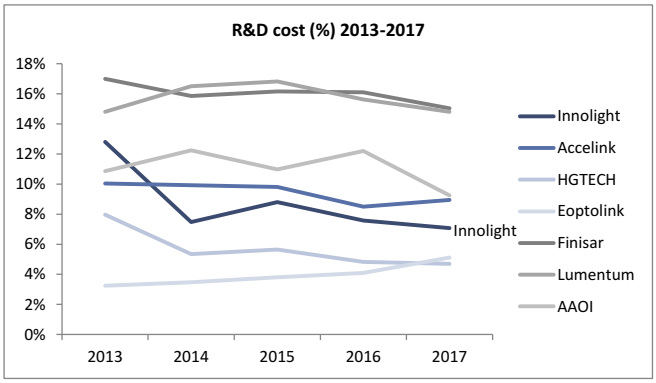
- SG&A

The company’s lower gross profit margin is further offset by its lower SG&A (ex. R&D) cost. Innolight’s SG&A expenses were relatively stable in the past five years, at around 6% of the company’s total revenue. The figure was higher in 2015 due to an employee stock incentive plan. In 2015, Innolight’s stock-based compensation was Rmb 3,370 mn vs. Rmb 21 mn and Rmb 1,429 mn for 2014 and 2016 respectively. On average, Innolight’s SG&A (ex. R&D) expenses were significantly lower than its global peers (~7%).

- Net profit

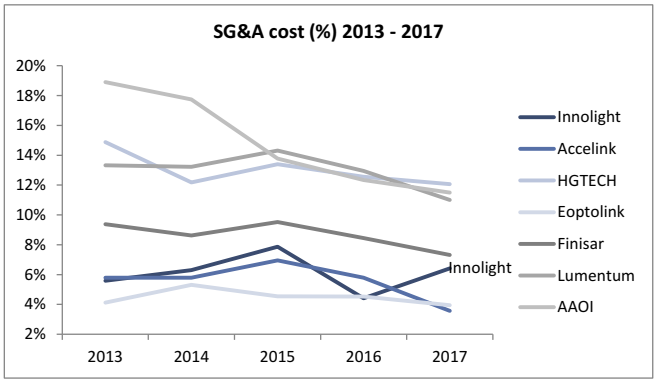
On the bottom line, Innolight has outperformed most of its peers in the past five years, with a stable profit margin at ~10%.

图表 50: R&D as % of sales



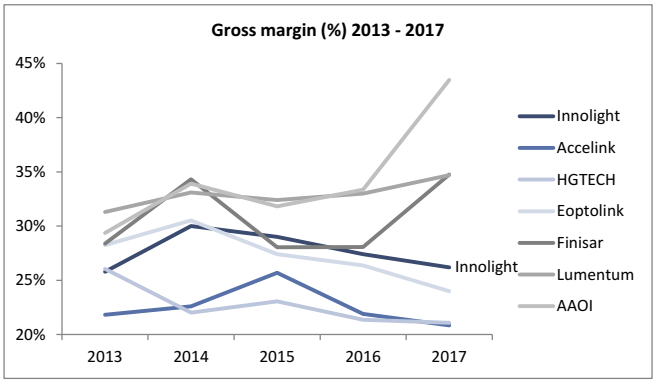
资料来源：Company data

图表 51: SG&A as % of sales



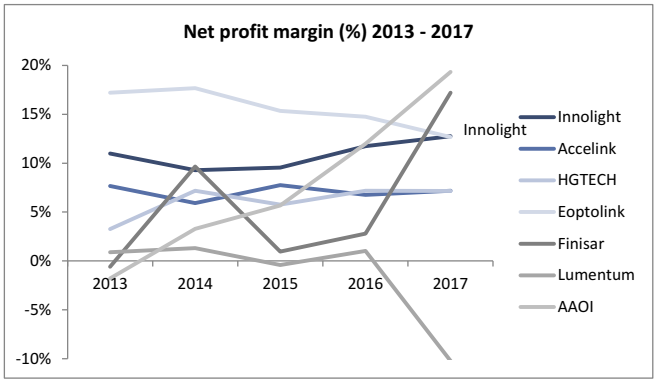
资料来源：Company data

图表 52: Gross margin



资料来源：Company data

图表 53: Net profit margin



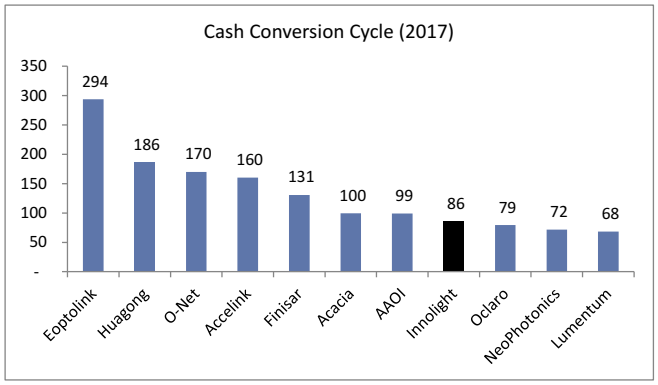
资料来源：Company data

Balance sheet and cash flow

- Shorter cash conversion cycle vs. domestic peers

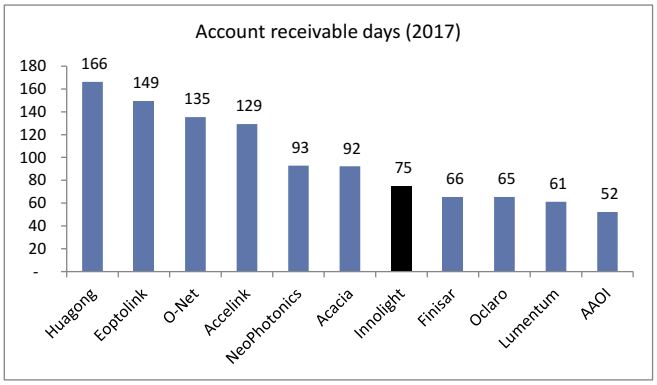
  In 2017, Innolight had a cash conversion cycle of 86 days (i.e., 2.9 months), which was much lower than domestic peers at more than 160 days, and close to that of overseas players level. The short cash conversion cycle mainly benefits from the lengthy account payable days. Innolight’s longer inventory days and AP days are a result of the fact that it purchases components from third-party suppliers.

图表 54: Cash conversion cycle vs. peers



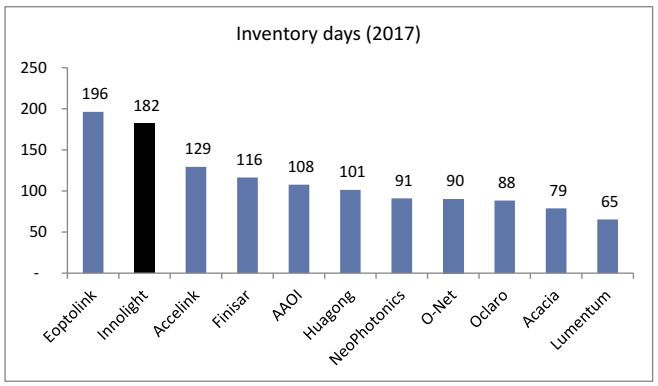
资料来源：Company data, Gao Hua Securities Research

图表 55: Account receivable days vs. peers



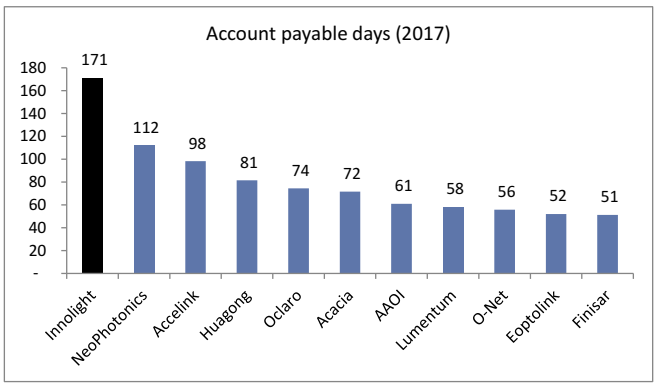
资料来源：Company data, Gao Hua Securities Research

图表 56: Inventory days vs. peers



资料来源：Company data, Gao Hua Securities Research

图表 57: Account payable days vs. peers



资料来源：Company data, Gao Hua Securities Research

- Improving return on equity

  Innolight's ROE has improved from 11% in 3Q2017 to 15.4% in 2Q2018, driven by growth in total asset turnover from 0.6x to 0.7x and net margin improvement from 11.4% to 11.9% over the same period. As we expect the company to continue gaining market share and enjoy operating leverage, we forecast ROE improving to 26% by 2020E.

图表 58: Industry leading return on equity

ROE Dupont analysis	2018E	2019E	2020E	3Q2017	4Q2017	1Q2018	2Q2018
Net profit margin (%)	11.7%	13.5%	14.1%	11.4%	3.1%	10.6%	11.9%
Turnover to asset ratio	0.7	0.8	0.9	0.6	0.6	0.7	0.7
Asset to equity ratio	1.9x	1.9x	1.8x	1.7x	1.9x	1.9x	1.8x
Return on equity (%)	**16.3%**	**20.7%**	**23.3%**	**11.0%**	**3.6%**	**14.6%**	**15.4%**

资料来源：Company data, Gao Hua Securities Research

- Low and stable financial leverage

  We see Innolight's financial leverage levels have remained low and stable over the past 4 quarters, and see it staying low over the next 3 years. Interest coverage ratios have shown improvement. We do not see any short-term solvency risks on debt repayments given its current low debt levels.

图表 59: Low and stable financial leverage

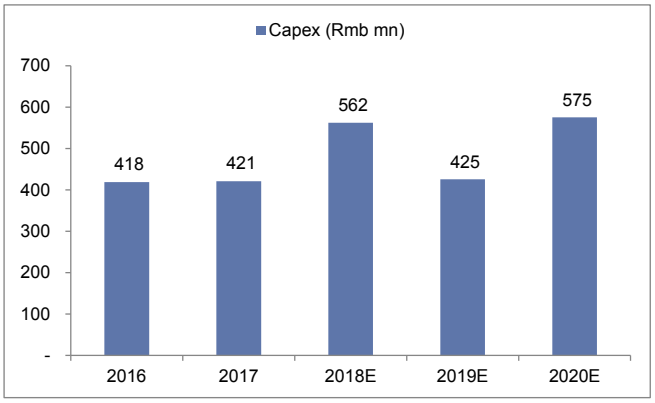
Gearing ratios	2018E	2019E	2020E	3Q2017	4Q2017	1Q2018	2Q2018
Total debt to capital ratio (x)	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Net debt to equity ratio (x)	0.0	(0.1)	(0.1)	0.0	0.0	0.1	0.0
EBIT interest coverage ratio (x)	10.4	13.5	18.6	8.3	10.9	5.6	11.8
EBITDA interest coverage (x)	12.8	15.7	21.1	7.5	16.7	5.6	16.9

资料来源：Company data, Gao Hua Securities Research

- Capex

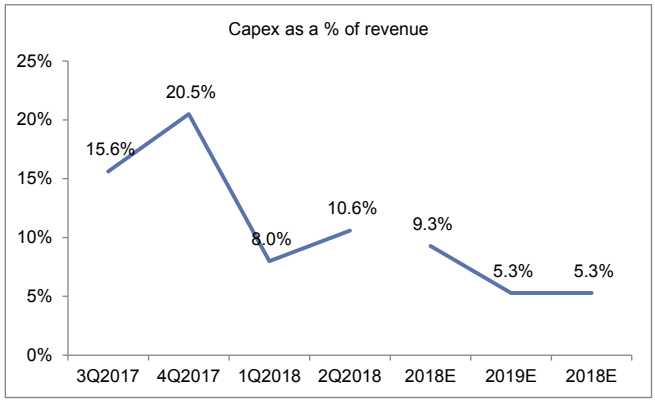
In 3Q2017, Innolight spent Rmb421mn on capex, accounting for 15.6% of its total revenue. Capex as % of revenue was at its peak in 4Q2017, then dropped to around 10%. Going forward, we expect Innolight's capex to be around Rmb500mn level in the next three years.

图表 60: Innolight capex



资料来源：Company data, Gao Hua Securities Research

图表 61: Innolight Capex as a % of revenue

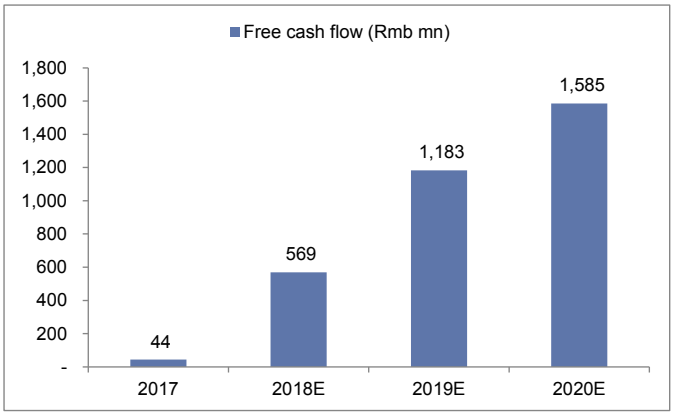


资料来源：Company data, Gao Hua Securities Research

- Free cash flow

We expect Innolight's free cash flow to grow stronger in next three years, mainly driven by margin improvements.

图表 62: Innolight free cash flow



资料来源：Company data, Gao Hua Securities Research

图表 63: Innolight’s income statement (Rmb mn)

Income statements	2014	2015	2016	2017	2018E	2019E	2020E
			Pro-forma	3,900			
Total sales/revenues	**747**	**1,165**	**1,959**	**2,357**	**6,055**	**8,045**	**10,876**
yoy %	42%	56%	68%	99%	55%	33%	35%
COGS	(522)	(832)	(1,422)	(1,726)	(4,492)	(5,930)	(7,975)
Total COGS	**(522)**	**(832)**	**(1,422)**	**(1,726)**	**(4,492)**	**(5,930)**	**(7,975)**
Gross profit	**224**	**333**	**536**	**632**	**1,563**	**2,114**	**2,901**
yoy %	51%	48%	61%	18%	147%	35%	37%
Gross margin %	30.1%	28.6%	27.4%	26.8%	25.8%	26.3%	26.7%
SG&A	(103)	(195)	(238)	(284)	(655)	(750)	(1,014)
Other operating income/(expense)	-	-	-	16	16	16	16
Total operating expense	(103)	(195)	(238)	(268)	(639)	(734)	(998)
EBITDA	**146**	**166**	**329**	**465**	**1,131**	**1,608**	**2,160**
yoy %	86%	13%	99%	41%	143%	42%	34%
EBITDA margin %	19.6%	14.2%	16.8%	19.7%	18.7%	20.0%	19.9%
Depreciation	(13)	(15)	(19)	(60)	(140)	(161)	(193)
Amortization	(12)	(12)	(12)	(41)	(68)	(66)	(64)
EBIT	**121**	**138**	**298**	**363**	**924**	**1,381**	**1,904**
yoy %	113%	14%	116%	22%	154%	49%	38%
EBIT margin %	16.3%	11.9%	15.2%	15.4%	15.3%	17.2%	17.5%
Net interest income/expense	(10)	(4)	(17)	(37)	(89)	(102)	(102)
Other non-operating income/expense	11	9	7	(119)	-	-	-
Non-operating income/(loss)	**1**	**5**	**(10)**	**(156)**	**(89)**	**(102)**	**(102)**
Pre-tax profit	**122**	**143**	**288**	**208**	**835**	**1,278**	**1,801**
yoy %	77%	17%	101%	(28%)	302%	53%	41%
Income taxes	(1)	(1)	(1)	(44)	(125)	(192)	(270)
Net income	**122**	**143**	**288**	**163**	**710**	**1,086**	**1,531**
yoy %	96%	17%	102%	(43%)	335%	53%	41%
Net margin %	16.3%	12.2%	14.7%	6.9%	11.7%	13.5%	14.1%
EPS - basic	**0.73**	**0.66**	**1.33**	**0.47**	**1.50**	**2.29**	**3.23**
EPS - fully diluted	0.73	0.66	1.33	0.47	1.50	2.29	3.23
Weighted avg. adj. shares outstanding (mn)	168	216	216	345	474	474	474
Fully diluted shares outstanding (mn)	168	216	216	345	474	474	474
Period end shares outstanding (mn)	216	216	216	474	474	474	474

资料来源：Company data, Gao Hua Securities Research

图表 64: Innolight balance sheet (Rmb mn)

Balance sheets	2014	2015	2016	2017	2018E	2019E	2020E
Cash and equivalents	101	218	518	957	1,274	1,692	2,236
Net receivables	196	300	636	1,110	1,264	1,679	2,271
Inventory/stocks	234	381	666	1,969	2,288	3,020	4,062
Other current assets	63	23	82	272	272	272	272
Current assets	**594**	**922**	**1,902**	**4,308**	**5,097**	**6,663**	**8,840**
Gross PP&E/Fixed assets	176	261	747	1,412	1,974	2,399	2,974
Less accumulated depreciation	(46)	(61)	(80)	(140)	(280)	(441)	(634)
Net PP&E/Fixed assets	**131**	**201**	**668**	**1,272**	**1,694**	**1,958**	**2,340**
Gross intangibles	78	72	85	2,235	2,235	2,235	2,235
Accumulated amortization	(24)	(36)	(43)	(62)	(130)	(195)	(259)
Net intangibles	**54**	**36**	**42**	**2,173**	**2,105**	**2,039**	**1,976**
Total investments	0	0	-	29	29	29	29
Other long-term assets	13	29	5	29	29	29	29
Total assets	**792**	**1,189**	**2,617**	**7,810**	**8,954**	**10,719**	**13,213**
Accounts payable	238	280	716	2,057	2,117	2,795	3,758
Short-term debt and current portion of long-term debt	151	266	564	781	1,097	1,097	1,097
Other current liabilities	26	38	57	110	110	110	110
Current liabilities	**414**	**585**	**1,337**	**2,947**	**3,324**	**4,001**	**4,965**
Long-term debt	-	-	385	241	299	299	299
Other long-term liabilities/creditors	20	13	23	616	616	616	616
Total long-term liabilities	**20**	**13**	**407**	**857**	**915**	**915**	**915**
Total liabilities	**434**	**598**	**1,744**	**3,804**	**4,239**	**4,916**	**5,880**
Preferred shares	-	-	-	-	-	-	-
Common stock (includes par value, capital surplus, and treasury)	262	396	471	3,752	3,752	3,752	3,752
Treasury stock	-	-	-	-	-	-	-
Retained earnings	96	196	403	252	962	2,049	3,580
Other common equity	0	(0)	(1)	2	2	2	2
Total common equity	**358**	**591**	**872**	**4,006**	**4,716**	**5,802**	**7,333**
Minority interest (balance sheet)	-	-	-	-	-	-	-
Total shareholders funds/equity	**358**	**591**	**872**	**4,006**	**4,716**	**5,802**	**7,333**
Total liabilities and equity	**792**	**1,189**	**2,617**	**7,810**	**8,954**	**10,719**	**13,213**

资料来源：Company data, Gao Hua Securities Research

图表 65: Innolight cash flow statement (Rmb mn)

Cash flow statements	2014	2015	2016	2017	2018E	2019E	2020E
Income pre-preferred share dividends	**122**	**143**	**288**	**163**	**710**	**1,086**	**1,531**
Minority interest add-back	-	-	-	-	-	-	-
Depreciation and amortization add-back	25	27	31	101	208	227	257
Net income from associates and jointly controlled entities	-	-	-	-	-	-	-
Net loss/(gain) on asset sales	-	-	-	-	-	-	-
(Increase)/decrease in working capital :	(83)	(209)	(185)	(436)	(413)	(470)	(669)
Accounts receivable	(122)	(104)	(336)	(474)	(154)	(415)	(591)
Inventory	(150)	(147)	(285)	(1,303)	(319)	(732)	(1,041)
Accounts payable	189	42	436	1,341	60	678	964
Other operating cash flow items	(46)	48	(112)	212	-	-	-
Cash flow from operations	**18**	**9**	**22**	**41**	**504**	**844**	**1,119**
Capital expenditure	(132)	(112)	(418)	(421)	(562)	(425)	(575)
(Acquisitions)/divestitures	-	-	(5)	(2)	-	-	-
Investments	-	0	(11)	27	-	-	-
Other investment cash flow items	(37)	38	17	249	-	-	-
Cash flow from investing	**(169)**	**(74)**	**(418)**	**(146)**	**(562)**	**(425)**	**(575)**
Dividends paid (common and preferred)	(7)	(6)	(16)	(21)	-	-	-
Share repurchase/issue (change In common stock)	123	86	37	760	-	-	-
Increase/(decrease) in short-term debt	565	722	656	260	316	-	-
Increase/(decrease) in long-term debt	-	-	-	-	58	-	-
Increase/(decrease) in preferred shares	-	-	-	-	-	-	-
Change in minority interest	-	-	-	-	-	-	-
Other financing cash flow items	(485)	(630)	2	(18)	-	-	-
Cash flow from financing	**196**	**172**	**678**	**981**	**374**	**-**	**-**
Effect of foreign exchange rate changes	**0**	**6**	**8**	**(7)**	**-**	**-**	**-**
Total cash flow	**45**	**113**	**291**	**869**	**316**	**418**	**544**

资料来源：Company data, Gao Hua Securities Research

Valuation: 12-month target price of Rmb46 reflects tariff uncertainties

We believe P/E is the key valuation metric investors focus on for Innolight, as it takes into account all the revenue and cost elements affecting earnings (cost structure, capital structure, effective tax rate, FX, etc.) and also reflects profit making ability. This is also in line with our valuation methodology for the A-share tech space.

We forecast 34% revenue and 47% EPS CAGR for Innolight over 2018E-2020E, and apply a 20X P/E multiple on 2019E EPS of Rmb2.29 to reflect our cautious view amid trade uncertainties. Our 12-month target price of Rmb46 implies 9% upside, and therefore we initiate at Neutral.

Potential positive catalysts over the next twelve months include:

1. Volume shipment of 400G products in 2019, Innolight is already shipping in small volumes to Google and Amazon;
2. 5G module procurement from Telecom customers in 2019, Innolight has already passed Huawei and ZTE’s testing and is shipping in small volumes to them now.

20X is the trough 12-month forward P/E multiple for Innolight compared with a historical average of 30X since 3Q17 when it was acquired by Zhongji Equipment. Considering Innolight’s above industry revenue/earnings CAGR, we believe 30X is reasonable under normal circumstances vs. current global peer average of 23X, while we choose 25X for our 10% tariff scenario as this is the midpoint multiple between our No tariff (30X) and 25% tariff (20X) scenarios.

We also explore different scenarios with the potential tariff, and a probability weighted theoretical value.

- No tariff: Rmb69 (based on 30X P/E on 2019E EPS of Rmb2.29), 64% upside
- 10% tariff: Rmb48 (based on 25X P/E on 2019E EPS of Rmb1.93), 14% upside
- 25% tariff: Rmb32 (based on 20X P/E on 2019E EPS of Rmb1.61), 24% downside

Our US macro team assigns a 70% chance of tariff implementation, with 25% on non-consumer products, and an eventual “deal” to be reached in 12 months’ time.

Based on this, we assign a 70% probability to 25% tariff scenario + a 30% probability to no tariff scenario, to derive an implied value of Rmb29*70%+Rmb69*30%=Rmb43. In terms of forecasts, we use the “no tariff” scenario given there has been no implementation to date and will adjust to the tariff level should the tariffs actually be implemented.

Quotes from US macro team:

- While a number of details are uncertain [to Trump Administration’s proposed US$200bn in additional tariffs on China], our Washington team expects the White

House to move forward with these tariffs, imposing a rate of 10% on consumer goods and 25% on other (industrial/intermediate) products.

- While the outlook is uncertain, we expect the White House to move forward with tariffs on the majority of the next round of $200bn in imports proposed in July (70% chance). We expect that the recently proposed 25% tariff rate (up from the earlier proposed 10% rate) will be applied to a subset of the $200bn of targeted imports. However, the decision here is likely to rest in part on whether the recent CNY depreciation has reversed or continued by the time the decision is made, likely in September.
- We now see USD/CNY weakening further past the psychologically important level of 7.00, towards 6.90 and 7.10 in 3 and 6 months, respectively, but a reversion to 6.60 in 12 months as an eventual "deal" still seems to us as a reasonable base case assumption.

图表 66: GS/GH Global Optical Component Valuation Comps (data as of Sep 12, 2018 market close)

Company	Ticker	Rating	Market	12m Target	Potential	Market cap	Revenue/EBITDA/EPS			P/E		PEG	EV/ EBITDA	EV/ Sales	FCF yield	Div yield	ROE
			Price	Price	+/-Side	US$ mn	2018E-2020E CAGR			2018E	2019E	2019E	2018E	2018E	2018E	2018E	2018E
Innolight (Rmb)	**300308.SZ**	**Neutral**	**42.1**	**46.0**	**9%**	**3,022**	**34.0%**	**38.2%**	**46.9%**	**28.1x**	**18.3x**	**0.4x**	**17.7x**	**3.3x**	**2.9%**	**0.0%**	**16.3%**
Accelink (Rmb)	002281.SZ	Buy*	25.2	30.0	19%	2,470	28.1%	38.2%	46.6%	45.8x	30.0x	0.7x	27.4x	3.1x	0.4%	0.7%	10.9%
Lumentum (US$)	LITE	Buy	61.3	79.0	29%	3,880	14.6%	18.2%	6.5%	12.6x	22.7x	-0.5x	9.3x	2.5x	4.5%	0.0%	29.5%
Finisar (US$)	FNSR	Sell	19.7	17.0	-14%	2,313	7.6%	21.6%	13.6%	12.7x	19.7x	-1.2x	9.3x	1.5x	-3.7%	0.0%	6.4%
Acacia (US$)	ACIA	Neutral	40.2	38.0	-5%	1,630	NM	NM	NM	61.4x	30.9x	0.3x	40.9x	3.9x	2.2%	0.0%	5.4%
Oclaro (US$)		NC	9.1	NA	NM	1,560	8.4%	15.3%	-1.3%	19.7x	21.4x	-2.8x	10.4x	2.3x	4.4%	NA	13.3%
AAOI (US$)		NC	33.1	NA	NM	651	15.9%	NM	22.7%	14.2x	11.3x	0.4x	8.0x	1.9x	0.0%	NA	NA
NeoPhotonics (US$)		NC	8.1	NA	NM	368	13.5%	NM	NM	NM	NM	NM	49.6x	1.1x	-2.3%	NA	NA
HGTech (Rmb)		NC	13.8	NA	NM	2,155	31.2%	31.9%	36.2%	31.3x	23.3x	0.7x	19.4x	2.2x	20.5%	0.4%	8.0%
Eoptolink (Rmb)		NC	21.2	NA	NM	708	21.8%	18.0%	22.6%	35.4x	28.4x	1.1x	29.9x	4.8x	20.1%	NA	11.3%
Average							**19.5%**	**25.9%**	**24.2%**	**29.0x**	**22.9x**	**-0.1x**	**22.2x**	**2.7x**	**4.9%**	**0.2%**	**12.6%**
Median							**15.9%**	**21.6%**	**22.6%**	**28.1x**	**22.7x**	**0.4x**	**18.6x**	**2.4x**	**2.5%**	**0.0%**	**11.1%**
STD							**9.8%**	**9.9%**	**17.9%**	**16.7x**	**6.2x**	**1.2x**	**14.5x**	**1.1x**	**8.6%**	**0.3%**	**7.7%**

* denotes stock is on our regional Conviction List. For NC companies, estimates are from Bloomberg

资料来源：Datastream, Bloomberg, Company data, Goldman Sachs Global Investment Research, Gao Hua Securities Research

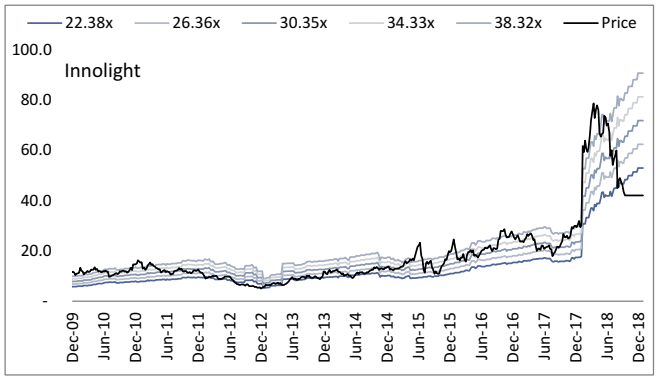
Where are we vs. consensus?

图表 67: Our 2018E-2020E net income is 3%-4% below Bloomberg consensus

	GSE			Bloomberg Consensus			GSE vs Cons		
(RMB mn)	**2018E**	**2019E**	**2020E**	**2018E**	**2019E**	**2020E**	**2018E**	**2019E**	**2020E**
Innolight									
Revenue	6,055	8,045	10,876	6,119	8,467	11,495	-1%	-5%	-5%
yoy %	157%	33%	35%	161%	38%	36%			
Gross profit	1,563	2,114	2,901	1,706	2,378	3,210	-8%	-11%	-10%
yoy %	147%	35%	37%	151%	39%	35%			
Net income	710	1,086	1,531	732	1,118	1,589	-3%	-3%	-4%
yoy %	335%	53%	41%	196%	53%	42%			

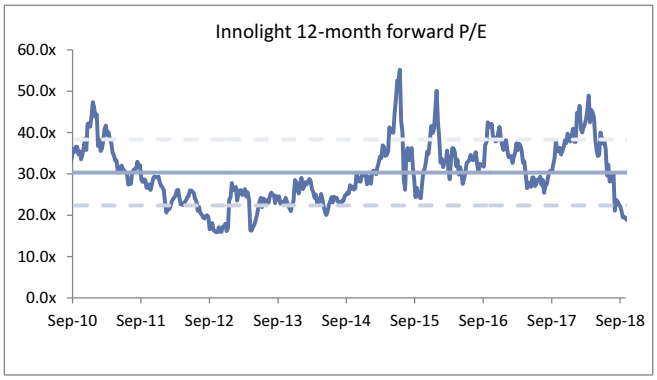
资料来源：Bloomberg, Company data, Gao Hua Securities Research

图表 68: Innolight 12-month forward P/E band



资料来源：Bloomberg, Gao Hua Securities Research

图表 69: Innolight 12-month forward P/E



资料来源：Bloomberg, Gao Hua Securities Research

Key risks: demand, tariff, and Silicon Photonics

1. Stronger or weaker demand from cloud and 5G capex

Our 34% revenue CAGR (2018E-202E) forecast for Innolight is based on resilient demand from both datacenter expansion and 5G rollout starting in 2H19. If the global datacenter spending accelerates due to fast growth of global data traffic demand or slows down due to rising component pricing as a result of the trade war or economic slowdown in certain markets, Innolight may experience a faster or slower growth trajectory than what we expect; same is true if China or global 5G rollout progress is faster or slower than our expectation. Currently, 30% of Innolight’s revenue come from domestic customers’ demand and 70% from overseas. Innolight now has very little exposure to the Telecom market, almost all of its revenue is generated by Datacom customers.

2. Uncertainties around tariff implementation

Amid the uncertainties around ongoing trade war between the United States and China, the US has announced a second batch of US$200bn tariff plans at a rate of either 10% or 25%, which may take effect later this year. Optical transceiver modules will be subject to the second batch of tariffs. On Sep 7th, the Wall Street Journal reported “Trump ready to roll with yet more tariffs, hitting $267bn in Chinese goods”. On Sep 12th, the Wall Street Journal reported “U.S. Proposing New Round of Trade Talks With China” before the US$200bn tariff goes into effect. Whether the tariffs will be implemented eventually and at what rate will they be implemented pose both upside and downside risks to Innolight’s fundamental business as well as share price. For more details please see our scenario analysis on potential US tariff impact and stress-testing the supply chain.

3. Competition from Silicon Photonics

What is Silicon Photonics?

Silicon Photonics is an emerging technology that uses semiconductor-grade silicon as the platform for the integration of active and passive photonic circuits along with electronic components on a single micro-chip. Silicon photonic devices can be made using existing semiconductor fabrication techniques, resulting in high-volume production with low cost. Since 2000, companies like Intel, IBM, Acacia and Luxtera have started to invest into the space and made visible progress.

Advantages of Silicon Photonics

- System integration: Silicon photonics IC integrates waveguides, modulator, detector and de/mux onto one single chip. According to Finisar, over 84% of the functions are integrated with high yield at wafer level in a Si fab. As silicon photonic chips are much smaller than the optical components it replaces, hand assembly of hundreds of piece parts can be eliminated, significantly reducing manufacturing complexity. In addition, the small size of a silicon photonic chip also leads to improved chip density.
- Low cost: Conventional VCSEL, DML and EML chips use InP or GaAs as raw material. Per inch, InP costs around $88 and GaAs costs around $55. In comparison, silicon photonics chips use Si, a semiconductor that can be produced from sand, which only costs around $2.5 per inch.
- Low power consumption: The first generation of CFP2 100G transceiver modules consumes around 20-24 watts. In comparison, a similar CFP2 100G transceiver module using silicon photonic chip only uses around 3.5 watts, an 85% improvement from the conventional module mainly driven by the high level of integration and compact size of the Silicon Photonics chips.
- Scalability: Silicon photonics chips have the capability to incorporate Wavelength Division Multiplexing (WDM) optics. Currently, 100G data rate is achieved by using 4 channels of 25G lasers at different wavelengths. With WDM, Silicon photonics optical transceiver can transmit up to 40 channels of light at different wavelengths, coupling to a single strand of optical fiber.

Major challenges faced in the 100G optical transceiver market

In 2015, Luxtera unveiled its 100G PSM4 optical transceiver module, supporting transmission distance of up to 2km. In 2016, Intel, for the first time, announced the commercial availability and volume production of its 100G silicon photonics optical transceiver module products in both PSM4 and CWDM4 specifications with transmission distance of up to 10km. Despite gaining adoption by Datacom customers in the beginning, Silicon Photonics 100G products face several challenges from conventional products.

- For very short reach links (<100m), VCSEL materially outperforms Silicon Photonics in all performance metrics (cost/power consumption/density).
- For the intermediate reach links (500m-2km), Silicon Photonics products compete with conventional DML products in both PSM4 and CWDM4 specifications.
    - Silicon Photonics 100G PSM4 transceiver module is a relatively mature product, taking up around 50% of the overall 100G PSM4 market share.

However, as PSM4 structure uses 70% more fibers than CWDM4 structure, the overall market share for PSM4 products is shrinking, with CWDM4 becoming the mainstream choice for data center connections.

- For 100G CWDM4 products, Silicon Photonics transceiver module still has not achieved volume production due to production yield and product reliability issues (coupling error, separate laser problem, low economies of scale for CMOS and immature upstream supply chain).

M&A rank for Innolight

Across our global coverage, we examine stocks using an M&A framework, considering both qualitative factors and quantitative factors (which may vary across sectors and regions) to incorporate the potential that certain companies could be acquired. We then assign a M&A rank as a means of scoring companies under our rated coverage from 1 to 3, with 1 representing high (30%-50%) probability of the company becoming an acquisition target, 2 representing medium (15%-30%) probability and 3 representing low (0%-15%) probability. For companies ranked 1 or 2, in line with our standard departmental guidelines we incorporate an M&A component into our target price. M&A rank of 3 is considered immaterial and therefore does not factor into our price target, and may or may not be discussed in research.

We have previously examined our Asia Pacific technology coverage using an M&A framework (see "Navigating the noise (6): Introduce M&A framework, update roadmap", July 4, 2016). In the framework, we examine companies' potential as M&A targets and rank them from 1 to 3 based on our assessment of three key factors.

Firstly, we look at whether there are any impediments, such as shareholder structure/preferences, industry regulations/government policies, and takeover defense strategies that could prevent a transaction from occurring. We then consider four qualitative factors attractiveness of technology, attractiveness of customers, cost synergy potential, and other/intangible value and two quantitative factors market cap and valuations.

Shareholder structure and potential impediments

We gauge whether there are any impediments to M&A because, if there are, a company is unlikely to become an M&A target even if it ranks 1 or 2 on qualitative/quantitative criteria.

When assessing potential impediments, we take into consideration:

· Major shareholder preferences (we assume that shareholders with a 20% or greater stake have significant influence, or a blocking stake), and take into account: any potential actions by major shareholders in the event of a possible acquisition by a third party (including whether they would likely be receptive, or if they may be opposed to selling), or if they have announced a preference to raise their stake in the company;

- Regulatory and or government policy impediments; and
- Possible takeover defense measures such as a poison pill.

We assign a “No” qualification if one or more of the three considerations above are applicable and a “Yes” qualification if these considerations do not apply.

Four qualitative assessment criteria

- Technology: We look at whether or not a company has attractive technology capable of generating future value, as well as its technological capabilities and intellectual property rights. We assign a rank of “3” if its technology is unattractive, “2” if it is moderately attractive, and “1” if it is very attractive.
- Customer base: We look at whether or not a company has an attractive customer base and product applications. We also take customer retention and end-market exposure (including sales channels) into account. We assign a rank of “3” if its customer base and product applications are unattractive, “2” if they are moderately attractive, “1” if they are attractive.
- Cost synergies: We look at prospects for growth in business scale and scope for profit margin/ yield improvement via acquisition of an M&A target company. We assign a rank of “3” if there is low possibility of synergies, “2” if there is some possibility , “1” if there is high possibility.
- Other: We look at whether or not a target company possesses attractive assets, including brand strength, outstanding management/employees, and intangible assets. We assign a rank of “3” if they are unattractive, “2” if they are moderately attractive, “1” if they are attractive.

Two quantitative assessment criteria

- Market cap: We score a company based on the assumption that the smaller it is the easier it is to acquire. We also take regional qualities (such as differing market cap ranges between regions) into account.
- Valuation: We look at whether a target company’s three-year average P/E and EV/DACF are below the industry/peer average for the same period, as we believe companies trading at a discount to peers are more likely to be acquired. We assign a score of “3” if the company appears overvalued relative to its respective industry peer group, “2” if its valuation is in line with the peer average, “1” if its valuation is discounted. We take into account differing valuation multiple ranges between the companies depending on their region and their peers.

图表 70: We assign an M&A ranking of “3” to Innolight

	Shareholders' structure				Qualitative score (1-3)				Quantitative score (1-3)			
Company Name	% of major shareholder	Shareholders' intention	No regulatory barrier	No anti-takeover measure	Technology	Customer base	Cost synergy	Other intangible asset	Market cap	Valuation unlocking	Total score	M&A Rank
Zhongji InnoLight	21%	No	Yes	No	2	3	2	3	2	3	2.5	3

资料来源：Gao Hua Securities Research

Within this overall framework, we assign an M&A rank of ‘3’ to Innolight. When Innolight was purchased by the listed Zhongji Equipment in 2017, the effective controller/controlling shareholder of the listed company (Mr. Wang Xiuwei, Chairman of Zhongji Equipment) made a promise to voluntarily remain as controlling shareholder and will not assist any party in seeking controlling shareholder status of the company within the 60 months of the deal’s completion. This promise practically blocks any possibility for an M&A during the defined period.

However, we believe M&A may be a possible scenario after the defined five year period given:

The company’s strategy advisor (former Chairman) historically co-founded several firms within the industry and sold to larger players later on. In 1995, he sold SDL, an optical equipment company to JDSU (later split into Lumentum and Viavi) for $41 billion. In 2000, he co-founded Pine Photonics Communications with Innolight’s current CMO Mr. Osa Mok. During his five year tenure at the company, he worked with Liu Sheng, Innolight’s current CEO, who was serving as the head of Pine Photonics’ China R&D center. Innolight’s current CTO, Wei-long William Lee also worked in Pine Photonics at the time as a senior optical engineer. The company was later sold to Opnext, the optoelectronics spin-off of Japan’s Hitachi. Mr. Liu Sheng continued to serve in Opnext as a senior manager in R&D before founding Innolight in 2008. We believe this experience makes Innolight’s current key management open to the idea of an M&A exit if a situation were to present itself.

图表 71: Recent optical component M&A deals summary

Recent optical component M&A deals summary				
Acquirer	**Target**	**Date**	**Deal size (mn USD)**	**Vertical/Horizontal**
Lumentum	Oclaro	Mar-18	1,800	Horizontal
O-net	3SP	Apr-17	19	Vertical
APAT Optoelec	Neophotonics (low-speed transceiver)	Jan-17	26	Horizontal
Accelink	Almae	May-16	23	Vertical
IPG photonics	Menara Networks	May-16	46	Vertical
Neophotonics	EigenLight	Nov-15	N/D	Vertical
Foxconn	AVAGO (optical module arm)	Sep-15	N/D	Vertical
O-net	ITF Technology	Jan-15	5	Vertical
Koch Industries	Oplink	Nov-14	445	Vertical
Neophotonics	Emcore	Oct-14	18	Horizontal
Finisar	u2t	Jan-14	27	Vertical
Neophotonics	LAPIS	Jan-13	37	Vertical
Accelink	WTD	Dec-12	N/D	Horizontal
Accelink	Ignis photonyx	Dec-12	7	Vertical
Finisar	RED-C	Jul-12	44	Vertical
Oclaro	Opnext	Mar-12	117	Horizontal
Neophotonics	Santur	Nov-11	47	Vertical
Finisar	Ignis	Mar-11	102	Vertical
Finisar	Broadway	Sep-10	N/D	Horizontal

Note: The Lumentum/Oclaro proposed deal is not closed.

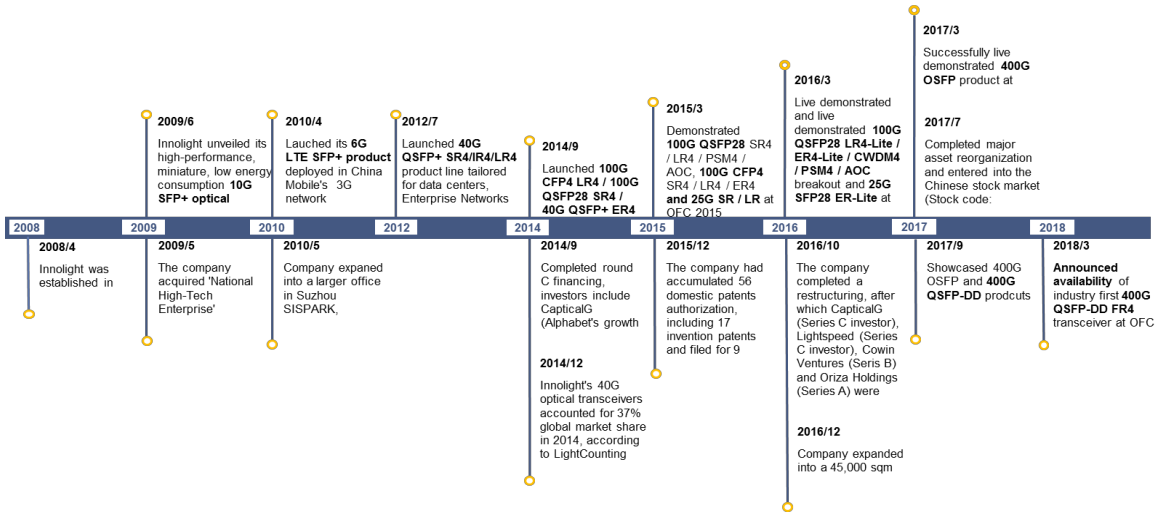
资料来源：Company data, Gao Hua Securities Research

Glossary

- CDR (clock and data recovery circuit) - connected to the optical transceiver on the end of a fiber channel link to extract timing information from a serial data stream to allow the receiving circuit to decode the transmitted data.
- LD (laser diode) - a semiconductor device similar to a light-emitting diode in which the laser beam is created at the diode’s junction.
- WDM De/Mux (wavelength division de/multiplexer) - A WDM system uses a multiplexer at the transmitter to join the several signals together, and a demultiplexer at the receiver to split them apart.
- SMF (single mode fiber) - an optical fiber designed to carry light only directly down the fiber.
- TIA (transimpedance amplifiers) - a current to voltage converter, almost exclusively implemented with one or more operational ampliers.
- PIN - A PIN diode is a diode with a wide, undoped intrinsic semiconductor region between a p-type semiconductor and an n-type semiconductor region.
- ROSA - receiver optical sub-assembly; TOSA - transmitter optical sub-assembly. ROSA and TOSA together constitute transceiver module.
- Coupling - optical coupling is a method of interconnecting two devices to transfer an optical signal using light waves in the field of optoelectronics. In practice, an optical coupling is a connection between two optical cables using a coupling device.

Appendix

图表 72: Company key milestones



资料来源：Company data, Gao Hua Securities Research

图表 73: Innolight product mix

P/N	Product Description	Data Rate (Gbit/s)	Reach	TX	RX	Power Consumption	Temperature (deg C)
400G							
C-DQ8FNMxxx-N00	QSFP-DD AOC	400G	3~100m	850nm VCSEL	PIN	<9W (each QSFP-DD)	0-70
T-DQ8FNS-N00	QSFP-DD SR8	400G	100m	850nm VCSEL	PIN	<9W	0-70
T-DQ4CNH-N00	QSFP-DD DR4	400G	500m	1310nm EML	PIN	<12W	0-70
T-DQ4CNT-N00	QSFP-DD FR4	400G	2km	EML CWDM	PIN	<12W	0-70
T-DQ4CNL-N00	QSFP-DD LR4	400G	10km	1296-1309nm LWDM EML	PIN	<12W	0-70
C-OS8FNMxxx-N00	OSFP AOC	400G	3~100m	850nm VCSEL	PIN	<9W (each OSFP)	0-70
T-OS8FNS-N00	OSFP SR8	400G	100m	850nm VCSEL	PIN	<9W	0-70
T-OC8FNT-N00	OSFP 2x FR4	400G	2km	EML CWDM	PIN	<12W	0-70
T-OS8FNL-N00	OSFP LR8	400G	10km	1274-1309nm LWDM EML	PIN	<14W	0-70
100G							
TR-FC85S-N00	QSFP28 SR4	100G	100m	850nm VCSEL	PIN	<2.5W	0~70
TR-FC13R-N00	QSFP28 LR4 (Ethernet)	100G	10km	1294 -1310nm LWDM DFB	PIN	<4.0W	0~70
TR-FC13L-NSN	QSFP28 LR4 Dual Rates	100G/112G	10km	1294 - 1310nm LWDM EML	PIN	<4.5W	0~70
TR-FC13V-N00	QSFP28 CLR4 CWDM (Non-FEC)	100G	2km	DFB CWDM	PIN	<3.5W	0~70
TR-FC13T-N00	QSFP28 CWDM4 (FEC)	100G	2km	DFB CWDM	PIN	<3.5W	0~70
TR-FC13X-N00	QSFP28 eCWDM4	100G	10km	DFB CWDM	PIN	<3.5W	0~70
TR-FC13D-N00	QSFP28 ER4 Lite	100G	30km(Non-FEC)/40km	1294 -1310nm LWDM EML	APD	<4.5W	0~70
TR-FC13D-NSN	QSFP28 ER4 Lite Dual Rates	100G/112G	30km(Non-FEC)/40km	1294 - 1310nm LWDM EML	APD	<4.5W	0~70
TR-VC13T-N00	QSFP28 PSM4	100G	2km	1310nm DFB	PIN	<3.5W	0~70
TP-VC13Txxxx-N00	QSFP28 PSM4 Pigtail	100G	2km	1310nm DFB	PIN	<3.5W	0~70
TF-FCxxx-N00	QSFP28 AOC	100G	3~100m	850nm VCSEL	PIN	<2.5W (each QSFP28)	0~70
TF-FPQYxxx-N00	QSFP28 to 4x SFP28 AOC	100G	3~100m	850nm VCSEL	PIN	<2.5W (QSFP28) / < 1.0W (each SFP28)	0~70
TR-FC85S-E00	QSFP28 SR4 (CPRI)	100G	100m	850nm VCSEL	PIN	<2.5W	-10~75
TR-FC13X-R00	QSFP28 CLR4 ET	100G	10km (w/FEC)	DFB CWDM	PIN	<4.5W	-20~85
40G							
TR-QQ85S-N00	QSFP+ SR4	40G	100m	850nm VCSEL	PIN	<1.5w	0~70
TR-QQ85X-N00	QSFP+ eSR4	40G	300m	850nm VCSEL	PIN	<1.5w	0~70
TR-QQ13T-N00	QSFP+ IR4	40G	2km	DFB CWDM	PIN	<3.5w	0-70
TR-QQ13L-N00	QSFP+ LR4	40G	10km	DFB CWDM	PIN	<3.5w	0~70
TR-QQ13E-N00	QSFP+ ER4	40G	40km	DFB CWDM	APD	<3.5w	0~70
TR-IQ13C-N00	QSFP+ PSM IR4	40G	1.4km	1310nm FP	PIN	<3.5w	0~70
TR-IQ13L-N00	QSFP+ PSM LR4	40G	10km	1310nm DFB	PIN	<3.5w	0~70
TF-QQxxx-N00	QSFP+ AOC	40G	100m	850nm VCSEL	PIN	<1.5w (each QSFP+)	0~70
TR-QQ13Y-N00	QSFP+ LX4	40G	150m/2km	DFB CWDM	PIN	<3.5w	0~70
TF-QPQXxxx-N00	QSFP+ to 4x SFP+ AOC	40G	100m	850nm VCSEL	PIN	<1.5w (QSFP+) / <0.8w (each SFP+)	0~70
25G							
TF-PYxxx-N00	SFP28 AOC	25G	3~100m	850nm VCSEL	PIN	<1.0W (each SFP28)	0~70
TR-PY85S-N00	SFP28 SR	25G	100m	850nm VCSEL	PIN	<1.0W	0~70
TR-PY13L-N00	SFP28 LR	25G	10km	1310nm DFB	PIN	<1.5W	0~70
TR-PY13D-N00	SFP28 ER Lite	25G	30km(Non-FEC)/40km	1310nm EML	APD	1.5W	0~70
TR-PY13L-V00	SFP28 LR IT	25G	10km	1310nm DFB	PIN	<1.5W	-40~85
TR-PY85S-V00	SFP28 SR IT	25G	100m	850nm VCSEL	PIN	<1.0W	-40~85
TR-LYxxL-V00	SFP28 LR CWDM IT	25G	10km	DFB CWDM	PIN	<1.5W	-40~85
TR-DYxxL-V00	SFP28 LR BiDi IT	25G	10km	1270/1330nm DFB	PIN	<1.0W	-40~85
TR-DY13D-R00	SFP28 ER Lite BiDi ET	25G	40km (w/FEC)	1270/1310nm EML	APD	<1.5W	-20~85
10G							
TR-PX13L-N00	SFP+ LR	10G	10km	1310nm DFB	PIN	<1w	0-70
TR-PX13L-V00	SFP+ LR	10G	10km	1310nm DFB	PIN	<1w	-40~85
TR-PX15E-N00	SFP+ ER	10G	40km	1550nm EML	PIN	<1.5w	0~70
TR-PX15Z-N00	SFP+ ZR	10G	80km	1550nm EML	APD	<1.5w	0~70
TR-GXxxE-NSN	SFP+ DWDM ER SONET	10G	40km	EML	PIN	<1.8w	0~70
TR-GXxxZ-NSN	SFP+ DWDM ZR SONET	10G	80km	EML	APD	<1.8w	0~70

资料来源：Company data, Gao Hua Securities Research

图表 74: Government policy

Policies	Year	Details
Guidance on construction & layout of **datacenters**	2013	• Build mega-datacenter in regions that are cold and have adequate energy. • Encourage building small/mid-sized datacenters for local and real-time applications, and deploy flexibly to market needs in close proximity to user's location.
Triple network integration	2015	• This refers to the process of traditional telecom, radio and television networks transforming to the next generation broadband telecom, radio and digital television network, which tend to share the same technical function and business scope. The goal is to integrate those three networks in order to promote network connectivity and resource sharing.
State council notice on the action outline for promoting and development of **Big Data**	2015	• Accelerate the opening up and sharing of government data, promote integration of resources and enhance governance capacity. • Promote innovation and development, nurture new industry format and support economy restructuring. • Build big data security protection system to enhance network safety.
State council on promoting cloud computing and cultivating new format of information industry	2015	• **By 2020, cloud computing applications should be popularized**, and cloud computing capabilities will reach advanced levels internationally, and master the key technologies of cloud computing and form a number of key enterprises with strong international competitiveness. • By 2020, establish comprehensive laws and regulations on could computing information systems.
Made in China 2025	2016	• **Facilitate 5G technology and product development, the formulation of relevant standards**, the overall maturity of the 5G value chain and international collaboration.
National informatization development strategy outline	2016	• Optimize the layout of datacenters, enhance the coordination and the development of big data, cloud computing and broadband networks.
ICT industry development plan 2016-2020	2016	• Revenue reached Rmb3.5 trillion in 2020, with CAGR of 15.5%. • ICT **infrastructure investment to total Rmb2.0 trillion by 2020.** • ICT development index rose to 72nd place in the world. • **Mobile broadband penetration rate to reach 85% (by 2020).** • Fixed broadband penetration rate reached 70%. • Monthly wireless data usage reached 3,100mb per user. • Countryside village fiber access rate reaching 98%.
Notice on the construction project of the 2018 new generation IT technology infrastructure	2017	• Specified that for <60Hz and below frequency band, no less than five cities **should start building 5G network in 2018**. For each city, base stations should be no less than 50 (in 2018). • **No. of 5G terminals should be no less than 500.** • Offer to the customers **is no less than 100Mbps, low latency 5G broadband service.**
Plan on the rollout of IPv6 network	2017	• Full compatibility of IPv6 network in hyperscale IDCs and 5G network by the end of 2018.
Expand and upgrade IT consumption action plan 2018 - 2020	2018	• Annual IT consumption should reach 6000 billion RMB by 2020; per annual growth rate should reach 11% . • By the year 2020, **98% of the administrative villages should achieve full 4G coverage** and fiber broadband access. • **By the year 2020, make sure that the 5G network is commercially available.** • Ensure that by 2020, all urban areas are covered by optical network and can offer > 1000Mbps access speed.

资料来源：Gao Hua Securities Research

信息披露附录

申明

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投资摘要部分通过将一只股票的主要指标与其行业和市场相比较来评价该股的投资环境。所描述的四个主要指标包括增长、回报、估值倍数和波动性。增长、回报和估值倍数都是运用数种方法综合计算而成，以确定该股在地区研究行业内所处的百分位排名。

每项指标的准确计算方式可能随着财务年度、行业和所属地区的不同而有所变化，但标准方法如下：

增长是下一年预测与当前年度预测的综合比较，如每股盈利、EBITDA 和收入等。 回报是各项资本回报指标一年预测的加总，如CROCI、平均运用资本回报率和净资产回报率。 估值倍数根据一年预期估值比率综合计算，如市盈率、股息收益率、EV/FCF、EV/EBITDA、EV/DACF、市净率。 波动性根据12个月的历史波动性计算并经股息调整。

并购评分

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Quantum

Quantum是提供具体财务报表数据历史、预测和比率的高盛专有数据库，它可以用于对单一公司的深入分析，或在不同行业和市场的公司之间进行比较。

GS SUSTAIN

GS SUSTAIN是一项侧重于通过发现优质行业领先企业而实现长期超额收益的全球投资策略。GS SUSTAIN 50关注名单列出了我们认为凭借出色的资本回报、具有可持续性的竞争优势和对ESG（环境、社会和企业治理）风险的有效管理而有望在长期内相对于全球同业表现出色的行业领军企业。候选企业主要基于对企业在这三方面表现的综合量化分析筛选而出。

相关的股票研究范围

侯雪婷：A股电信与科技、大中华电信与科技。

A股电信与科技：Accelink Technologies、China United Network Comm、Dahua Technology、Fiberhome Telecom Tech、Goodix、Hikvision Digital Technology、Hytera Communications Corp.、SG Micro Corp.、Wangsu Science & Technology Co.、Zhongji Innolight Co.、ZTE Corp. (A)。

大中华电信与科技：China Communication Services、China Mobile (HK)、China Mobile (HK) (ADR)、China Telecom (ADR)、China Telecom (H)、China Tower Corp.、China Unicom (ADS)、China Unicom (H)、Hua Hong Semiconductor Ltd.、Mediatek、Parade Technologies Ltd.、Silergy Corp.、SMIC (ADR)、SMIC (H)、TSMC、TSMC (ADR)、United Microelectronics Corp.、United Microelectronics Corp. (ADR)、ZTE Corp. (H)。

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与公司有关的法定披露

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没有对下述公司的具体信息披露： Zhongji Innolight Co. (Rmb42.06)

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总体潜在回报：代表当前股价低于或高于一定时间范围内预测目标价格的幅度，包括所有已付或预期股息。分析师被要求对研究范围内的所有股票给出目标价格。总体潜在回报、目标价格及相关时间范围在每份加入投资名单或重申维持在投资名单的研究报告中都有注明。

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