2019 Q1 Results Announcement
25 April 2019
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ASMPT Recognized as TOP 100 Global Tech Leaders

ONLY Back-end Equipment Supplier Being Recognized

2018 THOMSON REUTERS

TOP 100 GLOBAL TECH LEADER

“The Top 100 Global Technology Leaders are the organizations poised to propel the future of technology.”
Brian Scanlon, Chief Strategy Officer
Thomson Reuters, 2018
Corporate Overview
A World’s Technology & Market Leader

- In the semiconductor packaging equipment industry
- In the SMT solutions industry
- In CIS (CMOS Imaging Sensor) assembly equipment
- In LED equipment
- In Automotive electronics assembly equipment
- In the Lead frame market
ASMPT’s Global Presence

- Global R&D staff: >2,000
- Patents on key leading edge technologies: >1,400
- R&D centres worldwide: 10
- Manufacturing facilities: 12

Sales Offices
Business Centre / R&D / Manufacturing Site
ASMPT Major Facilities around the World

Hong Kong
Singapore
Boston
Porto
Longgang (龙岗)
Fuyong (福永)
Huilzhou (惠州)
Chengdu (成都)
Taoyuan
Weymouth
Beuningen
Johor
Johor Expansion (Ready 2019)
Munich
Regensburg

Three Business Segments With Leading Market Positions

**Back-end Equipment**
- Assembly & Packaging Equipment Market
  - #1 Die Bonders
  - #2 Wire Bonders
  - #1/2 Flip Chip Bonders
  - #1 Thermal Compression Bonders (TCB)
  - #1 LED Packaging Equipment
  - #1 CMOS Imaging Sensors (CIS) Equipment
  - #2 Encapsulation & Post Encapsulation Solutions
  - #3 Turret Test Equipment (Test Handlers)
  - #2 Laser Dicing and Grooving

Worldwide Market Position & Share

- **Assembly & Packaging Equipment Market**
  - ~25%
  - (2018)
  - Since 2002

**SMT Solutions**
- SMT Equipment Market
  - #1 CMOS Imaging Sensors (CIS) Equipment

Worldwide Market Position & Share

- **SMT Equipment Market**
  - ~23%
  - (2018)
  - Since 2016

**Materials**
- Leadframe Market
  - #3 Turret Test Equipment (Test Handlers)

Worldwide Market Position & Share

- **Leadframe Market**
  - ~9%
  - (2018)
  - Since 2018

Sources:
Market share for Back-end Equipment is based on information on packaging and assembly equipment market by VLSI, leadframe market by SEMI, and SMT market by ASMPT SIPLACE Market Intelligence.
2019 Q1 Financial Highlights
Q1 Financial Highlights

Quarterly Group Billings (US$ m)

Q1 2019 Billings

<table>
<thead>
<tr>
<th></th>
<th>USD</th>
<th>YoY</th>
<th>QoQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>466.6m</td>
<td>-15.8%</td>
<td>-23.2%</td>
</tr>
<tr>
<td>Back-end Equipment Segment</td>
<td>195.9m</td>
<td>-30.4%</td>
<td>-15.9%</td>
</tr>
<tr>
<td>Materials Segment</td>
<td>50.5m</td>
<td>-32.3%</td>
<td>-15.5%</td>
</tr>
<tr>
<td>SMT Solutions Segment</td>
<td>220.2m</td>
<td>+11.4%</td>
<td>-30.1%</td>
</tr>
</tbody>
</table>
Group Bookings

Quarterly Group Bookings (US$ m)

The Worst is Over?

- Q1 Group Booking: ▼ 3.0% QoQ
- Q1 Backend EQT Booking: ▼ 4.2% QoQ
  - CIS rebound > 100% QoQ
- Q1 Materials Booking: ▲ 15.2% QoQ
  - Historically a leading indicator for the Market
- Q1 SMT Booking: ▼ 5.1% QoQ

YoY Growth: -39.0%
QoQ Growth: -3.0%
## Q1 Group Financial Highlights

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>YoY</th>
<th>QoQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bookings</td>
<td>-39.0%</td>
<td>-3.0%</td>
<td></td>
</tr>
<tr>
<td>Revenue</td>
<td>-15.8%</td>
<td>-23.2%</td>
<td></td>
</tr>
<tr>
<td>Gross Margin</td>
<td>-369bps</td>
<td>+93bps</td>
<td></td>
</tr>
<tr>
<td>EBIT</td>
<td>-64.1%</td>
<td>-34.7%</td>
<td></td>
</tr>
<tr>
<td>Net Profit</td>
<td>-82.4%</td>
<td>-49.0%</td>
<td></td>
</tr>
<tr>
<td>Net Profit Margin</td>
<td>-1121bps</td>
<td>-149bps</td>
<td></td>
</tr>
</tbody>
</table>

### Factors affecting Q1 Profitability
- Product Mix
- Lower Sales volume
- Underutilization of capacity
- YoY OPEX increased by 6.6% mainly due to new acquisitions
We Are Ready to Ride the Next Wave of Growth
The “Smart” Era Made Possible with Data

Smart Factories
By 2022...
- 7 billion more Machine-to-Machine devices
- 300 EB/year

Smart Cars
By 2025...
- 8 million more Autonomous Vehicles
- 21,920 EB/year

Smart Things
By 2030...
- 100 billion more units
- 11,500 EB/year

34 ZB more data generated in a year by 2030

From These Three Drivers Alone

Sources:
Tuxera: Autonomous cars will generate more than 300 TB of data per year.
Wikibon: The Vital Role of Edge Computing in the Internet of Things
Data Traffic to continue ‘Exploding in Waves’ over the next years

Global Data Traffic Facts (in Zettabytes)

Data-Centric Era will spur Semiconductor Demand
Critical Requirements to Enable the Digital World

Critical Requirements

- Greater Storage
- Higher Bandwidth
- No Latency
- Lower Power

Technology Enabling Solutions

- Advanced Packaging
  - New structures, “right” form factor – Having more with less

- 5G Connectivity Infrastructure
  - 100x faster than 4G
  - Creates “near zero latency”

- Heterogeneous Integration
  - Significant improvement in functional density
  - High Bandwidth and Low Power
More than Moore: Heterogeneous Integration & Advanced Packaging Shifting the Value Chain

Shrinkage in Die Geometry

Solution: Heterogeneous Integration and Advanced Packaging

Moore’s Law Era

‘More than Moore’ Era

Increasing Cost of Die Geometry Shrinkage

Cost

Cost

Cost

Node Size (nm)

2014 2016 2018 2020 2022 2024 2026

Cost
Heterogeneous Integration & Advanced Packaging Unleashes the Power of A.I.

Advantages of Heterogeneous Integration

- Integrating multi-mode technologies to enable “More than Moore”
- Faster time to market
- Less IP issues
- Flexibility
- Cost savings

Crucial enabling technology for Artificial Intelligence

“High Bandwidth & Low Power Data Pipes ONLY Available On Heterogeneous Integration on Advanced Packages”

Source: Intel
Advanced Packaging: The Game Changer in Semiconductor Revolution

Advanced Packaging Technology Enabler

- HBM / Memory
- X-PU
- 2.5D Silicon Interposer
- HDI Substrate with Embedded Technology
- Integrated Passive Device, IPD Integration

End Applications

- Datacenters for HPC, Machine Learning
- Automotive – Sensors, Camera, Body Electronics, Safety Systems, Infotainment
- GPU for VR/AR & AI
- IoT Era – Smart Wearables & Smart Machines (Factories)

Advanced Packaging Technology Enabler

- Laser 1205 Laser Separation
- Wafer Dicing and Grooving
- SIPLACE CA Die Attach & SMT
- Wafers and SMT Feeders
- NUCLEUS Pick and Place
- Wafer and Panel

FIREBIRD TCB FLI

NEXX PVD | ECD
Bumping, TSV & RDL
Applications Fueling OPTO Business Growth

**MiniLED**
- Video Walls / Large Displays
- Market Size CAGR 2019 – 2023: ~ 90%

**MicroLED**
- Display for AR / VR
- Current Resolution: 2160 x 1200
- MicroLED is expected to offer 10X higher resolution

**Photonics**
- Data Centre / Cloud Computing
- Market Size CAGR 2019 – 2025: ~ 23.4%

**Video Walls / Large Displays**

**MicroLED**

**Photonics**

**Source:** Gamingscan, Electronics Weekly, LEDinside, ReportsinReports, Yole Development (Oct 2018)
Smartphone Innovations Continue to Drive CIS Business

50X Zooming Capability
(5X Optical + 10X Digital Zoom)
The Role of the Camera in the Data Era Redefined

Today...
- Videos
- Social Media Content
- Autonomous Vehicles

Future...
- Artificial Intelligence
- AR/VR
- Security: Features Recognition
- Industrial Inspection with Drones

Source: Youtube, Facebook, Instagram, IT World Canada, Nvidia, Precision Security Australia, Cramer.com, Weibo, Netflix, Youku
‘Smart Cars’ will drive Semiconductor Industry Growth

Semiconductor Content Value in a single unit vehicle, 2018 (in US$)

Standard Vehicle: $400 per Vehicle
Electric Vehicle: $2,000 per Vehicle
Autonomous Vehicle: $15,000 per Vehicle

Source: Semico Research
How will ‘Smart Cars’ drive ASMPT’s Growth?

**Sensors**
The eyes and ears to gather information from the Road

**Power**
Thermal management (e.g. Ag Sintering) will play important role

**5G to Cloud Connectivity**
Enable "V2X" communications

**Entertainment**
Frees up driver’s attention on road for entertainment
Artificial Intelligence (AI) is a Significant Driving Force for ASMPT

**Worldwide Deep Learning Chipset Revenue**

- SoC Accelerator & Other
- ASIC / AASP
- FPGA
- GPU
- CPU

*Source: Tractica, Mar 2019*

**CAGR: ~49.56%**

**A.I. Share within Semi industry**

Expected to grow to > $100B

In the next decade

*Source: PwC Strategy & analysis, IC Insights, JP Morgan*
5G to Bring About New Array of Applications in the Data-Era

Opportunities

- Antennas Array
- More Base Stations
- Substrate Like PCB
- Greater Demand for Chips and RF Filters
Hardware + Software + Services

**ASM SMART FACTORY SOLUTIONS**

**ENABLING THE DIGITAL WORLD**

IloT applications & services, IIoT portal
(Data Analytics, Business Intelligence, Cloud based)

Factory Level (MES)
(Planning, Process Flow Maintenance, Visualization)

Line Level
(Automation, Material Management, Lot Management)

Shop floor / Equipment
# Expanding Beyond Assembly and Packaging Solutions

<table>
<thead>
<tr>
<th>Application Markets</th>
<th>Industry Requirements</th>
<th>ASMPT’s Enabling Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS</td>
<td>Zero Foreign Particles</td>
<td>1µm Particle Inspection Capability with Auto Clean Solution</td>
</tr>
<tr>
<td>Automotive</td>
<td>Demands High Quality</td>
<td>2D and 3D All-in-one Vision System</td>
</tr>
<tr>
<td>Advanced Packaging</td>
<td>Zero PPM Defects</td>
<td>Made Strategic Investment into a Silicon Valley Startup on X-Ray Inspection Solutions</td>
</tr>
<tr>
<td></td>
<td>100%, on-line high speed inspection</td>
<td></td>
</tr>
</tbody>
</table>

- **Zero Foreign Particles**
- **Demands High Quality**
- **Zero PPM Defects**
- **100%, on-line high speed inspection**
Outlook
## Industry Growth Forecast (2019)

### Semiconductor Industry

<table>
<thead>
<tr>
<th>Source</th>
<th>Year</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLSI, Jan-19</td>
<td></td>
<td>-1.0%</td>
</tr>
<tr>
<td>IHS Markit, Jul-18</td>
<td></td>
<td>4.0%</td>
</tr>
<tr>
<td>IC Insights, Jan-19</td>
<td></td>
<td>1.6%</td>
</tr>
<tr>
<td>Cowan LRA, Aug-18</td>
<td></td>
<td>5.0%</td>
</tr>
<tr>
<td>WSTS, Mar-19</td>
<td></td>
<td>-3.0%</td>
</tr>
<tr>
<td>Gartner, Jan-19</td>
<td></td>
<td>2.6%</td>
</tr>
</tbody>
</table>

### Forecast Global Assembly & Packaging Equipment Market

#### VLSI Assembly & Packaging Equipment (Dec-18)

- 2013: -22%
- 2014: 27%
- 2015: -18%
- 2016: 16%
- 2017: 24%
- 2018F: 3%
- 2019F: -12%

#### SEMI Assembly & Packaging Equipment (Dec-17)

- 2013: -26%
- 2014: 33%
- 2015: -18%
- 2016: 20%
- 2017: 26%
- 2018F: 1.9%
Outlook

Q2 Group Billing: US$490 million to US$540 million

- Expect Back-end business to lead the QoQ improvement

Q2 Group Booking: Anticipate double-digit percentage improvement QoQ

Many customers believe chance of market improvement greater than chance of further market deterioration
# Q1 Segment Financial Highlights

<table>
<thead>
<tr>
<th>Q1 2019</th>
<th>Back-end Equipment Segment</th>
<th>Materials Segment</th>
<th>SMT Solutions Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YoY</td>
<td>QoQ</td>
<td>YoY</td>
</tr>
<tr>
<td>Bookings</td>
<td>-45.2%</td>
<td>-4.2%</td>
<td>-37.4%</td>
</tr>
<tr>
<td>Revenue</td>
<td>-30.4%</td>
<td>-15.9%</td>
<td>-32.3%</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>-508 bps</td>
<td>-383 bps</td>
<td>-271 bps</td>
</tr>
<tr>
<td>Segment Profit</td>
<td>-89.5%</td>
<td>-68.0%</td>
<td>-73.3%</td>
</tr>
<tr>
<td>Segment Profit Margin</td>
<td>-1928 bps</td>
<td>-558 bps</td>
<td>-406 bps</td>
</tr>
</tbody>
</table>
### Q1 2019 Segment Results - Back-End Equipment Business

<table>
<thead>
<tr>
<th></th>
<th>Q1 2019</th>
<th>YoY</th>
<th>QoQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bookings (USD)</td>
<td>223m</td>
<td>-45.2%</td>
<td>-4.2%</td>
</tr>
<tr>
<td>Billings (USD)</td>
<td>196m</td>
<td>-30.4%</td>
<td>-15.9%</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>39.2%</td>
<td>-508bps</td>
<td>-383bps</td>
</tr>
<tr>
<td>Segment Profit (HKD)</td>
<td>53m</td>
<td>-89.5%</td>
<td>-68.0%</td>
</tr>
<tr>
<td>Segment Profit Margin</td>
<td>3.4%</td>
<td>-1928bps</td>
<td>-558bps</td>
</tr>
</tbody>
</table>

- IC/Discrete and CIS took the lead in Backend EQT Booking
- Booking for IC/Discrete ▲ 30% QoQ (excluding ASM NEXX)
- CIS Booking more than double QoQ
- Gross Margin ▼: Lower sales volume and under-utilization of installed production capacity

![Billings (US$ m) chart](chart.png)
### Q1 2019 Segment Results - Materials Business

<table>
<thead>
<tr>
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<th>Q1 2019</th>
<th>YoY</th>
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</tr>
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<tbody>
<tr>
<td><strong>Bookings (USD)</strong></td>
<td>46m</td>
<td>-37.4%</td>
<td>+15.2%</td>
</tr>
<tr>
<td><strong>Billings (USD)</strong></td>
<td>50m</td>
<td>-32.3%</td>
<td>-15.5%</td>
</tr>
<tr>
<td><strong>Gross Margin</strong></td>
<td>10.4%</td>
<td>-271bps</td>
<td>+275bps</td>
</tr>
<tr>
<td><strong>Segment Profit (HKD)</strong></td>
<td>10m</td>
<td>-73.3%</td>
<td>+214.2%</td>
</tr>
<tr>
<td><strong>Segment Profit Margin</strong></td>
<td>2.6%</td>
<td>-406bps</td>
<td>+193bps</td>
</tr>
</tbody>
</table>

- **Booking ▲ 15.2% QoQ**
- **Historically a leading indicator for the market**
- **GM ▲ 275 bps QoQ to 10.4%**

The chart illustrates the YoY and QoQ growth for Billings (US$ m) from Q1 2014 to Q1 2019.
## Q1 2019 Segment Results - SMT Solutions Business

<table>
<thead>
<tr>
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<th>Q1 2019</th>
<th>YoY</th>
<th>QoQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bookings (USD)</strong></td>
<td>192m</td>
<td>-30.1%</td>
<td>-5.1%</td>
</tr>
<tr>
<td><strong>Billings (USD)</strong></td>
<td>220m</td>
<td>+11.4%</td>
<td>-30.1%</td>
</tr>
<tr>
<td><strong>Gross Margin</strong></td>
<td>34.5%</td>
<td>-269bps</td>
<td>+423bps</td>
</tr>
<tr>
<td><strong>Segment Profit (HKD)</strong></td>
<td>213m</td>
<td>+6.4%</td>
<td>-28.5%</td>
</tr>
<tr>
<td><strong>Segment Profit Margin</strong></td>
<td>12.4%</td>
<td>-58bps</td>
<td>+27bps</td>
</tr>
</tbody>
</table>

- **Billing ▲ 11.4% YoY**
- **Segment Profit ▲ 6.4% YoY**

*Billings (US$ m) YoY Growth: 11.4% QoQ Growth: -30.1%*
R&D Commitment Makes Us a Preferred Partner of Choice

- **2018 R&D expenditure**
  - US$ 205 million
  - 9.3% of equipment sales

- **USD1,423 million invested in R&D**

**Key Areas of Investment:**
- Package Interconnection
- Optics precision engineering
- Vibration control
- Laser dicing & grooving
- SMT
An Extensive Customer Base

- No single customer accounted for more than 10% of Group revenue
- Top 5 customers accounted for 18% of Group’s Q1 2019 revenue
- Top 20 customers include:
  - World’s leading IDMs
  - Tier 1 OSATs, major OSATs in China
  - Key LED players
  - Major camera module makers
  - Top EMS providers
  - Leading automotive component suppliers
- Among Top 20 customers of Group:
  - 6 from SMT Solutions segment
  - 4 from both Back-End Equipment & SMT Solutions segment

Q1 2019 Geographical Distribution of Revenue

- China 39.4%
- Europe 20.1%
- Americas 9.6%
- Vietnam 8.7%
- Malaysia 6.7%
- Taiwan 4.9%
- Thailand 2.8%
- Korea 2.6%
- Japan 1.1%
- Philippines 2.5%
- India 0.6%
- Others 1.0%

Q1 2019 Revenue Contribution from Top 5 Customers

- 2018: 18.0%
- Q1 2019: 18.0%
Awards & Recognition
Recent Awards & Recognition

- Technology Achievement Grand Award of HKIA 2017 (for the third time) Federation of HK Industries
- Directors of the Year Awards 2017 (Collective Board)
- Directors of the Year Awards 2018 (Individual Director) Hong Kong Institute of Directors
- Hong Kong Outstanding Enterprises 2017-18 HK Economic Digest
- 2017 All Stars of the Semiconductor Industry VLSI Research
- Singapore Quality Class Enterprise Singapore
Recent Awards & Recognition

- Factory of the Year 2016 Award (for SMT) by Produktion/AT Kearney
- Ranked among Top 10 of Best Managed HK Companies
- Ranked among Top 10 of Best at Investor Relations
- 2017 & 2018 “Triple Crown” with RANKED 1st/10 BEST/BEST Suppliers Awards from VLSIresearch
- 2016-17 Corporate Governance Asia – Best Investor Relations Company (HK)
- 2017 Corporate Governance Asia – Best CEO (Investor Relations)
- 2015 Hong Kong Awards for Industries: Technology Achievement Grand Award
VLSI Awards 2018