# CHANG WAH TECHNOLOGY CO., LTD (6548)

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# Outline

A、Global Layout

B、New Application for Pre-mold Technology – IPM

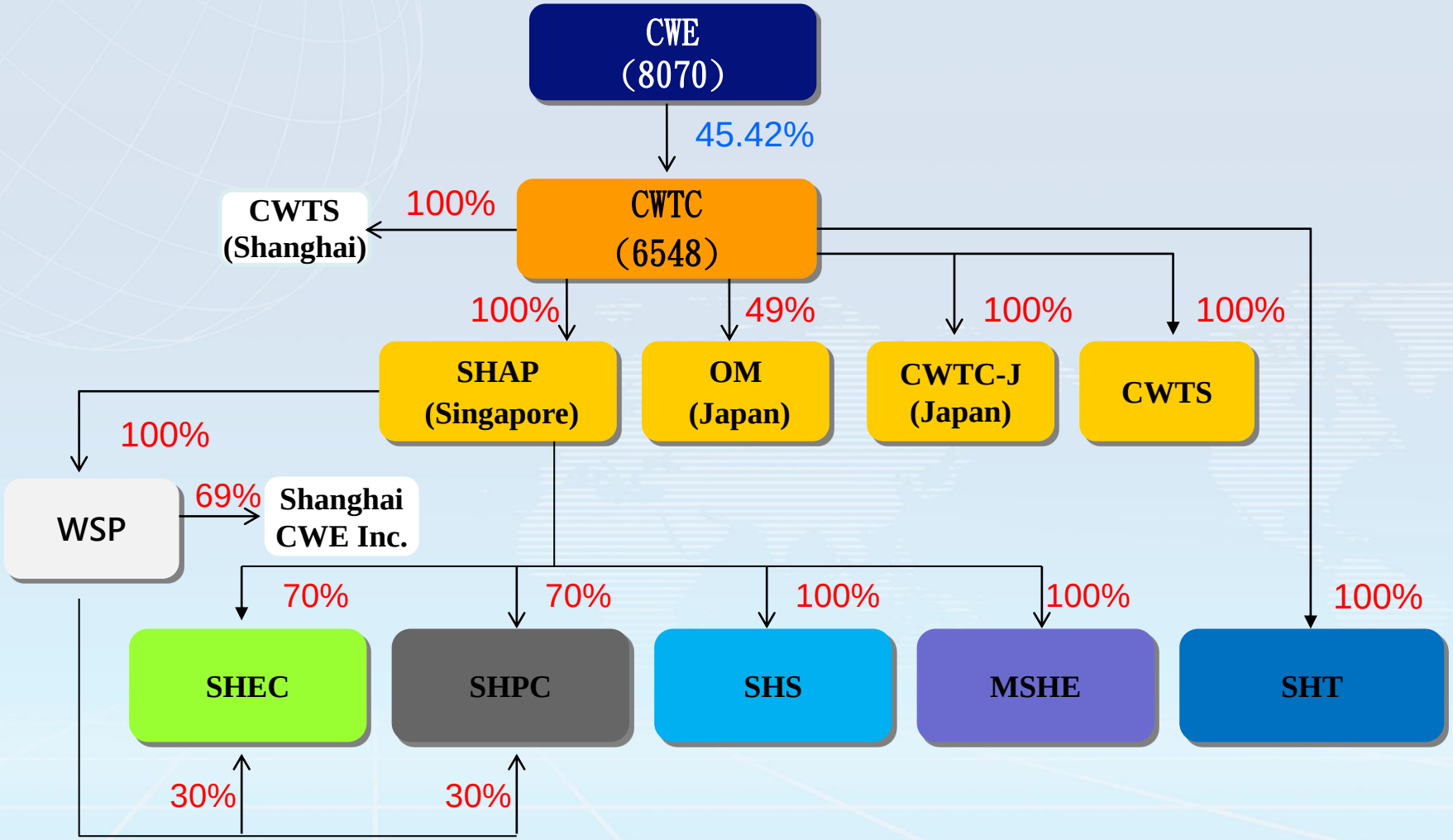
C、Business Overview

D、Future Prospects

E、Q&A

# A、Global Layout

# Investment Structure



# Plants and Factories

**Japan**

OM, 1981

**CHINA**

SHEC · 1998

SHPC · 2008

SHS · 2003

**Taiwan**

SHT · 1994

CWTC · 2009

**Malaysia**

MSHE · 1989

# B、New Application for Pre-mold Technology – IPM

# Customized Process

Copper plate | 1st Etching | 1st molding | Plating

⇒ Process Simplification

Copper plate | 1st Etching | 1st molding | **2**nd Etching | Plating

⇒ Wettable Frank QFN

# Advantage of Pre-mold Solution

- High reliability
  → No Ag leakage on side wall
- Solder Seen Terminals by 2nd etching
  → No flash in dimple, single saw instead of step saw
- Pre-mold DR-MQFN (saw type)
  → Hi density/mega strip/better 2nd bond/no mold tape
- LLGA/XQFN Pre-mold LF
  → Super thin/small package/mold flash free
- Generic DR-MQFN/MQFN
  → Easier logistic/shorten change over time
- Routable Metal substrate
  → Hi IO with Hi thermal / low cost BGA

# Pre-mold substrate advantages

- The customer packaging process is simplified, the final output yield is improved, the lead time is shortened, and more importantly, the customer does not have a wastewater problem (because there is no need to plating).

- The 2’ nd etched pre-mold(Wettable Frank QFN) is also a solution to the complicated cutting of the packaging and testing plant, fully in line with the automotive specifications.

# Pre-mold Patent Layout

| | TW | China | US | JP | Korea | Malasia |
|---|---|---|---|---|---|---|
| QFN | M521265 | 5334918 | — | — | — | — |
| Tie-bar Less L/F | M523189 | 5744144 | Currently applying | 3210520 | Currently applying | — |
| Moat Design L/F | M531057 | 6003205 | US9799613B1 | — | Currently applying | Currently applying |
| RMS L/F (Routable Metal Substrate) | I620279 | 6562112 | has been passed | — | — | — |
| **SST L/F (Wettable Frank)** | M539698 | 6475513 | Currently applying | 3213791 | — | — |
| LLGA | M541118 | 6458427 | Currently applying | 3211532 | Currently applying | Currently applying |
| **Generic L/F** | M551755 | 6971552 | has been passed | — | Currently applying | — |

# IPM market opportunities

- The Intelligent Power Module (IPM) encapsulates multiple power ICs, driver ICs, and passive components into different electronic components to achieve high-speed power switching, effectively control motor operation, and achieve energy-saving goals.
- IPM directly affect the energy-saving and operational efficiency of electronic products.
- IPM has a wide range of applications, especially suitable for driving inverters and various inverter power supplies, making it the best solution for motor speed control.

- In the high-frequency, high-current working environment, IPM heat dissipation function has become an important indicator for evaluating the quality of power modules.

- At present, the main suppliers of IPM are dedicated to the packaging technology of power modules. In addition to reducing the overall process cost, the thermal resistance of the power module should be reduced, so that IPM can achieve higher performance.

- QFN is undoubtedly the best low cost (compared to ceramic substrates) and is a high heat dissipation solution.

- Major IPM manufacturers have their own special packaging methods to ensure that their power modules can achieve maximum performance.

- The traditional QFN is backed by a PI film during the packaging process, which is not only environmentally friendly (consumable), increases cost, and the packaging process cannot withstand an ultra-high temperature environment.

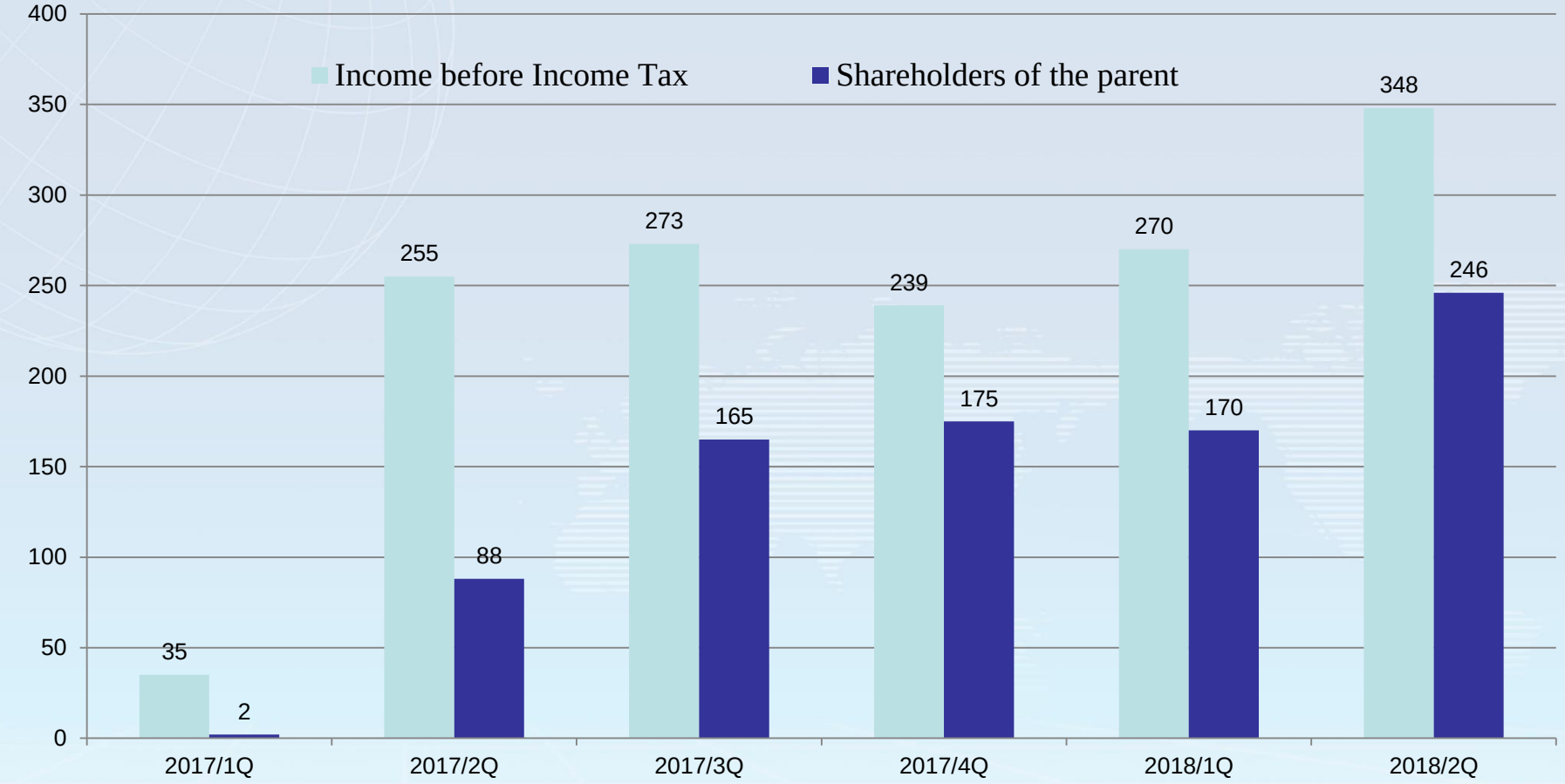
- Pre-mold QFN does not require a backing PI film to withstand the requirements of a high temperature packaging environment.

# Pre-mold Substrate Progress

- The general Pre-mold IC substrate will be shipped in 4Q.
- Wettable Frank QFN is expected to be mass-produced at the end of the year. ◦
- IPM is actively collaborating with customers to provide pre-mold QFN substrates for IPM applications in high temperature packaging.

# C、Business Overview

MN NTD




- **Profits rise quarter by quarter。**

# Financial Results(Consolidated Income Statement)

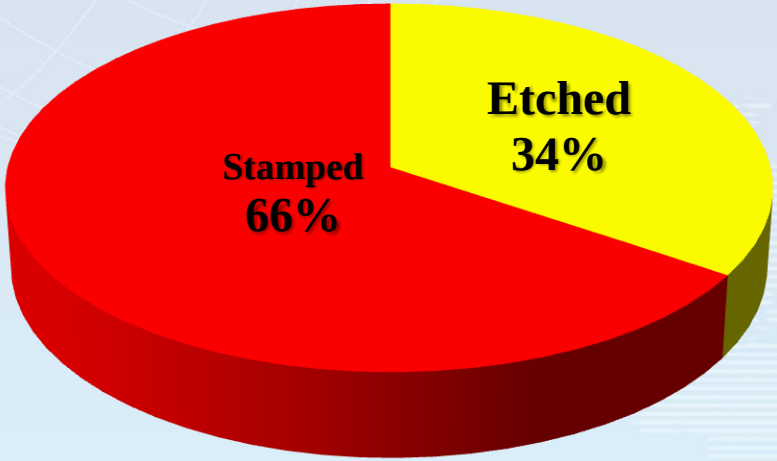
| MN NTD | 2Q 2018 Amount | 2Q 2018 % | 1Q 2018 Amount | 1Q 2018 % | QoQ % | 2Q 2017 (After renumbering) Amount | 2Q 2017 (After renumbering) % | YoY % |
|---|---|---|---|---|---|---|---|---|
| Revenues | 2,558 | 100 | 2,387 | 100 | 7 | 2,221 | 100 | 15 |
| Gross Profit | 449 | 18 | 459 | 19 | (2) | 430 | 19 | 4 |
| Operating Expenses | 183 | 7 | 174 | 7 | 5 | 164 | 7 | 12 |
| Operating Income | 266 | 10 | 285 | 12 | (7) | 266 | 12 | 0 |
| Non-operating Income | 82 | 3 | (15) | - 1 | - | 0 | - | - |
| Income before Tax | 348 | 14 | 270 | 11 | 29 | 266 | 12 | 31 |
| Tax | 100 | 4 | 98 | 4 | 2 | 84 | 4 | 19 |
| Net Income | 249 | 10 | 172 | 7 | 45 | 182 | 8 | 37 |
| Shareholders of the parent | 246 | | 170 | | 44 | 88 | | 180 |
| EPS(NTD) | 6.79 | | 4.71 | | | 2.94 | | |

# Consolidated Balance Sheet Summary

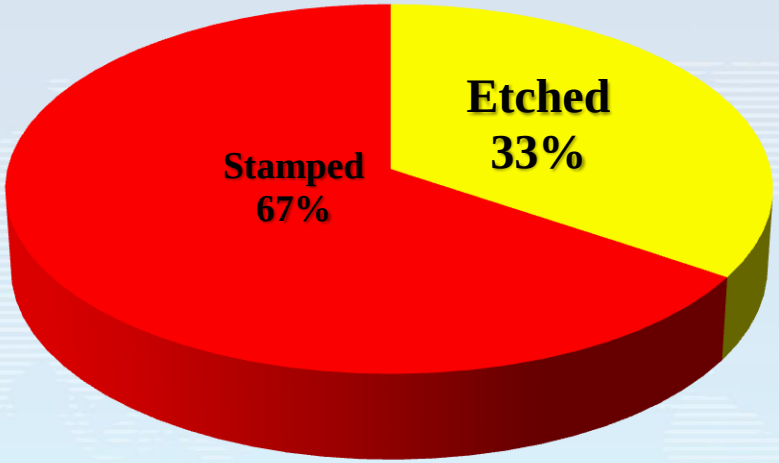
| Amount NTD in MN | 2016.12.31 (IFRSs) (After renumbering) | 2017.12.31 (IFRSs) | 2018.6.30 (IFRSs) |
|---|---|---|---|
| Cash & Short-Term Investments | 637 | 2,131 | 1,394 |
| Accounts Receivable | 523 | 1,825 | 2,183 |
| Current Assets | 1,625 | 5,350 | 5,169 |
| Long-Term Investments | 292 | 146 | 156 |
| Current Liabilities | 295 | 2,150 | 3,257 |
| Long-Term Liabilities | 299 | 3,970 | 4,048 |
| Shareholders' Equity | 966 | 5,064 | 4,941 |
| Total Assets | 2,333 | 9,100 | 9,060 |
| Book Value Per Share (NT$) | 39 | 140 | 136 |
| Current Ratio | 550% | 249% | 159% |
| Debt Ratio | 13% | 44% | 45% |

# Products Percentage(Process)

2017

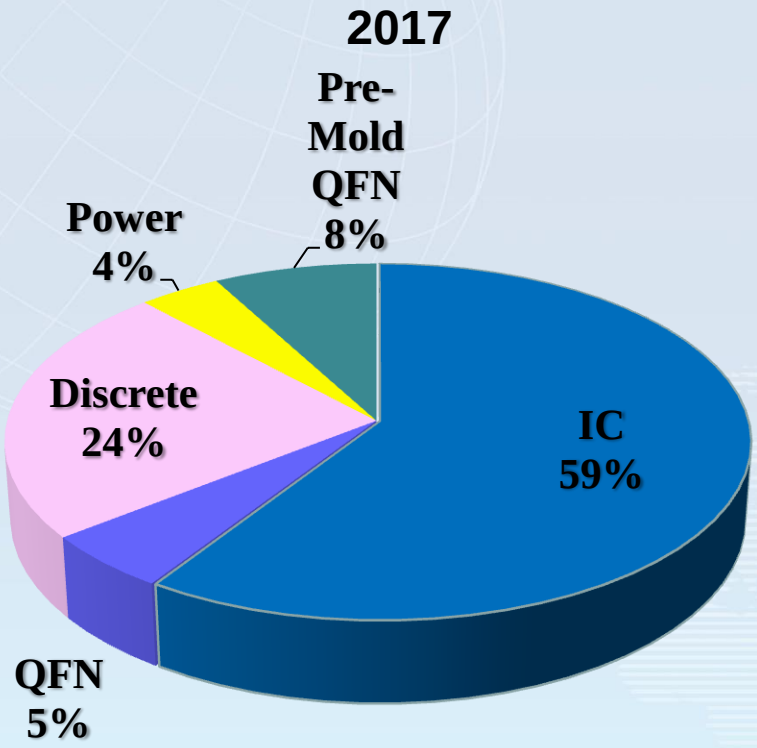


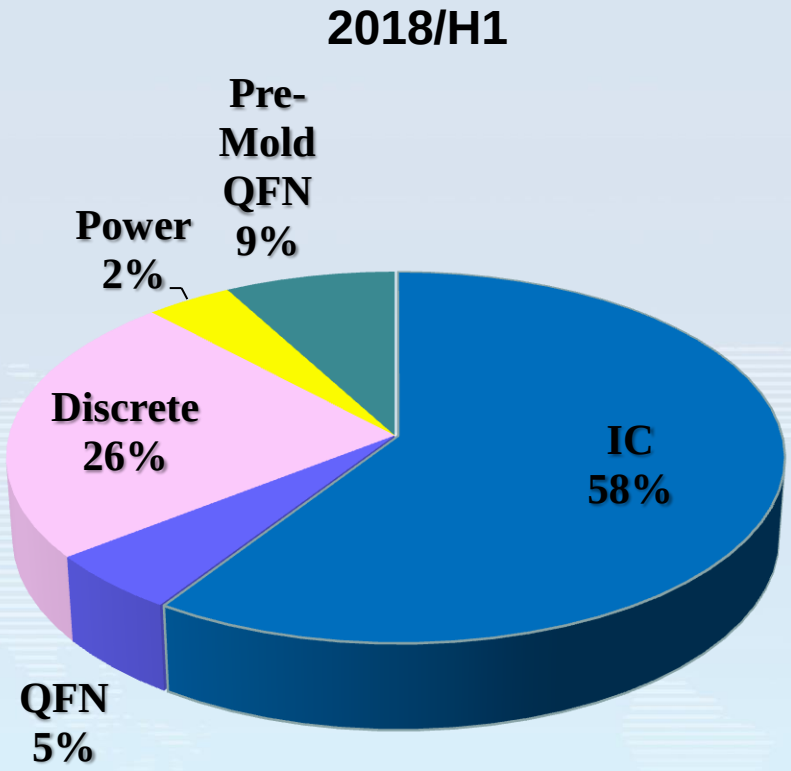

2018/H1




*Classified by sales amount (US$)

# Products Percentage(Application)



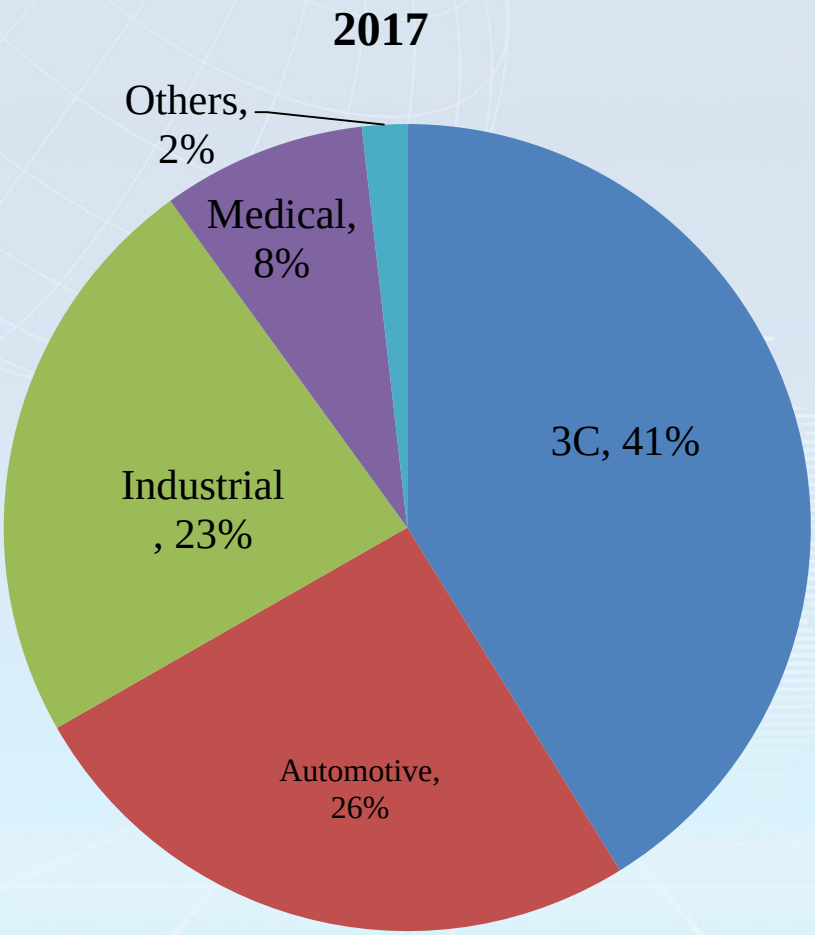



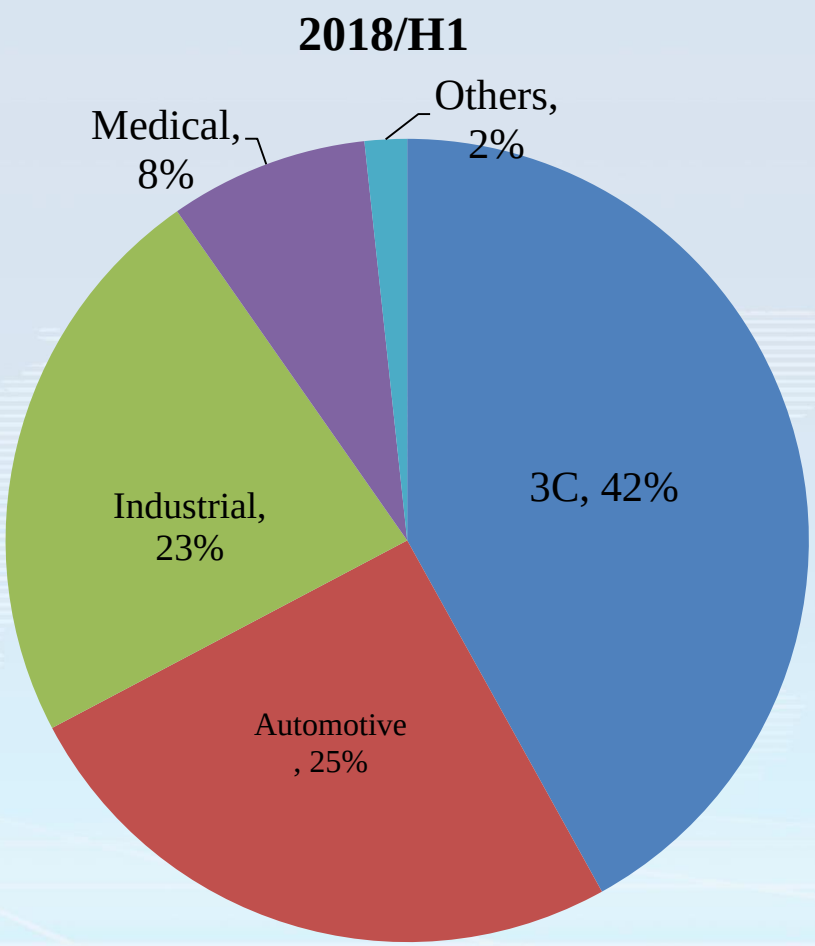

IC：SOP、TSSOP、TSOP、QFP

Discrete：SOT

*Classified by sales amount (US$)

# Lead Frame Application



# D、Future Prospects

# Outlook and Growth Momentum

- Expand Wettable Flank QFN substrate customers
- Develop IPM application market customers
- Etching elements for other applications
- New Factory
- M&A Opportunity

# E、Q&A