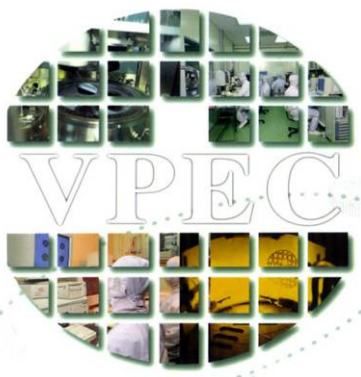




Company Profile

World-class leading edge with MOCVD

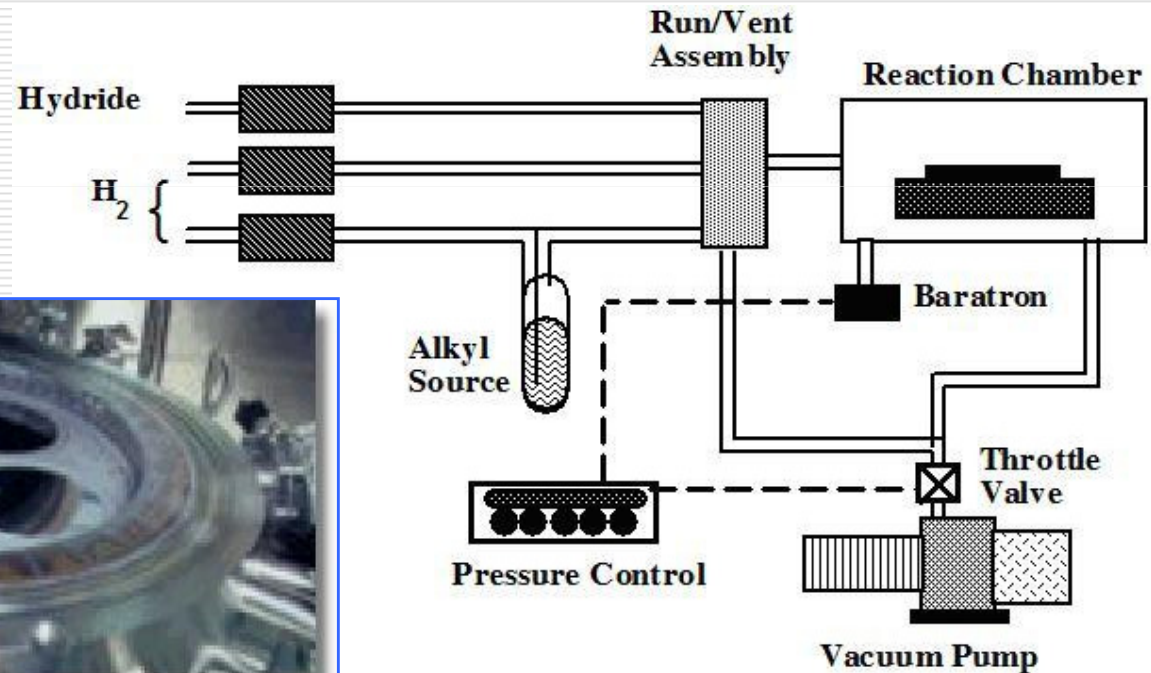




Core Technology

MOCVD (有機金屬氣相沉積法)

- Metal Organic Chemical Vapor Deposition





Core Technology

Production
Reactor

MOCVD Metal Organic Chemical Vapor Deposition

Way to
Produce

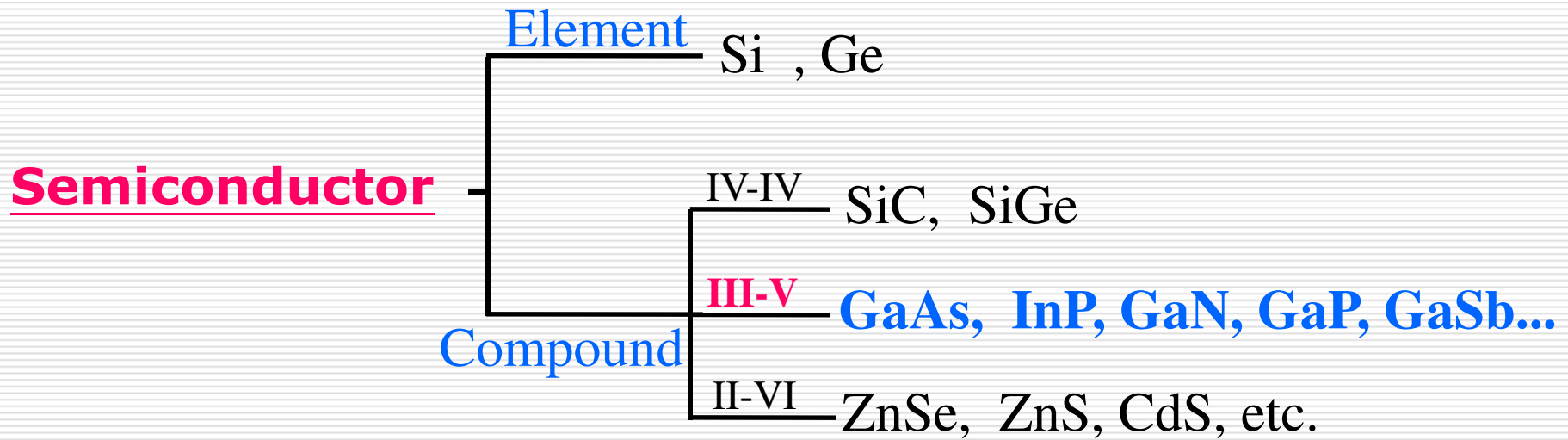
Through the organic metal chemical vapor deposition method, the semiconductor film is grown on the substrate, and the epitaxial layer is accurately controlled through the real-time monitoring of the machine to complete the production of epitaxial wafers for different products such as GaAs、InP and GaN.

Production
Principle

The epitaxial layer is heated by MOCVD in the cavity of the substrate, and an atomic layer is stacked layer by layer to form an epitaxial layer.



Semiconductor (by Material)



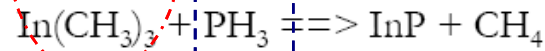
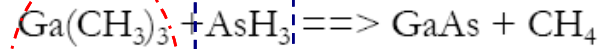
| Period | Column II | III | IV | V | VI |
|--------|-------------------|------------------|-------------------|-------------------|-------------------|
| 2 | Be 鈹 Beryllium | B 硼 Boron | C 碳 Carbon | N 氮 Nitrogen | O 氧 Oxygen |
| 3 | Mg 鎂 Magnesium | Al 鋁 Aluminum | Si 矽 Silicon | P 磷 Phosphorus | S 硫 Sulfur |
| 4 | Zn 鋅 Zinc | Ga 鎵 Gallium | Ge 鍺 Germanium | As 砷 Arsenic | Se 硒 Selenium |
| 5 | Cd 鎘 Cadmium | In 銦 Indium | Sn 錫 Tin | Sb 銻 Antimony | Te 碲 Tellurium |
| 6 | Hg 汞 Mercury | Tl 鉍 Thallium | Pb 鉛 Lead | | |

二元化合物 Binary : GaAs, InP, GaP, GaN, etc.
 三元化合物 Ternary : InGaAs, InGaP, AlGaAs, etc.
 四元化合物 Quaternary : AlGaInP, InGaAsP, etc.
 五元化合物 Pentanary : AlGaInAsN, etc.



Chemical Reaction During Epitaxy

化學反應式：



主要原物料：

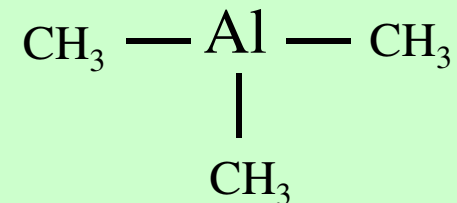
MO Source + **Hydride** + Carrier Gas : **H2**

- TEAl : Tri-ethyl-Aluminum (C_2H_5)₃Al
- TMGa : Tri-Methyl-Gallium (CH_3)₃ Ga
- TMIn : Tri-Methyl-Indium (CH_3)₃In
- DETe : Di-ethyl-Tellurium (C_2H_5)₂Te
- DEZn : Di-ethyl-Zinc (C_2H_5)₂Zn
- CP₂Mg : Bis (cyclo-penta-dienyl)-Magnesium 環戊二烯鎂

- AsH₃ : Arsine
- PH₃ : Phosphine
- SiH₄ : Silane
- Si₂H₆ : Disilane
- H₂Se : Hydrogen Selenide
- CBr₄ : Carbon Tetrabromide

TMAI Tri - Methyl - Aluminum (CH_3)₃Al

三 甲 基 鋁





Advantages of Compound Semiconductor

1. High Electron Mobility 高電子移動速率 (5.7x higher than CMOS)
2. High Frequency Response 高頻率響應
3. Wide Band Width 寬幅之頻寬
4. High Linearity 高線性度
5. High Power 高功率
6. Alternative Choice of Material 材料選擇多元性
7. 抗輻射

適用於無線通訊、光通訊、雷射



GaAs in Wireless Communication Supply Chain

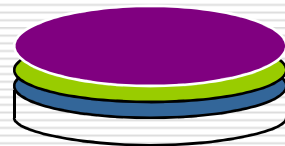
Sumitomo, Freiberg, AXT

2~6 " GaAs Substrate



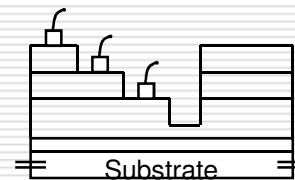
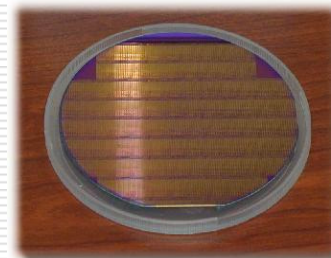
MOCVD Reactor

GaAs Epi- Wafer
磊晶片



IDM : Qorvo, Avago,
Skyworks

Microelectronics
IC Process

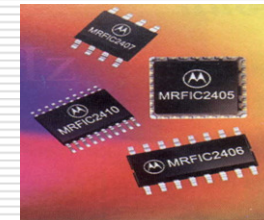


Foundry :

WIN, AWSC,
GCS



Wireless
Communication



IC Package & Testing



2018-2021 Q3 Financial Result

| | 2021 Q1-Q3 | % | 2020 | % | 2019 | % | 2018 | % |
|------------------|---------------|---------|-----------|---------|-----------|---------|-----------|---------|
| Revenue | 2,732,678 | 100.00% | 2,645,003 | 100.00% | 2,530,909 | 100.00% | 2,062,120 | 100.00% |
| Gross margin | 1,172,451 | 42.90% | 1,114,404 | 42.13% | 1,034,272 | 40.87% | 774,359 | 37.55% |
| Operating Profit | 830,602 | 30.40% | 687,515 | 25.99% | 648,983 | 25.64% | 463,906 | 22.50% |
| Financial Income | -19,391 | -0.71% | -40,212 | -1.52% | -20,380 | -0.81% | 25,273 | 1.23% |
| Tax | -147,921 | -5.41% | -114,715 | -4.34% | -114,278 | -4.52% | -92,009 | -4.46% |
| Net income | 663,290 | 24.27% | 532,588 | 20.14% | 514,325 | 20.32% | 397,170 | 19.26% |
| EPS | 3.59 | | 2.88 | | 2.79 | | 2.16 | |



2021 Outlook

5G mobile phone penetration rate



WiFi6 & WiFi6E



IoT Smart Link



Microelectronics

Automotive PA



5G millimeter wave base station PA



Defense industry



Low-orbit satellite LNA





2021 Outlook

5G Base station infrastructure

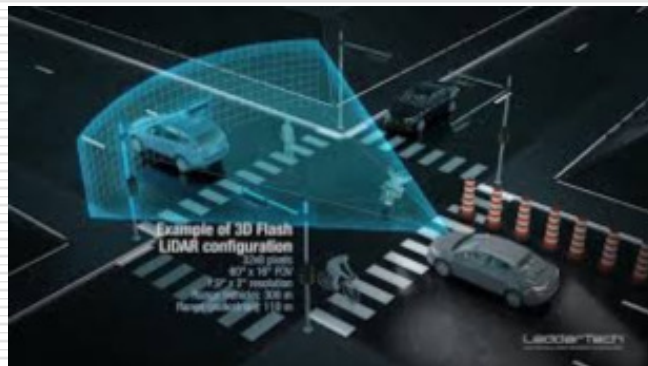


3D Sensing



Optoelectronics

LiDAR for vehicles



智慧機器視覺

