



Company Profile

World-class leading edge with MOCVD

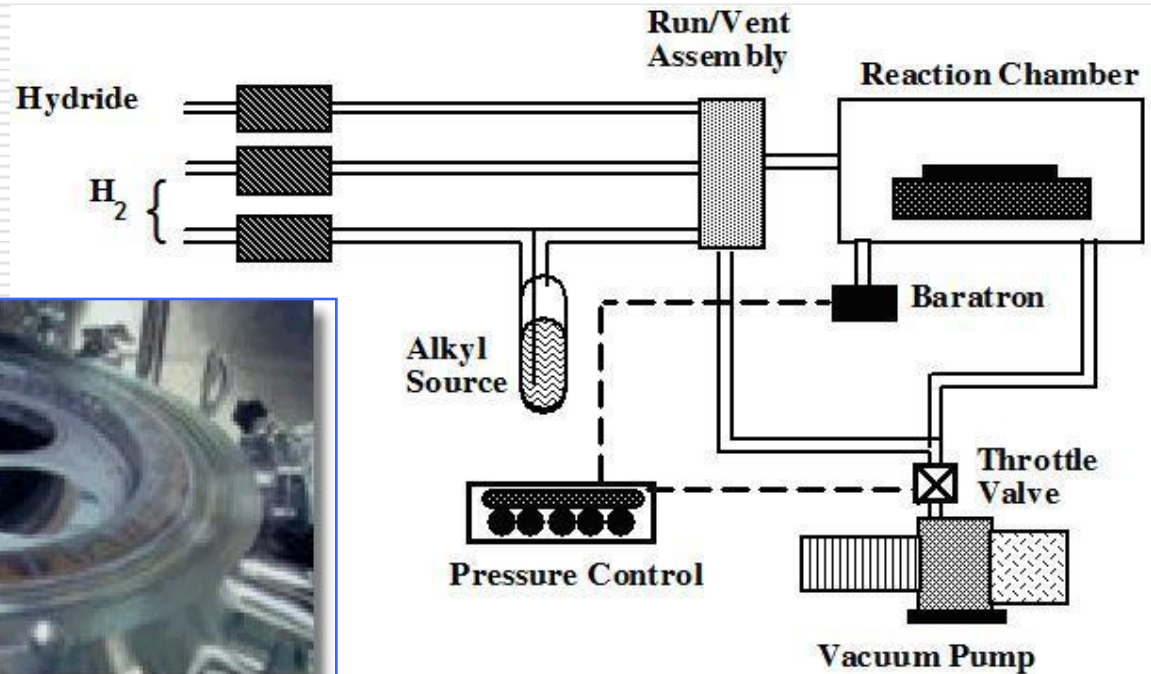




Core Technology

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.

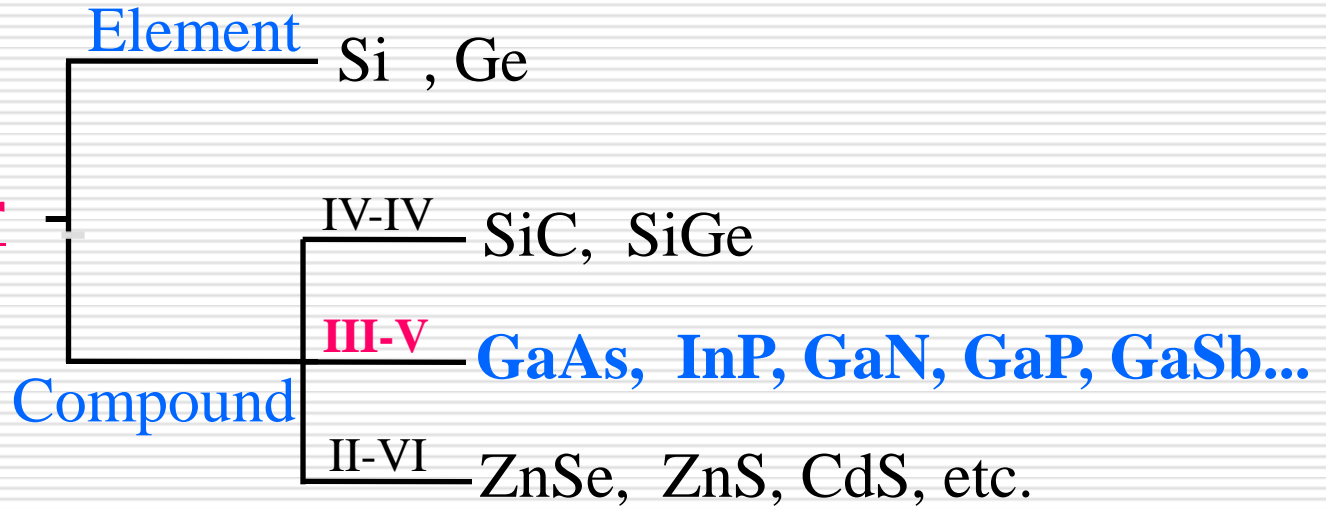
Production
Principle

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)

Semiconductor



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.

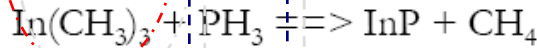
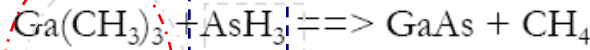
四元化合物 Quaternary : AlGaInP, InGaAsP, etc.

五元化合物 Pentanary : AlGaInAsN, etc.



Chemical Reaction During Epitaxy

化學反應式：



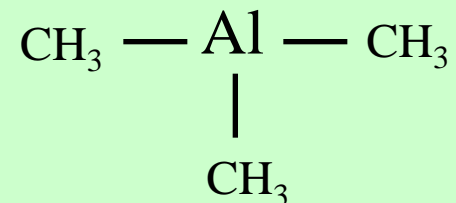
主要原物料：

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

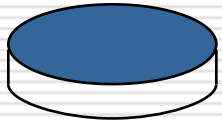
適用於微電子產品—HBT、pHEMT、BiHEMT、GaN on XX
光電子產品—PIN (PD、APD)、VCSEL、LD



GaAs in Wireless Communication Supply Chain

Sumitomo, Freiberg, AXT

2~6 "GaAs Substrate



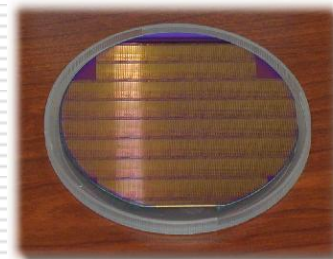
GaAs Epi- Wafer
磊晶片



IDM : Qorvo, Skyworks

Fabless : Avago,
Qualcomm, Richwave,

Microelectronics
IC Process

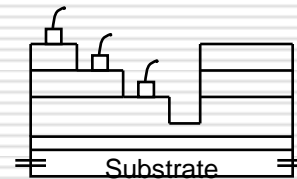
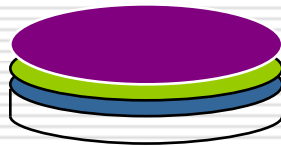


Wireless
Communication



MOCVD Reactor

VPEC is a Pure
Epi Provider



Foundry :
WIN, AWSC



IC Package & Testing



2020-2023H1 Financial Result

	2023H1	%	2022	%	2021	%	2020	%
Revenue	988,740	100.00%	2,603,629	100.00%	3,608,521	100.00%	2,645,003	100.00%
Gross margin	389,816	39.43%	1,089,007	41.83%	1,519,713	42.11%	1,114,404	42.13%
Operating Profit	116,895	11.82%	579,950	22.27%	1,056,519	29.28%	687,515	25.99%
Non-operating income & expense	9,706	0.98%	87,533	3.36%	-3,842	-0.11%	-40,212	-1.52%
Tax	-8,692	-0.88%	-122,755	-4.71%	-197,596	-5.48%	-114,715	-4.34%
Net income	117,909	11.93%	544,728	20.92%	855,081	23.70%	532,588	20.14%
EPS	0.64		2.95		4.62		2.88	



2023 Outlook-Microelectronics

5G Mobile Penetration



WiFi6/6E and WiFi7 (Developing)



IoT Smart Link



Micro Electronics

V2X PA



LEO Satellite



5G Base Station



Military



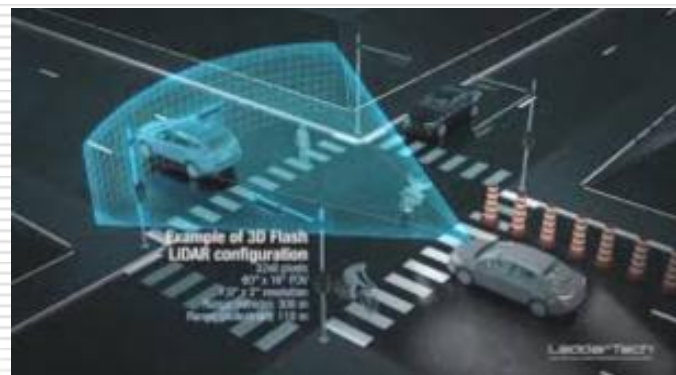


2023 Outlook-Optoelectronics

AR / VR Sensing (VCSEL/PD)



Car LiDAR (LD/PD)



Opto
electron
ics

Data Center Communication (PD/VCSEL)



Special Heat/IR Imaging (SWIR PD)



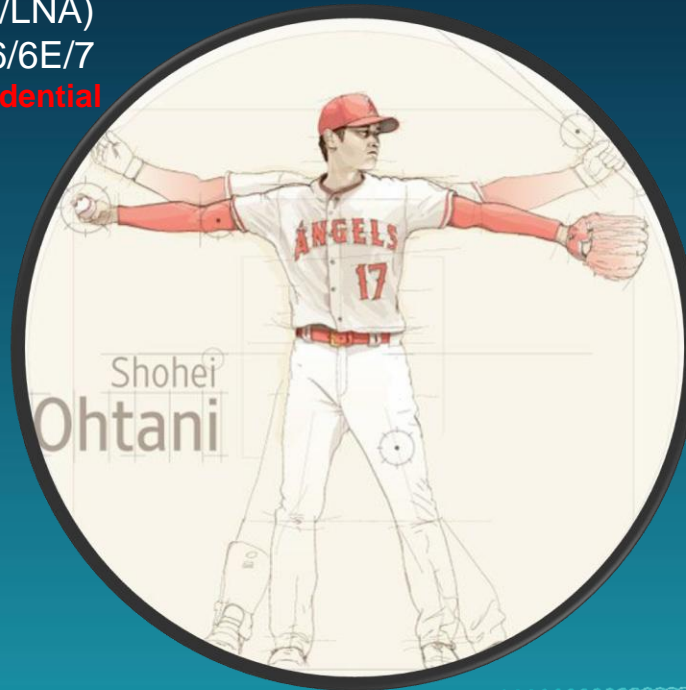
AR / VR

Emitter: VCSEL
Detector: PD
Eye-safety

Wireless

HBT (PA)
pHEMT (Switch/LNA)
WiFi 6/6E/7

VPEC Proprietary and Confidential



LiDAR Turnkey Solution

Emitter: VCSEL, EEL
Detector: GaAs PIN, APD
Eye-safety (1400nm ~ 1600nm)
Long Range Detection (400m)

V2X

HBT (PA)
pHEMT (Switch/LNA)
WiFi 6/6E/7

