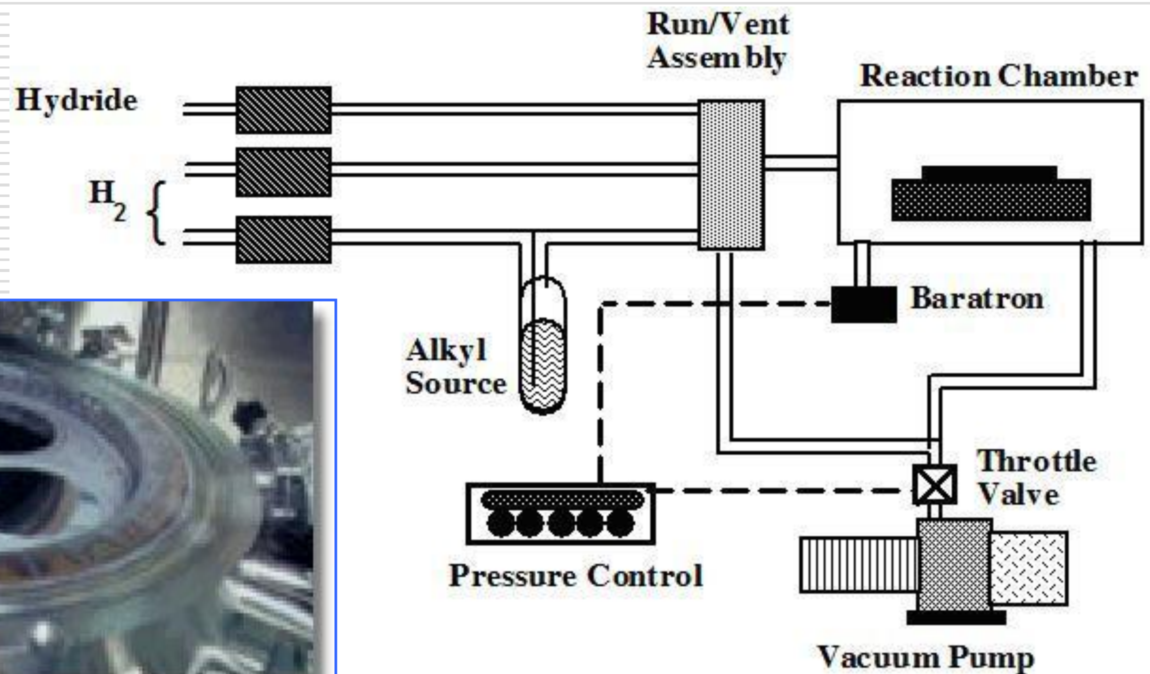
公司簡介

MOCVD創造世界級之競爭力

核心技術

MOCVD（有機金屬氣相沉積法）

- Metal Organic Chemical Vapor Deposition



核心技術

生產機台

MOCVD有機金屬化學氣相沉積法

Metal Organic Chemical Vapor Deposition

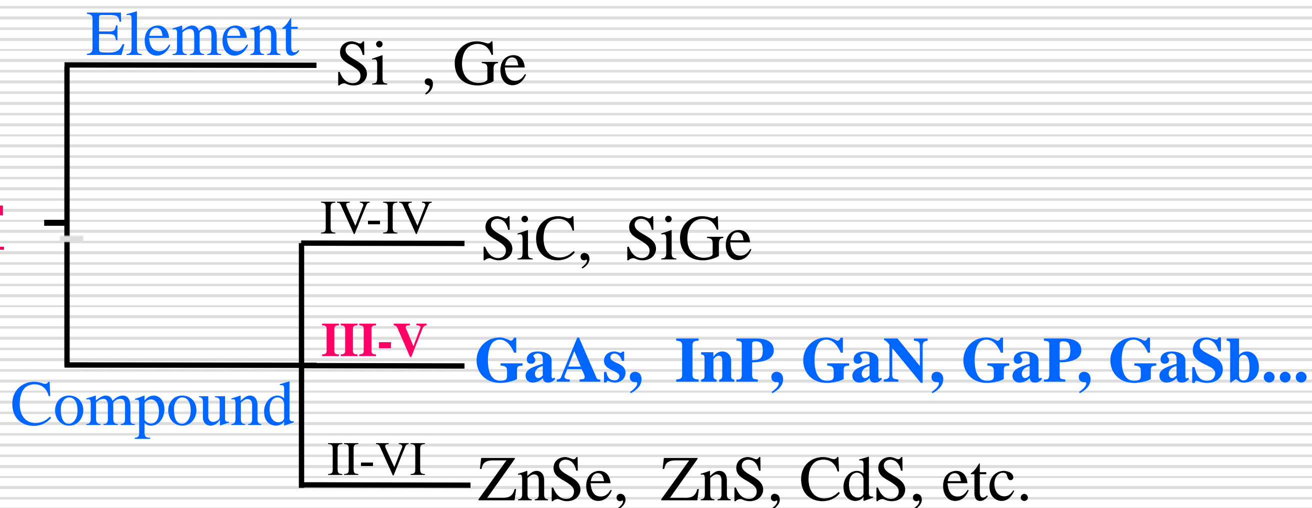
生產方式

透過有機金屬化學氣相沉積法，在基板上生長半導體薄膜的方式，同時透過機台即時監控，精確控制磊晶層，完成砷化鎵、磷化銦、氮化鎵等不同產品磊晶片生產。

生產原理

磊晶層是由MOCVD在腔體中加熱基板，一個原子層，層層堆疊，行成磊晶層。

半導體分類（依使用材料）



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 鉈 Thallium	Pb 鉛 Lead		

二元化合物 Binary : GaAs, InP, GaP,GaN, etc.

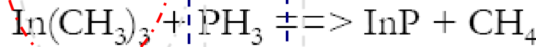
三元化合物 Ternary : InGaAs, InGaP, AlGaAs, etc.

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

五元化合物 Pentanary : AlGaInAsN, etc.

磊晶過程中之化學反應

化學反應式：



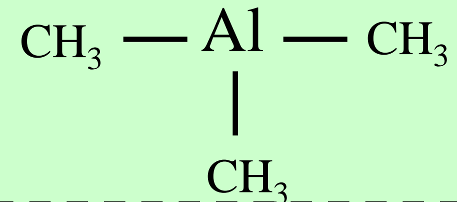
主要原物料:

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

TEAl : Tri-ethyl-Aluminum (C_2H5)$_3$Al
TMGa : Tri-Methyl-Gallium (CH_3)$_3$ Ga
TMIn : Tri-Methyl-Indium (CH3)$_3$In
DETe : Di-ethyl-Tellurium (C_2H5)$_2$Te
DEZn : Di-ethyl-Zinc (C_2H5)$_2$Zn
CP_2Mg : Bis (cyclo-penta-dienyl) Magnesium 環戊二烯鎂

AsH_3 : Arsine
PH_3 : Phosphine
SiH_4 : Silane
Si_2H_6 : Disiline
H_2Se : Hydrogen Selenide
CBr_4 : Carbon Tetrabromide

TMAl Tri - Methyl - Aluminum (CH_3)$_3$Al
三 甲基 鋁



化合物半導體材料特性

1. High Electron Mobility高電子移動速率(5.7x higher than CM0S)
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

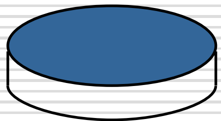
適用於**微電子產品**－HBT、pHEMT、BiHEMT、GaN on XX

光電子產品－ PIN（PD、APD）、VCSEL、LD、SC

微電子產品 產業供應鏈

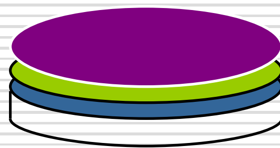
Sumitomo, Freiberg, AXT

2~6 ”GaAs Substrate



GaAs Epi- Wafer
磊晶片

MOCVD Reactor

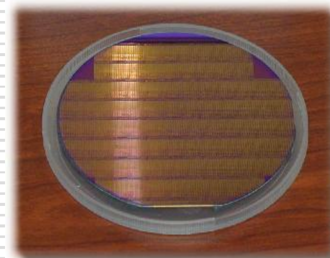


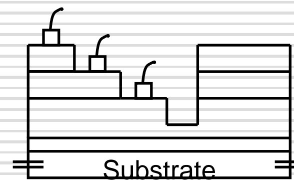
VPEC is a Pure Epi Provider

IDM：Qorvo, Skyworks

Fabless ：Avago, Qualcomm, Richwave,

Microelectronics IC Process





Foundry：

WIN, AWSC

Wireless Communication

IC Package & Testing

2020年-2023年損益情形

	2023	%	2022	%	2021	%	2020	%
Revenue	2,694,104	100.00%	2,603,629	100.00%	3,608,521	100.00%	2,645,003	100.00%
Gross margin	1,108,914	41.16%	1,089,007	41.83%	1,519,713	42.11%	1,114,404	42.13%
Operating Profit	542,069	20.12%	579,950	22.27%	1,056,519	29.28%	687,515	25.99%
Non-operating income & expense	-347	-0.01%	87,533	3.36%	-3,842	-0.11%	-40,212	-1.52%
Tax	-91,490	-3.40%	-122,755	-4.71%	-197,596	-5.48%	-114,715	-4.34%
Net income	450,232	16.71%	544,728	20.92%	855,081	23.70%	532,588	20.14%
EPS	2.43		2.95		4.62		2.88	

2024 Outlook

微電子產品

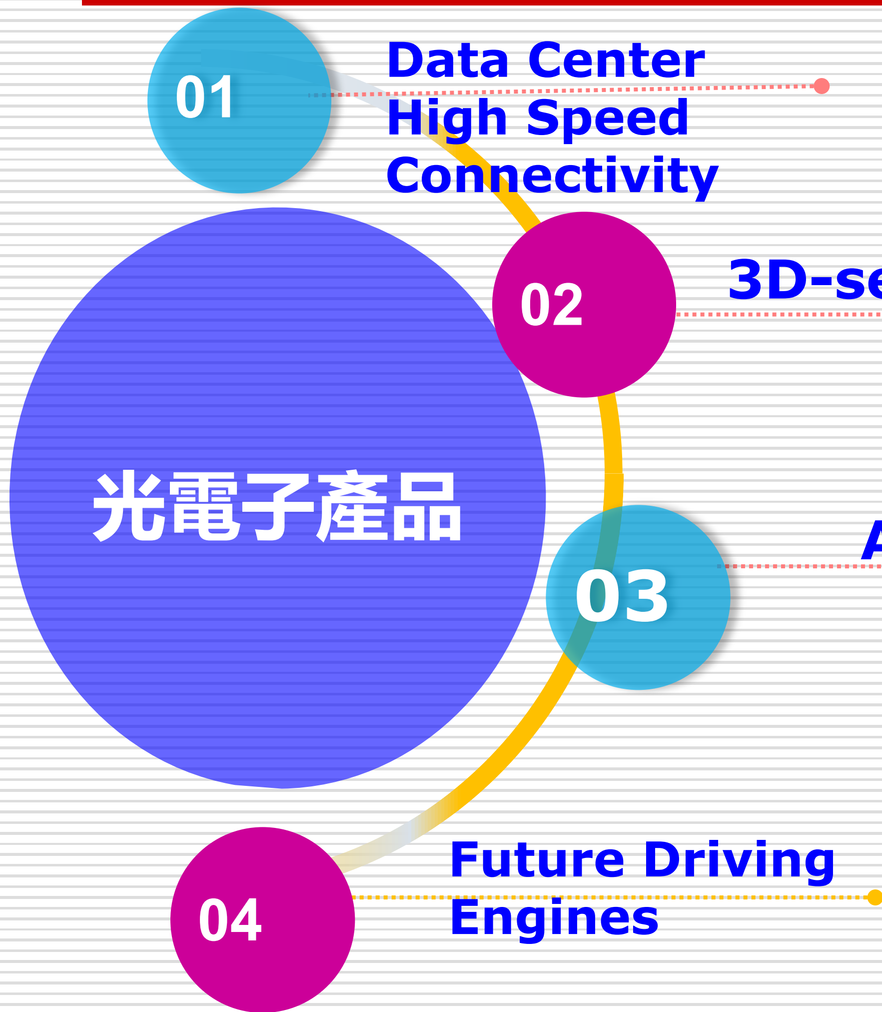
01 **5G Mobile Penetration**

02 **WiFi 7**

03 **V2X**

04 **IoT Smart Link (4G PA)**

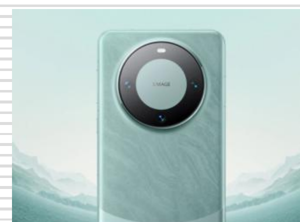
2024 Outlook



Data Center High Speed Connectivity

PD for 800G
VCSEL for 400G

3D-sening



VCSEL / PD

AR/VR

VCSEL

Future Driving Engines

VCSEL for 800G

LEO Solar Cell

3D Sensing & ToF

Car LiDAR (LD/PD)