

FA CONTROL SYSTEM

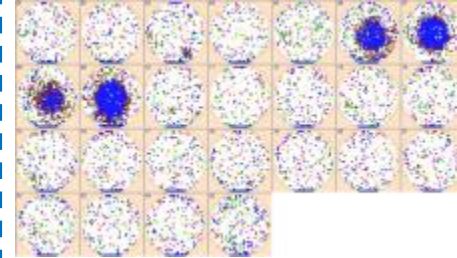
Quality Assurance
Quality & Reliability Assurance

FA PROCESS

▶ Corrective Action Feed back

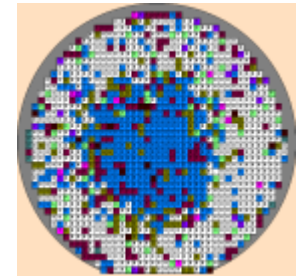
▪ Lot

- Yield drop of random fail
- Specific area fail
- Same fail category



▪ Wafer

- Specific area fail
- Same fail category but different Lots



▪ RMA

- Customer Returns

Detail rule will be defined for Novatek product

Failure Analysis Process

Define

- Probe Failure Category & Map Pattern Check
- Inline Measurement Data & Defects Check

Fault Isolation

- DC Test (EPM Full Map Test, HP4155 Test)
- PHEMOS Test (EMMI, InGaAs, OBIRCH, THEMOS)

De-Processing

- RIE & Wet Etching
- Polishing

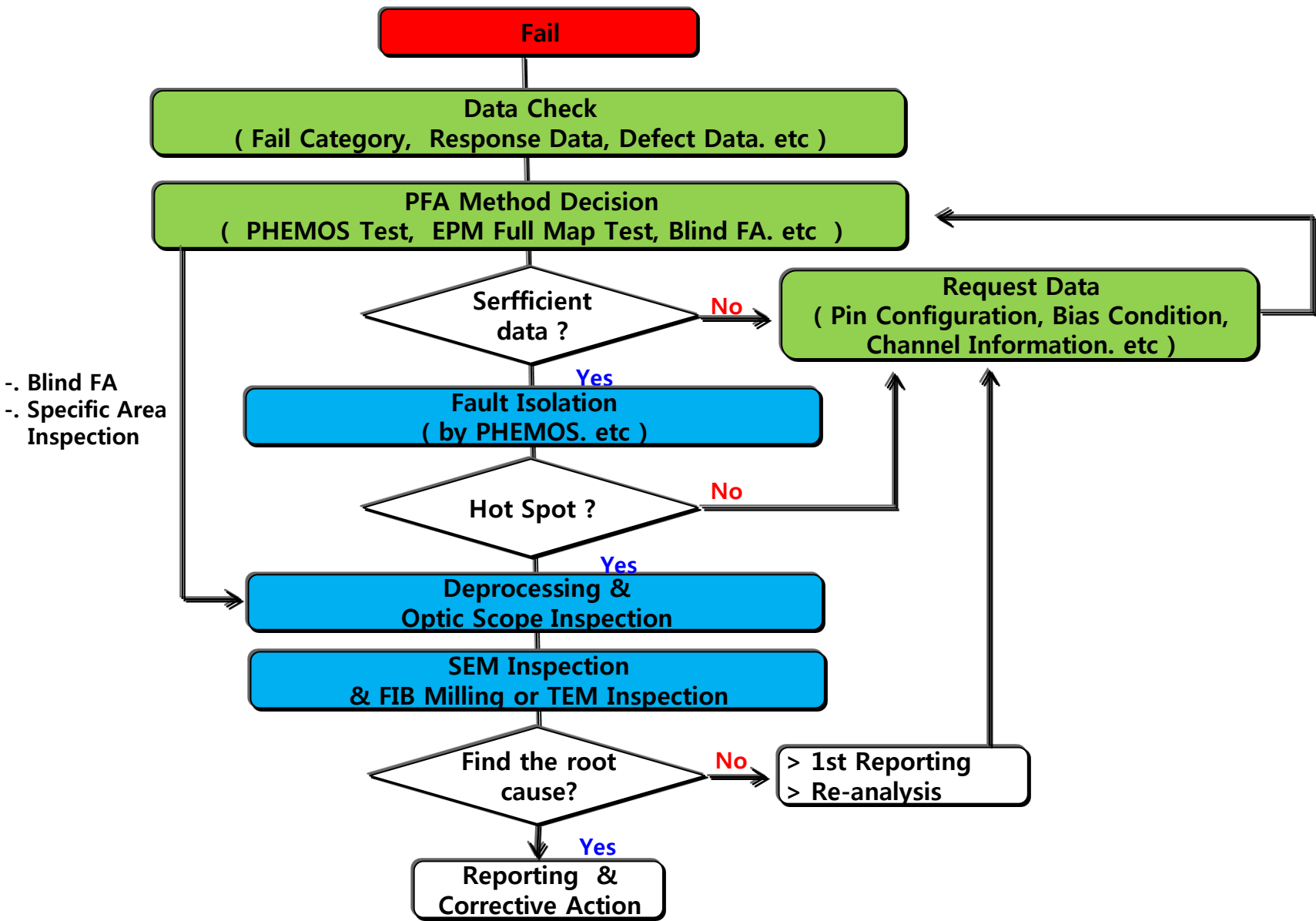
Inspection

- Optic Scope , SEM, FIB, TEM
- EDS, SIMS, AES

Corrective Action

- Results Feedback
- Corrective Action with Process Team

Failure Analysis Flow



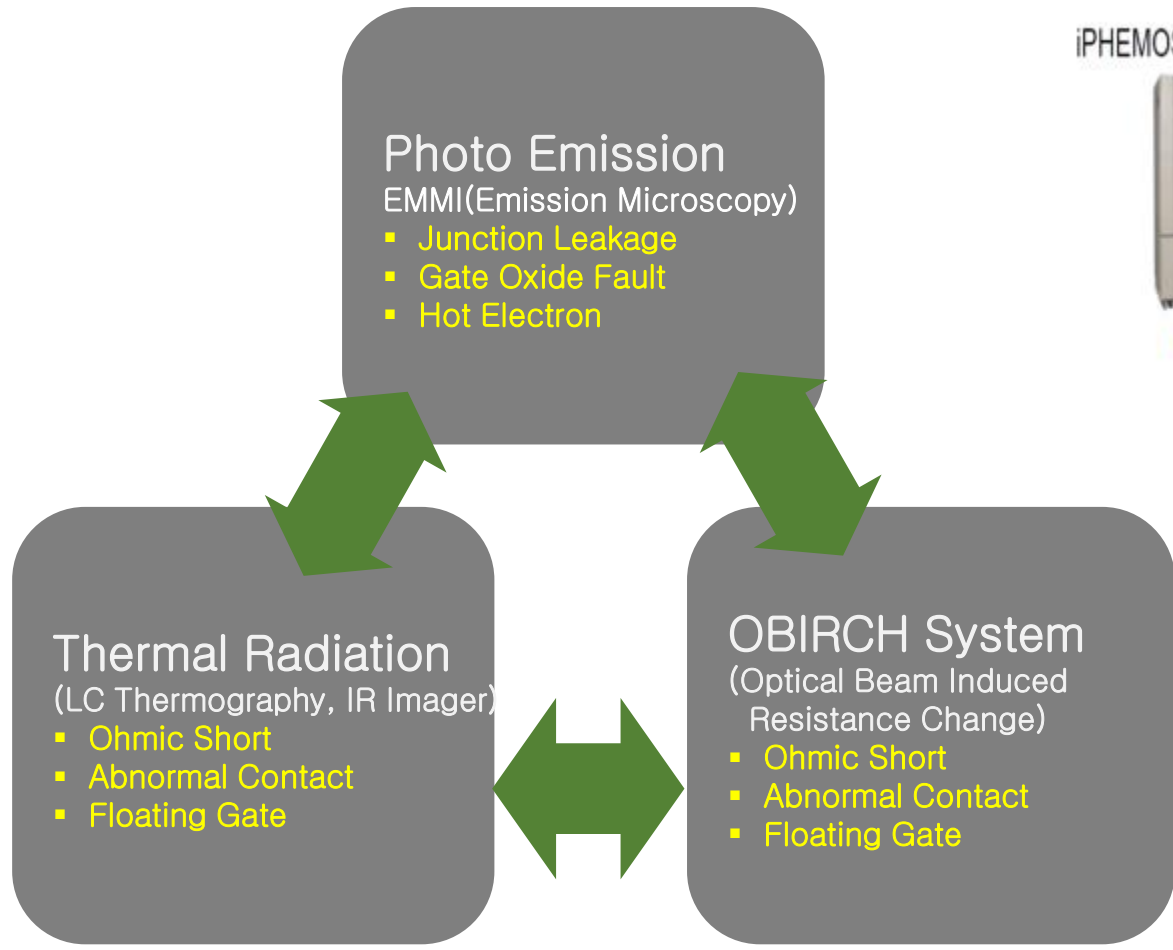
Failure Analysis Equipments

Analysis Type	Equipment	Model	Maker	Location
Physical Analysis	SEM	S-5000	HITACHI	SKHYSI
		S-5500		
	FIB	Helios 1200	FEI	Cheongju
		Helios 450		
	STEM	HD-2300A	HITACHI	Cheongju
		FB-2100		
TEM	JEM-ARM200F	JEOL	Cheongju	
Electrical Analysis	TLP Measurement	HP 4155	HP	Cheongju
		Agilent-1500B	Agilent	
	Photon Emission Micro Scope	PHEMOS-2000	HAMAMATSU	Cheongju
	Nano-Probe			Icheon

PHEMOS-2000 : EMMI / InGaAs / OBIRCH

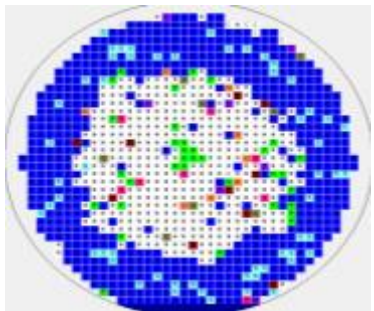
Fault Isolation Tools

▶ Emission Equipment

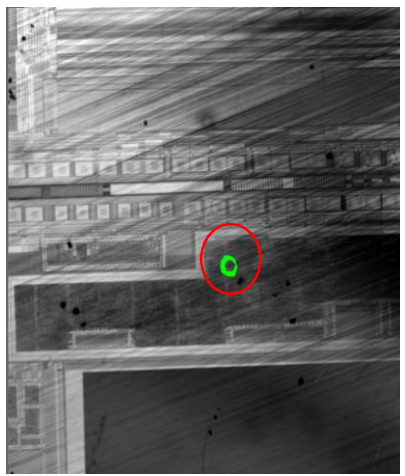


Example Of Photo Emission

▶ Tester link with EMMI for IDD failure

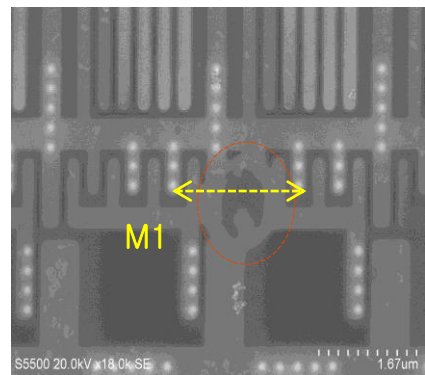


PROBE MAP
(IDD Fail)

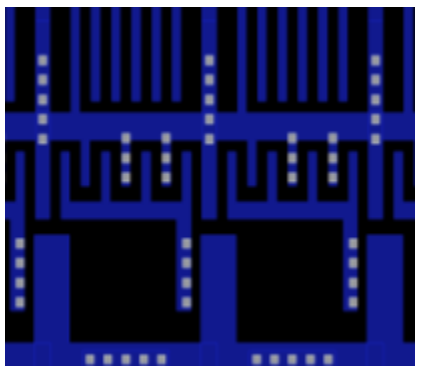


Emission image
CCD/InGaAs
Bias : 1.8V/Vdd
GND/Vss

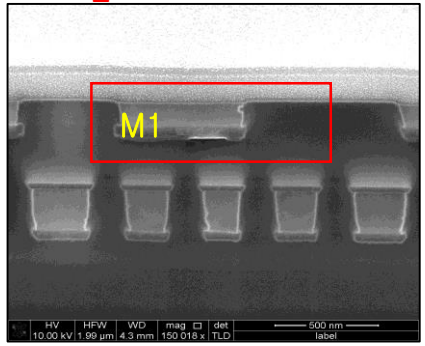
Fail_M1 Bridging



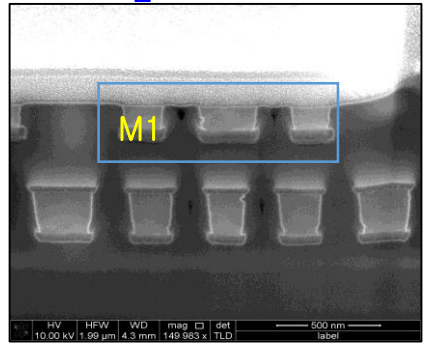
Layout



Fail_CROSS SECTION



Normal_CROSS SETION



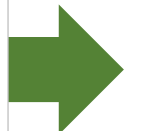
De-Processing (PKG & Wafer)

- ▶ De-Processing equipment
 - chemical decap / grinding decap



Plasma Etcher (RIE-10NR) Plasma Etcher (RIE-300NR)

Dry Etcher
(Removal PIQ & Passivation layer)



WET Station

Chemical Decap



Microscope



Polishing Grinder

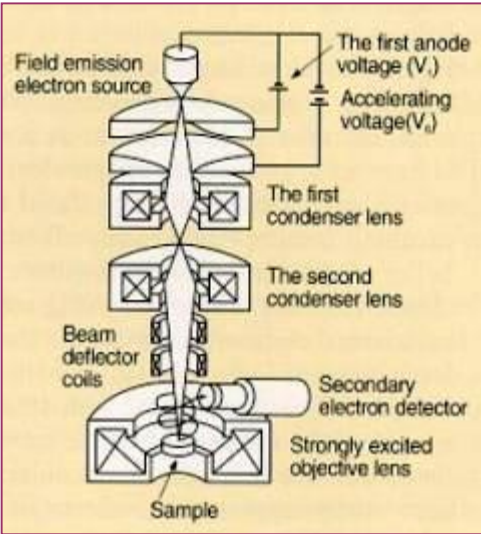
Grinding Decap



Inspection tool

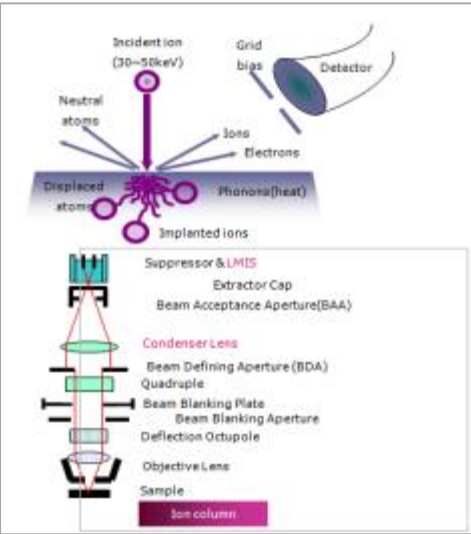
SEM

(Scanning Electron Microscopy)



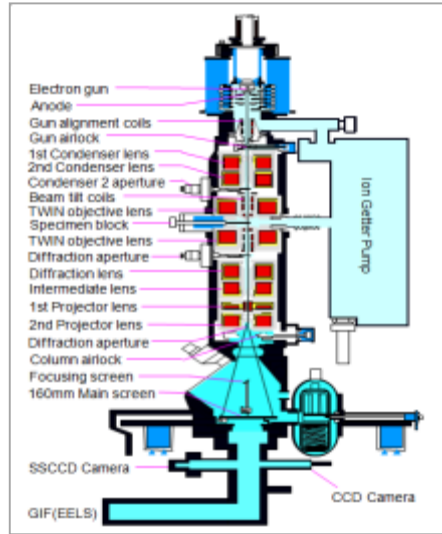
FIB

(Focused ION Beam)



TEM

(Transmission Electron Microscope)



Physical and chemical Analysis Tools



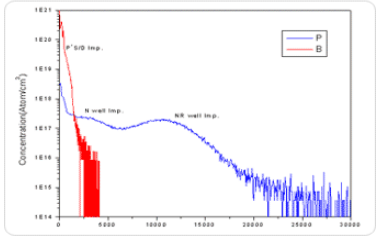
SIMS



TOF-SIMS



WF-SIMS



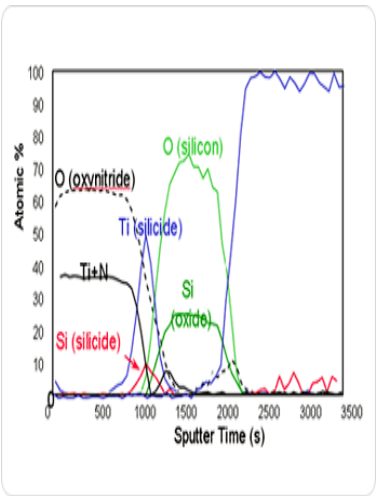
SIMS
Sputtering Ionized particle Mass



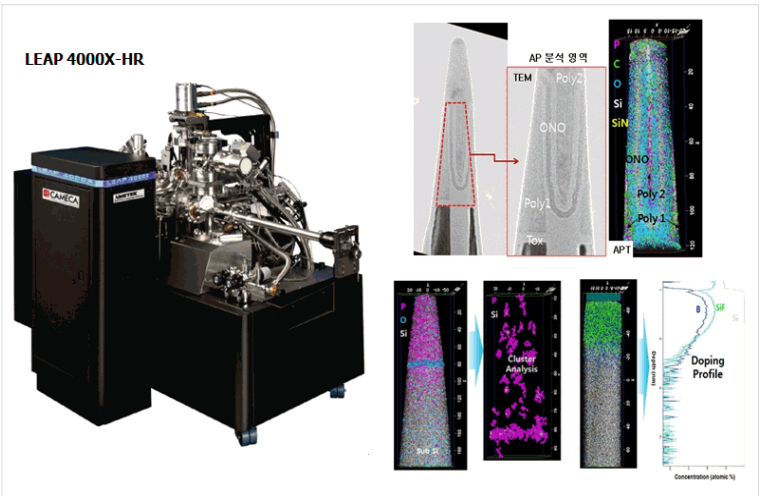
AFM
Atomic Force Microscopy



AES



AES
Auger Electron Sputter



APT

EoD