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Reverse Costing analysis

Power Integrations Inc – LXA20T600
Qspeed™ 600V 20A
low Q_{RR} Diode

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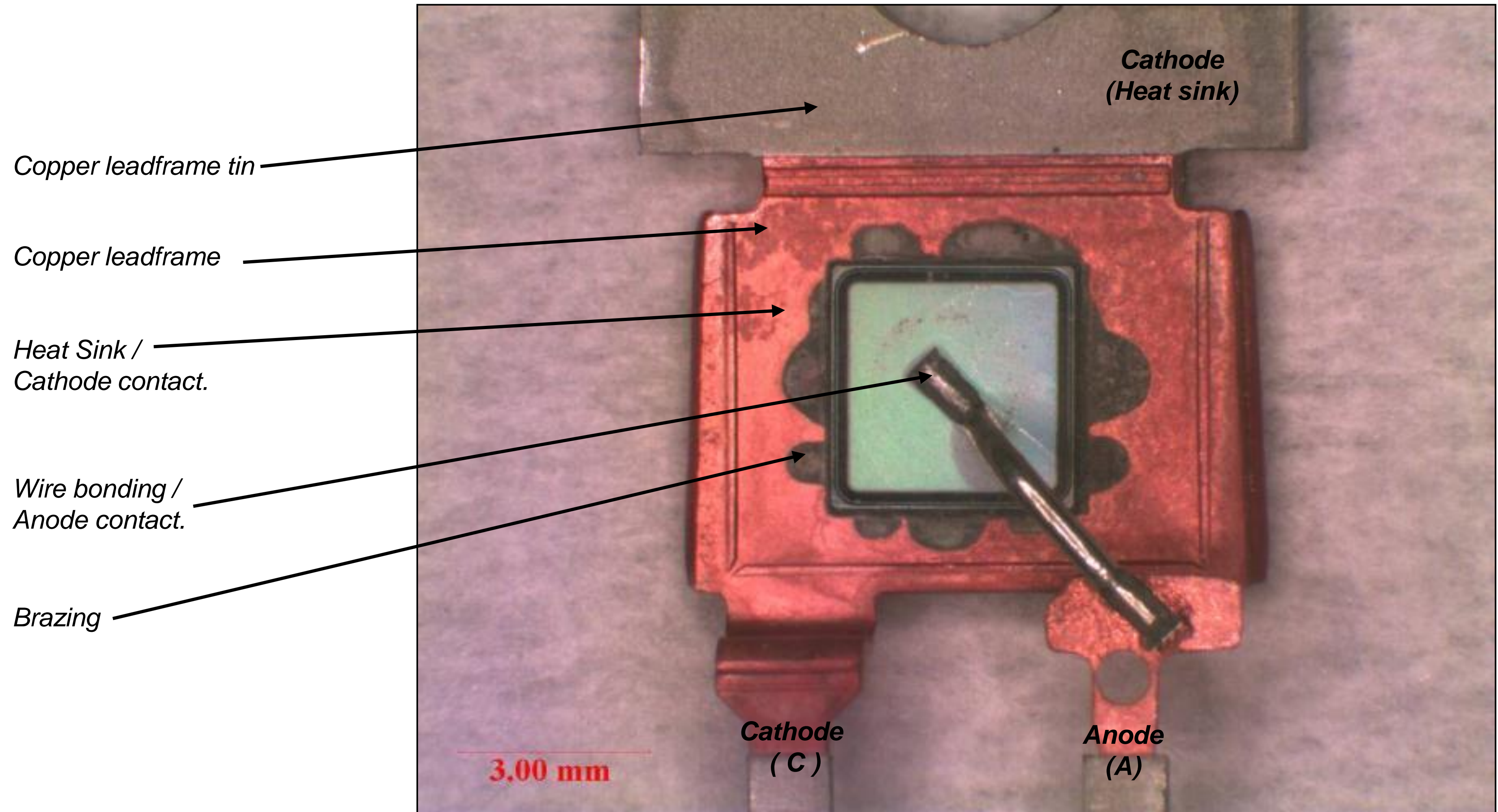
Package opening

Optical view : Package opening.



The die is connected to the package using : 1 bonding of 470µm diameter (Anode contact),

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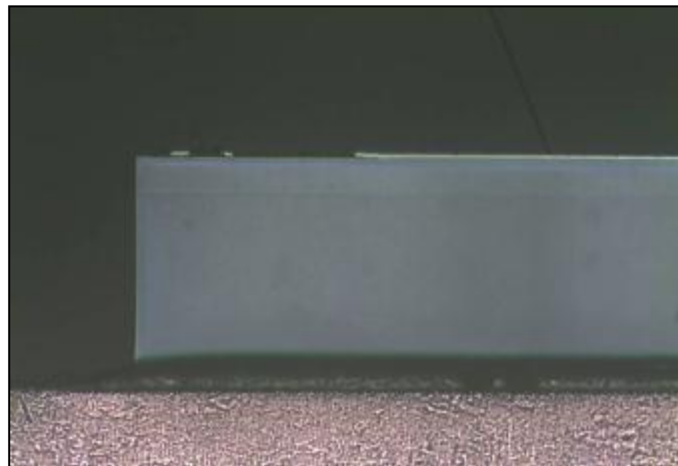
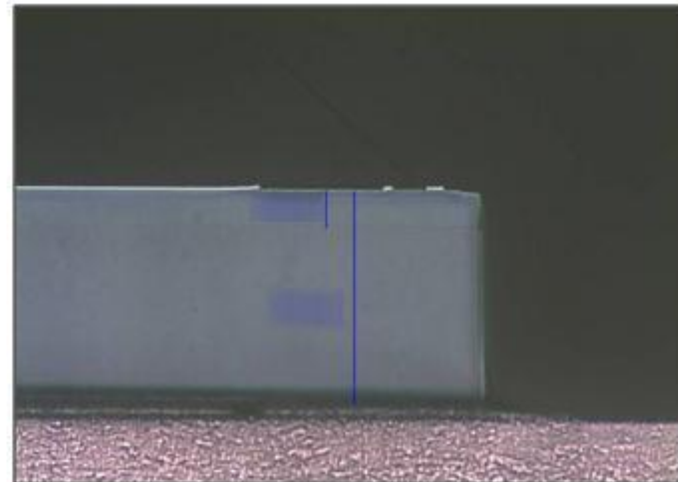
Epitaxy Layer

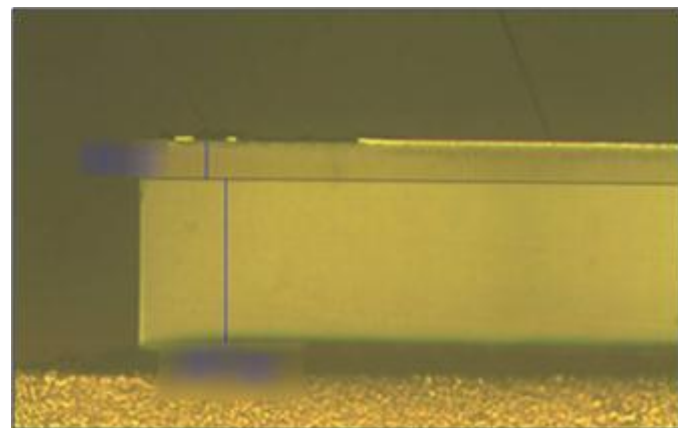


Optical view : die cross-section before the doping revelation. The epitaxy layer of XXµm is displayed.

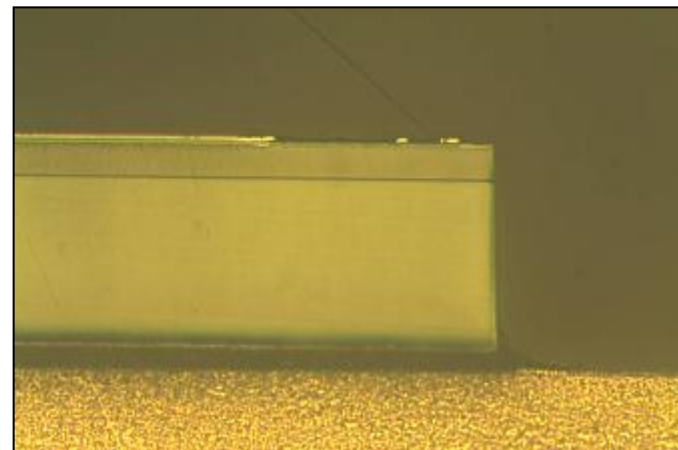


A epitaxy layer of XXµm is deposited on the substrat. The substrat is probably heavily doped and the epitaxy layer is the drift zone. Generally the epitaxy layers have at least 60µm of thickness for a breakdown voltage of 600V.

The trenches and the P implantation at the surface increase the breakdown voltage.



Optical view : die cross-section after the doping revelation. The epitaxy layer is displayed. The surface doping are equally displayed.



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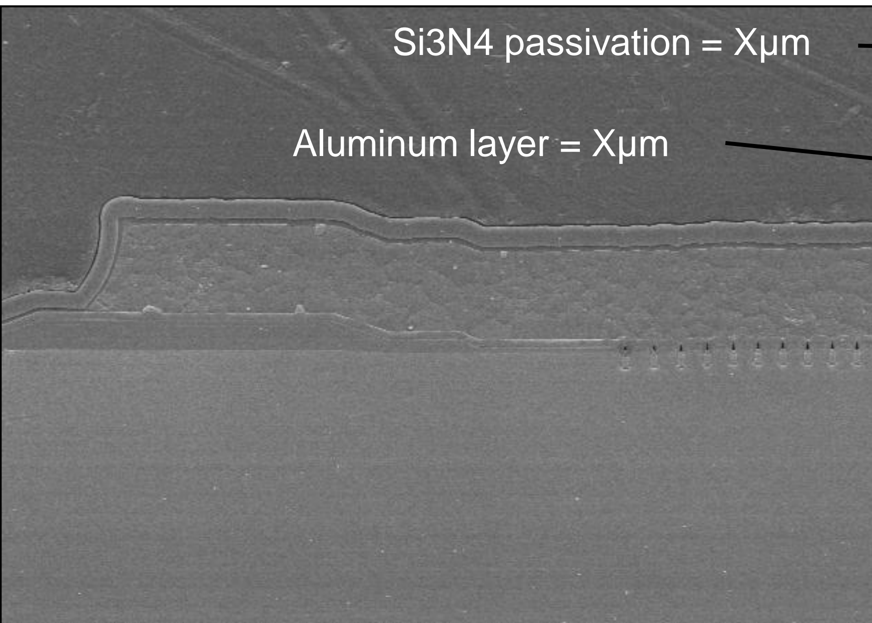
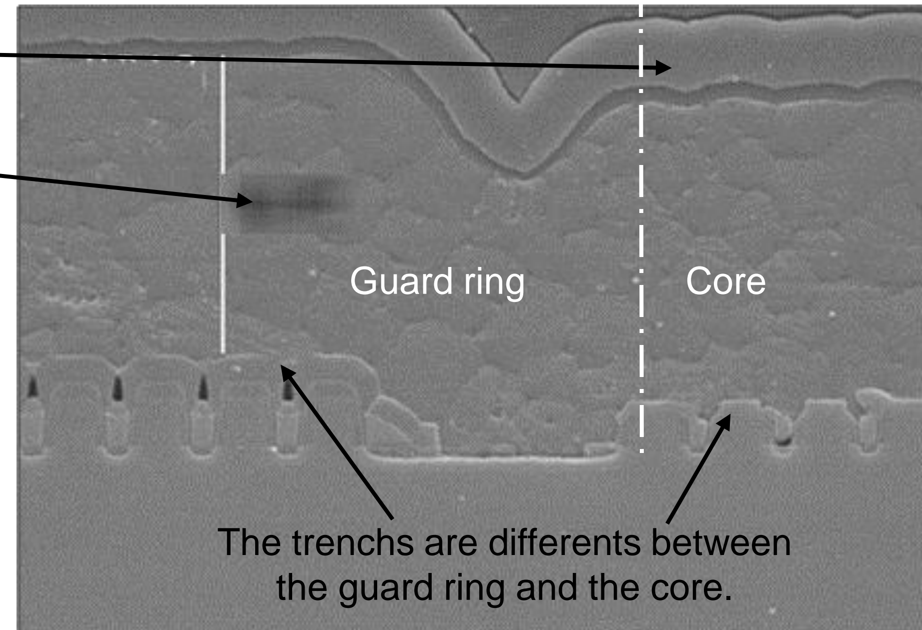
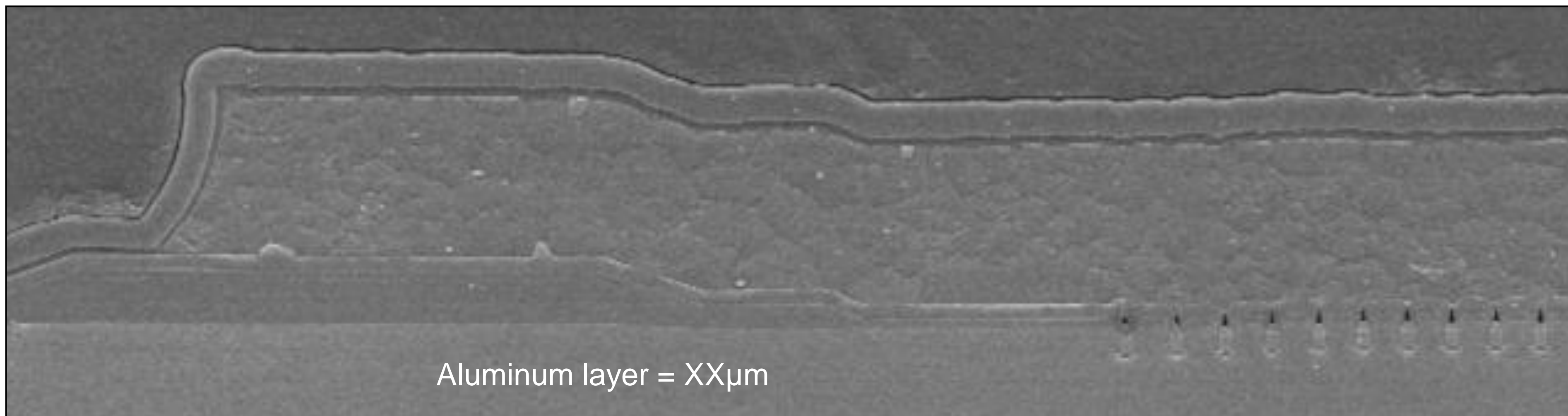
Guard Ring Details





SEM view : detail of the guard ring cross section



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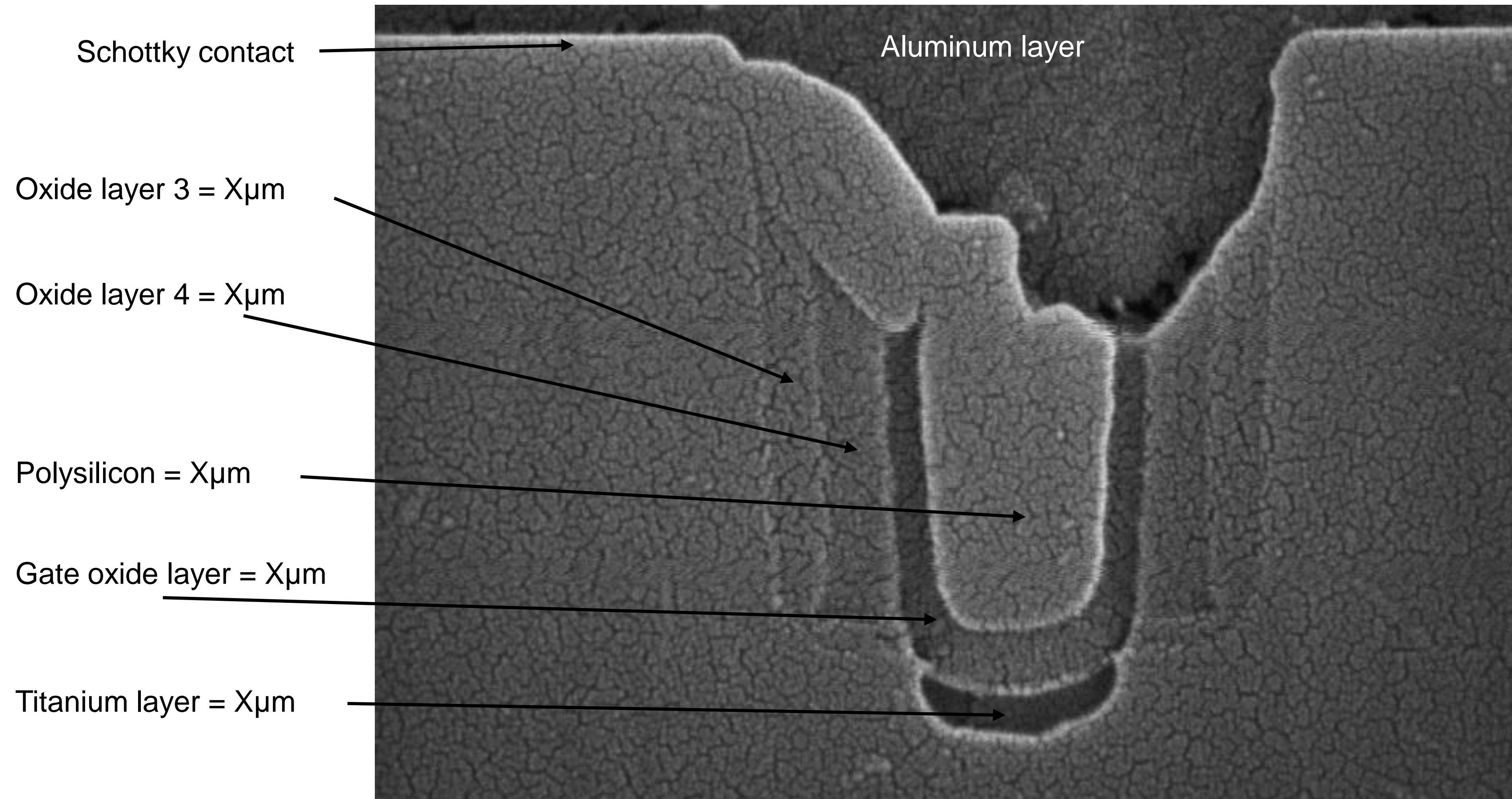
Control Gate Trench



SEM view : detail of the Control Gate trench

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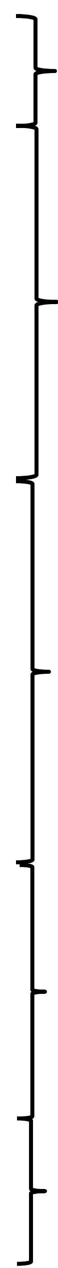
Process Flow (1/3)



Diode Unprobed Wafer Cost

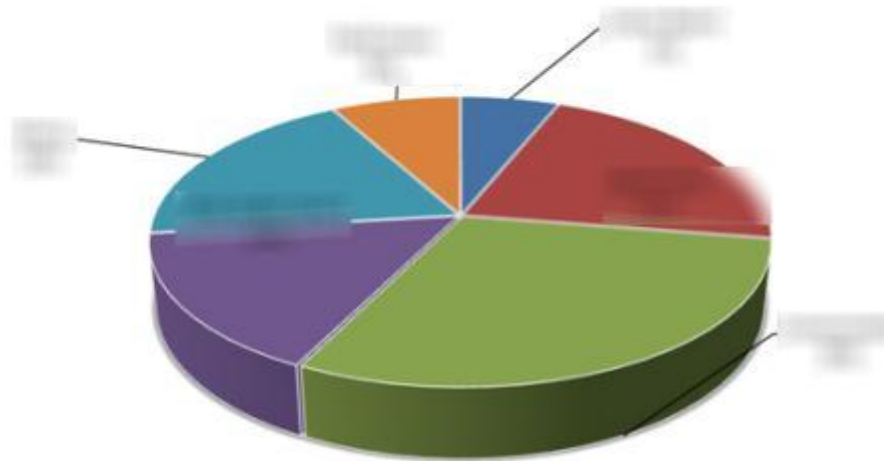
	Low Yield		Medium Yield		High Yield	
	Cost	Breakdown	Cost	Breakdown	Cost	Breakdown
Clean Room	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Equipment	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Consumable	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Raw wafer (SiC 4")	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Salary	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Yield losses	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TOTAL	[illegible]		[illegible]		[illegible]	
Fab Yield	[illegible]		[illegible]		[illegible]	

- The main part of the wafer cost is due to the raw wafer (XX.X%).

- The manufacturing yield is around XX% in 2011.

Details of the cost per step are given in the Excel Spreadsheet

Diode Wafer Cost Breakdown - Medium Yield



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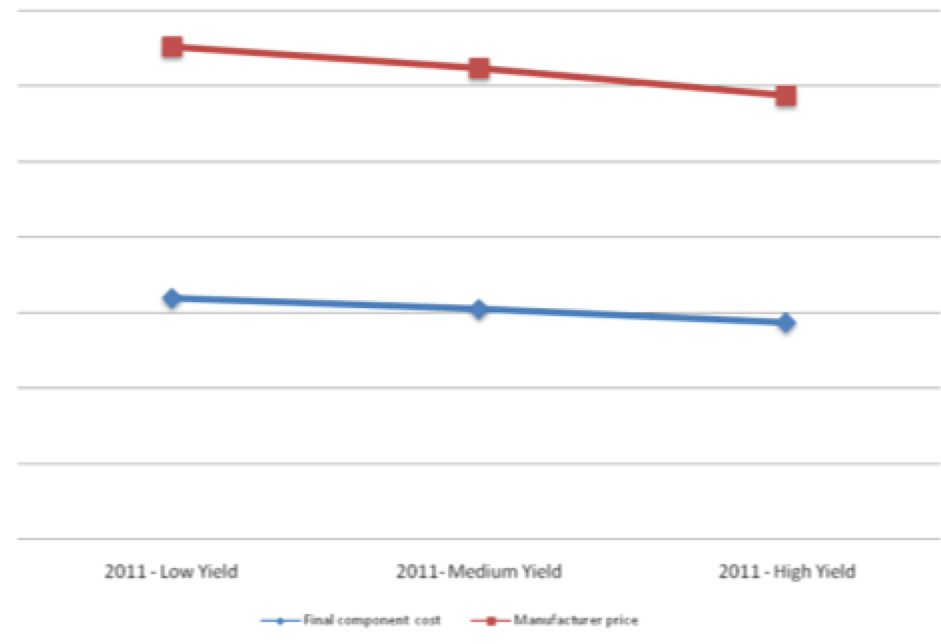
Selling Price

	Final component cost	Floor price	Manufacturer price
2011 - Low Yield	[illegible]	[illegible]	[illegible]
2011 - Medium Yield	[illegible]	[illegible]	[illegible]
2011 - High Yield	[illegible]	[illegible]	[illegible]

Note: These calculated selling prices are for large quantities purchased directly from Power Integration Inc.



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