GaAs Substrate

Gallium Arsenide (GaAs) is a direct bandgap semiconductor material and can be used to make devices with exceptional properties such as high electron mobility, high frequency with less noise, and high conversion efficiency. In the optoelectronics field, GaAs is used in the manufacturing of LD (Laser Diode), LED (Light Emitting Diode), and photovoltaic devices. In the RF field, GaAs is used in manufacturing of HBT (Heterojunction Bipolar Transistor), MESFET (Metal Semiconductor Field-effect Transistor), and HEMT (High Electron Mobility Transistor).

Vital Materials produces 2" to 6" GaAs substrates with VGF technology, including semi-insulating GaAs substrates and semiconducting GaAs substrates (Si or Zn doped). Low EPD GaAs substrates for VCSEL and specialty RF applications are also available. GaAs substrates with non-standard thicknesses and wafer orientations are available upon request.

	Unit	LD Applications Specifications	LED Applications Specifications		RF Specifications
Conduct Type		n-type	p-type / n-type		-
Crystal Growth Method		VGF	VGF		VGF
Dopant		Si	Si	Zn	Undoped / C
Dimension	inch	2", 3", 4" and 6"	2", 3", 4" and 6"		2", 3", 4"and 6"
Wafer Orientation*		(100) ±0.1°	(100) ±0.5°		(100) ±0.5°
OF/IF		US, EJ or notch	US, EJ or notch		US, EJ or notch
Carrier Concentration	/cm^3	(0.4-2.5) ×10^{18}	(0.5-5) ×10^{19}	(0.4-4)×10^{18}	
Resistivity (at RT)	ohm.cm	-	-		>10^7
Mobility	cm^2/v.s	>1500	>1000	50-120	>4000
Etch Pit Density (EPD)	/cm^2	<500	<5000		<5000
Laser Marking		Upon request	Upon request		Upon request
Thickness*	μm	(350-675) ±25	(350-675) ±25		(350-675) ±25
TTV (P/P)	μm	≤5	≤5		≤5
TTV (P/E)	μm	≤10	≤10		≤10
Warp	μm	≤10	≤10		≤10
Surface	Side1 Side2	Polished Polished/Etched	Polished Polished/Etched		Polished Polished/Etched
Epi-ready		Yes	Yes		Yes
Package		Cassette or single wafer container	Cassette or single wafer container		Cassette or single wafer container

* Wafer Orientation and Thickness are available upon request

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