GALLIUM ARSENIDE IMPATT DIODES

Gallium Arsenide Impatt Diodes are available as flat profile, high low profile and low high low profile devices. These terms describe the doping profile in the active region of the device.

For high low and low high low profiles the avalanche region is more closely confined in the region of peak electric field. This reduces the ratio of avalanche region width to total drift region width and leads to an increase in efficiency.

Gallium Arsenide Impatt diodes are ideally suited for use as basic oscillators for communication systems. Many are also useful as intermediate or final stage amplifiers in either pulsed or CW modes with lower AM and FM noise compared to Silicon Impatts.

The following ranges of Gallium Arsenide Impatts indicate the devices currently available.

SPECIFICATIONS @ +25°C

CW DEVICES (FLAT PROFILE)

Type Number	Operating Frequency Range (GHz)	Output Power (W)		Efficiency (%)	Thermal Resist. (°C/W)	Operating Voltage (V)	Operating Current (mA)	Junction Capacitance (pF)	Case Style
		Min.	Typ.	Min.	Max.	Typ.	Typ.	Typ.	
ML4112	8.0 - 9.5	0.50	0.70	10	25	70	100	0.5	111, 91
ML4114	9.5 - 11.0	0.50	0.70	10	25	65	100	0.5	111, 91
ML4116	11.0 - 12.5	0.50	0.70	10	25	55	120	0.5	111, 91
ML4117	17.0 - 19.0	0.40	0.50	7	35	35	150	0.4	118, 275
ML4119	32.0 - 36.0	0.20	0.25	6	45	22	160	0.3	118, 275

CW DEVICES (HIGH-LOW PROFILE)

Type Number	Operating Frequency Range (GHz)	Output Power (W)		Efficiency (%)	Thermal Resist. (°C/W)	Operating Voltage (V)	Operating Current (mA)	Junction Capacitance (pF)	Case Style
		Min.	Typ.	Min.	Max.	Typ.	Typ.	Typ.	
ML4115A	9.0 - 11.0	2.00	2.20	17	12	55	250	1.7	111, 91
ML4116A	11.0 - 15.0	1.20	1.50	16	20	45	200	1.3	111, 91
ML4117A	15.0 - 18.0	1.00	1.20	15	25	35	200	1.0	118, 275
ML4118A	18.0 - 22.0	0.50	0.65	14	35	32	150	0.8	118, 275
ML4119A	22.0 - 28.0	0.40	0.45	11	40	27	150	0.7	118, 275
ML4120A	28.0 - 36.0	0.35	0.40	12	45	18	180	0.6	118

4.0 WATT CW DEVICES (LOW HIGH LOW PROFILE)

Type Number	Operating Frequency Range (GHz)	Output Power (W)		Efficiency (%)	Thermal Resist. (°C/W)	Operating Voltage Range (V)	Operating Current (mA)	Junction Capacitance (pF)		Case Style
		Min.	Typ.	Min.	Max.		Max.	Min.	Max.	
ML4141	6.0 - 8.0	4.0	4.5	20	11	60 - 75	375	16 - 24		111
ML4142	8.00 - 10.0	3.8	4.1	20	11	50 - 60	425	20 - 30		111
ML4143	10.0 - 12.0	3.8	4.1	20	11	40 - 50	500	20 - 30		111

PULSED DEVICES

Type Number	Operating Frequency Range (GHz)	Peak Output Power (W) Min.	Min. Efficiency (%) Min.	Thermal Resist. (°C/W) Max.	Operating Voltage (V) Typ.	Operating Current (mA) Typ.	Junction Capacitance (pF) Typ.	Case Style
ML4135B	9.0 - 11.0	12	17	7	70	1.0	4.8	111, 91
ML4136B	11.0 - 15.0	10	16	10	60	0.8	3.6	111, 91
ML4137B	15.0 - 18.0	6	15	12	50	0.8	3.0	275
ML4138B	18.0 - 22.0	5	14	15	40	0.8	2.4	275
ML4139B	22.0 - 28.0	3	11	19	35	0.7	2.0	275
ML4140B	28.0 - 36.0	1.5	12	25	30	0.65	1.5	275
ML46043 (2-chip)	8.5 - 10.0	25	16	5	100	1.5	2.5	274

NOTES

1. Package capacitance and inductance are shown with the case style drawing at the rear of this catalogue.
   Available case styles:

CASE STYLE	PACKAGE DESCRIPTION	CASE STYLE	PACKAGE DESCRIPTION
92	Ceramic-Metal Double Pronged	274	Ceramic-Metal Stud
111	Ceramic-Metal Stud	275	Ceramic-Metal Stud

   Alternative case styles are available on request.

2. These diodes will deliver at least the minimum specified output power into a critically coupled load at a customer specified frequency in the indicated range.
3. Thermal resistance is obtained by measuring the change in breakdown voltage with d.c. current.
4. Junction capacitance is measured at 1.0MHz at (V_B -1) volts.
5. Efficiency = $\frac{RF\ Power\ Out}{DC\ Power\ In} x1$
6. Duty Cycle 15-30%; Pulse Width 1 to 5μS.