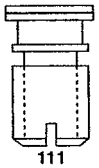
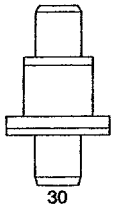
Gunn Diodes

V 2.00

Suggested Frequency Range (GHz)	Case Style	Part Number P_{OUT} 5 mW	Part Number P_{OUT} 10 mW	Page No.
Anode Heat Sink Diodes				
8 - 12	30	MA49618	MA49508	7 - 4
12 - 18	30	-	-	-
18 - 26	30	MA49499	MA49628	7 - 4
26 - 40	138	-	MA49191	7 - 3


111

Suggested Frequency Range (GHz)	Case Style	Part Number Anode Heat Sink Pulse 10 mW	Part Number Broadband Cathode Heat Sink 100 mW	Page No.
Anode Heat Sink Pulse and Broadband Diodes				
8 - 12	30	MA49870	-	7 - 5
8 - 12	148	-	MA49117	7 - 3
12 - 18	138	-	MA49126	7 - 3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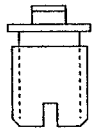

138/148

Suggested Frequency Range (GHz)	Case Style	Part Number P_{OUT} 10 mW	P_{OUT} 25 mW	P_{OUT} 50 mW	P_{OUT} 100 mW	P_{OUT} 250 mW	Page No.
Cathode Heat Sink Diodes							
5 - 8	30	-	MA49151	MA49152	MA49153	MA49154	7 - 2
5 - 8	111	-	MA49135	MA49136	MA49137	MA49138	7 - 2
8 - 12	30	-	MA49156	MA49157	MA49158	MA49159	7 - 2
8 - 12	111	-	MA49104	MA49106	MA49107	MA49109	7 - 2
12 - 18	30	-	MA49161	MA49162	MA49163	MA49164	7 - 2
12 - 18	111	-	MA49121	MA49122	MA49123	MA49124	7 - 2
18 - 26	30	-	-	MA49179	MA49180	-	7 - 3
18 - 26	138	-	-	MA49179-138	MA49180-138	-	7 - 3
18 - 26	148	-	-	MA49179-148	MA49180-148	MA49178	7 - 3
26 - 40	138	-	-	MA49172	MA49173	MA49837	7 - 3
26 - 40	138	-	-	-	MA49177[1]	-	7 - 3
40 - 50	138	-	-	MA49181	MA49838	-	7 - 3
40 - 50	138	-	-	MA49182	MA49839	-	7 - 3
50 - 60	138	-	-	-	MA49193	-	7 - 3
94	138	MA49840	MA49149	MA49498	-	-	7 - 3

1. Power = 150 mW

Commercial Fixed Frequency CW Gunn Diodes

These Gunn diodes are useful for low power transmitters and local oscillators used in the detection of moving targets in such applications as speed control radars, radar detectors, intrusion alarm systems, door openers and commercial marine navigational radar. These low power diodes can also be used in control applications such as near object direction for vehicles, traffic light control, anti-skid braking systems for vehicles, and door openers.

Specifications @ T_A = +25°C

Model Number	Case Style	Frequency[2,3] Min./Max. (GHz)	Min. CW[1,3] Output Power (mW)	Maximum[5] Operating Current (mA)	Nominal Operating Voltage (Volts)
MA49618*	30	9.0/12.0	5.0	80	8.0
MA49508*	30	9.0/12.0	10.0	160	8.0
MA49628*	30	18.0/26.0	10.0	200	5.0
MA49499*	30	18.0/26.0	5.0	100	5.0

* The heat sink is the anode.

Notes:

1. This power is delivered at a specified single frequency in the specified band .
2. The customer MUST species the desired operating frequency within the Indicated range.
3. Power is measured into a critically coupled load at a customer specified single frequency in the indicated range. Typical bandwidth is ±5%. The minimum indicated output power is guaranteed into a critically coupled load over the indicated bandwidth centered around the frequency specified by the customer. Higher power diodes are available on special request.
4. These diodes are designed to operate within a heat sink temperature -30°C to +70°C. However, for higher operating temperatures, please contact the factory.
5. The maximum threshold current is approximately 1.3 times the maximum operating current.
6. All diodes are burned in for a minimum period of 8 hours at diode case temperature (Tc) of 70 ± 5°C and a dc bias voltage of (Vop + 1.0 volts). upon request and for an additional charge, these diodes can be burned in for longer periods.

Screening of Gunn Diodes for High Reliability

M/A-COM's Gunn diodes have proven to have a high reliability when operated properly in oscillator systems at junction temperatures not exceeding 260°C. The following prescreening procedure is suggested as a means of further guaranteeing Gunn diode reliability over long periods of time.

Environmental and Lot Sampling Tests

M/A-COM's Environmental Laboratory has complete capability for all Group B and C test requirements including life test as required by MIL-STD19500 and MIL-STD-750.

Available Procedures for JANTX Equivalency

100% Screening	MIL-STD-750 Method	Conditions/Comments
High Temperature Storage	1032	200°C for 24 hours
Temperature Cycle	1051	-65°C to +200°C, 20 Cycles for 30 minutes
Acceleration	2006	20,000 g's
Fine Leak	1071	5 x 10^{-8} cm³/sec
Gross Leak	1071	Fluorocarbon or penetrative dye
Burn-In	1038	70°C heat sink temp. and V_{OP} + 1 volt (or 10%) for 96 hours

North America: Tel. (800) 366-2266 Fax (800) 618-8883 ■ Asia/Pacific: Tel. +81 (03) 3226-1671 Fax +81 (03) 3226-1451 ■ Europe: Tel. +44 (1344) 869 595 Fax +44 (1344) 300 020

Commercial Pulsed Gunn Diodes

This series of pulsed Gunn diodes have very low average current drain and are used in motion detection systems, burglar alarms and door openers.

Specifications @ T_A = +25°C

Model Number	Case Style	Frequency[2,3,8] Min./Max. (GHz)	Minimum[1,3,8] Peak Power (mW)	Maximum Operating Voltage (Volts)	Maximum[5] Operating Current (mA)
MA49870*	30	9.0/11.0	10.0	8.5	120

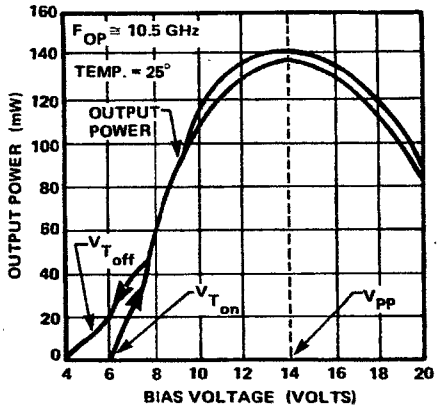
* Heat sink is anode.

Notes:

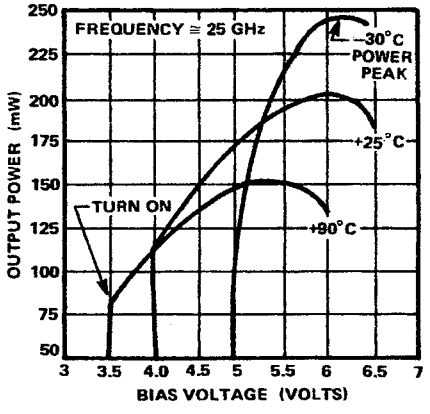
1. This power is delivered at a specified single frequency in the specified band .
2. The customer MUST specify the desired operating frequency within the indicated range.
3. Power is measured into a critically coupled load at a customer specified single frequency in the indicated range. Typical bandwidth is ± 5%. The minimum indicated output power is guaranteed into a critically coupled load over the indicated bandwidth centered around the frequency specified by the customer. Higher power diodes are available upon special request.
4. These diodes are designed to operate within a heat sink temperature -30°C to +70°C. However, for higher operating temperatures, please contact the factory.
5. The minimum threshold current is approximately 1.3 times the maximum operating current.
6. All diodes are burned in for a minimum period of 8 hours at diode case temperature (T_c) of 70 ± 5°C and with CW dc bias.
7. Frequency chirp during 0.5 (µs) is typically less than 10 MHz in a waveguide cavity.
8. Maximum duty cycle is 1%. Maximum pulse width is 1 (µs).

Typical Performance Curves

OUTPUT POWER vs BIAS VOLTAGE OF A TYPICAL X-BAND GUNN DIODE

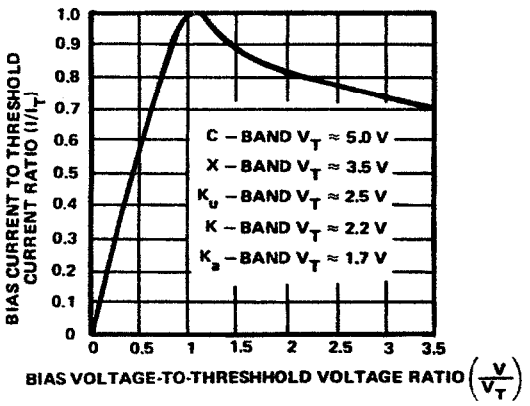


OUTPUT POWER vs BIAS VOLTAGE AND TEMPERATURE OF TYPICAL K-BAND GUNN DIODE

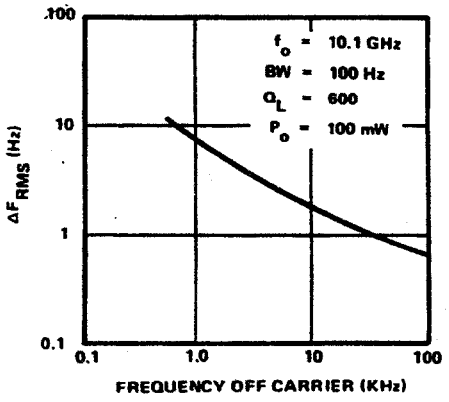


Typical Performance Curves (Con't)

CURRENT vs VOLTAGE CHARACTERISTICS



FM NOISE SPECTRUM



Gunn Diode Mounting and Heat Sink Considerations

The rise in temperature between the diode case and the active region is defined by AT - Rq, (Pin—Pout) In actual use the thermal drop between the ambient and the diode case must be taken into account in order to avoid exceeding the maximum active temperature of 260°C. The maximum active region temperature may be computed as follows:

Maximum active region temperature:

$$T_{AL} = T_A + \Delta T_{CA} + (P_{in} - P_{out})\ R\text{ø}$$

where:

T_A = Ambient temperature

ΔT_{CA} = Temperature difference between the diode case and the ambient at operating power.

Rø = Thermal resistance

T_{AL} = Active region temperature

In well designed heat sinks, the thermal difference ΔT_{CA} is usually less than 30°C for a power input of about 15 watts. This is an important factor in the design of Gunn oscillators and must be carefully considered.

Our technique for measuring thermal resistance is available upon request.