

V5

Features

- ♦ Broadband 50 Ohm Design Through X Band
- High Power Handling
- Voltage Ratings to 1000V
- Fast Switching Speeds
- Hermetically Sealed Package
- ♦ RoHS Compliant

Description

These M/A-Com Technology Solutions switch modules consist of a shunt mounted, passivated, PIN diode chip in a hermetically sealed strip-line package. These modules are optimized for use in a 50 ohm micro-strip or strip-line circuit. By incorporating the appropriate series inductance to produce a matched low pass filter structure in a zero or reverse bias condition, no external matching is required. To achieve high isolation, a forward bias current between +10mA to +100mA is applied to the center conductor which changes the module's inductive impedance from a high to a low-impedance state causing the RF power to be reflected.

Applications

The M/A-COM Technology Solutions MA47200 series modules maybe operated as a SPST reflective switch or as an attenuator by applying the appropriate forward or reverse DC bias. These broadband modules are designed to operate at frequencies from VHF through X Band. A variety of modules are available which offer a choice of breakdown voltages and switching speeds.

Specifications subject to change without prior notification.

Absolute Maximum Rating¹ @ $T_A = +25$ °C (unless otherwise specified)

Parameter	Rating
Voltage	Voltage rating per pg. 2 table
Operating Temperature	- 65°C to +150°C
Storage Temperature	-65°C to +175°C
Power Dissipation	P _{DISS} = 150°C -T _{AMBIENT} Thermal Resistance

 Operation of the device above any one of these parameters may cause permanent damage.

Available Stripline Packages

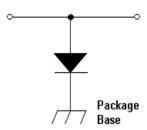




ODS-144

ODS-114

Internal Wiring Diagram





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All Specifications ($T_{AMB} = +25$ °C)

	Maximum	Maximum				Nominal Characteristics	
Part Num- ber	Reverse Voltage ¹ @ I _R <10µA	Chip Capacitance f = 1MHz pF	Maximum Series Resis- tance	Maximum Series Resis- tance	Maximum Thermal Re- sistance	Carrier Lifetime ²	I-Region Width Microns µm
MA47208	1000	$V_{R} = -100V$ $C_{J} \le 1.3pF$	I_F = 50mA Freq. = 100MHz $R_S \le .400 \Omega$	I _F = 100mA	10	1300	125
MA47222	150	V _R = -10V C _J ≤ .09pF	I_F = 10mA Freq. = 500MHz R_S ≤ 1.6 Ω	I_F = 100mA Freq. = 500MHz R_S ≤ 1.2 Ω	40	160	13
MA47223	500	V _R = -50V C _J ≤ .20pF		I_F = 100mA Freq. = 500MHz $R_S \le .6 \Omega$	20	1000	50

Notes:

Part Number ¹	Package	Test Frequency	Maximum Insertion³ Loss	Minimum Isolation	Nominal Switching Speed (nS)	
Part Number	Style	GHz	dB	dB	RF Off to RF On	RF On to RF Off
MA47208	114	1	V _R = 20V Loss ≤ 0.25dB	I _F = 25mA Isolation ≤ 30dB	300	150
MA47222	144	8	V _R = 0V Loss ≤ 0.50dB	I _F = 100mA Isolation ≤ 20dB	100	30
MA47223	144	4-8 ²	V _R = 0V Loss ≤ 0.50dB	I _F = 100mA Isolation ≤ 20dB	150	30

Notes:

- 1. All models have cathode heatsink
- 2. Swept frequency measurement
- 3. Maximum VSWR is 1.5:1 at specified insertion loss condition.

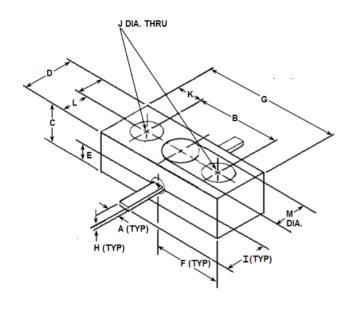
^{1.} The maximum specified V_R (reverse voltage) is sourced and the resultant reverse leakage current, Ir, is measured to be <10µA.

^{2.} Nominal carrier life time specified with diode biased at I_F = +10mA , I_{REV} = -6mA

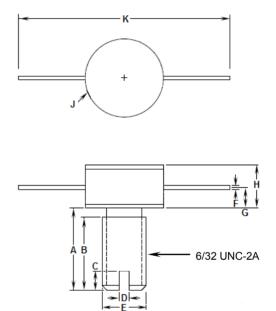
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Outline Drawing

Package Style 144



Package Style 114



DIMS.	MILS		MILLIMETERS		
	MIN.	MAX.	MIN.	MAX.	
Α	22 NOMINAL		.558 NOMINAL		
В	250 NOMINAL		6.35 NOMINAL		
С	125 NOMINAL		3.175 NOMINAL		
D	155	165	3.937	4.191	
E	65 NO	MINAL	1.651 NOMINAL		
F	195	215	4.953	5.461	
G	405	415	10.287	10.541	
Н	3		0.076		
I	120		3.048		
J	96 NOMINAL		2.438 NOMINAL		
K	75	85	1.905	2.159	
L	80 NOMINAL		2.032 N	OMINAL	
M	125 NOMINAL		3.175 NOMINAL		

DIMS.	MI	LS	MILLIMETERS		
DIIVIS.	MIN.	MAX.	MIN.	MAX.	
Α	255	265	6.48	6.73	
В	205		5.21		
С	60 NO	MINAL	1.52 NOMINAL		
D	30 NOMINAL		0.76 NOMINAL		
E	131	137	3.33	3.51	
F	11	13	0.28	0.33	
G	58	72	1.47	1.73	
Н	120	140	3.05	3.56	
J		255 DIA.		6.48 DIA.	
K	670 NOMINAL		17.02 NOMINAL		



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Environmental Ratings (Per MIL-STD 750)

The following table is recommended for Group B & C testing for TX and TXV level screening.

Inspection	Method	Condition
Storage Temperature	1031	- 65°C to +175°C
Operating Temperature		- 65°C to +150°C
Temperature Cycling	1051	5 cycles - 65°' to + 150°C
Shock	2016	500 g's
Vibration	2056	15 g's
Constant Acceleration	2006	20,000 g's
Humidity	1021	10 days

Screened Diodes (Per MIL-STD 750)

Suggested 100% preconditioning and screening for TX level and TXV level screening.

Inspection	Method	Condition
Internal Visual	2074	See Note 1
High Temp. Storage	1032	48 hours minimum @ max. storage temp.
Thermal Shock	1051	10 Cycles
Constant Acceleration	2006	20,000 g's, Y1
Fine Leak	1071	Н
Gross Leak	1071	C or E
Electrical		See Note
Burn-In	1038	See Note

Conditions and details of test depend on specific model number. Information available upon request.



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