

## Load Insensitive Mixer

Rev. V5

### Features

- LO 1 to 3400 MHz
- RF 1 to 3400 MHz
- IF 1 to 2000 MHz
- LO Drive +10 dBm (nominal)
- Insensitive to VSWR Mismatch
- High Intercept +18 dBm typical
- RoHS\* Compliant and 260°C Reflow Compatible

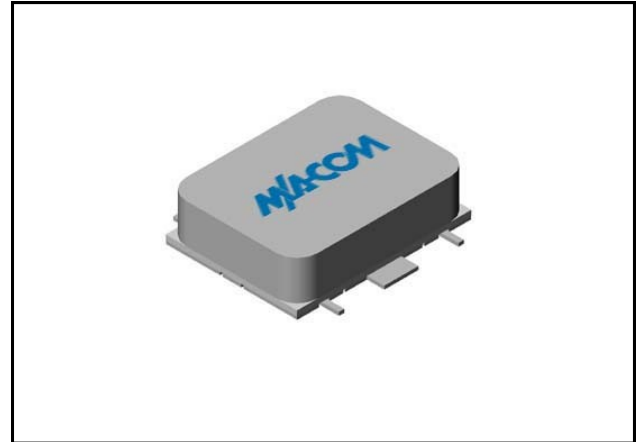
### Description

The SM4T is a termination insensitive mixer, designed for use in military, commercial and test equipment applications. The design utilizes Schottky bridge quad diodes, broadband ferrite baluns and internal loads to provide excellent performance without degradation due to external VSWR mismatches. Environmental screening available to MIL-STD-883, MIL-STD-202, or MIL-DTL-28837, consult factory.

### Ordering Information

Part Number	Package
SM4T	Surface Mount

### Product Image



### Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temperature	-54°C to +100°C
Storage Temperature	-65°C to +100°C
Peak Input Power	+27 dBm max @ +25°C +17 dBm max @ +100°C
Peak Input Current	50 mA DC

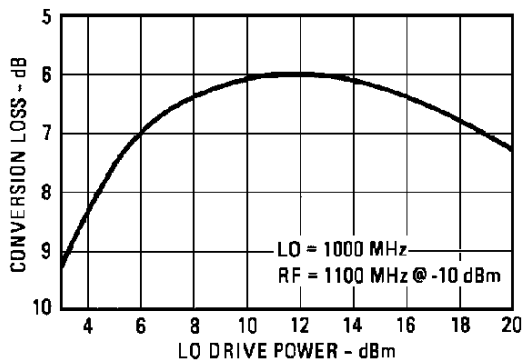
### Electrical Specifications: $Z_0 = 50\Omega$ $L_o = +10$ dBm (Downconverter application only)

Parameter	Test Conditions	Units	Typical	Guaranteed	
				+25°C	-54° to +85°C
SSB Conversion Loss (max)	fR = 0.005 - 1.0 GHz, fL = 0.005 - 1.0 GHz, fl = 0.001 - 0.5 GHz fR = 0.001 - 3 GHz, fL = 0.001 - 3 GHz, fl = 0.001 - 1.5 GHz fR = 0.001 - 3.4 GHz, fL = 0.001 - 3.4 GHz, fl = 0.001 - 2 GHz	dB	6.5 8.0 9.0	7.5 9.0 10.5	8.0 9.5 11.0
SSB Noise Figure		dB	Within 1 dB of conversion loss		
Isolation, L to R (min)	fL = 0.01 - 1.5 GHz fL = 0.01 - 3.4 GHz	dB	40 30	35 25	33 23
Isolation, L to I (min)	fL = 0.01 - 1.5 GHz fL = 0.01 - 3.4 GHz	dB	40 30	35 25	33 23
Isolation, R to I (min)	fR = 0.001 - 3.4 GHz	dB	25		
1 dB Conversion Comp.	fL = +10 dBm	dBm	+6		
Input IP3	fR1 = 1.9 GHz at -10 dBm, fR2 = 1.91 GHz at -10 dBm, fL = 2 GHz at +10 dBm	dBm	+18		

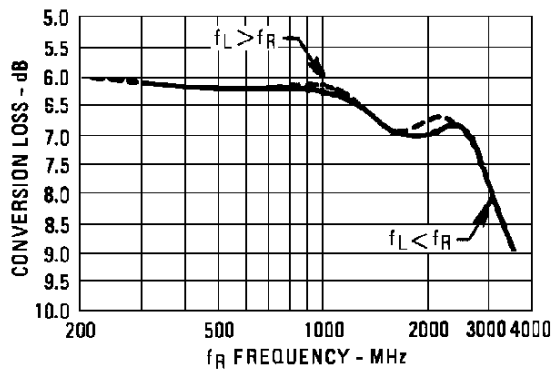
\* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

### Typical Performance Curves

#### Conversion Loss

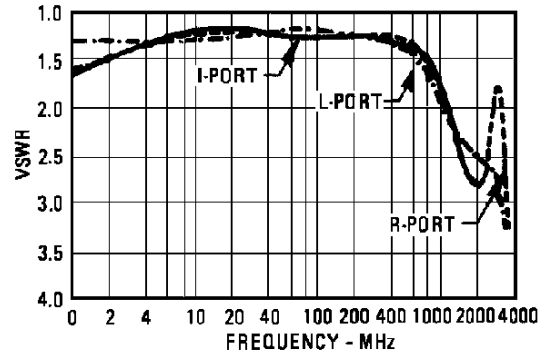


**Conversion Loss vs. Drive Level:** The minimum recommended drive level is +7 dBm. The maximum recommended drive level is +18 dBm.



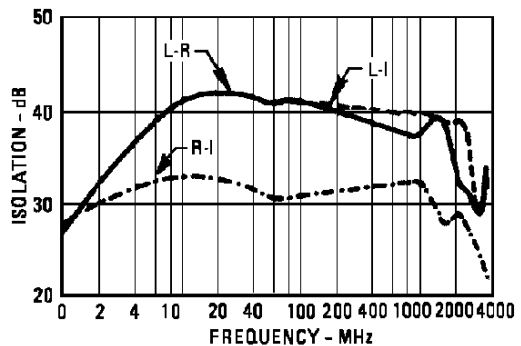
**Conversion Loss vs. Input Frequency:** Conversion loss of the mixer when used in an SSB system. Data plotted for a  $f_L$  of 100 MHz with  $f_L$  at +10 dBm.

#### VSWR



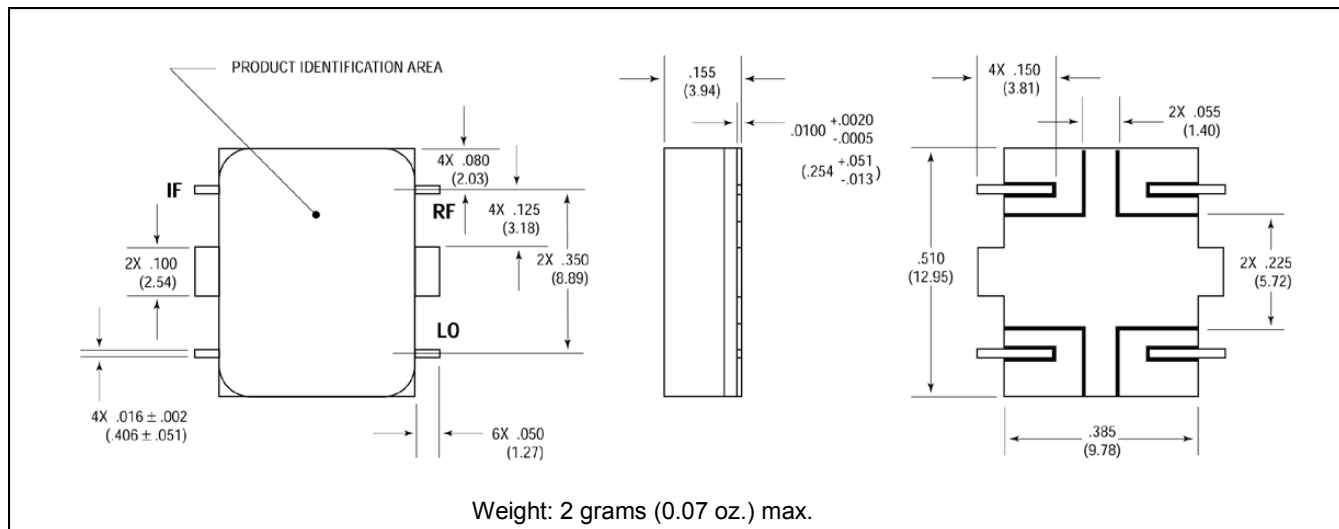
**VSWR vs. Frequency:** VSWR is the L-, I-, and R-ports in a 50 ohm system with  $f_L$  at +10 dBm. R- and I-port VSWR plotted with  $f_L$  at 1500 MHz.

#### Isolation



**Isolation vs. Frequency:** Level of  $f_L$  signal fed through to R- and I-port with respect to the level of the  $f_L$  signal at L-port. R-I Isolation plotted with  $f_L$  at 1500 MHz.

### Outline Drawing: *Lead Free Surface Mount \**



\* Dimensions are inches (millimeters) ±0.015 (0.38) unless otherwise specified.

M/A-COM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.