

Excellent Integrated System Limited

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

[M/A-Com Technology Solutions](#)
[MAADSS0008TR-3000](#)

For any questions, you can email us directly:

sales@integrated-circuit.com

MAADSS0008



Digital Attenuator, 1-Bit, 15 dB DC - 2.0 GHz

Rev. V2

Features

- Single 15-dB Step
- Low Loss, 0.3 dB Typical @ 900 MHz
- 2.5 to 5.0 Volt Operation
- Tape and Reel Packaging Available
- Lead-Free SOT-25 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of AT-267

Description

M/A-COM's MAADSS0008 is a 1-bit, 15-dB step GaAs MMIC digital attenuator in a lead-free SOT-25, 5 lead surface mount plastic package. The MAADSS0008 is ideally suited for use where high accuracy, very low power consumption and low intermodulation products are required.

Typical applications include wireless handsets, base stations, wireless LAN equipment, GPS receivers and any RF applications with automatic gain/level control circuits.

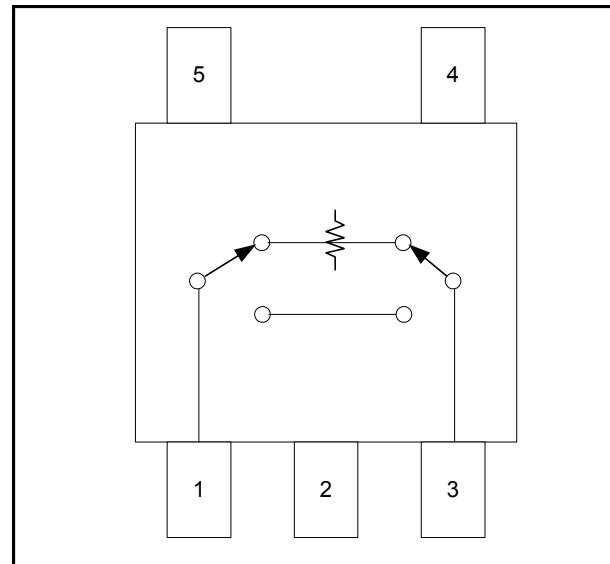
The MAADSS0008 is fabricated as a monolithic GaAs integrated circuit using a mature PHEMT process. The process features full chip passivation for performance and reliability.

Ordering Information ¹

Part Number	Package
MAADSS0008TR	1000 piece reel
MAADSS0008TR-3000	3000 piece reel
MAADSS0008SMB	Sample Board

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function
1	RF1	4	V1
2	Ground	5	V2
3	RF2		

Absolute Maximum Ratings ^{2,3}

Parameter	Absolute Maximum
Input Power	+21 dBm
Control Voltage	$ V_C \leq 8V$
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

2. Exceeding any one or combination of these limits may cause permanent damage to this device.
3. M/A-COM does not recommend sustained operation near these survivability limits.

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

MAADSS0008



Digital Attenuator, 1-Bit, 15 dB DC - 2.0 GHz

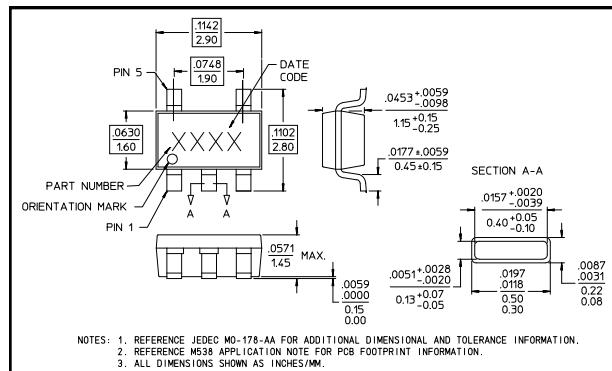
Rev. V2

Electrical Specifications⁴: $T_A = 25^\circ\text{C}$, $V_C = +2.5$ Volts, $Z_0 = 50 \Omega$

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss (Reference State)	1.0 GHz 2.0 GHz	dB	—	0.3 0.4 0.5	0.4
Attenuation	1.0 GHz 2.0 GHz	dB	14.6 14.4	15.1 14.9	15.6 15.4
VSWR	1.0 GHz 2.0 GHz	Ratio	—	1.2:1 1.3:1	—
Input IP ₃	1.0 GHz Insertion Loss State Attenuation State	dBm	40 40	50 50	—
P _{1dB}	1.0 GHz Insertion Loss State Attenuation State	dBm	24 20	26 23	—
Control Current	—	µA	—	—	10
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS	—	29	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	nS	—	50	—
Transients	In-band	mV	—	10	—

4. For positive voltage control, external DC blocking capacitors are required on all RF ports (pins 1, 2 and 3).

Lead-Free SOT-25[†]



† Reference Application Note M538 for lead-free solder reflow recommendations.

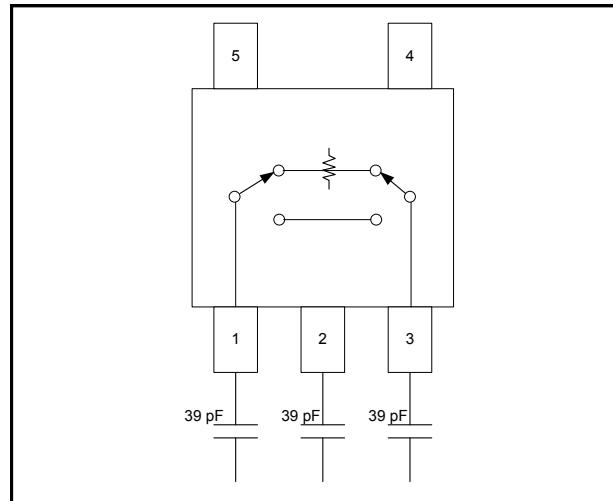
Truth Table^{5,6}

Mode (Control)	V1	V2	Attenuation
Positive ⁵	$0 \pm 0.2\text{V}$ $+2.5\text{V to }+5\text{V}$	$+2.5\text{V to }+5\text{V}$ $0 \pm 0.2\text{V}$	15 dB Reference State
Negative ⁶	$0 \pm 0.2\text{V}$ $-2.5\text{V to }-5\text{V}$	$-2.5\text{V to }-5\text{V}$ $0 \pm 0.2\text{V}$	Reference State 15 dB

5. External DC blocking capacitors are required as noted.

6. If negative control is used, DC blocking capacitors are not required on RF ports and ground.

Positive Control Voltage Schematic



MAADSS0008

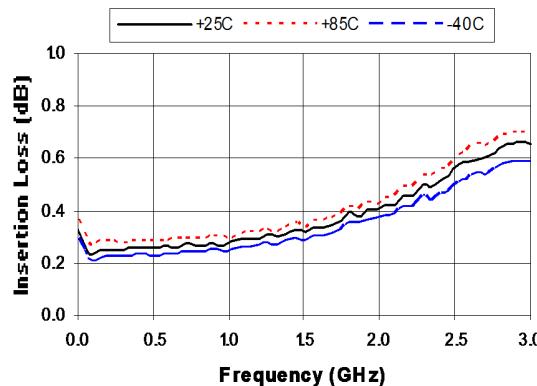
MACOMTM

**Digital Attenuator, 1-Bit, 15 dB
DC - 2.0 GHz**

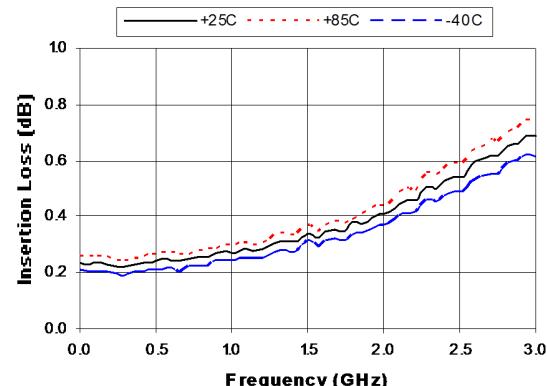
Rev. V2

Typical Performance Curves

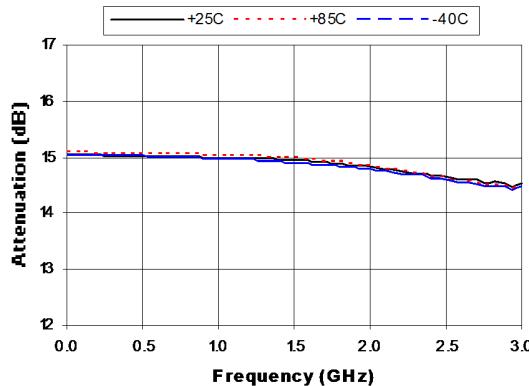
Insertion Loss with Negative Control



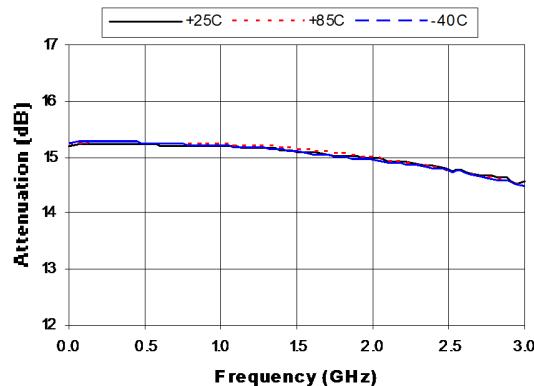
Insertion Loss with Positive Control



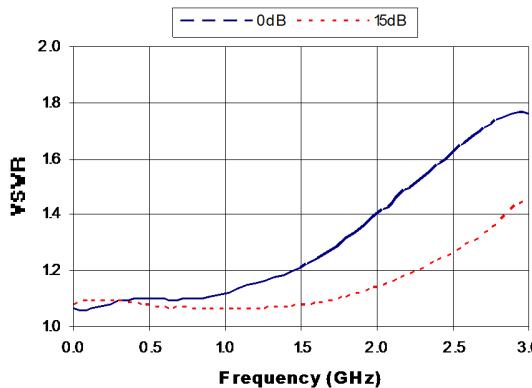
Attenuation with Negative Control



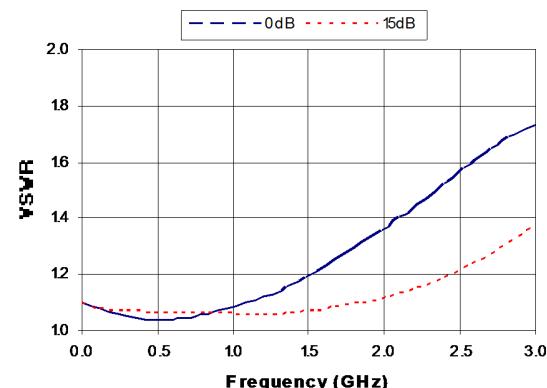
Attenuation with Positive Control



VSWR, 0 and 15 dB States with Negative Control at +25°C



VSWR, 0 and 15 dB States with Positive Control at +25°C



MAADSS0008



**Digital Attenuator, 1-Bit, 15 dB
DC - 2.0 GHz**

Rev. V2

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.

4

M/A-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit www.macom.com for additional data sheets and product information.

For further information and support please visit:
<https://www.macom.com/support>