

Cascadable Amplifier 1000 to 4000 MHz

Rev. V3

Features

- WIDE BANDWIDTH
- HIGH GAIN 17.5 dB (TYP.)
- LOW NOISE: 4.1 dB (TYP.)
- GaAs FET DESIGN

Description

The A45-1 RF amplifier is a discrete hybrid design, which uses thin film manufacturing processes for accurate performance and high reliability.

This single stage GaAs FET feedback amplifier design displays impressive performance characteristics over a broadband frequency range. An RF choke is used for DC power supply decoupling.

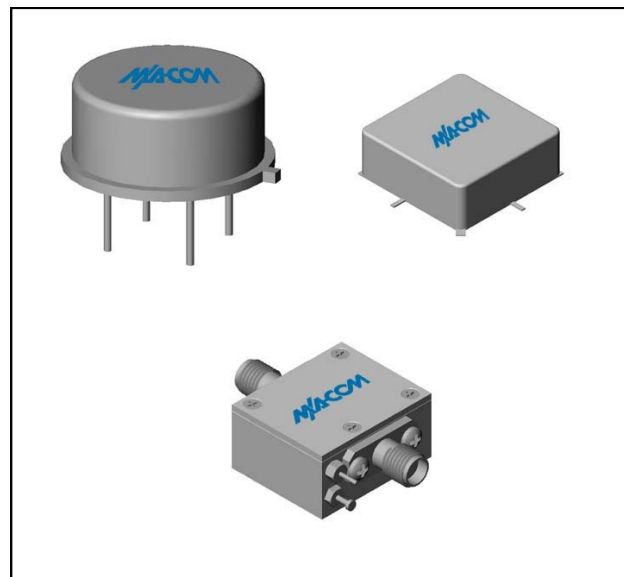
Both TO-8 and Surface Mount packages are hermetically sealed, and MIL-STD-883 environmental screening is available.

Ordering Information

Part Number	Package
A45-1	TO-8
SMA45-1	Surface Mount
CA45-1 **	SMA Connectorized

** The connectorized version is not RoHs compliant.

Product Image



Electrical Specifications: $Z_0 = 50\Omega$, $V_{CC} = +5 V_{DC}$

Parameter	Units	Typical	Guaranteed	
		25°C	0° to 50°C	-54° to +85°C*
Frequency	MHz	80-4200	1000-4000	1000-4000
Small Signal Gain (min)	dB	17.5	16.5	15.5
Gain Flatness (max)	dB	±0.6	±0.8	±1.0
Reverse Isolation	dB	36		
Noise Figure (max)	dB	4.0	5.0	5.5
Power Output @ 1 dB comp. (min)	dBm	13.0	12.5	12.0
IP3	dBm	+26		
IP2	dBm	+33		
Second Order Harmonic IP	dBm	+40		
VSWR Input / Output (max)		1.8:1 / 1.8:1	1.9:1 / 1.9:1	2.0:1 / 2.0:1
DC Current @ 5 Volts (max)	mA	65	75	80

Absolute Maximum Ratings

Parameter	Absolute Maximum
Storage Temperature	-62°C to +125°C
Case Temperature	125°C
DC Voltage	+6 V
Continuous Input Power	+13 dBm
Short Term Input power (1 minute max.)	100 mW
Peak Power (3 µsec max.)	0.25 W
"S" Series Burn-In Temperature (case)	125°C

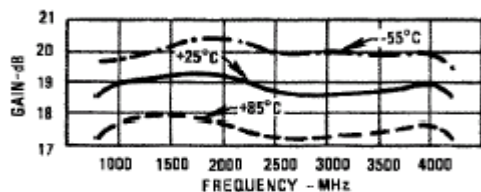
Thermal Data: $V_{CC} = +5 V_{DC}$

Parameter	Rating
Thermal Resistance θ_{jc}	132°C/W
Transistor Power Dissipation P_d	0.171 W
Junction Temperature Rise Above Case T_{jc}	23°C

1 * Over temperature performance limits for part number CA45-1, guaranteed from 0°C to +50°C only.

Rev. V3

Outline Drawing: TO-8 *



Frequency (MHz)	Noise Figure (dB)
1000	4.0
1500	3.5
2000	3.5
2500	3.3
3000	3.1
3500	3.0
4000	3.2

Graph showing Power Output (dBm) versus Frequency (MHz) for the 6X4 tube. The curves represent performance at different temperatures: -55°C, 25°C, and +85/+105°C. Power output generally increases with frequency up to about 3000 MHz and then decreases. Performance is highest at -55°C and lowest at +85/+105°C.

Frequency (MHz)	-55°C (dBm)	25°C (dBm)	+85/+105°C (dBm)
1000	13.8	13.2	12.5
2000	14.2	13.5	12.8
3000	14.5	13.8	13.1
4000	14.2	13.5	12.8

A line graph showing the relationship between Intercept Point (dBm) and Frequency (MHz) for a 2-tone test. The y-axis is labeled 'INTERCEPT POINT - dBm' and ranges from 25 to 50 in increments of 5. The x-axis is labeled 'FREQUENCY - MHz' and ranges from 1000 to 4000 in increments of 1000. Three curves are plotted: 'SECOND HARMONIC' (top curve, peaking at ~48 dBm around 2000 MHz), '2ND ORDER TWO TONE' (middle curve, peaking at ~40 dBm around 2000 MHz), and '3RD ORDER TWO TONE' (bottom curve, peaking at ~28 dBm around 2000 MHz). All curves show a slight decline at higher frequencies.

VSNR

3.0

2.0

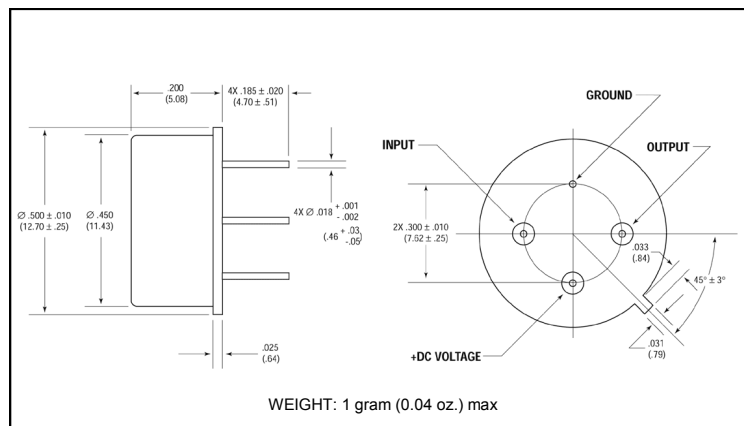
1.0

1000 1500 2000 2500 3000 3500 4000

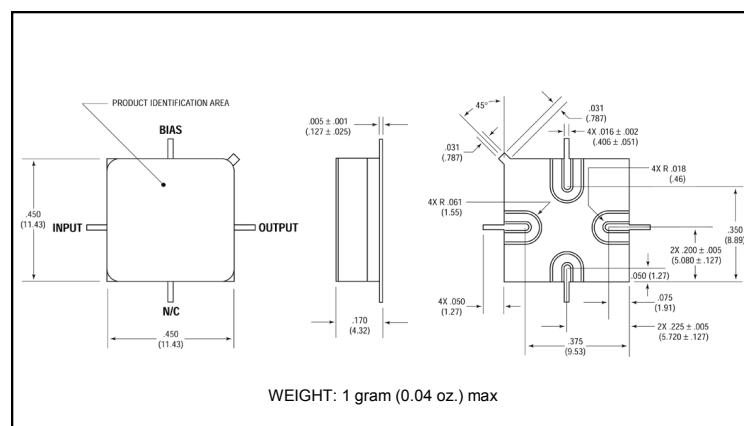
FREQUENCY - MHz

OUTPUT

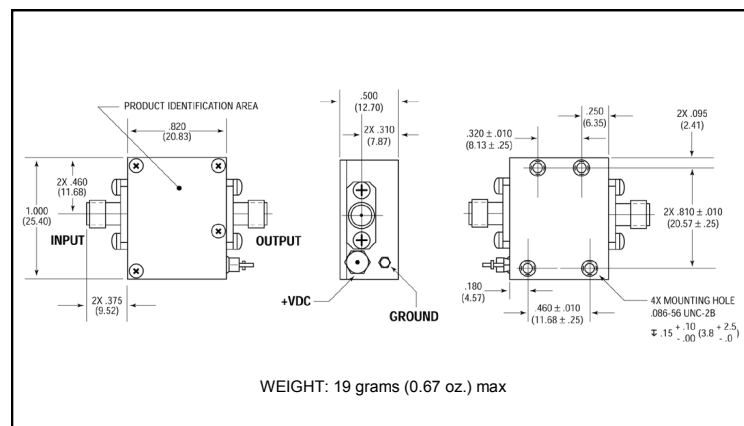
INPUT



Outline Drawing: Surface Mount *



Outline Drawing: SMA Connectorized *



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.