

Cascadable Amplifier 10 to 400 MHz

Rev. V3

Features

- HIGH OUTPUT LEVEL: +17 dBm (TYP.)
- HIGH EFFICIENCY: 33 mA @ +15 Vdc (TYP.)
- HIGH THIRD ORDER IP: +31 dBm (TYP.)
- WIDE POWER SUPPLY RANGE: +5 TO +15 VOLTS

Description

The A87-1 RF amplifier is a discrete hybrid design, which uses thin film manufacturing processes for accurate performance and high reliability.

This single stage bipolar transistor feedback amplifier design displays impressive performance over a broadband frequency range. Use of an impedance transformer offers the benefit of high dynamic range and high efficiency.

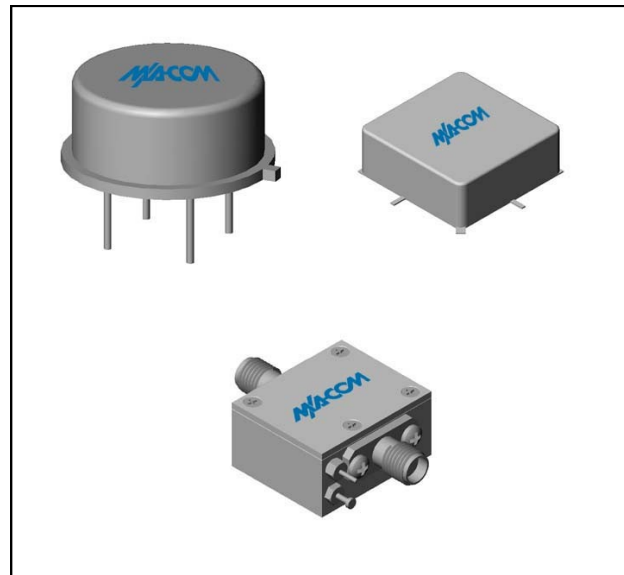
Both TO-8 and Surface Mount packages are hermetically sealed, and MIL-STD-883 environmental screening is available.

Ordering Information

Part Number	Package
A87-1	TO-8
SMA87-1	Surface Mount
CA87-1 **	SMA Connectorized

** The connectorized version is not RoHs compliant.

Product Image



Electrical Specifications: $Z_0 = 50\Omega$, $V_{CC} = +15 V_{DC}$

Parameter	Units	Typical	Guaranteed	
		25°C	0° to 50°C	-54° to +85°C*
Frequency	MHz	5-450	10-400	10-400
Small Signal Gain (min)	dB	16.0	15.0	14.5
Gain Flatness (max)	dB	±0.1	±0.6	±0.8
Reverse Isolation	dB	20		
Noise Figure (max)	dB	3.4	4.0	4.5
Power Output @ 1 dB comp. (min)	dBm	17.0	15.5	15.0
IP3	dBm	+31		
IP2	dBm	+46		
Second Order Harmonic IP	dBm	+52		
VSWR Input / Output (max)		1.4:1 / 1.4:1	1.8:1 / 1.8:1	2.0:1 / 2.0:1
DC Current @ 15 Volts (max)	mA	33	35	37

Absolute Maximum Ratings

Parameter	Absolute Maximum
Storage Temperature	-62°C to +125°C
Case Temperature	+125°C
DC Voltage	+17 V
Continuous Input Power	+13 dBm
Short Term Input power (1 minute max.)	50 mW
Peak Power (3 µsec max.)	0.5 W
"S" Series Burn-In Temperature (case)	+125°C

Thermal Data: $V_{CC} = +15 V_{DC}$

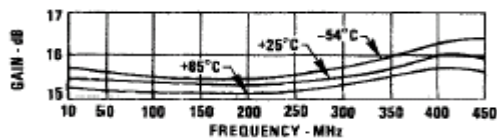
Parameter	Rating
Thermal Resistance θ_{jc}	185°C/W
Transistor Power Dissipation P_d	0.273 W
Junction Temperature Rise Above Case T_{jc}	51°C

1 * Over temperature performance limits for part number CA87-1, guaranteed from 0°C to +50°C only.



Rev. V3

Outline Drawing: TO-8 *

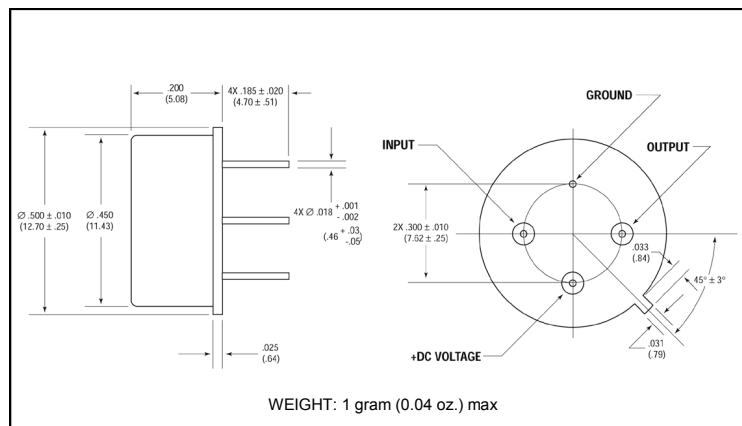


A line graph showing the power output (in dBm) of a 2N4350 JFET as a function of frequency (in MHz) for different temperatures. The y-axis ranges from 15 to 19 dBm, and the x-axis ranges from 10 to 400 MHz. Five curves are plotted for temperatures of +25°C, +85°C, +85°C, +25°C, and -54°C. The curves show that power output generally decreases with increasing frequency and is relatively stable across the temperature range shown.

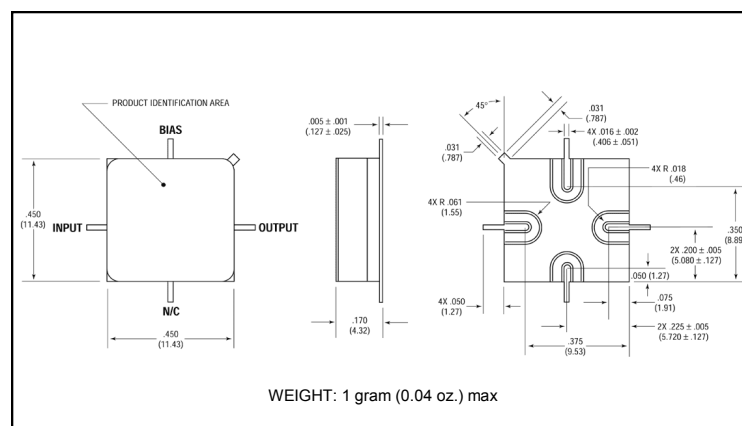
Frequency (MHz)	+25°C (Top)	+85°C	+85°C	+25°C (Bottom)	-54°C
10	18.5	18.2	18.0	17.8	17.5
100	18.2	17.8	17.5	17.2	16.8
200	17.8	17.5	17.2	16.8	16.5
300	17.5	17.2	16.8	16.5	16.2
400	17.8	17.5	17.2	16.8	16.5

Frequency (MHz)	3RD ORDER TWO-TONE (dBm)	2ND ORDER TWO-TONE (dBm)	2ND HARMONIC (dBm)
0	55	48	33
100	56	49	33.5
150	57	50	34
200	56	49	33.5
300	55	48	33
400	58	52	32

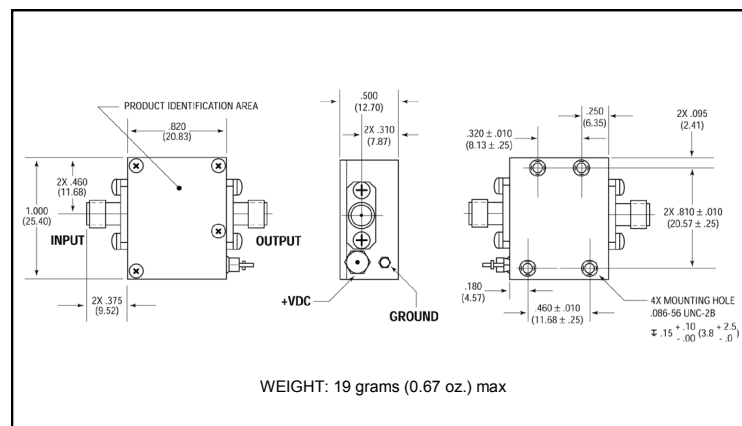
The graph shows the RMS voltage (V_{RMS}) on the y-axis (ranging from 1.0 to 4.0) versus Frequency (MHz) on the x-axis (logarithmic scale from 10 to 500). Two curves are plotted: 'INPUT' and 'OUTPUT'. The 'INPUT' curve starts at approximately 1.2 V_{RMS} at 10 MHz and remains relatively flat, reaching about 1.8 V_{RMS} at 400 MHz. The 'OUTPUT' curve follows the input curve until about 300 MHz, after which it rises sharply, reaching approximately 4.0 V_{RMS} at 500 MHz.



Outline Drawing: Surface Mount *



Outline Drawing: SMA Connectorized *



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