

50-900 MHz High Dynamic Range Amplifier



August 2007 - Rev 07-Aug-07

CMM6003-SC
RoHS

Features

- ✕ 50 to 900 MHz Frequency Range
- ✕ +41 dBm Output IP3
- ✕ -71 dBc CTB
- ✕ -48 dBc CSO
- ✕ 1.6 dB Noise Figure (@ 450 MHz)
- ✕ 17 dB Gain
- ✕ 22 dBm P1dB
- ✕ RoHS Compliant SOT-89 SMT Package
- ✕ Single Power Supply
- ✕ +3V to +5V Voltage Rail
- ✕ MTBF > 100 Years
- ✕ Ideal for CATV Applications



Description

The CMM6003-SC is a high dynamic range amplifier suitable for cable TV applications between 50 and 900 MHz. The combination of gain flatness, bandwidth, low noise figure and high third order intercept point make it ideal for cable modem, CATV distribution and laser diode driver applications. The CMM6003-SC can operate directly from 5V or 3.3V supply voltage in 75 ohm systems. The device is manufactured using a highly reliable GaAs MESFET technology with an MTBF of over 100 years at a mounting temperature of +85°C. All devices are 100% RF (at 800MHz) and DC tested and they come in an RoHs compliant SOT-89 package which provides excellent electrical stability and low thermal resistance.

Electrical Characteristics

Unless otherwise specified, the following specifications are guaranteed at room temperature in a Mimix test fixture.

Parameter	Condition	Min	Typ	Max	Units
Frequency Range		50	800	900	MHz
Gain	Externally matched	15	17	18	dB
Input Return Loss	Externally matched		-11		dB
Output IP3			+41		dBm
Noise Figure	@ 50 MHz		3.3		dB
Noise Figure	@ 800 MHz		1.9		dB
Output P1dB			22		dBm
Operating Current Range		120	150	180	mA
Supply Voltage			5.0		V

Notes:

1. T = 25°C, Vdd = 5.0, Frequency = 800 MHz, 50 Ohm system
2. OIP3 measured with two tones at output power of 5 dBm/tone separated by 10 MHz.

Absolute Maximum Ratings

Supply Voltage	+6.0V
RF Input Power*	+10 dBm
Storage Temperature	-55°C to 150°C
Junction Temperature	150°C
Operating Temperature	-40°C to +85°C
Thermal Resistance	59° C/W

Operation of this device above any of these parameters may cause damage.
*Operation with more than 10 dBm of input power may cause 2 dB degradation in OIP3 performance.

Typical Parameters

Parameter	Typical			Units
Frequency Range	100	450	900	MHz
Gain	17.5	17.2	16.3	dB
Input Return Loss	-12	-12	-11	dB
Output Return Loss	-16	-16	-13	dB
Output P1dB	23	23.6	23.8	dBm
Output IP3	40	39	37	dBm
Output IP2	52	52	52	dBm
Noise Figure	3.5	1.6	2	dB
CTB	-72			dBc
CSO	-48			dBc
Xmod	-65			dBc
Supply Voltage	5	5	5	V
Current	150	150	150	mA

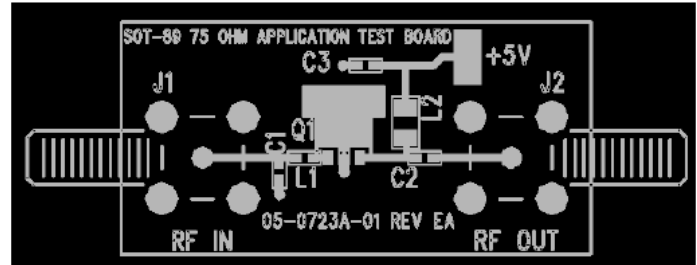
Notes:

1. Typical values reflect performance in recommended application circuit.

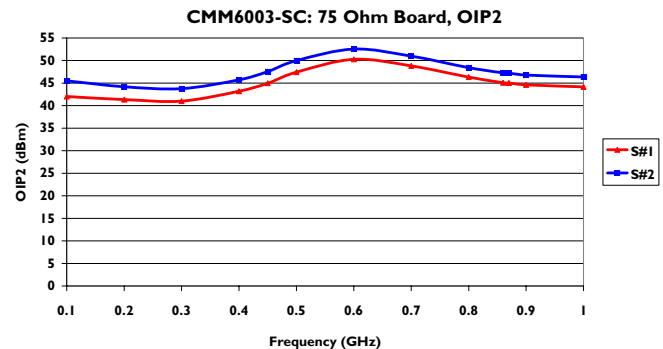
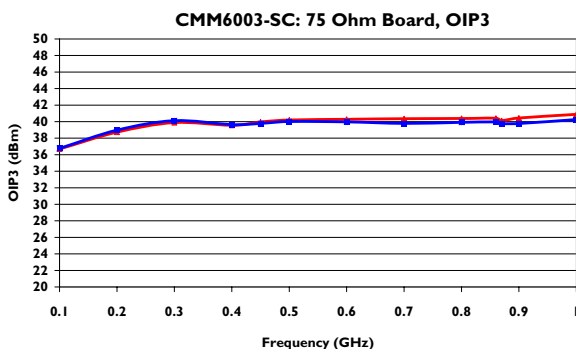
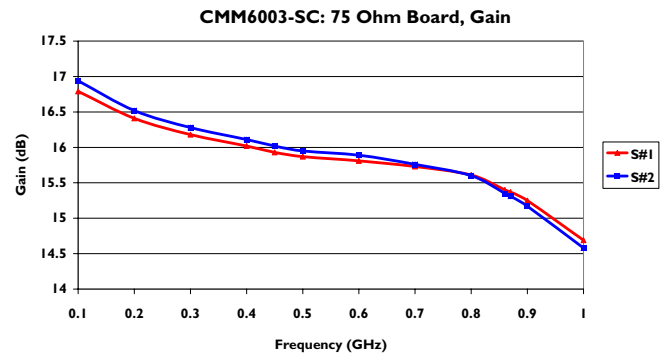
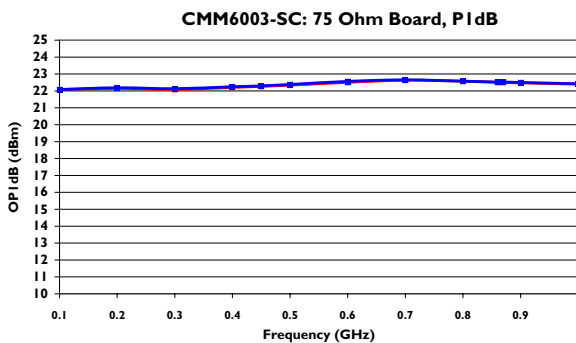
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Application Circuit: (75Ω)

Frequency	MHz	100	450	870
Gain	dB	17.5	17.2	16.3
Input Return Loss	dB	-12	-12	-11
Output Return Loss	dB	-16	-16	-13
Output P1 dB	dBm	23	23.6	23.8
Output IP3	dBm	40	39	37
Output IP2	dBm	52	52	52
Noise Figure	dB	3.5	1.6	2
CTB	dBc	-72		
CSO	dBc	-48		
Xmod	dBc	-65		
Supply Voltage	V	5	5	5
Current	mA	150	150	150



Ref Designator	Value	Size
C1,C2,C3	1000 pF	0603
L1	12 nH	0603
L2	270 nH	0603



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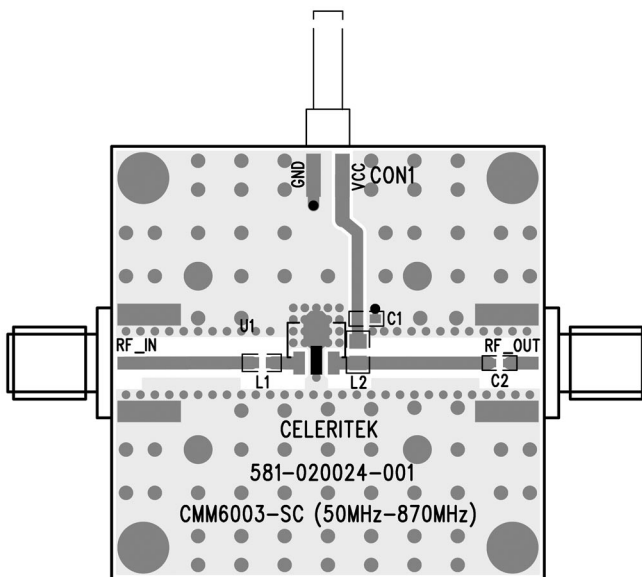
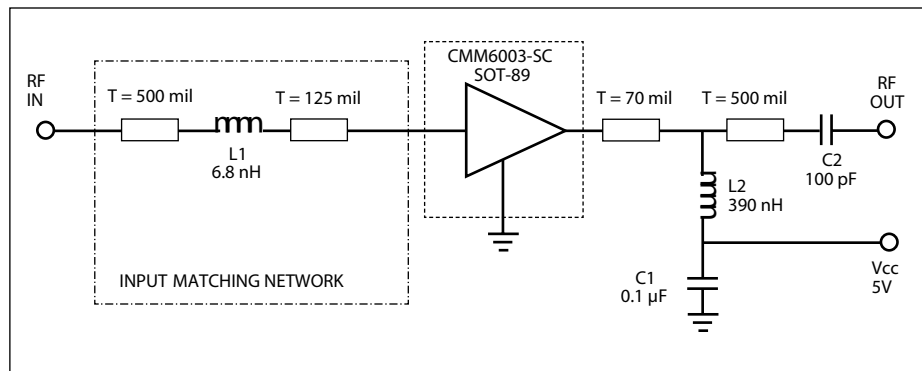
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Application Circuit: (50Ω)

Parameter	Typical			Units
	450	800	870	
Frequency Range	450	800	870	MHz
Gain	17.2	16.5	16.25	dB
Input Return Loss	-12.0	-11.5	-10.5	dB
Output Return Loss	-16	-14	-13	dB
Output IP3	+396	+41	+41	dBm
Output P1dB	23.6	23.7	23.8	dBm
Noise Figure	1.6	1.9	2.0	dB

Notes:

1. Typical values reflect performance in recommended application circuit.

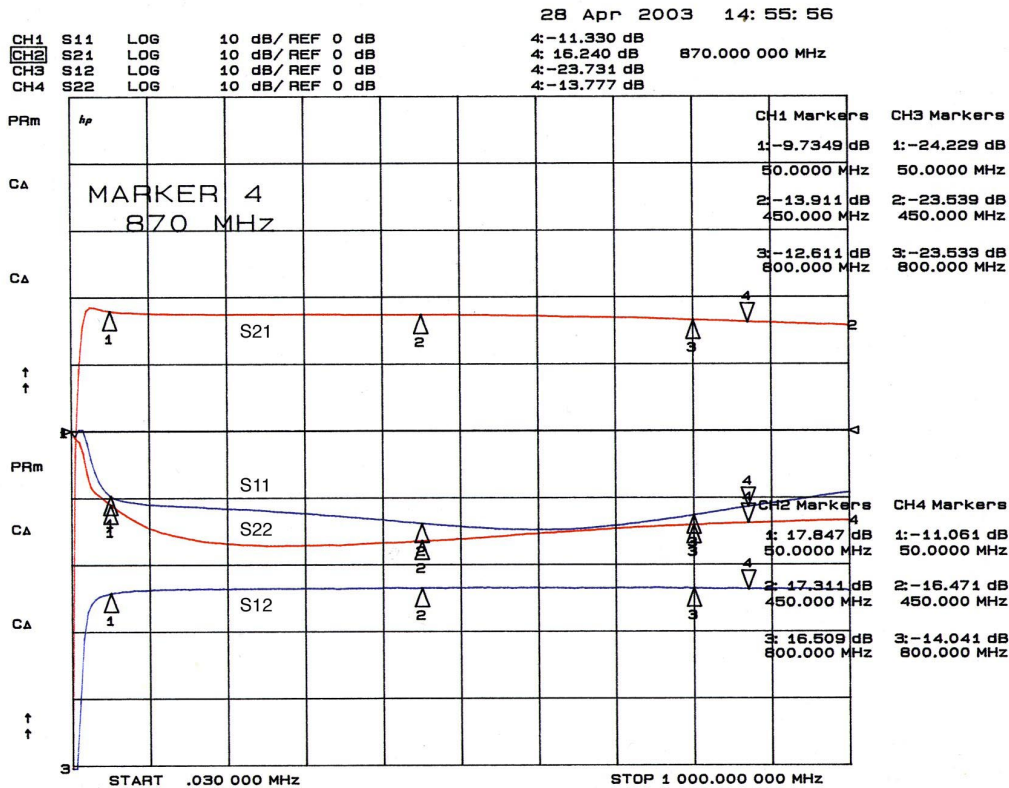


Ref Designator	Value	Description	Size
C1	0.1 μF	VITR 0.1 μF 25V CER CAP 0603 X7R 10%	0603
C2	100 pF	0603CG101J9B20 T/R	0603
L1	6.8 nH	TOKO LL 1608-F6N8J	0603
L2	390 nH	Coilcraft 0805CS-391XJBC	0603

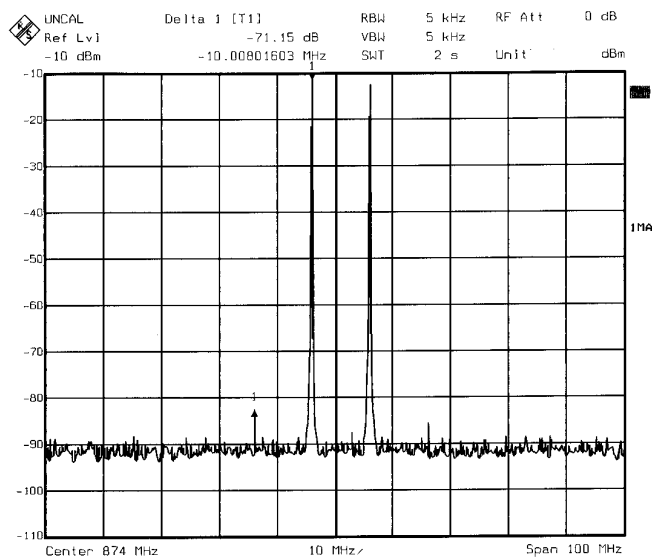
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S-Parameters vs. Frequency

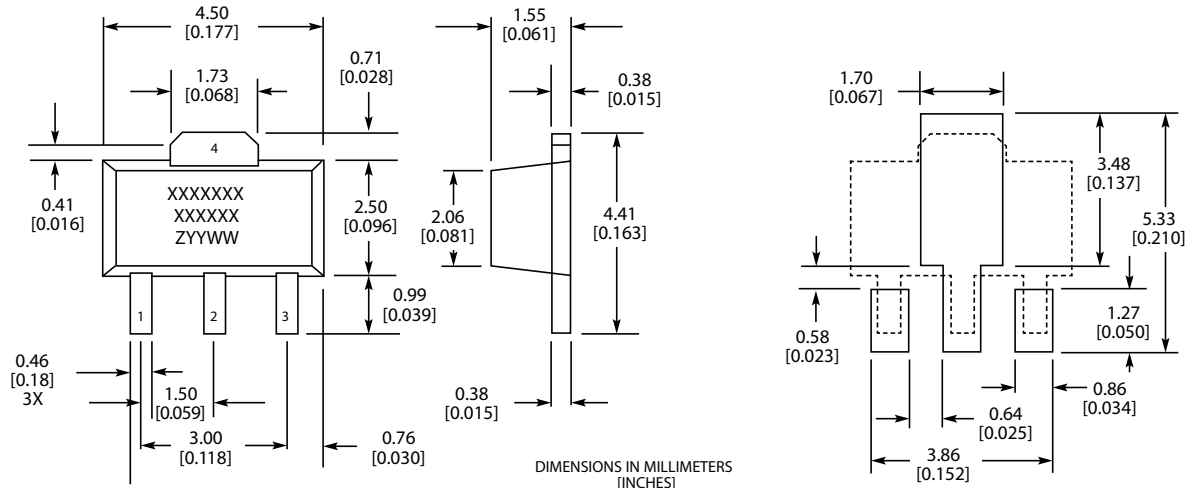


IP3 measured with 2 tones at an output power of 10 dBm/tone separated by 10 MHz



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Physical Dimensions



MARKINGS:
 XXXXXXXX = MIMIX MODEL NO.
 XXXXXX = WAFER LOT NO.
 ZYYWW = DATE CODE (YR/WEEK)
 FIRST LETTER COUNTRY OF ORIGIN IF OTHER THAN USA

Ordering Information

Part Number for Ordering

CMM6003-SC-0G00

CMM6003-SC-0G0T

PB-CMM6003-SC-0000

PB-CMM6003-SC-00A0

Description

Matte Tin plated RoHS compliant SOT-89 surface-mount power package in bulk quantity

Matte Tin plated RoHS compliant SOT-89 surface-mount power package in tape and reel

50 Ohm Evaluation Board

75 Ohm Evaluation Board

We also offer the plastic package with SnPb (Tin-Lead) or NiPdAu plating. Please contact your regional sales manager for more information regarding different plating types.