

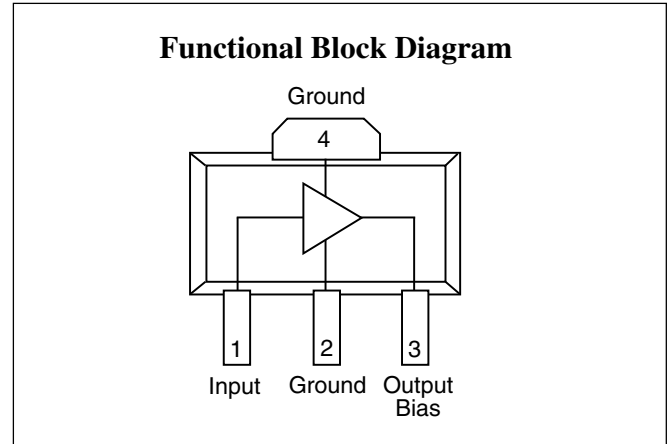


Advanced Product Information
April 2003 (1 of 4)

60 MHz to 3.0 GHz High Dynamic Range Amplifier

Features

- ❑ 60 MHz to 3.0 GHz Frequency Range
- ❑ 38 dBm Output IP3
- ❑ 2.5 dB Noise Figure
- ❑ 12.3 dB Gain
- ❑ 20.5 dBm P1dB
- ❑ SOT-89 SMT Package
- ❑ Single Power Supply
- ❑ +3V to +5V Voltage Rail



Description

The CMM6001-SC is a high dynamic range amplifier designed for applications operating within the 60 MHz to 3.0 GHz frequency range. It is an ideal solution for transmit and receive functions where high linearity is required.

The amplifier has the flexibility of being optimized for a number of wireless applications. The combination of low NF and high IP3 at the same bias point make it an ideal transmit or receive solution when used in applications including

cellular and PCS (personal communications service) operating from 0.8 to 2.2 GHz; MMDS (multichannel multipoint distribution systems) operating from 2.2 to 2.7 GHz; and WLAN (wireless LAN) operating at 2.4 GHz.

The CMM6001-SC is packaged in a low-cost, space efficient, surface mount SOT-89 package which provides excellent electrical stability and low thermal resistance. All devices are 100% RF and DC tested.

Electrical Characteristics

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

Parameter	Condition	Min	Typ	Max	Units
Frequency Range		0.60		3.0	GHz
Gain	Externally matched	10.5	12.5		dB
Input Return Loss	Externally matched		-10		dB
Output IP3		+33	+36		dBm
Noise Figure		2.5	2.8		dB
Output P1dB			20.5		dBm
Operating Current Range		55	75	100	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.

Typical Parameters

Parameter	Typical			Units
	900	1900	2400	
Frequency Range				MHz
Gain	12.5	11.5	10.8	dB
Input Return Loss	-18.0	-11.5	-10.0	dB
Output Return Loss	-17	-16	-15	dB
Output IP3	+36	+36	+36	dBm
Output P1dB	20.5	19.5	19.5	dBm
Noise Figure	2.7	2.8	2.9	dB

Notes:

1. Typical values reflect performance in recommended application circuit.

Absolute Maximum Ratings

Parameter	Rating	Parameter	Rating	Parameter	Rating
Supply Voltage	+6.0 V	Storage Temperature	-55°C to +125°C	Operating Temperature	-40°C to +85°C
RF Input Power	+10 dBm	Junction Temperature	150°C	Thermal Resistance	150°C/W

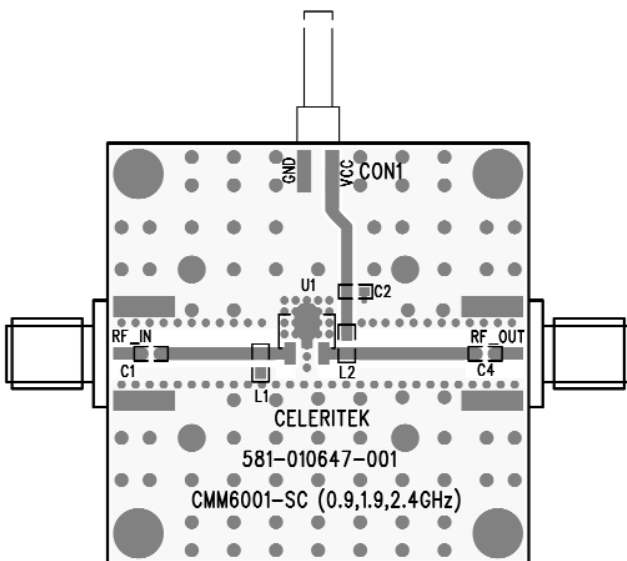
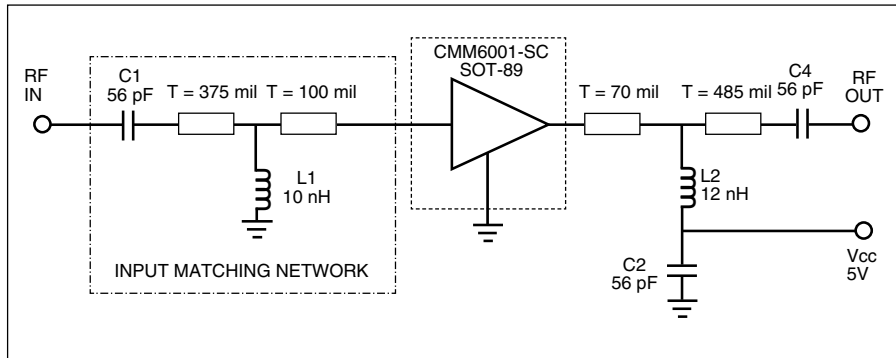
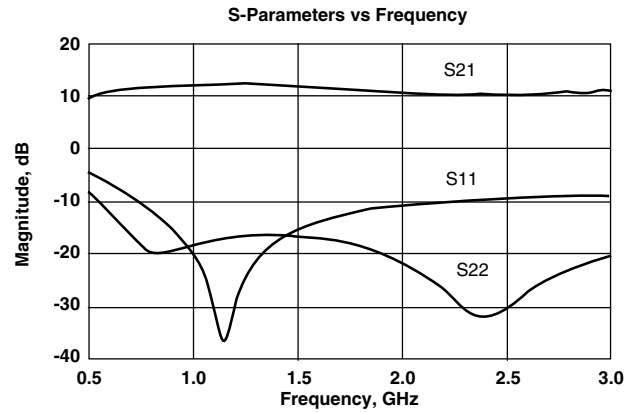
Operation of this device above any of these parameters may cause damage.

Application Circuit

Parameter	Typical			Units
	900	1900	2400	
Frequency Range	900	1900	2400	MHz
Gain	12.5	11.5	10.8	dB
Input Return Loss	-18.0	-11.5	-10.0	dB
Output Return Loss	-17	-16	-15	dB
Output IP3	+36	+36	+36	dBm
Output P1dB	20.5	19.5	19.5	dBm
Noise Figure	2.7	2.8	2.9	dB

Notes:

1. Typical values reflect performance in recommended application circuit.



Ref Designator	Value	Description	Size
C1, C4	56 pF	MCH185A560JK	0603
C2	0.1 μF	VITR 0.1μF 25V CER CAP 0603 X7R 10%	0603
L1	10 nH	TOKO LL1608-F10NJ	0603
L2	12 nH	TOKO LL1608-F12NK	0603

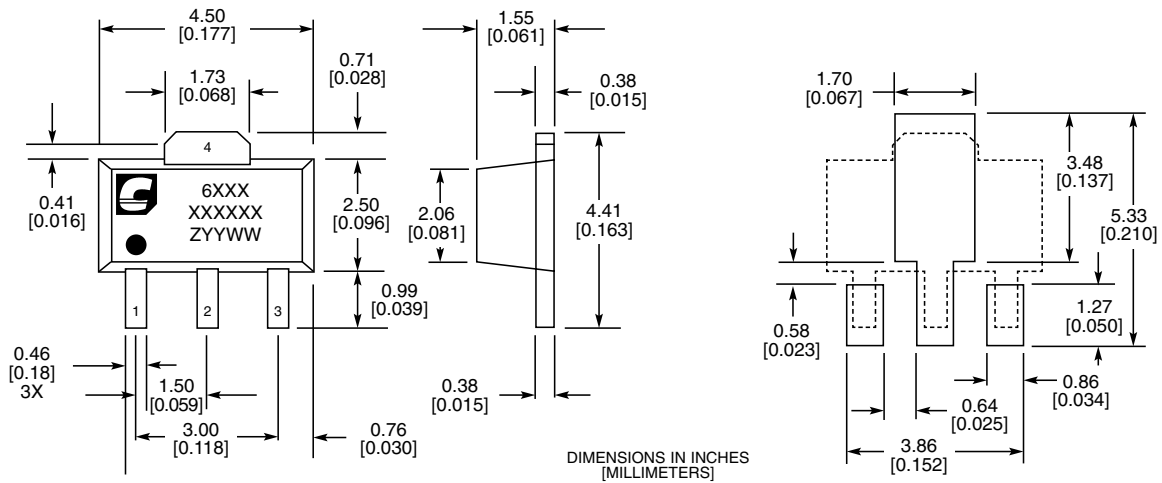


Typical Scattering Parameters (V_{ds} = +5V, I_{ds} = 75 mA, T = 22°C, unmatched device in a 50 ohm system)

Frequency (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	(Mag)	(Ang)	(Mag)	(Ang)	(Mag)	(Ang)	(Mag)	(Ang)
300	0.313	-38.56	4.435	159.70	0.118	-2.96	0.090	-50.49
400	0.307	-43.12	4.382	155.90	0.118	-7.56	0.078	-44.05
500	0.305	-48.70	4.344	151.60	0.118	-11.62	0.072	-38.92
600	0.304	-54.84	4.309	147.20	0.117	-15.23	0.070	-35.16
700	0.305	-61.22	4.270	142.70	0.117	-18.70	0.070	-32.63
800	0.307	-67.68	4.234	138.20	0.117	-22.02	0.071	-31.18
900	0.310	-74.20	4.197	133.60	0.116	-25.29	0.073	-30.88
1000	0.313	-80.57	4.158	129.00	0.116	-28.50	0.076	-31.21
1100	0.316	-86.85	4.122	124.40	0.115	-31.71	0.078	-31.76
1200	0.318	-93.11	4.085	119.90	0.115	-34.88	0.082	-32.50
1300	0.322	-99.29	4.043	115.30	0.114	-37.94	0.086	-33.84
1400	0.324	-105.40	4.004	110.70	0.114	-40.98	0.090	-35.26
1500	0.327	-111.40	3.960	106.20	0.113	-44.08	0.094	-36.85
1600	0.329	-117.40	3.919	101.70	0.112	-47.07	0.097	-38.64
1700	0.332	-123.40	3.879	97.22	0.112	-50.08	0.101	-40.76
1800	0.335	-129.20	3.838	92.77	0.111	-53.15	0.104	-42.85
1900	0.337	-135.00	3.799	88.32	0.110	-56.07	0.108	-45.06
2000	0.339	-140.80	3.760	83.87	0.109	-59.11	0.111	-47.37
2100	0.340	-146.50	3.720	79.47	0.109	-62.08	0.114	-49.53
2200	0.341	-152.30	3.679	75.03	0.108	-65.06	0.118	-51.72
2300	0.342	-158.20	3.639	70.64	0.107	-67.98	0.121	-53.76
2400	0.343	-164.10	3.600	66.25	0.106	-71.02	0.124	-55.82
2500	0.343	-169.80	3.561	61.89	0.105	-73.95	0.127	-57.84
2600	0.344	-175.80	3.524	57.51	0.105	-76.90	0.130	-59.75
2700	0.344	178.20	3.486	53.16	0.104	-79.96	0.133	-61.67
2800	0.344	172.20	3.448	48.81	0.103	-82.91	0.135	-63.35
2900	0.344	166.10	3.410	44.46	0.102	-85.93	0.137	-65.11
3000	0.344	160.00	3.373	40.13	0.101	-88.99	0.139	-66.85

Notes

Physical Dimensions



MARKINGS:
 6XXX = CELERITEK MODEL NO.
 XXXXXX = WAFER LOT NO.
 ZYYWW = DATE CODE (YR/WEEK)
 FIRST LETTER COUNTRY OF ORIGIN IF OTHER THAN USA

Ordering Information

The CMM6001-SC is available in a surface-mount SOT-89 package and devices are available in tape and reel.

Part Number for Ordering

CMM6001-SC

PB-CMM6001-SC

Package

SOT-89 surface-mount power package in tape and reel

Evaluation Board with SMA connectors for CMM6001-SC

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