CMM2308

800 to 2700 MHz
High Dynamic Range Amplifier

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CELERITEK

CMM2308

Preliminary Product Specifications
August 1996 *(1 of 4)*

800 to 2700 MHz High Dynamic Range Amplifier

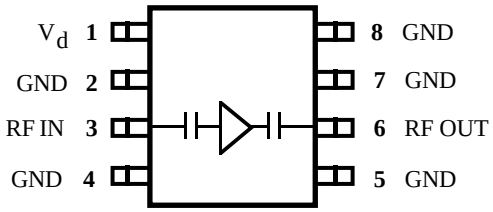
Features

- ❑ **+17 dBm Output Power**
- ❑ **<2.2 dB Noise Figure**
- ❑ **Low Current: 70 mA, Typ.**
- ❑ **Single +3V to +6V Supply**
- ❑ **DC Blocked >2:1 VSWR**
- ❑ **Low-Cost SOIC-8 Plastic Package**

Applications

- ❑ **Power Amplifier Drivers**
- ❑ **PCS Medium Power Amplifiers**
- ❑ **Medium Power WLANs**
- ❑ **Base Station Receivers**

Functional Block Diagram



Description

The Celeritek CMM2308 is a high dynamic range, pin-compatible, second source for the TriQuint® 9132 and the Mini-Circuits® VNA. Providing comparable gain and lower noise figure than either of the existing standard amplifiers at 25% less drain current, the CMM2308 is an excellent choice for power sensitive applications, while delivering more design margin. Packaged in a low-cost surface mount SOIC-8 package, the CMM2308 will drop into existing designs and offers improved features and performance.

Absolute Maximum Ratings

Parameter	Rating	Parameter	Rating	Parameter	Rating
Drain Voltage (+V_d)	+7 V	Power Dissipation	1.0 W	Operating Temperature	-40°C to +80°C
Drain Current (I_d)	150 mA	Thermal Resistance	55°C/W	Channel Temperature	175°C
RF Input Power	15 dBm	Storage Temperature	-65°C to +150°C	Soldering Temperature	260°C for 5 Sec

Recommended Operating Conditions

Parameter	Typ	Units	Parameter	Typ	Units
Drain Voltage (+V_d)	3.0 to 6.0	Volts	Operating Temperature (PC Board)	-40 to +70	°C

Electrical Characteristics

The following specifications are guaranteed at room temperature with drain voltage (+V_d) = 5.0 V ±5% at 2.5 GHz.

Parameter	Condition	Min	Typ	Max	Units
Frequency Range		800		2700	MHz
Small Signal Gain		17.5	19.0		dB
Noise Figure	1.8 to 2.5 GHz		2.2		dB
Power Output @ 1 dB Compression		15.5	17.0		dBm
Output 3rd Order Intercept			27		dBm
Input Return Loss			10		dB
Output Return Loss			10		dB
DC Supply Current			70	80	mA
Supply Voltage		3	5	6	V

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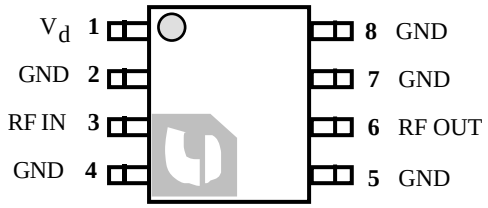
Connection Diagram and Pin Description

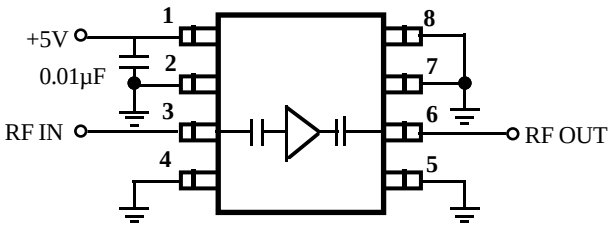


Pin #	Name	Description
1	$+V_d$	Drain voltage. Connect to positive supply.
2	GND	Ground.
3	RF IN	RF input (Internally DC blocked).
4	GND	Ground.
5	GND	Ground.
6	RF OUT	RF output (Internally DC blocked).
7	GND	Ground.
8	GND	Ground.

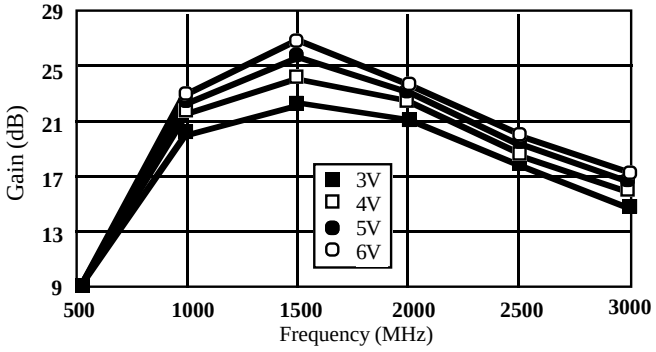
Typical Performance

The following typical performance parameters were tested in the test circuit shown at room temperature and with a drain voltage ($+V_d$) = 5 V, unless otherwise specified.

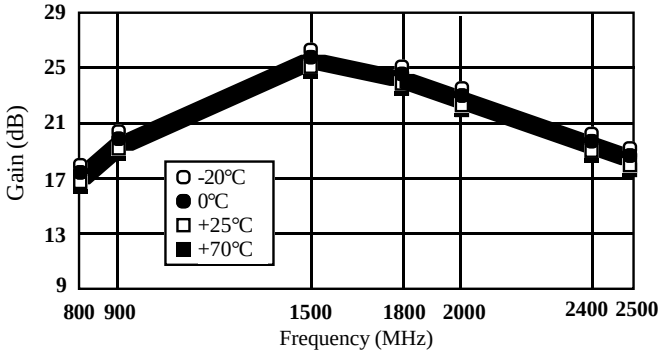
Test Circuit Diagram



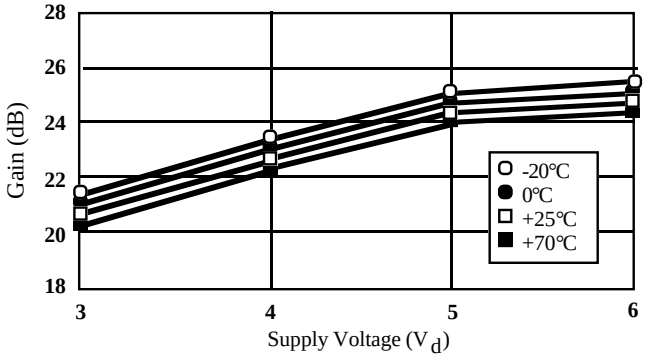
Gain vs Frequency vs V_d



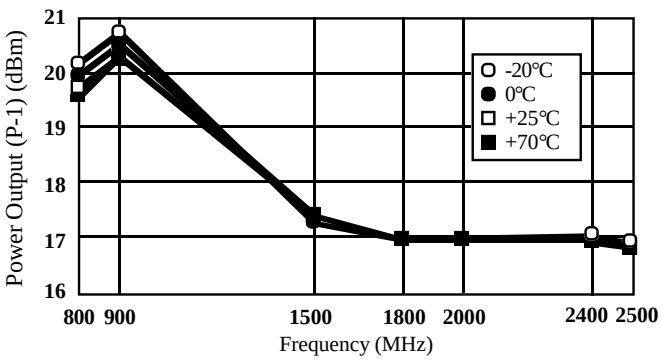
Gain vs Frequency vs Temperature @ 5V



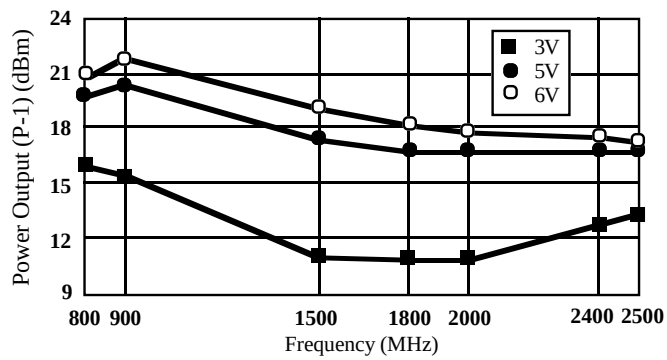
Gain vs V_d vs Temperature @ 1.8 GHz



Power Output (P-1) vs Frequency vs Temperature @ 5V

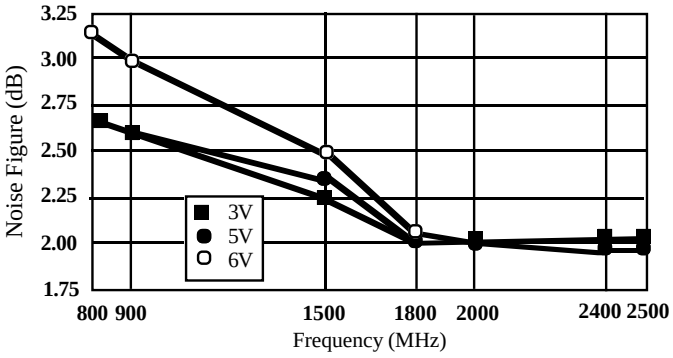


Power Output (P-1) vs Frequency vs V_d @ 25°C

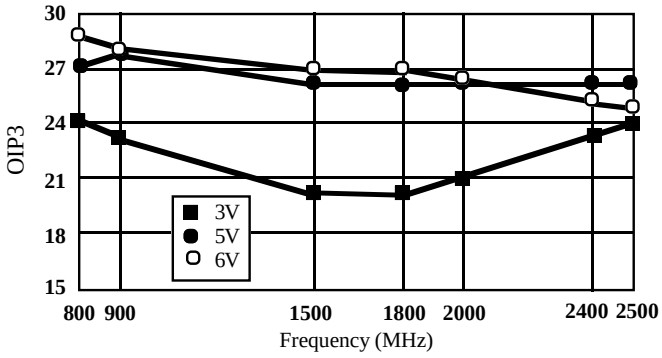


Typical Performance (Continued)

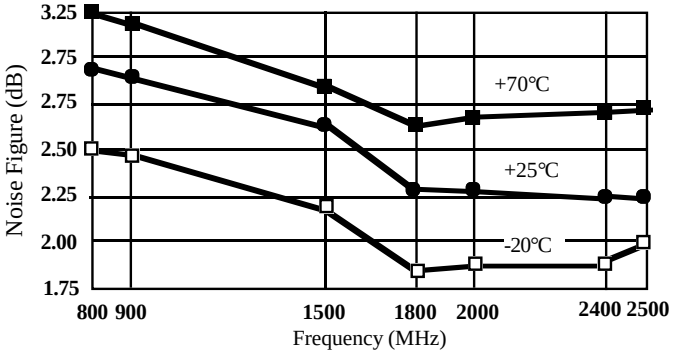
Noise Figure vs Frequency vs V_d @ 25°C



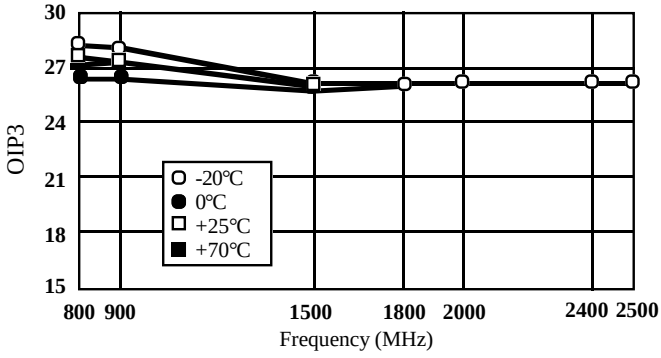
OIP3 vs Frequency vs V_d @ 25°C



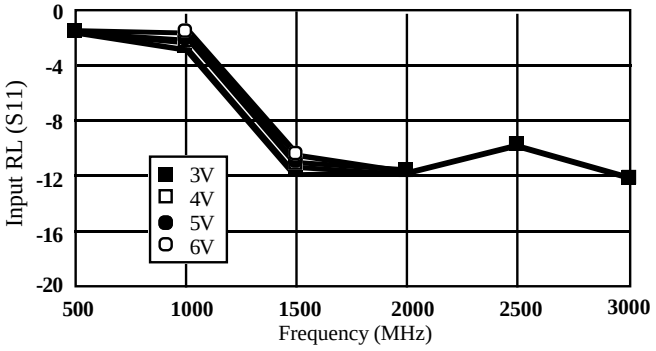
Noise Figure vs Frequency vs Temperature @ 5V



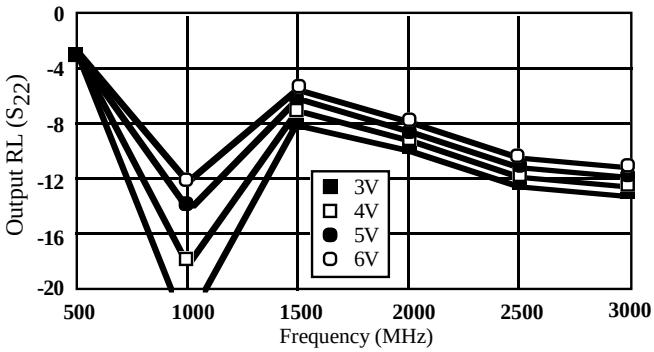
OIP3 vs Frequency vs Temperature @ 5V



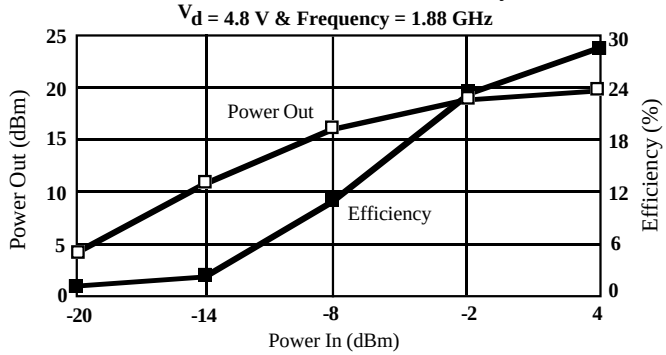
S11 vs Frequency vs V_d



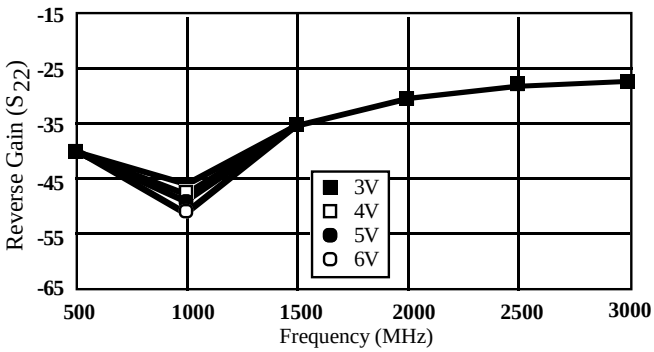
S_{22} vs Frequency vs V_d



Power In vs Power Out & Efficiency
V_d = 4.8 V & Frequency = 1.88 GHz



S_{12} vs Frequency vs V_d



Test Configuration and Evaluation

Celeritek tests the CMM2308 on an FR4 PC test board. FR4 was chosen for its low loss characteristics at frequencies up to 2.5 GHz. Plated through hole connections from the top of the board to the backside ground plane minimizes inductance in the ground connections. These through hole connections are as close as possible to each ground pin.

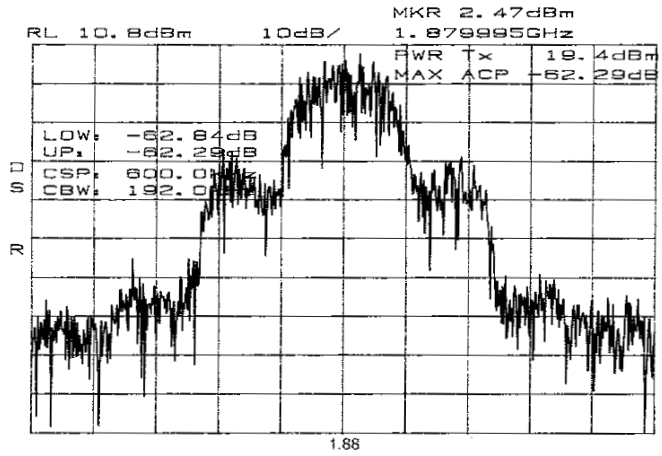
For evaluation purposes Celeritek offers a prototype evaluation board (PB-CMM2308-AJ) for the CMM2308. Please call the factory or a local representative for more information.

Handling Precaution

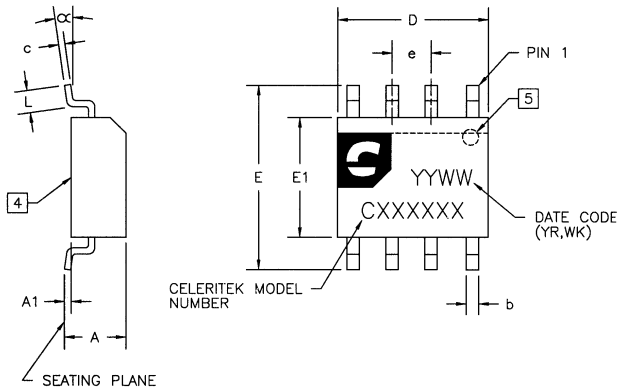
Microwave devices are sensitive to electrostatic discharge. Proper precautions should be taken to avoid ESD damage.

Adjacent Channel Power

π/4 DQPSK Modulation, V_d = 4.8 V



Physical Dimensions



NOTES:(UNLESS OTHERWISE SPECIFIED)
1. DIMENSIONS ARE IN MILLIMETERS[INCHES].
2. LEAD MATERIAL: COPPER
3. BODY MATERIAL: PLASTIC (EPOXY).
4. COUNTRY OF ORIGIN, IF OTHER THAN U.S., SHALL BE MARKED ON THIS SURFACE.
5. PIN 1 IDENTIFICATION IS A DOT OR BEVELED EDGE.

DIMENSION	MINIMUM	NOMINAL	MAXIMUM
A	1.35[0.053]	1.63[0.064]	1.75[0.069]
A1	0.10[0.004]	0.15[0.006]	0.20[0.008]
b	0.35[0.014]		0.45[0.018]
c	0.19[0.007]		0.22[0.009]
D	4.80[0.188]	4.90[0.193]	5.00[0.197]
E	5.80[0.228]	5.99[0.236]	6.20[0.244]
E1	3.80[0.150]	3.91[0.154]	4.00[0.158]
e		1.27[0.050]	
L	0.508[0.020]	0.64[0.025]	1.143[0.045]
α	0°		8°

Ordering Information

The CMM2308 is available in a surface mount SOIC-8 plastic package.

Part Number for Ordering	Package
CMM2308-AJ	**SOIC-8 surface mount narrow body plastic package**
CMM2308-AJ-000T	**SOIC-8 package in tape and reel**

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