

CMM1331-SM

12.7 to 13.5 GHz
1.5 Watt Power Amplifier



Advanced Product Specifications
October 2003 (1 of 2)

12.70 to 13.50 GHz 1.5 Watt Power Amplifier

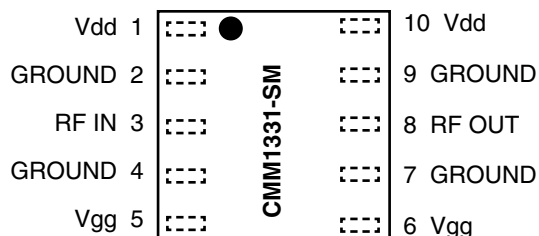
Features

- ❑ 32.0 dBm (Typ.) Saturated Output Power
- ❑ 32.0 dB (Typ.) Linear Gain
- ❑ Fully Matched
- ❑ Unconditionally Stable
- ❑ Low-Cost Surface Mount Package
- ❑ Optimum Thermal Dissipation

Applications

- ❑ Ku-Band VSAT Transmit Subsystems

Pin Functional Diagram



Description

The CMM1331-SM is a four-stage pHEMT GaAs MMIC power amplifier that is ideally suited for transmit subsystems designed for Ku-Band VSAT applications. The CMM1331-SM provides 32.0 dB linear gain and delivers 1.5 watts of output power at saturation operating from 12.70 to 13.50 GHz frequency.

The unconditional stability and internal matching provides for reduction of external components making this product a simple and low-cost solution. The low-cost, 6mm x 6mm x 1.6mm surface mount package offers the same excellent RF and thermal properties as a typical flange package.

Electrical Characteristics (T = +25°C, Vdd = 7V, Idq = 770mA)

Parameter	Condition	Min	Typ	Max	Units
Frequency Range		12.70		13.50	GHz
Output Power	@ 1dB compression	30.0	31.0		dBm
Saturated Output Power	Pout at Pin = 5.0 dBm	31.0	32.0		dBm
Output Power Variation	Over operating frequency		1.0	1.5	dBm
Linear Gain		29.0	32.0	35.0	dB
Linear Gain Variation	Over operating frequency			2.0	dB
Third Order Intercept Point			36.0		dBm
Input Reflection Coefficient			-10.0		dB
Output Reflection Coefficient			-7.0		dB
Gate Supply Voltage	Idq = 770 mA	-1.1	-0.9	-0.7	Volt
Drain Current	At Saturation		900	980	mA
Power Added Efficiency	At Saturation	22	26		%

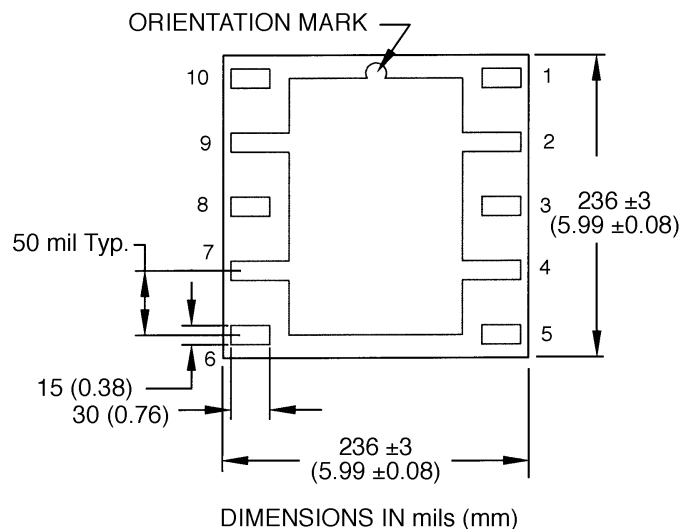
Electrical Specifications (TA = -40°C to +75°C)

Parameter	Condition	Min	Typ	Max	Units
Saturated Output Power	Variation from Room Temperature	-0.5			dBm
Linear Gain	Variation from Room Temperature	-2.5		3.5	dB
Stability		Unconditionally stable			

Maximum Ratings (TA = -40°C to +75°C) Operation outside these limits can cause permanent damage.

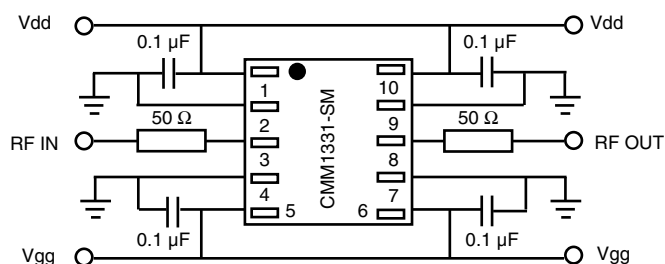
Parameter	Typ	Units	Parameter	Typ	Units
Drain Voltage (+Vdd)	8.5	Volts	RF Input Power (Pin)	7.0	dBm
Gate Voltage (Vgg)	-3.0	Volts	Dissipated Power (Pdiss)	7.2	Watts
Quiescent Current (Idq)	1000	mA	Storage Temperature	-50 to +150	°C
Gate Current (Ig)	5	mA	Operating Backside Temperature	-40 to +75	°C

Physical Dimensions (Bottom View)



Recommended Application Circuit

Note: This schematic represents the topology of the application circuit recommended by Celeritek.



Note: Due to the high gain of this device it is highly recommended to maintain the reverse isolation (S12) above 50 dB.

Biasing Notes

1. Dual bias is required
2. 0.1 μ F bypass capacitors are needed on PC board as close as possible to pins 1, 5, 6 and 10.
3. Positive (+) bias can be applied either at pin 1 or pin 6.
4. Negative (-) bias can be applied either at pin 5 or pin 10.
5. No DC block is required at RF IN/OUT.
6. Negative (-) bias must be applied before applying positive (+) bias.

Ordering Information

The CMM1331-SM is available in tube or tape and reel.

Part Number for Ordering

CMM1331-SM

Package

Surface mount package

Celeritek reserves the right to make changes without further notice to any products herein. Celeritek makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Celeritek assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Celeritek does not convey any license under its patent rights nor the rights of others. Celeritek products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Celeritek product could create a situation where personal injury or death may occur. Should Buyer purchase or use Celeritek products for any such unintended or unauthorized application, Buyer shall indemnify and hold Celeritek and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Celeritek was negligent regarding the design or manufacture of the part. Celeritek is a registered trademark of Celeritek, Inc. Celeritek, Inc. is an Equal Opportunity/Affirmative Action Employer.