Advanced Product Specifications
October 2003 *(1 of 2)*

12.70 to 13.50 GHz 1.5 Watt Power Amplifier

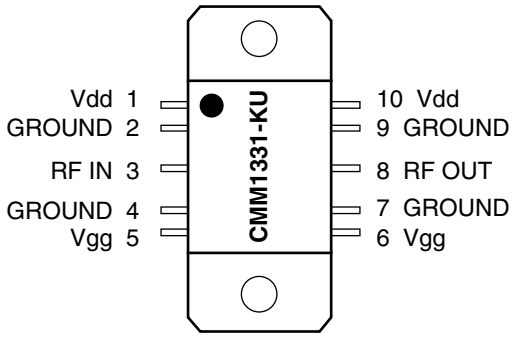
Features

- ❑ **32.5 dBm** (Typ.) **Saturated Output Power**
- ❑ **32.0 dB** (Typ.) **Linear Gain**
- ❑ **Fully Matched**
- ❑ **Unconditionally Stable**
- ❑ **Copper/Molybdenum Flange Package for Optimum Thermal Dissipation**

Applications

- ❑ **Ku-Band VSAT Transmit Subsystems**

Pin Functional Diagram



Description

The CMM1331-KU is a four-stage pHEMT GaAs MMIC power amplifier that is ideally suited for transmit subsystems designed for Ku-Band VSAT applications. The CMM1331-KU 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 package is designed with a base material of gold-plated copper/molybdenum composite that offers excellent thermal properties and minimum mechanical stress.

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

Parameter	Condition	Min	Typ	Max	Units
Frequency Range		12.70		13.50	GHz
Saturated Output Power	Pin = 3.0 dBm	32.0	32.5		dBm
Saturated Output Power Variation	Over operating frequency		0.3	0.6	dBm
Linear Gain		29.0	32.0	35.0	dB
Linear Gain Variation	Over operating frequency		2.5	4.5	dB
Input Reflection Coefficient			-10.0		dB
Output Reflection Coefficient			-7.0		dB
Gate Supply Voltage	Idq = 770 mA	-1.1	-0.9	-0.7	Volts
Drain Current	At Saturation		940	1000	mA
Power Added Efficiency		23.0	27.0		%
Thermal Resistance	Channel to Backside				°C/W

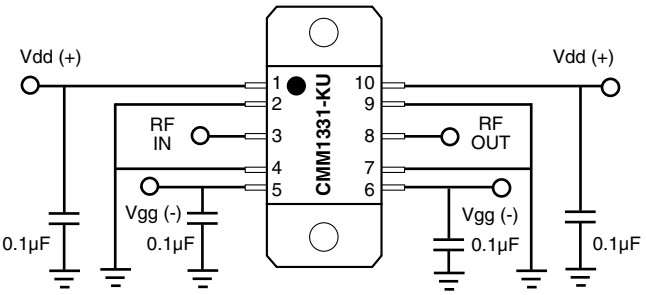
Electrical Characteristics (T = -40°C to +70°C, Vd = 7V, Idq = 770mA)

Parameter	Condition	Min	Typ	Max	Units
Saturated Power Output	Variation from room temperature value	-0.5			dBm
Linear Gain Variation	Variation from room temperature value	-2.5		3.5	dB
Stability		Unconditionally Stable			—

Maximum Ratings (TA = -40°C to +70°C) Operation outside any of these limits can cause permanent damage.

Parameter	Rating	Units	Parameter	Rating	Units
Drain Voltage ($+V_{dd}$)	8.5	Volts	RF Input Power (P_{in})	7.0	dBm
Gate Voltage (V_{gg})	-3.0	Volts	Storage Temperature	-50 to +150	°C
Bias Current (I_{dq})	1000	mA	Channel Temperature	175	°C
Gate Current (I_g)	5	mA	Dissipated Power (P_{dis})	7.3	Watts

Application Notes



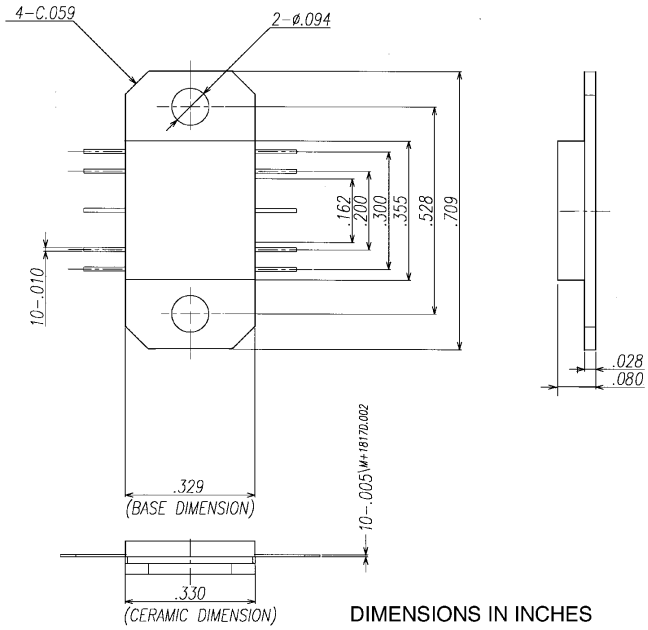
Biasing Notes

1. Dual bias is required
2. 0.1µF 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 6.
5. No DC block is required at RF IN/OUT.
6. Negative (-) bias must be applied before applying positive (+) bias.

Mounting Recommendations

1. Leads should be as short as possible.
2. Solder all leads on PC board. Solder area should be as small as possible. Grounds should be provided for pins 2, 4, 7, and 9 on PC boards.
3. Flange should be screwed down on adequate heat sink. Do not over torque screws in order to avoid breaks in ceramic and die (tightening torque: 6lbf-in).
4. Grounding shims should be placed between the flange and heat sink to ensure optimal ground contact. Aluminum or Copper foil can be used.
5. 50Ω RF IN/OUT interface are required for optimal electrical performance.
6. Due to the high gain of this device it is highly recommended to maintain the reverse isolation (S12) above 50 dB.

Physical Dimensions



Ordering Information

The CMM1331-KU is available in plastic trays.

Part Number for Ordering	Package
CMM1331-KU	**Leaded flange package in plastic trays**

CELERITEK

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