16.0-18.0 GHz
1.5-Watt Power Amplifier

May 2006 - Rev 24-May-06

CMM1631-SM
RoHS

Features

- 32dBm (Typ.) Saturated output power
- 26dB (Typ) Linear Gain
- Fully Matched
- Unconditionally Stable
- Low Cost, Surface Mount Package
- 6mmX6mmX1.6mm
- Optimum Thermal Dissipation
- 7V, 770mA



Applications

- Military Ku Band
- VSAT
- Point to Point Radio
- Ku-Band Space

General Description

The CMM1631-SM is a four stage pHEMT GaAs MMIC power amplifier packaged in a 6mm X6mm surface mount package. The CMM1631-SM provides 26dB of linear gain and delivers 1.5 watts of output power at saturation operating between 16 to 18GHz. The unconditional stability and internal matching provides for a reduction in external components making this product a simple and low cost solution. The true surface mount package makes it ideal solution in all manufacturing environments. The power amplifier is intended for use in the extended Ku-Band satellite applications.

Electrical Characteristics (T = +25°C, Vd = 6V, Idq = 1.5A)

Parameter	Condition	Min	Typ	Max	Units
Frequency Range		16.0		18.0	GHz
Output Power	@ 1dB compression		31.5		dBm
Saturated Output Power	Pin = 10 dBm		32.0		dBm
Saturated Output Power Variation	Over operating frequency		0.5	1.0	dBm
Linear Gain			26.5		dB
Linear Gain Variation	Over operating frequency		1.0	3.0	dB
Input Reflection Coefficient			-7.0		dB
Output Reflection Coefficient			-7.0		dB
Gate Supply Voltage	Idq = 800 mA	-1.1	-0.9	-0.7	Volts
Drain Current	At Saturation		800 mA		A
Power Added Efficiency	At Saturation		23		%

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		2.5	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 ($+V_{dd}$)	8.5	Volts	RF Input Power (P_{in})	13	dBm
Gate Voltage (V_{gg})	-3.0	Volts	Dissipated Power (P_{diss})	5.6	Watts
Quiescent Current (I_{dq})	1	A	Storage Temperature	-50 to +150	°C
Gate Current (I_g)	5	mA	Operating Backside Temperature	-40 to +75	°C

Preproduction

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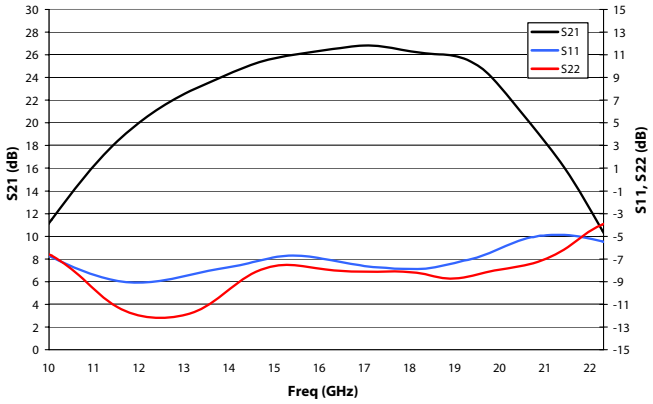
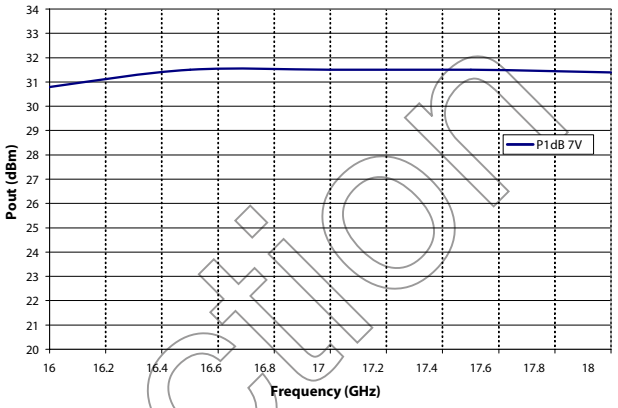
Power Amplifier Measurements (7 V, 800 mA)

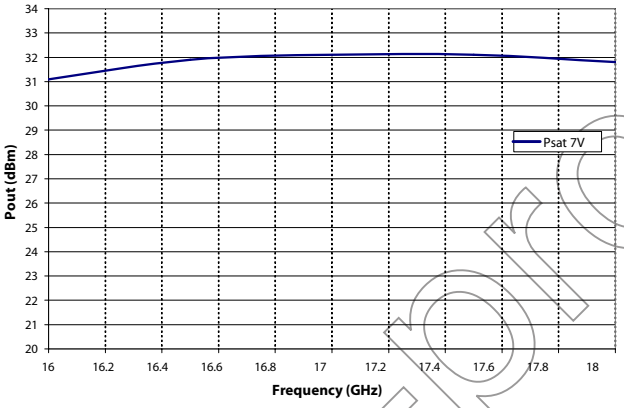
CMM1631-SM
Small Signal



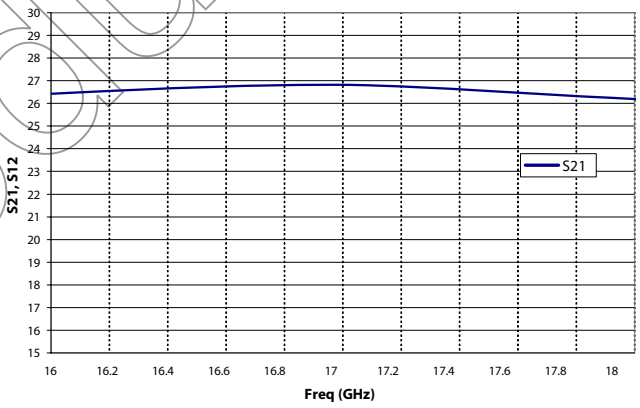
CMM1631-SM
P1dB



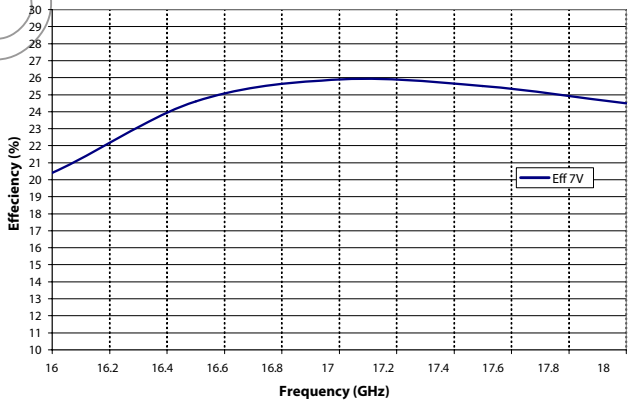
CMM1631-SM
Psat



CMM1631-SM
Gain



CMM1631-SM
Eff



Pre-production

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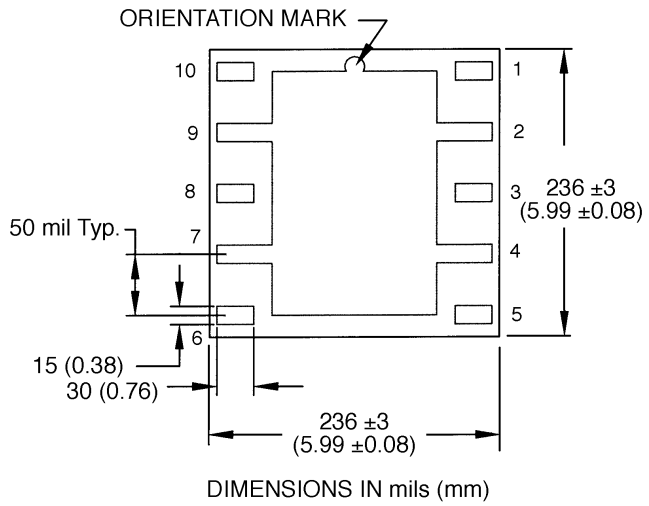
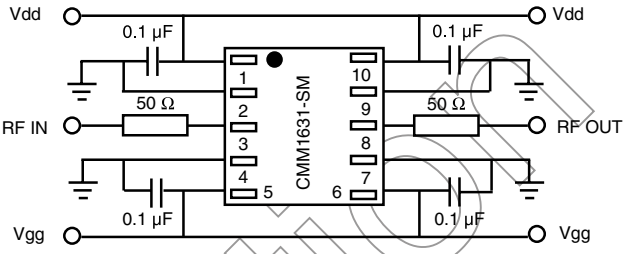
Physical Dimensions (Bottom View)



DIMENSIONS IN mils (mm)

Recommended Application Circuit

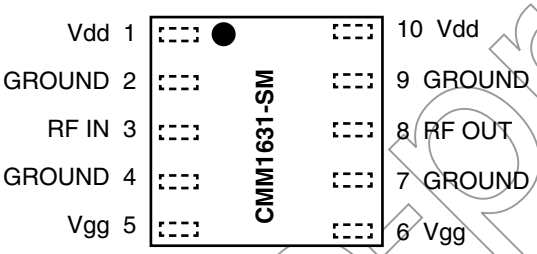
Note: This schematic represents the topology of the application circuit recommended by Celeritek.

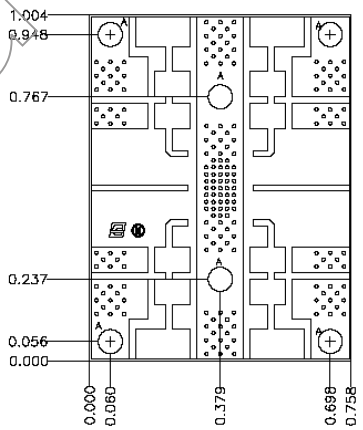


Note: Due to the high gain of this device it is highly recommended to maintain the reverse isolation (S12) above 50 dB.

Biasing Notes
1. Dual bias is required
2. 0.1µF 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.

Pin Functional Diagram





HOLE TABLE				
REF.	DIA.	TOL.	QTY.	PLATING
A	.070	+/-.0003	6	THRU
NONE	.010	+/-.0003	187	THRU

Ordering Information

The CMM1631-SM is available in available in tube or tape and reel.

Part Number for Ordering	Package
CMM1631-SM-0000	Surface mount package in bulk quantity
CMM1631-SM-000T	Surface mount package in tape and reel
PB-CMM1631-SM-0000	Evaluation Board

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