

16.0-18.0 GHz 1.5-Watt Power Amplifier

Mimix
BROADBAND™

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 |

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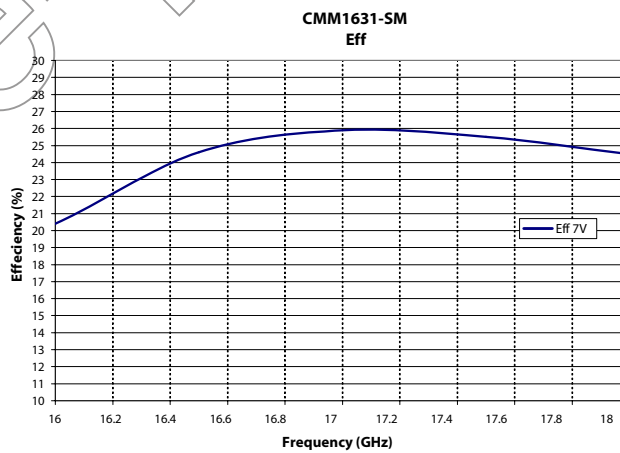
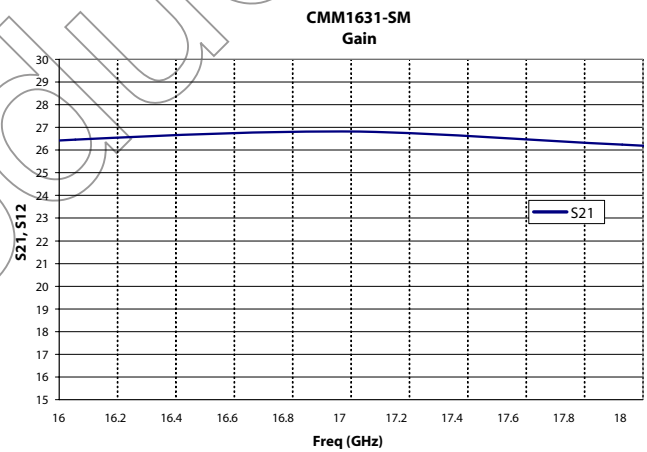
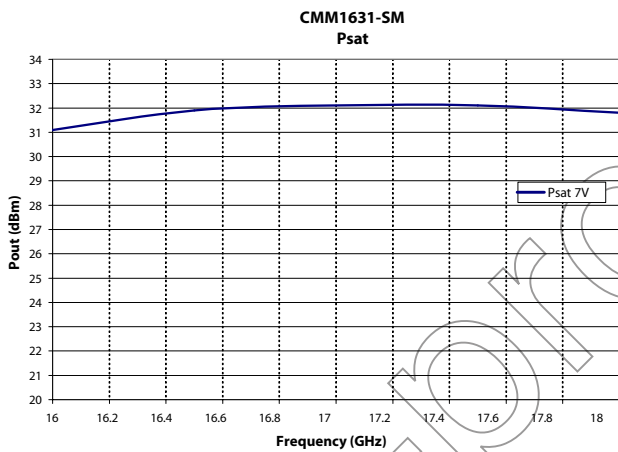
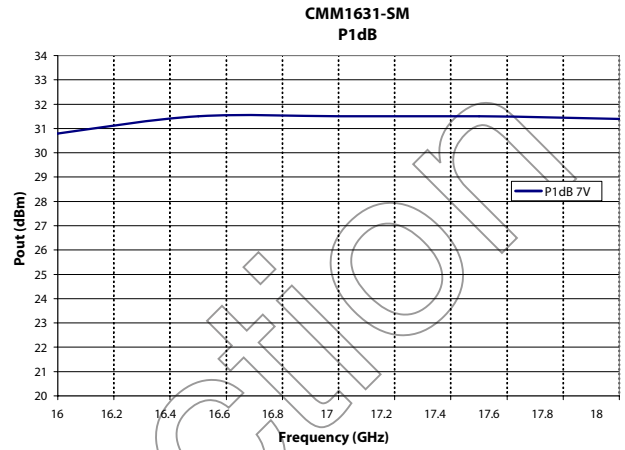
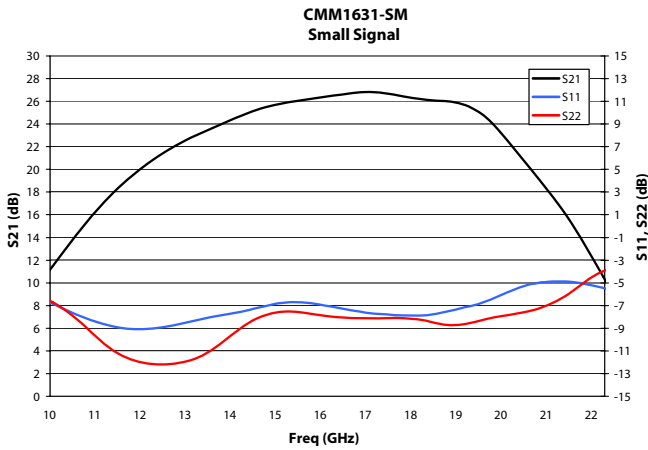
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Power Amplifier Measurements (7 V, 800 mA)



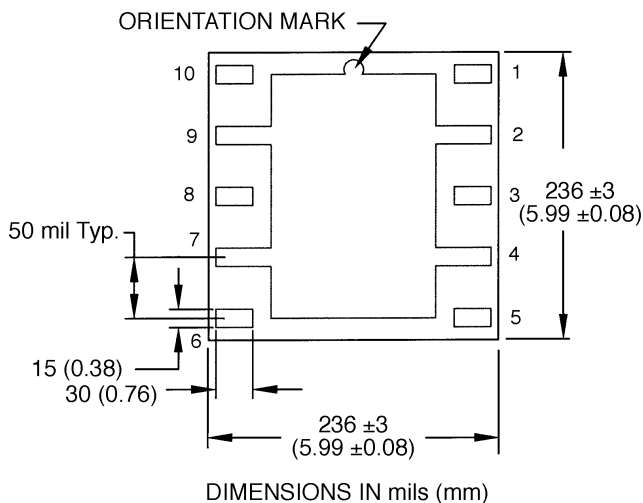
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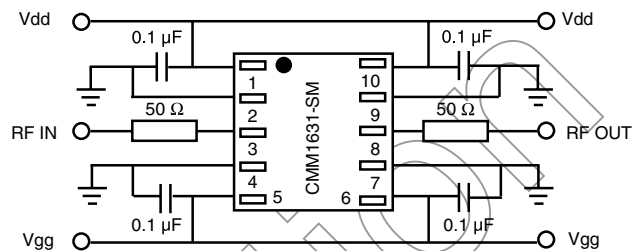
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Physical Dimensions (Bottom View)



Recommended Application Circuit

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

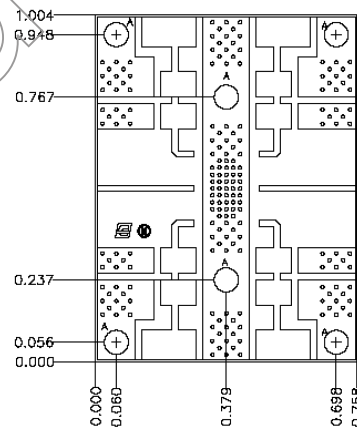
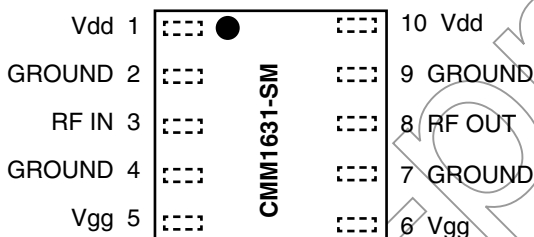


Note: Due to the high gain of this device it is highly recommended to maintain the reverse isolation (S12) above 50 dB.

Biasing Notes

1. Dual bias is required
2. 0.1µF 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 7.
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 | +/-0.0003 | 6 | THRU |
| NONE | .010 | +/-0.0003 | 187 | THRU |

Ordering Information

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

Part Number for Ordering

CMM1631-SM-0000
CMM1631-SM-000T
PB-CMM1631-SM-0000

Package

Surface mount package in bulk quantity
Surface mount package in tape and reel
Evaluation Board