

# 16.0-18.0 GHz 1.5-Watt Power Amplifier

## 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			

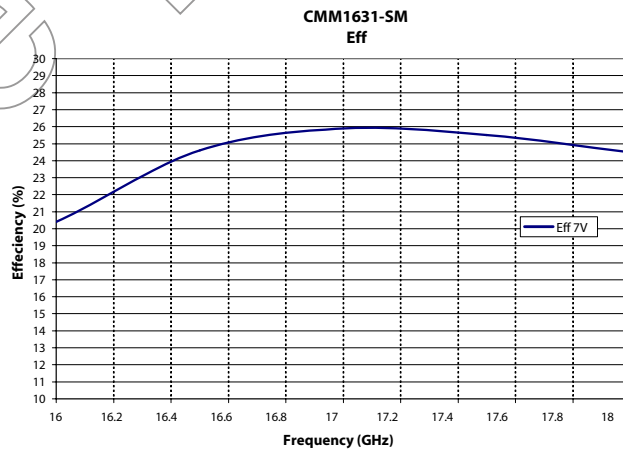
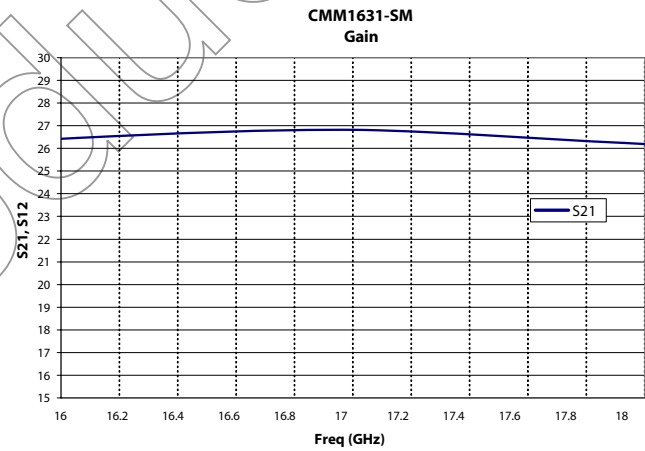
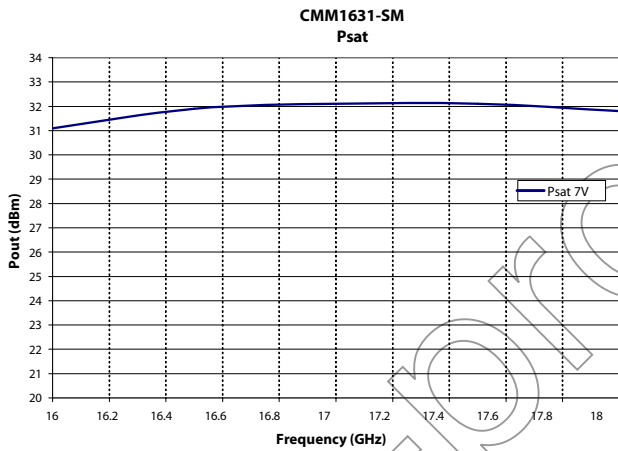
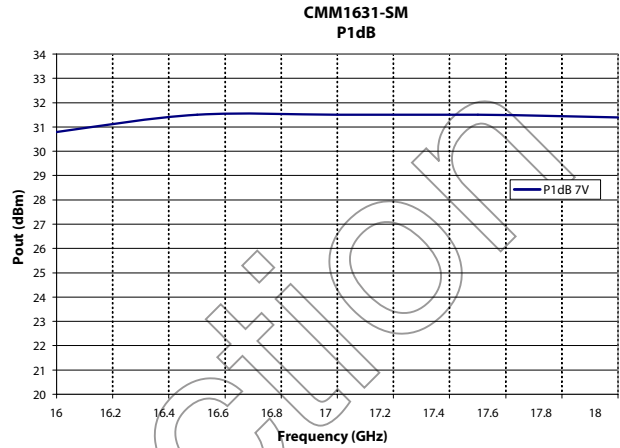
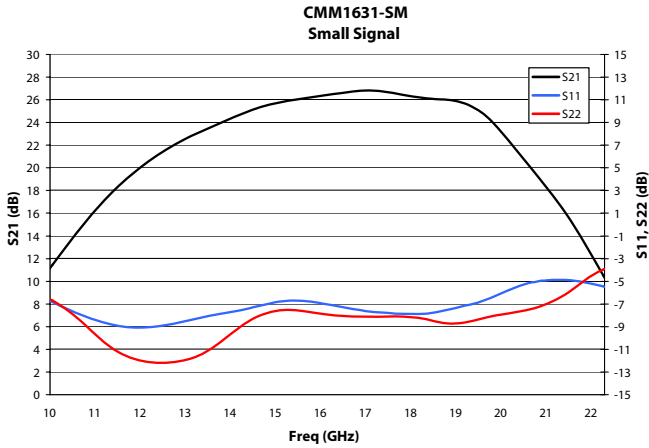
## Maximum Ratings (TA = -40°C to +75°C)

Operation outside these limits can cause permanent damage.

Parameter	Typ	Units	Parameter	Typ	Units
Drain Voltage (+V <sub>dd</sub> )	8.5	Volts	RF Input Power (P <sub>in</sub> )	13	dBm
Gate Voltage (V <sub>gg</sub> )	-3.0	Volts	Dissipated Power (P <sub>diss</sub> )	5.6	Watts
Quiescent Current (I <sub>dq</sub> )	1	A	Storage Temperature	-50 to +150	°C
Gate Current (I <sub>g</sub> )	5	mA	Operating Backside Temperature	-40 to +75	°C

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## Power Amplifier Measurements (7 V, 800 mA)

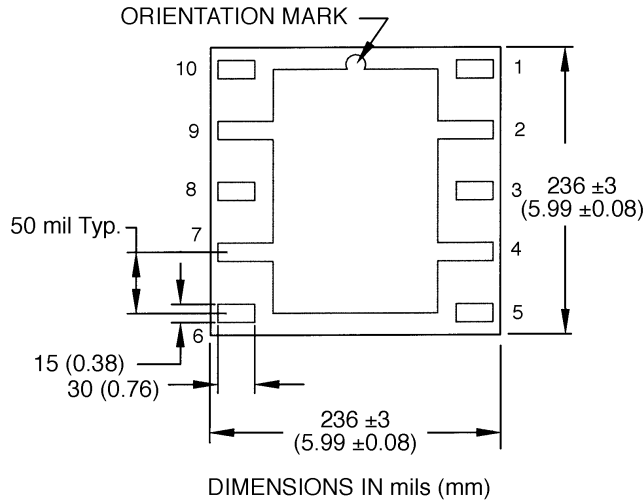


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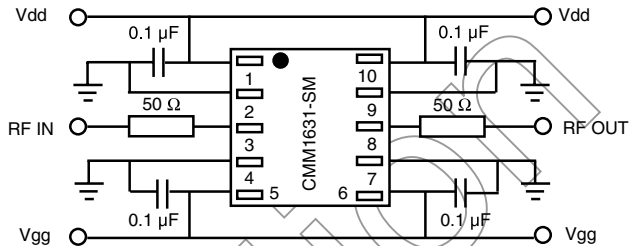
**CMM1631-SM**  
RoHS

## Physical Dimensions (Bottom View)



## Recommended Application Circuit

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

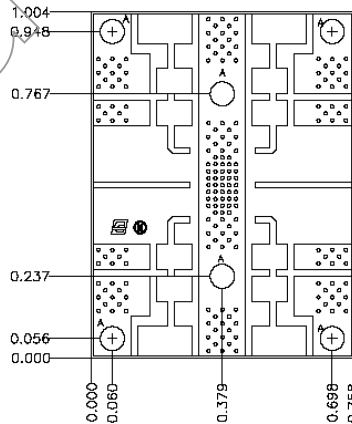
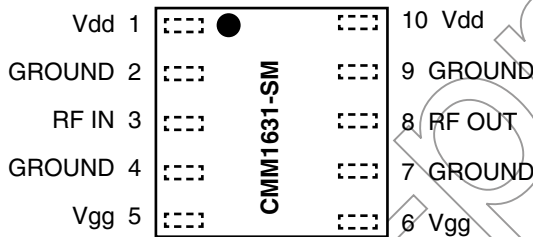


Note: Due to the high gain of this device it is highly recommended to maintain the reverse isolation (S12) above 50 dB.

### 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 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 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