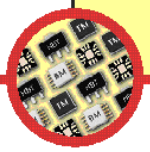
Gallium Nitride MMIC 2W DC – 18.0 GHz Power Amplifier

AM00018033TM-00
AM00018033TM-SN-R
November 2014
Rev 1



DESCRIPTION

AMCOM's AM00018033TM-SN-R is a broadband GaN MMIC power amplifier. It has 14dB gain, and 33 dBm output power over the DC to 12GHz band. The AM00018033TM-SN-R is in a ceramic package with a flange and straight RF and DC leads for drop-in assembly. Because of high DC power dissipation, good heat sinking is required. The package is RoHS compliant. This MMIC is matched to 50 Ohms. AM00018033TM-00 is the chip form of this MMIC.

FEATURES

- Ultra-Broadband from DC to 18GHz
- Saturated output power P_{sat} is 33dBm
- Gain, 14dB
- Input & output matched to 50 Ohms

APPLICATIONS

- Instrumentation
- Commercial telecom transmission equipment
- Fixed microwave backhaul

TYPICAL PERFORMANCE *

Bias Conditions: V_{ds1}= 28V , I_{ds} =360mA , V_{gs} =-2.4V**

Parameters	Minimum	Typical **	Maximum
Frequency	1.0 – 16 GHz	DC – 18 GHz	
Small Signal Gain	12dB	15dB	18dB
Gain Ripple		± 1.5dB	± 3.0dB
P1dB (0.5 – 4.0GHz)	-	28dBm	
P1dB (4.0 – 8.0GHz)	-	26dBm	
P1dB (8.0 – 12.0GHz)	-	24dBm	
Psat (0.5 – 4.0GHz)	33dBm	35dBm	
Psat (4.0 – 8.0GHz)	31dBm	33dBm	
Psat (8.0 – 12.0GHz)	27dBm	29dBm	
Psat Efficiency		15%	
Noise Figure		10dB	
IP3		TBD	
Input Return Loss		>12dB	
Output Return Loss		>10dB	
Thermal Resistance		TBD	

* Specifications subject to change without notice.

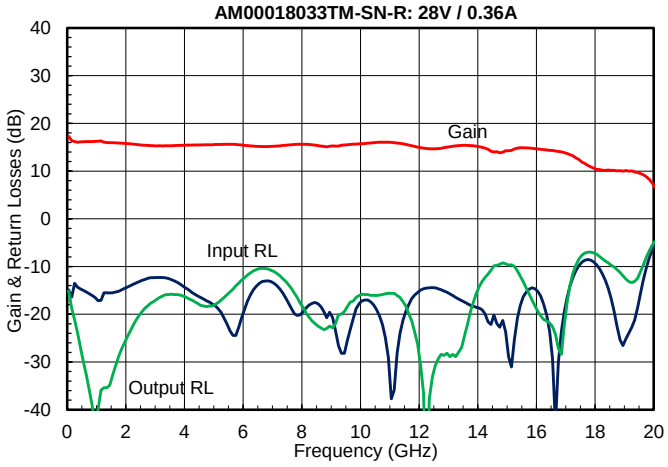
Email: info@amcomusa.com
Website: www.amcomusa.com
Tel. (301) 353-8400 Fax. (301) 353-8401
401 Professional Drive, Gaithersburg, MD 20879

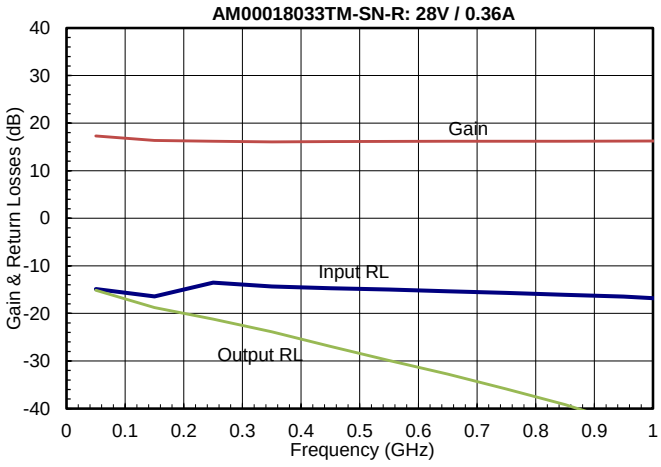
ABSOLUTE MAXIMUM RATING

Parameters	Symbol	Rating
Drain voltage	V_{ds1}	40V
Gate voltage	V_{gs}	-6V
Drain source current	I_{dsq}	0.48A
Continuous dissipation at 25ºC	P_t	19W
Channel temperature	T_{ch}	200°C
Operating temperature	T_{op}	-55°C to +85°C
Storage temperature	T_{sto}	-55°C to +135°C

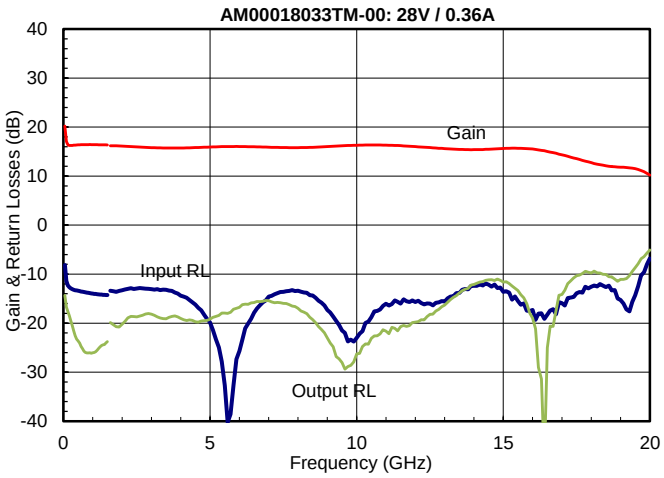
SMALL SIGNAL DATA*

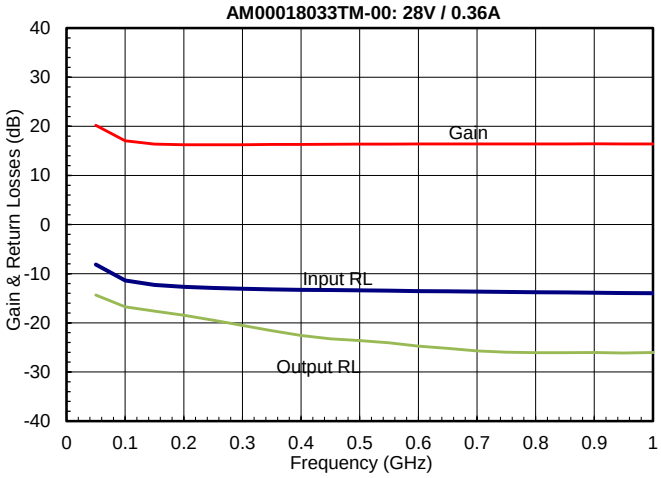
A) Packaged MMIC S-Parameters (AM00018033TM-SN-R)





B) MMIC Chip S-Parameters (AM00018033TM-00)





* S-Parameters measured using test fixture. Bias is V_{ds1}= 28V , I_{ds} =360mA, V_{gs} =-2.4V.

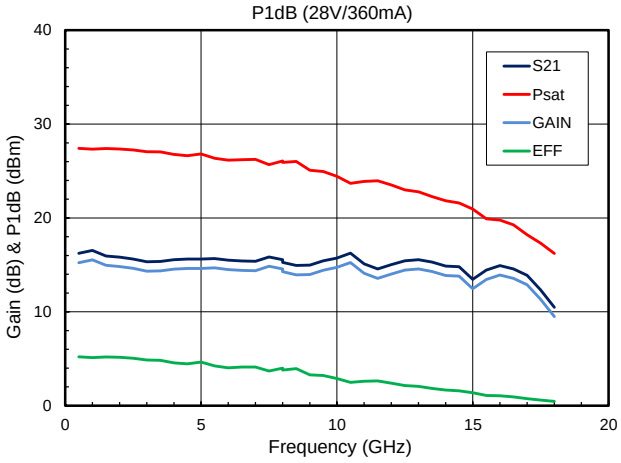
NOISE DATA

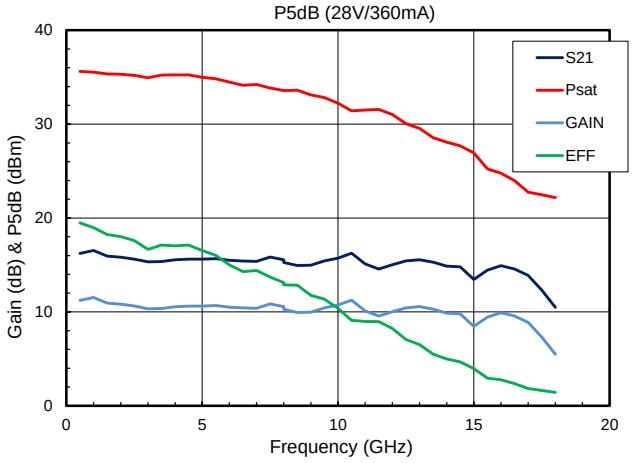
TBD

POWER DATA**

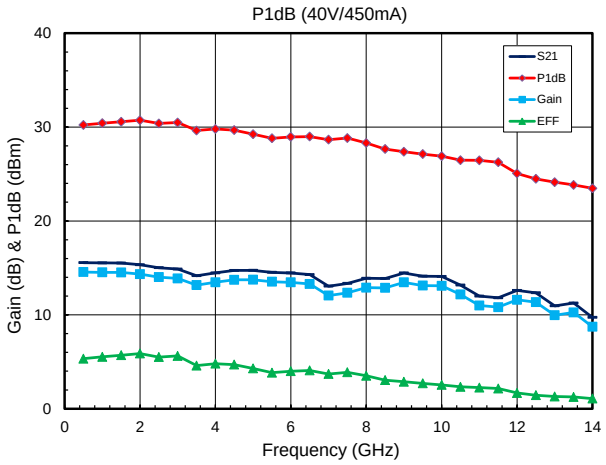
a) S21, Power, Compressed gain and efficiency at Vds = +28V, Ids = 0.36A , Vgs = -2.4V

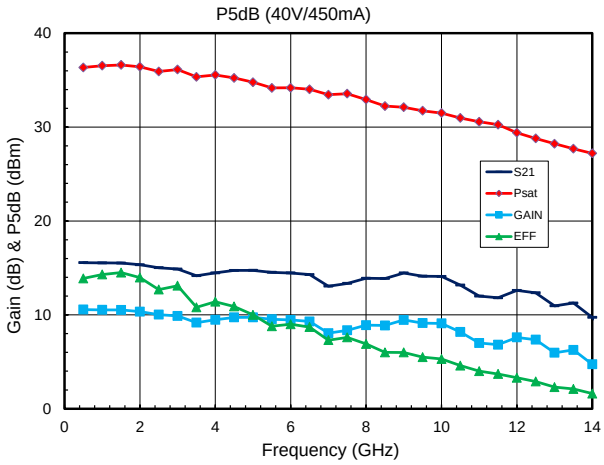
b)





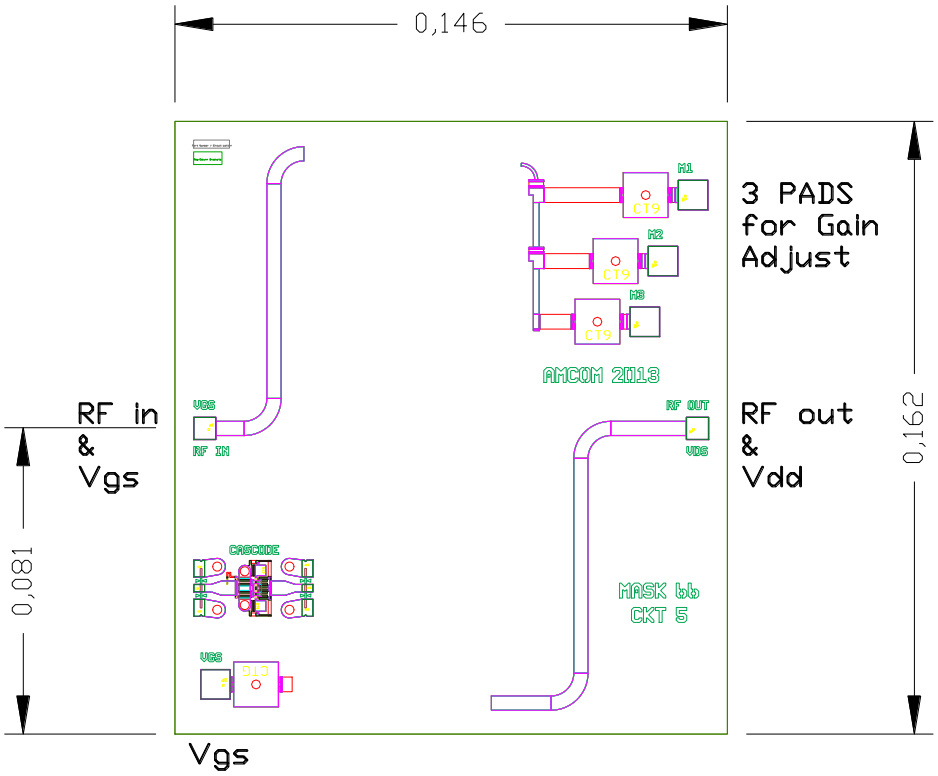
c) S21, Power, Compressed gain and efficiency at Vds = +40V, Ids = 0.45A , Vgs = -2.3V





** Power measured using test fixture and external bias tee.

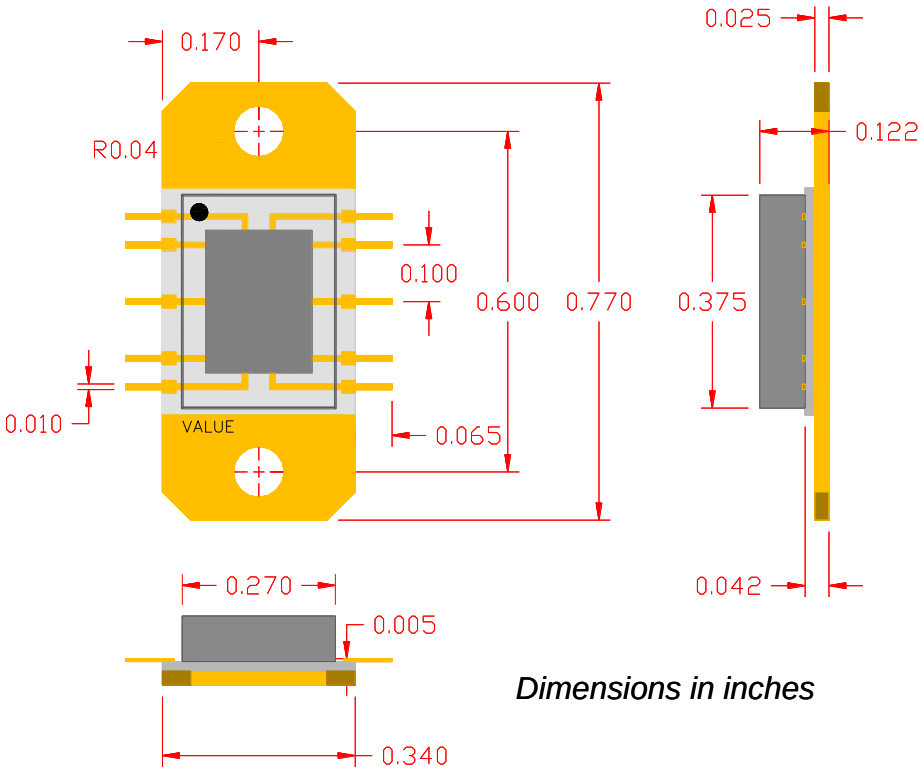
CHIP OUTLINE



Notes:

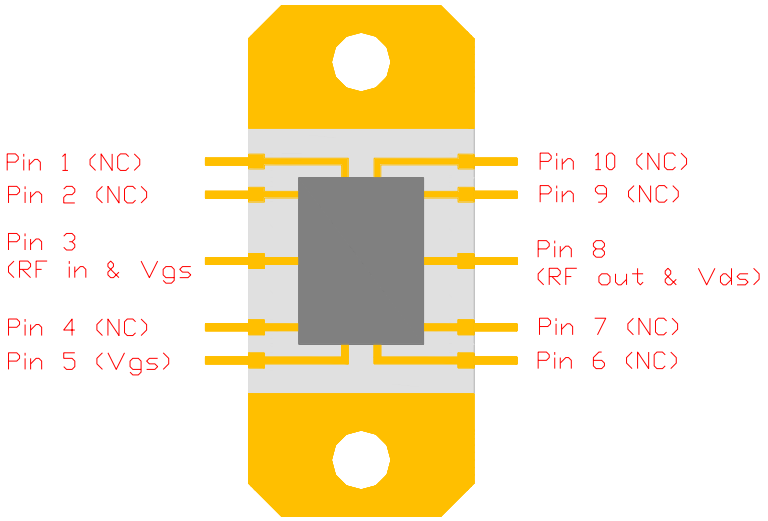
1- Dimensions in mils
2- Gate bias could be supplied either from the RF in pad or from the V_{gs} pad
3- V_{dd} bias should be supplied from RF out pad
4- 3 PADs are available to adjust fain flatness below 100MHz using large chip capacitors (i.e. > 1000pF)

PACKAGE OUTLINE



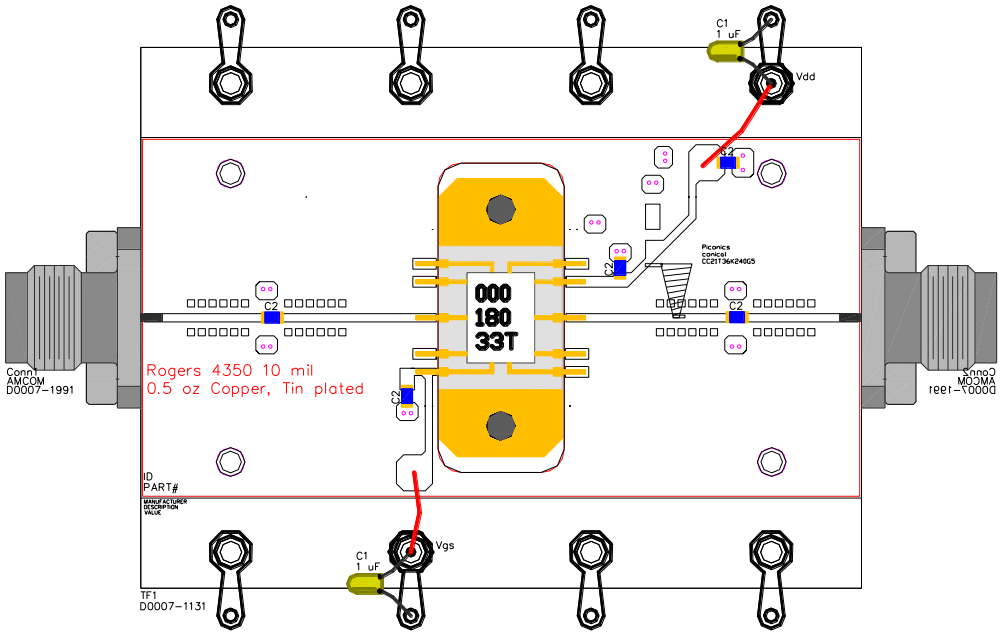
Dimensions in inches

Pin Layout



Pin No.	Function	Bias
1	NC	-
2	NC	-
3	RF in & Vgs	-2.4V
4	NC	-
5	Vgs	-2.4V
6	NC	-
7	NC	-
8	RF out & Vds	+28V
9	NC	-
10	NC	-

TEST CIRCUIT



Notes:
1- Use epoxy to mount PCB
2- C1=1uF, C2=1000pF
3- All SMT Caps & Resistors are 0603 size
4- Use Test Block No. D0007-1131
5- Use AMCOM K-Connector P/N D0007-1991
6- Use Piconics conical CC21T36K240G5

Important Notes:

1- Recommended current bias is 360mA. Gate biases of -2.4V is for reference only. V_{gs} could be adjusted to vary the current going thru the MMIC.

2- Do not apply V_{dd} without proper negative voltages on V_{gs}. Otherwise MMIC would fail due to excess heat.

3- V_{ds} is applied through the output RF port using bias tee and similarly V_{gs} is applied using a bias tee on the input RF port. Alternatively V_{gs} could be applied on PIN 5 as shown above, in that case a DC block is required instead of the bias tee on the input RF port.