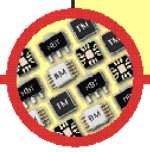
Gallium Nitride MMIC 12W 2.0 – 6.0 GHz Power Amplifier

AM206541TM-SN
May 2014
Rev 1



DESCRIPTION

AMCOM's AM206541TM-SN-R is a broadband GaN MMIC power amplifier. It has 26dB gain, and 41 dBm output power over the 2.0 to 6.5GHz band. The AM206541TM-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.

FEATURES

- Broadband from 2.0 to 6.5GHz
- Saturated output power Psat is 41dBm
- High gain, 26dB
- Input & output matched to 50 Ohms

APPLICATIONS

- Instrumentation
- Commercial telecom transmission equipment
- Fixed microwave backhaul

TYPICAL PERFORMANCE *

Parameters	Minimum	Typical **	Maximum
Frequency	2.5 – 6.0GHz	2.0 – 6.5GHz	
Small Signal Gain	22dB	26dB	30dB
Gain Ripple		± 2dB	± 5.0dB
P1dB	36dBm	38dBm	
Psat	39dBm	41dBm	
Psat Efficiency		20%	
Noise Figure		TBD	
IP3		TBD	
Input Return Loss	10dB	>17dB	
Output Return Loss	5dB	>7dB	
Thermal Resistance		TBD	

* Specifications subject to change without notice.

** Bias Conditions**: $V_{ds1} = V_{ds2} = +28V$, $I_{dsq1} + I_{dsq2} = 0.54A$, $V_{ds3} = +28V$, $I_{dsq3} = 0.9A$)

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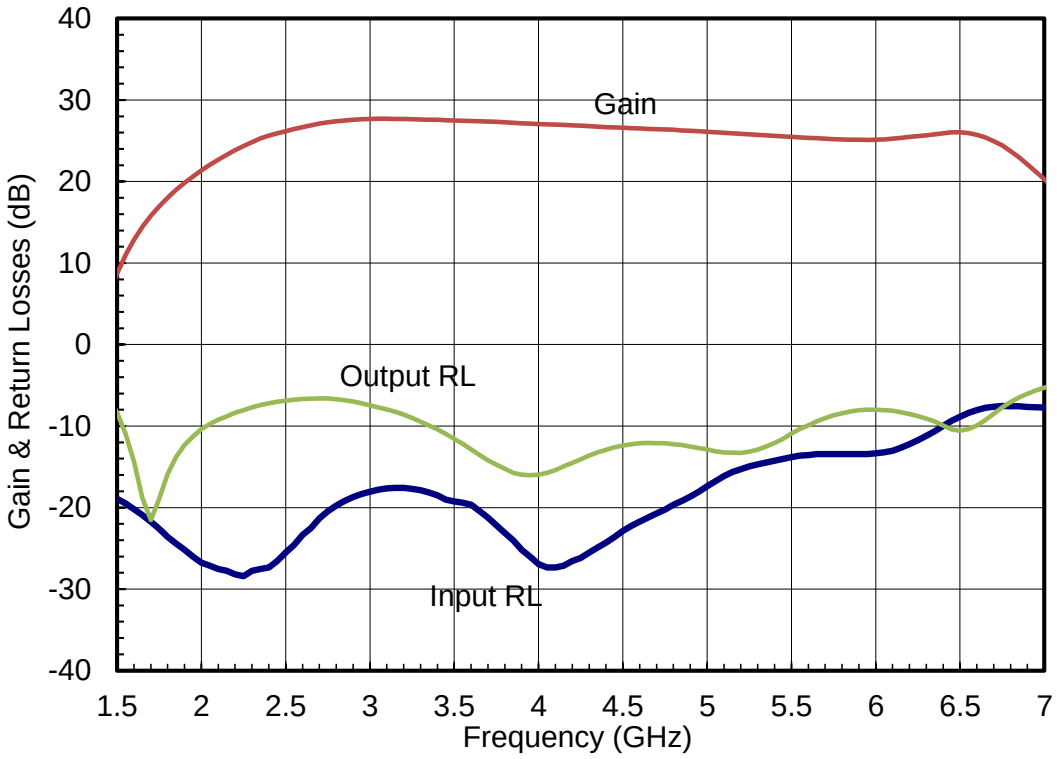
ABSOLUTE MAXIMUM RATING

Parameters	Symbol	Rating
First & second stage drain voltages	V_{ds1} , V_{ds2}	40V
Second stage drain voltage	V_{ds3}	40V
Gate source voltage	V_{gs1}& V_{gs2}	-6V
Drain source current	I_{dsq1} + I_{dsq2}	0.9A
Drain source current	I_{dsq3}	1.5A
Continuous dissipation at 25ºC	P_t	100W
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*

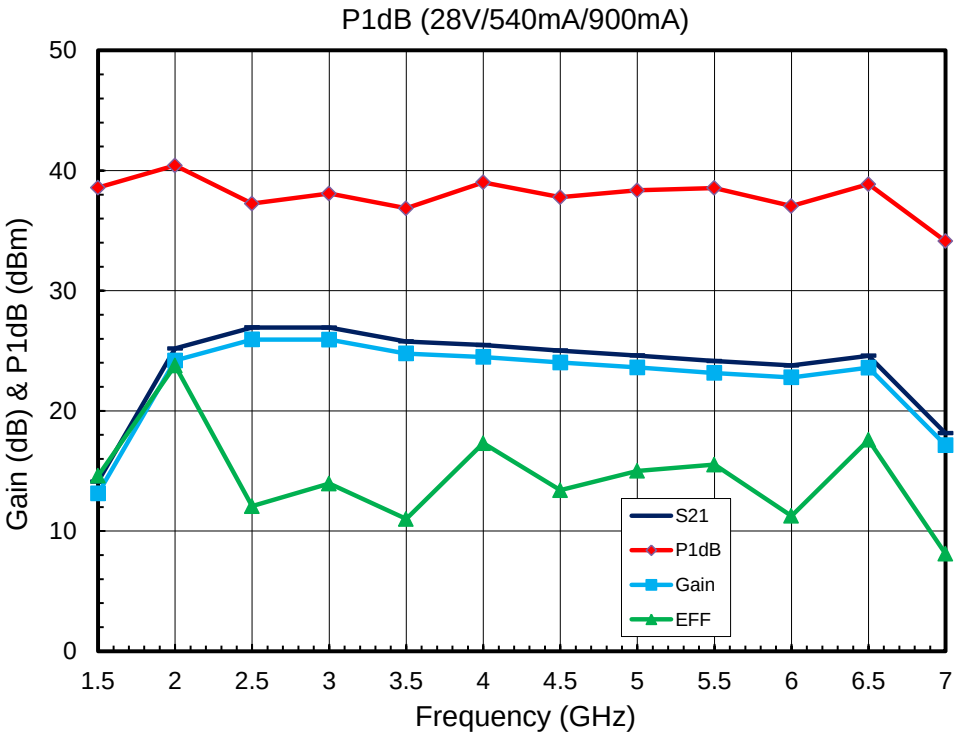


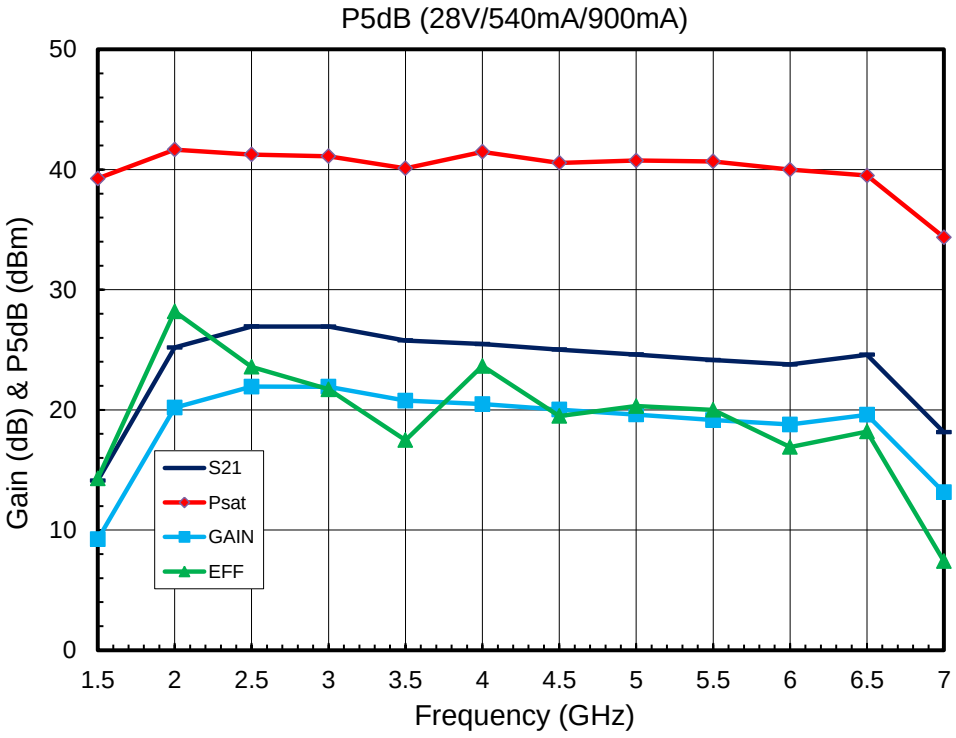
* S-Parameters measured using test fixture. Bias is V_{ds1} = V_{ds2} = V_{ds3}= 28V , I_{ds1} + I_{ds2}=540mA , I_{ds3}=900mA , V_{gs1} = V_{gs2} = V_{gs3} =-2.3V .

NOISE DATA

(TBD)

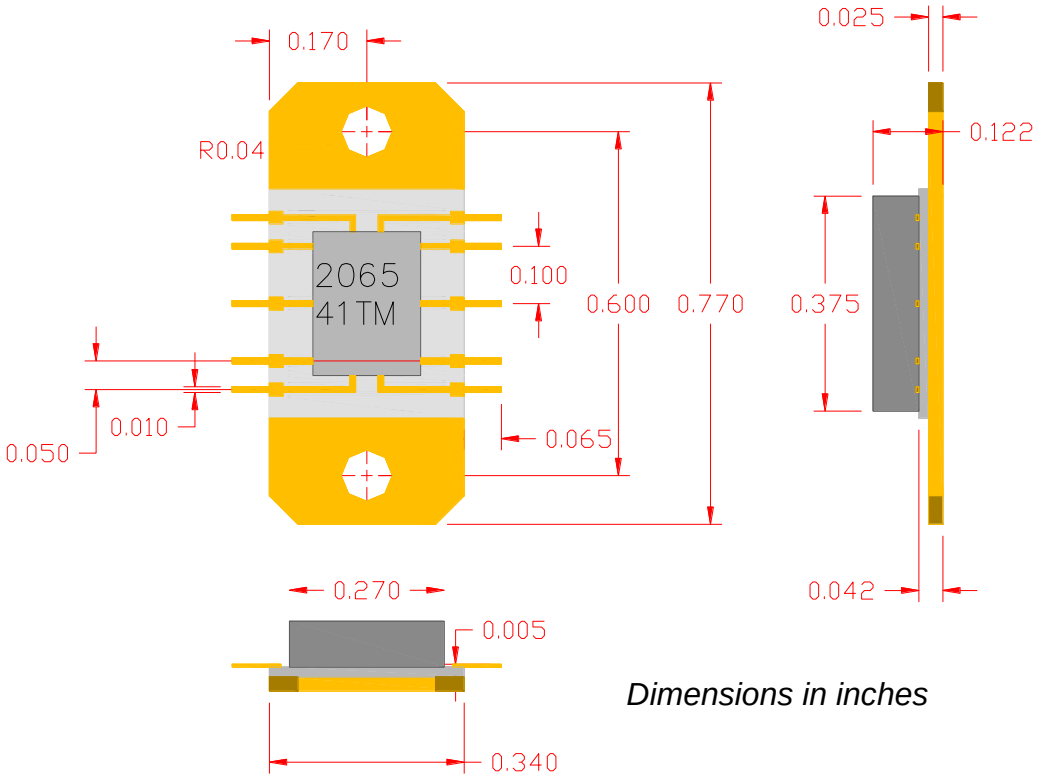
POWER DATA**





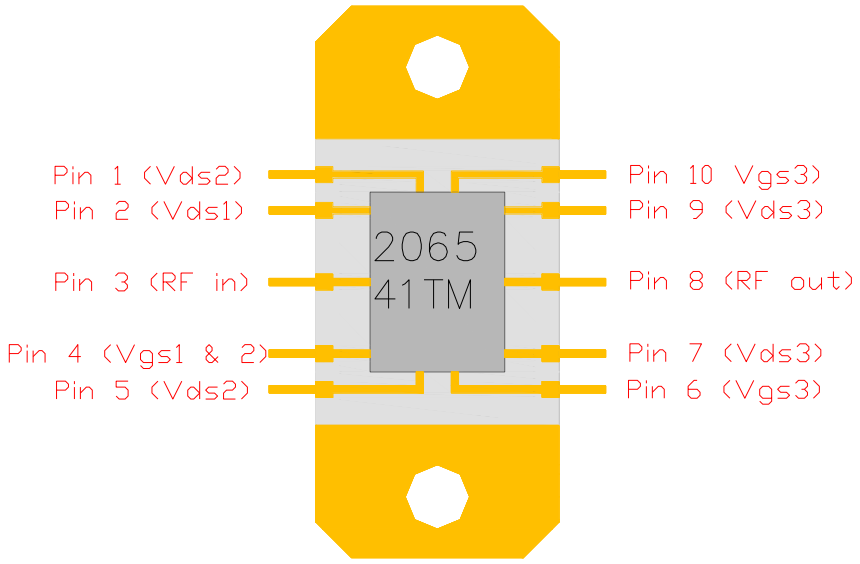
** Power measured using test fixture. Bias is V_{ds1} = V_{ds2} = V_{ds3} = 28V , I_{ds1} + I_{ds2}=540mA , I_{ds3}=900mA , V_{gs1} = V_{gs2} = V_{gs3} =-2.3V . Gain in the two graphs is the compressed gain at 1dB and 5dB compression respectively.

PACKAGE OUTLINE



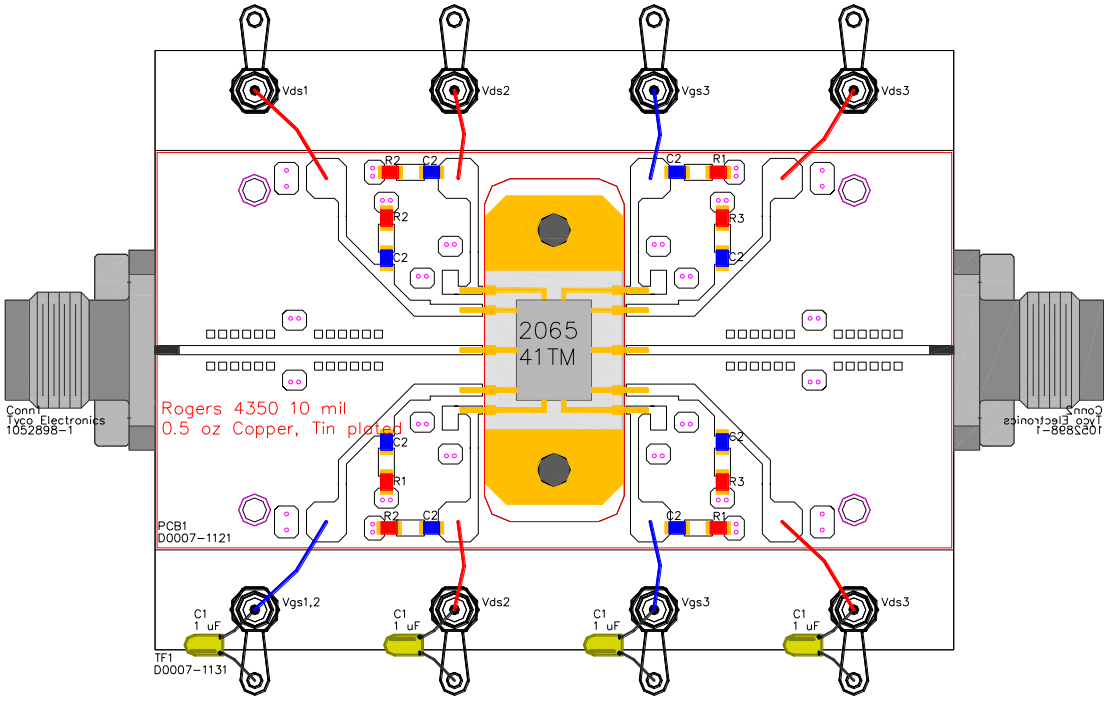
Dimensions in inches

Pin Layout



Pin No.	Function	Bias
1	Vds2	+28V
2	Vds1	+28V
3	RF in	-
4	Vgs1 & Vgs2	-2.3V
5	Vds2	+28V
6	Vgs3	-2.3V
7	Vds3	+28V
8	RF out	-
9	Vds1	+28V
10	Vgs3	-2.3V

TEST CIRCUIT



Notes:
1- Use epoxy to mount PCB
2- C1=1uF, C2=1000pF, R1=50ohms, R2=10ohms, R3=5ohms
3- All SMT Caps & Resistors are 0603 size

Important Notes:

1- Recommended current biases are 540mA for the first & second stage and 900mA for the third stage. Gate biases of -2.3V are for reference only. V_{gs1} & V_{gs2} could be adjusted to vary the currents going thru the first stage (V_{ds1} pin) & second stage (V_{ds12}pin). V_{gs3} could be adjusted to vary the currents going the third stage thru the two V_{ds3} pins.

2- Do not apply V_{ds1} , V_{ds2} & V_{ds3} without proper negative voltages on V_{gs1} , V_{gs2} & V_{gs3}. Otherwise MMIC would fail due to excess heat.