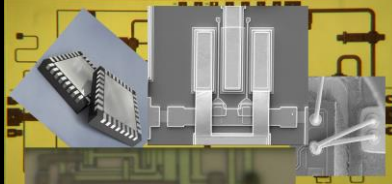


# TMC212

## 37-41 GHz

### Power Amplifier



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## Product Features

- RF frequency: 37 to 41 GHz
- Linear Gain: 23 dB
- Psat: 5 W (37 dBm)
- Package Size: 28-pin, X=6.0 mm, Y=6.0 mm, Z=1.2mm
- GaN HEMT Process
- DC Power: 24 VDC, ID1=175mA, ID2=225mA, IDT=400 mA

## Application

- 5G Wireless
- SATCOM
- Military Radar, EW

## Product Description

The TMC212 GaN HEMT Power amplifier is a three-stage Single-ended power MMIC, packaged in a 6x6x1.2 mm<sup>3</sup> SMT, designed for use in 5G wireless, SATCOM and Military Radar and EW applications. The bare die is available as TMC212D, X=3.5mm, Y=2.5mm, Z=-0.1mm. The TMC212D bare die is a 50 Ω matched design which eliminates the need for RF port matching. To maximize performance, impedance matching structures are needed on the PCB for the packaged part. To ensure rugged and reliable operation and moisture protection, the TMC212 is designed for hi-volume ROHS SMT attach methods.

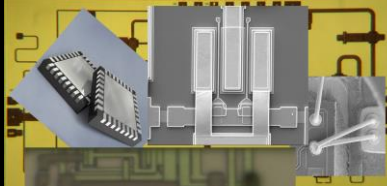
**Electrical Performance : Ta = 25 °C, F = 39 GHz, OFDM, 400 MHz, 64QAM**

	min	Typ	Max	Units
<b>Frequency</b>	37		41	GHz
<b>Gain</b>		23		dB
<b>EVM @ 27dBm</b>		2		%
<b>P1dB</b>		34		dBm
<b>Psat</b>	35	36	37	dBm
<b>PAE</b>		24		%
<b>OIP3</b>		43		dBm
<b>Bias Voltage (VD)</b>	18	24	28	V
<b>Bias Current (ID1)</b>	165	175	185	mA
<b>Bias Current (ID2)</b>	200	225	250	mA

# TMC212

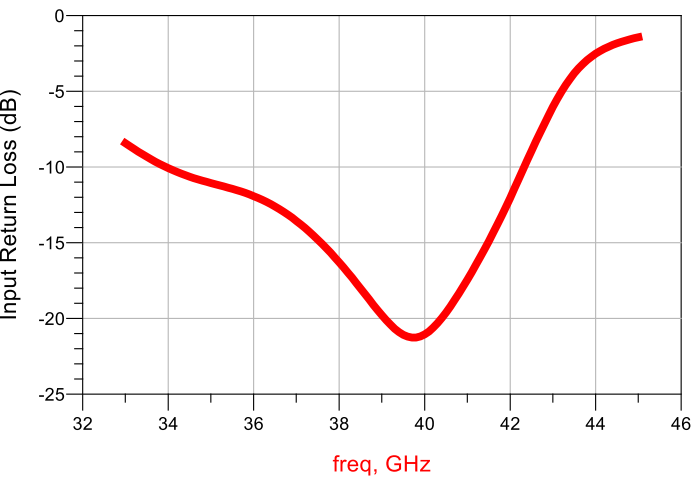
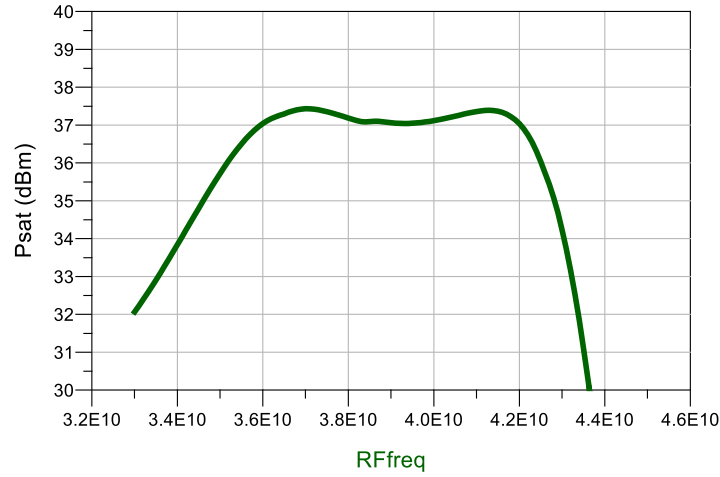
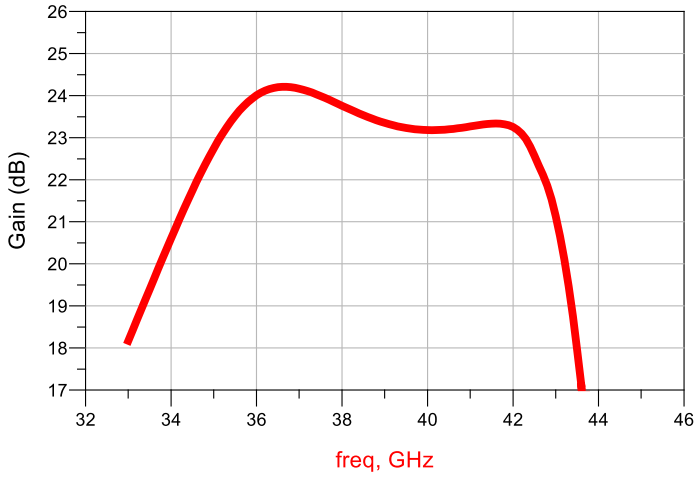
## 37-41 GHz

### Power Amplifier

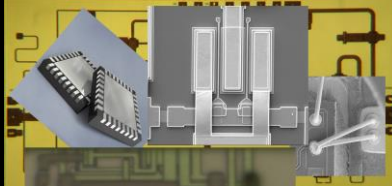


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**Electrical Performance : Ta = 25 °C, 24V/400mA**

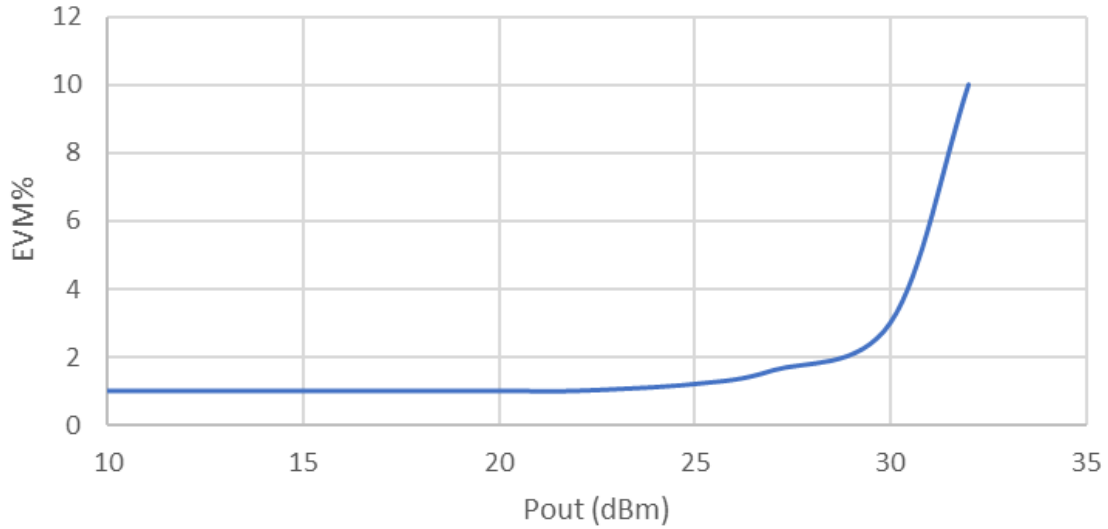


# TMC212 37-41 GHz Power Amplifier

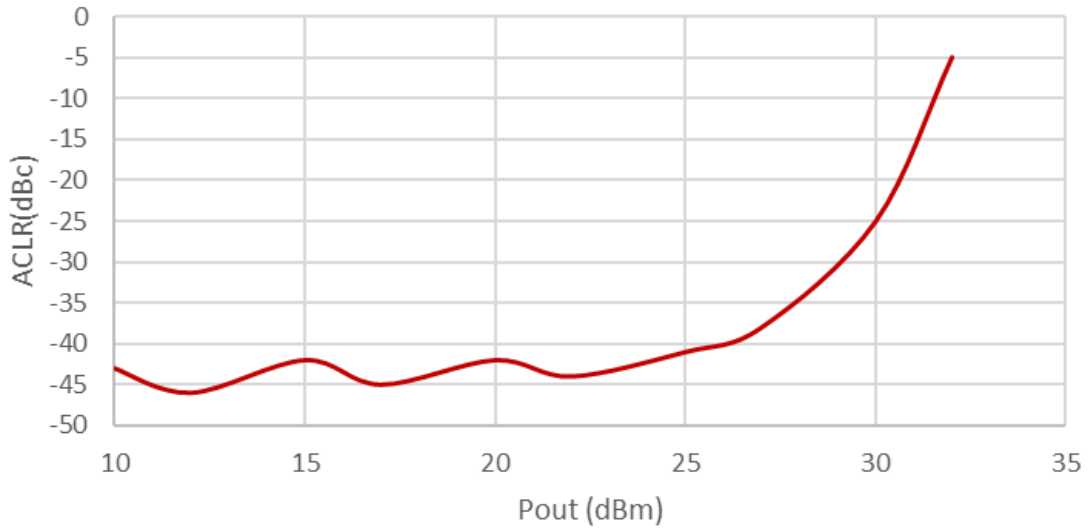


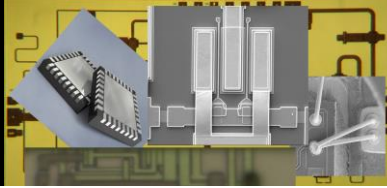
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### 5G NR n260



### 5G NR n260





## • Recommended Biasing

- The TMC212 is operated with two positive supplies VD1 and VD2 and two negative supply voltages VG1 and VG2.
- The positive voltages VD1 and VD2 can be connected together or biased separately. The negative voltages VG1 and VG2 can be connected together or biased separately.
- The positive supply must be connected to VD pads 23 and 25 on one side of the package. The negative bias should be connected to VG pads 24 and 26 on one side of the package.
- The VG1=VG2 is biased to -6V first, then VDD is gradually biased to +24V, and finally, VG1=VG2 is adjusted to around -5V for ID1=180mA and ID2=220mA DC current.
- Reverse the sequence during power down, i.e. bring the VG1=VG2 to -6V, lower VD1=VD2 to 0V, and then VG1=VG2 to 0.

## • Assembly Techniques

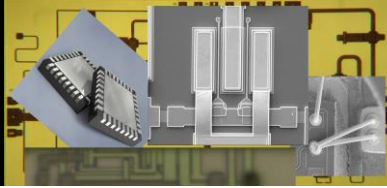
- The TMC212 is fabricated using a GaN-based semiconductor material structure and is to be packaged in an 6x6 air-cavity QFN. The package is back-metalized and can be mounted with standard PCB assembly techniques. The mounting surface should be clean and flat.

## • ESD Warning

- III-V MMICs are ESD-sensitive. Preventative ESD measures must be employed in all aspects of storage, handling, and assembly. MMIC ESD precautions, handling considerations, and die-attach and bonding methods are critical factors in successful III-V MMIC performance and reliability.

## • RoHS Compliance

- This part is RoHS compliant, meeting the requirements of the EU Restriction of Hazardous Substances Directive 2002/95/EC, commonly known as RoHS. Six substances are regulated: lead, mercury, cadmium, chromium VI (hexavalent chromium), polybrominated biphenyls (PBB), and polybrominated biphenyl ethers (PBDE). RoHS compliance requires that any residual concentration of these substances is below the Directive's maximum concentration values (MCV): cadmium 100ppm by weight and all others 1000ppm by weight.



## Absolute Maximum Ratings

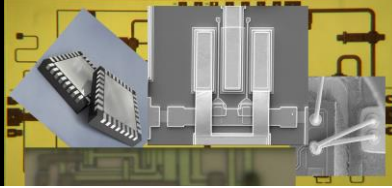
Parameter	Value/Range
Drain Voltage (VD)	+30 V
Gate Voltage (VG)	-7 to 0 V
Drain current (ID1)	400 mA
Drain current (ID2)	500 mA
Gate Current (IG1+IG2), Tj=180 C	20 mA
Power Dissipation, 85 C	16 W
Input Power, CW, 50 Ω	30 dBm
Mounting temperature, 30 sec	260 C
Storage Temperature	-55 to +150 C

Operation of TMC212 outside the parameter ranges given above can cause irreversible damage.

# TMC212

## 37-41 GHz

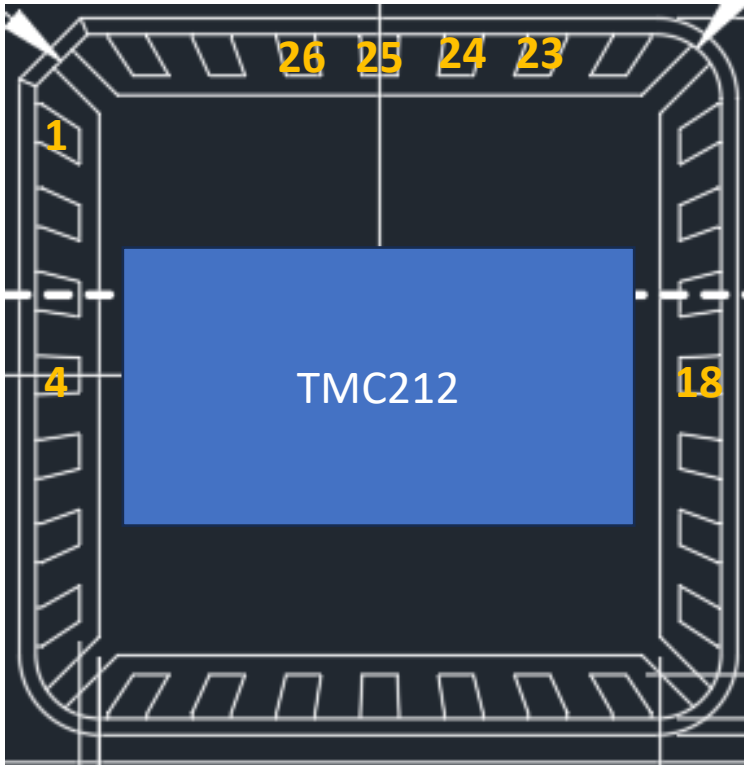
### Power Amplifier



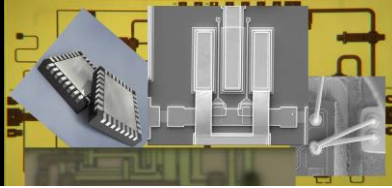
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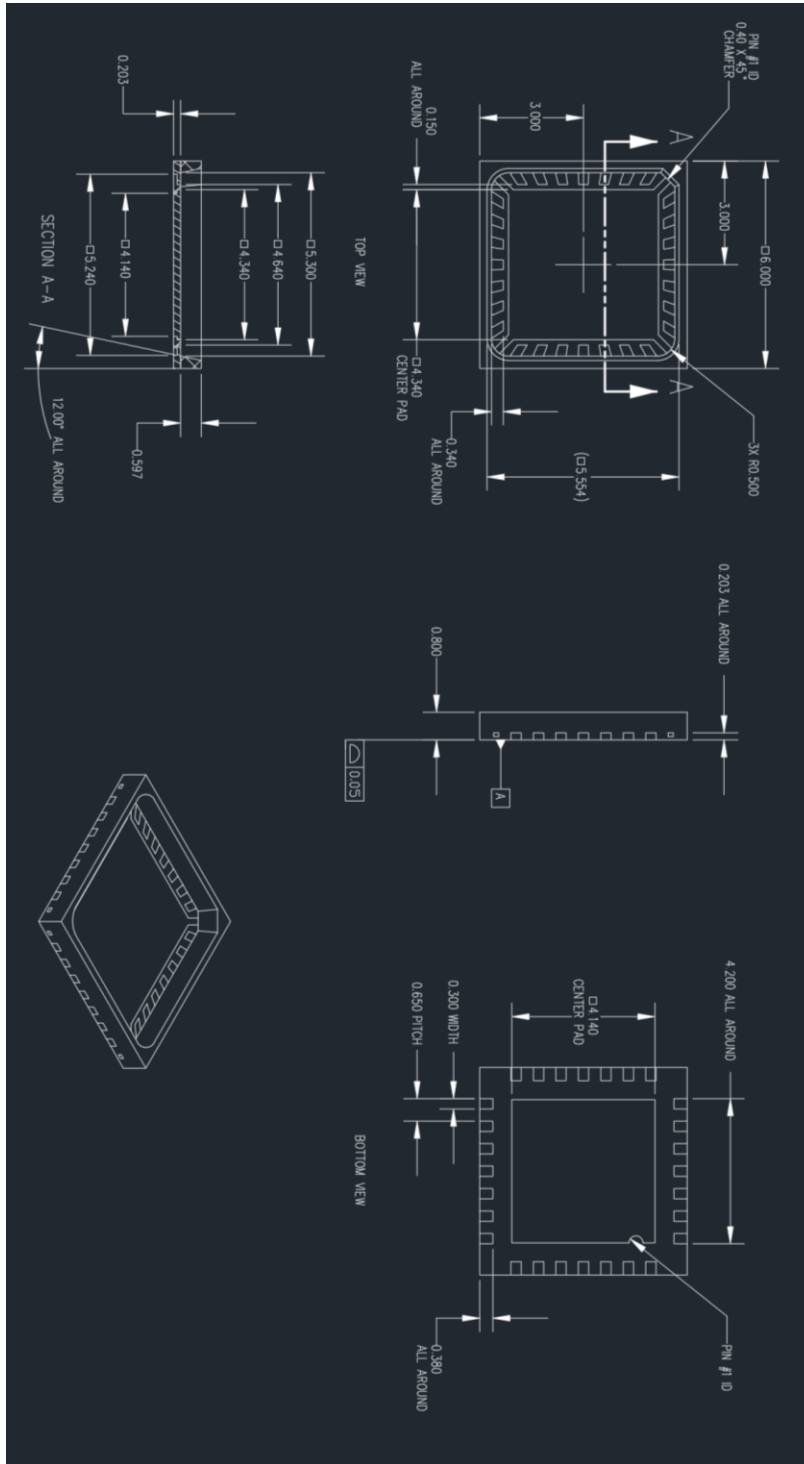
Pin#	Function
3	GND
4	RF Input
5	GND
17	GND
18	RF Output
19	GND
23	VD2
24	VG2
25	VD1
26	VG1
Other pins	GND



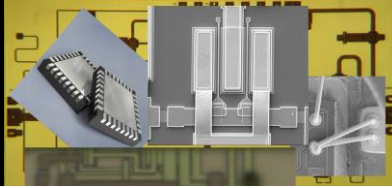
**TMC212**  
**37-41 GHz**  
**Power Amplifier**



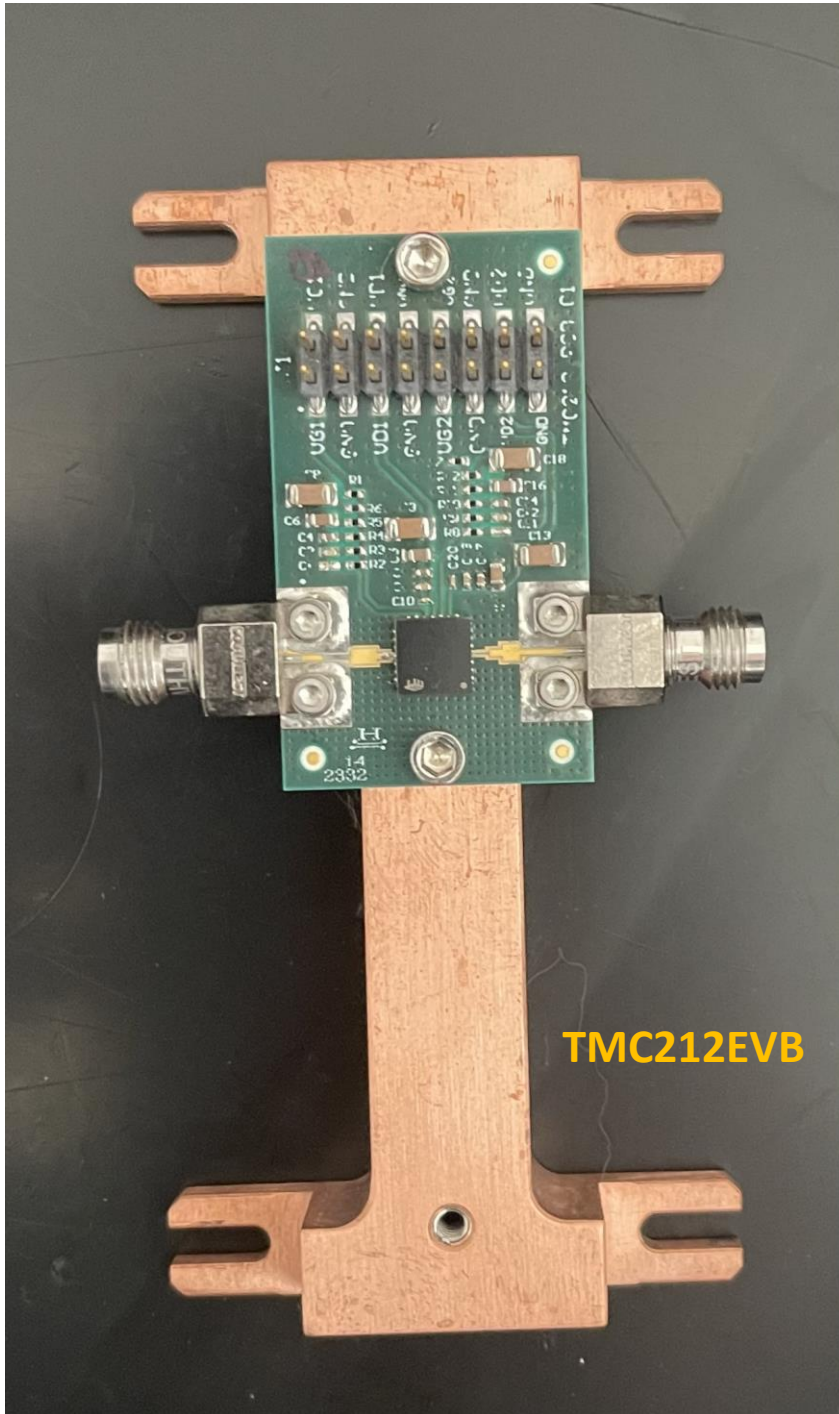
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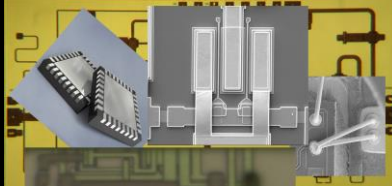




# TMC212

## 37-41 GHz

### Power Amplifier



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