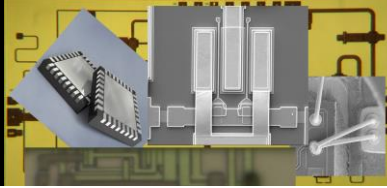


TMC253

26.5-31.5 GHz

Power Amplifier



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Product Features

- RF frequency: 26.5 to 31.5 GHz
- Linear Gain: 25 dB
- Psat: 6 W (38 dBm)
- Package Size: 28-pin, X=6.0 mm, Y=6.0 mm
- GaN HEMT Process
- DC Power: 24 VDC, ID1=215, ID2=285 mA

Application

- 5G Wireless
- SATCOM
- Military Radar, EW

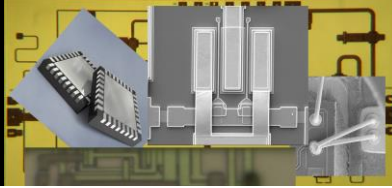
Product Description

The TMC253 GaN HEMT Power amplifier is a three-stage Single-ended power MMIC, packaged in a 6x6x1.2 mm³ SMT, designed for use in high linearity 5G wireless, SATCOM and Military Radar and EW applications. The TMC253 is a 50 Ω matched design which eliminates the need for RF port matching. To ensure rugged and reliable operation and moisture protection, the TMC253 is designed for hi-volume ROHS SMT attach methods. The bare die is available as TMC253D with X=3.5mm, Y=2.5mm, Z=0.1mm.

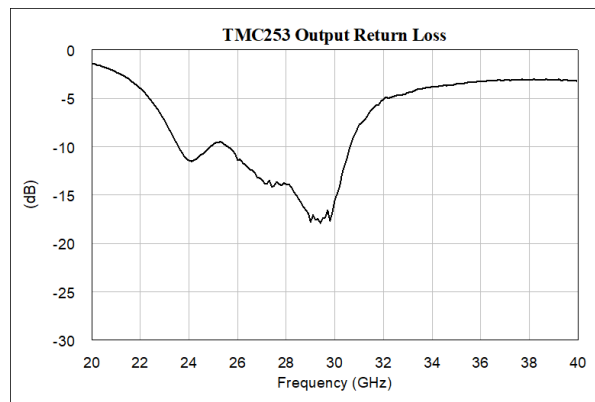
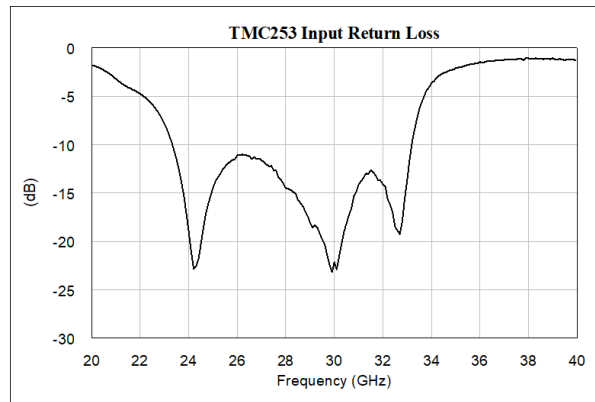
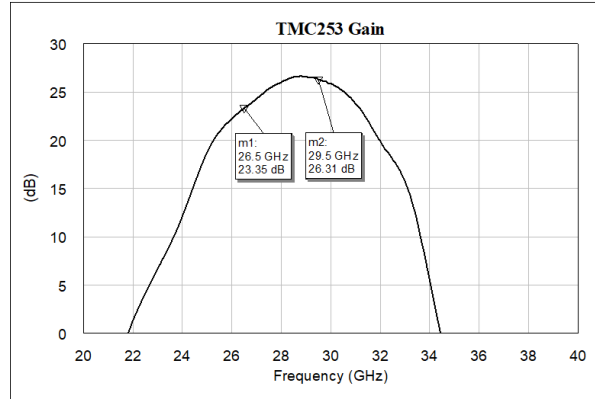
Electrical Performance : Ta = 25 °C, F = 28 GHz, OFDM, 400 MHz, 64QAM

	min	Typ	Max	Units
Frequency	26.5		31.5	GHz
Gain		25		dB
EVM @ 28dBm		3		%
P1dB		36		dBm
Psat		38		dBm
PAE		27		%
OIP3		45		dBm
Bias Voltage		24		V
Bias Current		500		mA

TMC253 26.5-31.5 GHz Power Amplifier



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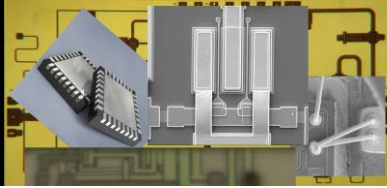


Bare Die (TMC253D) Electrical Performance : Ta = 25 °C, 24V/500mA.

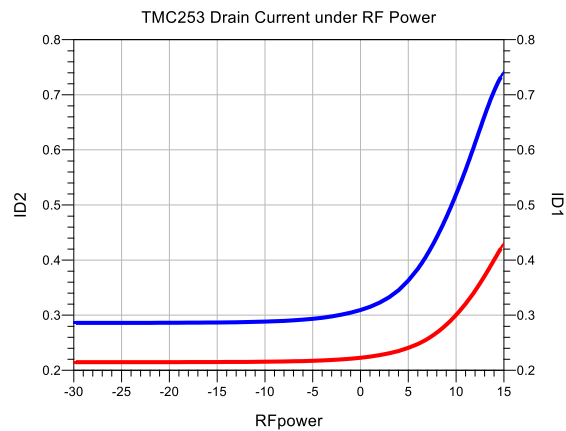
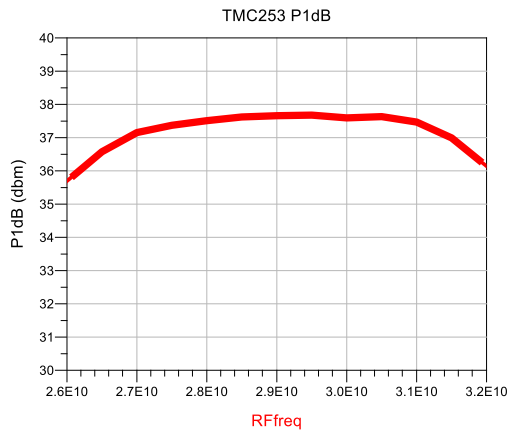
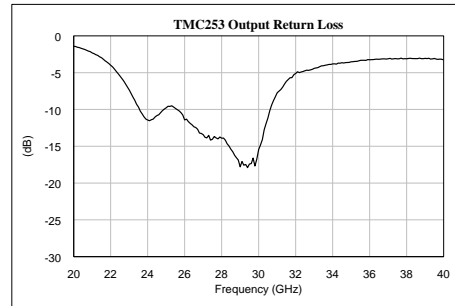
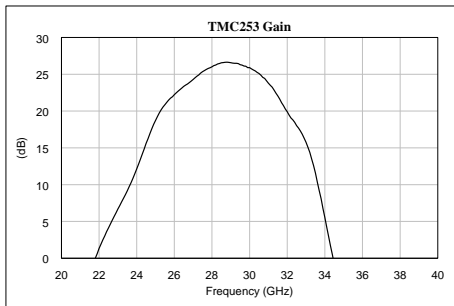
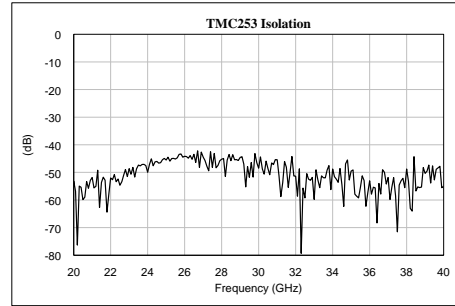
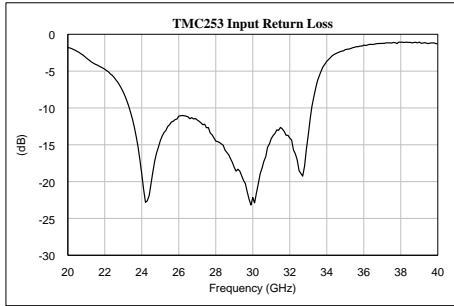
TMC253

26.5-31.5 GHz

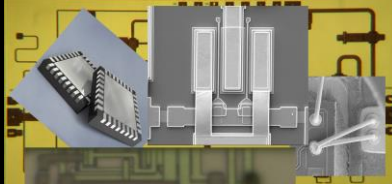
Power Amplifier



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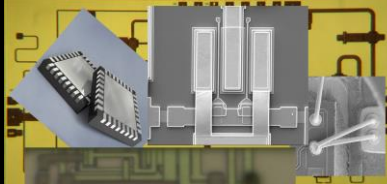
Packaged (TMC253) Electrical Performance on the PCB : Ta = 25 °C, 24V/500mA



Absolute Maximum Ratings

Parameter	Value/Range
Drain Voltage (VD)	+30 V
Gate Voltage (VG)	-7 to 0 V
Drain current (ID1)	500 mA
Drain current (ID2)	650 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 TMC253 outside the parameter ranges given above can cause irreversible damage.



• Recommended Biasing

- The TMC253 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 -3.7V for ID1+ID2=500mA 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 TMC253 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.

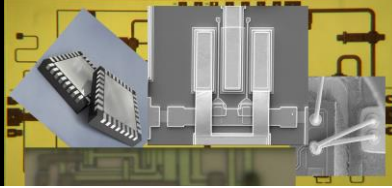
• RoHS Compliance

- 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.

TMC253

26.5-31.5 GHz

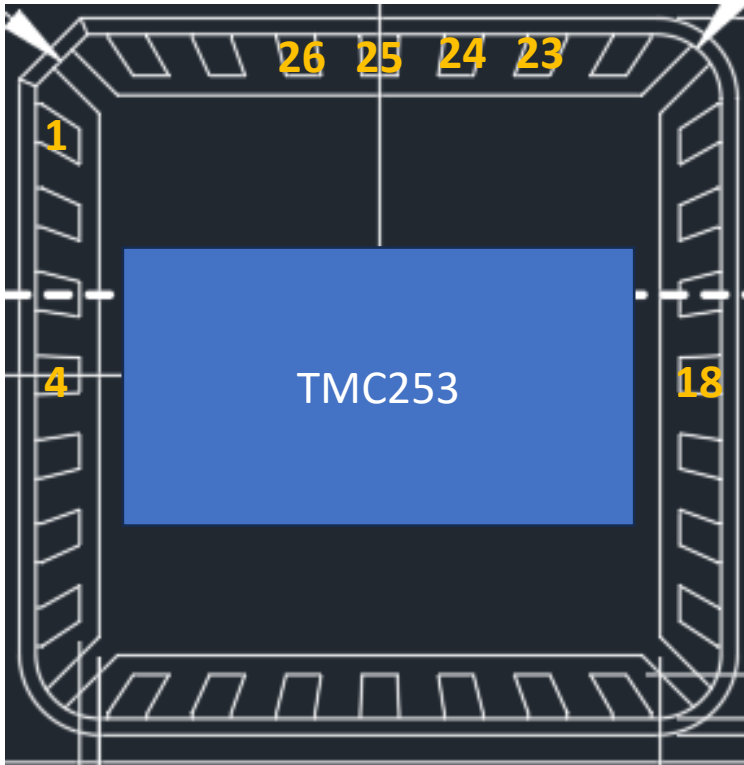
Power Amplifier



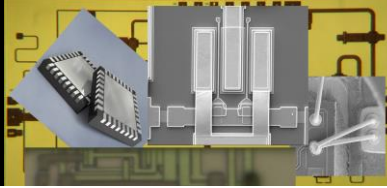
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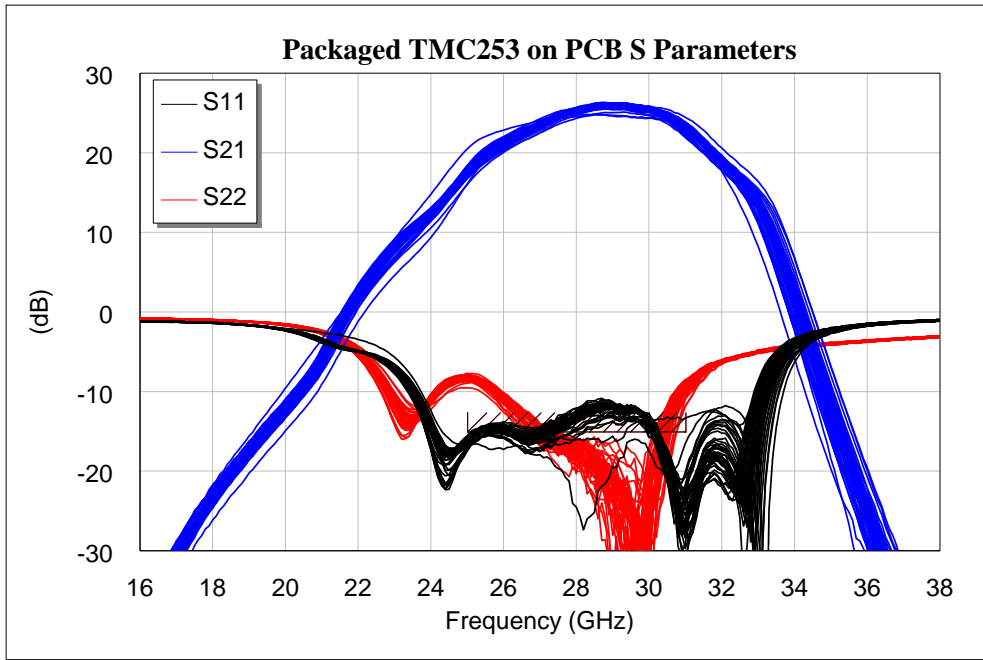
Pin#	Function
3	GND
4	RF Input
5	GND
17	GND
18	RF Output
19	GND
23	VD2
24	VG2
25	VD1
26	VG1
Other pins	GND



TMC253 26.5-31.5 GHz Power Amplifier

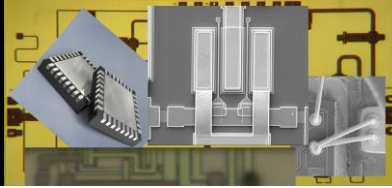


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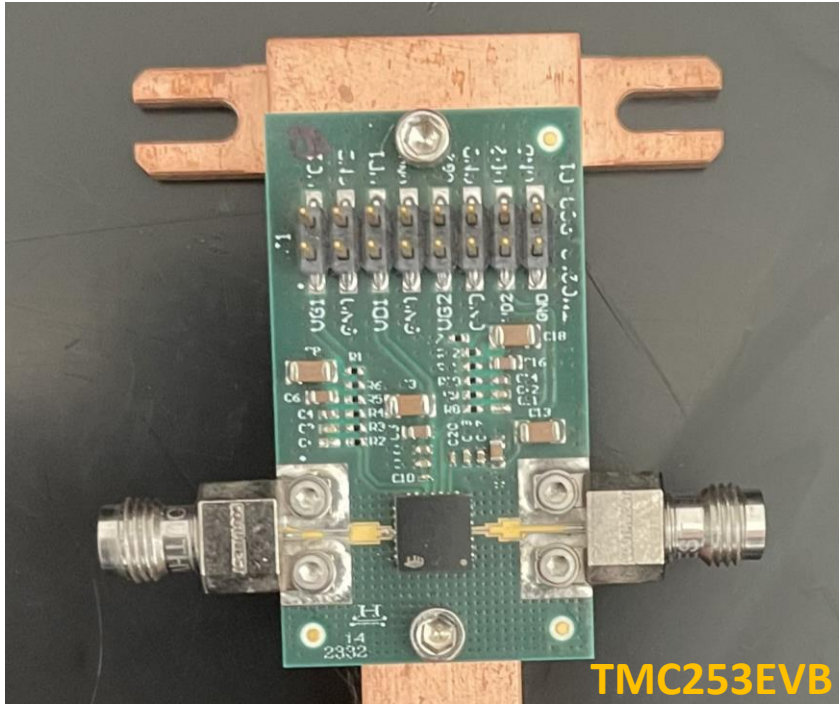


**Packaged (TMC253) Electrical Performance on the PCB : Ta = 25 °C, 24V/500mA,
Measured TMC253 Data**

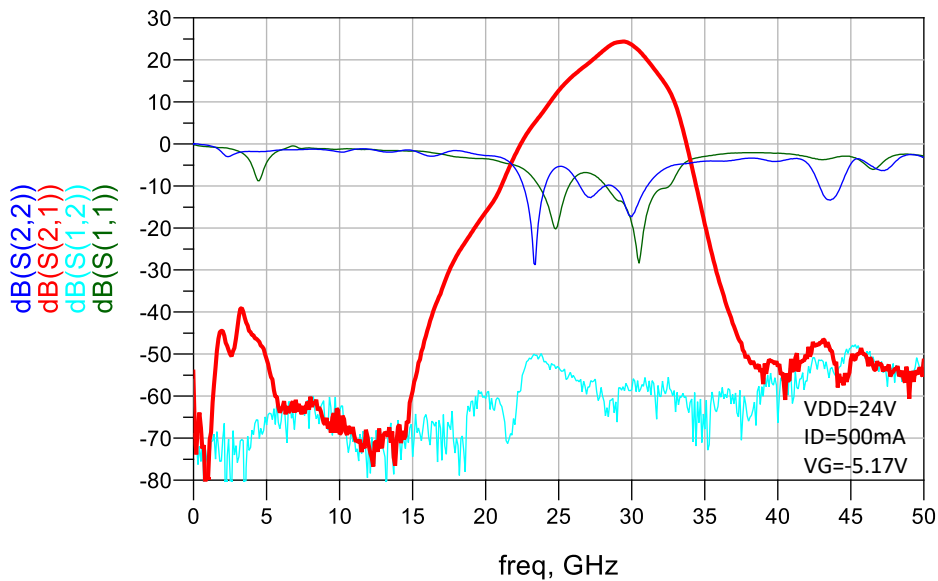
TMC253 26.5-31.5 GHz Power Amplifier



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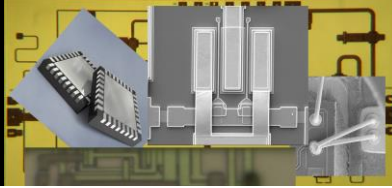
TMC253EVB_24V_500mA_including 3dB PCB loss



TMC253

26.5-31.5 GHz

Power Amplifier



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