mmTron
Unleashing the mmWave Frontier

TMC252
24-30 GHz Front End Module

Product Features

- RF frequency: 24 to 30 GHz
- TX Linear Gain: 22 dB, TX P_{sat}: 6 W
- TX Linear Gain: 19 dB, RX NF: 5dB
- Die Size: X=3.0 mm, Y=3.0 mm, Z=0.1mm
- TX DC Power: 23 VDC, 590 mA
- RX DC Power: 23 VDC, 60mA
- Positive Logic Switch: $V_{control}$ = (0V, 23V)

Application

- mmWave 5G
- Point-to-Point Radios and VSATs
- Fiber Optics
- Military, EW and Space

Product Description

The TMC252D GaN Front End Module is a high linearity device, designed for use in mmWave 5G, Radios, Military, EW and Space applications. In TX mode, the TMC252D delivers 6W saturated power from 24 to 30 GHz with 22% PAE. In RX mode, the TMC252D has 19dB gain and 5dB noise figure from 24 to 30 GHz. A single pole, double throw RF switch reconfigures the circuit's common port to TXOUT or RXIN using positive control voltage, eliminating the need for negative control voltage. Both bond pad and backside metallization are Au-based that is compatible with ribbon and wedge bonding and high conductivity epoxy and eutectic die attach methods. The packaged version is available as TMC252 in a 5x5 Air-Cavity QFN.

TX Electrical Performance : **Vdd = 23 V, Vgg = -3.8 V, TA = 25 °C, F = 27 GHz**				
	Min	**Typ**	**Max**	**Units**
Frequency	24		30	GHz
Gain		22		dB
P1dB		37		dBm
Psat		38		dBm
PAE @ Psat		22		%
OIP3		42		dBm
Bias Voltage		23		V
Bias Current		590		mA

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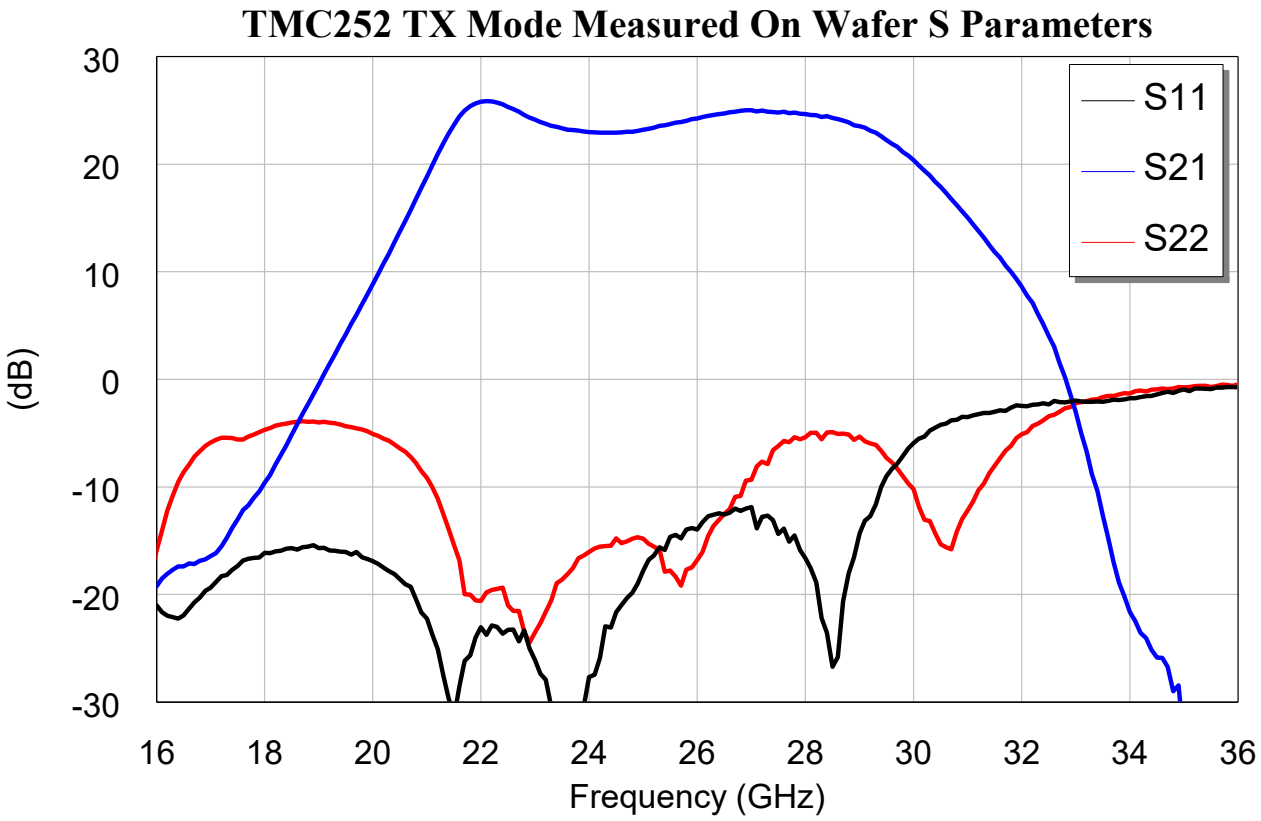
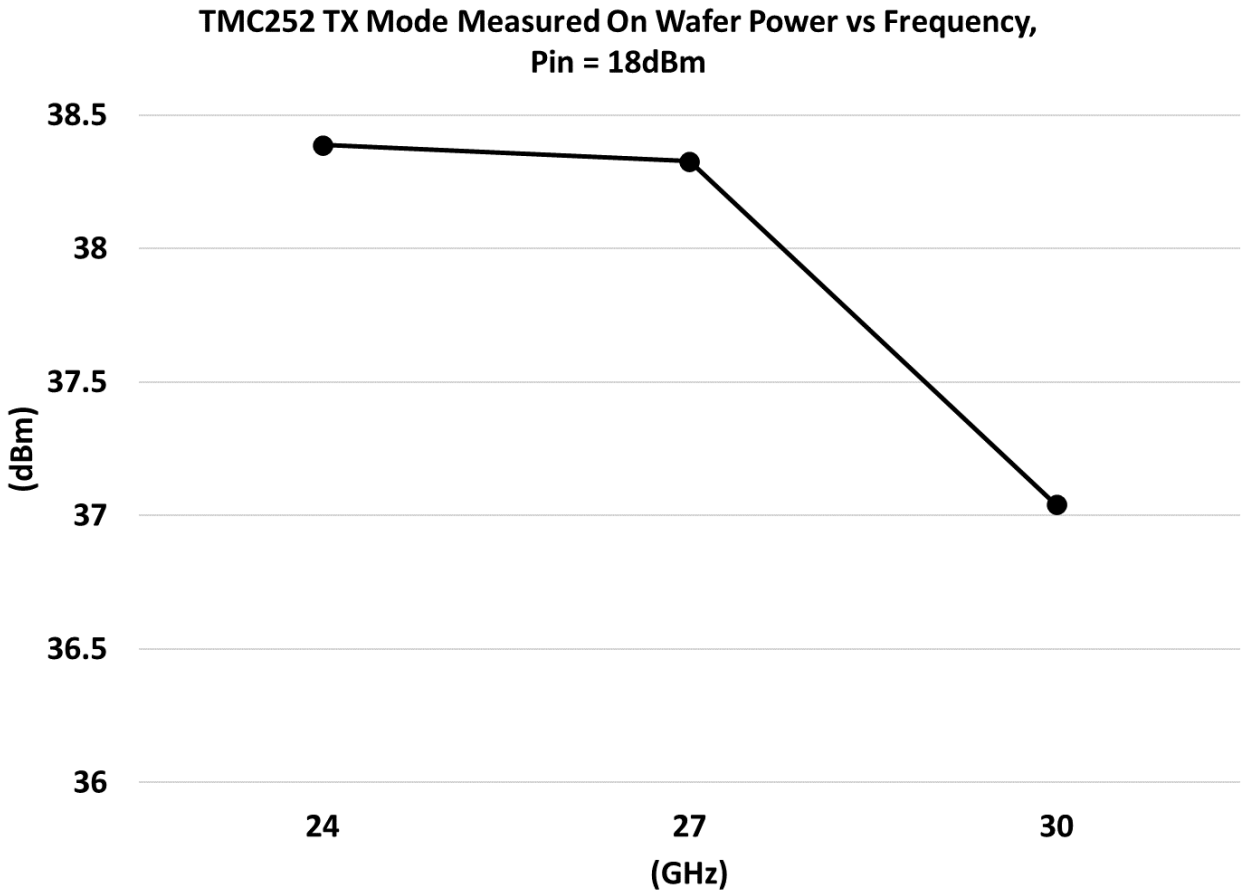
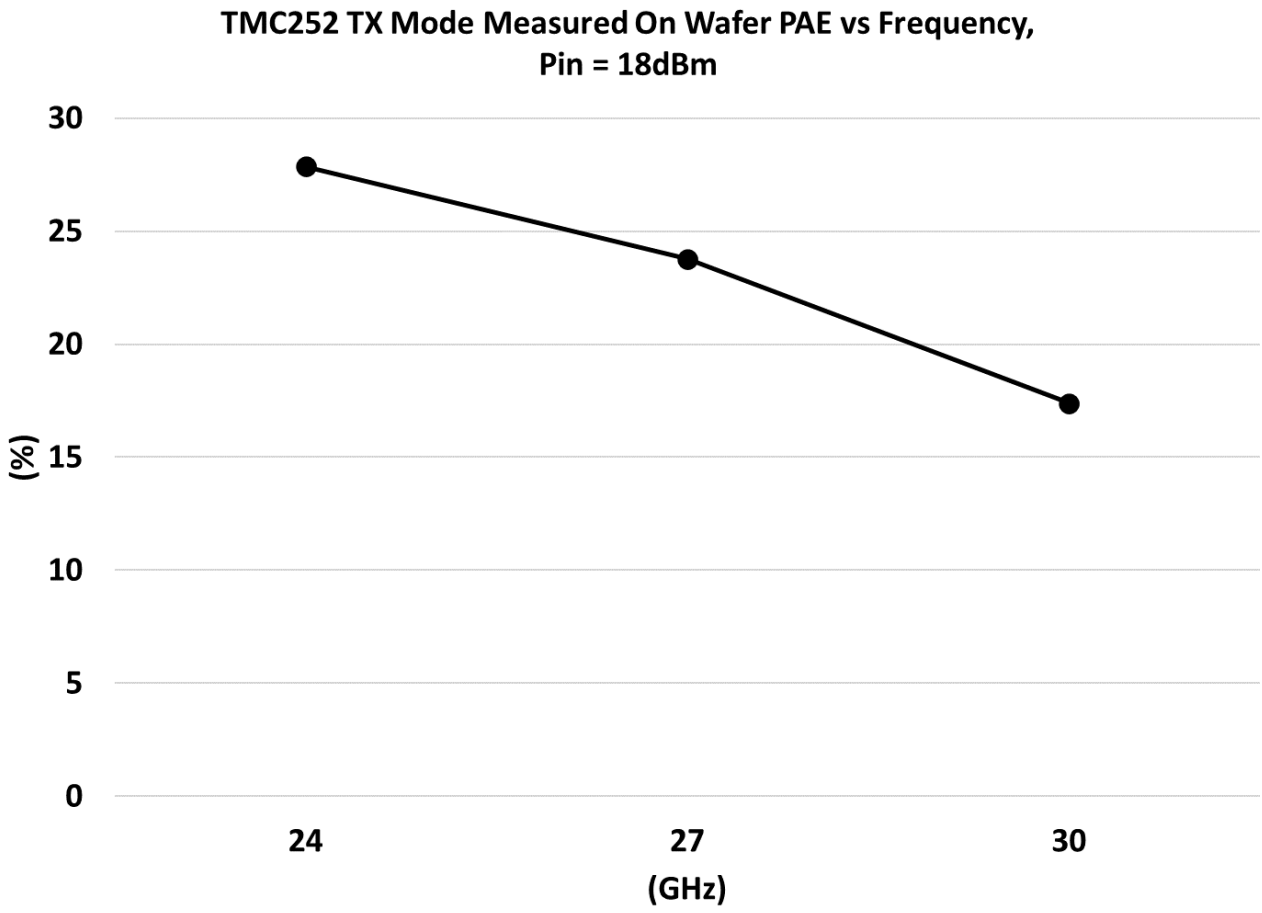
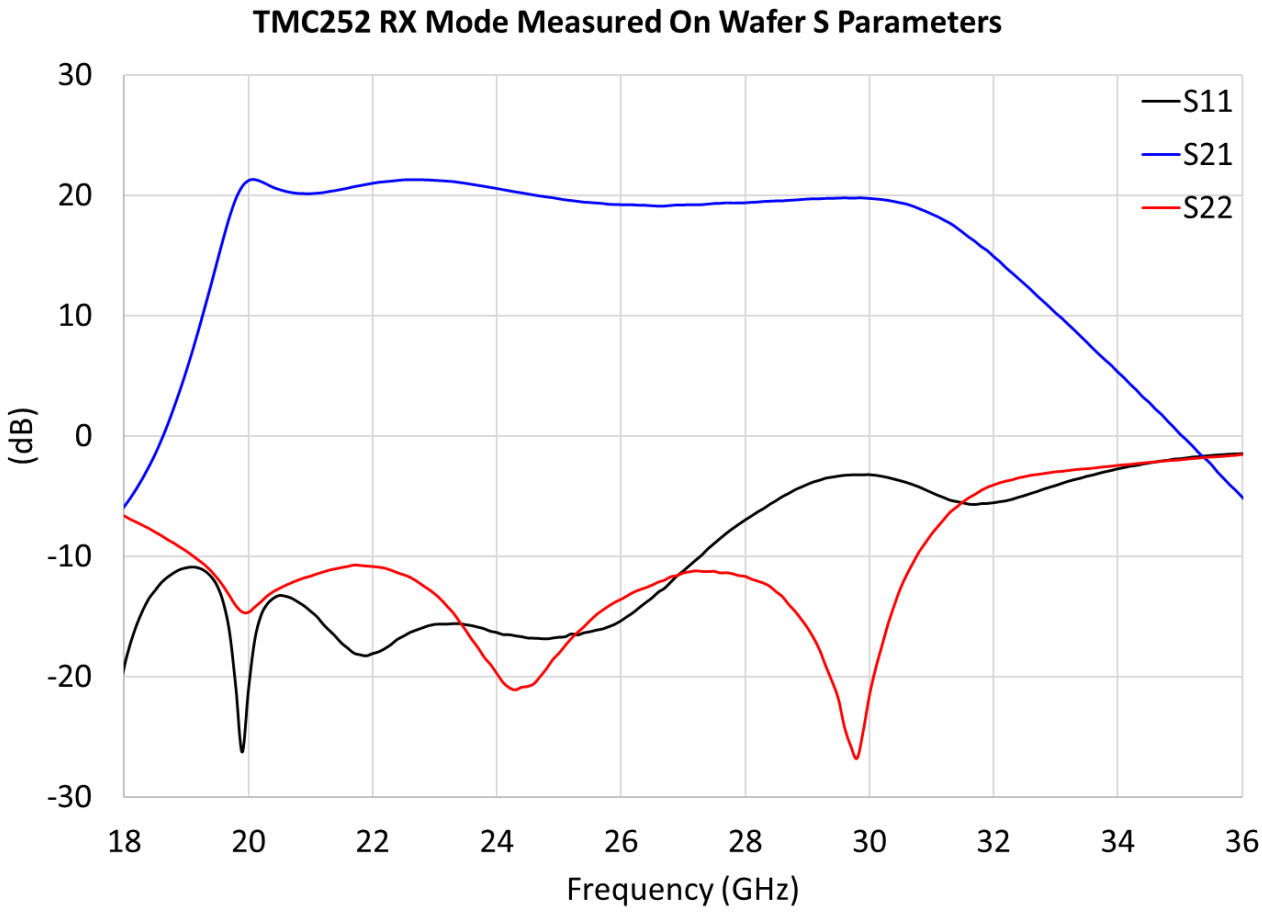
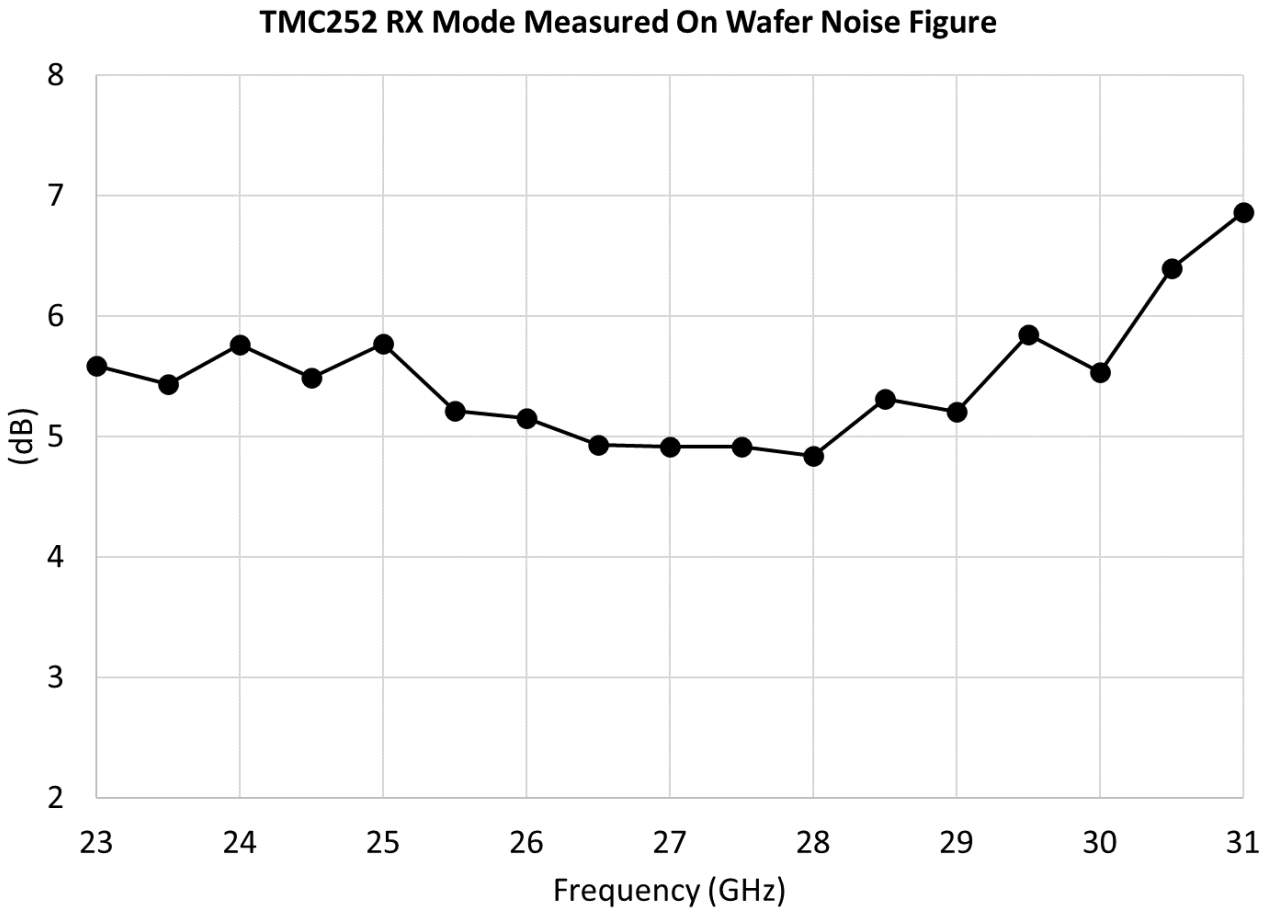
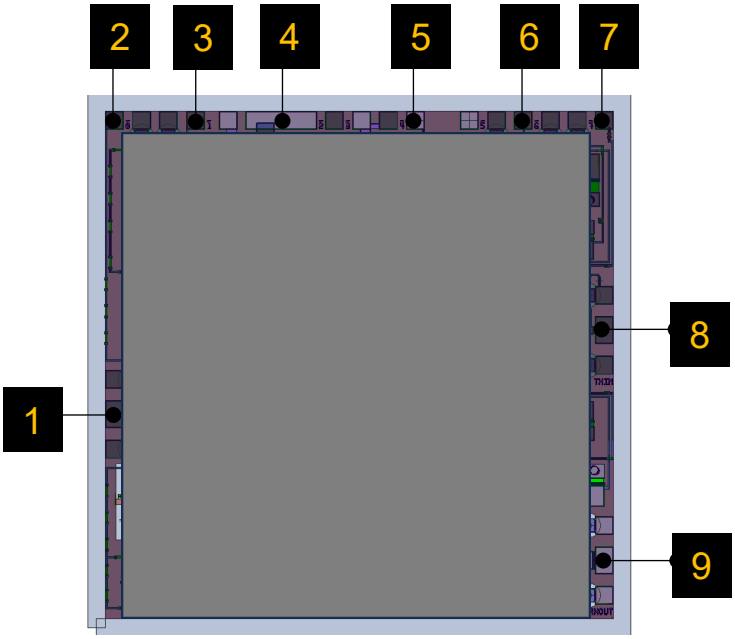

TMC252 TX Mode Measured On Wafer S Parameters
30
20
10
0
-10
-20
-30
(dB)
16
18
20
22
24
26
28
30
32
34
36
Frequency (GHz)
S11
S21
S22


TMC252 TX Mode Measured On Wafer Power vs Frequency,
Pin = 18dBm
38.5
38
37.5
37
36.5
36
(dBm)
24
27
30
(GHz)


TMC252 TX Mode Measured On Wafer PAE vs Frequency,
Pin = 18dBm
30
25
20
15
10
5
0
(%)
24
27
30
(GHz)


TMC252 RX Mode Measured On Wafer S Parameters
30
20
10
0
-10
-20
-30
(dB)
18
20
22
24
26
28
30
32
34
36
Frequency (GHz)
S11
S21
S22


TMC252 RX Mode Measured On Wafer Noise Figure
8
7
6
5
4
3
2
(dB)
23
24
25
26
27
28
29
30
31
Frequency (GHz)



Pad #	Function
1	COMMON
2	VCRX
3	VCTX
4	VDTX
5	VDRX
6	VGTX
7	VGRX
8	TXIN
9	RXOUT

DXF and detailed assembly drawings are available on request.



Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. mmTron Inc. recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications. 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 Compliant

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.

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