mmTron
Unleashing the mmWave Frontier

TMC812-D
11-65 GHz Low Loss Balun

Product Features

- RF frequency: 11 to 65 GHz
- Insertion Loss: 2.7 dB
- Amplitude Balance: 0.5 dB
- Phase Balance: 1.5 deg
- DC Coupled
- High Power Handling
- Die Size: X=1250 um, Y=850 um, Z=100 um

Application

- Instrumentation
- Wireless Communication
- SATCOM
- Radar, EW
- WLAN, WiMax

Product Description

The TMC812D is a wideband low loss MMIC balun (balanced to unbalanced transformer) die with an impedance ratio of 1:2 . TMC812D is designed for use in 5G wireless, SATCOM, Instrumentation, high-speed track-and-hold amplifiers, digital-to-analog converters, balanced amplifiers, signal integrity and Military Radar and EW applications. The TMC812D is a 50 W matched, DC-coupled and ROHS-compliant design. The TMC812D is designed and fabricated for maximum repeatability with low insertion loss, low amplitude unbalance, low phase unbalance, and excellent common mode rejection to ensure rugged and reliable operation and moisture protection. Both bond pad and backside metallization are Au-based and compatible with ribbon and wedge bonding and high conductivity epoxy and eutectic die attach methods. TMC812D is layed out symmetrically and is in die format thus enabling the integration of the balun directly into hybrid modules.

Electrical Performance				
	min	**Typ**	**Max**	**Units**
Frequency	11		65	GHz
Excess Insertion Loss		2.7		dB
Return Loss		10		dB
Common Mode Rejection		35		dB
Amplitude Balance		0.5		dB
Phase Match		1.5		deg

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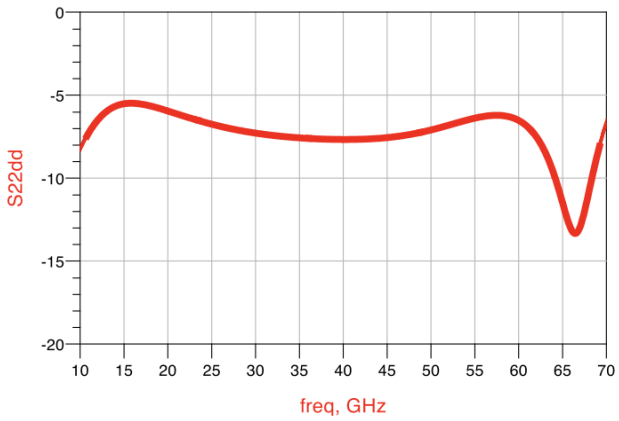
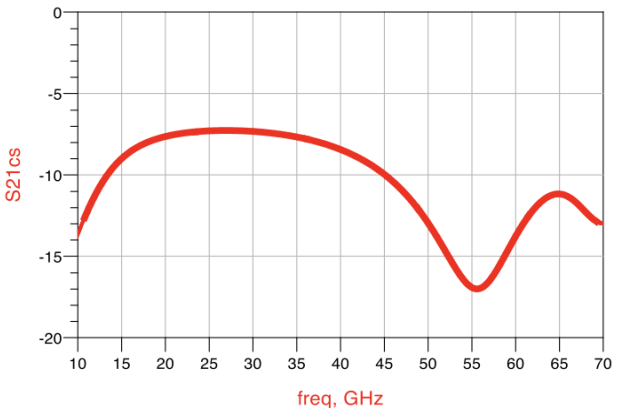

S22dd
0
-5
-10
-15
-20
10 15 20 25 30 35 40 45 50 55 60 65 70
freq, GHz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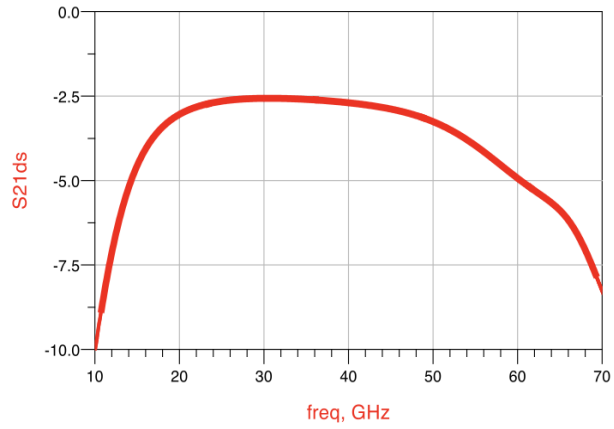
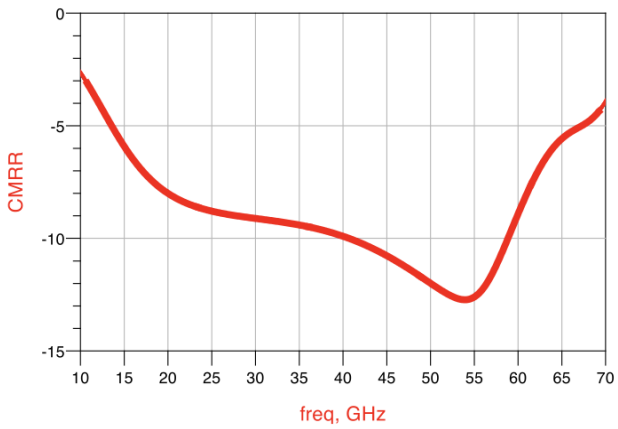
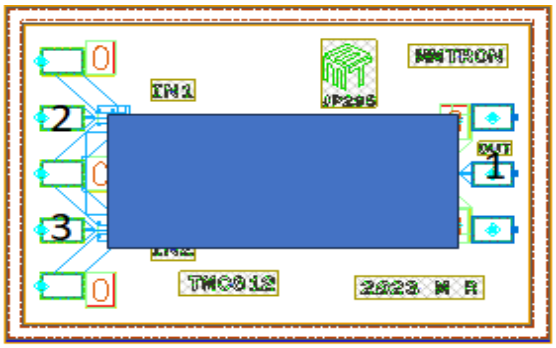
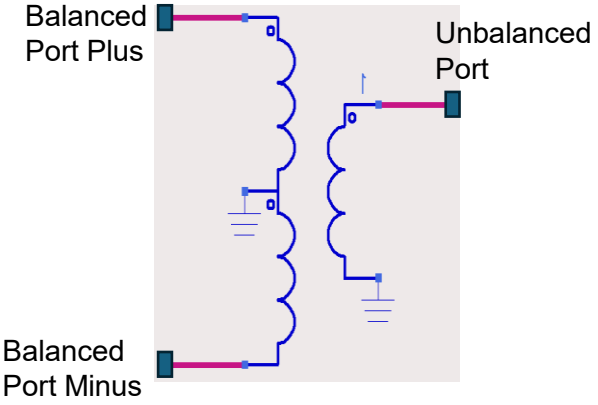
0
-5
-10
-15
-20
10 15 20 25 30 35 40 45 50 55 60 65 70
freq, GHz


S21ds
0.0
-2.5
-5.0
-7.5
-10.0
10 20 30 40 50 60 70
freq, GHz


CMRR
0
-5
-10
-15
10 15 20 25 30 35 40 45 50 55 60 65 70
freq, GHz





Pad #	Function
1	Unbalanced port
2	Balanced Port Plus
3	Balanced Port Minus

Pads 1, 2, and 3 are shorted to the ground.
The remaining 5 pads are GND.

Assembly Techniques

The TMC812D is fabricated using a GaAs-based semiconductor material structure. The die is back-metalized and can be mounted with standard assembly techniques. The mounting surface should be clean and flat.

Maximum Ratings

Parameter	Function
Operating Temperature	-55 °C to 100 °C
Input RF Power	35 dBm at 25 °C



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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