mmTron
Unleashing the mmWave Frontier

TMC655-D
DC-75 GHz Distributed Amplifier

Product Features

- RF frequency: DC to 75 GHz
- Linear Gain: 17 dB
- Noise Figure: 7 dB
- Die Size: X=2.6 mm, Y=1.45 mm, Z=0.05mm
- DC Power: 5 VDC, 270 mA

Applications

- Point-to-Point Radios and VSATs
- Test instrumentation
- Fiber Optics
- Military, EW and Space

Product Description

The TMC655-D GaAs PHEMT Distributed amplifier is a broadband high gain device with positive gain slope, designed for use in Radios, Test instrumentation, Military, EW and Space applications. The TMC655-D is a 50 W matched design providing 7dB of noise figure, offers excellent return loss at low-end for optical instrumentation, interface to photodiodes, and eliminates the need for RF port matching. 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.

Electrical Performance : **Vdd = 5 V, Vgg = -0.4 V, TA = 25 °C, F = 70 GHz**				
	min	**Typ**	**Max**	**Units**
Frequency	DC		75	GHz
Gain		17		dB
P1dB		19		dBm
Psat		20		dBm
Noise Figure		7		dB
OIP3		27		dBm
Bias Voltage		5		V
Bias Current		265		mA

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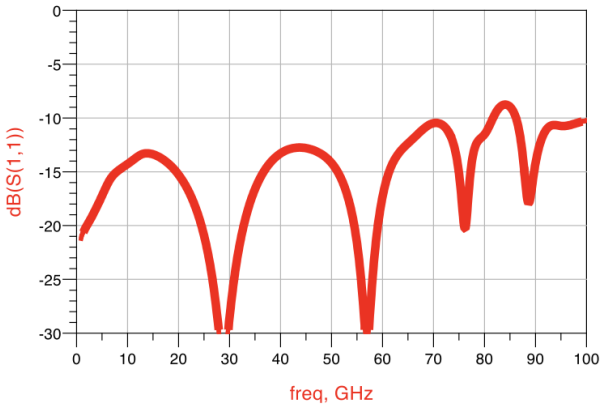
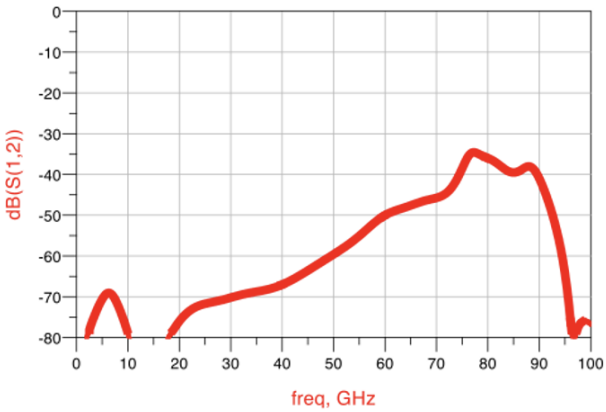
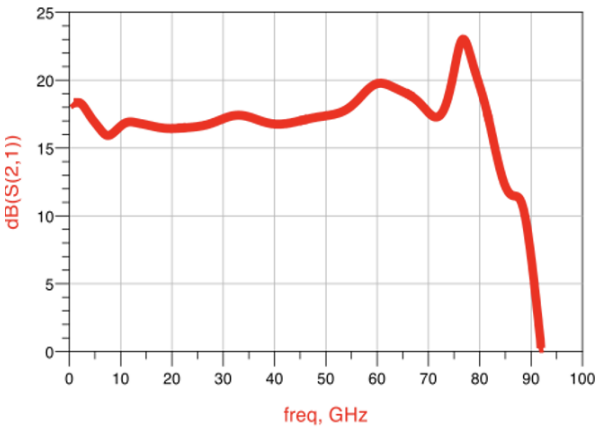
TMC655 Input Return Loss



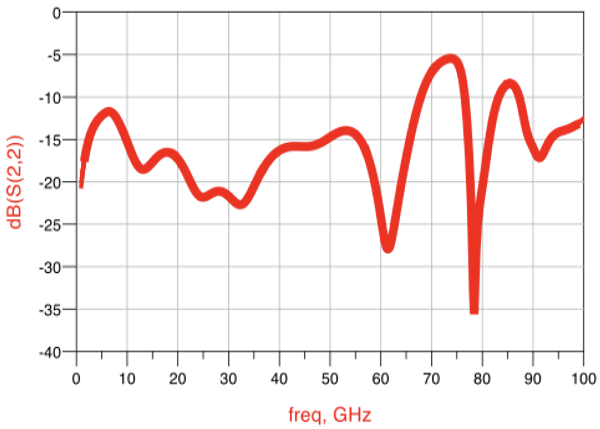
TMC655 Reverse Isolation



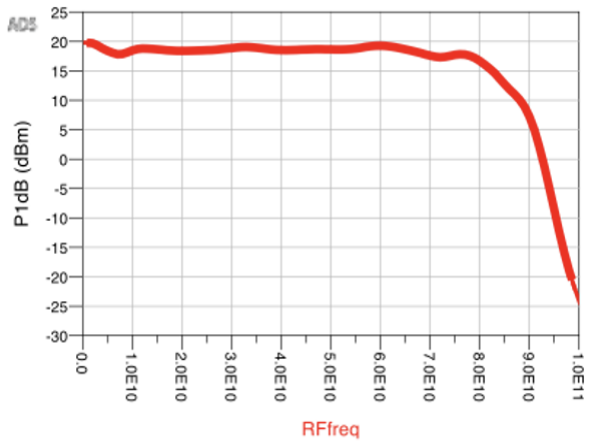
TMC655 Gain



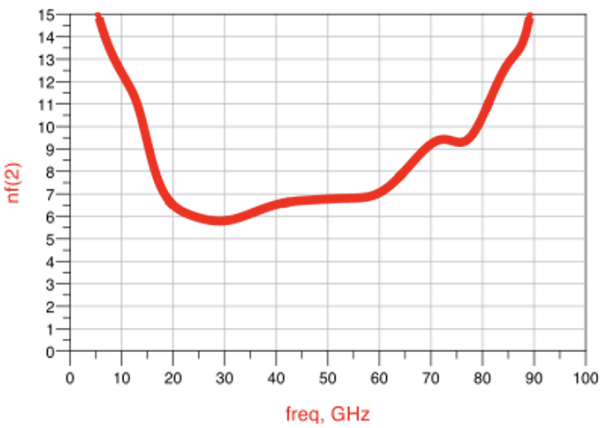
TMC655 Output Return Loss



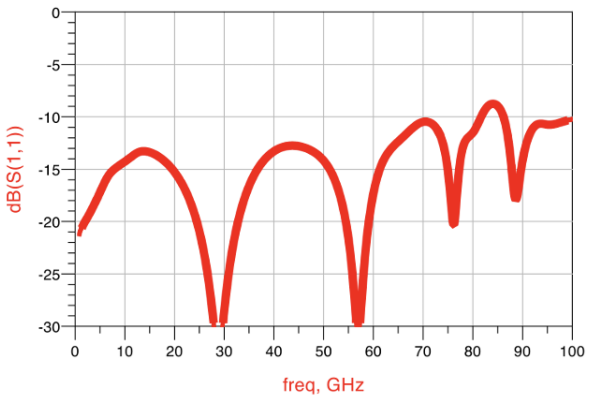
TMC655 P1dB



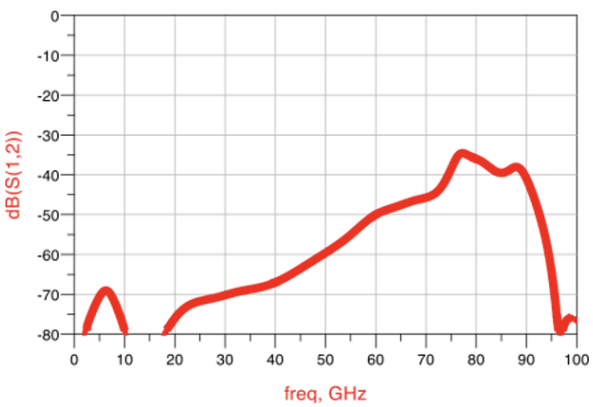
TMC655 Noise Figure



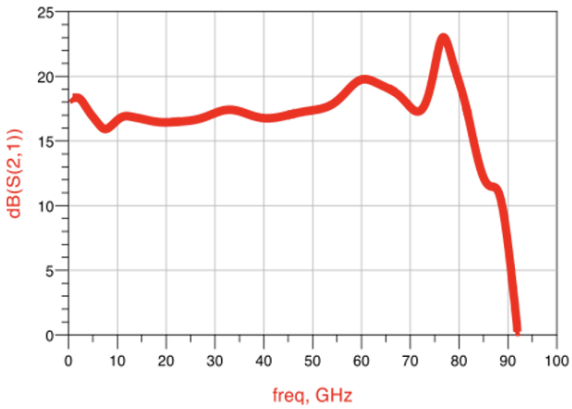
TMC655 Input Return Loss



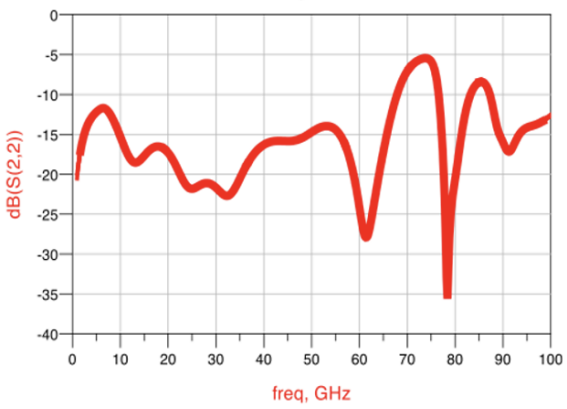
TMC655 Reverse Isolation



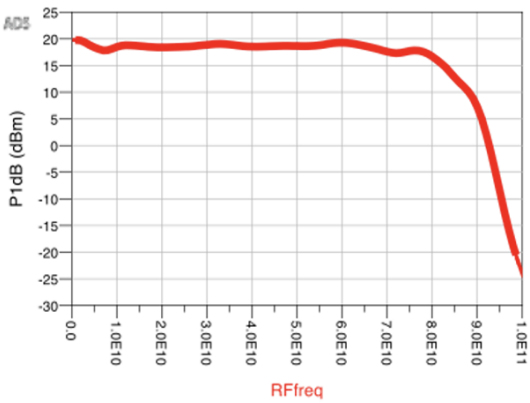
TMC655 Gain



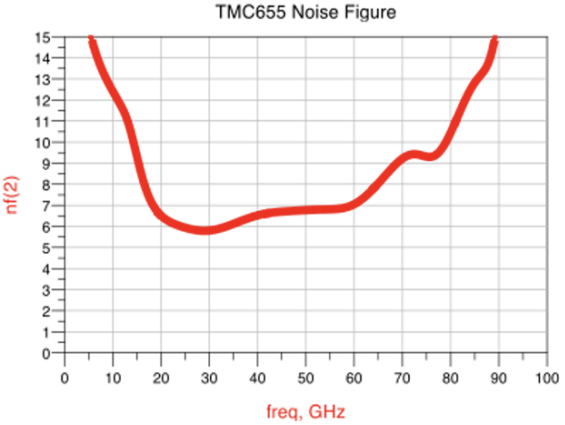
TMC655 Output Return Loss

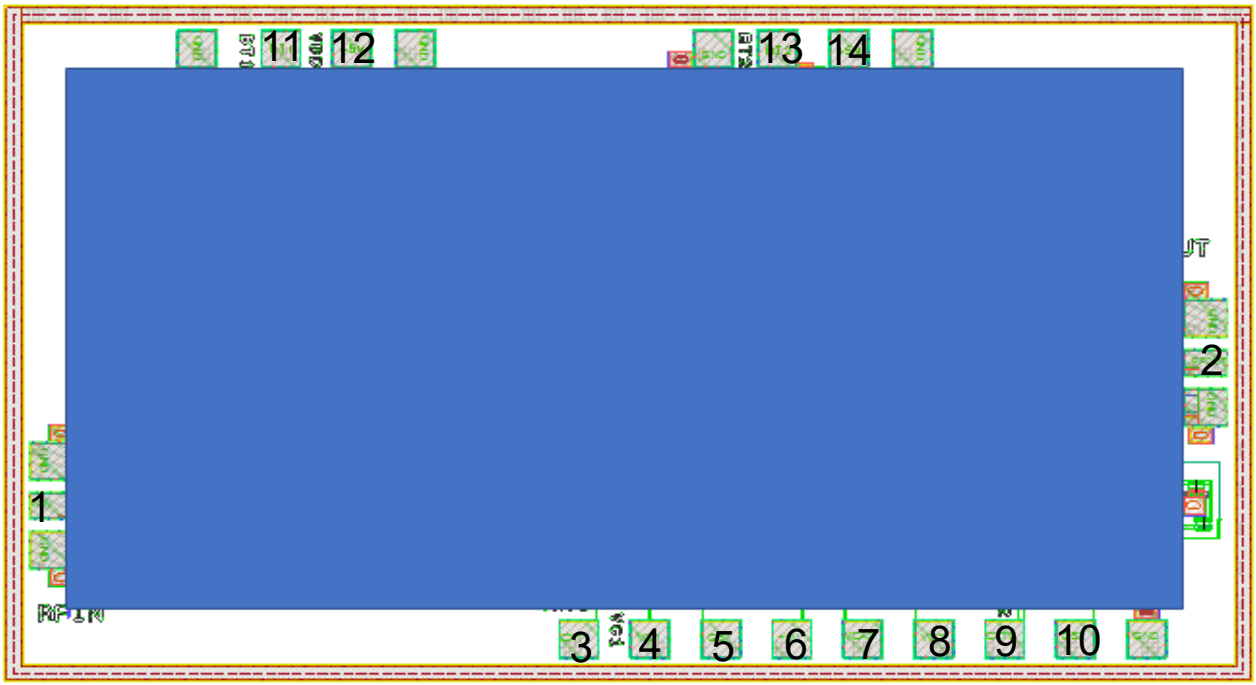


TMC655 P1dB

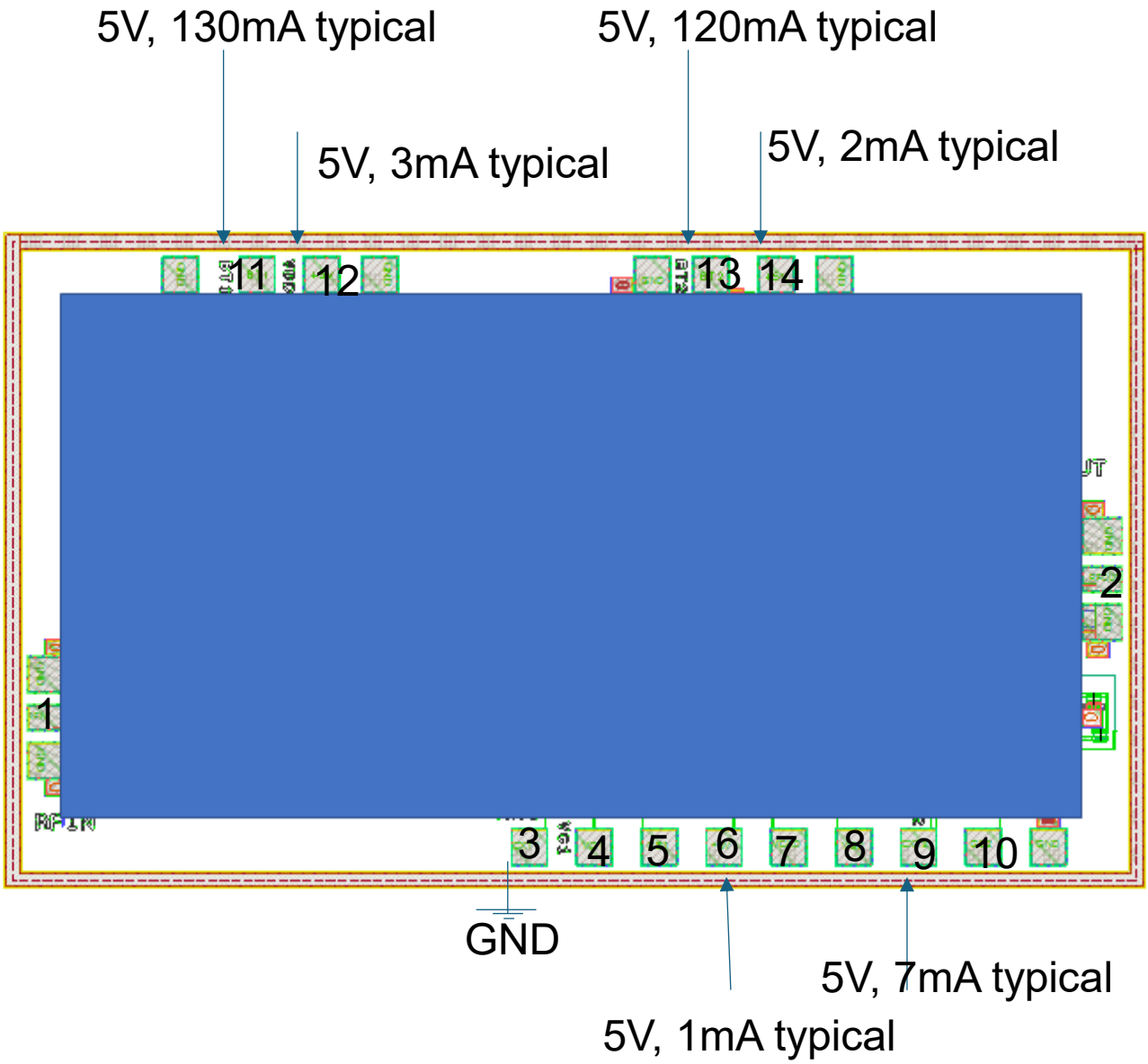


TMC655 Noise Figure





Pad #	Function	Connection
1	RF INPUT	DC-Coupled
2	RF OUTPUT	DC-Coupled
3	CXT1	Short wire bond to GND
4	VG1	-0.4V (adjust to achieve desired currents), draws -1mA
5	GS1	
6	VDD	5V, draws 1mA
7	VCAD	Short wire bond to 100pF+1nF Cap to GND, adjust for the low frequency end
8	VG2	
9	CXT2	5V, draws 7mA
10	GS2	
11	BT1	5V, draws 130mA
12	VDD	5V, draws 3mA
13	BT2	5V, draws 120mA
14	VDD	5V, draws 2mA


5V, 130mA typical
5V, 120mA typical
5V, 3mA typical
5V, 2mA typical
11
12
13
14
1
2
3
4
5
6
7
8
9
10
GND
5V, 7mA typical
5V, 1mA typical

Absolute Maximum Ratings

Parameters	Absolute Maximum Ratings
Drain Bias Voltage (VDD)	+7V
Gate Bias Voltage (VG1)	-2 to 0V
Gate Bias Current (IG1)	+4mA
RF Input Power (RFIN)(VDD=+7V)	+25 dBm
Channel Temperature	175 °C
Storage Temperature	-65 to +150 °C
Operating Temperature for MTTF > 1E6 hours	-55 to +125 °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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