

Features

- Frequency Range 20-28GHz
- Broadband Low Noise Amplifier
- Noise Figure less than 3.5dB at 27GHz
- Bias Voltage 3V
- Technology: 0.15 μ m GaAs
- Chip Dimensions: 1.7 x 1.4 x 0.10mm

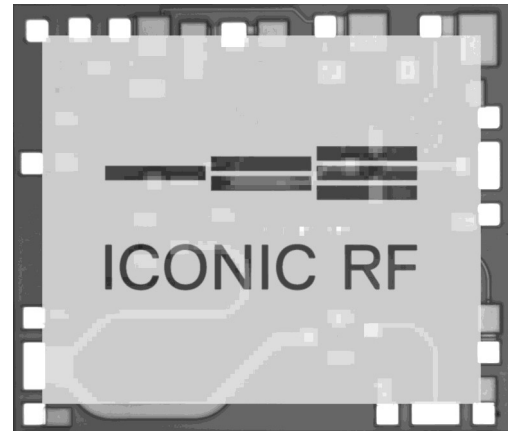
Applications

- 5G Phased array antenna systems

Description

The ICRF4003 is a two stage Low Noise Amplifier designed for broadband 20-28GHz applications. The chip is designed using an enhanced mode 0.15 μ m GaAs technology with integrated 50ohm matching circuits, SPDT PIN switch, DC blocking and bias control circuits.

Image



RX RF Performance | Test Conditions unless otherwise stated | $T_A=25^{\circ}\text{C}$, $V_D=3\text{V}$, $V_{CTRL,Vref}=3\text{V}$, $I_D=15\text{mA}$,

Parameter	Units	Min.	Typ.	Max.
Frequency	GHz	20		28
LNA Gain	dB		15	
LNA Noise Figure	dB		3.5	
LNA Input Return Loss	dB		-10	
LNA Output Return Loss	dB		-12	
LNA Drain Bias Voltage	V	2.7	3.0	3.3
LNA Drain Bias Current	mA	13	18	23
Bias Control Voltage	V	2.7	3.0	3.3
Bias Regulated Voltage	V	2.7	3.0	3.3
Switch Control Current	mA		10	
Switch Insertion Loss	dB		1.0	1.3
Switch Isolation	dB		-18	

TX RF Performance | Test Conditions unless otherwise stated | $T_A=25^{\circ}\text{C}$, $I_{RX}=10\text{mA}$

Parameter	Units	Min.	Typ.	Max.
Frequency	GHz	20		28
Switch Insertion Loss	dB		1.0	1.3
Switch Isolation	dB		-18	
Switch Control Current	mA		10	

Absolute Maximum Ratings

Parameter	Absolute Maximum
Drain to Gate Voltage (V_{DG})	4 V
Gate Voltage Range (V_G)	0V to 1V
Gate Current (I_G)	10 to 40mA
CW Input Power	+10dBm
Channel Temperature	150°C
Storage Temperature	-65°C to +150°C

Exceeding any one or combination of these limits may cause permanent damage to this device.
ICONIC RF does not recommend sustained operation near these survivability limits.

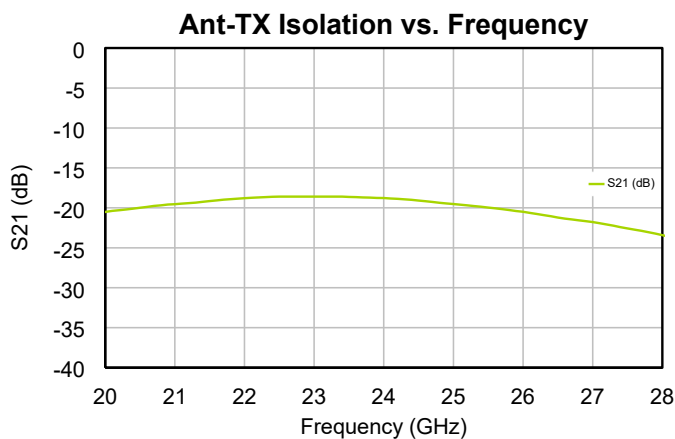
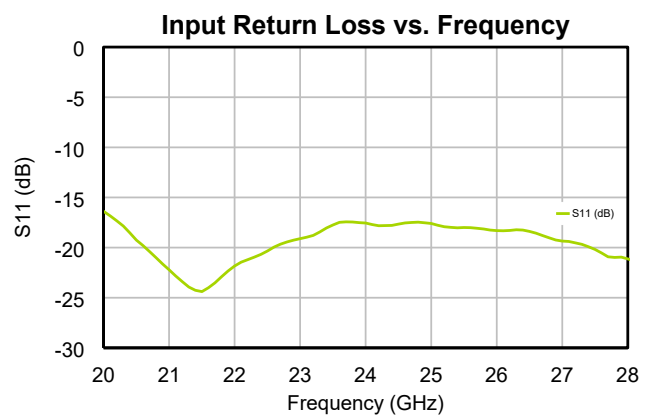
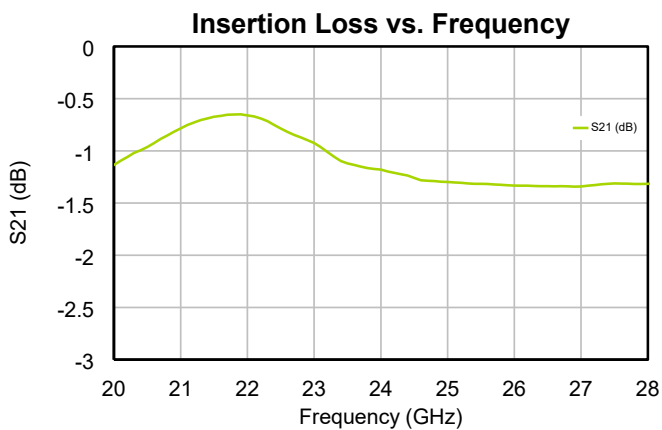
Handling Procedures

Please observe the following precautions to avoid damage:

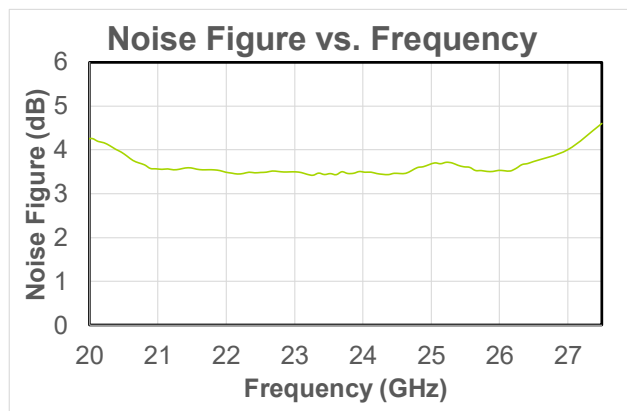
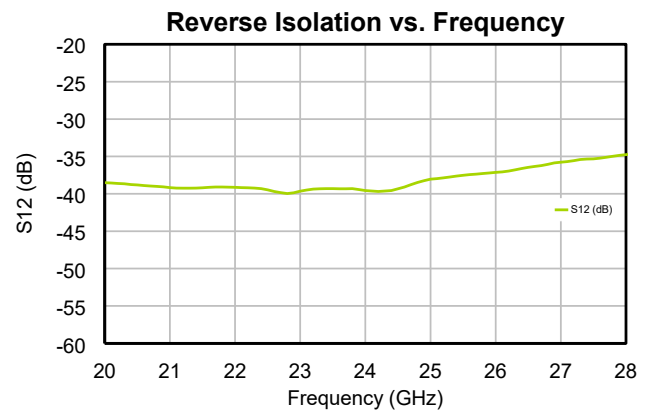
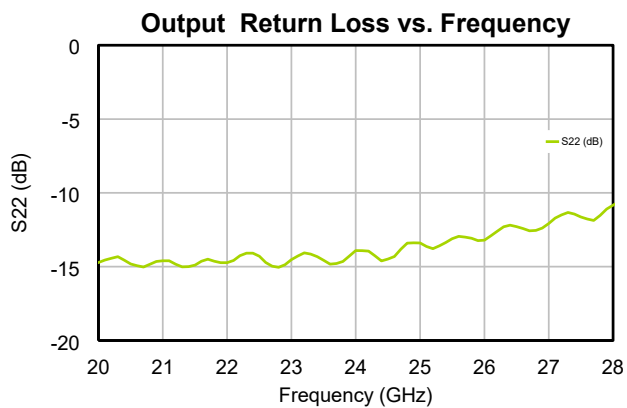
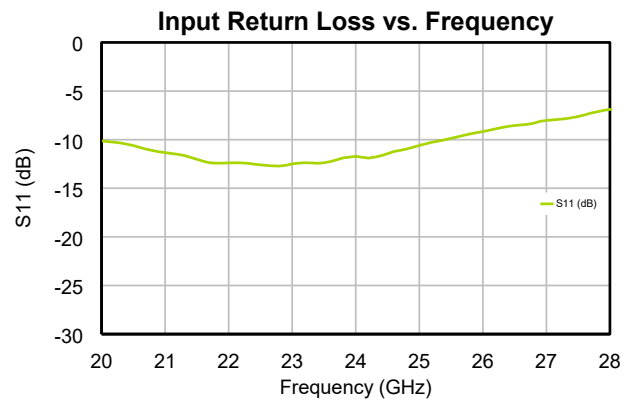
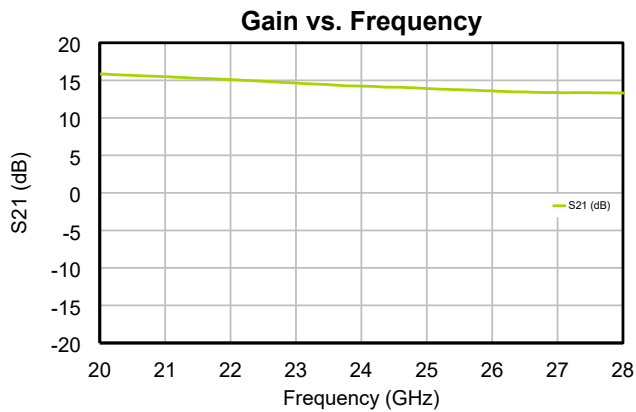
Static Sensitivity

Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

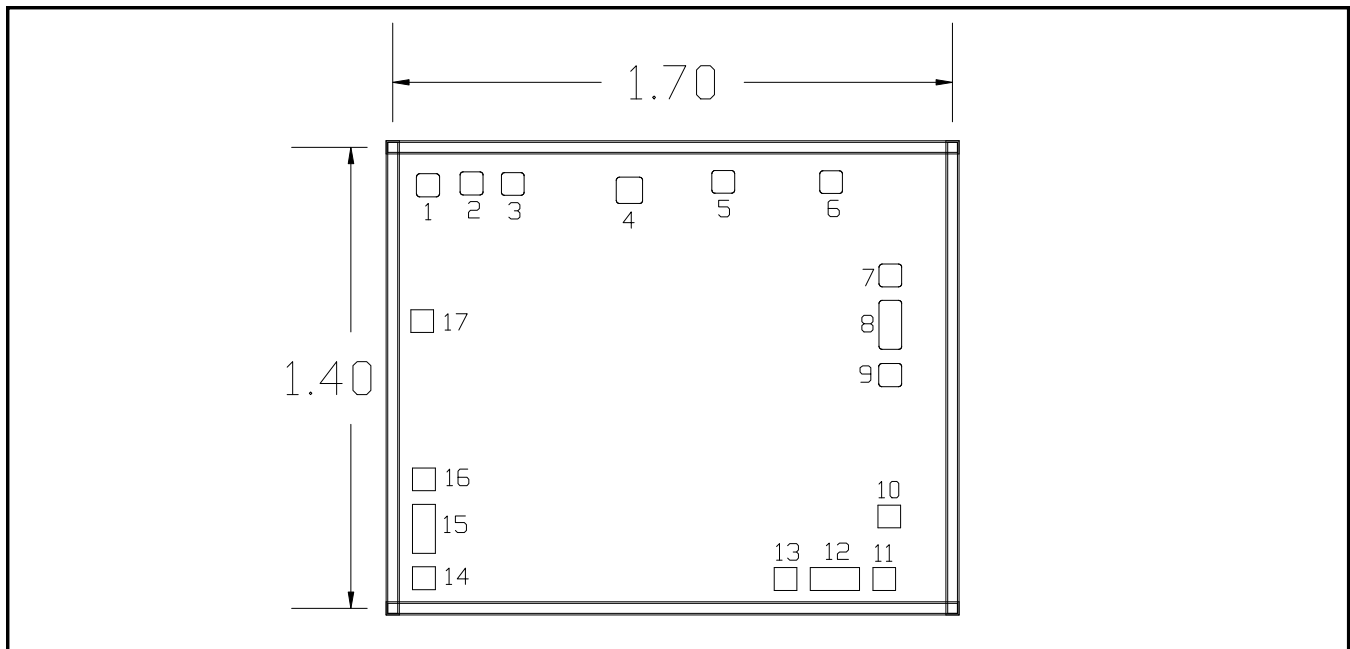
TX RF Performance | Test Conditions unless otherwise stated | $T_A=25^\circ\text{C}$, $\text{TX_ID}=10\text{mA}$



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Mechanical Drawing



Bond Pads

Pad No.	Dimensions (mm)	Function	Description
1	0.069 x 0.069	Bias CTRL	Control Voltage for Bias Circuit
2	0.069 x 0.069	Bias Ref	Reference Voltage for Bias Circuit
3	0.069 x 0.069	VG1	Stage 1 Gate Voltage
4	0.069 x 0.069	VD1	Stage 1 Drain Voltage
5	0.069 x 0.069	VG2	Stage 2 Gate Voltage
6	0.069 x 0.069	VD2	Stage 2 Drain Voltage
7,9,11,13,14,16	0.069 x 0.069	GND	Ground
8	0.069 x 0.149	RF LNA Out	RF LNA Out
10	0.069 x 0.069	V_RX Switch	RX Switch Voltage
12	0.069 x 0.149	RF Ant	RF Ant
15	0.069 x 0.149	TX In	TX In
17	0.069 x 0.069	V_TX Switch	TX Switch Voltage

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