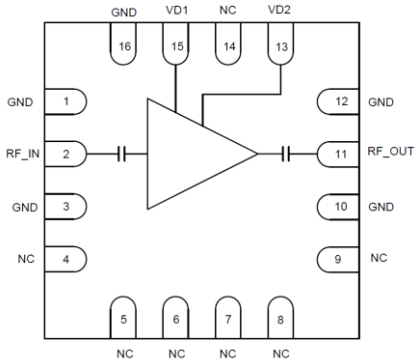
5.0 – 6.0 GHz Low Noise Amplifier

Features

- **Frequency Range : 5 - 6GHz**
- **Nominal Gain : 20dB**
- **Noise Figure : 1.6dB**
- **I/O Return Losses : 10dB**
- **Output P1dB : 12dBm**
- **Self-bias operation : 2V@ 47mA**
- **DC decoupled Input and Output**
- **Package Dimensions : 3mmx3mmx0.6mm**

Functional Diagram



Typical Applications

- Radar
- Military
- Test Equipment and Sensors.

Description

The ASL1045P3 is a Low Noise Amplifier MMIC packaged in QFN package size of 3mm x 3mm x 0.6mm, it is designed to operate over the frequency band of 5.0 to 6.0 GHz. The LNA uses 2 stages of amplification and provides 20dB of gain with a noise figure less than 1.6dB. The amplifier is well matched to 50ohms over the entire operating bandwidth having input & output return losses better than 10dB. The LNA has P1dB of 12dBm over the entire operating frequency band. The amplifier operates on 2V or 3V DC supply with a nominal current consumption of 45mA (typ). The die is fabricated using In GaAs pHEMT technology.

Absolute Maximum Ratings[1]

Parameter	Absolute Maximum	Units
Positive DC voltage	+6	V
RF input power	+20	dBm
Supply Current	100	mA
Operating Temperature	-55 to +85	^{o}C
Storage Temperature	-65 to +150	^{o}C

1. Operation beyond these limits may cause permanent damage to the component

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Electrical Specifications @ T_A = 25 °C, Vd = +2V, Z_o =50Ω,

Parameter	Min.	Typ.	Max.	Units
Frequency	5.0	-	6.0	GHz
Gain (1)	-	20	-	dB
Gain Flatness(1)	-	±0.7	-	dB
Noise Figure (1)	1.4	1.5	1.65	dB
Input Return Loss (1)	-	10	-	dB
Output Return Loss (1)	-	15	-	dB
Output Power (P_1dB) (1)		12(1)/14.5(2)		dBm
Supply Voltage		2		V
Supply Current		47		mA

Note:

1. Electrical specifications as measured in test fixture.
2. 14.5dBm P1dB can be achieved by operating last stage drain supply voltage at 3V.

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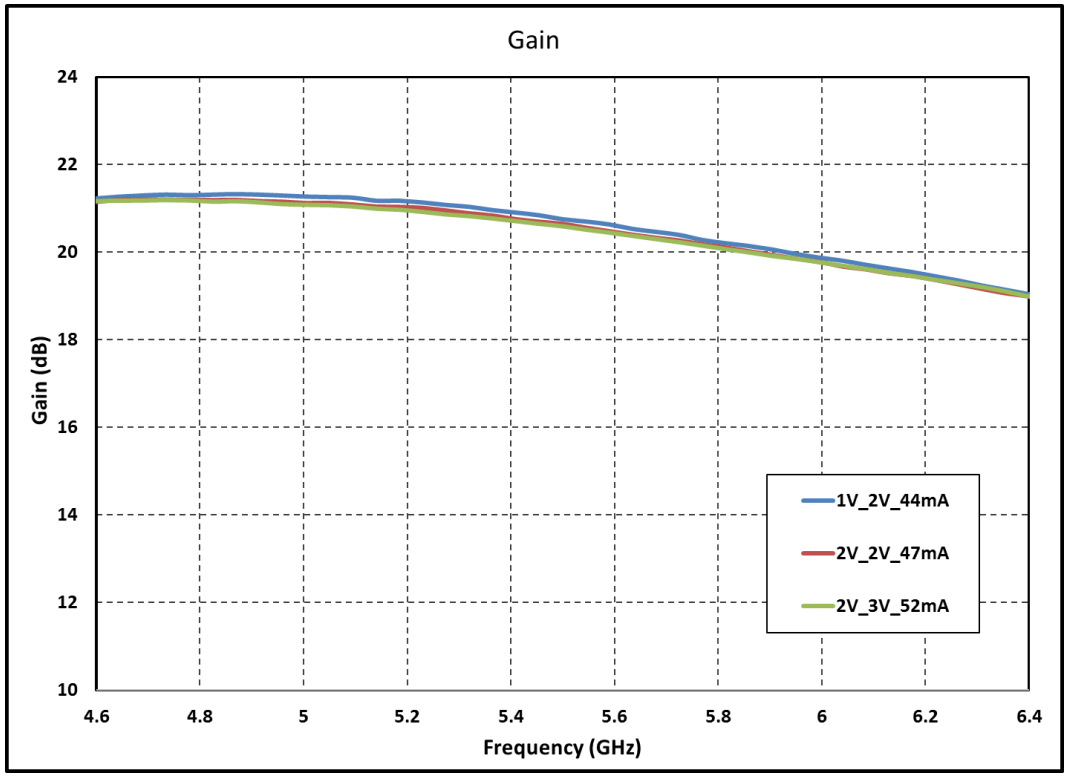
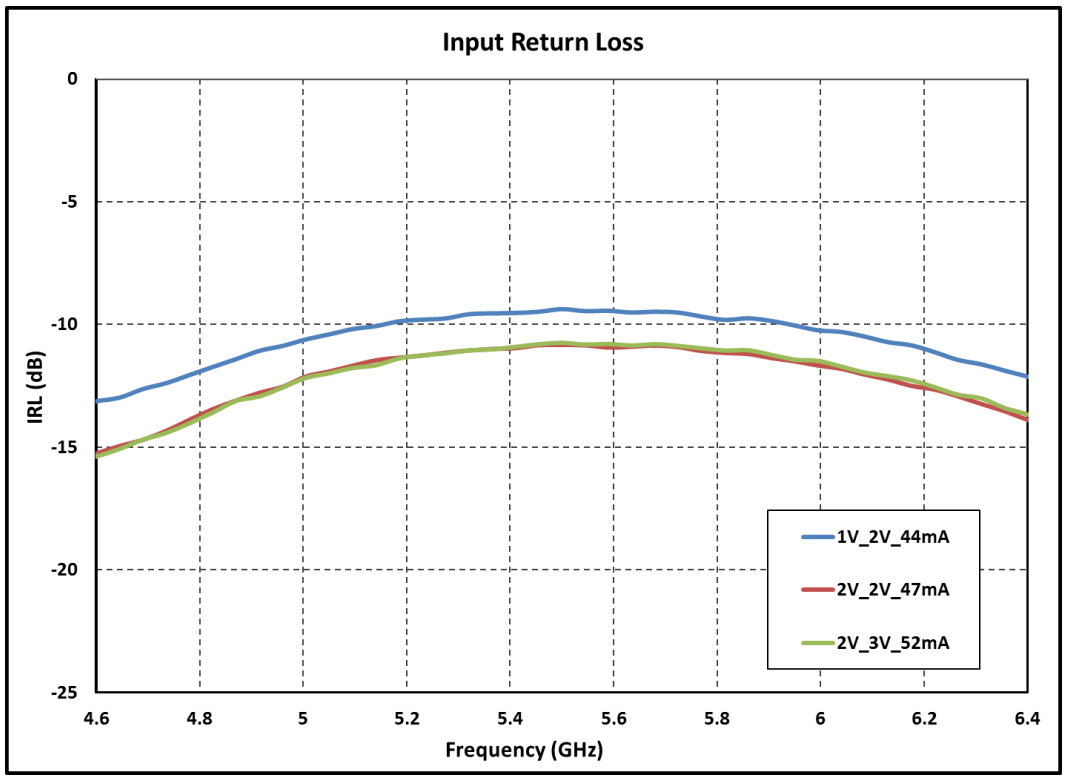
Test fixture data

Vd1= Vd2 @ different bias voltages, T_A = 25 ^oC





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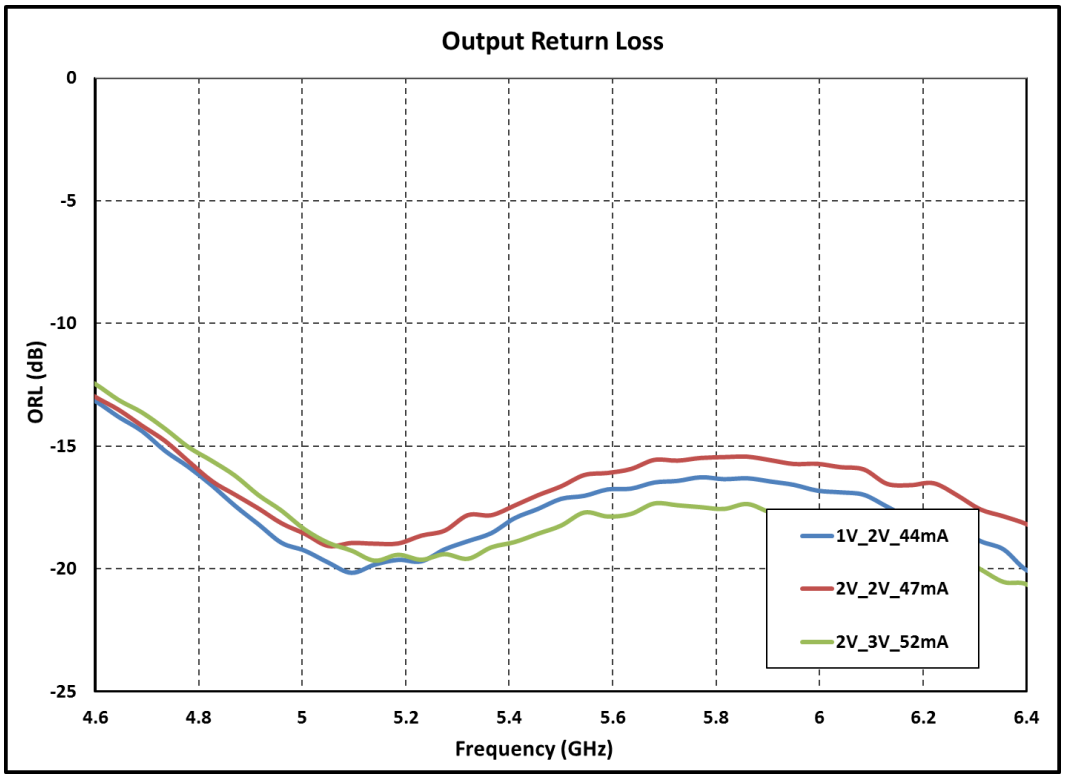

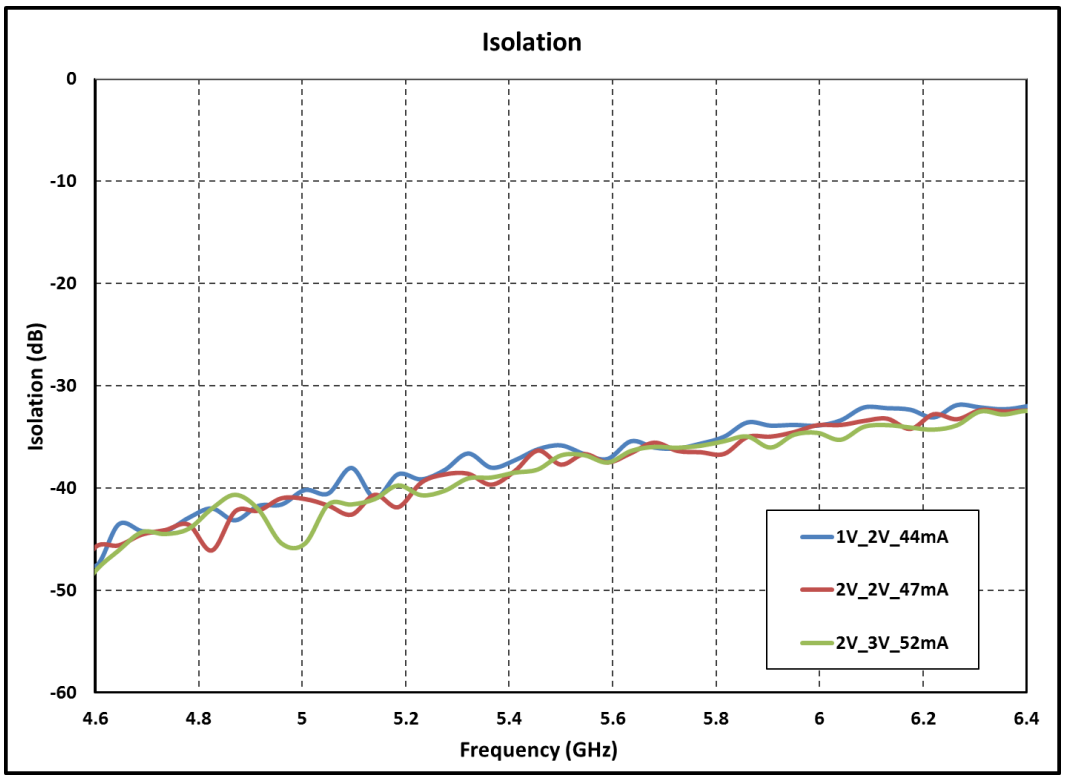

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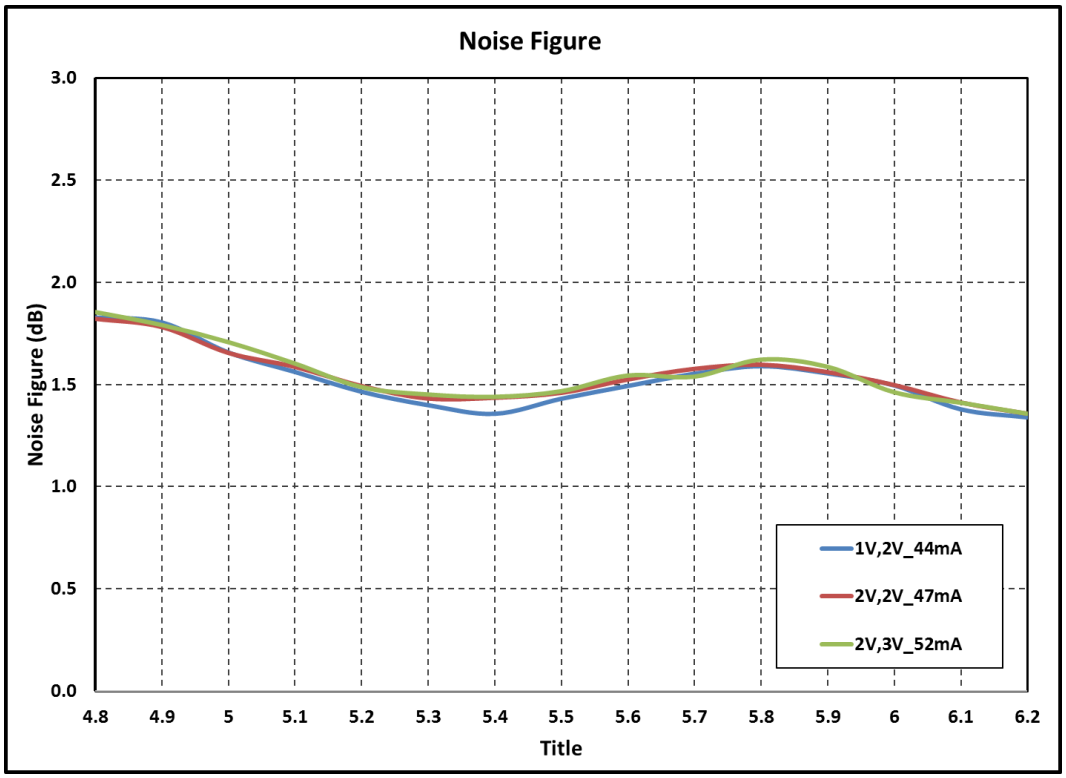

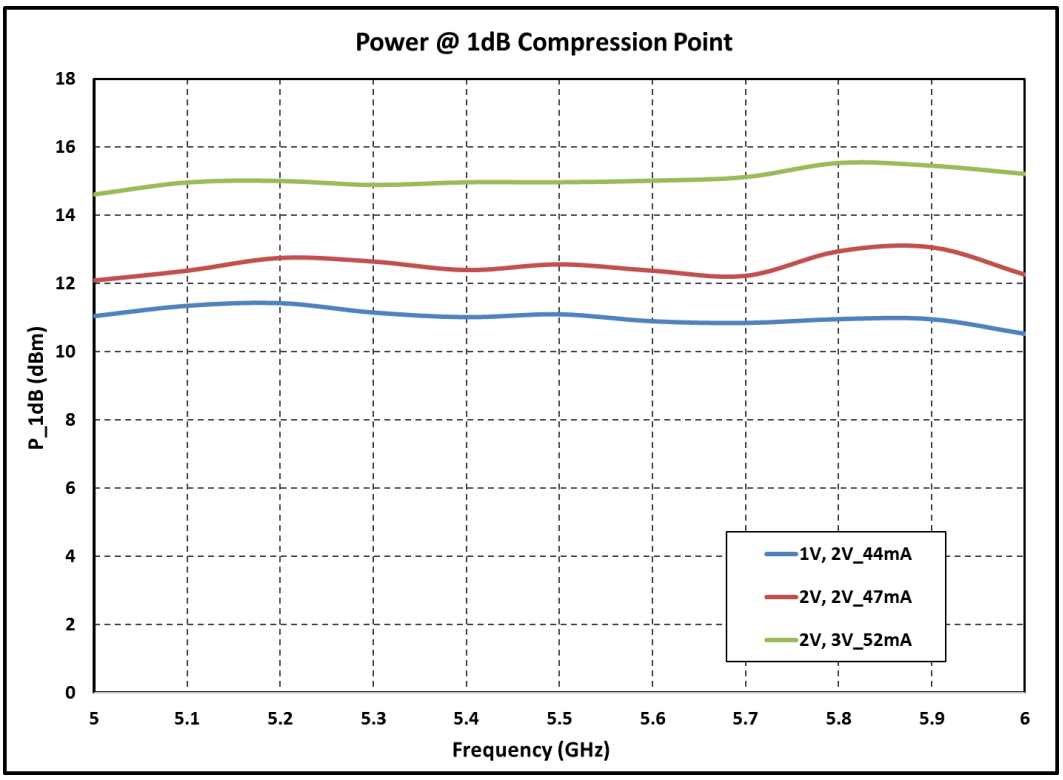

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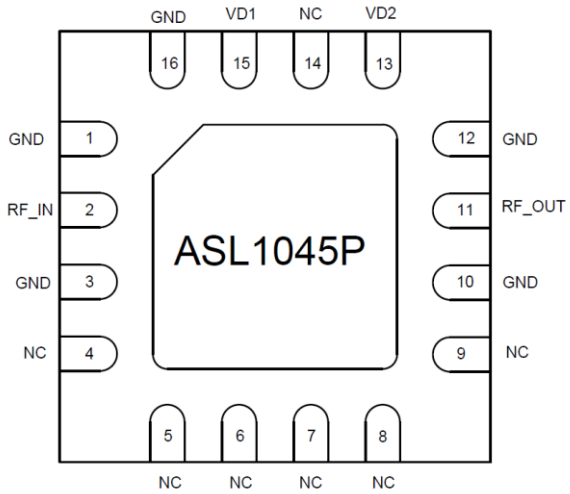
Pin Configuration Details

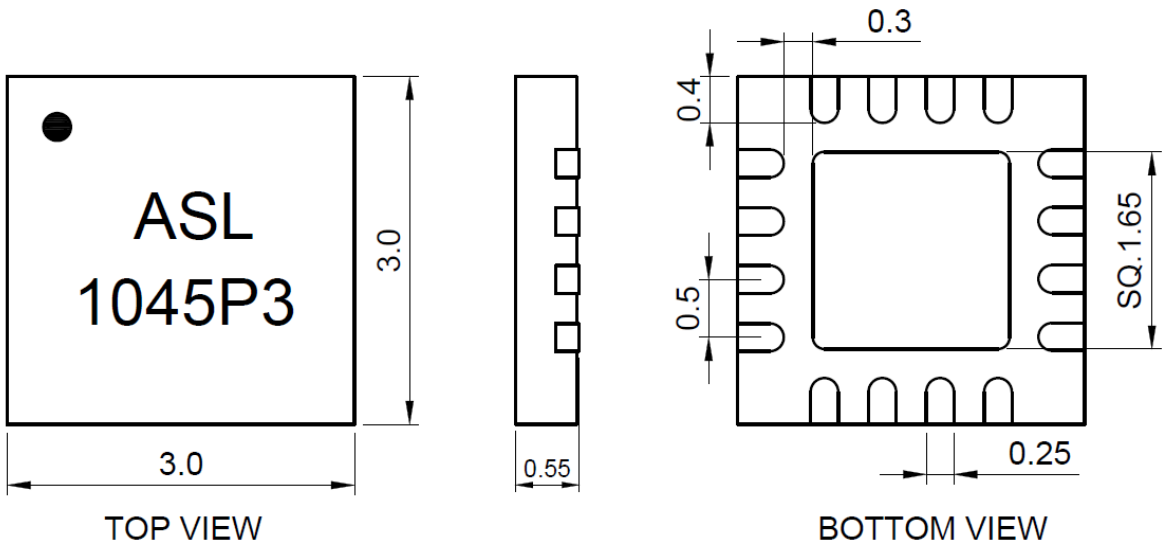


Pin Description:

Pin 2	**: RF in**
Pin 15	**: Drain Bias 1**
Pin 13	**: Drain Bias 2**
Pin 11	**: RF out**
Pin 1, 3,10,12,16	**: Ground**

Remaining all other Pins are NC (No Connection).

QFN Package Outline



Note: **All Units are in mm.**

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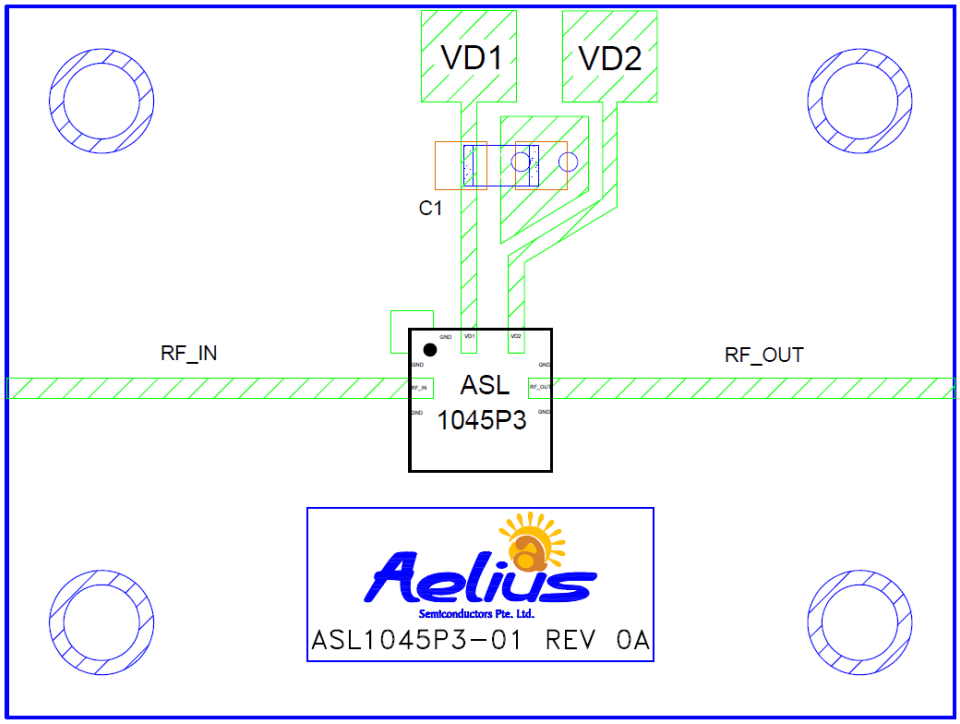
Recommended Assembly Diagram



Bill of Material

Component ID	Value	Description	Manufacturer	Part Number
C1	0.1µF	CAP MCC 0.1UF±10% 10V 0603 X7R	Digi-Key	0603ZC104KAT2A

Note:

1. Input and output 50 ohm lines are on 8 mil RO4003 substrate.
2. 0.1 µF capacitors may be additionally used as a second level of bypass for reliable operation.

GaAs MMIC devices are susceptible to Electrostatic discharge. Proper precautions should be observed during handling, assembly & testing.

All information and Specifications are subject to change without prior notice.

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