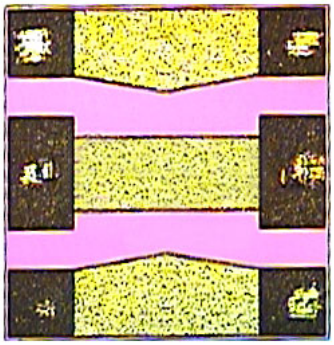
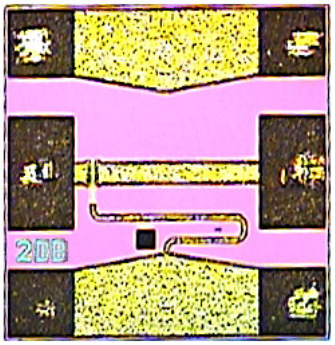
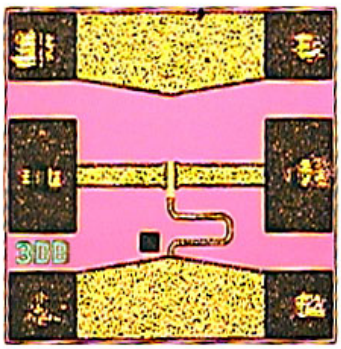
Wideband Fixed Attenuators



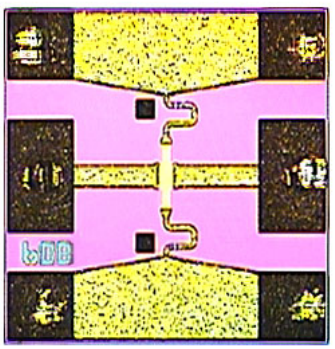
0 dB Attenuator



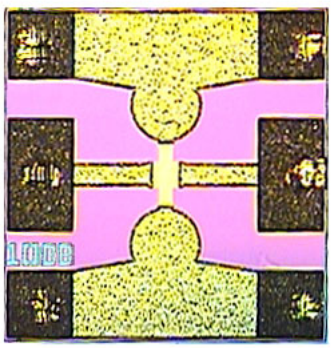
2 dB Attenuator



3 dB Attenuator



6 dB Attenuator



10 dB Attenuator

Key Features and Performance

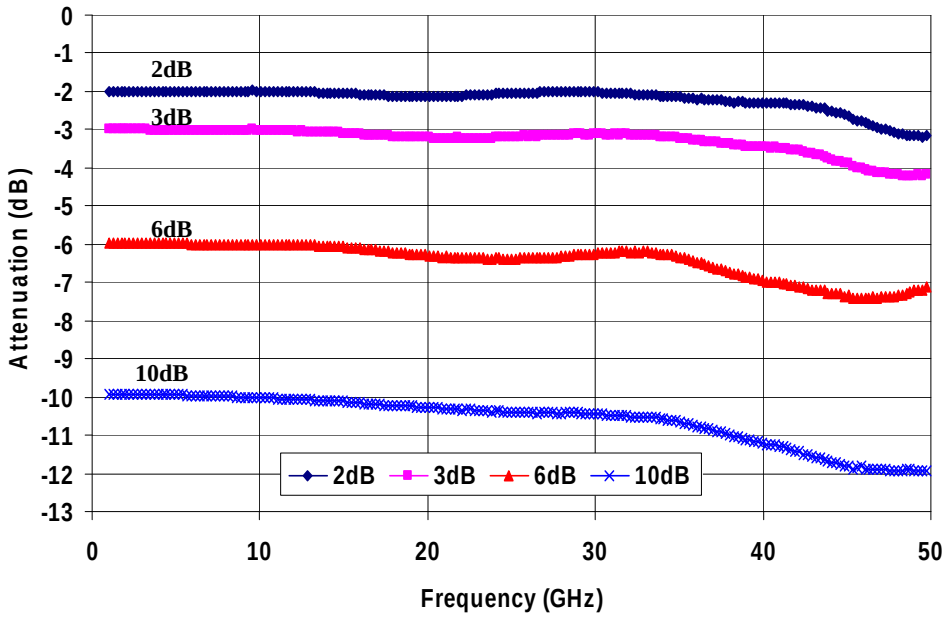
- Fixed 0, 2, 3, 6 and 10dB Attenators
- Broadband Response DC to > 40 GHz
- Excellent Return Loss > 15 dB
- Power Handling = 20 dBm
- On-Chip Grounding Vias
- 3MI Passive Part
- Low Price
- Small size: 0.5 x 0.5 x 0.1 mm
  (0.02 X 0.02 X 0.004 in)

Primary Applications

- Point to Point Radio
- Fiber Optic
- Wideband Military & Space
- Test Equipment

Typical Electrical Characteristics

Attenuators Probed in Fixtures



Datasheet subject to change without notice.

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TABLE I
ELECTRICAL CHARACTERISTICS
(Ta = 25 ^{0}C Nominal)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
	0dB Attenuation (-00)	DC – 30 GHz 1/	0	0.1	0.2	dB
	2dB Attenuation (-02)	DC – 30 GHz 1/	1.75	2	2.25	dB
	3dB Attenuation (-03)	DC – 30 GHz 1/	2.65	3	3.35	dB
	6dB Attenuation (-06)	DC – 30 GHz 1/	5.3	6	6.3	dB
	10dB Attenuation (-10)	DC – 30 GHz 1/	9.4	10	10.4	dB
IRL	Input Return Loss	DC – 40 GHz		15		dB
ORL	Output Return Loss	DC – 40 GHz		15		dB
	Maximum Power	2 - 18 GHz			20	dBm

1/ Measured on wafer with RF probes. Bond wires are not included in this measurement. Wafer is sample tested at ~10%. TGL4201-00 is not RF tested.

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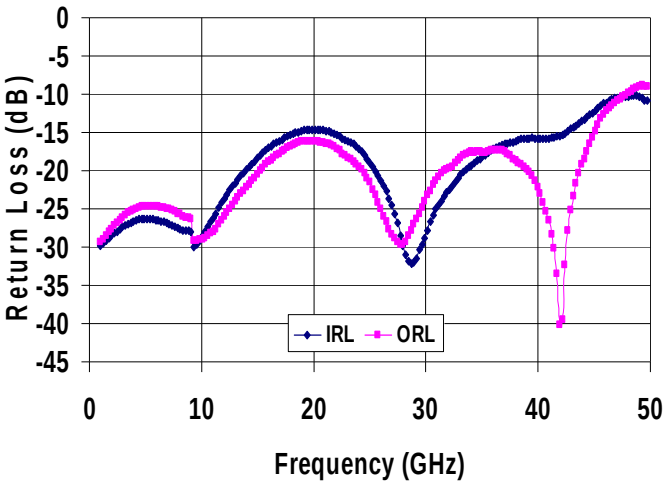
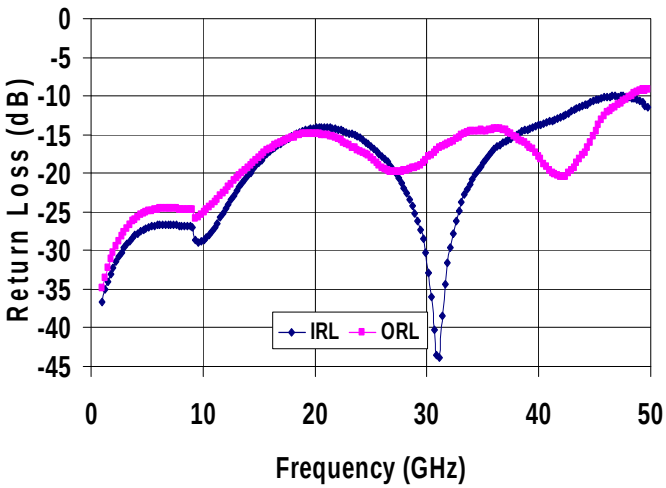
Typical Measurement Attenuators
Attenuators Probed in Fixtures

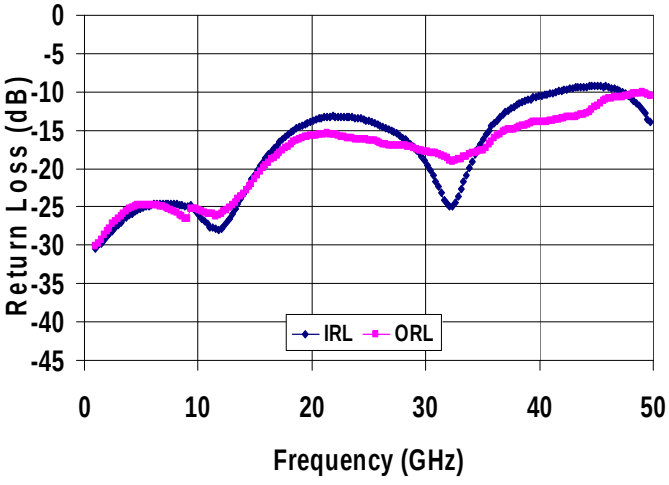
2 dB Attenuator



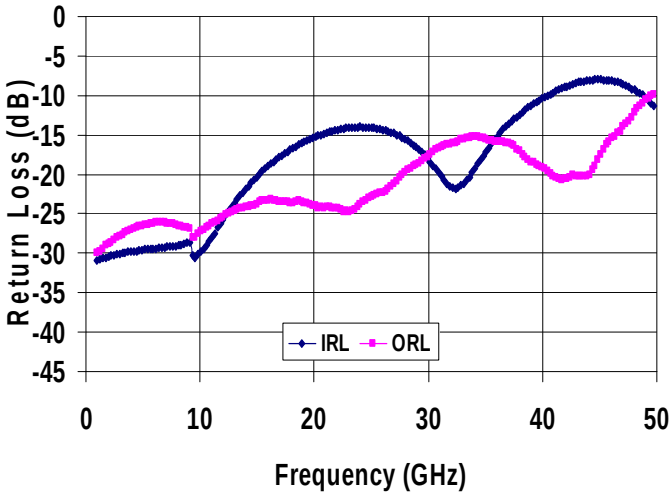
3 dB Attenuator



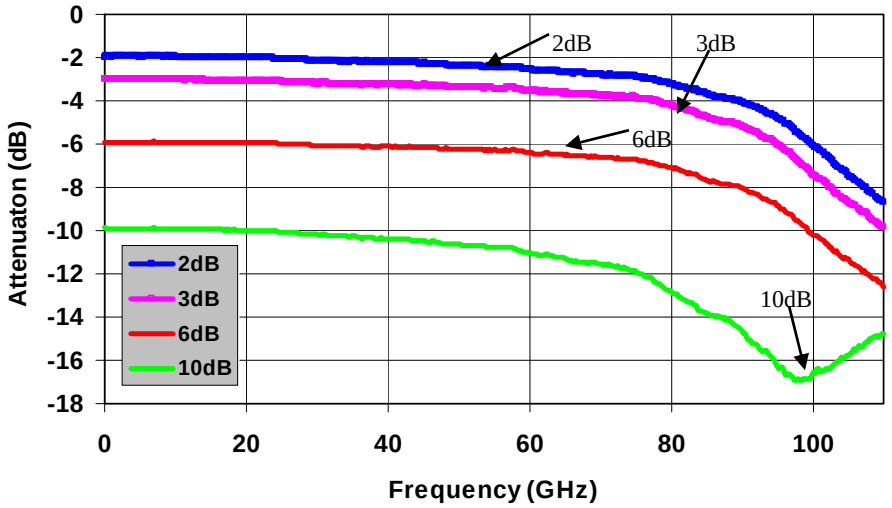
6 dB Attenuator

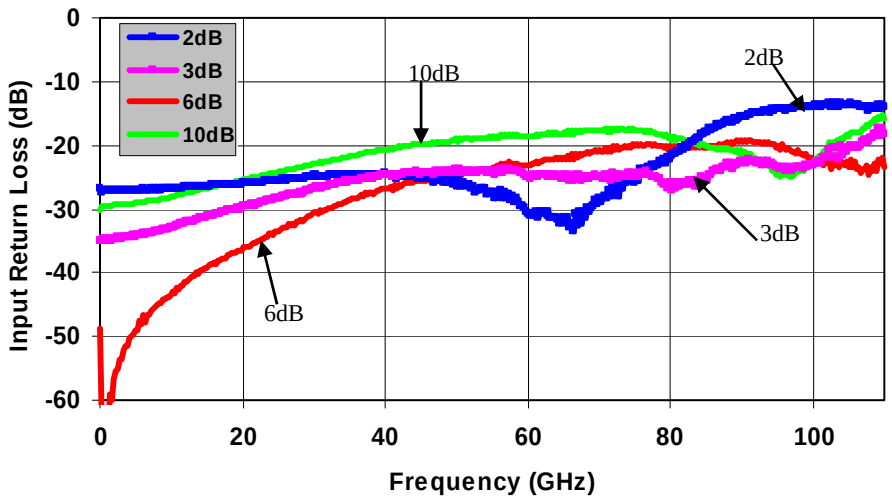


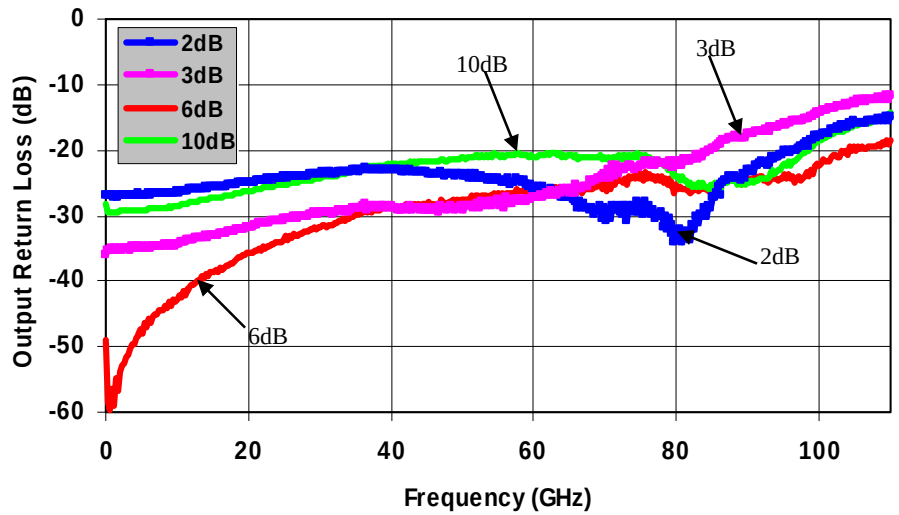
10 dB Attenuator



Typical Measurement Attenuators
No Bond Wires, Probed from 45 MHz to 110GHz







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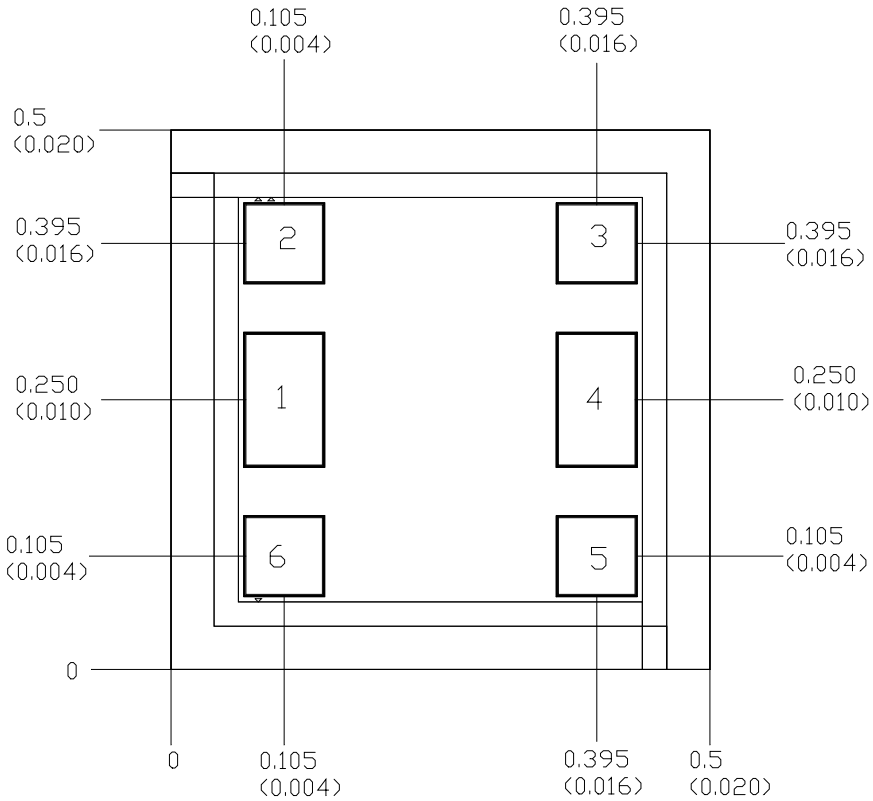
Mechanical Drawing



Units: millimeters (inches)
Thickness: 0.100 (0.004)
Chip edge to bond pad dimensions are shown to center of bond pad
Chip size tolerance: +/- 0.051 (0.002)

Bond Pad #1:	(RF In)	0.075 x 0.125	(0.003 x 0.005)
Bond Pad #2:	(N/C)*	0.075 x 0.075	(0.003 x 0.003)
Bond Pad #3:	(N/C)*	0.075 x 0.075	(0.003 x 0.003)
Bond Pad #4:	(RF Out)	0.075 x 0.125	(0.003 x 0.005)
Bond Pad #5:	(N/C)*	0.075 x 0.075	(0.003 x 0.003)
Bond Pad #6:	(N/C)*	0.075 x 0.075	(0.003 x 0.003)

* Note: GND is back side of MMIC

GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

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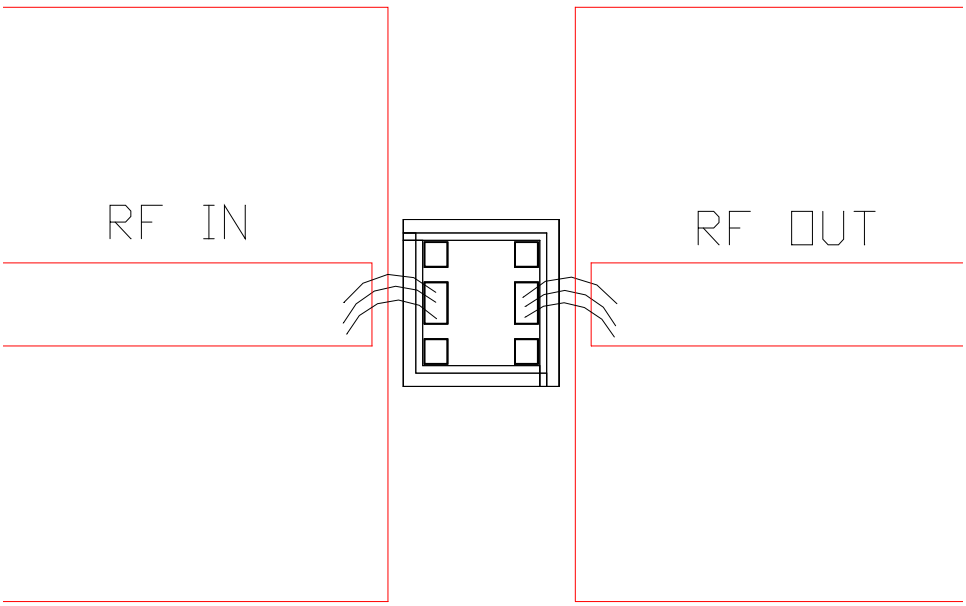
Chip Assembly Diagram



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Assembly Process Notes

Reflow process assembly notes:

- Use AuSn (80/20) solder with limited exposure to temperatures at or above 300▪C (30 seconds max).
- An alloy station or conveyor furnace with reducing atmosphere should be used.
- No fluxes should be utilized.
- Coefficient of thermal expansion matching is critical for long-term reliability.
- Devices must be stored in a dry nitrogen atmosphere.

Component placement and adhesive attachment assembly notes:

- Vacuum pencils and/or vacuum collets are the preferred method of pick up.
- The force impact is critical during auto placement.
- Organic attachment can be used in low-power applications.
- Curing should be done in a convection oven; proper exhaust is a safety concern.
- Microwave or radiant curing should not be used because of differential heating.
- Coefficient of thermal expansion matching is critical.

Interconnect process assembly notes:

- Thermosonic ball bonding is the preferred interconnect technique.
- Force, time, and ultrasonics are critical parameters.
- Aluminum wire should not be used.
- Maximum stage temperature is 200▪C.

GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

Ordering Information

PART NUMBER	ATTENUATOR
TGL4201-00	0 dB Attenuator
TGL4201-02	2 dB Attenuator
TGL4201-03	3 dB Attenuator
TGL4201-06	6 dB Attenuator
TGL4201-10	10 dB Attenuator

Mouser Electronics

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Qorvo:

TGL4201-00 TGL4201-02 TGL4201-03 TGL4201-06 TGL4201-10