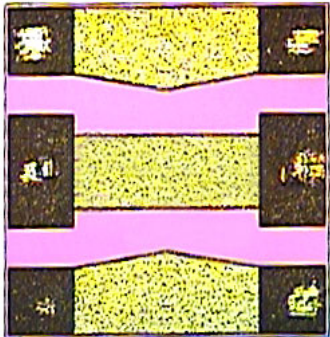
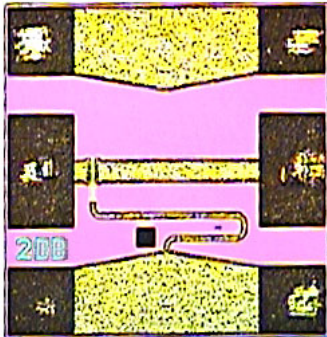


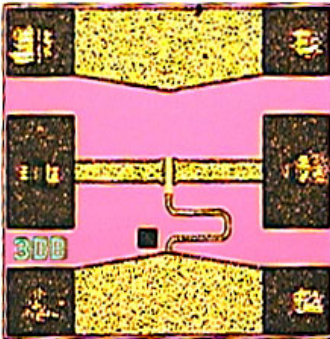
Wideband Fixed Attenuators



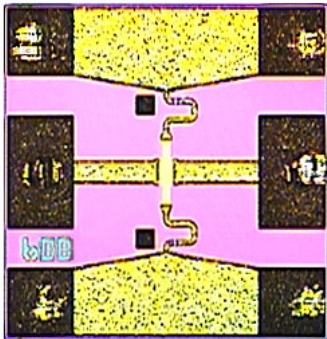
0 dB Attenuator



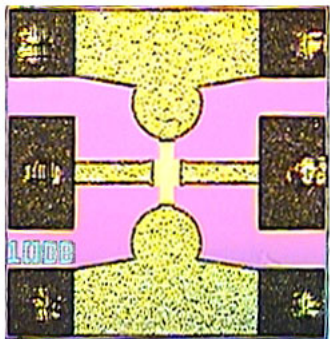
2 dB Attenuator



3 dB Attenuator



6 dB Attenuator



10 dB Attenuator

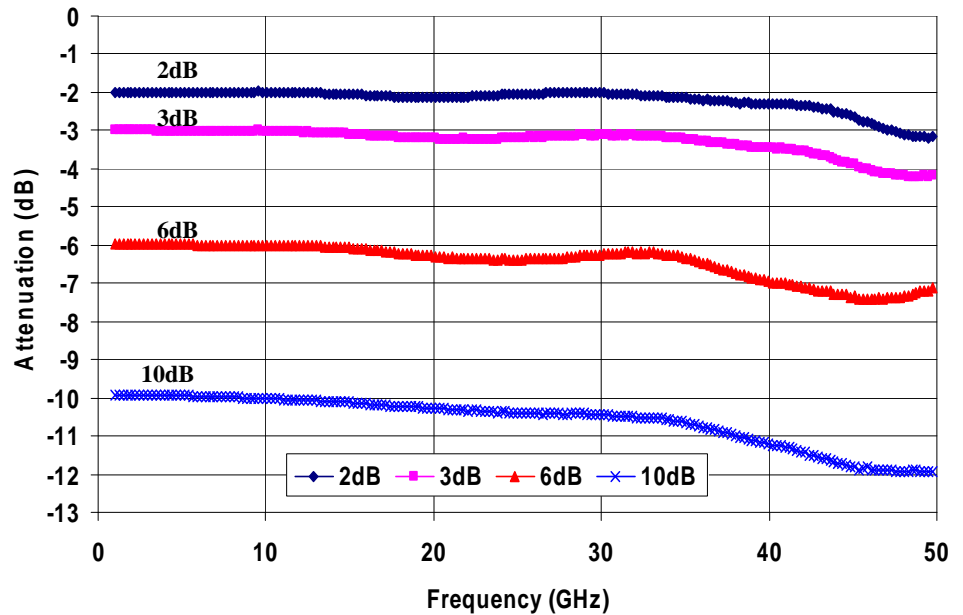
Key Features and Performance

- Fixed 0, 2, 3, 6 and 10dB Attenuators
- 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.

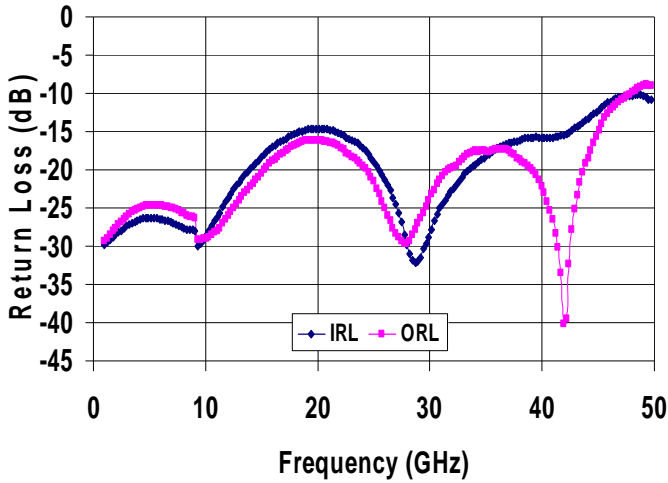
TABLE I
ELECTRICAL CHARACTERISTICS
(Ta = 25 °C Nominal)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
	0dB Attenuation (-00)	DC – 30 GHz <u>1/</u>	0	0.1	0.2	dB
	2dB Attenuation (-02)	DC – 30 GHz <u>1/</u>	1.75	2	2.25	dB
	3dB Attenuation (-03)	DC – 30 GHz <u>1/</u>	2.65	3	3.35	dB
	6dB Attenuation (-06)	DC – 30 GHz <u>1/</u>	5.3	6	6.3	dB
	10dB Attenuation (-10)	DC – 30 GHz <u>1/</u>	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

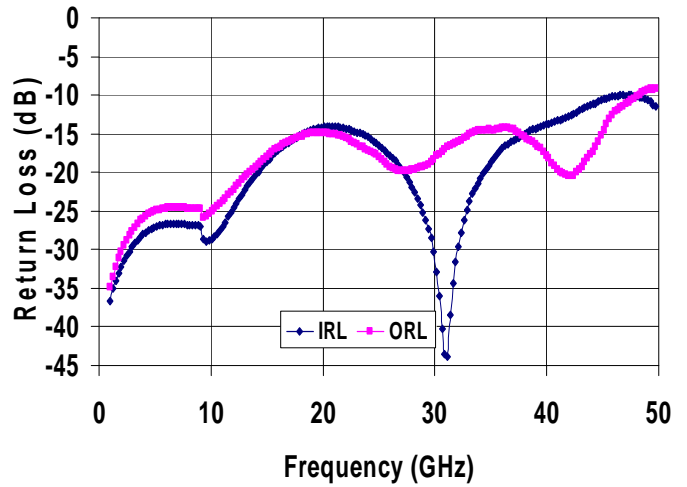
1/ Measured on wafer with RF probes. Bond wires are not included in this measurement.
 Wafer is sample tested at ~10%. TGL4201-00 is not RF tested.

Typical Measurement Attenuators
Attenuators Probed in Fixtures

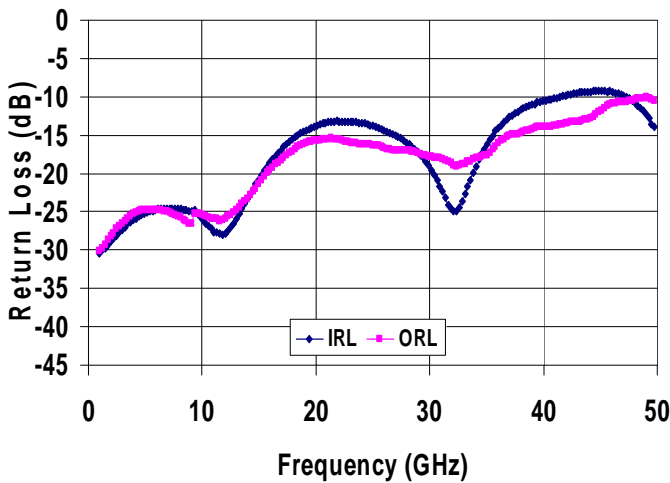
2 dB Attenuator



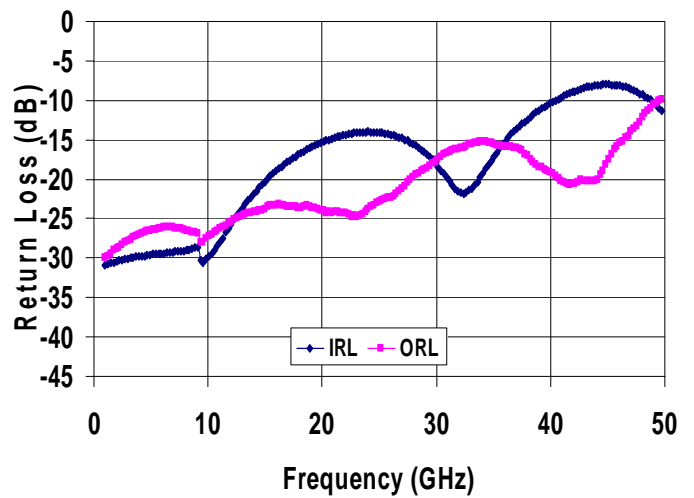
3 dB Attenuator



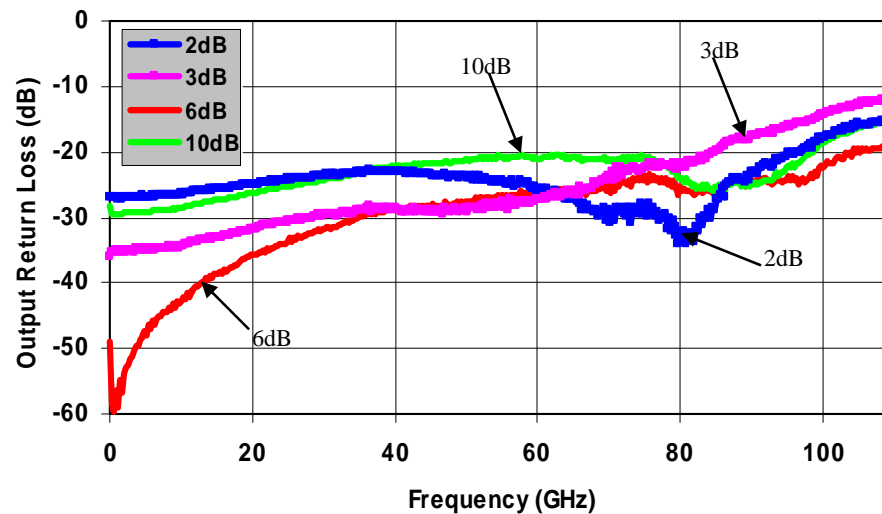
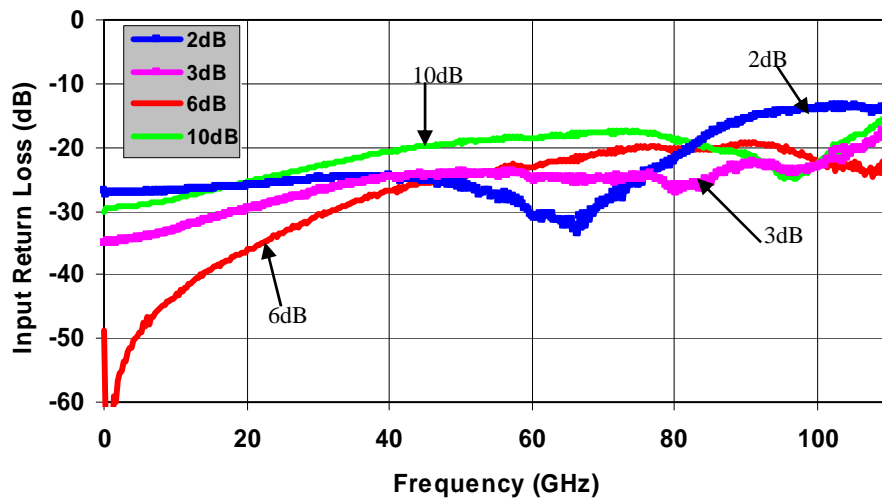
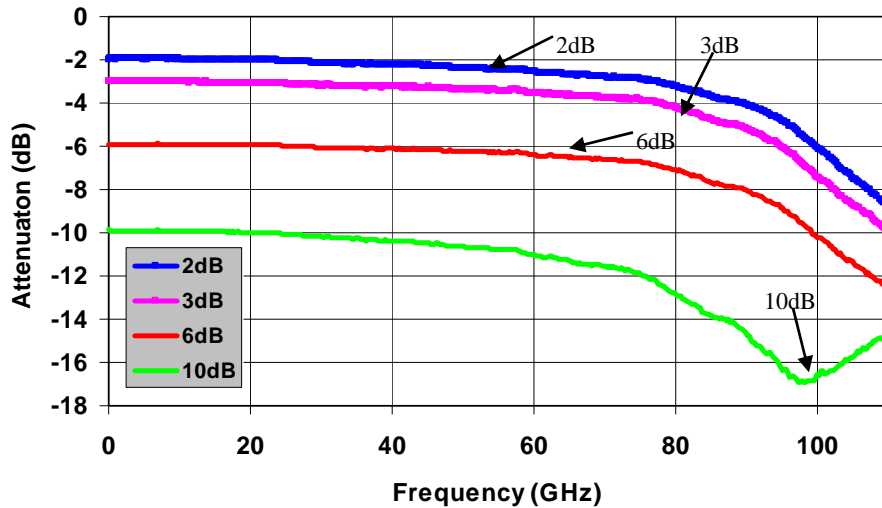
6 dB Attenuator



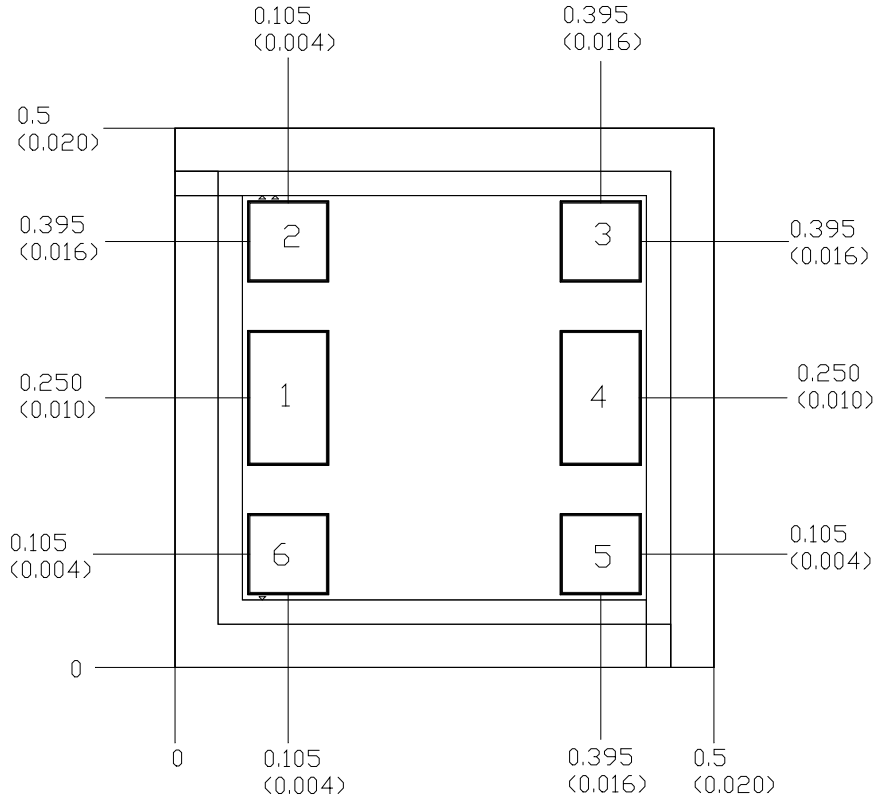
10 dB Attenuator



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



Mechanical Drawing



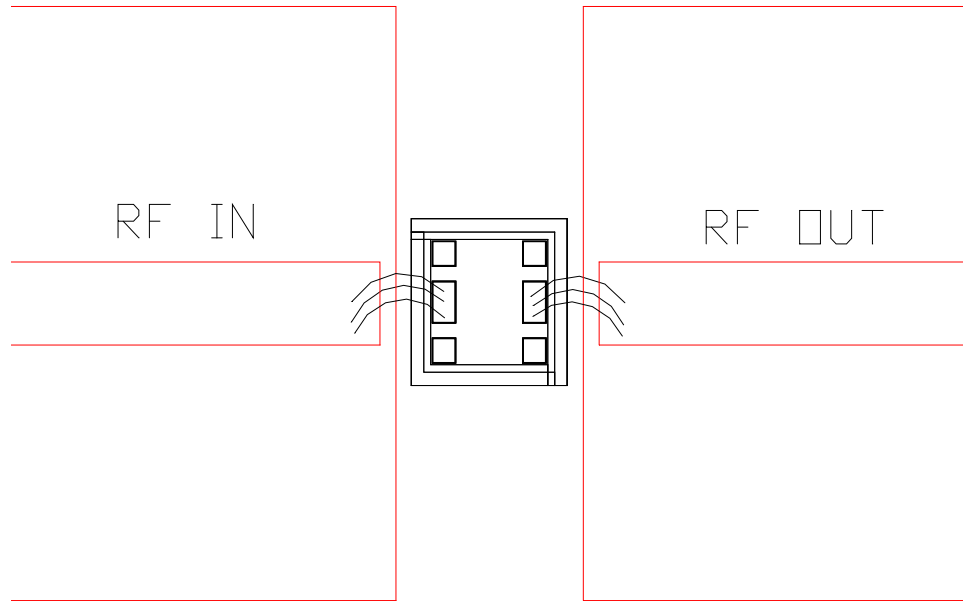
Units: millimeters (inches)
 Thickness: 0.100 (0.004)
 Chip edge to bond pad dimensions are shown to center of bond pad
 Chip size tolerance: +/- 0.051 (0.002)

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.

Chip Assembly Diagram



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

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

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