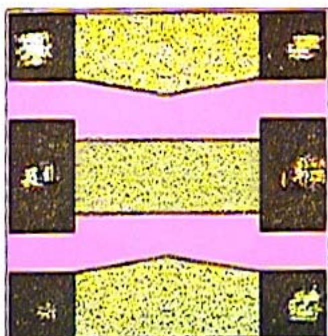
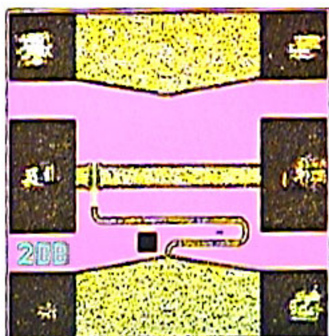
Wideband Fixed Attenuators

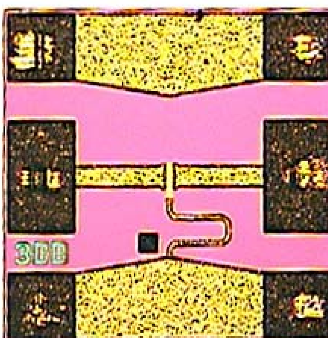
TGL4201-EPU



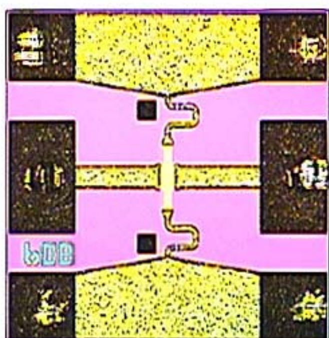
0 dB Attenuator



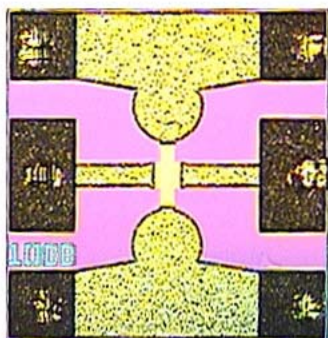
2 dB Attenuator



3 dB Attenuator



6 dB Attenuator



10 dB Attenuator

Key Features and Performance

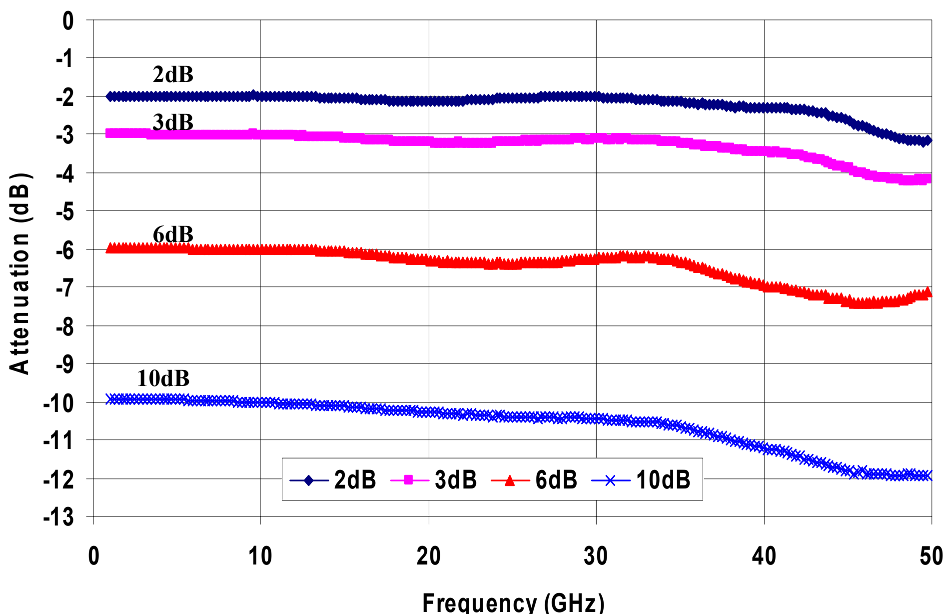
- Fixed 0, 2, 3, 6 and 10dB Attenators
- Broadband Response DC to > 40 GHz
- Excellent Return Loss > 15 dB
- Power Handling > 28 dBm
- On-Chip Grounding Vias
- 3MI Passive Part
- Low Price
- Small size: 0.5 x 0.5 x 0.1 mm
  (0.02 X 0.02 X 0.004 in)

Primary Applications

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

Typical Electrical Characteristics

Attenuators Probed in Fixtures



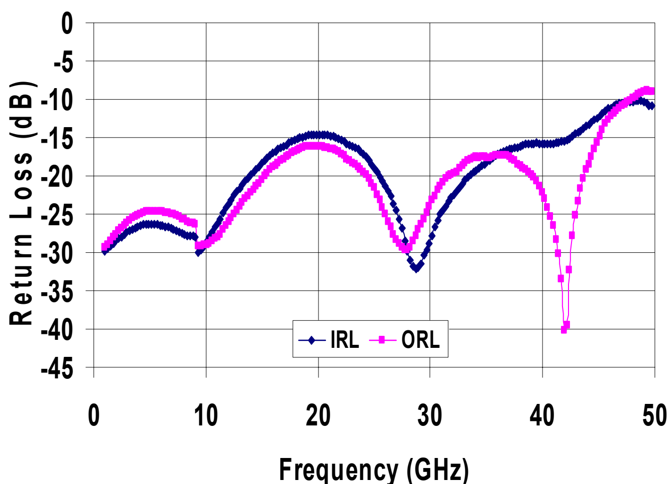
Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice

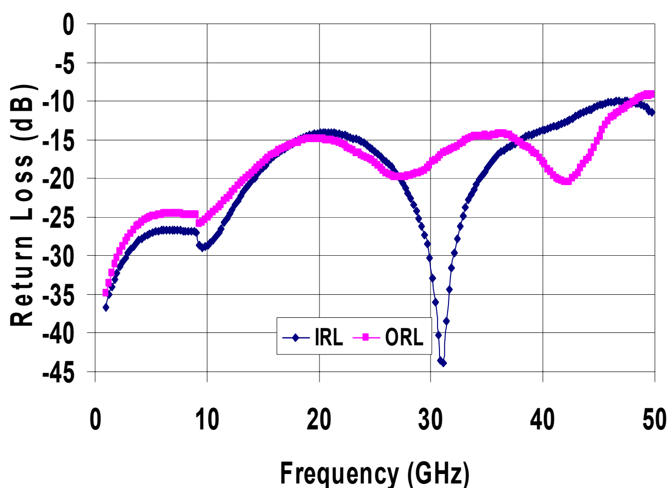
TABLE I
ELECTRICAL CHARACTERISTICS
(Ta = 25 ^{0}C Nominal)

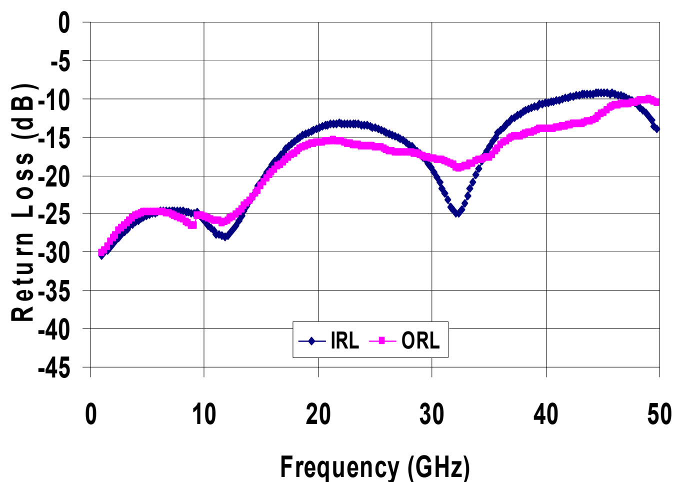
PARAMETER		TEST CONDITIONS	TYP	UNIT
	Attenuation	DC ~ 40 GHz	0dB for 0dB Attenuator 2dB for 2dB Attenuator 3dB for 3dB Attenuator 6dB for 6dB Attenuator 10dB for 10dB Attenuator	dB
IRL	Input Return Loss	DC ~ 40 GHz	15	dB
ORL	Output Return Loss	DC ~ 40 GHz	15	dB
	Maximum Power*	2 - 18 GHz	> 28	dBm

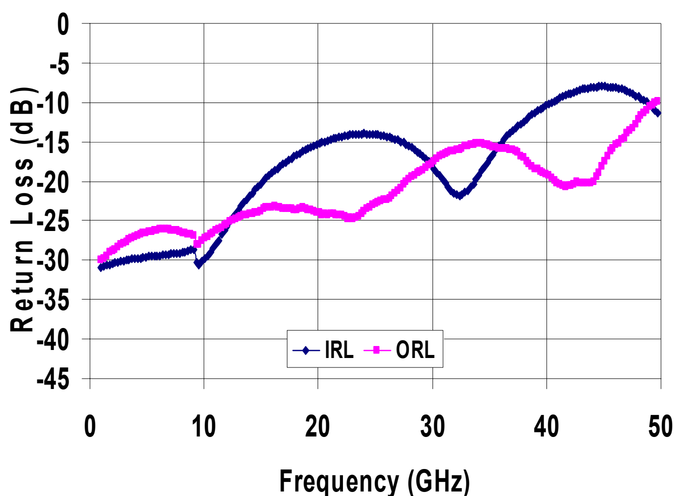
* This value is a result of burnout tests conducted on fixtured parts. Tests were performed with a fixed 50Ω input and output impedance, continuous wave input power. Failure criteria was a change of 0.5 dB attenuation.

Typical Measurement Attenuators
Attenuators Probed in Fixtures









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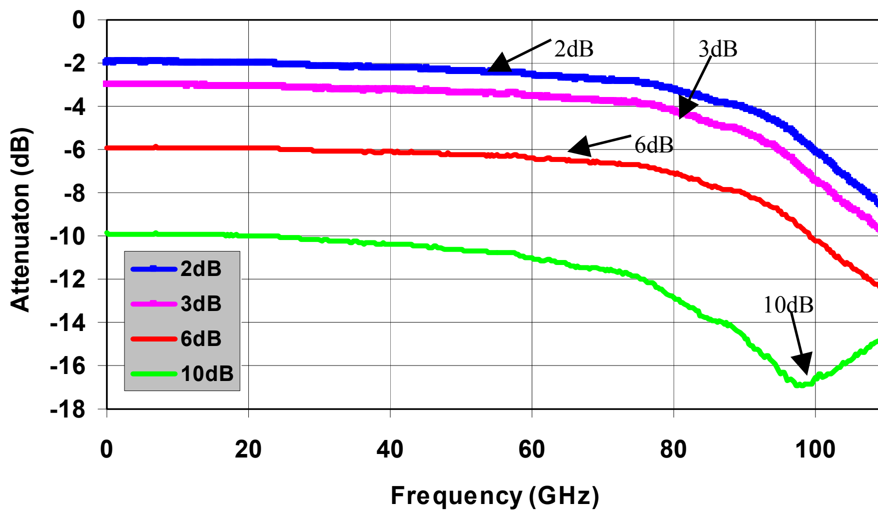
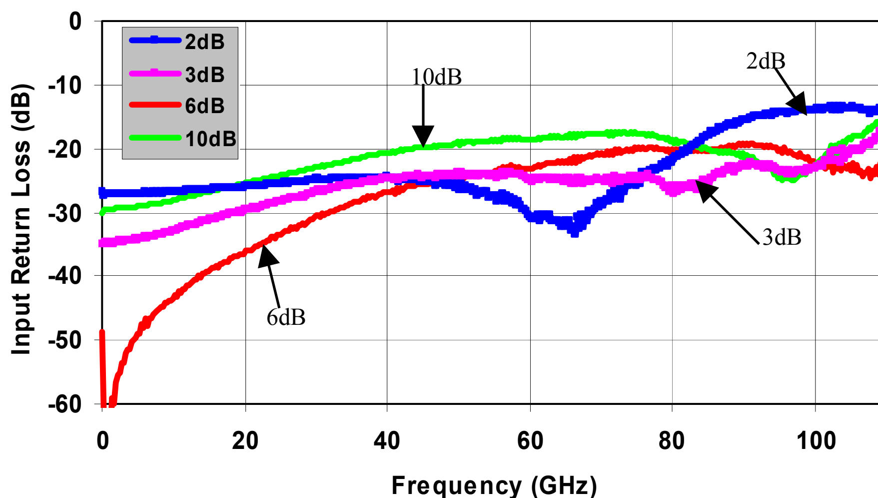
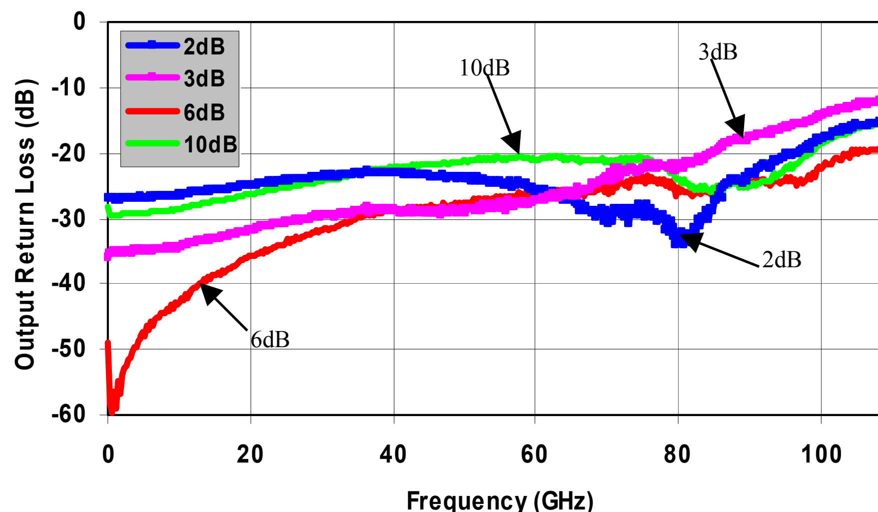
Typical Measurement Attenuators

No Bond Wire, Probed from 45 MHz to 110GHz







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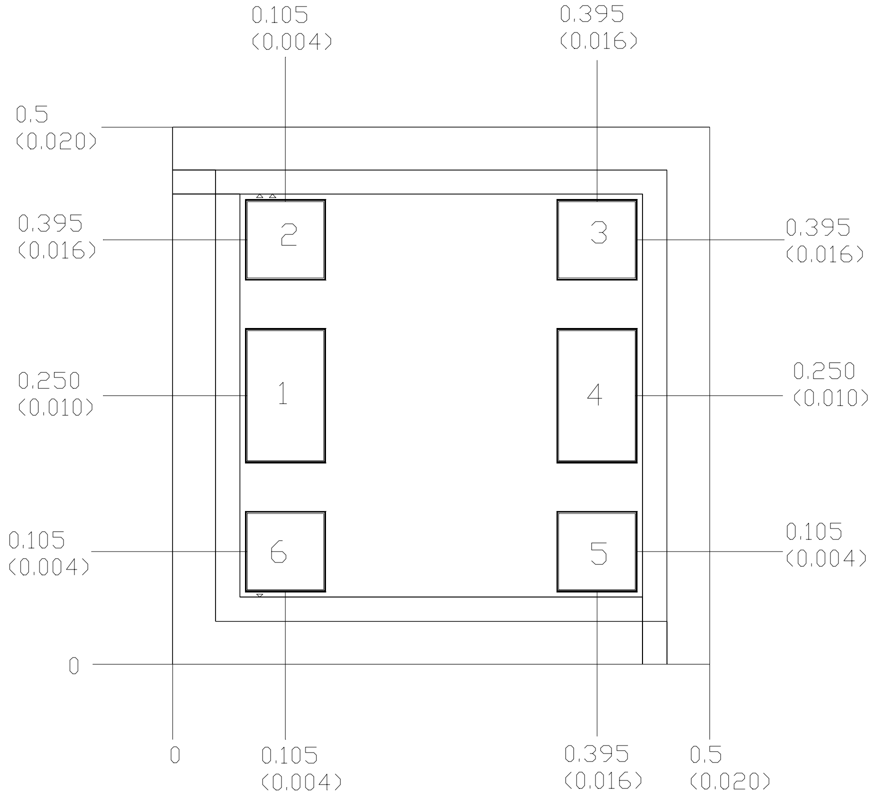
Mechanical Drawing



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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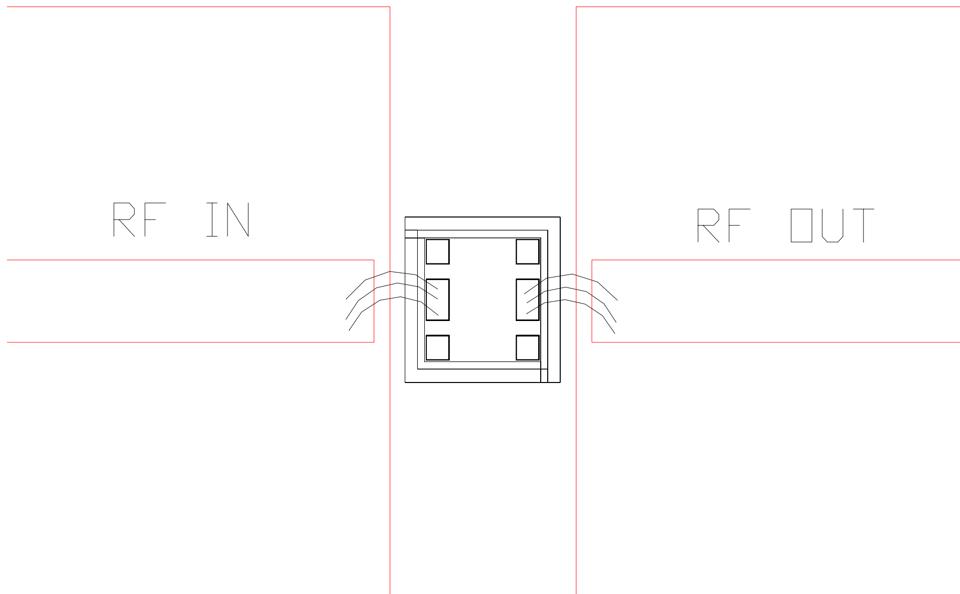
Chip Assembly Diagram



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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.

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Ordering Information

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

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