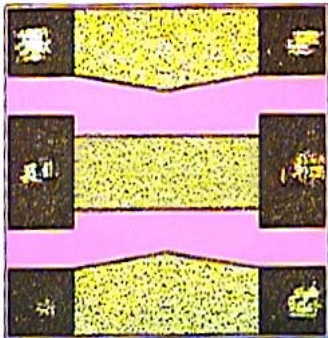
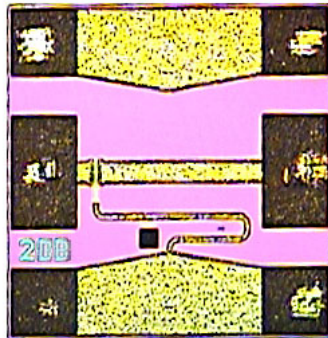


Wideband Fixed Attenuators

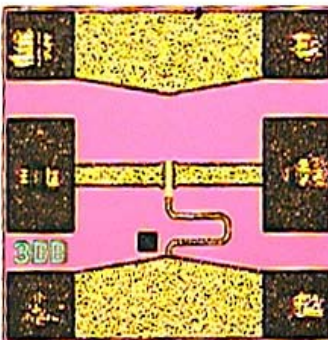
TGL4201-EPU



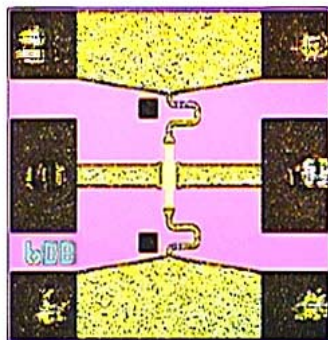
0 dB Attenuator



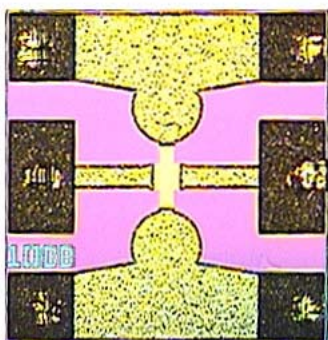
2 dB Attenuator



3 dB Attenuator



6 dB Attenuator



10 dB Attenuator

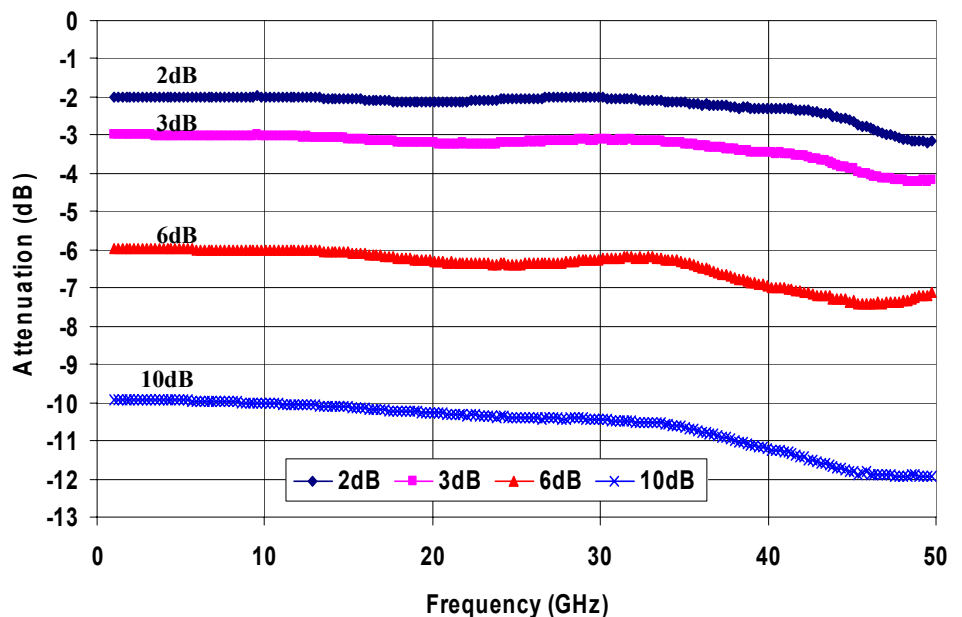
Key Features and Performance

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

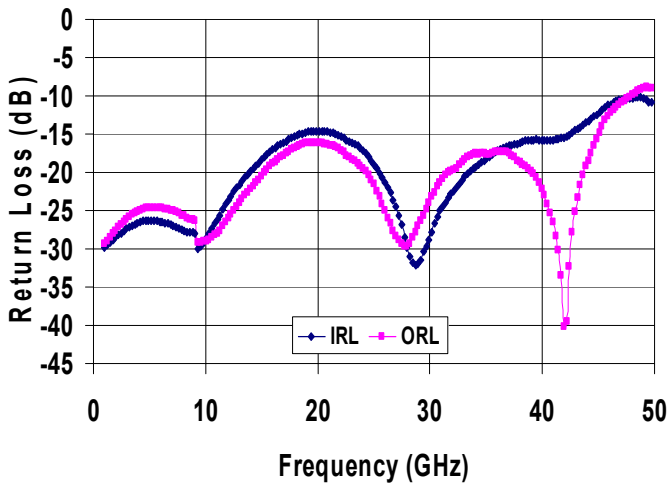
TABLE I
ELECTRICAL CHARACTERISTICS
(Ta = 25 °C Nominal)

| 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 |

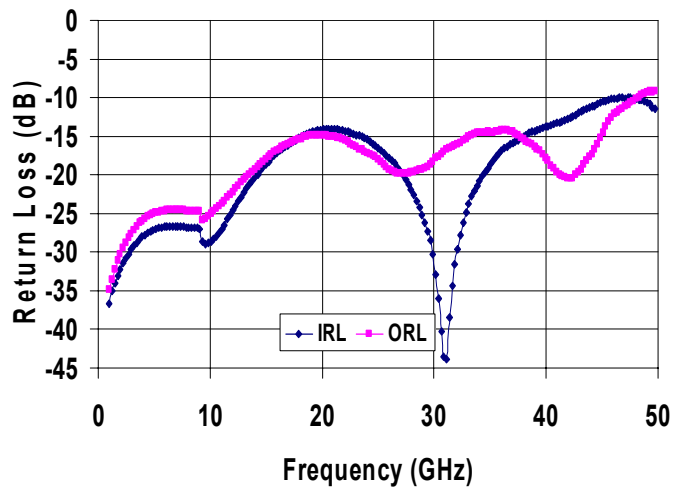
* This value is a result of burnout tests conducted on fixtured parts. Tests were performed with a fixed 50Ω input and output impedance, continuous wave input power. Failure criteria was a change of 0.5 dB attenuation.

Typical Measurement Attenuators
Attenuators Probed in Fixtures

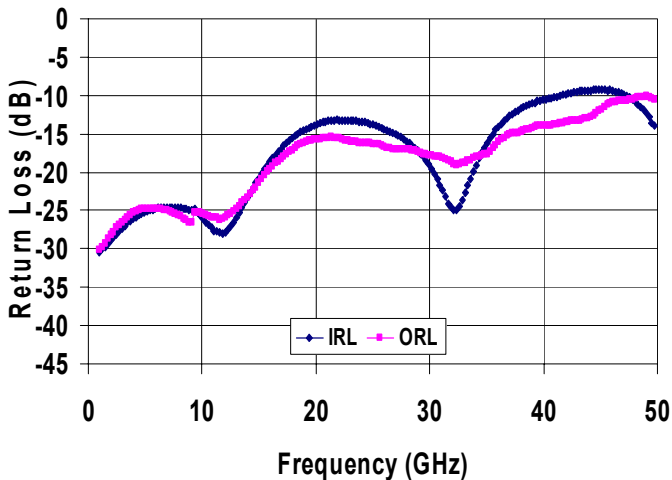
2 dB Attenuator



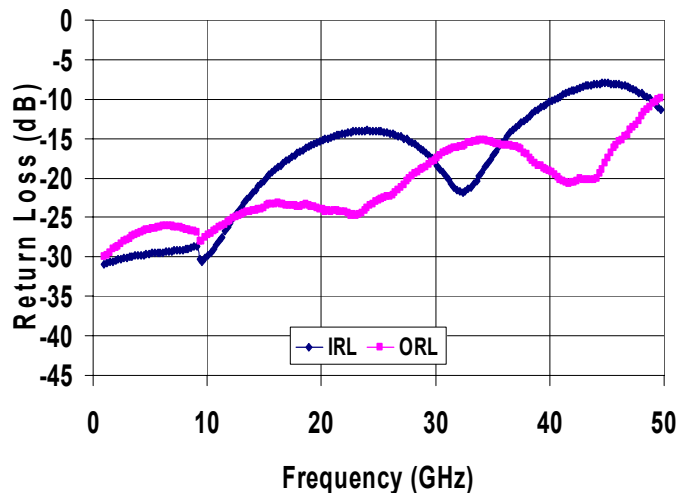
3 dB Attenuator



6 dB Attenuator

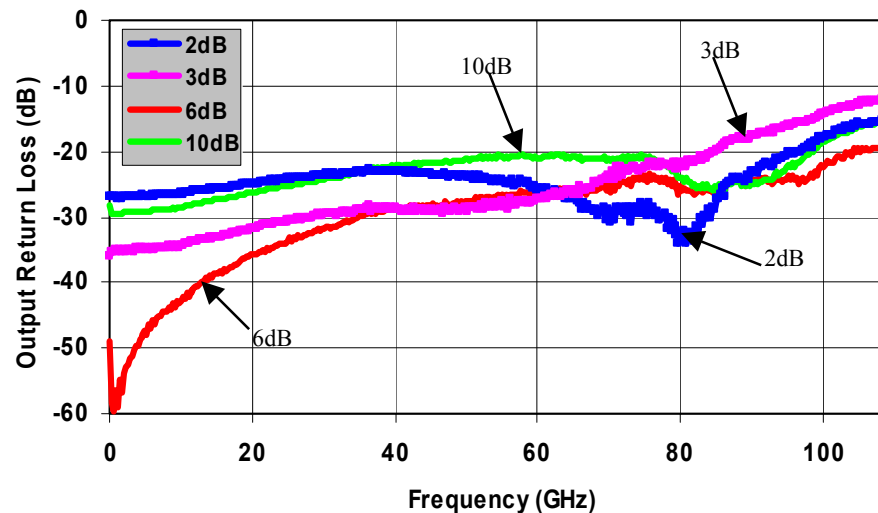
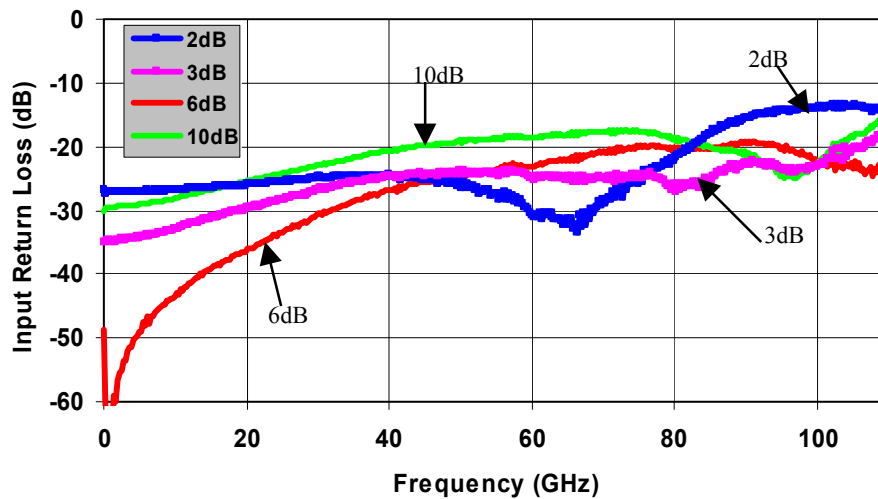
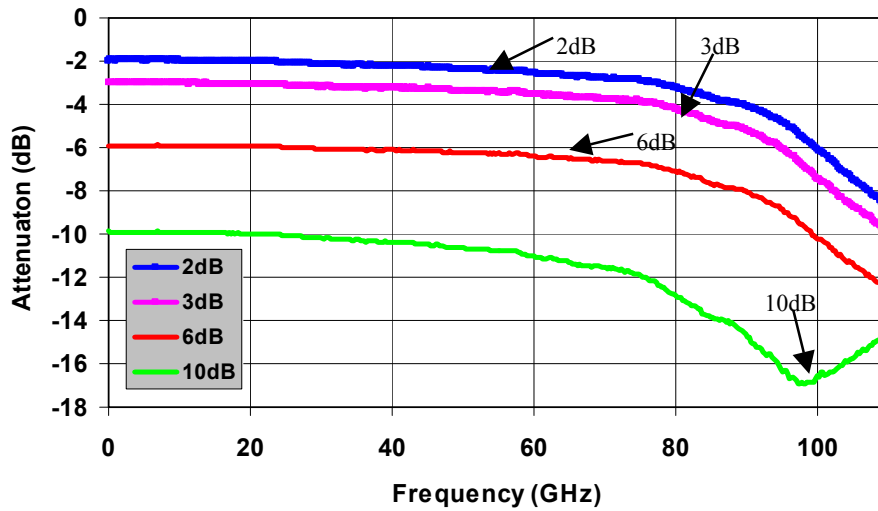


10 dB Attenuator



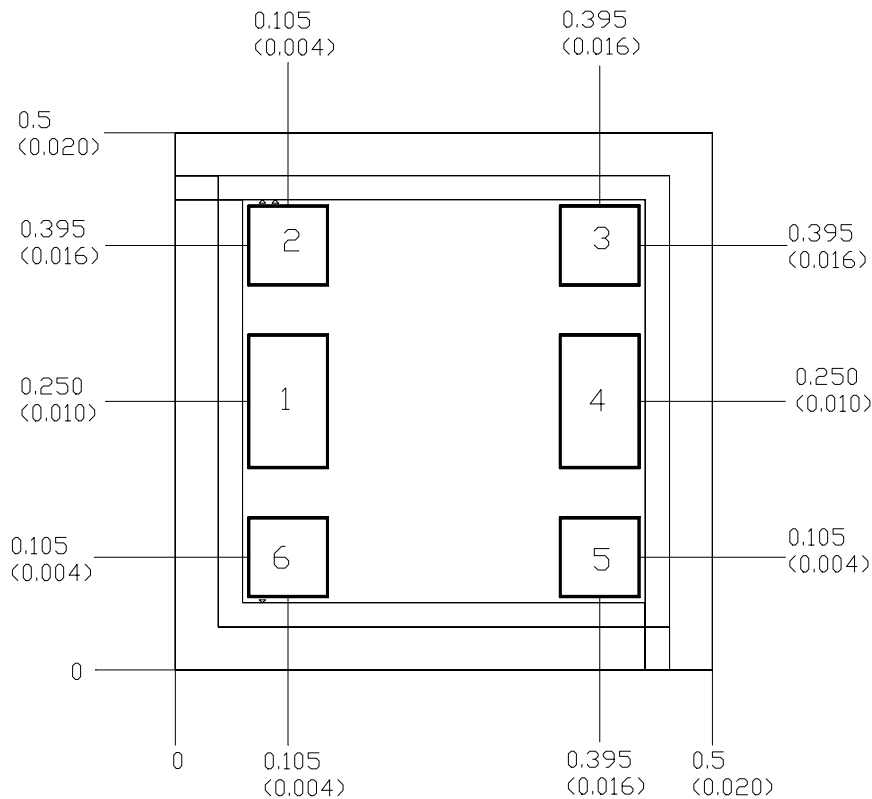
Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice

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



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

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)

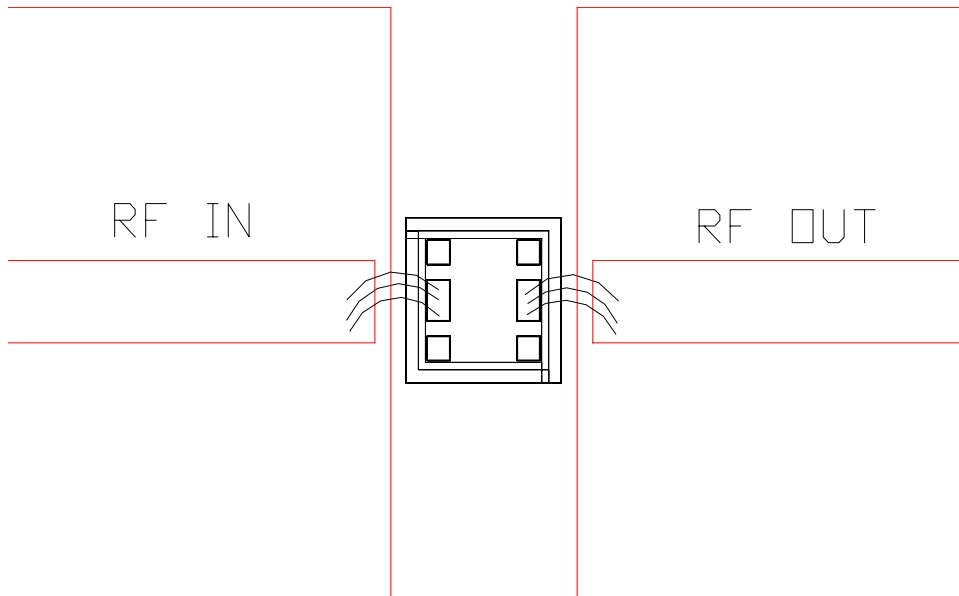
| | | | |
|--------------|----------|---------------|-----------------|
| Bond Pad #1: | (RF In) | 0.075 x 0.125 | (0.003 x 0.005) |
| Bond Pad #2: | (N/C)* | 0.075 x 0.075 | (0.003 x 0.003) |
| Bond Pad #3: | (N/C)* | 0.075 x 0.075 | (0.003 x 0.003) |
| Bond Pad #4: | (RF Out) | 0.075 x 0.125 | (0.003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

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

Chip Assembly Diagram



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

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

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-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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