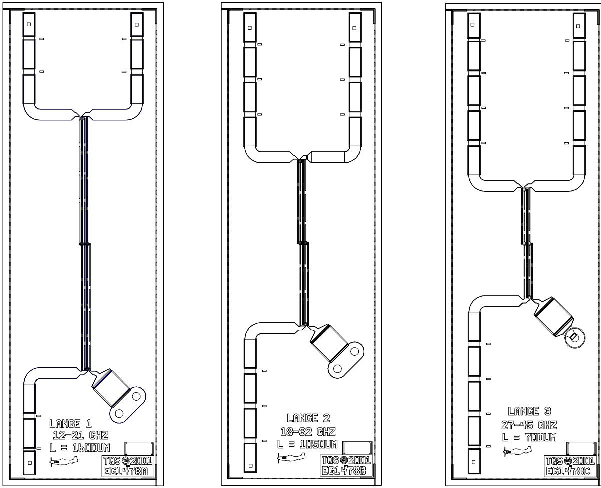
TriQuint SEMICONDUCTOR®

Advance Product Information
April 7, 2003

TGB2001-EPU
TGB4001-EPU
TGB4002-EPU

Lange Coupler Set



TGB2001	TGB4001	TGB4002
12-21GHz	18-32GHz	27-45GHz

Key Features and Performance

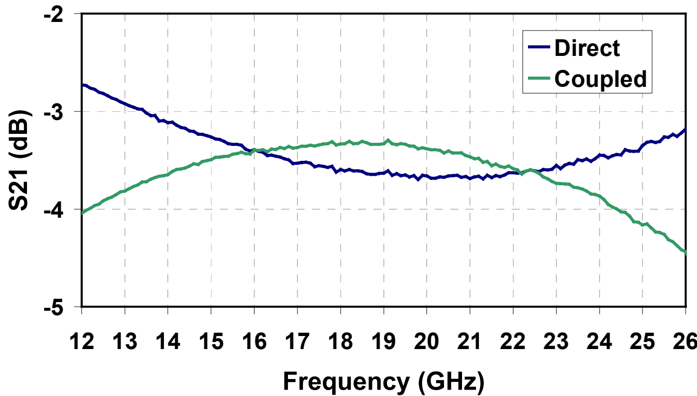
- Very Low Loss (<0.25dB Typical)
- High Power 1W 50Ω Termination
- Broadband 3dB Power Split
- Chip dimensions: 1.0 x 3.0 x 0.1 mm
  (40 x 120 x 4 mils)
- 3 sizes Cover 12GHz - 45GHz

Primary Applications

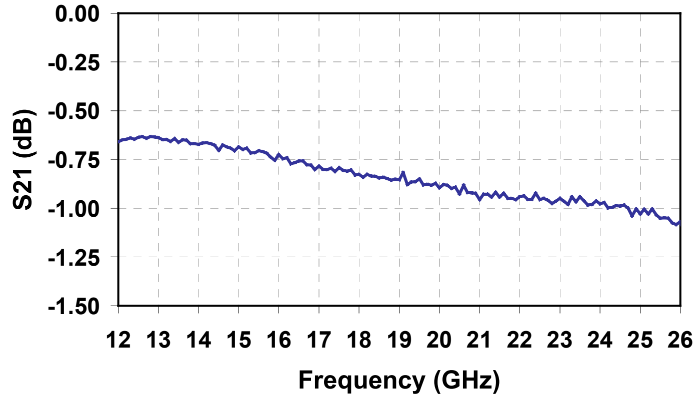
- Power Combining

Preliminary Measured Data

TGB2001



TGB2001 Back-to-Back



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
MAXIMUM RATINGS

Symbol	Parameter 1/	Value	Notes
P_{IN}	Input Continuous Wave Power	TBD dBm	
T_M	Mounting Temperature (30 Seconds)	320 ^{0}C	
T_{STG}	Storage Temperature	-65 to 150 ^{0}C	

1/ These ratings represent the maximum operable values for this device.

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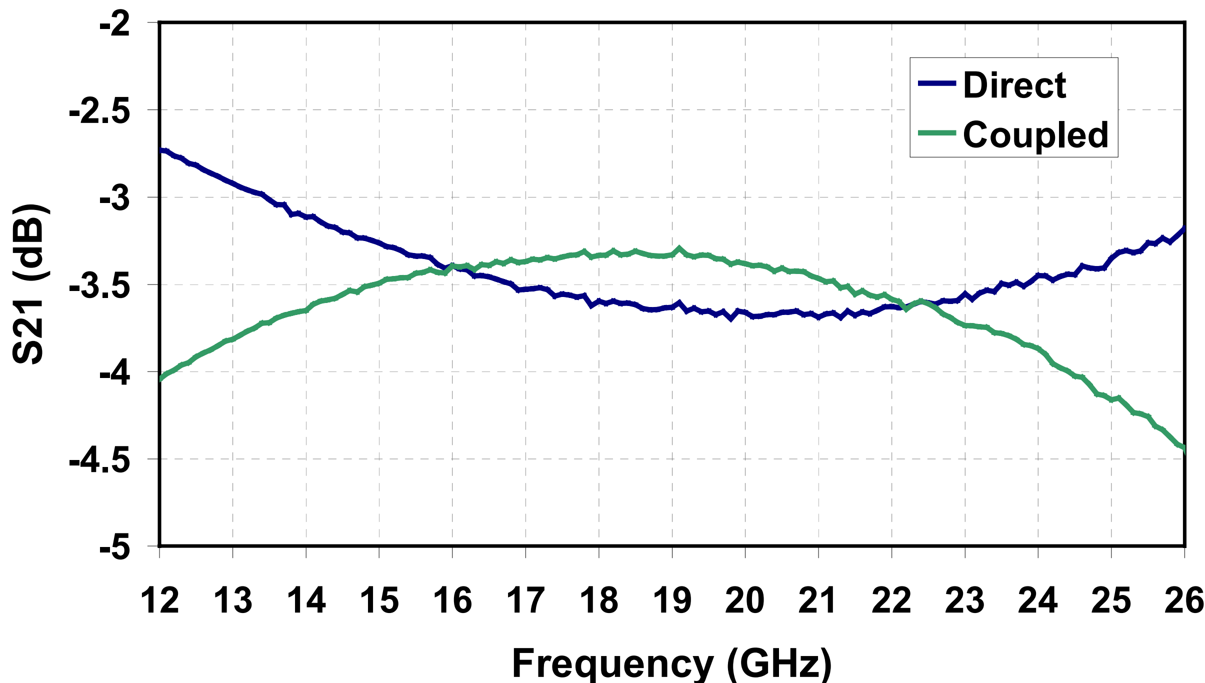
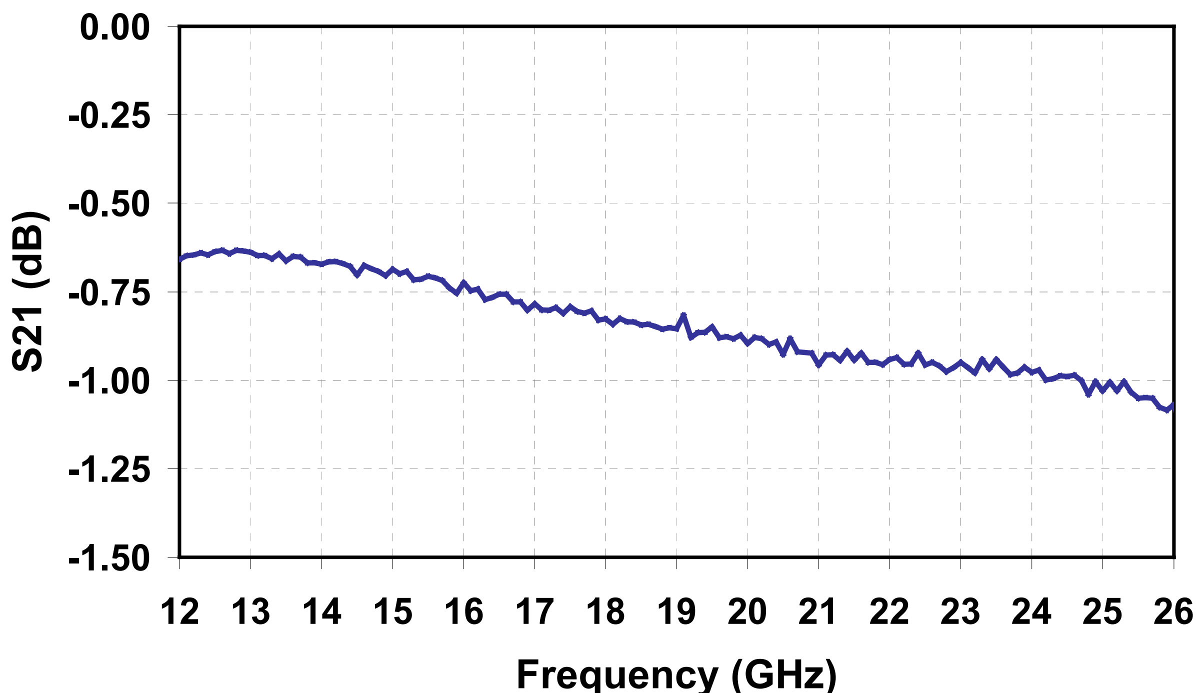
Typical Fixtured Performance

TGB2001



TGB2001 Back-to-Back



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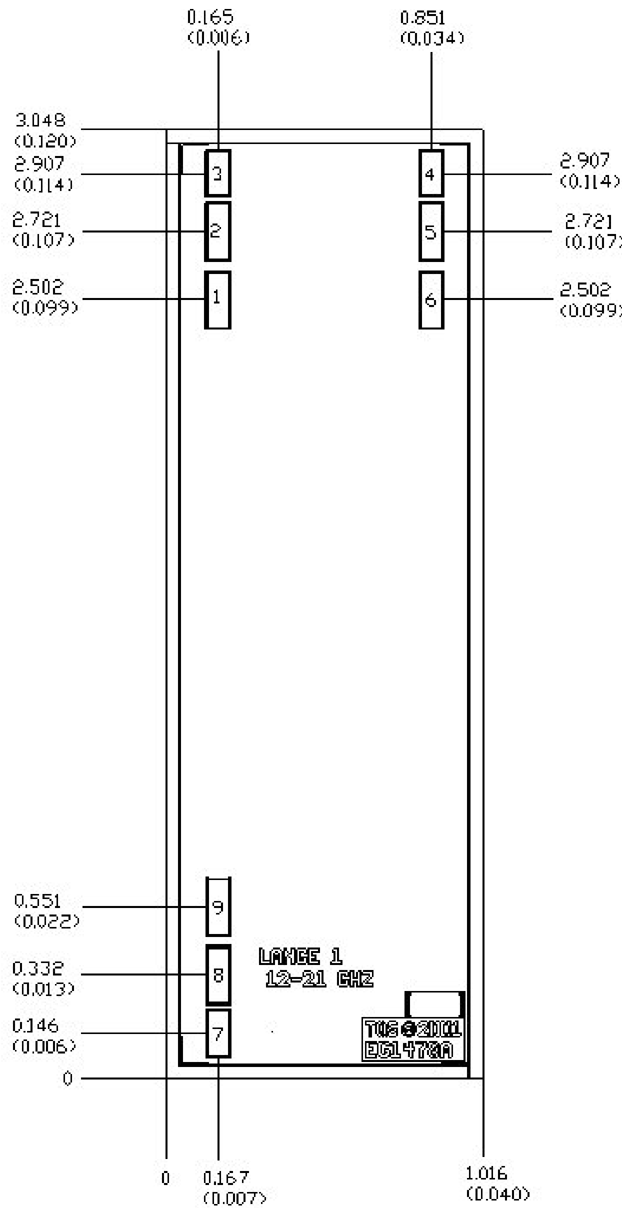
Mechanical Drawing TGB2001-EPU



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: (Port 1) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #2: (Port 1) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #3: (Port 1) 0.08 x 0.153 (0.003 x 0.006)
Bond pad #4: (Port 2) 0.08 x 0.153 (0.003 x 0.006)
Bond pad #5: (Port 2) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #6: (Port 2) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #7: (Port 3) 0.08 x 0.153 (0.003 x 0.006)
Bond pad #8: (Port 3) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #9: (Port 3) 0.08 x 0.188 (0.003 x 0.007)

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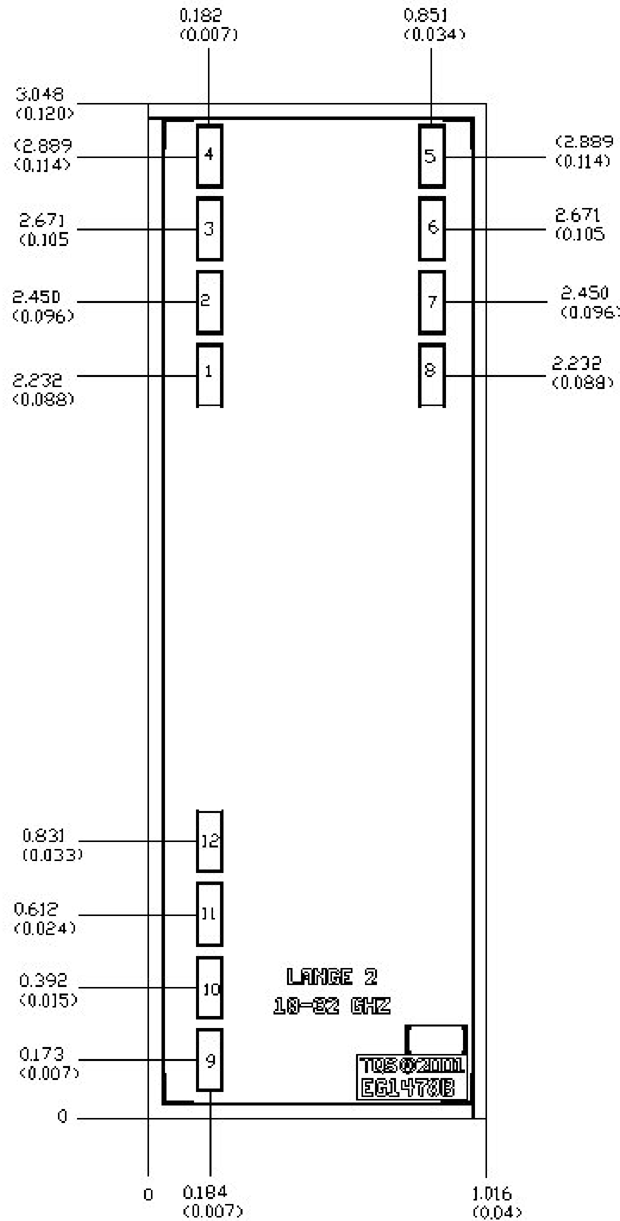
Mechanical Drawing
TGB4001-EPU



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: (Port 1) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #2: (Port 1) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #3: (Port 1) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #4: (Port 1) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #5: (Port 2) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #6: (Port 2) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #7: (Port 2) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #8: (Port 2) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #9: (Port 3) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #10: (Port 3) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #11: (Port 3) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #12: (Port 3) 0.08 x 0.188 (0.003 x 0.007)

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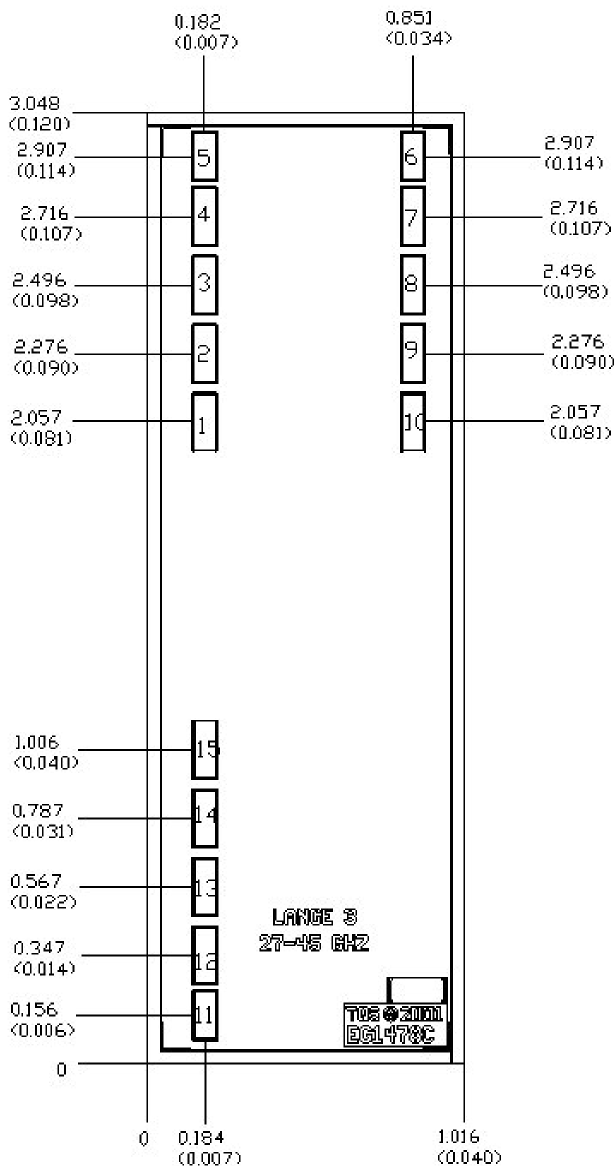
Mechanical Drawing
TGB4002-EPU



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: (Port 1) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #2: (Port 1) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #3: (Port 1) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #4: (Port 1) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #5: (Port 1) 0.08 x 0.163 (0.003 x 0.006)
Bond pad #6: (Part 2) 0.08 x 0.163 (0.003 x 0.006)
Bond pad #7: (Part 2) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #8: (Port 2) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #9: (Part 2) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #10: (Port 2) 0.08 x 0.188 (0.003 x 0.007)
Bond pad #11: (Port 3) 0.08 x 0.163 (0.003 x 0.006)
Bond pad #12: (Port 3) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #13: (Port 3) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #14: (Port 3) 0.08 x 0.190 (0.003 x 0.007)
Bond pad #15: (Port 3) 0.08 x 0.188 (0.003 x 0.007)

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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 maximum)
- 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.
- Air bridges must be avoided during placement.
- 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.
- Discrete FET devices with small pad sizes should be bonded with 0.0007-inch wire.
- 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.

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