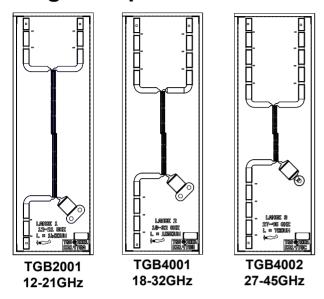
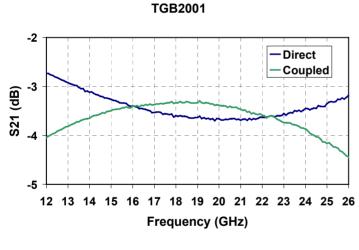


Lange Coupler Set



Preliminary Measured Data



Advance Product Information April 7, 2003

TGB2001-EPU TGB4001-EPU TGB4002-EPU

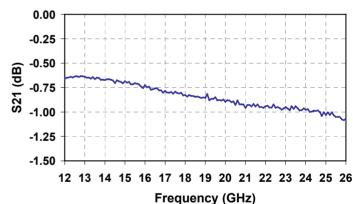
Key Features and Performance

- 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

TGB2001 Back-to-Back





Advance Product Information April 7, 2003

TGB2001-EPU TGB4001-EPU TGB4002-EPU

TABLE I MAXIMUM RATINGS

Symbol	Parameter <u>1</u> /	Value	Notes
P _{IN}	Input Continuous Wave Power	TBD dBm	
T _M	Mounting Temperature (30 Seconds)	320 °C	
T _{STG}	Storage Temperature	-65 to 150 ⁰ C	

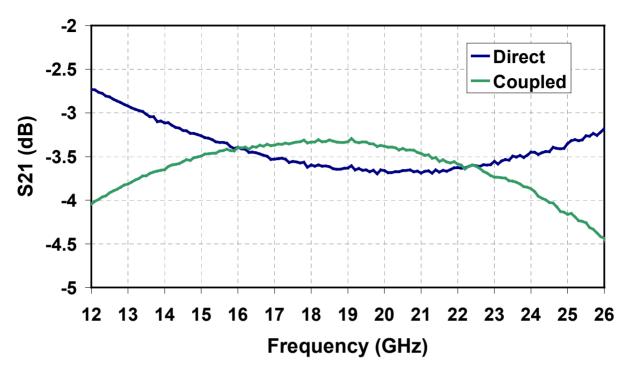
1/ These ratings represent the maximum operable values for this device.



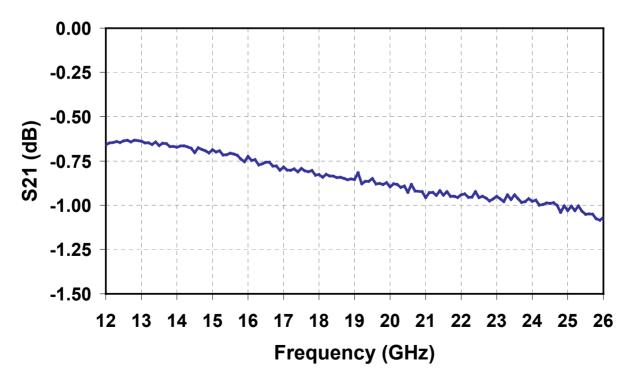


Typical Fixtured Performance TGB2001

TGB2001-EPU TGB4001-EPU TGB4002-EPU



TGB2001 Back-to-Back

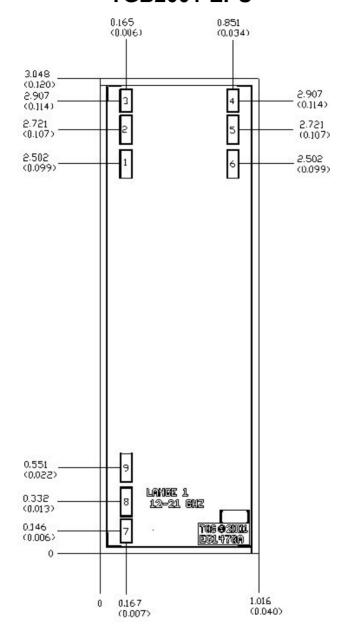






Mechanical Drawing TGB2001-EPU

TGB2001-EPU TGB4001-EPU TGB4002-EPU



Units: millimeters (inches) Thickness: 0,100 (0,004) Chip edge to bond pod dimensions ore shown to center of bond pad Chip size toleronce: +/- 0.051 (0.002) (Pont 1) 0.08 × 0.188 < 0.003 × Bond pad #1: Bond pad #2: (Port 1) $0.08 \times$ 0.190 (0.003 x 0.153 (0.003 0.153 (0.003 pod #3: (Port 1) $0.08 \times$ Bond Bond pad #4: (Port 2) $0.08 \times$ 0.006> #5: (Port 2) $0.08 \times$ 0.190 (0.003 Bond pad Bond pad #6: (Port 2) $0.08 \times$ 0.188 <0.003 × 0.007Bond pad #7: (Port 3) 0.08 × 0.153 (0.003 0.006> Bond pad #8: (Port 3) \times 80.0 $0.190~(0.003~\times$ 0.007)

0.08 × 0.188 (0.003 × 0.007)

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.

(Port 3)

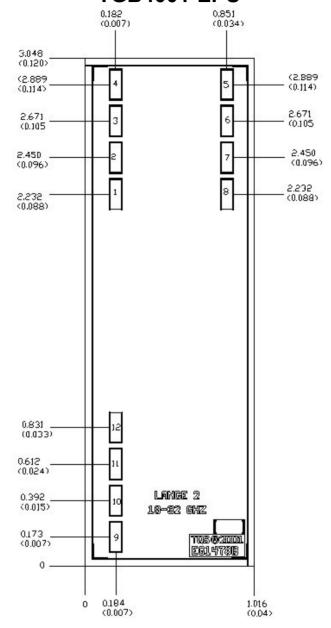
Bond pad #9:





Mechanical Drawing TGB4001-EPU

TGB2001-EPU TGB4001-EPU TGB4002-EPU



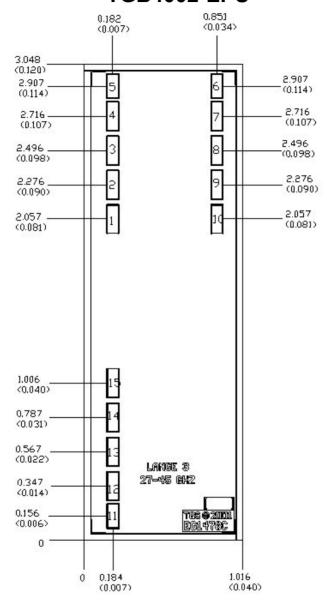
```
Units: millimeters (inches)
Thickness: 0.100 (0.004)
Thickness:
Chip edge to band pod dimensions are shown to center of band pod
Chip size talerance: +/- 0.051 (0.002)
Bond pad #1:
                  (Port 1)
                                0.09 \times 0.189
                                                <0.003 ×
                                                           0.007)
Bond pod #2:
                  (Port 1)
                                x 80.0
                                        0.190
                                                (D.003 x
                                                          0.007)
                                                (0.003 ×
                  (Port 1)
                                0.08 \times 0.190
                                                          0.0073
Bond pod
            #3
                                0.08 ×
                                        0.188
                                                <0.003
                                                           0.007)
                  (Port 1)
Bond pad
                                0.08
                                     ×
                                        0.189
                                                (0.003
            #5:
                  (Port 2)
Bond pad
                   (Port 2)
                                80.0
                                        0.190
                                                (0.003
                                                          0.007)
Bond pod
Bond pod #7:
                   (Port 2)
                                0.08
                                        0.190
                                                < 0.003
                                                          0.007)
                  (Port 2)
(Port 3)
(Port 3)
                                0.08
                                     × 0.189
                                                < 0.003
                                                          0.0070
Bond pad
            #8
                                80.0
                                        0.188
                                                (0.003
                                                           0.007)
Bond pad #9:
                                     ×
                                     × 0.190
Bond pod
            #10:
                                0.08
                                                (0.003
                                                          0.007)
Bond
      pod
            #11:
                   (Port
                          3)
                                        0.190
                                                (0,003
                   (Port
                          3)
                                0.08 \times 0.188
                                                (0.003
                                                          0.007)
```





Mechanical Drawing TGB4002-EPU

TGB2001-EPU TGB4001-EPU TGB4002-EPU



```
Units: millimeters (inches)
Thickness: 0.100 (0.004)
             to bond pod
                               dimensions are shown to center of bond pod
Chip edge
                                  0.05] (0.002)
0.08 × 0.186
0.08 × 0.190
Chip size tolerance:
Band pad
                   (Port 1)
                                                    (0.003 \times 0.007)
             #1:
                                                    (0.003
                                                               0.007)
Bond
      pod
                    (Port 1)
Bond
       pad #3:
                   (Part 1)
(Part 1)
                                  0.08 ×
                                          0.190
                                                   (0.003
                                                              0.0073
                                  × 80.0
                                                              0.007)
             #4:
Bond
       pool
                    (Part 1)
                                  0.08
                                          0.163
                                                    (0.003
                                                               (400.0
Bond
       pod
                   (Part 2)
(Part 2)
                                  0.08 ×
                                                    (0.003 ×
                                                               0.0065
Band
       pad
                                          0163
                                  0.08
                                          0.190
Bond
       pod
                   (Part 2)
(Part 2)
(Part 2)
(Port 3)
(Port 3)
(Port 3)
(Port 3)
       pad
                                  0.08
                                          0.190
                                                    (0.003
                                                              0.0073
                                  0.09
                                          0.190
                                                    (0.003)
                                                              0.0070
Band
      pad
                                  0.08
                                           0.188
                                                    (0.003
Bond
       bod
             #10
       pad
                                  0.08
                                           0.163
                                                    (0.003
                                                               0.006)
Bond
      pod #12:
                                  0.08
                                          0.190
0.190
                                                    (0.003)
                                                               0.0072
                                  0.08
                                                              0.007)
Bond
                                                    (0.003
                                 × 80.0
× 80.0
                                                   (0.003 × 0.007)
(0.003 × 0.007)
       pad
             #14:
                                           0.190
                    (Port 3)
Bond pod #15:
                                          0.188
```



Advance Product Information April 7, 2003

TGB2001-EPU TGB4001-EPU TGB4002-EPU

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.