



MMIC SURFACE MOUNT

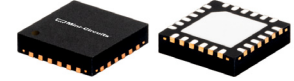
Power Splitter/Combiner

EP2K+

2 Way-0° 50Ω 5 to 20 GHz

THE BIG DEAL

- Ultra-Wide bandwidth, 5 to 20 GHz
- High Power Handling, 2.5W as a splitter
- Low cost splitter for 5G Application
- Excellent amplitude unbalance, 0.1 dB typ.
- Good phase unbalance, 2 to 5° typ.
- High ESD level
- Small size, 4x4 mm
- Aqueous washable
- DC passing



Generic photo used for illustration purposes only

CASE STYLE: DG1847

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

APPLICATIONS

- WIMAX
- ISM
- Instrumentation
- Radar
- WLAN
- Satellite communications
- LTE

PRODUCT OVERVIEW

Mini-Circuits' EP2K+ is a MMIC splitter/combiner designed for wideband operation from 5 to 20 GHz. This model provides excellent power ratings in a tiny device package (4x4x1 mm), with up to 2.5W power handling (as a splitter) and up to 1.2A DC current handling. Manufactured using GaAs IPD technology, it provides a high level of ESD protection and excellent reliability.

KEY FEATURES

| Feature | Advantages |
|---|---|
| Wideband, 5 to 20 GHz | One power splitter can be used in many applications, saving component count. Also ideal for wideband applications such as military and instrumentation. |
| Excellent power handling 2.5W as a splitter at 25°C 1.7W internal dissipation as a combiner at 25°C | In power combiner applications, half the power is dissipated internally. EP2K+ is designed to handle 1.7W internal dissipation as a combiner allowing reliable operation without excessive temperature rise. Similar splitters implemented as Wilkinson splitters on PCB require big resistors and additional heat sinking. As a splitter, EP2K+ can handle up to 2.5W in a very small package. |
| DC Passing up to 1.2A | DC current passing is helpful in applications where both RF & DC need to pass through the DUT, such as antenna mounted hardware. |
| Small size 4 x 4mm QFN package | Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB. |





ELECTRICAL SPECIFICATIONS¹ AT 25°C

| Parameter | Frequency (GHz) | Min. | Typ. | Max. | Unit |
|--|-----------------|------|------|------|--------|
| Frequency Range | | 5 | | 20 | GHz |
| Insertion Loss ² above 3.0 dB | 5 - 10 | — | 1.1 | 1.6 | dB |
| | 10 - 18 | — | 1.7 | 2.5 | |
| | 18 - 20 | — | 2.1 | 2.9 | |
| Isolation | 5 - 10 | 13 | 22 | — | dB |
| | 10 - 18 | 14 | 20 | — | |
| | 18 - 20 | 14 | 20 | — | |
| Phase Unbalance | 5 - 10 | — | 2.3 | 6.0 | Degree |
| | 10 - 18 | — | 3.7 | 8.0 | |
| | 18 - 20 | — | 4.2 | 9.0 | |
| Amplitude Unbalance | 5 - 10 | — | 0.1 | 0.3 | dB |
| | 10 - 18 | — | 0.1 | 0.5 | |
| | 18 - 20 | — | 0.1 | 0.5 | |
| VSWR (Port S) | 5 - 10 | — | 1.4 | — | :1 |
| | 10 - 18 | — | 1.4 | — | |
| | 18 - 20 | — | 1.5 | — | |
| VSWR (Port 1-2) | 5 - 10 | — | 1.3 | — | :1 |
| | 10 - 18 | — | 1.3 | — | |
| | 18 - 20 | — | 1.4 | — | |

1. Tested on Mini-Circuits Test Board TB-845-1+

2. Insertion Loss values are de-embedded from Test Board Loss; 0.5 dB at 5 GHz, 0.8 dB at 10 GHz, 1.3 dB at 18 GHz and 1.5 dB at 20 GHz

MAXIMUM RATINGS

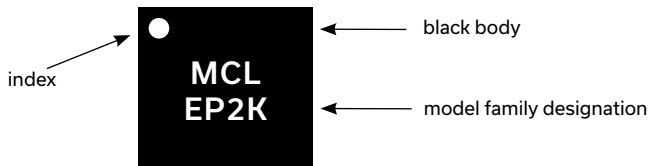
| Parameter | Ratings |
|-----------------------------|--|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -65°C to 150°C |
| Power Input (as a splitter) | 2.5W max. at 25°C. Derate linearly to 1.25W at 85°C |
| Internal Dissipation | 1.7W max. at 25°C. Derate linearly to 1.1W at 85°C |
| DC Current | 1.2A max. at 25°C. Derate linearly to 0.6A at 85°C |

Permanent damage may occur if any of these limits are exceeded.

PAD CONNECTIONS

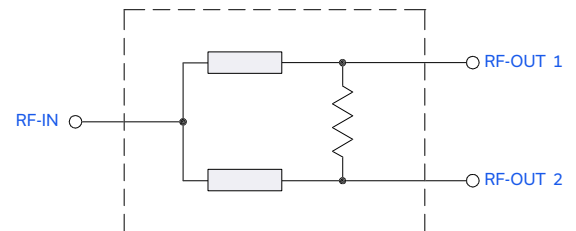
| Function | Pad Number |
|--------------------------------|-------------------------------------|
| SUM PORT | 3 |
| PORT 1 | 14 |
| PORT 2 | 17 |
| NOT USED, GROUND EXTERNALLY | 1, 2, 4-13, 15-16, 18-24, Paddle |

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

SIMPLIFIED ELECTRICAL SCHEMATIC





ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS [CLICK HERE](#)

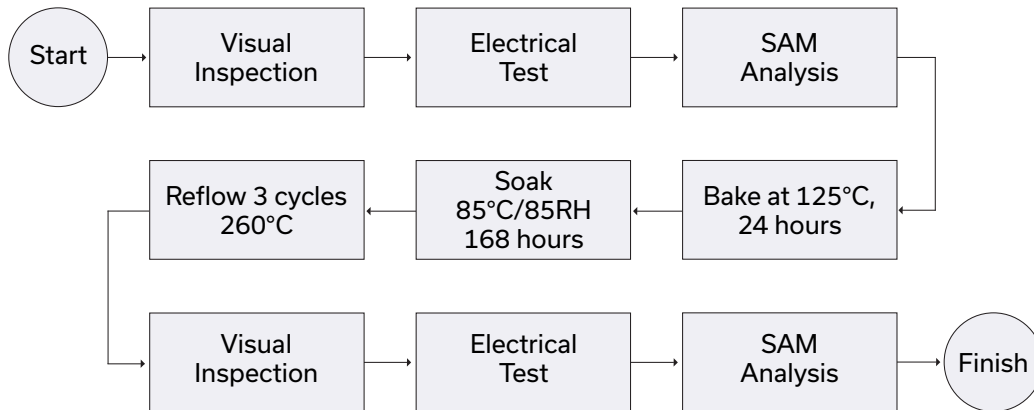
| | |
|--|---|
| Performance Data | Data Table Swept Graphs S-Parameter (S3P Files) Data Set (.zip file) |
| Case Style | DG1847 Plastic package, exposed paddle; lead finish: Matte Tin |
| Tape & Reel Standard quantities available on reel | F68 7" reels with 20, 50, 100, 200, 500, 1000 devices 13" reels with 2000, 3000, 4000 devices |
| Suggested Layout for PCB Design | PL-472 |
| Evaluation Board | TB-845-1+ |
| Environmental Ratings | ENV82 |

ESD RATING

Human Body Model (HBM): Class 2 (2000 to <4000 V) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M3 (200 to <400 V) in accordance with ANSI/ESD STM 5.2 - 1999

MSL TEST FLOW CHART



- NOTES**
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
 - B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
 - C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard. Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

2 Way-0° Power Splitter/Combiner

EP2K+

Typical Performance Data

TEST CONDITIONS: INPUT POWER = -8 dBm @Temperature = +25°C

| FREQUENCY (MHz) | TOTAL LOSS ¹ (dB) | | AMPLITUDE UNBALANCE (dB) | ISOLATION (dB) 1-2 | PHASE UNBALANCE (Deg) | FREQUENCY (MHz) | VSWR (:1) | | |
|--------------------|---------------------------------|------|--------------------------------|--------------------------|-----------------------------|--------------------|--------------|------|------|
| | S-1 | S-2 | | | | | S | 1 | 2 |
| 4000 | 3.55 | 3.64 | 0.09 | 15.17 | 0.26 | 4000 | 1.54 | 1.44 | 1.45 |
| 4200 | 3.53 | 3.63 | 0.10 | 15.72 | 0.26 | 4200 | 1.49 | 1.42 | 1.44 |
| 4400 | 3.49 | 3.60 | 0.11 | 16.30 | 0.23 | 4400 | 1.42 | 1.39 | 1.40 |
| 4600 | 3.46 | 3.56 | 0.10 | 16.92 | 0.19 | 4600 | 1.35 | 1.35 | 1.35 |
| 4800 | 3.43 | 3.52 | 0.10 | 17.60 | 0.21 | 4800 | 1.28 | 1.29 | 1.28 |
| 5000 | 3.41 | 3.50 | 0.10 | 18.34 | 0.24 | 5000 | 1.21 | 1.24 | 1.22 |
| 5200 | 3.40 | 3.49 | 0.10 | 19.11 | 0.28 | 5200 | 1.16 | 1.18 | 1.17 |
| 5400 | 3.40 | 3.50 | 0.10 | 19.92 | 0.31 | 5400 | 1.13 | 1.12 | 1.12 |
| 5600 | 3.41 | 3.51 | 0.10 | 20.74 | 0.34 | 5600 | 1.13 | 1.06 | 1.06 |
| 5800 | 3.43 | 3.53 | 0.10 | 21.51 | 0.37 | 5800 | 1.14 | 1.01 | 1.01 |
| 6000 | 3.44 | 3.55 | 0.11 | 22.27 | 0.40 | 6000 | 1.17 | 1.04 | 1.05 |
| 6200 | 3.46 | 3.57 | 0.11 | 22.93 | 0.41 | 6200 | 1.20 | 1.08 | 1.09 |
| 6400 | 3.48 | 3.59 | 0.12 | 23.39 | 0.41 | 6400 | 1.22 | 1.12 | 1.12 |
| 6600 | 3.49 | 3.61 | 0.12 | 23.71 | 0.39 | 6600 | 1.23 | 1.16 | 1.14 |
| 6800 | 3.51 | 3.63 | 0.12 | 23.86 | 0.41 | 6800 | 1.25 | 1.18 | 1.16 |
| 7000 | 3.53 | 3.65 | 0.12 | 23.93 | 0.41 | 7000 | 1.27 | 1.18 | 1.17 |
| 7500 | 3.57 | 3.69 | 0.12 | 23.83 | 0.41 | 7500 | 1.31 | 1.18 | 1.13 |
| 8000 | 3.65 | 3.76 | 0.11 | 22.98 | 0.52 | 8000 | 1.41 | 1.24 | 1.20 |
| 8500 | 3.75 | 3.87 | 0.12 | 22.22 | 0.65 | 8500 | 1.55 | 1.39 | 1.37 |
| 9000 | 3.81 | 3.95 | 0.14 | 21.39 | 0.67 | 9000 | 1.61 | 1.51 | 1.50 |
| 9500 | 3.81 | 3.96 | 0.15 | 20.51 | 0.70 | 9500 | 1.54 | 1.50 | 1.51 |
| 10000 | 3.71 | 3.89 | 0.18 | 19.84 | 0.63 | 10000 | 1.33 | 1.36 | 1.40 |
| 10500 | 3.65 | 3.83 | 0.18 | 19.51 | 0.52 | 10500 | 1.11 | 1.20 | 1.24 |
| 11000 | 3.71 | 3.86 | 0.15 | 19.69 | 0.51 | 11000 | 1.18 | 1.09 | 1.11 |
| 11500 | 3.75 | 3.91 | 0.15 | 20.47 | 0.74 | 11500 | 1.24 | 1.04 | 1.05 |
| 12000 | 3.75 | 3.92 | 0.18 | 21.48 | 0.86 | 12000 | 1.18 | 1.04 | 1.04 |
| 12500 | 3.77 | 3.97 | 0.20 | 21.89 | 0.87 | 12500 | 1.21 | 1.10 | 1.08 |
| 13000 | 3.89 | 4.10 | 0.20 | 21.53 | 0.86 | 13000 | 1.38 | 1.21 | 1.15 |
| 13500 | 4.09 | 4.30 | 0.21 | 20.78 | 0.91 | 13500 | 1.59 | 1.39 | 1.31 |
| 14000 | 4.28 | 4.49 | 0.21 | 20.04 | 0.92 | 14000 | 1.74 | 1.55 | 1.49 |
| 14500 | 4.33 | 4.55 | 0.22 | 19.56 | 1.01 | 14500 | 1.79 | 1.60 | 1.55 |
| 15000 | 4.29 | 4.50 | 0.21 | 19.44 | 1.03 | 15000 | 1.73 | 1.53 | 1.46 |
| 15500 | 4.22 | 4.44 | 0.23 | 19.44 | 1.16 | 15500 | 1.59 | 1.42 | 1.40 |
| 16000 | 4.11 | 4.38 | 0.26 | 19.38 | 1.20 | 16000 | 1.40 | 1.33 | 1.37 |
| 16500 | 4.08 | 4.36 | 0.28 | 19.19 | 0.95 | 16500 | 1.29 | 1.29 | 1.27 |
| 17000 | 4.16 | 4.40 | 0.23 | 18.68 | 0.99 | 17000 | 1.28 | 1.26 | 1.16 |
| 17500 | 4.19 | 4.42 | 0.23 | 18.35 | 1.43 | 17500 | 1.21 | 1.22 | 1.15 |
| 18000 | 4.18 | 4.47 | 0.29 | 18.48 | 1.69 | 18000 | 1.06 | 1.25 | 1.23 |
| 18500 | 4.33 | 4.67 | 0.33 | 19.23 | 1.62 | 18500 | 1.33 | 1.39 | 1.38 |
| 19000 | 4.52 | 4.86 | 0.34 | 20.41 | 1.49 | 19000 | 1.54 | 1.45 | 1.46 |
| 19500 | 4.53 | 4.86 | 0.33 | 21.27 | 1.31 | 19500 | 1.54 | 1.36 | 1.40 |
| 20000 | 4.49 | 4.80 | 0.31 | 21.39 | 1.31 | 20000 | 1.42 | 1.23 | 1.26 |
| 20500 | 4.47 | 4.78 | 0.31 | 20.82 | 1.29 | 20500 | 1.36 | 1.15 | 1.10 |
| 21000 | 4.52 | 4.84 | 0.33 | 20.33 | 1.34 | 21000 | 1.43 | 1.23 | 1.14 |
| 21500 | 4.57 | 4.90 | 0.33 | 20.13 | 1.25 | 21500 | 1.54 | 1.36 | 1.30 |
| 22000 | 4.58 | 4.93 | 0.35 | 20.09 | 1.19 | 22000 | 1.56 | 1.42 | 1.35 |

¹Total Loss = Insertion Loss + 3dB Splitter Loss



2 Way-0° Power Splitter/Combiner

EP2K+

Typical Performance Data

TEST CONDITIONS: INPUT POWER = -8 dBm @ Temperature = -45°C

| FREQUENCY (MHz) | TOTAL LOSS ¹ (dB) | | AMPLITUDE UNBALANCE (dB) | ISOLATION (dB) 1-2 | PHASE UNBALANCE (Deg) | FREQUENCY (MHz) | VSWR (:1) | | |
|--------------------|---------------------------------|------|--------------------------------|--------------------------|-----------------------------|--------------------|--------------|------|------|
| | S-1 | S-2 | | | | | S | 1 | 2 |
| 4000 | 3.41 | 3.49 | 0.08 | 15.06 | 0.20 | 4000 | 1.55 | 1.45 | 1.46 |
| 4200 | 3.39 | 3.48 | 0.09 | 15.57 | 0.21 | 4200 | 1.51 | 1.43 | 1.45 |
| 4400 | 3.36 | 3.45 | 0.09 | 16.09 | 0.24 | 4400 | 1.46 | 1.41 | 1.42 |
| 4600 | 3.33 | 3.41 | 0.09 | 16.66 | 0.19 | 4600 | 1.40 | 1.37 | 1.38 |
| 4800 | 3.29 | 3.37 | 0.09 | 17.30 | 0.23 | 4800 | 1.32 | 1.33 | 1.32 |
| 5000 | 3.26 | 3.34 | 0.09 | 17.94 | 0.23 | 5000 | 1.25 | 1.27 | 1.27 |
| 5200 | 3.23 | 3.32 | 0.08 | 18.65 | 0.21 | 5200 | 1.17 | 1.21 | 1.20 |
| 5400 | 3.22 | 3.31 | 0.08 | 19.44 | 0.25 | 5400 | 1.12 | 1.15 | 1.14 |
| 5600 | 3.23 | 3.31 | 0.08 | 20.27 | 0.27 | 5600 | 1.12 | 1.09 | 1.08 |
| 5800 | 3.24 | 3.32 | 0.08 | 21.07 | 0.33 | 5800 | 1.15 | 1.03 | 1.02 |
| 6000 | 3.25 | 3.34 | 0.08 | 21.98 | 0.38 | 6000 | 1.17 | 1.04 | 1.05 |
| 6200 | 3.27 | 3.35 | 0.09 | 22.83 | 0.42 | 6200 | 1.20 | 1.09 | 1.10 |
| 6400 | 3.27 | 3.37 | 0.10 | 23.47 | 0.40 | 6400 | 1.21 | 1.14 | 1.13 |
| 6600 | 3.28 | 3.38 | 0.10 | 23.97 | 0.37 | 6600 | 1.23 | 1.18 | 1.15 |
| 6800 | 3.29 | 3.38 | 0.10 | 24.37 | 0.39 | 6800 | 1.24 | 1.20 | 1.17 |
| 7000 | 3.29 | 3.39 | 0.10 | 24.62 | 0.38 | 7000 | 1.26 | 1.21 | 1.18 |
| 7500 | 3.31 | 3.41 | 0.10 | 24.23 | 0.43 | 7500 | 1.29 | 1.17 | 1.14 |
| 8000 | 3.39 | 3.48 | 0.09 | 22.63 | 0.50 | 8000 | 1.43 | 1.24 | 1.18 |
| 8500 | 3.54 | 3.63 | 0.09 | 21.28 | 0.74 | 8500 | 1.69 | 1.47 | 1.46 |
| 9000 | 3.60 | 3.73 | 0.13 | 20.27 | 0.82 | 9000 | 1.76 | 1.59 | 1.63 |
| 9500 | 3.50 | 3.64 | 0.14 | 19.59 | 0.69 | 9500 | 1.56 | 1.53 | 1.55 |
| 10000 | 3.36 | 3.50 | 0.14 | 19.37 | 0.68 | 10000 | 1.28 | 1.36 | 1.37 |
| 10500 | 3.31 | 3.45 | 0.14 | 19.63 | 0.75 | 10500 | 1.10 | 1.20 | 1.23 |
| 11000 | 3.33 | 3.47 | 0.14 | 20.20 | 0.60 | 11000 | 1.12 | 1.12 | 1.14 |
| 11500 | 3.36 | 3.47 | 0.11 | 20.68 | 0.73 | 11500 | 1.18 | 1.09 | 1.05 |
| 12000 | 3.38 | 3.51 | 0.12 | 20.53 | 1.02 | 12000 | 1.22 | 1.06 | 1.02 |
| 12500 | 3.42 | 3.58 | 0.16 | 19.87 | 1.11 | 12500 | 1.34 | 1.09 | 1.02 |
| 13000 | 3.50 | 3.69 | 0.19 | 19.59 | 1.08 | 13000 | 1.46 | 1.16 | 1.08 |
| 13500 | 3.62 | 3.81 | 0.19 | 19.89 | 1.07 | 13500 | 1.55 | 1.31 | 1.29 |
| 14000 | 3.75 | 3.94 | 0.19 | 20.59 | 1.08 | 14000 | 1.63 | 1.53 | 1.51 |
| 14500 | 3.86 | 4.06 | 0.20 | 21.17 | 1.21 | 14500 | 1.78 | 1.71 | 1.69 |
| 15000 | 3.92 | 4.13 | 0.21 | 20.59 | 1.38 | 15000 | 1.91 | 1.75 | 1.73 |
| 15500 | 3.79 | 4.01 | 0.22 | 19.01 | 1.40 | 15500 | 1.72 | 1.56 | 1.53 |
| 16000 | 3.67 | 3.88 | 0.21 | 17.68 | 1.47 | 16000 | 1.49 | 1.33 | 1.29 |
| 16500 | 3.73 | 3.93 | 0.20 | 17.20 | 1.68 | 16500 | 1.53 | 1.30 | 1.27 |
| 17000 | 3.69 | 3.91 | 0.22 | 17.44 | 1.92 | 17000 | 1.36 | 1.26 | 1.25 |
| 17500 | 3.61 | 3.83 | 0.22 | 18.36 | 1.98 | 17500 | 1.10 | 1.26 | 1.24 |
| 18000 | 3.66 | 3.88 | 0.22 | 19.44 | 2.18 | 18000 | 1.04 | 1.26 | 1.21 |
| 18500 | 3.70 | 3.95 | 0.24 | 19.69 | 2.53 | 18500 | 1.14 | 1.21 | 1.15 |
| 19000 | 3.76 | 4.08 | 0.32 | 18.91 | 2.79 | 19000 | 1.32 | 1.20 | 1.27 |
| 19500 | 3.96 | 4.32 | 0.36 | 18.02 | 2.43 | 19500 | 1.66 | 1.41 | 1.52 |
| 20000 | 4.33 | 4.69 | 0.35 | 17.97 | 2.31 | 20000 | 2.14 | 1.67 | 1.82 |
| 20500 | 4.35 | 4.66 | 0.31 | 18.54 | 2.24 | 20500 | 2.07 | 1.63 | 1.65 |
| 21000 | 3.88 | 4.23 | 0.35 | 20.66 | 2.87 | 21000 | 1.36 | 1.19 | 1.28 |
| 21500 | 3.73 | 4.13 | 0.40 | 25.48 | 2.78 | 21500 | 1.06 | 1.06 | 1.25 |
| 22000 | 3.76 | 4.16 | 0.39 | 22.73 | 2.31 | 22000 | 1.23 | 1.25 | 1.15 |

¹Total Loss = Insertion Loss + 3dB Splitter Loss



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IF/RF MICROWAVE COMPONENTS

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2 Way-0° Power Splitter/Combiner

EP2K+

Typical Performance Data

TEST CONDITIONS: INPUT POWER = -8 dBm @Temperature = +85°C

| FREQUENCY (MHz) | TOTAL LOSS ¹ (dB) | | AMPLITUDE UNBALANCE (dB) | ISOLATION (dB) 1-2 | PHASE UNBALANCE (Deg) | FREQUENCY (MHz) | VSWR (:1) | | |
|--------------------|---------------------------------|------|--------------------------------|--------------------------|-----------------------------|--------------------|--------------|------|------|
| | S-1 | S-2 | | | | | S | 1 | 2 |
| 4000 | 3.59 | 3.68 | 0.10 | 15.18 | 0.01 | 4000 | 1.52 | 1.43 | 1.44 |
| 4200 | 3.56 | 3.67 | 0.11 | 15.77 | 0.02 | 4200 | 1.47 | 1.41 | 1.43 |
| 4400 | 3.52 | 3.64 | 0.12 | 16.38 | 0.09 | 4400 | 1.40 | 1.38 | 1.39 |
| 4600 | 3.49 | 3.60 | 0.11 | 17.06 | 0.18 | 4600 | 1.32 | 1.33 | 1.33 |
| 4800 | 3.46 | 3.57 | 0.11 | 17.79 | 0.19 | 4800 | 1.24 | 1.27 | 1.26 |
| 5000 | 3.45 | 3.56 | 0.10 | 18.60 | 0.17 | 5000 | 1.18 | 1.22 | 1.20 |
| 5200 | 3.46 | 3.56 | 0.10 | 19.44 | 0.14 | 5200 | 1.14 | 1.16 | 1.14 |
| 5400 | 3.47 | 3.57 | 0.10 | 20.28 | 0.11 | 5400 | 1.12 | 1.10 | 1.09 |
| 5600 | 3.48 | 3.59 | 0.11 | 21.12 | 0.09 | 5600 | 1.13 | 1.05 | 1.05 |
| 5800 | 3.50 | 3.62 | 0.11 | 21.86 | 0.08 | 5800 | 1.15 | 1.03 | 1.03 |
| 6000 | 3.53 | 3.64 | 0.12 | 22.51 | 0.08 | 6000 | 1.18 | 1.06 | 1.06 |
| 6200 | 3.55 | 3.67 | 0.12 | 23.06 | 0.10 | 6200 | 1.20 | 1.10 | 1.10 |
| 6400 | 3.57 | 3.69 | 0.12 | 23.39 | 0.12 | 6400 | 1.22 | 1.13 | 1.12 |
| 6600 | 3.59 | 3.72 | 0.13 | 23.55 | 0.13 | 6600 | 1.23 | 1.15 | 1.14 |
| 6800 | 3.61 | 3.74 | 0.13 | 23.54 | 0.11 | 6800 | 1.26 | 1.17 | 1.16 |
| 7000 | 3.64 | 3.77 | 0.13 | 23.53 | 0.13 | 7000 | 1.28 | 1.17 | 1.18 |
| 7500 | 3.70 | 3.82 | 0.13 | 23.47 | 0.20 | 7500 | 1.33 | 1.19 | 1.14 |
| 8000 | 3.77 | 3.89 | 0.12 | 22.94 | 0.13 | 8000 | 1.40 | 1.25 | 1.19 |
| 8500 | 3.84 | 3.98 | 0.14 | 22.54 | 0.06 | 8500 | 1.50 | 1.36 | 1.34 |
| 9000 | 3.91 | 4.06 | 0.15 | 21.91 | 0.12 | 9000 | 1.54 | 1.47 | 1.44 |
| 9500 | 3.94 | 4.10 | 0.16 | 20.95 | 0.06 | 9500 | 1.51 | 1.48 | 1.48 |
| 10000 | 3.87 | 4.07 | 0.21 | 20.03 | 0.18 | 10000 | 1.34 | 1.35 | 1.42 |
| 10500 | 3.81 | 4.02 | 0.21 | 19.46 | 0.45 | 10500 | 1.12 | 1.19 | 1.25 |
| 11000 | 3.90 | 4.07 | 0.17 | 19.46 | 0.52 | 11000 | 1.23 | 1.09 | 1.15 |
| 11500 | 3.96 | 4.13 | 0.17 | 20.31 | 0.22 | 11500 | 1.29 | 1.06 | 1.10 |
| 12000 | 3.93 | 4.13 | 0.20 | 21.87 | 0.16 | 12000 | 1.17 | 1.03 | 1.06 |
| 12500 | 3.96 | 4.18 | 0.21 | 23.23 | 0.27 | 12500 | 1.18 | 1.13 | 1.14 |
| 13000 | 4.08 | 4.29 | 0.21 | 22.99 | 0.32 | 13000 | 1.33 | 1.24 | 1.19 |
| 13500 | 4.34 | 4.55 | 0.21 | 21.51 | 0.29 | 13500 | 1.60 | 1.45 | 1.36 |
| 14000 | 4.60 | 4.82 | 0.22 | 19.97 | 0.27 | 14000 | 1.85 | 1.61 | 1.55 |
| 14500 | 4.60 | 4.84 | 0.24 | 18.98 | 0.32 | 14500 | 1.85 | 1.56 | 1.52 |
| 15000 | 4.51 | 4.74 | 0.23 | 18.75 | 0.46 | 15000 | 1.71 | 1.43 | 1.33 |
| 15500 | 4.47 | 4.70 | 0.23 | 19.17 | 0.30 | 15500 | 1.58 | 1.35 | 1.34 |
| 16000 | 4.34 | 4.65 | 0.30 | 19.83 | 0.26 | 16000 | 1.36 | 1.31 | 1.40 |
| 16500 | 4.29 | 4.62 | 0.34 | 20.16 | 0.79 | 16500 | 1.18 | 1.28 | 1.32 |
| 17000 | 4.40 | 4.66 | 0.26 | 19.46 | 0.94 | 17000 | 1.21 | 1.26 | 1.12 |
| 17500 | 4.51 | 4.73 | 0.23 | 18.53 | 0.28 | 17500 | 1.24 | 1.20 | 1.13 |
| 18000 | 4.47 | 4.80 | 0.33 | 18.24 | 0.10 | 18000 | 1.11 | 1.24 | 1.25 |
| 18500 | 4.69 | 5.09 | 0.39 | 19.00 | 0.19 | 18500 | 1.46 | 1.47 | 1.51 |
| 19000 | 5.00 | 5.39 | 0.39 | 20.66 | 0.52 | 19000 | 1.79 | 1.60 | 1.68 |
| 19500 | 4.91 | 5.27 | 0.36 | 22.93 | 0.82 | 19500 | 1.58 | 1.43 | 1.52 |
| 20000 | 4.72 | 5.06 | 0.34 | 24.64 | 0.75 | 20000 | 1.18 | 1.19 | 1.27 |
| 20500 | 4.67 | 5.03 | 0.36 | 23.00 | 0.80 | 20500 | 1.15 | 1.08 | 1.24 |
| 21000 | 4.81 | 5.21 | 0.40 | 20.30 | 1.10 | 21000 | 1.36 | 1.26 | 1.26 |
| 21500 | 5.22 | 5.60 | 0.38 | 18.88 | 1.30 | 21500 | 1.90 | 1.62 | 1.62 |
| 22000 | 5.26 | 5.67 | 0.40 | 18.43 | 1.17 | 22000 | 1.96 | 1.65 | 1.73 |

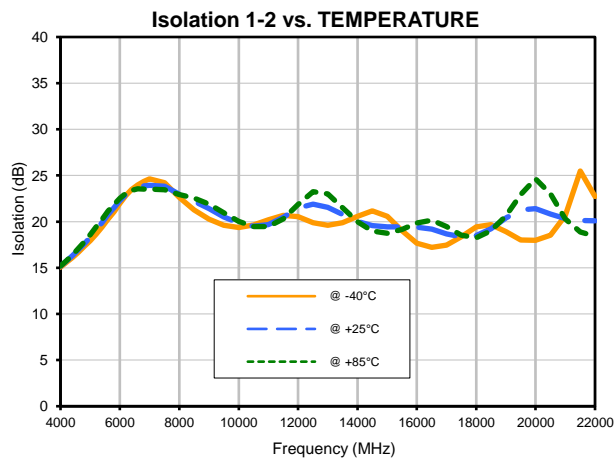
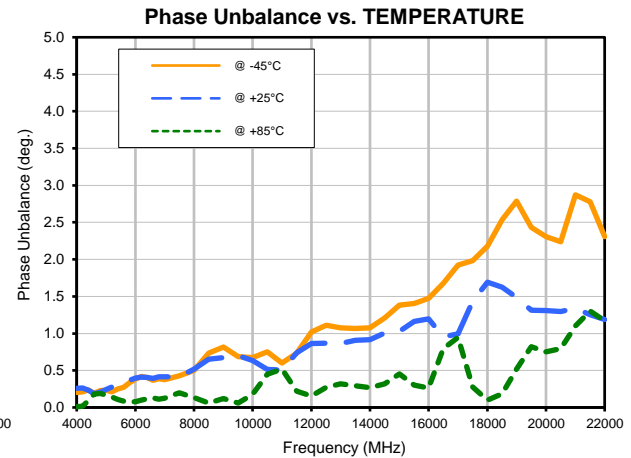
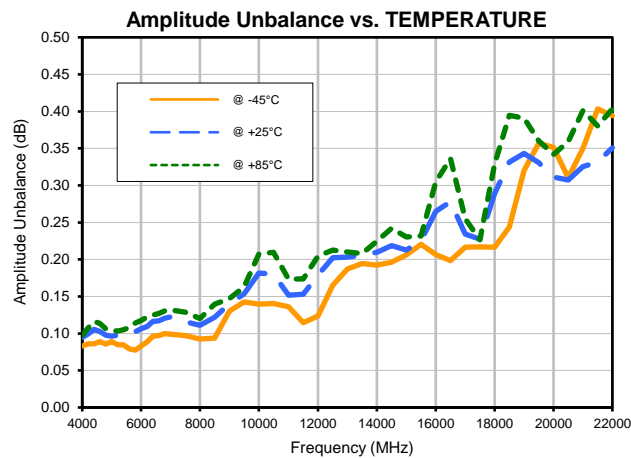
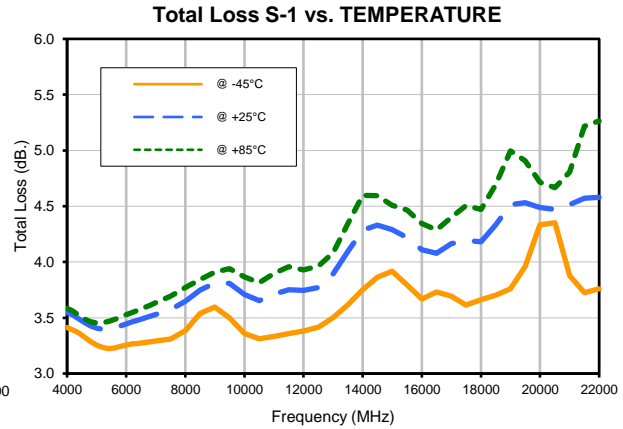
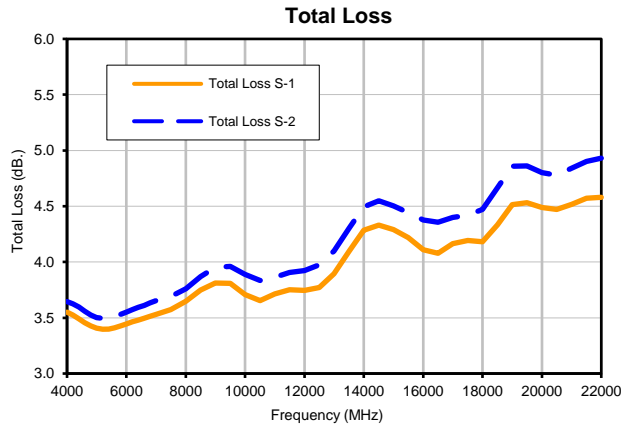
¹Total Loss = Insertion Loss + 3dB Splitter Loss



2 Way-0° Power Splitter/Combiner

EP2K+

Typical Performance Curves



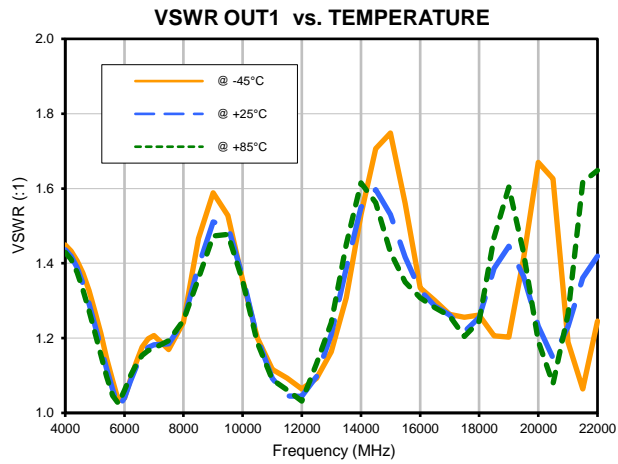
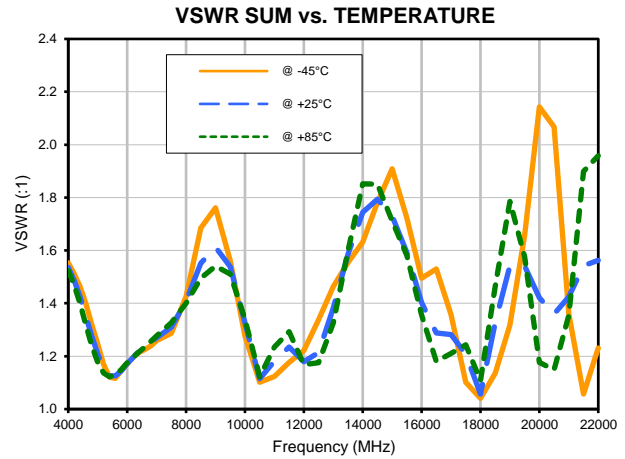
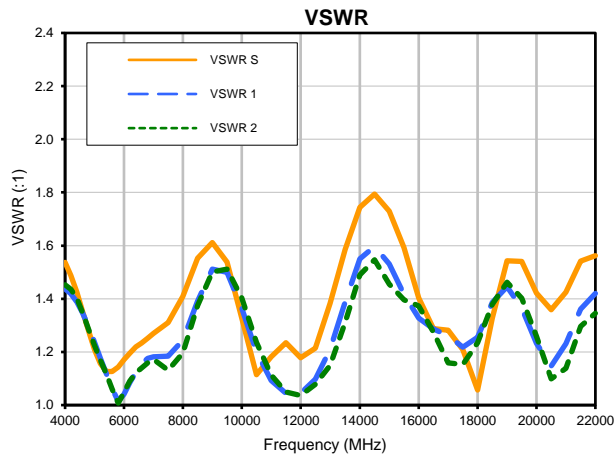
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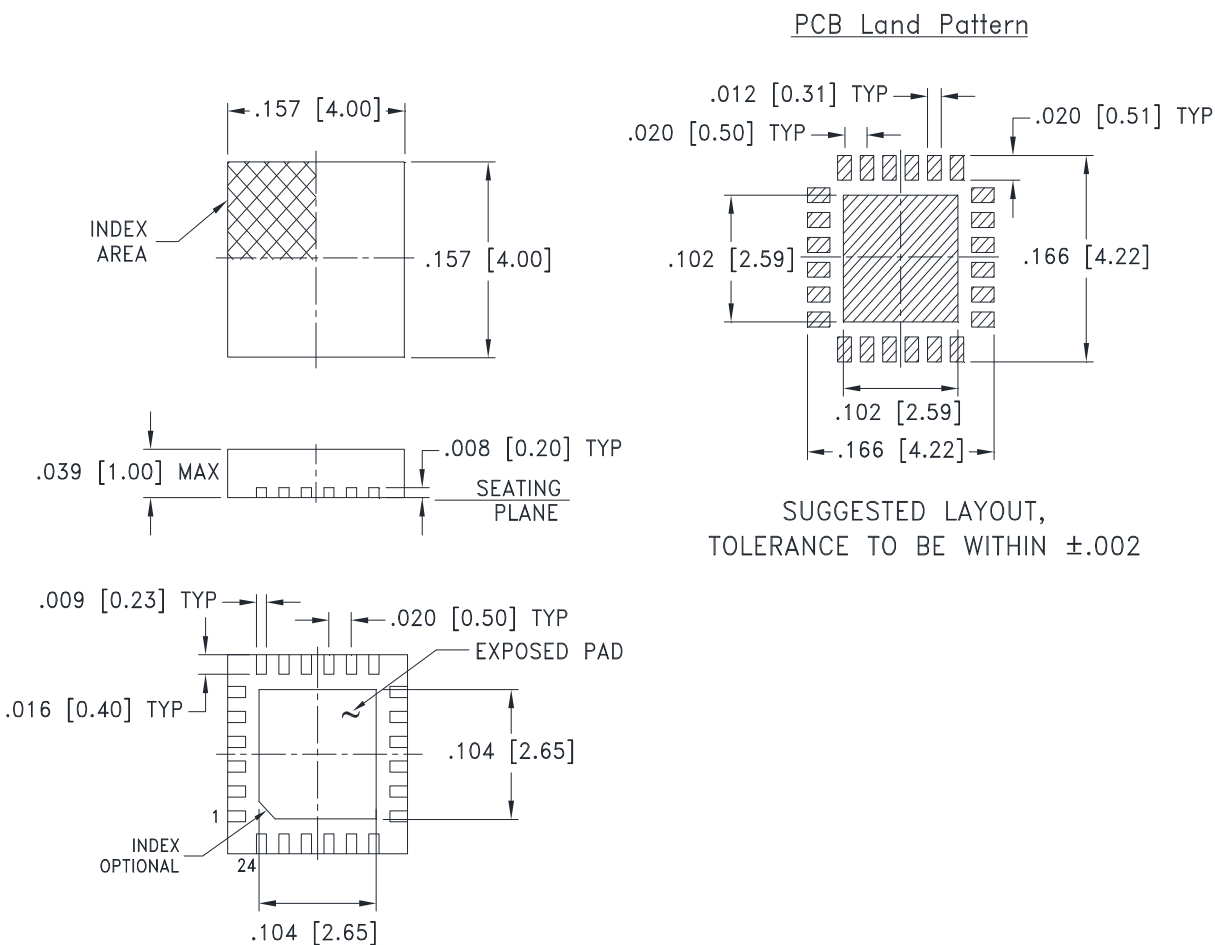
IF/RF MICROWAVE COMPONENTS

REV. OR
EP2K+
11/18/2015
Page 1 of 2

Typical Performance Curves



Outline Dimensions



Weight: .04 Grams

Dimensions are in inches (mm). Tolerances: 2 Pl. \pm .01; 3 Pl. \pm .005

Notes:

1. Case material: Plastic.
2. Termination finish:
 - For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier or Matte-Tin. All models, (+) suffix. See model Data sheet.
 - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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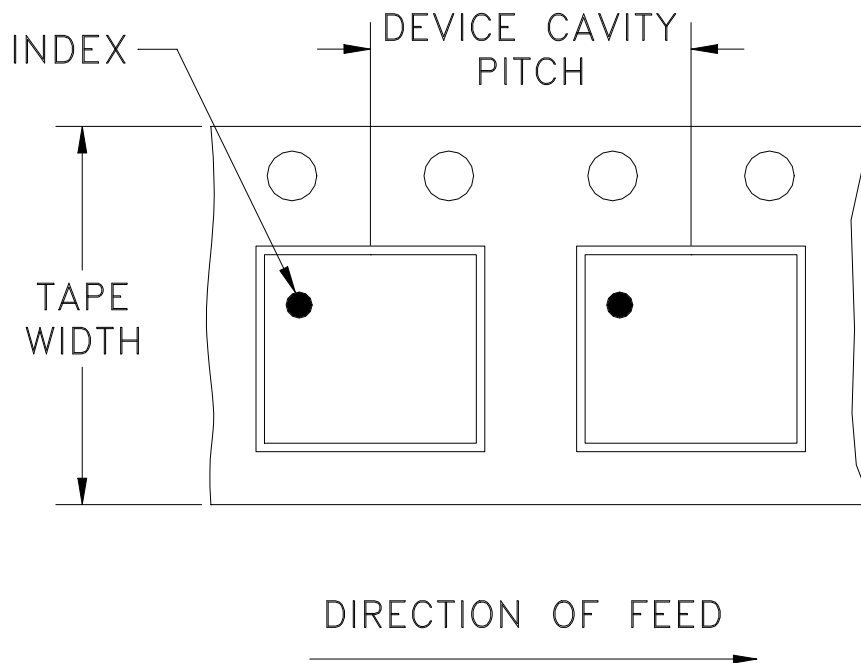
RF/IF MICROWAVE COMPONENTS

DG1847 Rev.: AH (16 FEB 23) ECO-016811 File: DG1847

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Tape & Reel Packaging TR-F68

DEVICE ORIENTATION IN T&R



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel see note | |
|----------------|-------------------------|-------------------|---------------------------|------|
| 12 | 8 | 7 | Small quantity standard | 20 |
| | | | | 50 |
| | | | | 100 |
| | | | | 200 |
| | | | | 500 |
| | | 7 | Standard | 1000 |
| | | 13 | Standard | 2000 |
| | | | | 3000 |
| 4000 | | | | |

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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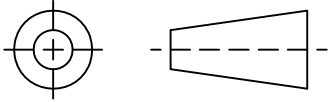
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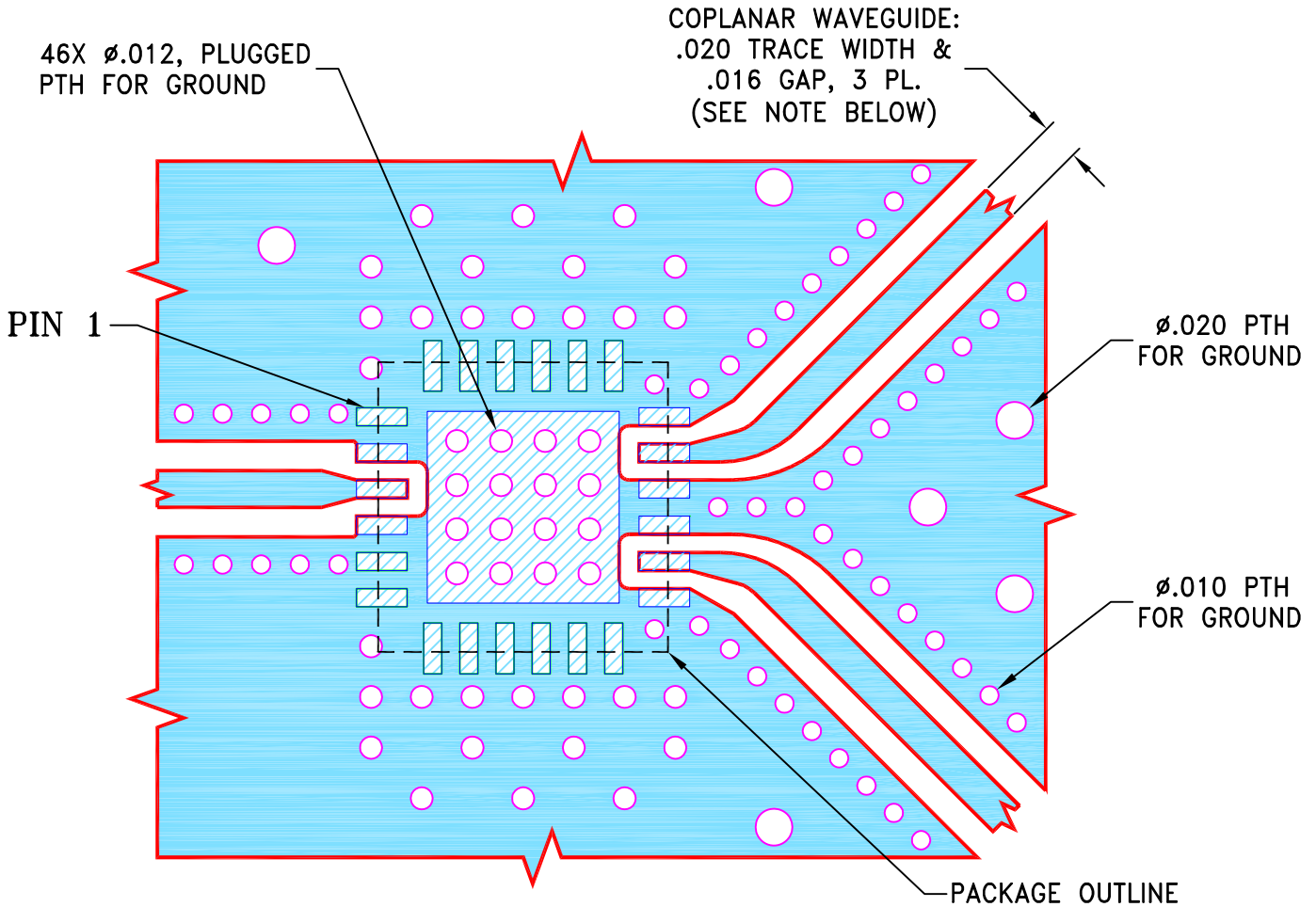
THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|-------------|----------|-----|------|
| OR | M153829 | NEW RELEASE | 11/16/15 | ITG | RS |
| | | | | | |
| | | | | | |

SUGGESTED MOUNTING CONFIGURATION
FOR DG1847 CASE STYLE, "24SP01" PIN CODE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .010"±.001"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

| UNLESS OTHERWISE SPECIFIED | INITIALS | | DATE |
|--|----------|-----|----------|
| DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ± | DRAWN | ITG | 11/16/15 |
| | CHECKED | YL | 11/16/15 |
| | APPROVED | RS | 11/16/15 |



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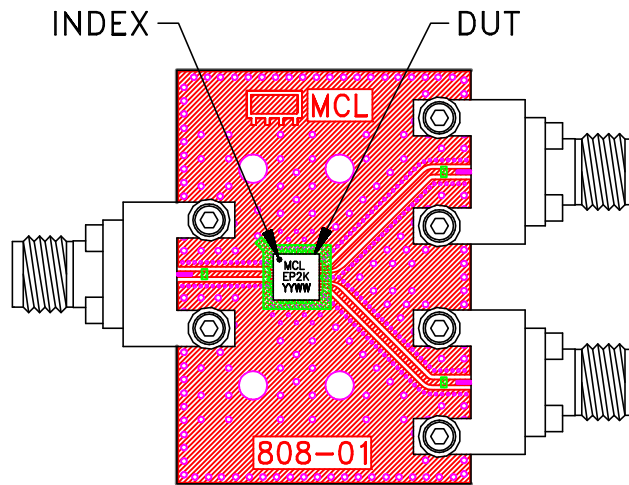
13 Neptune Avenue
Brooklyn NY 11235

PL, 24SP01, DG1847, TB-845+

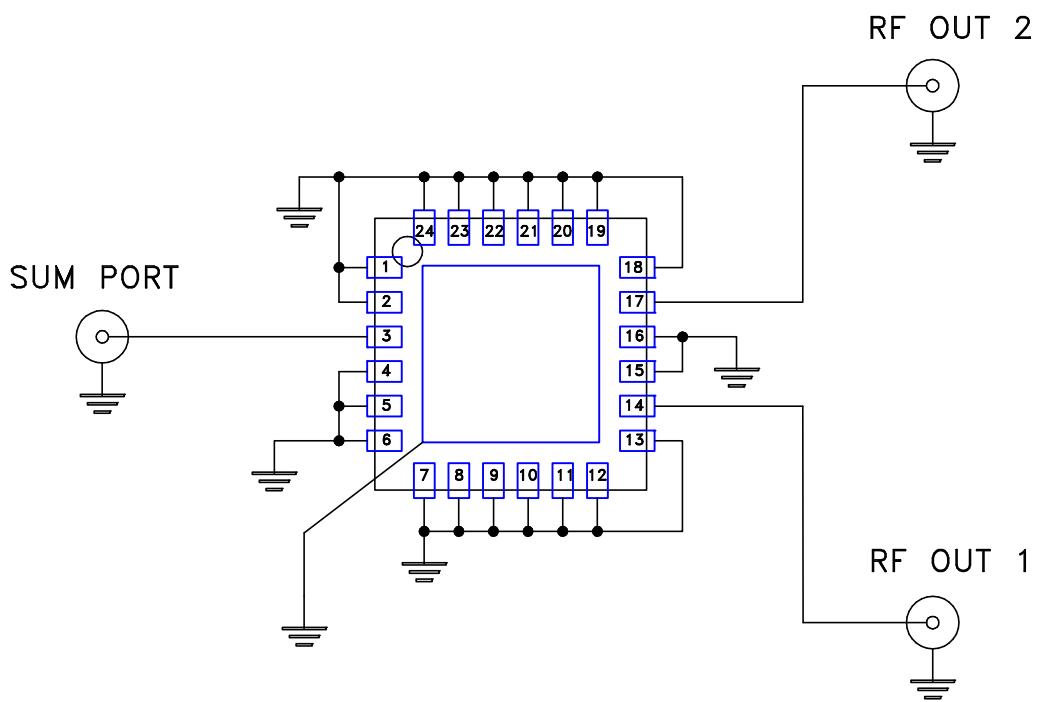
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| | | | |
|------------------|---------------------|--------------------------|------------|
| SIZE A | CODE IDENT 15542 | DRAWING NO: 98-PL-472 | REV: OR |
| FILE: 98PL472 | SCALE: 10:1 | SHEET: 1 OF 1 | |

Evaluation Board and Circuit




TB-845-1+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent,
Dielectric Constant=3.5, Thickness=.010 inch.

 **Mini-Circuits®**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification | Test/Inspection Condition | Reference/Spec |
|--------------------------------|--|---|
| Operating Temperature | -40° to 85°C or -45° to 85°C Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C or -65° to 150° Ambient Environment | Individual Model Data Sheet |
| Thermal Shock | -55° to 100°C, 100 cycles | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| Mechanical Shock | 1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only | MIL-STD-883, Method 2002, Condition B, except Y1 direction only |
| Vibration (Variable Frequency) | 50g peak | MIL-STD-883, Method 2007, Condition B |
| Autoclave | 15 psig, 100% RH, 121°C, 96 hours | JESD22-A102, Condition C |
| HAST | 130°C, 85% RH, 96 hours | JESD22-A110 |
| Solderability | 10X Magnification | J-STD-002, Para 4.2.5, Test S, 95% Coverage |
| Solder Reflow Heat | Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak | J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1 |
| Moisture Sensitivity: Level 1 | Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak | J-STD-020 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + | MIL-STD-202, Method 215 |



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification | Test/Inspection Condition | Reference/Spec |
|----------------------|----------------------------------|-----------------------|
| | monoethanolamine at 63°C to 70°C | |