



**Ultra Small Low Profile 1008 Balun
50Ω to 100Ω Balanced**



Description:

The XMB0465Z1-50100G is an ultra-small (1008), low profile, broadband balanced to unbalanced transformer in an easy to use Xinger style manufacturing friendly surface mount package. The XMB0465Z1-50100G has an unbalanced port impedance of 50Ω and a 100Ω balanced port impedance, with class leading CMRR. Which is ideal for data converter applications in the following markets: Test and Measurement, Telecom and COTS Mil-Aero. This impedance transformer enables single ended signals to be applied to differential ports on RFSOC's, ADC's, DAC's and integrated RF chipsets. The output ports have equal amplitude (-3dB) with 180-degree phase differential.

All the Xinger components are constructed from ceramic filled PTFE composites, which possess excellent electrical and mechanical stability. All parts have been subjected to rigorous Xinger qualification testing and units are 100% RF tested. Produced in an ENIG final finish.

Features:

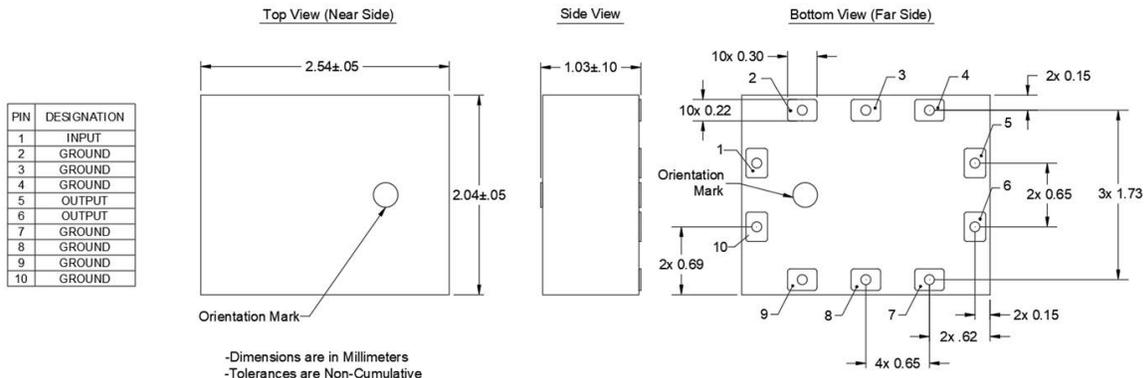
- 400-6000 MHz
- 50 Ohm to 2 x50 Ohm
- 1.03mm Height Profile
- CMRR <25dB
- Test and Measurement, Telecom and COTS Mil-Aero
- Low Loss (<7dB)
- Tight Amplitude Balance (± 0.9dB)
- Non-conductive Surface
- Production Friendly
- RoHS Compliant
- Halogen Free
- Tape and Reel

Electrical Specifications*:

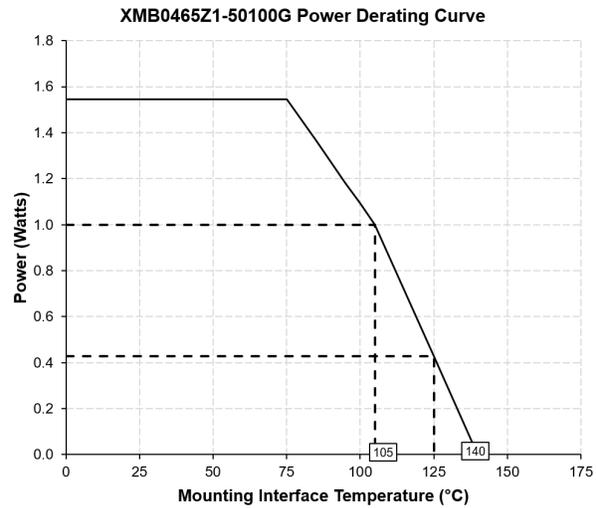
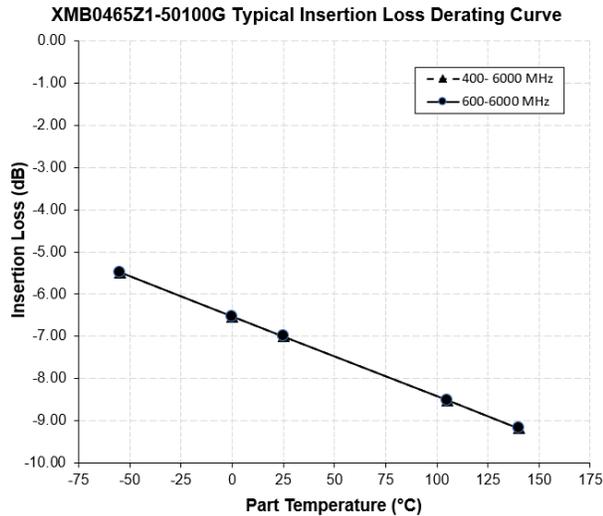
| Frequency | Port Impedance | Insertion Loss | Return Loss | Amplitude Balance |
|------------|----------------------------------|----------------|--------------------------|------------------------|
| <i>MHz</i> | <i>Unbalanced : Balanced</i> | <i>dB Max</i> | <i>dB Min</i> | <i>dB Max</i> |
| 400-6000 | 50:100 | 7.0 | 8 | ± 0.9 |
| 600-6000 | 50:100 | 7.0 | 9 | ± 0.8 |
| | Phase Balance | CMRR | Power | Operating Temp. |
| | <i>Degrees</i> | <i>dB Max</i> | <i>Avg. Watts @105°C</i> | <i>°C</i> |
| | 180 ± 5 | 25 | 1 | -55 to +140 |
| | 180 ± 5 | 25 | 1 | -55 to +140 |

*Specification based on performance of unit properly installed on a TTM test board with small signal applied. Specifications subject to change without notice. Refer to parameter definitions for details.

Mechanical Outline:



Insertion Loss and Power Derating Curves:



Insertion Loss Derating:

The insertion loss, at a given frequency, of the Balun is measured at 25°C and then averaged. The measurements are performed under small signal conditions (i.e. using a Vector Network Analyzer). The process is repeated at -55°C and 140°C. A best-fit line for the measured data is computed and then plotted from -55°C to 140°C.

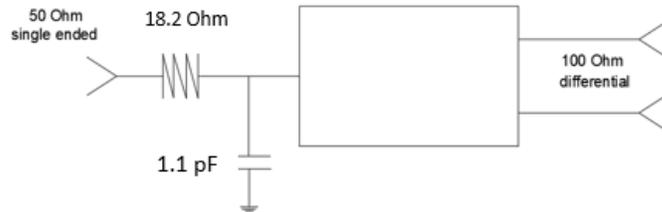
Power Derating:

The power handling and corresponding power derating plots are a function of the thermal resistance, mounting surface temperature (base plate temperature), maximum continuous operating temperature of the Balun, and the thermal insertion loss. The thermal insertion loss is defined in the Power Handling section of the data sheet.

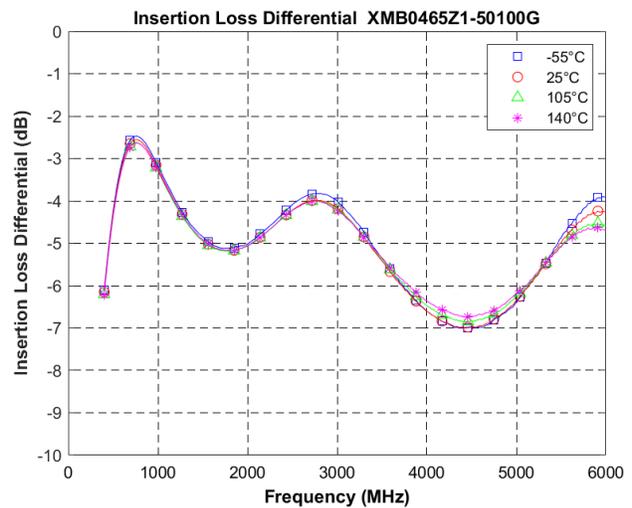
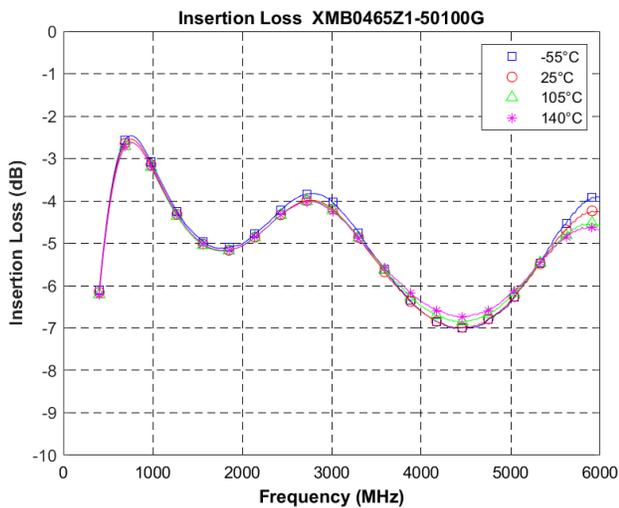
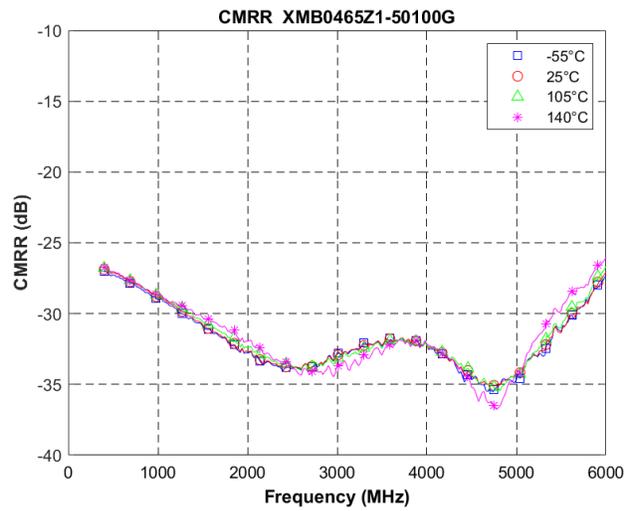
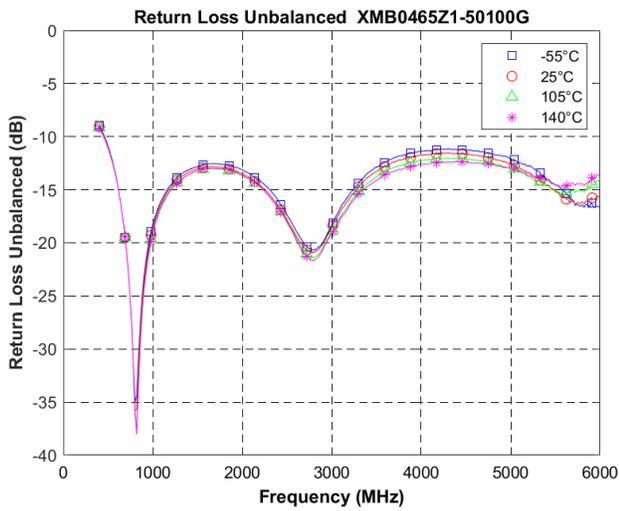
As the mounting interface temperature approaches the maximum continuous operating temperature, the power handling decreases to zero.

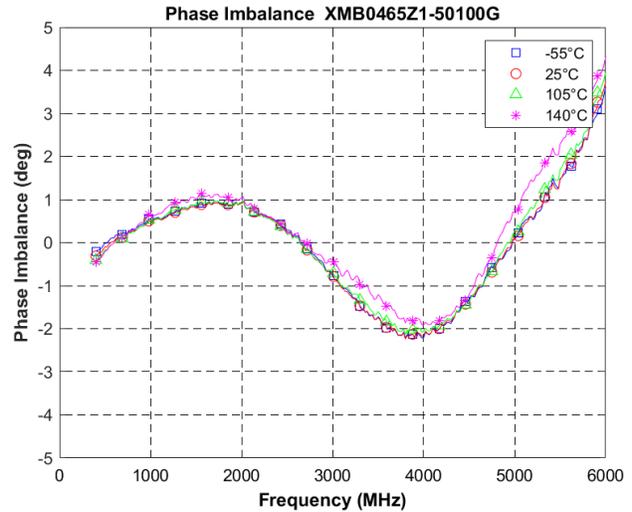
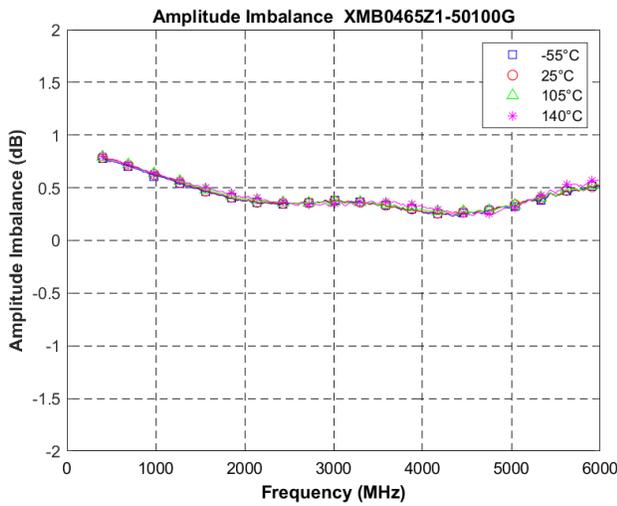
If mounting temperature is greater than 105°C, the Xinger Balun will perform reliably if the input power is derated to the curve above.

Typical Performance: 400 MHz to 6000 MHz

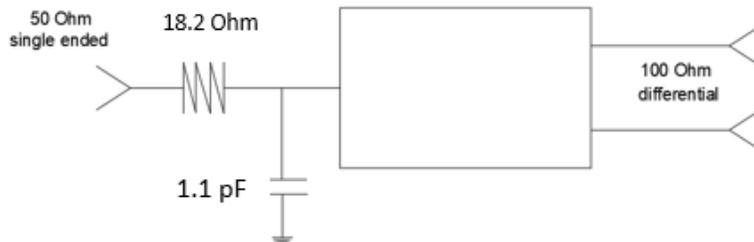


Note: The performance below is shown with series Resistor R1 of 10 Ohms and parallel capacitor C1 of 1.1pF tuned at pin 1 (50 Ohm port).

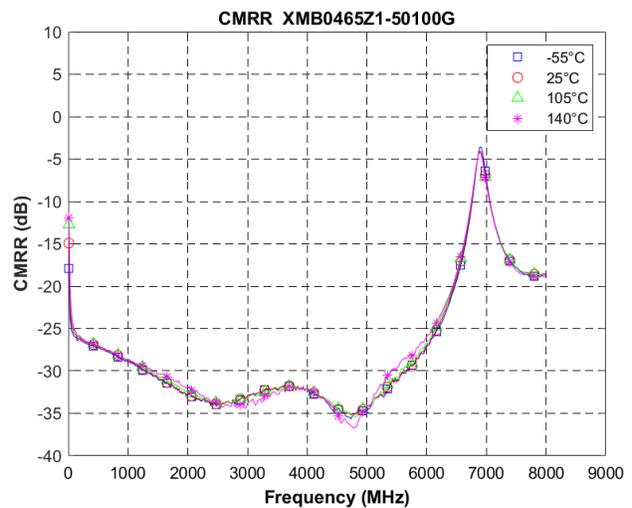
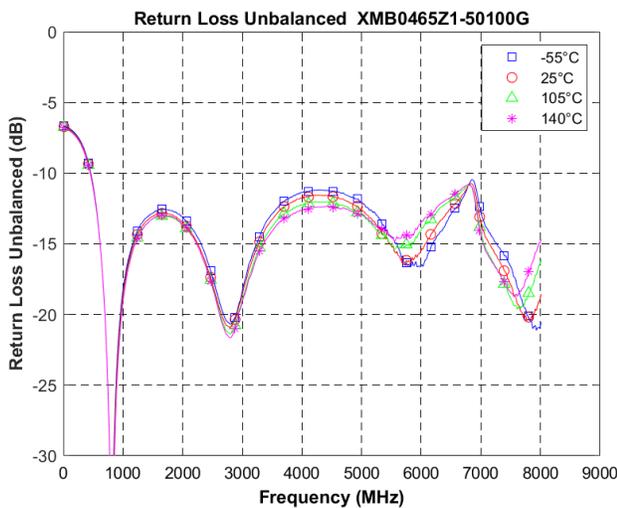


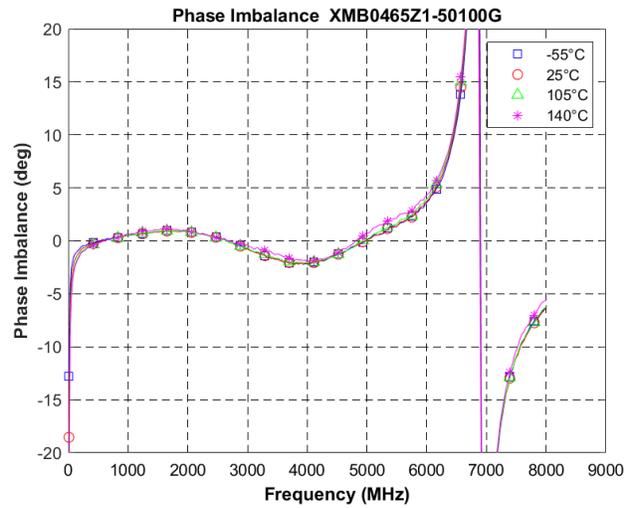
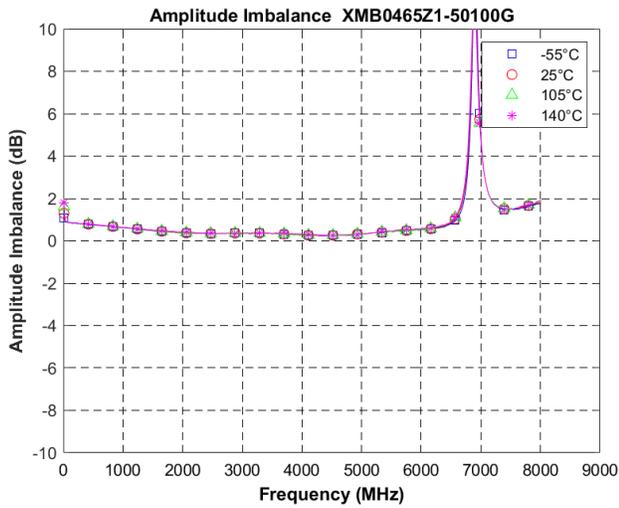
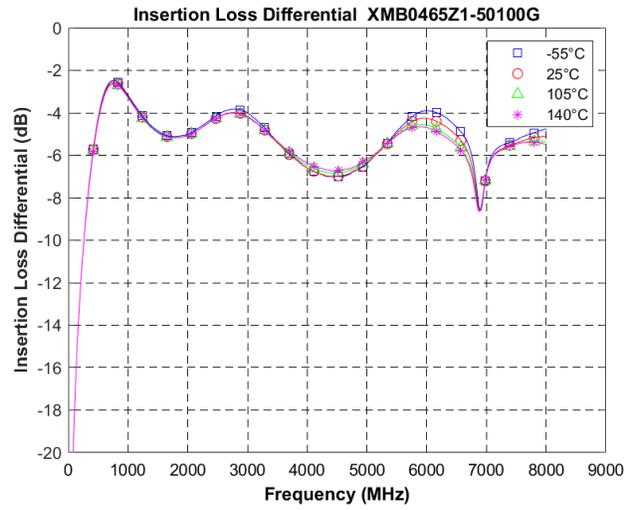
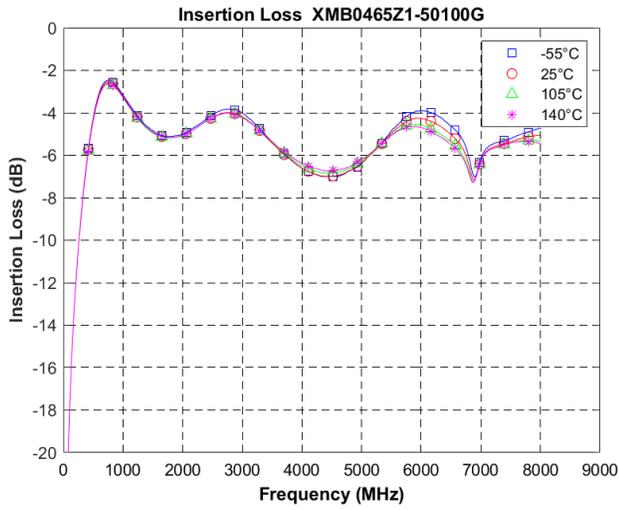


Broadband Performance: 10 MHz to 8010 MHz



Note: The performance below is shown with series Resistor R1 of 10 Ohms and parallel capacitor C1 of 1.1pF tuned at pin 1 (50 Ohm port).





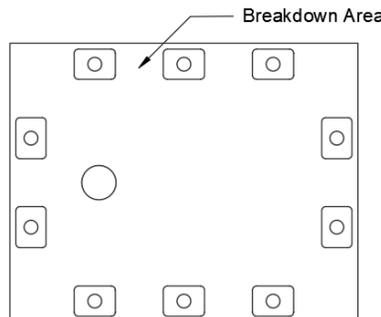
Definition of Measured Specifications:

| Parameter | Definition | Mathematical Representation |
|--------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Return Loss | The impedance match at the single ended port. | $RL = 20Log_{10}(S_{11})$ |
| Differential Port Return Loss | The impedance match at the differential port. | $RLD = 20Log_{10} 0.5 * (S_{22} - S_{23} - S_{32} + S_{33}) $ |
| Insertion Loss | Power loss from common mode to differential mode. | $ILD = 20Log_{10}(0.707 * (S_{21} - S_{31}))$ |
| Phase Imbalance | The difference in phase angle between the two differential ports, offset by 180 deg. | $PB = (Phase(S_{21}) - Phase(S_{31})) - 180^{\circ}$ |
| Amplitude Imbalance | The ratio of the power at differential ports. | $AB = 20Log_{10} \frac{S_{21}}{S_{31}} $ |
| Common Mode Rejection Ratio | The ratio of powers of the differential gain to the common-mode gain. | $CMRR = \pm 20Log_{10}(S_{21}+S_{31})/(S_{21}-S_{31})$ |

*100% RF test is performed per spec definition

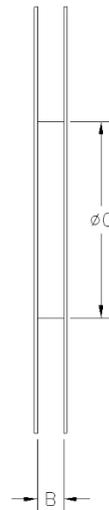
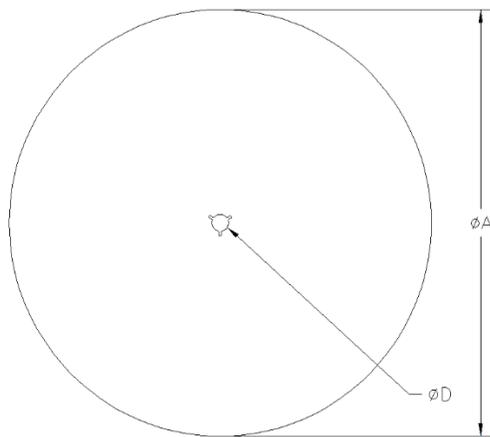
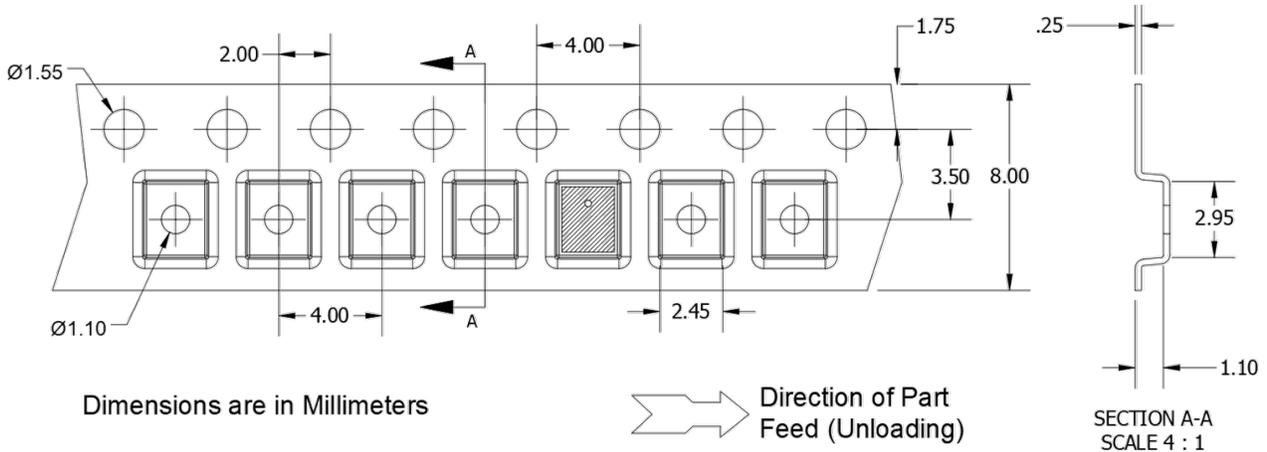
Peak Power Handling:

High-Pot testing of these components during the qualification procedure resulted in a minimum breakdown voltage of 1Kv (minimum recorded value). This voltage level corresponds to a breakdown resistance capable of handling at least 12dB peak over average power levels, for very short durations. The breakdown location consistently occurred across the pads and the ground bar. The breakdown levels at these points will be affected by any contamination in the gap area around these pads. These areas must be kept clean for optimum performance. It is recommended that the user test for voltage breakdown under the maximum operating conditions and over worst-case modulation induced power peaking. This evaluation should also include extreme environmental conditions (such as high humidity).



Packaging and Ordering Information:

Parts are available in reel and are packaged per EIA 481. Parts are oriented in tape and reel as shown below. Minimum order quantities are 4000 per reel.



| TABLE 1 (for 4000 pcs) | |
|-------------------------------|--------------|
| REEL DIMENSIONS (inches [mm]) | |
| ØA | 13.0 [330.0] |
| B | .315 [8.00] |
| ØC | 7.0 [177.80] |
| ØD | 0.512 [13.0] |

Part Naming Convention:

XMB 0465 Z 1 - 50 100 G

| Function & Family | Frequency Range | Package Size | Power Handling | Impedance | Finish |
|-----------------------------|-------------------------------------|-------------------|----------------|-------------------------|----------|
| XMB = Xinger Mil-Aero Balun | 0465 = typ freq range 0.4 - 6.0 GHz | Z = 0.10" x 0.08" | 1 = 0 - 100W | 50Ω to 100Ω Balanced | G = ENIG |

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