Xinger®

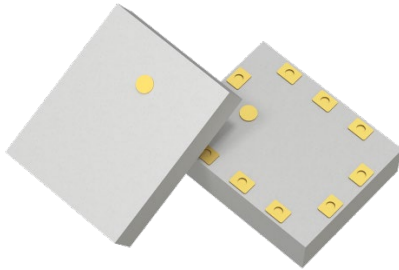## Ultra Small Low Profile 1008 Balun
50Ω to 100Ω Balanced

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 Converter applications in the following markets: Test and Measurement, Telecom and COTS Mil-Aero. This 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 of 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.
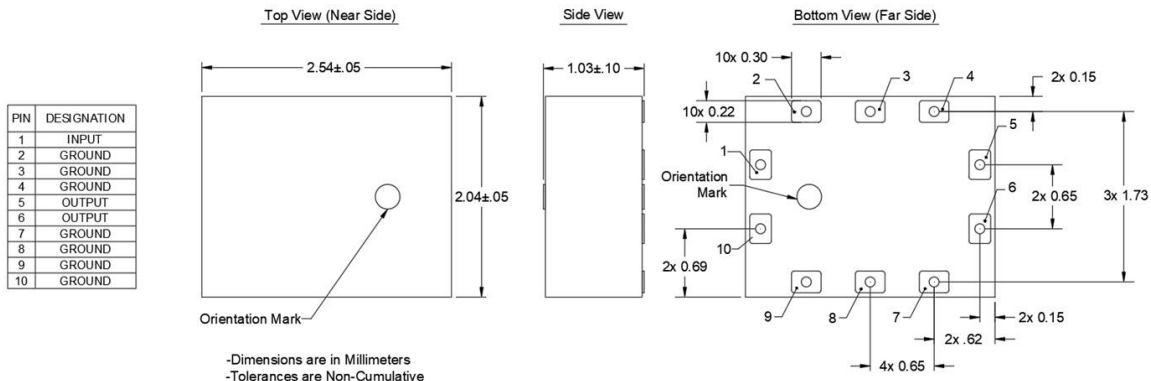
Features:

- **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
MHz	*Unbalanced : Balanced*	*dB Max*	*dB Min*	*dB Max*
400-6000	50:100	7.0	8	± 0.9
600-6000	50:100	7.0	9	± 0.8
Phase Balance	**CMRR**	**Power**	**Operating Temp.**
Degrees	*dB Max*	*Avg. Watts @105ºC*	*ºC*
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:

PIN	DESIGNATION
1	INPUT
2	GROUND
3	GROUND
4	GROUND
5	OUTPUT
6	OUTPUT
7	GROUND
8	GROUND
9	GROUND
10	GROUND

Top View (Near Side)
2.54±.05
2.04±.05
Orientation Mark

-Dimensions are in Millimeters
-Tolerances are Non-Cumulative

Side View
1.03±.10

Bottom View (Far Side)
10x 0.30
10x 0.22
2x 0.15
Orientation Mark
2x 0.65
3x 1.73
2x 0.69
2x 0.15
2x .62
4x 0.65

Insertion Loss and Power Derating Curves:

XMB0465Z1-50100G Typical Insertion Loss Derating Curve

Legend: 400- 6000 MHz, 600-6000 MHz

X-axis: Part Temperature (°C)
Y-axis: Insertion Loss (dB)

XMB0465Z1-50100G Power Derating Curve

X-axis: Mounting Interface Temperature (°C)
Y-axis: Power (Watts)
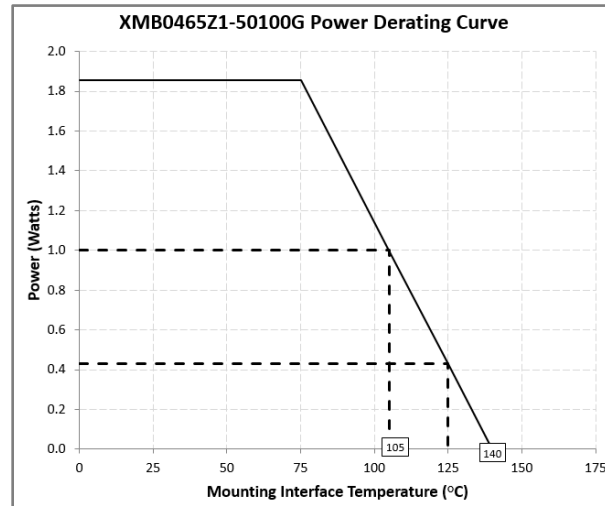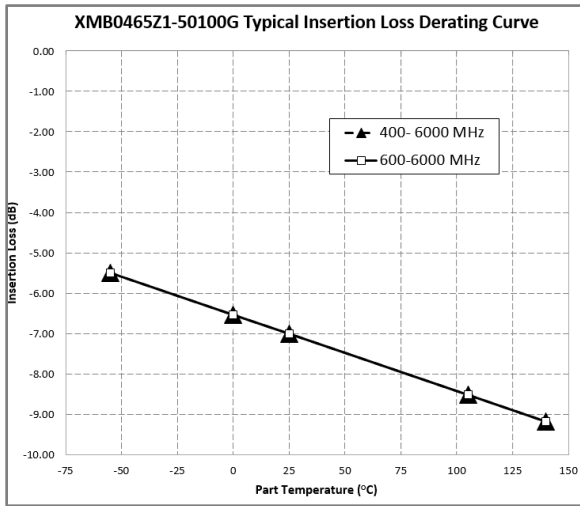
Insertion Loss Derating:

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 as long as the input power is derated to the curve above.
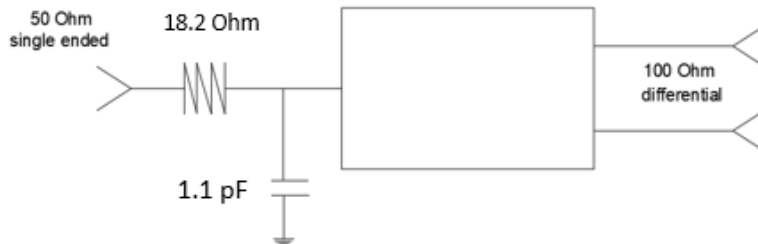
Typical Performance: 400 MHz to 6000 MHz
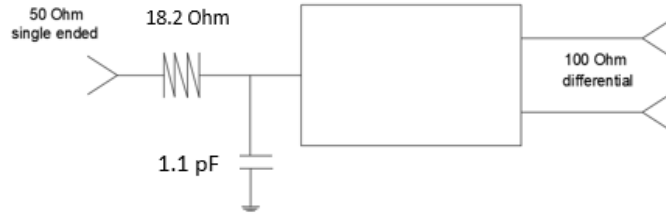
Note: The performance below is shown with series Resistor R1 of 10 Ohms and parallel capacitor C1 of 1.1pF tuned at pin 1 (50 Ohm port).
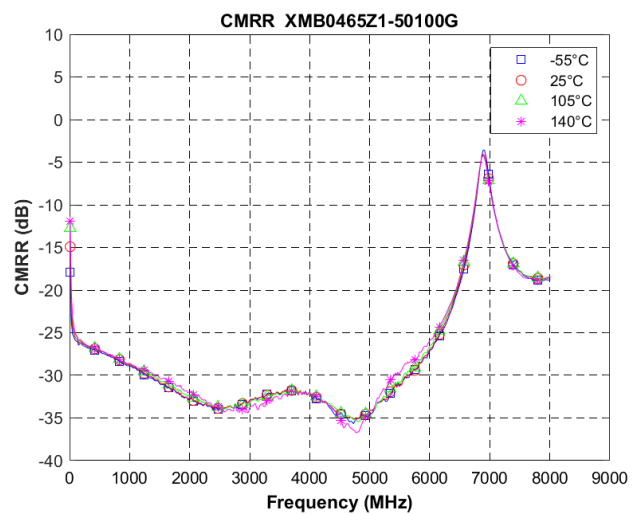
Amplitude Imbalance XMB0465Z1-50100G

Phase Imbalance XMB0465Z1-50100G
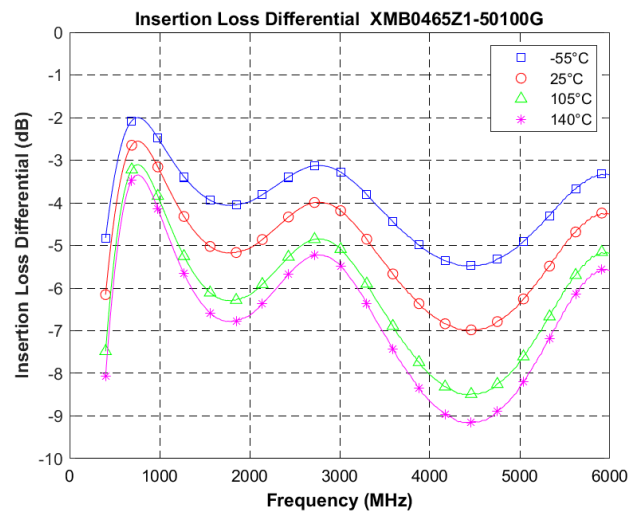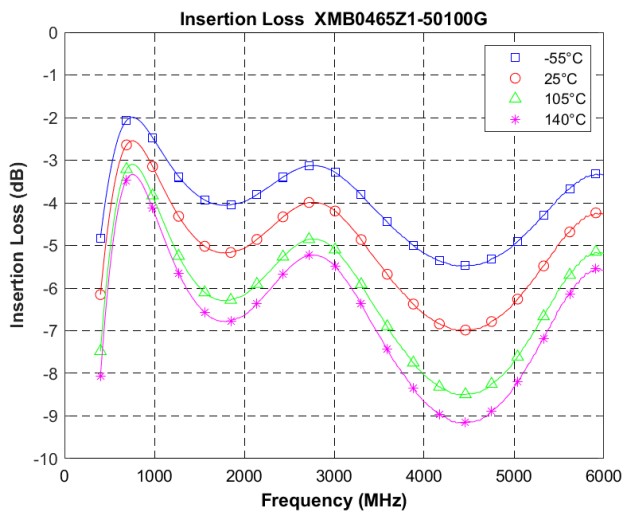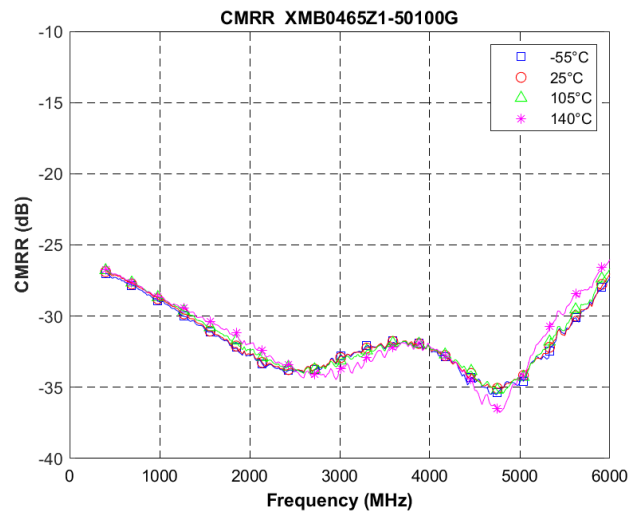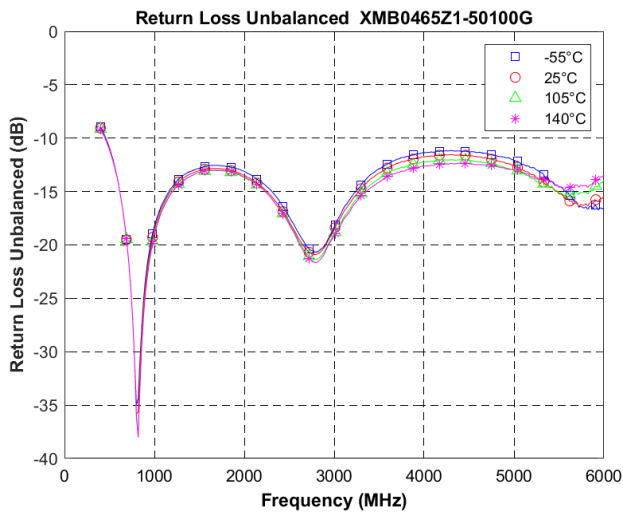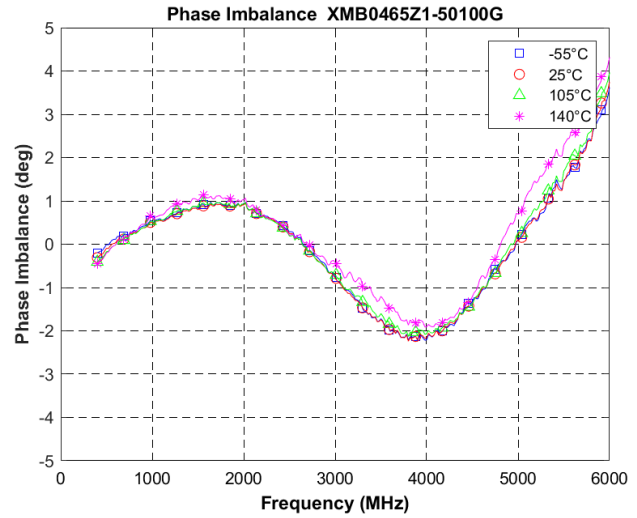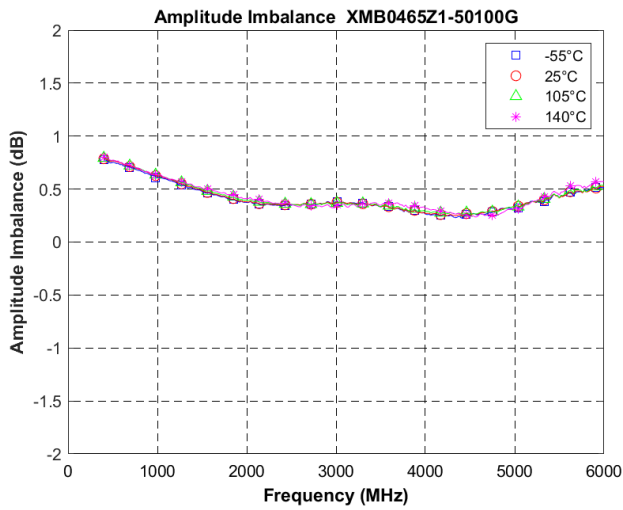
Broadband Performance: 10 MHz to 8010 MHz

50 Ohm single ended — 18.2 Ohm — 100 Ohm differential

1.1 pF

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).
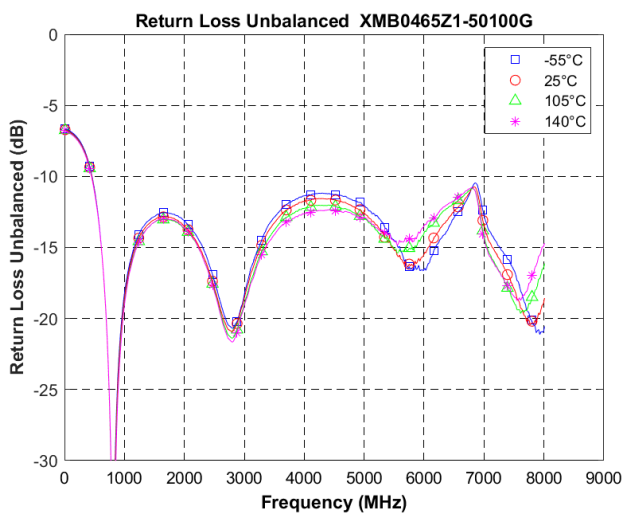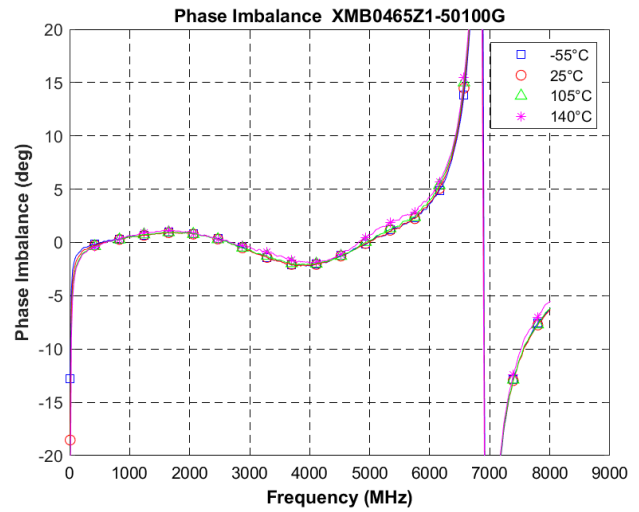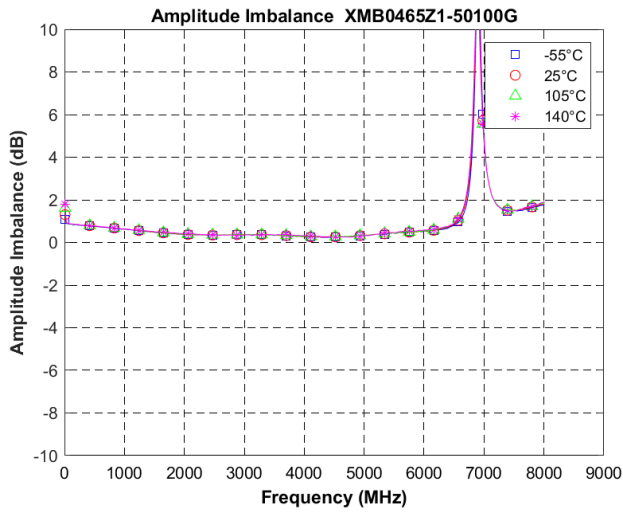
Return Loss Unbalanced XMB0465Z1-50100G

CMRR XMB0465Z1-50100G

TTM Technologies
Time-To-Market Interconnect Solutions

Insertion Loss XMB0465Z1-50100G

Insertion Loss Differential XMB0465Z1-50100G

Amplitude Imbalance XMB0465Z1-50100G

Phase Imbalance XMB0465Z1-50100G
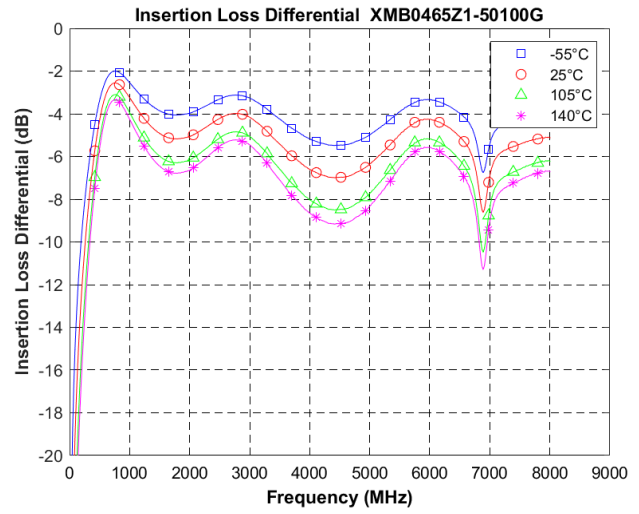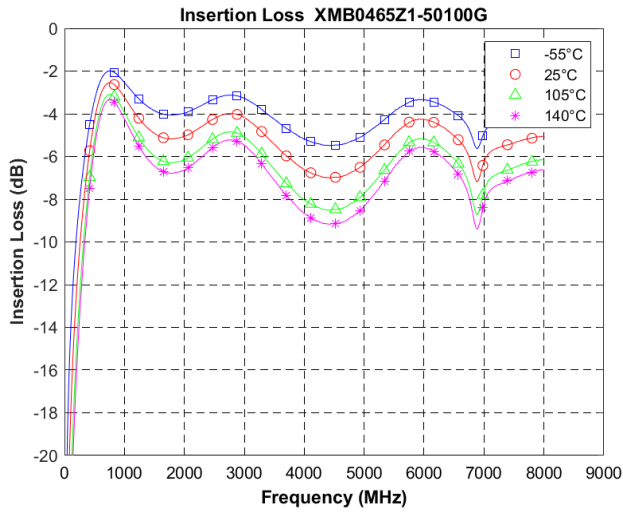
Definition of Measured Specifications:

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.	$PB = (\text{Phase}(S_{21}) - \text{Phase}(S_{31})) - 180°$
Amplitude Imbalance	The ratio of the power at differential ports.	$AB = 20Log_{10}\|\dfrac{S_{21}}{S_{31}}\|$
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).
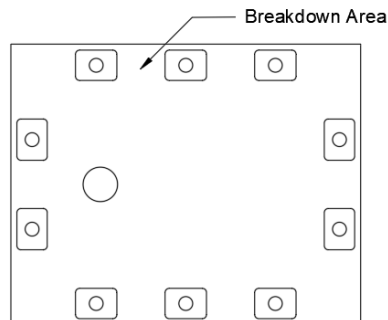
Packaging and Ordering Information:

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.
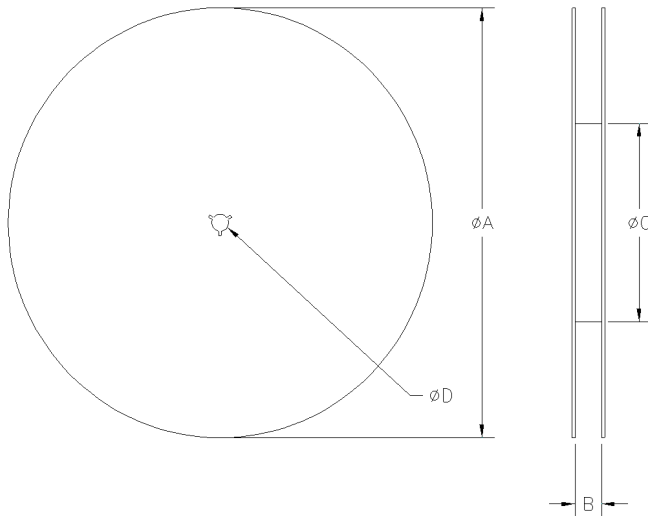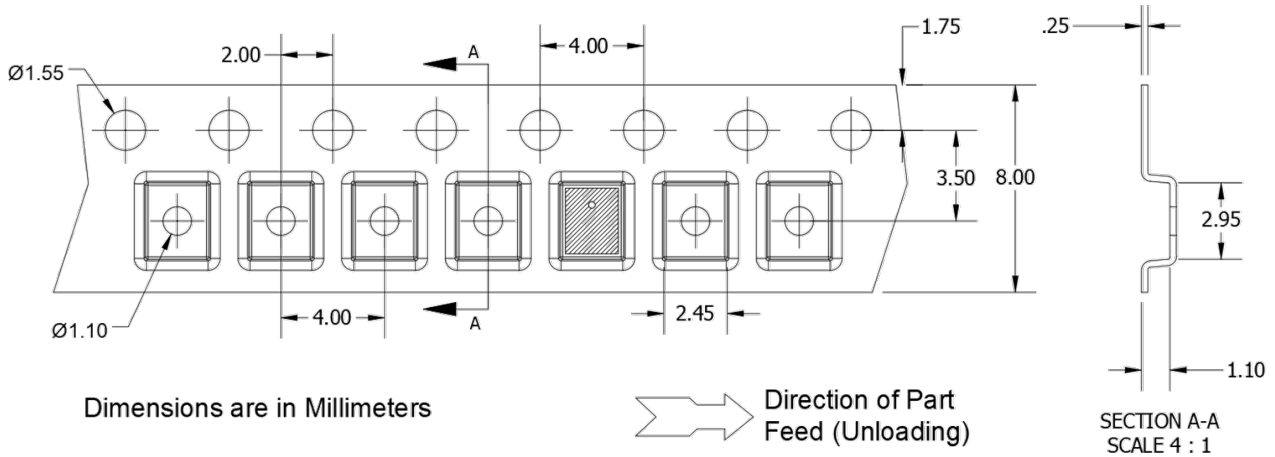

Dimensions are in Millimeters

Direction of Part Feed (Unloading)

SECTION A-A
SCALE 4 : 1

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]

Contact us:
rf&s_support@ttm.com