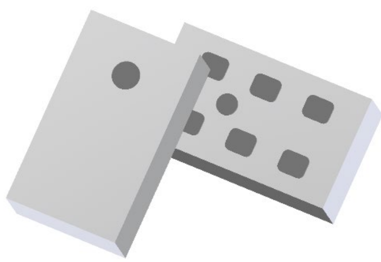
Ultra Small Low Profile 0603 RF Cross Over



Description:

The X0060L7575AHF2 is an ultra-small, low profile DC-2.5GHz RF crossover that enables the transition of two intersecting 75 Ohm RF traces in an easy to use Xinger style manufacturing friendly surface mount package. The 0603 (1.6 x 1mm) crossover is ideal for any critical applications demanding 75 Ohm impedance where layout and available space are at a premium and resorting to addition PWB layers and larger overall footprints are costly. With low insertion loss, high isolation and packaged with cost in mind, this novel component delivers reliability and repeatability.

Features:

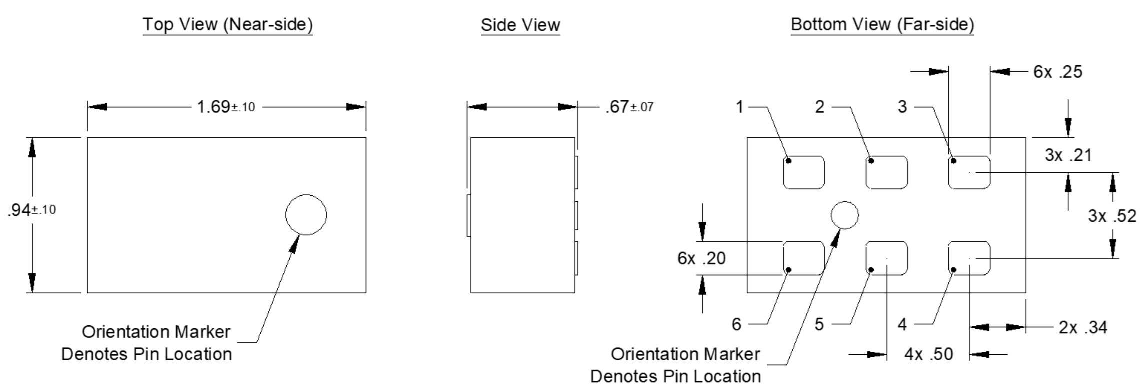
- **0 – 2500 MHz**
- **0.67mm Height Profile**
- **75 Ohm RF-RF Crossover**
- **For Broadcast applications**
- **Low Insertion Loss**
- **High Isolation**
- **Xinger style Surface Mountable**
- **Tape & Reel**
- **Non-conductive Surface**
- **RoHS Compliant**
- **Halogen Free**

Electrical Specifications:

Parameter (@25°C)	Min.	Typ.	Max	Unit
Frequency	0		2500	MHz
Port Impedance		75		Ω
Return Loss	19	21		dB
Insertion Loss		0.1	0.15	dB
Isolation (cross-talk)				
0 – 700 MHz	44	52		dB
700 - 1700 MHz	40	47		dB
1700 - 2500 MHz	38	43		dB
Power Handling (@85°C)			2	Watts
Operating Temperature	-55		+140	°C

**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.

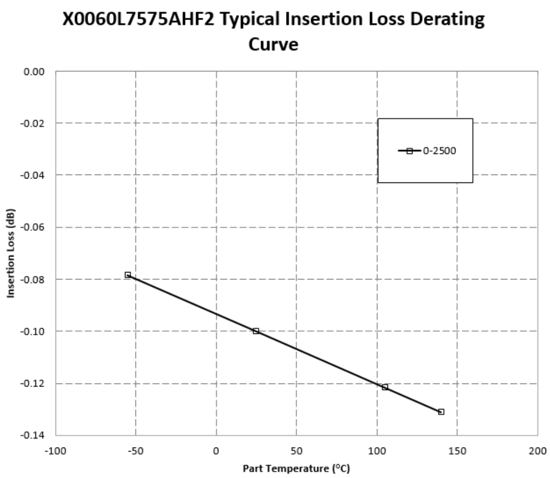
Mechanical Outline:

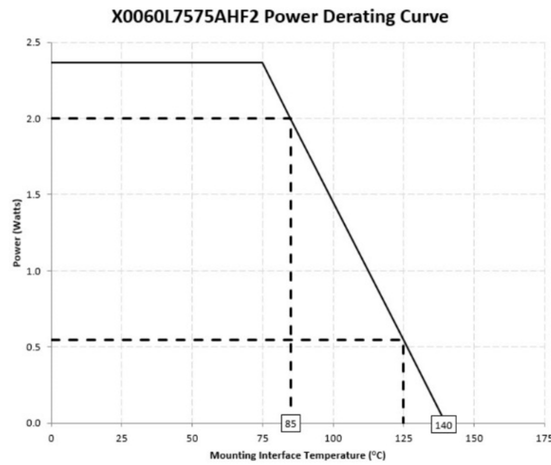


Pin	Designation
1	GND
2	RF 2 In/Out
3	GND
4	RF 1 In/Out
5	RF 2 In/Out
6	RF 1 In/Out

-Dimensions are in Millimeters
-Tolerances are Non-Cumulative

Insertion Loss and Power Derating Curves:





Insertion Loss Derating:

The insertion loss, at a given frequency, of a group of couplers 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:

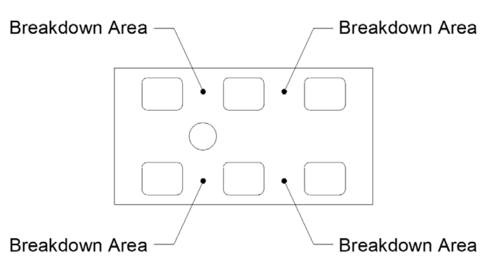
The power handling and corresponding power derating plots are a function of the thermal resistance, mounting surface temperature (base plate temperature), maximum continuous operating temperature of the coupler, and the thermal insertion loss. The thermal insertion loss is defined in the Power Handling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

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

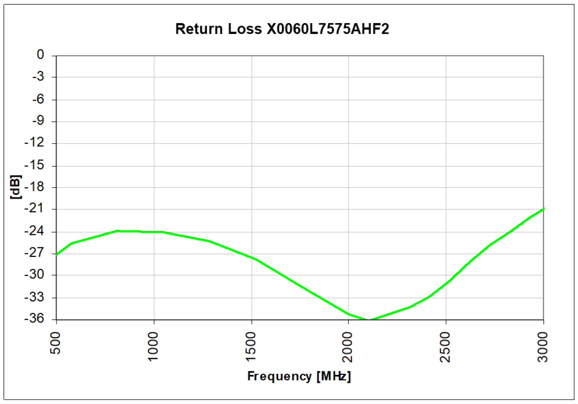
If mounting temperature is greater than 85°C, Xinger coupler will perform reliably as long as the input power is derated to the curve above.

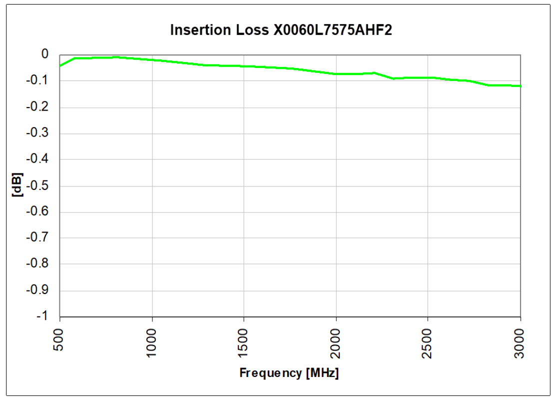
Peak Power Handling:

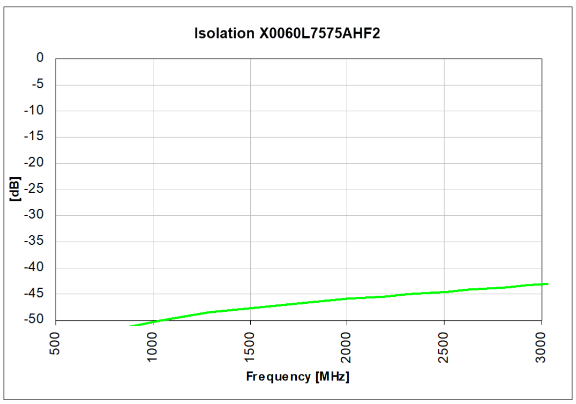
High-Pot testing of these components during the qualification procedure resulted in a minimum breakdown voltage of 1Kv (minimum recorded value). This voltage level corresponds to a breakdown resistance capable of handling at least 12dB peaks over average power levels, for very short durations. The breakdown location consistently occurred across the pads and the ground bar (see illustration below). 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).



Typical Broadband Performance: 500 MHz to 3000 MHz







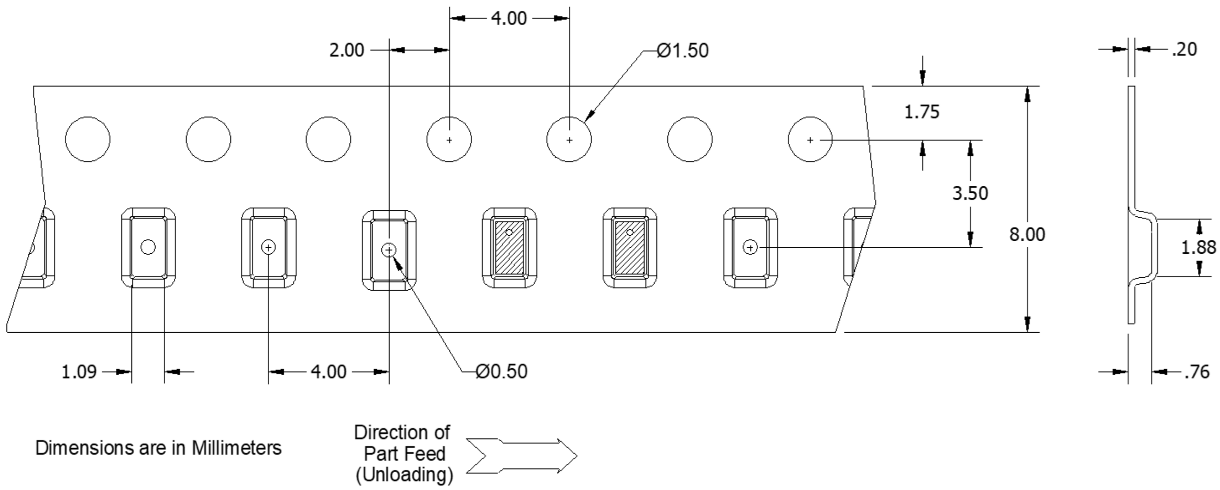
Definition of Measured Specifications:

Parameter	Definition	Mathematical Representation
VSWR (Voltage Standing Wave Ratio)	The impedance match of the coupler to a 50Ω system. A VSWR of 1:1 is optimal.	$VSWR = \frac{V_{max}}{V_{min}}$ Vmax = voltage maxima of a standing wave Vmin = voltage minima of a standing wave
Return Loss	The impedance match of the coupler to a 50Ω system. Return Loss is an alternate means to express VSWR.	$Return\ Loss(dB) = 20log\frac{VSWR+1}{VSWR-1}$
Mean Coupling	At a given frequency (ω_n), coupling is the input power divided by the power at the coupled port. Mean coupling is the average value of the coupling values in the band. N is the number of frequencies in the band.	$Coupling(dB) = C(\omega_n) = 10log\frac{P_{in}(\omega_n)}{P_{cpl}(\omega_n)}$ $Mean\ Coupling(dB) = \frac{\sum_{n=1}^{N} C(\omega_n)}{N}$
Insertion Loss	The input power divided by the sum of the power at the two output ports.	$Insertion\ Loss(dB) = 10log\frac{P_{in}}{P_{cpl}+P_{direct}}$
Transmission Loss	The input power divided by the power at the direct port.	$10log\frac{P_{in}}{P_{direct}}$
Directivity	The power at the coupled port divided by the power at the isolated port.	$10log\frac{P_{cpl}}{P_{iso}}$
Frequency Sensitivity	The decibel difference between the maximum in band coupling value and the mean coupling, and the decibel difference between the minimum in band coupling value and the mean coupling.	Max Coupling (dB) – Mean Coupling (dB) and Min Coupling (dB) – Mean Coupling (dB)
Group Delay	Group delay is average of group delay's from input port to the coupled port	Average (GD-C)
Group Delay (GD-DC)	Group delay is average of group delay's from input port to the direct port	Average (GD-DC)

*100% RF test is performed per spec definition for pin configuration 1 and 2.

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.



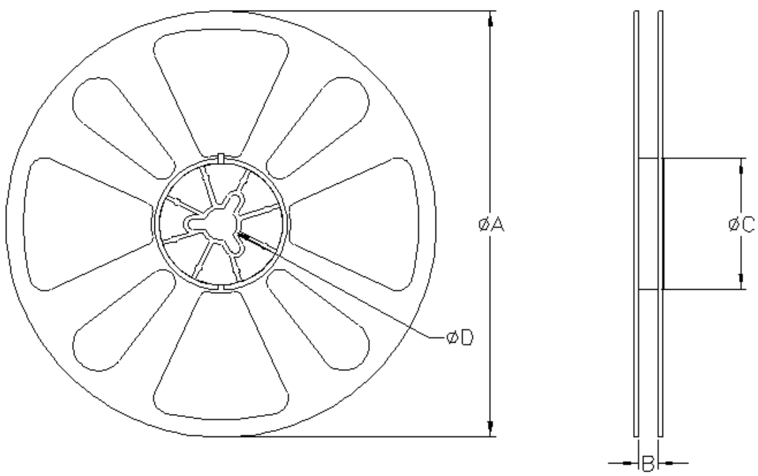


TABLE 1		
QUANTITY/REEL	REEL DIMENSIONS mm	
4000	ØA	177.80
	B	8.00
	ØC	50.80
	ØD	13.00

Contact us:
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