Pico Xinger
20dB Directional Coupler

Description:

The 1P620S Pico Xinger is a low profile, miniature 20dB directional coupler in an easy to use surface mount package designed for MMDS and WLAN applications. The 1P620S is for power and frequency detection as well as power injection. The 1P620S is an ideal solution for the ever-increasing demands of the wireless industry for smaller printed circuit boards and high performance.

Parts have been subjected to rigorous qualification testing and units are 100% tested. They are manufactured using materials with x and y thermal expansion coefficients compatible with common substrates such as FR4, G-10, RF-35, RO4003 and polyimide. Available in 6 of 6 RoHS compliant tin immersion (1P620S).

Features:

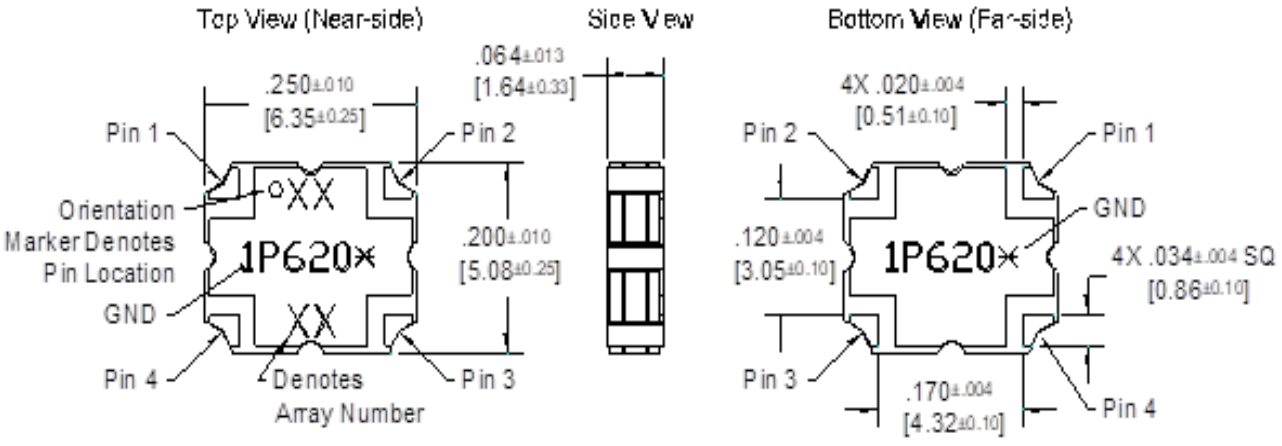
- **2300-2700 MHz**
- **MMDS and WLAN**
- **Very Low Loss**
- **High Directivity**
- **Surface Mountable**
- **Tape And Reel**
- **Lead Free**

Electrical Specifications**

Frequency	Mean Coupling	Insertion Loss	VSWR
MHz	*dB*	*dB Max*	*Max : 1*
2300-2700	20 ± 0.75	0.25	1.22
Freq. Sensitivity	**Directivity**	**Power Handling**	**Operating Temp.**
dB Max	*dB Min*	*Avg. CW Watts @85°C*	*°C*
± 0.2	20	25	-55 to +150

**Specification based on performance of unit properly installed on microstrip printed circuit boards with 50 Ω nominal impedance. Specifications subject to change without notice.

Mechanical Outline:

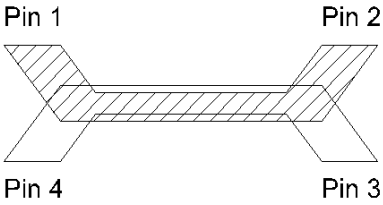


Dimensions are in Inches [Millimeters]
1P620* Rev A Mechanical Outline

*For RoHS Compliant Versions order with S suffix
Tolerances are Non-Cumulative

Hybrid Coupler Pin Configuration

The 1P620S has an orientation marker to denote Pin 1. Once port one has been identified the other ports are known automatically. Please see the chart below for clarification:

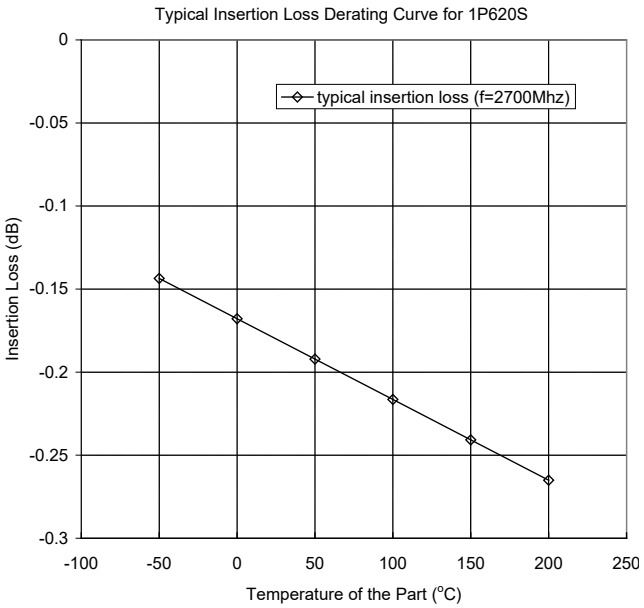


20dB Coupler Pin Configuration

Pin 1	Pin 2	Pin 3	Pin 4
Input	Direct	Isolated	Coupled
Direct	Input	Coupled	Isolated

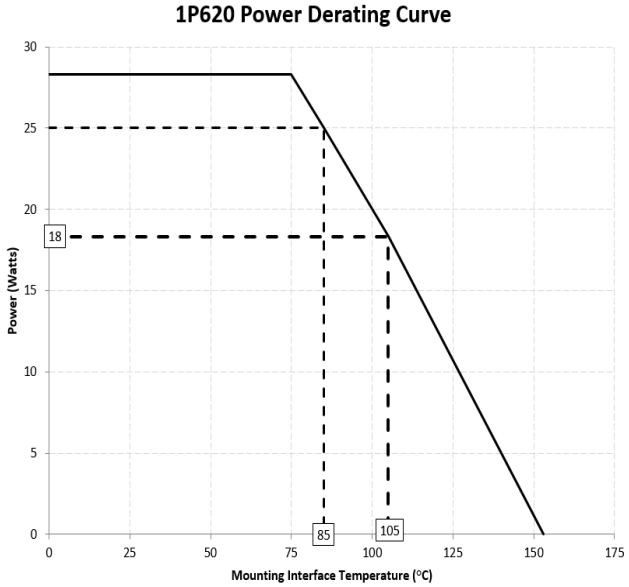
Note: The direct port has a DC connection to the input port and the coupled port has a DC connection to the isolated port.
For optimum IL and power handling performance, use Pin 1 or Pin 2 as inputs.

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 85°C and 150°C. A best-fit line for the measured data is computed and then plotted from -55°C to 150°C.



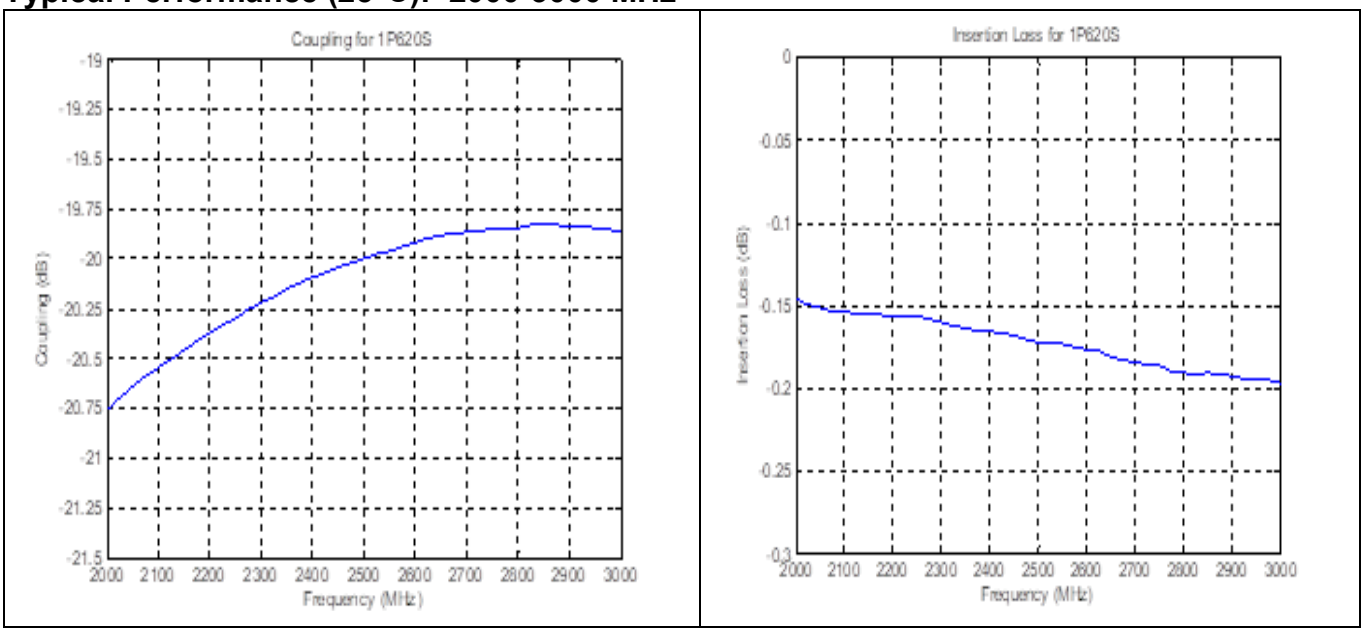
Power Derating

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.

Typical Performance (25°C): 2000-3000 MHz

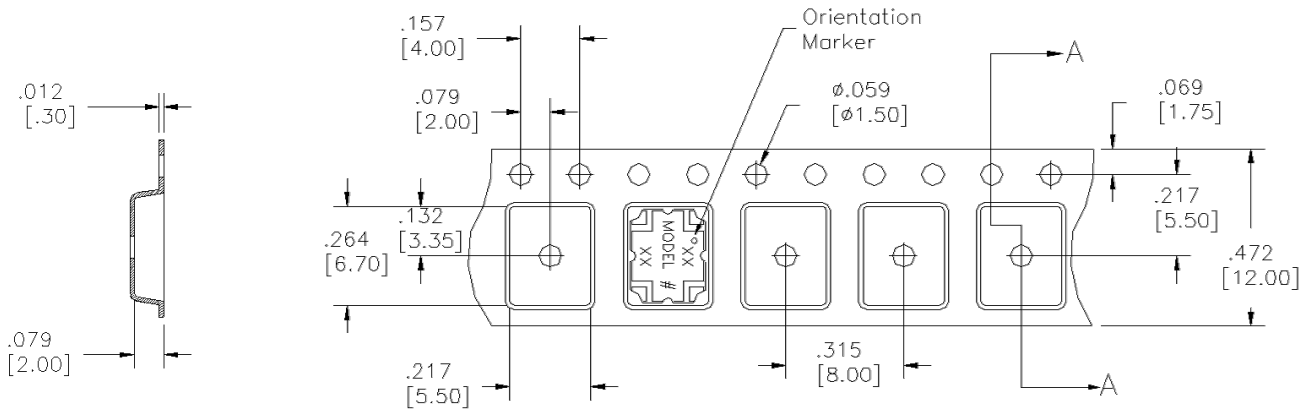


Definition of Measured Specifications

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.	$\mathrm{VSWR} = \frac{V_{max}}{V_{min}}$ 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.	$\mathrm{Return\ Loss(dB)} = 20\log\frac{\mathrm{VSWR}+1}{\mathrm{VSWR}-1}$
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.	$\mathrm{Coupling(dB)} = C(\omega_n) = 10\log\frac{P_{in}(\omega_n)}{P_{cpl}(\omega_n)}$ $\mathrm{Mean\ Coupling(dB)} = \frac{\sum_{n=1}^{N} C(\omega_n)}{N}$
Insertion Loss	The input power divided by the sum of the power at the two output ports.	$\mathrm{Insertion\ Loss(dB)} = 10\log\frac{P_{in}}{P_{cpl}+P_{direct}}$
Transmission Loss	The input power divided by the power at the direct port.	$10\log\frac{P_{in}}{P_{direct}}$
Directivity	The power at the coupled port divided by the power at the isolated port.	$10\log\frac{P_{cpl}}{P_{iso}}$
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)

Packaging and Ordering Information:

Packaging follows EIA-481-2. Parts are oriented in tape as shown below. Minimum order quantities are 2000 per reel and 77 per tube.



Xinger® Tape & Reel Diagram

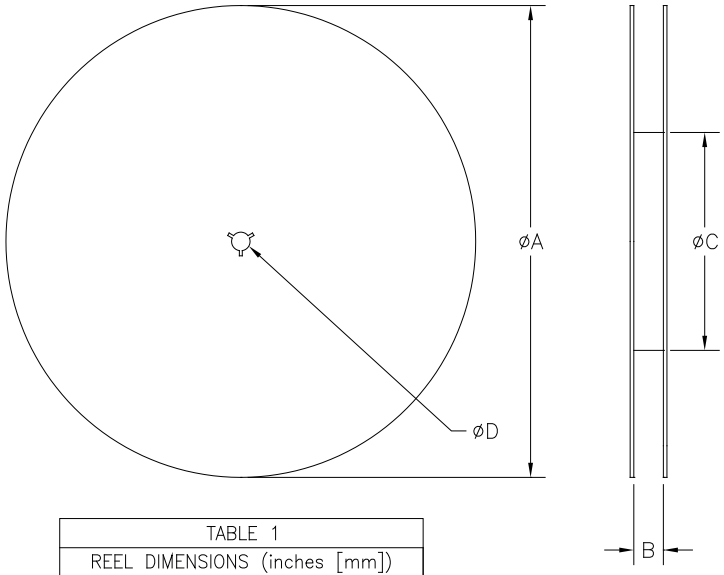


TABLE 1	
REEL DIMENSIONS (inches [mm])	
øA	13.3 [333.0]
B	0.472 [12.0]
øC	4.017 [102.03]
øD	0.512 [13.0]

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