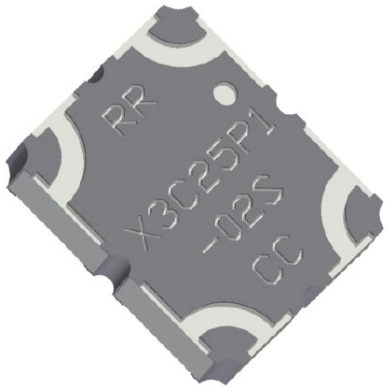


# Xinger III

## Coupler 2 dB, 90°



### Description

The X3C25P1-02SZ is a low profile, low cost high performance 2dB coupler in a new easy to use, manufacturing friendly surface mount package. It is designed for Doherty applications. The X3C25P1-02SZ is designed particularly for Doherty amplifiers, plus signal distribution and other applications where low insertion loss and tight amplitude and phase balance is required. It can be used in high power applications up to 70 watts.

Parts have been subjected to rigorous qualification testing and they are manufactured using materials with coefficients of thermal expansion (CTE) compatible with common substrates such as FR4, G-10, RF-35, RO4003 and polyimide. Produced with 6 of 6 RoHS compliant tin immersion finish.

### Features:

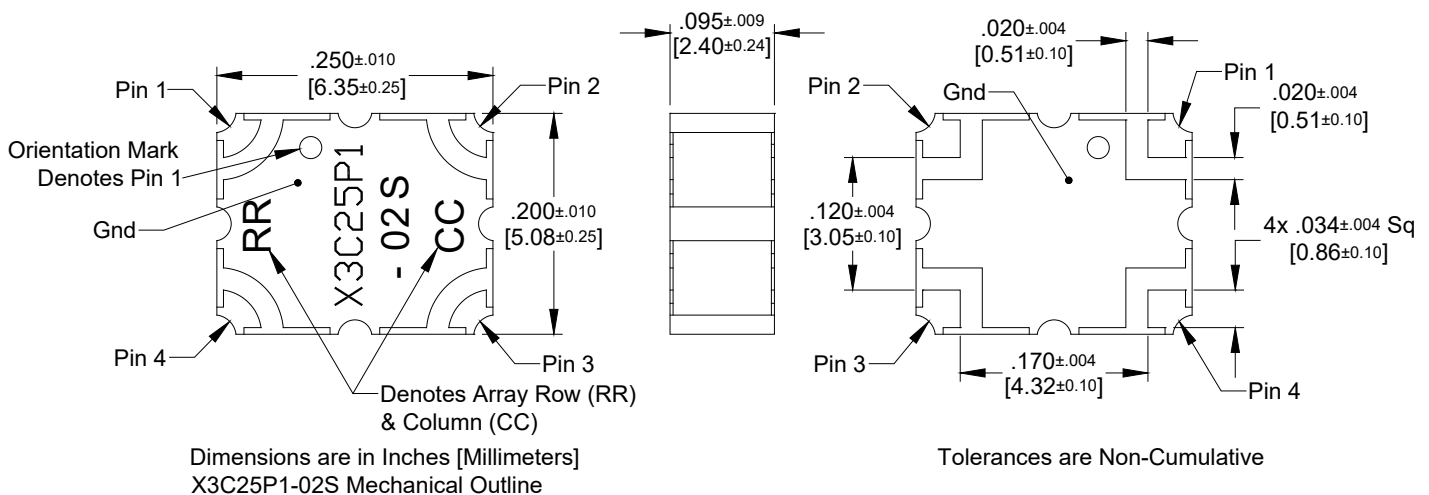
- 2300-2700 MHz
- Doherty Amplifier
- High Power
- Low cost
- Tight Amplitude Balance
- High Isolation
- Production Friendly
- Tape and Reel
- Lead-Free

### Electrical Specifications \*\*

Frequency	Insertion Loss	VSWR	Coupling
MHz	dB Max	Max : 1	dB
2300-2700	0.22	1.22	1.9 ± 0.20
Isolation	Phase	Power	Operating Temp.
dB Min	Degrees	Avg. CW Watts @95°C	°C
20	90 ± 4.0	70	-55 to +150

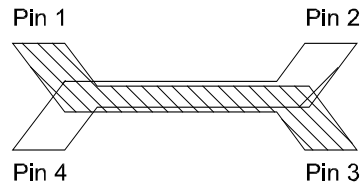
\*\*Specification based on performance of unit properly installed on Anaren Test Board 54147-0001 with small signal applied. Specifications subject to change without notice. Refer to parameter definitions for details.

### Mechanical Outline



## Coupler Pin Configuration

The X3C25P1-02SZ 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:



Configuration	Pin 1	Pin 2	Pin 3	Pin 4
<b>Splitter</b>	Input	Isolated	-5dB $\angle \theta - 90$	-2dB $\angle \theta$
<b>Splitter</b>	Isolated	Input	-2dB $\angle \theta$	-5dB $\angle \theta - 90$
<b>Splitter</b>	-5dB $\angle \theta - 90$	-2dB $\angle \theta$	Input	Isolated
<b>Splitter</b>	-2dB $\angle \theta$	-5dB $\angle \theta - 90$	Isolated	Input

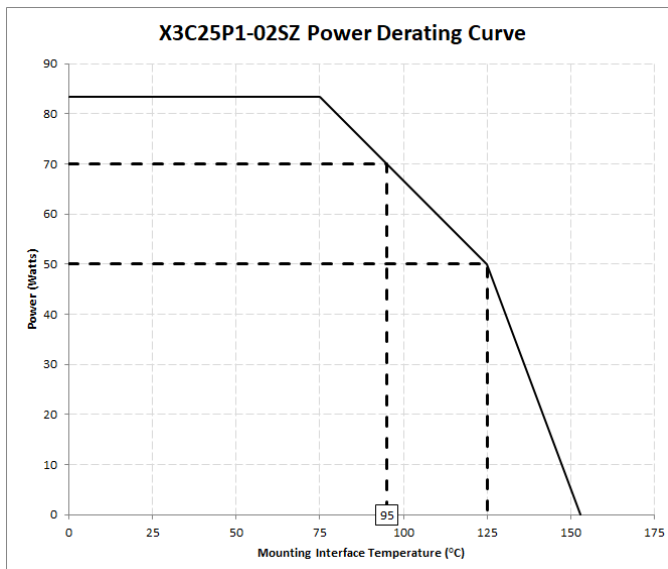


### Power Derating Curve

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 95°C, Xinger coupler will perform reliably as long as the input power is derated to the curve above.



## Mounting

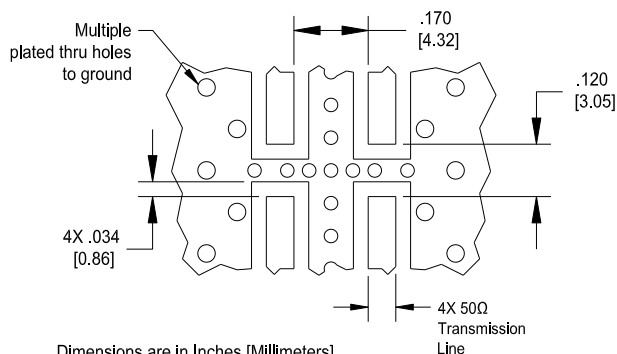
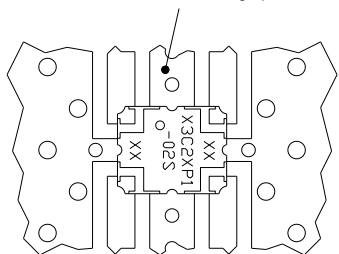
In order for Xinger surface mount couplers to work optimally, there must be 50Ω transmission lines leading to and from all of the RF ports. Also, there must be a very good ground plane underneath the part to ensure proper electrical performance. If either of these two conditions is not satisfied, electrical performance may not meet published specifications.

Overall ground is improved if a dense population of plated through holes connect the top and bottom ground layers of the PCB. This minimizes ground inductance and improves ground continuity. All of the Xinger hybrid and directional couplers are constructed from ceramic filled PTFE composites which possess excellent electrical and mechanical stability.

When a surface mount hybrid coupler is mounted to a printed circuit board, the primary concerns are; ensuring the RF pads of the device are in contact with the circuit trace of the PCB and insuring the ground plane of neither the component nor the PCB is in contact with the RF signal.

## Mounting Footprint

To ensure proper electrical and thermal performance there must be a ground plane with 100% solder connection underneath the part orientated as shown with text facing up.



Dimensions are in Inches [Millimeters]  
X3C25P1-02SZ Mounting Footprint

## Coupler Mounting Process

The process for assembling this component is a conventional surface mount process as shown in Figure 1. This process is conducive to both low and high volume usage.

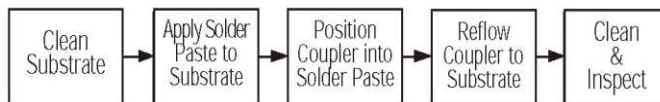


Figure 1: Surface Mounting Process Steps

**Storage of Components:** The Xinger III products are available in an immersion tin finish. Commonly used storage procedures used to control oxidation should be followed for these surface mount components. The storage temperatures should be held between 15°C and 60°C.

**Substrate:** Depending upon the particular component, the circuit material has a coefficient of thermal expansion (CTE) similar to commonly used board substrates such as RF35, RO4003, FR4, polyimide and G-10 materials. The similarity in CTE minimizes solder joint stresses due to similar expansion rates between component and board. Mounting to “hard” substrates (alumina etc.) is possible depending upon operational temperature requirements. The solder surfaces of the coupler are all copper plated with an immersion tin finish.

**Solder Paste:** All conventional solder paste formulations will work well with Anaren’s Xinger III surface mount components. Solder paste can be applied with stencils or syringe dispensers. An example of a stenciled solder paste deposit is shown in Figure 2. As shown in the figure solder paste is applied to the four RF pads and the entire ground plane underneath the body of the part.

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### Packaging and Ordering Information

Parts are available in reels and packaging follows EIA 481-D. Parts are oriented in tape and reel as shown below. Minimum order quantities are 2000 per reel.

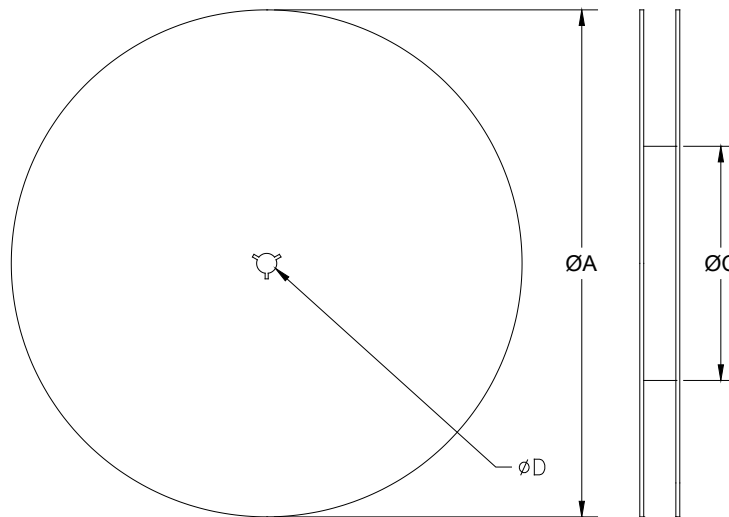
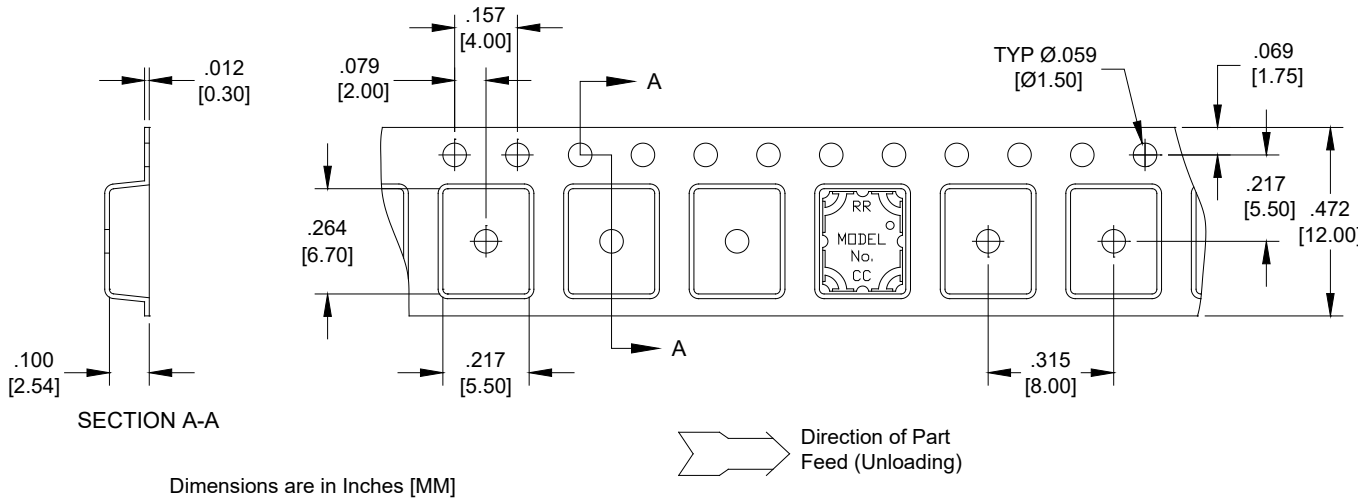


TABLE 1	
REEL DIMENSIONS (inches [mm])	
ØA	13.0 [330.0]
B	.472 [12.0]
ØC	4.017 [102.03]
ØD	0.512 [13.0]

