Xinger®

Pico Xinger
6dB Directional Coupler

Description

The JP506S is a low profile 6dB directional coupler in an easy to use surface mount package covering the WCDMA and other 3G applications. The JP506S is ideal for inline split/combine amplifiers, for power injection, and can be used in most high power designs. 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 and polyimide.

Features:

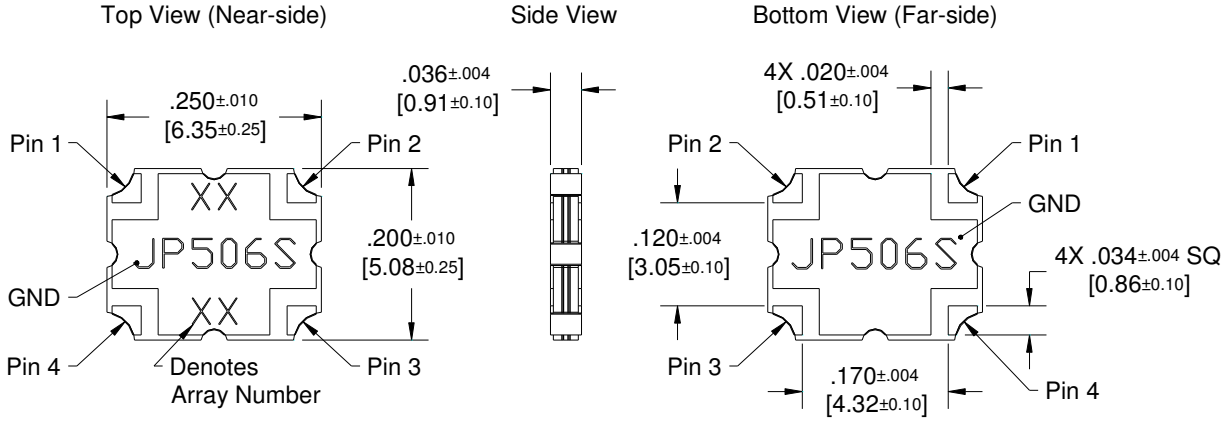
- **2.0 - 2.3GHz**
- **Low loss**
- **High Directivity**
- **Surface Mountable**
- **Tape And Reel**
- **Convenient Package**
- **100% Tested**
- **Lead Free**

ELECTRICAL SPECIFICATIONS**

Frequency	Mean Coupling	Insertion Loss	VSWR	Freq. Sensitivity
GHz	*dB*	*dB Max*	*Max : 1*	*dB Max*
1.805 – 1.880	6.2 ± 0.5	0.30	1.22	±0.20
1.93 – 1.99	6.0 ± 0.5	0.30	1.22	±0.20
2.0 – 2.3	6.0 ± 0.5	0.30	1.22	±0.20
Directivity	**Power Handling**	**ΘJC**	**Operating Temp.**	
dB Min	*Watts*	*ºC / Watt*	*ºC*	
18	20	35.2	-55 to +85	
18	20	35.2	-55 to +85	
20	20	35.2	-55 to +85	

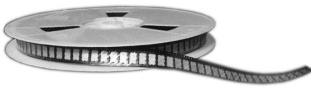
**Specification based on performance of unit properly installed on microstrip printed circuit boards with 50 Ω nominal impedance. Specifications subject to change without notice.

Outline Drawing



Dimensions are in Inches [Millimeters]
JP506S Mechanical Outline

Part is Symmetric About All Axis
Tolerances are Non-Cumulative



Available on Tape and Reel For Pick and Place Manufacturing.

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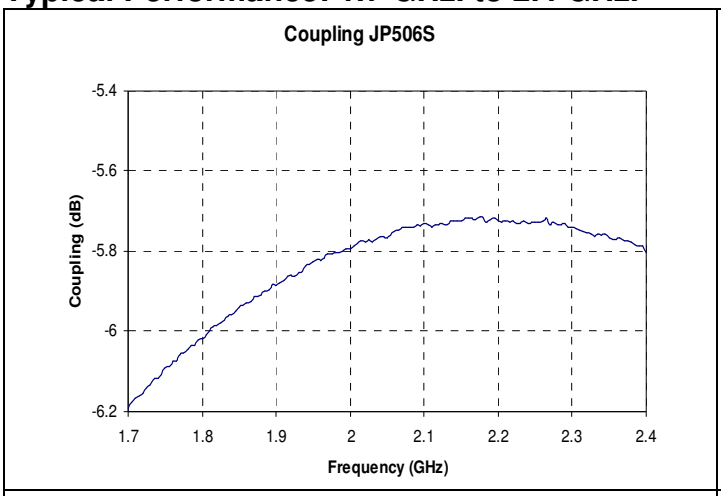
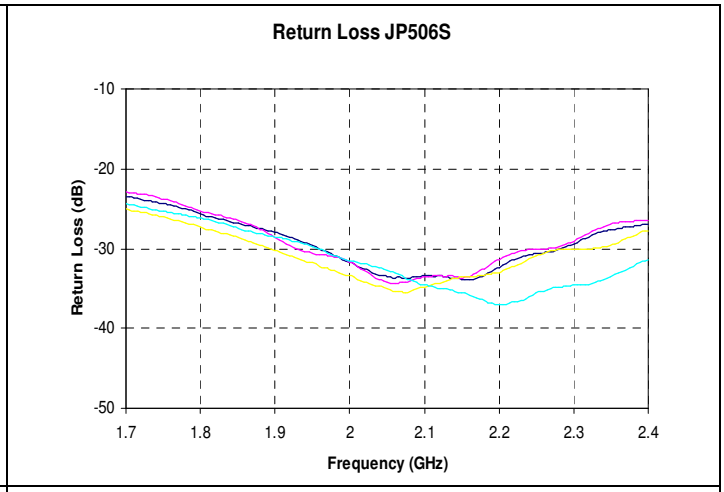
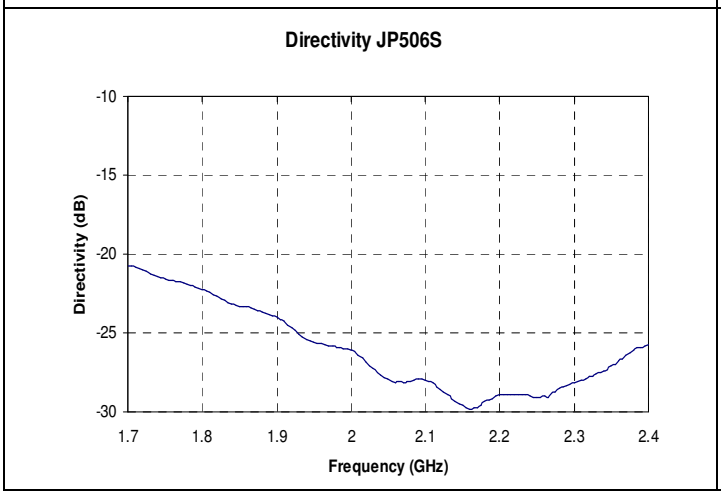
Model JP506S

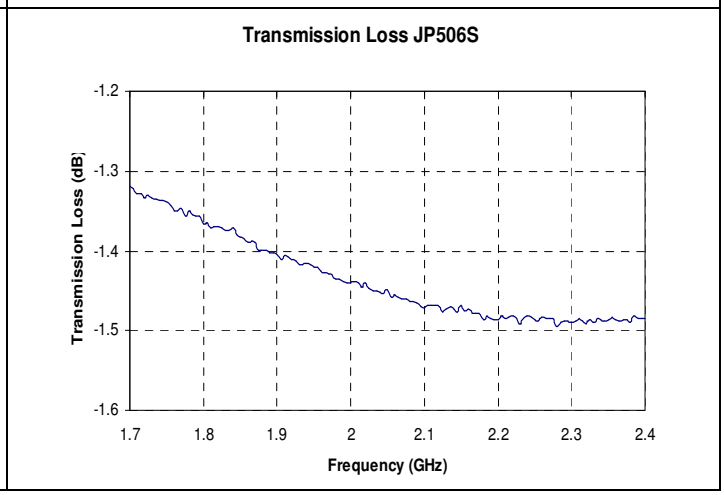
Rev. A

Typical Performance: 1.7 GHz. to 2.4 GHz.









COUPLING

Choice of a coupling value in an application normally depends on the power level of the main (sampled) line. For example, if the coupler is being used to monitor main line power, the coupling value is selected to provide sufficient power to the monitoring device and yet minimize system loss. Note that any coupler reduces power flowing in the main line by the amount coupled off; a 10dB coupler reduces main line power by 1 dB (10%) where a 20dB coupler reduces it by only 0.044dB (1%).

Anaren uses mean coupling and frequency sensitivity with the coupling specification. The mean coupling value is arrived at by periodically sampling the coupling value over the specified band and averaging the readings. Frequency sensitivity is the peak-to-peak variation in coupling over the specified band.

VSWR & DIRECTIVITY

In directional couplers, directivity is specified in lieu of isolation. Directivity is a measure of how well the coupled power is isolated from reflections at the main line output port. For example, open or short-circuiting the output port of a coupler with 20dB directivity would only affect the coupled output power by 1% and only 0.1% for 30dB directivity. High directivity is especially important if the coupler is being used to measure the VSWR of a device at its output port. In this application, accurate measurements of forward and reverse power are required.

In theory, VSWR and directivity characteristics of a coupler are perfect; the input and output ports are perfectly matched and no power is coupled to the isolated port. In practice, factors associated with the design and manufacturing processes limit VSWR and directivity. The

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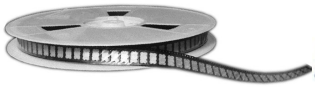

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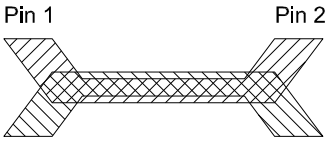
VSWR & DIRECTIVITY (CONTINUED)

internal meandering of the coupled lines and limitations of building perfect 50Ω transitions at the input and output ports of the device are the most significant factors against perfect VSWR and directivity. Typically, VSWR and directivity of 1.15:1 and 20 dB respectively are achieved in practice.

INSERTION LOSS

Coupler insertion loss is defined as the log of the input power divided by the sum of the power at the two output ports. In practice, typical loss is approximately 0.20 dB. Specification limits are somewhat higher due to imperfect test conditions; surface mount couplers must be tested in test fixtures, which negatively affect results.

PIN CONFIGURATION

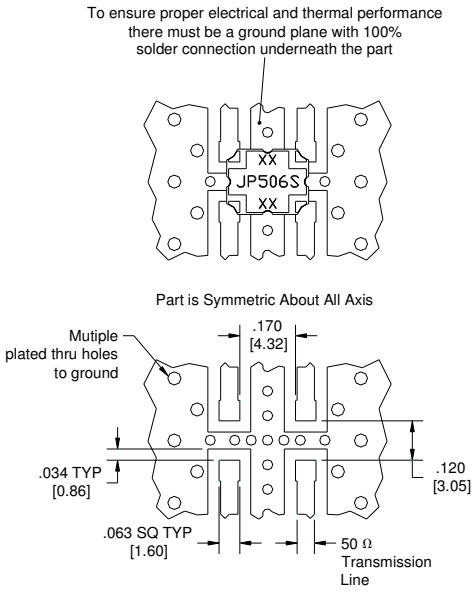


Directional Coupler Pin Configuration				
	Pin 1	Pin 2	Pin 3	Pin 4
Configuration #1	Input	Output	Isolated	Coupled
Configuration #2	Output	Input	Coupled	Isolated
Configuration #3	Isolated	Coupled	Input	Output
Configuration #4	Coupled	Isolated	Output	Input

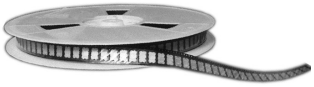
MOUNTING

For Xinger surface mount couplers to operate optimally, there must be 50Ω transmission lines leading to and from all of the RF ports. To ensure proper electrical and thermal performance, there must be a ground plane with 100% colder connection underneath the part. If either of these two conditions is not satisfied, insertion loss, coupling, VSWR and directivity may not meet published specifications.

SUGGESTED FOOTPRINT



Dimensions are in Inches [Millimeters]
JP506S Mounting Footprint



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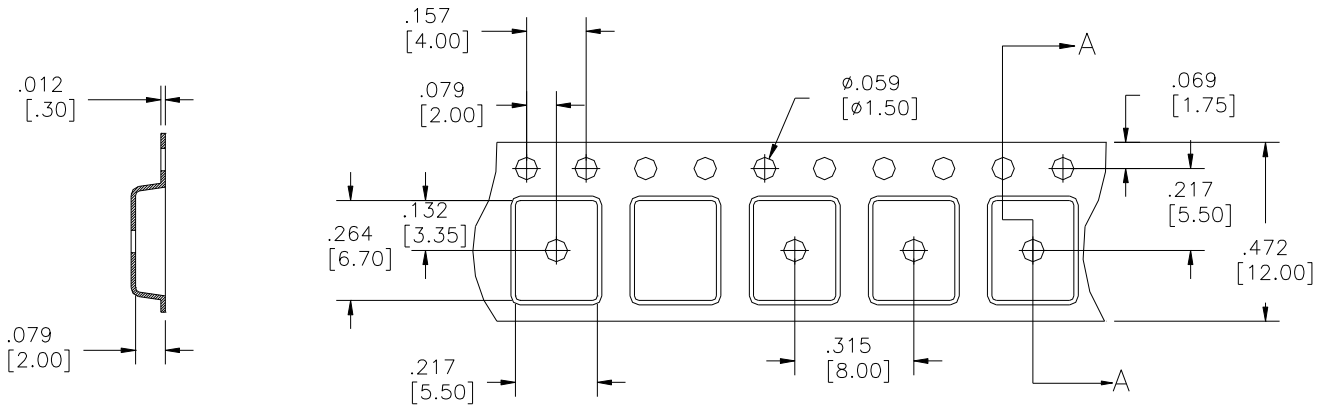
PACKAGING

Packaging follows EIA 481-2.



Xinger® Tape & Reel Diagram

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