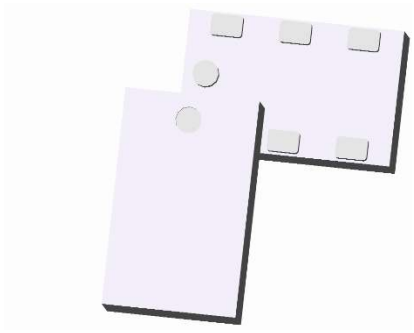
Xinger®

Ultra Low Profile 0805
3 dB, 90° Hybrid Coupler



Description:

The C3337J5003AHF is a low cost, low profile sub-miniature high performance 3 dB coupler in an easy to use surface mount package. It is designed for LTE, WiMax and WiBro applications. The C3337J5003AHF is ideal for balanced power and low noise amplifiers, plus signal distribution and other applications where low insertion loss and tight amplitude and phase balance are required. The C3337J5003AHF is available on tape and reel for pick and place high volume manufacturing.

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 qualification testing and units are 100% RF tested.

Features:

- **3070 – 3900 MHz**
- **0.7mm Height Profile**
- **High Isolation, Low Loss**
- **LTE Bands: 22, 42, 43**
- **WiMax WiBro Applications**
- **Surface Mountable**
- **Tape & Reel**
- **Non-conductive Surface**
- **RoHS Compliant**
- **Halogen-Free**
- **100% RF Tested**
- **-55°C to 105°C**

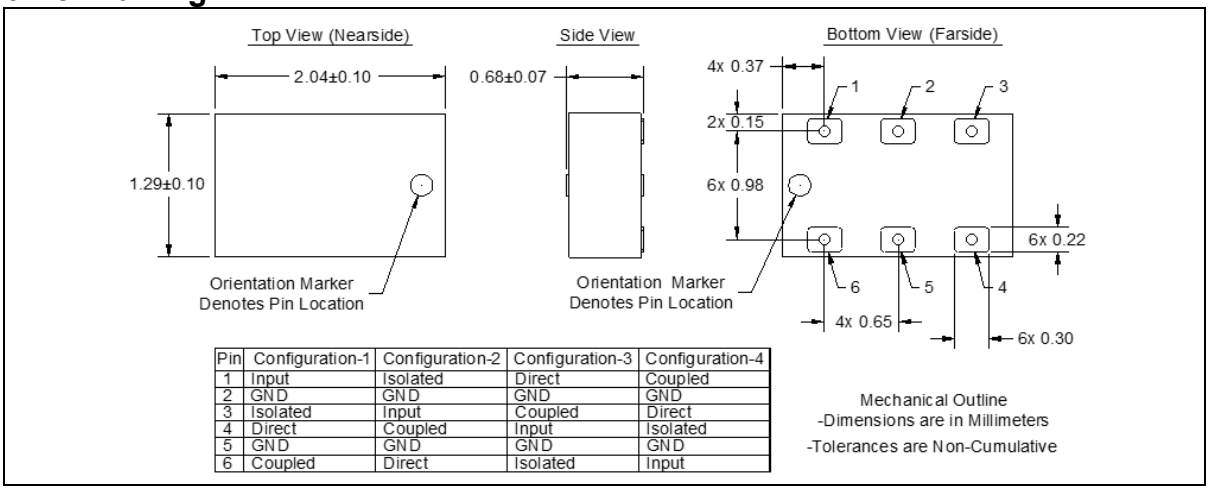
Detailed Electrical Specifications:

Specifications subject to change without notice.

Parameter	ROOM (25°C)									Unit
	Min.	Typ.	Max	Min.	Typ.	Max	Min.	Typ.	Max	
Frequency	3300		3700	3070		3805	3300		3900	MHz
Port Impedance		50			50			50		Ω
Return Loss	15	18		15	18		15	18		dB
Isolation	18	22		18	22		18	22		dB
Insertion Loss		0.2	0.3		0.2	0.4		0.2	0.3	dB
Amplitude Balance		0.3	1		0.3	1.2		0.3	1	dB
Phase Balance (relative to 90°)		3	7		4	7		3	7	Degrees
Group Delay	0.05	0.055	0.06	0.05	0.06	0.07	0.05	0.055	0.06	ns
Power Handling (85ºC)			4			4			4	Watts
Power Handling (105 ºC)			3			3			3	Watts
Operating Temperature	-55		140	-55		140	-55		140	ºC

* Insertion Loss stated at room temperature (Insertion Loss is approximately 0.1 dB higher at +85 ºC)

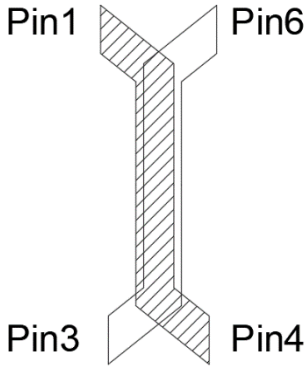
Outline Drawing:



Pin	Configuration-1	Configuration-2	Configuration-3	Configuration-4
1	Input	Isolated	Direct	Coupled
2	GND	GND	GND	GND
3	Isolated	Input	Coupled	Direct
4	Direct	Coupled	Input	Isolated
5	GND	GND	GND	GND
6	Coupled	Direct	Isolated	Input

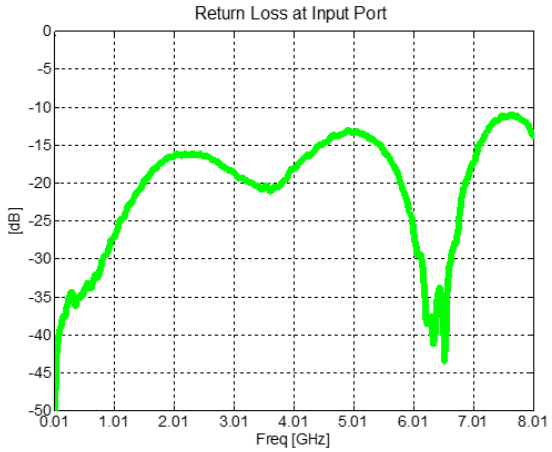
Mechanical Outline
-Dimensions are in Millimeters
-Tolerances are Non-Cumulative

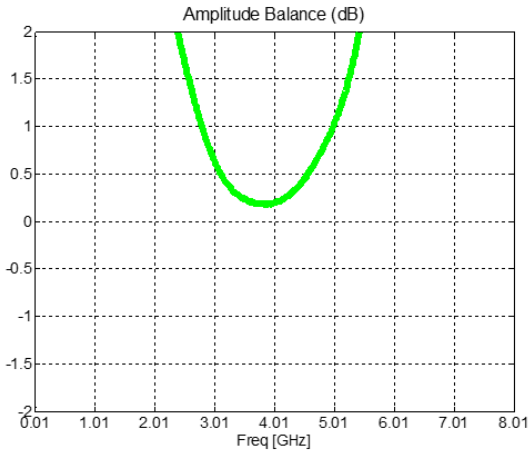
Pin Designation

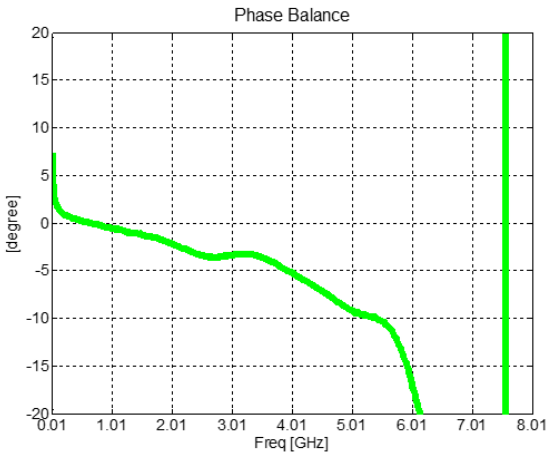


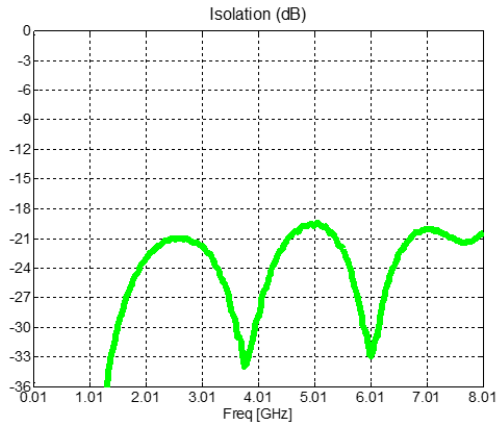
Configuration	Pin 1	Pin 3	Pin 4	Pin 6
Splitter	Input	Isolated	-3dB < Θ -90	-3dB < Θ
Splitter	Isolated	Input	-3dB < Θ	-3dB < Θ -90
Splitter	-3dB < Θ -90	-3dB < Θ	Input	Isolated
Splitter	-3dB < Θ	-3dB < Θ -90	Isolated	Input
***Combiner**	A < Θ -90	A < Θ	Isolated	Output
***Combiner**	A < Θ	A < Θ -90	Output	Isolated
***Combiner**	Isolated	Output	A < Θ -90	A < Θ
***Combiner**	Output	Isolated	A < Θ	A < Θ -90

Typical Broadband Performance: 10 MHz to 8010 MHz

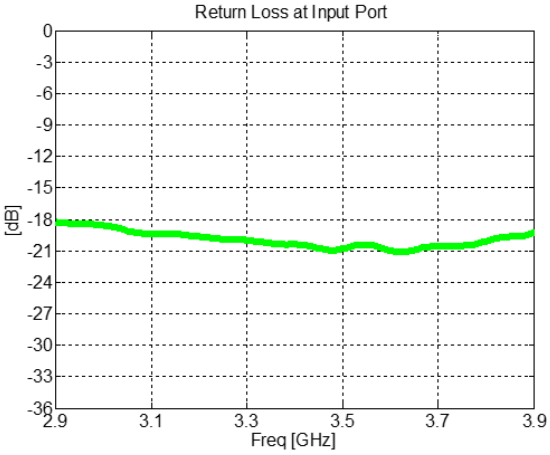


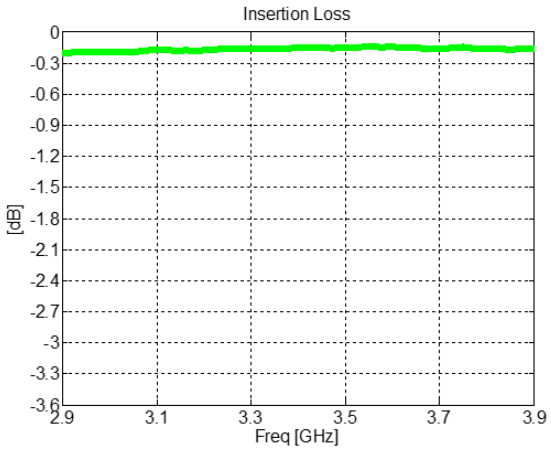


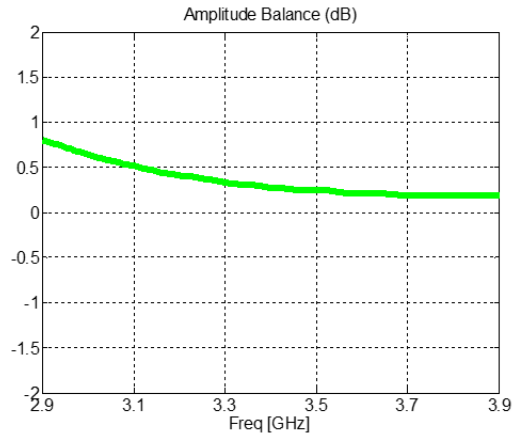


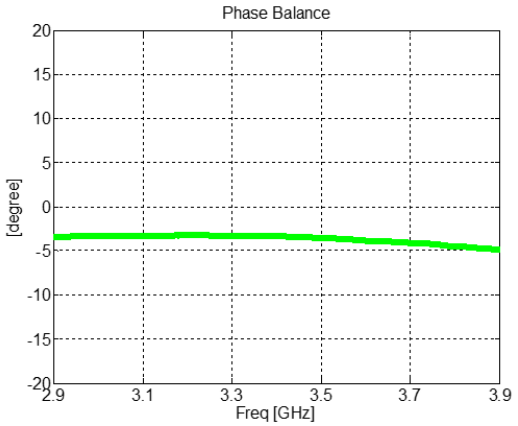


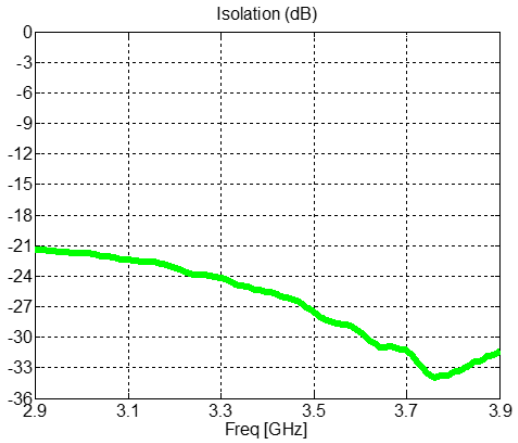
Typical Performance: 2900 MHz to 3900 MHz

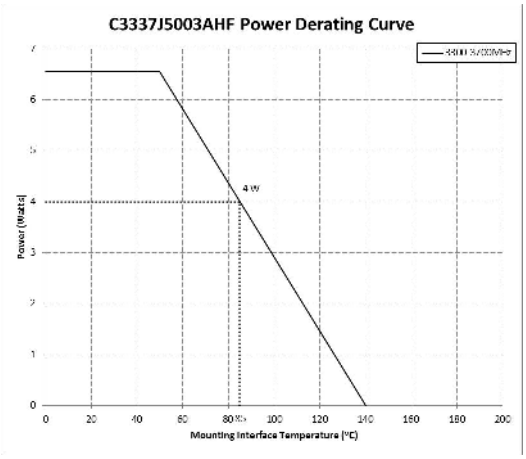












Definition of Measured Specifications

Parameter	Definition	Mathematical Representation *i*, *j*, *k*, *m* is denoted as the port index of input, isolated, direct and coupled port for specific pin configuration shown in the table
Return Loss	The impedance match of the coupler to a 50Ω system. Return Loss is an alternate means to express VSWR.	$RL = 20\log(\lvert S_{ii}\rvert)$
Isolation	The input power divided by the sum of the power at the two output ports.	$20\log\lvert S_{ji}\rvert$
Insertion Loss	The input power divided by the sum of the power at the two output ports.	$10\log_{10}(\lvert S_{mi}\rvert^2 + \lvert S_{ki}\rvert^2)$
Amplitude Balance	The difference in power between the two outputs.	$AB = 20\log\lvert S_{ki}/S_{mi}\rvert$
Phase Balance	The difference in phase angle between the two output ports.	$\angle S_{ki} - \angle S_{mi} + 90°$
Group Delay	Group delay is defined as the average of the mean group delay of the coupling path and the mean group delay of the direct path.	Group delay (ns) = $\frac{Mean\,(\,GD(S_{mi})\,) + Mean\,(\,GD(S_{ki})\,)}{2}$ where "*Mean*" is the arithmetic mean of the group delay over a frequency band.

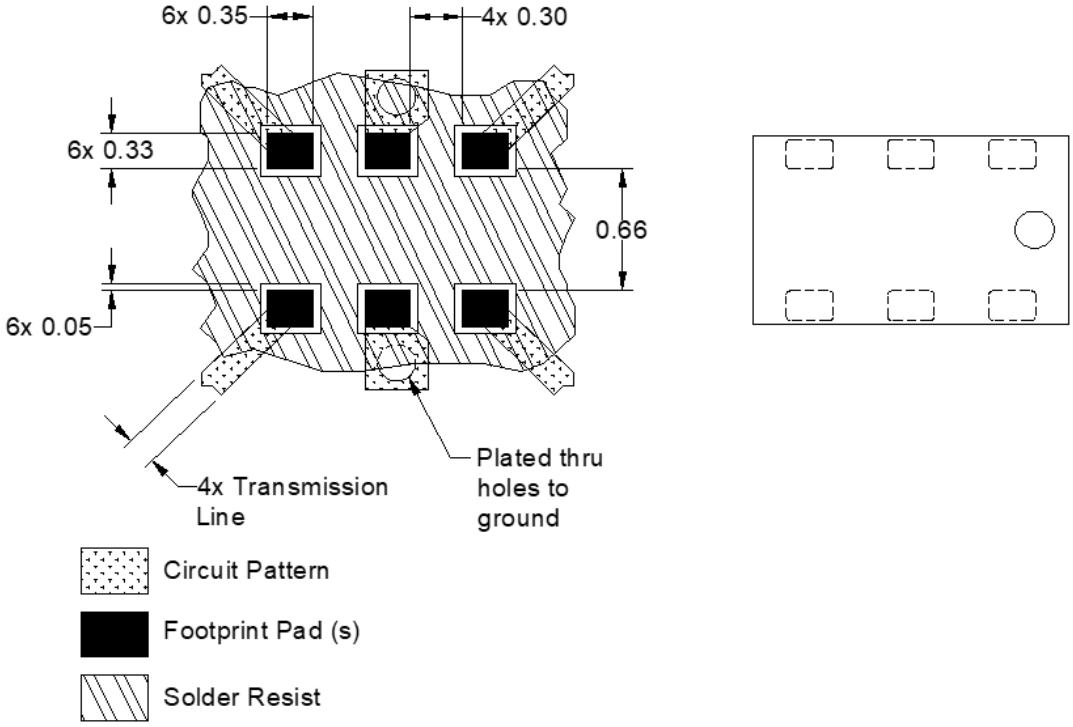
*100% RF test is performed per spec definition for pin configuration 1 and port 1 (input port) is connected to pin1, port 2 (isolated port) is connected to pin 3, port 3 (direct port) is connected to pin 4 and port 4 (isolated) is connected to pin 6.

Mounting Configuration:

In order for Xinger surface mount components to work optimally, the proper impedance transmission lines must be used to connect to the RF ports. If this condition is not satisfied, insertion loss, Isolation and VSWR may not meet published specifications.

All of the Xinger components are constructed from organic PTFE based composites which possess excellent electrical and mechanical stability. Xinger components are compliant to a variety of ROHS and Green standards and ready for Pb-free soldering processes. Pads are Gold plated with a Nickel barrier.

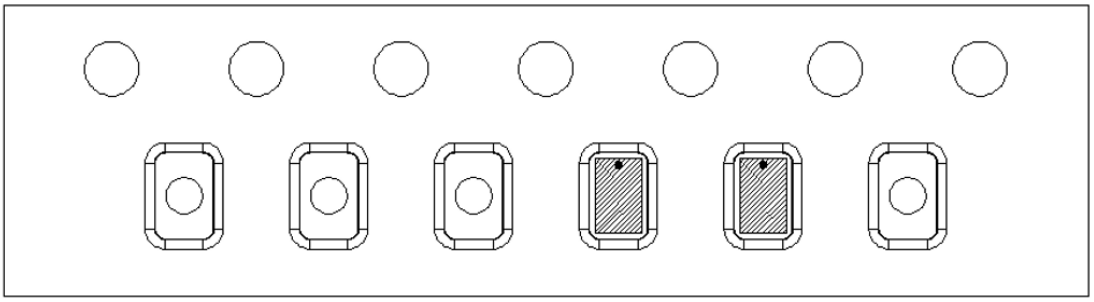
An example of the PCB footprint used in the testing of these parts is shown below. In specific designs, the transmission line widths need to be adjusted to the unique dielectric coefficients and thicknesses as well as varying pick and place equipment tolerances.



Dimensions are in Millimeters
Mounting Footprint

Packaging and Ordering Information:

Parts are available in reel and are packaged per EIA 481-D. Parts are oriented in tape and reel as shown below. Minimum order quantities are 10,000 per reel.



Direction of Part Feed (Unloading)

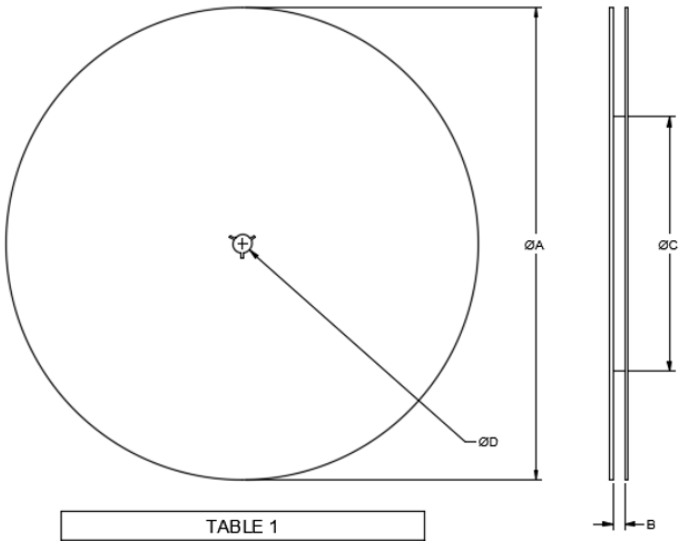


TABLE 1	
REEL DIMENSIONS (inches [mm])	
ØA	13.0 [330.0]
B	.315 [8.0]
ØC	7.0 [177.8]
ØD	.512 [13.0]

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