



# THC4250A03

## Hybrid Coupler 3dB, 90°

Rev A1.0

The THC4250A03 is a low profile, high performance 3dB hybrid coupler in a new easy to use, manufacturing friendly surface mount package. The THC4250A03 is particularly for balanced power and low noise amplifiers, plus signal designed distribution and other applications where low insertion loss and tight amplitude and phase balance is required. It can be used in power applications up to 150 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, RO4350 and polyimide.

### Features:

- . 2500–6000 MHz
- . Low Insertion Loss
- . Tight Amplitude Balance
- . High Isolation
- . Low VSWR
- . Good Repeatability
- . CTE compatible with FR4, G-10, RF-35, RO4350B and polyimide
- . Immersion gold, prevent surface oxidation & scratch
- . RoHS Compliant

### Electrical Specifications

Frequency	Isolation	Insertion Loss	VSWR	Amplitude Balance
MHz	dB Min	dB Max	Max:1	dB Max
2500-6000	20.0	0.25	1.22	±0.65

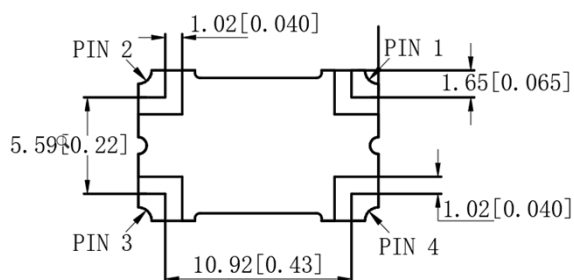
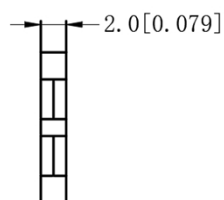
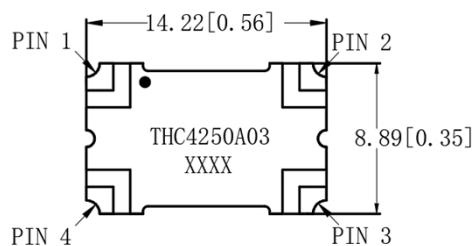
  

Phase Balance	Power	Size	Thickness	Operating Temp.
Degrees	Avg.CW.Watts	mm	mm	°C
90±3.0	150	14.22*8.89	2.0	-55 to+105

TOP VIEW

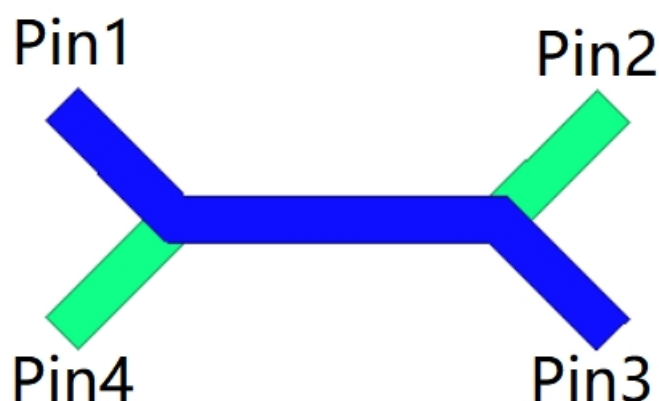
SIDE VIEW

BOTTOM VIEW



## Hybrid Coupler Pin Configuration

The THC4250A03 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	$-3\text{dB} \angle \theta - 90^\circ$	$-3\text{dB} \angle \theta$
<b>Splitter</b>	Isolated	Input	$-3\text{dB} \angle \theta$	$-3\text{dB} \angle \theta - 90^\circ$
<b>Splitter</b>	$-3\text{dB} \angle \theta - 90^\circ$	$-3\text{dB} \angle \theta$	Input	Isolated
<b>Splitter</b>	$-3\text{dB} \angle \theta$	$-3\text{dB} \angle \theta - 90^\circ$	Isolated	Input
<b>Combiner</b>	$A \angle \theta - 90^\circ$	$A \angle \theta$	Isolated	Output
<b>Combiner</b>	$A \angle \theta$	$A \angle \theta - 90^\circ$	Output	Isolated
<b>Combiner</b>	Isolated	Output	$A \angle \theta - 90^\circ$	$A \angle \theta$
<b>Combiner</b>	Output	Isolated	$A \angle \theta$	$A \angle \theta - 90^\circ$

Note:

“A” is the amplitude of the applied signals. When two quadrature signals with equal amplitudes are applied to the coupler as described in the table, they will combine at the output port. If the amplitudes are not equal, some of the applied energy will be directed to the isolated port.



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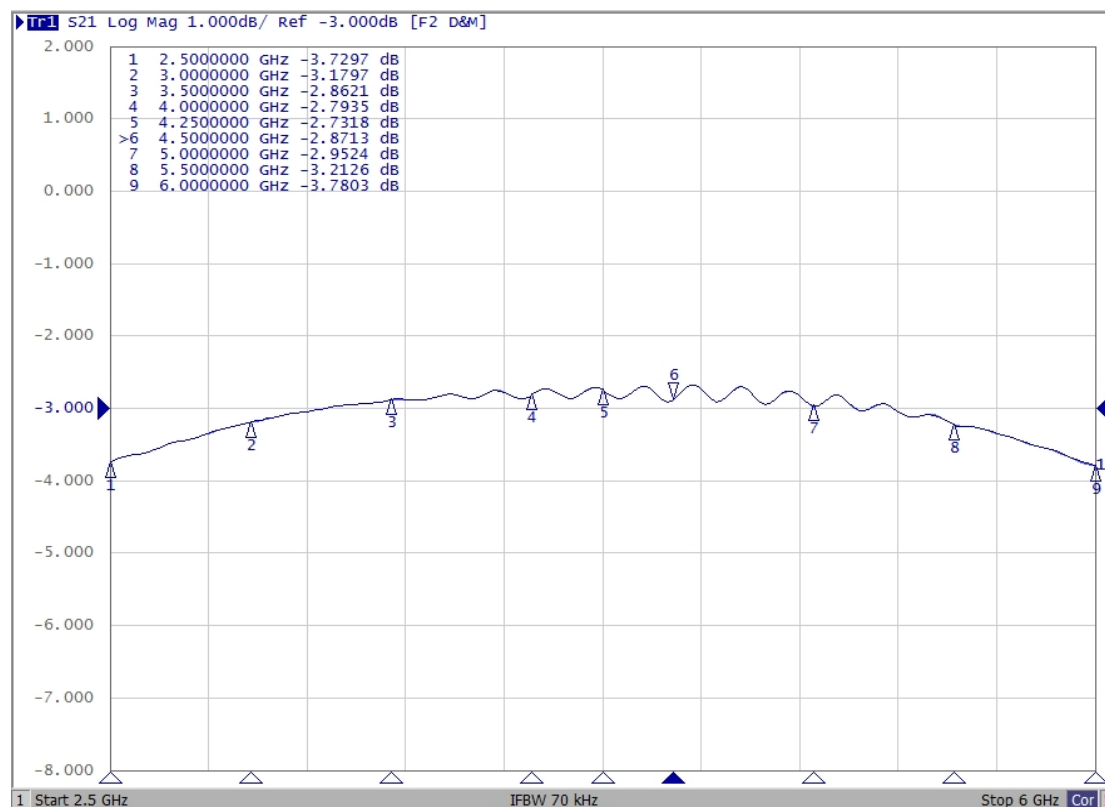
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## Typical Performance Data

Frequency		MHz	2500	3000	3500	4000	4250	4500	5000	5500	6000
Coupling		dB	-3.73	-3.18	-2.86	-2.79	-2.73	-2.87	-2.95	-3.21	-3.78
Transmission		dB	-2.47	-3.02	-3.26	-3.40	-3.45	-3.53	-3.52	-3.23	-2.79
Insertion Loss		dB	-0.08	-0.09	-0.10	-0.09	-0.08	-0.18	-0.22	-0.22	-0.22
Isolation		dB	-24.46	-27.86	-29.37	-25.39	-23.52	-22.21	-20.68	-20.66	-21.70
Phase		degree	91.11	90.96	90.71	91.43	91.20	92.62	92.61	91.59	91.71
VSWR	Input	/	1.19	1.15	1.08	1.03	1.04	1.07	1.08	1.03	1.06
	coupler	/	1.14	1.08	1.08	1.12	1.14	1.16	1.17	1.11	1.00
	Transmission	/	1.16	1.11	1.08	1.04	1.03	1.05	1.13	1.18	1.15
	Isolated	/	1.20	1.13	1.08	1.11	1.14	1.17	1.19	1.14	1.05

## Coupling(dB):



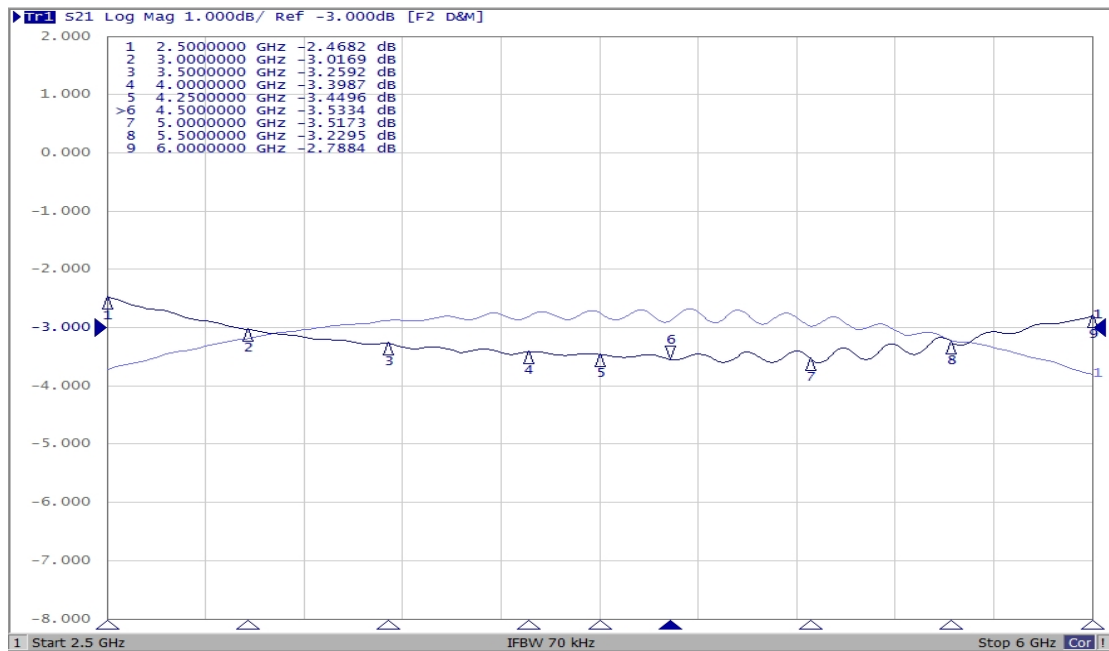


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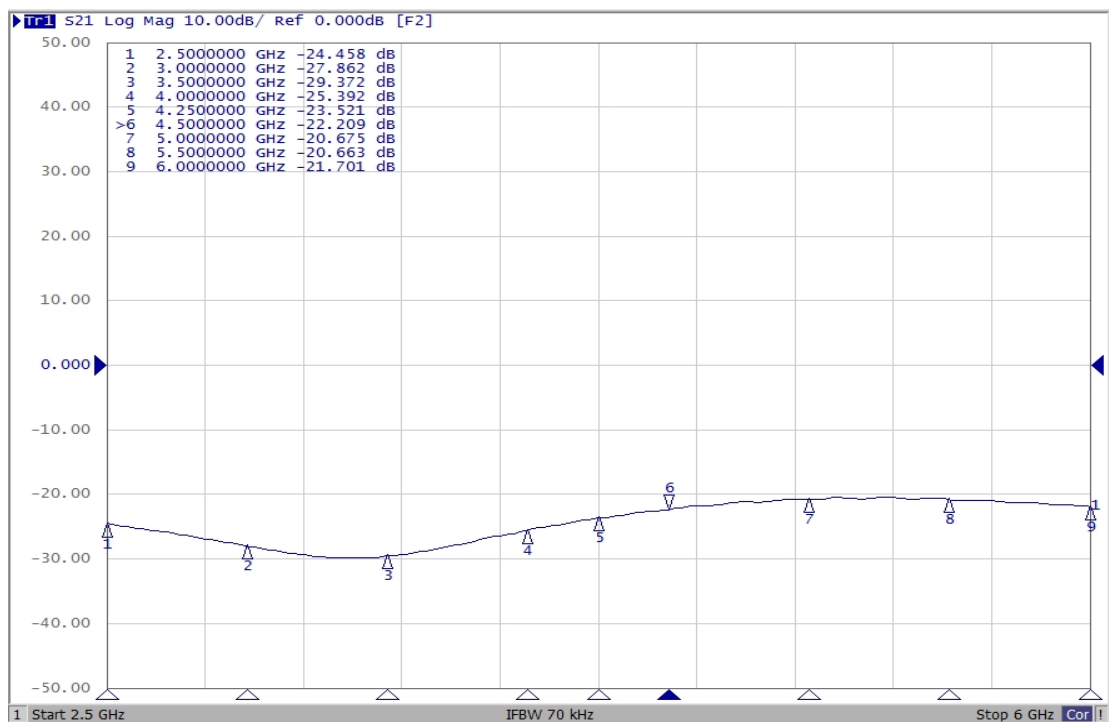
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## Transmission(dB):



## Isolation(dB):





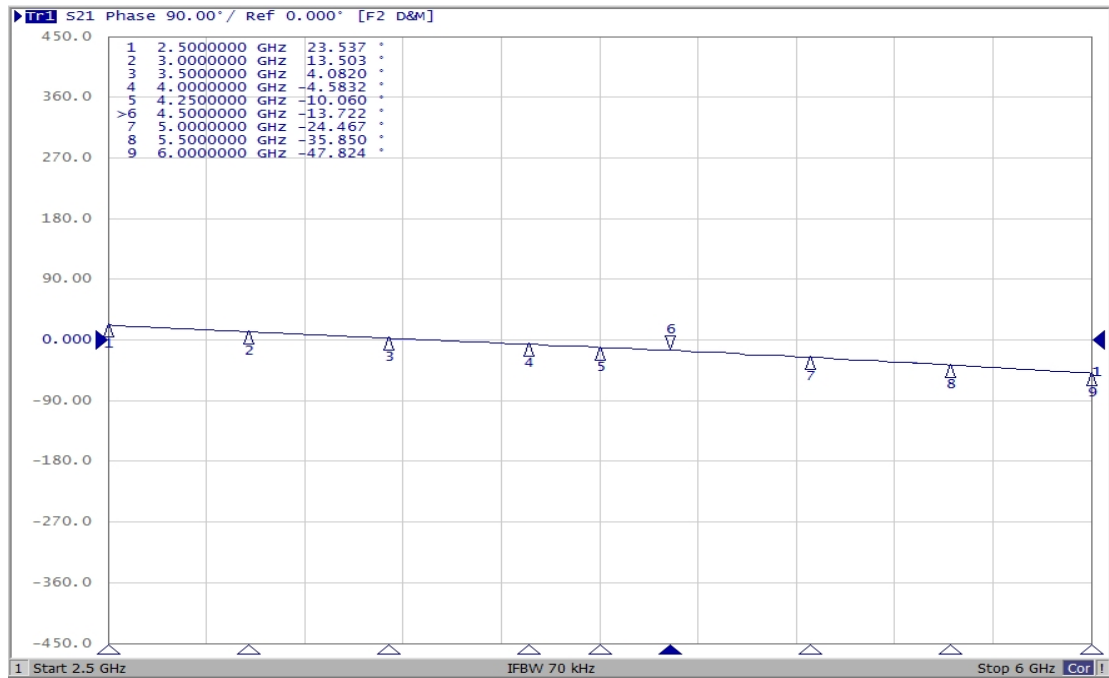
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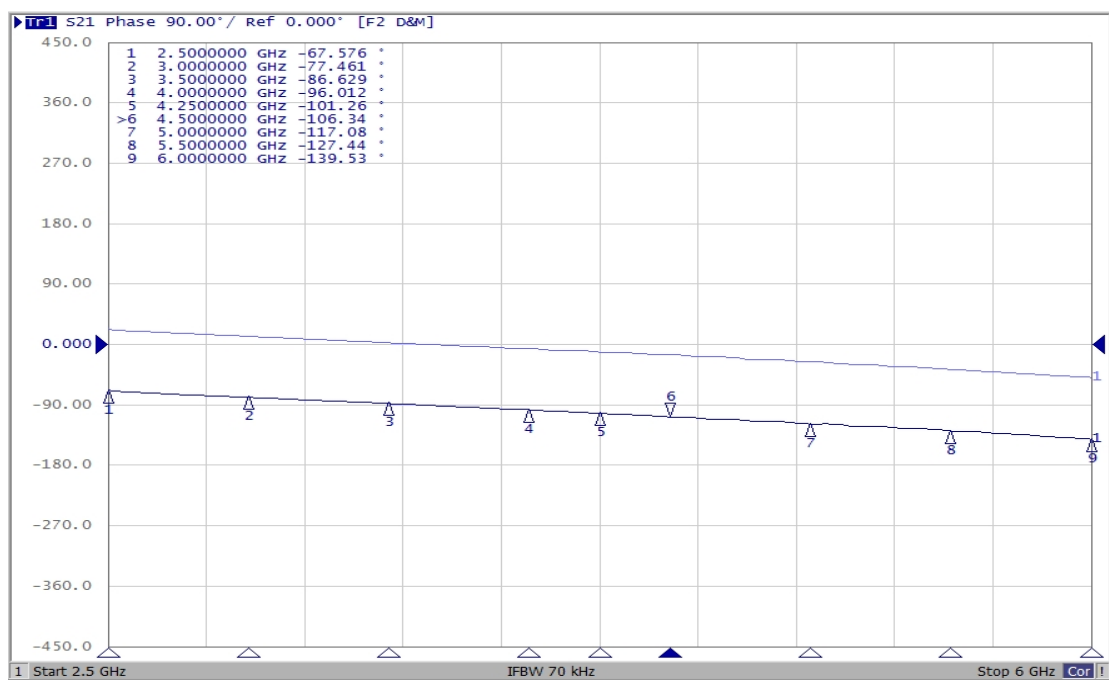
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Phase(degree):

Coupling Phase(degree):



Transmission Phase(degree):





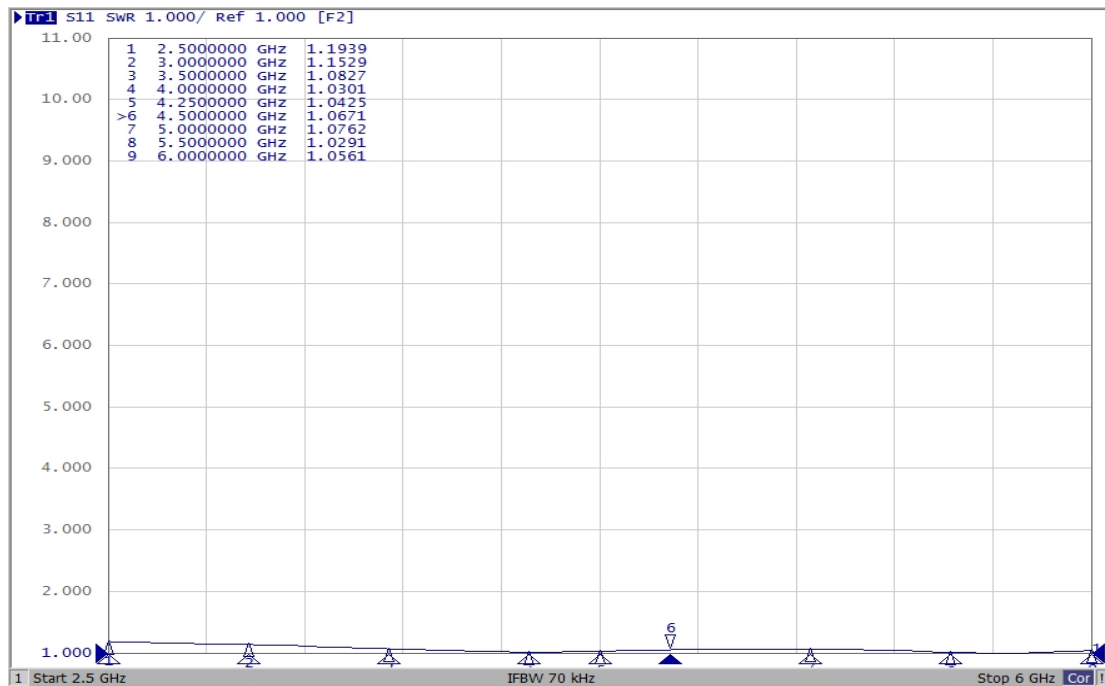
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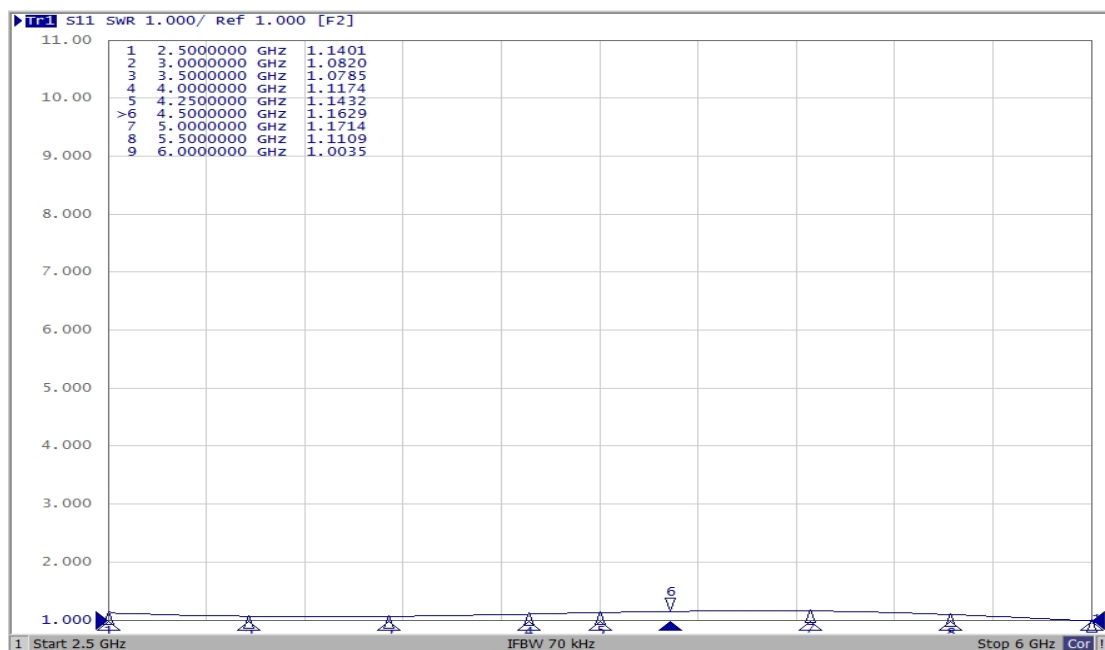
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**VSWR :**

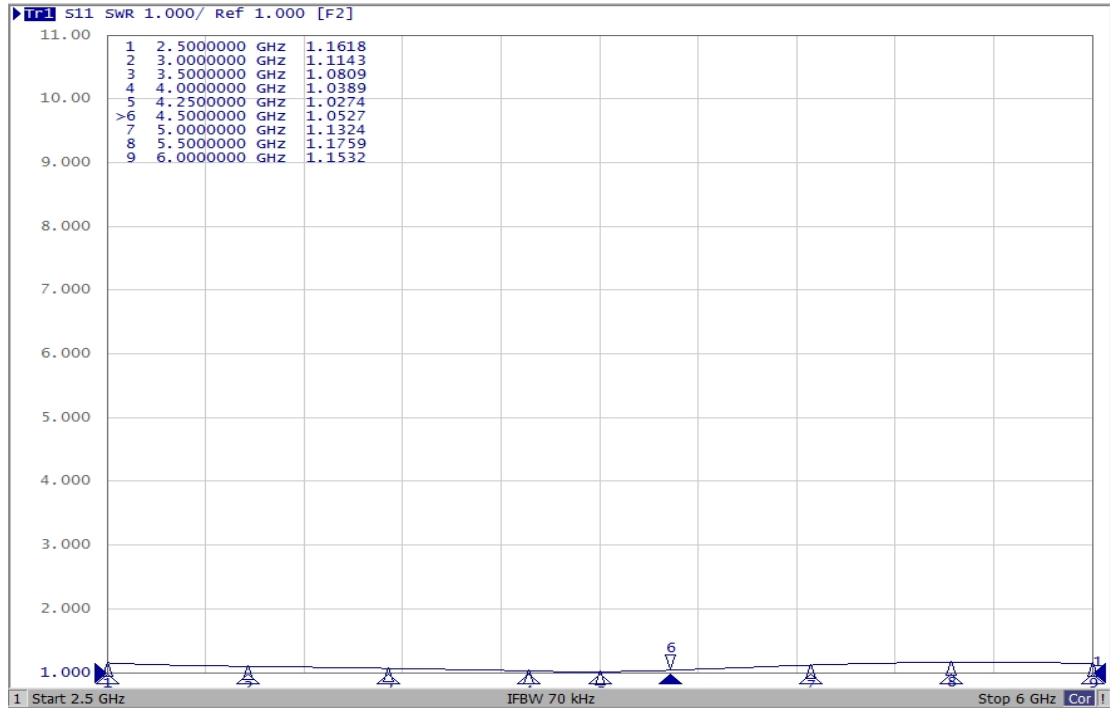
Input Port:



Coupling Port:



## Transmission Port:



## Isolation Port:

