



# THC1900E03

## Hybrid Coupler 3dB, 90°

Rev A1.0

The THC1900E03 is a low profile, high performance 3dB hybrid coupler in a new easy to use, manufacturing friendly surface mount package. It is designed for AMPS Band applications. The THC1900E03 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, R04350 and polyimide.

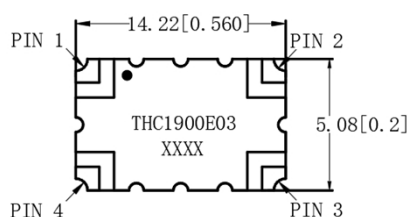
### Features:

- . 1500-2300 MHz
- . AMPS
- . High Power
- . Very Low Loss
- . Tight Amplitude Balance
- . High Isolation
- . Low VSWR
- . Good Repeatability
- . CTE compatible with FR4, G-10, RF-35, R04350B and polyimide
- . Immersion gold, prevent surface oxidation & scratch
- . RoHS Compliant
- . Tape & Reel Package available

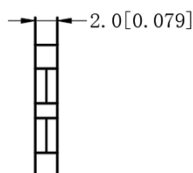
### Electrical Specifications

Frequency	Isolation	Insertion Loss	VSWR	Amplitude Balance
MHz	dB Min	dB Max	Max:1	dB Max
1500-2300	-25.0	0.15	1.16	±0.35
Phase Balance	Power	Size	Thickness	Operating Temp.
Degrees	Avg.CW.Watts	mm	mm	°C
90±1.5	150	14.22*5.08	2.0	-55 to+105

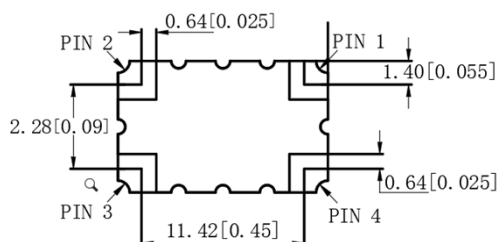
### TOP VIEW



### SIDE VIEW

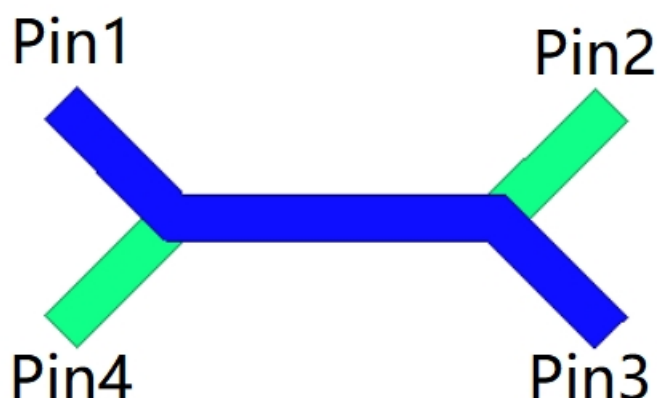


### BOTTOM VIEW



## Hybrid Coupler Pin Configuration

The THC1900E03 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:

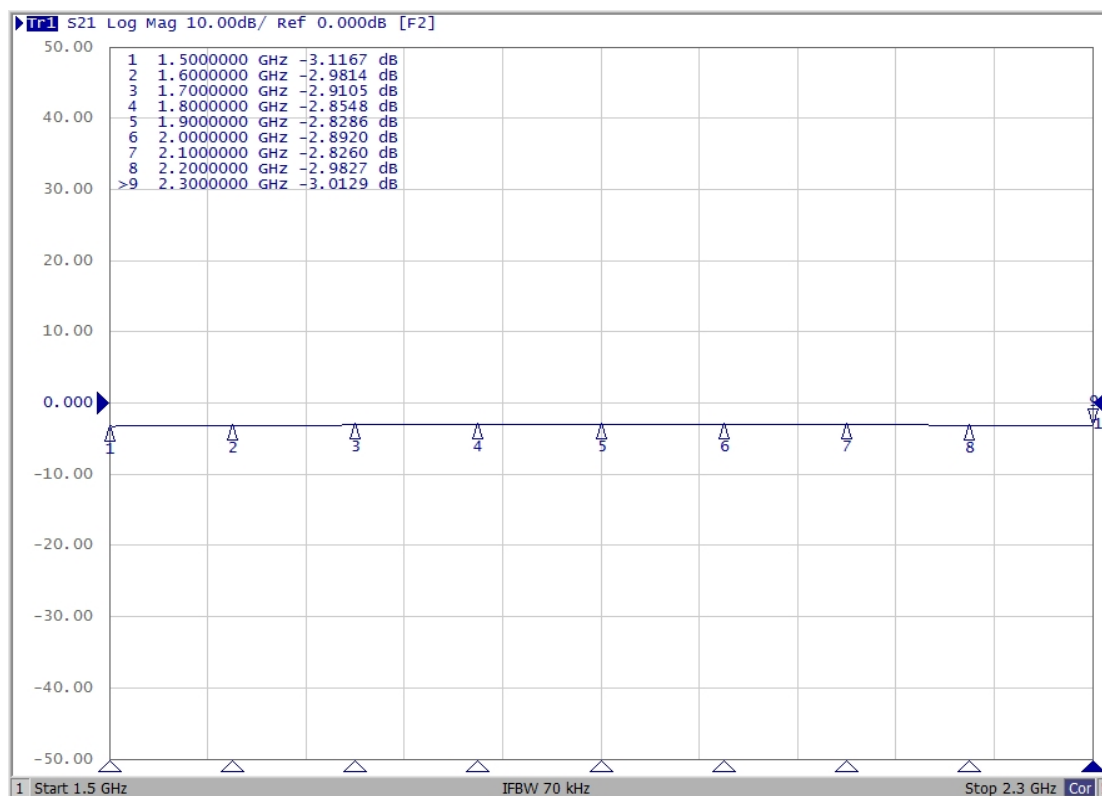
“A” is the amplitude of the applied signals. When two quadrature signals with equal amplitudes are applied to the coupler as described in the table, they will combine at the output port. If the amplitudes are not equal, some of the applied energy will be directed to the isolated port.

## Typical Performance Data

Frequency		MHz	1500	1600	1700	1800	1900	2000	2100	2200	2300
Coupling		dB	-3.12	-2.98	-2.91	-2.85	-2.83	-2.89	-2.83	-2.98	-3.01
Transmission		dB	-3.19	-3.32	-3.39	-3.48	-3.50	-3.56	-3.48	-3.47	-3.38
Insertion Loss		dB	-0.15	-0.14	-0.14	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15
Isolation		dB	-25.04	-25.90	-26.85	-27.97	-29.07	-30.09	-30.34	-29.61	-28.05
Phase		degree	89.63	89.66	89.96	89.89	90.33	89.94	90.38	90.29	90.30
VSWR	Input	/	1.13	1.12	1.10	1.09	1.08	1.07	1.08	1.08	1.10
	coupler	/	1.16	1.13	1.10	1.06	1.04	1.02	1.04	1.08	1.11
	Transmission	/	1.13	1.11	1.10	1.08	1.07	1.05	1.04	1.03	1.03
	Isolated	/	1.14	1.12	1.09	1.08	1.06	1.06	1.05	1.07	1.09

## Typical Performance

### Coupling(dB):

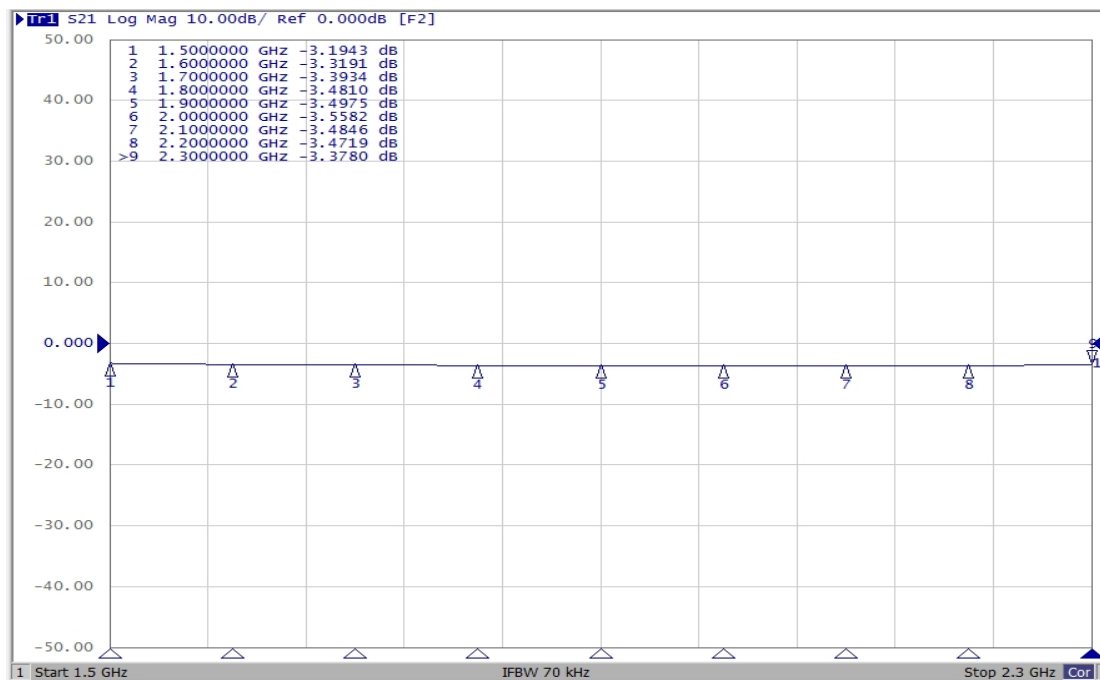




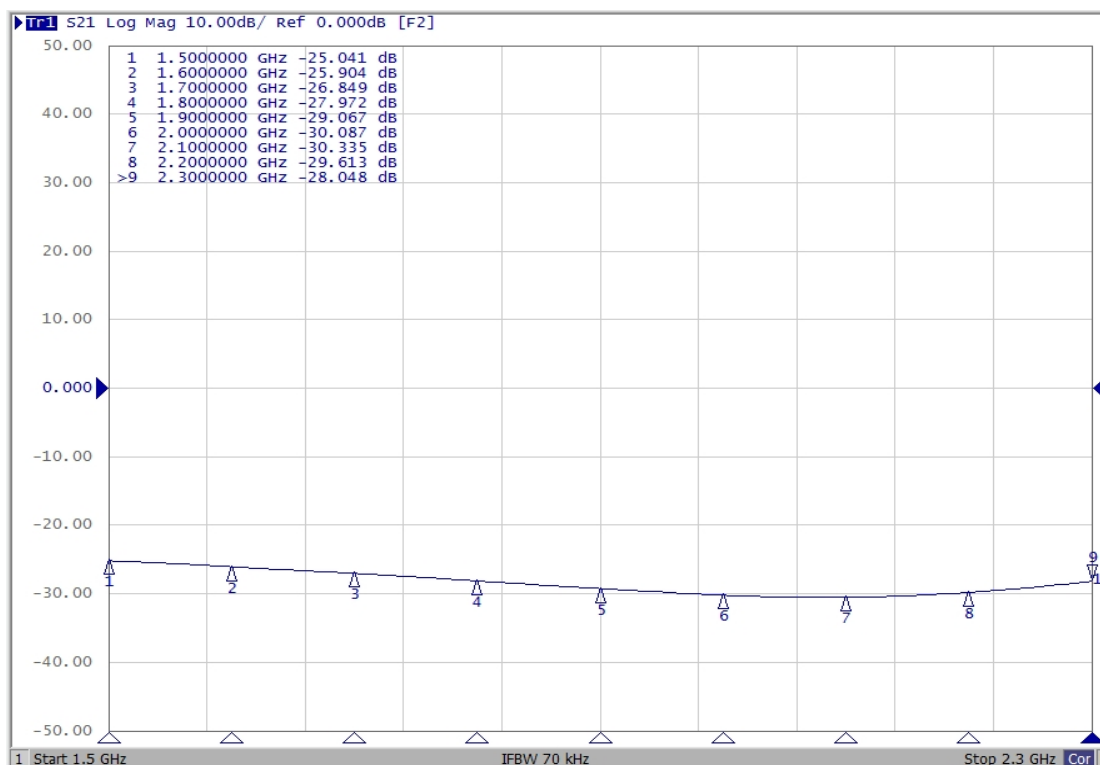
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## Transmission(dB):

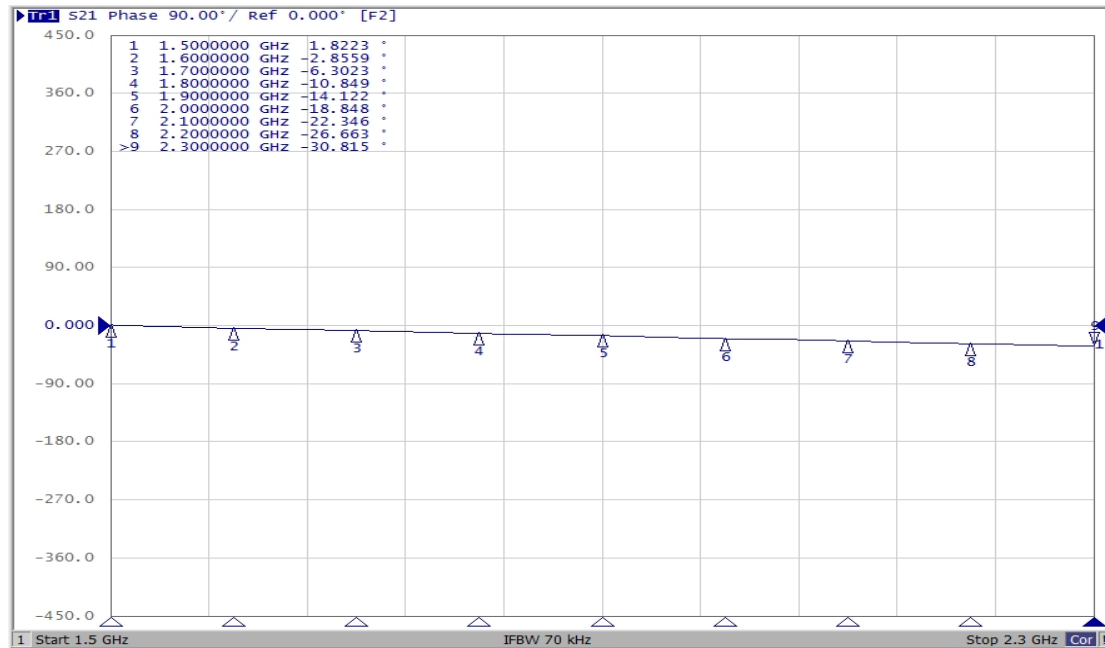


## Isolation(dB):

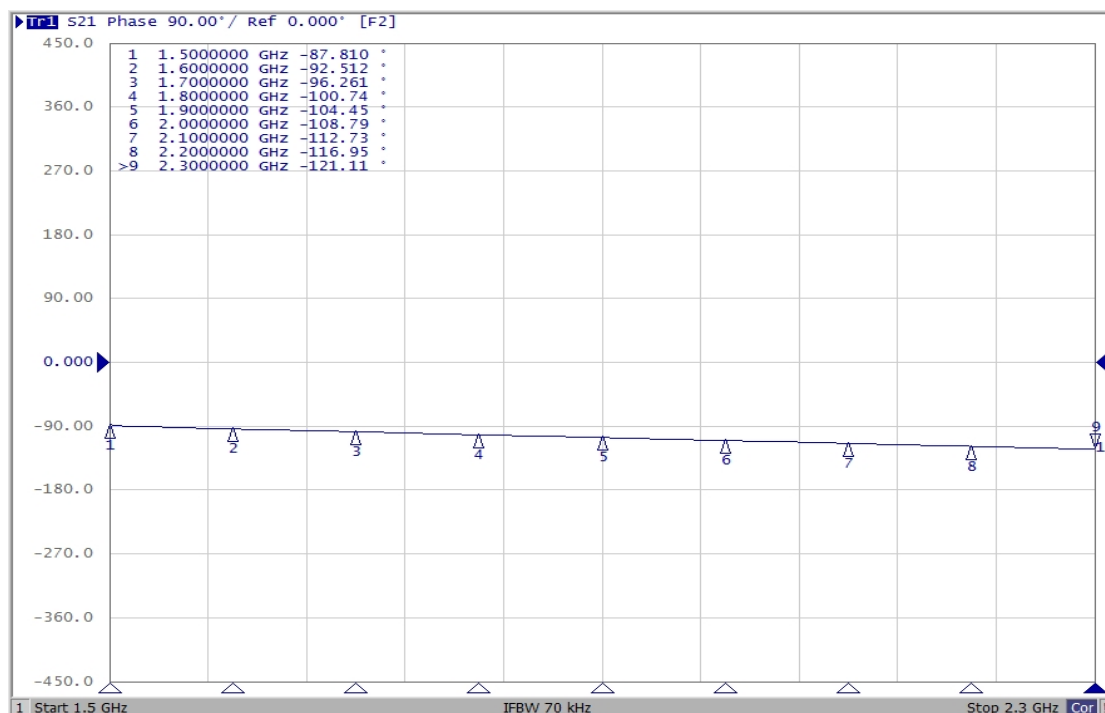


Phase(degree):

Coupling Phase(degree):



Transmission Phase(degree):





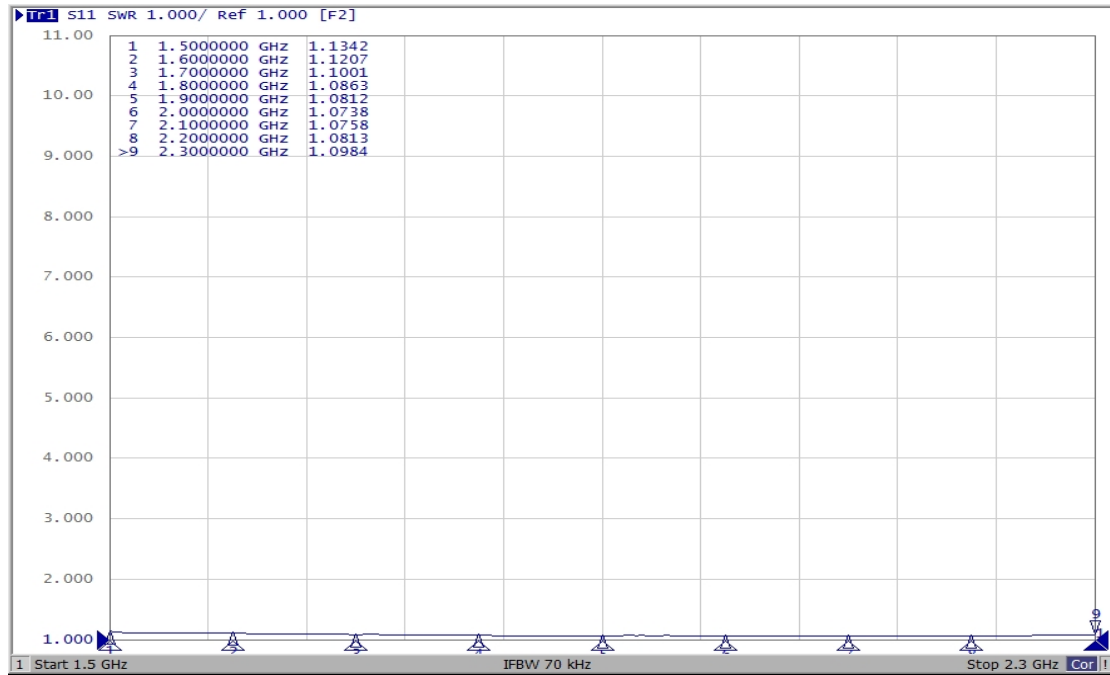
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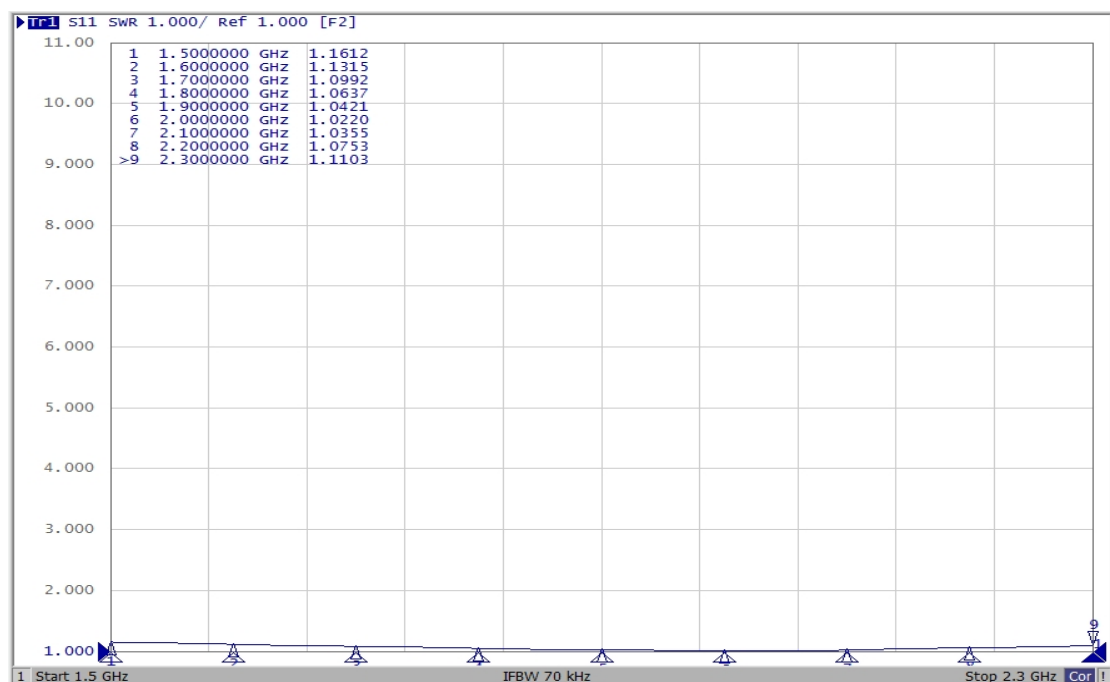
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**VSWR :**

Input Port:



Coupling Port:

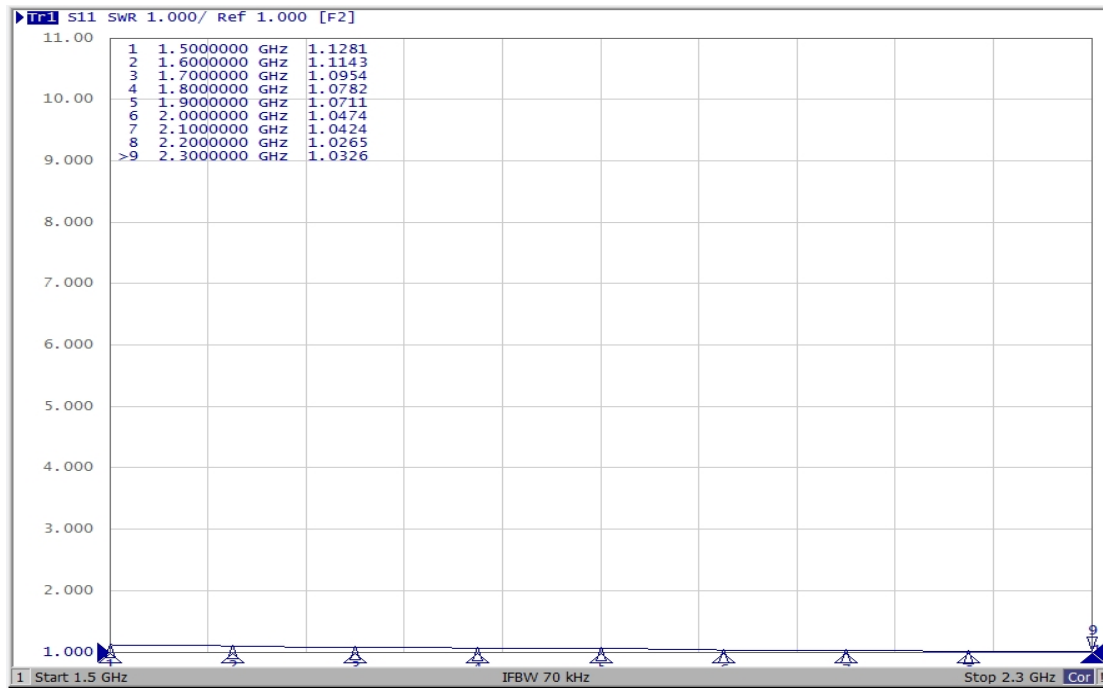




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Transmission Port:



Isolation Port:

