

## Directional Coupler 20 dB SMA Female 2 to 8 GHz

### Directional Couplers Technical Data Sheet

#### Product Description

Directional couplers are important components for use in isolating, separating, replicating, and combining microwave signals. They can serve as accurate attenuator measurements as they eliminate reflections. They are incredibly useful in sampling RF signals for use in detectors, gain control and feedback loops.

The APTDC-20-02000800-SMA is part of AmpliTech's catalog of single and dual directional couplers that offer a wide range of coupling values and frequency ranges. The device comes with N female connectors.

Specifications	Min	Typ	Max	Min
Frequency	2		8	GHz
Impedance		50		Ohm
Coupling		20 ± 1.0		dB
Frequency Sensitivity (Flatness)		± 0.50	± 1.25	dB
Mainline Loss <sup>1</sup>			0.45	dB
Directivity	18			dB
Return Loss (In and Out)	19	24		dB
Return Loss (Coupling)	19	22		dB
Input Power (CW) <sup>2</sup>			50	Watts (CW)

#### Mechanical

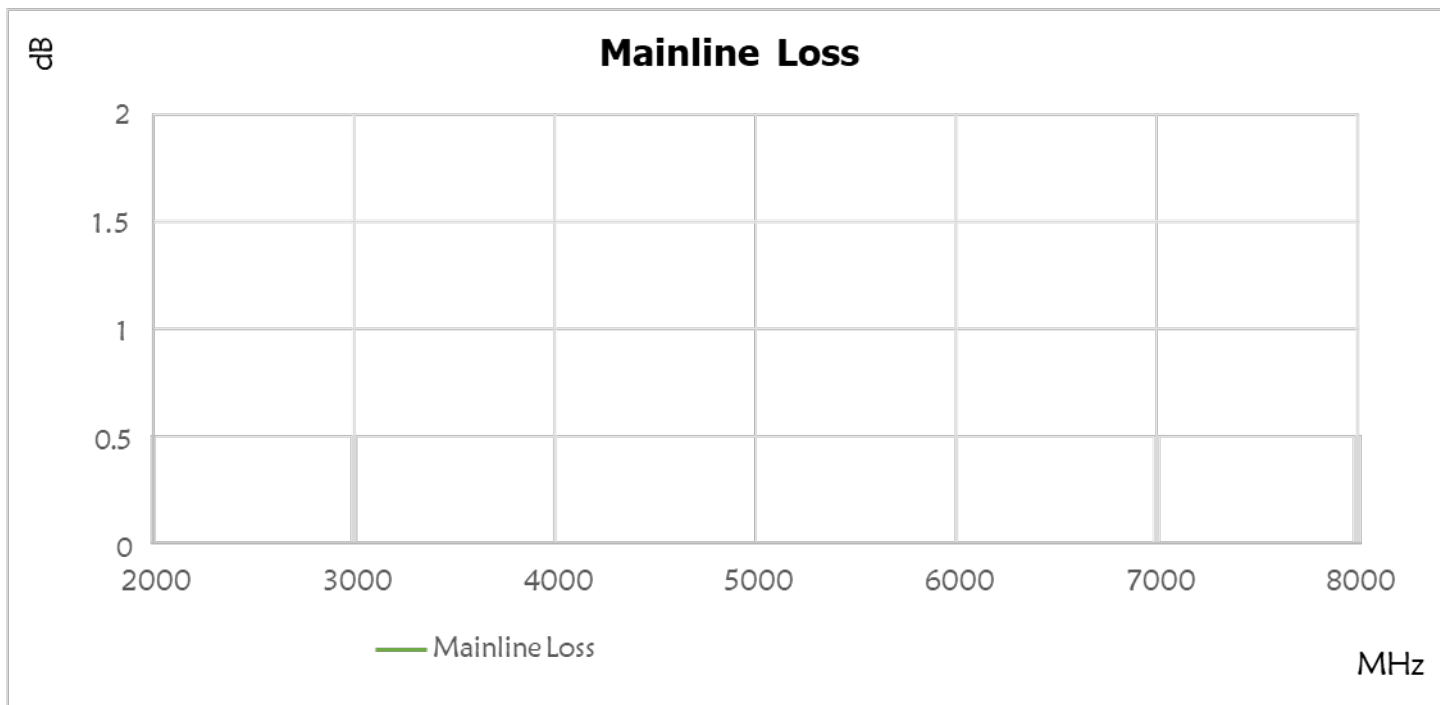
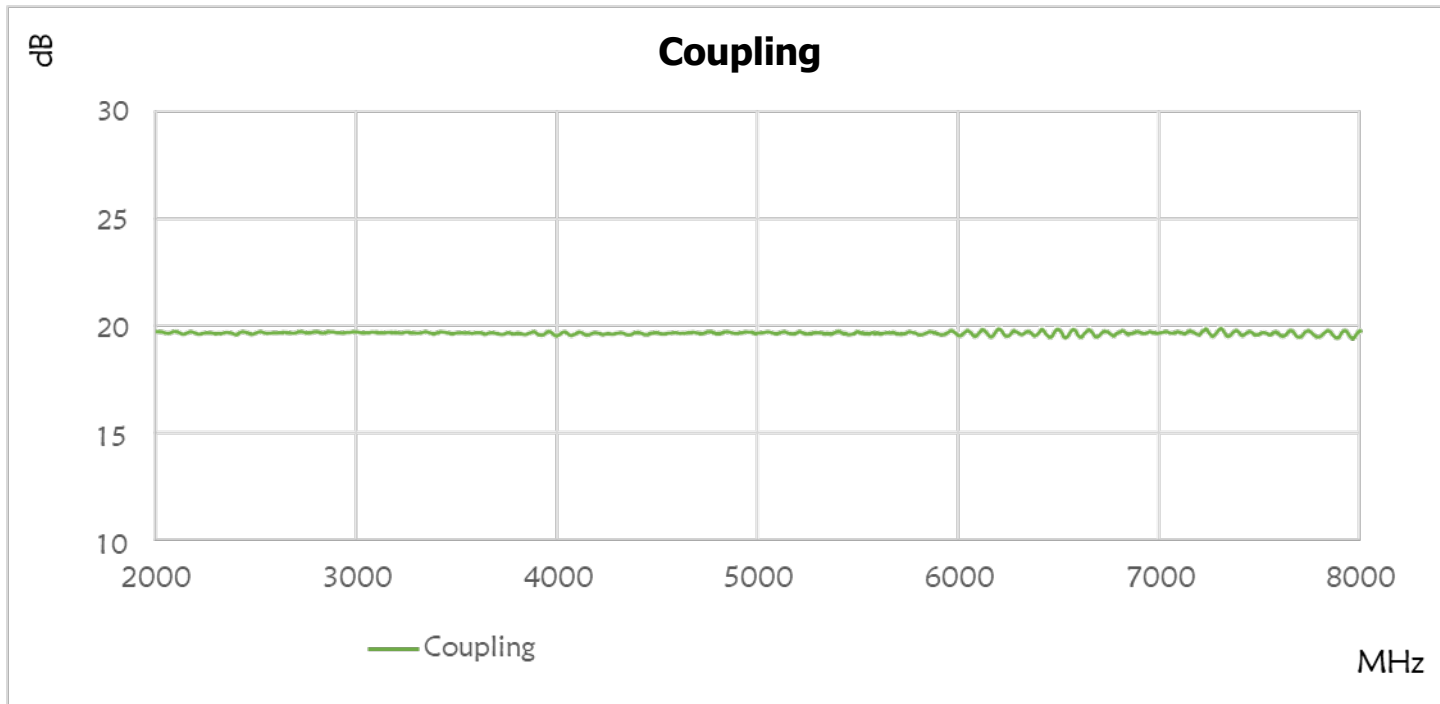
Connector Interface	SMA-Female
Operating Temperature <sup>2</sup>	-55 to +85 °C
Storage Temperature	-55 to +100 °C
Weight Estimate	1 oz (28 g)
Humidity	10-90% non-condensing
Environment	Indoors Use Only

#### Materials

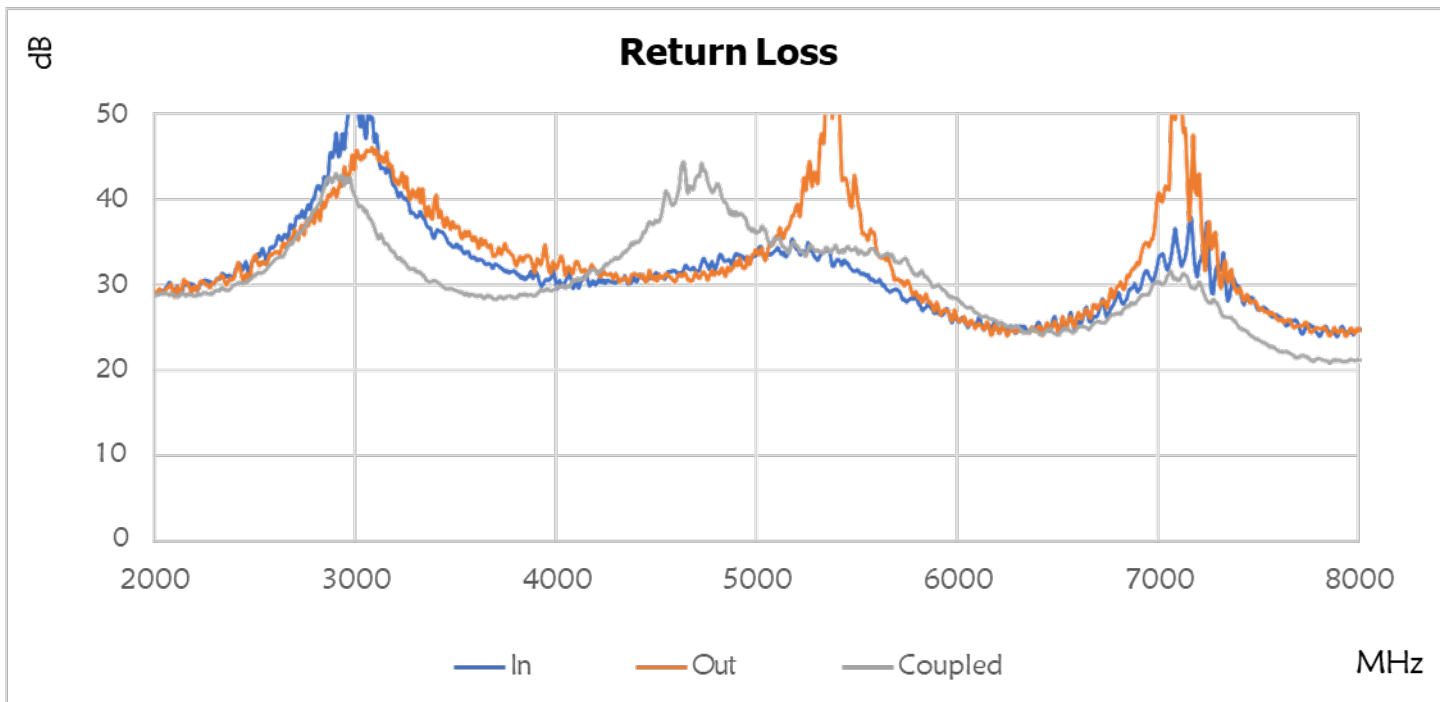
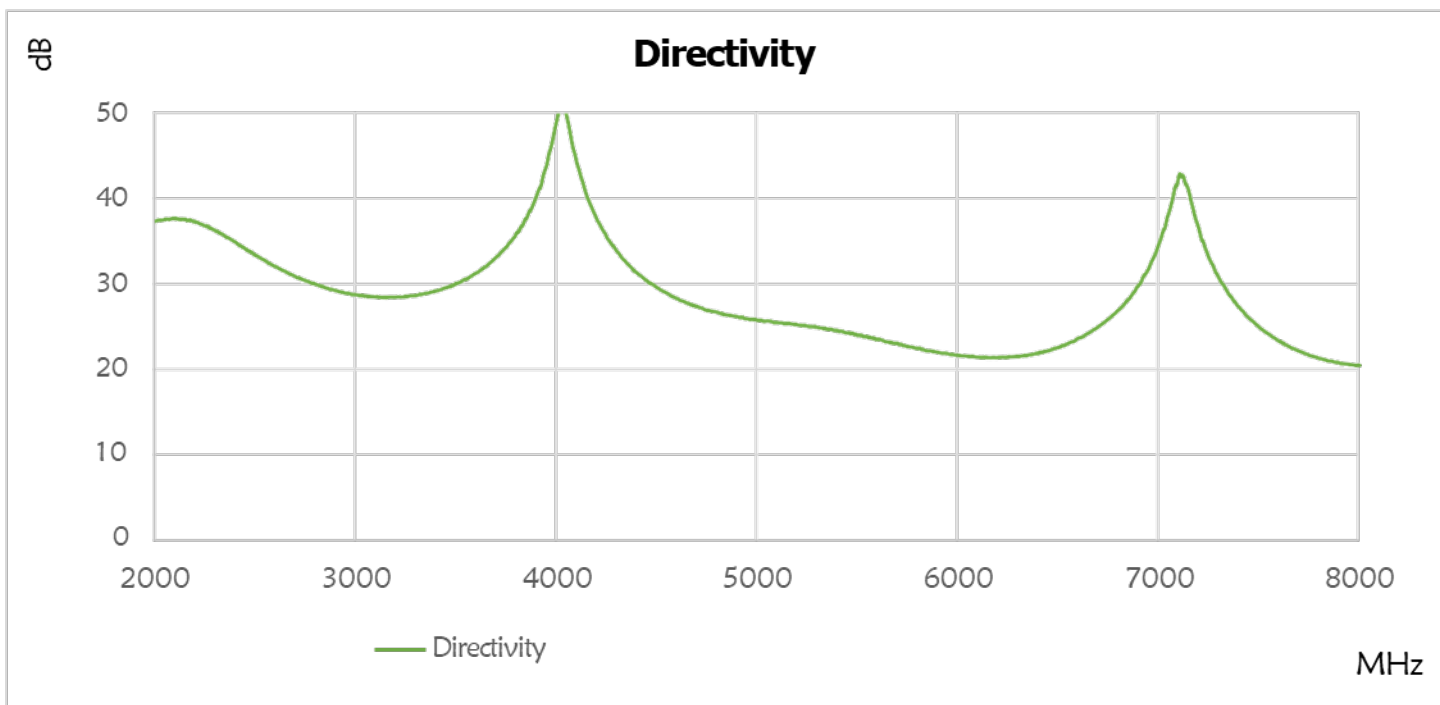
RoHS /REACH Compliant <sup>3</sup>	Yes
Enclosure	Aluminum
Connectors	Stainless Steel
Contacts	Be Cu, Gold Plated
Insulators	PTFE
Finish	Gray Paint

1. Mainline loss includes coupling loss.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Electrical specifications at +25 °C only.
4. To the best of our knowledge at the time of publication.
5. Non-RoHS solder is available upon request.

**Typical Performance at +25 °C**



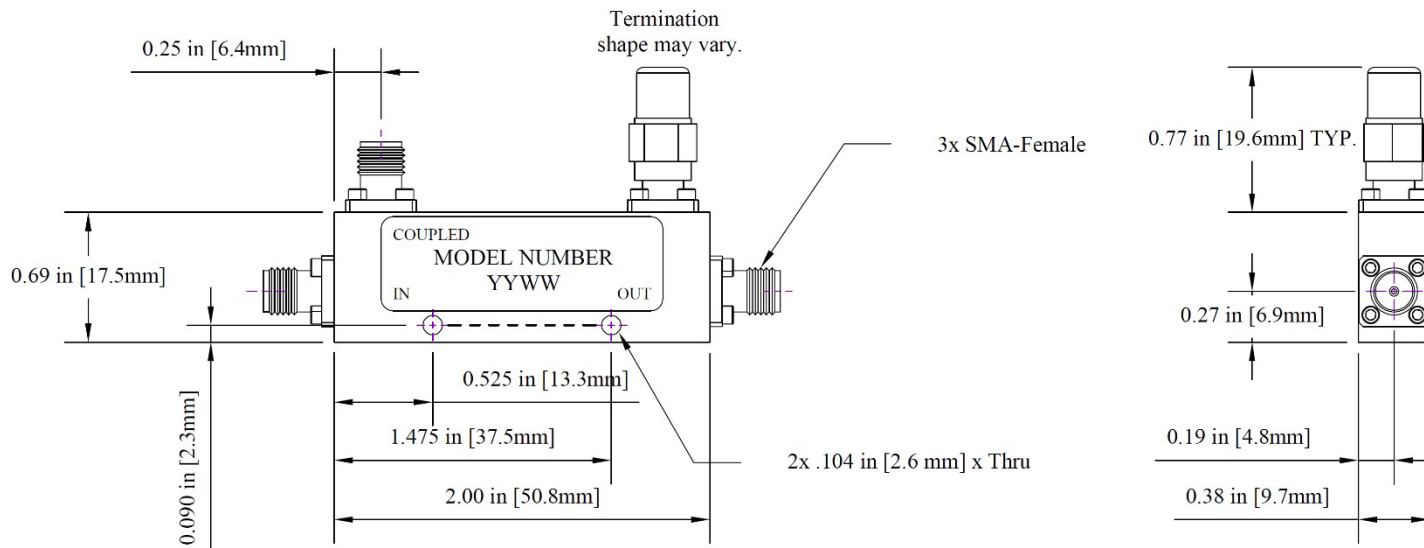
**Typical Performance at +25 °C**



### Typical Performance at +25 °C

Frequency (MHz)	Return Loss (dB)			Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl.	Directivity (dB)
	In	Out	Cpl.			
2000	41.6	38.0	36.9	0.17	20.4	38.8
2500	36.6	38.5	28.2	0.17	20.9	28.6
3000	36.4	40.2	40.1	0.18	20.4	32.2
3500	46.2	44.4	26.2	0.22	20.0	35.1
4000	40.2	35.4	24.4	0.24	20.4	25.9
4500	31.9	31.3	36.0	0.21	20.8	27.0
5000	35.3	32.2	25.2	0.28	20.6	53.6
5500	39.5	41.5	24.6	0.26	19.9	30.6
6000	35.2	32.0	28.0	0.22	19.9	33.1
6500	27.7	30.9	25.7	0.21	20.5	27.7
7000	31.6	29.4	31.2	0.33	20.7	23.8
7500	33.3	34.4	27.2	0.29	20.3	28.6
8000	35.9	35.8	25.4	0.34	19.8	27.8

## Outline Dimensions



Dimensions are in inches, [mm] shown for convenience.  
Tolerances on 2-pl decimals:  $\pm .03$ . 3-pl decimals:  $\pm .015$ .