

Directional Coupler 20 dB SMA Female 500 MHz to 20 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-20-00502000-SMA is part of AmpliTech's catalog of single and dual directional couplers that offer a wide range of coupling values and frequency ranges.

Specifications	Min	Typ	Max	Min
Frequency	0.5		20	GHz
Impedance		50		Ohm
Coupling		20 ± 1.2		dB
Frequency Sensitivity (Flatness)		± 0.6	± 1.8	dB
Mainline Loss ¹		1.1	1.7	dB
Directivity	11	17		dB
Return Loss (In and Out)	13	16		dB
Return Loss (Coupling)	12	14		dB
Input Power (CW) ²			20	Watts (CW)

Mechanical

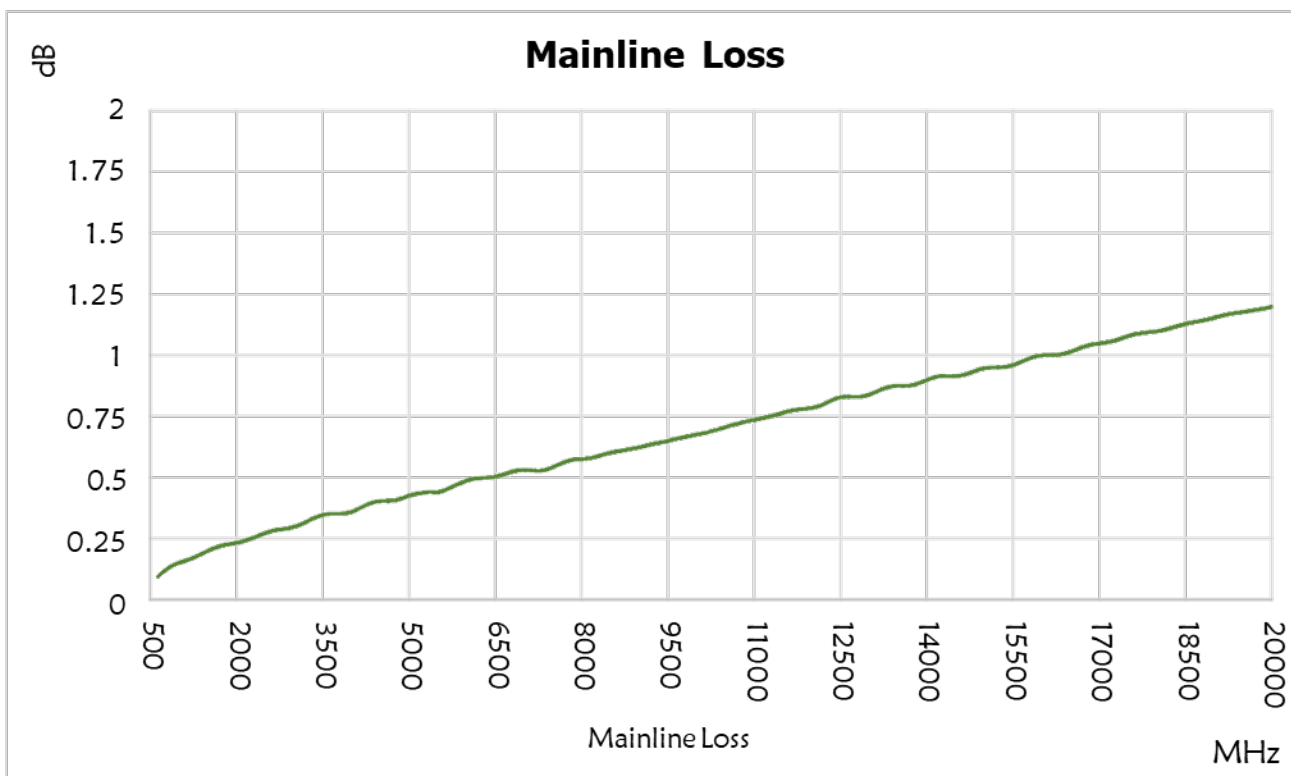
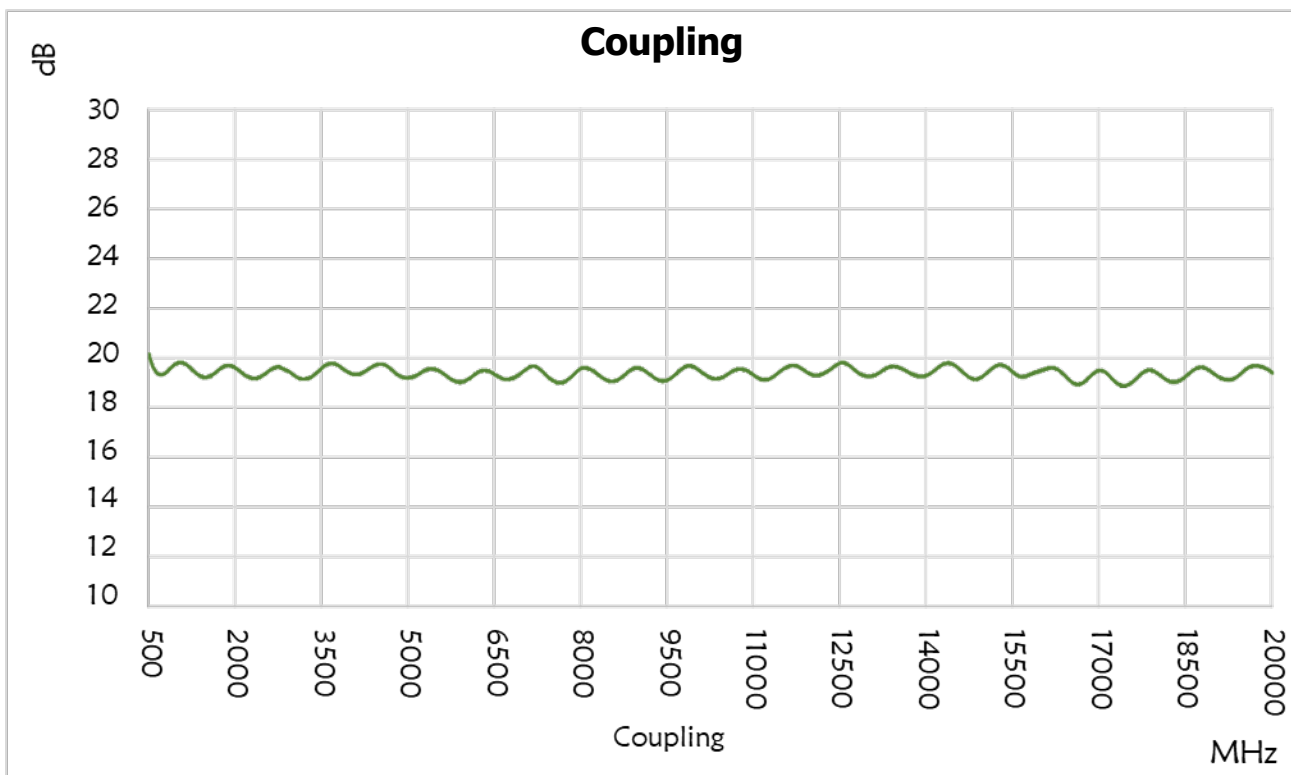
Connector Interface	SMA-Female
Operating Temperature ²	-55 to +85 °C
Storage Temperature	-55 to +100 °C
Weight Estimate	3.5 oz (86 g)
Humidity	10-90% non-condensing
Environment	Indoors Use Only

Materials

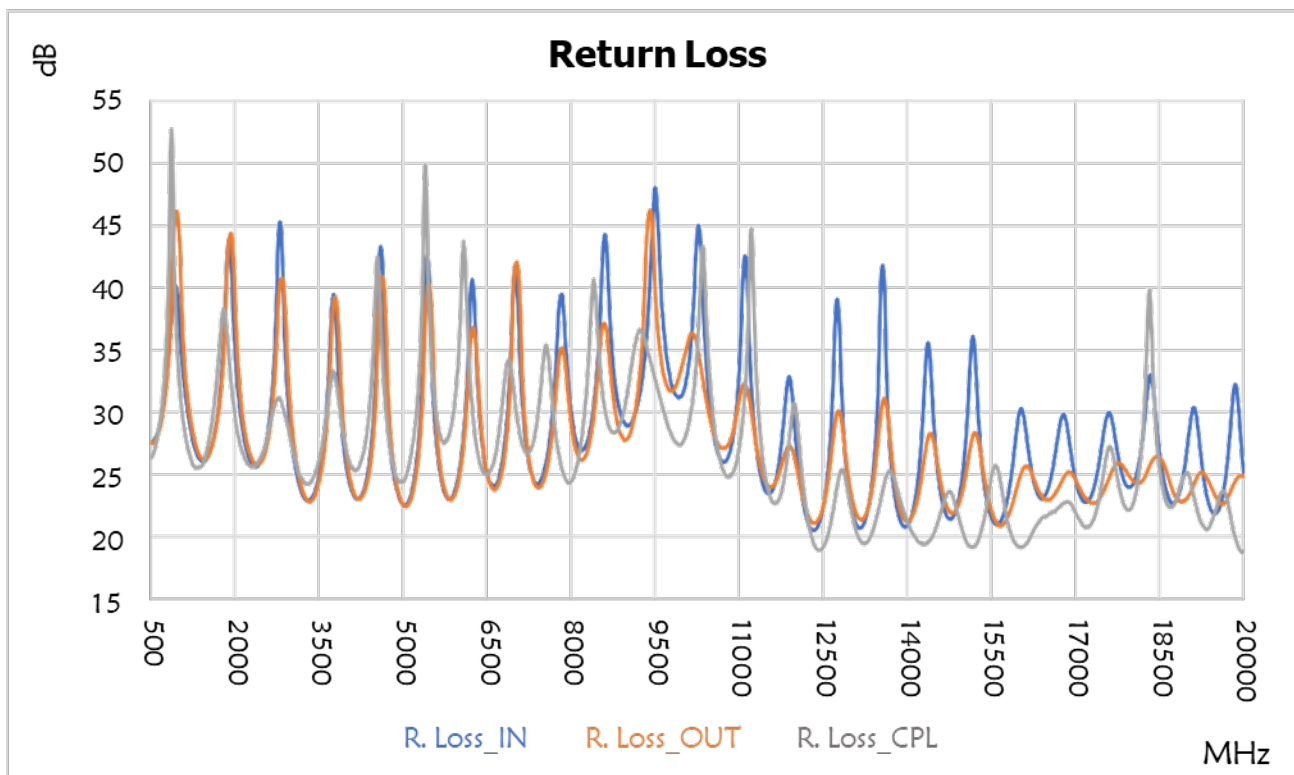
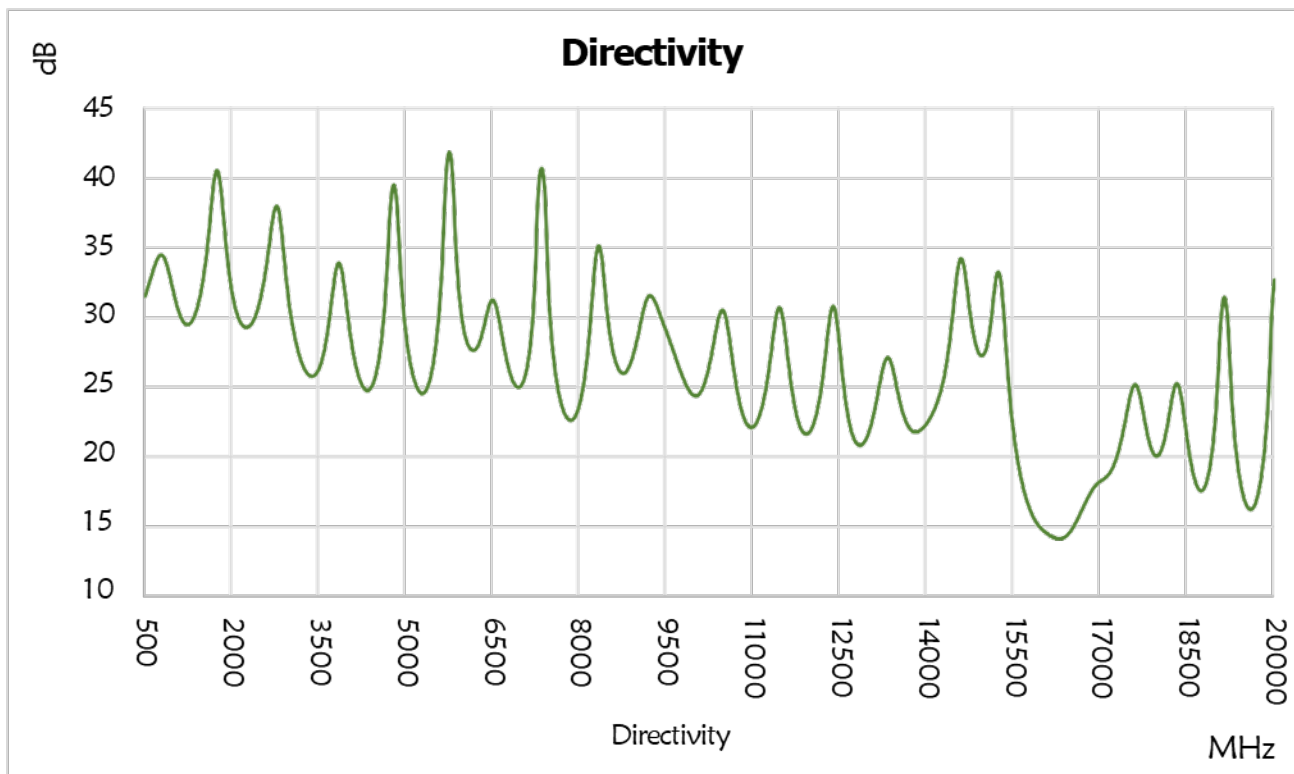
RoHS /REACH Compliant ³	Yes
Enclosure	Aluminum
Connectors	Stainless Steel
Contacts	Be Cu, Gold Plated
Insulators	PTFE
Finish	Gray Paint

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



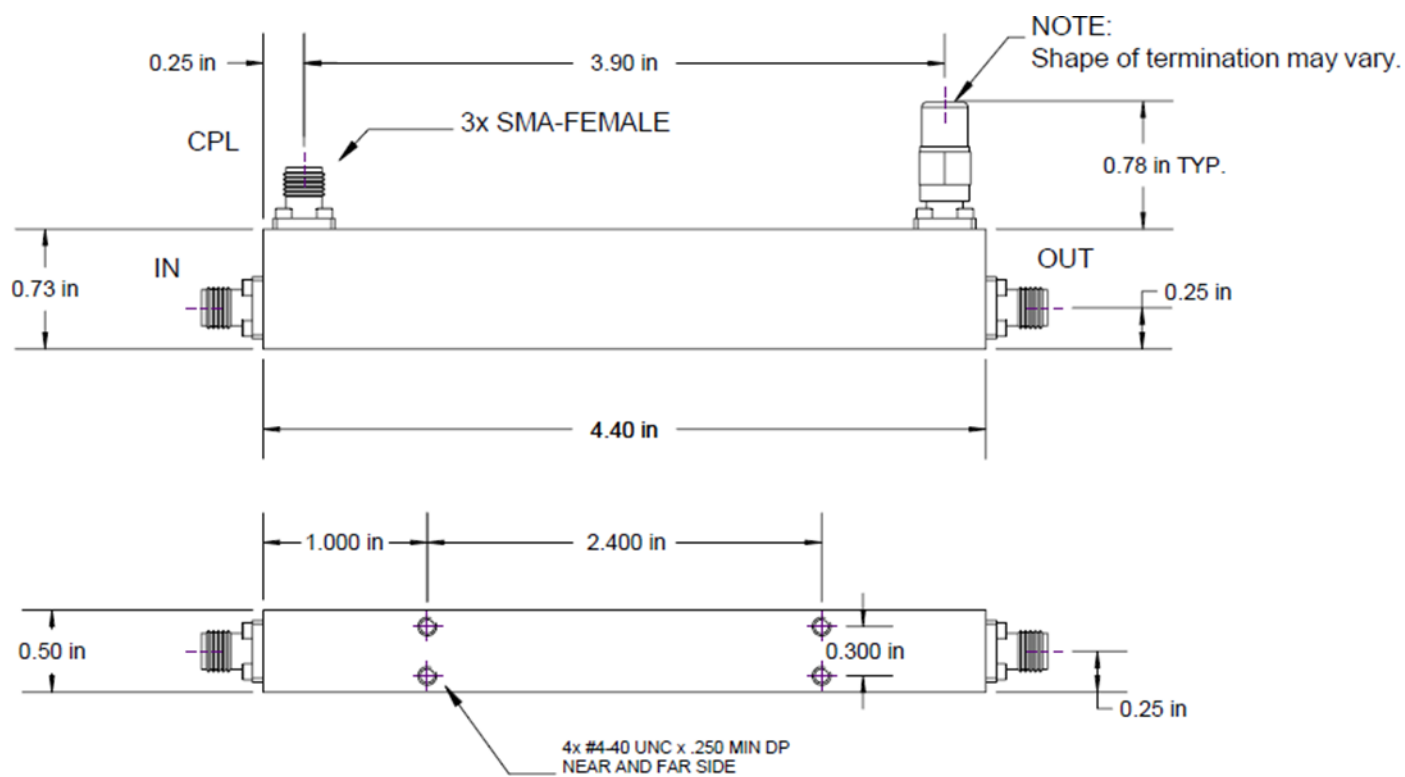
Typical Performance at +25 °C



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Frequency (MHz)	Return Loss (dB)			Mainline Loss (dB)	Coupling (dB)	Directivity (dB)
	In	Out	Cpl.	In-Out	In-Cpl.	
500	27.6	27.9	26.8	0.2	19.8	32.8
1000	33.5	34.0	30.7	0.2	19.9	30.4
1500	27.0	27.3	27.9	0.2	19.3	35.3
2000	31.0	31.1	28.5	0.3	19.6	30.3
2500	28.1	27.8	27.4	0.3	19.5	33.4
3000	26.0	26.1	26.9	0.3	19.3	28.6
3500	26.5	26.7	27.0	0.4	19.7	27.4
4000	24.0	23.7	26.2	0.4	19.4	27.7
4500	39.0	39.4	42.7	0.4	19.8	28.2
5000	22.8	22.5	24.7	0.4	19.3	26.6
5500	29.5	29.2	32.8	0.5	19.5	30.5
6000	27.4	27.6	39.5	0.5	19.2	27.9
6500	24.5	23.8	25.3	0.5	19.3	30.7
7000	35.5	36.5	29.5	0.5	19.6	26.1
7500	26.2	25.9	35.0	0.6	19.1	25.9
8000	28.7	26.6	24.7	0.6	19.7	25.5
8500	42.6	38.3	32.6	0.6	19.1	27.5
9000	29.3	28.7	32.6	0.7	19.6	30.2
9500	42.6	35.2	32.1	0.7	19.2	28.0
10000	32.5	35.8	28.1	0.7	19.6	24.7
10500	27.9	27.8	29.9	0.7	19.4	28.9
11000	38.8	32.9	28.4	0.8	19.3	22.7
11500	23.5	24.0	23.6	0.8	19.6	27.5
12000	25.4	24.4	29.4	0.8	19.4	22.9
12500	24.1	24.5	19.6	0.8	19.9	24.0
13000	21.5	22.0	21.5	0.9	19.3	23.1
13500	55.9	32.2	23.2	0.9	19.7	23.2
14000	21.5	21.6	21.0	0.9	19.4	23.0
14500	24.5	24.7	21.1	0.9	19.6	35.3
15000	28.7	26.2	19.9	0.9	19.5	28.7
15500	21.1	21.2	25.6	1.0	19.4	19.3
16000	30.6	25.8	19.3	1.0	19.6	14.5
16500	24.7	23.2	22.0	1.1	19.1	15.5
17000	23.7	23.9	21.8	1.1	19.5	18.6
17500	29.9	24.6	26.1	1.1	19.1	25.7
18000	24.5	24.4	22.8	1.1	19.4	21.0
18500	25.1	26.0	24.6	1.1	19.4	18.9
19000	29.6	23.9	25.0	1.2	19.3	31.0
19500	22.2	22.8	22.7	1.2	19.6	16.1
20000	23.2	24.3	19.2	1.2	19.4	29.7

Outline Dimensions



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