



WERLATONE



Mismatch Tolerant[®] Designs

High Power

Efficiency

Bandwidth



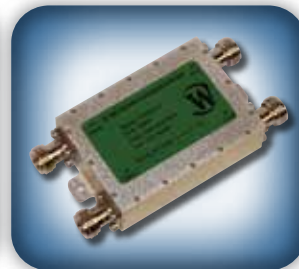
Directional Couplers



0° Combiners/Dividers



90° Hybrid Couplers



180° Hybrid Combiners



Absorptive Filters

When Every Watt Counts!

Werlatone®, Inc.
T 845.278.2220
sales@werlatone.com

July 2014

www.werlatone.com

About Werlatone

Table of Contents

Directional Couplers:

Description:	Page 3
- 6 & 10 dB:	Page 4
- 20 dB:	Page 5
- 30 dB:	Pages 6,7
- 40 dB:	Pages 8,9
- 50 dB:	Pages 10,11
- 60 dB:	Page 12
- 70 dB:	Page 13

0° Combiners/Dividers:

Description:	Pages 16,17
- 2-Ways:	Pages 18,19
- 4-Ways:	Pages 20,21
- N-Ways:	Page 22

90° Hybrid Couplers:

Pages 24,25

180° Hybrid Combiners:

Page 26

Absorptive Filters:

Page 27

Our Story

Founded in 1965, **Werlatone®**, Inc. is a leading supplier of high power, broadband passive RF components to include, RF Directional Couplers and RF Combiners & RF Dividers to customers worldwide. Our commitment to the highest quality, best performance, and on-time delivery places us among the most respected suppliers in the industry.

We Excel when your application requires a custom, high power, broadband solution. As year-to-year product sales consist of 65% custom passive RF components and 35% catalog items, our entire staff is dedicated to your individual specifications.

We Design our Directional Couplers, Combiners and Dividers to meet the most stringent operating conditions.

Our Directional Couplers, Combiners and Dividers may operate into high load VSWR conditions, for extended periods, without damage. Our **Mismatch Tolerant®** RF Directional Couplers and Combiners / Dividers allow continuous operation into open and short conditions.

Our Markets

Military:

- Communication & EW
- HF, VHF, UHF, S-Band
- Fixed, Mobile, Airborne, Ship Board

Commercial:

- AM, FM, VHF, UHF, Cellular
- Digital UHF, Satellite Radio

Industrial:

- EMC, Medical, Semiconductors

Test and Measurement:

- Commercial Test Facilities
- University Labs
- Government Test Facilities

Our Designs

High Power, Multi-Octave Performance:

- Frequency: DC to 6 GHz
- Power: 5 W CW to 100 kW CW

Mismatch Tolerant® Designs:

- Operate, at rated power, into Severe Load Mismatch

Tolerate Extreme Environmental Conditions:

- Designed or tested to MIL-STD specifications

Non-Magnetic Designs:

- Suitable for MRI applications

RF Transformers:

- For other than 50 ohm applications

Absorptive Filters:

- Non-Reflective Designs

Environmental Testing

In conjunction with high power testing, **Werlatone** will test most designs on a cold (-55°C) and hot (+85°C) plate to insure power handling and electrical specifications at common military temperature extremes. MIL-STD-810 Shock, Vibration, Humidity, Salt Spray, and Fungus testing, are performed at a contracted third party facility.

In-House High Power Testing

Werlatone's in-house high power test lab allows us to test most new designs, at rated power, within our own facility. We often host our customers during a design phase, allowing them to witness a combiner or coupler test in support of their qualification requirements. The high power test lab also facilitates in-house burn-in, based on contract requirements.



High Power Testing

In-House



Manufacturing

To J-STD-001



Quality Assurance

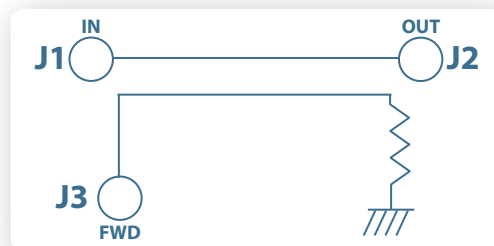
ISO 9001:2008 Certified

Directional Couplers

3-Port UNI-Directional Coupler:

Consists of a main line and a coupled line. One end of the coupled line is internally terminated, while the other end serves as a coupled port.

Ideal for sampling and monitoring power in one direction at a given time. It is necessary to physically reverse the orientation of the unit to change from a forward to a reverse power measurement.

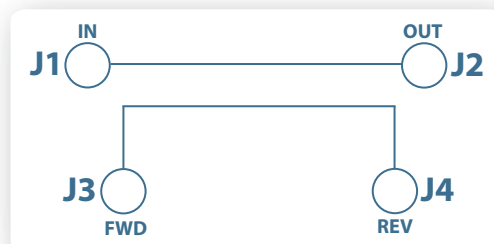


UNI

4-Port BI-Directional Coupler:

Similar to the 3-Port Uni-Directional Coupler, except that both ends of the coupled line serve as coupled ports.

Convenient for simultaneously monitoring both forward and reverse power. The directivity of this coupler design is, however, dependent upon well matched 50 Ohm loads on the coupled ports.

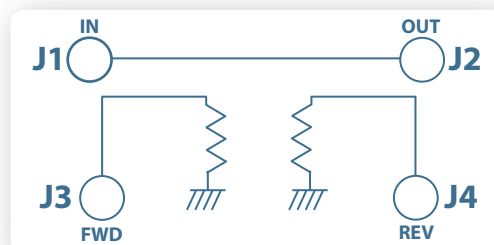


BI

4-Port DUAL Directional Coupler:

Employs two, 3-Port Uni-Directional Couplers, internally connected, in tandem, providing measurement of both forward and reverse power.

Ideal for simultaneously monitoring a system's forward and reverse power and for reflectometer measurements. Unlike the Bi-Directional Coupler, the directivity of the Dual Directional Coupler is unaffected by the loads on the coupled ports.



DUAL

Werlatone Broadband Dual, Uni, and Bi Directional RF Couplers are designed to tolerate the most stringent operating conditions associated with military and EMC testing environments. Many of our RF Directional Couplers, designated **Mismatch Tolerant®**, will operate continuously, at rated power, into an Infinite VSWR. Once again, the **Mismatch Tolerant®** capability is extremely valuable in military and EMC testing environments. Our extensive line of multi-octave Directional Coupler designs achieves up to 1000:1 bandwidths, while maintaining exceptional coupling flatness, directivity, VSWR, and insertion loss.

Our patented line of High Power, Broadband, 10:1 Bandwidth Bi and Uni-Directional RF Couplers achieves very tight coupling values (6-20 dB), at very low insertion loss. These stripline coupler designs are electrically shorter and physically smaller than traditional coupler designs. **Werlatone** currently produces a line of Multi-Octave Drop-In and Surface Mount Couplers, designed for placement within an amplifier module. Please contact us with your specific bandwidth so that we can discuss our current capabilities.

Connectorized Dual, Uni, and Bi-Directional RF Couplers are available with an array of standard connector options. Please provide your connector configuration so that we can build the RF Coupler to your requirements. Additional connector options may be available and may affect the cost of your Uni, Bi, or Dual Directional Coupler. Please contact our sales department for more information.



6 & 10 dB

Directional Couplers

6 dB

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness ($\pm$ dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C3093	2-50	Uni	200	0.25	0.2	1.15	20	Connectorized	3 x 3 x 1.95
C5011	30-88	Uni	100	0.5	0.3	1.30	20	Connectorized	3 x 3 x 1.5
C7118	30-90	Uni	400	0.5	0.2	1.30	20	Connectorized	4 x 4 x 2.25
C6933	60-600	Bi	200	1.0	0.35	1.20	20	Connectorized	6 x 4 x 0.75
C8217	60-600	Uni	200	1.0	0.35	1.20	20	Connectorized	6 x 4 x 0.75
C7141W	100-500	Uni	100	1.0	0.3	1.30	20	Connectorized	7 x 5 x 1.8
C9270W	100-1000	Uni	100	1.0	0.6	1.30	17	Connectorized	7.05 x 3.3 x 1.2
C7113	100-1000	Bi	200	1.0	0.35	1.20	20	Connectorized	6.2 x 2.7 x 0.75
C8163W	100-1000	Uni	200	1.0	0.4	1.30	20	Connectorized	7.05 x 3.3 x 1.2
C9534	100-1000	Uni	350	1.0	0.4	1.30	17	Connectorized	6.75 x 3 x 1.2
C7150	200-2000	Bi	200	1.0	0.25	1.20	20	Connectorized	6 x 2 x 0.85
C7248	300-3000	Bi	100	1.0	0.35	1.25	15	Connectorized	6 x 2 x 0.85
C8214	700-2500	Bi	100	1.0	0.35	1.25	15	Connectorized	6 x 2 x 0.85

10 dB

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness ($\pm$ dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C6804	1-100	Dual	100	0.5	0.5	1.30	18	Connectorized	4 x 3 x 1.5
C8483	2-32	Uni	500	0.5	0.3	1.30	20	Connectorized	3 x 3 x 1.88
C7008	20-180	Dual	100	0.5	1.0	1.25	20	Connectorized	5 x 2 x 1.5
C7050	20-180	Uni	100	0.25	0.5	1.30	20	Connectorized	2 x 2 x 1.87
C7081	30-512	Bi	50	1.0	0.5	1.30	13	Connectorized	4 x 3 x 1
C7148	60-600	Bi	200	1.0	0.35	1.20	20	Connectorized	6 x 4 x 0.75
C7929	100-200	Uni	200	1.0	0.3	1.25	20	Connectorized	6.4 x 3 x 1.2
C9271W	100-1000	Uni	100	1.0	0.5	1.20	17	Connectorized	7.05 x 3.3 x 1.2
C7126	100-1000	Bi	200	1.0	0.3	1.20	20	Connectorized	6.4 x 2.7 x 0.75
C7058	200-2000	Bi	200	1.0	0.3	1.25	20	Connectorized	6.4 x 1.6 x 0.72
C7151	300-3000	Bi	100	1.0	0.35	1.20	15	Connectorized	3.7 x 2 x 0.75
C8671	300-3000	Uni	100	1.0	0.35	1.20	15	Connectorized	3.7 x 2 x 0.75
C7925	500-2000	Bi	200	1.2	0.35	1.25	20	Connectorized	3.7 x 2 x 0.75

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

Decades Ahead® | When Every Watt Counts



20 dB

Directional Couplers

20 dB Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness (± dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C8064	1-120	Uni	1,000	0.3	0.15	1.15	20	Connectorized	4 x 4 x 2.25
C7646	1-500	Dual	30	1.0	3.0	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C5562	1-500	Uni	30	1.0	1.2	1.20	20	Connectorized	5.2 x 2.7 x 1.7
C8994	2-32	Bi	200	0.5	0.2	1.25	20	Connectorized	3 x 3 x 2
C1804	2-32	Bi	1,000	0.5	0.2	1.25	20	Connectorized	3 x 3 x 2
C7199	2-2000	Uni	20	1.0	1.75	1.25	20	Connectorized	6 x 1.5 x 1.1
C8356	20-550	Bi	100	1.0	0.7	1.30	20	Connectorized	2 x 1.5 x 1.06
C7751	30-50	Dual	100	0.5	0.5	1.30	20	Connectorized	5 x 2 x 1.5
C7054	30-160	Dual	100	0.5	0.5	1.30	20	Connectorized	5 x 2 x 1.5
C7800	30-2800	Uni	20	1.0	2.25	1.35	20	Connectorized	6 x 1.5 x 1.1
C8188	30-3000	Uni	20	1.0	2.4	1.35	18	Connectorized	6 x 1.5 x 1.1
C7149	60-600	Bi	200	1.0	0.3	1.20	20	Connectorized	6 x 4 x 0.75
C7127	100-1000	Bi	200	1.0	0.2	1.20	20	Connectorized	5 x 2.7 x 0.72
C8373	100-2500	Bi	200	1.75	0.8	1.25	15	Connectorized	9.6 x 1.5 x 0.9
C7783	200-1000	Bi	200	0.75	0.2	1.20	20	Connectorized	3 x 1.5 x 0.53
C6600	200-2000	Bi	200	1.2	0.25	1.25	18	Connectorized	4 x 2 x 0.72
C8060	200-6000	Bi	200	2.25	1.1	1.40	14	Connectorized	4.8 x 0.88 x 0.5
C6467	225-400	Uni	500	0.5	0.4	1.30	20	Connectorized	7 x 2 x 1.25
C9481	300-2000	Uni	20	1.0	0.35	1.20	18	Connectorized	3.7 x 2 x 0.75
C7152	300-3000	Bi	100	1.2	0.35	1.20	15	Connectorized	3.7 x 2 x 0.75
C7530	300-3000	Uni	100	1.0	0.35	1.20	18	Connectorized	3.7 x 2 x 0.75
C7940	450-2500	Bi	100	0.7	0.3	1.25	17	Connectorized	1.3 x 0.65 x 0.09
C7753	700-4200	Bi	100	1.0	0.35	1.25	18	Connectorized	1.8 x 1 x 0.59
C8644	1800-6100	Bi	60	1.0	0.4	1.25	18	Connectorized	1.1 x 0.75 x 0.48
C9639	2500-6000	Bi	100	1.0	0.4	1.25	18	Connectorized	1.1 x 0.75 x 0.48

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com



30 dB

Directional
Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness ($\pm$ dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C5091	0.01-250	Dual	100	0.5	0.8	1.25	20	Connectorized	5.2 x 2.7 x 1.7
C6442	0.01-400	Dual	100	0.5	0.8	1.25	20	Connectorized	5.2 x 2.7 x 1.7
C5964	0.01-1000	Dual	50	0.5	1.2	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C8991	0.01-1000	Dual	50	0.5	1.2	1.10	20	Connectorized	5.2 x 2.7 x 1.7
C5948	0.1-10	Dual	1,500	0.25	0.1	1.25	25	Connectorized	6.5 x 2.5 x 1.2
C6400	0.1-1000	Dual	100	0.5	1.2	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C6934	0.1-1000	Dual	150	0.5	1.2	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C6089	0.5-17	Dual	300	0.5	0.3	1.30	25	Connectorized	4 x 2 x 1.88
C6416	0.5-32	Dual	50	0.25	0.15	1.15	25	Connectorized	4 x 2 x 1.88
C5085	0.5-32	Dual	500	0.25	0.15	1.15	25	Connectorized	4 x 2 x 1.88
C3881	0.5-32	Dual	1,500	0.25	0.1	1.05	25	Connectorized	6.5 x 2.5 x 1.2
C3063	0.5-32	Dual	3,000	0.25	0.1	1.05	25	Connectorized	6.5 x 2.5 x 1.2
C9852	1-50	Dual	500	0.2	0.15	1.15	25	Connectorized	4 x 2 x 1.88
C6165	1-100	Dual	100	0.2	0.25	1.15	25	Connectorized	4 x 2 x 1.88
C7311	1-500	Dual	100	1.0	0.8	1.20	20	Connectorized	2.7 x 1.5 x 1.1
C6493	1-2000	Dual	50	1.0	1.25	1.35	18	Connectorized	2.7 x 1.5 x 1.1
C2531	1.5-100	Dual	750	0.2	0.2	1.15	25	Connectorized	4 x 2 x 1.88
C5891	2-50	Dual	100	0.2	0.15	1.10	25	Connectorized	4 x 2 x 1.88
C5828	10-100	Dual	100	0.5	0.25	1.10	20	Connectorized	4 x 2 x 1.88
C3720	10-1000	Dual	50	0.5	1.0	1.30	20	Connectorized	5 x 2 x 1.5
C6326	10-2000	Dual	75	1.0	1.25	1.35	18	Connectorized	2.7 x 1.5 x 1.1
C6261	13.56	Dual	1,000	0.5	0.1	1.15	20	Connectorized	6.5 x 2.5 x 1.2
C4025	20-100	Dual	250	0.5	0.25	1.25	20	Connectorized	4 x 2 x 1.88
C1807	20-100	Dual	750	0.5	0.2	1.15	25	Connectorized	4 x 2 x 1.88
C1569	20-200	Dual	250	0.5	0.25	1.10	20	Connectorized	4 x 2 x 1.88
C7881	20-500	Dual	25	1.0	0.75	1.20	20	Connectorized	2.7 x 1.5 x 1.1
C6740	20-500	Dual	100	0.5	0.9	1.20	20	Connectorized	5.2 x 2.7 x 1.7
C9401	20-520	Dual	100	0.5	0.7	1.25	20	Connectorized	1.8 x 1.16 x 0.57
C9770	20-1000	Dual	50	0.5	0.7	1.10	20	Connectorized	3 x 2 x 1
C9191	20-1000	Dual	100	0.5	0.7	1.25	20	Connectorized	1.8 x 1.16 x 0.57
C9552	20-1000	Dual	150	0.5	0.8	1.30	20	Connectorized	3 x 2 x 1

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

We Specialize In Custom Applications



30 dB

Directional Couplers

30 dB Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness (± dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C5522	30-90	Dual	100	0.5	0.25	1.10	20	Connectorized	4 x 2 x 1.88
C6235	30-90	Dual	500	0.2	0.15	1.10	25	Connectorized	4 x 2 x 1.88
C9184	30-512	Dual	100	0.5	0.7	1.25	20	Connectorized	1.8 x 1.16 x 0.57
C9766	30-512	Dual	175	0.5	0.7	1.30	20	Connectorized	3 x 2 x 1
C9790	30-520	Dual	600	0.8	0.8	1.20	20	Connectorized	6 x 2.2 x 2.2
C6090	88-108	Dual	150	0.25	0.2	1.20	25	Connectorized	6 x 3 x 1.1
C6130	100-200	Dual	200	0.5	0.25	1.10	20	Connectorized	4 x 2 x 1.88
C6137	100-500	Dual	50	0.75	0.25	1.25	20	Connectorized	5 x 2 x 2
C1407	100-500	Dual	250	0.75	0.25	1.25	20	Connectorized	5 x 2 x 2
C5083	200-400	Dual	100	0.5	0.1	1.10	26	Connectorized	3 x 3 x 1.09
C4063	200-1000	Dual	100	0.5	0.35	1.15	20	Connectorized	3 x 3 x 1.09
C5094	400-1000	Dual	400	0.25	0.2	1.15	20	Connectorized	3 x 3 x 1.09
C7962	450-2500	Bi	100	1.0	0.2	1.20	17	SMT	1.15 x 0.7 x 0.07
C6762	470-860	Dual	250	0.5	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C5279	500-1000	Dual	50	0.3	0.2	1.20	25	Connectorized	3 x 3 x 1.09
C5445	500-1000	Dual	500	0.25	0.2	1.15	20	Connectorized	3 x 3 x 1.09
C7915	500-2000	Uni	50	0.3	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C7402	500-2500	Uni	100	0.5	0.3	1.30	20	Connectorized	3 x 3 x 1.09
C8056	500-3500	Bi	100	0.8	0.3	1.20	20	Connectorized	1.34 x 1 x 0.57
C8025	500-3500	Bi	125	0.75	0.3	1.25	18	Drop-In**	1.3 x 1 x 0.07
C8000	600-6000	Bi	100	1.0	0.4	1.25	15	Connectorized	1.8 x 1 x 0.56
C8692	700-3000	Dual	100	0.75	0.25	1.30	15	Connectorized	3 x 3 x 1.09
C5061	800-1000	Dual	500	0.2	0.1	1.10	25	Connectorized	3 x 3 x 1.09
C8098	800-2000	Bi	200	0.7	0.25	1.20	20	Drop-In**	1.3 x 1 x 0.07
C6162	800-2200	Dual	200	0.5	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C6529	800-2800	Dual	100	0.5	0.3	1.30	20	Connectorized	3 x 3 x 1.09
C5673	1000-2000	Dual	50	0.25	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C5572	1000-2000	Dual	600	0.25	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C6710	1000-3000	Dual	100	0.5	0.3	1.30	20	Connectorized	3 x 3 x 1.09
C5283	2000-4000	Dual	300	0.5	0.3	1.35	15	Connectorized	3 x 3 x 1.09
C8384	2000-6000	Dual	100	0.75	0.35	1.30	15	Connectorized	1.2 x 0.9 x 0.51

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

** Available with Solder Point or Tab Interface

P7 | Send Us Your Specs!

High Power RF Components



40 dB

Directional Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness ($\pm$ dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C9475	0.01-250	Dual	100	0.5	0.5	1.10	20	Connectorized	5.2 x 2.7 x 1.7
C5100	0.01-250	Dual	500	0.75	0.4	1.25	20	Connectorized	10.5 x 3 x 2
C6177	0.01-250	Dual	1,000	0.75	0.4	1.25	20	Connectorized	10.5 x 3 x 2
C6047	0.01-400	Dual	500	0.5	0.5	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C2630	0.01-1000	Dual	100	0.5	0.6	1.30	20	Connectorized	5 x 2 x 1.51
C5571	0.01-1000	Dual	200	0.5	0.6	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C6021	0.01-1000	Dual	500	0.5	0.45	1.30	20	Connectorized	6.7 x 2.27 x 1.7
C5959	0.1-30	Dual	500	0.75	0.1	1.25	20	Connectorized	6.46 x 2.5 x 1.2
C1795	0.1-1000	Dual	100	0.5	0.5	1.30	20	Connectorized	5 x 2 x 1.51
C5081	0.1-1000	Dual	200	0.5	0.6	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C5725	0.1-1000	Dual	500	0.5	0.5	1.25	20	Connectorized	5.2 x 2.7 x 1.7
C2671	0.5-32	Dual	3,000	0.25	0.1	1.05	25	Connectorized	6.46 x 2.52 x 1.2
C3744	0.5-32	Dual	5,000	0.5	0.05	1.15	20	Connectorized	5 x 3 x 2.25
C6207	1-30	Dual	100	0.25	0.15	1.15	20	Connectorized	4 x 2 x 1.88
C6483	1-500	Dual	100	0.5	0.4	1.20	20	Connectorized	5 x 2 x 1.51
C7353	1-500	Dual	1,000	0.5	0.3	1.20	20	Connectorized	6 x 2.2 x 2.2
C9688	1-1000	Dual	800	1.0	0.5	1.20	20	Connectorized	6 x 2.2 x 2.2
C6067	1.5-30	Dual	500	0.25	0.1	1.30	25	Connectorized	4 x 2 x 2
C6070	1.5-30	Dual	2,500	0.25	0.1	1.05	25	Connectorized	6.46 x 2.25 x 1.2
C9040	2-35	Dual	2,500	0.5	0.05	1.15	30	Connectorized	5 x 3.5 x 3
C8858	10-1000	Dual	250	0.5	0.4	1.30	20	Connectorized	2.1 x 1.16 x 0.57
C9071	20-130	Dual	1,000	0.5	0.3	1.20	20	Connectorized	5.75 x 3 x 1.88
C9117	20-500	Dual	200	0.5	0.4	1.25	20	Connectorized	3 x 2 x 1
C8740	20-512	Dual	200	0.5	0.3	1.15	20	Tabs	1.5 x 0.95 x 0.55
C8869	20-520	Dual	200	0.5	0.3	1.15	20	Connectorized	1.76 x 1.16 x 0.57
C8631	20-1000	Dual	150	0.5	0.35	1.25	20	Tabs	1.5 x 0.95 x 0.5
C8696	20-1000	Dual	150	0.5	0.35	1.25	20	Connectorized	1.76 x 1.16 x 0.57
C9446	20-1000	Dual	250	0.5	0.5	1.30	20	Connectorized	3 x 2 x 1
C8686	20-1000	Dual	500	0.5	0.35	1.25	20	Connectorized	5.2 x 2.7 x 1.7
C6101	30-512	Dual	100	0.6	0.25	1.25	20	Connectorized	3.7 x 2.3 x 1.6
C7734	30-2500	Dual	100	1.75	0.35	1.25	18	Connectorized	3.5 x 2.6 x 0.7

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com



40 dB

Directional
Couplers

40 dB Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness (± dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C3910	80-1000	Dual	200	0.3	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C5982	80-1000	Dual	500	0.3	0.2	1.10	20	Connectorized	3 x 3 x 1.09
C8059	80-1000	Dual	1,000	0.5	0.2	1.20	20	Connectorized	6 x 3 x 1.09
C5315	100-500	Dual	200	0.3	0.2	1.10	20	Connectorized	3 x 3 x 1.09
C5497	100-500	Dual	600	0.3	0.2	1.10	20	Connectorized	3 x 3 x 1.09
C6079	100-500	Dual	1,000	0.3	0.2	1.10	20	Connectorized	3 x 3 x 1.09
C5334	100-500	Dual	2,000	0.3	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C6200	100-1000	Dual	1,000	0.5	0.2	1.20	20	Connectorized	6 x 3 x 1.09
C7711	100-3000	Dual	100	1.0	0.35	1.25	18	Connectorized	3 x 2.2 x 0.7
C8998	100-3000	Dual	250	1.0	0.4	1.25	18	Connectorized	3 x 2.2 x 1.1
C5768	200-1000	Dual	500	0.3	0.2	1.10	20	Connectorized	3 x 3 x 1.09
C6727	200-2000	Dual	300	0.75	0.25	1.30	20	Connectorized	3 x 3 x 1.09
C5369	400-1000	Dual	1,000	0.25	0.2	1.15	20	Connectorized	3 x 3 x 1.09
C6110	400-2000	Dual	200	0.5	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C5560	470-860	Dual	500	0.2	0.1	1.10	25	Connectorized	3 x 3 x 1.59
C6756	470-860	Dual	1,000	0.3	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C6099	500-1000	Dual	500	0.25	0.2	1.15	20	Connectorized	3 x 3 x 1.09
C6473	500-1000	Dual	1,500	0.25	0.2	1.15	20	Connectorized	3 x 3 x 1.09
C7811	500-2500	Dual	100	0.5	0.2	1.25	20	Connectorized	3 x 2 x 0.6
C6559	500-3000	Dual	1,000	0.75	0.25	1.30	15	Connectorized	3 x 3 x 1.59
C9721	500-4000	Dual	300	0.75	0.2	1.30	15	Connectorized	3 x 3 x 1.09
C8698	700-3800	Dual	250	1.0	0.2	1.30	15	Connectorized	3 x 3 x 1.09
C5744	800-2400	Dual	500	0.5	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C5613	800-2800	Dual	300	0.75	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C5681	800-2800	Dual	1,000	0.75	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C6721	800-3000	Dual	400	0.75	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C5977	1000-2000	Dual	600	0.3	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C7343	1000-2000	Dual	1,000	0.3	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C6026	1000-3000	Dual	600	0.5	0.3	1.30	20	Connectorized	3 x 3 x 1.09
C8284	1000-3000	Dual	1,000	0.5	0.3	1.35	18	Connectorized	3 x 3 x 1.59
C6102	2000-4000	Dual	400	0.5	0.2	1.30	15	Connectorized	3 x 3 x 1.09

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com



50 dB Directional Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness (± dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C5960	0.01-250	Dual	1,000	0.75	0.4	1.25	20	Connectorized	10.5 x 3 x 2
C1460	0.01-250	Dual	2,000	1.0	0.15	1.15	20	Connectorized	10 x 3 x 3
C4080	0.01-250	Dual	3,500	1.0	0.2	1.15	20	Connectorized	10 x 4.6 x 3.5
C6145	0.01-400	Dual	500	0.5	0.5	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C6277	0.01-1000	Dual	500	0.5	0.45	1.30	20	Connectorized	6.7 x 2.27 x 1.7
C9828	0.1-30	Dual	1,000	0.5	0.15	1.15	20	Connectorized	6 x 2.2 x 2.2
C7325	0.1-250	Dual	1,000	0.5	0.15	1.15	20	Connectorized	6 x 2.2 x 2.2
C5377	0.1-1000	Dual	200	0.5	0.6	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C3807	0.3-30	Dual	5,250	0.5	0.05	1.10	20	Connectorized	5 x 3 x 2.24
C2800	0.5-32	Dual	5,000	0.5	0.05	1.15	20	Connectorized	5 x 3 x 2.24
C7090	1-100	Dual	1,000	0.5	0.2	1.15	20	Connectorized	6 x 2.2 x 2.2
C7354	1-500	Dual	1,000	1.0	0.15	1.20	20	Connectorized	6 x 2.2 x 2.2
C6238	1.5-30	Dual	5,000	0.3	0.05	1.10	25	Connectorized	5 x 3 x 2.24
C6120	10-50	Dual	5,000	0.5	0.05	1.15	20	Connectorized	6 x 3 x 2.24
C3900	10-55	Dual	10,000	0.5	0.05	1.20	30	Connectorized	6 x 3 x 2.24
C5134	10-55	Dual	20,000	0.5	0.1	1.10	25	Connectorized	6 x 3 x 2.24
C5671	10-100	Dual	1,000	0.25	0.1	1.10	20	Connectorized	3.75 x 3 x 1.87
C5827	10-100	Dual	3,000	0.5	0.1	1.15	25	Connectorized	3 x 3 x 2
C6981	10-100	Dual	5,000	0.5	0.1	1.10	25	Connectorized	6 x 3 x 2.24
C5425	10-175	Dual	1,200	0.25	0.1	1.10	20	Connectorized	3.75 x 3 x 1.88
C5464	10-200	Dual	500	0.5	0.15	1.20	20	Connectorized	3.75 x 3 x 1.88
C5526	13-14	Dual	1,000	0.1	0.05	1.05	30	Connectorized	6 x 3 x 1.09
C6217	13-14	Dual	3,000	0.1	0.05	1.05	30	Connectorized	6 x 3 x 1.09
C6418	13-175	Dual	10,000	0.5	0.1	1.20	25	Connectorized	6 x 3 x 2.24
C5951	20-150	Dual	3,000	0.5	0.1	1.05	25	Connectorized	3.75 x 3 x 1.88
C2310	20-230	Dual	2,000	0.5	0.1	1.05	20	Connectorized	3.75 x 3 x 1.88
C9613	20-500	Dual	200	0.5	0.35	1.30	20	Connectorized	5.2 x 2.7 x 1.7
C6407	20-500	Dual	800	0.5	0.3	1.20	20	Connectorized	6 x 3 x 1.09
C9439	20-520	Dual	1,000	1.0	0.3	1.30	20	Connectorized	4.45 x 2.4 x 1.59
C8896	20-1000	Dual	500	0.5	0.35	1.25	20	Connectorized	5.2 x 2.7 x 1.7
C9107	20-1000	Dual	1,000	1.0	0.4	1.30	20	Connectorized	4.45 x 2.4 x 1.59

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com



50 dB

Directional Couplers

50 dB Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness (± dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C7868	30-2500	Dual	200	1.0	0.25	1.20	20	Connectorized	3.5 x 2.6 x 0.7
C5923	50-500	Dual	5,000	0.5	0.1	1.15	25	Connectorized	3 x 3 x 1.59
C7632	63-65	Dual	400	0.3	0.15	1.15	25	Connectorized	6 x 3 x 1.59
C5263	80-220	Dual	3,000	0.5	0.1	1.10	20	Connectorized	3 x 3 x 1.09
C3908	80-1000	Dual	1,500	0.3	0.1	1.20	20	Connectorized	3 x 3 x 1.09
C6338	80-1000	Dual	2,500	0.3	0.1	1.20	20	Connectorized	3 x 3 x 1.09
C8429	100-500	Dual	200	0.3	0.1	1.20	20	Connectorized	3 x 3 x 1.09
C8212	100-500	Dual	1,000	0.3	0.2	1.10	20	Connectorized	3 x 3 x 1.09
C5324	100-500	Dual	1,500	0.3	0.2	1.15	20	Connectorized	3 x 3 x 1.09
C6204	100-500	Dual	3,000	0.5	0.1	1.10	25	Connectorized	6 x 3 x 2.24
C6766	100-500	Dual	3,000	0.3	0.2	1.20	25	Connectorized	3 x 3 x 1.09
C6411	100-700	Dual	3,000	0.5	0.15	1.15	20	Connectorized	3 x 3 x 1.09
C8895	123-133	Dual	200	0.5	0.15	1.20	27	Connectorized	6 x 3 x 1.09
C6504	123-133	Dual	2,250	0.5	0.15	1.20	25	Connectorized	6 x 3 x 1.09
C7067	123-133	Dual	2,250	0.5	0.15	1.20	27	Connectorized	6 x 3 x 1.09
C7633	126-128	Dual	400	0.3	0.15	1.15	25	Connectorized	3 x 3 x 1.59
C9624	175-177	Dual	16,500	0.1	0.05	1.10	25	Connectorized	6" Line Section
C3052	225-400	Dual	5,000	0.25	0.1	1.15	25	Connectorized	4" Line Section
C6374	280-320	Dual	600	0.3	0.1	1.15	20	Connectorized	3 x 3 x 1.09
C6918	297-302	Dual	1,000	0.3	0.15	1.15	20	Connectorized	3 x 3 x 1.59
C6461	400-1000	Dual	1,500	0.3	0.1	1.10	23	Connectorized	3 x 3 x 1.09
C5846	470-860	Dual	800	0.3	0.1	1.20	20	Connectorized	3 x 3 x 1.09
C5532	470-860	Dual	10,000	0.2	0.1	1.15	20	Connectorized	6" Line Section
C6265	500-3000	Dual	500	0.75	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C9043	500-3500	Dual	500	1.0	0.25	1.35	15	Connectorized	3 x 3 x 1.09
C9219	640-660	Dual	3,500	0.5	0.1	1.15	30	Connectorized	7" Line Section
C5070	800-2800	Dual	1,500	0.75	0.2	1.30	20	Connectorized	3 x 3 x 1.09
C8076	800-3000	Dual	600	0.5	0.25	1.30	15	Connectorized	3 x 3 x 1.09
C5069	1000-2000	Dual	1,500	0.3	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C9344	1000-2500	Dual	3,000	0.5	0.2	1.30	20	Connectorized	6" Line Section
C8249	1000-3000	Dual	2,000	0.75	0.2	1.35	15	Connectorized	3 x 3 x 1.59

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

Multi-Octave Performance



60 dB

Directional Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness ($\pm$ dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C1979	0.01-100	Dual	10,000	1.0	0.1	1.30	20	Connectorized	12 x 6 x 4.5
C5925	0.01-250	Dual	3,500	1.0	0.15	1.15	20	Connectorized	10 x 4.6 x 3.5
C5389	1.5-32	Dual	10,000	0.5	0.1	1.10	25	Connectorized	6 x 3 x 2.3
C5328	1.5-32	Dual	10,000	0.5	0.05	1.10	25	Connectorized	6" Line Section
C3824	1.5-80	Dual	500	0.5	0.15	1.10	20	Connectorized	4 x 2 x 2
C5023	2-30	Dual	25,000	0.5	0.05	1.10	20	Connectorized	6" Line Section
C3587	2-32	Dual	5,000	0.5	0.05	1.05	20	Connectorized	5 x 3 x 2.3
C3939	2-50	Dual	4,000	0.5	0.1	1.10	20	Connectorized	6 x 3 x 2.5
C6154	2-50	Dual	8,000	0.5	0.1	1.10	30	Connectorized	6 x 3 x 2.5
C5993	10-150	Dual	2,500	0.25	0.1	1.10	20	Connectorized	3.7 x 3 x 1.88
C5954	10-200	Dual	10,000	0.5	0.1	1.10	25	Connectorized	6 x 3 x 2.24
C8147	20-130	Dual	3,000	0.5	0.15	1.20	20	Connectorized	6 x 3 x 2.24
C5352	20-500	Dual	1,500	0.5	0.15	1.20	20	Connectorized	3 x 3 x 2
C6222	25-500	Dual	5,250	0.35	0.05	1.15	30	Connectorized	3 x 3 x 1.59
C6029	30-100	Dual	50,000	0.5	0.05	1.10	20	Connectorized	6" Line Section
C8238	30-150	Dual	1,000	0.5	0.1	1.10	20	Connectorized	3.75 x 3 x 1.88
C8805	30-520	Dual	2,000	0.35	0.1	1.15	25	Connectorized	3 x 3 x 1.09
C8405	62-65	Dual	3,000	0.3	0.15	1.15	25	Connectorized	6 x 3 x 1.09
C9502	80-1000	Dual	2,000	0.5	0.2	1.30	20	Connectorized	6" Line Section
C8719	80-1000	Dual	2,500	0.5	0.1	1.30	20	Connectorized	3 x 3 x 1.59
C5353	80-1000	Dual	3,000	0.5	0.2	1.25	20	Connectorized	8" Line Section
C5027	80-1000	Dual	4,000	0.5	0.1	1.30	20	Connectorized	3 x 3 x 1.59
C6796	80-1000	Dual	5,000	0.5	0.2	1.25	20	Connectorized	6" Line Section
C8705	100-500	Dual	2,000	0.5	0.2	1.15	20	Connectorized	3 x 3 x 1.09
C5044	100-1000	Dual	2,000	0.6	0.15	1.20	20	Connectorized	3 x 3 x 1.09
C8653	121-125	Dual	1,000	0.5	0.15	1.20	25	Connectorized	3 x 3 x 1.09
C7134	125-130	Dual	2,000	0.5	0.15	1.20	25	Connectorized	3 x 3 x 1.09
C8406	126-129	Dual	3,000	0.5	0.15	1.20	25	Connectorized	3 x 3 x 1.59
C7020	127-129	Dual	2,000	0.5	0.15	1.20	25	Connectorized	3 x 3 x 1.09
C5342	470-860	Dual	5,000	0.25	0.1	1.15	20	Connectorized	6" Line Section
C5864	500-1000	Dual	3,000	0.5	0.2	1.25	20	Connectorized	6" Line Section

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com



70 dB

Directional
Couplers

70 dB Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Flatness ($\pm$ dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C5845	1-10	Dual	20,000	0.5	0.05	1.10	25	Connectorized	6 x 3 x 2.24
C3957	1-30	Dual	2,000	0.5	0.05	1.20	20	Connectorized	6 x 3 x 2.24
C2702	1-30	Dual	15,000	0.3	0.05	1.05	35	Connectorized	6" Line Section
C2717	1-30	Dual	100,000	0.3	0.05	1.05	35	Connectorized	6" Line Section
C6318	1-50	Dual	10,000	0.5	0.05	1.10	30	Connectorized	6" Line Section
C6413	1-50	Dual	20,000	0.5	0.05	1.10	25	Connectorized	6 x 3 x 2.24
C8058	1-50	Dual	40,000	0.75	0.05	1.10	20	Connectorized	6 x 3 x 2.24
C1449	1-100	Dual	10,000	0.75	0.05	1.10	20	Connectorized	6 x 3 x 2.24
C5104	1.5-150	Dual	4,000	0.75	0.1	1.20	20	Connectorized	5 x 3 x 2.24
C2892	2-30	Dual	25,000	0.25	0.05	1.10	30	Connectorized	6" Line Section
C7422	2-30	Dual	50,000	0.5	0.1	1.15	30	Connectorized	6" Line Section
C2306	2-32	Dual	10,000	0.5	0.05	1.05	30	Connectorized	6" Line Section
C9018	2-32	Dual	50,000	0.5	0.05	1.05	30	Connectorized	6" Line Section
C2872	10-220	Dual	10,000	0.5	0.1	1.15	20	Connectorized	6 x 3 x 2.24
C9046	10-500	Dual	10,000	0.75	0.2	1.30	20	Connectorized	6 x 3 x 2.24
C6344	10-500	Dual	10,000	0.75	0.2	1.30	20	Connectorized	6" Line Section
C9562	30-300	Dual	50,000	0.5	0.15	1.15	20	Connectorized	6" Line Section
C9792	30-520	Dual	10,000	0.75	0.15	1.30	20	Connectorized	6" Line Section
C9606	40-100	Dual	100,000	0.5	0.05	1.10	20	Connectorized	6" Line Section
C5045	100-1000	Dual	8,000	0.6	0.15	1.30	20	Connectorized	6" Line Section

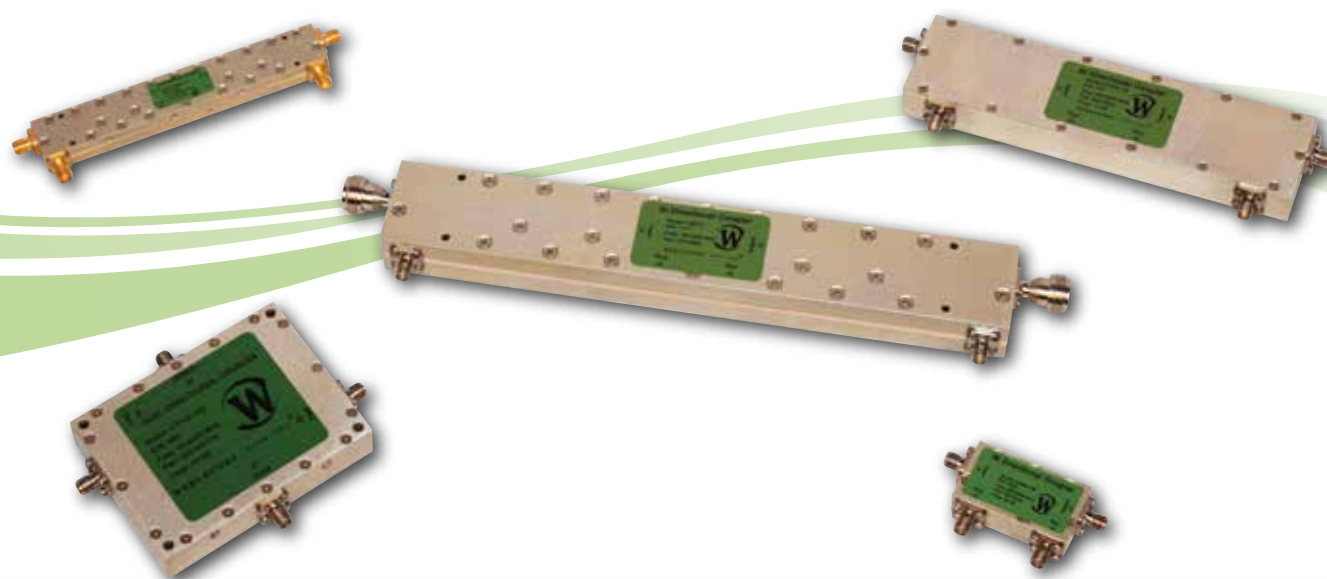
* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

Test & Measurement Directional Couplers

Werlatone is a leading supplier of High Power, Ultra-Wideband Directional Couplers throughout the world. Over the last 50 years we've grown our Test and Measurement Coupler line in support of specific programs, but also based on our market vision, whether in the military or commercial segments.

Multi-Octave Directional Couplers are available throughout the market place, as are high power designs. **Werlatone**, however, provides a combination of bandwidth, power, and low loss. Loss on such designs is very critical as it will quickly translate to heat and ultimately unit failure. The Model C8060 (20 dB Bi-Directional Coupler, 200-6000 MHz, 200 W CW) is a perfect example of **Werlatone's** high power, efficiency, and bandwidth, resulting in a low loss and compact design. As a test coupler, the C8060 allows for accurate readings at lower power due to its coupling factor. With an attenuator, the user can loosen the coupling to test at higher power levels as well. Regardless, the loss and thus the heating remain minimal.

The combination of **High Power, Efficiency, and Bandwidth** is challenging and often requires customization. Our line of Wideband, High Power Directional Couplers continues to grow.



Test & Measurement Couplers

Model	Frequency (MHz)	Type	Power (Watts CW)	Coupling (dB)	Insertion Loss (dB)	VSWR (Main Line)	Directivity (dB)	Mounting Style	Size (L x W x H) (Inches)
C9688	1-1000	Dual	800	40	0.5	1.20	20	Connectorized	6 x 2.2 x 2.2
C7734	30-2500	Dual	100	43	0.35	1.25	18	Connectorized	3.5 x 2.6 x 0.7
C8188	30-3000	Uni	20	20	2.4	1.35	18	Connectorized	6 x 1.5 x 1.1
C3910	80-1000	Dual	200	40	0.2	1.20	20	Connectorized	3 x 3 x 1.09
C8373	100-2500	Bi	200	20	0.8	1.25	15	Connectorized	9.6 x 1.48 x 0.9
C7711	100-3000	Dual	100	40	0.35	1.25	18	Connectorized	3 x 2.2 x 0.7
C7058	200-2000	Bi	200	10	0.3	1.25	20	Connectorized	6.4 x 1.6 x 0.72
C8060	200-6000	Bi	200	20	1.1	2.25	14	Connectorized	4.8 x 0.88 x 0.5
C7248	300-3000	Bi	100	6	0.35	1.25	15	Connectorized	6 x 2 x 0.85
C8000	600-6000	Bi	100	30	0.4	1.25	15	Connectorized	1.8 x 1 x 0.56
C8214	700-2500	Bi	100	6	0.35	1.25	15	Connectorized	6 x 2 x 0.85
C8644	1800-6100	Bi	60	20	0.4	1.25	18	Connectorized	1.1 x 0.75 x 0.48

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

Radial Combiners and Dividers

Werlatone Mismatch Tolerant® High Power Radial Combiners and Dividers are ideal for Radar, EW and Telecom systems. **Werlatone's** full line of Radial Combiners and Dividers address multiple high power, amplifier applications. Our designs range from 3-Way to 32-Way Solutions, from VHF through S-Band, up to 10:1 Bandwidth, at power levels to 8 kW CW, and 32 kW peak!

Our Radial Combiners and Dividers are in-phase, radial transmission line structures, which combine or divide in a single stage, generating lower losses than the typical Wilkinson technique. By using unique Combining methods, we allow for higher frequency operation and excellent reliability, while supporting a Solid State approach. Without internal terminations, extensive heat-sinking and losses can be avoided.

Werlatone specializes in custom requirements. We offer a variety of connector configurations to include, N Female, 7/16 Female, 1 5/8" EIA, or 3 1/8" EIA. Right Angle variations are also available. **Werlatone's** Radial Combiners and Dividers are the most rugged in the RF industry, and are built to satisfy harsh military and commercial environments.



Combiners/Dividers

Model	Type	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Connectors (Sum Port, Inputs/Outputs)
D8182	5-Way	1175-1375	1,500	0.4	1.35	1 5/8" EIA, N Female
D8454	8-Way	370-450	10,000	0.25	1.30	3 1/8" EIA, N Female
D9816	8-Way	330-530	10,000	0.25	1.30	3 1/8" EIA, N Female
D9710	8-Way	1000-2500	2,000	0.3	1.40	1 5/8" EIA, N Female
D9529	8-Way	2305-2360	1,000	0.2	1.15	7/16 Female, N Female
D9528	8-Way	2305-2360	2,000	0.2	1.15	7/8" EIA, N Female
D5320	12-Way	470-860	500	0.3	1.30	All N Female
D9194	16-Way	2305-2360	1,000	0.2	1.15	7/16 Female, SMA
D9527	16-Way	2305-2360	2,000	0.2	1.15	7/8" EIA, N Female
D6083	16-Way	2310-2350	2,000	0.2	1.15	7/8" EIA, SMA
D9706	16-Way	2700-3500	6,000	0.35	1.35	Waveguide, N Female
D6857	32-Way	1200-1400	4,000	0.5	1.35	1 5/8" EIA, TNC
D9559	32-Way	2200-2750	40	0.4	1.40	N Female, SMA

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

0° (In-Phase) Combiners & Dividers

Werlatone Mismatch Tolerant® High Power RF Combiners and Dividers will operate into High Load VSWR conditions, for extended periods, without damage.

For broadband Non-Coherent Combining applications, (combining two or more signals of differing power, frequency and/or phase onto a single output), Werlatone provides Non-Coherent RF Combiner designs with proven heat dissipation techniques. When specified, we design our High Power Combiners and RF Dividers to tolerate full input failures on adjacent port(s). This insures that remaining transmitter(s) may continue to operate until the amplifier system can be properly shut down for maintenance.

With extensive experience as a supplier to military platforms worldwide, Werlatone designs its High Power Broadband Combiners, Power Dividers, and N-Way Combiners for duty in the most stringent operating conditions.

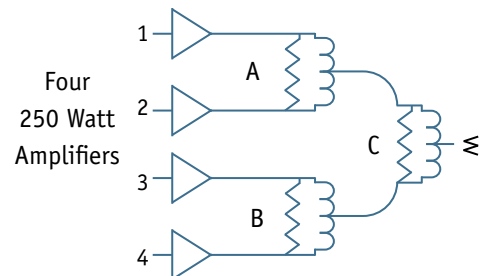
To Consider When Specifying Your Combiner

Isolating Termination Dissipation

Isolating terminations enable the dissipation of power due to various unbalances and possible input failures. In the case of high power combiners, however, it may be a system layout and/or cost which determine whether to include terminations with enough dissipation capability to absorb the unbalanced power that results from one or more input failures.

A schematic representation of four 250 Watt amplifiers feeding a 4-Way Combiner, outlines the power output and the power dissipation requirement associated with various failure scenarios. It should be noted that all losses shown in the chart are independent of the combiner insertion loss.

Input Failure(s) VS Power Output



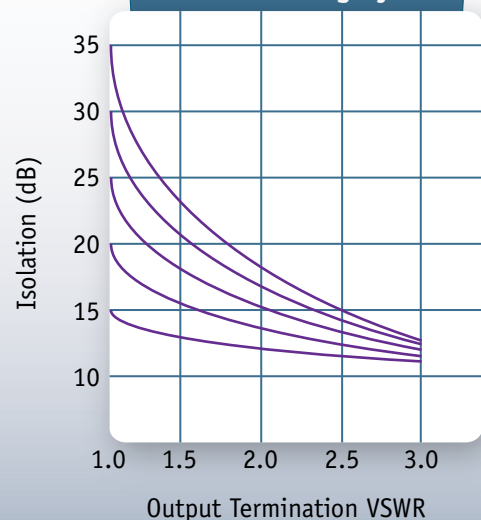
Input Failure(s)	Watts P-Out	Dissipated Power (Watts)		
		A	B	C
0	1000	0	0	0
1	562.5	125	0	62.5
1 & 2	250	0	0	250
1 & 3	250	125	125	0
1, 2 & 3	62.5	0	125	62.5

Isolation vs Output Termination VSWR for a Combining Hybrid

Signal coupling, expressed in dB, between input ports, under matched impedance conditions.

Inherent isolation degrades as a function of Output Termination VSWR. As the Output Termination VSWR approaches 2.5:1, a combiner with infinite Inherent Isolation, provides only 2 dB more Output Isolation than one with 15 dB Inherent Isolation, and only 1 dB more than a unit with 20 dB Inherent Isolation. Therefore, any investment in a unit with greater than 20 dB Inherent Isolation, operating into an Output Termination VSWR greater than or equal to 2.5:1, should be reviewed.

Isolation VS Output Termination VSWR For a Combining Hybrid



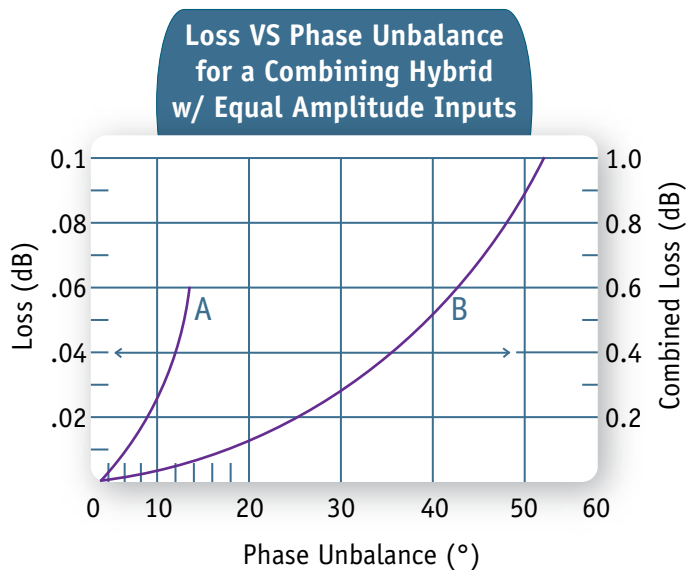
Multi-Octave Performance

Loss vs Phase Unbalance

The difference in phase delay from any input to the sum port. Most units exhibit a typical Phase Unbalance of 1-5 degrees.

Curve A illustrates how Phase Unbalance influences the loss of a 2-Way Combiner. Since even a 10 degree Phase Unbalance results in only 0.033 dB loss above insertion loss, in certain applications the Phase Unbalance may be over specified.

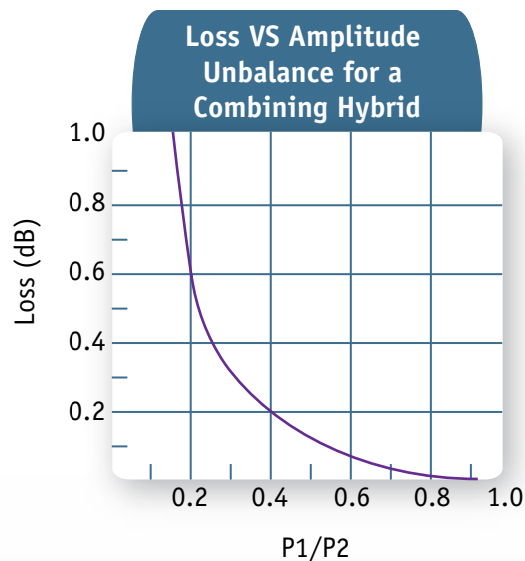
Curve B may be utilized to determine the Combined Loss due to the Phase Unbalance of a combiner and two driving amplifiers. As an example, two amplifiers phase tracked to 15 degrees and a combiner with 10 degree Phase Unbalance, results in a loss of approximately 0.22 dB above the insertion loss. The power represented by the 0.22 dB loss is dissipated within the isolation termination(s).



Loss vs Amplitude Balance

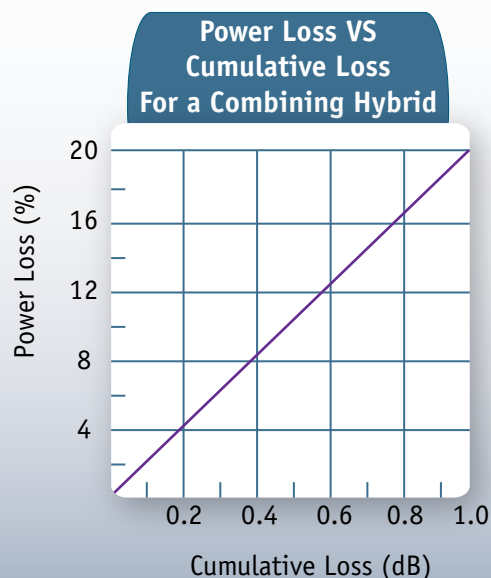
Any unbalance in amplitude between the input ports to a combiner (expressed as P1/P2), while driving from two identical RF sources.

Amplitude Unbalance affects the loss of a Combiner / System. On a 2-Way Combiner, extending the P1/P2 axis to < 0.1 , shows that a complete failure of one input source results in a loss of 3 dB. Thus, one-half of the input power reaches the output, while one-half dissipates within the isolating termination(s). As an example, one RF source (P1) generating 100 Watts and the other RF source (P2) generating 200 Watts will provide an unbalance ratio (P1/P2) of 0.5. The resulting loss due to this Amplitude Unbalance is approximately 0.13 dB.



Power Loss vs Cumulative Loss for a Combining Hybrid

The percentage of power loss is a function of cumulative loss. Adding the combiner insertion loss to the combiner phase and amplitude unbalance loss, results in a cumulative loss.



Tolerate Severe Input Unbalances



2-Way

In-Phase Combiners/Dividers

Model	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Phase Balance ($\pm^\circ$)	Isolation (dB)	Mounting Style	Size (L x W x H) (Inches)
D5674	0.01-250	100	1.5	1.40	8	18	Connectorized	7.38 x 6 x 3.17
D6103	0.1-20	400	0.2	1.20	5	20	Connectorized	7 x 3.8 x 2.7
D6300	0.1-250	100	0.5	1.35	5	15	Connectorized	6.5 x 4.45 x 2
D9090	0.1-250	400	0.6	1.35	5	15	Connectorized	6.5 x 4.45 x 2
D5253	1-30	200	0.3	1.30	5	20	Connectorized	3 x 3 x 2.25
D9589	1-32	1,000	0.1	1.30	5	20	Connectorized	3 x 3 x 2.25
D9335	1-1000	100	0.7	1.40	5	15	Connectorized	3 x 1.6 x 0.8
D5312	1.5-30	500	0.2	1.30	5	20	Connectorized	3 x 3 x 2.25
D2076	1.5-30	3,000	0.1	1.25	2	22	Connectorized	7 x 3.75 x 2.62
D2075	1.5-30	6,000	0.2	1.25	5	20	Connectorized	15.5 x 11.75 x 5.3
D6046	1.5-30	10,000	0.2	1.25	3	20	Connectorized	15.5 x 11.75 x 5.3
D8969	1.5-30	12,500	0.2	1.25	3	20	Connectorized	17 x 17 x 8
D2551	2-32	1,000	0.1	1.30	5	20	Connectorized	3 x 3 x 2.25
D5889	2-50	200	0.2	1.30	4	20	Connectorized	3 x 3 x 2.25
D1635	2-220	200	0.4	1.30	4	20	Connectorized	3 x 3 x 2.25
D8976	2-220	400	0.4	1.30	5	20	Connectorized	6.5 x 4.45 x 2
D6037	10-140	400	0.3	1.35	5	20	Connectorized	6.5 x 4.45 x 2
D5687	10-500	200	0.5	1.40	5	20	Connectorized	5 x 3.5 x 2
D5607	10-500	500	0.4	1.35	5	20	Connectorized	6.5 x 4.5 x 2
D6163	10-1000	25	0.75	1.35	5	20	Connectorized	3 x 1.6 x 0.8
D8123	20-60	5,000	0.2	1.25	5	20	Connectorized	15.5 x 11.75 x 5.3
D5786	20-100	200	0.25	1.30	5	20	Connectorized	3 x 3 x 2.25
D1994	20-100	600	0.3	1.30	5	20	Connectorized	5 x 3 x 2.3
D7965	20-100	1,200	0.2	1.20	5	20	Connectorized	7 x 4 x 1.62
D7897	20-100	1,600	0.2	1.20	5	20	Connectorized	7 x 4 x 2.62
D6253	20-500	25	0.5	1.35	5	25	Connectorized	3 x 1.6 x 0.8
D7974	20-500	50	0.35	1.30	3	20	Connectorized	3 x 1.6 x 0.8
D7171	20-500	100	0.3	1.30	3	20	Connectorized	2.45 x 2 x 0.67
D7105	20-500	500	0.35	1.30	5	20	Connectorized	3.3 x 2.65 x 1
D9891	20-500	1,000	0.8	1.40	5	18	Connectorized	6.5 x 6.25 x 2.25
D5576	20-500	1,500	0.5	1.35	5	15	Connectorized	8 x 7.5 x 4.5

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

Protect Against Full Input Failures



2-Way

In-Phase Combiners/Dividers

2-Way Combiners

Model	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Phase Balance ($\pm^\circ$)	Isolation (dB)	Mounting Style	Size (L x W x H) (Inches)
D9598	20-520	200	0.35	1.30	5	20	Connectorized	3.3 x 2.65 x 1
D8632	20-1000	50	0.7	1.40	5	20	Connectorized	2.2 x 1.5 x 0.9
D8300	20-1000	100	0.5	1.35	5	20	Connectorized	2.45 x 2 x 0.91
D8682	20-1000	500	0.7	1.35	5	15	Connectorized	5.2 x 2.65 x 1.8
D9264	20-1000	1,000	0.8	1.40	5	18	Connectorized	6.5 x 6.25 x 2.25
D8339	20-2000	5	1.2	1.70	5	15	Connectorized	3 x 1.6 x 0.8
D8341	20-2000	20	1.2	1.70	5	15	Connectorized	3 x 1.6 x 0.8
D8496	30-90	50	0.25	1.25	4	25	Connectorized	3.4 x 3.4 x 2.25
D8832	30-512	650	0.5	1.35	5	20	Connectorized	6.5 x 4.5 x 2
D5676	80-1000	500	0.5	1.40	5	15	Connectorized	13 x 7 x 2.25
D8383	80-1000	1,000	0.5	1.40	5	18	Connectorized	13 x 7 x 2.22
D6129	80-1000	2,000	0.5	1.40	5	15	Connectorized	11.75 x 10 x 2.25
D6760	100-500	50	0.5	1.35	5	25	Connectorized	3 x 1.6 x 0.8
D5900	100-500	1,000	0.25	1.20	5	23	Connectorized	7.5 x 7 x 2
D6078	100-500	2,000	0.25	1.20	5	20	Connectorized	13 x 7 x 2.25
D7885	200-2500	200	0.65	1.40	5	15	Connectorized	7.7 x 1.6 x 0.81
D7231	450-2000	125	0.5	1.40	5	15	Connectorized	6 x 2 x 1
D9061	500-1000	750	0.25	1.35	5	14	Connectorized	5 x 3 x 1.25
D7823	500-2500	200	0.4	1.35	5	15	Connectorized	4.7 x 2 x 0.8
D9392	500-2500	500	0.3	1.35	5	15	Connectorized	4.7 x 1.7 x 1.1
D3800	800-1000	200	0.3	1.30	5	20	Connectorized	3 x 2 x 1.5
D6669	800-2000	200	0.4	1.40	5	15	Connectorized	5.5 x 2.75 x 1.25
D8986	800-3800	300	0.4	1.40	5	15	Connectorized	3.7 x 1.9 x 0.87
D8543	800-4200	250	0.5	1.40	5	15	Connectorized	3.7 x 1.9 x 0.87
D8468	800-5000	150	0.6	1.35	5	15	Connectorized	3.4 x 1.4 x 0.87
D6767	1000-2000	600	0.25	1.40	5	15	Connectorized	4 x 3.5 x 1.06
D9900	2000-4000	50	0.5	1.40	5	15	Connectorized	5.5 x 2.75 x 1.25
D9215	2000-4000	200	0.35	1.40	5	15	Connectorized	3.2 x 2.3 x 0.87
D9667	2000-6000	500	0.5	1.50	5	15	Connectorized	2.52 x 2.4 x 1.16
D9042	3000-6000	250	0.35	1.40	5	15	Connectorized	2.03 x 2 x 0.87
D5743	3100-3500	300	0.4	1.40	5	20	Connectorized	3.75 x 3 x 1.19

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

P19 | Send Us Your Specs!

Fully Isolated Designs | Conservatively Rated

4-Way Combiners



4-Way In-Phase Combiners/Dividers

Model	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Phase Balance ($\pm^\circ$)	Isolation (dB)	Mounting Style	Size (L x W x H) (Inches)
D9161	0.1-15	100	0.25	1.30	5	20	Connectorized	6 x 5 x 2
D9162	0.1-15	2,500	0.35	1.30	5	18	Connectorized	13 x 7.25 x 3.6
D5704	0.1-30	1,000	0.4	1.30	5	20	Connectorized	9.5 x 8.5 x 3
D3510	0.5-30	5	0.5	1.30	5	30	Connectorized	3 x 3 x 2.3
D5855	1-30	200	0.2	1.20	3	25	Connectorized	6 x 5 x 2
D8230	1-30	2,500	0.2	1.15	5	30	Connectorized	10.5 x 5.4 x 1.3
D5796	1-32	400	0.3	1.25	5	20	Connectorized	6 x 5 x 2
D5387	1-50	1,000	0.3	1.30	5	20	Connectorized	9.5 x 8.5 x 3
D1624	1-500	100	0.8	1.40	5	25	Connectorized	6 x 5 x 2.25
D1572	1-1000	50	1.2	1.50	6	20	Connectorized	6 x 5 x 2.25
D6183	1-1000	250	1.2	1.45	5	18	Connectorized	8 x 6 x 2.25
D5807	1.5-30	4,000	0.25	1.20	5	25	Connectorized	13 x 11 x 3.7
D6139	1.5-32	5,000	0.25	1.25	5	20	Connectorized	13 x 11 x 5
D6774	1.5-32	20,000	0.3	1.20	5	20	Connectorized	21 x 17.25 x 11
D5775	1.5-50	3,000	0.2	1.15	5	25	Connectorized	13 x 11 x 3.7
D9645	2-30	4,000	0.35	1.20	5	20	Connectorized	20.25 x 16.9 x 5.2
D7685	2-100	2,500	0.5	1.30	5	20	Connectorized	16.5 x 13 x 5.5
D7312	10-100	100	0.35	1.20	5	20	Connectorized	3 x 3 x 0.8
D9008	10-100	200	0.4	1.30	5	20	Connectorized	6 x 5 x 2
D6517	10-100	500	0.4	1.30	5	20	Connectorized	6 x 5 x 2
D6448	10-100	1,000	0.4	1.30	2	20	Connectorized	6 x 5 x 2
D3857	10-100	5,000	0.6	1.40	5	18	Connectorized	18 x 17 x 5
D6530	10-500	100	0.6	1.25	5	20	Connectorized	3 x 3 x 0.8
D8959	20-100	1,750	0.3	1.30	3	23	Connectorized	9 x 6.5 x 3.25
D8110	20-130	600	0.4	1.25	5	20	Connectorized	6 x 4.5 x 2
D9221	20-130	10,000	0.3	1.25	5	20	Connectorized	14.75 x 12 x 5
D2786	20-150	4,000	0.5	1.35	5	20	Connectorized	18 x 17 x 5
D8803	20-300	1,750	0.5	1.30	5	18	Connectorized	9.4 x 8.4 x 3.25
D6405	20-500	50	0.65	1.30	5	20	Connectorized	3 x 3 x 0.8
D5816	20-500	200	0.5	1.35	5	20	Connectorized	5.1 x 5 x 1.41
D5612	20-500	500	0.7	1.40	5	20	Connectorized	7.5 x 7 x 2.25

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

Operate into High Load VSWR Conditions



4-Way

In-Phase Combiners/Dividers

4-Way Combiners

Model	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Phase Balance ($\pm^\circ$)	Isolation (dB)	Mounting Style	Size (L x W x H) (Inches)
D5575	20-500	1,000	0.7	1.40	5	18	Connectorized	7.5 x 7 x 2.25
D7365	20-1000	100	0.75	1.35	5	20	Connectorized	5.09 x 2.3 x 1
D9317	20-1000	200	0.7	1.40	5	15	Connectorized	3.75 x 3.75 x 0.9
D7439	20-1000	250	0.75	1.35	5	18	Connectorized	5.1 x 5 x 1.5
D9048	20-1000	500	0.6	1.35	5	17	Connectorized	5 x 4.7 x 1.4
D9075	20-1000	1,000	0.65	1.35	5	15	Connectorized	5.7 x 4.7 x 1.75
D9310	20-3000	50	1.2	1.50	5	15	Connectorized	3.35 x 2.75 x 0.85
D9649	20-4000	50	1.5	1.70	12	12	Connectorized	2.75 x 2.75 x 0.85
D5920	30-90	150	0.3	1.30	5	20	Connectorized	6 x 5 x 2
D5778	30-90	5,000	0.3	1.30	5	20	Connectorized	18 x 17 x 5
D8907	30-520	1,000	0.7	1.40	5	18	Connectorized	7.5 x 7 x 1.75
D2413	50-200	4,000	0.4	1.30	5	20	Connectorized	18 x 17 x 5
D9002	80-1000	750	0.6	1.35	5	17	Connectorized	5 x 4.7 x 1.4
D9440	80-1000	1,000	0.65	1.35	5	15	Connectorized	5.7 x 4.7 x 1.75
D6738	100-500	50	0.65	1.30	5	20	Connectorized	3 x 3 x 0.8
D5400	100-500	500	0.5	1.40	5	20	Connectorized	7.5 x 7 x 2.25
D5300	100-500	1,200	0.5	1.40	5	20	Connectorized	7.5 x 7 x 2.25
D1990	100-1000	25	0.7	1.50	5	20	Connectorized	5 x 2 x 1.89
D1969	100-1000	100	0.6	1.50	5	20	Connectorized	6 x 5 x 2.25
D9416	200-1000	500	0.65	1.35	5	17	Connectorized	5 x 4.7 x 1.4
D5809	225-400	400	0.4	1.30	5	25	Connectorized	7.5 x 7 x 2.5
D5907	470-860	1,000	0.35	1.40	5	18	Connectorized	6 x 5 x 2
D8158	500-1000	50	0.75	1.35	5	20	Connectorized	5.1 x 2.3 x 1
D5074	800-1000	100	0.35	1.50	5	18	Connectorized	6 x 3 x 1.6
D8422	800-2300	800	0.5	1.25	5	11	Connectorized	5.5 x 4.25 x 2.25
D7539	800-2800	200	0.6	1.35	5	15	Connectorized	5.5 x 4.1 x 1.1
D7435	800-4200	80	1.0	1.50	5	12	Connectorized	6 x 5.5 x 0.9
D7695	900-1300	200	0.4	1.30	5	20	Connectorized	4 x 3.3 x 0.8
D5784	1750-1850	200	0.6	1.30	5	20	Connectorized	4.5 x 4 x 1.3
D5176	1850-2000	50	0.5	1.30	6	20	Connectorized	5.5 x 4.1 x 1.1
D7386	3000-3600	300	0.5	1.40	5	15	Connectorized	6 x 3 x 0.81

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

P21 | Send Us Your Specs!



N-Way

In-Phase Combiners/Dividers

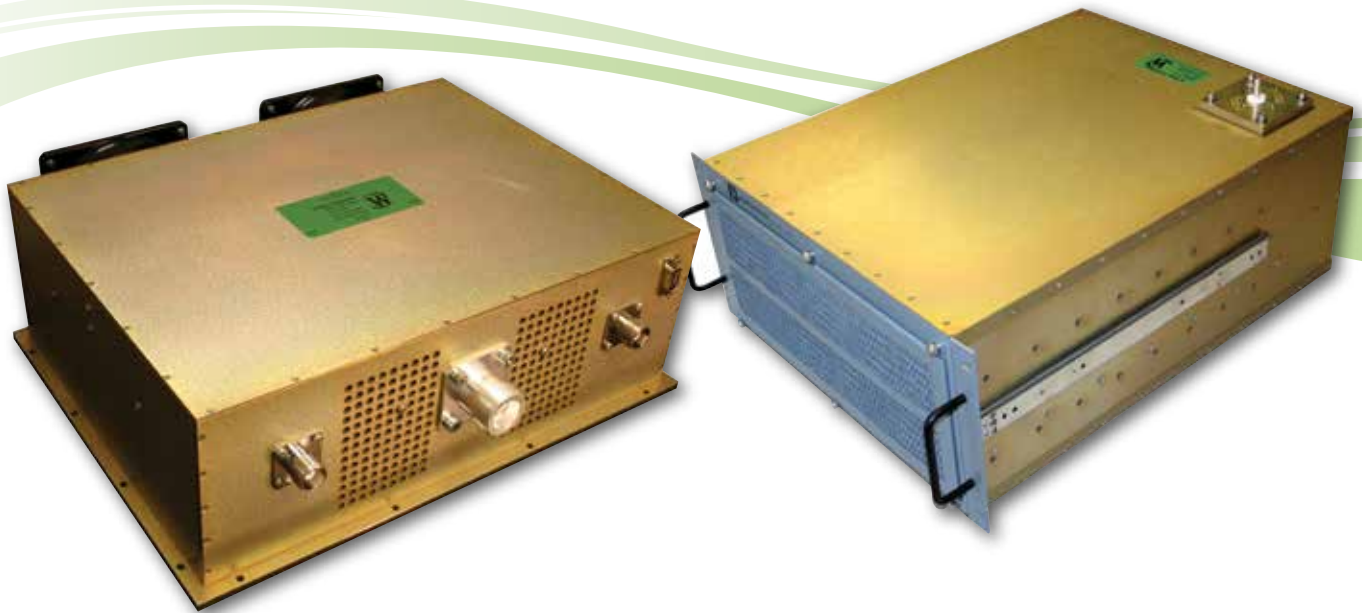
Model	Type	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Isolation (dB)	Mounting Style	Size (L x W x H) (Inches)
D9820	6-Way	1.5-30	100	0.7	1.35	25	Connectorized	7 x 5 x 2
D6846	6-Way	1.5-30	4,000	0.35	1.35	20	Connectorized	19.5 x 19 x 5.15
D8421	8-Way	1.5-30	12,000	0.3	1.30	20	Connectorized	22.5 x 19.5 x 8.75
D9079	8-Way	10-165	800	0.65	1.50	20	Connectorized	19 x 8 x 2.25
D9206	5-Way	10-175	100	0.8	1.50	15	Connectorized	6.75 x 5 x 2.25
D6717	3-Way	20-130	100	0.35	1.30	18	Connectorized	5 x 3 x 2.25
D8146	3-Way	20-130	1,500	0.35	1.40	18	Connectorized	13 x 6 x 2.75
D5829	8-Way	20-500	400	0.75	1.40	20	Connectorized	12 x 7.75 x 2.25
D9980	3-Way	20-2500	50	1.0	1.30	0	Connectorized	3.35 x 2.75 x 0.85
D8032	3-Way	25-450	200	0.75	1.35	20	Connectorized	5.4 x 3 x 1
D7070	3-Way	30-500	100	0.75	1.35	20	Connectorized	5.4 x 3 x 1.31
D7438	3-Way	100-500	100	0.75	1.35	20	Connectorized	5.4 x 3 x 1.31
D9422	8-Way	120-122	200	0.6	1.25	20	Connectorized	10 x 8 x 2.25
D7743	16-Way	125-128	400	0.85	1.40	20	Connectorized	12 x 12 x 4
D5876	3-Way	150-1000	350	0.65	1.30	0	Connectorized	8.4 x 7.55 x 1.55
D9423	8-Way	169-171	200	0.5	1.25	20	Connectorized	10 x 8 x 2.25
D6861	8-Way	290-300	200	0.5	1.25	20	Connectorized	10 x 8 x 2.25
D8271	8-Way	290-300	200	0.5	1.25	20	Connectorized	10 x 8 x 2.25
D7167	16-Way	290-300	400	0.65	1.30	20	Connectorized	12 x 12 x 4
D7169	8-Way	390-400	200	0.5	1.25	20	Connectorized	10 x 8 x 2.25
D7977	16-Way	389-402	400	0.5	1.30	20	Connectorized	14 x 12 x 5
D7976	8-Way	398-402	400	0.5	1.25	20	Connectorized	10 x 8 x 2.25
D5543	3-Way	400-470	100	0.2	1.20	0	Connectorized	4.75 x 2 x 1.88
D6196	6-Way	400-475	750	0.4	1.30	20	Connectorized	13.5 x 8.5 x 2
D9493	8-Way	400-500	100	0.4	1.30	0	Connectorized	9.5 x 4.1 x 1.13
D6191	3-Way	400-2400	500	0.65	1.30	0	Connectorized	8.4 x 5.8 x 1.5
D5321	12-Way	470-860	5,000	0.3	1.30	0	Connectorized	10 x 5 x 5
D9399	8-Way	850-860	100	0.4	1.20	0	Connectorized	9.5 x 3.5 x 1.13
D9462	8-Way	1000-2500	100	0.35	1.40	0	Connectorized	4.75 x 2.3 x 0.75
D9939	8-Way	1000-2500	200	0.4	1.40	0	Connectorized	4.75 x 2.3 x 1.1
D6310	16-Way	2300-2400	200	0.2	1.15	0	Connectorized	5 x 4.25 x 0.9

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

Big Stuff!! High Power Combiners & Dividers

Big Stuff!! Werlatone offers a full line of High Power Combiners & Dividers for frequency bands covering HF through S-Band, at power levels to **20 kW CW and 100 kW Peak**. Our low loss designs are ideal for Coherent Combining applications (when the inputs offer equal frequency, power, and phase) and for Non-Coherent Combining applications (when all is not equal).

2-Way, 4-Way, and N-Way designs can be supplied Isolated or Non-Isolated, based on your requirement. Our **Big Stuff** is built to withstand high unbalanced input powers, and operate into severe Load Mismatch conditions. Various mounting styles are available, to include Rack Mount, Drawer Mount, and Radial Type.



Combiners/Dividers

Model	Type	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Isolation (dB)	Mounting Style	Size (L x W x H)
D8265	2-Way	1-50	5,000	0.3	1.25	20	Connectorized	15.5 x 11.75 x 5.3
D2075	2-Way	1.5-30	6,000	0.2	1.25	20	Connectorized	15.5 x 11.75 x 5.3
D8969	2-Way	1.5-30	12,500	0.2	1.25	20	Connectorized	17 x 17 x 8
D6139	4-Way	1.5-32	5,000	0.25	1.25	20	Connectorized	13 x 11 x 5
D6774	4-Way	1.5-32	20,000	0.3	1.20	20	Connectorized	21 x 17.25 x 11
D6846	6-Way	1.5-30	4,000	0.35	1.35	20	Connectorized	3U, 19" Rack
D8421	8-Way	1.5-30	12,000	0.3	1.30	20	Connectorized	22.5 x 19.5 x 8.8
D7685	4-Way	2-100	2,500	0.5	1.30	20	Connectorized	16.5 x 13 x 5.5
D9221	4-way	20-130	10,000	0.3	1.25	20	Connectorized	14.75 x 12 x 5
D2786	4-Way	20-150	4,000	0.5	1.35	20	Connectorized	18 x 17 x 5
D6078	2-Way	100-500	2,000	0.25	1.20	20	Connectorized	13 x 7 x 2.25
H7521	2-Way (180°)	200-400	2,500	0.3	1.30	20	Connectorized	15 x 10 x 2
D7502	2-Way	400-1000	2,500	0.25	1.20	0	Connectorized	9.4 x 3.4 x 1.25

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

Multi-Octave, Broadband Quadrature Designs



90°

Hybrid Couplers

Model	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Phase Balance ($\pm^\circ$)	Isolation (dB)	Mounting Style	Size (L x W x H) (Inches)
QH6306	0.5-2	50	0.4	1.30	6	20	Connectorized	4 x 2.25 x 2
QH6213	2-30	1,200	0.3	1.25	6	25	Connectorized	9 x 8 x 3.6
QH6212	2-30	80	0.3	1.25	5	25	Connectorized	4 x 3 x 1.5
QH9368	2-30	500	0.3	1.25	6	25	Connectorized	7 x 3.75 x 2.62
QH6213	2-30	1,200	0.3	1.25	6	25	Connectorized	9 x 8 x 3.6
QH3350	6-130	10	0.6	1.30	5	20	Connectorized	3.75 x 3 x 1.5
QH3351	6-130	250	0.5	1.30	5	20	Connectorized	5.5 x 4.75 x 1.75
QH6312	10-150	10	0.6	1.30	5	20	Connectorized	3 x 3 x 1.5
QH6313	10-150	250	0.6	1.30	5	20	Connectorized	5.5 x 4.75 x 1.5
QH7328	20-100	500	0.4	1.35	5	25	Connectorized	4.6 x 3.75 x 1.7
QH3502	20-200	25	0.7	1.40	10	20	Connectorized	3.75 x 3 x 1.5
QH3503	20-200	200	0.7	1.40	10	20	Connectorized	6 x 3 x 1.9
QH9386	20-520	25	0.6	1.40	10	20	Connectorized	2.7 x 2.7 x 1.25
QH9338	20-520	250	0.6	1.30	10	20	Connectorized	2.7 x 2.7 x 1.25
QH8540	20-520	250	0.6	1.30	10	20	Copper Pins	2.7 x 2.7 x 0.9
QH3554	30-88	50	0.4	1.30	3	20	Connectorized	5 x 3 x 2
QH9056	30-520	400	0.8	1.30	6	18	Drop-In**	4 x 1.7 x 0.29
QH9972	30-520	400	0.8	1.30	7	18	Connectorized	5 x 3.5 x 1.1
QH9304	60-1000	150	1.0	1.40	6	18	Tabs	2 x 1 x 0.16
QH8718	80-1000	100	0.8	1.40	5	16	Drop-In**	2.6 x 1.2 x 0.15
QH9103	80-1000	100	1.0	1.40	5	16	Connectorized	3.1 x 1.7 x 0.84
QH8849	80-1000	250	0.65	1.40	5	16	Drop-In**	2.9 x 2.1 x 0.31
QH8859	80-1000	250	0.65	1.40	6	16	Connectorized	3.5 x 3.2 x 1.06
QH8911	80-1000	250	0.7	1.45	5	18	Connectorized	4.25 x 2.88 x 1
QH5927	100-200	2,500	0.4	1.15	2	20	Connectorized	15.8 x 3 x 1.5
QH6308	100-500	25	0.6	1.40	10	20	Connectorized	4 x 2 x 1.5
QH8756	100-500	2,000	0.35	1.30	3	18	Connectorized	21.8 x 2.2 x 2
QH7816	100-512	200	0.5	1.30	5	20	Connectorized	3.7 x 1.92 x 0.85
QH8100	100-512	250	0.45	1.30	5	20	Drop-In**	3.3 x 1.52 x 0.28
QH9030	100-512	400	0.4	1.30	5	20	Connectorized	4 x 2.42 x 1.1
QH9044	100-512	400	0.4	1.30	5	20	Connectorized	4 x 1.92 x 1.1

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

** Available with Solder Point or Tab Interface



90°

Hybrid Couplers

90° Hybrids

Model	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Phase Balance (±°)	Isolation (dB)	Mounting Style	Size (L x W x H) (Inches)
QH7774	100-1000	50	0.6	1.30	5	20	Connectorized	5.1 x 2.1 x 1.1
QH8180	119-123	500	0.3	1.20	5	20	Connectorized	3 x 3 x 1.88
QH8589	126-130	500	0.3	1.20	5	20	Connectorized	3 x 3 x 1.88
QH8922	150-2000	100	0.75	1.40	5	17	SMT	1.47 x 1.13 x 0.16
QH9141	150-2000	150	0.85	1.40	5	18	Connectorized	2.2 x 2 x 1.06
QH8905	160-170	300	0.4	1.25	10	20	Connectorized	6 x 5 x 2.25
QH9496	200-500	200	0.3	1.15	3	25	Drop-In**	2.8 x 1.25 x 0.16
QH3571	200-500	1,000	0.2	1.30	3	20	Connectorized	8 x 2 x 1
QH9497	200-600	200	0.35	1.25	5	20	Drop-In**	2.8 x 1.25 x 0.16
QH9498	200-650	200	0.45	1.35	5	18	Drop-In**	2.8 x 1.25 x 1.16
QH7819	200-1000	100	0.6	1.35	5	20	SMT	2.5 x 0.75 x 0.15
QH7785	200-1000	100	0.5	1.30	5	20	Drop-In**	2.5 x 0.75 x 0.15
QH2597	225-400	300	0.3	1.30	3	20	Connectorized	8 x 1 x 1
QH5599	225-400	2,000	0.2	1.30	3	20	Connectorized	8 x 2 x 1
QH6651	225-410	1,200	0.2	1.30	5	20	Connectorized	8 x 2 x 1.12
QH7540	225-520	300	0.25	1.30	5	20	Connectorized	3.8 x 2.8 x 0.53
QH8065	398-402	1,000	0.4	1.30	5	20	Connectorized	6 x 5 x 2.25
QH6258	400-1000	1,500	0.3	1.30	5	18	Connectorized	5.6 x 2.4 x 1.2
QH7900	450-2800	125	0.55	1.35	5	18	SMT	1.5 x 1.1 x 0.095
QH8960	470-860	250	0.3	1.30	3	20	Connectorized	3 x 1.14 x 1
QH3548	470-860	300	0.3	1.30	3	20	Connectorized	3.7 x 1.3 x 1
QH7856	500-2000	200	0.55	1.35	5	18	Connectorized	2.1 x 1.49 x 0.75
QH7644	500-2500	150	0.55	1.35	5	19	Drop-In**	1.65 x 1.1 x 0.09
QH7902	500-2500	200	0.7	1.35	5	18	Connectorized	2.1 x 1.49 x 0.75
QH7100	500-2800	350	0.25	1.35	5	20	Connectorized	2.6 x 2.3 x 0.8
QH7622	500-3000	150	0.55	1.35	5	19	Drop-In**	1.65 x 1.1 x 0.09
QH8281	500-3000	200	0.7	1.35	5	18	Connectorized	2.1 x 1.49 x 0.75
QH7741	800-3000	200	0.3	1.40	5	18	Drop-In**	1.35 x 0.65 x 0.09
QH8105	800-4200	150	0.55	1.35	5	18	Drop-In**	1.5 x 1.08 x 0.09
QH8362	800-4200	150	0.55	1.35	5	18	Connectorized	1.55 x 1.08 x 0.47
QH8193	2000-6000	100	0.25	1.30	5	20	Drop-In**	0.85 x 0.33 x 0.14

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

** Available with Solder Point or Tab Interface



180°

Hybrid Combiners/Dividers

Model	Frequency (MHz)	Power (Watts CW)	Insertion Loss (dB)	VSWR	Phase Balance ($\pm^\circ$)	Isolation (dB)	Mounting Style	Size (L x W x H) (Inches)
H6287	0.1-50	500	0.5	1.30	6	30	Connectorized	9 x 8 x 3.61
H5675	0.1-250	100	1.0	1.40	8	18	Connectorized	10 x 8 x 2.25
H3931	0.2-20	6,000	0.3	1.25	5	20	Connectorized	9 x 7 x 4
H6152	0.2-35	50	0.4	1.30	5	20	Connectorized	2.5 x 1.5 x 1.12
H2979	0.3-100	100	1.0	1.50	5	20	Connectorized	5 x 3 x 2.3
H1484	2-32	500	0.2	1.30	3	25	Connectorized	5 x 3 x 2.3
H6286	2-32	1,000	0.3	1.30	5	20	Connectorized	8.25 x 4.5 x 2.69
H2052	20-150	100	0.5	1.30	5	20	Connectorized	5 x 3 x 2.25
H2977	20-150	200	0.5	1.30	5	20	Connectorized	5 x 3 x 2.25
H7267	20-512	20	0.8	1.40	5	25	Connectorized	4 x 1.6 x 0.8
H6751	20-512	50	0.8	1.40	5	25	Connectorized	4 x 1.6 x 0.8
H8837W	20-512	100	0.6	1.40	5	20	Connectorized	4.7 x 2.3 x 0.8
H8151	20-1000	20	1.3	1.40	5	20	Connectorized	3.91 x 1.6 x 0.8
H3178	30-88	200	0.35	1.35	5	20	Connectorized	5 x 3.9 x 3
H6289	30-90	50	0.8	1.40	5	25	Connectorized	4 x 1.6 x 0.8
H1483	88-108	600	0.2	1.30	3	25	Connectorized	6 x 3 x 2.25
H1846	88-108	1,200	0.2	1.30	3	20	Connectorized	6 x 3 x 2.25
H7683	100-500	100	0.8	1.40	5	25	Connectorized	4 x 1.6 x 0.8
H7450	100-500	200	1.0	1.35	5	20	Connectorized	6 x 5 x 2.25
H7971	100-1000	50	1.30	1.30	5	20	Connectorized	4 x 1.6 x 0.8
H3670	200-400	400	0.2	1.40	5	20	Connectorized	5 x 3 x 2.24
H8150	200-1000	20	1.20	1.40	5	20	Connectorized	3.91 x 1.6 x 0.31
H7498	200-1000	750	0.3	1.30	5	20	Connectorized	8.5 x 5 x 1.5
H9140	200-1600	100	1.7	1.50	10	16	Connectorized	4 x 1.6 x 0.8
H4072	290-320	600	0.4	1.30	5	25	Connectorized	3 x 3 x 2.25
H9331	350-1000	150	0.3	1.30	7	18	SMT	2.6 x 1.8 x 0.28
H9395	350-1000	250	0.3	1.30	7	20	Connectorized	3.5 x 2.48 x 1.06
H2543	400-470	600	0.3	1.25	5	20	Connectorized	3 x 3 x 2.25
H7877	400-2000	350	0.35	1.25	5	20	Connectorized	4.5 x 2.65 x 1.2
H5817	470-860	1,200	0.2	1.50	3	18	Connectorized	5 x 2 x 1.88
H7492	500-2500	200	0.45	1.35	8	20	Connectorized	3.75 x 2.2 x 0.85

* For outline drawing, performance curves, and connector options, visit us at www.werlatone.com

High Power Absorptive Filters

Model AF9350



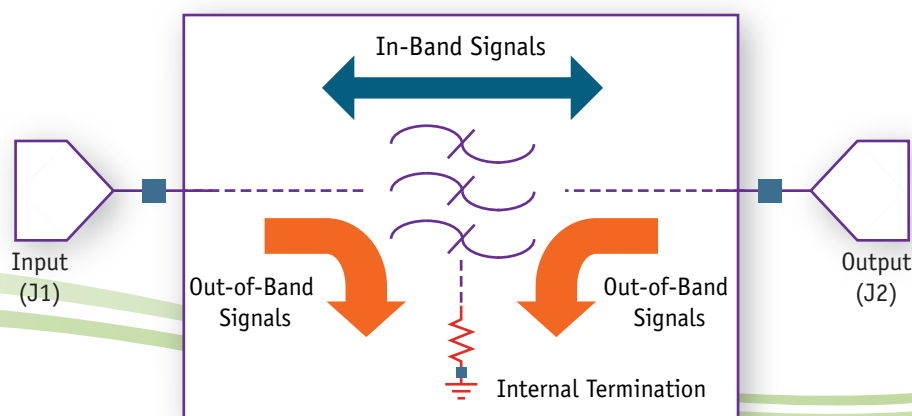
Model AF9349



Model AF9313



NON-Reflective!



* Input / Output Characteristic Impedance: 50 Ω

Characteristics of an Absorptive Filter

- **In-Band Signals** are transmitted through the filter to the output port. The shape (magnitude & phase) of the transmission is that of S21.
- **Out-of-Band Signals** are **NOT** reflected back to the source. Rather, signals are sent to an internal termination, preventing inter-modulation products.

Advantages of an Absorptive Filter

- Eliminates instability of a PA at out-of-band frequencies.
- Eliminates In-Band ripples due to out-of-band reflected energies.
- Eliminates false trigger of power detector circuitry due to reflected harmonics.
- Less susceptible to temperature change.
- **Mismatch Tolerant**® designs greatly reduces the dependency of the system on the length of interconnecting cable between two non-perfect components.
- Reduces potential damage to power amplifiers due to reflection of high power out-of-band energies.

* Additional information available. Please contact Werlatone directly.

Low Pass Filters

Model	Frequency (MHz)			Power (W CW)		Insertion Loss(dB)		Rejection(dB)		VSWR	
	Pass Band	3dB Corner	Stop Band	Pass Band	Stop Band	Pass Band	Stop Band	Pass Band	Stop Band	Pass Band	Stop Band
AF9673	1-2.7	3.5	3.9-32	1,200	150	0.4	50	1.40:1	1.40:1		
AF9438	1-30	32	50-380	5,000	250	0.5	50	1.30:1	1.60:1		
AF9349	10-150	200	270-1500	500	25	0.4	50	1.35:1	1.60:1		
AF9255	10-170	220	300-1500	50	10	0.6	50	1.25:1	1.60:1		
AF9187	10-490	620	850-3000	100	10	0.5	45	1.40:1	1.90:1		
AF9350	10-500	540	750-3000	400	25	0.5	45	1.25:1	1.60:1		
AF9960	10-500	540	750-3000	600	25	0.5	45	1.25:1	1.60:1		
AF9680	10-520	540	1040-3000	160	10	0.6	60	1.25:1	1.60:1		
AF9313	10-870	1340	1700-4000	100	10	0.6	53	1.30:1	1.60:1		

* Specifications are for reference only and subject to change without notice.

SINCE 1965



Werlatone®, Inc.
17 Jon Barrett Road
Patterson, NY 12563
T 845.278.2220
F 845.278.3440
sales@werlatone.com

www.werlatone.com



Registered to
ISO 9001