



Engineering Driven, Customer Focused.

90° Hybrid Couplers

Directional Couplers

Cool Chip Heat Spreaders

Combiners / Dividers

Impedance Transformers

Resistors & Terminations

180° Baluns

Custom Products



Broadband, High Power Passive Components

**RF and Microwave Passive Components for Military, Commercial,
Medical, Industrial, and Wireless Applications since 2005**

Innovative Power Products is a leading manufacturer of high-power broadband passive RF components. Since 2005, we have provided solutions for commercial, industrial, medical, and military markets for power combining, signal sampling and resistive devices for power amplifiers, antenna and radar systems.

For us, “**Engineering Driven, Customer Focused**” is not just a tagline but the way we do business. Engineers turn to IPP when they need high-power broadband components from experts in RF splitting, combining, sampling, and impedance transforming. We build products functioning from 1 MHz. to 14 GHz., ranging from 15 Watts to 4kW CW. We are always pushing to go higher power and broader band.

Our team consists of experienced power amplifier and amplifier systems design engineers, so we understand the high-quality standards and strict timelines that our customers need to meet. Products from IPP are also backed by our stellar performance record and ISO quality standards.

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Many of our products
are available as REACH
and RoHS compliant



Made in USA

Our Quality Management System
is certified in accordance with
ISO standard 9001:2015

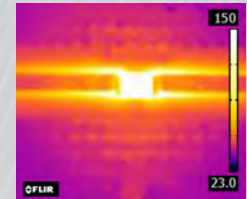
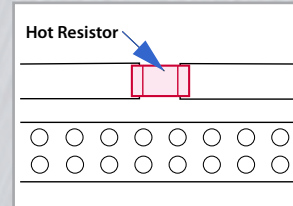
Aluminum Nitride Ceramic Chip Used To Transfer Heat



IPP's Cool Chip is designed to draw heat from one location that is too hot and move it to a different location that can absorb the heat. These devices are manufactured on a highly thermally conductive ceramic substrate (Aluminum Nitride) that is electrically isolated and safe to use. The terminals are gold-plated over nickel, making them easy to solder with many different alloy types. These devices are ideal for small, compact areas with high heat concentrations, intended for both military and commercial applications.

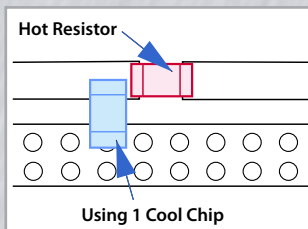
Thermal Testing Shows Significant Reduction in Temperature Using Cool Chip

The following thermal images are from actual tests taken with our Cool Chips. These images show the heat generated from a resistor which is mounted on a PCB that has a dielectric constant of 2.20 and a thermal conductivity of 0.20 (W/mK). The Aluminum Nitride substrate has a thermal conductivity of 170 W/mK.

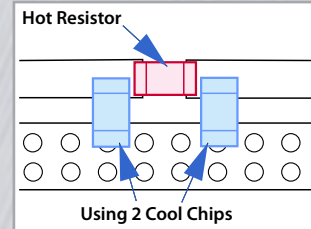


Without the Cool Chip, the resistor was running at 150°C

Results with One Cool Chip



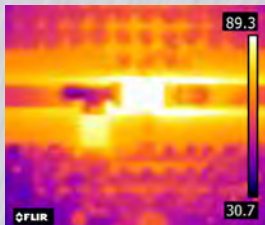
After installing one Cool Chip, as shown on left, with one side soldered to a heat sink, the temperature of the resistor changed as follows:



After installing two Cool Chips as shown on left, with one side soldered to a heat sink, the temperature of the resistor changed as follows:

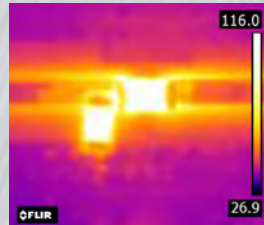
Cool Chip with Edge Wrap

IPP-CCN1206-40
From: 150.0° C
To: 89.3° C



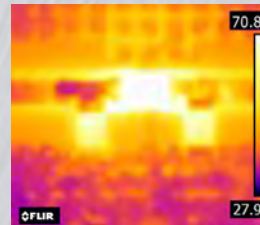
Cool Chip with No Edge Wrap

IPP-CCN1206-40N
From: 150.0° C
To: 116.0° C



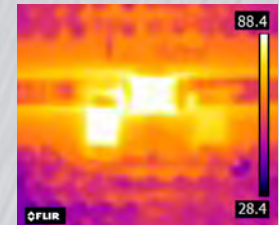
Cool Chips with Edge Wrap

IPP-CCN1206-40
From: 150.0° C
To: 70.8° C



Cool Chips with No Edge Wrap

IPP-CCN1206-40N
From: 150.0° C
To: 88.4° C

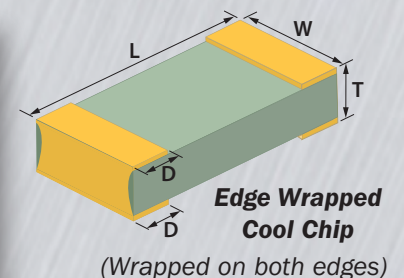


Results may vary depending on the PCB materials used, the heatsink material and the heatsink path.

Cool Chips

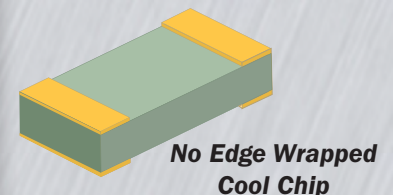
PART NUMBER	DIMENSIONS: INCHES				THERMAL RESISTANCE (W/°C)	CAPACITANCE SERIES (pF)	CAPACITANCE SHUNT (pF)
	L	W	D	T			
IPP-CCN0805-40	0.080	0.050	0.020	0.040	9.26	< 0.10	< 0.10
IPP-CCN0805-40N	0.080	0.050	0.020	0.040	13.90	< 0.10	< 0.10
IPP-CCN1206-40	0.120	0.060	0.025	0.040	11.58	< 0.10	< 0.10
IPP-CCN1206-40N	0.120	0.060	0.025	0.040	14.67	< 0.10	< 0.10
IPP-CCN1010-40	0.100	0.100	0.020	0.040	5.80	< 0.10	< 0.15
IPP-CCN1010-40N	0.100	0.100	0.020	0.040	9.26	< 0.10	< 0.15

Tolerance for all dimensions is +/- .005



Edge Wrapped Cool Chip

(Wrapped on both edges)



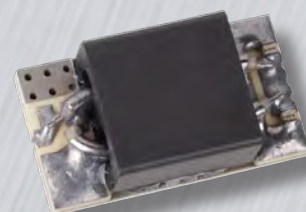
No Edge Wrapped Cool Chip

(Terminal Type "N" identifies No Wrap)

IPP's line of surface mount single-ended impedance transformers are engineered for commercial, industrial, and military applications. These are discrete components, offering a small, pick-and-place capable solution for space-constrained designs where impedance matching presents a challenge. With our technology, we can offer these unbalanced to unbalanced transformers (Single Ended) in a wide variety of impedance ratios while maintaining a compact design in frequencies ranging from 20 to 6000 MHz.

Single-Ended Impedance Transformers

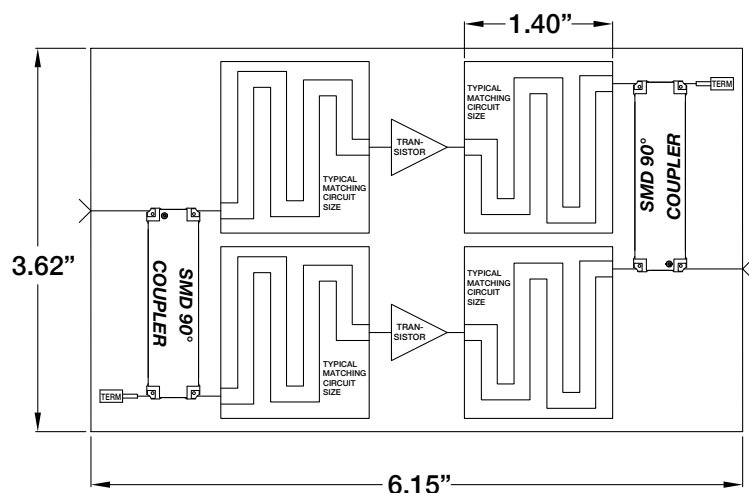
PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	IMPEDANCE (OHMS) J1 J2	PACKAGE SIZE (INCHES)	PACKAGE STYLE
IPP-5020	20 - 1000	25	0.50	1.40:1	50 25	0.60 x 1.25 x 0.27	SMD
IPP-5021	20 - 1000	100	0.80	1.43:1	50 12.5	0.55 x 1.00 x 0.33	SMD
IPP-5027	30 - 1000	25	0.75	1.45:1	50 12.5	0.57 x 0.51 x 0.20	SMD
IPP-5014	30 - 1000	100	0.75	1.43:1	50 12.5	0.55 x 1.00 x 0.33	SMD
IPP-5022	100 - 520	100	0.50	1.30:1	50 12.5	0.55 x 1.00 x 0.33	SMD
IPP-5023	100 - 1500	100	0.75	1.43:1	50 12.5	0.55 x 1.00 x 0.33	SMD
IPP-5036	500 - 3000	100	0.50	1.30:1	50 25	0.60 x 0.55 x 0.062	SMD
IPP-5037	500 - 3000	100	0.75	1.35:1	50 12.5	1.00 x 1.00 x 0.10	SMD
IPP-5047	500 - 3000	150	0.75	1.35:1	50 25	1.00 x 1.00 x 0.10	SMD
IPP-5038	800 - 1000	100	0.30	1.35:1	50 25	0.60 x 0.55 x 0.062	SMD
IPP-5039	800 - 1000	100	0.50	1.35:1	50 12.5	0.60 x 0.55 x 0.062	SMD
IPP-5032	1000 - 3000	100	0.45	1.35:1	50 25	0.50 x 0.55 x 0.062	SMD
IPP-5033	1000 - 3000	100	0.50	1.35:1	50 12.5	0.60 x 0.55 x 0.062	SMD
IPP-5034	2000 - 6000	100	0.50	1.45:1	50 25	0.56 x 0.35 x 0.062	SMD
IPP-5035	2000 - 6000	100	0.50	1.40:1	50 12.5	0.60 x 0.55 x 0.062	SMD
IPP-5040	2400 - 2500	100	0.35	1.30:1	50 25	0.56 x 0.35 x 0.062	SMD
IPP-5041	2400 - 2500	100	0.40	1.30:1	50 12.5	0.56 x 0.35 x 0.062	SMD



Size Comparison: Traditional Method vs. IPP-5036

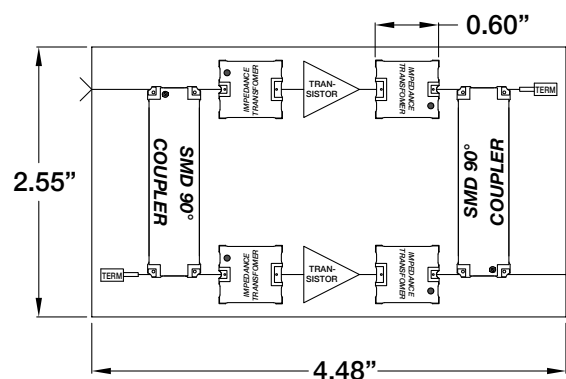
Traditional: 1.40" x 1.62"

Based on Microstrip PCB: Dk: 3.6 Thickness: 0.030"



IPP-5036: 0.60" x 0.55"

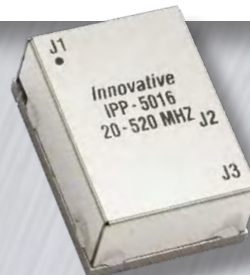
Surface Mount Impedance Transformer



For reference only. Diagram based on a 500 - 3000 MHz. design using IPP-7032 and IPP-7121 couplers with IPP-5036 single-ended impedance transformer.

180° Baluns

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	IMPEDANCE (OHMS) J1 J2, J3		PACKAGE SIZE (INCHES)	PACKAGE STYLE
IPP-5013	2 - 28	100	0.30	1.30:1	0.30	5	50	25	1.10 x 1.15 x 0.45	SMD
IPP-5048	2 - 50	100	0.30	1.30:1	0.30	5	50	25	1.10 x 1.15 x 0.45	SMD
IPP-5002	20 - 520	100	0.45	1.30:1	0.45	5	50	25	1.10 x 1.15 x 0.45	SMD
IPP-5016	20 - 520	150	0.45	1.30:1	0.45	5	50	25	1.10 x 1.50 x 0.65	SMD
IPP-5024	20 - 1000	15	0.65	1.30:1	0.55	6	50	25	0.90 x 0.82 x 0.39	SMD
IPP-5003	20 - 1000	100	0.50	1.30:1	0.45	6	50	25	1.10 x 1.15 x 0.45	SMD
IPP-5012	20 - 1000	100	0.80	1.35:1	0.45	7	50	12.5	2.00 x 2.10 x 0.54	Drop-in
IPP-5025	30 - 1500	15	0.70	1.30:1	0.65	7	50	25	0.90 x 0.82 x 0.39	SMD
IPP-5019	30 - 1500	25	0.60	1.35:1	0.60	7	50	25	0.85 x 1.10 x 0.45	SMD
IPP-5004	30 - 1500	100	0.60	1.35:1	0.60	7	50	25	1.10 x 1.15 x 0.45	SMD
IPP-5049	70 - 2000	150	0.60	1.30:1	0.50-0.90	8	50	25	1.10 x 1.50 x 0.65	SMD
IPP-5005	80 - 1000	100	0.45	1.30:1	0.35	5	50	25	1.10 x 1.15 x 0.45	SMD
IPP-5006	100 - 520	100	0.30	1.30:1	0.40	5	50	25	1.10 x 1.15 x 0.45	SMD
IPP-5001	225 - 2000	100	0.55	1.35:1	0.45	8	50	25	1.10 x 1.15 x 0.45	SMD
IPP-5026	500 - 2000	15	0.70	1.35:1	0.45	7	50	25	0.90 x 0.82 x 0.39	SMD
IPP-5007	500 - 2000	100	0.45	1.35:1	0.40	7	50	25	1.10 x 1.15 x 0.45	SMD



90° Impedance Transforming Couplers

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	ISOLATION (dB, MIN)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	IMPEDANCE (OHMS) J1 J2, J3		PACKAGE SIZE (INCHES)	PACKAGE STYLE
IPP-7102IT	225 - 450	100	0.45	1.25:1	15.0	0.60	5	50	25	0.75 x 2.00	SMD
IPP-7103IT	400 - 1000	200	0.50	1.30:1	15.0	0.75	5	50	25	0.80 x 1.80	SMD
IPP-2281IT	700 - 2700	200	0.75	1.30:1	14.0	0.80	5	50	25	1.30 x 2.20	Drop-in
IPP-7104IT	900 - 1300	200	0.45	1.25:1	16.0	0.50	5	50	25	0.50 x 1.00	SMD
IPP-7105IT	1000 - 2500	200	0.50	1.30:1	14.0	0.90	5	50	25	0.50 x 1.50	SMD
IPP-2282IT	1000 - 2500	300	0.50	1.30:1	14.0	0.90	5	50	25	0.80 x 2.20	Drop-in
IPP-7106IT	2700 - 3500	250	0.40	1.30:1	15.0	0.25	5	50	25	0.50 x 1.00	SMD

Note: Other impedance values available.

U.S. Patent Number 8174338



90° Hybrid Couplers: Surface Mount

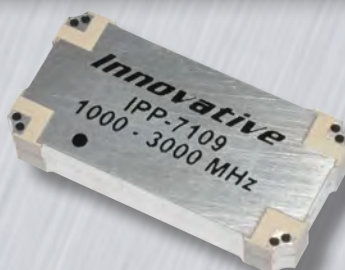
PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	ISOLATION (dB, MIN)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	PACKAGE SIZE (INCHES)
IPP-7171	20 - 1000	25	1.40	1.35:1	17.0	0.75	15	1.50 x 1.20
IPP-7068	30 - 88	200	0.53	1.35:1	15.5	1.00	7	0.75 x 2.00
IPP-7181	80 - 1000	250	0.90	1.40:1	15.0	1.20	7	1.00 x 1.75
IPP-7064	88 - 108	200	0.45	1.30:1	17.0	0.35	5	0.75 x 2.00
IPP-7057	100 - 520	300	0.60	1.30:1	16.0	0.80	7	0.75 x 2.00
IPP-7030	130 - 180	250	0.25	1.25:1	20.0	0.25	3	1.00 x 1.00
IPP-7012	200 - 1000	150	0.60	1.30:1	16.0	0.80	5	0.75 x 2.00
IPP-7094	225 - 450	150	0.25	1.25:1	18.0	0.45	5	0.50 x 1.00
IPP-7054	225 - 450	200	0.25	1.25:1	20.0	0.50	5	0.50 x 1.26
IPP-7116	225 - 2000	200	0.80	1.30:1	17.0	1.00	5	1.13 x 1.47
IPP-7061	280 - 330	200	0.25	1.27:1	18.0	0.25	5	0.50 x 1.00
IPP-7137	380 - 520	200	0.30	1.25:1	18.0	0.40	3	0.48 x 0.65
IPP-7130	400 - 500	350	0.20	1.15:1	25.0	0.22	3	1.00 x 1.00
IPP-7056	400 - 1000	150	0.25	1.25:1	18.0	0.65	5	0.50 x 1.00
IPP-7046	500 - 1000	200	0.25	1.25:1	18.0	0.55	5	0.48 x 0.65
IPP-7146	500 - 2500	50	0.60	1.35:1	16.0	0.85	5	0.50 x 1.00
IPP-7017	500 - 2500	100	0.50	1.30:1	18.0	0.65	5	0.50 x 1.80
IPP-7147	500 - 2500	350	0.55	1.43:1	16.0	0.80	6	0.80 x 1.80
IPP-7032	500 - 3000	100	0.60	1.30:1	18.0	0.80	5	0.50 x 1.80
IPP-7121	500 - 3000	200	0.60	1.40:1	14.5	0.80	5	0.50 x 1.80
IPP-7164	500 - 6000	100	1.25	1.70:1	13.0	1.70	8	0.50 x 1.80
IPP-7095	600 - 1600	150	0.25	1.25:1	19.0	0.85	5	0.38 x 1.40
IPP-7118	690 - 6000	50	0.80	1.40:1	15.0	0.90	9	0.50 x 1.00
IPP-7148	690 - 6000	130	0.80	1.50:1	15.0	0.90	10	0.50 x 1.00
IPP-7155	700 - 3200	100	0.50	1.30:1	18.0	0.55	5	0.40 x 1.80
IPP-7124	700 - 4200	150	0.65	1.50:1	13.0	0.85	8	0.20 x 1.80
IPP-7080	740 - 960	225	0.20	1.12:1	25.0	0.30	2	0.48 x 0.65
IPP-7052	800 - 1000	225	0.20	1.25:1	20.0	0.30	5	0.48 x 0.65
IPP-7053	800 - 1000	300	0.15	1.25:1	20.0	0.30	5	0.50 x 1.00
IPP-7048	800 - 1600	200	0.25	1.25:1	19.0	0.55	5	0.25 x 0.85
IPP-7059	800 - 2200	150	0.25	1.30:1	18.0	0.80	5	0.35 x 0.56
IPP-7077	800 - 2500	150	0.25	1.25:1	18.0	1.10	5	0.35 x 0.56
IPP-7010	800 - 2500	200	0.50	1.30:1	18.0	0.60	5	0.40 x 1.80
IPP-7013	800 - 2700	200	0.50	1.35:1	17.0	0.65	5	0.40 x 1.80
IPP-7063	800 - 3800	100	0.50	1.30:1	18.0	0.65	5	0.40 x 1.80
IPP-7066	800 - 4500	125	0.65	1.35:1	15.0	0.80	5	0.20 x 1.80
IPP-7166	900 - 1700	400	0.25	1.30:1	17.0	0.50	5	0.50 x 1.00
IPP-7016	960 - 1220	200	0.25	1.25:1	20.0	0.25	5	0.35 x 0.56
IPP-7108	960 - 1220	300	0.20	1.25:1	20.0	0.20	3	0.50 x 1.00
IPP-7047	1000 - 2000	150	0.25	1.25:1	20.0	0.55	5	0.35 x 0.56



90° Hybrid Couplers: Surface Mount

(Continued)

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	ISOLATION (dB, MIN)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	PACKAGE SIZE (INCHES)
IPP-7055	1000 - 2500	150	0.25	1.25:1	19.0	0.70	5	0.35 x 0.56
IPP-7168	1000 - 3000	200	0.25	1.30:1	16.0	1.10	5	0.35 x 0.56
IPP-7109	1000 - 3000	400	0.25	1.30:1	17.0	1.10	6	0.50 x 1.00
IPP-7015	1000 - 4200	80	0.50	1.30:1	18.0	0.60	5	0.40 x 1.80
IPP-7120	1000 - 4200	90	0.50	1.35:1	16.0	0.70	5	0.50 x 0.90
IPP-7026	1000 - 6000	50	0.75	1.40:1	15.0	0.80	5	0.20 x 1.65
IPP-7087	1000 - 6000	100	0.75	1.35:1	15.0	0.80	5	0.20 x 1.65
IPP-7134	1200 - 1400	250	0.25	1.30:1	20.0	0.20	5	0.35 x 0.56
IPP-7045	1500 - 2750	150	0.25	1.25:1	20.0	0.45	5	0.25 x 0.85
IPP-7076	1650 - 2250	250	0.25	1.30:1	18.0	0.30	5	0.50 x 1.00
IPP-7036	1700 - 2200	150	0.25	1.25:1	20.0	0.40	5	0.35 x 0.56
IPP-7007	1700 - 2700	200	0.25	1.30:1	15.0	0.60	5	0.35 x 0.56
IPP-7085	2000 - 2300	300	0.15	1.20:1	20.0	0.30	3	0.50 x 1.00
IPP-7018	2000 - 4000	100	0.35	1.31:1	18.0	0.50	5	0.35 x 0.56
IPP-7173	2000 - 4000	200	0.35	1.35:1	16.0	0.70	7	0.50 x 1.00
IPP-7006	2000 - 6000	100	0.27	1.30:1	18.0	1.00	5	0.20 x 0.56
IPP-7150	2000 - 6000	150	0.40	1.30:1	17.0	0.40	6	0.20 x 1.25
IPP-7028	2000 - 6000	150	0.25	1.30:1	15.0	1.00	5	0.20 x 0.56
IPP-7111	2000 - 6000	250	0.25	1.30:1	17.0	1.40	5	0.35 x 0.56
IPP-7136	2000 - 6500	300	0.25	1.30:1	17.0	1.65	5	0.35 x 0.56
IPP-7043	2000 - 6800	100	0.30	1.30:1	17.0	1.25	5	0.20 x 0.56
IPP-7093	2000 - 8000	50	0.80	1.40:1	15.0	0.65	8	0.20 x 1.21
IPP-7183	2400 - 2500	600	0.15	1.22:1	20.0	0.30	4	0.35 x 0.56
IPP-7004	2500 - 6000	100	0.30	1.30:1	18.0	0.75	5	0.20 x 0.56
IPP-7031	2600 - 6100	100	0.30	1.30:1	18.0	0.75	5	0.20 x 0.56
IPP-7019	2700 - 3100	300	0.30	1.30:1	18.0	0.30	5	0.50 x 1.00
IPP-7075	2700 - 3500	200	0.25	1.25:1	20.0	0.20	5	0.35 x 0.56
IPP-7074	2700 - 3500	300	0.20	1.30:1	18.0	0.25	5	0.50 x 1.00
IPP-7132	2700 - 3500	400	0.30	1.30:1	17.0	0.30	5	0.50 x 1.00
IPP-7151	3000 - 9000	100	0.30	1.35:1	16.0	1.00	7	0.20 x 0.40
IPP-7133	4000 - 6000	100	0.25	1.30:1	18.0	0.45	5	0.20 x 0.56
IPP-7039	4000 - 8000	75	0.30	1.30:1	17.0	0.60	6	0.20 x 0.40
IPP-7156	5100 - 5900	300	0.40	1.35:1	15.0	0.25	6	0.50 x 1.00
IPP-7044	6000 - 8500	100	0.40	1.30:1	17.0	0.35	6	0.20 x 0.40
IPP-7114	6000 - 12000	50	0.45	1.35:1	16.0	0.70	6	0.20 x 0.25
IPP-7153	6000 - 12000	100	0.40	1.40:1	16.0	0.70	6	0.20 x 0.25
IPP-7020	7000 - 8000	125	0.30	1.30:1	17.0	0.35	5	0.20 x 0.40
IPP-7145	7500 - 10500	120	0.30	1.35:1	17.0	0.50	6	0.20 x 0.40
IPP-7112	8000 - 12000	50	0.30	1.35:1	17.0	0.55	6	0.20 x 0.25
IPP-7119	9000 - 10000	50	0.28	1.35:1	17.0	0.50	6	0.20 x 0.25



90° Hybrid Couplers: Drop-In

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	ISOLATION (dB, MIN)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	PACKAGE SIZE (INCHES)
IPP-2255	20 - 520	200	0.80	1.30:1	16.0	0.30	10	2.20 x 3.00
IPP-2315	20 - 1000	50	0.80	1.35:1	16.0	0.30	12	1.71 x 1.90
IPP-2247	20 - 1000	150	0.90	1.30:1	16.0	0.25	12	2.20 x 3.00
IPP-2364	20 - 1000	250	1.15	1.45:1	7.0	0.70	10	3.40 x 4.10
IPP-2052	30 - 88	400	0.25	1.30:1	18.0	0.95	5	2.65 x 2.65
IPP-2133	80 - 500	800	0.35	1.30:1	16.0	0.95	5	2.50 x 6.00
IPP-2269	80 - 1000	250	0.75	1.35:1	15.0	1.30	8	2.00 x 3.00
IPP-2363	90 - 180	400	0.30	1.20:1	18.0	0.50	2	0.80 x 2.20
IPP-2330	100 - 520	200	0.45	1.30:1	17.0	0.75	5	1.50 x 3.30
IPP-2331	100 - 520	400	0.45	1.30:1	17.0	0.75	5	1.50 x 3.30
IPP-2332	100 - 520	800	0.42	1.30:1	16.0	0.75	5	1.50 x 3.30
IPP-2092	100 - 520	200	0.60	1.30:1	16.0	0.75	6	1.51 x 2.07
IPP-2001	120 - 230	200	0.30	1.25:1	20.0	0.50	5	0.80 x 2.20
IPP-2019	130 - 180	200	0.25	1.25:1	20.0	0.40	5	0.80 x 2.20
IPP-2087	130 - 180	800	0.20	1.25:1	18.0	0.30	5	2.65 x 2.65
IPP-2057	200 - 1000	150	0.50	1.30:1	16.0	0.75	5	0.90 x 3.20
IPP-2136	200 - 2000	100	0.80	1.40:1	16.0	0.90	8	1.00 x 3.30
IPP-2058	225 - 400	250	0.25	1.20:1	20.0	0.50	5	0.56 x 1.62
IPP-2184	225 - 400	250	0.30	1.20:1	20.0	0.50	2	0.50 x 2.00
IPP-2031	225 - 450	400	0.25	1.25:1	20.0	0.50	5	0.80 x 2.20
IPP-2038	225 - 450	800	0.20	1.25:1	20.0	0.50	5	2.65 x 2.65
IPP-2262	225 - 512	200	0.30	1.20:1	20.0	0.60	5	0.56 x 1.62
IPP-2002	400 - 1000	200	0.25	1.25:1	18.5	0.65	5	0.50 x 1.35
IPP-2333	400 - 1000	400	0.25	1.25:1	18.5	0.70	5	0.50 x 1.35
IPP-2102	400 - 1000	800	0.20	1.25:1	20.0	0.70	5	2.65 x 2.65
IPP-2006	500 - 1000	200	0.25	1.20:1	20.0	0.50	5	0.50 x 1.35
IPP-2061	500 - 1000	400	0.25	1.25:1	20.0	0.55	5	0.50 x 2.00
IPP-2334	500 - 2500	150	0.50	1.30:1	18.0	0.65	5	0.80 x 2.20
IPP-2335	500 - 2500	200	0.50	1.35:1	17.0	0.70	6	0.80 x 2.20
IPP-2298	500 - 2500	300	0.50	1.32:1	17.0	0.70	6	0.80 x 2.20
IPP-2322	500 - 2500	600	0.60	1.30:1	17.0	0.75	6	1.20 x 3.20
IPP-2336	500 - 3000	175	0.60	1.30:1	17.0	0.90	5	0.80 x 2.20
IPP-2148	500 - 3000	200	0.50	1.32:1	17.0	0.70	5	0.80 x 2.20
IPP-2024	800 - 1600	200	0.25	1.25:1	20.0	0.50	5	0.50 x 1.35
IPP-2167	800 - 1650	400	0.20	1.30:1	18.0	0.60	5	0.50 x 1.35
IPP-2139	800 - 2000	300	0.25	1.25:1	19.0	0.65	5	0.50 x 1.35
IPP-2337	800 - 2500	225	0.50	1.30:1	18.0	0.60	5	0.80 x 2.20
IPP-2084	800 - 2500	400	0.40	1.30:1	17.0	0.50	5	0.90 x 3.20
IPP-2338	800 - 2700	400	0.45	1.35:1	17.0	0.60	6	0.80 x 2.20
IPP-2079	800 - 3000	200	0.50	1.30:1	16.0	0.65	5	0.80 x 2.20
IPP-2394	902 - 928	1000	0.20	1.25:1	19.0	0.30	5	1.00 x 2.50
IPP-2049	950 - 1850	500	0.20	1.25:1	18.0	0.50	5	1.00 x 2.50
IPP-2370	1000 - 1200	400	0.25	1.25:1	20.0	0.40	5	0.50 x 1.35
IPP-2347	2000 - 4000	400	0.30	1.30:1	18.0	0.50	5	0.50 x 1.35
IPP-2055	2000 - 6000	50	0.45	1.30:1	19.0	1.00	5	0.25 x 1.30
IPP-2074	2000 - 6000	100	0.30	1.30:1	18.0	1.00	5	0.25 x 1.30
IPP-2393	2400 - 2500	1000	0.25	1.30:1	17.0	0.30	5	1.00 x 1.50



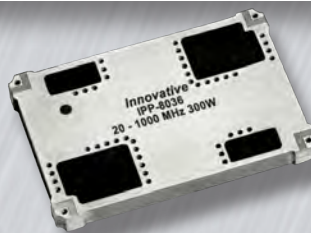
90° Hybrid Couplers: Connectorized

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	ISOLATION (dB, MIN)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	PACKAGE SIZE (INCHES)	CONNECTOR TYPE (FEMALE)
IPP-2218	20 - 520	200	0.80	1.30:1	16.0	0.30	10	3.00 x 3.00	SMA
IPP-2181	30 - 88	400	0.35	1.30:1	18.0	0.95	5	3.70 x 4.10	SMA
IPP-2104	30 - 88	400	0.35	1.30:1	18.0	0.95	5	3.70 x 4.10	N
IPP-2125	66 - 108	200	0.45	1.25:1	20.0	0.40	5	3.70 x 4.10	SMA
IPP-2222	80 - 500	200	0.75	1.30:1	16.0	0.75	6	2.94 x 3.35	SMA
IPP-2226	80 - 500	800	0.50	1.30:1	16.0	0.95	5	3.93 x 8.15	N
IPP-2223	80 - 1000	250	0.80	1.35:1	16.0	1.30	8	3.44 x 4.39	N
IPP-2193	100 - 250	1000	0.30	1.25:1	18.0	0.85	5	3.70 x 4.10	N
IPP-2066	100 - 500	400	0.60	1.25:1	18.0	0.70	5	4.00 x 7.00	N
IPP-2116	100 - 500	800	0.50	1.30:1	16.0	0.80	5	3.93 x 7.15	N
IPP-2345	100 - 520	300	0.70	1.30:1	17.0	0.65	6	3.35 x 1.92	SMA
IPP-2111	130 - 180	200	0.30	1.25:1	20.0	0.40	5	2.23 x 3.90	N
IPP-2220	130 - 180	800	0.40	1.25:1	18.0	0.30	5	4.09 x 4.72	N
IPP-2206	200 - 1000	150	0.80	1.30:1	16.0	0.80	5	2.00 x 3.23	SMA
IPP-2180	225 - 400	200	0.45	1.25:1	20.0	0.50	5	2.00 x 3.25	SMA
IPP-2207	300 - 600	200	0.50	1.27:1	18.0	0.65	5	1.71 x 1.94	SMA
IPP-2117	400 - 1000	800	0.40	1.25:1	20.0	0.70	5	3.95 x 4.08	N
IPP-2227	400 - 2500	200	0.75	1.30:1	17.0	0.80	5	2.74 x 3.29	SMA
IPP-2200	500 - 1000	200	0.40	1.25:1	20.0	0.55	5	1.54 x 1.80	SMA
IPP-2208	500 - 2500	100	0.75	1.30:1	18.0	0.65	5	1.65 x 3.23	SMA
IPP-2123	500 - 2500	150	0.60	1.30:1	18.0	0.65	5	2.23 x 3.90	SMA
IPP-2160	500 - 3000	125	0.70	1.30:1	18.0	0.80	5	2.23 x 3.90	SMA
IPP-2204	600 - 1300	100	0.50	1.30:1	17.0	0.65	5	1.41 x 1.53	SMA
IPP-2316	700 - 6000	50	1.00	1.35:1	15.0	0.90	7	1.71 x 1.94	SMA
IPP-2228	800 - 1600	200	0.65	1.25:1	19.0	0.55	5	1.41 x 1.74	SMA
IPP-2209	800 - 2500	200	0.75	1.30:1	18.0	0.60	5	1.65 x 3.23	SMA
IPP-2157	800 - 2500	400	0.50	1.30:1	17.0	0.50	5	2.33 x 4.94	N
IPP-2210	800 - 2700	200	0.75	1.35:1	17.5	0.65	5	1.65 x 3.23	SMA
IPP-2134	800 - 2700	1500	0.50	1.35:1	16.0	0.70	5	2.67 x 4.98	7/16
IPP-2229	1000 - 2000	150	0.50	1.25:1	20.0	0.55	5	1.41 x 1.53	SMA
IPP-2155	1000 - 2000	400	0.60	1.25:1	20.0	0.40	5	1.94 x 2.95	N
IPP-2230	1000 - 3000	150	0.50	1.30:1	18.0	1.10	5	1.50 x 2.10	SMA
IPP-2122	1000 - 4200	80	0.60	1.30:1	18.0	0.50	5	2.23 x 3.90	SMA
IPP-2231	1000 - 6000	50	0.90	1.40:1	15.0	0.80	5	1.81 x 2.93	SMA
IPP-2127	2000 - 4000	400	0.50	1.30:1	18.0	0.50	5	1.94 x 3.40	N
IPP-2212	2000 - 6000	100	0.60	1.30:1	18.0	1.00	5	1.41 x 1.53	SMA
IPP-2213	2500 - 6000	100	0.60	1.30:1	18.0	0.75	5	1.41 x 1.53	SMA
IPP-2217	2700 - 3100	200	0.45	1.30:1	18.0	0.30	5	1.71 x 1.94	SMA
IPP-2214	4000 - 8000	75	0.60	1.30:1	17.0	0.60	6	1.26 x 1.53	SMA
IPP-2216	6000 - 8500	100	0.40	1.30:1	17.0	0.35	6	1.26 x 1.53	SMA
IPP-2215	7000 - 8000	125	0.60	1.30:1	17.0	0.35	5	1.26 x 1.53	SMA

Directional Couplers: Surface Mount

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	NOMINAL COUPLING (dB)	COUPLING FLATNESS (+/- dB)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	DIRECTIVITY (dB, MIN)	COUPLER TYPE	PACKAGE SIZE (INCHES)
IPP-8047	1 - 200	30	20	0.50	0.20	1.25:1	20	BDC	0.66 x 0.66
IPP-8071	2 - 100	120	20	0.50	0.25	1.25:1	20	BDC	1.10 x 1.15
IPP-8044	20 - 520	300	50	0.60	0.25	1.25:1	20	DDC	1.00 x 1.50
IPP-8070	20 - 1000	150	50	0.65	0.30	1.30:1	20	DDC	0.75 x 1.25
IPP-8036	20 - 1000	300	50	0.60	0.29	1.25:1	20	DDC	1.00 x 1.50
IPP-8093	20 - 2000	20	35	1.00	0.50	1.40:1	16	BDC	1.00 x 0.50
IPP-8045	30 - 520	300	50	0.50	0.25	1.25:1	20	DDC	1.00 x 1.50
IPP-8046	100 - 500	300	40	0.60	0.25	1.25:1	20	DDC	1.00 x 1.50
IPP-8061	225 - 450	150	30	1.25	0.25	1.25:1	16	BDC	0.50 x 1.00
IPP-8002	225 - 450	200	30	1.25	0.25	1.25:1	16	BDC	1.00 x 1.00
IPP-8042	225 - 2500	100	35	1.00	0.30	1.25:1	18	DDC	1.00 x 1.00
IPP-8063	225 - 2500	200	45	0.75	0.25	1.25:1	20	DDC	1.00 x 1.50
IPP-8025	200 - 1000	300	40	0.60	0.35	1.25:1	20	DDC	1.00 x 1.50
IPP-8059	225 - 1850	100	35	1.00	0.40	1.25:1	18	DDC	0.75 x 1.50
IPP-8057	500 - 2500	150	33	1.00	0.25	1.25:1	20	DDC	0.50 x 1.00
IPP-8041	500 - 2500	200	36	0.75	0.25	1.25:1	20	DDC	1.00 x 1.50
IPP-8090	500 - 3000	200	32	1.00	0.30	1.30:1	17	DDC	1.00 x 1.00
IPP-8013	595 - 1300	150	34	0.75	0.25	1.25:1	18	SDC	0.50 x 1.00
IPP-8005	800 - 1200	150	10	0.70	0.25	1.25:1	10	BDC	0.35 x 0.56
IPP-8032	800 - 1200	150	20	0.60	0.25	1.25:1	20	BDC	0.35 x 0.56
IPP-8033	800 - 1220	300	20	0.30	0.20	1.25:1	20	BDC	0.50 x 1.00
IPP-8069	800 - 2500	150	15	0.75	0.40	1.25:1	20	BDC	0.50 x 1.00
IPP-8029	800 - 2500	150	20	0.75	0.25	1.25:1	20	BDC	0.50 x 1.00
IPP-8051	800 - 2500	150	20	0.85	0.40	1.25:1	20	DDC	1.00 x 1.50
IPP-8078	800 - 4200	150	32	0.80	0.30	1.30:1	18	DDC	1.00 x 0.50
IPP-8004	1000 - 2000	200	20	1.20	0.20	1.28:1	20	BDC	0.35 x 0.56
IPP-8015	1150 - 2750	150	34	0.50	0.25	1.25:1	18	SDC	0.50 x 1.00
IPP-8085	1700 - 2450	300	30	0.40	0.15	1.25:1	18	BDC	0.50 x 1.00
IPP-8038	2000 - 4000	100	20	0.90	0.25	1.30:1	20	BDC	0.35 x 0.56
IPP-8000	2000 - 6000	100	10	1.60	0.25	1.30:1	18	BDC	0.20 x 0.56
IPP-8039	2000 - 6000	100	20	1.90	0.25	1.30:1	16	BDC	0.20 x 0.56
IPP-8111	2000 - 6000	150	20	2.00	0.35	1.35:1	17	DDC	0.48 x 0.65
IPP-8048	2500 - 6000	100	10	0.50	0.40	1.35:1	15	BDC	0.35 x 1.00
IPP-8007	2500 - 6000	100	20	0.50	0.40	1.35:1	18	BDC	0.35 x 1.00
IPP-8001	2500 - 6000	100	20	1.20	0.25	1.30:1	20	BDC	0.35 x 0.56

BDC: Bi-Directional Coupler. SDC: Single Directional Coupler. DDC: Dual Directional Coupler.



Directional Couplers: Drop-In

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	NOMINAL COUPLING (dB)	COUPLING FLATNESS (+/- dB)	INSERTION LOSS (dB, MAX)	VSWR (MAX)	DIRECTIVITY (dB, MIN)	PACKAGE SIZE (INCHES)
IPP-3025	20 - 500	200	50	0.50	0.25	1.25:1	20	1.50 x 2.50
IPP-3105	20 - 500	500	50	0.50	0.30	1.25:1	20	1.50 x 2.50
IPP-3121	20 - 1000	200	50	0.60	0.35	1.25:1	20	1.50 x 2.50
IPP-3122	80 - 1000	300	50	0.60	0.25	1.25:1	20	1.50 x 2.50
IPP-3057	100 - 500	100	40	0.50	0.25	1.25:1	20	1.50 x 2.50
IPP-3150	100 - 500	500	40	0.50	0.30	1.25:1	20	1.50 x 2.50
IPP-3091	100 - 850	200	50	0.50	0.25	1.25:1	20	1.50 x 1.50
IPP-3064	100 - 1000	200	50	0.50	0.25	1.25:1	20	1.50 x 2.50
IPP-3026	500 - 2500	200	40	0.50	0.25	1.25:1	18	1.50 x 2.50
IPP-3078	500 - 3000	200	40	0.75	0.35	1.25:1	16	1.46 x 2.50
IPP-3037	800 - 2500	300	40	0.50	0.25	1.25:1	18	1.50 x 2.50



Directional Couplers: Connectorized

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	VSWR MAIN LINE (MAX.)	NOMINAL COUPLING (dB)	COUPLING FLATNESS (+/- dB)	INSERTION LOSS (dB, MAX)	DIRECTIVITY (dB, MIN)	CONNECTOR TYPE MAIN	CONNECTOR TYPE COUPLED	PACKAGE SIZE (INCHES)
IPP-3151	2 - 30	2500	1.25:1	50	0.30	0.15	22	N	SMA	2.00 x 4.00
IPP-3011	20 - 500	500	1.25:1	50	0.50	0.20	20	N	SMA	1.50 x 2.50
IPP-3206	20 - 520	200	1.25:1	40	0.60	0.40	20	SMA	SMA	1.76 x 1.16
IPP-3175	20 - 520	1000	1.25:1	50	0.50	0.20	25	N	SMA	1.75 x 4.33
IPP-3131	20 - 1000	200	1.25:1	50	0.60	0.28	20	SMA	SMA	1.50 x 2.50
IPP-3132	20 - 1000	500	1.25:1	50	0.60	0.28	20	N	SMA	1.50 x 2.50
IPP-3130	20 - 1000	1000	1.25:1	50	0.60	0.29	20	SC	SMA	1.75 x 4.33
IPP-3111	80 - 1000	500	1.25:1	50	0.50	0.19	20	N	SMA	1.50 x 2.50
IPP-3113	80 - 1000	2000	1.25:1	50	0.50	0.15	20	SC	SMA	3.50 x 3.50
IPP-3076	100 - 500	200	1.20:1	40	0.30	0.25	20	SMA	SMA	1.50 x 2.50
IPP-3059	108 - 118	450	1.20:1	30	0.35	0.25	24	N	SMA	6.00 x 1.50
IPP-3185	225 - 2500	100	1.30:1	50	1.00	0.50	18	N	SMA	2.16 x 2.41
IPP-3021	400 - 1000	200	1.25:1	40	0.50	0.30	20	N	SMA	1.50 x 2.50
IPP-3071	500 - 2500	200	1.25:1	40	0.50	0.30	18	SMA	SMA	1.50 x 2.50
IPP-3146	500 - 2500	500	1.25:1	40	0.60	0.30	20	N	SMA	1.50 x 2.50
IPP-3070	500 - 3000	200	1.25:1	40	0.50	0.35	18	N	SMA	1.50 x 2.50
IPP-3189	690 - 6000	400	1.25:1	42	1.00	0.20	16	N	SMA	2.00 x 2.25
IPP-3045	700 - 3200	400	1.30:1	40	0.50	0.30	20	N	N	3.00 x 3.00
IPP-3129	700 - 3800	400	1.30:1	40	0.50	0.30	20	N	SMA	3.00 x 3.00
IPP-3008	700 - 4200	200	1.25:1	20	1.00	0.35	18	SMA	SMA	0.92 x 2.85
IPP-3216	700 - 6000	250	1.30:1	40	0.75	0.40	17	N	SMA	1.50 x 1.50
IPP-3007	800 - 2500	200	1.25:1	40	0.50	0.25	20	SMA	SMA	1.50 x 2.50
IPP-3069	800 - 2500	500	1.25:1	40	0.50	0.30	20	N	SMA	1.50 x 2.50
IPP-3143	800 - 4200	600	1.30:1	40	0.70	0.30	18	SC	N	3.00 x 3.00
IPP-3003	1000 - 3000	200	1.30:1	40	0.50	0.30	20	N	N	3.00 x 3.00
IPP-3032	1000 - 3000	1000	1.25:1	50	0.50	0.15	20	SC	SMA	3.50 x 3.50
IPP-3072	2000 - 6000	100	1.30:1	20	0.70	0.35	16	SMA	SMA	1.18 x 1.70
IPP-3085	2000 - 6000	200	1.30:1	20	0.70	0.38	15	N	SMA	1.18 x 1.70
IPP-3190	2000 - 6000	400	1.30:1	40	0.75	0.35	17	7/16	SMA	2.00 x 2.00
IPP-3238	2000 - 8000	600	1.35:1	40	1.00	0.30	17	N	SMA	1.30 x 4.13

Combiners/Dividers: Drop-In

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	VSWR (MAX)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	INSERTION LOSS (dB, MAX)	ISOLATION (dB, MIN)	N-WAY	PACKAGE SIZE (INCHES)
IPP-1052	20 - 600	200	1.30:1	0.20	5	0.60	15	2-Way	3.00 x 3.00
IPP-1102	20 - 1000	100	1.30:1	0.30	5	0.75	12	2-Way	2.00 x 3.25
IPP-1103	20 - 1000	200	1.30:1	0.25	5	0.75	12	4-Way	3.00 x 4.00
IPP-1106	80 - 1000	200	1.30:1	0.25	5	0.75	12	4-Way	3.00 x 4.00
IPP-1107	400 - 1000	200	1.25:1	0.20	5	0.50	15	2-Way	2.40 x 2.40
IPP-1108	400 - 1000	200	1.30:1	0.25	5	0.60	10	4-Way	2.61 x 3.63
IPP-1104	500 - 2500	200	1.30:1	0.20	5	0.40	15	2-Way	2.00 x 4.70
IPP-1105	500 - 2500	200	1.30:1	0.25	5	0.80	8	4-Way	3.00 x 4.00
IPP-1109	1000 - 4000	100	1.30:1	0.25	5	0.60	14	2-Way	2.00 x 4.50

Combiners/Dividers: Connectorized

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	VSWR (MAX)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	INSERTION LOSS (dB, MAX)	ISOLATION (dB, MIN)	N-WAY	CONNECTOR TYPE INPUT	CONNECTOR TYPE SUM	PACKAGE SIZE (INCHES)
IPP-1154	2 - 30	1000	1.30:1	0.15	5	0.30	30	2-Way	N	N	4.35 x 5.00
IPP-1228	5 - 1000	150	1.45:1	0.30	5	0.60	12	2-Way	SMA	SMA	2.00 x 3.25
IPP-1023	20 - 1000	50	1.30:1	0.20	5	0.60	15	2-Way	N	N	3.00 x 3.00
IPP-1028	20 - 1000	100	1.30:1	0.30	5	0.60	15	2-Way	SMA	SMA	2.00 x 3.25
IPP-1193	20 - 1000	150	1.25:1	0.20	5	1.10	10	8-Way	SMA	SMA	3.44 x 6.28
IPP-1020	20 - 1000	200	1.30:1	0.25	5	0.75	12	4-Way	SMA	SMA	3.00 x 4.00
IPP-1021	20 - 1000	300	1.25:1	0.25	5	0.75	12	4-Way	N	N	4.72 x 5.10
IPP-1141	20 - 1000	500	1.30:1	0.20	5	0.80	10	2-Way	N	N	4.35 x 5.00
IPP-1121	80 - 1000	800	1.30:1	0.25	5	0.65	10	4-Way	N	N	5.10 x 4.72
IPP-1205	80 - 1000	100	1.25:1	0.20	5	0.55	15	2-Way	SMA	SMA	2.00 x 3.25
IPP-1206	80 - 1000	150	1.25:1	0.20	5	1.00	10	8-Way	SMA	SMA	3.44 x 6.28
IPP-1207	80 - 1000	200	1.25:1	0.20	5	0.55	15	2-Way	SMA	N	2.25 x 3.25
IPP-1014	80 - 1000	200	1.30:1	0.25	5	0.75	12	4-Way	SMA	SMA	3.00 x 4.00
IPP-1208	80 - 1000	500	1.25:1	0.20	5	0.80	10	2-Way	N	N	4.35 x 5.00
IPP-1015	80 - 1000	500	1.30:1	0.25	5	0.75	12	4-Way	N	N	4.72 x 5.10
IPP-1176	80 - 1000	1500	1.30:1	0.25	5	0.40	Non Isolated	2-Way	SC	7/16	5.00 x 5.50
IPP-1177	80 - 1000	1500	1.25:1	0.25	5	0.90	5	4-Way	N	SC	4.40 x 4.83
IPP-1145	100 - 500	50	1.30:1	0.20	5	0.75	10	8-Way	N	N	3.34 x 9.37
IPP-1209	100 - 500	100	1.25:1	0.10	5	0.45	18	2-Way	SMA	SMA	2.00 x 3.25
IPP-1146	100 - 500	150	1.30:1	0.20	5	0.50	8	3-Way	N	N	4.00 x 6.00
IPP-1210	100 - 500	200	1.25:1	0.20	5	0.45	18	2-Way	SMA	SMA	2.00 x 3.25
IPP-1211	100 - 500	200	1.25:1	0.20	5	0.60	15	4-Way	SMA	SMA	3.00 x 4.00
IPP-1132	100 - 500	500	1.40:1	0.20	5	0.60	8	2-Way	N	N	4.36 x 5.36
IPP-1212	100 - 500	500	1.25:1	0.20	5	0.50	15	4-Way	N	N	4.72 x 5.10
IPP-1213	100 - 500	1500	1.40:1	0.20	5	0.60	8	2-Way	N	SC	4.73 x 5.36
IPP-1199	100 - 500	1500	1.25:1	0.25	5	0.60	11	4-Way	N	SC	4.40 x 4.96
IPP-1070	400 - 1000	200	1.25:1	0.20	5	0.50	15	2-Way	SMA	SMA	2.40 x 2.40
IPP-1068	400 - 1000	200	1.30:1	0.25	5	0.60	10	4-Way	SMA	SMA	3.00 x 4.00
IPP-1000	400 - 1000	750	1.30:1	0.20	5	0.40	10	4-Way	TNC	SC	3.27 x 8.52
IPP-1241	400 - 1000	1500	1.25:1	0.20	5	0.40	Non Isolated	2-Way	N	SC	3.50 x 3.50
IPP-1116	400 - 1000	1500	1.30:1	0.20	5	0.65	5	4-Way	N	SC	5.25 x 5.60
IPP-1152	400 - 1000	500	1.30:1	0.20	5	0.50	14	2-Way	N	N	2.45 x 2.83

Combiners/Dividers: Connectorized (Continued)

PART NUMBER	FREQUENCY (MHz)	AVERAGE POWER (WATTS)	VSWR (MAX)	AMPLITUDE BALANCE (+/- dB)	PHASE BALANCE (+/- DEG)	INSERTION LOSS (dB, MAX)	ISOLATION (dB, MIN)	N-WAY	CONNECTOR TYPE INPUT	SUM	PACKAGE SIZE (INCHES)
IPP-1100	500 - 2500	200	1.30:1	0.20	5	0.40	13	2-Way	SMA	N	2.00 x 4.70
IPP-1101	500 - 2500	200	1.30:1	0.25	5	0.80	8	4-Way	SMA	SMA	3.00 x 4.00
IPP-1224	500 - 2500	300	1.30:1	0.25	5	0.80	6	4-Way	SMA	N	3.00 x 4.00
IPP-1265	500 - 2500	1500	1.35:1	0.35	6	0.70	Non Isolated	4-Way	N	7/16	4.50 x 7.00
IPP-1272	700 - 6000	125	1.35:1	0.30	5	0.90	8	2-Way	SMA	SMA	3.00 x 5.20
IPP-1271	700 - 6000	300	1.35:1	0.40	7	1.10	6.5	4-Way	SMA	N	3.90 x 5.20
IPP-1191	800 - 2500	175	1.25:1	0.20	5	0.50	13	2-Way	SMA	SMA	2.40 x 2.40
IPP-1035	800 - 2500	200	1.30:1	0.25	5	0.60	12	4-Way	SMA	SMA	3.00 x 4.00
IPP-1221	800 - 2500	600	1.30:1	0.20	5	0.50	7.5	2-Way	N	N	2.24 x 4.10
IPP-1036	800 - 2500	600	1.30:1	0.20	5	0.60	6	4-Way	N	N	4.35 x 4.50
IPP-1054	800 - 2500	800	1.30:1	0.20	5	0.60	7.5	2-Way	N	SC	3.00 x 4.50
IPP-1169	800 - 3000	800	1.30:1	0.30	6	0.45	Non Isolated	2-Way	N	SC	5.00 x 3.00
IPP-1136	800 - 4200	100	1.30:1	0.25	5	1.00	12	4-Way	SMA	SMA	3.50 x 6.00
IPP-1088	800 - 4200	200	1.30:1	0.25	5	1.00	10	2-Way	N	N	3.00 x 5.20
IPP-1089	800 - 4200	200	1.30:1	0.25	5	1.00	10	4-Way	N	N	3.90 x 5.20
IPP-1174	800 - 4200	200	1.30:1	0.25	6	1.20	6	8-Way	SMA	N	5.70 x 6.13
IPP-1110	1000 - 2000	400	1.30:1	0.50	5	0.60	13	4-Way	SMA	N	3.00 x 5.00
IPP-1215	1000 - 3000	200	1.30:1	0.20	5	0.45	13	2-Way	SMA	N	2.00 x 4.70
IPP-1216	1000 - 3000	200	1.30:1	0.25	5	0.60	12	4-Way	SMA	N	3.35 x 4.00
IPP-1217	1000 - 3000	500	1.30:1	0.20	5	0.50	7.5	2-Way	N	N	3.00 x 4.50
IPP-1218	1000 - 3000	500	1.30:1	0.25	6	0.65	8	4-Way	N	N	5.00 x 5.00
IPP-1049	1000 - 3000	1000	1.30:1	0.20	5	0.25	Non Isolated	2-Way	SC	SC	4.18 x 4.35
IPP-1219	1000 - 3000	1000	1.30:1	0.25	5	0.50	Non Isolated	4-Way	N	N	5.00 x 5.75
IPP-1046	1000 - 4000	100	1.30:1	0.25	5	0.60	14	2-Way	SMA	SMA	2.00 x 4.50
IPP-1158	1000 - 6000	100	1.50:1	0.30	6	0.85	6	4-Way	SMA	SMA	3.90 x 5.20
IPP-1195	2000 - 4000	800	1.30:1	0.20	5	0.40	Non Isolated	2-Way	N	SC	2.03 x 2.68
IPP-1016	2000 - 6000	100	1.30:1	0.25	5	0.35	12	2-Way	SMA	SMA	1.40 x 2.00
IPP-1254	2000 - 6000	100	1.30:1	0.25	5	0.35	12	2-Way	TNC	TNC	1.40 x 2.00
IPP-1013	2000 - 6000	100	1.30:1	0.25	5	0.80	10	4-Way	SMA	SMA	2.50 x 5.00
IPP-1256	2000 - 6000	200	1.30:1	0.15	5	0.30	Non Isolated	2-Way	SMA	N	2.20 x 2.30
IPP-1099	2000 - 6000	400	1.30:1	0.15	5	0.30	Non Isolated	2-Way	N	7/16	2.20 x 2.30
IPP-1135	2000 - 6000	400	1.30:1	0.30	5	0.80	Non Isolated	4-Way	N	N	2.96 x 4.51
IPP-1300	2000 - 8000	150	1.30:1	0.25	6	0.55	Non Isolated	2-Way	SMA	N	1.50 x 2.50
IPP-1303	2000 - 8000	250	1.30:1	0.25	6	0.60	12	2-Way	SMA	N	1.50 x 2.50
IPP-1316	2000 - 8000	300	1.30:1	0.25	6	0.60	12	2-Way	SMA	N	1.50 x 2.50
IPP-1314	2000 - 8000	300	1.35:1	0.30	6	0.80	7.5	4-Way	SMA	N	2.60 x 3.08
IPP-1188	2900 - 3100	400	1.25:1	0.20	5	0.40	14	2-Way	N	N	2.45 x 2.83



RF Resistors: Flangeless / Flanged

PART NUMBER	POWER (WATTS)	CAPACITANCE (pF)	LEAD WIDTH (INCHES)	CHIP SIZE (INCHES)	FLANGE SIZE (INCHES)
IPP-RN101-XXX	30	1.00	0.04	.100 x .200	Flangeless
IPP-RN103-XXX	100	1.56	0.04	.250 x .250	Flangeless
IPP-RN105-XXX	100	1.95	0.05	.225 x .350	Flangeless
IPP-RN113-XXX	250	4.00	0.05	.375 x .375	Flangeless
IPP-RN114-XXX	300	7.80	0.12	.500 x .500	Flangeless
IPP-RN201-XXX	30	1.00	0.04	.100 x .200	.200 x .300 x .062
IPP-RN203-XXX	60	1.56	0.04	.250 x .250	.250 x .515 x .062
IPP-RN205-XXX	100	1.95	0.05	.225 x .350	.225 x .800 x .070
IPP-RN221-XXX	100	1.56	0.04	.250 x .250	.250 x .515 x .140
IPP-RN206-XXX	150	3.40	0.05	.225 x .350	.225 x .800 x .070
IPP-RN213-XXX	250	4.00	0.05	.375 x .375	.375 x .975 x .110
IPP-RN214-XXX	300	7.80	0.12	.500 x .500	.500 x 1.10 x .110
IPP-RN215-XXX	300	7.80	0.12	.500 x .500	.500 x 1.25 x .110
IPP-RN216-XXX	650	18.0	0.25	1.00 x 1.04	1.04 x 1.90 x .125

Note: XXX is a placeholder for Resistor Value. Standard values for Resistors are 50 and 100 ohms. Other values are available. All parts listed are Aluminum Nitride resistors with a lead thickness of 0.005 inches.

RF Resistors: Low Capacitance

PART NUMBER	POWER (WATTS)	CAPACITANCE (pF)	LEAD WIDTH (INCHES)	CHIP SIZE (INCHES)	FLANGE SIZE (INCHES)
IPP-RN101LC-XXX	30	0.40	0.04	.100 x .200	Flangeless
IPP-RN103LC-XXX	65	0.80	0.04	.250 x .250	Flangeless
IPP-RN201LC-XXX	30	0.40	0.04	.100 x .200	.200 x .300 x .062
IPP-RN203LC-XXX	65	0.60	0.04	.250 x .250	.250 x .515 x .062
IPP-RN213LC-XXX	200	2.10	0.05	.375 x .375	.375 x .975 x .110

Note: XXX is a placeholder for Resistor Value. Standard values for Resistors are 50 and 100 ohms. Other values are available. All parts listed are Aluminum Nitride resistors with a lead thickness of 0.005 inches.

RF Terminations: Flangeless / Flanged

PART NUMBER	POWER (WATTS)	FREQUENCY (GHz)	VSWR (GHz)	LEAD WIDTH (INCHES)	CHIP SIZE (INCHES)	FLANGE SIZE (INCHES)
IPP-TN101-50	30	DC - 6.0	< 1.25:1	0.04	.100 x .200	Flangeless
IPP-TN103-50	100	DC - 6.0	< 1.25:1	0.04	.250 x .250	Flangeless
IPP-TN111-50	150	DC - 3.0	< 1.30:1	0.05	.250 x .375	Flangeless
IPP-TN113-50	275	DC - 3.0	< 1.30:1	0.05	.375 x .375	Flangeless
IPP-TN114-50	350	DC - 1.6	< 1.30:1	0.12	.500 x .500	Flangeless
IPP-TN201-50	30	DC - 6.0	< 1.25:1	0.04	.100 x .200	.200 x .300 x .062
IPP-TN201R-50	30	DC - 6.0	< 1.25:1	0.04	.100 x .200	.250 x .300 x .062
IPP-TN222-50	50	DC - 8.5	< 1.35:1	0.04	.250 x .250	.250 x .515 x .062
IPP-TN222R-50	50	DC - 8.5	< 1.35:1	0.04	.250 x .250	.250 x .515 x .062
IPP-TN222C-50	50	DC - 8.5	< 1.35:1	0.04	.250 x .250	.250 x .515 x .062
IPP-TN203-50	60	DC - 6.0	< 1.25:1	0.04	.250 x .250	.250 x .515 x .062
IPP-TN203R-50	60	DC - 6.0	< 1.25:1	0.04	.250 x .250	.250 x .515 x .062
IPP-TN203C-50	60	DC - 6.0	< 1.25:1	0.04	.250 x .250	.250 x .515 x .062
IPP-TN220-50	100	DC - 6.0	< 1.25:1	0.04	.250 x .250	.250 x .515 x .140
IPP-TN220R-50	100	DC - 6.0	< 1.25:1	0.04	.250 x .250	.250 x .515 x .140
IPP-TN220C-50	100	DC - 6.0	< 1.25:1	0.04	.250 x .250	.250 x .515 x .140
IPP-TN211-50	100	DC - 3.0	< 1.30:1	0.05	.250 x .375	.375 x .560 x .062
IPP-TN211R-50	100	DC - 3.0	< 1.30:1	0.05	.250 x .375	.375 x .560 x .062
IPP-TN212-50	150	DC - 3.0	< 1.30:1	0.05	.250 x .375	.375 x .870 x .070
IPP-TN213-50	275	DC - 3.0	< 1.30:1	0.05	.375 x .375	.375 x .975 x .110
IPP-TN214-50	350	DC - 1.6	< 1.30:1	0.12	.500 x .500	.500 x 1.100 x .110
IPP-TN215-50	350	DC - 1.6	< 1.30:1	0.12	.500 x .500	.500 x 1.25 x .110
IPP-TN216-50	650	DC - 0.6	< 1.50:1	0.25	1.000 x 1.040	1.040 x 1.900 x .125

Note: Standard value of 50 ohms shown. All parts listed are Aluminum Nitride terminations with a lead thickness of 0.005 inches.

RF Terminations: Coaxial

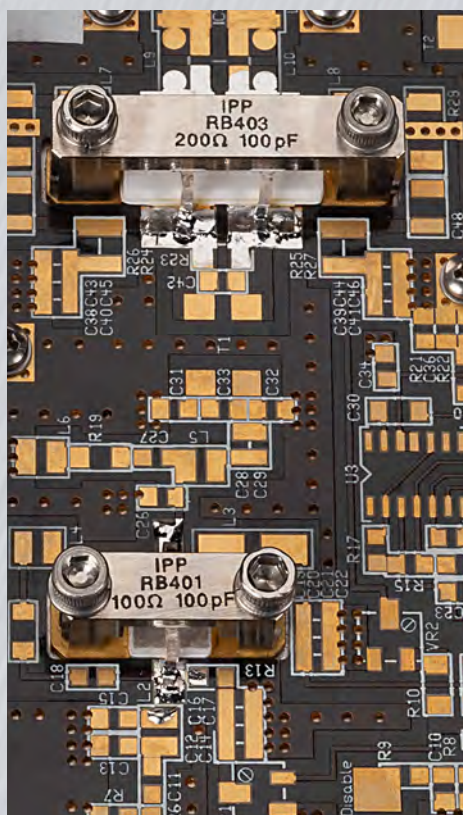
PART NUMBER	POWER (WATTS)	FREQUENCY (GHz)	VSWR (GHz)	CONNECTOR TYPE	PACKAGE SIZE (INCHES)
IPP-TN301-50	30	DC - 4.2	< 1.25:1	SMA (F)	.50 x 1.00 x .41
IPP-TN301-50-M	30	DC - 4.2	< 1.25:1	SMA (M)	.50 x 1.00 x .41
IPP-TN302-50	50	DC - 6.0	< 1.25:1	SMA (F)	.96 x 1.38 x .57
IPP-TN302-50-M	50	DC - 6.0	< 1.25:1	SMA (M)	.96 x 1.38 x .57
IPP-TN303-50	100	DC - 6.0	< 1.25:1	SMA (F)	.96 x 1.38 x .57
IPP-TN303-50-M	100	DC - 6.0	< 1.25:1	SMA (M)	.96 x 1.38 x .57
IPP-TN304-50	150	DC - 3.0	< 1.30:1	SMA (F)	1.63 x 2.00 x 1.02
IPP-TN304-50-M	150	DC - 3.0	< 1.30:1	SMA (M)	1.63 x 2.00 x 1.02
IPP-TN305-50	275	DC - 3.0	< 1.30:1	N (F)	1.63 x 2.00 x 1.02
IPP-TN305-50-M	275	DC - 3.0	< 1.30:1	N (M)	1.63 x 2.00 x 1.02
IPP-TN306-50	500	DC - 1.0	< 1.35:1	N (F)	1.63 x 2.00 x 1.07
IPP-TN306-50-M	500	DC - 1.0	< 1.35:1	N (M)	1.63 x 2.00 x 1.07
IPP-TN307-50	600	DC - 0.5	< 1.50:1	N (F)	1.97 x 3.66 x 1.03
IPP-TN307-50-M	600	DC - 0.5	< 1.50:1	N (M)	1.97 x 3.66 x 1.03

Note: All parts listed are Aluminum Nitride terminations. Other connector types are available.

RF Feedback Resistors

PART NUMBER	POWER (WATTS)	FREQUENCY (MHz)	VALUE (OHMS)	CAPACITANCE (pF, MAX)	DC BLOCKING CAPACITANCE (pF)	FLANGE SIZE (INCHES)	RESISTORS PER FLANGE
IPP-RB401-100	15	DC - 3000	100	0.75	N/A	0.225 x 0.689 x 0.330	One
IPP-RB401-200	15	DC - 3000	200	0.75	N/A	0.225 x 0.689 x 0.330	One
IPP-RB401-100-0100	15	DC - 3000	100	0.75	100	0.225 x 0.689 x 0.330	One
IPP-RB401-200-0100	15	DC - 3000	200	0.75	100	0.225 x 0.689 x 0.330	One
IPP-RB402-100	15	DC - 3000	100	0.75	N/A	0.225 x 0.800 x 0.375	One
IPP-RB402-200	15	DC - 3000	200	0.75	N/A	0.225 x 0.800 x 0.375	One
IPP-RB402-100-0100	15	DC - 3000	100	0.75	100	0.225 x 0.800 x 0.375	One
IPP-RB402-200-0100	15	DC - 3000	200	0.75	100	0.225 x 0.800 x 0.375	One
IPP-RB403-100	15	DC - 3000	100	0.75	N/A	0.225 x 1.140 x 0.375	Two
IPP-RB403-200	15	DC - 3000	200	0.75	N/A	0.225 x 1.140 x 0.375	Two
IPP-RB403-100-0100	15	DC - 3000	100	0.75	100	0.225 x 1.140 x 0.375	Two
IPP-RB403-200-0100	15	DC - 3000	200	0.75	100	0.225 x 1.140 x 0.375	Two

Note: For packages with two resistors, value shown is for each resistor/capacitor. All parts listed have a lead thickness of 0.005 inches.



IPP's line of Feedback Resistors are designed to support wideband RF/Microwave solid-state transistor power amplifiers, which require resistive feedback. Using negative resistive feedback is a simple way to improve transistor amplifier stability and frequency gain sloping.

These feedback resistors are flange mounted and designed to fit directly over the RF/microwave transistor using the same mounting holes as the transistor. This mounting configuration utilizes normally unused space above the transistor without taking up valuable PCB area adjacent to the transistor. In addition to saving space, this mounting arrangement decreases parasitic inductance associated with resistor leads by providing the shortest lead length possible between the transistor input and output. The short lead length and corresponding lower inductance allow for higher frequency operation.

Our feedback resistors are constructed using nickel-plated aluminum flanges with BeO ceramic resistors, providing excellent thermal conductivity and low parasitic capacitance. These products are available in a range of resistor values and power levels to match various applications. Flange styles are designed with mounting holes to match up with many popular transistor footprints. Feedback resistors are available with or without DC blocking capacitors, and values can be customized as required.



Custom Products

At Innovative Power Products, we realize that not every project can use one of our standard products; therefore, IPP is ready to design and manufacture custom solutions to fit your exact specifications.

Our experience in amplifier design, assembly and testing enables us to understand most system requirements. Discover the benefits of integrating your team with our engineers to assist with the initial architecture to optimize your design.

Our Customer Service and Engineering staff is readily available to discuss your particular application.

Our Custom Services Include:

- Product Integration
- Custom Configurations
- 2-Way up to 32-Way Combiners
- 4-Way: 90 Degree Couplers with Integrated Balun
- Serial Combining
- Impedances other than 50 Ohms
- 180 Degree Hybrid Couplers
- Custom Resistor Assemblies

We Design with Your Engineering Team from Concept to Finished Product:

Customer Requirement:

4-Way Combiner with

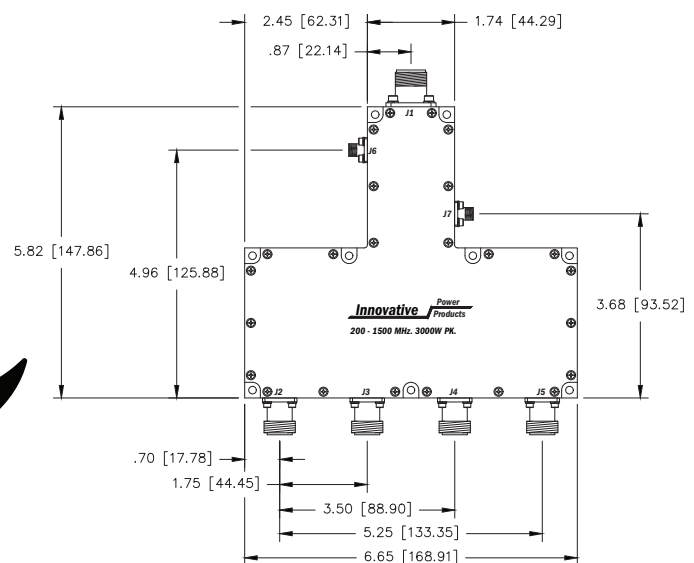
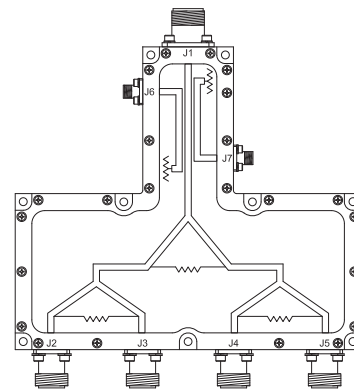
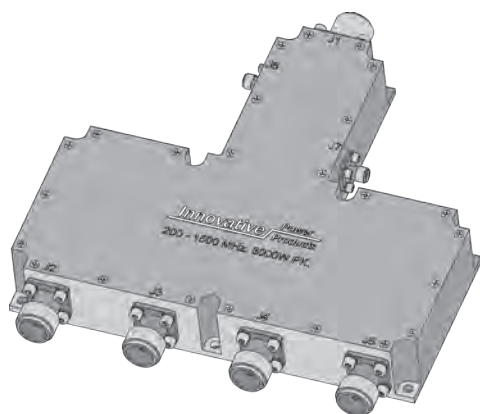
50dB Dual Directional Coupler

Approx. Size: 6 in. x 7 in.

Frequency: 200 – 1500 MHz.

Peak Power: 3 kW

Pulse width and duty cycle: 1 ms @ 10%

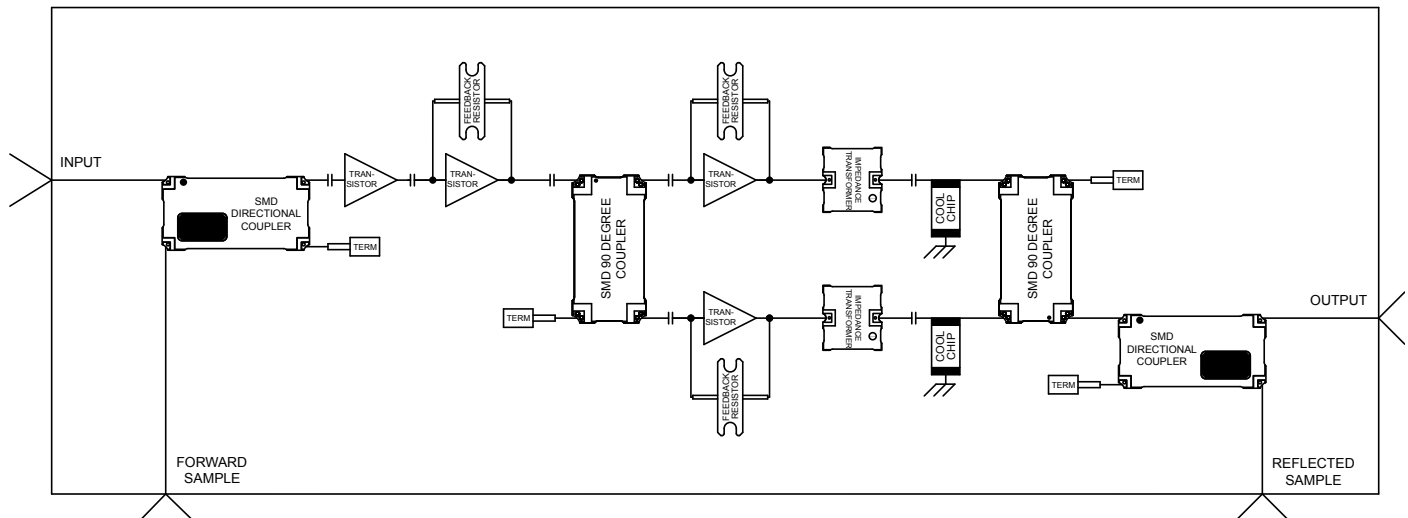


Where IPP is Used

These diagrams are representative of where IPP products might be used in power amplifier modules and systems and are for illustration purposes only. These do not include the many additional applications such as medical or antenna systems. For technical help, please contact our team at info@innovativepp.com or by calling (631) 563-0088.

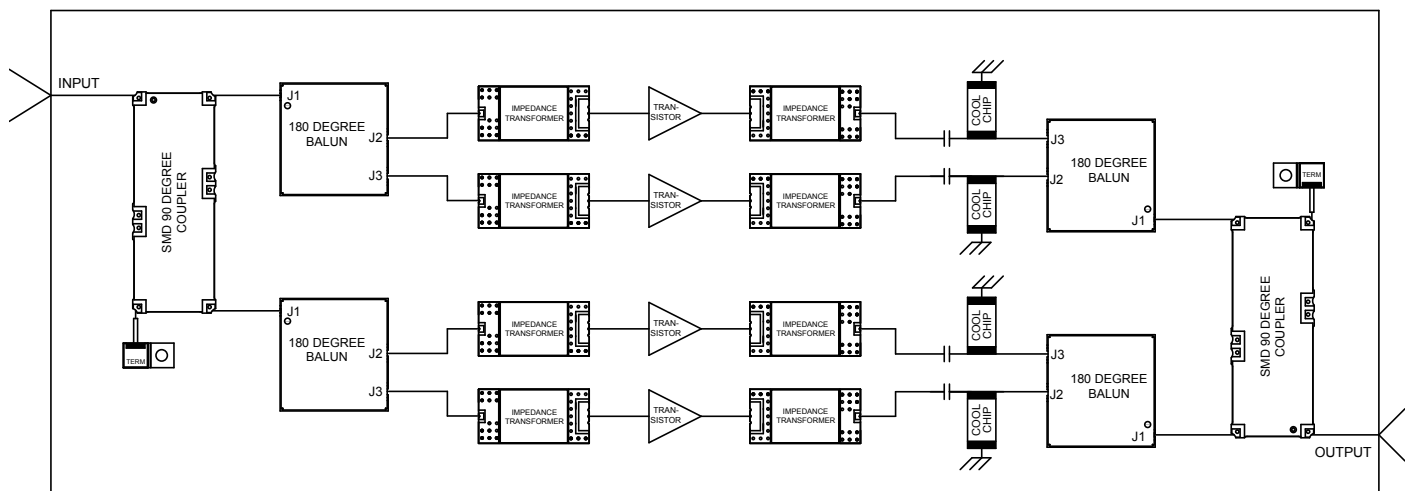
Driver Amp

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4 Transistor Amp Module (Shown with SMD)

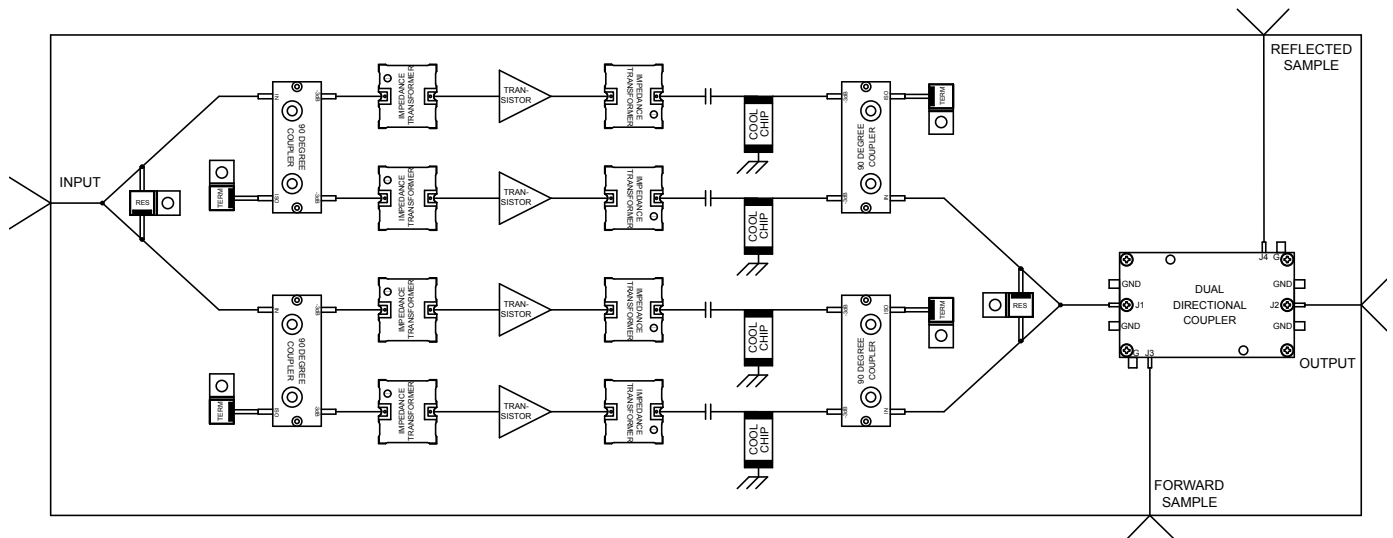
**Innovative Power®
Products**



Items not drawn to scale.

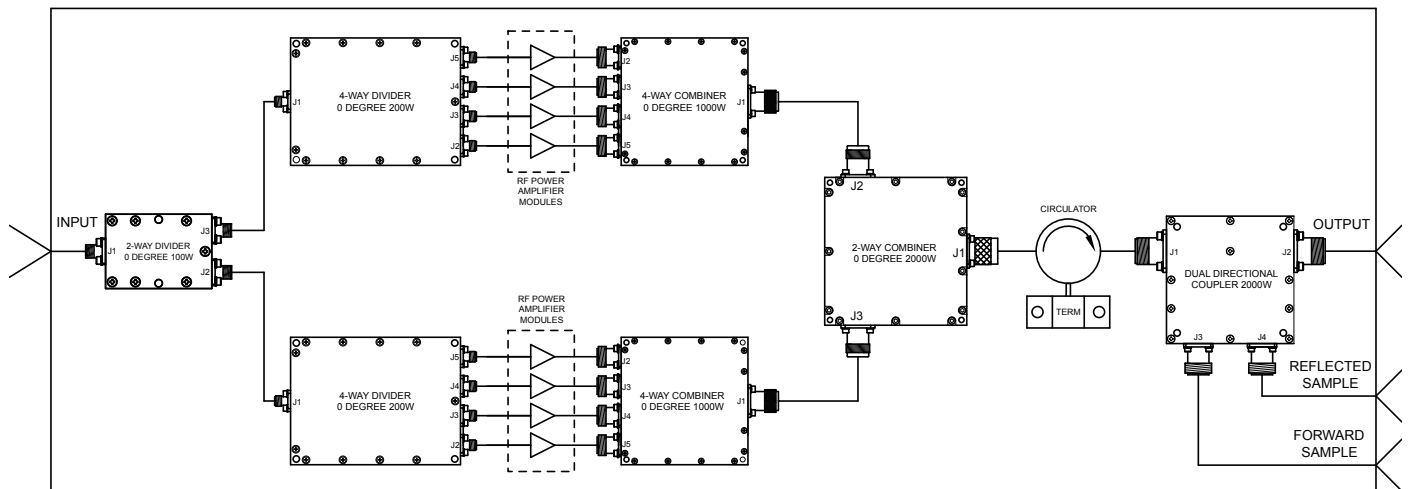
4 Transistor Amp Module (Shown with Drop-In)

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Products**



Power Amp System

**Innovative Power®
Products**



Items not drawn to scale.

**At Innovative Power Products
we build more than radio frequency products...
we build relationships that last.**



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