

INTEGRATED PASSIVE COMPONENTS



Johanson Technology has developed a line of small, highly reliable RF ceramic components manufactured with a proprietary LTCC (low temperature co-fired ceramic) process. These components operate over several bands from 900MHz to 6 GHz covering Cellular, DECT, WLAN, Bluetooth, 802.11 (a,b and g) and GPS applications.

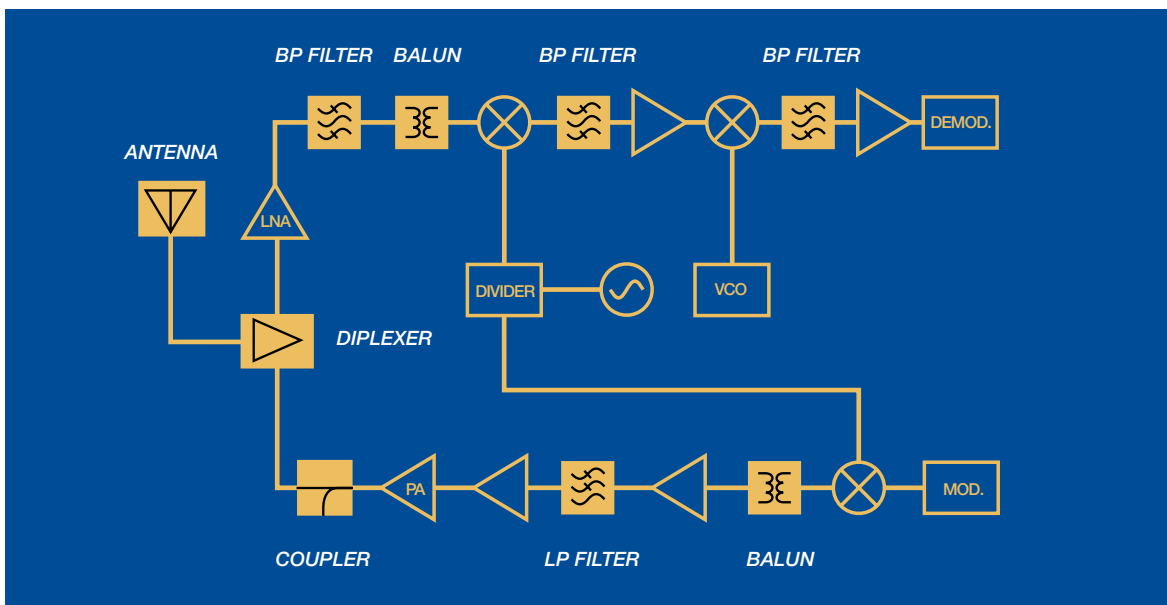
In addition to the array of listed components we can support custom solutions for high volume applications with design flexibility and short development times. Contact us today with your specific technical requirements.

KEY FEATURES

- Custom Solutions
- LTCC Based Designs
- Low Insertion Loss
- Miniature Size / Low Profile
- Temperature Stable
- Surface Mount
- RoHS Compliant, Standard, Use No Suffix

SUPPORTED APPLICATION BANDS

- | | | |
|------------------------------------|------------------------------|--------|
| • Wireless LAN, Bluetooth, Home RF | • 2.4 GHz & 5.5 GHz ISM Band | • GPS |
| • GSM/EDGE/GPRS/DCS/PCS/WCDMA | • Zigbee | • UNII |
| • WiMAX 802.16 d/e | • MIMO | • UWB |



CERAMIC CHIP ANTENNAS

Part Number	Frequency (MHz)	Peak Gain	Ave. Gain	Return Loss (min)	Case Size
0868AT43A0020	858 - 878	-1.0 dBi typ (XZ-total)	-4.0 dBi typ (XZ-total)	9.5 dB	43-1
0915AT43A0026	902 - 928	-1.0 dBi typ (XZ-total)	-4.0 dBi typ (XZ-total)	8.5 dB	43-1
0920AT50A080	880 - 960	-0.7 dBi typ (XZ-V)	-2.6 dBi typ (XZ-V)	8.5 dB	50
1575AT43A40	1555 - 1595	-1.5 dBi typ (XZ-V)	-2.5 dBi typ (XZ-V)	9.5 dB	43-1
1575AT47A40_	1555 - 1595	-1.0 dBi typ (XZ-V)	-3.0 dBi typ (XZ-V)	9.5 dB	47-1
1575AT48A0010	1570 - 1580	1.5 dBi typ. (XZ-total)	-1.0 dBi typ. (XZ-total)	9.5 dB	50
2450AT18A100	2400 - 2500	0.5 dBi typ (XZ-V)	-0.5 dBi typ (XZ-V)	9.5 dB	18-4
2450AT18B100	2400 - 2500	0.5 dBi typ (XZ-V)	-0.5 dBi typ (XZ-V)	9.5 dB	18-4
2450AT42A100	2400 - 2500	0 dBi typ (XZ-V)	-1 dBi typ (XZ-V)	9.5 dB	42-1A
2450AT42B100	2400 - 2500	0 dBi typ (XZ-V)	-1.5 dBi typ (XZ-V)	9.5 dB	42-2
2450AT42D0100	2400 - 2500	0.5 dBi typ. (XZ-total)	-2.0 dBi typ (XZ-V)	6.0 dB	42-1B
2450AT43A100	2400 - 2500	2.0 dBi typ (XZ-V)	0.5 dBi typ (XZ-V)	9.5 dB	43-1
2450AT43B100	2400 - 2500	1.0 dBi typ (XZ-V)	-0.5 dBi typ (XZ-V)	9.5 dB	43-2
2450AT43D100	2400 - 2500	-0.5 dBi typ (XZ-V)	-3.6 dBi typ (XZ-V)	9.5 dB	43-3
2450AT43F0100	2400 - 2500	2.1 dBi typ. (XZ-total)	1.0 dBi typ. (XZ-total)	9.5 dB	43-3
2450AT45A100_	2400 - 2500	3.0 dBi typ (XZ-V)	1.0 dBi typ (XZ-V)	9.5 dB	45-1
2450AD46A5400 (Dual Band)	LB: 2400 - 2500 HB: 4900 - 5900	1.0 dBi typ (XZ-V) -2.5 dBi typ (XZ-V)	-1.5 dBi typ (YZ-V) -2.5 dBi typ (YZ-V)	8.5 dB 8.5 dB	46-1
2500AT44M0400	2300 - 2700	2.5 dBi typ (XZ-V)	0.5 dBi typ (XZ-V)	9.5 dB	44-2
2500AT52M3555 WiMax (Tri-Band)	2300 - 2690 3300 - 3900 5150 - 5875	2.5 dBi typ (XZ-V) 2.0 dBi typ. (XZ-V) 2.0 dBi typ. (XZ-V)	-2.0 dBi typ. -4.0 dBi typ. -3.0 dBi typ.	9.5 dB	See Spec Sheet
2650AT43A0100	2600 - 2700	0.5 dBi typ. (XZ-total)	-1.7 dBi typ. (XZ-total)	3.0 dB	50
3100AT51A7200	3100 - 10300	1.5 dBi typ (XZ-V)	-3.5 dBi typ (XZ-V)	9.5 dB	51-1
4000AT44A1800	3100 - 4900	2.7 dBi typ. (XY-H)	-3.5 dBi typ. (XY-H)	7.4 dB	44-2
5250AT43A200_	5150 - 5350	3.6 dBi typ (XZ-V)	-2.3 dBi typ (XZ-V)	9.5 dB	43-1
5400AT18A1000	4900 - 5900	2.0 dBi typ. (XZ-V)	-2.5 dBi typ (XZ-V)	9.5 dB	18-4
5775AT43A100_	5725 - 5825	3.9 dBi typ (XZ-V)	-1.5 dBi typ (XZ-V)	9.5 dB	43-1

ANTENNA MODULES

Part Number	Center Freq. (MHz)	Peak Gain	Ave. Gain	Return Loss (min)	Case Size
1575AM55B0001	1575.42 MHz	-1.5 dBi typ (XZ-V)	-2.5 dBi typ (XZ-V)	9.5 dB	See Spec Sheet

Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.



BAND-PASS FILTERS: 2.45 GHZ

Part Number	Frequency (MHz)	Insertion Loss (max.)	Attenuation (min)	Return Loss (min)	Ripple (typical)	Case Size
2450BP07A0100	2450 ± 50	2.5 dB	25 dB @ 824 - 960 MHz 25 dB @ 1710 - 1910 MHz 25 dB @ 4800 - 5000 MHz 15 dB @ 7200 - 7500 MHz	9.5 dB	-	07-1
2450BP14D0100	2450 ± 50	1.7 dB	30 dB @ 880 - 915 MHz 30 dB @ 1710 - 1785 MHz 25 dB @ 1850 - 1910 MHz 25 dB @ 4800 - 5000 MHz 15 dB @ 7200 - 7500 MHz	9.5 dB	-	14-1
2450BP14E0100	2450 ± 50	2.5 dB	35 dB @ 824 - 960 MHz 38 dB @ 1710 - 1910 MHz 25 dB @ 4800 - 5000 MHz 20 dB @ 7200 - 7500 MHz	9.5 dB	-	14-1
2450BP15B100	2450 ± 50	2.2 dB	30 dB @ 1200-1300 MHz 15 dB @ 2000 MHz 25 dB @ 3000 MHz 20 dB @ 3600-3800 MHz 20 dB @ 4800-5000 MHz	9.5 dB	-	15-3A
2450BP15C100	2450 ± 50	2.2 dB	30 dB @ 1200-1300 MHz 15 dB @ 2000 MHz 25 dB @ 3000 MHz 20 dB @ 3600-3800 MHz 20 dB @ 4800-5000 MHz	9.5 dB	-	15-3B
2450BP15D100	2450 ± 50	2.6 dB	30 dB @ 880 - 1990 MHz 20 dB @ 2110 - 2170 MHz 30 dB @ 4800 - 5000 MHz 20 dB @ 7200 - 7500 MHz	9.5 dB	-	15-1G
2450BP15E0100	2450 ± 50	1.5 dB	30 dB @ 880 - 915 MHz 30 dB @ 1710 - 1785 MHz 25 dB @ 1850 - 1910 MHz 25 dB @ 4800 - 5000 MHz 15 dB @ 7200 - 7500 MHz	9.5 dB	-	15-3C
2450BP15F0100	2450 ± 50	2.5 dB	35 dB @ 824 - 960 MHz 38 dB @ 1710 - 1910 MHz 25 dB @ 4800 - 5000 MHz 20 dB @ 7200 - 7500 MHz	9.5 dB	-	15-1G
2450BP15G0100	2450 ± 50	2.0 dB	30 dB @ 824 - 960 MHz 28 dB @ 1710 - 1910 MHz 20 dB @ 1910 - 1990 MHz 20 dB @ 4800 - 5000 MHz 30 dB @ 7200 - 7500 MHz	9.5 dB	-	15-1G
2450BP18C100B	2450 ± 50	2.0 dB	30 dB @ 1.75 GHz 25 dB @ 2.10 GHz 22 dB @ 4.8-5.0 GHz	9.5 dB	0.7 dB	18-2
2450BP18C100C	2450 ± 50	2.5 dB	30 dB @ 1.2-1.8 GHz 25 dB @ 2.1 GHz 35 dB @ 4.8-5.0 GHz	9.5 dB	0.7 dB	18-3A
2450BP39C100A	2450 ± 50	2.5 dB	42 dB @ 1.71-1.99 GHz 30 dB @ 2.1 GHz 30 dB @ 4.8-5.0 GHz	9.5 dB	0.7 dB	39-1B
2450BP39C100B	2450 ± 50	1.8 dB	30 dB @ 1.71-1.78 GHz 25 dB @ 1.85-1.91 GHz 25 dB @ 4.8-5.0 GHz	9.5 dB	0.7 dB	39-1B
2450BP39C100C	2450 ± 50	1.5 dB	30 dB @ 800-915 MHz 30 dB @ 1710-1785 MHz 25 dB @ 1850-1910 MHz 25 dB @ 4800-5000 MHz 15 dB @ 7200-7500 MHz	9.5 dB	-	39-1B

Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.

BAND-PASS FILTERS: 2.45 GHz

Part Number	Frequency (MHz)	Insertion Loss (max.)	Attenuation (min)	Return Loss (min)	Ripple (typical)	Case Size
2450BP39C100D	2450 ± 50	2.2 dB	30 dB @ 880 - 915 MHz 30 dB @ 1710 - 1785 MHz 25 dB @ 1910 MHz 25 dB @ 2100 MHz 25 dB @ 4800 - 5000 MHz 15 dB @ 7200 - 7500 MHz	9.5 dB	-	39-1D
2450BP39D100B	2450 ± 50	2.5 dB	35 dB @ 880 - 915 MHz 18 dB @ 1710 - 1990 MHz 12 dB @ 2100 MHz 35 dB @ 3200 MHz 22 dB @ 4800 - 5000 MHz 22 dB @ 7200 - 7500 MHz	9.5 dB	-	39-1B
2450BP39D100C	2450 ± 50	1.2 dB	30 dB @ 880-915 MHz 30 dB @ 1710 - 1785 MHz 25 dB @ 1850 - 1910 MHz 25 dB @ 4800 - 5000 MHz 15 dB @ 7200 - 7500 MHz	9.5 dB	-	39-1B
2450BP39F100A	2450 ± 50	2.4 dB	45 dB @ 880-915 MHz 48 dB @ 1710 - 1990 MHz 20 dB @ 2110 - 2170 MHz 30 dB @ 4800 - 5000 MHz 36 dB @ 7200 - 7500 MHz	9.5 dB	-	39-1B

BAND-PASS FILTERS: 5.5 GHz

Part Number	Frequency (MHz)	Insertion Loss (max.)	Attenuation (min)	Return Loss (min)	Ripple (typical)	Case Size
5400BP39A1000	4900 - 5900	3.5 dB	24 dB @ 3800 - 4500 MHz 20 dB @ 6300 - 7100 MHz	8.5 dB	-	39-1B
5487BP15B675	5150 - 5825	1.8 dB	35 dB @ 2.57-2.90 GHz 22 dB @ 10.3-11.6 GHz 30 dB @ 15.45-17.47 GHz	9.5 dB	0.7 dB	15-1B
5487BP15C675	5150 - 5825	1.8 dB	35 dB @ 2.57-2.90 GHz 27 dB @ 10.3-11.65 GHz 20 dB @ 15.45-17.475 GHz	9.5 dB	0.7 dB	15-1B
5515BP15B725	5150 - 5875	1.5 dB	30 dB @ 3500 MHz	9.5 dB	-	15-3B
5515BP15B730	5150 - 5875	2.8 dB	30 dB @ 0.5-4.0 GHz 25 dB @ 10.3-11.8 GHz 15 dB @ 10.3-11.8 GHz	9.5 dB	0.7 dB	15-1B
5515BP15B975	4900 - 5875	1.5 dB	30 dB @ 3500 MHz	9.5 dB	-	15-3B
5515BP15C975	4900 - 5875	2.0 dB	30 dB @ 500-4000MHz 20 dB @ 4200MHz 15 dB @ 9800 11750MHz	8.5 dB	-	15-3B
5515BP15C1020	4900 - 5920	1.5 dB	30 dB @ 3500 MHz	9.5 dB	-	15-3B
5515BP15C725	5150 - 5875	2.5 dB	30 dB @ 500-4000 MHz	9.5 dB	-	15-3A
5515BP15C975	4900 - 5875	1.8 dB	30 dB @ 500-4000MHz 20 dB @ 4200MHz 15 dB @ 9800-11750MHz	8.5 dB	-	15-3A
5525BP15A0750	4900 - 5920	1.5 dB	30 dB @ 3500 MHz	9.5 dB	-	15-3B

Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.

BAND-PASS FILTERS: OTHER

Part Number	Frequency (MHz)	Insertion Loss (max)	Attenuation (min)	Return Loss (min)	Ripple (typical)	Case Size
0610BP18A0280	470 - 750	3.5 dB	30 dB @ 174-230 MHz 35 dB @ 880-915 MHz 30 dB @ 1710-1785 MHz 30 dB @ 1920-1980 MHz	10 dB	-	18-4
1810BP07B200	1710 - 1910	2.0 dB	20 dB @ 855-955 MHz 12 dB @ 2565-2865 MHz	9.5 dB	-	07-1
1810BP07C200	1710 - 1910	2.0 dB	20 dB @ 855-955 MHz 10 dB @ 2565-2865 MHz	9.5 dB	-	07-1
1906BP18A027	1893 - 1920	1.5 dB	38 dB @ 1405-1440 MHz 10 dB @ 1649-1680 MHz 24 dB @ 3786-3840 MHz 20 dB @ 5679-5760 MHz	9.5 dB	-	18-3B
1906BP18C027	1893 - 1920	2.0 dB	TBD	9.5 dB	-	18-TBD
1906BP39B027	1893 - 1920	2.8 dB	40 dB @ 1660 MHz 12 dB @ 2139 MHz	9.5 dB	-	
2500BP15M400	2300 - 2700	2.0 dB	15 dB @ 100-1800 MHz 20 dB @ 3400-11700 MHz	9.5 dB	-	15-3
2593BP44B186	2500 - 2686	2.0 dB	40 dB @ 1870-2056 MHz	9.5 dB	-	44-1
2600BP14M0200	2500 - 2700	2.2 @ 25 dB 2.5 @ -40-85 dB	30 dB @ 806 - 915 MHz 30 dB @ 1710 - 1785 MHz 30 dB @ 1850 - 1910 MHz 30 dB @ 1920 - 1980 MHz 13 dB @ 3300 - 3900 MHz 20 dB @ 4900 - 5900 MHz	9.5 dB	-	14-2
3480BP39A0140	3410 - 3550	4 dB	30 dB @ 2540 MHz 14 dB @ 4020 MHz 34 dB @ 5150 - 5350 MHz	10 dB	-	39-1A
3600BP14M0600	3300 - 3700	1.8 @ 25 dB 2.0 @ -40-85 dB	30 dB @ 806 - 915 MHz 30 dB @ 1710 - 1785 MHz 30 dB @ 1850 - 1910 MHz 30 dB @ 1920 - 1980 MHz 31 dB @ 2400 - 2500 MHz 18 dB @ 4900 - 5900 MHz	9.5 dB	-	14-2
3600BP15M600	3300 - 3900	1.8 dB	15 dB @ 0.1-2.6 GHz 9 dB @ 4.4 GHz 20 dB @ 6.0-9.9 GHz	9.5 dB	-	15-3B
4000BP15U1800	3100 - 4900	2.0 dB	25 dB @ 1.75 GHz 13 dB @ 2.10 GHz	8.5 dB	-	15-2B
4020BP39A0160	3940 - 4100	3.0 dB	42.4 dB @ < 2540 MHz 20.8 dB @ 3480 MHz 14 dB @ 4560 MHz 45.2 dB @ 5150 - 5350 MHz	20.8 dB	-	39-1A
4560BP39A0180	4470 - 4650	2.97 dB	48.3 dB @ < 2540 MHz 19.1 dB @ 4020 MHz 19 dB @ 5150 - 5350 MHz 35.9 dB @ 5725 - 7000 MHz	17.5 dB	-	39-1A
5130BP18U4060	3100 - 7160	1.6 dB	25 dB @ 824 - 960 MHz 25 dB @ 1710 - 1990 MHz 15 dB @ 2400 - 2500 MHz 20 dB @ 10100 - 10600 MHz	9.5 dB	-	18-4

Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.

BAND-PASS FILTERS: OTHER

Part Number	Frequency (MHz)	Insertion Loss (max)	Attenuation (min)	Return Loss (min)	Ripple (typical)	Case Size
6120BP39A0240	6000 - 6240	2.71 dB	42.8 dB @ < 2540 MHz 20.5 dB @ 5350 MHz 17.5 dB @ 7000 - 10,000 MHz	19.43 dB	-	39-1A
6960BP39A0280	6820 - 7100	2.64 dB	42.7 dB @ < 2540 MHz 32.8 dB @ 5150 - 5350 MHz 24.8 dB @ 5725 - 5825 MHz 25.1 dB @ < 6120 MHz	23.4	-	39-1A

HIGH-PASS FILTERS

Part Number	Frequency (MHz)	Insertion Loss (max)	Attenuation (min)	Return Loss (min)	Case Size
1900HP41A500	1650 - 2150	2.0 dB	30 dB @ 950 - 1450 MHz	8.5 dB	41-1
2450HP14A100	2400 - 2500	1.0 dB	9 dB @ 824 - 960 MHz 20 dB @ 1917 MHz	9.5 dB	14-1B
2450HP15A100	2400 - 2500	0.85 dB	25 dB @ 875 - 920 MHz 20 dB @ 1705 - 1790 MHz 19 dB @ 1845 - 1915 MHz	9.5 dB	See Spec Sheet

NOTCH FILTER

Part Number	Frequency Range (max)	Insertion Loss (max)	Attenuation (min)	Return Loss (min)	Case Size
4000NF39A6550	3.0 dB @ 3200-4800 MHz	3.0 @ 5900-7200 MHz	30 dB @ 950 - 1450 MHz	8.5 dB	41-1

EMI FILTER

Part Number	No. of Sections	Cutoff Freq (MHz)	Attenuation (min)	Case Size
0400FA15A0400	4	400	20 dB @ 800 - 1000 MHz	See Spec Sheet

DUAL LOW PASS FILTER

Part Number	Frequency (MHz)	Insertion Loss (max)	Attenuation (min) 2x F_o 3x F_o	Return Loss (min)	Case Size
0869LD14C1810	824 - 915 1710 - 1910	0.6 dB 0.6 dB	25 dB 18 dB 22 dB 20 dB	9.5 dB	14-1C1

Basic case size drawings for above part numbers are located on pages 35-36.

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LOW-PASS FILTERS

Part Number	Frequency (MHz)	Insertion Loss (max)	Attenuation (min)	Return Loss (min)	Case Size
0500LP15A500	0 - 500	0.70 dB	9 dB @ 824 - 960 MHz 25 dB @ 1710 - 1990 MHz 25 dB @ 2400 - 4000 MHz	9.5 dB	15-1A
0868LP15A020	858 - 878	0.50 dB	30 dB @ 2 x Fo 40 dB @ 3 x Fo	14.0 dB	15-2A
0869LP14A090	824 - 915	0.60 dB	20 dB @ 2x Fo 15 dB @ 3x Fo	10.9 dB	14-1A
0898LP18A035	880 - 915	0.60 dB	30 dB @ 2x Fo 18 dB @ 3x Fo	10.9 dB	18-2
0915LP15B026	902 - 928	0.50 dB	30 dB @ 2x Fo 30 dB @ 3x Fo	14.0 dB	15-2A
1200LP41A0500	950 - 1450	2.0 dB	27 dB @ 1650 - 2150 MHz	8.5 dB	41-1
1200LP41B0500	950 - 1450	2.0 dB	24 dB @ 1650-2150 (+25°C)	8.5 dB	41-1
1200LP41C0500	950 - 1450	2.0 dB	24 dB @ 1650-2150 (+25°C)	8.5 dB	41-1
1748LP18A075	1710 - 1785	0.60 dB	30 dB @ 2x Fo 18 dB @ 3x Fo	10.9 dB	18-2
1810LP07A200	1710 - 1910	0.50 dB	20 dB @ 2x Fo 20 dB @ 3x Fo	10.9 dB	07-1
1810LP07B200	1710 - 1910	0.60 dB	26 dB @ 3420 - 3570 MHz 21 dB @ 3700 - 3820 MHz 21 dB @ 5130 - 5730 MHz	9.5 dB	07-1
1810LP14A200	1710 - 1910	0.60 dB	30 dB @ 3420 - 3570 MHz 25 dB @ 3700 - 3820 MHz 20 dB @ 5130 - 5730 MHz	11.7 dB	14-1A
1880LP14A060	1850 - 1910	0.60 dB	27 dB @ 2x Fo 19 dB @ 3x Fo	11.7 dB	14-1A
2450LP14A100	2400 - 2500	0.50 dB	25 dB @ 2x Fo 18 dB @ 3x Fo	14.0 dB	14-1A
2450LP14B100	2400 - 2500	0.50 dB	35 dB @ 2x Fo 25 dB @ 3x Fo	14.0 dB	14-1A
2450LP15A050	2400 - 2500	0.50 dB	27 dB @ 2x Fo 25 dB @ 3x Fo 25 dB @ 4x Fo	10.9 dB	15-2A
3550LP14A300	3400 - 3700	0.65 dB	25 dB @ 2x Fo 25 dB @ 3x Fo	14.0 dB	14-1A
5515LP15A730	5150 - 5875	0.50 dB	25 dB @ 2x Fo 18 dB @ 3x Fo	10.9 dB	15-2A

Basic case size drawings for above part numbers are located on pages 35-36.

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DIRECTIONAL COUPLERS

Part Number	Frequency (MHz)	Insertion Loss (max)	Return Loss (min)	Coupling (dB)	Isolation (min.)	Case Size
0450CP14A0040	450	0.2 dB	20.8 dB	27.5 ± 2.0 dB	45.0 dB	See Spec Sheet
0836CP07A0025	824 - 849	0.2 dB	29.1 dB	31.0 dB	42.0 dB	See Spec Sheet
0848CP14A075	810 - 885	0.25 dB	15.6 dB	20.3 ± 1.0 dB	28.0 dB	14-1A
0869CP14A090	824 - 915	0.3 dB	15.6 dB	17 ± 1.0 dB	26.0 dB	14-1A
0898CP14A035	880 - 915	0.28 dB	15.6 dB	18 ± 1.0 dB	26.0 dB	14-1A
0898CP14B035	880 - 915	0.25 dB	15.6 dB	20 ± 1.0 dB	28.0 dB	14-1A
0898CP15A035	880 - 915	0.50 dB	14.0 dB	20 ± 1.0 dB	25.0 dB	15-1C
0967CP14A024	955 - 979	0.50 dB	15.6 dB	12.5 ± 1.0 dB	19.0 dB	14-1A
1747CP14A075	1710 - 1785	0.44 dB	15.6 dB	14.5 ± 1.0 dB	25.0 dB	14-1A
1748CP15A075	1710 - 1785	0.50 dB	14.0 dB	20 ± 1.0 dB	25.0 dB	15-1C
1810CP14A200	1710 - 1910	0.30 dB	15.6 dB	20 ± 1.0 dB	25.0 dB	14-1A
2450CP14A100	2400 - 2500	0.74 dB	TBD dB	10 ± 1.0 dB	22.0 dB	14-1A
2450CP14B100	2400 - 2500	0.34 dB	TBD dB	17.65 ± 1.0 dB	25.0 dB	14-1A

DIRECTIONAL COUPLER WITH LOW PASS FILTER

Part Number	Frequency (MHz)	Insertion Loss (max)	Return Loss (min)	Coupling (dB)	Isolation (min.)	Attenuation (min.)		Case Size
						2 x Fo	3 x Fo	
0898CF15A035_	880 - 915	0.7 dB	14 dB	20 ± 1.0	25.0 dB	22.0 dB	17.0 dB	15-1C
0910CF15A0100	860 - 960	1.0 dB	20 dB	13 ± 1.0	30.0 dB	30 dB @ 2 x Fo 30 dB @ 3 x Fo 30 dB @ 4 x Fo 30 dB @ 5 x Fo		15-2B
0910CF15B0100	860 - 960	1.2 dB	20 dB	10 ± 1.0	30.0 dB	27 dB @ 2 x Fo 30 dB @ 3 x Fo 30 dB @ 4 x Fo 30 dB @ 5 x Fo		15-2B
0910CF15C0100	860 - 960	1.0 dB	20 dB	16 ± 1.0	30.0 dB	30 dB @ 2 x Fo 30 dB @ 3 x Fo 30 dB @ 4 x Fo 30 dB @ 5 x Fo		15-2B
1748CF15A075_	1710 - 1785	0.5 dB	14 dB	20 ± 1.0	25.0 dB	22.0 dB	17.0 dB	15-1C
2450CF15A0100	2400 - 2500	0.8 dB	20 dB	15 ± 1.0	22.0 dB	20.0 dB		15-2B
2600CF15A0200	2500 - 2700	0.4 dB	16 dB	20 ± 1.0	29.0 dB	25.0 dB		15-2B
5300CF15A0950	4900 - 5850	0.8 dB	20 dB	15 ± 1.0	22.0 dB	20.0 dB		15-2B

DIRECTIONAL COUPLER - SPLITTER, 3 dB HYBRID

Part Number	Frequency (MHz)	Insertion Loss (max)	Return Loss (min)	Isolation (min.)	Case Size
0880CH15A060	850 - 910	3.3 ± 0.5 dB	14.0 dB	20.0 dB	15-4A
1472CH15A050	1452 - 1492	3.3 ± 0.5 dB	14.0 dB	16.0 dB	15-4B
1950CH15A100	1900 - 2000	3.3 ± 0.5 dB	14.0 dB	16.0 dB	15-4A
2450CH15A0100	2400 - 2500	3.3 ± 0.5 dB	14.0 dB	15.0 dB	15-5*

* For specific case size and layout information please download the specification sheet(s) from our website

Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.

DIRECTIONAL COUPLER - DUAL BAND, SINGLE PATH

Part Number	Frequency (MHz)	Insertion Loss (max)	Return Loss (min)	Coupling (dB)	Isolation (min.)	Case Size
0869CP14B1050	B1) 824 - 915 B2) 999 - 1102	0.4 dB 0.6 dB	15.6 dB 15.6 dB	14.2 ± 1.0 12.7 ± 1.0	23.0 dB 23.0 dB	14-1A

DIRECTIONAL COUPLER - DUAL BAND, DUAL PATH

Part Number	Frequency (MHz)	Insertion Loss (max)	Return Loss (min)	Coupling (dB)	Isolation (min.)	Case Size
0869CD14A1810	B1) 824 - 915 B2) 1710 - 1910	0.40 dB 0.40 dB	14.0 dB 14.0 dB	19.5 ± 1.0 19.5 ± 1.0	B1 In > Term: 30.0 dB B1 In > Term: 30.0 dB	15-2D
0869CD14B1810	B1) 824 - 915 B2) 1710 - 1910	0.40 dB 0.40 dB	14.0 dB 14.0 dB	19.5 ± 1.0 19.5 ± 1.0	B1 In > Term: 30.0 dB B1 In > Term: 30.0 dB	15-2D* * opposite pin outs
0898CD15B1748	B1) 880 - 915 B2) 1710 - 1785	0.40 dB 0.40 dB	10.9 dB 10.9 dB	19.2 ± 1.0 19.2 ± 1.0	B1 In > B2 Out: 35.0 dB B1 In > B2 In: 25.0 dB B1 Out > B2 In: 25.0 dB B1 In > Term: 23.0 dB B2 In > Term: 23.0 dB	15-2A
0898CD15C1748	B1) 1710 - 1785 B2) 880 - 91	0.45 dB 0.35 dB	10.9 dB 10.9 dB	14.0 ± 1.5 19.2 ± 1.0	B1 In > B2 Out: 35.0 dB B1 In > B2 In: 24.0 dB B1 Out > B2 In: 24.0 dB B1 In > Term: 24.0 dB B2 In > Term: 24.0 dB	15-2A
0898CD15D1748	B1) 880 - 915 B2) 1710 - 1785	0.35 dB 0.50 dB	14.0 dB 14.0 dB	19.0 ± 1.0 14.0 ± 1.5	B1 In > B2 Out: 25.5 dB B1 In > B2 In: 21.0 dB B1 Out > B2 In: 22.0 dB B1 In > Term: 17.0 dB B2 In > Term: 24.0 dB	15-2A

CERAMIC CHIP BALUNS

Part Number	Frequency (MHz)	Impedance Unbal./Bal.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Amplitude Difference (max)	Case Size
0465BL15B100	460 - 470	50/100	1.0 dB	9.5 dB	180°±10°	1.5 dB	15-1A
0866BL15C200	800 - 900	50/200	1.2 dB	9.5 dB	180°±10°	1.0 dB	15-1E
0896BL14B050	851 - 941	50/50	1.5 dB	9.5 dB	180°±10°	0.7 dB	14-1A
0900BL15C050	800 - 1000	50/50	1.2 dB	9.5 dB	180°±10°	2.0 dB	15-1D
0900BL18B100	800 - 1000	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	18-1
0900BL18B200	800 - 1000	50/200	1.0 dB	9.5 dB	180°±10°	2.0 dB	18-1
0917BL18B100	889 - 945	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	18-1
1450BL15A200	1400 - 1500	50/200	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1C
1472BL15B0100	1452 - 1492	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1A
1600BL15B050	1500 - 1700	50/50	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1B
1600BL15B100	1500 - 1700	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1B
1800BL18B200	1700 - 1900	50/200	0.8 dB	9.5 dB	180°±10°	2.0 dB	18-1
1850BL15B050	1700 - 2000	50/50	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1B
1850BL15B100	1700 - 2000	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1B
1850BL15B200	1700 - 2000	50/200	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1B

Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.

CERAMIC CHIP BALUNS

Part Number	Frequency (MHz)	Impedance Unbal./Bal.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Amplitude Difference (max)	Case Size
2100BL18B200	2000 - 2200	50/200	0.8 dB	9.5 dB	180°±10°	2.0 dB	18-1
2450BL14B050	2400 - 2500	50/50	1.5 dB	9.5 dB	180°±10°	2.0 dB	14-1A
2450BL14B100	2400 - 2500	50/100	1.3 dB	9.5 dB	180°±10°	2.0 dB	14-1A
2450BL14B200	2400 - 2500	50/200	1.2 dB	9.5 dB	180°±10°	2.0 dB	14-1A
2450BL14C050	2400 - 2500	50/50	1.2 dB	9.5 dB	180°±10°	2.0 dB	14-1A
2450BL14C100	2400 - 2500	50/100	1.2 dB	9.5 dB	180°±10°	1.5 dB	14-1A
2450BL14C200	2400 - 2500	50/200	1.3 dB	9.5 dB	180°±10°	2.0 dB	14-1A
2450BL15B050	2400 - 2500	50/50	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1C
2450BL15B100	2400 - 2500	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1C
2450BL15B150	2400 - 2500	50/150	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1A
2450BL15B200	2400 - 2500	50/200	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1C
2450BL15K050	2400 - 2500	50/50	1.2 dB	9.5 dB	180°±10°	2.0 dB	15-1C
2450BL15K100	2400 - 2500	50/100	1.2 dB	9.5 dB	180°±10°	2.0 dB	15-1C
2500BL14M050	2300 - 2700	50/50	1.2 dB	9.5 dB	180°±15°	1.5 dB	14-1A
2500BL14M100	2300 - 2700	50/100	1.2 dB	9.5 dB	180°±15°	1.5 dB	14-1A
3600BL14M050	3300 - 3900	50/50	1.2 dB	9.5 dB	180°±15°	1.5 dB	14-1A
3600BL14M100	3300 - 3900	50/100	1.2 dB	9.5 dB	180°±15°	1.5 dB	14-1A
3700BL15B050	3400 - 4000	50/50	1.2 dB	9.5 dB	180°±25°	2.0 dB	15-1C
3700BL15B100	3400 - 4000	50/100	1.0 dB	9.5 dB	180°±20°	1.0 dB	15-1C
3700BL15B200	3400 - 4000	50/200	1.2 dB	9.5 dB	180°±20°	1.0 dB	15-1A
4000BL14U100	3100 - 4800	50/100	1.2 dB	9.5 dB	180°±20°	1.5 dB	14-1A
5250BL14B100	5150 - 5350	50/100	1.0 dB	9.5 dB	180°±15°	1.5 dB	14-1A
5250BL15B100	5150 - 5350	50/100	1.2 dB	9.5 dB	180°±10°	2.0 dB	15-1C
5325BL15B050	5150 - 5500	50/50	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1C
5400BL14B100	5350 - 5450	50/100	1.2 dB	9.5 dB	180°±10°	1.5 dB	14-1A
5400BL15K050	4900 - 5875	50/50	1.2 dB	8.5 dB	180°±10°	2.0 dB	15-1A
5400BL15B050	4900 - 5900	50/50	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1C
5400BL15B100	4900 - 5900	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1C
5400BL15B200	4900 - 5875	50/200	1.0 dB	9.5 dB	180°±10°	2.0 dB	15-1B
5500BL15U0100	3000 - 8000	50/100	1.8 dB	9.5 dB	180°±15°	2.0 dB	15-1A
5512BL15B100	5150 - 5875	50/100	1.0 dB	11.7 dB	180°±10°	2.0 dB	15-1C
5800BL15B100	5725 - 5875	50/100	1.0 dB	9.5 dB	180°±8°	0.75 dB	15-1C

CERAMIC CHIP BALUNS, DUAL BAND

Part Number	Frequency (MHz)	Impedance Unbal./Bal.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Case Size
0918BD41B050	B1: 900 - 940 B2: 1850 - 1920	50/50 50/50	1.2 dB 1.7 dB	8.5 dB 8.5 dB	180°±10° 180°±10°	41-2

BALUNS / MATCHING NETWORKS; SPECIFIC CHIPSET APPLICATIONS

Part Number	Frequency (MHz)	Impedance Unbal./Bal.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Case Size
0896BM15A0001	868 - 915	50/Conj match to T.I. CC11XX	1.5 dB	9.5 dB	180°±15°	15-1E

Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.

CERAMIC CHIP BALUN FILTER

Part Number	Frequency (MHz)	Impedance Unbal./Bal.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Case Size
0896FB15A0100	868 - 915	50/100	1.5 dB	11.7 dB	180°±15°	15-1E
2345FB39A0050	2300 - 2390	50/50	3.2 dB	11.7 dB	180°±10°	39-2B
2450FB14K0001	2400 - 2500	50 / 28+j64	3.5 dB	9.5 dB	180°±10°	14-1A
2450FB14K0002	2400 - 2500	50 / 16+j40	3.0 dB	9.5 dB	180°±10°	15-2B
2450FB15A0050	2400 - 2500	50/50	1.5 dB	9.5 dB	180°±10°	15-1A
2450FB15K0002	2400 - 2500	50 / 16+j40	3.0 dB	9.5 dB	180°±10°	15-2B
2450FB15K0003	2400 - 2500	50 / 20+j50	3.0 dB	9.5 dB	180°±10°	15-2B
2450FB15K0004	2400 - 2500	50 / 28+j64	3.2 dB	9.5 dB	180°±10°	15-2B
2450FB15K0005	2400 - 2500	50 / 22+j64	3.5 dB	9.5 dB	180°±10°	15-2B
2450FB39A0050	2400 - 2500	50/50	2.0 dB	9.5 dB	180°±10°	39-2B
2450FB39B100	2400 - 2500	50/100	2.0 dB	9.5 dB	180°±10°	39-2A
2450FB39C100	2400 - 2500	50/100	3.0 dB	9.5 dB	180°± 8°	39-2B
2450FB39K001	2400 - 2500	50 / 22+j100	3.0 dB	9.5 dB	180°± 8°	39-2B
2595FB16A0100	2300 - 2690	50/100	2.5 dB	9.5 dB	180°± 10°	16-1*
2595FB39A0050	2500 - 2690	50/50	3.2 dB	9.5 dB	180°± 10°	39-2B
3500FB39A0050	3400 - 3600	50/50	2.9 dB	9.5 dB	180°± 12°	39-2B

* For specific case size and layout information please download the specification sheet(s) from our website

CERAMIC CHIP DIPLEXERS - LPF / BPF

Part Number	Frequency (MHz)	Attenuation Low Band	Attenuation High Band	Return Loss (min)	Case Size
2450DP15E5400	2400 - 2500 4900 - 5900	0.70 dB max. 20 dB min.	17 dB min. 1.60 dB max.	9.5 dB 9.5 dB	Case 15-1B# # (opposite pin outs)
2450DP15D5400	2400 - 2500 4900 - 5900	0.70 dB max. 20 dB min.	19 dB min. 1.40 dB max.	9.5 dB 9.5 dB	Case 15-1B#
2450DP15F5400	2400 - 2500 4900 - 5900	0.70 dB max 19 dB min.	19 dB min. 1.00 dB max.	9.5 dB 9.5 dB	Case 15-1D (Ultra Low Profile)

CERAMIC CHIP DIPLEXERS - OPTIMIZED FOR HARMONIC REJECTION

Part Number	Frequency (MHz)	Attenuation Low Band	Attenuation High Band	Return Loss (min)	Case Size
0892DP14B1850	824 - 960 1710 - 1990	0.60 dB max. 15 dB min.	20 dB min. 0.90 dB max.	9.5 dB 9.5 dB	Case 14-1
0892DP15B1850	824 - 960 1710 - 1990	2.5 dB max. 20 dB min.	17 dB min. 1.5 dB max.	9.5 dB 9.5 dB	Case 15-1D
1407DP15A2450	824 - 1990 2400 - 2500	1.5 dB max. 15 dB min.	20 dB min. 2.0 dB max.	9.5 dB 9.5 dB	Case 15-1A
2400DP39B5425	2400 - 2500 4900 - 5900	2.50 dB min. 20 dB max.	17 dB max. 1.50 dB min.	9.5 dB 9.5 dB	Case 39-3B

Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.

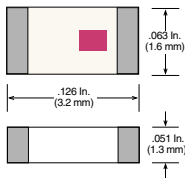
CERAMIC CHIP DIPLEXERS - LPF / HPF

Part Number	Frequency (MHz)	Attenuation Low Band	Attenuation High Band	Return Loss (min)	Case Size
0859DP18A1920_	824 - 894 1850 - 1990	0.55 dB max. 20 dB min.	20 dB min. 0.55 dB max.	12 dB 12 dB	18-1
0859DP18B1920	824 - 894 1850 - 1990	0.60 dB max. 20 dB min.	20 dB min. 0.65 dB max.	12 dB 12 dB	18-1
0892DP14A1850_	824 - 960 1710 - 1990	0.50 dB max. 15 dB min.	25 dB min. 0.80 dB max.	12 dB 12 dB	14-1A
0892DP14B1850_	824 - 960 1710 - 1990	0.60 dB max. 20 dB min.	15 dB min. 0.90 dB max.	9.5 dB 9.5 dB	14-1A
0892DP15B1850	824 - 960 1710 - 1990	1.30 dB max. 18 dB min.	16 dB min. 1.35 dB max.	9.5 dB 9.5 dB	14-1A
0892DP15B1940	824 - 960 1710 - 1990	1.30 dB max. 18 dB min.	16 dB min. 1.35 dB max.	9.5 dB 9.5 dB	14-1A
0892DP15D1940	824 - 960 1710 - 1990	0.70 dB max. 18 dB min.	16 dB min. 0.8 dB max.	9.5 dB 9.5 dB	15-1H
0920DP18A1795_	880 - 960 1710 - 1880	0.75 dB max. 20 dB min.	20 dB min. 0.55 dB max.	12 dB 12 dB	18-1
0967DP18A1795_	954 - 980 1710 - 1880	0.75 dB max. 20 dB min.	20 dB min. 0.55 dB max.	12 dB 12 dB	18-1
1407DP15A2450	824 - 960 2400 - 2500	1.5 max. 20 dB min.	15 dB min. 2.0 dB max.	9.5 dB 9.5 dB	15-1A
2400DP39A5425	2400 - 2500 4900 - 5950	1.80 dB max. 20 dB min.	20 dB min. 1.50 dB max.	9.5 dB 9.5 dB	39-3B
2400DP39B5425	2300 - 2500 4900 - 5950	2.50 dB max. 20 dB min.	20 dB min. 1.50 dB max.	9.5 dB 9.5 dB	39-3C
2450DP15A5512	2400 - 2500 5150 - 5875	0.70 dB max. 20 dB min.	15 dB min. 0.90 dB max.	9.5 dB 9.5 dB	15-2A*
2450DP15B5512	2400 - 2500 5150 - 5875	0.70 dB max. 20 dB min.	15 dB min. 0.90 dB max.	9.5 dB 9.5 dB	15-2A* * (opposite pin outs)
2450DP15D5400	2400 - 2500 4900 - 5900	0.70 dB max 20 dB min	19 dB min 1.4 dB max	9.5 dB 9.5 dB	15-1B
2450DP15E5400	2400 - 2500 4900 - 5900	0.70 dB max 20 dB min	17 dB min 1.6 dB max	9.5 dB 9.5 dB	15-1B#
2450DP15F5400	2400 - 2500 4900 - 5900	0.70 dB max 19 dB min	19 dB min 1.4 dB max	9.5 dB 9.5 dB	15-1D^
2450DP15G5400	2400 - 2500 4900 - 5900	0.70 dB max 19 dB min	18 dB min 1.0 dB max	9.5 dB 9.5 dB	15-1G

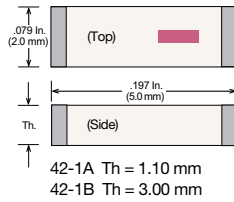
Basic case size drawings for above part numbers are located on pages 35-36.

Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.

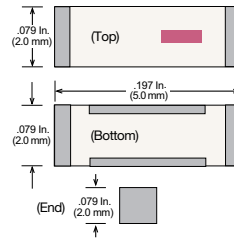
Case 18-4



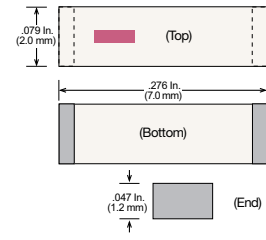
Case 42-1



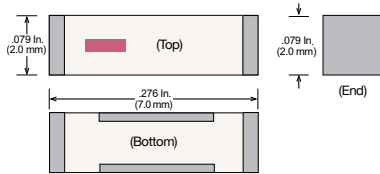
Case 42-2



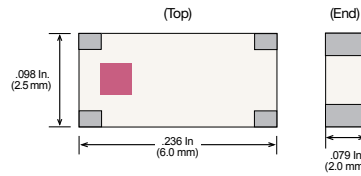
Case 43-1



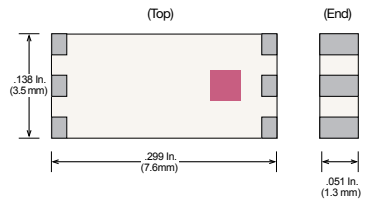
Case 43-2



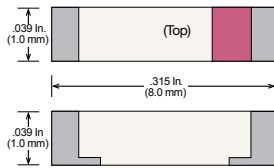
Case 43-3



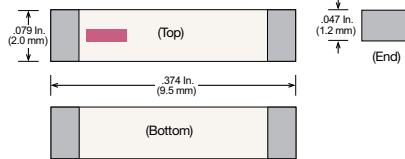
Case 44-1



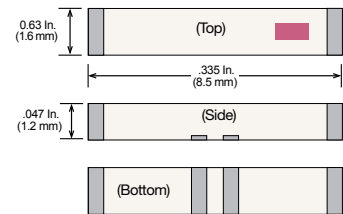
Case 44-2



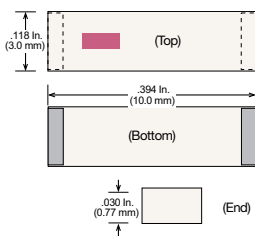
Case 45-1



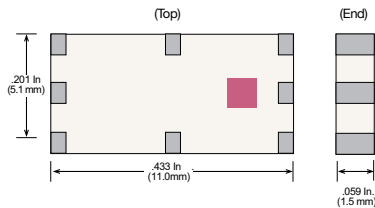
Case 46-1



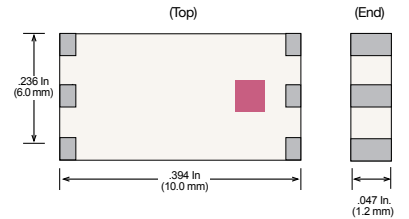
Case 47-1



Case 50

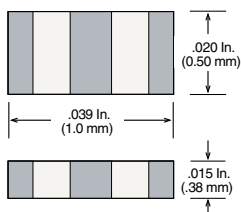


Case 51-1

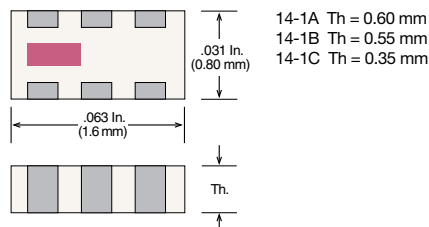


IPC EXCEPT ANTENNA

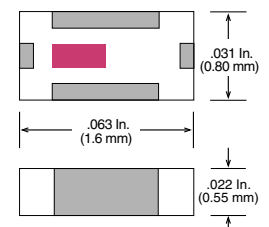
Case 07-1 (EIA 0402/ 1005)



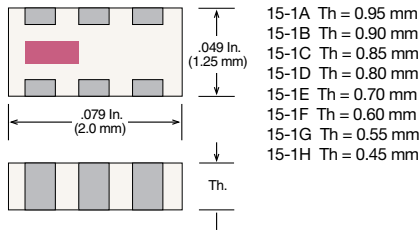
Case 14-1 (EIA 0603/ 1608)



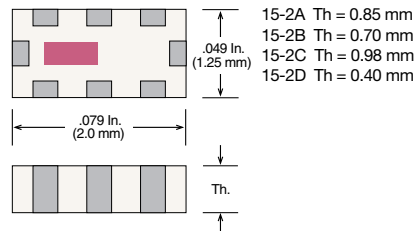
Case 14-2



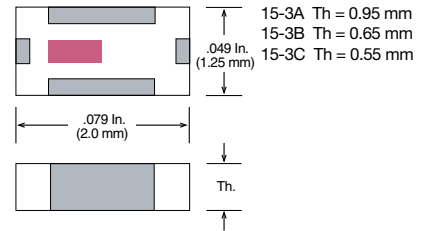
Case 15-1 (EIA 0805 / 2012)



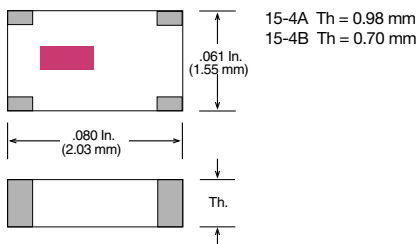
Case 15-2 (EIA 0805 / 2012)



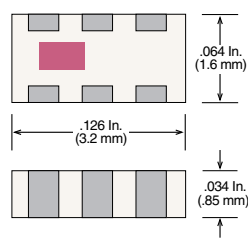
Case 15-3 (EIA 0805 / 2012)



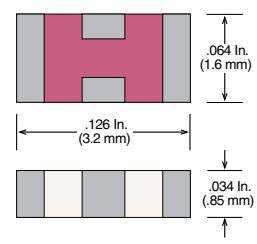
Case 15-4 (EIA 0805 / 2012)



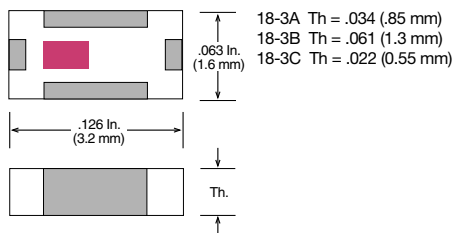
Case 18-1 (EIA 1206 / 3216)



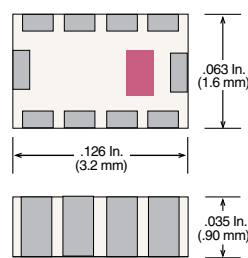
Case 18-2 (EIA 1206 / 3216)



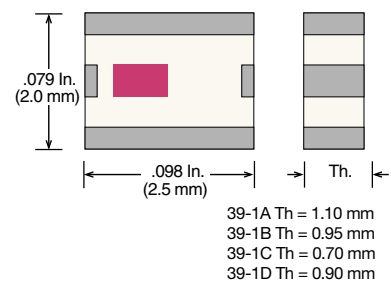
Case 18-3 (EIA 1206 / 3216)



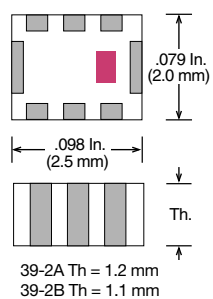
Case 18-4 (EIA 1206 / 3216)



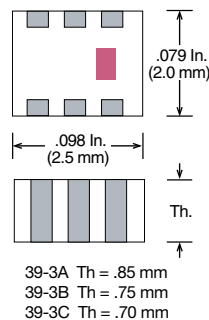
Case 39-1 (2520)



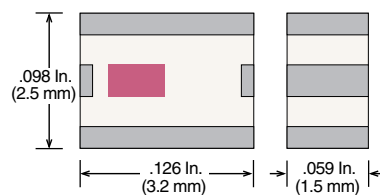
Case 39-2 (2025)



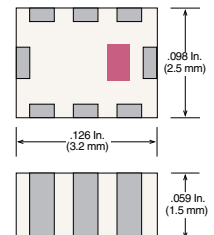
Case 39-3 (2025)



Case 41-1 (EIA 1210 / 3225)



Case 41-2 (EIA 1210 / 3225)



Detailed specifications and performance curves for the RF Ceramic Component line are located on our website.