Thin Film Directional Coupler

CP0402P High Directivity, Tight Coupling Tolerance

GENERAL DESCRIPTION

ITF (Integrated Thin-Film) TECHNOLOGY

The CP0402P Series High Directivity, Tight Coupling Tolerance LGA Coupler is based on the proprietary RFAP Thin-Film multilayer technology. The technology provides a miniature part with excellent high frequency performance and ugged construction for reliable automatic assembly.

The ITF Coupler is offered in a variety of frequency bands compatible with various types of high frequency wireless systems.

APPLICATIONS

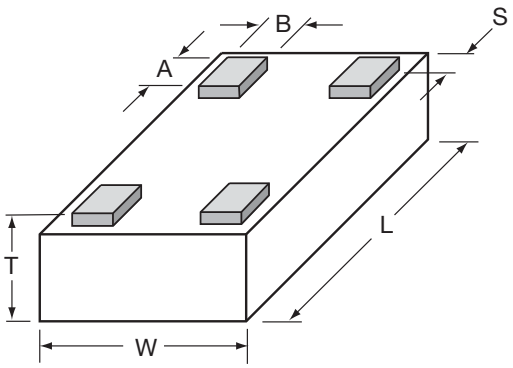
- Wireless communications
- Wireless LAN's
- GPS
- WiMAX

LAND GRID ARRAY ADVANTAGES

- Inherent Low Profile
- Self Alignment during Reflow
- Excellent Solderability
- Low Parasitics
- Better Heat Dissipation

DIMENSIONS: (Bottom View)

millimeters (inches)



L	1.00±0.05 (0.040±0.002)
W	0.58±0.04 (0.023±0.002)
T	0.35±0.05 (0.014±0.002)

A	0.20±0.05 (0.008±0.002)
B	0.18±0.05 (0.007±0.002)
S	0.05±0.05 (0.002±0.002)

HOW TO ORDER

CP	0402	P	XXXX	X	N	TR
Style	**Size** 0402	**Type** ±0.5dB Tight Tolerance	**Frequency** MHz	**Sub-Type**	**Termination** LGA Lead-Free	**Taped & Reeled**

QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

- Static Humidity: 85°C, 85% RH, 160 hours
- Endurance: 125°C, I_R, 4 hours

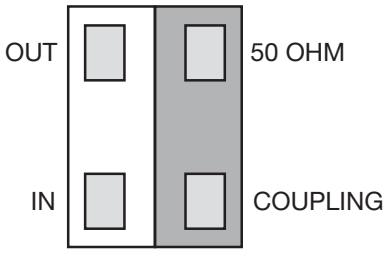
TERMINATION

Nickel/Lead-Free Solder coating compatible with automatic soldering technologies: reflow, wave soldering, vapor phase and manual.

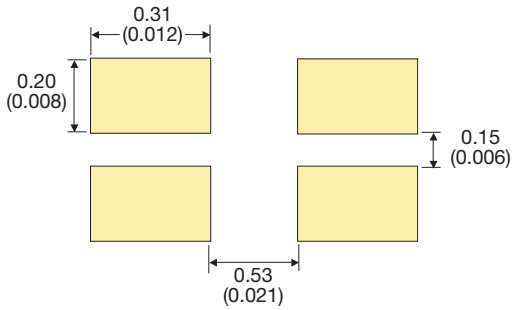
OPERATING TEMPERATURE:

-40°C to +85°C

TERMINALS (Top View)



Recommended Pad Layout Dimensions mm (inches)



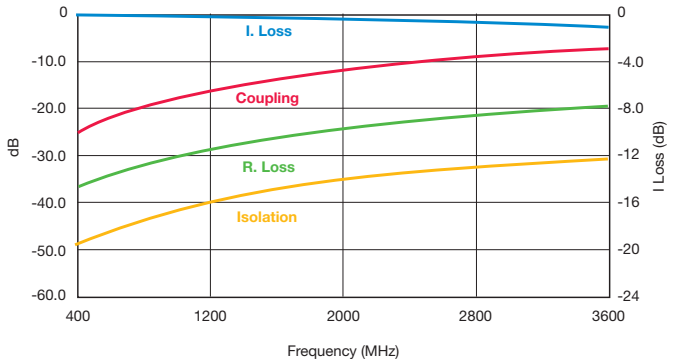
Thin Film Directional Coupler

CP0402P High Directivity, Tight Coupling Tolerance

Coupler P/N CP0402PxxxxANTR

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0402P0836AN	824 - 849	19.10±0.5	0.25	32	
	CP0402P0881AN	869 - 894	18.60±0.5	0.25	31	
GSM	CP0402P0902AN	890 - 915	18.50±0.5	0.25	31	
	CP0402P0947AN	935 - 960	18.00±0.5	0.25	31	
E-GSM	CP0402P0897AN	880 - 915	18.50±0.5	0.25	31	
	CP0402P0942AN	925 - 960	18.00±0.5	0.25	31	
PDC	CP0402P1441AN	1429 - 1453	14.50±0.5	0.40	28	
PCN	CP0402P1747AN	1710 - 1785	13.00±0.5	0.50	26	21
	CP0402P1842AN	1805 - 1880	12.50±0.5	0.50	26	
PCS	CP0402P1880AN	1850 - 1910	12.30±0.5	0.50	25	
	CP0402P1960AN	1930 - 1990	12.00±0.5	0.50	25	
PHP	CP0402P1907AN	1895 - 1920	12.30±0.5	0.50	25	
WCDMA	CP0402P1950AN	1920 - 1980	12.00±0.5	0.50	25	
	CP0402P2140AN	2110 - 2170	11.00±0.5	0.60	25	
DECT	CP0402P1890AN	1880 - 1900	12.30±0.5	0.50	25	
Wireless LAN	CP0402P2442AN	2400 - 2484	10.30±0.5	0.70	23	
WLL	CP0402P3500AN	3400 - 3600	7.50±0.5	1.30	20	19

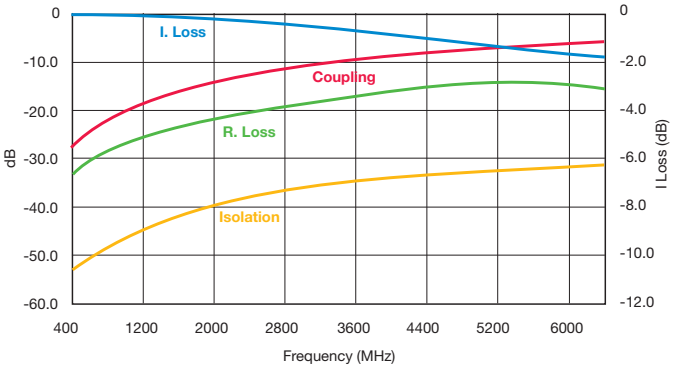
CP0402PxxxxANTR



Coupler P/N CP0402PxxxxBNTR

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0402P0836BN	824 - 849	22.00±0.5	0.20	28	
	CP0402P0881BN	869 - 894	21.70±0.5	0.20	28	
GSM	CP0402P0902BN	890 - 915	21.50±0.5	0.20	28	
	CP0402P0947BN	935 - 960	21.00±0.5	0.25	27	
E-GSM	CP0402P0897BN	880 - 915	21.50±0.5	0.20	28	
	CP0402P0942BN	925 - 960	21.00±0.5	0.25	27	
PDC	CP0402P1441BN	1429 - 1453	17.50±0.5	0.25	24	
PCN	CP0402P1747BN	1710 - 1785	16.00±0.5	0.30	23	27
	CP0402P1842BN	1805 - 1880	15.50±0.5	0.35	23	
PCS	CP0402P1880BN	1850 - 1910	15.50±0.5	0.35	23	
	CP0402P1960BN	1930 - 1990	15.00±0.5	0.35	22	
PHP	CP0402P1907BN	1895 - 1920	15.50±0.5	0.35	23	
WCDMA	CP0402P1950BN	1920 - 1980	15.00±0.5	0.35	23	
	CP0402P2140BN	2110 - 2170	14.00±0.5	0.40	23	
DECT	CP0402P1890BN	1880 - 1900	15.50±0.5	0.35	23	
Wireless LAN	CP0402P2442BN	2400 - 2484	13.30±0.5	0.40	21	
WLL	CP0402P3500BN	3400 - 3600	9.50±0.5	0.80	17	22

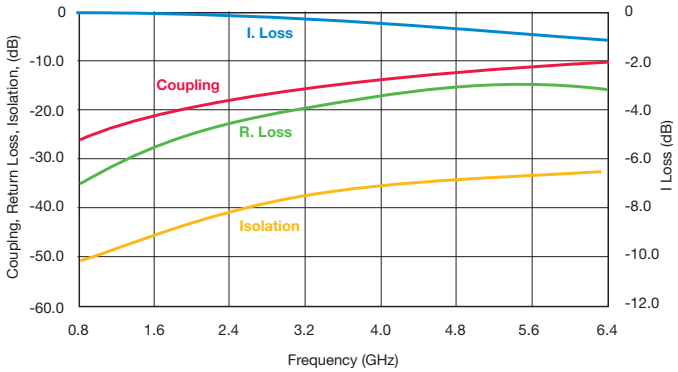
CP0402PxxxxBNTR



Coupler P/N CP0402PxxxxENTR

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0402P0836EN	824 - 849	27.20±0.5	0.20	35	
	CP0402P0881EN	869 - 894	26.80±0.5	0.20	34	
GSM	CP0402P0902EN	890 - 915	26.50±0.5	0.20	34	
	CP0402P0947EN	935 - 960	26.00±0.5	0.20	34	25
E-GSM	CP0402P0897EN	880 - 915	26.50±0.5	0.20	34	
	CP0402P0942EN	925 - 960	26.00±0.5	0.20	34	
PDC	CP0402P1441EN	1429 - 1453	22.30±0.5	0.25	29	
PCN	CP0402P1747EN	1710 - 1785	20.50±0.5	0.25	27	
	CP0402P1842EN	1805 - 1880	20.30±0.5	0.25	26	
PCS	CP0402P1880EN	1850 - 1910	20.00±0.5	0.25	26	
	CP0402P1960EN	1930 - 1990	20.00±0.5	0.25	26	
PHP	CP0402P1907EN	1895 - 1920	20.00±0.5	0.25	26	23
WCDMA	CP0402P1950EN	1920 - 1980	20.00±0.5	0.25	26	
	CP0402P2140EN	2110 - 2170	18.80±0.5	0.30	26	
DECT	CP0402P1890EN	1880 - 1900	20.00±0.5	0.25	26	
Wireless LAN	CP0402P2442EN	2400 - 2484	18.00±0.5	0.35	23	
WLL	CP0402P3500EN	3400 - 3600	15.00±0.5	0.40	18	17

CP0402PxxxxENTR



Thin-Film Directional Couplers

CP0402 / CP0603 High Directivity Couplers Test Jigs

GENERAL DESCRIPTION

These jigs are designed for testing the CP0402 and CP0603 High Directivity Couplers using a Vector Network Analyzer.

They consist of a dielectric substrate, having 50Ω microstrips as conducting lines and a bottom ground plane located at a distance of 0.254mm (0.010") from the microstrips.

The substrate used is Neltec's NH9338ST0254C1BC.

The connectors are SMA type (female), 'Johnson Components Inc.' Product P/N: 142-0701-841.

Both a measurement jig and a calibration jig are provided.

The calibration jig is designed for a full 2-port calibration, and consists of an open line, short line and through line. LOAD calibration can be done by a 50Ω SMA termination.

MEASUREMENT PROCEDURE

When measuring a component, it can be either soldered or pressed using a non-metallic stick until all four ports touch the appropriate pads. Set the VNA to the relevant frequency band. Connect the VNA using a 10dB attenuator on the jig terminal connected to port 2. Follow the VNA's instruction manual and use the calibration jig to perform a full 2-Port calibration in the required bandwidths.

Place the coupler on the measurement jig as follows:

Input (Coupler) ➜ Connector 1 (Jig) Termination (Coupler) ➜ Connector 3 (Jig)
Output (Coupler) ➜ Connector 2 (Jig) Coupling (Coupler) ➜ Connector 4 (Jig)

To measure I. Loss connect:

Connector 1 (Jig) ➜ Port 1 (VNA) Connector 3 (Jig) ➜ 50Ω
Connector 2 (Jig) ➜ Port 2 (VNA) Connector 4 (Jig) ➜ 50Ω

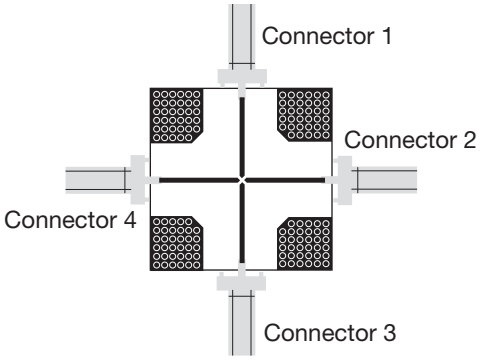
To measure R. Loss and Coupling connect:

Connector 1 (Jig) ➜ Port 1 (VNA) Connector 3 (Jig) ➜ 50Ω
Connector 2 (Jig) ➜ 50Ω Connector 4 (Jig) ➜ Port 2 (VNA)

To measure Isolation connect:

Connector 1 (Jig) ➜ 50Ω Connector 3 (Jig) ➜ 50Ω
Connector 2 (Jig) ➜ Port 1 (VNA) Connector 4 (Jig) ➜ Port 2 (VNA)

Measurement Jig



Calibration Jig