Thin-Film Directional Couplers

CP0603 High Directivity LGA Termination

3

GENERAL DESCRIPTION
ITF (Integrated Thin-Film) TECHNOLOGY

The ITF LGA Coupler is based on thin-film multilayer technology. The technology provides a miniature part with excellent high frequency performance and rugged 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

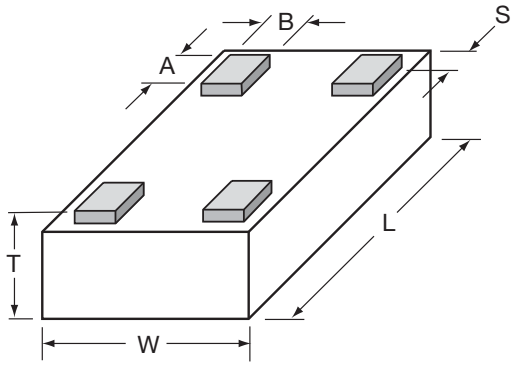
- Mobile Communications
- Satellite TV Receivers
- GPS
- Vehicle Location Systems
- Wireless LAN's

FEATURES

- Inherent Low Profile
- Self Alignment during Reflow
- Excellent Solderability
- Low Parasitics
- Better Heat Dissipation
- Operating/Storage Temp -40°C to +85°C
- Power Rating 3W RF Cont

DIMENSIONS: (Bottom View)

millimeters (inches)



L	1.60±0.10 (0.063±0.004)
W	0.84±0.10 (0.033±0.004)
T	0.60±0.10 (0.024±0.004)

A	0.25±0.05 (0.010±0.002)
B	0.20±0.05 (0.008±0.002)
S	0.05±0.05 (0.002±0.002)

HOW TO ORDER

CP	0603	X	****	X	N	TR
Style Directional Coupler	**Size** 0603	**Type**	**Frequency** (MHz)	**Sub Type**	**Termination Code** L = LGA Sn90, Pb10 **N = LGA Sn100	**Packaging Code** TR = Tape and Reel

**RoHS Compliant

QUALITY INSPECTION

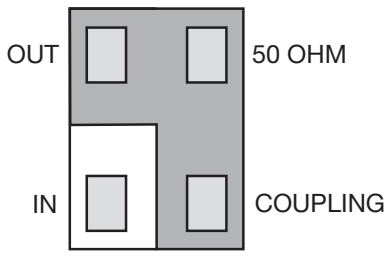
Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

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

TERMINATION

Sn90Pb10 or Lead-Free Sn100 Nickel/Solder coating compatible with automatic soldering technologies: reflow, wave soldering, vapor phase and manual.

TERMINALS (Top View)

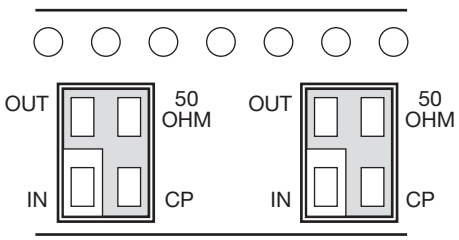


RoHS COMPLIANT

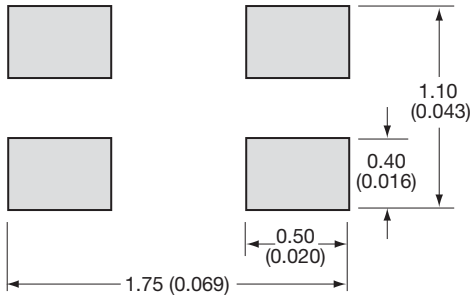
Pb: Free

Please select correct termination style

ORIENTATION IN TAPE



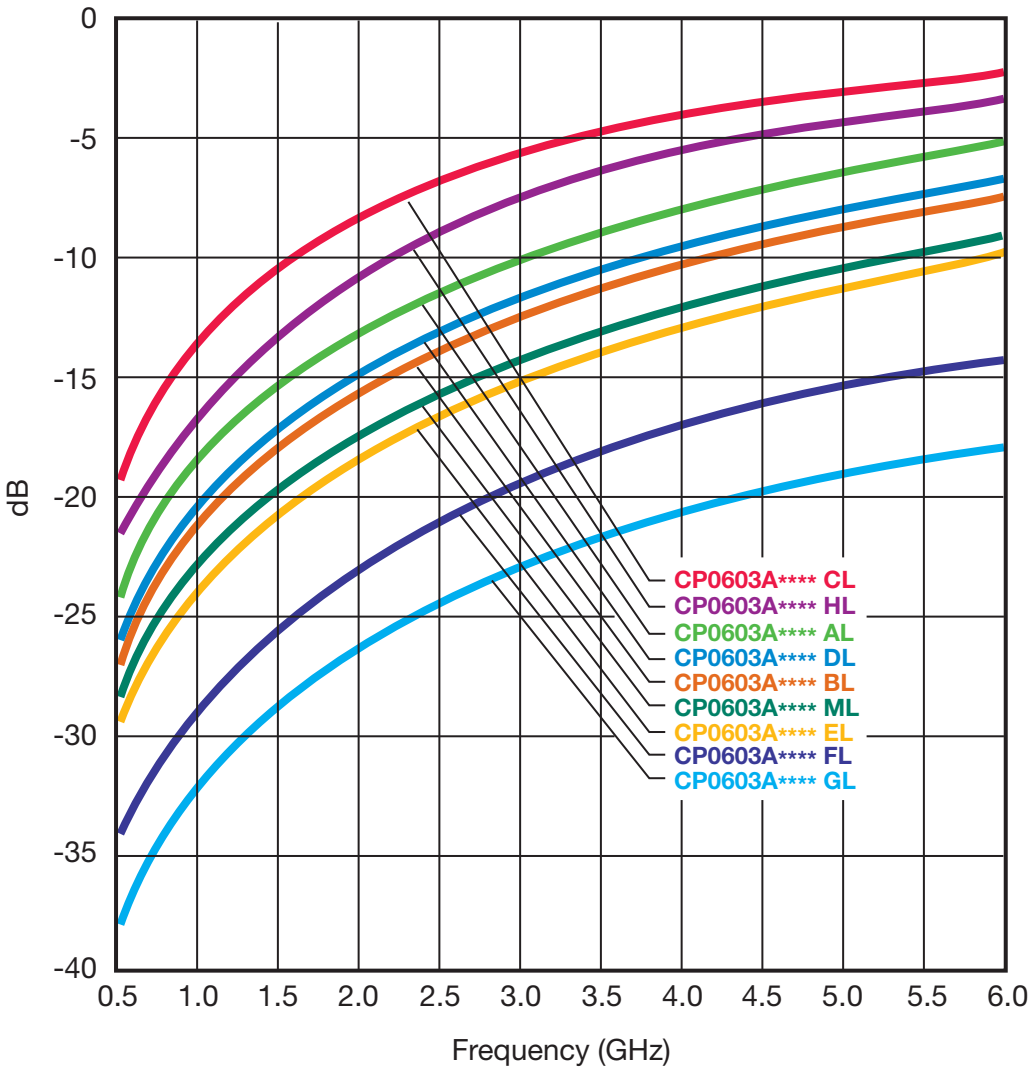
Recommended Pad Layout Dimensions mm (inches)



*The recommended distance to the PCB Ground Plane is 0.254mm (0.010")

COUPLER TYPE SELECTION GRAPH

Coupling vs. Frequency



Intermediate coupling factors are readily available.
Please contact factory.

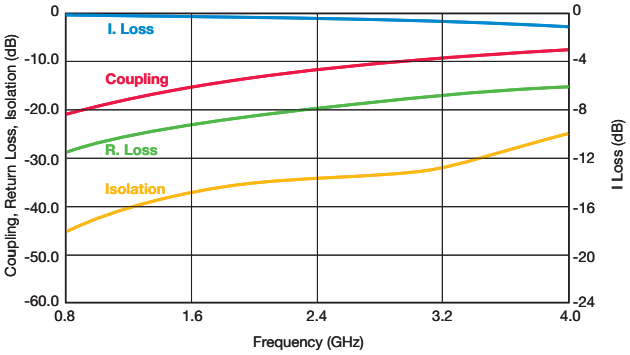
Thin-Film Directional Couplers

CP0603 High Directivity LGA Type

Coupler P/N CP0603AxxxxAL

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836AL	824 - 849	20.0	0.25	28	22
	CP0603A0881AL	869 - 894	19.7			
GSM	CP0603A0902AL	890 - 915	19.4		27	
	CP0603A0947AL	935 - 960	19.0			
E-GSM	CP0603A0897AL	880 - 915	19.4		28	
	CP0603A0942AL	925 - 960	19.0		27	
PDC	CP0603A1441AL	1429 - 1453	15.5	0.40	24	
PCN	CP0603A1747AL	1710 - 1785	14.0	0.50	22	
	CP0603A1842AL	1805 - 1880	13.5			
PCS	CP0603A1880AL	1850 - 1910	13.2			
	CP0603A1960AL	1930 - 1990	13.0	0.55	21	
PHP	CP0603A1907AL	1895 - 1920	13.2	0.50	22	
DECT	CP0603A1890AL	1880 - 1900				
Wireless LAN	CP0603A2442AL	2400 - 2484	11.5	0.75	20	

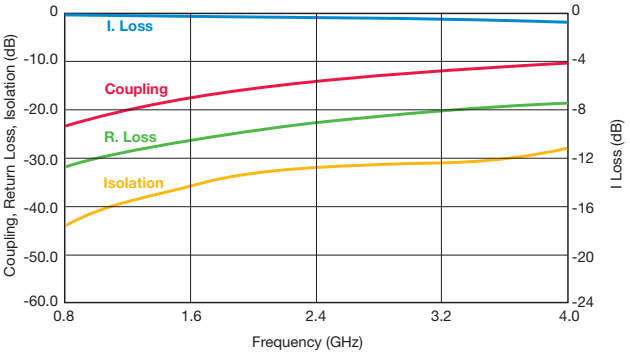
CP0603AxxxxALTR



Coupler P/N CP0603AxxxxBL

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836BL	824 - 849	23.0	0.20	31	20
	CP0603A0881BL	869 - 894	22.7			
GSM	CP0603A0902BL	890 - 915	22.5			
	CP0603A0947BL	935 - 960	22.0		30	
E-GSM	CP0603A0897BL	880 - 915	22.5		31	
	CP0603A0942BL	925 - 960	22.0		30	
PDC	CP0603A1441BL	1429 - 1453	18.5	0.25	27	
PCN	CP0603A1747BL	1710 - 1785	17.0		25	
	CP0603A1842BL	1805 - 1880	16.4			
PCS	CP0603A1880BL	1850 - 1910	16.2			
	CP0603A1960BL	1930 - 1990	16.0		24	
PHP	CP0603A1907BL	1895 - 1920	16.1		25	
DECT	CP0603A1890BL	1880 - 1900	16.2			
Wireless LAN	CP0603A2442BL	2400 - 2484	14.2	0.35	23	

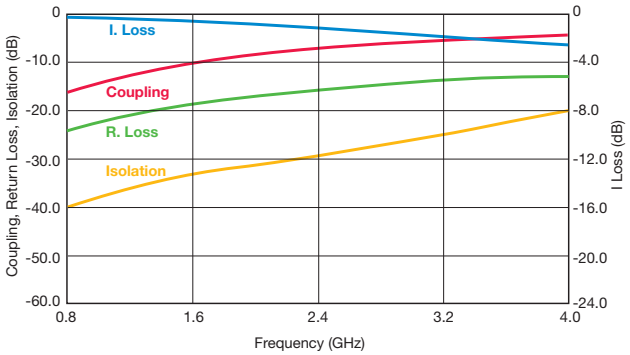
CP0603AxxxxBLTR



Coupler P/N CP0603AxxxxCL

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836CL	824 - 849	15.2	0.35	23	23
	CP0603A0881CL	869 - 894	15.0			
GSM	CP0603A0902CL	890 - 915	14.7			
	CP0603A0947CL	935 - 960	14.3	0.40	22	
E-GSM	CP0603A0897CL	880 - 915	14.7	0.35	23	
	CP0603A0942CL	925 - 960	14.3	0.40	22	
PDC	CP0603A1441CL	1429 - 1453	11.0	0.70	19	
PCN	CP0603A1747CL	1710 - 1785	9.5	0.80	18	21
	CP0603A1842CL	1805 - 1880	9.0	0.90	17	
PCS	CP0603A1880CL	1850 - 1910	8.8			
	CP0603A1960CL	1930 - 1990	8.5	1.00		
PHP	CP0603A1907CL	1895 - 1920	8.8	0.90		
DECT	CP0603A1890CL	1880 - 1900				
Wireless LAN	CP0603A2442CL	2400 - 2484	7.0	1.40	15	

CP0603AxxxxCLTR



Important: Couplers can be used at any frequency within the indicated range.

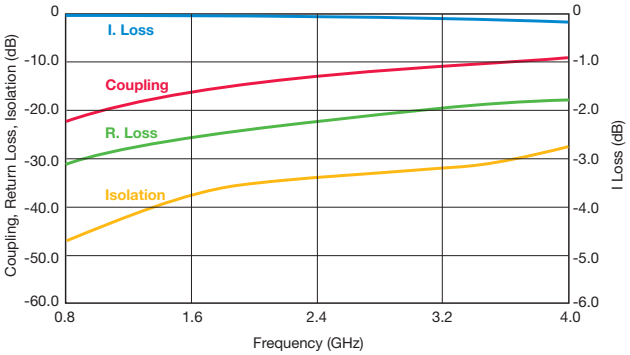
Thin-Film Directional Couplers

CP0603 High Directivity LGA Type

Coupler P/N CP0603AxxxxDL

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836DL	824 - 849	22.0	0.25	31	22
	CP0603A0881DL	869 - 894	21.8		30	
GSM	CP0603A0902DL	890 - 915	21.3			
	CP0603A0947DL	935 - 960	21.0	0.30		
E-GSM	CP0603A0897DL	880 - 915	21.3	0.25		
	CP0603A0942DL	925 - 960	21.0	0.30		
PDC	CP0603A1441DL	1429 - 1453	17.7	0.40	27	21
PCN	CP0603A1747DL	1710 - 1785	16.0		25	
	CP0603A1842DL	1805 - 1880	15.4			
PCS	CP0603A1880DL	1850 - 1910	15.2		24	
	CP0603A1960DL	1930 - 1990	15.0			
PHP	CP0603A1907DL	1895 - 1920	15.2			
DECT	CP0603A1890DL	1880 - 1900				
Wireless LAN	CP0603A2442DL	2400 - 2484	13.3	0.55	22	

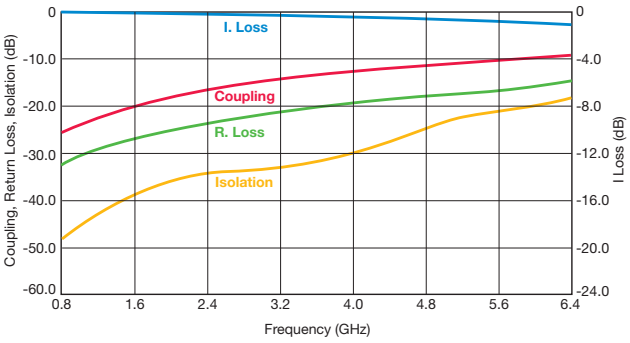
CP0603AxxxxDLTR



Coupler P/N CP0603AxxxxEL

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836EL	824 - 849	25.8	0.20	32	21
	CP0603A0881EL	869 - 894	25.3			
GSM	CP0603A0902EL	890 - 915	25.0			
	CP0603A0947EL	935 - 960	24.7		31	
E-GSM	CP0603A0897EL	880 - 915	25.0		32	
	CP0603A0942EL	925 - 960	24.7		31	
PDC	CP0603A1441EL	1429 - 1453	21.0	0.25	28	
PCN	CP0603A1747EL	1710 - 1785	19.5	0.30	26	
	CP0603A1842EL	1805 - 1880	19.0			
PCS	CP0603A1880EL	1850 - 1910	18.8			
	CP0603A1960EL	1930 - 1990	18.5			
PHP	CP0603A1907EL	1895 - 1920	18.7			
DECT	CP0603A1890EL	1880 - 1900	18.8			
Wireless LAN	CP0603A2442EL	2400 - 2484	17.0	0.40	24	

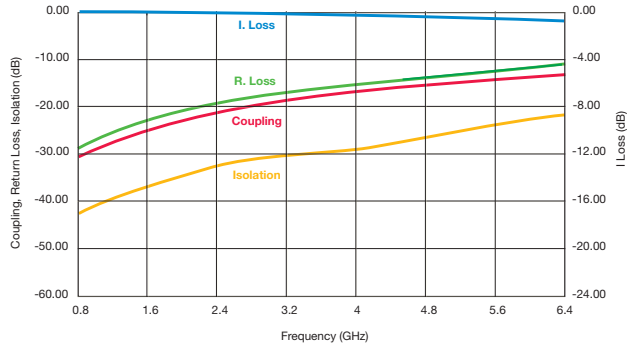
CP0603AxxxxELTR



Coupler P/N CP0603AxxxxFL

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836FL	824 - 849	31.2	0.20	28	12
	CP0603A0881FL	869 - 894	30.8			
GSM	CP0603A0902FL	890 - 915	30.5		27	
	CP0603A0947FL	935 - 960	30.2			
E-GSM	CP0603A0897FL	880 - 915	30.5			
	CP0603A0942FL	925 - 960	30.2			
PDC	CP0603A1441FL	1429 - 1453	27.0	0.25	23	
PCN	CP0603A1747FL	1710 - 1785	25.0		21	
	CP0603A1842FL	1805 - 1880	24.5			
PCS	CP0603A1880FL	1850 - 1910	24.3			
	CP0603A1960FL	1930 - 1990	24.0		20	
PHP	CP0603A1907FL	1895 - 1920	24.2		21	
DECT	CP0603A1890FL	1880 - 1900				
Wireless LAN	CP0603A2442FL	2400 - 2484	21.5		20	

CP0603AxxxxFLTR



Important: Couplers can be used at any frequency within the indicated range.

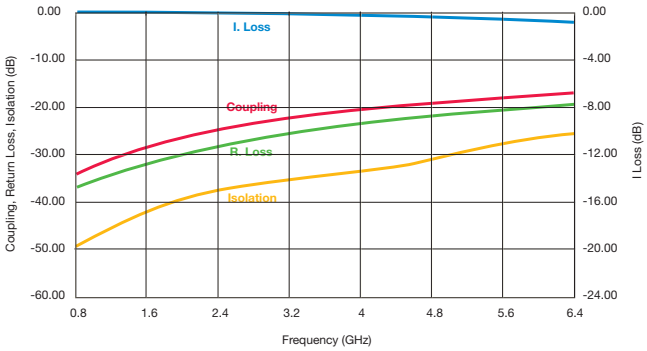
Thin-Film Directional Couplers

CP0603 High Directivity LGA Type

Coupler P/N CP0603AxxxxGL

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836GL	824 - 849	34.2	0.20	39	13
	CP0603A0881GL	869 - 894	33.8			
GSM	CP0603A0902GL	890 - 915	33.6			
	CP0603A0947GL	935 - 960	33.2		38	
E-GSM	CP0603A0897GL	880 - 915	33.6		39	
	CP0603A0942GL	925 - 960	33.2		38	
PDC	CP0603A1441GL	1429 - 1453	30.0	0.25	34	
PCN	CP0603A1747GL	1710 - 1785	28.5		32	
	CP0603A1842GL	1805 - 1880	28.0			
PCS	CP0603A1880GL	1850 - 1910	27.7			
	CP0603A1960GL	1930 - 1990	27.5		31	
PHP	CP0603A1907GL	1895 - 1920	27.6		32	
DECT	CP0603A1890GL	1880 - 1900	27.7			
Wireless LAN	CP0603A2442GL	2400 - 2484	25.5		31	

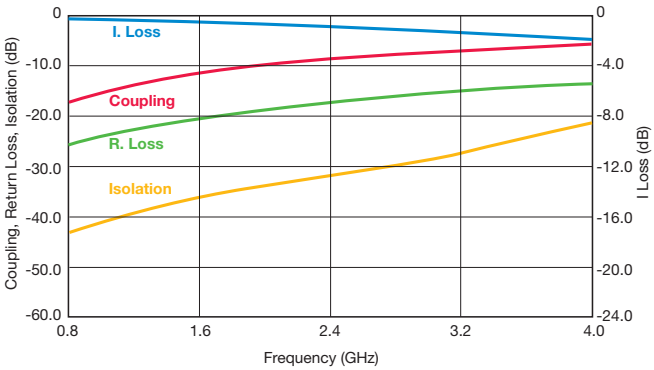
CP0603AxxxxGLTR



Coupler P/N CP0603AxxxxHL

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836HL	824 - 849	17.3	0.30	26	26
	CP0603A0881HL	869 - 894	17.0		25	
GSM	CP0603A0902HL	890 - 915	16.7			
	CP0603A0947HL	935 - 960	16.3	0.35		
E-GSM	CP0603A0897HL	880 - 915	17.0			
	CP0603A0942HL	925 - 960	16.3			
PDC	CP0603A1441HL	1429 - 1453	13.0	0.55	22	
PCN	CP0603A1747HL	1710 - 1785	11.4	0.75	20	24
	CP0603A1842HL	1805 - 1880	11.0		19	
PCS	CP0603A1880HL	1850 - 1910	10.8			
	CP0603A1960HL	1930 - 1990	10.5			
PHP	CP0603A1907HL	1895 - 1920	10.7			
DECT	CP0603A1890HL	1880 - 1900	10.8			
Wireless LAN	CP0603A2442HL	2400 - 2484	8.8	1.00	17	

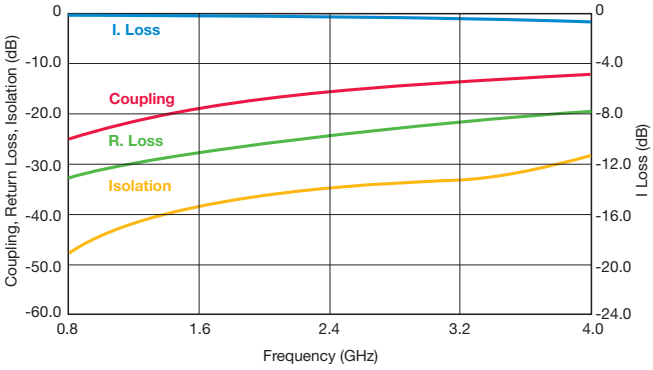
CP0603AxxxxHLTR



Coupler P/N CP0603AxxxxML

Application	P/N Examples	Frequency Band [MHz]	Coupling [dB]	I. Loss max. [dB]	Return Loss [dB]	Directivity [dB]
AMPS	CP0603A0836ML	824 - 849	24.2	0.20	33	23
	CP0603A0881ML	869 - 894	23.8		32	
GSM	CP0603A0902ML	890 - 915	23.4			
	CP0603A0947ML	935 - 960	23.2			
E-GSM	CP0603A0897ML	880 - 915	23.4			
	CP0603A0942ML	925 - 960	23.2			
PDC	CP0603A1441ML	1429 - 1453	20.0	0.25	28	20
PCN	CP0603A1747ML	1710 - 1785	18.4		27	
	CP0603A1842ML	1805 - 1880	18.0		26	
PCS	CP0603A1880ML	1850 - 1910	17.8			
	CP0603A1960ML	1930 - 1990	17.5			
PHP	CP0603A1907ML	1895 - 1920	17.7			
DECT	CP0603A1890ML	1880 - 1900	17.8			
Wireless LAN	CP0603A2442ML	2400 - 2484	15.6	0.35	24	

CP0603AxxxxMLTR



Important: Couplers can be used at any frequency within the indicated range.

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

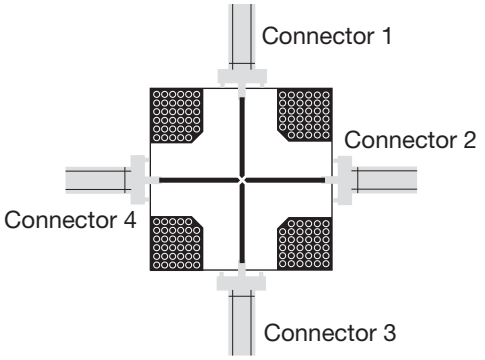
To measure R. Loss and Coupling connect:

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