

# Thin-Film Directional Couplers



## CP0603 High Directivity LGA Termination

### 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<br>(0.063±0.004) |
| W | 0.84±0.10<br>(0.033±0.004) |
| T | 0.60±0.10<br>(0.024±0.004) |

|   |                            |
|---|----------------------------|
| A | 0.25±0.05<br>(0.010±0.002) |
| B | 0.20±0.05<br>(0.008±0.002) |
| S | 0.05±0.05<br>(0.002±0.002) |

### HOW TO ORDER

|                                                       |                                         |                              |                                               |                                  |                                                                                   |                                                               |
|-------------------------------------------------------|-----------------------------------------|------------------------------|-----------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>CP</b><br>T<br><b>Style</b><br>Directional Coupler | <b>0603</b><br>T<br><b>Size</b><br>0603 | <b>X</b><br>T<br><b>Type</b> | <b>****</b><br>T<br><b>Frequency</b><br>(MHz) | <b>X</b><br>T<br><b>Sub Type</b> | <b>N</b><br>T<br><b>Termination Code</b><br>L = LGA Sn90, Pb10<br>**N = LGA Sn100 | <b>TR</b><br>T<br><b>Packaging Code</b><br>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<sub>R</sub>, 4 hours

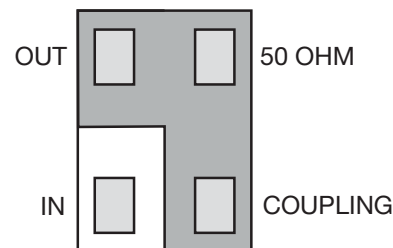
### TERMINATION

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

### ORIENTATION IN TAPE



### TERMINALS (Top View)



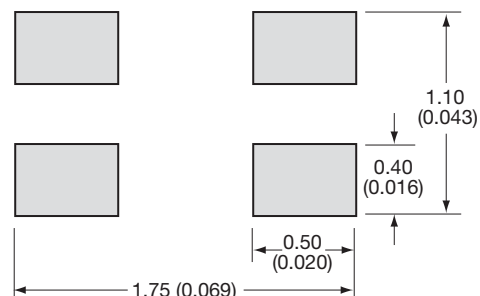
Not RoHS Compliant



For RoHS compliant products, please select correct termination style.

### Recommended Pad Layout Dimensions

mm (inches)



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

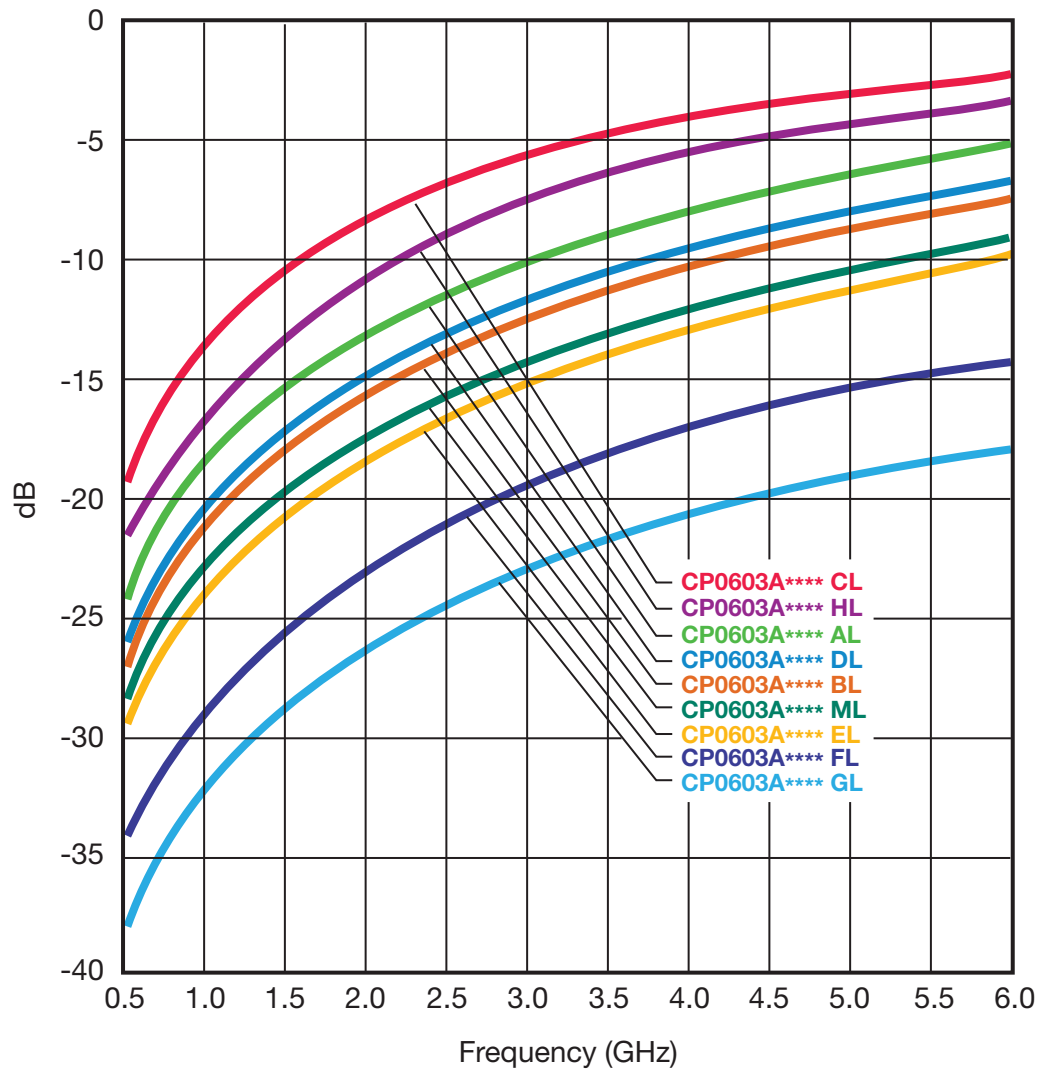
# Thin-Film Directional Couplers



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### 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          |                   |                  |                  |
|              | CP0603A0947AL | 935 - 960            | 19.0          |                   |                  |                  |
| E-GSM        | CP0603A0897AL | 880 - 915            | 19.4          |                   | 27               |                  |
|              | CP0603A0942AL | 925 - 960            | 19.0          |                   |                  |                  |
| 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          | 0.55              | 21               |                  |
|              | CP0603A1960AL | 1930 - 1990          | 13.0          |                   |                  |                  |
| 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          |                   |                  |                  |      |      |
| E-GSM       | CP0603A0897BL | 880 - 915            | 22.5          | 0.25              | 30               |                  |      |      |
|             | CP0603A0942BL | 925 - 960            | 22.0          |                   |                  |                  |      |      |
| PDC         | CP0603A1441BL | 1429 - 1453          | 18.5          |                   |                  |                  | 0.25 | 27   |
| PCN         | CP0603A1747BL | 1710 - 1785          | 17.0          |                   |                  |                  |      |      |
|             | CP0603A1842BL | 1805 - 1880          | 16.4          |                   |                  |                  |      |      |
| PCS         | CP0603A1880BL | 1850 - 1910          | 16.2          |                   |                  |                  |      |      |
|             | CP0603A1960BL | 1930 - 1990          | 16.0          | 25                |                  |                  |      |      |
| PHP         | CP0603A1907BL | 1895 - 1920          | 16.1          |                   |                  |                  |      |      |
| DECT        | CP0603A1890BL | 1880 - 1900          | 16.2          |                   |                  |                  |      |      |
|             | Wireless LAN  | CP0603A2442BL        | 2400 - 2484   |                   | 14.2             |                  |      | 0.35 |

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          | 0.40              | 22               |                  |
|              | CP0603A0947CL | 935 - 960            | 14.3          |                   |                  |                  |
| E-GSM        | CP0603A0897CL | 880 - 915            | 14.7          | 0.35              | 23               |                  |
|              | CP0603A0942CL | 925 - 960            | 14.3          |                   |                  |                  |
| PDC          | CP0603A1441CL | 1429 - 1453          | 11.0          | 0.70              | 19               |                  |
| PCN          | CP0603A1747CL | 1710 - 1785          | 9.5           | 0.80              | 18               |                  |
|              | CP0603A1842CL | 1805 - 1880          | 9.0           | 0.90              | 17               |                  |
| PCS          | CP0603A1880CL | 1850 - 1910          | 8.8           |                   |                  | 1.00             |
|              | CP0603A1960CL | 1930 - 1990          | 8.5           |                   |                  |                  |
| PHP          | CP0603A1907CL | 1895 - 1920          | 8.8           | 0.90              | 17               |                  |
| 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          |                   |                  |                  |
| GSM          | CP0603A0902DL | 890 - 915            | 21.3          |                   |                  |                  |
|              | CP0603A0947DL | 935 - 960            | 21.0          | 0.30              | 30               |                  |
| E-GSM        | CP0603A0897DL | 880 - 915            | 21.3          | 0.25              |                  | 21               |
|              | CP0603A0942DL | 925 - 960            | 21.0          | 0.30              |                  |                  |
| PDC          | CP0603A1441DL | 1429 - 1453          | 17.7          | 0.40              | 27               |                  |
| PCN          | CP0603A1747DL | 1710 - 1785          | 16.0          |                   | 25               |                  |
|              | CP0603A1842DL | 1805 - 1880          | 15.4          |                   |                  |                  |
| PCS          | CP0603A1880DL | 1850 - 1910          | 15.2          |                   |                  |                  |
|              | CP0603A1960DL | 1930 - 1990          | 15.0          |                   | 24               |                  |
| 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               | 21               |
|              | CP0603A0942EL | 925 - 960            | 24.7          |                   | 31               |                  |
| PDC          | CP0603A1441EL | 1429 - 1453          | 21.0          | 0.25              | 28               |                  |
| PCN          | CP0603A1747EL | 1710 - 1785          | 19.5          | 0.30              |                  |                  |
|              | CP0603A1842EL | 1805 - 1880          | 19.0          |                   |                  |                  |
| PCS          | CP0603A1880EL | 1850 - 1910          | 18.8          |                   |                  |                  |
|              | CP0603A1960EL | 1930 - 1990          | 18.5          |                   | 26               |                  |
| PHP          | CP0603A1907EL | 1895 - 1920          | 18.7          |                   |                  |                  |
| DECT         | CP0603A1890EL | 1880 - 1900          | 18.8          |                   |                  |                  |
| Wireless LAN | CP0603A2442EL | 2400 - 2484          | 17.0          | 0.40              | 24               |                  |

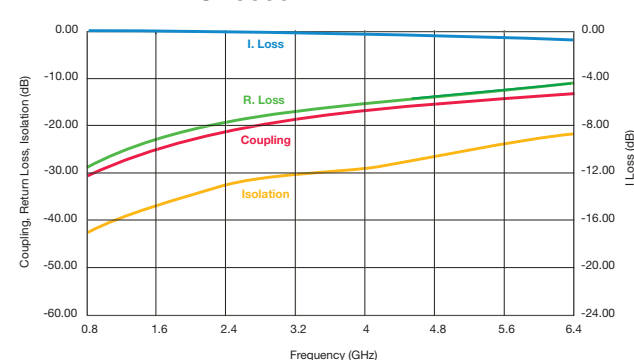
CP0603AxxxxELTR



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          |                   |                  |                  |
|              | CP0603A0947FL | 935 - 960            | 30.2          |                   | 27               |                  |
| E-GSM        | CP0603A0897FL | 880 - 915            | 30.5          |                   |                  | 12               |
|              | CP0603A0942FL | 925 - 960            | 30.2          |                   |                  |                  |
| PDC          | CP0603A1441FL | 1429 - 1453          | 27.0          | 0.25              | 23               |                  |
| PCN          | CP0603A1747FL | 1710 - 1785          | 25.0          |                   |                  |                  |
|              | CP0603A1842FL | 1805 - 1880          | 24.5          |                   |                  |                  |
| PCS          | CP0603A1880FL | 1850 - 1910          | 24.3          |                   |                  |                  |
|              | CP0603A1960FL | 1930 - 1990          | 24.0          |                   | 20               |                  |
| PHP          | CP0603A1907FL | 1895 - 1920          | 24.2          |                   |                  |                  |
| 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<br>CP0603A0881GL | 824 - 849<br>869 - 894     | 34.2<br>33.8  | 0.20              | 39               | 13               |
| GSM          | CP0603A0902GL<br>CP0603A0947GL | 890 - 915<br>935 - 960     | 33.6<br>33.2  |                   | 38<br>39         |                  |
| E-GSM        | CP0603A0897GL<br>CP0603A0942GL | 880 - 915<br>925 - 960     | 33.6<br>33.2  |                   | 39<br>38         |                  |
| PDC          | CP0603A1441GL                  | 1429 - 1453                | 30.0          | 0.25              | 34               |                  |
| PCN          | CP0603A1747GL<br>CP0603A1842GL | 1710 - 1785<br>1805 - 1880 | 28.5<br>28.0  |                   | 32               |                  |
| PCS          | CP0603A1880GL<br>CP0603A1960GL | 1850 - 1910<br>1930 - 1990 | 27.7<br>27.5  |                   | 31               |                  |
| PHP          | CP0603A1907GL                  | 1895 - 1920                | 27.6          |                   | 32               |                  |
| DECT         | CP0603A1890GL                  | 1880 - 1900                | 27.7          |                   | 31               |                  |
| 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<br>CP0603A0881HL | 824 - 849<br>869 - 894     | 17.3<br>17.0  | 0.30              | 26               | 26               |
| GSM          | CP0603A0902HL<br>CP0603A0947HL | 890 - 915<br>935 - 960     | 16.7<br>16.3  |                   | 25               |                  |
| E-GSM        | CP0603A0897HL<br>CP0603A0942HL | 880 - 915<br>925 - 960     | 17.0<br>16.3  | 0.35              | 25               |                  |
| PDC          | CP0603A1441HL                  | 1429 - 1453                | 13.0          | 0.55              | 22               |                  |
| PCN          | CP0603A1747HL<br>CP0603A1842HL | 1710 - 1785<br>1805 - 1880 | 11.4<br>11.0  | 0.75              | 20               | 24               |
| PCS          | CP0603A1880HL<br>CP0603A1960HL | 1850 - 1910<br>1930 - 1990 | 10.8<br>10.5  |                   | 19               |                  |
| PHP          | CP0603A1907HL                  | 1895 - 1920                | 10.7          |                   | 19               |                  |
| DECT         | CP0603A1890HL                  | 1880 - 1900                | 10.8          |                   | 17               |                  |
| 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<br>CP0603A0881ML | 824 - 849<br>869 - 894     | 24.2<br>23.8  | 0.20              | 33               | 23               |
| GSM          | CP0603A0902ML<br>CP0603A0947ML | 890 - 915<br>935 - 960     | 23.4<br>23.2  |                   | 32               |                  |
| E-GSM        | CP0603A0897ML<br>CP0603A0942ML | 880 - 915<br>925 - 960     | 23.4<br>23.2  |                   | 32               |                  |
| PDC          | CP0603A1441ML                  | 1429 - 1453                | 20.0          | 0.25              | 28               | 20               |
| PCN          | CP0603A1747ML<br>CP0603A1842ML | 1710 - 1785<br>1805 - 1880 | 18.4<br>18.0  |                   | 27               |                  |
| PCS          | CP0603A1880ML<br>CP0603A1960ML | 1850 - 1910<br>1930 - 1990 | 17.8<br>17.5  |                   | 26               |                  |
| PHP          | CP0603A1907ML                  | 1895 - 1920                | 17.7          |                   | 26               |                  |
| DECT         | CP0603A1890ML                  | 1880 - 1900                | 17.8          |                   | 26               |                  |
| Wireless LAN | CP0603A2442ML                  | 2400 - 2484                | 15.6          | 0.35              | 24               |                  |

CP0603AxxxxMLTR



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