

# Thin-Film Directional Couplers



## CP0402 High Directivity LGA Termination

### GENERAL DESCRIPTION

#### ITF (Integrated Thin-Film) TECHNOLOGY

The ITF High Directivity 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

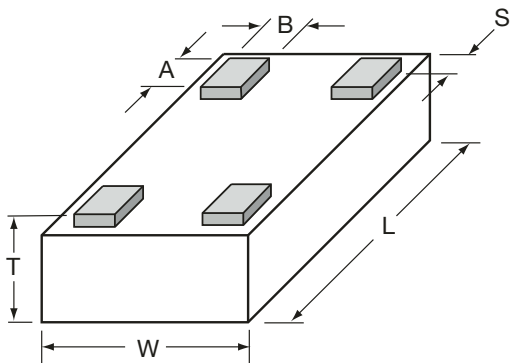
- Mobile Communications
- Satellite TV Receivers
- GPS
- Vehicle Location Systems
- Wireless LAN's

### 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 | 1.00±0.05<br>(0.040±0.002) |
| W | 0.58±0.04<br>(0.023±0.002) |
| T | 0.35±0.05<br>(0.014±0.002) |

|   |                            |
|---|----------------------------|
| A | 0.20±0.05<br>(0.008±0.002) |
| B | 0.18±0.05<br>(0.007±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>0402</b><br>T<br><b>Size</b><br>0402 | <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>LGA Termination</b><br>L = LGA Sn90, Pb10<br>**N = LGA Sn100<br><b>**RoHS compliant</b> | <b>TR</b><br>T<br><b>Packaging Code</b><br>TR = Tape and Reel |
|-------------------------------------------------------|-----------------------------------------|------------------------------|-----------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|

### QUALITY INSPECTION

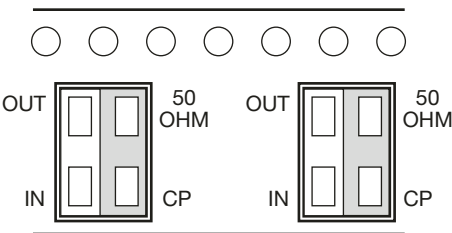
Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

- Static Humidity: 85°C, 85% RH, 160 hours
- Endurance: 125°C, I<sub>R</sub>, 4 hours

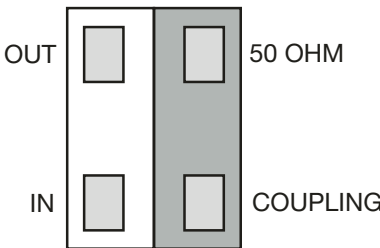
### TERMINATION

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)



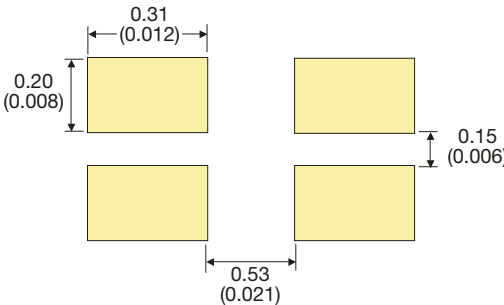
**Not RoHS Compliant**



For RoHS compliant products, please select correct termination style.

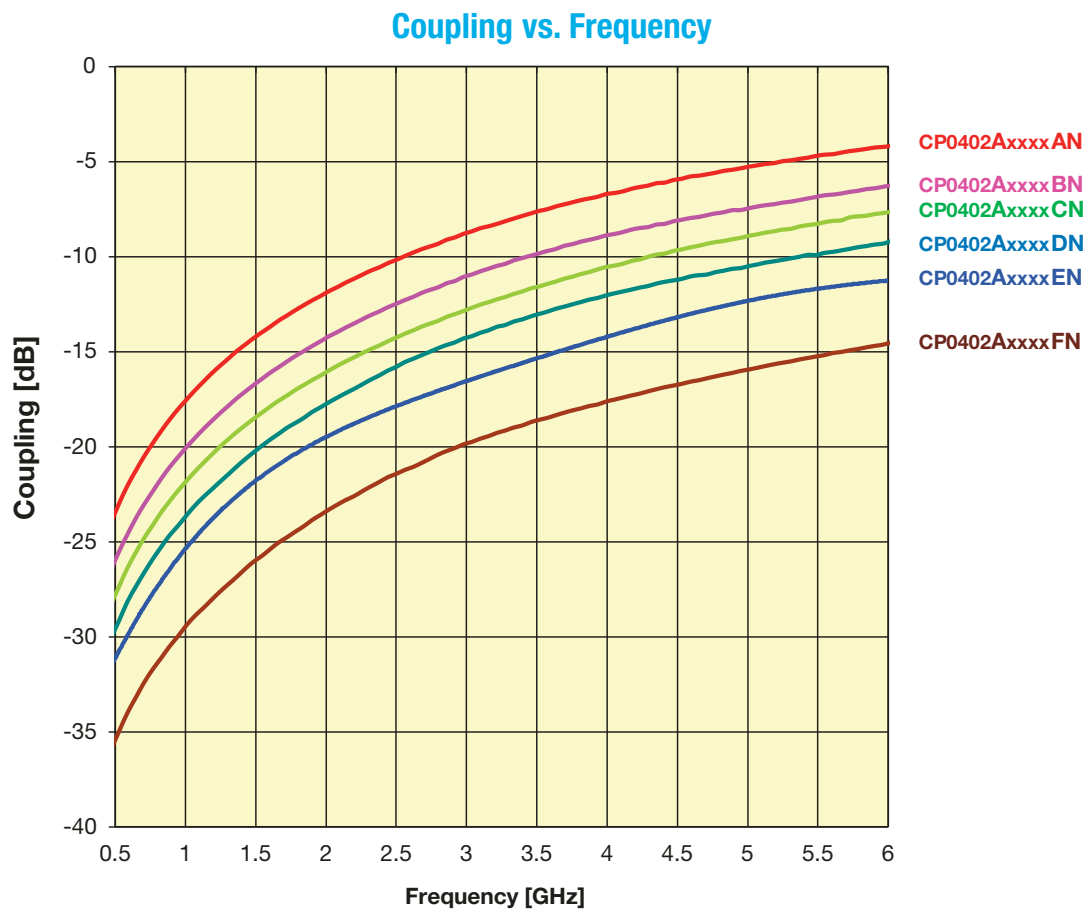
### Recommended Pad Layout Dimensions

mm (inches)



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

### CP0402 - TYPE SELECTION CHART



Intermediate coupling factors are readily available.  
Please contact factory.

# Thin-Film Directional Couplers

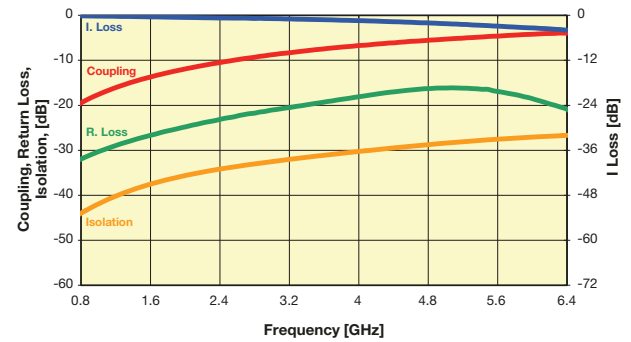


## CP0402 High Directivity LGA Termination

Coupler P/N CP0402AxxxxAN

| Application  | P/N Examples* | Frequency Band [MHz] | Coupling [dB] | I. Loss max. [dB] | Return Loss [dB] | Directivity [dB] |
|--------------|---------------|----------------------|---------------|-------------------|------------------|------------------|
| AMPS         | CP0402A0836AN | 824 - 849            | 19.10         | 0.25              | 32               | 21               |
|              | CP0402A0881AN | 869 - 894            | 18.60         | 0.25              | 31               |                  |
| GSM          | CP0402A0902AN | 890 - 915            | 18.50         | 0.25              | 31               |                  |
|              | CP0402A0947AN | 935 - 960            | 18.00         | 0.25              | 31               |                  |
| E-GSM        | CP0402A0897AN | 880 ÷ 915            | 18.50         | 0.25              | 31               |                  |
|              | CP0402A0942AN | 925 ÷ 960            | 18.00         | 0.25              | 31               |                  |
| PDC          | CP0402A1441AN | 1429 - 1453          | 14.50         | 0.40              | 28               |                  |
| PCN          | CP0402A1747AN | 1710 - 1785          | 13.00         | 0.50              | 26               |                  |
|              | CP0402A1842AN | 1805 - 1880          | 12.50         | 0.50              | 26               |                  |
| PCS          | CP0402A1880AN | 1850 - 1910          | 12.30         | 0.50              | 25               |                  |
|              | CP0402A1960AN | 1930 - 1990          | 12.00         | 0.50              | 25               |                  |
| PHP          | CP0402A1907AN | 1895 - 1920          | 12.30         | 0.50              | 25               |                  |
| DECT         | CP0402A1890AN | 1880 - 1900          | 12.30         | 0.50              | 25               |                  |
| Wireless LAN | CP0402A2442AN | 2400 - 2484          | 10.30         | 0.70              | 23               |                  |
|              | CP0402A3500AN | 3450 - 3550          | 7.60          | 1.30              | 15               | 14               |
| WiFi         | CP0402A5000AN | 4950 - 5050          | 5.00          | 1.50              | 15               | 13               |
|              | CP0402A5500AN | 5450 - 5550          | 4.60          | 1.50              | 14               | 13               |
|              | CP0402A6000AN | 5950 - 6050          | 4.00          | 1.50              | 14               | 13               |

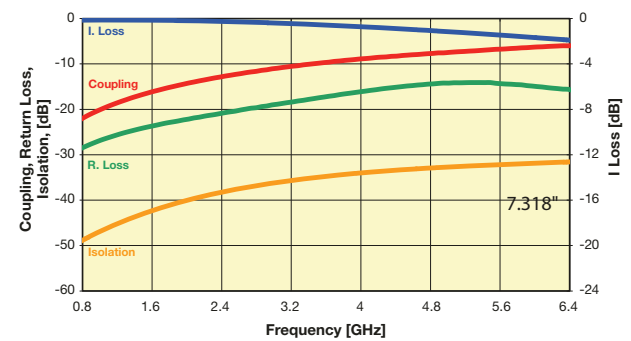
CP0402AxxxxANTR



Coupler P/N CP0402AxxxxBN

| Application  | P/N Examples  | Frequency Band [MHz] | Coupling [dB] | I. Loss max. [dB] | Return Loss [dB] | Directivity [dB] |
|--------------|---------------|----------------------|---------------|-------------------|------------------|------------------|
| AMPS         | CP0402A0836BN | 824 - 849            | 22.00         | 0.20              | 28               | 27               |
|              | CP0402A0881BN | 869 - 894            | 21.70         | 0.20              | 28               |                  |
| GSM          | CP0402A0902BN | 890 - 915            | 21.50         | 0.20              | 28               |                  |
|              | CP0402A0947BN | 935 - 960            | 21.00         | 0.25              | 27               |                  |
| E-GSM        | CP0402A0897BN | 880 ÷ 915            | 21.50         | 0.20              | 28               |                  |
|              | CP0402A0942BN | 925 ÷ 960            | 21.00         | 0.25              | 27               |                  |
| PDC          | CP0402A1441BN | 1429 - 1453          | 17.50         | 0.25              | 24               |                  |
| PCN          | CP0402A1747BN | 1710 - 1785          | 16.00         | 0.30              | 23               |                  |
|              | CP0402A1842BN | 1805 - 1880          | 15.50         | 0.35              | 23               |                  |
| PCS          | CP0402A1880BN | 1850 - 1910          | 15.50         | 0.35              | 23               |                  |
|              | CP0402A1960BN | 1930 - 1990          | 15.00         | 0.35              | 22               |                  |
| PHP          | CP0402A1907BN | 1895 - 1920          | 15.50         | 0.35              | 23               |                  |
| DECT         | CP0402A1890BN | 1880 - 1900          | 15.50         | 0.35              | 23               |                  |
| Wireless LAN | CP0402A2442BN | 2400 - 2484          | 13.30         | 0.40              | 21               |                  |
|              | CP0402A3500AN | 3450 - 3550          | 9.40          | 0.80              | 18               | 14               |
| WiFi         | CP0402A5000AN | 4950 - 5050          | 7.40          | 1.20              | 14               | 13               |
|              | CP0402A5500AN | 5450 - 5550          | 6.70          | 1.60              | 14               | 13               |
|              | CP0402A6000AN | 5950 - 6050          | 6.10          | 2.00              | 14               | 13               |

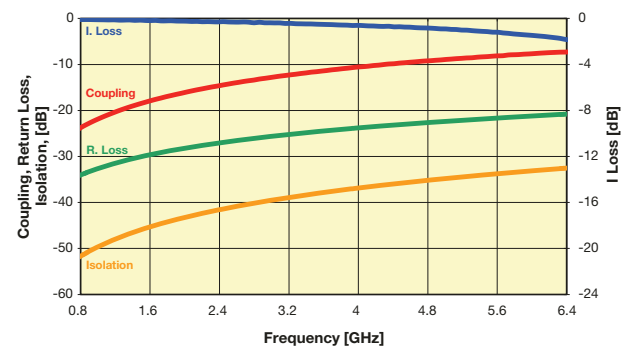
CP0402AxxxxBNTR



Coupler P/N CP0402AxxxxCN

| Application  | P/N Examples  | Frequency Band [MHz] | Coupling [dB] | I. Loss max. [dB] | Return Loss [dB] | Directivity [dB] |
|--------------|---------------|----------------------|---------------|-------------------|------------------|------------------|
| AMPS         | CP0402A0836CN | 824 - 849            | 23.60         | 0.20              | 33               | 22               |
|              | CP0402A0881CN | 869 - 894            | 23.00         | 0.20              | 33               |                  |
| GSM          | CP0402A0902CN | 890 - 915            | 23.00         | 0.20              | 26               |                  |
|              | CP0402A0947CN | 935 - 960            | 22.50         | 0.20              | 33               |                  |
| E-GSM        | CP0402A0897CN | 880 ÷ 915            | 23.00         | 0.20              | 25               |                  |
|              | CP0402A0942CN | 925 ÷ 960            | 22.50         | 0.20              | 32               |                  |
| PDC          | CP0402A1441CN | 1429 - 1453          | 19.00         | 0.25              | 31               |                  |
| PCN          | CP0402A1747CN | 1710 - 1785          | 17.20         | 0.25              | 30               |                  |
|              | CP0402A1842CN | 1805 - 1880          | 17.00         | 0.25              | 30               |                  |
| PCS          | CP0402A1880CN | 1850 - 1910          | 16.80         | 0.25              | 30               |                  |
|              | CP0402A1960CN | 1930 - 1990          | 16.50         | 0.25              | 29               |                  |
| PHP          | CP0402A1907CN | 1895 - 1920          | 16.80         | 0.25              | 29               |                  |
| DECT         | CP0402A1890CN | 1880 - 1900          | 16.80         | 0.25              | 30               |                  |
| Wireless LAN | CP0402A2442CN | 2400 - 2484          | 14.70         | 0.45              | 28               |                  |
|              | CP0402A3500AN | 3450 - 3550          | 10.97         | 0.67              | 23               | 17               |
| WiFi         | CP0402A5000AN | 4950 - 5050          | 8.00          | 1.00              | 21               | 16               |
|              | CP0402A5500AN | 5450 - 5550          | 7.50          | 1.10              | 21               | 15               |
|              | CP0402A6000AN | 5950 - 6050          | 7.10          | 1.30              | 23               | 15               |

CP0402AxxxxCNTR



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



# Thin-Film Directional Couplers

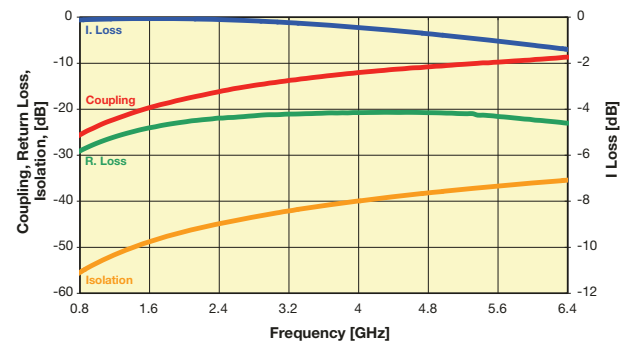


## CP0402 High Directivity LGA Termination

Coupler P/N CP0402AxxxxDN

| Application  | P/N Examples* | Frequency Band [MHz] | Coupling [dB] | I. Loss max. [dB] | Return Loss [dB] | Directivity [dB] |
|--------------|---------------|----------------------|---------------|-------------------|------------------|------------------|
| AMPS         | CP0402A0836DN | 824 - 849            | 25.20         | 0.20              | 29               | 20               |
|              | CP0402A0881DN | 869 - 894            | 24.80         | 0.20              | 28               |                  |
| GSM          | CP0402A0902DN | 890 - 915            | 24.70         | 0.20              | 28               |                  |
|              | CP0402A0947DN | 935 - 960            | 24.10         | 0.20              | 28               |                  |
| E-GSM        | CP0402A0897DN | 880 ÷ 915            | 24.70         | 0.20              | 28               | 18               |
|              | CP0402A0942DN | 925 ÷ 960            | 24.10         | 0.20              | 28               |                  |
| PDC          | CP0402A1441DN | 1429 - 1453          | 20.50         | 0.20              | 25               |                  |
|              | CP0402A1747DN | 1710 - 1785          | 19.00         | 0.20              | 24               |                  |
| PCN          | CP0402A1842DN | 1805 - 1880          | 18.50         | 0.25              | 23               | 18               |
|              | CP0402A1880DN | 1850 - 1910          | 18.20         | 0.25              | 23               |                  |
|              | CP0402A1960DN | 1930 - 1990          | 18.00         | 0.25              | 23               |                  |
|              | CP0402A1907DN | 1895 - 1920          | 18.10         | 0.25              | 23               |                  |
| DECT         | CP0402A1890DN | 1880 - 1900          | 18.20         | 0.25              | 23               | 17               |
| Wireless LAN | CP0402A2442DN | 2400 - 2484          | 16.00         | 0.35              | 22               |                  |
|              | CP0402A3500AN | 3450 - 3550          | 12.50         | 0.46              | 21               |                  |
|              | CP0402A5000AN | 4950 - 5050          | 10.00         | 0.65              | 21               |                  |
| WiFi         | CP0402A5500AN | 5450 - 5550          | 9.60          | 0.76              | 20               | 15               |
|              | CP0402A6000AN | 5950 - 6050          | 9.10          | 0.84              | 20               | 15               |

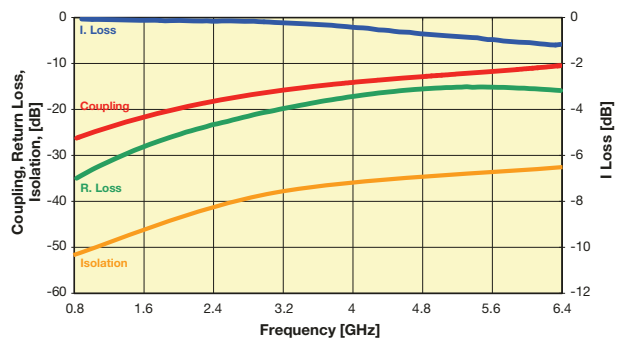
CP0402AxxxxDNTR



Coupler P/N CP0402AxxxxEN

| Application  | P/N Examples  | Frequency Band [MHz] | Coupling [dB] | I. Loss max. [dB] | Return Loss [dB] | Directivity [dB] |
|--------------|---------------|----------------------|---------------|-------------------|------------------|------------------|
| AMPS         | CP0402A0836EN | 824 - 849            | 27.20         | 0.20              | 35               | 25               |
|              | CP0402A0881EN | 869 - 894            | 26.80         | 0.20              | 34               |                  |
| GSM          | CP0402A0902EN | 890 - 915            | 26.50         | 0.20              | 34               |                  |
|              | CP0402A0947EN | 935 - 960            | 26.00         | 0.20              | 34               |                  |
| E-GSM        | CP0402A0897EN | 880 ÷ 915            | 26.50         | 0.20              | 34               | 23               |
|              | CP0402A0942EN | 925 ÷ 960            | 26.00         | 0.20              | 34               |                  |
| PDC          | CP0402A1441EN | 1429 - 1453          | 22.30         | 0.25              | 29               |                  |
|              | CP0402A1747EN | 1710 - 1785          | 20.50         | 0.25              | 27               |                  |
| PCN          | CP0402A1842EN | 1805 - 1880          | 20.30         | 0.25              | 26               | 23               |
|              | CP0402A1880EN | 1850 - 1910          | 20.00         | 0.25              | 26               |                  |
|              | CP0402A1960EN | 1930 - 1990          | 20.00         | 0.25              | 26               |                  |
|              | CP0402A1907EN | 1895 - 1920          | 20.00         | 0.25              | 26               |                  |
| DECT         | CP0402A1890EN | 1880 - 1900          | 20.00         | 0.25              | 26               | 16               |
| Wireless LAN | CP0402A2442EN | 2400 - 2484          | 18.00         | 0.35              | 23               |                  |
|              | CP0402A3500AN | 3450 - 3550          | 15.00         | 0.37              | 20               |                  |
|              | CP0402A5000AN | 4950 - 5050          | 12.50         | 0.50              | 18               |                  |
| WiFi         | CP0402A5500AN | 5450 - 5550          | 11.50         | 0.65              | 16               | 13               |
|              | CP0402A6000AN | 5950 - 6050          | 11.10         | 0.70              | 15               | 13               |

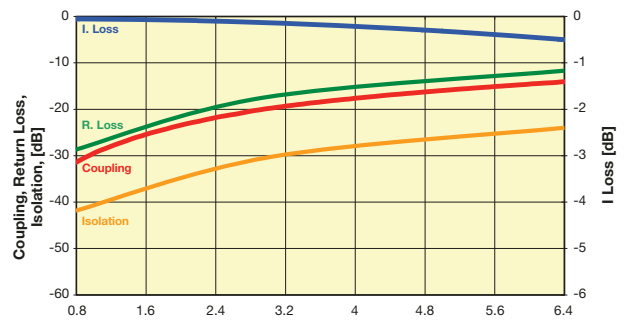
CP0402AxxxxENTR



Coupler P/N CP0402AxxxxFN

| Application  | P/N Examples  | Frequency Band [MHz] | Coupling [dB] | I. Loss max. [dB] | Return Loss [dB] | Directivity [dB] |
|--------------|---------------|----------------------|---------------|-------------------|------------------|------------------|
| AMPS         | CP0402A0836FN | 824 - 849            | 31.00         | 0.20              | 29.10            | 11               |
|              | CP0402A0881FN | 869 - 894            | 30.70         | 0.20              | 28.60            |                  |
| GSM          | CP0402A0902FN | 890 - 915            | 30.60         | 0.20              | 28.50            |                  |
|              | CP0402A0947FN | 935 - 960            | 30.00         | 0.20              | 28.10            |                  |
| E-GSM        | CP0402A0897FN | 880 ÷ 915            | 30.60         | 0.20              | 28.50            | 11               |
|              | CP0402A0942FN | 925 ÷ 960            | 30.00         | 0.20              | 28.10            |                  |
| PDC          | CP0402A1441FN | 1429 - 1453          | 26.50         | 0.20              | 25.00            |                  |
|              | CP0402A1747FN | 1710 - 1785          | 25.00         | 0.20              | 23.80            |                  |
| PCN          | CP0402A1842FN | 1805 - 1880          | 24.50         | 0.20              | 23.60            | 11               |
|              | CP0402A1880FN | 1850 - 1910          | 24.20         | 0.20              | 23.50            |                  |
|              | CP0402A1960FN | 1930 - 1990          | 24.00         | 0.20              | 23.30            |                  |
|              | CP0402A1907FN | 1895 - 1920          | 24.20         | 0.20              | 23.40            |                  |
| DECT         | CP0402A1890FN | 1880 - 1900          | 24.20         | 0.20              | 23.50            | 9                |
| Wireless LAN | CP0402A2442FN | 2400 - 2484          | 22.00         | 0.25              | 22.60            |                  |
|              | CP0402A3500AN | 3450 - 3550          | 18.00         | 0.27              | 22.00            |                  |
|              | CP0402A5000AN | 4950 - 5050          | 15.70         | 0.30              | 23.01            |                  |
| WiFi         | CP0402A5500AN | 5450 - 5550          | 15.20         | 0.30              | 20.36            | 7.5              |
|              | CP0402A6000AN | 5950 - 6050          | 14.50         | 0.30              | 18.94            | 7.5              |

CP0402AxxxxFNTR



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