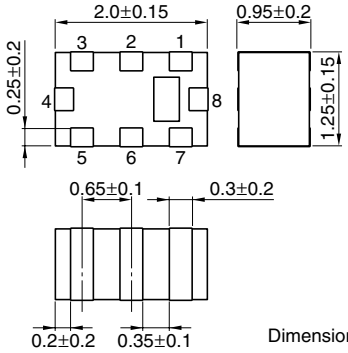
# Multilayer Chip Dual-Band Directional Couplers For GSM/DCS/PCS-Tx

**Conformity to RoHS Directive**

## HHM Series HHM2317B3

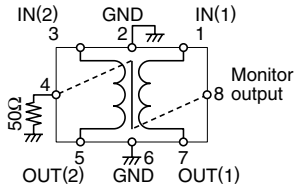
### SHAPES AND DIMENSIONS



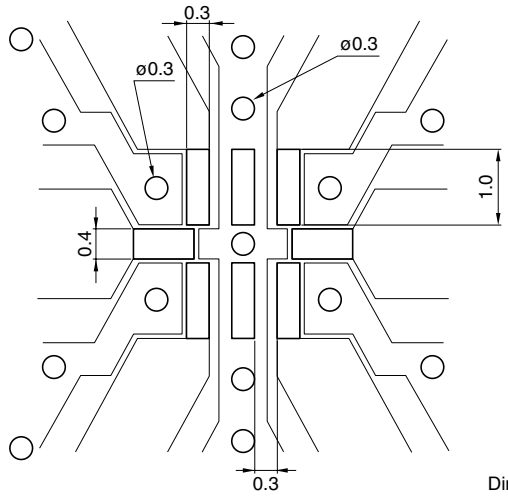

| Terminal functions | |
|---|---|
| 1 | Band1 input port |
| 2 | GND |
| 3 | Band2 input port |
| 4 | 50Ω termination |
| 5 | Band2 output port |
| 6 | GND |
| 7 | Band1 output port |
| 8 | Monitor output port |

Dimensions in mm

### CIRCUIT DIAGRAM




### RECOMMENDED PC BOARD PATTERNS




Dimensions in mm

This width is 50Ω
CPW for 0.6mm thick Teflon substrate.

- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

## ELECTRICAL CHARACTERISTICS

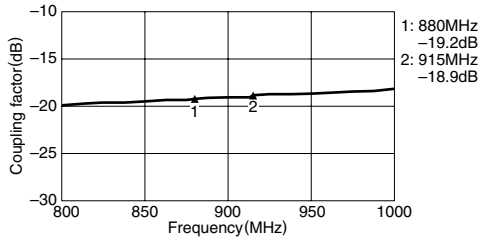
| | | | | | |
|---|---|---|---|---|---|
| Band | | | 1 | 2 | |
| System | | | GSM | DCS | PCS |
| Frequency range | | (MHz) | 880 to 915 | 1710 to 1785 | 1850 to 1910 |
| Coupling factor | | (dB) | –19.0±1.0 | –14.0±1.0 | –13.5±1.0 |
| Insertion loss | | (dB)max. | 0.30 | 0.45 | 0.50 |
| Isolation* | $IN_1$-$OUT_2$ | (dB)min. | 27 | 27 | 27 |
| | $IN_2$-$OUT_1$ | (dB)min. | 25 | 25 | 25 |
| | $IN_1$-$IN_2$ | (dB)min. | 22 | 22 | 22 |
| | IN-Load | (dB)min. | 27 | 25 | 24 |
| VSWR | | max. | 1.3 | 1.3 | 1.3 |
| Temperature range | Operating | (°C) | –40 to +85 | –40 to +85 | –40 to +85 |
| | Storage | (°C) | –40 to +85 | –40 to +85 | –40 to +85 |

* Isolation between opposite bands is specified over the frequency ranges of both bands.
Isolation in-band is specified over the frequency of the band in frequency.

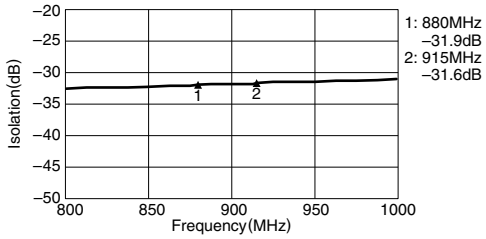
## FREQUENCY CHARACTERISTICS

### GSM900

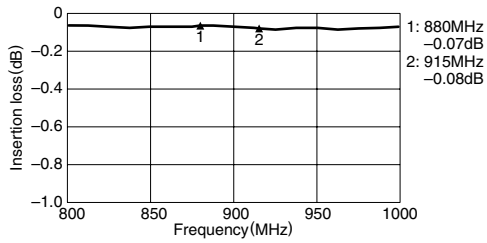
#### COUPLING



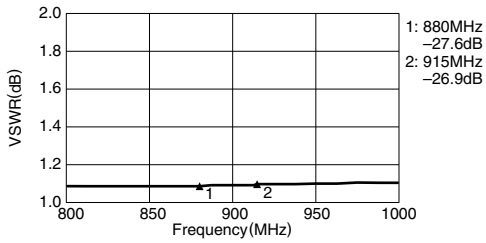

#### ISOLATION




#### INSERTION LOSS

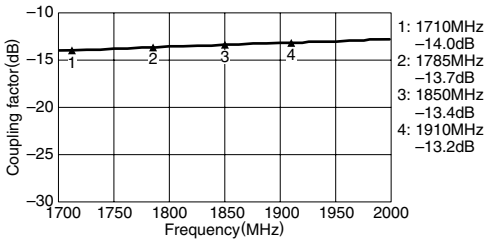



#### VSWR

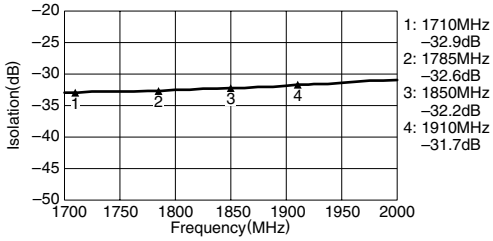



### DCS1800/PCS1900

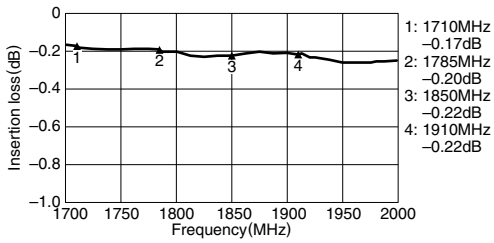
#### COUPLING




#### ISOLATION




#### INSERTION LOSS




#### VSWR