

## Antenna Info

### Antenna 1:

Manufacturer: Ethertronics Incorporated  
Model: 1000418  
Gain @ 4.9-5.9GHz: 3.5 dBi peak  
Gain @ 2.39-2.49GHz: 2.5 dBi peak  
Description: Isolated Magnetic Dipole (IMD)

### Antenna Cable Info

Manufacturer: Sunridge Corporation  
Model: MCD-R-60-105-MCBG  
Cable Loss @ 4.9-5.9GHz: 0.78 dB  
Cable Loss @ 2.39-2.49GHz: 0.47 dB  
Description: Coax, MCD/W.FL to MCB/U.FL, 105mm

Compliance with FCC Part 15.203: The antenna cable connects to the device through a W.FL connector. The other end is a U.FL connector, which is then attached to the antenna. This does not use a standard antenna jack.

The Ethertronics Incorporated and Sunridge Corporation datasheets follow.

### Antenna 2:

Manufacturer: Pulse Electronics  
Model: W3006  
Gain @ 4.9-5.9GHz: 4.2 dBi peak  
Gain @ 2.39-2.49GHz: 3.2 dBi peak  
Description: Ceramic Chip Antenna

### Antenna Cable Info

Manufacturer: Sunridge Corporation  
Model: MCD-DH-68-035A  
Cable Loss @ 4.9-5.9GHz: 0.33 dB  
Cable Loss @ 2.39-2.49GHz: 0.20 dB  
Description: Coax, MCD/W.FL to MCD/W.FL, 35mm

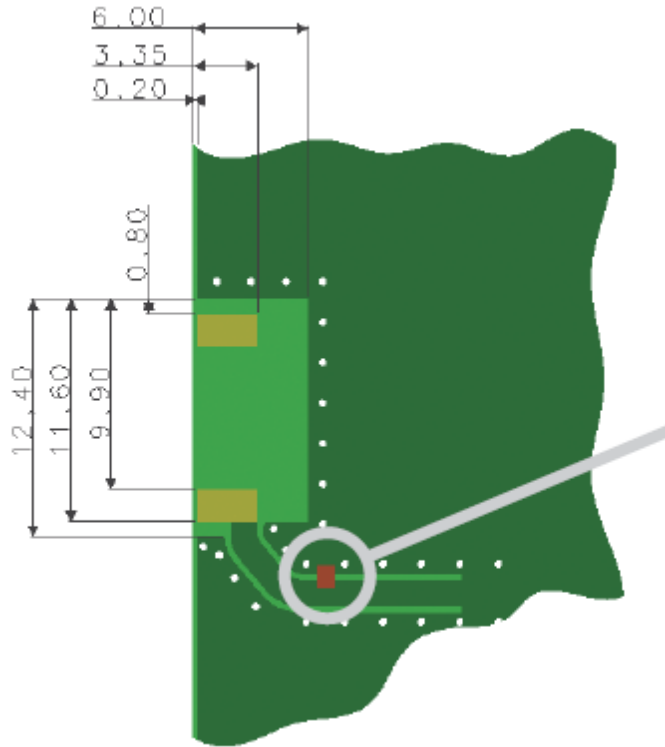
### Antenna Feed Trace Requirements:

**All host board designs using a feed trace with chip antenna Pulse W3006 must be approved and signed off by Logic PD prior to production.**

The design must follow these guidelines:

- The 37x Torpedo + Wireless SOM -31 must have a cable, Sunridge Corporation MCD-DH-68-035A of length 35mm or longer (same or more dB loss), attached to the W.FL antenna connector of the SOM. The other end of this cable must connect to a W.FL connector on the host board.
- The trace on the host board shall be 50 ohms microstrip over a continuous ground plane. That ground plane shall be the same ground plane as the one that the chip antenna is coupled to.
- There shall be no other traces within 4 times the width of the feed trace, and no traces between the feed trace and the continuous ground plane.

- The feed trace must be routed on the outside layers of the board with ground guard vias every .100" or less.
- The feed trace may have 1 through-hole via allowing the trace to transition from the top to bottom (or vice versa).
- The feed trace must be less than 1" in length.
- The feed trace may include passive components for impedance matching purposes.
- The ground plane must be cleared under the chip antenna for an area of 11.60 x 6.00mm. The cleared ground plane must follow the image guidelines below (dimensions in mm):

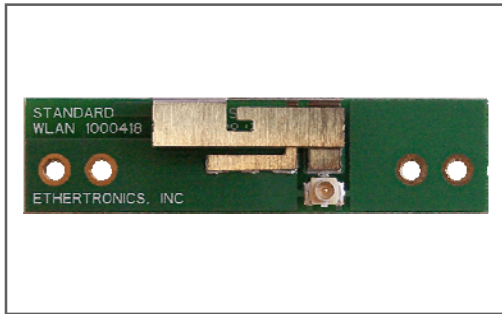


Compliance with FCC Part 15.203: The antenna cable connects to the device through a W.FL connector. The other end is a W.FL connector, which is then attached to the host PCB. This does not use a standard antenna jack.

The Pulse Electronics and Sunridge Corporation datasheets follow.

## Prestta™ WLAN Embedded Antenna

2.4/4.9/5.2/5.8 GHz (802.11 a/b/g/n + Japan)



Ethertronics' Prestta series of Isolated Magnetic Dipole™ (IMD) stamped metal antennas address the challenges facing today's product designers. IMD's high performance and isolation characteristics offer better connectivity and minimal interference. IMD antennas can be used in a variety of devices:

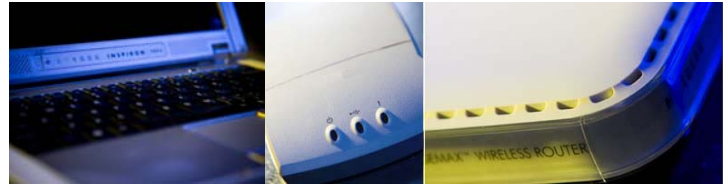
- Notebook Computers
- Access Points
- Industrial Handhelds
- WiFi enabled Televisions & Monitors

### TECHNOLOGY ADVANTAGES



**Stays in Tune**  
IMD antenna technology provides superior RF field containment, resulting in less interaction with surrounding components. Ethertronics IMD antennas resist de-tuning; providing a robust radio link regardless of the usage position.

Prestta WLAN antennas use patented IMD technology in a stamped metal configuration to provide high performance. IMD antennas requires a smaller design keep-out area, carry lower program development risk which yields a quicker time-to-market, without sacrificing RF performance.



### KEY BENEFITS

#### DESIGN ADVANTAGES

##### Quicker Time-to-Market

- By optimizing antenna size, performance and emissions, customer and regulatory specifications are more easily met.

##### Greater Flexibility

- Ethertronics' first-in-class IMD technology enables you to develop concept designs that are more advanced and that deliver superior performance in reception-critical applications.
- Connector located on the PCB allows for custom cable lengths to fit a variety of devices

##### RoHS Compliant

- Ethertronics' antennas are fully compliant with the European RoHS Directive 2002/95/EC.

#### END USER ADVANTAGES

##### Unique Form Factors Support Advanced Industrial Designs

- Smaller, more efficient IMD embedded antennas break through restrictive design rules and provide new freedom in component placement.

##### Superior Range & Signal Strength

- Better antenna function means longer range and greater sensitivity to critically precise signals—delivering greater customer satisfaction while building brand loyalty.

#### SERVICE AND SUPPORT

##### Extensive RF Experience

- Our WLAN antennas are supported by documentation, and when needed, by the expertise of RF engineers who have integrated hundreds of antenna designs into wireless devices.

##### Global Operations & Design Support

- Ethertronics' global operations supports an integrated network of design centers that can take projects from concept to production.

**PRODUCT: WLAN a/b/g/n + Japan**

**Ethertronics' Internal (Embedded) Antenna Specifications.**

Below are the typical specs for a WLAN application.

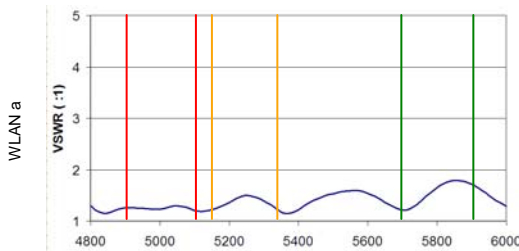
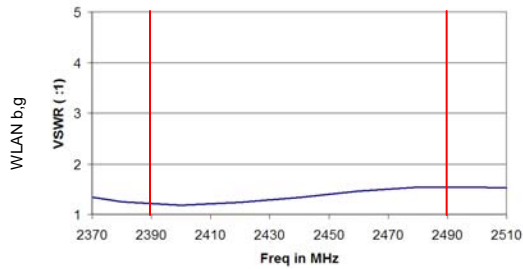
**Electrical Specifications**  
Typical Characteristics

| WLAN a/b/g/n + Japan Antenna (GHz) | 2.390-2.490 b, g                    | 4.900-5.100 Japan | 5.150-5.350 a | 5.70-5.900 a |
|------------------------------------|-------------------------------------|-------------------|---------------|--------------|
| Peak Gain                          | 1.5-2.5 dBi                         | 1.5-3.5 dBi       | 2-3.5 dBi     | 2-3.5 dBi    |
| Efficiency                         | 65%                                 | 65%               | 65%           | 70%          |
| VSWR Match                         | <2.0:1                              | <1.5:1            | <2.0:1        | <2.0:1       |
| Feed Point Impedance               | 50 Ω unbalanced (other if required) |                   |               |              |

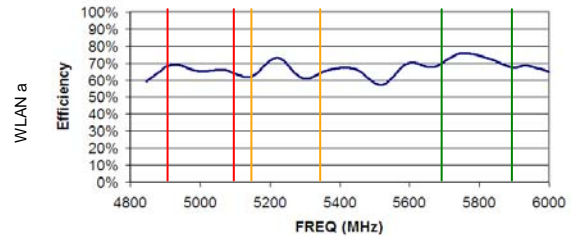
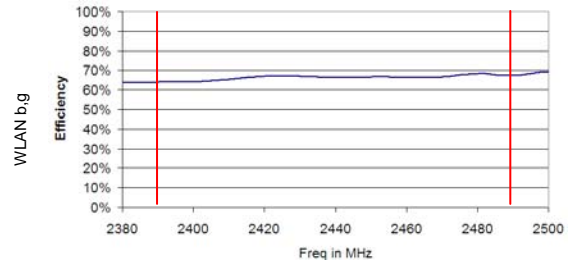
**Mechanical Specifications**

|                   |   |
|-------------------|---|
| Dimensions        | 17.9 x 6.9 x 4.3 mm (Antenna); 45.0 x 11.3 x 0.8 mm (PCB) |
| Weight            | 1.6 g   |
| Cable / Connector | Contact Ethertronics for details.                         |
| Cable Length      | 150 mm, 300mm 450mm, 600mm available                      |

**VSWR**

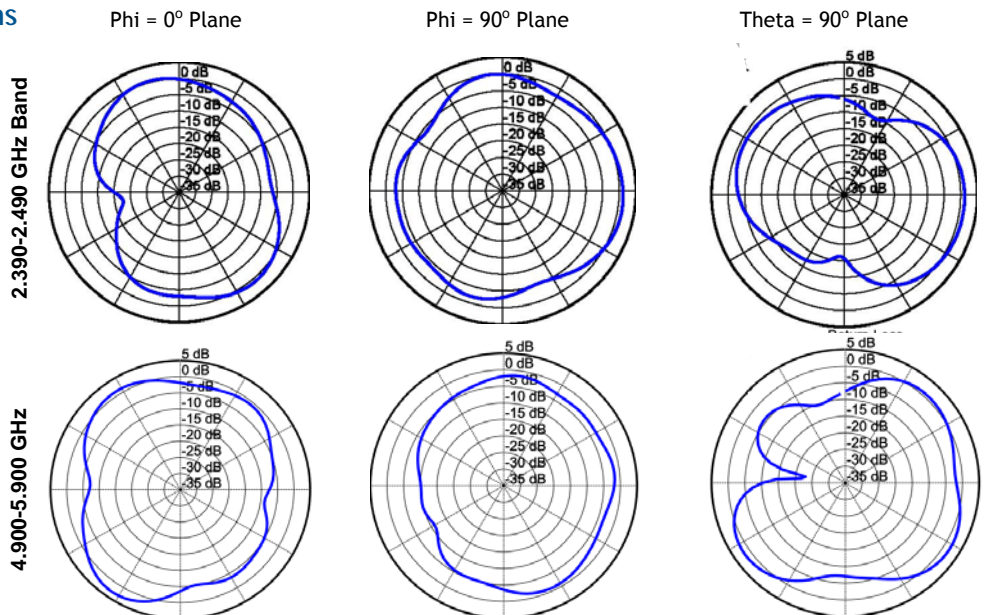
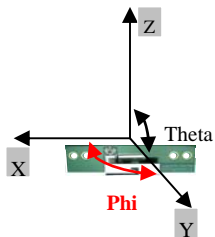


**Efficiencies**



**Antenna Radiation Patterns**

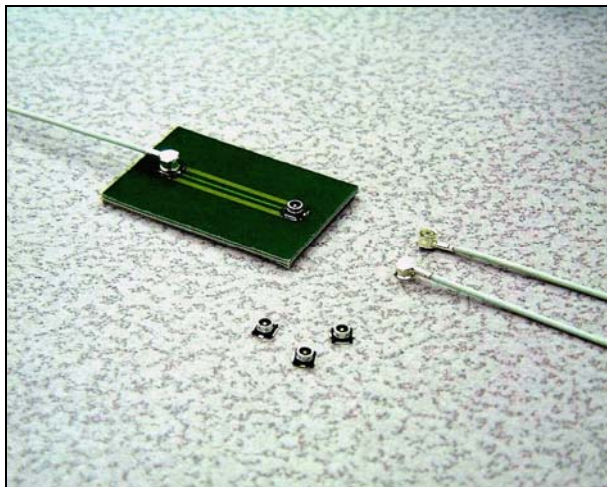
Typical Performance



# Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height



Sunridge MCB series coaxial product fulfills the rigorous requirements of high frequency data transmission in digital world. Constructed in supreme Teflon coax cable and advanced mechanical design, MCB delivers high electrical performance of a typical 1.3 max VSWR measurement at 6.0GHz, while providing for a sturdy interconnection in a slim form factor of 3.0mm square footprint by 2.5mm max mated height. For tight spaced application, MCB2 plug offers an ultra low-mated profile of 2.0mm on the same MCB socket.

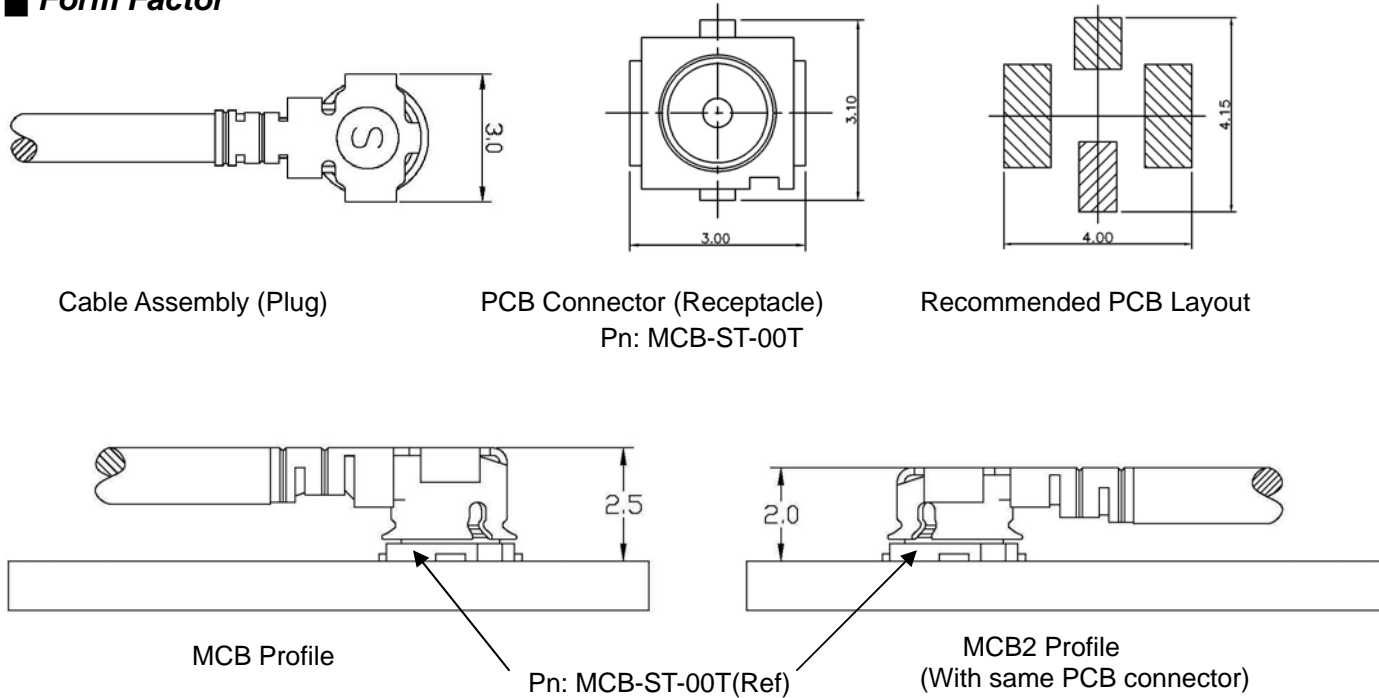


Applications: For Bluetooth, 802.11 WLAN, GPS, wireless communication designs in smart cell phone, PDA, and notebook or hand held information devices - for up to 6GHz frequency. A perfect push-button solution for antenna feedline.

## ■ Features

- Space Economy: PCB footprint of 3.1mm x 3.0mm, mated height of 2.5mm or 2.0mm.
- Teflon Cable: Silver-plated center conductor with Teflon dielectric and jacket.
- Application-specific cable options: from 0.81mm OD flexible cable ideal for intricate routing inside a cramped package, to 1.24mm or 1.32mm OD cable that delivers RG178 performance with space and weight saving.
- PCB connector: Integral molded construction ensures product reliability.
- Sturdy Connection: Lead-in and interlock features among mating pair ensure solid coupling.
- Accessory: Extraction tool for easy replacement, and MCB-SMA adapter for tester fitting.

## ■ Form Factor



(dimension: mm)



[www.sunridgecorp.com](http://www.sunridgecorp.com)

**Sunridge Corporation**

*Specialist in Interconnect Solutions*

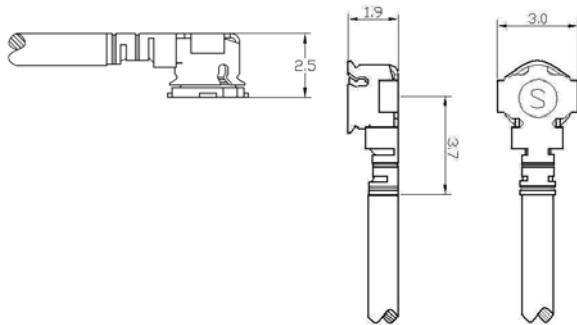


# Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height



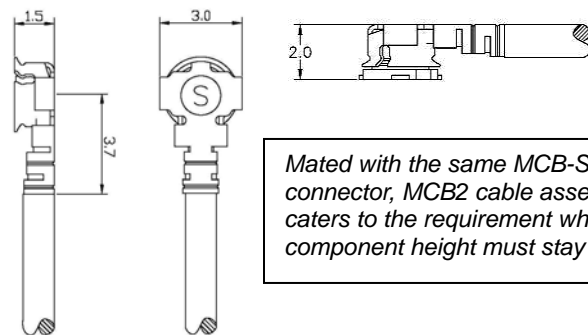
## MCB Cable Assembly

(Mate with MCB-ST-00T: 2.5mm max heights.)



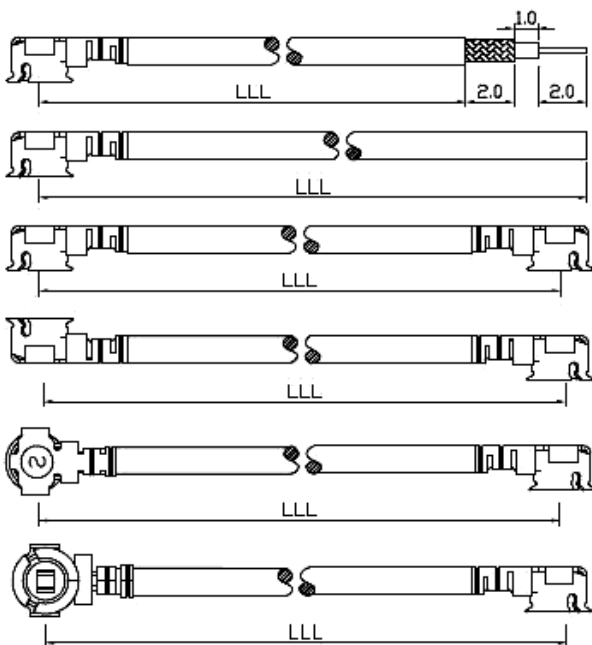
## MCB2 Cable Assembly -- For Space Tight Applications

(Mate with MCB-ST-00T: 2.0mm heights.)



**Cable Option:** MCB head can be assembled with cables of 0.81mm OD to 1.33mm OD.

**Cable Option:** Due to its miniature structure, MCB2 head can only be assembled with cable of 1.13mm OD or smaller, i.e., #59, #60 or #68 cable.



PN: MCB-SH-XX-LLL-T

PN: MCB-SH-XX-LLL-F

PN: MCB-DH-XX-LLL

(Both connectors face down)

PN: MCB-DH-XX-LLL-R1

(One connector faces down, one faces up)

PN: MCB-DH-XX-LLL-R2

(End view: near conn faces down, far conn faces right)

PN: MCB-DH-XX-LLL-R3

(End view: near conn faces down, far conn faces left)

### ● P/N Designation

For MCB head

MCBG - XX- XX - XXX - X (gold plated)

MCB - XX- XX - XXX - X (silver plated)

A B C D

For MCB2 head

MCB2G - XX- XX - XXX - X (gold plated)

MCB2 - XX- XX - XXX - X (silver plated)

A B C D

**A. Head Configuration:** SH: Single-Headed Cable Assembly  
DH: Double-Headed Cable Assembly

**B. Coaxial Cable Code:** see cable selection guide (p.4)

**C. Length (in mm):** e.g., LLL = 200 means 200mm; LLL = 073 means 73mm

**D. End Cut (for SH) T:** stripped, tinned at outer & center conductor  
F: open end flat cut

**D. Orientation:** blank: Both connectors face down  
(for DH) R1: One faces down, one up  
R2: End view: near one faces down, far one right  
R3: End view: near one faces down, far one left

[www.sunridgecorp.com](http://www.sunridgecorp.com)

(dimension: mm)



Sunridge Corporation

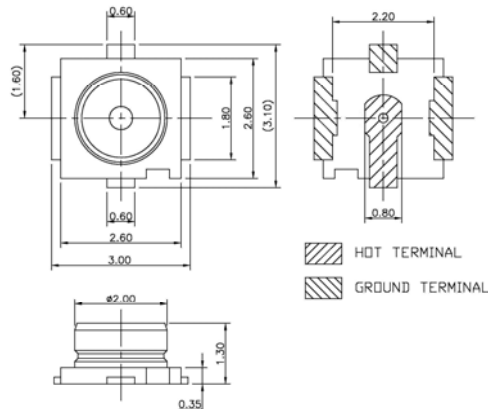
Specialist in Interconnect Solutions





**PCB Connector**

Pn: MCBG-ST-00T ( gold plated )  
 MCB-ST-00T ( silver plated )

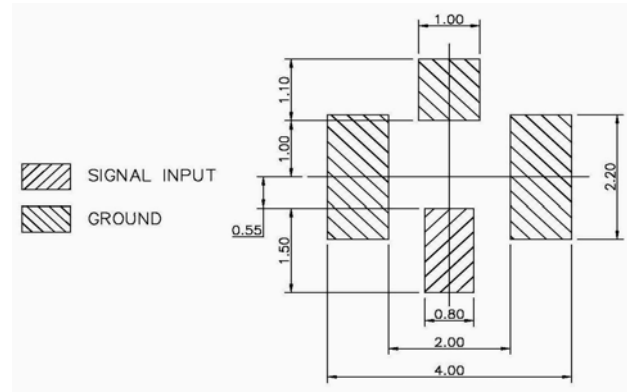


Stranded Package: 5,000pcs per tape reel.

**Material Spec**

**Outer Contact:** Copper Alloy, Gold or Silver Plated.  
**Center Contact:** Copper Alloy, Gold Plated.  
**Insulator:** Engineering Plastic.  
**Cable:** Silver plated center conductor with Teflon dielectric and jacket.

**Recommended PCB Layout**

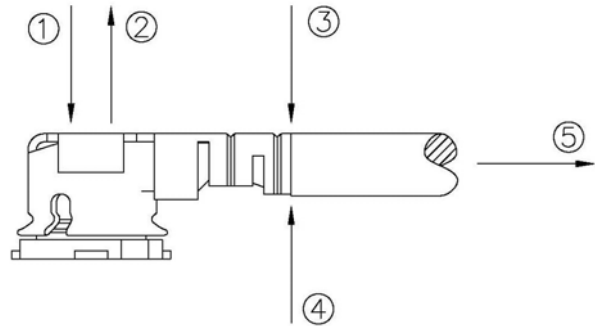


| Electrical Characteristics |                |
|----------------------------|----------------|
| VSWR @ 6GHz                | 1.3 Max.       |
| Nominal Impedance          | 50 ohm         |
| Temperature Range          | -40°C to +90°C |
| Voltage Rating             | 250Vrms        |
| Contact Resistance         | 15m ohm Max    |
| Withstanding Voltage       | AC300Vrms      |
| Insulation Resistance      | 500m ohm Min   |

**Insertion/Extraction Tool:** Pn: ET-MCB

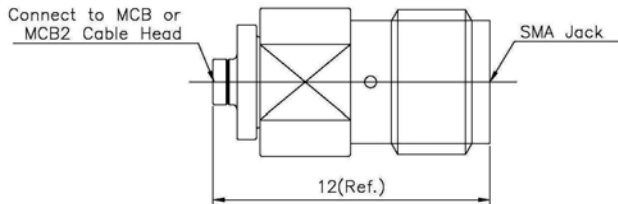


**Mechanical Application:**



- ① Insertion force (with tool): 800gf.
  - ② Extraction force (with tool): 600gf.
  - ③ Retention, downward force: 200gf max.
  - ④ Retention, upward force: 200gf max.
  - ⑤ Retention, pull back: 400gf max
- Durability: 30 cycles

**Adapter:** Pn: MCBP-SMAJ  
 (Connection to Network Analyzer)



MCB Plug to SMA Jack

# Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height



## Cable Selection Guide

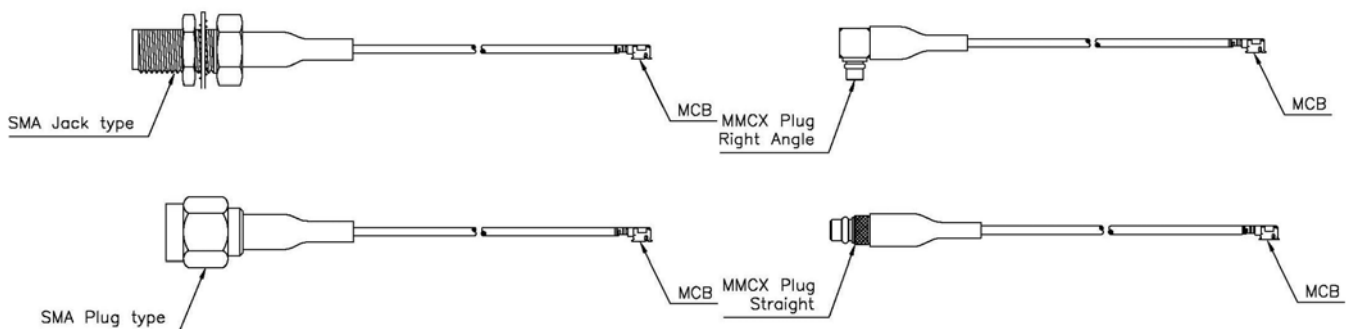
| Cable Designation Code     |                   |           | #54 *                     | #56 *                                 | #53                       | #59                       | #60                       | #68                       |
|----------------------------|-------------------|-----------|---------------------------|---------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Inner conductor            | No. and Dia.      | (No./mm)  | 7/0.102                   | 1/0.26                                | 7/0.08                    | 7/0.08                    | 7/0.064                   | 7/0.05                    |
|                            | Material          | —         | Silver plated copper wire | Silver pltd/copper covered steel wire | Silver plated copper wire | Silver plated copper wire | Silver plated copper wire | Silver plated copper wire |
|                            | Total Dia.        | (mm)      | 0.305                     | 0.26                                  | 0.24                      | 0.24                      | 0.192                     | 0.15                      |
| Dielectric                 | Material          | —         | FEP                       | FEP                                   | FEP                       | FEP                       | FEP                       | PFA                       |
|                            | Total Dia .       | (mm)      | 0.88                      | 0.8                                   | 0.66                      | 0.68                      | 0.53                      | 0.4                       |
| Outer conductor            | Material          | —         | Tinned copper wire        | Tinned copper wire                    | Tinned copper wire        | Tinned copper wire        | Tinned copper wire        | Tinned copper wire        |
|                            | Dia. of wire      | (mm)      | 0.05                      | 0.05                                  | 0.05                      | 0.05                      | 0.05                      | 0.05                      |
|                            | Total Dia.        | (mm)      | 1.13                      | 1.05                                  | 1.12 (double shield)      | 0.93                      | 0.78                      | 0.65                      |
| Jacket                     | Material          | —         | FEP                       | FEP                                   | FEP                       | FEP                       | FEP                       | PFA                       |
|                            | Nominal thickness | (mm)      | 0.1                       | 0.1                                   | 0.1                       | 0.1                       | 0.1                       | 0.08                      |
| Overall Dia.               |                   | (mm)      | 1.33                      | 1.24                                  | 1.32                      | 1.13                      | 0.98                      | 0.81                      |
| Nominal impedance          |                   | (Ohm)     | 50                        | 50                                    | 50                        | 50                        | 50                        | 50                        |
| Voltage rating             |                   | Vrms Max. | 300                       | 300                                   | 300                       | 300                       | 300                       | 300                       |
| Nominal static capacitance |                   | (pF/m)    | 96                        | 100                                   | 95                        | 97                        | 97                        | 96                        |
| Insertion loss             | dB/m at 1GHz      |           | 1.61                      | 1.56                                  | 2.11                      | 2.06                      | 2.66                      | 3.53                      |
|                            | dB/m at 2GHz      |           | 2.33                      | 2.30                                  | 3.04                      | 2.97                      | 3.82                      | 5.17                      |
|                            | dB/m at 2.4GHz    |           | 2.58                      | 2.54                                  | 3.35                      | 3.27                      | 4.45                      | 5.71                      |
|                            | dB/m at 3GHz      |           | 2.92                      | 2.90                                  | 3.77                      | 3.69                      | 4.73                      | 6.45                      |
|                            | dB/m at 5GHz      |           | 4.10                      | 4.25                                  | 4.98                      | 4.87                      | 6.21                      | 8.53                      |
|                            | dB/m at 6GHz      |           | 4.31                      | 4.48                                  | 5.50                      | 5.38                      | 7.45                      | 9.42                      |

(data as provided by material suppliers, for reference only)

\* #54 or #56 performs as well as RG178 (1.80mm OD) in a much smaller size, which works well for MCB's unique design; its RG178 alike structure, meanwhile, is process compatible for a wide variety of RF connector types.

## Integrated Solution

MCB- single headed cable is typically integrated with another R/F connector for interconnection, say, from module board to panel or to antenna fitting. Sunridge is equally committed to both R/F cable assy customers and OEM's. Send your application requirement to [engineering@sunridgecorp.com](mailto:engineering@sunridgecorp.com) for a project evaluation.



(dimension: mm)



[www.sunridgecorp.com](http://www.sunridgecorp.com)

Sunridge Corporation

Specialist in Interconnect Solutions





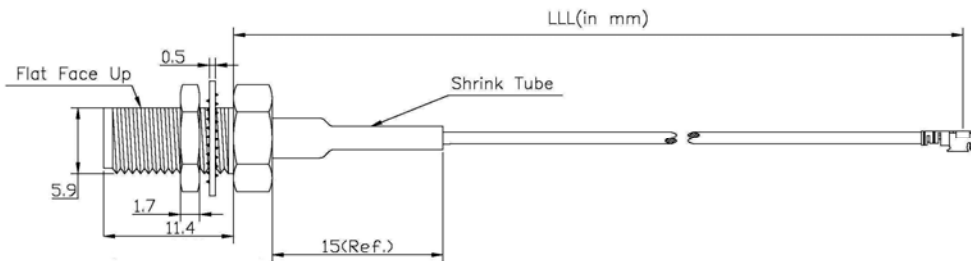
# Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height



## MCB- Derivative Cable Assembly P/N Selector:

(Illustration of the most commonly used MCB-RF cable assy. A variety of other RF configurations is readily available at Sunridge Corp. Contact [engineering@sunridgecorp.com](mailto:engineering@sunridgecorp.com) for project inquiry.)

### ■ MCB to SMA Bulkhead Jack (Panel Mount) Cable Assembly:



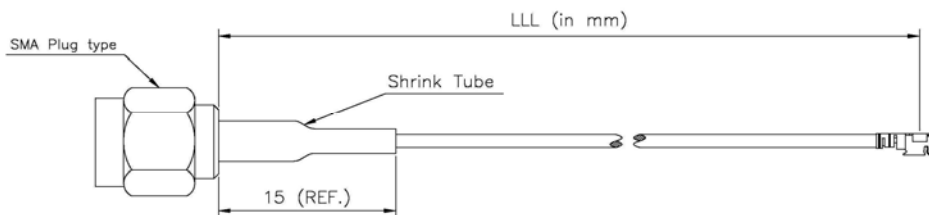
| Range            | Tolerance |
|------------------|-----------|
| 50 < LLL < 100   | ± 2       |
| 100 < LLL < 200  | ± 3       |
| 300 < LLL < 300  | ± 5       |
| 300 < LLL < 500  | ± 10      |
| 500 < LLL < 1000 | ± 25      |
| 1000 < LLL       | ± 60      |

LLL: Length in mm. e.g., LLL = 200 means 200mm; LLL = 073 means 73mm

| Descriptions                        | Recommended Cable | Sunridge P/N (MCB gold plated) |
|-------------------------------------|-------------------|--------------------------------|
| MCB to SMAJB                        | #54, 1.33 mm OD   | MCBG-RH-54-LLL-SMAJB207        |
| MCB to SMAJB Reverse Polarity (RP)  | #54, 1.33 mm OD   | MCBG-RH-54-LLL-SMAJB281        |
| MCB to SMAJB with O-Ring Seal       | #54, 1.33 mm OD   | MCBG-RH-54-LLL-SMAJB209        |
| MCB to SMAJB RP with O-ring Seal    | #54, 1.33 mm OD   | MCBG-RH-54-LLL-SMAJB283        |
| MCB2 to SMAJB                       | #59, 1.13 mm OD   | MCB2G-RH-59-LLL-SMAJB103       |
| MCB2 to SMAJB Reverse Polarity (RP) | #59, 1.13 mm OD   | MCB2G-RH-59-LLL-SMAJB181       |
| MCB2 to SMAJB with O-Ring Seal      | #59, 1.13 mm OD   | MCB2G-RH-59-LLL-SMAJB105       |
| MCB2 to SMAJB RP with O-ring Seal   | #59, 1.13 mm OD   | MCB2G-RH-59-LLL-SMAJB183       |

P/N Selection (referring to catalog P.2): For MCB silver-plated option, use MCB- or MCB2- prefix. For 2.5mm mated height, use MCBG (or MCB) prefix; for 2.0mm mated height application, use MCB2G (or MCB2) prefix.

### ■ MCB to SMA Plug Cable Assembly:



| Range            | Tolerance |
|------------------|-----------|
| 50 < LLL < 100   | ± 2       |
| 100 < LLL < 200  | ± 3       |
| 300 < LLL < 300  | ± 5       |
| 300 < LLL < 500  | ± 10      |
| 500 < LLL < 1000 | ± 25      |
| 1000 < LLL       | ± 60      |

LLL: Length in mm. e.g., LLL = 200 means 200mm; LLL = 073 means 73mm

| Descriptions                       | Recommended Cable | Sunridge P/N (MCB gold plated) |
|------------------------------------|-------------------|--------------------------------|
| MCB to SMAP                        | #54, 1.33 mm OD   | MCBG-RH-54-LLL-SMAP205         |
| MCB to SMAP Reverse Polarity (RP)  | #54, 1.33 mm OD   | MCBG-RH-54-LLL-SMAP281         |
| MCB2 to SMAP                       | #59, 1.13 mm OD   | MCB2G-RH-59-LLL-SMAP103        |
| MCB2 to SMAP Reverse Polarity (RP) | #59, 1.13 mm OD   | MCB2G-RH-59-LLL-SMAP181        |

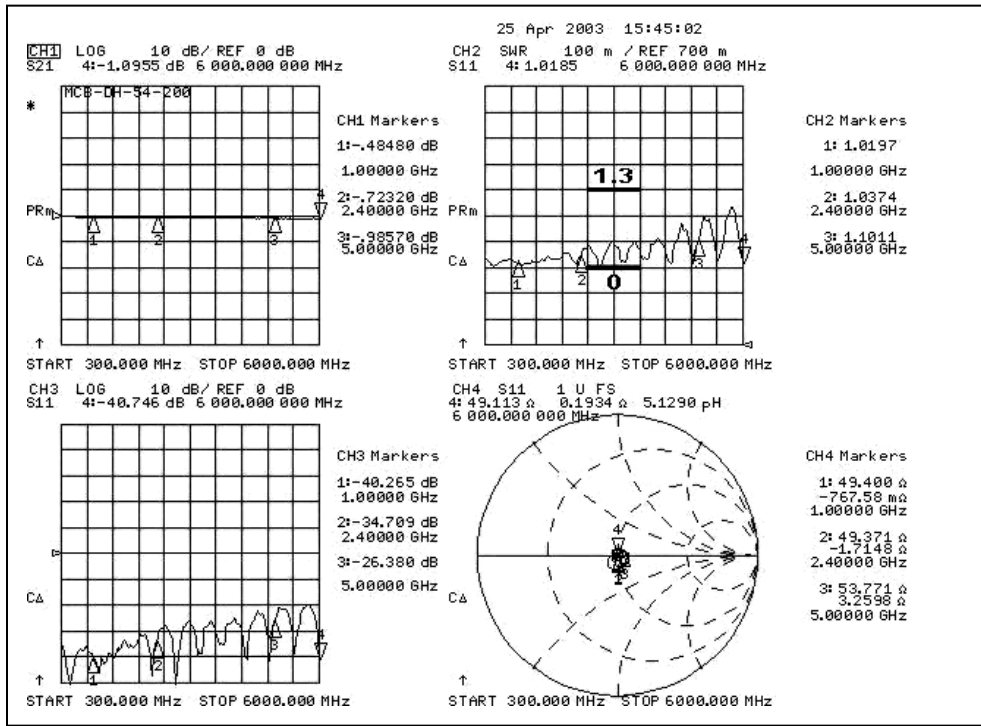
P/N Selection (referring to catalog P.2): For MCB silver-plated option, use MCB- or MCB2- prefix. For 2.5mm mated height, use MCBG (or MCB) prefix; for 2.0mm mated height application, use MCB2G (or MCB2) prefix.

# Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height



## Performance Measurement Reference:

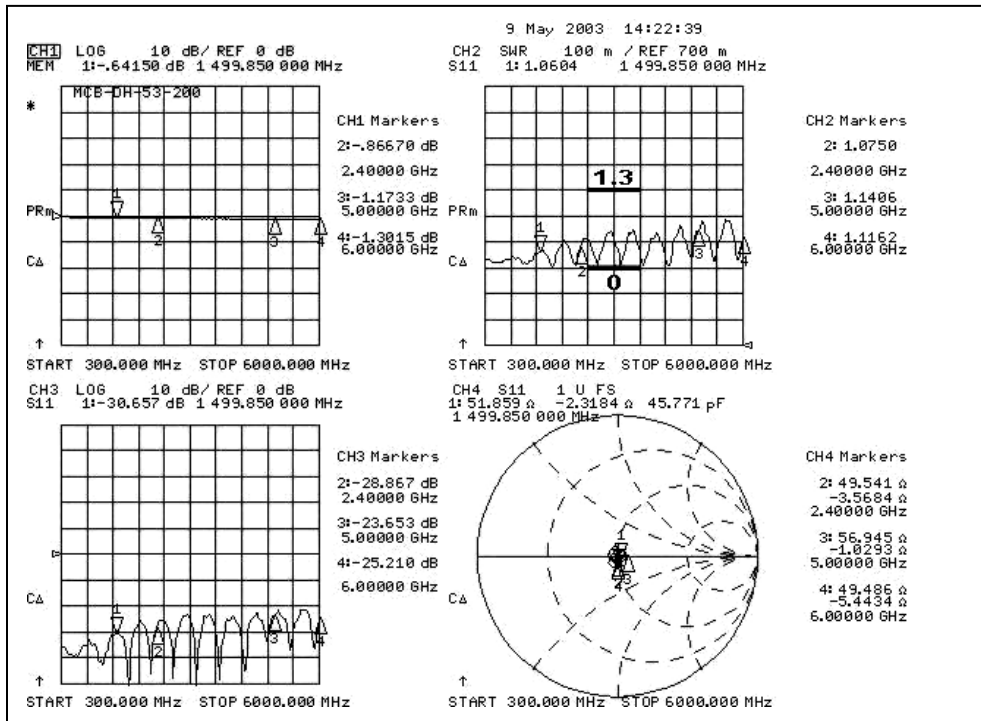
(Test sample: MCB dual head cable assy, 200mm; Test instrument: Agilent 8753ES network analyzer.)



### MCB-DH-54-200

Length: 200mm  
Cable Code: #54  
OD: 1.33mm  
Inner Conductor: 0.24mm  
Dielectric: 0.88mm  
Outer Conductor: 1.13mm  
Jacket: 1.33mm

RG178 grade



### MCB-DH-53-200

Length: 200mm  
Cable Code: #53  
OD: 1.32mm  
Inner Conductor: 0.24mm  
Dielectric: 0.66mm  
Outer Conductor: 1.12mm, double shielded  
Jacket: 1.32mm



[www.sunridgecorp.com](http://www.sunridgecorp.com)

Sunridge Corporation

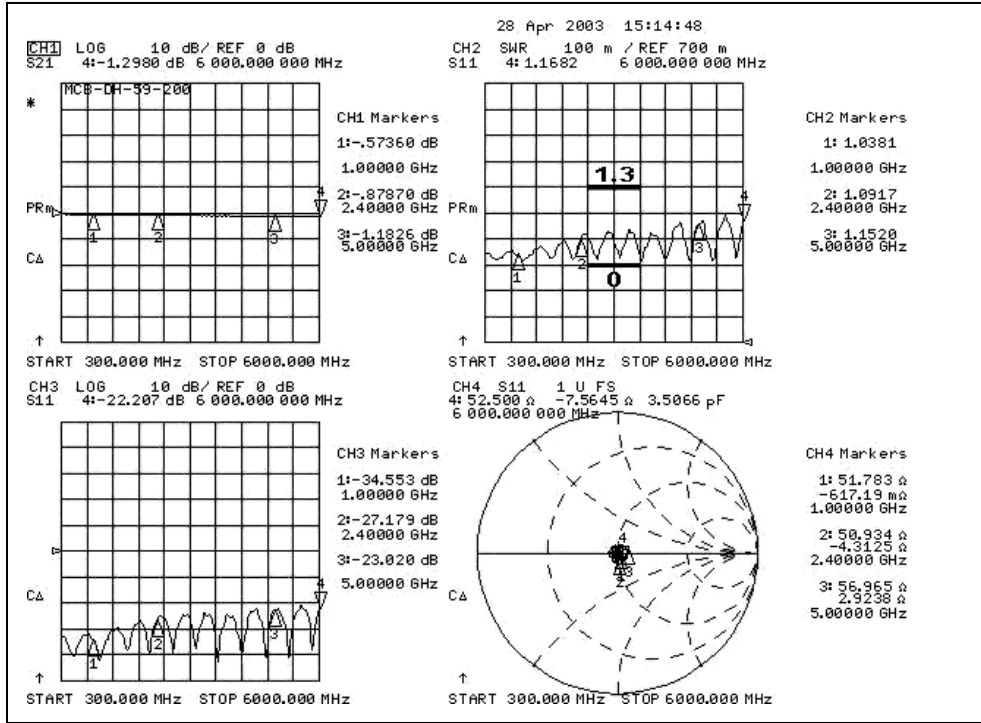
Specialist in Interconnect Solutions

# Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height



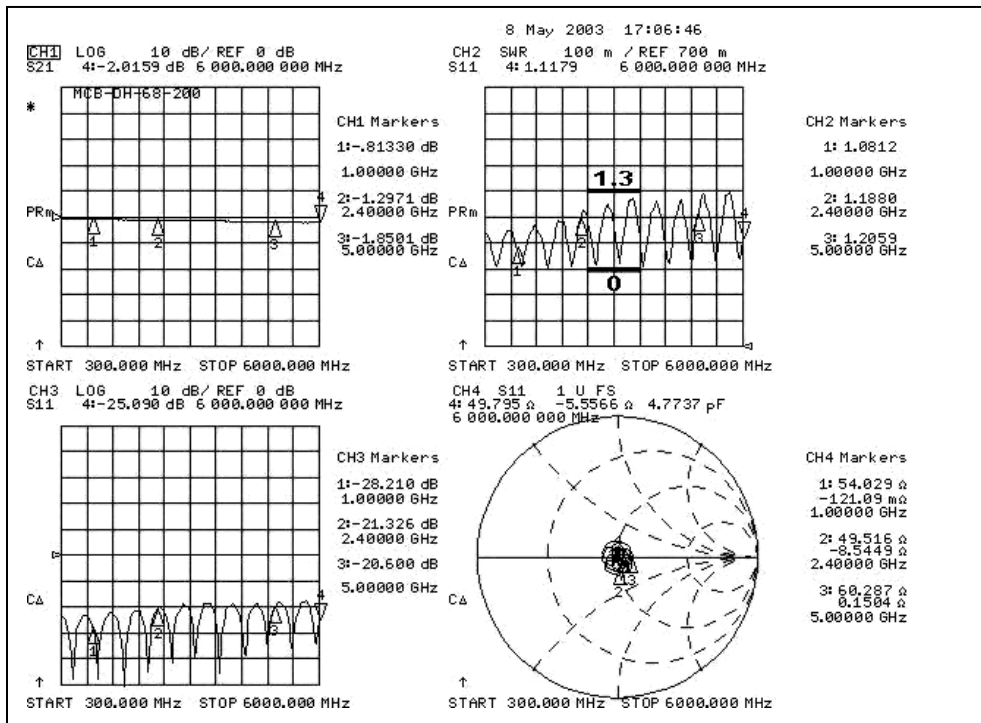
## Performance Measurement Reference:

(Test sample: MCB dual head cable assy, 200mm; Test instrument: Agilent 8753ES network analyzer.)



### MCB-DH-59-200

Length: 200mm  
Cable Code: #59  
OD: 1.13mm  
Inner Conductor: 0.24mm  
Dielectric: 0.68mm  
Outer Conductor: 0.93mm  
Jacket: 1.13mm



### MCB-DH-68-200

Length: 200mm  
Cable Code: #68  
OD: 0.81mm  
Inner Conductor: 0.15mm  
Dielectric: 0.40mm  
Outer Conductor: 0.65mm  
Jacket: 0.81mm



[www.sunridgecorp.com](http://www.sunridgecorp.com)

Sunridge Corporation

Specialist in Interconnect Solutions

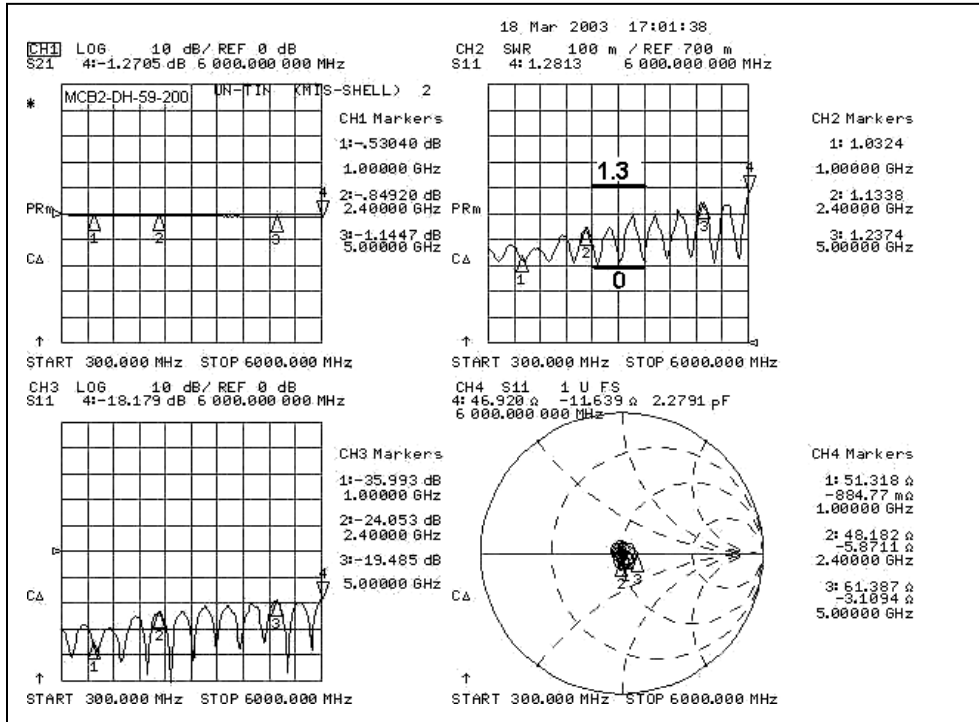


# Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height



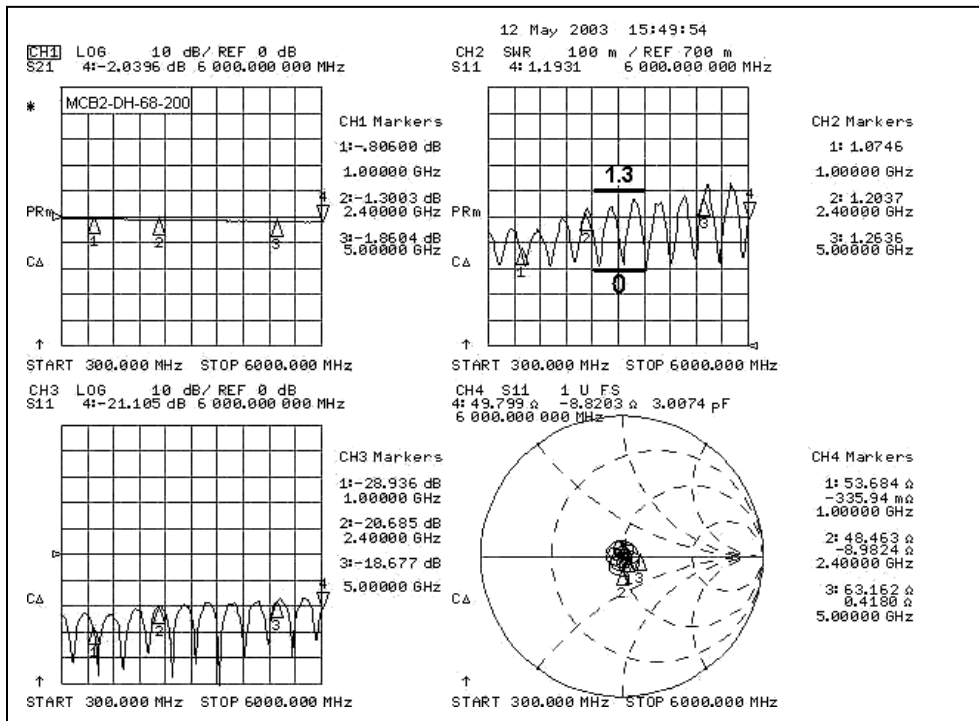
## Performance Measurement Reference:

(Test sample: MCB2 dual head cable assy, 200mm; Test instrument: Agilent 8753ES network analyzer.)



### MCB2-DH-59-200

Length: 200mm  
Cable Code: #59  
OD: 1.13mm  
Inner Conductor: 0.24mm  
Dielectric: 0.68mm  
Outer Conductor: 0.93mm  
Jacket: 1.13mm



### MCB2-DH-68-200

Length: 200mm  
Cable Code: #68  
OD: 0.81mm  
Inner Conductor: 0.15mm  
Dielectric: 0.40mm  
Outer Conductor: 0.65mm  
Jacket: 0.81mm



[www.sunridgecorp.com](http://www.sunridgecorp.com)

**Sunridge Corporation**

Specialist in Interconnect Solutions



USA Headquarters: 1-626-535-1780  
Taiwan Operations: 886-2-2906-2119  
E-mail: [sales@sunridgecorp.com](mailto:sales@sunridgecorp.com)

# Sunridge MCD Series – Ultimate Miniature Coaxial Interconnect, 1.55mm Mated Height



Sunridge MCD series coaxial product fulfills the rigorous requirements of high frequency data transmission in digital world. Constructed in supreme Teflon coax cable and advanced mechanical design, MCD delivers high electrical performance of a typical 1.3 max VSWR at 6.0GHz, while providing for a sturdy interconnection in a slim form factor of 2.0mm x 2.0mm footprint by 1.55mm mated height.

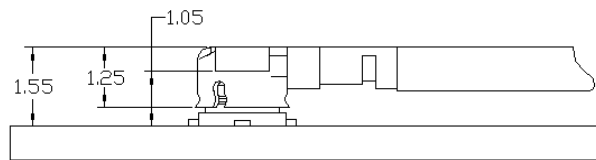


**Typical Application:**  
Smart cell phone, portable or wearable information devices, such as GPS receiver in wrist watch form factor, or hand-free sunglass cell phone.

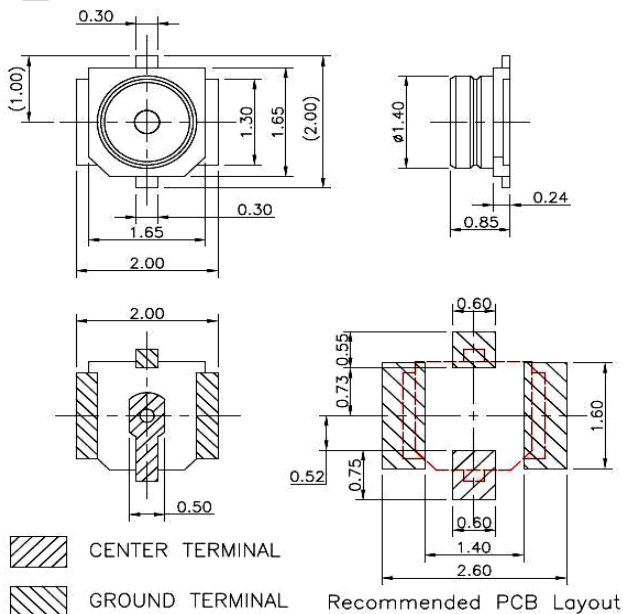
## Features

- Space Economy: 2.0mm x 2.0mm PCB footprint, mated height of 1.55mm.
- Teflon Cable s: Silver plated center conductor, Teflon dielectric and jacket.
- Cable Options: 0.81mm OD for routing flexibility; 0.91mm OD (with copper foil shield) for low insertion loss; 0.98mm OD, for structure strength.
- PCB connector: Integral molded construction ensures product reliability.
- Sturdy Connection: Lead-in and interlock features among mating pair ensure solid coupling.
- Accessory: Insertion/extraction tool, test adapters for connection to MCD cable head and PCB connector.

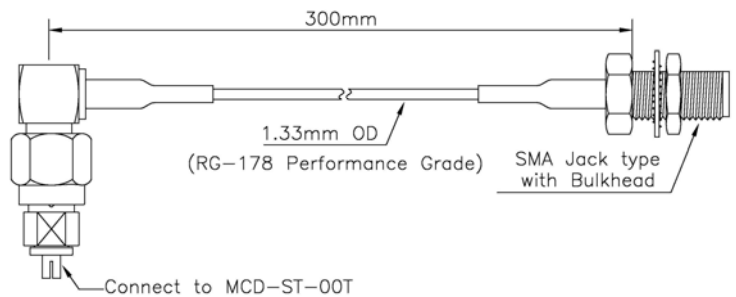
## Form Factor



## PCB Connector Pn: MCD-ST-00T



## MCD Test Probe Pn: MCD-TP-LLL-SMAJB207 (For Production Test on MCD-ST-00T)



Note: For "SMA Plug" fitting, specify Pn MCD-TP-300-SMAP205

| Characteristics       |                |
|-----------------------|----------------|
| Frequency Range       | DC to 6GHz     |
| Nominal Impedance     | 50 ohm         |
| Temperature Range     | -40°C to +90°C |
| Contact Resistance    | 25m ohm max    |
| Withstanding Voltage  | AC 200Vrms     |
| Insulation Resistance | 500M ohm min   |
| Durability            | 20 Cycles      |

[www.sunridgecorp.com](http://www.sunridgecorp.com)



(dimension: mm)

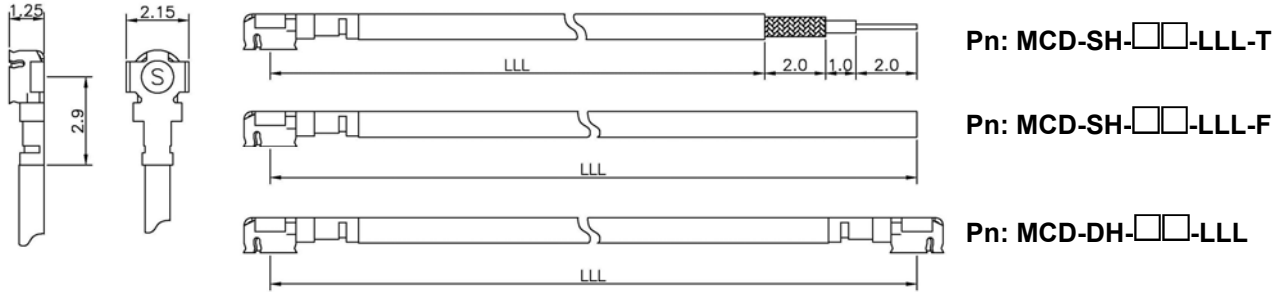


**Sunridge Corporation**

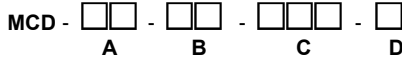
*Specialist in Interconnect Solutions*



**MCD Cable Assembly**



**P/N Designation**

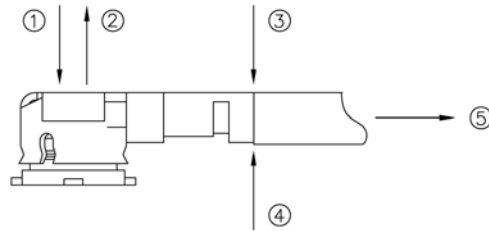


- A. Head Configuration:** SH: Single-Headed Cable construction  
DH: Double-Headed Cable construction
- B. Coaxial Cable Code:** see cable selection guide
- C. Length (in mm):** Ex: LLL = 200: 200mm.
- D. End Cut (SH only):** T : open end striped & tinned.  
F : open end flat cut

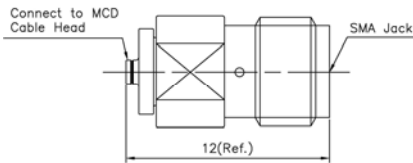
**Insertion/Extraction Tool Pn: ET-MCD**



**Mechanical Application**



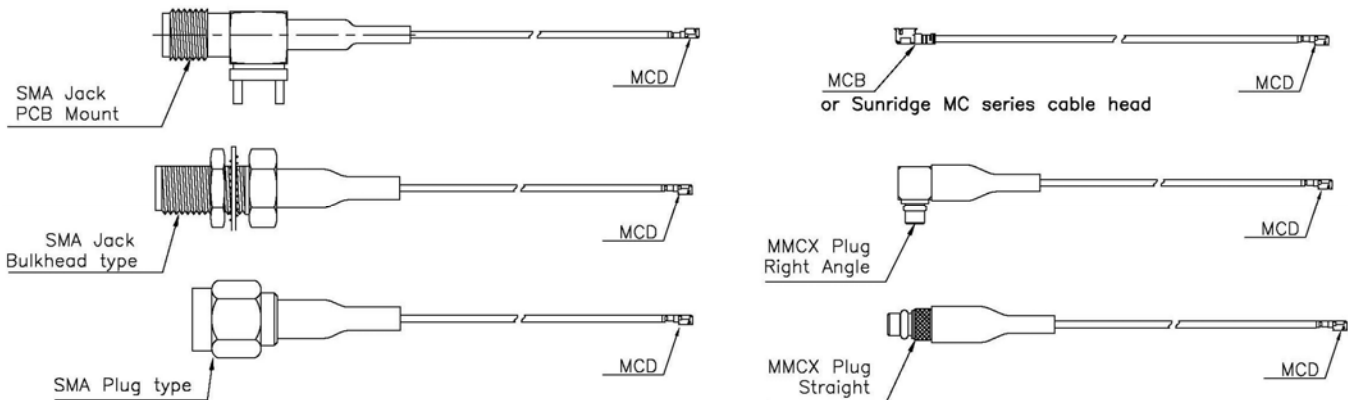
**Test Adaptor Pn: MCDP-SMAJ**  
(Connection to Network Analyzer)



- ① Insertion force (with tool): 600gf.
  - ② Extraction force (with tool): 400gf.
  - ③ Retention, downward force: 200gf max.
  - ④ Retention, upward force: 200gf max.
  - ⑤ Retention, pull back: 400gf max
- Durability: 20 cycles

**Integrated Solution**

MCD- cable head is typically integrated with another R/F connector for a variety of applications, such as from module to host board or to panel fitting. Sunridge is committed to support customers' integration requirement. Send your project inquiry to [engineering@sunridgecorp.com](mailto:engineering@sunridgecorp.com) for an effective solution.



[www.sunridgecorp.com](http://www.sunridgecorp.com)

(dimension: mm)



## Cable Selection Guide

| Cable Designation Code     |                   |           | #62                            | #60                       | #68                       |
|----------------------------|-------------------|-----------|--------------------------------|---------------------------|---------------------------|
| Inner conductor            | No. and Dia.      | (No./mm)  | 7/0.07                         | 7/0.064                   | 7/0.05                    |
|                            | Material          | —         | Silver plated copper wire      | Silver plated copper wire | Silver plated copper wire |
|                            | Total Dia.        | (mm)      | 0.21                           | 0.192                     | 0.15                      |
| Dielectric                 | Material          | —         | FEP                            | FEP                       | PFA                       |
|                            | Total Dia.        | (mm)      | 0.63                           | 0.53                      | 0.4                       |
| Outer conductor            | Material          | —         | Tinned copper wire/copper tape | Tinned copper wire        | Silver plated copper wire |
|                            | Dia. of wire      | (mm)      | 0.05                           | 0.05                      | 0.05                      |
|                            | Total Dia.        | (mm)      | 0.80                           | 0.78                      | 0.65                      |
| Jacket                     | Material          | —         | FEP                            | FEP                       | PFA                       |
|                            | Nominal thickness | (mm)      | 0.05                           | 0.1                       | 0.08                      |
| Overall Dia.               |                   | (mm)      | 0.91                           | 0.98                      | 0.81                      |
| Nominal impedance          |                   | (Ohm)     | 50                             | 50                        | 50                        |
| Voltage rating             |                   | Vrms Max. | 300                            | 300                       | 300                       |
| Nominal static capacitance |                   | (pF/m)    | 97                             | 97                        | 96                        |
| Insertion loss             | dB/m at 1GHz      |           | 2.00                           | 2.66                      | 3.53                      |
|                            | dB/m at 2GHz      |           | 2.60                           | 3.82                      | 5.17                      |
|                            | dB/m at 2.4GHz    |           | 3.10                           | 4.45                      | 5.71                      |
|                            | dB/m at 3GHz      |           | 3.50                           | 4.73                      | 6.45                      |
|                            | dB/m at 5GHz      |           | 4.00                           | 6.21                      | 8.53                      |
|                            | dB/m at 6GHz      |           | 4.40                           | 7.45                      | 9.42                      |

## Application Note:

### ● #68 Cable of 0.81mm OD:

Feature: Thin and flexible. Good for short-length application that requires maximum flexibility and minimum pull-strain.

Suitable for: (1.) MCD-SH-68-LLL-T, single head cable assy with stripped end, for soldering directly to PCB. (2.) Board to board connection between two Sunridge MC- series PCB connectors, e.g., MCD-to-MCD or MCD-to-MCB (if the other end is free of the height constraint of 1.55mm) cable assy, etc. (3.) MCD-to-RF cable assy, such as MCD to SMA Jack (either panel mount or PCB mount) for connection to external antenna.

### ● #60 Cable of 0.98mm OD:

Features: Lower insertion loss. Strong mechanical structure.

Suitable for: (1.) MCD-SH-60-LLL-T, single head cable assy with stripped end, for soldering directly to PCB. (2.) Board to board connection between two Sunridge MC- series PCB connectors, e.g., MCD-to-MCD or MCD-to-MCB (if the other end is free of the height constraint of 1.55mm) cable assy, etc. (3.) MCD-to-RF cable assy, such as MCD to SMA Jack (either panel mount or PCB mount) for connection to external antenna.

### ● #62 Cable of 0.91mm OD:

Features: Very low insertion loss, and good EMI-shielding.

Caution: #62 cable is highly heat sensitive; thus, it should NOT be used for subsequent manual soldering. MCD-SH-62-LLL-T is NOT recommended for soldering directly to PCB or for assembly with another RF connector.

Suitable for: (1.) Board to board connection between two Sunridge MC- series PCB connectors, e.g., MCD-to-MCD or MCD-to-MCB (if the other end is free of the height constraint of 1.55mm) cable assy, etc. (2.) For low insertion-loss and low EMI requirement, Sunridge can offer MCD-to-RF cable assy solution with #62 cable, such as MCD to SMA Jack, upon customer's request.

[www.sunridgecorp.com](http://www.sunridgecorp.com)

(dimension: mm)



**Sunridge Corporation**

*Specialist in Interconnect Solutions*

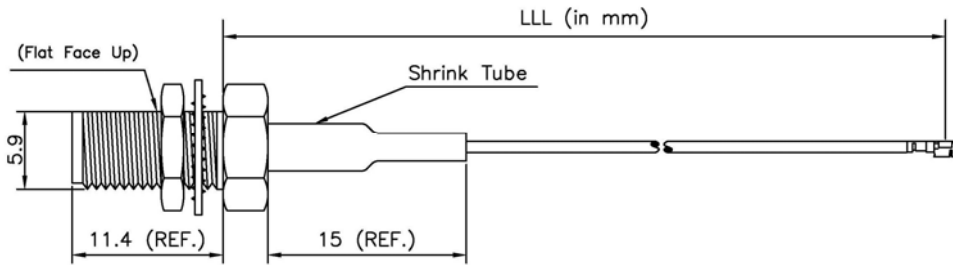




**MCD- Derivative Cable Assembly P/N Selector:**

(Illustration of the most commonly used MCD-RF cable assy. A variety of other RF configurations is readily available at Sunridge Corp. Contact [engineering@sunridgecorp.com](mailto:engineering@sunridgecorp.com) for project inquiry.)

■ **MCD to SMA Bulkhead Jack (Panel Mount) Cable Assembly:**

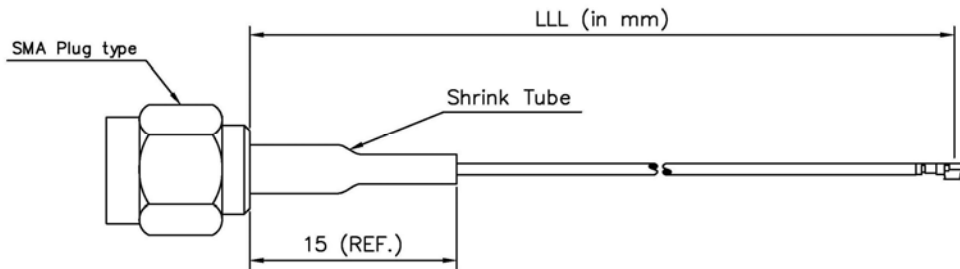


| Range            | Tolerance |
|------------------|-----------|
| 50 < LLL < 100   | ± 2       |
| 100 < LLL < 200  | ± 3       |
| 300 < LLL < 300  | ± 5       |
| 300 < LLL < 500  | ± 10      |
| 500 < LLL < 1000 | ± 25      |
| 1000 < LLL       | ±60       |

LLL: Length in mm. e.g., LLL = 200 means 200mm; LLL = 073 means 73mm

| Descriptions                       | Recommended Cable | Sunridge P/N           |
|------------------------------------|-------------------|------------------------|
| MCD to SMAJB                       | #60, 0.98 mm OD   | MCD-RH-60-LLL-SMAJB103 |
| MCD to SMAJB Reverse Polarity (RP) | #60, 0.98 mm OD   | MCD-RH-60-LLL-SMAJB181 |
| MCD to SMAJB with O-Ring Seal      | #60, 0.98 mm OD   | MCD-RH-60-LLL-SMAJB105 |
| MCD to SMAJB RP with O-ring Seal   | #60, 0.98 mm OD   | MCD-RH-60-LLL-SMAJB183 |

■ **MCD to SMA Plug Cable Assembly:**



| Range            | Tolerance |
|------------------|-----------|
| 50 < LLL < 100   | ± 2       |
| 100 < LLL < 200  | ± 3       |
| 300 < LLL < 300  | ± 5       |
| 300 < LLL < 500  | ± 10      |
| 500 < LLL < 1000 | ± 25      |
| 1000 < LLL       | ±60       |

LLL: Length in mm. e.g., LLL = 200 means 200mm; LLL = 073 means 73mm

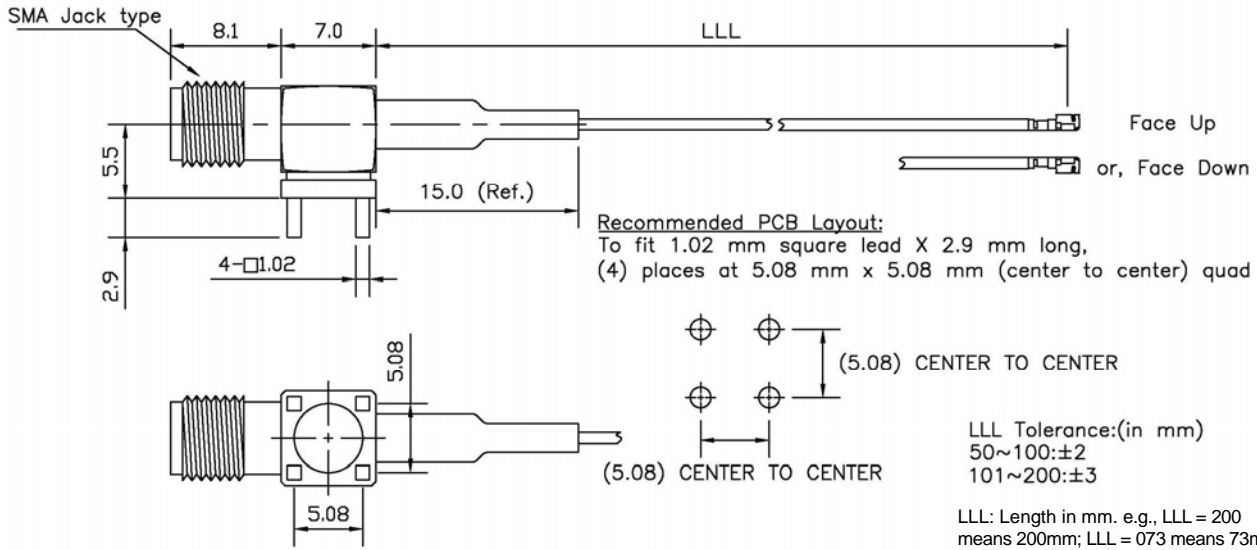
| Descriptions                      | Recommended Cable | Sunridge P/N          |
|-----------------------------------|-------------------|-----------------------|
| MCD to SMAP                       | #60, 0.98 mm OD   | MCD-RH-60-LLL-SMAP103 |
| MCD to SMAP Reverse Polarity (RP) | #60, 0.98 mm OD   | MCD-RH-60-LLL-SMAP181 |







**MCD to SMA Jack (PCB Mount) Cable Assembly:**



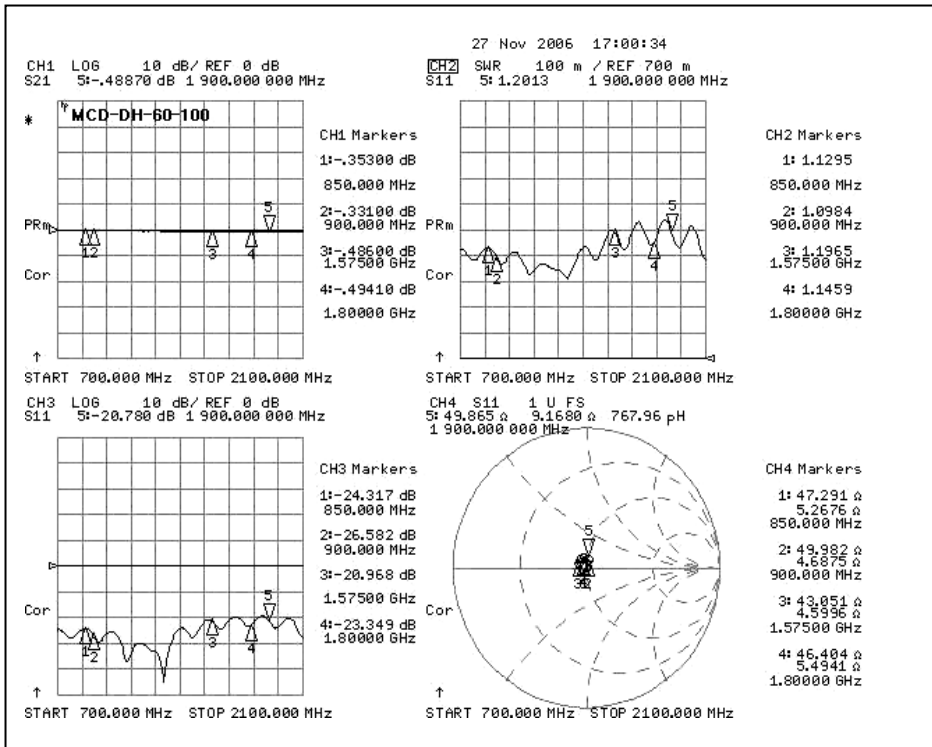
| Descriptions  | Recommended Cable | Sunridge P/N              |
|---|-------------------|---------------------------|
| MCD to SMAJ PCB Mount (Converse Orientation, MCD Faces Up)  | #60, 0.98 mm OD   | MCD-RH-60-LLL-SMAJX105-R1 |
| MCD to SMAJ PCB Mount (Regular Orientation, MCD Faces Down) | #60, 0.98 mm OD   | MCD-RH-60-LLL-SMAJX105    |

**Performance Measurement Reference:**

(Test sample: MCD dual head cable assy; Test instrument: Agilent 8753ES.)

**MCD-DH-60-100**

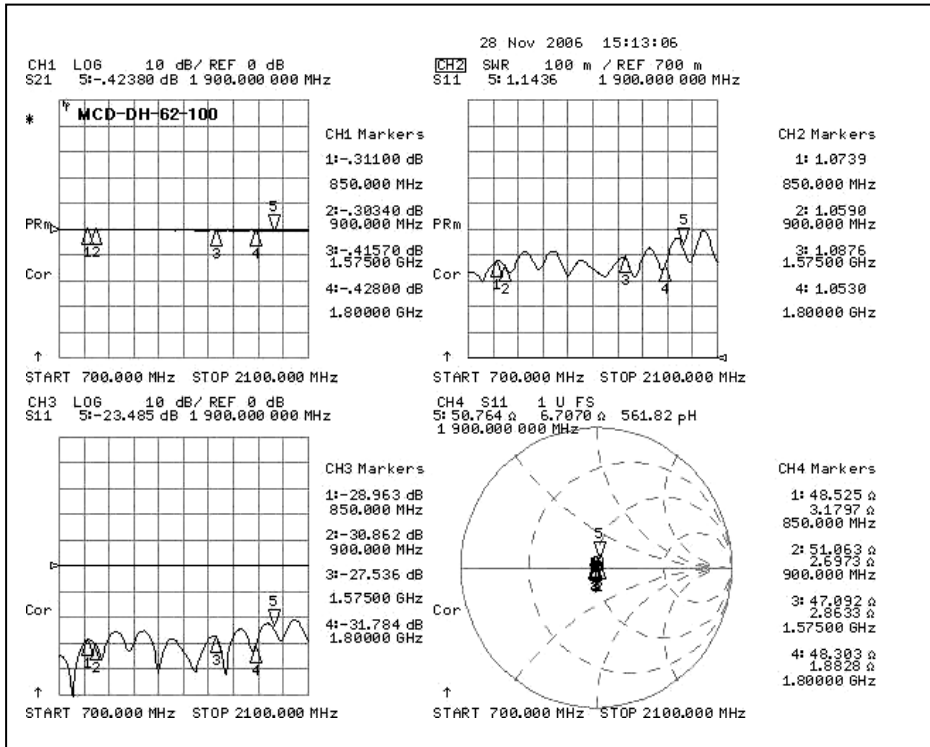
Length: 100mm  
 Cable Code: #60  
 OD: 0.98mm  
 Inner Conductor: 0.192mm  
 Dielectric: 0.53mm  
 Outer Conductor: 0.78mm  
 Jacket: 0.98mm





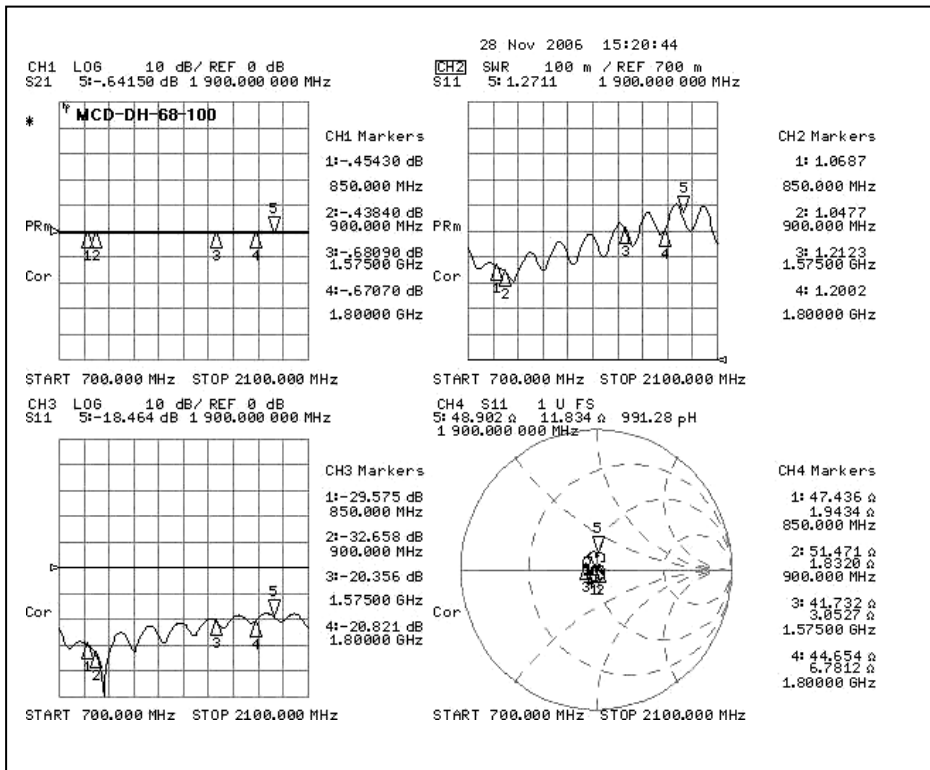
**Performance Measurement Reference:**

(Test sample: MCD dual head cable assy,100mm;Test instrument: Agilent 8753ES.)



**MCD-DH-62-100**

Length: 100mm  
Cable Code: #62  
OD: 0.90mm  
Inner Conductor: 0.21mm  
Dielectric: 0.63mm  
Outer Conductor(Copper PET):0.65mm  
Outer Conductor: 0.80mm  
Jacket: 0.90mm



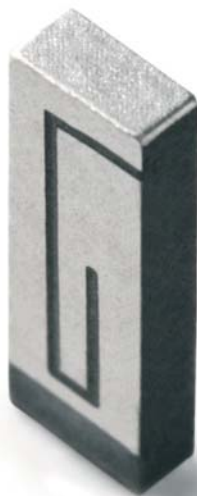
**MCD-DH-68-100**

Length: 100mm  
Cable Code: #68  
OD: 0.81mm  
Inner Conductor: 0.15mm  
Dielectric: 0.4mm  
Outer Conductor: 0.65mm  
Jacket: 0.81mm



# Dualband WLAN Ceramic Chip Antenna

Ground cleared under antenna 11.60 x 6.00 mm. Pulse Part Number: W3006



## Features

- Omnidirectional radiation
- Low profile
- Compact size WxLxH (10.0 x 3.2 x 1.5 mm)
- Low weight (240 mg)
- Fully SMD compatible
- Lead free soldering compatible
- Tape and reel packing
- RoHS Compliant Product
- Single feed point

## Applications

- IEEE 802.11a/b/g
- 5 GHz WLAN
- 2.4 GHz WLAN
- 2.4 GHz ISM Band Systems
- ZigBee IEEE 802.15.4

## Electrical specifications @ +25 °C

*Note: Electrical characteristics depend on test board (GP) size and antenna positioning on GP and Ground Clearance area size.*

## Dualband WLAN

Typical performance (testboard size 80 x 37 mm, PWB ground clearance area 11.60 x 6.00 mm)  
1.5nH shunt inductor used for impedance matching.

| Frequency Range [MHz] | Max Gain [dBi]                 | Efficiency [%] / [dB]                        | Return loss min. [dB] | Impedance [Ω] | Operating Temperature [°C] |
|-----------------------|--------------------------------|--|-----------------------|---------------|----------------------------|
| 2400–2483.5           | 3.2 (peak)<br>2.7 (band edges) | 70 / -1.55 (peak)<br>65 / -1.85 (band edges) | -8                    | 50            | -40 to +85                 |
| 5150–5850             | 4.2 (peak)<br>3.0 (band edges) | 80 / -0.95 (peak)<br>70 / -1.55 (band edges) | -10                   | 50            | -40 to +85                 |

## Pulse Finland Oy

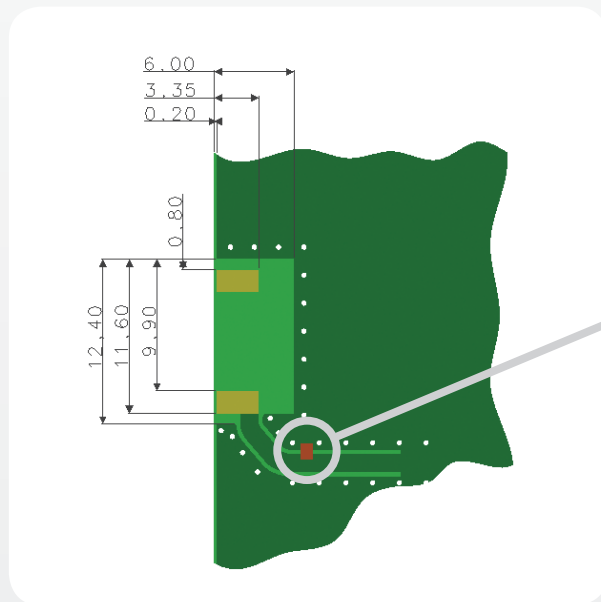
Takatie 6  
90440 Kempele, Finland  
Tel: +358 207 935 500  
Fax: +358 207 935 501  
[www.pulseeng.com/antennas](http://www.pulseeng.com/antennas)



# Dualband WLAN Ceramic Chip Antenna

Ground cleared under antenna 11.60 x 6.00 mm. Pulse Part Number: W3006

**Recommended test board layout for electrical characteristic measurement,  
test board outline size 80 x 37mm**



Shunt matching inductor,  
1.5nH with presented setup.  
Exact inductor value depends  
on specific application.

Feed line should be designed to match 50  $\Omega$  characteristic impedance, depending on PWB material and thickness.

## Pulse Finland Oy

Takatie 6  
90440 Kempele, Finland  
Tel: +358 207 935 500  
Fax: +358 207 935 501

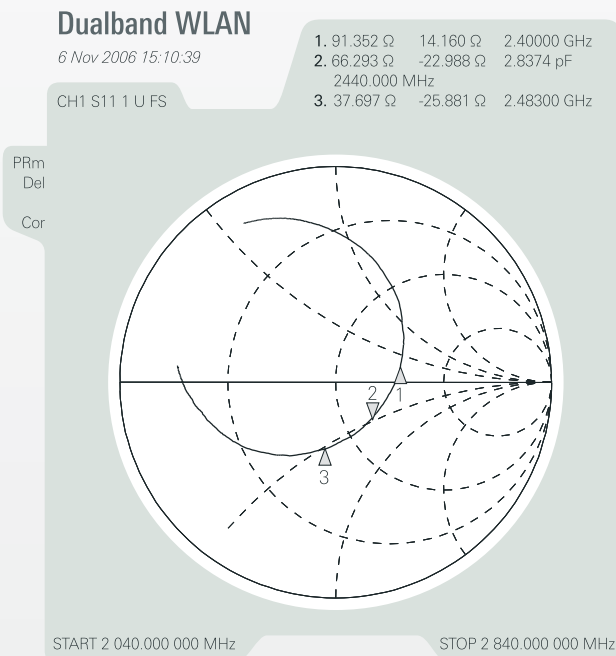
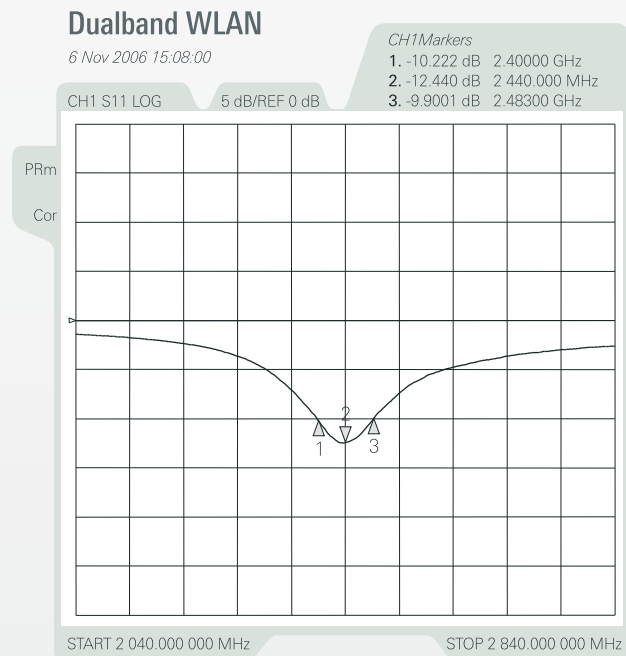
[www.pulseeng.com/antennas](http://www.pulseeng.com/antennas)

# Dualband WLAN Ceramic Chip Antenna

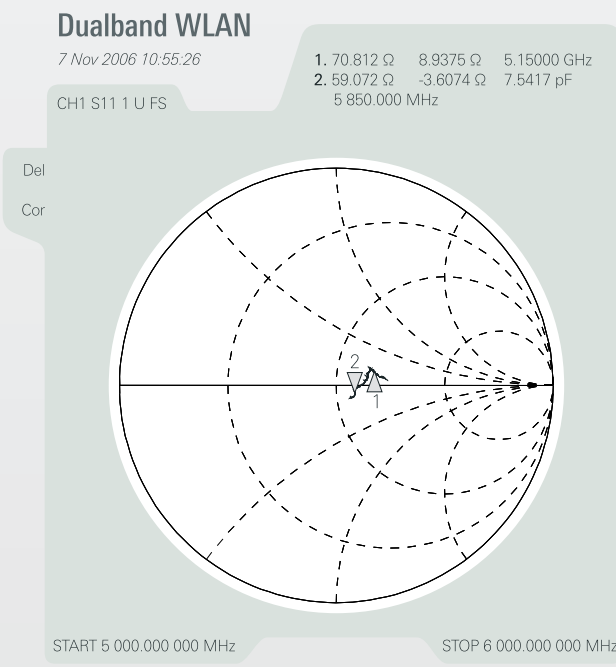
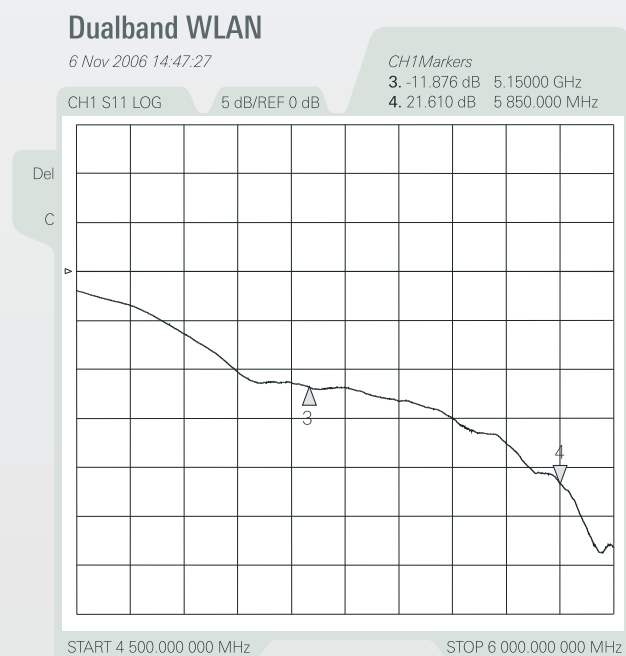
Ground cleared under antenna 11.60 x 6.00 mm. Pulse Part Number: W3006

## Typical Electrical Characteristics (T=25 °C)

2,4 GHz Typical Return Loss S11/ impedance, measured on the test board



5GHz Typical Return Loss S11/ impedance, measured on the test board



**Pulse Finland Oy**

Takatie 6  
90440 Kempele, Finland  
Tel: +358 207 935 500  
Fax: +358 207 935 501  
[www.pulseeng.com/antennas](http://www.pulseeng.com/antennas)

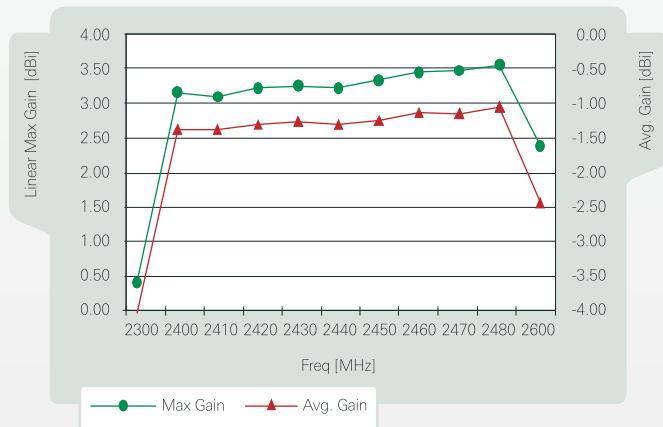


# Dualband WLAN Ceramic Chip Antenna

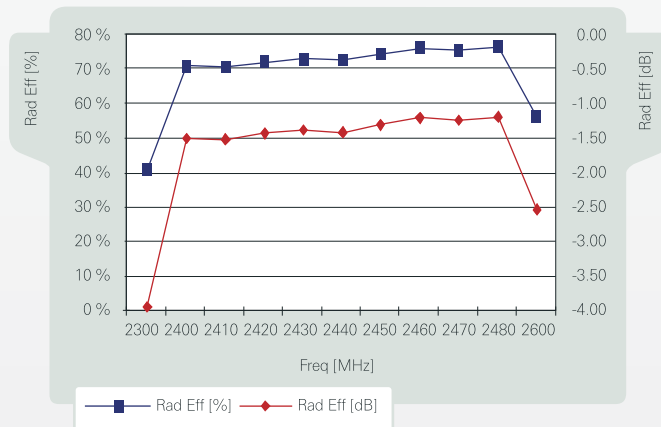
Ground cleared under antenna 11.60 x 6.00 mm. Pulse Part Number: W3006

## 2,4 GHz free space efficiency and maximum gain

DualBand WiFi 2.4G 10 x 3.2 x 1.5 mm

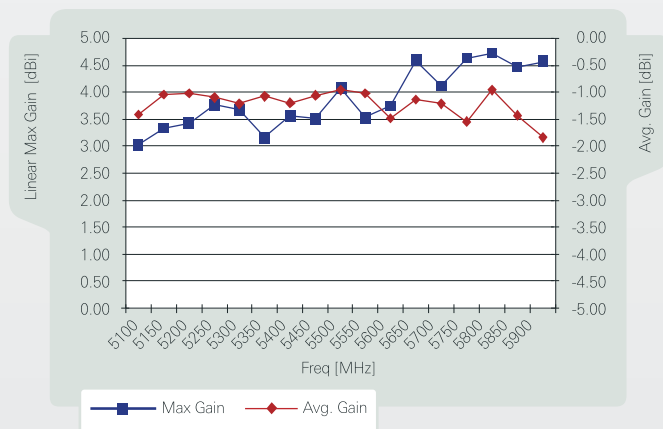


DualBand WiFi 2.4G 10 x 3.2 x 1.5 mm

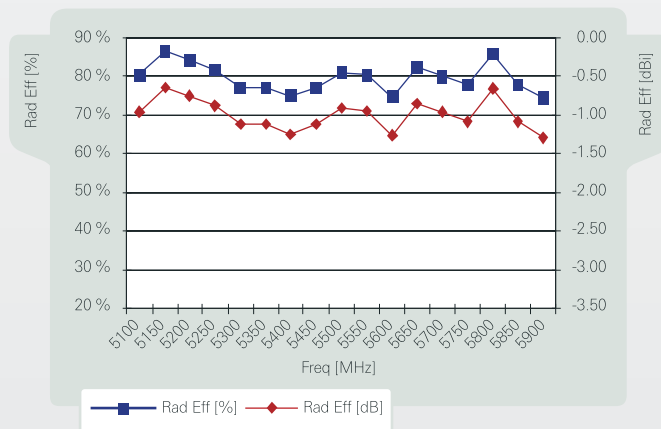


## 5 GHz free space efficiency and maximum gain

DualBand WiFi 5G 10 x 3.2 x 1.5 mm



DualBand WiFi 5G 10 x 3.2 x 1.5 mm



### Pulse Finland Oy

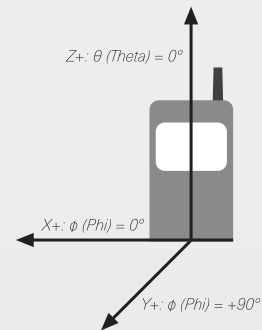
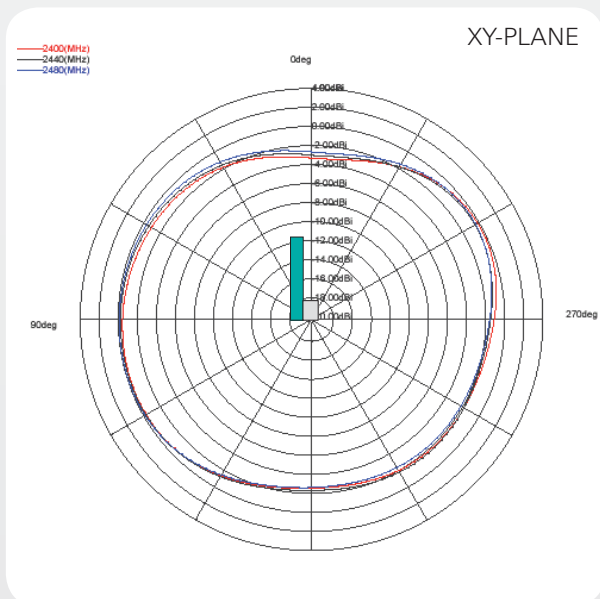
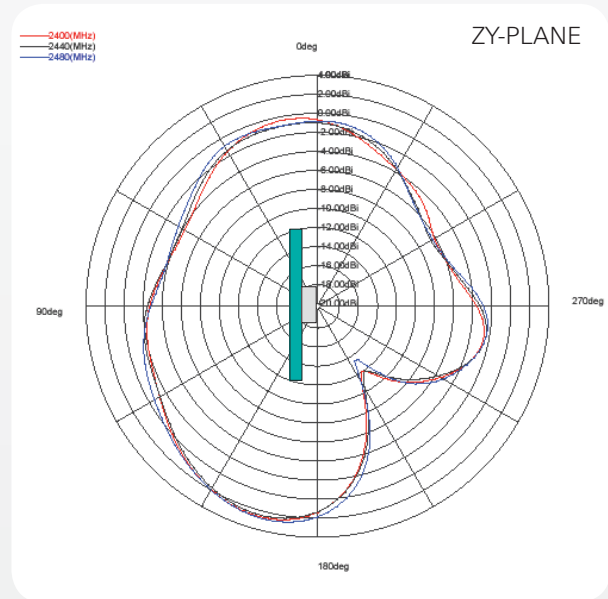
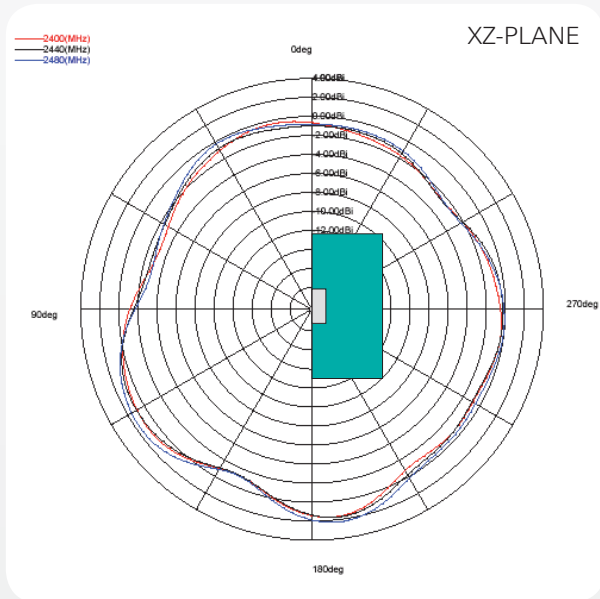
Takatie 6  
 90440 Kempele, Finland  
 Tel: +358 207 935 500  
 Fax: +358 207 935 501  
[www.pulseeng.com/antennas](http://www.pulseeng.com/antennas)



# Dualband WLAN Ceramic Chip Antenna

Ground cleared under antenna 11.60 x 6.00 mm. Pulse Part Number: W3006

## 2,4 GHz Typical Free space Radiation Patterns



### Pulse Finland Oy

Takatie 6  
90440 Kempele, Finland  
Tel: +358 207 935 500  
Fax: +358 207 935 501

[www.pulseeng.com/antennas](http://www.pulseeng.com/antennas)



# Dualband WLAN Ceramic Chip Antenna

Ground cleared under antenna 11.60 x 6.00 mm. Pulse Part Number: W3006

## 5 GHz Typical Free space Radiation Patterns

