

## Antenna Info

Manufacturer: Pulse

Model: W1038

Gain: 4.9dBi peak

Description: Whip, Omni-directional

## Antenna Cable Info

Manufacturer: Sunridge Corporation

Model: MCBG-RH-54-080-SMAJB281

Cable Loss: 0.21dB

Description: MCB to SMAJB Reverse Polarity (RP)

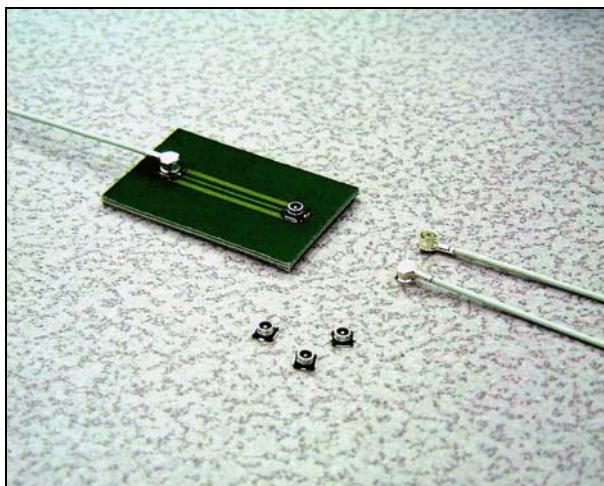
Compliance with FCC Part 15.203: The antenna cable connects to the device through a MCB (or U.FL) connector. The other end of the cable is a reverse polarity SMA connector, which is then attached to the antenna. This allows customer replacement if need, but does not use a standard antenna jack.

The Sunridge Corporation and Pulse datasheets follow.

# 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.

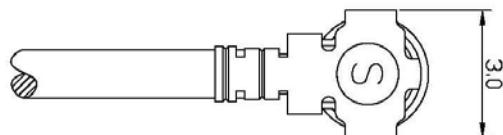


Applications: For Bluetooth, 802.11 WLAN, GPS, wireless communication designs in smart cell phone, PDA, and notebook or hand held information devices - for up to 6GHz frequency. A perfect push-button solution for antenna feedline.

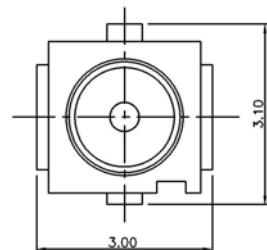
## ■ Features

- 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 crammed 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.

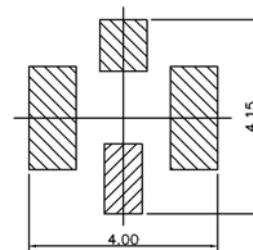
## ■ Form Factor



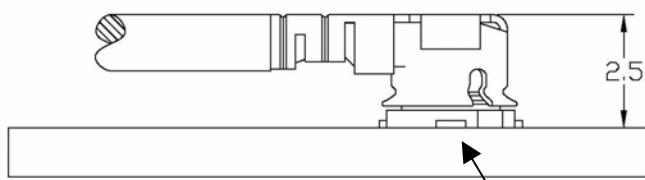
Cable Assembly (Plug)



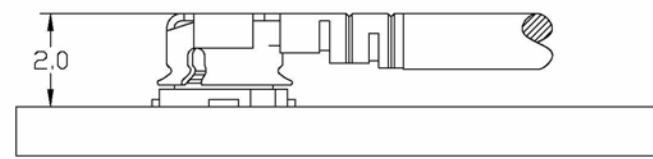
PCB Connector (Receptacle)  
Pn: MCB-ST-00T



Recommended PCB Layout



MCB Profile



MCB2 Profile  
(With same PCB connector)



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

(dimension: mm)



**Sunridge Corporation**

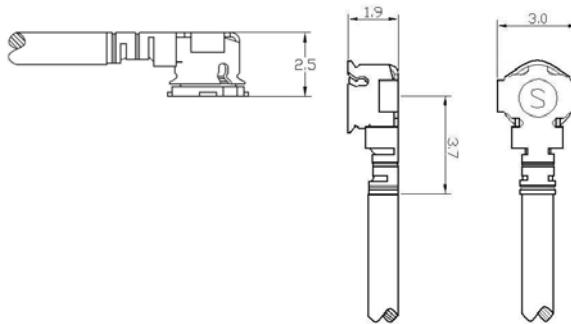
**Specialist in Interconnect Solutions**

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



## ■ MCB Cable Assembly

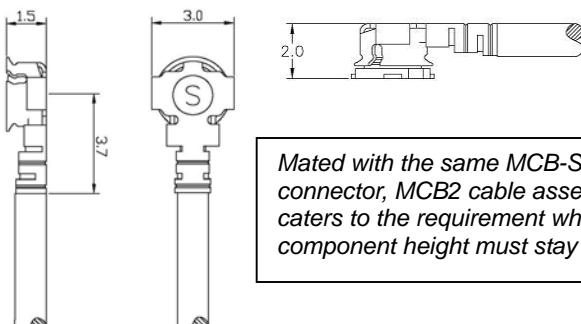
(Mate with MCB-ST-00T: 2.5mm max heights.)



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

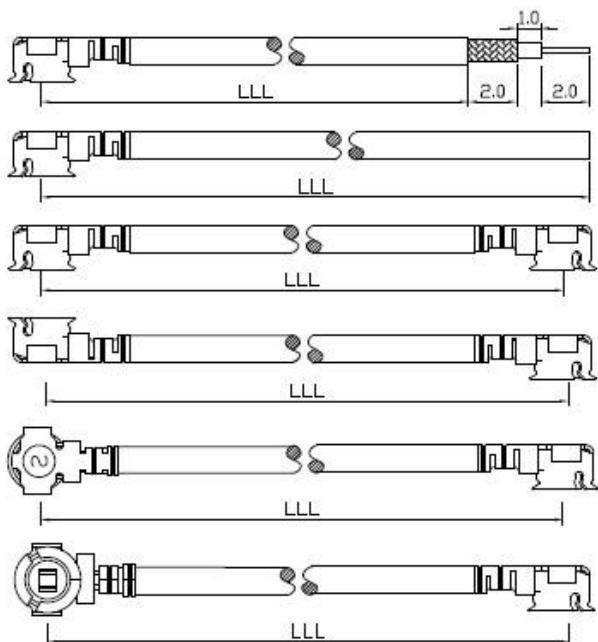
## ■ MCB2 Cable Assembly -- For Space Tight Applications

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



Mated with the same MCB-ST-00T pcb connector, MCB2 cable assembly caters to the requirement where component height must stay at 2.0mm.

**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.



### ● 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 = 053 means 53mm

**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)

**Sunridge Corporation**

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

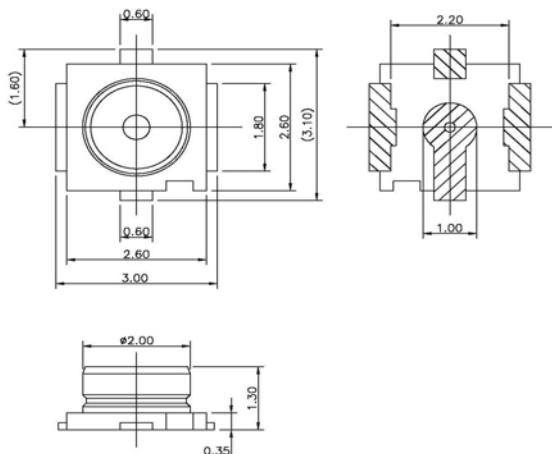
(dimension: mm)

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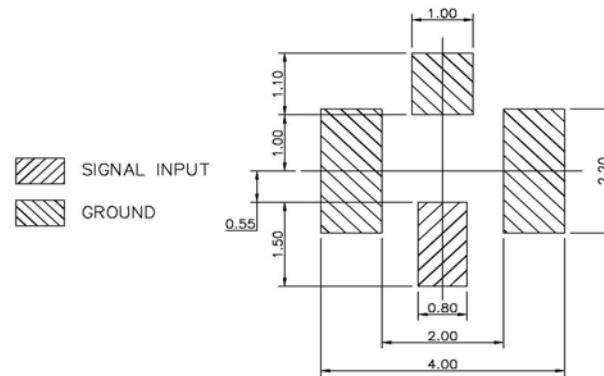


### ■ PCB Connector

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



### ■ Recommended PCB Layout



### ■ Material Spec

**Outer Contact:** Copper Alloy, Gold or Silver Plated.  
**Center Contact:** Copper Alloy, Gold Plated.

**Insulator:** Engineering Plastic.

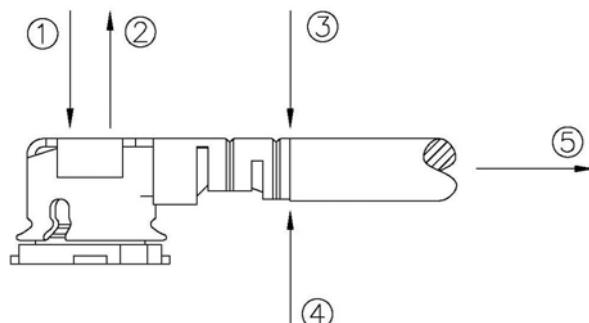
**Cable:** Silver plated center conductor with  
Teflon dielectric and jacket.

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

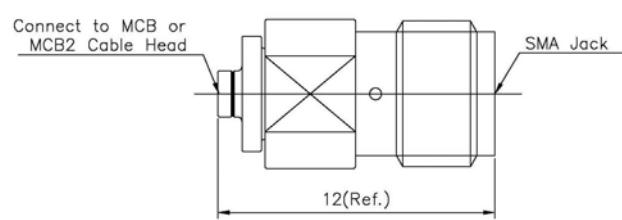


### ■ Mechanical Application:



### ■ Adapter: Pn: MCBP-SMAJ

(Connection to Network Analyzer)



MCB Plug to SMA Jack

- ① Insertion force: 500gf.
- ② Extraction force (with tool): 400gf.
- ③ Retention, downward force: 200gf max.
- ④ Retention, upward force: 200gf max.
- ⑤ Retention, pull back: 2,000gf max

Durability: 30 cycles





## Cable Selection Guide

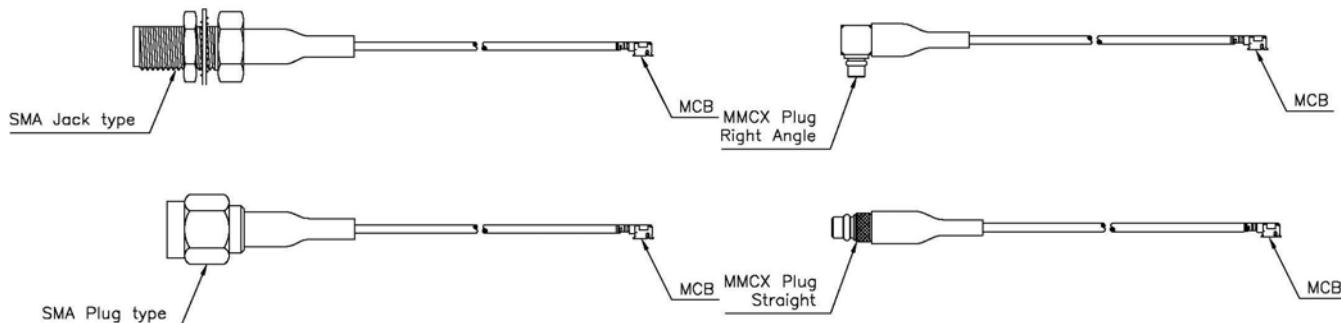
Cable Designation Code			#54 *	#56 *	#53	#59	#60	#68
Inner conductor	No. and Dia.	(No./mm)	7/0.102	1/0.26	7/0.08	7/0.08	7/0.064	7/0.05
	Material	—	Silver plated copper wire	Silver pltd/copper covered steel wire	Silver plated copper wire			
	Total Dia.	(mm)	0.305	0.26	0.24	0.24	0.192	0.15
Dielectric	Material	—	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.



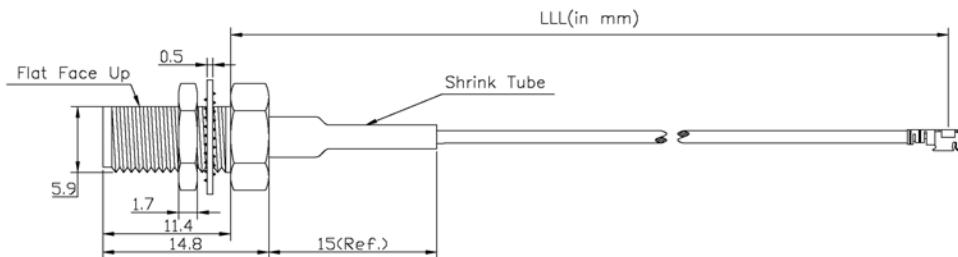
# Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height



## 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:

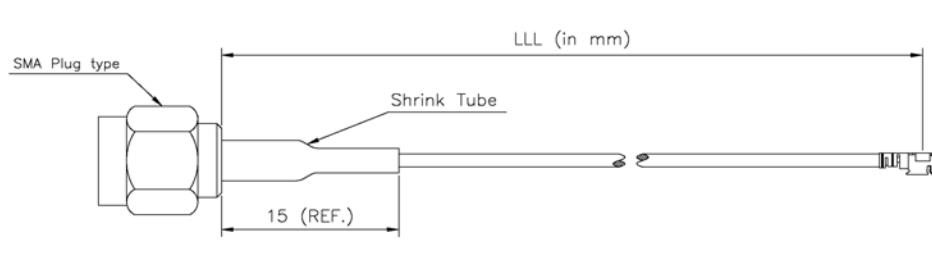


Range	Tolerance
50 < LLL < 100	± 2
100 < LLL < 200	± 3
300 < LLL < 300	± 5
300 < LLL < 500	± 10
500 < LLL < 1000	± 25
1000 < LLL	±60

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

Note: For silver-plating option of MCB head, specify MCB- or MCB2- prefix in Sunridge P/N.

### ■ 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

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

Note: For silver-plating option of MCB head, specify MCB- or MCB2- prefix in Sunridge P/N.

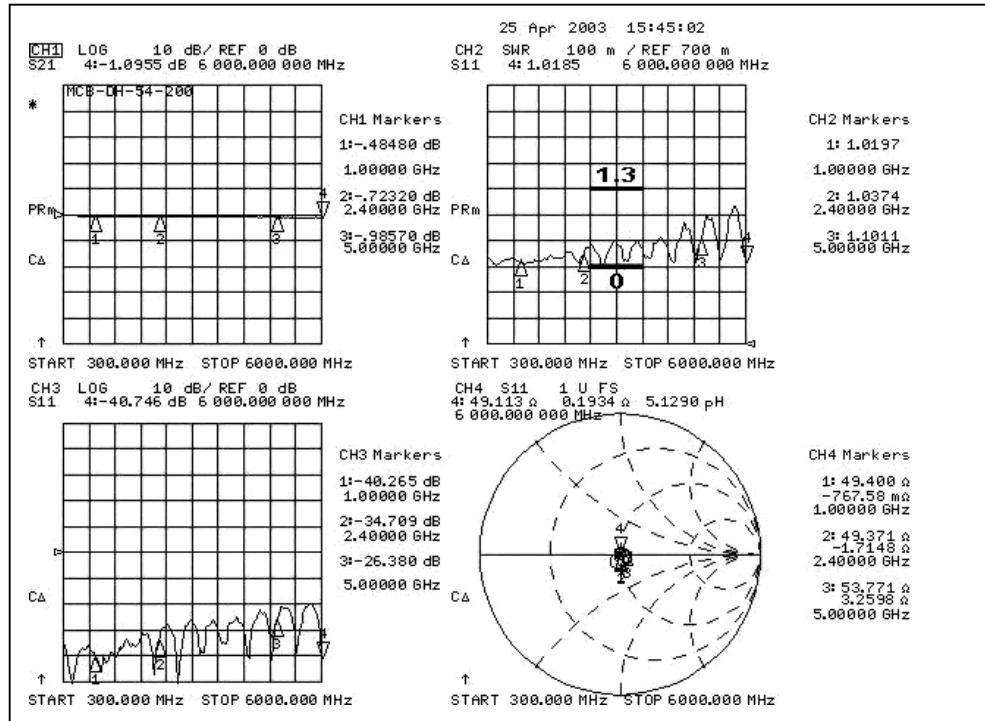


## **Sunridge MCB Series – Miniature Coaxial Interconnect, 2.5mm or 2.0mm Mated Height**



## ■ *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

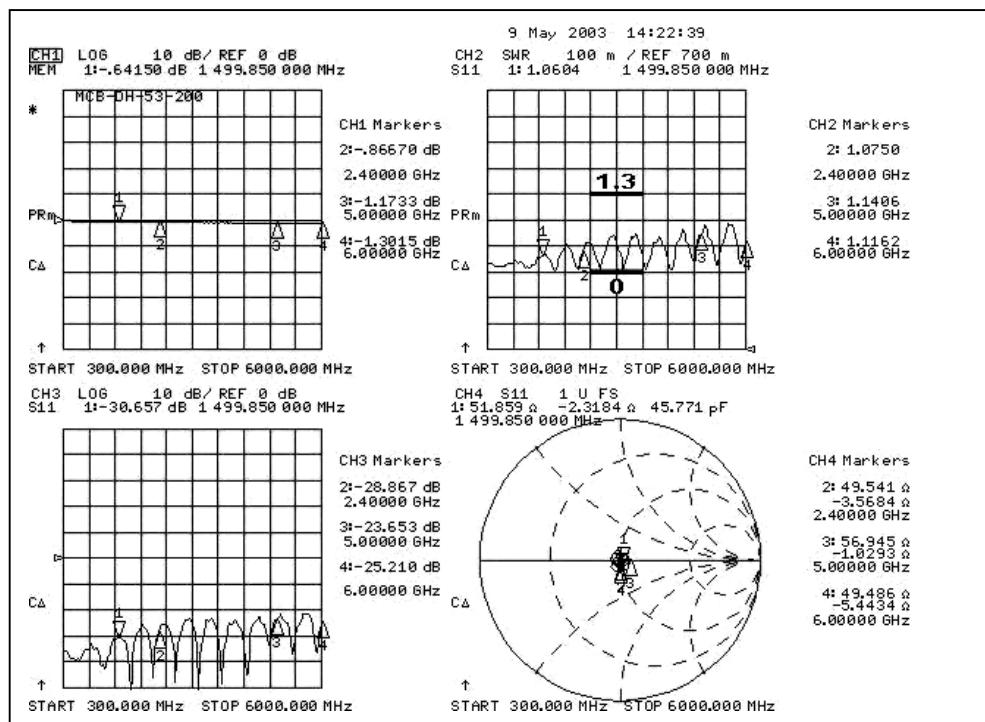
OD: 1.33mm

Inner Conductor: 0

Dielectric: 0.88mm

## Outer Conductor

RG178 grade



MCB-DH-53-200

Length: 200mm

Cable Code: #53

OD: 1.32mm

Inner Conductor: 0

Dielectric: 0.66mm

### Outer Conductor:

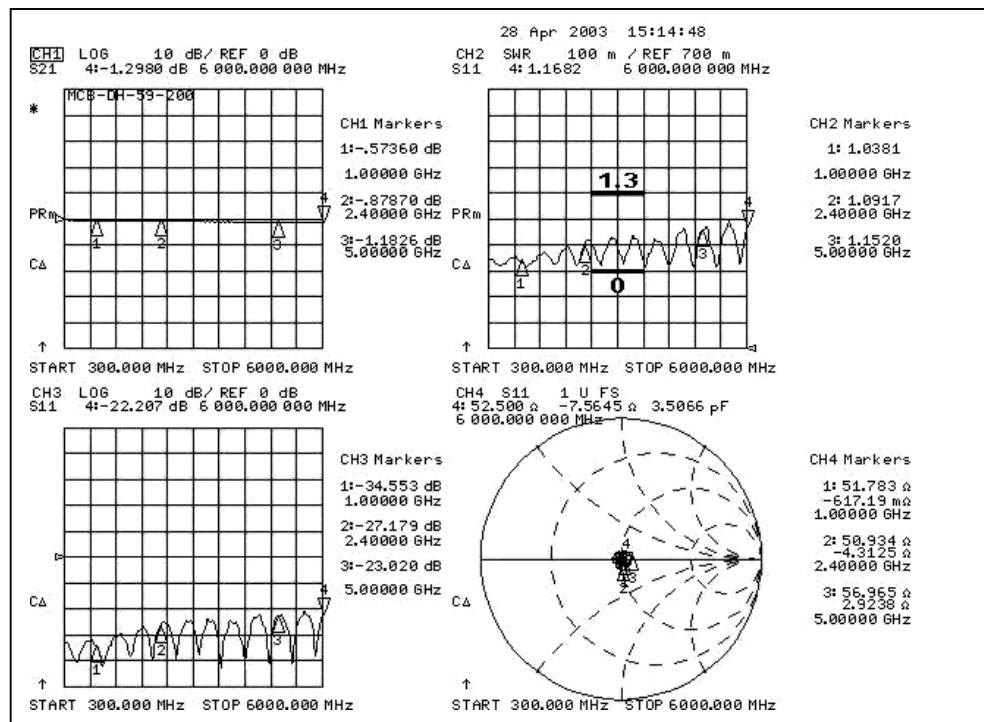
1.12mm, double

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



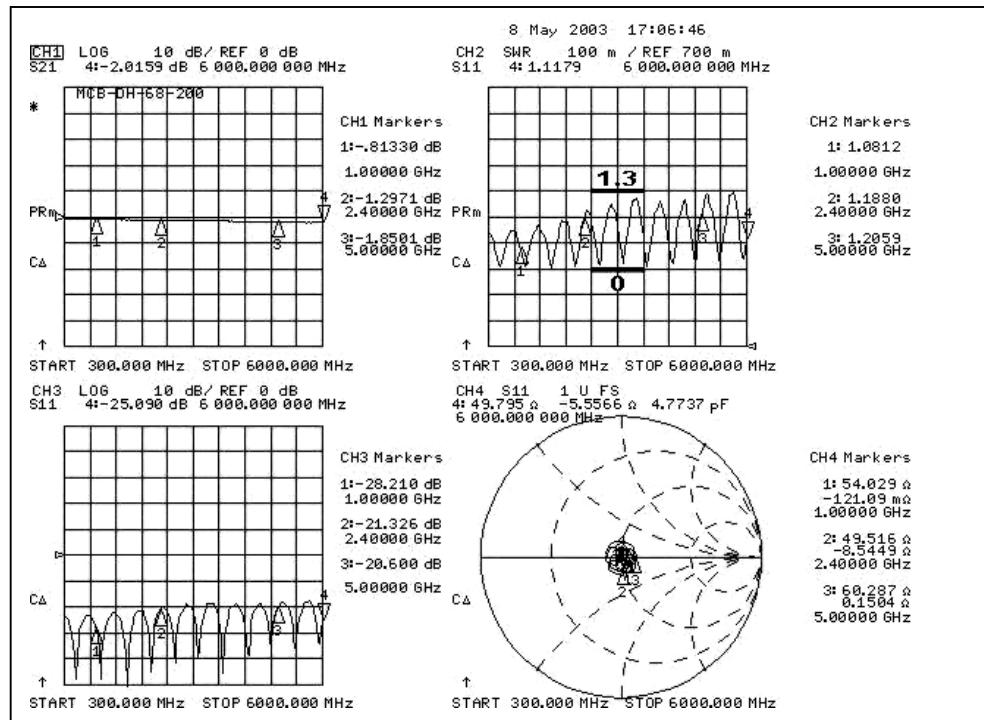
## Performance Measurement Reference:

(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

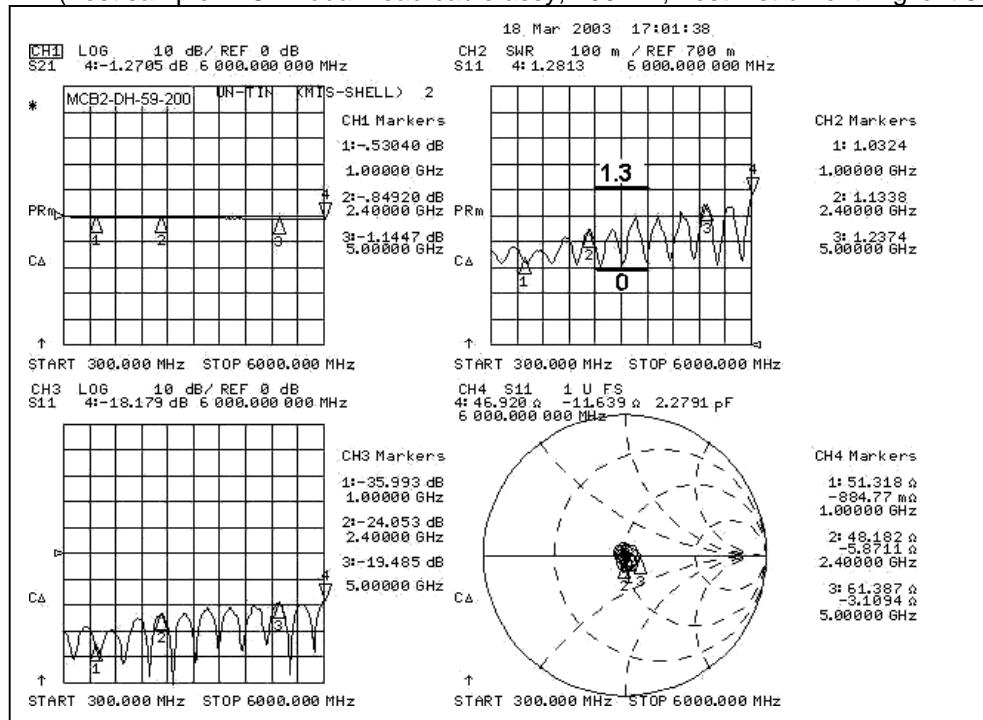
Length: 200mm  
Cable Code: #68  
OD: 0.81mm  
Inner Conductor: 0.15mm  
Dielectric: 0.40mm  
Outer Conductor: 0.65mm  
Jacket: 0.81mm

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



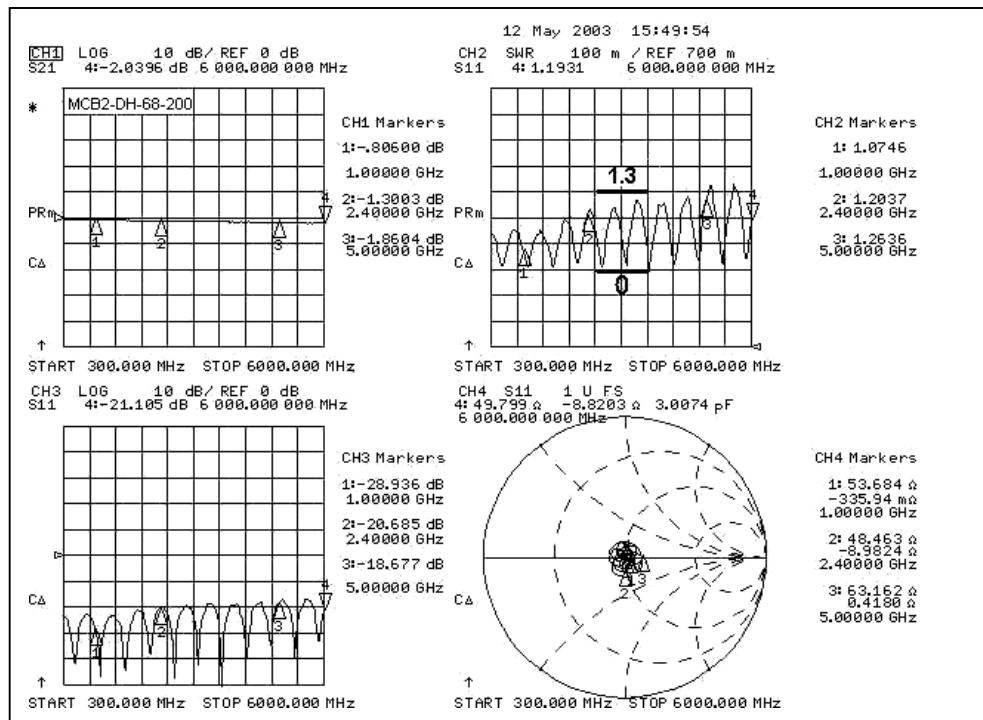
## Performance Measurement Reference:

(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

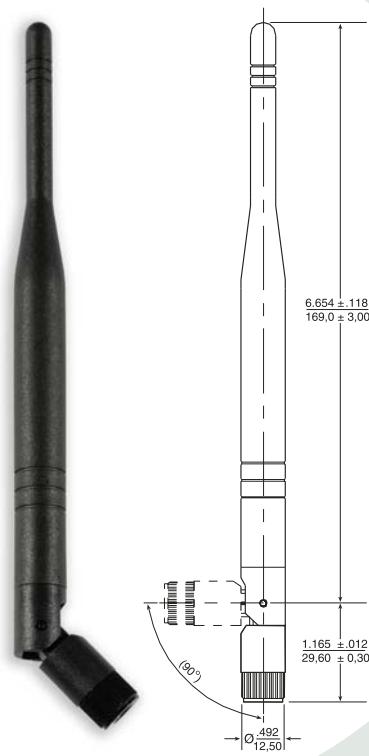


## MCB2-DH-68-200

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

# Wireless External Antenna for 2.4 GHz Applications

Pulse Part Number: W1038



## Features

- High gain performance
- For WLAN devices using WiFi (802.11b/g), Bluetooth® and ZigBee™
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

## Color Options

- Black\*
- Gray (Pantone cool gray 8C)
- Gray (Pantone 429C)
- Gray (Pantone cool gray 7C)

## Connector Options

- Reverse SMA (Male)\*
- SMA (Male)

\* Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors

Weight..... 25.1 grams  
Carton..... 20/bag; 500/carton

Dimensions:  $\frac{\text{Inches}}{\text{mm}}$

Unless otherwise specified, all tolerances are  $\pm \frac{.010}{0.25}$

## Electrical Specifications @ 25 °C

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1038	2.4 – 2.5	4.9	50 Ω	$\leq 2.0$	Vertical	1/4, dipole	Omni	Black

### Pulse Antennas

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

### External Antennas Sales Contacts

USA	858 674 8100	Shanghai	86 21 32181071
UK	44 1483 401 700	China	86 769 5538070
France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		



# Wireless External Antenna for 2.4 GHz Applications

Pulse Part Number: W1038

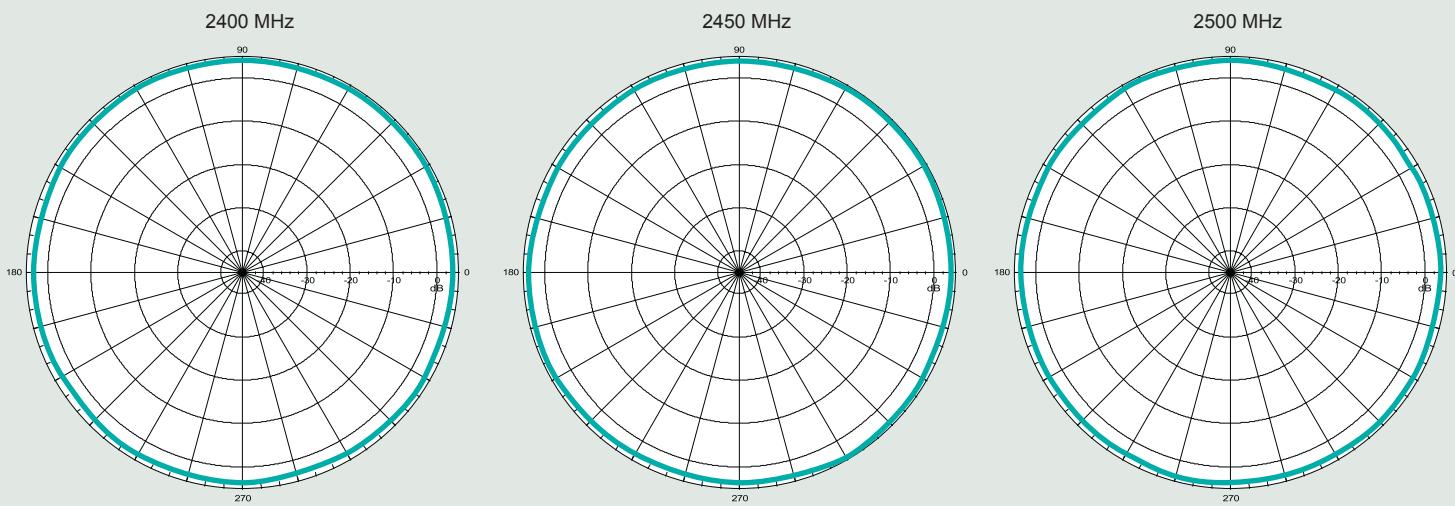
## Application Notes

Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN

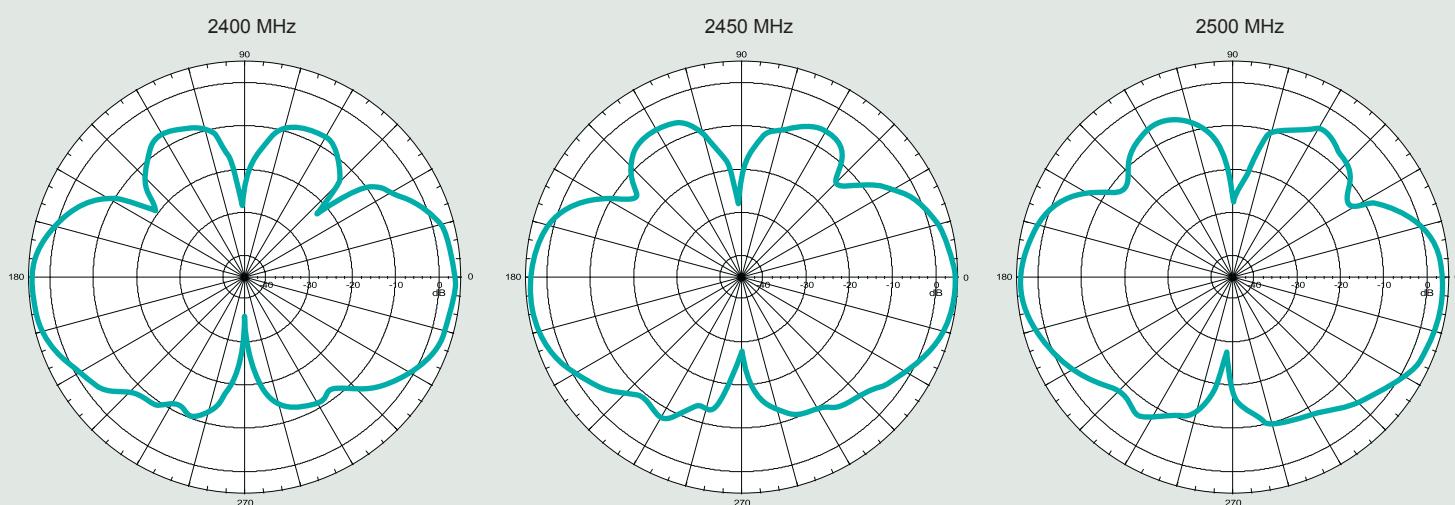
applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

## Gain Performance W1038

### Horizontal Position



### Vertical Position



### Pulse Antennas

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

### External Antennas Sales Contacts

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