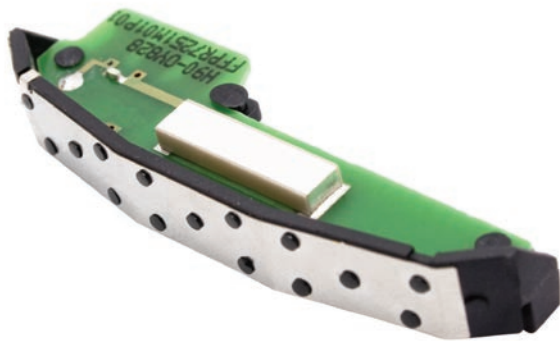


# Combined 4-band GSM and W-CDMA 2100 Antenna

40 x 8 x 6 mm maximum dimensions outside PWB ground plane. Pulse Part Number: W3530



## Features

- Low profile, low volume; 40 x 8 x 6 mm<sup>3</sup>
- Weight: 1,6 g.
- Wide return loss bandwidth allows placement in devices of various sizes
- Performance less dependent on the ground plane size
- All operating bands combined to single feed point for multi-band RF-engines
- Antenna requires SMT contact clips' mounting on device PWB
- ROHS compliant product

## Applications

- Mobile and MtoM devices operating on GSM bands (GSM850, EGSM900, PCN1800, PCS1900) and W-CDMA 2100. Actual antenna free space performance depends on the device dimensions and cover materials surrounding the device.

## Electrical specifications @ +25 °C

*Typical performance in electrical test setup, thus table includes implementation loss from plastic covers. Test board ground plane size 100 x 40 mm.*

Operating band	Frequency Range [MHz]	Total efficiency in free space (in test setup) [dB]	Return loss min. [dB]	Impedance [Ω]	Max input PWR	Operating Temperature [°C] (1)
GSM850	824 – 894	-1,0 – -2,5	-6	50	35 dBm	-30 to +95
EGSM900	880 – 960	-1,0 – -2,5	-6	50	35 dBm	-30 to +95
PCN1800	1710 – 1880	-2,0 – -3,5	-6	50	35 dBm	-30 to +95
PCS1900	1850 – 1990	-2,0 – -3,5	-6	50	35 dBm	-30 to +95
W-CDMA2100/TX	1920 – 1980	-3,0 – -3,5	-6	50	35 dBm	-30 to +95
W-CDMA2100/RX	2110 – 2170	-2,5 – -3,5	-6	50	35 dBm	-30 to +95

(1) Specified antenna parameters are measured in +25 °C. Minor antenna detuning occurs when operating temperature is varied within given temperature range.

## 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)



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## Terminal Configuration

Antenna has 3 contact pads for contact to device PWB thus respective 3 contacts are needed also on the device PWB. Recommended contact method is to use SMT c-clips mounted on the device PWB. The required electrical function of each clip is defined in Figure 1. The antenna has 2 ground contacts which are connected to the PWB ground plane and one feed contact, connected to the transceiver RF port. Recommended transmission line type between the transceiver port and the antenna feed contact is a 50 Ohm strip line. Main dimensions of the antenna C-clip used in the electrical test setup on the device PWB are defined in Figure 2. Antenna module dimensions are shown in Figure 3.

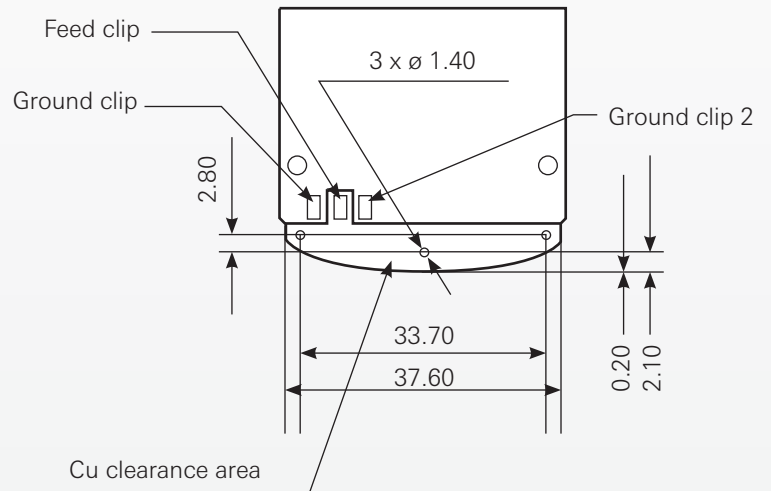


Figure 1. Antenna electrical contacts required on device PWB.

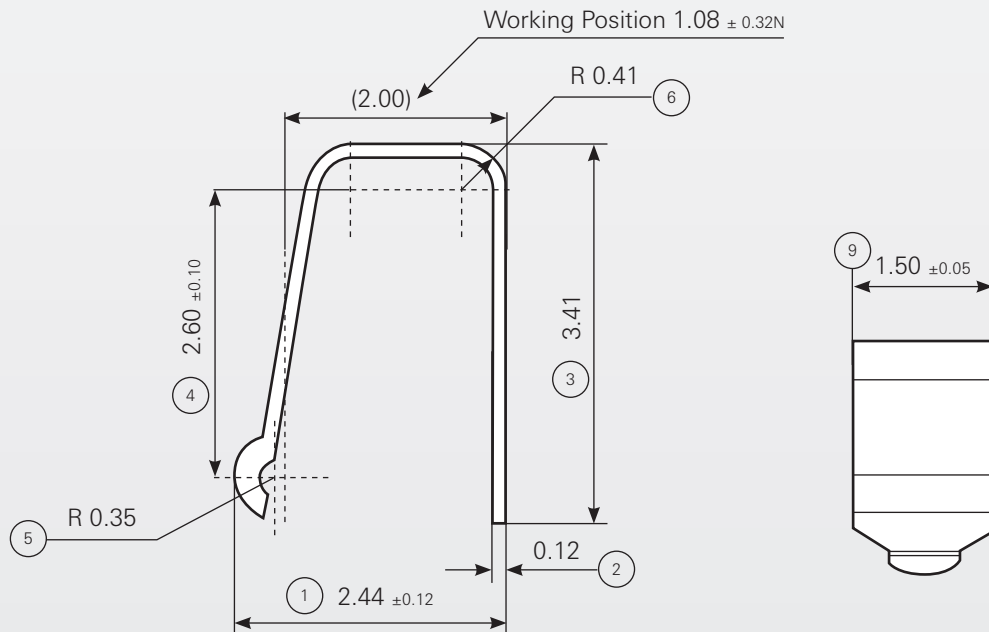


Figure 2. Example of antenna SMT contact clip design used in the electrical test setup.

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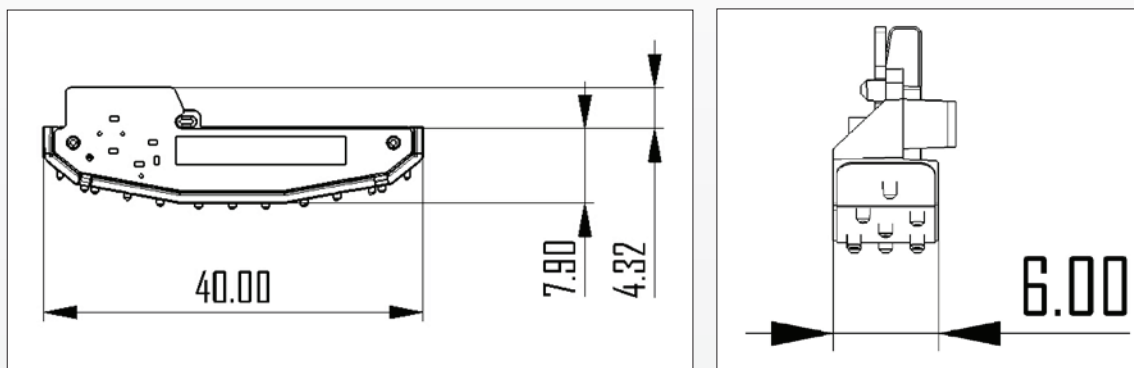


Figure 3. Antenna module main dimensions.

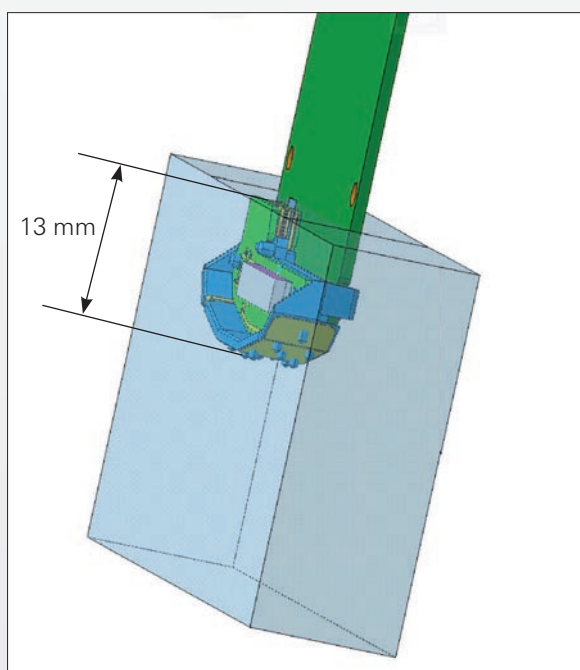


Figure 4. Metal object clearance space around the antenna module.

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# Combined 4-band GSM and W-CDMA 2100 Antenna

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## Typical Electrical Characteristics in free space (T=25 °C)

Measured in the specified test setup.

### 4-band GSM and W-CDMA2100

CH1 S11 log MAG 3 dB/REF 0 dB

- 1. -8.5363 dB 824 MHz
- 2. -14.764 dB 960 MHz
- 3. -10.812 dB 1.71 GHz
- 4. -11.614 dB 2.17 GHz

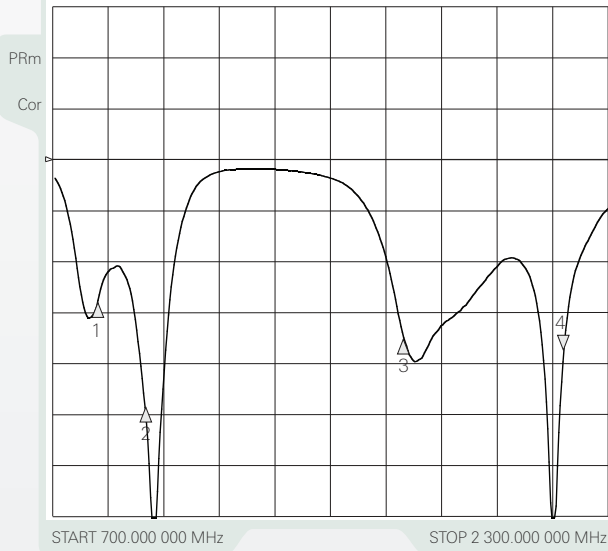


Figure 5. Antenna return loss in free space.

### 4-band GSM and W-CDMA2100

CH1 S11 1 U FS

- 1. 27.862  $\Omega$  -16.173  $\Omega$  824 MHz
- 2. 43.105  $\Omega$  15.191  $\Omega$  960 MHz
- 3. 40.195  $\Omega$  24.023  $\Omega$  1.71 GHz
- 4. 46.49  $\Omega$  25.994  $\Omega$  1.9065 nH  
2 170.000 000 MHz

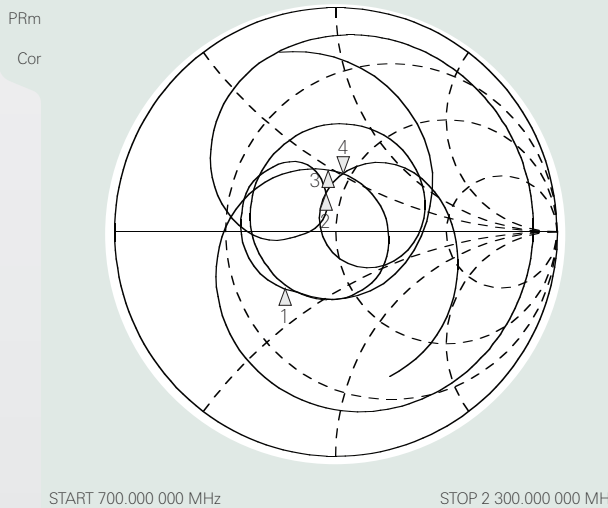


Figure 6. Antenna impedance in free space.

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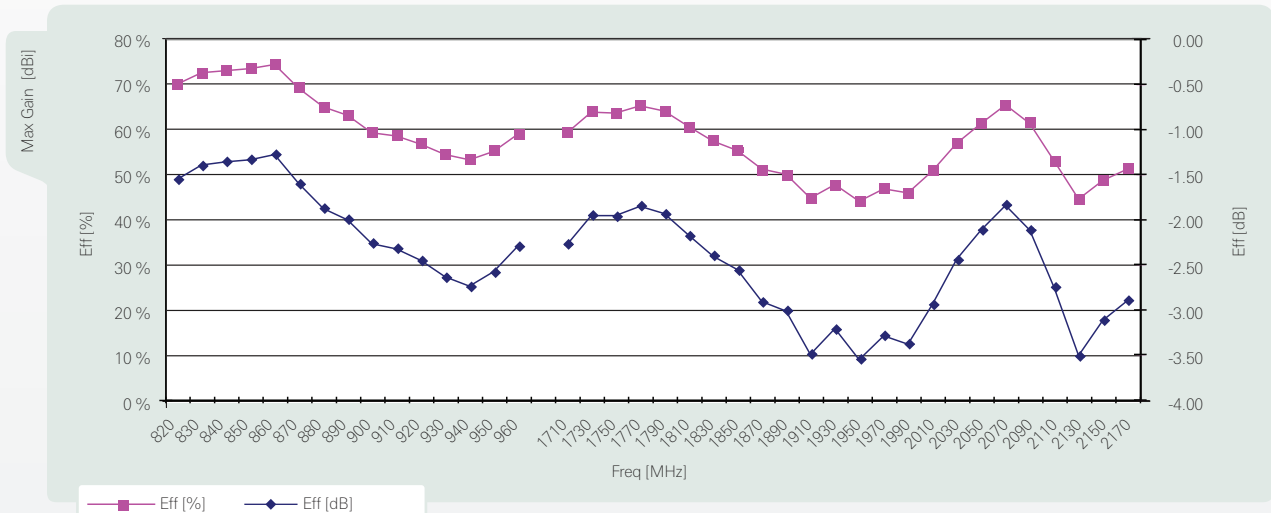


Figure 7. Antenna total efficiency in free space with test setup.

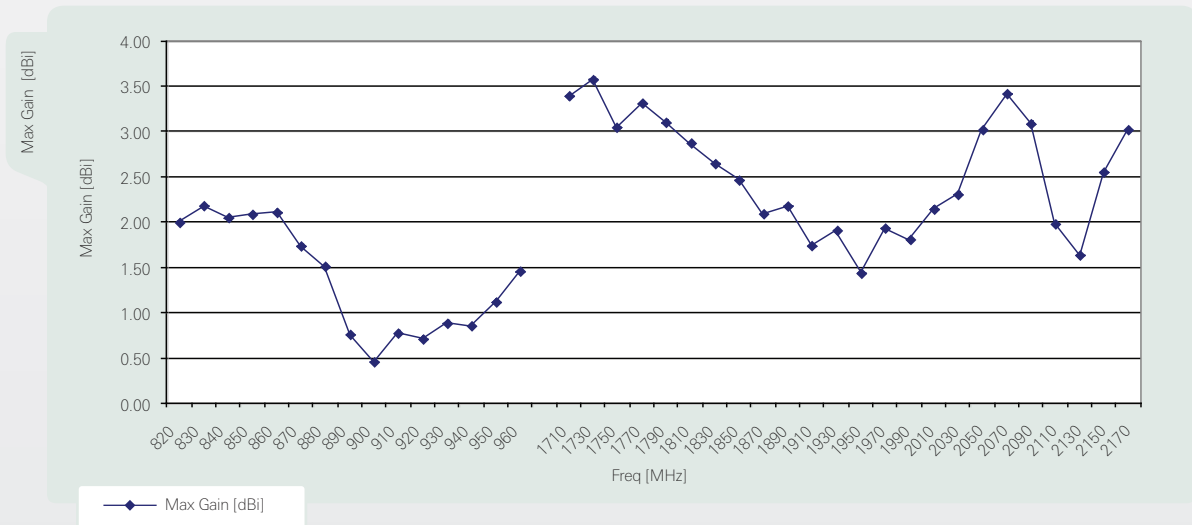


Figure 8. Antenna maximum gain in free space with test setup.