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TITLE : WLL Quad Band BASE ANTENNA

GSM850: 824~894MHz / EGSM: 880~960MHz

DCS : 1710~1880MHz /PCS: 1850~1990MHz

PART NUMBER : MQD-8899-DG

0	PROPOSED	MQD-8899-DG	Y.S. LEE	2007.OCT.15.
REV NO.	REVISION RECORD	ECN	BY	DATE
WRITTEN BY :	CHECKED BY :	APPROVED BY :	DATE :	
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1. DESCRIPTION

1.1 Scope

A sleeve dipole antenna, consisting of copper cylinder and a thin radiator which is a inner conductor of a coaxial line, is a half wave dipole antenna used for a portable and base station unit for wireless communication.

1.2 Part Number

MJ Telcom Antenna Part No. : MQD-8899-DG

1.3 Units and Definitions

V.S.W.R : Voltage Standing Wave Ratio

dBi : Antenna gain in dB relative to a isotropic antenna

g : Acceleration of gravity (about 9.8 m/sec²)

RH : Relative Humidity

1.4 Conditions

Unless otherwise stated all temperature tolerance are $\pm 3^{\circ}\text{C}$ and all RH tolerance are ± 5 percentage units.

Unless otherwise stated all values are valid at $\pm 20^{\circ}\text{C}$ and 50% RH.

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2. ELECTRICAL SPECIFICATIONS

2-1 Frequency range : GSM850:824~894 MHz EGSM:880~960MHz
 DCS :1710~1880MHz PCS :1850~1990MHz
 2-2 V.S.W.R : Less than 3.0:1
 2-3 Gain (dBi)
 824~894 MHz : 1.68 ± 0.5 (max)
 880~960 MHz : 1.24 ± 0.5 (max)
 1710~1880 MHz : 0.5 ± 0.5 (max)
 1850~1990 MHz : 0.72 ± 0.5 (max)
 2-4 Radiation pattern : Omni-directional
 2-5 Polarization : VERTICAL
 2-6 Power input(Watts) : 5(Max)
 2-7 Antenna Type : Sleeve half Wave length dual dipole
 2-8 Impedance : 50Ω Nominal

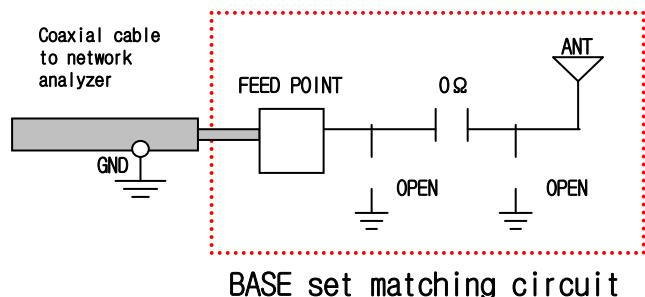
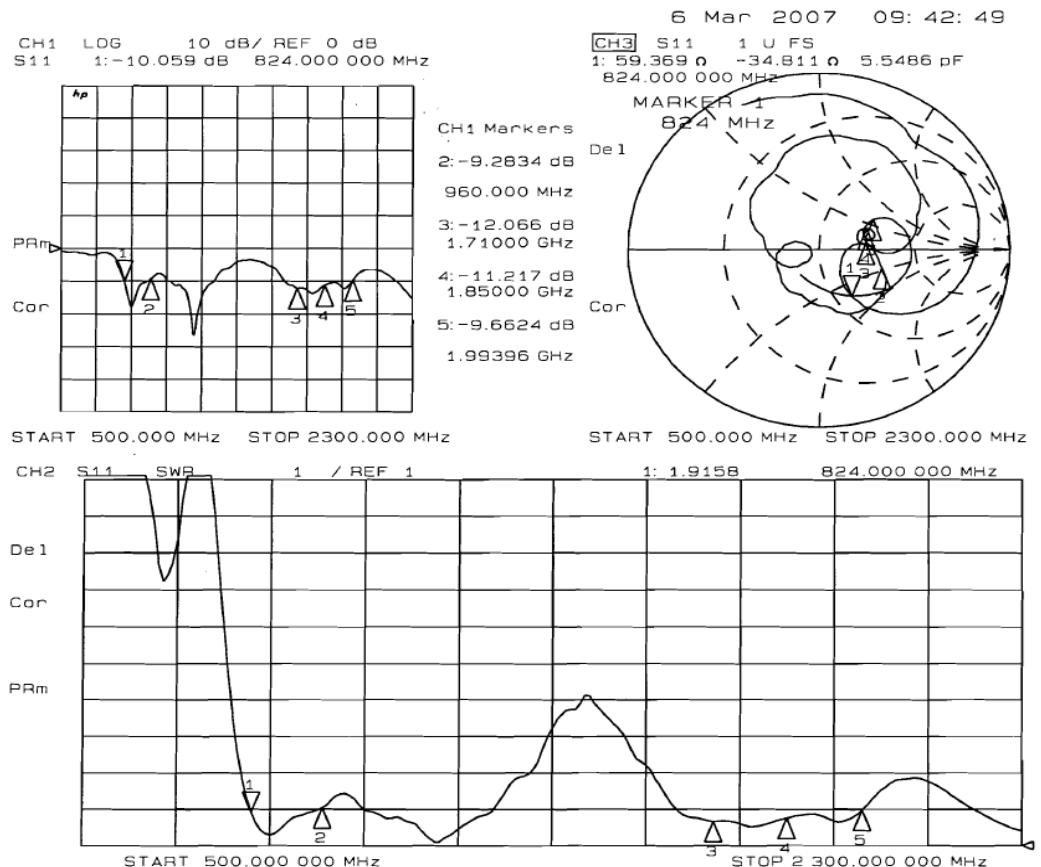
3. MECHANICAL SPECIFICATIONS

3-1 Overall Length of Ant.: 210.0 ± 2.0 mm
 3-2 Weight : 34 g
 3-3 Connector Type : TNC-Male(Nickel plate)
 3-4 Temperature : $-30^{\circ}\text{C} \sim +70^{\circ}\text{C}$
 3-5 Cover material : Urethane x DARK GRAY
 3-6 joint color : NYLON x DARK GRAY
 3-7 Joint pin : BsBM x Nickel plate
 3-8 RF Cable : RG 316S Brown color

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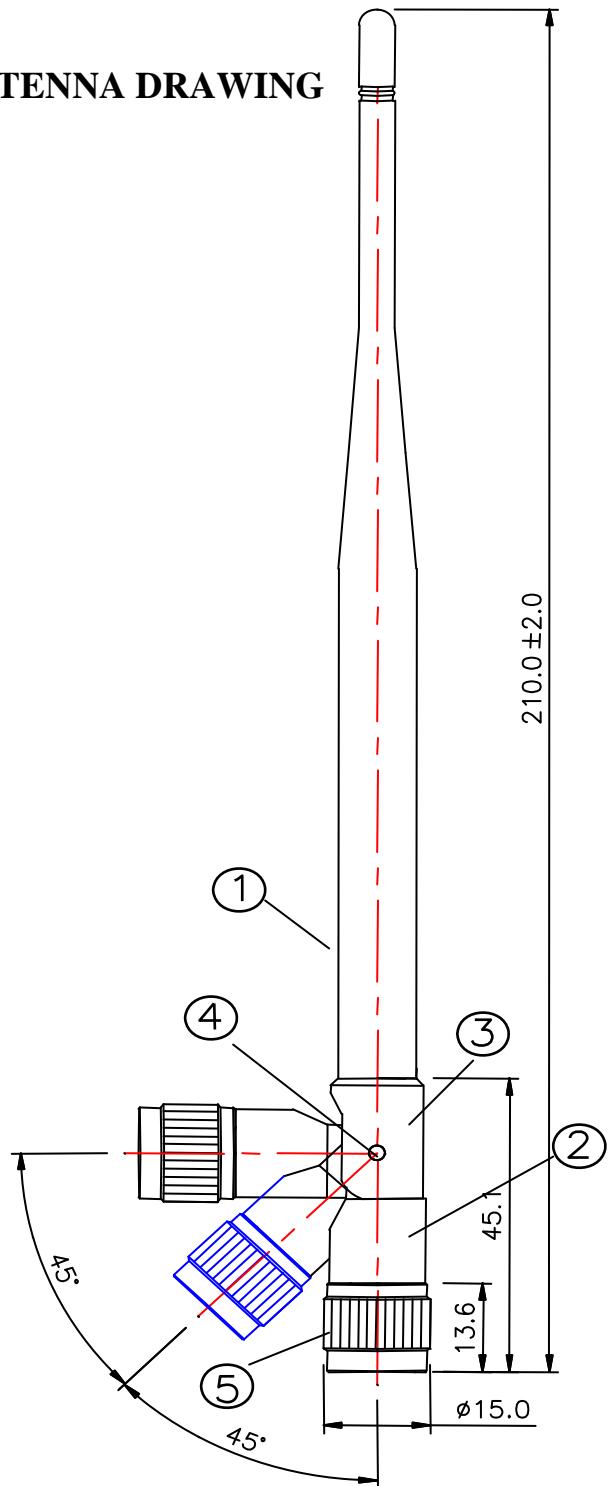
4.V.S.W.R Characteristics



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6. ANTENNA DRAWING



NOTE:

1. Ant. Color :Dark gray
2. Connector finish:Nickel plate
3. All dimensions are in mm

NO	DESCRIPTION	MATERIAL
1	COVER	URETHANE
2	JOINT "B"	Nylon 66
3	JOINT "A"	Nylon 66
4	JOINT PIN	BsBm NiPLATE
5	TNC-MALE	BsBm NiPLATE

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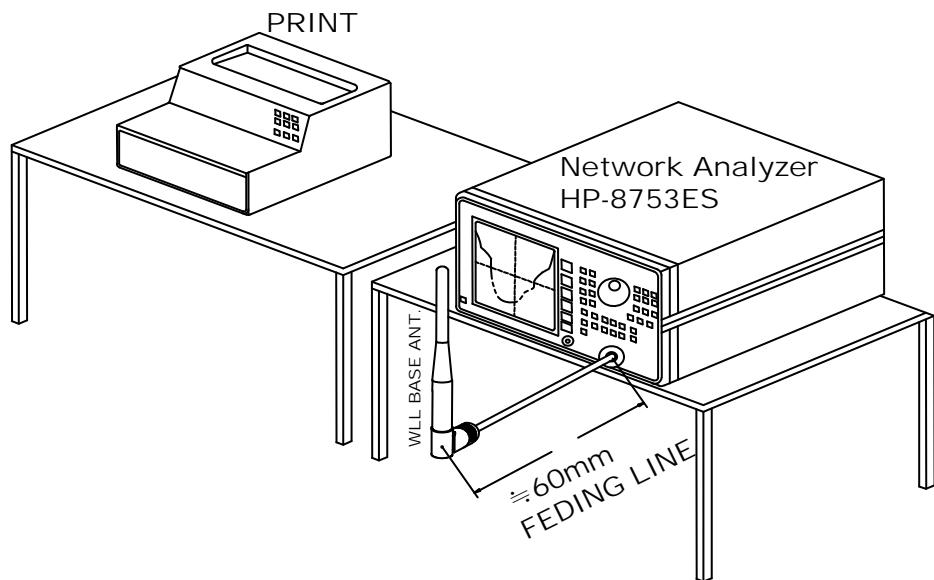
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6. Electrical test procedure

ITEM	Specifications	Measuring method
Frequency Range	824~894MHz, 880~960 MHz 880 ~960MHz 1850~1990 MHz	
Impedance Nominal value	50 Ω	
V.S.W.R	Less than 3.0 : 1	



A 50 ohms coaxial cable is connected to the TNC-FEMALE connector. In the other end the coaxial cable is connected to a network analyzer. The analyzer calibrated so that the reference plane is at the end the coaxial cable connected to the antenna.

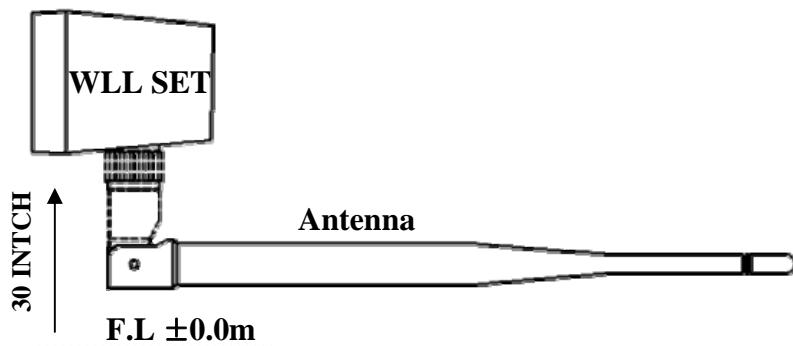
7. Mechanical test procedure**7-1. Tensile Load****7-2. Drop**

ITEM	Specifications	Demand
Appearance	222.4 ± 1 mm	Refer to 6. DRAWING
Tensile Load	Force 3Kgf	Without mechanical damage, electrical performance according to 2.(VSWR) after test

The antenna is assembled to the test equipment according to figure.

The specified force is applied during 30 sec to the top of the sleeve parallel to the antenna axis.

ITEM	Specifications	Demand
Drop	Drop height : 30inch No. of drop : 18 times Set weight : 500 Kg	No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after test



The antenna is dropped downwards onto a steel surface steel plate.

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7. Mechanical test procedure

7-3. Rotation

7-4. Tilted

ITEM	Specifications	Demand
Rotation 360 degree (1 cycle)	No. of rotation : 200 cycle	No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after test

The antenna is assembled to the test equipment. The rotation is done in random direction. One direction 1 cycle is from 0 degree → 90 degree → 180 degree → 360 degree. And another 1 cycle is from 360 degree → 180 degree → 90 degree → 0 degree.

ITEM	Specifications	Demand
Tilted 0° → 45° → 90° (1 cycle)	No. of rotation : 200 cycle	No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after test

The antenna is assembled to the test equipment. The rotation is done in random direction.

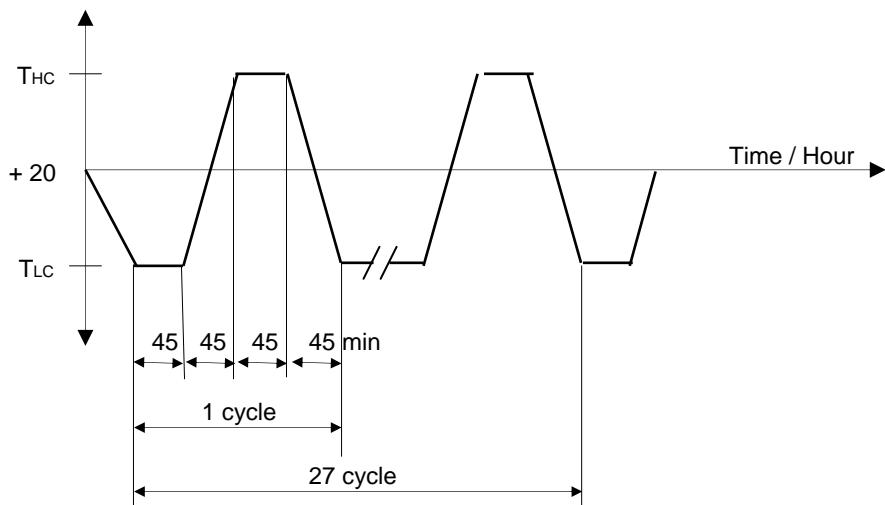
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8. Environmental test procedure**8-1 Thermal shock**

ITEM	Specifications	Demand
Thermal shock	Cycling Temperature : -10°C ~ +60°C at 50%RH	No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after 1 hour relaxing period at +20°C and 50%RH

The antenna is placed in a climatic chamber. The temperature is cycled as follows : The temperature is kept constant at low cycling temperature for 45min, increased to high cycling temperature during 45min, kept constant for 45min and then decreased to low cycling temperature during 45min. This procedure is repeated 27 times ending at room temperature, see figure.



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8. Environmental test procedure

8-2. Operating Temperature

8-3. Humidity

ITEM	Specifications	Demand
Operating Temperature	- 30°C ~ + 70°C at 50%RH	No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data during the test

The antenna is kept at +20°C and 50%RH for at least 1 hour.

The antenna is placed at low temperature. The antenna is taken out after 1 hour, and VSWR performance less than 3.0:1.

The antenna is kept at +20°C and 50%RH for at least 1 hour.

The antenna is placed at high temperature.

The antenna is taken out after 1 hour, and VSWR performance less than 3.0:1.

ITEM	Specifications	Demand
Humidity	Condition : +60°C and 90%RH	No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after the test.

The antenna is placed in climatic chamber for 24 hours.

The antenna is taken out from the chamber and measured after another 24 hours in room temperature.

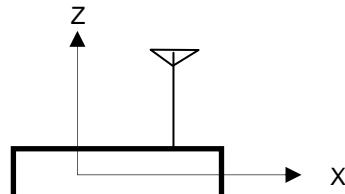
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8. Environmental test procedure**8-4. Vibration**

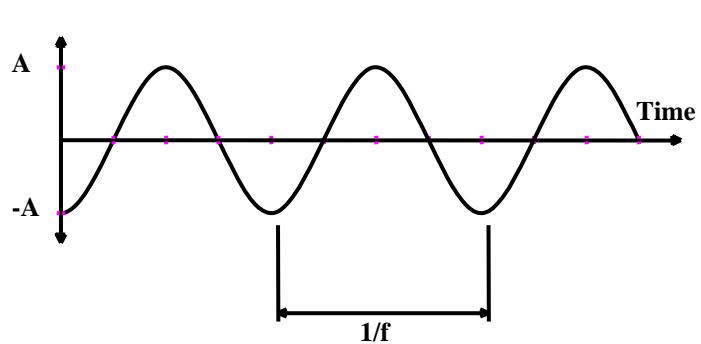
ITEM	Specifications	Demand
Vibration	Frequency : 8-25-8 Hz (1 cycle) Sweep rate : 1 octave/min Maximum amplitude : $A = 1.5$ mm Maximum acceleration : 2g	No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after the test.

The antenna is assembled in the test equipment. The vibration is done both in x- and z- directions, according to figure, with a duration of 1 hour in each direction.

[vibration direction]



[vibration form]



9. TEST FACILITIES

Electrical

- Anechoic Chamber
- Far-field Antenna Measurement System (FR/Orbit)
- Network Analyzer (HP-8753ES) : VSWR, Impedance

Mechanical

- Torque gage
- Calipers
- Test Zig

Environmental

- Climatic chamber