

Measurement of MPE

1. Foreword

In adopt with the Human Exposure IEEE C95.1, and according to the FCC 1.1310. The *Maximum Permissible Exposure (MPE)* is obligated to measure in order to prove the safety of radiation harmfulness to the human body.

The *Gain* of the antenna used is measured in an *Anechoic chamber*. The *maximum total power to the antenna* is to be recorded. By adopting the ***Friis Transmission Formula*** and the *power gain of the antenna*, we can find the distance right away from the product, where the limit of the MPE is.

2. Description of EUT

EUT	:	External Conexant 56K Data/Fax Bluetooth Modem
Model No.	:	BT-56SA-SCD
FCC ID	:	JCHBT56SASCD
Classification	:	Mobile Device
		(i) Under normal use condition, the antenna is at least 20cm away from the user;
		(ii) Warning statement for keeping 20cm separation distance and the prohibition of operating next to the person has been printed in the user's manual
Frequency Range	:	2400 MHz to 2483.5 MHz
Support Channel	:	80 Channels
Channel Spacing	:	1 MHz
Modulation Skill	:	GFSK
Power Type	:	Powered by the AC Adapter (Model No.: MW41-0900800UA) (I/P: 230VAC, 50Hz; O/P: 9VAC, 800mA)
Applicant	:	WELL Communication Corp. 11F, No. 788, Chung Cheng Rd., Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

3. Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	100	6
3.0-30	1842/f	4.89/f	900/f ²	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	100	30
1.34-30	824/f	2.19/f	180/f ²	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

[The EUT is tested in transmit and receive modes and in the first, middle and the last channel separately. The following shows only our observation have the greatest emissions.]

According to **OET BULLETIN 56 Fourth Edition/August 1999**, equation for predicting RF fields, by the **Friis Transmission Formula**:

$$\text{Power density at the specific separation (portable): } S = \frac{PG}{4pR^2} = \frac{2.12 \times 1.995}{4p(20)^2} = 8.414 \times 10^{-4} \text{ mW / cm}^2$$

$$\text{Estimated safe separation: } R = \sqrt{\frac{PG}{4p}} = \sqrt{\frac{2.12 \times 1.995}{4p}} = 0.58 \text{ cm}$$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 0.58 cm."

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

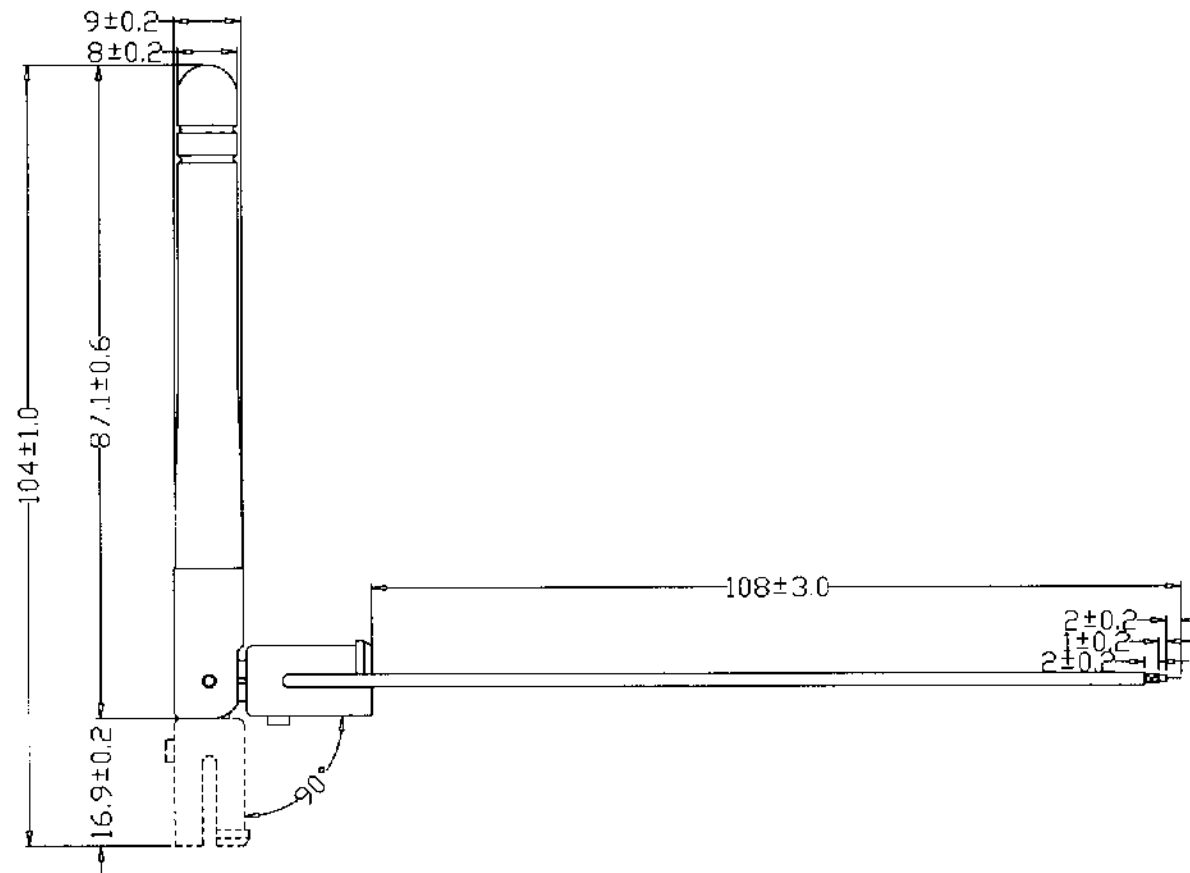
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

The Numeric gain G of antenna with a gain specified in dB is determined by:

$$G = \text{Log}^{-1} (\text{dB antenna gain}/10)$$

$$G = \text{Log}^{-1} (3 / 10) = 1.995$$

REV		BY	REVISIONS		DATE
			DESCRIPTION		
1					



METRIC

THIRD ANGLE PROJECTION

1			
ITEM NO.	QTY REQD	PART NUMBER	DESCRIPTION
PARTS LIST			
DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		DATE	欣格科技股份有限公司 Antenniques Corp. Ltd.
DECIMALS ANGLES		DATE	
X = ± 0.50 X = ± 0.25 XX = ± 0.13		DATE	TITLE
MATERIAL		DATE	宏傳 MCF003A-204-01
FINISH		DATE	
1	2	REV AO	SIZE A4
DO NOT SCALE DRAWING		1 OF 1	SCALE 1/1
		PART NO.	MCF003A-204-01
		DRAWING NO.	WR-R-AD0225-A1

TECHNICAL DATA

● Electrical Properties

Frequency Range	: 2.4~2.5GHz
Impedance	: 50 Ohm nominal
VSWR	: ≤ 2.0
Gain	: 3dBi
Radiation	: Omni
Polarization	: Vertical
Electrical Wave	: $\lambda/4$ Dipole

● Mechanical Properties

Antenna Cover	: PU
Color	: Black
Operation Temperature	: $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$
Storage Temperature	: $-30^{\circ}\text{C} \sim +75^{\circ}\text{C}$