

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 1.1 General Information

### Client Information

Applicant: Modern Marketing Concepts, Inc.  
Address of applicant: 1220 E Oak, St. Louisville, KY 40204 United States

Manufacturer: Timsen Development Limited  
Address of manufacturer: 5F, 447# Tianhebei Road, Guangzhou, China

### General Description of EUT:

Product Name: DISCOVERY  
Trade Name: CROSLEY  
Model No.: CR8009A-DU  
Adding Model(s): CR8009X-XXXX ( "X-XXXX" can be replaced by letter from "A" to "Z", number from "0" to "9" or blank)  
Rated Voltage: DC 5V  
Battery Capacity: /  
Adapter Model: MODEL: ZWSP-050100US0202  
INPUT: AC 100-240V,~50/60Hz , 0.5A  
OUTPUT: DC5.0V, 1000mA  
Software Version: V 1.0  
Hardware Version: V 1.0  
FCC ID: AUSCR8009  
Equipment Type: Mobile

### Technical Characteristics of EUT:

Bluetooth Version: V4.2 (BR/EDR mode)  
Frequency Range: 2402-2480MHz  
RF Output Power: -3.73dBm (Conducted)  
Data Rate: 1Mbps, 2Mbps  
Modulation: GFSK, π/4 DQPSK  
Quantity of Channels: 79  
Channel Separation: 1MHz  
Type of Antenna: PCB Antenna  
Antenna Gain: -0.58dBi

## 1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: \* = Plane-wave equivalents power density

### 1.3 MPE Calculation Method

$$S = (30*P*G) / (377*R^2)$$

S = power density (in appropriate units, e.g., mw/cm<sup>2</sup>)

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,  
the power gain factor is normally numeric gain.

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

### 1.4 MPE Calculation Result

Maximum Tune-Up output power: -3 (dBm)

Maximum peak output power at antenna input terminal: 0.50 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2441 (MHz)

Antenna gain: -0.58 (dBi)

Directional gain (numeric gain): 0.87

The worst case is power density at prediction frequency at 20cm: 0.0001 (mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

Result: Pass