



# RF Exposure Requirements

## 1 General Information

### Client Information

**Applicant** ..... : Modern Marketing Concepts, Inc.  
**Address of applicant** ..... : 1220 E Oak, St. Louisville, KY 40204 United States  
**Manufacturer** ..... : The same as above  
**Address of manufacturer** ..... : The same as above

### General Description of E.U.T

**FCC ID** ..... : AUSCR1102A  
**Product Name** ..... : Jukebox Am/Fm Radio with Bluetooth player  
**Model No.** ..... : CR1102A ,CR1102XX-XXXX (XX-XXXX can be replaced by letter from "A"to"Z" number from "0" to "9" or blank, the variable 'X' represents the color )  
**Model Description** ..... : All models are identical except appearance color.  
**Rated Voltage** ..... : DC 12V, 1A  
**Battery Capacity** ..... : ---  
**Power Adapter** ..... : K12E120100U  
Input: 100-240V~, 50/60Hz, 0.35A; Output: DC 12.0V, 1.0A

### Technical Characteristics of EUT

**Bluetooth Version** ..... : Bluetooth BR+EDR  
**Frequency Range** ..... : 2402-2480MHz  
**Max. RF Output Power** ..... : -4.796dBm (Conducted)  
**Modulation** ..... : GFSK,  $\pi/4$ QPSK, 8DPSK  
**Data Rate** ..... : 1Mbps, 2Mbps, 3Mbps  
**Quantity of Channels** ..... : 79  
**Channel Separation** ..... : 1MHz  
**Type of Antenna** ..... : PCB Antenna  
**Antenna Gain** ..... : -0.58dBi



## 2 Applicable Standard

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

## 3 Calculation Method

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

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), R=20cm.

## 4 MPE Calculation Result

| Frequency (MHz) | Antenna Gain (dBi) | Numeric gain | Conducted Power (dBm) | Maximum Tune-up output power |      | PD (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-----------------|--------------------|--------------|-----------------------|------------------------------|------|--------------------------|-----------------------------|
|                 |                    |              |                       | (dBm)                        | (mW) |                          |                             |
| 2480            | -0.58              | 0.87         | -4.796                | -4.00                        | 0.40 | 0.00007                  | 1.0                         |

Result: Pass

=====End of Report=====