

## RF EXPOSURE EVALUATION

### EUT Specification

<b>EUT</b>	Bluetooth FM Clock Radio with USB Charging
<b>Model Number</b>	iBT232, iBT232GX8, iBT232a (a could be single or multiple digits by any alphabets denote different cabinet color different cabinet color)
<b>FCC ID</b>	EMOIBT232A
<b>Antenna gain (Max)</b>	0 dBi
<b>Operation Frequency</b>	2.4G:2402MHz-2480MHz
<b>Input Rating</b>	AC 120V/60Hz
<b>Classification Per Stipulated Test Standard</b>	§ 15.247(i), § 2.1093
<b>Modulation</b>	GFSK, pi/4-DQPSK , 8-DPSK
<b>Max. output power</b>	-3.92 dBm(0.000406 W)
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

### Test Requirement:

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According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm <sup>2</sup> )	Average Time
<b>(A) Limits for Occupational/Control Exposures</b>				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

## 1 Friis transmission formula: $P_d = \frac{P_{out} \cdot G}{4 \cdot \pi \cdot R^2}$

Where

$P_d$  = Power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = Numeric gain of the antenna relative to isotropic antenna

$\pi$  = 3.1416

$R$  = distance between observation point and center of the radiator in cm

$P_d$  the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## 2 Measurement Result

Antenna gain: 0 dBi

Mode	Frequency (MHz)	Output Power (dBm)	Target Power W/tolerance (dBm)	Max tune up power tolerance (dBm)	Max tune up power tolerance (mW)	Power Density at R=20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Verdict
GFSK	2402	-6.09	-7±1	-6	0.25	0.000050	1	PASS
	2441	-5.95	-6±1	-5	0.32	0.000063	1	PASS
	2480	-5.18	-6±1	-5	0.32	0.000063	1	PASS
pi/4-DQPSK	2402	-5.30	-6±1	-5	0.32	0.000063	1	PASS
	2441	-5.22	-6±1	-5	0.32	0.000063	1	PASS
	2480	-4.47	-5±1	-4	0.40	0.000079	1	PASS
8-DPSK	2402	-4.91	-5±1	-4	0.40	0.000079	1	PASS
	2441	-4.93	-5±1	-4	0.40	0.000079	1	PASS
	2480	-3.92	-4±1	-3	0.50	0.000100	1	PASS

Signature:

A handwritten signature in black ink is positioned to the left of a circular purple stamp. The stamp features a stylized 'M' logo in the center, with the text 'EMTEK (HONGGUAN) CO., LTD.' around the top inner edge and 'TESTING' at the bottom. Two small asterisks are located on the left and right sides of the stamp's inner border.

Sam Lv

Date: 2021-09-14