

## RF EXPOSURE EVALUATION

### EUT Specification

<b>EUT</b>	Bluetooth Alarm Clock with UV Sanitizing and USB charging
<b>Model Number</b>	iBTW88
<b>FCC ID</b>	EMOIUVBT1A
<b>Antenna gain (Max)</b>	0.5dBi
<b>Operation Frequency</b>	2402-2480MHz
<b>Input Rating</b>	DC 9V form adapter
<b>Classification Per Stipulated Test Standard</b>	§15.247(i), §2.1093
<b>Kind of Device: Bluetooth Ver.4.2</b>	
<b>Modulation</b>	BT:(GFSK, $\pi/4$ -DQPSK, 8DPSK)
<b>Max. output power</b>	BT: 0.07dBm(0.001016W)

### Test Requirement:

## RF EXPOSURE EVALUATION

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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$ = Power density in  $mW/cm^2$

$P_{out}$ =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,  $1mW/cm^2$ . 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:0.5 dBi

BT DSS:

Operating Mode	Test Channel	Measured power (dBm)	Tune up tolerance (dBm)	Max tune up conducted power (dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm ( $mW/cm^2$ )	Power density Limits ( $mW/cm^2$ )
GFSK	2402	-2.44	-2±1	1	1.25893	0.5	1.122	0.000281015	1
GFSK	2441	-3.07	-3±1	-2	0.63096	0.5	1.122	0.000140841	1
GFSK	2480	-2.74	-3±1	-2	0.63096	0.5	1.122	0.000140841	1
1/4π-DQPSK	2402	-0.51	-1±1	0	1	0.5	1.122	0.000223218	1
1/4π-DQPSK	2441	-1.09	-1±1	0	1	0.5	1.122	0.000223218	1
1/4π-DQPSK	2480	-0.85	-1±1	0	1	0.5	1.122	0.000223218	1
8DPSK	2402	0.07	0±1	1	1.25893	0.5	1.122	0.000281015	1
8DPSK	2441	-0.61	-1±1	0	1	0.5	1.122	0.000223218	1
8DPSK	2480	-0.24	0±1	1	1.25893	0.5	1.122	0.000281015	1

Signature:

A handwritten signature in black ink, appearing to read 'Sam Lv'. The signature is fluid and cursive, with a long horizontal stroke at the beginning and a small 'v' at the end.

Sam Lv  
Date: 2020-08-10