

RF EXPOSURE EVALUATION

EUT Specification

EUT	Keypad
Model Number	GB538823, GB538824, GB538825(Note: All models are the same, except the model name.)
FCC ID	WUI-PXNDBLE50KP
Antenna gain (Max)	0 dBi
Operation Frequency	BT: 2402-2480MHz 2.4G: 2402-2480MHz
Input Rating	DC 6-19V
Kind of Device: Bluetooth Ver. 5.0	
Modulation	GFSK
Max. output power	BT: 2.77dBm(0.0019W) 2.4G: 14.36dBm(0.0273W)

Test Requirement:

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 ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

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

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

$P_i=3.1416$

R= 20cm distance between observation point and center of the radiator in cm

P_d the limit of MPE, $1\text{mW}/\text{cm}^2$. 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.

11.2 Measurement Result

Antenna gain: 0 dBi

BT

Mode	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain (Numeric)	Evaluation result (mW/cm^2)	Power density Limits (mW/cm^2)
GFSK	2402	2.71	3 ± 1	4	1	0.000500	1
GFSK	2440	2.48	3 ± 1	4	1	0.000500	1
GFSK	2480	2.77	3 ± 1	4	1	0.000500	1

2.4G

Mode	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain (Numeric)	Evaluation result (mW/cm^2)	Power density Limits (mW/cm^2)
GFSK	2402	13.66	14 ± 1	15	1	0.006291	1
GFSK	2440	14.36	14 ± 1	15	1	0.006291	1
GFSK	2480	12.96	13 ± 1	14	1	0.004997	1

Signature:



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