

RF EXPOSURE EVALUATION

EUT Specification

EUT	Portable Power Station
Model Number	SR1KW8L-SG1-US
FCC ID	2BBDT-1KW8
Antenna gain (Max)	2.21dBi
Operation Frequency	WIFI: 2412 MHz to 2462 MHz BLE: 2402 MHz to 2480 MHz
Input Rating	100-120V~, 50/60Hz, 15A max., 1800W max.
Max. output power	BLE: 1.75dBm IEEE 802.11b: 11.59 dBm IEEE 802.11g: 11.56 dBm IEEE 802.11n-HT20: 11.34 dBm IEEE 802.11n-HT40: 10.33 dBm

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

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

P_d the limit of MPE, $1\text{mW}/\text{cm}^2$. If we know the maximum gain of the antenna, through the calculation, we will know the distance where the MPE limit is reached.

11.2 Measurement Result

Antenna gain: 2.21dBi

BLE:

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	1.38	1±1	2	1.663	0.000524	1
GFSK	2440	1.75	2±1	3	1.663	0.000660	1
GFSK	2480	0.82	1±1	2	1.663	0.000524	1

WIFI:

Operating Mode	Test Channel	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)
802.11b	1	12±1	13	19.953	2.21	1.663	0.006601	1
	6	11±1	12	15.849	2.21	1.663	0.005244	1
	11	11±1	12	15.849	2.21	1.663	0.005244	1
802.11g	1	12±1	13	19.953	2.21	1.663	0.006601	1
	6	11±1	12	15.849	2.21	1.663	0.005244	1
	11	11±1	12	15.849	2.21	1.663	0.005244	1
802.11n (HT20)	1	11±1	12	15.849	2.21	1.663	0.005244	1
	6	11±1	12	15.849	2.21	1.663	0.005244	1
	11	11±1	12	15.849	2.21	1.663	0.005244	1
802.11n (HT40)	3	10±1	11	12.589	2.21	1.663	0.004165	1
	6	10±1	11	12.589	2.21	1.663	0.004165	1
	9	10±1	11	12.589	2.21	1.663	0.004165	1

Signature:

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Date: 2023-07-06