

RF Exposure Evaluation

Test report
On Behalf of
Things on Edge
For
Cricket

Model List : REV 1.0

FCC ID: 2AW7I-VEV

Prepared for : Things on Edge
1 Cammell Walk, CB259LT, Cambridge, United Kingdom

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1 General Description of EUT

Equipment	Cricket
Model Name	REV 1.0
Serial No.	N/A
Trade Mark	N/A
FCC ID	2AW7I-VEV
Hardware Version:	V1.0
Software Version:	V2.58
Operation frequency	802.11b/g/n 20: 2412~2462 MHz
Number of Channels	802.11b/g/n20: 11CH
Antenna Type	PCB Antenna
Antenna Gain	0dBi
Modulation Type	CCK/DSSS/OFDM
Power Source	DC 5.0V from PC/others

2 RF Exposure Compliance Requirement

2.1 Standard Requirement

According to FCC Part1.1310: 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 part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3~3.0	614	1.63	*(100)	6
3.0~30	1842/f	4.89/f	*(900/f ²)	6
30~300	61.4	0.163	1.0	6
300~1500 .....	.....	.....	f/300	6
1500~100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3~1.34	614	1.63	*(100)	30
1.34~30	824/f	2.19/f	*(180/f ²)	30
30~300	27.5	0.073	0.2	30
300~1500 .....	.....	.....	f/1500	30
1500~100,000 .....	.....	.....	1.0	30

F= Frequency in MHz Friis

Formula

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 =gain of antenna in linear scale

$\pi = 3.1416$

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

P_d is the limit of MPE . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

3 EUT RF Exposure

Antenna Gain: 2Bi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is in linear scale. Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

802.11b mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	13.94	14±1	15	31.623
Middle(2437MHz)	11.73	12±1	13	19.953
Highest(2462MHz)	12.48	12±1	13	19.953

802.11g mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	12.71	13±1	14	25.119
Middle(2437MHz)	11.14	11±1	12	15.849
Highest(2462MHz)	12.01	11±1	12	15.849

802.11n(HT20)mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	12.48	13±1	14	25.119
Middle(2437MHz)	11.90	11±1	12	15.849
Highest(2462MHz)	11.83	11±1	12	15.849

Worst case: 802.11b mode Lowest (2412MHz)

Using the maximum value of the test report

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R =10 cm (mW/cm ²)	Limit	Result
31.623	0	0.0252	1	PASS

Remark: The Max Conducted Peak Output Power data refer to report Report No.: HK2008072126-E
Value : $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (31.623 \cdot 1) / (4 \cdot 3.1416 \cdot 102) = 0.0252 \text{ mW/cm}^2$