

RF EXPOSURE EVALUATION

EUT Specification

EUT	150Mbps Wireless N USB Module
Model Number	BL-R8188EU1
FCC ID	S8J-R8188EU1F
Antenna gain (Max)	2 dBi
Operation Frequency	WIFI:2412MHz-2462MHz
Input Rating	DC 5 V
Classification Per Stipulated Test Standard	§15.247(i), §2.1091
Modulation	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n;
Max. output power	15.66 dBm
Evaluation applied	<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 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

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

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

π = 3.1416

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

P_d the limit of MPE, 1mW/cm². 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: 2 dBi

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
802.11b	1	2412	13.25	30	PASS
	6	2437	14.46	30	PASS
	11	2462	15.66	30	PASS
802.11g	1	2412	12.40	30	PASS
	6	2437	13.05	30	PASS
	11	2462	14.35	30	PASS
802.11n (HT20)	1	2412	11.22	30	PASS
	6	2437	12.62	30	PASS
	11	2462	13.44	30	PASS
802.11n (HT40)	3	2422	9.52	30	PASS
	6	2437	10.46	30	PASS
	9	2452	11.05	30	PASS

Operating Mode	Test Channel	Target Power W/tolerance (dBm)	Max tune up power tolerance (dBm)	Max tune up power tolerance (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Limit (mW/cm ²)	Limit	Verdict
								(mW/cm ²)	PASS
802.11b	1	13±1	14	25.12	2.000	1.584893	0.007920	1	PASS
	6	14±1	15	31.62	2.000	1.584893	0.009971	1	PASS
	11	15±1	16	39.81	2.000	1.584893	0.012552	1	PASS
802.11g	1	12±1	13	19.95	2.000	1.584893	0.006291	1	PASS
	6	13±1	14	25.12	2.000	1.584893	0.007920	1	PASS
	11	14±1	15	31.62	2.000	1.584893	0.009971	1	PASS
802.11n (HT20)	1	11±1	12	15.85	2.000	1.584893	0.004997	1	PASS
	6	12±1	13	19.95	2.000	1.584893	0.006291	1	PASS
	11	13±1	14	25.12	2.000	1.584893	0.007920	1	PASS
802.11n (HT40)	3	9±1	10	10.00	2.000	1.584893	0.003153	1	PASS
	6	10±1	11	12.59	2.000	1.584893	0.003969	1	PASS
	9	11±1	12	15.85	2.000	1.584893	0.004997	1	PASS

Signature:



Sam Lv

Date: 2021-11-11