
RF EXPOSURE EVALUATION

EUT Specification

EUT	Android Box
Model Number	R801, R802, R803, R805, R806, R811, R812, R813, R815, R816
FCC ID	2BAF2-R801
Antenna gain (Max)	2.4GWIFI : 1.37 dBi BT/BLE : 1.51 dBi 5GWIFI : 1.45dBi LTE Band 2: Maximum Gain is 0.69dBi. LTE Band 4: Maximum Gain is 0.62dBi. LTE Band 5: Maximum Gain is 0.58dBi. LTE Band 7: Maximum Gain is 1.1dBi. LTE Band 12: Maximum Gain is 0.7dBi. LTE Band 17: Maximum Gain is 0.7dBi. LTE Band 38: Maximum Gain is 1.1dBi. LTE Band 41: Maximum Gain is 1.1dBi.
Operation Frequency	BT/BLE:2402-2480MHz 2.4GWIFI:2412-2462MHz 5GWIFI: 5180~5240MHz; 5260-5320MHz; 5500-5700MHz; 5745~5825MHz: 5190~5230MHz; 5260-5320MHz; 5510-5670MHz; 5755~5795MHz,5210MHz, 5290MHz, 5530MHz, 5775MHz LTE Band 2: 1850 ~ 1910 MHz LTE Band 4: 1710 ~ 1755 MHz LTE Band 5: 824 ~ 849 MHz LTE Band 7: 2500 ~ 2570 MHz LTE Band 12: 699MHz ~ 716MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2555MHz ~ 2655MHz
Input Rating	DC 5V from adapter
Max. output power	LTE B2: 24.97dBm, LTE B4: 24.95 dBm LTE B5: 24.87dBm, LTE B7: 24.89dBm LTE B12: 24.88dBm, LTE B17: 24.80dBm LTE B38: 24.21dBm, LTE B41: 24.38dBm EDR: 3.53 dBm, BLE: 3.5 dBm 5GHz WiFi: Band 1: 16.78dBm, Band 2: 16.86dBm Band 3: 16.79dBm, Band 4: 16.80dBm 2.4GHz WiFi: b:13.83dBm, g:13.40dBm, n20:13.65dBm, n40:13.58dBm

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

π =3.1416

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

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.

11.2 Measurement Result

Mode	Frequency range(MHz)	Max 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)
EDR	2402-2480	3.53	3±1	4	1.416	0.000708	1
BLE	2402-2480	3.5	3±1	4	1.416	0.000708	1
2.4GWIFI	2412-2462	13.83	14±1	15	1.371	0.008629	1
	2412-2462	13.40	13±1	14	1.371	0.006854	1
	2412-2462	13.65	14±1	15	1.371	0.008629	1
	2422-2452	13.58	13±1	14	1.371	0.006854	1
5G WIFI	B1(5150-5250)	16.78	17±1	18	1.396	0.017537	1
	B2(5250-5350)	16.86	17±1	18	1.396	0.017537	1
	B3(5470-5725)	16.79	17±1	18	1.396	0.017537	1
	B4(5725-5850)	16.80	17±1	18	1.396	0.017537	1
LTE	B2 (1850-1910)	24.97	25±1	26	1.172	0.092886	1
	B4 (1710-1755)	24.95	25±1	26	1.153	0.091401	1
	B5(824-849)	24.87	25±1	26	1.143	0.090563	0.5493
	B7(2500-2570)	24.89	25±1	26	1.288	0.102082	1
	B12 (699-716)	24.88	25±1	26	1.175	0.093100	0.4660
	B17 (704-716)	24.80	25±1	26	1.175	0.093100	0.4733
	B38 (2570-2620)	24.21	24±1	25	1.288	0.081087	1
	B41 (2555-2655)	24.38	24±1	25	1.288	0.081087	1

Maximum Simultaneous transmission MPE Ratios for 2.4GWIFI+LTE:

Max MPE ratio _{WIFI}	Max MPE Ratio _{LTE}	Σ MPE ratios	Limit	Result
0.008629	0.102082	0.110711	1	Pass
MPE= Limit of Power Density (S) (mW/cm2)/ Limit of Power Density (S) (mW/cm2) ratios				

Maximum Simultaneous transmission MPE Ratios for 5GWIFI+LTE:

Max MPE ratio _{WIFI}	Max MPE Ratio _{LTE}	Σ MPE ratios	Limit	Result
0.017537	0.102082	0.119619	1	Pass
MPE= Limit of Power Density (S) (mW/cm2)/ Limit of Power Density (S) (mW/cm2) ratios				

Maximum Simultaneous transmission MPE Ratios for BT+LTE:

Max MPE ratio _{WIFI}	Max MPE Ratio _{LTE}	Σ MPE ratios	Limit	Result
0.000708	0.102082	0.10279	1	Pass
MPE= Limit of Power Density (S) (mW/cm2)/ Limit of Power Density (S) (mW/cm2) ratios				

Signature:



Stone Tang

Date: 2023-06- 12