

FCC ID : 2AJ55HOLYSTONEZW

RF EXPOSURE EVALUATION

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/cm²)	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

1.1 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 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.

1.2 Measurement Result

WIFI 5G (MIMO):

The 5G WIFI has two antennas and support Multiple Outputs for 802.11n mode for this report; Antenna 1 Gain is 2.75 dBi; Antenna 2 Gain is 2.75 dBi; for this function is belong to Correlated Categorization equipment

According to KDB 662911, for equall antenna gains,

Directional gain = GANT + 10 log(NANT) dBi=7.14 dBi

Frequency band	Measure d power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
5150MHz-5250MHz	18.36	17 to19	19	5.18	0.08180	1
5725MHz-5850MHz	19.91	18 to 20	20	5.18	0.10297	1

BLE:

Antenna gain: 0.59 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
-1.42	-1 to 0	0	1.15	0.00023	1

SRD 2.4G:

Antenna gain: ANT 1: 2 dBi, ANT 2: 2 dBi

Smart system: SISO

Emission Level(dBuV/m)	EIRP (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
89.64	-5.59	0	1.58	0.00032	1
* EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77					

WIFI /BLE/SRD2.4G support for simultaneous delivery

MAX RF EXPOSURE EVALUATION

WIFI 5G	BLE	SRD 2.4G	Summation of Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
0.10297	0.00023	0.00032	0.10559	<1

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