

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)

FCC ID: 2ARN2-21EM10

EUT Specification

EUT	Car dash cam
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.24GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☒ Others: 2402~2480MHz GSM 850: TX:824.2~848.8 MHz PCS 1900: TX:1850.2~1909.8 MHz UMTS Band 2: TX:1852.4~1907.6 MHz UMTS Band 4: TX: 1710 ~ 1755 MHz UMTS Band 5: TX: 826.4 ~ 846.6 MHz: LTE-FDD Band 2: TX: 1850.7 ~ 1909.3 MHz LTE-FDD Band 4: TX:1710.7 ~ 1754.3 MHz LTE-FDD Band 5: TX: 824.7 ~ 848.3 MHz LTE-FDD Band 12: TX: 699.7 ~ 715.3 MHz LTE-FDD Band 17: TX: 706.5 ~ 713.5 MHz FM: 88.1-107.9MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ____
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm2) ☒ General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Antenna gain (Max)	BLE: 2 dBi 2.4G WIFI: 2 dBi GSM 850: 2 dBi PCS 1900: 2 dBi WCDMA Band 2: 2 dBi WCDMA Band 4: 2 dBi WCDMA Band 5: 2 dBi LTE-FDD Band 2: 2 dBi LTE-FDD Band 4: 2 dBi LTE-FDD Band 5: 2 dBi

	LTE-FDD Band 12: 2 dBi LTE-FDD Band 17: 2 dBi FM: 1.2 dBi
Directional Gain (Max)	/
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

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

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

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.

Max Measurement Result

Operating Mode	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits
	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	(mW/cm ²)
2.4G WIFI	14.99	14.99 ±1	15.99	2	0.0125	1
BLE	1.315	1.315 ±1	2.32	2	0.0005	1
GSM 850	33.41	33.41 ±1	34.41	2	0.8709	0.5495
PCS 1900	32.00	32.00 ±1	33.00	2	0.6294	1
UMTS Band 2	24.47	24.47 ±1	25.47	2	0.1112	1
UMTS Band 4	22.42	22.42 ±1	23.42	2	0.0693	1
UMTS Band 5	23.81	23.81 ±1	24.81	2	0.0955	0.5509
LTE BAND 2	25.25	25.25 ±1	26.25	2	0.1330	1
LTE BAND 4	25.06	25.06 ±1	26.06	2	0.1273	1
LTE BAND 5	25.47	25.47 ±1	26.47	2	0.1399	0.5509
LTE BAND 12	25.54	25.54 ±1	26.54	2	0.1422	0.4665
LTE BAND 17	24.93	24.93 ±1	25.93	2	0.1236	0.4710

Note: BLE & WIFI cannot support simultaneous transmission.