

RF EXPOSURE EVALUATION

EUT Specification

EUT	BATHROOM LED TV
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz, 2.422 ~ 2.452GHz ☒ WLAN: 5.18GHz ~ 5.24GHz ☒ WLAN: 5.745GHz ~ 5.825GHz ☒ Others(Bluetooth: 2.402GHz ~ 2.480GHz)
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others _____
Antenna diversity	☒ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	For EDR, BDR: 2.452dBm(1.76mW) For BLE: 2.420dBm(1.75mW) For 2.4G WIFI: 14.349dBm(27.22mW) For U-NII-1: 13.505dBm(22.41mW) For U-NII-3: 14.482dBm(28.07mW)
Antenna gain	2.0dBi
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)
300-1500	--	--	F/1500
1500-100000	--	--	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 = 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.

Measurement Result

Only the worst case was recorded in the report.

Channel	Channel Frequency (MHz)	Max Output power (dBm)	Max Output power (dBm) E.I.R.P	Power density at 20cm (mW/ cm ²)	Power density Limits (mW/cm ²)
Test mode: BT (GFSK)					
High	2480	2.452	4.452	0.000555	1
Test mode: 2.4G WIFI (IEEE 802.11b)					
Low	2412	13.282	15.282	0.006713	1
Test mode: 2.4G WIFI (IEEE 802.11n(HT20)) -SISO					
Low(ant1)	2412	12.439	14.439	0.005529	1
Low(ant2)	2412	12.058	14.058	0.005064	1
Test mode: 2.4G WIFI (IEEE 802.11n(HT20)) -MIMO					
Low(ant1)	2412	13.149	15.149	0.006511	1
Low(ant2)	2412	12.147	14.147	0.005169	1
Test mode: 5G WIFI (IEEE 802.11a)					
Mid	5785	14.482	16.482	0.00885	1
Test mode: 5G WIFI (IEEE 802.11 ac(VHT20)) SISO					
Mid(ant1)	5785	12.003	14.003	0.005001	1
Mid(ant2)	5785	12.049	14.049	0.005054	1
Test mode: 5G WIFI (IEEE 802.11 ac(VHT20)) MIMO					
Mid(ant1)	5785	12.622	14.622	0.005767	1
Mid(ant2)	5785	12.166	14.166	0.005192	1

When bluetooth and WiFi(2.4G) work together:

Ratio BT	2.4G WIFI (SISO) Ratio	2.4G WIFI (MIMO) Ratio	BT+2.4G WIFI (SISO) Ratio Total	BT+2.4G WIFI (MIMO) Ratio Total	Ratio Limits
0.000555	0.005529	0.01168	0.006084	0.012235	1

When bluetooth and WiFi(5G) work together:

Ratio BT	5G WIFI (SISO) Ratio	5G WIFI (MIMO) Ratio	BT+5G WIFI (SISO) Ratio Total	BT+5G WIFI (MIMO) Ratio Total	Ratio Limits
0.000555	0.005054	0.010959	0.005609	0.01151	1

Note: No simultaneously transmit for 2.4G WIFI and 5G WIFI.

According to KDB447498 D01 V06, Compliance with RF Exposure requirement.