

RF EXPOSURE EVALUATION

KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.

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)

EUT Specification

FCC ID	2BFMY-TFP4GDVR
EUT	TFP-4G DVR
Frequency band (Operating)	<input type="checkbox"/> BT: 2.402GHz ~ 2.480GH <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> RLAN: 5.180GHz ~ 5.240GHz <input type="checkbox"/> RLAN: 5.260GHz ~ 5.320GHz <input type="checkbox"/> RLAN: 5.500GHz ~ 5.700GHz <input type="checkbox"/> RLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others: WCDMA Band II: 1852.40MHz~1907.60MHz WCDMA Band V: 826.40MHz~846.60MHz WCDMA Band IV: 1712.40MHz~1752.60MHz LTE FDD Band 2: 1850.7 MHz – 1909.3 MHz LTE FDD Band 4: 1710.7 MHz – 1754.3 MHz LTE FDD Band 5: 824.7 MHz – 848.3 MHz LTE FDD Band 12: 699.7 MHz – 715.3 MHz LTE FDD Band 13: 779.5 MHz – 784.5 MHz LTE FDD Band 14: 790.5 MHz – 795.5 MHz LTE FDD Band 66: 1710.7 MHz-1779.3 MHz LTE FDD Band 71: 665.5 MHz – 695.5 MHz
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Antenna gain (Max)	Wi-Fi 2.4G: 1.64dBi WCDMA Band II: 2.38dBi WCDMA Band V: 1.08dBi

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	WCDMA Band IV: 0.9dBi LTE FDD Band 2: 2.38dBi LTE FDD Band 4: 1.08dBi LTE FDD Band 5: 0.9dBi LTE FDD Band 12: -2.21dBi LTE FDD Band 13: 0.78dBi LTE FDD Band 14: 0.78dBi LTE FDD Band 66: 1.24dBi LTE FDD Band 71: 0.5dBi
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

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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	Max. Conducted Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits (mW/cm ²)
	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	
WiFi 2.4G	14.04	14.0 ±1	15.00	1.64	0.0092	1
WCDMA Band II	22.45	22.0 ±1	23.00	2.38	0.0687	1
WCDMA Band V	22.93	22.0 ±1	23.00	1.08	0.0509	1
WCDMA Band IV	22.31	22.0 ±1	23.00	0.9	0.0489	1
LTE Band 2	22.01	22.0 ±1	23.00	2.38	0.0687	1
LTE Band 4	22.23	22.0 ±1	23.00	1.08	0.0509	1
LTE Band 5	23.46	23.0 ±1	24.00	0.9	0.0615	1
LTE Band 12	23.15	23.0 ±1	24.00	-2.21	0.0301	1
LTE Band 13	23.63	23.0 ±1	24.00	0.78	0.0598	1
LTE Band 14	23.57	23.0 ±1	24.00	0.78	0.0598	1
LTE Band 66	22.67	22.0 ±1	23.00	1.24	0.0528	1
LTE Band 71	23.44	23.0 ±1	24.00	0.5	0.0561	1



No. Applicable Simultaneous Transmission

1. WiFi 2.4G+WCDMA
2. WiFi 2.4G+LTE

The Maximum simultaneous transmission for LTE Band2+WiFi 2.4G:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$=S_{WLAN}/S_{limit-2.4G} + S_{LTE B2}/S_{limit-LTE}$$

$$=0.0092/1+0.0687/1$$

$$=0.0779$$

$$< 1.0$$

Result: No Standalone SAR test is required.

