MAXIMUM PERMISSIBLE EXPOSURE

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	2ABC5-E0140
EUT	Android Tablet
Frequency band (Operating)	☒ BT: 2.402GHz ~ 2.480GHz ☒ WLAN: 2.412GHz ~ 2.462GHz ☒ RLAN: 5.180GHz ~ 5.240GHz ☐ RLAN: 5.260GHz ~ 5.320GHz ☐ RLAN: 5.500GHz ~ 5.700GHz ☒ RLAN: 5.745GHz ~ 5.825GHz ☒ Others: NFC: 13.56MHz RFID: 125kHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ___
Exposure classification	☐ Occupational/Controlled exposure ☒ General Population/Uncontrolled exposure
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Antenna gain (Max)	BT&WiFi 2.4G: 2.99dBi WiFi 5.2G: 3.84dBi WiFi 5.8G: 3.84dBi
Evaluation applied	☒ MPE Evaluation ☐ 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	30
1500-100000	--	--	1	30

Friis transmission formula: Pd=(Pout*G)\(4*pi*R2)

Where
Pd= Power density in mW/cm^2
Pout=output power to antenna in Mw
G= gain of antenna in linear scale
Pi=3.1416
R= distance between observation point and center of the radiator in cm
Pd the limit of MPE. 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

Operating Mode	Maximum output power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
BDR&EDR	2.94	2.94 ±1	3.94	2.99	0.0010	1
BLE	2.95	2.95 ±1	3.95	2.99	0.0010	1
WiFi 2.4G	14.52	14.52 ±1	15.52	2.99	0.0141	1
WiFi 5.2G	15.64	15.64 ±1	16.64	3.84	0.0222	1
WiFi 5.8G	15.21	15.21 ±1	16.21	3.84	0.0201	1

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Operating Mode	Maximum output power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
NFC	-49.20	-49.20 ±1	-48.20	0.000000003	1
RFID	-40.97	-40.97 ±1	-39.97	0.00000002	1

$$E = EIRP - 20\log D + 104.8$$

where:

E = electric field strength in dBμV/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

For NFC: EIRP=E-104.8+20logD=46.06-104.8+20log3=-49.20dBm

For RFID: EIRP=E-104.8+20logD=54.29-104.8+20log3=-40.97dBm

The Maximum simultaneous transmission for WiFi 5.2G+NFC+RFID:

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

$=S_{WiFi\ 5.2G}/S_{limit}+ S_{NFC}/S_{limit}+ S_{RFID}/S_{limit}$

=0.0222/1+0.000000003/1+0.00000002/1

=0.022200023

< 1.0

Result: No Standalone SAR test is required.

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