



RF Exposure Evaluation

FCC ID: 2ATEU-YB010051

REQUIREMENT

KDB447498 D01 General RF Exposure Guidance v06, Clause 4.3.1(a)

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$

Where

-f(GHz) is the RF channel transmit frequency in GHz

-Power and distance are rounded to the nearest mW and mm before calculation

-The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

-The exposure safety distance is less than 5mm.

TEST RESULT

Passed

Not Applicable

BLE

Test mode	Channel Frequency (MHz)	Max. Measured Power (dBm)	Max. Tune up tolerance Power (dBm)	Max. Tune up tolerance Power (mW)	Calculatin g data	Limit	Results
GFSK_1M	2402	0.55	0.55±1	1.43	0.44	3.00	Pass
	2440	0.44	0.44±1	1.39	0.43		
	2480	0.18	0.18±1	1.31	0.41		
GFSK_2M	2402	0.52	0.52±1	1.42	0.44		
	2440	0.44	0.44±1	1.39	0.43		
	2480	0.14	0.14±1	1.30	0.41		



NFC

Antenna Gain=0dBi(Numeric 1.0), $\pi=3.14$

Frequency	Max. Measured Power (dBm)	Max. Tune up tolerance Power	Max. Tune up tolerance Power	Calculating data	Limit	Results
MHz	dBm	(dBm)	(mW)	0.0023	3.00	Pass
13.56	-11.15	-11.15±1	0.097			

According to the follow transmitter output power (P_t) formula:

$$P_t = (E \times d)^2 / (30 \times g_t)$$

P_t =transmitter output power in watts

g_t =numeric gain of the transmitting antenna (unitless)

E =electric field strength in V/m

d =measurement distance in meters (m)

According to the formula described above:

$$E_{max} = \underline{83.90} \text{ dBuV/m} = 0.016 \text{ V/m}, d = 3 \text{ m}, g_t = 1.0$$

$$P_t = (E \times d)^2 / (30 \times g_t) = (0.016 \times 3)^2 / (30 \times 1.0) = \underline{0.0000768 \text{ W}} = \underline{0.0768 \text{ mW}} = -11.15 \text{ dBm}$$

Note:

1. Only the worst case recorded.
2. The 2.4G BLE and NFC can transmit simultaneously and

$$\text{MPE Ratio (BLE+NFC)} = 0.44/3 + 0.0023/3 = 0.147 < 3$$

and it satisfy the RF exposure requirements for simultaneous transmission that the sum of the MPE radios < 3

*****THE END*****