



CTC Laboratories, Inc.

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RF Exposure Evaluation

FCC ID: 2APPZ-I60K

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

EUT Specification

Product Name:	Video Door Phone
Trade Mark:	Fanvil
Model/Type reference:	i60k
Listed Model(s):	/
Frequency band (Operating)	<input type="checkbox"/> BT: 2.402GHz ~ 2.480GHz <input checked="" type="checkbox"/> BLE: 2.402GHz ~ 2.480GHz <input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> Others 13.56MHz
Device category	<input type="checkbox"/> Portable (<5mm separation) <input type="checkbox"/> Mobile (>20cm separation) <input checked="" type="checkbox"/> Fixed (>20cm separation) <input type="checkbox"/> Others
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Antenna gain (Max)	BLE: 3dBi NFC: 0dBi

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**Limit****Limits for Maximum Permissible Exposure (MPE)**

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposure				
300-1500	--	--	F/300	<6
1500-100000	--	--	5	<6
(B) Limits for General Population/Uncontrolled Exposure				
300-1500	--	--	F/1500	<30
1500-100000	--	--	1	<30

Calculation Method

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 limit of MPE is 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

Mode	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Tune Up Tolerance (dB)	Max. Tune Up Power (dBm)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
BLE 2M	2402	3	4.79	±1	5	0.00126	1

NFC:

$$eirp = pt \times gt = (E \times d)^2 / 30$$

where:

pt = transmitter output power in watts,

gt = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m, --- $10^{(dBuV/m)/20} / 10^6$

d = measurement distance in meters (m), --- 3m

So $pt = (E \times d)^2 / (30 \times gt)$

13.56MHz Field strength = 57.92dBuV/m @3m

Ant gain 0dBi, Ant numeric gain = 1

$$So pt = \{[10^{(57.92/20)}/10^6 \times 3]^2 / (30 \times 1)\} \times 1000 \text{ mW} = 0.0001858 \text{ mW}$$

Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.



Note:

1. BLE and NFC can be launched simultaneously. Simultaneous evaluation of compliant RF exposur: $0.00126/1+0.0001858/1=0.0014458<1$
2. Calculate by Worst-case mode.
2. Max. Tune Up Power by Manufacturer's Declaration, and Max. Tune Up Power is used to calculate.
3. For a more detailed features description, please refer to the RF Test Report.

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

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