



## CTC Laboratories, Inc.

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### RF Exposure Evaluation

FCC ID: 2APPZ-I60

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

#### EUT Specification

Product Name:	Video Door Phone
Trade Mark:	<b>Fanvil</b>
Model/Type reference:	i60
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 <u>13.56MHz</u>
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: 3.7dBi 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 <sup>2</sup> )	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:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where:

$P_d$  = Power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  limit of MPE is 1mW/cm<sup>2</sup>. 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
BLE 1M	2402	3.7	5.17	±1	6	0.00186	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 = 52.53 dBuV/m @3m

Ant gain 0dBi, Ant numeric gain = 1

So  $pt = \{ [10^{(52.53/20)/10^6} \times 3]^2 / (30 \times 1) \} \times 1000 \text{ mW} = 0.0000537 \text{ mW}$

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:  $0.00186/1+0.0000537/1=0.0019137<1$
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\*\*\*\*\*