



# CTC Laboratories, Inc.

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## Maximum Permissible Exposure Evaluation

FCC ID: 2APPZ-I56A

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

Product Name:	Indoor Station
Trade Mark:	Fanvil <b>Fanvil</b>
Model/Type reference:	i56A
Listed Model(s):	N/A
Frequency band (Operating)	<input checked="" type="checkbox"/> BT: 2.402GHz ~ 2.480GHz <input checked="" type="checkbox"/> BLE: 2.402GHz ~ 2.480GHz <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> RLAN: 5.180GHz ~ 5.240GHz <input checked="" type="checkbox"/> RLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others
Device category	<input type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input checked="" type="checkbox"/> fixed (>20cm separation) <input type="checkbox"/> Others ____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S=5mW/cm2) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm2)
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)	3dBi for 2.4GHz 5.5dBi for 5GHz WIFI
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

### 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> )	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

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Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = Power density in  $mW/cm^2$

$P_{out}$  = 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

$P_d$  the limit of MPE  $1mW/cm^2$ . 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

BLE							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm ( $mW/cm^2$ )	Power density Limits ( $mW/cm^2$ )
GFSK	2402	-0.58	0±1	1	3	0.00050	1
	2440	1.18	1±1	2	3	0.00063	1
	2480	1.41	1±1	2	3	0.00063	1

BR/ EDR							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm ( $mW/cm^2$ )	Power density Limits ( $mW/cm^2$ )
GFSK	2402	2.37	2±1	3	3	0.00079	1
	2441	3.87	3±1	4	3	0.00100	1
	2480	4.18	4±1	5	3	0.00126	1
$\pi/4$ -DQPSK	2402	0.12	0±1	1	3	0.00050	1
	2441	1.08	1±1	2	3	0.00063	1
	2480	1.71	1±1	2	3	0.00063	1
8-DPSK	2402	0.4	0±1	1	3	0.00050	1
	2441	1.57	1±1	2	3	0.00063	1
	2480	2.17	3±1	4	3	0.00100	1



2.4G WIFI							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
802.11 b	2412	17.13	17±1	18	3	0.02505	1
	2437	17.33	17±1	18	3	0.02505	1
	2462	17.03	17±1	18	3	0.02505	1
802.11n40	2412	14.40	14±1	15	3	0.01255	1
	2437	14.47	14±1	15	3	0.01255	1
	2462	14.52	14±1	15	3	0.01255	1

5G WIFI U-NII-1							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
802.11a	5180	13.24	13±1	14	5.5	0.01773	1
802.11a	5200	13.29	13±1	14	5.5	0.01773	1
802.11 N20	5240	13.09	13±1	14	5.5	0.01773	1
802.11 ac40	5190	12.39	12±1	13	5.5	0.01408	1
	5230	12.43	12±1	13	5.5	0.01408	1
802.11 ac80	5210	10.94	10±1	11	5.5	0.00889	1

5G WIFI U-NII-3							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
802.11 ac20	5745	12.70	12±1	13	5.5	0.01408	1
802.11 a	5785	12.32	12±1	13	5.5	0.01408	1
802.11 n20	5825	12.35	12±1	13	5.5	0.01408	1
802.11 n40	5755	12.13	12±1	13	5.5	0.01408	1

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802.11 ac40	5795	11.98	11±1	12	5.5	0.01119	1
802.11 ac80	5775	10.80	10±1	11	5.5	0.00889	1

The WLAN or Bluetooth can transmit simultaneously

WLAN Power density at 20cm (mW/cm <sup>2</sup> )	BT Power density at 20cm (mW/cm <sup>2</sup> )	Total Power density at 20cm (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
0.02505	0.00126	0.02631	1

**Note**

For a more detailed features description, please refer to the RF Test Report.

\*\*\*\*\*THE END\*\*\*\*\*