Shenzhen CTA Testing Technology Co., Ltd.
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

RF Exposure evaluation

Report Reference No. ..... :	**CTA24103100107**
FCC ID. ..... :	**2AYD5-I24D02**
Compiled by (position+printed name+signature):	File administrators Jinghua Xiao
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Date of issue ..... :	Sep.20, 2024

Representative Laboratory Name ..... :	**Shenzhen CTA Testing Technology Co., Ltd.**
Address ..... :	Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name..... :	**Imin Technology Pte Ltd**
Address ..... :	11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943

Test specification ..... **:**	
Standard..... :	47CFR §1.1310 Basis and purpose 47CFR §2.1091 Radiofrequency radiation exposure evaluation: mobile devices
TRF Originator ..... :	Shenzhen Global Test Service Co.,Ltd.
Master TRF ..... :	Dated 2014-12

Test item description ..... :	**POS Device**
Trade Mark ..... :	iMin
Manufacturer ..... :	Imin Technology Pte Ltd
Model/Type reference ..... :	I24D02
Listed Models ..... :	N/A
Hardware Version ..... :	N/A
Software Version ..... :	N/A
Rating ..... :	DC 24V/1.5A by adapter
Result ..... :	**PASS**

T E S T R E P O R T

Test Report No. : **CTA24103100107**	Sep.20, 2024 Date of issue

Equipment under Test	:	POS Device
Model /Type	:	I24D02
Listed model	:	N/A
Applicant	:	**Imin Technology Pte Ltd**
Address	:	11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943
Manufacturer	:	**Imin Technology Pte Ltd**
Address	:	11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943

Test Result:	**PASS**

Contents

1. SUMMARY

1.1 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

●	N/A	M/N:	N/A
		Manufacturer:	N/A

1.2 Product Description

Product Name:	POS Device
Trade Mark:	iMin
Model/Type reference:	I24D02
List Model:	N/A
Model Declaration	N/A
Power supply:	DC 24V/1.5A by adapter
Hardware Version	N/A
Software Version	N/A
Sample ID	CTA241031001-S0001-3# CTA241031001-S0001-4# (Version A) CTA241031001-S0001-5# (Version B) CTA241031001-S0001-6# (Version C) CTA241031001-S0001-7# (Version D)
Bluetooth	
Frequency Range	2402MHz ~ 2480MHz
Channel Number	79 channels for Bluetooth (DSS) 40 channels for Bluetooth (DTS)
Channel Spacing	1MHz for Bluetooth (DSS) 2MHz for Bluetooth (DTS)
Modulation Type	GFSK, π/4-DQPSK, 8DPSK for Bluetooth (DSS) GFSK for Bluetooth (DTS)
2.4GWLAN	
WLAN Operation frequency	IEEE 802.11b:2412-2462MHz IEEE 802.11g:2412-2462MHz IEEE 802.11n HT20:2412-2462MHz IEEE 802.11n HT40:2422-2452MHz IEEE 802.11ax HE20:2412-2462MHz IEEE 802.11ax HE40:2422-2452MHz
WLAN Modulation Type	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax HE20: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax HE40: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Channel number:	11 Channel for IEEE 802.11b/g/n/ax (HT20) 7 Channel for IEEE 802.11n/ax (HT40)

Channel separation:	5MHz
WIFI(5.2G/5.3G/5.7G/5.8G Band)	
WLAN Operation frequency	5180-5240MHz/ 5260MHz to 5320MHz/ 5500MHz to 5700MHz/ 5745MHz to 5825MHz
WLAN Modulation Type	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11ac VHT20: OFDM (256QAM,64QAM, 16QAM, QPSK,BPSK) IEEE 802.11ax HE20: OFDMA (1024QAM,256QAM,64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11ac VHT40: OFDM (256QAM,64QAM, 16QAM, QPSK,BPSK) IEEE 802.11ax HE40: OFDMA (1024QAM,256QAM,64QAM, 16QAM, QPSK,BPSK) IEEE 802.11ac VHT80: OFDM (256QAM,64QAM, 16QAM, QPSK,BPSK) IEEE 802.11ax HE80: OFDMA (1024QAM,256QAM,64QAM, 16QAM, QPSK,BPSK)
Channel number:	4 Channels for 20MHz bandwidth(5180-5240MHz) 4 Channels for 20MHz bandwidth(5260-5320MHz) 11 Channels for 20MHz bandwidth(5500-5700MHz) 5 channels for 20MHz bandwidth(5745-5825MHz) 2 channels for 40MHz bandwidth(5190~5230MHz) 2 channels for 40MHz bandwidth(5270~5310MHz) 5 Channels for 40MHz bandwidth(5510-5670MHz) 2 channels for 40MHz bandwidth(5755~5795MHz) 1 channels for 80MHz bandwidth(5210MHz) 1 channels for 80MHz bandwidth(5290MHz) 2 Channels for 80MHz bandwidth(5530-5610MHz) 1 channels for 80MHz bandwidth(5775MHz)
Antenna Description	Internal Antenna, 2.05dBi(Max.) for 2.4G Band and 3.87dBi(Max.) for 5G Band
RFID(13.56MHz) (Optional)	
Frequency Range	13.56MHz
Channel Number	1
Modulation Type	ASK
Antenna Description	Internal Antenna, 0dBi (Max.), NFC has two optional antennas, antenna 1(Model:DS2-52) and antenna 2 (Model:DS2-51).
Remark: The I24D02 model has 4 versions; Version A: One large display and one small display (large display+ 10 inch small display) Version B: Only one large display Version C: Double large display Version D: One large display and one small display (large display+ 5 inch small display)	

2. TEST ENVIRONMENT

2.1 Address of the test laboratory

Shenzhen CTA Testing Technology Co., Ltd.
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

2.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 517856 Designation Number: CN1318
Shenzhen CTA Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.
A2LA-Lab Cert. No.: 6534.01
Shenzhen CTA Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.
The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

2.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen CTA Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen CTA Testing Technology Co., Ltd. :

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. METHOD OF MEASUREMENT

3.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
According to §1.1310 and §2.1091 RF exposure is calculated.
KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.2 Requirement

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498 D01 General RF Exposure Guidance v06 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3.3 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	($900/f^2$)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	($180/f^2$)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz
*=Plane-wave equivalent power density

3.4 MPE Calculation Method

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$
Where: S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to an isotropic radiator
R=distance to the center of radiation of the antenna

As declared by the Applicant, the EUT transmits with the maximum soure-baed Duty Cycle of 100%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, r =20cm, as well as the gain of the used antenna is 2.05dBi &3.87dBi for BT&WLAN, and the power drift from Turn-up Procedure provide by manufacturer as following states, the RF power density can be obtained.

3.5 Antenna Information

I24D02 can only use antennas certificated as follows provided by manufacturer;

Internal Identification	Antenna Identification in Internal photos	Antenna type and antenna number	Operate frequency band	Maximum antenna gain
Antenna 0	BT&WLAN	Internal Antenna	2.4 – 2.5 GHz 5.0 – 6.0 GHz	2.05dBi(Max.) for 2.4G band 3.87dBi(Max.) for 5G band

4. Conducted Power Results

NFC

Mode	Channel	Frequency (MHz)	Field strength of fundamental (dBuV/m) @3m
ASK	1	13.56	113.11

Bluetooth

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	8.47
	39	2441	9.94
	78	2480	9.70
π/4DQPSK	0	2402	8.16
	39	2441	9.64
	78	2480	9.50
8DPSK	0	2402	8.19
	39	2440	9.63
	78	2480	9.47
GFSK(BT LE)	0	2402	8.31
	19	2440	9.70
	39	2480	9.37

2.4GWLAN

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
802.11b	01	2412	14.27
	06	2437	15.06
	11	2462	15.37
802.11g	01	2412	16.25
	06	2437	17.21
	11	2462	17.69
802.11n(HT20)	01	2412	16.30
	06	2437	17.10
	11	2462	17.51
802.11n(HT40)	03	2422	15.66
	06	2437	16.73
	09	2452	16.49
802.11ax(HE20)	01	2412	10.77
	06	2437	14.55
	11	2462	15.06
802.11ax(HE40)	03	2422	13.88
	06	2437	14.45
	09	2452	13.99

5.2GWLAN

Mode	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
802.11a	36	5180	14.56
	40	5200	13.62
	48	5240	13.43
802.11n20	36	5180	12.16
	40	5200	12.30
	48	5240	11.50
802.11n40	38	5190	11.98
	46	5230	11.89
802.11ac20	36	5180	11.90
	40	5200	11.71
	48	5240	11.55
802.11ac40	38	5190	11.74
	46	5230	12.09
802.11ac80	42	5210	12.01
802.11ax20	36	5180	13.89
	40	5200	14.32
	48	5240	13.67
802.11ax40	38	5190	14.31
	46	5230	16.00
802.11ax80	42	5210	14.30

5.3GWLAN

Mode	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
802.11a	52	5260	10.86
	56	5280	10.05
	64	5320	10.19
802.11n20	52	5260	10.00
	56	5280	9.96
	64	5320	10.17
802.11n40	54	5270	9.97
	58	5310	10.40
802.11ac20	52	5260	10.48
	56	5280	10.32
	64	5320	10.13
802.11ac40	54	5270	10.70
	58	5310	9.43
802.11ac80	62	5290	11.03
802.11ax20	52	5260	10.32
	56	5280	10.10
	64	5320	10.01
802.11ax40	54	5270	10.27
	58	5310	9.61
802.11ax80	62	5290	9.38

5.7GWLAN

Mode	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
802.11a	100	5500	13.15
	120	5600	13.84
	140	5700	14.79
802.11n20	100	5500	13.51
	120	5600	13.81
	140	5700	14.55
802.11n40	102	5510	13.24
	118	5590	13.63
	134	5670	14.09
802.11ac20	100	5500	13.64
	120	5600	13.45
	140	5700	14.38
802.11ac40	102	5510	12.57
	118	5590	13.48
	134	5670	13.90
802.11ac80	106	5530	13.03
	122	5610	14.01
802.11ax20	100	5500	13.19
	120	5600	13.88
	140	5700	14.67
802.11ax40	102	5510	12.56
	118	5590	13.41
	134	5670	13.86
802.11ax80	106	5530	13.84
	122	5610	13.94

5.8GWLAN

Mode	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
802.11a	149	5745	12.35
	157	5785	12.35
	165	5825	12.35
802.11n20	149	5745	12.59
	157	5785	12.25
	165	5825	12.51
802.11n40	151	5755	12.45
	159	5795	12.59
802.11ac20	149	5745	13.12
	157	5785	12.32
	165	5825	13.11
802.11ac40	151	5755	12.58
	159	5795	12.52
802.11ac80	155	5775	12.52
802.11ax20	149	5745	13.02
	157	5785	12.79
	165	5825	12.86
802.11ax40	151	5755	12.73
	159	5795	12.46
802.11ax80	155	5775	12.83

5. Manufacturing Tolerance

Bluetooth

GFSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	8.00	9.00	9.00
Tolerance ±(dB)	1.0	1.0	1.0
π/4DQPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	8.00	9.00	9.00
Tolerance ±(dB)	1.0	1.0	1.0
8DPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	8.00	9.00	9.00
Tolerance ±(dB)	1.0	1.0	1.0
GFSK BT LE (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	8.00	9.00	9.00

2.4GWLAN

IEEE 802.11b (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	14.00	15.00	15.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11g (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	16.00	17.00	17.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	16.00	17.00	17.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Peak)			
Channel	Channel 03	Channel 06	Channel 09
Target (dBm)	15.00	16.00	16.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ax HE20 (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	10.00	14.00	15.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ax HE40 (Peak)			
Channel	Channel 03	Channel 06	Channel 09
Target (dBm)	13.00	14.00	13.00
Tolerance ±(dB)	1.0	1.0	1.0

5.2GWLAN

IEEE 802.11a (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	14.00	13.00	13.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	12.00	12.00	11.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n VHT40 (Average)			
Channel	Channel 38	Channel 46	/
Target (dBm)	11.00	11.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	11.00	11.00	11.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 38	Channel 46	/
Target (dBm)	11.00	12.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 42	/	/
Target (dBm)	12.00	/	/
Tolerance ±(dB)	1.0	/	/
IEEE 802.11ax HE20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	13.00	14.00	13.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ax HE40 (Average)			
Channel	Channel 38	Channel 46	/
Target (dBm)	14.00	16.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ax HE80 (Average)			
Channel	Channel 42	/	/
Target (dBm)	14.00	/	/
Tolerance ±(dB)	1.0	/	/

5.3GWLAN

IEEE 802.11a (Average)			
Channel	Channel 52	Channel 56	Channel 64
Target (dBm)	10.00	10.00	10.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 52	Channel 56	Channel 64
Target (dBm)	10.00	9.00	10.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Average)			
Channel	Channel 52	Channel 56	/
Target (dBm)	9.00	10.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 52	Channel 56	Channel 64
Target (dBm)	10.00	10.00	10.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 54	Channel 58	/
Target (dBm)	10.00	9.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 62	/	/
Target (dBm)	11.00	/	/
Tolerance ±(dB)	1.0	/	/
IEEE 802.11ax HE20 (Average)			
Channel	Channel 52	Channel 56	Channel 64
Target (dBm)	10.00	10.00	10.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ax HE40 (Average)			
Channel	Channel 54	Channel 58	/
Target (dBm)	10.00	9.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ax HE80 (Average)			
Channel	Channel 62	/	/
Target (dBm)	9.00	/	/
Tolerance ±(dB)	1.0	/	/

5.7GWLAN

IEEE 802.11a (Average)			
Channel	Channel 100	Channel 120	Channel 140
Target (dBm)	13.00	13.00	14.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 100	Channel 120	Channel 140
Target (dBm)	13.00	13.00	14.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Average)			
Channel	Channel 102	Channel 118	Channel 134
Target (dBm)	13.00	13.00	14.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 100	Channel 120	Channel 140
Target (dBm)	13.00	13.00	14.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 102	Channel 118	Channel 134
Target (dBm)	12.00	13.00	13.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 106	Channel 122	/
Target (dBm)	13.00	14.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ax HE20 (Average)			
Channel	Channel 100	Channel 120	Channel 140
Target (dBm)	13.00	13.00	14.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ax HE40 (Average)			
Channel	Channel 102	Channel 118	Channel 134
Target (dBm)	12.00	13.00	13.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ax HE80 (Average)			
Channel	Channel 106	Channel 122	/
Target (dBm)	13.00	13.00	/
Tolerance ±(dB)	1.0	1.0	/

5.8GWLAN

IEEE 802.11a (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	12.00	12.00	12.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	12.00	12.00	12.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Average)			
Channel	Channel 151	Channel 159	/
Target (dBm)	12.00	12.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	13.00	12.00	13.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 151	Channel 159	/
Target (dBm)	12.00	12.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 155	/	/
Target (dBm)	12.00	/	/
Tolerance ±(dB)	1.0	/	/
IEEE 802.11ax HE20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	13.00	12.00	12.00
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ax HE40 (Average)			
Channel	Channel 151	Channel 159	/
Target (dBm)	12.00	12.00	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ax HE80 (Average)			
Channel	Channel 155	/	/
Target (dBm)	12.00	/	/
Tolerance ±(dB)	1.0	/	/

6. Measurement Results

6.1 Standalone MPE Evaluation

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, r =20cm, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

NFC

Mode	Channel	Frequency (MHz)	Field strength of fundamental @ 3m		Field strength of fundamental @ 0.2m		Electric Field Strength (V/m)
			(dBuV/m)	V/m	(dBuV/m)	V/m	
ASK	1	13.56	63.11	0.0143	110.15	3.2187	60.77

BT

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
GFSK	10.00	10.0000	2.05	1.6032	0.0032	1.0000
π/4DQPSK	10.00	10.0000	2.05	1.6032	0.0032	1.0000
8DPSK	10.00	10.0000	2.05	1.6032	0.0032	1.0000
GFSK (BT LE)	10.00	10.0000	2.05	1.6032	0.0032	1.0000

2.4GWLAN

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
802.11b	16.00	39.8107	2.05	1.6032	0.0127	1.0000
802.11g	18.00	63.0957	2.05	1.6032	0.0201	1.0000
802.11n(HT20)	18.00	63.0957	2.05	1.6032	0.0201	1.0000
802.11n(HT40)	17.00	50.1187	2.05	1.6032	0.0160	1.0000
802.11ax(HE20)	16.00	39.8107	2.05	1.6032	0.0127	1.0000
802.11ax(HE40)	15.00	31.6228	2.05	1.6032	0.0101	1.0000

5.2GWLAN

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
802.11a	15.00	31.6228	3.87	2.4378	0.0153	1.0000
802.11n20	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11n40	12.00	15.8489	3.87	2.4378	0.0077	1.0000
802.11ac20	12.00	15.8489	3.87	2.4378	0.0077	1.0000
802.11ac40	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11ac80	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11ax20	15.00	31.6228	3.87	2.4378	0.0153	1.0000
802.11ax40	17.00	50.1187	3.87	2.4378	0.0243	1.0000
802.11ax80	15.00	31.6228	3.87	2.4378	0.0153	1.0000

5.3GWLAN

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MP20 Limits (mW/cm^2)
	dBm	mW				
802.11a	11.00	12.5893	3.87	2.4378	0.0061	1.0000
802.11n20	11.00	12.5893	3.87	2.4378	0.0061	1.0000
802.11n40	11.00	12.5893	3.87	2.4378	0.0061	1.0000
802.11ac20	11.00	12.5893	3.87	2.4378	0.0061	1.0000
802.11ac40	11.00	12.5893	3.87	2.4378	0.0061	1.0000
802.11ac80	12.00	15.8489	3.87	2.4378	0.0077	1.0000
802.11ax20	11.00	12.5893	3.87	2.4378	0.0061	1.0000
802.11ax40	11.00	12.5893	3.87	2.4378	0.0061	1.0000
802.11ax80	10.00	10.0000	3.87	2.4378	0.0048	1.0000

5.7GWLAN

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MP20 Limits (mW/cm^2)
	dBm	mW				
802.11a	15.00	31.6228	3.87	2.4378	0.0153	1.0000
802.11n20	15.00	31.6228	3.87	2.4378	0.0153	1.0000
802.11n40	15.00	31.6228	3.87	2.4378	0.0153	1.0000
802.11ac20	15.00	31.6228	3.87	2.4378	0.0153	1.0000
802.11ac40	14.00	25.1189	3.87	2.4378	0.0122	1.0000
802.11ac80	15.00	31.6228	3.87	2.4378	0.0153	1.0000
802.11ax20	15.00	31.6228	3.87	2.4378	0.0153	1.0000
802.11ax40	14.00	25.1189	3.87	2.4378	0.0122	1.0000
802.11ax80	14.00	25.1189	3.87	2.4378	0.0122	1.0000

5.8GWLAN

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
802.11a	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11n20	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11n40	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11ac20	14.00	25.1189	3.87	2.4378	0.0122	1.0000
802.11ac40	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11ac80	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11ax20	14.00	25.1189	3.87	2.4378	0.0122	1.0000
802.11ax40	13.00	19.9526	3.87	2.4378	0.0097	1.0000
802.11ax80	13.00	19.9526	3.87	2.4378	0.0097	1.0000

Remark:

1. Output power including tune-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer;

6.2 Simultaneous Transmission MPE

The sample support one Bluetooth chip and one WLAN modular and one Bluetooth antenna,and one WLAN antennas, WLAN not support MIMO, Need consider simultaneous transmission ;

According to KDB447498 D01 General RF Exposure Guidance v06 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;
∑ of MPE ratios ≤ 1.0

6.2.1 Summary simultaneous transmission results

Maximum Simultaneous transmission MPE Ratios for **NFC,2.4GWLAN**

Maximum MPE ratio NFC	Maximum MPE ratio 2.4GWLAN	∑MPE ratios	Limit	Results
0.0529	0.0201	0.073	1.0	PASS

7. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB447498 D01 General RF Exposure Guidance v06, No SAR is required.

.....End of Report.....