

Test Report

Applicant	:	KINDOO LLP		
Address	:	7-2070 Harvey Ave., Unit #163, Kelowna, British Columbia, N/A V1Y 8P8 Canada		
Product Name	:	Access control		
Brand Mark	:	KINDOO		
Model	:	KIN S B01		
Series model	:	N/A		
FCC ID	:	2A7TP-KINSB01		
Report Number	:	BLA-EMC-202502-A1601		
Date of Receipt	:	Feb. 12, 2025		
Date of Test	:	Feb. 12, 2025 to Feb. 21, 2025		
Test Standard	:	47 CFR Part 15, Subpart C 15.247		
Test Result	:	Pass		

Compiled by: Mark then Review by: Success



BlueAsia of Technical Services(Shenzhen) Co.,Ltd.

Address: Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China



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Revise Record

Version No.	Date	Description
01	Feb. 24, 2024	Original

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1 General information

1.1 General information

Applicant	KINDOO LLP
Address	7-2070 Harvey Ave., Unit #163, Kelowna, British Columbia, N/A V1Y
Audress	8P8 Canada
Manufacturer	KINDOO LLP
Address	7-2070 Harvey Ave., Unit #163, Kelowna, British Columbia, N/A V1Y
Address	8P8 Canada
Factory	KINDOO LLP
Address	7-2070 Harvey Ave., Unit #163, Kelowna, British Columbia, N/A V1Y
Audress	8P8 Canada

1.2 General description of EUT

Product name	Access control
Model no.	KIN S B01
Operation Frequency:	2402MHz-2480MHz
Modulation Type:	GFSK
Rate data:	1Mbps
Channel Spacing:	2MHz
Number of Channels:	40
Antenna Type:	Internal antenna
Antenna Gain:	3.7dBi (Provided by customer)
Power supply:	DC 6V
Hardware Version	1.0
Software Version	1.0
Note: For a more detailed the applicant and/or manu	description, please refer to Specification or User's Manual supplied by facturer.

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2 Test summary

No.	Test item	FCC standard	Test Method(Clause)	Result
1	Antenna Requirement	§15.203	N/A	Pass
2	Conducted Emissions at AC Power Line (150kHz-30MHz)	§15.207	ANSI C63.10-2013 Clause 6.2	Pass
3	Conducted Peak Output Power	§15.247(b)(3)	ANSI C63.10-2013 Cluase 7.8.5	Pass
4	Minimum 6dB Bandwidth	§15.247a(2)	ANSI C63.10-2013 Cluase 11.8.1	Pass
5	Power Spectrum Density	§15.247(d)	ANSI C63.10-2013 Cluase 11.10.2	Pass
6	Conducted Band Edges Measurement	§15.247(d)	ANSI C63.10-2013 Cluase 11.13	Pass
7	Conducted Spurious Emissions	§15.247(d)	ANSI C63.10-2013 Cluase 11.11	Pass
8	Radiated Spurious Emissions	§15.209 §15.247(d)	ANSI C63.10-2013 Cluase 6.4,6.5,6.6	Pass
9	Radiated Emissions which fall in the restricted bands	§15.209 §15.247(d)	ANSI C63.10-2013 Cluase 11.12	Pass

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3 Test Configuration

3.1 Test mode

Test Mode Note 1	Description		
TX	Keep the EUT in continuously transmitting with modulation mode.		
RX	Keep the EUT in receiving mode		
TX Low channel	Keep the EUT in continuously transmitting mode in low channel		
TX middle channel	Keep the EUT in continuously transmitting mode in middle channel		
TX high channel	Keep the EUT in continuously transmitting mode in high channel		

Note 1: The EUT was configured to measure its highest possible emission and/or immunity level. The test modes were adapted according to the operation manual for use.

Power level setup in software					
Test Software Name	J-Link RTT Viewer				
Mode	Channel Frequency (MHz) Soft Set				
	CH00	2402			
ТХ	CH20	2442	TX level : Default		
	CH39	2480			

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3.2 Operation Frequency each of channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

3.3 Test channel

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2442MHz
The Highest channel	2480MHz

3.4 Auxiliary equipment

Device Type	Manufacturer	Model Name	Serial No.	Remark
PC	Lenovo	E460C	1	From lab
FC	Lenovo	E400C	/	(No.BLA-ZC-BS-2022005)
Rechargeable battery	TIANNENG	6-DZF-20.3	/	/
DC POWER SUPPLY	ZHAOXIN	KXN-305D	/	1

3.5 Test environment

Environment	Temperature	Voltage	
Normal	25°C	DC 6V	

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4 Laboratory information

4.1 Laboratory and accreditations

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

Company name:	BlueAsia of Technical Services(Shenzhen) Co., Ltd.				
Address:	Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China				
CNAS accredited No.:	L9788				
A2LA Cert. No.:	5071.01				
FCC Designation No.:	CN1252				
ISED CAB identifier No.:	CN0028				
Telephone:	+86-755-28682673				
FAX:	+86-755-28682673				

4.2 Measurement uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

Parameter	Expanded Uncertainty
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB
Temperature	±3 °C
Supply voltages	±3 %
Time	±5 %

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5 Test equipment

Radiated Spurious Emissions (Below 1GHz)

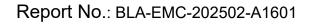
Equipment	Name	Model	Manufacture	S/N	Cal. Date	Due. Date
BLA-EMC-002-01	Anechoic	9*6*6	SKET	N/A	2024/3/27	2027/3/26
BLA-EIVIC-002-01	chamber	chamber	SKEI	N/A	2024/3/27	2027/3/20
	Control room	966 control	SKET	N/A	2024/3/27	2027/3/26
BLA-EMC-002-02	Control room	room	SKET	N/A	2024/3/27	2027/3/20
BLA-EMC-009	EMI receiver	ESR7	R&S	101199	2024/08/08	2025/08/07
BLA-EMC-043	Loop antenna	FMZB1519B	Schwarzbeck	00102	2024/06/29	2026/06/28
BLA-EMC-065	Broadband	VULB9168	Schwarzbeck	01065P	2024/06/29	2026/06/27
BLA-EWIC-005	antenna	VULD9100	Schwarzbeck	01005P	2024/00/29	2020/00/27
BLA-XC-01	Coaxial Cable	N/A	BlueAsia	V01	N/A	N/A
BLA-XC-02	Coaxial Cable	N/A	BlueAsia	V02	N/A	N/A
Padiated Spurious Emissions (Above 10Uz)						

Radiated Spurious Emissions (Above 1GHz)

Equipment	Name	Model	Manufacture	S/N	Cal. Date	Due. Date
BLA-EMC-001	Anechoic	9*6*6	SKET	N/A	2023/11/16	2026/11/15
-01	chamber	chamber	SKET	N/A	2023/11/10	2020/11/15
BLA-EMC-001	Control Room	966 control	OVET		0000/44/46	0005/44/45
-02	Control Room	room	SKET	N/A	2023/11/16	2025/11/15
BLA-EMC-008	Spectrum	FSP40	R&S	100817	2024/08/08	2025/08/07
BLA-EMC-012	Broadband	VULB9168	Schwarzbeck	00836	2022/10/12	2025/10/11
BLA-ENIC-012	antenna	VULD9100	Schwarzbeck	P:00227	2022/10/12	2025/10/11
BLA-EMC-013	Horn Antenna	BBHA9120D	Schwarzbeck	01892	2024/06/29	2026/06/28
	Amplifier	PA_000318G-	000318G- 45 SKET	PA201804300	2024/08/08	2025/08/07
BLA-EMC-014		45		3		
BLA-EMC-046	<u>Filter benk</u>	2.4G/5G Filter	SKET	NI/A	2024/06/28	2025/06/27
BLA-ENIC-040	Filter bank	bank	SKEI	N/A	2024/06/28	2025/06/27
BLA-EMC-061	Receiver	ESPI7	R&S	101477	2024/06/28	2025/06/27
	A man lifi a n	LNPA_30M01	OVET	SK202106080	2024/06/28	2025/06/27
BLA-EMC-066	Amplifier	G-30	SKET	1		
	Amplifier	LNPA_18G40		SK202207130	2024/06/22	2025/06/27
BLA-EMC-086	Amplifier	G-50dB	1	2024/06/28	2025/06/27	
BLA-EMC-087	Horn Antenna	BBHA 9170	Schwarzbeck	1106	2024/06/29	2026/06/28

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r									
BLA-XC-03	Coaxial	Cable	N//	۹	B	ueAsia	V03	N/A	N/A
BLA-XC-04	Coaxial	Cable	N//	۹	В	ueAsia	V04	N/A	N/A
RF conducted									
Equipment	N	lame	N	/lodel	Ма	anufacture	S/N	Cal. Date	Due. Date
BLA-EMC-003- 003	Shie	ld room	ę	5*3*3		SKET	N/A	2023/11/16	2025/11/15
BLA-EMC-016	Signal	Generator	N	5182A		Agilent	MY52420567	2024/06/28	2025/06/27
BLA-EMC-038	Spe	ectrum	N	9020A		Agilent	MY49100060	2024/08/08	2025/08/07
BLA-EMC-042	Powe	er sensor	RPF	R3006W		DARE	14100889SN042	2024/08/08	2025/08/07
BLA-EMC-044	comm	Radio nunication ester	CN	/W500		R&S	132429	2024/08/08	2025/08/07
BLA-EMC-064	Signal	Generator	N	5182B	K	EYSIGHT	MY58108892	2024/06/28	2025/06/27
BLA-EMC-079	Spe	ectrum	N	9020A		Agilent	MY54420161	2024/08/08	2025/08/07
BLA-EMC-088	Audio	Analyzer	A	TS-1	F	Audio Precision	ATS141094	2024/06/28	2025/06/27
Conducted Em	issions		-1						
Equipment		Name		Mod	el	Manufactu re	J S/N	Cal. Date	Due. Date
BLA-EMC-003-0	01	Shield roo	m	8*3*	3	SKET	N/A	2023/11/16	2025/11/15
BLA-EMC-009		EMI receiv	/er	ESR	27	R&S	101199	2024/08/08	2025/08/07
BLA-EMC-011		LISN		ENV2	216	R&S	101372	2024/08/08	2025/08/07
BLA-EMC-033		Impedano transform		DC-20	GHz	DFXP	N/A	2024/06/28	2025/06/27
BLA-EMC-041		LISN		AT16	6-2	ATTEN	AKK180600 0003	2024/08/08	2025/08/07
BLA-EMC-045	Im	npedance s network		ISNT8 6	-cat	TESEQ	53580	2024/08/08	2025/08/07
BLA-EMC-095	v	Single-chai vehicle artif power netw	icial	NNB 812		Schwarzb ck	e 01045	2024/06/28	2025/06/27
	5	Single-chai	nnel	NNB	м	Schwarzb	<u>م</u>		

NNBM

8124

Schwarzbe

ck

01075

2024/06/28

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vehicle artificial

power network

BLA-EMC-096

2025/06/27



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		N1/A	Dhu Asia	N/05	N//A	N//A	
BLA-XC-05	Coaxial Cable	N/A	BlueAsia	V05	N/A	N/A	

Test Software Record:

Software No.	Software Name	Manufacture	Software version	Test site
BLA-EMC-S001	EZ-EMC	EZ	EEMC-3A1+	RE
BLA-EMC-S002	EZ-EMC	EZ	EEMC-3A1+	RE
BLA-EMC-S003	EZ-EMC	EZ	EEMC-3A1+	CE
BLA-EMC-S010	MTS 8310	MW	2.0.0.0	RF

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6 Test result

6.1 Antenna requirement

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

6.1.1 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of a so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT antenna:

The antenna is Internal antenna. The best case gain of the antenna is 3.7dBi.



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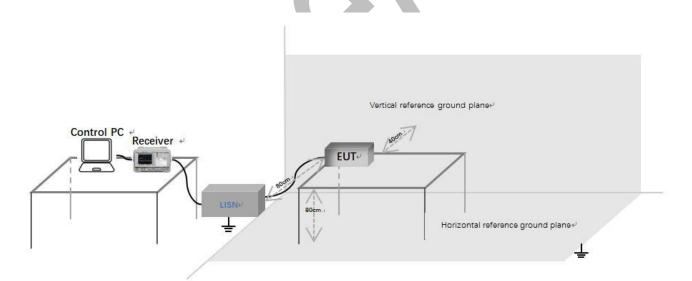
6.2 Conducted emissions at AC power line (150 kHz-30 MHz)

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	TX

6.2.1 Limit

	Conducted limit(dBµV)					
Frequency of emission(MHz)	Quasi-peak	Average				
0.15-0.5	66 to 56*	56 to 46*				
0.5-5	56	46				
5-30	60	50				
*Decreases with the logarithm of the frequency.						

6.2.2 Test setup



Description of test setup connection:

- a) Connect the control PC to the receiver through a USB to GPIB cable;
- b) The receiver is connected to the LISN through a coaxial line;
- c) Connect the power port of LISN to the EUT.

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6.2.3 Procedure

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

LISN=Read Level+ Cable Loss+ LISN Factor

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-13.87

-7.07

-18.42

-12.59

-14.71

-14.67

-18.09

-15.96

QP

AVG

QP

QP

AVG

AVG

QP

AVG

56.00

46.00

56.00

46.00

60.00

50.00

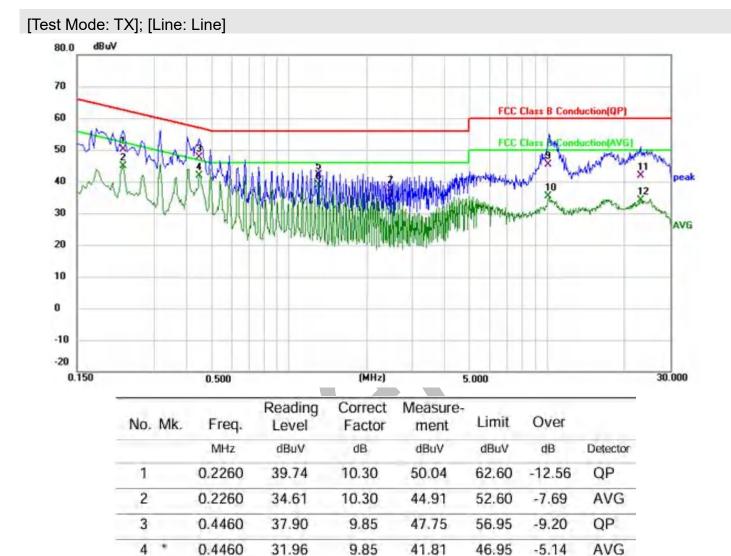
60.00

50.00



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6.2.4 Test data



9.83

9.83

9.98

9.98

0.54

0.54

13.11

13.11

42.13

38.93

37.58

33.41

45.29

35.33

41.91

34.04

32.30

29.10

27.60

23.43

44.75

34.79

28.80

20.93

1.3020

1.3020

2.4700

2.4700

10.1459

10.1459

23.0740

23.0740

5

6

7

8

9

10

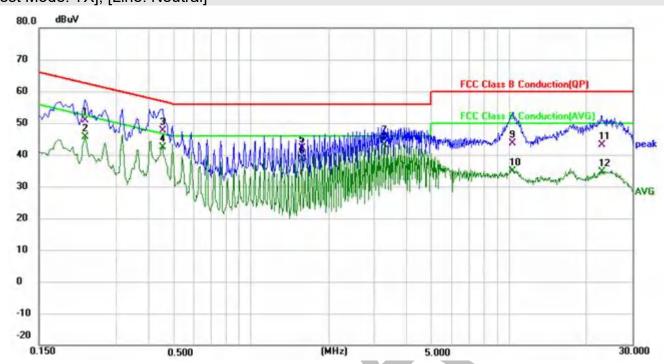
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[Test Mode: TX]; [Line: Neutral]

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2260	40.64	10.23	50.87	62.60	-11.73	QP
2		0.2260	35.31	10.23	45.54	52.60	-7.06	AVG
3		0.4500	37.90	9.79	47.69	56.88	-9.19	QP
4		0.4500	32.68	9.79	42.47	46.88	-4.41	AVG
5	_	1.5700	32.30	9.78	42.08	56.00	-13.92	QP
6		1.5700	28.73	9.78	38.51	46.00	-7.49	AVG
7		3.2780	35.20	9.97	45.17	56.00	-10.83	QP
8	•	3.2780	33.14	9.97	43.11	46.00	-2.89	AVG
9		10.3260	43.23	0.42	43.65	60.00	-16.35	QP
10		10.3260	34.53	0.42	34.95	50.00	-15.05	AVG
11		22.8500	30.20	13.02	43.22	60.00	-16.78	QP
12		22.8500	21.51	13.02	34.53	50.00	-15.47	AVG

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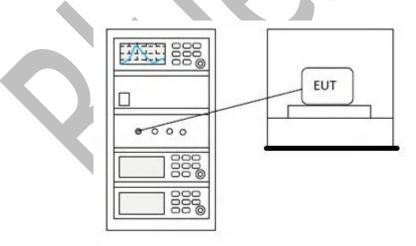
6.3 Conducted peak output Power

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.5
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	TX

6.3.1 Limit

Frequency range(MHz)	Output power of the intentional radiator(watt)	
	1 for ≥50 hopping channels	
902-928	0.25 for 25≤ hopping channels <50	
	1 for digital modulation	
	1 for ≥75 non-overlapping hopping channels	
2400-2483.5	0.125 for all other frequency hopping systems	
	1 for digital modulation	
5725-5850	1 for frequency hopping systems and digital modulation	

6.3.2 Test setup



6.3.3 Test data

Pass: Please refer to appendix A for details

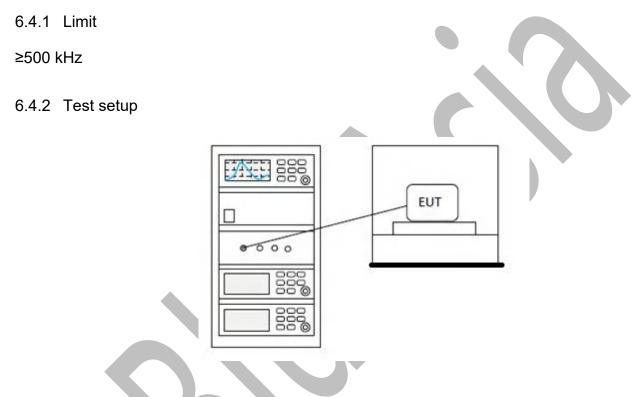
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6.4 Minimum 6dB bandwidth

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 11.8.1
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	ТХ



6.4.3 Test data

Pass: Please refer to appendix A for details

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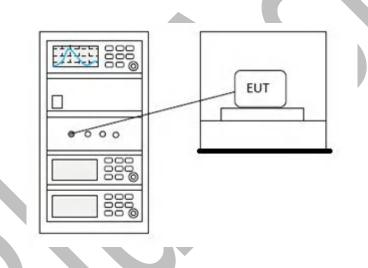
6.5 Power spectrum density

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 11.10.2
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	ТХ

6.5.1 Limit

≤8dBm in any 3 kHz band during any time interval of continuous transmission

6.5.2 Test setup



6.5.3 Test data

Pass: Please refer to appendix A for details

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6.6 Conducted Band Edges Measurement

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	TX

6.6.1 Limit

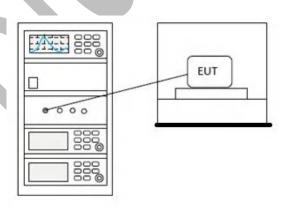
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20dB.

Attenuation below the general limits specified in §15.209(a) is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

6.6.2 Test setup



6.6.3 Test data

Pass: Please refer to appendix A for details

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6.7 Conducted spurious emissions

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	TX

6.7.1 Limit

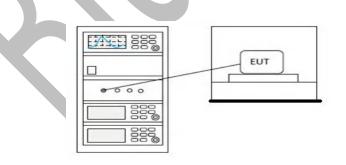
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20dB.

Attenuation below the general limits specified in §15.209(a) is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

6.7.2 Test setup



6.7.3 Test data

Pass: Please refer to appendix A for details

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6.8 Radiated spurious emissions

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	TX

6.8.1 Limit

Frequency(MHz)	Field Measuremen	
	strength(microvolts/meter)	distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

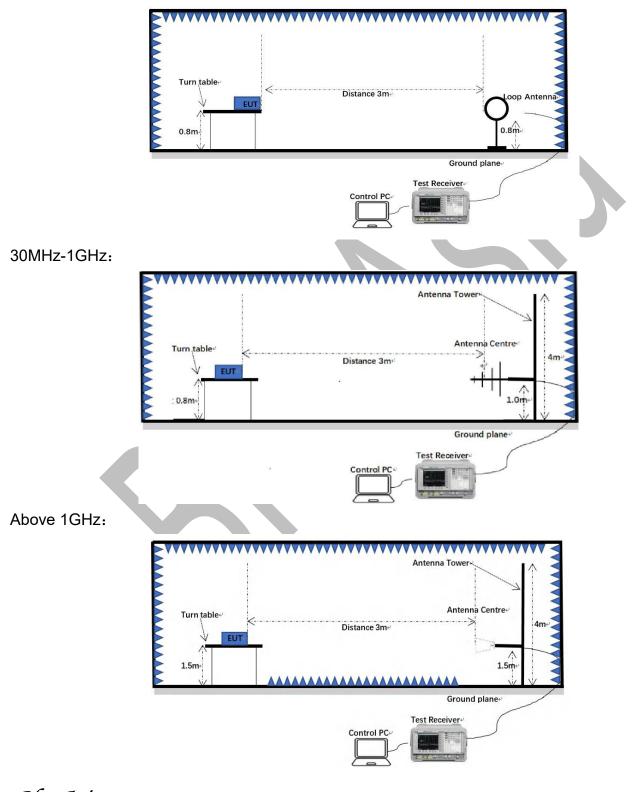
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6.8.2 Test setup

Below 1GHz:



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6.8.3 Procedure

- a) For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c) The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h) Test the EUT in the lowest channel, the middle channel, the highest channel.
- i) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j) Repeat above procedures until all frequencies measured was complete.

Note 1: Scan from 9 kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. Fundamental frequency is blocked by filter, and only spurious emission is shown. Note 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only

the peak measurement is shown in the report.

Note 3: The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic

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equation with a sample calculation is as follows:

Level (dBuV) = Reading (dBuV) + Factor (dB/m)

0)

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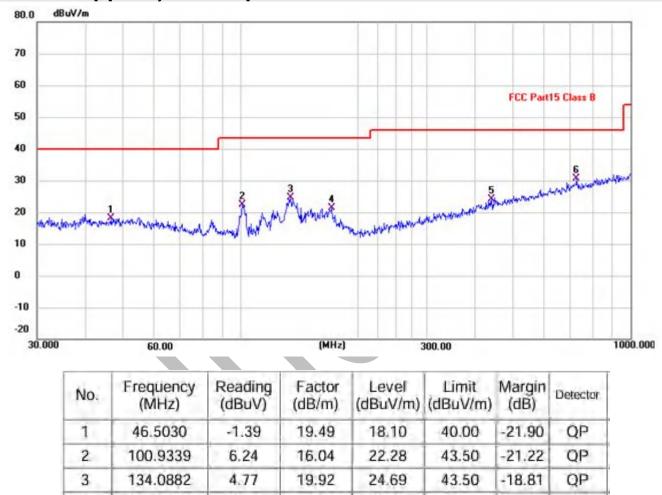


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6.8.4 Test data

Below 1GHz

Remark: During the test, pre-scan the BLE1M mode, and found the BLE1M low channel mode which it is worse case.



19.30

23.62

29.08

21.37

24.25

30.54

43.50

46.00

46.00

-22.13

-21.75

-15.46

QP

QP

QP

[Test mode: TX]; [Polarity: Horizontal]

Test Result: Pass

4

5

6

٠

171.3926

440.1963

726.8052

2.07

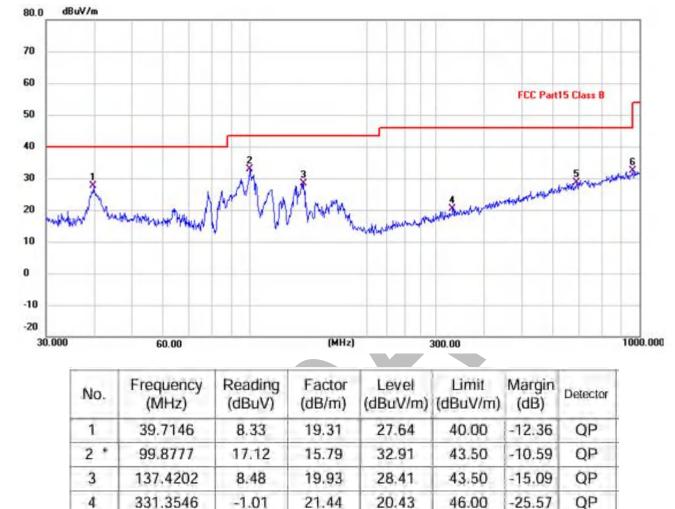
0.63

1.46

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27.96

31.23

28.63

32.34

46.00

46.00

-17.37

-13.66

QP

QP

[Test mode: TX]; [Polarity: Vertical]

Test Result: Pass

5

6

689.5644

958.7943

0.67

1.11

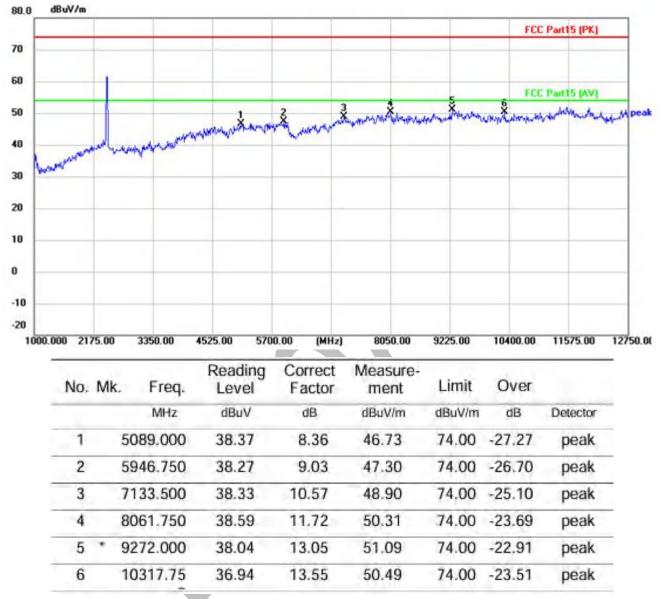
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Above 1GHz:

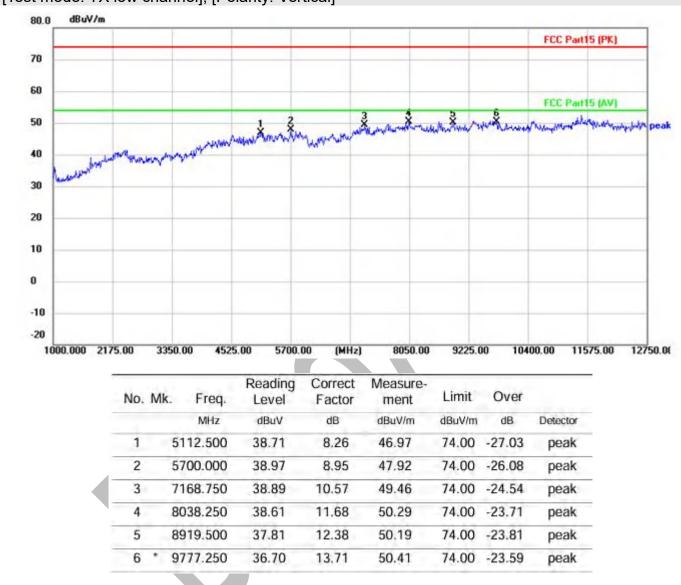




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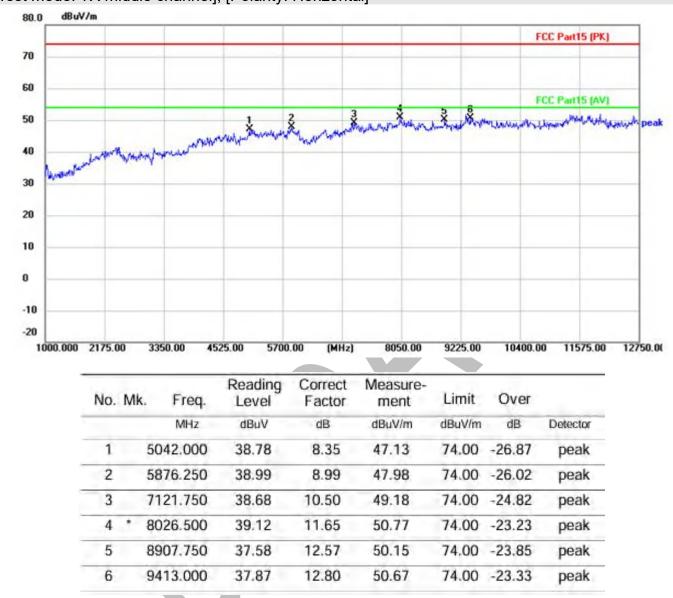
[Test mode: TX low channel]; [Polarity: Vertical]

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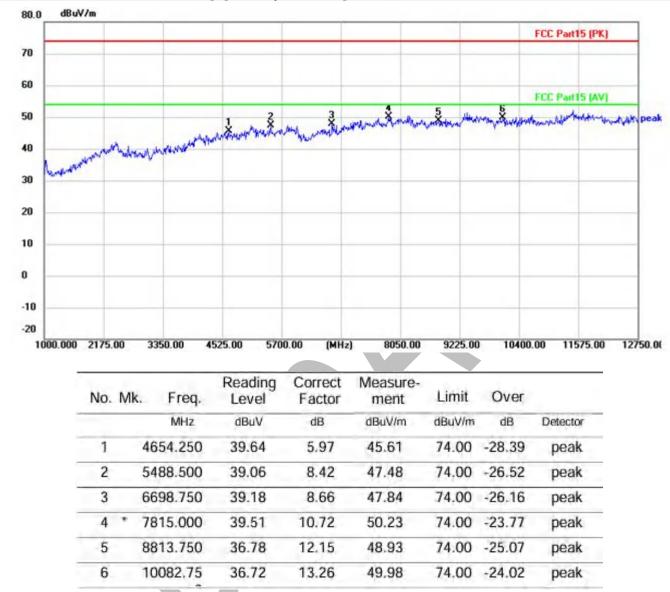


[Test mode: TX middle channel]; [Polarity: Horizontal]

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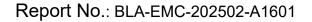


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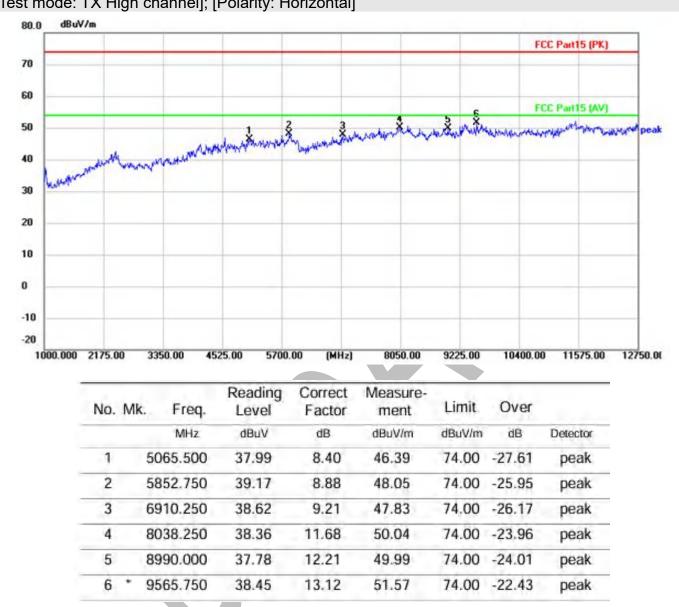
[Test mode: TX middle channel]; [Polarity: Vertical]

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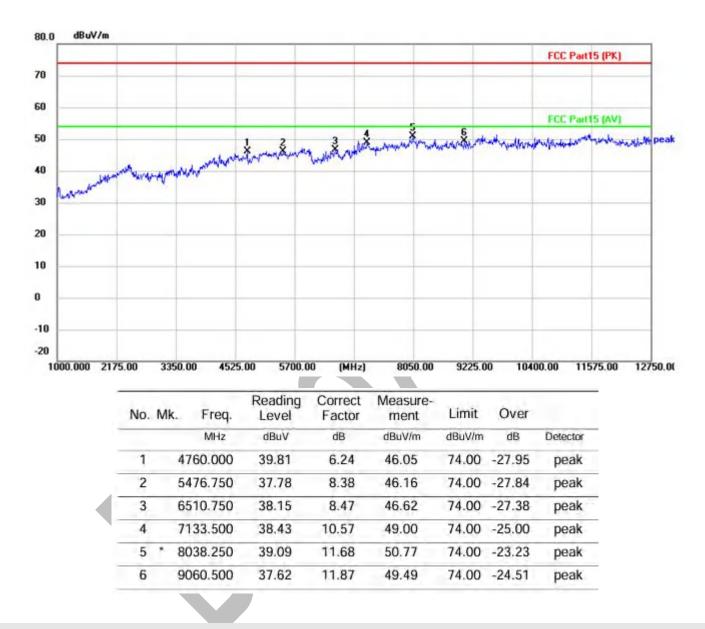


[Test mode: TX High channel]; [Polarity: Horizontal]

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[Test mode: TX High channel]; [Polarity: Vertical]

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6.9 Radiated emissions which fall in the restricted bands

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	TX

6.9.1 Limit

Frequency(MHz)	Field	Measurement
	strength(microvolts/meter)	distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

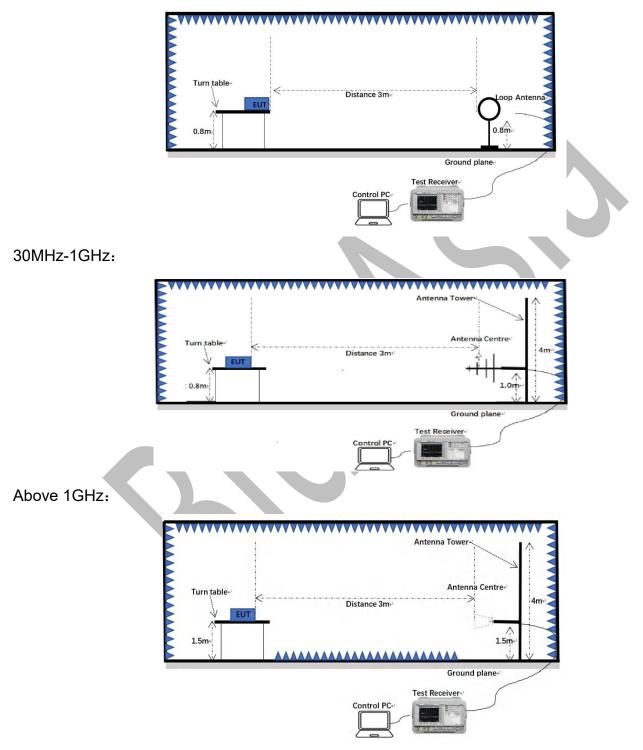
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6.9.2 Test setup

Below 1GHz:



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6.9.3 Procedure

- a) For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c) The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h) Test the EUT in the lowest channel, the middle channel, the highest channel.
- i) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j) Repeat above procedures until all frequencies measured was complete.

Note 1: Level (dBuV) = Reading (dBuV) + Factor (dB/m)

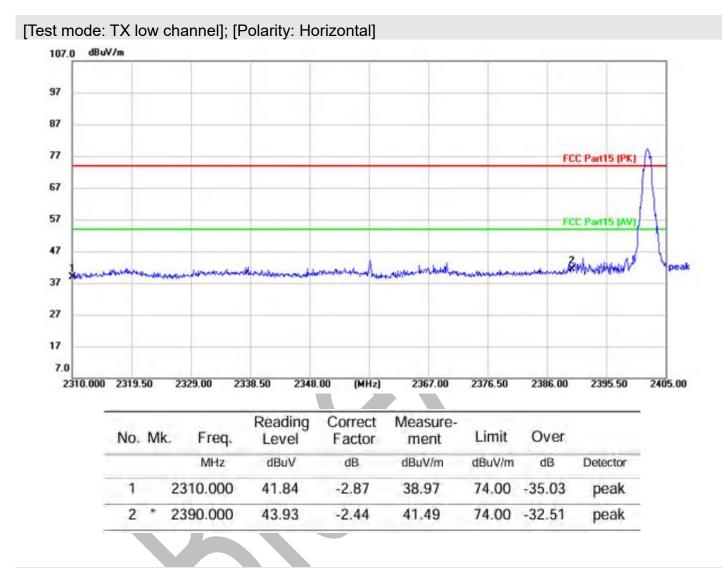
Note 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

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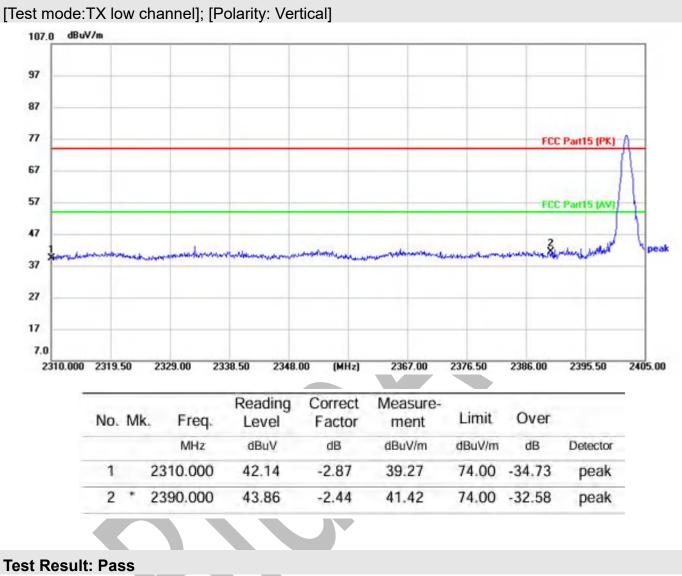
6.9.4 Test data



Test Result: Pass



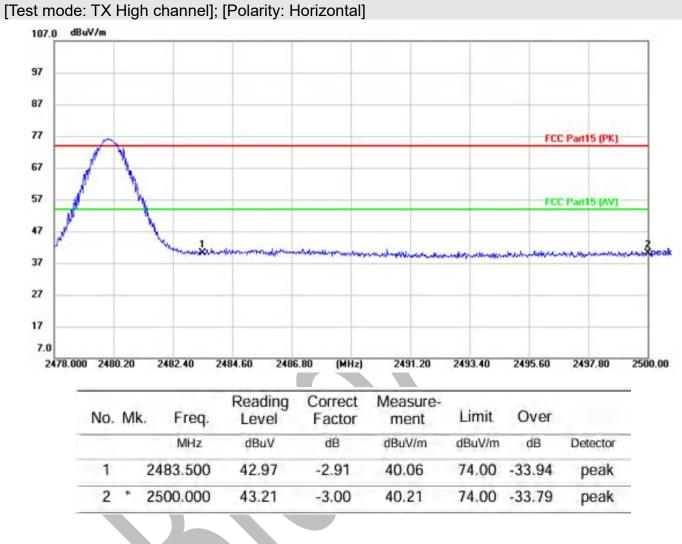
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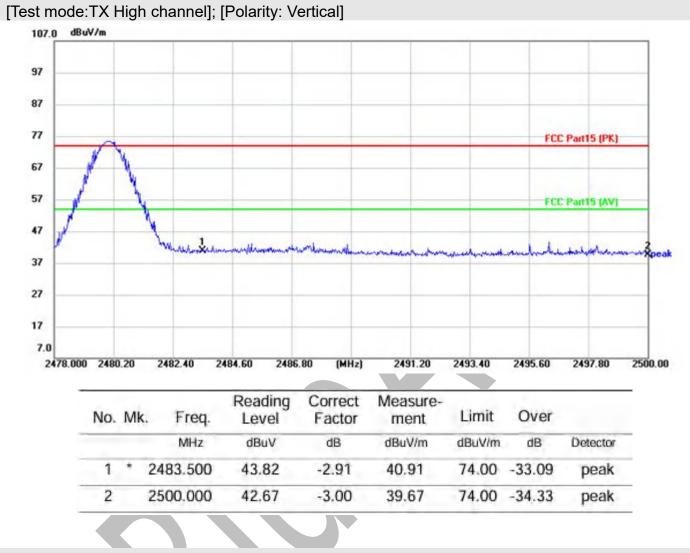


Test Result: Pass





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Test Result: Pass

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7 Appendix A

7.1 Maximum Conducted Output Power

Condition	Mode	Frequency	Antenna	Conducted Power	Limit	Verdict
		(MHz)		(dBm)	(dBm)	
NVNT	BLE 1M	2402	Ant1	-3.795	30	Pass
NVNT	BLE 1M	2442	Ant1	-4.627	30	Pass
NVNT	BLE 1M	2480	Ant1	-3.556	30	Pass

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Power NVNT BLE 1M 2402MHz Ant1

Power NVNT BLE 1M 2442MHz Ant1







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	50 Ω AC		SENSE:INT	ALIGNAUTO	09:34:18	8 AM Feb 21, 2025
ter Freq 2.	480000000 G	Hz PNO: Fast ↔ IFGain:Low	⊶ Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 100/100		RACE 123456 TYPE MWWWW DET PNNNNN
	ffset 2.49 dB 20.00 dBm				Mkr1 2.479 -3.	667 GHz 556 dBm
	L					
			 1			
					_	
						-
ter 2.48000 s BW 3.0 MI	0 GHz	43.1	BW 8.0 MHz	Pure	Span ep 1.333 ms	10.00 MHz
5 DVV 3.0 IVII	72	#V		STATUS	ep 1.353 ms	(10001 pts)
				STATUS		

Power NVNT BLE 1M 2480MHz Ant1



0)/4



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7.2-6dB Bandwidth

Condition	Mode	Frequency	Antenna	-6 dB Bandwidth	Limit -6 dB	Verdict
		(MHz)		(MHz)	Bandwidth (MHz)	
NVNT	BLE 1M	2402	Ant1	0.704	0.5	Pass
NVNT	BLE 1M	2442	Ant1	0.728	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.719	0.5	Pass

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R T RF 50Ω AC			ALIGNAUTO	09:30:35 AM Feb 21, 3	2025	
enter Freq 2.402000000	GHz #IFGain:Low	Center Freq: 2.402000 Trig: Free Run #Atten: 30 dB	000 GHz Avg Hold: 100/100			
Ref Offset 2.28 dB				Mkr3 2.402372 G -11.084 dE		
g						
.3			.1			
28	Δ^2 or Δ^2		3			
72	month		and the property and the			
7				and		
7.7 manunghow				margan	m	
7.7						
7.7					_	
7.7						
enter 2.402 GHz				Onen 2 P		
Res BW 100 kHz		#VBW 300 k	Hz	Span 2 N Sweep 1.333		
Occupied Bandwidt	h	Total Power	2.14 dBm			
1.0	0774 MHz					
Transmit Freq Error	19.283 kHz	OBW Power	99.00 %			
x dB Bandwidth	704.4 kHz	x dB	-6.00 dB			

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1

-6dB Bandwidth NVNT BLE 1M 2442MHz Ant1







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nter Freq 2.48	80000000 G	Hz #IFGain:Low	SENSE:INT Center Freq: 2.480000 Trig: Free Run #Atten: 30 dB	0000 GHz Avg Hold: 100/100	Radio Std: None Radio Device: BTS
	Offset 2.49 dB 22.49 dBm				Mkr3 2.480381 GHz -11.710 dBm
		1			
5			a 1		
9		\wedge^2	0	3	
-				Tomas Which have me	
5	- And				an market and the second se
	Amanda				The sources
and the manda					
5					
5					
5					
nter 2.48 GHz es BW 100 kH			#VBW 3001	(Hz	Span 2 MHz Sweep 1.333 ms
			Tetal Devues	0.00 dBm	
Occupied B		721 MHz	Total Power	2.33 dBm	
Occupied B	1.0	721 MHz 21.030 kHz			
Fransmit Fred	1.0 Error	721 MHz 21.030 kHz 719.2 kHz	Total Power OBW Power x dB	2.33 dBm 99.00 % -6.00 dB	
Fransmit Fred	1.0 Error	21.030 kHz	OBW Power	99.00 %	
Occupied B Fransmit Frec dB Bandwid	1.0 Error	21.030 kHz	OBW Power	99.00 %	

-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



3

0)/

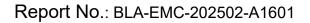


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7.3 Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 1M	2402	Ant1	1.0663
NVNT	BLE 1M	2442	Ant1	1.0749
NVNT	BLE 1M	2480	Ant1	1.0708

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R T RF 50Ω AC		SENSE:INT Center Freg: 2.4020000		10:05:49 AM Feb 21, 2025 Radio Std: None	
Center Freq 2.40200000	GHZ #IFGain:Low		Avg Hold: 100/100 Radio Device: BTS		
Ref Offset 2.28 df					
og					
12.3					
2.28					
7.72	in the second	harmound	ammon		
27.7	~~~~~		and the second s		
37.7	M		my my		
47.7	m		Jun -	man and	
57.7 manana	~			Mannan	
67.7					
Center 2.402 GHz #Res BW 30 kHz		#VBW 100 ki	łz	Span 3 MHz Sweep 3.333 ms	
Occupied Bandwidt	h	Total Power	3.67 dBm		
1.	0663 MHz				
Transmit Freq Error	11.125 kHz	OBW Power	99.00 %		
x dB Bandwidth	1.330 MHz	x dB	-26.00 dB		

OBW NVNT BLE 1M 2402MHz Ant1

OBW NVNT BLE 1M 2442MHz Ant1





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Center Freq 2.480000000 GHz #IFGain:Low		Center Freq: 2.48000000 Trig: Free Run #Atten: 30 dB	ALIGNAUTO 00 GHz Avg Hold: 100/100	09:34:24 AM Feb 21, 2025 Radio Std: None Radio Device: BTS
Ref Offset 2.49 10 dB/div Ref 22.49 dE				
- og 12.5				
2.49				
7.51		~~~		
17.5		man me	man	
27.5			n the	
37.5	m			John man
47.5	- Jew		har	Ma
57.5				monter
67.5				
Center 2.48 GHz #Res BW 30 kHz		#VBW 100 kH	1-	Span 3 MHz Sweep 3.333 ms
FRES DW JU KHZ		#VBW 100 KF	12	aweep 5.555 ms
ר Transmit Freq Error x dB Bandwidth	15.189 MHz 15.189 kHz 1.306 MHz	OBW Power x dB	99.00 % -26.00 dB	
Transmit Freq Error	15.189 kHz			
Transmit Freq Error	15.189 kHz			
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	
Transmit Freq Error x dB Bandwidth	15.189 kHz		-26.00 dB	

OBW NVNT BLE 1M 2480MHz Ant1



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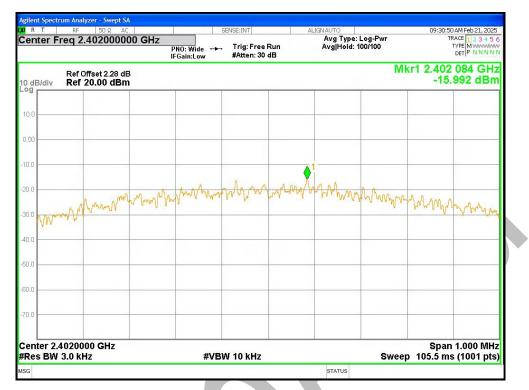
7.4 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	-15.992	8	Pass
NVNT	BLE 1M	2442	Ant1	-17.855	8	Pass
NVNT	BLE 1M	2480	Ant1	-16.756	8	Pass

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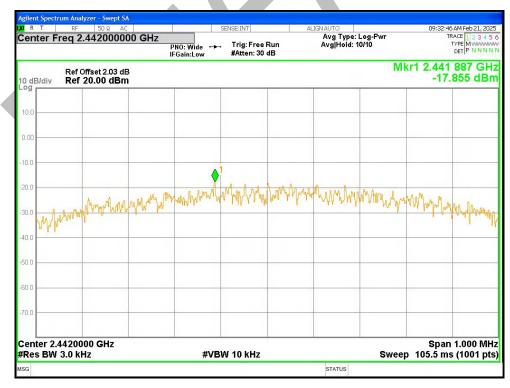


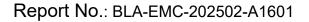
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PSD NVNT BLE 1M 2402MHz Ant1

PSD NVNT BLE 1M 2442MHz Ant1







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RT	RF 50 Ω AC			SENSE:INT	A	LIGNAUTO			5 AM Feb 21, 2025
enter F	req 2.4800000	PI	NO: Wide 🔸 Gain:Low	. Trig: Free #Atten: 30		Avg Type: Avg Hold: 1	Log-Pwr 10/10		RACE 123456 TYPE MWWWWW DET PNNNNN
dB/div	Ref Offset 2.49 dB Ref 20.00 dBm						N	/lkr1 2.480 -16.	086 GHz 756 dBm
0.0						-		_	
.00									
0.0			1			1	-		
0.0	MAN ANNANA	Arman	1 M M	และสุราชาวิทรา	manporth	all hall and and	MANY	Mugny milly	WANA
D.0									
0.0									
0.0									
0.0									
enter 2.4 Res BW	4800000 GHz 3.0 kHz		#VB	W 10 kHz			Swe	Span ep 105.5 m	1.000 MHz
G	OID NIL					STATUS	0110	op 10010 III.	5 (1001 pto)

PSD NVNT BLE 1M 2480MHz Ant1



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7.5 Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-50.81	-20	Pass
NVNT	BLE 1M	2480	Ant1	-50.75	-20	Pass

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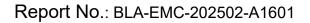
Band Edge NVNT BLE 1M 2402MHz Ant1 Ref

Band Edge NVNT BLE 1M 2402MHz Ant1 Emission

	AC	SENSE:INT		ALIGNAUTO			7 AM Feb 21, 2
Center Freq 2.35600	PNC): Fast ↔→ Trig: Fr in:Low #Atten:		Avg Type: Avg Hold:	Log-Pwr 100/100		TYPE MWWW DET P NNN
Ref Offset 2.2 10 dB/div Ref 20.00 d						Mkr1 2.4 -4.	01 8 G 539 dE
10.0							
0.00					-		
-10.0							Â
-20.0					-	-	-24 63
-30.0							
-40.0							11
-50.0					\wedge^4	3	02
-60.0 Law and a start of the	and many many many and	Anterna marine	draw has have been a	energe below where	untraderilitions	monorthan	mont
-70.0							
Start 2.30600 GHz #Res BW 100 kHz		#VBW 300 kl	1-		Pwoo	Stop 2. p 9.600 ms	40600 G
						-	5 (1001 P
MKR MODE TRC SQL 1 N 1 f 2 N 1 f 3 N 1 f 4 N 1 f 5	× 2.401 8 GHz 2.400 0 GHz 2.390 0 GHz 2.377 0 GHz	4.539 dBm -55.819 dBm -59.542 dBm -55.450 dBm	UNCTION	UNCTION WIDTH		UNCTION VALUE	
6 7 8 9 10 11							

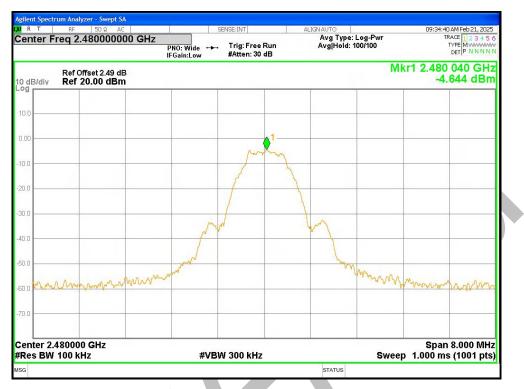
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Band Edge NVNT BLE 1M 2480MHz Ant1 Ref

Band Edge NVNT BLE 1M 2480MHz Ant1 Emission

	Т			Ω AC	SE	ENSE:INT		ALIGN AUTO			42 AM Feb 21, 202
Cen	nter	Freq	2.5260		IO: Fast 🔸	Trig: Free I #Atten: 30		Avg Type Avg Hold:			TYPE MWWWW DET P N N N N
10 d	B/div		ef Offset 2 ef 20.00							Mkr1 2.4 -4	80 3 GH .549 dBi
Log											
10.0		A1									
0.00		X									
-10.0		1									
-20.0											-24.64 d
-30.0		1									
-40.0	H										-
-50.0	+	10	24) ⁴			_		1			
-60.0	week	mark 1	mount	man manus man	who make many	Ason disciplingen	to an and the rest	moundance	purchassion	- man for the second	www.www.man
-70.0			_								_
Star	L_	1760	0 GHz							Stop 2	.57600 GI
#Re	s Bl	N 10	0 kHz		#VBV	/ 300 kHz			Swe	ep 9.600 m	
MKR	MODE	TRC S	CL	×	Y	FUN	CTION FI	JNCTION WIDTH		FUNCTION VALUE	
1			F	2.480 3 GHz	-4.549 d						
23	N N	1 1	T F	2.483 5 GHz 2.500 0 GHz	-57.469 d -57.358 d	IBm					
4	Ν	1 1	F	2.485 9 GHz	-55.392 d	IBm					
6											
7											
9											
10											
11											



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7.6 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-39.50	-20	Pass
NVNT	BLE 1M	2442	Ant1	-41.12	-20	Pass
NVNT	BLE 1M	2480	Ant1	-41.31	-20	Pass

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Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission

Ref Offset 2.28 dB PNO: Fast + Trig: Free Run #Atten: 30 dB 10 dB/div Ref 20.00 dBm	Avg Type: Log-Pwr wg Hold: 10/10 TRACE 12345 TYPE Mwwww DET P NNNN Mkr1 2.412 GH2 -4.932 dBm -2453 @m
10 dB/div Ref 20.00 dBm 10 d 10 d	-4.932 dBn
100 100 100 100 200 200 200 200	
100 100 200 200 40.0 40.0 50.0	
-10.0 -20.0	
-20.0 -2	
-30.0 -40.0 -50.0 -50.0 -60.0 -70.0 Start 30 MHz	
40.0 40.0	and the second of the second and the second of the second
50.0 60.0 70.0 Start 30 MHz	and the second
-60.0 -70.0 Start 30 MHz	magnet offer and a second of the second of t
-70.0	
Start 30 MHz	
	Stop 26.50 GH Sweep 2.530 s (1001 pt
MKR MODE TRC SCL X Y FUNCTION FUNCTION	WIDTH FUNCTION VALUE
1 N 1 f 2.412 GHz -4.932 dBm 2 N 1 f 4.795 GHz -44.031 dBm	
3 N 1 f 4.795 GHz -44.031 dBm	
5 N 1 f 9.639 GHz -56.248 dBm	
6 7	
9	
10	
11	>

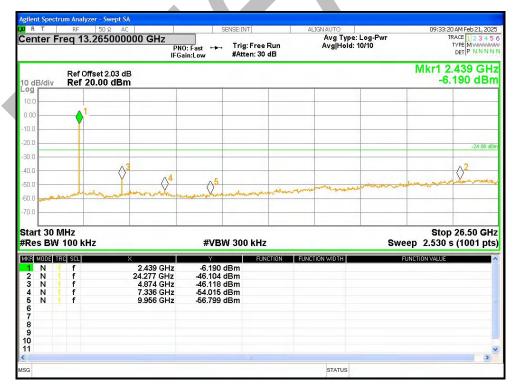


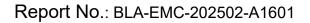
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Tx. Spurious NVNT BLE 1M 2442MHz Ant1 Ref

Tx. Spurious NVNT BLE 1M 2442MHz Ant1 Emission







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Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref

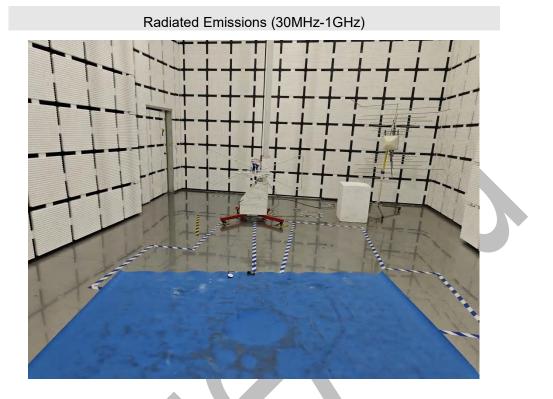
Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission

	Т			50 Ω AC		s	ENSE:INT		ALIGN AUTO			AM Feb 21, 20
Cen	nter	Fre	q 13.26	550000		0: Fast ↔→ ain:Low	Trig: Fre #Atten: 3		Avg Tyj Avg Hol	be: Log-Pwr d: 10/10	TF	TYPE MWWWW DET P NNN
10 d	B/div		Ref Offse Ref 20.0								Mkr1 2. -5.	492 GH 238 dBi
Log 10.0												
0.00			A1									
			Y									
-10.0												
-20.0								-				-24.39 0
-30.0				-								0
-40.0	I			\bigcirc	л4	. 5				1.000	in the second	
-50.0			manage	to	A A	\bigcirc^5	and some days	and the many	worker when when you	- tor at all all all all a star and a	to the state of the state	
-60.0	-	a share		Contraction of the		AND CONTRACTOR OF THE ADDRESS OF THE						
-70.0	\vdash											
Stai #Re			lz 00 kHz			#VB\	V 300 kH	z		Swe	Stop eep 2.530 s	26.50 GH (1001 pt
1000	MODE	TRC		×		Y		NCTION	FUNCTION WIDTH		FUNCTION VALUE	
MKR			f		2.492 GHz 25.732 GHz	-5.238						
1	Ν		f									
1 2 3	NNN		f		4.953 GHz	-47.598						
1 2 3 4 5	N N					-47.598 (-55.210 (-56.395 (dBm					
1 2 3 4 5 6	ZZZZ		f		4.953 GHz 7.442 GHz	-55.210	dBm					
1 2 3 4 5 6 7 8	ZZZZ		f		4.953 GHz 7.442 GHz	-55.210	dBm					
1 2 3 4 5 6 7 8 9 10	ZZZZ		f		4.953 GHz 7.442 GHz	-55.210	dBm					
1 2 3 4 5 6 7 8 9	ZZZZ		f		4.953 GHz 7.442 GHz	-55.210	dBm					



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Appendix B: photographs of test setup



Radiated Emissions (above 1GHz)



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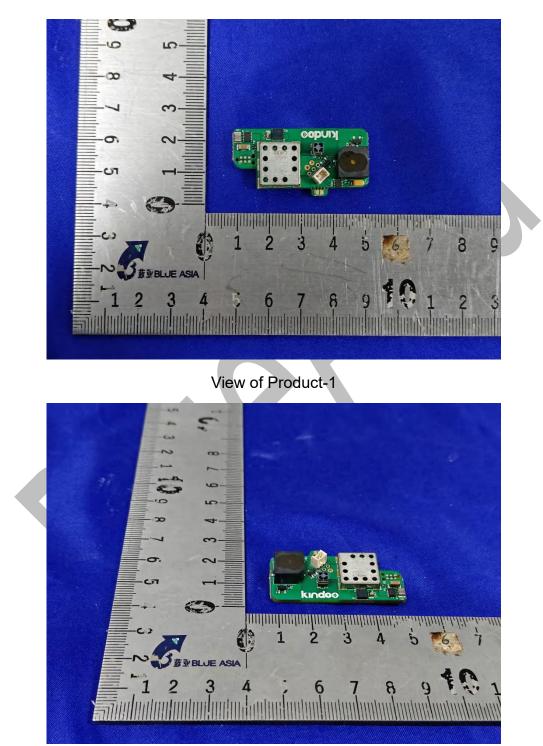


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Appendix C: photographs of EUT



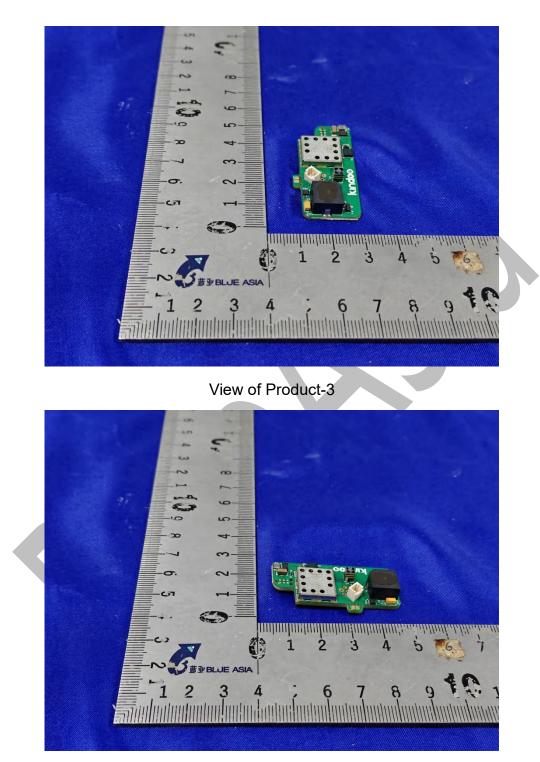
View of Product-2

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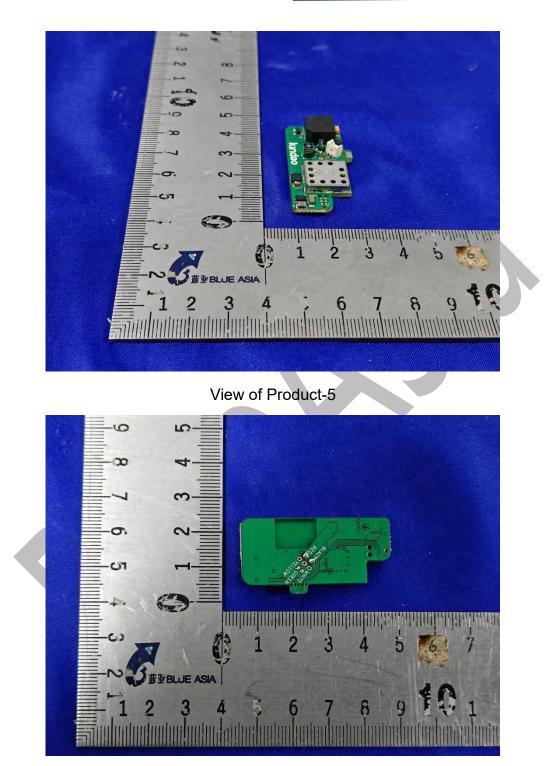
View of Product-4

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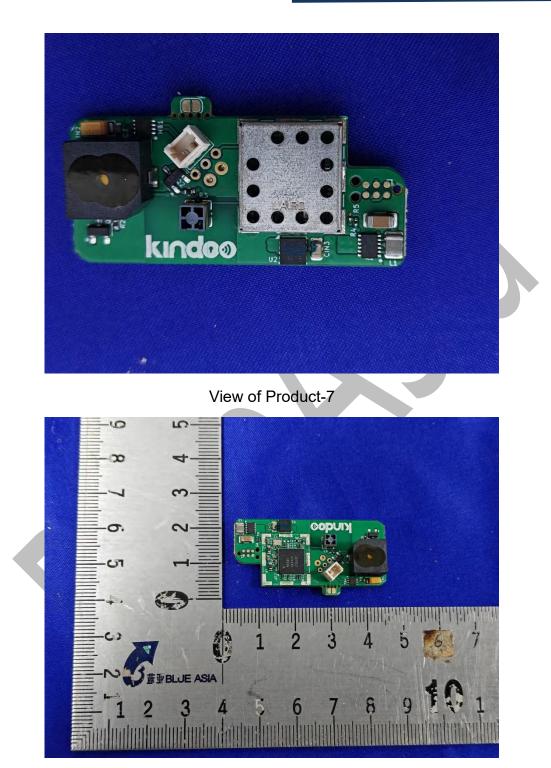
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View of Product-6

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View of Product-8

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View of Product-9

----END OF REPORT----

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