

Prüfbericht-Nr.: <i>Test report no.:</i>	CN22J919 001	Auftrags-Nr.: <i>Order no.:</i>	168396000	Seite 1 von 20 <i>Page 1 of 20</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-10-26	
Auftraggeber: <i>Client:</i>	Fujian Newland Auto-ID Tech. Co., Ltd. Newland Science & Technology Park, No.1 Rujiang West Rd, Mawei, Fuzhou, P.R.China			
Prüfgegenstand: <i>Test item:</i>	Hand Held Barcode Scanner			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	BSH-32B, NLS-HR32-BT (Trademark: STAR, Newland)			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.247 RSS-247 Issue 2 February 2017 RSS-Gen Issue 5 March 2019			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-10-31	Please refer to Photo Document		
Prüfmuster-Nr.: <i>Test sample no:</i>	A003360077-001~004 A003381606-001~002			
Prüfzeitraum: <i>Testing period:</i>	2022-11-01 – 2022-11-18			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	2023-04-18	Ausstellungsdatum: <i>Issue date:</i>	2023-04-18	
Stellung / Position:	Project Manager	Stellung / Position:	Reviewer	
Sonstiges / Other:	FCC ID: SL9BSH-32B IC: 29936-BSH32B, PMN: Hand Held Barcode Scanner HVIN: BSH-32B, NLS-HR32-BT			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

RESULT: Pass

5.1.3 CONDUCTED POWER SPECTRAL DENSITY

RESULT: Pass

5.1.4 6dB BANDWIDTH

RESULT: Pass

5.1.5 99% BANDWIDTH

RESULT: Pass

5.1.6 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH

RESULT: Pass

5.1.7 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.8 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

Appendix B: Test Results.

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China

FCC Registration No.: 694916

ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (TS8997)				
Equipment	Manufacturer	Model	Serial No.	Cal. until
Signal Analyzer	R&S	FSV 40	101441	2023-08-01
OSP	R&S	OSP 150	101017	2023-11-21
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	R&S	WMS32 (V11.00.00)	N/A	N/A
Power Meter	R&S	NRP2	107105	2023-11-21
Wideband Power Sensor	R&S	NRP-Z81	105677	2023-08-01
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2024-06-22
Unwanted Emission Testing (TS9975)				
Equipment	Manufacturer	Model	Serial No.	Cal. until
EMI Test Receiver	R&S	ESR 7	102021	2023-08-02
Signal Analyzer	R&S	FSV 40	101439	2023-08-01
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2023-08-01
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2023-08-02
Amplifier	R&S	SCU-18F	180070	2023-08-02
Amplifier	R&S	SCU40A	100475	2023-08-02
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2024-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2024-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2024-08-27
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2023-08-06
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-22

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Conducted Emission				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102680	2023-02-27
Artificial Mains Network	R&S	ENV216	101445	2023-02-27
Artificial Mains Network	R&S	ENV432	101546	2023-02-27
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 2.08 \%$
RF output power, conducted	$\pm 0.99 \text{ dB}$
RF power density, conducted	$\pm 0.99 \text{ dB}$
Unwanted Emissions, conducted	$\pm 0.89 \text{ dB}$
All emissions, radiated	$\pm 4.17 \text{ dB}$
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	$\pm 3.70 \text{ dB} / \pm 3.30 \text{ dB}$

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at 362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a Hand Held Barcode Scanner, which supports Bluetooth low energy wireless technology.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	Hand Held Barcode Scanner
Type Designation:	BSH-32B, NLS-HR32-BT (The models are identical except for colour of plastic enclosure. The colour of plastic enclosure may be black or white.)
Trade Mark:	STAR, Newland
FCC ID:	SL9BSH-32B
IC:	29936-BSH32B
HVIN:	Hand Held Barcode Scanner
PMN:	BSH-32B, NLS-HR32-BT
Operating Voltage:	Internal battery operated (3.7Vdc) DC 5V (charging by base)
Testing Voltage:	Fully charged battery
Operating Temperature Range:	0 °C ~ +40 °C
AC/DC Adapter:	Model: R122-0501500ID Input: 100-240V, 50/60Hz Output: DC 5V, 1.5A
Technical Specification of Bluetooth LE	
Frequency Range:	2402 MHz to 2480 MHz
Type of Modulation:	GFSK
Channel Number:	40 channels
Data Rate:	1 Mbps, 2 Mbps
Channel Separation:	2 MHz
Antenna Type:	Integral Antenna
Antenna Gain:	2.00 dBi

Table 3: RF Channel and Frequency of Bluetooth Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Test frequencies are lowest channel: 2402 MHz, middle channel: 2440 MHz and highest channel: 2480 MHz

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Bluetooth LE transmitting mode
 - 1) Low Channel
 - 2) Middle Channel
 - 3) High Channel
- B. On, Normal operation mode with BLE connected
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- User Manual
- ID Label and Location Info

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model NLS-HR32-BT in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 4: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N	Remark
Laptop	Lenovo	T480	PF-16A6N8	/
Signal Cable	Newland	/	/	155cm
USB Dongle	Newland	FSC-BP101Y	/	/
Base	Newland	BSH-32B	WLSSBIDC0 D3008297B	DC 5V Input

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

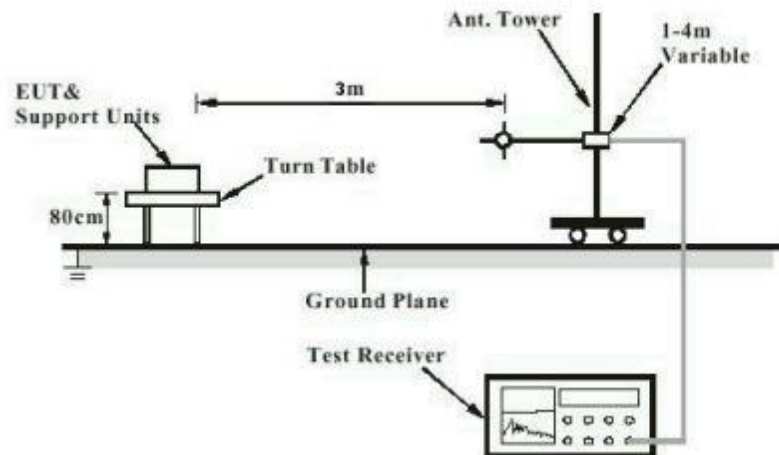


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

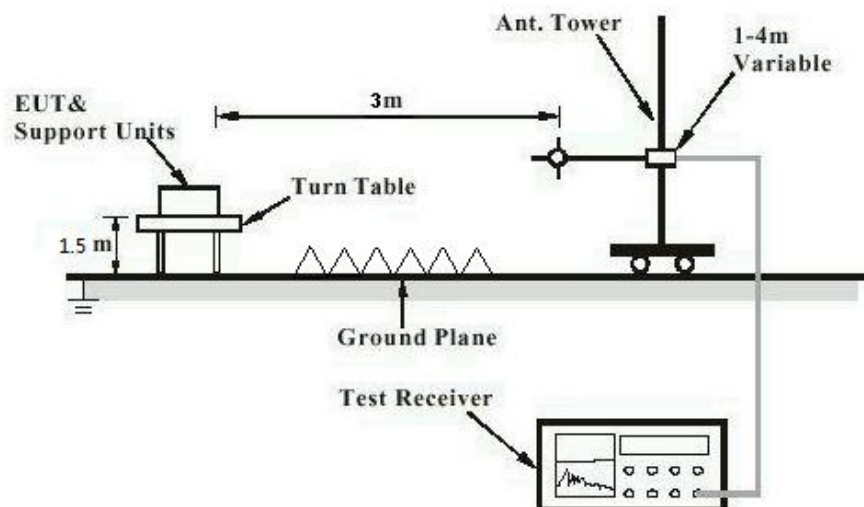


Diagram of Measurement Configuration for Mains Conduction Measurement

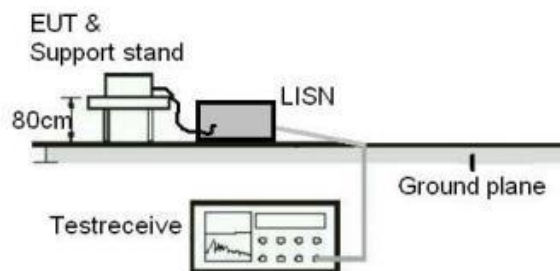
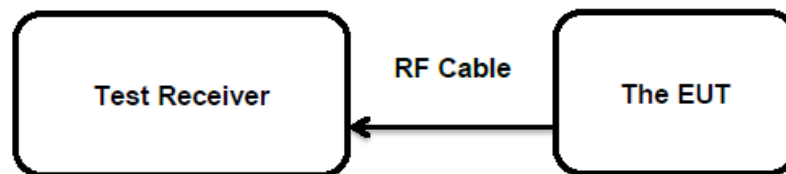


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard

: FCC Part 15.247(b)(4) and Part 15.203
RSS-Gen Clause 6.8

The EUT has an Integral antenna, the gain of antenna is 2.00 dBi, which that permanent attachment and no consideration of replacement.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

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5.1.2 Maximum Peak Conducted Output Power

RESULT:
Pass
Test Specification

Test standard : FCC Part 15.247(b)(3)
RSS-247 Clause 5.4(d)

Basic standard : ANSI C63.10: 2013

Limits : 1.0 Watts

Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-11-10 to 2022-11-17

Input voltage : Fully charged battery

Operation mode : A

Test channel : Low / Middle / High

Ambient temperature : 23.2 °C

Relative humidity : 51 %

Atmospheric pressure : 101 kPa

Table 5: Test Result of Maximum Peak Conducted Output Power

Test Mode	Data Rate	Test Channel (MHz)	Measured Peak Power		Limit (W)
			(dBm)	(W)	
Bluetooth (Low Energy)	1 Mbps	2402	-1.40	0.0007	< 1.0
		2440	-1.90	0.0006	
		2480	-2.00	0.0006	
	2 Mbps	2402	-0.70	0.0009	
		2440	-1.30	0.0007	
		2480	-1.60	0.0007	
Maximum Measured Value			-0.70	0.0009	

Note:

- 1) The cable loss is taken into account in results.
- 2) Antenna gain(G): 2.00 dBi, and the EIRP far below 4W.

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5.1.3 Conducted Power Spectral Density

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.247(e) RSS-247 Clause 5.2(b)
Basic standard	: ANSI C63.10: 2013
Limits	: < 8 dBm / 3kHz
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2022-11-10 to 2022-11-18
Input voltage	: Fully charged battery
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 23.2 °C
Relative humidity	: 51 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

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5.1.4 6dB Bandwidth

RESULT:**Pass****Test Specification**

Test standard	:	FCC Part 15.247(a)(2) RSS-247 Clause 5.2(a)
Basic standard	:	ANSI C63.10: 2013
Limits	:	> 500 KHz
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-11-10 to 2022-11-17
Input voltage	:	Fully charged battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	23.2 °C
Relative humidity	:	51 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

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5.1.5 99% Bandwidth

RESULT:**Pass****Test Specification**

Test standard	: RSS-Gen Clause 6.7
Basic standard	: ANSI C63.10: 2013
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2022-11-10 to 2022-11-17
Input voltage	: Fully charged battery
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 23.2 °C
Relative humidity	: 51 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

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5.1.6 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.247(d) RSS-247 Clause 5.5
Basic standard	: ANSI C63.10: 2013
Limits	: 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2022-11-10 to 2022-11-18
Input voltage	: Fully charged battery
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 23.2 °C
Relative humidity	: 51 %
Atmospheric pressure	: 101 kPa

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to test plots, and compliance is achieved as well.

For the measurement records, refer to the appendix B.

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5.1.7 Radiated Spurious Emission

RESULT:**Pass****Test Specification**

Test standard	:	FCC Part 15.247(d) & FCC Part 15.205 RSS-247 Clause 3.3
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a) of FCC part 15.247(d) RSS-Gen Section 8.9 & 8.10
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2022-11-16
Input voltage	:	Fully charged battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

Remark:

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix B.

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5.1.8 Conducted Emission on AC Mains

RESULT:**Pass****Test Specification**

Test standard	:	FCC Part 15.207(a) RSS-Gen Clause 8.8
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.207(a) RSS-Gen Table 3
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-11-01
Input voltage	:	AC 120V, 60Hz
Operation mode	:	B
Earthing	:	Not connected
Ambient temperature	:	24.6 °C
Relative humidity	:	49.5 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

7 List of Tables

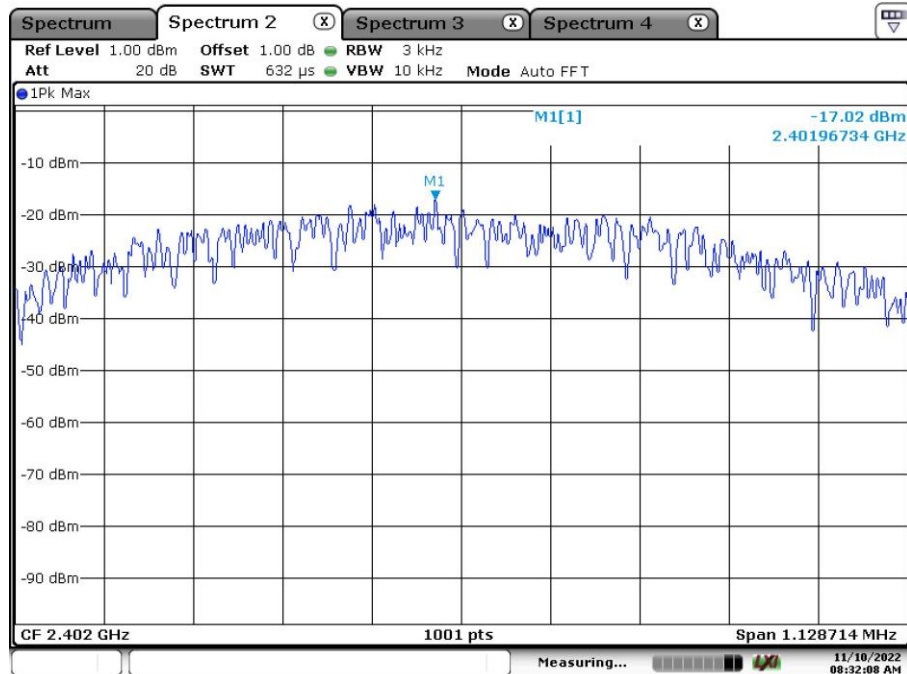
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Appendix B: Test Results of Bluetooth LE

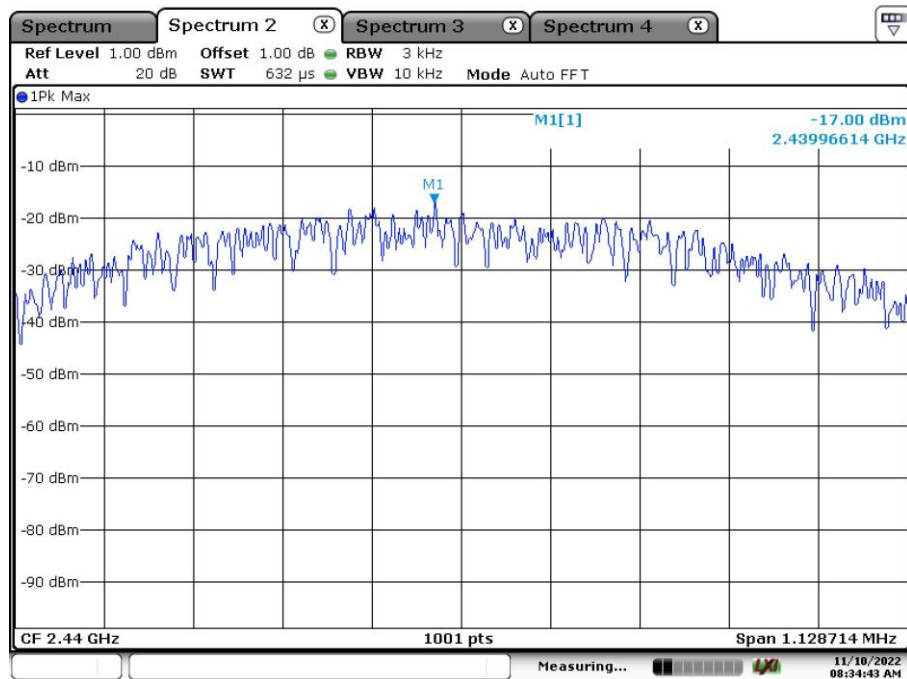
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Appendix B.1: Test Results of Conducted Power Spectral Density

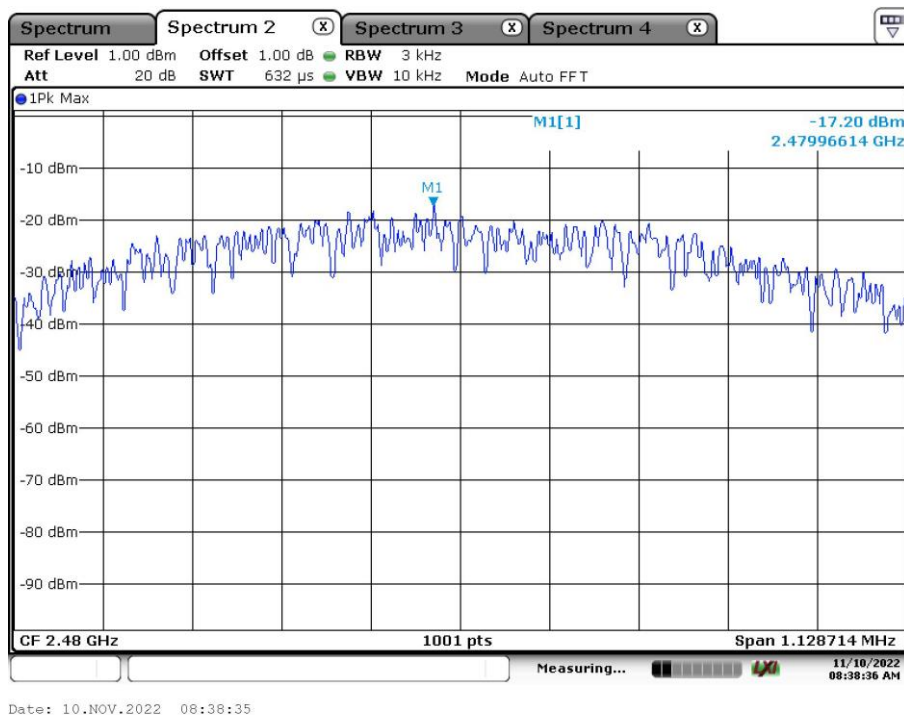
Bluetooth LE Mode, 1Mbps



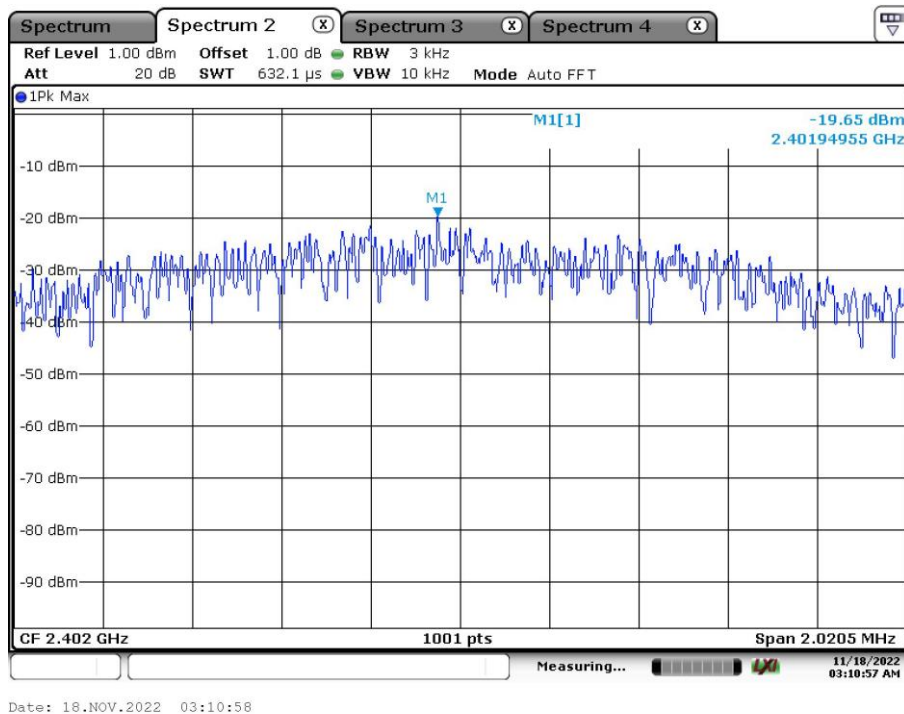
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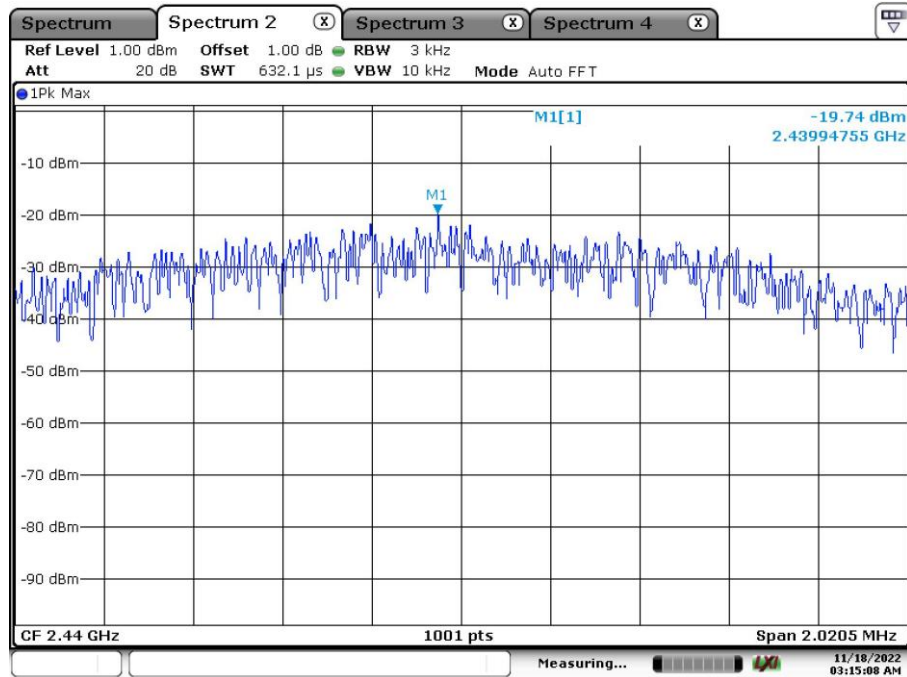


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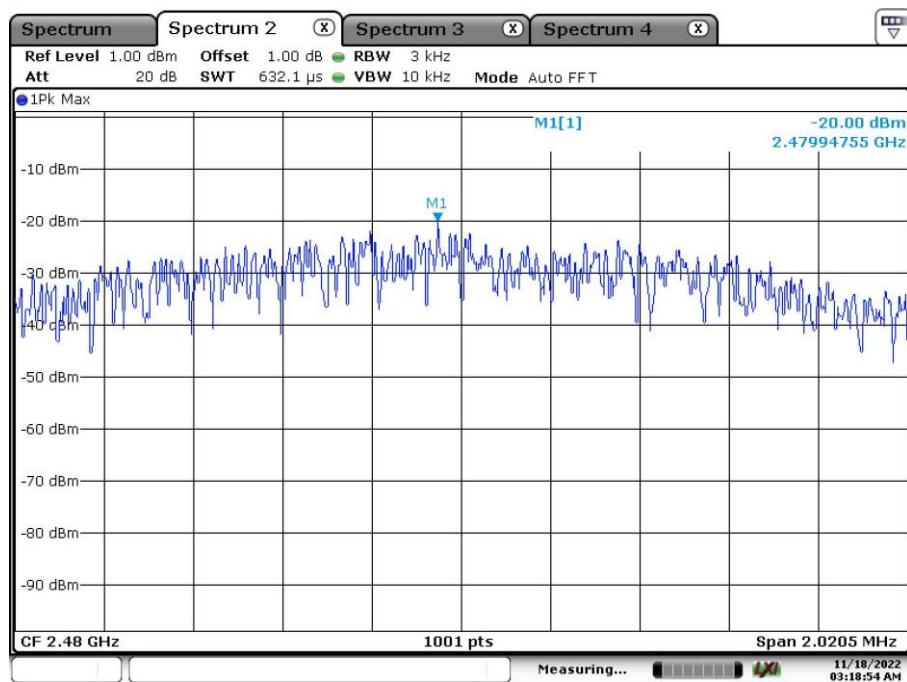


Bluetooth LE Mode, 2Mbps





Date: 18.NOV.2022 03:15:08



Date: 18.NOV.2022 03:18:54

Appendix B.2: Test Results of 6dB Bandwidth

Bluetooth LE Mode, 1Mbps

Minimum Emission Bandwidth 6 dB (2402 MHz; 10.000 dBm; 1 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

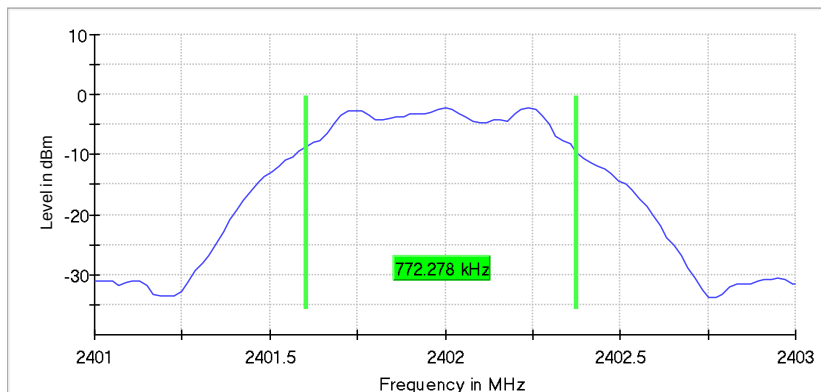
6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	0.772278	0.500000	---	2401.603960	2402.376238

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2402.000000	-2.3	PASS

6 dB Bandwidth



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40300 GHz	2.40300 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
SweepTime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	9 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.14 dB	0.50 dB

Minimum Emission Bandwidth 6 dB (2440 MHz; 10.000 dBm; 1 MHz)

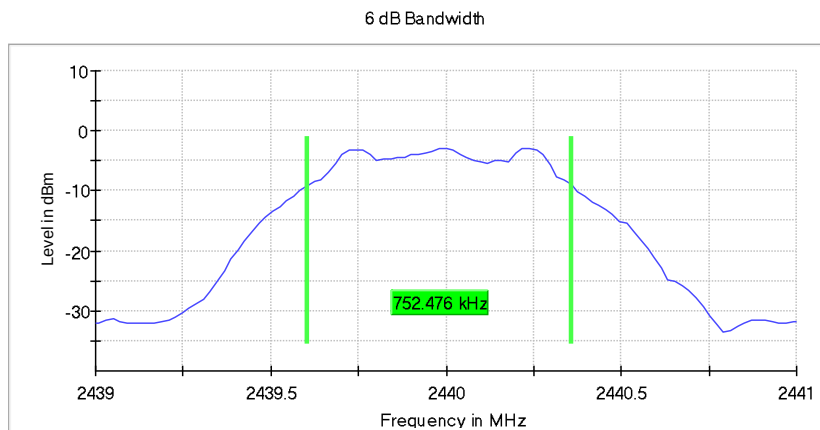
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	0.752476	0.500000	---	2439.603960	2440.356436

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	-2.9	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43900 GHz	2.43900 GHz
Stop Frequency	2.44100 GHz	2.44100 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
Sweeptime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	9 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.11 dB	0.50 dB

Minimum Emission Bandwidth 6 dB (2480 MHz; 10.000 dBm; 1 MHz)

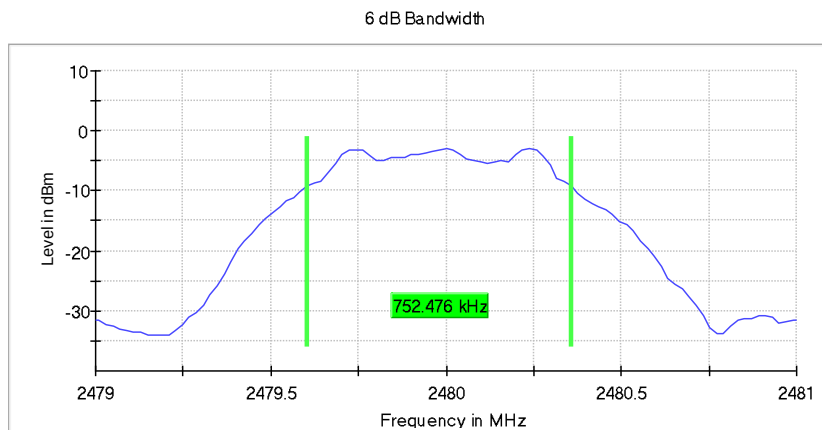
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	0.752476	0.500000	---	2479.603960	2480.356436

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	-3.0	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47900 GHz	2.47900 GHz
Stop Frequency	2.48100 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
Sweeptime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	7 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.08 dB	0.50 dB

Bluetooth LE Mode, 2Mbps

Minimum Emission Bandwidth 6 dB (2402 MHz; 10.000 dBm; 2 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

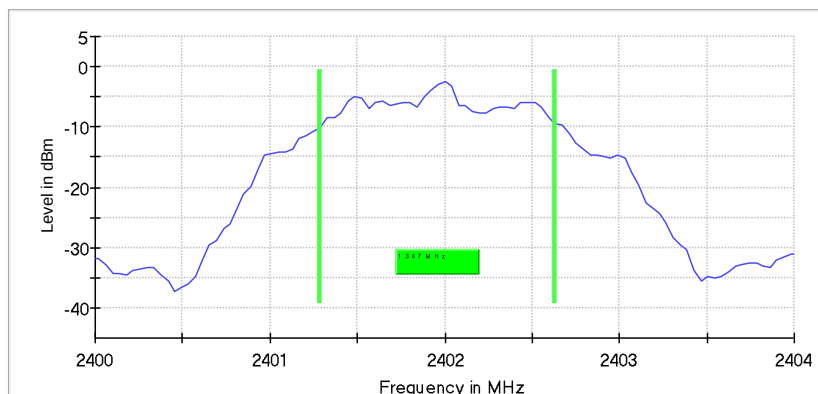
6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	1.346534	0.500000	---	2401.287129	2402.633663

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2402.000000	-2.5	PASS

6 dB Bandwidth



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.40400 GHz	2.40400 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 80
SweepTime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	15 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.00 dB	0.50 dB

Minimum Emission Bandwidth 6 dB (2440 MHz; 10.000 dBm; 2 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

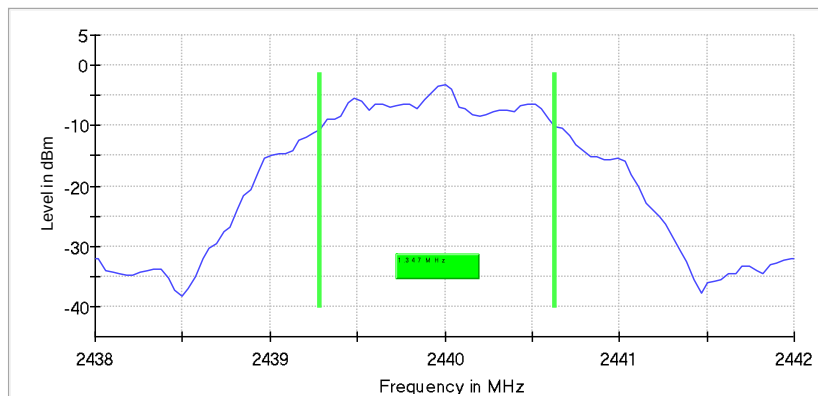
6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.346534	0.500000	---	2439.287129	2440.633663

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	-3.1	PASS

6 dB Bandwidth



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43800 GHz	2.43800 GHz
Stop Frequency	2.44200 GHz	2.44200 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 80
Sweptime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	11 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.13 dB	0.50 dB

Minimum Emission Bandwidth 6 dB (2480 MHz; 10.000 dBm; 2 MHz)

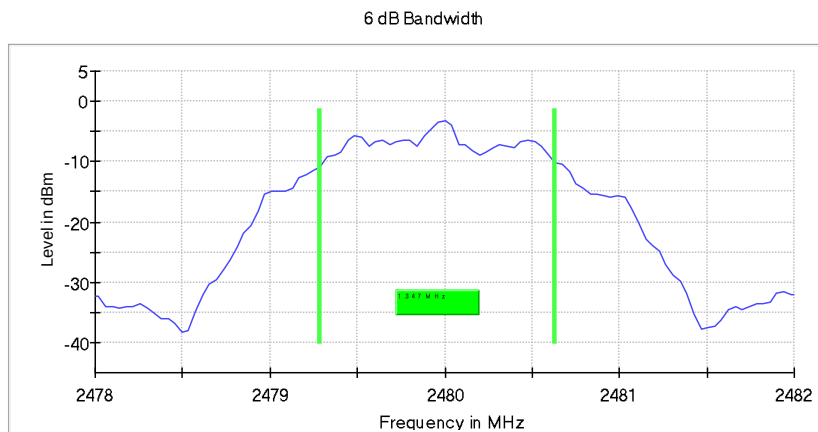
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.346534	0.500000	---	2479.287129	2480.633663

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	-3.2	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47800 GHz	2.47800 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 80
Sweptime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	11 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.04 dB	0.50 dB

Appendix B.3: Test Results of 99% Bandwidth

Bluetooth LE Mode, 1Mbps

Occupied Channel Bandwidth 99% (2402 MHz; 10.000 dBm; 1 MHz)

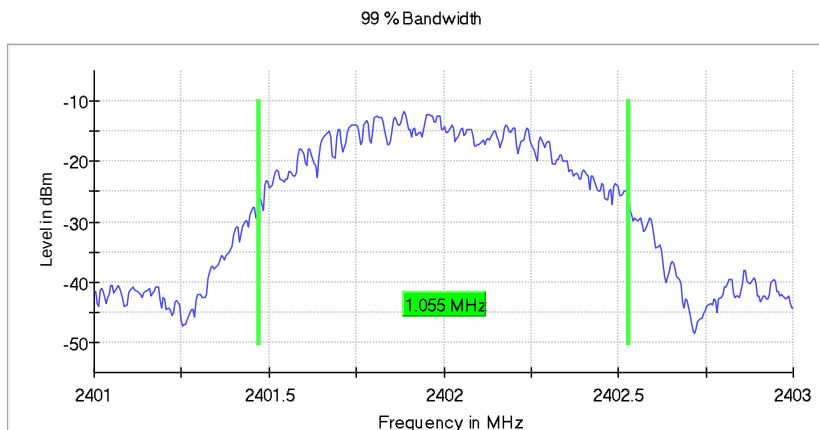
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	1.055000	---	---	2401.472500	2402.527500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2402.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40300 GHz	2.40300 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	>= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	400	~ 400
SweepTime	189.648 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.11 dB	0.30 dB

Occupied Channel Bandwidth 99% (2440 MHz; 10.000 dBm; 1 MHz)

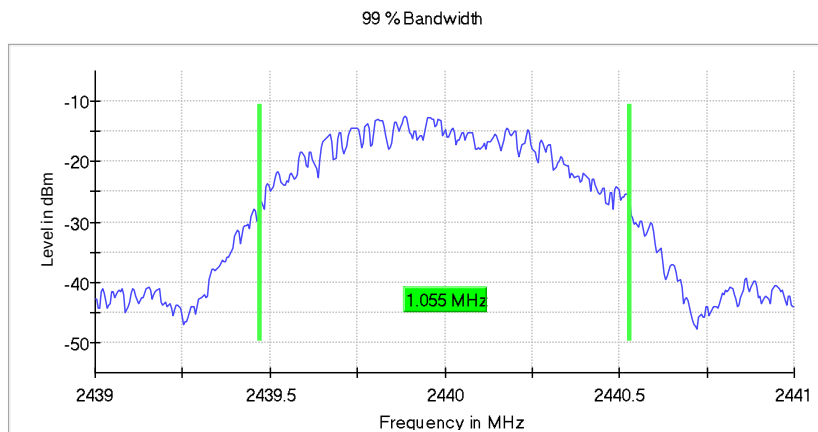
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.055000	---	---	2439.472500	2440.527500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43900 GHz	2.43900 GHz
Stop Frequency	2.44100 GHz	2.44100 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	>= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	400	~ 400
Sweeptime	189.648 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.09 dB	0.30 dB

Occupied Channel Bandwidth 99% (2480 MHz; 10.000 dBm; 1 MHz)

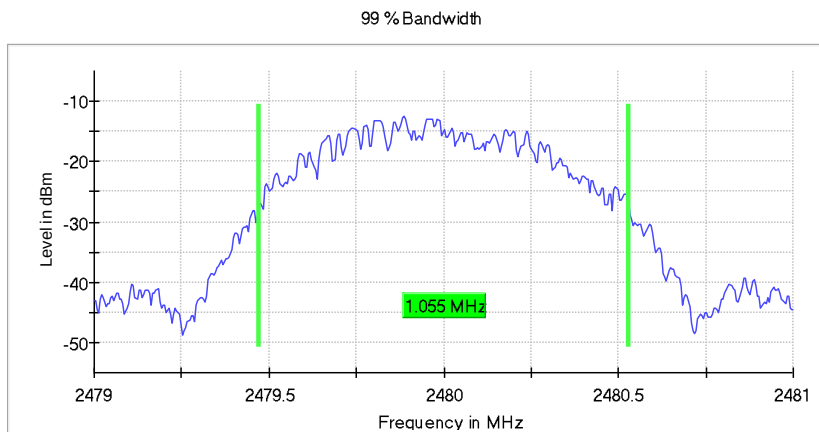
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.055000	---	---	2479.472500	2480.527500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47900 GHz	2.47900 GHz
Stop Frequency	2.48100 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	>= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	400	~ 400
Sweeptime	189.648 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.13 dB	0.30 dB

Bluetooth LE Mode, 2Mbps

Occupied Channel Bandwidth 99% (2402 MHz; 10.000 dBm; 2 MHz)

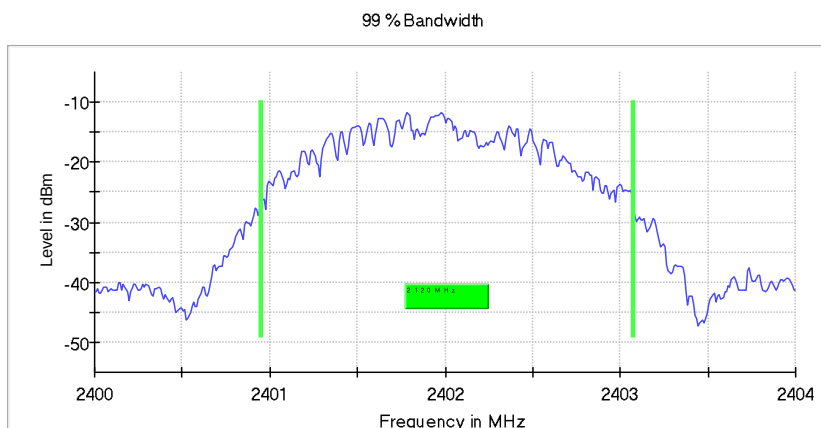
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	2.120000	---	---	2400.955000	2403.075000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2402.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.40400 GHz	2.40400 GHz
Span	4.000 MHz	4.000 MHz
RBW	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
SweepTime	94.824 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.14 dB	0.30 dB

Occupied Channel Bandwidth 99% (2440 MHz; 10.000 dBm; 2 MHz)

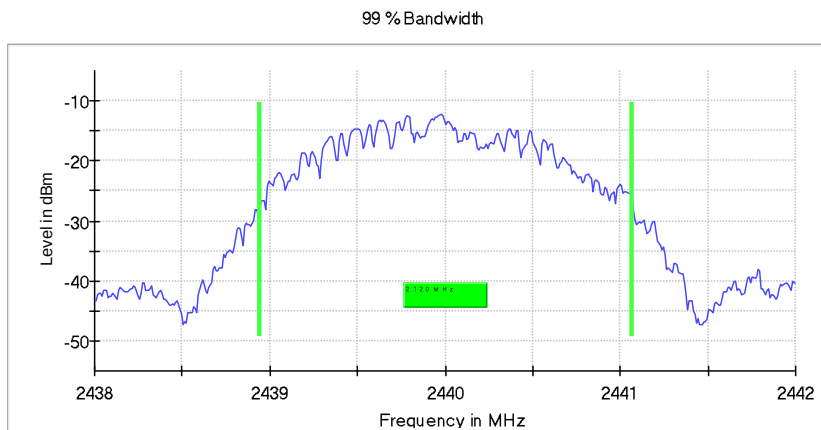
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	2.120000	---	---	2438.945000	2441.065000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43800 GHz	2.43800 GHz
Stop Frequency	2.44200 GHz	2.44200 GHz
Span	4.000 MHz	4.000 MHz
RBW	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
SweepTime	94.824 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.16 dB	0.30 dB

Occupied Channel Bandwidth 99% (2480 MHz; 10.000 dBm; 2 MHz)

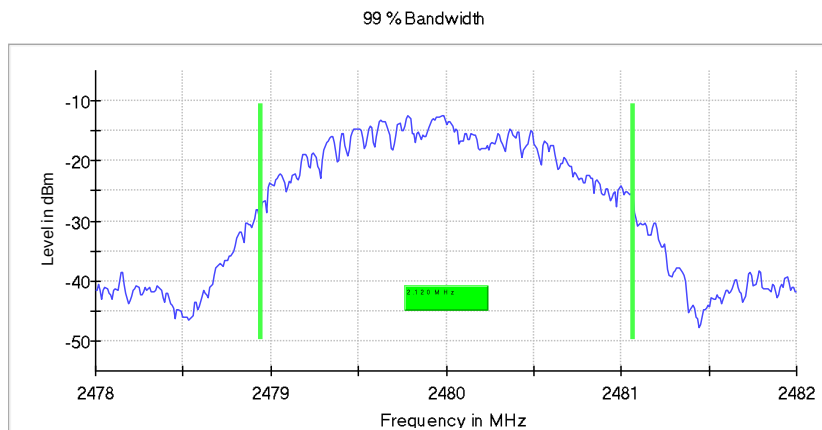
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	2.120000	---	---	2478.945000	2481.065000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS



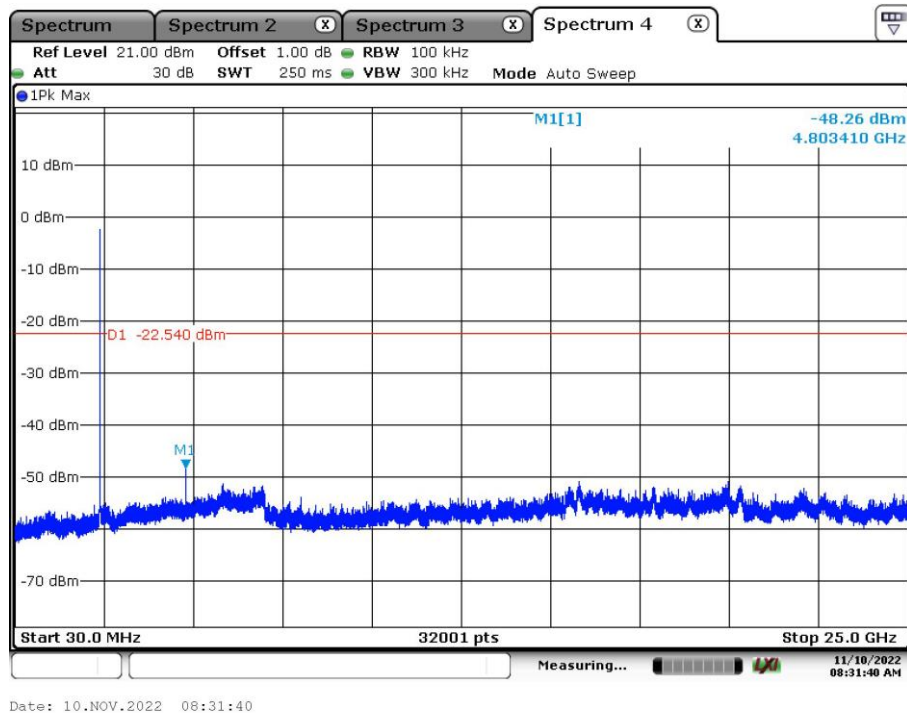
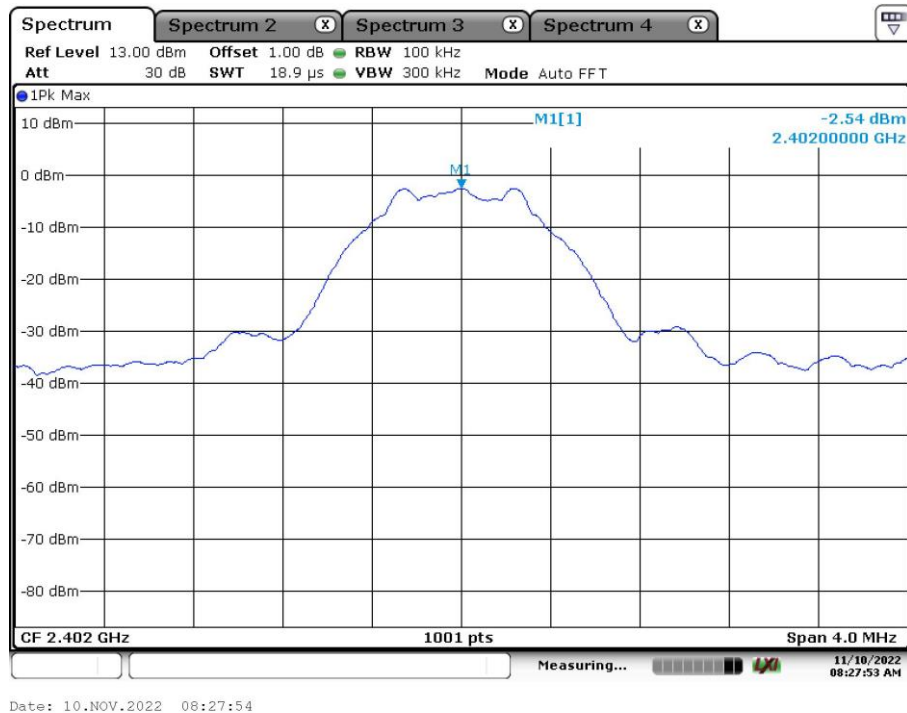
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47800 GHz	2.47800 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz
RBW	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
SweepTime	94.824 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	6 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.13 dB	0.30 dB

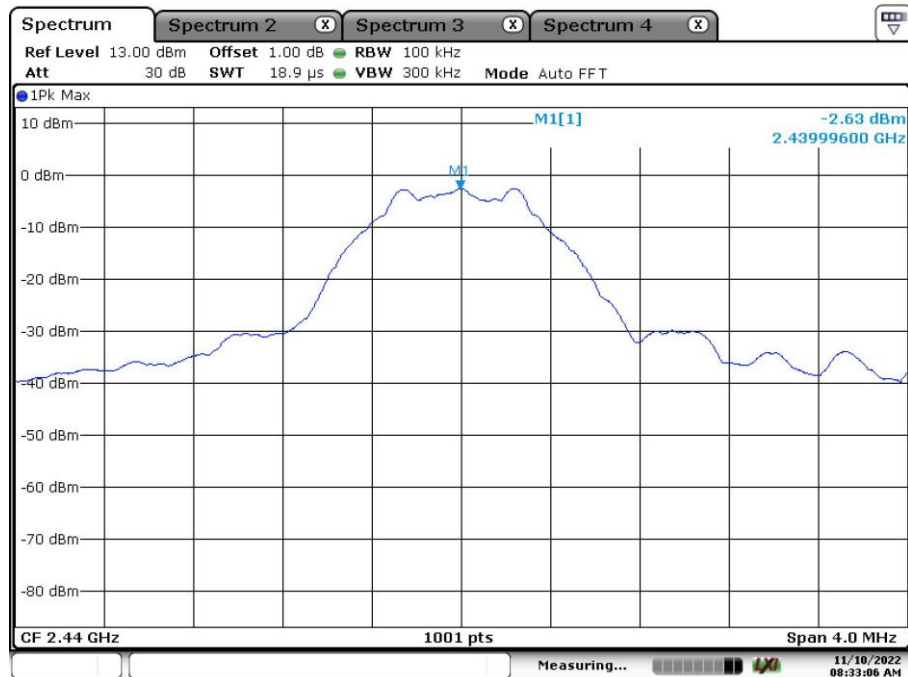
Appendix B.4: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Bluetooth LE Mode, 1Mbps

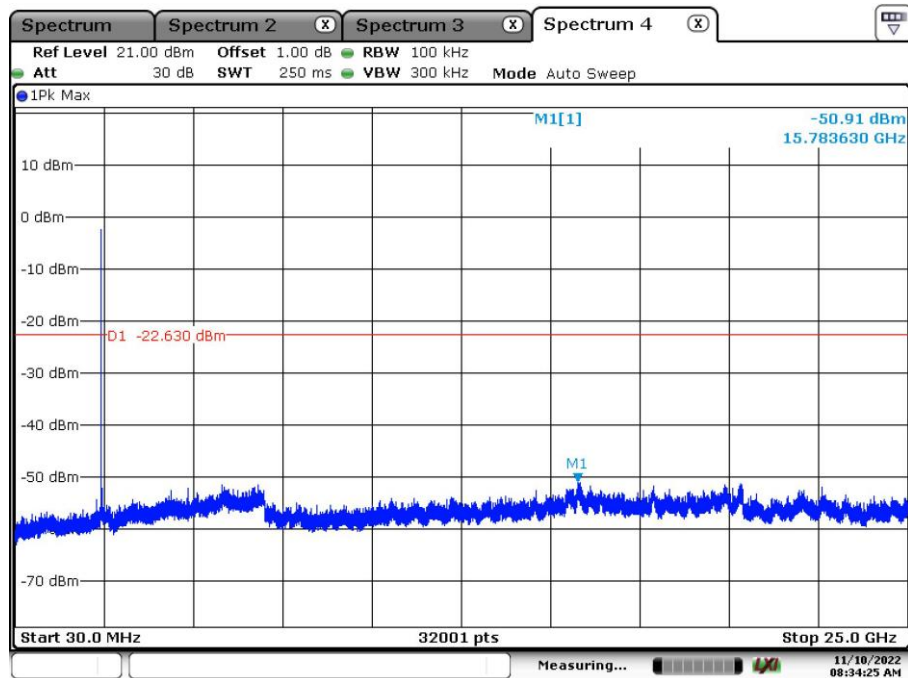
Low Channel:



Middle Channel:

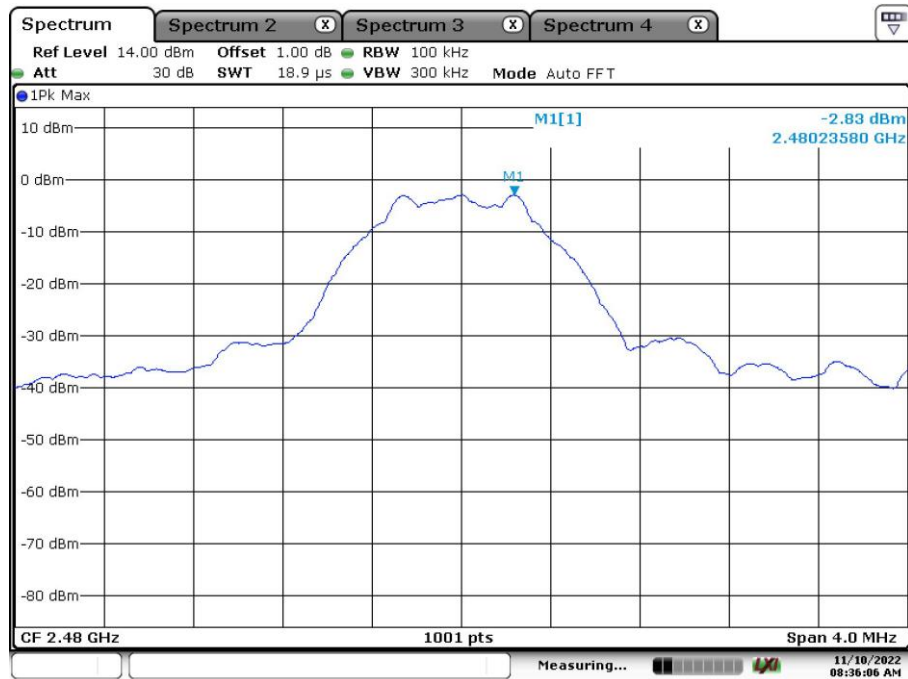


Date: 10.NOV.2022 08:33:05

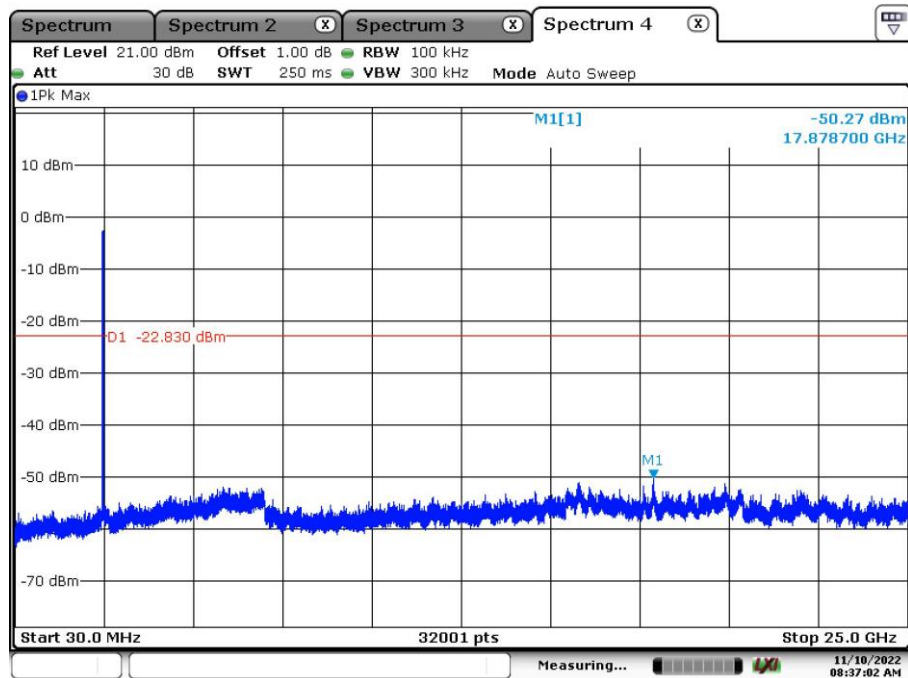


Date: 10.NOV.2022 08:34:25

High Channel:

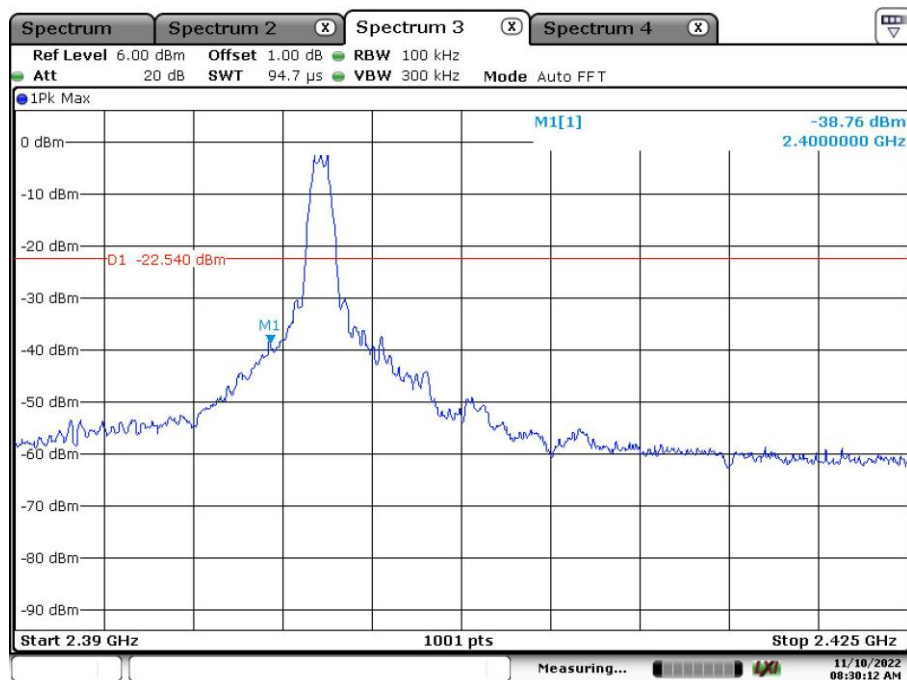


Date: 10.NOV.2022 08:36:06



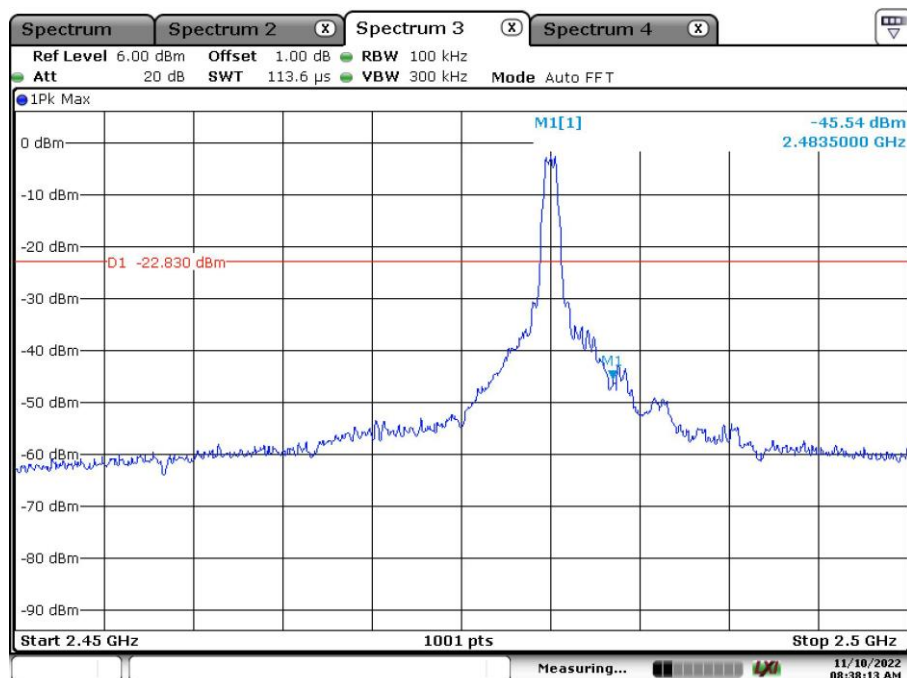
Date: 10.NOV.2022 08:37:01

Band Edge, Low Channel:



Date: 10.NOV.2022 08:30:12

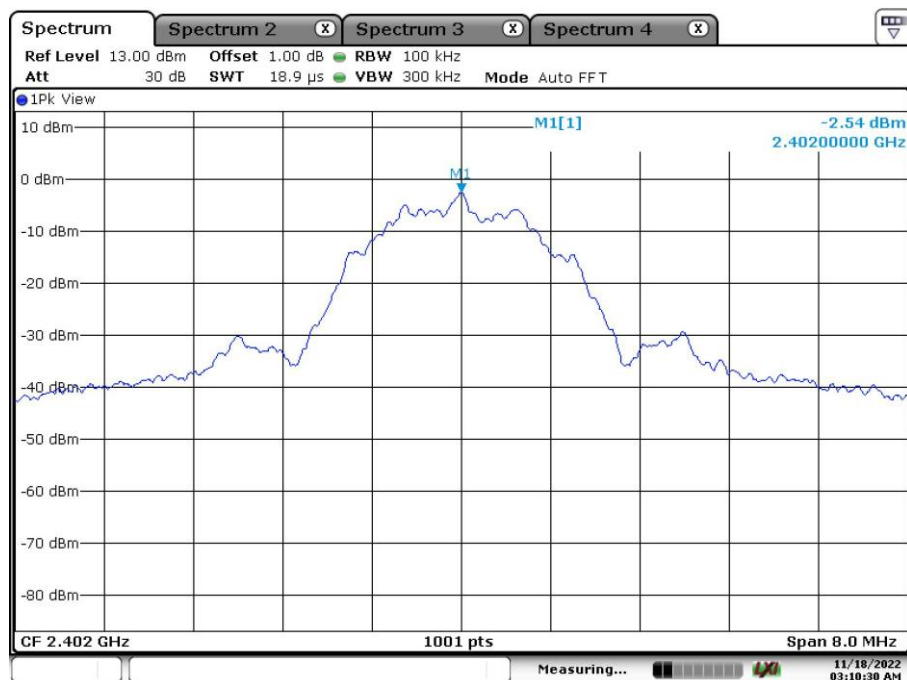
Band Edge, High Channel:



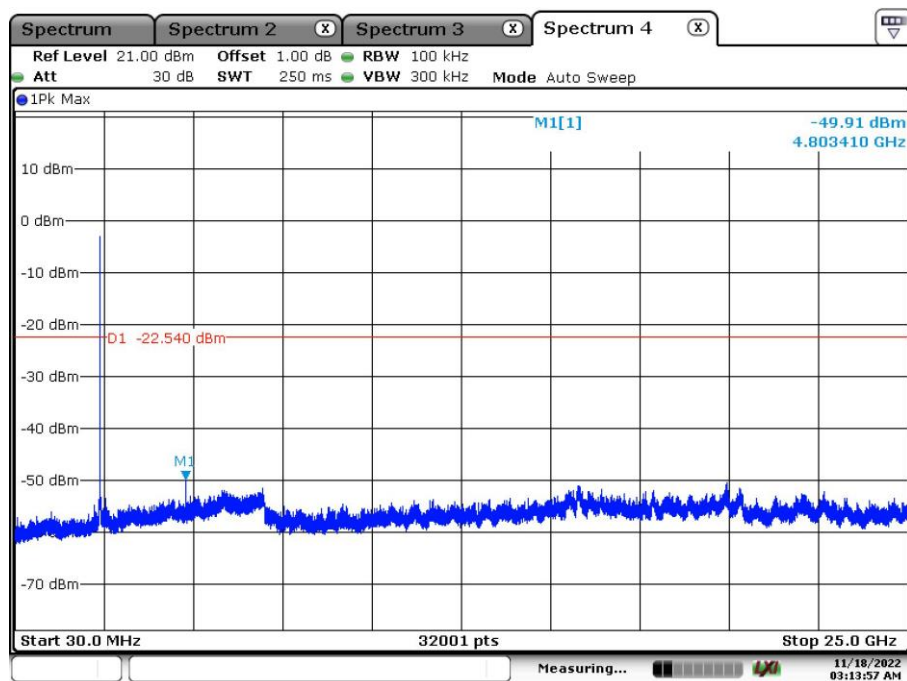
Date: 10.NOV.2022 08:38:12

Bluetooth LE Mode, 2Mbps

Low Channel:

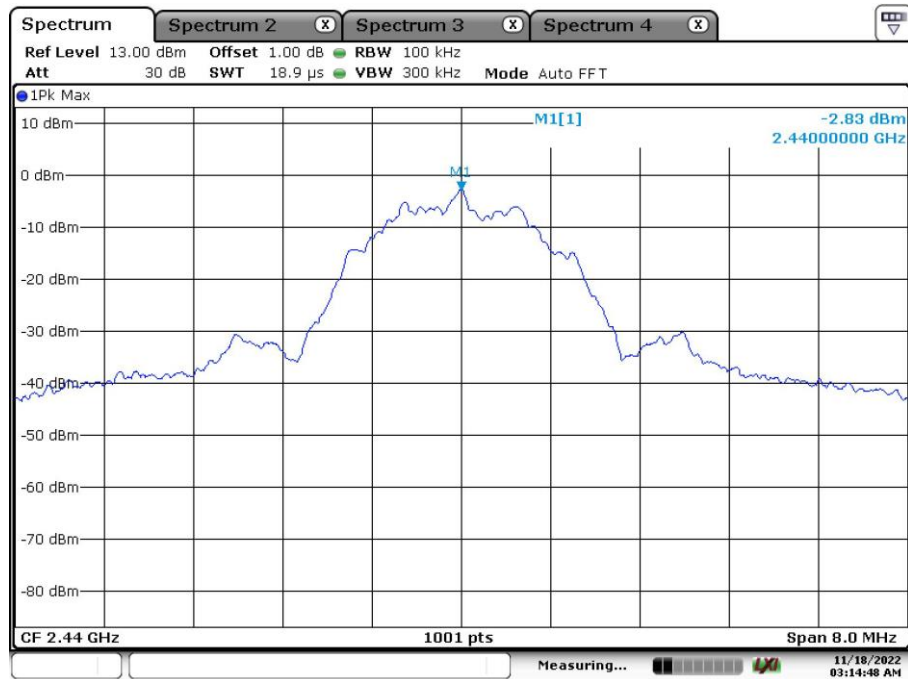


Date: 18.NOV.2022 03:10:30

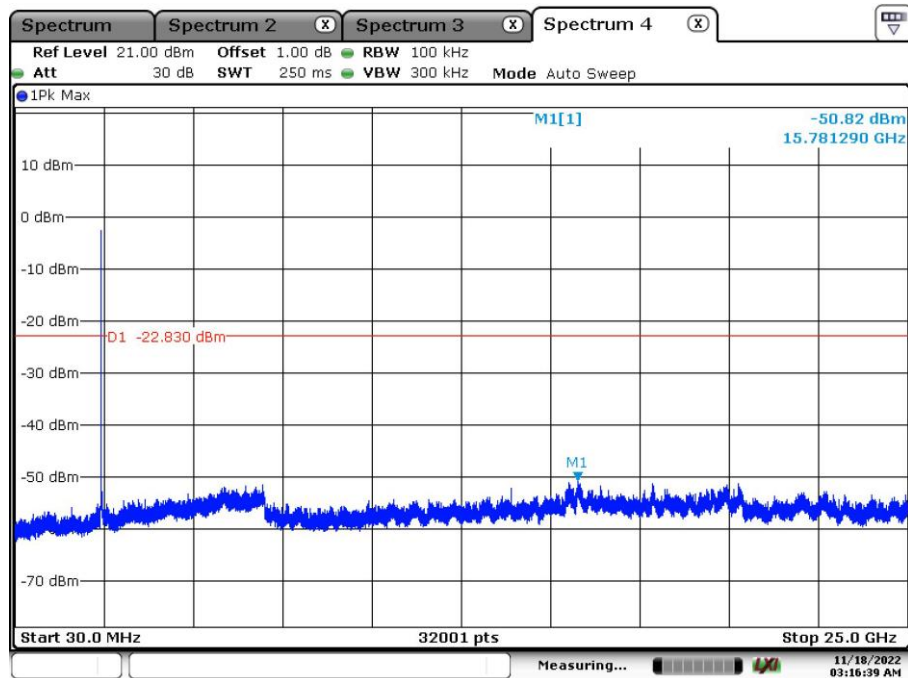


Date: 18.NOV.2022 03:13:57

Middle Channel:

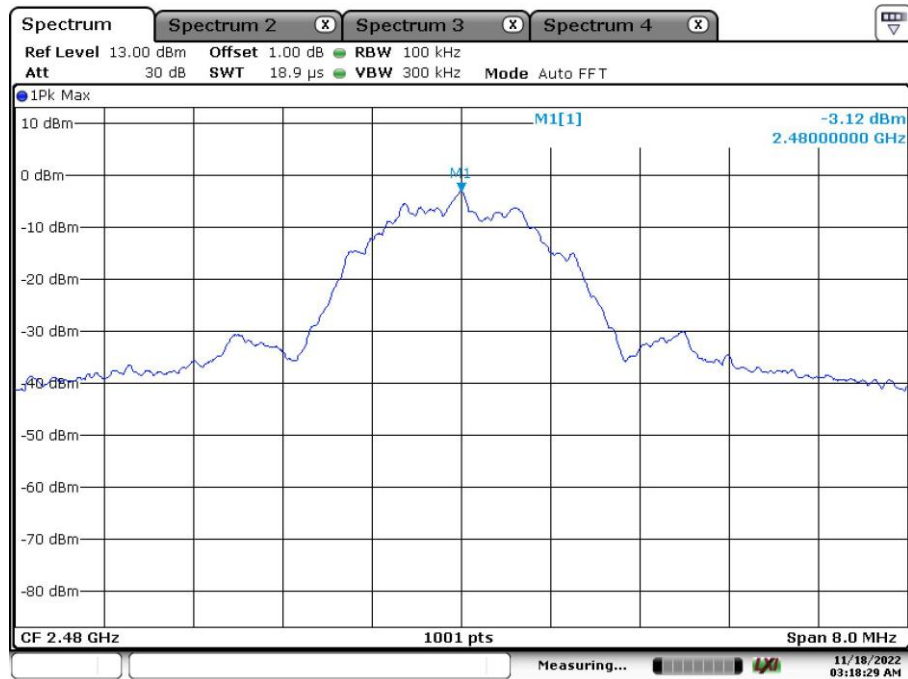


Date: 18.NOV.2022 03:14:48

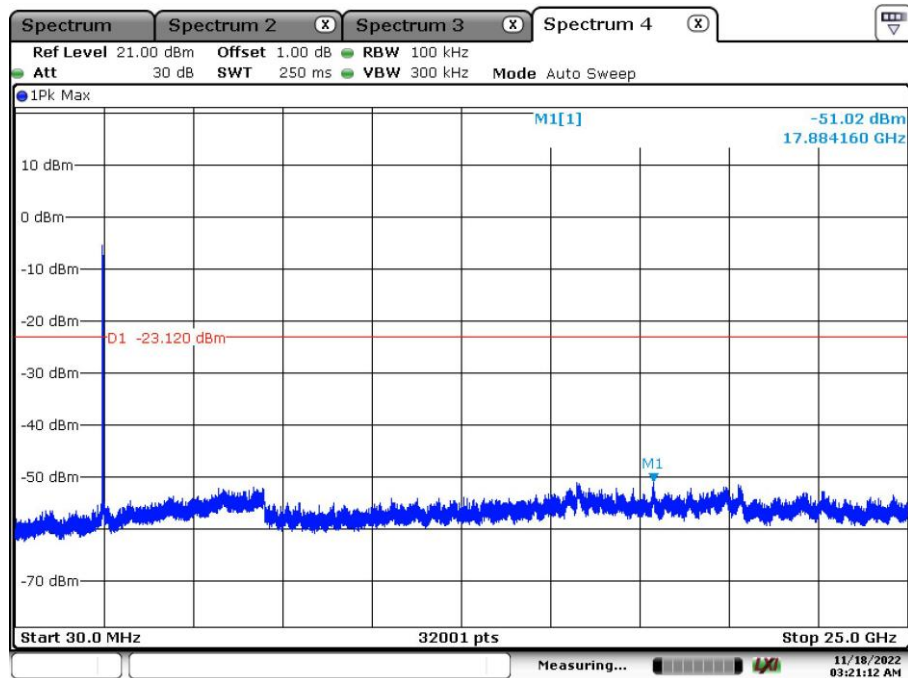


Date: 18.NOV.2022 03:16:39

High Channel:

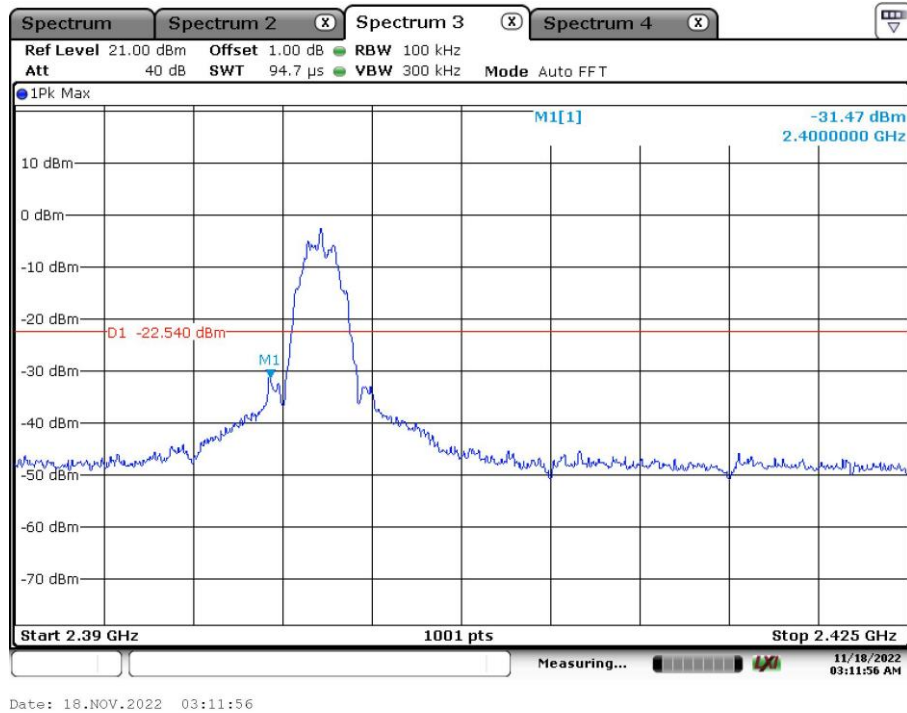


Date: 18.NOV.2022 03:18:29

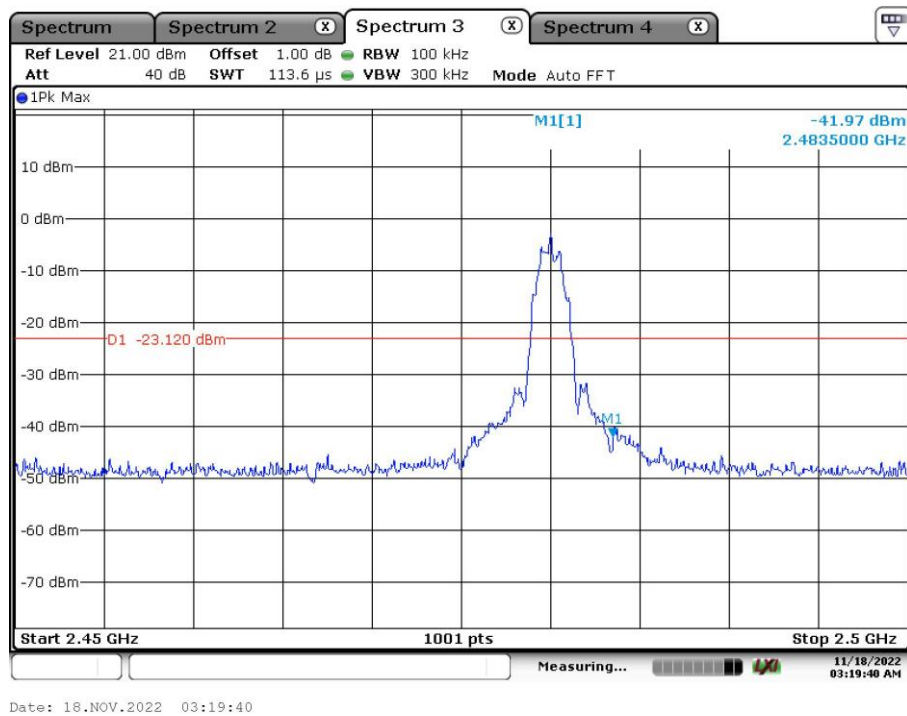


Date: 18.NOV.2022 03:21:12

Band Edge, Low Channel:



Band Edge, High Channel:



Appendix B.5: Test Results of Radiated Spurious Emissions

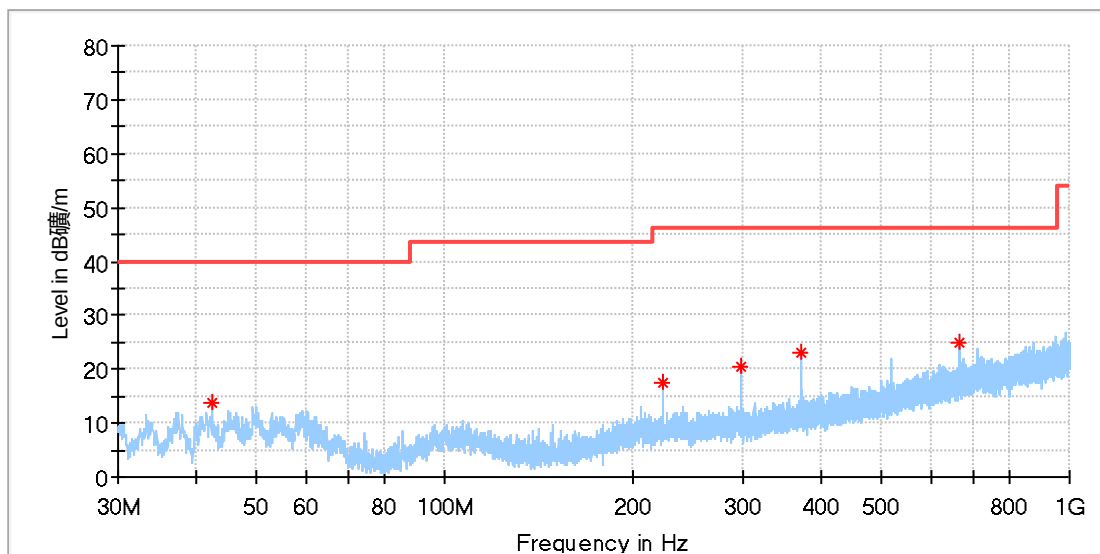
Note:

- 1) This testing was carried out on different modulations, but only the worst case was presented in this report.
- 2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

30 MHz - 1GHz

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

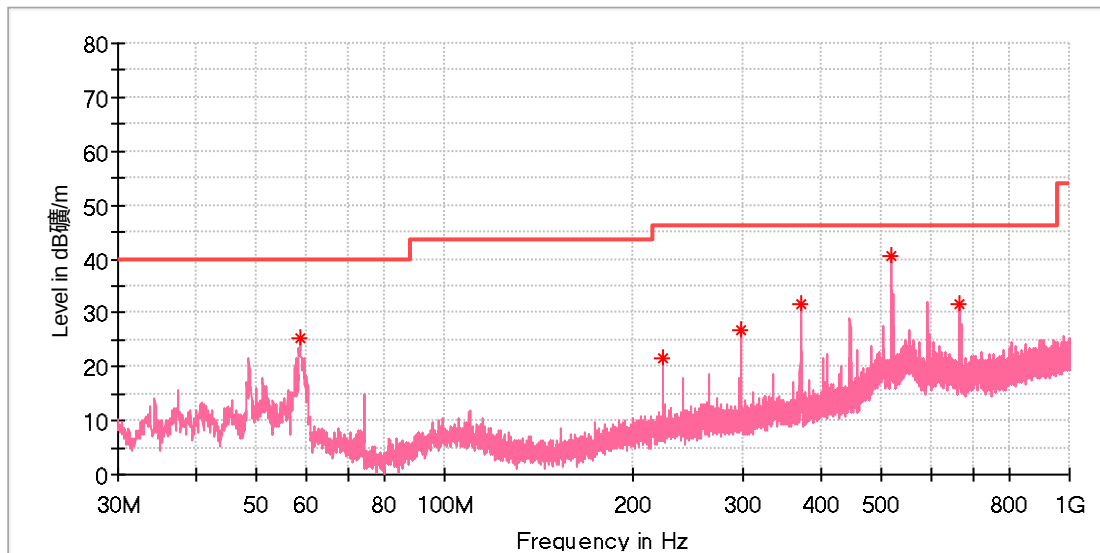
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
42.386154	13.70	40.00	26.30	100.0	H	93.0	-19.8
222.768846	17.52	46.00	28.48	100.0	H	175.0	-18.8
297.048462	20.31	46.00	25.69	100.0	H	149.0	-16.7
371.290769	23.19	46.00	22.81	100.0	H	175.0	-14.7
668.371923	25.05	46.00	20.95	100.0	H	340.0	-9.0

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
58.689615	25.14	40.00	14.86	100.0	V	145.0	-19.1
222.768846	21.62	46.00	24.38	100.0	V	48.0	-18.8
297.011154	26.76	46.00	19.24	100.0	V	297.0	-16.7
371.290769	31.55	46.00	14.45	100.0	V	89.0	-14.7
519.812692	40.38	46.00	5.62	100.0	V	153.0	-11.9
668.334615	31.59	46.00	14.41	100.0	V	145.0	-9.0

Final_Result

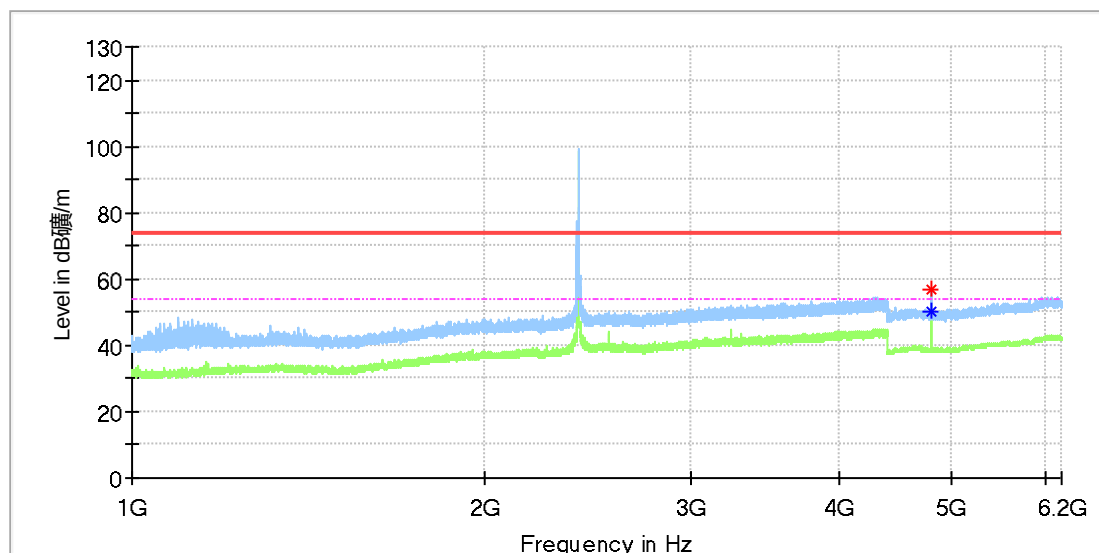
Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

1GHz - 18GHz

Note: The highest waveform in the figure is Bluetooth Fundamental.

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

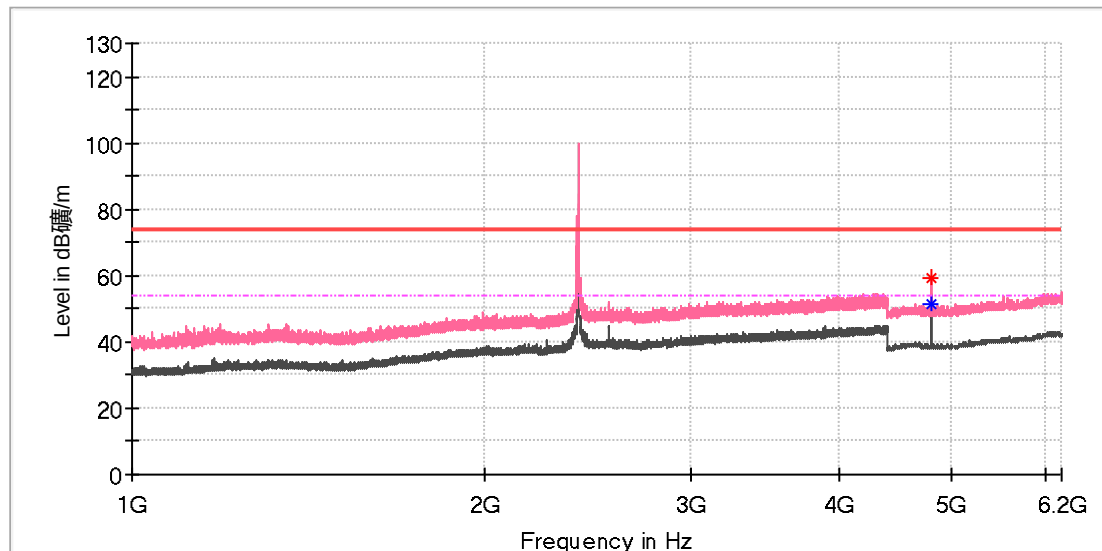
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	---	50.42	54.00	3.58	100.0	H	0.0	11.8
4804.500000	56.72	---	74.00	17.28	100.0	H	0.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

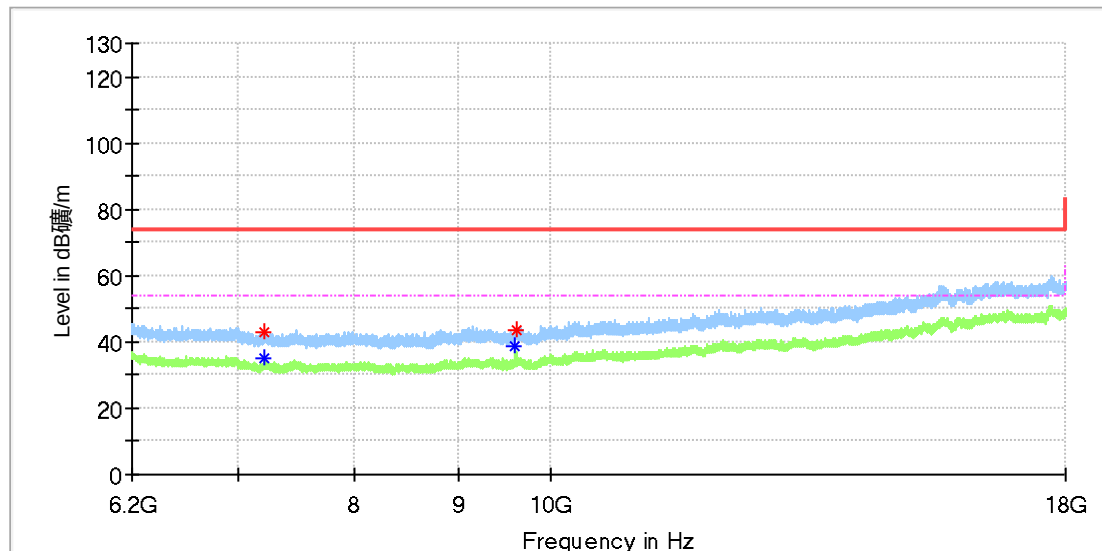
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	59.06	---	74.00	14.94	100.0	V	123.0	11.8
4804.500000	---	51.90	54.00	2.10	100.0	V	123.0	11.8

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name: Hand Held Barcode Scanner
Model: BSH-32B
Test Mode: BLE 1M_Low channel
Order No/Sample No: 168396000/A003360077-003
Test Voltage: Battery
Remark: Temp 23 Humi:58%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical Freqs

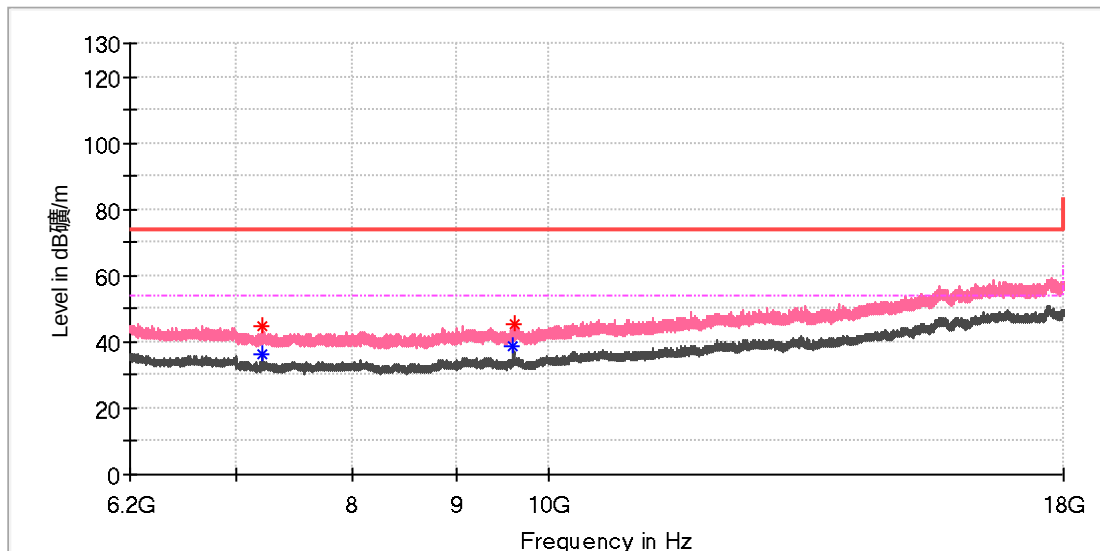
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7204.966667	---	34.86	54.00	19.14	100.0	H	36.0	8.8
7217.258333	42.80	---	74.00	31.20	100.0	H	120.0	8.7
9606.758333	---	38.54	54.00	15.46	100.0	H	301.0	10.4
9608.725000	43.69	---	74.00	30.31	100.0	H	83.0	10.4

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name: Hand Held Barcode Scanner
Model: BSH-32B
Test Mode: BLE 1M_Low channel
Order No/Sample No: 168396000/A003360077-003
Test Voltage: Battery
Remark: Temp 23 Humi:58%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical Freqs

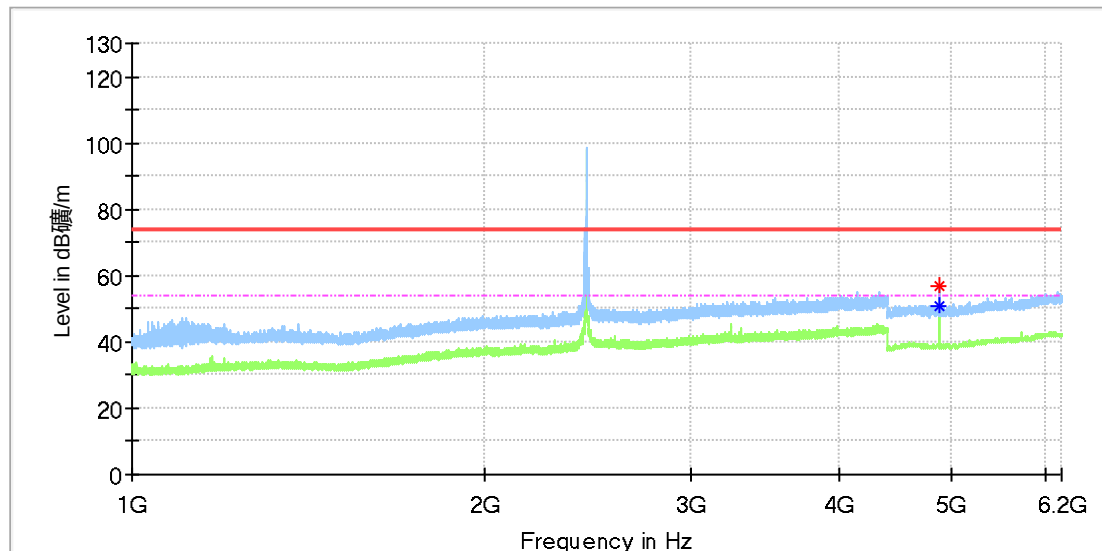
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7204.966667	44.89	---	74.00	29.11	100.0	V	110.0	8.8
7204.966667	---	36.21	54.00	17.79	100.0	V	110.0	8.8
9606.758333	---	38.93	54.00	15.07	100.0	V	110.0	10.4
9608.233333	45.12	---	74.00	28.88	100.0	V	45.0	10.4

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name: Hand Held Barcode Scanner
Model: BSH-32B
Test Mode: BLE 1M_Mid channel
Order No/Sample No: 168396000/A003360077-003
Test Voltage: Battery
Remark: Temp 23 Humi:58%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical Freqs

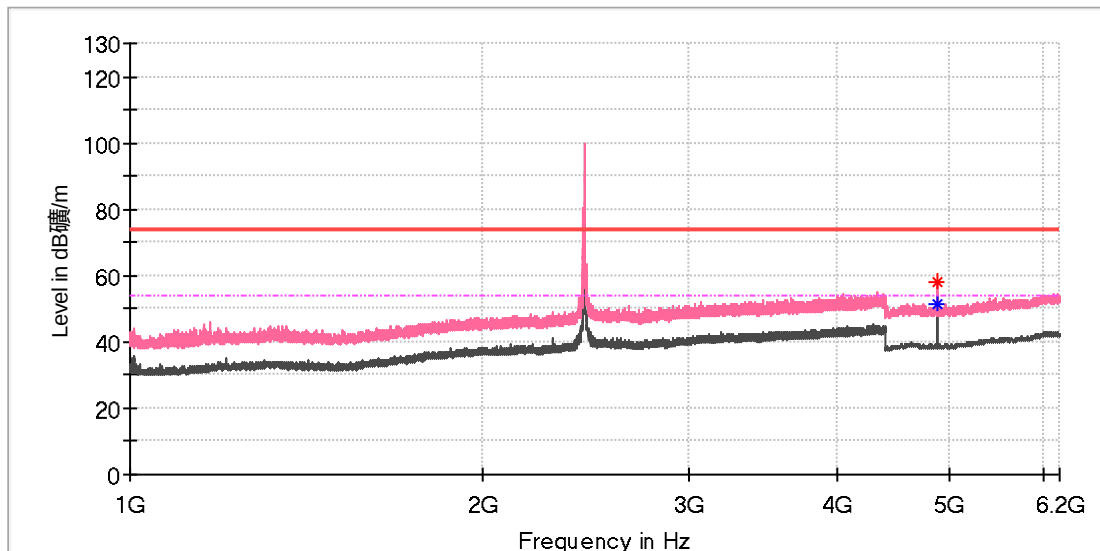
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	---	50.50	54.00	3.50	100.0	H	7.0	11.8
4880.500000	56.55	---	74.00	17.45	100.0	H	356.0	11.8

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

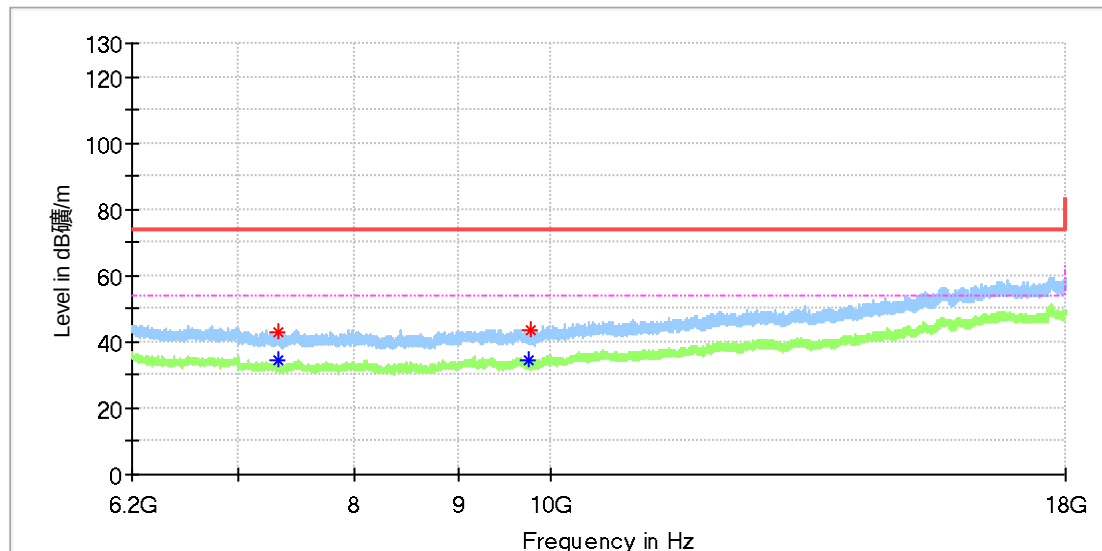
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	57.80	---	74.00	16.20	100.0	V	100.0	11.8
4880.500000	---	51.63	54.00	2.37	100.0	V	100.0	11.8

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name: Hand Held Barcode Scanner
Model: BSH-32B
Test Mode: BLE 1M_Mid channel
Order No/Sample No: 168396000/A003360077-003
Test Voltage: Battery
Remark: Temp 23 Humi:58%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical Freqs

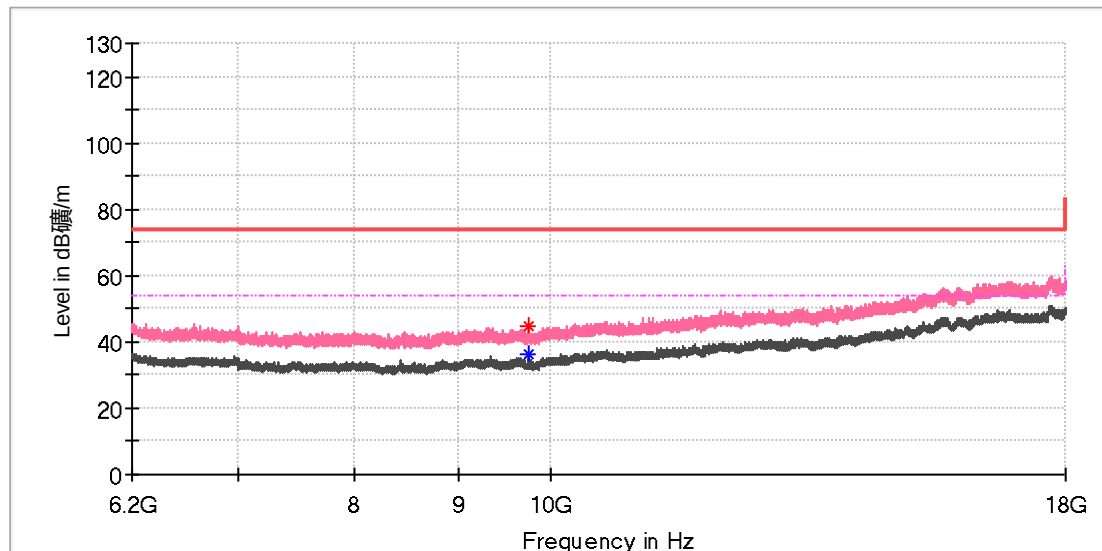
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7318.541667	43.14	---	74.00	30.86	100.0	H	47.0	8.2
7319.033333	---	34.28	54.00	19.72	100.0	H	0.0	8.2
9760.650000	---	34.58	54.00	19.42	100.0	H	288.0	10.4
9769.991667	43.31	---	74.00	30.69	100.0	H	144.0	10.4

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

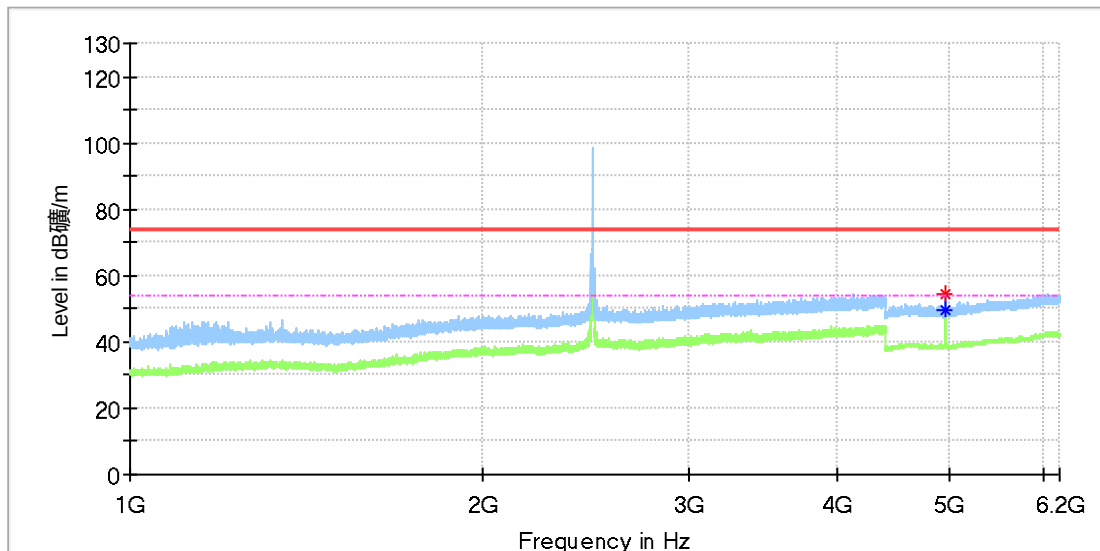
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9758.683333	---	36.29	54.00	17.71	100.0	V	314.0	10.4
9760.650000	44.90	---	74.00	29.10	100.0	V	314.0	10.4

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name: Hand Held Barcode Scanner
Model: BSH-32B
Test Mode: BLE 1M_High channel
Order No/Sample No: 168396000/A003360077-003
Test Voltage: Battery
Remark: Temp 23 Humi:58%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical Freqs

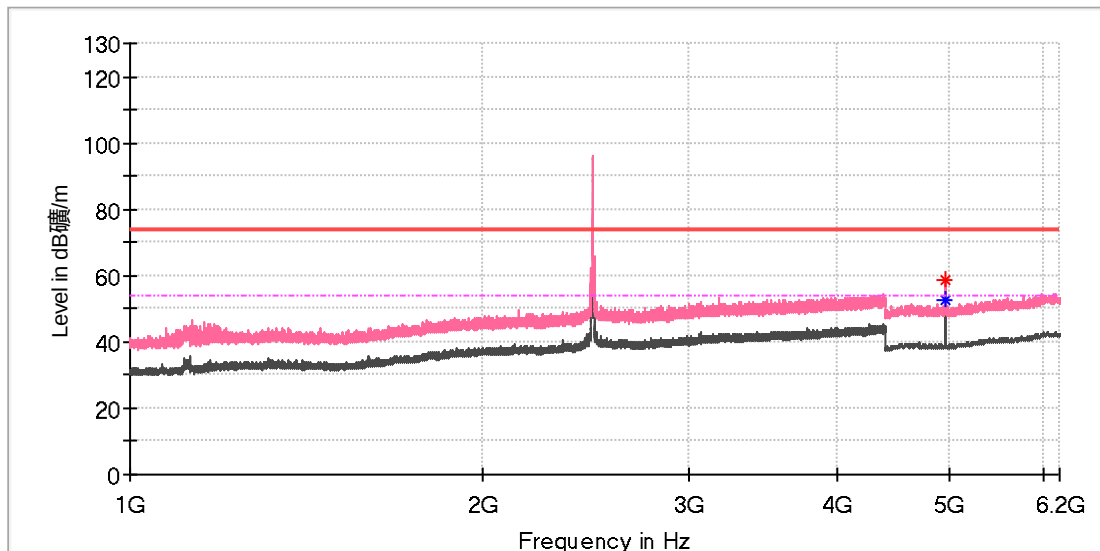
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	54.64	---	74.00	19.36	100.0	H	221.0	11.8
4960.000000	---	49.58	54.00	4.42	100.0	H	221.0	11.8

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

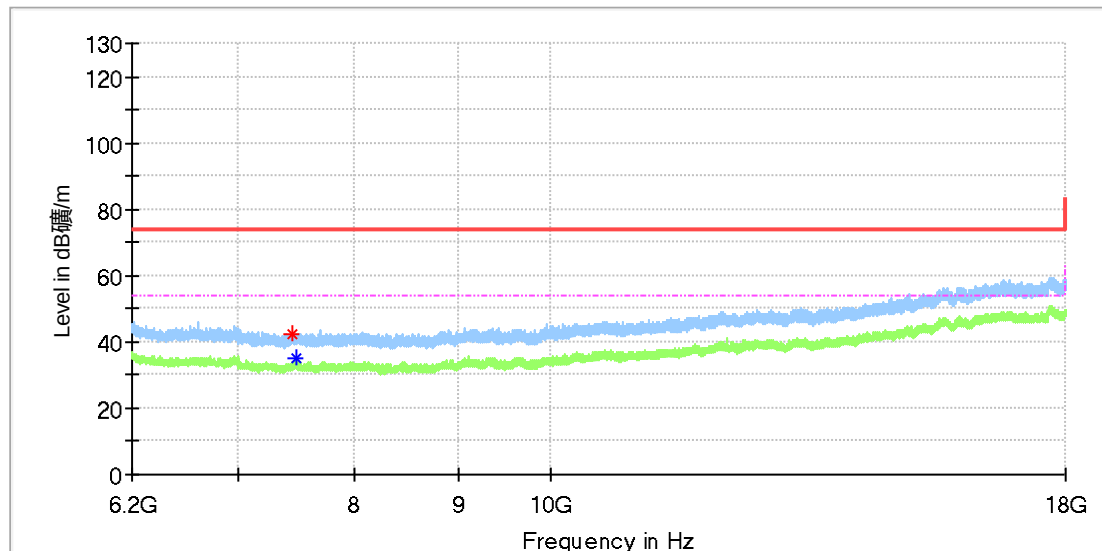
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	58.94	---	74.00	15.06	100.0	V	296.0	11.8
4960.500000	---	52.33	54.00	1.67	100.0	V	296.0	11.8

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name: Hand Held Barcode Scanner
Model: BSH-32B
Test Mode: BLE 1M_High channel
Order No/Sample No: 168396000/A003360077-003
Test Voltage: Battery
Remark: Temp 23 Humi:58%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical Freqs

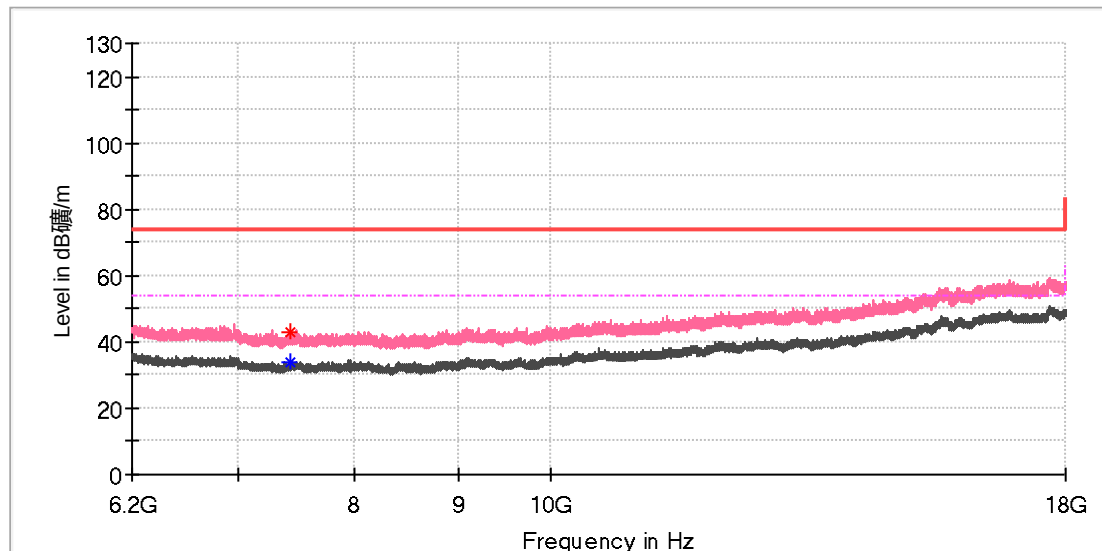
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7441.950000	42.25	---	74.00	31.75	100.0	H	321.0	8.4
7477.350000	---	34.92	54.00	19.08	100.0	H	32.0	8.6

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7431.625000	---	33.63	54.00	20.37	100.0	V	243.0	8.4
7436.050000	42.92	---	74.00	31.08	100.0	V	278.0	8.4

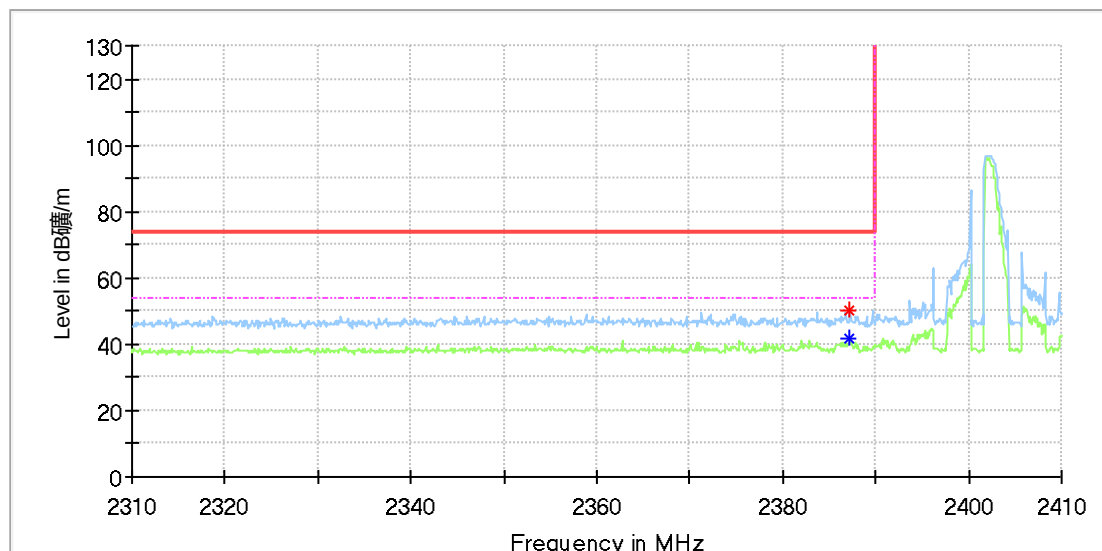
Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Appendix B.6: Test Results of Radiated Emissions in Restricted Bands

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

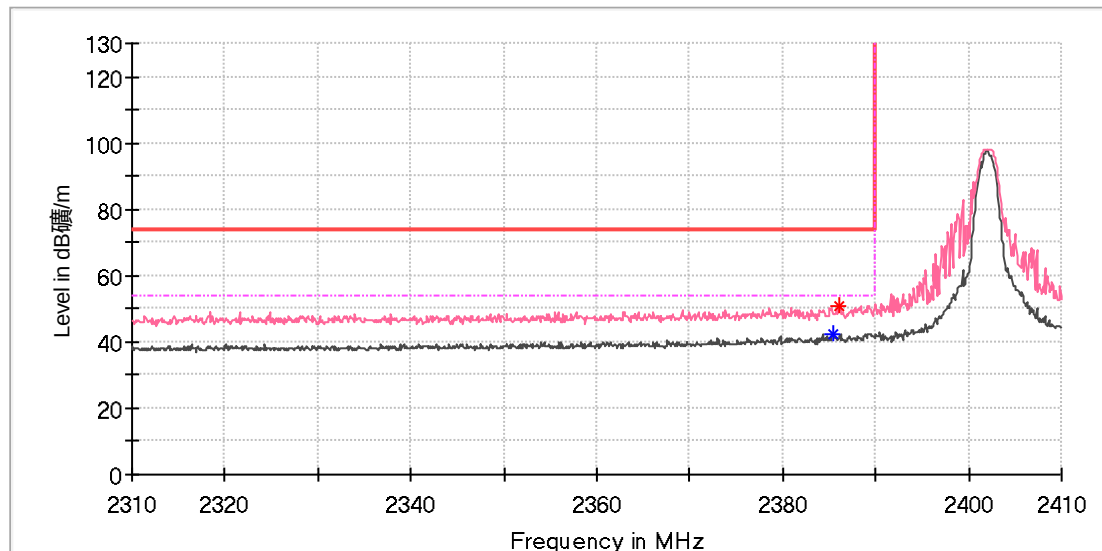
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2387.200000	---	41.43	54.00	12.57	100.0	H	0.0	7.0
2387.200000	50.01	---	74.00	23.99	100.0	H	0.0	7.0

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name: Hand Held Barcode Scanner
Model: BSH-32B
Test Mode: BLE 1M_Low channel
Order No/Sample No: 168396000/A003360077-003
Test Voltage: Battery
Remark: Temp 23 Humi:58%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

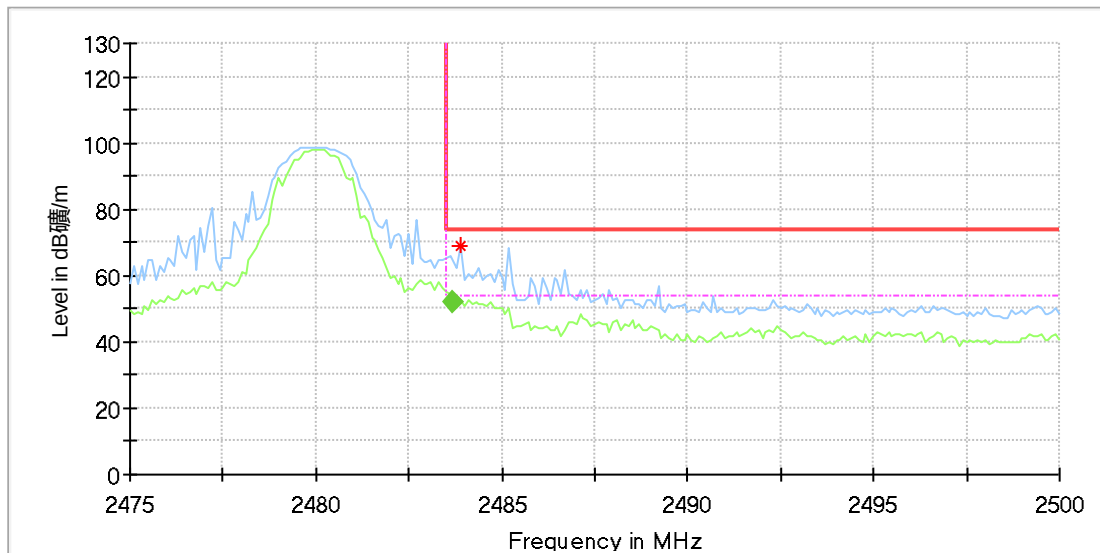
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2385.400000	---	42.59	54.00	11.41	100.0	V	6.0	7.0
2386.000000	50.50	---	74.00	23.50	100.0	V	60.0	7.0

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

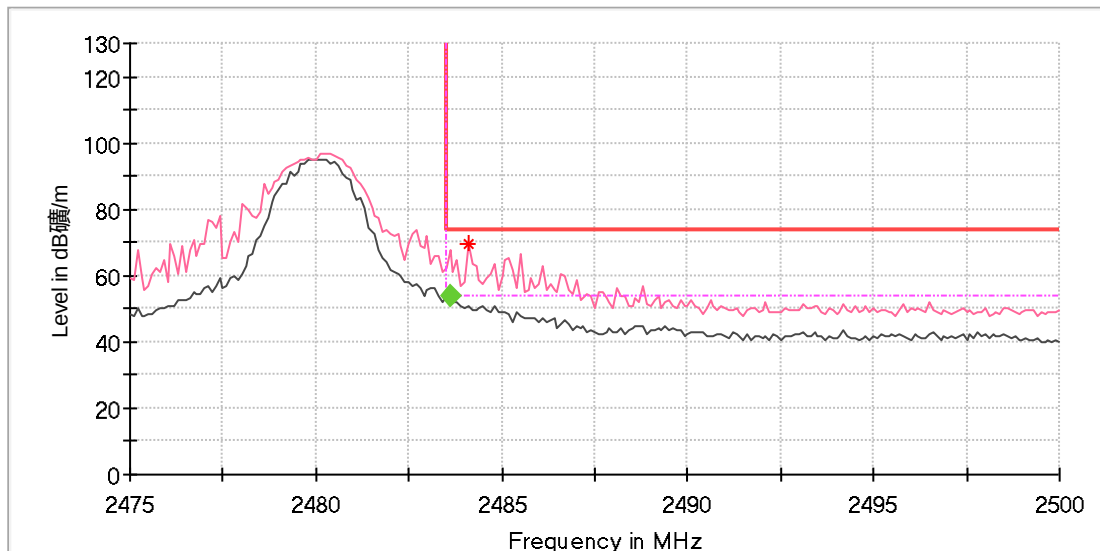
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.900000	68.70	---	74.00	5.30	100.0	H	256.0	7.4

Final Result

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.693400	52.02	54.00	1.98	100.0	H	247.0	7.4

EUT Information

EUT Name:	Hand Held Barcode Scanner
Model:	BSH-32B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168396000/A003360077-003
Test Voltage:	Battery
Remark:	Temp 23 Humi:58%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2484.100000	69.72	---	74.00	4.28	100.0	V	244.0	7.4

Final_Result

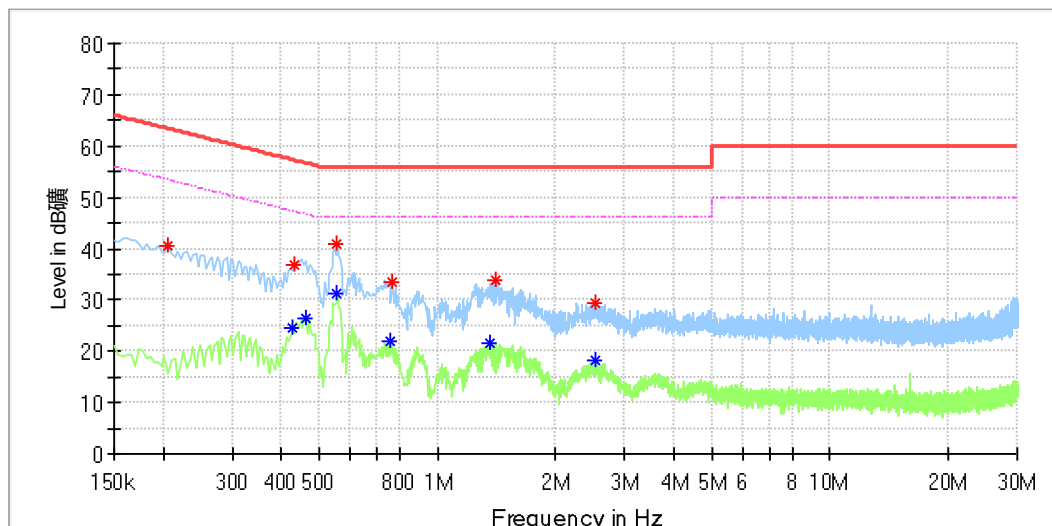
Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.646750	53.31	54.00	0.69	105.0	V	243.0	7.4

Appendix B.7: Test Plots of Conducted Emission on AC Mains

Normal operation mode

EUT Information

EUT Name:	Hand Held Barcode Scanner
Order Number:	168396000
Model:	BSH-32B
Test Mode:	Normal operation mode
Test Voltage:	AC 120V/60Hz
Test By:/Review By:	Eric Guo/Gary Chen
Test Standard:	FCC Part 15
Tem./Hum./Pressure:	24.6°C/49.5%/101kPa
Remark:	SR2

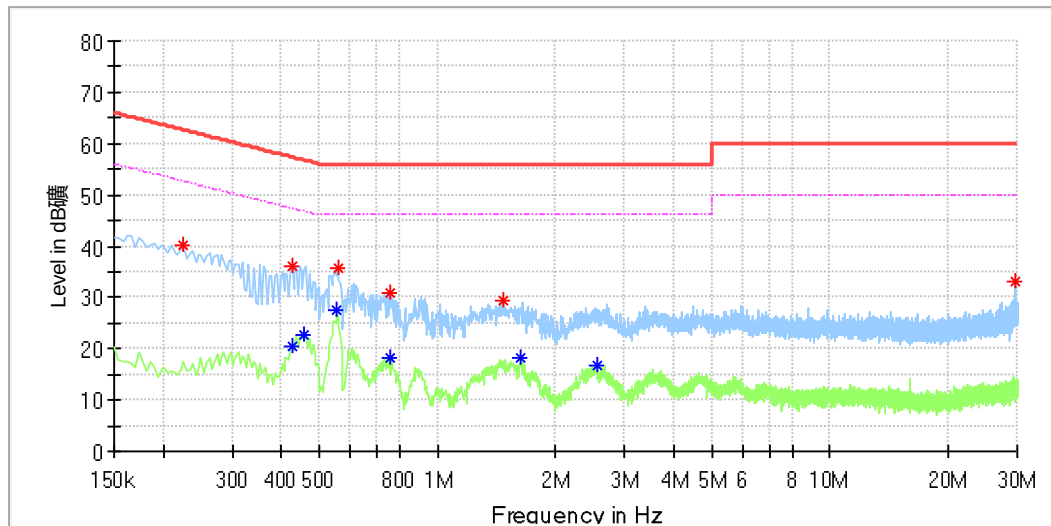


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.206000	40.71	---	63.37	22.65	L1	9.9
0.426000	---	24.39	47.33	22.94	L1	9.9
0.430000	36.65	---	57.25	20.60	L1	9.9
0.462000	---	26.42	46.66	20.23	L1	10.0
0.554000	---	31.42	46.00	14.58	L1	10.0
0.554000	40.95	---	56.00	15.05	L1	10.0
0.754000	---	21.87	46.00	24.13	L1	10.0
0.770000	33.46	---	56.00	22.54	L1	10.0
1.362000	---	21.65	46.00	24.35	L1	10.1
1.406000	33.79	---	56.00	22.21	L1	10.1
2.530000	29.57	---	56.00	26.43	L1	10.2
2.530000	---	18.31	46.00	27.69	L1	10.2

EUT Information

EUT Name: Hand Held Barcode Scanner
Order Number: 168396000
Model: BSH-32B
Test Mode: Normal operation mode
Test Voltage: AC 120V/60Hz
Test By:/Review By: Eric Guo/Gary Chen
Test Standard: FCC Part 15
Tem./Hum./Pressure: 24.6°C/49.5%/101kPa
Remark: SR2



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.226000	40.10	---	62.60	22.50	N	9.8
0.426000	35.96	---	57.33	21.37	N	9.8
0.426000	---	20.54	47.33	26.79	N	9.8
0.458000	---	22.75	46.73	23.98	N	9.8
0.554000	---	27.59	46.00	18.41	N	9.8
0.558000	35.86	---	56.00	20.14	N	9.8
0.758000	---	18.35	46.00	27.65	N	9.8
0.758000	30.97	---	56.00	25.03	N	9.8
1.470000	29.23	---	56.00	26.77	N	9.8
1.634000	---	18.24	46.00	27.76	N	9.8
2.542000	---	16.79	46.00	29.21	N	9.9
29.710000	33.07	---	60.00	26.93	N	10.4