Prüfbericht - Produkte
Test Report - Products

TÜVRheinland®

Prüfbericht-Nr.: *Test report no.:*	60408929 001	**Auftrags-Nr.:** *Order no.:*	168270705	Seite 1 von 19 *Page 1 of 19*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2020-06-24	
Auftraggeber: *Client:*	**Beijing Niu Technology Co., Ltd.** No.1 building, No.195 yard, Huilongguan East Street, Changping District, Beijing			
Prüfgegenstand: *Test item:*	Smart Central Controller			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	V35LTE			
Auftrags-Inhalt: *Order content:*	FCC approval			
Prüfgrundlage: *Test specification:*	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 2: Section 2.1091			

Wareneingangsdatum: *Date of sample receipt:*	2020-06-29
Prüfmuster-Nr.: *Test sample no.:*	A002855156-001~004
Prüfzeitraum: *Testing period:*	2020-07-30 - 2020-08-17
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd. Testing Center
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass

geprüft von: *tested by:*		**genehmigt von:** *authorized by:*	
Datum: *Date:* 2020-09-02	Bell Hu	**Ausstellungsdatum:** *Issue date:* 2020-09-02	Winnie Hou
Stellung / Position	Bell Hu / Project Manager	**Stellung** / Position	Winnie Hou / Technical Certifier

Sonstiges / *Other:*

FCC ID: 2AQ95-NIUV35LTE.
This device contains a LTE module, FCC ID:XMR201605EC25A.

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:* Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged:*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhalt
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	1 = very good	2 = good	3 = satisfactory	4 = sufficient	5 = poor
	P(ass) = passed a.m. test specifications(s)		F(ail) = failed a.m. test specifications(s)	N/A = not applicable	N/T = not tested

TUV Rheinland (Shenzhen) Co., Ltd. 1601 R&D Room, 1602-1604, 17-18F, Building 7 Site C, Vanke Cloud City Phase I, Xingke First Street, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, P.R. China
Mail: service@de.tuv.com http://www.tuv.com

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

Contents

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: Test Results of BLE

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd. Testing Center
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

TÜV Rheinland (Shenzhen) Co., Ltd. Testing Center

Radio Spectrum Testing (TS8997)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
Signal Analyzer	R&S	FSV 40	101441	2021-08-10
OSP	R&S	OSP 150	101017	2020-12-17
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	2020-12-17
Wideband Power Sensor	R&S	NRP-Z81	105350	2020-12-17
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2021-07-23
Unwanted Emission Testing (TS9975)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2021-08-11
Signal Analyzer	R&S	FSV 40	101439	2021-08-10
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2021-08-10
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2021-08-10
Amplifier	R&S	SCU-18F	180070	2021-08-10
Amplifier	R&S	SCU40A	100475	2020-09-20
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2020-09-01
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18313	2021-09-02
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	2021-07-06

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 basics 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
Radio Frequency	±1 x 10-7
RF Power (conducted)	±2.5 dB
Radiated Emission of Transmitter, valid up to 26.5 GHz	±6 dB
Radiated Emission of Receiver, valid up to 26.5 GHz	±6 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB
Radiated Emission (3m SAC), 30MHz to 1000MHz	± 4.52 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.37 dB
Temperature	±1 °C
Humidity	±5 %
Voltage (DC)	±1 %
Voltage (AC, <10kHz)	±2 %

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A 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. Testing Center 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 Smart Central Controller, which supports Bluetooth Low Energy function and LTE.

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	Smart Central Controller
Type Designation	V35LTE
FCC ID	2AQ95-NIUV35LTE
Operating Voltage	DC 3.7V@2200mAh via Li-ion Battery
Test Voltage	Fully charged battery
Antenna Type	Integral Antenna
Antenna Gain	-0.8 dBi
Technical Specification of BLE	
Frequency Range	2402 MHz to 2480 MHz
Type of Modulation	GFSK(BT_LE)
Channel Number	40 channels
Data Rate	1 Mbps
Channel Separation	2 MHz

Table 3: RF Channel and Frequency of BLE

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 for BLE

3.3 Independent Operation Modes

The basic operation modes are:

A. On, BLE transmitting mode
   1) Low Channel
   2) Middle Channel
   3) High Channel

B. Co-location (BLE+LTE)

C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form

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.

4.3 Special Accessories and Auxiliary Equipment

Table 4: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N	Rating
Laptop	Lenovo	T480	PF-16A6N8	N/A
DC power Supply	Topward	3303D	809332	0-30 Volts, 0-3 Amps

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)

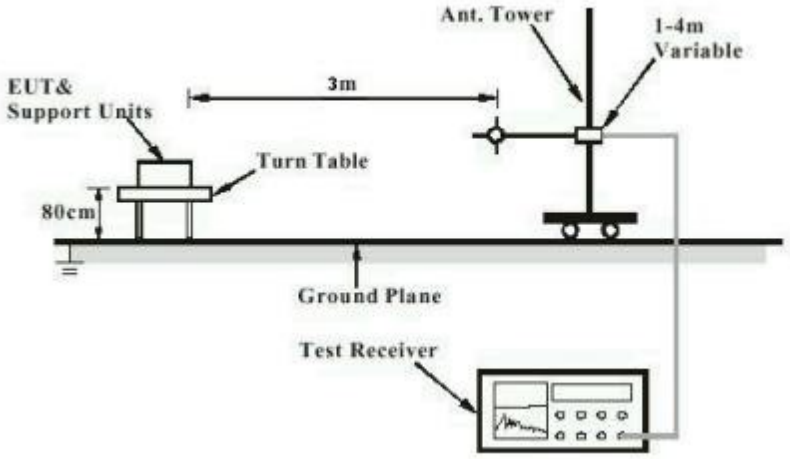


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

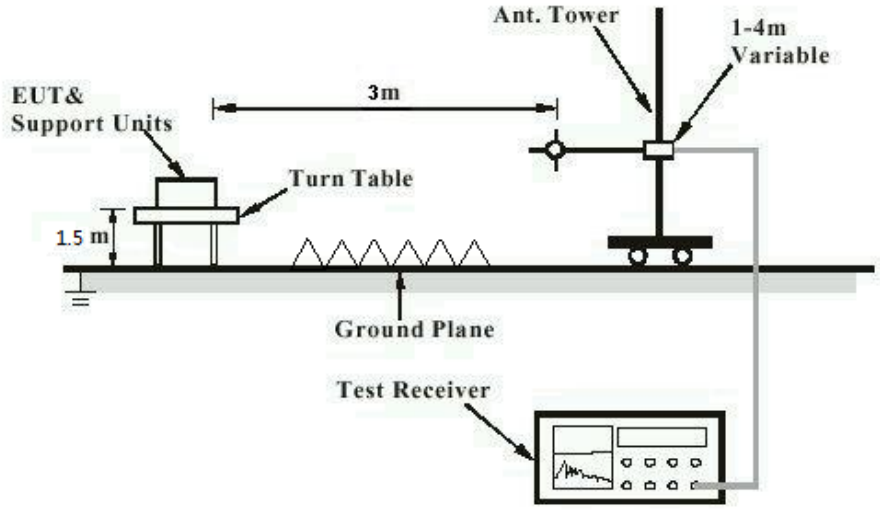
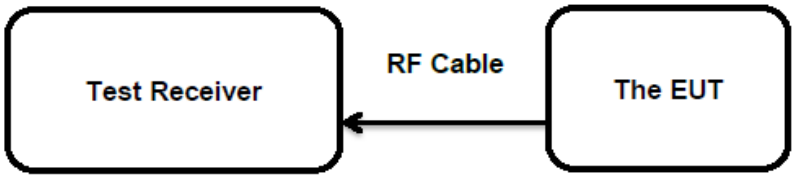


Diagram of Measurement Configuration for Conducted Transmitter Measurement



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

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is -0.8dBi, 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.

5.1.2 Maximum Peak Conducted Output Power

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(b)(3)
Basic standard	:	ANSI C63.10: 2013
Limits	:	1.0 Watts
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2020-08-03
Input voltage	:	Fully charged battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

Table 5: Test Result of Maximum Peak Conducted Output Power, BLE

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
GFSK (BLE)	2402	-2.0	0.0006	< 1.0
	2440	-1.49	0.0007	
	2480	-0.75	0.0008	
Maximum Measured Value		-0.75	0.0008	

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G): -0.8 dBi
e.i.r.p.=$P_{(Peak\ power)}$+ G, which is far below the 4 W

5.1.3 Conducted Power Spectral Density

RESULT: **Pass**

Test Specification

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

Test Setup

Date of testing	:	Refer to test result
Input voltage	:	Fully charged battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

5.1.4 6dB Bandwidth

RESULT: **Pass**

Test Specification

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

Test Setup

Date of testing	:	2020-08-03
Input voltage	:	Fully charged battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

5.1.5 99% Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	RSS-Gen Clause 6.6
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2020-08-03
Input voltage	:	Fully charged battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

5.1.6 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d)
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	:	Refer to test result
Input voltage	:	Fully charged battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
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 A.

5.1.7 Radiated Spurious Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d) & FCC Part 15.205
Basic standard	:	ANSI C63.10: 2013
Limits	:	FCC Part 15.209(a)
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2020-07-31 ~ 2020-08-17
Input voltage	:	Fully charged battery
Operation mode	:	A, B
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

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

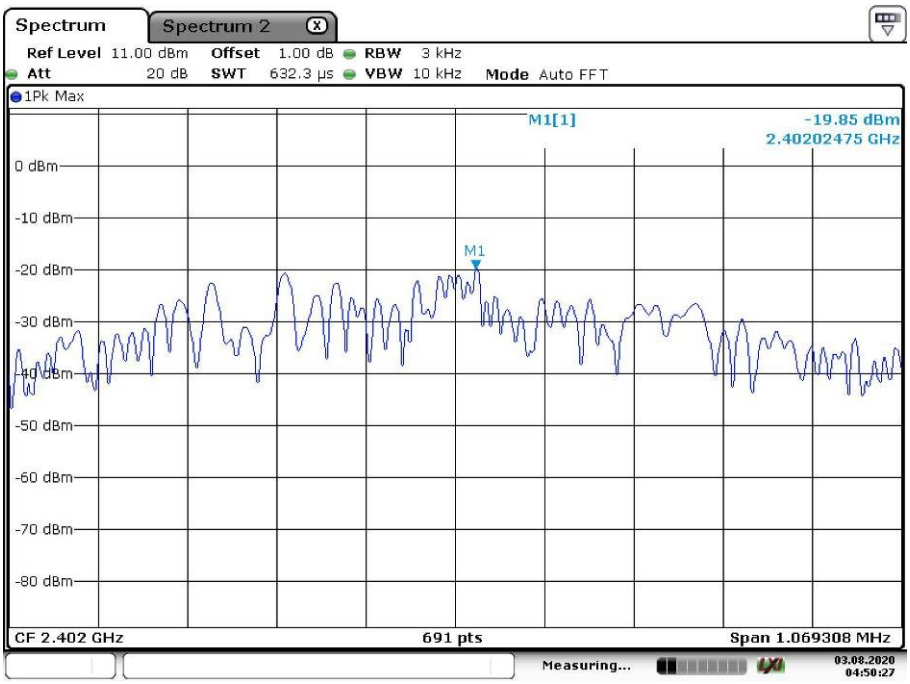
For the measurement records, refer to the appendix A.

6 List of Tables

Appendix A: Test Results of BLE

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

Low Channel



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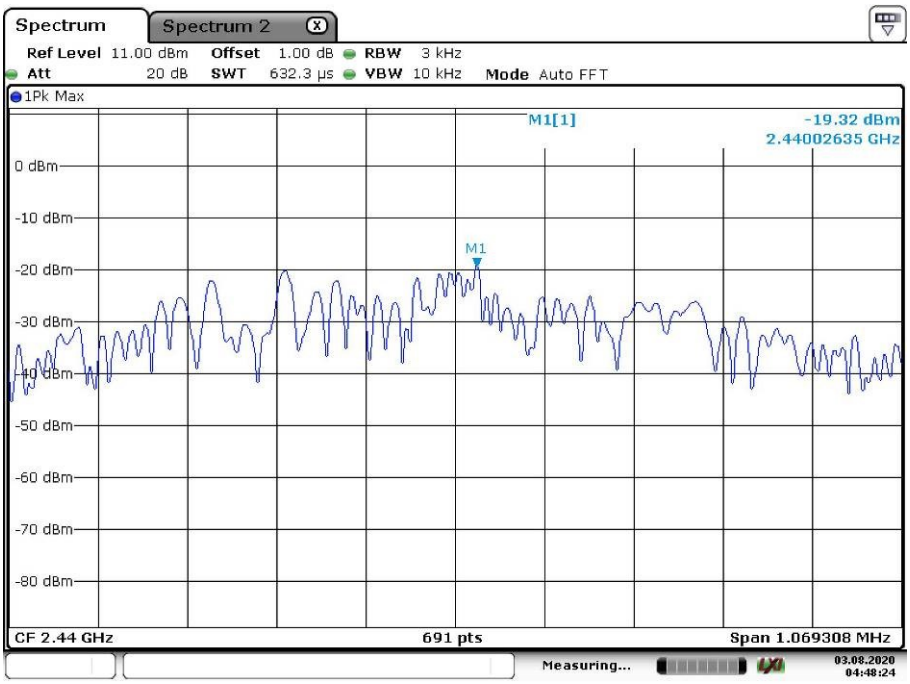
Middle Channel



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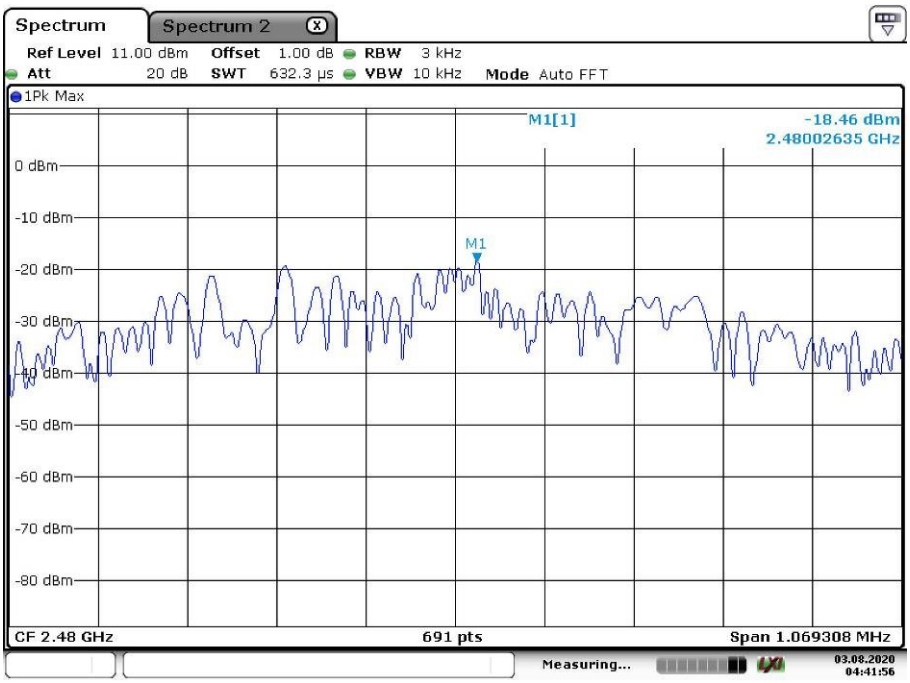
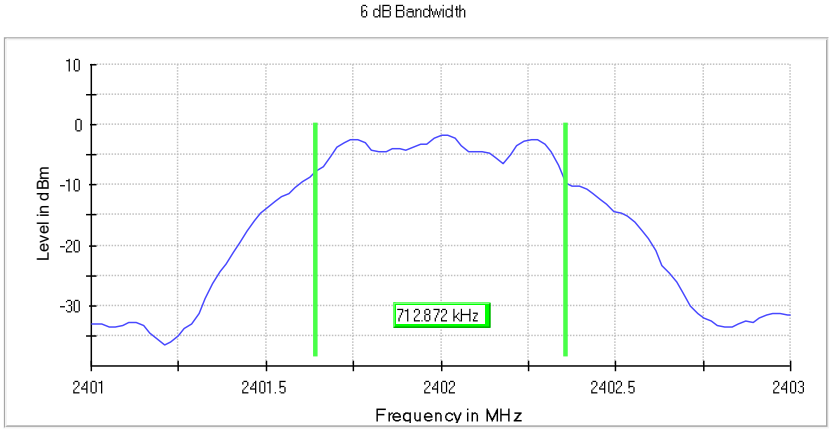
High Channel

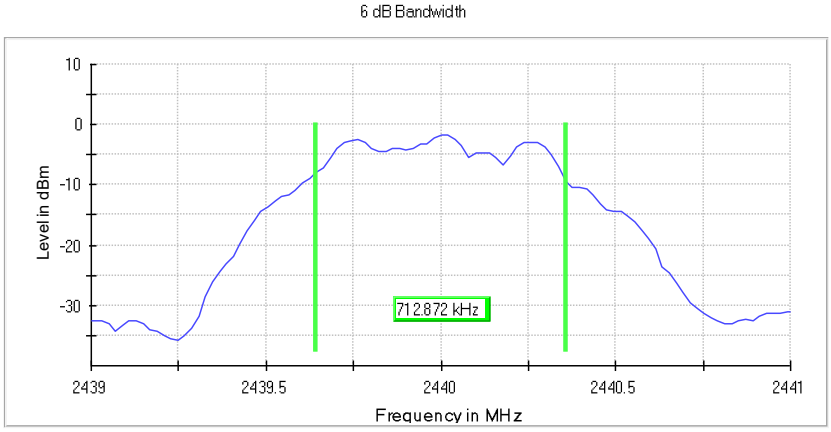


Appendix A.2: Test Results of 6dB Bandwidth

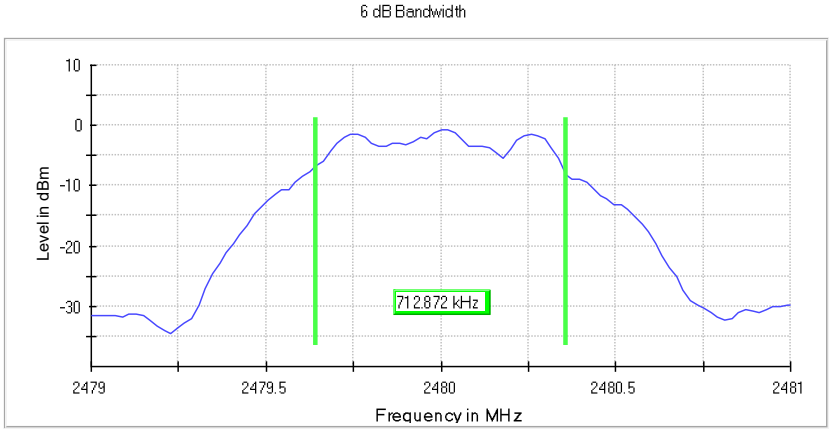
Low Channel
(RBW=100KHz, VBW=300KHz)



Middle Channel
(RBW=100KHz, VBW=300KHz)

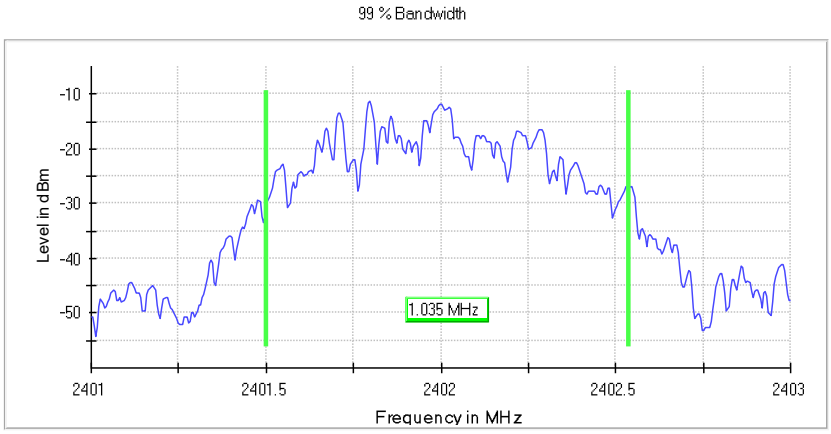


High Channel
(RBW=100KHz, VBW=300KHz)

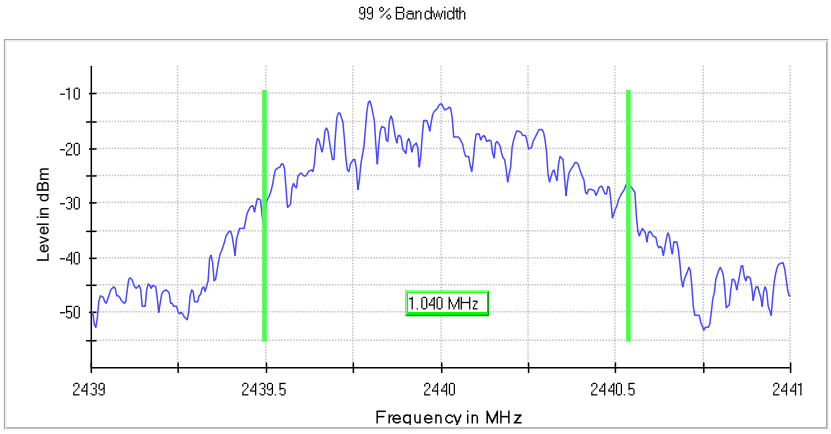


Appendix A.3: Test Results of 99% Bandwidth

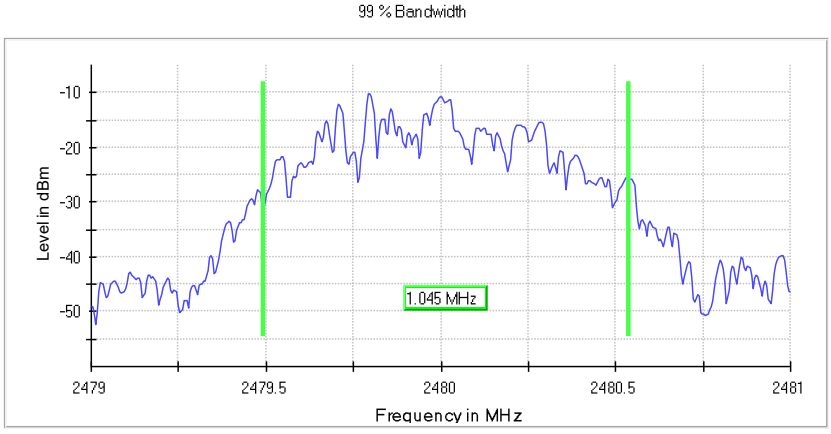
Low Channel
(RBW=10KHz, VBW=30KHz)



Middle Channel
(RBW=10KHz, VBW=30KHz)

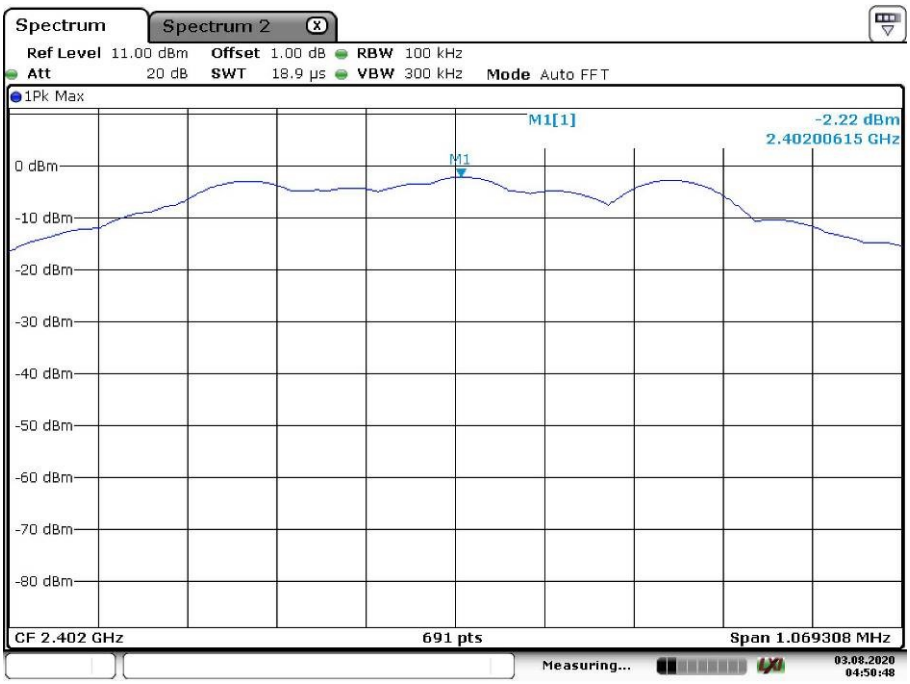


High Channel
(RBW=10KHz, VBW=30KHz)



Appendix A.4: Test Results of Conducted Spurious Emissions

Low Channel



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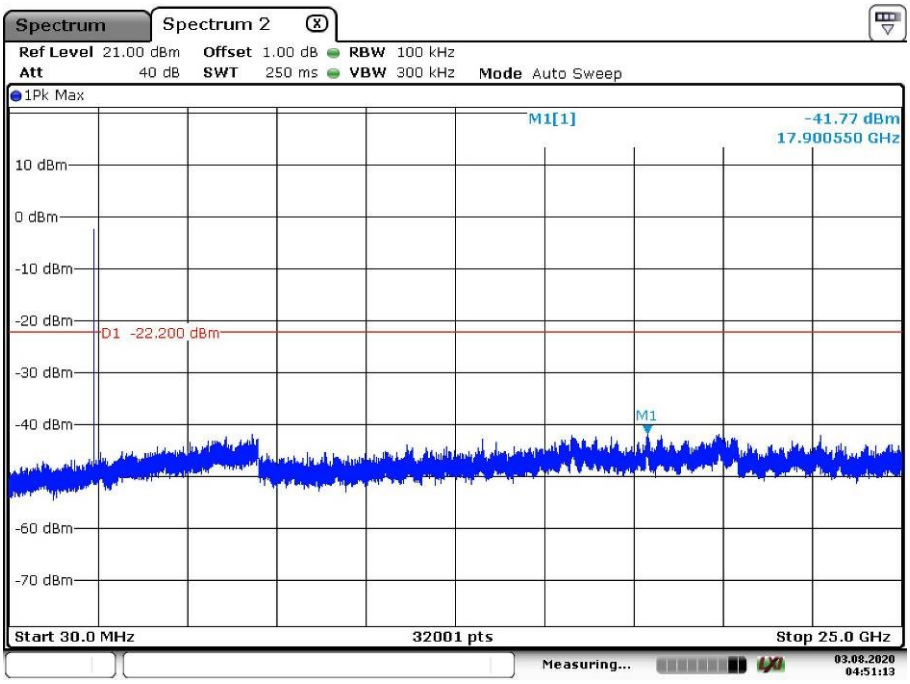
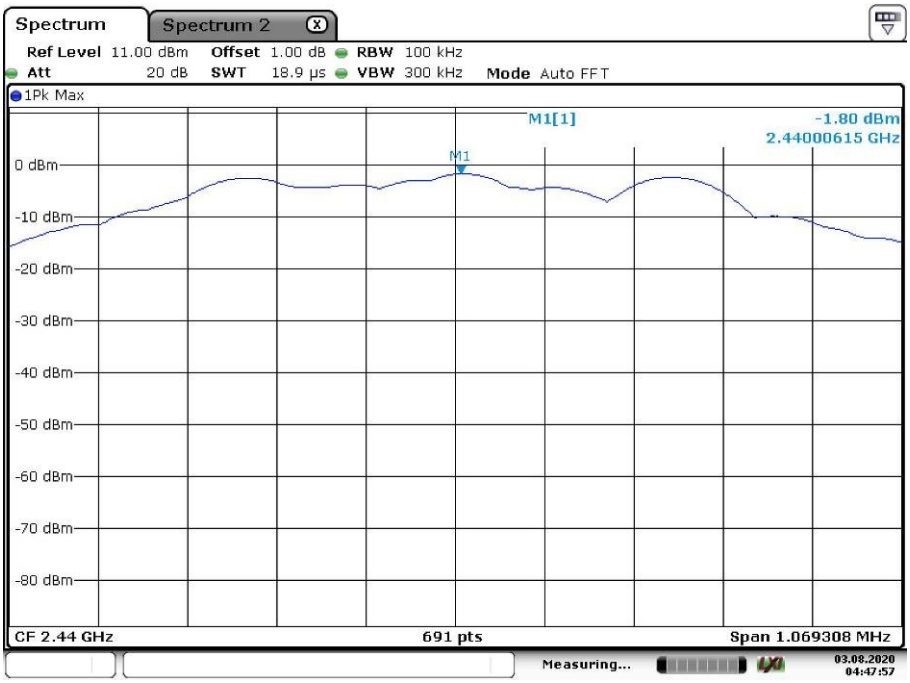


Date: 3.AUG.2020 04:51:13

Middle Channel



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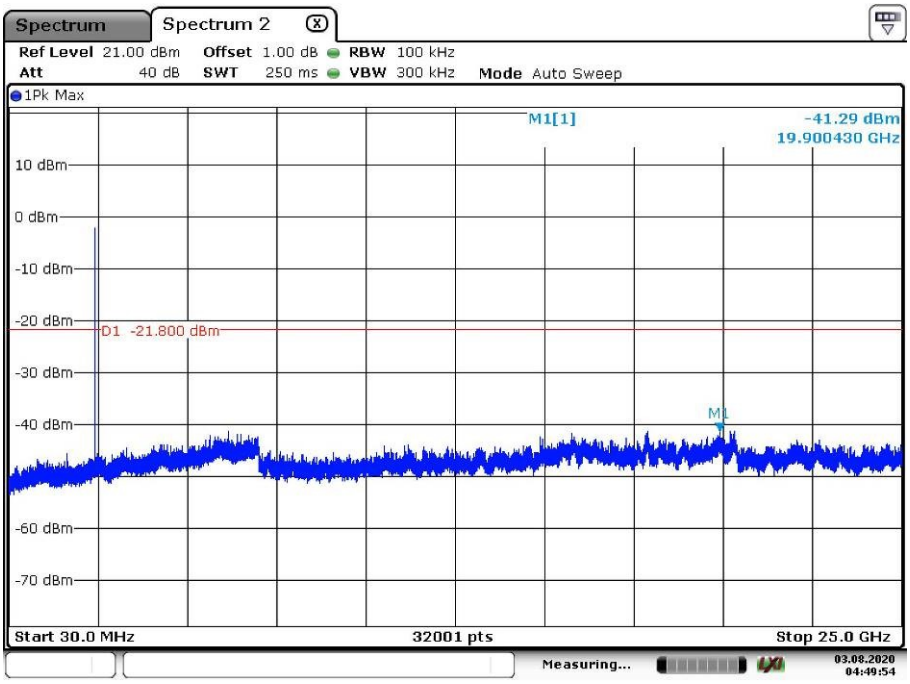
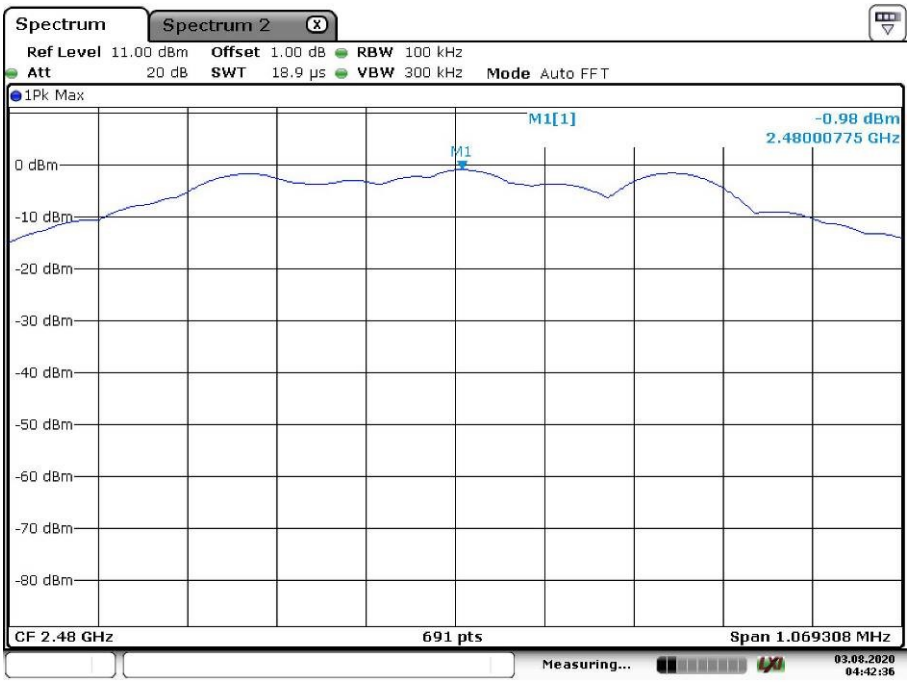


Date: 3.AUG.2020 04:49:54

High Channel



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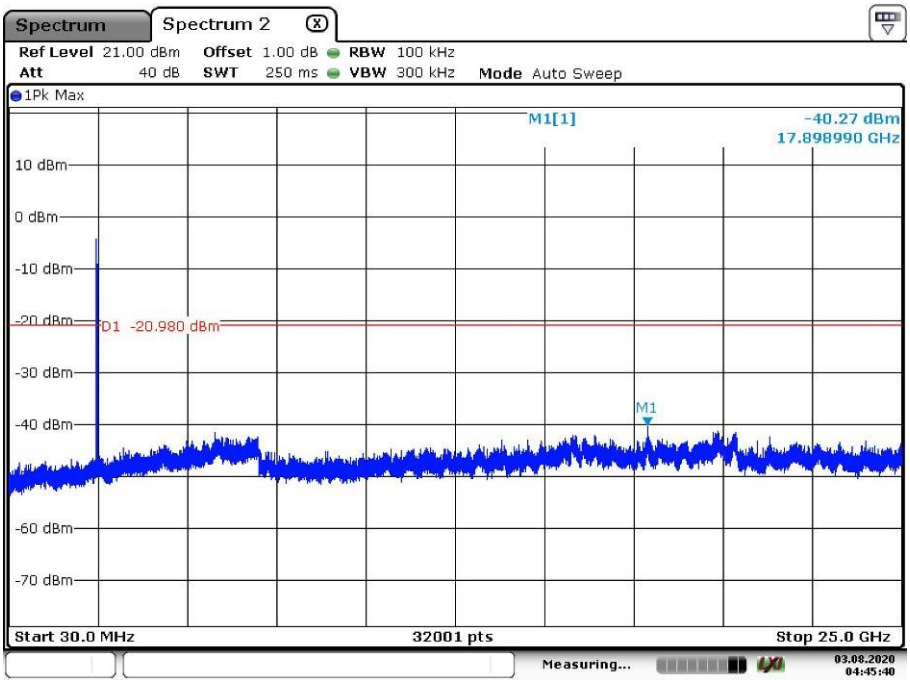
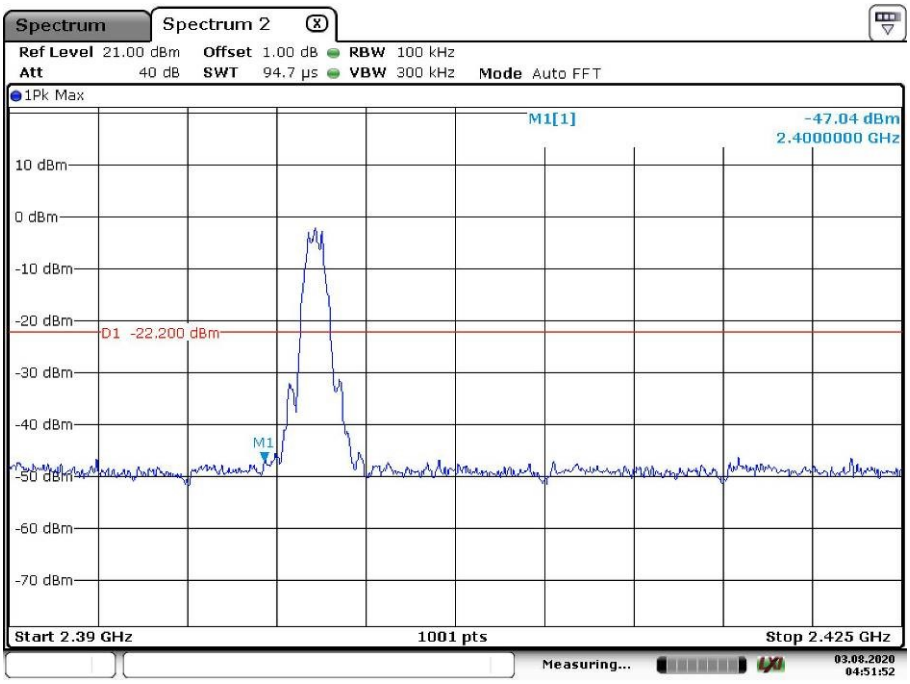


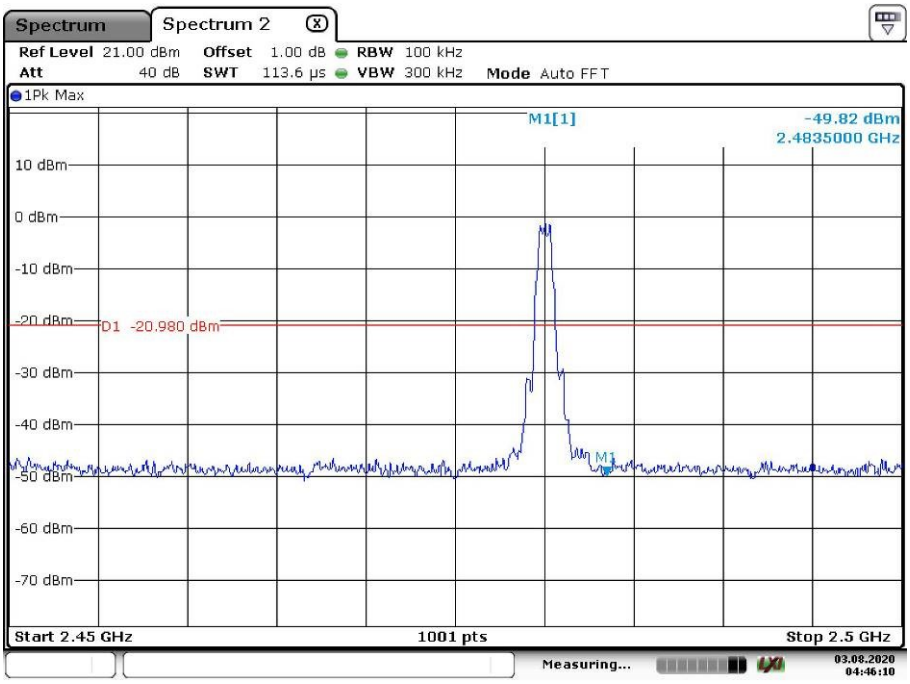
Date: 3.AUG.2020 04:45:40

Band Edge, Low Channel



Date: 3.AUG.2020 04:51:52

Band Edge, High Channel



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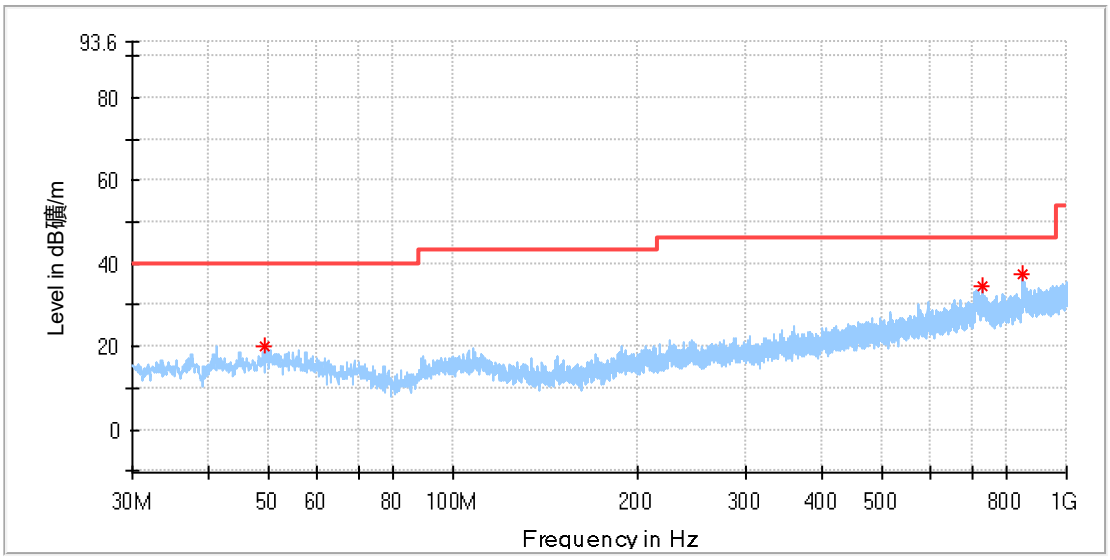
Appendix A.5: Test Results of Radiated Spurious Emissions

30 MHz to 1GHz

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_Low
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



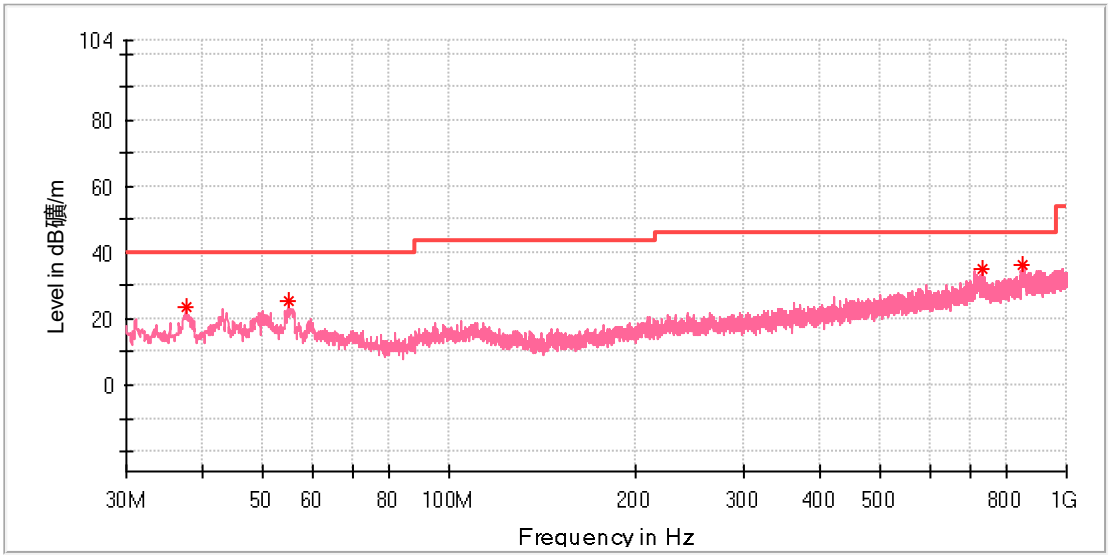
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.400000	20.17	40.00	19.83	100.0	H	275.0	-18.6
728.400000	34.51	46.00	11.49	100.0	H	0.0	-7.9
845.333500	37.31	46.00	8.69	100.0	H	195.0	-6.0

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_Low
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



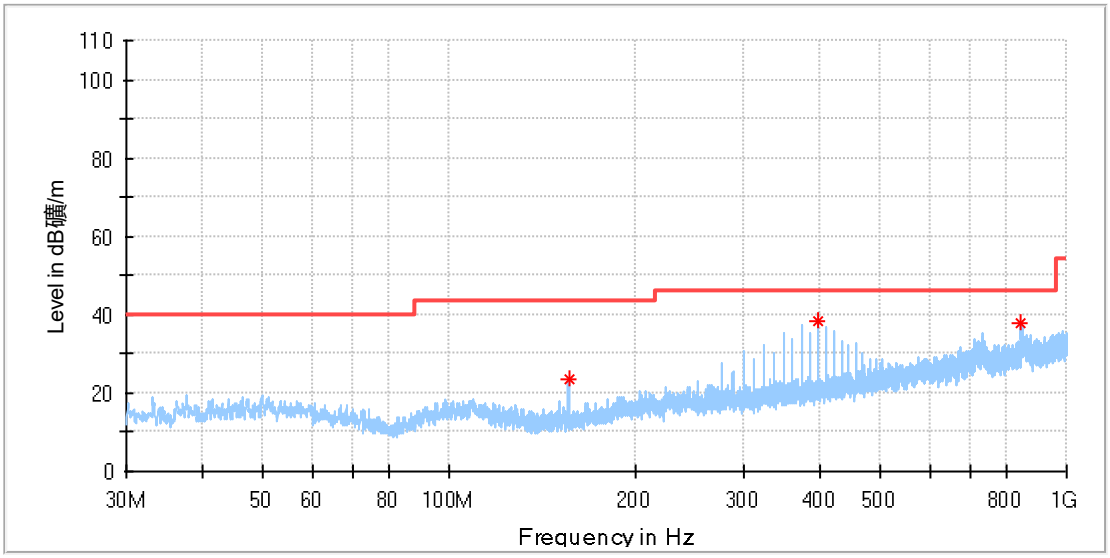
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.469000	23.75	40.00	16.25	100.0	V	74.0	-21.3
54.880500	25.20	40.00	14.80	100.0	V	314.0	-18.7
728.982000	34.84	46.00	11.16	100.0	V	64.0	-7.9
845.721500	36.39	46.00	9.61	100.0	V	195.0	-6.0

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_High
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



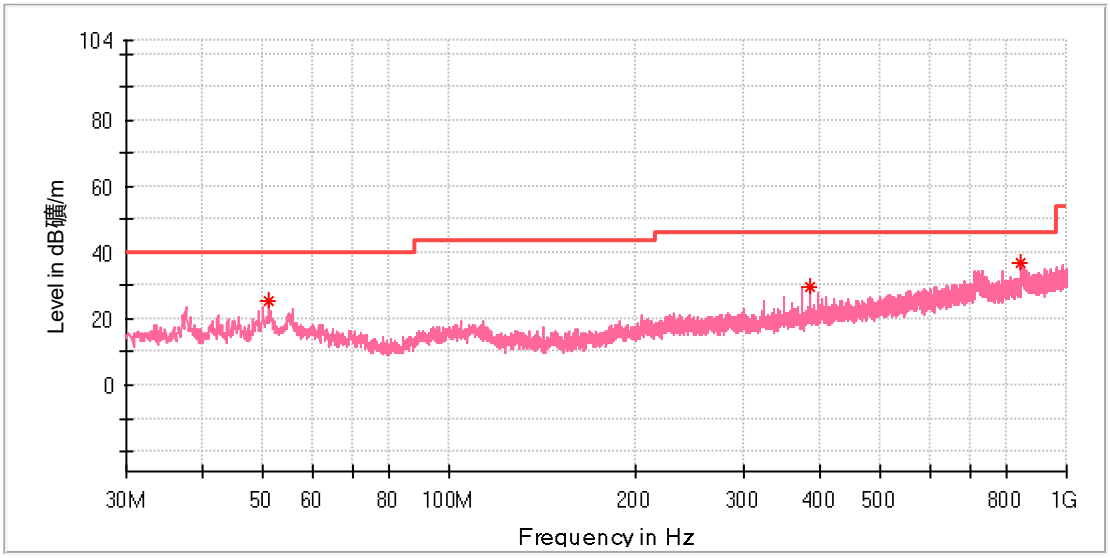
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
156.003000	23.54	43.50	19.96	100.0	H	241.0	-22.2
396.029500	38.26	46.00	7.74	100.0	H	84.0	-14.2
844.848500	37.65	46.00	8.35	100.0	H	241.0	-6.0

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_High
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:47%
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)
51.000500	25.59	40.00	14.41	100.0	V	60.0	-18.6
384.001500	29.82	46.00	16.18	100.0	V	354.0	-14.5
844.897000	36.71	46.00	9.29	100.0	V	69.0	-6.0

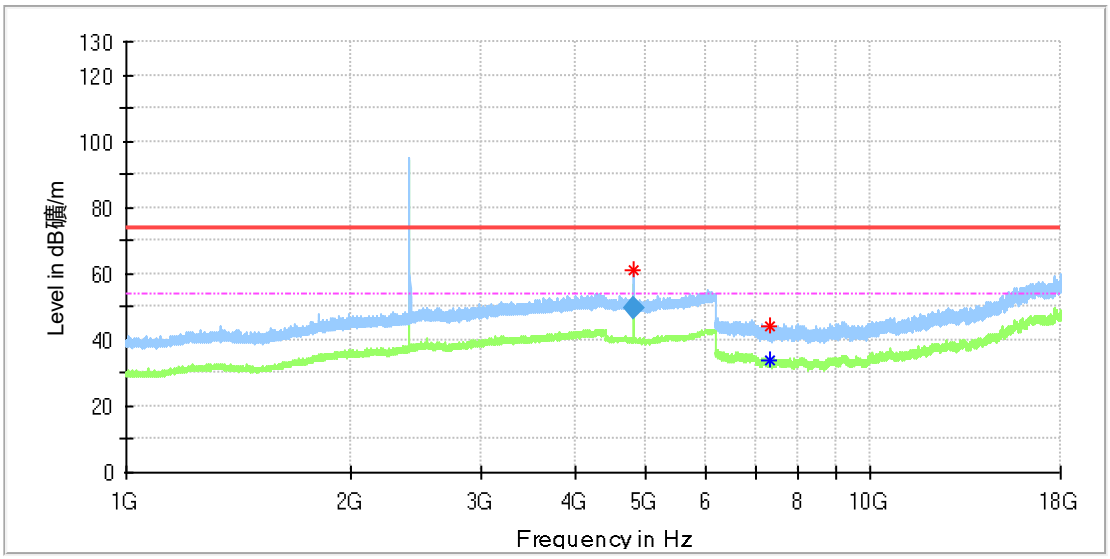
Above 1GHz

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

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_Low
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



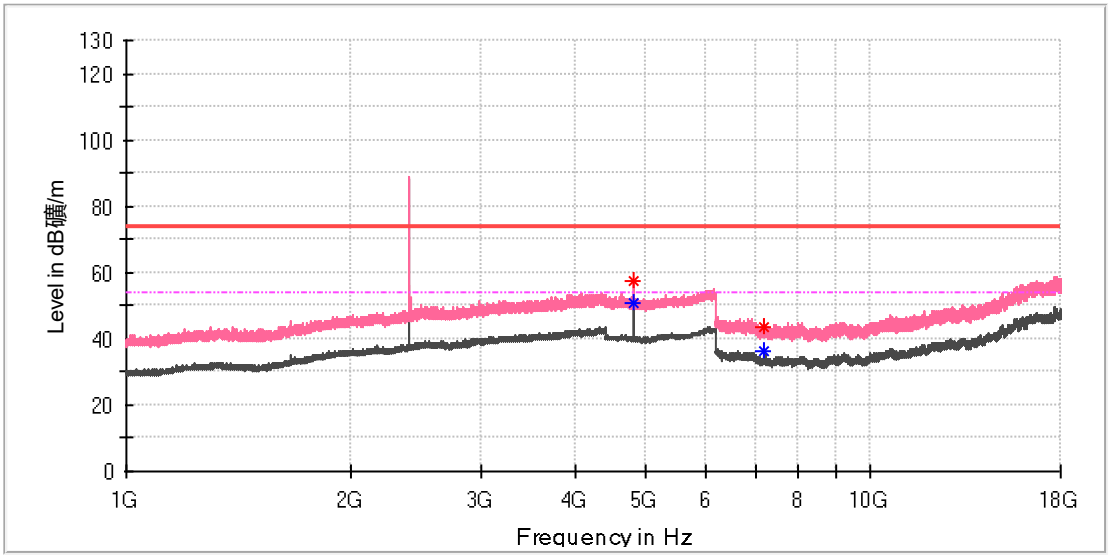
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	61.04	---	74.00	12.96	100.0	H	78.0	13.6
4804.480556	---	49.53	54.00	4.48	100.0	H	79.0	13.6
7303.791667	44.10	---	74.00	29.90	100.0	H	240.0	8.3
7305.758333	---	33.88	54.00	20.12	100.0	H	355.0	8.3

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_Low
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



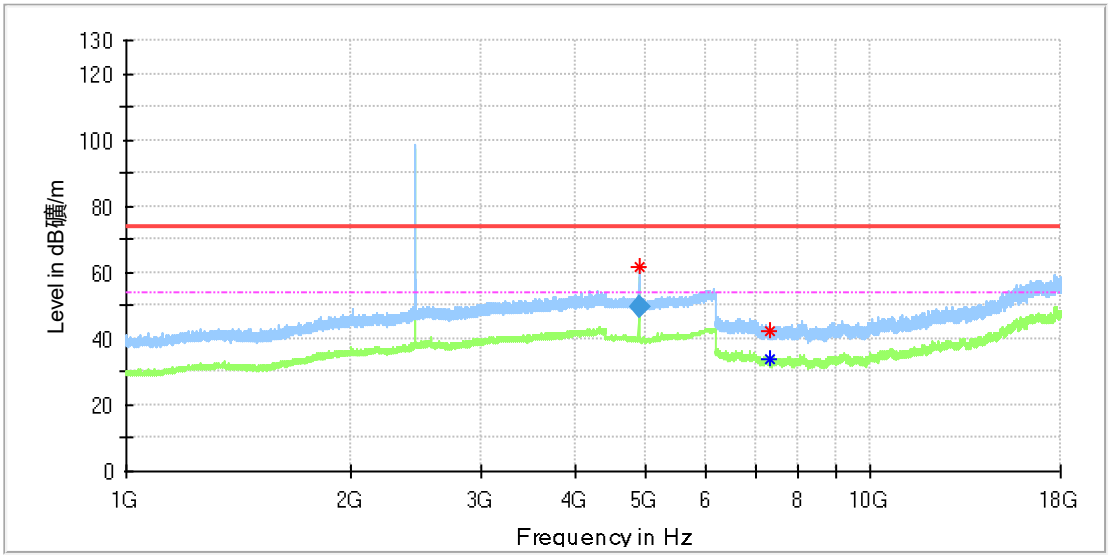
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.000000	---	51.09	54.00	2.91	100.0	V	0.0	13.6
4804.500000	57.31	---	74.00	16.69	100.0	V	356.0	13.6
7204.966667	43.45	---	74.00	30.55	100.0	V	283.0	8.8
7204.966667	---	36.57	54.00	17.43	100.0	V	283.0	8.8

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_Mid
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



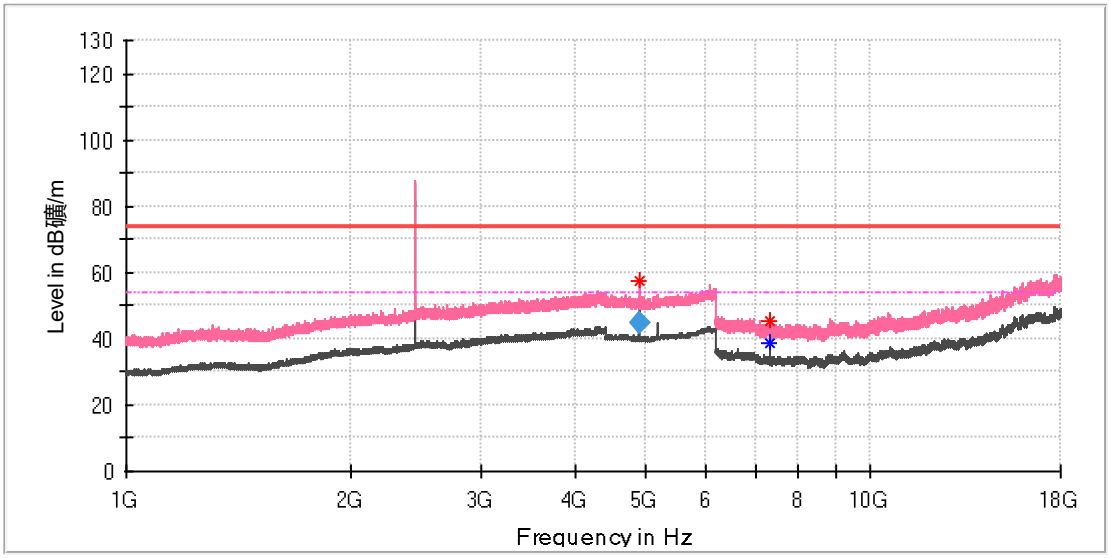
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	61.71	---	74.00	12.29	100.0	H	78.0	13.4
4879.508333	---	49.69	54.00	4.31	100.0	H	78.0	13.4
7324.933333	---	33.66	54.00	20.34	100.0	H	265.0	8.2
7325.425000	42.60	---	74.00	31.40	100.0	H	298.0	8.2

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_Mid
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



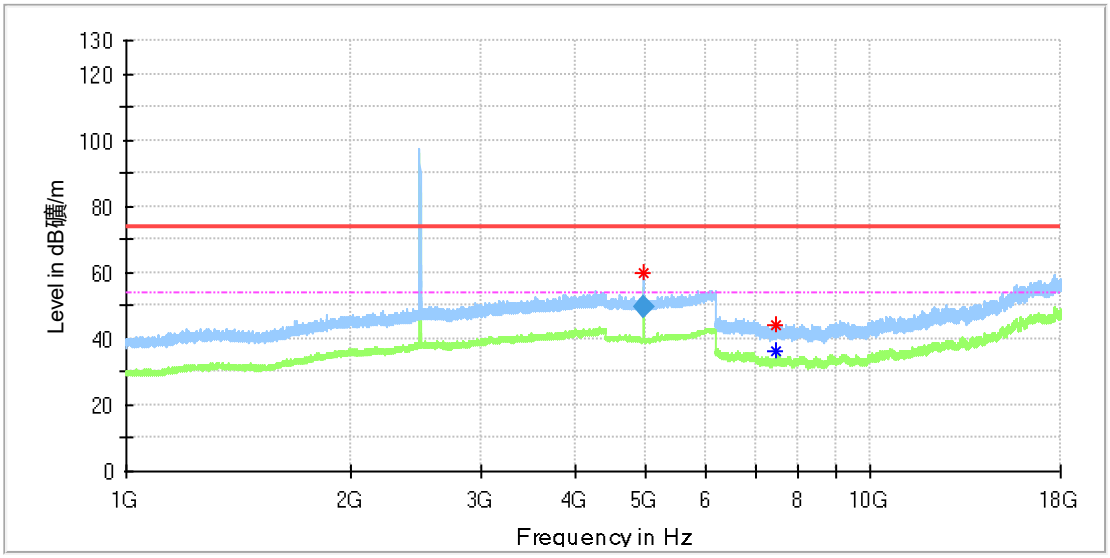
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.000000	57.55	---	74.00	16.45	100.0	V	143.0	13.4
4879.488889	---	44.82	54.00	9.18	100.0	V	133.0	13.4
7320.016667	---	38.81	54.00	15.19	100.0	V	100.0	8.2
7321.000000	45.06	---	74.00	28.94	100.0	V	85.0	8.2

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_High
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



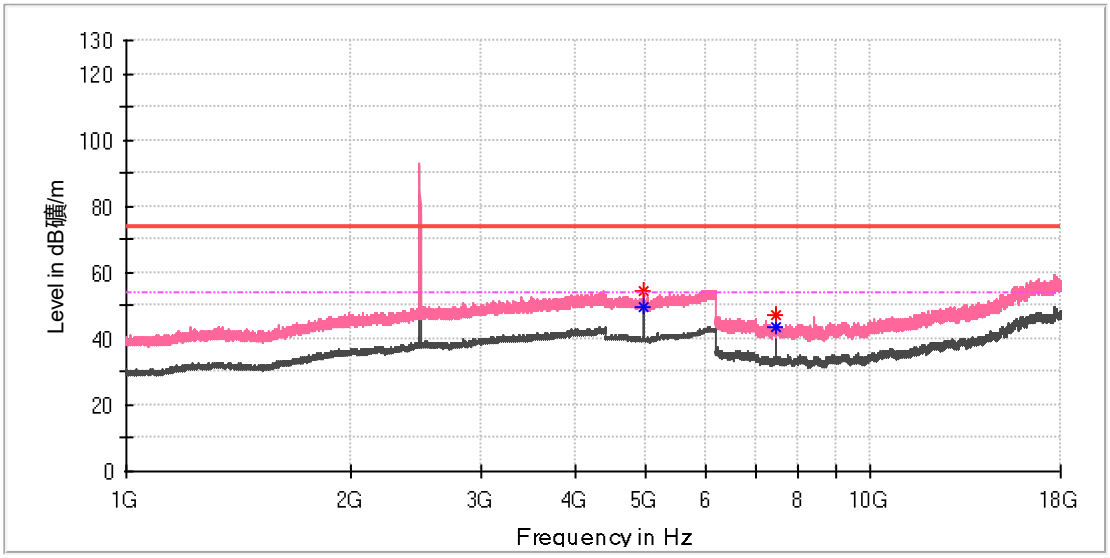
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.500000	60.15	---	74.00	13.85	100.0	H	179.0	13.2
4959.972222	---	49.49	54.00	4.51	100.0	H	182.0	13.2
7440.475000	---	36.00	54.00	18.00	100.0	H	128.0	8.4
7442.933333	43.94	---	74.00	30.06	100.0	H	92.0	8.4

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_High
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

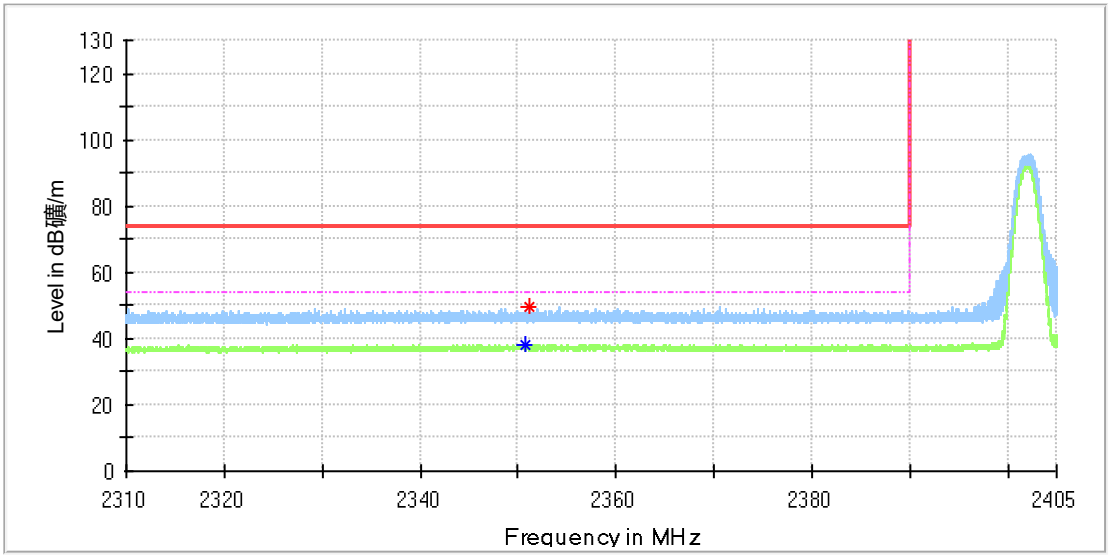
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.500000	54.54	---	74.00	19.46	100.0	V	142.0	13.2
4960.000000	---	49.75	54.00	4.25	100.0	V	142.0	13.2
7439.491667	47.23	---	74.00	26.77	100.0	V	349.0	8.4
7439.983333	---	43.37	54.00	10.63	100.0	V	101.0	8.4

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

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_Low
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



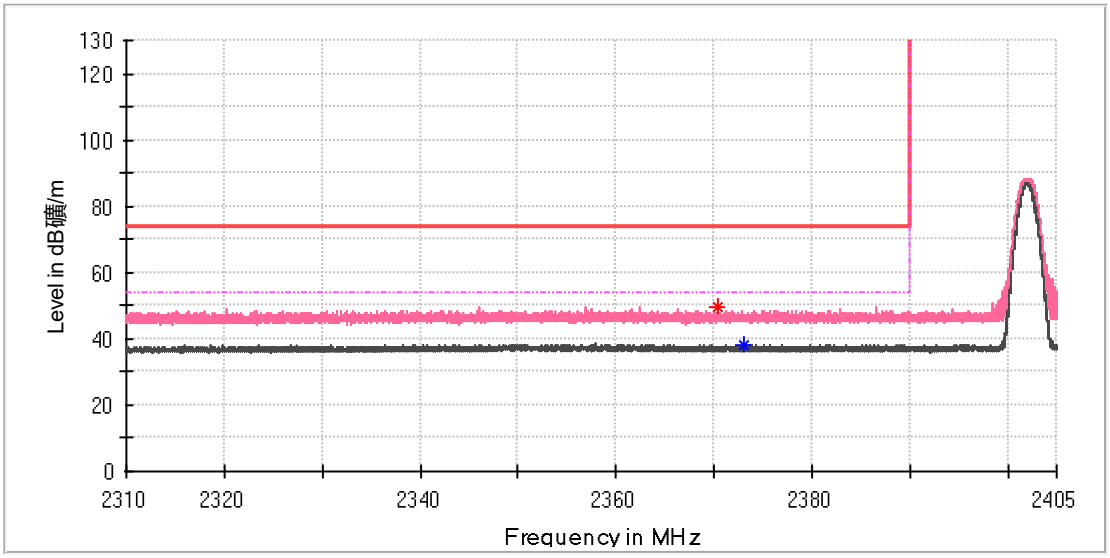
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2350.701563	---	38.20	54.00	15.80	100.0	H	0.0	6.9
2351.075625	49.69	---	74.00	24.31	100.0	H	312.0	6.9

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_Low
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



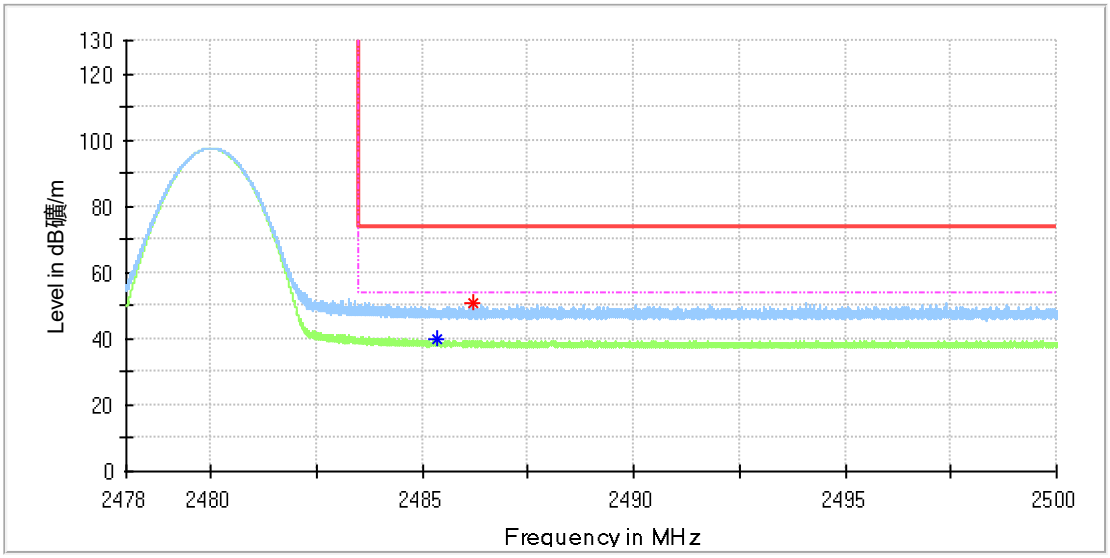
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2370.390313	49.33	---	74.00	24.67	100.0	V	90.0	6.9
2373.080000	---	37.98	54.00	16.02	100.0	V	103.0	6.9

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_High
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



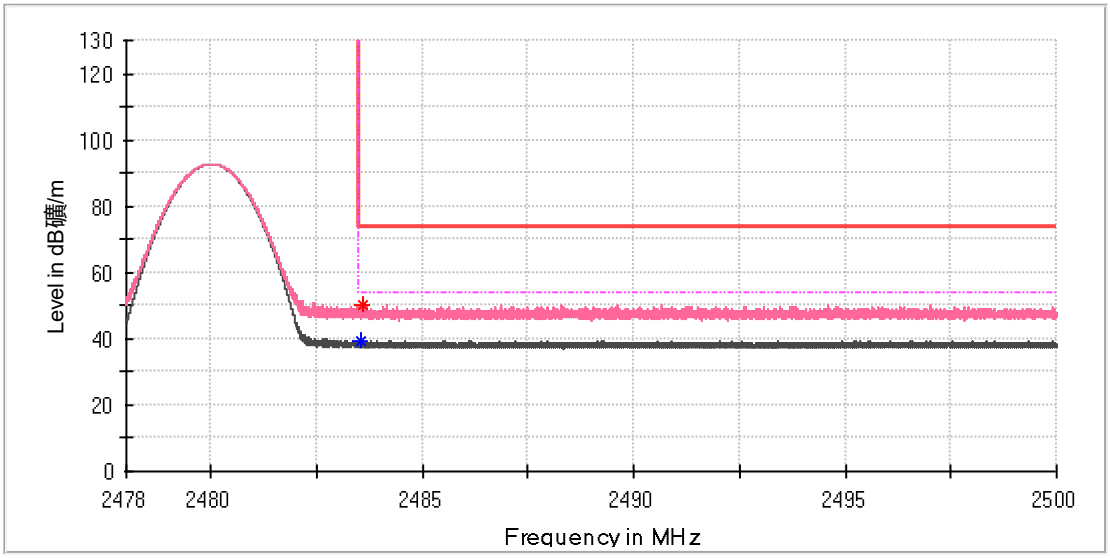
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2485.354875	---	39.81	54.00	14.19	100.0	H	239.0	7.4
2486.208750	50.78	---	74.00	23.22	100.0	H	239.0	7.4

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	BLE_High
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:42%
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)
2483.549500	---	39.33	54.00	14.67	100.0	V	135.0	7.4
2483.610000	49.97	---	74.00	24.03	100.0	V	254.0	7.4

Appendix A.7: Test Results of Co-location

BLE+WCDMA

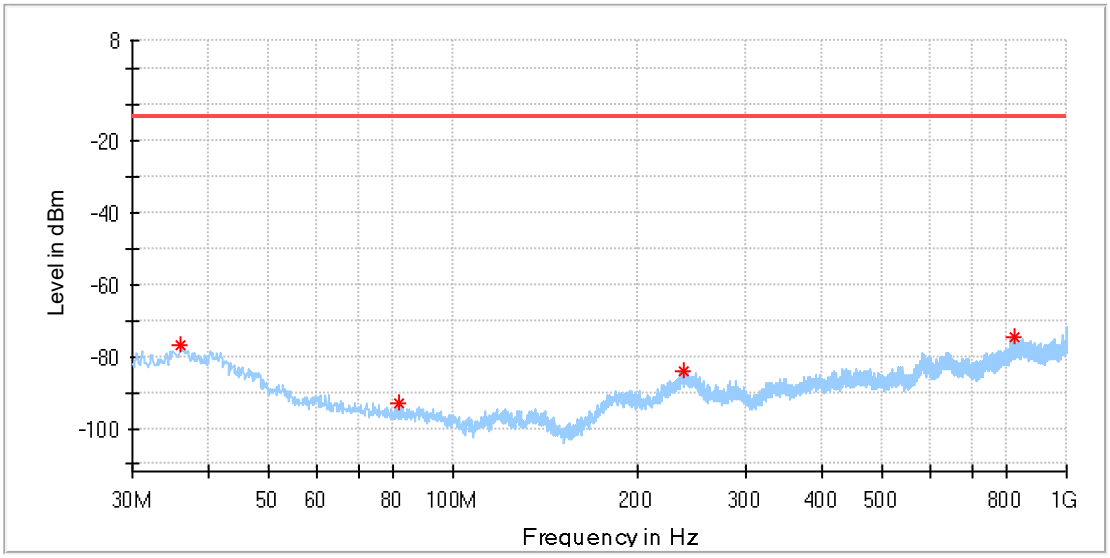
Pre-scan all bands, and only worst-case reported as below.

30 MHz to 1GHz:

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	Co-location_BLE_CH0+WCDMA Band 2_RMC12.2K_CH9400
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:48%
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



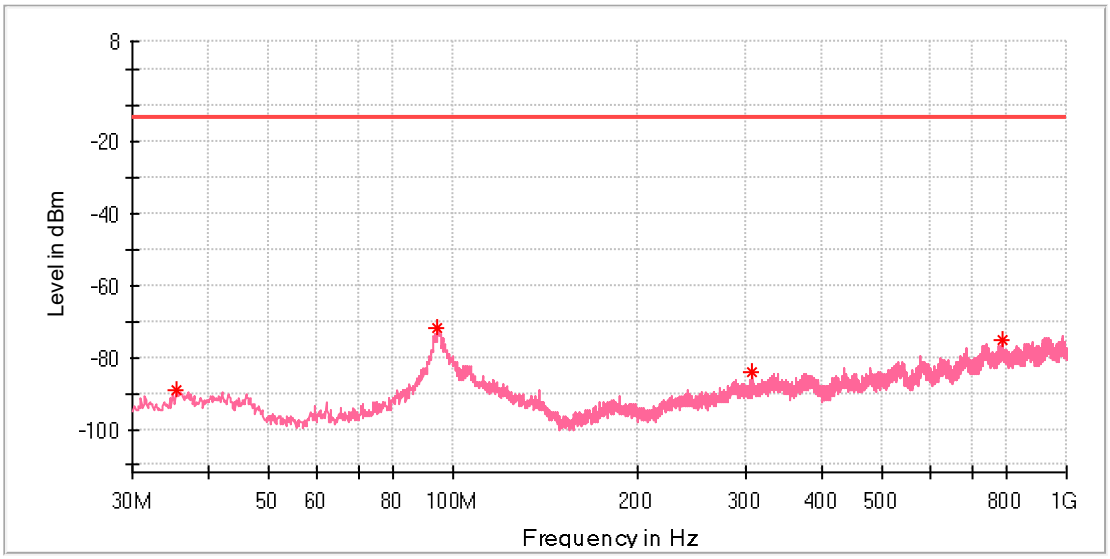
Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
36.062500	-76.93	-13.00	63.93	100.0	H	217.0	-113.3
81.773750	-93.00	-13.00	80.00	100.0	H	173.0	-123.3
237.095000	-84.08	-13.00	71.08	100.0	H	96.0	-111.0
820.550000	-74.49	-13.00	61.49	100.0	H	229.0	-101.3

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	Co-location_BLE_CH0+WCDMA Band 2_RMC12.2K_CH9400
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:48%
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

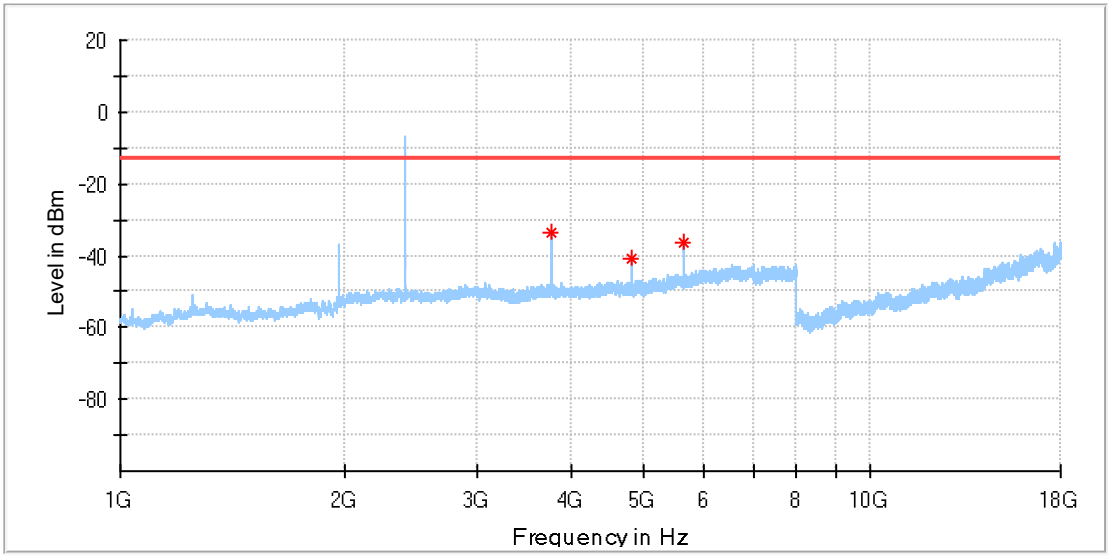
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
35.335000	-88.99	-13.00	75.99	100.0	V	52.0	-126.6
94.505000	-72.09	-13.00	59.09	100.0	V	24.0	-99.6
307.905000	-84.29	-13.00	71.29	100.0	V	2.0	-111.2
784.053750	-75.40	-13.00	62.40	100.0	V	70.0	-102.5

Above 1GHz:

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	Co-location_BLE_CH0+WCDMA Band 2_RMC12.2K_CH9400
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 22 Humi:50%
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



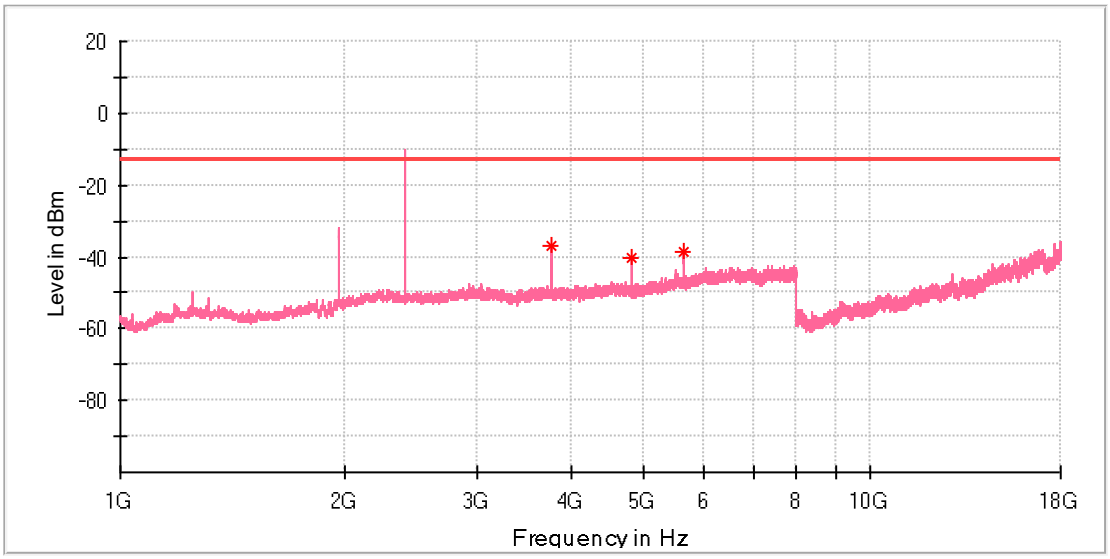
Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3761.500000	-33.79	-13.00	20.79	100.0	H	159.0	-86.6
4804.000000	-40.68	-13.00	27.68	100.0	H	133.0	-85.8
5643.000000	-36.11	-13.00	23.11	100.0	H	227.0	-83.8

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	Co-location_BLE_CH0+WCDMA Band 2_RMC12.2K_CH9400
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 22 Humi:50%
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3761.000000	-37.09	-13.00	24.09	100.0	V	139.0	-87.0
4803.500000	-40.55	-13.00	27.55	100.0	V	273.0	-85.9
5642.000000	-38.66	-13.00	25.66	100.0	V	92.0	-83.8

BLE+LTE Bands

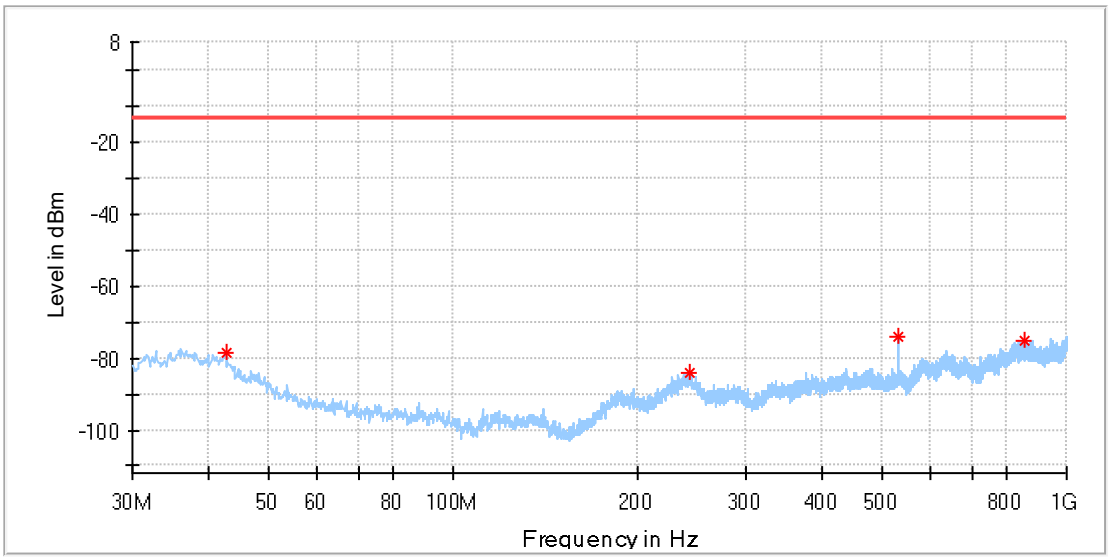
Pre-scan all bands and only the worst-case reported as below.

30 MHz to 1GHz:

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	Co-location_BLE_CH0+LTE Band 2_QPSK20M_CH18900_1RB#0
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:48%
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



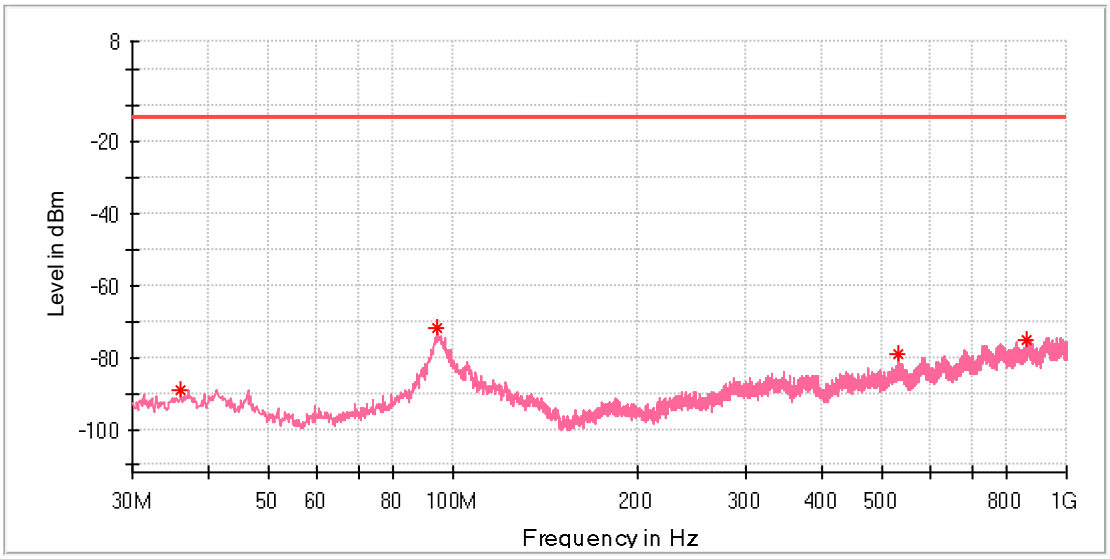
Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
42.610000	-78.70	-13.00	65.70	100.0	H	214.0	-112.6
242.793750	-84.15	-13.00	71.15	100.0	H	247.0	-110.0
531.005000	-73.98	-13.00	60.98	100.0	H	164.0	-109.9
854.621250	-74.95	-13.00	61.95	100.0	H	138.0	-100.3

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	Co-location_BLE_CH0+LTE Band 2_QPSK20M_CH18900_1RB#0
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 23 Humi:48%
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

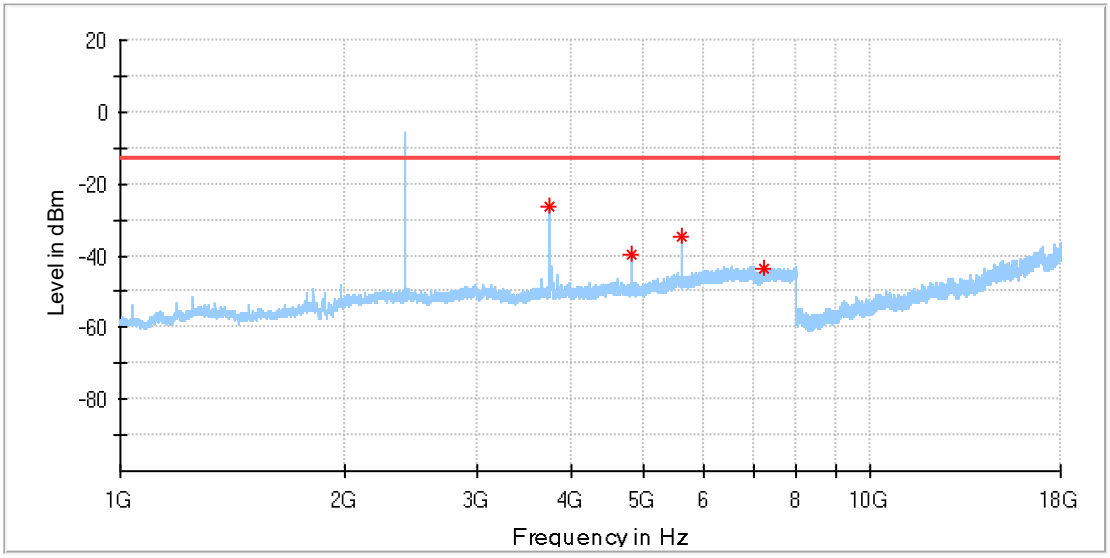
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
35.941250	-89.02	-13.00	76.02	100.0	V	79.0	-125.7
94.020000	-71.93	-13.00	58.93	100.0	V	283.0	-99.9
531.126250	-79.00	-13.00	66.00	100.0	V	335.0	-107.8
863.351250	-74.89	-13.00	61.89	100.0	V	100.0	-100.9

Above 1GHz:

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	Co-location_BLE_CH0+LTE Band 2_QPSK20M_CH18900_1RB#0
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 22 Humi:50%
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



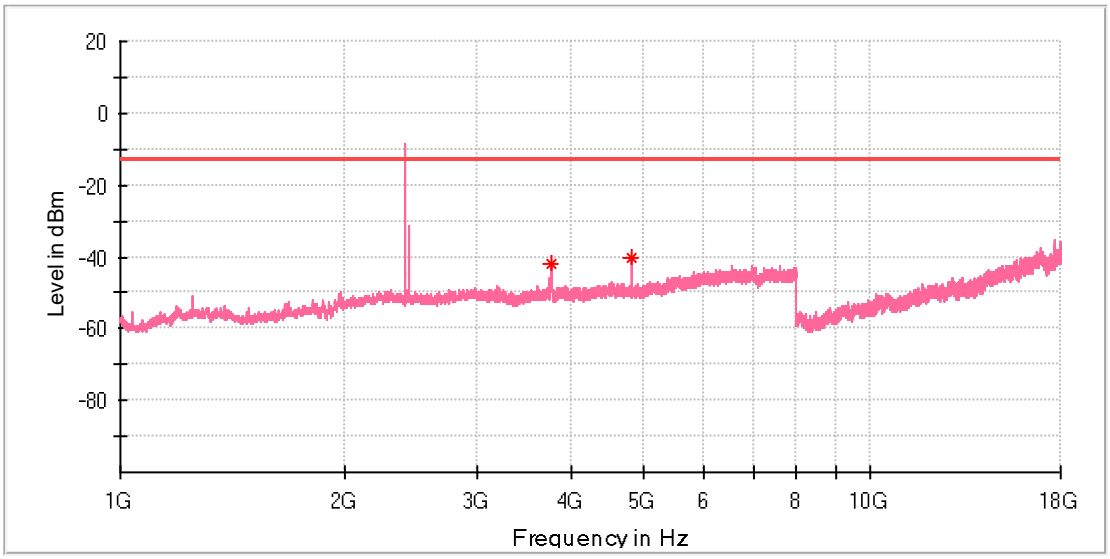
Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3742.000000	-26.59	-13.00	13.59	100.0	H	329.0	-86.6
4804.500000	-39.77	-13.00	26.77	100.0	H	297.0	-85.8
5613.500000	-34.54	-13.00	21.54	100.0	H	313.0	-83.7
7208.500000	-43.71	-13.00	30.71	100.0	H	321.0	-79.7

Test Report

EUT Information

EUT Name:	Smart Central Controller
Model:	V35LTE
Test Mode:	Co-location_BLE_CH0+LTE Band 2_QPSK20M_CH18900_1RB#0
Test Voltage::	DC 3.7V fully charged battery
Remark:	Temp 22 Humi:50%
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3759.500000	-41.70	-13.00	28.70	100.0	V	187.0	-87.0
4803.500000	-40.29	-13.00	27.29	100.0	V	228.0	-85.9