Prüfbericht-Nr.: *Test report no.:*	**CN218GXE 001**	**Auftrags-Nr.:** *Order no.:*	**168310620**	Seite 1 von **15** *Page 1 of 15*
Kunden-Referenz-Nr.: *Client reference no.:*	**N/A**	**Auftragsdatum:** *Order date:*	2021-04-06	
Auftraggeber: *Client:*	Vendon SIA, Krasta iela 44, Riga, LV-1003, Latvia			
Prüfgegenstand: *Test item:*	vBox2 Data Collection Device			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	VP-B2/4/4G			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification:*	47 CFR FCC Part 15 Subpart B			

Wareneingangsdatum: *Date of sample receipt:*	2021-04-06	Refer to Photo Documentation
Prüfmuster-Nr.: *Test sample no:*	A003025581-003, A003025581-004	
Prüfzeitraum: *Testing period:*	2021-04-07 – 2021-04-21	
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result*:*	Pass	

geprüft von: *tested by:*	X Hardy Suo	**genehmigt von:** *authorized by:*	X Sam Lin
Datum: *Date:* 2021-05-11		**Ausstellungsdatum:** *Issue date:* 2021-05-11	
Stellung / *Position:*	**Sachverständige(r)/Expert**	**Stellung** / *Position:*	**Sachverständige(r)/Expert**
Sonstiges / *Other:*	FCC ID: 2AZE3-VP-B244G		

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 = mangelhaft
	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 specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

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.
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.
V05

TEST SUMMARY

5.1.1 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

5.1.2 RADIATED EMISSIONS

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: Test Results of FCC Part 15 Subpart B

Appendix B: Photographs of the Test Set-up

1.2 TEST STANDARD(S)

Applied Rules: 47 CFR FCC Part 15 Subpart B
Test Method: ANSI C63.4:2014

1.3 List of Document Change

No.	Report No.	Description
1	CN218GXE 001	First release.

2. TEST SITES

2.1 TEST FACILITIES

TÜV Rheinland (Shenzhen) Co., Ltd.
(FCC Registration No.: 694916 & IC Registration Number: 25069)

Address: No. 362, Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China

2.2 TEST DATE

Date of test: 2021-04-07 to 2021-04-21

2.3 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Table 1: List of Test and Measurement Equipment

Description	**Manufacturer**	**Model**	**Serial No.**	**Calibrated until** (DD.MM.YYYY)
Radiated Emissions				
EMI Test Receiver	Rohde & Schwarz	ESR 7	102021	11.08.2021
Signal Analyzer	Rohde & Schwarz	FSV 40	101439	10.08.2021
System Controller Interface	Rohde & Schwarz	SCI-100	S10010038	N/A
Filterbank	Rohde & Schwarz	Wlan	100759	10.08.2021
OSP	Rohde & Schwarz	OSP 120	102040	N/A
Pre-amplifier	Rohde & Schwarz	SCU08F1	08320031	10.08.2021
Amplifier	Rohde & Schwarz	SCU-18F	180070	10.08.2021
Amplifier	Rohde & Schwarz	SCU40A	100475	10.09.2021
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	08.08.2022
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	08.08.2022
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	08.08.2022
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	13.09.2022
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18313	02.09.2021
Test software	Rohde & Schwarz	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	06.07.2021

Description	Manufacturer	Model	Serial No.	Calibrated until (DD.MM.YYYY)
Conducted Emissions				
EMI Test Receiver	Rohde & Schwarz	ESR3	102428	16.08.2021
Artificial Mains Network	Rohde & Schwarz	ENV216	102333	16.08.2021
EMC32 test software	Rohde & Schwarz	EMC32 (Ver.10.50.00)	N/A	N/A

2.4 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.5 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.

2.6 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) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. facility located at No. 362, Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3. GENERAL PRODUCT INFORMATION

3.1 GENERAL DESCRIPTION

The EUT is an IoT device for data collection from vending machine or coffee machines. It transmits collected data over celluar network to server gateway.

It contains the certified transmitter module (FCC ID: 2AJYU-8VC0001).

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

3.2 RATING AND SYSTEM DETAILS

Table 2: Rating of EUT

General Information of EUT	Description
Kind of Equipment:	vBox2 Data Collection Device
Type Designation:	VP-B2/4/4G
FCC ID:	2AZE3-VP-B244G
Type of Equipment:	End device
Antenna Type:	External Antenna
Operating Voltage:	DC 12 – 34V, 250-100mA AC 9 – 24V, 400-200mA

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

A. On, communication link established
   1) CAT-M operating
      i. Low channel
      ii. Middle channel
      iii. High channel
   2) NB-IoT operating
      i. Low channel
      ii. Middle channel
      iii. High channel
   3) GPRS/EGPRS operating
      i. Low channel
      ii. Middle channel
      iii. High channel
B. Standby/Idle
C. Off

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

3.5 SUBMITTED DOCUMENTS

☒ User Manual
☒ Circuit Diagram
☒ Block Diagram
☒ Schematics
☐ Model Difference Letter
☒ Rating Label
☒ PCB Layout
☒ Photo Document
☒ Parts List

4. TEST SET-UP AND OPERATION MODES

4.1 PRINCIPLE OF CONFIGURATION SELECTION

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.

Immunity: The equipment under test (EUT) was configured to have their highest possible susceptibility against the tested phenomena. 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 testing were performed according to the procedure in ANSI C63.4:2014.

4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

Table 3: Auxiliary Equipment used during test

Name	Model	Manufacturer	S/N
Switching Adapter	SYS1308N-2412-W2E	Sunny	N/A
LTE Antenna	JCG018L Frequency Range: 698~960/1710~2690MHz Omnidirectional antenna Gain: 2.75 dBi (Max.) Cable: RG 174 3M	JIAXING JINCHANG ELECTRONIC TECHNOLOGY CO.,LTD	N/A

4.4 COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Mains Conduction Measurement

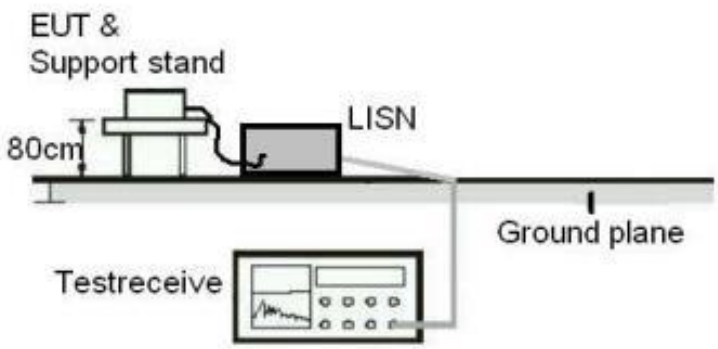


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

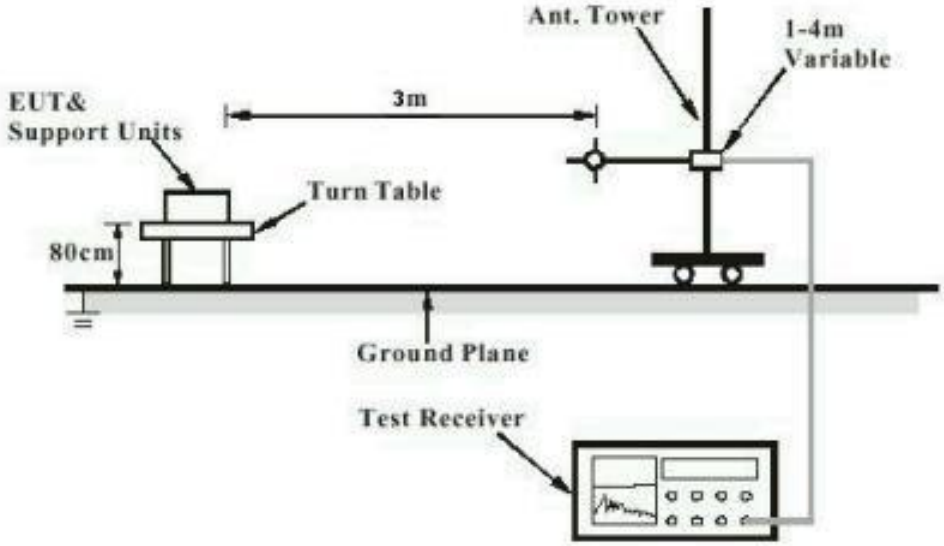
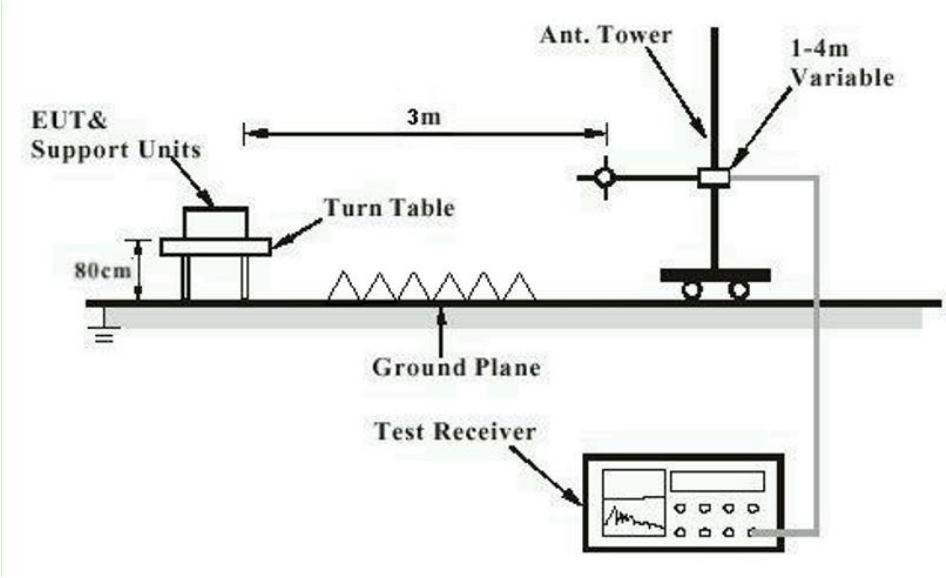


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)



5. TEST RESULTS

5.1 ESSENTIAL REQUIREMENTS OF STANDARD

5.1.1 CONDUCTED EMISSION ON AC MAINS

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 15 Subpart B
Basic standard	:	ANSI C63.4:2014
Frequency range	:	0.15 – 30 MHz
Limits	:	FCC Part 15.107(a)
Test procedure	:	Clause 7.3 of ANSI C63.4:2014
Kind of test site	:	Shielding Room

Test Setup

Date of testing	:	2021-04-07 to 2021-04-21
Input voltage	:	DC Power input (AC 120V @ 60Hz via AC/DC adapter) AC 9V AC 34V
Test environment	:	☒ Normal test conditions ☐ Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 ºC
Relative humidity	:	48%
Atmospheric pressure	:	101.0 kPa

Refer to attached Appendix A for details of test results.

5.1.2 RADIATED EMISSIONS

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 15 Subpart B
Basic standard	:	ANSI C63.4: 2014
Frequency range	:	30 MHz – 10 GHz
Classification	:	Class B
Limits	:	FCC Part 15.109(a)
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2021-04-07 to 2021-04-21
Input voltage	:	DC Power input (AC 120V @ 60Hz via AC/DC adapter) AC 9V AC 34V
Test environment	:	☒ Normal test conditions ☐ Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 ºC
Relative humidity	:	47%
Atmospheric pressure	:	101.0 kPa

Refer to attached Appendix A for details of test results.

6. SYSTEM MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Table 4: System Measurement Uncertainty

Items		Extended Uncertainty
Radiated Emissions	Radiated emission below 1 GHz	±3.97 dB
	Radiated emission above 1 GHz	±4.30 dB
Conducted Emissions	9kHz to 150kHz	± 3.70 dB
	150kHz to 30MHz	± 3.30 dB
Remark: 95% Confidence Levels, K=2.		

7. LIST OF TABLES

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========== END OF REPORT ==========

Appendix A: Test Results of FCC Part 15 Subpart B

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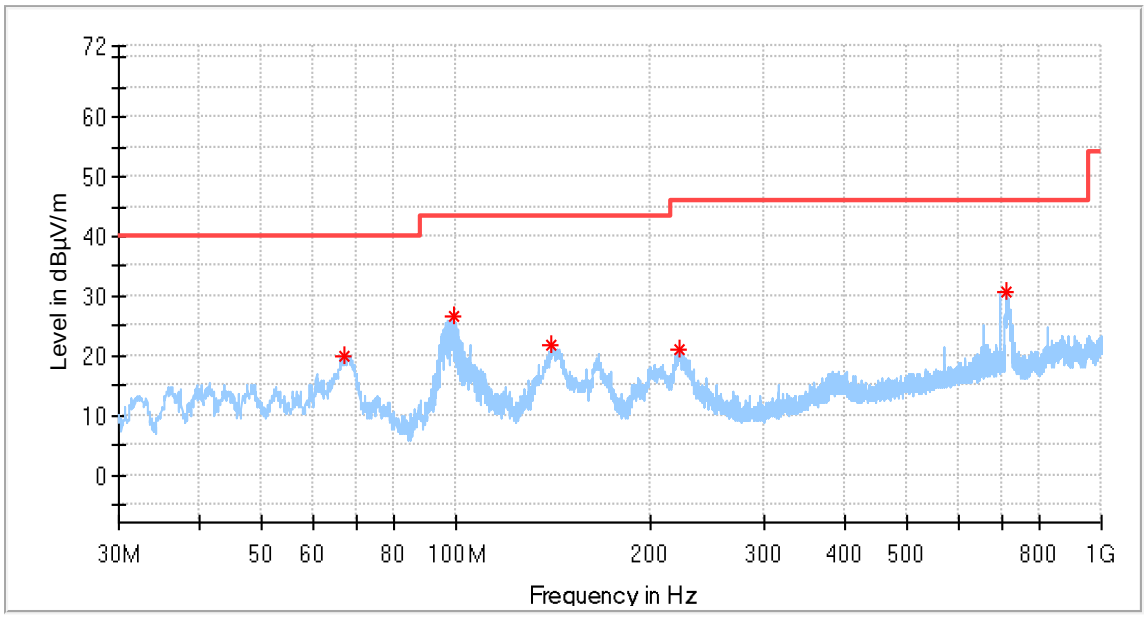
Line 24
Neutral 25

APPENDIX A.1: RADIATED EMISSIONS FOR NB-IOT TRAFFIC

Below 1 GHz

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	NB_Band 5_3.75kHz_QPSK_Ch20401_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:47%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

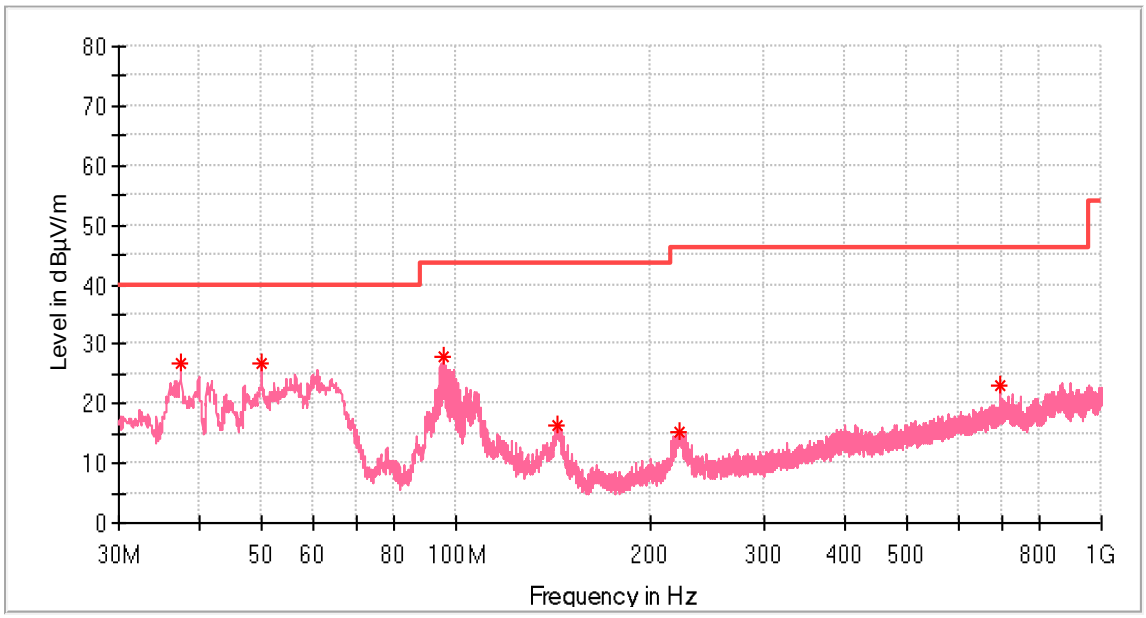
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
67.102500	20.05	40.00	19.95	100.0	H	324.0	-21.0
99.112500	26.43	43.50	17.07	100.0	H	294.0	-19.3
140.822500	21.82	43.50	21.68	100.0	H	252.0	-22.3
221.429500	21.03	46.00	24.97	100.0	H	304.0	-18.5
712.104000	30.75	46.00	15.25	100.0	H	46.0	-7.5

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	NB_Band 5_3.75kHz_QPSK_Ch20401_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:47%
Test Standard:	FCC Part 15B
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)
37.517500	26.63	40.00	13.37	100.0	V	61.0	-21.1
49.982000	26.86	40.00	13.14	100.0	V	0.0	-18.5
95.523500	27.95	43.50	15.55	100.0	V	294.0	-19.8
143.005000	16.36	43.50	27.14	100.0	V	41.0	-22.3
222.157000	15.22	46.00	30.78	100.0	V	211.0	-18.5
697.263000	23.10	46.00	22.90	100.0	V	284.0	-7.8

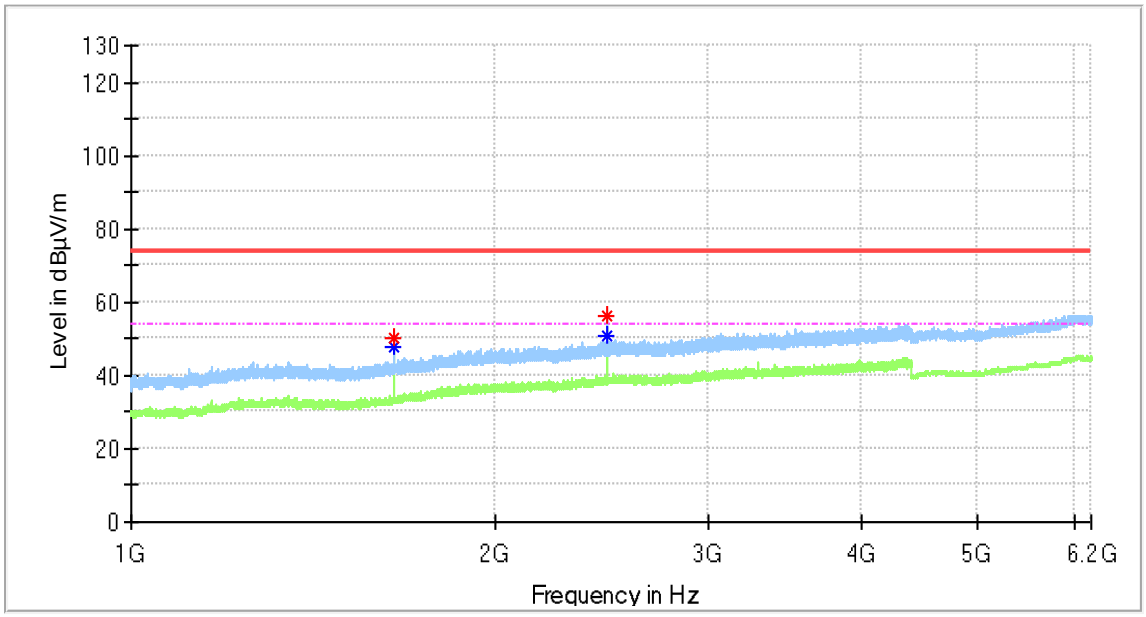
Final_Result

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

Above 1 GHz

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	NB_Band 5_3.75kHz_QPSK_Ch20401_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

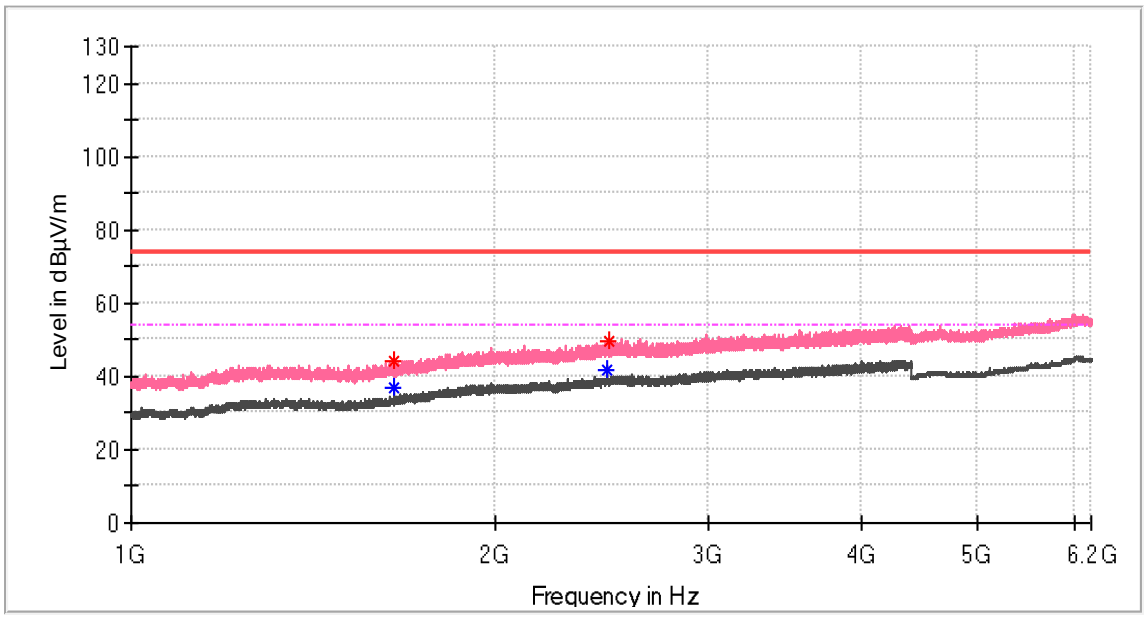
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1647.870000	---	47.52	54.00	6.48	100.0	H	150.0	2.5
1647.870000	50.10	---	74.00	23.90	100.0	H	150.0	2.5
2472.200000	55.95	---	74.00	18.05	100.0	H	161.0	7.4
2472.540000	---	50.71	54.00	3.29	100.0	H	161.0	7.4

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	NB_Band 5_3.75kHz_QPSK_Ch20401_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

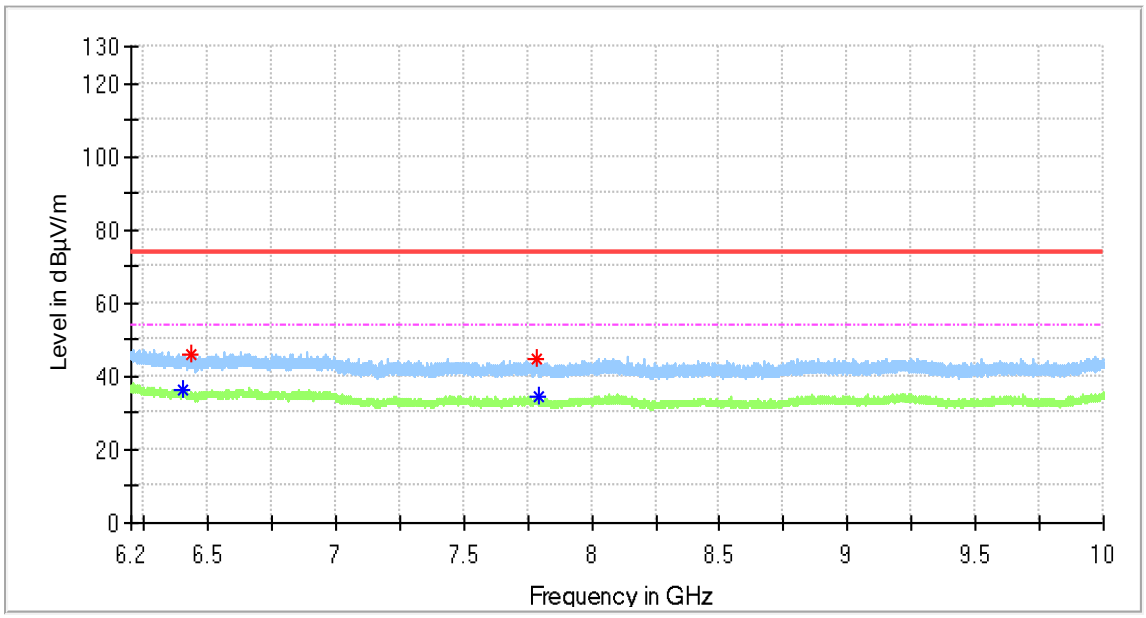
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1647.700000	---	36.86	54.00	17.14	100.0	V	191.0	2.5
1648.210000	44.17	---	74.00	29.83	100.0	V	301.0	2.5
2471.520000	---	41.94	54.00	12.06	100.0	V	280.0	7.4
2480.190000	49.34	---	74.00	24.66	100.0	V	115.0	7.4

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	NB_Band 5_3.75kHz_QPSK_Ch20401_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
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)
6406.150000	---	36.01	54.00	17.99	100.0	H	223.0	8.9
6438.133333	45.93	---	74.00	28.07	100.0	H	112.0	8.7
7788.241667	44.93	---	74.00	29.07	100.0	H	259.0	8.9
7794.575000	---	34.19	54.00	19.81	100.0	H	354.0	8.9

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	NB_Band 5_3.75kHz_QPSK_Ch20401_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
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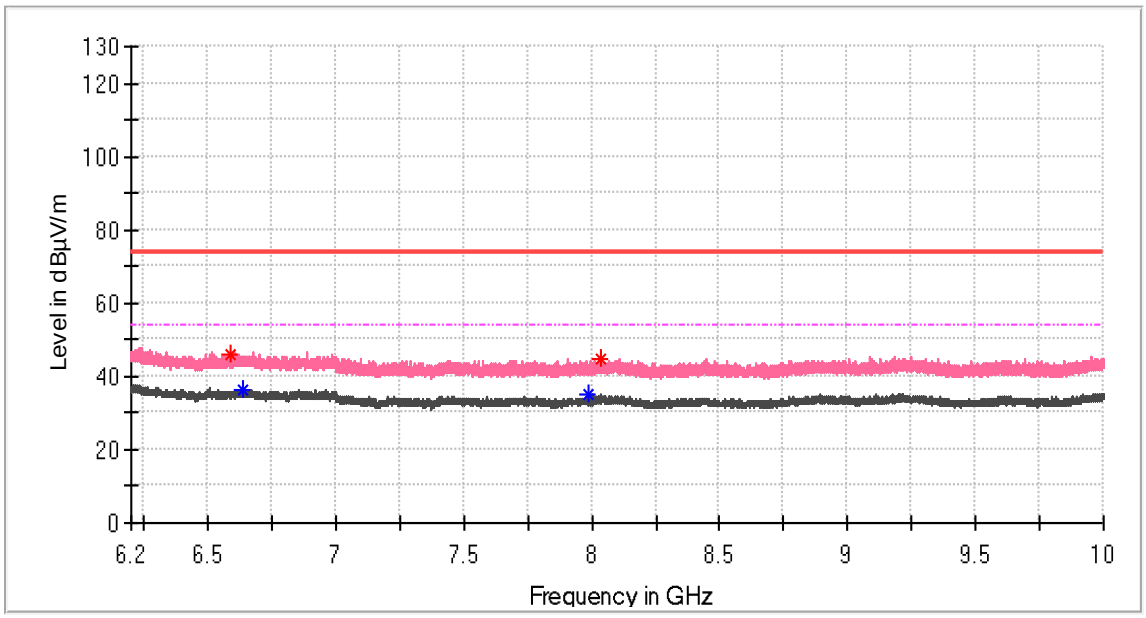


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6590.766667	45.70	---	74.00	28.30	100.0	V	80.0	8.7
6633.041667	---	36.42	54.00	17.58	100.0	V	226.0	8.9
7983.466667	---	34.98	54.00	19.02	100.0	V	178.0	8.8
8033.500000	44.82	---	74.00	29.18	100.0	V	1.0	8.9

Final_Result

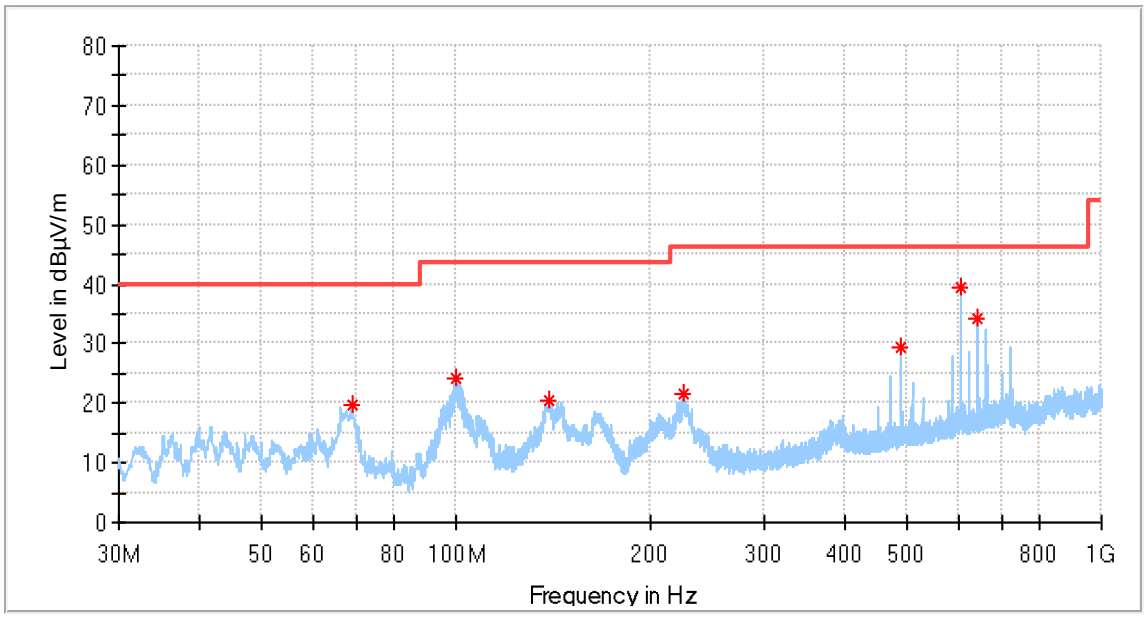
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

APPENDIX A.2: RADIATED EMISSIONS FOR CAT-M TRAFFIC

Below 1 GHz

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	CAT-M_Band 26_3M_QPSK_Ch26915_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:47%
Test Standard:	FCC Part 15B
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)
68.945500	19.54	40.00	20.46	100.0	H	323.0	-21.6
99.791500	24.33	43.50	19.17	100.0	H	266.0	-19.2
139.513000	20.42	43.50	23.09	100.0	H	240.0	-22.3
225.164000	21.41	46.00	24.59	100.0	H	295.0	-18.3
489.683000	29.38	46.00	16.62	100.0	H	56.0	-11.9
605.016000	39.37	46.00	6.63	100.0	H	351.0	-9.6
643.331000	34.07	46.00	11.93	100.0	H	286.0	-9.1

Final_Result

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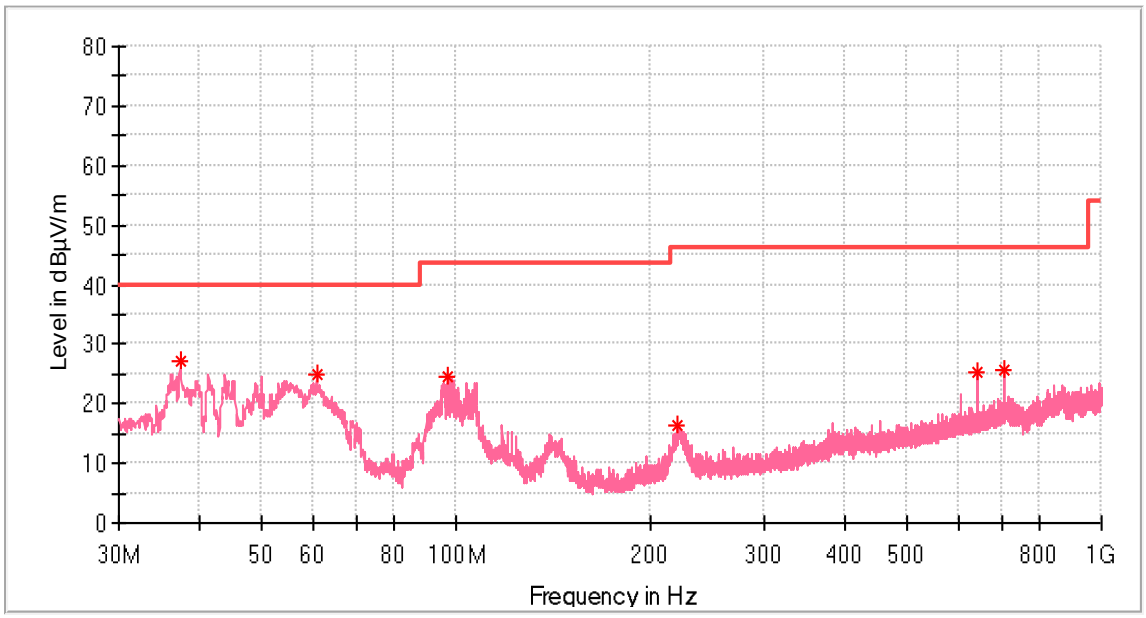
EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	CAT-M_Band 26_3M_QPSK_Ch26915_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:47%
Test Standard:	FCC Part 15B
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	27.26	40.00	12.74	100.0	V	319.0	-21.2
60.797500	24.84	40.00	15.16	100.0	V	155.0	-19.3
97.172500	24.51	43.50	18.99	100.0	V	267.0	-19.6
220.459500	16.28	46.00	29.72	100.0	V	221.0	-18.6
643.282500	25.46	46.00	20.54	100.0	V	319.0	-9.1
706.769000	25.74	46.00	20.26	100.0	V	328.0	-7.6

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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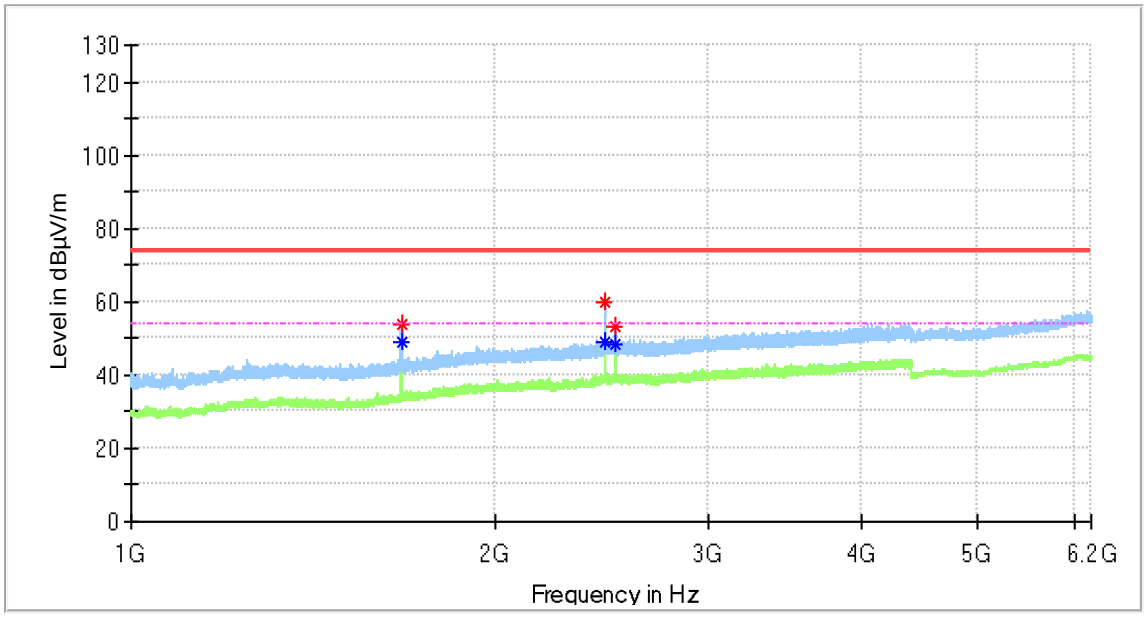
Above 1 GHz

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	CAT-M_Band 26_3M_QPSK_Ch26915_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
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)
1670.820000	53.74	---	74.00	20.26	100.0	H	147.0	2.9
1670.820000	---	49.26	54.00	4.74	100.0	H	147.0	2.9
2461.830000	59.72	---	74.00	14.28	100.0	H	257.0	7.5
2462.000000	---	48.91	54.00	5.09	100.0	H	257.0	7.4
2506.200000	53.07	---	74.00	20.93	100.0	H	169.0	7.4
2506.370000	---	48.67	54.00	5.33	100.0	H	169.0	7.4

Final_Result

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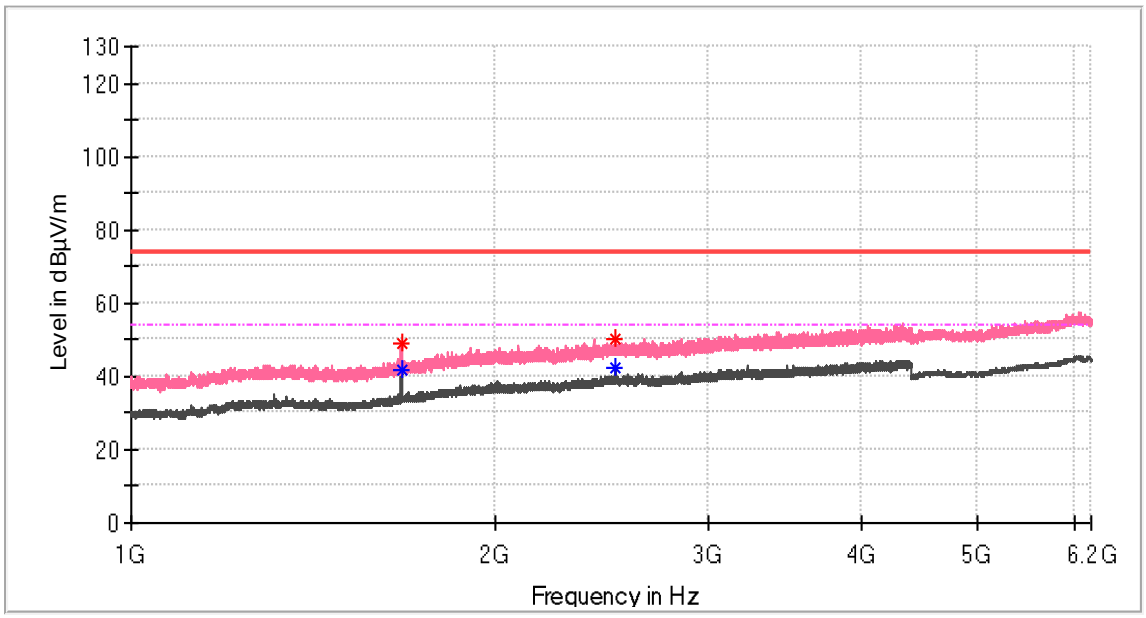
EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	CAT-M_Band 26_3M_QPSK_Ch26915_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
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)
1670.990000	48.79	---	74.00	25.21	100.0	V	187.0	2.9
1670.990000	---	41.52	54.00	12.48	100.0	V	187.0	2.9
2506.710000	---	42.28	54.00	11.72	100.0	V	208.0	7.4
2514.190000	50.21	---	74.00	23.79	100.0	V	197.0	7.4

Final_Result

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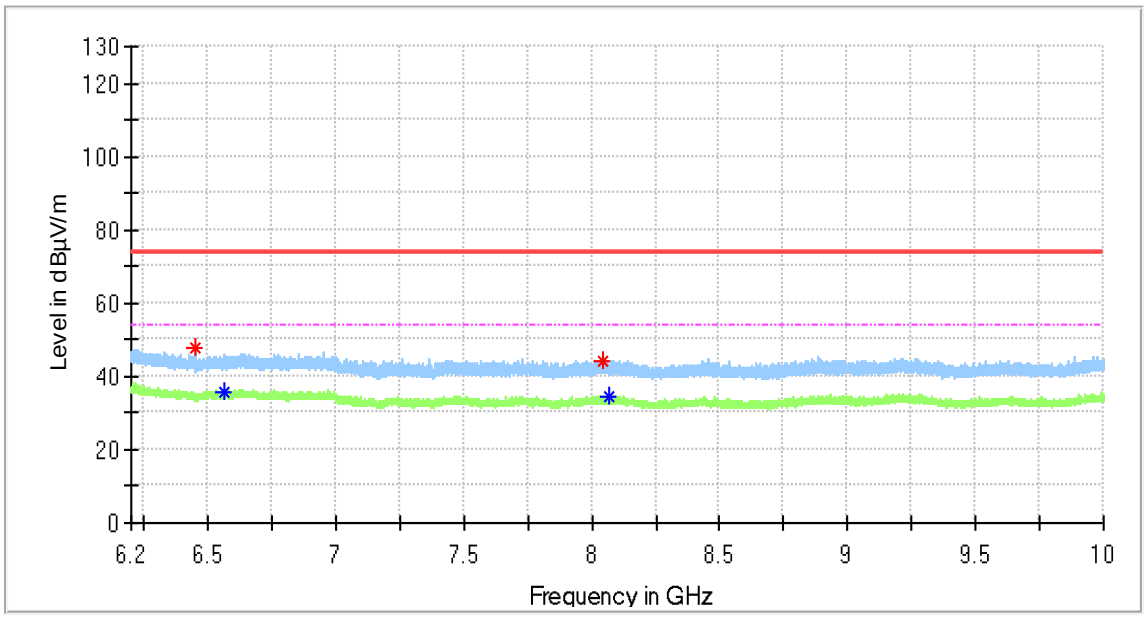
EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	CAT-M_Band 26_3M_QPSK_Ch26915_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

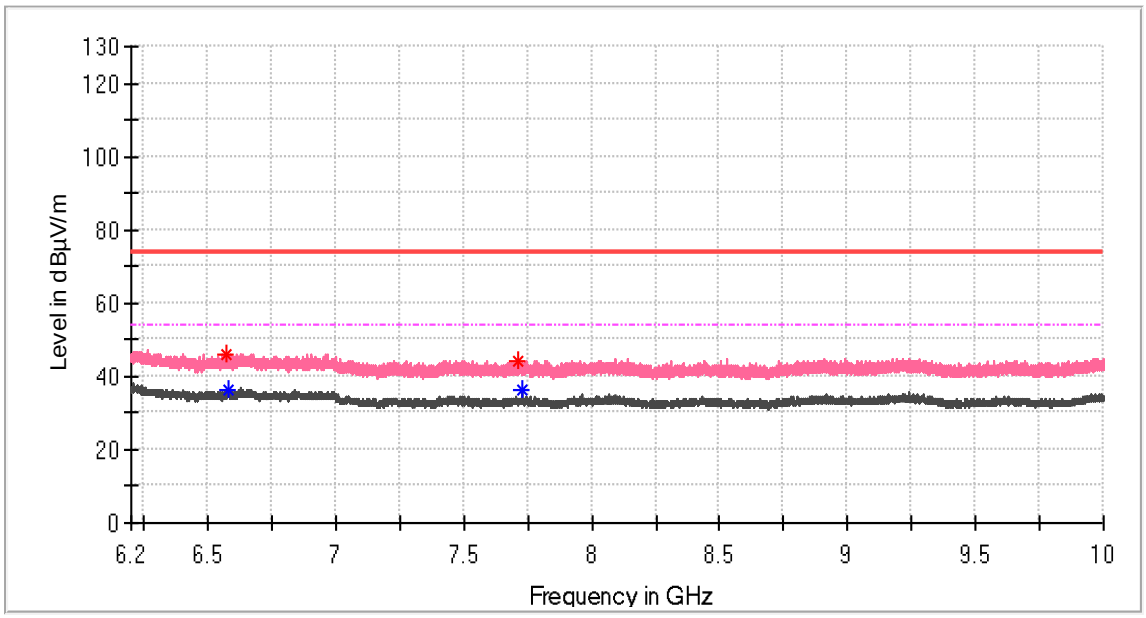
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6449.533333	47.50	---	74.00	26.50	100.0	H	13.0	8.7
6567.808333	---	35.83	54.00	18.17	100.0	H	74.0	8.7
8046.008333	44.29	---	74.00	29.71	100.0	H	135.0	8.9
8071.500000	---	34.54	54.00	19.46	100.0	H	0.0	8.9

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	CAT-M_Band 26_3M_QPSK_Ch26915_1@0
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
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)
6567.966667	46.24	---	74.00	27.76	100.0	V	169.0	8.7
6580.000000	---	36.27	54.00	17.73	100.0	V	352.0	8.7
7710.975000	44.15	---	74.00	29.85	100.0	V	352.0	8.7
7730.133333	---	36.51	54.00	17.49	100.0	V	97.0	8.7

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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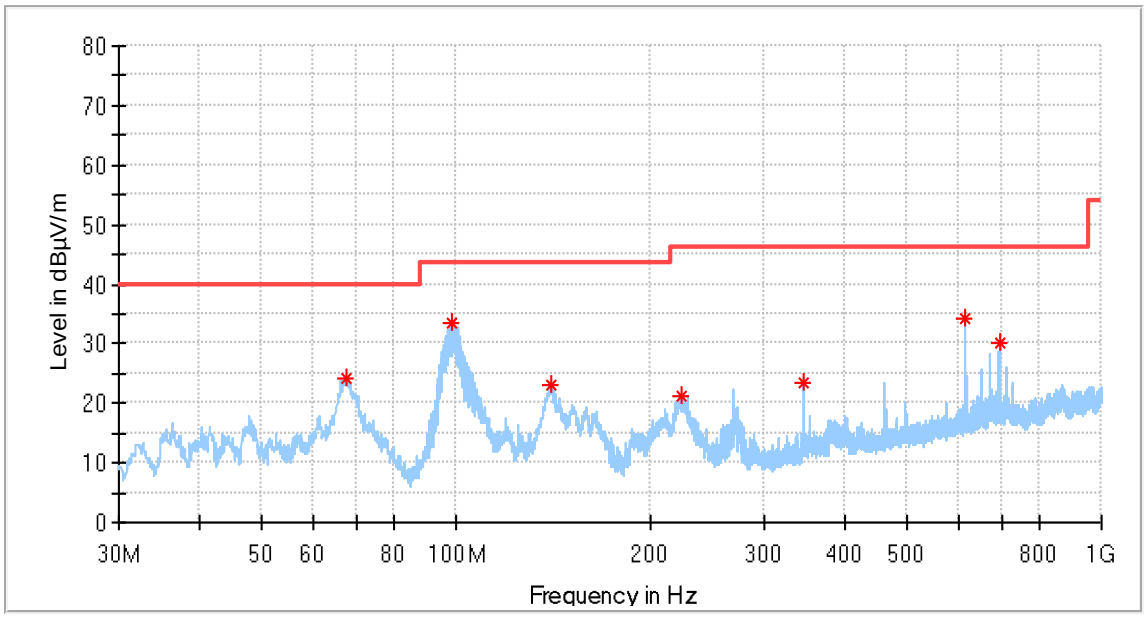
APPENDIX A.3: RADIATED EMISSIONS FOR GPRS OPERATION

Below 1 GHz

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM850_GPRS_1Tx_Ch251
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:47%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

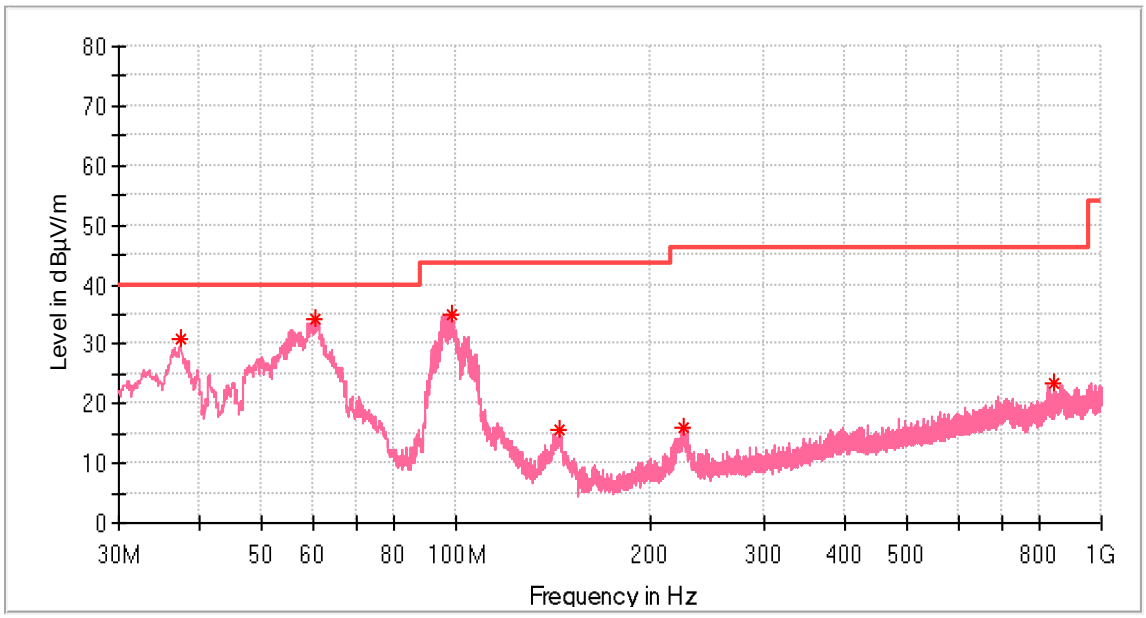
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
67.345000	24.16	40.00	15.84	100.0	H	320.0	-21.1
98.724500	33.56	43.50	9.94	100.0	H	301.0	-19.3
140.434500	23.16	43.50	20.34	100.0	H	72.0	-22.3
223.418000	21.31	46.00	24.69	100.0	H	301.0	-18.4
345.686500	23.50	46.00	22.50	100.0	H	213.0	-14.8
614.425000	34.19	46.00	11.81	100.0	H	46.0	-9.4
695.226000	30.14	46.00	15.86	100.0	H	301.0	-7.9

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM850_GPRS_1Tx_Ch251
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:47%
Test Standard:	FCC Part 15B
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)
37.517500	30.83	40.00	9.17	100.0	V	210.0	-21.1
60.312500	34.15	40.00	5.85	100.0	V	190.0	-19.2
98.676000	35.06	43.50	8.44	100.0	V	283.0	-19.3
144.993500	15.52	43.50	27.98	100.0	V	53.0	-22.3
224.291000	16.06	46.00	29.94	100.0	V	210.0	-18.4
845.721500	23.48	46.00	22.52	100.0	V	103.0	-4.6

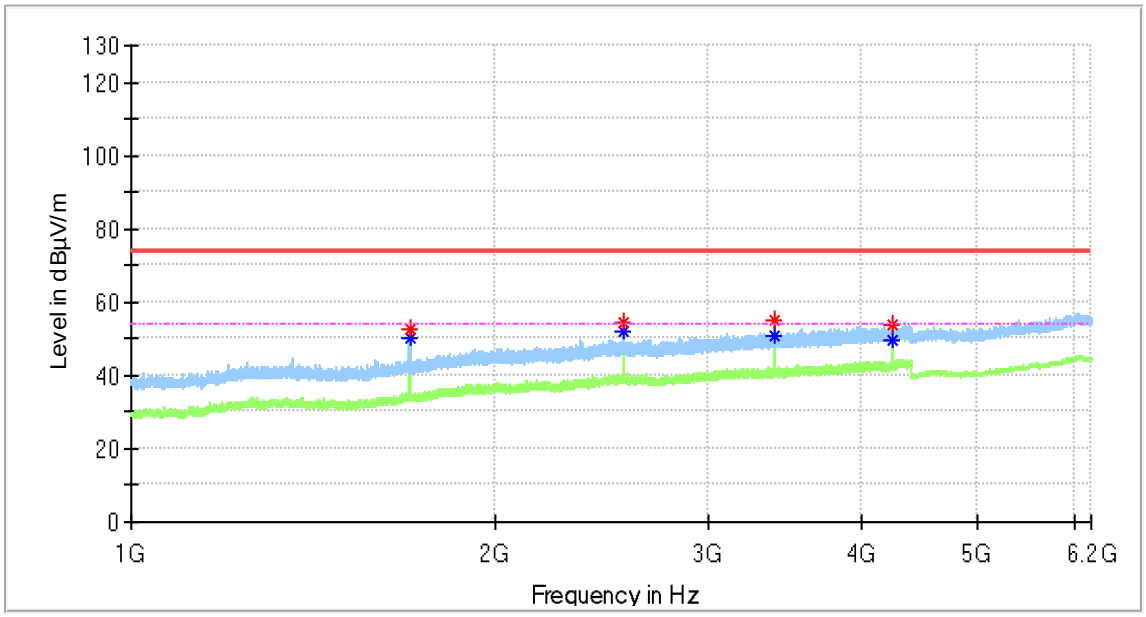
Final_Result

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

Above 1 GHz

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM850_GPRS_1Tx_Ch251
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

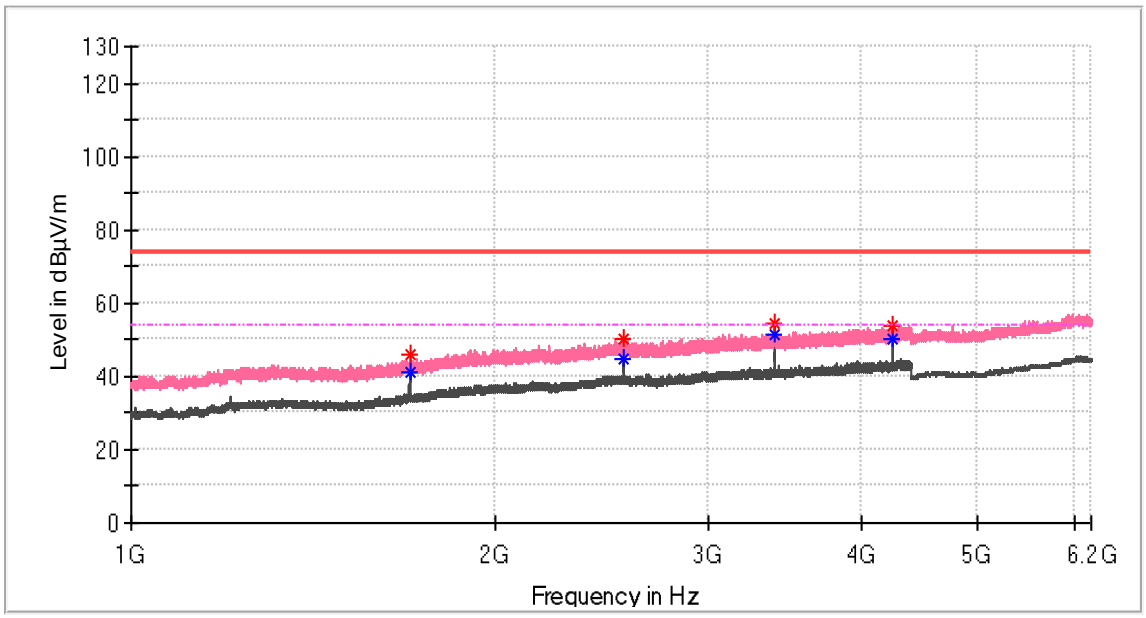
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1697.340000	52.34	---	74.00	21.66	100.0	H	259.0	3.3
1697.510000	---	50.37	54.00	3.63	100.0	H	259.0	3.3
2546.320000	54.60	---	74.00	19.40	100.0	H	46.0	7.6
2546.490000	---	51.75	54.00	2.25	100.0	H	46.0	7.6
3394.790000	54.73	---	74.00	19.27	100.0	H	159.0	8.7
3394.960000	---	50.73	54.00	3.27	100.0	H	159.0	8.7
4244.280000	53.74	---	74.00	20.26	100.0	H	80.0	10.3
4244.450000	---	49.47	54.00	4.53	100.0	H	80.0	10.3

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM850_GPRS_1Tx_Ch251
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

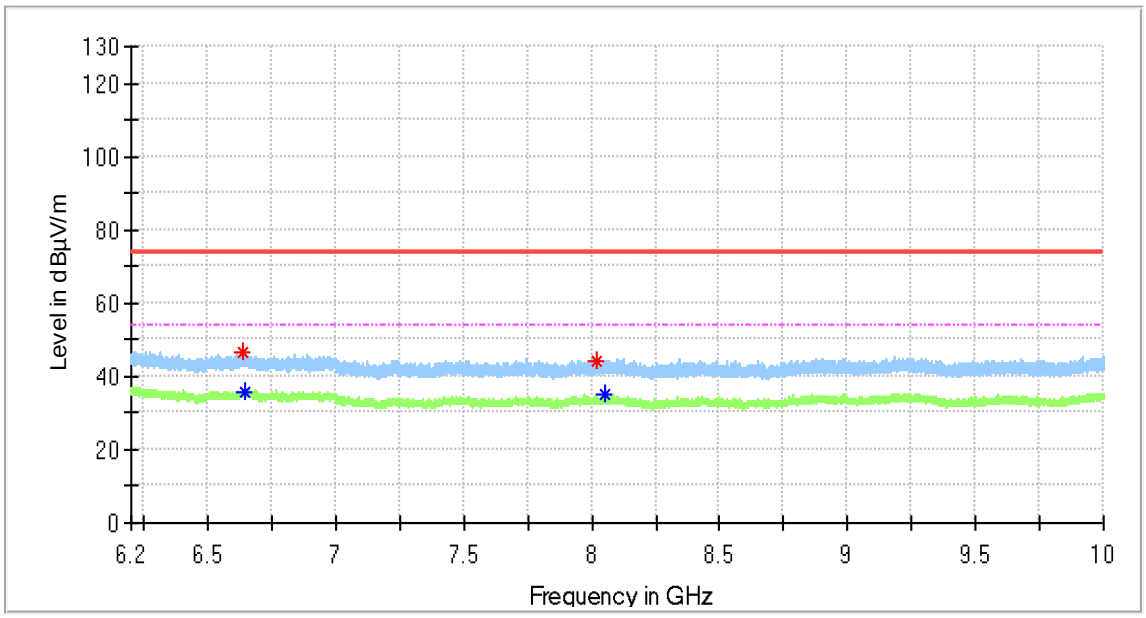
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1697.340000	---	41.32	54.00	12.68	100.0	V	0.0	3.3
1697.680000	46.08	---	74.00	27.92	100.0	V	0.0	3.3
2546.150000	---	44.69	54.00	9.31	100.0	V	96.0	7.6
2546.660000	50.13	---	74.00	23.87	100.0	V	96.0	7.6
3394.790000	54.61	---	74.00	19.39	100.0	V	259.0	8.7
3394.790000	---	51.36	54.00	2.64	100.0	V	259.0	8.7
4243.770000	53.88	---	74.00	20.12	100.0	V	0.0	10.3
4243.940000	---	50.06	54.00	3.94	100.0	V	0.0	10.3

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM850_GPRS_1Tx_Ch251
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

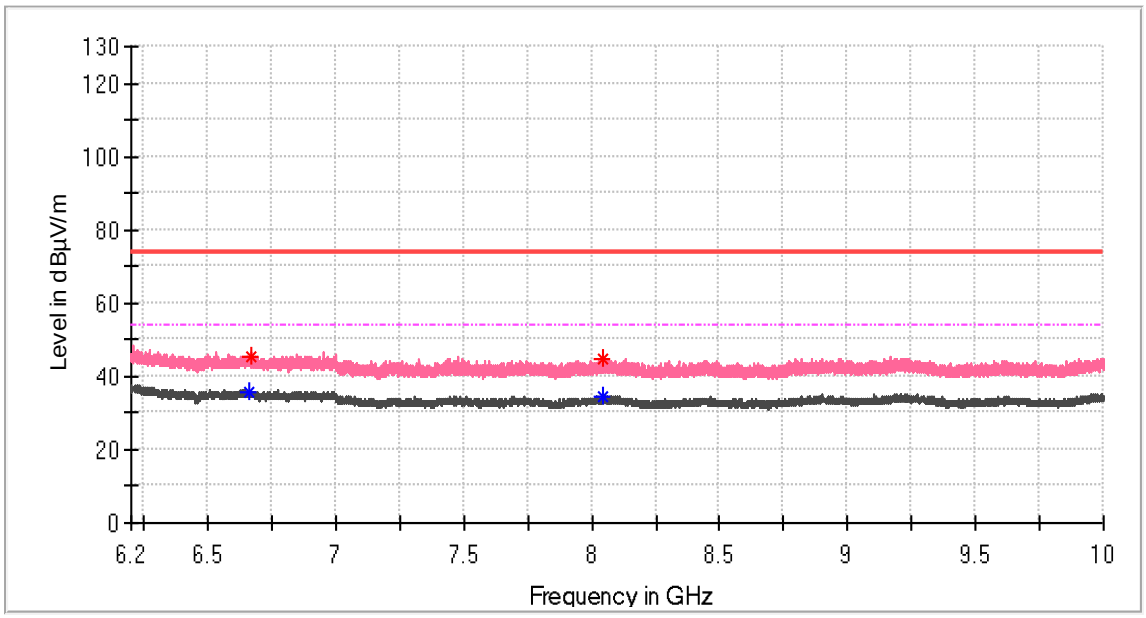
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6633.041667	46.45	---	74.00	27.55	100.0	H	0.0	8.9
6643.175000	---	35.82	54.00	18.18	100.0	H	161.0	9.0
8017.033333	44.23	---	74.00	29.77	100.0	H	137.0	8.9
8053.133333	---	34.94	54.00	19.06	100.0	H	330.0	8.9

Final_Result

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

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM850_GPRS_1Tx_Ch251
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
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)
6661.858333	---	35.97	54.00	18.03	100.0	V	177.0	8.9
6665.183333	45.45	---	74.00	28.55	100.0	V	213.0	8.9
8044.266667	---	34.35	54.00	19.65	100.0	V	31.0	8.9
8047.433333	44.51	---	74.00	29.49	100.0	V	91.0	8.9

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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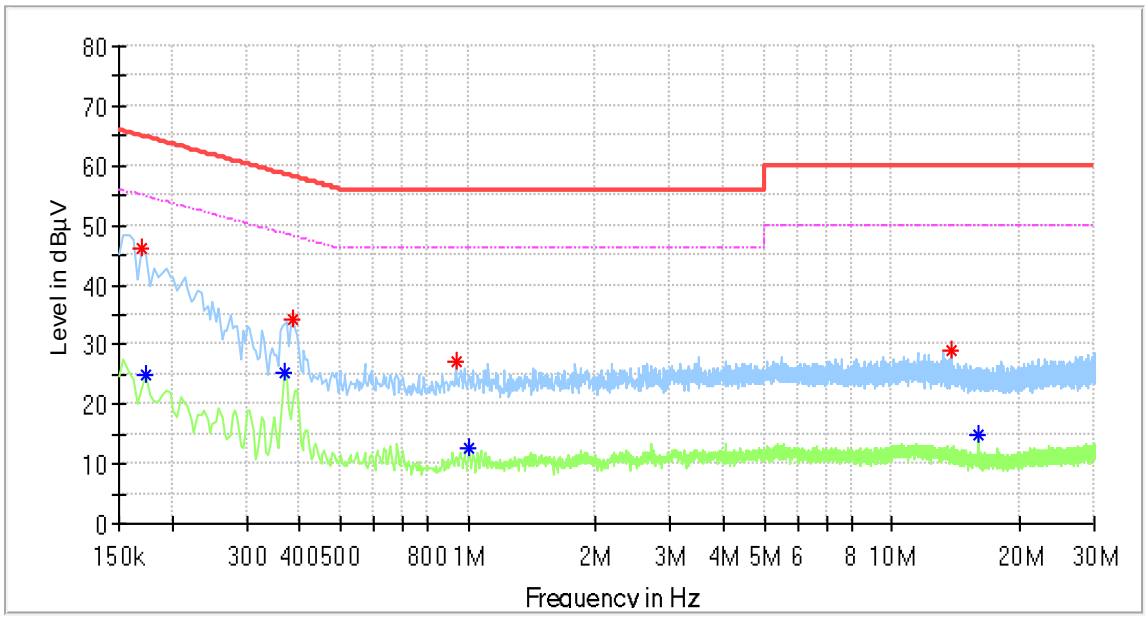
APPENDIX A.4: CONDUCTED EMISSIONS WITH AC/DC ADAPTER

Line

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM Link
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dB磺)	Average (dB磺)	Limit (dB磺)	Margin (dB)	Line	Corr. (dB)
0.170000	46.26	---	64.96	18.70	L1	9.9
0.174000	---	25.07	54.77	29.69	L1	9.9
0.370000	---	25.17	48.50	23.33	L1	9.9
0.386000	34.13	---	58.15	24.02	L1	9.9
0.934000	27.05	---	56.00	28.95	L1	10.0
1.006000	---	12.48	46.00	33.52	L1	10.0
13.822000	29.07	---	60.00	30.93	L1	10.4
15.998000	---	14.82	50.00	35.18	L1	10.4

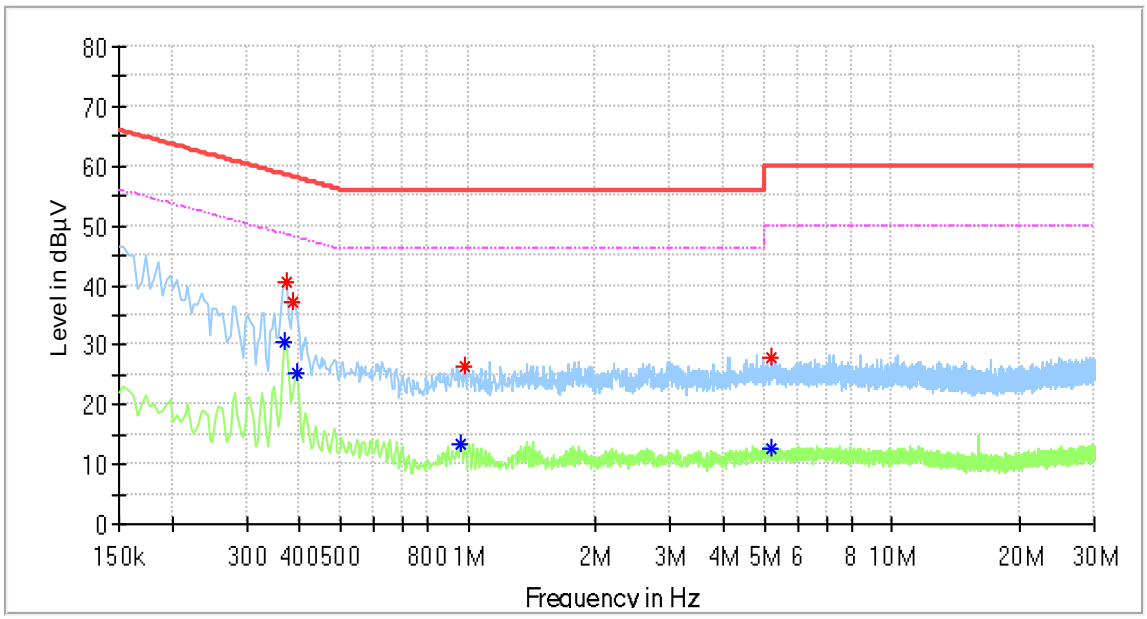
Final_Result

Frequency (MHz)	QuasiPeak (dB磺)	Average (dB磺)	Limit (dB磺)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
---	---	---	---	---	---	---		---

Neutral

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM Link
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dB磺)	Average (dB磺)	Limit (dB磺)	Margin (dB)	Line	Corr. (dB)
0.370000	---	30.44	48.50	18.06	N	9.8
0.374000	40.72	---	58.41	17.69	N	9.8
0.386000	37.35	---	58.15	20.80	N	9.8
0.394000	---	25.31	47.98	22.67	N	9.8
0.962000	---	13.54	46.00	32.46	N	9.8
0.986000	26.46	---	56.00	29.54	N	9.8
5.206000	27.82	---	60.00	32.18	N	9.9
5.210000	---	12.81	50.00	37.19	N	9.9

Final_Result

Frequency (MHz)	QuasiPeak (dB磺)	Average (dB磺)	Limit (dB磺)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
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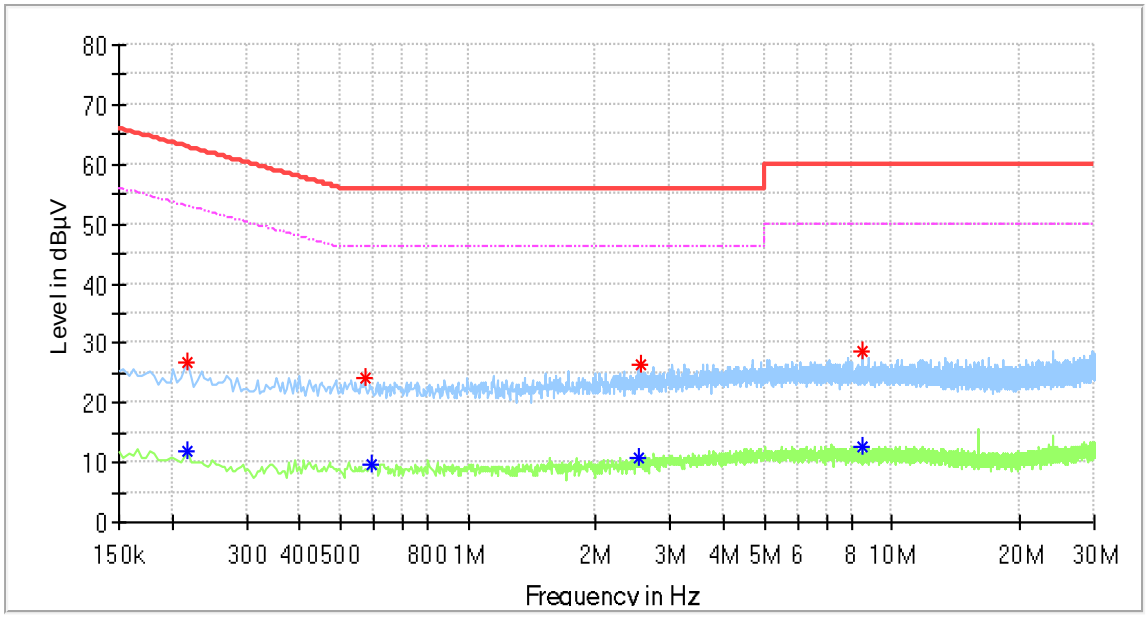
APPENDIX A.5: CONDUCTED EMISSIONS WITH AC 9V MAINS

Line

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM Link
Test Voltage::	AC 9V
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dB磺)	Average (dB磺)	Limit (dB磺)	Margin (dB)	Line	Corr. (dB)
0.218000	---	12.07	52.90	40.82	L1	9.9
0.218000	26.65	---	62.90	36.25	L1	9.9
0.570000	24.01	---	56.00	31.99	L1	10.0
0.590000	---	9.79	46.00	36.21	L1	10.0
2.538000	---	10.61	46.00	35.39	L1	10.2
2.542000	26.54	---	56.00	29.46	L1	10.2
8.506000	---	12.57	50.00	37.43	L1	10.3
8.542000	28.62	---	60.00	31.38	L1	10.3

Final_Result

Frequency (MHz)	QuasiPeak (dB磺)	Average (dB磺)	Limit (dB磺)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
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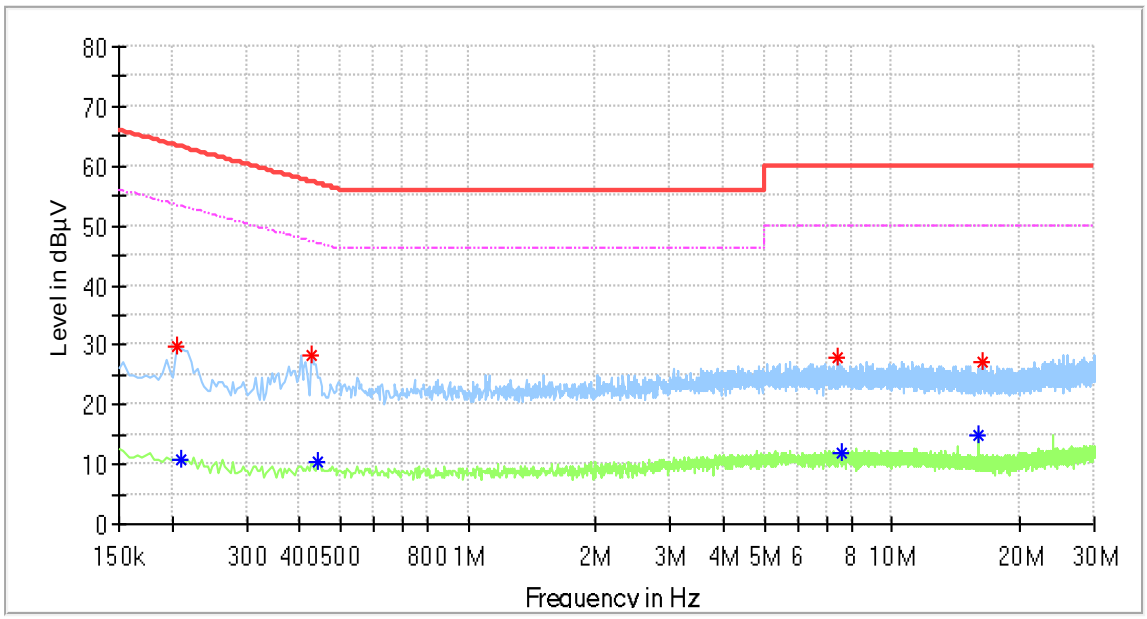
Neutral

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM Link
Test Voltage::	AC 9V
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dB礦)	Average (dB礦)	Limit (dB礦)	Margin (dB)	Line	Corr. (dB)
0.206000	29.90	---	63.37	33.46	N	9.8
0.210000	---	10.64	53.21	42.57	N	9.8
0.426000	28.31	---	57.33	29.02	N	9.8
0.442000	---	10.38	47.02	36.65	N	9.8
7.454000	27.94	---	60.00	32.06	N	10.0
7.618000	---	12.04	50.00	37.96	N	10.0
16.002000	---	14.95	50.00	35.05	N	10.2
16.298000	27.08	---	60.00	32.92	N	10.2

Final_Result

Frequency (MHz)	QuasiPeak (dB礦)	Average (dB礦)	Limit (dB礦)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
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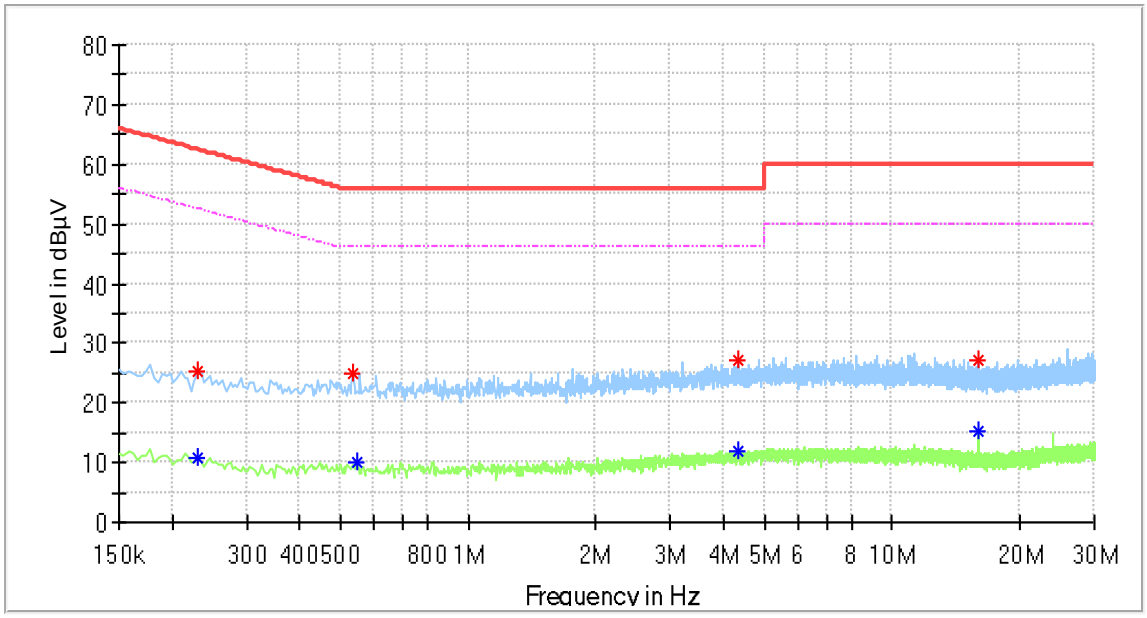
APPENDIX A.6: CONDUCTED EMISSIONS WITH AC 24V MAINS

Line

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM Link
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dB磺)	Average (dB磺)	Limit (dB磺)	Margin (dB)	Line	Corr. (dB)
0.230000	---	10.61	52.45	41.84	L1	9.9
0.230000	25.43	---	62.45	37.02	L1	9.9
0.534000	25.08	---	56.00	30.92	L1	10.0
0.546000	---	10.19	46.00	35.81	L1	10.0
4.318000	27.15	---	56.00	28.85	L1	10.2
4.334000	---	11.99	46.00	34.01	L1	10.2
15.998000	---	15.28	50.00	34.72	L1	10.4
16.002000	27.27	---	60.00	32.73	L1	10.4

Final_Result

Frequency (MHz)	QuasiPeak (dB磺)	Average (dB磺)	Limit (dB磺)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
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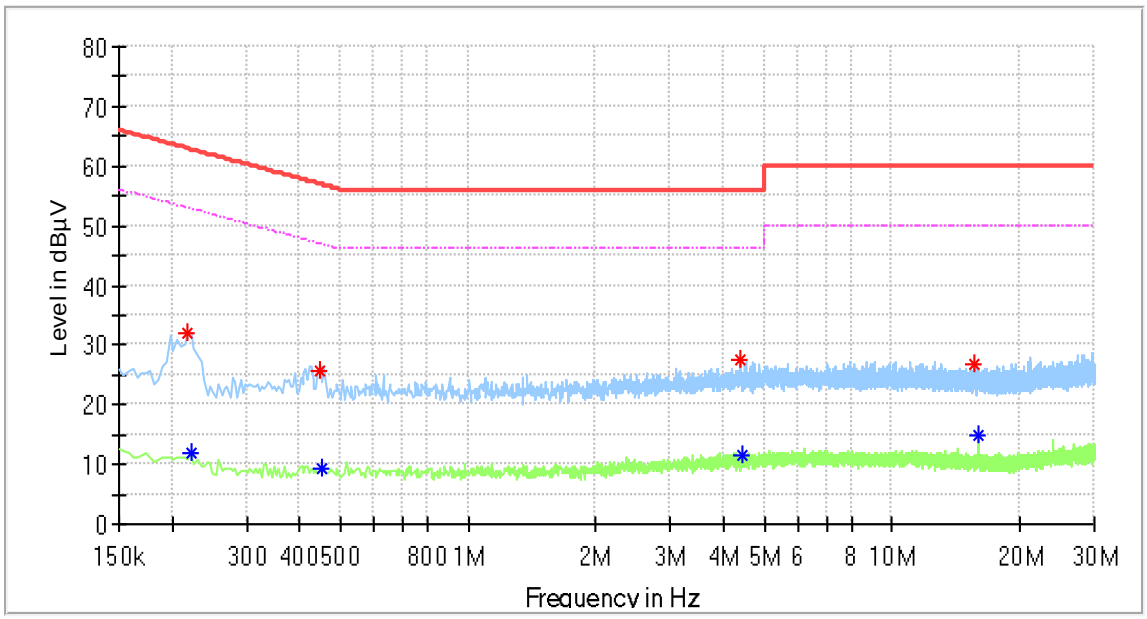
Neutral

EUT Information

EUT Name:	vBox2 IoT Device
Model:	VP-B2 4 4G
Test Mode:	GSM Link
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:48%
Test Standard:	FCC Part 15B
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dB礦)	Average (dB礦)	Limit (dB礦)	Margin (dB)	Line	Corr. (dB)
0.218000	31.94	---	62.90	30.96	N	9.8
0.222000	---	12.07	52.74	40.67	N	9.8
0.446000	25.77	---	56.95	31.18	N	9.8
0.454000	---	9.12	46.80	37.68	N	9.8
4.378000	27.35	---	56.00	28.65	N	9.9
4.414000	---	11.48	46.00	34.52	N	9.9
15.654000	26.86	---	60.00	33.14	N	10.1
16.002000	---	14.83	50.00	35.17	N	10.2

Final_Result

Frequency (MHz)	QuasiPeak (dB礦)	Average (dB礦)	Limit (dB礦)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
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