

RADIO PERFORMANCE TEST REPORT

Test Report No. : OT-21O-RWD-037
Reception No. : 2110004558
Applicant : Samsung Electronics Co Ltd
Address : 19 Chapin Rd., Building D, Pine Brook, New Jersey, 07058, United States
Manufacturer : Samsung Electronics Co Ltd
Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do 16677, Korea
Type of Equipment : Wi-Fi/BT Transceiver
FCC ID. : A3LWCB731M
Model Name : WCB731M
Multiple Model Name : WCB730M, WCB737M, WCB736M
Serial number : N/A
Total page of Report : 75 pages (including this page)
Date of Incoming : October 07, 2021
Date of issue : October 25, 2021

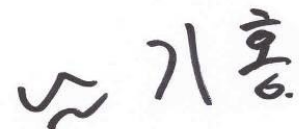
SUMMARY

The equipment complies with the regulation; **FCC PART 15 SUBPART C Section 15.247**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.





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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-21O-RWD-037	October 25, 2021	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : Samsung Electronics Co Ltd

Address : 19 Chapin Rd., Building D, Pine Brook, New Jersey, 07058, United States

Contact Person : Jenni Chun / General Manager

Telephone No. : 973-808-6375

FCC ID : A3LWCB731M

Model Name : WCB731M

Brand Name : 

Serial Number : N/A

Date : October 25, 2021

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Modular Transmitter, Wi-Fi/BT Transceiver
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2020
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247 KDB 558074 D01 15.247 Meas Guidance v05r02
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6 dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Peak Conducted Output Power	Met the Limit / PASS
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (d)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (e)	Peak Power Spectral Density	Met the Limit / PASS
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.247.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2020. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea.

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-20122/ C-14617/ G-10666/ T-11842

ISED (Innovation, Science and Economic Development Canada) – Registration No. Site# 3736A-3

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

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ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

3. GENERAL INFORMATION

3.1 Product Description

The Samsung Electronics Co Ltd, Model WCB731M (referred to as the EUT in this report) is a Wi-Fi/BT Transceiver. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Wi-Fi/BT Transceiver	
Temperature Range	-20 °C ~ 50 °C	
OPERATING FREQUENCY	Bluetooth LE	2 402 MHz ~ 2 480 MHz
	Bluetooth	2 402 MHz ~ 2 480 MHz
	WLAN 2.4 GHz	2 412 MHz ~ 2 472 MHz (802.11b/g/n(HT20))
		2 422 MHz ~ 2 462 MHz (802.11n(HT40))
	WLAN 5 150 MHz ~ 5 250 MHz Band	5 180 MHz ~ 5 240 MHz (802.11a/n(HT20)/ac(VHT20))
		5 190 MHz ~ 5 230 MHz (802.11n(HT40)/ac(VHT40))
		5 210 MHz (802.11ac(VHT80))
	WLAN 5 250 MHz ~ 5 350 MHz Band	5 260 MHz ~ 5 320 MHz (802.11a/n(HT20)/ac(VHT20))
		5 270 MHz ~ 5 310 MHz (802.11n(HT40)/ac(VHT40))
		5 290 MHz (802.11ac(VHT80))
	WLAN 5 470 MHz ~ 5 725 MHz Band	5 500 MHz ~ 5 720 MHz (802.11a/n(HT20)/ac(VHT20))
		5 510 MHz ~ 5 710 MHz (802.11n(HT40)/ac(VHT40))
		5 530 MHz ~ 5 690 MHz (802.11ac(VHT80))
	WLAN 5 725 MHz ~ 5 850 MHz Band	5 745 MHz ~ 5 825 MHz (802.11a/n(HT20)/ac(VHT20))
		5 755 MHz ~ 5 795 MHz (802.11n(HT40)/ac(VHT40))
		5 775 MHz (802.11ac(VHT80))
MODULATION TYPE	Bluetooth LE	GFSK for 1 Mbps / 2 Mbps
	Bluetooth	GFSK for 1Mbps, $\pi/4$ -DQPSK for 2Mbps, 8-DPSK for 3Mbps
	WLAN 2.4 GHz	802.11b: DSSS Modulation(DBPSK/DQPSK/CCK)
		802.11g/n(HT20)/n(HT40): OFDM Modulation(BPSK/QPSK/16QAM/64QAM)
	WLAN 5 GHz	802.11a/n(HT20)/n(HT40)/ac(VHT80): OFDM Modulation(BPSK/QPSK/16QAM/64QAM)

RF OUTPUT POWER	Bluetooth LE	1 Mbps	11.26 dBm
		2 Mbps	11.25 dBm
	Bluetooth	1 Mbps	11.26 dBm
		2 Mbps	10.89 dBm
		3 Mbps	11.19 dBm
	WLAN 2.4 GHz	Antenna 0	17.30 dBm(802.11b) 11.15 dBm(802.11g) 10.75 dBm(802.11n_HT20) 9.49 dBm(802.11n_HT40)
		Antenna 1	17.32 dBm(802.11b) 14.60 dBm(802.11g) 14.31 dBm(802.11n_HT20) 13.54 dBm(802.11n_HT40)
		Multiple Antenna	16.22 dBm(802.11g) 15.90 dBm(802.11n_HT20) 14.98 dBm(802.11n_HT40)
	WLAN 5 150 MHz ~ 5 250 MHz Band	Antenna 0	8.73 dBm(802.11a) 8.77 dBm(802.11n_HT20) 10.33 dBm(802.11n_HT40) 8.88 dBm(802.11ac_VHT80)
		Antenna 1	9.02 dBm(802.11a) 8.88 dBm(802.11n_HT20) 10.46 dBm(802.11n_HT40) 9.22 dBm(802.11ac_VHT80)
		Multiple Antenna	11.79 dBm(802.11a) 11.69 dBm(802.11n_HT20) 13.27 dBm(802.11n_HT40) 12.06 dBm(802.11ac_VHT80)

RF OUTPUT POWER	WLAN 5 250 MHz ~ 5 350 MHz Band	Antenna 0	9.82 dBm(802.11a) 9.67 dBm(802.11n_HT20) 9.69 dBm(802.11n_HT40) 10.53 dBm(802.11ac_VHT80)
		Antenna 1	9.12 dBm(802.11a) 9.05 dBm(802.11n_HT20) 8.95 dBm(802.11n_HT40) 10.35 dBm(802.11ac_VHT80)
		Multiple Antenna	12.40 dBm(802.11a) 12.27 dBm(802.11n_HT20) 12.35 dBm(802.11n_HT40) 13.45 dBm(802.11ac_VHT80)
	WLAN 5 470 MHz ~ 5 725 MHz Band	Antenna 0	9.83 dBm(802.11a) 9.80 dBm(802.11n_HT20) 10.16 dBm(802.11n_HT40) 10.28 dBm(802.11ac_VHT80)
		Antenna 0_Straddle	8.38 dBm(802.11a) 8.23 dBm(802.11n_HT20) 9.65 dBm(802.11n_HT40) 10.80 dBm(802.11ac_VHT80)
		Antenna 1	10.68 dBm(802.11a) 11.18 dBm(802.11n_HT20) 11.77 dBm(802.11n_HT40) 10.50 dBm(802.11ac_VHT80)
		Antenna 1_Straddle	11.29 dBm(802.11a) 11.07 dBm(802.11n_HT20) 12.29 dBm(802.11n_HT40) 14.30 dBm(802.11ac_VHT80)

RF OUTPUT POWER	WLAN 5 470 MHz ~ 5 725 MHz Band	Multiple Antenna	13.00 dBm(802.11a) 13.47 dBm(802.11n_HT20) 13.89 dBm(802.11n_HT40) 13.40 dBm(802.11ac_VHT80)
		Multiple Antenna _Straddle	13.08 dBm(802.11a) 12.89 dBm(802.11n_HT20) 14.18 dBm(802.11n_HT40) 15.90 dBm(802.11ac_VHT80)
	WLAN 5 725 MHz ~ 5 850 MHz Band	Antenna 0	8.85 dBm(802.11a) 8.93 dBm(802.11n_HT20) 7.67 dBm(802.11n_HT40) 7.83 dBm(802.11ac_VHT80)
		Antenna 0_Straddle	0.54 dBm(802.11a) 0.90 dBm(802.11n_HT20) -2.66 dBm(802.11n_HT40) -4.53 dBm(802.11ac_VHT80)
		Antenna 1	10.67 dBm(802.11a) 10.78 dBm(802.11n_HT20) 10.94 dBm(802.11n_HT40) 10.77 dBm(802.11ac_VHT80)
		Antenna 1_Straddle	3.53 dBm(802.11a) 3.78 dBm(802.11n_HT20) 0.13 dBm(802.11n_HT40) -0.95 dBm(802.11ac_VHT80)
		Multiple Antenna	12.86 dBm(802.11a) 12.77 dBm(802.11n_HT20) 12.62 dBm(802.11n_HT40) 12.55 dBm(802.11ac_VHT80)
		Multiple Antenna _Straddle	5.30 dBm(802.11a) 5.58 dBm(802.11n_HT20) 1.97 dBm(802.11n_HT40) 0.63 dBm(802.11ac_VHT80)

ANTENNA TYPE	Chip Antenna		
ANTENNA GAIN	Bluetooth LE	-0.44 dBi	
	Bluetooth	-0.44 dBi	
	WLAN 2.4 GHz	Antenna 0	1.54 dBi
		Antenna 1	1.35 dBi
		Multiple Antenna	4.46 dBi
	5 150 MHz ~ 5 250 MHz Band	Antenna 0	1.00 dBi
		Antenna 1	1.25 dBi
		Multiple Antenna	4.14 dBi
	5 250 MHz ~ 5 350 MHz Band	Antenna 0	1.53 dBi
		Antenna 1	1.42 dBi
		Multiple Antenna	4.49 dBi
	5 470 MHz ~ 5 725 MHz Band	Antenna 0	1.51 dBi
		Antenna 1	1.50 dBi
		Multiple Antenna	4.52 dBi
	5 725 MHz ~ 5 850 MHz Band	Antenna 0	0.86 dBi
		Antenna 1	1.51 dBi
		Multiple Antenna	4.21 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)		40 MHz	

3.2 Alternative type(s)/model(s); also covered by this test report.

-. The following lists consist of the added model and their differences.

Model Name	Differences	Tested
WCB731M	Basic Model (2 MIC, IRB at the Top)	☒
WCB730M	This model is identical to the basic model except for the removal of MIC.	☒
WCB737M	This model is identical to the basic model except for the IRB at the Bottom	☒
WCB736M	This model is identical to the basic model except for IRB at the Bottom and the removal of MIC	☒

Note: 1. Applicant consigns only basic model to test. Therefore this test report just guarantees the units, which have been tested.

2. The Applicant/manufacturer is responsible for the compliance of all variants.

4. EUT MODIFICATIONS

-. None

5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Samsung Electronics Co Ltd	HDWB-2285 V1.0	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
WCB731M	Samsung Electronics Co Ltd	Wi-Fi/BT Transceiver (EUT)	
HP Probook	HP	Notebook PC	EUT
PPP009L-E	LIE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	AC Adapter	

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting is programmed.

For final testing, the EUT was set at 2 402 MHz, 2 440 MHz, and 2 480 MHz to get a maximum emission levels from the EUT. The EUT was moved throughout the XY, XZ, and YZ planes and the worst case is "XY" axis, but the worst data was recorded in this report.

-. Frequency / Channel Operations

Channel	Frequency
0	2 402
19	2 440
39	2 480

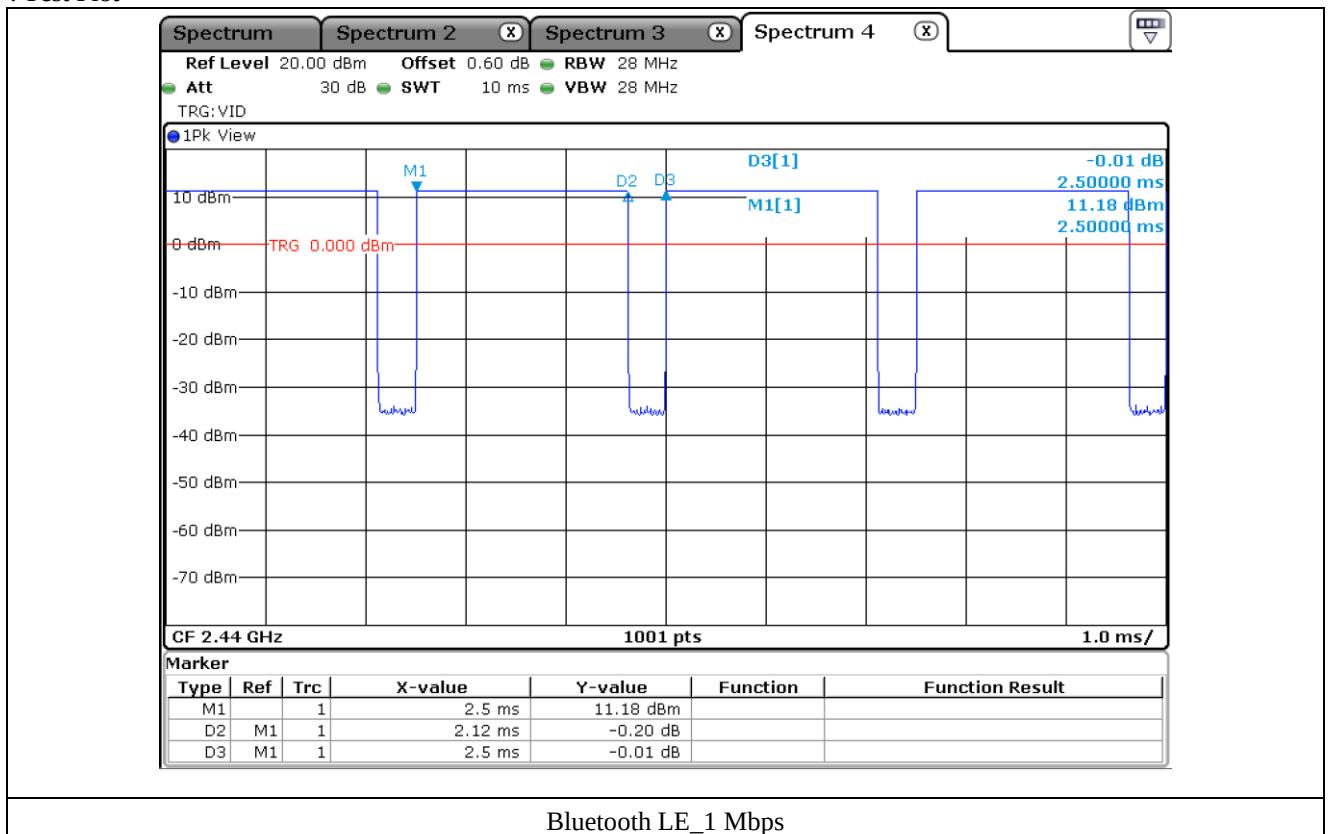
-. Duty Cycle

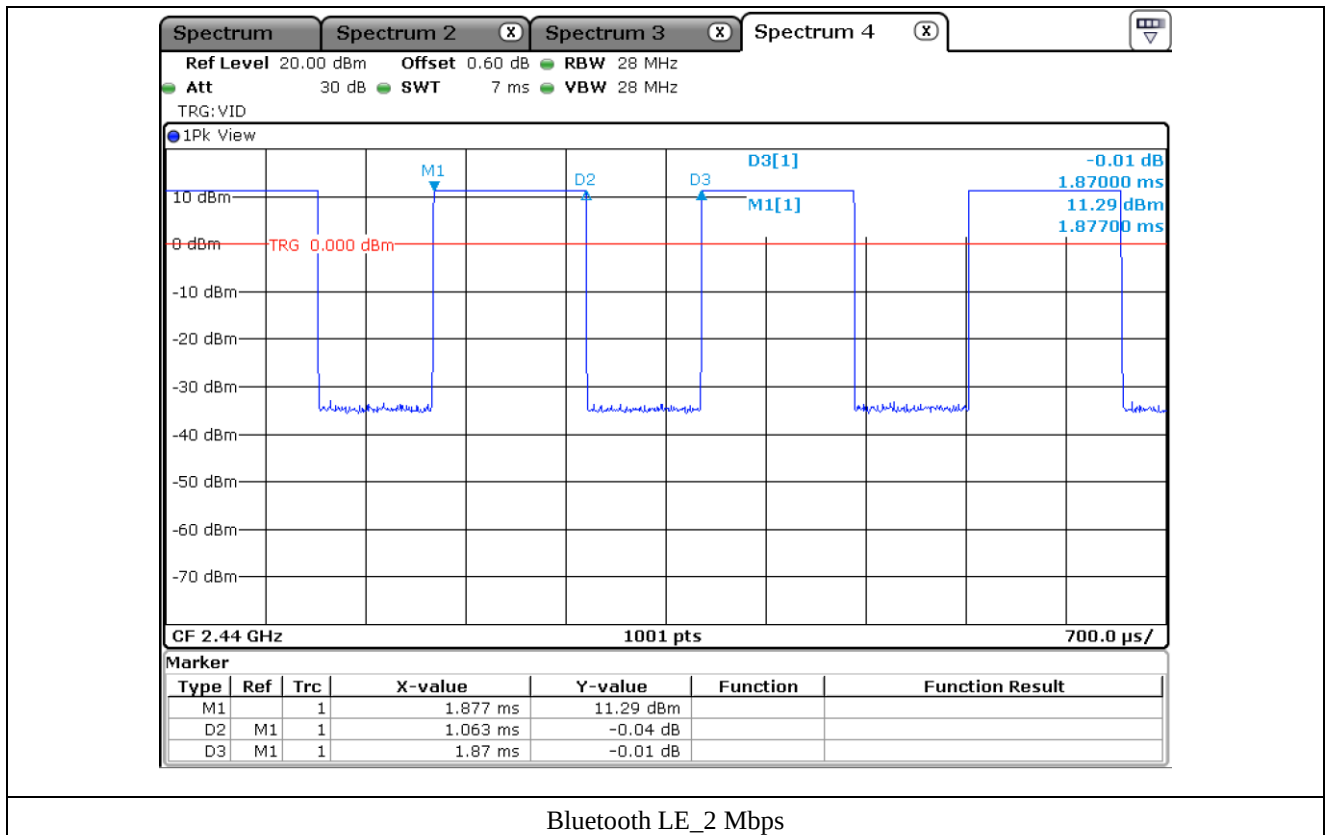
Mode	Tx On Time [ms]	Tx Off Time [ms]	Duty Cycle [%]	Correction Factor [dB]
Bluetooth LE [1 Mbps]	2.120	0.380	84.80	0.72
Bluetooth LE [2 Mbps]	1.063	0.807	56.84	2.45

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : $10 * \log(1 / (\text{Duty Cycle} / 100))$

-. Test Plot





5.4 Configuration of Test System

Line Conducted Test: The EUT was connected to USB and the power of USB was connected to Notebook PC. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2020 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2020 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter Semi Anechoic Chamber.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.5 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The antenna of the EUT is a Chip Antenna on the main board in the EUT, so no consideration of replacement by the user.

6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

6.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

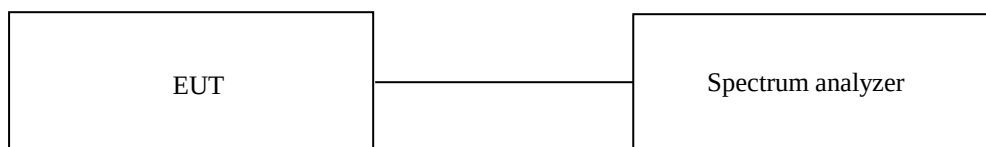
7. MINIMUM 6 dB BANDWIDTH

7.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 % R.H.

7.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



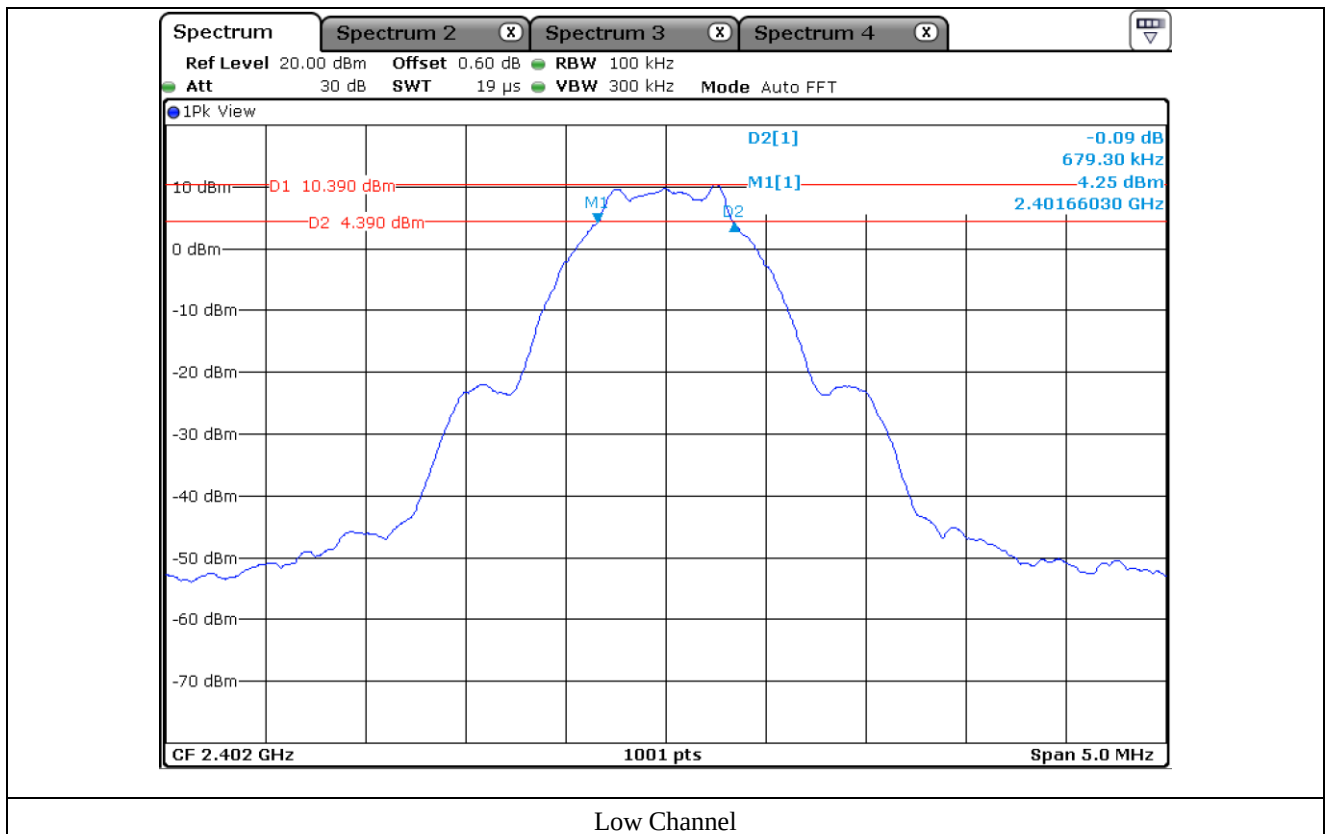
7.3 Test Date

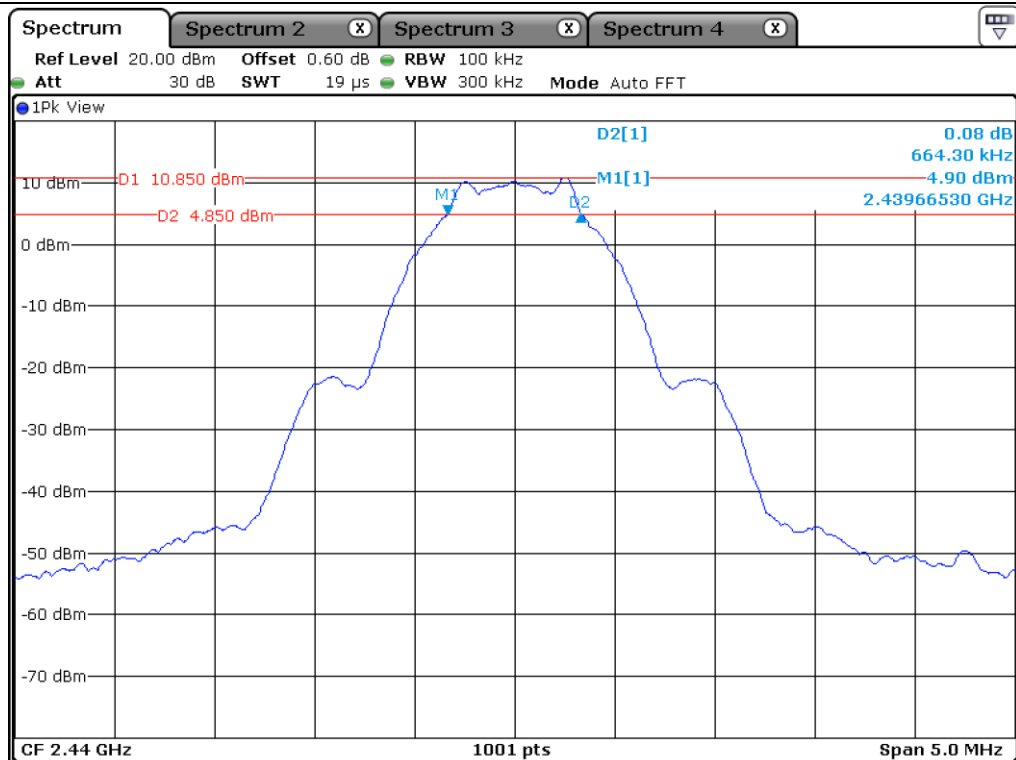
October 07, 2021 ~ October 20, 2021

7.4 Test data for 1 Mbps

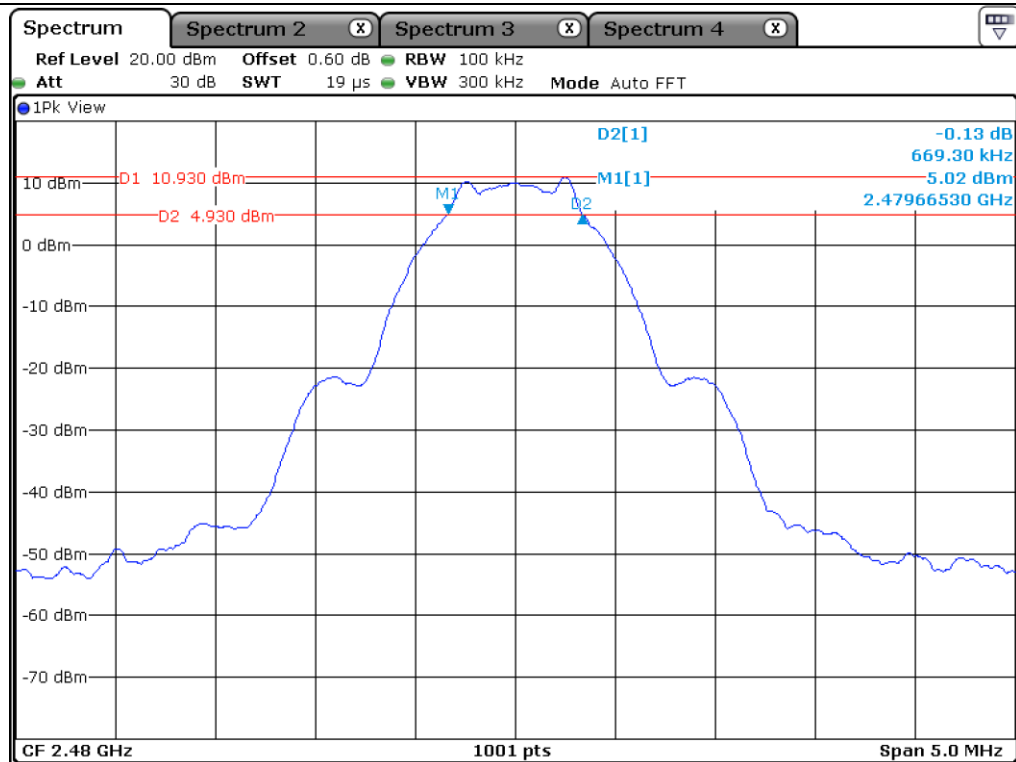
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402.00	679.30	500.00	179.30
Middle	2 440.00	664.30	500.00	164.30
High	2 480.00	669.30	500.00	169.30

Remark. Margin = Measured Value - Limit





Middle Channel



High Channel

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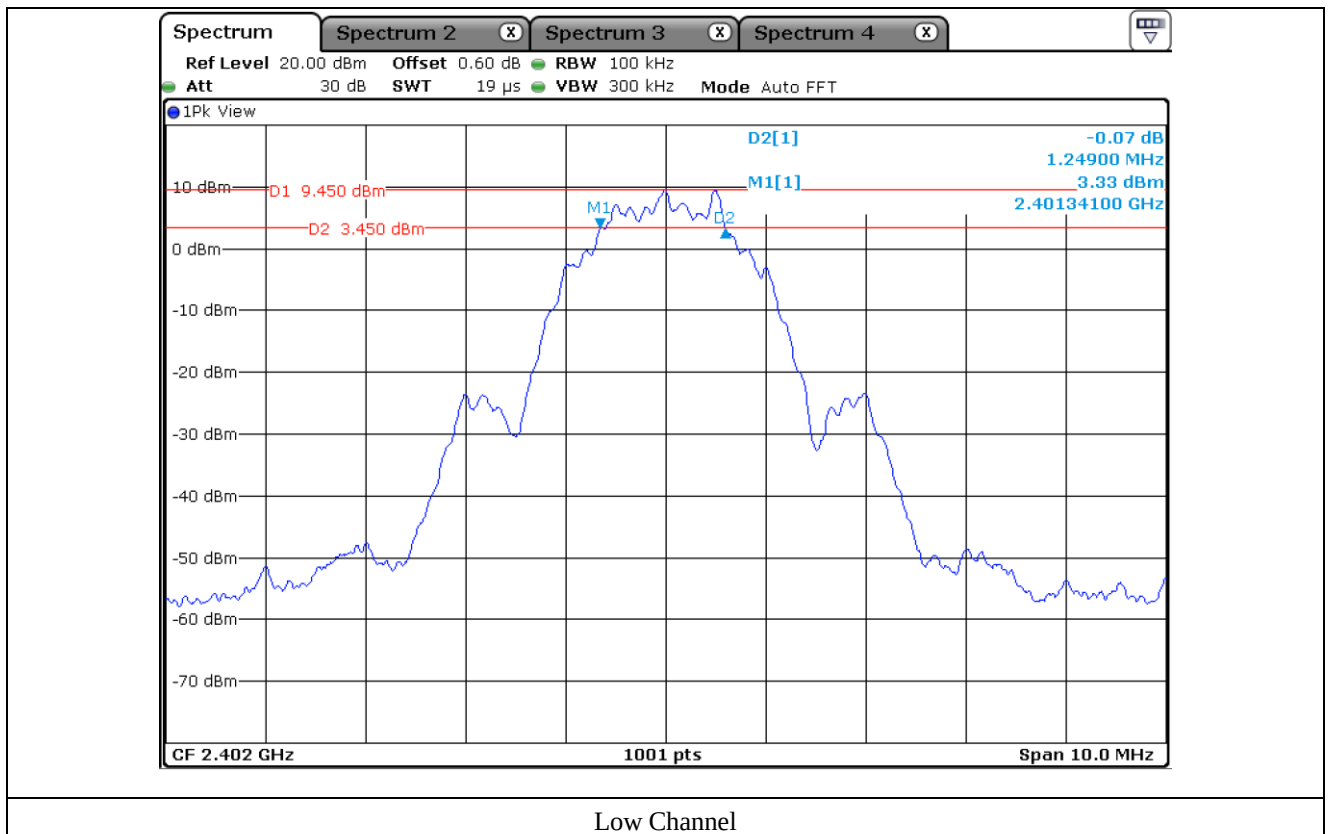
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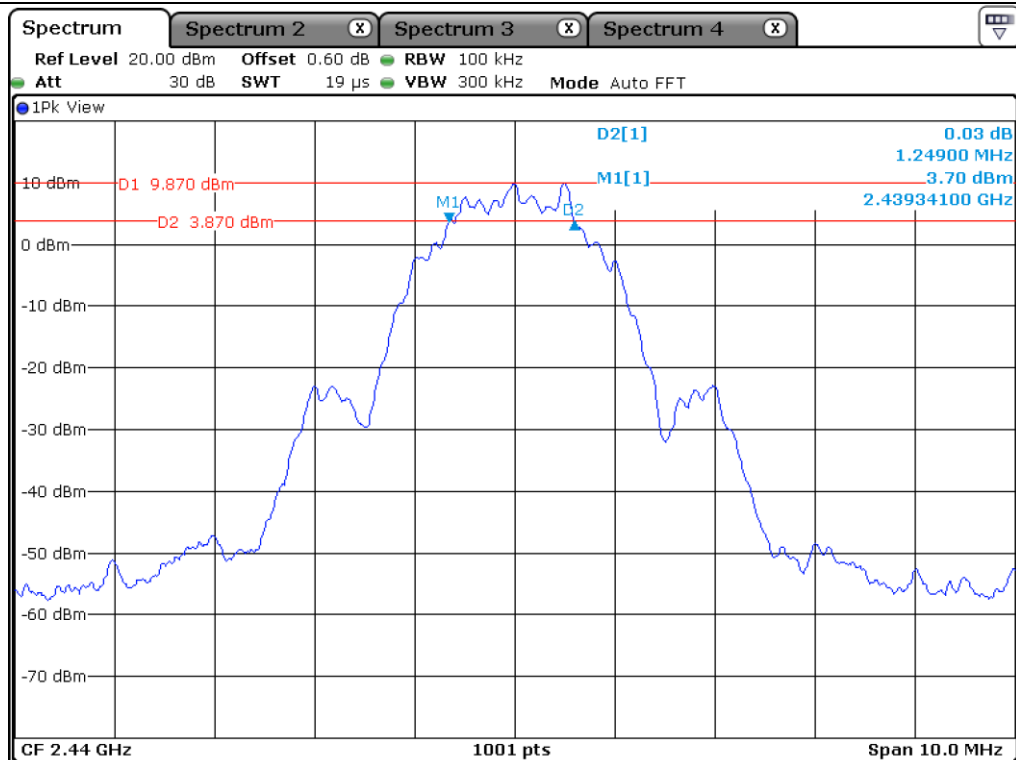
ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

7.5 Test data for 2 Mbps

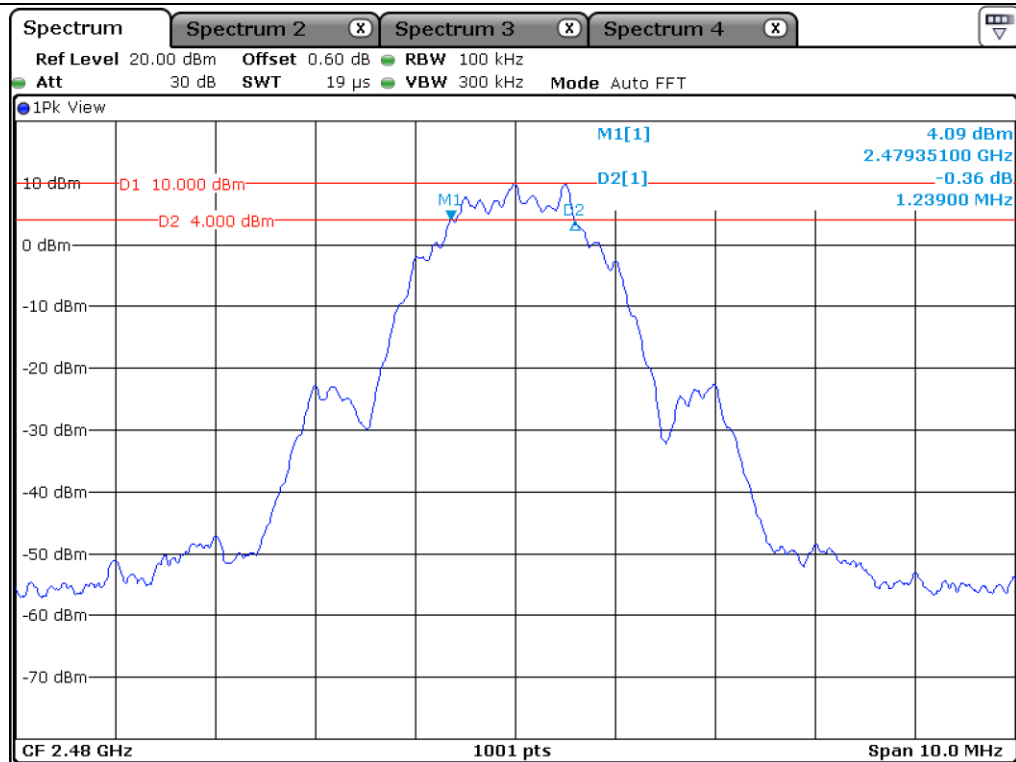
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402.00	1 249.00	500.00	749.00
Middle	2 440.00	1 249.00	500.00	749.00
High	2 480.00	1 239.00	500.00	739.00

Remark. Margin = Measured Value - Limit





Middle Channel



High Channel

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8. MAXIMUM PEAK OUTPUT POWER

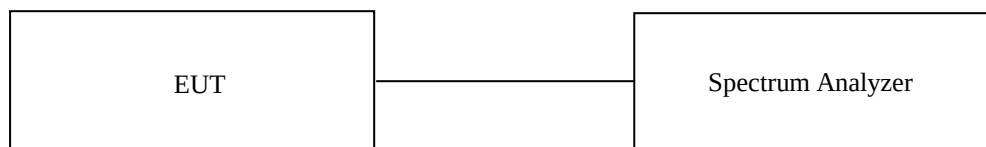
8.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 % R.H.

8.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to $\geq$ DTS Bandwidth, the video bandwidth is set to 3 times the resolution bandwidth.



8.3 Test Date

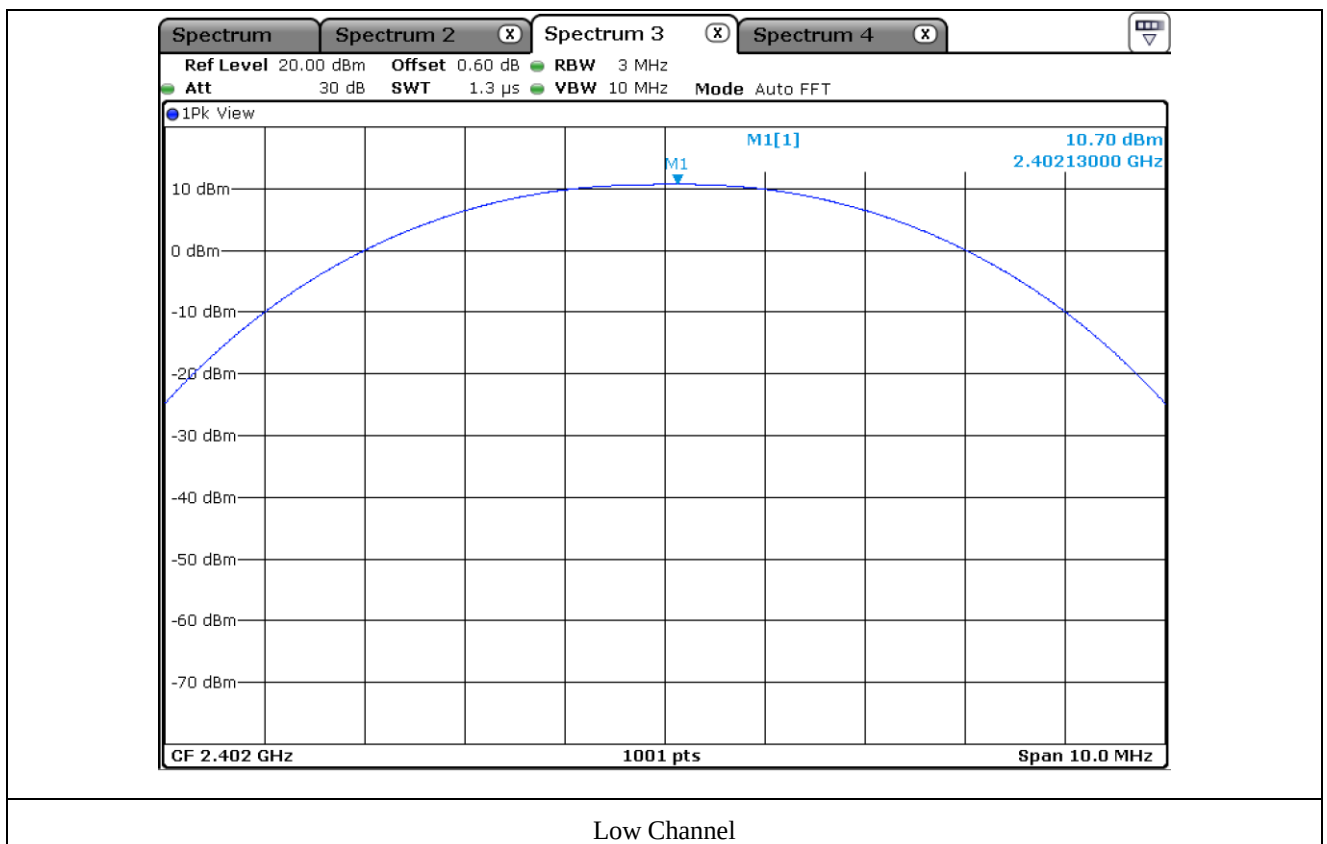
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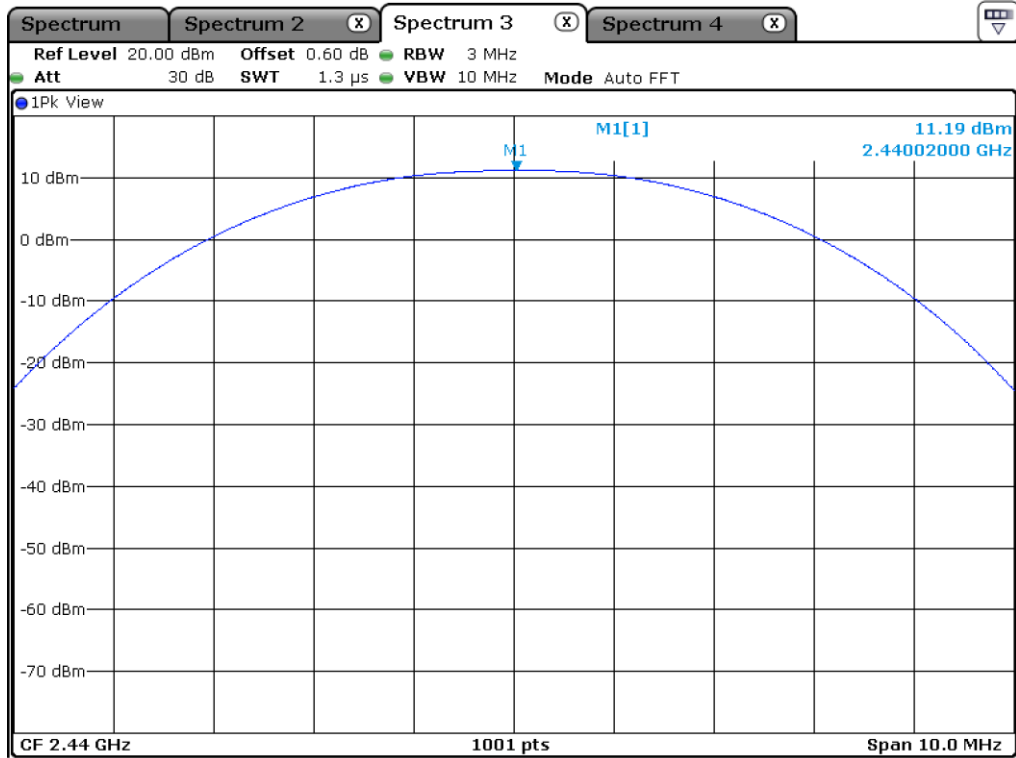
8.4 Test data for 1 Mbps

-. Test Result : Pass

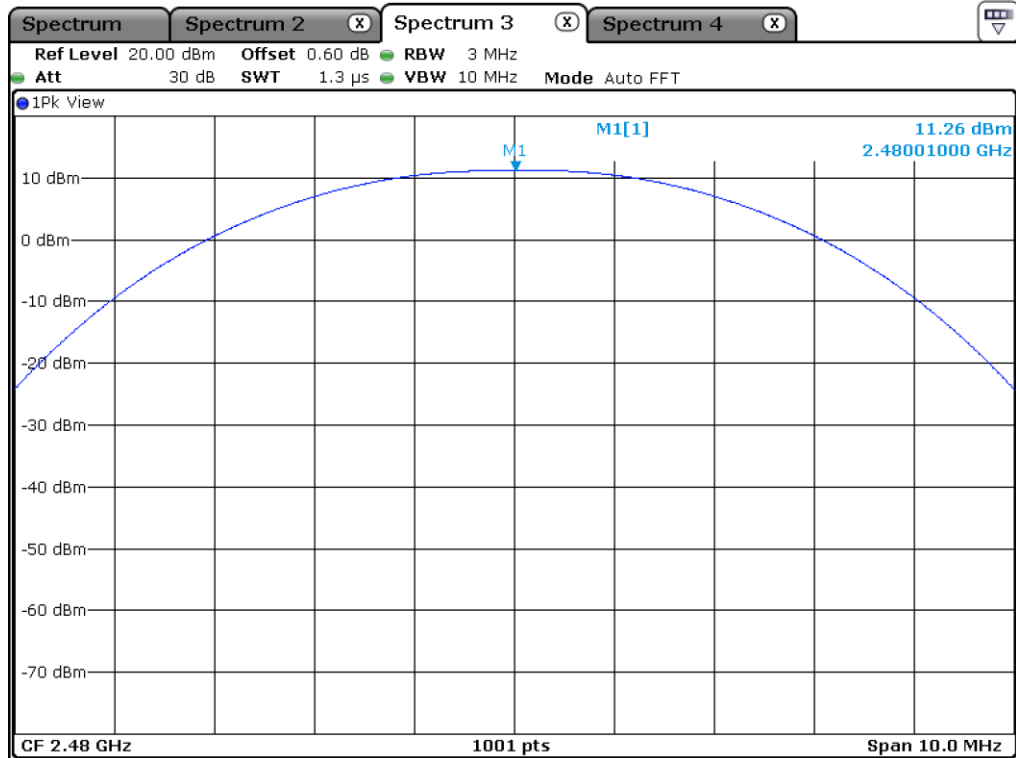
CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402.00	10.70	30.00	19.30
MIDDLE	2 440.00	11.19	30.00	18.81
HIGH	2 480.00	11.26	30.00	18.74

Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)





Middle Channel



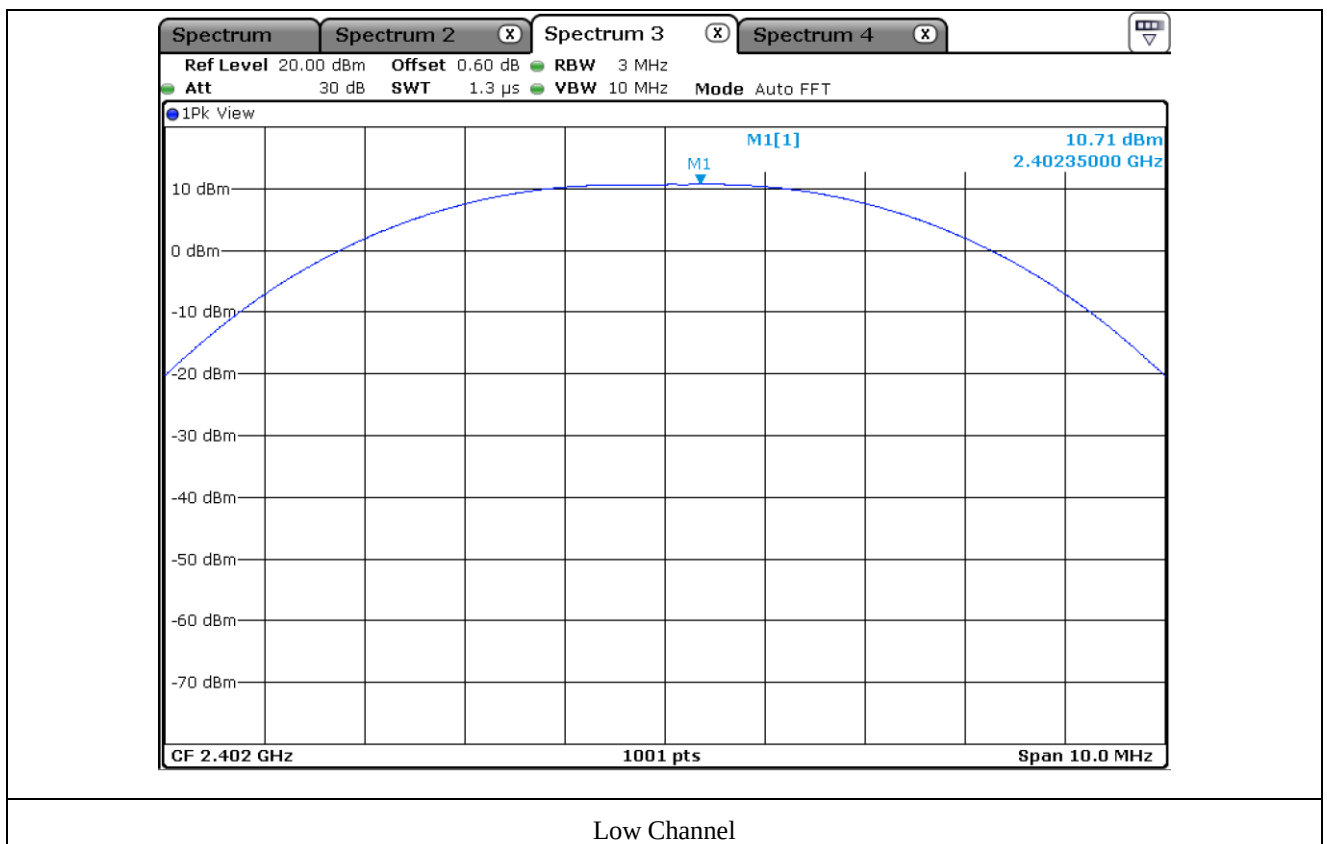
High Channel

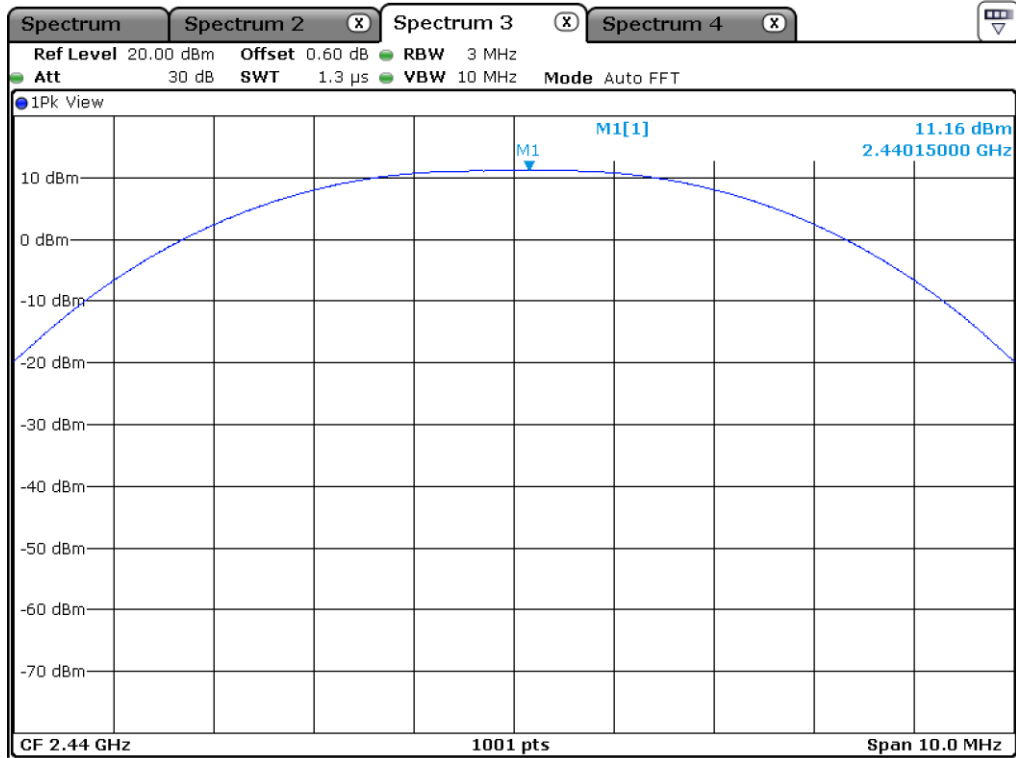
8.5 Test data for 2 Mbps

-. Test Result : Pass

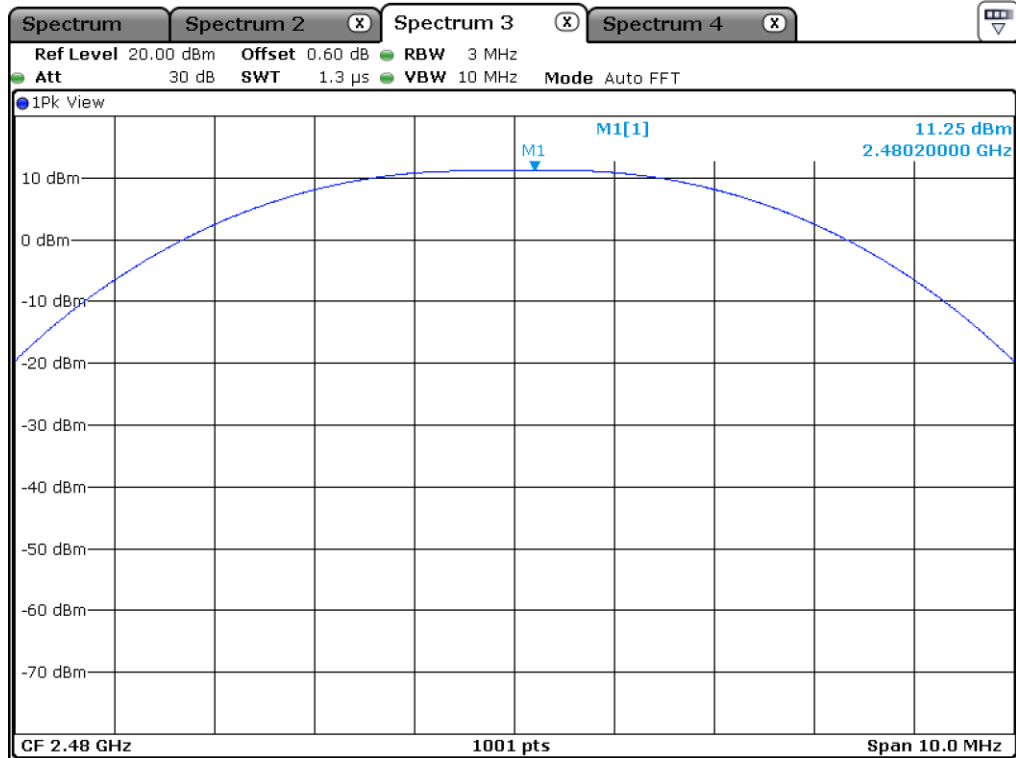
CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402.00	10.71	30.00	19.29
MIDDLE	2 440.00	11.16	30.00	18.84
HIGH	2 480.00	11.25	30.00	18.75

Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)





Middle Channel



High Channel

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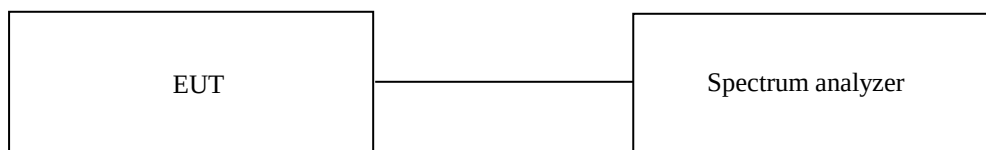
9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

9.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 % R.H.

9.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, the video bandwidth is set to 3 times the resolution bandwidth and peak detection was used.



9.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m semi anechoic chamber. The EUT was placed on turntable approximately 1.5 m above the ground plane.

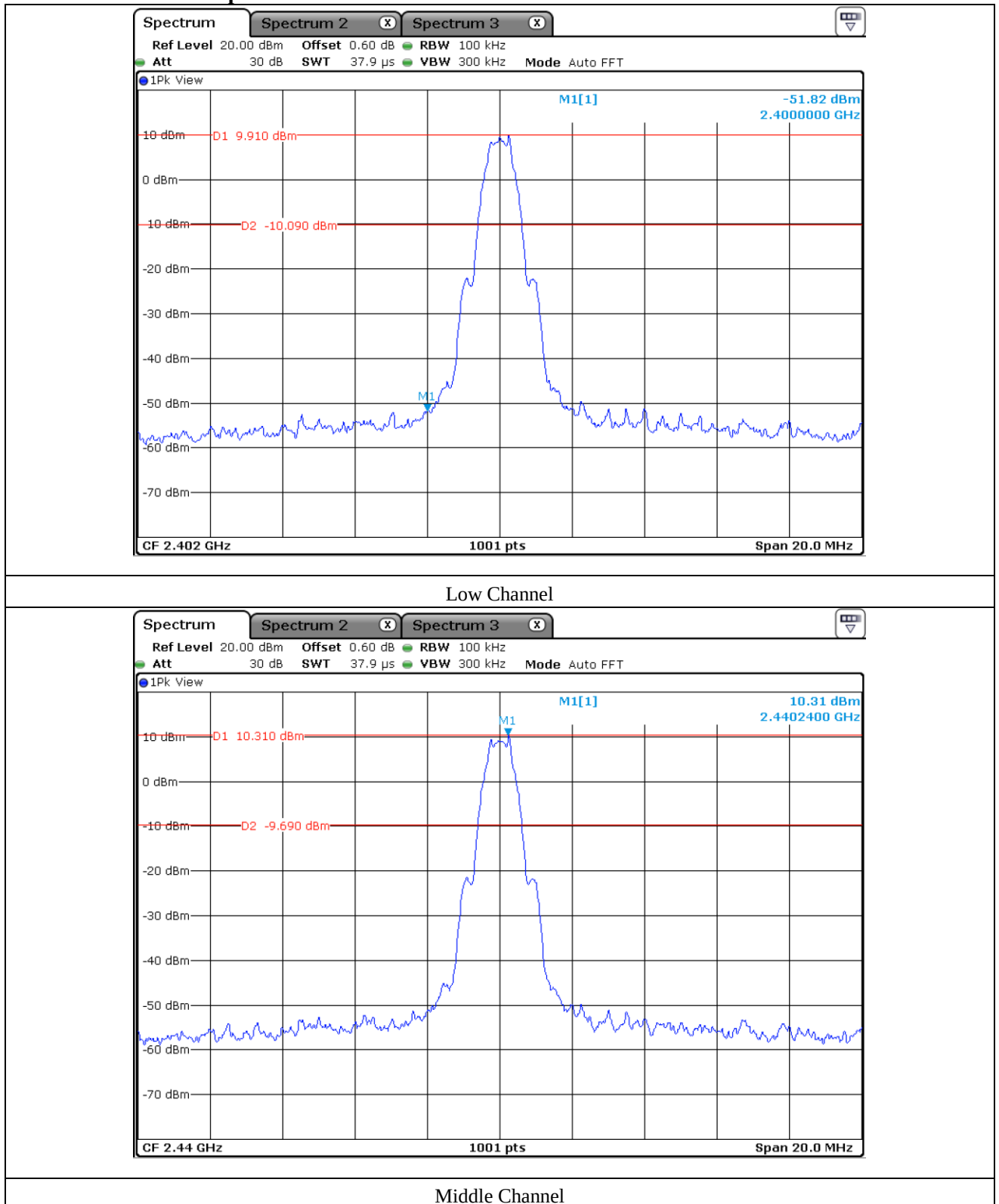
The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

9.4 Test Date

October 07, 2021 ~ October 20, 2021

9.5 Test data for conducted emission

9.5.1 Test data for 1 Mbps

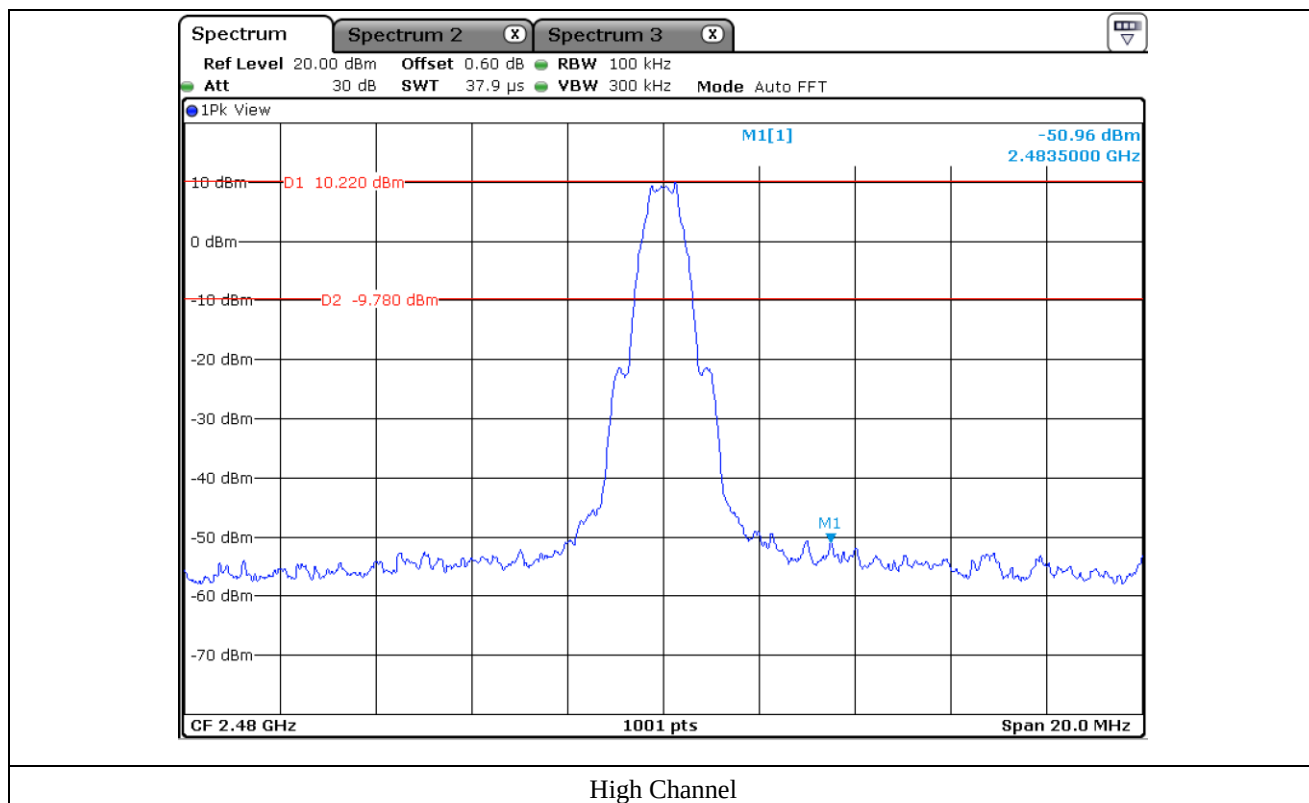


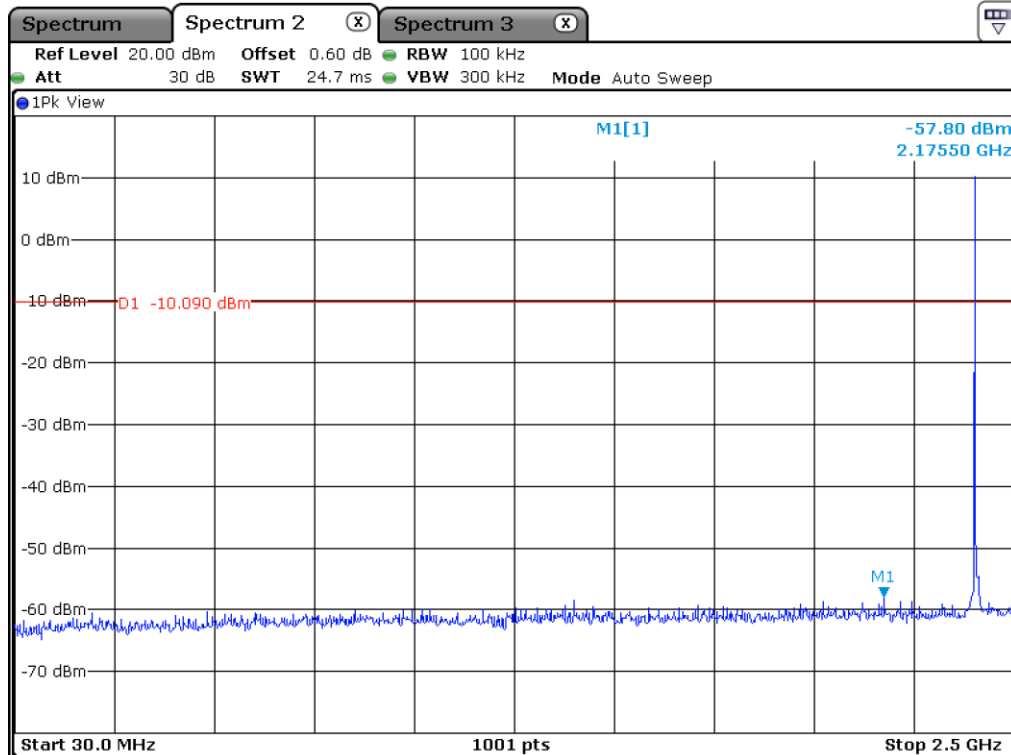
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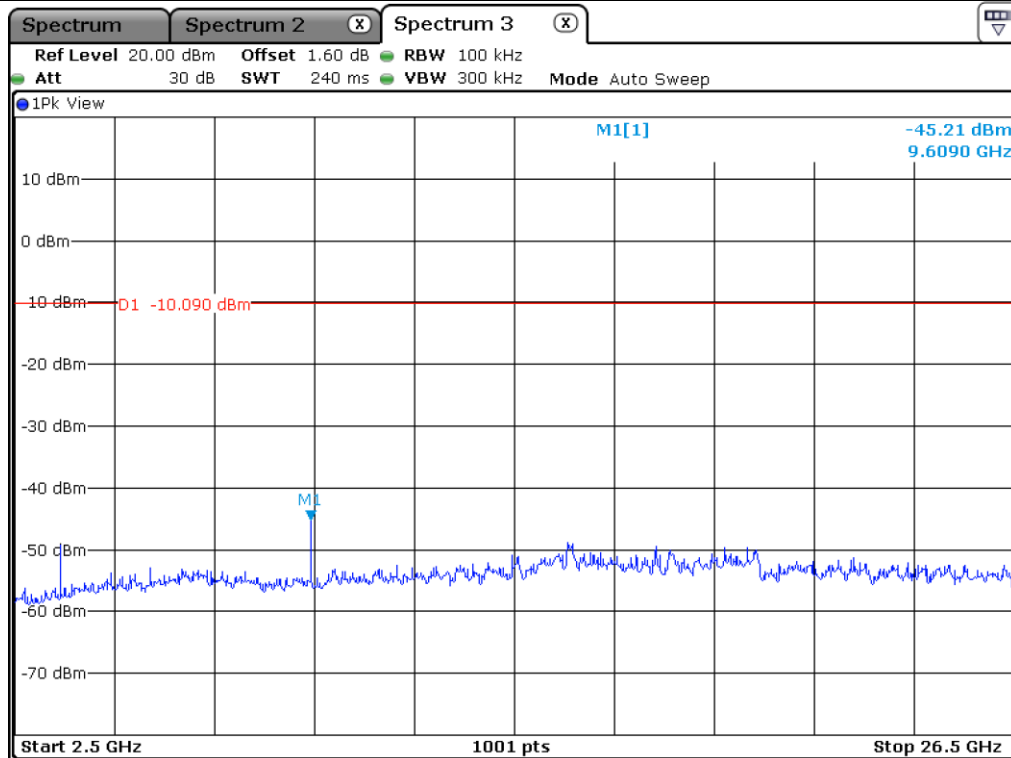
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Low Channel



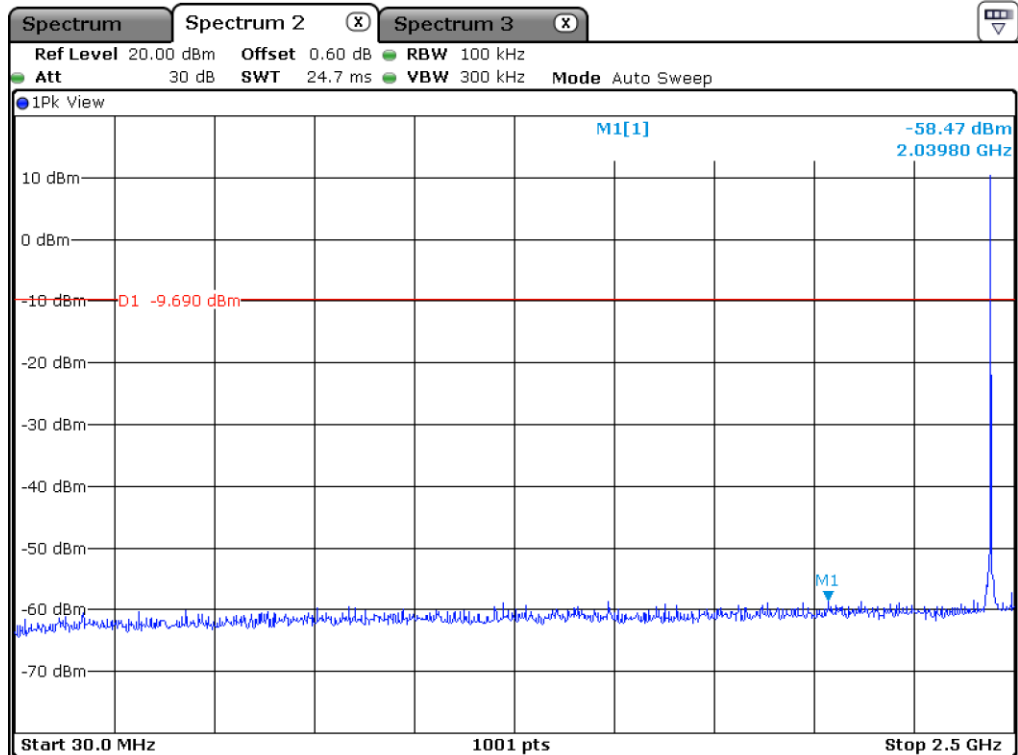
Low Channel

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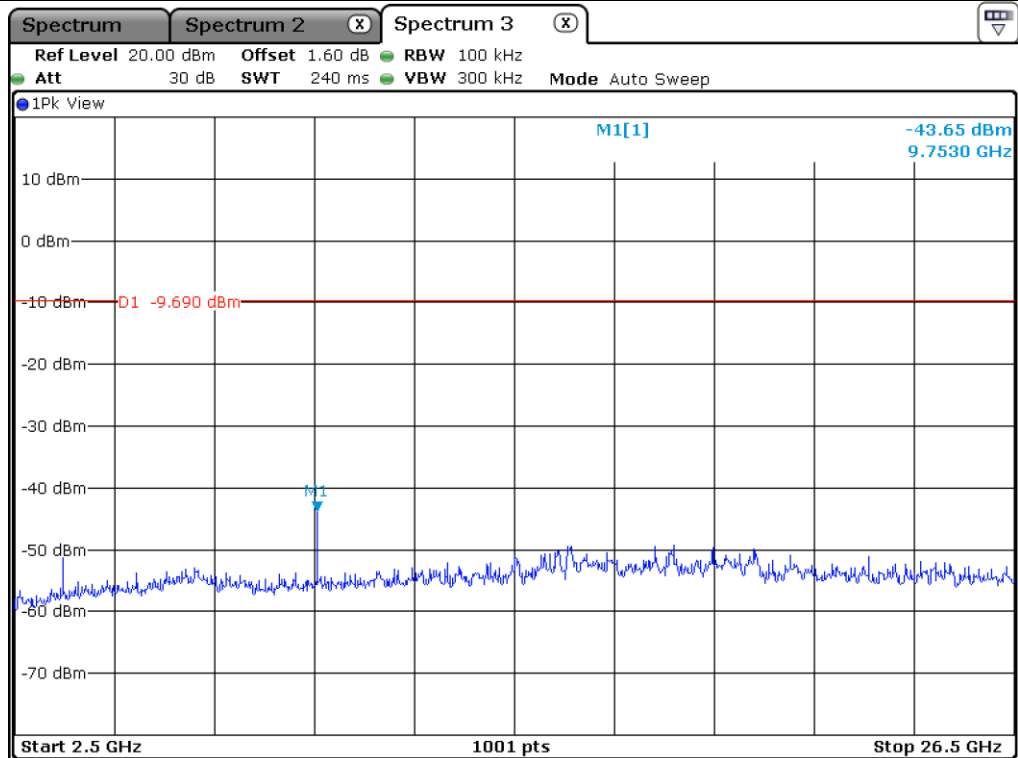
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Middle Channel



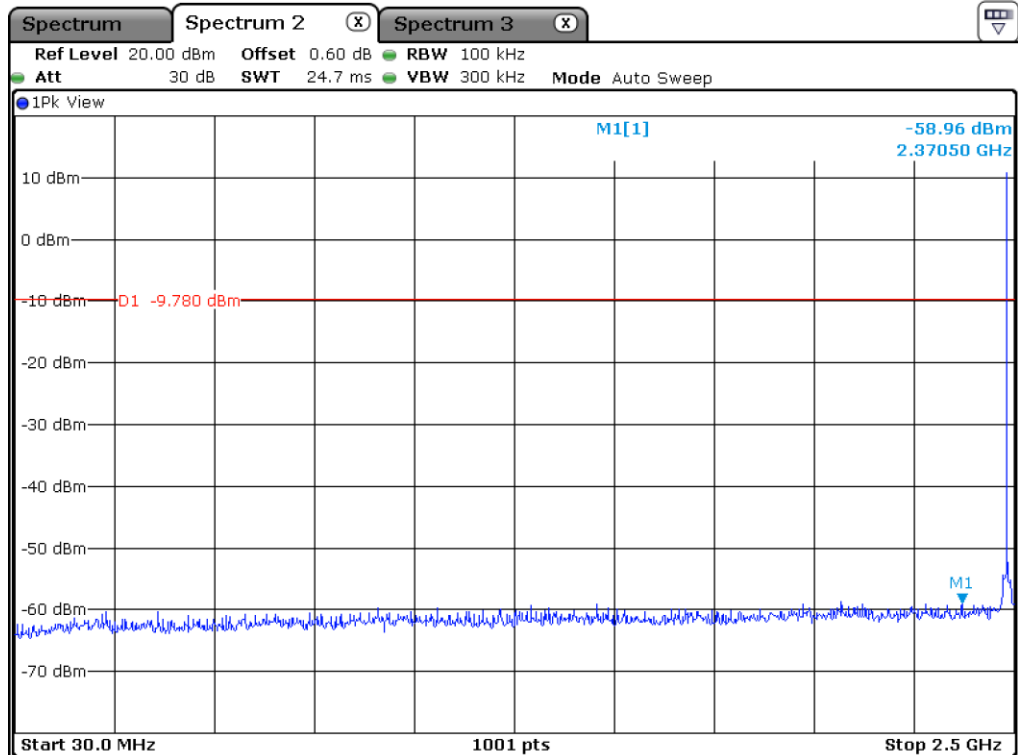
Middle Channel

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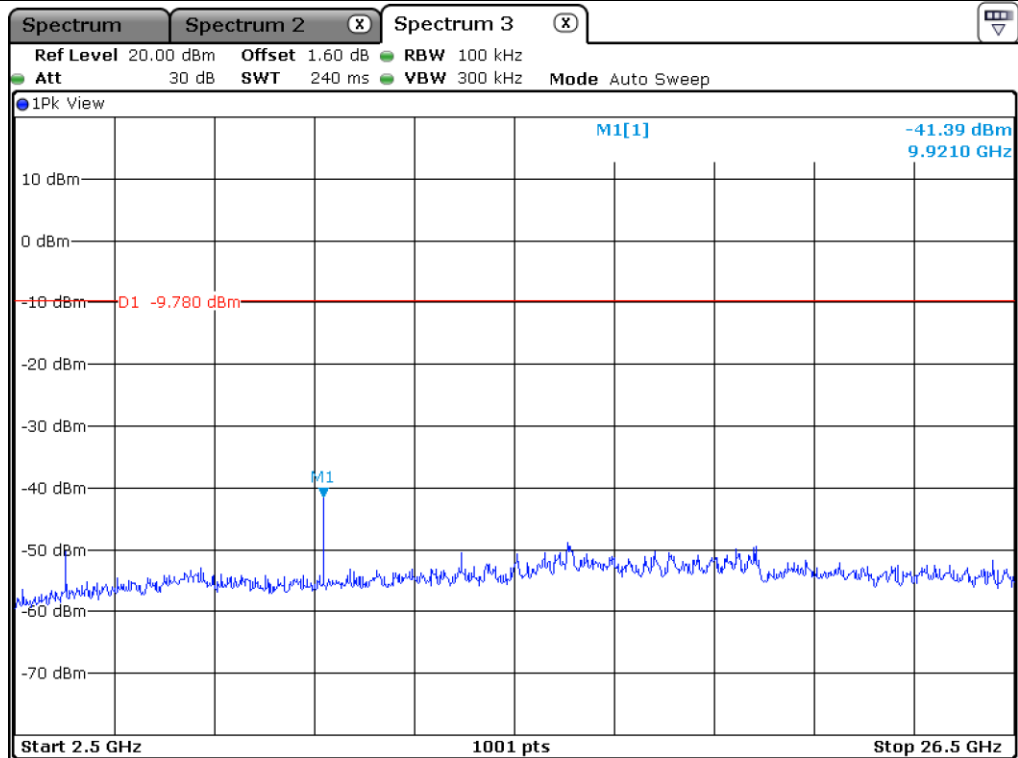
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High Channel



High Channel

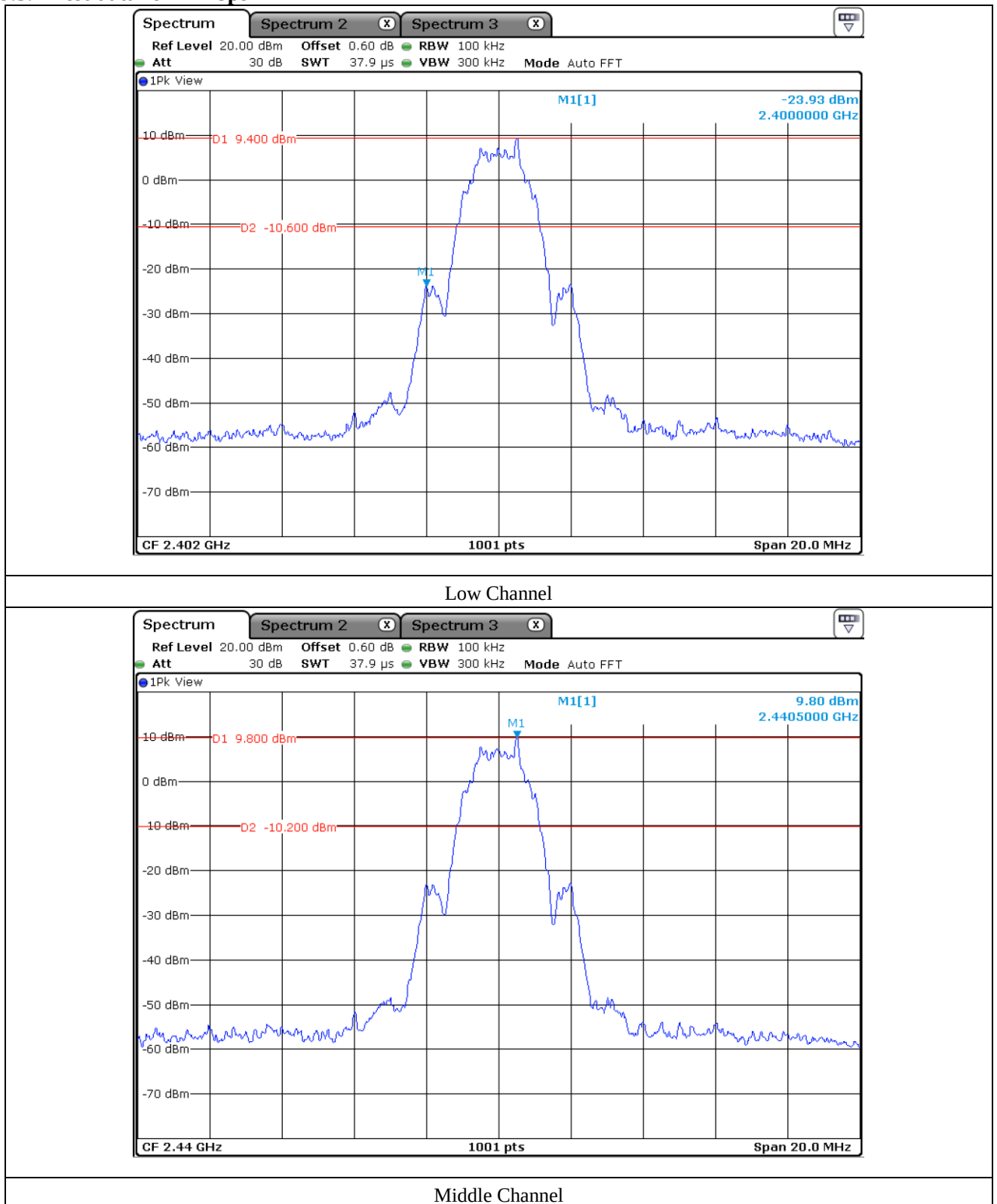
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9.5.2 Test data for 2 Mbps

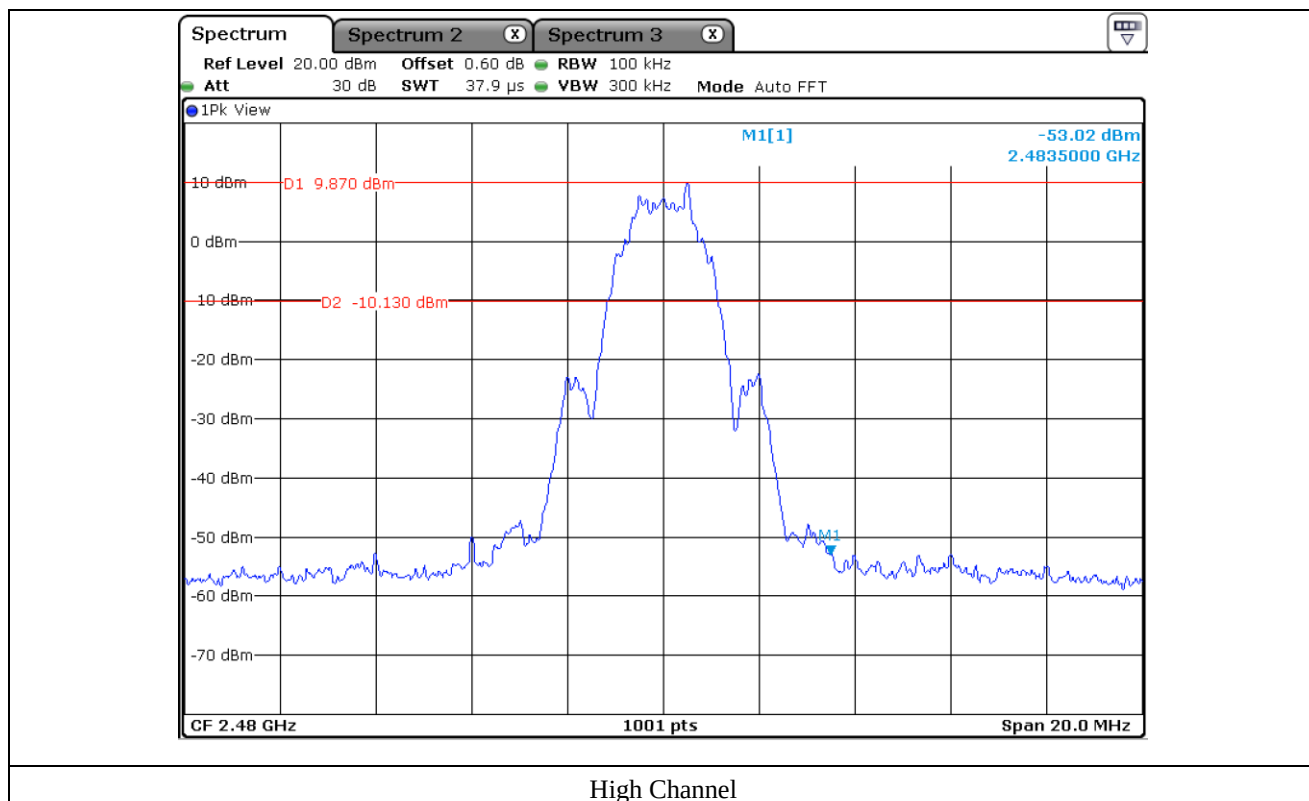


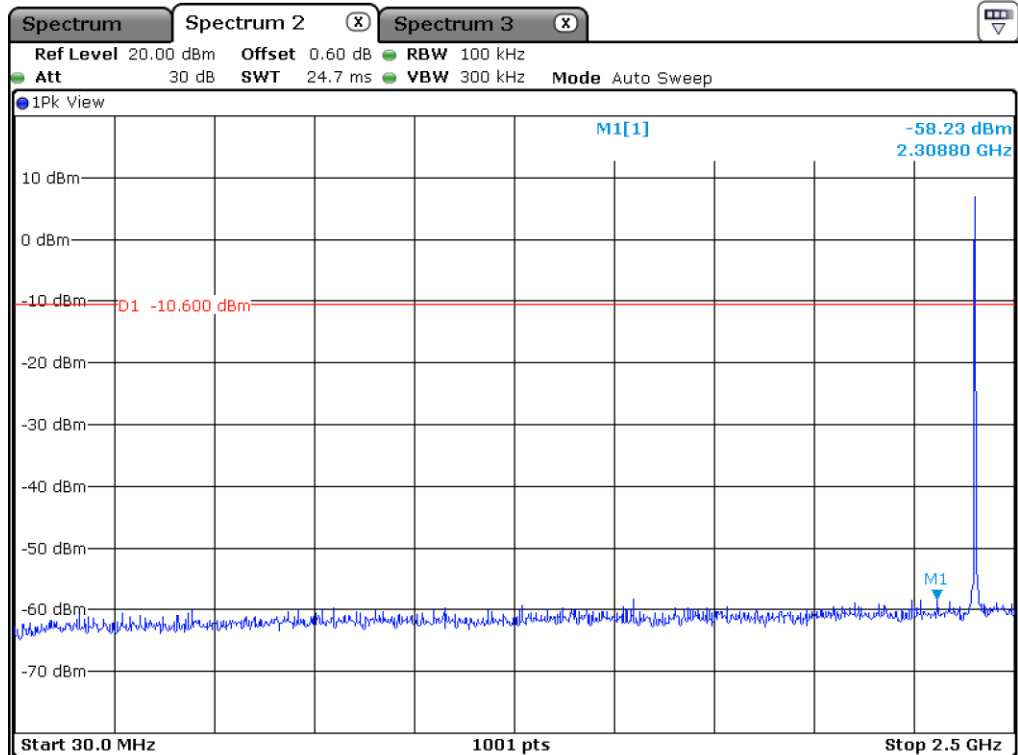
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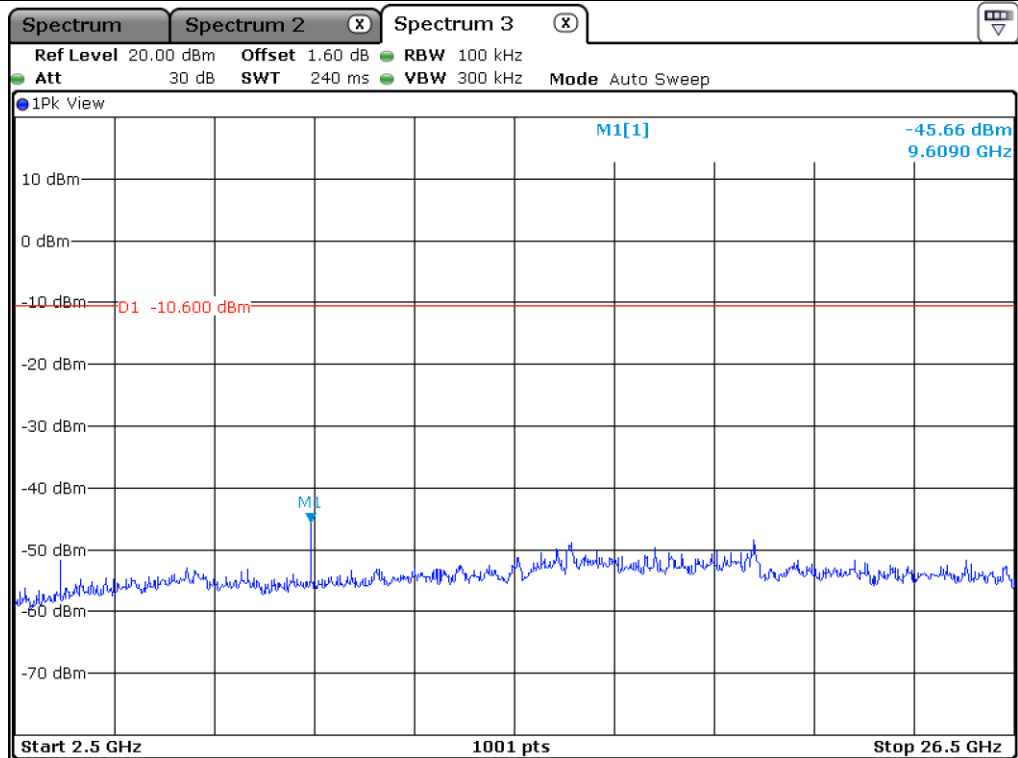
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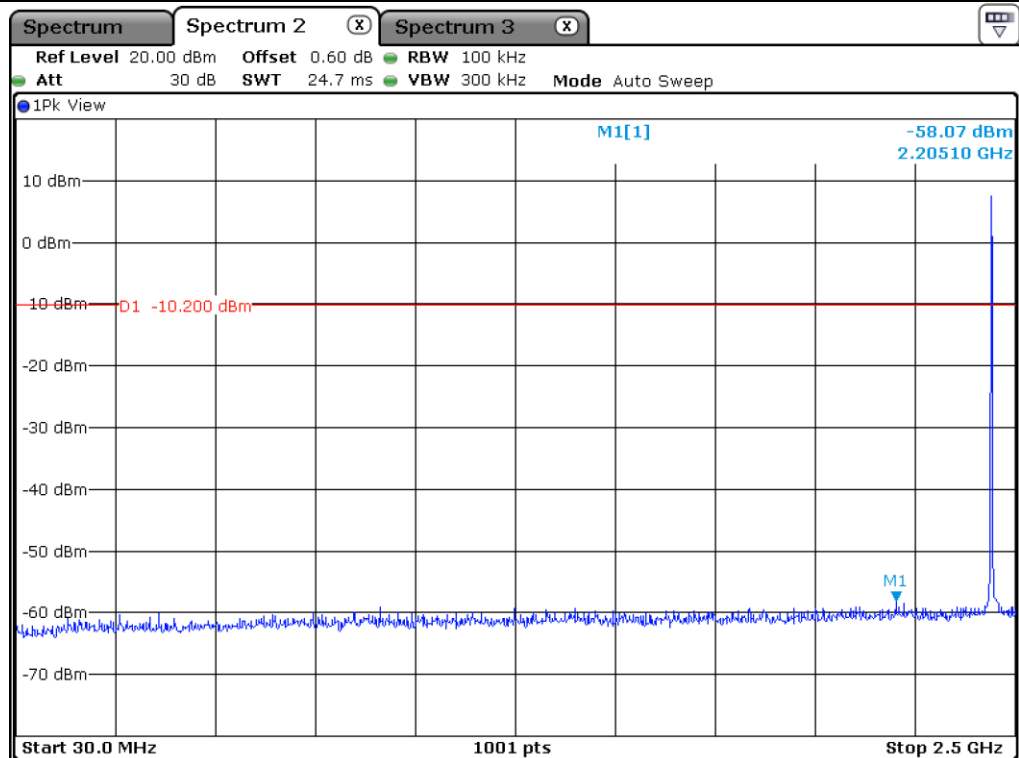




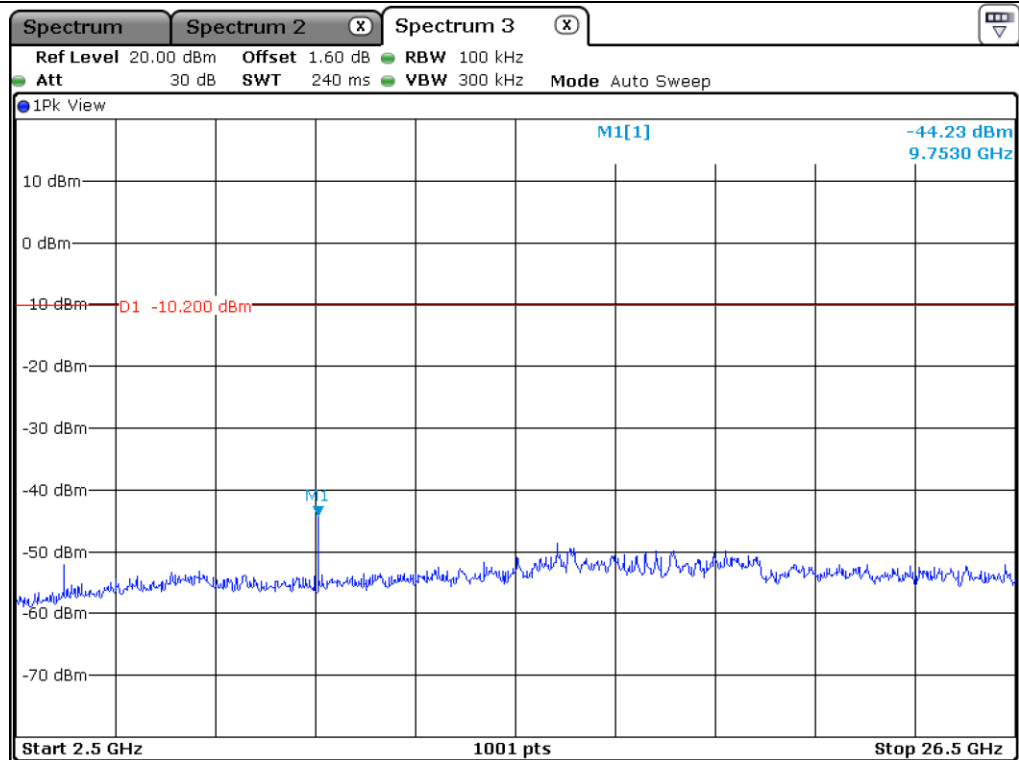
Low Channel



Low Channel



Middle Channel



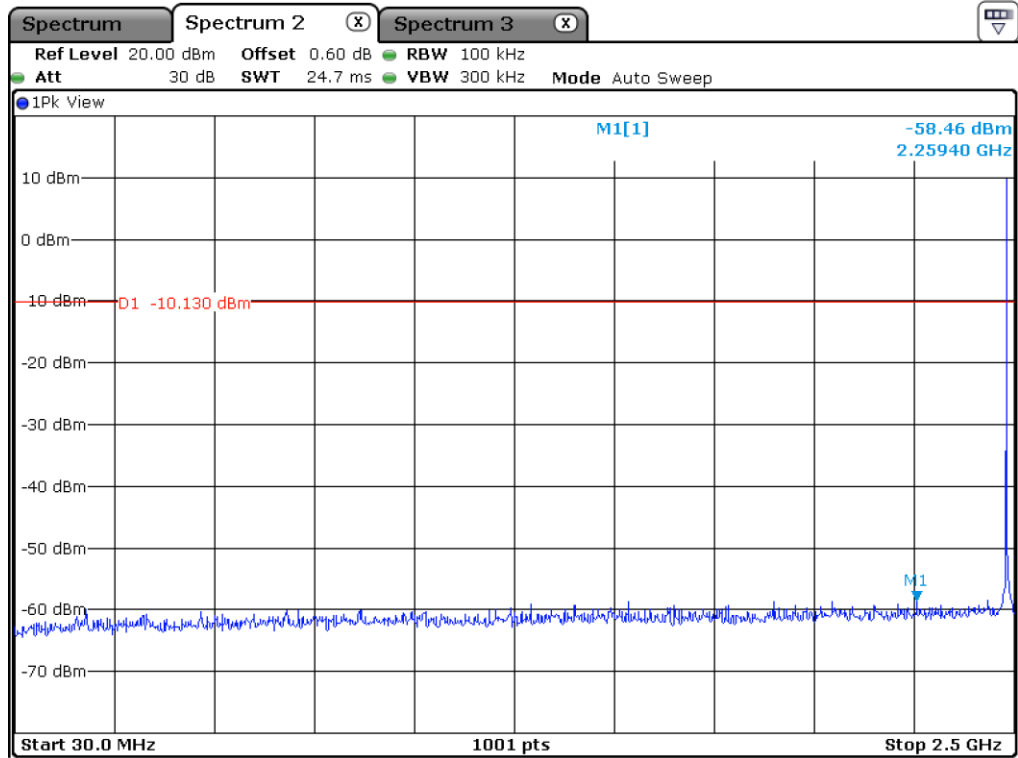
Middle Channel

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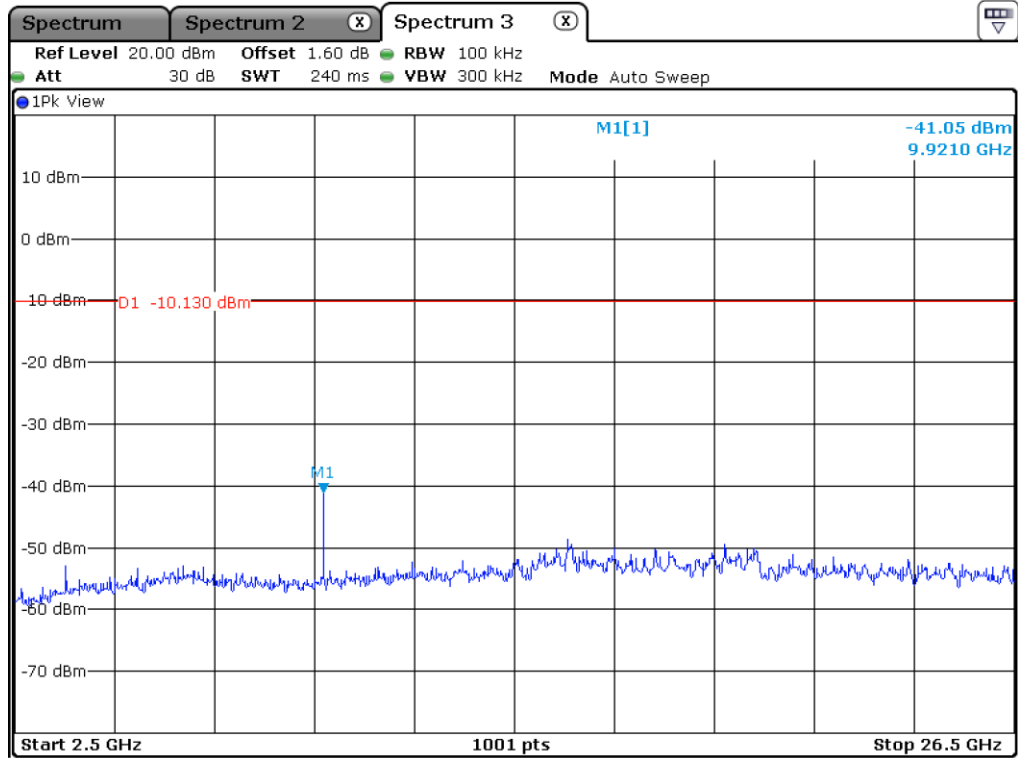
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High Channel



High Channel

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9.6 Test data for radiated emission

9.6.1 Radiated Emission which fall in the Restricted Band

9.6.1.1 Test data for 1 Mbps

- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 84.80 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
2 362.48	51.86	Peak	H	27.50	8.20	45.79	-	41.77	74.00	32.23
2 390.00	42.61	Average	H	27.50	8.20	45.79	0.72	33.24	54.00	20.76
2 320.58	51.20	Peak	V	27.50	8.20	45.79	-	41.11	74.00	32.89
2 390.00	42.50	Average	V	27.50	8.20	45.79	0.72	33.13	54.00	20.87
Test Data for High Channel										
2 483.50	57.46	Peak	H	27.30	8.33	45.79		47.30	74.00	26.70
2 483.50	47.94	Average	H	27.30	8.33	45.79	0.72	38.50	54.00	15.50
2 483.50	57.20	Peak	V	27.30	8.33	45.79		47.04	74.00	26.96
2 483.50	47.47	Average	V	27.30	8.33	45.79	0.72	38.03	54.00	15.97

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{AMP Gain} + \text{Duty Factor}$$

9.6.1.2 Test data for 2 Mbps

- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 56.84 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
2 337.85	51.90	Peak	H	27.50	8.20	45.79	-	41.81	74.00	32.19
2 390.00	42.67	Average	H	27.50	8.20	45.79	2.45	35.03	54.00	18.97
2 362.03	51.14	Peak	V	27.50	8.20	45.79	-	41.05	74.00	32.95
2 390.00	42.50	Average	V	27.50	8.20	45.79	2.45	34.86	54.00	19.14
Test Data for High Channel										
2 483.50	60.79	Peak	H	27.30	8.33	45.79	-	50.63	74.00	23.37
2 483.50	52.13	Average	H	27.30	8.33	45.79	2.45	44.42	54.00	9.58
2 483.50	60.08	Peak	V	27.30	8.33	45.79	-	49.92	74.00	24.08
2 483.50	51.15	Average	V	27.30	8.33	45.79	2.45	43.44	54.00	10.56

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{AMP Gain} + \text{Duty Factor}$$

9.6.2 Spurious & Harmonic Radiated Emission

9.6.2.1 Test data for 1 Mbps

- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
1 MHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Frequency range : 1 GHz ~ 26.5 GHz
- . Measurement distance : 3 m
- . Duty Cycle : 84.80 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 804.00	49.29	Peak	H	31.10	11.19	45.10	-	46.48	74.00	27.52
4 804.00	39.40	Average	H	31.10	11.19	45.10	0.72	37.31	54.00	16.69
4 804.00	49.20	Peak	V	31.10	11.19	45.10	-	46.39	74.00	27.61
4 804.00	39.36	Average	V	31.10	11.19	45.10	0.72	37.27	54.00	16.73
Test Data for Middle Channel										
4 880.00	49.33	Peak	H	31.10	11.24	45.10	-	46.57	74.00	27.43
4 880.00	39.39	Average	H	31.10	11.24	45.10	0.72	37.35	54.00	16.65
4 880.00	49.28	Peak	V	31.10	11.24	45.10	-	46.52	74.00	27.48
4 880.00	39.26	Average	V	31.10	11.24	45.10	0.72	37.22	54.00	16.78
Test Data for High Channel										
4 960.00	49.43	Peak	H	31.20	11.33	45.03	-	46.93	74.00	27.07
4 960.00	39.45	Average	H	31.20	11.33	45.03	0.72	37.67	54.00	16.33
4 960.00	49.21	Peak	V	31.20	11.33	45.03	-	46.71	74.00	27.29
4 960.00	39.36	Average	V	31.20	11.33	45.03	0.72	37.58	54.00	16.42

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Total Level (dBμV/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{AMP Gain} + \text{Duty Factor}$$

9.6.2.2 Test data for 2 Mbps

- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
1 MHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Duty Cycle : 56.84 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 804.00	49.40	Peak	H	31.10	11.19	45.10	-	46.59	74.00	27.41
4 804.00	39.43	Average	H	31.10	11.19	45.10	2.45	39.07	54.00	14.93
4 804.00	49.45	Peak	V	31.10	11.19	45.10	-	46.64	74.00	27.36
4 804.00	39.25	Average	V	31.10	11.19	45.10	2.45	38.89	54.00	15.11
Test Data for Middle Channel										
4 880.00	49.46	Peak	H	31.10	11.24	45.10	-	46.70	74.00	27.30
4 880.00	39.44	Average	H	31.10	11.24	45.10	2.45	39.13	54.00	14.87
4 880.00	49.27	Peak	V	31.10	11.24	45.10	-	46.51	74.00	27.49
4 880.00	39.15	Average	V	31.10	11.24	45.10	2.45	38.84	54.00	15.16
Test Data for High Channel										
4 960.00	49.44	Peak	H	31.20	11.33	45.03	-	46.94	74.00	27.06
4 960.00	39.40	Average	H	31.20	11.33	45.03	2.45	39.35	54.00	14.65
4 960.00	49.37	Peak	V	31.20	11.33	45.03	-	46.87	74.00	27.13
4 960.00	39.17	Average	V	31.20	11.33	45.03	2.45	39.12	54.00	14.88

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Total Level (dBμV/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{AMP Gain} + \text{Duty Factor}$$

10. PEAK POWER SPECTRAL DENSITY

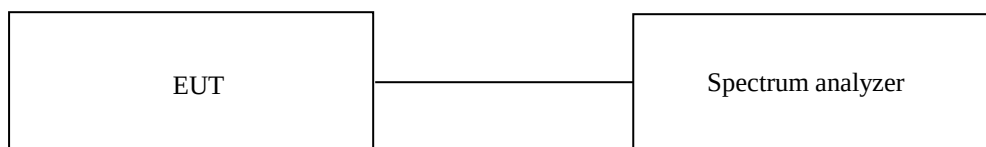
10.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 % R.H.

10.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$, the video bandwidth is set to 3 times the resolution bandwidth.



10.3 Test Date

October 07, 2021 ~ October 20, 2021

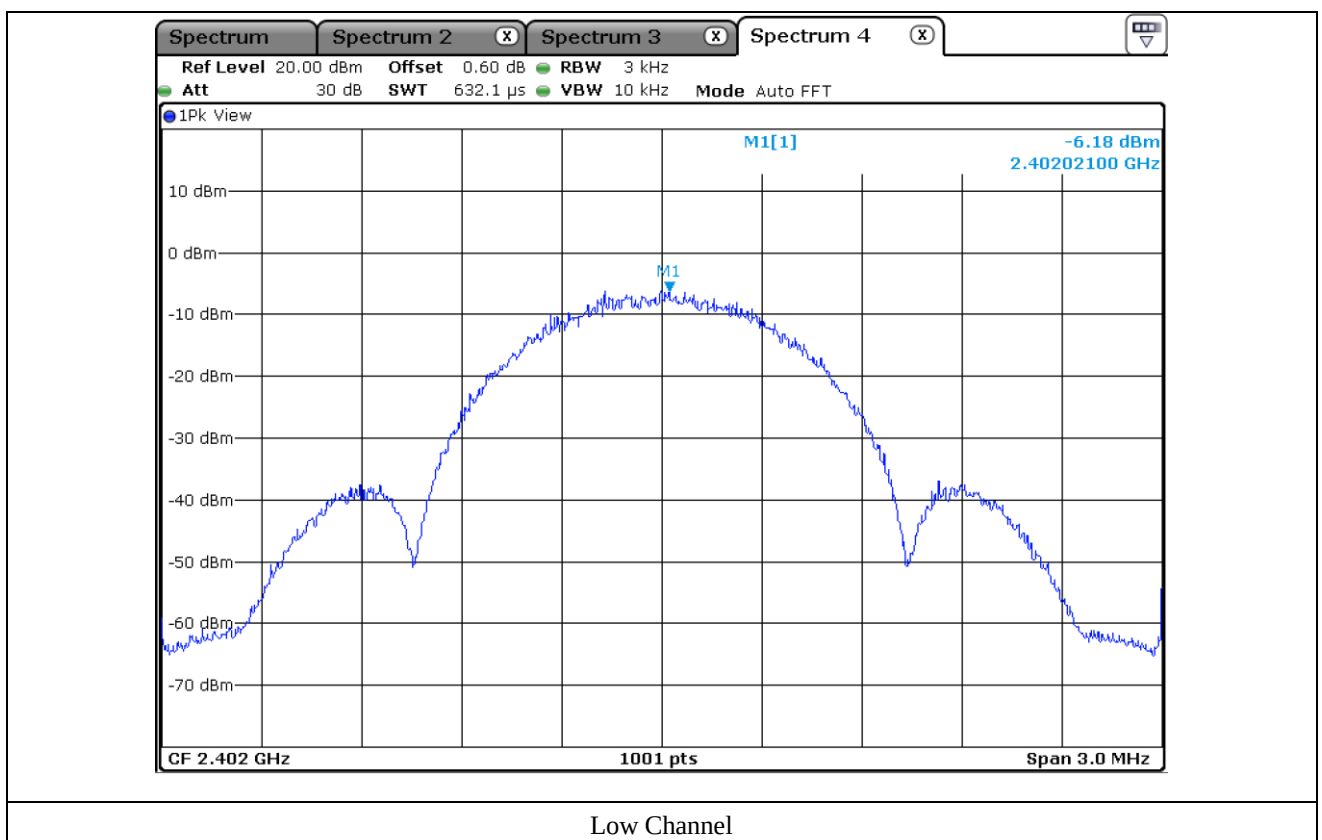
10.4 Test data for 1 Mbps

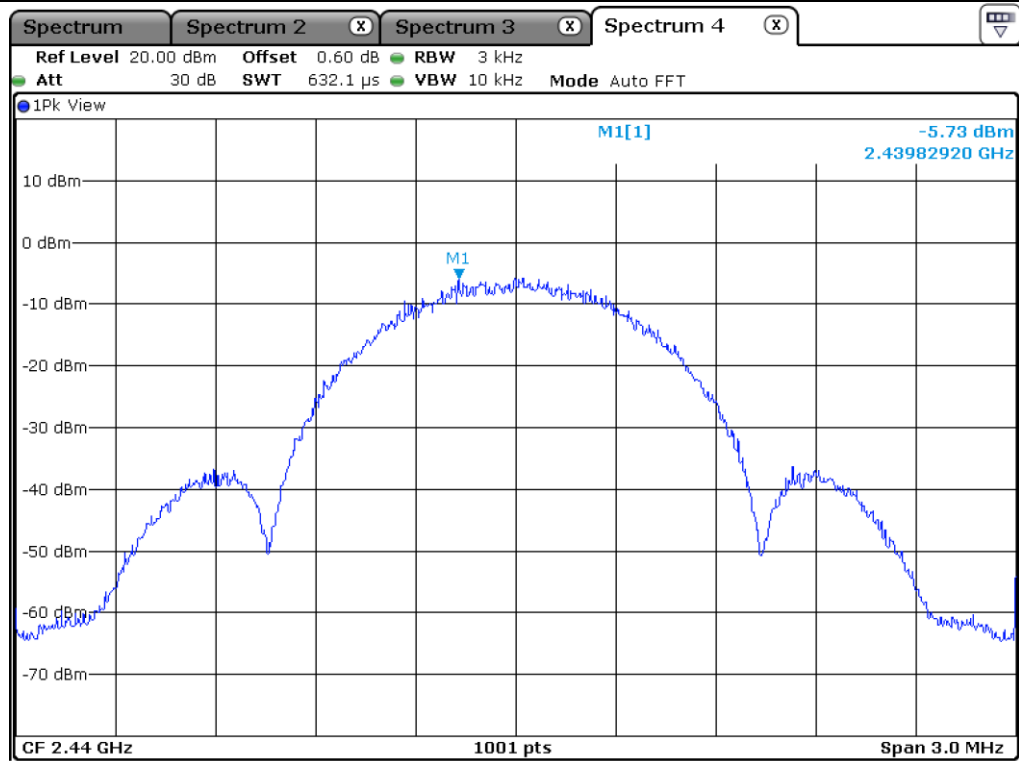
-. Test Result : Pass

-. Operating Condition : Continuous transmitting mode

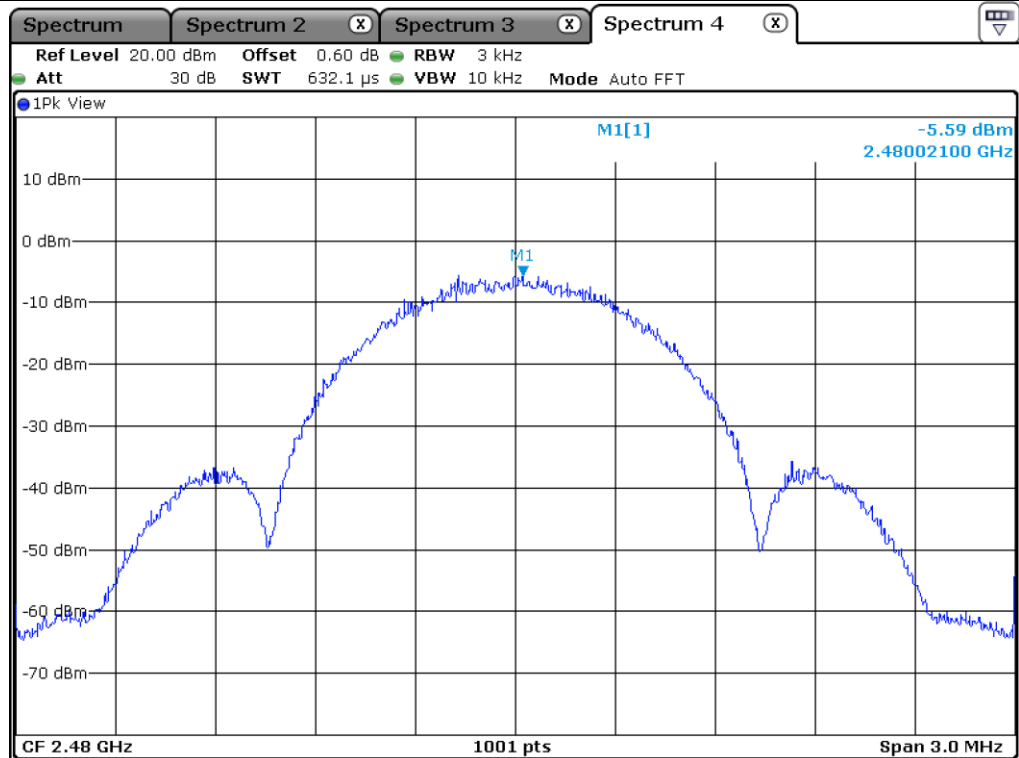
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402.00	-6.18	8.00	14.18
Middle	2 440.00	-5.73	8.00	13.73
High	2 480.00	-5.59	8.00	13.59

Remark. Margin = Limit – Measured value





Middle Channel



High Channel

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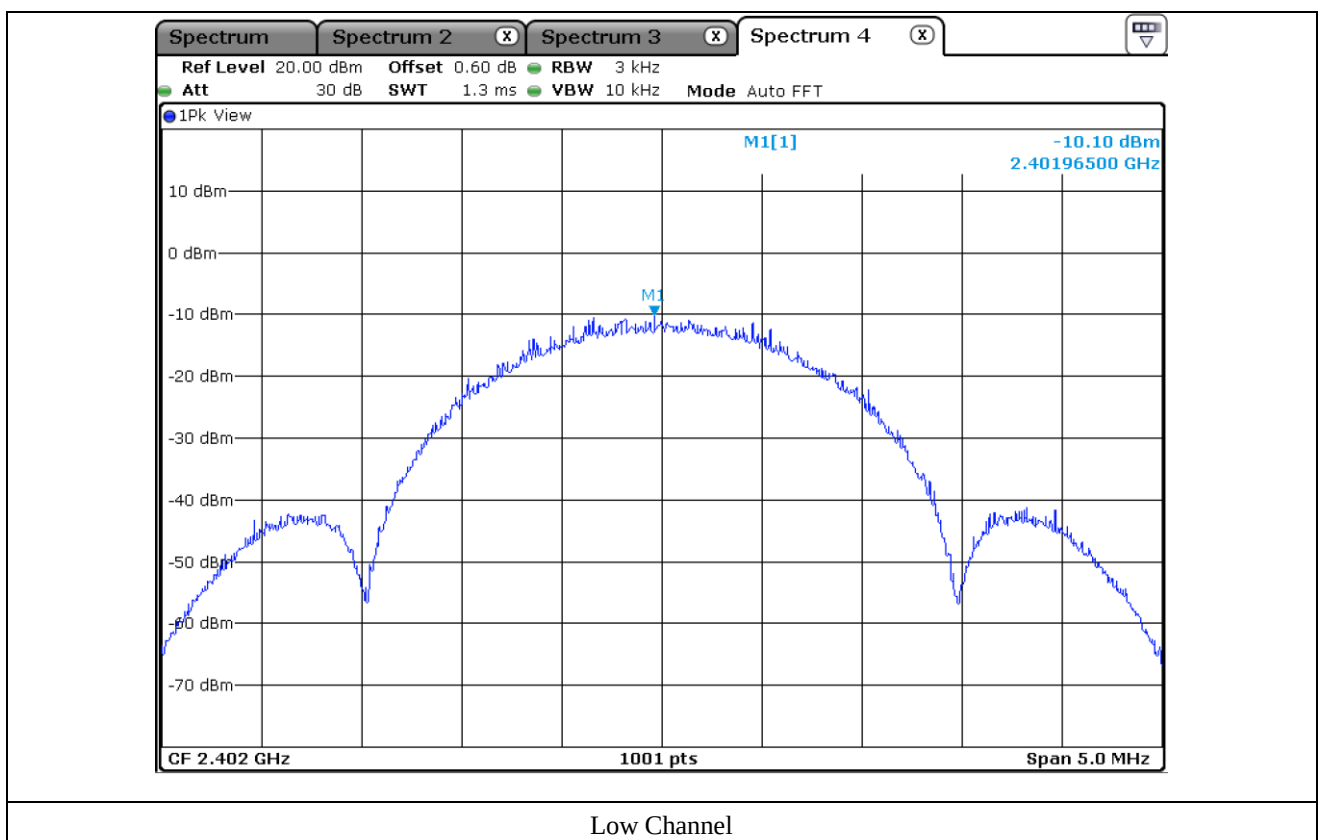
10.5 Test data for 2 Mbps

-. Test Result : Pass

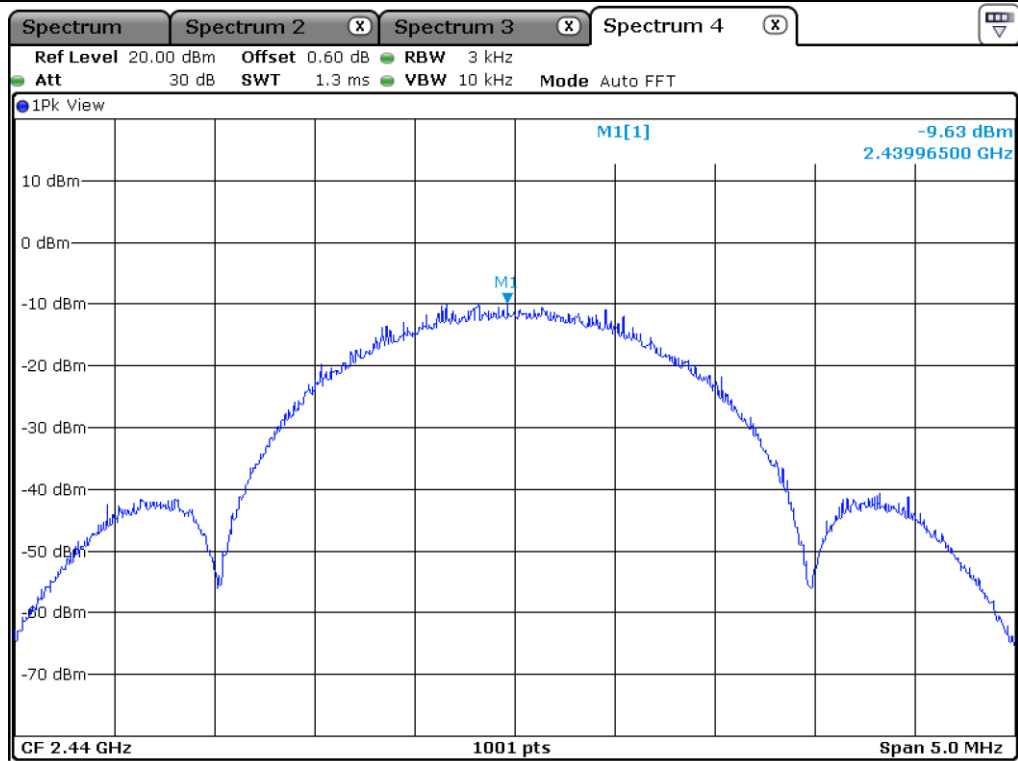
-. Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402.00	-10.10	8.00	18.10
Middle	2 440.00	-9.63	8.00	17.63
High	2 480.00	-9.14	8.00	17.14

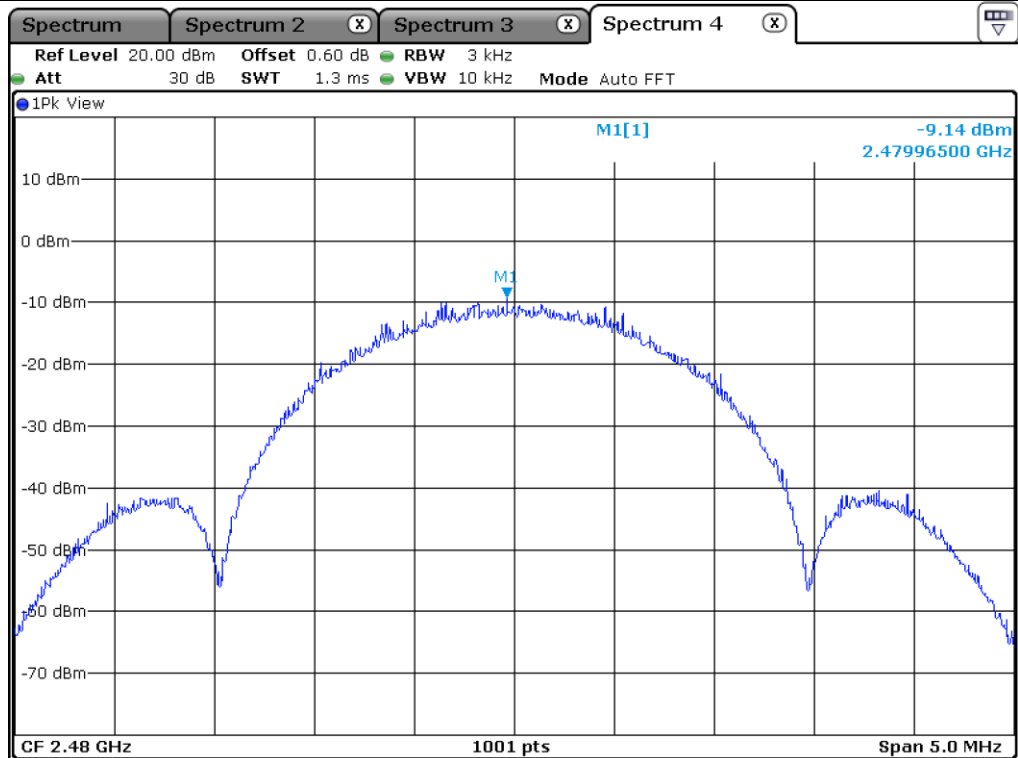
Remark. Margin = Limit – Measured value



Low Channel



Middle Channel



High Channel

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11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 % R.H.

11.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

11.3 Test Date

October 07, 2021 ~ October 20, 2021

11.4 Test data for the Basic model (WCB731M)

11.4.1 Test data for 30 MHz ~ 1 000 MHz

11.4.1.1 Test data for Bluetooth LE

Humidity Level : 46 % R.H.

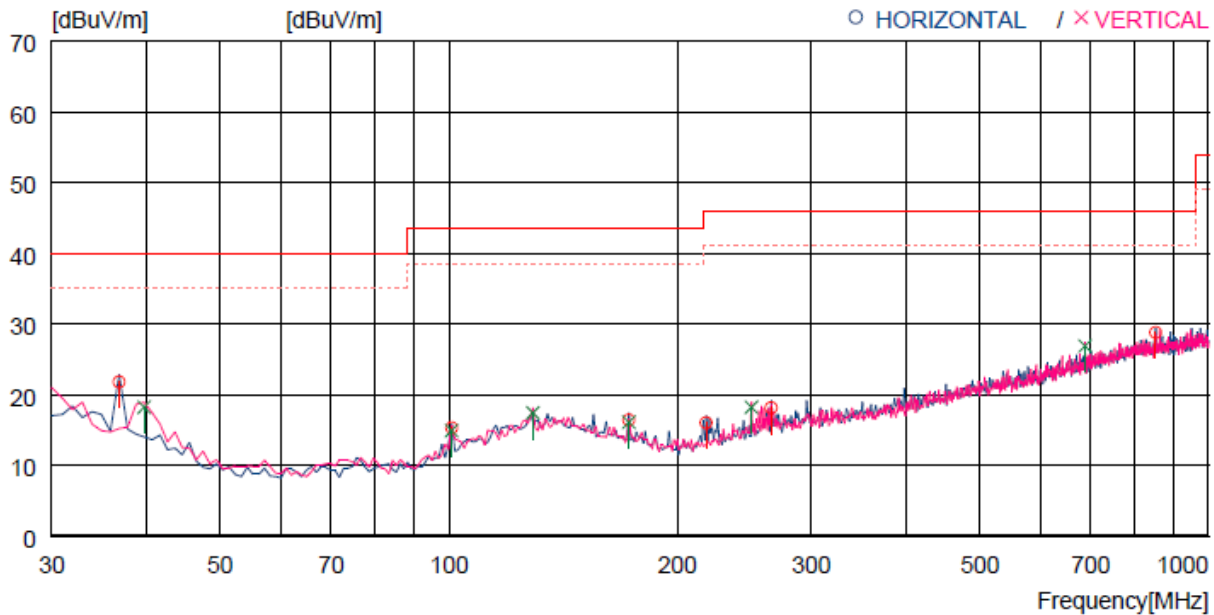
Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
---- Horizontal ----										
1	36.790	34.0	18.5	1.3	32.0	21.8	40.0	18.2	100	330
2	100.810	30.1	15.4	1.8	32.0	15.3	43.5	28.2	100	44
3	172.590	29.0	17.1	2.3	32.0	16.4	43.5	27.1	100	188
4	218.180	29.0	16.4	2.6	32.0	16.0	46.0	30.0	100	330
5	265.710	29.0	18.2	2.9	32.0	18.1	46.0	27.9	100	330
6	852.550	28.2	27.3	5.1	31.8	28.8	46.0	17.2	100	330
---- Vertical ----										
7	39.700	31.5	17.4	1.3	32.0	18.2	40.0	21.8	100	262
8	100.810	29.7	15.4	1.8	32.0	14.9	43.5	28.6	100	5
9	128.940	28.4	19.0	2.0	32.0	17.4	43.5	26.1	100	5
10	172.590	28.7	17.1	2.3	32.0	16.1	43.5	27.4	100	254
11	250.190	29.6	17.8	2.8	32.0	18.2	46.0	27.8	100	5
12	687.655	29.2	25.4	4.6	32.3	26.9	46.0	19.1	100	284

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11.4.1.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

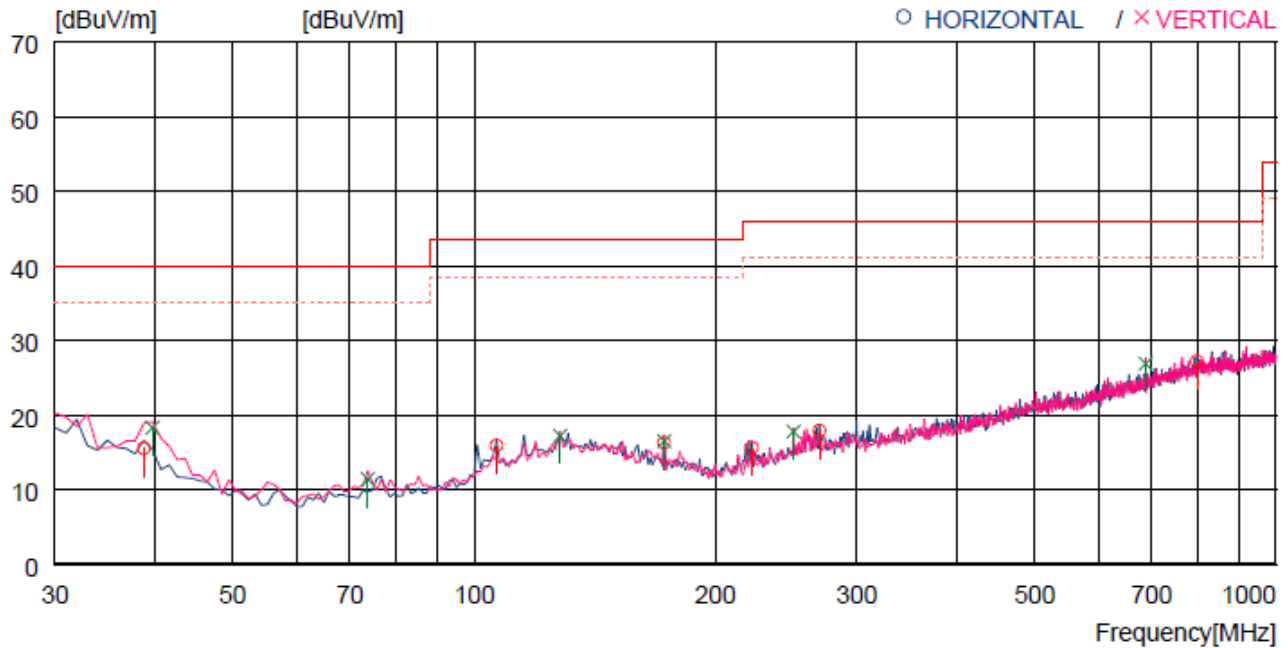
Humidity Level : 46 % R.H. Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
---- Horizontal ----										
1	38.730	28.4	17.8	1.3	32.0	15.5	40.0	24.5	100	338
2	106.630	29.6	16.4	1.9	32.0	15.9	43.5	27.6	100	315
3	172.590	28.9	17.1	2.3	32.0	16.3	43.5	27.2	100	338
4	222.060	28.4	16.6	2.6	32.0	15.6	46.0	30.4	100	264
5	269.590	28.7	18.3	2.9	32.0	17.9	46.0	28.1	100	338
6	797.262	27.1	27.1	5.0	32.0	27.2	46.0	18.8	100	204
---- Vertical ----										
7	39.700	31.6	17.4	1.3	32.0	18.3	40.0	21.7	100	340
8	73.650	29.0	12.9	1.6	32.1	11.4	40.0	28.6	100	85
9	127.970	28.2	19.0	2.0	32.0	17.2	43.5	26.3	100	192
10	172.590	29.1	17.1	2.3	32.0	16.5	43.5	27.0	100	85
11	250.190	29.2	17.8	2.8	32.0	17.8	46.0	28.2	100	85
12	687.655	29.2	25.4	4.6	32.3	26.9	46.0	19.1	100	85

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11.5 Test data for the Multiple model (WCB730M)

11.5.1 Test data for 30 MHz ~ 1 000 MHz

11.5.1.1 Test data for Bluetooth LE

Humidity Level : 46 % R.H.

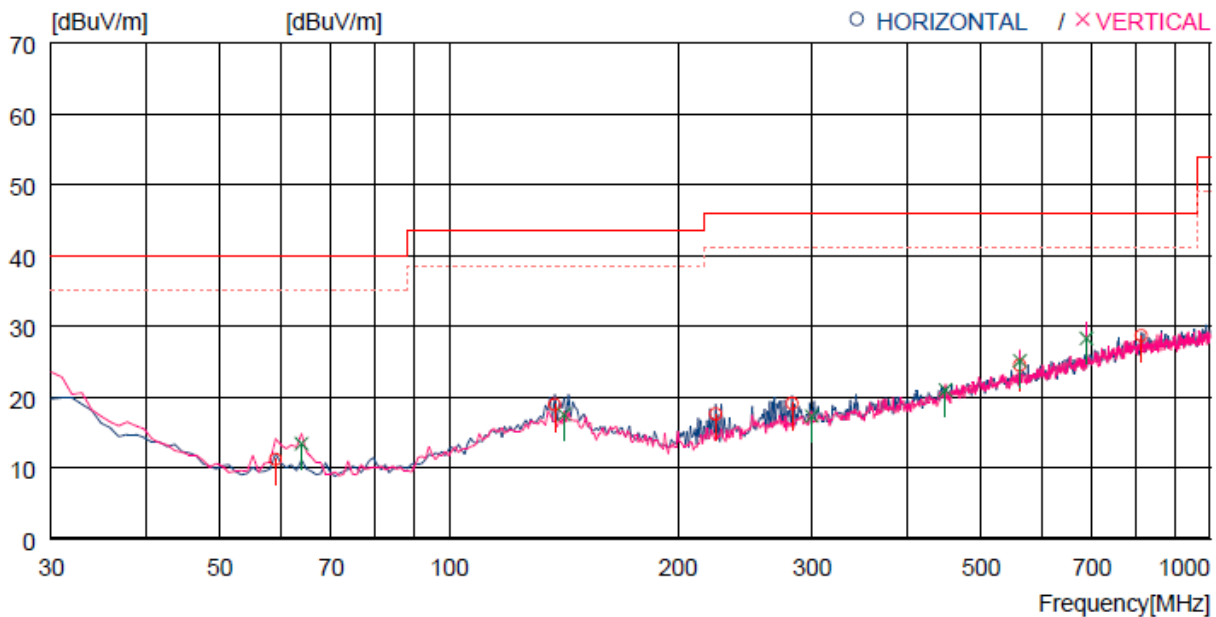
Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	59.100	29.6	12.2	1.5	32.1	11.2	40.0	28.8	400	359
2	137.670	29.4	19.4	2.1	32.0	18.9	43.5	24.6	200	250
3	224.000	30.3	16.7	2.6	32.0	17.6	46.0	28.4	200	128
4	282.200	29.5	18.7	2.9	32.0	19.1	46.0	26.9	100	273
5	562.529	29.0	23.8	4.1	32.4	24.5	46.0	21.5	400	184
6	811.812	28.6	27.1	5.0	32.0	28.7	46.0	17.3	400	92
----- Vertical -----										
7	63.950	31.6	12.4	1.5	32.1	13.4	40.0	26.6	200	359
8	141.550	28.0	19.4	2.1	32.0	17.5	43.5	26.0	200	359
9	299.660	27.1	19.2	3.0	32.0	17.3	46.0	28.7	300	0
10	449.041	27.6	21.9	3.7	32.2	21.0	46.0	25.0	300	3
11	562.529	29.6	23.8	4.1	32.4	25.1	46.0	20.9	300	82
12	687.655	30.6	25.4	4.6	32.3	28.3	46.0	17.7	200	359

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11.5.1.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

Humidity Level : 46 % R.H.

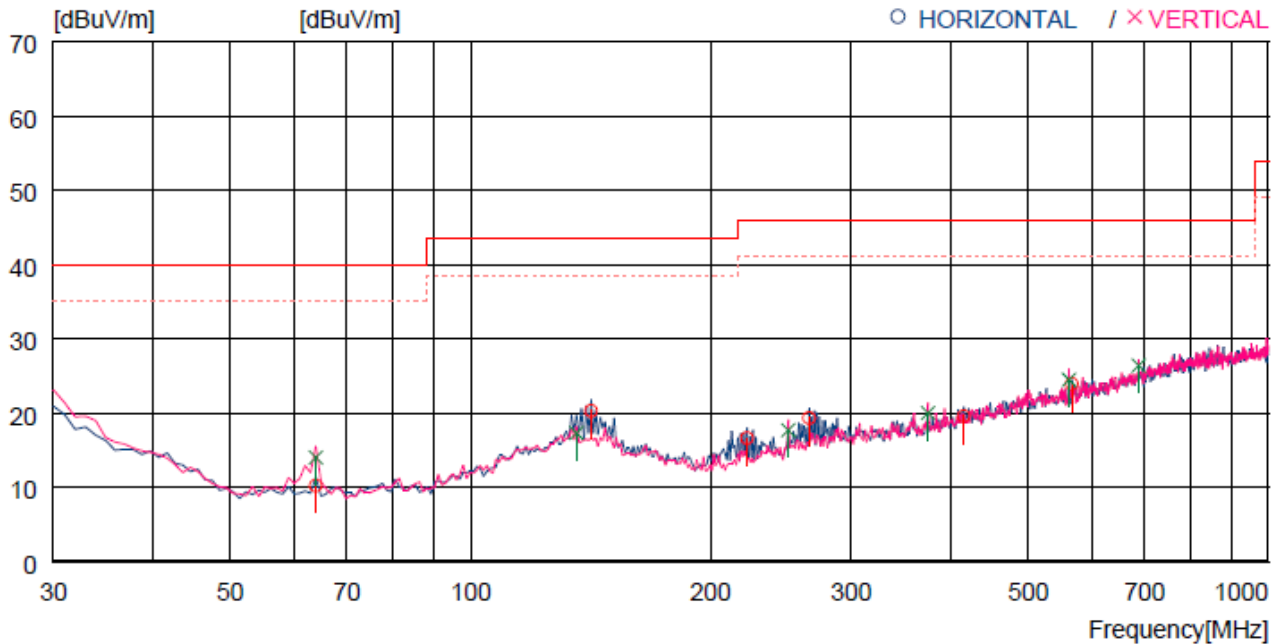
Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	63.950	28.4	12.4	1.5	32.1	10.2	40.0	29.8	251	359
2	141.550	30.8	19.4	2.1	32.0	20.3	43.5	23.2	251	359
3	222.060	29.4	16.6	2.6	32.0	16.6	46.0	29.4	100	0
4	265.710	30.2	18.2	2.9	32.0	19.3	46.0	26.7	200	107
5	415.091	27.1	21.1	3.5	32.1	19.6	46.0	26.4	200	354
6	567.379	28.4	23.8	4.1	32.4	23.9	46.0	22.1	100	344
----- Vertical -----										
7	63.950	32.2	12.4	1.5	32.1	14.0	40.0	26.0	300	284
8	135.730	27.9	19.3	2.1	32.0	17.3	43.5	26.2	300	49
9	250.190	29.1	17.8	2.8	32.0	17.7	46.0	28.3	300	359
10	374.350	28.4	20.3	3.4	32.1	20.0	46.0	26.0	400	0
11	562.529	29.0	23.8	4.1	32.4	24.5	46.0	21.5	290	359
12	687.655	28.7	25.4	4.6	32.3	26.4	46.0	19.6	300	309

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11.6 Test data for the Multiple model (WCB737M)

11.6.1 Test data for 30 MHz ~ 1 000 MHz

11.6.1.1 Test data for Bluetooth LE

Humidity Level : 46 % R.H.

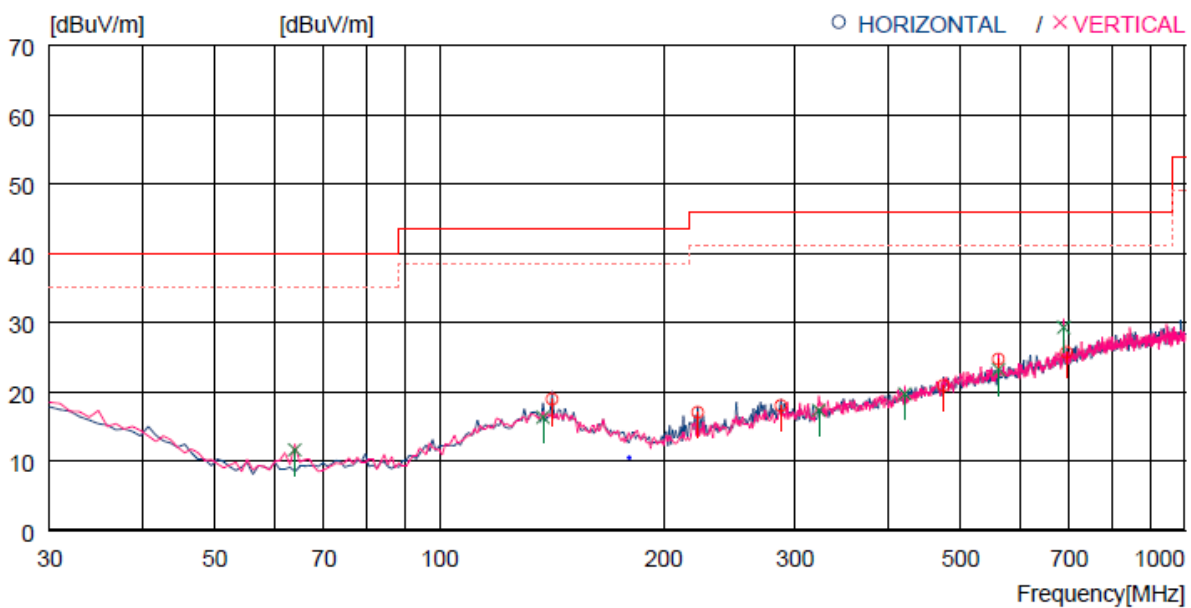
Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	141.550	29.4	19.4	2.1	32.0	18.9	43.5	24.6	200	2
2	222.060	29.8	16.6	2.6	32.0	17.0	46.0	29.0	200	2
3	287.050	28.2	18.8	3.0	32.0	18.0	46.0	28.0	100	290
4	474.261	26.8	22.5	3.8	32.2	20.9	46.0	25.1	200	2
5	562.529	29.2	23.8	4.1	32.4	24.7	46.0	21.3	200	2
6	693.475	27.9	25.5	4.6	32.3	25.7	46.0	20.3	200	358
----- Vertical -----										
7	63.950	29.8	12.4	1.5	32.1	11.6	40.0	28.4	100	359
8	137.670	26.8	19.4	2.1	32.0	16.3	43.5	27.2	200	11
9	322.940	26.7	19.5	3.1	32.0	17.3	46.0	28.7	200	281
10	420.911	27.0	21.2	3.6	32.1	19.7	46.0	26.3	100	265
11	562.529	27.7	23.8	4.1	32.4	23.2	46.0	22.8	200	165
12	687.655	31.6	25.4	4.6	32.3	29.3	46.0	16.7	200	281

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11.6.1.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

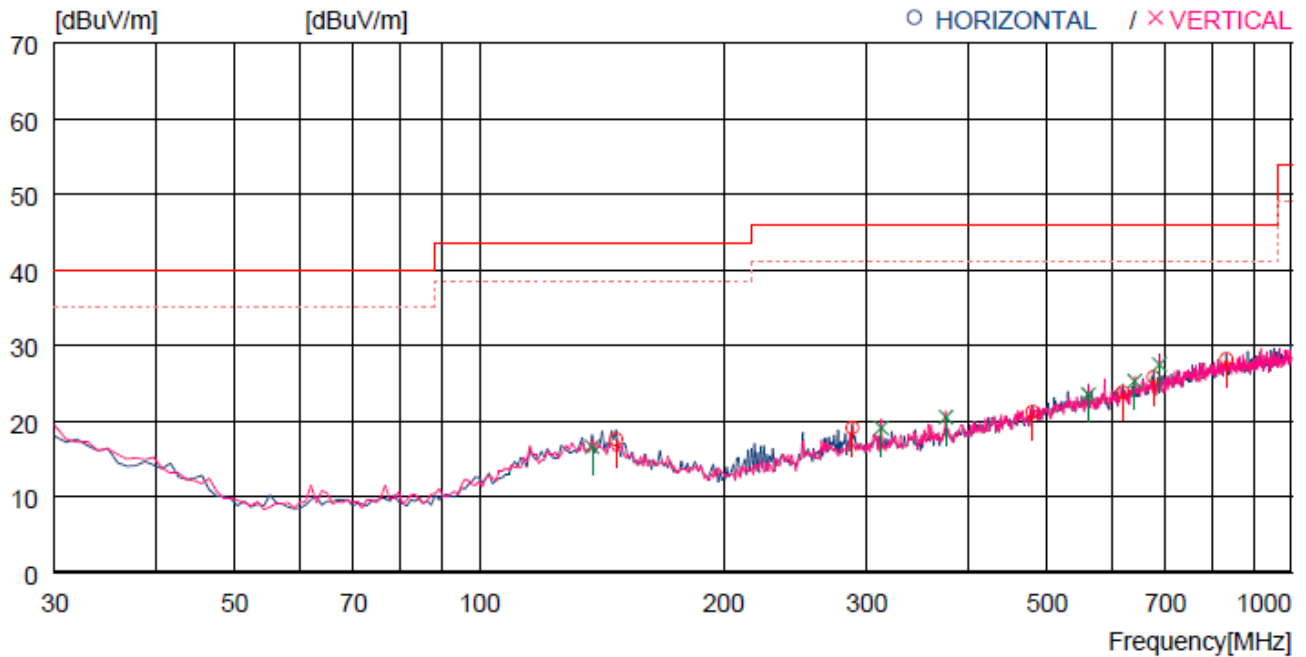
Humidity Level : 46 % R.H. Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
---- Horizontal ----										
1	147.370	28.6	18.9	2.1	32.0	17.6	43.5	25.9	200	356
2	288.020	29.2	18.9	3.0	32.0	19.1	46.0	26.9	100	285
3	480.081	27.1	22.6	3.8	32.3	21.2	46.0	24.8	200	260
4	619.757	27.4	24.5	4.3	32.4	23.8	46.0	22.2	100	0
5	676.016	28.3	25.3	4.5	32.3	25.8	46.0	20.2	200	356
6	831.211	27.8	27.2	5.1	31.9	28.2	46.0	17.8	200	199
---- Vertical ----										
7	137.670	27.1	19.4	2.1	32.0	16.6	43.5	26.9	200	352
8	312.270	28.6	19.4	3.1	32.0	19.1	46.0	26.9	100	0
9	375.320	28.9	20.3	3.4	32.1	20.5	46.0	25.5	100	285
10	562.529	28.0	23.8	4.1	32.4	23.5	46.0	22.5	100	0
11	641.097	28.5	24.8	4.4	32.4	25.3	46.0	20.7	100	176
12	687.655	29.8	25.4	4.6	32.3	27.5	46.0	18.5	200	352

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11.7 Test data for the Multiple model (WCB736M)

11.7.1 Test data for 30 MHz ~ 1 000 MHz

11.7.1.1 Test data for Bluetooth LE

Humidity Level : 46 % R.H.

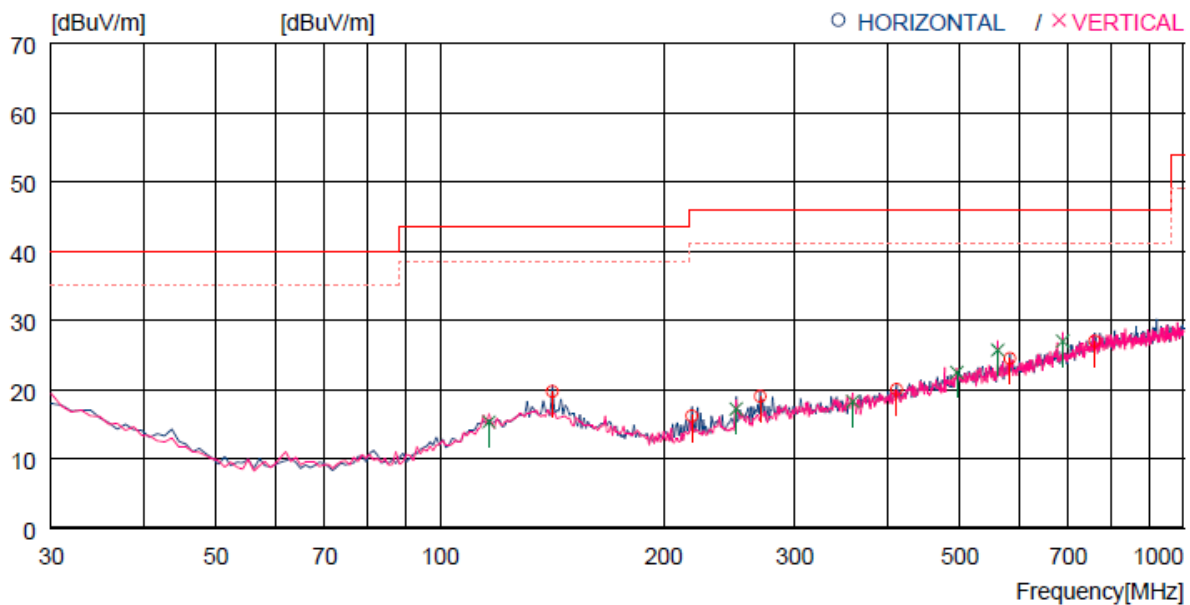
Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
---- Horizontal ----										
1	141.550	30.2	19.4	2.1	32.0	19.7	43.5	23.8	200	0
2	218.180	29.2	16.4	2.6	32.0	16.2	46.0	29.8	200	148
3	269.590	29.8	18.3	2.9	32.0	19.0	46.0	27.0	100	98
4	411.210	27.6	21.0	3.5	32.1	20.0	46.0	26.0	200	0
5	583.868	28.7	24.0	4.2	32.4	24.5	46.0	21.5	200	290
6	759.433	27.8	26.5	4.8	32.1	27.0	46.0	19.0	300	353
---- Vertical ----										
7	116.330	27.4	18.0	1.9	32.0	15.3	43.5	28.2	300	141
8	250.190	28.6	17.8	2.8	32.0	17.2	46.0	28.8	300	49
9	358.830	27.0	20.1	3.3	32.1	18.3	46.0	27.7	400	279
10	495.601	27.9	23.0	3.9	32.3	22.5	46.0	23.5	400	0
11	562.529	30.2	23.8	4.1	32.4	25.7	46.0	20.3	300	200
12	687.655	29.3	25.4	4.6	32.3	27.0	46.0	19.0	400	0

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11.7.1.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

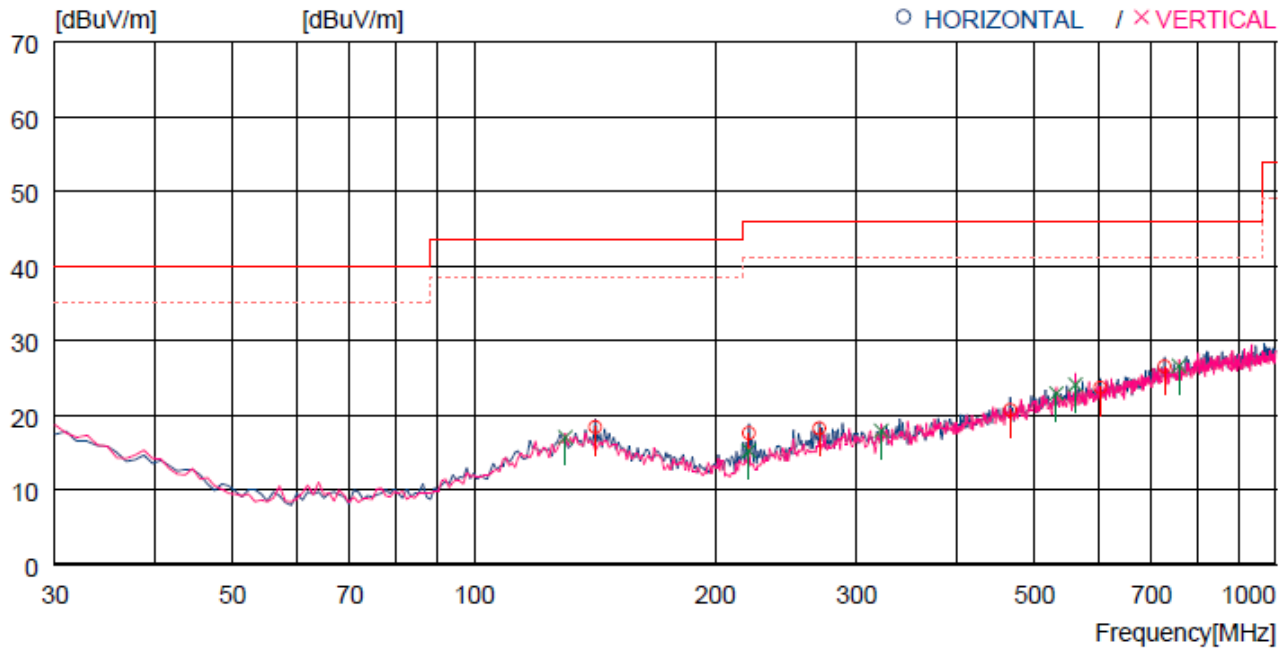
Humidity Level : 46 % R.H. Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
---- Horizontal ----										
1	141.550	28.9	19.4	2.1	32.0	18.4	43.5	25.1	200	6
2	220.120	30.5	16.5	2.6	32.0	17.6	46.0	28.4	200	124
3	269.590	29.0	18.3	2.9	32.0	18.2	46.0	27.8	100	112
4	466.501	26.9	22.3	3.7	32.2	20.7	46.0	25.3	200	6
5	604.238	27.6	24.3	4.2	32.4	23.7	46.0	22.3	200	175
6	726.454	28.0	26.0	4.7	32.2	26.5	46.0	19.5	100	145
---- Vertical ----										
7	129.910	28.0	19.0	2.0	32.0	17.0	43.5	26.5	100	210
8	220.120	28.1	16.5	2.6	32.0	15.2	46.0	30.8	100	359
9	321.970	27.3	19.5	3.1	32.0	17.9	46.0	28.1	100	12
10	532.460	27.7	23.5	4.0	32.3	22.9	46.0	23.1	100	327
11	562.529	28.6	23.8	4.1	32.4	24.1	46.0	21.9	100	359
12	757.493	27.4	26.5	4.8	32.1	26.6	46.0	19.4	100	151

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11.8 Test data for Below 30 MHz

- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

11.9 Test data for above 1 GHz

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

12. CONDUCTED EMISSION TEST

12.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 % R.H.

12.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μ H + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

12.3 Test Date

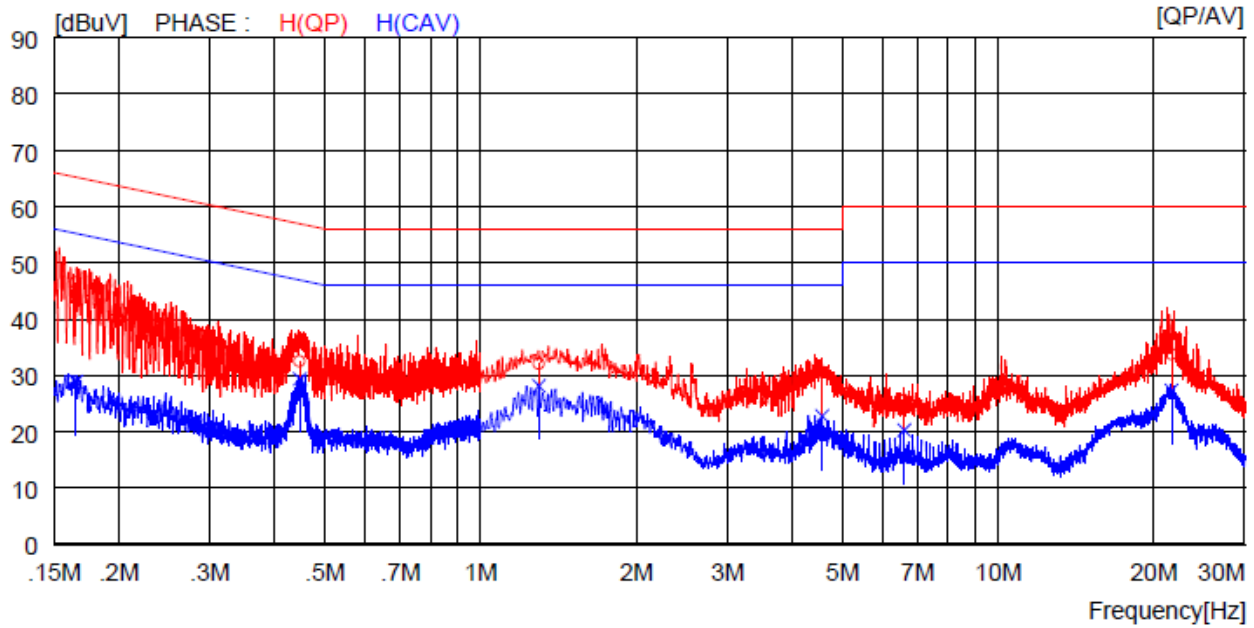
October 07, 2021 ~ October 20, 2021

12.4 Test data for the Basic model (WCB731M)

12.4.1 Test data for Bluetooth LE

- . Resolution bandwidth : 9 kHz
- . Frequency range : 0.15 MHz ~ 30 MHz
- . Tested Line : LIVE LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16500	36.5	----	10.0	46.5	----	65.2	----	18.7	----	H (QP)
2	0.44700	22.5	----	10.0	32.5	----	56.9	----	24.4	----	H (QP)
3	1.29600	21.9	----	10.1	32.0	----	56.0	----	24.0	----	H (QP)
4	4.57200	20.4	----	10.2	30.6	----	56.0	----	25.4	----	H (QP)
5	6.58500	15.4	----	10.2	25.6	----	60.0	----	34.4	----	H (QP)
6	21.66000	23.3	----	10.4	33.7	----	60.0	----	26.3	----	H (QP)
7	0.16500	----	18.9	10.0	----	28.9	----	55.2	----	26.3	H (CAV)
8	0.44700	----	19.4	10.0	----	29.4	----	46.9	----	17.5	H (CAV)
9	1.29600	----	18.0	10.1	----	28.1	----	46.0	----	17.9	H (CAV)
10	4.57200	----	12.6	10.2	----	22.8	----	46.0	----	23.2	H (CAV)
11	6.58500	----	10.1	10.2	----	20.3	----	50.0	----	29.7	H (CAV)
12	21.66000	----	16.9	10.4	----	27.3	----	50.0	----	22.7	H (CAV)

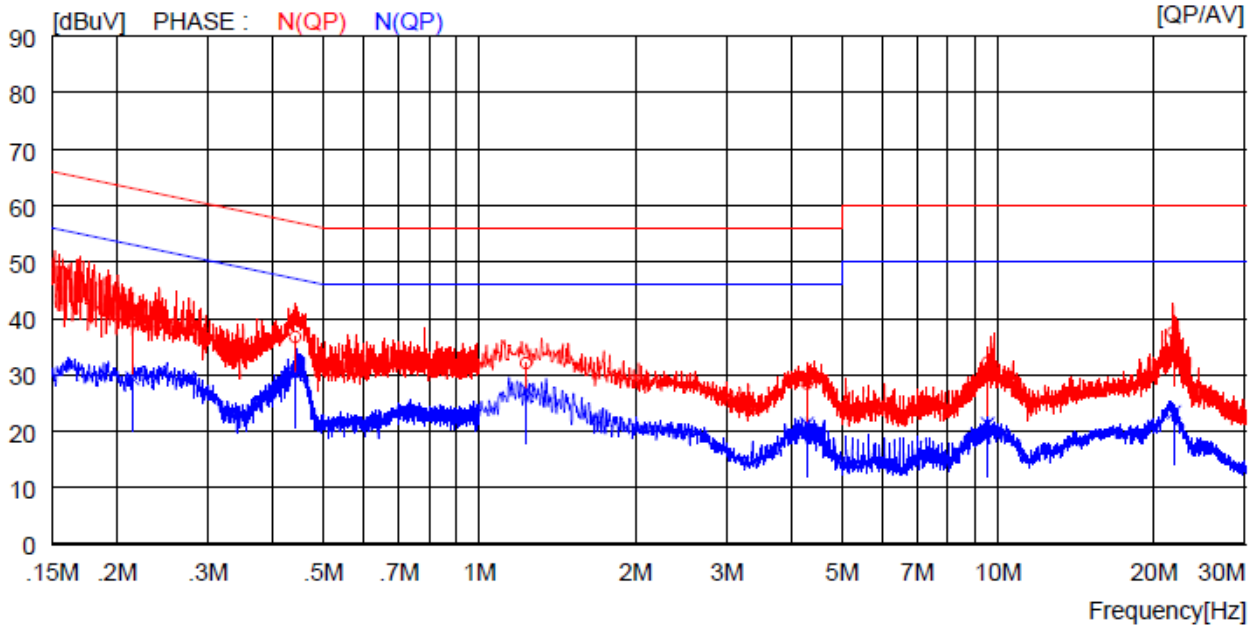
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-. Tested Line : NEUTRAL LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.21400	29.7	----	10.0	39.7	----	63.0	----	23.3	----	N (QP)
2	0.44200	26.7	----	10.0	36.7	----	57.0	----	20.3	----	N (QP)
3	1.23200	22.0	----	10.1	32.1	----	56.0	----	23.9	----	N (QP)
4	4.28400	18.3	----	10.1	28.4	----	56.0	----	27.6	----	N (QP)
5	9.56000	22.0	----	10.2	32.2	----	60.0	----	27.8	----	N (QP)
6	21.86000	27.1	----	10.4	37.5	----	60.0	----	22.5	----	N (QP)
7	0.21400	----	19.4	10.0	----	29.4	----	53.0	----	23.6	N (CAV)
8	0.44200	----	20.2	10.0	----	30.2	----	47.0	----	16.8	N (CAV)
9	1.23200	----	17.2	10.1	----	27.3	----	46.0	----	18.7	N (CAV)
10	4.28400	----	11.2	10.1	----	21.3	----	46.0	----	24.7	N (CAV)
11	9.56000	----	11.1	10.2	----	21.3	----	50.0	----	28.7	N (CAV)
12	21.86000	----	13.0	10.4	----	23.4	----	50.0	----	26.6	N (CAV)

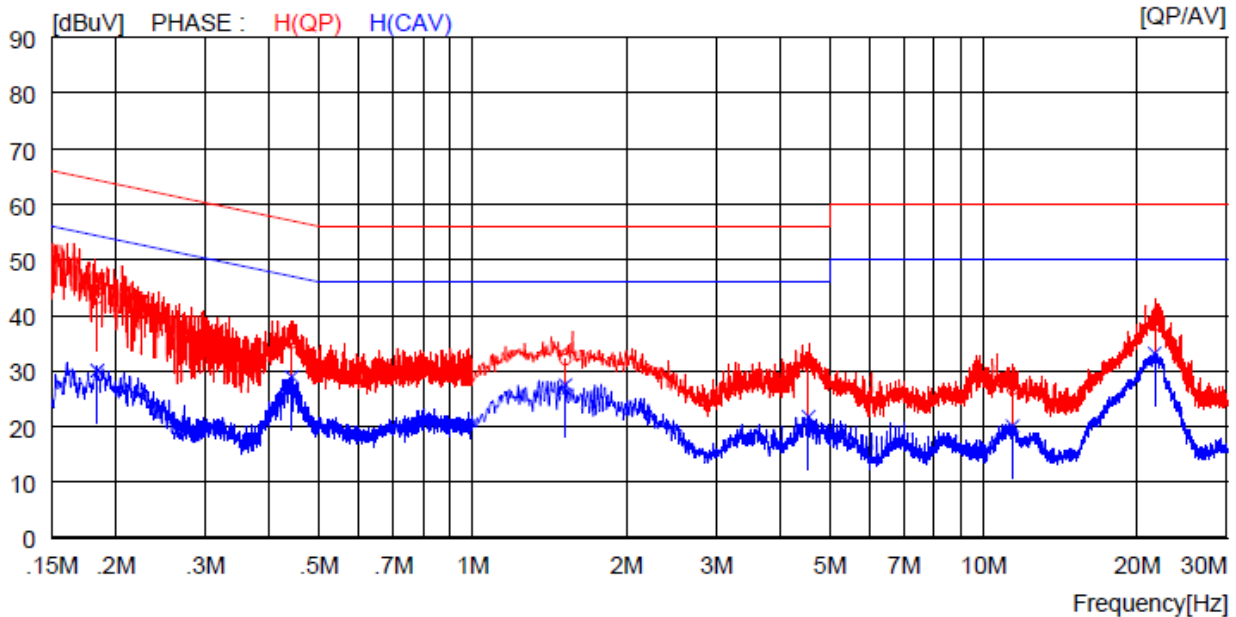
Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

12.4.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : LIVE LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.18400	33.1	----	10.0	43.1	----	64.3	----	21.2	----	H(QP)
2	0.44200	25.0	----	10.0	35.0	----	57.0	----	22.0	----	H(QP)
3	1.52000	22.0	----	10.1	32.1	----	56.0	----	23.9	----	H(QP)
4	4.54400	21.4	----	10.2	31.6	----	56.0	----	24.4	----	H(QP)
5	11.42000	16.5	----	10.2	26.7	----	60.0	----	33.3	----	H(QP)
6	21.67000	27.8	----	10.4	38.2	----	60.0	----	21.8	----	H(QP)
7	0.18400	----	20.1	10.0	----	30.1	----	54.3	----	24.2	H(CAV)
8	0.44200	----	19.0	10.0	----	29.0	----	47.0	----	18.0	H(CAV)
9	1.52000	----	17.4	10.1	----	27.5	----	46.0	----	18.5	H(CAV)
10	4.54400	----	11.6	10.2	----	21.8	----	46.0	----	24.2	H(CAV)
11	11.42000	----	9.9	10.2	----	20.1	----	50.0	----	29.9	H(CAV)
12	21.67000	----	22.7	10.4	----	33.1	----	50.0	----	16.9	H(CAV)

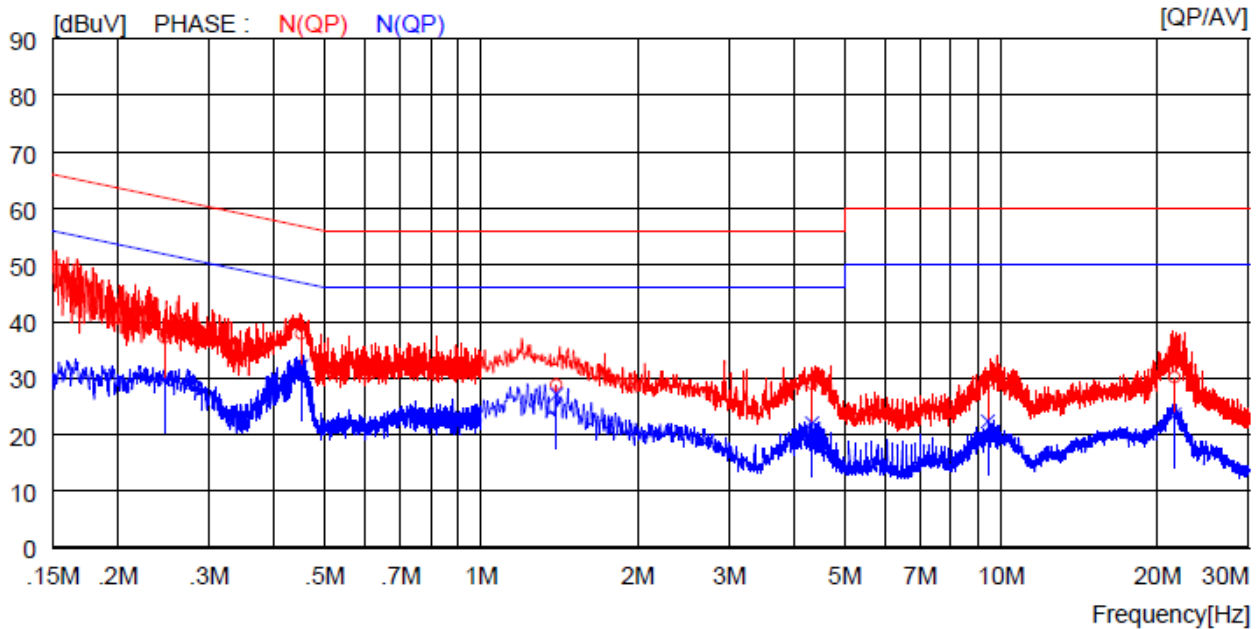
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OTC-TRF-RF-001(0)

-. Tested Line : NEUTRAL LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.24600	27.2	----	10.0	37.2	----	61.9	----	24.7	----	N (QP)
2	0.45100	27.8	----	10.0	37.8	----	56.9	----	19.1	----	N (QP)
3	1.39600	18.7	----	10.1	28.8	----	56.0	----	27.2	----	N (QP)
4	4.33600	18.9	----	10.1	29.0	----	56.0	----	27.0	----	N (QP)
5	9.45500	19.2	----	10.2	29.4	----	60.0	----	30.6	----	N (QP)
6	21.60000	19.7	----	10.4	30.1	----	60.0	----	29.9	----	N (QP)
7	0.24600	----	19.7	10.0	----	29.7	----	51.9	----	22.2	N (CAV)
8	0.45100	----	22.1	10.0	----	32.1	----	46.9	----	14.8	N (CAV)
9	1.39600	----	17.0	10.1	----	27.1	----	46.0	----	18.9	N (CAV)
10	4.33600	----	11.9	10.1	----	22.0	----	46.0	----	24.0	N (CAV)
11	9.45500	----	12.1	10.2	----	22.3	----	50.0	----	27.7	N (CAV)
12	21.60000	----	13.2	10.4	----	23.6	----	50.0	----	26.4	N (CAV)

Remark: Margin (dB) = Limit – Level (Result)

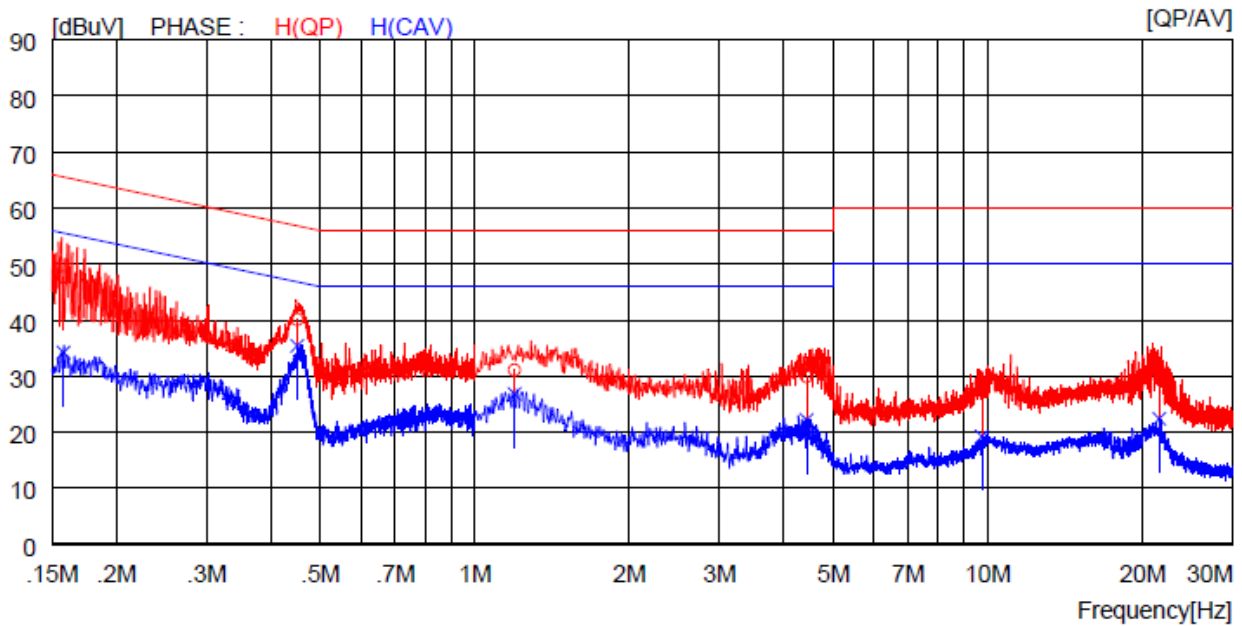
The emission level in above table is included the transducer factor that means insertion loss (LISN),
cable loss and attenuator.

12.5 Test data for the Multiple model (WCB730M)

12.5.1 Test data for Bluetooth LE

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : LIVE LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15800	37.8	----	9.9	47.7	----	65.6	----	17.9	----	H (QP)
2	0.45100	30.2	----	9.9	40.1	----	56.9	----	16.8	----	H (QP)
3	1.19600	21.1	----	10.0	31.1	----	56.0	----	24.9	----	H (QP)
4	4.43600	19.8	----	10.1	29.9	----	56.0	----	26.1	----	H (QP)
5	9.73500	18.7	----	10.2	28.9	----	60.0	----	31.1	----	H (QP)
6	21.59000	20.7	----	10.4	31.1	----	60.0	----	28.9	----	H (QP)
7	0.15800	----	24.3	9.9	----	34.2	----	55.6	----	21.4	H (CAV)
8	0.45100	----	25.5	9.9	----	35.4	----	46.9	----	11.5	H (CAV)
9	1.19600	----	16.8	10.0	----	26.8	----	46.0	----	19.2	H (CAV)
10	4.43600	----	12.1	10.1	----	22.2	----	46.0	----	23.8	H (CAV)
11	9.73500	----	9.0	10.2	----	19.2	----	50.0	----	30.8	H (CAV)
12	21.59000	----	12.0	10.4	----	22.4	----	50.0	----	27.6	H (CAV)

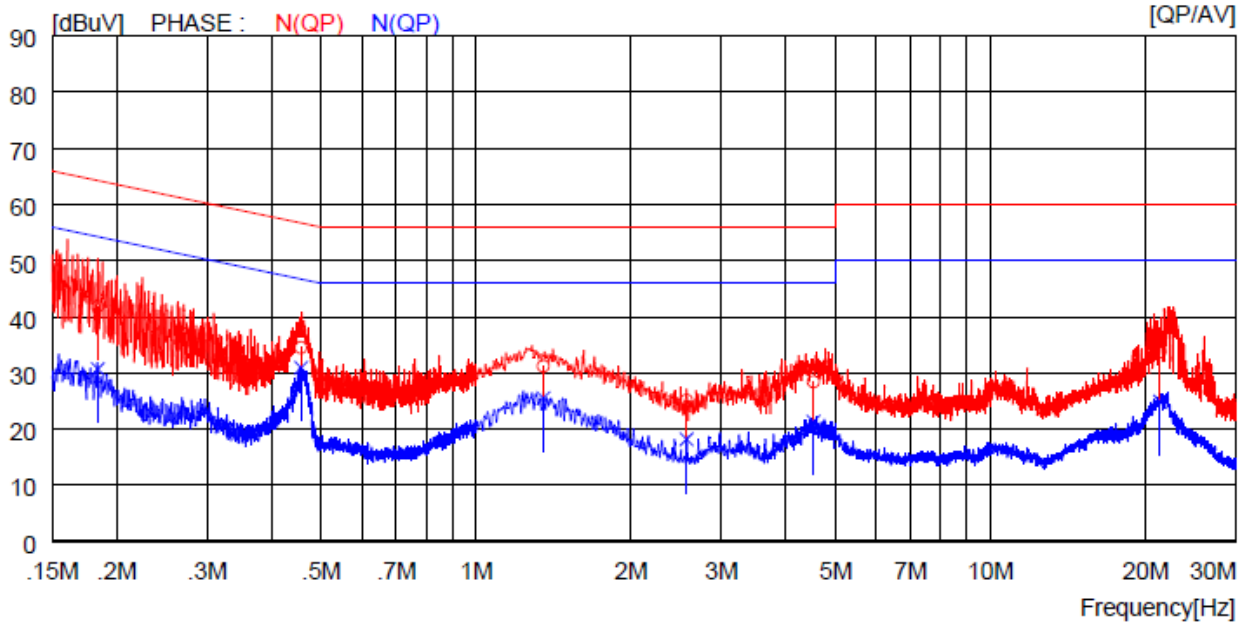
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-. Tested Line : NEUTRAL LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.18400	31.9	----	9.9	41.8	----	64.3	----	22.5	----	N (QP)
2	0.45700	24.6	----	9.9	34.5	----	56.7	----	22.2	----	N (QP)
3	1.35200	21.1	----	10.1	31.2	----	56.0	----	24.8	----	N (QP)
4	2.56800	15.0	----	10.1	25.1	----	56.0	----	30.9	----	N (QP)
5	4.52800	18.3	----	10.1	28.4	----	56.0	----	27.6	----	N (QP)
6	21.37000	23.3	----	10.4	33.7	----	60.0	----	26.3	----	N (QP)
7	0.18400	----	20.8	9.9	----	30.7	----	54.3	----	23.6	N (CAV)
8	0.45700	----	21.0	9.9	----	30.9	----	46.7	----	15.8	N (CAV)
9	1.35200	----	15.4	10.1	----	25.5	----	46.0	----	20.5	N (CAV)
10	2.56800	----	8.1	10.1	----	18.2	----	46.0	----	27.8	N (CAV)
11	4.52800	----	11.2	10.1	----	21.3	----	46.0	----	24.7	N (CAV)
12	21.37000	----	14.5	10.4	----	24.9	----	50.0	----	25.1	N (CAV)

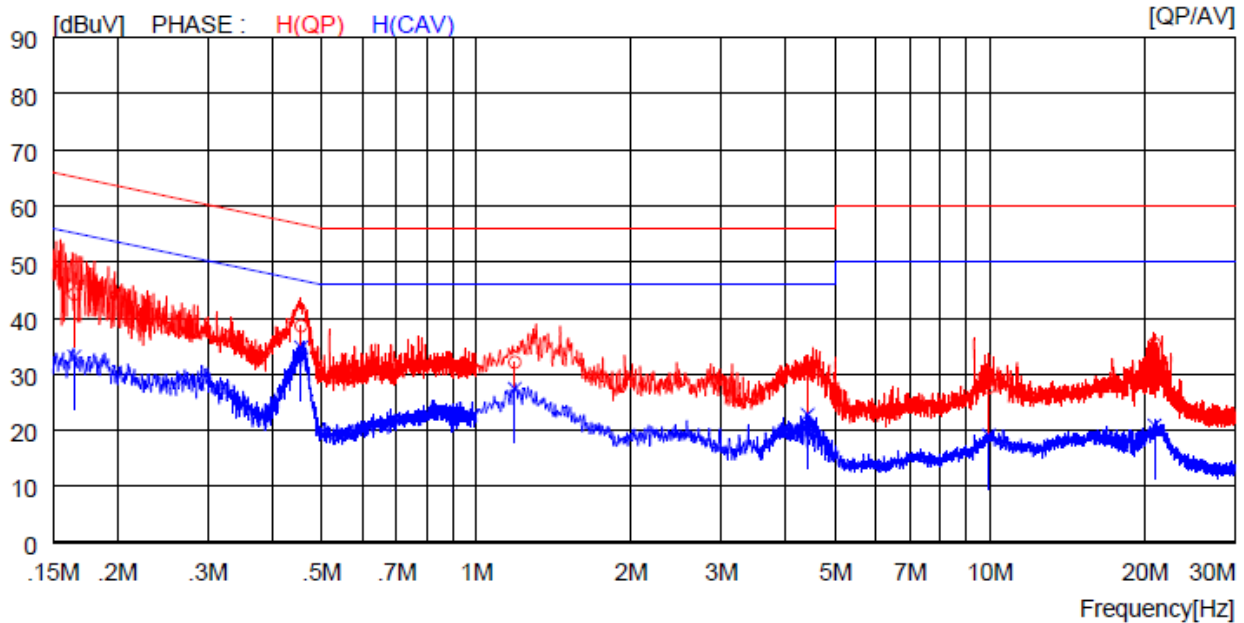
Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

12.5.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : LIVE LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16500	34.4	----	9.9	44.3	----	65.2	----	20.9	----	H (QP)
2	0.45600	28.7	----	9.9	38.6	----	56.8	----	18.2	----	H (QP)
3	1.18800	22.1	----	10.0	32.1	----	56.0	----	23.9	----	H (QP)
4	4.41600	20.1	----	10.1	30.2	----	56.0	----	25.8	----	H (QP)
5	9.95000	17.4	----	10.2	27.6	----	60.0	----	32.4	----	H (QP)
6	20.90000	25.0	----	10.4	35.4	----	60.0	----	24.6	----	H (QP)
7	0.16500	----	23.3	9.9	----	33.2	----	55.2	----	22.0	H (CAV)
8	0.45600	----	24.9	9.9	----	34.8	----	46.8	----	12.0	H (CAV)
9	1.18800	----	17.4	10.0	----	27.4	----	46.0	----	18.6	H (CAV)
10	4.41600	----	12.7	10.1	----	22.8	----	46.0	----	23.2	H (CAV)
11	9.95000	----	8.9	10.2	----	19.1	----	50.0	----	30.9	H (CAV)
12	20.90000	----	10.5	10.4	----	20.9	----	50.0	----	29.1	H (CAV)

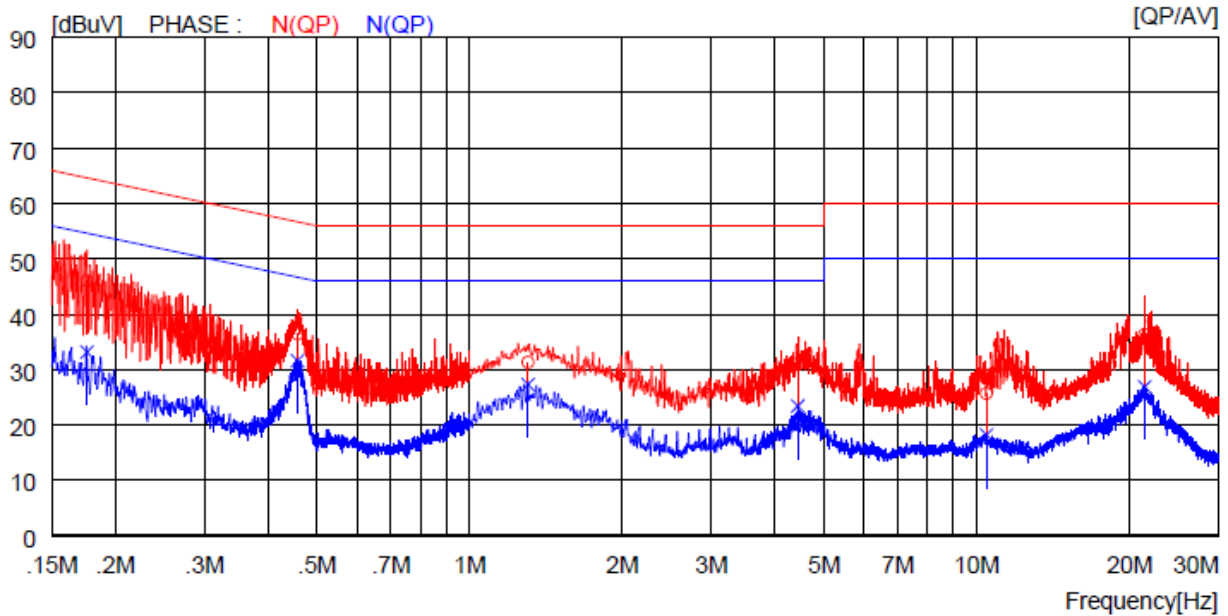
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OTC-TRF-RF-001(0)

-. Tested Line : NEUTRAL LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.17600	36.2	----	9.9	46.1	----	64.7	----	18.6	----	N(QP)
2	0.45800	26.5	----	9.9	36.4	----	56.7	----	20.3	----	N(QP)
3	1.30400	21.2	----	10.1	31.3	----	56.0	----	24.7	----	N(QP)
4	4.44000	21.0	----	10.1	31.1	----	56.0	----	24.9	----	N(QP)
5	10.46000	15.5	----	10.2	25.7	----	60.0	----	34.3	----	N(QP)
6	21.46000	25.9	----	10.4	36.3	----	60.0	----	23.7	----	N(QP)
7	0.17600	----	23.3	9.9	----	33.2	----	54.7	----	21.5	N(CAV)
8	0.45800	----	21.7	9.9	----	31.6	----	46.7	----	15.1	N(CAV)
9	1.30400	----	17.2	10.1	----	27.3	----	46.0	----	18.7	N(CAV)
10	4.44000	----	13.3	10.1	----	23.4	----	46.0	----	22.6	N(CAV)
11	10.46000	----	8.0	10.2	----	18.2	----	50.0	----	31.8	N(CAV)
12	21.46000	----	16.5	10.4	----	26.9	----	50.0	----	23.1	N(CAV)

Remark: Margin (dB) = Limit – Level (Result)

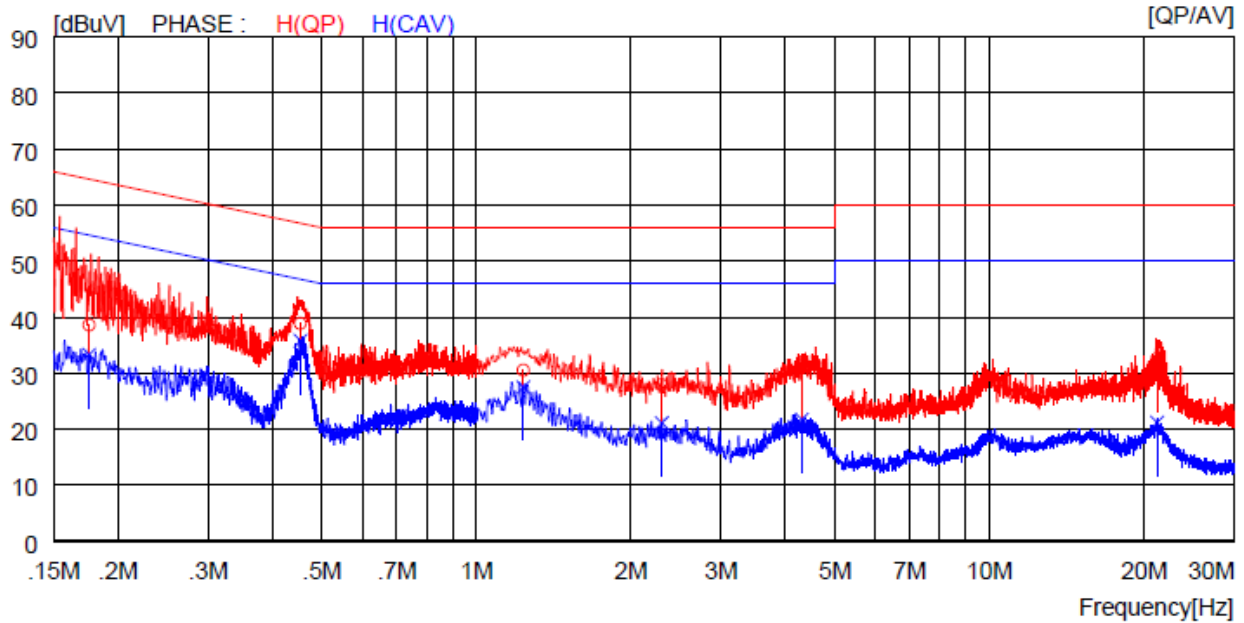
The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

12.6 Test data for the Multiple model (WCB737M)

12.6.1 Test data for Bluetooth LE

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : LIVE LINE

LIMIT : EN.KN.FCC.VCCI CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.17600	28.7	----	9.9	38.6	----	64.7	----	26.1	----	H (QP)
2	0.45400	29.0	----	9.9	38.9	----	56.8	----	17.9	----	H (QP)
3	1.23600	20.4	----	10.1	30.5	----	56.0	----	25.5	----	H (QP)
4	2.30000	17.8	----	10.1	27.9	----	56.0	----	28.1	----	H (QP)
5	4.31200	21.1	----	10.1	31.2	----	56.0	----	24.8	----	H (QP)
6	21.24000	22.2	----	10.4	32.6	----	60.0	----	27.4	----	H (QP)
7	0.17600	----	23.4	9.9	----	33.3	----	54.7	----	21.4	H (CAV)
8	0.45400	----	25.9	9.9	----	35.8	----	46.8	----	11.0	H (CAV)
9	1.23600	----	17.4	10.1	----	27.5	----	46.0	----	18.5	H (CAV)
10	2.30000	----	11.0	10.1	----	21.1	----	46.0	----	24.9	H (CAV)
11	4.31200	----	11.6	10.1	----	21.7	----	46.0	----	24.3	H (CAV)
12	21.24000	----	10.8	10.4	----	21.2	----	50.0	----	28.8	H (CAV)

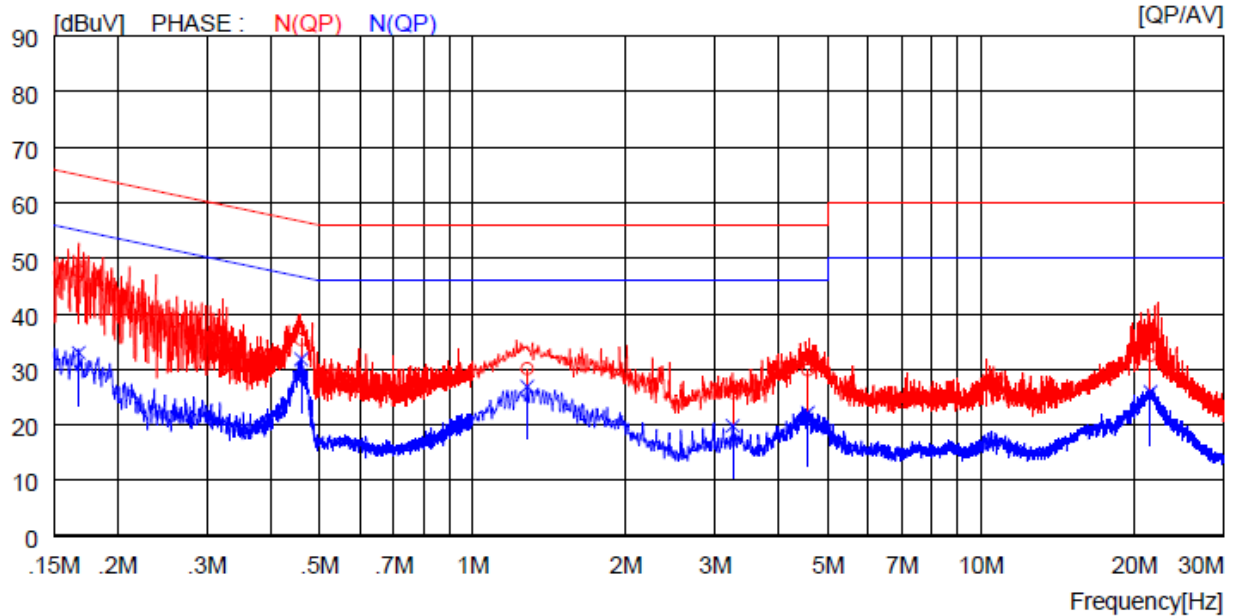
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-. Tested Line : NEUTRAL LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16800	37.8	----	9.9	47.7	----	65.1	----	17.4	----	N (QP)
2	0.46000	25.5	----	9.9	35.4	----	56.7	----	21.3	----	N (QP)
3	1.28000	20.0	----	10.1	30.1	----	56.0	----	25.9	----	N (QP)
4	3.24800	15.7	----	10.1	25.8	----	56.0	----	30.2	----	N (QP)
5	4.56400	19.8	----	10.1	29.9	----	56.0	----	26.1	----	N (QP)
6	21.53000	22.2	----	10.4	32.6	----	60.0	----	27.4	----	N (QP)
7	0.16800	----	23.1	9.9	----	33.0	----	55.1	----	22.1	N (CAV)
8	0.46000	----	21.9	9.9	----	31.8	----	46.7	----	14.9	N (CAV)
9	1.28000	----	16.8	10.1	----	26.9	----	46.0	----	19.1	N (CAV)
10	3.24800	----	9.7	10.1	----	19.8	----	46.0	----	26.2	N (CAV)
11	4.56400	----	12.1	10.1	----	22.2	----	46.0	----	23.8	N (CAV)
12	21.53000	----	15.5	10.4	----	25.9	----	50.0	----	24.1	N (CAV)

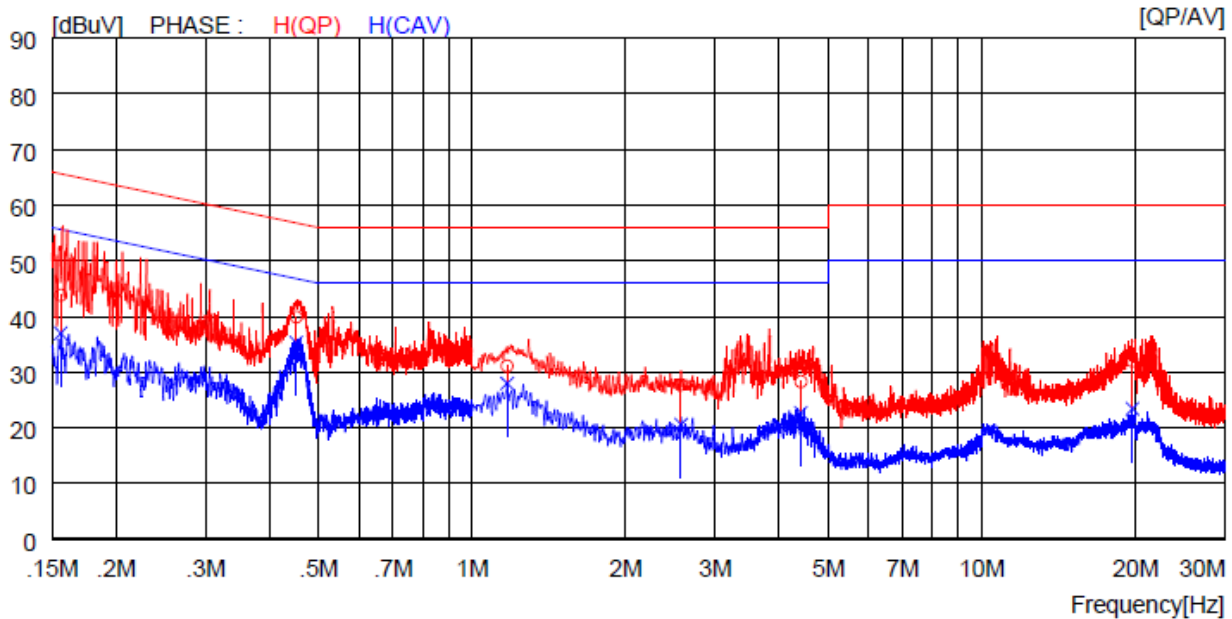
Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

12.6.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

- . Resolution bandwidth : 9 kHz
- . Frequency range : 0.15 MHz ~ 30 MHz
- . Tested Line : LIVE LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15600	33.9	----	9.9	43.8	----	65.7	----	21.9	----	H (QP)
2	0.45200	30.0	----	9.9	39.9	----	56.8	----	16.9	----	H (QP)
3	1.17200	21.1	----	10.0	31.1	----	56.0	----	24.9	----	H (QP)
4	2.57200	17.6	----	10.1	27.7	----	56.0	----	28.3	----	H (QP)
5	4.42000	18.2	----	10.1	28.3	----	56.0	----	27.7	----	H (QP)
6	19.75000	21.6	----	10.4	32.0	----	60.0	----	28.0	----	H (QP)
7	0.15600	----	27.1	9.9	----	37.0	----	55.7	----	18.7	H (CAV)
8	0.45200	----	25.4	9.9	----	35.3	----	46.8	----	11.5	H (CAV)
9	1.17200	----	18.0	10.0	----	28.0	----	46.0	----	18.0	H (CAV)
10	2.57200	----	10.5	10.1	----	20.6	----	46.0	----	25.4	H (CAV)
11	4.42000	----	12.6	10.1	----	22.7	----	46.0	----	23.3	H (CAV)
12	19.75000	----	13.0	10.4	----	23.4	----	50.0	----	26.6	H (CAV)

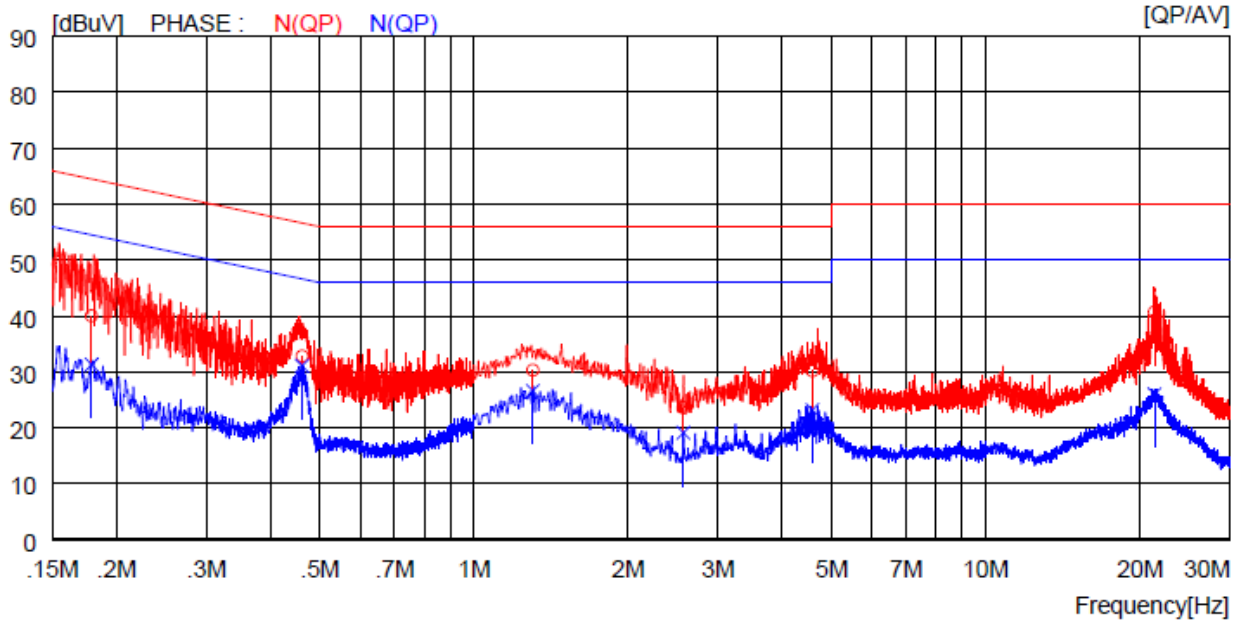
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OTC-TRF-RF-001(0)

-. Tested Line : NEUTRAL LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ		READING		C.FACTOR		RESULT		LIMIT		MARGIN	PHASE
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]		
1	0.17900	30.1	----	9.9	40.0	----	64.5	----	24.5	----	N(QP)	
2	0.46200	22.9	----	9.9	32.8	----	56.7	----	23.9	----	N(QP)	
3	1.30400	20.2	----	10.1	30.3	----	56.0	----	25.7	----	N(QP)	
4	2.56800	13.5	----	10.1	23.6	----	56.0	----	32.4	----	N(QP)	
5	4.59200	20.1	----	10.1	30.2	----	56.0	----	25.8	----	N(QP)	
6	21.38000	30.3	----	10.4	40.7	----	60.0	----	19.3	----	N(QP)	
7	0.17900	----	21.4	9.9	----	31.3	----	54.5	----	23.2	N(CAV)	
8	0.46200	----	21.2	9.9	----	31.1	----	46.7	----	15.6	N(CAV)	
9	1.30400	----	16.5	10.1	----	26.6	----	46.0	----	19.4	N(CAV)	
10	2.56800	----	9.0	10.1	----	19.1	----	46.0	----	26.9	N(CAV)	
11	4.59200	----	13.1	10.1	----	23.2	----	46.0	----	22.8	N(CAV)	
12	21.38000	----	15.6	10.4	----	26.0	----	50.0	----	24.0	N(CAV)	

Remark: Margin (dB) = Limit – Level (Result)

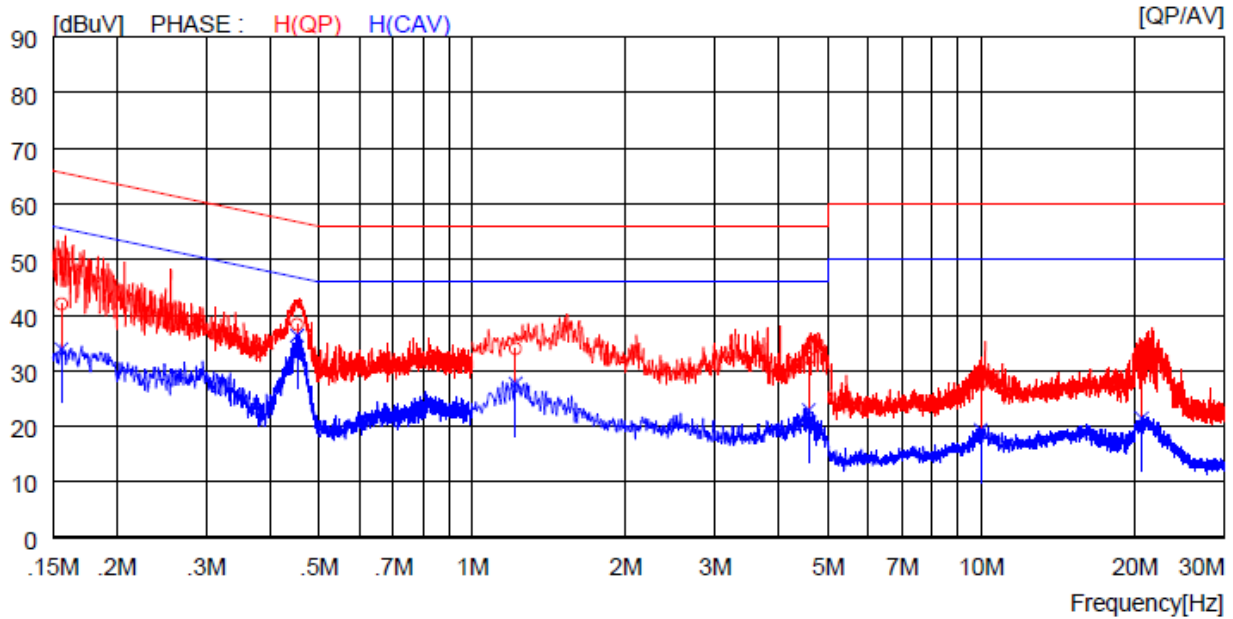
The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

12.7 Test data for the Multiple model (WCB736M)

12.7.1 Test data for Bluetooth LE

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : LIVE LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15600	32.1	----	9.9	42.0	----	65.7	----	23.7	----	H (QP)
2	0.45300	28.4	----	9.9	38.3	----	56.8	----	18.5	----	H (QP)
3	1.21600	23.9	----	10.1	34.0	----	56.0	----	22.0	----	H (QP)
4	4.58400	22.2	----	10.1	32.3	----	56.0	----	23.7	----	H (QP)
5	9.97000	17.6	----	10.2	27.8	----	60.0	----	32.2	----	H (QP)
6	20.67000	21.1	----	10.4	31.5	----	60.0	----	28.5	----	H (QP)
7	0.15600	----	24.0	9.9	----	33.9	----	55.7	----	21.8	H (CAV)
8	0.45300	----	26.4	9.9	----	36.3	----	46.8	----	10.5	H (CAV)
9	1.21600	----	17.6	10.1	----	27.7	----	46.0	----	18.3	H (CAV)
10	4.58400	----	12.8	10.1	----	22.9	----	46.0	----	23.1	H (CAV)
11	9.97000	----	9.1	10.2	----	19.3	----	50.0	----	30.7	H (CAV)
12	20.67000	----	11.0	10.4	----	21.4	----	50.0	----	28.6	H (CAV)

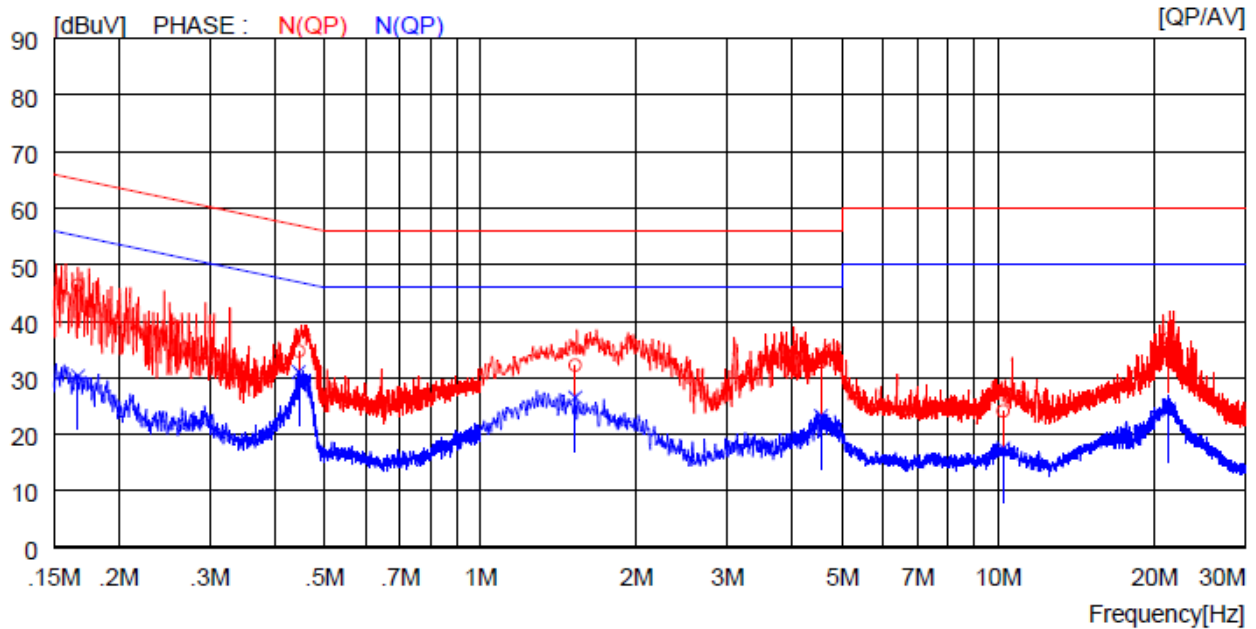
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OTC-TRF-RF-001(0)

-. Tested Line : NEUTRAL LINE

LIMIT : EN.KN.FCC.VCCI CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBUV]	AV [dBUV]		QP [dBUV]	AV [dBUV]	QP [dBUV]	AV [dBUV]	QP [dBUV]	AV [dBUV]	
1	0.16700	36.5	----	9.9	46.4	----	65.1	----	18.7	----	N (QP)
2	0.44600	24.8	----	9.9	34.7	----	56.9	----	22.2	----	N (QP)
3	1.52400	22.1	----	10.1	32.2	----	56.0	----	23.8	----	N (QP)
4	4.54800	22.7	----	10.1	32.8	----	56.0	----	23.2	----	N (QP)
5	10.22000	13.9	----	10.2	24.1	----	60.0	----	35.9	----	N (QP)
6	21.37000	26.5	----	10.4	36.9	----	60.0	----	23.1	----	N (QP)
7	0.16700	----	20.4	9.9	----	30.3	----	55.1	----	24.8	N (CAV)
8	0.44600	----	21.1	9.9	----	31.0	----	46.9	----	15.9	N (CAV)
9	1.52400	----	16.4	10.1	----	26.5	----	46.0	----	19.5	N (CAV)
10	4.54800	----	13.1	10.1	----	23.2	----	46.0	----	22.8	N (CAV)
11	10.22000	----	7.3	10.2	----	17.5	----	50.0	----	32.5	N (CAV)
12	21.37000	----	14.0	10.4	----	24.4	----	50.0	----	25.6	N (CAV)

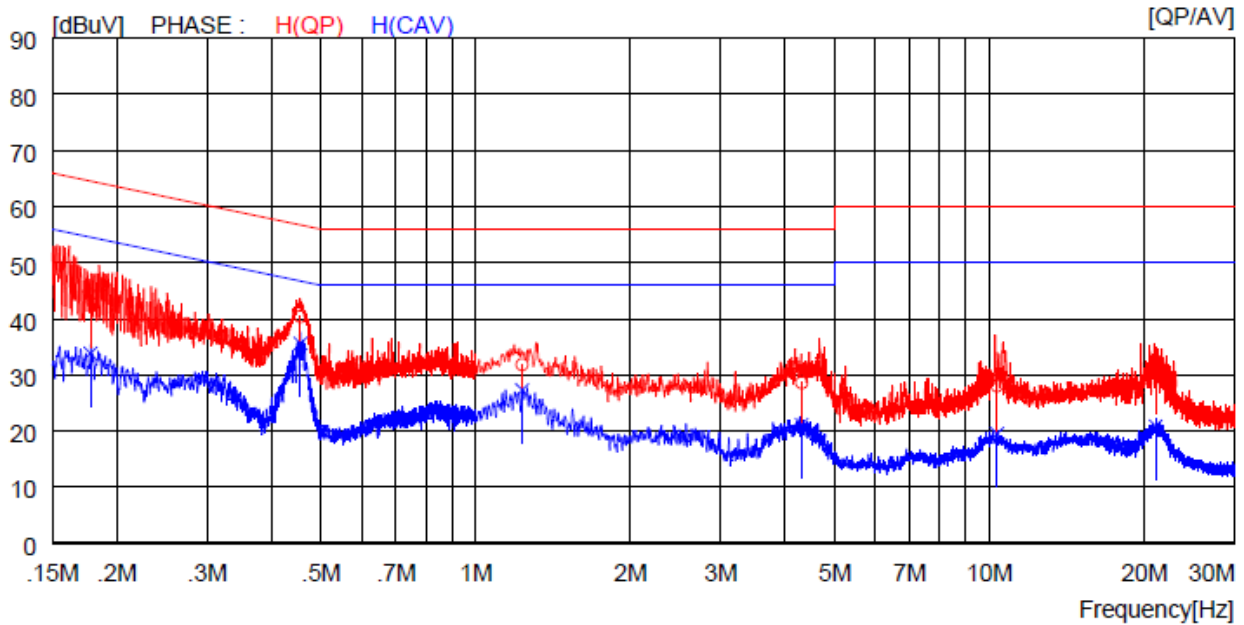
Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

12.7.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : LIVE LINE

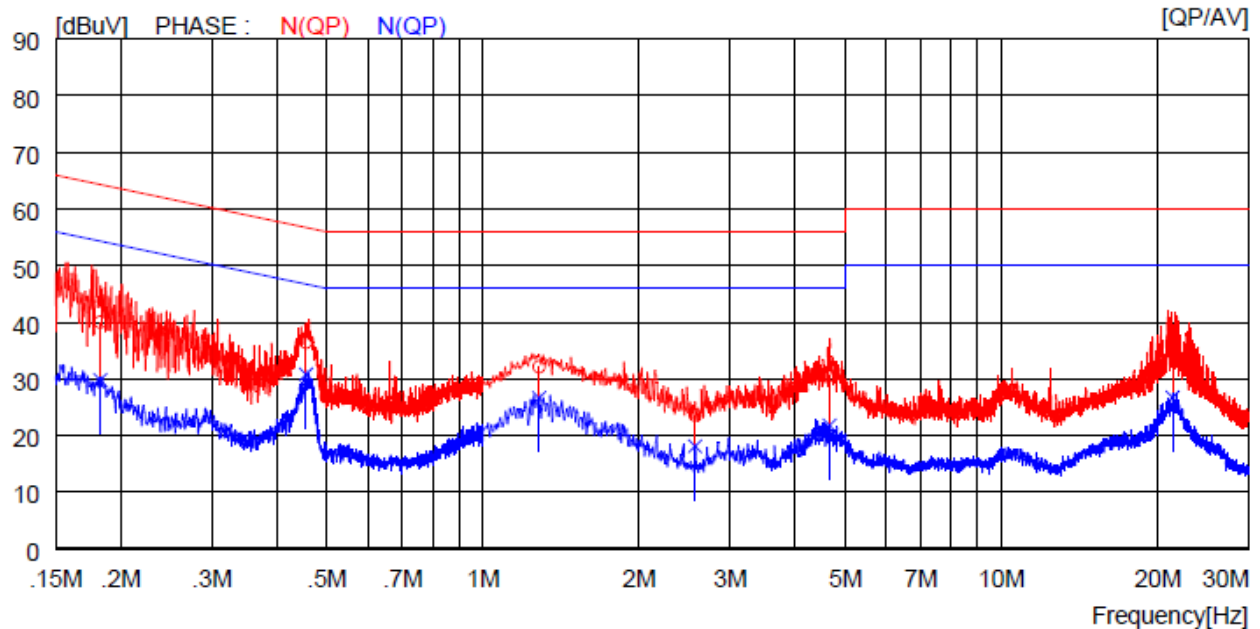
LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.17800	34.4	----	9.9	44.3	----	64.6	----	20.3	----	H (QP)
2	0.45600	30.5	----	9.9	40.4	----	56.8	----	16.4	----	H (QP)
3	1.23200	21.7	----	10.1	31.8	----	56.0	----	24.2	----	H (QP)
4	4.31200	18.5	----	10.1	28.6	----	56.0	----	27.4	----	H (QP)
5	10.36000	17.8	----	10.2	28.0	----	60.0	----	32.0	----	H (QP)
6	21.06000	22.2	----	10.4	32.6	----	60.0	----	27.4	----	H (QP)
7	0.17800	----	23.9	9.9	----	33.8	----	54.6	----	20.8	H (CAV)
8	0.45600	----	25.7	9.9	----	35.6	----	46.8	----	11.2	H (CAV)
9	1.23200	----	17.2	10.1	----	27.3	----	46.0	----	18.7	H (CAV)
10	4.31200	----	11.0	10.1	----	21.1	----	46.0	----	24.9	H (CAV)
11	10.36000	----	9.3	10.2	----	19.5	----	50.0	----	30.5	H (CAV)
12	21.06000	----	10.5	10.4	----	20.9	----	50.0	----	29.1	H (CAV)

-. Tested Line : NEUTRAL LINE

LIMIT : EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Quasi-Peak Limits (Mains Ports)
EN.KN.FCC.VCCI_CISPR Pub.22 Class B, Average Limits (Mains Ports)



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.18300	30.1	----	9.9	40.0	----	64.3	----	24.3	----	N (QP)
2	0.45600	26.5	----	9.9	36.4	----	56.8	----	20.4	----	N (QP)
3	1.28400	22.0	----	10.1	32.1	----	56.0	----	23.9	----	N (QP)
4	2.56800	13.5	----	10.1	23.6	----	56.0	----	32.4	----	N (QP)
5	4.66000	20.5	----	10.1	30.6	----	56.0	----	25.4	----	N (QP)
6	21.38000	26.8	----	10.4	37.2	----	60.0	----	22.8	----	N (QP)
7	0.18300	----	19.9	9.9	----	29.8	----	54.3	----	24.5	N (CAV)
8	0.45600	----	20.9	9.9	----	30.8	----	46.8	----	16.0	N (CAV)
9	1.28400	----	16.5	10.1	----	26.6	----	46.0	----	19.4	N (CAV)
10	2.56800	----	8.0	10.1	----	18.1	----	46.0	----	27.9	N (CAV)
11	4.66000	----	11.7	10.1	----	21.8	----	46.0	----	24.2	N (CAV)
12	21.38000	----	16.3	10.4	----	26.7	----	50.0	----	23.3	N (CAV)

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

13. LIST OF TEST EQUIPMENT

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
FSV40-N	Rohde & Schwarz	Signal Analyzer	102177	Apr. 16, 2021 (1Y)
ESW 44	Rohde & Schwarz	EMI Test Receiver	101851	Mar. 23, 2021 (1Y)
310N	Sonoma Instrument	Pre-Amplifier	392756	Oct. 14, 2021 (1Y)
SCU18	Rohde & Schwarz	Pre-Amplifier	102266	Jul. 14, 2021 (1Y)
PAM-840A	Com-Power	Pre-Amplifier	461339	Oct. 12, 2021 (1Y)
DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
FMZB 1513	Schwarzbeck	Loop Antenna	1513-235	Mar. 24, 2020 (2Y)
HLP-2008	TDK	Hybrid Antenna	131316	Feb. 27, 2020 (2Y)
BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 20, 2021 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jan. 07, 2021(1Y)
HPF 3GHz	Rohde & Schwarz	High Pass Filter	N/A	Feb. 08, 2021 (1Y)
ESCI	Rohde & Schwarz	EMI TEST RECEIVER	101012	Oct. 20, 2021 (1Y)
NSLK8126	Schwarzbeck	AMN	8126-404	Mar. 16, 2021 (1Y)
ESH3-Z2	Rohde & Schwarz	PULSE LIMITER	100655	Mar. 15, 2021 (1Y)

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ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)