

TEST REPORT

Product Name : MIXER COMBO
Model Number : MX 4, MX 8, MX 14, MX 15, MX 16, MX 18, MX 10,
DELTA 10, DELTA 126, DELTA 156, DELTA 128,
DELTA 158, PARTY 8
FCC ID : YEB-MX

Prepared for : OPALUX ELECTRONICS MFY. CO., LTD.
Address : 21F, No.86 LONGWAN NEW RESIDENTIAL QUARTERS,
NINGBO, China

Prepared by : EMTEK (NINGBO) CO., LTD.
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Report Number : ENB2605110113W00101R
Date(s) of Tests : May 11, 2026 to May 28, 2026
Date of issue : June 15, 2026

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1 TEST RESULT CERTIFICATION

Applicant	:	OPALUX ELECTRONICS MFY. CO., LTD.
Address	:	21F, No.86 LONGWAN NEW RESIDENTIAL QUARTERS, NINGBO, China
Manufacturer	:	OPALUX ELECTRONICS MFY. CO., LTD.
Address	:	21F, No.86 LONGWAN NEW RESIDENTIAL QUARTERS, NINGBO, China
Trade Mark	:	N/A
EUT	:	MIXER COMBO
Model No.	:	MX 4, MX 8, MX 14, MX 15, MX 16, MX 18, MX 10, DELTA 10, DELTA 126, DELTA 156, DELTA 128, DELTA 158, PARTY 8

Measurement Procedure Used:

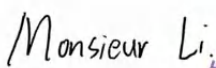
APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C	PASS

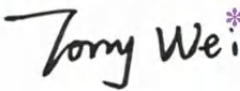
The above equipment was tested by EMTEK(NINGBO) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2020) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2, Part 15.247.

The test results of this report relate only to the tested sample identified in this report

Date of Test : May 11, 2026 to May 28, 2026

Prepared by : 
WK Luo /Engineer

Reviewer : 
Monsieur Li /Supervisor

Approved & Authorized Signer : 
Tony Wei /Manager

Modified History

Version	Report No.	Revision Date	Summary
/	ENB2605110113W00101R	/	Original Report



2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product:	MIXER COMBO
Model Number:	MX 4, MX 8, MX 14, MX 15, MX 16, MX 18, MX 10, DELTA 10, DELTA 126, DELTA 156, DELTA 128, DELTA 158, PARTY 8 All the models differ only in terms of the appearance shape, the material of the casing, and the number of channels. Beyond that, the schematic diagrams, PCB layouts, etc. are all the same. Among them, models MX 4, MX 14, MX 16 and MX 18 do not come with speakers. The models MX 8, MX 10, MX 15, DELTA 10, DELTA 126, DELTA 156, DELTA 128, DELTA 158, and PARTY 8 come with speaker accessories. We chose the model MX 8 for the test.
Device Type:	Bluetooth V5.0
Data Rate:	1Mbps for GFSK modulation 2Mbps for $\pi/4$ -DQPSK modulation
Modulation:	GFSK, $\pi/4$ -DQPSK
Operating Frequency Range(s) :	2402-2480MHz
Number of Channels:	79 Channels
Antenna Type	PCB Antenna
Antenna Gain:	1.70 dBi
Operation voltage:	AC 115V/60Hz or AC 230V 50Hz
Test Voltage:	AC 115V/60 Hz
Temperature Range:	0° C ~ +40° C

Note: for more details, please refer to the User's manual of the EUT.

3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.247(a)(1)	Emission Bandwidth	PASS	
15.247(a)(1)	Carrier Frequency Separation	PASS	
15.247(a)(1)	Number of Hopping Frequencies	PASS	
15.247(a)(1)	Average Time of Occupancy (Dwell Time)	PASS	
15.247(b)(1)	Maximum Peak Conducted Output Power	PASS	
15.247(d)	Conducted Spurious Emissions	PASS	
15.247(d) 15.209 15.205	Radiated Spurious Emissions	PASS	
15.207	Conducted Emission	PASS	
15.203 15.247(b)	Antenna Application	PASS	
15.247 (a) (1)/g/h	Frequency Hopping System	PASS	
NOTE1: N/A (Not Applicable)			
NOTE2: According to ANSI C63.10-2020, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for **FCC ID: YEB-MX** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart C

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

4.2 MEASUREMENT EQUIPMENT USED

Conducted Emission Test Equipment

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-001	EMI Test Receiver	R & S	ESCI	101108	Oct. 24, 2025	1 Year
ENE-336	L.I.S.N	Schwarzbeck	NSLK 8126	8126-05059	June 18, 2025	1 Year
ENE-159	Pulse Limiter	Schwarzbeck	VTSD 9561F-N	2611115-001-0033	Oct. 23, 2025	1 Year
ENE-278	RF Switching Unit	HTEC	HRSU	222101	June 19, 2025	1 Year
ENE-149	Conduction Test Room 1#	SKET	11.5*5*4m	/	March 05, 2025	3 Year

For Spurious Emissions Test

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-185	EMI Test Receiver	R&S	ESR7	102480	March 02, 2026	1 Year
ENE-188	Low Frequency Field Antenna	Schwarzbeck	FMZB 1513-60	00026	June 26, 2025	3 Year
ENE-190	Antenna Multiple	Schwarzbeck	VULB 9163	01499	March 09, 2025	3 Year
ENE-195	Pre-Amplifier	JS Denki	PA09K03-40	JSPA21019	March 02, 2026	1 Year
ENE-204	Low Frequency Notch Filter RF Switching	JS Denki	JSDSW-F	JSDSW2211 D02	March 02, 2026	1 Year
ENE-251	6dB Attenuator	Mini-Circuits	UNAT-6+	11542	June 18, 2025	1 Year
ENE-144	3-Meter Anechoic Chamber2#	SKET	9*6*6m	/	June 21, 2025	3 Year
ENE-171	EXA Signal Analyzer	KEYSIGHT	N9010B	MY60242467	Oct. 24, 2025	1 Year
ENE-191	Horn Antenna	Schwarzbeck	BBHA 9120 D	02588	March 09, 2025	3 Year
ENE-198	Pre-Amplifier	JS Denki	PA0118-50	JSPA21022	March 02, 2026	1 Year
ENE-206	High Frequency Notch FilterRf Switching	JS Denki	JSDSW-F	202083582	March 02, 2026	1 Year

For other test items:

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-253	EXG Analog Singnal Generator	Keysight	N5173B	MY61253062	June 19, 2025	1 Year
ENE-254	MXG Vector Singnal Generator	Keysight	N5182B	MY61350131	June 19, 2025	1 Year
ENE-255	Frepency Extender	Keysight	N5183BX07	MY61500104	June 19, 2025	1 Year
ENE-256	EXA Signal Anaalyzer	Keysight	N9010B	MY62060219	June 19, 2025	1 Year
ENE-257	WIRELESS CONNECTIVITY TESTER	ROHDE & SCHWARZ	CMW 270	1201.0002 K75-102608-Pb	June 19, 2025	1 Year
ENE-172	RF Control Unit	Tonscend	JS0806-2(V.6 E)	21L8060521	March 02, 2026	1 Year
ENE-092	DC Power Supply	KEFUNA	KDP3603	2004D3062946	June 19, 2025	1 Year
ENE-093	Attenuator 10dB	talent Microwave	TA10A2-S-18	N/A	June 19, 2025	1 Year
ENE-094	Attenuator 20dB	talent Microwave	TA20A2-S-18	N/A	June 19, 2025	1 Year

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (1Mbps for GFSK modulation(DH5); 2Mbps for $\pi/4$ -DQPSK modulation(2DH5);)were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for Bluetooth

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	39	2441	...	...
1	2403	40	2442	76	2478
2	2404	41	2443	77	2479
...	...	...	...	78	2480
Note: $f_c = 2402\text{MHz} + (k-1) \times 1\text{MHz}$ $k=1$ to 79					

Test Frequency and channel for Bluetooth

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	39	2441	78	2480

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at:

EMTEK (NINGBO) CO., LTD.

No. 8, Building 8, Lane 216, Qingyi Road, Ningbo High-Tech Zone, Ningbo, Zhejiang, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: Accredited by CNAS

The Certificate Registration Number is L6666.

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)

Designation by FCC

Designation Number: CN1354

Test Firm Registration Number: 427606

Accredited by A2LA

The Certificate Number is 4321.03.

Accredited by ISED

The Conformity Assessment Body Identifier is CN0114

Name of Firm

: EMTEK (NINGBO) CO., LTD.

Site Location

: No. 8, Building 8, Lane 216, Qingyi Road, Ningbo High-Tech Zone, Ningbo, Zhejiang, China

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Parameter	Measurement Uncertainty
Frequency error	$\pm 20\text{Hz}$
Occupied Bandwidth	$\pm 0.5\text{KHz}$
Transmitter output power	$\pm 0.6\text{dB}$
Conducted spurious emissions	$\pm 3.2\text{dB}$
Radiated spurious emissions	$\pm 4.5\text{dB}$
Temperature	$\pm 1.2^{\circ}\text{C}$
Humidity	$\pm 3\%$
DC voltages	$\pm 0.25\text{V}$
Time	$\pm 1\%$

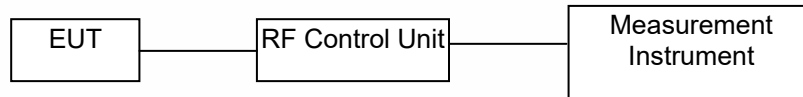
Measurement Uncertainty for a level of Confidence of 95%



7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP 1

The Bluetooth component's antenna port(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2020 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

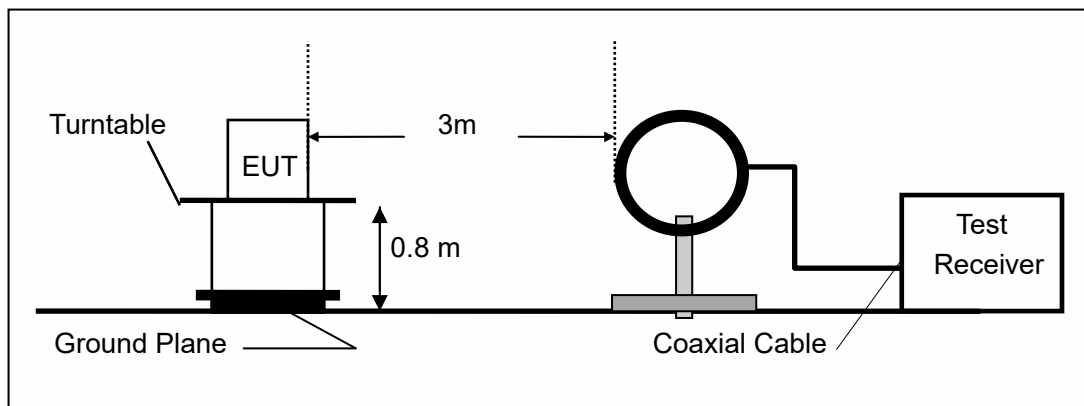
The EUT is placed on a turntable 0.8meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

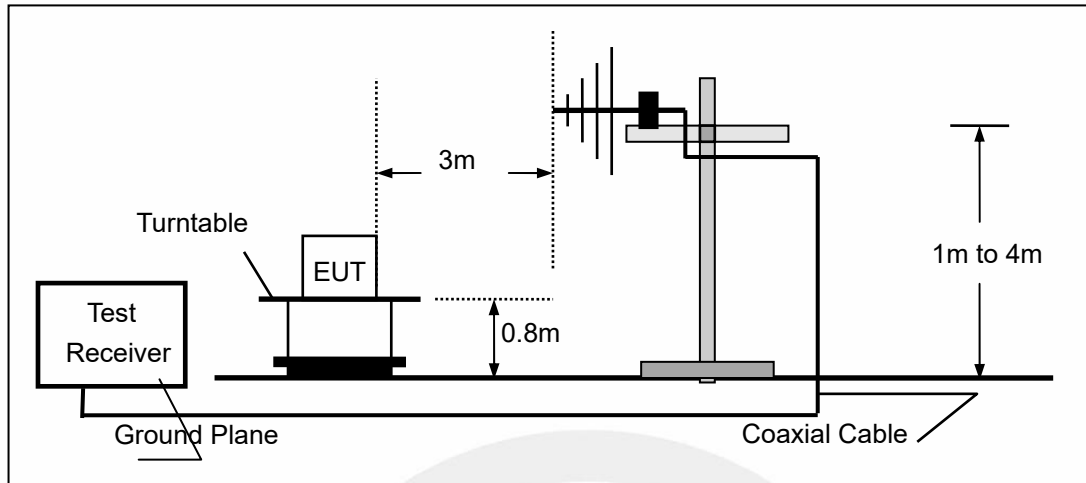
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

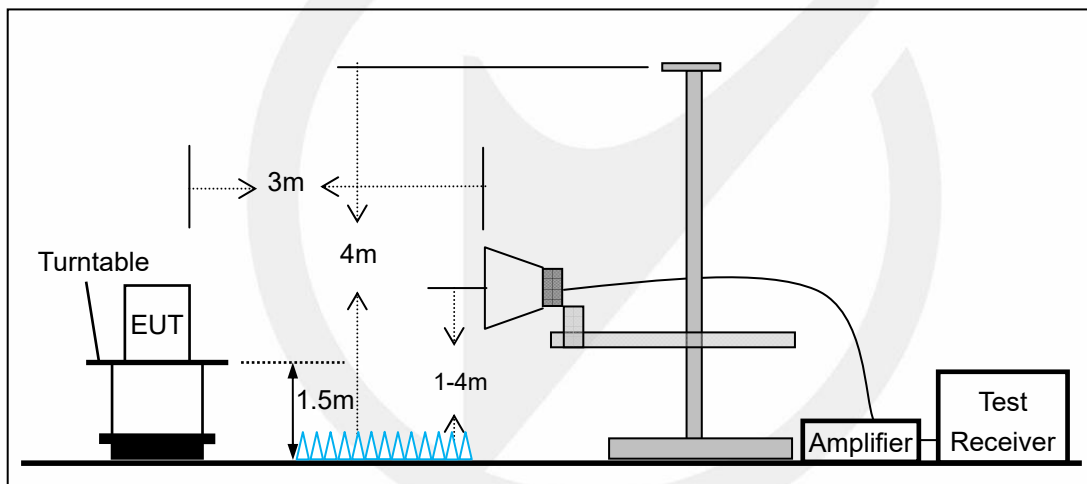
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

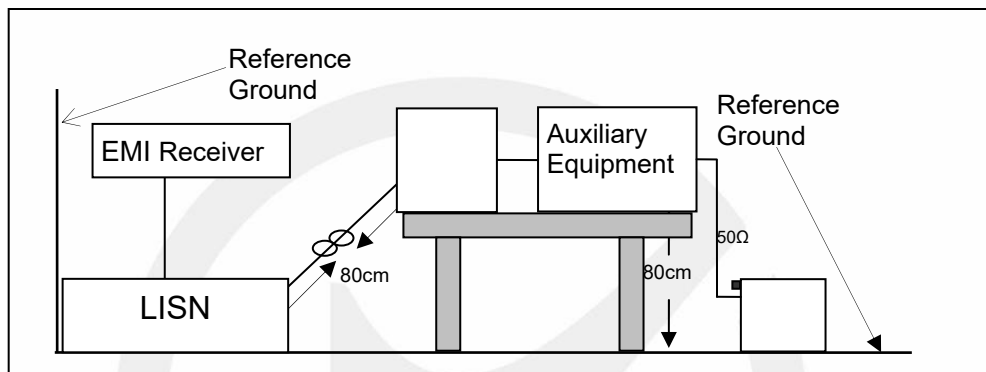


7.3 CONDUCTED EMISSION TEST SETUP

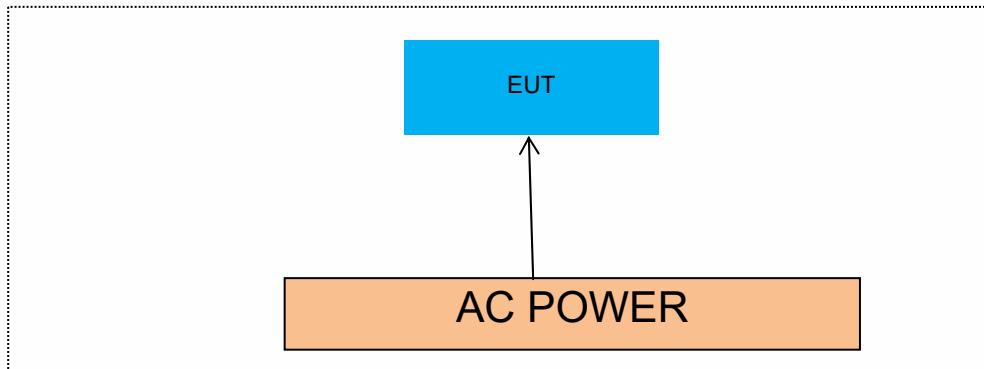
The mains cable of the EUT (Perfect Share Mini) must be connected to LISN. The LISN shall be placed 0.8m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.8m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2020 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8 FREQUENCY HOPPING SYSTEM REQUIREMENTS

8.1 Standard Applicable

According to FCC Part 15.247(a)(1), The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

(h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

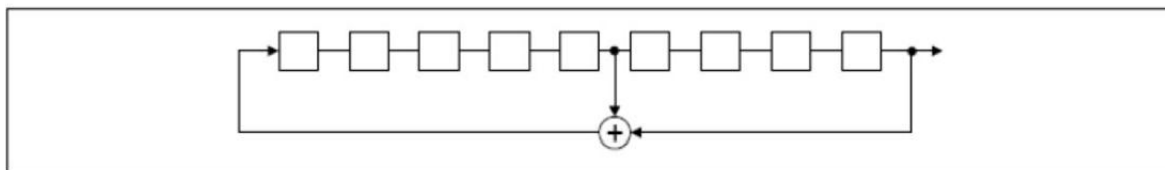
8.2 EUT Pseudorandom Frequency Hopping Sequence

The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master. The channel is divided into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The normal hop is 1 600 hops/s.

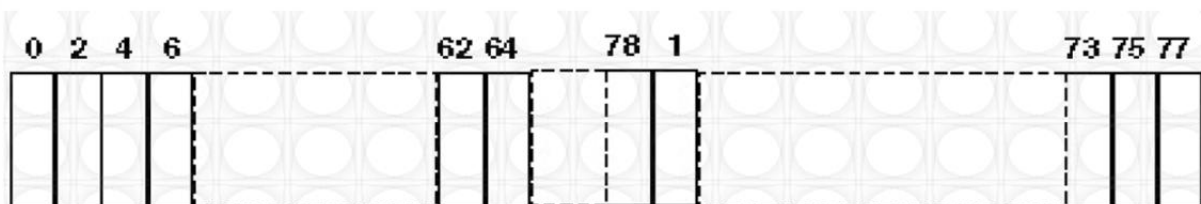
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage, and the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones. Number of shift register stages: 9

Length of pseudo-random sequence: $2^9 - 1 = 511$ bits

Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence



Each frequency used equally on the average by each transmitter.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

8.3 Equal Hopping Frequency Use

All Bluetooth units participating in the piconet are time and hop-synchronized to the channel.

Example of a 79 hopping sequence in data mode:

35, 27, 6, 44, 14, 61, 74, 32, 1, 11, 23, 2, 55, 65, 29, 3, 9, 52, 78, 58, 40, 25, 0, 7, 18, 26, 76, 60, 47, 50, 2, 5, 16, 37, 70, 63, 66, 54, 20, 13, 4, 8, 15, 21, 26, 10, 73, 77, 67, 69, 43, 24, 57, 39, 46, 72, 48, 33, 17, 31, 75, 19, 41, 62, 68, 28, 51, 66, 30, 56, 34, 59, 71, 22, 49, 64, 38, 45, 36, 42, 53

Each Frequency used equally on the average by each transmitter

8.4 Frequency Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule.

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

9 TEST REQUIREMENTS

9.1 20DB&99%BANDWIDTH

9.1.1 Applicable Standard

According to FCC Part 15.247(a)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

9.1.2 Conformance Limit

No limit requirement.

9.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.1.4 Test Procedure

The EUT was operating in Bluetooth mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 30 kHz.

Set the video bandwidth (VBW) = 100 kHz.

Set Span = approximately 2 to 3 times the 20 dB bandwidth

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

Measure and record the results in the test report.

Test Results

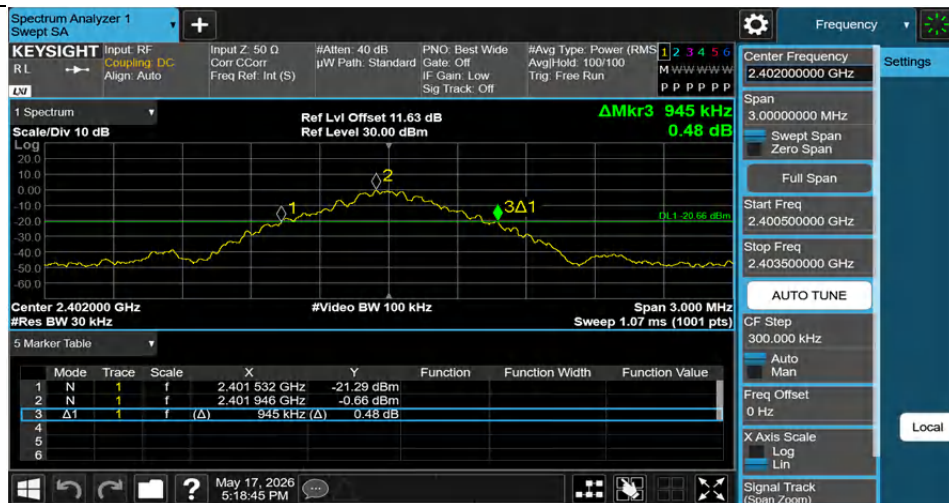
Temperature:	25° C
Relative Humidity:	66%
ATM Pressure:	1011 mbar

Note: N/A

20dB Emission Bandwidth

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.945	2401.532	2402.477	---	---
DH5	Ant1	2441	0.942	2440.535	2441.477	---	---
DH5	Ant1	2480	0.945	2479.535	2480.480	---	---
2DH5	Ant1	2402	1.326	2401.331	2402.657	---	---
2DH5	Ant1	2441	1.317	2440.337	2441.654	---	---
2DH5	Ant1	2480	1.332	2479.325	2480.657	---	---

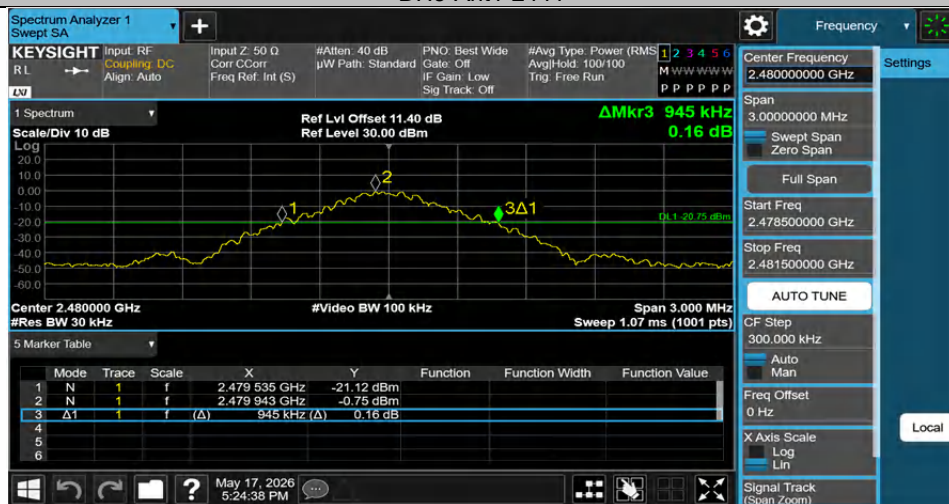




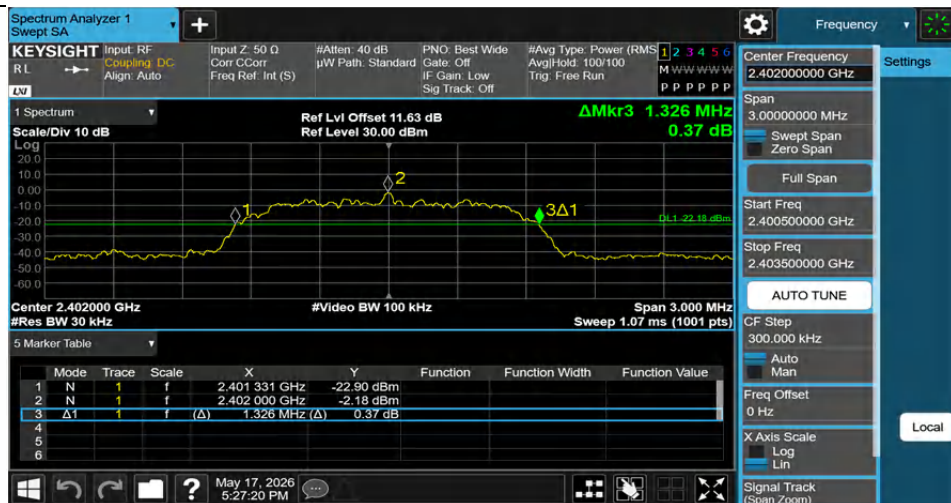
DH5-Ant1-2402



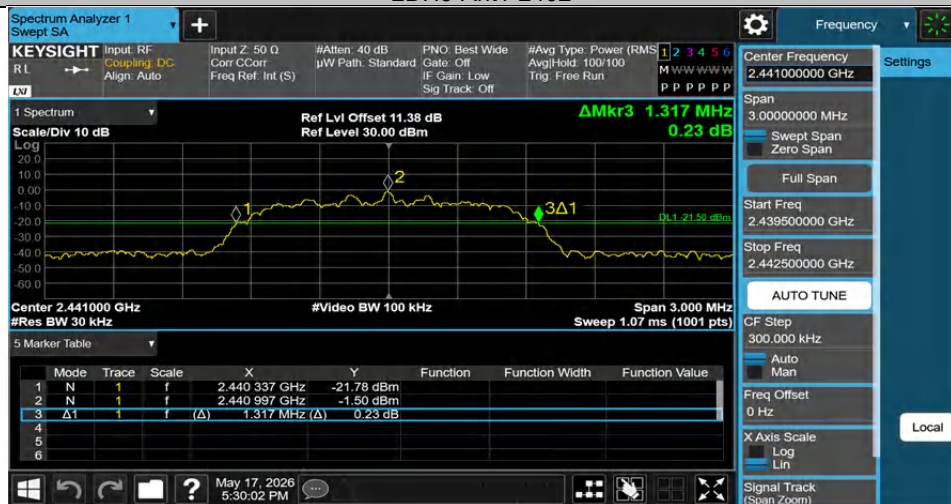
DH5-Ant1-2441



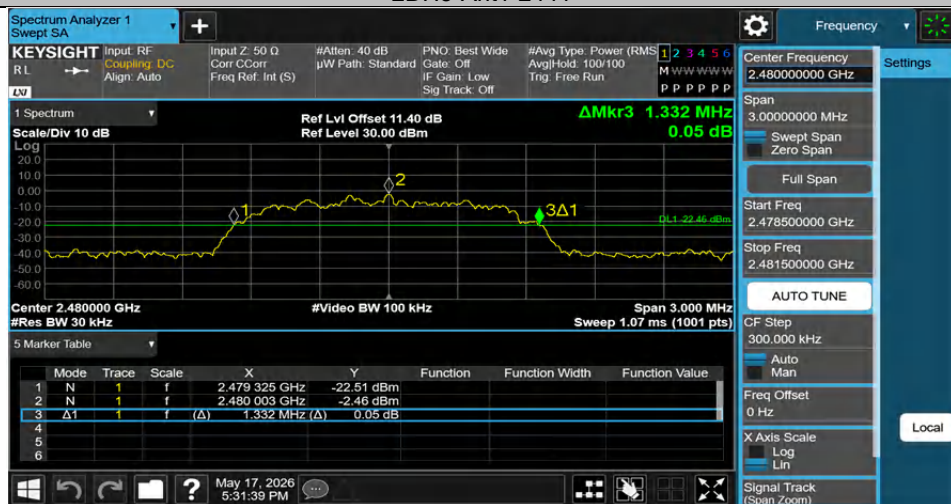
DH5-Ant1-2480



2DH5-Ant1-2402



2DH5-Ant1-2441

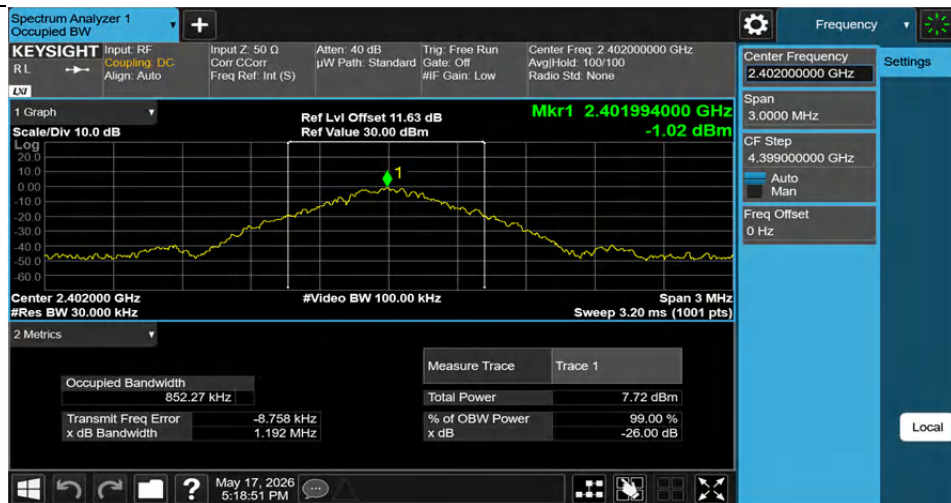


2DH5-Ant1-2480

Occupied Channel Bandwidth

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.85227	2401.5651	2402.4174	---	---
DH5	Ant1	2441	0.85753	2440.5646	2441.4221	---	---
DH5	Ant1	2480	0.86095	2479.5615	2480.4224	---	---
2DH5	Ant1	2402	1.1882	2401.3991	2402.5873	---	---
2DH5	Ant1	2441	1.1895	2440.3995	2441.5890	---	---
2DH5	Ant1	2480	1.2162	2479.3857	2480.6019	---	---

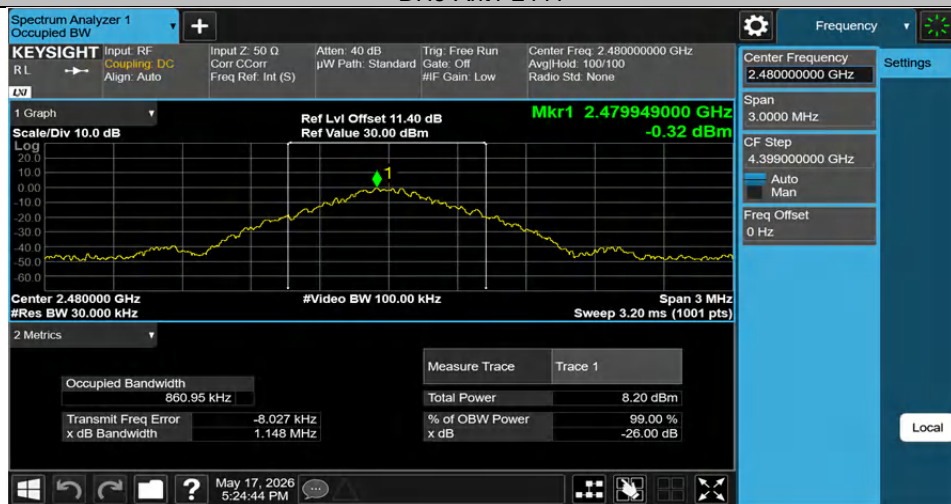




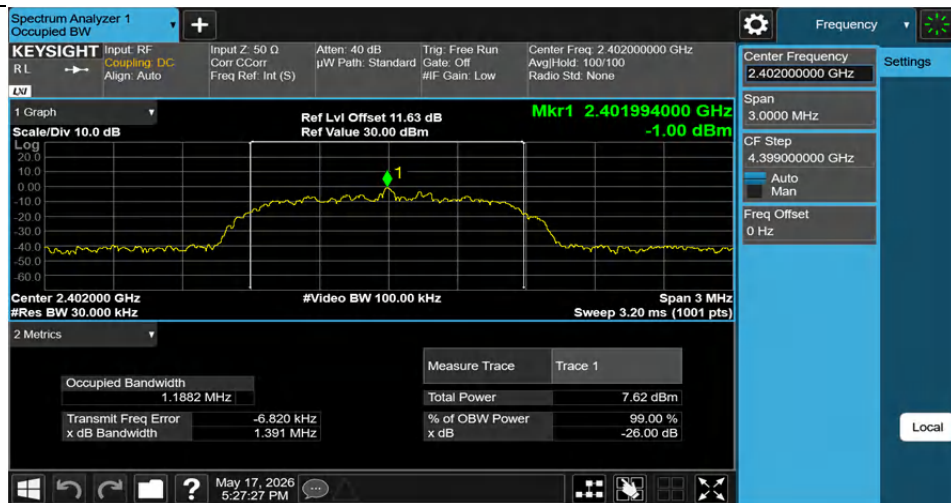
DH5-Ant1-2402



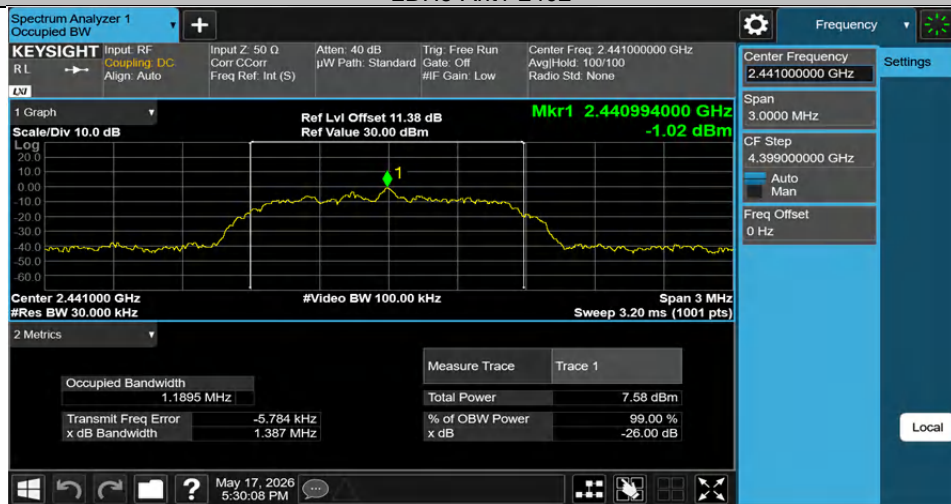
DH5-Ant1-2441



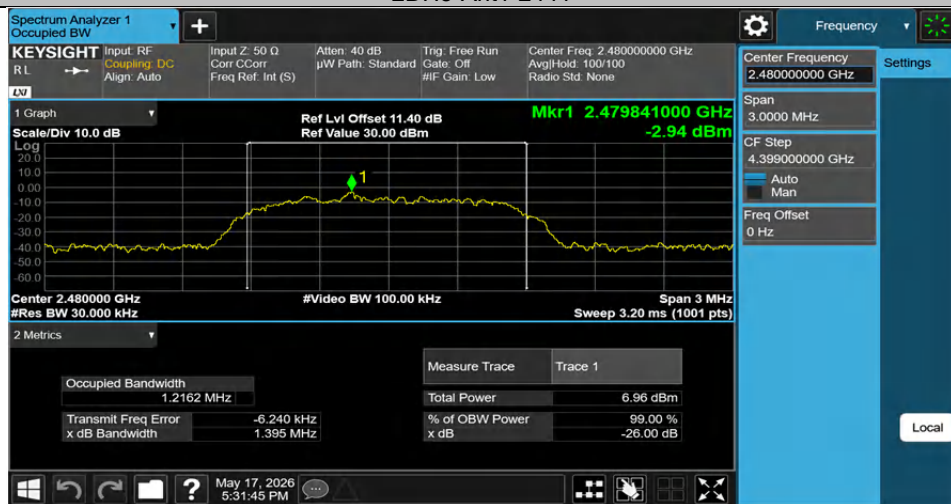
DH5-Ant1-2480



2DH5-Ant1-2402



2DH5-Ant1-2441



2DH5-Ant1-2480

9.2 CARRIER FREQUENCY SEPARATION

9.2.1 Applicable Standard

According to FCC Part 15.247(a)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

9.2.2 Conformance Limit

Frequency hopping systems operating in the 2400-2483.5MHz band shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

In case of an output power less than 125mW, the frequency hopping system may have channels separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

9.2.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.2.4 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Set the RBW = 300kHz. Set VBW = 300kHz.

Set the span = wide enough to capture the peaks of two adjacent channels

Set Sweep time = auto couple.

Set Detector = peak. Set Trace mode = max hold.

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

Test Results

Temperature:	25° C
Relative Humidity:	66%
ATM Pressure:	1011 mbar

Note: For GFSK, pi/4-DQPSK Limit = 20dB bandwidth * 2/3

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.014	≥0.945	PASS
2DH5	Ant1	Hop	1.036	≥0.888	PASS



9.3 NUMBER OF HOPPING FREQUENCIES

9.3.1 Applicable Standard

According to FCC Part 15.247(a)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

9.3.2 Conformance Limit

Frequency hopping systems operating in the 2400-2483.5MHz band shall use at least 15 channels.

9.3.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.3.4 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation (2400-2483.5MHz)

RBW = 300KHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

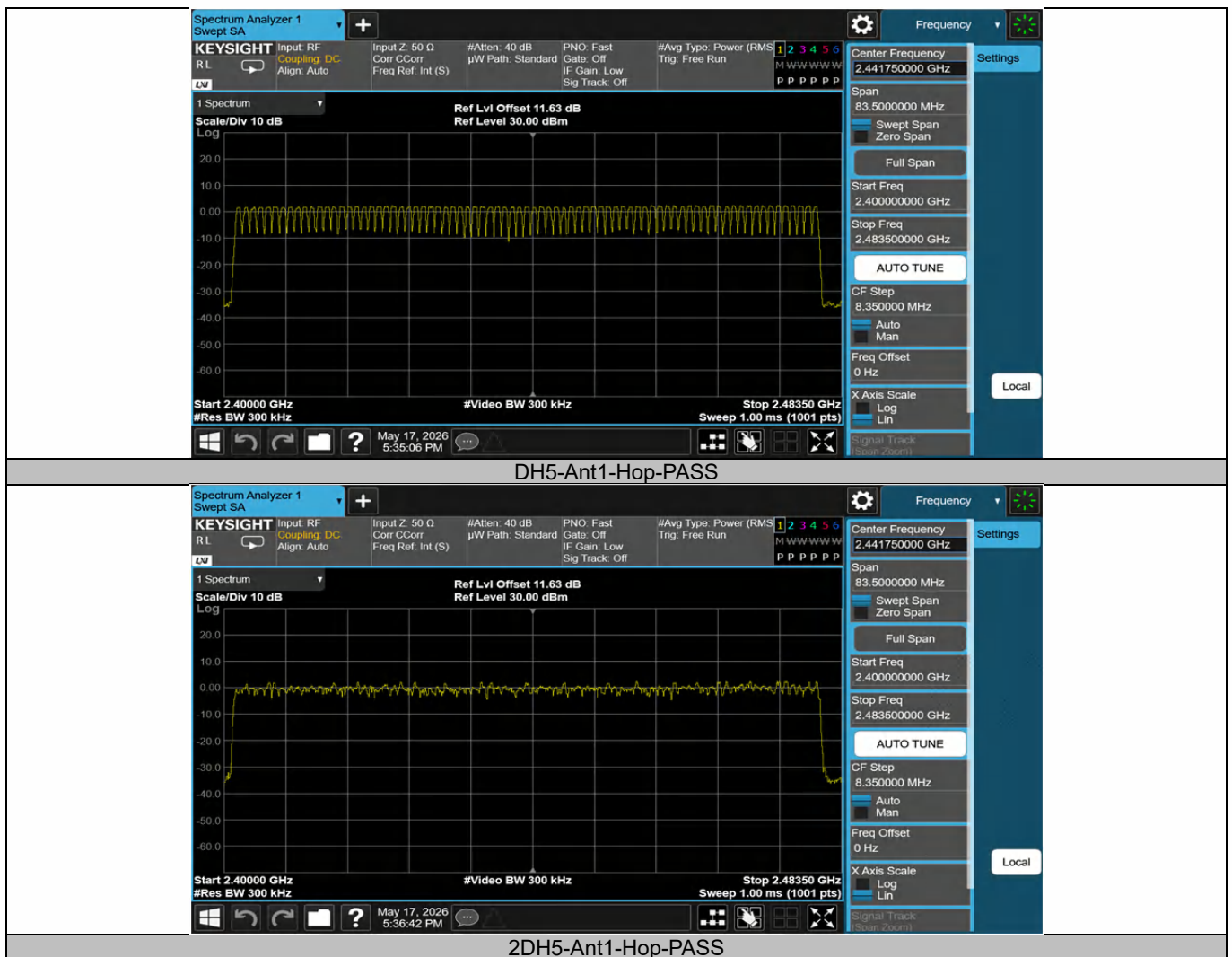
Allow the trace to stabilize. It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies.

Test Results

Temperature:	25° C
Relative Humidity:	66%
ATM Pressure:	1011 mbar

Note: N/A

TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥ 15	PASS
2DH5	Ant1	Hop	79	≥ 15	PASS



9.4 AVERAGE TIME OF OCCUPANCY (DWELL TIME)

9.4.1 Applicable Standard

According to FCC Part 15.247(a)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

9.4.2 Conformance Limit

For frequency hopping systems operating in the 2400-2483.5MHz band, the averagetime of occupancy on any channel shall not be greater than 0.4s within a period of 0.4smultiplied by the number of hopping channels employed.

9.4.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.4.4 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzersettings:

Span = zero span, centered on a hopping channel

RBW = 1 MHz

VBW $\geq$ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subpara graphs of this Section.

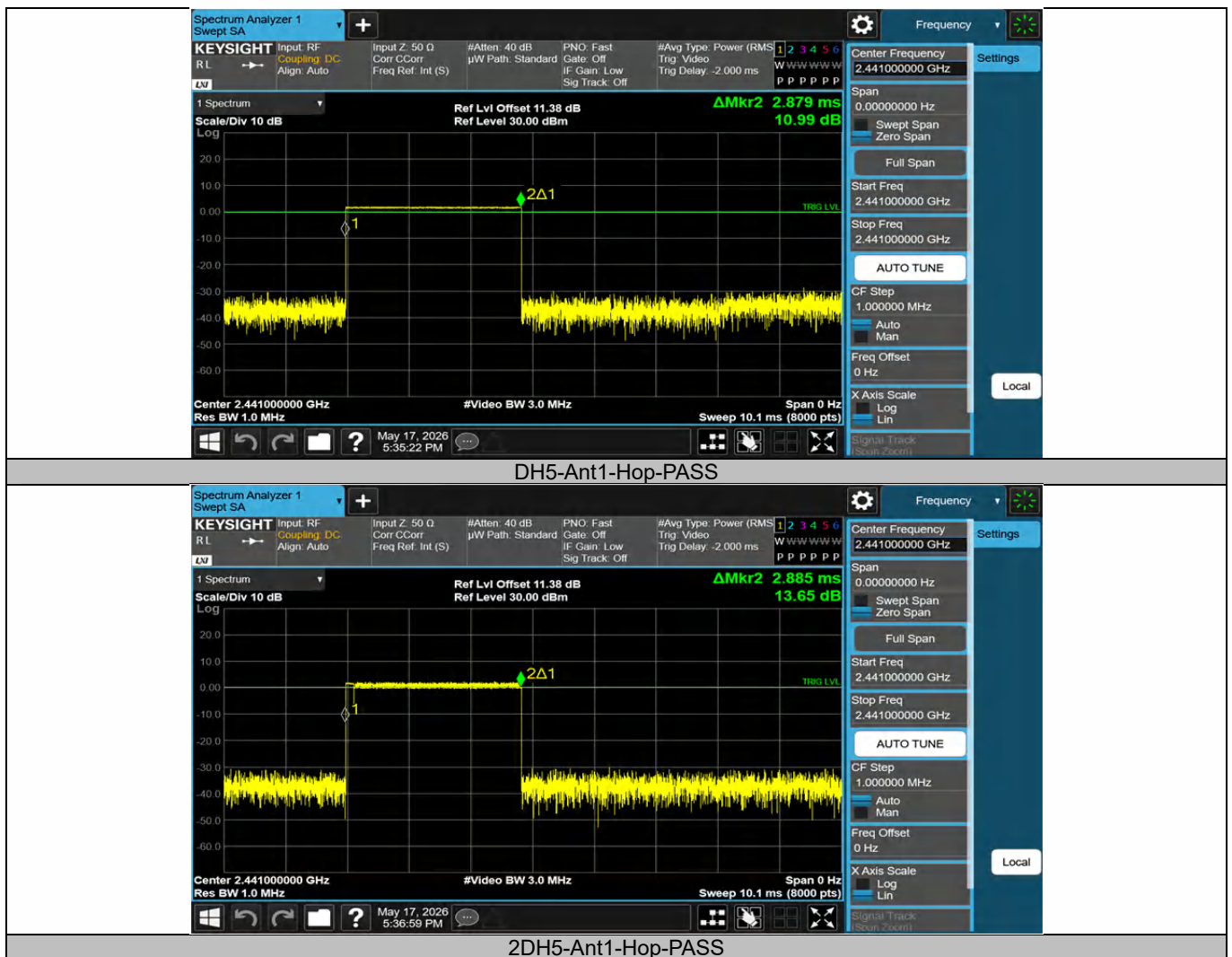
9.4.5 Test Results

Temperature:	25° C
Relative Humidity:	66%
ATM Pressure:	1011 mbar

Note: Total Hops(DH5)=(1600/6/79)*31.6
 Total Hops(2DH5)=(1596/6/79)*31.6
 Total Hops(3DH5)=(1602/6/79)*31.6
 Dwell Time=Burst Width*Total Hops

All the antenna(Antenna 1) and modes(GFSK, $\pi/4$ -DQPSK) mode have been tested, and the worst(Antenna 1,GFSK) result recorded was report as below:

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.879	106.67	0.307	≤ 0.4	PASS
2DH5	Ant1	Hop	2.885	106.67	0.308	≤ 0.4	PASS



9.5 MAXIMUM PEAK CONDUCTED OUTPUT POWER

9.5.1 Applicable Standard

According to FCC Part 15.247(b)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

9.5.2 Conformance Limit

The max For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.5.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.5.4 Test Procedure

As an alternative to a peak power measurement, compliance with the limit can be based on a measurement of the maximum conducted output power.

Use the following spectrum analyzer settings:

Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel(about 8MHz)

Set RBW > the 20 dB bandwidth of the emission being measured(about 3MHz)

Set VBW $\geq$ RBW

Set Sweep = auto

Set Detector function = peak

Set Trace = max hold

Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission to determine the peak amplitude level.

Test Results

Temperature:	25° C
Relative Humidity:	66%
ATM Pressure:	1011 mbar

Note: N/A

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	2.09	≤ 20.97	PASS
DH5	Ant1	2441	2.06	≤ 30	PASS
DH5	Ant1	2480	2.42	≤ 30	PASS
2DH5	Ant1	2402	2.73	≤ 20.97	PASS
2DH5	Ant1	2441	2.75	≤ 20.97	PASS
2DH5	Ant1	2480	3.03	≤ 20.97	PASS





9.6 CONDUCTED SUPRIIOUS EMISSION

9.6.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

9.6.2 Conformance Limit

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

9.6.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.6.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

■ Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DSS channel center frequency.

Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel.

Set the RBW = 100 kHz. Set the VBW $\geq 3 \times$ RBW.

Set Detector = peak. Set Sweep time = auto couple.

Set Trace mode = max hold. Allow trace to fully stabilize.

Use the peak marker function to determine the maximum Maximumconducetedlevel.

Note that the channel found to contain the maximum conduceted level can be used to establish the reference level.

■ Band-edge measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation

Set RBW $\geq 1\%$ of the span=100kHzSet VBW $\geq 3 \times$ RBW

Set Sweep = autoSet Detector function = peakSet Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize.

Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

■ Emission level measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.(30MHz to 25GHz).Set RBW = 100 kHzSet VBW $\geq$ RBW

Set Sweep = autoSet Detector function = peakSet Trace = max hold

Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.

9.6.5 Test Results

Temperature:	25°C
Relative Humidity:	66%
ATM Pressure:	1011 mbar

Note: N/A

■ Reference level measurement

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
DH5	Ant1	2402	2402.00	1.43
DH5	Ant1	2441	2440.99	1.59
DH5	Ant1	2480	2479.84	2.11
2DH5	Ant1	2402	2402.16	1.65
2DH5	Ant1	2441	2441.14	1.29
2DH5	Ant1	2480	2479.86	1.72

■ Band-edge measurement

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	1.43	-38.81	≤-18.57	PASS
DH5	Ant1	High	2480	2.11	-42.22	≤-17.89	PASS
DH5	Ant1	Low	Hop_2402	0.05	-41	≤-19.96	PASS
DH5	Ant1	High	Hop_2480	0.88	-42.56	≤-19.12	PASS
2DH5	Ant1	Low	2402	1.65	-40.34	≤-18.35	PASS
2DH5	Ant1	High	2480	1.72	-43.98	≤-18.28	PASS
2DH5	Ant1	Low	Hop_2402	-1.58	-45.48	≤-21.58	PASS
2DH5	Ant1	High	Hop_2480	-2.58	-42.45	≤-22.58	PASS

■ Emission level measurement

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	30~1000	1.43	-61.22	≤-18.57	PASS
DH5	Ant1	2402	1000~26500	1.43	-43.99	≤-18.57	PASS
DH5	Ant1	2441	30~1000	1.59	-61.43	≤-18.41	PASS
DH5	Ant1	2441	1000~26500	1.59	-43.52	≤-18.41	PASS
DH5	Ant1	2480	30~1000	2.11	-61.49	≤-17.89	PASS
DH5	Ant1	2480	1000~26500	2.11	-44.93	≤-17.89	PASS
2DH5	Ant1	2402	30~1000	1.65	-60.65	≤-18.35	PASS
2DH5	Ant1	2402	1000~26500	1.65	-47.84	≤-18.35	PASS
2DH5	Ant1	2441	30~1000	1.29	-61.67	≤-18.71	PASS
2DH5	Ant1	2441	1000~26500	1.29	-44.23	≤-18.71	PASS
2DH5	Ant1	2480	30~1000	1.72	-60.58	≤-18.28	PASS
2DH5	Ant1	2480	1000~26500	1.72	-48.3	≤-18.28	PASS

■ Reference level measurement





2DH5-Ant1-2402-PASS

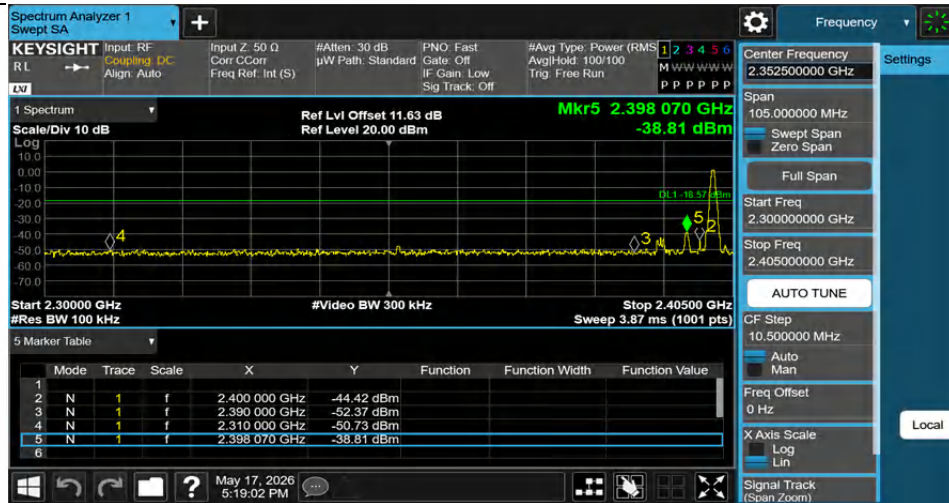


2DH5-Ant1-2441-PASS

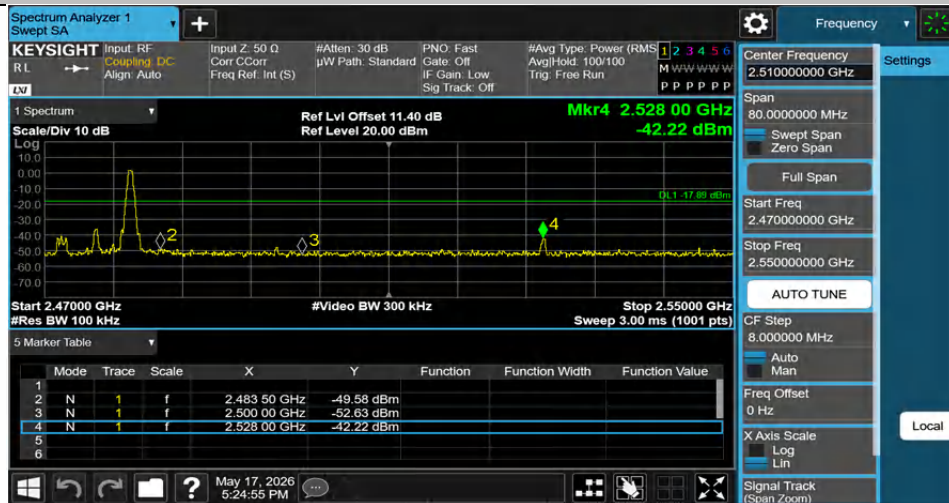


2DH5-Ant1-2480-PASS

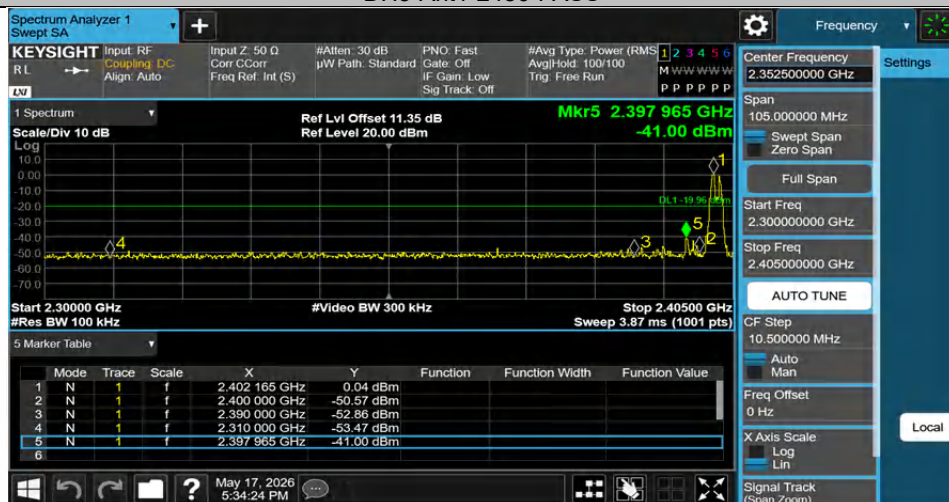
■ Band-edge measurement



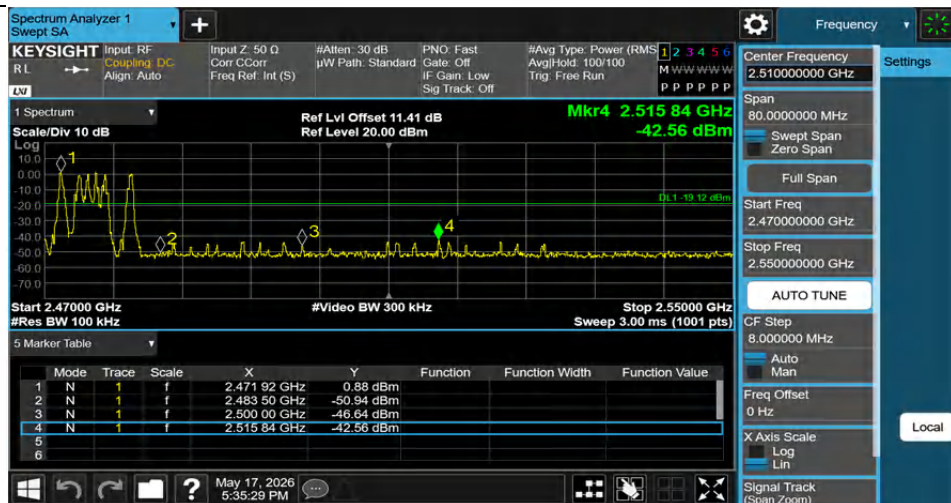
DH5-Ant1-2402-PASS



DH5-Ant1-2480-PASS



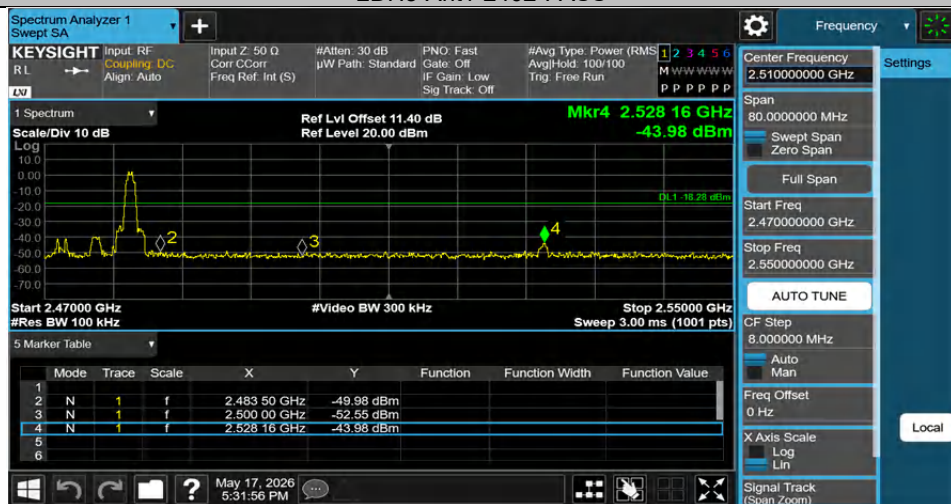
DH5-Ant1-Hop_2402-PASS



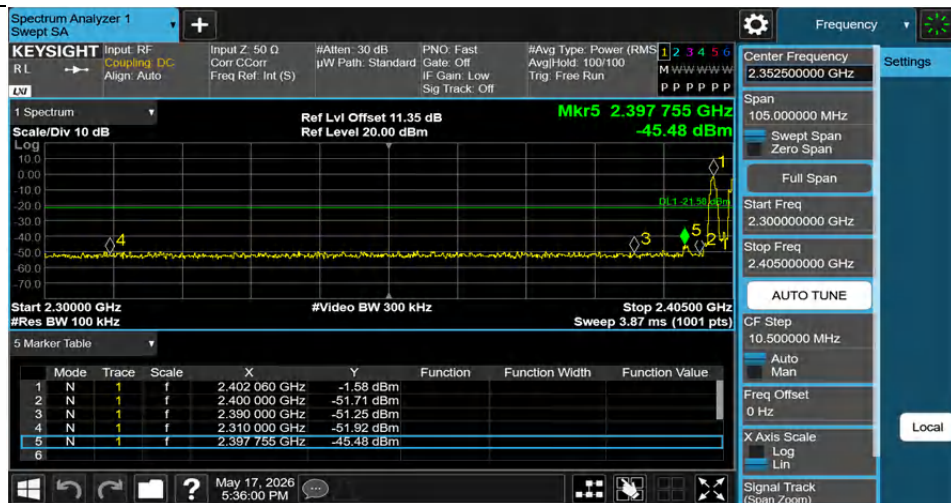
DH5-Ant1-Hop 2480-PASS



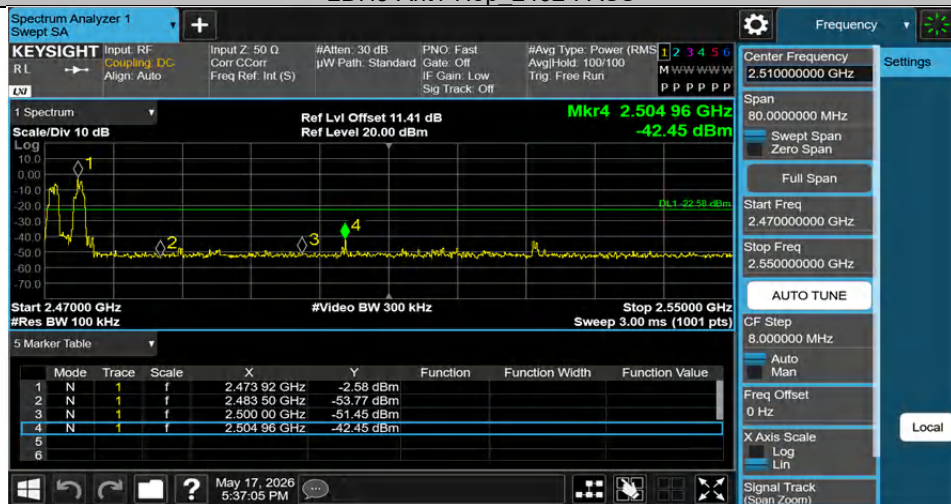
2DH5-Ant1-2402-PASS



2DH5-Ant1-2480-PASS

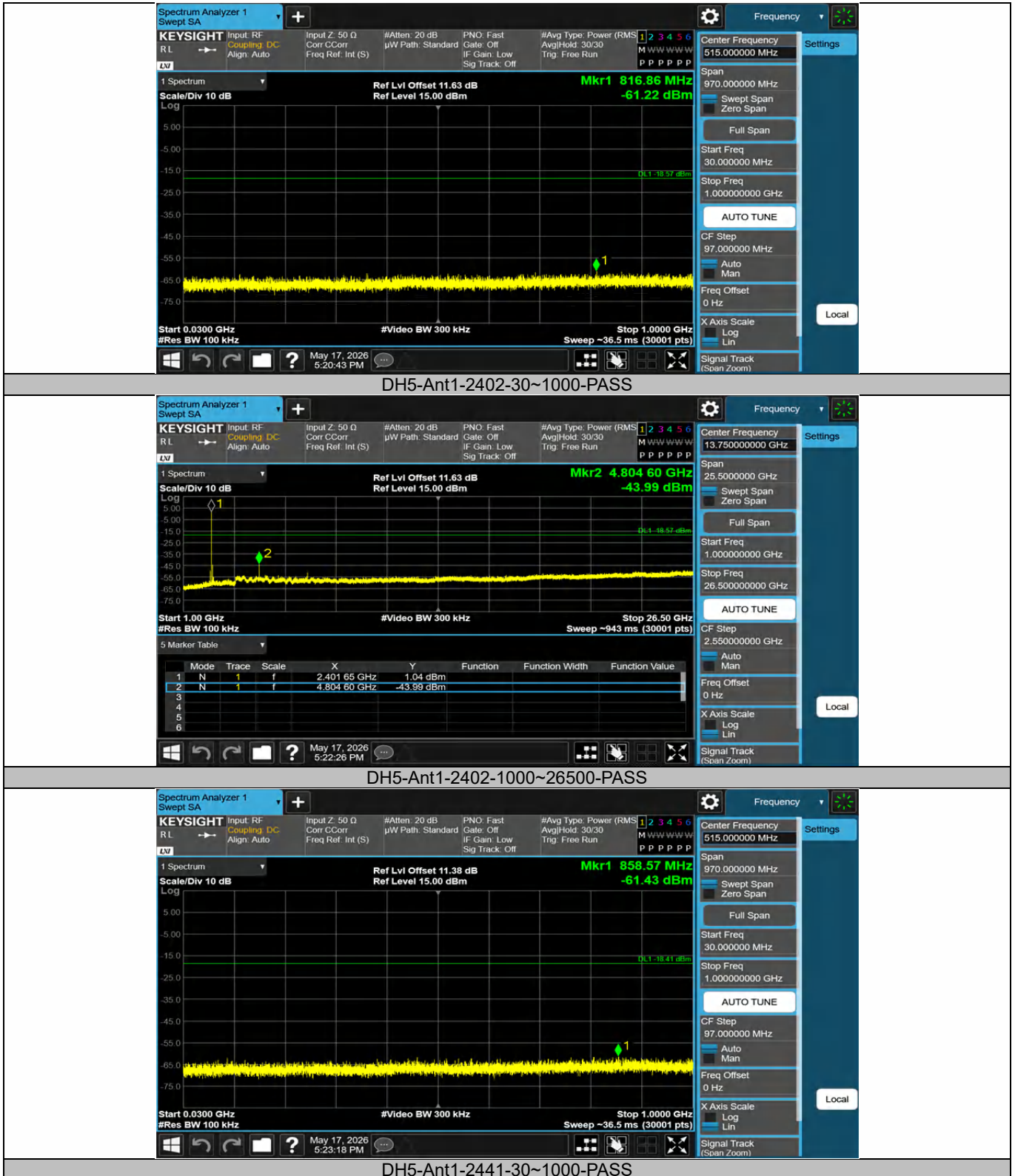


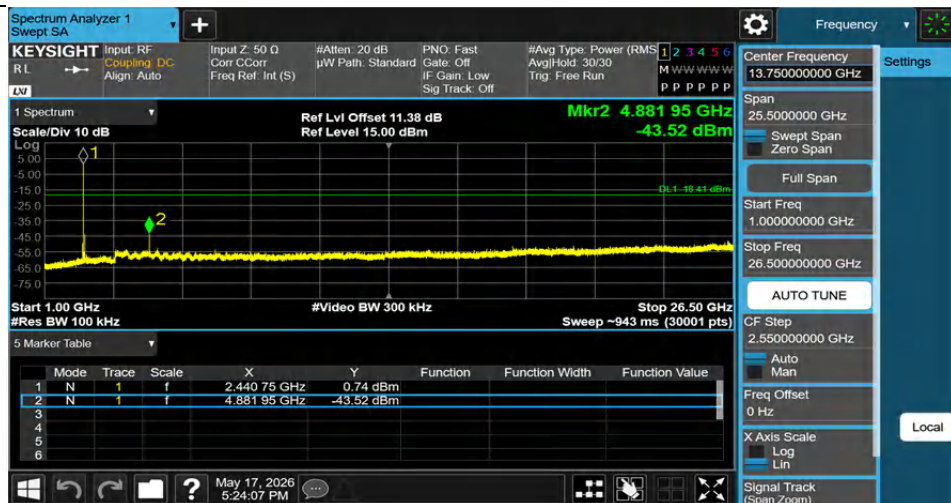
2DH5-Ant1-Hop_2402-PASS



2DH5-Ant1-Hop_2480-PASS

■ Emission level measurement





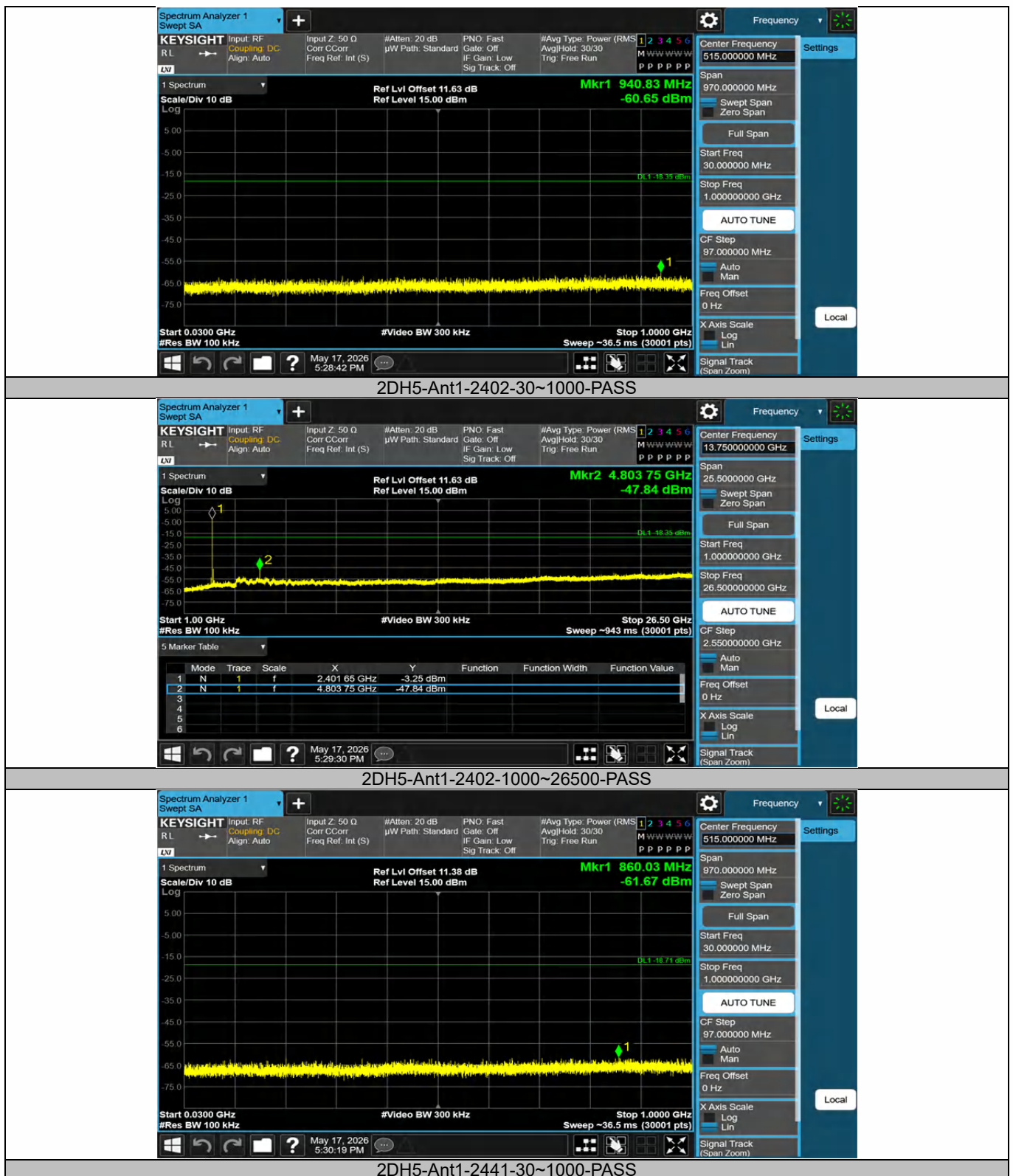
DH5-Ant1-2441-1000~26500-PASS

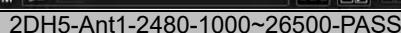
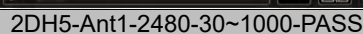
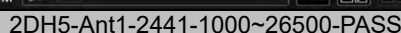


DH5-Ant1-2480-30~1000-PASS



DH5-Ant1-2480-1000~26500-PASS





9.7 RADIATED SPURIOUS EMISSION

9.7.1 Applicable Standard

According to FCC Part 15.247(d), 15.205, 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02
According to IC RSS-Gen and RSS-247

9.7.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

9.7.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

9.7.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 1GHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz for

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 9kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 200Hz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2020 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

9.7.5 Test Results

■ Spurious Emission below 30MHz(9KHz to 30MHz)

Temperature:	25° C
Relative Humidity:	66%
ATM Pressure:	1011 mbar

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

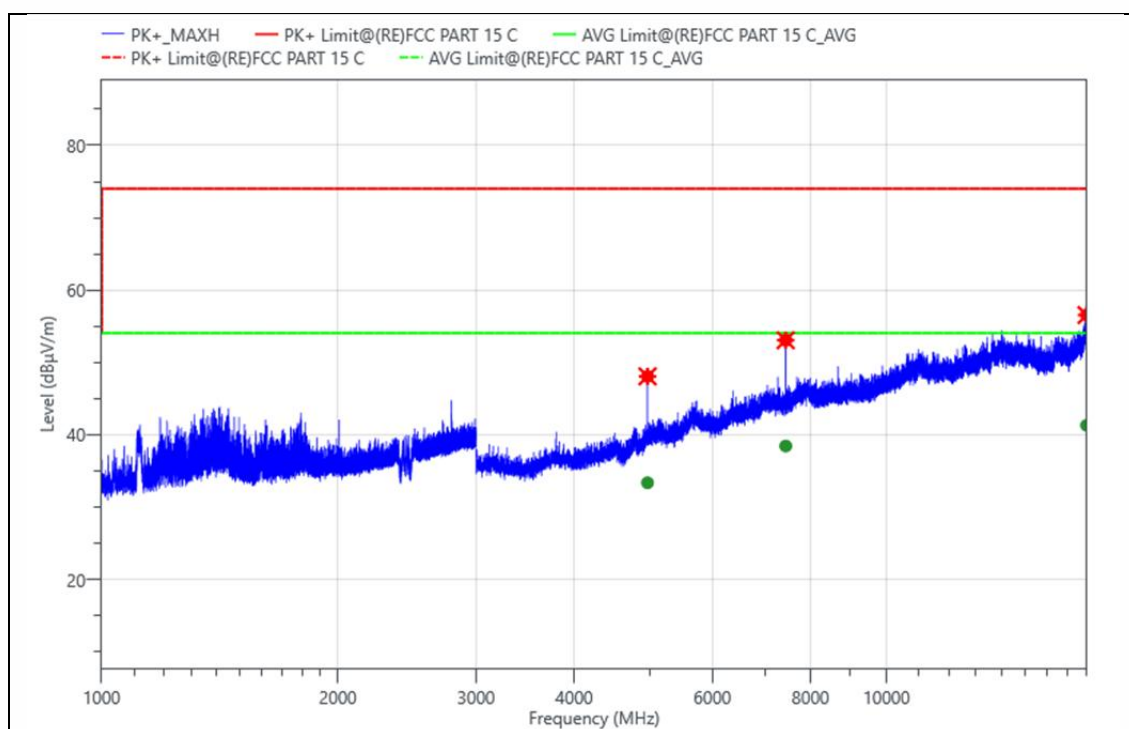
Distance extrapolation factor = $40\log(\text{Specific distance}/\text{test distance})$ (dB);

Limit line = Specific limits(dBuV) + distance extrapolation factor

■ Spurious Emission Above 1GHz(1GHz to 25GHz)

All the antenna(Antenna 1) and modes(GFSK, $\pi/4$ -DQPSK) mode have been tested, and the worst(Antenna 1,GFSK) result recorded was report as below:

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2480
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%

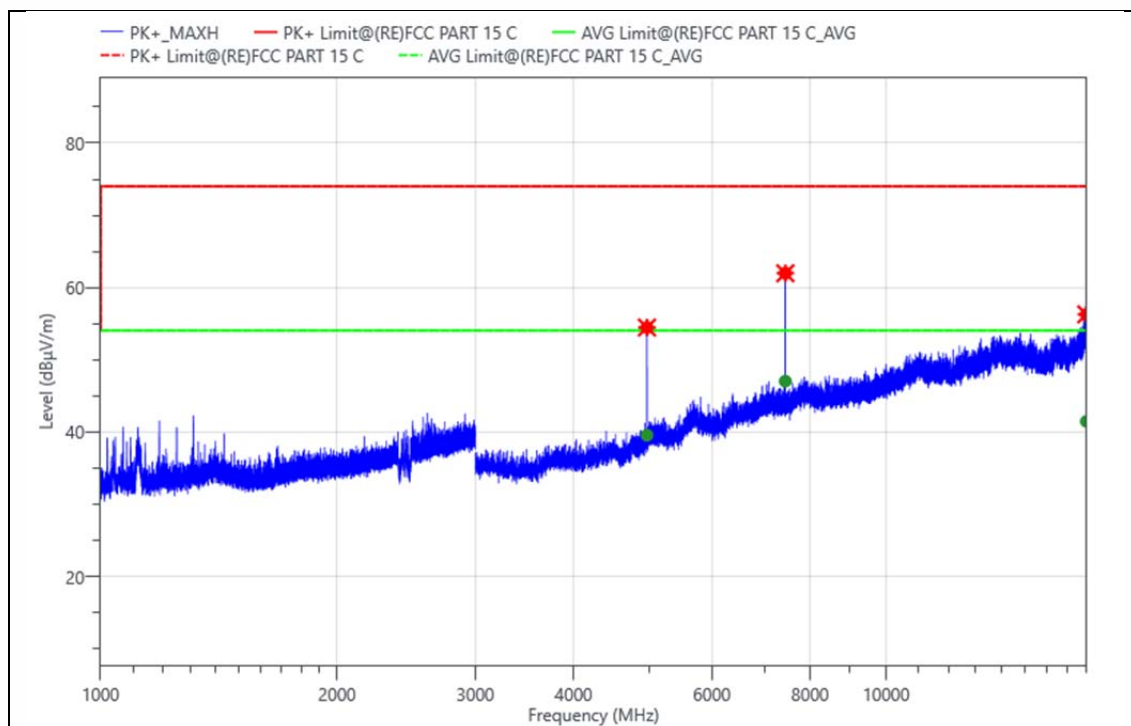


Final_Result

(Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	4960.000	55.49	-7.41	48.08	74.00	25.92	PK+	V	PASS
2	4960.000	40.78	-7.41	33.37	54.00	20.63	AVG	V	PASS
3	7439.500	53.22	-0.14	53.08	74.00	20.92	PK+	V	PASS
4	7439.500	38.59	-0.14	38.45	54.00	15.55	AVG	V	PASS
5	17984.500	43.09	13.47	56.56	74.00	17.44	PK+	V	PASS
6	17984.500	27.85	13.47	41.32	54.00	12.68	AVG	V	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2480
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%

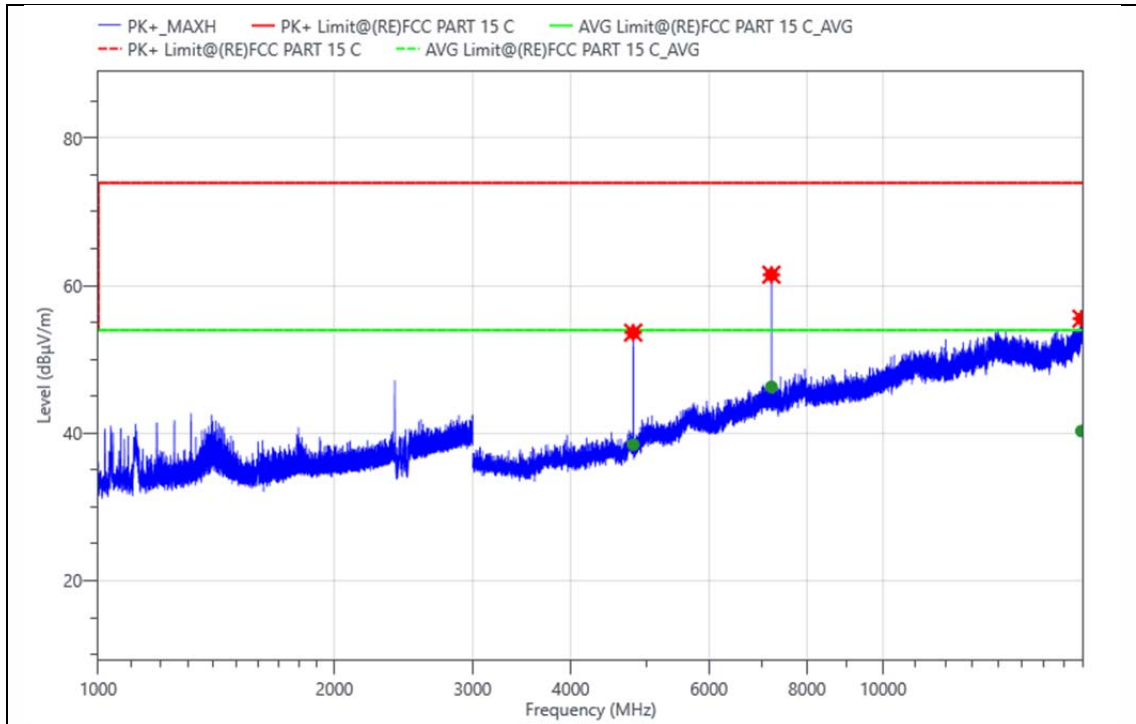


Final_Result

(Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	4960.000	61.89	-7.41	54.48	74.00	19.52	PK+	H	PASS
2	4960.000	46.98	-7.41	39.57	54.00	14.43	AVG	H	PASS
3	7441.000	62.12	-0.13	61.99	74.00	12.01	PK+	H	PASS
4	7441.000	47.18	-0.13	47.05	54.00	6.95	AVG	H	PASS
5	17984.000	42.83	13.47	56.30	74.00	17.70	PK+	H	PASS
6	17984.000	28.01	13.47	41.48	54.00	12.52	AVG	H	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2402
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%

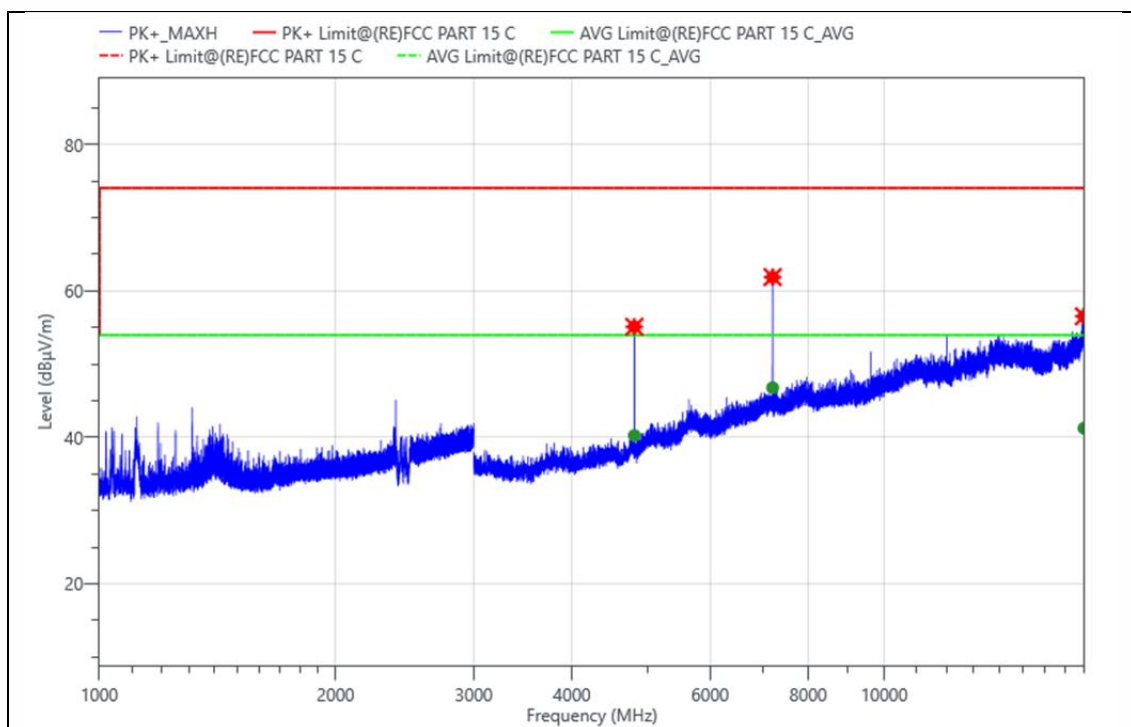


Final_Result

(Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	4804.000	62.43	-8.8	53.63	74.00	20.37	PK+	V	PASS
2	4804.000	47.25	-8.8	38.45	54.00	15.55	AVG	V	PASS
3	7205.500	62.04	-0.56	61.48	74.00	12.52	PK+	V	PASS
4	7205.500	46.83	-0.56	46.27	54.00	7.73	AVG	V	PASS
5	17898.000	43.09	12.43	55.52	74.00	18.48	PK+	V	PASS
6	17898.000	27.86	12.43	40.29	54.00	13.71	AVG	V	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2402
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%

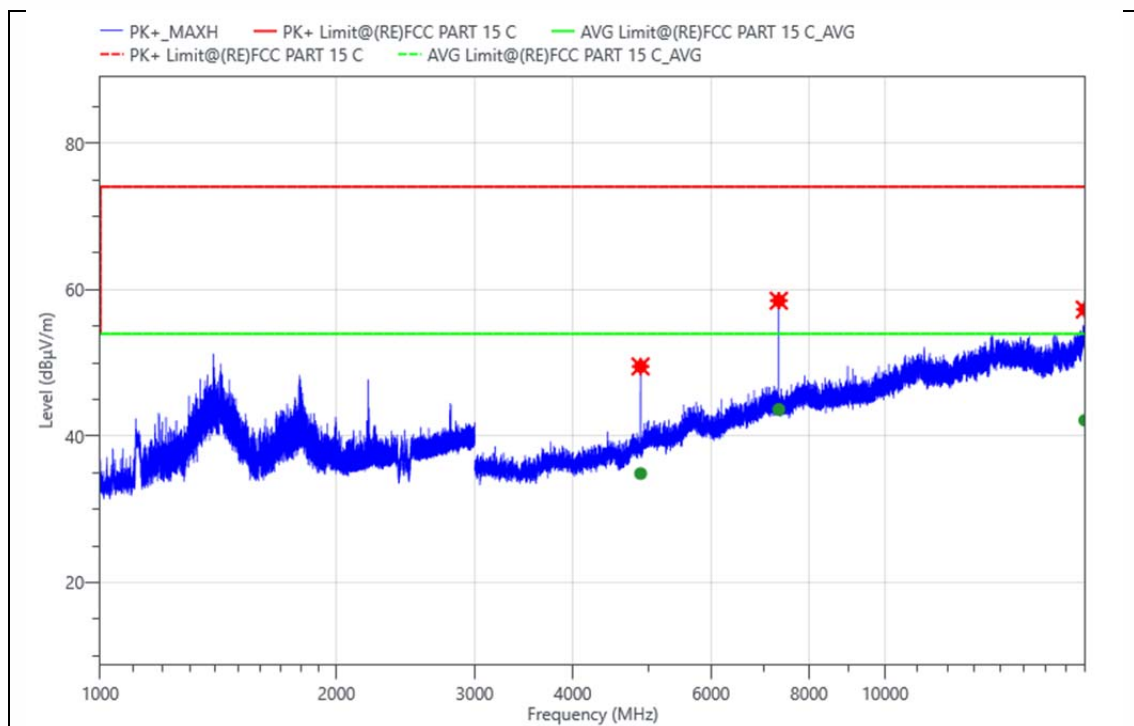


Final_Result

(Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	4804.000	63.89	-8.8	55.09	74.00	18.91	PK+	H	PASS
2	4804.000	49.05	-8.8	40.25	54.00	13.75	AVG	H	PASS
3	7206.500	62.43	-0.56	61.87	74.00	12.13	PK+	H	PASS
4	7206.500	47.33	-0.56	46.77	54.00	7.23	AVG	H	PASS
5	17967.000	43.26	13.26	56.52	74.00	17.48	PK+	H	PASS
6	17967.000	27.98	13.26	41.24	54.00	12.76	AVG	H	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2441
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%

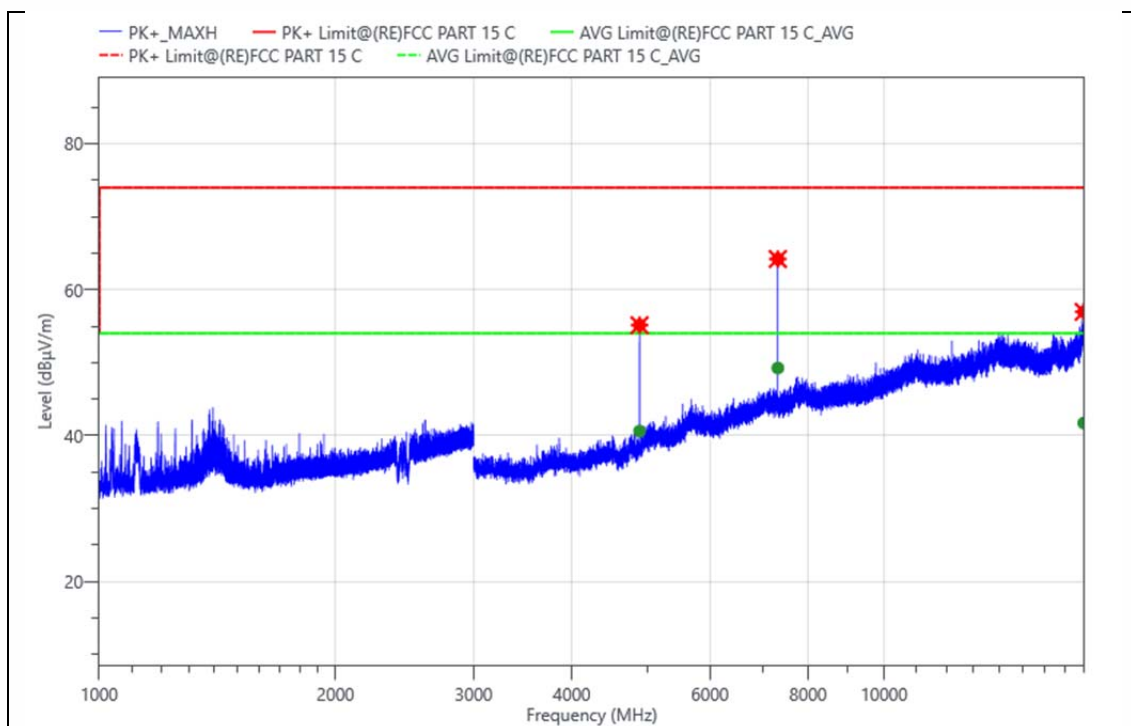


Final_Result

(Margin=Limit-Meas.(Reading+Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	4882.000	57.72	-8.22	49.50	74.00	24.50	PK+	V	PASS
2	4882.000	43.09	-8.22	34.87	54.00	19.13	AVG	V	PASS
3	7320.000	58.85	-0.38	58.47	74.00	15.53	PK+	V	PASS
4	7320.000	44.01	-0.38	43.63	54.00	10.37	AVG	V	PASS
5	17968.500	43.99	13.28	57.27	74.00	16.73	PK+	V	PASS
6	17968.500	28.87	13.28	42.15	54.00	11.85	AVG	V	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2441
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%



Final_Result

(Margin=Limit-Meas.(Reading + Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	4882.000	63.35	-8.22	55.13	74.00	18.87	PK+	H	PASS
2	4882.000	48.85	-8.22	40.63	54.00	13.37	AVG	H	PASS
3	7321.000	64.58	-0.38	64.20	74.00	9.80	PK+	H	PASS
4	7321.000	47.65	-0.38	47.27	54.00	6.73	AVG	H	PASS
5	17964.500	43.73	13.23	56.96	74.00	17.04	PK+	H	PASS
6	17964.500	28.50	13.23	41.73	54.00	12.27	AVG	H	PASS

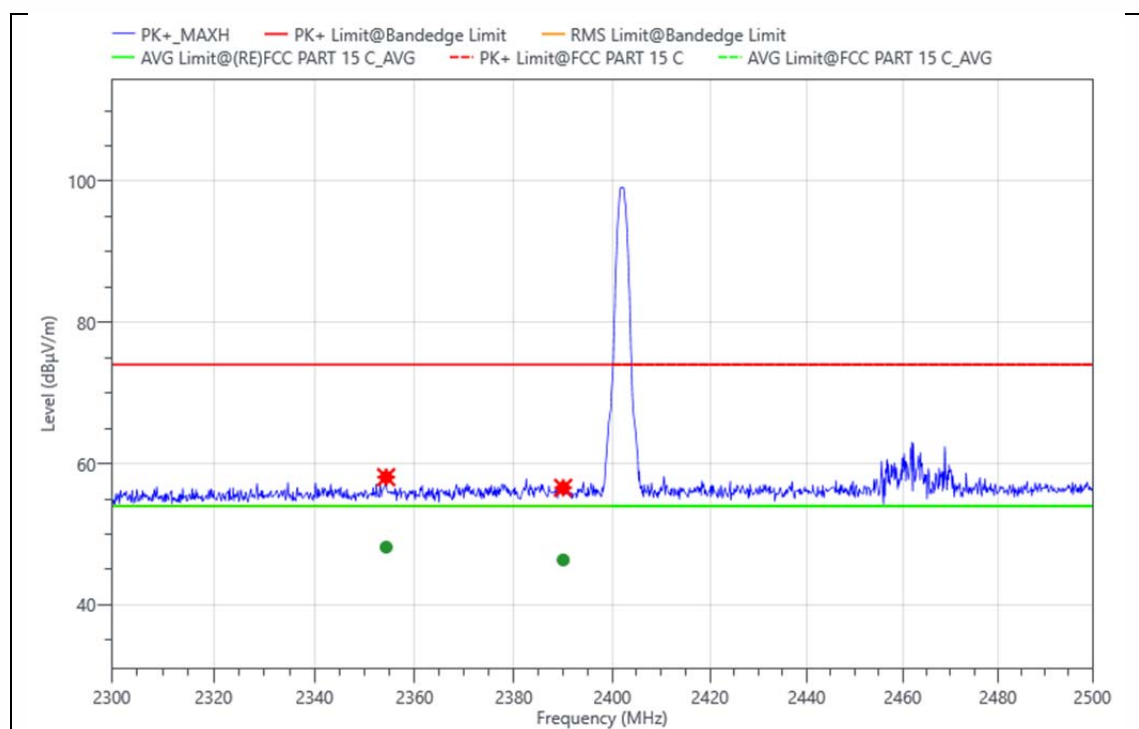
Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=1kHz).
- (2) Emission Level= Reading Level+Correct Factor.
- (3) Correct Factor= Ant_F + Cab_L - Preamp
- (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5)The test frequency range, 18GHz~25GHz test result on peak is lower than average limit, all is the noise base, therefore no data appear in the report.

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

All the antenna(Antenna 1) and modes(GFSK, $\pi/4$ -DQPSK, Hopping) mode have been tested, and the worst(GFSK) result recorded was report as below:

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2402
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%

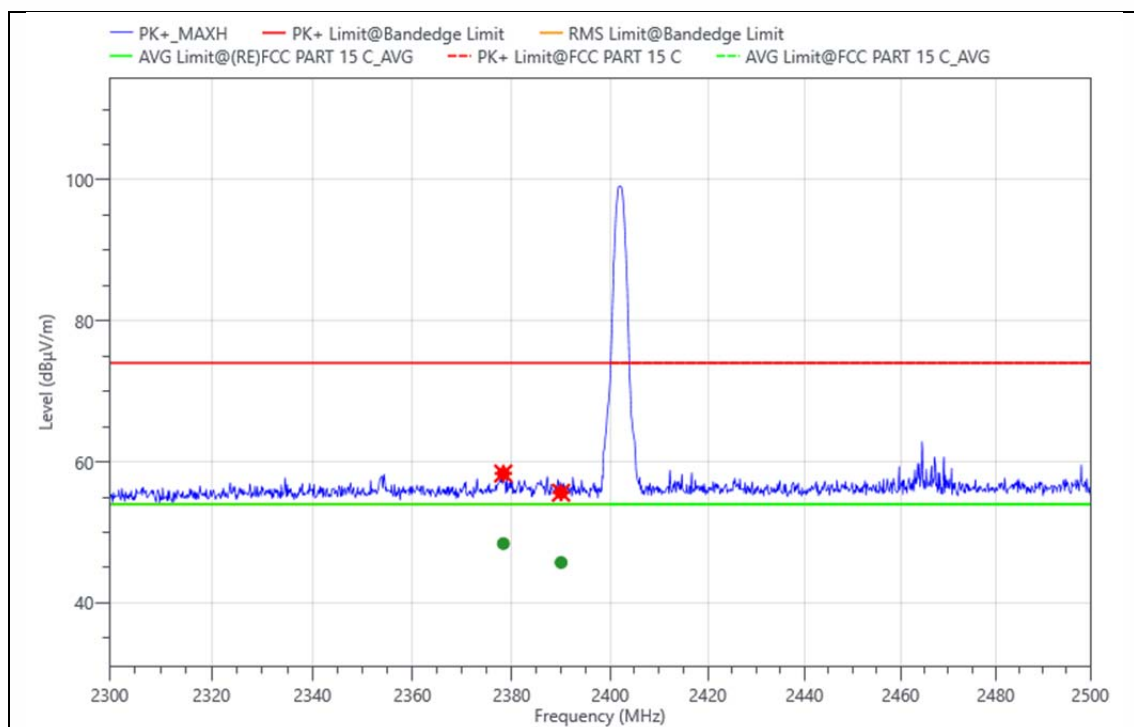


Final_Result

(Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	2354.300	28.10	29.99	58.09	74.00	15.91	PK+	V	PASS
2	2354.300	18.19	29.99	48.18	54.00	5.82	AVG	V	PASS
3	2390.000	26.52	30.06	56.58	74.00	17.42	PK+	V	PASS
4	2390.000	16.31	30.06	46.37	54.00	7.63	AVG	V	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2402
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%

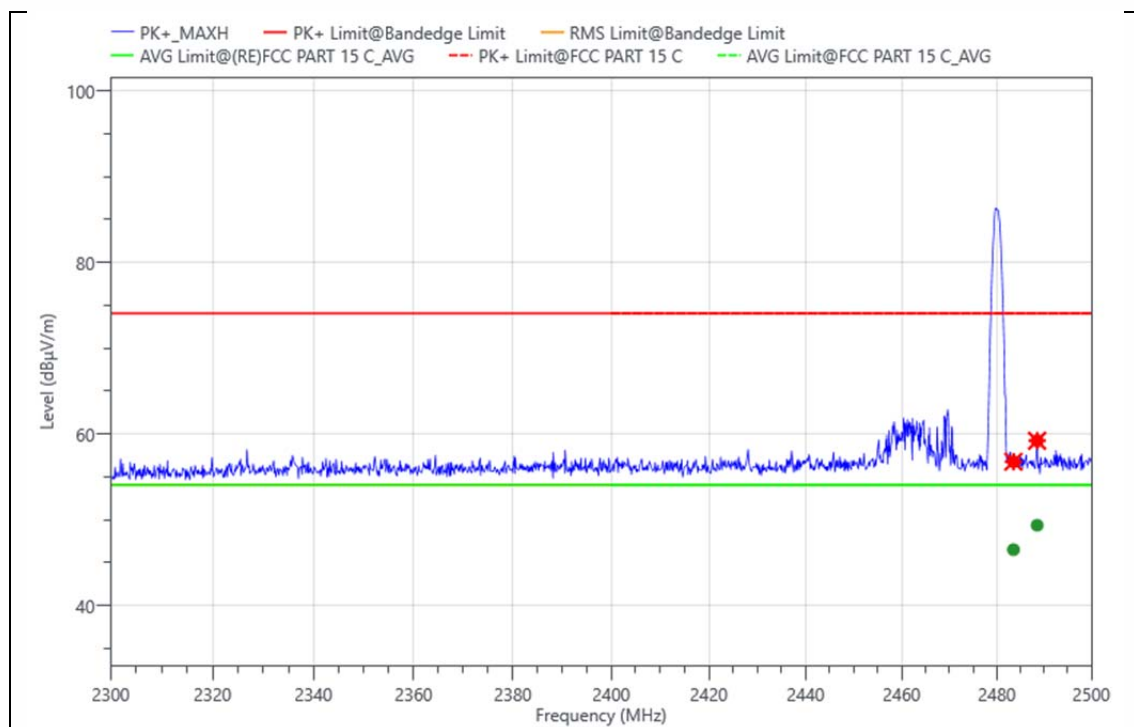


Final_Result

(Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	2378.300	28.31	30.05	58.36	74.00	15.64	PK+	H	PASS
2	2378.300	18.38	30.05	48.43	54.00	5.57	AVG	H	PASS
3	2390.000	25.58	30.06	55.64	74.00	18.36	PK+	H	PASS
4	2390.000	15.68	30.06	45.74	54.00	8.26	AVG	H	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2480
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%

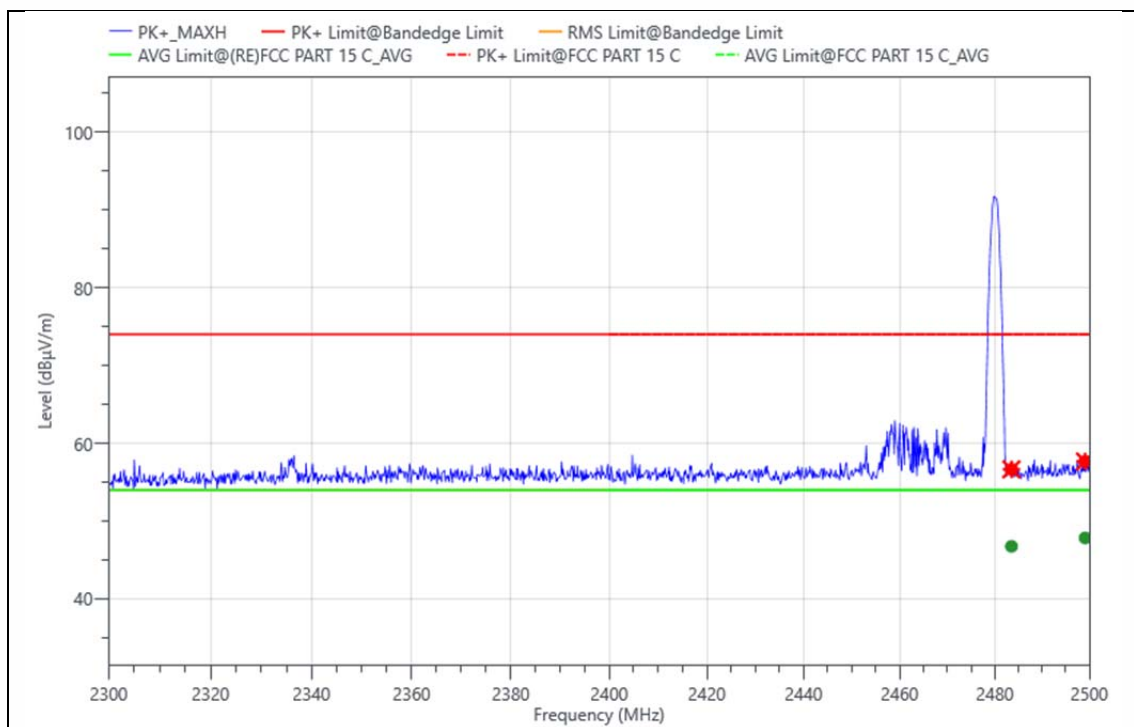


Final Result

(Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	2483.500	26.43	30.34	56.77	74.00	17.23	PK+	V	PASS
2	2483.500	16.18	30.34	46.52	54.00	7.48	AVG	V	PASS
3	2488.500	28.85	30.36	59.21	74.00	14.79	PK+	V	PASS
4	2488.500	19.01	30.36	49.37	54.00	4.63	AVG	V	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MX 8	Mode :	TX2480
Voltage :	AC 120V/60HZ	Engineer :	WK Luo
Temp :	20°C	Humi :	52%



Final_Result (Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV/m)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
1	2483.500	26.32	30.34	56.66	74.00	17.34	PK+	H	PASS
2	2483.500	16.43	30.34	46.77	54.00	7.23	AVG	H	PASS
3	2499.100	27.28	30.39	57.67	74.00	16.33	PK+	H	PASS
4	2499.100	17.46	30.39	47.85	54.00	6.15	AVG	H	PASS

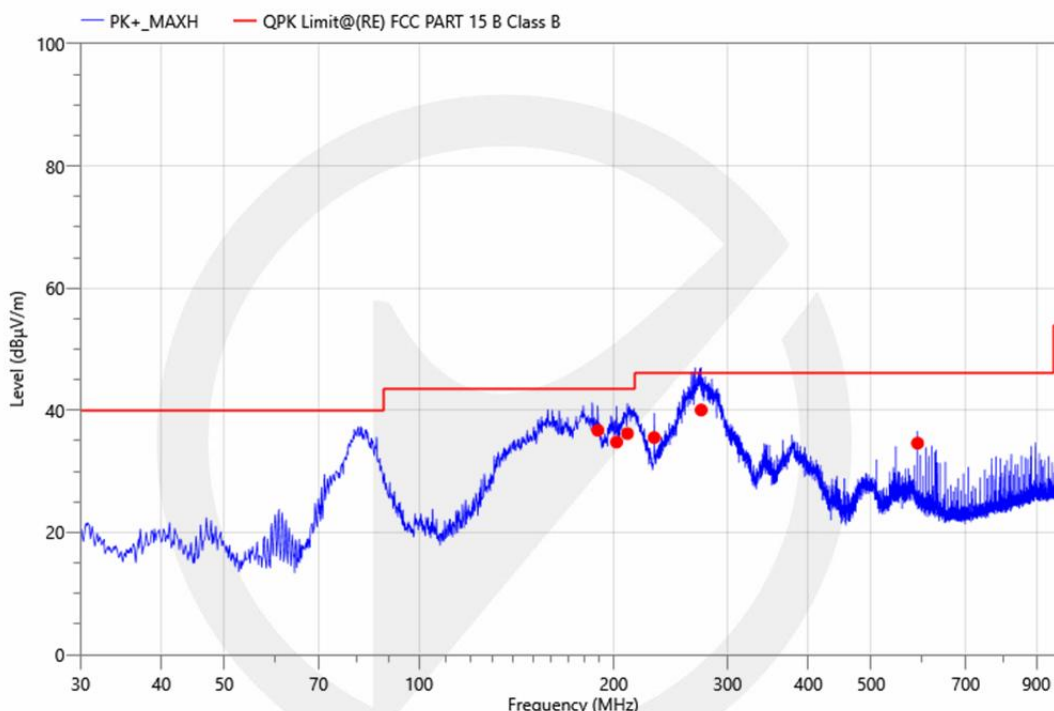
Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=1kHz).
- (2) Emission Level= Reading Level+Correct Factor.
- (3) Correct Factor= Ant_F + Cab_L - Preamp
- (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission below 1GHz(30MHz to 1GHz)

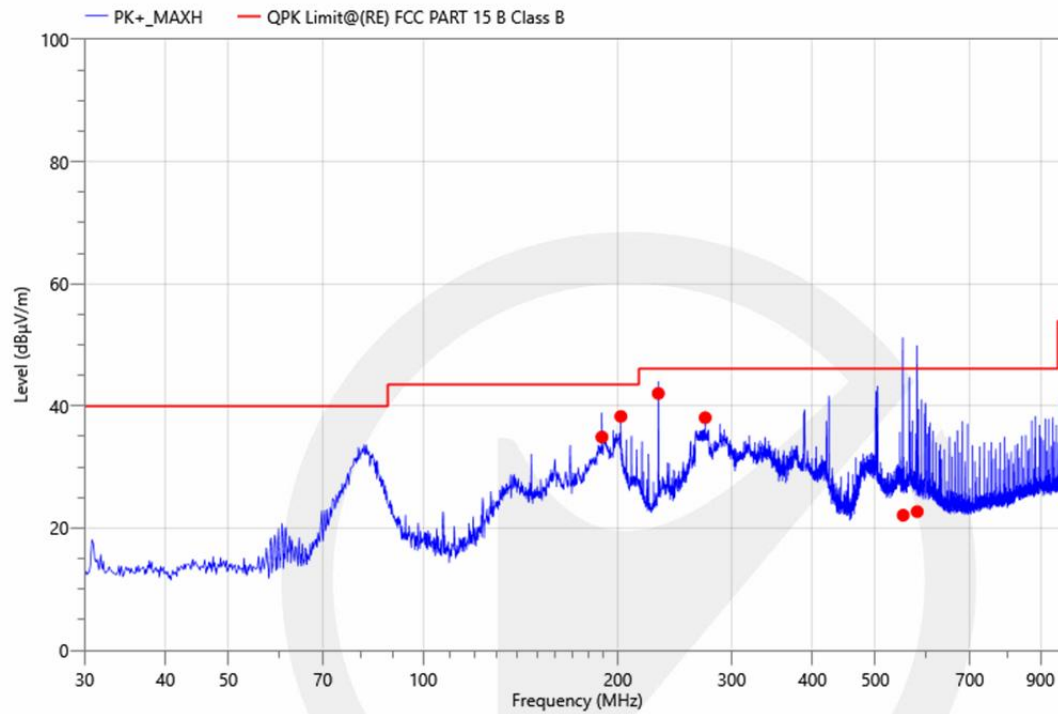
All the antenna(Antenna 1) and modes(GFSK, $\pi/4$ -DQPSK) mode have been tested, and the worst(Antenna 1,GFSK) for 2402 MHz result recorded was report as below:

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2402
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp :	18°C	Humi :	67%



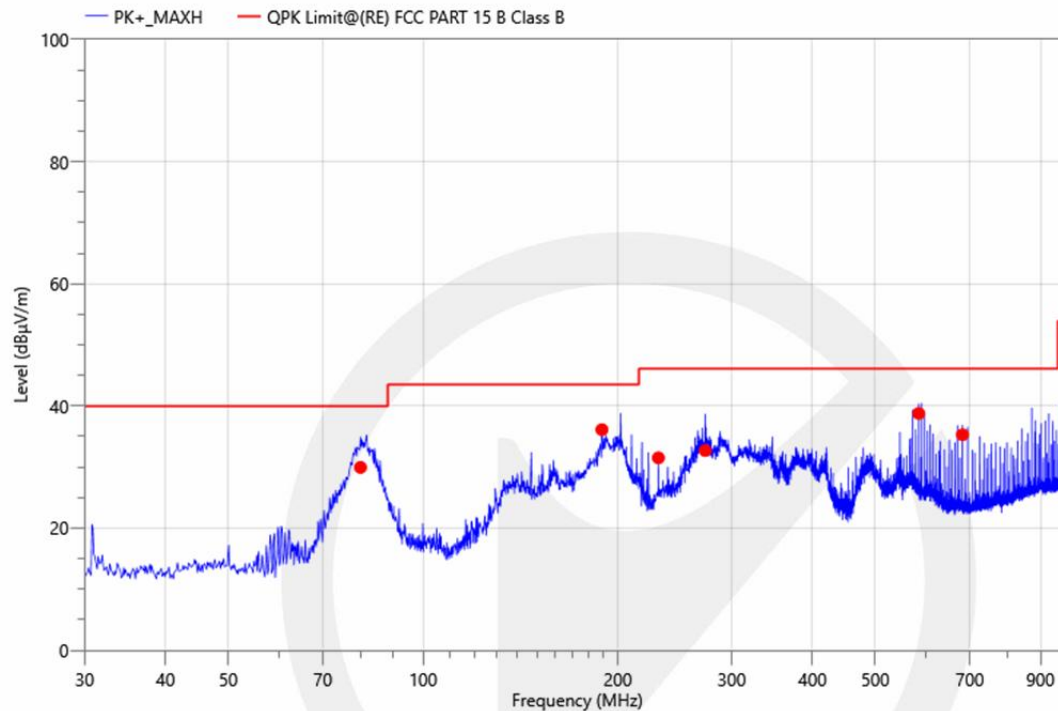
No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	189.007	62.11	-25.38	36.73	43.50	6.77	QPK	100	V	360.0	PASS
2	202.078	58.95	-24.15	34.80	43.50	8.70	QPK	100	V	3.8	PASS
3	210.032	60.16	-23.97	36.19	43.50	7.31	QPK	100	V	343.6	PASS
4	230.984	58.79	-23.25	35.54	46.00	10.46	QPK	100	V	347.8	PASS
5	273.082	62.09	-22.04	40.05	46.00	5.95	QPK	100	V	318.6	PASS
6	589.884	49.17	-14.56	34.61	46.00	11.39	QPK	100	V	262.7	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2402
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp :	18°C	Humi :	67%



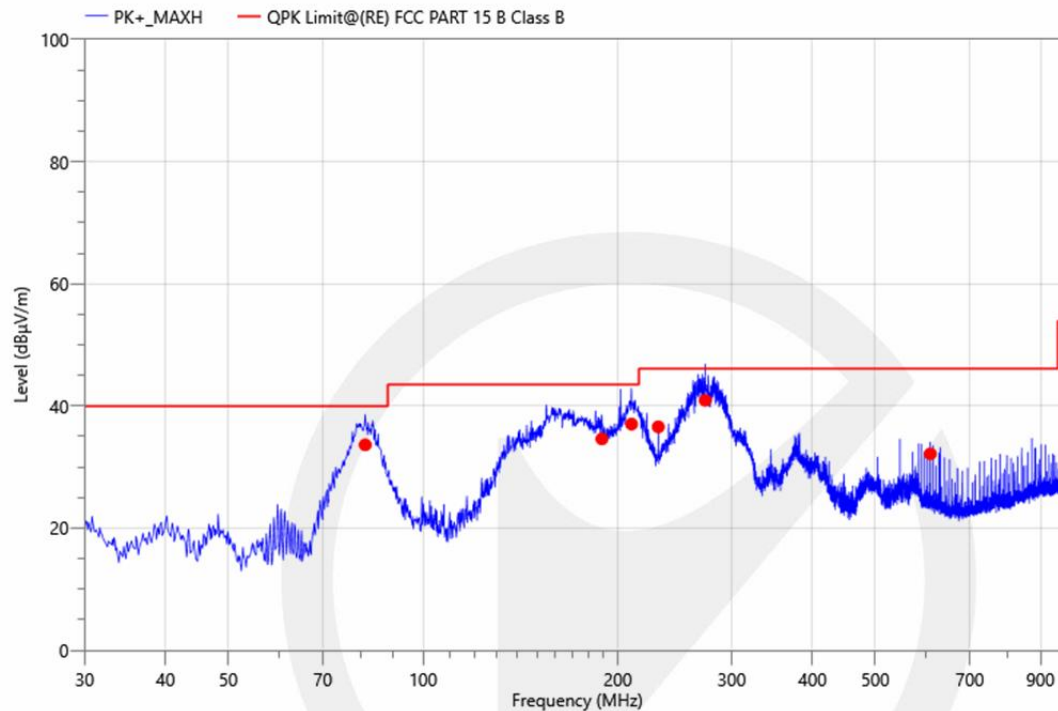
No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	188.983	60.29	-25.38	34.91	43.50	8.59	QPK	200	H	199.2	PASS
2	202.175	62.44	-24.15	38.29	43.50	5.21	QPK	200	H	216.4	PASS
3	230.984	65.30	-23.25	42.05	46.00	3.95	QPK	200	H	216.4	PASS
4	272.985	60.13	-22.05	38.08	46.00	7.92	QPK	100	H	225.1	PASS
5	552.256	37.88	-15.77	22.11	46.00	23.89	QPK	200.0	H	36.1	PASS
6	580.475	37.42	-14.72	22.70	46.00	23.30	QPK	200	H	36.1	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2441
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp :	18°C	Humi :	67%



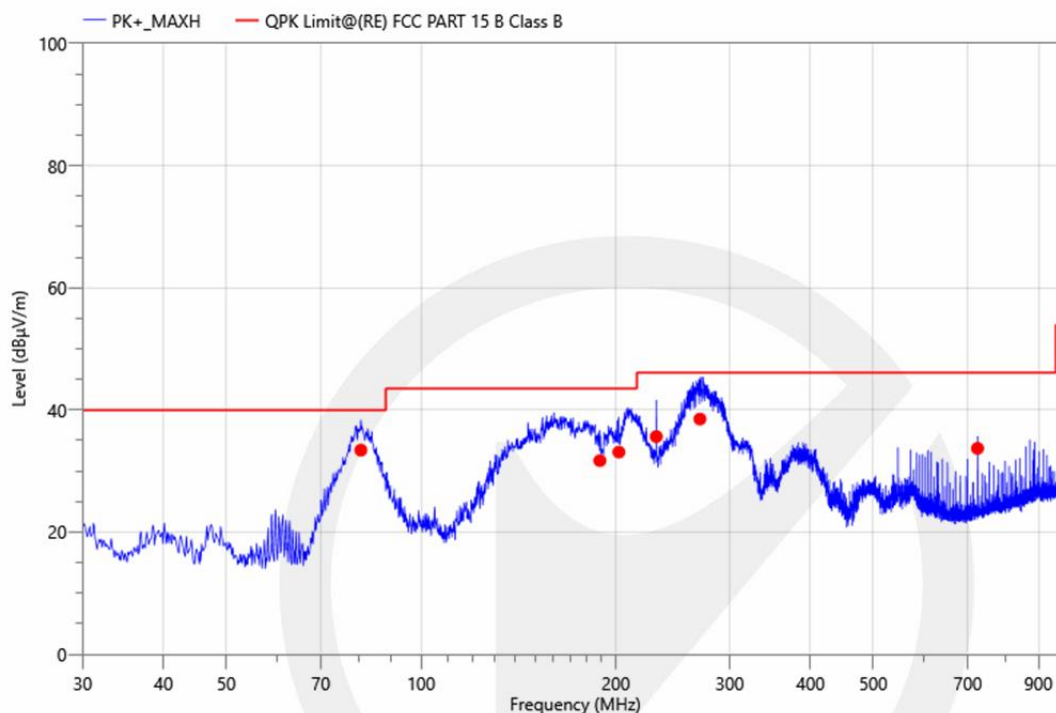
No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	80.052	56.60	-26.65	29.95	40.00	10.05	QPK	200	H	167.3	PASS
2	188.983	61.50	-25.38	36.12	43.50	7.38	QPK	200	H	203.6	PASS
3	231.081	54.75	-23.24	31.51	46.00	14.49	QPK	100	H	48.8	PASS
4	272.985	54.75	-22.05	32.70	46.00	13.30	QPK	100	H	224.4	PASS
5	583.773	53.45	-14.67	38.78	46.00	7.22	QPK	200	H	322.6	PASS
6	682.131	49.89	-14.6	35.29	46.00	10.71	QPK	200	H	73.2	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2441
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp :	18°C	Humi :	67%



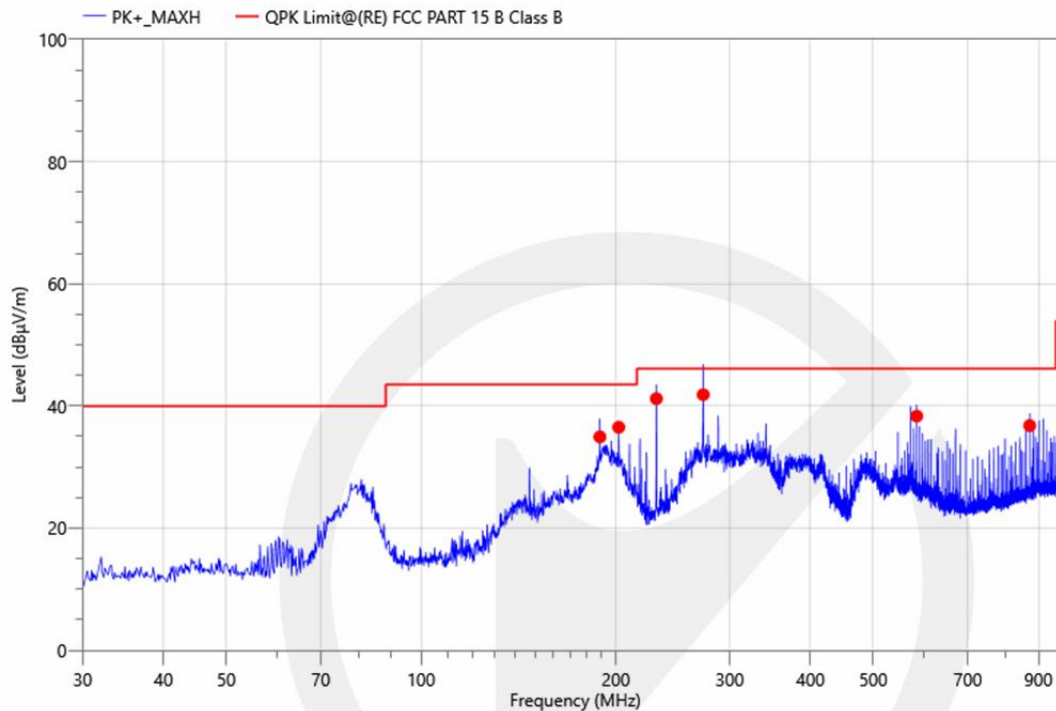
No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	81.410	60.10	-26.46	33.64	40.00	6.36	QPK	100	V	133.8	PASS
2	188.983	59.99	-25.38	34.61	43.50	8.89	QPK	100	V	352.9	PASS
3	210.032	61.01	-23.97	37.04	43.50	6.46	QPK	100	V	315.4	PASS
4	230.984	59.83	-23.25	36.58	46.00	9.42	QPK	100	V	352.9	PASS
5	272.985	62.97	-22.05	40.92	46.00	5.08	QPK	100	V	324.9	PASS
6	608.314	46.56	-14.4	32.16	46.00	13.84	QPK	100	V	233.8	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2480
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp :	18°C	Humi :	67%



No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	80.731	59.96	-26.55	33.41	40.00	6.59	QPK	100	V	145.0	PASS
2	188.983	57.09	-25.38	31.71	43.50	11.79	QPK	100	V	355.1	PASS
3	202.175	57.26	-24.15	33.11	43.50	10.39	QPK	100	V	360	PASS
4	230.984	58.89	-23.25	35.64	46.00	10.36	QPK	100	V	352.1	PASS
5	269.784	60.59	-22.08	38.51	46.00	7.49	QPK	100	V	269.4	PASS
6	724.617	47.84	-14.13	33.71	46.00	12.29	QPK	100	V	190.8	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No :	ENB2605110113W001-1-1	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2480
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp :	18°C	Humi :	67%



No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	188.983	60.32	-25.38	34.94	43.50	8.56	QPK	100	H	181.7	PASS
2	202.078	60.66	-24.15	36.51	43.50	6.99	QPK	100	H	26.3	PASS
3	231.081	64.44	-23.24	41.20	46.00	4.80	QPK	100	H	65.0	PASS
4	272.985	63.90	-22.05	41.85	46.00	4.15	QPK	100	H	244.2	PASS
5	583.773	53.01	-14.67	38.34	46.00	7.66	QPK	100	H	341.2	PASS
6	872.445	48.25	-11.46	36.79	46.00	9.21	QPK	100	H	130.5	PASS

9.8 CONDUCTED EMISSION TEST

9.8.1 Applicable Standard

According to FCC Part 15.207

9.8.2 Conformance Limit

Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50
Note: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.		

9.8.3 Test Configuration

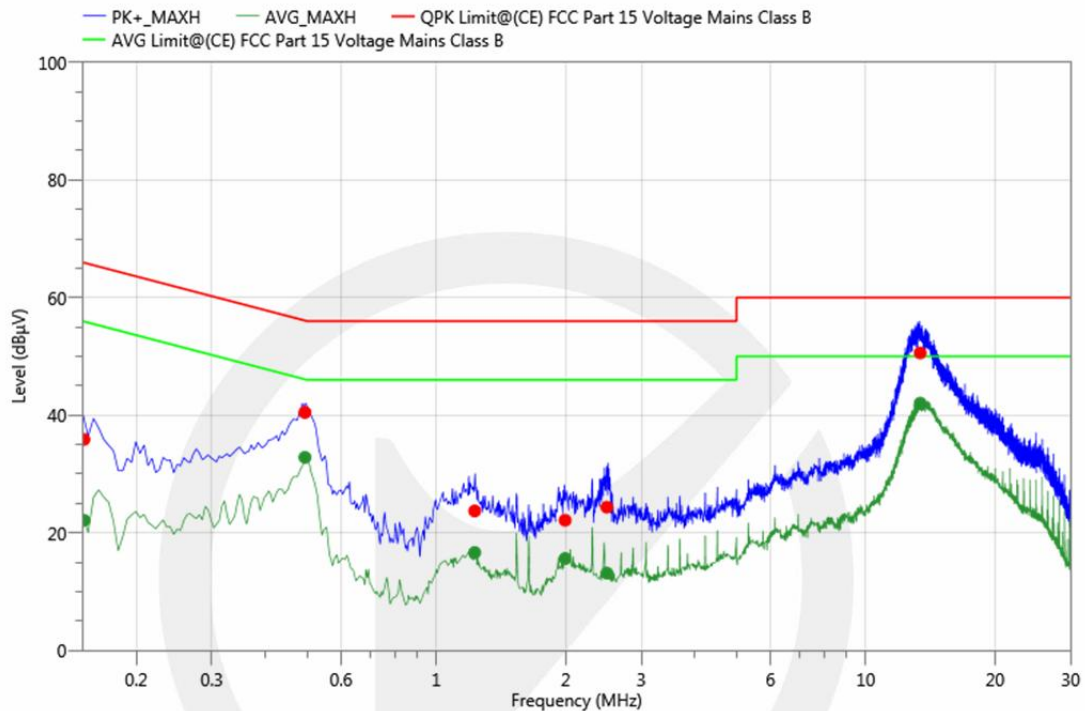
Test according to clause 7.3 conducted emission test setup

9.8.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

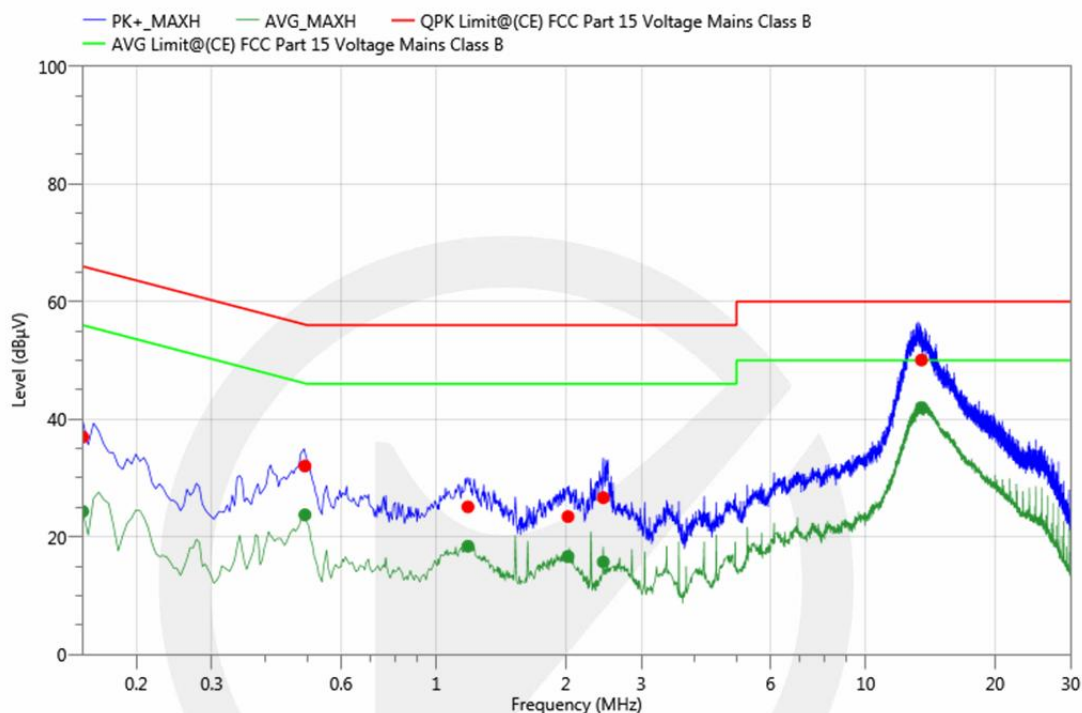
9.8.5 Test Results

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2402
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp. :	24°C	Humi. :	55%



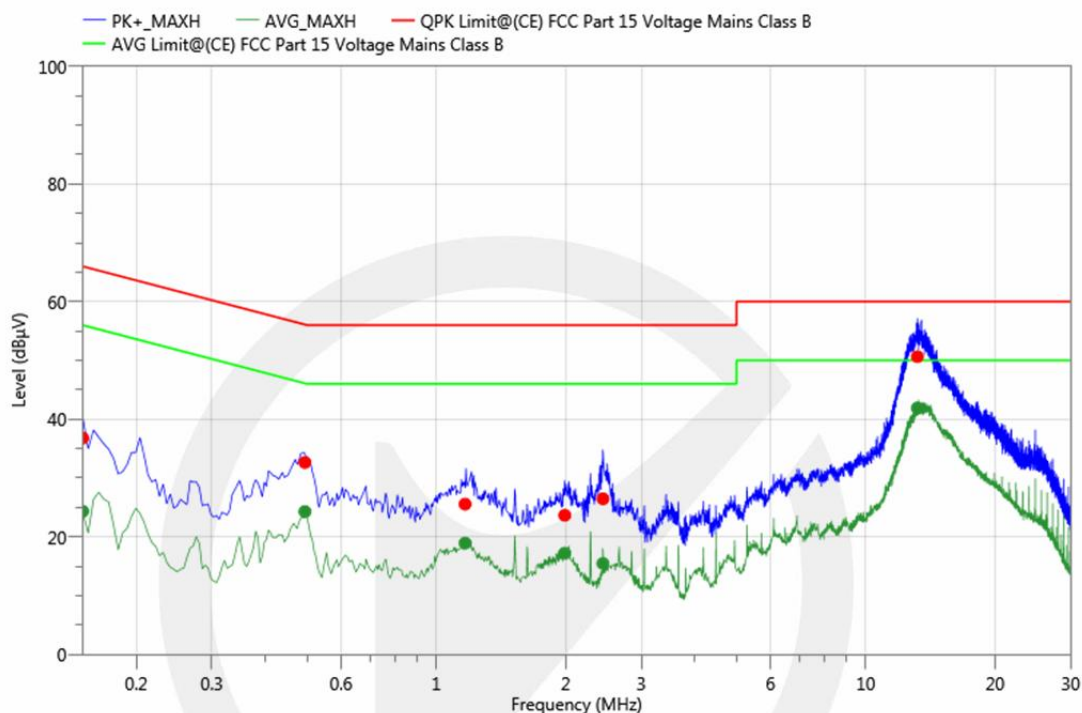
No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.151	25.65	10.22	35.87	65.94	30.07	QPK	N	GND	PASS
2	0.151	11.90	10.22	22.12	55.94	33.82	AVG	N	GND	PASS
3	0.494	30.13	10.33	40.46	56.10	15.64	QPK	N	GND	PASS
4	0.494	22.49	10.33	32.82	46.10	13.28	AVG	N	GND	PASS
5	1.228	13.40	10.31	23.71	56.00	32.29	QPK	N	GND	PASS
6	1.228	6.34	10.31	16.65	46.00	29.35	AVG	N	GND	PASS
7	1.994	11.91	10.22	22.13	56.00	33.87	QPK	N	GND	PASS
8	1.994	5.40	10.22	15.62	46.00	30.38	AVG	N	GND	PASS
9	2.495	14.03	10.32	24.35	56.00	31.65	QPK	N	GND	PASS
10	2.495	2.81	10.32	13.13	46.00	32.87	AVG	N	GND	PASS
11	13.385	39.67	10.92	50.59	60.00	9.41	QPK	N	GND	PASS
12	13.385	31.12	10.92	42.04	50.00	7.96	AVG	N	GND	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2402
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp. :	24°C	Humi. :	55%



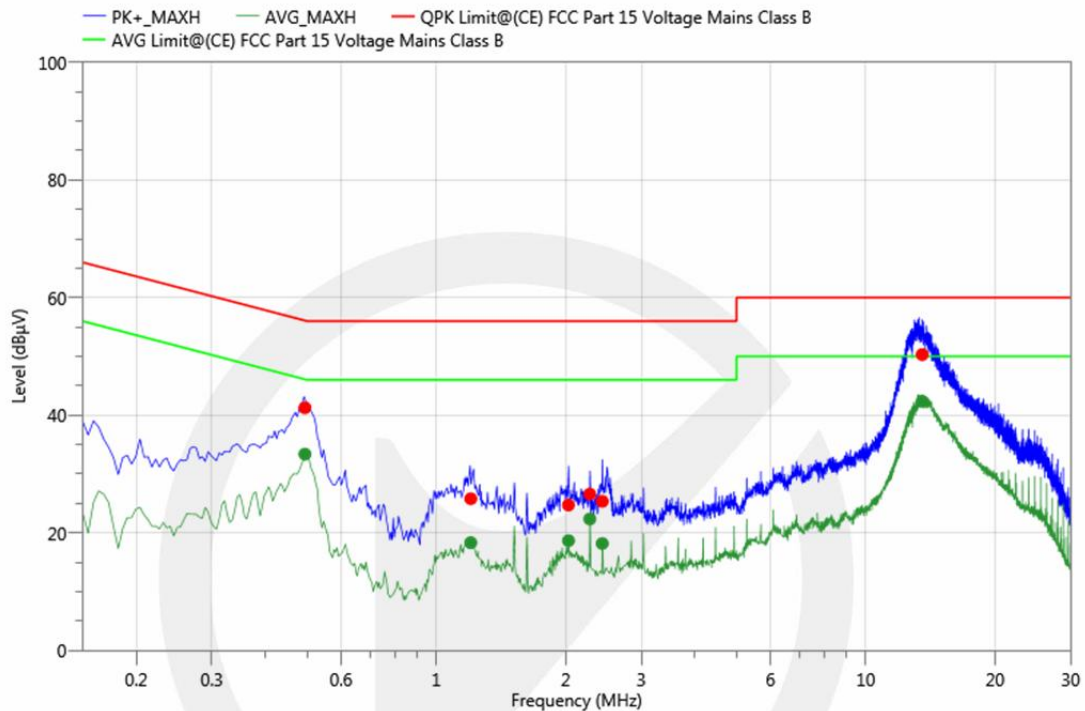
No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.150	26.79	10.18	36.97	66.00	29.03	QPK	L1	GND	PASS
2	0.150	14.13	10.18	24.31	56.00	31.69	AVG	L1	GND	PASS
3	0.494	21.69	10.34	32.03	56.10	24.07	QPK	L1	GND	PASS
4	0.494	13.39	10.34	23.73	46.10	22.37	AVG	L1	GND	PASS
5	1.184	14.79	10.29	25.08	56.00	30.92	QPK	L1	GND	PASS
6	1.184	8.10	10.29	18.39	46.00	27.61	AVG	L1	GND	PASS
7	2.025	13.16	10.26	23.42	56.00	32.58	QPK	L1	GND	PASS
8	2.025	6.40	10.26	16.66	46.00	29.34	AVG	L1	GND	PASS
9	2.446	16.35	10.3	26.65	56.00	29.35	QPK	L1	GND	PASS
10	2.446	5.42	10.3	15.72	46.00	30.28	AVG	L1	GND	PASS
11	13.475	39.18	10.89	50.07	60.00	9.93	QPK	L1	GND	PASS
12	13.475	31.10	10.89	41.99	50.00	8.01	AVG	L1	GND	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2441
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp. :	24°C	Humi. :	55%



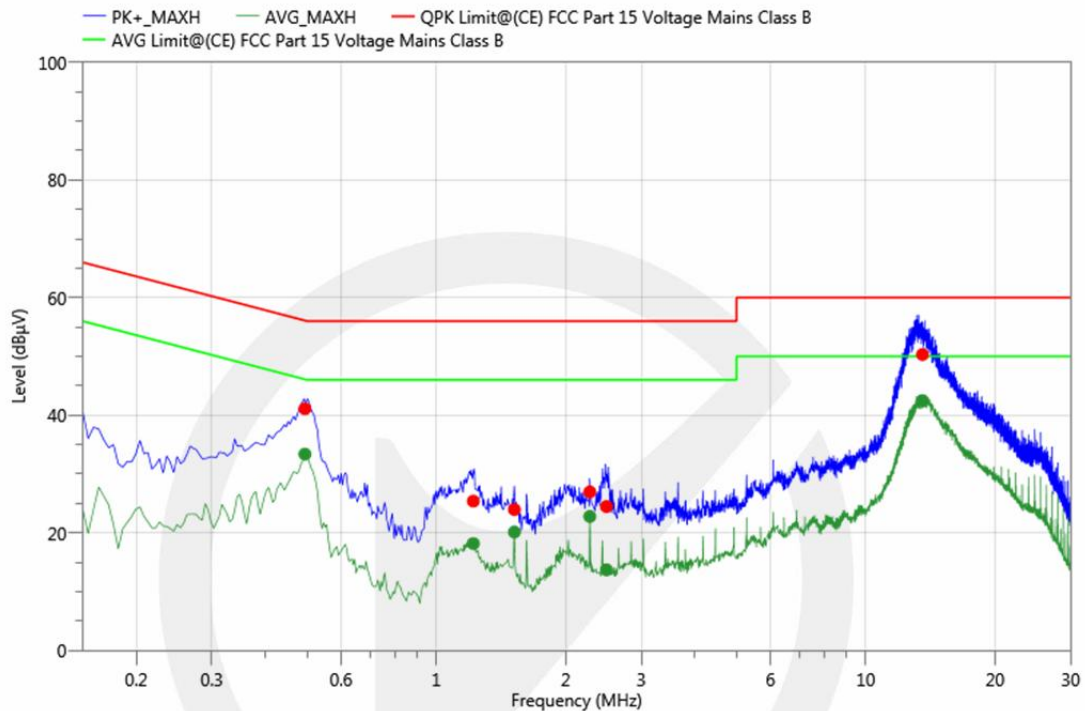
No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.150	26.61	10.18	36.79	66.00	29.21	QPK	L1	GND	PASS
2	0.150	14.15	10.18	24.33	56.00	31.67	AVG	L1	GND	PASS
3	0.494	22.30	10.34	32.64	56.10	23.46	QPK	L1	GND	PASS
4	0.494	13.94	10.34	24.28	46.10	21.82	AVG	L1	GND	PASS
5	1.166	15.26	10.29	25.55	56.00	30.45	QPK	L1	GND	PASS
6	1.166	8.63	10.29	18.92	46.00	27.08	AVG	L1	GND	PASS
7	1.990	13.40	10.26	23.66	56.00	32.34	QPK	L1	GND	PASS
8	1.990	6.95	10.26	17.21	46.00	28.79	AVG	L1	GND	PASS
9	2.442	16.16	10.3	26.46	56.00	29.54	QPK	L1	GND	PASS
10	2.442	5.16	10.3	15.46	46.00	30.54	AVG	L1	GND	PASS
11	13.184	39.75	10.89	50.64	60.00	9.36	QPK	L1	GND	PASS
12	13.184	31.01	10.89	41.90	50.00	8.10	AVG	L1	GND	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2441
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp. :	24°C	Humi. :	55%



No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.494	30.93	10.33	41.26	56.10	14.84	QPK	N	GND	PASS
2	0.494	23.04	10.33	33.37	46.10	12.73	AVG	N	GND	PASS
3	1.202	15.47	10.32	25.79	56.00	30.21	QPK	N	GND	PASS
4	1.202	7.99	10.32	18.31	46.00	27.69	AVG	N	GND	PASS
5	2.030	14.48	10.23	24.71	56.00	31.29	QPK	N	GND	PASS
6	2.030	8.43	10.23	18.66	46.00	27.34	AVG	N	GND	PASS
7	2.276	16.30	10.28	26.58	56.00	29.42	QPK	N	GND	PASS
8	2.276	12.07	10.28	22.35	46.00	23.65	AVG	N	GND	PASS
9	2.433	15.03	10.31	25.34	56.00	30.66	QPK	N	GND	PASS
10	2.433	7.86	10.31	18.17	46.00	27.83	AVG	N	GND	PASS
11	13.528	39.38	10.93	50.31	60.00	9.69	QPK	N	GND	PASS
12	13.528	31.44	10.93	42.37	50.00	7.63	AVG	N	GND	PASS

Project No. :	ENB2605110113W001	Customer :	OPALUX ELECTRONICS MFY. CO., LTD.
Sample No. :	ENB2605110113W001	EUT :	MIXER COMBO
Model :	MIX 8	Mode :	TX2480
Voltage :	AC 120V/60Hz	Engineer :	Andy
Temp. :	24°C	Humi. :	55%



No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.494	30.77	10.33	41.10	56.10	15.00	QPK	N	GND	PASS
2	0.494	23.05	10.33	33.38	46.10	12.72	AVG	N	GND	PASS
3	1.219	15.07	10.31	25.38	56.00	30.62	QPK	N	GND	PASS
4	1.219	7.86	10.31	18.17	46.00	27.83	AVG	N	GND	PASS
5	1.519	13.67	10.28	23.95	56.00	32.05	QPK	N	GND	PASS
6	1.519	9.84	10.28	20.12	46.00	25.88	AVG	N	GND	PASS
7	2.276	16.67	10.28	26.95	56.00	29.05	QPK	N	GND	PASS
8	2.276	12.50	10.28	22.78	46.00	23.22	AVG	N	GND	PASS
9	2.489	14.14	10.32	24.46	56.00	31.54	QPK	N	GND	PASS
10	2.489	3.38	10.32	13.70	46.00	32.30	AVG	N	GND	PASS
11	13.551	39.39	10.93	50.32	60.00	9.68	QPK	N	GND	PASS
12	13.551	31.56	10.93	42.49	50.00	7.51	AVG	N	GND	PASS

9.9 ANTENNA APPLICATION

9.9.1 Antenna Requirement

Standard	Requirement
FCC CRF Part15.203	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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
FCC 47 CFR Part 15.247 (b)	If transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.9.2 Result

PASS.

- Note:
- ☒ Antenna use a permanently attached antenna which is not replaceable.
 - ☐ Not using a standard antenna jack or electrical connector for antenna replacement
 - ☐ The antenna has to be professionally installed (please provide method of installation)

Please refer to the attached document Internal Photos to show the antenna connector.

*** End of Report ***