



**FCC 47 CFR PART 15 SUBPART C  
ISED RSS-247 ISSUE 3**

**TEST REPORT**

*For*

**LED Device**

**MODEL NUMBER: 929003858301, 929003858401, 929003858501**

**ALTERNATIVE MODEL NUMBER: 9290038583, 9290038584, 9290038585**

**PROJECT NUMBER: 4791649191**

**REPORT NUMBER: 4791649191-1**

**FCC ID: 2AGBW9290038583X**

**IC: 20812-38583X**

**ISSUE DATE: Apr. 06, 2025**

*Prepared for*

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Form-ULID-008536-14 V4.0

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	04/06/2025	Initial Issue	

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## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: Signify (China) Investment Co., Ltd.  
Address: Building 9, Lane 888, Tianlin Road, Minhang District, Shanghai 200233 China

### Manufacturer Information-1

Company Name: Dongguan ZOYO Electronics Technology Co., Ltd.  
Address: 1st Building, NO.11, Nange west Road, Nanya Village, Daojiao Town, Dongguan, Guangdong

### Manufacturer Information-2

Company Name: Silver Age Vietnam Technology Company Limited  
Address: Lot A2, Gia Le industrial zone, Xuan Quang Dong commune, Dong Hung district, Thai Binh province, VN

### EUT Description

Product Name: LED Device  
Model Number: 929003858301, 929003858401, 929003858501  
Alternative Model Number: 9290038583, 9290038584, 9290038585  
Model Difference:  
1. 9290038583, 9290038584, 9290038585 are alternative models of the main models 929003858301, 929003858401, 929003858501. The alternative models and the main models are identical, the only difference is model number.  
2. Their electrical circuit design, layout, components used and internal wiring are identical, only the size of LED device is different.  
Sample Number: 8056478  
Data of Receipt Sample: Jan. 22, 2025  
Test Date: Jan. 22, 2025~ Feb. 30, 2024

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	PASS
ISED RSS-247 Issue 3	PASS
ISED RSS-GEN Issue 5	PASS

Summary of Test Results			
Clause	Test Items	FCC and ISSED Rules	Test Results
1	6 dB Bandwidth and 99% Occupied Bandwidth	FCC 15.247 (a) (2) RSS-247 Clause 5.2 (a) RSS-Gen Clause 6.7	PASS
2	Conducted Power	FCC 15.247 (b) (3) RSS-247 Clause 5.4 (d) RSS-Gen Clause 6.12	PASS
3	Power Spectral Density	FCC 15.247 (e) RSS-247 Clause 5.2 (b)	PASS
4	Conducted Band edge And Spurious emission	FCC 15.247 (d) RSS-247 Clause 5.5 RSS-GEN Clause 6.13	PASS
5	Radiated Band edges and Spurious emission	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9 RSS-GEN Clause 6.13	PASS
6	Conducted Emission Test for AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 6.8	PASS
<p>Note:</p> <p>The measurement result for the sample received is &lt;Pass&gt; according to &lt; ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15C, ISSED RSS-GEN, ISSED RSS-247&gt; when &lt;Accuracy Method&gt; decision rule is applied.</p>			

Prepared By:

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Emily Wang

Authorized By:

*Kevin Shen*

Kevin Shen

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05r02, 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 3 and ISED RSS-GEN Issue 5.

## 3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<b>A2LA (Certificate No.: 4829.01)</b> <b>UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA.</b> <b>FCC (FCC Designation No.: CN1247)</b> <b>UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.</b> <b>IC (IC Designation No.: 25056; CAB No.: CN0073)</b> <b>UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.</b>
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Note 1: All tests measurement facilities use to collect the measurement data are located at No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China

Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS.

Note 3: The test anechoic chamber in UL-CCIC COMPANY LIMITED had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.1 dB
DTS Bandwidth	1.9 %
Maximum Conducted Output Power	1.3 dB
Maximum Power Spectral Density Level	1.5 dB
Band-edge Compliance	1.9%
Unwanted Emissions in Non-restricted Freq Bands	9kHz-30MHz: $\pm 0.90$ dB 30MHz-1GHz: $\pm 1.5$ dB 1GHz-12.75GHz: $\pm 1.9$ dB 12.75GHz-26.5GHz: $\pm 2.1$ dB
Radiation Emission test (include Fundamental emission) (9kHz-30MHz)	3.4dB
Radiation Emission test (include Fundamental emission) (30MHz-1GHz)	3.4dB
Radiation Emission test (1GHz to 26GHz) (include Fundamental emission)	3.5dB (1GHz-18GHz)
	3.9dB (18GHz-26.5GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

Equipment:	LED Device
Model Name:	929003858301
Transmit Frequency Range:	2405 MHz ~ 2480 MHz
Modulation:	O-QPSK
Test software of EUT:	HueApprobationTool (manufacturer declare)
Antenna Type:	PCB PIFA Antenna
Antenna Gain:	-6.08 dBi
	Note: This data is provided by customer and our lab isn't responsible for this data.



## 5.2. MAXIMUM OUTPUT POWER

Mode	Frequency (MHz)	Channel Number	Max. Output Power(dBm)
Zigbee	2405-2480	11-26 [16]	7.26

## 5.3. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2405	12	2410	13	2415	14	2420
15	2425	16	2430	17	2435	18	2440
19	2445	20	2450	21	2455	22	2460
23	2465	24	2470	25	2475	26	2480

## 5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel		Frequency
O-QPSK	Low Channel	CH 11	2405MHz
	Middle Channel	CH 18	2440MHz
	High Channel	CH 26	2480MHz

## 5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worst Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
Test Software		HueApprobationTool		
Modulation Type	Transmit Antenna Number	Test Channel		
		LCH	MCH	HCH
GFSK	1	8	8	8

## 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2400-2483.5	PCB PIFA Antenna	-6.08

Note: This data is provided by customer and our lab isn't responsible for this data.

Test Mode	Transmit and Receive Mode	Description
Zigbee	<input checked="" type="checkbox"/> 1TX, 1RX	Antenna1 can be used as transmitting/receiving antenna independently.

## 5.7. THE WORSE CASE CONFIGURATIONS

Model	Alternative Models	Size of LED Device
929003858301	9290038583	7-meter light string
929003858401	9290038584	14-meter light string
929003858501	9290038585	28-meter light string

The six models have the same RF module, only the size of LED device is different, all the models had been test, only the worst case was recorded in this report.

## 5.8. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	101kPa	
Temperature	TN	23 ~ 28°C
Voltage:	VL	N/A
	VN	AC 120V
	VH	N/A

Note: VL= Lower Extreme Test Voltage  
VN= Nominal Voltage  
VH= Upper Extreme Test Voltage  
TN= Normal Temperature

## 5.9. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Description
1	Laptop	ThinkPad	E580	/
2	Fixed Frequency Board	/	/	Supplied by customer

### I/O PORT

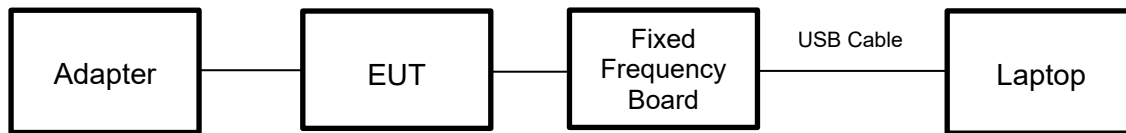
Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB	USB	100cm Length	/

### ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	/	/	/	/

**TEST SETUP**

The EUT can work in an engineer mode with a software through a laptop.

**SETUP DIAGRAM FOR TESTS**

## 5.10. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions Test (Instrument)							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESR3	126700	2023-11-25	2024-11-02	2025-11-01
<input checked="" type="checkbox"/>	Two-Line V-Network	R&S	ENV216	126701	2023-11-25	2024-11-02	2025-11-01
Conducted Emissions Test (Software)							
Used	Description		Manufacturer		Name	Version	
<input checked="" type="checkbox"/>	Software for Conducted Emissions Test		R&S		EMC32	9.25.00	
Radiated Emissions Test (Instrument)							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI test receiver	R&S	ESR7	222993	2024-03-23	2025-03-22	2026-03-14
<input checked="" type="checkbox"/>	EMI test receiver	R&S	ESR26	126703	2023-11-25	2024-11-02	2025-11-01
<input checked="" type="checkbox"/>	Spectrum Analyzer	R&S	FSV3044	222992	2024-03-23	2025-03-22	2026-03-14
<input checked="" type="checkbox"/>	Receiver Antenna (9kHz-30MHz)	Schwarzbeck	FMZB 1513	155456	2021-06-03	2024-05-27	2027-05-26
<input checked="" type="checkbox"/>	Receiver Antenna (30MHz-1GHz)	Schwarzbeck	VULB 9168	171952	2021-07-05	2024-07-04	2027-07-03
<input checked="" type="checkbox"/>	Receiver Antenna (1GHz-18GHz)	R&S	HF907	126705	2022-02-28	2025-02-17	2028-02-16
<input checked="" type="checkbox"/>	Receiver Antenna (18GHz-26.5GHz)	Schwarzbeck	BBHA9170	126706	2022-02-28	2025-02-17	2028-02-16
<input checked="" type="checkbox"/>	Pre-amplification (To 18GHz)	Tonscnd	TAP01018050	224539	2023-10-10	2024-10-10	2025-10-09
<input checked="" type="checkbox"/>	Pre-amplification (To 18GHz)	R&S	SCU-18D	134667	2023-11-25	2024-11-02	2025-11-01
<input checked="" type="checkbox"/>	Pre-amplification (To 26.5GHz)	R&S	SCU-26D	135391	2023-11-25	2024-11-02	2025-11-01
<input checked="" type="checkbox"/>	Band Reject Filter	Wainwright	WRCGV12-2375-2400-2485-2510-40SS	1	2023-12-18	2024-11-02	2025-11-01
<input checked="" type="checkbox"/>	High Pass Filter	COM-MW	ZBF13-3-18G-01	2	2023-12-18	2024-11-02	2025-11-01
Radiated Emissions Test (Software)							
Used	Description		Manufacturer		Name	Version	
<input checked="" type="checkbox"/>	Software for Radiated Emissions Test		Tonscnd		JS32-RE	5.0.0.2	
Antenna Port Test (Instrument)							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9010B	155368	2024-03-23	2025-03-22	2026-03-14
<input checked="" type="checkbox"/>	Power Meter	MWT	MW100-RFCB	221694	2024-03-23	2025-03-22	2026-03-14
<input checked="" type="checkbox"/>	Power Meter	Anritsu	MA24406A	12896	2024-03-23	2025-03-22	2026-03-14
<input checked="" type="checkbox"/>	Attenuator	PASTERNAK	PE7087-6	1624	/	2024-11-04	2025-11-03
Antenna Port Test (Software)							
Used	Description		Manufacturer		Name	Version	
<input checked="" type="checkbox"/>	Software for Antenna Port Test		Tonscnd		JS1120-3 Test System	V3.2.22	

## 6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6 dB Bandwidth and 99% Occupied Bandwidth	KDB 558074 D01 15.247 Meas Guidance v05r02	8.2
2	Output Power	KDB 558074 D01 15.247 Meas Guidance v05r02	8.3.1.3 (11.9.1.3 PKPM1 Peak power meter method of ANSI C63.10)
3	Power Spectral Density	KDB 558074 D01 15.247 Meas Guidance v05r02	8.4 (11.10.2 Method PKPSD of ANSI C63.10)
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.5
5	Out-of-band emissions in restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.6
6	Band-edge	KDB 558074 D01 15.247 Meas Guidance v05r02	8.7
7	Conducted Emission Test for AC Power Port	ANSI C63.10-2013	6.2

## 7. ANTENNA PORT TEST RESULTS

### 7.1. ON TIME AND DUTY CYCLE

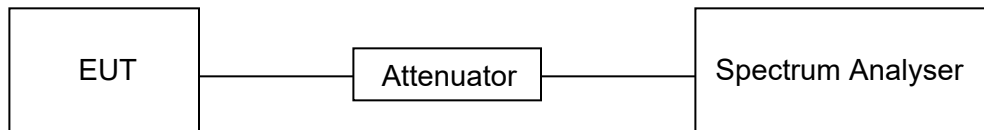
#### LIMITS

None; for reporting purposes only

#### PROCEDURE

FCC KDB 558074 Zero-Span Spectrum Analyzer Method

#### TEST SETUP



#### TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

#### TEST RESULTS TABLE

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (kHz)	Final VBW (kHz)
Zigbee	100	100	1	100%	0	0.01	0.01

Note: 1) Duty Cycle Correction Factor=10log(1/x).  
 2) Where: x is Duty Cycle (Linear)  
 3) Where: T is On Time (transmit duration)

## TEST GRAPHS





## 7.2. 6 dB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

### LIMITS

FCC Part15 (15.247), Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(a)(2) ISED RSS-247 5.2 (a)	6dB Bandwidth	$\geq 500\text{kHz}$	2400-2483.5
ISED RSS-Gen Clause 6.7	99 % Occupied Bandwidth	For reporting purposes only	2400-2483.5

### TEST PROCEDURE

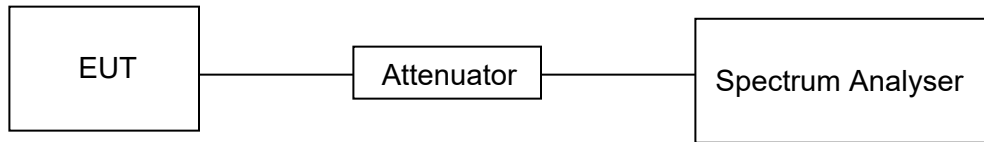
Refer to ANSI C63.10-2013 clause 11.8 for DTS bandwidth and clause 6.9 for Occupied Bandwidth.

Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Frequency Span	For 6 dB Bandwidth: enough to capture all products of the modulation carrier emission For 99 % Occupied Bandwidth: Between 1.5 times and 5 times the OBW
Detector	Peak
RBW	For 6 dB Bandwidth: 100 kHz For 99 % Occupied Bandwidth: 1 % to 5 % of the occupied bandwidth
VBW	For 6 dB Bandwidth: $\geq 3 \times \text{RBW}$ For 99 % Occupied Bandwidth: $\geq 3 \times \text{RBW}$
Trace	Max hold
Sweep	Auto couple

a) Use the 99 % power bandwidth function of the instrument, allow the trace to stabilize and report the measured bandwidth.

b) Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

**TEST SETUP****TEST ENVIRONMENT**

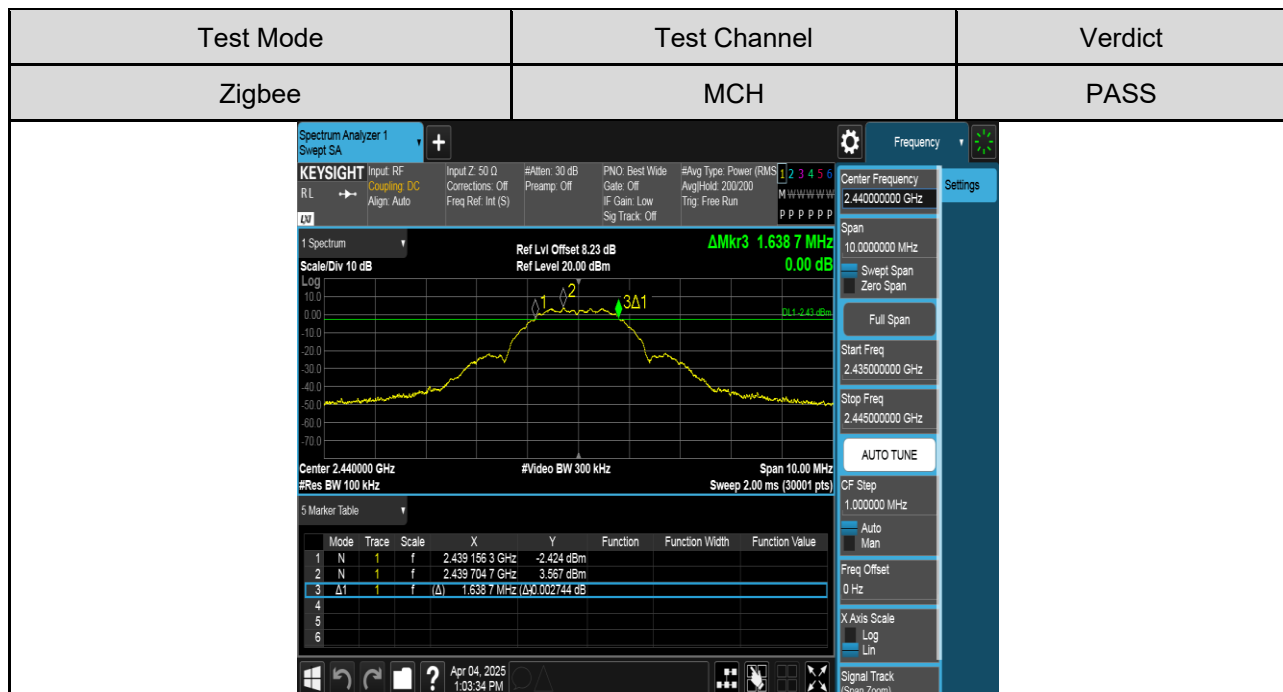
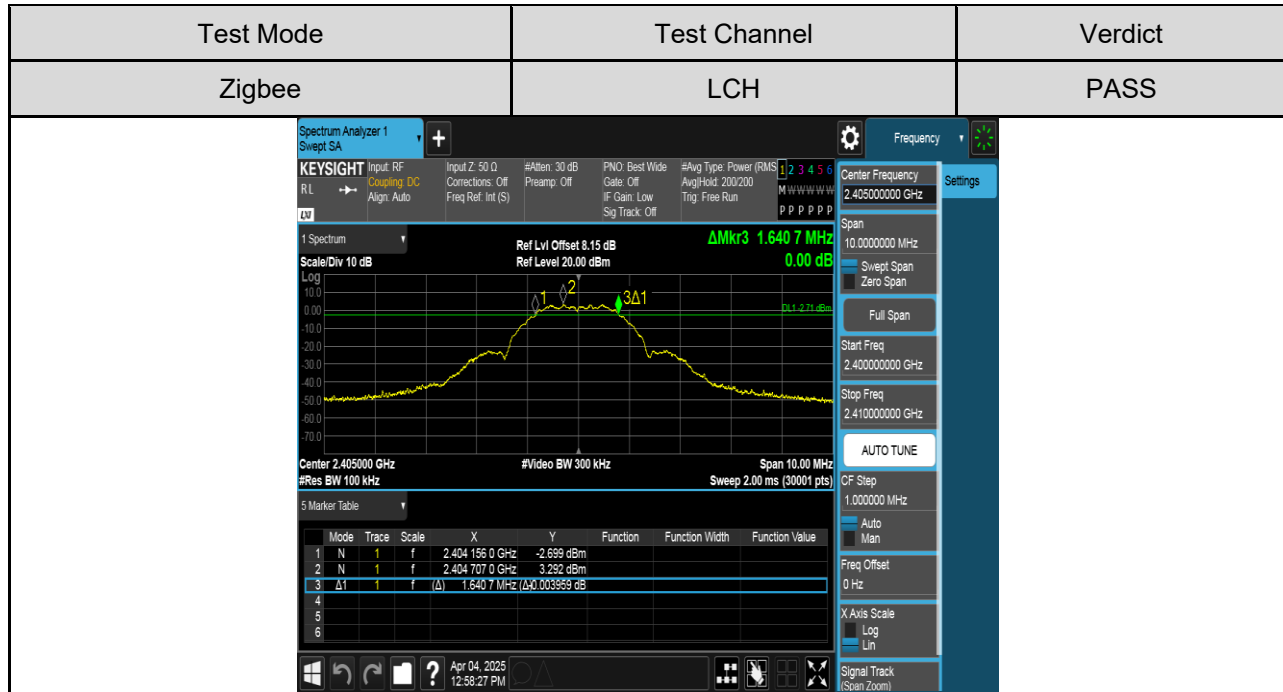
Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

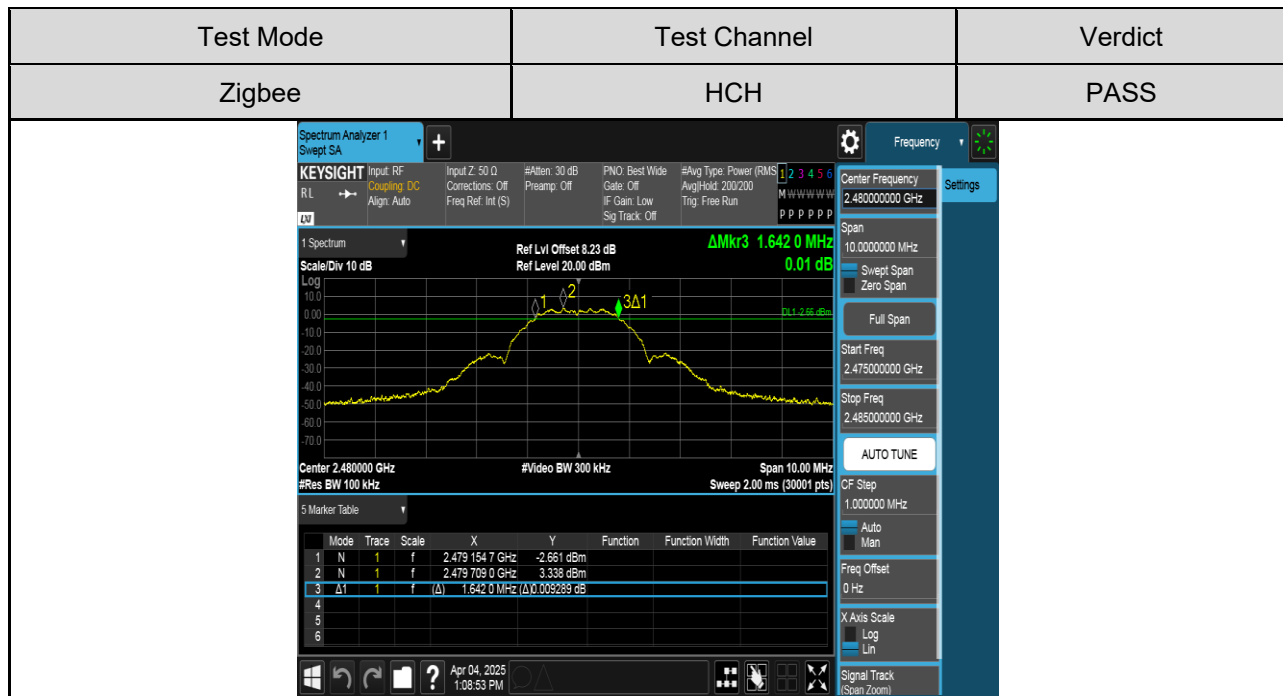
**TEST RESULTS TABLE**

Test Mode	Test Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Result
Zigbee	LCH	1.6407	2.2609	Pass
	MCH	1.6387	2.2644	Pass
	HCH	1.6420	2.2685	Pass

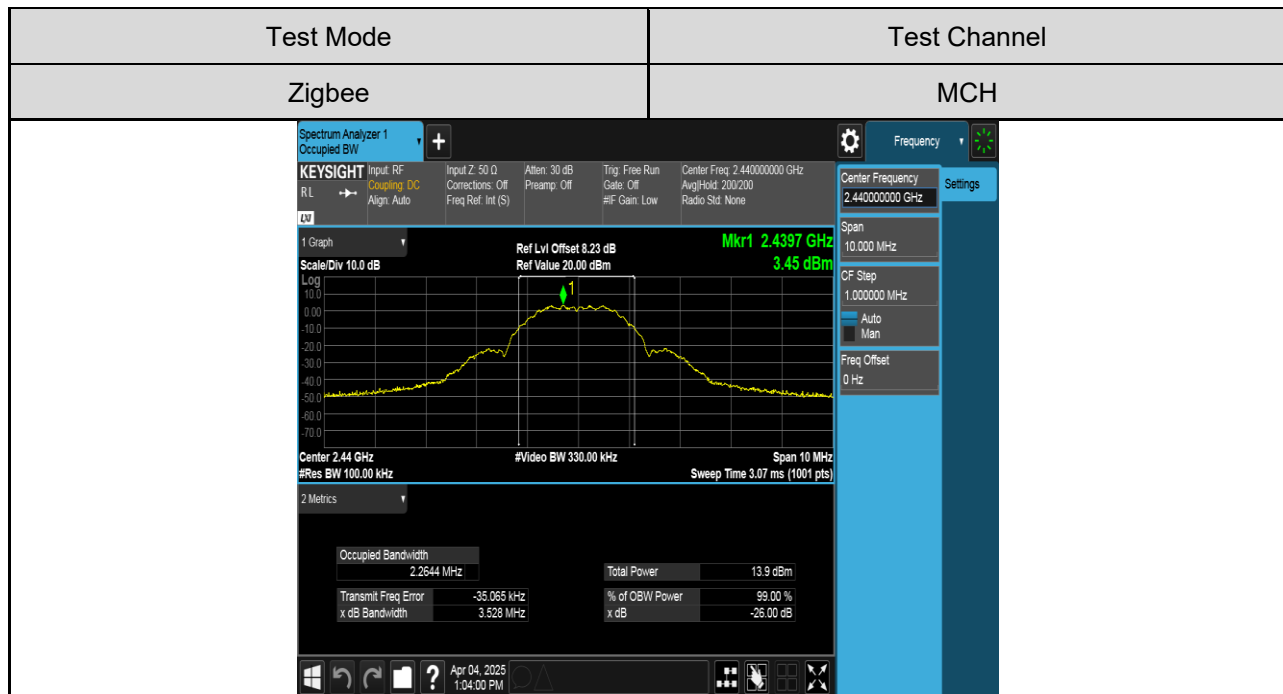
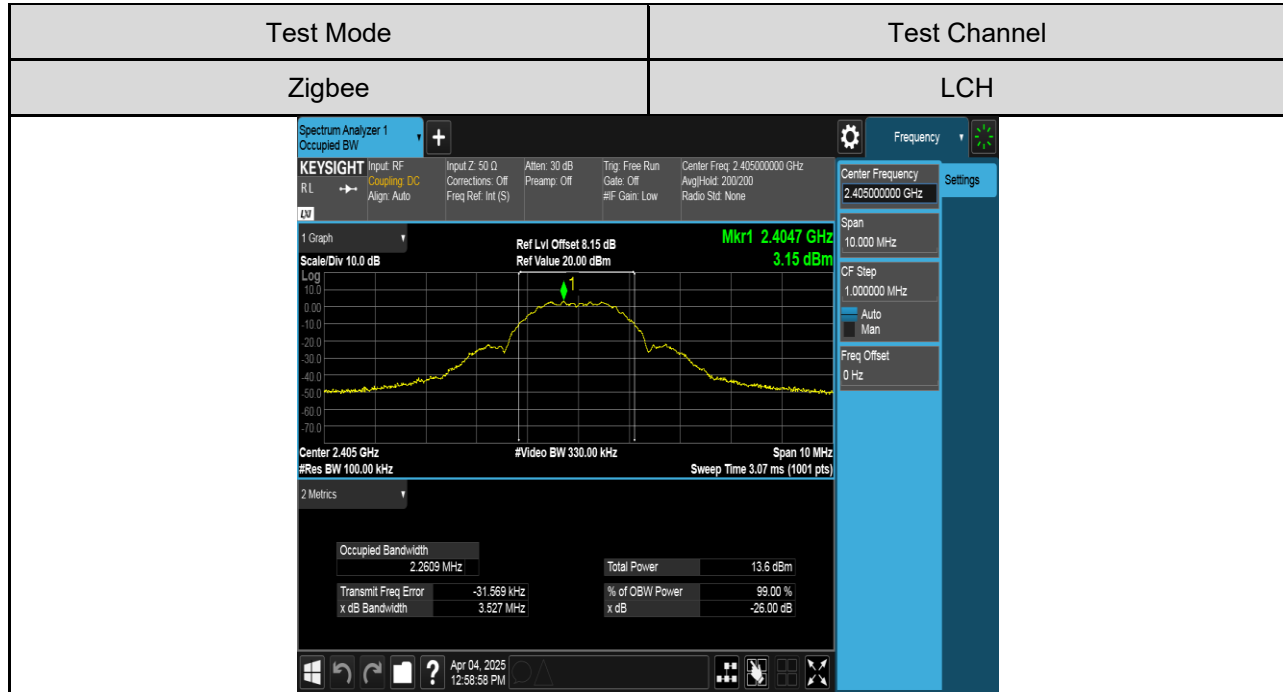
## TEST GRAPHS

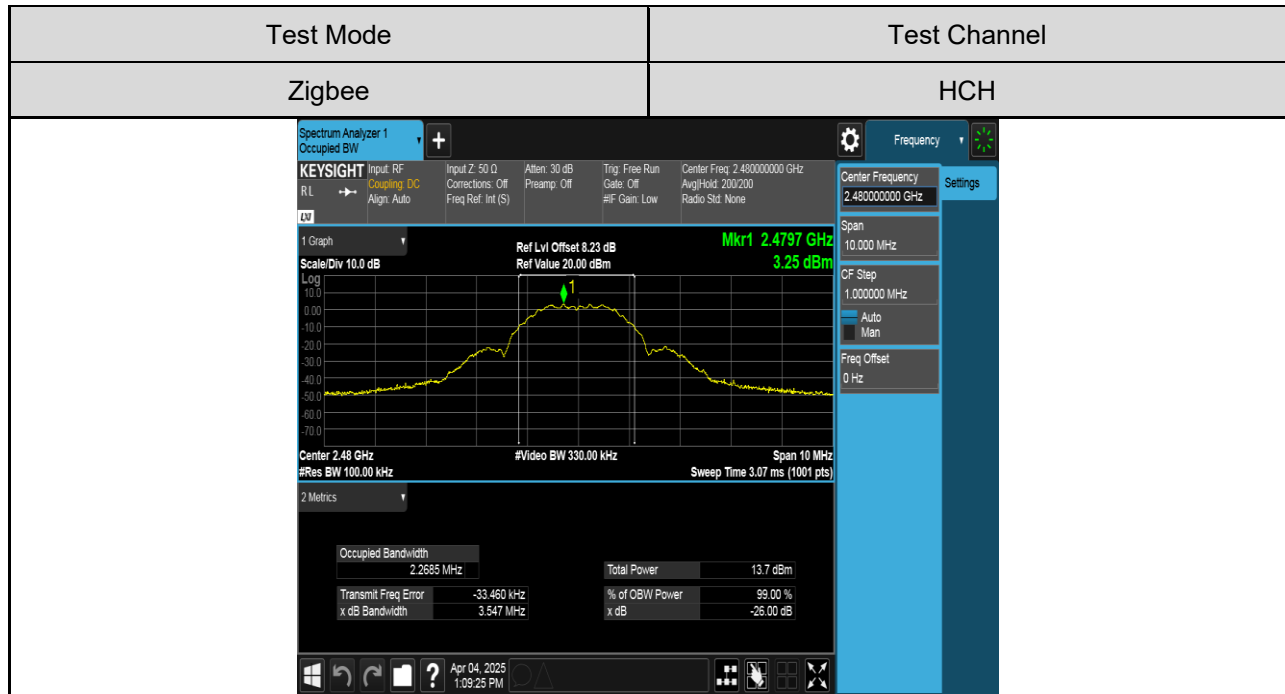
### 6dB Bandwidth





## 99% Bandwidth





### 7.3. CONDUCTED OUTPUT POWER

#### LIMITS

FCC Part15 (15.247), Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(b)(3)	Output Power	1 watt or 30dBm	2400-2483.5

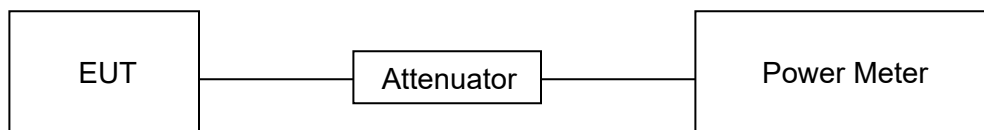
#### TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.  
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.  
Measure the power of each channel.  
PK Detector used for PK result.  
Peak Detector used for Peak result.

#### TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

#### TEST SETUP



**TEST RESULTS TABLE**

Test Mode	Test Channel	Maximum Conducted Output Power (PK)	LIMIT
		dBm	dBm
Zigbee	LCH	6.97	30
	MCH	7.26	30
	HCH	7.01	30



## 7.4. POWER SPECTRAL DENSITY

### LIMITS

FCC Part15 (15.247), Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e)	Power Spectral Density	8 dBm/3 kHz	2400-2483.5

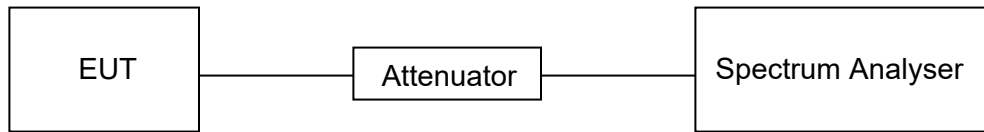
### TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW	$\geq 3 \times \text{RBW}$
Span	$1.5 \times \text{DTS bandwidth}$
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

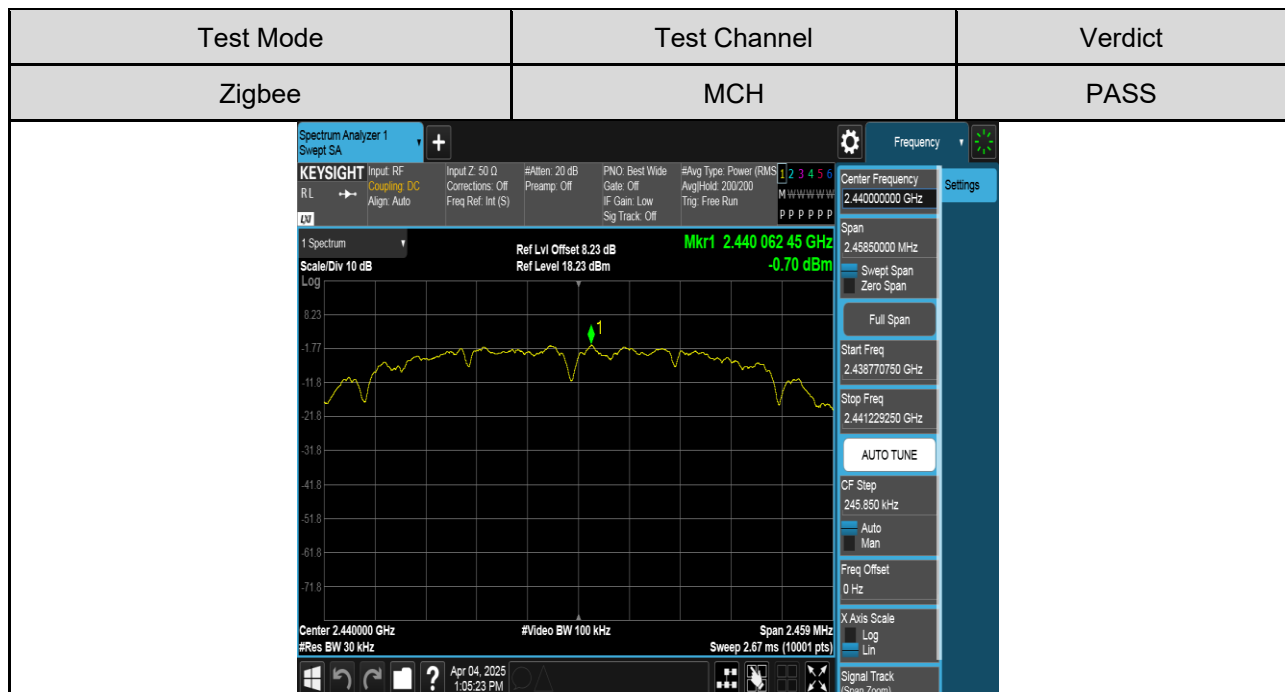
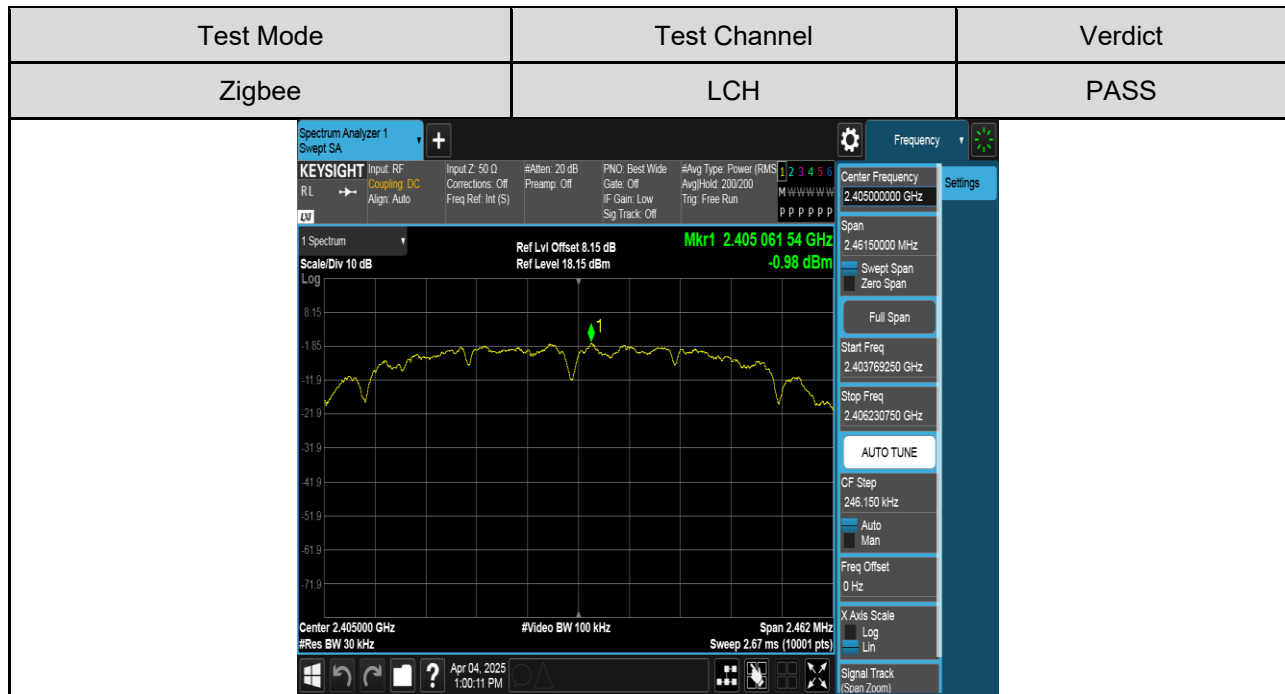
**TEST SETUP****TEST ENVIRONMENT**

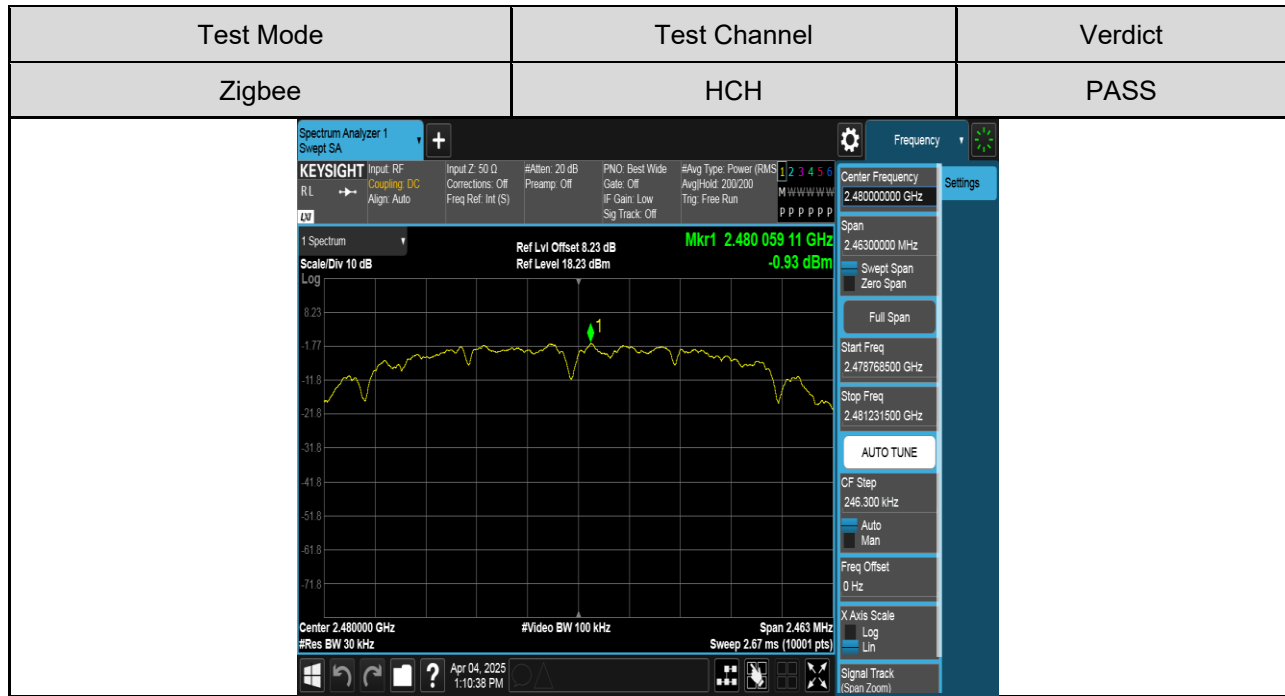
Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

**TEST RESULTS TABLE**

Test Mode	Test Channel	Maximum Peak power spectral density (dBm/30kHz)	Result
Zigbee	LCH	-0.98	30
	MCH	-0.70	30.00
	HCH	-0.93	30.00

### TEST GRAPHS





## 7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

### LIMITS

FCC Part15 (15.247), Subpart C		
Section	Test Item	Limit
FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

### TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

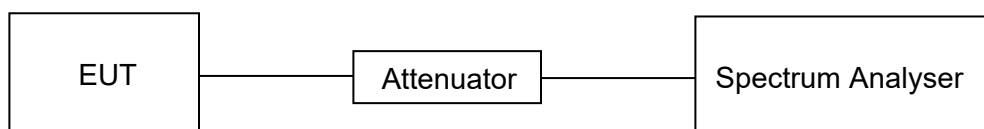
Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100 kHz
VBW	$\geq 3 \times \text{RBW}$
measurement points	$\geq \text{span}/\text{RBW}$
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level.

### TEST SETUP



## TEST ENVIRONMENT

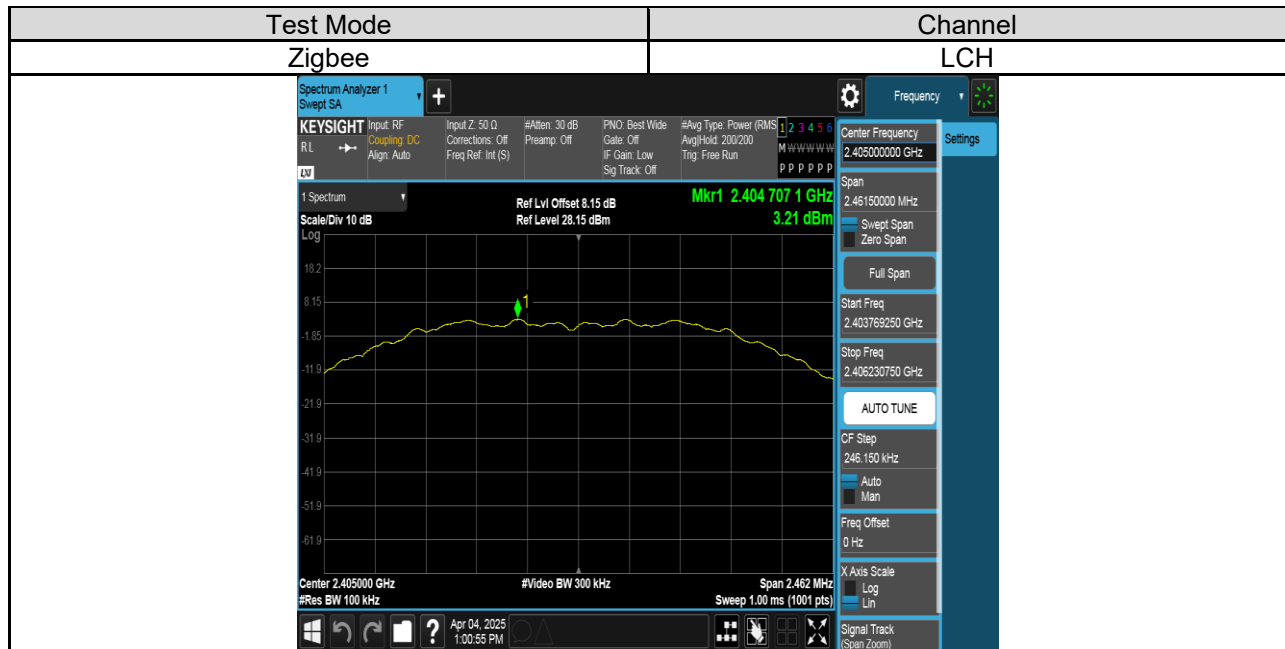
Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

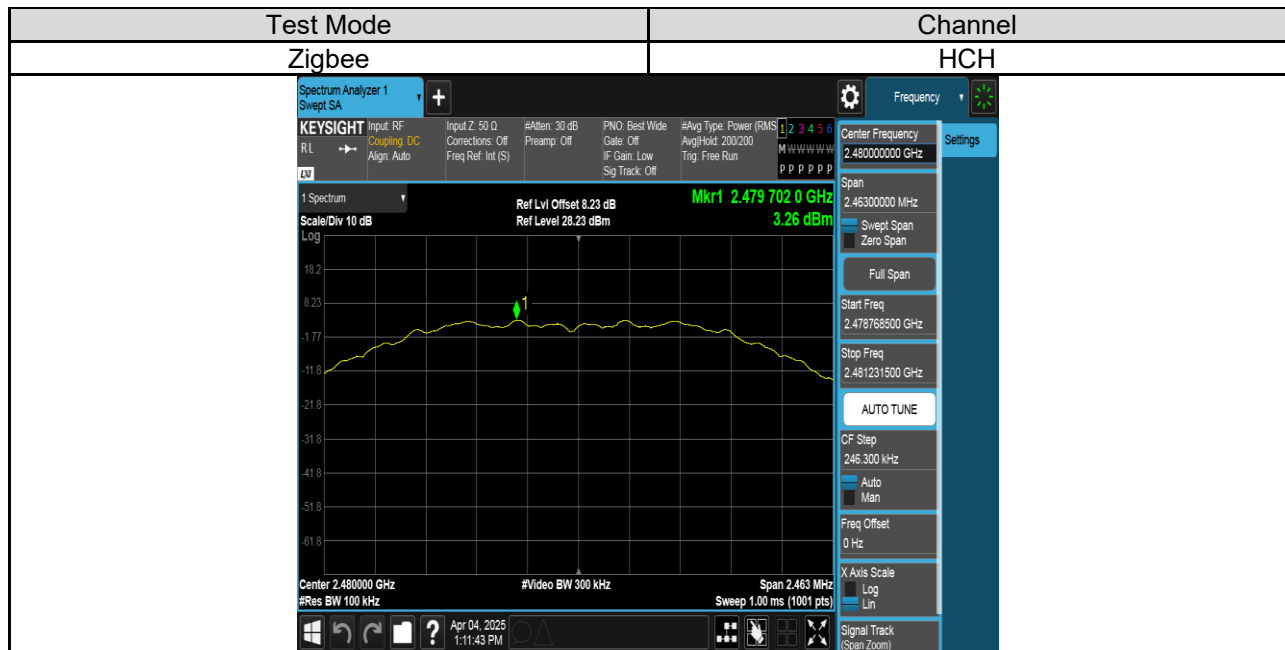
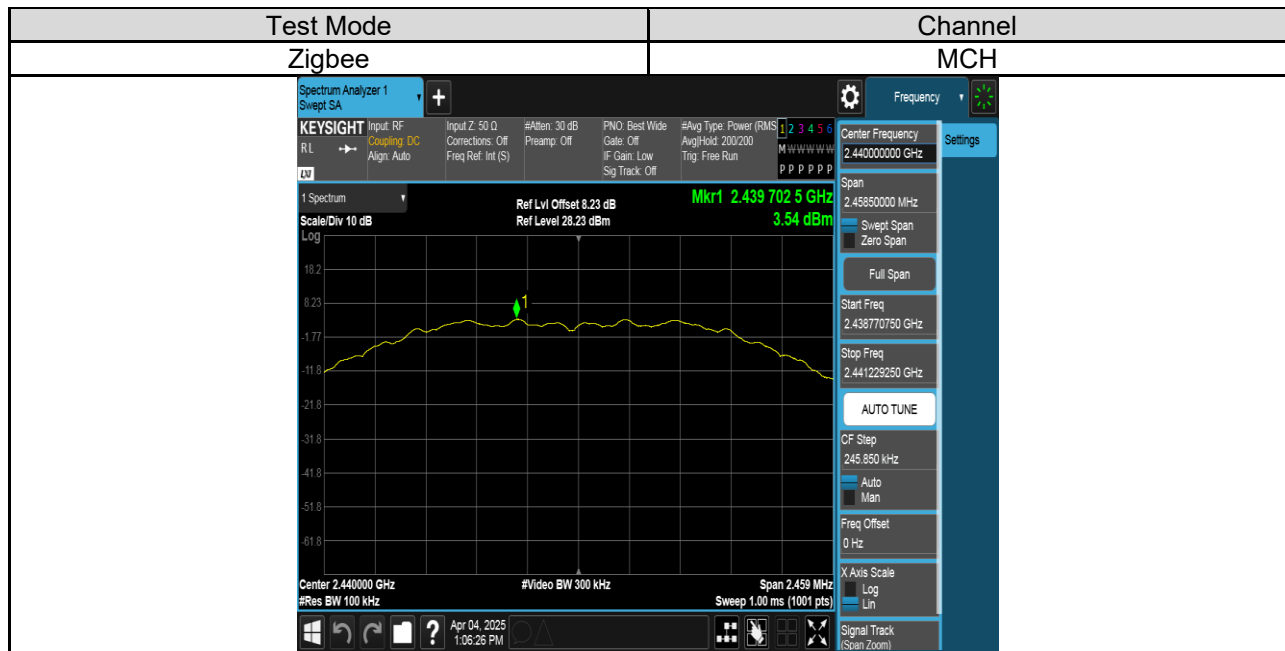
## PART 1: REFERENCE LEVEL MEASUREMENT

### TEST RESULTS TABLE

Test Mode	Test Channel	Result[dBm]
Zigbee	LCH	3.21
	MCH	3.54
	HCH	3.26

## TEST GRAPHS



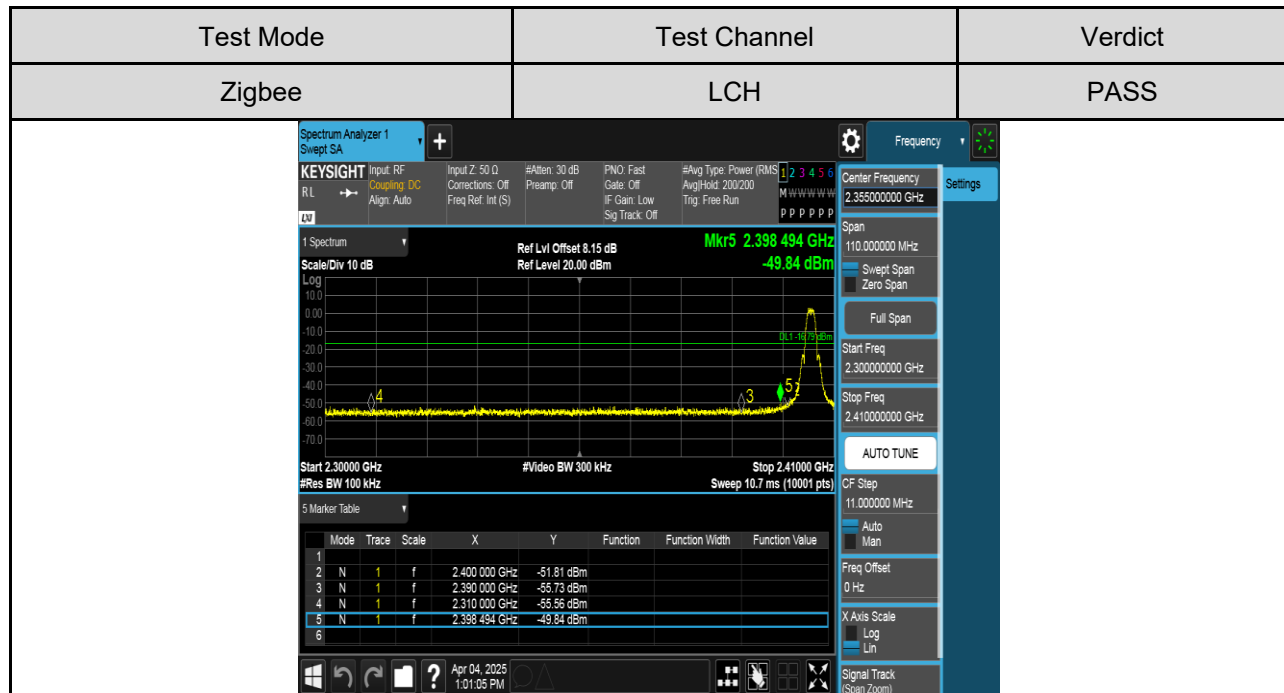


## PART 2: CONDUCTED BANDEDGE

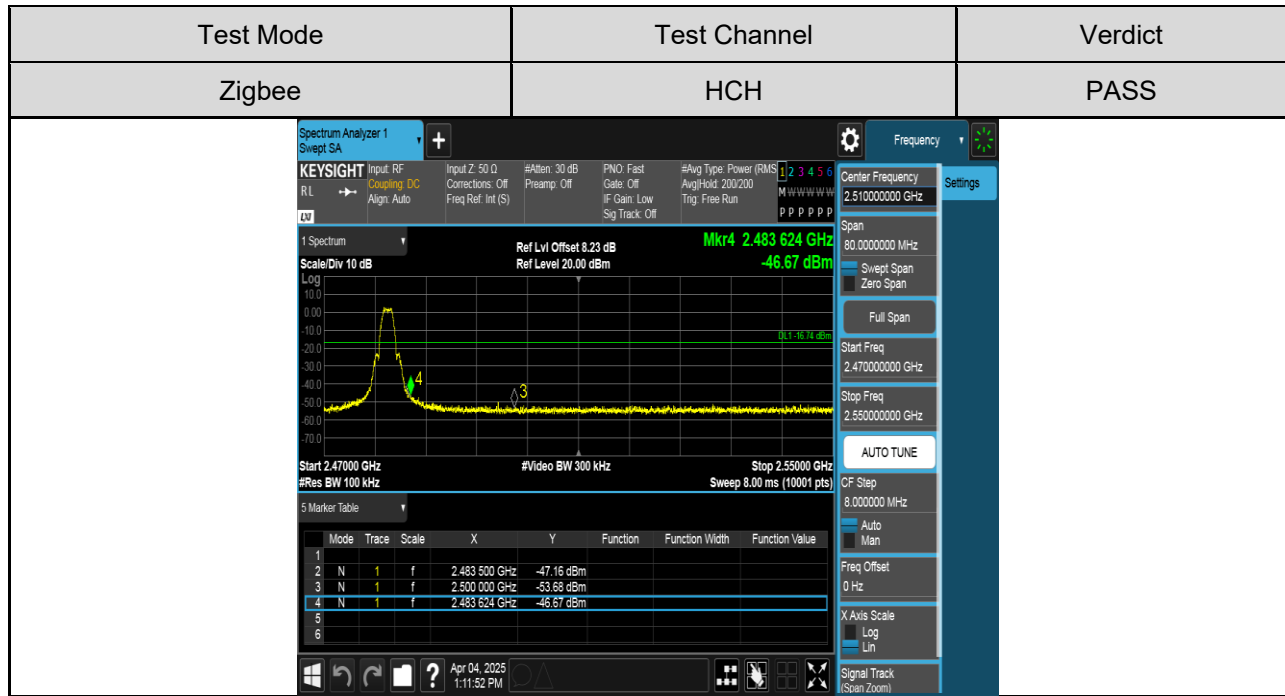
### TEST RESULTS TABLE

Test Mode	Test Channel	Result	Verdict
Zigbee	LCH	Refer to the Test Graph	PASS
	HCH	Refer to the Test Graph	PASS

### TEST GRAPHS





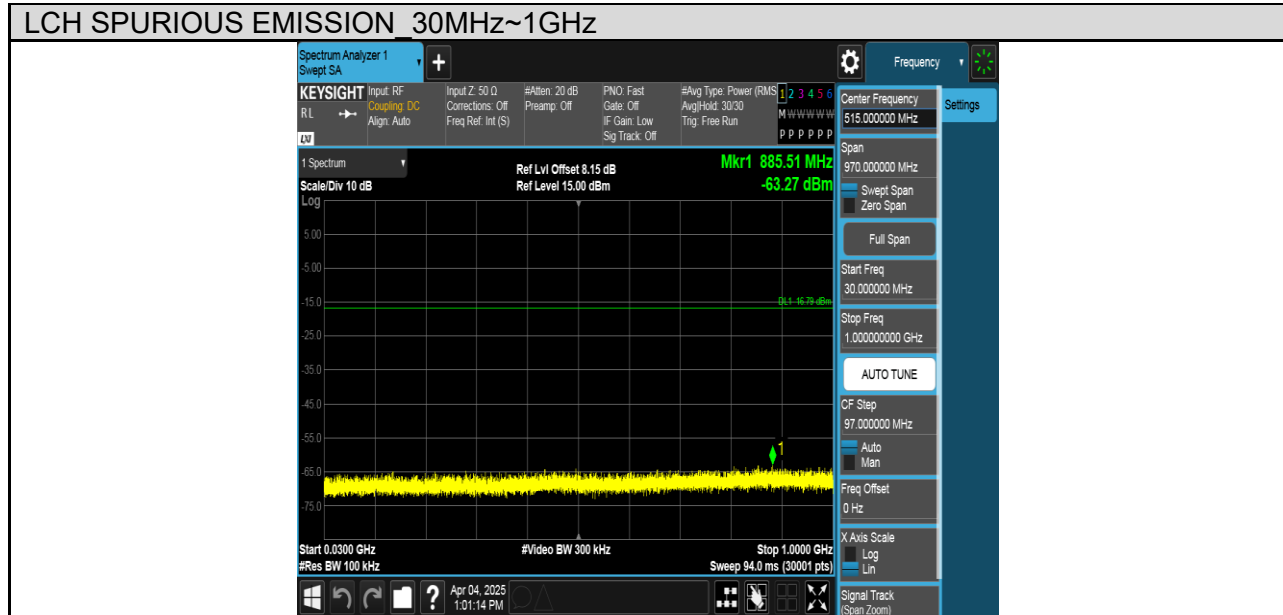


**PART 3: CONDUCTED SPURIOUS EMISSION****TEST RESULTS TABLE**

Test Mode	Test Channel	Result	Verdict
Zigbee	LCH	Refer to the Test Graph	PASS
	MCH	Refer to the Test Graph	PASS
	HCH	Refer to the Test Graph	PASS

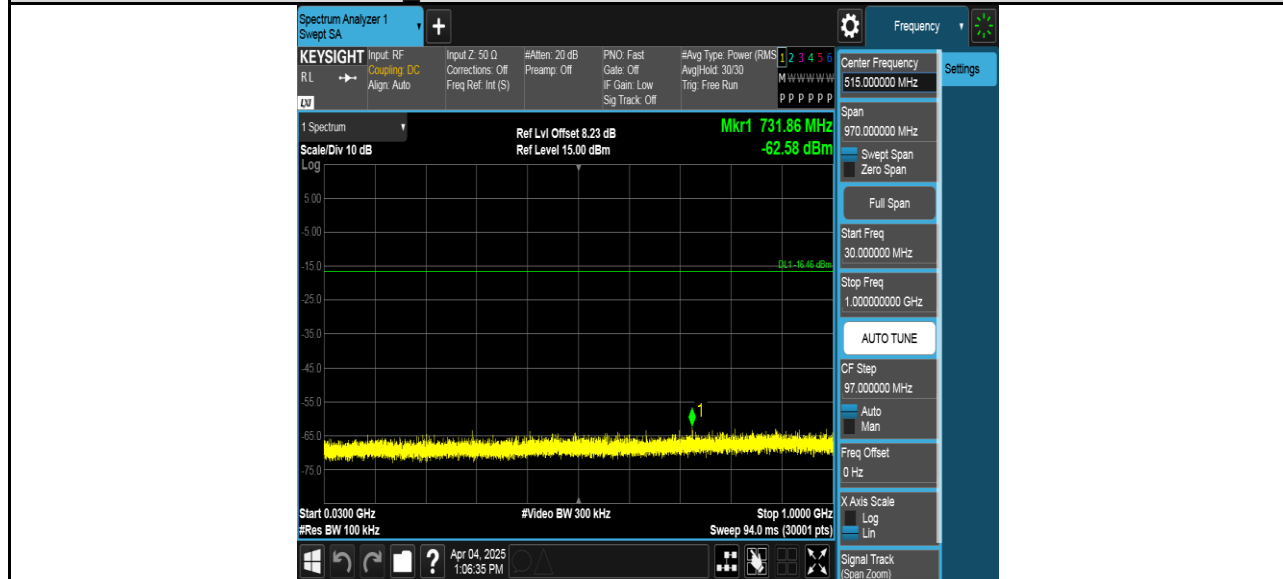
## TEST GRAPHS

Test Mode	Channel	Verdict
Zigbee	LCH	PASS



Test Mode	Channel	Verdict
Zigbee	MCH	PASS

### MCH SPURIOUS EMISSION 30MHz~1GHz

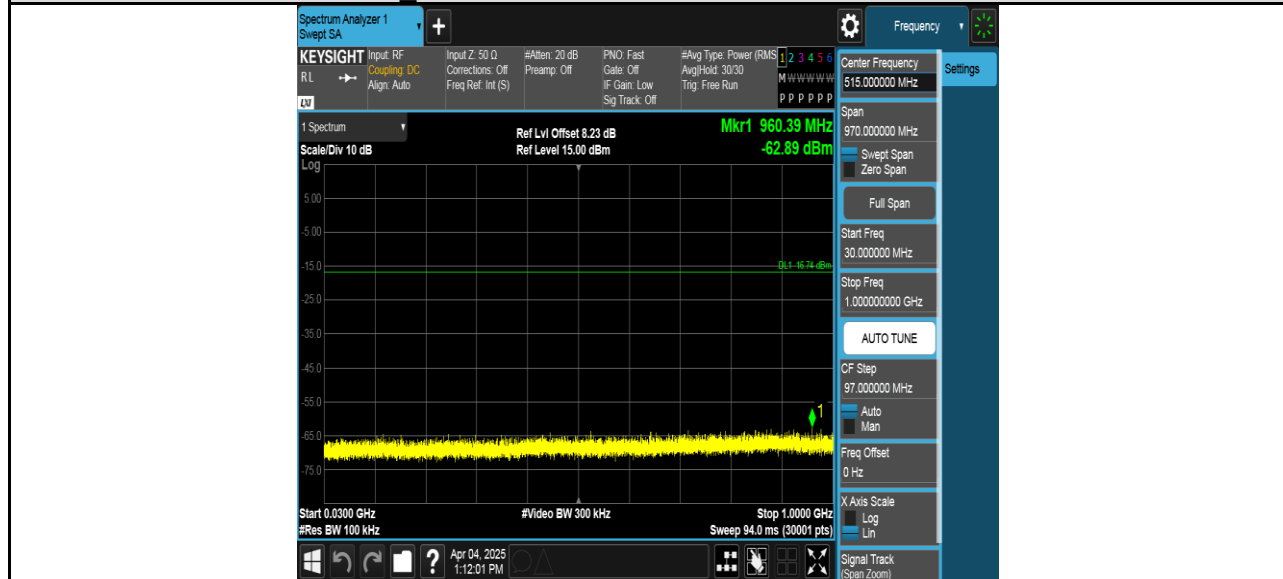


### MCH SPURIOUS EMISSION 1GHz~26.5GHz

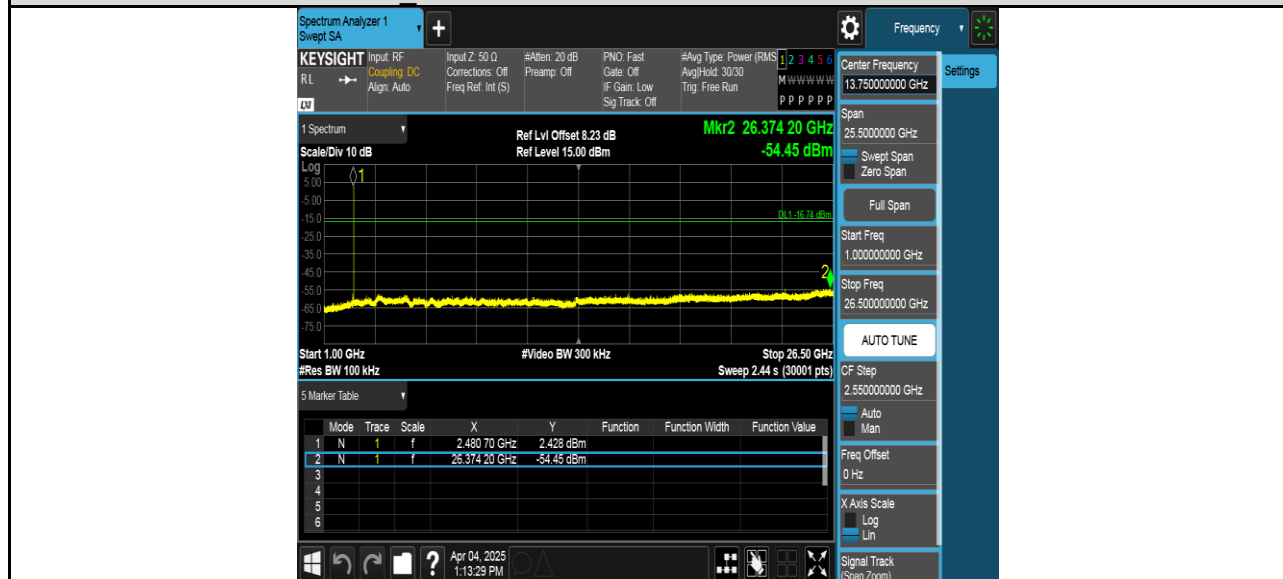


Test Mode	Channel	Verdict
Zigbee	HCH	PASS

### HCH SPURIOUS EMISSION 30MHz~1GHz



### HCH SPURIOUS EMISSION 1GHz~26.5GHz



## 8. RADIATED TEST RESULTS

### 8.1. LIMITS AND PROCEDURE

#### LIMITS

Please refer to FCC §15.205 and §15.209, ISED RSS-247 Clause 5.5, ISED RSS-GEN Clause 8.9&6.13 (Transmitter)

Radiation Disturbance Test Limit for ISED (9kHz-1GHz)

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

**Table 5 – General field strength limits at frequencies above 30 MHz**

Frequency (MHz)	Field strength ( $\mu\text{V}/\text{m}$ at 3 m)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

**Table 6 – General field strength limits at frequencies below 30 MHz**

Frequency	Magnetic field strength (H-Field) ( $\mu\text{A}/\text{m}$ )	Measurement distance (m)
9 - 490 kHz <sup>Note 1</sup>	$6.37/F$ (F in kHz)	300
490 - 1705 kHz	$63.7/F$ (F in kHz)	30
1.705 - 30 MHz	0.08	30

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

Please refer to FCC KDB 558074

Radiation Disturbance Test Limit for FCC (Class B) (9kHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

## Radiation Disturbance Test Limit for FCC (Above 1G)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

## Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	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	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	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	( <sup>2</sup> )
13.36-13.41			

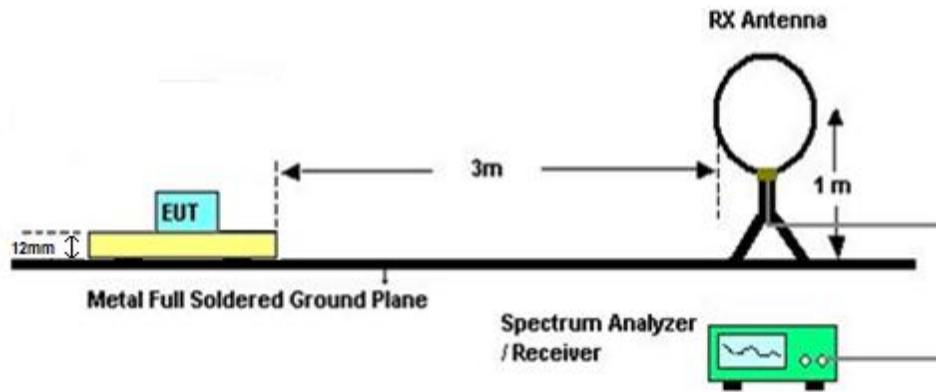
Note: <sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup>Above 38.6c



## TEST SETUP AND PROCEDURE

Below 30MHz

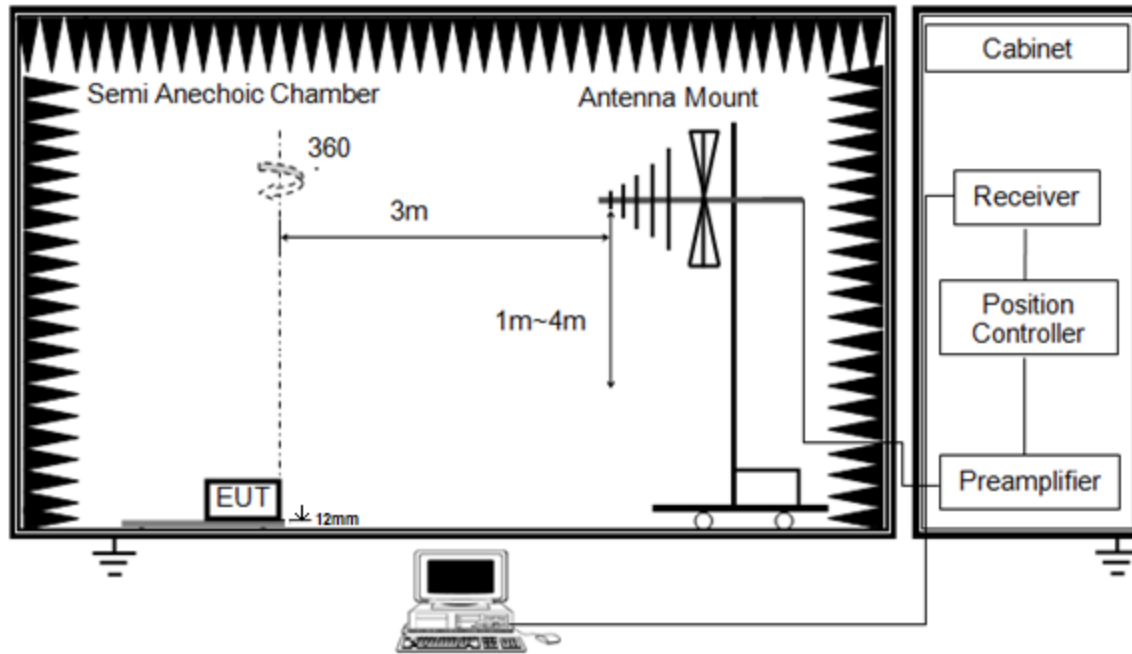


The setting of the spectrum analyser

RBW	200 Hz (From 9kHz to 0.15MHz) / 9kHz (From 0.15MHz to 30MHz)
VBW	200 Hz (From 9kHz to 0.15MHz) / 9kHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/Average
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 12 mm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector
6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. For the actual test configuration, please refer to the related item in this test report  
(Photographs of the Test Configuration)
8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377  $\Omega$ . For example, the measurement frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to  $Y-51.5 = Z$  dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

Below 1G

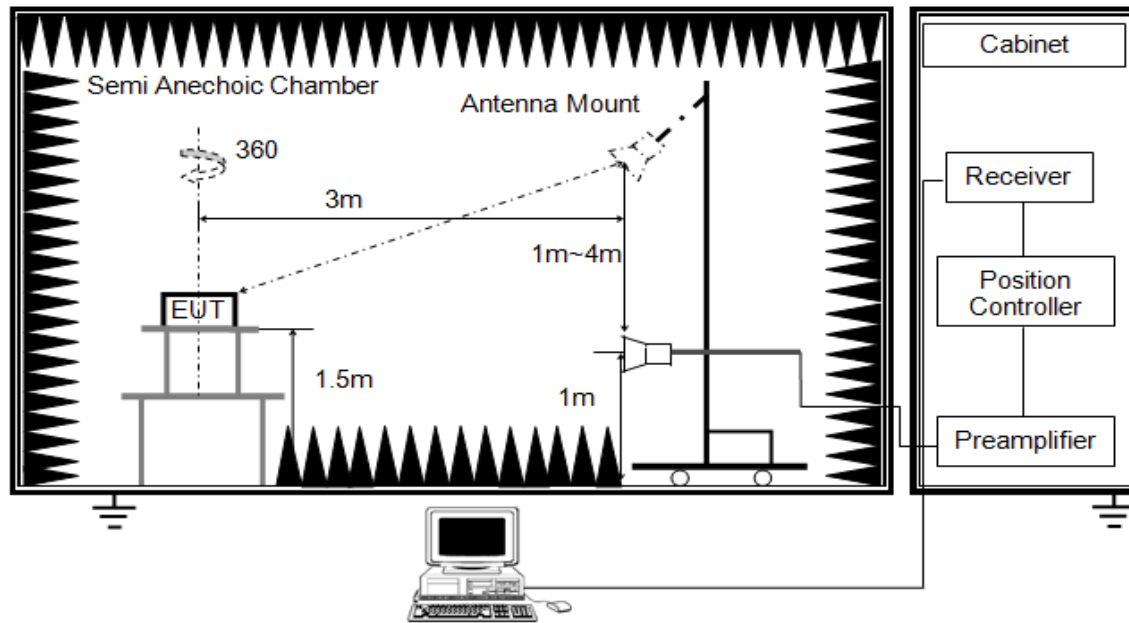


The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 12 mm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Above 1G

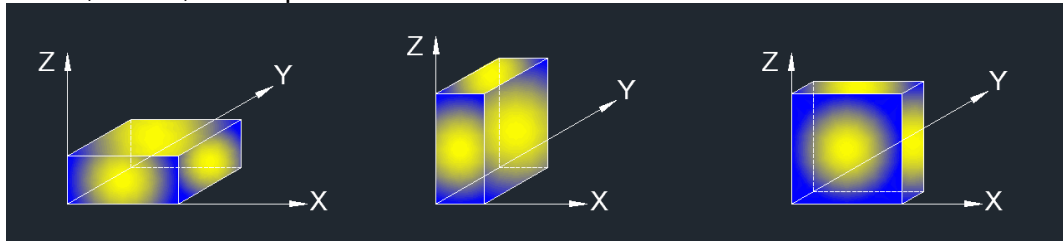


The setting of the spectrum analyser

RBW	1 MHz
VBW	PEAK:3 MHz AVG: See note6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz, the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements; and 1 MHz resolution bandwidth with video bandwidth  $\geq 1/T$  but not less than the setting list in section 7.1 when use peak detector, max hold to be run for at least  $[50 \cdot (1/\text{Duty Cycle})]$  traces for average measurements. For the Duty Cycle need to refer the results in section 7.1.
7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

X axis, Y axis, Z axis positions:



Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worse case (X axis) data recorded in the report.

## 8.2. TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

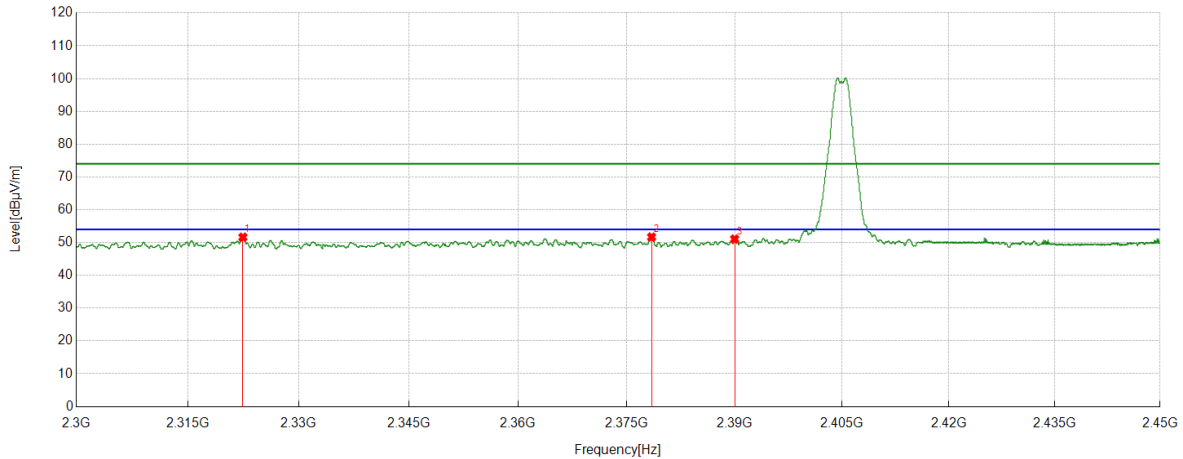
## 8.3. RESTRICTED BANDEDGE

### TEST RESULT TABLE

Test Mode	Channel	Puw(dBm)	Verdict
Zigbee	LCH	<Limit	PASS
	HCH	<Limit	PASS

## TEST GRAPHS

Test Mode	Channel	Polarization	Verdict
Zigbee	LCH	Horizontal	PASS

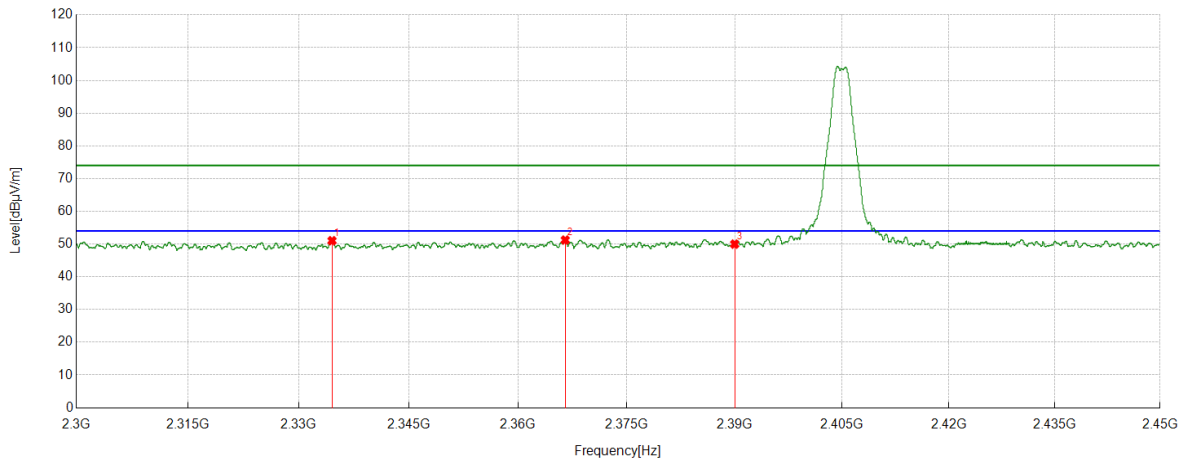


### PK Result:

No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	2322.4653	38.22	13.40	51.62	74.00	-22.38	Horizontal
2	2378.4598	37.91	13.76	51.67	74.00	-22.33	Horizontal
3	2390.0000	37.33	13.72	51.05	74.00	-22.95	Horizontal

- Note: 1. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.  
2. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz (refer to clause 7.1.).  
3. Measurement = Reading Level + Correct Factor.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	LCH	Vertical	PASS

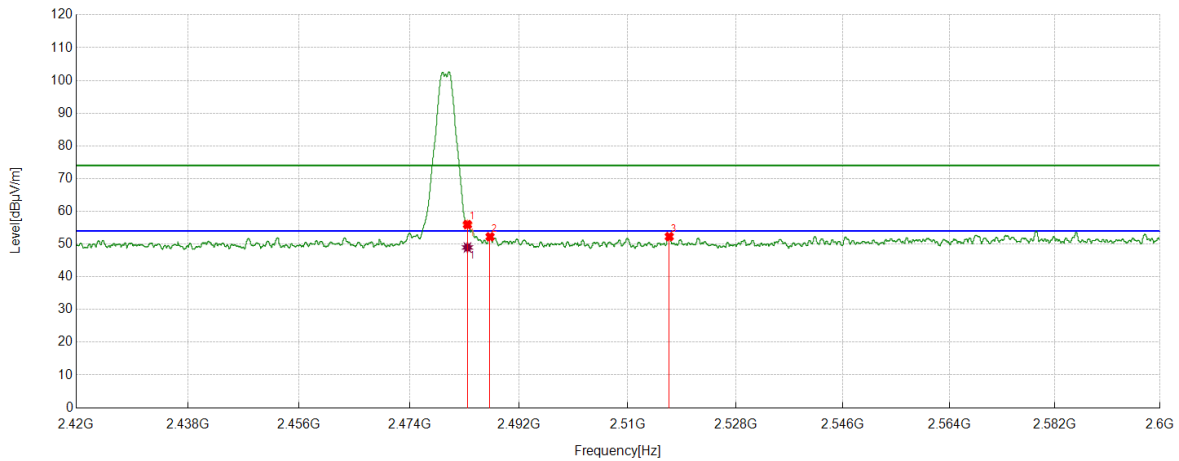


PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	2334.5606	37.63	13.39	51.02	74.00	-22.98	Vertical
2	2366.5146	37.61	13.62	51.23	74.00	-22.77	Vertical
3	2390.0000	36.26	13.72	49.98	74.00	-24.02	Vertical

- Note: 1. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.  
2. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz (refer to clause 7.1.).  
3. Measurement = Reading Level + Correct Factor.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	HCH	Horizontal	PASS



#### PK Result:

No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	2483.5000	41.85	14.12	55.97	74.00	-18.03	Horizontal
2	2487.2159	38.03	14.20	52.23	74.00	-21.77	Horizontal
3	2516.8971	37.79	14.48	52.27	74.00	-21.73	Horizontal

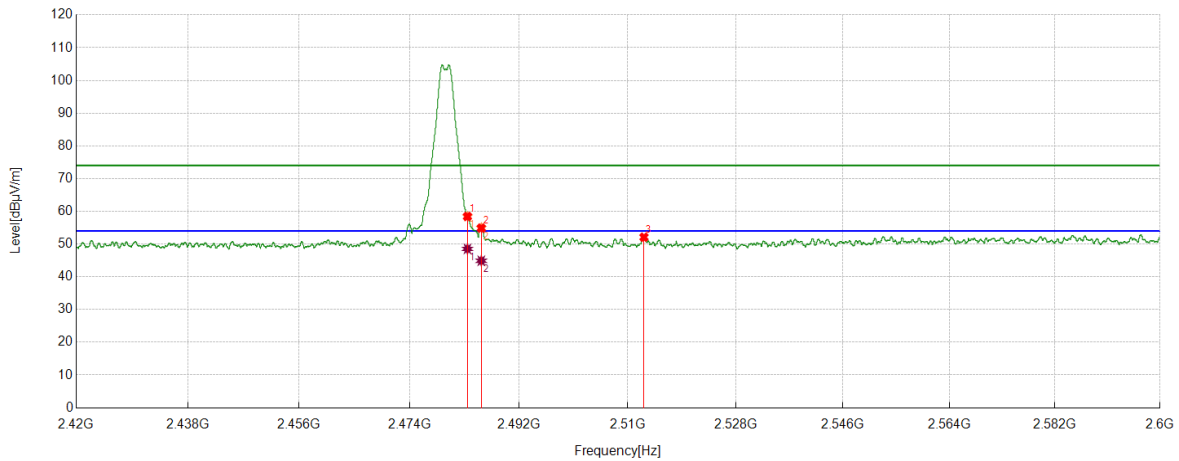
#### AV Result:

No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	2483.5000	34.84	14.12	48.96	54.00	-5.04	Horizontal

- Note: 1. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.  
2. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz (refer to clause 7.1.).  
3. Measurement = Reading Level + Correct Factor.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



Test Mode	Channel	Polarization	Verdict
Zigbee	HCH	Vertical	PASS



#### PK Result:

No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	2483.5000	44.32	14.12	58.44	74.00	-15.56	Vertical
2	2485.7757	40.70	14.17	54.87	74.00	-19.13	Vertical
3	2512.6891	37.65	14.44	52.09	74.00	-21.91	Vertical

#### AV Result:

No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	2483.5000	34.40	14.12	48.52	54.00	-5.48	Vertical
2	2485.7757	30.72	14.17	44.89	54.00	-9.11	Vertical

- Note: 1. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.  
2. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz (refer to clause 7.1.).  
3. Measurement = Reading Level + Correct Factor.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

## 8.4. SPURIOUS EMISSIONS

### TEST RESULTS TABLE

#### 1) For 1GHz~18GHz

Test Mode	Channel	P <sub>uw</sub> (dBm)	Verdict
Zigbee	LCH	<Limit	PASS
	MCH	<Limit	PASS
	HCH	<Limit	PASS

Note:

Through pre-testing all the test modes and test channels, but only the data of the worst case is included in this test report.

#### 2) For 9kHz~30MHz

Test Mode	Channel	P <sub>uw</sub> (dBm)	Verdict
Zigbee	MCH	<Limit	PASS

Note:

Through pre-testing all the test modes and test channels, but only the data of the worst case is included in this test report.

#### 3) For 30MHz~1GHz

Test Mode	Channel	P <sub>uw</sub> (dBm)	Verdict
Zigbee	MCH	<Limit	PASS

Note:

Through pre-testing all the test modes and test channels, but only the data of the worst case is included in this test report.

#### 4) For 18GHz~26.5GHz

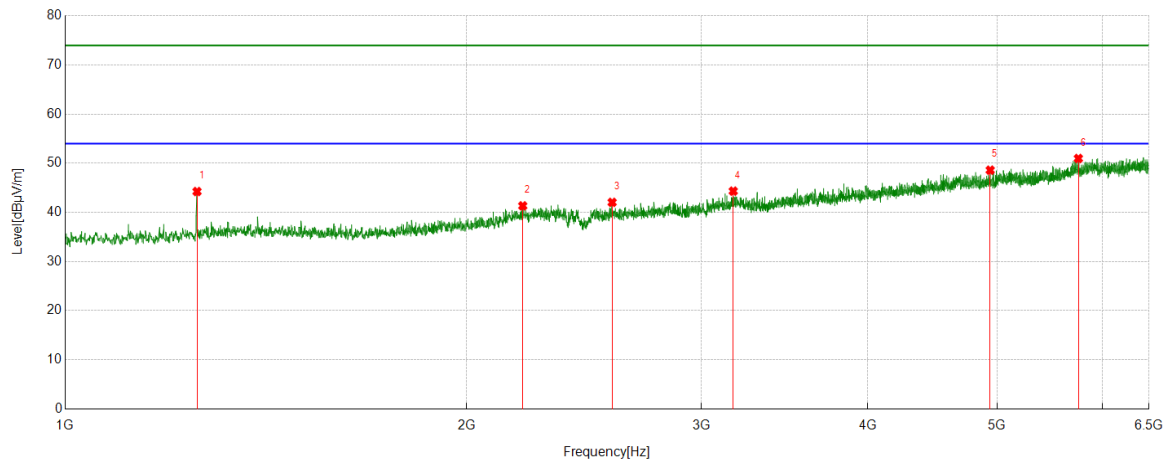
Test Mode	Channel	P <sub>uw</sub> (dBm)	Verdict
Zigbee	MCH	<Limit	PASS

Note:

Through pre-testing all the test modes and test channels, but only the data of the worst case is included in this test report.

**Part 1: 1GHz~6.5GHz**
**HARMONICS AND SPURIOUS EMISSIONS**

Test Mode	Channel	Polarization	Verdict
Zigbee	LCH	Horizontal	PASS


**PK Result:**

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	1255.7820	45.10	-0.86	44.24	74.00	-29.76	Horizontal
2	2203.9630	37.48	3.84	41.32	74.00	-32.68	Horizontal
3	2571.8215	38.54	3.49	42.03	74.00	-31.97	Horizontal
4	3170.0213	37.96	6.36	44.32	74.00	-29.68	Horizontal
5	4940.5551	36.21	12.38	48.59	74.00	-25.41	Horizontal
6	5753.2817	35.38	15.59	50.97	74.00	-23.03	Horizontal

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

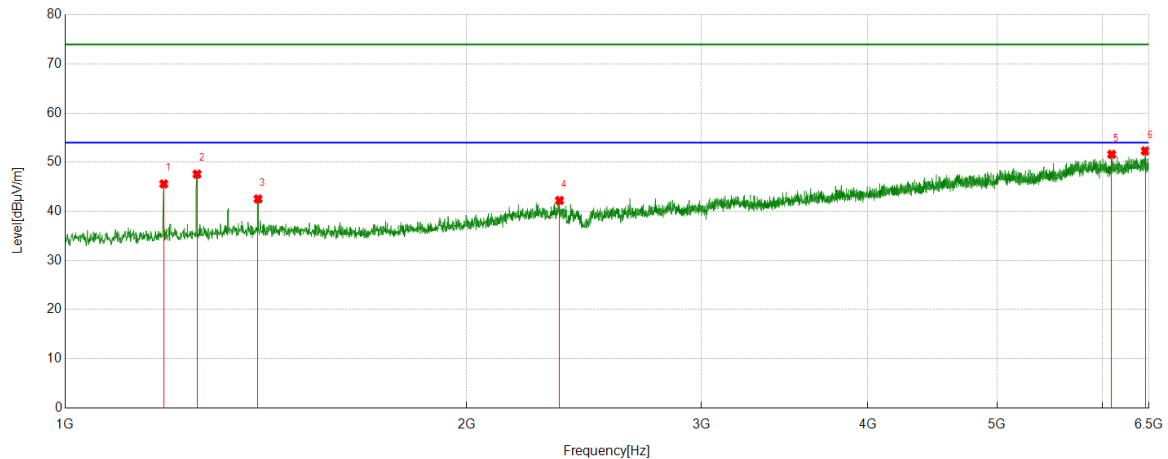
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Peak: Peak detector.

5. For below 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.

6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	LCH	Vertical	PASS

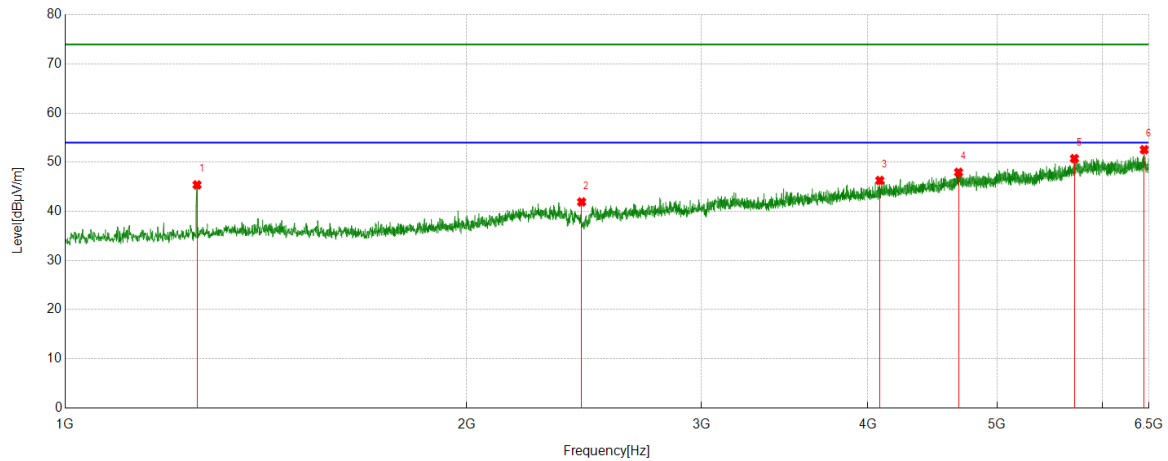


#### PK Result:

No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	1185.6482	46.79	-1.21	45.58	74.00	-28.42	Vertical
2	1255.7820	48.43	-0.86	47.57	74.00	-26.43	Vertical
3	1395.3619	42.95	-0.43	42.52	74.00	-31.48	Vertical
4	2348.3560	38.29	3.92	42.21	74.00	-31.79	Vertical
5	6094.3243	35.86	15.74	51.60	74.00	-22.40	Vertical
6	6457.3697	34.74	17.56	52.30	74.00	-21.70	Vertical

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.  
4. Peak: Peak detector.  
5. For below 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	MCH	Horizontal	PASS

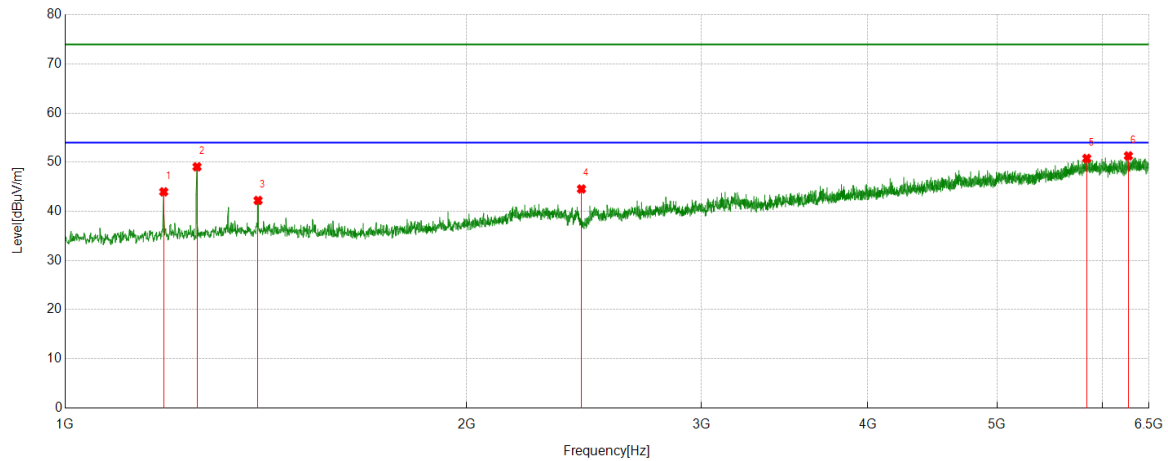


#### PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	1255.7820	46.25	-0.86	45.39	74.00	-28.61	Horizontal
2	2439.8050	38.16	3.75	41.91	74.00	-32.09	Horizontal
3	4083.1354	37.21	9.08	46.29	74.00	-27.71	Horizontal
4	4677.8972	35.61	12.34	47.95	74.00	-26.05	Horizontal
5	5714.0893	35.62	15.13	50.75	74.00	-23.25	Horizontal
6	6447.0559	35.05	17.51	52.56	74.00	-21.44	Horizontal

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.  
4. Peak: Peak detector.  
5. For below 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	MCH	Vertical	PASS

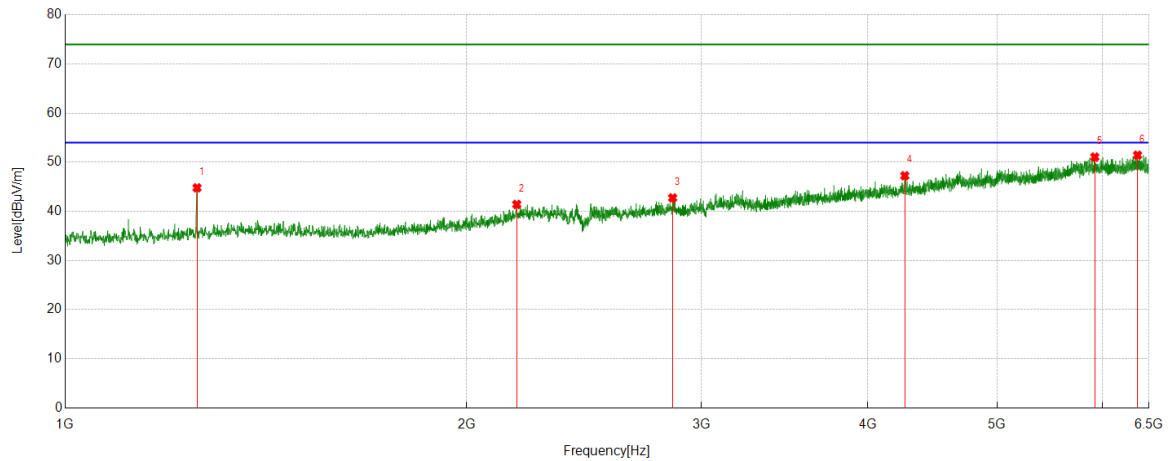


#### PK Result:

No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	1185.6482	45.18	-1.21	43.97	74.00	-30.03	Vertical
2	1255.7820	49.93	-0.86	49.07	74.00	-24.93	Vertical
3	1395.3619	42.65	-0.43	42.22	74.00	-31.78	Vertical
4	2439.1174	40.80	3.75	44.55	74.00	-29.45	Vertical
5	5837.1671	34.69	16.09	50.78	74.00	-23.22	Vertical
6	6272.4091	34.61	16.69	51.30	74.00	-22.70	Vertical

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.  
4. Peak: Peak detector.  
5. For below 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	HCH	Horizontal	PASS

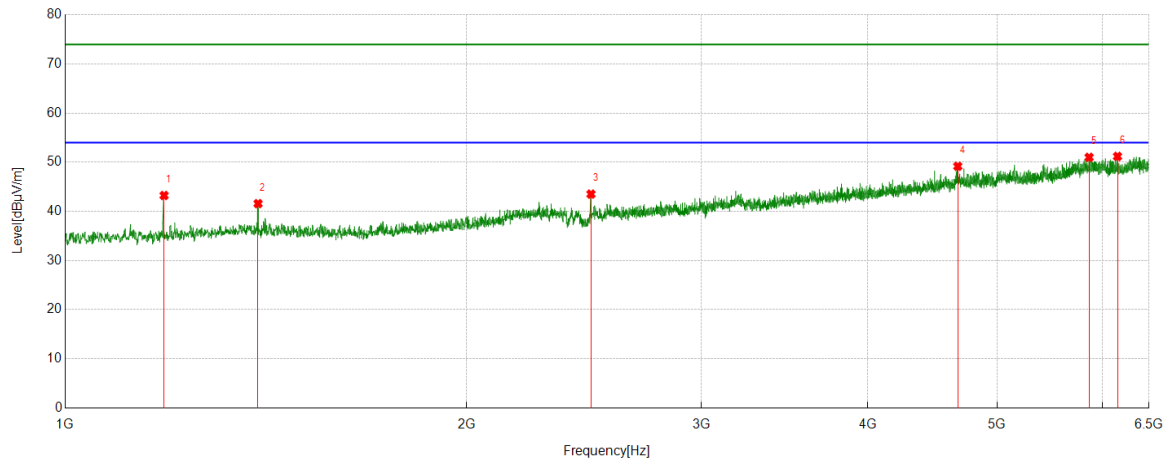


#### PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	1255.7820	45.65	-0.86	44.79	74.00	-29.21	Horizontal
2	2181.2727	37.53	3.88	41.41	74.00	-32.59	Horizontal
3	2855.1069	37.21	5.53	42.74	74.00	-31.26	Horizontal
4	4263.2829	37.07	10.18	47.25	74.00	-26.75	Horizontal
5	5918.9899	34.82	16.24	51.06	74.00	-22.94	Horizontal
6	6372.1090	33.90	17.54	51.44	74.00	-22.56	Horizontal

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.  
4. Peak: Peak detector.  
5. For below 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	HCH	Vertical	PASS



#### PK Result:

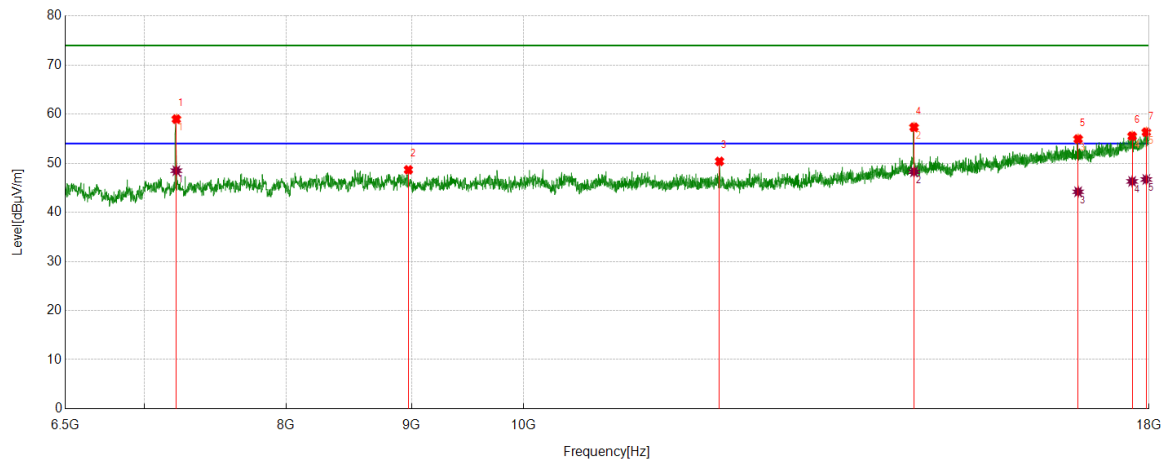
No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	1186.3358	44.45	-1.22	43.23	74.00	-30.77	Vertical
2	1395.3619	42.00	-0.43	41.57	74.00	-32.43	Vertical
3	2479.6850	39.60	3.91	43.51	74.00	-30.49	Vertical
4	4671.7090	36.78	12.40	49.18	74.00	-24.82	Vertical
5	5861.2327	35.44	15.56	51.00	74.00	-23.00	Vertical
6	6155.5194	34.93	16.26	51.19	74.00	-22.81	Vertical

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.  
4. Peak: Peak detector.  
5. For below 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



**Part 2: 6.5GHz~18GHz**
**HARMONICS AND SPURIOUS EMISSIONS**

Test Mode	Channel	Polarization	Verdict
Zigbee	LCH	Horizontal	PASS


**PK Result:**

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7215.9645	54.91	4.07	58.98	74.00	-15.02	Horizontal
2	8974.2468	42.30	6.36	48.66	74.00	-25.34	Horizontal
3	12022.1278	42.34	8.04	50.38	74.00	-23.62	Horizontal
4	14433.1166	44.33	13.01	57.34	74.00	-16.66	Horizontal
5	16839.7925	37.96	16.97	54.93	74.00	-19.07	Horizontal
6	17716.7771	36.09	19.44	55.53	74.00	-18.47	Horizontal
7	17953.9942	35.85	20.48	56.33	74.00	-17.67	Horizontal

**AV Result:**

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7215.9645	44.41	4.07	48.48	54.00	-5.52	Horizontal
2	14433.1166	35.25	13.01	48.26	54.00	-5.74	Horizontal
3	16839.7925	27.22	16.97	44.19	54.00	-9.81	Horizontal
4	17716.7771	26.86	19.44	46.30	54.00	-7.70	Horizontal
5	17953.9942	26.22	20.48	46.70	54.00	-7.30	Horizontal

Note: 1. Measurement = Reading Level + Correct Factor.

2. If peak result complies with AV limit, AV Result is deemed to comply with AV limit.

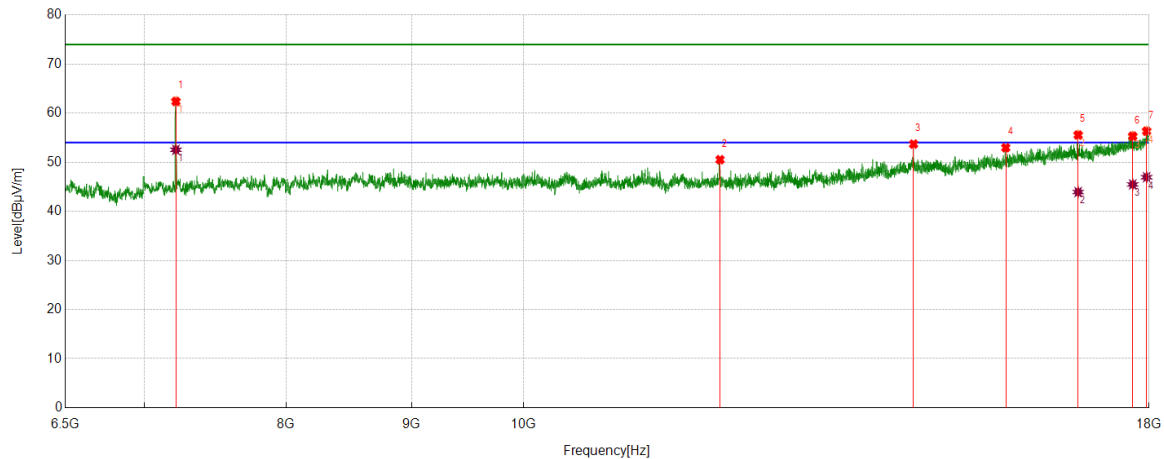
3. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.

4. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz(refer to clause 7.1.).

5. For above 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.

6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	LCH	Vertical	PASS



#### PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7213.0891	58.33	4.06	62.39	74.00	-11.61	Vertical
2	12027.8785	42.41	8.11	50.52	74.00	-23.48	Vertical
3	14427.3659	40.69	13.01	53.70	74.00	-20.30	Vertical
4	15732.7791	38.55	14.41	52.96	74.00	-21.04	Vertical
5	16839.7925	38.58	16.97	55.55	74.00	-18.45	Vertical
6	17726.8409	35.80	19.51	55.31	74.00	-18.69	Vertical
7	17959.7450	35.78	20.55	56.33	74.00	-17.67	Vertical

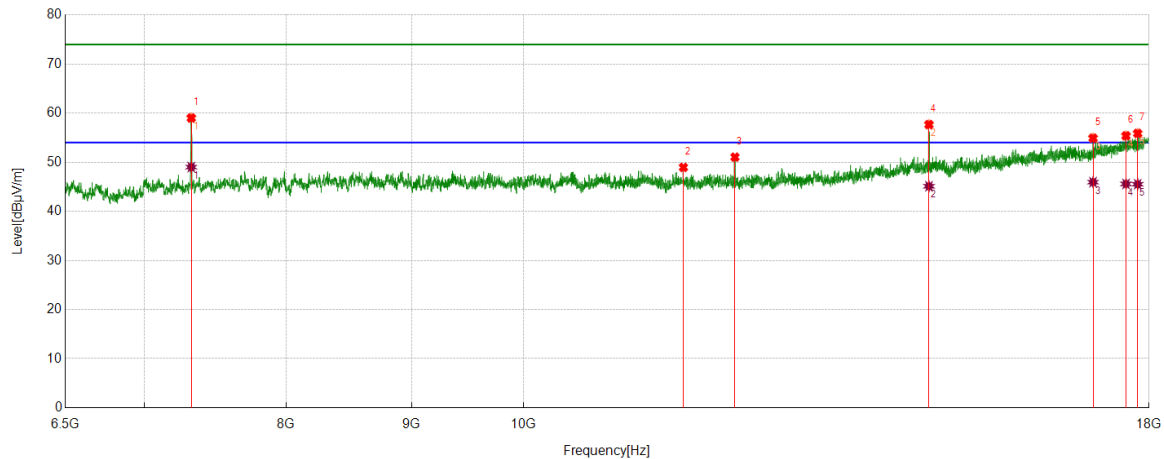
#### AV Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7213.0891	48.48	4.06	52.54	54.00	-1.46	Vertical
2	16839.7925	26.96	16.97	43.93	54.00	-10.07	Vertical
3	17726.8409	25.97	19.51	45.48	54.00	-8.52	Vertical
4	17959.7450	26.40	20.55	46.95	54.00	-7.05	Vertical

Note: 1. Measurement = Reading Level + Correct Factor.

2. If peak result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.
4. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz(refer to clause 7.1.).
5. For above 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	MCH	Horizontal	PASS



#### PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7318.0398	55.04	3.98	59.02	74.00	-14.98	Horizontal
2	11621.0151	41.27	7.68	48.95	74.00	-25.05	Horizontal
3	12197.5247	42.52	8.52	51.04	74.00	-22.96	Horizontal
4	14637.2672	45.07	12.61	57.68	74.00	-16.32	Horizontal
5	17077.0096	37.97	16.95	54.92	74.00	-19.08	Horizontal
6	17614.7018	36.54	18.85	55.39	74.00	-18.61	Horizontal
7	17808.7886	36.18	19.70	55.88	74.00	-18.12	Horizontal

#### AV Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7318.0398	45.03	3.98	49.01	54.00	-4.99	Horizontal
2	14637.2672	32.50	12.61	45.11	54.00	-8.89	Horizontal
3	17077.0096	28.99	16.95	45.94	54.00	-8.06	Horizontal
4	17614.7018	26.73	18.85	45.58	54.00	-8.42	Horizontal
5	17808.7886	25.82	19.70	45.52	54.00	-8.48	Horizontal

Note: 1. Measurement = Reading Level + Correct Factor.

2. If peak result complies with AV limit, AV Result is deemed to comply with AV limit.

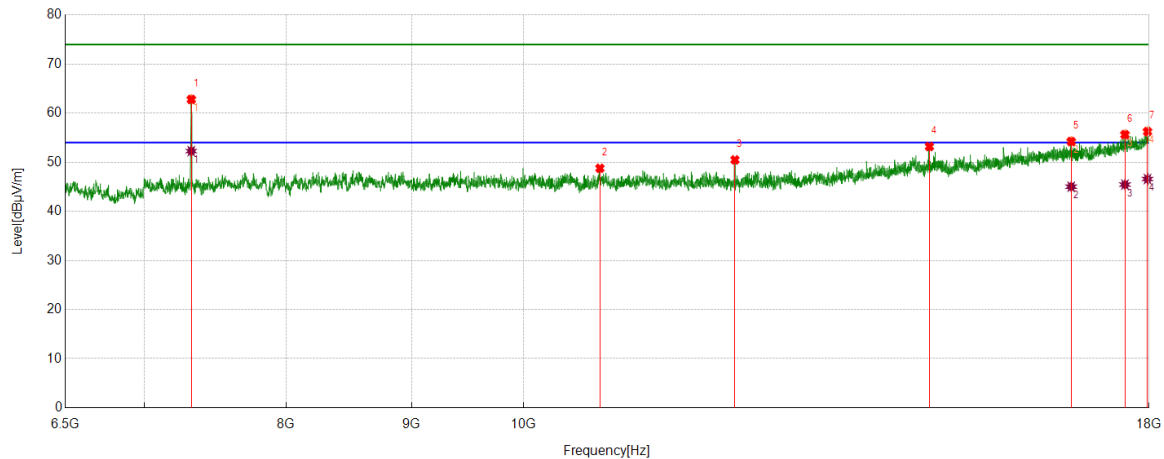
3. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.

4. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz(refer to clause 7.1.).

5. For above 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.

6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	MCH	Vertical	PASS



#### PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7318.0398	58.82	3.98	62.80	74.00	-11.20	Vertical
2	10744.0305	41.68	7.09	48.77	74.00	-25.23	Vertical
3	12197.5247	41.96	8.52	50.48	74.00	-23.52	Vertical
4	14643.0179	40.60	12.60	53.20	74.00	-20.80	Vertical
5	16730.5288	37.53	16.70	54.23	74.00	-19.77	Vertical
6	17597.4497	36.80	18.83	55.63	74.00	-18.37	Vertical
7	17974.1218	35.67	20.58	56.25	74.00	-17.75	Vertical

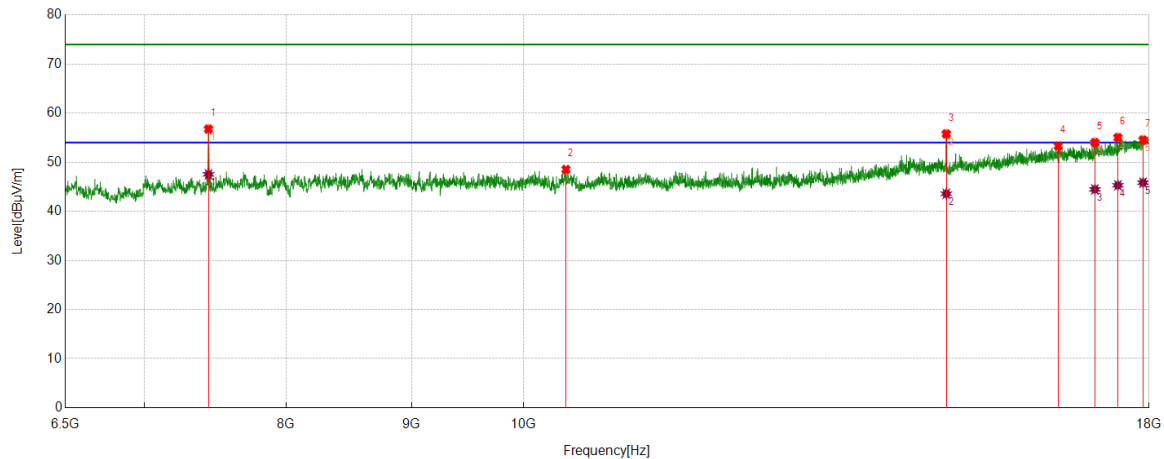
#### AV Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7318.0398	48.29	3.98	52.27	54.00	-1.73	Vertical
2	16730.5288	28.32	16.70	45.02	54.00	-8.98	Vertical
3	17597.4497	26.61	18.83	45.44	54.00	-8.56	Vertical
4	17974.1218	26.00	20.58	46.58	54.00	-7.42	Vertical

Note: 1. Measurement = Reading Level + Correct Factor.

2. If peak result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.
4. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz(refer to clause 7.1.).
5. For above 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	HCH	Horizontal	PASS



#### PK Result:

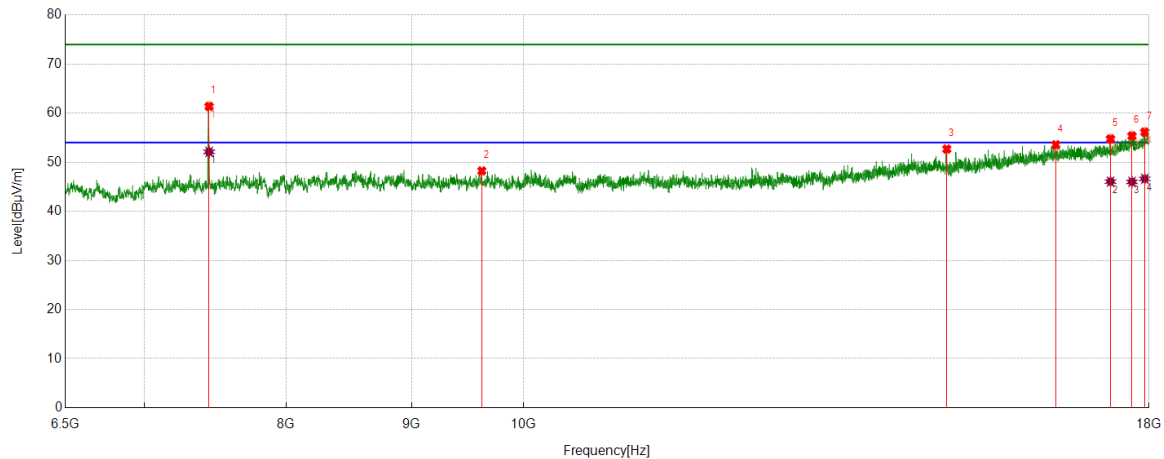
No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	7437.3672	52.54	4.21	56.75	74.00	-17.25	Horizontal
2	10406.1758	41.76	6.77	48.53	74.00	-25.47	Horizontal
3	14877.3597	43.06	12.71	55.77	74.00	-18.23	Horizontal
4	16527.8160	36.85	16.45	53.30	74.00	-20.70	Horizontal
5	17107.2009	37.01	17.00	54.01	74.00	-19.99	Horizontal
6	17480.9976	36.59	18.43	55.02	74.00	-18.98	Horizontal
7	17899.3624	34.74	19.79	54.53	74.00	-19.47	Horizontal

#### AV Result:

No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	7437.3672	43.32	4.21	47.53	54.00	-6.47	Horizontal
2	14877.3597	30.87	12.71	43.58	54.00	-10.42	Horizontal
3	17107.2009	27.47	17.00	44.47	54.00	-9.53	Horizontal
4	17480.9976	26.87	18.43	45.30	54.00	-8.70	Horizontal
5	17899.3624	26.05	19.79	45.84	54.00	-8.16	Horizontal

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If peak result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.  
4. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz(refer to clause 7.1.).  
5. For above 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	HCH	Vertical	PASS



#### PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7441.6802	57.20	4.18	61.38	74.00	-12.62	Vertical
2	9615.4519	41.85	6.38	48.23	74.00	-25.77	Vertical
3	14884.5481	39.95	12.74	52.69	74.00	-21.31	Vertical
4	16490.4363	36.88	16.68	53.56	74.00	-20.44	Vertical
5	17360.2325	36.75	18.00	54.75	74.00	-19.25	Vertical
6	17713.9017	35.96	19.41	55.37	74.00	-18.63	Vertical
7	17928.1160	35.98	20.16	56.14	74.00	-17.86	Vertical

#### AV Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	7441.6802	47.94	4.18	52.12	54.00	-1.88	Vertical
2	17360.2325	28.06	18.00	46.06	54.00	-7.94	Vertical
3	17713.9017	26.60	19.41	46.01	54.00	-7.99	Vertical
4	17928.1160	26.46	20.16	46.62	54.00	-7.38	Vertical

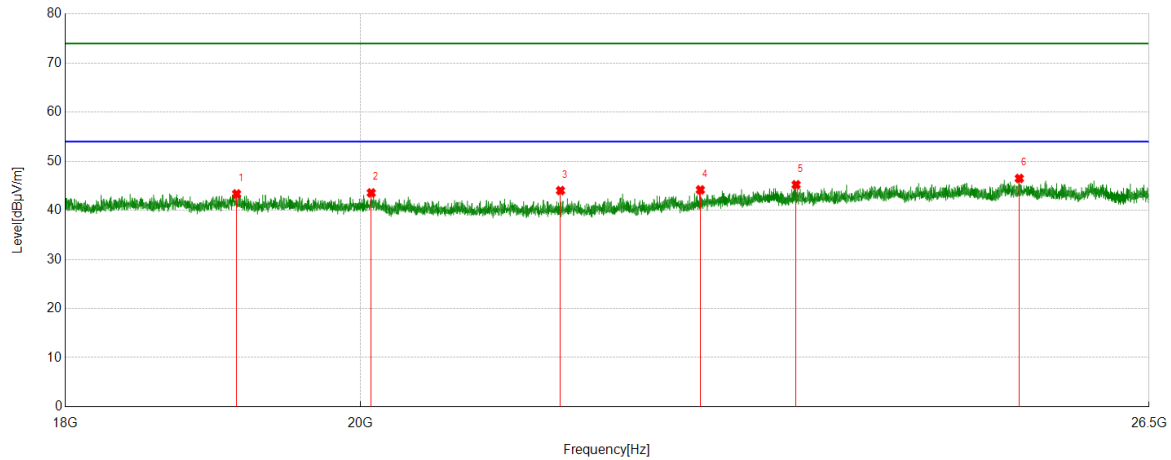
Note: 1. Measurement = Reading Level + Correct Factor.

2. If peak result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak result: Peak detector, RBW: 1 MHz, VBW: 3 MHz.
4. Average result: Peak detector, RBW: 1 MHz, VBW: 1/T MHz(refer to clause 7.1.).
5. For above 3GHz part, filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

### Part 3: 18GHz~26.5GHz

#### SPURIOUS EMISSIONS 18GHz ~ 26.5GHz (WORST-CASE CONFIGURATION)

Test Mode	Channel	Polarization	Verdict
Zigbee	MCH	Horizontal	PASS

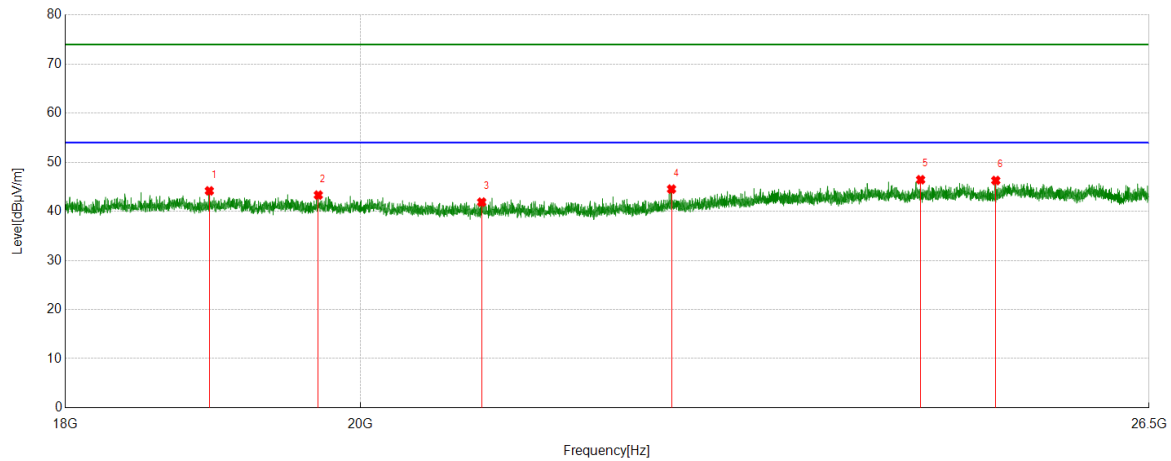


#### PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	19135.7136	49.20	-5.85	43.35	74.00	-30.65	Horizontal
2	20077.6078	48.68	-5.13	43.55	74.00	-30.45	Horizontal
3	21480.2480	49.87	-5.84	44.03	74.00	-29.97	Horizontal
4	22579.4079	48.64	-4.47	44.17	74.00	-29.83	Horizontal
5	23364.0364	48.47	-3.26	45.21	74.00	-28.79	Horizontal
6	25301.3801	49.81	-3.32	46.49	74.00	-27.51	Horizontal

- Note: 1. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.  
3. Measurement = Reading Level + Correct Factor.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Test Mode	Channel	Polarization	Verdict
Zigbee	MCH	Vertical	PASS



PK Result:

No.	Frequency [MHz]	Reading Level [dBuV/m]	Correct Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
1	18950.3950	50.29	-6.12	44.17	74.00	-29.83	Vertical
2	19701.8702	48.71	-5.40	43.31	74.00	-30.69	Vertical
3	20884.3384	47.82	-5.95	41.87	74.00	-32.13	Vertical
4	22348.1848	49.58	-5.05	44.53	74.00	-29.47	Vertical
5	24425.7926	49.38	-2.94	46.44	74.00	-27.56	Vertical
6	25089.7090	49.80	-3.52	46.28	74.00	-27.72	Vertical

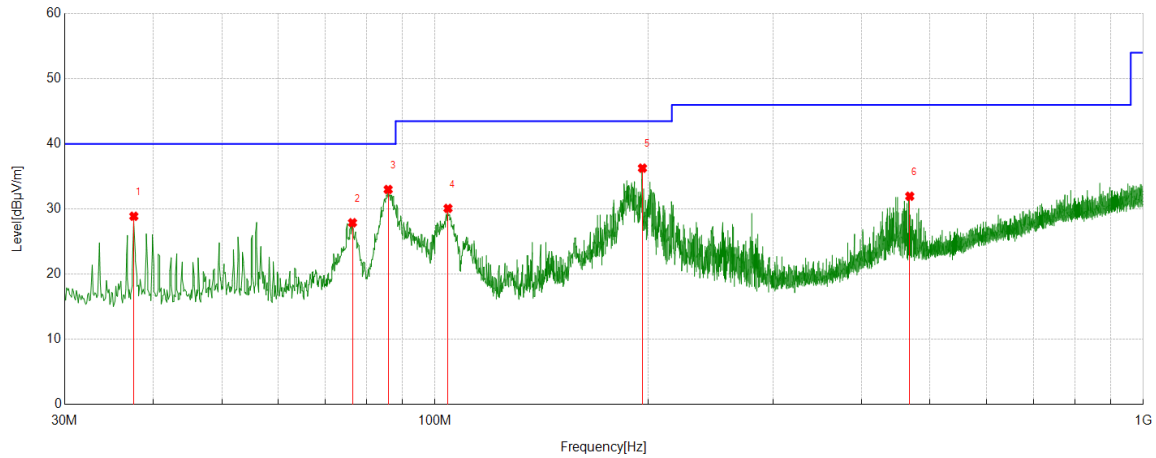
- Note: 1. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.  
3. Measurement = Reading Level + Correct Factor.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



#### Part 4: 30MHz~1GHz

##### SPURIOUS EMISSIONS 30MHz ~ 1GHz (WORST-CASE CONFIGURATION)

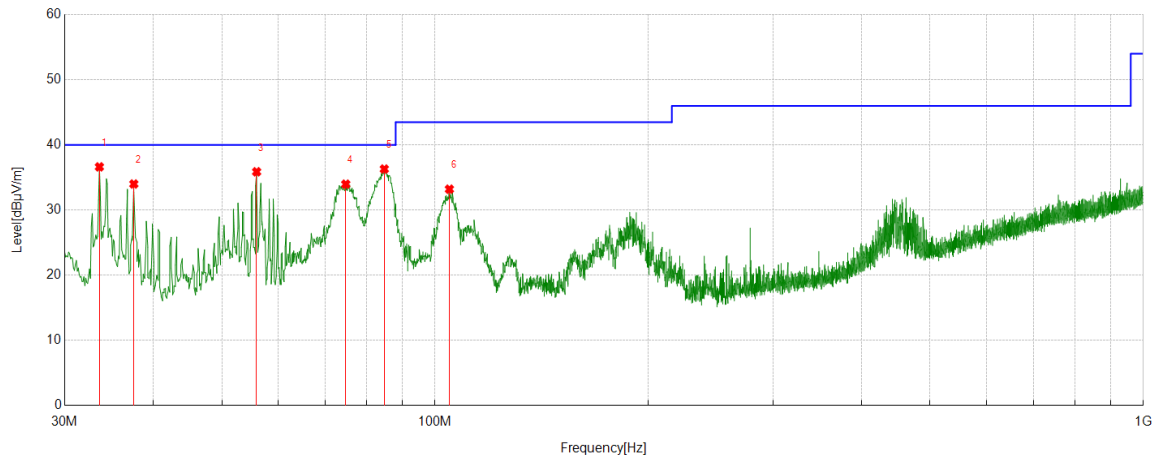
Test Mode	Channel	Polarization	Verdict
Zigbee	MCH	Horizontal	PASS



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	37.5668	9.67	19.22	28.89	40.00	-11.11	Peak
2	76.4676	11.40	16.49	27.89	40.00	-12.11	Peak
3	85.8776	18.67	14.33	33.00	40.00	-7.00	Peak
4	104.3094	13.80	16.30	30.10	43.50	-13.40	Peak
5	196.2746	19.00	17.28	36.28	43.50	-7.22	Peak
6	467.9988	6.61	25.35	31.96	46.00	-14.04	Peak

Note: 1. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.  
2. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.  
3. Measurement = Reading Level + Correct Factor.

Test Mode	Channel	Polarization	Verdict
Zigbee	MCH	Vertical	PASS

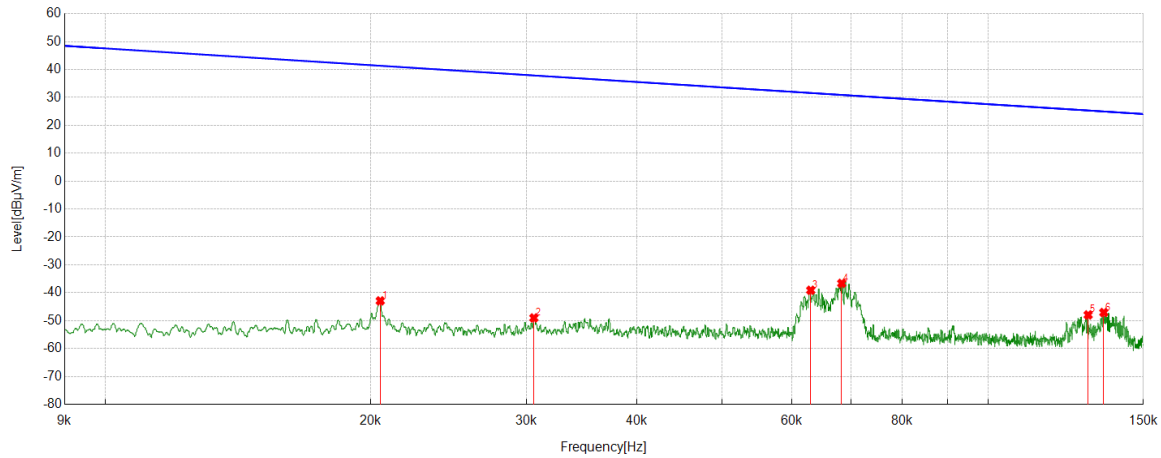


No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
1	33.5894	17.82	18.81	36.63	40.00	-3.37	Peak
2	37.5668	14.78	19.22	34.00	40.00	-6.00	Peak
3	55.9986	15.52	20.36	35.88	40.00	-4.12	Peak
4	74.8185	17.15	16.82	33.97	40.00	-6.03	Peak
5	84.8105	21.85	14.45	36.30	40.00	-3.70	Peak
6	104.7945	16.80	16.40	33.20	43.50	-10.30	Peak

Note: 1. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.  
2. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.  
3. Measurement = Reading Level + Correct Factor.

**Part 5: 9kHz~30MHz**
**SPURIOUS EMISSIONS 9kHz ~ 30MHz (WORST CASE CONFIGURATION-FACE ON)**

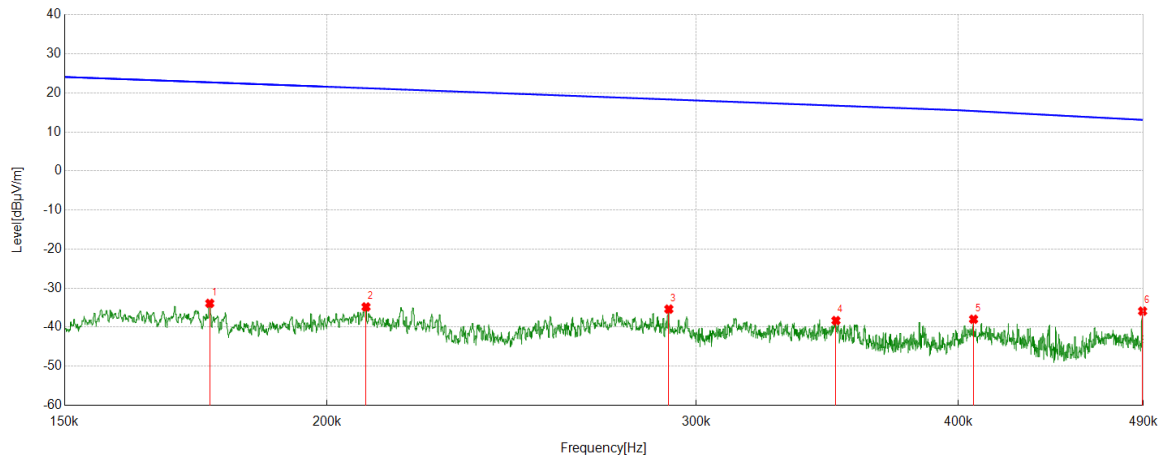
Test Mode	Channel	Frequency Range	Verdict
Zigbee	MCH	9kHz~150kHz	PASS



No.	Frequency	Reading Level	Correct Factor	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dBuA/m]	[dBuA/m]	[dB]	
1	0.0205	18.81	-61.74	-42.93	41.38	-94.43	-10.12	-84.31	Peak
2	0.0306	12.55	-61.60	-49.05	37.87	-100.55	-13.63	-86.92	Peak
3	0.0630	22.48	-61.61	-39.13	31.61	-90.63	-19.89	-70.74	Peak
4	0.0683	24.96	-61.61	-36.65	30.92	-88.15	-20.58	-67.57	Peak
5	0.1299	13.75	-61.72	-47.97	25.34	-99.47	-26.16	-73.31	Peak
6	0.1353	14.62	-61.73	-47.11	24.98	-98.61	-26.52	-72.09	Peak

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.  
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

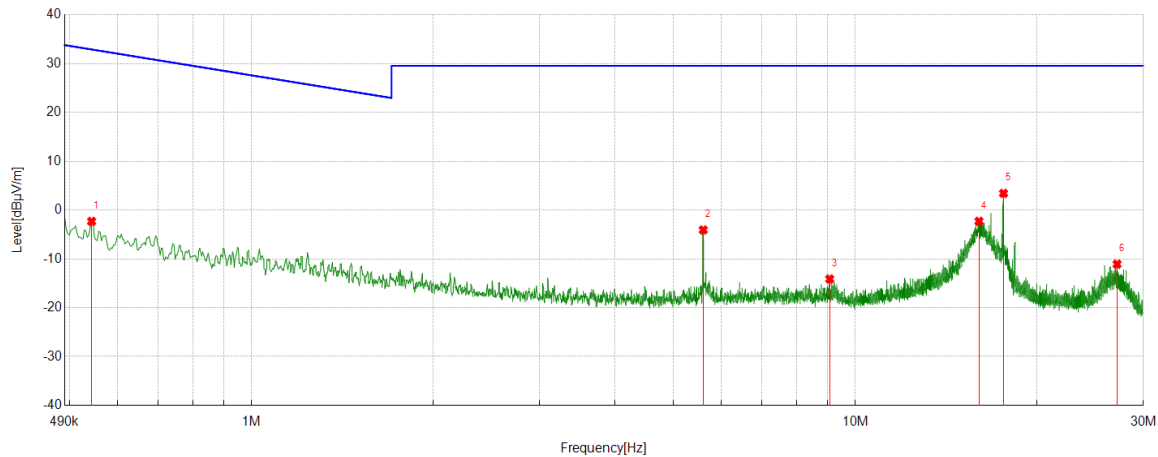
Test Mode	Channel	Frequency Range	Verdict
Zigbee	MCH	150kHz~490kHz	PASS



No.	Frequency	Reading Level	Correct Factor	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dBuA/m]	[dBuA/m]	[dB]	
1	0.1759	27.86	-61.76	-33.90	22.70	-85.40	-28.80	-56.60	Peak
2	0.2088	26.96	-61.77	-34.81	21.21	-86.31	-30.29	-56.02	Peak
3	0.2911	26.44	-61.82	-35.38	18.32	-86.88	-33.18	-53.70	Peak
4	0.3497	23.52	-61.83	-38.31	16.73	-89.81	-34.77	-55.04	Peak
5	0.4067	23.87	-61.84	-37.97	15.36	-89.47	-36.14	-53.33	Peak
6	0.4896	25.98	-61.88	-35.90	13.09	-87.40	-38.41	-48.99	Peak

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.  
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

Test Mode	Channel	Frequency Range	Verdict
Zigbee	MCH	490kHz~30MHz	PASS



No.	Frequency	Reading Level	Correct Factor	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	[MHz]	[dBuV/m]	[dB]	[dBuV/m]	[dBuV/m]	[dBuA/m]	[dBuA/m]	[dB]	
1	0.5431	19.57	-21.89	-2.32	32.91	-53.82	-18.59	-35.23	Peak
2	5.5987	17.75	-21.83	-4.08	29.54	-55.58	-21.96	-33.62	Peak
3	9.0694	7.54	-21.67	-14.13	29.54	-65.63	-21.96	-43.67	Peak
4	16.0286	19.23	-21.54	-2.31	29.54	-53.81	-21.96	-31.85	Peak
5	17.5987	24.92	-21.51	3.41	29.54	-48.09	-21.96	-26.13	Peak
6	27.1431	10.57	-21.66	-11.09	29.54	-62.59	-21.96	-40.63	Peak

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.  
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

## 9. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

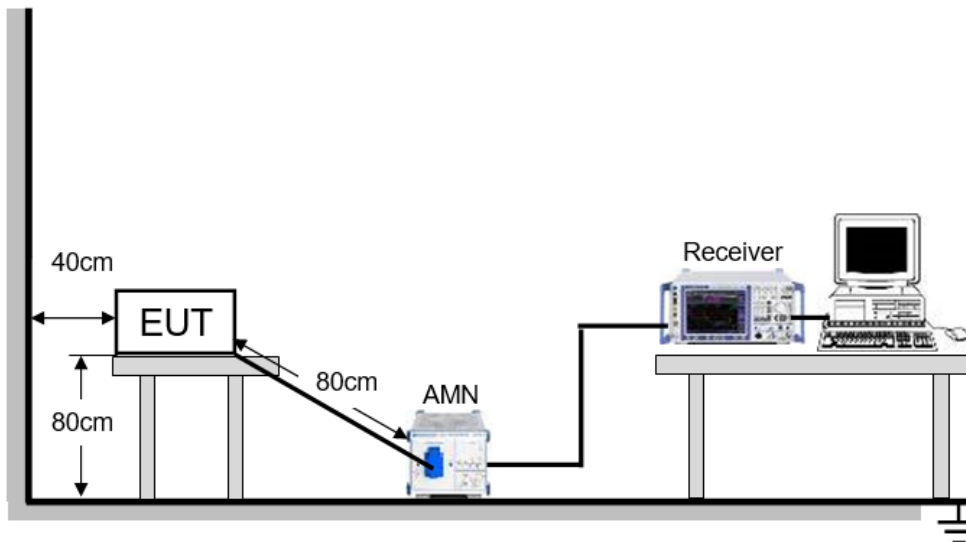
Please refer to FCC §15.207 (a)

FREQUENCY (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

### TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

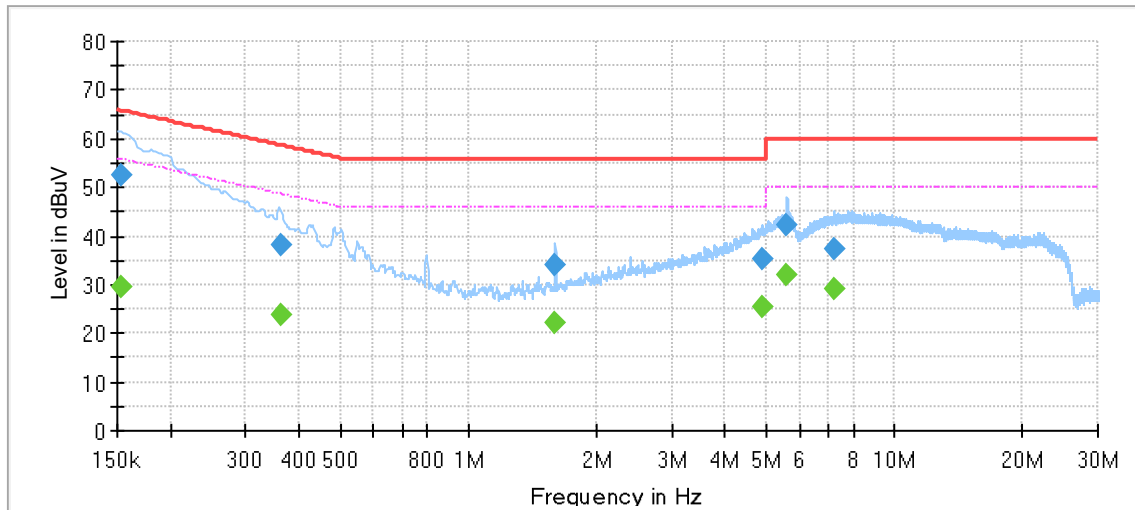
### TEST SETUP AND PROCEDURE



The EUT is put on a table of non-conducting material that is 12 mm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

### LINE L RESULTS (WORST-CASE CONFIGURATION)

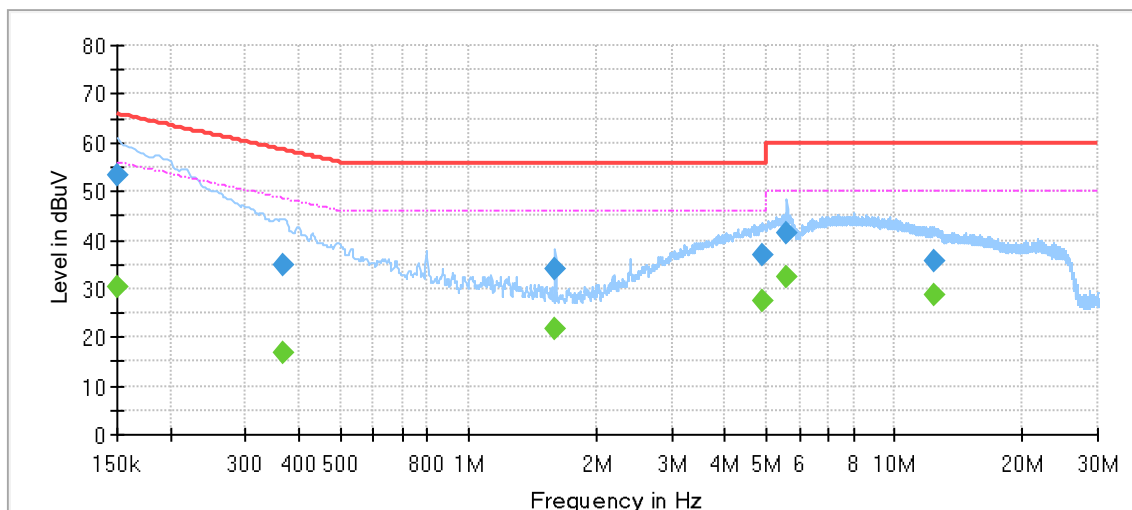


### Final Result

Frequency [MHz]	QuasiPeak [dBμV]	Average [dBμV]	Limit [dBμV]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Line	Filter	Corr. [dB]
0.152488	---	29.74	55.86	26.13	1500.0	9.000	L1	OFF	9.6
0.152488	52.59	---	65.86	13.27	1500.0	9.000	L1	OFF	9.6
0.363925	---	23.77	48.64	24.87	1500.0	9.000	L1	OFF	9.6
0.363925	38.19	---	58.64	20.45	1500.0	9.000	L1	OFF	9.6
1.597725	---	22.12	46.00	23.88	1500.0	9.000	L1	OFF	9.6
1.597725	34.02	---	56.00	21.98	1500.0	9.000	L1	OFF	9.6
4.876250	---	25.52	46.00	20.48	1500.0	9.000	L1	OFF	9.7
4.876250	35.13	---	56.00	20.87	1500.0	9.000	L1	OFF	9.7
5.600113	---	32.01	50.00	17.99	1500.0	9.000	L1	OFF	9.7
5.600113	42.42	---	60.00	17.58	1500.0	9.000	L1	OFF	9.7
7.202063	---	29.21	50.00	20.79	1500.0	9.000	L1	OFF	9.7
7.202063	37.45	---	60.00	22.55	1500.0	9.000	L1	OFF	9.7

- Note: 1. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
2. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
3. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.  
4. The extension cord/outlet strip was calibrated with the LISN as required by ANSI C63.10:2013 Clause 6.2.2.  
5. Pre-testing all test modes and channels and find the MCH of Zigbee which is the worst case, so only the worst case is included in this test report.

### LINE N RESULTS (WORST-CASE CONFIGURATION)



### Final Result

Frequency [MHz]	QuasiPeak [dBμV]	Average [dBμV]	Limit [dBμV]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Line	Filter	Corr. [dB]
0.150000	---	30.26	56.00	25.74	1500.0	9.000	N	OFF	9.5
0.150000	53.27	---	66.00	12.73	1500.0	9.000	N	OFF	9.5
0.368900	---	16.79	48.53	31.73	1500.0	9.000	N	OFF	9.6
0.368900	34.96	---	58.53	23.57	1500.0	9.000	N	OFF	9.6
1.597725	---	21.63	46.00	24.37	1500.0	9.000	N	OFF	9.6
1.597725	34.07	---	56.00	21.93	1500.0	9.000	N	OFF	9.6
4.898638	---	27.52	46.00	18.48	1500.0	9.000	N	OFF	9.6
4.898638	37.08	---	56.00	18.92	1500.0	9.000	N	OFF	9.6
5.600113	---	32.29	50.00	17.71	1500.0	9.000	N	OFF	9.7
5.600113	41.62	---	60.00	18.38	1500.0	9.000	N	OFF	9.7
12.408400	---	28.85	50.00	21.15	1500.0	9.000	N	OFF	9.8
12.408400	35.84	---	60.00	24.16	1500.0	9.000	N	OFF	9.8

- Note: 1. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
2. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
3. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.  
4. The extension cord/outlet strip was calibrated with the LISN as required by ANSI C63.10:2013 Clause 6.2.2.  
5. Pre-testing all test modes and channels and find the HCH of Zigbee which is the worst case, so only the worst case is included in this test report.



## 10. ANTENNA REQUIREMENTS

### APPLICABLE REQUIREMENTS

Please refer to FCC §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. 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.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### ANTENNA GAIN

The antenna gain of EUT is less than 6 dBi

**END OF REPORT**