



FCC RADIO TEST REPORT

FCC ID : G954331X
Equipment Name : DOCSIS Cable Gateway
Trade Name : Technicolor
Model Number : CGM4331COM
Applicant / Manufacturer : Technicolor Connected Home USA LLC
5030 Sugarloaf Parkway, Building 6, Lawrenceville
Georgia, United States, 30044
Standard : 47 CFR FCC Part 15.247

The product was received on Jun. 26, 2019, and testing was started from Jun. 26, 2019 and completed on Jul. 26, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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TEL : 886-3-656-9065
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Report Template No.: CB Ver1.0



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Cindy Peng



1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std.	Ch. Frequency (MHz)	Channel Number
2400-2483.5	802.15.4	2405-2475	11-25 [15]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	Zigbee	5	1TX

Note:

- ♦ Zigbee uses a O-QPSK (250kbps) modulation.
- ♦ BWch is the nominal channel bandwidth.
- ♦ Nss-Min is the minimum number of spatial streams.
- ♦ Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	-	-	-	-	5.48
2	2	-	-	-	-	5.48

Note 1: The above information was declared by manufacturer.

Note 2: The EUT has two antennas for Zigbee use.

For Zigbee (1TX/1RX) :

The EUT supports the antenna with TX and RX diversity functions.

Both Port 1 and Port 2 support transmit and receive functions, but only one of them will be used at one time.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
Zigbee	1	0	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)

Note:

- ♦ DC is Duty Cycle.
- ♦ DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From power adapter		
Function	☒ Point-to-multipoint	☐ Point-to-point	
Test Software Version	Telnet		

Note: The above information was declared by manufacturer.



1.2 Applicable Standards

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

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013
- ♦ FCC KDB 558074 D01 v05r02

1.3 Testing Location Information

Testing Location				
☐	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	TEL : 886-3-327-3456	FAX : 886-3-327-0973
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.	TEL : 886-3-656-9065	FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH02-CB	Owen Hsu	21~23°C / 52~54%	Jul. 02, 2019
Radiated below 1GHz	03CH05-CB	Cola Fan	26~27.3°C / 62~66%	Jul. 25, 2019
Radiated above 1GHz	03CH06-CB	Mason Chen	21~25°C / 56~60%	Jun. 26, 2019~Jun. 27, 2019
AC Conduction	CO01-CB	Max Lin	24.1~24.6°C / 58~59%	Jul. 26, 2019

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Mode

For Port 1:

Mode	Power Setting
Zigbee	-
2405MHz	3
2440MHz	3
2475MHz	3

For Port 2:

Mode	Power Setting
Zigbee	-
2405MHz	3
2440MHz	3
2475MHz	3

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	Normal Link
1	EUT + Adapter 1
2	EUT + Adapter 2

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains
Operating Mode	
1	Port 1
2	Port 2

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	Normal Link
1	EUT + Adapter 1
2	EUT + Adapter 2
Operating Mode > 1GHz	CTX
Operating Mode	
1	Port 1
2	Port 2



The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + WLAN 5GHz
2	WLAN 5GHz + Zigbee + Bluetooth
Refer to Sporton Test Report No.: FA971031 for Co-location RF Exposure Evaluation.	

Note: The EUT can only be used at Y axis position.

2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

Accessories				
No.	Equipment Name	Brand Name	Model Name	Rating
1	Adapter 1	AcBel	ADK002	INPUT: 100-120V ~50/60Hz, 1.5A, OUTPUT: 12V, 4.6A
2	Adapter 2	Netbit	NBC56A120460VU	INPUT: 100-120V ~50/60Hz, 1.5A, OUTPUT: 12V, 4.6A



2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	LAN NB	DELL	E6430	N/A
B	2.4G NB	DELL	E6430	N/A
C	5G NB	DELL	E6430	N/A
D	Phone1	SAMPO	HT-B 907WL	N/A
E	Phone2	SAMPO	HT-B 907WL	N/A
F	Terminal system	HUAWEI	SmartAX ma5633	N/A
G	Server	HUAWEI	ETP48200-C5A3	N/A
H	Terminal system NB	DELL	INSPIRON 3576	N/A
I	2.5G PC	DELL	T3400	N/A
J	SPLITTER	N/A	N/A	N/A
K	MoCA	Standalone	B2140	N/A
L	MoCA NB	DELL	E6430	N/A

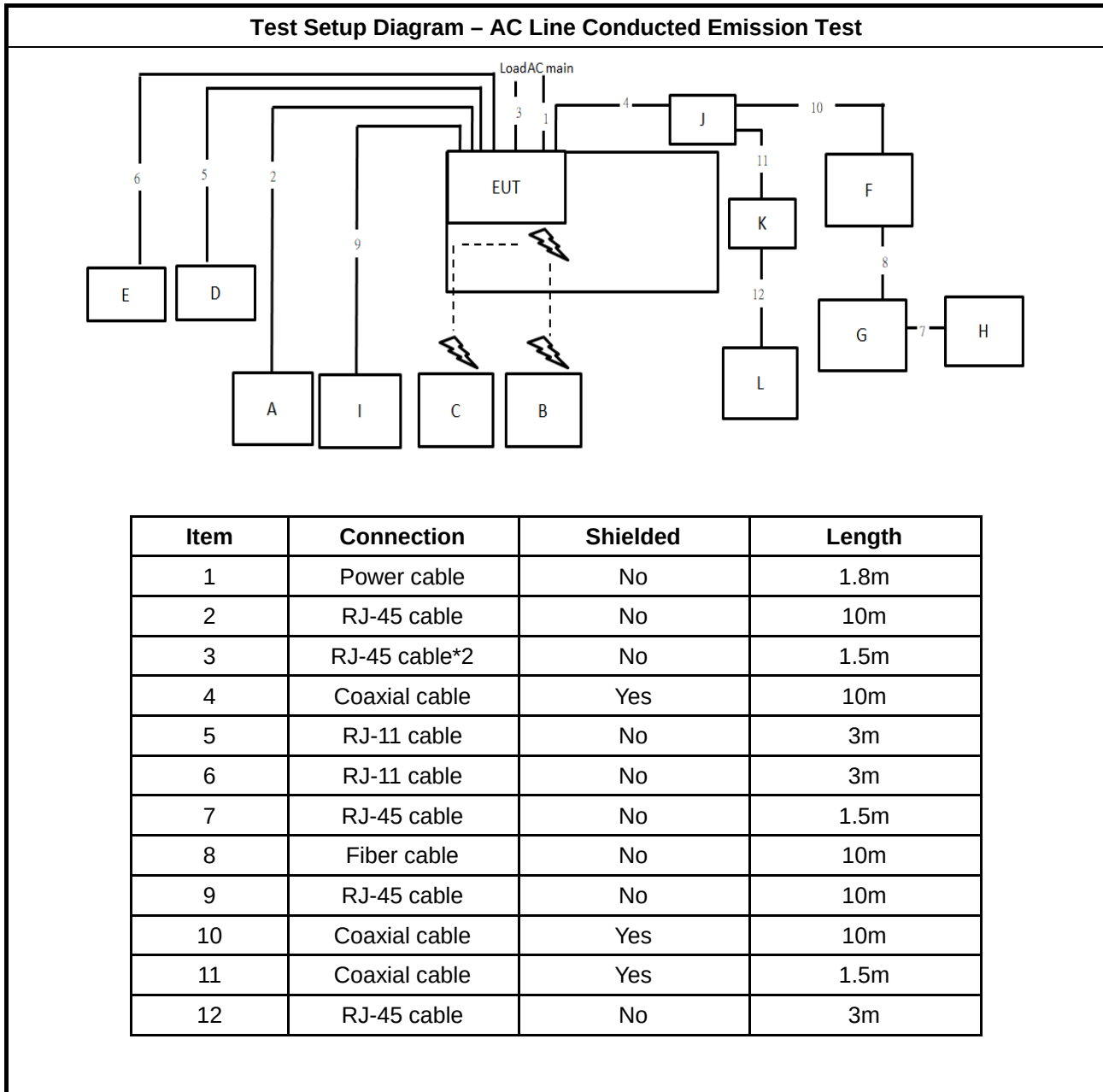
For Radiated (below 1GHz):

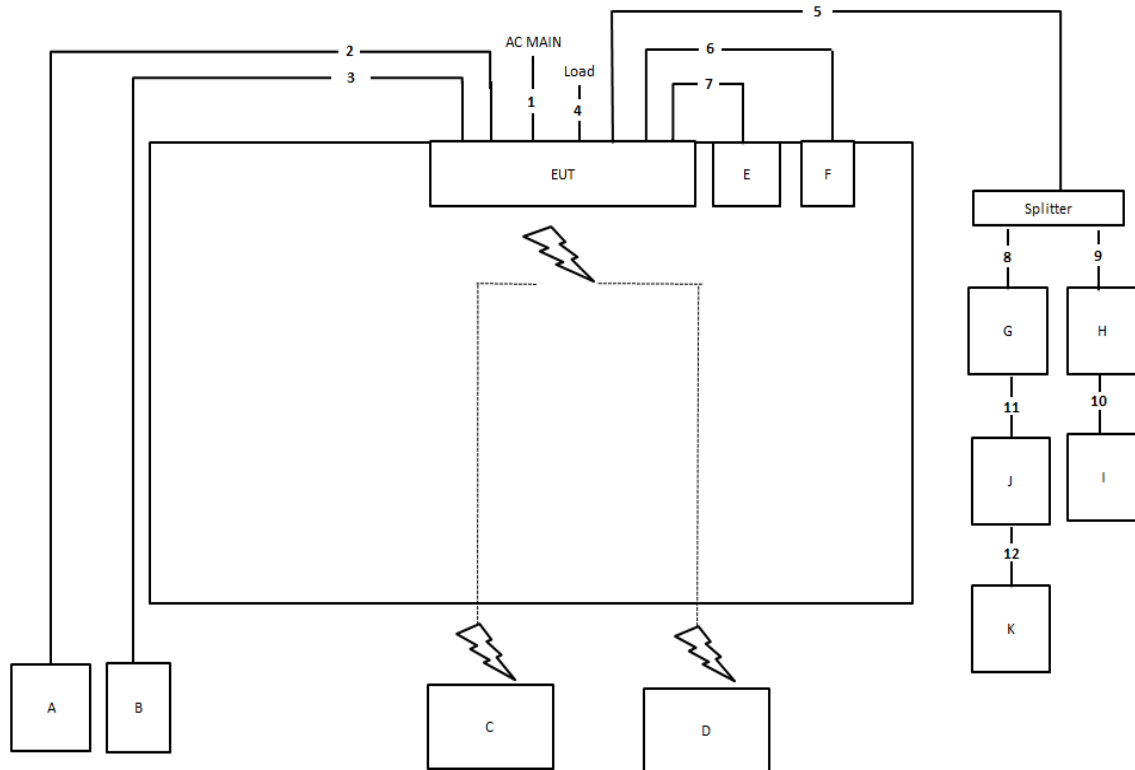
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A
B	NB	DELL	E4300	N/A
C	NB	DELL	E4300	N/A
D	NB	DELL	E4300	N/A
E	Phone	PHILIPS	M20	N/A
F	Phone	H-T-T	F-689	N/A
G	Terminal system	HUAWEI	SmartAX MA5633	N/A
H	MoCA	Standalone	B2140	N/A
I	NB	DELL	E4300	N/A
J	Server	HUAWEI	ETP48200-C5A3	N/A
K	NB	DELL	Inspiron 15	N/A

For Radiated (above 1GHz) and RF Conducted:

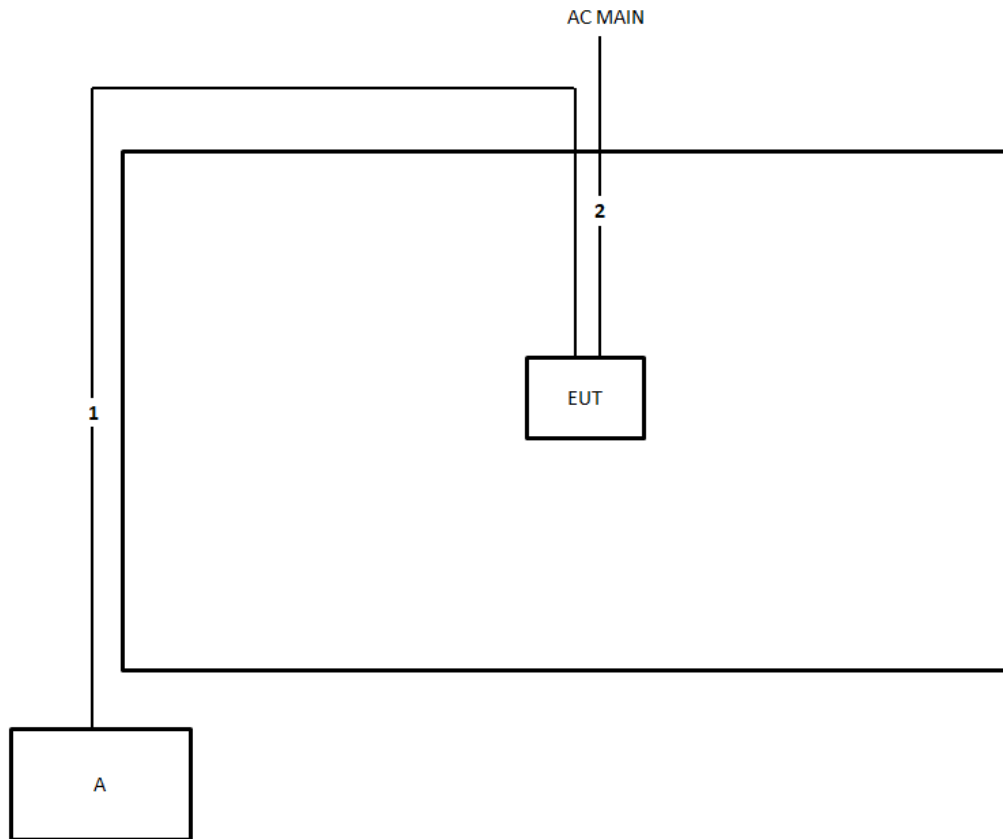
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A

2.6 Test Setup Diagram



Test Setup Diagram - Radiated Test < 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	1.5m
5	Coaxial cable	Yes	10m
6	RJ-11 cable	No	1.5m
7	RJ-11 cable	No	1.5m
8	Coaxial cable	Yes	1.5m
9	Coaxial cable	Yes	1.5m
10	RJ-45 cable	No	1.5m
11	Fiber cable	No	10m
12	RJ-45 cable	No	1.5m

Test Setup Diagram - Radiated Test > 1GHz


Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	1.8m



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

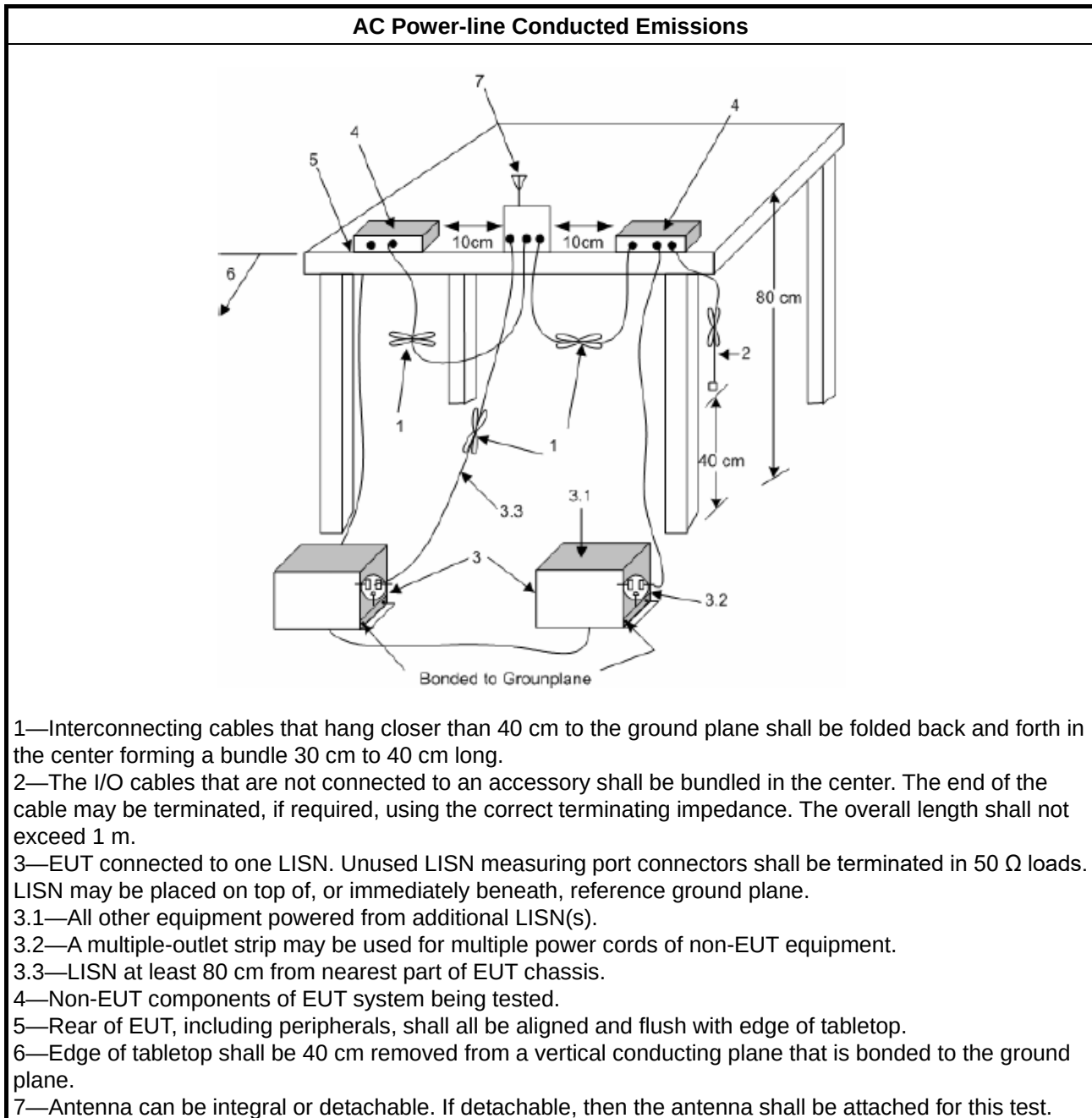
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit	
Systems using digital modulation techniques:	
▪	6 dB bandwidth $\geq$ 500 kHz.

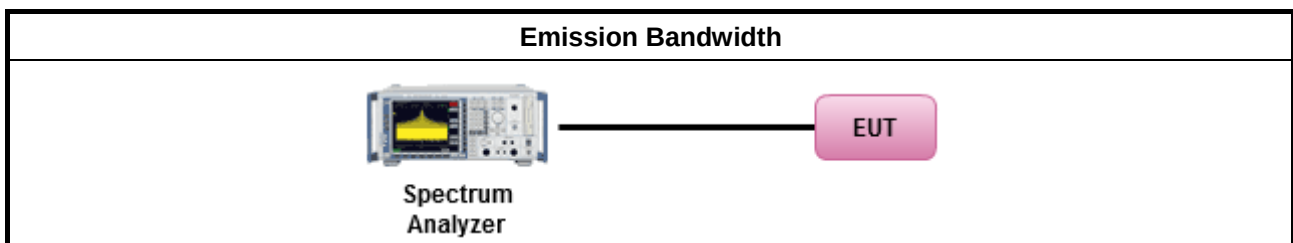
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
▪	For the emission bandwidth shall be measured using one of the options below:
☒	Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
☐	Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B



3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	▪ Smart antenna system (SAS):
	- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

3.3.2 Measuring Instruments

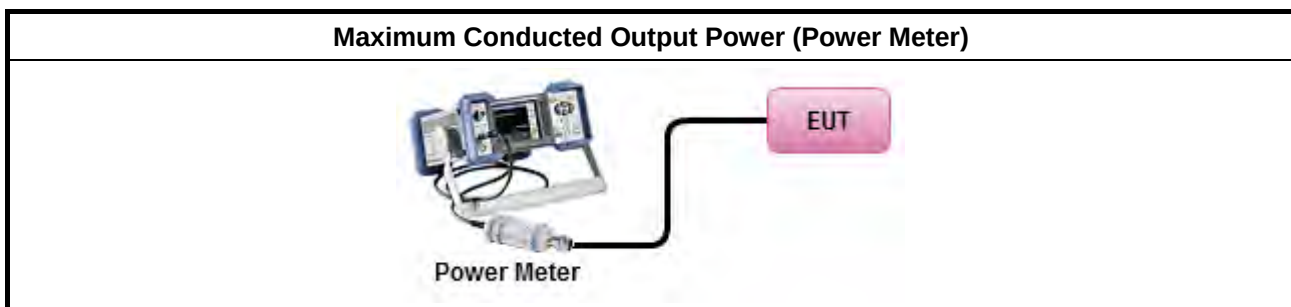
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
☐	Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW $\geq$ EBW method).
☐	Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
▪ Maximum Conducted Output Power	
[duty cycle $\geq$ 98% or external video / power trigger]	
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
duty cycle < 98% and average over on/off periods with duty factor	
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
Measurement using a power meter (PM)	
☒	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
☐	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).

For conducted measurement.	
	If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	If multiple transmit chains, EIRP calculation could be following as methods: $P_{\text{total}} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $\text{EIRP}_{\text{total}} = P_{\text{total}} + \text{DG}$

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C



3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
▪ Power Spectral Density (PSD) ≤ 8 dBm/3kHz

3.4.2 Measuring Instruments

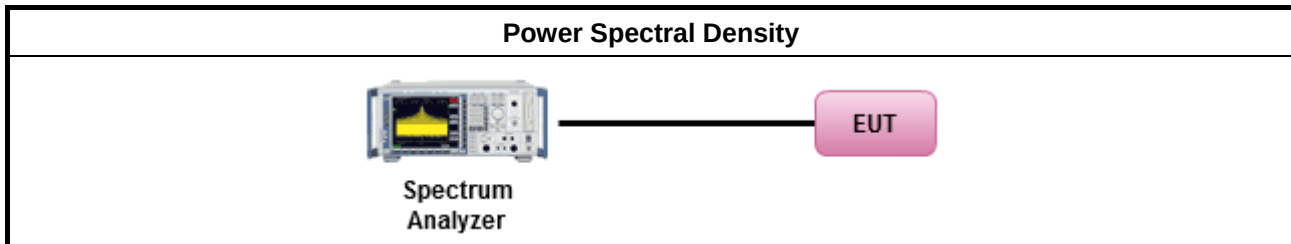
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
☒ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD. [duty cycle $\geq 98\%$ or external video / power trigger]
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPS-1.
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPS-2.
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPS-3.
duty cycle $< 98\%$ and average over on/off periods with duty factor
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPS-1A. (alternative).
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPS-2A. (alternative)
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPS-3A. (alternative)
▪ For conducted measurement.
▪ If The EUT supports multiple transmit chains using options given below:
☒ Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,

- ☐ Option 3: Measure and add $10 \log(N)$ dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with $10 \log(N)$. Or each transmit chains shall be add $10 \log(N)$ to compared with the limit.

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dBc)
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.	

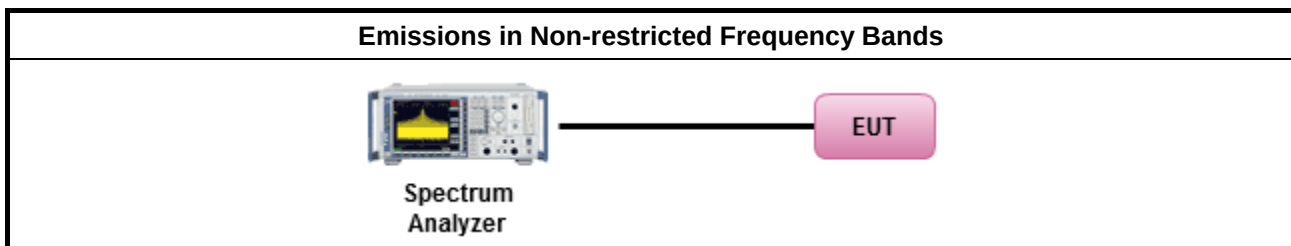
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted bands.

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E



3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. 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 of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more 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). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

3.6.2 Measuring Instruments

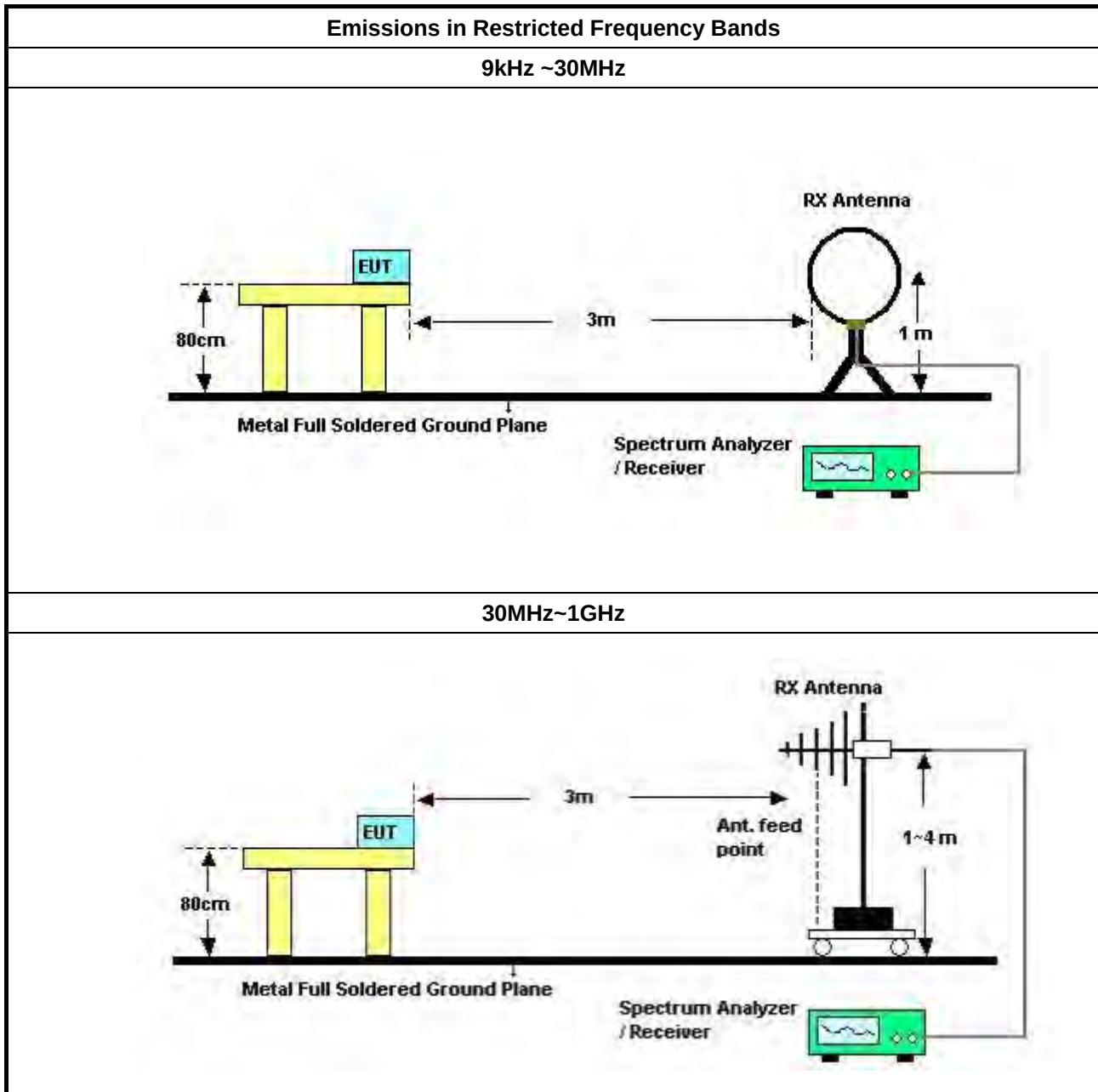
Refer a test equipment and calibration data table in this test report.

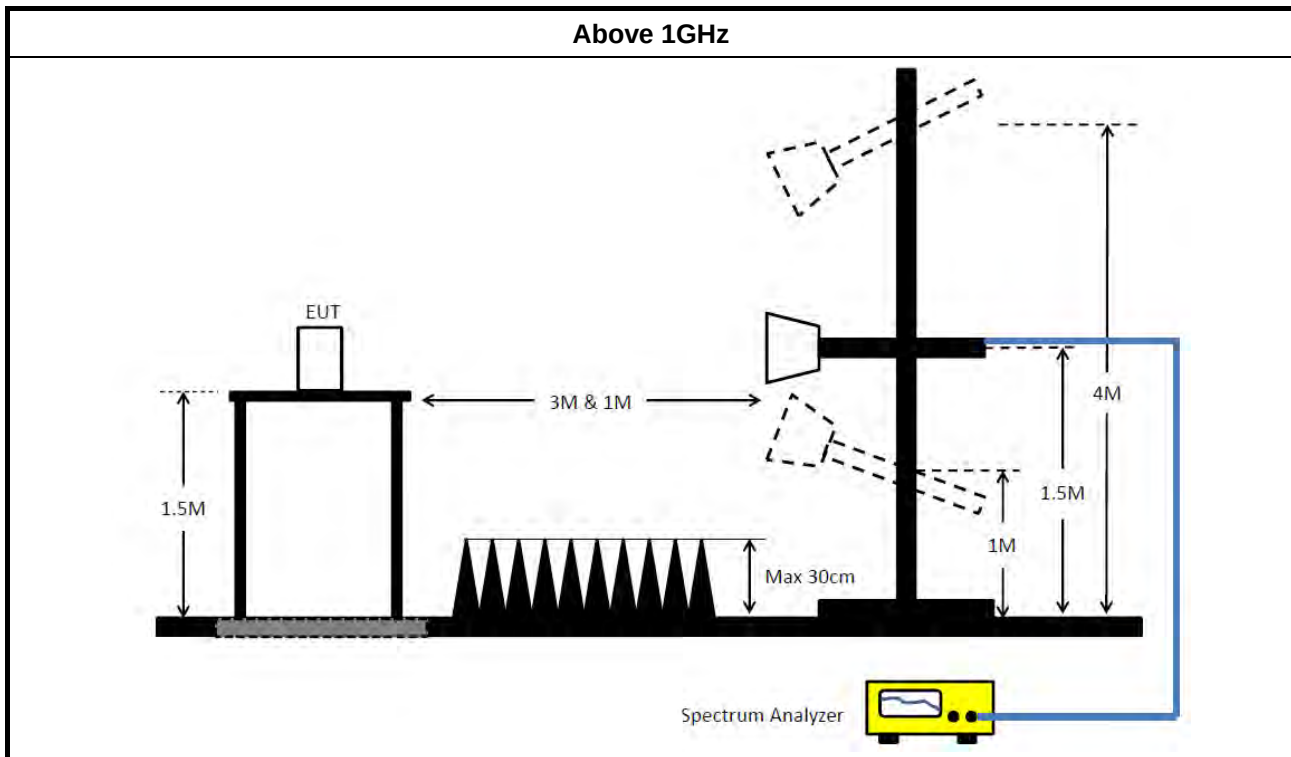


3.6.3 Test Procedures

Test Method	
The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.
☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle $\geq 98\%$).
☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW $\geq 1/T$).
☐	Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time.
☐	Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
For the transmitter band-edge emissions shall be measured using following options below:	
	Refer as FCC KDB 558074 clause 8.7 & c63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
	Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
	For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

3.6.4 Test Setup





3.6.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F



4 Test Equipment and Calibration Data

For AC Conduction:

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 29, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 24, 2018	Dec. 23, 2019	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)

For Radiated (below 1GHz):

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESE & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH05-CB)

**For Radiated (above 1GHz):**

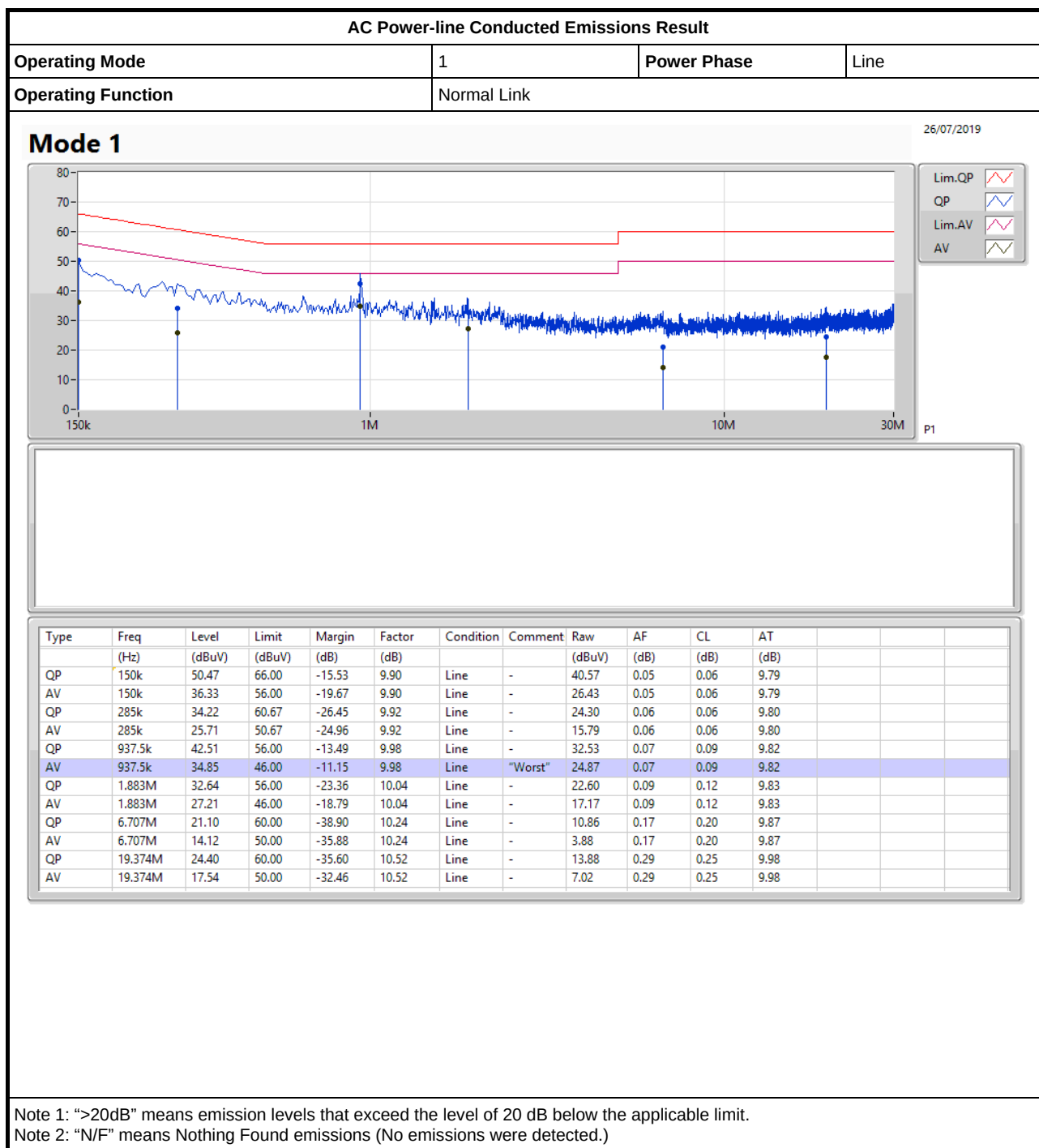
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1292	1GHz~18GHz	Jul. 20, 2018	Jul. 19, 2019	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 08, 2019	May 07, 2020	Radiation (03CH06-CB)
Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 03, 2018	Oct. 02, 2019	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUHNER	RG402	High Cable-05	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUHNER	RG402	High Cable-05+24	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH06-CB)

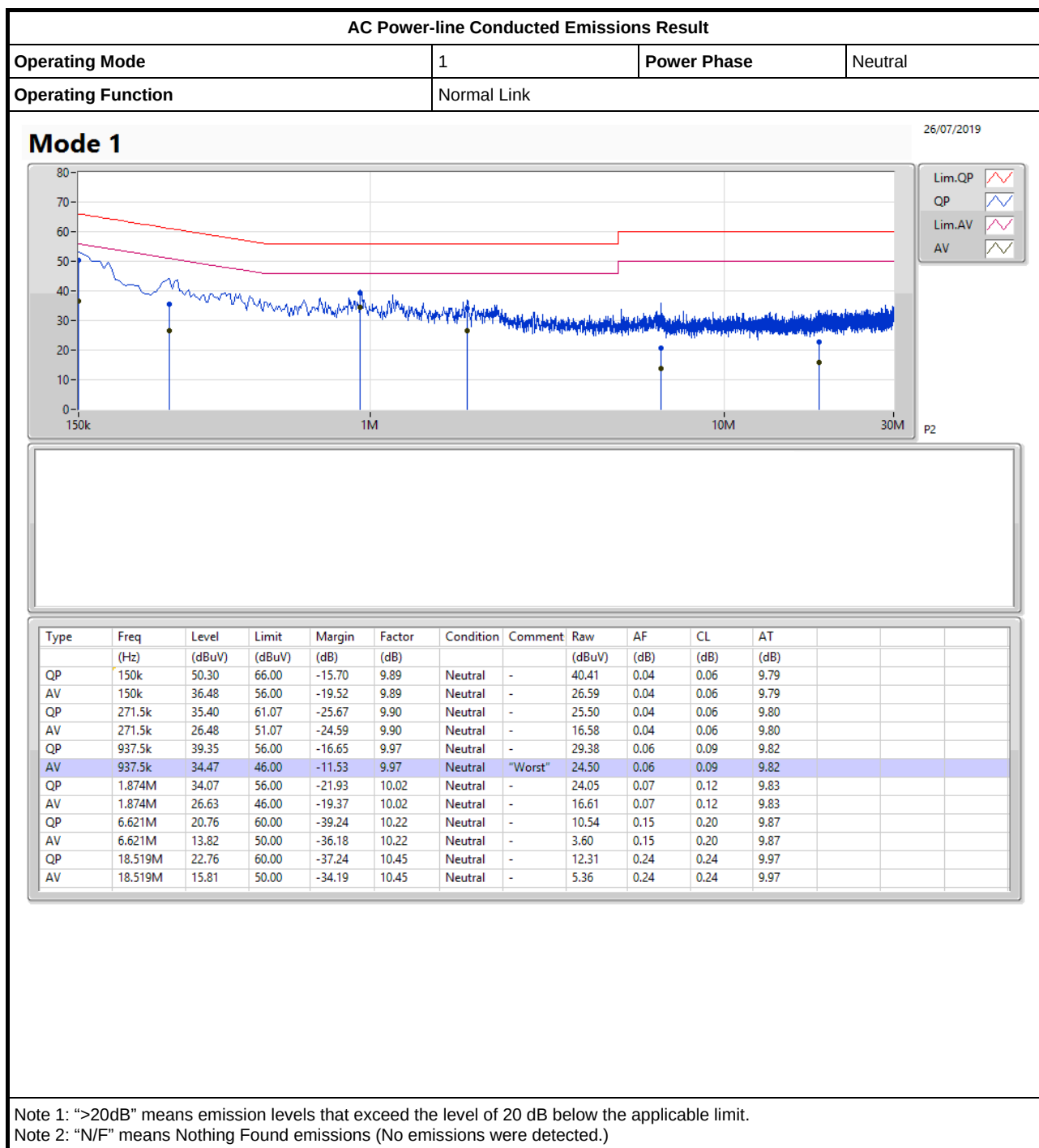
For RF Conducted:

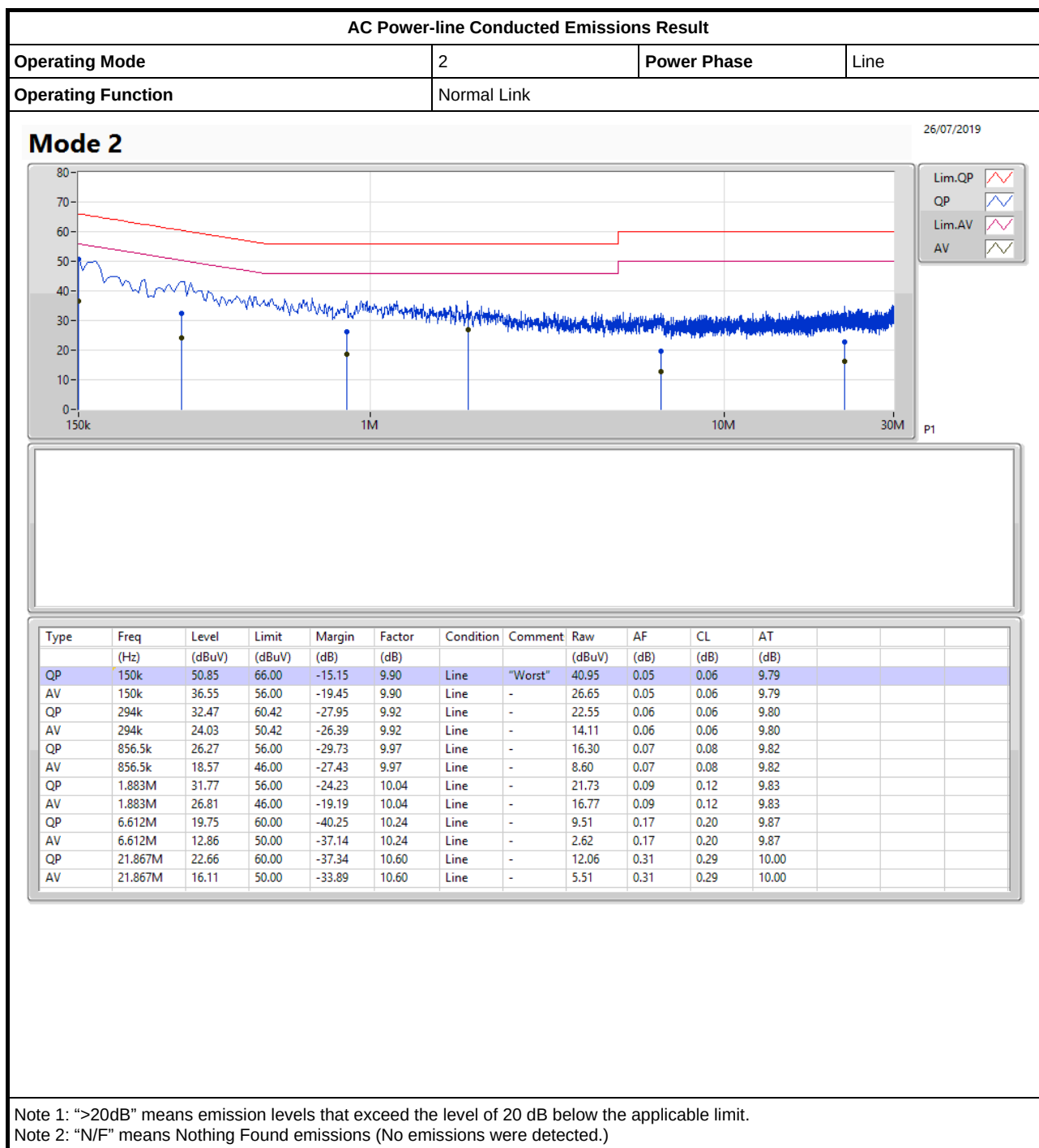
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 03, 2018	Sep. 02, 2019	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 03, 2018	Sep. 02, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-3	1 GHz ~ 26.5 GHz	Oct. 24, 2018	Oct. 23, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)

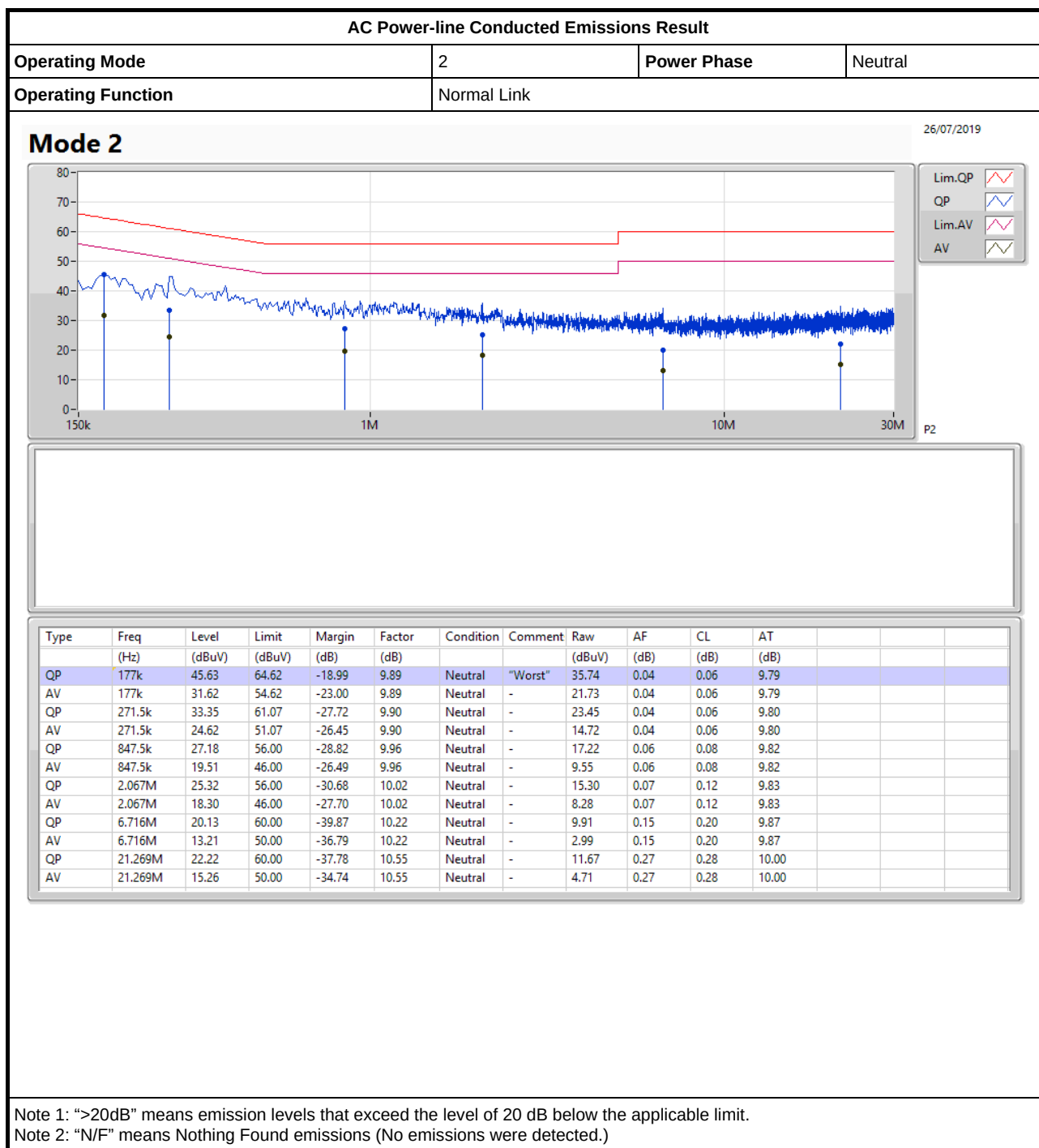
Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.









**Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Zigbee	1.675M	2.243M	2M24G1D	1.644M	2.237M
Zigbee	1.669M	2.242M	2M24G1D	1.644M	2.222M

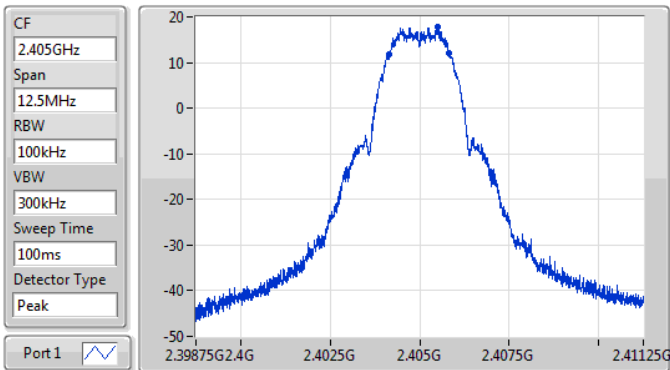
Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
Zigbee	-	-	-	-	-	-
2405MHz	Pass	500k	1.675M	2.243M		
2440MHz	Pass	500k	1.663M	2.237M		
2475MHz	Pass	500k	1.644M	2.243M		
Zigbee	-	-	-	-	-	-
2405MHz	Pass	500k			1.669M	2.222M
2440MHz	Pass	500k			1.669M	2.229M
2475MHz	Pass	500k			1.644M	2.242M

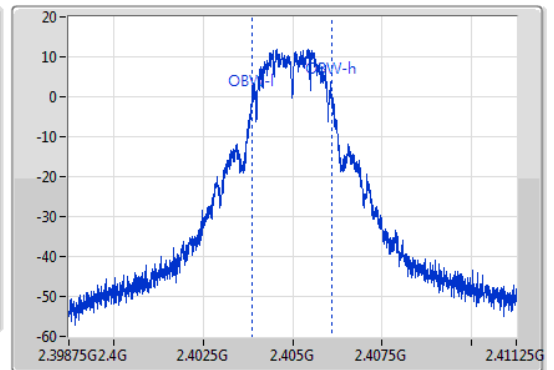
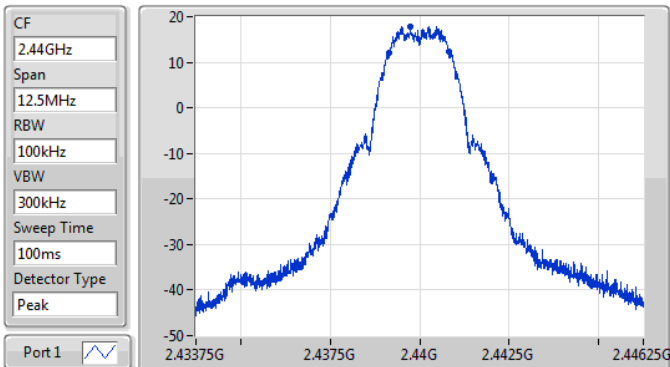
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

Zigbee
2405MHz


6dB(Hz)	FI-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	FI-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.675M	2.40415G	2.405825G	2.243M	2.403868G	2.406111G	500k	1

EBW

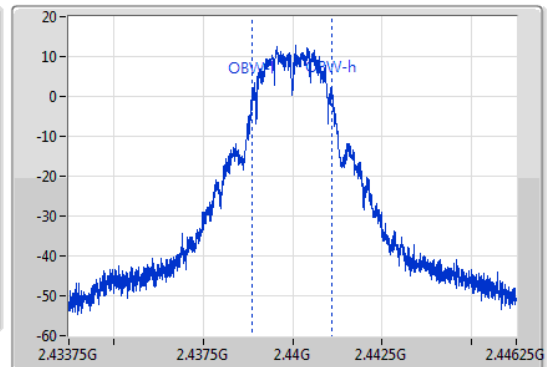
02/07/2019


Zigbee
2440MHz


6dB(Hz)	FI-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	FI-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.663M	2.439144G	2.440806G	2.237M	2.438875G	2.441112G	500k	1

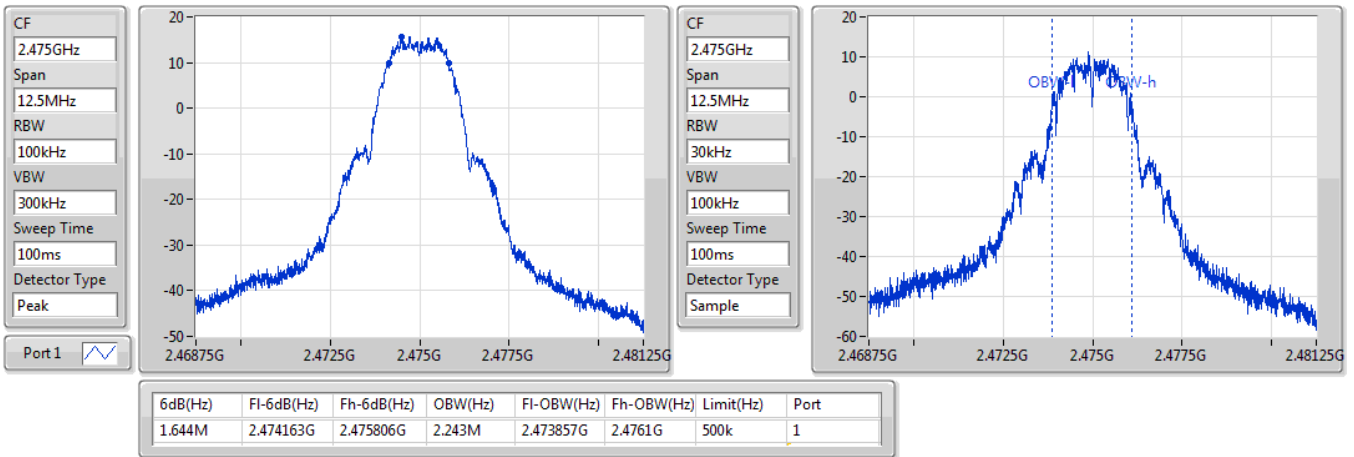
EBW

02/07/2019

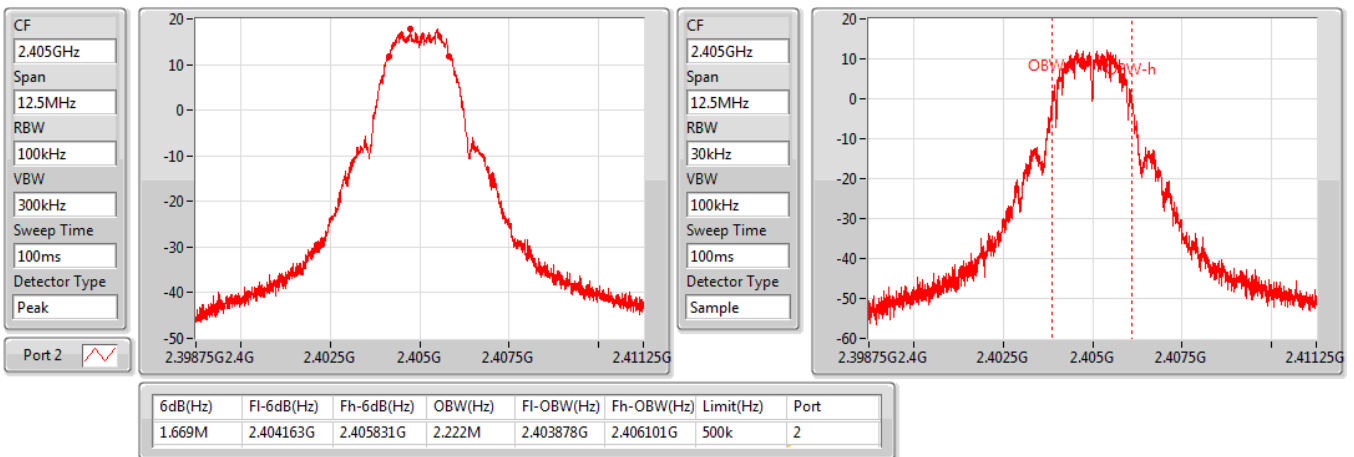


Zigbee
2475MHz
EBW

02/07/2019

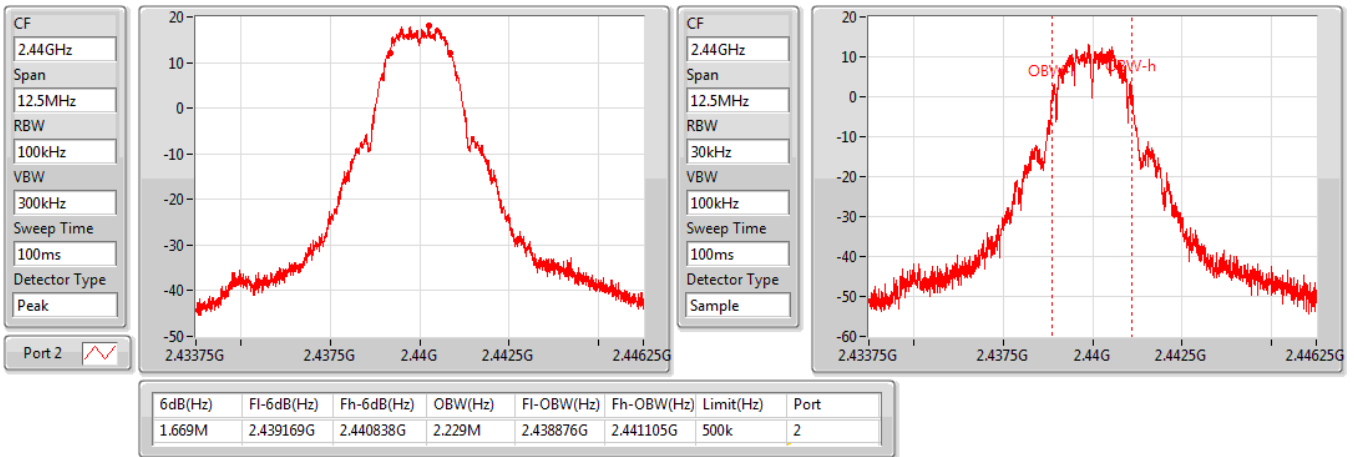

Zigbee
2405MHz
EBW

02/07/2019

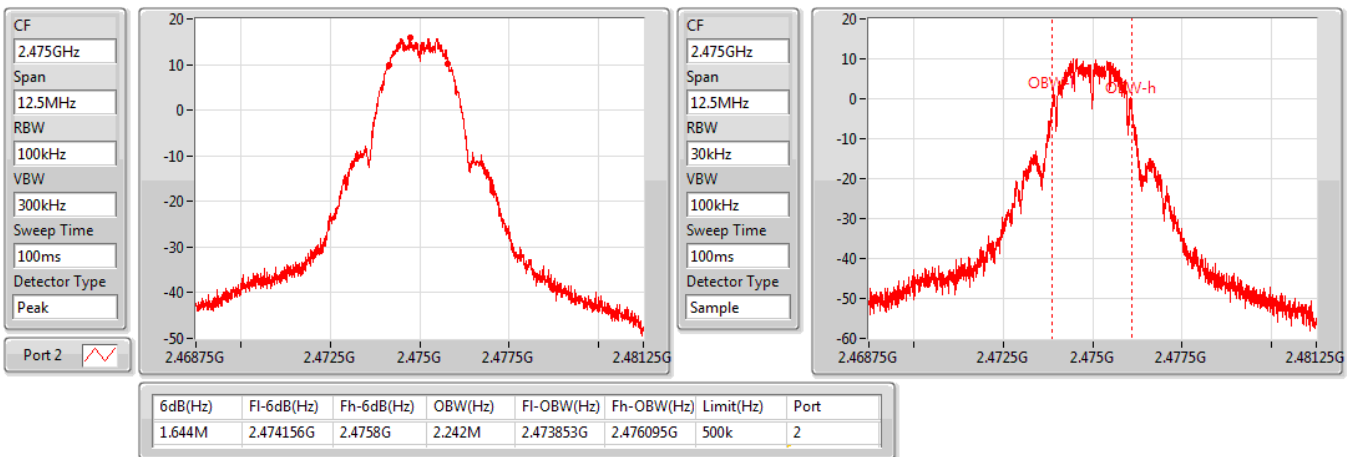


Zigbee
2440MHz
EBW

02/07/2019


Zigbee
2475MHz
EBW

02/07/2019





Average Power Result

Appendix C

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Zigbee	21.50	0.14125
Zigbee	21.53	0.14223

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)
Zigbee	-	-	-	-	-	-
2405MHz	Pass	5.48	21.30		21.30	30.00
2440MHz	Pass	5.48	21.50		21.50	30.00
2475MHz	Pass	5.48	19.09		19.09	30.00
Zigbee	-	-	-	-	-	-
2405MHz	Pass	5.48		21.41	21.41	30.00
2440MHz	Pass	5.48		21.53	21.53	30.00
2475MHz	Pass	5.48		19.24	19.24	30.00

DG = Directional Gain; **Port X** = Port X output power



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Zigbee	5.36
Zigbee	6.51

RBW=3 kHz.

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Zigbee	-	-	-	-	-	-
2405MHz	Pass	5.48	4.31		4.31	8.00
2440MHz	Pass	5.48	5.36		5.36	8.00
2475MHz	Pass	5.48	3.99		3.99	8.00
Zigbee	-	-	-	-	-	-
2405MHz	Pass	5.48		4.48	4.48	8.00
2440MHz	Pass	5.48		6.51	6.51	8.00
2475MHz	Pass	5.48		2.52	2.52	8.00

DG = Directional Gain; RBW=3 kHz;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

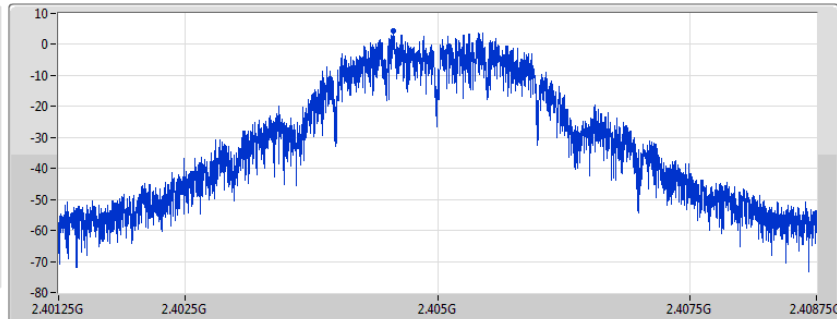
Zigbee

2405MHz

PSD

02/07/2019

CF
2.405GHz
Span
7.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
238.933333ms
Detector Type
Peak



Port 1

Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.31	4.31	4.31

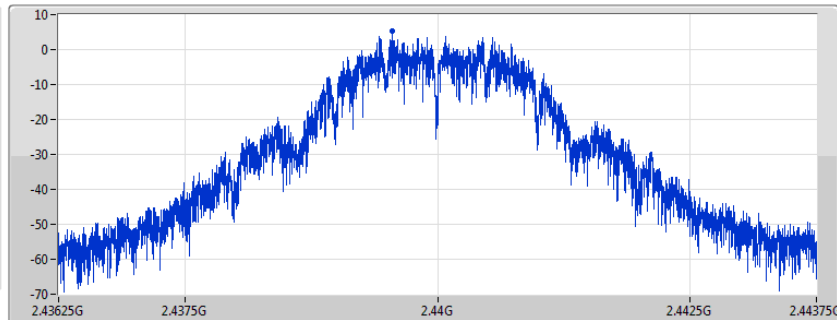
Zigbee

2440MHz

PSD

02/07/2019

CF
2.44GHz
Span
7.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
238.933333ms
Detector Type
Peak



Port 1

Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
5.36	5.36	5.36

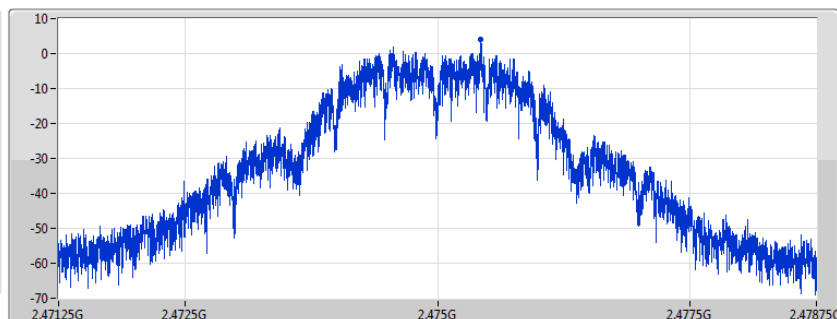
Zigbee

2475MHz

PSD

02/07/2019

CF
2.475GHz
Span
7.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
238.933333ms
Detector Type
Peak



Port 1

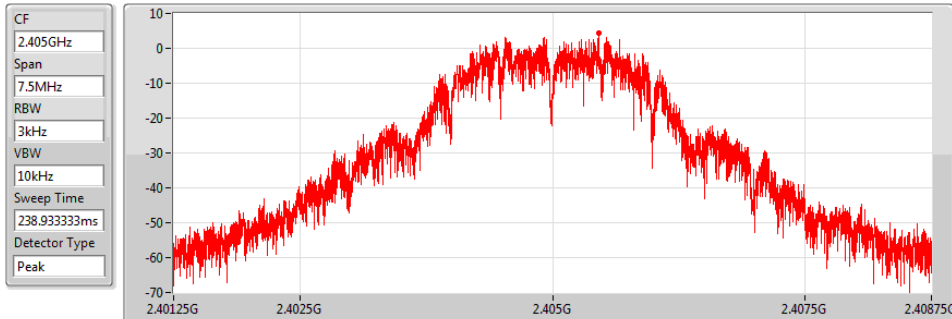
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
3.99	3.99	3.99

Zigbee

2405MHz

PSD

02/07/2019



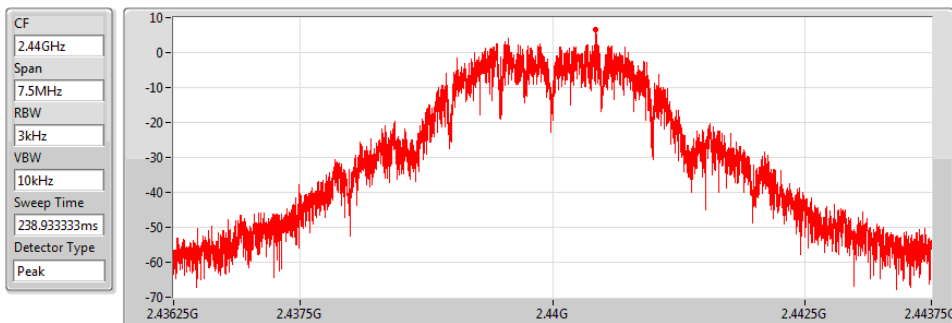
Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.48	4.48		4.48

Zigbee

2440MHz

PSD

02/07/2019



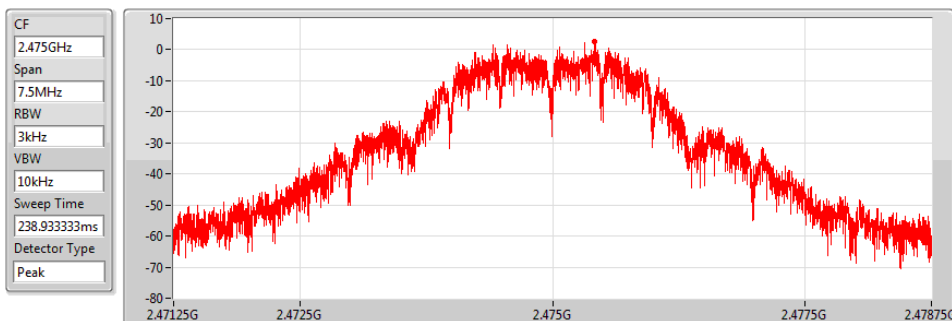
Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
6.51	6.51		6.51

Zigbee

2475MHz

PSD

02/07/2019



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
2.52	2.52		2.52



Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	2.43945G	16.90	-13.10	2.05193G	-56.58	2.39978G	-41.63	2.48458G	-55.21	7.21705G	-45.00	1
Zigbee	Pass	2.44046G	16.42	-13.58	2.30121G	-56.56	2.39995G	-41.49	2.48623G	-54.81	24.88465G	-45.16	2

Result

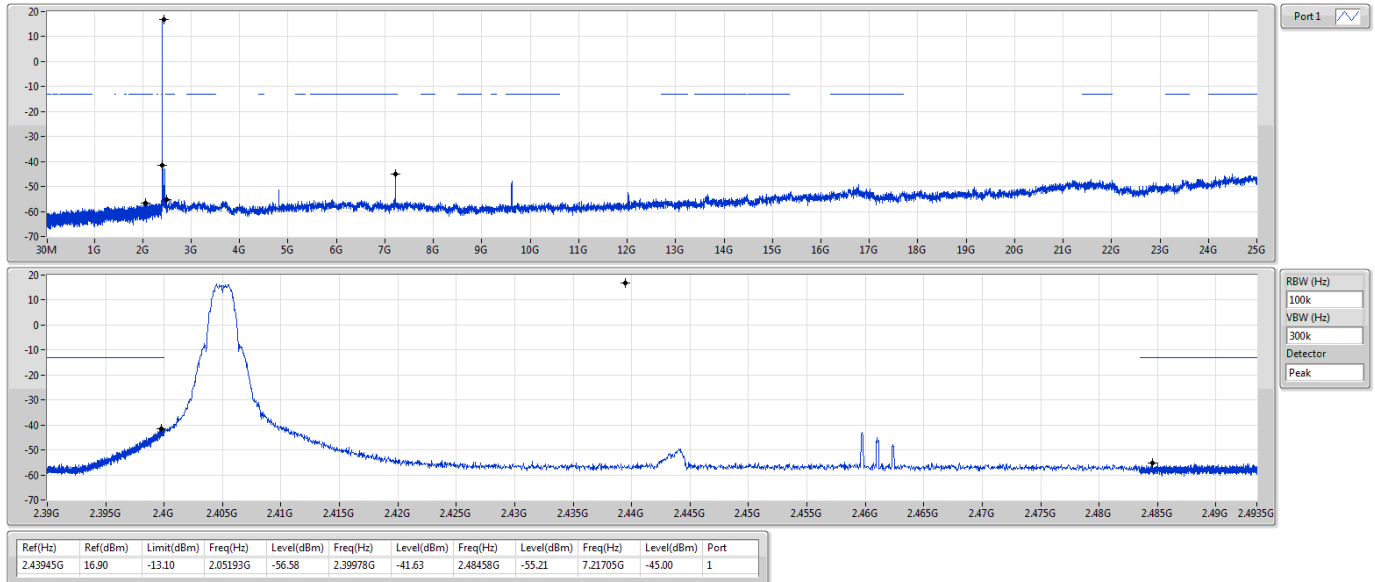
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	2.43945G	16.90	-13.10	2.05193G	-56.58	2.39978G	-41.63	2.48458G	-55.21	7.21705G	-45.00	1
2440MHz	Pass	2.43945G	16.90	-13.10	2.13984G	-56.96	2.3947G	-55.51	2.4889G	-55.23	24.92685G	-45.21	1
2475MHz	Pass	2.43945G	16.90	-13.10	2.17259G	-55.11	2.39525G	-55.50	2.48382G	-55.60	24.87621G	-44.74	1
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	2.44046G	16.42	-13.58	2.30121G	-56.56	2.39995G	-41.49	2.48623G	-54.81	24.88465G	-45.16	2
2440MHz	Pass	2.44046G	16.42	-13.58	2.0776G	-56.30	2.39993G	-55.17	2.49265G	-55.79	24.77212G	-45.52	2
2475MHz	Pass	2.44046G	16.42	-13.58	1.98379G	-56.50	2.39885G	-55.11	2.48565G	-54.99	24.48516G	-44.75	2

Zigbee

2405MHz

CSE NdB

02/07/2019

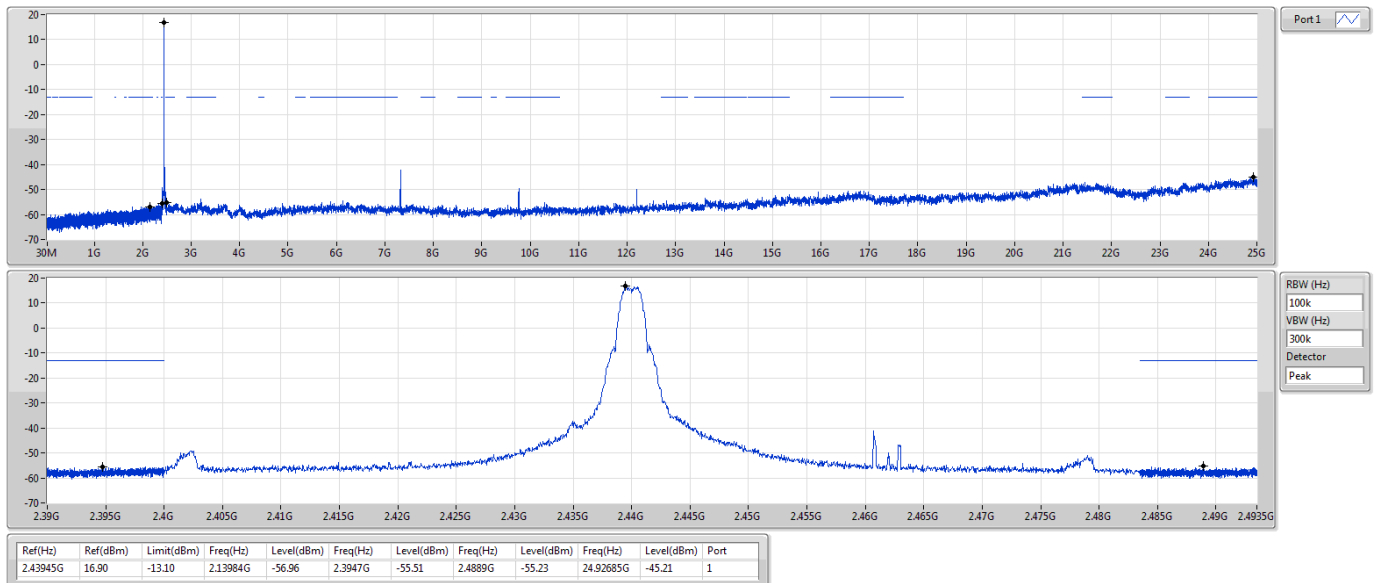


Zigbee

2440MHz

CSE NdB

02/07/2019

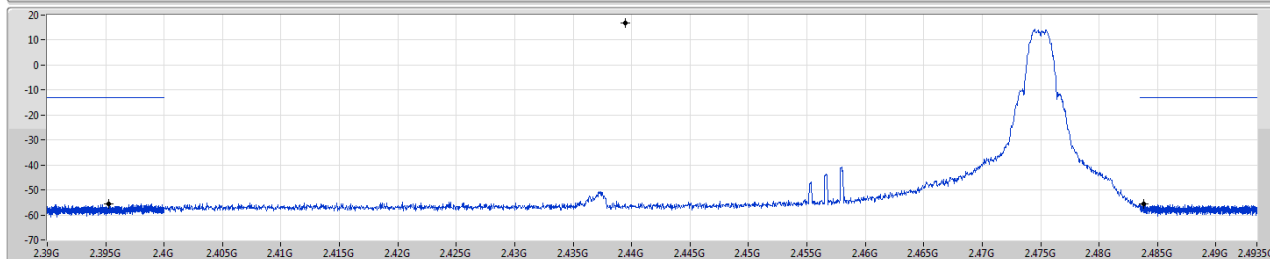
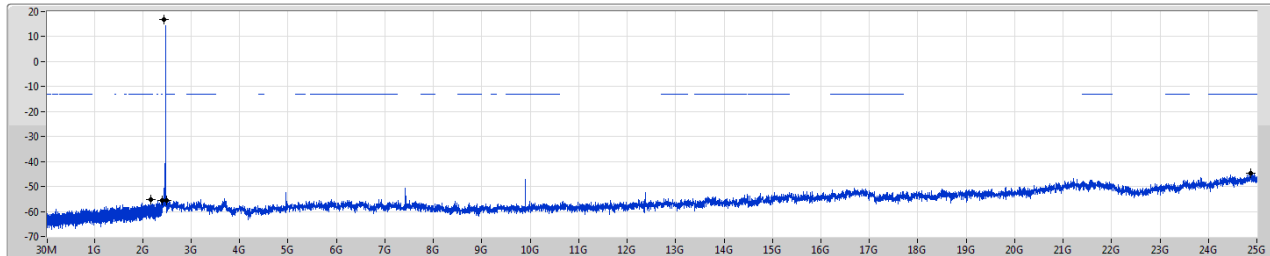


Zigbee
2475MHz

CSE NdB

02/07/2019

Port 1

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

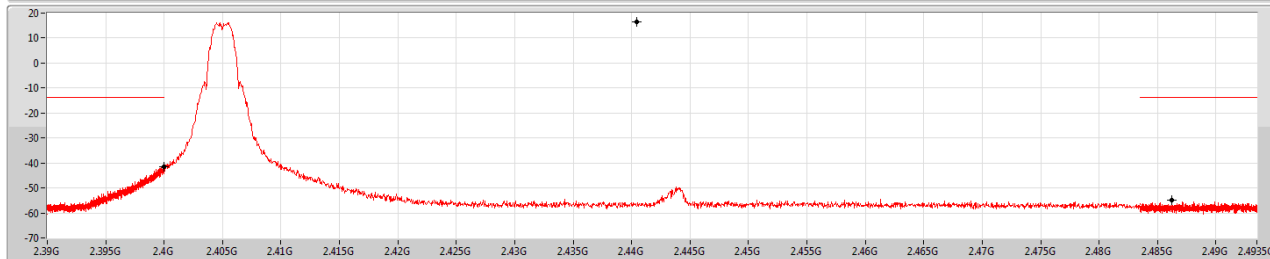
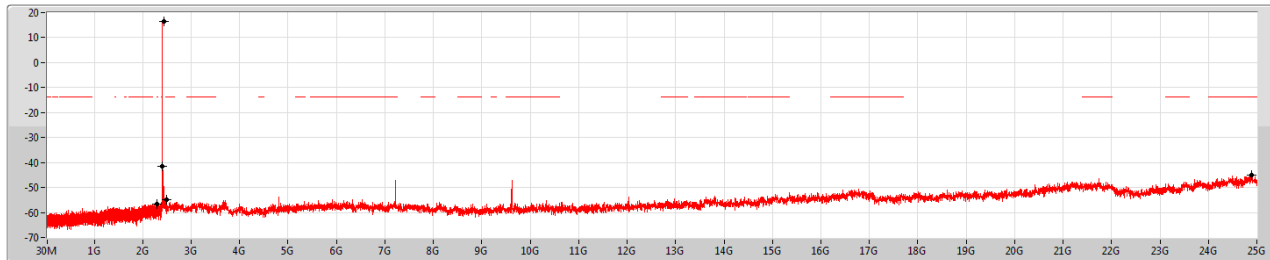
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43945G	16.90	-13.10	2.17259G	-55.11	2.39525G	-55.50	2.48382G	-55.60	2.47621G	-44.74	1

Zigbee
2405MHz

CSE NdB

02/07/2019

Port 2

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

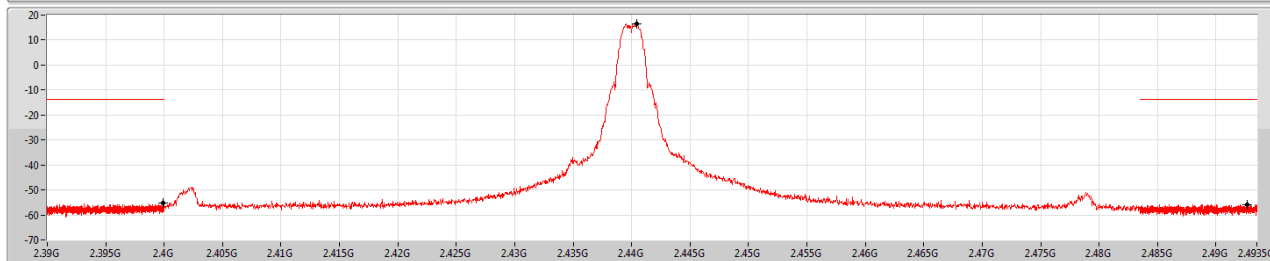
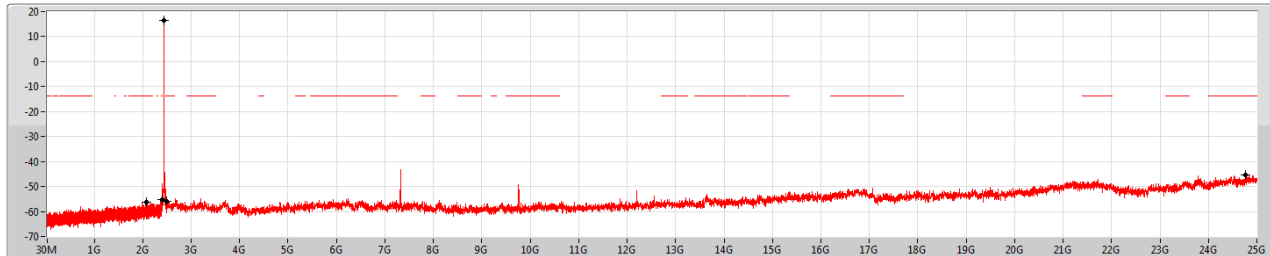
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44046G	16.42	-13.58	2.30121G	-56.56	2.39995G	-41.49	2.48623G	-54.81	2.48465G	-45.16	2

Zigbee
2440MHz

CSE NdB

02/07/2019

Port 2

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

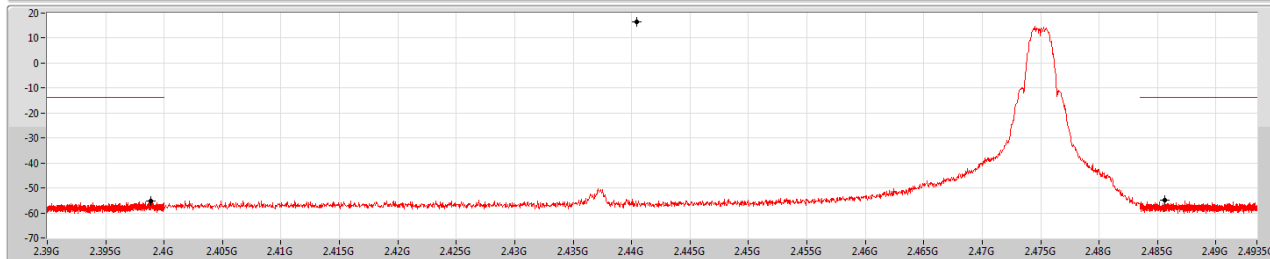
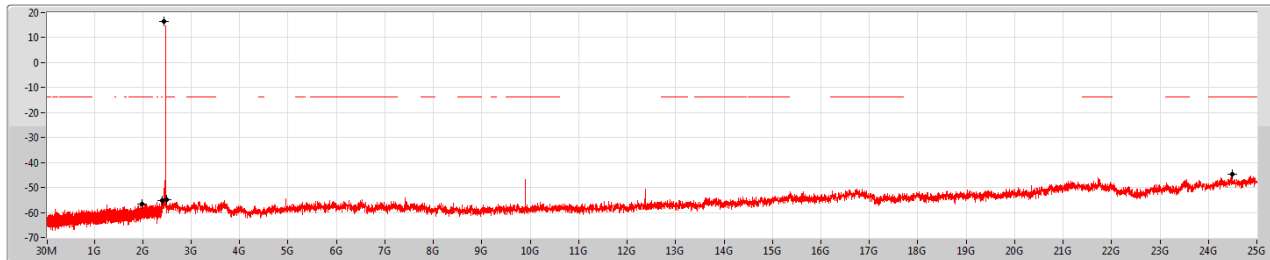
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44046G	16.42	-13.58	2.0776G	-56.30	2.39993G	-55.17	2.49265G	-55.79	2.477212G	-45.52	2

Zigbee
2475MHz

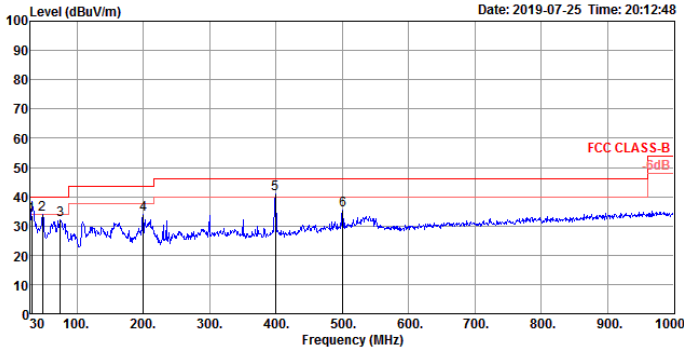
CSE NdB

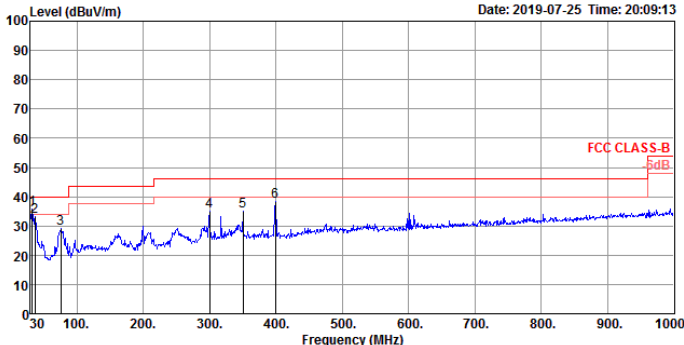
02/07/2019

Port 2

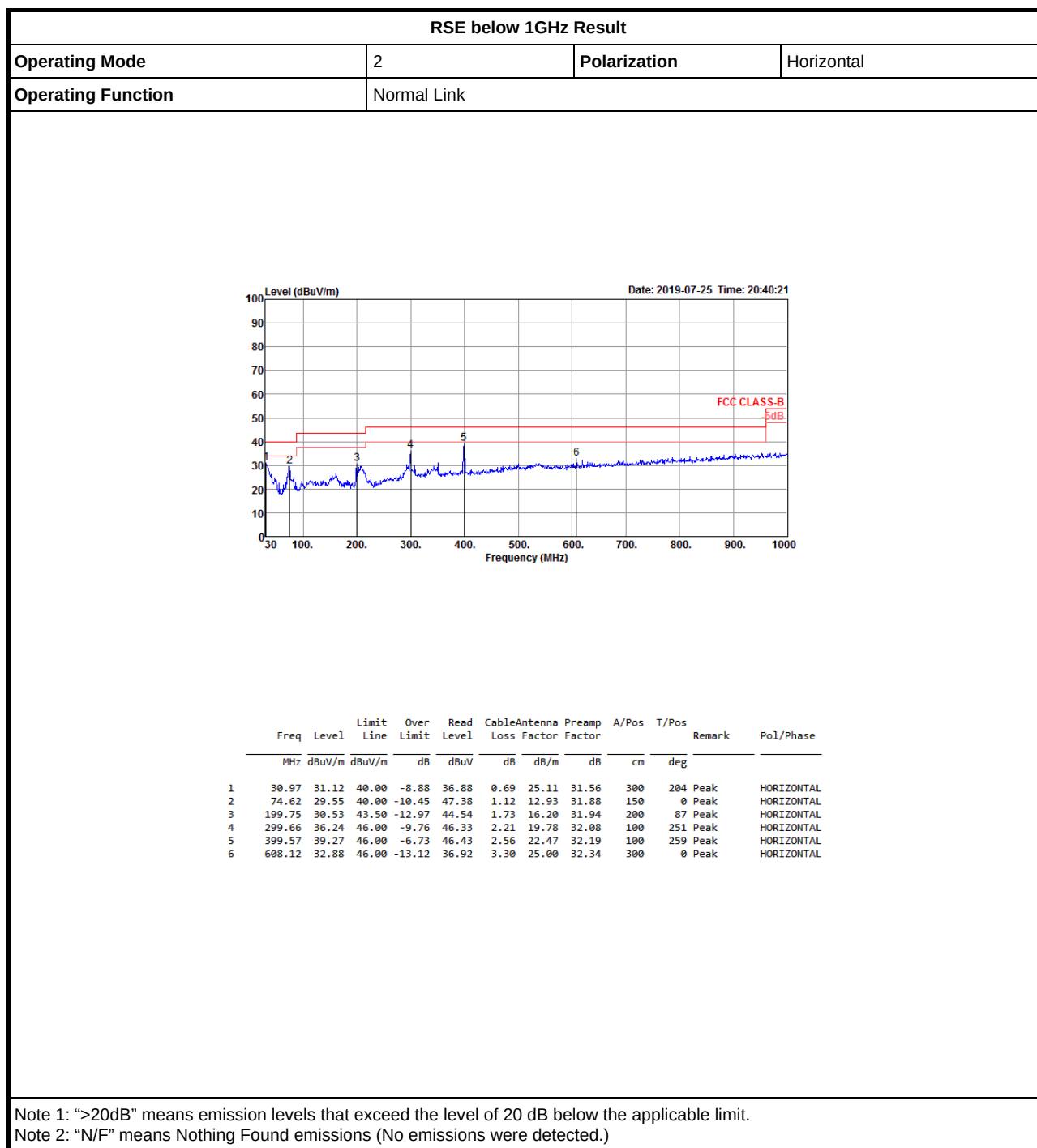
RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44046G	16.42	-13.58	1.98379G	-56.50	2.39885G	-55.11	2.48565G	-54.99	2.48516G	-44.75	2

RSE below 1GHz Result																																																																																																											
Operating Mode		1			Polarization			Vertical																																																																																																			
Operating Function		Normal Link																																																																																																									
Level (dBuV/m) Date: 2019-07-25 Time: 20:12:48  <table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>CableAntenna</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>31.94</td><td>33.68</td><td>40.00</td><td>-6.32</td><td>40.00</td><td>0.71</td><td>24.51</td><td>31.54</td><td>100</td><td>167 QP</td><td>VERTICAL</td></tr><tr><td>2</td><td>48.43</td><td>34.12</td><td>40.00</td><td>-5.88</td><td>49.44</td><td>0.92</td><td>15.46</td><td>31.70</td><td>100</td><td>224 Peak</td><td>VERTICAL</td></tr><tr><td>3</td><td>74.62</td><td>32.06</td><td>40.00</td><td>-7.94</td><td>49.89</td><td>1.12</td><td>12.93</td><td>31.88</td><td>200</td><td>360 Peak</td><td>VERTICAL</td></tr><tr><td>4</td><td>199.75</td><td>34.00</td><td>43.50</td><td>-9.50</td><td>48.01</td><td>1.73</td><td>16.20</td><td>31.94</td><td>100</td><td>187 Peak</td><td>VERTICAL</td></tr><tr><td>5</td><td>399.57</td><td>40.86</td><td>46.00</td><td>-5.14</td><td>48.02</td><td>2.56</td><td>22.47</td><td>32.19</td><td>125</td><td>172 Peak</td><td>VERTICAL</td></tr><tr><td>6</td><td>500.45</td><td>35.37</td><td>46.00</td><td>-10.63</td><td>41.08</td><td>2.94</td><td>23.83</td><td>32.48</td><td>100</td><td>222 Peak</td><td>VERTICAL</td></tr></table>													Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		1	31.94	33.68	40.00	-6.32	40.00	0.71	24.51	31.54	100	167 QP	VERTICAL	2	48.43	34.12	40.00	-5.88	49.44	0.92	15.46	31.70	100	224 Peak	VERTICAL	3	74.62	32.06	40.00	-7.94	49.89	1.12	12.93	31.88	200	360 Peak	VERTICAL	4	199.75	34.00	43.50	-9.50	48.01	1.73	16.20	31.94	100	187 Peak	VERTICAL	5	399.57	40.86	46.00	-5.14	48.02	2.56	22.47	32.19	125	172 Peak	VERTICAL	6	500.45	35.37	46.00	-10.63	41.08	2.94	23.83	32.48	100	222 Peak	VERTICAL
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																																																																																																
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg																																																																																																	
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2	48.43	34.12	40.00	-5.88	49.44	0.92	15.46	31.70	100	224 Peak	VERTICAL																																																																																																
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4	199.75	34.00	43.50	-9.50	48.01	1.73	16.20	31.94	100	187 Peak	VERTICAL																																																																																																
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RSE below 1GHz Result																																																																																																											
Operating Mode		1			Polarization			Horizontal																																																																																																			
Operating Function		Normal Link																																																																																																									
Level (dBuV/m) Date: 2019-07-25 Time: 20:09:13  <table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>CableAntenna</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>32.91</td><td>35.76</td><td>40.00</td><td>-4.24</td><td>42.57</td><td>0.72</td><td>23.99</td><td>31.52</td><td>200</td><td>16</td><td>Peak</td></tr><tr><td>2</td><td>36.79</td><td>33.22</td><td>40.00</td><td>-6.78</td><td>42.24</td><td>0.78</td><td>21.69</td><td>31.49</td><td>200</td><td>35</td><td>Peak</td></tr><tr><td>3</td><td>75.59</td><td>29.18</td><td>40.00</td><td>-10.82</td><td>46.92</td><td>1.13</td><td>13.01</td><td>31.88</td><td>300</td><td>63</td><td>Peak</td></tr><tr><td>4</td><td>299.66</td><td>35.18</td><td>46.00</td><td>-10.82</td><td>45.27</td><td>2.21</td><td>19.78</td><td>32.08</td><td>100</td><td>258</td><td>Peak</td></tr><tr><td>5</td><td>350.10</td><td>34.92</td><td>46.00</td><td>-11.08</td><td>43.40</td><td>2.46</td><td>21.20</td><td>32.14</td><td>100</td><td>280</td><td>Peak</td></tr><tr><td>6</td><td>399.57</td><td>38.45</td><td>46.00</td><td>-7.55</td><td>45.61</td><td>2.56</td><td>22.47</td><td>32.19</td><td>100</td><td>134</td><td>Peak</td></tr></table>													Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		1	32.91	35.76	40.00	-4.24	42.57	0.72	23.99	31.52	200	16	Peak	2	36.79	33.22	40.00	-6.78	42.24	0.78	21.69	31.49	200	35	Peak	3	75.59	29.18	40.00	-10.82	46.92	1.13	13.01	31.88	300	63	Peak	4	299.66	35.18	46.00	-10.82	45.27	2.21	19.78	32.08	100	258	Peak	5	350.10	34.92	46.00	-11.08	43.40	2.46	21.20	32.14	100	280	Peak	6	399.57	38.45	46.00	-7.55	45.61	2.56	22.47	32.19	100	134	Peak
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																																																																																																
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg																																																																																																	
1	32.91	35.76	40.00	-4.24	42.57	0.72	23.99	31.52	200	16	Peak																																																																																																
2	36.79	33.22	40.00	-6.78	42.24	0.78	21.69	31.49	200	35	Peak																																																																																																
3	75.59	29.18	40.00	-10.82	46.92	1.13	13.01	31.88	300	63	Peak																																																																																																
4	299.66	35.18	46.00	-10.82	45.27	2.21	19.78	32.08	100	258	Peak																																																																																																
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RSE below 1GHz Result																																																																																																												
Operating Mode		2			Polarization			Vertical																																																																																																				
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Level (dBuV/m) 100 90 80 70 60 50 40 30 20 10 0 Date: 2019-07-25 Time: 20:42:24 FCC CLASS-B 5dB 30 100. 200. 300. 400. 500. 600. 700. 800. 900. 1000 Frequency (MHz)																																																																																																												
<table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>CableAntenna</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>32.91</td><td>33.40</td><td>40.00</td><td>-6.60</td><td>40.21</td><td>0.72</td><td>23.99</td><td>31.52</td><td>100</td><td>143 QP</td><td>VERTICAL</td></tr><tr><td>2</td><td>48.43</td><td>33.04</td><td>40.00</td><td>-6.96</td><td>48.36</td><td>0.92</td><td>15.46</td><td>31.70</td><td>150</td><td>266 Peak</td><td>VERTICAL</td></tr><tr><td>3</td><td>67.83</td><td>30.68</td><td>40.00</td><td>-9.32</td><td>48.95</td><td>1.01</td><td>12.60</td><td>31.88</td><td>200</td><td>107 Peak</td><td>VERTICAL</td></tr><tr><td>4</td><td>73.65</td><td>32.10</td><td>40.00</td><td>-7.90</td><td>50.02</td><td>1.10</td><td>12.86</td><td>31.88</td><td>200</td><td>3 Peak</td><td>VERTICAL</td></tr><tr><td>5</td><td>199.75</td><td>35.85</td><td>43.50</td><td>-7.65</td><td>49.86</td><td>1.73</td><td>16.20</td><td>31.94</td><td>100</td><td>168 Peak</td><td>VERTICAL</td></tr><tr><td>6</td><td>399.57</td><td>42.45</td><td>46.00</td><td>-3.55</td><td>49.61</td><td>2.56</td><td>22.47</td><td>32.19</td><td>125</td><td>188 Peak</td><td>VERTICAL</td></tr></table>														Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		1	32.91	33.40	40.00	-6.60	40.21	0.72	23.99	31.52	100	143 QP	VERTICAL	2	48.43	33.04	40.00	-6.96	48.36	0.92	15.46	31.70	150	266 Peak	VERTICAL	3	67.83	30.68	40.00	-9.32	48.95	1.01	12.60	31.88	200	107 Peak	VERTICAL	4	73.65	32.10	40.00	-7.90	50.02	1.10	12.86	31.88	200	3 Peak	VERTICAL	5	199.75	35.85	43.50	-7.65	49.86	1.73	16.20	31.94	100	168 Peak	VERTICAL	6	399.57	42.45	46.00	-3.55	49.61	2.56	22.47	32.19	125	188 Peak	VERTICAL
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																																																																																																	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg																																																																																																		
1	32.91	33.40	40.00	-6.60	40.21	0.72	23.99	31.52	100	143 QP	VERTICAL																																																																																																	
2	48.43	33.04	40.00	-6.96	48.36	0.92	15.46	31.70	150	266 Peak	VERTICAL																																																																																																	
3	67.83	30.68	40.00	-9.32	48.95	1.01	12.60	31.88	200	107 Peak	VERTICAL																																																																																																	
4	73.65	32.10	40.00	-7.90	50.02	1.10	12.86	31.88	200	3 Peak	VERTICAL																																																																																																	
5	199.75	35.85	43.50	-7.65	49.86	1.73	16.20	31.94	100	168 Peak	VERTICAL																																																																																																	
6	399.57	42.45	46.00	-3.55	49.61	2.56	22.47	32.19	125	188 Peak	VERTICAL																																																																																																	
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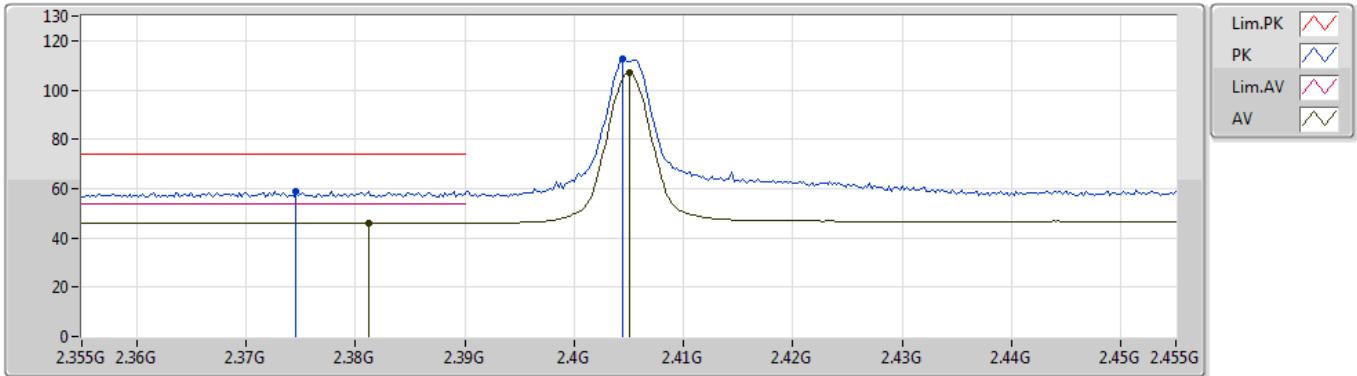
**For Port 1:
Summary**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	7.42652G	48.32	54.00	-5.68	10.86	3	Horizontal	95	1.66	-

Zigbee

26/06/2019

2405MHz_TX



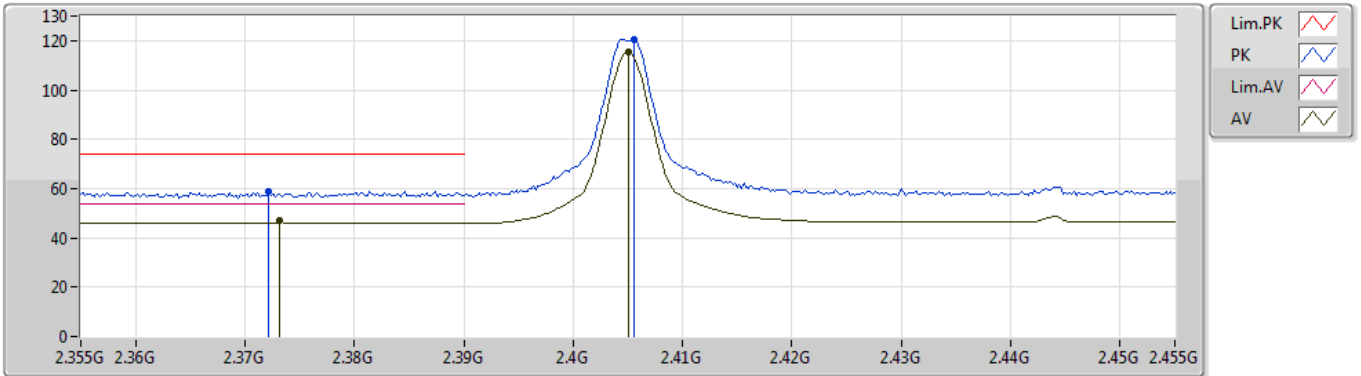
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3746G	58.89	74.00	-15.11	31.16	3	Vertical	237	1.30	-				
AV	2.3812G	45.98	54.00	-8.02	31.19	3	Vertical	237	1.30	-				
PK	2.4044G	112.39	Inf	-Inf	31.24	3	Vertical	237	1.30	-				
AV	2.405G	107.23	Inf	-Inf	31.24	3	Vertical	237	1.30	-				

Zigbee

26/06/2019

2405MHz_TX



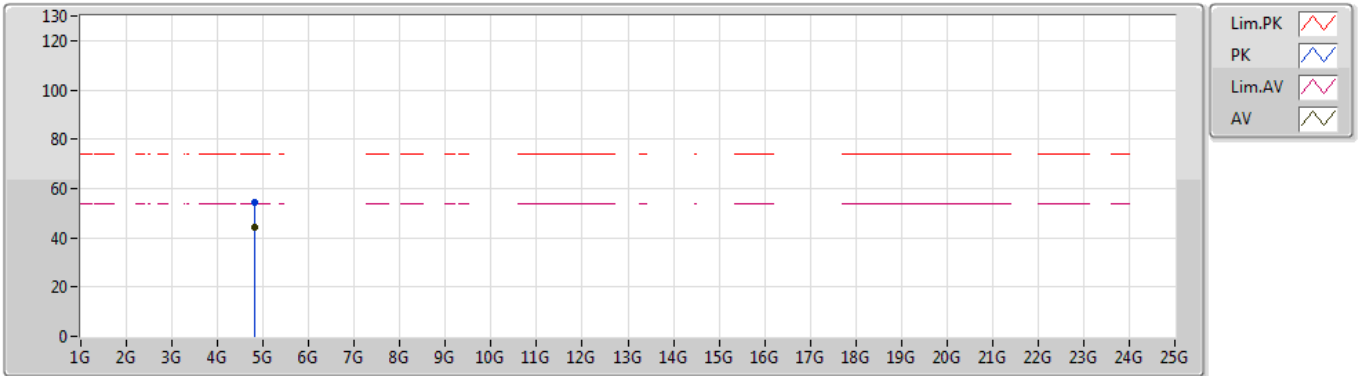
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3722G	58.95	74.00	-15.05	31.16	3	Horizontal	1	1.10	-				
AV	2.3732G	46.96	54.00	-7.04	31.16	3	Horizontal	1	1.10	-				
PK	2.4056G	120.58	Inf	-Inf	31.24	3	Horizontal	1	1.10	-				
AV	2.405G	115.56	Inf	-Inf	31.24	3	Horizontal	1	1.10	-				

Zigbee

26/06/2019

2405MHz_TX



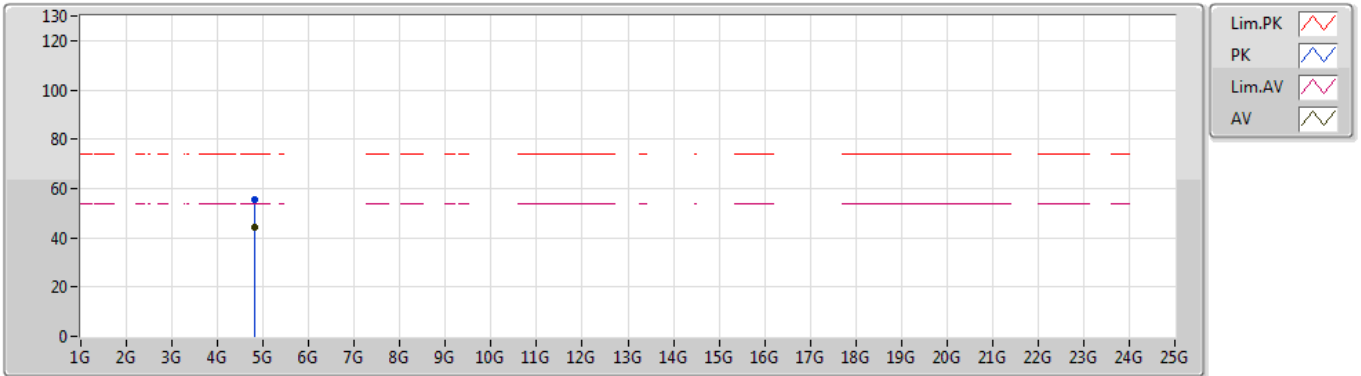
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Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.80888G	54.38	74.00	-19.62	7.13	3	Vertical	19	2.03	-				
AV	4.80904G	44.39	54.00	-9.61	7.13	3	Vertical	19	2.03	-				

Zigbee

26/06/2019

2405MHz_TX



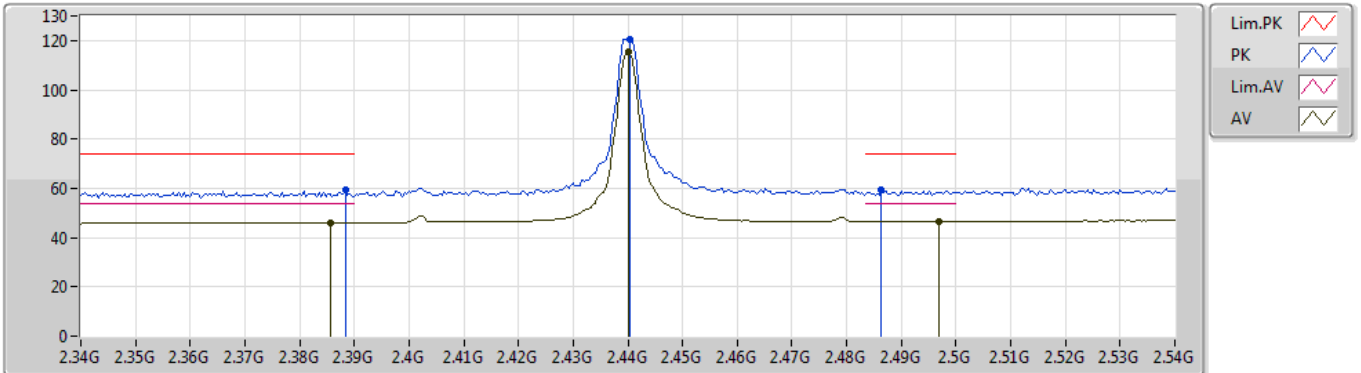
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Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.80904G	55.25	74.00	-18.75	7.13	3	Horizontal	88	1.89	-				
AV	4.80896G	44.45	54.00	-9.55	7.13	3	Horizontal	88	1.89	-				

Zigbee

2440MHz_TX

26/06/2019



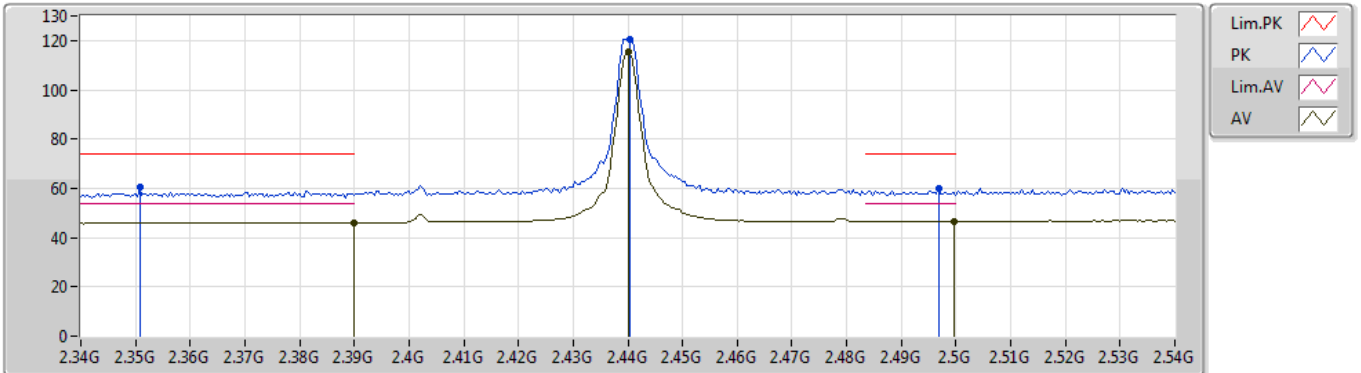
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Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	2.3884G	59.49	74.00	-14.51	31.20	3	Vertical	3	2.23	-
AV	2.3856G	46.00	54.00	-8.00	31.19	3	Vertical	3	2.23	-
PK	2.4404G	120.65	Inf	-Inf	31.31	3	Vertical	3	2.23	-
AV	2.44G	115.47	Inf	-Inf	31.31	3	Vertical	3	2.23	-
PK	2.4864G	59.16	74.00	-14.84	31.40	3	Vertical	3	2.23	-
AV	2.4968G	46.58	54.00	-7.42	31.42	3	Vertical	3	2.23	-

Zigbee

26/06/2019

2440MHz_TX



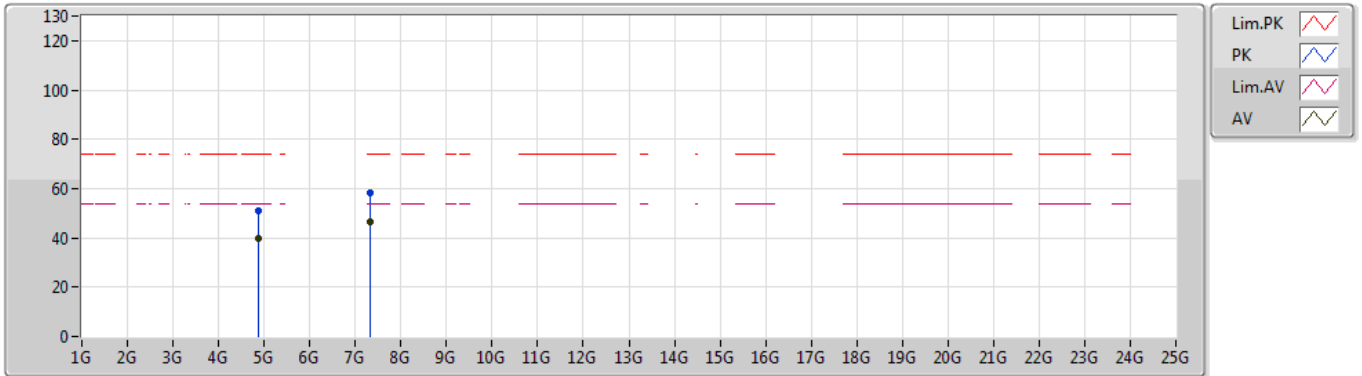
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Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	2.3508G	60.26	74.00	-13.74	31.11	3	Horizontal	357	2.24	-
AV	2.39G	46.03	54.00	-7.97	31.20	3	Horizontal	357	2.24	-
PK	2.4404G	120.67	Inf	-Inf	31.31	3	Horizontal	357	2.24	-
AV	2.44G	115.51	Inf	-Inf	31.31	3	Horizontal	357	2.24	-
PK	2.4968G	59.76	74.00	-14.24	31.42	3	Horizontal	357	2.24	-
AV	2.4996G	46.61	54.00	-7.39	31.43	3	Horizontal	357	2.24	-

Zigbee

26/06/2019

2440MHz_TX



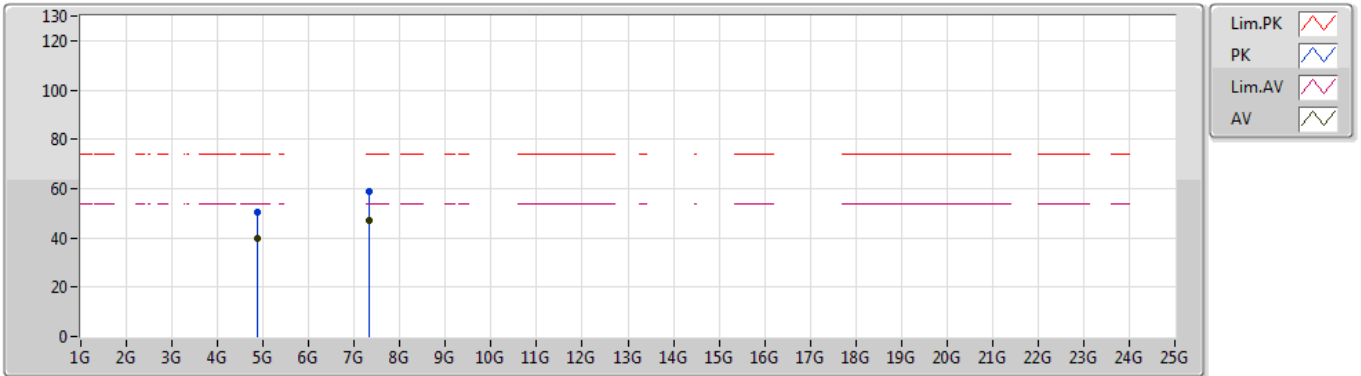
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	4.8812G	50.79	74.00	-23.21	7.30	3	Vertical	83	1.76	-
AV	4.88096G	39.74	54.00	-14.26	7.30	3	Vertical	83	1.76	-
PK	7.31816G	58.54	74.00	-15.46	10.57	3	Vertical	97	2.00	-
AV	7.31848G	46.64	54.00	-7.36	10.57	3	Vertical	97	2.00	-

Zigbee

26/06/2019

2440MHz_TX



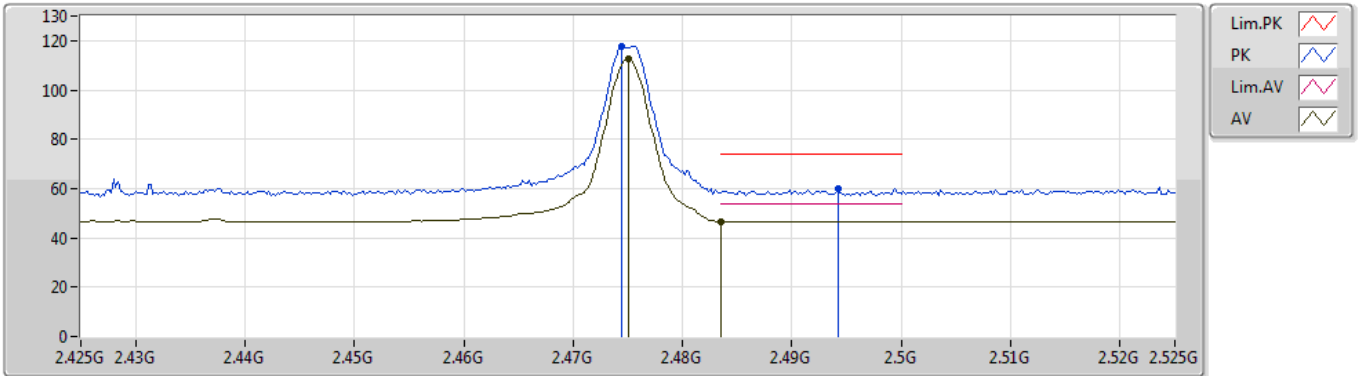
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	4.88112G	50.57	74.00	-23.43	7.30	3	Horizontal	90	1.73	-
AV	4.88104G	39.99	54.00	-14.01	7.30	3	Horizontal	90	1.73	-
PK	7.31816G	58.84	74.00	-15.16	10.57	3	Horizontal	98	1.98	-
AV	7.3184G	46.96	54.00	-7.04	10.57	3	Horizontal	98	1.98	-

Zigbee

2475MHz_TX

26/06/2019



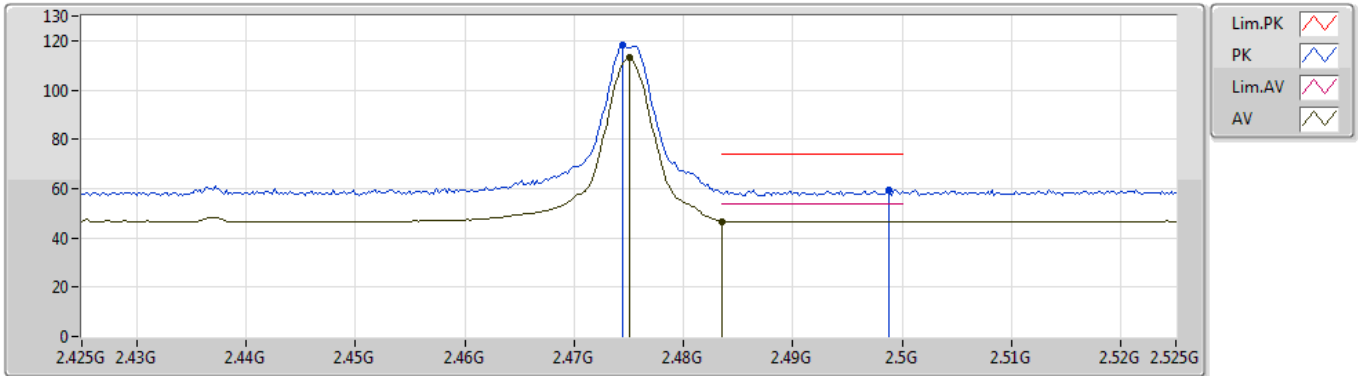
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.4744G	117.89	Inf	-Inf	31.38	3	Vertical	360	2.17	-				
AV	2.475G	112.81	Inf	-Inf	31.38	3	Vertical	360	2.17	-				
PK	2.4942G	59.77	74.00	-14.23	31.42	3	Vertical	360	2.17	-				
AV	2.4835G	46.67	54.00	-7.33	31.39	3	Vertical	360	2.17	-				

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2475MHz_TX



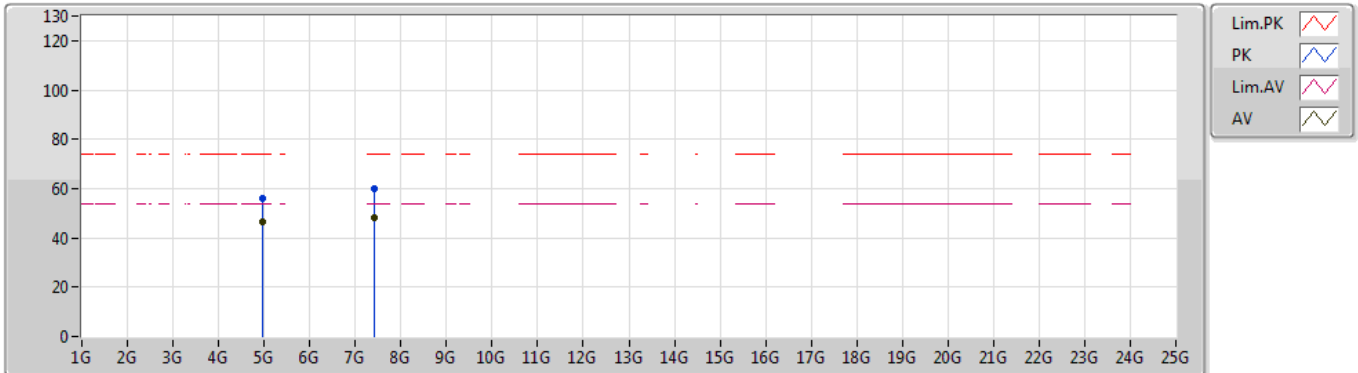
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.4744G	118.09	Inf	-Inf	31.38	3	Horizontal	1	1.97	-				
AV	2.475G	112.92	Inf	-Inf	31.38	3	Horizontal	1	1.97	-				
PK	2.4988G	59.62	74.00	-14.38	31.43	3	Horizontal	1	1.97	-				
AV	2.4835G	46.78	54.00	-7.22	31.39	3	Horizontal	1	1.97	-				

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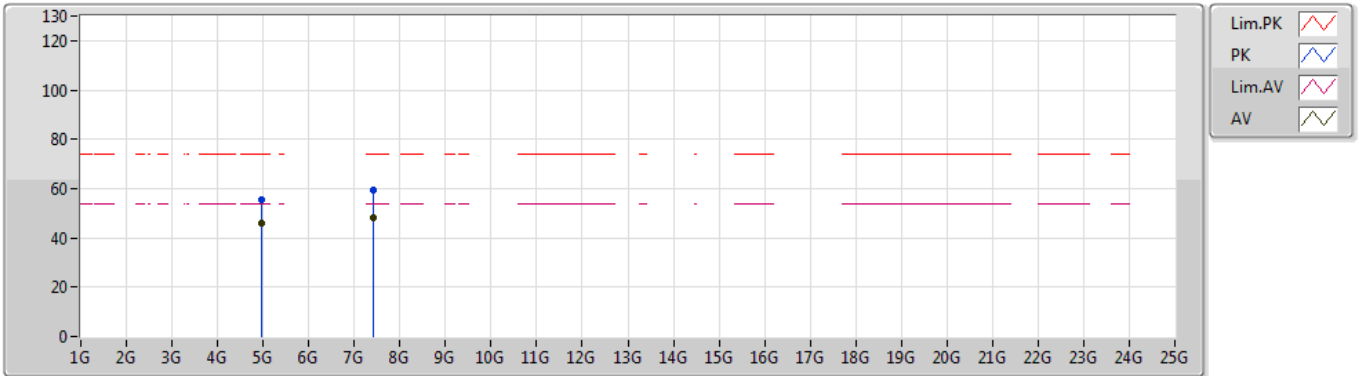
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	4.9508G	56.17	74.00	-17.83	7.47	3	Vertical	99	1.60	-
AV	4.95096G	46.37	54.00	-7.63	7.47	3	Vertical	99	1.60	-
PK	7.4266G	59.86	74.00	-14.14	10.86	3	Vertical	88	1.67	-
AV	7.42652G	48.25	54.00	-5.75	10.86	3	Vertical	88	1.67	-

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EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.95096G	55.28	74.00	-18.72	7.47	3	Horizontal	94	1.44	-				
AV	4.95104G	45.68	54.00	-8.32	7.47	3	Horizontal	94	1.44	-				
PK	7.42652G	59.65	74.00	-14.35	10.86	3	Horizontal	95	1.66	-				
AV	7.42652G	48.32	54.00	-5.68	10.86	3	Horizontal	95	1.66	-				



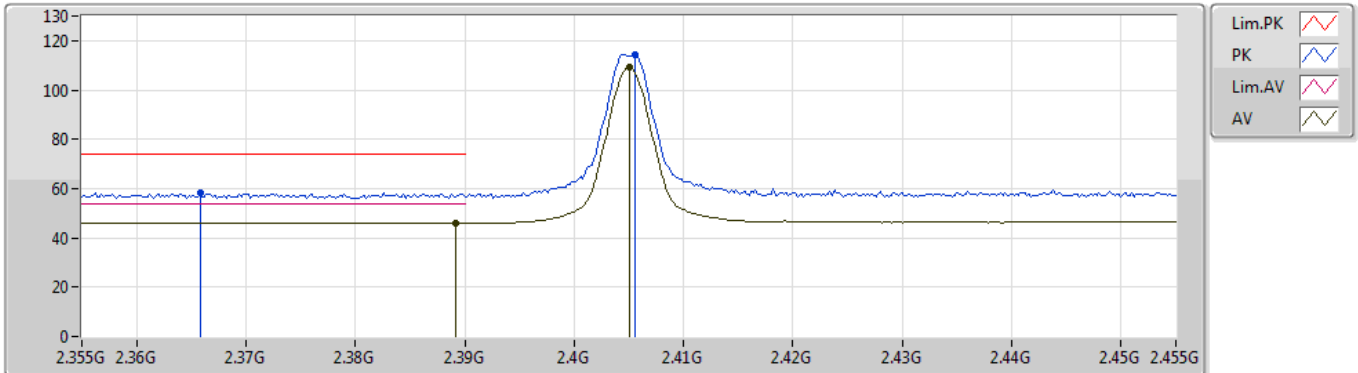
**For Port 2:
Summary**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	7.42644G	49.32	54.00	-4.68	10.86	3	Vertical	100	1.48	-

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2405MHz_TX



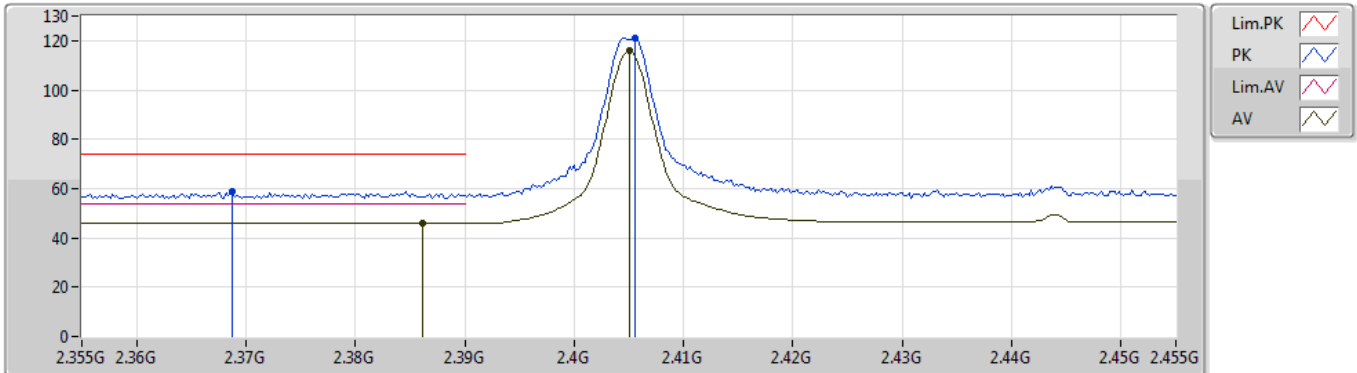
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3658G	58.23	74.00	-15.77	31.15	3	Vertical	82	2.96	-				
AV	2.3892G	46.02	54.00	-7.98	31.20	3	Vertical	82	2.96	-				
PK	2.4056G	114.42	Inf	-Inf	31.24	3	Vertical	82	2.96	-				
AV	2.405G	109.32	Inf	-Inf	31.24	3	Vertical	82	2.96	-				

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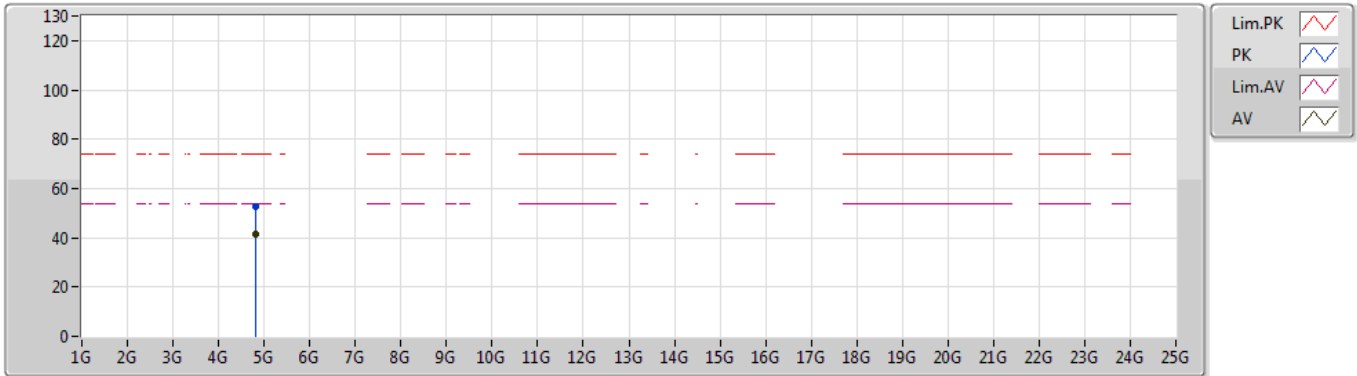
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3688G	58.70	74.00	-15.30	31.15	3	Horizontal	173	1.73	-				
AV	2.3862G	46.03	54.00	-7.97	31.20	3	Horizontal	173	1.73	-				
PK	2.4056G	120.91	Inf	-Inf	31.24	3	Horizontal	173	1.73	-				
AV	2.405G	115.94	Inf	-Inf	31.24	3	Horizontal	173	1.73	-				

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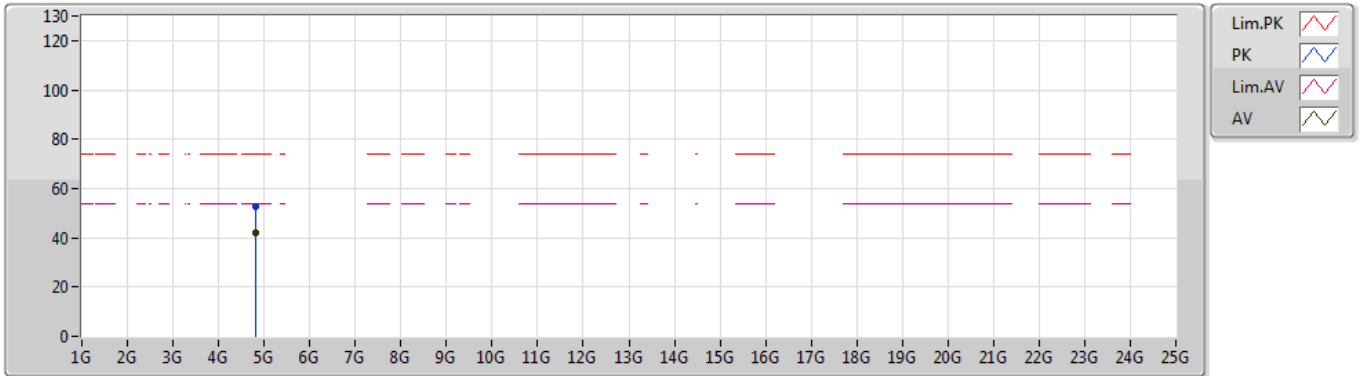
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.81136G	52.54	74.00	-21.46	7.13	3	Vertical	11	1.76	-				
AV	4.80904G	41.74	54.00	-12.26	7.13	3	Vertical	11	1.76	-				

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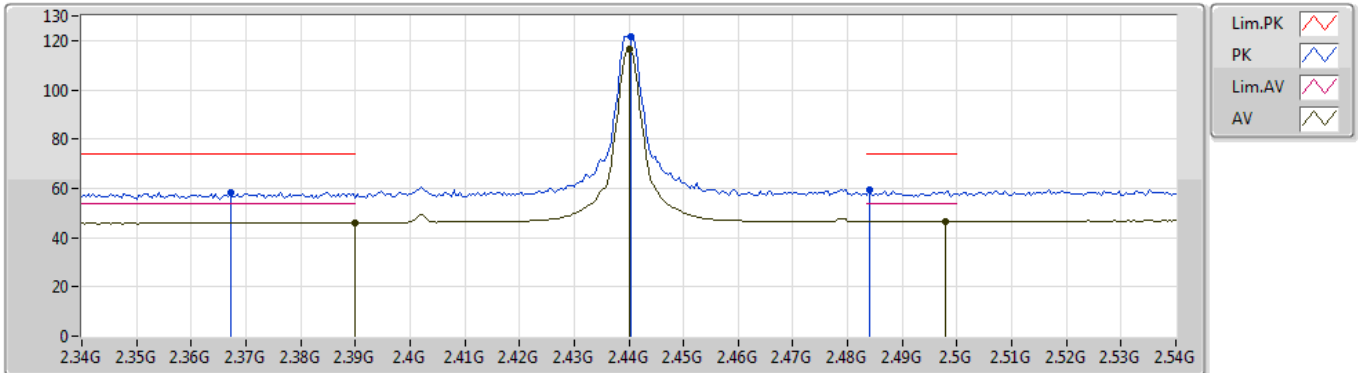
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.80928G	52.72	74.00	-21.28	7.13	3	Horizontal	54	1.86	-				
AV	4.80904G	42.05	54.00	-11.95	7.13	3	Horizontal	54	1.86	-				

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2440MHz_TX



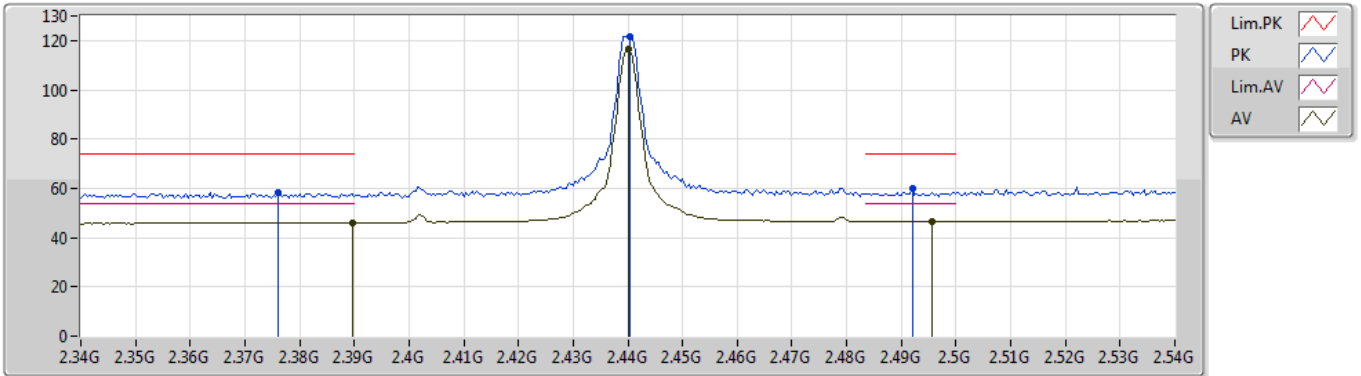
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3672G	58.22	74.00	-15.78	31.15	3	Vertical	172	2.30	-				
AV	2.39G	45.99	54.00	-8.01	31.20	3	Vertical	172	2.30	-				
PK	2.4404G	121.85	Inf	-Inf	31.31	3	Vertical	172	2.30	-				
AV	2.44G	116.78	Inf	-Inf	31.31	3	Vertical	172	2.30	-				
PK	2.484G	59.23	74.00	-14.77	31.39	3	Vertical	172	2.30	-				
AV	2.498G	46.58	54.00	-7.42	31.43	3	Vertical	172	2.30	-				

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2440MHz_TX



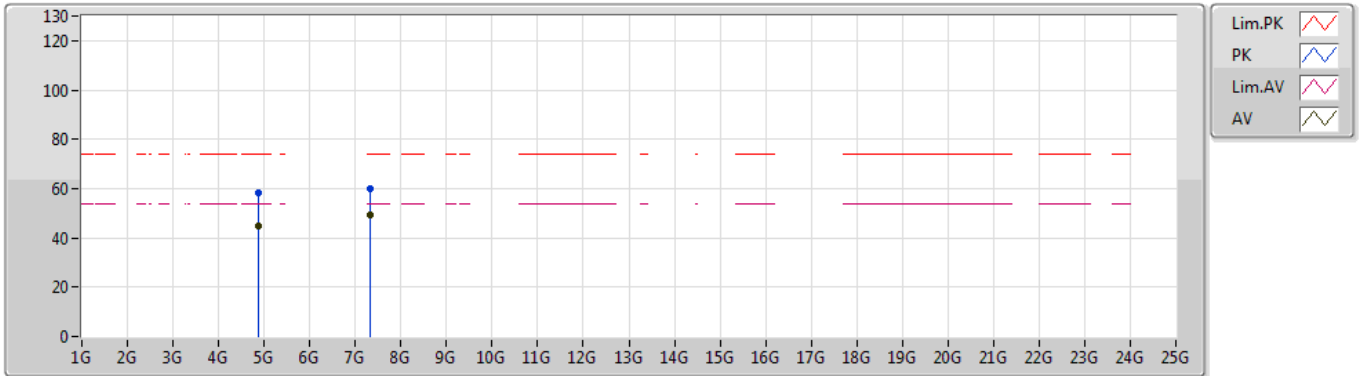
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	2.376G	58.32	74.00	-15.68	31.17	3	Horizontal	159	1.85	-
AV	2.3896G	45.96	54.00	-8.04	31.20	3	Horizontal	159	1.85	-
PK	2.4404G	121.71	Inf	-Inf	31.31	3	Horizontal	159	1.85	-
AV	2.44G	116.63	Inf	-Inf	31.31	3	Horizontal	159	1.85	-
PK	2.492G	59.71	74.00	-14.29	31.42	3	Horizontal	159	1.85	-
AV	2.4956G	46.52	54.00	-7.48	31.42	3	Horizontal	159	1.85	-

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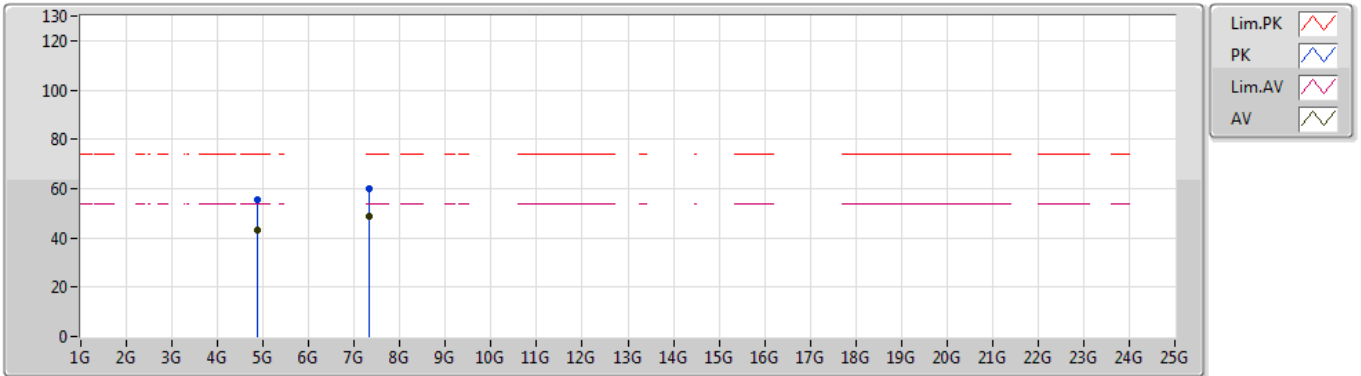
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.8812G	58.32	74.00	-15.68	7.30	3	Vertical	46	1.53	-				
AV	4.8808G	44.90	54.00	-9.10	7.30	3	Vertical	46	1.53	-				
PK	7.31824G	60.12	74.00	-13.88	10.57	3	Vertical	53	1.65	-				
AV	7.31856G	49.06	54.00	-4.94	10.57	3	Vertical	53	1.65	-				

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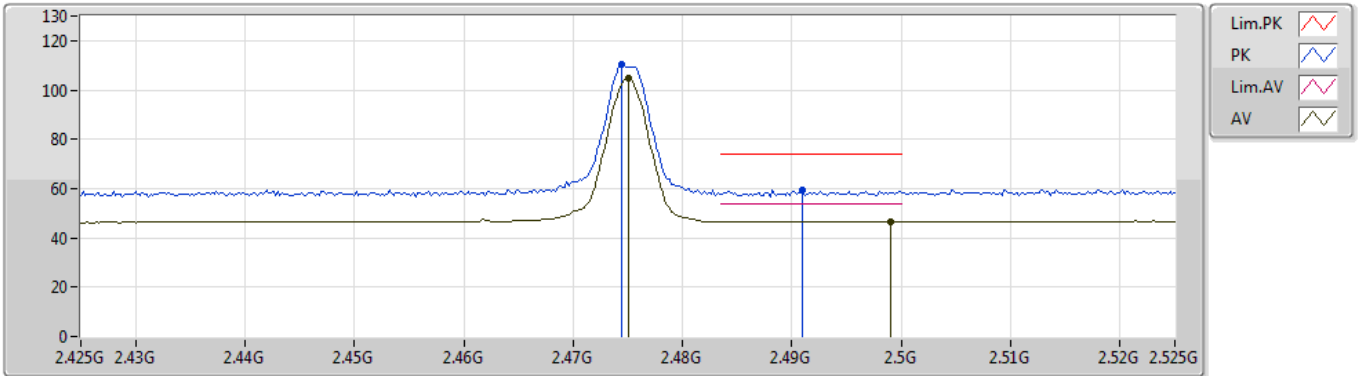
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.88104G	55.44	74.00	-18.56	7.30	3	Horizontal	99	1.58	-				
AV	4.88104G	43.32	54.00	-10.68	7.30	3	Horizontal	99	1.58	-				
PK	7.31816G	60.01	74.00	-13.99	10.57	3	Horizontal	51	1.65	-				
AV	7.31856G	48.58	54.00	-5.42	10.57	3	Horizontal	51	1.65	-				

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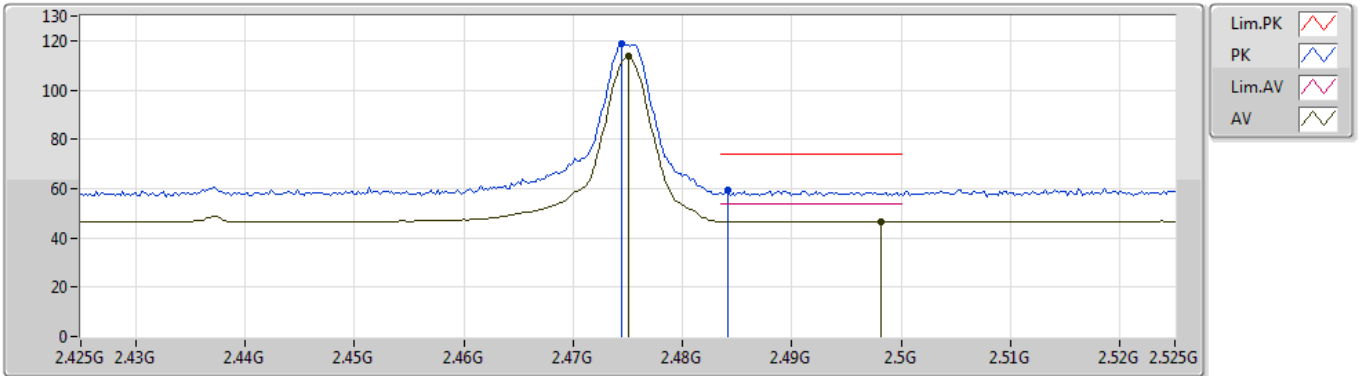
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.4744G	110.13	Inf	-Inf	31.38	3	Vertical	82	2.76	-				
AV	2.475G	104.74	Inf	-Inf	31.38	3	Vertical	82	2.76	-				
PK	2.491G	59.40	74.00	-14.60	31.42	3	Vertical	82	2.76	-				
AV	2.499G	46.60	54.00	-7.40	31.43	3	Vertical	82	2.76	-				

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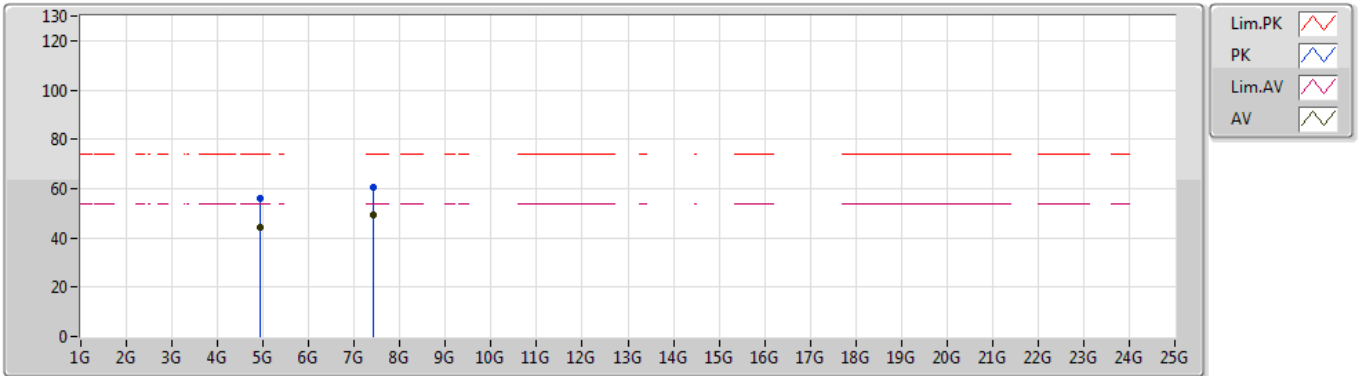
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.4744G	118.89	Inf	-Inf	31.38	3	Horizontal	164	2.05	-				
AV	2.475G	113.49	Inf	-Inf	31.38	3	Horizontal	164	2.05	-				
PK	2.4842G	59.57	74.00	-14.43	31.39	3	Horizontal	164	2.05	-				
AV	2.4982G	46.63	54.00	-7.37	31.43	3	Horizontal	164	2.05	-				

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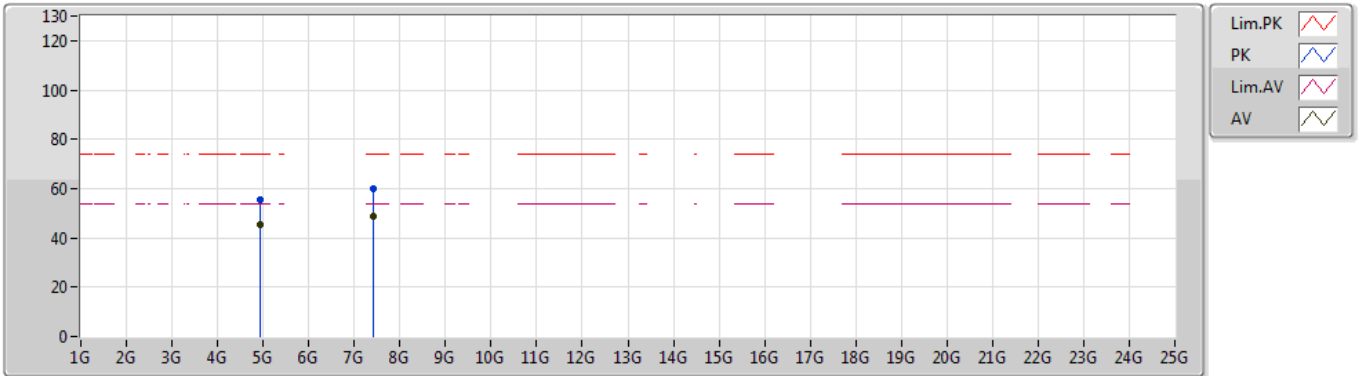
EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	4.9488G	56.21	74.00	-17.79	7.46	3	Vertical	281	1.37	-
AV	4.9492G	44.54	54.00	-9.46	7.46	3	Vertical	281	1.37	-
PK	7.4266G	60.34	74.00	-13.66	10.86	3	Vertical	100	1.48	-
AV	7.42644G	49.32	54.00	-4.68	10.86	3	Vertical	100	1.48	-

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EUT Y_1TX
Setting 3
02-B-4
FSU(100015)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.94864G	55.60	74.00	-18.40	7.46	3	Horizontal	25	2.32	-				
AV	4.94896G	45.27	54.00	-8.73	7.46	3	Horizontal	25	2.32	-				
PK	7.42324G	60.13	74.00	-13.87	10.85	3	Horizontal	60	1.66	-				
AV	7.42644G	48.90	54.00	-5.10	10.86	3	Horizontal	60	1.66	-				