



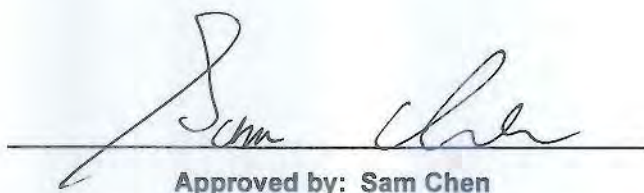
FCC RADIO TEST REPORT

FCC ID : Q87-03564
Equipment : Linksys Tri-Band Wireless-AC Router
Brand Name : Linksys
Model Name : MR8300 V1.1/ MR8250 V1.1
Applicant : Linksys LLC
121 Theory Drive Irvine, CA 92617, United States
Standard : 47 CFR FCC Part 15.247

The product was received on Mar. 06, 2020, and testing was started from Mar. 06, 2020 and completed on Apr. 07, 2020. 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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History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A10_6 Ver1.2

Page Number : 3 of 31
Issued Date : Jun. 15, 2020
Report Version : 01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.1	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:

1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.
2. 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: Viola Huang**



1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1	1

Note:

- ♦ Bluetooth LE uses a GFSK modulation.
- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Port	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	1	FIT	ANEP5M2-CCG05-EH	Dipole Antenna	I-PEX	Note1
2	2	FIT	ANEP5M2-CCG06-EH	Dipole Antenna	I-PEX	
3	1	FIT	ANEP5M2-CCG07-EH	Dipole Antenna	I-PEX	
4	2	FIT	ANEP5M2-CCG08-EH	Dipole Antenna	I-PEX	
5	1	PSA	RFMTA271200NNAB003	PIFA Antenna	N/A	

Note 1:

Ant.	Port	Gain (dBi)					
		WLAN 2.4GHz	WLAN 5GHz Band 1	WLAN 5GHz Band 2	WLAN 5GHz Band 3	WLAN 5GHz Band 4	Bluetooth
1	1	2.81	2.54	2.87	-	-	-
2	2	2.35	2.75	2.41	-	-	-
3	1	-	-	-	3.15	2.89	-
4	2	-	-	-	3.35	2.97	-
5	1	-	-	-	-	-	3.28

Note 2: The above information was declared by manufacturer.

Note 3:

For 2.4GHz function:

For IEEE 802.11b/g/n/ac (2TX/2RX):

Ant. 1 (Port 1) and Ant. 2 (Port 2) can be used as transmitting/receiving antenna.

Ant. 1 (Port 1) and Ant. 2 (Port 2) could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac (2TX/2RX):

Band 1~Band 2

Ant. 1 (Port 1) and Ant. 2 (Port 2) can be used as transmitting/receiving antenna.

Ant. 1 (Port 1) and Ant. 2 (Port 2) could transmit/receive simultaneously.

Band 3~Band 4

Ant. 3 (Port 1) and Ant. 4 (Port 2) can be used as transmitting/receiving antenna.

Ant. 3 (Port 1) and Ant. 4 (Port 2) could transmit/receive simultaneously.

For Bluetooth function (1TX/1RX):

Only Ant. 5 (Port 1) can be used as transmitting/receiving antenna.

**1.1.3 Mode Test Duty Cycle**

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.624	2.05	405u	3k

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	BtCLI & Blue Test3			
Support Mode	☒	LE 1M PHY: 1 Mb/s		
	☐	LE Coded PHY (S=2): 500 Kb/s		
	☐	LE Coded PHY (S=8): 125 Kb/s		
	☐	LE 2M PHY: 2 Mb/s		

Note: The above information was declared by manufacturer.

1.1.5 Table for Multiple Listing

Model Name	Software Versions	Equip Adapter	LED Design	Support Function	Description
MR8300 V1.1	WLAN: 2.0.0.200811 Bluetooth: OpenWrt Chaos Calmer 15.05.1 r35193 /	Adapter 1~3	Please refer to the photographs of EUT	Master (AP Router, Repeater, Bridge)	All models are identical; different models serve as marketing strategy.
MR8250 V1.1	LuCI branch (git-16.190.28508-c9d9415)	Adapter 1~3	Same as above		

Note: From the above models, model: MR8300 V1.1 was selected as representative model for the test and it's data was recorded in this report.

Note: Only AP Router mode has been selected to test and recorded in the test report from manufacturer requirement.



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

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ FCC KDB 558074 D01 v05r02
- ♦ FCC KDB 414788 D01 v01r01

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	Jay Luo	20.9~22.3°C / 47~48%	Mar. 19, 2020 ~ Mar. 27, 2020
Radiated below 1GHz	03CH05-CB	Cola Fan	21.3~23.2°C / 46~49%	Mar. 13, 2020 ~ Apr. 07, 2020
Radiated above 1GHz	03CH01-CB	Cola Fan	20~21.5°C / 46~50%	Mar. 06, 2020 ~ Apr. 07, 2020
AC Conduction	CO01-CB	Peter Wu	23~24°C / 55~58%	Mar. 14, 2020

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D 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

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	7
2440MHz	7
2480MHz	7

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	AP Router mode: EUT + Adapter 1
2	AP Router mode: EUT + Adapter 2 + US plug
3	AP Router mode: EUT + Adapter 3
For operating mode 3 is the worst case and it was record in this test report.	

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



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	CTX
WLAN 2.4GHz: The EUT was performed at Y axis and Z axis position for Emissions in Restricted Frequency Bands above 1GHz test, and the worst case was found at Y axis. So the measurement will follow this same test configuration. WLAN 5GHz/Bluetooth: The EUT was performed at Y axis and Z axis position for Emissions in Restricted Frequency Bands above 1GHz test, and the worst case was found at Z axis. So the measurement will follow this same test configuration.	
1	WLAN 2.4GHz: EUT in Y axis + Adapter 1
2	WLAN 2.4GHz: EUT in Y axis + Adapter 2 + US plug
3	WLAN 2.4GHz: EUT in Y axis + Adapter 3
Mode 1 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4~6 will follow this same test mode.	
4	WLAN 5GHz: EUT in Z axis + Adapter 1
5	Bluetooth BR+EDR: EUT in Z axis + Adapter 1
6	Bluetooth LE: EUT in Z axis + Adapter 1
For operating mode 1 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
The EUT was performed at Y axis and Z axis position for harmonic test, and the worst case was found at Z axis. So the measurement will follow this same test configuration. The EUT was performed at Y axis and Z axis position for bandedge test, and the worst case was found at Y axis. So the measurement will follow this same test configuration.	
1	EUT in Z axis for harmonic
	EUT in Y axis for bandedge

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 Band 1~2 + WLAN 5GHz Band 3~4 + Bluetooth
Refer to Sporton Test Report No.: FA710901-06 for Co-location RF Exposure Evaluation.	



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			
Equipment Name	Brand Name	Model Name	Rating
Adapter 1 (Fixed plug)	Ktec	KSA-24W-120200HU	Input: 100-240V, 50/60Hz, 0.6A Output: 12V, 2.0A
Adapter 2 (Interchangeable plug)	Ktec	KSA-24W-120200D5	Input: 100-240V, 50/60Hz, 0.6A Output: 12V, 2.0A
Adapter 3 (Fixed plug)	APD	WB-24J12FU	Input: 100-240V, 50-60Hz, 0.7A Max. Output: 12V, 2A
Others			
US plug*1 (for adapter 2 use only)			
RJ-45 cable*1, Non-shielded, 0.9m			



2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	LAN1 NB	DELL	E6430	N/A
B	WAN NB	DELL	E6430	N/A
C	2.4G NB	DELL	E6430	N/A
D	5G-1 NB	Apple	A1278	N/A
E	5G-2 NB	DELL	E6430	N/A
F	Smart phone	Samsung	Galaxy J2	N/A
G	Flash disk3.0	Transcend	JetFlash-700	N/A

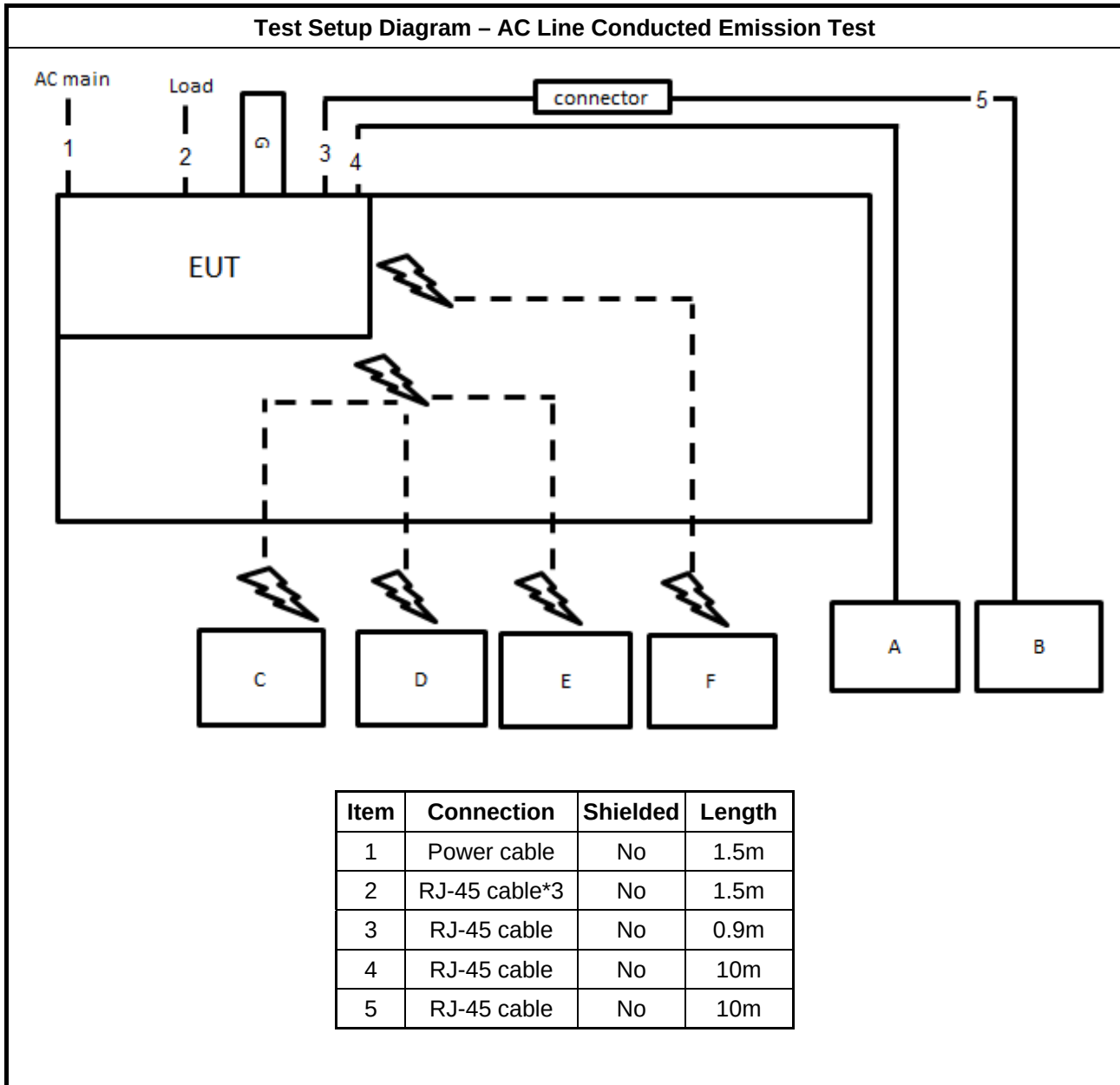
For Radiated:

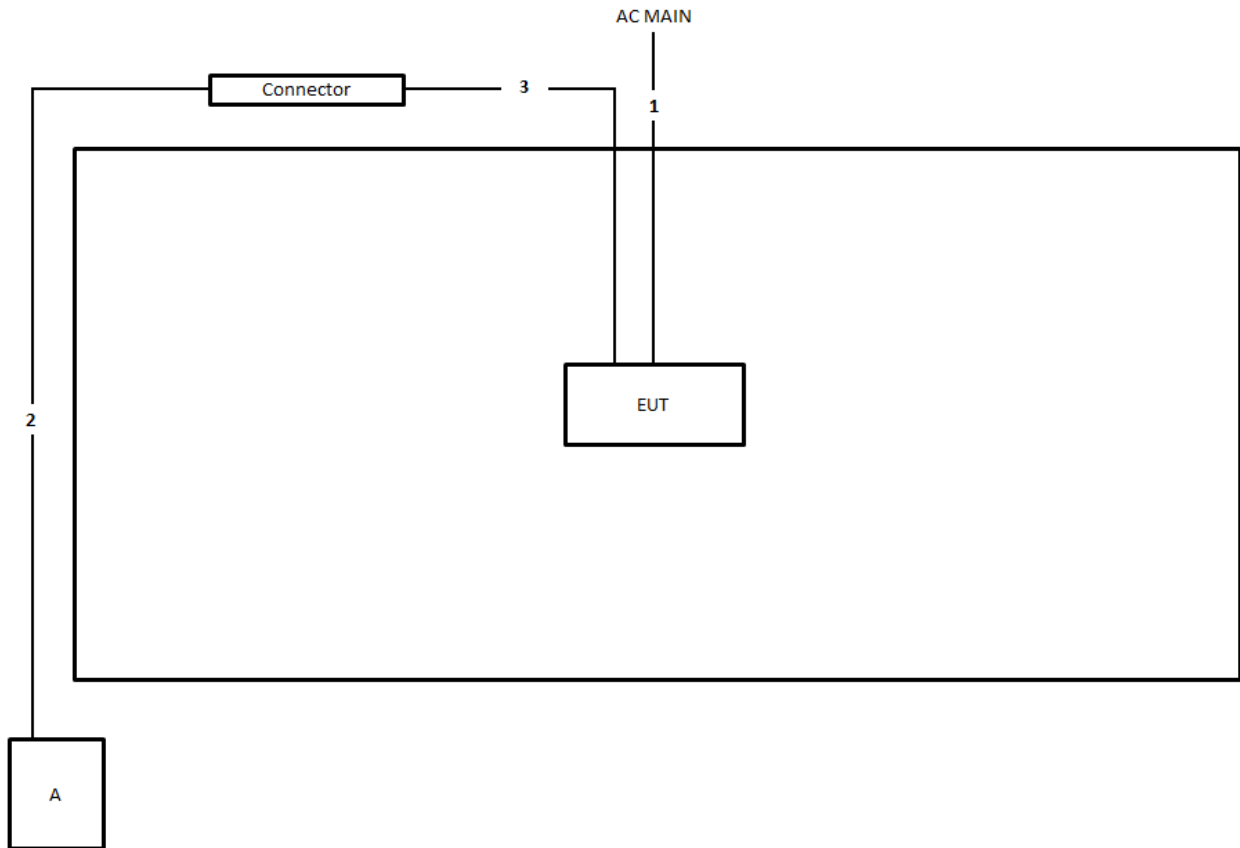
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	M4800	N/A

For RF Conducted:

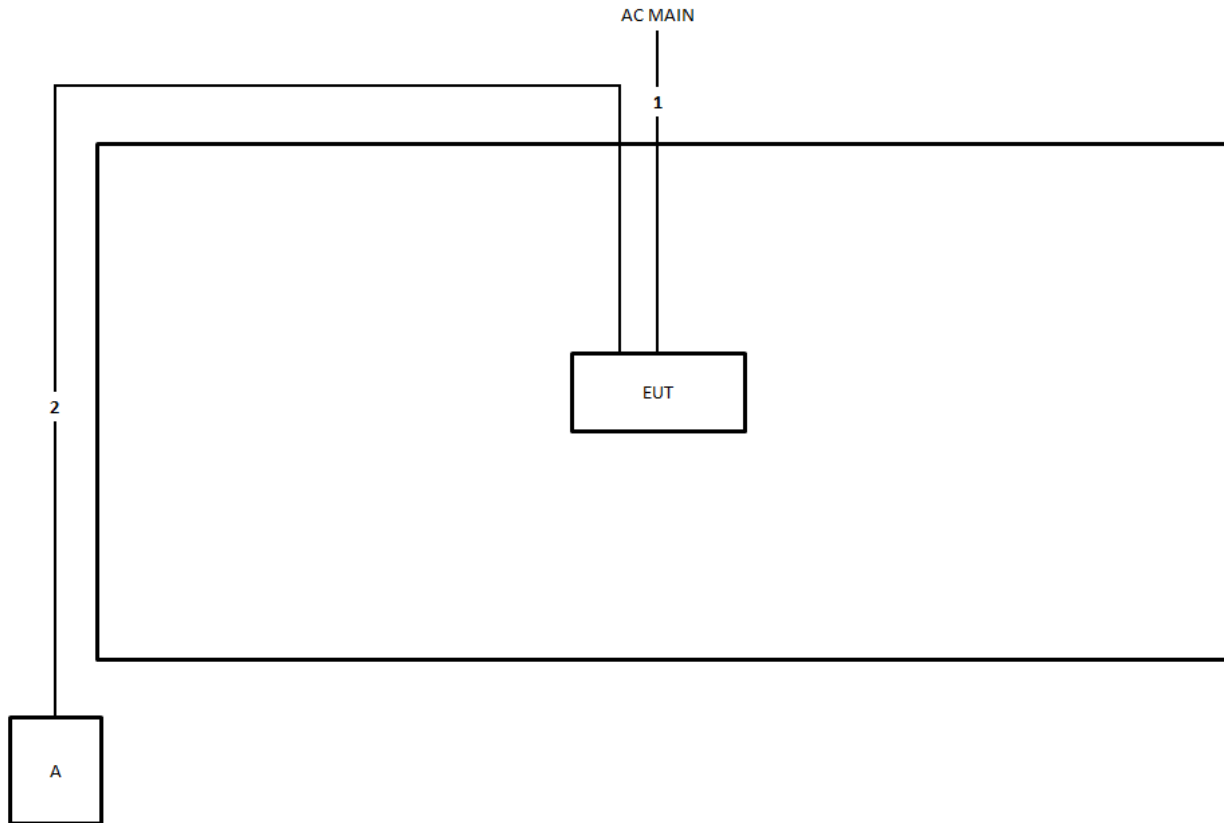
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A

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	0.9m

Test Setup Diagram - Radiated Test > 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m



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.

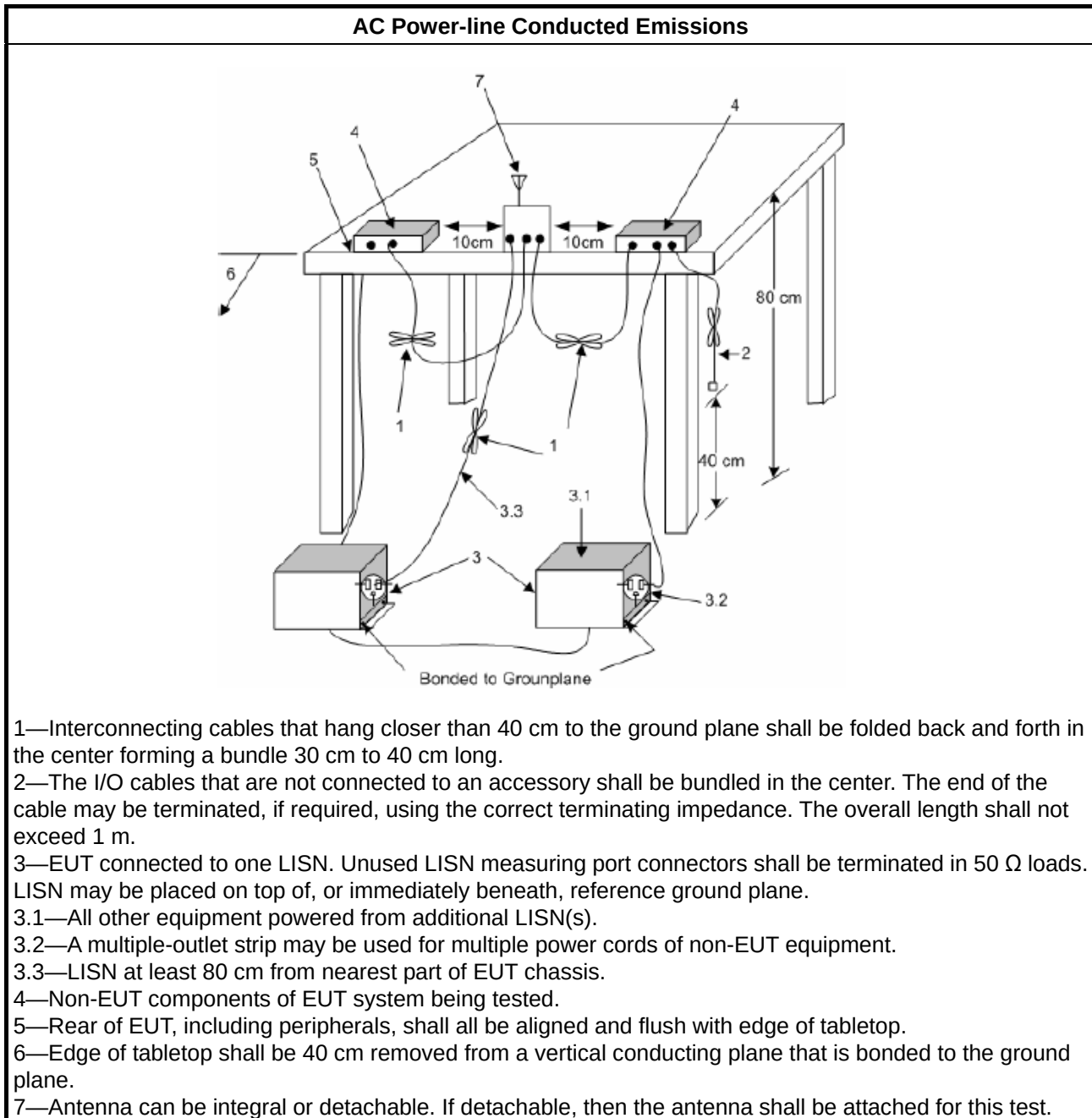
3.1.2 Measuring Instruments

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 Measurement Results Calculation

The measured Level is calculated using:

- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- Margin = - Limit + (Read Level + LISN Factor + Cable Loss)

3.1.6 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.

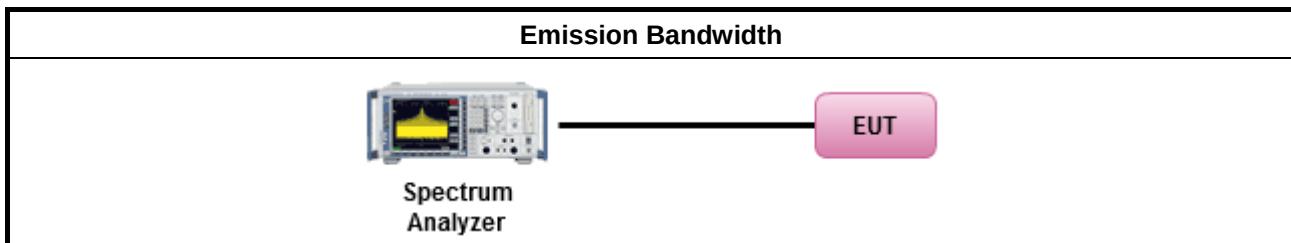
3.2.2 Measuring Instruments

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.	

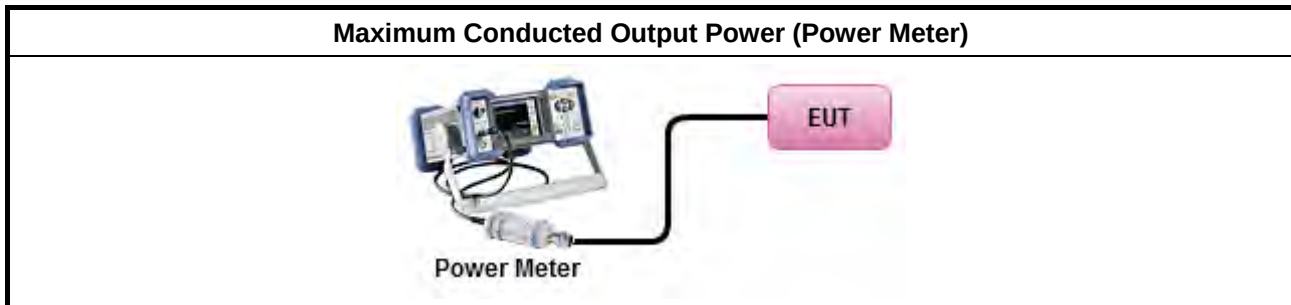
3.3.2 Measuring Instruments

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 ≥ 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 ≥ 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: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

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

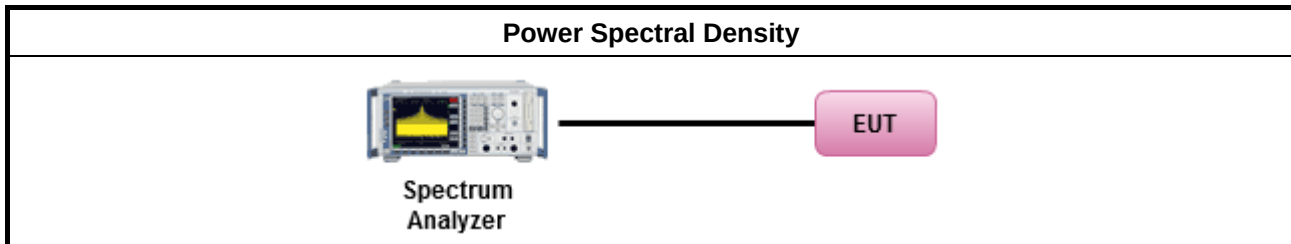
3.4.2 Measuring Instruments

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 Method Max. PSD. [duty cycle $\geq 98\%$ or external video / power trigger]
▪ 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.	

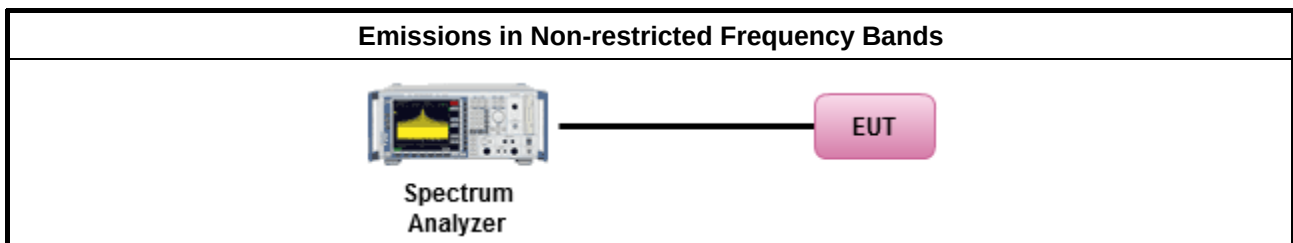
3.5.2 Measuring Instruments

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

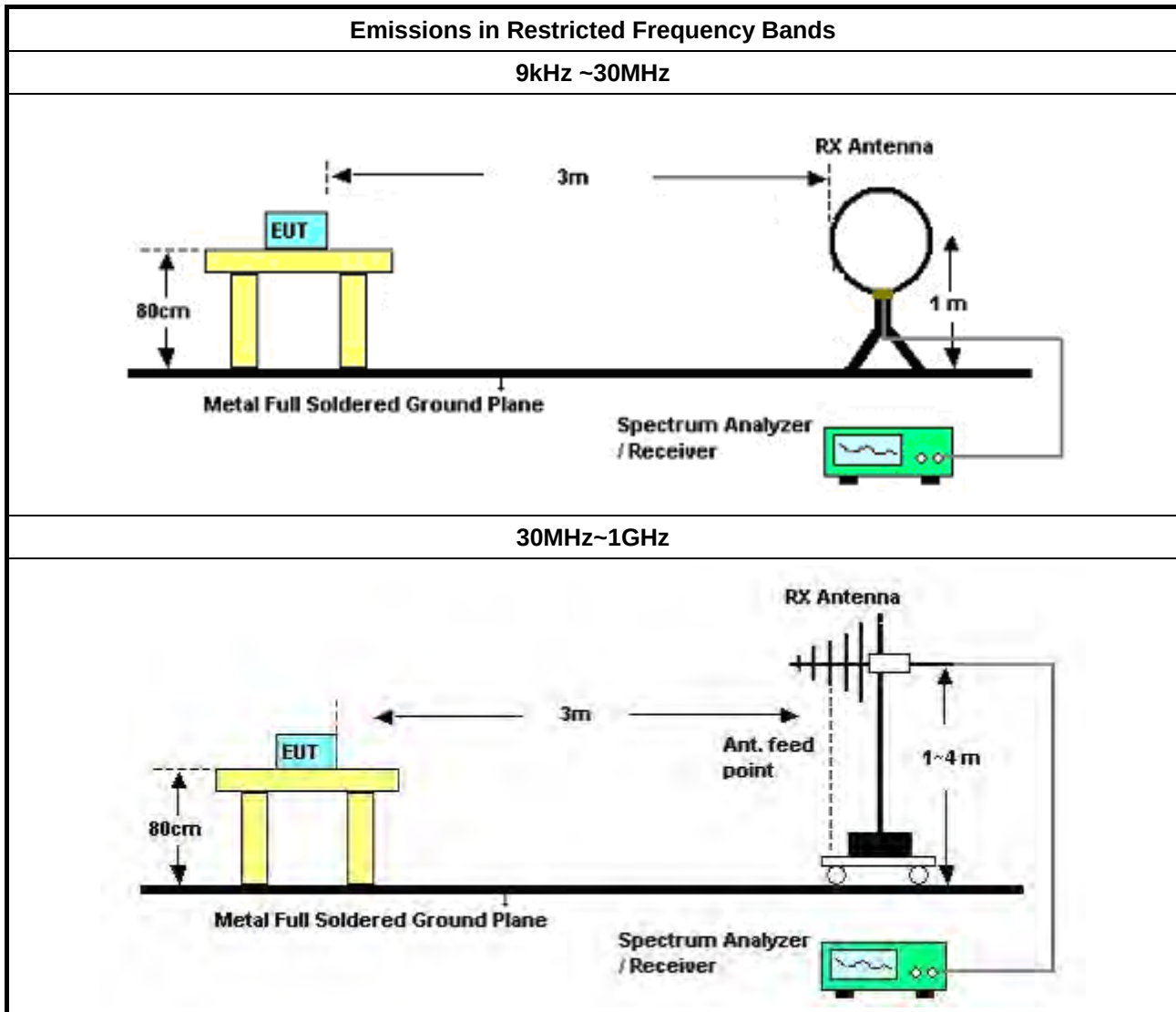
Refer a test equipment and calibration data table in this test report.

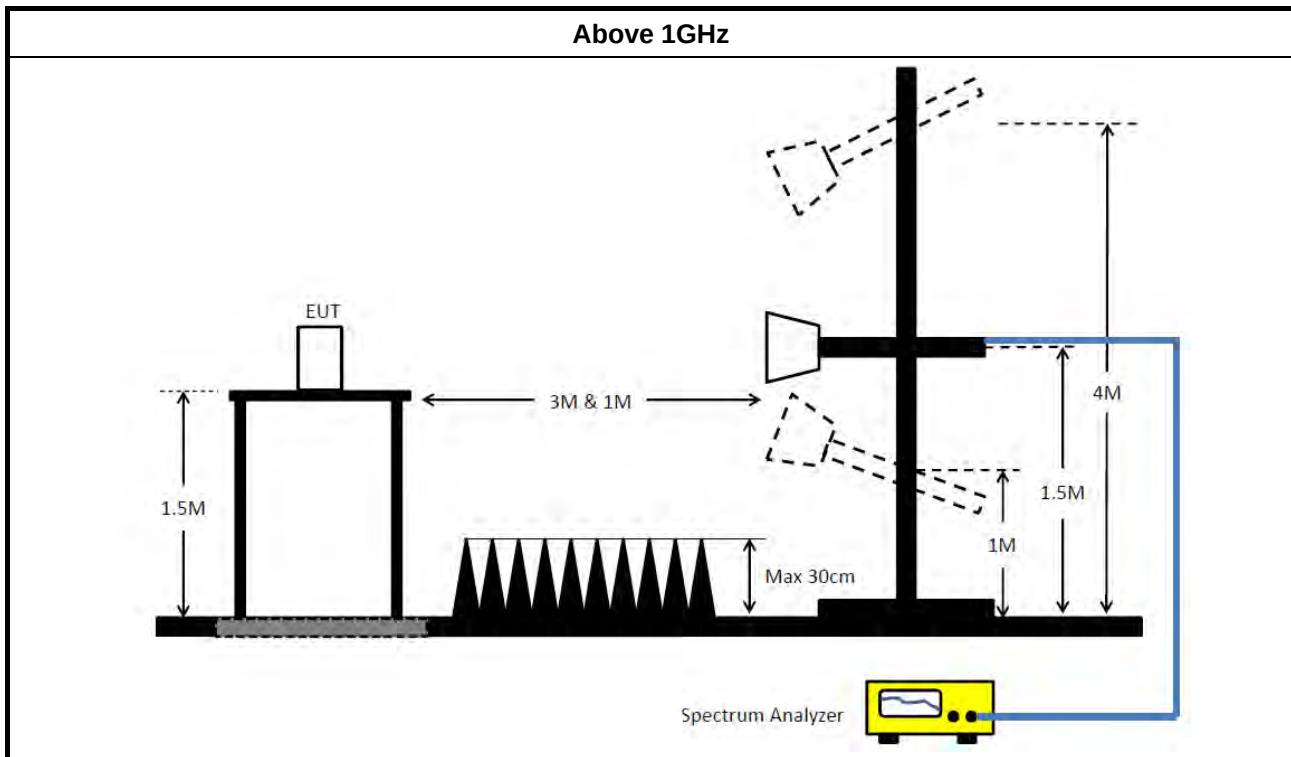


3.6.3 Test Procedures

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 - Preamplifier Factor (if applicable) = Level.

3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Feb. 26, 2020	Feb. 25, 2021	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 25, 2019	Dec. 24, 2020	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Feb. 25, 2020	Feb. 24, 2021	Conduction (CO01-CB)
Impedance Stabilization Network	Teseq	ISN T800	24557	150kHz ~ 230MHz	Nov. 25, 2019	Nov. 24, 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)
Bilog Antenna with 6dB Attenuator	Schaffner & EMCI	CBL6112 & N-6-06	2888 & AT-N0611	30MHz ~ 1GHz	Oct. 12, 2019	Oct. 11, 2020	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	31244	9kHz - 30 MHz	Mar. 16, 2020	Mar. 15, 2021	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Aug. 15, 2019	Aug. 14, 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. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
Horn Antenna	ETS-LINDGREN	3115	00075790	750MHz ~ 18GHz	Nov. 04, 2019	Nov. 03, 2020	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2020	Jan. 07, 2021	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100019	9kHz ~ 40GHz	Jun. 19, 2019	Jun. 18, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jul. 02, 2019	Jul. 01, 2020	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-3	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)

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

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



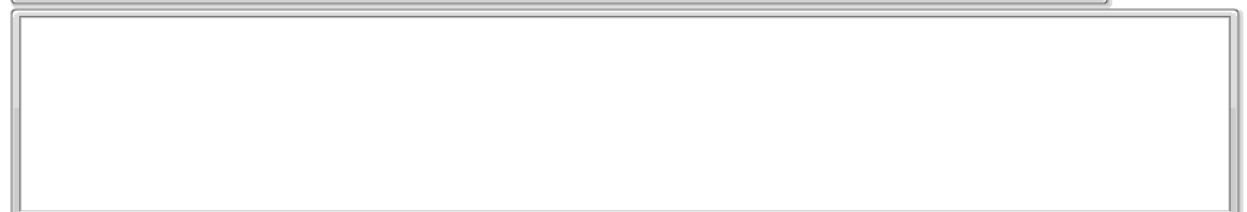
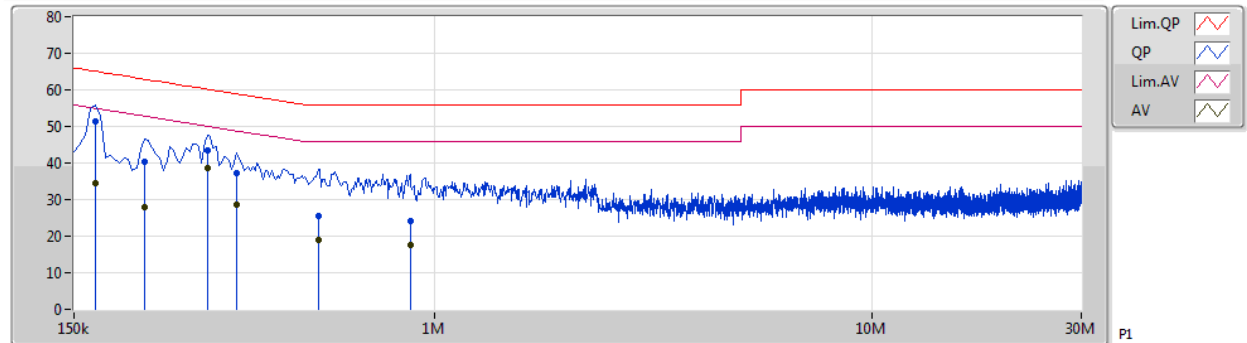
AC Power Port Conducted Emission Result

Appendix A

Summary

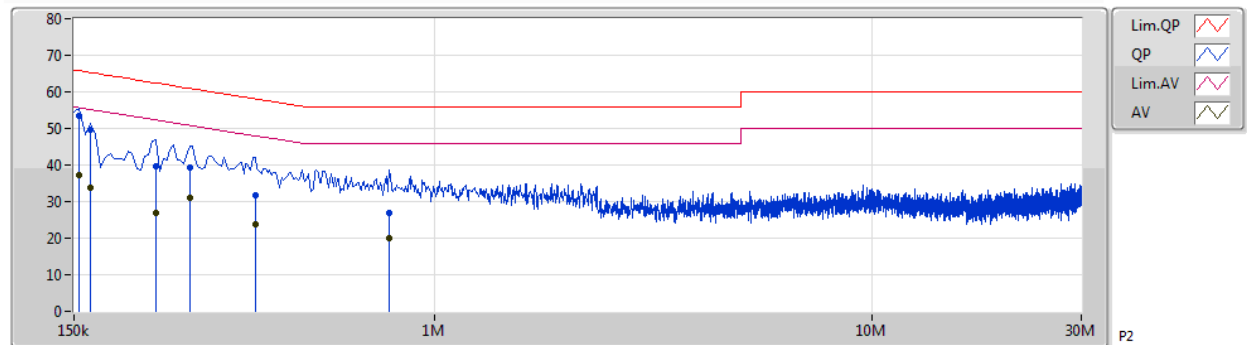
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition
Mode 3	Pass	AV	303k	38.60	50.17	-11.57	10.23	Line

Mode 3



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	168k	51.35	65.06	-13.71	10.21	Line	-	41.14	0.05	0.06	10.10			
AV	168k	34.37	55.06	-20.69	10.21	Line	-	24.16	0.05	0.06	10.10			
QP	217.5k	40.32	62.92	-22.60	10.22	Line	-	30.10	0.05	0.07	10.10			
AV	217.5k	27.87	52.92	-25.05	10.22	Line	-	17.65	0.05	0.07	10.10			
QP	303k	43.52	60.17	-16.65	10.23	Line	-	33.29	0.05	0.08	10.10			
AV	303k	38.60	50.17	-11.57	10.23	Line	"Worst"	28.37	0.05	0.08	10.10			
QP	352.5k	37.19	58.91	-21.72	10.23	Line	-	26.96	0.05	0.08	10.10			
AV	352.5k	28.52	48.91	-20.39	10.23	Line	-	18.29	0.05	0.08	10.10			
QP	541.5k	25.56	56.00	-30.44	10.24	Line	-	15.32	0.05	0.09	10.10			
AV	541.5k	18.93	46.00	-27.07	10.24	Line	-	8.69	0.05	0.09	10.10			
QP	879k	24.28	56.00	-31.72	10.27	Line	-	14.01	0.06	0.11	10.10			
AV	879k	17.61	46.00	-28.39	10.27	Line	-	7.34	0.06	0.11	10.10			

Mode 3



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	154.5k	53.55	65.75	-12.20	10.21	Neutral	"Worst"	43.34	0.05	0.06	10.10			
AV	154.5k	37.37	55.75	-18.38	10.21	Neutral	-	27.16	0.05	0.06	10.10			
QP	163.5k	49.80	65.27	-15.47	10.21	Neutral	-	39.59	0.05	0.06	10.10			
AV	163.5k	33.69	55.27	-21.58	10.21	Neutral	-	23.48	0.05	0.06	10.10			
QP	231k	39.82	62.41	-22.59	10.22	Neutral	-	29.60	0.05	0.07	10.10			
AV	231k	26.81	52.41	-25.60	10.22	Neutral	-	16.59	0.05	0.07	10.10			
QP	276k	39.38	60.93	-21.55	10.22	Neutral	-	29.16	0.05	0.07	10.10			
AV	276k	31.20	50.93	-19.73	10.22	Neutral	-	20.98	0.05	0.07	10.10			
QP	388.5k	31.73	58.10	-26.37	10.23	Neutral	-	21.50	0.05	0.08	10.10			
AV	388.5k	23.63	48.10	-24.47	10.23	Neutral	-	13.40	0.05	0.08	10.10			
QP	789k	26.79	56.00	-29.21	10.27	Neutral	-	16.52	0.06	0.11	10.10			
AV	789k	19.86	46.00	-26.14	10.27	Neutral	-	9.59	0.06	0.11	10.10			



Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	601.25k	1.028M	1M03F1D	572.5k	1.023M

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;

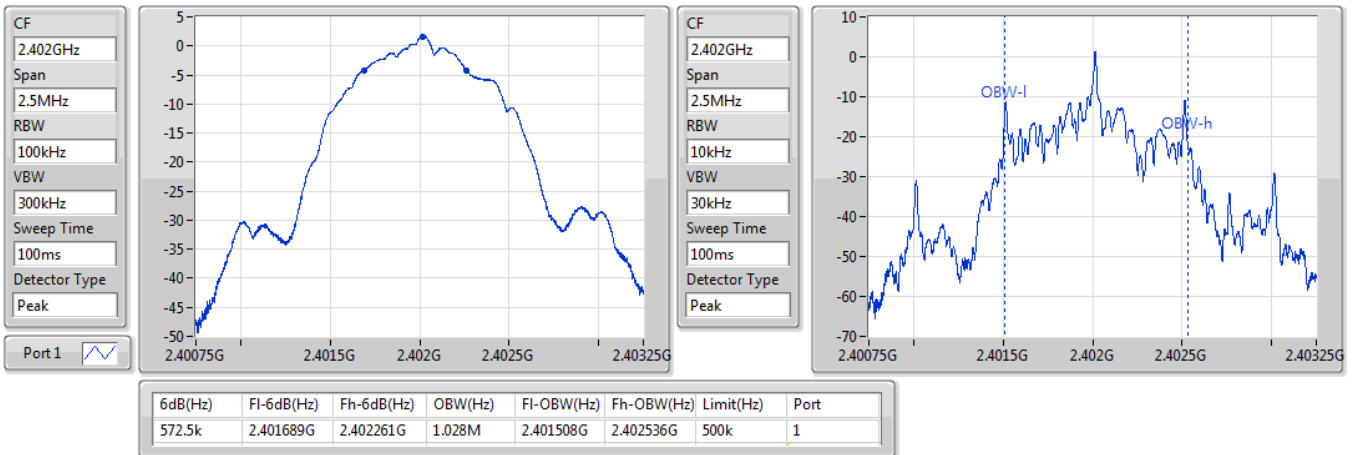
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	572.5k	1.028M
2440MHz	Pass	500k	600k	1.023M
2480MHz	Pass	500k	601.25k	1.023M

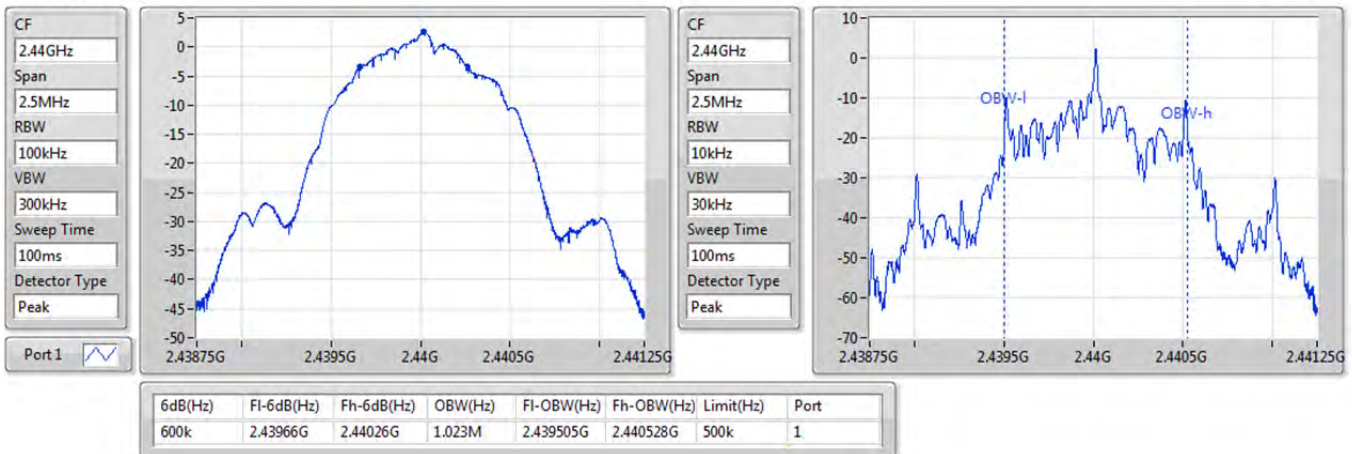
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

BT-LE(1Mbps)
2402MHz

23/03/2020


BT-LE(1Mbps)
2440MHz

23/03/2020



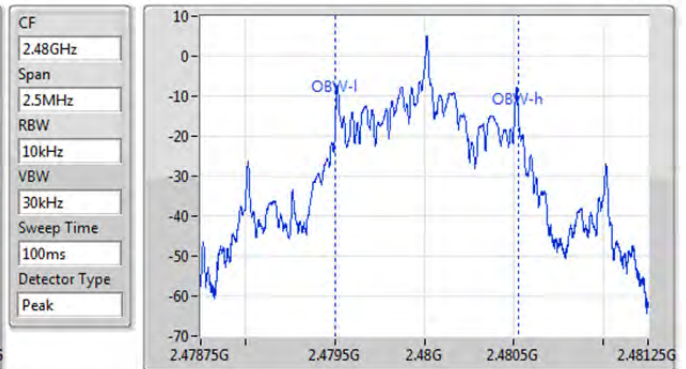
BT-LE(1Mbps)

2480MHz



EBW

23/03/2020





Average Power-DTS

Appendix C

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	5.42	0.00348



Average Power-DTS

Appendix C

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.28	1.87	30.00
2440MHz	Pass	3.28	2.60	30.00
2480MHz	Pass	3.28	5.42	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	4.08

RBW=3 kHz.

Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.28	0.38	8.00
2440MHz	Pass	3.28	1.32	8.00
2480MHz	Pass	3.28	4.08	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;

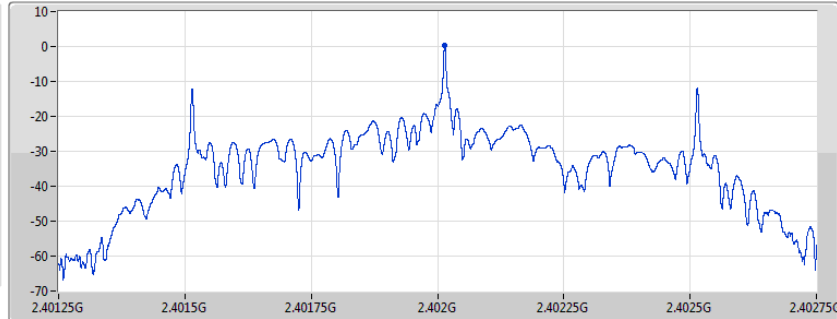
BT-LE(1Mbps)

PSD

2402MHz

23/03/2020

CF
2.402GHz
Span
1.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
632.18121us
Detector Type
Peak



Port 1

Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
0.38	0.38	0.38

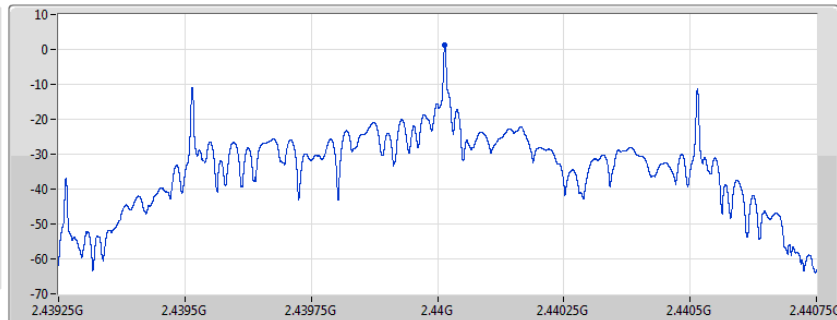
BT-LE(1Mbps)

PSD

2440MHz

23/03/2020

CF
2.44GHz
Span
1.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
632.18121us
Detector Type
Peak



Port 1

Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
1.32	1.32	1.32

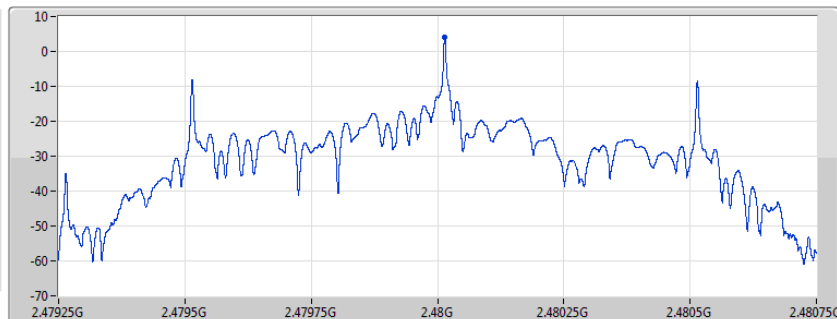
BT-LE(1Mbps)

PSD

2480MHz

23/03/2020

CF
2.48GHz
Span
1.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
632.18121us
Detector Type
Peak



Port 1

Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.08	4.08	4.08



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)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.48003G	5.37	-24.63	684.77M	-52.67	2.4G	-48.74	2.4G	-49.42	2.48944G	-51.23	15.28714G	-40.58	1



Result

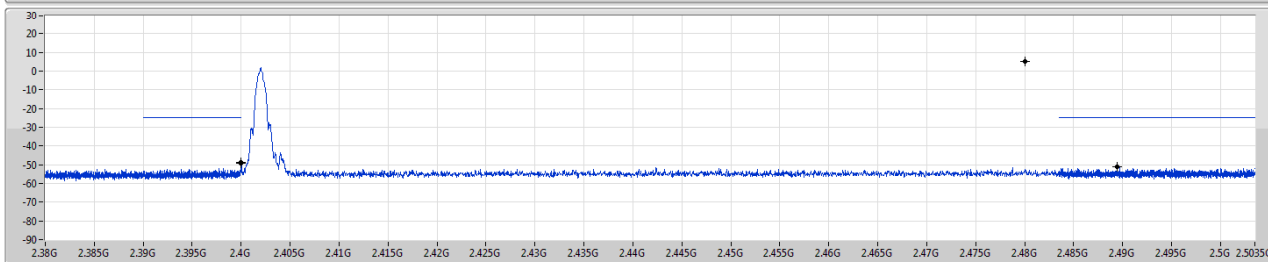
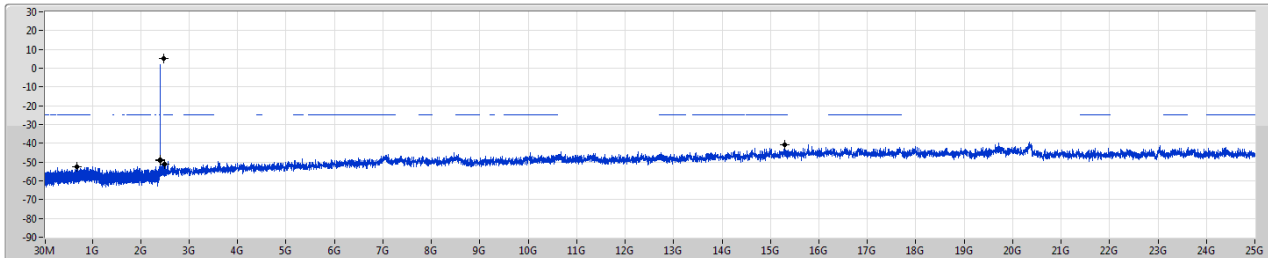
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.48003G	5.37	-24.63	684.77M	-52.67	2.4G	-48.74	2.4G	-49.42	2.48944G	-51.23	15.28714G	-40.58	1
2440MHz	Pass	2.48003G	5.37	-24.63	920.94M	-52.38	2.39689G	-52.05	2.4G	-55.00	2.49208G	-51.00	17.12341G	-41.64	1
2480MHz	Pass	2.48003G	5.37	-24.63	742.34M	-52.03	2.393G	-51.93	2.4835G	-54.34	2.49742G	-51.26	16.52444G	-41.47	1

BT-LE(1Mbps)

2402MHz

CSE NdB

23/03/2020



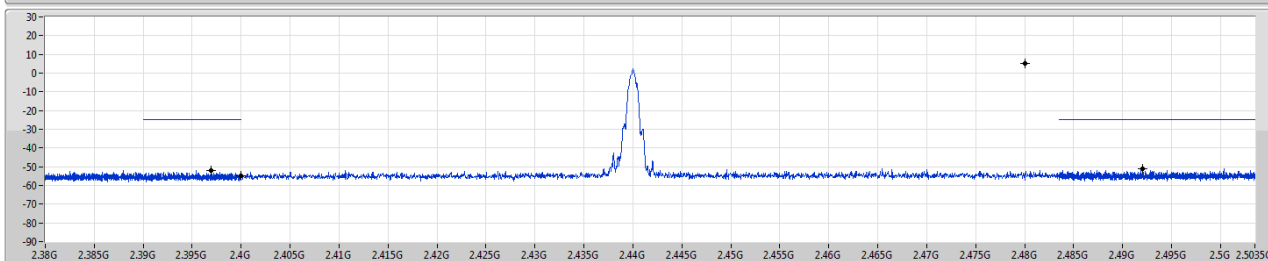
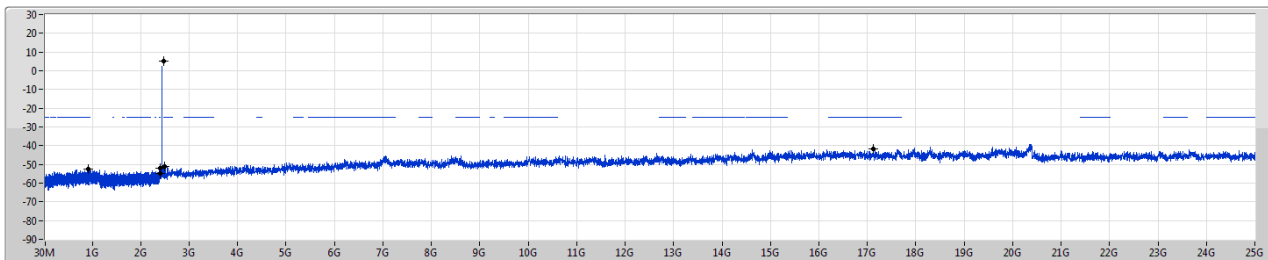
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48003G	5.37	-24.63	684.77M	-52.67	2.4G	-48.74	2.4G	-49.42	2.48944G	-51.23	15.28714G	-40.58	1

BT-LE(1Mbps)

2440MHz

CSE NdB

23/03/2020



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48003G	5.37	-24.63	920.94M	-52.38	2.39689G	-52.05	2.4G	-55.00	2.48208G	-51.00	17.12341G	-41.64	1

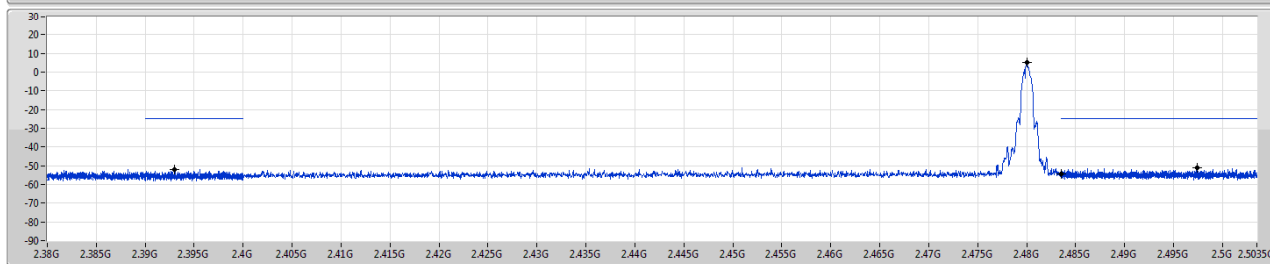
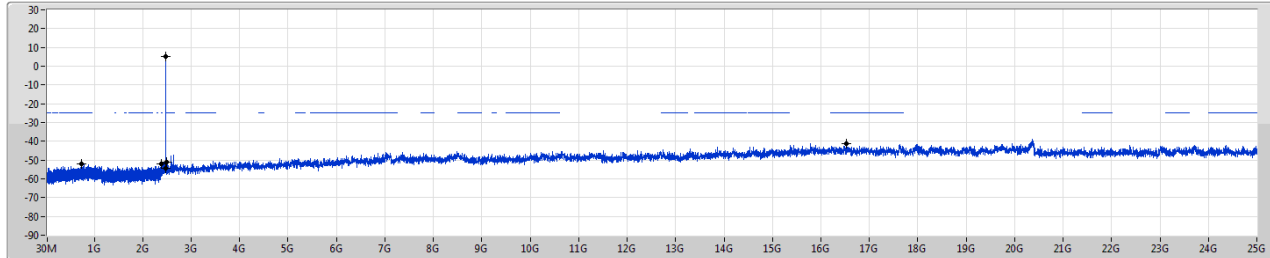
BT-LE(1Mbps)

2480MHz

CSE NdB

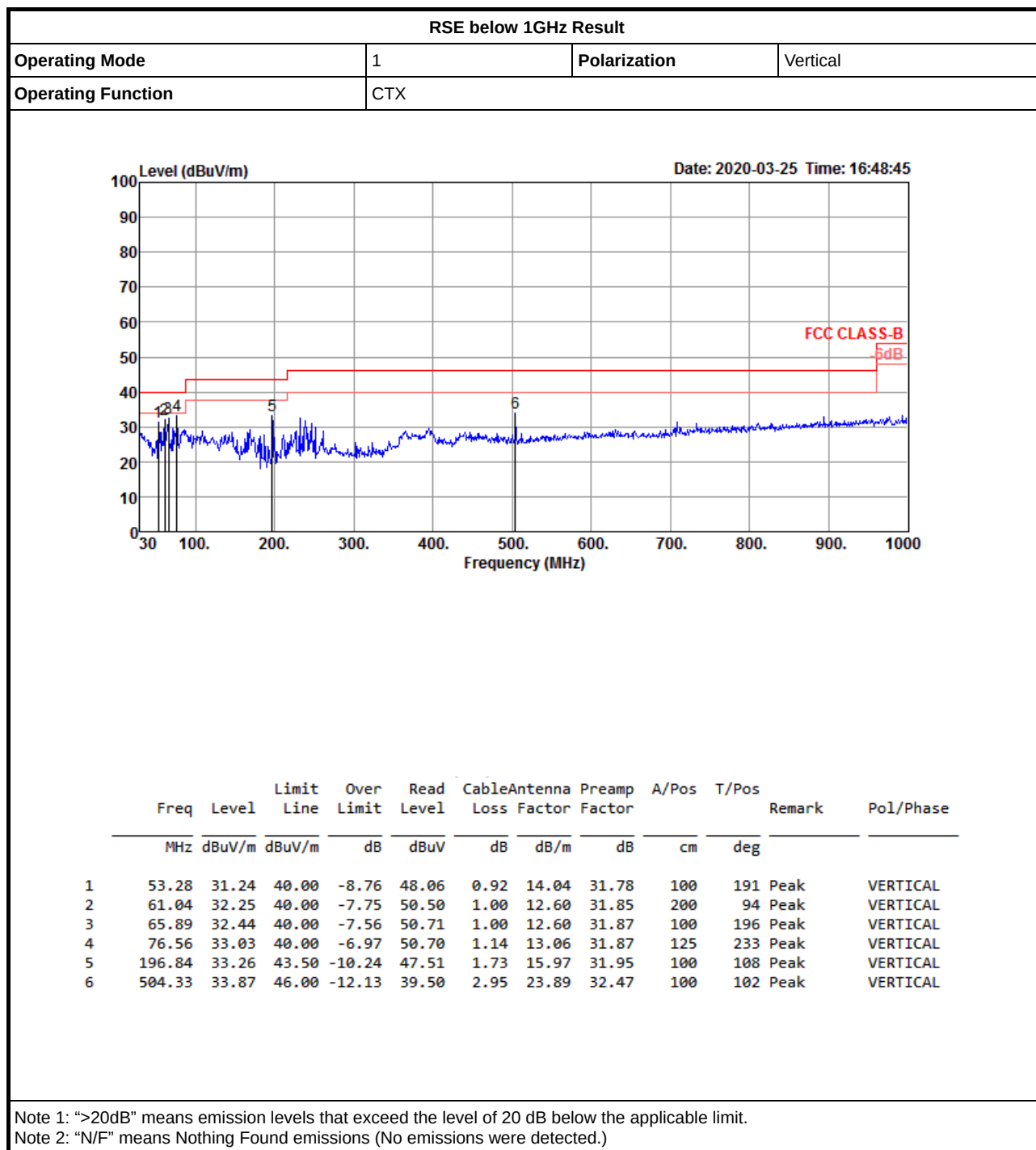
23/03/2020

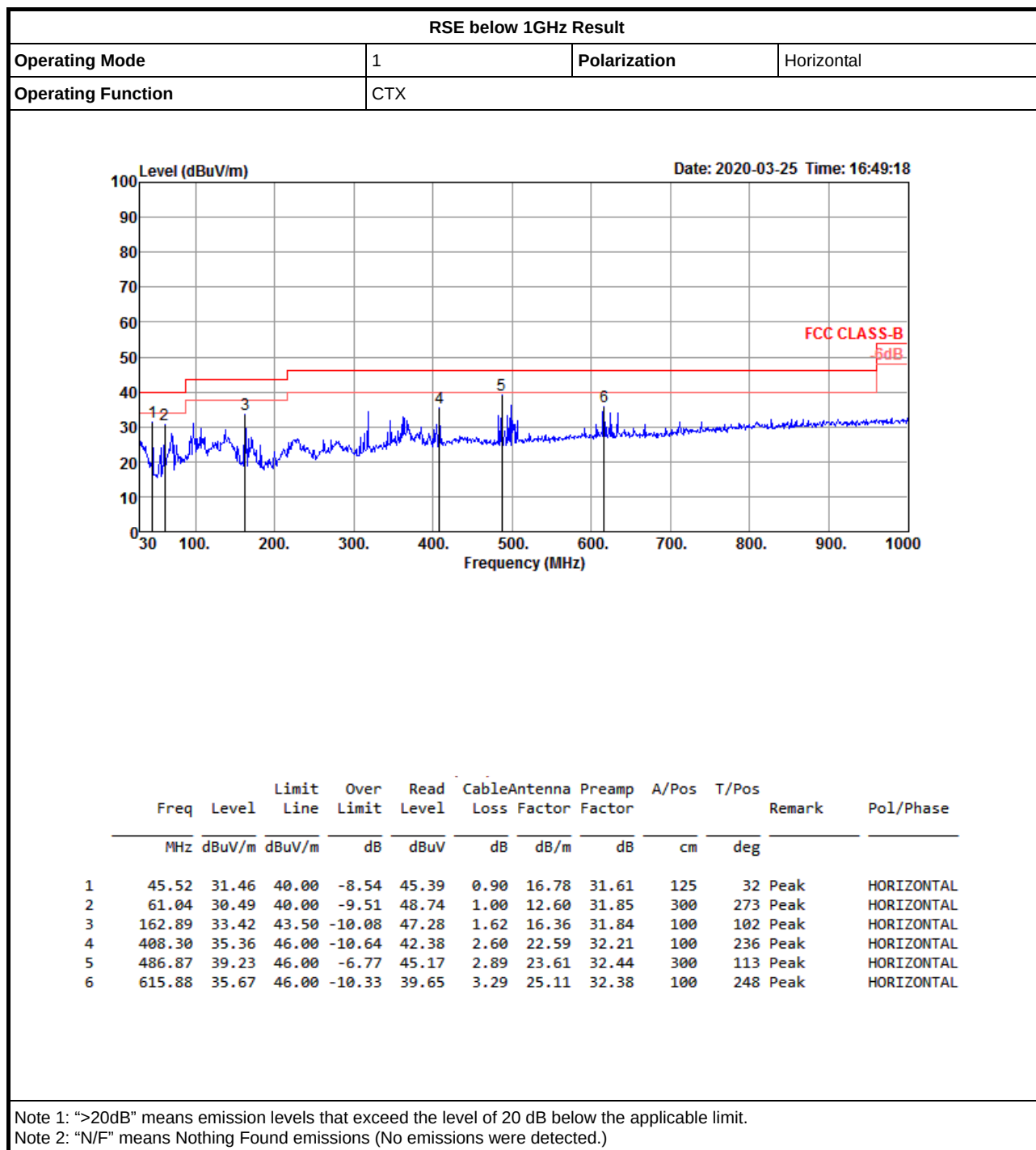
Port 1



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)	Freq(Hz)	Level(dBm)	Port
2.48003G	5.37	-24.63	742.34M	-52.03	2.393G	-51.93	2.4835G	-54.34	2.49742G	-51.26	16.52444G	-41.47	1







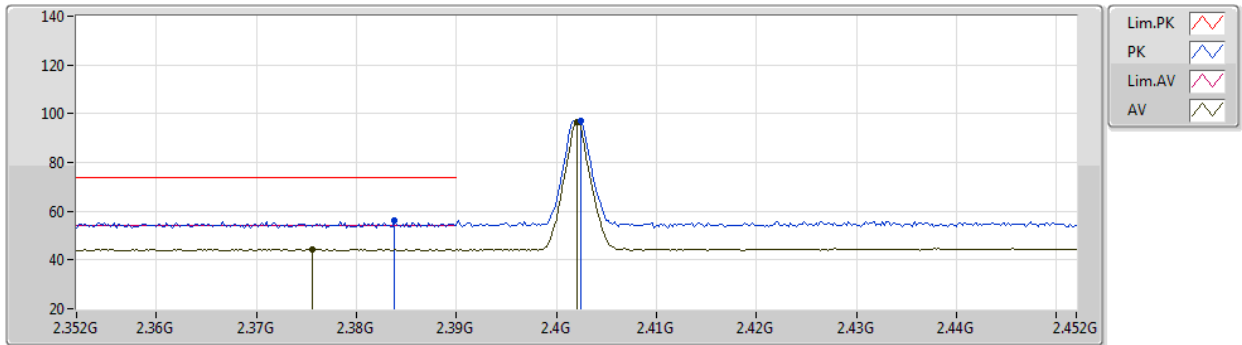
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.4835G	50.50	54.00	-3.50	3	Horizontal	313	2.81	-

BT-LE(1Mbps)

2402MHz_TX

19/03/2020



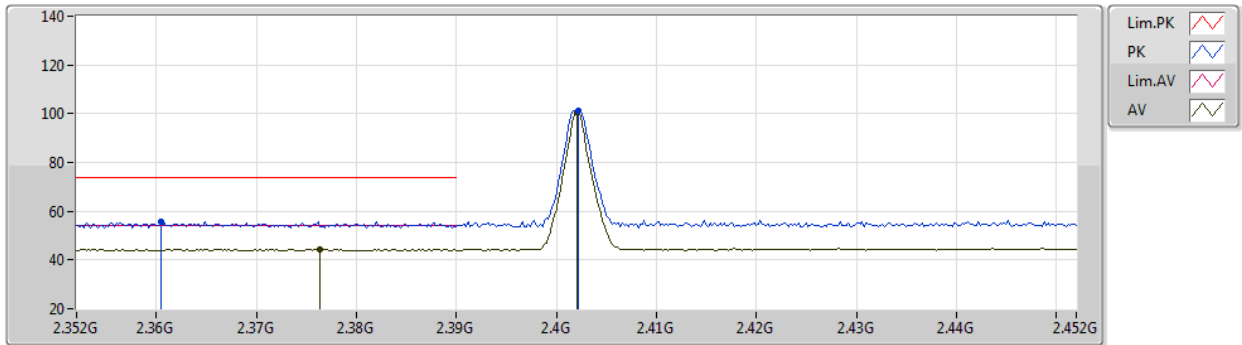
EUT Y_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3838G	56.20	74.00	-17.80	24.20	3	Vertical	193	1.32	-	28.27	3.73	-
AV	2.3756G	44.42	54.00	-9.58	12.44	3	Vertical	193	1.32	-	28.25	3.73	-
PK	2.4024G	97.21	Inf	-Inf	65.16	3	Vertical	193	1.32	-	28.31	3.74	-
AV	2.402G	96.30	Inf	-Inf	64.25	3	Vertical	193	1.32	-	28.31	3.74	-

BT-LE(1Mbps)

2402MHz_TX

19/03/2020



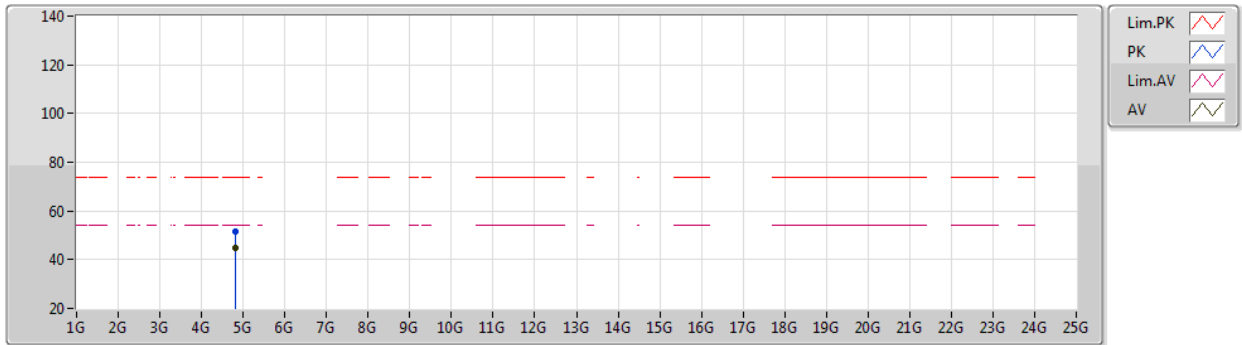
EUT Y_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3604G	55.90	74.00	-18.10	23.96	3	Horizontal	304	3.00	-	28.22	3.72	-
AV	2.3764G	44.42	54.00	-9.58	12.44	3	Horizontal	304	3.00	-	28.25	3.73	-
PK	2.4022G	101.40	Inf	-Inf	69.35	3	Horizontal	304	3.00	-	28.31	3.74	-
AV	2.402G	100.44	Inf	-Inf	68.39	3	Horizontal	304	3.00	-	28.31	3.74	-

BT-LE(1Mbps)

2402MHz_TX

19/03/2020



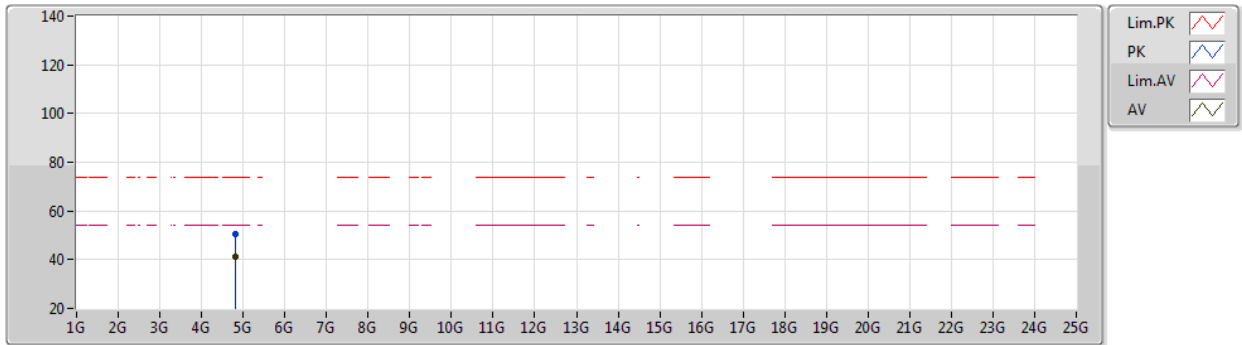
EUT Z_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.80429G	51.59	74.00	-22.41	46.36	3	Vertical	36	1.00	-	33.51	6.56	34.84
AV	4.80398G	45.04	54.00	-8.96	39.81	3	Vertical	36	1.00	-	33.51	6.56	34.84

BT-LE(1Mbps)

2402MHz_TX

19/03/2020



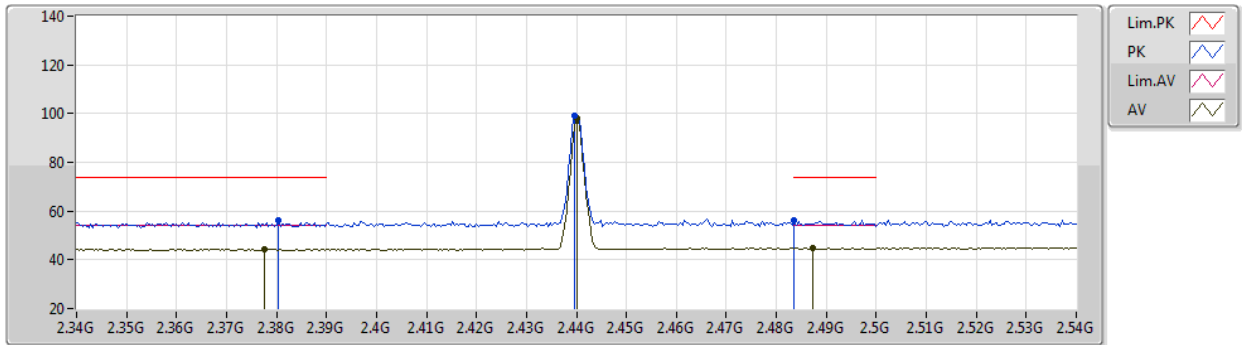
EUT Z_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.8043G	50.42	74.00	-23.58	45.19	3	Horizontal	213	2.56	-	33.51	6.56	34.84
AV	4.80405G	41.24	54.00	-12.76	36.01	3	Horizontal	213	2.56	-	33.51	6.56	34.84

BT-LE(1Mbps)

2440MHz_TX

19/03/2020



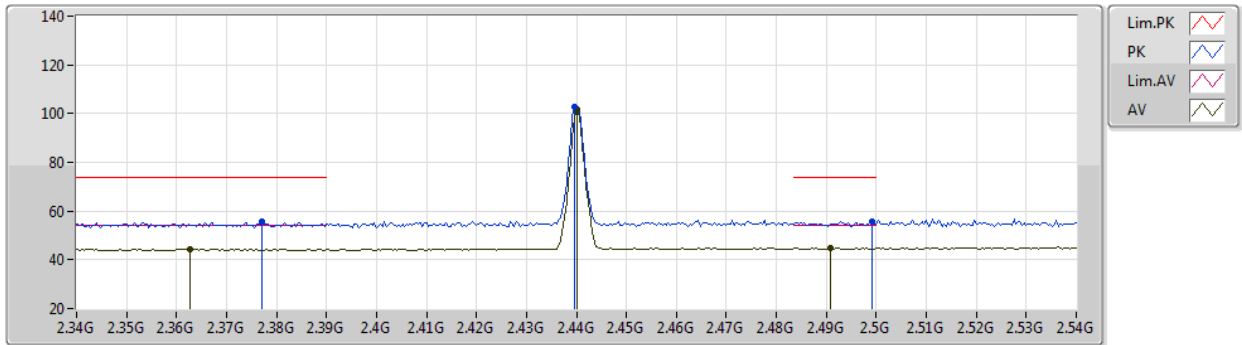
EUT_V1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3804G	55.95	74.00	-18.05	23.96	3	Vertical	196	1.50	-	28.26	3.73	-
AV	2.3776G	44.31	54.00	-9.69	12.32	3	Vertical	196	1.50	-	28.26	3.73	-
PK	2.4396G	98.90	Inf	-Inf	66.72	3	Vertical	196	1.50	-	28.42	3.76	-
AV	2.44G	97.95	Inf	-Inf	65.77	3	Vertical	196	1.50	-	28.42	3.76	-
PK	2.4835G	56.43	74.00	-17.57	24.09	3	Vertical	196	1.50	-	28.55	3.79	-
AV	2.4872G	44.82	54.00	-9.18	12.47	3	Vertical	196	1.50	-	28.56	3.79	-

BT-LE(1Mbps)

2440MHz_TX

19/03/2020



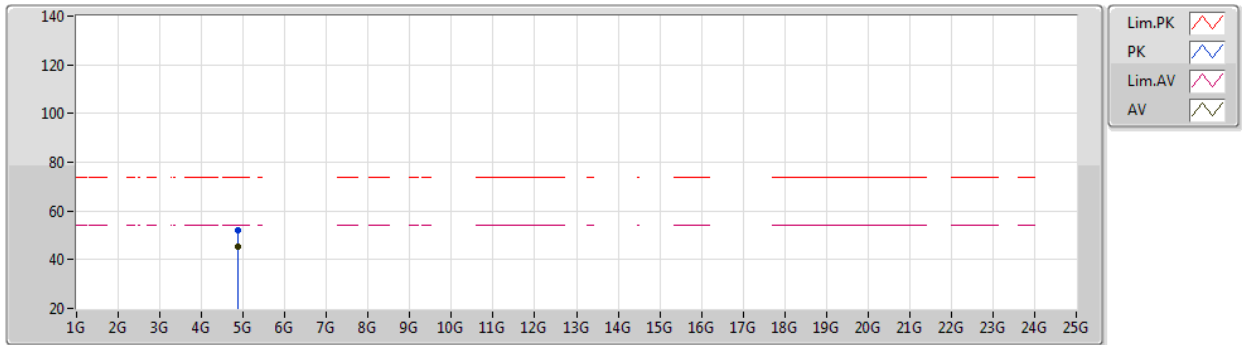
EUT Y_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3772G	55.53	74.00	-18.47	23.55	3	Horizontal	312	2.90	-	28.25	3.73	-
AV	2.3628G	44.41	54.00	-9.59	12.46	3	Horizontal	312	2.90	-	28.23	3.72	-
PK	2.4396G	102.60	Inf	-Inf	70.42	3	Horizontal	312	2.90	-	28.42	3.76	-
AV	2.44G	101.62	Inf	-Inf	69.44	3	Horizontal	312	2.90	-	28.42	3.76	-
PK	2.4992G	55.55	74.00	-18.45	23.15	3	Horizontal	312	2.90	-	28.60	3.80	-
AV	2.4908G	44.90	54.00	-9.10	12.54	3	Horizontal	312	2.90	-	28.57	3.79	-

BT-LE(1Mbps)

2440MHz_TX

19/03/2020



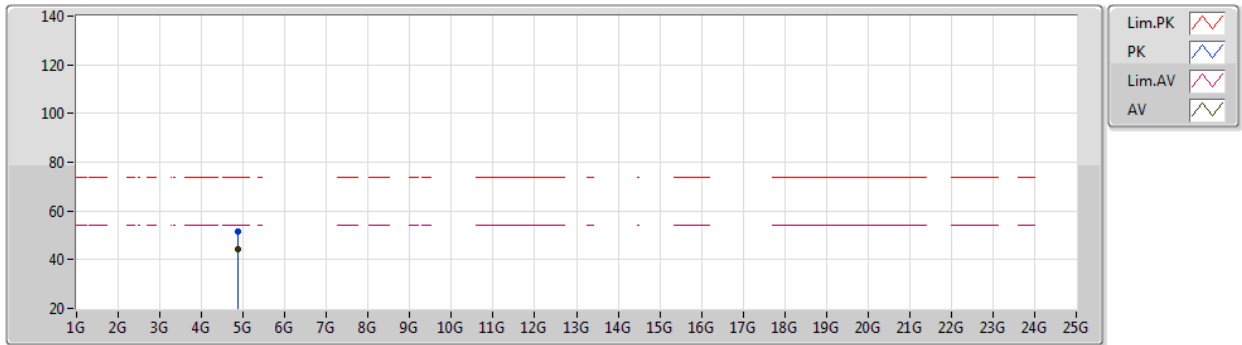
EUT Z_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.87971G	52.19	74.00	-21.81	46.73	3	Vertical	343	1.32	-	33.66	6.58	34.78
AV	4.88003G	45.48	54.00	-8.52	40.02	3	Vertical	343	1.32	-	33.66	6.58	34.78

BT-LE(1Mbps)

2440MHz_TX

19/03/2020



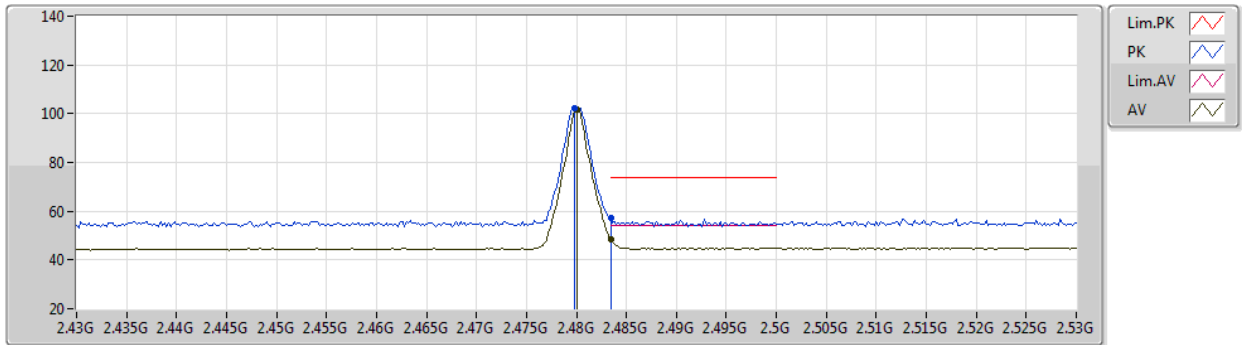
EUT Z_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88028G	51.68	74.00	-22.32	46.22	3	Horizontal	297	1.05	-	33.66	6.58	34.78
AV	4.88006G	44.22	54.00	-9.78	38.76	3	Horizontal	297	1.05	-	33.66	6.58	34.78

BT-LE(1Mbps)

2480MHz_TX

19/03/2020



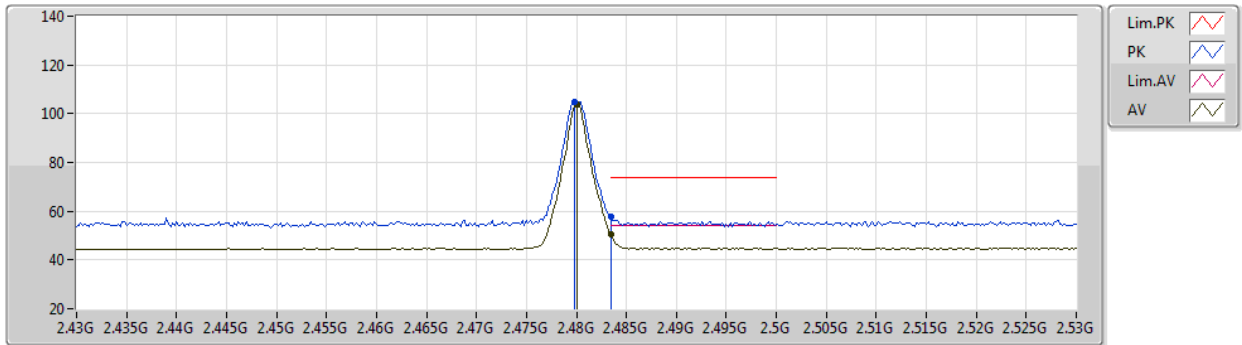
EUT Y_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4798G	102.49	Inf	-Inf	70.16	3	Vertical	342	1.00	-	28.54	3.79	-
AV	2.48G	101.56	Inf	-Inf	69.23	3	Vertical	342	1.00	-	28.54	3.79	-
PK	2.4835G	57.11	74.00	-16.89	24.77	3	Vertical	342	1.00	-	28.55	3.79	-
AV	2.4835G	48.58	54.00	-5.42	16.24	3	Vertical	342	1.00	-	28.55	3.79	-

BT-LE(1Mbps)

2480MHz_TX

19/03/2020



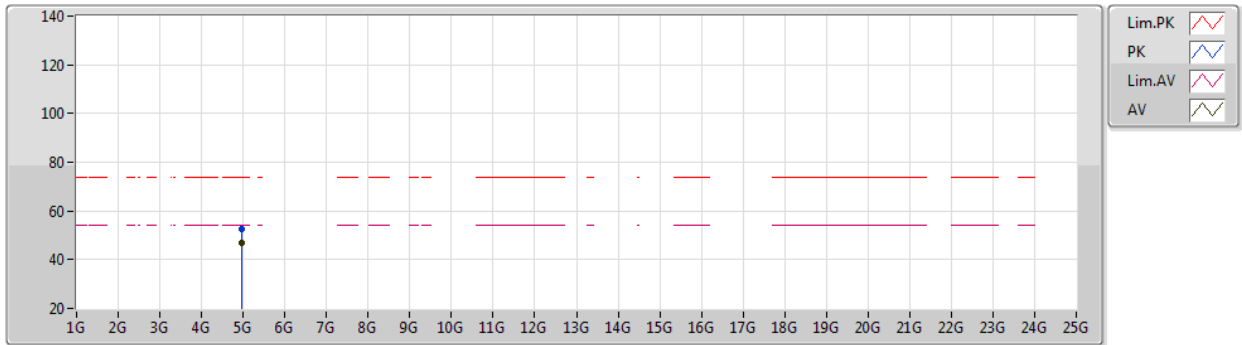
EUT Y_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4798G	105.04	Inf	-Inf	72.71	3	Horizontal	313	2.81	-	28.54	3.79	-
AV	2.48G	104.02	Inf	-Inf	71.69	3	Horizontal	313	2.81	-	28.54	3.79	-
PK	2.4835G	57.58	74.00	-16.42	25.24	3	Horizontal	313	2.81	-	28.55	3.79	-
AV	2.4835G	50.50	54.00	-3.50	18.16	3	Horizontal	313	2.81	-	28.55	3.79	-

BT-LE(1Mbps)

2480MHz_TX

19/03/2020



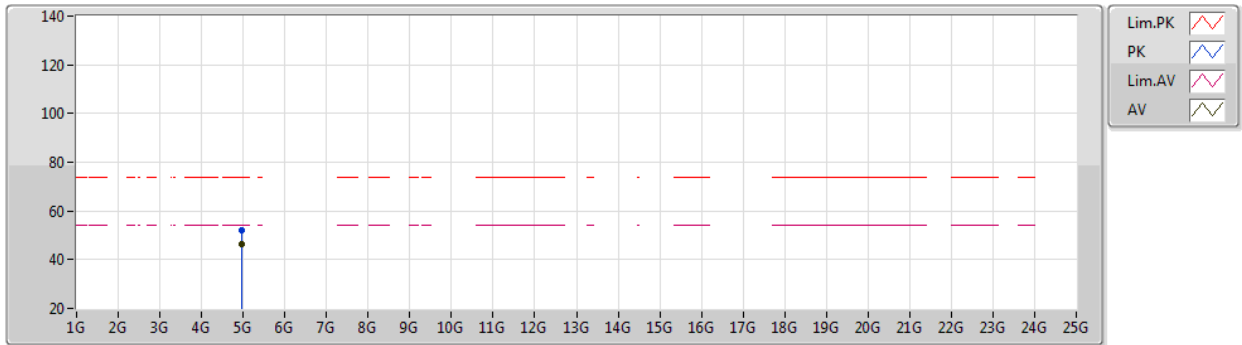
EUT Z_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.95974G	52.41	74.00	-21.59	46.69	3	Vertical	332	1.27	-	33.82	6.61	34.71
AV	4.95998G	46.65	54.00	-7.35	40.93	3	Vertical	332	1.27	-	33.82	6.61	34.71

BT-LE(1Mbps)

2480MHz_TX

19/03/2020



EUT Z_1TX
Setting 7
03-A-J-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.95942G	52.26	74.00	-21.74	46.54	3	Horizontal	299	1.23	-	33.82	6.61	34.71
AV	4.96001G	46.45	54.00	-7.55	40.73	3	Horizontal	299	1.23	-	33.82	6.61	34.71