FCC Test Report

Equipment	:	802.11ac Tri Band PoE Access Point
Brand Name	:	LITE-ON, MOJO
Model No.	:	WP8333V1, C-110
FCC ID	:	PPQ-WP8333V1
Standard	:	47 CFR FCC Part 15.247
Frequency	:	2400 MHz – 2483.5 MHz
Function	:	☒Point-to-multipoint; ☐Point-to-point
Applicant	:	LITE-ON Technology Corp. Bldg. C, 90, Chien 1 Rd., Chung-Ho, New Taipei City, 23585 Taiwan
Manufacturer	:	Lite-On Network Communication (Dongguan) Limited 30#Keji Rd.,Yin Hu Industrial Area,Qingxi Town,DongGuan City,Guangdong,China

The product sample received on Apr. 17, 2017 and completely tested on Jun. 15, 2017. We, SPORTON, 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 test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONALINC., the test report shall not be reproduced except in full.

Cliff Chang
SPORTON INTERNATIONAL INC.

Testing Laboratory
1190

Table of Contents

Summary of Test Result

Conformance Test Specifications				
Report Clause	**Ref. Std. Clause**	**Description**	**Limit**	**Result**
1.1.2	15.203	Antenna Requirement	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	FCC 15.207	Complied
3.2	15.247(a)	DTS Bandwidth	≥500kHz	Complied
3.3	15.247(b)	Maximum Conducted Output Power	Power [dBm]:30	Complied
3.4	15.247(e)	Power Spectral Density	PSD [dBm/3kHz]:8	Complied
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	Non-Restricted Bands: >30 dBc	Complied
3.6	15.247(d)	Emissions in Restricted Frequency Bands	Restricted Bands: FCC 15.209	Complied

Revision History

Report No.	Version	Description	Issued Date
FR741722AD	Rev. 01	Initial issue of report	Jun. 23, 2017

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	1	1TX

Note:
- Bluetooth LE uses a GFSK (1Mbps) modulation for DSSS.
- BWch is the channel separation
- 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.	Brand Holder	Model Name	Antenna Type	Connector	Radio
1	Master Wave Technology CO., LTD	98P7NPIPF000	PCB Antenna	I-PEX	R1
2	Master Wave Technology CO., LTD	98P7NPIPF001	PCB Antenna	I-PEX	R1
3	Master Wave Technology CO., LTD	98P7PUIPF000	PCB Antenna	I-PEX	R2
4	Master Wave Technology CO., LTD	98P7QUIPF000	PCB Antenna	I-PEX	R2
5	Master Wave Technology CO., LTD	98P7RPIPF000	PCB Antenna	I-PEX	R3
6	Master Wave Technology CO., LTD	98P7RPIPF001	PCB Antenna	I-PEX	R3
7	Master Wave Technology CO., LTD	98P7SMIPF000	PCB Antenna	I-PEX	R4

Ant.	Gain (dBi)										
	Radio 1			Radio 2		Radio 3					Radio 4
	2.4G	5G B1	5G B4	5G B1	5G B4	2.4G	5G B1	5G B2	5G B3	5G B4	BT
1	6.3	4.3	5.3	-	-	-	-	-	-	-	-
2	6.5	4.9	6.1	-	-	-	-	-	-	-	-
3	-	-	-	5.6	5.9	-	-	-	-	-	-
4	-	-	-	5.6	4.6	-	-	-	-	-	-
5	-	-	-	-	-	6.5	4.7	4.7	5.6	6.0	-
6	-	-	-	-	-	6.5	4.8	5.4	5.8	5.5	-
7	-	-	-	-	-	-	-	-	-	-	2.1

Note1: The EUT has seven antennas.

Note2: The EUT contain Radio 3 (2.4G)/(5G) RF module (Model Name: WM862FEMD FCC ID: PPQ-WM862FEMD)

For 2.4GHz function:

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

Radio 1

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

Radio 3

Ant. 5 (port 1) and Ant. 6 (port 2) could transmit/receive simultaneously.

For 5GHz function:

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

Radio 1 (For B1 and B4)

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

Radio 2 (For B1 and B4)

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

Radio 3 (For B1~B4)

Ant. 5 (port 1) and Ant. 6 (port 2) could transmit/receive simultaneously.

For bluetooth function:

For bluetooth mode (1TX/1RX)

Radio 4

Only Ant. 7 (port 1) can be used as transmitting/receiving antenna.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)
BT-LE	0.642	1.925

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter or PoE

1.1.5 Table for Multiple Listing

The brand/model names in the following table are all refer to the identical product.

Brand Name	Model Name	Description
LITE-ON	WP8333V1	All the models are identical, the difference model name for difference brand served as marketing strategy.
MOJO	C-110	

From the above models, model: WP8333V1 was selected as representative model for the test and its data was recorded in this report.

1.1.6 Table for Explanation of Flash

EUT No.	Brand name	Model name	Flash
1	winbond	25Q256JVFQ	32M+32M
2	MXIC	MX25L51245GMI-08G	64M

1.2 Testing Applied 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 v04

1.3 Testing Location Information

Testing Location							
☐	HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.			
		TEL	:	886-3-327-3456	FAX	:	886-3-318-0055
☒	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	TH01-CB	Ron Huang & Peter Wu	23.1°C / 75%	May 15, 2017 ~ Jun. 02, 2017
Radiated below 1GHz	03CH01-CB	Joy Tseng & Welson Chen	22°C / 54%	Jun. 15, 2017
Radiated above 1GHz	03CH01-CB	Joy Tseng & Welson Chen	22°C / 54%	May 11, 2017 ~ Jun. 15, 2017
AC Conduction	CO01-CB	Kane Liu	21°C / 60%	Jun. 03, 2017

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)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74×10^{-8}	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
BT-LE_Nss1_1TX	-
2402MHz	8
2440MHz	8
2480MHz	8

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 1 - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + Adapter
2	EUT 1 - R1 (2.4G) + R2 (5G) + R3 (5G) + R4 (BT) + Adapter
Mode 2 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	EUT 1 - R1 (5G) + R2 (5G) + R3 (5G) + R4 (BT) + Adapter
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	Normal Link
1	EUT 1 in Y axis - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + Adapter
2	EUT 1 in Z axis - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + Adapter
Mode 1 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	EUT 1 in Y axis - R1 (2.4G) + R2 (5G) + R3 (5G) + R4 (BT) + Adapter
Mode 1 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow this same test mode.	
4	EUT 1 in Y axis - R1 (5G) + R2 (5G) + R3 (2.4G) + R4 (BT) + Adapter
Mode 1 has been evaluated to be the worst case among Mode 1~4, thus measurement for Mode 5 will follow this same test mode.	
5	EUT 1 in Y axis - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + PoE
Mode 5 has been evaluated to be the worst case among Mode 1~5, thus measurement for Mode 6 will follow this same test mode.	
6	EUT 2 in Y axis - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + PoE
For operating mode 5 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
	The EUT was performed at X axis, Y axis and Z axis position for Radiated emission above 1GHz test, and the worst case was found at X axis. So the measurement will follow this same test configuration.
1	EUT 2 in X axis - R4 (BT)

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Radiated Emission Co-location
Test Condition	Radiated measurement
Operating Mode	Normal Link
1	EUT 2 - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT)
2	EUT 2 - R1 (2.4G) + R2 (5G) + R3 (5G) + R4 (BT)
3	EUT 2 - R1 (5G) + R2 (5G) + R3 (2.4G) + R4 (BT)
4	EUT 2 - R1 (5G) + R2 (5G) + R3 (5G) + R4 (BT)
For operating mode 4 is the worst case and it was record in this test report.	
Refer to Appendix G for Radiated Emission Co-location.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	EUT 2 - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT)
2	EUT 2 - R1 (2.4G) + R2 (5G) + R3 (5G) + R4 (BT)
3	EUT 2 - R1 (5G) + R2 (5G) + R3 (2.4G) + R4 (BT)
4	EUT 2 - R1 (5G) + R2 (5G) + R3 (5G) + R4 (BT)
Refer to Sporton Test Report No.: FA741722 for Co-location RF Exposure Evaluation.	

Note: The PoE and Adapter were for measurement only, would not be marketed.

The PoE and Adapter information as below:

Support Unit	Brand	Model Number
PoE	Ruckus	740-64214-001
Adapter	APD	WB-18D12FU

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

N/A

2.5 Support Equipment

For Test Site No: CO01-CB

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	NB*5	DELL	E6430	DoC
2	Device	LITE-ON	WP8333V1	PPQ-WP8333V1
3	Flash disk3.0	Transcend	JetFlash-700	DoC
4	Adapter	APD	WB-18D12FU	DoC

For Test Site No: 03CH01-CB (below 1GHz)

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	NB*5	DELL	E4300	DoC
2	Device	LITE-ON	WP8333V1	PPQ-WP8333V1
3	Flash disk3.0	Silicon Power	B06	DoC
4	PoE	Ruckus	740-64214-001	DoC

For Test Site No: 03CH01-CB (above 1GHz)

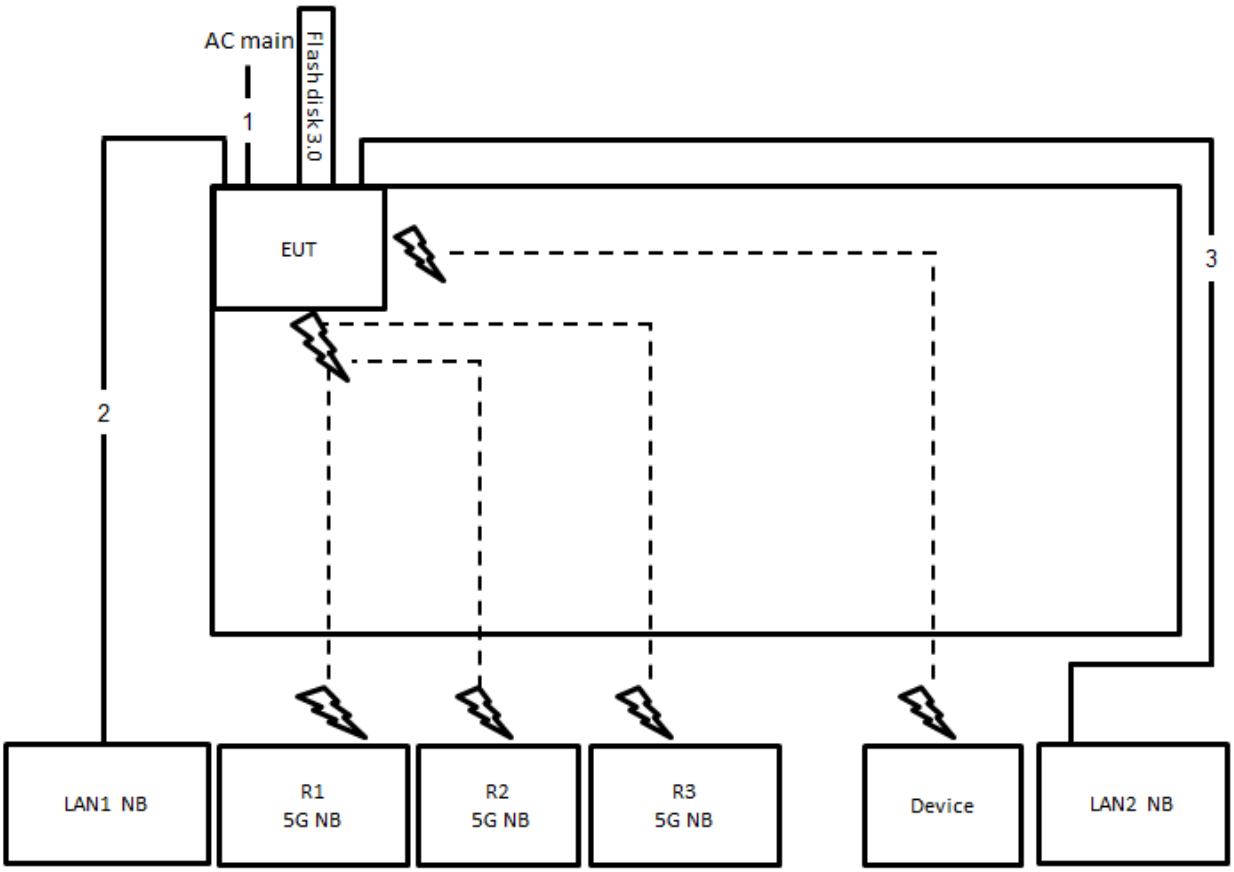
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	NB	DELL	E4300	DoC
2	Adapter	APD	WB-18D12FU	DoC

For Test Site No: TH01-CB

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	NB	DELL	E4300	DoC
2	Adapter	APD	WB-18D12FU	DoC

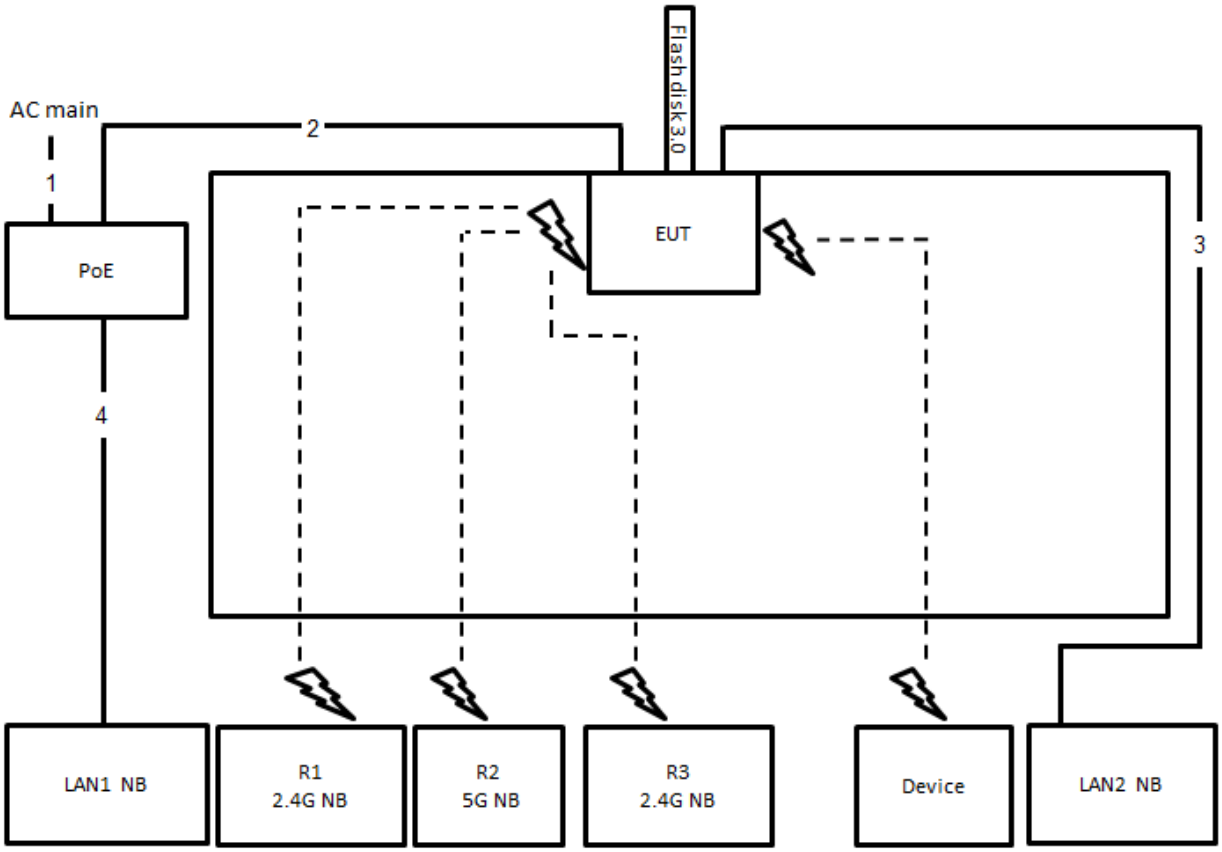
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



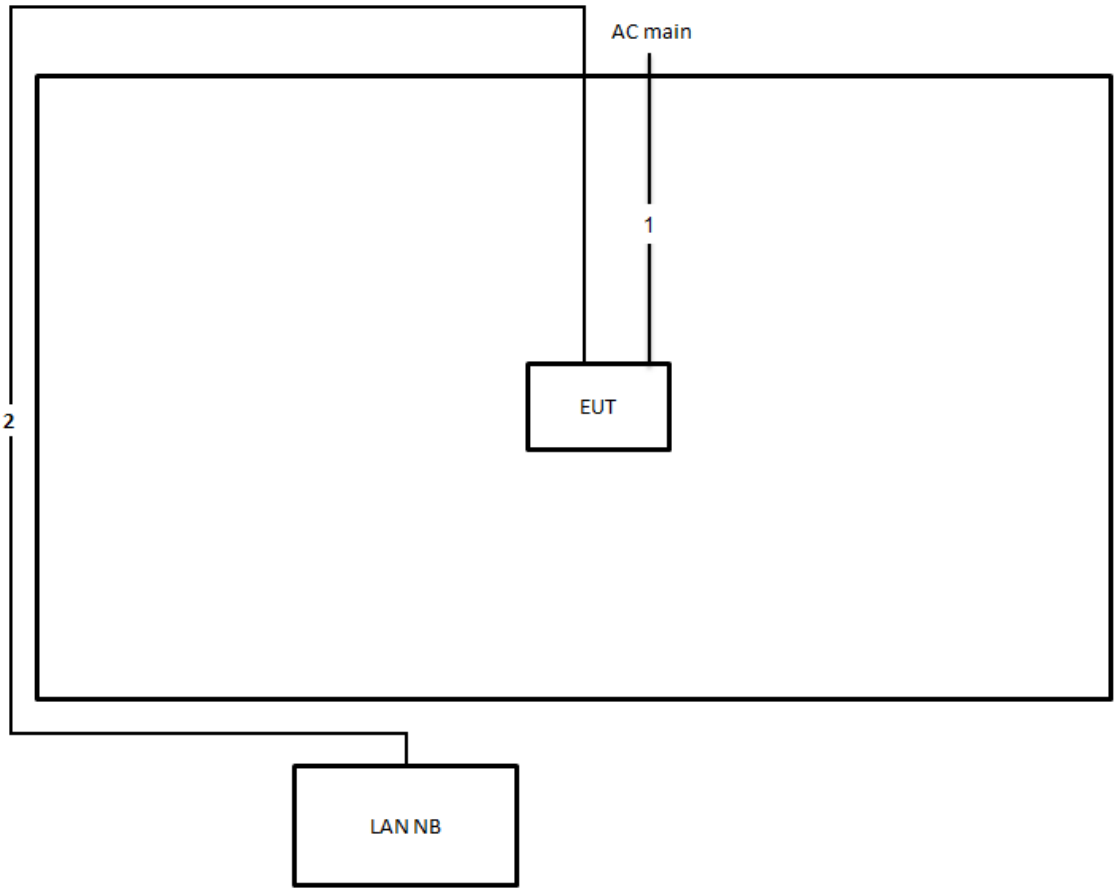
Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m

Test Setup Diagram - Radiated Test < 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	0.7m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	1.5m

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

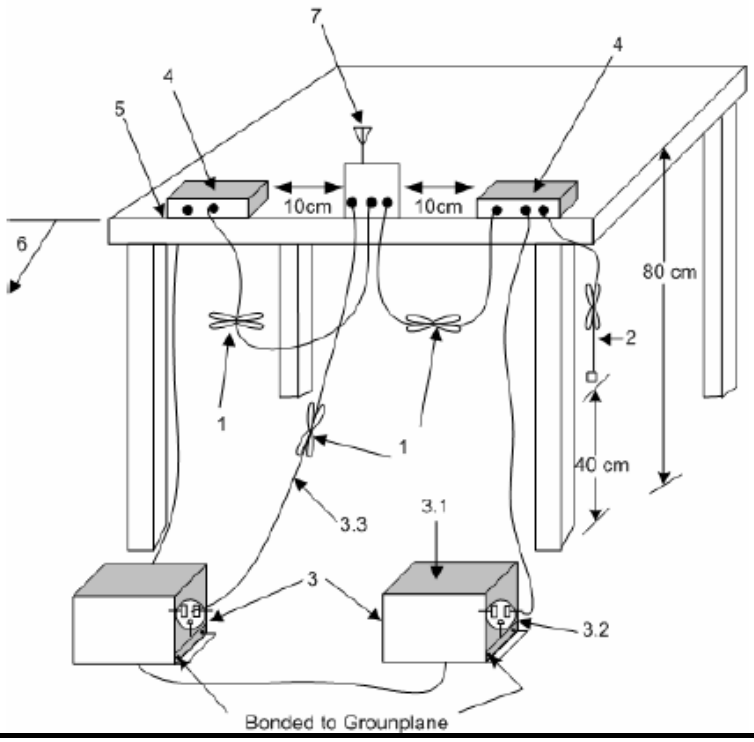
Refer a test equipment and calibration data table in this test report.

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

AC Power-line Conducted Emissions



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 ≥ 500 kHz.

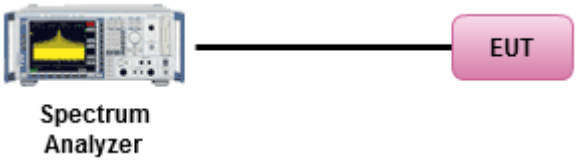
3.2.2 Measuring Instruments

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 8.1 Option 1 for6 dB bandwidth measurement.
	☐ Refer as FCC KDB 558074, clause 8.2 Option 2 for6 dB bandwidth measurement.
	☐ Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth


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 9.1.1 Option 1 (RBW ≥ EBW method).
	☐ Refer as FCC KDB 558074, clause 9.1.2 Option 2 (peak power meter for VBW ≥ DTS BW)
▪ Maximum Conducted Output Power	
	[duty cycle ≥ 98% or external video / power trigger]
	☐ Refer as FCC KDB 558074, clause 9.2.2.2 Method AVGSA-1 (spectral trace averaging).
	☐ Refer as FCC KDB 558074, clause 9.2.2.3 Method AVGSA-1 Alt. (slow sweep speed)
	duty cycle < 98% and average over on/off periods with duty factor
	☐ Refer as FCC KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
	☐ Refer as FCC KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
	☒ Refer as FCC KDB 558074, clause 9.2.3 Method AVGPM-G (using an 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: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)


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

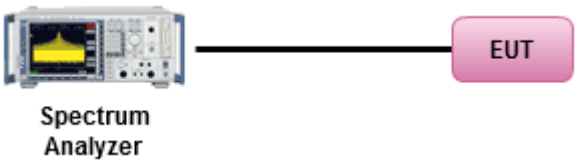
3.4.2 Measuring Instruments

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 10.2 Method PKPSD (RBW=3-100kHz; Detector=peak).		
	[duty cycle ≥ 98% or external video / power trigger]		
	☐ Refer as FCC KDB 558074, clause 10.3 Method AVGPSD-1 (spectral trace averaging).		
	☐ Refer as FCC KDB 558074, clause 10.4 Method AVGPSD-2 (slow sweep speed)		
	duty cycle < 98% and average over on/off periods with duty factor		
	☐ Refer as FCC KDB 558074, clause 10.5 Method AVGPSD-1 Alt (spectral trace averaging).		
	☐ Refer as FCC KDB 558074, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed)		
▪ 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

Power Spectral Density


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 (dB)**
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

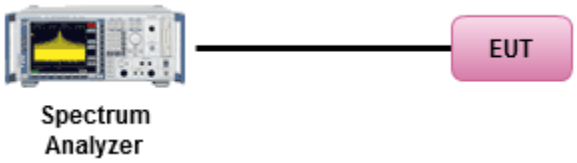
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
▪ Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands



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 below30 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.

3.6.2 Measuring Instruments

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

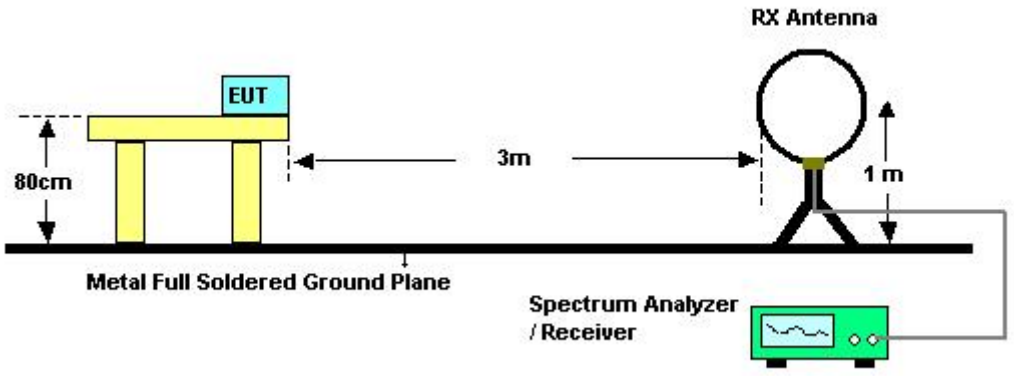
3.6.3 Test Procedures

Test Method			
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].			
▪ Refer as ANSI C63.10, clause 6.9.2.2 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 12 for unwanted emissions into restricted bands.		
		☐	Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle ≥98%)
		☐	Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
		☒	Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW≥1/T).
		☐	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		☒	Refer as FCC KDB 558074, clause 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 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 13.2 (ANSI C63.10, clause 6.9.3) for marker-delta method for band-edge measurements.		
	▪ Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).		
▪ For conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 12.2.2.			
	▪ 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.		

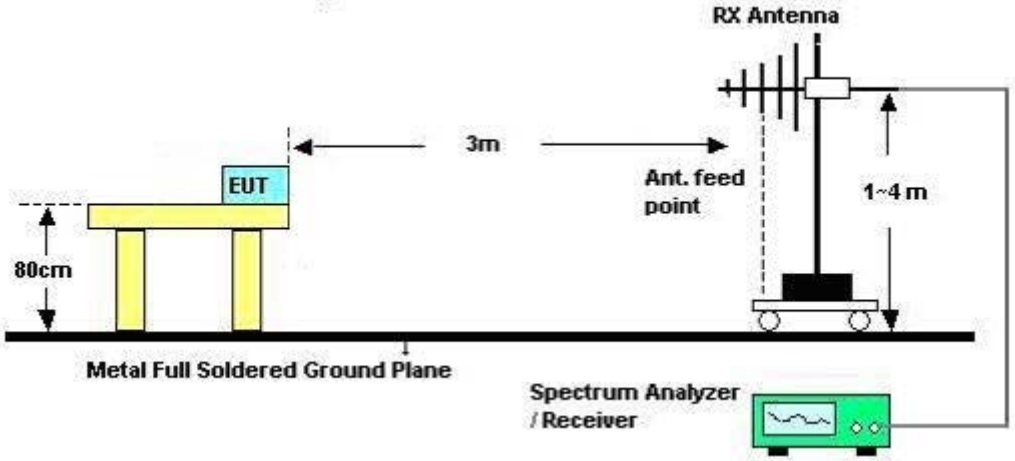
3.6.4 Test Setup

Transmitter Radiated Emissions

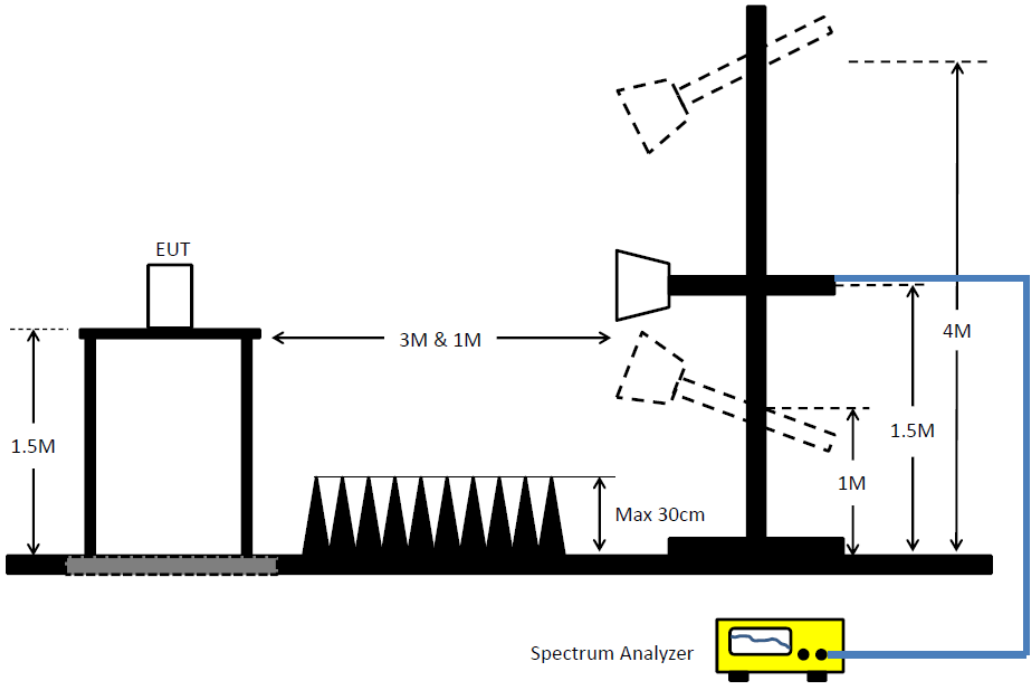
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.5 Transmitter Radiated Unwanted Emissions (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.

3.6.6 Transmitter Radiated Unwanted Emissions

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 23, 2017	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 14, 2016	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 21, 2016	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 23, 2017	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2016	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 02, 2017	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 2016	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 06, 2017	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-l0-7	N/A	N/A	Radiation (03CH01-CB)

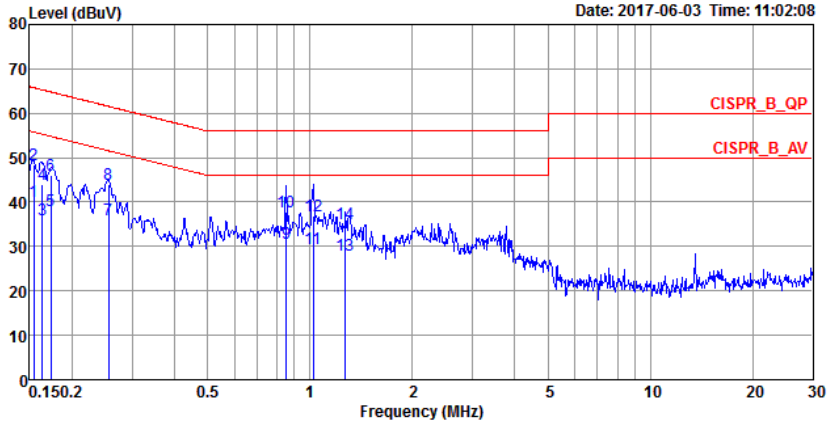
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 22, 2016	Conducted (TH01-CB)

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

*Calibration Interval of instruments listed above is two year.

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

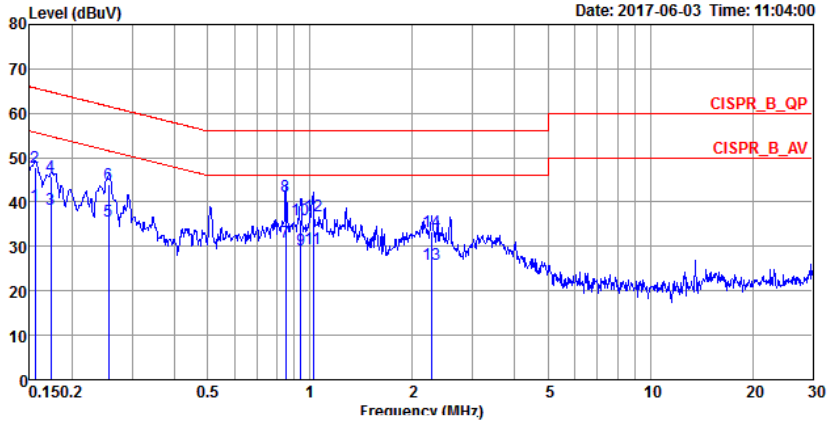
AC Power-line Conducted Emissions Result			
Operating Mode	3	**Power Phase**	Neutral
Operating Function	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1540	40.09	-15.69	55.78	29.83	10.10	0.16	Average	NEUTRAL
2	0.1540	48.48	-17.30	65.78	38.22	10.10	0.16	QP	NEUTRAL
3	0.1633	36.00	-19.30	55.30	25.75	10.10	0.15	Average	NEUTRAL
4	0.1633	44.07	-21.23	65.30	33.82	10.10	0.15	QP	NEUTRAL
5	0.1731	38.22	-16.59	54.81	27.98	10.10	0.14	Average	NEUTRAL
6	0.1731	45.91	-18.90	64.81	35.67	10.10	0.14	QP	NEUTRAL
7	0.2562	36.03	-15.53	51.56	25.86	10.08	0.09	Average	NEUTRAL
8	0.2562	44.07	-17.49	61.56	33.90	10.08	0.09	QP	NEUTRAL
9	0.8528	30.56	-15.44	46.00	20.30	10.10	0.16	Average	NEUTRAL
10	0.8528	37.76	-18.24	56.00	27.50	10.10	0.16	QP	NEUTRAL
11	1.0211	29.65	-16.35	46.00	19.41	10.05	0.19	Average	NEUTRAL
12	1.0211	36.90	-19.10	56.00	26.66	10.05	0.19	QP	NEUTRAL
13	1.2688	28.09	-17.91	46.00	17.87	10.02	0.20	Average	NEUTRAL
14	1.2688	35.15	-20.85	56.00	24.93	10.02	0.20	QP	NEUTRAL

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result			
Operating Mode	3	**Power Phase**	Line
Operating Function	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1557	39.40	-16.29	55.69	29.24	10.00	0.16	Average	LINE
2	0.1557	47.93	-17.76	65.69	37.77	10.00	0.16	QP	LINE
3	0.1731	38.26	-16.55	54.81	28.12	10.00	0.14	Average	LINE
4	0.1731	45.66	-19.15	64.81	35.52	10.00	0.14	QP	LINE
5	0.2562	35.76	-15.80	51.56	25.75	9.92	0.09	Average	LINE
6	0.2562	44.04	-17.52	61.56	34.03	9.92	0.09	QP	LINE
7	0.8483	31.00	-15.00	46.00	20.88	9.96	0.16	Average	LINE
8	0.8483	41.37	-14.63	56.00	31.25	9.96	0.16	QP	LINE
9	0.9381	29.36	-16.64	46.00	19.22	9.96	0.18	Average	LINE
10	0.9381	36.16	-19.84	56.00	26.02	9.96	0.18	QP	LINE
11	1.0211	29.41	-16.59	46.00	19.26	9.96	0.19	Average	LINE
12	1.0211	36.87	-19.13	56.00	26.72	9.96	0.19	QP	LINE
13	2.2726	26.07	-19.93	46.00	15.92	9.96	0.19	Average	LINE
14	2.2726	33.42	-22.58	56.00	23.27	9.96	0.19	QP	LINE

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
BT-LE_Nss1_1TX	-	-	-	-	-
2.4-2.4835GHz	701.25k	1.024M	1M02F1D	696.25k	1.022M

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;

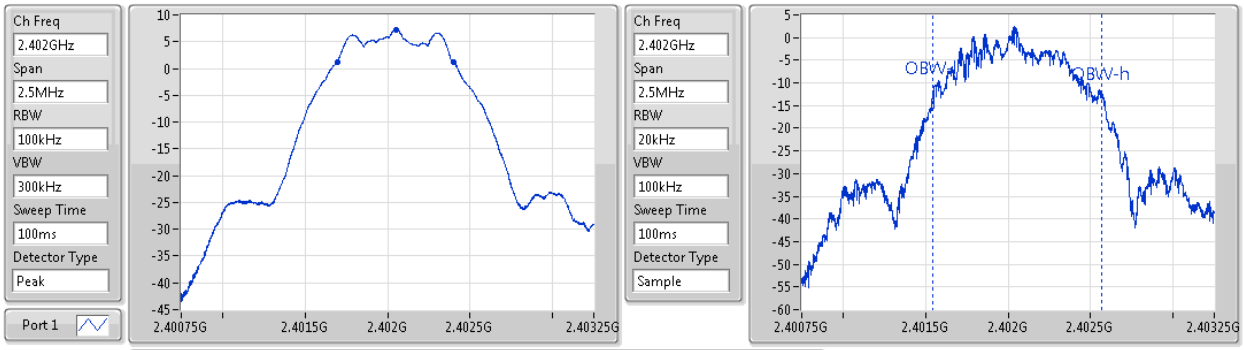
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE_Nss1_1TX	-	-	-	-
2402MHz	Pass	500k	701.25k	1.024M
2440MHz	Pass	500k	696.25k	1.022M
2480MHz	Pass	500k	697.5k	1.024M

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

BT-LE_Nss1_1TX **EBW**

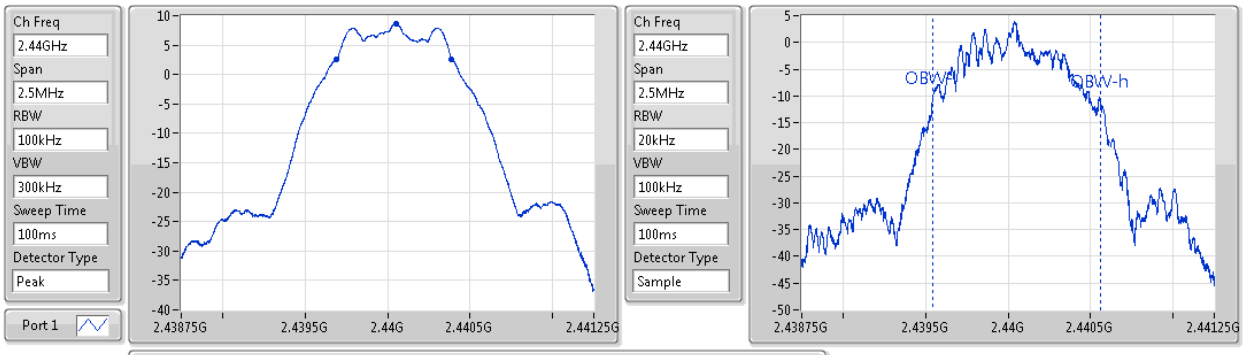
2402MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
701.25k	2.401698G	2.402399G	1.024M	2.401546G	2.402571G	500k	1

BT-LE_Nss1_1TX **EBW**

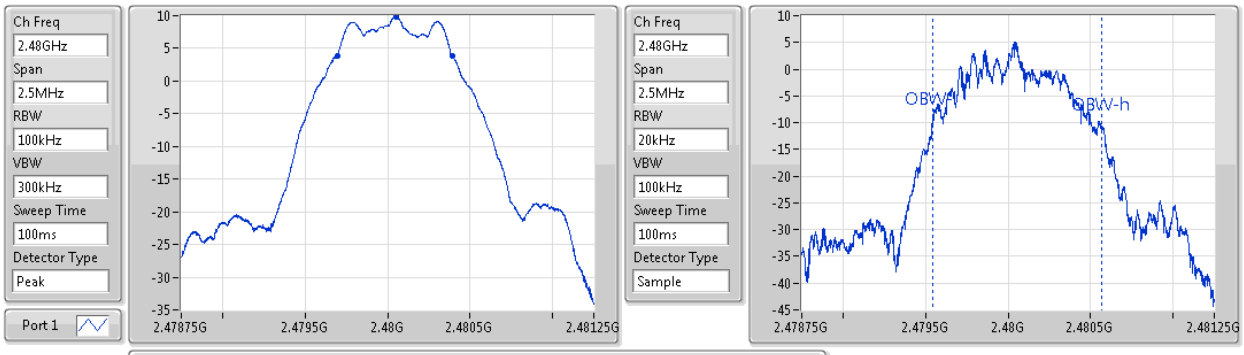
2440MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
696.25k	2.439691G	2.440388G	1.022M	2.439541G	2.440563G	500k	1

BT-LE_Nss1_1TX **EBW**

2480MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
697.5k	2.479696G	2.480394G	1.024M	2.479543G	2.480567G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
BT-LE_Nss1_1TX	-	-
2.4-2.4835GHz	9.68	0.00929

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
BT-LE_Nss1_1TX	-	-	-	-	-
2402MHz	Pass	2.10	7.11	7.11	30.00
2440MHz	Pass	2.10	8.43	8.43	30.00
2480MHz	Pass	2.10	9.68	9.68	30.00

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

Summary

Mode	PD (dBm/RBW)
BT-LE_Nss1_1TX	-
2.4-2.4835GHz	-5.56

RBW=3kHz.

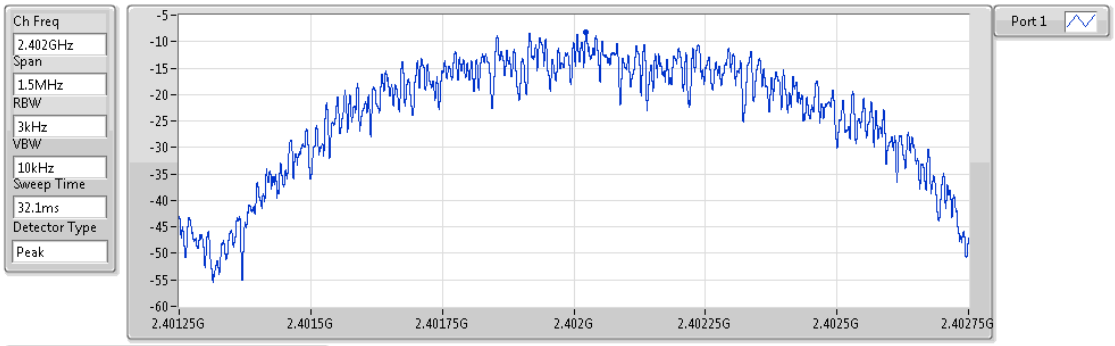
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE_Nss1_1TX	-	-	-	-	-
2402MHz	Pass	2.10	-8.15	-8.15	8
2440MHz	Pass	2.10	-6.72	-6.72	8
2480MHz	Pass	2.10	-5.56	-5.56	8

DG = Directional Gain; RBW=3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

BT-LE_Nss1_1TX **PSD**

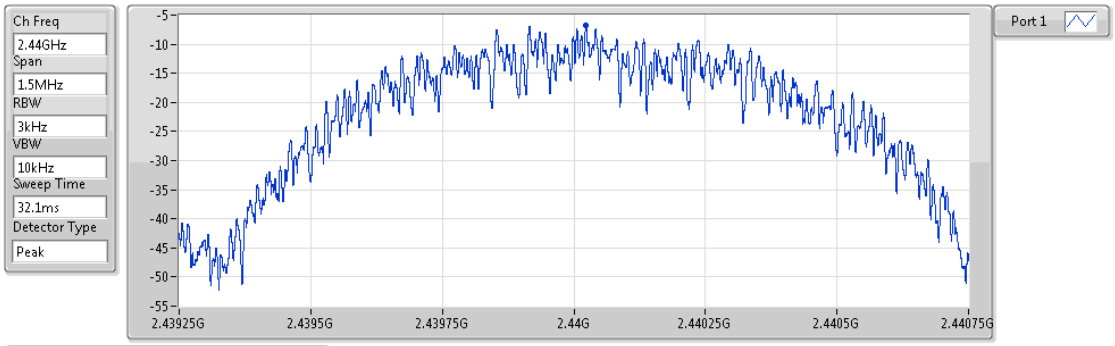
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.15	-8.15	-8.15

BT-LE_Nss1_1TX **PSD**

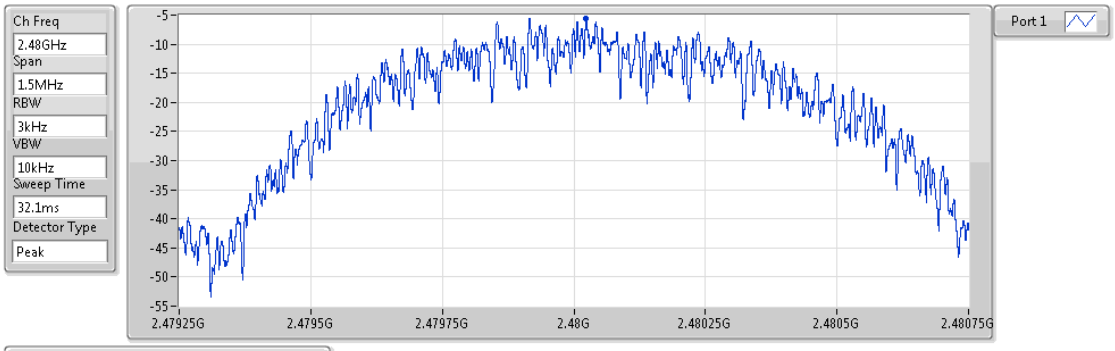
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.72	-6.72	-6.72

BT-LE_Nss1_1TX **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-5.56	-5.56	-5.56

Summary

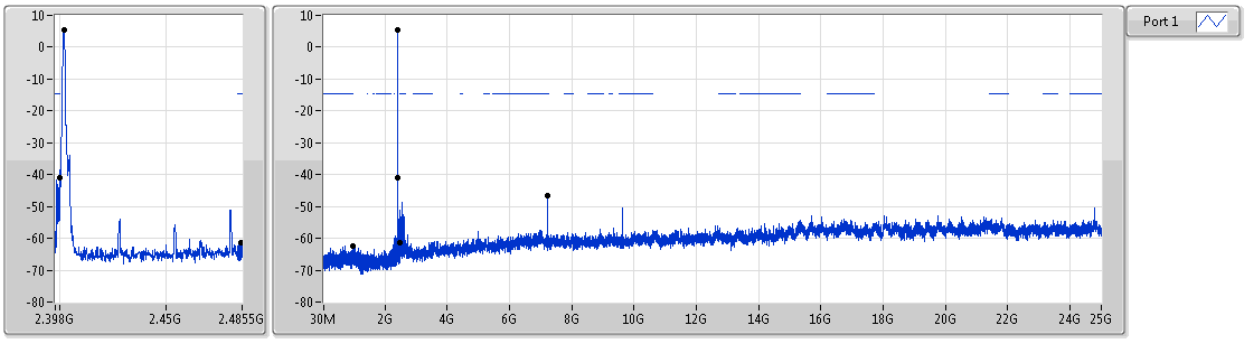
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	2.402004G	5.51	-24.49	946.416M	-62.47	2.399996G	-41.00	2.485204G	-61.34	7.205102G	-46.52	1

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)	Port
BT-LE_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402004G	5.51	-24.49	946.416M	-62.47	2.399996G	-41.00	2.485204G	-61.34	7.205102G	-46.52	1
2440MHz	Pass	2.440247G	7.89	-22.11	855.248M	-62.86	2.39862G	-62.80	2.48502G	-61.89	2.541786G	-47.04	1
2480MHz	Pass	2.48016G	9.77	-20.23	2.306832G	-61.95	2.399972G	-61.86	2.483512G	-45.51	9.920914G	-47.43	1

BT-LE_Nss1_1TX **CSE NdB**

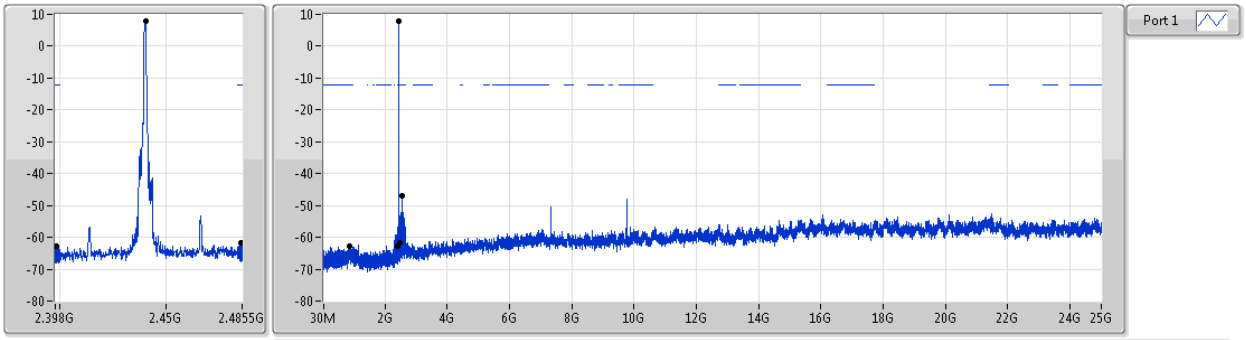
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402004G	5.51	-14.49	946.416M	-62.47	2.399996G	-41.00	2.485204G	-61.34	7.205102G	-46.52	1

BT-LE_Nss1_1TX **CSE NdB**

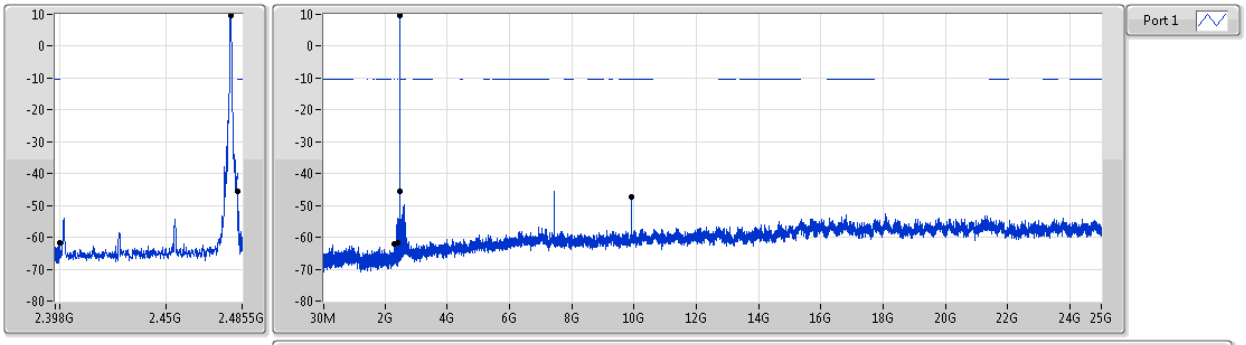
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.440247G	7.89	-12.11	855.248M	-62.86	2.39862G	-62.80	2.48502G	-61.89	2.541786G	-47.04	1

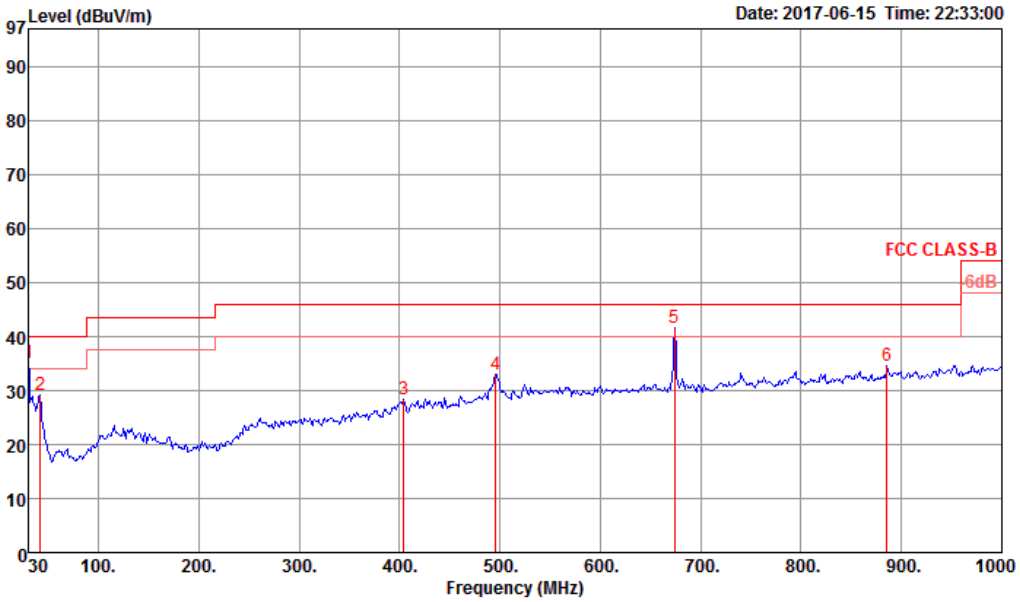
BT-LE_Nss1_1TX **CSE NdB**

2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48016G	9.77	-10.23	2.306832G	-61.95	2.399972G	-61.86	2.483512G	-45.51	9.920914G	-47.43	1

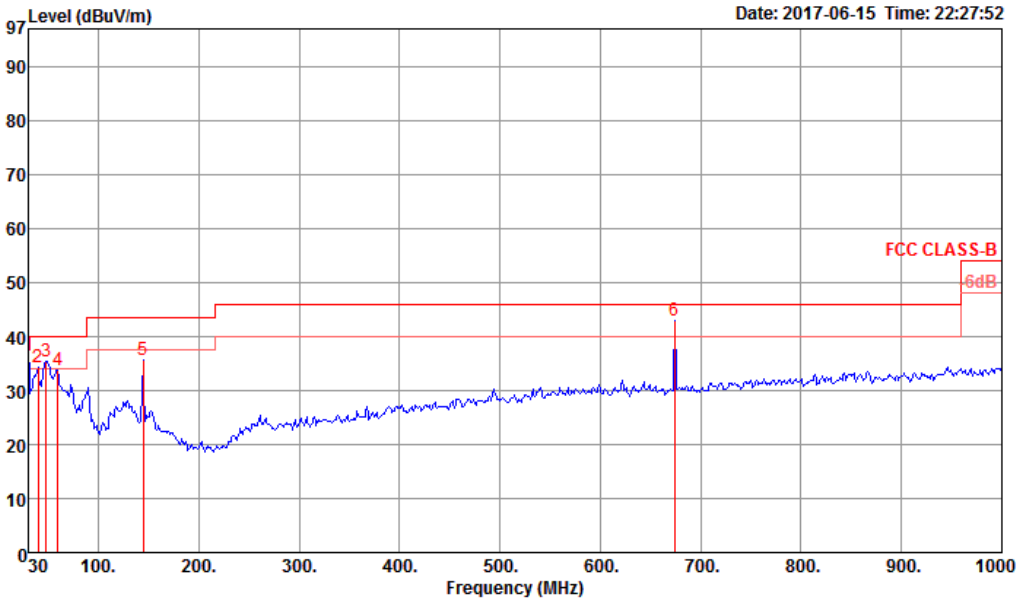
RSE below 1GHz Result			
Operating Mode	5	**Polarization**	Horizontal
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.00	35.04	40.00	-4.96	37.28	2.10	24.24	28.58	100	0	Peak	HORIZONTAL
2	41.64	29.27	40.00	-10.73	37.01	2.12	18.71	28.57	100	0	Peak	HORIZONTAL
3	404.42	28.42	46.00	-17.58	32.27	3.12	21.78	28.75	100	0	Peak	HORIZONTAL
4	495.60	32.97	46.00	-13.03	35.36	3.44	23.42	29.25	100	0	Peak	HORIZONTAL
5	674.08	41.54	46.00	-4.46	41.76	3.94	25.18	29.34	100	0	Peak	HORIZONTAL
6	885.54	34.49	46.00	-11.51	32.43	4.50	26.42	28.86	100	0	Peak	HORIZONTAL

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

RSE below 1GHz Result			
Operating Mode	5	**Polarization**	Vertical
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.00	36.51	40.00	-3.49	38.75	2.10	24.24	28.58	300	0	Peak	VERTICAL
2	39.70	34.23	40.00	-5.77	40.76	2.11	19.94	28.58	300	0	Peak	VERTICAL
3	47.46	35.39	40.00	-4.61	46.34	2.15	15.47	28.57	300	0	Peak	VERTICAL
4	59.10	33.78	40.00	-6.22	47.91	2.17	12.23	28.53	300	0	Peak	VERTICAL
5	144.46	35.79	43.50	-7.71	44.91	2.32	16.79	28.23	300	0	Peak	VERTICAL
6	674.08	42.98	46.00	-3.02	43.20	3.94	25.18	29.34	300	0	Peak	VERTICAL

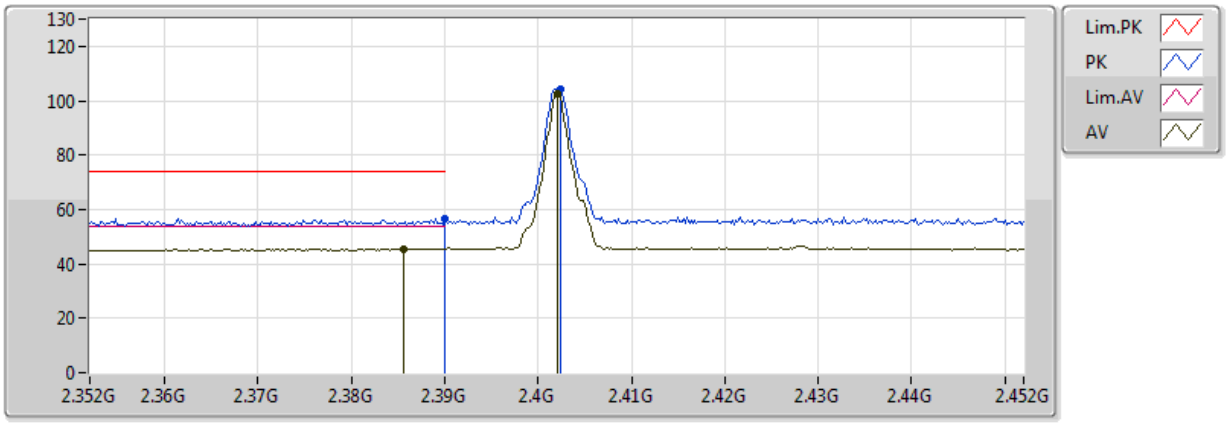
Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	AV	2.483502G	53.00	54.00	-1.00	32.13	3	V	329	2.29	-

BT-LE_Nss1_1TX

2402MHz_TX

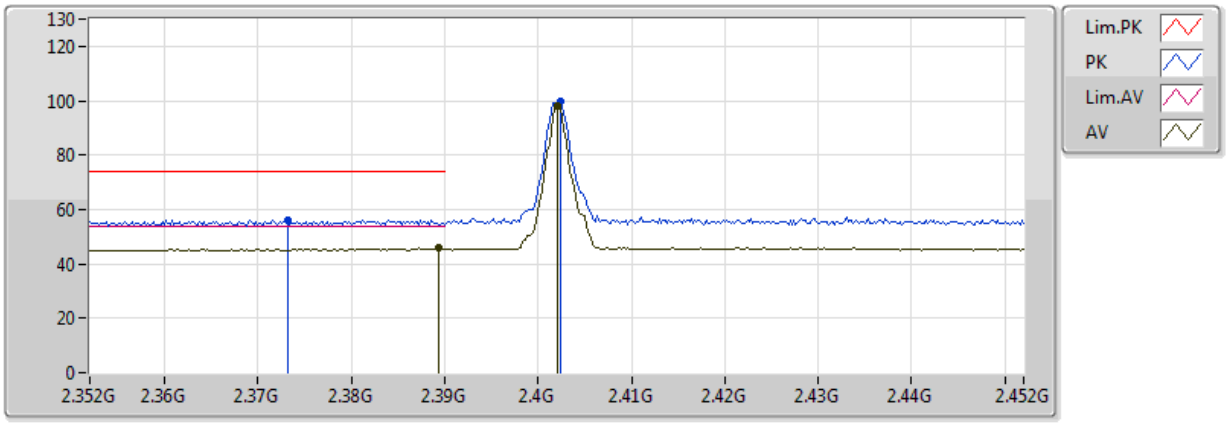


20170511
EUT X_1TX
Setting 8
04-J-6
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.3856G	45.64	54.00	-8.36	32.67	3	V	22	1.62	-
AV	2.402G	102.76	Inf	-Inf	32.67	3	V	22	1.62	-
PK	2.39G	56.81	74.00	-17.19	32.67	3	V	22	1.62	-
PK	2.4024G	104.34	Inf	-Inf	32.67	3	V	22	1.62	-

BT-LE_Nss1_1TX

2402MHz_TX

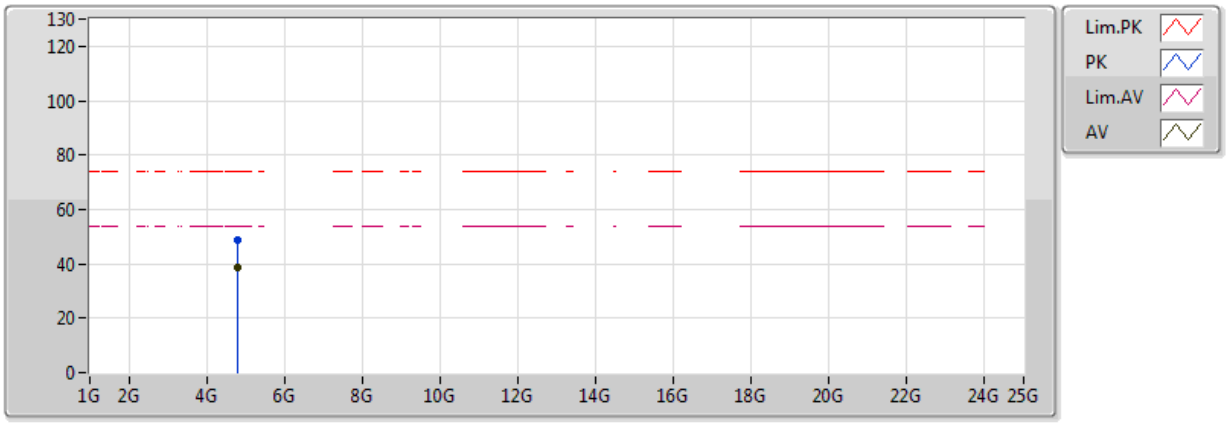


20170511
EUT X_1TX
Setting 8
04-J-6
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.3894G	45.89	54.00	-8.11	32.67	3	H	24	1.05	-
AV	2.402G	97.85	Inf	-Inf	32.67	3	H	24	1.05	-
PK	2.3732G	56.20	74.00	-17.80	32.66	3	H	24	1.05	-
PK	2.4024G	99.49	Inf	-Inf	32.67	3	H	24	1.05	-

BT-LE_Nss1_1TX

2402MHz_TX

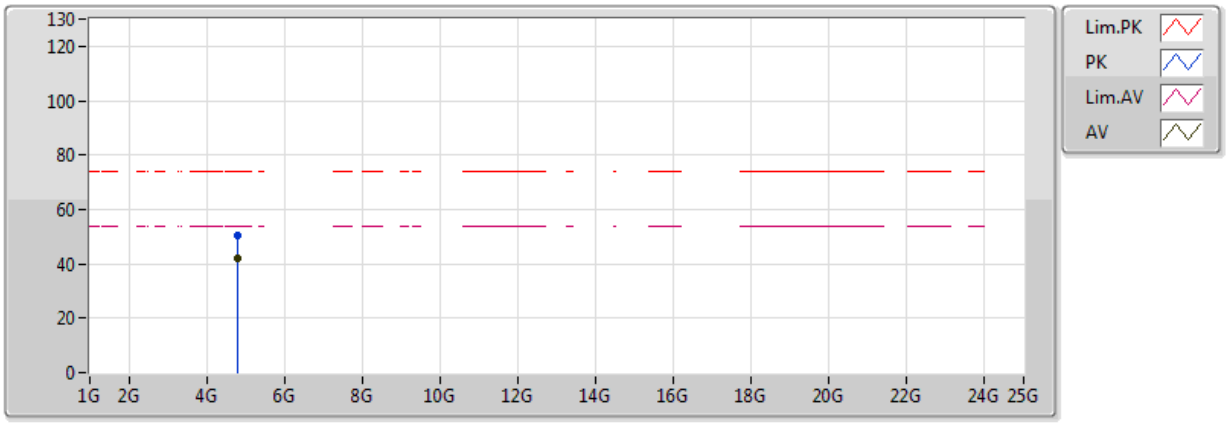


20170511
EUT X_1TX
Setting 8
04-J-6
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.80396G	38.80	54.00	-15.20	3.64	3	V	301	1.45	-
PK	4.80398G	48.72	74.00	-25.28	3.64	3	V	301	1.45	-

BT-LE_Nss1_1TX

2402MHz_TX

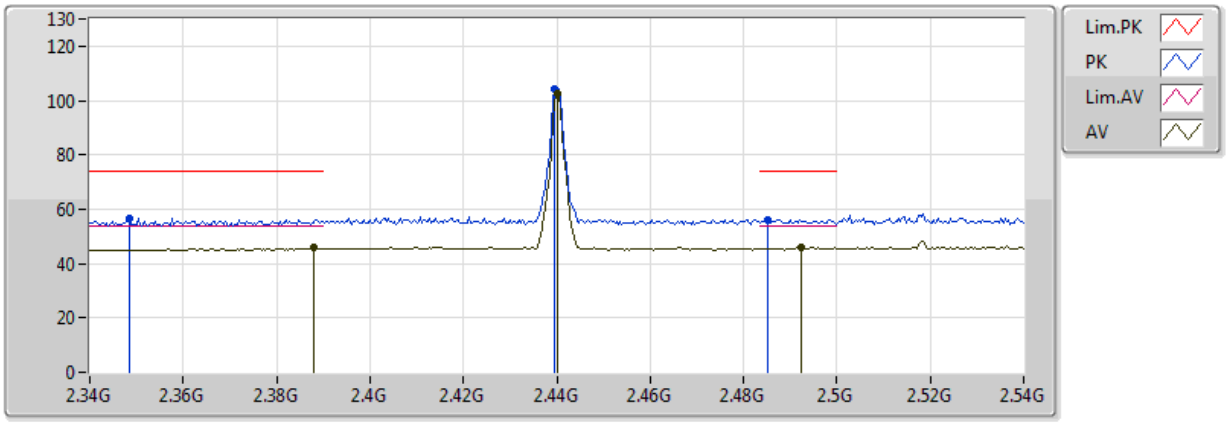


20170511
EUT X_1TX
Setting 8
04-J-6
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.80404G	42.29	54.00	-11.71	3.64	3	H	45	1.48	-
PK	4.80368G	50.67	74.00	-23.33	3.64	3	H	45	1.48	-

BT-LE_Nss1_1TX

2440MHz_TX

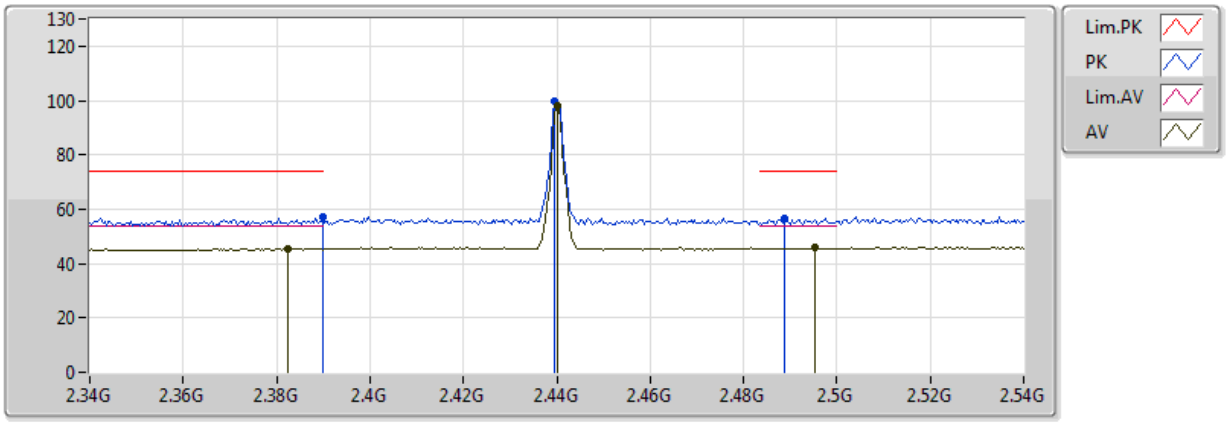


20170511
EUT X_1TX
Setting 8
04-J-6
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.388G	45.72	54.00	-8.28	32.67	3	V	25	1.48	-
AV	2.44G	102.80	Inf	-Inf	32.72	3	V	25	1.48	-
AV	2.4924G	45.85	54.00	-8.15	32.79	3	V	25	1.48	-
PK	2.3484G	56.75	74.00	-17.25	32.65	3	V	25	1.48	-
PK	2.4396G	104.27	Inf	-Inf	32.72	3	V	25	1.48	-
PK	2.4852G	56.16	74.00	-17.84	32.78	3	V	25	1.48	-

BT-LE_Nss1_1TX

2440MHz_TX

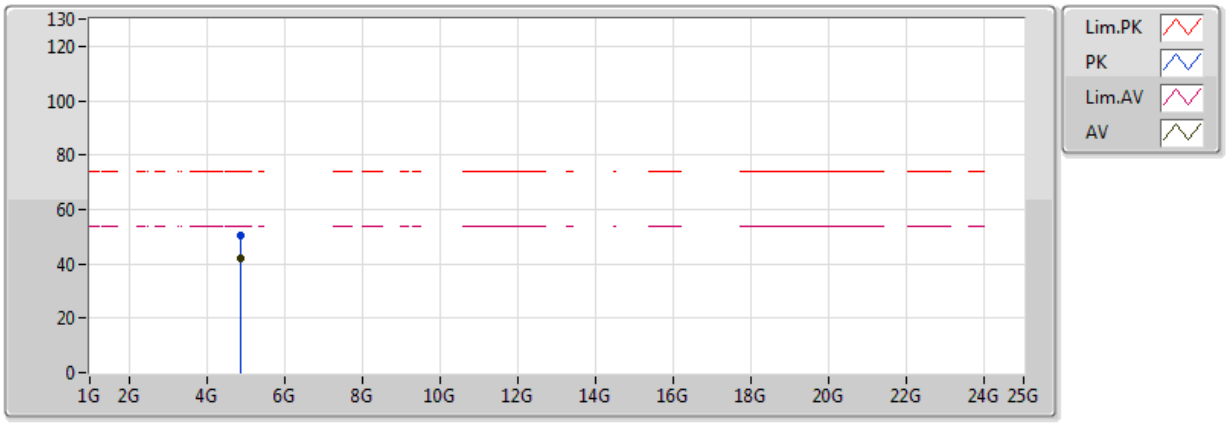


20170511
EUT X_1TX
Setting 8
04-J-6
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.3824G	45.54	54.00	-8.46	32.66	3	H	29	1.42	-
AV	2.44G	98.00	Inf	-Inf	32.72	3	H	29	1.42	-
AV	2.4952G	45.87	54.00	-8.13	32.79	3	H	29	1.42	-
PK	2.39G	57.10	74.00	-16.90	32.67	3	H	29	1.42	-
PK	2.4396G	99.47	Inf	-Inf	32.72	3	H	29	1.42	-
PK	2.4888G	56.59	74.00	-17.41	32.79	3	H	29	1.42	-

BT-LE_Nss1_1TX

2440MHz_TX

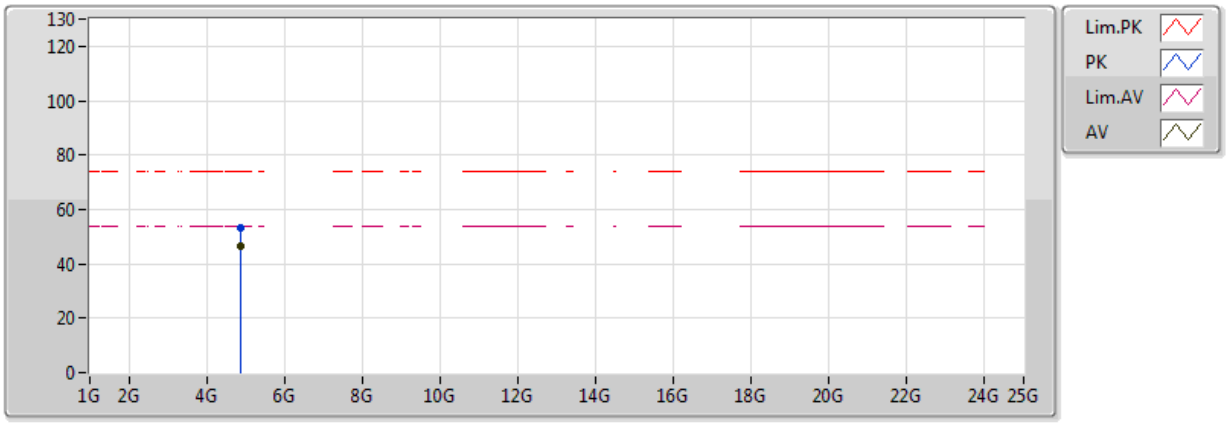


20170511
EUT X_1TX
Setting 8
04-J-6
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.88G	42.15	54.00	-11.85	3.85	3	V	299	2.69	-
PK	4.88066G	50.48	74.00	-23.52	3.86	3	V	299	2.69	-

BT-LE_Nss1_1TX

2440MHz_TX

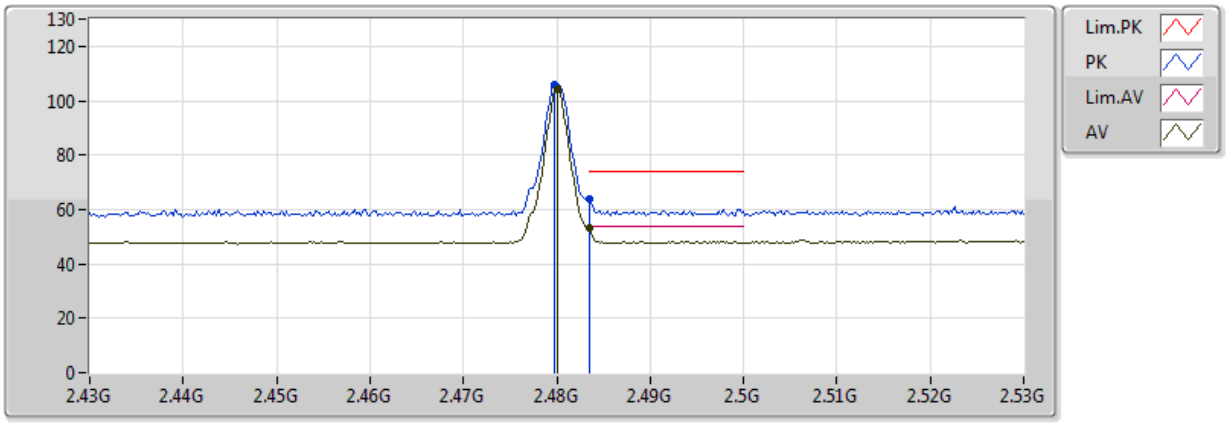


20170511
EUT X_1TX
Setting 8
04-J-6
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.88014G	46.30	54.00	-7.70	3.85	3	H	43	1.55	-
PK	4.88012G	53.11	74.00	-20.89	3.85	3	H	43	1.55	-

BT-LE_Nss1_1TX

2480MHz_TX

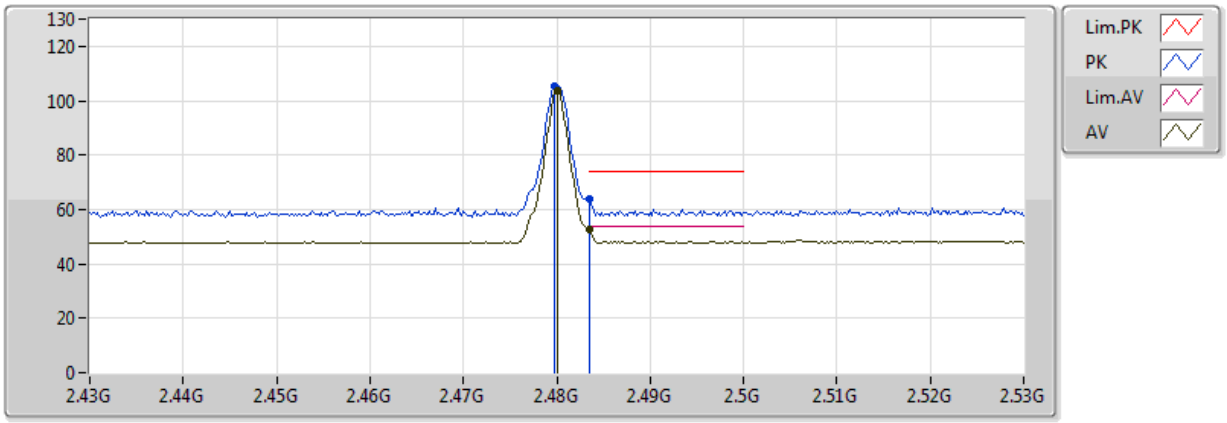


20170511
EUT X_1TX
Setting 8
02-W-3
FSU

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.48G	104.34	Inf	-Inf	32.12	3	V	329	2.29	-
AV	2.483502G	53.00	54.00	-1.00	32.13	3	V	329	2.29	-
PK	2.4798G	105.85	Inf	-Inf	32.12	3	V	329	2.29	-
PK	2.483502G	63.92	74.00	-10.08	32.13	3	V	329	2.29	-

BT-LE_Nss1_1TX

2480MHz_TX

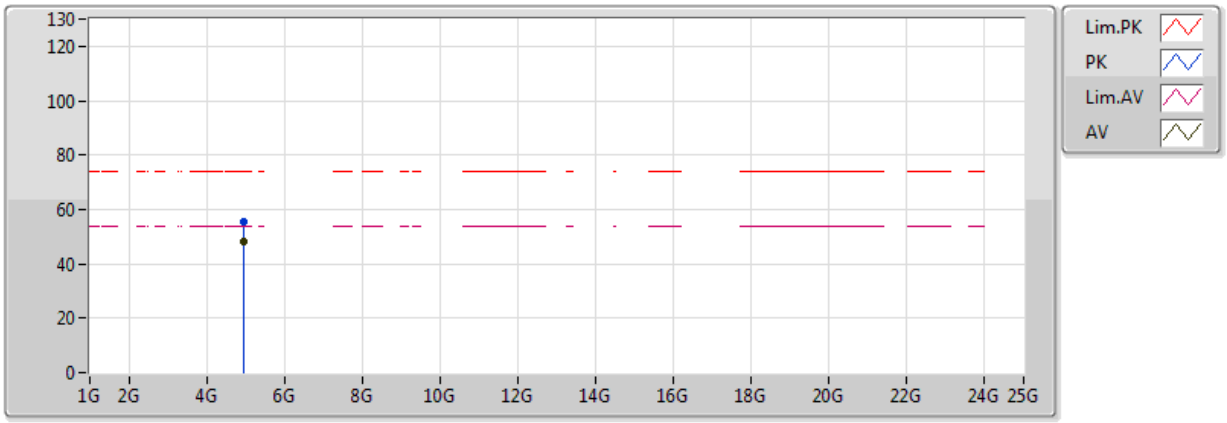


20170511
EUT X_1TX
Setting 8
02-W-3
FSU

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.48G	103.77	Inf	-Inf	32.12	3	H	13	2.40	-
AV	2.483502G	52.62	54.00	-1.38	32.13	3	H	13	2.40	-
PK	2.4798G	105.21	Inf	-Inf	32.12	3	H	13	2.40	-
PK	2.483502G	64.02	74.00	-9.98	32.13	3	H	13	2.40	-

BT-LE_Nss1_1TX

2480MHz_TX

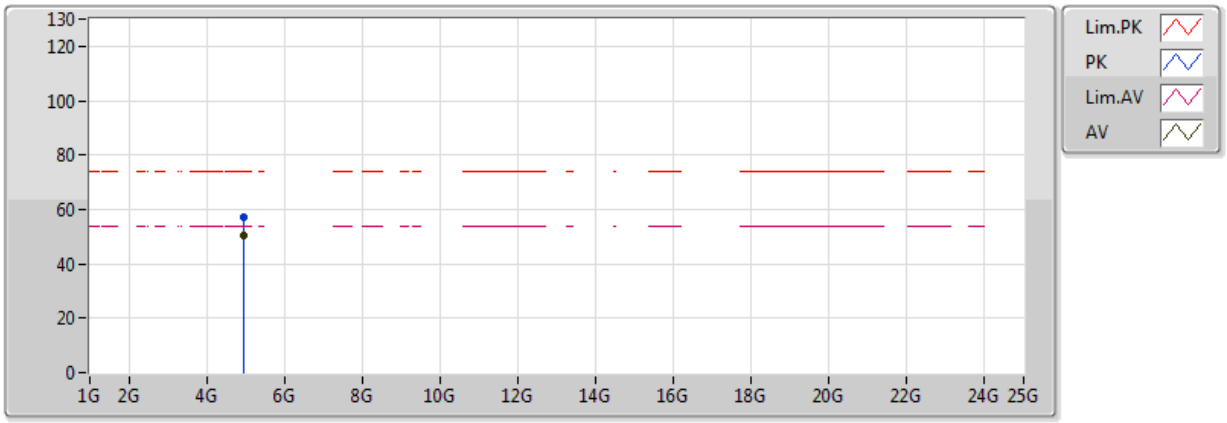


20170511
EUT X_1TX
Setting 8
02-W-3
FSU

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.960028G	48.19	54.00	-5.81	8.41	3	V	301	2.54	-
PK	4.960052G	55.22	74.00	-18.78	8.41	3	V	301	2.54	-

BT-LE_Nss1_1TX

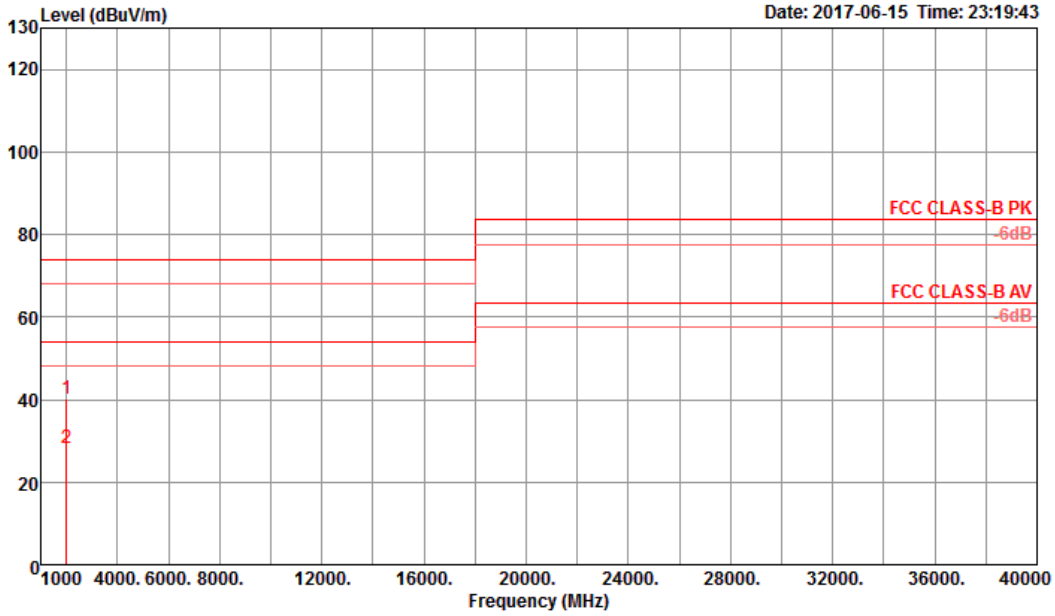
2480MHz_TX



20170511
EUT X_1TX
Setting 8
02-W-3
FSU

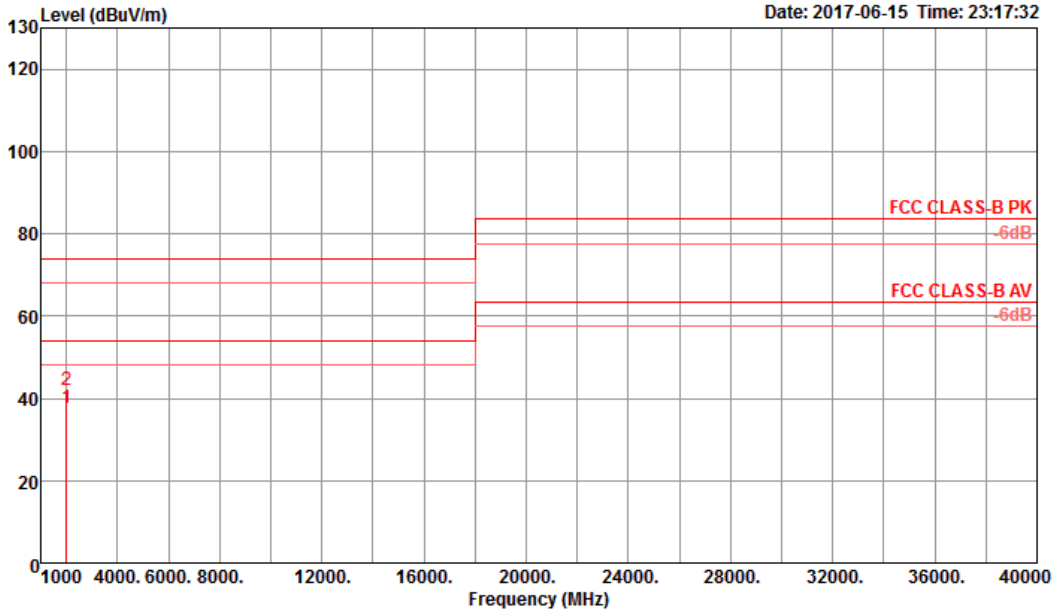
Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.960062G	50.29	54.00	-3.71	8.41	3	H	348	1.65	-
PK	4.959568G	57.04	74.00	-16.96	8.40	3	H	348	1.65	-

RSE Co-location Result			
Operating Mode	4	**Polarization**	Horizontal
Operating Function	Normal Link - R1 (5G) + R2 (5G) + R3 (5G) + R4 (BT)		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2016.12	40.10	74.00	-33.90	43.35	3.82	27.54	34.61	225	49	Peak	HORIZONTAL
2	2016.15	28.11	54.00	-25.89	31.36	3.82	27.54	34.61	225	49	Average	HORIZONTAL

RSE Co-location Result			
Operating Mode	4	**Polarization**	Vertical
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2016.30	37.57	54.00	-16.43	40.82	3.82	27.54	34.61	143	298	Average	VERTICAL
2	2016.42	42.10	74.00	-31.90	45.35	3.82	27.54	34.61	143	298	Peak	VERTICAL