FCC Test Report

Equipment	:	Digital Satellite Receiver
Brand Name	:	AT&T
Model No.	:	HR54-500
FCC ID	:	O6ZHR54R1
Standard	:	47 CFR FCC Part 15.247
Operating Band	:	2400 MHz – 2483.5 MHz
Function	:	☒ Point-to-multipoint; ☐ Point-to-point
Applicant	:	Humax Co., Ltd. HUMAX Village, 11-4, Sunae-dong, Bundang-gu Seongnam city, Gyeonggi-do South Korea 463-825
Manufacturer	:	Humax Co., Ltd. HUMAX Village, 11-4, Sunae-dong, Bundang-gu Seongnam city, Gyeonggi-do South Korea 463-825

The product sample received on Oct. 25, 2017 and completely tested on Nov. 28, 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 INTERNATIONAL INC., the test report shall not be reproduced except in full.

Cliff Chang
SPORTON INTERNATIONAL INC.

Testing Laboratory
1190

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PHOTOGRAPHS OF EUT V01

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
FR7O2406AC	Rev. 01	Initial issue of report	Dec. 06, 2017

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Product Type	Ch. Frequency (MHz)	Channel Number
2400-2483.5	RF4CE	2425-2475	15-25 [11]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	RF4CE	5	1TX

Note:
- RF4CE use a combination of O-QPSK modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Port	Brand	Part Number	Antenna Type	Connector	
1	2	Airgain	N2425HMHRA-290	PCB Antenna	I-PEX	
2	1	Airgain	N2425HMHRD-190	PCB Antenna	I-PEX	
Ant.	**Port**	**Brand**	**Part Number**	**Antenna Type**	**Connector**	**Gain (dBi)**
3	1	-	-	Printed Antenna	N/A	5.2
4	2	-	-	Printed Antenna	N/A	4.8

Frequency (MHz)	Ant. 1 Gain (dBi)	Ant. 2 Gain (dBi)	Composite Gain (dBi)
2400	2.1	4.0	4.2
2410	2.2	3.8	
2420	2.3	3.7	
2430	2.6	3.7	
2440	2.7	3.7	
2450	2.7	3.7	
2460	2.8	3.8	
2470	3.0	3.8	
2480	3.1	3.8	
2490	3.2	3.8	
5150	4.0	3.2	5.5
5200	3.8	3.7	
5300	3.6	3.3	5.4
5400	3.6	4.1	
5500	3.1	4.0	5.6
5600	3.4	4.2	
5700	3.3	3.7	
5800	3.9	3.6	5.5
5850	4.1	3.8	

<For 2.4GHz function>

For IEEE 802.11b mode <1TX/1RX>:

Only Port 1 can be used as transmitting/receiving antenna.

For IEEE 802.11g mode <1TX/1RX>:

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

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

The Port 2 generated the worst case, so it was selected to test and record in the report.

For IEEE 802.11n mode <2TX/2RX>:

Port 1 and Port 2 will transmit/receive the same signal simultaneously.

Port 1 and Port 2 can be used as transmitting/receiving antennas.

<For 5GHz function>

For IEEE 802.11a mode <1TX/1RX>:

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

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

The Port 1 generated the worst case, so it was selected to test and record in the report.

For IEEE 802.11n mode <2TX/2RX>:

Port 1 and Port 2 will transmit/receive the same signal simultaneously.

Port 1 and Port 2 can be used as transmitting/receiving antennas.

<For RF4CE funciton>

For RF4CE mode <1TX/1RX>:

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

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

The Port 2 generated the worst case, so it was selected to test and record in the report.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
RF4CE	100%	0.000	n/a (DC>=0.98)	n/a (DC>=0.98)

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter			
Beamforming Function	☐	With beamforming	☒	Without beamforming
Test Software Version	ttermpro			

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
- FCC KDB 662911 D01 v02r01

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	Gino Huang	22°C / 55%	Oct. 31, 2017~Nov. 28, 2017
Radiated	03CH01-CB	Gino Huang / Zero Chen / Joy Tseng	22°C / 54%	Oct. 31, 2017~Nov. 25, 2017
AC Conduction	CO02-CB	Peter Wu / GN Hou	24°C / 56%	Oct. 27, 2017~Nov. 28, 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
RF4CE_Nss1_1TX	-
2425MHz	3
2450MHz	3
2475MHz	3

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
1	CTX - 2.4GHz
2	CTX - 5GHz
3	CTX - RF4CE
Mode 1 generated the worst test result, so it was recorded in this 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	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.

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
1	CTX - 2.4GHz
2	CTX - 5GHz
3	CTX - RF4CE
Mode 2 generated the worst test result, so it was recorded in this report.	
Operating Mode > 1GHz	CTX

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + RF4CE
2	WLAN 5GHz + RF4CE
Refer to Sporton Test Report No.: FA7O2406 for Co-location RF Exposure Evaluation.	

Note1: The EUT can only use Z axis position.

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

Accessories			
Equipment Name	**Brand Name**	**Model Name**	**Rating**
Adapter	DIRECTV	EPS44R3-16	INPUT: 120V ~ 1.1A, 60Hz OUTPUT: 12V, 4A
Equipment Name	**Brand Name**	**Part Number**	**Rating**
Hard Disk	SEAGATE	1SD102-500	-

2.5 Support Equipment

For Test Site No: CO01-CB

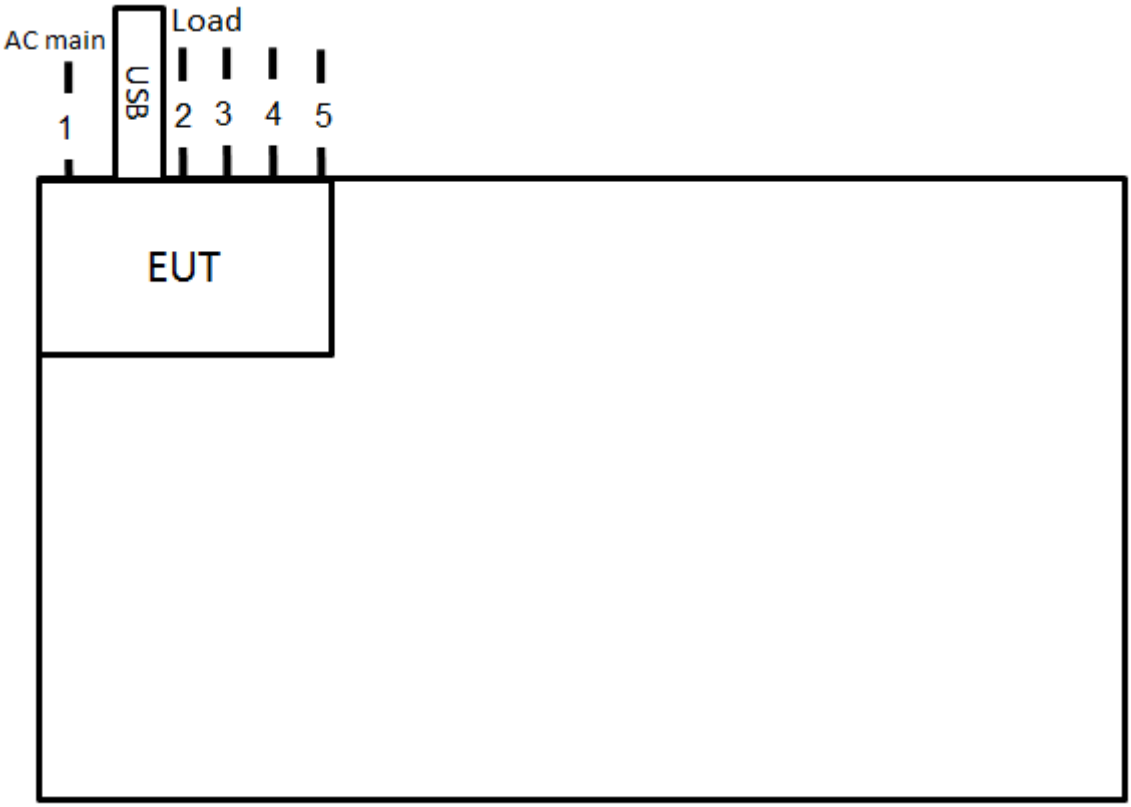
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	NB	DELL	E6430	DoC
2	Flash disk	Silicon	I-Series	DoC

For Test Site No: 03CH01-CB and TH01-CB

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	DoC

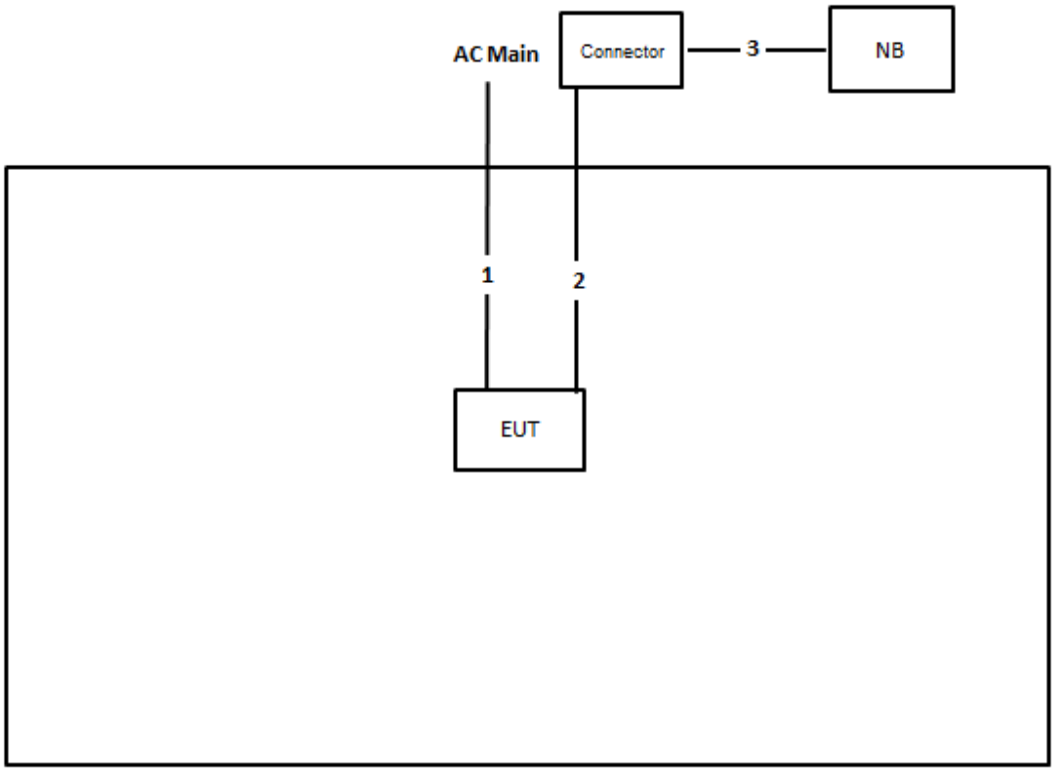
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length
1	Power cable	No	3.2m
2	RJ-45 cable	No	1.5m
3	HDMI cable	Yes	1.5m
4	Optical fiber cable	No	1.5m
5	Coaxial cable	Yes	1.5m

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	Power cable	No	3.2m
2	RS232 to USB cable	No	0.45m
3	USB cable	No	1.8m

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

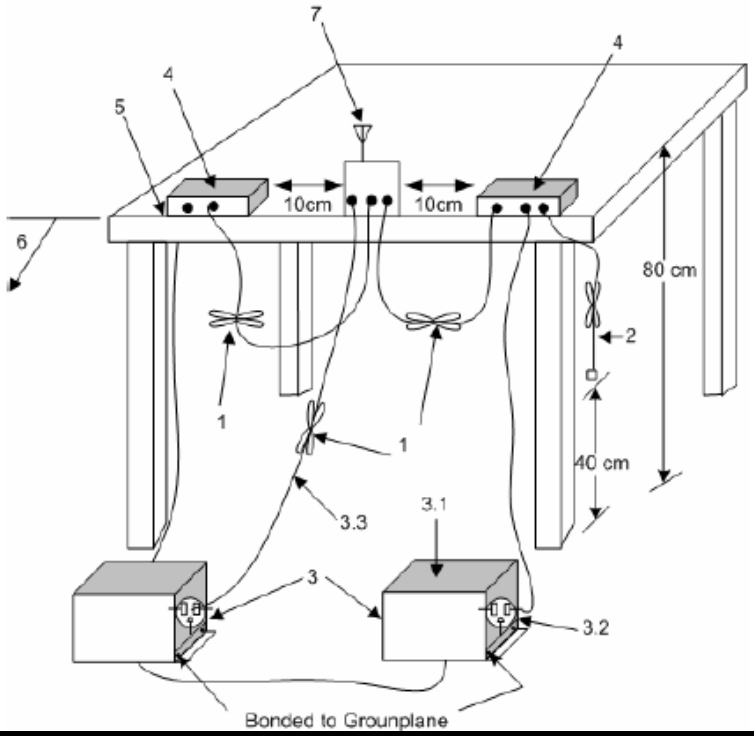
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

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

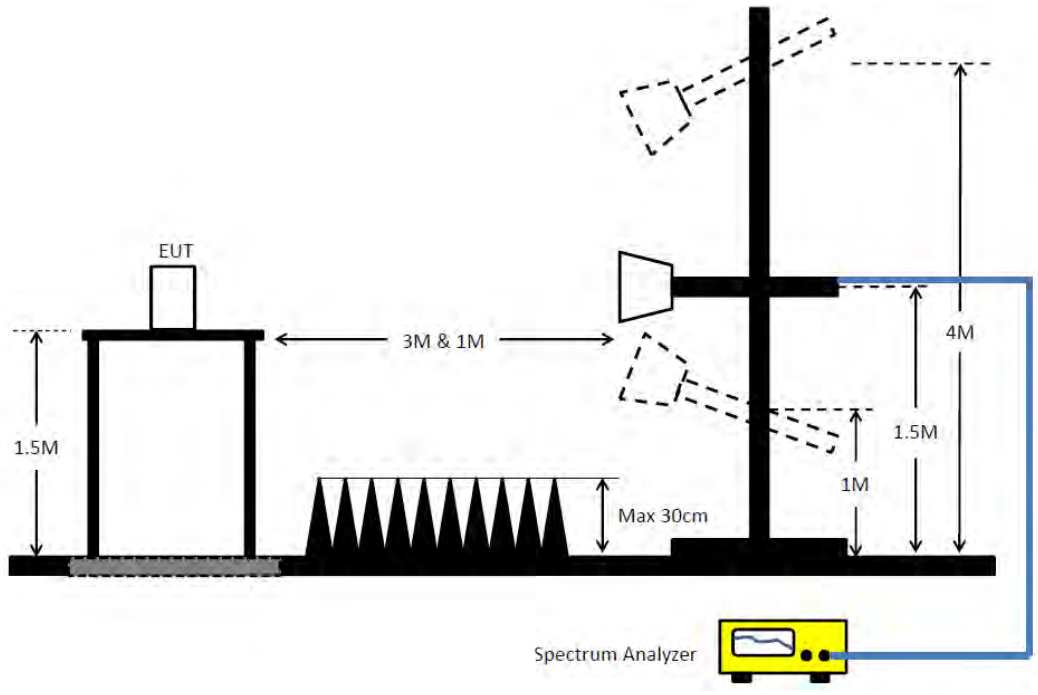
Refer a test equipment and calibration data table in this test report.

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 for 6 dB bandwidth measurement.
	☐ Refer as FCC KDB 558074, clause 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

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

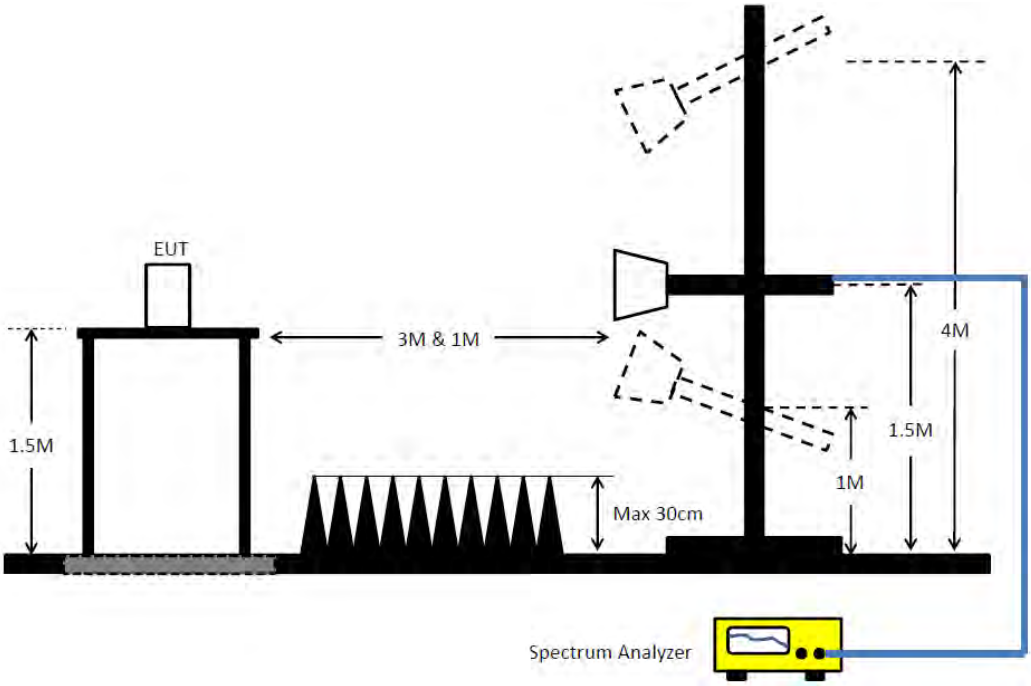
Refer a test equipment and calibration data table in this test report.

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).
	☐ Refer as FCC KDB 558074, clause 9.1.2 PKPM1 Peak power meter method.
▪ For Radiated measurement.	
	▪ If a radiated test configuration is used, then the measured power or field strength levels shall be converted to equivalent conducted power levels for comparison to the applicable output power limit. This may be accomplished by first measuring the radiated field strength or power levels using a methodology for maximum peak conducted power or maximum conducted (average) power as applicable and peak or average power spectral density as applicable. The radiated field strength or power level can then be converted to EIRP (see ANSI C63.10 for guidance). The equivalent conducted output power or power spectral density is then determined by subtracting the EUT transmit antenna gain (guidance applicable to devices utilizing multiple antenna technologies is provided in KDB Publication 662911) from the EIRP (assuming logarithmic representation). All calculations and parameter assumptions shall be provided in the test report.

3.3.4 Test Setup

Maximum Conducted Output Power



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.

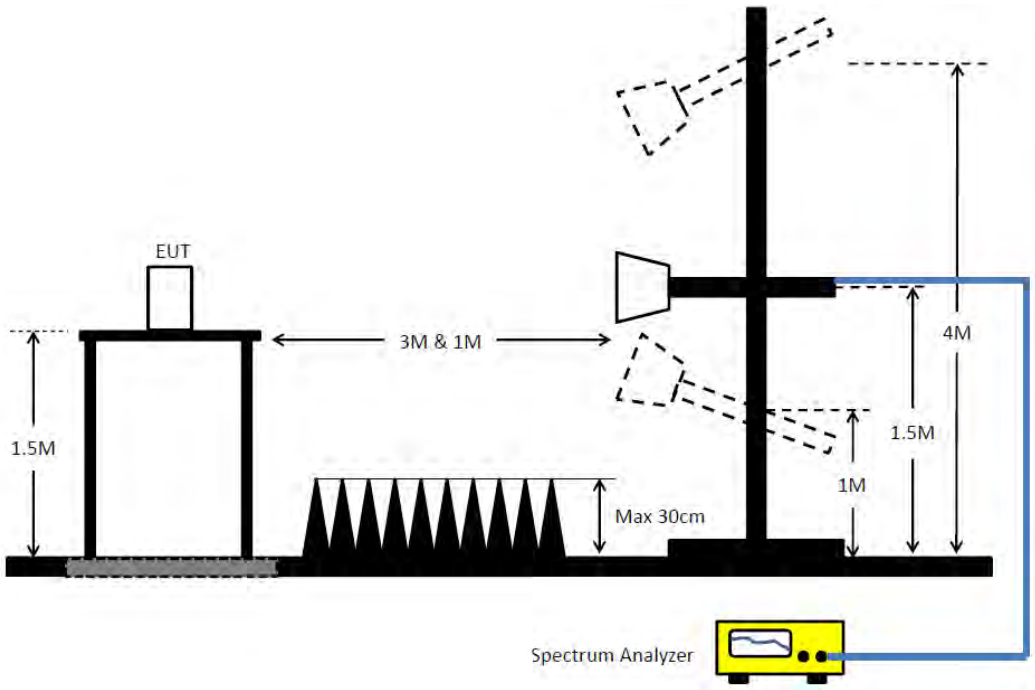
3.4.3 Test Procedures

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.

▪	For Radiated measurement.	
		If a radiated test configuration is used, then the measured power or field strength levels shall be converted to equivalent conducted power levels for comparison to the applicable output power limit. This may be accomplished by first measuring the radiated field strength or power levels using a methodology for maximum peak conducted power or maximum conducted (average) power as applicable and peak or average power spectral density as applicable. The radiated field strength or power level can then be converted to EIRP (see ANSI C63.10 for guidance). The equivalent conducted output power or power spectral density is then determined by subtracting the EUT transmit antenna gain (guidance applicable to devices utilizing multiple antenna technologies is provided in KDB Publication 662911) from the EIRP (assuming logarithmic representation). All calculations and parameter assumptions shall be provided in the test report.

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

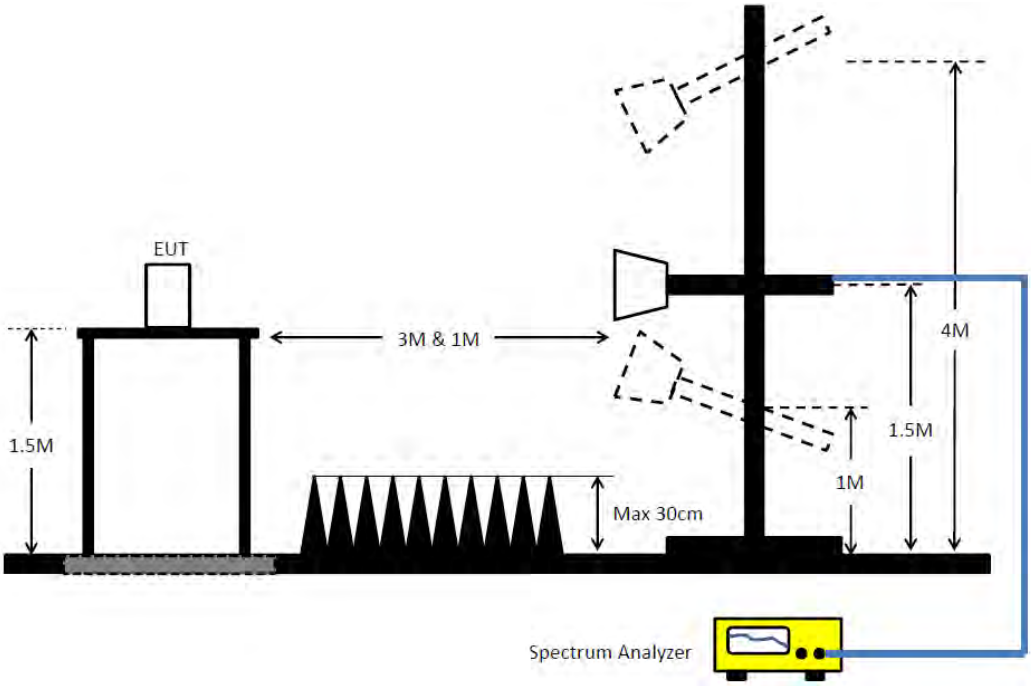
Refer a test equipment and calibration data table in this test report.

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 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.

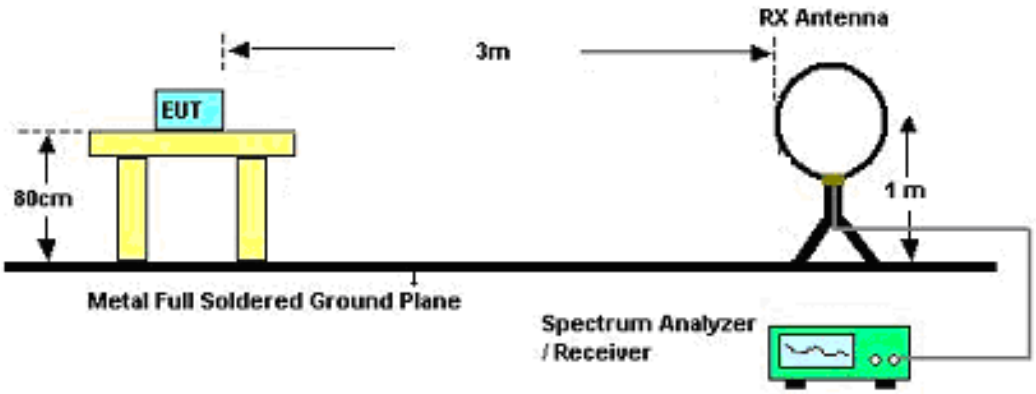
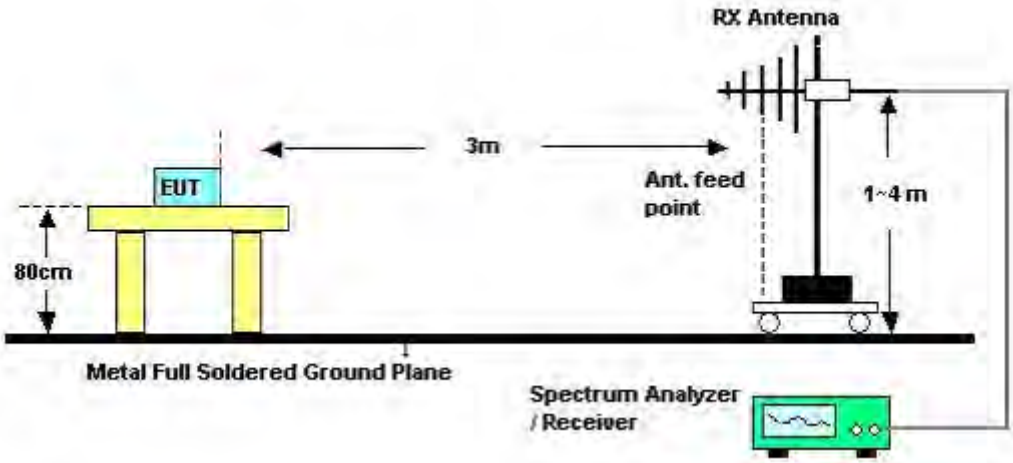
3.6.2 Measuring Instruments

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

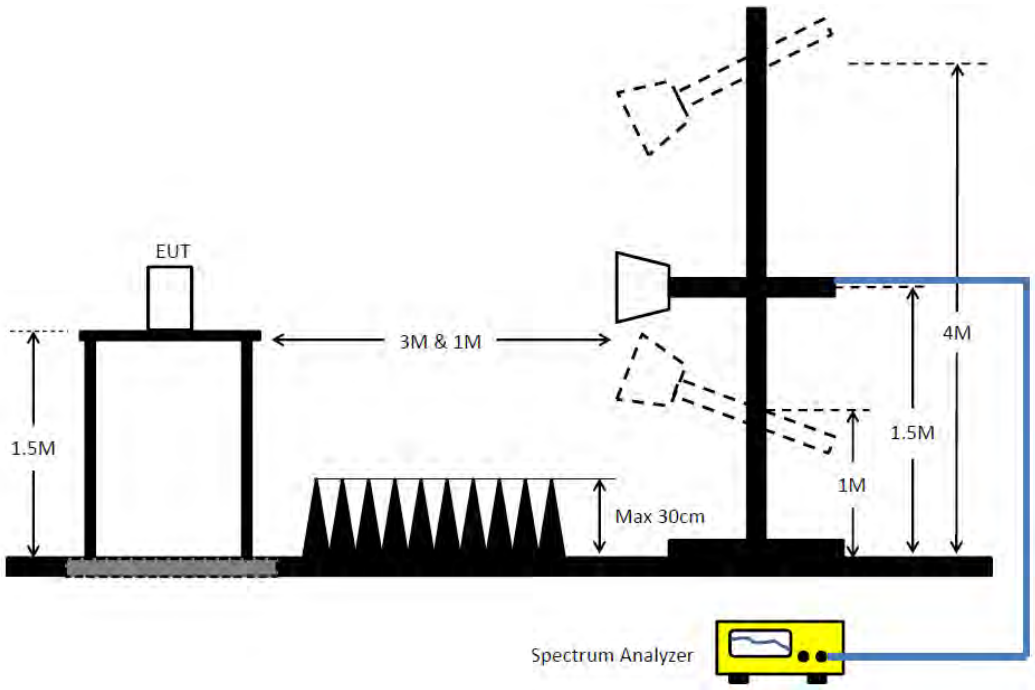
3.6.3 Test Procedures

Test Method		
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
▪ Refer as ANSI C63.10, clause 6.9.2.2 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 Test Result of Transmitter Radiated Unwanted Emissions

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 14, 2016	Dec. 13, 2017	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 21, 2016	Dec. 20, 2017	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 16, 2017	Jan. 15, 2018	Conduction (CO02-CB)
COND Cable	Woken	Cable	01	0.15MHz ~ 30MHz	Nov. 30, 2016	Nov. 29, 2017	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F	9561-F073	9kHz ~ 30MHz	Oct. 03, 2017	Oct. 02, 2018	Conduction (CO02-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2017	Aug. 29, 2018	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Mar. 15, 2018*	Radiation (03CH01-CB
Horn Antenna	EMCO	3115	9610-4976	1GHz ~ 18GHz	Apr. 27, 2017	Apr. 26, 2018	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 05, 2017	Jul. 04, 2018	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 02, 2017	May 01, 2018	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Jan. 15, 2018	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 10, 2017	Jul. 09, 2018	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSV40	101024	9kHz ~ 40GHz	Aug. 31, 2017	Aug. 30, 2018	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 06, 2017	May 05, 2018	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Dec. 25, 2017	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)

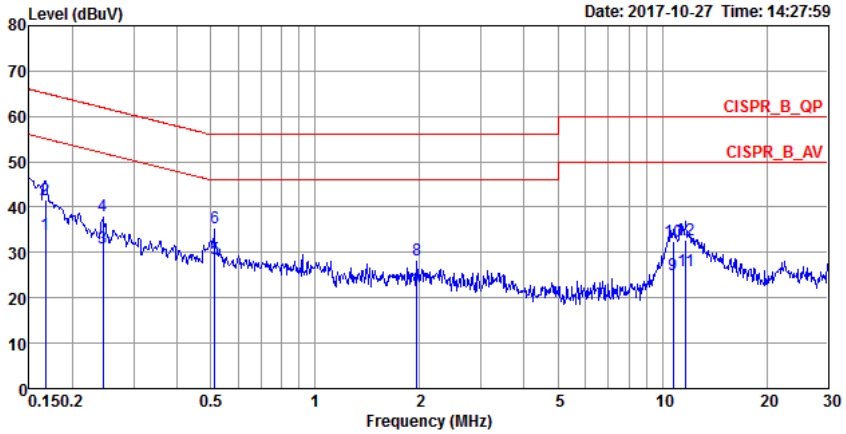
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY54320015	50MHz~18GHz	Apr. 24, 2017	Apr. 23, 2018	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.

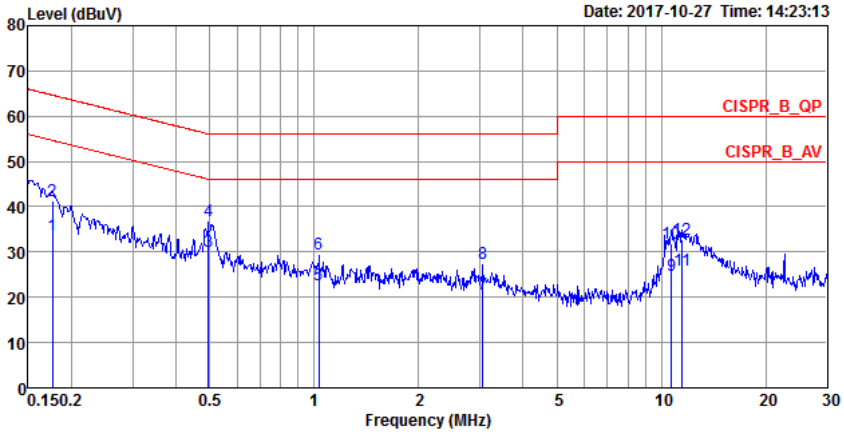
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	CTX - EUT 2.4GHz		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1668	33.93	-21.19	55.12	23.93	9.96	0.04	Average	LINE
2	0.1668	41.54	-23.58	65.12	31.54	9.96	0.04	QP	LINE
3	0.2442	31.03	-20.92	51.95	21.08	9.90	0.05	Average	LINE
4	0.2442	38.07	-23.88	61.95	28.12	9.90	0.05	QP	LINE
5	0.5128	28.61	-17.39	46.00	18.68	9.89	0.04	Average	LINE
6	0.5128	35.44	-20.56	56.00	25.51	9.89	0.04	QP	LINE
7	1.9593	21.52	-24.48	46.00	11.43	10.01	0.08	Average	LINE
8	1.9593	28.21	-27.79	56.00	18.12	10.01	0.08	QP	LINE
9	10.7330	25.14	-24.86	50.00	14.88	10.07	0.19	Average	LINE
10	10.7330	32.47	-27.53	60.00	22.21	10.07	0.19	QP	LINE
11	11.6826	25.88	-24.12	50.00	15.59	10.09	0.20	Average	LINE
12	11.6826	32.84	-27.16	60.00	22.55	10.09	0.20	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.)

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	CTX - EUT 2.4GHz		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1758	33.77	-20.91	54.68	23.72	10.00	0.05	Average	NEUTRAL
2	0.1758	41.47	-23.21	64.68	31.42	10.00	0.05	QP	NEUTRAL
3	0.4966	29.97	-16.09	46.06	19.98	9.95	0.04	Average	NEUTRAL
4	0.4966	36.80	-19.26	56.06	26.81	9.95	0.04	QP	NEUTRAL
5	1.0320	22.62	-23.38	46.00	12.58	9.98	0.06	Average	NEUTRAL
6	1.0320	29.50	-26.50	56.00	19.46	9.98	0.06	QP	NEUTRAL
7	3.0576	20.66	-25.34	46.00	10.53	10.02	0.11	Average	NEUTRAL
8	3.0576	27.56	-28.44	56.00	17.43	10.02	0.11	QP	NEUTRAL
9	10.6763	24.90	-25.10	50.00	14.56	10.15	0.19	Average	NEUTRAL
10	10.6763	31.94	-28.06	60.00	21.60	10.15	0.19	QP	NEUTRAL
11	11.4983	26.06	-23.94	50.00	15.69	10.17	0.20	Average	NEUTRAL
12	11.4983	32.90	-27.10	60.00	22.53	10.17	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.)

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
RF4CE_Nss1_1TX	-	-	-	-	-
2.4-2.4835GHz	1.588M	2.456M	2M46D1D	1.563M	2.45M

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;

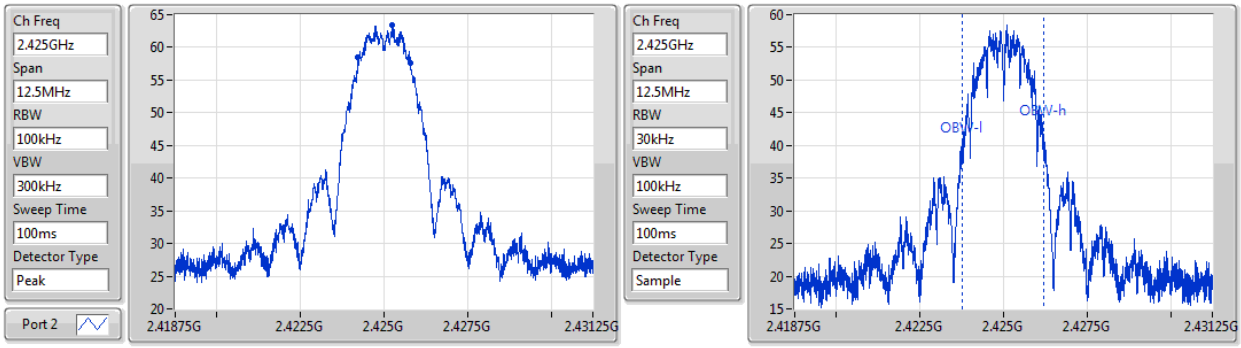
Result

Mode	Result	Limit (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
RF4CE_Nss1_1TX	-	-	-	-
2425MHz	Pass	500k	1.563M	2.45M
2450MHz	Pass	500k	1.563M	2.456M
2475MHz	Pass	500k	1.588M	2.45M

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

RF4CE_Nss1_1TX **EBW**

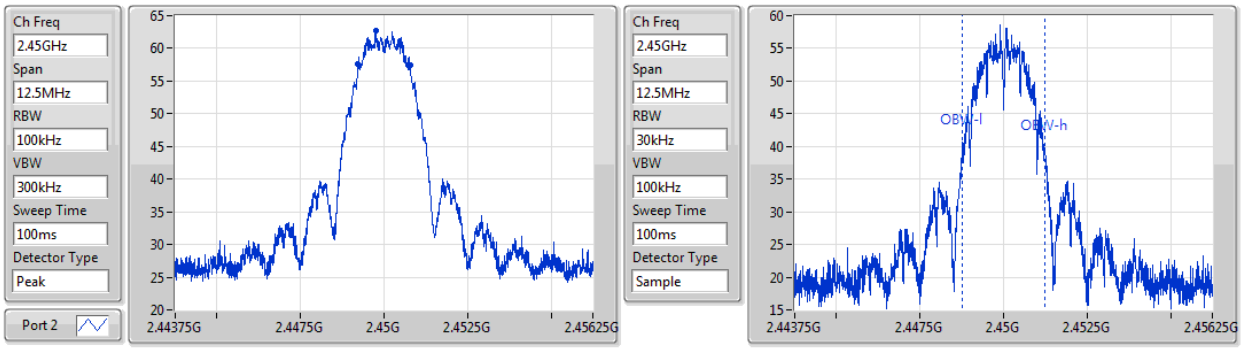
2425MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.563M	2.424225G	2.425788G	2.45M	2.423769G	2.426219G	500k	2

RF4CE_Nss1_1TX **EBW**

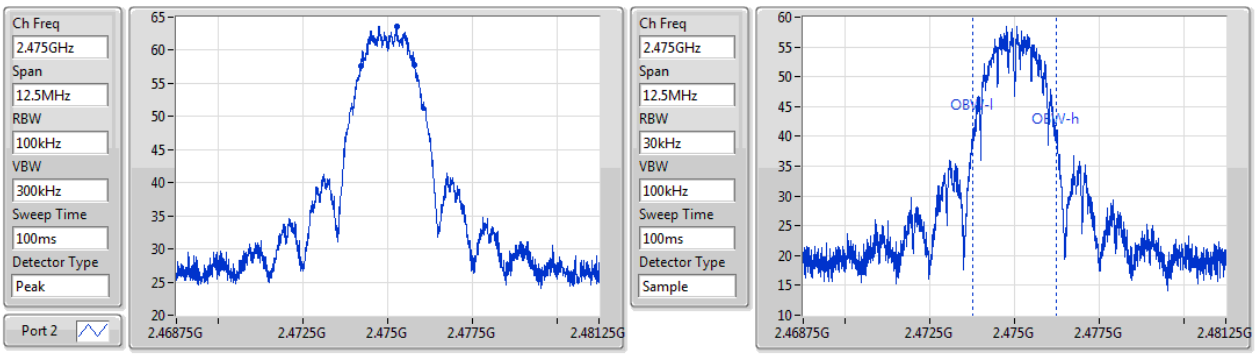
2450MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.563M	2.449225G	2.450788G	2.456M	2.448769G	2.451225G	500k	2

RF4CE_Nss1_1TX **EBW**

2475MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.588M	2.474213G	2.4758G	2.45M	2.473775G	2.476225G	500k	2

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
RF4CE	-6.17	0.00024

Result

Mode	Result	DG (dBi)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)
RF4CE	-	-	-	-	-
2425MHz	Pass	4.8	-6.60	-6.60	30.00
2450MHz	Pass	4.8	-6.35	-6.35	30.00
2475MHz	Pass	4.8	-6.17	-6.17	30.00

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

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
RF4CE	-	-	-	-	-
2425MHz	Pass	5.2	-7.40	-7.40	30.00
2450MHz	Pass	5.2	-6.95	-6.95	30.00
2475MHz	Pass	5.2	-6.97	-6.97	30.00

DG = Directional Gain; **Port X** = Port X output power
Worst case was Port 2 based on Port 1 EIRP power lower than Port 2.

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
RF4CE	-18.22

RBW=3kHz.

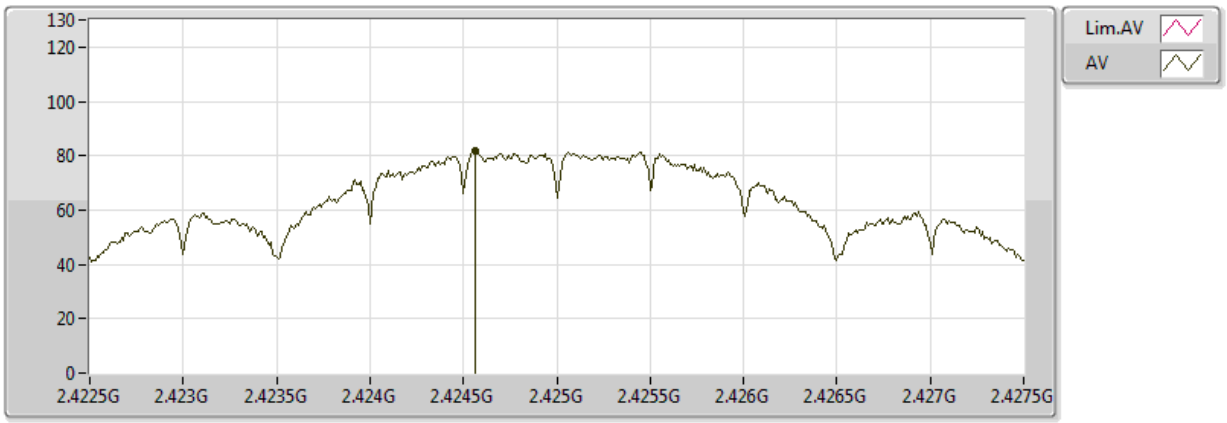
Result

Mode	Result	DG (dBi)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
RF4CE	-	-	-	-	-
2425MHz	Pass	4.8	-18.22	-18.22	8.00
2450MHz	Pass	4.8	-18.90	-18.90	8.00
2475MHz	Pass	4.8	-18.59	-18.59	8.00

DG = Directional Gain; RBW=3kHz;
EIRP PSD refer to KDB 558074 12.2.2 e)
E (dBuV)=EIRP(dBm) - 20log D + 104.8 = EIRP(dBm) – 20log(3) +104.8 = EIRP(dBm)-95.2
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

RF4CE_Nss1_1TX

2425MHz_TX

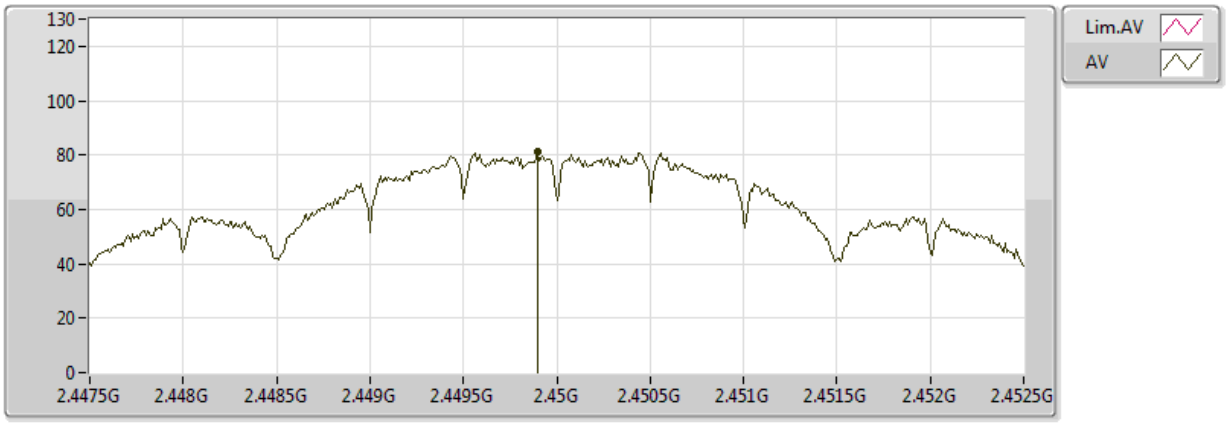


20171110
EUT Z_1TX(ANT2)
Setting 3
01-G-2
FSP(100080)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.42456G	81.78	Inf	-Inf	30.92	3	Horizontal	292	1.40

RF4CE_Nss1_1TX

2450MHz_TX

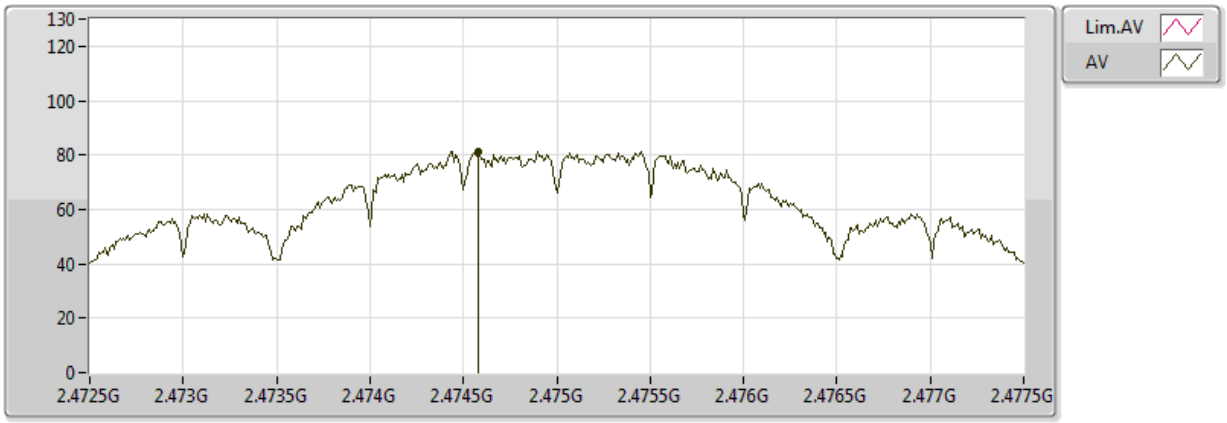


20171110
EUT Z_1TX(ANT2)
Setting 3
01-G-2
FSP(100080)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.4499G	81.10	Inf	-Inf	30.99	3	Horizontal	290	1.41

RF4CE_Nss1_1TX

2475MHz_TX



20171110
EUT Z_1TX(ANT2)
Setting 3
01-G-2
FSP(100080)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.47458G	81.41	Inf	-Inf	31.05	3	Horizontal	291	1.42

Summary

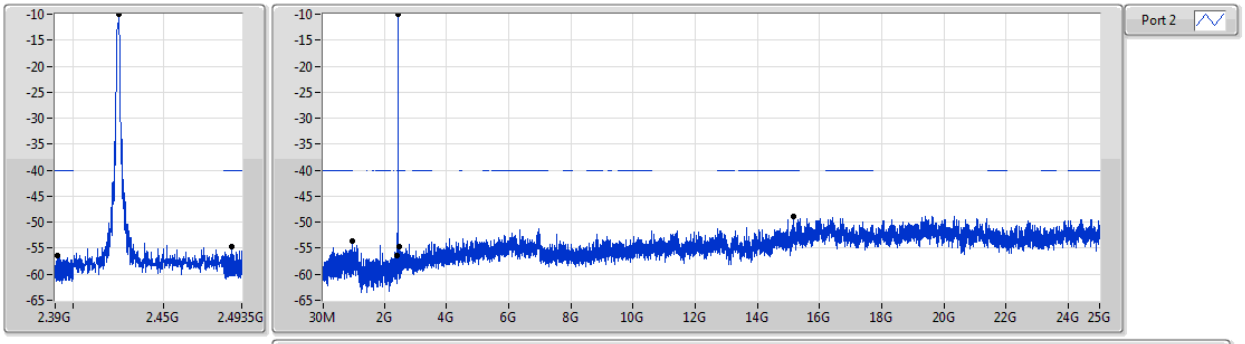
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
RF4CE_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	2.449766G	-11.31	-41.31	726.2M	-54.71	2.39054G	-55.96	2.4868G	-55.11	24.397951G	-48.80	2

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
RF4CE_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2425MHz	Pass	2.425217G	-10.06	-40.06	958.66M	-53.60	2.391G	-56.36	2.4879G	-54.64	15.161846G	-48.92	2
2450MHz	Pass	2.449766G	-11.31	-41.31	726.2M	-54.71	2.39054G	-55.96	2.4868G	-55.11	24.397951G	-48.80	2
2475MHz	Pass	2.474649G	-10.87	-40.87	897.3M	-52.85	2.39856G	-56.15	2.48406G	-55.25	16.273105G	-48.55	2

RF4CE_Nss1_1TX **CSE NdB**

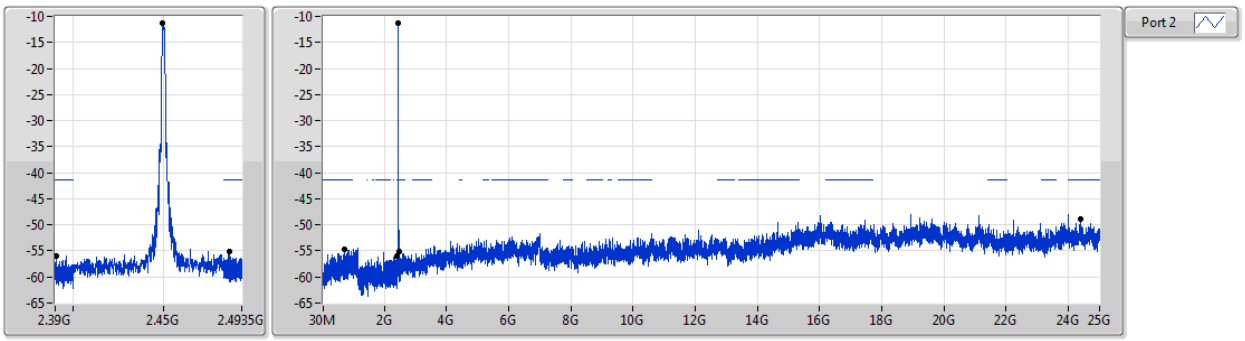
2425MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.425217G	-10.06	-40.06	958.66M	-53.60	2.391G	-56.36	2.4879G	-54.64	15.161846G	-48.92	2

RF4CE_Nss1_1TX **CSE NdB**

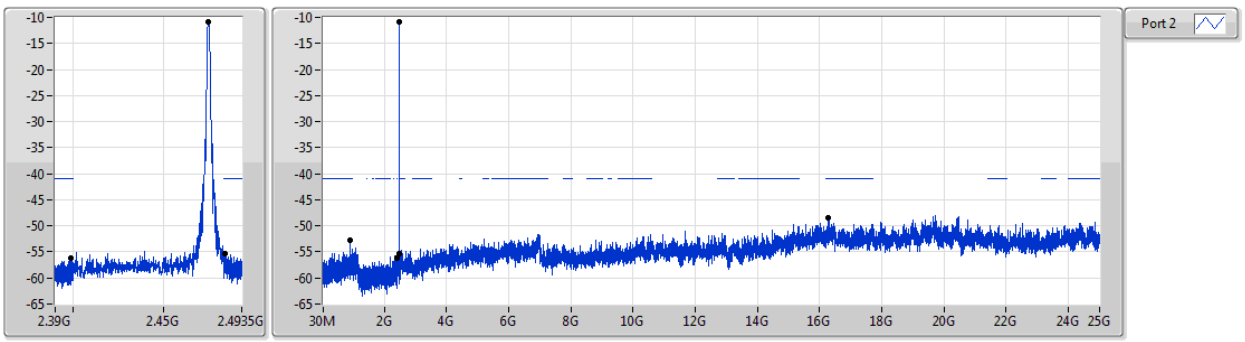
2450MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.449766G	-11.31	-41.31	726.2M	-54.71	2.39054G	-55.96	2.4868G	-55.11	24.397951G	-48.80	2

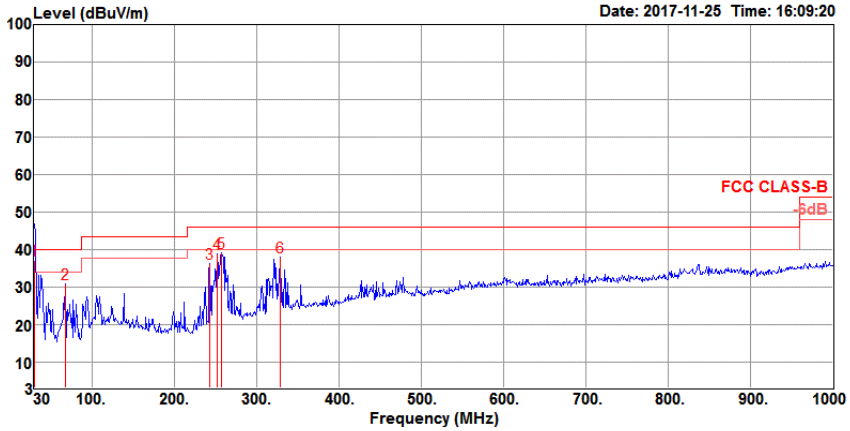
RF4CE_Nss1_1TX **CSE NdB**

2475MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.474649G	-10.87	-40.87	897.3M	-52.85	2.39856G	-56.15	2.48406G	-55.25	16.273105G	-48.55	2

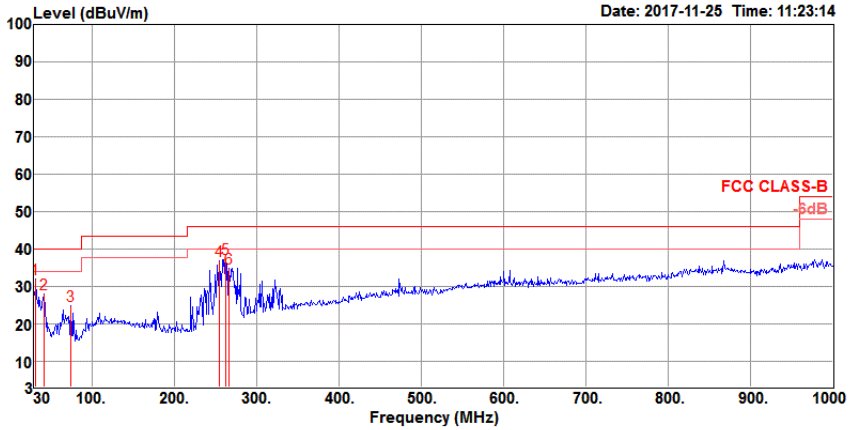
RSE below 1GHz Result			
Operating Mode	2	**Polarization**	Horizontal
Operating Function	CTX - EUT 5GHz		



	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	36.93	40.00	-3.07	44.50	0.67	24.29	32.53	200	212	QP	HORIZONTAL
2	67.83	30.80	40.00	-9.20	49.96	1.17	12.20	32.53	100	20	Peak	HORIZONTAL
3	243.40	36.24	46.00	-9.76	48.48	2.58	17.65	32.47	150	162	Peak	HORIZONTAL
4	252.13	38.91	46.00	-7.09	49.97	2.64	18.76	32.46	200	283	Peak	HORIZONTAL
5	257.95	39.13	46.00	-6.87	49.37	2.69	19.53	32.46	150	146	Peak	HORIZONTAL
6	328.76	38.01	46.00	-7.99	47.70	3.08	19.67	32.44	200	30	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	2	**Polarization**	Vertical
Operating Function	CTX - EUT 5GHz		



	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	31.94	31.80	40.00	-8.20	40.43	0.67	23.23	32.53	100	0	Peak	VERTICAL
2	41.64	27.94	40.00	-12.06	41.55	0.94	17.96	32.51	100	328	Peak	VERTICAL
3	74.62	24.87	40.00	-15.13	43.93	1.20	12.27	32.53	100	250	Peak	VERTICAL
4	255.04	36.90	46.00	-9.10	47.61	2.66	19.09	32.46	100	2	Peak	VERTICAL
5	262.80	37.25	46.00	-8.75	47.38	2.72	19.61	32.46	200	162	Peak	VERTICAL
6	266.68	34.83	46.00	-11.17	45.12	2.75	19.41	32.45	100	20	Peak	VERTICAL

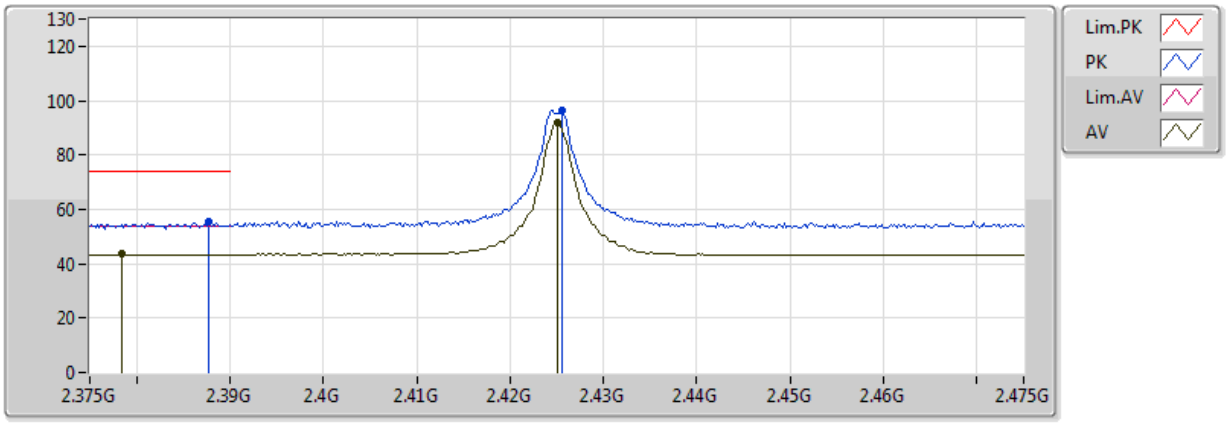
Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
RF4CE_Nss1_1TX	Pass	AV	2.484G	45.24	54.00	-8.76	31.39	3	Horizontal	300	1.01	-

RF4CE_Nss1_1TX

2425MHz_TX

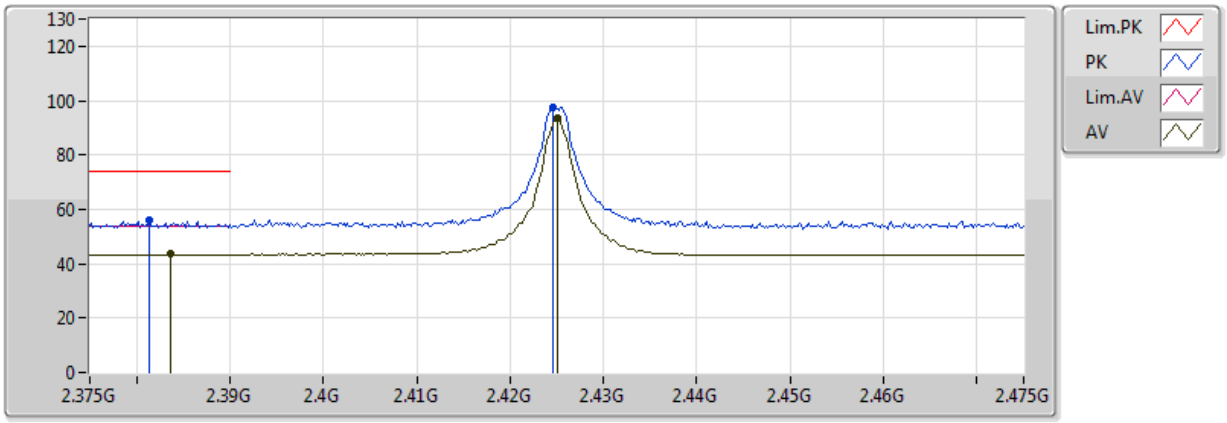


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.3784G	43.44	54.00	-10.56	31.50	3	Vertical	218	1.04
AV	2.425G	92.04	Inf	-Inf	31.45	3	Vertical	218	1.04
PK	2.3878G	55.27	74.00	-18.73	31.48	3	Vertical	218	1.04
PK	2.4256G	96.34	Inf	-Inf	31.45	3	Vertical	218	1.04

RF4CE_Nss1_1TX

2425MHz_TX

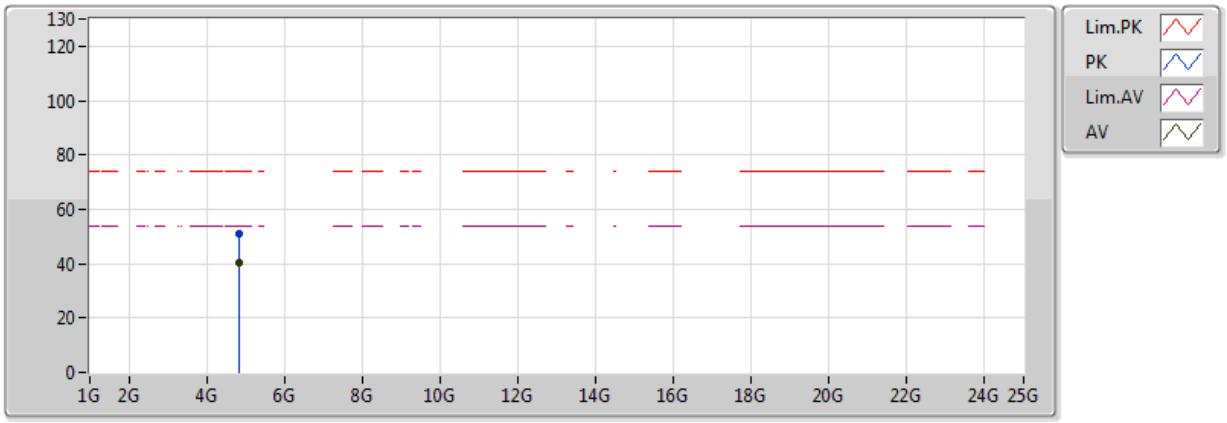


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.3836G	43.43	54.00	-10.57	31.49	3	Horizontal	1	1.45
AV	2.425G	93.40	Inf	-Inf	31.45	3	Horizontal	1	1.45
PK	2.3814G	55.91	74.00	-18.09	31.49	3	Horizontal	1	1.45
PK	2.4246G	97.64	Inf	-Inf	31.45	3	Horizontal	1	1.45

RF4CE_Nss1_1TX

2425MHz_TX

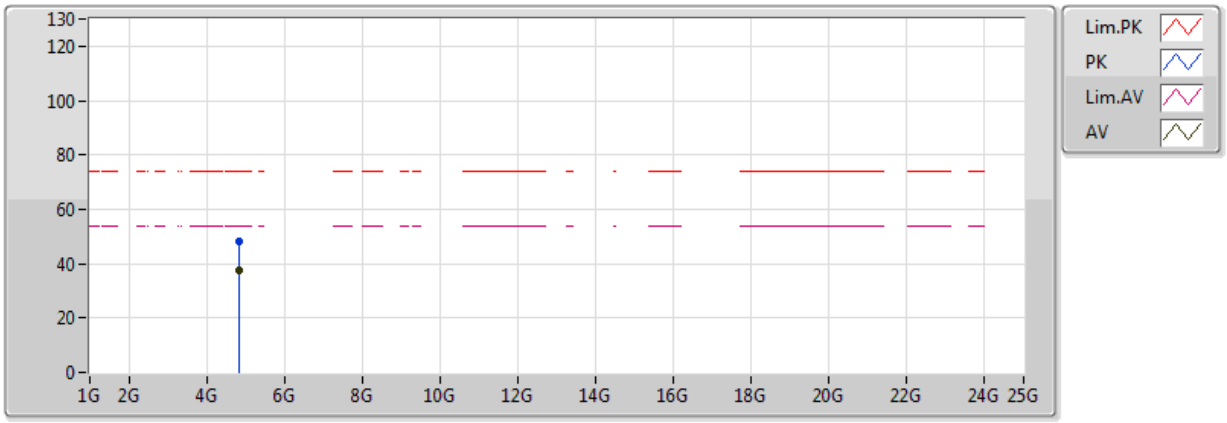


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	4.84898G	40.60	54.00	-13.40	3.31	3	Vertical	242	1.50
PK	4.85104G	51.07	74.00	-22.93	3.31	3	Vertical	242	1.50

RF4CE_Nss1_1TX

2425MHz_TX

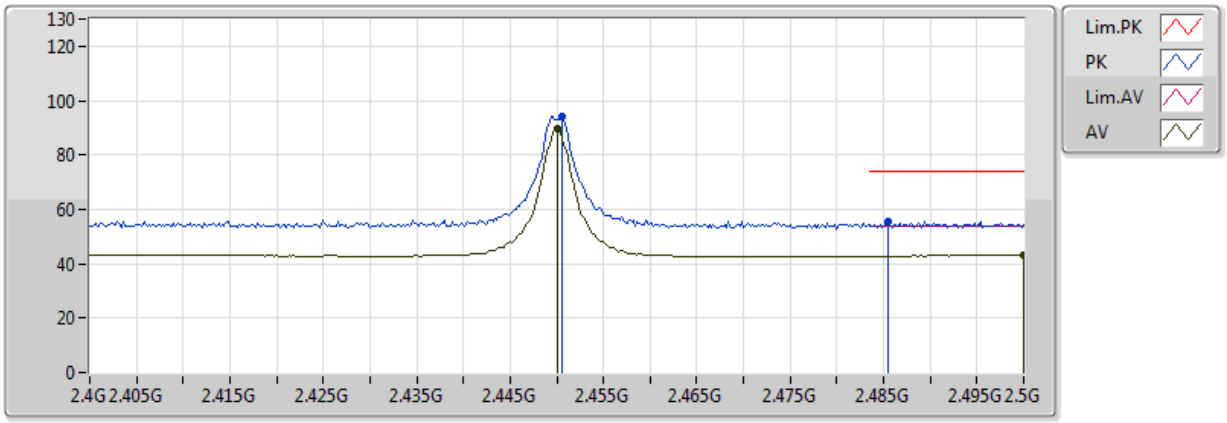


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	4.84908G	37.57	54.00	-16.43	3.31	3	Horizontal	97	1.42
PK	4.85112G	48.43	74.00	-25.57	3.31	3	Horizontal	97	1.42

RF4CE_Nss1_1TX

2450MHz_TX

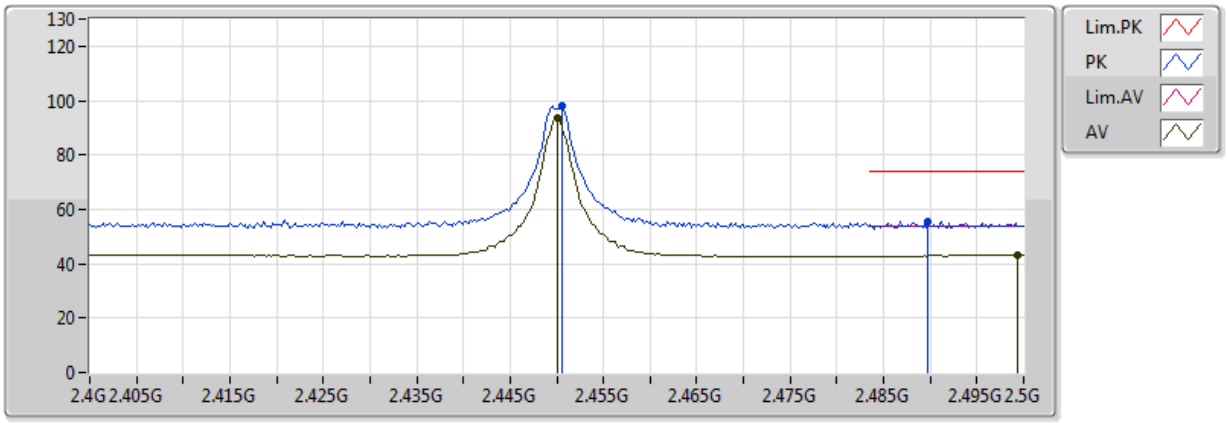


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.45G	89.85	Inf	-Inf	31.43	3	Vertical	208	1.09
AV	2.499998G	42.96	54.00	-11.04	31.38	3	Vertical	208	1.09
PK	2.4506G	94.07	Inf	-Inf	31.42	3	Vertical	208	1.09
PK	2.4854G	55.40	74.00	-18.60	31.39	3	Vertical	208	1.09

RF4CE_Nss1_1TX

2450MHz_TX

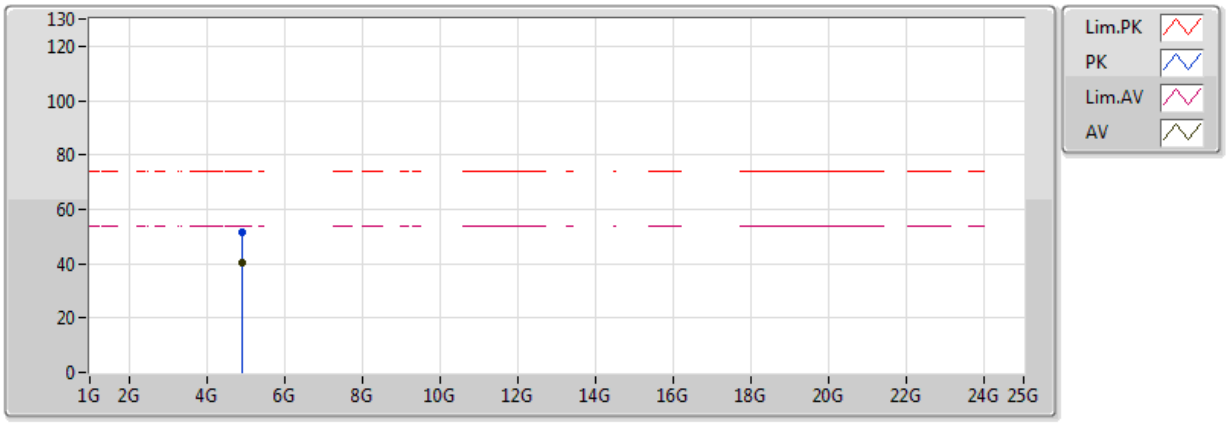


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.45G	93.65	Inf	-Inf	31.43	3	Horizontal	300	1.02
AV	2.4994G	42.95	54.00	-11.05	31.38	3	Horizontal	300	1.02
PK	2.4506G	97.91	Inf	-Inf	31.42	3	Horizontal	300	1.02
PK	2.4898G	55.59	74.00	-18.41	31.39	3	Horizontal	300	1.02

RF4CE_Nss1_1TX

2450MHz_TX

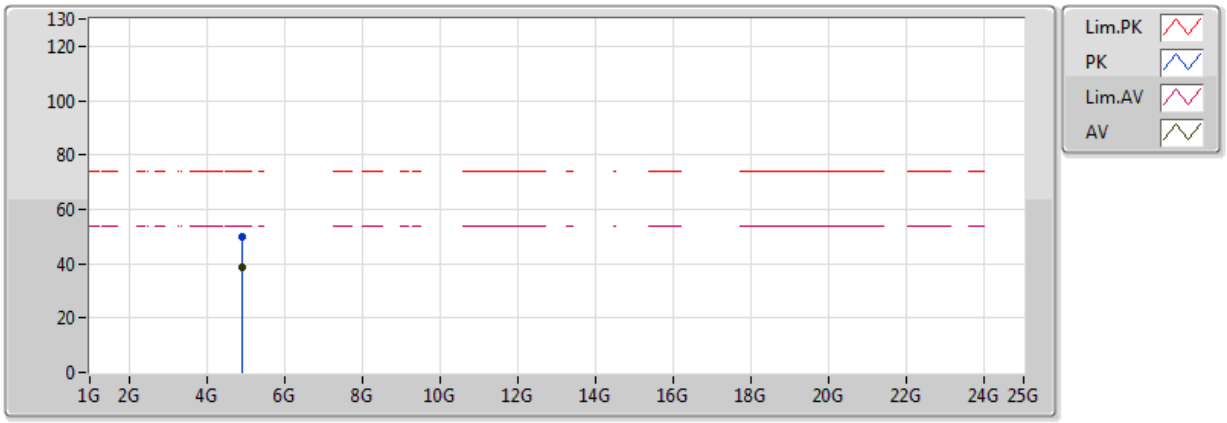


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	4.90099G	40.47	54.00	-13.53	3.47	3	Vertical	214	1.57
PK	4.90096G	51.66	74.00	-22.34	3.47	3	Vertical	214	1.57

RF4CE_Nss1_1TX

2450MHz_TX

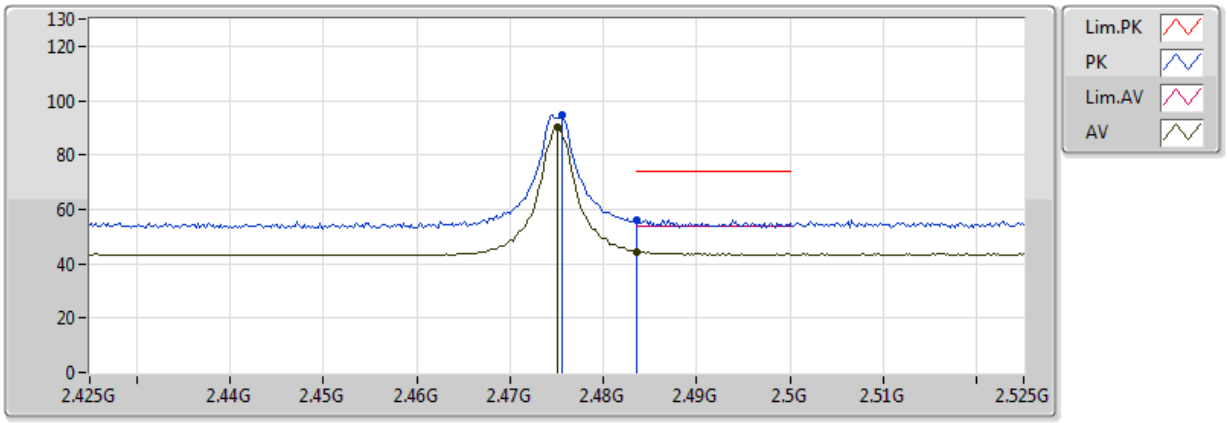


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	4.90098G	38.41	54.00	-15.59	3.47	3	Horizontal	170	2.99
PK	4.90101G	50.01	74.00	-23.99	3.47	3	Horizontal	170	2.99

RF4CE_Nss1_1TX

2475MHz_TX

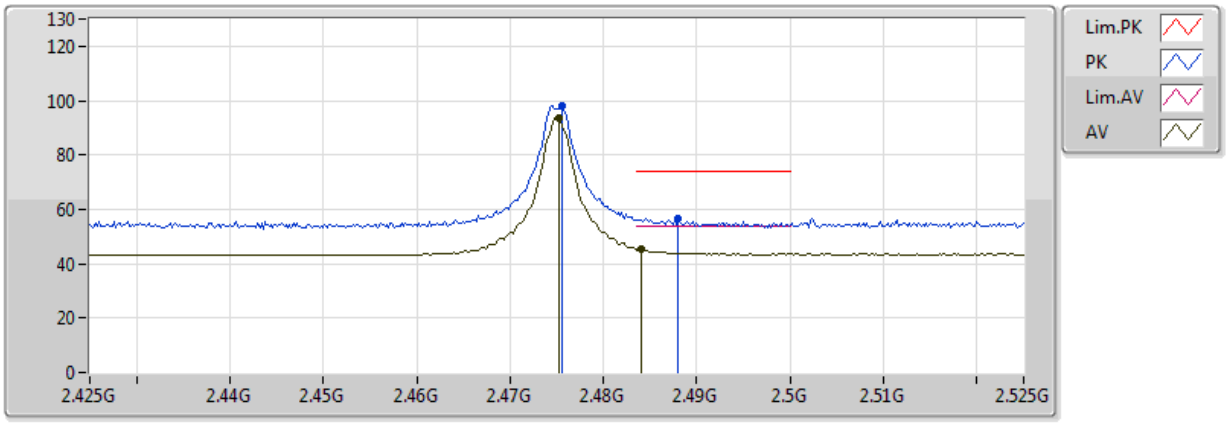


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.475G	90.47	Inf	-Inf	31.40	3	Vertical	208	1.17
AV	2.483502G	44.29	54.00	-9.71	31.39	3	Vertical	208	1.17
PK	2.4756G	94.71	Inf	-Inf	31.40	3	Vertical	208	1.17
PK	2.483502G	56.28	74.00	-17.72	31.39	3	Vertical	208	1.17

RF4CE_Nss1_1TX

2475MHz_TX

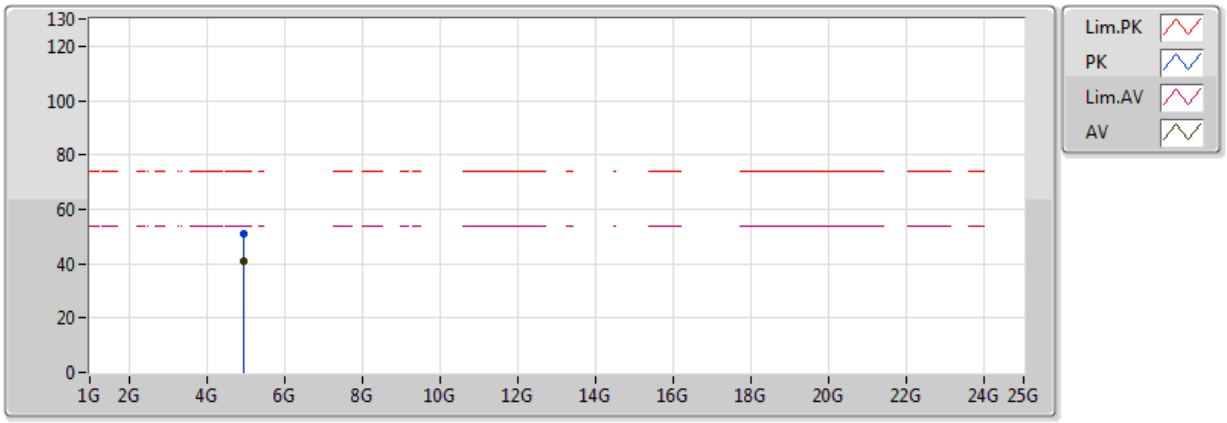


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	2.4752G	93.83	Inf	-Inf	31.40	3	Horizontal	300	1.01
AV	2.484G	45.24	54.00	-8.76	31.39	3	Horizontal	300	1.01
PK	2.4756G	98.01	Inf	-Inf	31.40	3	Horizontal	300	1.01
PK	2.488G	56.55	74.00	-17.45	31.39	3	Horizontal	300	1.01

RF4CE_Nss1_1TX

2475MHz_TX

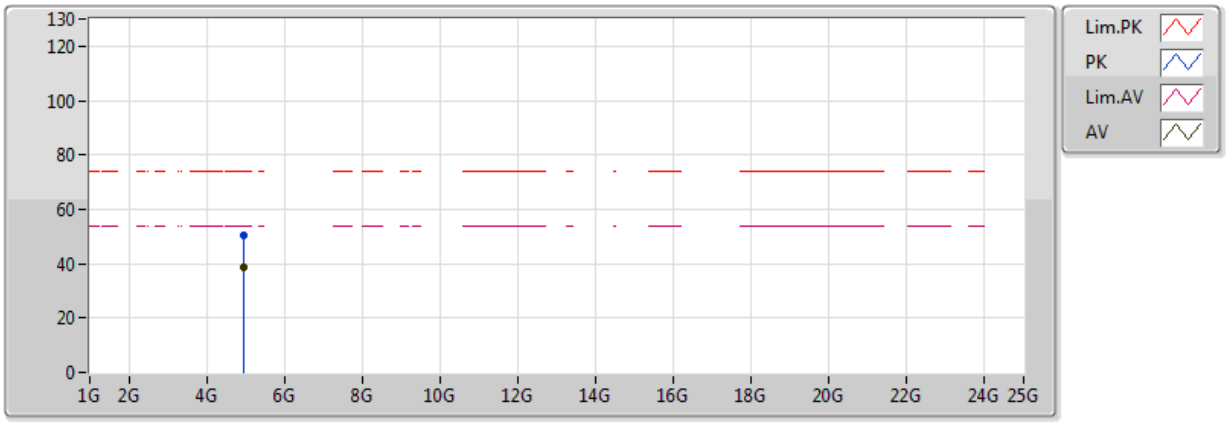


20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	4.951G	40.89	54.00	-13.11	3.64	3	Vertical	214	1.50
PK	4.94908G	50.76	74.00	-23.24	3.64	3	Vertical	214	1.50

RF4CE_Nss1_1TX

2475MHz_TX



20171103
EUT Z_1TX Ant 2
Setting 3
01-N-2
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)
AV	4.949G	38.56	54.00	-15.44	3.64	3	Horizontal	176	2.94
PK	4.94892G	50.29	74.00	-23.71	3.64	3	Horizontal	176	2.94