

FCC Test Report

FCC ID : U94EARIS1218-T
Equipment : Wireless Pedestal
Brand Name : Humantechnik
Model Name : Earis transmitter
Applicant : Adec & Partner AG
Staldenbachstrasse 30, 8808 Pfäeffikon, Switzerland
Manufacturer : Humantechnik GmbH
Im Woerth 25, 79576 Weil am Rhein, Germany
Standard : 47 CFR FCC Part 15.247

The product was received on Dec. 02, 2018, and testing was started from Jan. 11, 2019 and completed on Jan. 23, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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



Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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



Table of Contents

HISTORY OF THIS TEST REPORT	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Information.....	5
1.2 Testing Applied Standards	6
1.3 Testing Location Information	6
1.4 Measurement Uncertainty	6
2 TEST CONFIGURATION OF EUT.....	7
2.1 Test Condition	7
2.2 Test Channel Mode	7
2.3 The Worst Case Measurement Configuration.....	8
2.4 Accessories and Support Equipment	10
2.5 Test Setup Diagram	11
3 TRANSMITTER TEST RESULT	14
3.1 AC Power-line Conducted Emissions	14
3.2 DTS Bandwidth.....	15
3.3 Maximum Conducted Output Power	16
3.4 Power Spectral Density	18
3.5 Emissions in Non-restricted Frequency Bands	19
3.6 Emissions in Restricted Frequency Bands.....	20
4 TEST EQUIPMENT AND CALIBRATION DATA	23
APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS	
APPENDIX B. TEST RESULTS OF DTS BANDWIDTH	
APPENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	
APPENDIX D. TEST RESULTS OF POWER SPECTRAL DENSITY	
APPENDIX E. TEST RESULTS OF EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS	
APPENDIX F. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS	
APPENDIX G. TEST PHOTOS	
PHOTOGRAPHS OF EUT V01	



History of this test report

Report No.	Version	Description	Issued Date
FR8N0224AC	Rev. 01	Initial issue of report	Mar. 05, 2019

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	FCC 15.203
3.1	15.207	AC Power-line Conducted Emissions	PASS	FCC 15.207
3.2	15.247(a)	DTS Bandwidth	PASS	≥500kHz
3.3	15.247(b)	Maximum Conducted Output Power	PASS	Power [dBm]: 30
3.4	15.247(e)	Power Spectral Density	PASS	PSD [dBm/3kHz]: 8
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	Non-Restricted Bands: > 20 dBc
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	Restricted Bands: FCC 15.209

Declaration of Conformity:

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

Comments and explanations:

None

Reviewed by: Jackson Tsai

Report Producer: Michelle Tsai

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Modulation	Ch. Frequency (MHz)	Channel Number
2400-2483.5	FSK	2406-2478	1-88 [88]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	FSK	3.8	2TX

Note:

- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	OneWave Electronic Co., Ltd.	WAN3216F245M05	Chip Antenna 3216 M-Ant 2.45G	fixed on board

Ant.	Port	Gain (dBi)
		SRD 2.4G
1	1	2.41

For SRD 2.4GHz function:

For SRD 2.4G mode (1TX/1RX)

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

1.1.3 EUT Information

Operational Condition			
EUT Power Type	From DC Power Supply/Host System		
Beamforming Function	☐ With beamforming	☒ Without beamforming	
Type of EUT			
☒	Stand-alone		
☐	Combined (EUT where the radio part is fully integrated within another device)		
	Combined Equipment - Brand Name / Model No.: ...		
☐	Plug-in radio (EUT intended for a variety of host systems)		
	Host System - Brand Name / Model No.: ...		
☐	Other:		

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)
FSK	1	0

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.

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
- KDB 558074 D01 v05
- KDB 662911 D01 v02r01

1.3 Testing Location Information

Testing Location			
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
		TEL : 886-3-327-3456	FAX : 886-3-327-0973
Test site Designation No. TW1190 with FCC.			
☐	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)	
		TEL : 886-3-656-9065	FAX : 886-3-656-9085
Test site Designation No. TW0006 with FCC.			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH06-HY	Streak	23.4°C / 64%	14/Jan/2018
Radiated (Below 30MHz)	03CH01-HY	Yen-Liang Ou	22°C / 58%	23/Jan/2018
Radiated (Above 30MHz)	03CH03-HY	Jeff	23.5°C / 65%	11/Jan/2018
AC Conduction	CO04-HY	Lego	21°C / 55%	17/Jan/2018

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)	3.54 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	1.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 °C	Confidence levels of 95%
Humidity	4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	2.2V

2.2 Test Channel Mode

Test Software Version	PurePath Wireless Commander 1.0.0(Bulid ID 36940)
-----------------------	---

Mode	PowerSetting
FSK	-
2406MHz	0
2442MHz	5
2478MHz	2

2.3 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	DC Power Supply Mode

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	SRD link, Transmitter: Analog In+Mic In+charging , Underchin receiver(Earis PR receiver): Audio Out , Conventinet sound: Strong(low frequency range),adapter model : SCA0501500P
2	SRD link, Transmitter: Digital In+Mic In+charging , Underchin receiver(Earis PR receiver): Audio Out , Conventinet sound: Strong(high frequency range),adapter model : SCA0501500P
3	Charging with Underchin receiver and Battery
4	Underchin receiver(Earis PR receiver): Mic In,adapter model : SCA0501500P
5	SRD link, Transmitter: Analog In+Mic In+charging , pocket receiver(Earis receiver) with earhpone: Audio Out , Conventinet sound: Strong(low frequency range),adapter model : SCA0501500P
6	SRD link, Transmitter: Digital In+Mic In+charging , pocket receiver(Earis receiver) with inductive neckloop : Audio Out , Conventinet sound: Strong(high frequency range) ,adapter model : SCA0501500P
7	Charging with Pocket receiver and Battery
8	SRD link, Transmitter: Analog In+Mic In+charging , Underchin receiver(Earis PR receiver): Audio Out , Conventinet sound: Strong(low frequency range),adapter model : SJA0501500PU
Mode 1 configuration was tested and found to be the worst case and measured during the test.	
Operating Mode > 1GHz	CTX
1	DC Power Supply Mode
Orthogonal Planes of EUT	Y Plane
	

2.4 Accessories and Support Equipment

Accessories				
AC Adapter 1	Brand Name	HELMS-MEN	Model Name	SCA0501500P
	Power Rating	I/P: 100 - 240Vac,300 mA, O/P: 5 Vdc,1500mA		
	Power Cord	1.5 meter, non-shielded cable, w/o ferrite core		
AC Adapter 2	Brand Name	HELMS-MEN	Model Name	SJA0501500PU
	Power Rating	I/P: 100 - 240Vac,300 mA, O/P: 5 Vdc,1500mA		
	Power Cord	1.46 meter, non-shielded cable, w/o ferrite core		
rechargeable batter	-			
Wireless Headset 1 (Earis 1)	Brand Name	Humantechnik	Model Name	Earis receiver
Wireless Headset 2 (Earis 2)	Brand Name	Humantechnik	Model Name	Earis PR receiver
Toslink cable	Power Cord	1.46 meter, non-shielded cable, w/o ferrite core		
audio connection lead with 3.5 mm stereo jack plugs	Power Cord	2.1 meter, non-shielded cable, w/o ferrite core		
audio-adapter RCA to 3.5mm stereo jack	Power Cord	0.24 meter, non-shielded cable, w/o ferrite core		
inductive neckloop	Power Cord	0.73 meter, non-shielded cable, w/o ferrite core		

Reminder: Regarding to more detail and other information, please refer to user manual.

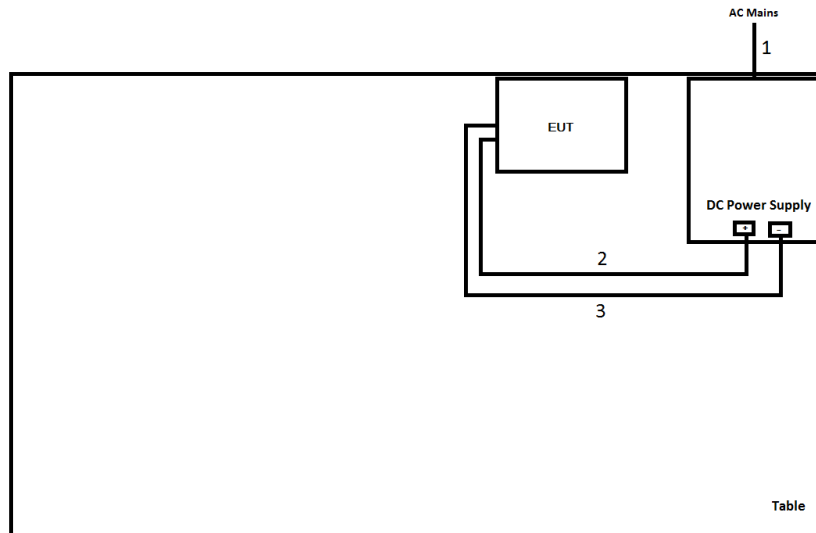
Support Equipment – RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5410	DoC
2	Adapter for NB	DELL	HA65NM130	NA
3	DC Power Supply	GW	GPS-3030DD	NA

Support Equipment – Radiated Emission (Below 30MHz)				
No.	Equipment	Brand Name	Model Name	FCC ID
1	DVD	SONY	DVP-NS76H	N/A

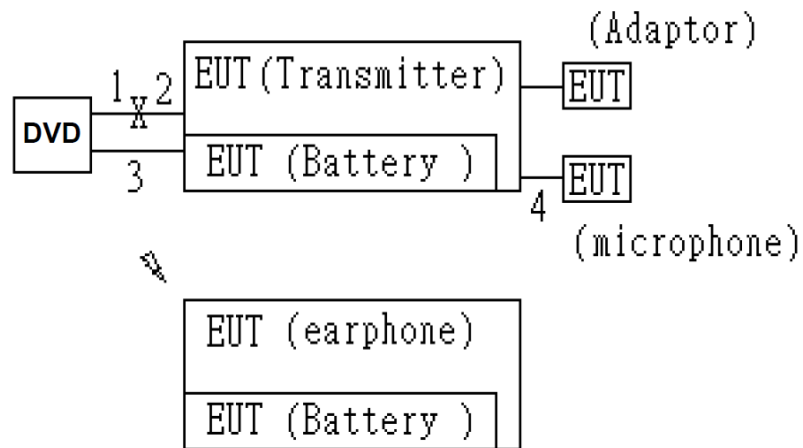
Support Equipment – AC Conduction and Radiated Emission (Above 30MHz)				
No.	Equipment	Brand Name	Model Name	FCC ID
1	DC Power Supply	GW	GPC-6030D	NA

2.5 Test Setup Diagram

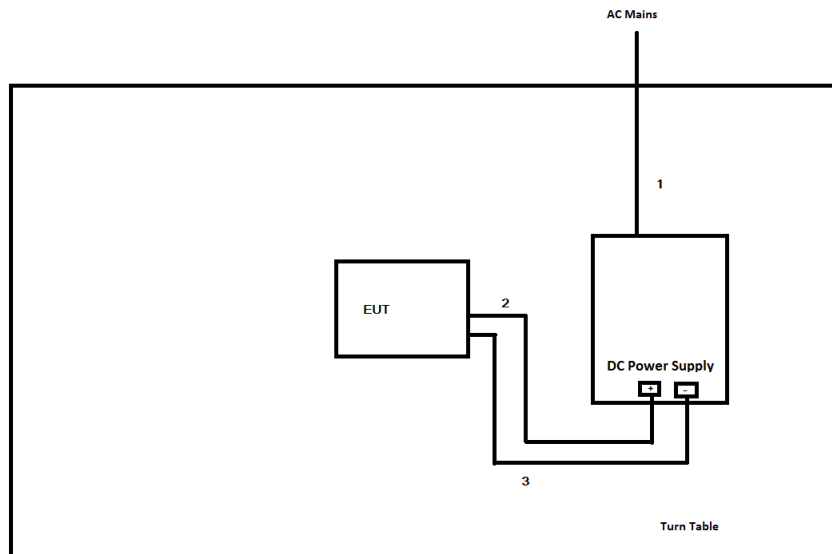
Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.8	-
2	DC Power line	No	1.0	-
3	DC Power line	No	1.0	-

Test Setup Diagram - Radiated Emission (Below 30MHz)


Item	Connection	Shielded	Length(m)	Remark
1	Audio Cable	No	0.2	EUT
2	Audio Cable	No	2.1	EUT
3	Fiber Cable	No	1.5	EUT
4	Audio Cable	No	1.5	EUT

Test Setup Diagram - Radiated Emission (Above 30MHz)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.8	-
2	DC Power line	No	1.0	-
3	DC Power line	No	1.0	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

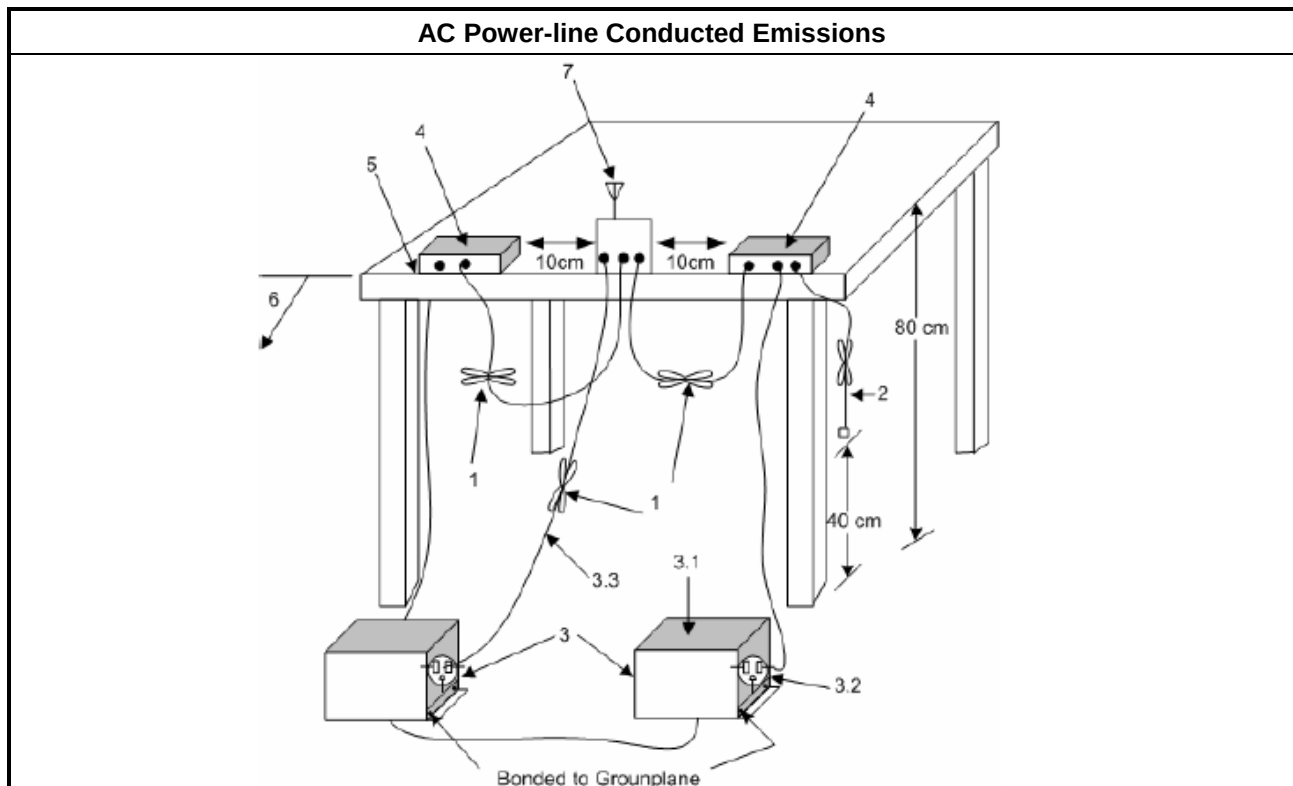
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

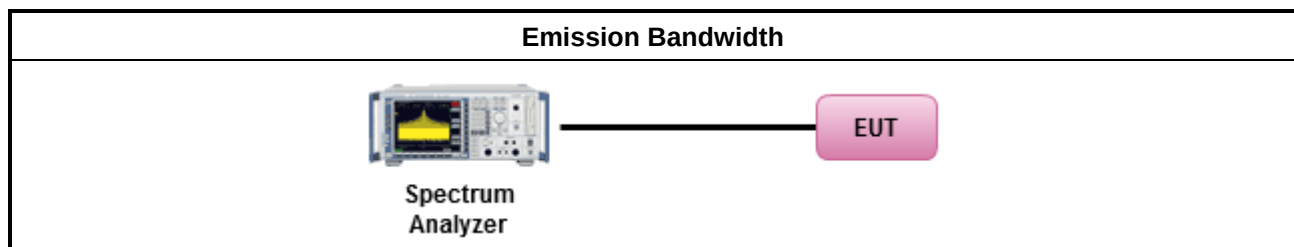
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪	For the emission bandwidth shall be measured using one of the options below:
☒	Refer as KDB 558074. clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
☐	Refer as RSS-Gen, clause 6.7 for for occupied bandwidth testing.
☐	Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm	
	Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm	
	Smart antenna system (SAS):	
	-	Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	-	Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	-	Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm
e.i.r.p. Power Limit:		
	2400-2483.5 MHz Band	
	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)	
	Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm	
	Smart antenna system (SAS)	
	-	Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	-	Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	-	Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ 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.		

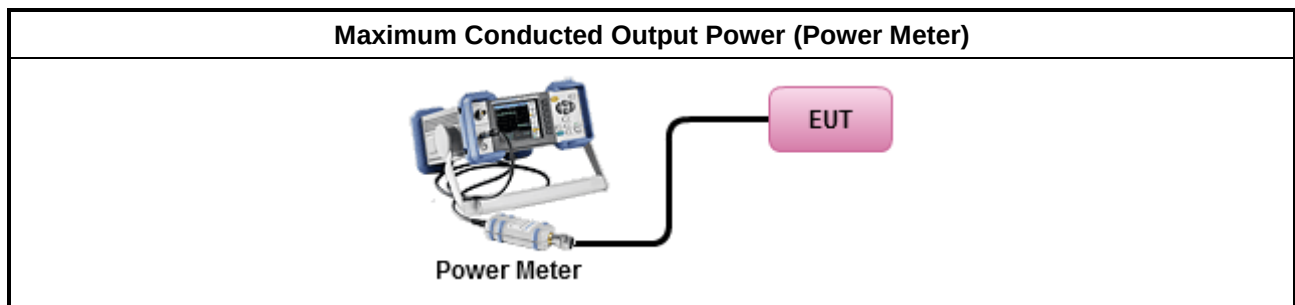
3.3.2 Measuring Instruments

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 KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
☐	Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
☒	Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
Maximum Average Conducted Output Power	
☐	Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
☒	Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
For conducted measurement.	
If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.	
If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

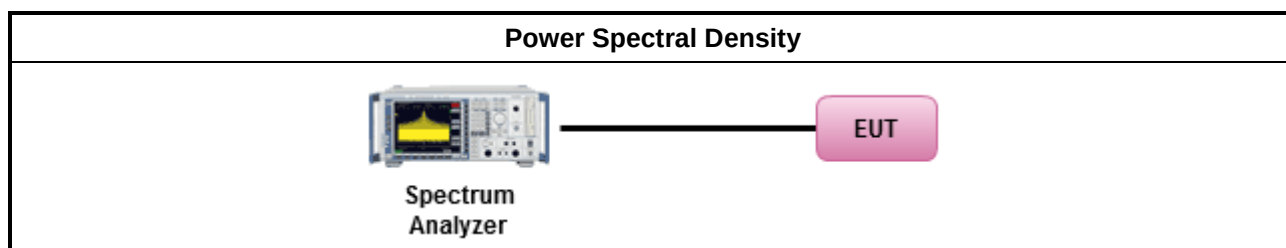
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method	
▪	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
☒	Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Method PKPSD.
▪	For conducted measurement.
▪	If The EUT supports multiple transmit chains using options given below:
▪	Measure and sum the spectra across the outputs. Refer as 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.

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (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.	

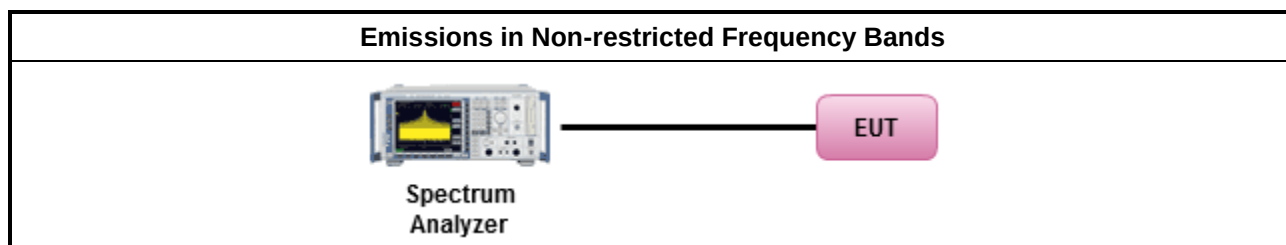
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method
Refer as KDB 558074, clause 8.5 (11.11 of ANSI C63.10) for non-restricted frequency bands.

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

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

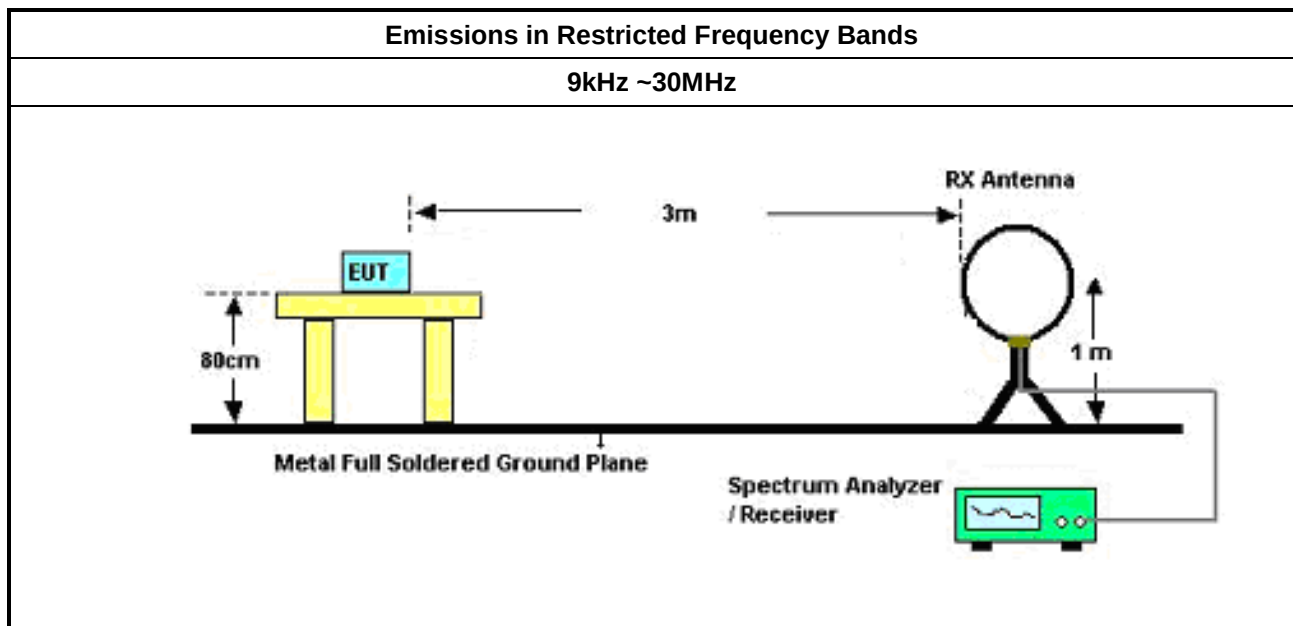
3.6.2 Measuring Instruments

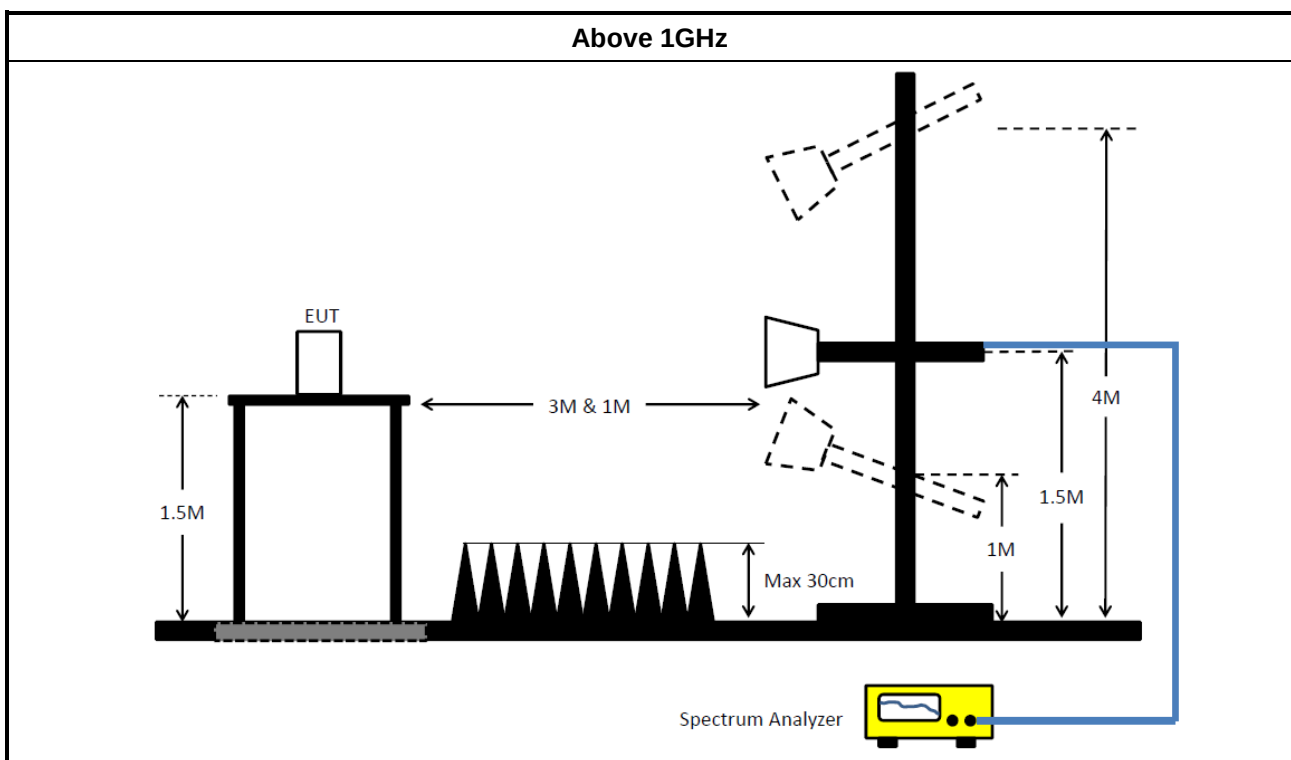
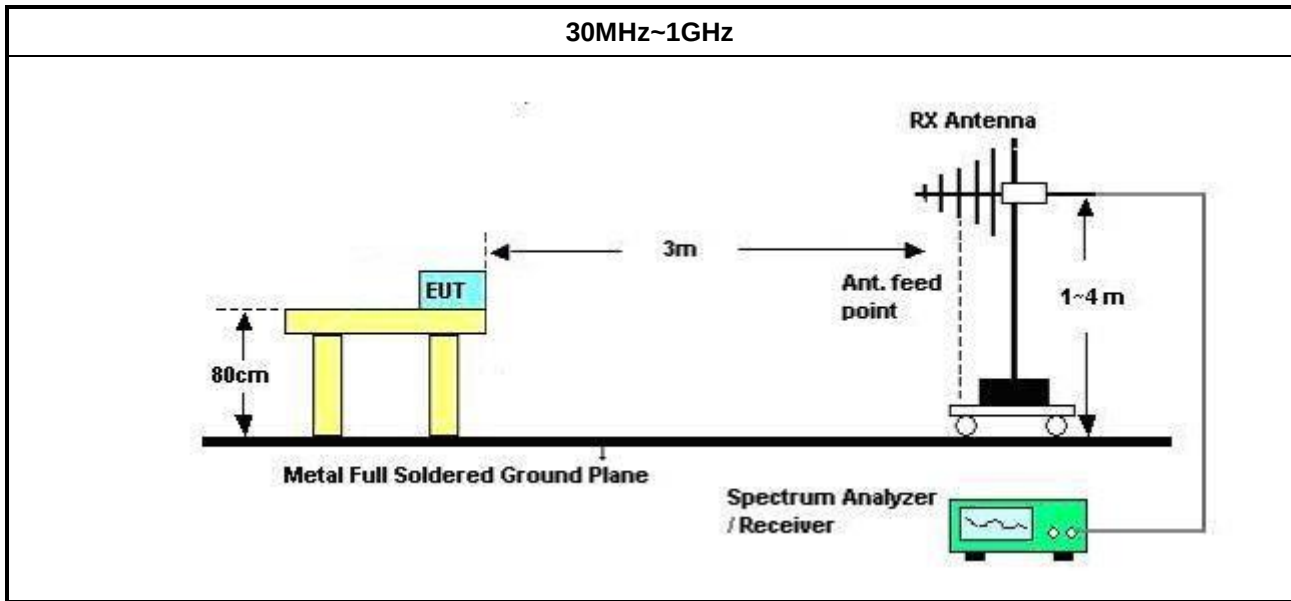
Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method	
The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
For the transmitter band-edge emissions shall be measured using following options below:	
	Refer as KDB 558074 clause 8.7.1, 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 KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
Use the following spectrum analyzer settings:	
	Set RBW=100 kHz for $f < 1$ GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.
	Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement. For average measurement, refer as 1.1.4.

3.6.4 Test Setup





3.6.5 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

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

3.6.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR	102051	9KHz ~ 3.6GHz	03/May/2018	02/May/2019
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	08/Nov/2018	07/Nov/2019
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	17/Sep/2018	16/Sep/2019
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2018	11/Oct/2019

NCR : Non-Calibration Require

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	10Hz~40GHz	05/Feb/2018	04/Feb/2019
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	05/Feb/2018	04/Feb/2019
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	05/Feb/2018	04/Feb/2019
2Way Divider	Microwave	MVE8546	TH01-DV-01	1MHz~6MHz	23/Jan/2018	22/Jan/2019
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz~1G	11/Jan/2019	10/Jan/2020
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	1G~18G	11/Jan/2019	10/Jan/2020
Cable 0.5m	HUBER	MY10714/4	RF Cable - 05	30MHz~1G	11/Jan/2019	10/Jan/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020

**Instrument for Radiated Test (Below 30MHz)**

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
N.S.A. Measurement	Riken	SAC-3M	03CH01-HY	30 MHz ~ 1 GHz 3m	11/Jan/2019	Radiation (03CH01-HY)
EMI Test Receiver	R&S	ESU-26	100422	20Hz ~ 26.5GHz	25/Oct/2018	Radiation (03CH01-HY)
PreAmplifier	COM-POWER	PA-103	161050	1 MHz ~ 1 GHz	24/Jul/2018	Radiation (03CH01-HY)
Bilog Antenna with 5dB Attenuator	SCHAFFNER& MTJ	CBL6112D & MTJ6102-05	2678 / 001	30 MHz ~ 2 GHz	07/Jul/2018	Radiation (03CH01-HY)
Turn Table	HD	DS 420	420/648/00	0 - 360 degree	NCR	Radiation (03CH01-HY)
Antenna Mast	Sunol Sciences	TLT2	011911-01	1 m - 4 m	NCR	Radiation (03CH01-HY)
RF Cable-R03m	Jye Bao	RG142	CB019	9KHz ~ 1 GHz	14/Dec/2018	Radiation (03CH01-HY)
Software	Sporton	SENSE-EMI	V5.10.2	-	NCR	Radiation (03CH01-HY)

NCR : Non-Calibration Require**Instrument for Radiated Test (Above 30MHz)**

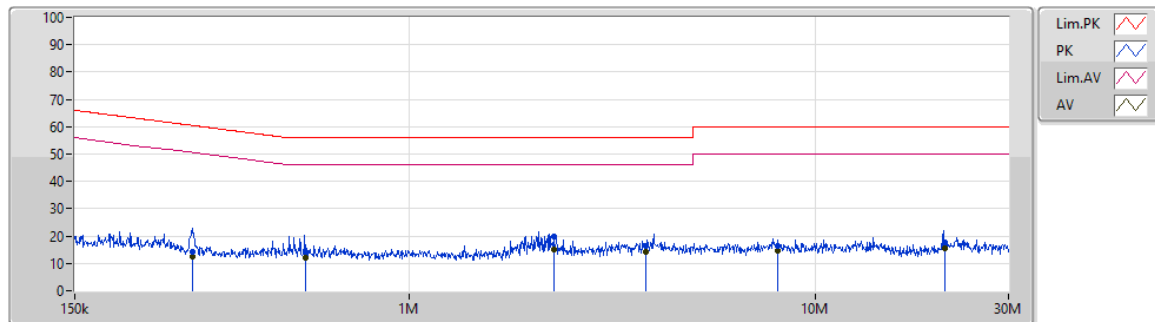
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	30/Oct/2018	29/Oct/2019
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	30/Oct/2018	29/Oct/2019
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	23/Apr/2018	19/Apr/2019
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	05/Sep/2018	04/Sep/2019
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	10/Apr/2018	09/Apr/2019
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	18/Jul/2018	17/Jul/2019
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	29/Jan/2018	28/Jan/2019
RF Cable-high	SUHNER	SUCOFLEX 106	CB222	1GHz ~ 40GHz	29/Jan/2018	28/Jan/2019
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz ~ 40GHz	06/Feb/ 2018	05/Feb/2019
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	18/Apr/ 2018	17/Apr/2019
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz ~ 40GHz	24/Aug/2018	23/Aug/2019
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	28/Mar/2018	27/Mar/2019

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Neutral
Operating Function	DC Power Supply Mode		

DC Conduction_Mode 1

17/01/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	292.16k	14.07	60.46	-46.39	19.48	Line	-	-5.41	9.59	0.01	9.88			
AV	292.16k	12.57	50.46	-37.89	19.48	Line	-	-6.91	9.59	0.01	9.88			
QP	555.468k	14.19	56.00	-41.81	19.48	Line	-	-5.29	9.59	0.01	9.88			
AV	555.468k	12.19	46.00	-33.81	19.48	Line	-	-7.29	9.59	0.01	9.88			
QP	2.271M	20.03	56.00	-35.97	19.55	Line	-	0.48	9.62	0.04	9.89			
AV	2.271M	14.98	46.00	-31.02	19.55	Line	"Worst"	-4.57	9.62	0.04	9.89			
QP	3.834M	16.47	56.00	-39.53	19.57	Line	-	-3.10	9.63	0.05	9.89			
AV	3.834M	14.40	46.00	-31.60	19.57	Line	-	-5.17	9.63	0.05	9.89			
QP	8.109M	16.31	60.00	-43.69	19.61	Line	-	-3.30	9.66	0.06	9.89			
AV	8.109M	14.48	50.00	-35.52	19.61	Line	-	-5.13	9.66	0.06	9.89			
QP	20.937M	17.83	60.00	-42.17	19.63	Line	-	-1.80	9.62	0.11	9.90			
AV	20.937M	15.51	50.00	-34.49	19.63	Line	-	-4.12	9.62	0.11	9.90			

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

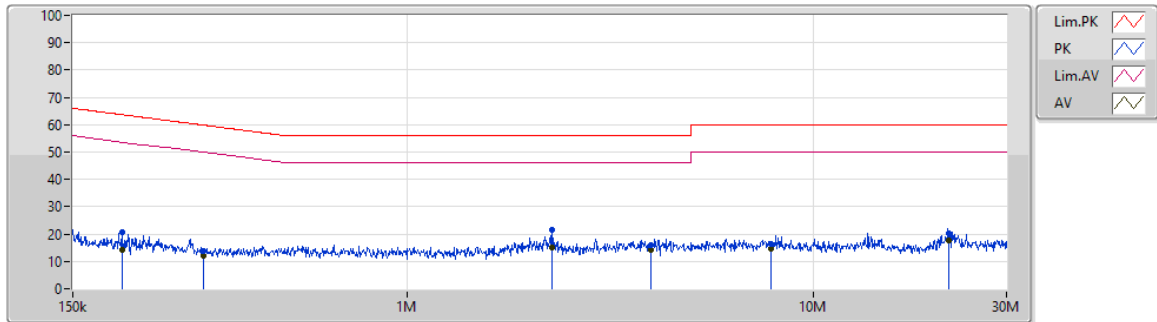
Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	DC Power Supply Mode		

DC Conduction_Mode 1

17/01/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	198.211k	20.78	63.69	-42.91	19.47	Neutral	-	1.31	9.59	0.01	9.87			
AV	198.211k	14.15	53.69	-39.54	19.47	Neutral	-	-5.32	9.59	0.01	9.87			
QP	315.894k	13.75	59.80	-46.05	19.48	Neutral	-	-5.73	9.59	0.01	9.88			
AV	315.894k	12.24	49.80	-37.56	19.48	Neutral	-	-7.24	9.59	0.01	9.88			
QP	2.273M	21.44	56.00	-34.56	19.54	Neutral	-	1.90	9.61	0.04	9.89			
AV	2.273M	15.21	46.00	-30.79	19.54	Neutral	"Worst"	-4.33	9.61	0.04	9.89			
QP	3.992M	15.82	56.00	-40.18	19.55	Neutral	-	-3.73	9.61	0.05	9.89			
AV	3.992M	14.19	46.00	-31.81	19.55	Neutral	-	-5.36	9.61	0.05	9.89			
QP	7.906M	16.30	60.00	-43.70	19.60	Neutral	-	-3.30	9.65	0.06	9.89			
AV	7.906M	14.59	50.00	-35.41	19.60	Neutral	-	-5.01	9.65	0.06	9.89			
QP	21.656M	20.44	60.00	-39.56	19.69	Neutral	-	0.75	9.68	0.11	9.90			
AV	21.656M	17.66	50.00	-32.34	19.69	Neutral	-	-2.03	9.68	0.11	9.90			

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)
2.4-2.4835GHz	-	-	-	-	-
FSK	2.304M	3.765M	3M77F1D	2.185M	3.708M

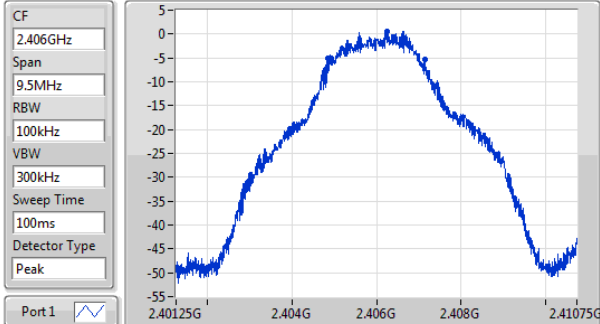
Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;

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)
FSK	-	-	-	-
2406MHz_TnomVnom	Pass	500k	2.304M	3.765M
2442MHz_TnomVnom	Pass	500k	2.185M	3.751M
2478MHz_TnomVnom	Pass	500k	2.195M	3.708M

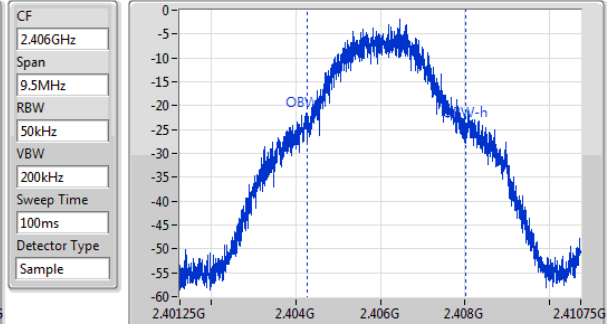
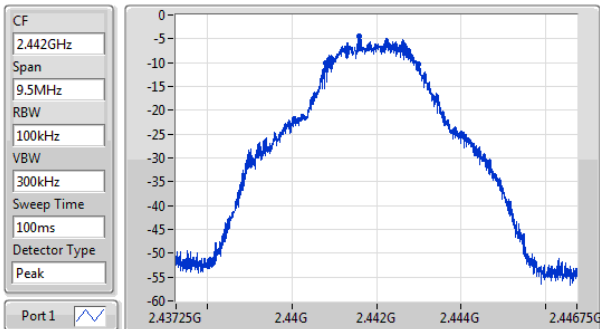
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

FSK
2406MHz


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
2.304M	2.404836G	2.40714G	3.765M	2.404258G	2.408022G	500k	1

EBW

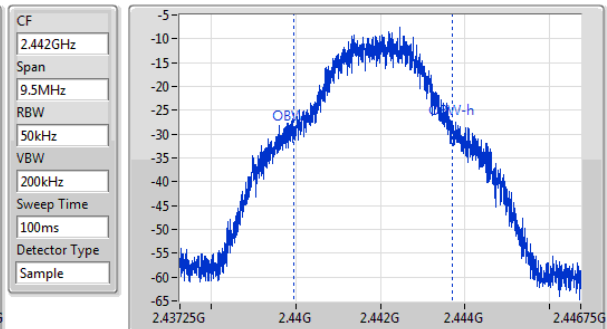
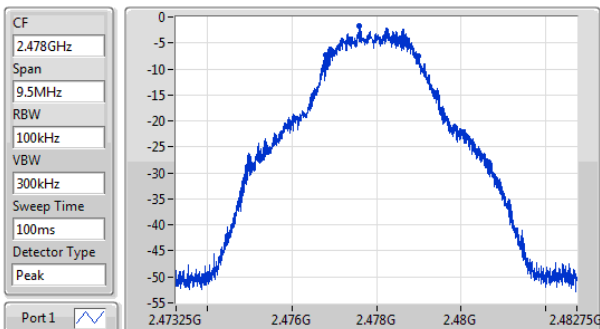
03/01/2019


FSK
2442MHz


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
2.185M	2.440808G	2.442993G	3.751M	2.439954G	2.443704G	500k	1

EBW

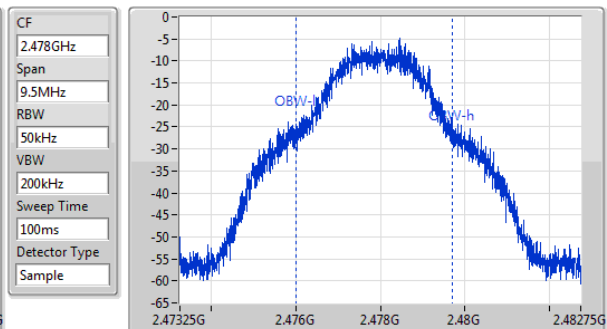
04/01/2019


FSK
2478MHz


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
2.195M	2.476803G	2.478998G	3.708M	2.475997G	2.479704G	500k	1

EBW

14/01/2019



**Summary**

Mode	Power	Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
FSK	3.58	0.00228

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
FSK	-	-	-	-
2406MHz_TnomVnom	Pass	2.41	3.58	30.00
2442MHz_TnomVnom	Pass	2.41	2.78	30.00
2478MHz_TnomVnom	Pass	2.41	1.49	30.00

Summary

Mode	Power	Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
FSK	4.63	0.00290

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
FSK	-	-	-	-
2406MHz_TnomVnom	Pass	2.41	4.63	30.00
2442MHz_TnomVnom	Pass	2.41	3.81	30.00
2478MHz_TnomVnom	Pass	2.41	2.52	30.00

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
FSK	-14.02

RBW=3kHz.

Result

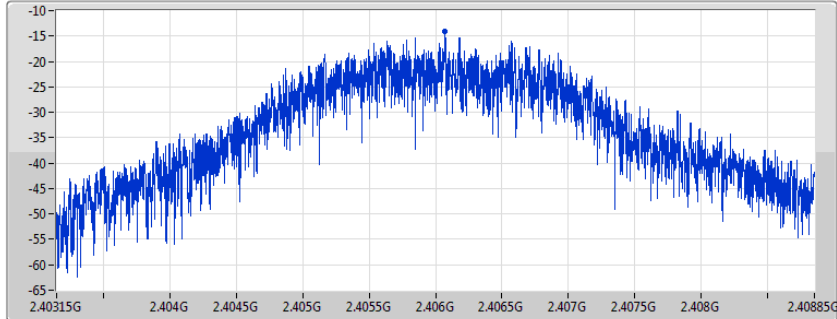
Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
FSK	-	-	-	-
2406MHz_TnomVnom	Pass	2.41	-14.02	8.00
2442MHz_TnomVnom	Pass	2.41	-20.28	8.00
2478MHz_TnomVnom	Pass	2.41	-17.17	8.00

RBW=3kHz.

FSK

2406MHz

CF
2.406GHz
Span
5.7MHz
RBW
3kHz
VBW
10kHz
Sweep Time
63.4ms
Detector Type
Peak



PSD

03/01/2019

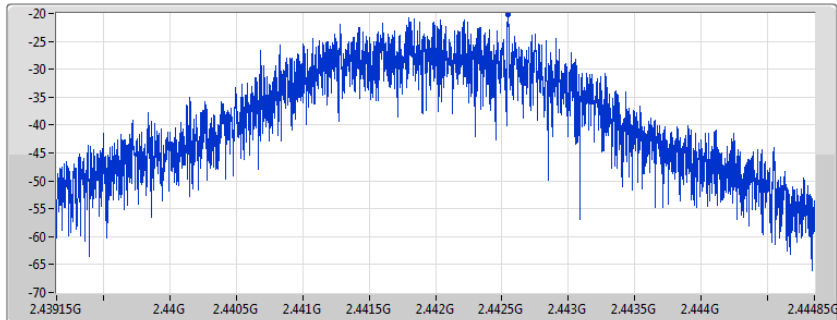
Port 1

Sum	PD	Port 1
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-14.02	-14.02	-14.02

FSK

2442MHz

CF
2.442GHz
Span
5.7MHz
RBW
3kHz
VBW
10kHz
Sweep Time
63.4ms
Detector Type
Peak



PSD

04/01/2019

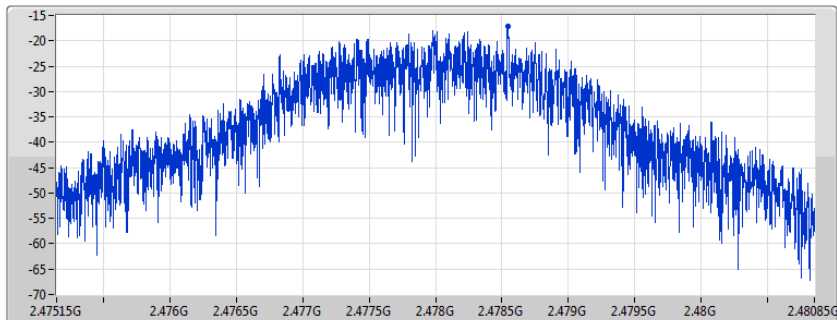
Port 1

Sum	PD	Port 1
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-20.28	-20.28	-20.28

FSK

2478MHz

CF
2.478GHz
Span
5.7MHz
RBW
3kHz
VBW
10kHz
Sweep Time
63.4ms
Detector Type
Peak



PSD

14/01/2019

Port 1

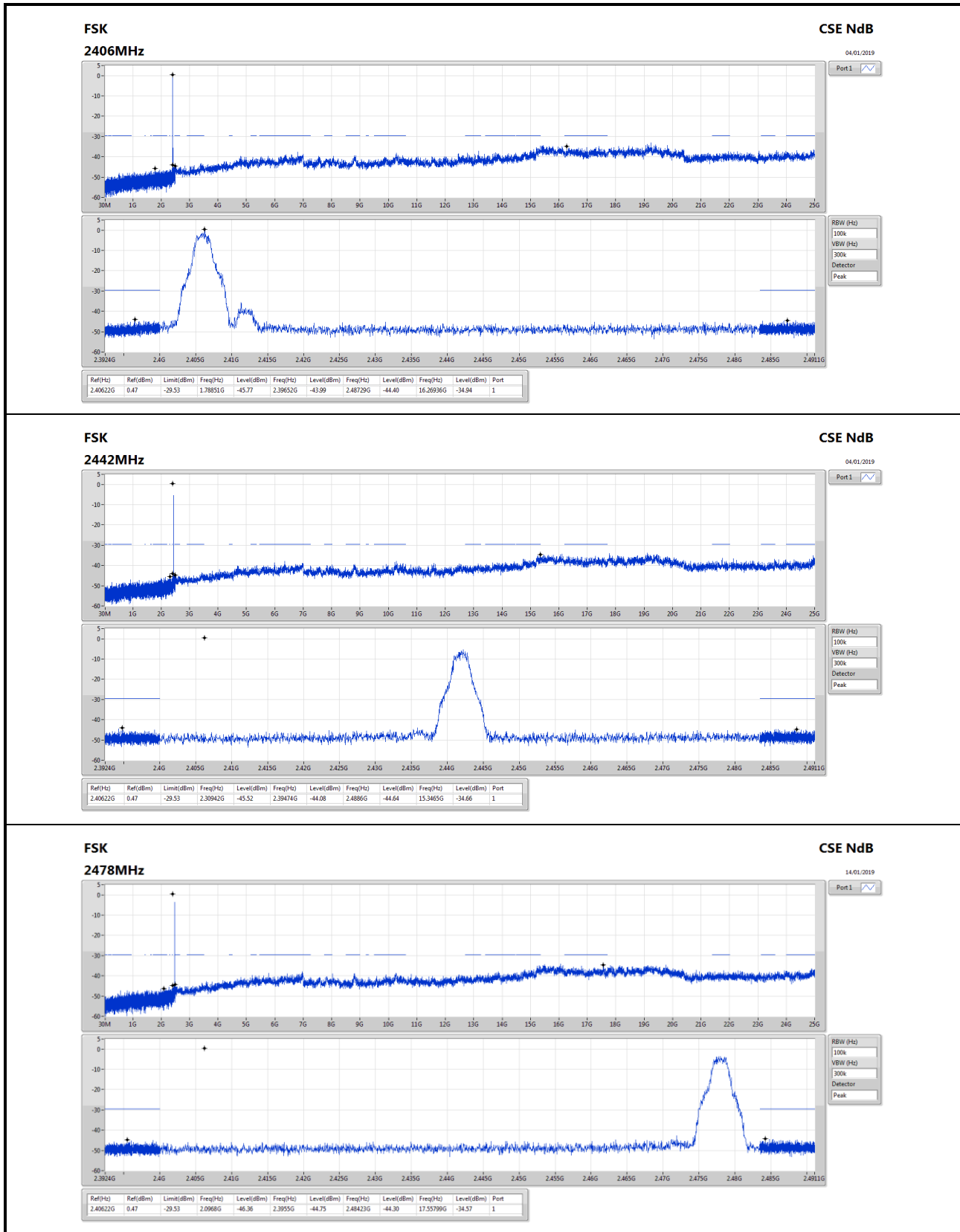
Sum	PD	Port 1
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-17.17	-17.17	-17.17

Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
FSK	Pass	2.40622G	0.47	-29.53	2.0968G	-46.36	2.3955G	-44.75	2.48423G	-44.30	17.55799G	-34.57	1

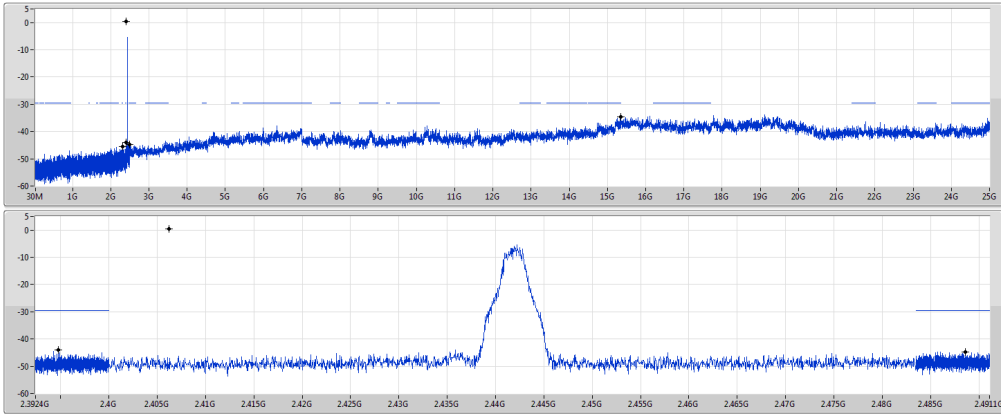
Result

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
FSK	-	-	-	-	-	-	-	-	-	-	-	-	-
2406MHz_TnomVnom	Pass	2.40622G	0.47	-29.53	1.78851G	-45.77	2.39652G	-43.99	2.48729G	-44.40	16.26936G	-34.94	1
2442MHz_TnomVnom	Pass	2.40622G	0.47	-29.53	2.30942G	-45.52	2.39474G	-44.08	2.4886G	-44.64	15.3465G	-34.66	1
2478MHz_TnomVnom	Pass	2.40622G	0.47	-29.53	2.0968G	-46.36	2.3955G	-44.75	2.48423G	-44.30	17.55799G	-34.57	1



FSK
2442MHz

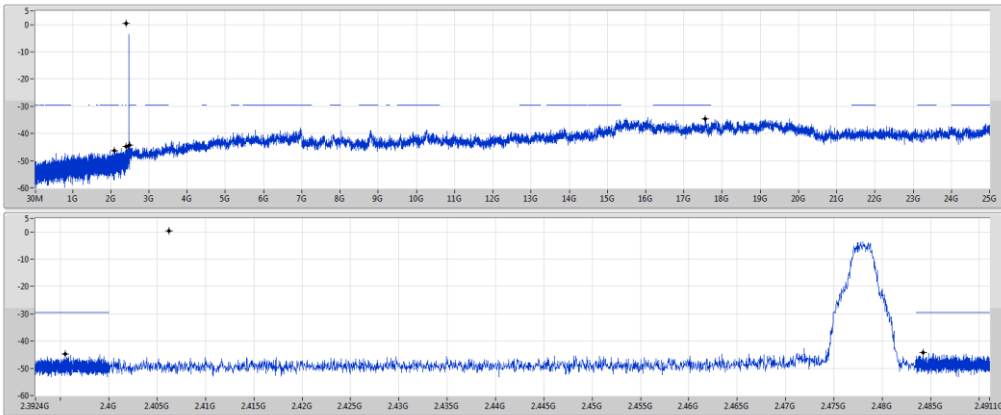
CSE NdB
04/01/2019
Port 1



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40622G	0.47	-29.53	2.30942G	-45.52	2.39474G	-44.08	2.4886G	-44.64	15.3465G	-34.66	1

FSK
2478MHz

CSE NdB
14/01/2019
Port 1



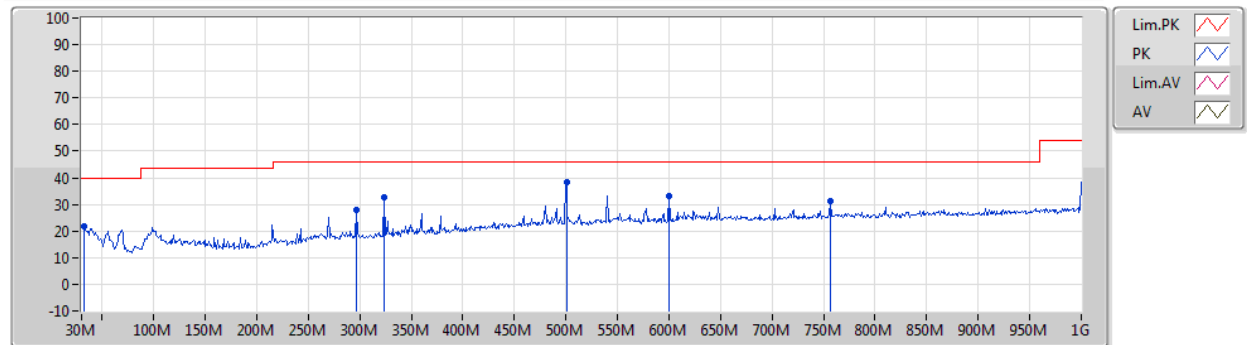
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40622G	0.47	-29.53	2.0968G	-46.36	2.3955G	-44.75	2.48423G	-44.30	17.55796G	-34.57	1

Summary

Mode	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Condition	Azimuth (°)	Height (m)
Mode 1	PK	500.45M	38.40	46.00	-7.60	-6.22	Vertical	187	1

Mode 1

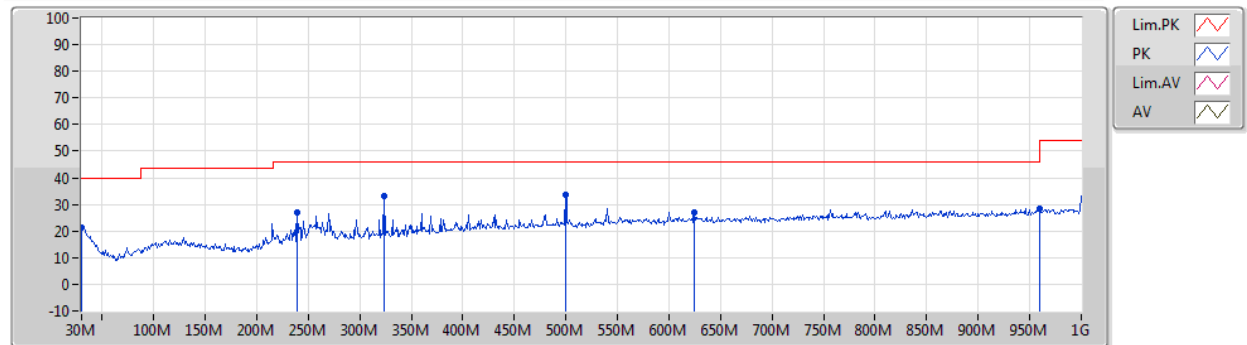
23/01/2019



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	31.94M	21.80	40.00	-18.20	-9.08	3	Vertical	-	-	-	30.88	22.63	0.86	32.57
PK	296.75M	27.83	46.00	-18.17	-11.71	3	Vertical	-	-	-	39.54	18.22	2.36	32.29
PK	323.91M	32.86	46.00	-13.14	-11.06	3	Vertical	-	-	-	43.92	18.72	2.47	32.25
PK	500.45M	38.40	46.00	-7.60	-6.22	3	Vertical	187	1	"Worst"	44.62	22.51	3.24	31.97
PK	600.36M	33.13	46.00	-12.87	-4.70	3	Vertical	-	-	-	37.83	23.69	3.42	31.81
PK	756.53M	31.33	46.00	-14.67	-3.08	3	Vertical	-	-	-	34.41	24.76	3.80	31.64

Mode 1

23/01/2019



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	30M	21.44	40.00	-18.56	-8.16	3	Horizontal	-	-	-	29.60	23.66	0.76	32.58
PK	239.52M	26.79	46.00	-19.21	-13.88	3	Horizontal	-	-	-	40.67	16.39	2.11	32.38
PK	323.91M	33.28	46.00	-12.72	-11.06	3	Horizontal	-	-	-	44.34	18.72	2.47	32.25
PK	499.48M	33.48	46.00	-12.52	-6.22	3	Horizontal	179	1	"Worst"	39.70	22.51	3.24	31.97
PK	624.61M	26.90	46.00	-19.10	-4.15	3	Horizontal	-	-	-	31.05	24.07	3.57	31.79
PK	959.26M	28.22	46.00	-17.78	-0.75	3	Horizontal	-	-	-	28.97	26.09	4.55	31.39



RSE TX above 1GHz Result

Appendix F.2

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
FSK_Nss1_1TX	Pass	AV	7.3257G	48.05	54.00	-5.95	9.21	3	Vertical	19	2.78	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
FSK_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-	-
2406MHz_TX	Pass	AV	2.3888G	45.78	54.00	-8.22	30.68	3	Vertical	91	2.97	-
2406MHz_TX	Pass	AV	2.406G	88.92	Inf	-Inf	30.73	3	Vertical	91	2.97	-
2406MHz_TX	Pass	PK	2.3822G	57.49	74.00	-16.51	30.67	3	Vertical	91	2.97	-
2406MHz_TX	Pass	PK	2.4064G	93.09	Inf	-Inf	30.74	3	Vertical	91	2.97	-
2406MHz_TX	Pass	AV	2.3896G	45.80	54.00	-8.20	30.69	3	Horizontal	62	1.29	-
2406MHz_TX	Pass	AV	2.406G	95.37	Inf	-Inf	30.73	3	Horizontal	62	1.29	-
2406MHz_TX	Pass	PK	2.3642G	57.63	74.00	-16.37	30.60	3	Horizontal	62	1.29	-
2406MHz_TX	Pass	PK	2.4064G	99.57	Inf	-Inf	30.74	3	Horizontal	62	1.29	-
2406MHz_TX	Pass	AV	4.81794G	44.27	54.00	-9.73	6.53	3	Vertical	0	2.69	-
2406MHz_TX	Pass	PK	4.81812G	49.16	74.00	-24.84	6.53	3	Vertical	0	2.69	-
2406MHz_TX	Pass	AV	4.81794G	43.84	54.00	-10.16	6.53	3	Horizontal	60	1.21	-
2406MHz_TX	Pass	PK	4.81806G	48.95	74.00	-25.05	6.53	3	Horizontal	60	1.21	-
2442MHz_TX	Pass	AV	2.3896G	43.73	54.00	-10.27	32.01	3	Vertical	171	2.55	-
2442MHz_TX	Pass	AV	2.442G	88.34	Inf	-Inf	32.17	3	Vertical	171	2.55	-
2442MHz_TX	Pass	AV	2.5G	44.46	54.00	-9.54	32.34	3	Vertical	171	2.55	-
2442MHz_TX	Pass	PK	2.3644G	54.89	74.00	-19.11	31.91	3	Vertical	171	2.55	-
2442MHz_TX	Pass	PK	2.4412G	94.65	Inf	-Inf	32.16	3	Vertical	171	2.55	-
2442MHz_TX	Pass	PK	2.494G	55.62	74.00	-18.38	32.33	3	Vertical	171	2.55	-
2442MHz_TX	Pass	AV	2.3876G	43.83	54.00	-10.17	32.00	3	Horizontal	56	2.77	-
2442MHz_TX	Pass	AV	2.442G	94.04	Inf	-Inf	32.17	3	Horizontal	56	2.77	-
2442MHz_TX	Pass	AV	2.4976G	44.41	54.00	-9.59	32.33	3	Horizontal	56	2.77	-
2442MHz_TX	Pass	PK	2.3856G	55.35	74.00	-18.65	32.00	3	Horizontal	56	2.77	-
2442MHz_TX	Pass	PK	2.4412G	100.32	Inf	-Inf	32.16	3	Horizontal	56	2.77	-
2442MHz_TX	Pass	PK	2.488G	55.67	74.00	-18.33	32.30	3	Horizontal	56	2.77	-
2442MHz_TX	Pass	AV	4.8839G	45.09	54.00	-8.91	3.64	3	Vertical	191	2.95	-
2442MHz_TX	Pass	AV	7.3257G	48.05	54.00	-5.95	9.21	3	Vertical	19	2.78	-
2442MHz_TX	Pass	PK	4.8828G	56.35	74.00	-17.65	3.63	3	Vertical	191	2.95	-
2442MHz_TX	Pass	PK	7.3236G	60.85	74.00	-13.15	9.21	3	Vertical	19	2.78	-
2442MHz_TX	Pass	AV	4.8779G	42.38	54.00	-11.62	3.62	3	Horizontal	277	1.02	-
2442MHz_TX	Pass	AV	7.3256G	45.97	54.00	-8.03	9.21	3	Horizontal	180	2.99	-
2442MHz_TX	Pass	PK	4.8778G	48.72	74.00	-25.28	3.62	3	Horizontal	277	1.02	-
2442MHz_TX	Pass	PK	7.3266G	58.20	74.00	-15.80	9.21	3	Horizontal	180	2.99	-
2478MHz_TX	Pass	AV	2.478G	79.96	Inf	-Inf	30.95	3	Vertical	219	1.56	-
2478MHz_TX	Pass	AV	2.4984G	46.86	54.00	-7.14	31.01	3	Vertical	219	1.56	-
2478MHz_TX	Pass	PK	2.4776G	84.16	Inf	-Inf	30.95	3	Vertical	219	1.56	-
2478MHz_TX	Pass	PK	2.4968G	59.49	74.00	-14.51	31.00	3	Vertical	219	1.56	-
2478MHz_TX	Pass	AV	2.478G	92.49	Inf	-Inf	30.95	3	Horizontal	74	1.07	-
2478MHz_TX	Pass	AV	2.4835G	47.64	54.00	-6.36	30.97	3	Horizontal	74	1.07	-
2478MHz_TX	Pass	PK	2.4772G	96.70	Inf	-Inf	30.95	3	Horizontal	74	1.07	-
2478MHz_TX	Pass	PK	2.4836G	58.93	74.00	-15.07	30.97	3	Horizontal	74	1.07	-
2478MHz_TX	Pass	AV	4.94994G	47.99	54.00	-6.01	6.83	3	Vertical	14	2.60	-
2478MHz_TX	Pass	AV	7.43346G	47.72	54.00	-6.28	11.62	3	Vertical	141	2.73	-
2478MHz_TX	Pass	PK	4.95G	51.88	74.00	-22.12	6.83	3	Vertical	14	2.60	-
2478MHz_TX	Pass	PK	7.43442G	58.64	74.00	-15.36	11.62	3	Vertical	141	2.73	-
2478MHz_TX	Pass	AV	4.94994G	46.30	54.00	-7.70	6.83	3	Horizontal	67	1.07	-
2478MHz_TX	Pass	AV	7.43358G	47.13	54.00	-6.87	11.62	3	Horizontal	344	1.04	-
2478MHz_TX	Pass	PK	4.95006G	50.45	74.00	-23.55	6.84	3	Horizontal	67	1.07	-



RSE TX above 1GHz Result

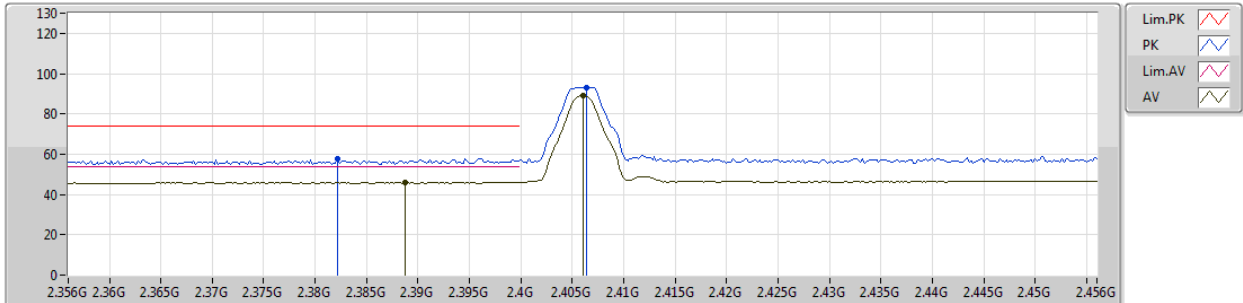
Appendix F.2

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2478MHz_TX	Pass	PK	7.43262G	57.99	74.00	-16.01	11.61	3	Horizontal	344	1.04	-

FSK_Nss1_1TX

2406MHz_TX

11/01/2019

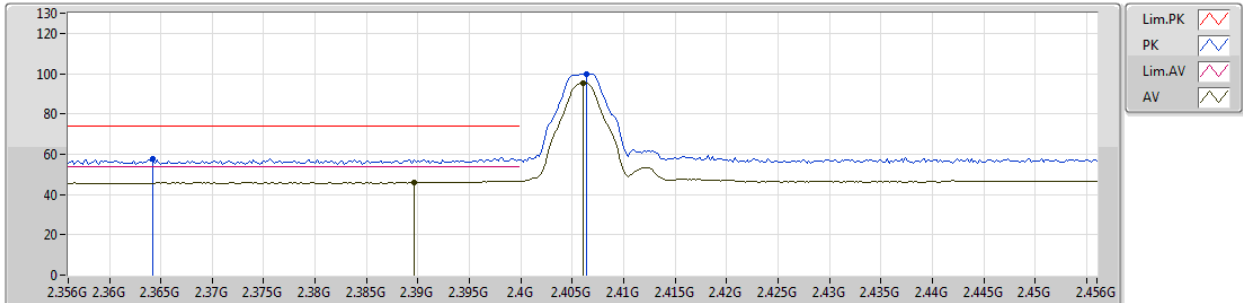


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.3888G	45.78	54.00	-8.22	30.68	3	Vertical	91	2.97	-
AV	2.406G	88.92	Inf	-Inf	30.73	3	Vertical	91	2.97	-
PK	2.3822G	57.49	74.00	-16.51	30.67	3	Vertical	91	2.97	-
PK	2.4064G	93.09	Inf	-Inf	30.74	3	Vertical	91	2.97	-

FSK_Nss1_1TX

2406MHz_TX

11/01/2019

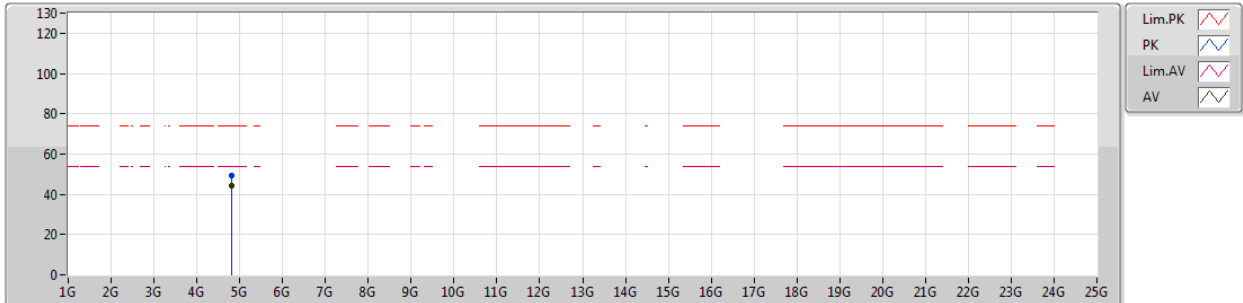


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.3896G	45.80	54.00	-8.20	30.69	3	Horizontal	62	1.29	-
AV	2.406G	95.37	Inf	-Inf	30.73	3	Horizontal	62	1.29	-
PK	2.3642G	57.63	74.00	-16.37	30.60	3	Horizontal	62	1.29	-
PK	2.4064G	99.57	Inf	-Inf	30.74	3	Horizontal	62	1.29	-

FSK_Nss1_1TX

2406MHz_TX

11/01/2019

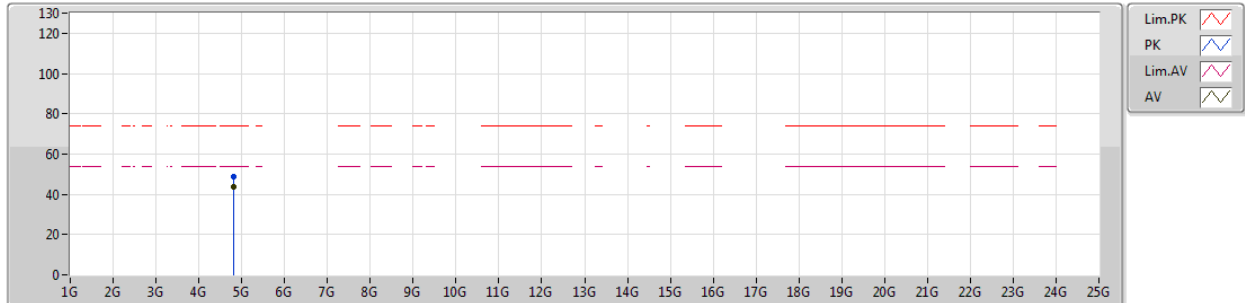


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments								
AV	4.81794G	44.27	54.00	-9.73	6.53	3	Vertical	0	2.69	-								
PK	4.81812G	49.16	74.00	-24.84	6.53	3	Vertical	0	2.69	-								

FSK_Nss1_1TX

2406MHz_TX

11/01/2019

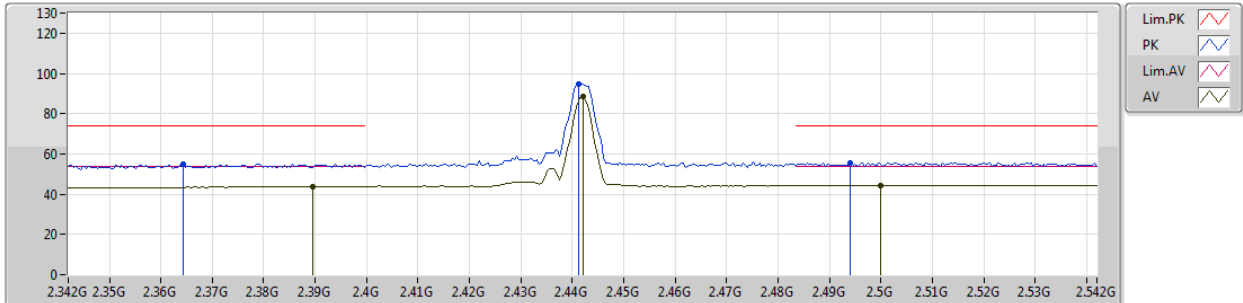


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments								
AV	4.81794G	43.84	54.00	-10.16	6.53	3	Horizontal	60	1.21	-								
PK	4.81806G	48.95	74.00	-25.05	6.53	3	Horizontal	60	1.21	-								

FSK_Nss1_1TX

2442MHz_TX

11/01/2019

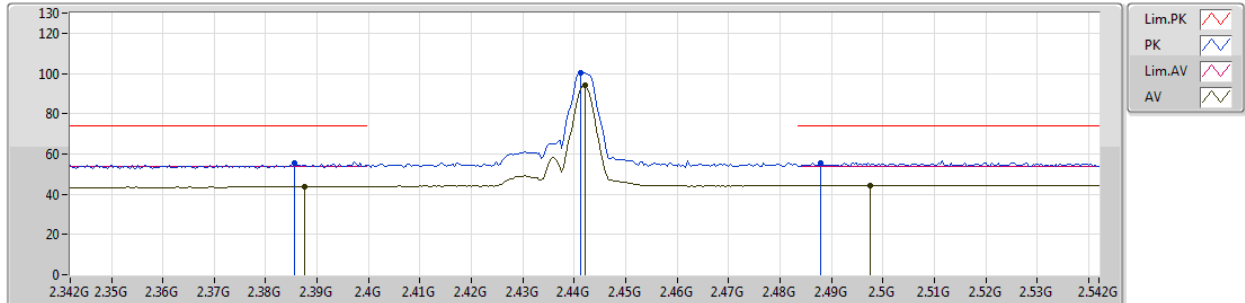


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.3896G	43.73	54.00	-10.27	32.01	3	Vertical	171	2.55	-
AV	2.442G	88.34	Inf	-Inf	32.17	3	Vertical	171	2.55	-
AV	2.5G	44.46	54.00	-9.54	32.34	3	Vertical	171	2.55	-
PK	2.3644G	54.89	74.00	-19.11	31.91	3	Vertical	171	2.55	-
PK	2.4412G	94.65	Inf	-Inf	32.16	3	Vertical	171	2.55	-
PK	2.494G	55.62	74.00	-18.38	32.33	3	Vertical	171	2.55	-

FSK_Nss1_1TX

2442MHz_TX

11/01/2019

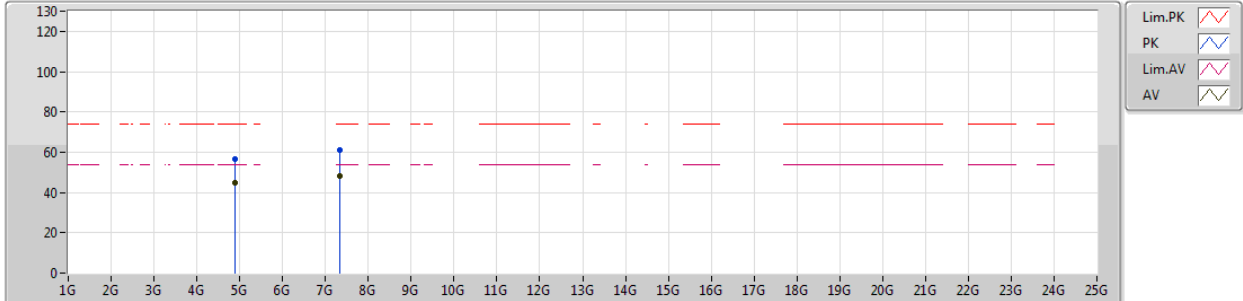


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.3876G	43.83	54.00	-10.17	32.00	3	Horizontal	56	2.77	-
AV	2.442G	94.04	Inf	-Inf	32.17	3	Horizontal	56	2.77	-
AV	2.4976G	44.41	54.00	-9.59	32.33	3	Horizontal	56	2.77	-
PK	2.3856G	55.35	74.00	-18.65	32.00	3	Horizontal	56	2.77	-
PK	2.4412G	100.32	Inf	-Inf	32.16	3	Horizontal	56	2.77	-
PK	2.488G	55.67	74.00	-18.33	32.30	3	Horizontal	56	2.77	-

FSK_Nss1_1TX

11/01/2019

2442MHz_TX

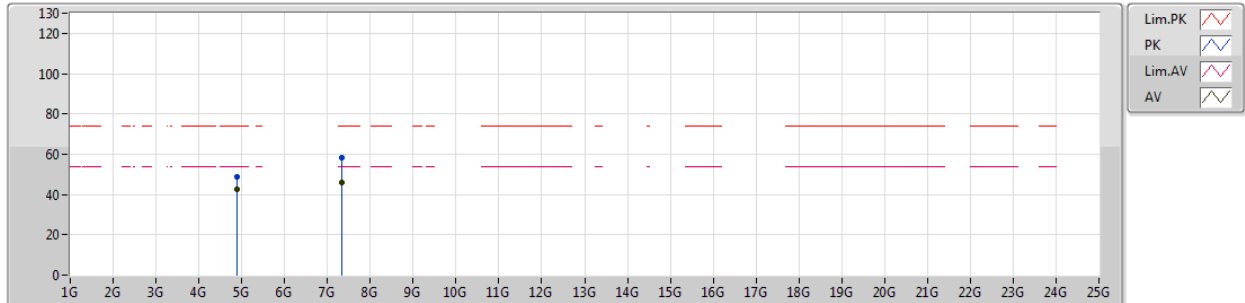


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.8839G	45.09	54.00	-8.91	3.64	3	Vertical	191	2.95	-
AV	7.3257G	48.05	54.00	-5.95	9.21	3	Vertical	19	2.78	-
PK	4.8828G	56.35	74.00	-17.65	3.63	3	Vertical	191	2.95	-
PK	7.3236G	60.85	74.00	-13.15	9.21	3	Vertical	19	2.78	-

FSK_Nss1_1TX

2442MHz_TX

11/01/2019

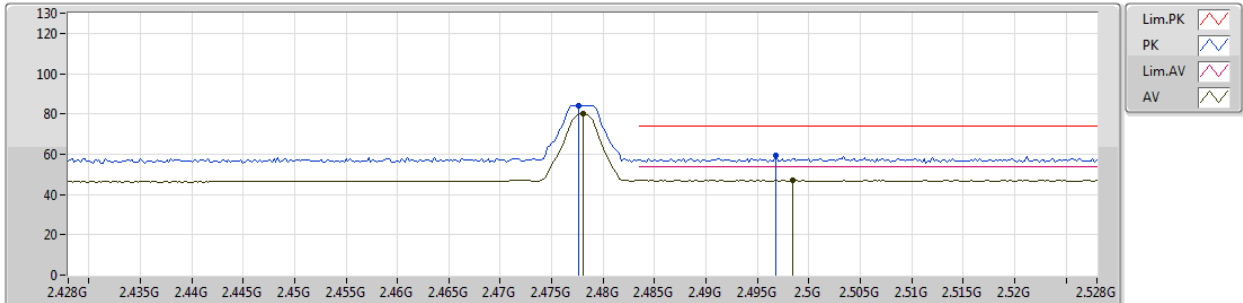


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.8779G	42.38	54.00	-11.62	3.62	3	Horizontal	277	1.02	-
AV	7.3256G	45.97	54.00	-8.03	9.21	3	Horizontal	180	2.99	-
PK	4.8778G	48.72	74.00	-25.28	3.62	3	Horizontal	277	1.02	-
PK	7.3266G	58.20	74.00	-15.80	9.21	3	Horizontal	180	2.99	-

FSK_Nss1_1TX

2478MHz_TX

11/01/2019

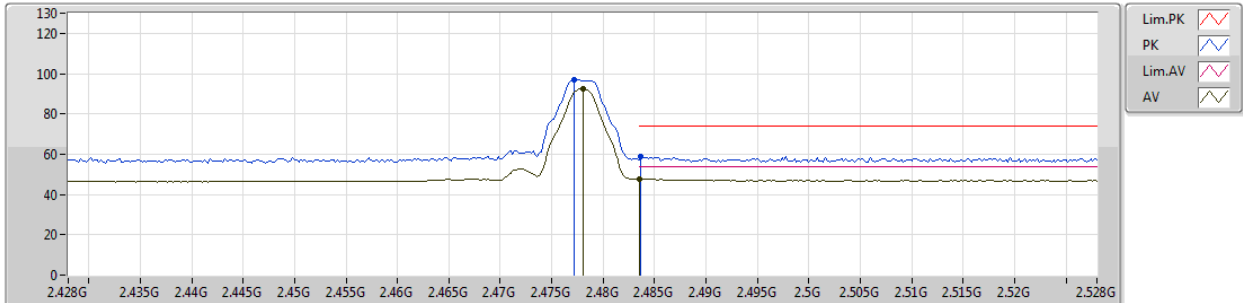


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.478G	79.96	Inf	-Inf	30.95	3	Vertical	219	1.56	-
AV	2.4984G	46.86	54.00	-7.14	31.01	3	Vertical	219	1.56	-
PK	2.4776G	84.16	Inf	-Inf	30.95	3	Vertical	219	1.56	-
PK	2.4968G	59.49	74.00	-14.51	31.00	3	Vertical	219	1.56	-

FSK_Nss1_1TX

2478MHz_TX

11/01/2019

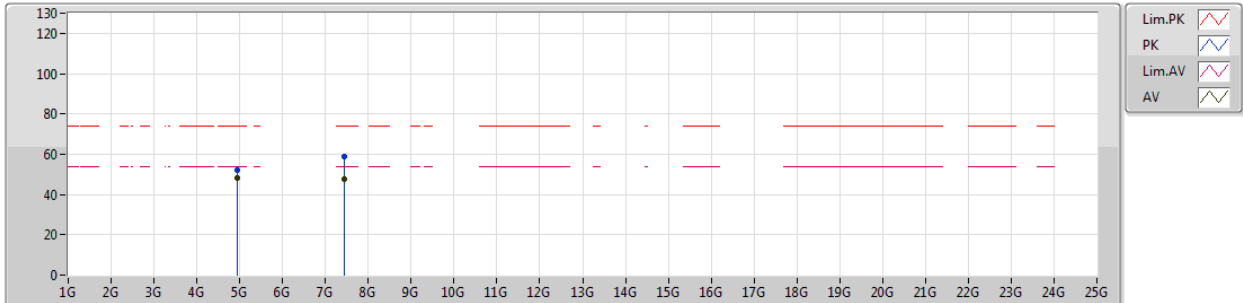


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.478G	92.49	Inf	-Inf	30.95	3	Horizontal	74	1.07	-
AV	2.4835G	47.64	54.00	-6.36	30.97	3	Horizontal	74	1.07	-
PK	2.4772G	96.70	Inf	-Inf	30.95	3	Horizontal	74	1.07	-
PK	2.4836G	58.93	74.00	-15.07	30.97	3	Horizontal	74	1.07	-

FSK_Nss1_1TX

2478MHz_TX

11/01/2019

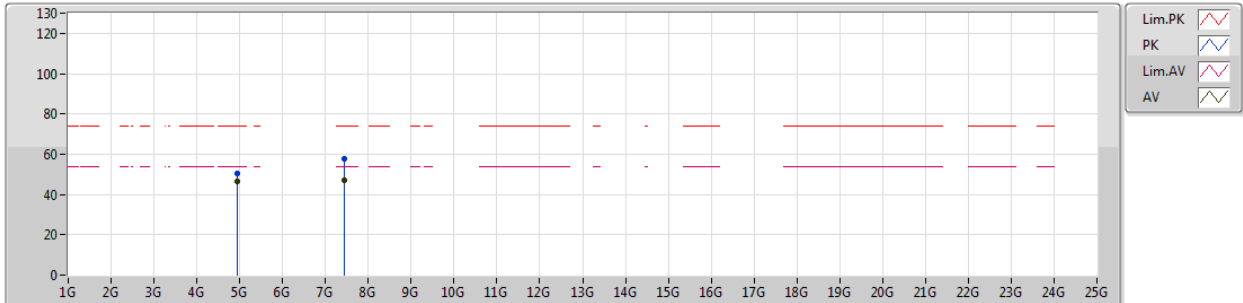


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments							
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)								
AV	4.94994G	47.99	54.00	-6.01	6.83	3	Vertical	14	2.60	-							
AV	7.43346G	47.72	54.00	-6.28	11.62	3	Vertical	141	2.73	-							
PK	4.95G	51.88	74.00	-22.12	6.83	3	Vertical	14	2.60	-							
PK	7.43442G	58.64	74.00	-15.36	11.62	3	Vertical	141	2.73	-							

FSK_Nss1_1TX

2478MHz_TX

11/01/2019

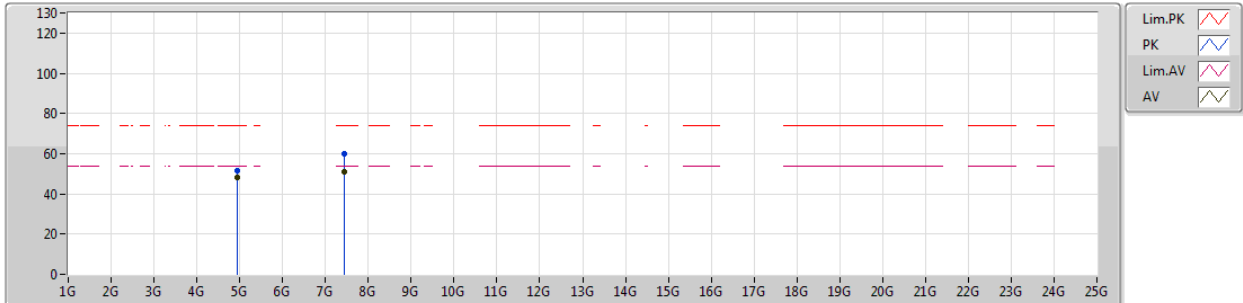


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.94994G	46.30	54.00	-7.70	6.83	3	Horizontal	67	1.07	-
AV	7.43358G	47.13	54.00	-6.87	11.62	3	Horizontal	344	1.04	-
PK	4.95006G	50.45	74.00	-23.55	6.84	3	Horizontal	67	1.07	-
PK	7.43262G	57.99	74.00	-16.01	11.61	3	Horizontal	344	1.04	-

FSK_Nss1_1TX

2478MHz_TX

11/01/2019



EUT :Z

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.94994G	48.08	54.00	-5.92	6.83	3	Vertical	14	2.60	-
AV	7.43376G	51.18	54.00	-2.82	11.62	3	Vertical	141	2.73	-
PK	4.94994G	51.76	74.00	-22.24	6.83	3	Vertical	14	2.60	-
PK	7.43376G	59.70	74.00	-14.30	11.62	3	Vertical	141	2.73	-