

FCC TEST REPORT

FCC ID : 2AHIS-VH02R01
Equipment : Vayyar Home
Brand Name : Vayyar
Model Name : Vayyar Home
Applicant : Vayyar Imaging Ltd.
26 Shabazi St., Yehud 5610103, Israel
Manufacturer : XAVi Technologies Corporation
22F., No.69, Sec. 2, Guangfu Rd., Sanchong Dist.,
New Taipei City 241, Taiwan (R.O.C.)
Standard : 47 CFR FCC Part 15.231

The product was received on Jul. 21, 2020, and testing was started from Aug. 10, 2020 and completed on Aug. 21, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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



Approved by: 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

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	The Worst Case Modulation Configuration	7
2.3	The Worst Case Measurement Configuration	7
2.4	Accessories and Support Equipment	9
2.5	Test Setup Diagram	10
3	TRANSMITTER TEST RESULT	12
3.1	AC Power-line Conducted Emissions	12
3.2	Emission Bandwidth	16
3.3	Fundamental Emissions	18
3.4	Transmitter Radiated Unwanted Emissions	20
3.5	Operation Restriction.....	30
4	TEST EQUIPMENT AND CALIBRATION DATA.....	32

APPENDIX A. TEST PHOTOS

PHOTOGRAPHS OF EUT v01



TEL : 886-3-327-3456
FAX : 886-3-327-0973
Report Template No.: HE1-C7 Ver2.4

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	Not Required	-
3.2	15.231(c)	Emission Bandwidth	PASS	-
3.3	15.231(e)	Fundamental Emissions	PASS	-
3.4	15.231(e)	Transmitter Radiated Unwanted Emissions	PASS	-
3.4.7	15.231(a)/(e)	Operation Restriction	PASS	-

Declaration of Conformity:

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

Comments and Explanations:

None.

Reviewed by: Sam Tsai

Report Producer: Amber Chiu

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range(MHz)	Modulation	Ch. Frequency (MHz)	Channel Number	Fundamental Field Strength (dBuV/m)
418	OOK	418	1	72.05
Note 1: Field strength performed average level at 3m.				

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	INPAQ Technology Co. Ltd.	RFFPA661004IMU B301	Dipole antenna	I-PEX	-3.4

1.1.3 Type of EUT

Operational Condition	
EUT Power Type	From AC Adapter
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 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☐	Operated normal mode for worst duty cycle
☒	Operated test mode for worst duty cycle
Test Signal Duty Cycle	T(s)
☒ 25%	7.9875

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

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

- ♦ KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location				
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)		
		TEL : 886-3-327-3456	FAX : 886-3-327-0973	
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.				
☒	Wen Shan	ADD : No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)		
		TEL : 886-3-318-0787	FAX : 886-3-318-0287	
Test site Designation No. TW1097 with FCC.				

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO0-HY	Edward Wan	24.8~25.5°C / 62~64%	22/Aug/2020
RF Conducted	TH06-HY	Raven Chien	22.3~25.3°C / 54~61%	10/Aug/2020~ 21/Aug/2020
Radiated Emission	03CH09-HY	Daniel Hsu	22.5~24.8°C / 52~58%	19/Aug/2020

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)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.0 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

Condition Item	Abbreviation/Remark	Remark
Tnom Vnom	Tnom	20°C
-	Vnom	120V

2.2 The Worst Case Modulation Configuration

Modulation Used for Conformance Testing		
Mode	Field Strength (dBuV/m at3m)	Test Channel Frequencies (MHz)
FSK	72.05	418

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. Adapter Mode

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emission Bandwidth, Fundamental Emissions, Radiated Unwanted Emissions		
Test Condition	Radiated measurement		
User Position	☐ EUT will be placed in fixed position.		
	☐ EUT will be placed in mobile position and operating multiple positions.		
	☒ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.		
Operating Mode	CTX		
	☒ 1. Adapter Mode		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT			V

The Worst Case Mode for Following Conformance Tests	
Tests Item	Operation Restriction (silent time and operated time)
Test Condition	Conducted measurement
Test Mode	Operated normally mode for worst duty cycle condition.

2.4 Accessories and Support Equipment

Accessories				
AC Adapter	Brand Name	RUIDIR	Model Name	RD0502000-USBA-87MG
	Power Rating	I/P: 100 - 240 Vac, 300 mA, O/P: Vdc, 2000 mA		

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

Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	USB Cable	Fujiei	US0090	-	-
2	VTREE USB-CONSULE BOARD	Xavi	V0.1-200515	-	-

Note: Support equipment No.1 & 2 was provided by customer.

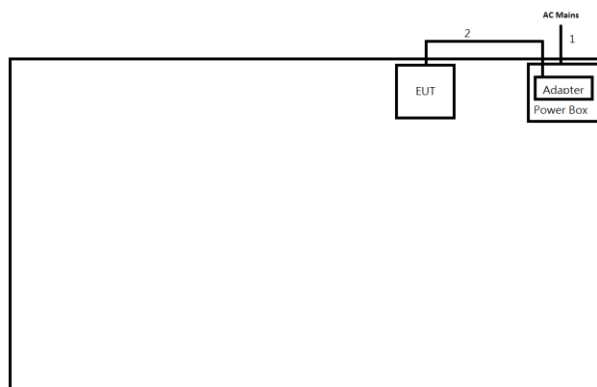
Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-
3	USB Cable	Fujiei	US0090	-	-
4	VTREE USB-CONSULE BOARD	Xavi	V0.1-200515	-	-

Note: Support equipment No.3 & 4 was provided by customer.

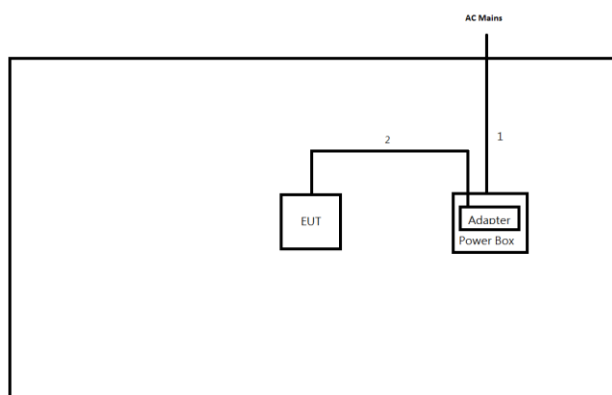
Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	USB Cable	Fujiei	US0090	-	-
2	VTREE USB-CONSULE BOARD	Xavi	V0.1-200515	-	-

2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	USB cable	No	1.5	-

Test Setup Diagram - Radiated Test


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	USB cable	No	1.5	-

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

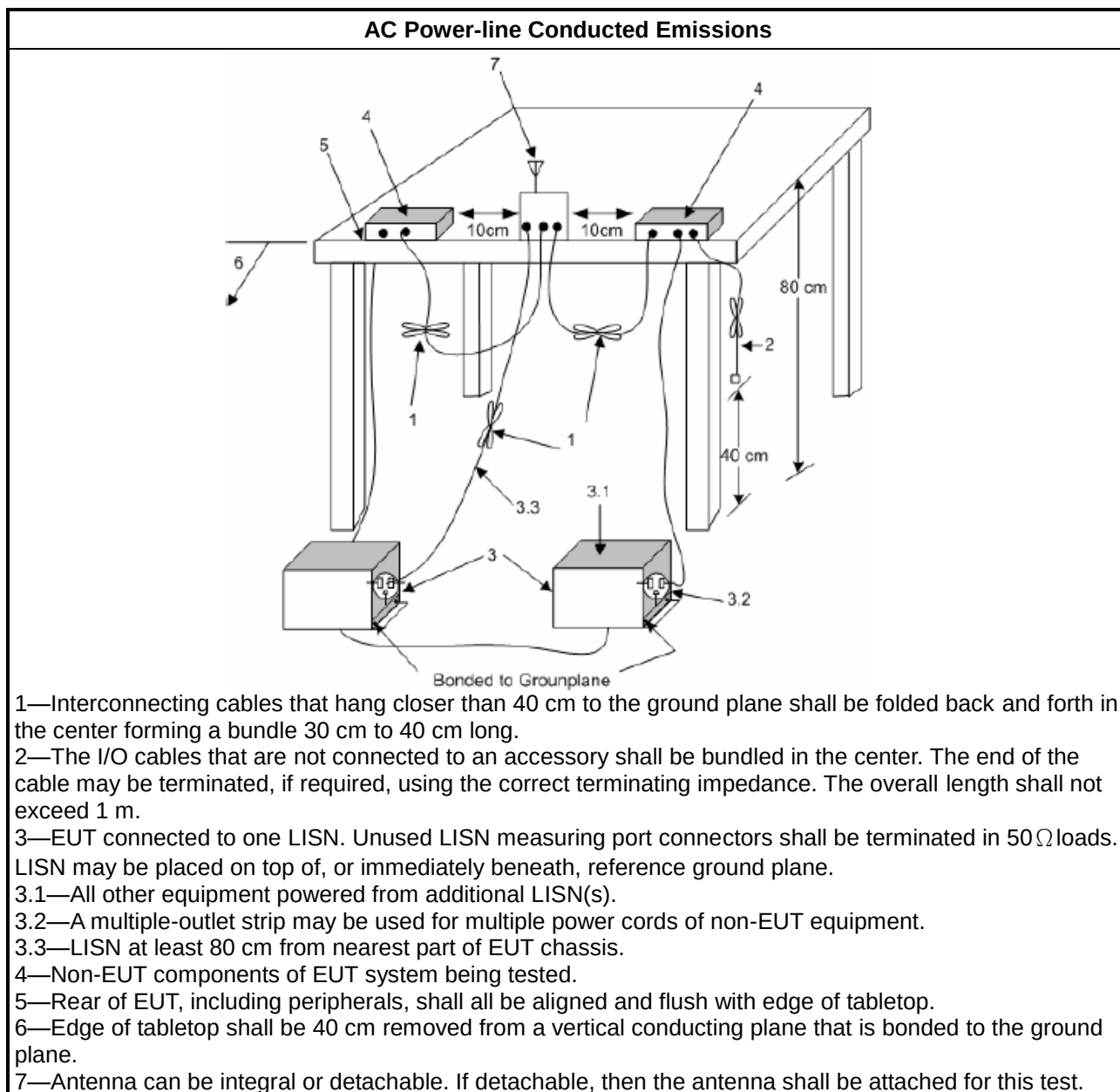
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Measurement Results Calculation

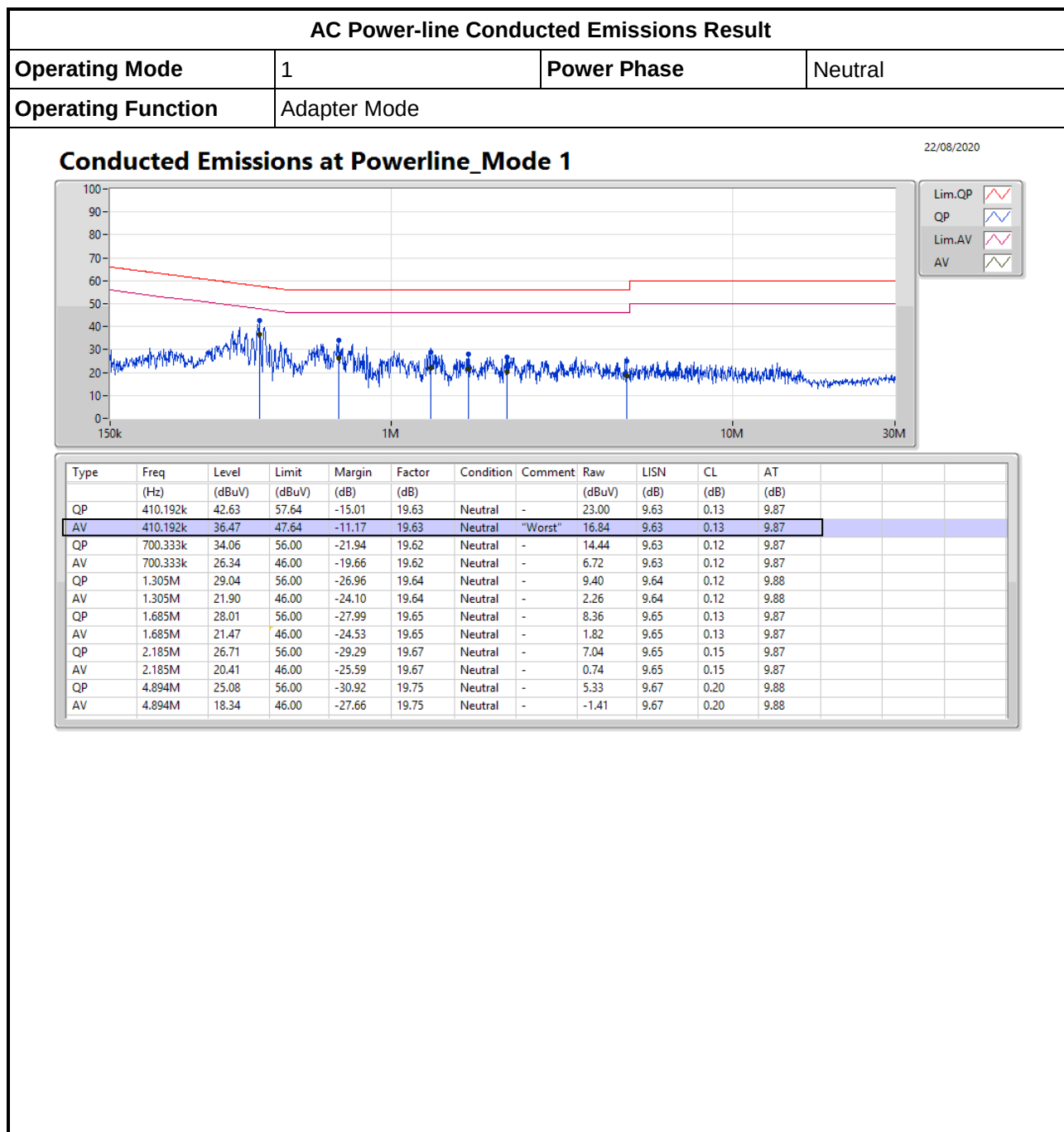
The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

3.1.5 Test Setup



3.1.6 Test Result of AC Power-line Conducted Emissions

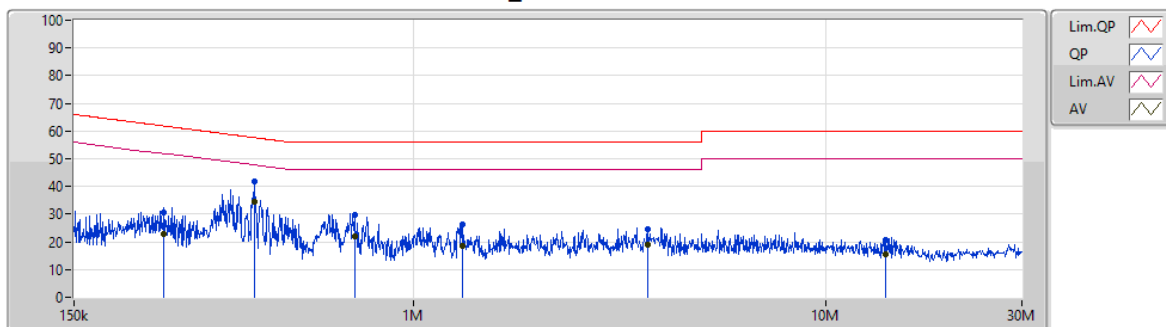


AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Adapter Mode		

Conducted Emissions at Powerline_Mode 1

22/08/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	248.05k	30.78	61.81	-31.03	19.64	Line	-	11.14	9.65	0.12	9.87			
AV	248.05k	23.06	51.81	-28.75	19.64	Line	-	3.42	9.65	0.12	9.87			
QP	410.192k	41.77	57.64	-15.87	19.64	Line	-	22.13	9.64	0.13	9.87			
AV	410.192k	34.42	47.64	-13.22	19.64	Line	"Worst"	14.78	9.64	0.13	9.87			
QP	720.179k	29.75	56.00	-26.25	19.63	Line	-	10.12	9.64	0.12	9.87			
AV	720.179k	21.98	46.00	-24.02	19.63	Line	-	2.35	9.64	0.12	9.87			
QP	1.316M	26.23	56.00	-29.77	19.64	Line	-	6.59	9.64	0.12	9.88			
AV	1.316M	18.48	46.00	-27.52	19.64	Line	-	-1.16	9.64	0.12	9.88			
QP	3.701M	24.55	56.00	-31.45	19.72	Line	-	4.83	9.66	0.18	9.88			
AV	3.701M	19.03	46.00	-26.97	19.72	Line	-	-0.69	9.66	0.18	9.88			
QP	13.983M	20.55	60.00	-39.45	19.85	Line	-	0.70	9.67	0.30	9.88			
AV	13.983M	15.58	50.00	-34.42	19.85	Line	-	-4.27	9.67	0.30	9.88			

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit	
☒	Emission bandwidth falls completely within authorized band.
☒	$F_c(70\sim 900\text{MHz}): BW \leq f_c \times 0.25\%$
☐	$F_c(>900\text{MHz}): BW \leq f_c \times 0.5\%$

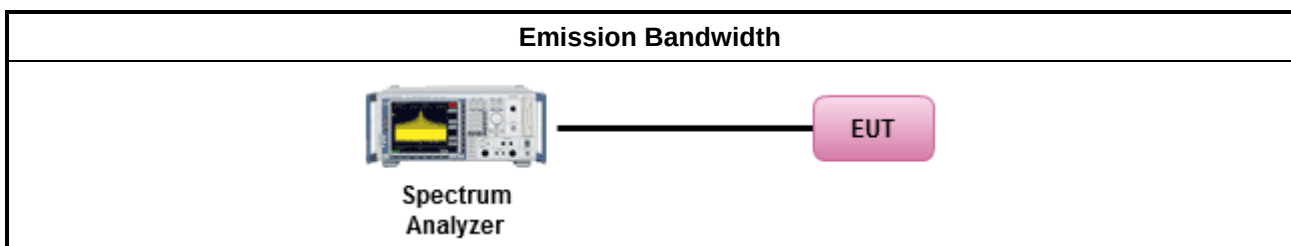
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

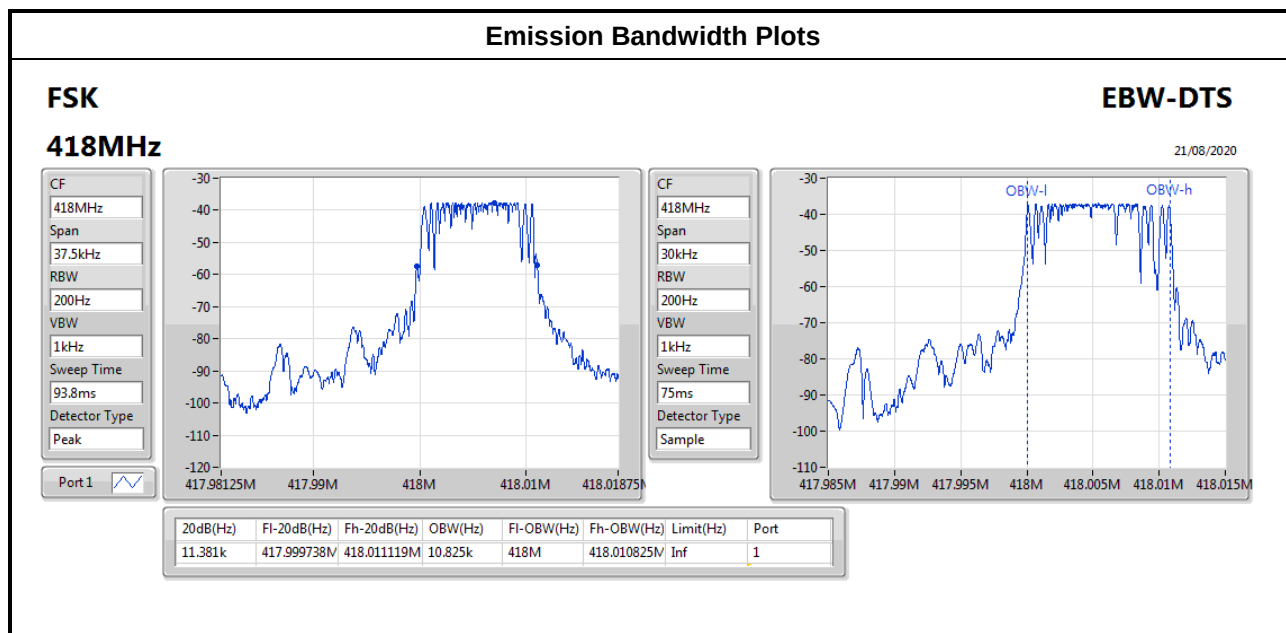
Test Method	
☒	Refer as ANSI C63.10, clause 6.9.3 for 20 dB emission bandwidth and 99% occupied bandwidth measurement.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Emission Bandwidth Result			
Modulation Mode	Frequency (MHz)	99% Bandwidth(kHz)	20dB Bandwidth(kHz)
OOK	418	10.83	11.38
Limit		N/A	1.045
Result		Complied	



3.3 Fundamental Emissions

3.3.1 Fundamental Emissions Limit

For manually operated within 5 sec, activated automatically within 5 sec, periodic transmissions		
Frequency Band (MHz)	Fundamental Limit (uV/m) at 3m	Fundamental Limit (dBuV/m) at 3m
40.66-40.70	2250	67
70-130	1250	61.9
130-174	1250-3750(**)	61.9-71.5
174-260	3750	71.5
260-470	3750-12500(**)	71.5-81.9
Above 470	12500	81.9
**1. Linear interpolations. Based on the average value of the measured emissions.		

For periodic transmissions (lower field strength)		
Frequency Band (MHz)	Fundamental Limit (uV/m) at 3m	Fundamental Limit (dBuV/m) at 3m
40.66-40.70	1000	60
70-130	500	54
130-174	500-1500(**)	54-63.5
174-260	1500	63.5
260-470	1500-5000(**)	63.5-74
Above 470	5000	74
** 1. Linear interpolations. Based on the average value of the measured emissions.		

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

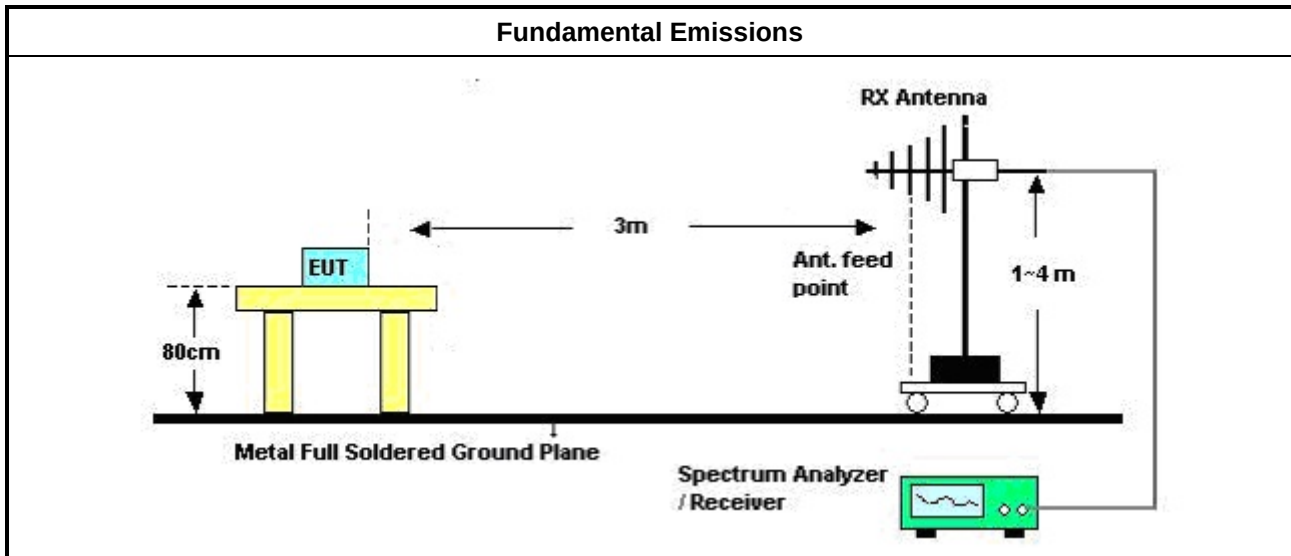
☒	For the transmitter emissions shall be measured using following options below:
☐	Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW) – Duty cycle $\geq$ 100%.
☒	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$. Average emission = peak emission + 20 log (duty cycle).
☒	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
☒	For radiated measurement, refer as ANSI C63.10, clause 6.5 for radiated emissions

3.3.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.3.5 Test Setup



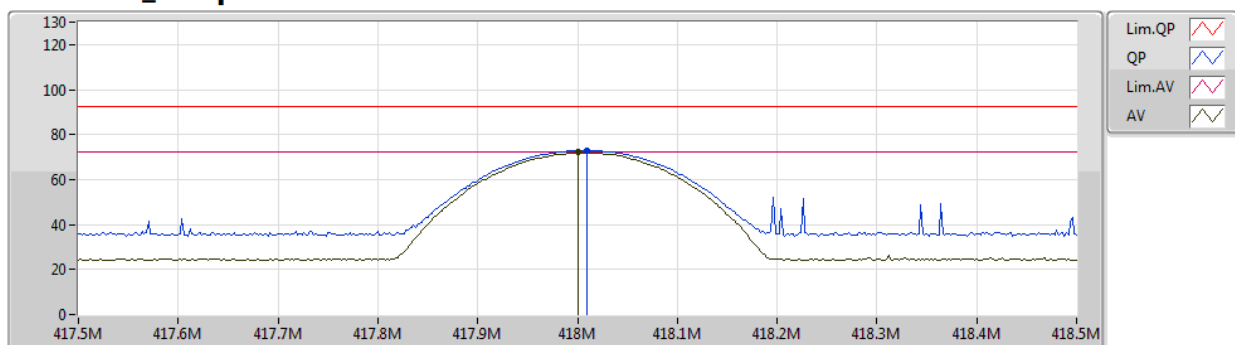
3.3.6 Test Result of Fundamental Emissions

Field Strength of Fundamental Emissions Result					
Modulation Mode	Frequency (MHz)	Fundamental (dBuV/m)@3m	Margin (dB)	Limit (dBuV/m)@3m	Type
OOK	418	72.05	-0.28	72.33	Average
OOK	418	72.99	-19.34	92.33	Peak
Result		Complied			
Note 1: Measurement worst emissions of receive antenna polarization: Vertical					
Note 2: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).					

SRD_Nss1_1TX

418MHz_Adapter

19/08/2020



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)
AV	418M	72.05	72.33	-0.28	23.43	3	Vertical	360	1.00	-	48.62	21.69	1.74	-
PK	418.01M	72.99	92.33	-19.34	23.43	3	Vertical	360	1.00	-	49.56	21.69	1.74	-

3.4 Transmitter Radiated Unwanted Emissions

3.4.1 Transmitter Radiated Unwanted Emissions Limit

For manually operated within 5 sec, activated automatically within 5 sec, periodic transmissions		
Unwanted emissions limit follow this table or the general limits FCC 15.209, whichever limit permits higher field strength.		
Frequency Band (MHz)	Spurious Limit (uV/m) at 3m	Spurious Limit (dBuV/m) at 3m
40.66-40.70	225	47
70-130	125	41.9
130-174	125-375(**)	41.9-51.5
174-260	375	51.5
260-470	375-1250(**)	51.5-61.9
Above 470	1250	61.9
**1. Linear interpolations. Based on the average value of the measured emissions.		

For periodic transmissions (lower field strength)		
Unwanted emissions limit follow this table or the general limits FCC 15.209, whichever limit permits higher field strength.		
Frequency Band (MHz)	Spurious Limit (uV/m) at 3m	Spurious Limit (dBuV/m) at 3m
40.66-40.70	100	40
70-130	50	34
130-174	50-150(**)	34-43.5
174-260	150	43.5
260-470	150-500(**)	43.5-54
Above 470	500	54
** 1. Linear interpolations Based on the average value of the measured emissions.		

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method – General Information	
☒	The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].
☐	Refer as ANSI C63.10, clause 6.10.3 bandedge 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 ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW) – Duty cycle $\geq$ 100%.
☒	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from $20\log$ (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle).
☒	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
☒	For the transmitter bandedge emissions shall be measured using following options below:
☒	Refer as ANSI C63.10, clause 6.10 for band-edge testing.
☐	Refer as ANSI C63.10, clause 6.10.6.2 for marker-delta method for band-edge measurements.
☒	For radiated measurement.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.
☒	The any unwanted emissions level shall not exceed the fundamental emission level.
☒	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.
☐	KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.
☐	- Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field. - Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

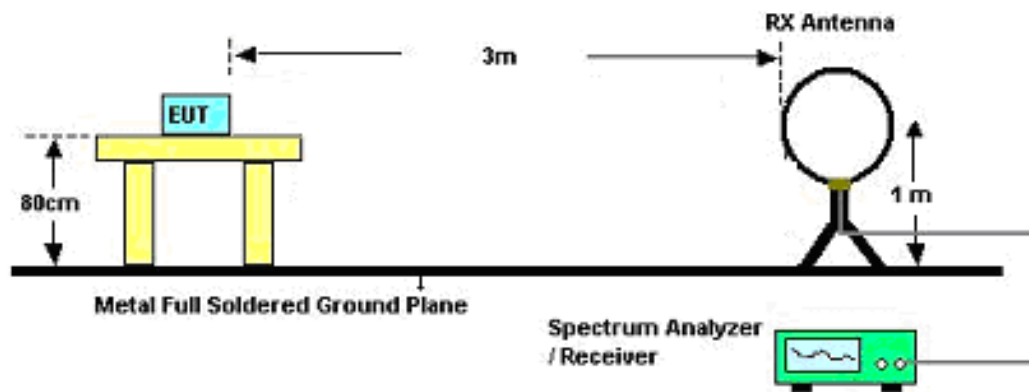
3.4.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

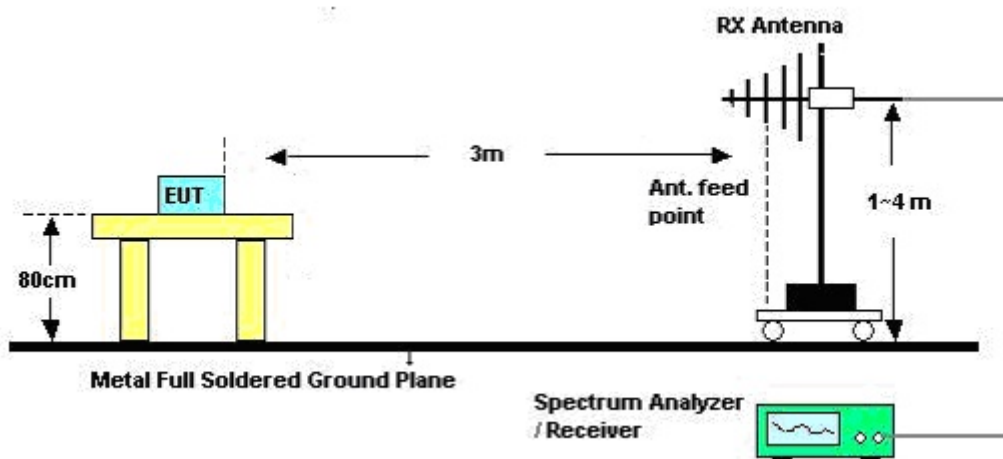
3.4.5 Test Setup

Transmitter Spurious and Out of Band Emissions (9 kHz - 30 MHz)

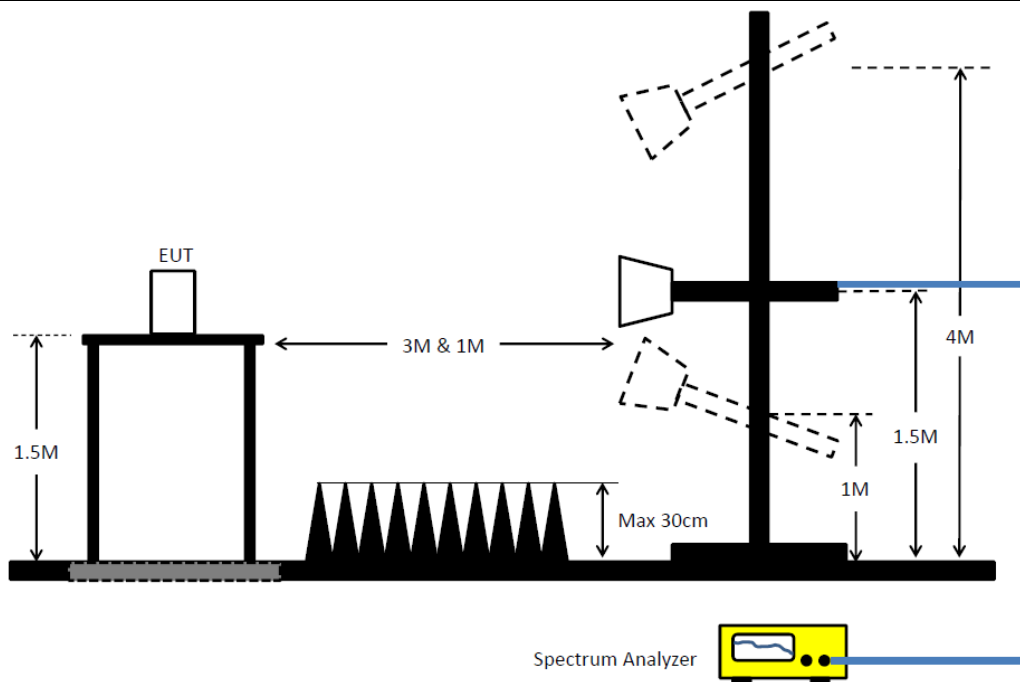


Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna.

Transmitter Radiated Unwanted Emissions (below 1GHz)



Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.

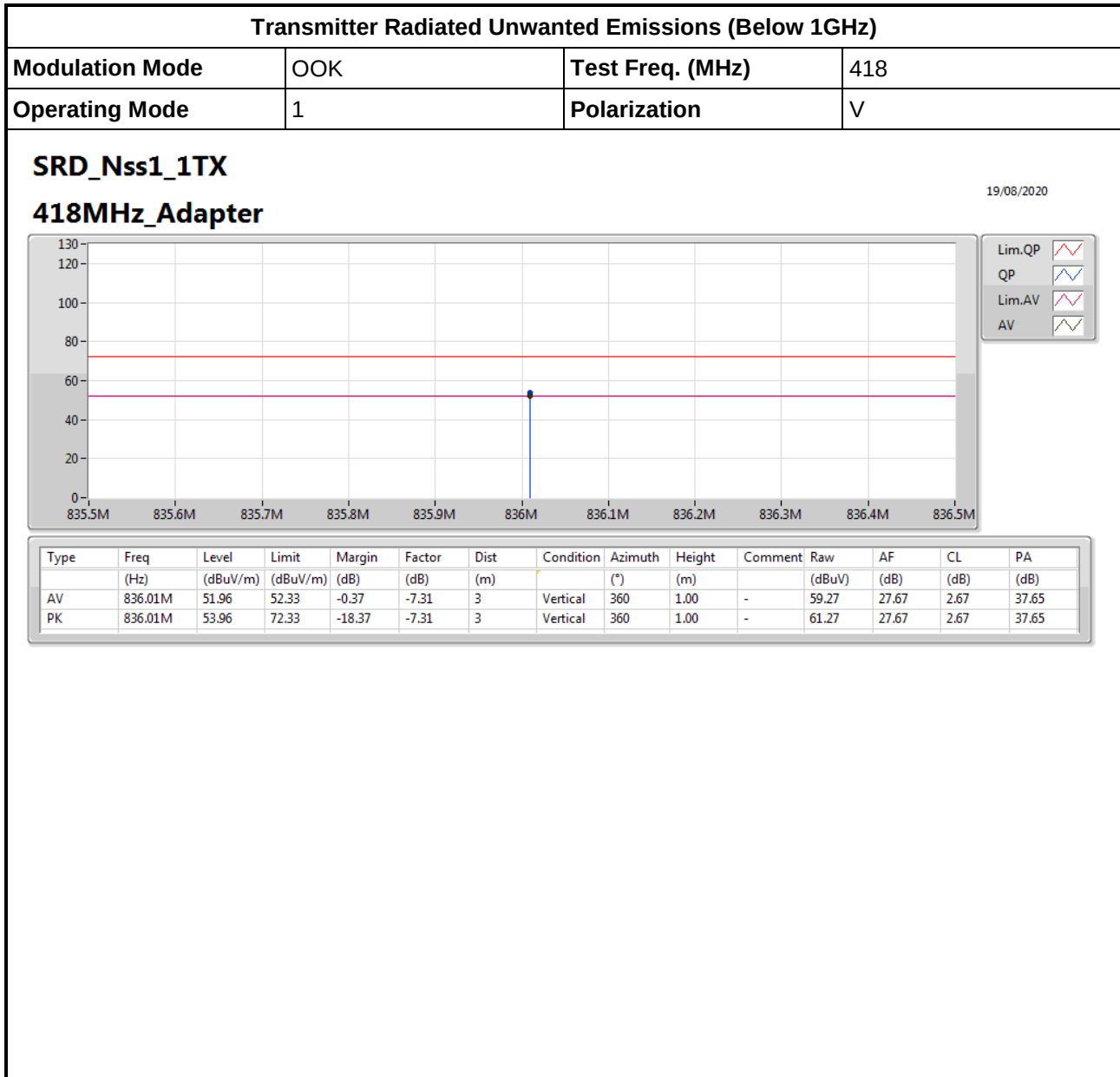
Transmitter Radiated Unwanted Emissions (Above 1GHz)


Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

3.4.6 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.

3.4.7 Transmitter Radiated Unwanted Emissions (Below 1GHz)

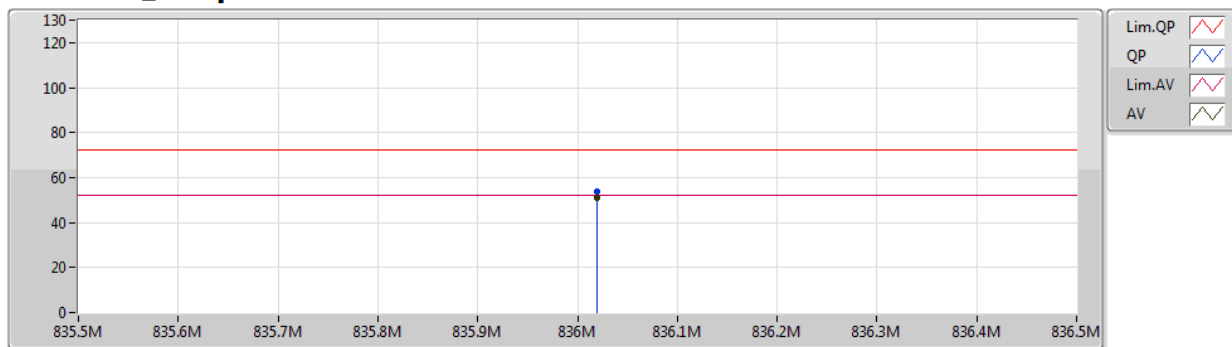


Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation Mode	OOK	Test Freq. (MHz)	418
Operating Mode	1	Polarization	H

SRD_Nss1_1TX
418MHz_Adapter

19/08/2020



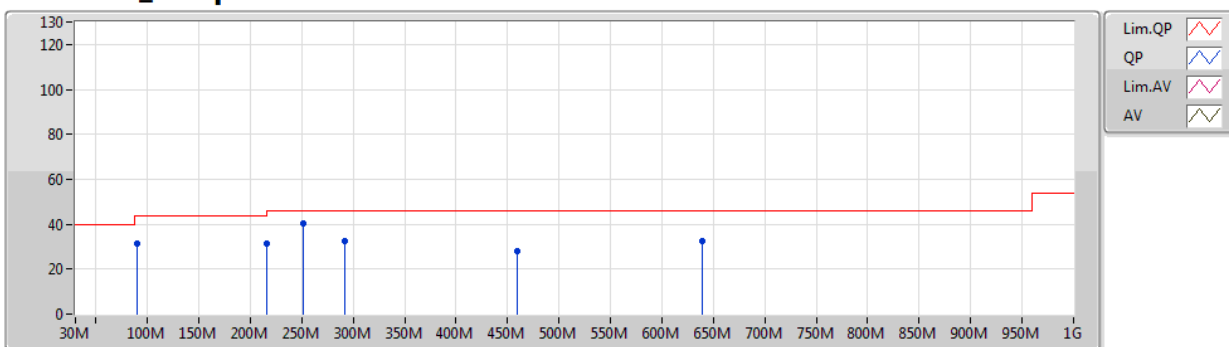
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	836.02M	50.86	52.33	-1.47	-7.31	3	Horizontal	0	1.00	-	58.17	27.67	2.67	37.65
PK	836.02M	53.90	72.33	-18.43	-7.31	3	Horizontal	0	1.00	-	61.21	27.67	2.67	37.65

Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation Mode	OOK	Test Freq. (MHz)	418
Operating Mode	1	Polarization	V

SRD_Nss1_1TX
418MHz_Adapter

19/08/2020



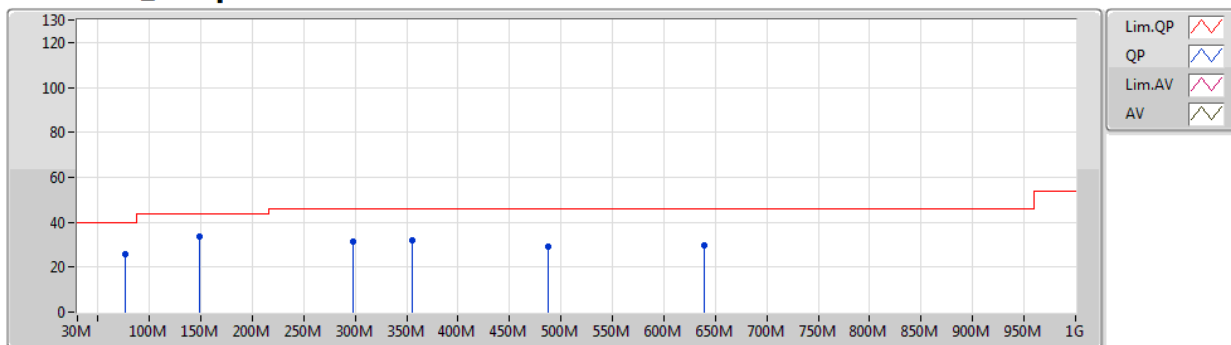
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	90.14M	31.65	43.50	-11.85	-22.09	3	Vertical	0	1.00	-	53.74	13.84	0.70	36.63
PK	216M	31.16	43.50	-12.34	-21.11	3	Vertical	0	1.00	-	52.27	13.99	1.16	36.26
PK	251.16M	40.57	46.00	-5.43	-17.36	3	Vertical	0	1.00	-	57.93	17.77	1.30	36.43
PK	291.9M	32.60	46.00	-13.40	-16.80	3	Vertical	0	1.00	-	49.40	18.18	1.38	36.36
PK	458.74M	27.89	46.00	-18.11	-12.47	3	Vertical	0	1.00	-	40.36	22.39	1.82	36.68
PK	639.16M	32.64	46.00	-13.36	-9.35	3	Vertical	0	1.00	-	41.99	25.48	2.20	37.03

Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation Mode	OOK	Test Freq. (MHz)	418
Operating Mode	1	Polarization	H

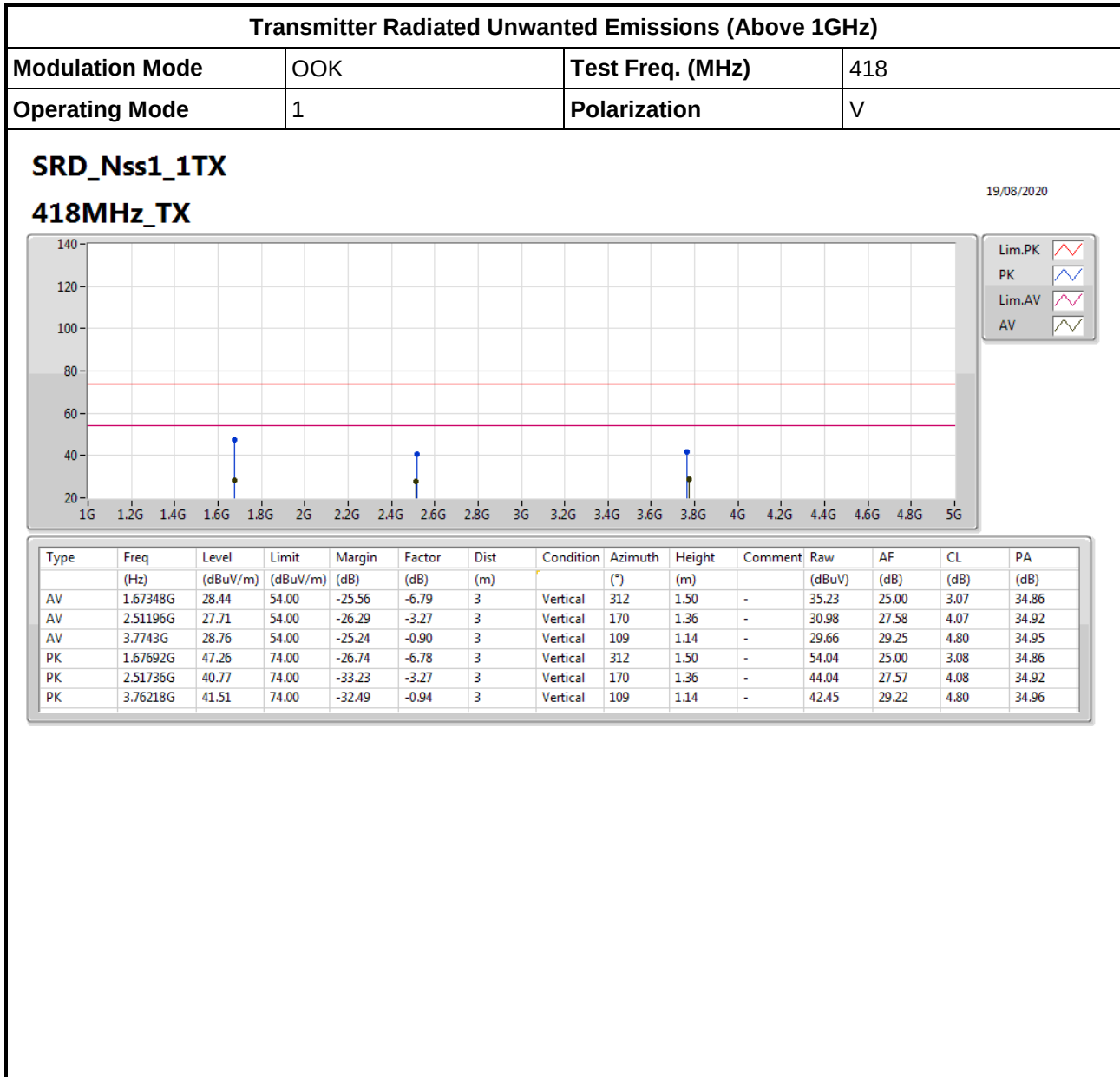
SRD_Nss1_1TX
418MHz_Adapter

19/08/2020



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	76.56M	25.73	40.00	-14.27	-24.21	3	Horizontal	360	1.00	-	49.94	11.87	0.70	36.78
PK	148.34M	33.54	43.50	-9.96	-19.09	3	Horizontal	360	1.00	-	52.63	16.30	0.94	36.33
PK	297.72M	31.61	46.00	-14.39	-16.72	3	Horizontal	360	1.00	-	48.33	18.23	1.40	36.35
PK	355.92M	31.69	46.00	-14.31	-15.35	3	Horizontal	360	1.00	-	47.04	19.62	1.52	36.49
PK	487.84M	28.95	46.00	-17.05	-12.23	3	Horizontal	360	1.00	-	41.18	22.80	1.88	36.91
PK	639.16M	29.62	46.00	-16.38	-9.35	3	Horizontal	360	1.00	-	38.97	25.48	2.20	37.03

3.4.8 Transmitter Radiated Unwanted Emissions (Above 1GHz)

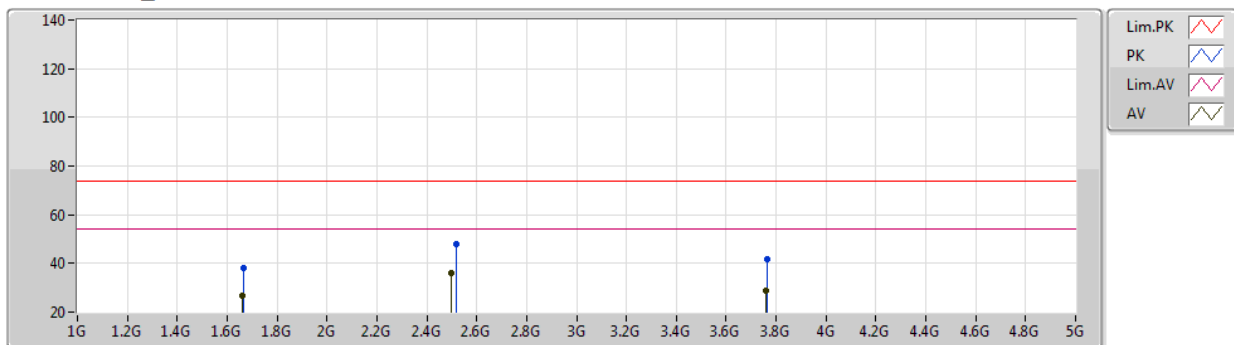


Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	OOK	Test Freq. (MHz)	418
Operating Mode	1	Polarization	H

SRD_Nss1_1TX
418MHz_TX

19/08/2020



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)
AV	1.66234G	26.64	54.00	-27.36	-6.81	3	Horizontal	250	1.02	-	33.45	25.00	3.06	34.87
AV	2.49618G	36.06	54.00	-17.94	-3.28	3	Horizontal	188	1.84	-	39.34	27.60	4.04	34.92
AV	3.76128G	28.90	54.00	-25.10	-0.94	3	Horizontal	112	1.50	-	29.84	29.22	4.80	34.96
PK	1.66798G	38.29	74.00	-35.71	-6.79	3	Horizontal	250	1.02	-	45.08	25.00	3.07	34.86
PK	2.51742G	47.97	74.00	-26.03	-3.27	3	Horizontal	188	1.84	-	51.24	27.57	4.08	34.92
PK	3.76428G	41.74	74.00	-32.26	-0.93	3	Horizontal	112	1.50	-	42.67	29.23	4.80	34.96

3.5 Operation Restriction

3.5.1 Operation Restriction Limit

Operation Restriction Limit	
☐	Manually operated: manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 sec of being released.
☐	Activated automatically: transmitter activated automatically shall cease transmission within 5 sec after activation.
☐	Periodic transmissions: permitted with total transmission time of 2 sec per hour or less.
☒	Periodic transmissions (lower field strength): each transmission is not greater than 1 sec and the silent period between transmissions is at least 30 times the duration of the transmission but in no case less than 10 sec.

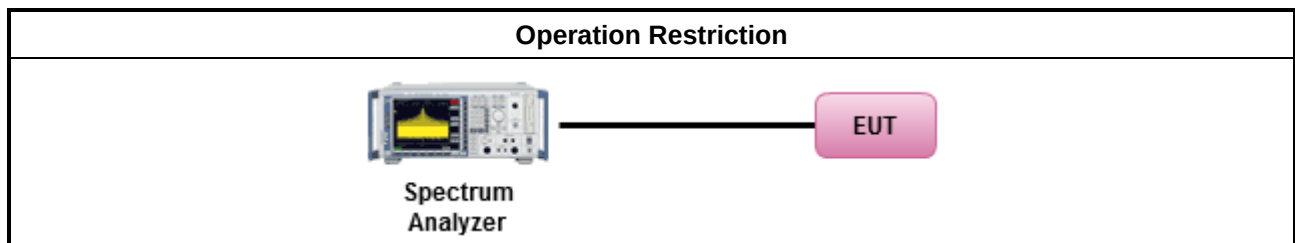
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method	
☒	Refer as ANSI C63.10, clause 7.4 for periodic operation measurement.

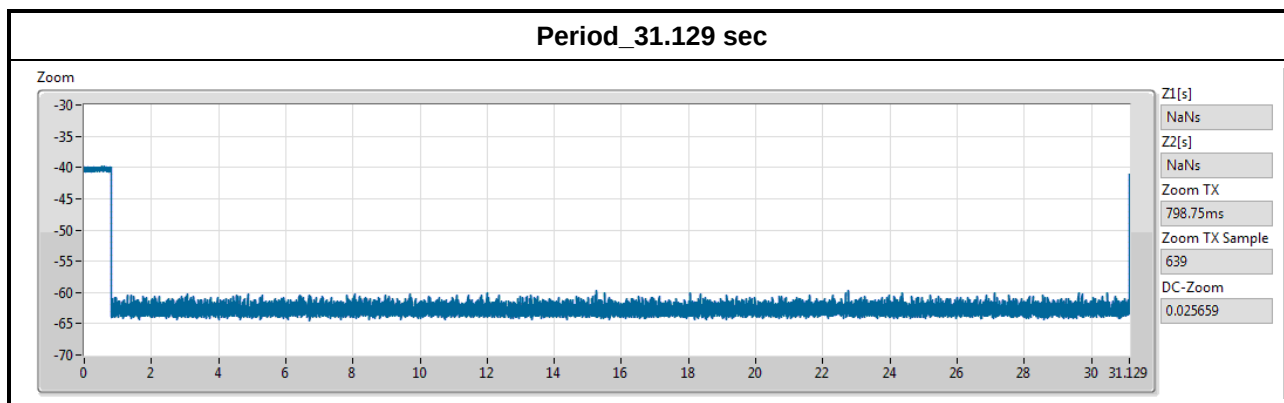
3.5.4 Test Setup



3.5.5 Test Result of Operation Restriction

Operation Condition	Pulse Duration (s)	Limits (s)
Transmission time (TX-on)	0.39968	1.00
Silent duration (TX-on+TX-off)	31.129	10.00

Transmission time = 1 Pulse On time * 3 Pulse in 1s * 10 Pulse in 20s = 10.2ms * 3 * 10 = 306ms
 Note : 30 time limit : 0.39968 sec*30=11.99 sec



4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	29/May/2020	28/May/2021
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	05/Nov/2019	04/Nov/2020
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	23/Sep/2019	22/Sep/2020
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	24/Sep/2019	23/Sep/2020

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101029	10KHz ~ 40GHz	01/Oct/2019	30/Sep/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	11/Nov/2020
Pulse Sensor	Anritsu	MA2411B	1027452	300MHz~40GHz	18/Mar/2020	17/Mar/2021
Power Meter	Anritsu	ML2495A	1124009	300MHz~40GHz	18/Mar/2020	17/Mar/2021

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz~1GHz 3m	27/Mar/2020	26/Mar/2021
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz~18GHz 3m	19/Mar/2020	18/Mar/2021
Signal Analyzer	R&S	FSV 40	101029	10Hz~40GHz	01/Oct/2019	30/Sep/2020
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	14/Apr/2020	13/Apr/2021
Microwave Preamplifier	Agilent	8449B	3008A02326	1GHz~26.5GHz	24/Jul/2020	23/Jul/2021
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D&MT J6102-05	35418 & 3	30MHz~1GHz	30/Sep/2019	29/Sep/2020
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	28/May/2020	27/May/2021
RF Cable-low	Jye Bao	RG142	CB031+324530/4	30MHz~1GHz	12/Feb/2020	11/Feb/2021
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX104	324530/4+17173/4	1GHz~40GHz	12/Feb/2020	11/Feb/2021
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz~40GHz	13/Mar/2020	12/Mar/2021
Preamplifier	MITEQ	TTA1840-35-H G	1864481	18GHz~40GHz	10/Mar/2020	09/Mar/2021
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2020	15/Mar/2021
EMI Test Receiver	R&S	ESR3	102051	9kHz~3.6GHz	29/May/2020	28/May/2021