FCC Radio Test Report

Applicant	:	**Relay, Inc.**
Equipment	:	**Relay**
Brand Name	:	**RelayM**
Model Name	:	**RY2267**
FCC ID	:	**2AMBHRY2267**
Standard	:	**47 CFR FCC Part 15.519**
Test Date(S)	:	**Jan. 15, 2025 ~ Feb. 19, 2025**

We, Sporton International Inc. (Kunshan), 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. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED
Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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Appendix A. Setup Photographs

History of this test report

Report No.	Version	Description	Issued Date
FR250505H	01	Initial issue of report	Feb. 24, 2025
FR250505H	02	Added the marker and remark on the ch09 Plot2 on the page 19. This report is an updated version, replacing the report issued on Feb. 24, 2025	Mar. 13, 2025

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.4	15.203 15.519(a)(2)	Antenna Requirement	PASS	15.203
3.1	15.207	AC Power-line Conducted Emissions	PASS	15.207
3.2	15.519(b)	UWB Bandwidth	PASS	≥ 500MHz
3.3	15.519(a)(1)	Technical requirements for Hand Held UWB systems	PASS	15.519(a)(1)
3.4	15.519(e)	Peak Emissions within a 50 MHz Bandwidth	PASS	≤ 0 dBm/50MHz
3.5	15.519(c) /15.519(d)	Radiated Emissions	PASS	UWB Emissions: 15.519(c) GPS Emissions: 15.519(d) Digital Emissions: 15.209

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Applicant

Relay, Inc.

2230 Bandmate Way, Suite 500, Raleigh, NC 27607, USA

1.2 Manufacturer

Relay, Inc.

2230 Bandmate Way, Suite 500, Raleigh, NC 27607, USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Relay
Brand Name	RelayM
Model Name	RY2267
FCC ID	2AMBHRY2267
IMEI Code / SN	Conduction: 990007540010797/990007540010789 Radiation: 0010805
HW Version	v01
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Channel Number & Tx/Rx Frequency Range	CH09: 7987.2 MHz
Antenna Type	**<Ant. 5> :** PIFA Antenna **<Ant. 6> :** PIFA Antenna
UWB category	hand held device
Antenna Gain	**<ANT6>:** **<CH09> :** 4.5 dBi
Type of Modulation	BPM-BPSK

Note: Ant.5 is Rx only.

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Type of EUT

Operational Condition	
EUT Power Type	From Battery
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:

1.7 Testing Location Information

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-KS 03CH06-KS	CN1257	314309

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated	03CH06-KS	Levi Zhao	22 ~ 23 °C 41 ~ 42 %	Jan. 15, 2025~ Feb. 09, 2025
Conduction	CO01-KS	Amos Zhang	25.3 ~ 26.2°C 38 ~ 40 %	Feb. 05, 2025

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH06-KS	AUDIX	E3	6.2009-8-24al
2.	CO01-KS	AUDIX	E3	6.2009-8-24

1.9 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 15F
- ANSI C63.10-2013
- FCC KDB 414788 D01 Radiated Test Site v01r01
- FCC KDB 393764 D01 v02
- FCC KDB 412172 D01 v01r01

2 Test Configuration of EUT

2.1 Test Mode

Test Configuration					
Mode	**Ant**	**UWB Channel**	**preamble_cidx**	**rx_sts_mode**	**packet_length**
Mode 1	6	9	10	SP 0	4
Mode 2	6	9	10	SP 0	127
Mode 3	6	9	10	SP 1	4
Mode 4	6	9	10	SP 1	127
Mode 5	6	9	10	SP 3	0
Mode 6	6	9	27	SP 0	4095
Mode 7	6	9	27	SP 1	4095
Mode 8	6	9	27	SP 3	0

2.2 The Worst Case Measurement Configuration

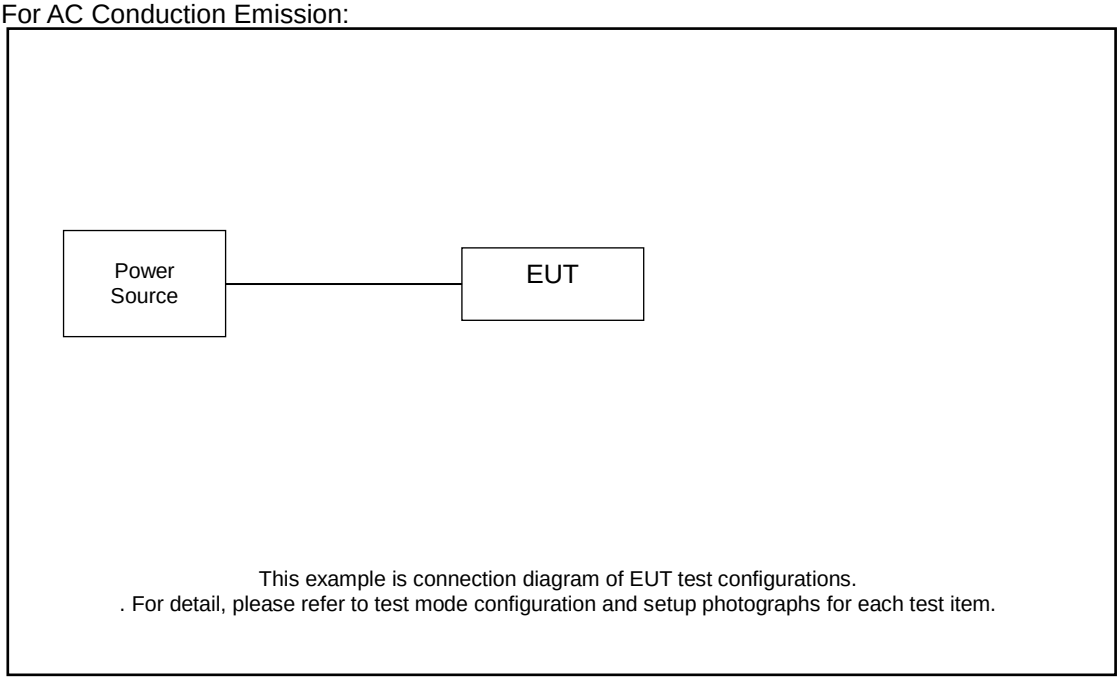
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	CTX
1	Standalone mode

The Worst Case Mode for Following Conformance Tests			
Tests Item	UWB Bandwidth, Peak Emissions within a 50 MHz Bandwidth, Radiated Emissions		
Test Condition	Radiated measurement		
Operating Mode	CTX		
1	Standalone mode		
Mode 1 configuration was tested and found to be the worst case and measured during the test.			
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
Worst Planes of EUT			V

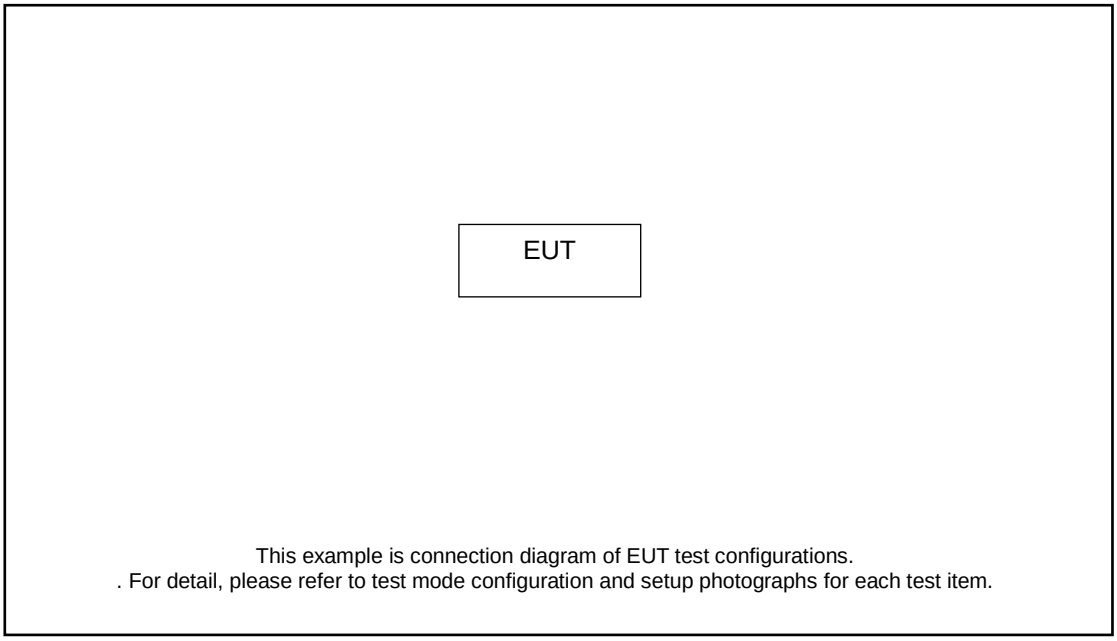
Remark:
1. The measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find Z plane as worst plane and recorded in this report.

2.3 Test Setup Diagram

For AC Conduction Emission:



For Radiated Emission:



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.		

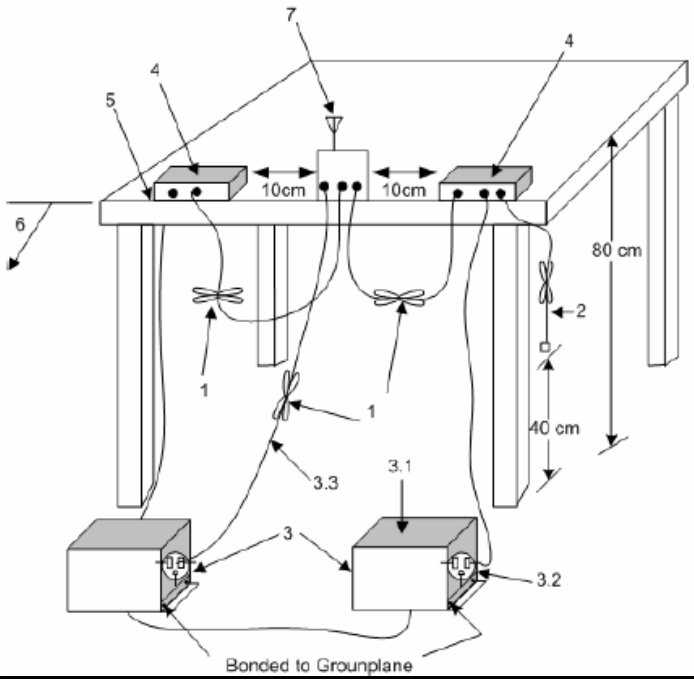
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

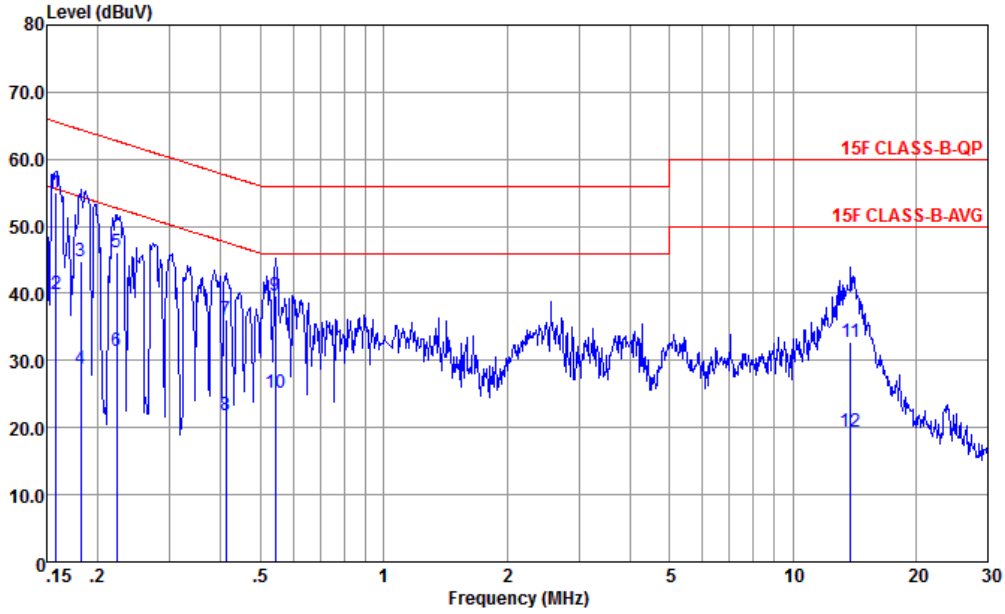
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup

AC Power-line Conducted Emissions


3.1.5 Test Result

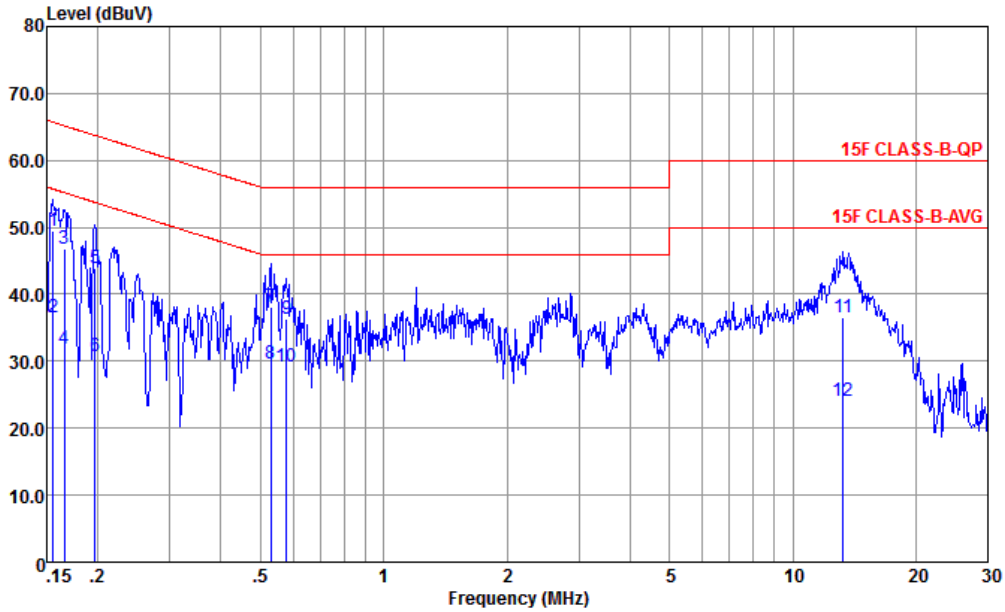
Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : 15F CLASS-B-QP LISN-060105-L 2024 LINE

	Freq MHz	Level dBuV	Over Limit dB	Limit Line dBuV	Read Level dBuV	LISN Factor dB	Cable Loss dB	Remark
1 *	0.158	55.06	-10.50	65.56	44.50	0.11	10.45	QP
2	0.158	39.86	-15.70	55.56	29.30	0.11	10.45	Average
3	0.182	44.75	-19.67	64.42	34.20	0.09	10.46	QP
4	0.182	28.75	-25.67	54.42	18.20	0.09	10.46	Average
5	0.222	46.15	-16.59	62.74	35.61	0.08	10.46	QP
6	0.222	31.45	-21.29	52.74	20.91	0.08	10.46	Average
7	0.410	36.05	-21.59	57.64	25.60	-0.03	10.48	QP
8	0.410	21.75	-25.89	47.64	11.30	-0.03	10.48	Average
9	0.544	39.77	-16.23	56.00	29.50	-0.12	10.39	QP
10	0.544	25.17	-20.83	46.00	14.90	-0.12	10.39	Average
11	13.841	32.68	-27.32	60.00	22.60	-0.19	10.27	QP
12	13.841	19.38	-30.62	50.00	9.30	-0.19	10.27	Average

Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : 15F CLASS-B-QP LISN-060105-N 2024 NEUTRAL

	Freq MHz	Level dBuV	Over Limit dB	Limit Line dBuV	Read Level dBuV	LISN Factor dB	Cable Loss dB	Remark
1 *	0.156	49.37	-16.32	65.69	38.80	0.12	10.45	QP
2	0.156	36.47	-19.22	55.69	25.90	0.12	10.45	Average
3	0.166	46.78	-18.38	65.16	36.21	0.12	10.45	QP
4	0.166	31.88	-23.28	55.16	21.31	0.12	10.45	Average
5	0.197	43.89	-19.87	63.76	33.30	0.13	10.46	QP
6	0.197	30.79	-22.97	53.76	20.20	0.13	10.46	Average
7	0.529	38.05	-17.95	56.00	27.80	-0.15	10.40	QP
8	0.529	29.55	-16.45	46.00	19.30	-0.15	10.40	Average
9	0.579	36.42	-19.58	56.00	26.20	-0.16	10.38	QP
10	0.579	29.12	-16.88	46.00	18.90	-0.16	10.38	Average
11	13.267	36.66	-23.34	60.00	26.60	-0.21	10.27	QP
12	13.267	23.96	-26.04	50.00	13.90	-0.21	10.27	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)

3.2 UWB bandwidth

3.2.1 UWB bandwidth Limit

UWB bandwidth Limit
☒ UWB bandwidth ≥ 500 MHz or Fractional bandwidth ≥ 0.2; Fractional bandwidth = $2(f_H - f_L)/(f_H + f_L)$

3.2.2 Measuring Instruments

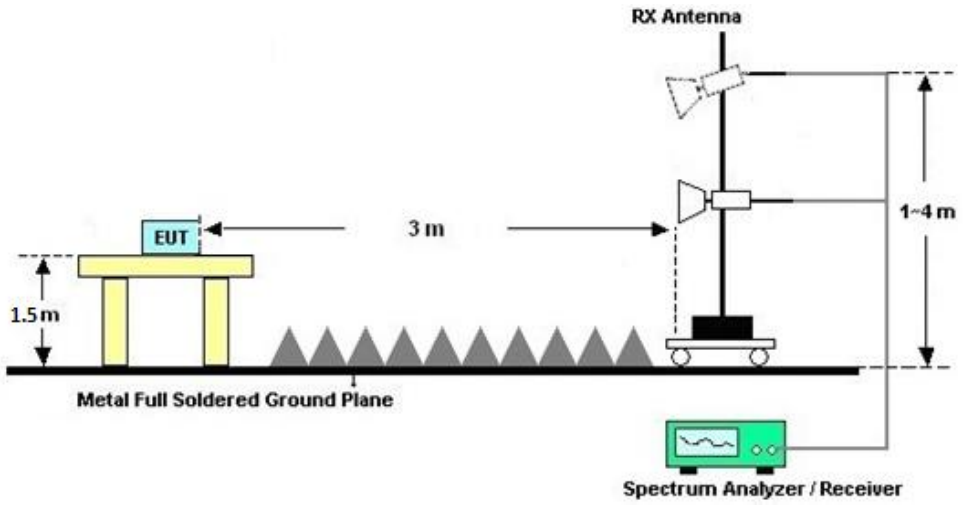
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
☒ For the UWB bandwidth shall be measured using one of the options below:	
	☒ Refer as ANSI C63.10, clause 6.9.3 and clause 10.1 for UWB bandwidth testing.

3.2.4 Test Setup

UWB Bandwidth - Test Distance: 3m



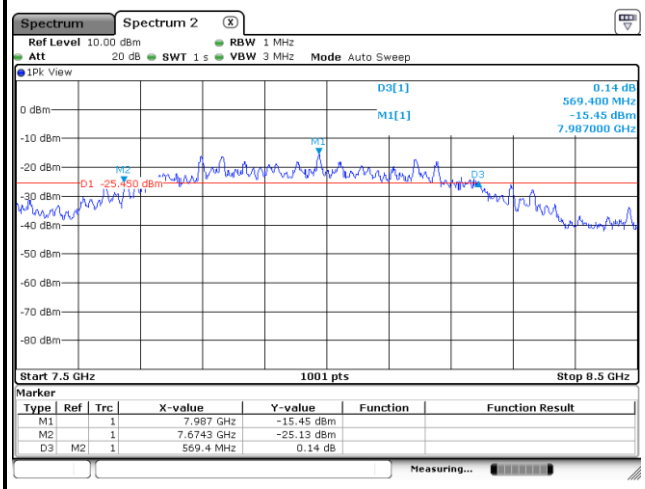
3.2.5 Test Result of UWB Bandwidth

Mode	ANT	Channel	preamble_cidx	rx_sts_mode	packet_length	Bandwidth(MHz)	Limit(MHz)	Result	Pol(H/V)
Mode 1	6	9	10	SP 0	4	569.4	≥500	Pass	H
Mode 2	6	9	10	SP 0	127	601.4	≥500	Pass	H
Mode 3	6	9	10	SP 1	4	567.4	≥500	Pass	H
Mode 4	6	9	10	SP 1	127	569.4	≥500	Pass	H
Mode 5	6	9	10	SP 3	0	571.4	≥500	Pass	H
Mode 6	6	9	27	SP 0	4095	540.5	≥500	Pass	H
Mode 7	6	9	27	SP 1	4095	540.5	≥500	Pass	H
Mode 8	6	9	27	SP 3	0	559.4	≥500	Pass	H

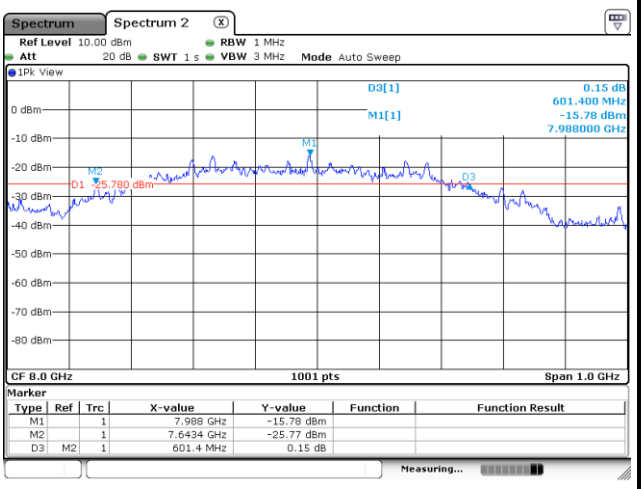
<Ant.6>

CH09 Bandwidth Plots

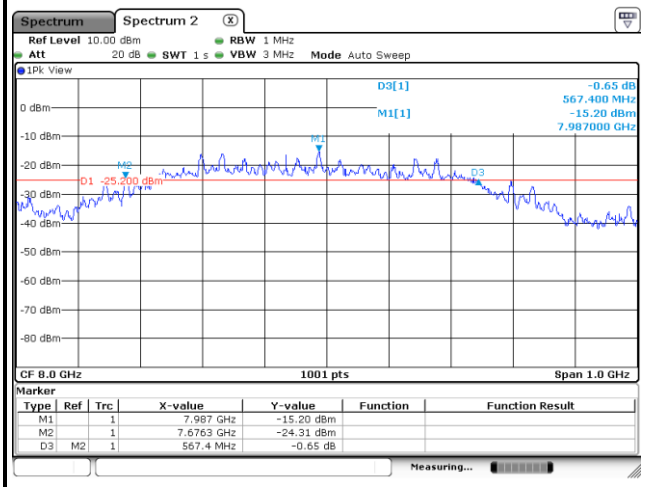
Mode 1: cidx-10_sts-0_packet length-4



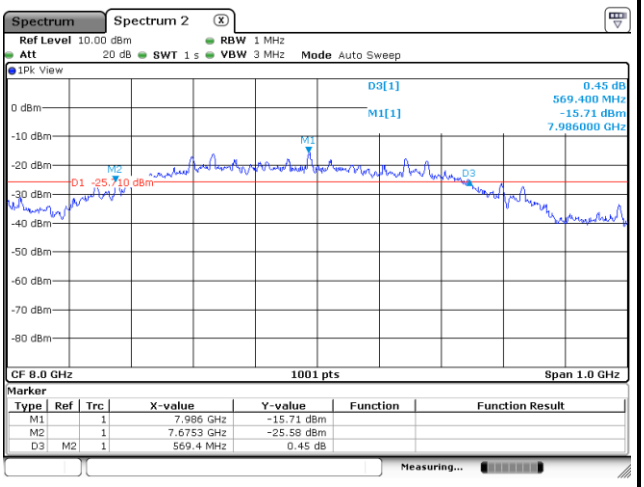
Mode 2: cidx-10_sts-0_packet length-127



Mode 3: cidx-10_sts-1_packet length-4

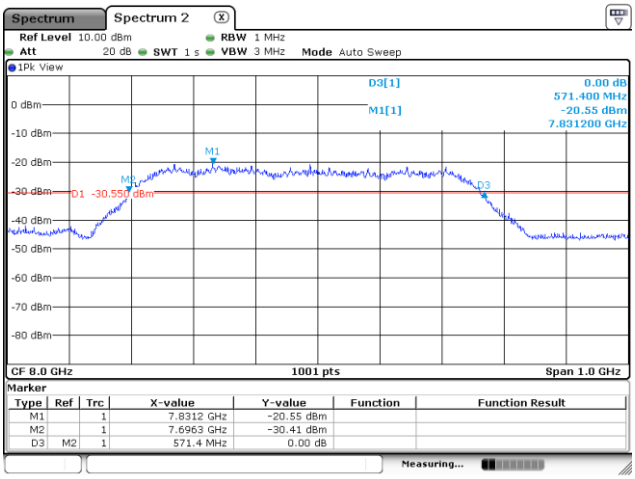


Mode 4: cidx-10_sts-1_packet length-127

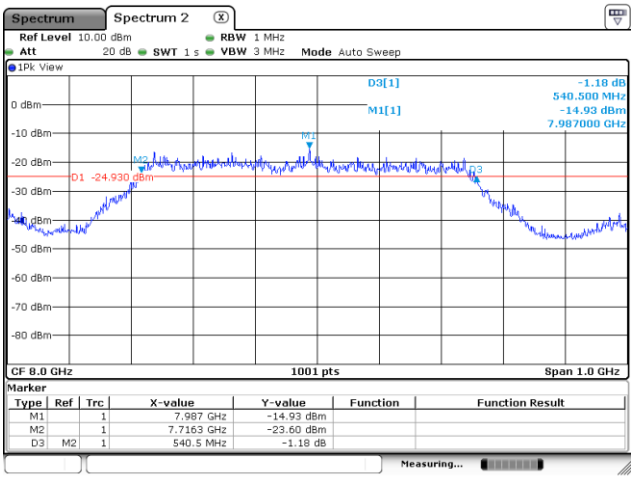


CH09 Bandwidth Plots

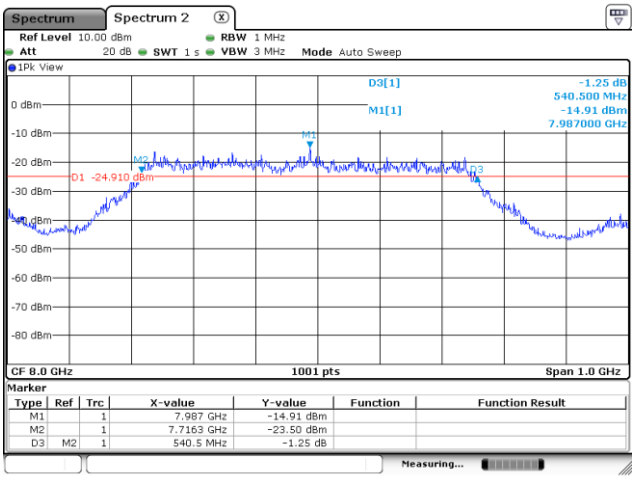
Mode 5: cidx-10_sts-3_packet length-0



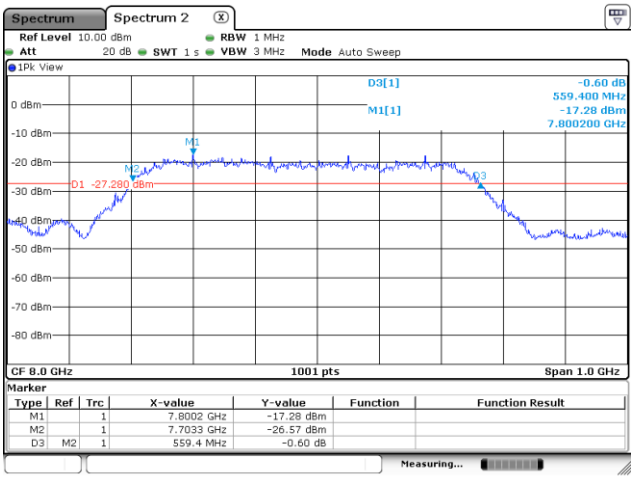
Mode 6: cidx-27_sts-0_packet length-4095



Mode 7: cidx-27_sts-1_packet length-4095



Mode 8: cidx-27_sts-3_packet length-0



3.3 Technical requirements for hand held UWB systems

3.3.1 Technical Requirements for transmission Limit

FCC 15.519(a) (1) A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

3.3.2 Measuring Instruments

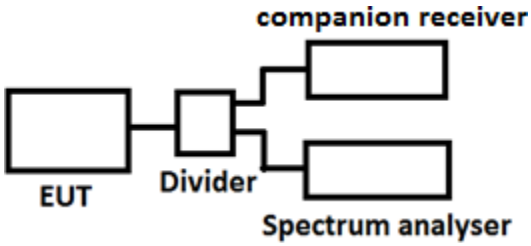
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedure

Follow the test step as below:

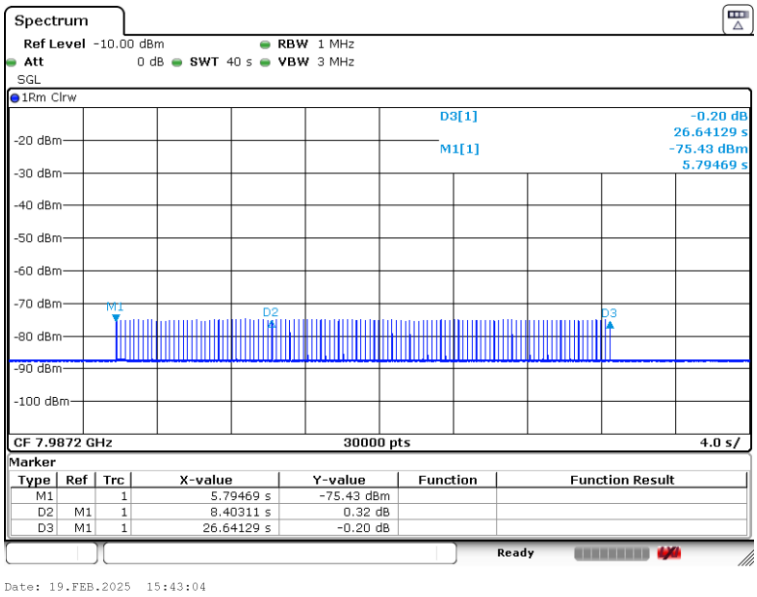
1. Turn on both EUT and companion receiver.
2. Set the EUT to TX mode, and EUT starts polling.
3. Set the companion receiver to associate EUT and EUT starts to transmit.
4. Disable the TX function of EUT.
5. Check if EUT stop transmitting once step 4 is made. (see plot 1 in clause 3.3.5)
6. Turn off both EUT and companion receiver.
7. Repeat step 1 to step 3.
8. Disable the RX function of the companion receiver to disassociate the EUT.
9. Check if EUT stop transmitting once step 8 is made. (see plot 2 in clause 3.3.5)

3.3.4 Test Setup



3.3.5 Test Result

CH09 Plot 1

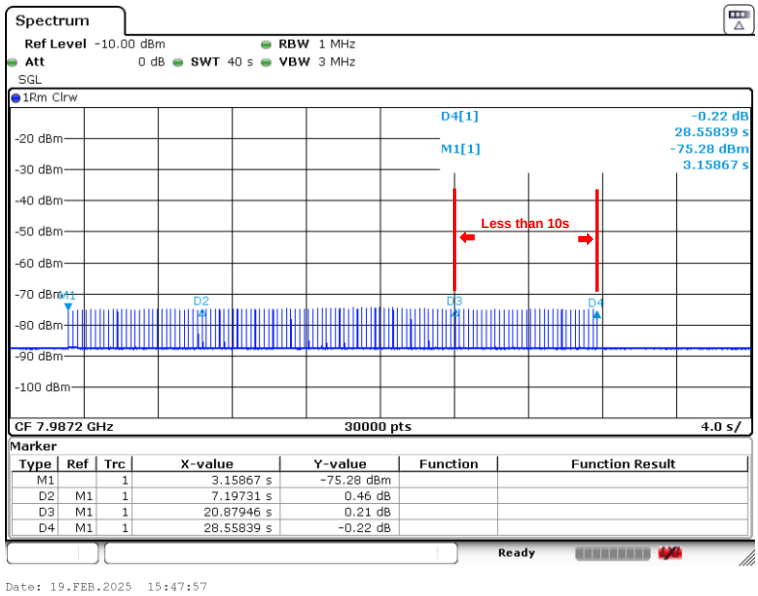


M1: Set the EUT to TX mode, and EUT starts polling.

D2: Set the companion receiver to associate EUT and EUT starts to transmit.

D3: Disable the TX function of EUT.

CH09 Plot 2



M1: Set the EUT to TX mode, and EUT starts polling.
D2: Set the companion receiver to associate EUT and EUT starts to transmit.
D3: RX function of the companion receiver is disabled. EUT disassociates the companion receiver and stops transmitting, but continues polling until D4 stop polling.

3.4 Peak Power Measurement

3.4.1 Peak Power Measurement Limit

Peak Power Measurement Limit
P_{eirp} = 0 dBm/50MHz

3.4.2 Measuring Instruments

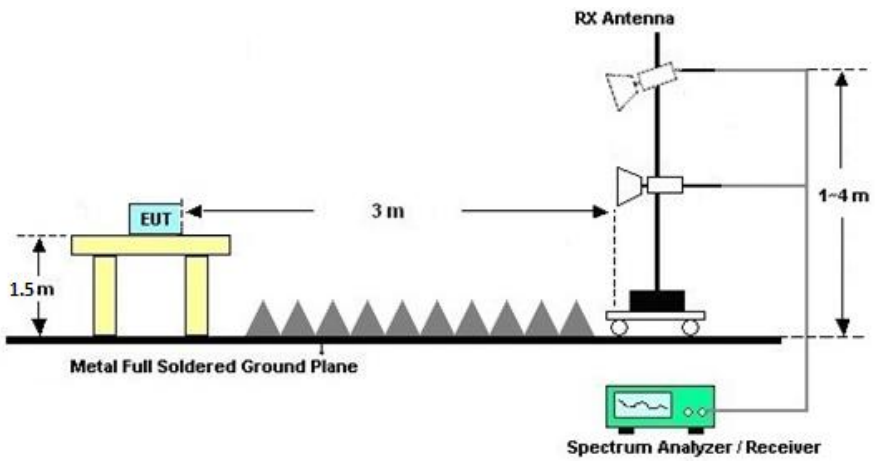
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method		
☒	Peak Power Measurement	
	☒	Refer as ANSI C63.10, clause 10.3.1 for radiated measurement procedure testing.
	☒	Refer as ANSI C63.10, clause 10.3.2 for measurement distance is 3m
	☒	Refer as ANSI C63.10, clause 10.3.5 for peak detector procedure testing
	☒	Refer as ANSI C63.10, clause 10.3.6 for bandwidth conversion of peak power
☒ Frequency of max peak power is pre-located: The span bandwidth is continuously reduced to find the worst frequency. Once the worst frequency is found, the setting of spectrum analyzer is set as below: • Central frequency: Worst frequency point • Span: Zero span • RBW: 40MHz • VBW: 40MHz • Detector: Peak detector • Trace: Max hold		

3.4.4 Test Setup

Peak Power Measurement

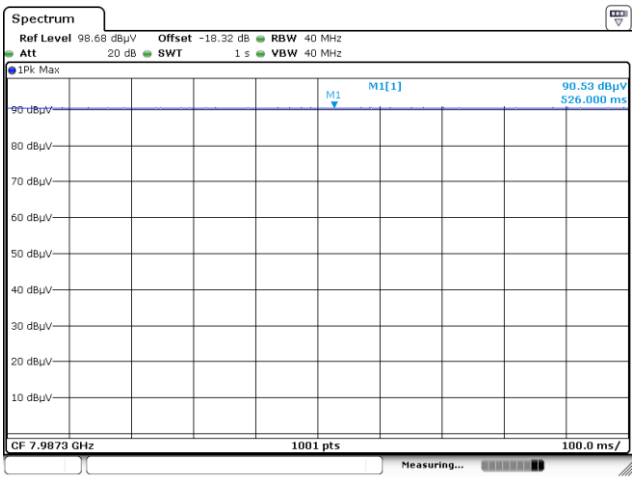
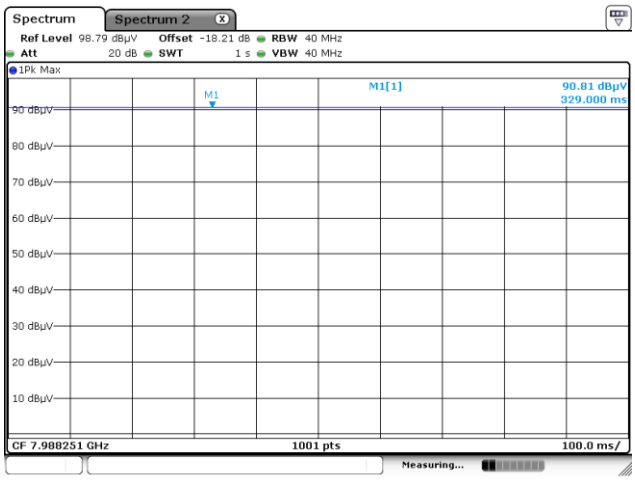
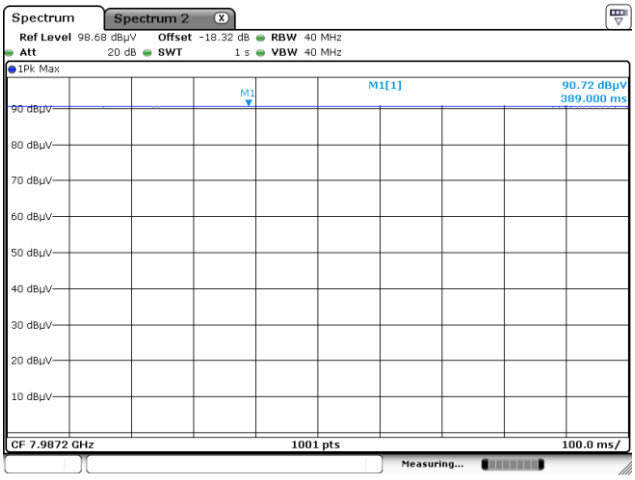
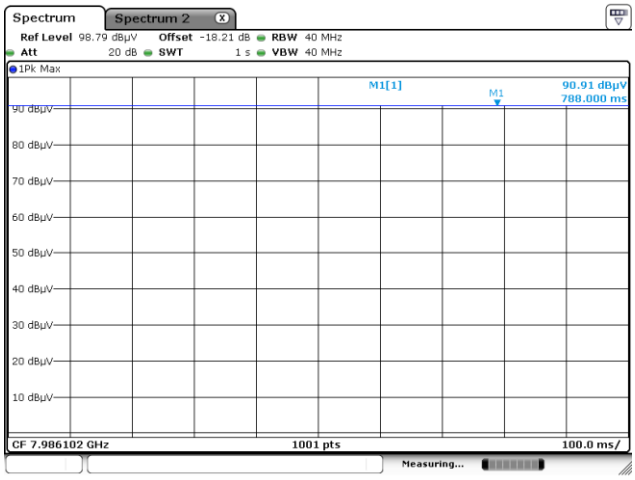


3.4.5 Test Result of Peak Power Measurement

Peak Measurement Result									
Mode	Ant	Freq. (MHz)	E-Field (dBuV/m)	$ERIP_{40MHz}$ (dBm)	$ERIP_{50MHz}$ Limit(dBm)	$EIRP_{40MHz}$ Limit (dBm)	Margin [dB]	Result	Pol [H/V]
1	6	7987.3	90.53	-4.67	0	-1.94	-2.73	Pass	H
2	6	7988.251	90.81	-4.39	0	-1.94	-2.45	Pass	H
3	6	7987.2	90.72	-4.48	0	-1.94	-2.54	Pass	H
4	6	7986.102	90.91	-4.29	0	-1.94	-2.35	Pass	H
5	6	7987	81.54	-13.66	0	-1.94	-11.72	Pass	H
6	6	7987.2	87.47	-7.73	0	-1.94	-5.79	Pass	H
7	6	7987.151	87.41	-7.79	0	-1.94	-5.85	Pass	H
8	6	7987	83.92	-11.28	0	-1.94	-9.34	Pass	H

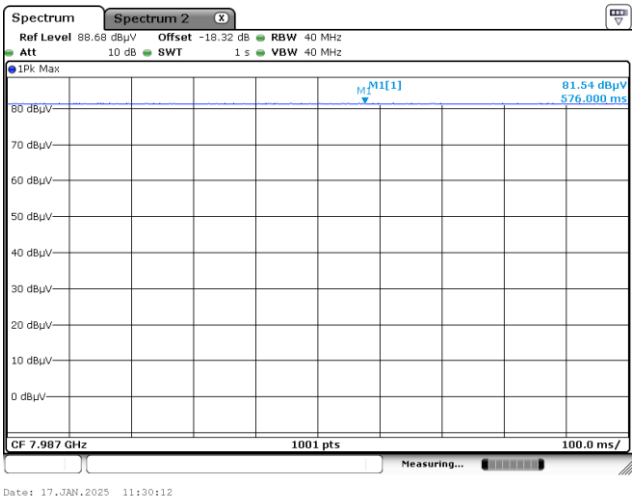
Note 1: EIRP [dBm] = E-Field [dBuV/m] - 95.2;
Note 2: Bandwidth Correction Factor (BWCF) = 20 log (40MHz/50MHz).
Note 3: $EIRP_{40MHz}$ Limit = $EIRP_{50MHz}$ Limit + BWCF, FCC Part 15.521(g).
Note 4: Measurement worst emissions of receive antenna polarization.

<Ant.6>

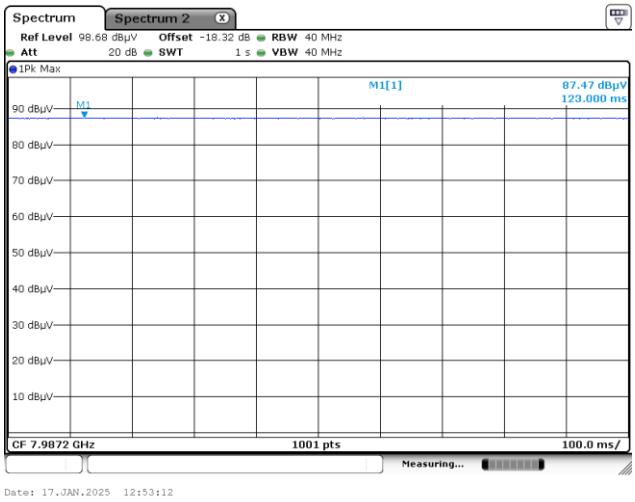
CH09 Peak Power Measurement Plots	
Mode 1: cidx-10_sts-0_packet length-4	**Mode 2: cidx-10_sts-0_packet length-127**
	
Mode 3: cidx-10_sts-1_packet length-4	**Mode 4: cidx-10_sts-1_packet length-127**
	

CH09 Peak Power Measurement Plots

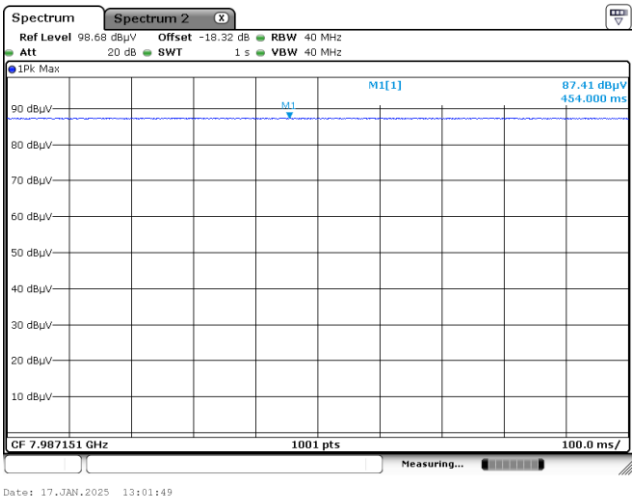
Mode 5: cidx-10_sts-3_packet length-0



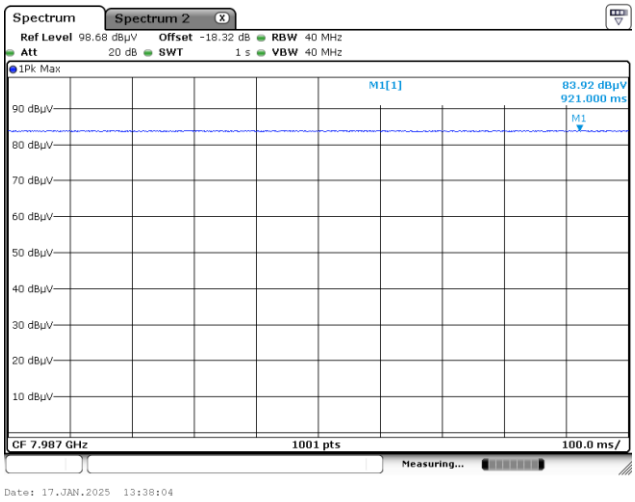
Mode 6: cidx-27_sts-0_packet length-4095



Mode 7: cidx-27_sts-1_packet length-4095



Mode 8: cidx-27_sts-3_packet length-0



3.5 Radiated Emissions

3.5.1 Radiated Emissions Limit

Radiated Emissions below 960MHz and Emissions from Digital Circuitry 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.

Radiated Emissions above 960MHz Limit		
Frequency Range (MHz)	**EIRP (dBm)**	**EIRP (dBuV/m @3m)**
960-1610	−75.3	19.9
1610-1990	−63.3	31.9
1990-3100	−61.3	33.9
3100-10600	−41.3	53.9
Above 10600	−61.3	33.9

Radiated Emissions in GPS Bands Limit		
Frequency Range (MHz)	**EIRP (dBm)**	**EIRP (dBuV/m @3m)**
1164-1240	-85.3	9.90
1559-1610	-85.3	9.90

Note: E (dBuv/m) = EIRP (dBm) + 95.20, example, E(dBuV/m) = -85.3 + 95.20 = 9.90 dBuV/m.

3.5.2 Measuring Instruments

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

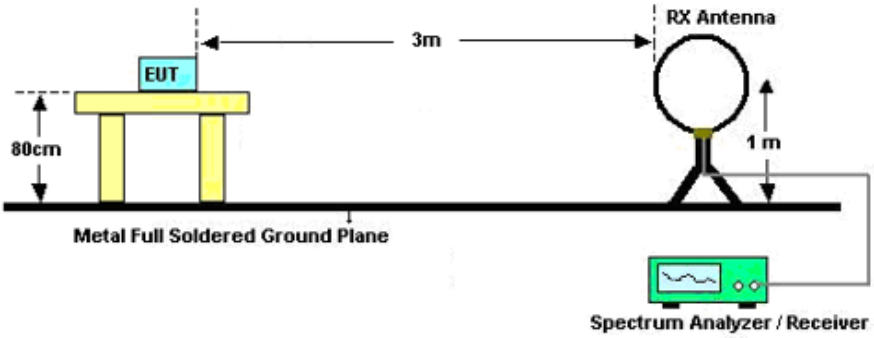
3.5.3 Test Procedures

Test Method for Radiated Emissions above 960MHz		
☒	Radiated Emissions above 960MHz	
	☒	Refer as ANSI C63.10, clause 10.3.1 for radiated measurement procedure testing.
	☒	Refer as ANSI C63.10, clause 10.3.2 for measurement distance is 3m. In some cases, it may be necessary to measure the radiated UWB emissions at a closer distance to obtain enough signal and margin to overcome the measurement system noise floor. Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)
	☒	Refer as ANSI C63.10, clause 10.3.4 for rms detector procedure testing.
	☒	Refer as ANSI C63.10, clause 10.3.7 for evaluating AVG-PSD (RBW=1MHz).
	☒	Refer as ANSI C63.10, clause 10.3.10 for evaluating AVG-PSD in GPS Band (RBW≥1kHz).
☒	For radiated measurement.	
	☒	Refer as ANSI C63.10, clause 10.3.8 following eirp can be used radiated test configuration.
	☒	Refer as ANSI C63.10, clause 10.3.9 following eirp can be directly determined using the field strength.

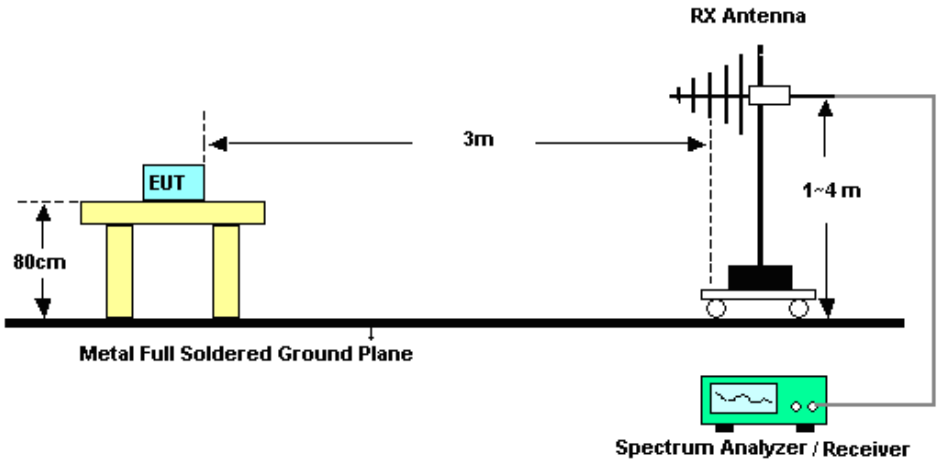
Test Method for Radiated Emissions below 960MHz and Emissions from Digital Circuitry		
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing 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) for above 30MHz-960MHz; 40dB/decade for frequency below 30MHz.	
☒	For the transmitter unwanted emissions shall be measured using following options below:	
	☒	Refer as ANSI C63.10, clause 4.1.4 Detector functions and selection of bandwidth
	☐	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 20log (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 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 0.5m or 1m or 3m.
	☒	If the noise floor can’t meet the limit, the test distance will be shorten and described in the report.
☒	Any unwanted emissions level shall not exceed the fundamental emission level.	

3.5.4 Test Setup

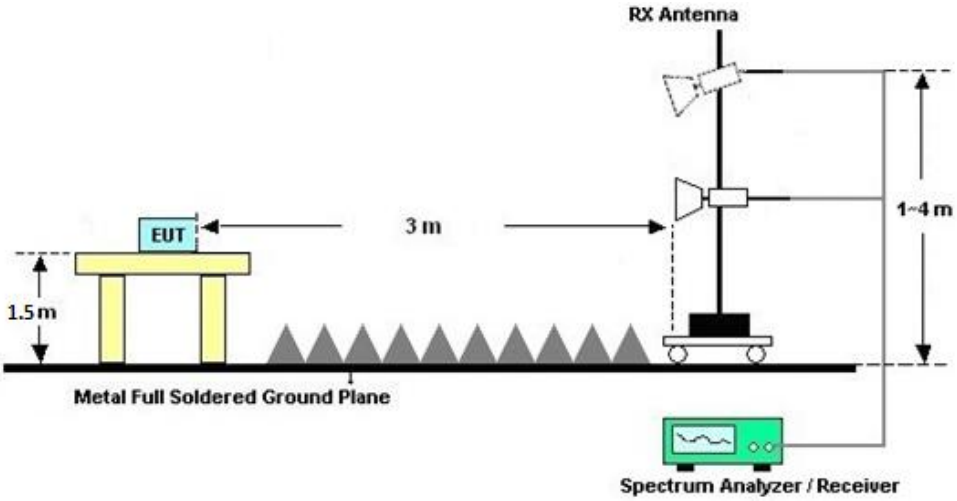
Radiated Emissions below 30MHz



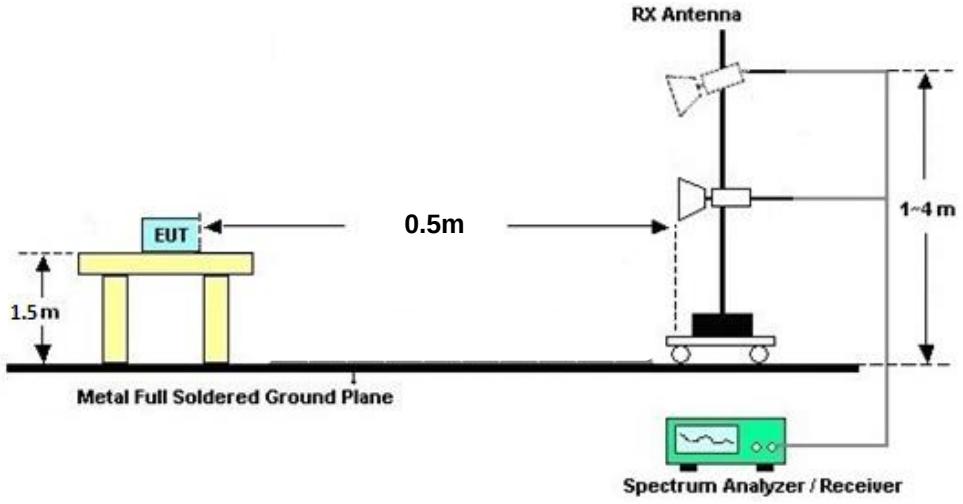
Radiated Emissions from 30MHz to 1GHz and Emissions from Digital Circuitry



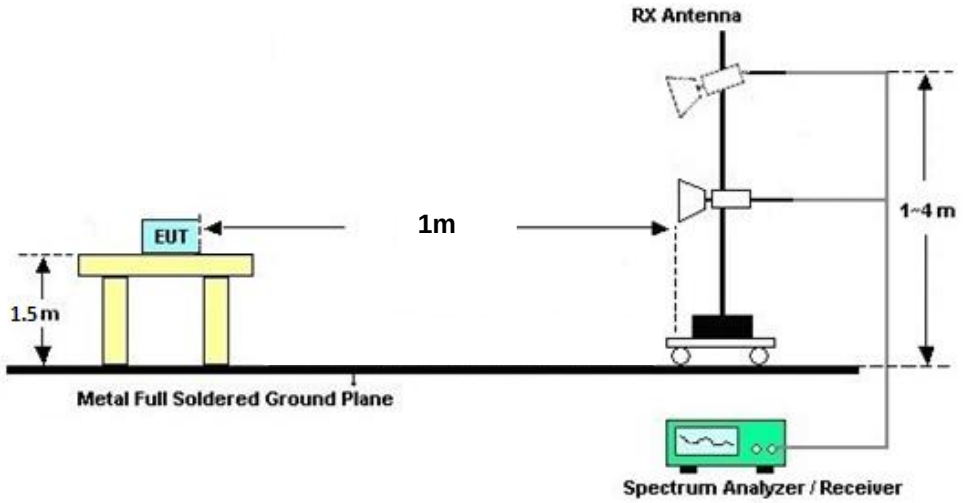
Radiated Emissions from 3.20 GHz to 10.60 GHz



Radiated Emissions from 0.96GHz to 1.164 GHz, 1.24GHz to 1.559 GHz and 10.60 GHz to 18GHz



Radiated Emissions 1.164 GHz to 1.24GHz, 1.559 GHz to 1.61GHz, 1.61 GHz to 3.2GHz and above 18GHz



Note 1: Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn antenna.
Note 2: If test distance other than 3m is used, the used test distance will be recorded in test result.

3.5.5 Radiated 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.
There is adequate comparison measurement of both open-field test site and alternative test site -semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.5.6 Radiated Emissions (Fundamental)

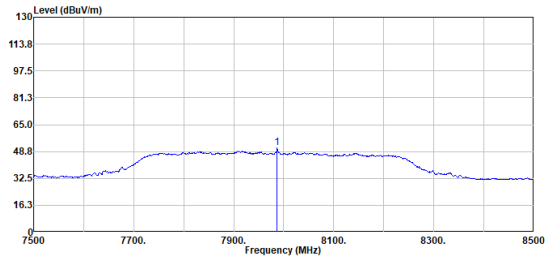
Test mode	Ant	Frequency (MHz)	Emission Level (dBuV/m)	Emission Limit (dBm/MHz)	Emission Limit (dBuV/m)	Margin (dB)	Result	Pol (H/V)
1	6	7987	51.11	-41.3	53.9	-2.79	Pass	V
2	6	7857	53.02	-41.3	53.9	-0.88	Pass	V
3	6	7987	52.16	-41.3	53.9	-1.74	Pass	V
4	6	7849	53.72	-41.3	53.9	-0.18	Pass	V
5	6	7987	51.4	-41.3	53.9	-2.5	Pass	V
6	6	7987	52.19	-41.3	53.9	-1.71	Pass	V
7	6	7987	52.23	-41.3	53.9	-1.67	Pass	V
8	6	7987	52.25	-41.3	53.9	-1.65	Pass	V

Note: E (dBuv/m) Limit= EIRP (dBm) Lmit + 95.2 = -41.3 + 95.2 = 53.9 dBuV/m.

<Ant.6>

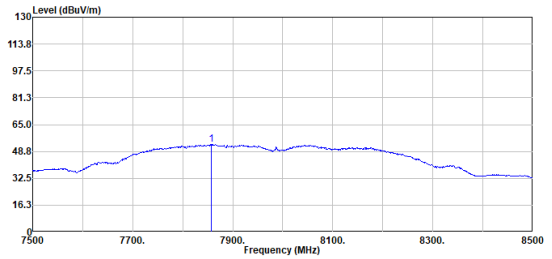
CH09 Radiated Emissions (Fundamental)			
Operating Function	Standalone mode	**Polarization**	V
		Test Distance	3m

Mode 1: cidx-10_sts-0_packet length-4



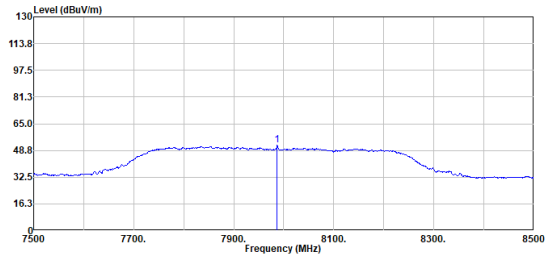
	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	7987.00	51.11	------	------	69.43	35.83	12.41	66.56	0.00	261	184	Average	Vertical

Mode 2: cidx-10_sts-0_packet length-127



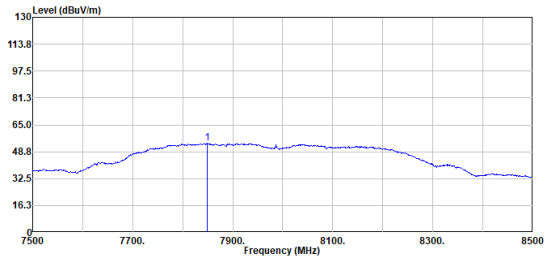
	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	7857.00	53.02	------	------	71.23	35.90	12.23	66.34	0.00	273	185	Average	Vertical

Mode 3: cidx-10_sts-1_packet length-4



	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	7987.00	52.16	------	------	70.48	35.83	12.41	66.56	0.00	254	176	Average	Vertical

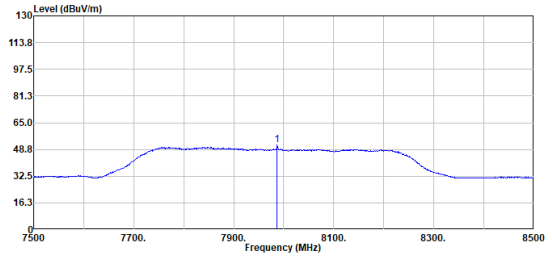
Mode 4: cidx-10_sts-1_packet length-127



	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	7849.00	53.72	------	------	71.93	35.90	12.22	66.33	0.00	254	176	Average	Vertical

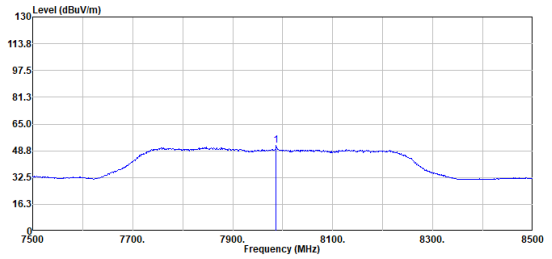
CH09 Radiated Emissions (Fundamental)			
Operating Function	Standalone mode	**Polarization**	V
		Test Distance	3m

Mode 5: cidx-10_sts-3_packet length-0



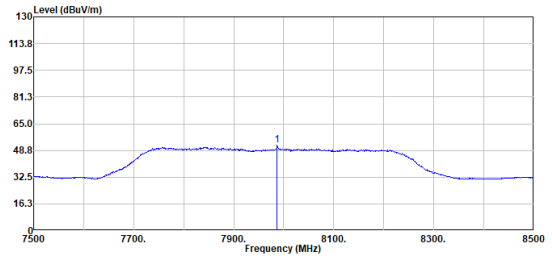
	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	7987.00	51.40	------	------	69.72	35.83	12.41	66.56	0.00	264	181	Average	Vertical

Mode 6: cidx-27_sts-0_packet length-4095



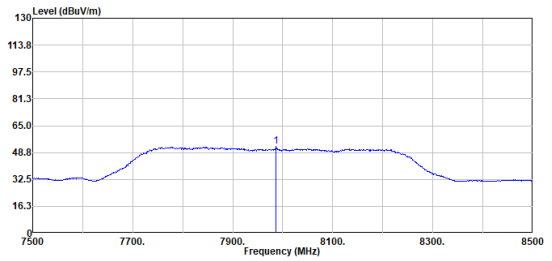
	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	7987.00	52.19	------	------	70.51	35.83	12.41	66.56	0.00	264	181	Average	Vertical

Mode 7: cidx-27_sts-1_packet length-4095



	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	7987.00	52.23	------	------	70.55	35.83	12.41	66.56	0.00	264	181	Average	Vertical

Mode 8: cidx-27_sts-3_packet length-0

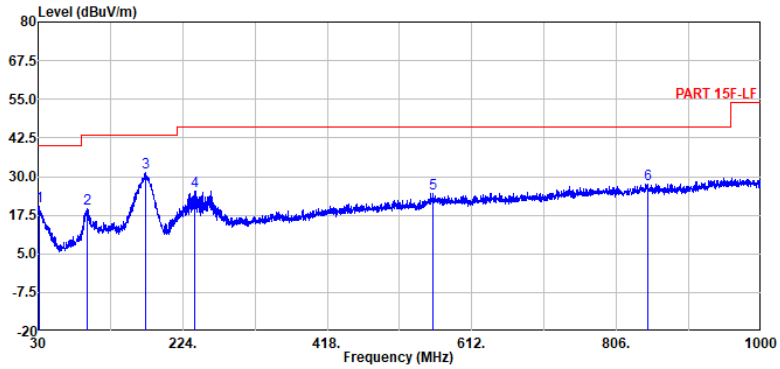


	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	7987.00	52.25	------	------	70.57	35.83	12.41	66.56	0.00	264	181	Average	Vertical

3.5.7 Radiated Emissions (30MHz – 1GHz)

<Ant. 6>

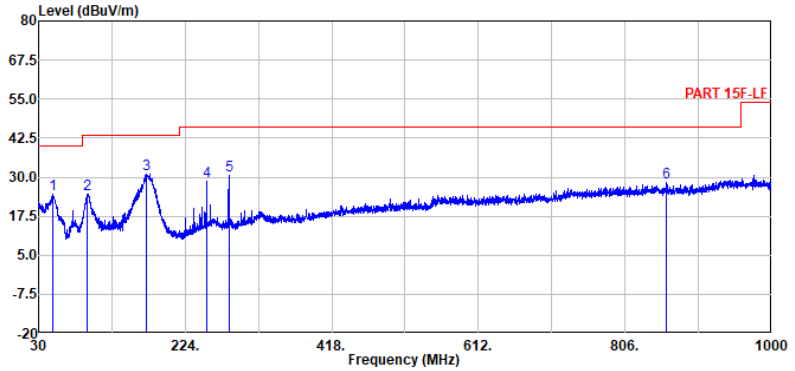
CH09 Radiated Emissions (30MHz – 1GHz)			
Test Mode	Mode 4: cidx-10_sts-1_packet length-127	**Polarization**	H
Operating Function	Standalone mode	**Test Distance**	3m



	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	31.21	20.33	40.00	-19.67	28.27	24.50	0.36	32.80	0.00	---	---	Peak	Horizontal
2	95.72	19.53	43.50	-23.97	35.63	15.57	1.00	32.67	0.00	---	---	Peak	Horizontal
3	173.56	31.41	43.50	-12.09	47.30	15.46	1.38	32.73	0.00	---	---	Peak	Horizontal
4	240.73	25.40	46.00	-20.60	39.24	17.37	1.65	32.86	0.00	---	---	Peak	Horizontal
5	559.86	24.39	46.00	-21.61	28.87	26.31	2.45	33.24	0.00	---	---	Peak	Horizontal
6	847.71	27.62	46.00	-18.38	28.08	29.11	3.03	32.60	0.00	---	---	Peak	Horizontal

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Peak emission setting: RBW=120kHz; VBW = 300kHz.

CH09 Radiated Emissions (30MHz – 1GHz)			
Test Mode	Mode 4: cidx-10_sts-1_packet length-127	**Polarization**	V
Operating Function	Standalone mode	**Test Distance**	3m



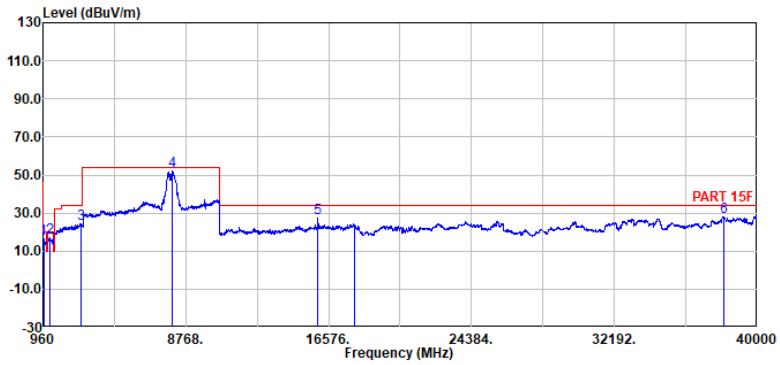
	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	48.92	24.42	40.00	-15.58	41.68	14.89	0.60	32.75	0.00	---	---	Peak	Vertical
2	94.99	24.50	43.50	-19.00	40.69	15.48	1.00	32.67	0.00	---	---	Peak	Vertical
3	173.32	30.94	43.50	-12.56	46.81	15.48	1.38	32.73	0.00	---	---	Peak	Vertical
4	252.37	28.65	46.00	-17.35	41.05	18.83	1.66	32.89	0.00	---	---	Peak	Vertical
5	281.72	30.54	46.00	-15.46	42.84	18.79	1.76	32.85	0.00	---	---	Peak	Vertical
6	861.29	28.12	46.00	-17.88	28.76	28.83	3.05	32.52	0.00	---	---	Peak	Vertical

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Peak emission setting: RBW=120kHz; VBW = 300kHz.

3.5.8 Radiated Emissions (960MHz – 40GHz)

<Ant.6>

CH09 Radiated Emissions (960MHz – 40GHz)			
Test Mode	Mode 4: cidx-10_sts-1_packet length-127	**Polarization**	H
Operating Function	Standalone mode		
Test Distance	960 ~1164 MHz: 0.5m 1164 ~ 1240 MHz: 1m 1240 ~ 1559 MHz: 0.5m 1559 ~ 1610 MHz: 1m 1610 ~ 3200 MHz: 1m 3200 ~ 10600 MHz: 3m 10600 ~ 18000 MHz: 0.5m 18000 ~ 40000 MHz: 1m		

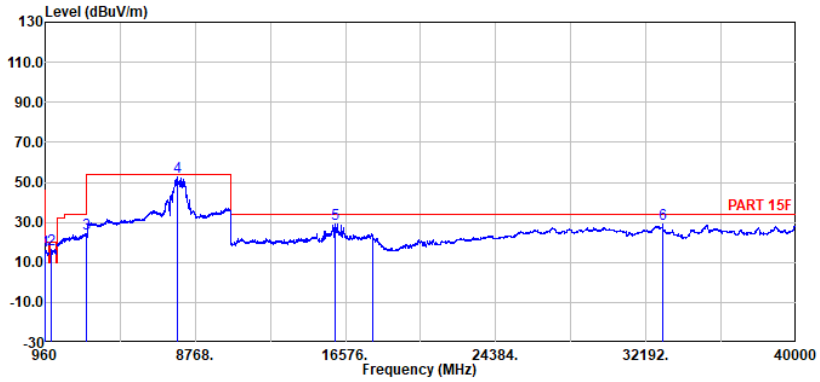


	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	993.25	16.41	19.90	-3.49	63.55	29.00	4.26	64.84	-15.56	---	---	Average	Horizontal
2	1369.20	17.13	19.90	-2.77	63.96	28.76	4.97	65.00	-15.56	---	---	Average	Horizontal
3	3044.18	24.45	33.90	-9.45	58.71	32.92	7.42	65.06	-9.54	---	---	Average	Horizontal
4	8039.60	51.97	53.90	-1.93	70.33	35.80	12.44	66.60	0.00	---	---	Average	Horizontal
5	15972.40	27.65	33.90	-6.25	48.87	41.04	17.74	64.44	-15.56	---	---	Average	Horizontal
6	38174.00	28.19	33.90	-5.71	18.88	40.34	33.65	55.14	-9.54	---	---	Average	Horizontal

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Average emission setting outside GPS Bands: RBW=1MHz; VBW=3MHz.
Note 5: Average emission setting in GPS bands: RBW=1kHz; VBW=3kHz.
Note 6:

- Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)
  Example: Distance extrapolation factor = 20log (0.5m/3m) = -15.56 (dB)
- Corrected Reading: Antenna Factor (dB/m) + Cable Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) + Distance Factor (Aux Factor) (dB) = Level (dBuV/m)

CH09 Radiated Emissions (960MHz – 40GHz)			
Test Mode	Mode 4: cidx-10_sts-1_packet length-127	**Polarization**	V
Operating Function	Standalone mode		
Test Distance	960 ~1164 MHz: 0.5m 1164 ~ 1240 MHz: 1m 1240 ~ 1559 MHz: 0.5m 1559 ~ 1610 MHz: 1m 1610 ~ 3200 MHz: 1m 3200 ~ 10600 MHz: 3m 10600 ~ 18000 MHz: 0.5m 18000 ~ 40000 MHz: 1m		



	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	975.50	16.18	19.90	-3.72	63.10	29.00	4.25	64.61	-15.56	---	---	Average	Vertical
2	1275.73	16.67	19.90	-3.23	63.68	28.55	4.79	64.79	-15.56	---	---	Average	Vertical
3	3106.19	24.36	53.90	-29.54	58.75	32.80	7.53	65.18	-9.54	---	---	Average	Vertical
4	7832.40	52.72	53.90	-1.18	70.93	35.90	12.19	66.30	0.00	---	---	Average	Vertical
5	16016.80	29.22	33.90	-4.68	50.40	41.07	17.76	64.45	-15.56	---	---	Average	Vertical
6	33070.00	29.09	33.90	-4.81	25.67	37.29	30.59	54.92	-9.54	---	---	Average	Vertical

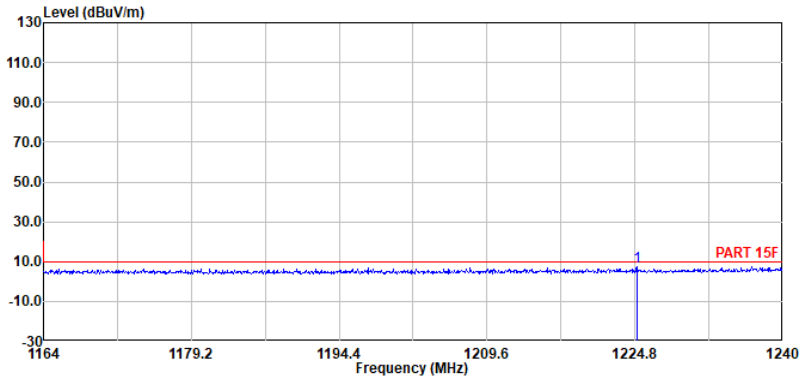
Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Average emission setting outside GPS Bands: RBW=1MHz; VBW=3MHz.
Note 5: Average emission setting in GPS bands: RBW=1kHz; VBW=3kHz.
Note 6:

- Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)
  Example: Distance extrapolation factor = 20log (0.5m/3m) = -15.56 (dB)
- Corrected Reading: Antenna Factor (dB/m) + Cable Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) + Distance Factor (Aux Factor) (dB) = Level (dBuV/m)

3.5.9 Radiated Emissions (1164MHz – 1240MHz)

<Ant.6>

CH09 Radiated Emissions (1164MHz – 1240MHz)			
Test Mode	Mode 4: cidx-10_sts-1_packet length-127	**Polarization**	H
Operating Function	Standalone mode	**Test Distance**	1m

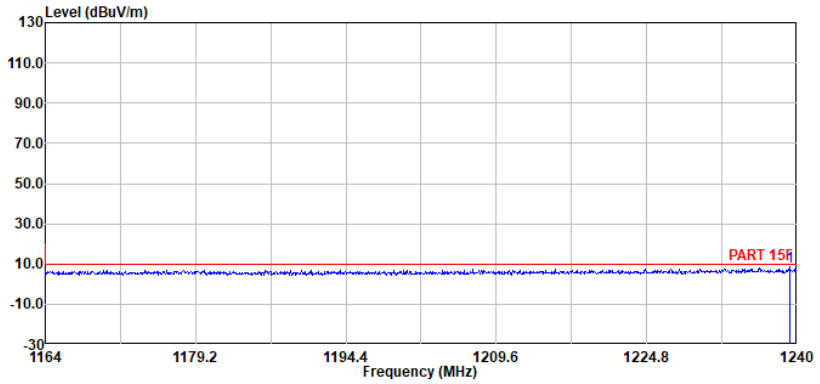


	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	1225.03	7.56	9.90	-2.34	47.74	28.05	4.80	63.49	-9.54	---	---	Average	Horizontal

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Average emission setting: RBW=1kHz; VBW=3kHz.
Note 5:

- Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)
  Example: Distance extrapolation factor = 20log (1m/3m) = -9.54 (dB)
- Corrected Reading: Antenna Factor (dB/m) + Cable Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) + Distance Factor (Aux Factor) (dB) = Level (dBuV/m)

CH09 Radiated Emissions (1164MHz – 1240MHz)			
Test Mode	Mode 4: cidx-10_sts-1_packet length-127	**Polarization**	V
Operating Function	Standalone mode	**Test Distance**	1m



	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	1239.24	8.35	9.90	-1.55	48.24	28.31	4.83	63.49	-9.54	---	---	Average	Vertical

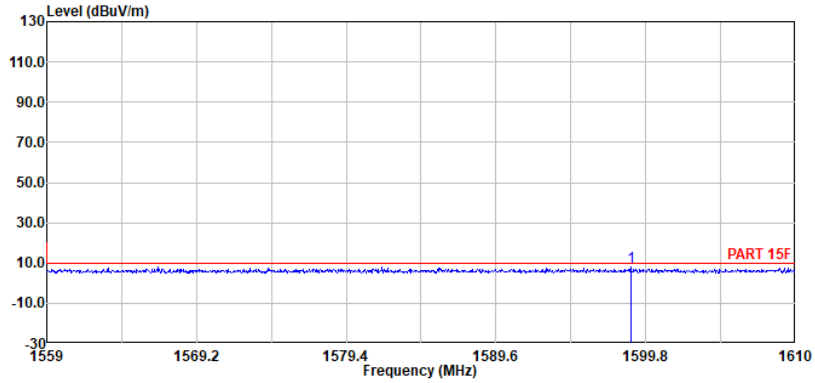
Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Average emission setting: RBW=1kHz; VBW=3kHz.
Note 5:

- Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)
  Example: Distance extrapolation factor = 20log (1m/3m) = -9.54 (dB)
- Corrected Reading: Antenna Factor (dB/m) + Cable Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) + Distance Factor (Aux Factor) (dB) = Level (dBuV/m)

3.5.10 Radiated Emissions (1559MHz – 1610MHz)

<Ant.6>

CH09 Radiated Emissions (1559MHz – 1610MHz)			
Test Mode	Mode 4: cidx-10_sts-1_packet length-127	**Polarization**	H
Operating Function	Standalone mode	**Test Distance**	1m

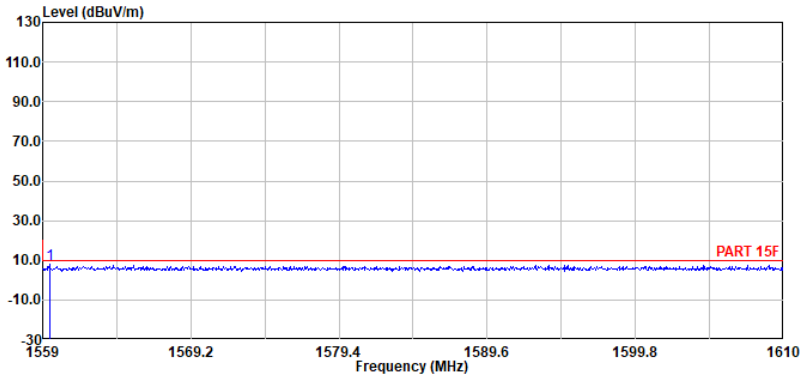


	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	1598.78	7.94	9.90	-1.96	47.01	28.60	5.49	63.62	-9.54	---	---	Average	Horizontal

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Average emission setting: RBW=1kHz; VBW=3kHz.
Note 5:

- Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)
  Example: Distance extrapolation factor = 20log (1m/3m) = -9.54 (dB)
- Corrected Reading: Antenna Factor (dB/m) + Cable Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) + Distance Factor (Aux Factor) (dB) = Level (dBuV/m)

CH09 Radiated Emissions (1559MHz – 1610MHz)			
Test Mode	Mode 4: cidx-10_sts-1_packet length-127	**Polarization**	V
Operating Function	Standalone mode	**Test Distance**	1m



	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg		
1	1559.46	7.89	9.90	-2.01	47.18	28.44	5.42	63.61	-9.54	---	---	Average	Vertical

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Average emission setting: RBW=1kHz; VBW=3kHz.
Note 5:

- Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)
  Example: Distance extrapolation factor = 20log (1m/3m) = -9.54 (dB)
- Corrected Reading: Antenna Factor (dB/m) + Cable Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) + Distance Factor (Aux Factor) (dB) = Level (dBuV/m)

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Keysight	N9038A	MY56400023	3Hz~8.5GHz;Max 30dBm	Jan. 02, 2025	Jan. 15, 2025~ Feb. 19, 2025	Jan. 01, 2026	Radiation (03CH06-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471084	10Hz-44GHz	Jul. 04, 2024	Jan. 15, 2025~ Feb. 19, 2025	Jul. 03, 2025	Radiation (03CH06-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 08, 2024	Jan. 15, 2025~ Feb. 19, 2025	Sep. 07, 2025	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Sep. 03, 2024	Jan. 15, 2025~ Feb. 19, 2025	Sep. 02, 2025	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 11, 2024	Jan. 15, 2025~ Feb. 19, 2025	Apr. 10, 2025	Radiation (03CH06-KS)
SHF-EHF Horn	Com-power	AH-840	101116	18GHz~40GHz	Oct. 22, 2024	Jan. 15, 2025~ Feb. 19, 2025	Oct. 21, 2025	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	380827	9KHz ~1GHZ	Jul. 04, 2024	Jan. 15, 2025~ Feb. 19, 2025	Jul. 03, 2025	Radiation (03CH06-KS)
Amplifier	EM	EM18G40GA	060728	18~40GHz	Jan. 03, 2025	Jan. 15, 2025~ Feb. 19, 2025	Jan. 02, 2026	Radiation (03CH06-KS)
high gain Amplifier	EM	EM01G18GA	060845	1Ghz-18Ghz	Jan. 03, 2025	Jan. 15, 2025~ Feb. 19, 2025	Jan. 02, 2026	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY57280119	500MHz~26.5GHz	Oct. 09, 2024	Jan. 15, 2025~ Feb. 19, 2025	Oct. 08, 2025	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jan. 15, 2025~ Feb. 19, 2025	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jan. 15, 2025~ Feb. 19, 2025	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jan. 15, 2025~ Feb. 19, 2025	NCR	Radiation (03CH06-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Feb. 05, 2025	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Aug. 20, 2024	Feb. 05, 2025	Aug. 19, 2025	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Feb. 05, 2025	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 09, 2024	Feb. 05, 2025	Oct. 08, 2025	Conduction (CO01-KS)

NCR: No Calibration Required.

5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.84dB**

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.3 dB**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.06 dB**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.18 dB**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.38 dB**

---------- THE END ----------