Testing Laboratory 3787

RADIO TEST REPORT

FCC ID	:	2AAAS-CM11
Equipment	:	Vivint outdoor camera Pro (Gen 3)
Brand Name	:	Vivint
Model Name	:	VS-ODC400-WHT
Applicant	:	Vivint, Inc. 3401 N Ashton Blvd., Lehi, UT, 84043 United States
Manufacturer	:	WNC Corporation 20 Park Avenue II,Hsinchu Science Park Hsinchu 300, Taiwan
Standard	:	47 CFR FCC Part 15.255

The product was received on Jun. 02, 2025, and testing was started from Jun. 06, 2025 and completed on Jun. 17, 2025. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2020 47 CFR FCC Part 15.255 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. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR551936	01	Initial issue of report	Jul. 09, 2025

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.207	AC Power Conducted Emissions	PASS	-
3.2	15.255(e)	Occupied Bandwidth	PASS	-
3.3	15.255(c)(2)(i)	EIRP Power	PASS	-
3.4	15.255(d)	Transmitter Spurious Emissions	PASS	-
3.5	15.255(f)	Frequency Stability	PASS	-
3.6	15.255(a),(h)	Operation Restriction and Group Installation	PASS	-

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 chapter "Measurement Uncertainty".

Disclaimer:

1. 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.
2. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.

Reviewed by: Sam Chen

Report Producer: Sandy Chuang

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information			
Frequency Range (GHz)	**Operating Frequency Range (GHz)**	**Test Frequency (GHz)**	**Modulation**
57-71 GHz	57.75~58.675	58.188	FMCW

1.1.2 Antenna Information

Ant.	**Brand**	**Model Name**	**Antenna Type**	**Connector**	**Gain (dBi)**		**TX/RX Function**
					TX1	**TX2**	
1	WNC	UMD-RV01x	Combline antenna	N/A	7.90	7.60	2TX/3RX

Note: The above information was declared by manufacturer.

1.1.3 Power Levels

Worst Power Levels		
Applicable power levels	☐ Conducted ☒ EIRP	
Frequency (GHz)	Highest (P_{high}):	
	Mode	Peak Power (dBm)
58.188	FMCW	18.79

1.1.4 Operating Conditions

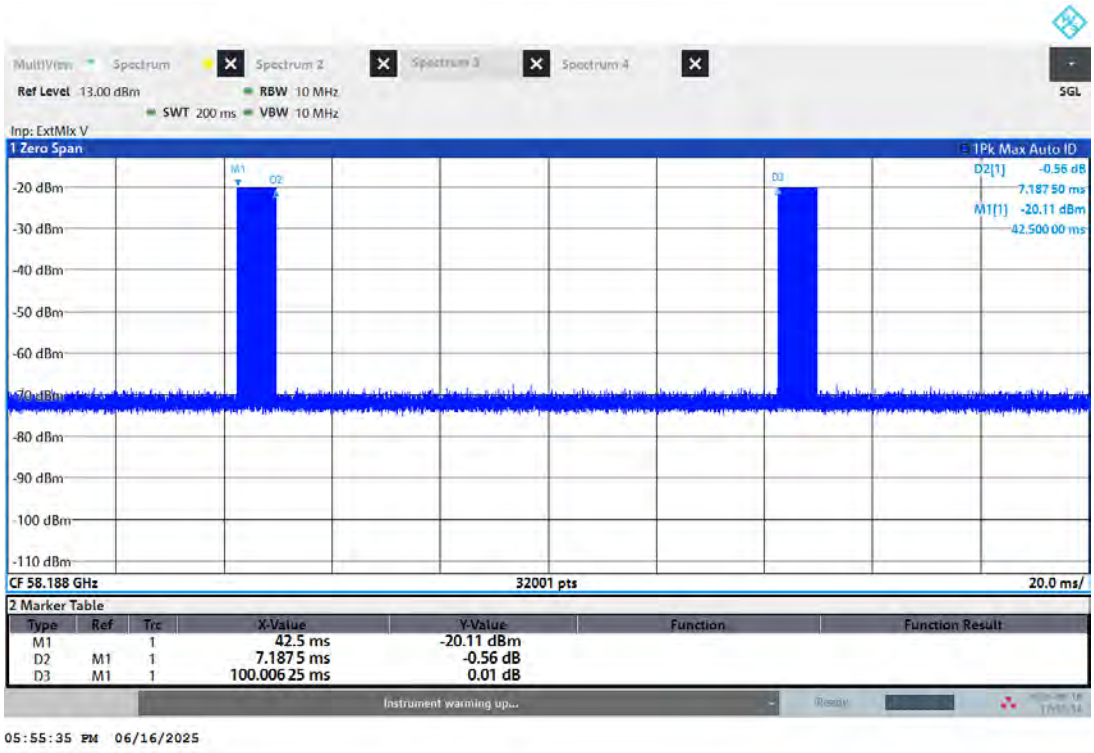
Operating Conditions				
☐ -20 °C to +50 °C				
☐ 0 °C to +40 °C				
☒ Other: -25 °C to +45 °C				
EUT Power Type	From DC power			
Test Software Version				
Supply Voltage	☐ AC	State AC voltage		V
Supply Voltage	☒ DC	State DC voltage	12	V

1.1.5 Equipment Use Condition

Equipment Use Condition	
☐	Fixed field disturbance sensors at 61-61.5GHz
☐	Except fixed field disturbance sensors at 61-61.5GHz
☐	Except fixed field disturbance sensors
☐	Field disturbance sensors/radar
☐	For fixed field disturbance sensors that occupy 500 MHz or less
☐	Field disturbance sensor/radar Personal portable equipment
☐	Field disturbance Sensors /radar(Outdoor drones/UA uses)
☒	Field disturbance Sensors /radar(vehicular applications (e.g., in-cabin radars))
☐	Field disturbance Sensors /radar(unrestricted radar use-case applications)
☐	Field disturbance Sensors /radar(Fixed outdoor or vehicular uses)(except in-cabin)
☐	For pulsed field disturbance sensors/radars

1.1.6 Duty Cycle

TX-on(ms)	TX-on+TX-off(ms)	Duty Cycle(%)	Duty Cycle factor(dB)
7.19	100.01	7.19	11.43



1.1.7 Desensitization

FMCW Chirp Width (MHz)	Chirp Time (µs)	Chirp Rate (MHz/µs)	Chirp Rate (Hz/S)	RBW (MHz)	RBW (Hz)	Normalized Sweep Rate (lin)	Peak Amplitude Response (lin)	Desensitization Factor (dB)
900	57	15.79	1.58E+13	1	1.00E+06	15.79	0.377	8.48

1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15.255
- ANSI C63.10-2020 Section 9. “Procedures for testing millimeter-wave systems”

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

- FCC KDB 414788 D01 v01r01
- FCC KDB 364244 D01 v01r01

1.3 Testing Location

Testing Location Information	
Test Lab.：Sporton International Inc. Hsinchu Laboratory	
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo’ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) TEL: 886-3-656-9065 FAX: 886-3-656-9085 Test site Designation No. TW3787 with FCC. Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated (Frequency Stability)	TH03-CB	Nyle Chang	21.8~22 / 61~62	Jun. 12, 2025
Radiated (Others)	03CH04-CB	Eddie Weng	21.4~22.6 / 57~61	Jun. 06, 2025~ Jun. 17, 2025
AC Conduction	CO01-CB	Tim Chen	22~23 / 58~60	Jun. 09, 2025

1.4 Measurement Uncertainty

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.8 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.8 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.7 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%
Radiated Emission (40GHz ~ 60GHz)	3.0 dB	Confidence levels of 95%
Radiated Emission (60GHz ~ 90GHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (90GHz ~ 200GHz)	3.1 dB	Confidence levels of 95%
Occupied Bandwidth	2.1 %	Confidence levels of 95%
Frequency Stability	0.02 ppm	Confidence levels of 95%
Radiated EIRP	3.2 dB	Confidence levels of 95%
Temperature	1.0°C	Confidence levels of 95%

2 Test Configuration of Equipment under Test

2.1 Parameters of Test Software Setting

Frequency (GHz)	58.188
Software Setting	Default

2.2 Conformance Tests and Related Test Frequencies

Test Item	Test Frequencies (GHz)
AC Power Conducted Emissions Test Voltage: 120Vac / 60Hz	58.188
Occupied Bandwidth	58.188
EIRP Power	58.188
Transmitter Spurious Emissions (below 1 GHz)	58.188
Transmitter Spurious Emissions (1 GHz-40 GHz)	58.188
Transmitter Spurious Emissions (above 40 GHz)	58.188
Frequency Stability	58.188

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC Power Conducted Emissions
Test Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Normal Link: EUT

The Worst Case Mode for Following Conformance Tests	
Tests Item	Occupied Bandwidth Radiated E.I.R.P Power Frequency Stability
Test Condition	Radiated measurement
Operating Mode	CTX
	After evaluating, EUT in Y axis was the worst case, so the measurement will follow this same test configuration.
1	EUT in Y axis

The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Radiated Unwanted Emissions
Test Condition	Radiated measurement
Operating Mode < 1GHz	CTX
	After evaluating, EUT in Y axis was the worst case, so the measurement will follow this same test configuration.
1	EUT in Y axis
Operating Mode > 1GHz	CTX
	After evaluating, EUT in Y axis was the worst case, so the measurement will follow this same test configuration.
1	EUT in Y axis

2.4 EUT Operation during Test

For Normal Link:

During the test, the EUT operation to normal function.

For others:

During the test, executed the test program to control the EUT continuously transmit RF signal.

2.5 Accessories

N/A

2.6 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	DC Power Supply	MOTECH	LPS-305	N/A
B	Fixture	WNC	Fixture board_Ver.A	N/A

2.7 Far Field Boundary Calculations

The far-field boundary is given as:

far field = (2 * L^2) /**λ**

where:

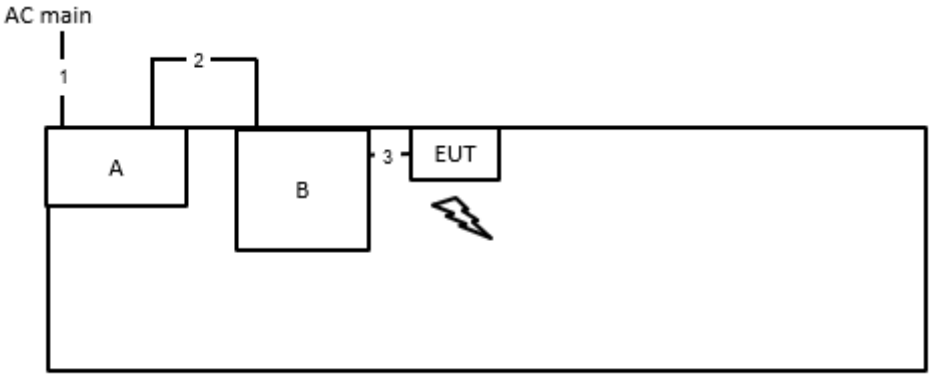
L = Largest Antenna Dimension, including the reflector, in meters

λ= wavelength in meters

Far Field (m)				
Frequency (GHz)	**L (m)**	**Lambda (m)**	**d(Far Field) (m)**	**d(Far Field) (cm)**
58.188	0.01	0.0051557	0.039	3.88

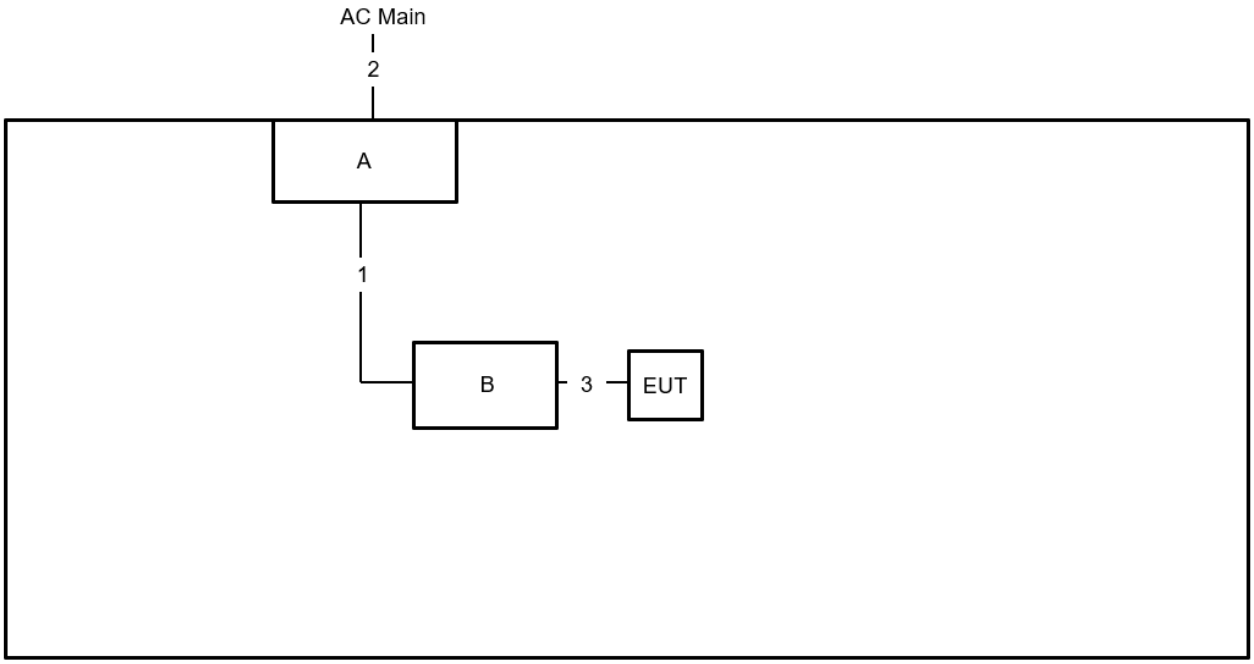
2.8 Test Setup Diagram

Test Setup Diagram - AC Power Conducted Emissions



Item	Connection	Shielded	Length
1	Power cable	No	0.8m
2	DC cable	No	0.75m
3	DC cable	No	0.05m

Test Setup Diagram - Transmitter Spurious Emissions



Item	Connection	Shielded	Length
1	DC Power Cable	No	0.75m
2	Power cable	No	0.8m
3	DC Cable	No	0.05m

3 Transmitter Test Result

3.1 AC Power Conducted Emissions

3.1.1 Limit of AC Power Conducted Emissions

AC Power 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: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

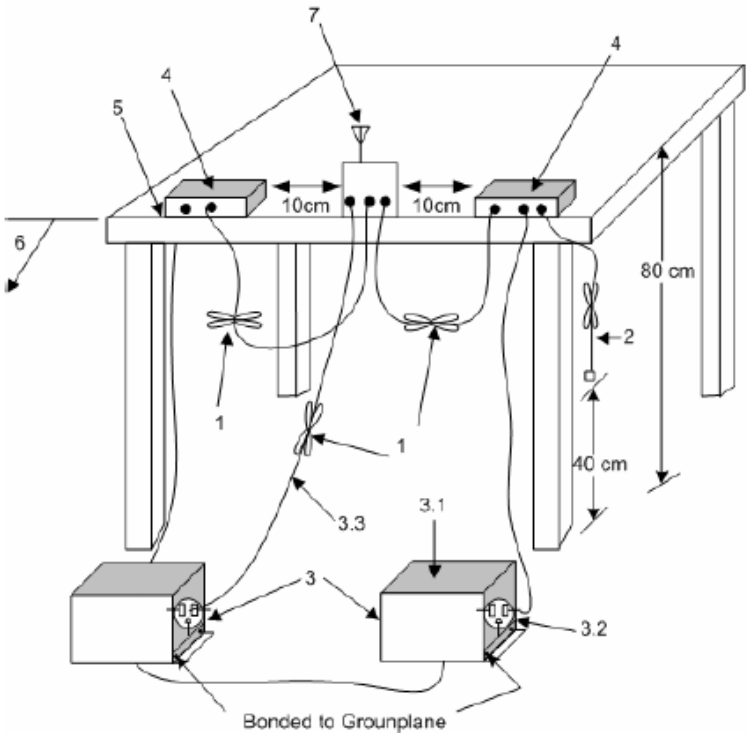
Refer a measuring instruments list in this test report.

3.1.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020, clause 6.2.

3.1.4 Test Setup

AC Power Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.5 Measurement Results Calculation

The measured Level is calculated using:

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

b. Margin = -Limit + Level

3.1.6 Test Result of AC Power Conducted Emissions

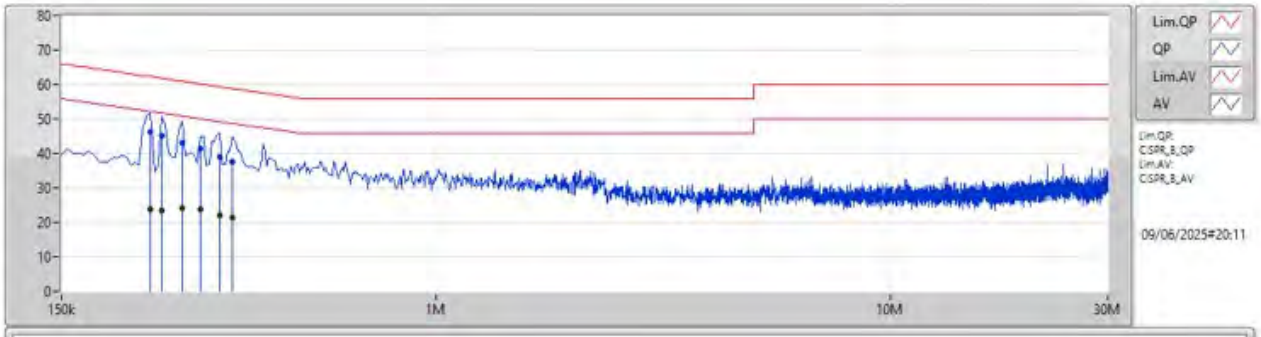
Test Conditions	see ANSI C63.10, clause 5.11
Test Setup	see ANSI C63.10, clause 6.2.3

NOTE 1: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes. If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing.

NOTE 2: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.1.

Phase	Line	Configuration	Normal Link

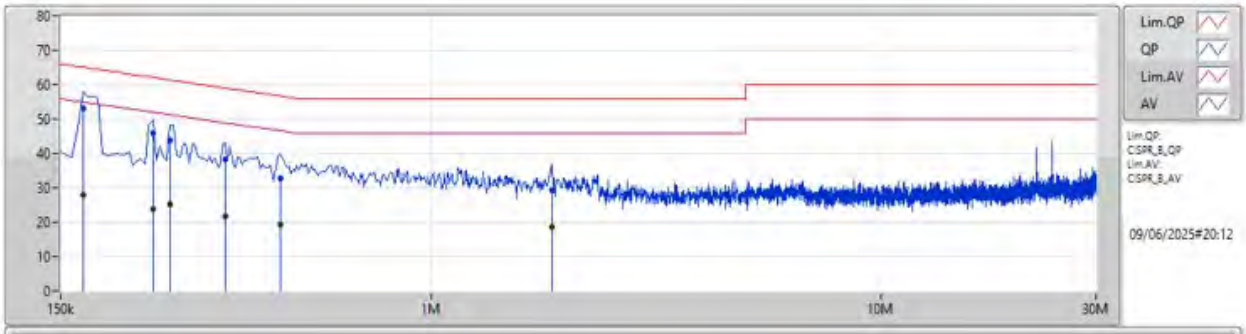
Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	235.5k	46.37	62.25	-15.88	10.12	Line	"Worst"	36.25	0.06	0.08	9.98
AV	235.5k	23.83	52.25	-28.42	10.12	Line	-	13.71	0.06	0.08	9.98
QP	249k	45.13	61.79	-16.66	10.12	Line	-	35.01	0.06	0.08	9.98
AV	249k	23.54	51.79	-28.25	10.12	Line	-	13.42	0.06	0.08	9.98
QP	276k	43.02	60.93	-17.91	10.14	Line	-	32.88	0.06	0.08	10.00
AV	276k	24.31	50.93	-26.62	10.14	Line	-	14.17	0.06	0.08	10.00
QP	303k	41.25	60.17	-18.92	10.16	Line	-	31.09	0.05	0.09	10.02
AV	303k	23.74	50.17	-26.43	10.16	Line	-	13.58	0.05	0.09	10.02
QP	334.5k	38.96	59.35	-20.39	10.17	Line	-	28.79	0.05	0.09	10.03
AV	334.5k	22.12	49.35	-27.23	10.17	Line	-	11.95	0.05	0.09	10.03
QP	357k	37.64	58.79	-21.15	10.19	Line	-	27.45	0.05	0.10	10.04
AV	357k	21.46	48.79	-27.33	10.19	Line	-	11.27	0.05	0.10	10.04

Phase	Neutral	Configuration	Normal Link

Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	168k	53.27	65.06	-11.79	10.09	Neutral	"Worst"	43.18	0.08	0.08	9.93
AV	168k	27.93	55.06	-27.13	10.09	Neutral	-	17.84	0.08	0.08	9.93
QP	240k	45.90	62.10	-16.20	10.14	Neutral	-	35.76	0.08	0.08	9.98
AV	240k	23.68	52.10	-28.42	10.14	Neutral	-	13.54	0.08	0.08	9.98
QP	262.5k	43.86	61.35	-17.49	10.15	Neutral	-	33.71	0.08	0.08	9.99
AV	262.5k	25.02	51.35	-26.33	10.15	Neutral	-	14.87	0.08	0.08	9.99
QP	348k	38.15	59.00	-20.85	10.21	Neutral	-	27.94	0.08	0.09	10.04
AV	348k	21.82	49.00	-27.18	10.21	Neutral	-	11.61	0.08	0.09	10.04
QP	460.5k	32.83	56.69	-23.86	10.26	Neutral	-	22.57	0.08	0.10	10.08
AV	460.5k	19.42	46.69	-27.27	10.26	Neutral	-	9.16	0.08	0.10	10.08
QP	1.851M	29.37	56.00	-26.63	10.21	Neutral	-	19.16	0.11	0.13	9.97
AV	1.851M	18.69	46.00	-27.31	10.21	Neutral	-	8.48	0.11	0.13	9.97

3.2 Occupied Bandwidth

3.2.1 Limit of Occupied Bandwidth

6dBc Bandwidth (see Note 1)	None
99% Occupied Bandwidth (see Note 2)	None

NOTE 1: The 6dBc bandwidth is the frequency bandwidth of the signal power at the -6 dBc points when measured with a 100 kHz resolution bandwidth. These measurements shall also be performed at normal test conditions.

NOTE 2: The 99% occupied bandwidth is the frequency bandwidth of the signal power at the 99% channel power of occupied bandwidth when resolution bandwidth should be approximately 1 % to 5 % of the occupied bandwidth (OBW). These measurements shall also be performed at normal test conditions.

3.2.2 Measuring Instruments

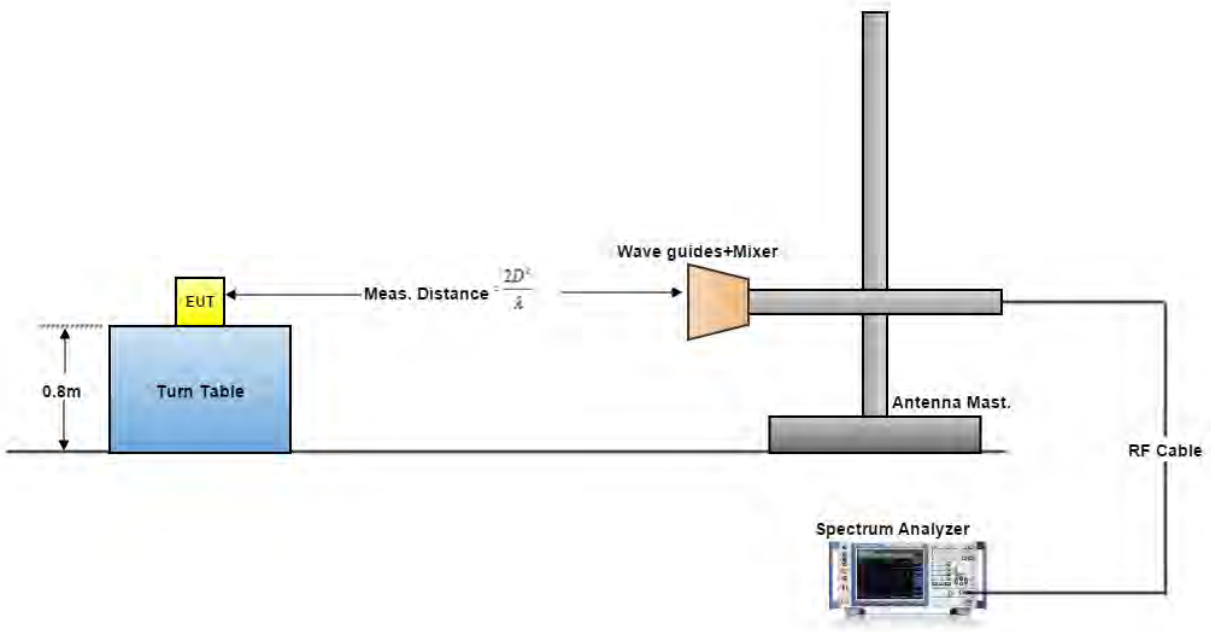
Refer a measuring instruments list in this test report.

3.2.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020, clauses 9.4.

3.2.4 Test Setup

Occupied Channel Bandwidth



3.2.5 Test Result of Occupied Bandwidth

Test Conditions	see ANSI C63.10, clause 5.11
Test Setup	see ANSI C63.10, clause 9.4

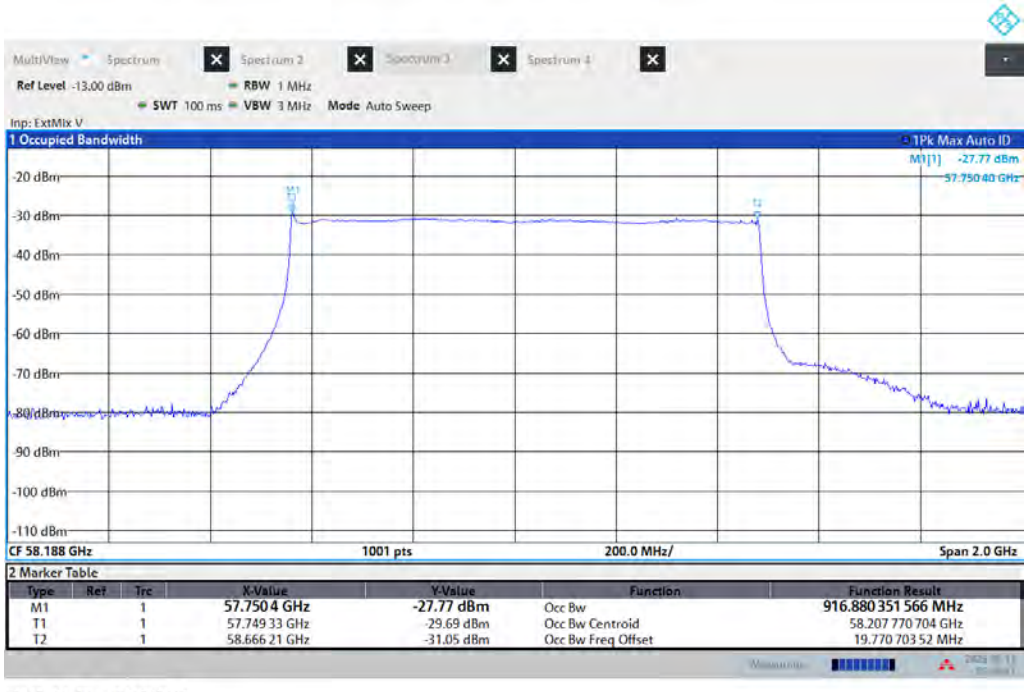
NOTE: If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing. Refer as ANSI C63.10, clause 15, observe and record with plotted graphs or photographs the worst-case (i.e., widest) occupied bandwidth produced by these different modulation sources.

Test Results			
Test Freq. (GHz)	**6 dBc Bandwidth (MHz)**	**99% Occupied Bandwidth (MHz)**	**Limit (MHz)**
58.188	916.88	919.10	N/A

3.2.5.1 Bandwidth Plots

6 dBc Bandwidth

Occupied Bandwidth



3.3 EIRP Power

3.3.1 Limit of EIRP Power

Applications	Frequency Range (GHz)	Peak (dBm)	Average (dBm)	Duty Cycle Requirement
Field disturbance sensors/radar	57 ~ 71	< 10	N/A	N/A
For fixed field disturbance sensors that occupy 500 MHz or less	61 ~ 61.5	< 43	< 40	N/A
	57 ~ 61 & 61.5 ~ 71	< 13	< 10	N/A
Field disturbance sensor/radar Personal portable equipment	59.3 ~ 71	< 10	N/A	N/A
Field disturbance Sensors /radar (Outdoor drones/UA uses)	60 ~ 64	< 20	N/A	At least 16.5 ms off time per 33 ms Operation shall be limited to a maximum of 121.92 m above ground level.
Field disturbance Sensors /radar (vehicular applications (e.g., in-cabin radars))	57 ~ 59.4	Indoor < 20 Outdoor< 30	N/A	N/A
Field disturbance Sensors /radar (unrestricted radar use-case applications)	57 ~ 61.56	< 3	N/A	N/A
		< 20	N/A	At least 16.5 ms off time per 33 ms
	57 ~ 64	< 14	N/A	At least 25.5 ms off time per 33 ms
Field disturbance Sensors /radar (Fixed outdoor or vehicular uses) (except in-cabin)	57 ~ 64	< 20	N/A	At least 16.5 ms off time per 33 ms
For pulsed field disturbance sensors/radars	57 ~ 64	< 33	< 13	Pulse duration < 6 ns Duty cycle < 10%, in any 0.3 µs time window
	61.5 ~ 64	< 25	< 5	Any 0.3 µs time window

NOTE: For the applicable limit, see 15.255 (c)

3.3.2 Measuring Instruments

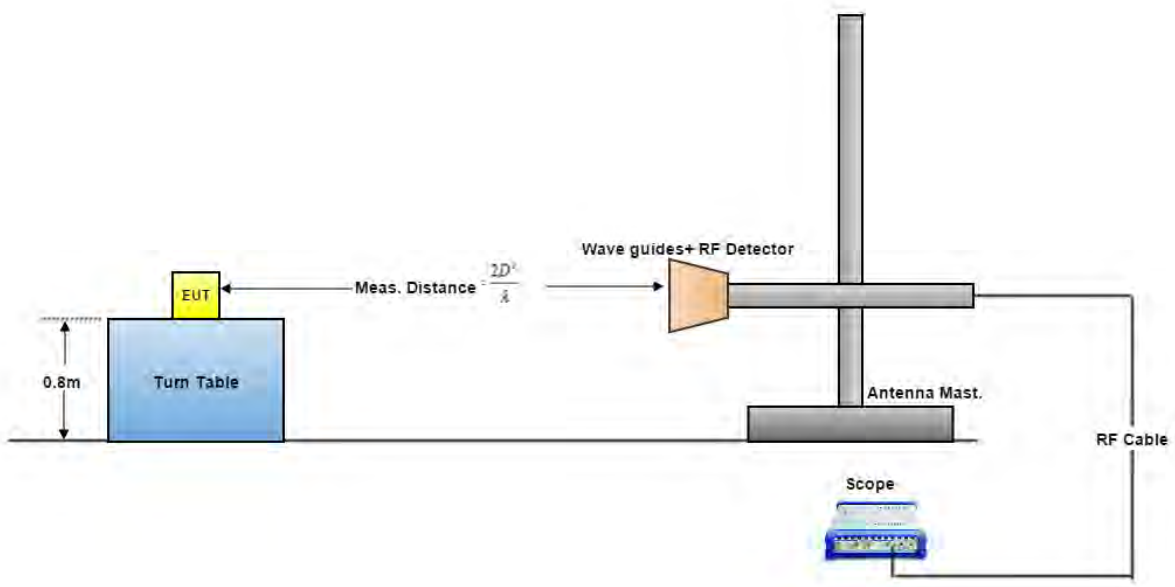
Refer a measuring instruments list in this test report.

3.3.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020 clause 9.8.

3.3.4 Test Setup

EIPR Power



3.3.5 Test Result of EIRP Power

Test Conditions	see ANSI C63.10, clause 5.11 & clause 9
Test Setup	see ANSI C63.10, clause 9.8

NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worst case combination to be used for the conformance testing.

3.3.6 Test Result of EIRP Power

Freq. (GHz)	Rx Gain (dBi)	P-Peak (dBm)	Test Distance (m)	Desensitization Factor (dB)	EIRP-Peak (dBm)	EIRP-Peak Limit (dBm)	Test Result
58.188	23.6	-27.80	0.50	8.48	18.79	30	Pass

Calculate the EIRP from the radiated measurement in the far-field using Equation:

EIRP = 21.98 – 20log(λ) + 20log(D) + P – G

where:

EIRP: is the equivalent isotropic radiated power, in dBm

P: is the power measured at the output of the test antenna, in dBm

λ: is the wavelength of the emission under investigation [300/fMHz], in m

G: is the gain of the test antenna, in dBi.

3.4 Transmitter Spurious Emissions

3.4.1 Limit of Transmitter Spurious Emissions

Frequency Range	Limit
Radiated emissions below 40 GHz	Reference to section 15.209
Radiated emissions above 40 GHz – 200GHz	90 pW/cm^2 @ 3 m (Equivalent EIRP 102 μW, -9.91dBm)
NOTE 1: For the applicable limit, see 15.255(d). NOTE 2: Spurious emissions shall not exceed the level of the fundamental emission.	

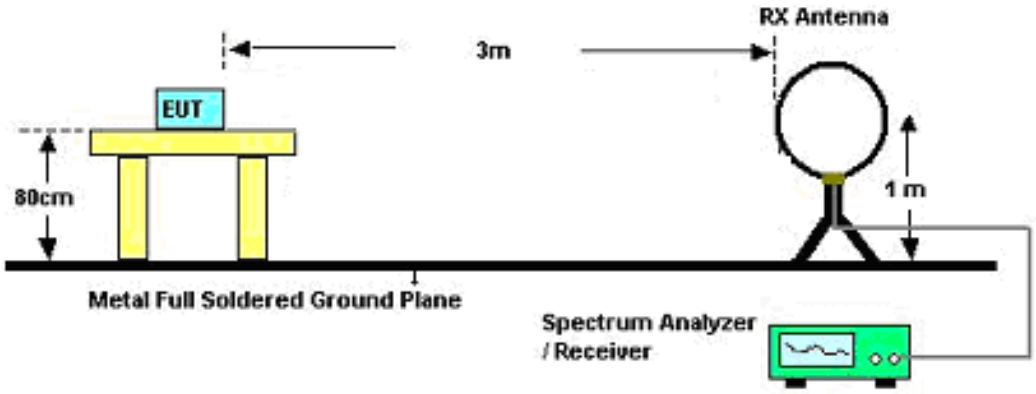
3.4.2 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020, clause 9.11

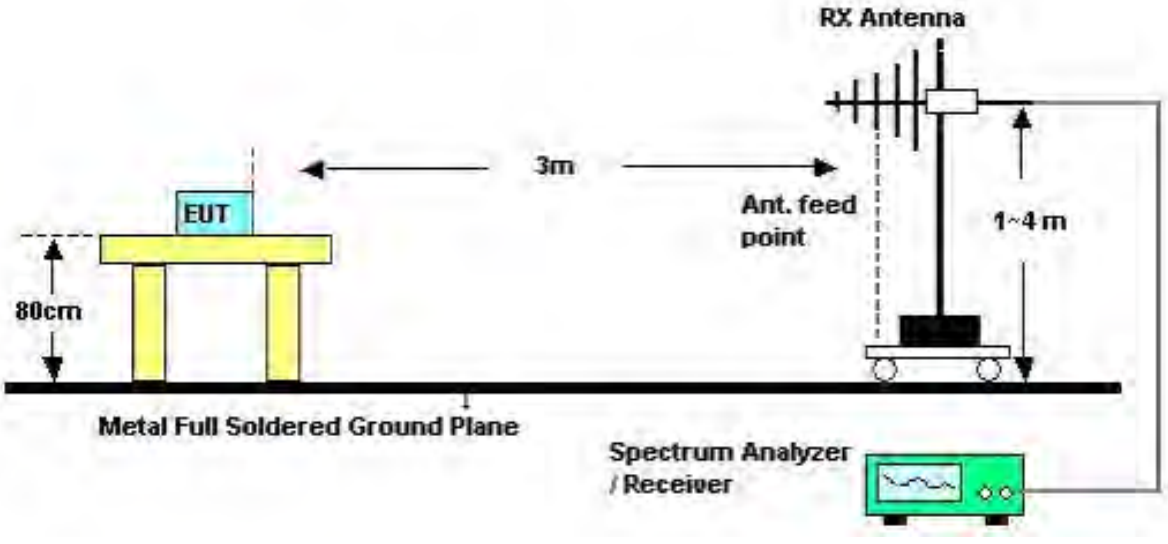
3.4.3 Test Setup

Transmitter Spurious Emissions

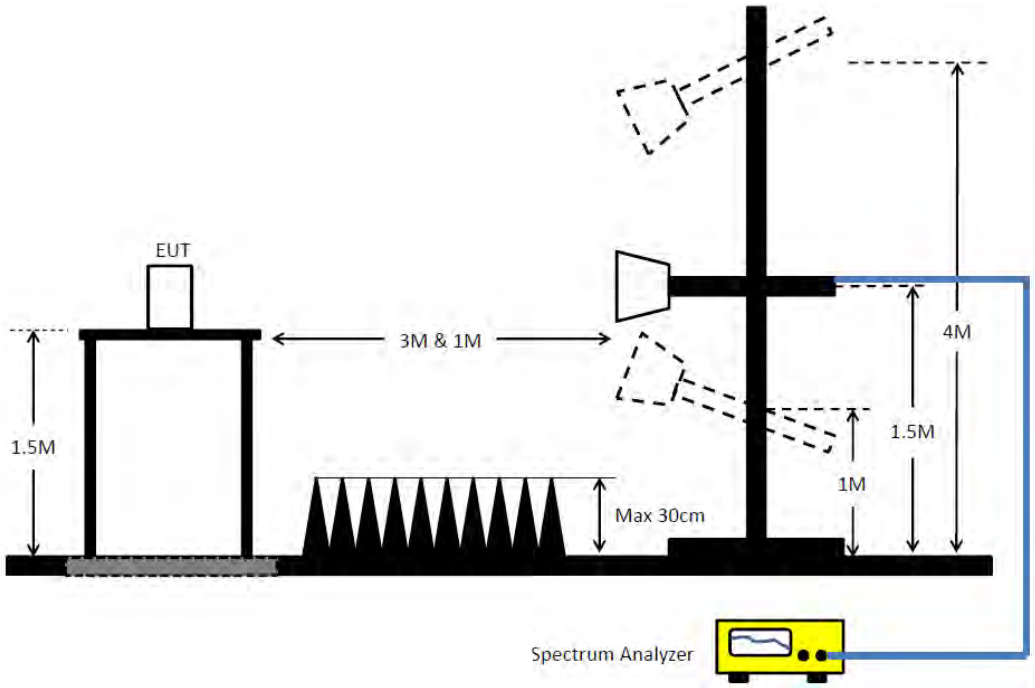
9kHz ~30MHz



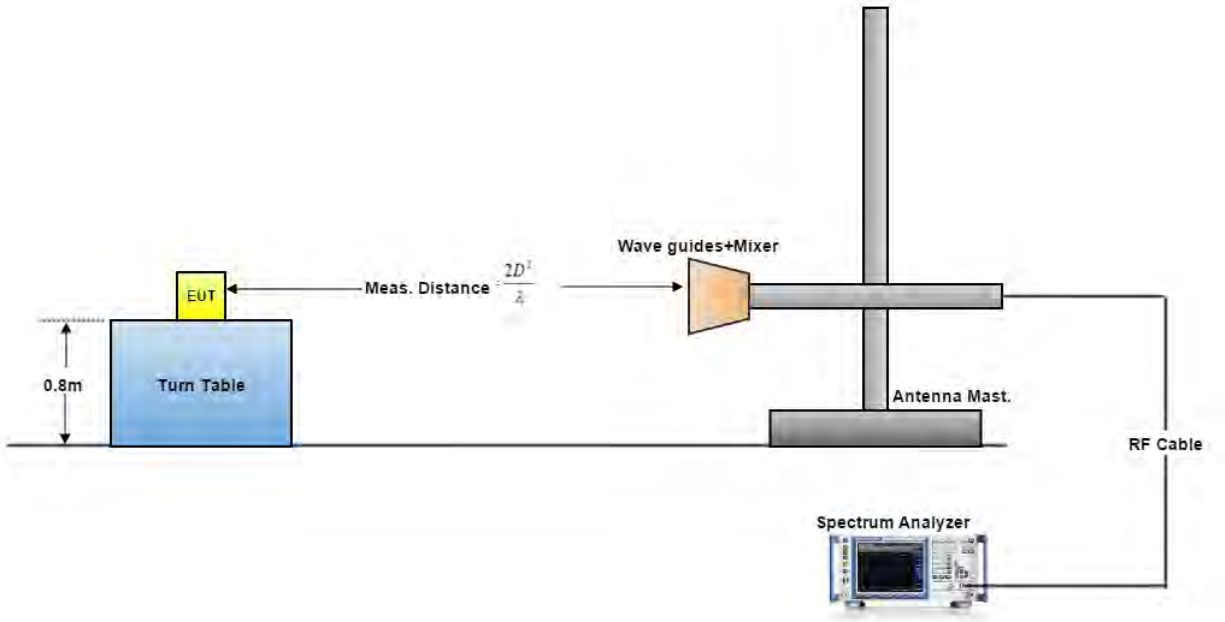
30MHz~1GHz



1GHz ~40GHz



Above 40GHz



A measuring distance of at 3 m shall be used for measurements at frequencies up to 15 GHz. For frequencies above 15 GHz, any suitable measuring distance may be used. The measurement distance is chosen up to far field distance, depending on the test system noise floor for detecting spurious emission signals. Then above 15 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from spec. distance (3 m) to measurement distance. Distance extrapolation factor = 20 log (spec. distance [3 m] / measurement distance [N m]) (dB) .The measurements described in ANSI C63.10, clause 7.8.6. If the emission cannot be detected at 1 m, reduce the RBW to increase system sensitivity. Note the value. If the emission still cannot be detected, move the horn closer to the EUT, noting the distance at which a measurement is made.

3.4.4 Measurement Results Calculation

The measured Level is calculated using:

For below 40GHz

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

For above 40GHz

EIRP = Meas. Level - RX Antenna Gain + 20*log(4*Pi(3.14159)*D/(300/(Frequency*1000)))

3.4.5 Test Result of Transmitter Spurious Emissions

Test Conditions	see ANSI C63.10, clause 5.11 & clause 9
Test Setup	see ANSI C63.10, clause 9.11, 9.12
NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes.	

3.4.5.1 Test Result of Transmitter Spurious Emissions (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

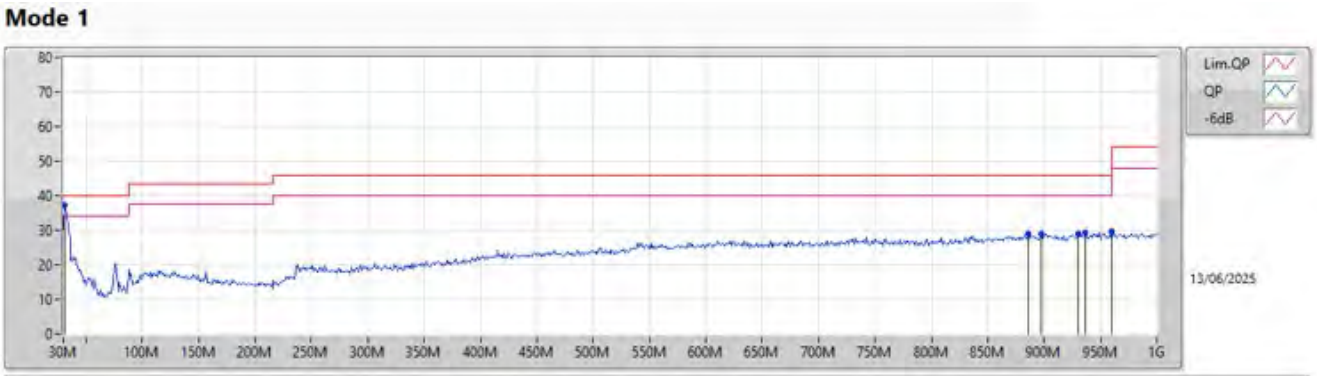
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.4.5.2 Test Result of Transmitter Spurious Emissions

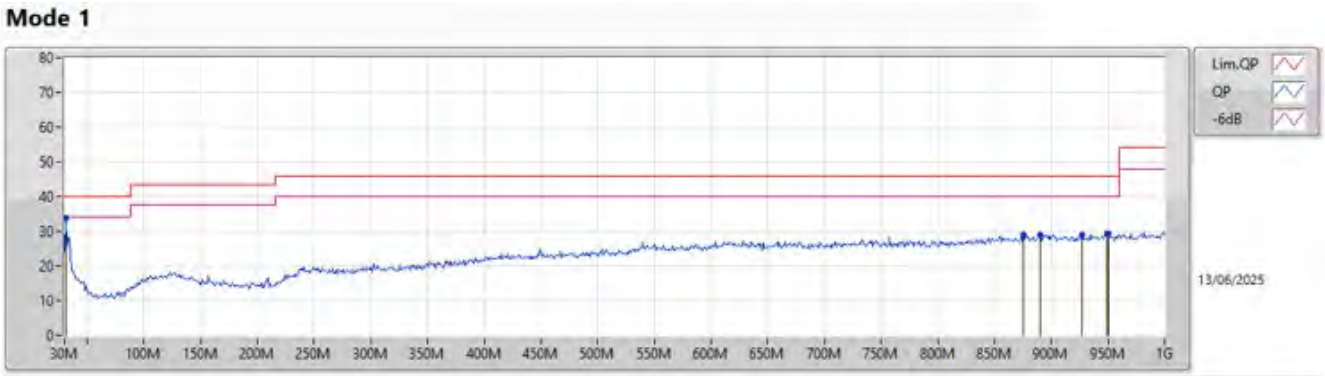
Test Range	30 MHz – 1000 MHz	Test Distance	3 m
Test Freq. (GHz)	58.188		

Vertical



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)
PK	30.97M	37.09	40.00	-2.91	-6.74	3	Vertical	277	1.25	-	43.83	23.62	0.33	30.69
PK	886.51M	29.04	46.00	-16.96	-2.44	3	Vertical	340	1.50	-	31.48	26.42	3.36	32.22
PK	897.18M	28.89	46.00	-17.11	-2.12	3	Vertical	18	1.00	-	31.01	26.70	3.38	32.20
PK	930M	28.85	46.00	-17.15	-2.03	3	Vertical	12	1.00	-	30.88	26.62	3.44	32.09
PK	936.95M	29.39	46.00	-16.61	-1.95	3	Vertical	189	1.25	-	31.34	26.67	3.45	32.07
PK	960M	29.57	54.00	-24.43	-1.76	3	Vertical	128	1.25	-	31.33	26.81	3.49	32.06

Horizontal

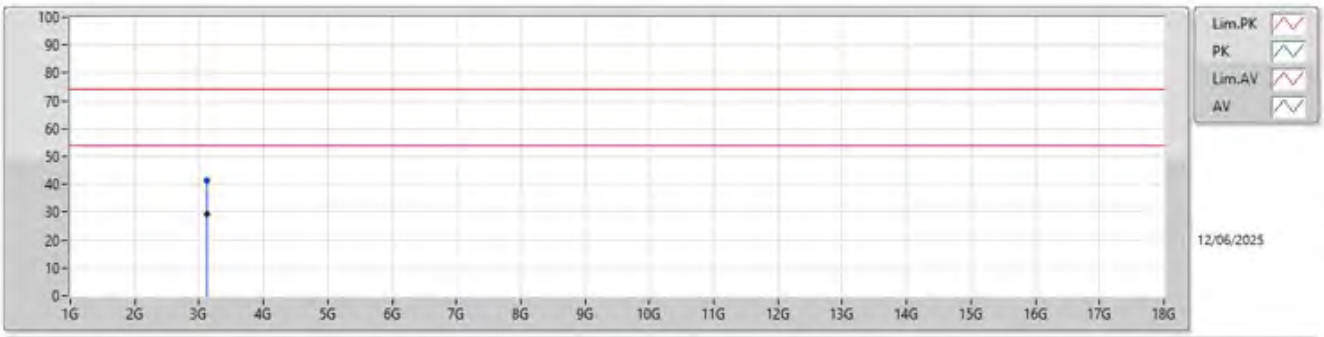


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)
PK	30.97M	33.92	40.00	-6.08	-6.74	3	Horizontal	113	1.25	-	40.66	23.62	0.33	30.69
PK	875.84M	29.03	46.00	-16.97	-2.57	3	Horizontal	358	1.00	-	31.60	26.33	3.34	32.24
PK	890.39M	29.04	46.00	-16.96	-2.34	3	Horizontal	360	1.25	-	31.38	26.50	3.37	32.21
PK	927.25M	28.92	46.00	-17.08	-2.00	3	Horizontal	91	2.00	-	30.92	26.67	3.43	32.10
PK	949.56M	29.20	46.00	-16.80	-1.85	3	Horizontal	39	1.00	-	31.05	26.71	3.47	32.03
PK	950.53M	29.14	46.00	-16.86	-1.85	3	Horizontal	285	1.50	-	30.99	26.71	3.47	32.03

Test Range	1 GHz – 18 GHz	Test Distance	3 m
Test Freq. (GHz)	58.188		

Vertical

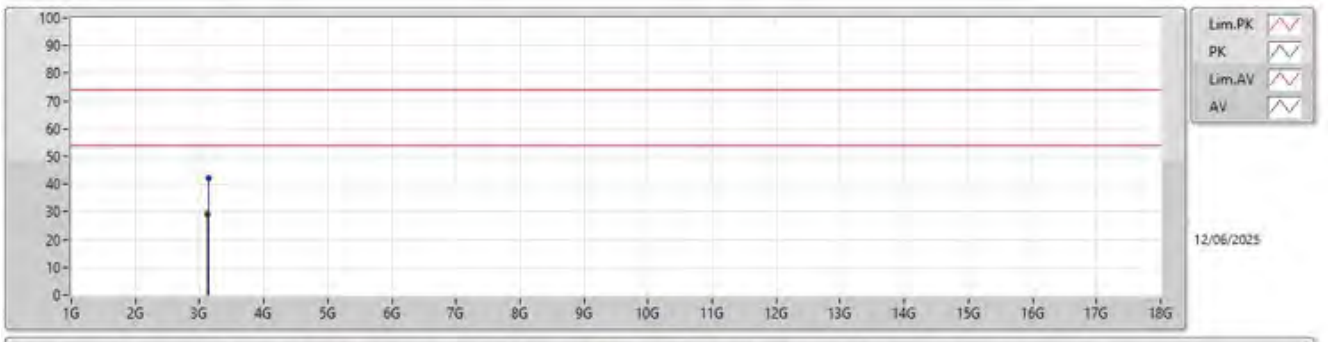
Mode 1



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)
PK	3.12902G	41.21	74.00	-32.79	-8.67	3	Vertical	358	1.81	-	49.88	28.73	7.08	44.48
AV	3.12792G	29.27	54.00	-24.73	-8.68	3	Vertical	358	1.81	-	37.95	28.72	7.08	44.48

Horizontal

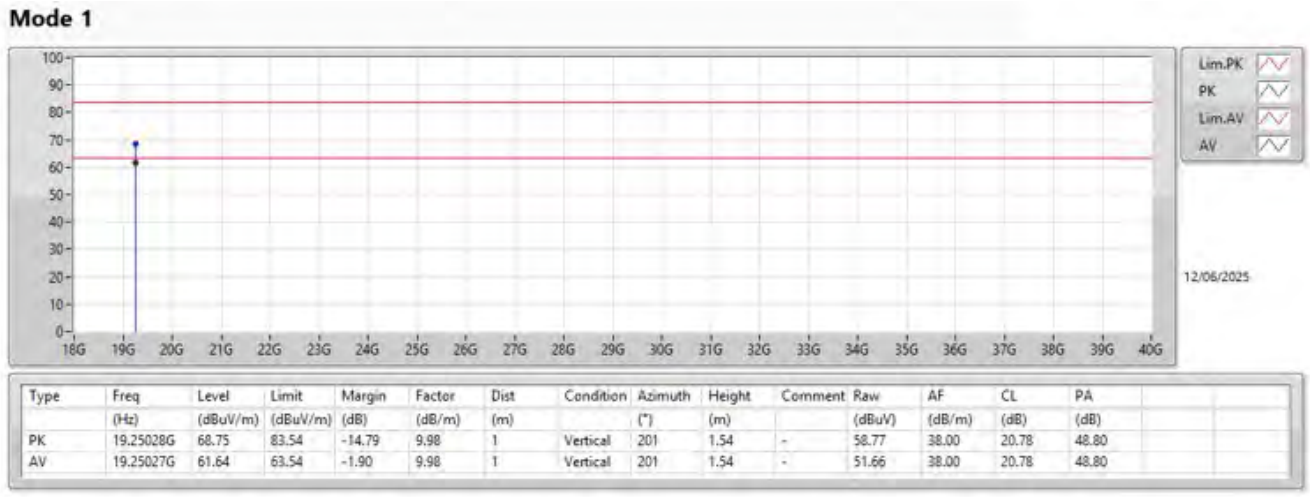
Mode 1



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)
PK	3.13258G	42.26	74.00	-31.74	-8.63	3	Horizontal	355	1.72	-	50.89	28.76	7.09	44.48
AV	3.13125G	29.40	54.00	-24.60	-8.64	3	Horizontal	355	1.72	-	38.04	28.75	7.09	44.48

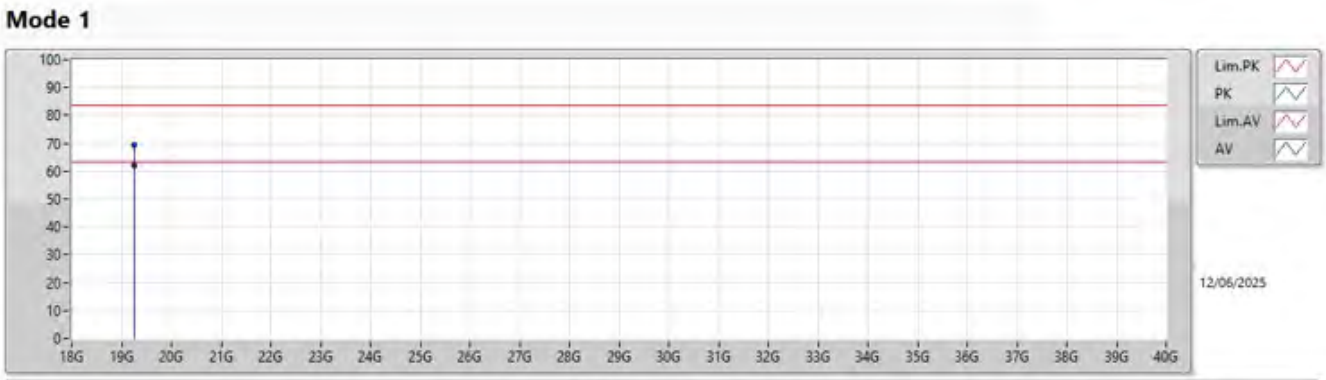
Test Range	18 GHz – 40 GHz	Test Distance	1 m
Test Freq. (GHz)	58.188		

Vertical



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)
PK	19.25028G	68.75	83.54	-14.79	9.98	1	Vertical	201	1.54	-	58.77	38.00	20.78	48.80
AV	19.25027G	61.64	63.54	-1.90	9.98	1	Vertical	201	1.54	-	51.66	38.00	20.78	48.80

Horizontal



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)
PK	19.25031G	69.23	83.54	-14.31	9.98	1	Horizontal	203	1.58	-	59.25	38.00	20.78	48.80
AV	19.25026G	62.04	63.54	-1.50	9.98	1	Horizontal	203	1.58	-	52.06	38.00	20.78	48.80

Test Range	40GHz – 200GHz

Test Frequency (GHz)	Rx Antenna Gain (dBi)	Measurement Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)
58.188	23.60	0.50	51.74	-73.01
EIRP (dBm)	**Specification Distance (m)**	**Power Density (pW/cm^2)**	**Limit (pW/cm^2)**	**Test Result**
-35.91	3	0.2266	90	PASS

Note:

EIRP = Prx – Grx + Free Space Path Loss = Prx – Grx + 20Log(4πd/ λ)2
Which
Prx = Read Level.
Grx = Rx Antenna Gain.
A distance factor is offset and the formula is 20LOG(D1/D2)
Which
D1 = Specification Distance
D2 = Measurement Distance

3.5 Frequency Stability

3.5.1 Limit of Frequency Stability

Frequency Stability	Limit
Refer as 15.255(f) and ANSI C63.10-2020, clause 9.5	within the frequency bands
Note: These measurements shall also be performed at normal and extreme test conditions.	

3.5.2 Measuring Instruments

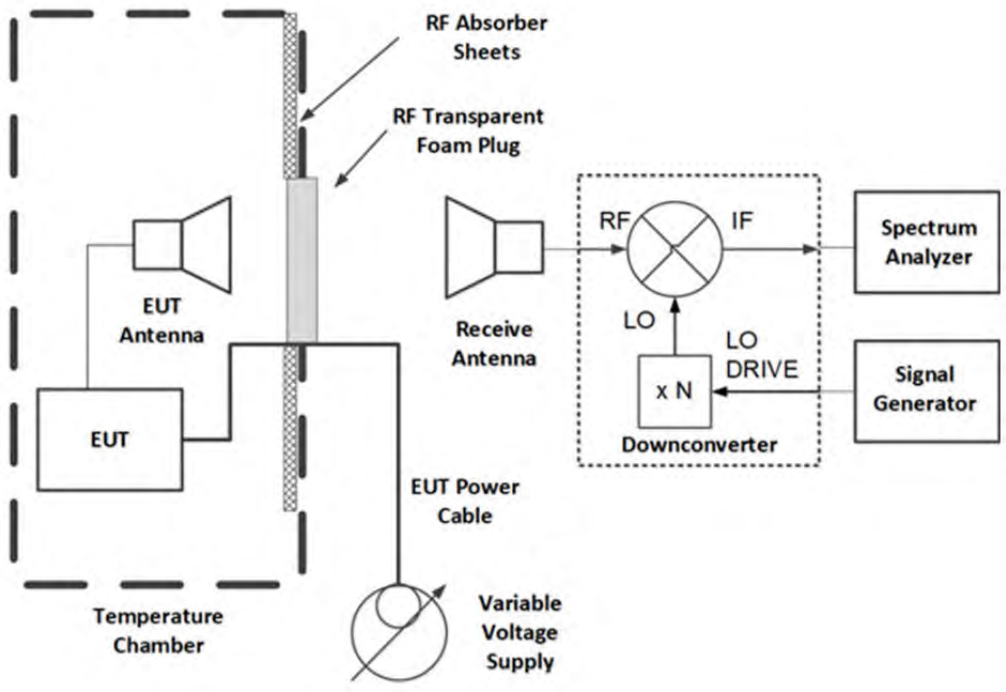
Refer a measuring instruments list in this test report.

3.5.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020, clauses 9.5.

3.5.4 Test Setup

Frequency Stability



3.5.5 Test Result of Frequency Stability

Test Conditions	see ANSI C63.10, clause 5.11 & clause 9
Test Setup	see ANSI C63.10, clause 9.5
NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes.	

3.5.5.1 Frequency Stability with Respect to Ambient Temperature

Frequency Stability with Respect to Ambient Temperature			
Test Results			
Test Temperature (°C)	**Measured Frequency (MHz)**	**Delta Frequency (kHz)**	**Limit (±kHz)**
-25	58210.025	547	Within band
-20	58210.355	877	Within band
-10	58210.457	979	Within band
0	58210.419	941	Within band
10	58209.383	-95	Within band
20	58209.478	Reference	Within band
30	58209.234	-244	Within band
40	58208.54	-938	Within band
45	58207.724	-1754	Within band
NOTE: The manufacturer's specified temperature range of -25 to +45°C.			

3.5.5.2 Frequency Stability When Varying Supply Voltage

Frequency Stability When Varying Supply Voltage			
Test Results			
Test Voltage: (Vdc)	**Measured Frequency (MHz)**	**Delta Frequency (kHz)**	**Limit (±kHz)**
10.2	58209.514	36	Within band
12	58209.478	Reference	Within band
13.8	58209.599	121	Within band

3.6 Operation Restriction and Group Installation

3.6.1 Limit of Operation Restriction and Group Installation

Item	Limit
Operation Restriction	Operation is not permitted for the following products: ♦ Equipment used on aircraft or satellites. (Refer as 15.255 (a)) ♦ Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation. (Refer as 15.255 (a))
Group Installation	Operation is not permitted for the following products: ♦ External phase-locking (Refer as 15.255 (h))

3.6.2 Result of Operation Restriction

Manufacturer declares that EUT will not been used on aircraft or satellites. Then user manual will include a statement to caution EUT is not permitted for used on aircraft or satellites.

3.6.3 Result of Group Installation

The frequency, amplitude and phase of the transmit signal are set within the EUT. There are no external phase-locking inputs or any other means of combining two or more units together to realize a beam-forming array.

4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.4GHz	Mar. 06, 2025	Mar. 05, 2026	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50 -16-2	04083	150kHz ~ 100MHz	Feb. 18, 2025	Feb. 17, 2026	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	May 10, 2025	May 09, 2026	Conduction (CO01-CB)
Pulse Limiter	Rohde& Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Oct. 16, 2024	Oct. 15, 2025	Conduction (CO01-CB)
COND Cable	Woken	Cable	CO01	9kHz ~ 30MHz	Oct. 16, 2024	Oct. 15, 2025	Conduction (CO01-CB)
Test Software	SPORTON	SENSE-EMI	V5.11	150kHz-30MHz	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6121	65417	9kHz - 30MHz	Oct. 17, 2024	Oct. 16, 2025	Radiation (03CH04-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH04-CB	30 MHz ~ 1 GHz	Jul. 31, 2024	Jul. 30, 2025	Radiation (03CH04-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH04-CB	1GHz ~18GHz 3m	Feb. 21, 2025	Feb. 20, 2026	Radiation (03CH04-CB)
BILOG ANTENNA with 6 dB attenuator	Schaffner & EMCI	CBL6112B & N-6-06	22021&AT-N0607	30MHz ~ 1GHz	Oct. 05, 2024	Oct. 04, 2025	Radiation (03CH04-CB)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120D-01816	1GHz~18GHz	Dec. 20, 2024	Dec. 19, 2025	Radiation (03CH04-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Sep. 23, 2024	Sep. 22, 2025	Radiation (03CH04-CB)
Pre-Amplifier	EMCI	EMC330N	980391	20MHz ~ 3GHz	May 21, 2025	May 20, 2026	Radiation (03CH04-CB)
Pre-Amplifier	SGH	SGH5265	20211115-1	1~ 26.5GHz	Jan. 16, 2025	Jan. 15, 2026	Radiation (03CH04-CB)
Pre-Amplifier	SGH	SGH184	20221107-3	18GHz ~ 40GHz	Nov. 25, 2024	Nov. 24, 2025	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Mar. 24, 2025	Mar. 23, 2026	Radiation (03CH04-CB
EMI Test Receiver	R&S	ESR7	102172	9kHz ~ 7GHz	Oct. 21, 2024	Oct. 20, 2025	Radiation (03CH04-CB)
RF Cable-low	Woken	RG402	Low Cable-03+67	30MHz – 1GHz	Apr. 25, 2025	Apr. 24, 2026	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21	1GHz - 18GHz	Apr. 25, 2025	Apr. 24, 2026	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21+67	1GHz - 18GHz	Apr. 25, 2025	Apr. 24, 2026	Radiation (03CH04-CB)
Test Software	SPORTON	SENSE-EMI	V5.11.8	30MHz-40GHz	N.C.R.	N.C.R.	Radiation (03CH04-CB)

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
*Harmonic Mixer	R&S	FS-Z60	100114	40GHz~60GHz	Nov. 22, 2024	Nov. 21, 2026	Radiation (03CH04-CB)
*Harmonic Mixer	R&S	FS-Z75	100966	50GHz~75GHz	Nov. 22, 2024	Nov. 21, 2026	Radiation (03CH04-CB)
*Harmonic Mixer	R&S	FS-Z90	102135	60GHz~90GHz	Sep. 13, 2024	Sep. 12, 2026	Radiation (03CH04-CB)
*Harmonic Mixer	R&S	FS-Z140	101160	90GHz~140GHz	Jan. 20, 2025	Jan. 19, 2027	Radiation (03CH04-CB)
*Harmonic Mixer	R&S	FS-Z220	101065	140GHz~ 220GHz	Jan. 20, 2025	Jan. 19, 2027	Radiation (03CH04-CB)
Standard Horn Antenna	Custom Microwave	M19RH	U91113-A	40 ~ 60 GHz	N.C.R.	N.C.R.	Radiation (03CH04-CB)
Standard Horn Antenna	Custom Microwave	M15RH	V91113-A	50 ~ 75 GHz	N.C.R.	N.C.R.	Radiation (03CH04-CB)
Standard Horn Antenna	Custom Microwave	M12RH	E91113-A	60 ~ 90 GHz	N.C.R.	N.C.R.	Radiation (03CH04-CB)
Standard Horn Antenna	Custom Microwave	M08RH	F91113-A	90 ~ 140 GHz	N.C.R.	N.C.R.	Radiation (03CH04-CB)
Standard Horn Antenna	Custom Microwave	M05RH	G91113-A	140 ~ 220 GHz	N.C.R.	N.C.R.	Radiation (03CH04-CB)
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Jan. 02, 2025	Jan. 01, 2026	Radiation (TH03-CB)
Temp. and Humidity Chamber	Gaint Force	GTH-408-40-CP-AR	MAA1410-011	-40~100 degree	Aug. 30, 2024	Aug. 29, 2025	Radiation (TH03-CB)
RF Cable	Woken	RG402	High Cable-11	30MHz –18 GHz	Oct. 01, 2024	Sep. 30, 2025	Radiation (TH03-CB)
RF Cable	Woken	RG402	High Cable-12	30MHz –18 GHz	Oct. 01, 2024	Sep. 30, 2025	Radiation (TH03-CB)
RF Cable	Woken	RG402	High Cable-13	30MHz –18 GHz	Oct. 01, 2024	Sep. 30, 2025	Radiation (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz –18 GHz	Oct. 01, 2024	Sep. 30, 2025	Radiation (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz –18 GHz	Oct. 01, 2024	Sep. 30, 2025	Radiation (TH03-CB)

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

"*" Calibration Interval of instruments listed above is two years.

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