

TEST REPORT

For

RFID READER/WRITER

In conformity with

FCC CFR 47 Part15 Subpart C / RSS-210 Issue 10

Model : TR3XM-C106-A3540

FCC ID : MK4C106-A3540

ISED ID : 31742-C106A3540

Report No. : WE240515BH1-12

Issue Date : July 02, 2024

Prepared for

TAKAYA Corporation
661-1, Ibara-cho, Ibara-City, Okayama, 715-8503, Japan

Prepared by

SGS Japan Inc.
3-5-23, Kitayamata, Tsuzuki-ku, Yokohama, 224-0021, Japan
Telephone: +81+(0)50-1780-7880
FAX: +81+(0)45- 592-7506

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History

Report No.	Date	Revisions	Issued By
WE240515BH1-11	June 28, 2024	Initial Issue	R. Shimada
WE240515BH1-12	July 02, 2024	Change ISSED ID	R. Shimada

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1 General information

1.1 Product description

Test item	: RFID READER/WRITER
Manufacturer	: TAKAYA Corporation
Address	: 661-1, Ibara-cho, Ibara-City, Okayama, 715-8503, Japan
Model	: TR3XM-C106-A3540
FCC ID	: MK4C106-A3540
ISED ID	: 31742-C106A3540
Serial numbers	: 0000 0001 (Large loop antenna) : 0000 0002 (Small loop antenna) : 0000 0003 (Dummy load)
Hardware version	: V11
Software version	: 1001STV03
Transmitting Frequency	: 13.56 MHz
Type of Modulation	: ASK
Operating temperature range	: 0 to +55 degree C
Receipt date of EUT	: June 17, 2024
Nominal power source voltages	: DC 3.3V - 5.0V

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1.2 Test(s) performed/ Summary of test result

Test specification(s)	: FCC CFR 47 Part 15 Subpart C (April 15, 2024) RSS-210 Issue 10, RSS-Gen Issue 5
Test method(s)	: ANSI C63.10: 2013
Test(s) started	: June 18, 2024
Test(s) completed	: June 20, 2024
Summary of test result	: Complied

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.

The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.

Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer

: Shimada Ryota
R. Shimada
C&P Connectivity Wireless RF Lab

Reviewer

: [Signature]
Y. Taki
Manager, C&P Connectivity Wireless

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1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at SGS Japan Inc., located in 3-5-23, Kitayamata, Tsuzuki-ku, Yokohama, 224-0021, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed under registration number JP5001 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <https://www.fcc.gov>.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring ETSI TR 100 028-1 V1.4.1 (2001-12).

The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

Conducted emission (150 kHz - 30 MHz):	± 3.3 dB
Radiated emission (9 kHz - 30 MHz):	± 5.6 dB
Radiated emission (30 MHz - 1000 MHz):	± 5.1 dB

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1.5 Summary of test results

Requirements	Section in FCC	Section in RSS	Section in this report	Results
Occupied bandwidth	15.215 (c)	RSS-Gen 6.7	2.1	-
Radiated Emissions between 9 kHz to 30 MHz	15.225 (a) - (d)	RSS-210 B.6	2.2	Complied
Radiated Emissions between 30 to 1000 MHz	15.209	RSS-Gen 8.9	2.3	Complied
Carrier Frequency Stability	15.225 (e)	RSS-210 B.6	2.4	Complied
AC Power Line Conducted Emissions	15.207	RSS-Gen 8.8	2.5	Complied
Antenna requirement	15.203	RSS-Gen 6.8	2.6	Complied

The field strength of spurious emission was measured in three orthogonal EUT positions (X-Plane, Y- Plane and Z- Plane).

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1.6 Setup of equipment under test (EUT)

1.6.1 Test configuration of EUT

The test configuration of the EUT refers to following tables.

Table: EUT

No.	Equipment	Model name	S/N	Note
1-1	RFID READER/WRITER	TR3XM-C106-A3540	0000 0001	Large loop antenna
1-2	RFID READER/WRITER	TR3XM-C106-A3540	0000 0002	Small loop antenna
1-3	RFID READER/WRITER	TR3XM-C106-A3540	0000 0003	Dummy load

The EUT has 2 antennas, Large loop antenna and Small loop antenna. In practice, only one antenna is selected and no two antennas transmit simultaneously.

The tests were conducted with both antennas and the worst case (Large loop antenna) is reported.

Table: Support equipment

No.	Item	Model Name	Manufacturer	S/N
2	Interface board	TR3-IF-1C	TAKAYA Corporation	15080321(F)
3	AC adapter	UN312-0520	UNIFIVE CO., LTD.	G12-0289256
4	PC	IdeaPad 3 15ABA7	Lenovo	PF43JS6Z
5	USB OUTPUT CHARGER	KBC-E1A	SANYO Electric Co., Ltd.	-
6	Battery	HR-3UTGA	SANYO Electric Co., Ltd.	-
7	Jig	-	-	-

Table: Cable connected to the EUT

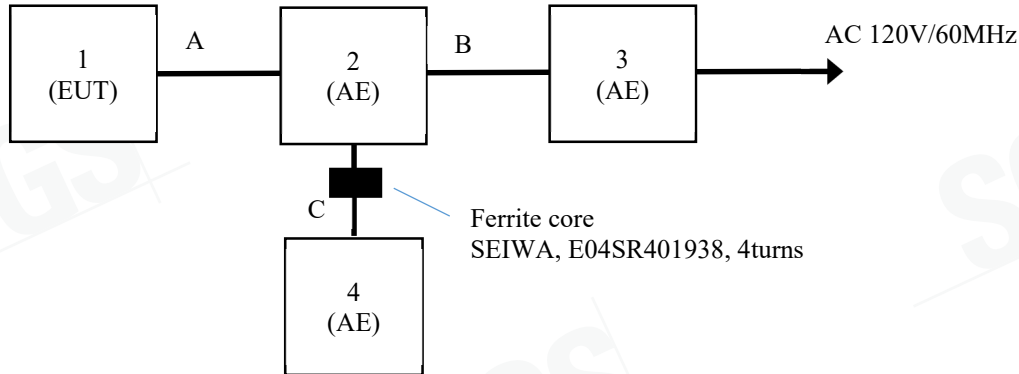
No.	Cable Name	From	To	Length [m]	Shielded	Ferrite
A	Control Signal Cable 1	1	2	0.1	No	No
B	DC Cable 1	2	3	1.5	No	No
C	Control Signal Cable 2	2	4	1.5	Yes	Yes
D	DC Cable 2	1	5	0.3	Yes	No
E	DC Cable 3	1	7	0.8	Yes	No
F	DC Cable 4	7	DC	1.5	No	No
G	USB Cable	4	7	0.5	Yes	No

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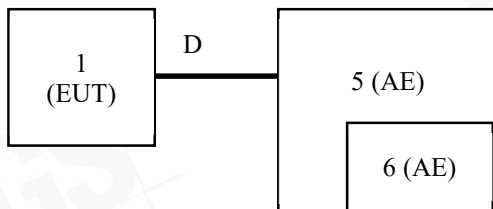
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1.6.2 Setup diagram of tested system:

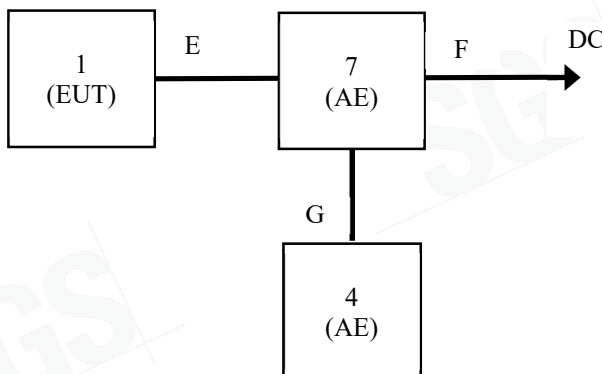
[Configuration 1]



[Configuration 2]



[Configuration 3]



1.6.3 Operating condition:

Operating mode:

Transmission mode (Duty cycle 71.6 %)

The EUT supports ASK 10% and 100% modulations.

The tests were conducted in both modulations and the worst case (ASK 100%) is reported.

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1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

1.8 Deviation from the standard

No deviations from the standards described in clause 1.2.

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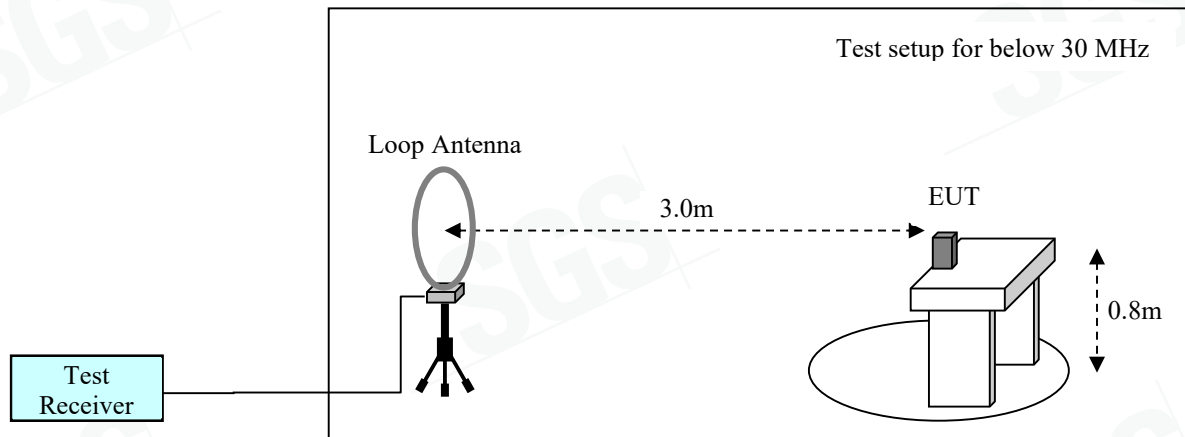
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2 Test procedure and test data

2.1 Occupied Bandwidth (99 %)

Test setup

Test setup diagram is as follows.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 6.9.3

- RBW: 1 to 5 % of OBW
- VBW > 3 x RBW
- Span: OBW x 1.5 to 5
- Trace: Max hold

Limitation

There are no limitations.

The measurement value is used for the emission designator.

Test equipment used (refer to List of utilized test equipment)

AC01	LP06	CL11	TR06		
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Test Date

Tested Date: June 18, 2024

Humidity: 69 %

Temperature: 23 degC

Atmos. Press: 1006 hPa

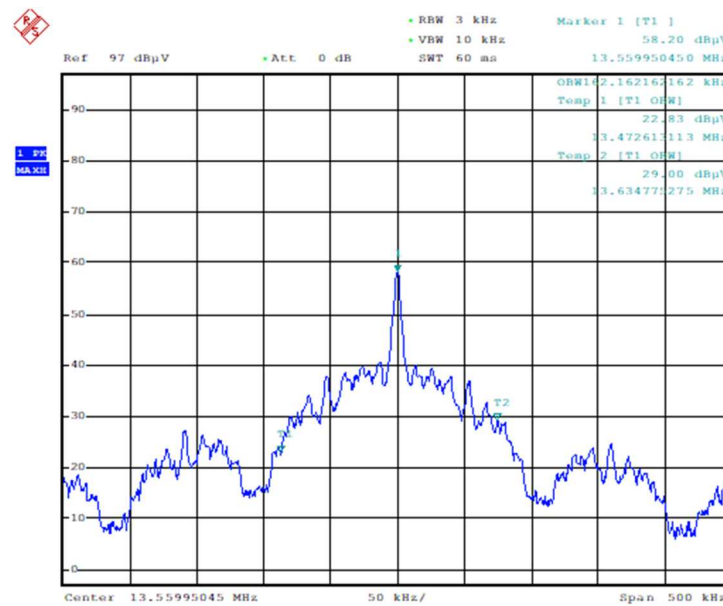
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Test results

Operating mode: Transmission mode
EUT configuration: Configuration 1

Transmission Frequency [MHz]	99% Bandwidth [kHz]
13.56	162.16



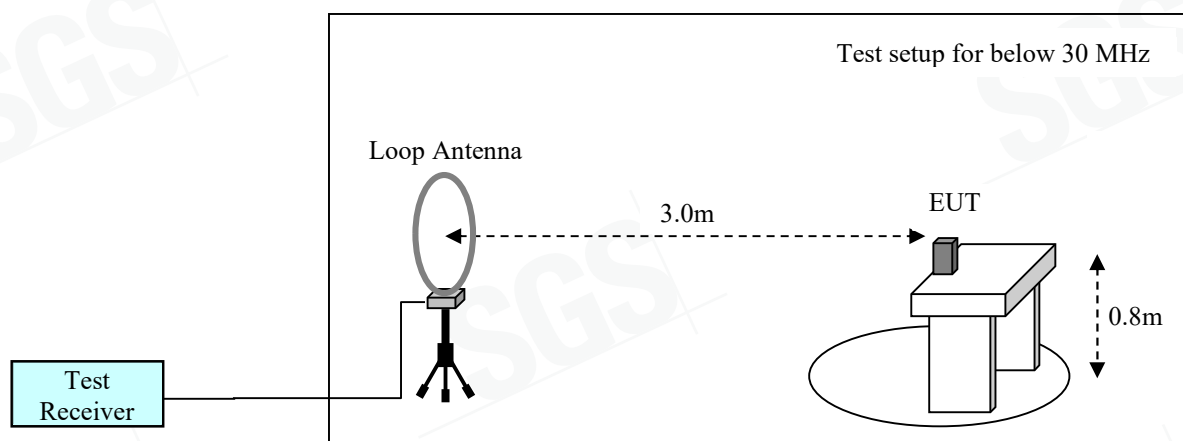
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2.2 Transmitter radiated spurious emissions between 9 kHz to 30 MHz

Test setup

Test setup was implemented according to the method of ANSI C63.10 clause 6.4.



Test procedure

Measurement procedures were implemented according to the method of ANSI C63.10: 2013 clauses 6.4.

The EUT is placed on a non-conducted table which is 0.8m height from a ground plane and the measurement antenna to EUT distance is 3 meters. The turn table is rotated for 360 degrees to determine the maximum emission level.

In the frequency range of 9 kHz to 30 MHz, a calibrated loop antenna was positioned with its plane vertical at the distance 3m from the EUT with an extrapolation of corrected distance factor and rotated about its vertical axis for maximum response at each azimuth about the EUT. For certain applications, the loop antenna also needs to be positioned horizontally. The lowest height of the loop antenna shall be 1 m above the ground.

EUT is placed at three different orientations (X, Y and Z axis) in order to find the worst orientation.

The spectrum analyzer and receiver are set to the followings;

Below 30 MHz:

RBW=10 kHz, VBW= 30 kHz, final measurement is carried out with a receiver RBW of 9 kHz (QP)

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Applicable rule and limitation

§15.205 / RSS-Gen 8.10 restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.490 - 0.510	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(1)

§15.209 / RSS-Gen 8.9 general requirements

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30

In the emission table above, the tighter limit applies at the band edges.

The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz.

Radiated emission limits in the above bands are based on measurements employing an average detector.

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§15.225 / RSS-210 B.6 Operation within the band 13.110 – 14.010 MHz

Frequency (MHz)	Field strength @30m (uV/m)	Field strength @30m (dBuV/m)	Field strength @3m (dBuV/m)
13.110 - 13.410	106	40.5	61.8
13.410 - 13.553	334	50.5	71.8
13.553 - 13.567	15,848	84.0	105.3
13.567 - 13.710	334	50.5	71.8
13.710 - 14.010	106	40.5	61.8

$\text{dBuV/m} = 20 \times \log(\text{uV/m})$, Corrected distance factor (refer to ANSI C63.10 6.4.4.2)

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the above radiated emission limits in § 15.209 / RSS-Gen 8.9.

Test equipment used (refer to List of utilized test equipment)

AC01	LP06	CL11	TR06	
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Test software used

EMI1 Ver. 6.1

Test results - Complied with requirement.

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Test Data

Tested Date: June 18, 2024 Temperature: 23 degC
Humidity: 69 % Atmos. Press: 1006 hPa

§15.225 (a), (b), (c) / RSS-210 B.6 (a) (i), (ii), (iii) Fundamental emission

Operating mode: Transmission mode
EUT configuration: Configuration 1
EUT condition: Z-plane (Maximum condition)
Measurement distance: 3 m

Frequency (MHz)	Reading at 3m (dBuV)	Detector (QP/Ave)	Corr. Factor (dB)	Result (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)	Ant
13.53348	36.7	QP	10.2	46.9	71.8	24.9	0deg
13.55994	55.6	QP	10.2	65.8	105.3	39.5	0deg
13.58633	35.9	QP	10.3	46.2	71.8	25.6	0deg
13.40092	27.5	QP	10.2	37.7	61.9	24.2	90deg
13.53249	40.3	QP	10.2	50.5	71.8	21.3	90deg
13.56000	59.6	QP	10.2	69.8	105.3	35.5	90deg
13.58751	39.5	QP	10.3	49.8	71.8	22.0	90deg
13.72058	24.3	QP	10.2	34.5	61.9	27.4	90deg

Correction Factor [dB] = Antenna Factor [dB/m] + Cable Loss [dB]

Sample calculation at 13.53249 MHz result as follow:

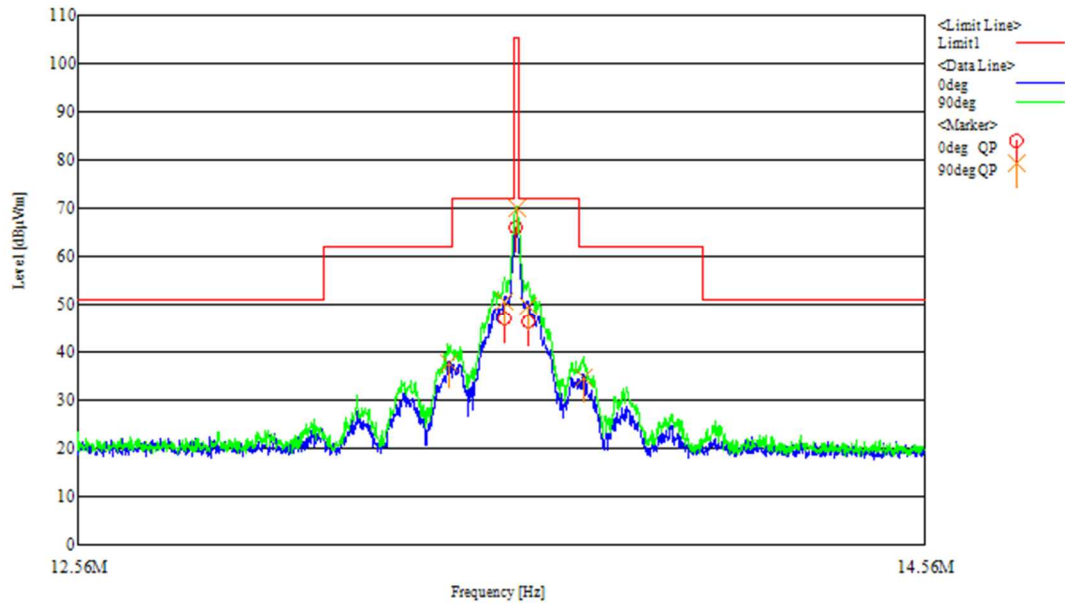
Result [dBuV] = Reading + C.F = 40.3 + 10.2 = 50.5 [dBuV/m]

Margin = Limit – Result = 71.8 – 50.5 = 21.3 [dB]

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[Plot] Fundamental emission, Z-plane (Maximum condition)



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§15.225 (d) / RSS-210 B.6 (a) (iv) Harmonics and spurious emission between 9 kHz to 30MHz

Operating mode: Transmission mode

EUT configuration: Configuration 1

EUT condition: X-plane (Maximum condition)

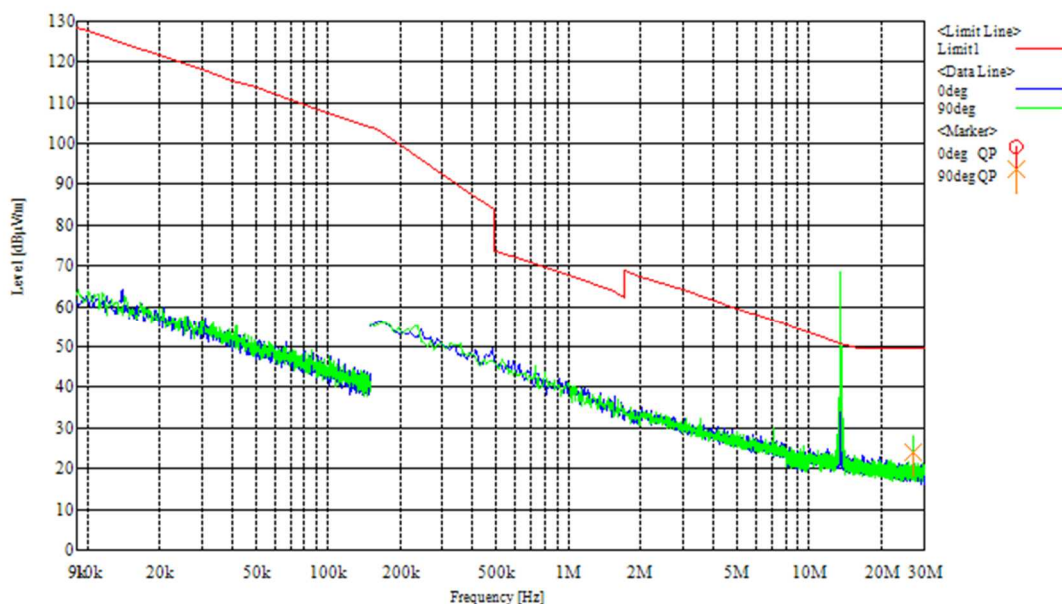
Measurement distance: 3 m

Frequency (MHz)	Reading at 3m (dBuV)	Detector (QP/Ave)	Corr. Factor (dB)	Result (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)	Ant
27.12006	16.5	QP	7.6	24.1	49.5	25.4	90deg
-	-	-	-	-	-	-	-

Correction Factor [dB] = Antenna Factor [dB/m] + Cable Loss [dB]

All other emissions have more than 20 dB margin or are below the noise floor.

[Plot] Harmonics and spurious emission between 9 kHz to 30MHz, X-plane (Maximum condition)



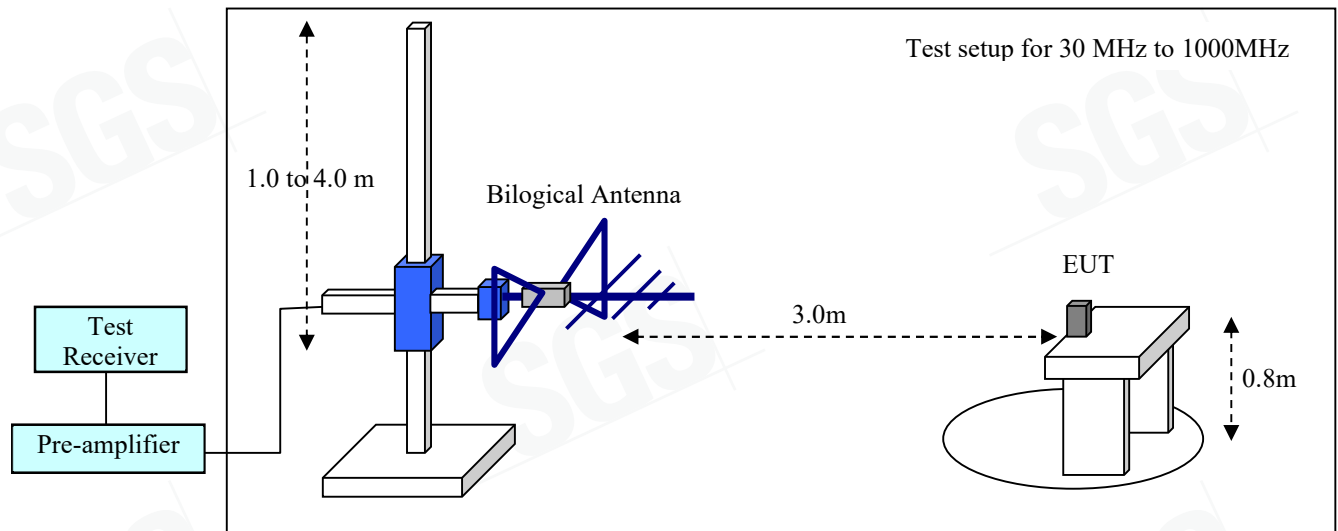
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2.3 Transmitter radiated spurious emissions between 30MHz to 1000MHz

Test setup

Test setup was implemented according to the method of ANSI C63.10 clause 6.



Test procedure

Measurement procedures were implemented according to the method of ANSI C63.10: 2013 clauses 6.5.

Exploratory radiated measurements were performed at the measurement distance of 3 meters using broadband antennas and a spectrum analyzer. The EUT was set up in its typical configuration and arrangement, and operated in its various modes.

For each mode of operation required to be tested, the frequency spectrum were monitored. Variations in antenna height between 1 and 4 m, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) were explored to produce the emission that has the highest amplitude relative to the limit. Based on the exploratory measurement results, the one EUT, cable and wire arrangement, and mode of operation that produces the emission that has the highest amplitude relative to the limit is selected for the final measurement. This investigation was performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. EUT was placed at three different orientations (X, Y and Z axis) in order to find the worst orientation.

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Applicable rule and limitation

§15.209 / RSS-Gen 8.9 general requirements

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Measurement Distance (m)	Field Strength (uV/m)	Field Strength (dBuV/m)
30 – 88	3	100	40.0
88 – 216	3	150	43.5
216 – 960	3	200	46.0
Above 960	3	500	53.9

In the emission table above, the tighter limit applies at the band edges.

The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector.

Test equipment used (refer to List of utilized test equipment)

AC01	CL11	TR06	PR21	BA07			
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Test software used

EMI1 Ver. 6.1

Test results - Complied with requirement.

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Test DataTested Date: June 18, 2024
Humidity: 69 %Temperature: 23 degC
Atmos. Press: 1006 hPaOperating mode: Transmission mode
EUT configuration: Configuration 2
EUT condition: Y-plane (Maximum condition)
Measurement distance: 3 m

§15.225(d) Harmonics and spurious emission between 30MHz to 1000MHz (refer 15.209)

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	216.966	39.4	12.2	8.8	30.2	30.2	46.0	15.8	Hori.
2	230.508	45.3	11.7	8.9	30.2	35.7	46.0	10.3	Hori.
3	260.708	42.8	12.7	9.1	30.2	34.4	46.0	11.6	Hori.
4	325.425	41.7	13.8	9.6	30.2	34.9	46.0	11.1	Hori.
5	488.152	34.0	17.1	10.7	30.2	31.6	46.0	14.4	Hori.
6	515.290	33.6	17.1	10.9	30.2	31.4	46.0	14.6	Hori.

Calculation method

The Correction Factors and RESULT are calculated as followings.

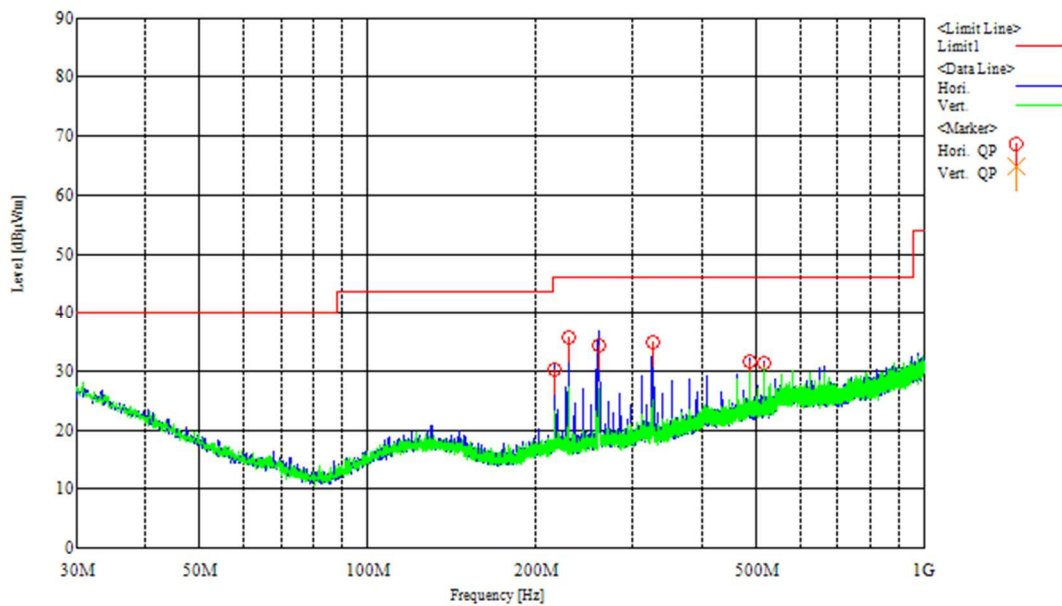
Correction Factor [dB/m] = FACTOR [dB/m] + CABLE LOSS [dB] – GAIN [dB]

RESULT [dBuV/m] = READING [dBuV] + Correction Factor [dB/m]

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[Plot] Harmonics and spurious emission between 30MHz to 1000MHz, Y-plane (Maximum condition)



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2.4 Frequency stability

Test setup

Test setup was implemented according to the method of ANSI C63.10: 2013 clauses 6.8 “Frequency stability tests”.

Test procedure

Measurement procedures were implemented according to the test method of ANSI C63.10: 2013 clause 6.8.1.

Place the de-energized EUT in the temperature test chamber. Supply the EUT with nominal ac voltage, or install a new or fully charged battery in the EUT. An antenna was connected to the antenna output connector of the EUT if possible.

The frequency counter was connected to the measurement antenna with a suitable length of coaxial cable.

The environmental chamber set to the highest temperature specified in applicable regulation.

Allow sufficient time (approximately 30 minutes) for the temperature of the chamber to stabilize.

Turn the EUT on and measure the EUT operating frequency at startup, and two, five, and ten minutes after startup.

The measurements were performed that the temperature chamber set to reduce the lowest temperature specified in applicable regulation.

Applicable rule and limitation

§15.225 (e) / RSS-210 B.6 (b) : Frequency tolerance

Test items	Variation ranges		Limit
Temperature variations	-20 to +50 degrees C	3.3 -10% ~ 5 +10% V DC *	+/-0.01%

Note1: The above operating range is declared by manufacturer.

Test equipment used (refer to List of utilized test equipment)

TR06	TC01	TH10	
------	------	------	--

Test results - Complied with requirement.

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Test Data

Tested Date: June 19, 2024 Temperature: 21 degC
Humidity: 61 % Atmos. Press: 1006 hPa

Operating mode: Transmission mode
EUT configuration: Configuration 3

Temp. (Degrees)	Voltages (V)	Measured Frequency (MHz)				Worst Deviation (%)	Limit (%)
		Start-up	2 min.	5 min.	10 min.		
-20	4	13.5600750	13.5600750	13.5600750	13.5600750	0.00055	+/-0.01
-10	4	13.5600945	13.5600960	13.5600960	13.5600960	0.00071	+/-0.01
0	4	13.5600885	13.5600810	13.5600795	13.5600795	0.00065	+/-0.01
10	4	13.5600605	13.5600470	13.5600455	13.5600455	0.00045	+/-0.01
20	5.5	13.5600440	13.5600260	13.5600260	13.5600245	0.00032	+/-0.01
	4	13.5600260	13.5600095	13.5600080	13.5600070	0.00019	+/-0.01
	2.97	13.5599680	13.5599695	13.5599695	13.5599695	-0.00024	+/-0.01
30	4	13.5599560	13.5599515	13.5599515	13.5599515	-0.00036	+/-0.01
40	4	13.5599245	13.5599100	13.5599085	13.5599100	-0.00067	+/-0.01
50	4	13.5598905	13.5598805	13.5598800	13.5598800	-0.00089	+/-0.01

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2.5 AC power line conducted emissions

Test setup

Test setup was implemented according to the method of ANSI C63.10: 2013 clause 6.2.

Test procedure

Measurement procedures were implemented according to the method of ANSI C63.10: 2013 clauses 6.2 “Standard test method for ac power line conducted emissions from unlicensed wireless devices”.

Exploratory measurements were used the spectrum analyzer to identify the frequency of the emission that has the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable positions, and with a typical system equipment configuration and arrangement.

Final ac power line conducted emission measurements were performed based on the exploratory tests.

The EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit are selected for the final measurement.

When the measurement value is greater than average limitation the average detection measurements were performed.

Applicable rule and limitation

§15.207 (a) / RSS-Gen 8.8: AC power line conducted emissions limits

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency. The lower limit applies at the band edges.

Test equipment used (refer to List of utilized test equipment)

TR09	CL72	LN05				
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Test software used

EMI Ver. 6.1

Test results - Complied with requirement.

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Test Data

Tested Date: June 20, 2024 Temperature: 25 degC
Humidity: 57 % Atmos. Press: 1006 hPa

Operating mode: Transmission mode (with the antenna connected)
EUT configuration: Configuration 1

No.	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Margin		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
1	0.308	18.8	11.4	10.1	28.9	21.5	60.0	50.0	31.1	28.5	Va
2	13.560	70.0	66.4	10.3	80.3	76.7	60.0	50.0	-20.3	-26.7	Va
3	27.120	36.7	21.8	10.6	47.3	32.4	60.0	50.0	12.7	17.6	Va
4	0.165	21.1	10.8	10.3	31.4	21.1	65.2	55.2	33.8	34.1	Vb
5	0.324	20.1	11.9	10.1	30.2	22.0	59.6	49.6	29.4	27.6	Vb
6	0.495	12.0	4.6	10.1	22.1	14.7	56.1	46.1	34.0	31.4	Vb
7	13.560	70.1	66.5	10.4	80.5	76.9	60.0	50.0	-20.5	-26.9	Vb
8	27.119	37.4	22.5	10.7	48.1	33.2	60.0	50.0	11.9	16.8	Vb

The power line conducted emission voltage is calculated by adding the LISN factor and Cable loss attenuation from the measured reading. The calculation is as follows:

Result = Reading + C. F
where C.F = LISN Factor + Cable Loss [dB]

Operating mode: Transmission mode (with dummy load)
EUT configuration: Configuration 1

No.	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Margin		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
1	13.560	3.7	-1.6	10.3	14.0	8.7	60.0	50.0	46.0	41.3	Va
2	13.560	3.8	-1.5	10.4	14.2	8.9	60.0	50.0	45.8	41.1	Vb

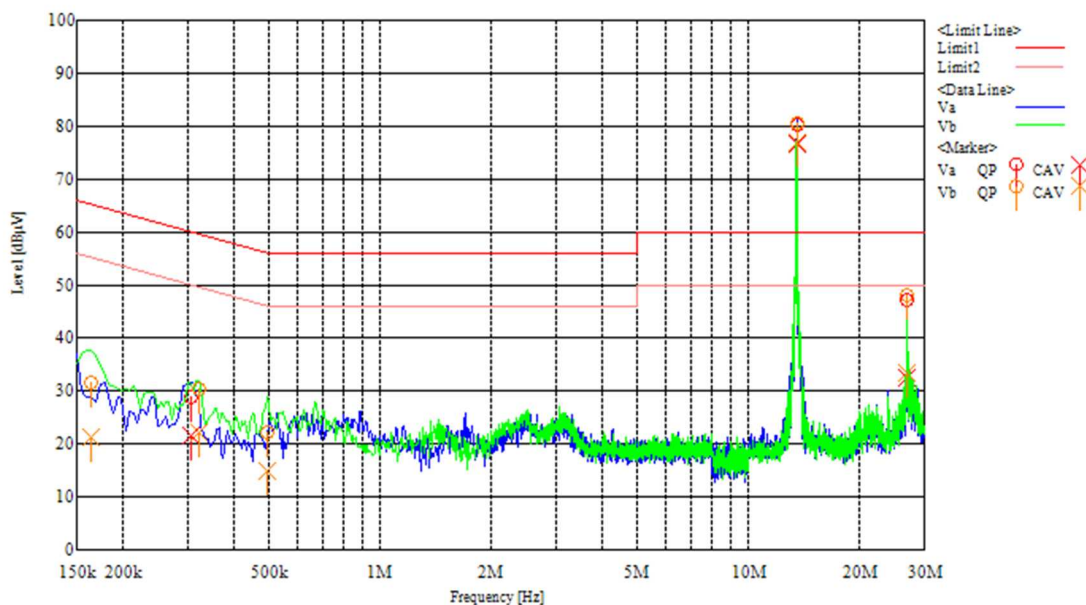
The retest results with a dummy load shown above indicate that the emissions within the transmitter's fundamental emission band are in compliance with Section 15.207 limits, in accordance with KDB 174176 Line Conducted FAQs v01r01.

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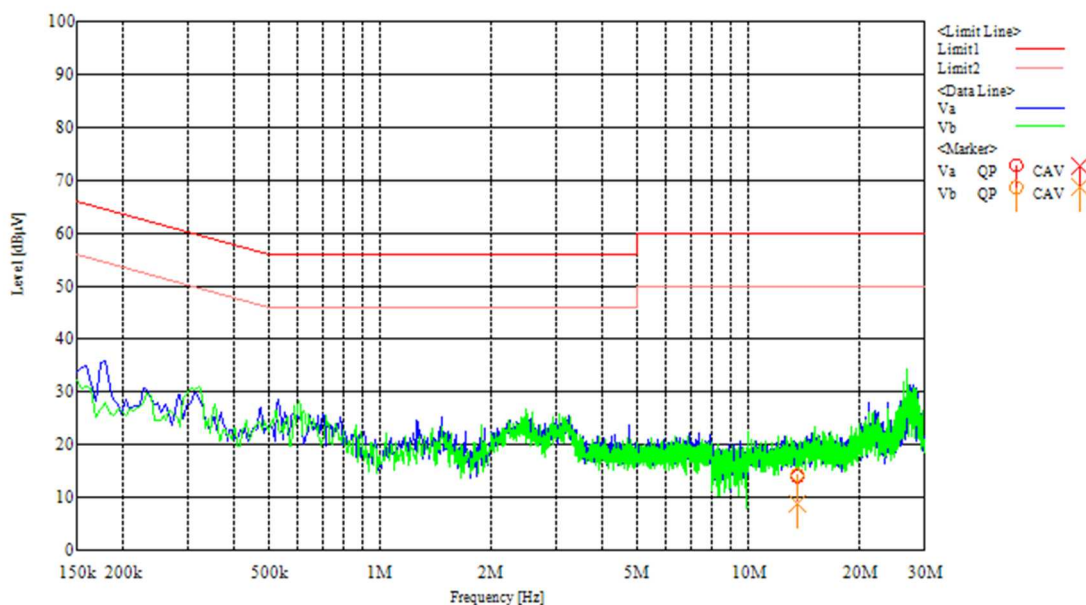
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[Plot] AC power line conducted emissions (0.15 MHz-30MHz)

With antenna connected



With dummy load



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2.6 Antenna requirement

Applicable rule and limitation

§15.203 / RSS-Gen 6.8: Antenna requirements

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

Results – Complied with requirement

EUT uses no other antenna than the following antennas which are permanently attached to the EUT, and no two antennas transmit simultaneously.

The EUT therefore complies with the requirements of this clause.

No.	Antenna type	Antenna gain
1	Loop antenna (Large)	-65.7 dBi
2	Loop antenna (Small)	-75.0 dBi

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4 List of utilized test equipment/ calibration

RFT ID No.	Kind of Equipment and Precision	Manufacturer	Model No.	Serial Number	Calibration Date	Calibrated until
AC01(EM)	Anechoic Chamber (1st test room)	JSE	203397C	-	2024/03/29	2025/03/31
BA07	Biological Antenna	TESEQ	CBL6143A	26670	2024/03/11	2025/03/31
CL11	Antenna Cable for RE	RFT	-	-	2024/03/05	2025/03/31
CL72	Antenna Cable for CE	RFT	-	-	2024/01/17	2025/01/31
LP06	Loop Antenna	ETS-Lindgren	6502	00164299	2023/10/20	2024/10/31
LN05	LISN	Kyoritsu	KNW-407F	8-1773-2	2023/09/26	2024/09/30
PR21	Pre. Amplifier	Anritsu	MH648A	6200467119	2024/03/12	2025/03/31
TR06	Test Receiver (F/W : 4.73 SP4)	Rohde & Schwarz	ESU26	100002	2023/12/15	2024/12/31
TR09	Test Receiver (F/W : 4.43 SP3)	Rohde & Schwarz	ESU8	100386	2023/09/28	2024/09/30
AT17	Attenuator	JFW	50HF-006N	AT17	2024/03/05	2025/03/31
TH10	Temp/Humi meter	rotronic	HC-IC102	61641228	2023/12/15	2024/12/31
TC01	Temperature Chamber	ESPEC	SH-641	92000964	-	-

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

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