

EMC Test Report

Applicant : Cermate Technologirs Inc.
Product Type : Human machine interface
Trade Name : Cermate
Model Number : PT2043-WSK, CT2043-WSK, eV2043-WSK, FC2043-WSK, FE2043-WSK, FT043-WSK, GT2043-WSK, HT2043-WSK, KT2043-WSK, LT2043-WSK, LUI043-WSK, MG-2043-WSK, MMPT2043-WSK, MT2043-WSK, NT2043-WSK, OP2043-WSK, OT2043-WSK, RT2043-WSK, TU2043-WSK, UT2043-WSK, VT2043-WSK, WT2043-WSK, xPT2043-WSK, XT2043-WSK, PT2043-WSP, CT2043-WSP, eV2043-WSP, FC2043-WSP, FE2043-WSP, FT043-WSP, GT2043-WSP, HT2043-WSP, KT2043-WSP, LT2043-WSP, LUI043-WSP, MG-2043-WSP, MMPT2043-WSP, MT2043-WSP, NT2043-WSP, OP2043-WSP, OT2043-WSP, RT2043-WSP, TU2043-WSP, UT2043-WSP, VT2043-WSP, WT2043-WSP, xPT2043-WSP, XT2043-WSP, NT2043-WSP10
Applicable Standard : ICES-003: Issue 7
ANSI C63.4: 2014
Received Date : Jun. 04, 2021
Test Period : Jun. 10, 2021
Issued Date : Jun. 28, 2021

Issued by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade District,
Taoyuan City 33465, Taiwan (R.O.C.)
Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Foundation accreditation number: 1330

Test Firm IC Registration number: 7381A

Certified Scope: 9 kHz ~ 40 GHz

Note:

- 1.The test results are valid only for samples provided by customers and under the test conditions described in this report.
- 2.This report shall not be reproduced except in full, without the written approval of A Test Lab Technology Corporation.
- 3.The relevant information is provided by customers in this test report. According to the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error in the information which affects the validity of the test results, the laboratory does not take the responsibility.



Revision History

Rev.	Issued Date	Revisions	Revised By
00	Jun. 28, 2021	Initial Issue	Nina Lin

Verification of Compliance

Applicant : Cermate Technologirs Inc.

Product Type : Human machine interface

Trade Name : Cermate

Model Number : PT2043-WSK, CT2043-WSK, eV2043-WSK, FC2043-WSK, FE2043-WSK, FT043-WSK, GT2043-WSK, HT2043-WSK, KT2043-WSK, LT2043-WSK, LUI043-WSK, MG-2043-WSK, MMPT2043-WSK, MT2043-WSK, NT2043-WSK, OP2043-WSK, OT2043-WSK, RT2043-WSK, TU2043-WSK, UT2043-WSK, VT2043-WSK, WT2043-WSK, xPT2043-WSK, XT2043-WSK, PT2043-WSP, CT2043-WSP, eV2043-WSP, FC2043-WSP, FE2043-WSP, FT043-WSP, GT2043-WSP, HT2043-WSP, KT2043-WSP, LT2043-WSP, LUI043-WSP, MG-2043-WSP, MMPT2043-WSP, MT2043-WSP, NT2043-WSP, OP2043-WSP, OT2043-WSP, RT2043-WSP, TU2043-WSP, UT2043-WSP, VT2043-WSP, WT2043-WSP, xPT2043-WSP, XT2043-WSP, NT2043-WSP10

EUT Rated Voltage : INPUT : DC 21.6~26.4 V
OUTPUT : DC 5 V

Test Voltage : 120 Vac / 60 Hz, 240 Vac / 60 Hz

Applicable Standard : ICES-003: Issue 7
ANSI C63.4: 2014

Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade District,
Taoyuan City 33465, Taiwan (R.O.C.)
Tel : +886-3-2710188 / Fax : +886-3-2710190

Taiwan Accreditation Foundation accreditation number: 1330
<http://www.atl-lab.com.tw/e-index.htm>

The above equipment has been tested by A Test Lab Techno Corp., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved By : Terry Liao
(Manager) (Terry Liao)

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1 General Information

1.1. Summary of Test Requirement

Emission			
Standard	Item	Result	Remark
ICES-003: 3.2.1 ANSI C63.4	Conducted Emission	PASS	Meet Class A limit
ICES-003: 3.2.2 ANSI C63.4	Radiated Emission	PASS	Meet Class A limit

Decision Rule

- ☒ Uncertainty is not included.
☐ Uncertainty is included.

1.2. Testing Location

Site Name: A Test Lab Techno Corp.

<http://www.atl-lab.com.tw/e-index.htm>

Site Address: No. 140-1, Changan Street, Bade District, Taoyuan City 33465, Taiwan (R.O.C.)

Tel : +886-3-2710188

Fax : +886-3-2710190

1.3. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty (dB)
Conducted Emission	AC Power Port	9 kHz ~ 150 kHz	± 2.7
		150 kHz ~ 30 MHz	± 2.7

Test Item	Test Site	Frequency Range		Uncertainty (dB)
Radiated Emission	TE06	30 MHz ~ 1000 MHz	Horizontal	± 4.4
			Vertical	± 4.5
	TE01	30 MHz ~ 1000 MHz		± 5.0
		1000 MHz ~ 6000 MHz		± 5.2
		6000 MHz ~ 18000 MHz		± 5.5
		18000 MHz ~ 26500 MHz		± 4.8
		26500 MHz ~ 40000 MHz		± 5.4
	TE09	30 MHz ~ 1000 MHz		± 5.1
		1000 MHz ~ 6000 MHz		± 5.0
		6000 MHz ~ 18000 MHz		± 5.3
		18000 MHz ~ 26500 MHz		± 4.5
		26500 MHz ~ 40000 MHz		± 5.4
Note: The Vertical and Horizontal measurement uncertainty of 1 GHz to 40 GHz is evaluated and choose which polarity is worst value.				

1.4. Test Site Environment

Test Item	Items	Required (IEC 60068-1)	Actual
ICES-003 Section 6.1 Conducted Emission	Temperature (°C)	15-35	15-30
	Humidity (%RH)	25-75	45-75
	Barometric pressure (mbar)	860-1060	990-1005
ICES-003 Section 6.2 Radiated Emission	Temperature (°C)	15-35	15-30
	Humidity (%RH)	25-75	45-75
	Barometric pressure (mbar)	860-1060	990-1005

2 EUT Description

Applicant	Cermate Technologirs Inc. 7F-1, No.168, Lien Cheng Rd., Chung-Ho District, New Taipei City, Taiwan 235
Manufacturer	Cermate Technologirs Inc. 7F-1, No.168, Lien Cheng Rd., Chung-Ho District, New Taipei City, Taiwan 235
Product Type	Human machine interface
Trade Name	Cermate
Model Number	PT2043-WSK, CT2043-WSK, eV2043-WSK, FC2043-WSK, FE2043-WSK, FT043-WSK, GT2043-WSK, HT2043-WSK, KT2043-WSK, LT2043-WSK, LUI043-WSK, MG-2043-WSK, MMPT2043-WSK, MT2043-WSK, NT2043-WSK, OP2043-WSK, OT2043-WSK, RT2043-WSK, TU2043-WSK, UT2043-WSK, VT2043-WSK, WT2043-WSK, xPT2043-WSK, XT2043-WSK, PT2043-WSP, CT2043-WSP, eV2043-WSP, FC2043-WSP, FE2043-WSP, FT043-WSP, GT2043-WSP, HT2043-WSP, KT2043-WSP, LT2043-WSP, LUI043-WSP, MG-2043-WSP, MMPT2043-WSP, MT2043-WSP, NT2043-WSP, OP2043-WSP, OT2043-WSP, RT2043-WSP, TU2043-WSP, UT2043-WSP, VT2043-WSP, WT2043-WSP, xPT2043-WSP, XT2043-WSP, NT2043-WSP10
Difference description of model number	Difference is due to selling region.
I/O Ports	Refer to User Manual
Highest Operating Frequency	300 MHz

3 Test Methodology

3.1. Decision of Test Mode

3.1.1. The following test mode(s) were scanned during the preliminary test:

Pre-Test Mode	
Mode 1: Normal Operation Mode (120 V / 60 Hz)	
Mode 2: Normal Operation Mode (240 V / 60 Hz)	

3.1.2. After the preliminary scan, the following test mode was final mode and found to produce the highest emission level.

Final Test Mode			
Emission	Conducted Emission		Mode 1 / Mode 2
	Radiated Emission	Below 1 GHz	Mode 1 / Mode 2
		Above 1 GHz	Mode 1 / Mode 2

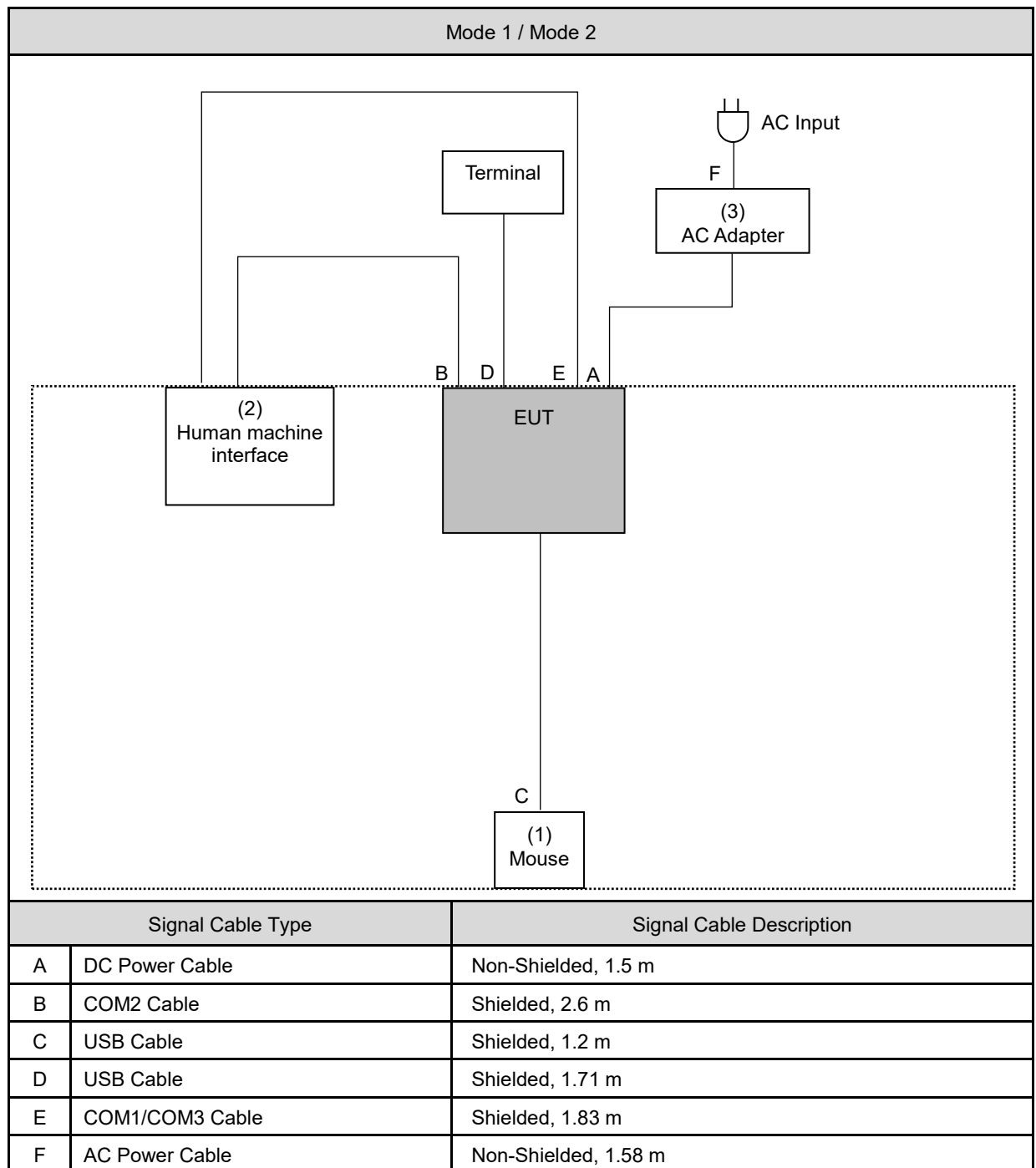
The above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

3.2. EUT Test Step

1.Setup the EUT and simulators as shown on 3.3.
2.Turn on the power of all equipment.
3.Connected Human machine interface and transfer data(Read/Write).
4.Start to test till get the worst reading.

Measurement Software			
No.	Description	Software	Version
1	Conducted Emission	EZ EMC	1.1.4.3
2	Radiated Emission _ Below 1 GHz	EZ EMC	1.1.4.2
3	Radiated Emission _ Above 1 GHz	EZ EMC	1.1.4.4

3.3. Configuration of Test System Details





Devices Description					
Product		Manufacturer	Model Number	Serial Number	Power Cord
(1)	Mouse	DELL	MOCZL	CN-049 TWY-73826-63N015S	Power by EUT
(2)	Human machine interface	Cermate	PT2043-WSK	N/A	Non-Shielded, 1.5 m
(3)	AC Adapter	MEAN WELL	SE-100-24	N/A	Non-Shielded, 1.5 m

3.4. Test Instruments

Test Period : Jun. 10, 2021

Testing Engineer : Shenglung Wen

Conducted Emission test site					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Test Receiver	R&S	ESCI	100367	05/21/2021	1 year
LISN	R&S	ENV216	101040	03/29/2021	1 year
LISN	R&S	ENV216	101041	04/08/2021	1 year
Cable	Woken	00100D1380194M	TE-02-03 (CB-098)	05/28/2021	1 year
Test Site	ATL	TE02	TE02	N.C.R.	-----

Test Period : Jun. 10, 2021

Testing Engineer : Jary Huang

Radiated Emission - 10 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Amplifier	EMCI	EMC9135	980298	11/02/2020	1 year
Amplifier	EMCI	EMC9135	980299	11/30/2020	1 year
Test Receiver	R&S	ESCI	100722	10/28/2020	1 year
Test Receiver	R&S	ESCI	101000	11/27/2020	1 year
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	670	11/11/2020	1 year
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	671	11/26/2020	1 year
RF Cable	EMC	EMC102-N-N-6000	TE06-H-1	02/15/2021	1 year
RF Cable	EMC	EMC102-N-N-7000	TE06-H-2	02/15/2021	1 year
RF Cable	EMC	EMC102-N-N-3000	TE06-H-3	02/15/2021	1 year
RF Cable	EMC	EMC102-N-N-1000	TE06-H-4	02/15/2021	1 year
RF Cable	EMC	EMC102-N-N-7000	TE06-V-2	02/15/2021	1 year
RF Cable	EMC	EMC102-N-N-3000	TE06-V-3	02/15/2021	1 year
RF Cable	EMC	EMC102-N-N-1000	TE06-V-4	02/15/2021	1 year
RF Cable	EMC	EMC104-N-N-6000	TE06-V-5	02/15/2021	1 year
Test Site	ATL	TE06	TE06	10/18/2020	1 year

Note: N.C.R. = No Calibration Request.



Test Period : Jun. 10, 2021

Testing Engineer : Travis Kuo, Jason Chen

Radiated Emission - 3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Keysight	N9010A	MY52221312	01/18/2021	1 year
Amplifier (1-26.5 GHz)	EMCI	EMC012645SE	980289	01/15/2021	1 year
Double Ridged Horn Antenna (1-18 GHz)	ETS	3117	00128055	09/10/2020	1 year
Microwave Cable	SUHNER	suflex104	313229/4	02/19/2021	1 year
Microwave Cable	EMCI	EMC104-SM-SM-13000	170814	02/19/2021	1 year
Test Site(VSWR)	ATL	TE01	TE01	08/08/2020	1 year

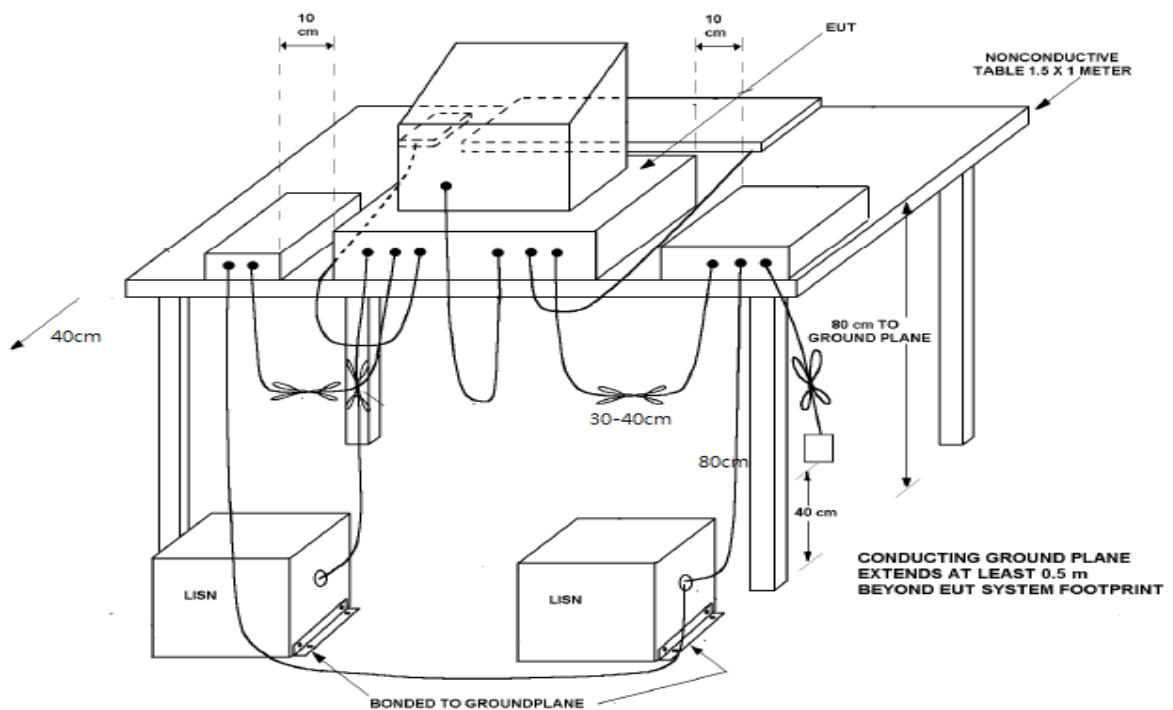
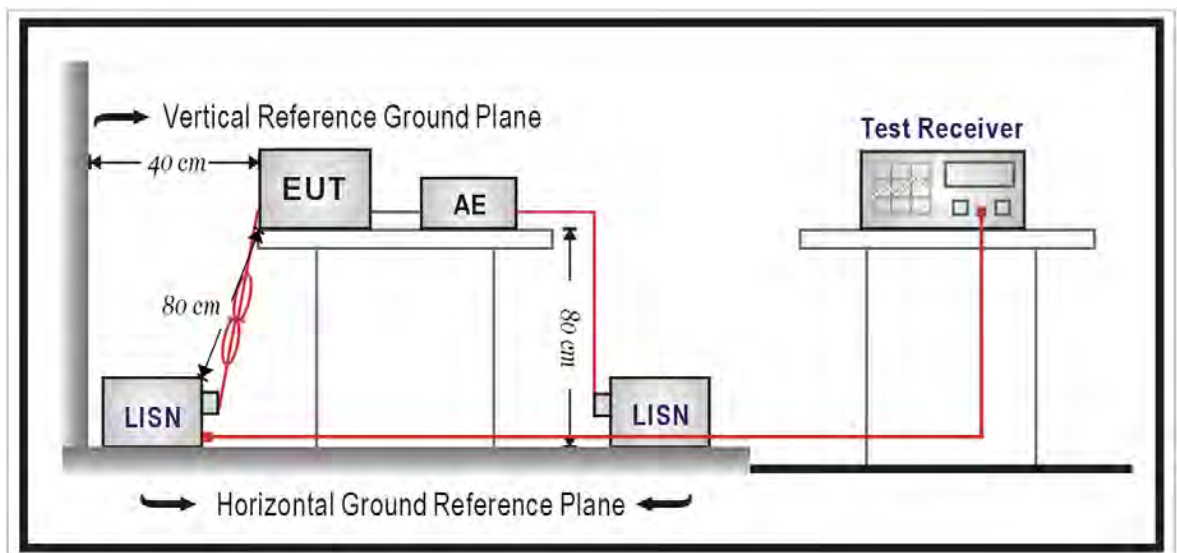
Note: N.C.R. = No Calibration Request.

4 Measurement Procedure

4.1. Conducted Emission

4.1.1. Test Setup

A.C. mains setup



4.1.2. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a $50\ \Omega // 50\ \mu\text{H}$ coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a $50\ \Omega // 50\ \mu\text{H}$ coupling impedance with 50 ohm termination.

Tabletop device shall be placed on a non-conducting platform, of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The wall of screened room shall be located 40 cm to the rear of the EUT. Other surfaces of tabletop or floor standing EUT shall be at least 80 cm from any other ground conducting surface including one or more LISNs. For floor-standing device shall be placed under the EUT with a 12 mm insulating material.

Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a resolution bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1.1, as applicable, including the average limit and the quasi-peak limit when using respectively, an average detector and quasi-peak detector measured in accordance with the methods described of related standard. When all of peak value were complied with quasi-peak and average limit from 150 kHz to 30 MHz then quasi-peak and average measurement was unnecessary.

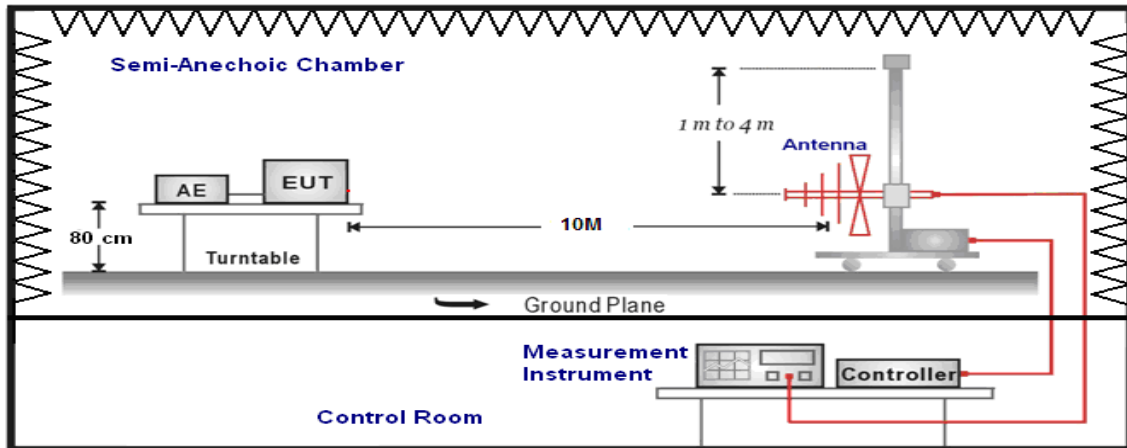
The AMN shall be placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for AMNs mounted on top of the ground reference plane. This distance is between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment shall be at least 0,8 m from the AMN. If the mains power cable is longer than 1m then the cable shall be folded back and forth at the centre of the lead to form a bundle no longer than 0.4m. All of interconnecting cables that hang closer than 40cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long. All of EUT and AE shall be separate place more than 0.1 m. All $50\ \Omega$ ports of the LISN shall be resistively terminated into $50\ \Omega$ loads when not connected to the measuring instrument.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

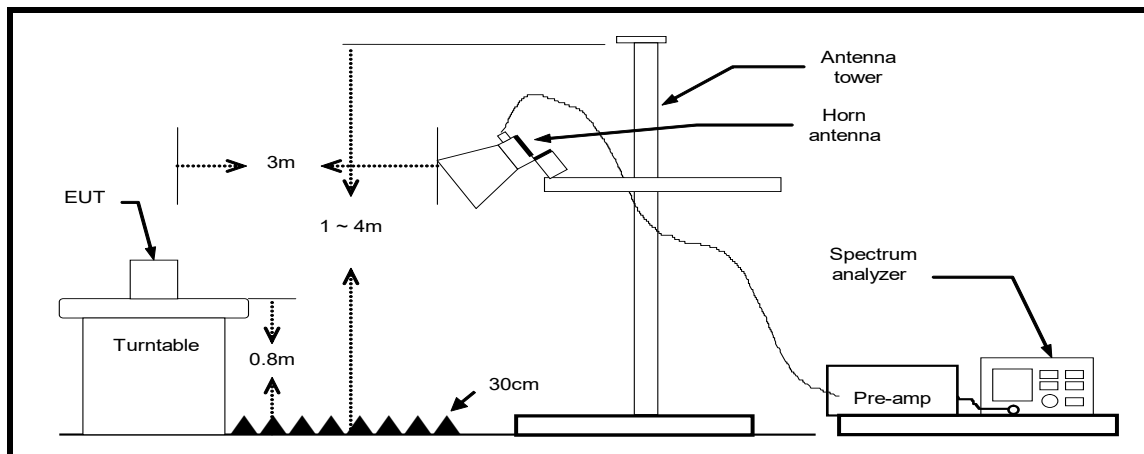
4.2. Radiated Emission

4.2.1. Test Setup

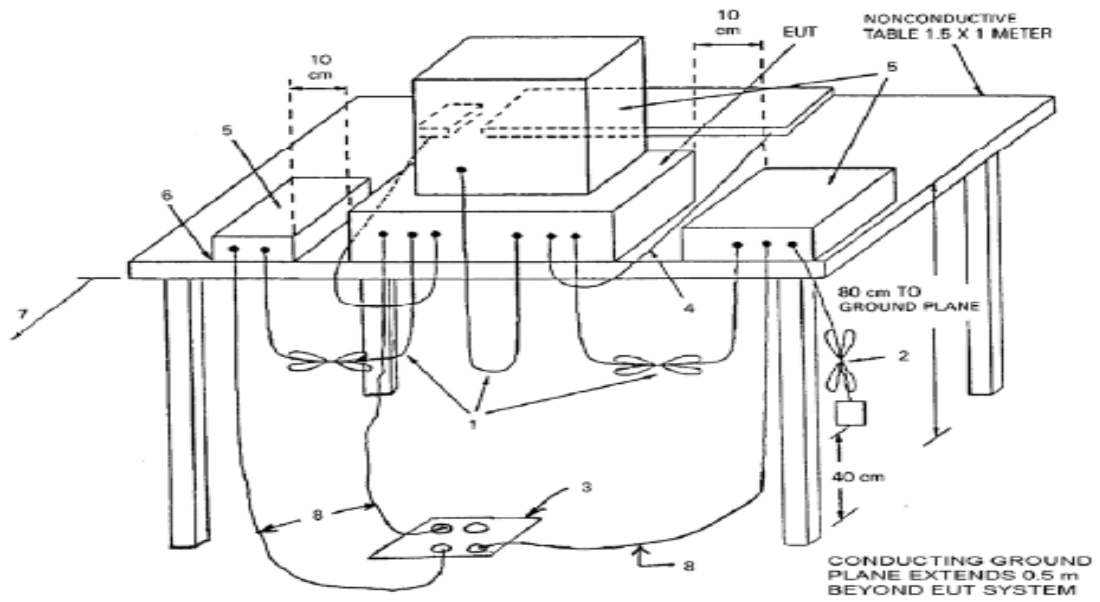
Below 1 GHz



Above 1 GHz



Test arrangement for radiated emissions of tabletop equipment.



4.2.2. Test Procedure

Below 1 GHz

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. When the EUT is floor-standing equipment, it is placed on the ground plane which has a 12 mm non-conductive covering to insulate the EUT from the ground plane.

The turn table is 0.8 m height and 2.0 m wide x 1.0 m deep size. It can rotate 360 degrees to determine the position of the maximum emission level. The spacing between the each equipment was 10 cm. The mains cables are dropped to floor and are round to receptacle. Interconnecting cables of table top equipment that hang closer than 0.4 m to the ground plane are folded back and forth forming a bundle 0.3 m to 0.4 m long, hanging approximately in the middle between ground plane and table. The EUT was positioned such that the distance from antenna to the EUT was 10 meters and the receive antenna was moved from 1 m to 4 m to investigate maximum highest emission at least 6 points over the frequency range from 30 MHz to 1 GHz using a resolution bandwidth of 120 kHz and measured by the quasi-peak detector.

According to this standard paragraph 15.109, as an alternative to the radiated emission limits, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement".

Above 1 GHz

The Setup is same as Below 1 GHz placement. The turn table is 0.8m height and 1.8 m wide x 1.0 m deep size. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meter for above 1 GHz, the highest frequency performed according to internal source frequency of the EUT, the specification was below:

Highest frequency (F_x) generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
$F_x \leq 108$	1000
$108 < F_x \leq 500$	2000
$500 < F_x \leq 1000$	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Absorber shall be spread between floor of a turn table and a receive antenna shown in 4.2.3. The antenna used boresight antenna master from 1 meter and 4 meters to find out the maximum emission level and find the highest emission at least 6 points. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

Radiated emissions were applied to above 1 GHz using a resolution bandwidth of 1 MHz and measured by the peak and average detector which antenna to the EUT distance was 3 meters. If the EUT was meet both limits and measurement with the average detector receiver is unnecessary.

5 Test Result

5.1. Conducted Emission

■ Limit

A.C. Mains Conducted Emission Limit

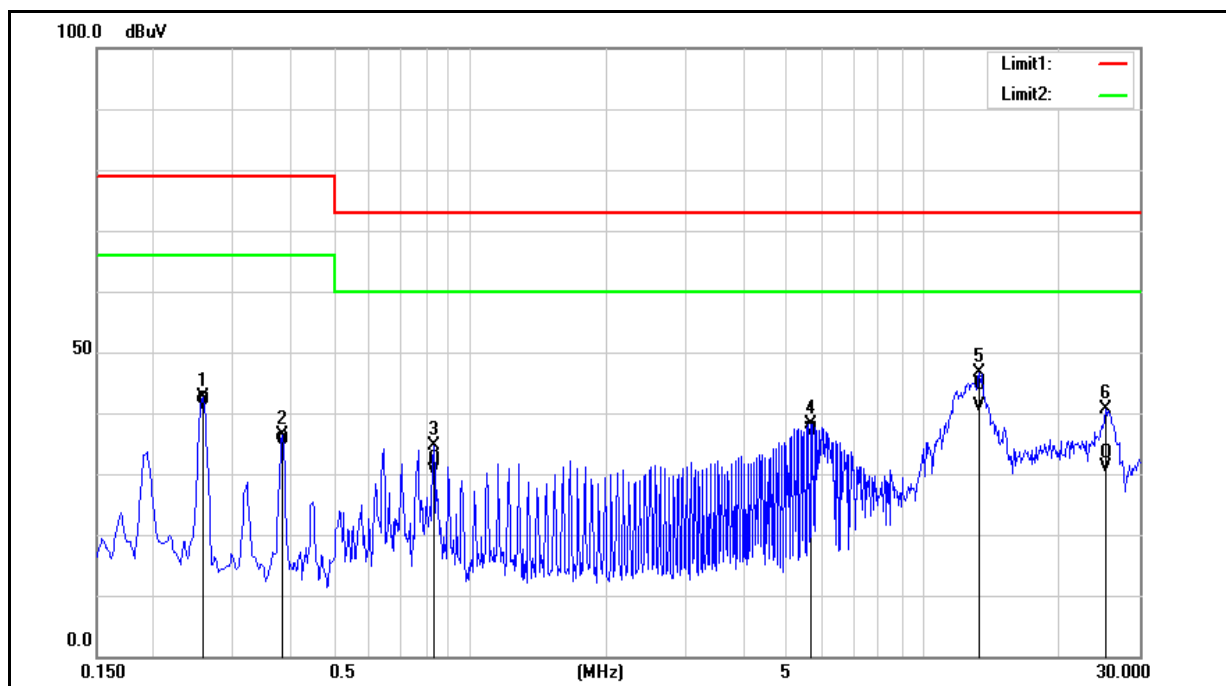
Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

■ Test Result

Test Standard:	ICES-003	Power Line:	L1
Test Mode:	Mode 1	Test Power:	AC 120 V / 60 Hz
Description:			

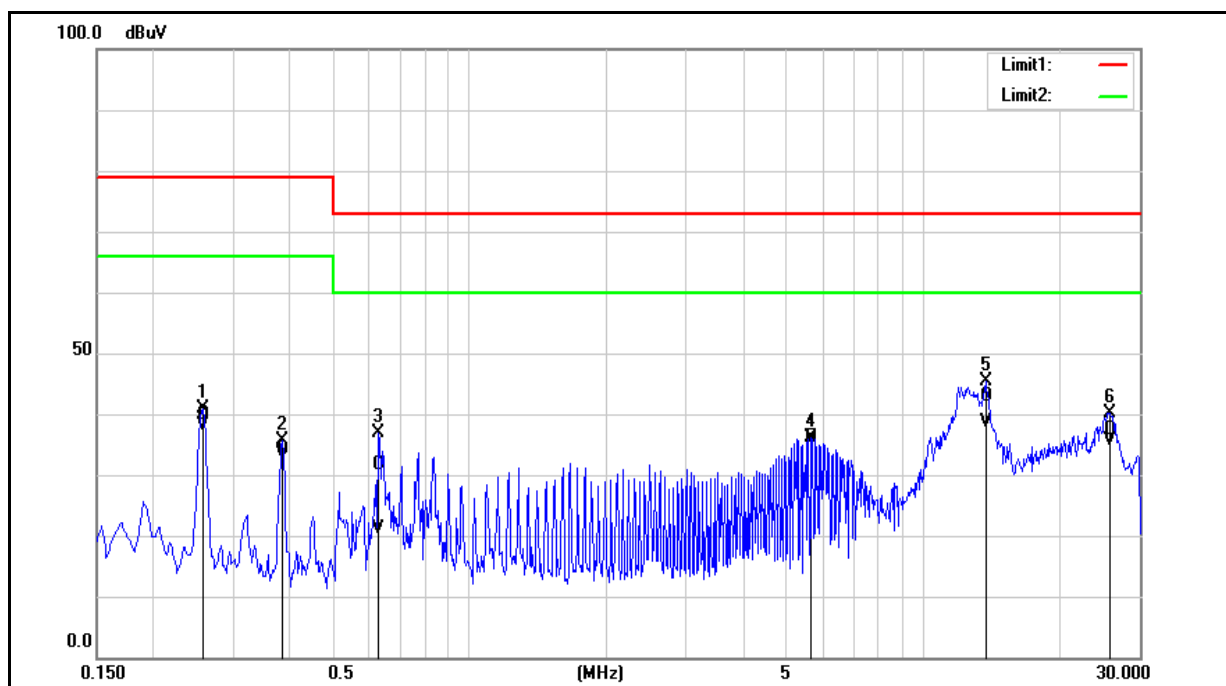


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.2580	32.46	31.53	9.75	42.21	41.28	79.00	66.00	-36.79	-24.72	Pass
2	0.3860	25.78	25.32	9.75	35.53	35.07	79.00	66.00	-43.47	-30.93	Pass
3	0.8340	22.58	20.69	9.77	32.35	30.46	73.00	60.00	-40.65	-29.54	Pass
4	5.6420	27.30	27.29	9.91	37.21	37.20	73.00	60.00	-35.79	-22.80	Pass
5	13.3340	34.55	31.14	10.03	44.58	41.17	73.00	60.00	-28.42	-18.83	Pass
6	25.2580	23.24	21.00	10.07	33.31	31.07	73.00	60.00	-39.69	-28.93	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Test Standard:	ICES-003	Power Line:	N
Test Mode:	Mode 1	Test Power:	AC 120 V / 60 Hz
Description:			

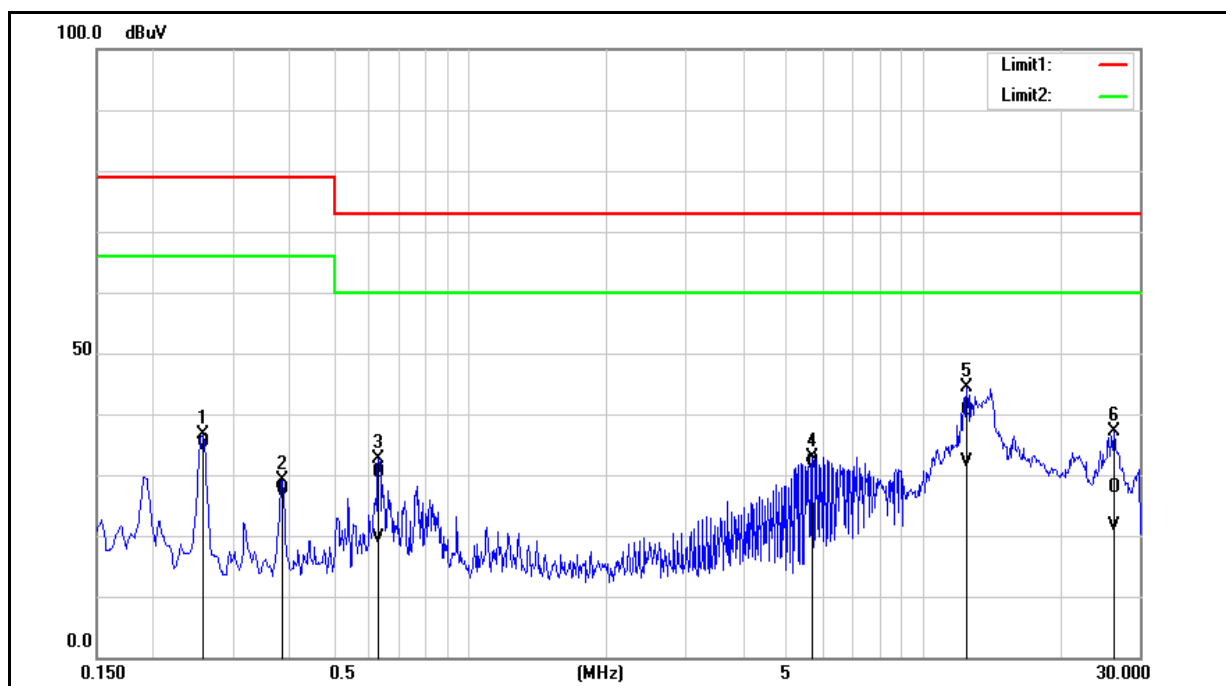


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.2580	30.18	28.29	9.74	39.92	38.03	79.00	66.00	-39.08	-27.97	Pass
2	0.3860	24.41	23.56	9.74	34.15	33.30	79.00	66.00	-44.85	-32.70	Pass
3	0.6300	21.94	11.49	9.75	31.69	21.24	73.00	60.00	-41.31	-38.76	Pass
4	5.6340	26.12	26.10	9.92	36.04	36.02	73.00	60.00	-36.96	-23.98	Pass
5	13.7060	32.75	28.51	10.10	42.85	38.61	73.00	60.00	-30.15	-21.39	Pass
6	25.7460	27.14	25.35	10.25	37.39	35.60	73.00	60.00	-35.61	-24.40	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Test Standard:	ICES-003	Power Line:	L1
Test Mode:	Mode 2	Test Power:	AC 240 V / 60 Hz
Description:			

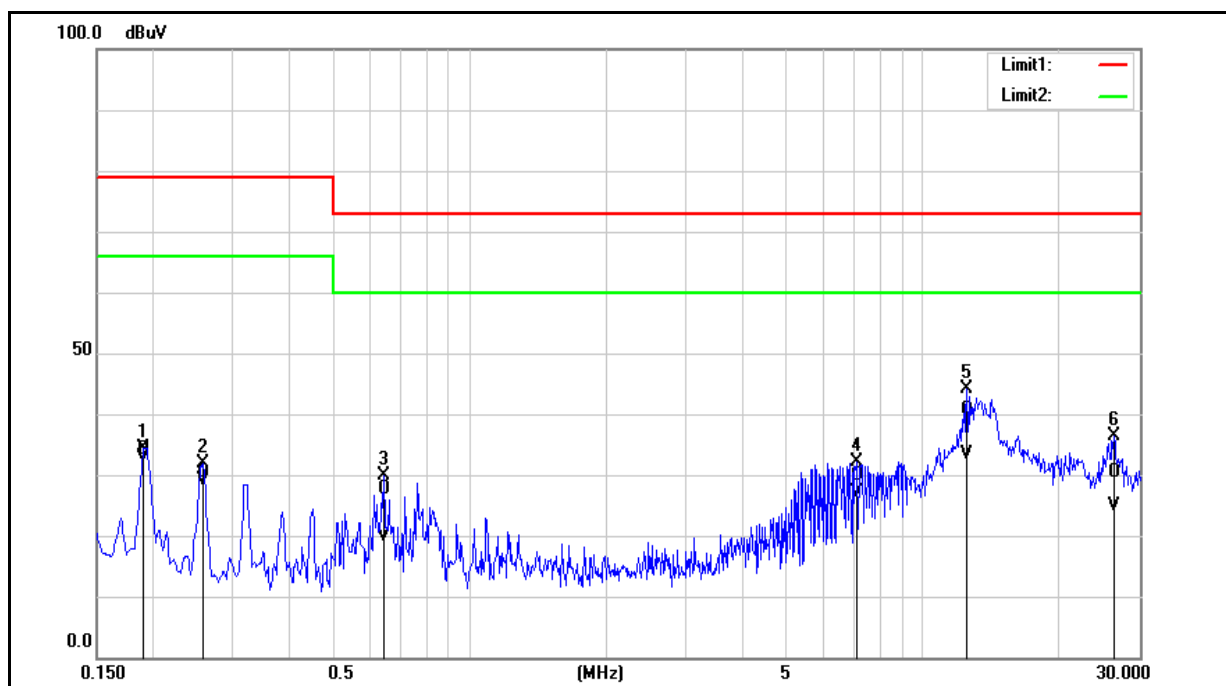


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.2580	25.71	25.04	9.74	35.45	34.78	79.00	66.00	-43.55	-31.22	Pass
2	0.3860	17.94	17.22	9.74	27.68	26.96	79.00	66.00	-51.32	-39.04	Pass
3	0.6300	20.58	10.00	9.75	30.33	19.75	73.00	60.00	-42.67	-40.25	Pass
4	5.6940	22.16	21.35	9.92	32.08	31.27	73.00	60.00	-40.92	-28.73	Pass
5	12.4780	30.46	22.04	10.07	40.53	32.11	73.00	60.00	-32.47	-27.89	Pass
6	26.3660	17.68	11.49	10.26	27.94	21.75	73.00	60.00	-45.06	-38.25	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Test Standard:	ICES-003	Power Line:	N
Test Mode:	Mode 2	Test Power:	AC 240 V / 60 Hz
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1900	24.30	23.26	9.74	34.04	33.00	79.00	66.00	-44.96	-33.00	Pass
2	0.2580	20.56	19.45	9.74	30.30	29.19	79.00	66.00	-48.70	-36.81	Pass
3	0.6460	17.98	10.21	9.75	27.73	19.96	73.00	60.00	-45.27	-40.04	Pass
4	7.1020	19.84	17.22	9.96	29.80	27.18	73.00	60.00	-43.20	-32.82	Pass
5	12.4740	30.50	23.21	10.07	40.57	33.28	73.00	60.00	-32.43	-26.72	Pass
6	26.3540	20.18	14.74	10.26	30.44	25.00	73.00	60.00	-42.56	-35.00	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

5.2. Radiated Emission

■ Limit

Under 1 GHz test shall not exceed following value

ICES-003								
Frequency range (MHz)	Class A				Class B			
	Distance (m)	dBuV/m	Distance (m)	dBuV/m	Distance (m)	dBuV/m	Distance (m)	dBuV/m
30 to 88	3	50	10	40	3	40	10	30
88 to 216	3	54	10	43.5	3	43.5	10	33.1
216 to 230	3	56.9	10	46.4	3	46	10	35.6
230 to 960	3	57	10	47	3	47	10	37
Above 960	3	60	10	49.5	3	54	10	43.5

Above 1 GHz test shall not exceed following value

Frequency (MHz)	dBuV/m (Distance 3m)			
	Class A		Class B	
	Average	Peak	Average	Peak
1000 ~ 40000	60	80	54	74

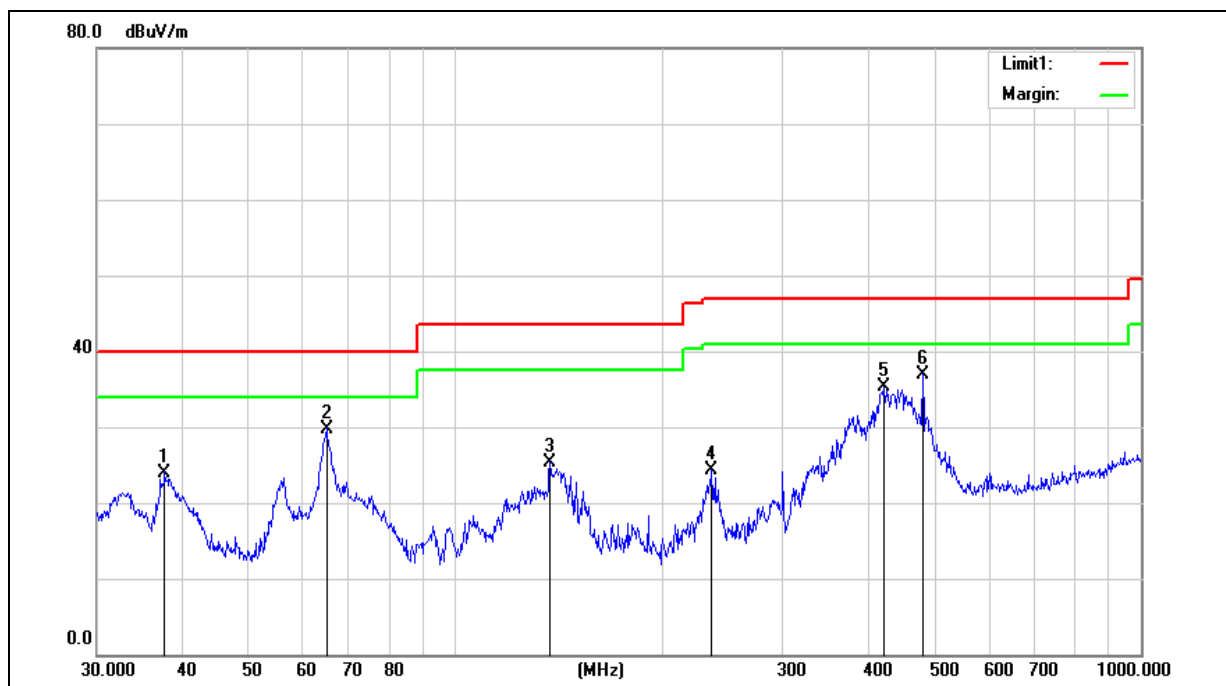
- Remark:
1. The tighter limit shall apply at the edge between two frequency bands.
 2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 3. RF Voltage (dBuV/m) = $20 \log \text{RF Voltage } (\mu\text{V/m})$
 4. Peak detector limit is corresponding to 20 dB above the maximum permitted average limit.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency (F_x) generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
$F_x \leq 108$	1000
$108 < F_x \leq 500$	2000
$500 < F_x \leq 1000$	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

■ Test Result

Test Standard:	ICES-003	Test Distance:	10 m
Test Mode:	Mode 1	Test Power:	AC 120 V / 60 Hz
Measurement Range:	30 MHz~1 GHz	Ant.Polar.:	Horizontal



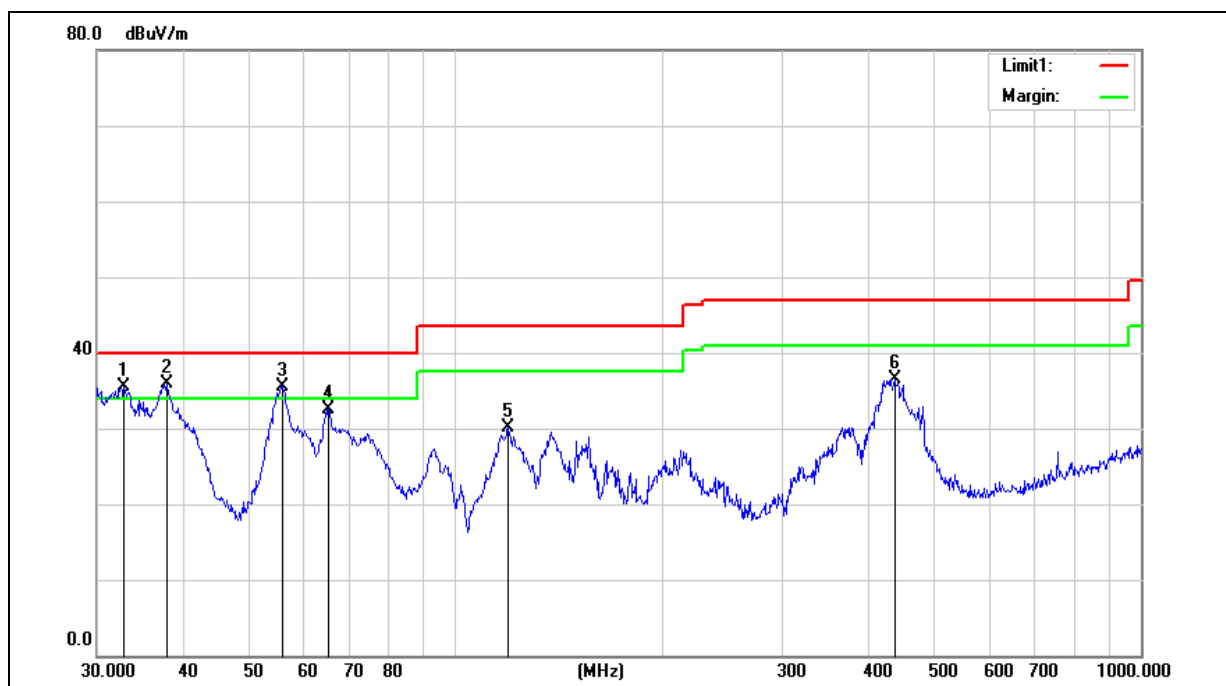
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	37.6798	42.01	-18.01	24.00	40.00	-16.00	399	126	QP
2	64.8865	48.23	-18.43	29.80	40.00	-10.20	200	158	QP
3	137.4202	42.64	-17.24	25.40	43.50	-18.10	399	290	QP
4	236.6447	42.37	-18.07	24.30	47.00	-22.70	399	144	QP
5	422.0577	48.13	-12.83	35.30	47.00	-11.70	200	51	QP
6	480.5276	48.50	-11.50	37.00	47.00	-10.00	200	51	QP

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

Example: 24.00 = -18.01 + 42.01

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	ICES-003	Test Distance:	10 m
Test Mode:	Mode 1	Test Power:	AC 120 V / 60 Hz
Measurement Range:	30 MHz~1 GHz	Ant.Polar.:	Vertical



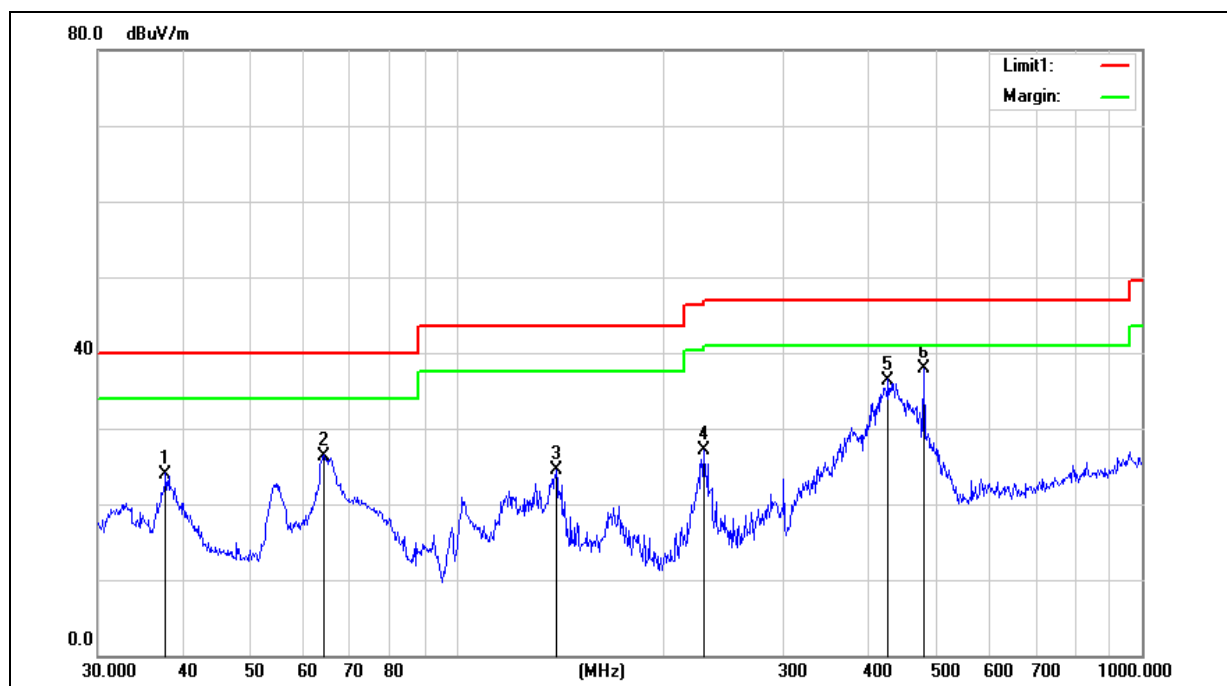
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	32.8637	53.69	-18.19	35.50	40.00	-4.50	199	99	QP
2	37.9450	53.01	-17.11	35.90	40.00	-4.10	399	129	QP
3	56.0007	52.31	-16.71	35.60	40.00	-4.40	100	23	QP
4	65.3432	50.18	-17.58	32.60	40.00	-7.40	100	9	QP
5	119.4361	48.02	-17.92	30.10	43.50	-13.40	100	105	QP
6	437.1200	46.93	-10.43	36.50	47.00	-10.50	100	333	QP

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

Example: $35.50 = -18.19 + 53.69$

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	ICES-003	Test Distance:	10 m
Test Mode:	Mode 2	Test Power:	AC 240 V / 60 Hz
Measurement Range:	30 MHz~1 GHz	Ant.Polar.:	Horizontal

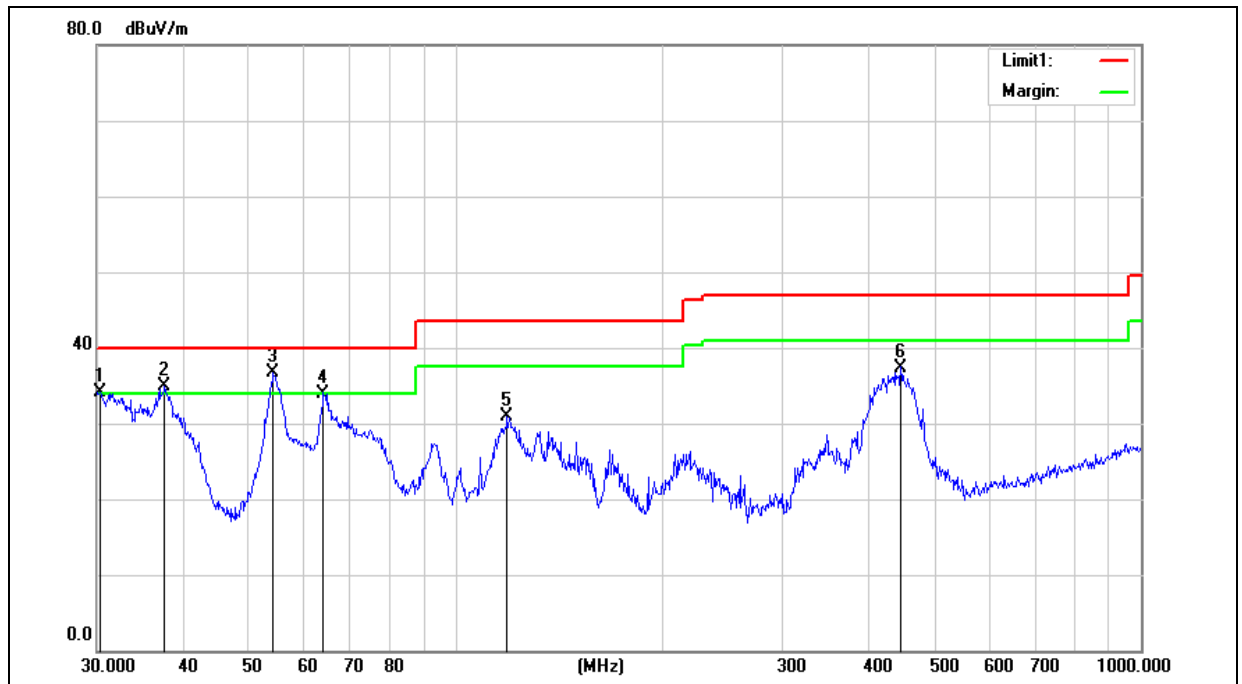


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	37.6798	42.01	-18.01	24.00	40.00	-16.00	399	131	QP
2	64.2074	44.70	-18.30	26.40	40.00	-13.60	200	161	QP
3	139.8508	41.60	-17.00	24.60	43.50	-18.90	300	265	QP
4	229.2931	45.88	-18.78	27.10	46.40	-19.30	399	341	QP
5	426.5210	49.09	-12.69	36.40	47.00	-10.60	200	40	QP
6	480.5276	49.50	-11.50	38.00	47.00	-9.00	200	30	QP

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	ICES-003	Test Distance:	10 m
Test Mode:	Mode 2	Test Power:	AC 240 V / 60 Hz
Measurement Range:	30 MHz~1 GHz	Ant.Polar.:	Vertical

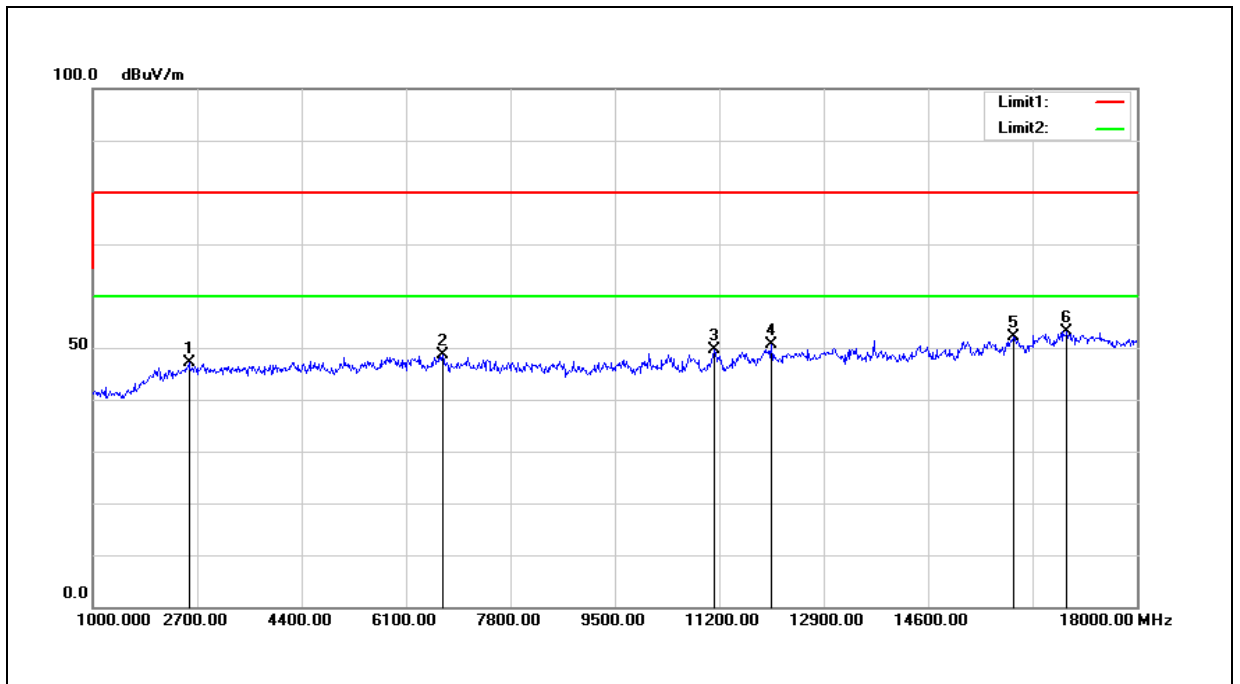


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	30.3173	52.19	-18.09	34.10	40.00	-5.90	199	351	QP
2	37.6798	52.07	-17.17	34.90	40.00	-5.10	299	183	QP
3	54.2610	53.46	-16.76	36.70	40.00	-3.30	100	66	QP
4	64.2074	51.34	-17.34	34.00	40.00	-6.00	243	0	QP
5	119.0180	48.93	-18.03	30.90	43.50	-12.60	100	117	QP
6	446.4141	47.58	-10.18	37.40	47.00	-9.60	100	341	QP

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	ICES-003	Test Distance:	3 m
Test Mode:	Mode 1	Test Power:	AC 120 V / 60 Hz
Measurement Range:	1 GHz~18 GHz	Ant.Polar.:	Horizontal



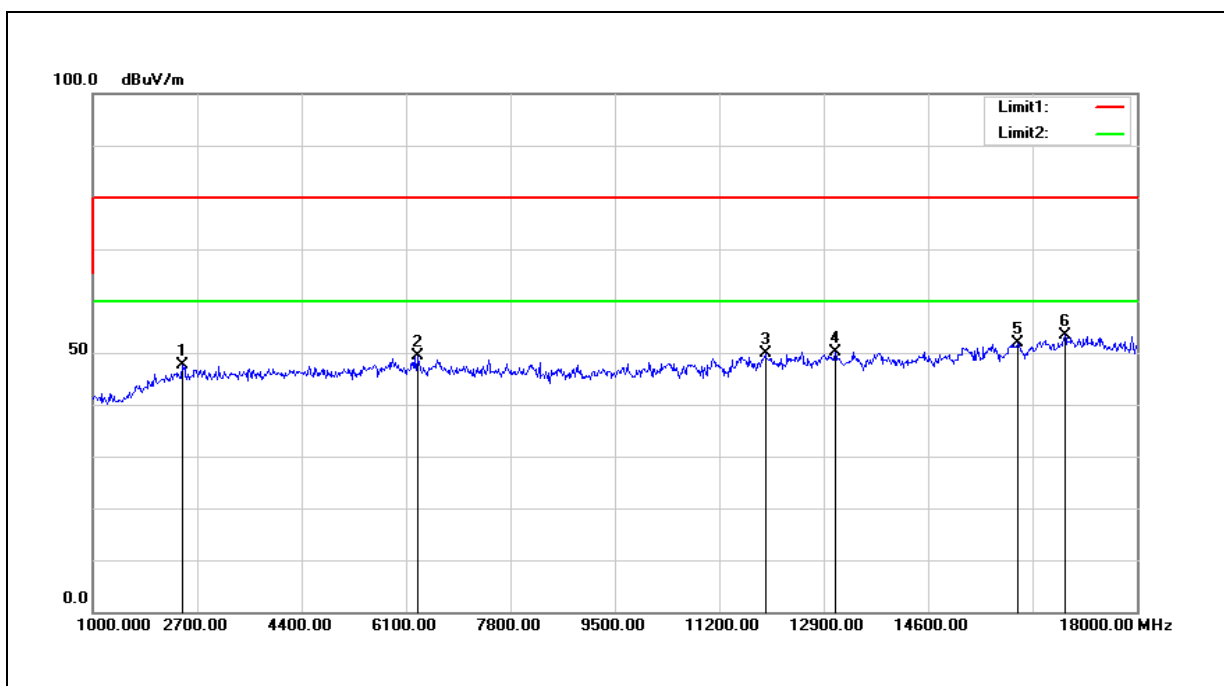
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2564.000	55.58	-8.41	47.17	80.00	-32.83	200	203	peak
2	6695.000	50.76	-2.13	48.63	80.00	-31.37	200	122	peak
3	11115.000	46.28	3.43	49.71	80.00	-30.29	200	146	peak
4	12050.000	45.63	5.10	50.73	80.00	-29.27	100	173	peak
5	15994.000	42.78	9.31	52.09	80.00	-27.91	100	284	peak
6	16861.000	41.98	11.17	53.15	80.00	-26.85	200	297	peak

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

Example: $47.17 = -8.41 + 55.58$

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	ICES-003	Test Distance:	3 m
Test Mode:	Mode 1	Test Power:	AC 120 V / 60 Hz
Measurement Range:	1 GHz~18 GHz	Ant.Polar.:	Vertical



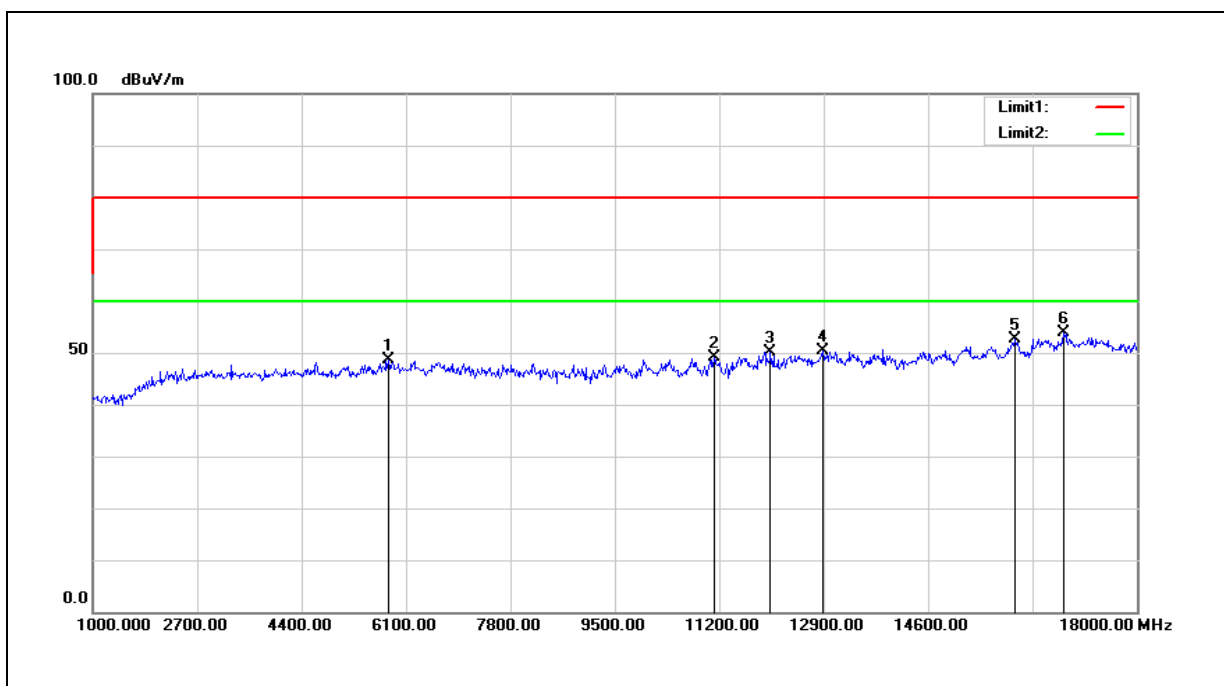
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2462.000	56.27	-8.61	47.66	80.00	-32.34	200	161	peak
2	6287.000	52.03	-2.67	49.36	80.00	-30.64	100	168	peak
3	11948.000	44.94	4.98	49.92	80.00	-30.08	200	126	peak
4	13087.000	44.31	5.89	50.20	80.00	-29.80	200	358	peak
5	16062.000	42.39	9.48	51.87	80.00	-28.13	200	126	peak
6	16827.000	42.29	11.14	53.43	80.00	-26.57	100	319	peak

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

Example: $47.66 = -8.61 + 56.27$

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	ICES-003	Test Distance:	3 m
Test Mode:	Mode 2	Test Power:	AC 240 V / 60 Hz
Measurement Range:	1 GHz~18 GHz	Ant.Polar.:	Horizontal

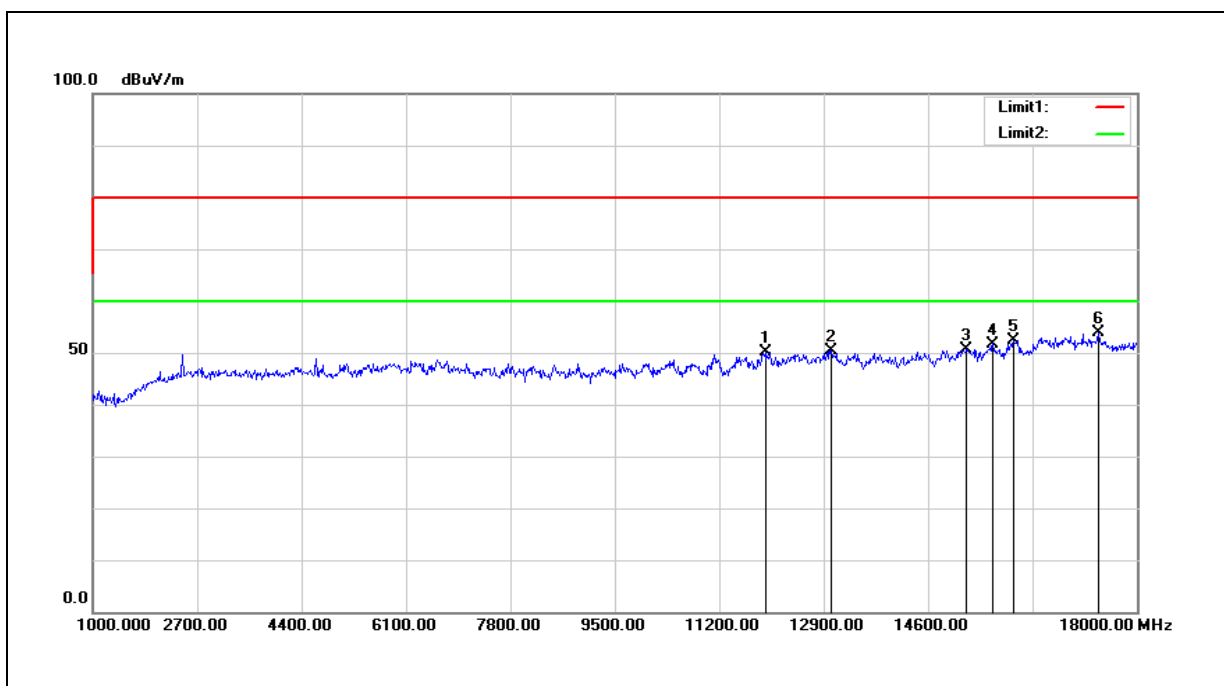


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5811.000	52.23	-3.61	48.62	80.00	-31.38	100	237	peak
2	11115.000	45.77	3.43	49.20	80.00	-30.80	200	52	peak
3	12033.000	45.01	5.09	50.10	80.00	-29.90	100	5	peak
4	12883.000	44.64	5.69	50.33	80.00	-29.67	100	22	peak
5	16011.000	43.41	9.34	52.75	80.00	-27.25	200	29	peak
6	16810.000	42.87	11.11	53.98	80.00	-26.02	100	214	peak

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	ICES-003	Test Distance:	3 m
Test Mode:	Mode 2	Test Power:	AC 240 V / 60 Hz
Measurement Range:	1 GHz~18 GHz	Ant.Polar.:	Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	11948.000	45.19	4.98	50.17	80.00	-29.83	100	360	peak
2	13019.000	44.46	5.85	50.31	80.00	-29.69	100	360	peak
3	15229.000	42.07	8.45	50.52	80.00	-29.48	200	149	peak
4	15654.000	42.67	9.08	51.75	80.00	-28.25	200	354	peak
5	15994.000	43.01	9.31	52.32	80.00	-27.68	100	157	peak
6	17371.000	43.18	10.63	53.81	80.00	-26.19	187	360	peak

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

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