FCC Test Report

Report No.:	RFBEBU-WTW-P21081017-1
FCC ID:	E8HSA203H
Test Model:	SA203H
Received Date:	2021/7/2
Test Date:	2021/9/17 ~ 2021/10/8
Issued Date:	2021/10/20
Applicant:	Chicony Electronics Co., Ltd.
Address:	No.69, Sec. 2, Guangfu Rd., Sanchong Dist., New Taipei City 241, Taiwan(R.O.C.)
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
FCC Registration / Designation Number:	198487 / TW2021

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Release Control Record

Issue No.	Description	Date Issued
RFBEBU-WTW-P21081017-1	Original release	2021/10/20

1 Certificate of Conformity

Product:	Active Stylus SA203H
Brand:	ASUS
Test Model:	SA203H
Sample Status:	Engineering sample
Applicant:	Chicony Electronics Co., Ltd.
Test Date:	2021/9/17 ~ 2021/10/8
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.209) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Annie Chang , **Date:** 2021/10/20

Annie Chang / Senior Specialist

Approved by : Rex. Lai , **Date:** 2021/10/20

Rex Lai / Associate Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.209)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -18.56dB at 3.35200MHz
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -4.45dB at 44.55MHz

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	3.00 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.38 dB
	30MHz ~ 1GHz	5.70 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Active Stylus SA203H
Brand	ASUS
Test Model	SA203H
Sample Status	Engineering sample
Power Supply Rating	3.7Vdc from battery or 5Vdc from host equipment (Charging only)
Modulation Type	MFSK
Operating Frequency	18-89kHz / 111-210kHz
Number of Channel	172
Antenna Type	Loop antenna
Field Strength	-29.65dBuV/m @300m (25kHz) -30.23dBuV/m @300m (175kHz)
Accessory Device	N/A
Data Cable Supplied	Shielded USB type A to C cable (0.15m)

Note:

1. GFSK and MFSK can not transmit at same time.
2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

172 channels are provided for EUT:

Channel	Freq. (kHz)	Channel	Freq. (kHz)	Channel	Freq. (kHz)	Channel	Freq. (kHz)	Channel	Freq. (kHz)
1	18	41	58	81	119	121	159	161	199
2	19	42	59	82	120	122	160	162	200
3	20	43	60	83	121	123	161	163	201
4	21	44	61	84	122	124	162	164	202
5	22	45	62	85	123	125	163	165	203
6	23	46	63	86	124	126	164	166	204
7	24	47	64	87	125	127	165	167	205
8	25	48	65	88	126	128	166	168	206
9	26	49	66	89	127	129	167	169	207
10	27	50	67	90	128	130	168	170	208
11	28	51	68	91	129	131	169	171	209
12	29	52	69	92	130	132	170	172	210
13	30	53	70	93	131	133	171		
14	31	54	71	94	132	134	172		
15	32	55	72	95	133	135	173		
16	33	56	73	96	134	136	174		
17	34	57	74	97	135	137	175		
18	35	58	75	98	136	138	176		
19	36	59	76	99	137	139	177		
20	37	60	77	100	138	140	178		
21	38	61	78	101	139	141	179		
22	39	62	79	102	140	142	180		
23	40	63	80	103	141	143	181		
24	41	64	81	104	142	144	182		
25	42	65	82	105	143	145	183		
26	43	66	83	106	144	146	184		
27	44	67	84	107	145	147	185		
28	45	68	85	108	146	148	186		
29	46	69	86	109	147	149	187		
30	47	70	87	110	148	150	188		
31	48	71	88	111	149	151	189		
32	49	72	89	112	150	152	190		
33	50	73	111	113	151	153	191		
34	51	74	112	114	152	154	192		
35	52	75	113	115	153	155	193		
36	53	76	114	116	154	156	194		
37	54	77	115	117	155	157	195		
38	55	78	116	118	156	158	196		
39	56	79	117	119	157	159	197		
40	57	80	118	120	158	160	198		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To		Description
	RE<1G	PLC	
A	√	Note 1	EUT Operating Mode
B	√	√	EUT Charging Mode (Powered from Notebook)
C	√	√	EUT Charging Mode (Powered from Adapter)

Where **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

NOTE:
1. No need to concern of Conducted Emission due to the EUT is powered by battery.
2. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Z-plane.

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Operating Frequency (kHz)	Tested Frequency (kHz)	Modulation Type
A	18-89 / 111-210	25, 175	MFSK
B & C	-	-	-

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Operating Frequency (kHz)	Tested Frequency (kHz)	Modulation Type
B & C	-	-	-

Test Condition:

Applicable To	EUT Configure Mode	Environmental Conditions	Input Power	Tested by
RE<1G	A	23 deg. C, 68% RH	3.7Vdc	Ian Chang
	B	22 deg. C, 67% RH	120Vac, 60Hz (System)	Ian Chang
	C	22 deg. C, 67% RH	120Vac, 60Hz (Adapter)	Ian Chang
PLC	B	25 deg. C, 75% RH	120Vac, 60Hz (System)	Ian Chang
	C	25 deg. C, 75% RH	120Vac, 60Hz (Adapter)	Ian Chang

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	ASUS	ZenBook	N/A	N/A	Supplied by client
B.	Adapter	Apple	A1385	N/A	N/A	Provided by Lab

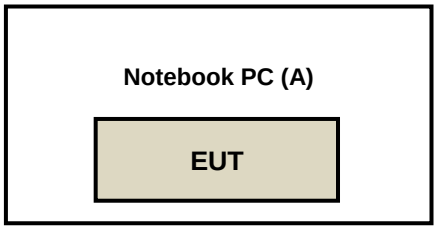
Note: All power cords of the above support units are non-shielded (1.8m).

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	0.15	Y	0	Supplied by client

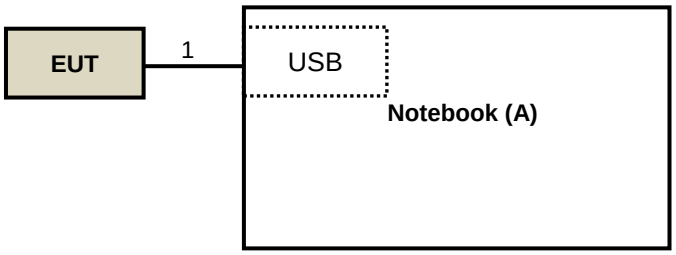
Note: The core(s) is(are) originally attached to the cable(s).

3.3.1 Configuration Of System Under Test

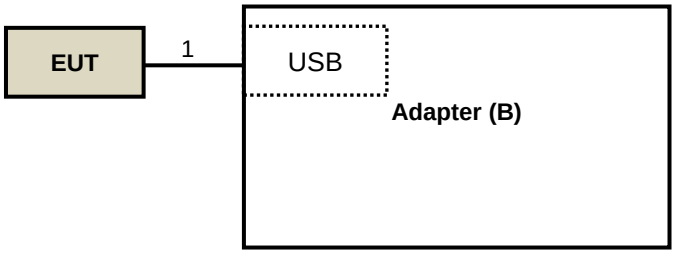
Mode A:



Mode B:



Mode C:



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.209)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

For Frequency Below 30MHz

Frequency (MHz)	Field Strength (dBuV/m)		Measurement Distance (meters)
	uV/m	dBuV/m	
0.009 – 0.490	2400 / F (kHz)	48.52-13.80	300
0.490 – 1.705	24000 / F (kHz)	33.80-22.97	30
1.705 – 30.0	30	29.54	30

For Frequency Between 30-1000MHz

Frequency (MHz)	uV/m (at 3m)	dBuV/m (at 3m)
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

4.1.2 Test Instruments

Description & Manufacturer	Model no.	Serial No.	Calibrated Date	Calibrated Until
Test Receiver Agilent	N9038A	MY51210129	2021/3/12	2022/3/11
Software BVADT	ADT_Radiated_V8.7.08	NA	NA	NA
Software BVADT	ADT_RF Test Software V6.6.5.4	NA	NA	NA
Auto Control System(Antenna Tower, Table, Controller) ADT	SC100+AT100+TT100	0306	NA	NA
Pre_Amplifier EMCI	EMC001340	980269	2021/6/29	2022/6/28
LOOP ANTENNA EMCI	LPA600	270	2021/9/2	2023/9/1
RF Coaxial Cable Pacific	8D-FB	Cable-CH6-02	2021/7/13	2022/7/12
Pre_Amplifier HP	8447D	2432A03504	2021/2/18	2022/2/17
Bi-log Broadband Antenna Schwarzbeck	VULB9168	139	2020/11/6	2021/11/5
Attenuator Mini-Circuits	UNAT-5+	PAD-CH6-01	2021/7/13	2022/7/12
RF Coaxial Cable Pacific	8D-FB	Cable-CH6-02	2021/7/13	2022/7/12

NOTE: 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Chamber No. 6.
3. Tested Date: 2021/9/17 ~ 2021/10/8

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9kHz-90kHz, 110kHz-490kHz) set to average detect function and peak detect function.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200Hz at frequency range 9kHz to 150kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency range 150kHz to 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Note:

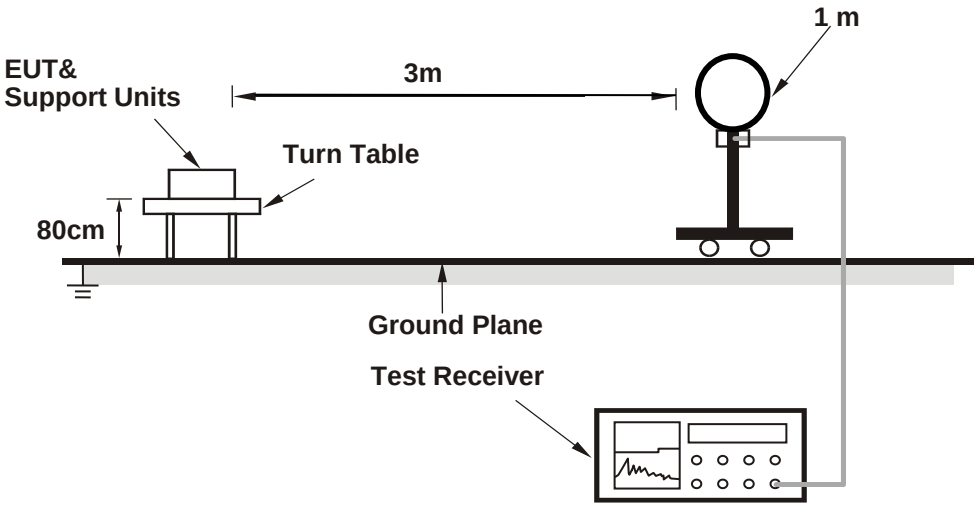
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

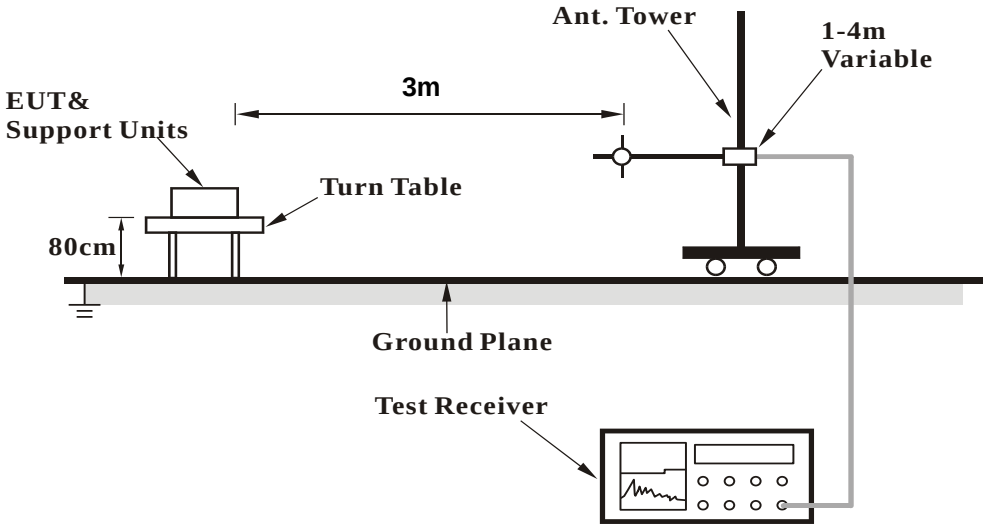
No deviation.

4.1.5 Test Set Up

For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

Mode A:

a. Put the EUT on the Notebook.
b. Set the EUT under transmission condition continuously at specific channel frequency.

Mode B & C:

a. Connect the EUT to Notebook or Adapter.
b. Set the EUT under charging condition.

4.1.7 Test Results

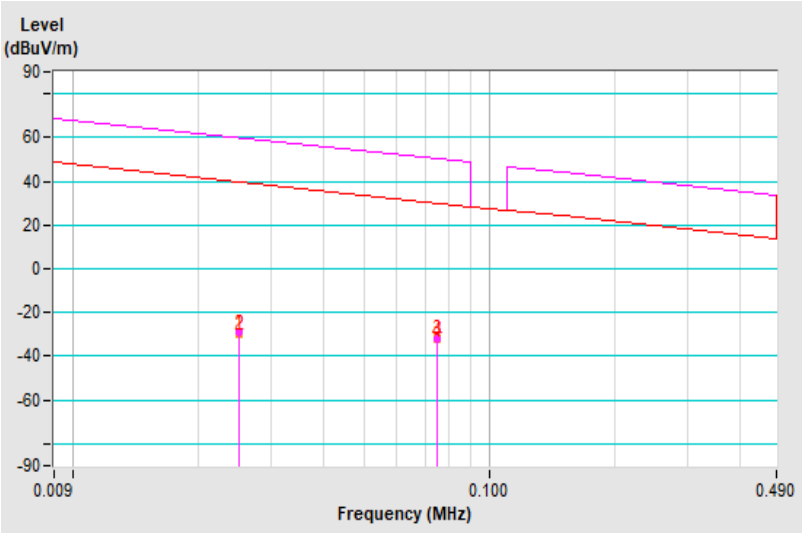
9kHz~490kHz Data:

Test Frequency	25kHz	Detector Function	Peak (PK) Average (AV)
Frequency Range	9kHz ~ 490kHz		
Test Mode	A		

Antenna Polarity : Parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.025	-29.11 PK	59.64	-88.75	1.00	135	16.90	-46.01
2	*0.025	-29.65 AV	39.64	-69.29	1.00	135	16.36	-46.01
3	0.075	-31.91 PK	50.09	-82.00	1.00	205	24.37	-56.28
4	0.075	-32.23 AV	30.09	-62.32	1.00	205	24.05	-56.28

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.
   Distance factor@3m = 40*log(3/300) = -80dB

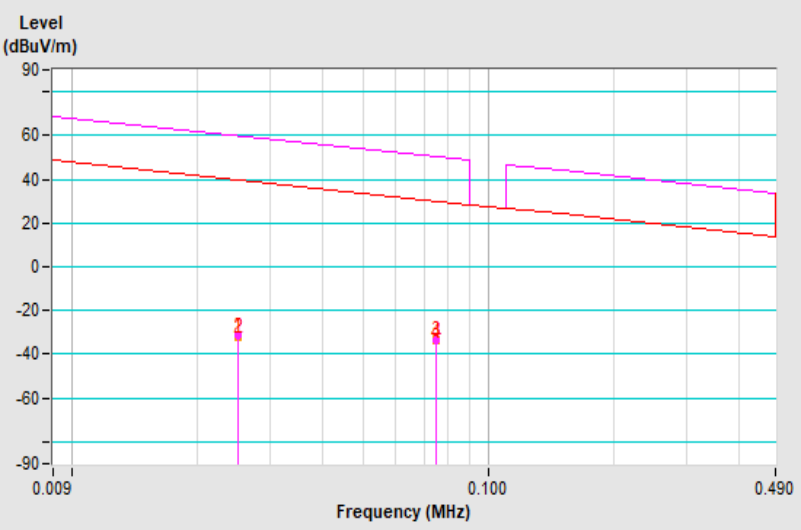


Test Frequency	25kHz	Detector Function	Peak (PK) Average (AV)
Frequency Range	9kHz ~ 490kHz		
Test Mode	A		

Antenna Polarity : Perpendicular								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.025	-31.63 PK	59.64	-91.27	1.00	189	14.38	-46.01
2	*0.025	-31.89 AV	39.64	-71.53	1.00	189	14.12	-46.01
3	0.075	-33.52 PK	50.09	-83.61	1.00	221	22.76	-56.28
4	0.075	-33.94 AV	30.09	-64.03	1.00	221	22.34	-56.28

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.
   Distance factor@3m = 40*log(3/300) = -80dB

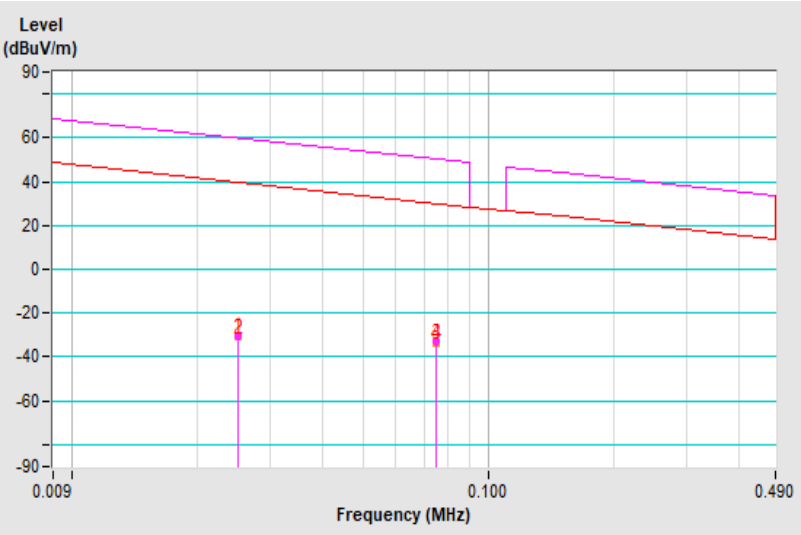


Test Frequency	25kHz	Detector Function	Peak (PK) Average (AV)
Frequency Range	9kHz ~ 490kHz		
Test Mode	A		

Antenna Polarity : Ground-parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.025	-30.32 PK	59.64	-89.96	1.00	145	15.69	-46.01
2	*0.025	-30.61 AV	39.64	-70.25	1.00	145	15.40	-46.01
3	0.075	-32.96 PK	50.09	-83.05	1.00	239	23.32	-56.28
4	0.075	-33.25 AV	30.09	-63.34	1.00	239	23.03	-56.28

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.
   Distance factor@3m = 40*log(3/300) = -80dB

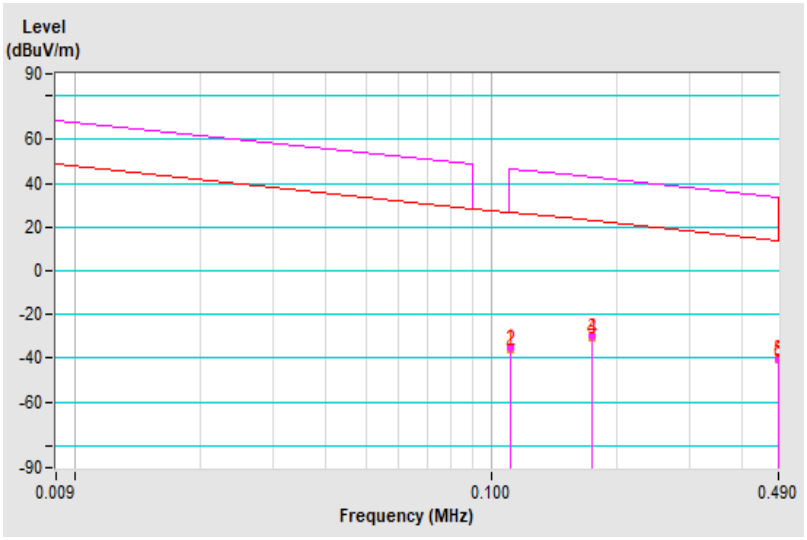


Test Frequency	175kHz	Detector Function	Peak (PK) Average (AV)
Frequency Range	9kHz ~ 490kHz		
Test Mode	A		

Antenna Polarity : Parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.111	-35.02 PK	46.69	-81.71	1.00	132	25.01	-60.03
2	0.111	-35.53 AV	26.69	-62.22	1.00	132	24.50	-60.03
3	*0.175	-29.89 PK	42.74	-72.63	1.00	163	32.61	-62.50
4	*0.175	-30.23 AV	22.74	-52.97	1.00	163	32.27	-62.50
5	0.489	-40.36 PK	33.82	-74.18	1.00	188	30.07	-70.43
6	0.489	-40.59 AV	13.82	-54.41	1.00	188	29.84	-70.43

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.
   Distance factor@3m = 40*log(3/300) = -80dB

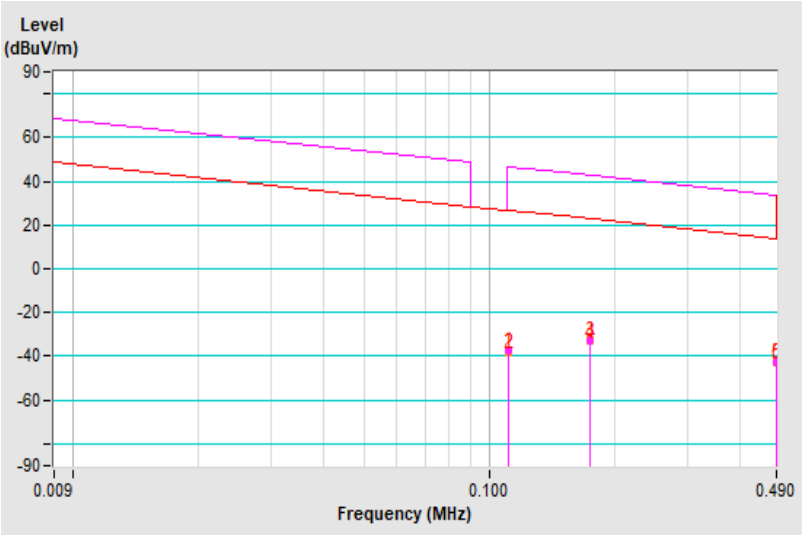


Test Frequency	175kHz	Detector Function	Peak (PK) Average (AV)
Frequency Range	9kHz ~ 490kHz		
Test Mode	A		

Antenna Polarity : Perpendicular								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.111	-37.39 PK	46.69	-84.08	1.00	157	22.64	-60.03
2	0.111	-37.98 AV	26.69	-64.67	1.00	157	22.05	-60.03
3	*0.175	-32.55 PK	42.74	-75.29	1.00	254	29.95	-62.50
4	*0.175	-32.97 AV	22.74	-55.71	1.00	254	29.53	-62.50
5	0.489	-42.36 PK	33.82	-76.18	1.00	208	28.07	-70.43
6	0.489	-42.59 AV	13.82	-56.41	1.00	208	27.84	-70.43

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.
   Distance factor@3m = 40*log(3/300) = -80dB

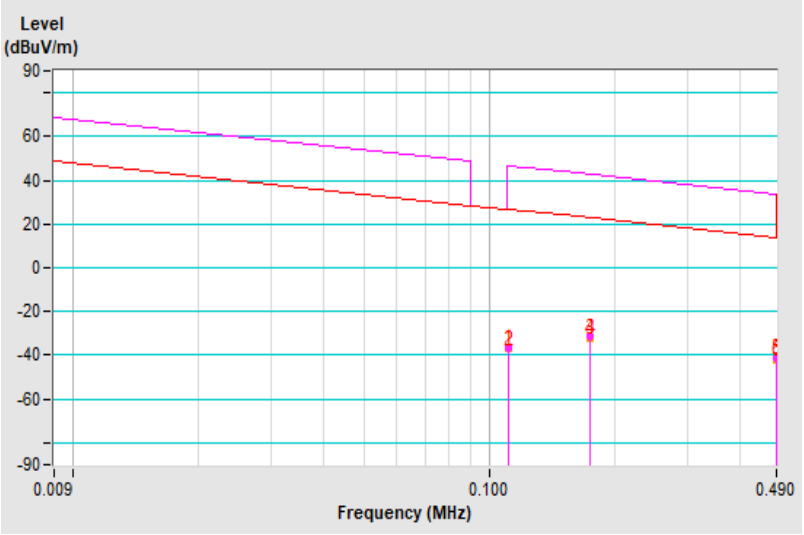


Test Frequency	175kHz	Detector Function	Peak (PK) Average (AV)
Frequency Range	9kHz ~ 490kHz		
Test Mode	A		

Antenna Polarity : Ground-parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.111	-36.62 PK	46.69	-83.31	1.00	102	23.41	-60.03
2	0.111	-36.87 AV	26.69	-63.56	1.00	102	23.16	-60.03
3	*0.175	-31.49 PK	42.74	-74.23	1.00	299	31.01	-62.50
4	*0.175	-31.87 AV	22.74	-54.61	1.00	299	30.63	-62.50
5	0.489	-41.15 PK	33.82	-74.97	1.00	188	29.28	-70.43
6	0.489	-41.68 AV	13.82	-55.50	1.00	188	28.75	-70.43

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.
   Distance factor@3m = 40*log(3/300) = -80dB



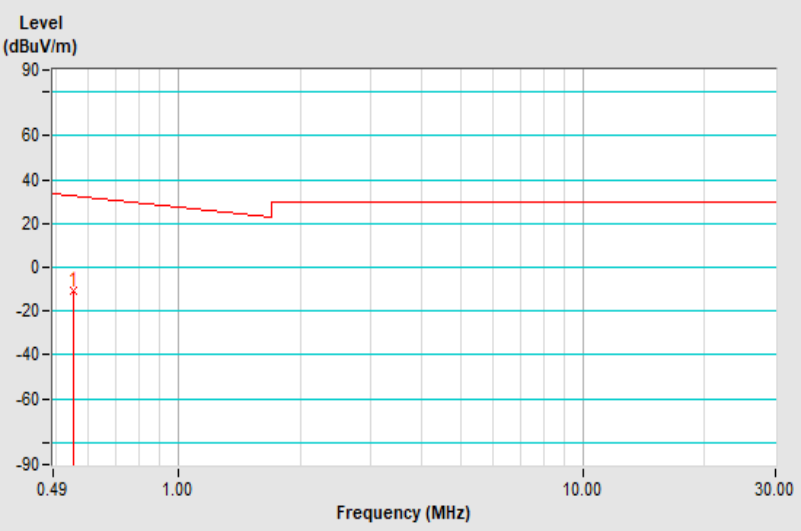
490kHz~30MHz Data:

Test Frequency	25kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490kHz ~ 30MHz		
Test Mode	A		

Antenna Polarity : Parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.550	-10.63 QP	32.80	-43.43	1.00	178	20.38	-31.01

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.
   Distance factor@3m = 40*log(3/30) = -40dB

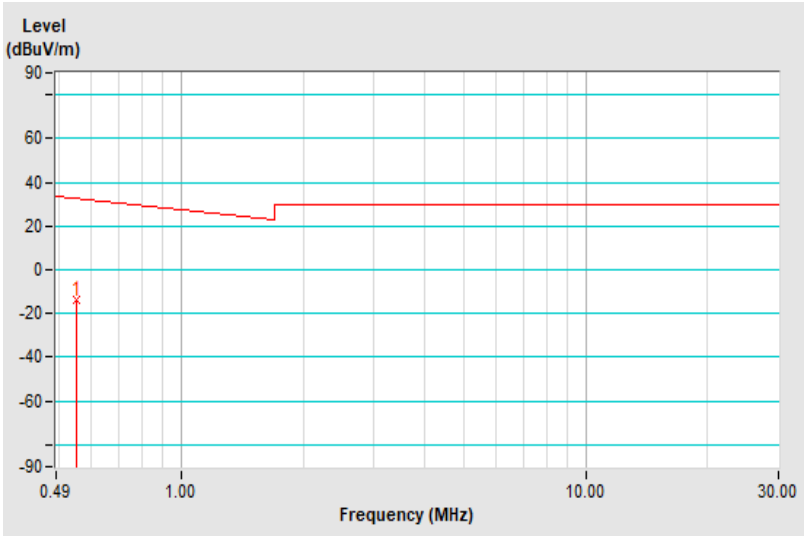


Test Frequency	25kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490kHz ~ 30MHz		
Test Mode	A		

Antenna Polarity : Perpendicular								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.550	-13.54 QP	32.80	-46.34	1.00	123	17.47	-31.01

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.
   Distance factor@3m = 40*log(3/30) = -40dB

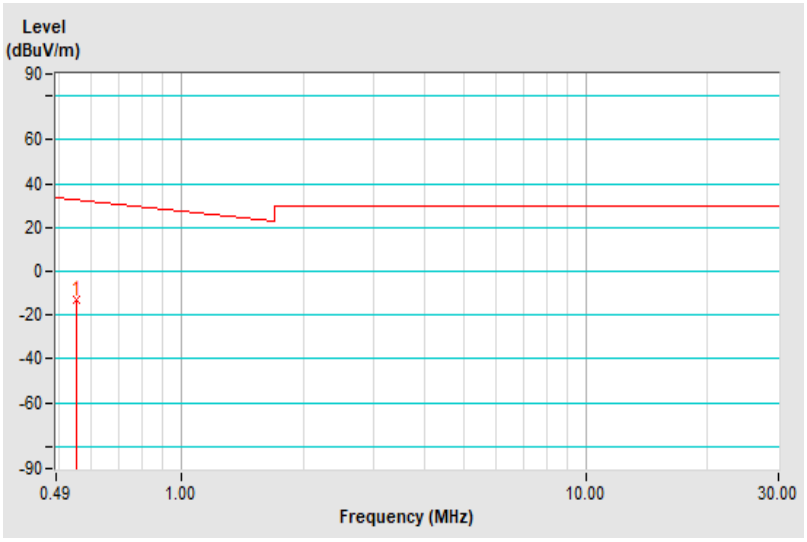


Test Frequency	25kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490kHz ~ 30MHz		
Test Mode	A		

Antenna Polarity : Ground-parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.550	-12.78 QP	32.80	-45.58	1.00	235	18.23	-31.01

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.
   Distance factor@3m = 40*log(3/30) = -40dB

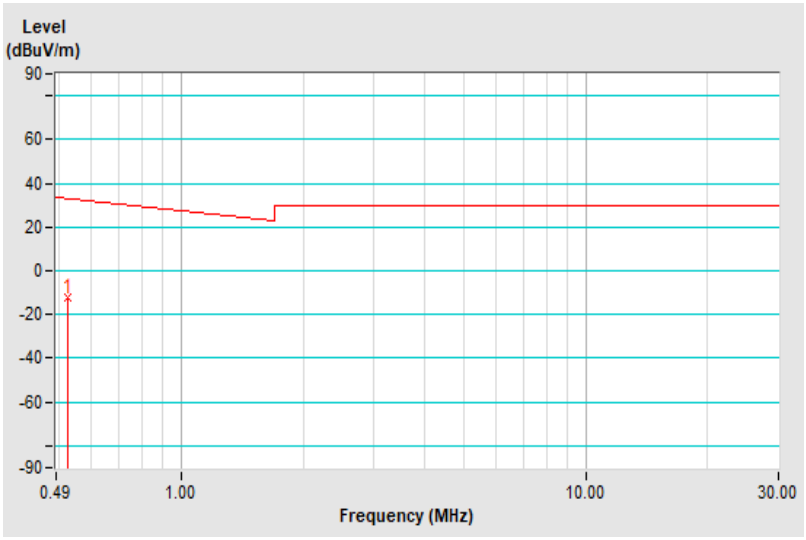


Test Frequency	175kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490kHz ~ 30MHz		
Test Mode	A		

Antenna Polarity : Parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.525	-11.89 QP	33.20	-45.09	1.00	285	18.93	-30.82

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.
   Distance factor@3m = 40*log(3/30) = -40dB

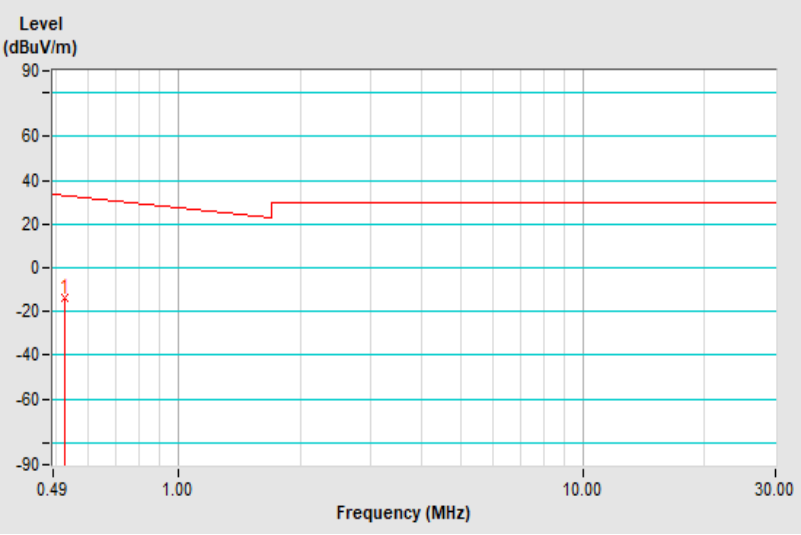


Test Frequency	175kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490kHz ~ 30MHz		
Test Mode	A		

Antenna Polarity : Perpendicular								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.525	-13.48 QP	33.20	-46.68	1.00	142	17.34	-30.82

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.
   Distance factor@3m = 40*log(3/30) = -40dB

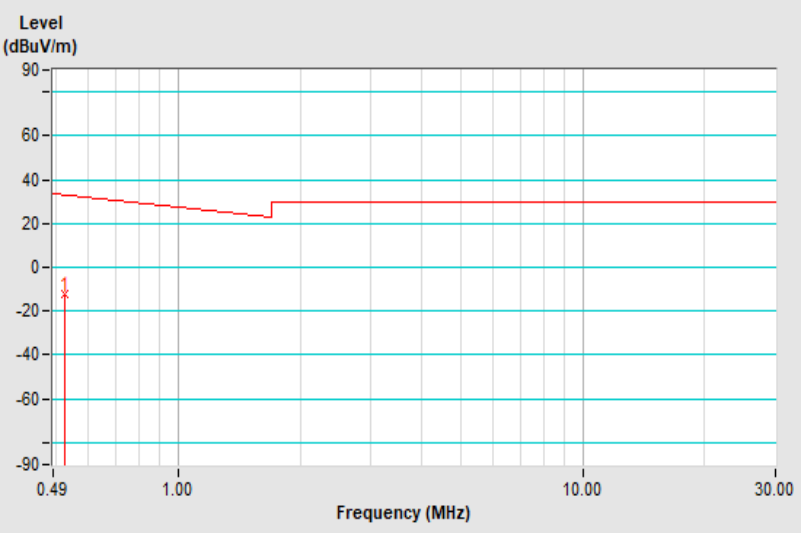


Test Frequency	175kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490kHz ~ 30MHz		
Test Mode	A		

Antenna Polarity : Ground-parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.525	-12.54 QP	33.20	-45.74	1.00	216	18.28	-30.82

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.
   Distance factor@3m = 40*log(3/30) = -40dB



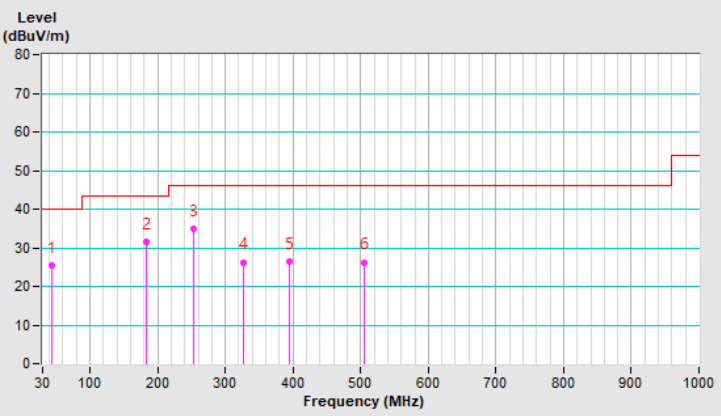
30MHz ~ 1GHz Data:

Test Frequency	25kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A		

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	42.61	25.32 QP	40.00	-14.68	2.97 H	200	32.61	-7.29
2	182.29	31.42 QP	43.50	-12.08	2.63 H	166	39.09	-7.67
3	253.10	34.77 QP	46.00	-11.23	2.40 H	143	40.96	-6.19
4	326.82	26.22 QP	46.00	-19.78	2.13 H	117	29.57	-3.35
5	394.72	26.35 QP	46.00	-19.65	1.80 H	85	28.60	-2.25
6	505.30	26.15 QP	46.00	-19.85	3.41 H	243	25.98	0.17

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

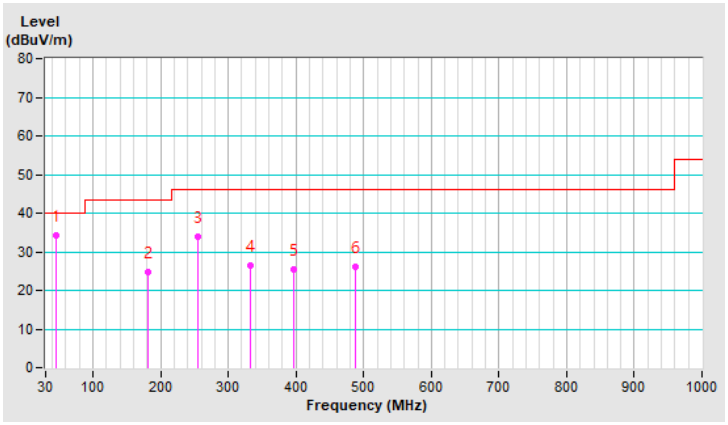


Test Frequency	25kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A		

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	44.55	34.25 QP	40.00	-5.75	1.26 V	137	41.38	-7.13
2	181.32	24.81 QP	43.50	-18.69	1.64 V	174	32.38	-7.57
3	254.07	33.86 QP	46.00	-12.14	1.86 V	196	40.04	-6.18
4	331.67	26.54 QP	46.00	-19.46	2.64 V	273	29.82	-3.28
5	395.69	25.37 QP	46.00	-20.63	2.90 V	299	27.61	-2.24
6	486.87	26.24 QP	46.00	-19.76	3.14 V	322	26.43	-0.19

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

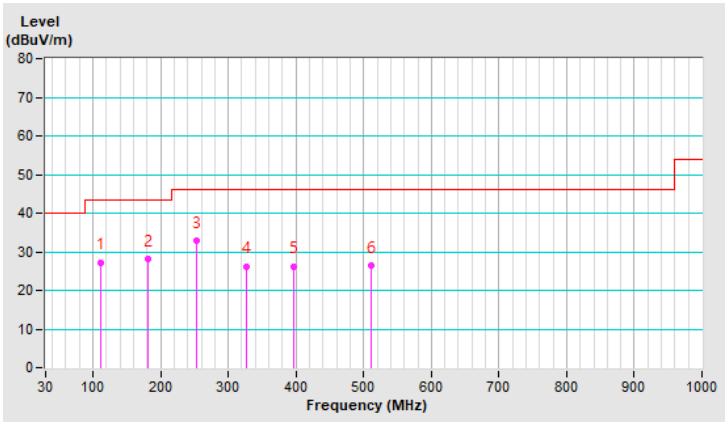


Test Frequency	175kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A		

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	111.48	27.14 QP	43.50	-16.36	2.89 H	114	36.76	-9.62
2	181.32	28.05 QP	43.50	-15.45	2.60 H	142	35.62	-7.57
3	253.10	32.72 QP	46.00	-13.28	2.39 H	163	38.91	-6.19
4	325.85	26.25 QP	46.00	-19.75	2.07 H	195	29.61	-3.36
5	395.69	26.17 QP	46.00	-19.83	1.76 H	225	28.41	-2.24
6	511.12	26.30 QP	46.00	-19.70	1.41 H	260	25.93	0.37

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

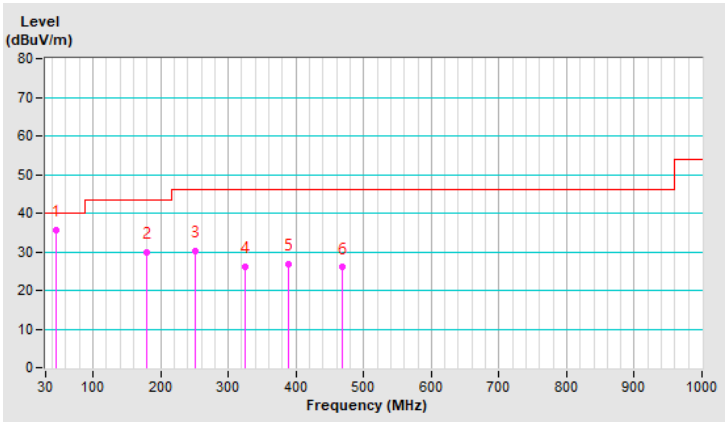


Test Frequency	175kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A		

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**44.55**	**35.55 QP**	**40.00**	**-4.45**	**3.10 V**	**211**	**42.68**	**-7.13**
2	178.41	29.83 QP	43.50	-13.67	3.32 V	234	36.99	-7.16
3	251.16	30.18 QP	46.00	-15.82	3.59 V	260	36.42	-6.24
4	324.88	26.21 QP	46.00	-19.79	2.29 V	132	29.59	-3.38
5	388.90	26.88 QP	46.00	-19.12	2.05 V	108	29.19	-2.31
6	468.44	26.01 QP	46.00	-19.99	1.69 V	73	26.45	-0.44

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

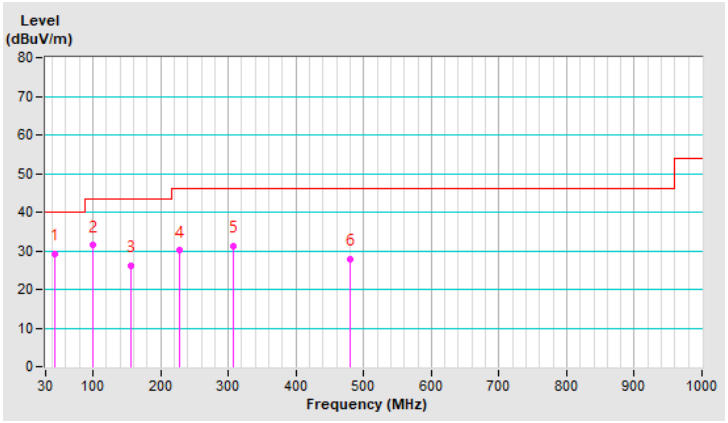


Frequency Range	30 MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	B		

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	42.76	29.26 QP	40.00	-10.74	2.54 H	158	36.54	-7.28
2	99.02	31.37 QP	43.50	-12.13	2.27 H	131	42.53	-11.16
3	155.28	26.15 QP	43.50	-17.35	1.74 H	78	32.39	-6.24
4	227.06	30.08 QP	46.00	-15.92	1.53 H	57	38.51	-8.43
5	306.60	31.31 QP	46.00	-14.69	1.27 H	32	35.21	-3.90
6	479.26	27.83 QP	46.00	-18.17	3.04 H	207	28.11	-0.28

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

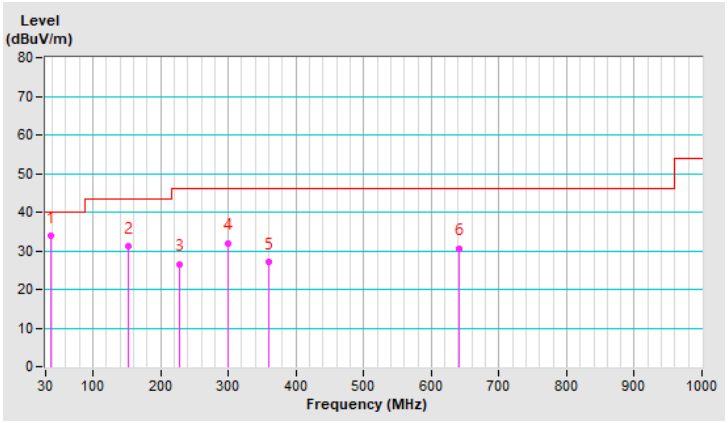


Frequency Range	30 MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	B		

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	36.94	33.78 QP	40.00	-6.22	1.52 V	50	41.89	-8.11
2	151.40	31.03 QP	43.50	-12.47	1.76 V	75	37.37	-6.34
3	227.06	26.45 QP	46.00	-19.55	1.26 V	25	34.88	-8.43
4	298.84	32.03 QP	46.00	-13.97	2.08 V	106	36.22	-4.19
5	358.98	27.02 QP	46.00	-18.98	2.30 V	127	29.98	-2.96
6	640.28	30.49 QP	46.00	-15.51	2.68 V	165	27.24	3.25

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

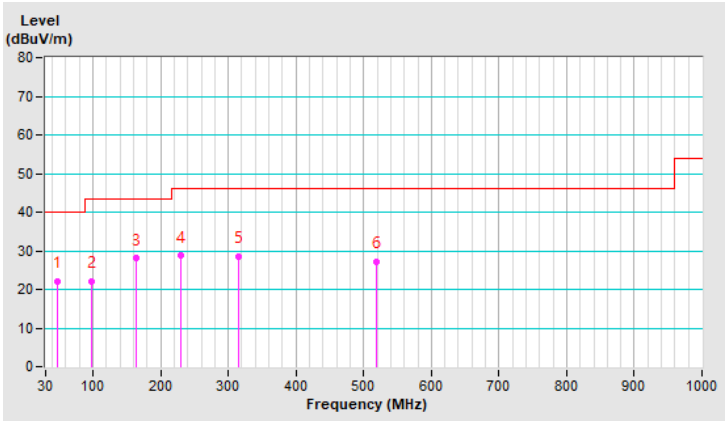


Frequency Range	30 MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	C		

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	46.64	21.99 QP	40.00	-18.01	2.03 H	195	28.98	-6.99
2	97.08	22.09 QP	43.50	-21.41	1.79 H	218	33.59	-11.50
3	163.04	27.99 QP	43.50	-15.51	1.55 H	242	34.22	-6.23
4	229.00	28.66 QP	46.00	-17.34	1.36 H	261	36.98	-8.32
5	314.36	28.57 QP	46.00	-17.43	1.21 H	275	32.21	-3.64
6	518.06	27.17 QP	46.00	-18.83	1.02 H	299	26.75	0.42

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

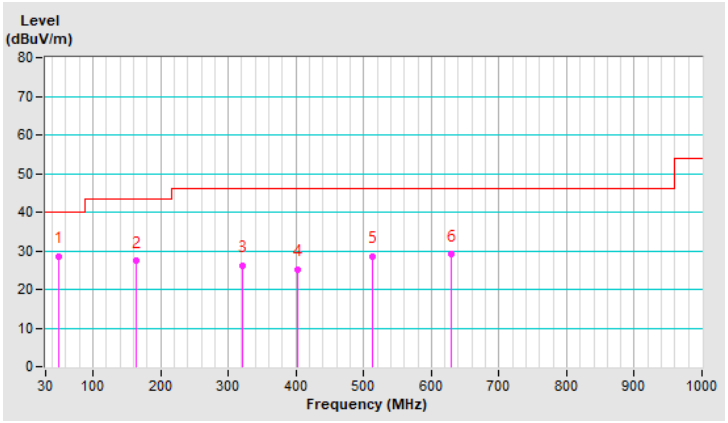


Frequency Range	30 MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	C		

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	48.58	28.60 QP	40.00	-11.40	1.23 V	29	35.46	-6.86
2	163.04	27.36 QP	43.50	-16.14	1.50 V	54	33.59	-6.23
3	320.18	26.19 QP	46.00	-19.81	1.69 V	74	29.69	-3.50
4	401.66	25.16 QP	46.00	-20.84	1.85 V	89	27.32	-2.16
5	512.24	28.48 QP	46.00	-17.52	2.04 V	109	28.08	0.40
6	628.64	29.04 QP	46.00	-16.96	2.22 V	126	25.95	3.09

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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 of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model no.	Serial No.	Calibrated Date	Calibrated Until
Test Receiver ESR3 R&S	ESR3	102412	2021/1/29	2022/1/28
LISN SCHWARZBECK	NSLK 8128	8128-244	2020/11/19	2021/11/18
LISN SCHWARZBECK	NNLK8129	8129229	2021/5/20	2022/5/19
DC LISN SCHWARZBECK	NNLK 8121	8121-808	2021/4/18	2022/4/17
LISN SCHWARZBECK	NNLK 8121	8121-731	2021/4/28	2022/4/27
LISN R&S	ENV216	101196	2021/4/26	2022/4/25
LISN R&S	ESH3-Z5	100220	2020/12/1	2021/11/30
LISN R&S	ESH3-Z6	844950/018	2021/7/25	2022/7/24
DC LISN R&S	ESH3-Z6	100219	2021/7/25	2022/7/24
High Voltage Probe Schwarzbeck	TK9420	00982	2021/1/8	2022/1/7
RF Coaxial Cable Commate	5D-FB	Cable-CO5-01	2021/1/29	2022/1/28
Attenuator STI	STI02-2200-10	NO.4	2021/9/3	2022/9/2
50 Ohms Terminator LYNICS	0900510	E1-01-305	2021/2/17	2022/2/16
Isolation Transformer Erika Fiedler	D-65396	017	2021/9/9	2022/9/8
Software BVADT	Cond_V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Linkou Conduction 05.
3. Tested Date: 2021/10/8

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

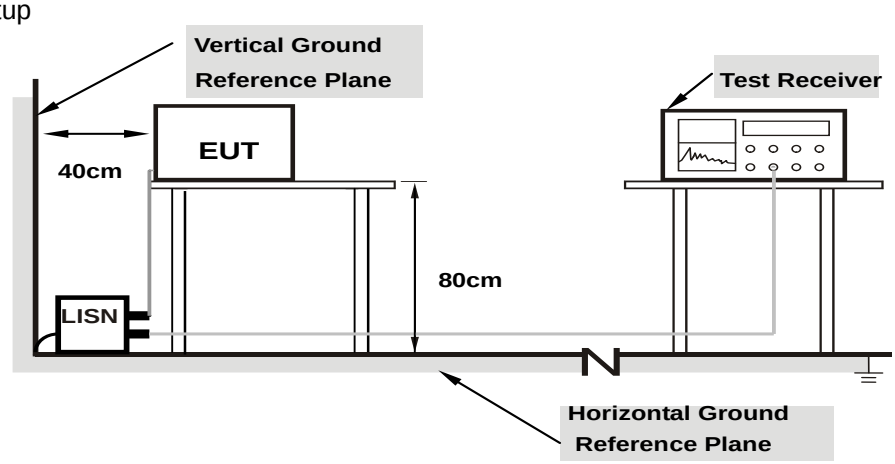
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

a. Connect the EUT to Notebook or Adapter.

b. Set the EUT under charging condition.

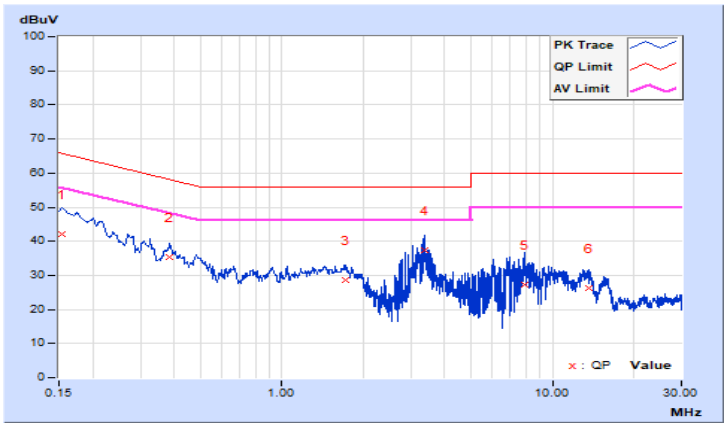
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	9.89	32.36	12.67	42.25	22.56	65.78	55.78	-23.53	-33.22
2	0.38600	9.91	25.28	16.75	35.19	26.66	58.15	48.15	-22.96	-21.49
3	1.71200	10.01	18.67	8.33	28.68	18.34	56.00	46.00	-27.32	-27.66
4	**3.35200**	**10.10**	**27.34**	**12.41**	**37.44**	**22.51**	**56.00**	**46.00**	**-18.56**	**-23.49**
5	7.86400	10.29	17.03	8.51	27.32	18.80	60.00	50.00	-32.68	-31.20
6	13.58800	10.52	15.79	9.65	26.31	20.17	60.00	50.00	-33.69	-29.83

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

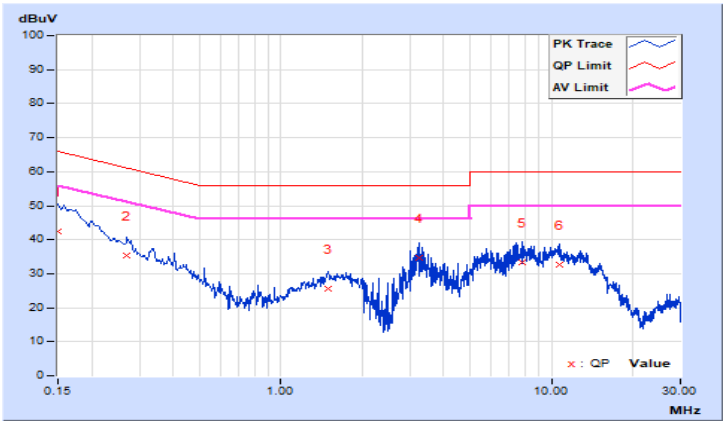


Frequency Range	150kHz ~ 30MHz	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.90	32.55	14.61	42.45	24.51	66.00	56.00	-23.55	-31.49
2	0.27000	9.92	25.49	13.88	35.41	23.80	61.12	51.12	-25.71	-27.32
3	1.49600	10.02	15.49	6.84	25.51	16.86	56.00	46.00	-30.49	-29.14
4	3.25200	10.11	24.69	11.32	34.80	21.43	56.00	46.00	-21.20	-24.57
5	7.80800	10.30	23.03	15.42	33.33	25.72	60.00	50.00	-26.67	-24.28
6	10.77600	10.41	22.34	15.77	32.75	26.18	60.00	50.00	-27.25	-23.82

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

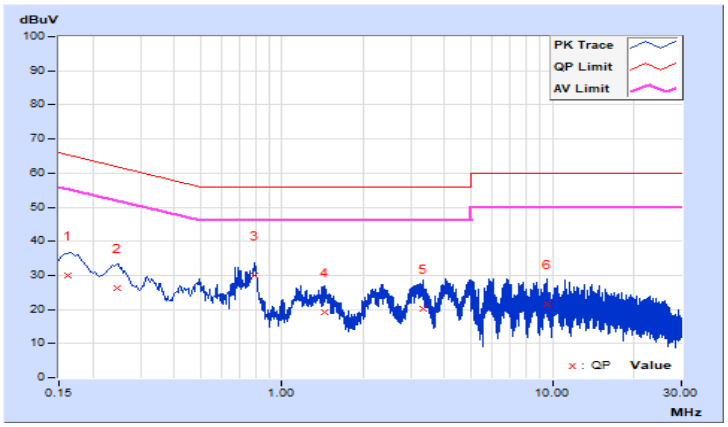


Frequency Range	150kHz ~ 30MHz	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16224	9.89	20.08	2.63	29.97	12.52	65.35	55.35	-35.38	-42.83
2	0.24777	9.89	16.22	2.74	26.11	12.63	61.83	51.83	-35.72	-39.20
3	0.79332	9.96	20.08	14.25	30.04	24.21	56.00	46.00	-25.96	-21.79
4	1.43473	10.00	9.26	2.87	19.26	12.87	56.00	46.00	-36.74	-33.13
5	3.32374	10.10	10.01	4.74	20.11	14.84	56.00	46.00	-35.89	-31.16
6	9.58369	10.36	11.03	5.36	21.39	15.72	60.00	50.00	-38.61	-34.28

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

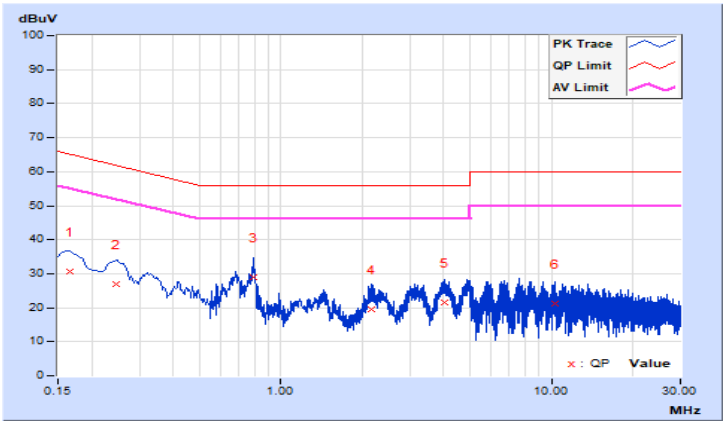


Frequency Range	150kHz ~ 30MHz	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16526	9.91	20.75	3.09	30.66	13.00	65.20	55.20	-34.54	-42.20
2	0.24777	9.91	17.19	1.49	27.10	11.40	61.83	51.83	-34.73	-40.43
3	0.78941	9.97	18.85	10.59	28.82	20.56	56.00	46.00	-27.18	-25.44
4	2.16609	10.06	9.53	4.89	19.59	14.95	56.00	46.00	-36.41	-31.05
5	4.01208	10.15	11.25	6.30	21.40	16.45	56.00	46.00	-34.60	-29.55
6	10.32287	10.39	10.85	5.74	21.24	16.13	60.00	50.00	-38.76	-33.87

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

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Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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