

FCC Test Report

Report No.: RFBGMK-WTW-P23050624

FCC ID: K7SWIA007

Test Model: WIA007

Received Date: 2023/5/25

Test Date: 2023/5/29 ~ 2023/6/17

Issued Date: 2023/6/21

Applicant: Belkin International, Inc.

Address: 555 S. Aviation Blvd., Suite 180, El Segundo, CA 90245-4852, USA

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
RFBGMK-WTW-P23050624	Original release.	2023/6/21

1 Certificate of Conformity

Product: BoostCharge Pro Universal Easy Align Wireless Charging Pad 15W

Brand: belkin

Test Model: WIA007

Sample Status: Engineering sample

Applicant: Belkin International, Inc.

Test Date: 2023/5/29 ~ 2023/6/17

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:

2023/6/21

Annie Chang / Senior Specialist

Approved by :

Jeremy Lin

, Date:

2023/6/21

Jeremy Lin / Project Engineer

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 -2.37dB at 4.09812MHz
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -12.8dB at 337.4MHz

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) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	3.00 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.38 dB
	30MHz ~ 1000MHz	5.7 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	BoostCharge Pro Universal Easy Align Wireless Charging Pad 15W
Brand	belkin
Test Model	WIA007
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter
Modulation Type	FSK
Operating Frequency	147.5kHz, 125kHz
Antenna Type	Coil antenna
Field Strength	7.6dBuV/m (@300m) (AV)
Accessory Device	Adapter
Data Cable Supplied	N/A
Maximum Power Output from the Charging Coil	15W

Note:

1. The EUT uses following adapter.

Brand	AOHAI
Model	A675-120200W-EU1
AC Input	100-240V, 0.7A, 50/60Hz
DC Output	12V, 2A
DC Output Cable	1.2m, non-shielded, without core

2. Due to radiated measurements are made and the antenna gain is already accounted for this device, so provide an antenna datasheet and/or antenna measurement report is not required. The antenna dimensions and pictures (include antenna wire length if have) are stated in EUT photo exhibit.

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

The following test frequency is provided to this EUT:

Operating Frequency (kHz)	Test Mode
147.5	Operating Mode & Standby Mode
125	Standby Mode

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE<1G	PLC	BW	
A	√	√	√	Charging mode with max Load (147.5kHz)
B	√	√	√	Charging mode with iPhone (147.5kHz)
C	√	√	√	Standby mode (147.5kHz+125kHz)

Where **RE<1G**: Radiated Emission below 1GHz **PLC**: Power Line Conducted Emission
BW: 20dB Bandwidth

Note: For pre-scan EUT without airgap / with airgap and find the worst case (EUT without airgap) as a representative test condition.

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	Tested Frequency (kHz)
A	147.5kHz
B	147.5kHz
C	147.5kHz+125kHz

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	Tested Frequency (kHz)
A	147.5kHz
B	147.5kHz
C	147.5kHz+125kHz

20dB Bandwidth 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	Tested Frequency
A	147.5kHz
B	147.5kHz
C	147.5kHz+125kHz

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE<1G	25 deg. C, 76% RH	120Vac, 60Hz	William Su
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Jed Wu
BW	25 deg. C, 76% RH	120Vac, 60Hz	Dalen Dai

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.

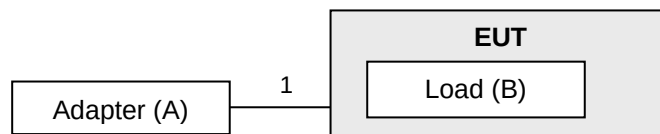
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Adapter	AOHAI	A675-120200W-EU1	N/A	N/A	Supplied by applicant
B	Load	N/A	N/A	N/A	N/A	Supplied by applicant
C	iPhone	APPLE	A2403	N/A	BCG-E3544A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC cable	1	1.2	No	0	Supplied by applicant

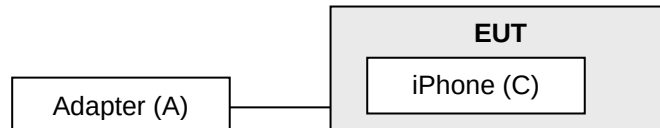
3.3.1 Configuration of System under Test

Charging Mode:

Test Mode A

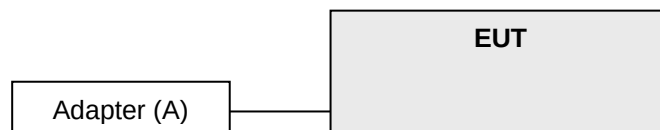


Test Mode B



Standby Mode:

Test 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:

47 CFR FCC Part 15, Subpart C (Section 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)	Field Strength (dBuV/m)		Measurement Distance (meters)
	uV/m	dBuV/m	
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

4.1.2 Test Instruments

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Loop Antenna EMCI	LPA600	270	2021/9/2	2023/9/1
Bi_Log Antenna Schwarzbeck	VULB 9168	137	2022/10/21	2023/10/20
Coupling / Decoupling Network Schwarzbeck	CDNE-M2	00097	2022/6/1	2023/5/31
	CDNE-M3	00091	2022/6/1	2023/5/31
MXE EMI Receiver Agilent	N9038A	MY51210129	2023/3/24	2024/3/23
		MY51210137	2022/6/9	2023/6/8
Preamplifier EMCI	EMC001340	980269	2022/6/28	2023/6/27
Preamplifier HP	8447D	2432A03504	2023/2/16	2024/2/15
RF Coaxial Cable Pacific	8D-FB	Cable-CH6-02	2022/6/30	2023/6/29
Signal Analyzer R&S	FSV40	101544	2023/5/9	2024/5/8
Software BVADT	Radiated_V7.7.1.1.1	N/A	N/A	N/A
	Radiated_V8.7.08	N/A	N/A	N/A
Tower ADT	AT100	0306	N/A	N/A
Turn Table ADT	TT100	0306	N/A	N/A

- 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 Linkou 966 Chamber 6 (CH 6).
 3. Tested Date: 2023/5/29

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:

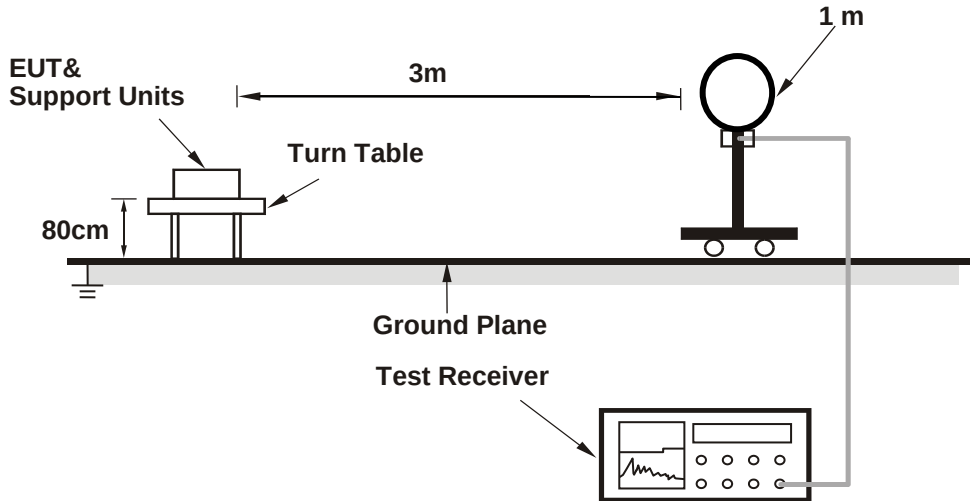
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

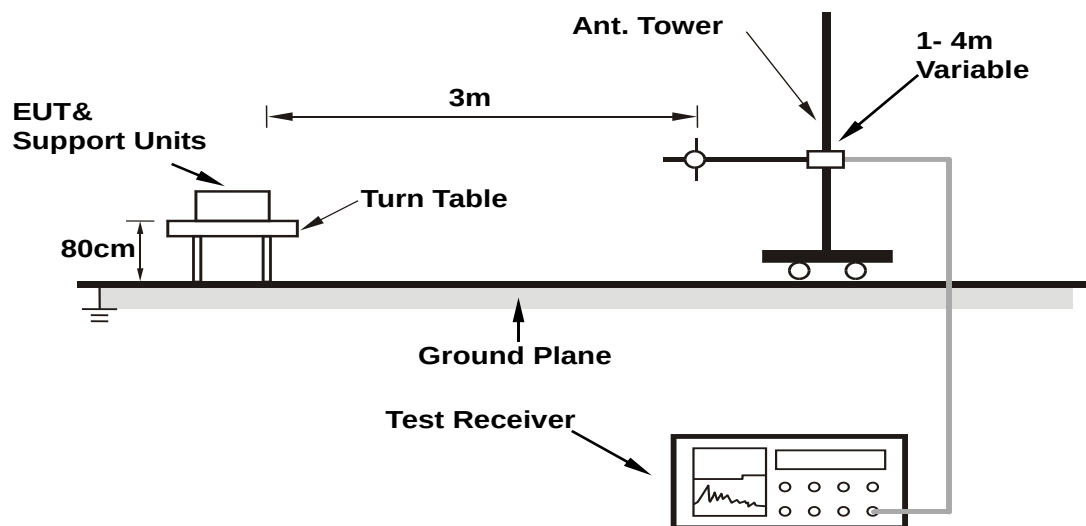
No deviation.

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

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Below 30MHz Data:

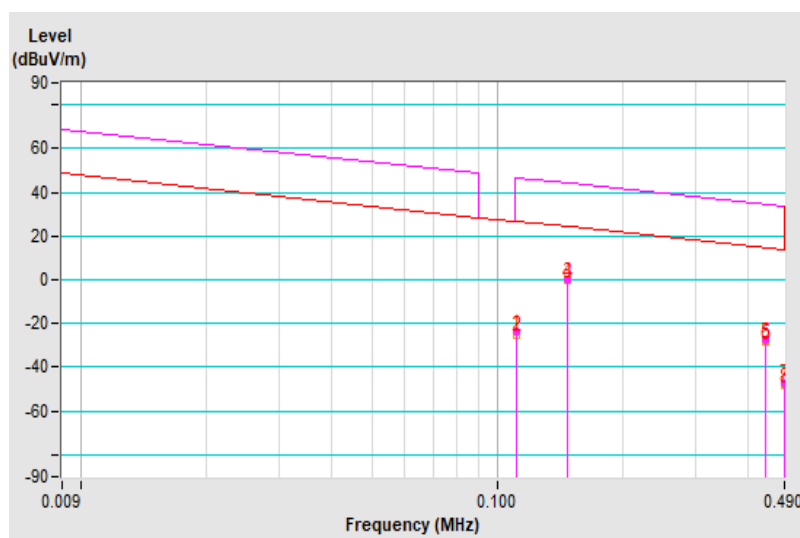
Mode A

Test Frequency	147.5kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-23.9 PK	46.7	-70.6	1.00	199	36.2	-60.1
2	0.1110	-24.8 AV	26.7	-51.5	1.00	199	35.3	-60.1
3	*0.1475	-0.1 PK	44.2	-44.3	1.00	233	61.4	-61.5
4	*0.1475	-0.2 AV	24.2	-24.4	1.00	233	61.3	-61.5
5	0.4425	-27.7 PK	34.7	-62.4	1.00	211	42.0	-69.7
6	0.4425	-28.6 AV	14.7	-43.3	1.00	211	41.1	-69.7
7	0.4890	-47.2 PK	33.8	-81.0	1.00	269	23.2	-70.4
8	0.4890	-48.4 AV	13.8	-62.2	1.00	269	22.0	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * ”: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

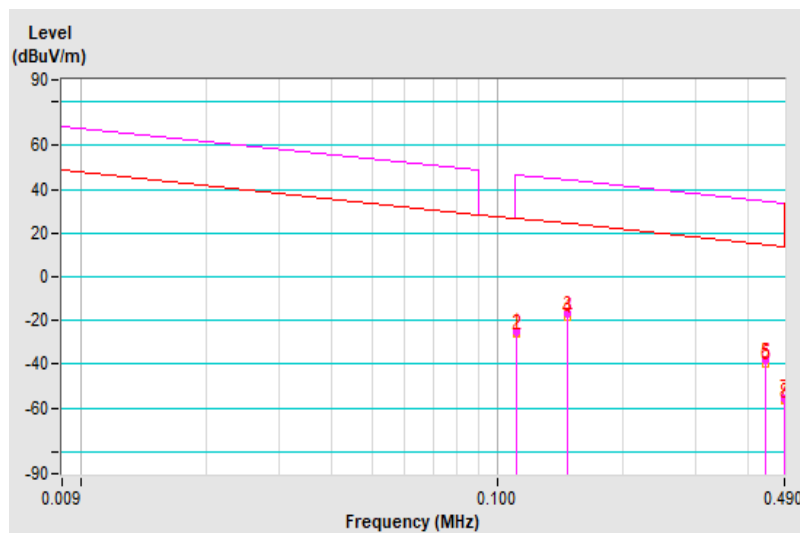


Test Frequency	147.5kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-24.9 PK	46.7	-71.6	1.00	195	35.2	-60.1
2	0.1110	-25.8 AV	26.7	-52.5	1.00	195	34.3	-60.1
3	*0.1475	-17.1 PK	44.2	-61.3	1.00	236	44.4	-61.5
4	*0.1475	-18.2 AV	24.2	-42.4	1.00	236	43.3	-61.5
5	0.4425	-38.2 PK	34.7	-72.9	1.00	284	31.5	-69.7
6	0.4425	-39.4 AV	14.7	-54.1	1.00	284	30.3	-69.7
7	0.4890	-55.6 PK	33.8	-89.4	1.00	206	14.8	-70.4
8	0.4890	-56.7 AV	13.8	-70.5	1.00	206	13.7	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * “: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

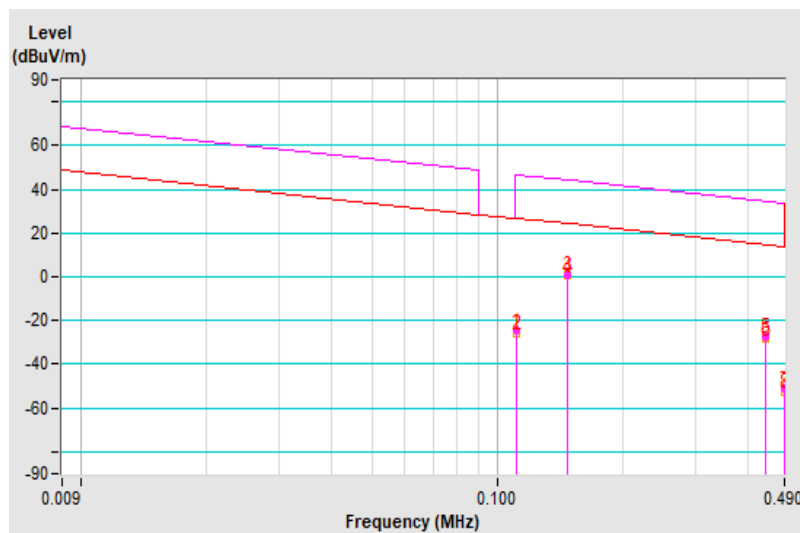


Test Frequency	147.5kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-24.7 PK	46.7	-71.4	1.00	301	35.4	-60.1
2	0.1110	-25.8 AV	26.7	-52.5	1.00	301	34.3	-60.1
3	*0.1475	1.1 PK	44.2	-43.1	1.00	255	62.6	-61.5
4	*0.1475	0.6 AV	24.2	-23.6	1.00	255	62.1	-61.5
5	0.4425	-27.3 PK	34.7	-62.0	1.00	288	42.4	-69.7
6	0.4425	-28.5 AV	14.7	-43.2	1.00	288	41.2	-69.7
7	0.4890	-51.2 PK	33.8	-85.0	1.00	221	19.2	-70.4
8	0.4890	-52.6 AV	13.8	-66.4	1.00	221	17.8	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * “: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

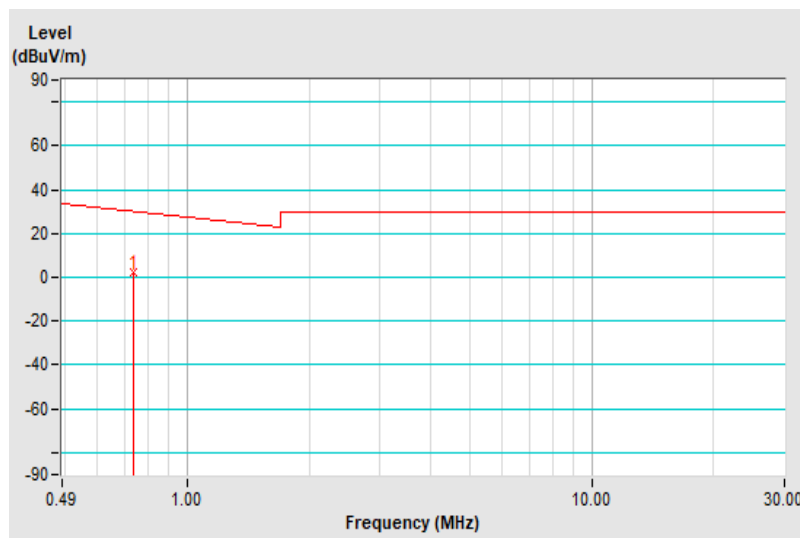


Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.7375	2.2 QP	30.2	-28.0	1.00	305	34.7	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.

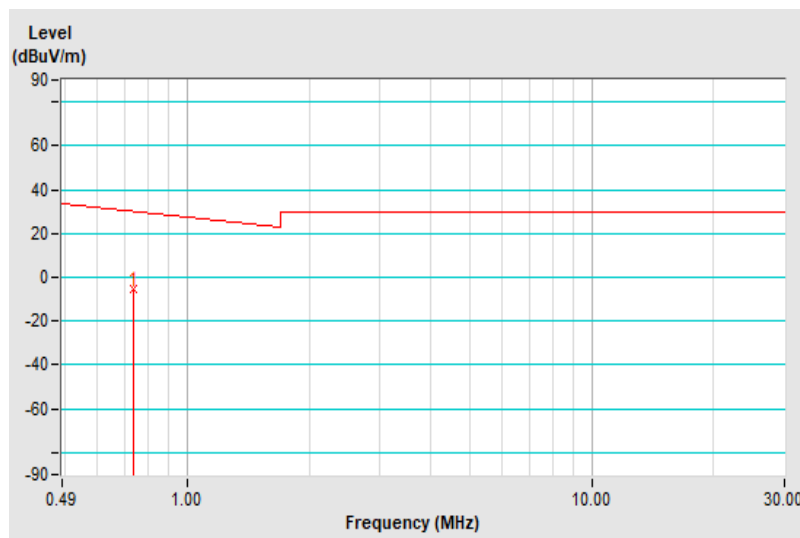


Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.7375	-5.7 QP	30.2	-35.9	1.00	216	26.8	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.

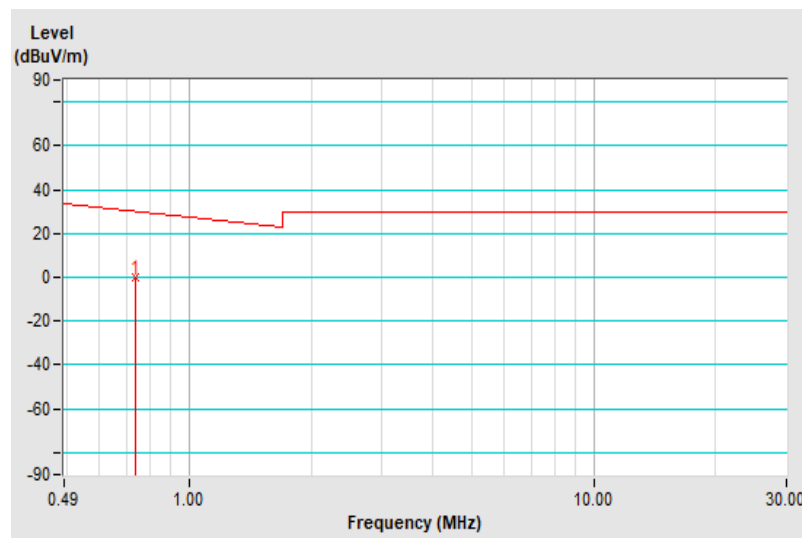


Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.7375	-0.3 QP	30.2	-30.5	1.00	295	32.2	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.



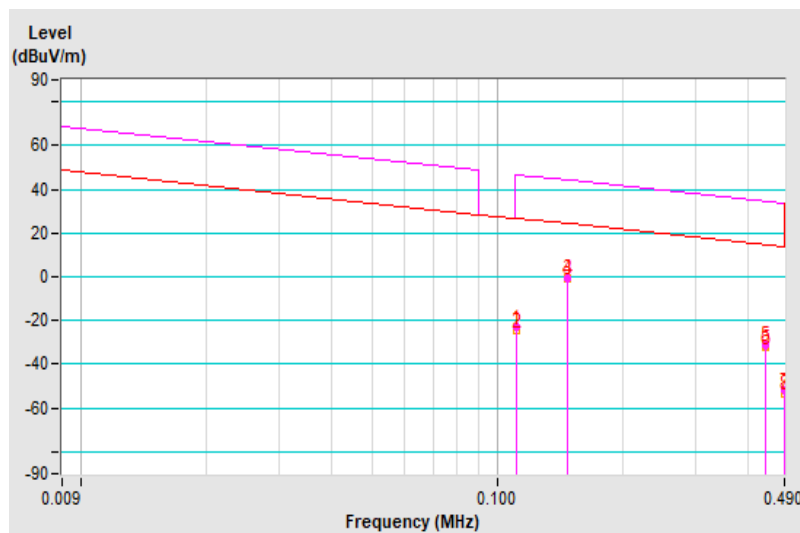
Mode B

Test Frequency	147.5kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-23.1 PK	46.7	-69.8	1.00	299	37.0	-60.1
2	0.1110	-24.6 AV	26.7	-51.3	1.00	299	35.5	-60.1
3	*0.1475	-0.5 PK	44.2	-44.7	1.00	266	61.0	-61.5
4	*0.1475	-0.6 AV	24.2	-24.8	1.00	266	60.9	-61.5
5	0.4425	-31.0 PK	34.7	-65.7	1.00	194	38.7	-69.7
6	0.4425	-32.1 AV	14.7	-46.8	1.00	194	37.6	-69.7
7	0.4890	-52.0 PK	33.8	-85.8	1.00	123	18.4	-70.4
8	0.4890	-53.2 AV	13.8	-67.0	1.00	123	17.2	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * “: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

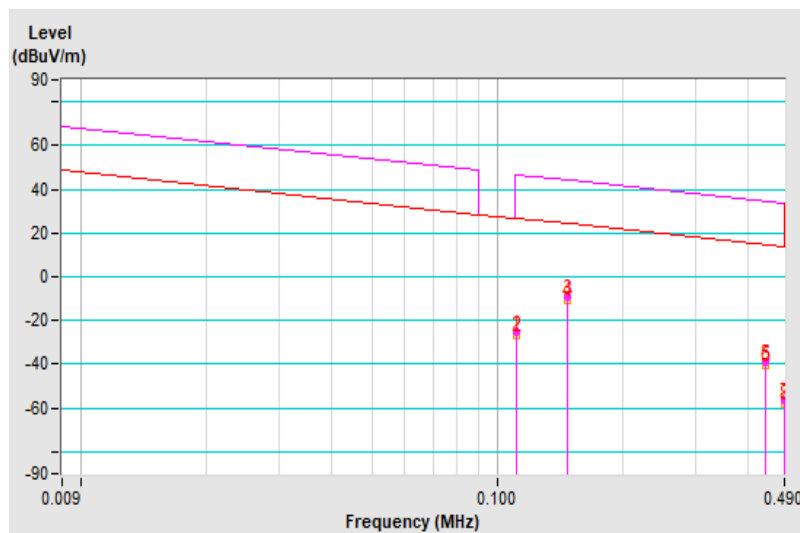


Test Frequency	147.5kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-25.5 PK	46.7	-72.2	1.00	201	34.6	-60.1
2	0.1110	-26.6 AV	26.7	-53.3	1.00	201	33.5	-60.1
3	*0.1475	-9.5 PK	44.2	-53.7	1.00	286	52.0	-61.5
4	*0.1475	-10.7 AV	24.2	-34.9	1.00	286	50.8	-61.5
5	0.4425	-39.2 PK	34.7	-73.9	1.00	305	30.5	-69.7
6	0.4425	-40.3 AV	14.7	-55.0	1.00	305	29.4	-69.7
7	0.4890	-56.5 PK	33.8	-90.3	1.00	188	13.9	-70.4
8	0.4890	-57.6 AV	13.8	-71.4	1.00	188	12.8	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * “: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

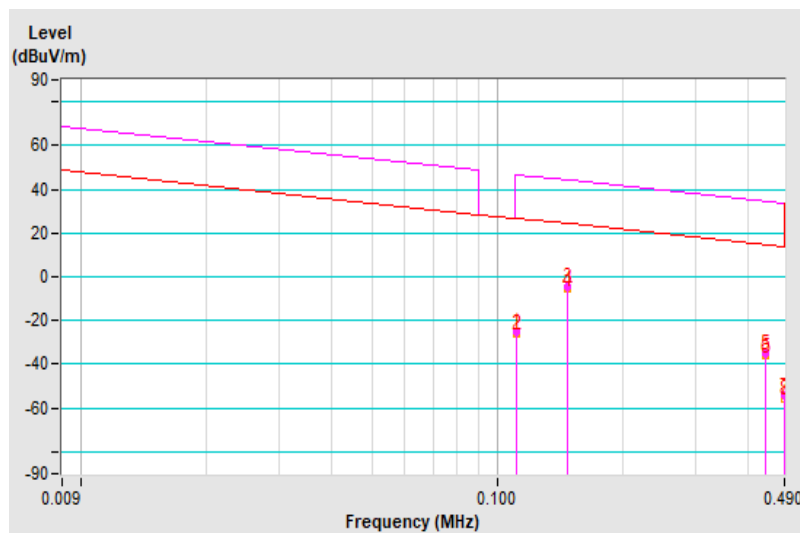


Test Frequency	147.5kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-24.8 PK	46.7	-71.5	1.00	158	35.3	-60.1
2	0.1110	-25.9 AV	26.7	-52.6	1.00	158	34.2	-60.1
3	*0.1475	-4.5 PK	44.2	-48.7	1.00	255	57.0	-61.5
4	*0.1475	-5.5 AV	24.2	-29.7	1.00	255	56.0	-61.5
5	0.4425	-34.8 PK	34.7	-69.5	1.00	316	34.9	-69.7
6	0.4425	-35.9 AV	14.7	-50.6	1.00	316	33.8	-69.7
7	0.4890	-54.4 PK	33.8	-88.2	1.00	223	16.0	-70.4
8	0.4890	-55.6 AV	13.8	-69.4	1.00	223	14.8	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * “: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

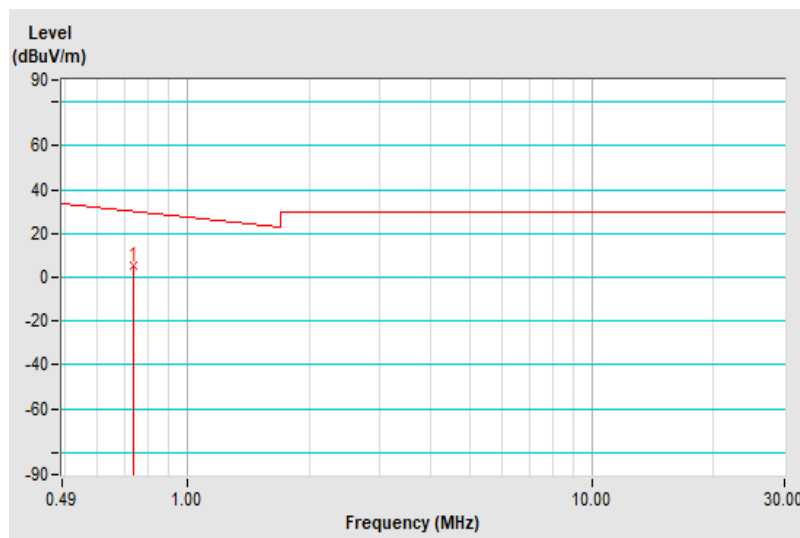


Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.7375	5.7 QP	30.2	-24.5	1.00	238	38.2	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.

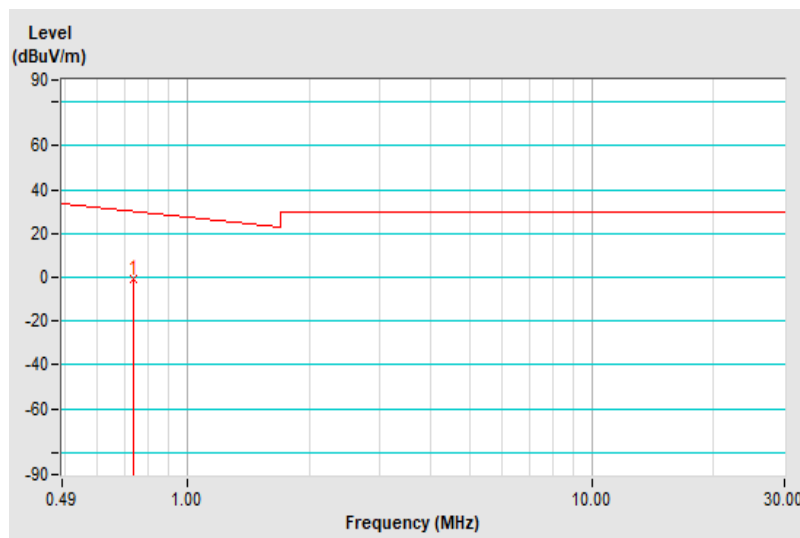


Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.7375	-0.4 QP	30.2	-30.6	1.00	255	32.1	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.

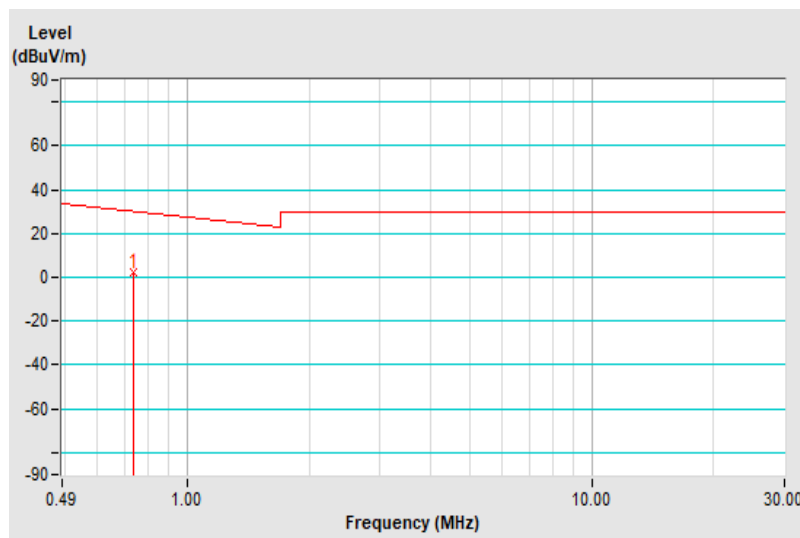


Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.7375	2.6 QP	30.2	-27.6	1.00	254	35.1	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.



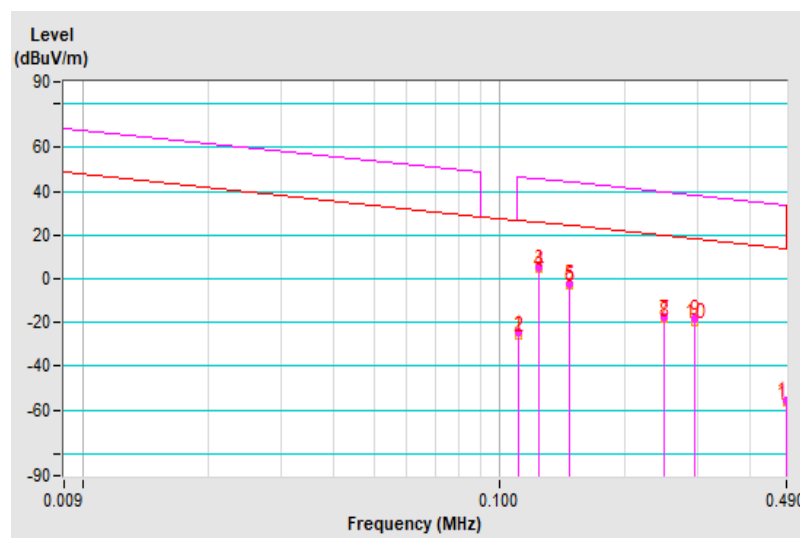
Mode C

Test Frequency	147.5kHz + 125kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-24.5 PK	46.7	-71.2	1.00	243	35.6	-60.1
2	0.1110	-25.6 AV	26.7	-52.3	1.00	243	34.5	-60.1
3	*0.1250	5.1 PK	45.7	-40.6	1.00	229	65.8	-60.7
4	*0.1250	4.2 AV	25.7	-21.5	1.00	229	64.9	-60.7
5	*0.1475	-2.1 PK	44.2	-46.3	1.00	233	59.4	-61.5
6	*0.1475	-3.0 AV	24.2	-27.2	1.00	233	58.5	-61.5
7	0.2500	-17.6 PK	39.6	-57.2	1.00	225	47.8	-65.4
8	0.2500	-18.5 AV	19.6	-38.1	1.00	225	46.9	-65.4
9	0.2950	-18.1 PK	38.2	-56.3	1.00	244	49.1	-67.2
10	0.2950	-19.8 AV	18.2	-38.0	1.00	244	47.4	-67.2
11	0.4890	-55.5 PK	33.8	-89.3	1.00	249	14.9	-70.4
12	0.4890	-56.7 AV	13.8	-70.5	1.00	249	13.7	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * “: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

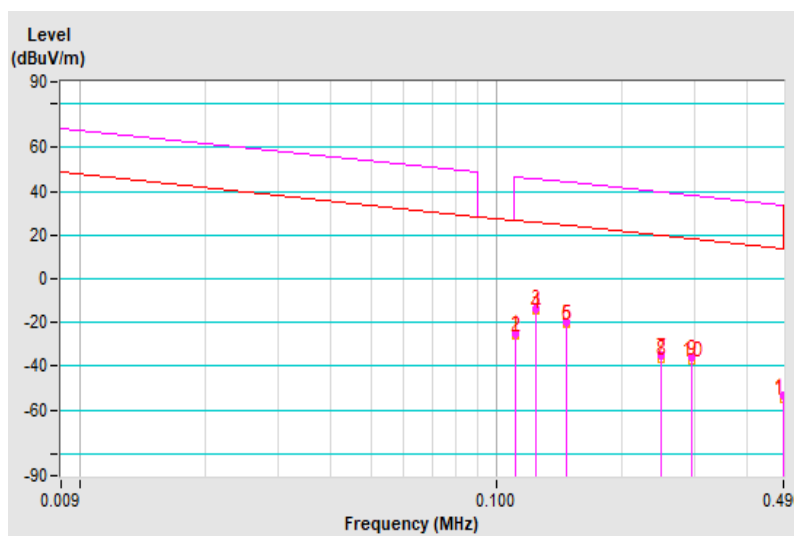


Test Frequency	147.5kHz + 125kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-24.9 PK	46.7	-71.6	1.00	304	35.2	-60.1
2	0.1110	-25.7 AV	26.7	-52.4	1.00	304	34.4	-60.1
3	*0.1250	-13.6 PK	45.7	-59.3	1.00	199	47.1	-60.7
4	*0.1250	-14.7 AV	25.7	-40.4	1.00	199	46.0	-60.7
5	*0.1475	-19.9 PK	44.2	-64.1	1.00	168	41.6	-61.5
6	*0.1475	-20.6 AV	24.2	-44.8	1.00	168	40.9	-61.5
7	0.2500	-35.3 PK	39.6	-74.9	1.00	333	30.1	-65.4
8	0.2500	-36.5 AV	19.6	-56.1	1.00	333	28.9	-65.4
9	0.2950	-36.1 PK	38.2	-74.3	1.00	281	31.1	-67.2
10	0.2950	-37.3 AV	18.2	-55.5	1.00	281	29.9	-67.2
11	0.4890	-53.5 PK	33.8	-87.3	1.00	113	16.9	-70.4
12	0.4890	-54.6 AV	13.8	-68.4	1.00	113	15.8	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * “: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

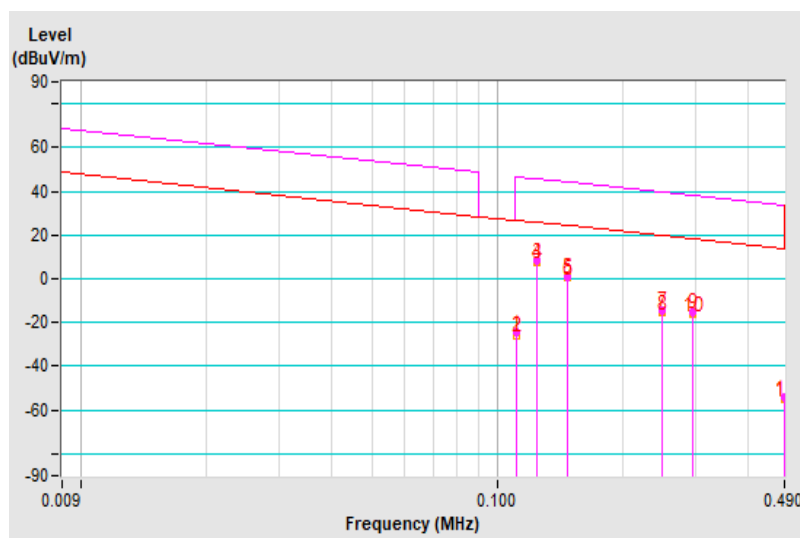


Test Frequency	147.5kHz + 125kHz	Detector Function	Peak (PK)
Frequency Range	9 kHz ~ 490 kHz		Average (AV)

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	0.1110	-24.6 PK	46.7	-71.3	1.00	266	35.5	-60.1
2	0.1110	-25.7 AV	26.7	-52.4	1.00	266	34.4	-60.1
3	*0.1250	8.1 PK	45.7	-37.6	1.00	281	68.8	-60.7
4	*0.1250	7.6 AV	25.7	-18.1	1.00	281	68.3	-60.7
5	*0.1475	1.1 PK	44.2	-43.1	1.00	222	62.6	-61.5
6	*0.1475	0.7 AV	24.2	-23.5	1.00	222	62.2	-61.5
7	0.2500	-14.2 PK	39.6	-53.8	1.00	210	51.2	-65.4
8	0.2500	-15.4 AV	19.6	-35.0	1.00	210	50.0	-65.4
9	0.2950	-15.1 PK	38.2	-53.3	1.00	289	52.1	-67.2
10	0.2950	-16.3 AV	18.2	-34.5	1.00	289	50.9	-67.2
11	0.4890	-54.2 PK	33.8	-88.0	1.00	255	16.2	-70.4
12	0.4890	-55.2 AV	13.8	-69.0	1.00	255	15.2	-70.4

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
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The test distance for below 0.49 MHz is 3 m, extrapolate the measured field strength to a distance of 300 meters.
Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
6. “ * “: Fundamental frequency.
7. Loop antenna was used for all radiated emission below 30MHz.

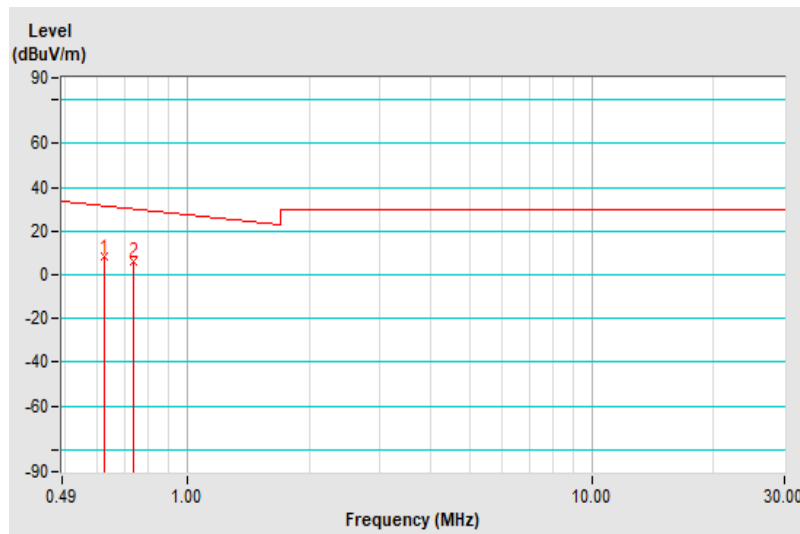


Test Frequency	147.5kHz + 125kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.6250	8.1 QP	31.7	-23.6	1.00	228	39.7	-31.6
2	0.7375	6.3 QP	30.2	-23.9	1.00	265	38.8	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.

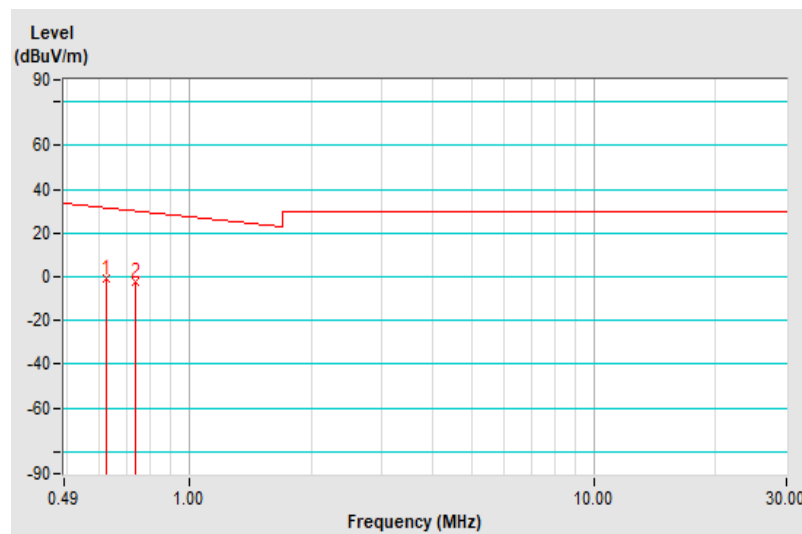


Test Frequency	147.5kHz + 125kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.6250	-0.7 QP	31.7	-32.4	1.00	184	30.9	-31.6
2	0.7375	-2.1 QP	30.2	-32.3	1.00	147	30.4	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.

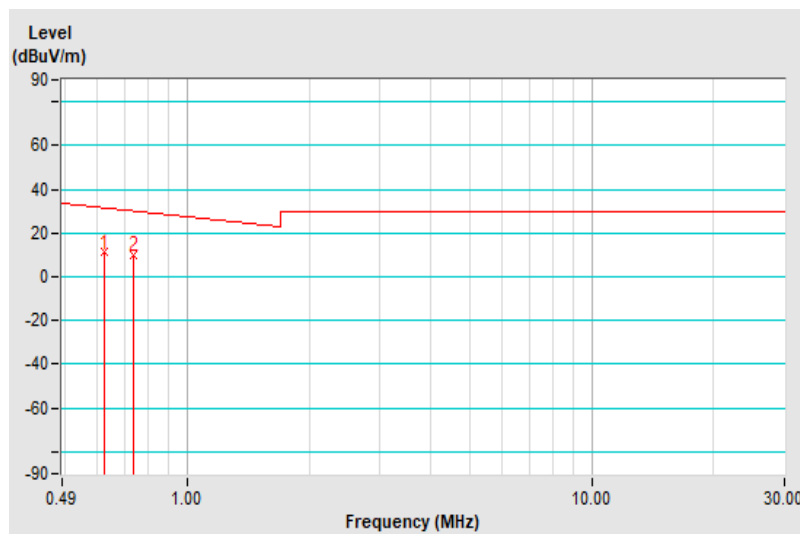


Test Frequency	147.5kHz + 125kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	490 kHz ~ 30 MHz		

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	0.6250	11.2 QP	31.7	-20.5	1.00	302	42.8	-31.6
2	0.7375	10.2 QP	30.2	-20.0	1.00	331	42.7	-32.5

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
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 ~ 30 MHz is 3 m, extrapolate the measured field strength to a distance of 30 meters.
Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$
6. Loop antenna was used for all radiated emission below 30MHz.



Above 30MHz Data:

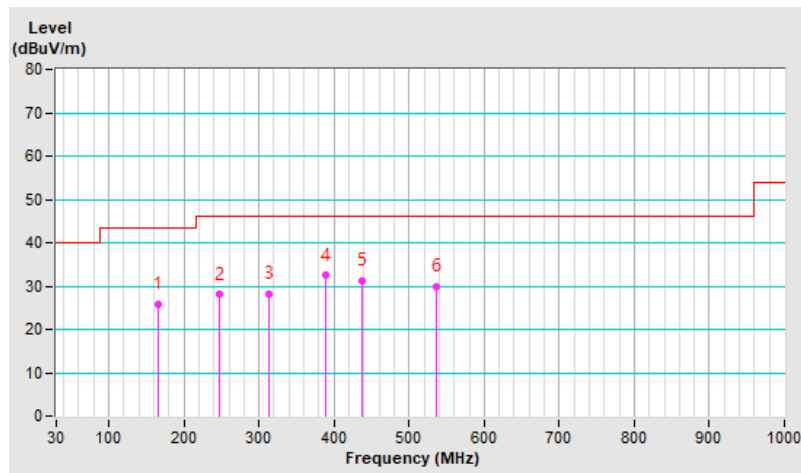
Mode A

Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
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	166.7	25.8 QP	43.5	-17.7	1.15 H	14	34.3	-8.5
2	248.2	28.0 QP	46.0	-18.0	1.30 H	301	36.4	-8.4
3	312.6	28.3 QP	46.0	-17.7	1.35 H	292	34.0	-5.7
4	389.6	32.4 QP	46.0	-13.6	1.56 H	93	36.6	-4.2
5	438.1	31.2 QP	46.0	-14.8	1.14 H	250	33.8	-2.6
6	535.9	29.9 QP	46.0	-16.1	1.03 H	112	31.0	-1.1

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)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

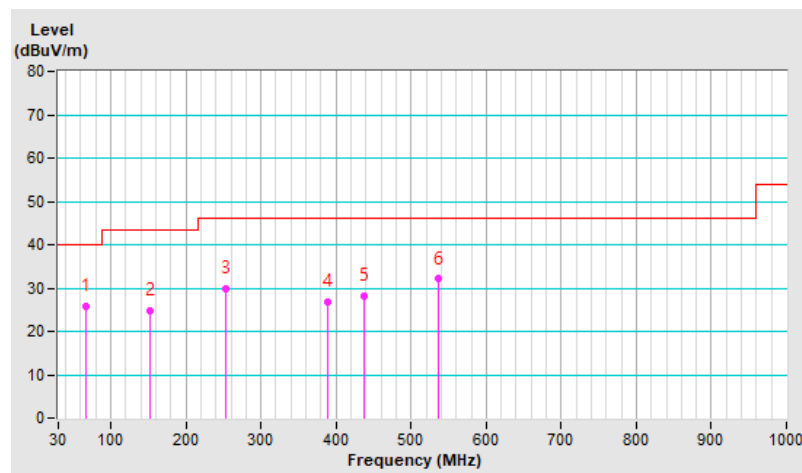


Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
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	66.5	25.7 QP	40.0	-14.3	1.16 V	177	35.9	-10.2
2	152.1	24.8 QP	43.5	-18.7	1.20 V	126	33.1	-8.3
3	252.6	30.0 QP	46.0	-16.0	1.30 V	86	38.2	-8.2
4	389.6	26.9 QP	46.0	-19.1	1.26 V	202	31.1	-4.2
5	438.3	28.2 QP	46.0	-17.8	1.55 V	253	30.8	-2.6
6	535.6	32.1 QP	46.0	-13.9	1.00 V	145	33.2	-1.1

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)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



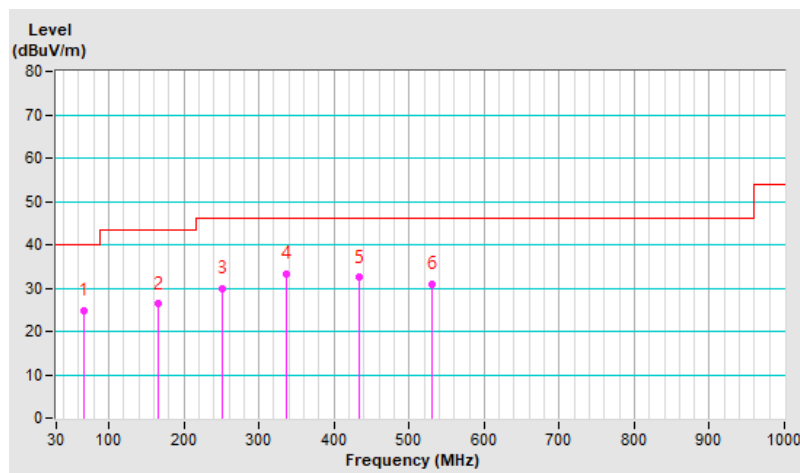
Mode B

Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
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	66.5	24.9 QP	40.0	-15.1	1.33 H	168	35.1	-10.2
2	166.4	26.3 QP	43.5	-17.2	1.22 H	89	34.8	-8.5
3	251.1	30.0 QP	46.0	-16.0	1.39 H	292	38.3	-8.3
4	337.4	33.2 QP	46.0	-12.8	1.43 H	134	38.4	-5.2
5	433.9	32.4 QP	46.0	-13.6	1.05 H	89	35.2	-2.8
6	530.4	31.0 QP	46.0	-15.0	1.13 H	241	32.1	-1.1

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)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

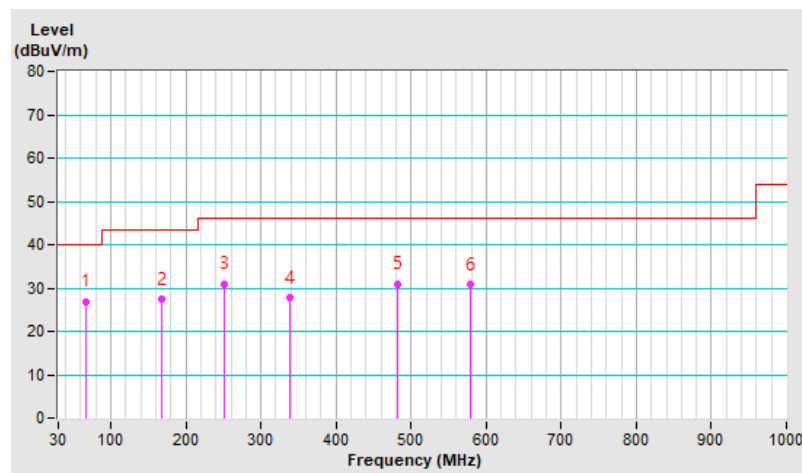


Test Frequency	147.5kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
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	66.6	26.9 QP	40.0	-13.1	1.23 V	293	37.1	-10.2
2	167.7	27.3 QP	43.5	-16.2	1.05 V	173	35.9	-8.6
3	251.8	30.9 QP	46.0	-15.1	1.19 V	77	39.2	-8.3
4	337.6	27.7 QP	46.0	-18.3	1.38 V	210	32.9	-5.2
5	482.3	30.8 QP	46.0	-15.2	1.54 V	286	32.8	-2.0
6	578.5	30.7 QP	46.0	-15.3	1.29 V	145	30.3	0.4

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)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



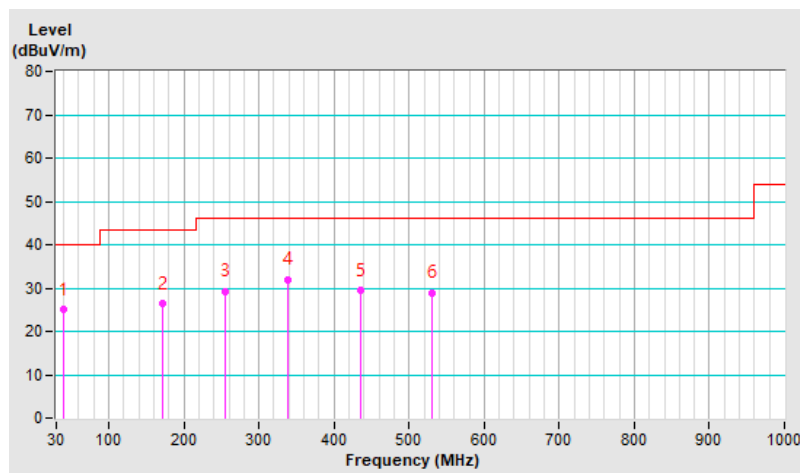
Mode C

Test Frequency	147.5kHz + 125kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
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	39.9	25.0 QP	40.0	-15.0	1.00 H	306	34.5	-9.5
2	171.4	26.3 QP	43.5	-17.2	1.22 H	74	35.1	-8.8
3	255.8	29.1 QP	46.0	-16.9	1.33 H	294	37.2	-8.1
4	337.8	31.9 QP	46.0	-14.1	1.52 H	156	37.1	-5.2
5	434.7	29.4 QP	46.0	-16.6	1.38 H	326	32.1	-2.7
6	530.1	28.8 QP	46.0	-17.2	1.19 H	243	29.9	-1.1

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)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

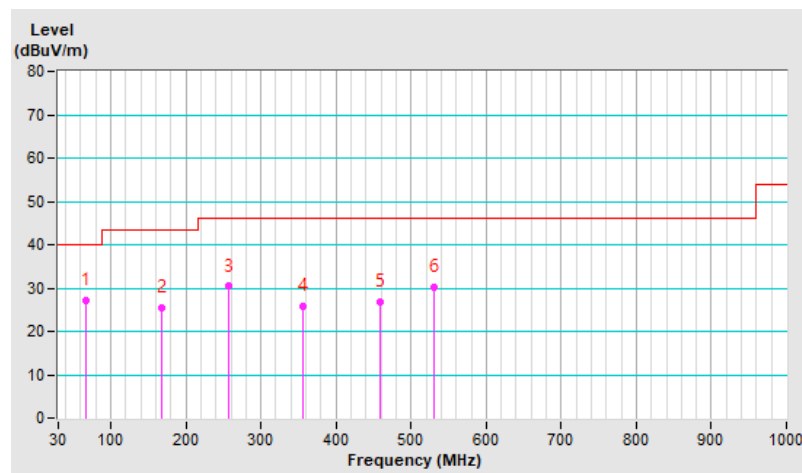


Test Frequency	147.5kHz + 125kHz	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
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	66.5	27.1 QP	40.0	-12.9	1.13 V	311	37.3	-10.2
2	168.5	25.5 QP	43.5	-18.0	1.20 V	160	34.1	-8.6
3	257.1	30.4 QP	46.0	-15.6	1.42 V	77	38.4	-8.0
4	356.2	25.8 QP	46.0	-20.2	1.33 V	131	30.9	-5.1
5	458.2	26.9 QP	46.0	-19.1	1.28 V	276	29.2	-2.3
6	530.7	30.2 QP	46.0	-15.8	1.10 V	291	31.3	-1.1

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)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



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
50 ohm terminal resistance LYNICS	0900510	E1-01-305	2023/2/13	2024/2/12
		E1-011285	2022/9/19	2023/9/18
		E1-011286	2022/9/19	2023/9/18
DC LISN R&S	ESH3-Z6	100219	2022/8/2	2023/8/1
		844950/018	2022/8/2	2023/8/1
EMI Test Receiver R&S	ESR3	102412	2022/12/21	2023/12/20
Fixed Attenuator STI	STI02-2200-10	NO.4	2022/9/2	2023/9/1
High Voltage Probe Schwarzbeck	TK9420	00982	2022/12/14	2023/12/13
Isolation Transformer Erika Fiedler	D-65396	017	2022/9/8	2023/9/7
LISN Schwarzbeck	NNLK 8121	8121-00759	2022/8/18	2023/8/17
		8121-808	2023/5/2	2024/5/1
	NSLK 8128	8128-244	2022/11/8	2023/11/7
RF Coaxial Cable Commate	5D-FB	Cable-CO5-01	2023/1/19	2024/1/18
Software BVADT	Cond_V7.3.7.4	N/A	N/A	N/A

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 5.

3. The VCCI Site Registration No. C-11093.

4. Tested Date: 2023/6/2 ~ 2023/6/17

4.2.3 Test Procedures

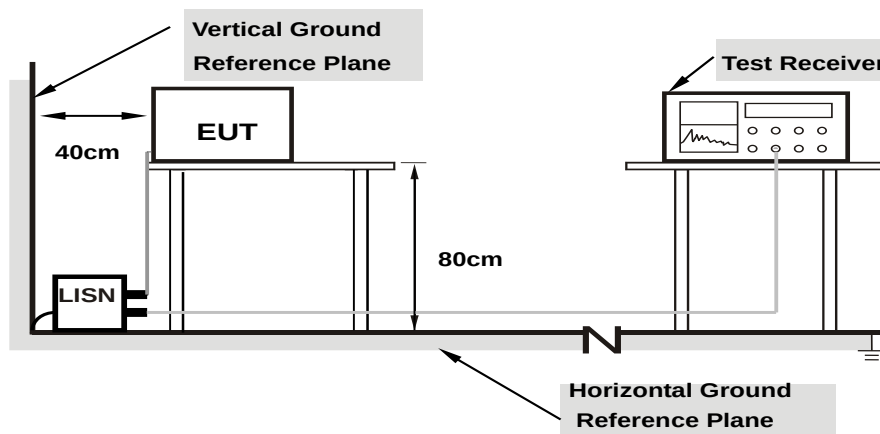
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were 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: 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

Same as item 4.1.6.

4.2.7 Test Results

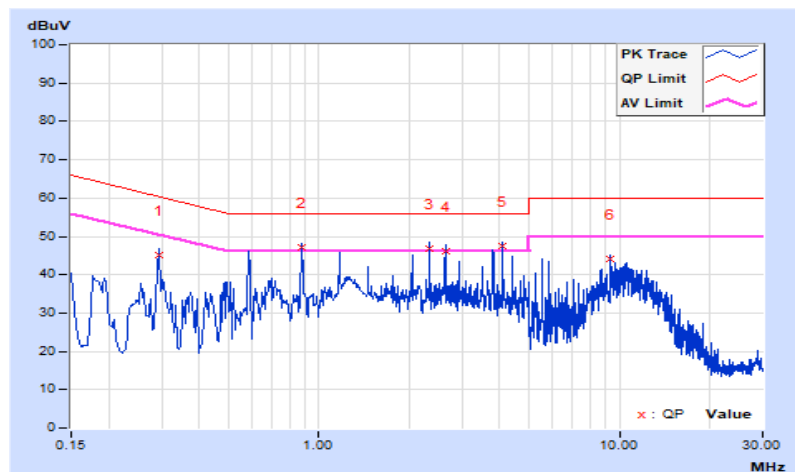
Mode A

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
------------------------	----------------	---	---------------------------------------

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	0.29471	10.20	35.06	30.51	45.26	40.71	60.39	50.39	-15.13	-9.68
2	0.87937	10.37	36.71	32.67	47.08	43.04	56.00	46.00	-8.92	-2.96
3	2.34208	10.45	36.43	32.45	46.88	42.90	56.00	46.00	-9.12	-3.10
4	2.63541	10.46	35.72	31.65	46.18	42.11	56.00	46.00	-9.82	-3.89
5	4.09812	10.54	36.99	33.09	47.53	43.63	56.00	46.00	-8.47	-2.37
6	9.36859	10.68	33.41	22.16	44.09	32.84	60.00	50.00	-15.91	-17.16

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

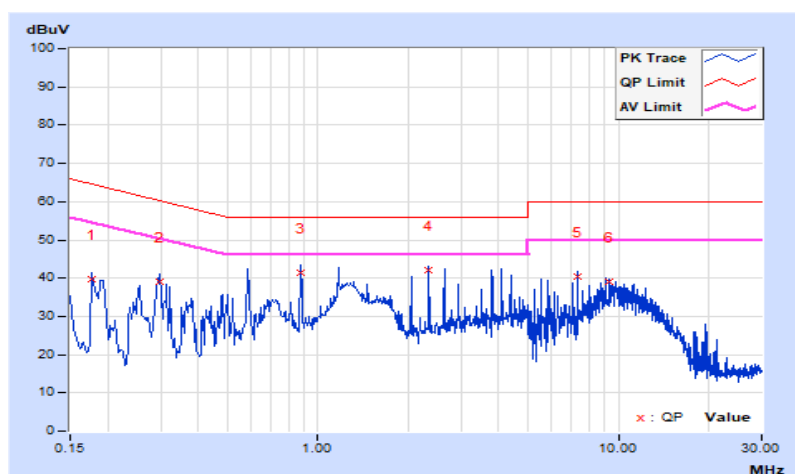


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17738	10.16	29.51	12.97	39.67	23.13	64.61	54.61	-24.94	-31.48
2	0.29862	10.22	28.70	19.78	38.92	30.00	60.28	50.28	-21.36	-20.28
3	0.87937	10.29	31.03	29.38	41.32	39.67	56.00	46.00	-14.68	-6.33
4	2.34208	10.34	31.75	30.15	42.09	40.49	56.00	46.00	-13.91	-5.51
5	7.31922	10.58	29.72	27.72	40.30	38.30	60.00	50.00	-19.70	-11.70
6	9.35685	10.66	28.35	18.40	39.01	29.06	60.00	50.00	-20.99	-20.94

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



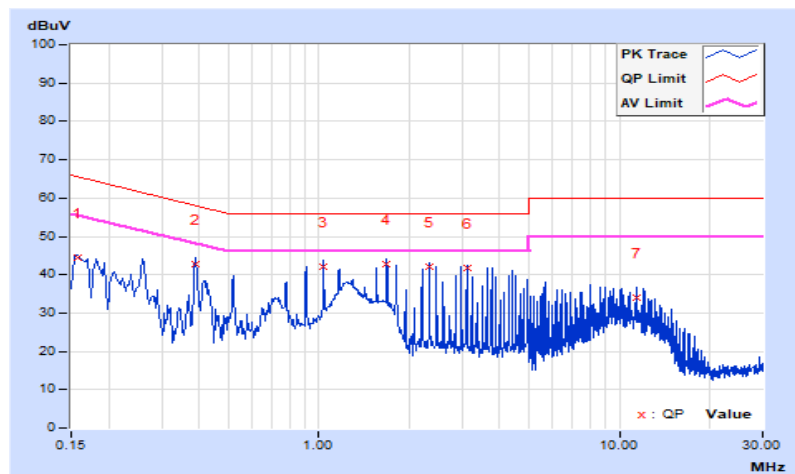
Mode B

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
------------------------	----------------	---	---------------------------------------

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	0.15687	10.09	34.40	16.92	44.49	27.01	65.63	55.63	-21.14	-28.62
2	0.39000	10.25	32.53	27.87	42.78	38.12	58.06	48.06	-15.28	-9.94
3	1.03600	10.40	31.74	28.18	42.14	38.58	56.00	46.00	-13.86	-7.42
4	1.68400	10.42	32.25	28.79	42.67	39.21	56.00	46.00	-13.33	-6.79
5	2.33200	10.45	31.69	28.20	42.14	38.65	56.00	46.00	-13.86	-7.35
6	3.11200	10.49	31.23	27.82	41.72	38.31	56.00	46.00	-14.28	-7.69
7	11.40800	10.73	23.27	19.00	34.00	29.73	60.00	50.00	-26.00	-20.27

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

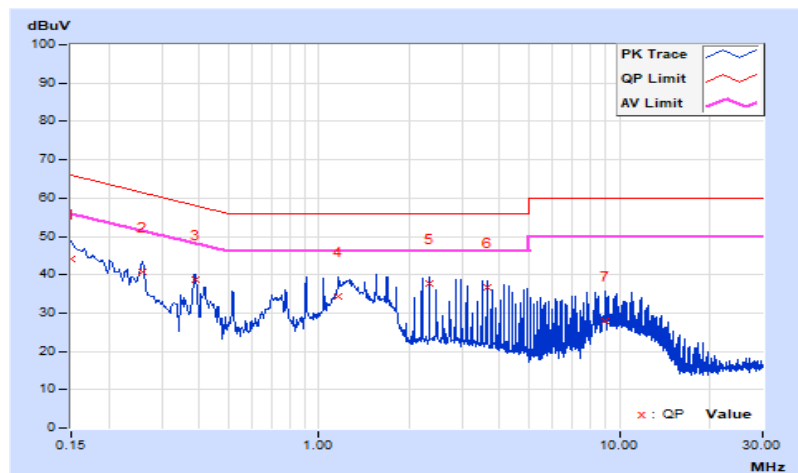


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.10	33.85	14.38	43.95	24.48	66.00	56.00	-22.05	-31.52
2	0.25800	10.22	30.61	24.70	40.83	34.92	61.50	51.50	-20.67	-16.58
3	0.38725	10.23	28.52	23.54	38.75	33.77	58.12	48.12	-19.37	-14.35
4	1.16400	10.30	24.00	20.69	34.30	30.99	56.00	46.00	-21.70	-15.01
5	2.33200	10.33	27.37	24.40	37.70	34.73	56.00	46.00	-18.30	-11.27
6	3.62800	10.43	26.30	23.44	36.73	33.87	56.00	46.00	-19.27	-12.13
7	8.94400	10.64	17.38	11.95	28.02	22.59	60.00	50.00	-31.98	-27.41

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



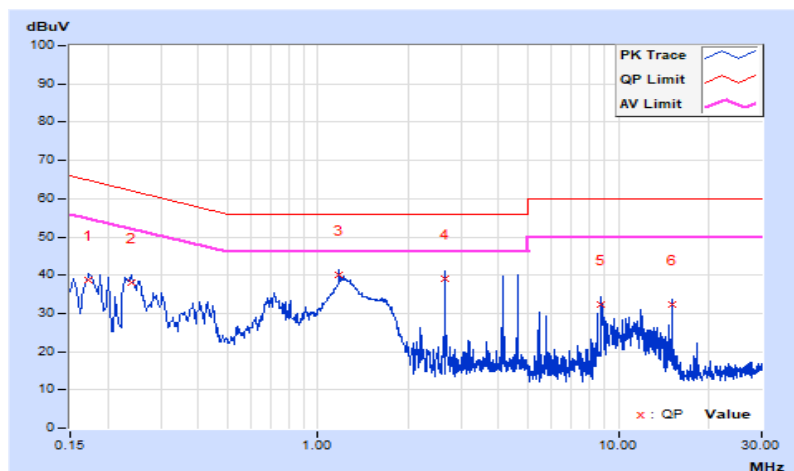
Mode C

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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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	0.17329	10.11	28.46	9.39	38.57	19.50	64.80	54.80	-26.23	-35.30
2	0.23962	10.18	27.93	12.59	38.11	22.77	62.11	52.11	-24.00	-29.34
3	1.17371	10.41	29.64	13.09	40.05	23.50	56.00	46.00	-15.95	-22.50
4	2.64323	10.47	28.59	13.05	39.06	23.52	56.00	46.00	-16.94	-22.48
5	8.77803	10.67	21.61	8.41	32.28	19.08	60.00	50.00	-27.72	-30.92
6	15.05127	10.82	21.56	8.62	32.38	19.44	60.00	50.00	-27.62	-30.56

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

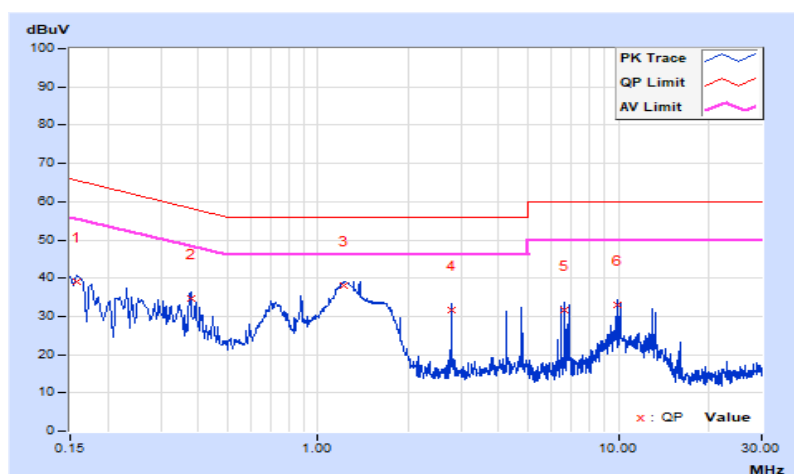


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15760	10.11	28.92	4.10	39.03	14.21	65.59	55.59	-26.56	-41.38
2	0.37684	10.23	24.60	11.12	34.83	21.35	58.35	48.35	-23.52	-27.00
3	1.21461	10.30	27.87	8.55	38.17	18.85	56.00	46.00	-17.83	-27.15
4	2.79185	10.37	21.26	9.02	31.63	19.39	56.00	46.00	-24.37	-26.61
5	6.64653	10.56	21.02	8.88	31.58	19.44	60.00	50.00	-28.42	-30.56
6	9.90831	10.68	22.46	9.77	33.14	20.45	60.00	50.00	-26.86	-29.55

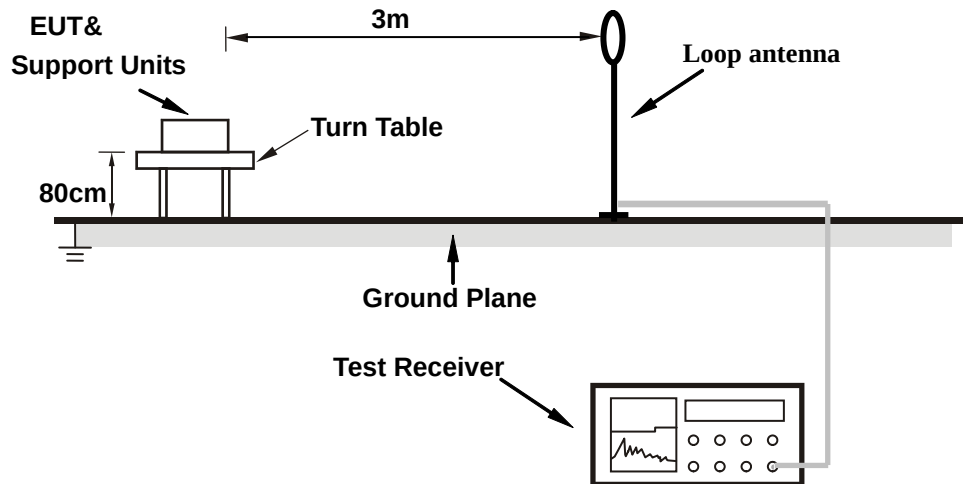
Remarks:

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



4.3 20dB Bandwidth Measurement

4.3.1 Test SetUp



4.3.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.3 Test Procedure

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter Semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Then the Loop antenna was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband loop antenna, which is fixed of a 1m height above the ground, and set away from 3m to the EUT to find the disturbance reading on each frequency.
- The test-receiver system was set to Quasi-peak detect function and specified bandwidth.

4.3.4 Deviation from Test Standard

No deviation.

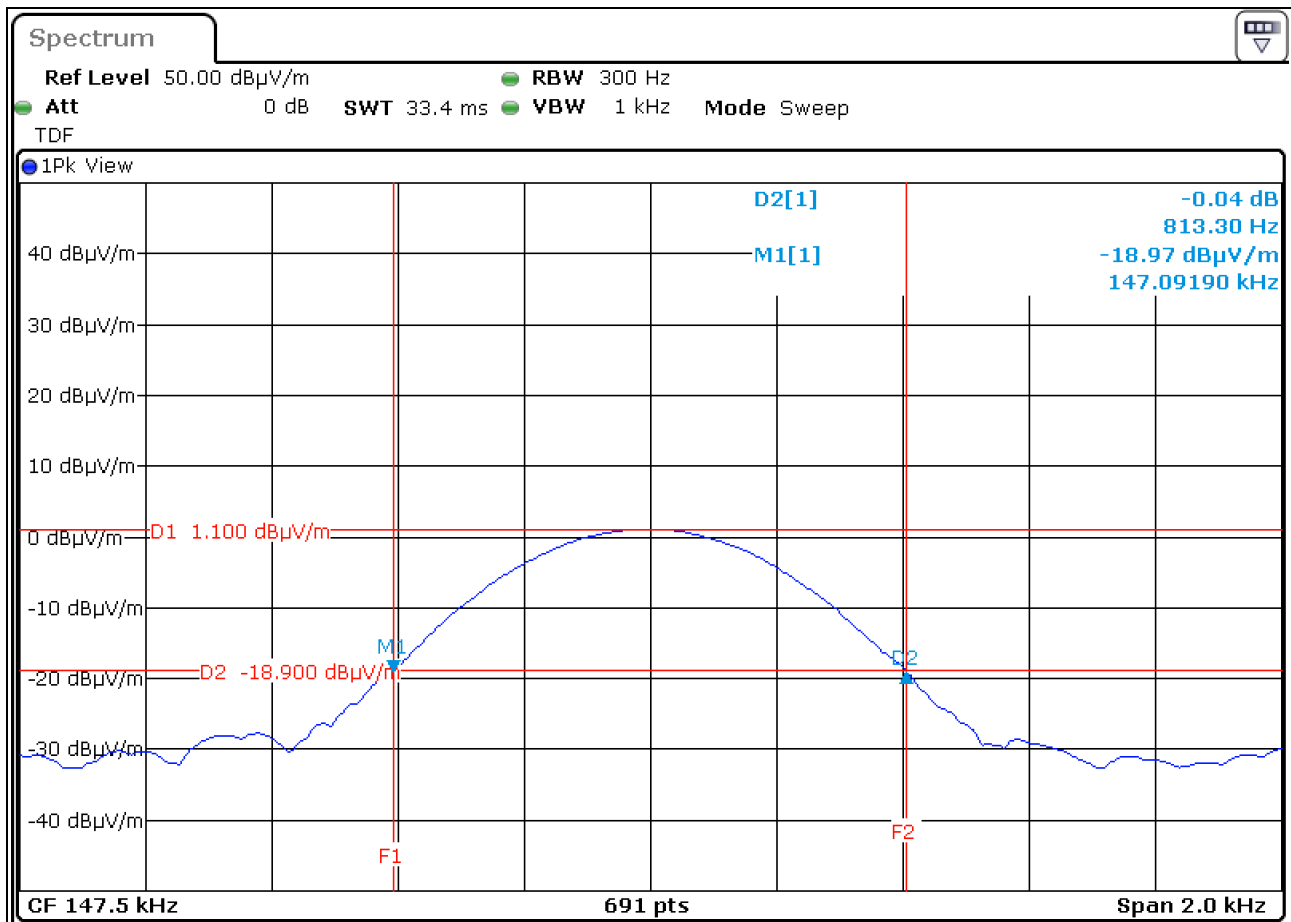
4.3.5 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously.

4.3.6 Test Results

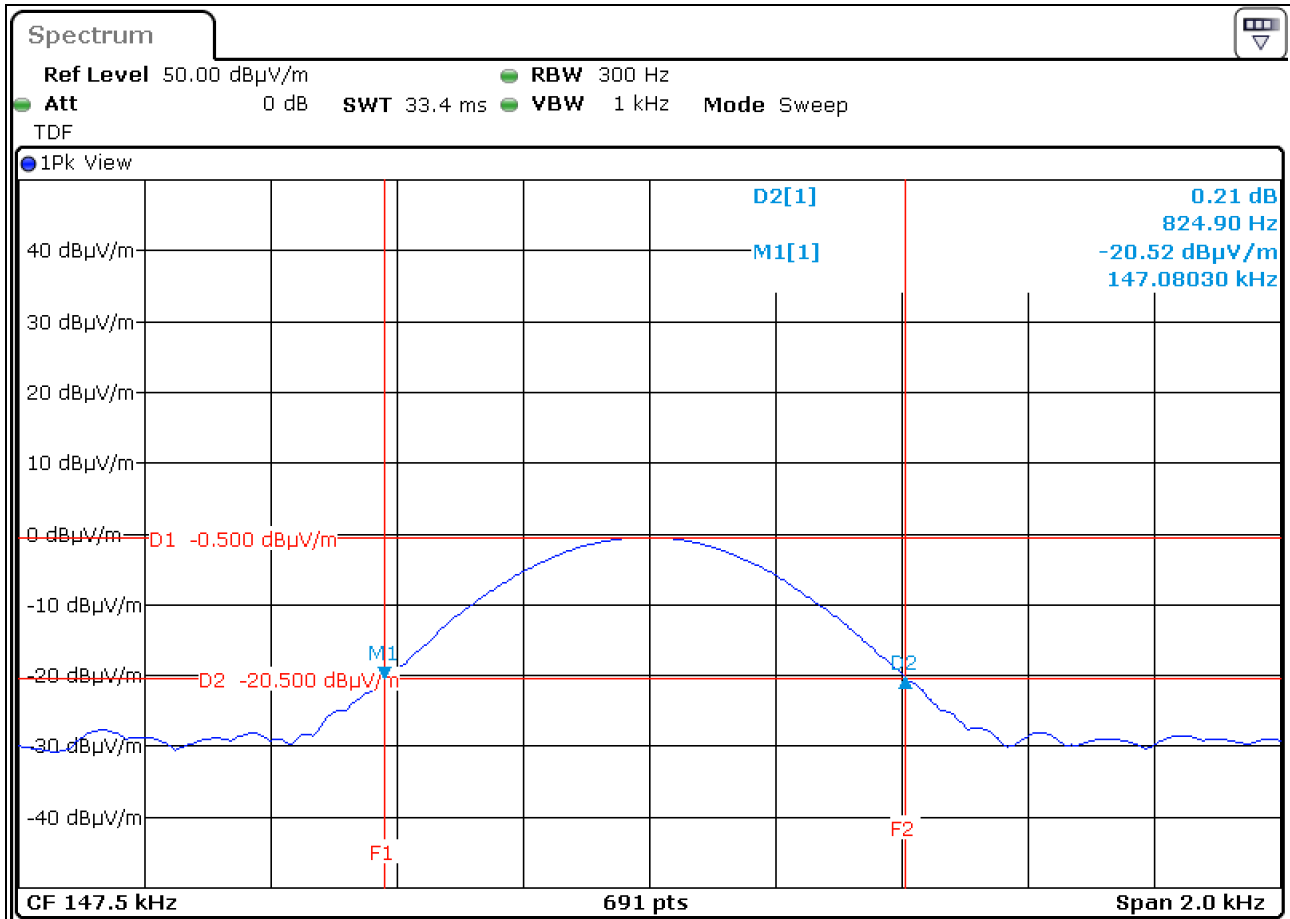
Test Mode A

Frequency (kHz)	20dB Bandwidth (Hz)	Pass / Fail
147.5	813	Pass



Test Mode B

Frequency (kHz)	20dB Bandwidth (Hz)	Pass / Fail
147.5	824	Pass



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.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: <http://ee.bureauveritas.com.tw>

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

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