FCC Test Report

Report No.:	RFBEDV-WTW-P23080241-4
FCC ID:	BEJNT-16T90SP
Model No.:	16T90SP
Series Model:	16T90SP** ,16TD90SP**,16TG90SP**,16TB90SP** Remark "*" can be 0 to 9 or A to Z or dash or blank (Refer to item 3.1 for the more details)
Received Date:	2023/8/10
Test Date:	2023/9/29 ~ 2023/12/20
Issued Date:	2023/12/28
Applicant:	LG Electronics USA, Inc.
Address:	111 Sylvan Avenue North Bulding Englewood Cliffs New Jerssy United States
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
Test Location:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RFBEDV-WTW-P23080241-4	Original Release	2023/12/28

1 Certificate of Conformity

Product:	Notebook Computer
Brand:	LG or LG
Model No.:	16T90SP
Series Model:	16T90SP** ,16TD90SP**,16TG90SP**,16TB90SP** Remark "*" can be 0 to 9 or A to Z or dash or blank (Refer to item 3.1 for the more details)
Sample Status:	DV Sample
Applicant:	LG Electronics USA, Inc.
Test Date:	2023/9/29 ~ 2023/12/20
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.225) 47 CFR FCC Part 15, Subpart C (Section 15.215) 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 : Vera Huang , **Date:** 2023/12/28

Vera Huang / Specialist

Approved by : Jeremy Lin , **Date:** 2023/12/28

Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.225, 15.215)			
FCC Clause	Test Item	Result	Remarks
15.207	Conducted emission test	Pass	Meet the requirement of limit. Minimum passing margin is -4.12 dB at 13.55859 MHz.
15.225 (a)	The field strength of any emissions within the band 13.553-13.567 MHz	Pass	Meet the requirement of limit. Minimum passing margin is -58.8dB at 13.56MHz.
15.225 (b)	The field strength of any emissions within the bands 13.410-13.553 MHz and 13.567-13.710 MHz	Pass	Meet the requirement of limit.
15.225 (c)	The field strength of any emissions within the bands 13.110-13.410 MHz and 13.710-14.010 MHz	Pass	Meet the requirement of limit.
15.225 (d)	The field strength of any emissions appearing outside of the 13.110-14.010 MHz band	Pass	Meet the requirement of limit. Minimum passing margin is -4.9dB at 30.97MHz.
15.225 (e)	The frequency tolerance	Pass	Meet the requirement of limit.
15.215 (c)	20dB Bandwidth	Pass	Meet the requirement of limit.

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	2.99 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.44 dB
	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Notebook Computer
Brand	LG or LG
Model No.	16T90SP
Series Model	16T90SP** ,16TD90SP**,16TG90SP**,16TB90SP** Remark "*" can be 0 to 9 or A to Z or dash or blank
Model Difference	Refer to Note
Sample Status	DV Sample
Power Supply Rating	15.52Vdc from battery 5.0Vdc or 9.0Vdc or 15.0Vdc or 20.0Vdc from adapter
Modulation Type	ASK
Operating Frequency	13.56MHz
Data Rate	484 kbit/s
Field Strength	Mode A: 25.2dBuV/m (QP) (30m) Mode B: 17.2dBuV/m (QP) (30m)
Antenna Type	Loop antenna

Note:

1. The model is listed as below.

Brand	Model Name	Remark
LG or LG	16T90SP	Main test model
	16T90SP**	"*" can be 0 to 9 or A to Z or dash or blank, for marketing purposes only
	16TD90SP**	
	16TG90SP**	
	16TB90SP**	

2. The EUT contains following accessory devices.

BT/WLAN Module	Brand	Intel
	Model	AX211D2W
Battery	Brand	LG or LG
	Model	LB3122MM
	Power Rating	15.52Vdc, Typical capacity: 4963mAh/77Wh, Rated Capacity: 4733mAh/73.46Wh
Active Stylus Pen	Brand	LGE
	Model	PEW7
AC Adapter	Brand	LG or LG
	Model	LP65WFC20P-NJ
	Part Number	N/A
	AC Input	100-240V~, 50-60Hz, 1.6A
	DC Output	(PDO) 5.0Vdc, 3.0A, 15.0W or 9.0Vdc, 3.0A, 27.0W or 15.0Vdc, 3.0A, 45.0W or 20.0Vdc, 3.25A, 65.0W (PPS) 5.0V-20.0Vdc, 3.25A, Max 65.0W
Type C to Type C cable	Brand	Luxshare
	Model	L1LUC022-CS-H
	Specification	1.95mm

3. The antenna information is listed as below.

Ant No.	Brand	Model	Antenna Type	Connector Type	Remark	Difference
1	INPAQ	NF-C-F9-R0-206 (Black)	Loop antenna	FPC	Main sorce	The antennas are electrical identical which circuit and design is the same, only different in color.
	INPAQ	NF-C-F9-R0-215 (White)	Loop antenna	FPC	2nd sorce	
2	AWAN	AFF00-000107 (Black)	Loop antenna	FPC	Main sorce	The antennas are electrical identical which circuit and design is the same, only different in color.
	AWAN	AFF00-000111 (White)	Loop antenna	FPC	2nd sorce	

*Only main sorce of antenna 1 & 2 as a representative for test.
*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.

4. 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

1 channel is provided to this EUT

Channel	Freq. (MHz)
1	13.56

3.2.1 Test Mode Applicability and Tested Channel Deta

EUT Configure Mode	Applicable to				Description
	RE	PLC	FS	EB	
A	√	√	√	√	EUT + INPAQ antenna (Model: NF-C-F9-R0-206)
B	√	√	√	√	EUT + AWAN antenna (Model: AFF00-000107)

Where RE: Radiated Emission PLC: Power Line Conducted Emission

FS: Frequency Stability EB: 20dB Bandwidth measurement

Note: EUT can be used in the following ways: X-axis/ Y-axis/ Z-axis for tablet mode and Laptop mode. Pre-scan these ways and find the worst case as a representative test condition. The worst case was found when positioned on **Y-plane** for tablet mode.

Radiated 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	Available Channel	Tested Channel	Modulation Type
A, B	1	1	ASK

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	Available Channel	Tested Channel	Modulation Type
A, B	1	1	ASK

Frequency Stability:

☒ 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	Available Channel	Tested Channel	Modulation Type
A, B	1	1	ASK

20dB Bandwidth:

☒ 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	Available Channel	Tested Channel	Modulation Type
A, B	1	1	ASK

Test Condition:

Applicable to	EUT Configure Mode	Environmental Conditions	Input Power	Tested by
RE	A	20.9 deg. C, 65.2 % RH	120 Vac, 60 Hz	Thomas Cheng
	B	22 deg. C, 64 % RH	120 Vac, 60 Hz	Vincent Chen
PLC	A	23 deg. C, 72 % RH	120 Vac, 60 Hz	Vincent Chen
	B	25 deg. C, 75 % RH	120 Vac, 60 Hz	Vincent Chen
FS	A	25 deg. C, 60 % RH	120 Vac, 60 Hz	Thomas Cheng
	B	23 deg. C, 65 % RH	120 Vac, 60 Hz	Vincent Chen
EB	A	25 deg. C, 60 % RH	120 Vac, 60 Hz	Thomas Cheng
	B	23 deg. C, 65 % RH	120 Vac, 60 Hz	Vincent Chen

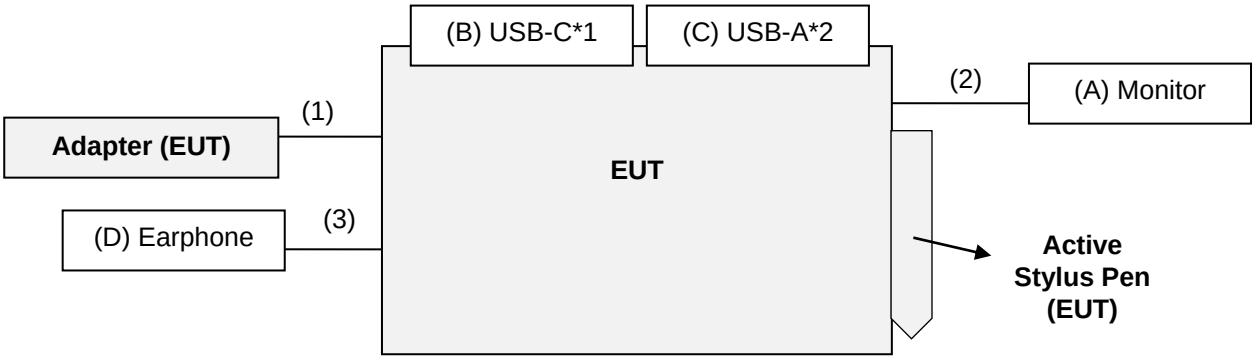
3.3 Description of Support Units

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.	Monitor	Dell	A14S2421HSXmTW	CN-01KWFW-WSL00-24C-711B	N/A	Provided by Lab
B.	USB-C*1	SanDisk	SDDDC3-032G	N/A	N/A	Provided by Lab
C.	USB-A*2	SanDisk	SDDDC3-032G	N/A	N/A	Provided by Lab
D.	Earphone	APPLE	MB77PFEB	N/A	N/A	Provided by Lab

No.	Cable Descriptions	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Qty.)	Remark
1.	Type C to Type C cable	1	1.95	Yes	0	Accessory of EUT
2.	HDMI	1	1.8	Yes	0	Provided by Lab
3.	Earphone Cable	1	1.8	No	0	Provided by Lab

3.3.1 Configuration of System under Test



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:

Test standard:
FCC Part 15, Subpart C (15.225)
FCC Part 15, Subpart C (15.215)
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 Measurement

4.1.1 Limits of Radiated Emission Measurement

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

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

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower &Turn Max-Full	MFA-440H	AT93021705	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Turn Table Controller Max-Full	MG-7802	NA	NA	NA
MXE EMI Receiver Keysight	N9038A	MY55420137	2023/5/3	2024/5/2
EXA Signal Analyzer Agilent	N9010A	MY52220207	2023/1/3	2024/1/2
Loop Antenna TESEQ	HLA 6121	45745	2023/8/8	2024/8/7
Loop Antenna Electro-Metrics	EM-6879	269	2023/9/23	2024/9/22
Preamplifier EMCI	EMC001340	980201	2023/9/27	2024/9/26
RF Coaxial Cable EMCI	5D-NM-BM	140903+140902	2023/1/7	2024/1/6
Preamplifier EMCI	EMC 330H	980112	2023/9/27	2024/9/26
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-472	2022/10/21	2023/10/20
			2023/10/16	2024/10/15
RF Coaxial Cable Woken	8D-FB	Cable-Ch10-01	2023/9/27	2024/9/26

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 HY - 966 chamber 5.
3. Test date: 2023/9/29 ~ 2023/12/19

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 (9 kHz-90 kHz, 110 kHz-490 kHz) 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 band (9kHz-150kHz) and 9kHz at frequency below 30MHz (except 9kHz-150kHz).
2. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 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:

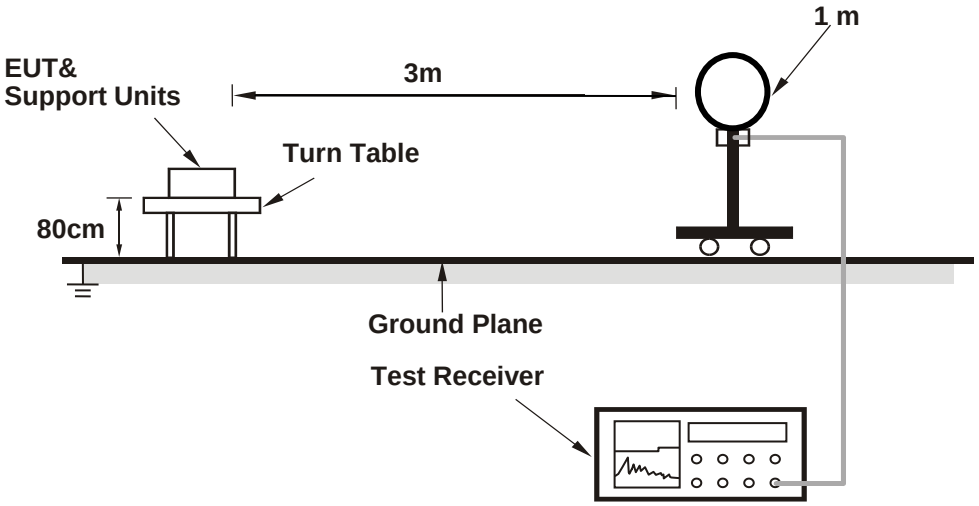
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

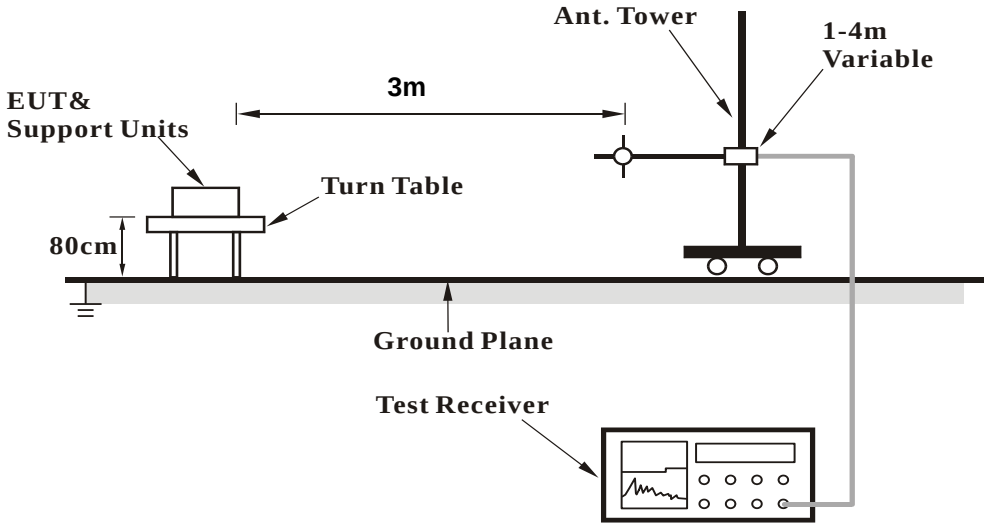
No deviation.

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).

KDB 414788 OFS and Chamber Correlation Justification
- Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.
- Parallel-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

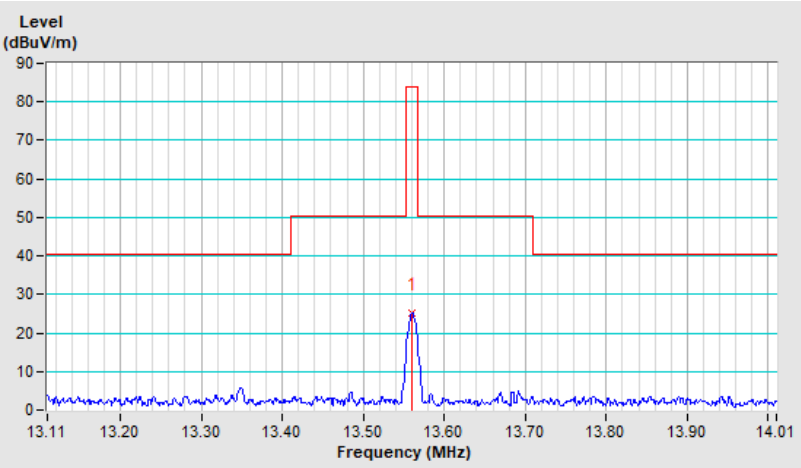
Mode A

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.11 ~ 14.01MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	20.9°C, 65.2% RH	Tested By	Thomas Cheng

Antenna Polarity & Test Distance: Loop Antenna Parallel at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	***13.56**	**25.2 QP**	**84.0**	**-58.8**	**1.00**	**23**	**43.8**	**-18.6**

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. " * " : Fundamental frequency.
6. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

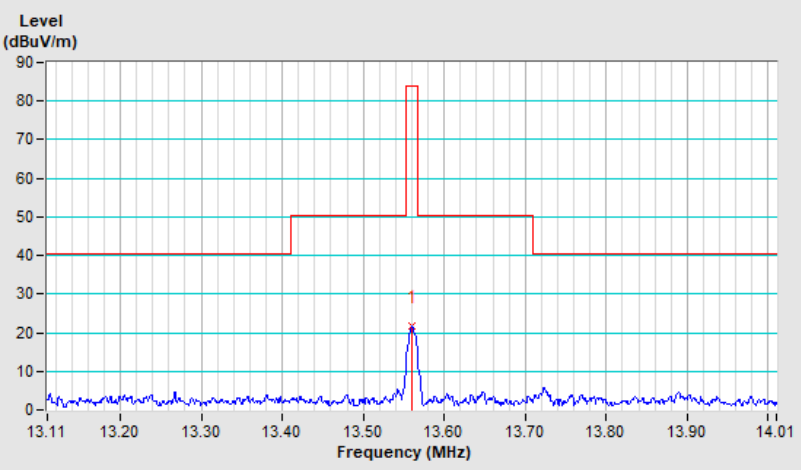


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.11 ~ 14.01MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	20.9°C, 65.2% RH	Tested By	Thomas Cheng

Antenna Polarity & Test Distance: Loop Antenna Perpendicular at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*13.56	21.6 QP	84.0	-62.4	1.00	300	40.2	-18.6

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. “ * “ : Fundamental frequency.
6. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

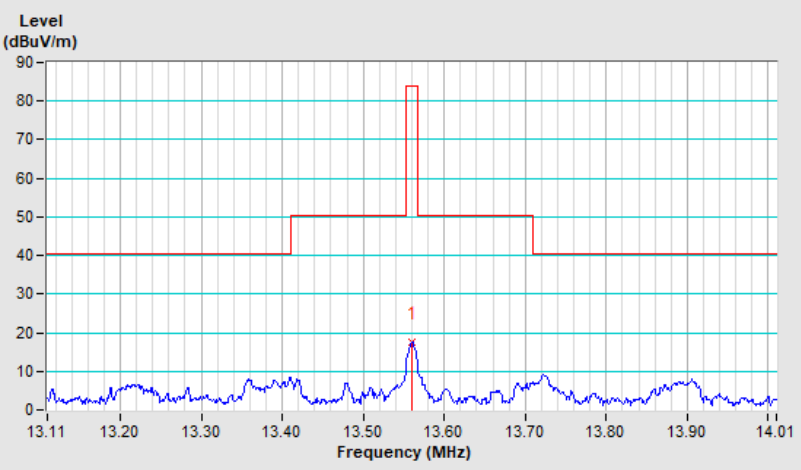


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.11 ~ 14.01MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	20.9°C, 65.2% RH	Tested By	Thomas Cheng

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*13.56	17.5 QP	84.0	-66.5	1.00	259	36.1	-18.6

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. “ * “ : Fundamental frequency.
6. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

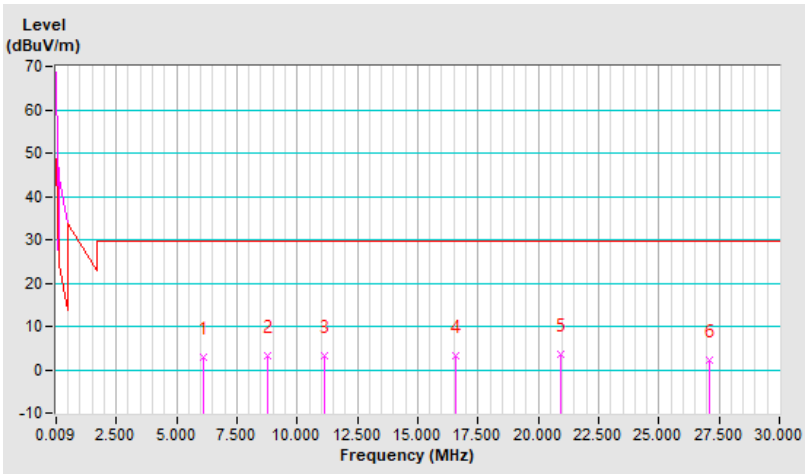


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	20.9°C, 65.2% RH	Tested By	Thomas Cheng

Antenna Polarity & Test Distance: Loop Antenna Parallel at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	6.10	2.9 QP	29.5	-26.6	1.00	89	21.7	-18.8
2	8.77	3.1 QP	29.5	-26.4	1.00	2	22.0	-18.9
3	11.14	3.3 QP	29.5	-26.2	1.00	18	21.7	-18.4
4	16.56	3.2 QP	29.5	-26.3	1.00	18	21.4	-18.2
5	20.91	3.6 QP	29.5	-25.9	1.00	74	21.8	-18.2
6	27.12	2.3 QP	29.5	-27.2	1.00	186	20.1	-17.8

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

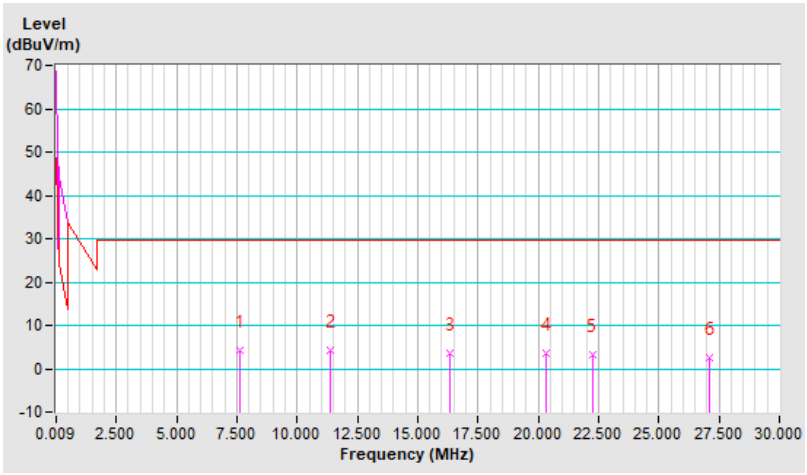


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	20.9°C, 65.2% RH	Tested By	Thomas Cheng

Antenna Polarity & Test Distance: Loop Antenna Perpendicular at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7.63	4.1 QP	29.5	-25.4	1.00	285	23.0	-18.9
2	11.38	4.3 QP	29.5	-25.2	1.00	19	22.7	-18.4
3	16.35	3.5 QP	29.5	-26.0	1.00	20	21.8	-18.3
4	20.31	3.7 QP	29.5	-25.8	1.00	103	21.7	-18.0
5	22.23	3.2 QP	29.5	-26.3	1.00	306	21.5	-18.3
6	27.12	2.4 QP	29.5	-27.1	1.00	331	20.2	-17.8

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

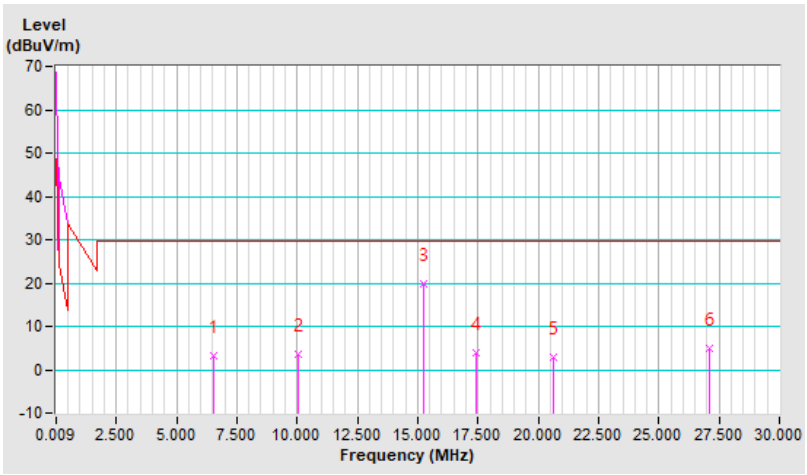


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	20.9°C, 65.2% RH	Tested By	Thomas Cheng

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	6.52	3.1 QP	29.5	-26.4	1.00	151	21.9	-18.8
2	10.03	3.6 QP	29.5	-25.9	1.00	17	22.2	-18.6
3	15.27	19.7 QP	29.5	-9.8	1.00	129	38.2	-18.5
4	17.40	3.8 QP	29.5	-25.7	1.00	2	21.8	-18.0
5	20.64	2.9 QP	29.5	-26.6	1.00	183	21.0	-18.1
6	27.12	4.9 QP	29.5	-24.6	1.00	143	22.7	-17.8

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

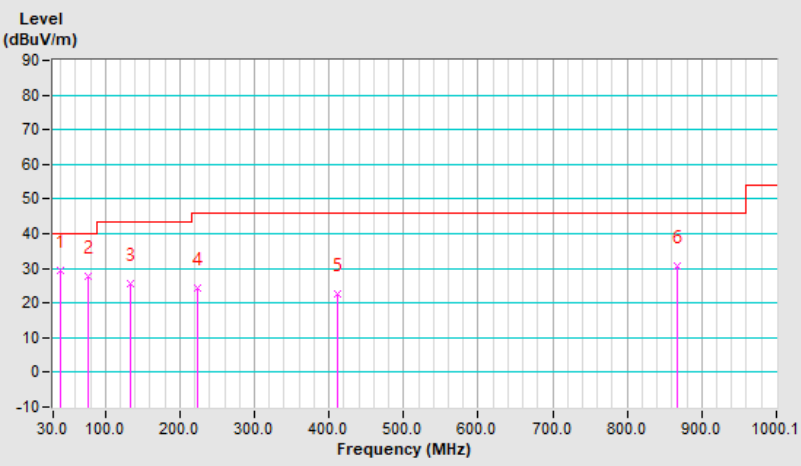


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	20.9°C, 65.2% RH	Tested By	Thomas Cheng

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	40.67	29.5 QP	40.0	-10.5	1.00 H	18	42.0	-12.5
2	77.53	27.7 QP	40.0	-12.3	1.50 H	304	44.1	-16.4
3	132.83	25.4 QP	43.5	-18.1	2.00 H	126	38.7	-13.3
4	224.02	24.5 QP	46.0	-21.5	2.00 H	224	40.5	-16.0
5	411.25	22.5 QP	46.0	-23.5	2.50 H	195	31.8	-9.3
6	867.20	30.5 QP	46.0	-15.5	2.00 H	184	31.3	-0.8

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. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value

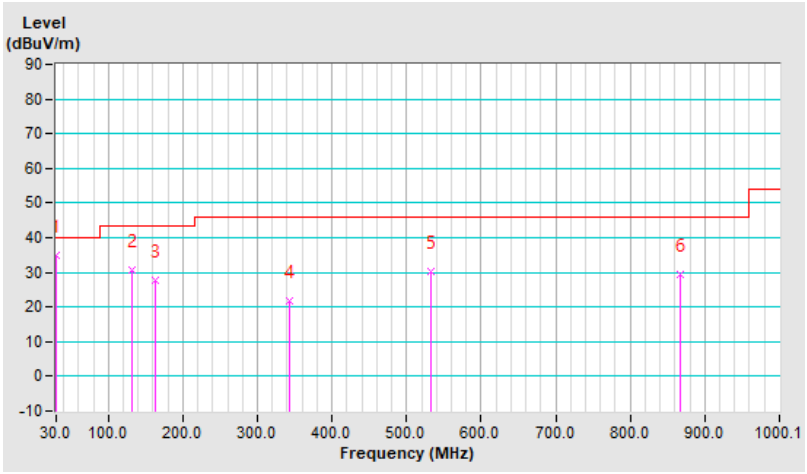


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	20.9°C, 65.2% RH	Tested By	Thomas Cheng

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	**30.97**	**35.1 QP**	**40.0**	**-4.9**	**1.00 V**	**227**	**48.3**	**-13.2**
2	130.89	30.7 QP	43.5	-12.8	2.00 V	172	44.2	-13.5
3	162.90	27.6 QP	43.5	-15.9	1.50 V	87	40.4	-12.8
4	343.34	21.7 QP	46.0	-24.3	2.50 V	251	32.7	-11.0
5	532.51	30.2 QP	46.0	-15.8	2.00 V	20	36.4	-6.2
6	867.20	29.6 QP	46.0	-16.4	2.00 V	54	30.4	-0.8

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. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value



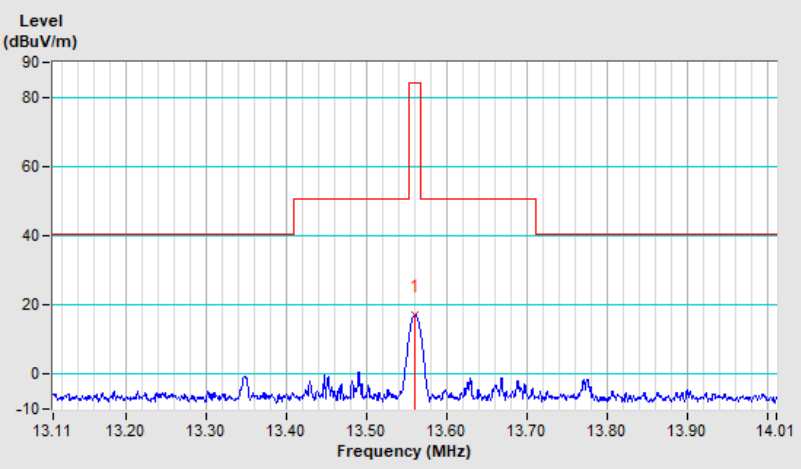
Mode B

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.11 ~ 14.01MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	22°C, 64% RH	Tested By	Vincent Chen

Antenna Polarity & Test Distance: Loop Antenna Parallel at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*13.56	17.2 QP	84.0	-66.8	1.00	42	35.8	-18.6

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. " * " : Fundamental frequency.
6. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

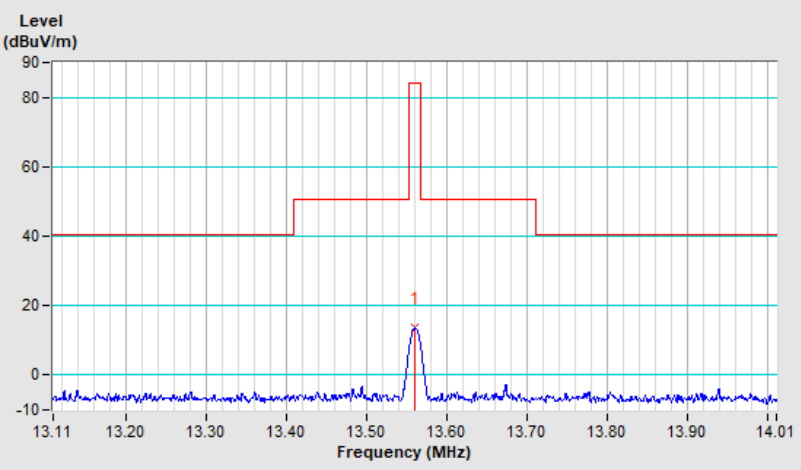


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.11 ~ 14.01MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	22°C, 64% RH	Tested By	Vincent Chen

Antenna Polarity & Test Distance: Loop Antenna Perpendicular at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*13.56	13.6 QP	84.0	-70.4	1.00	119	32.2	-18.6

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. “ * “ : Fundamental frequency.
6. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

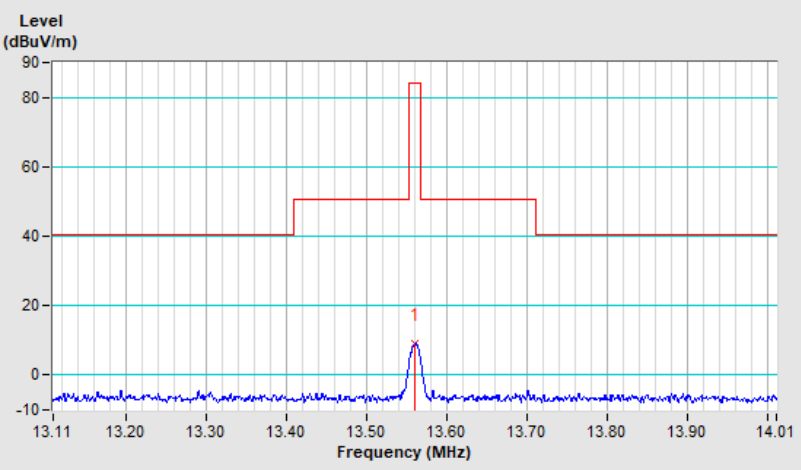


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.11 ~ 14.01MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	22°C, 64% RH	Tested By	Vincent Chen

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*13.56	9.2 QP	84.0	-74.8	1.00	209	27.8	-18.6

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. “ * “ : Fundamental frequency.
6. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

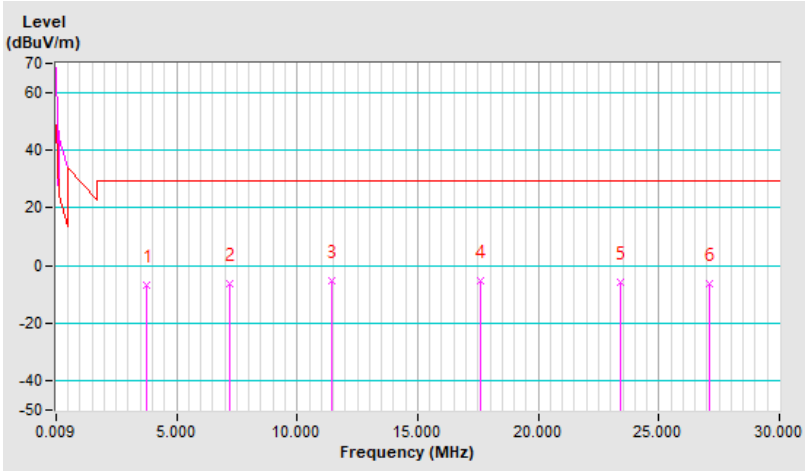


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	22°C, 64% RH	Tested By	Vincent Chen

Antenna Polarity & Test Distance: Loop Antenna Parallel at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3.79	-7.0 QP	29.5	-36.5	1.00	248	13.3	-20.3
2	7.21	-6.5 QP	29.5	-36.0	1.00	158	12.3	-18.8
3	11.44	-5.2 QP	29.5	-34.7	1.00	86	13.2	-18.4
4	17.61	-5.4 QP	29.5	-34.9	1.00	331	12.5	-17.9
5	23.43	-6.0 QP	29.5	-35.5	1.00	56	12.5	-18.5
6	27.12	-6.4 QP	29.5	-35.9	1.00	259	11.4	-17.8

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

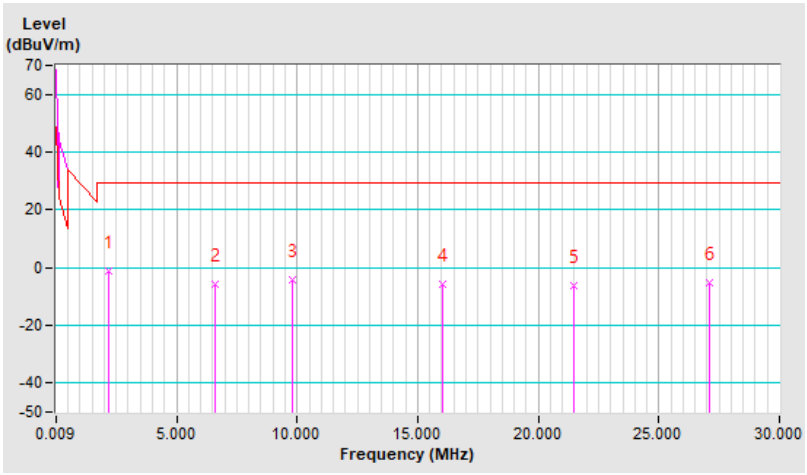


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	22°C, 64% RH	Tested By	Vincent Chen

Antenna Polarity & Test Distance: Loop Antenna Perpendicular at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2.20	-1.2 QP	29.5	-30.7	1.00	83	19.2	-20.4
2	6.61	-5.8 QP	29.5	-35.3	1.00	260	13.0	-18.8
3	9.79	-4.1 QP	29.5	-33.6	1.00	340	14.6	-18.7
4	16.05	-5.8 QP	29.5	-35.3	1.00	289	12.6	-18.4
5	21.48	-6.3 QP	29.5	-35.8	1.00	18	11.9	-18.2
6	27.12	-5.5 QP	29.5	-35.0	1.00	2	12.3	-17.8

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

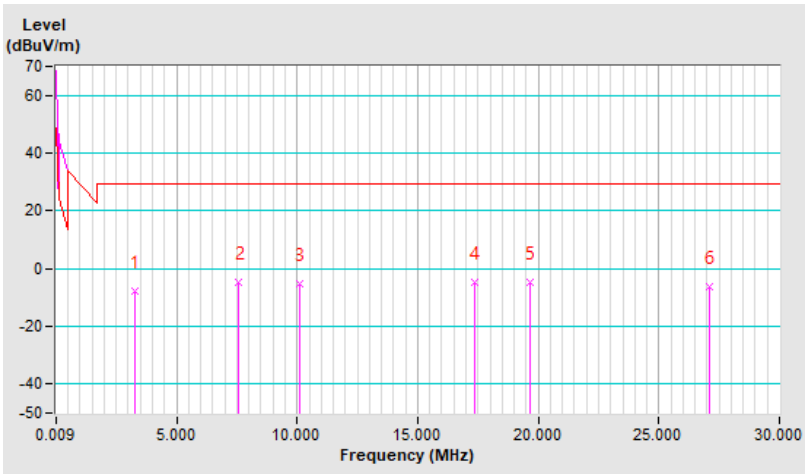


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	22°C, 64% RH	Tested By	Vincent Chen

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3.25	-7.6 QP	29.5	-37.1	1.00	149	12.8	-20.4
2	7.60	-4.9 QP	29.5	-34.4	1.00	86	14.0	-18.9
3	10.09	-5.4 QP	29.5	-34.9	1.00	342	13.2	-18.6
4	17.34	-4.9 QP	29.5	-34.4	1.00	30	13.1	-18.0
5	19.65	-4.5 QP	29.5	-34.0	1.00	154	13.4	-17.9
6	27.12	-6.2 QP	29.5	-35.7	1.00	72	11.6	-17.8

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 conversion factor.
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value.
5. The test distance for 0.49 ~ 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters. Distance factor@30m = 40 *log(3/30) = -40dB

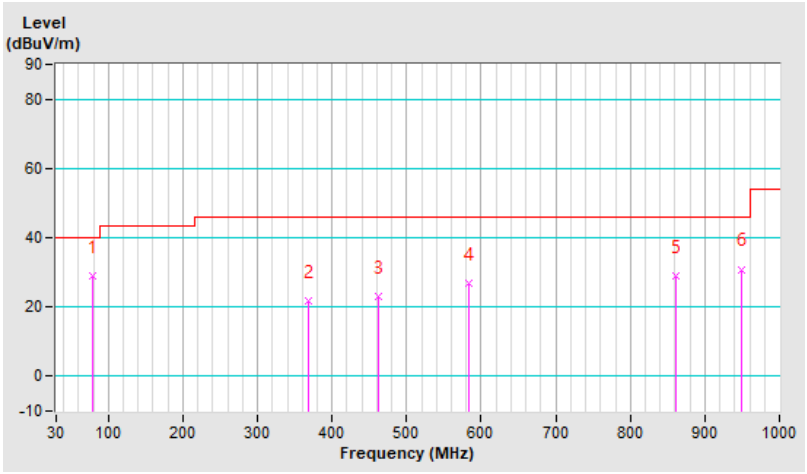


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	22°C, 64% RH	Tested By	Vincent Chen

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	78.50	29.1 QP	40.0	-10.9	2.00 H	307	46.1	-17.0
2	367.56	21.9 QP	46.0	-24.1	1.00 H	347	32.4	-10.5
3	462.62	23.2 QP	46.0	-22.8	1.00 H	278	31.1	-7.9
4	583.87	26.8 QP	46.0	-19.2	1.50 H	282	32.2	-5.4
5	861.29	29.1 QP	46.0	-16.9	2.00 H	51	30.0	-0.9
6	949.56	30.9 QP	46.0	-15.1	1.00 H	164	31.2	-0.3

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. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value

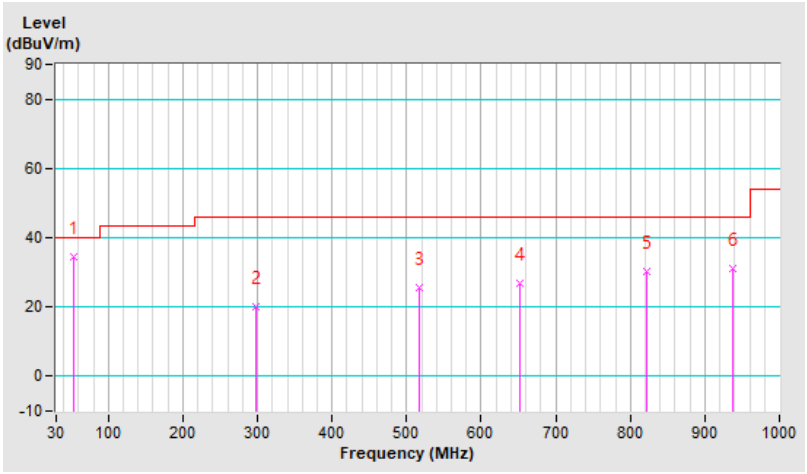


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	22°C, 64% RH	Tested By	Vincent Chen

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	53.28	34.7 QP	40.0	-5.3	1.00 V	232	47.2	-12.5
2	298.69	20.2 QP	46.0	-25.8	1.00 V	273	32.3	-12.1
3	517.91	25.7 QP	46.0	-20.3	1.50 V	2	32.0	-6.3
4	652.74	27.0 QP	46.0	-19.0	1.00 V	136	30.9	-3.9
5	822.49	30.1 QP	46.0	-15.9	1.00 V	109	31.0	-0.9
6	936.95	31.0 QP	46.0	-15.0	2.00 V	52	31.4	-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. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value



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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102412	2022/12/21	2023/12/20
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	2023/9/2	2024/9/1
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	2023/3/7	2024/3/6
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ENV216	101196	2023/5/22	2024/5/21
Software ADT	BV ADT_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 HY - Conduction 2 (Conduction 2).
3. The VCCI Site Registration No. is C-12047.
4. Test date: 2023/10/7 ~ 2023/12/20

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.

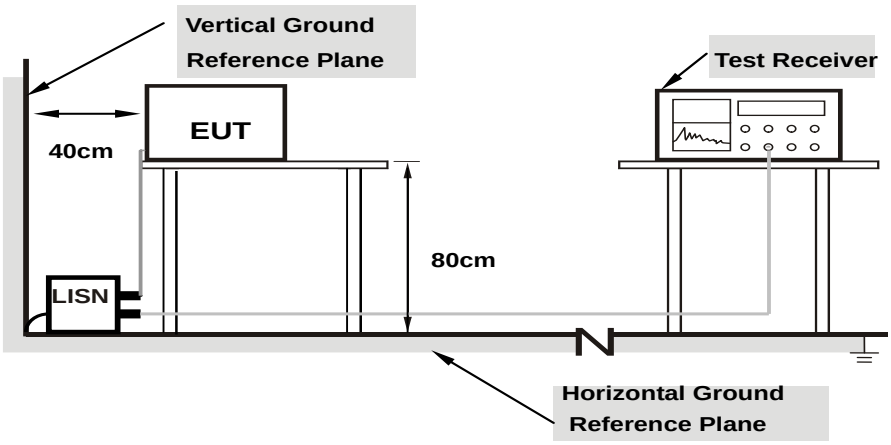
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

Same as 4.1.6.

4.2.7 Test Results

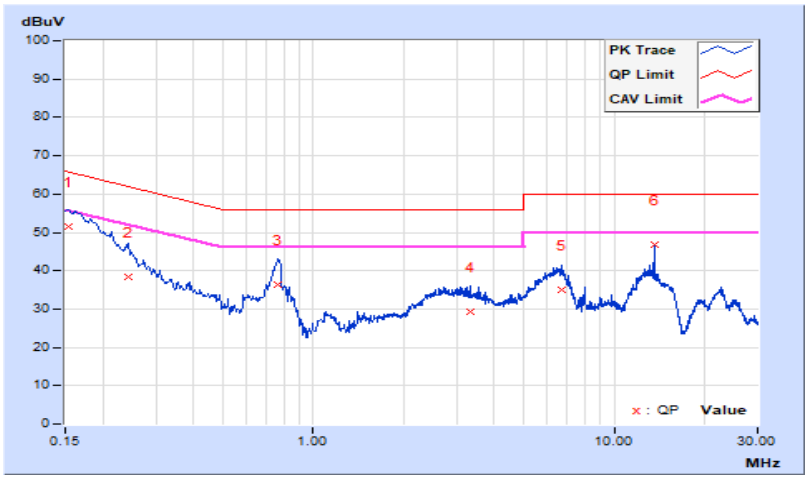
Mode A

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	10.37	41.19	28.23	51.56	38.60	65.78	55.78	-14.22	-17.18
2	0.24164	10.42	28.07	16.43	38.49	26.85	62.04	52.04	-23.55	-25.19
3	0.76600	10.52	25.90	16.39	36.42	26.91	56.00	46.00	-19.58	-19.09
4	3.33200	10.62	18.67	12.92	29.29	23.54	56.00	46.00	-26.71	-22.46
5	6.68400	10.69	24.27	18.59	34.96	29.28	60.00	50.00	-25.04	-20.72
6	13.56000	10.81	36.13	32.30	46.94	43.11	60.00	50.00	-13.06	-6.89

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

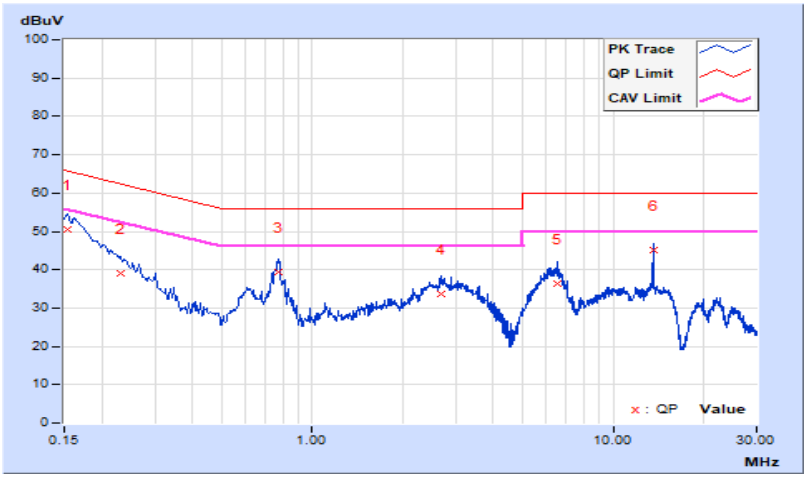


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15400	10.40	40.08	26.93	50.48	37.33	65.78	55.78	-15.30	-18.45
2	0.22984	10.45	28.74	17.18	39.19	27.63	62.46	52.46	-23.27	-24.83
3	0.77400	10.55	28.71	23.19	39.26	33.74	56.00	46.00	-16.74	-12.26
4	2.69600	10.63	23.05	18.07	33.68	28.70	56.00	46.00	-22.32	-17.30
5	6.53600	10.78	25.63	20.18	36.41	30.96	60.00	50.00	-23.59	-19.04
6	13.56000	10.95	34.05	30.58	45.00	41.53	60.00	50.00	-15.00	-8.47

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



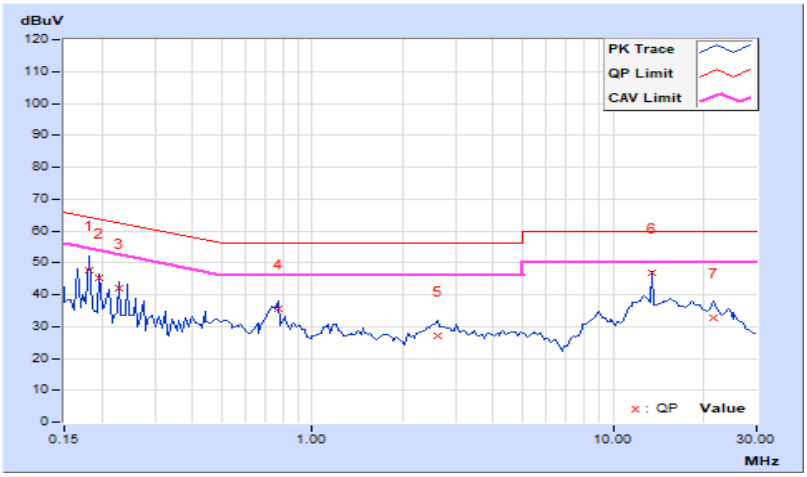
Mode B

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.18125	10.39	37.23	25.00	47.62	35.39	64.43	54.43	-16.81	-19.04
2	0.19687	10.40	34.94	23.12	45.34	33.52	63.74	53.74	-18.40	-20.22
3	0.22812	10.41	31.49	22.63	41.90	33.04	62.52	52.52	-20.62	-19.48
4	0.76953	10.52	25.14	18.36	35.66	28.88	56.00	46.00	-20.34	-17.12
5	2.62891	10.58	16.35	12.10	26.93	22.68	56.00	46.00	-29.07	-23.32
6	**13.55859**	**10.81**	**36.08**	**35.07**	**46.89**	**45.88**	**60.00**	**50.00**	**-13.11**	**-4.12**
7	21.51563	10.90	21.94	17.34	32.84	28.24	60.00	50.00	-27.16	-21.76

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

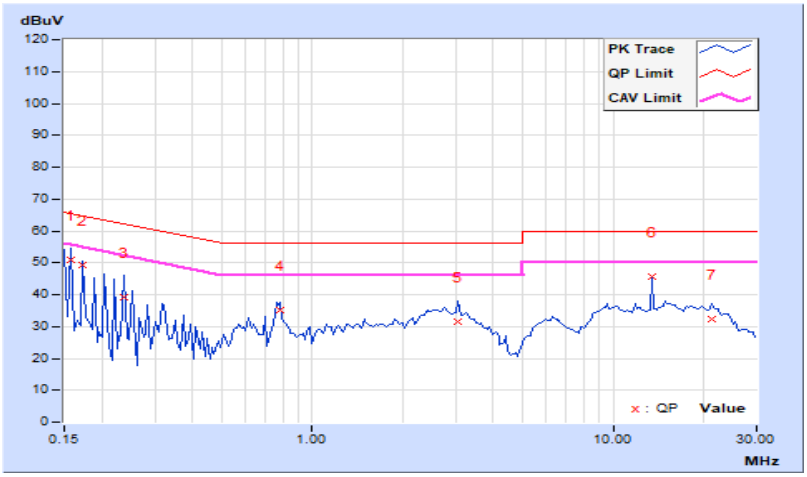


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15781	10.41	40.54	24.12	50.95	34.53	65.58	55.58	-14.63	-21.05
2	0.17344	10.42	38.81	25.02	49.23	35.44	64.79	54.79	-15.56	-19.35
3	0.23594	10.46	28.73	12.37	39.19	22.83	62.24	52.24	-23.05	-29.41
4	0.78125	10.55	24.51	19.33	35.06	29.88	56.00	46.00	-20.94	-16.12
5	3.04688	10.66	20.73	16.61	31.39	27.27	56.00	46.00	-24.61	-18.73
6	13.55859	10.95	34.68	34.04	45.63	44.99	60.00	50.00	-14.37	-5.01
7	21.33984	11.10	21.03	16.13	32.13	27.23	60.00	50.00	-27.87	-22.77

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

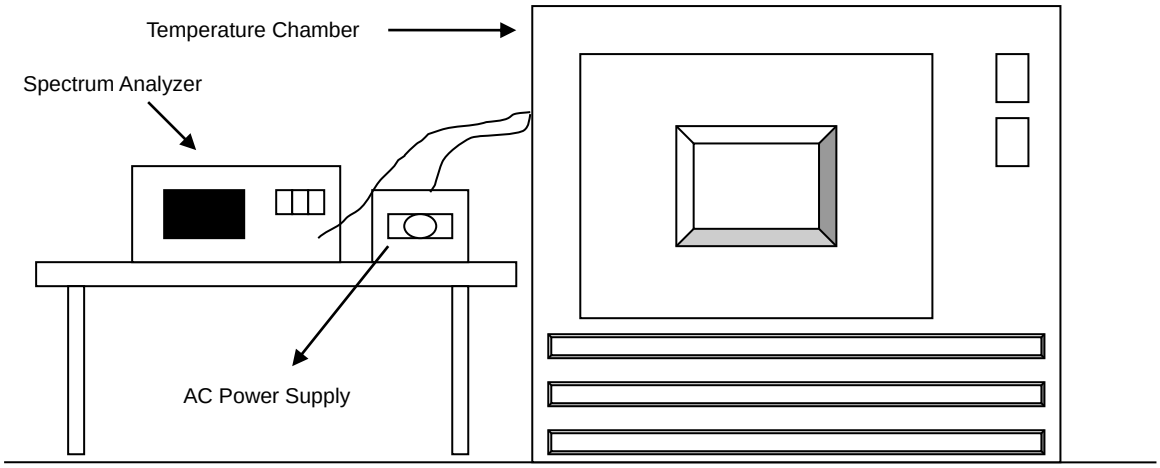


4.3 Frequency Stability

4.3.1 Limits of Frequency Stability Measurement

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.3.2 Test Setup



4.3.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
AC Power Source ExTech	CFW-105	E000603	N/A	N/A
Digital Multimeter Fluke	87-III	70360742	2023/7/6	2024/7/5
Software BV	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A
Spectrum Analyzer R&S	FSV40	100980	2023/5/3	2024/5/2
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	2022/12/27	2023/12/26

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. Test date: 2023/11/1 ~ 2023/11/20

4.3.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.

b. Turned the EUT on and coupled its output to a spectrum analyzer.

c. Turned the EUT off and set the chamber to the highest temperature specified.

d. Allowed sufficient time (approximately 30 min) for the temperature of the chamber to stabilize then turned the EUT on and measured the operating frequency after 2, 5, and 10 minutes.

e. Repeat step d with every 10 degrees reduction until the lowest temperature achieved.

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

Same as Item 4.1.6.

4.3.7 Test Result

Mode A

Frequency Stability Versus Temp.									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	120	13.55996	-0.00029	13.55997	-0.00022	13.55996	-0.00029	13.55996	-0.00029
40	120	13.56007	0.00052	13.56007	0.00052	13.56007	0.00052	13.56007	0.00052
30	120	13.55997	-0.00022	13.55996	-0.00029	13.55996	-0.00029	13.55996	-0.00029
20	120	13.55994	-0.00044	13.55993	-0.00052	13.55993	-0.00052	13.55993	-0.00052
10	120	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007
0	120	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007
-10	120	13.55994	-0.00044	13.55994	-0.00044	13.55994	-0.00044	13.55995	-0.00037
-20	120	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022	13.56004	0.00029

Frequency Stability Versus Voltage									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	138	13.55994	-0.00044	13.55993	-0.00052	13.55993	-0.00052	13.55993	-0.00052
	120	13.55994	-0.00044	13.55993	-0.00052	13.55993	-0.00052	13.55993	-0.00052
	102	13.55994	-0.00044	13.55993	-0.00052	13.55993	-0.00052	13.55993	-0.00052

Mode B

Frequency Stability Versus Temp.									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	120	13.55996	-0.00029	13.55996	-0.00029	13.55995	-0.00037	13.55995	-0.00037
40	120	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015	13.55998	-0.00015
30	120	13.56001	0.00007	13.55999	-0.00007	13.55999	-0.00007	13.56001	0.00007
20	120	13.55999	-0.00007	13.55998	-0.00015	13.55998	-0.00015	13.55998	-0.00015
10	120	13.56003	0.00022	13.56003	0.00022	13.56004	0.00029	13.56003	0.00022
0	120	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55999	-0.00007
-10	120	13.55998	-0.00015	13.55998	-0.00015	13.55998	-0.00015	13.55998	-0.00015
-20	120	13.56002	0.00015	13.56002	0.00015	13.56003	0.00022	13.56001	0.00007

Frequency Stability Versus Voltage									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	138	13.55999	-0.00007	13.55998	-0.00015	13.55998	-0.00015	13.55998	-0.00015
	120	13.55999	-0.00007	13.55998	-0.00015	13.55998	-0.00015	13.55998	-0.00015
	102	13.55999	-0.00007	13.55998	-0.00015	13.55998	-0.00015	13.55998	-0.00015

4.4 20dB Bandwidth

4.4.1 Limits of 20dB Bandwidth Measurement

The 20dB bandwidth shall be specified in operating frequency band.

4.4.2 Test Setup

4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 1kHz RBW and 3kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.4.5 Deviation from Test Standard

No deviation.

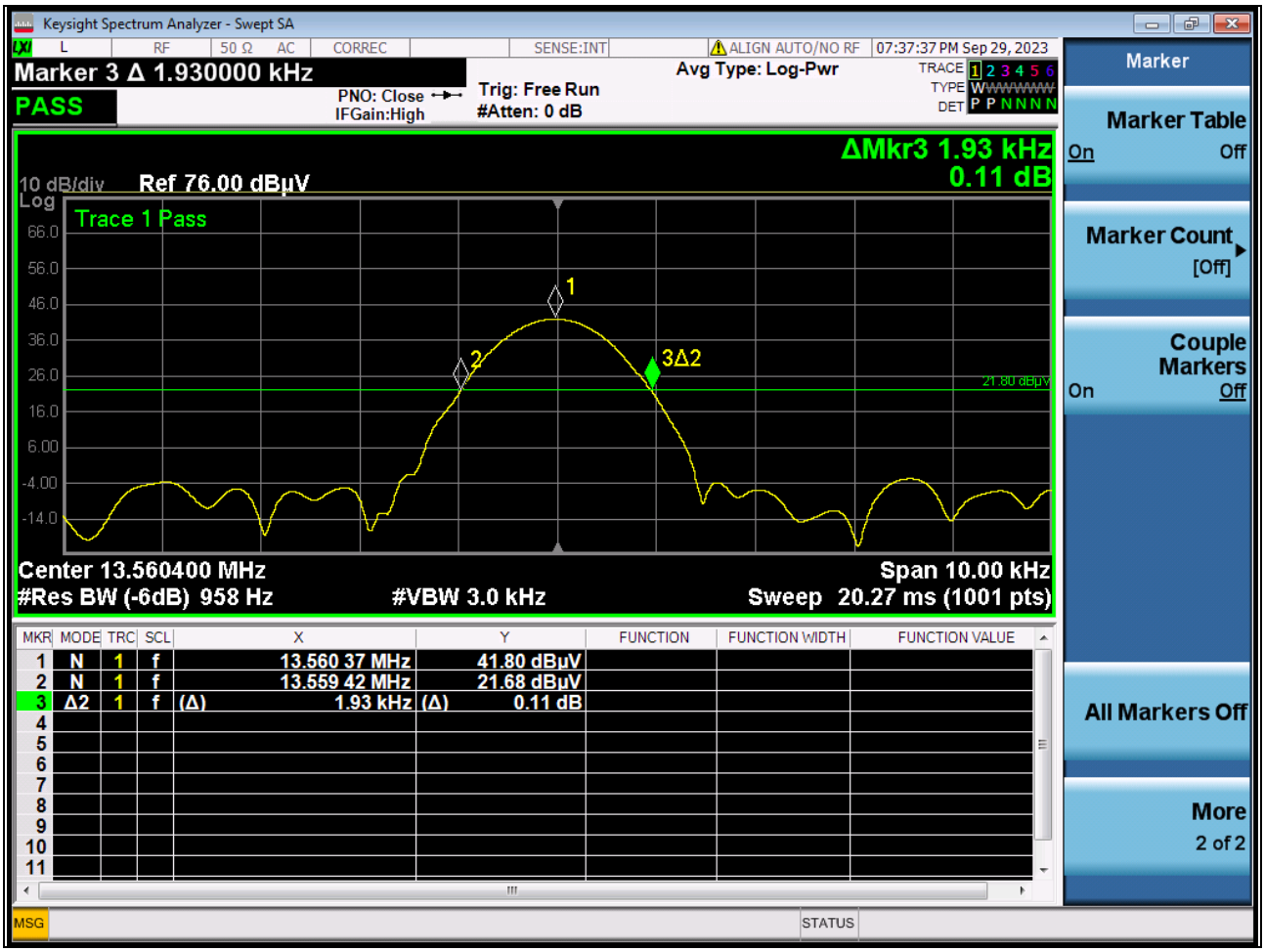
4.4.6 EUT Operating Conditions

Same as Item 4.1.6.

4.4.7 Test Results

Mode A

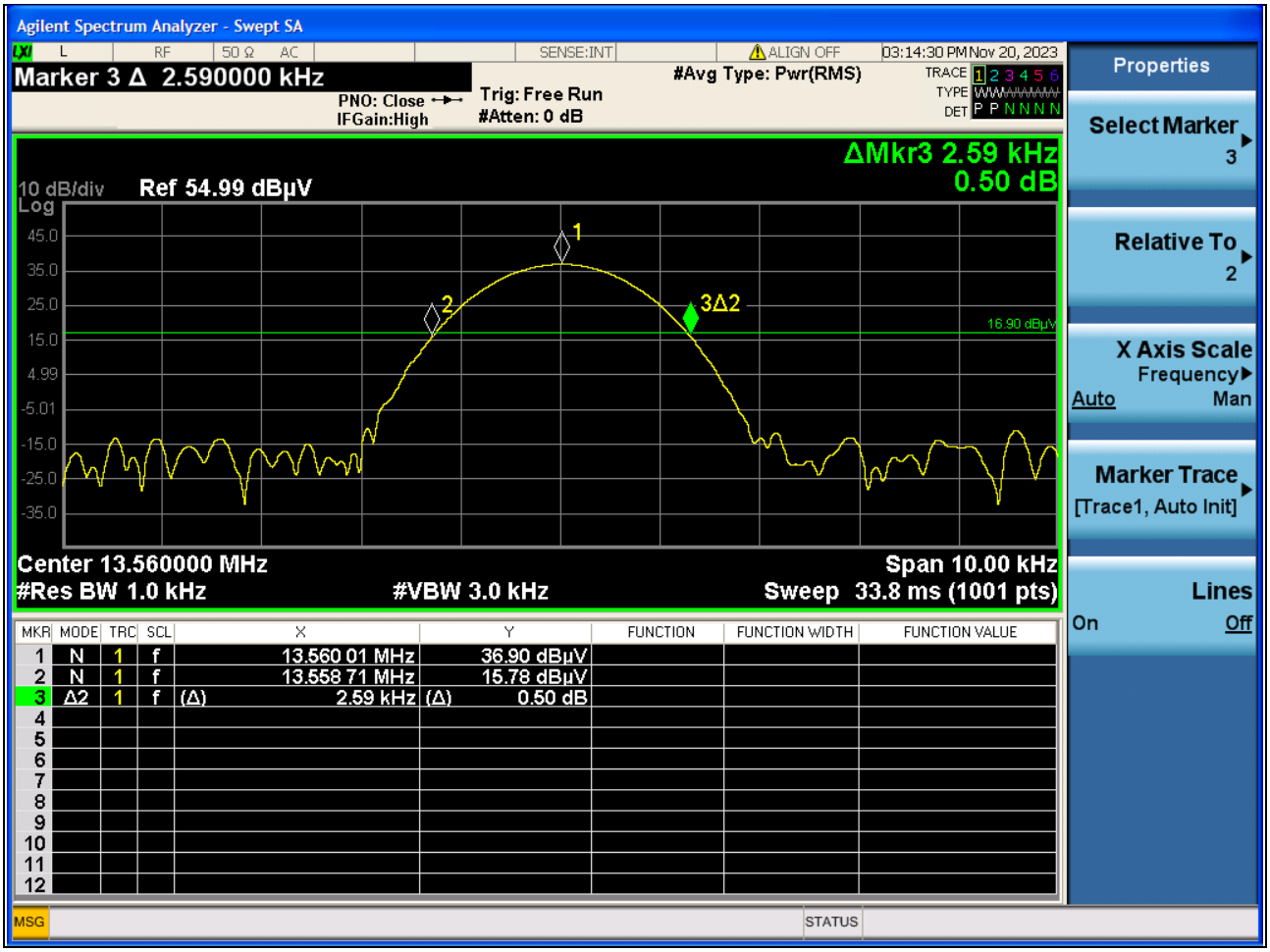
20dBc point (Low) (MHz)	20dBc point (High) (MHz)	Operating frequency band (MHz)	Pass / Fail
13.55942	13.56135	13.553~13.567	Pass



Note: The signal look like CW signal, so RBW can't be match 1~5 % OBW.

Mode B

20dBc point (Low) (MHz)	20dBc point (High) (MHz)	Operating frequency band (MHz)	Pass / Fail
13.55871	13.56130	13.553~13.567	Pass



Note: The signal look like CW signal, so RBW can't be match 1~5 % OBW.

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:

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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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