FCC Test Report

Report No.:	RFBCWX-WTW-P22031274
FCC ID:	2AGMLEWTJ680FK
Test Model:	EWTJ680F-K
Received Date:	Apr. 08, 2022
Test Date:	Apr. 22 ~ May 30, 2022
Issued Date:	Jun. 10, 2022
Applicant:	East Wind Technologies, Inc.
Address:	7F-3, No. 390, Sec. 1, Fu-Hsin South Road, Taipei, Taiwan
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 (1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
Test Location (2):	No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
FCC Registration / Designation Number (1):	788550 / TW0003
FCC Registration / Designation Number (2):	281270 / TW0032

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBCWX-WTW-P22031274	Original release	Jun. 10, 2022

1 Certificate of Conformity

Product:	RFID READER MODULE
Brand:	EWT
Model:	EWTJ680F-K
Sample Status:	Engineering Sample
Applicant:	East Wind Technologies, Inc.
Test Date:	Apr. 22 ~ May 30, 2022
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 : _____ , **Date:** Jun. 10, 2022

Polly Chien / Specialist

Approved by : _____ , **Date:** Jun. 10, 2022

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 -20.18dB at 13.56200MHz
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 -61.74dB 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 -5.82dB at 40.68MHz.
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	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~1000MHz	2.93 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	RFID READER MODULE
Brand	EWT
Model	EWTJ680F-K
Sample Status	Engineering Sample
Power Supply Rating	5Vdc-12Vdc from host equipment
Modulation Type	ASK
Data Rate	Type A: 106 kbit/s Type F: 212 kbit/s, 424 kbit/s Type V: 26.48 kbit/s
Operating Frequency	13.56MHz
Field Strength	22.26dBμV/m (30m)
Antenna Type	Refer to Note as below
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The antenna information is listed as below.

Brand	Model	Antenna Type	Connector	Antenna Gain (dBi)
EWT	EWTJ680F-K-02	PCB	IPEX	10

2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 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	
-	√	√	√	√	-

Where RE: Radiated Emission PLC: Power Line Conducted Emission
FS: Frequency Stability EB: 20dB Bandwidth measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Z-plane.

Radiated Emission Test:

☒ 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
-	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
-	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
-	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
-	1	1	ASK

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE	28 deg. C, 66% RH	5Vdc	Tim Chen, Edison Lee
PLC	25 deg. C, 75% RH	5Vdc	Titan Hsu
FS	22 deg. C, 67% RH	5Vdc	Tim Chen
EB	28 deg. C, 66% RH	5Vdc	Tim Chen

3.3 Description of Support Units

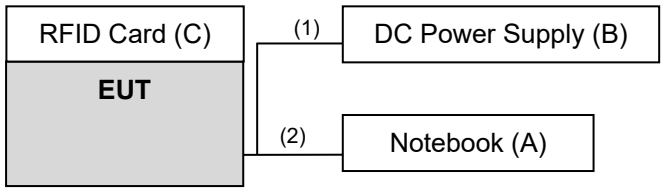
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	HP	15s-du0003TU	CND9281WLL	FCC DoC Approved	-
B.	DC Power Supply	JIN YIH Technology	SP3051	SP30512113402	NA	-
C.	RFID Card	NXP	Mifare DesDire	NA	NA	Provided by client Type A
			I-code SLIX	NA	NA	Provided by client Type V
		SONY	Felica RCS966	NA	NA	Provided by client Type F

Note:
1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as communication a partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC in to DC out to RS232	1	1.8	Y	0	Provided by client
2.	USB to RS232	1	2.2	Y	0	Provided by client

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:

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
Test Receiver Rohde & Schwarz	ESR3	102783	Dec. 21, 2021	Dec. 20, 2022
Spectrum Analyzer KEYSIGHT	N9020B	MY60110513	Dec. 24, 2021	Dec. 23, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-1214	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1170	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-995	Nov. 14, 2021	Nov. 13, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC330N	980798	Jan. 17, 2022	Jan. 16, 2023
Preamplifier EMCI	EMC118A45SE	980809	Dec. 30, 2021	Dec. 29, 2022
Preamplifier EMCI	EMC184045SE	980786	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC104-SM-SM-(9000+2000+1000)	201244+ 201232+ 210103	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMCCFD400-NM-NM-(9000+300+500)	201251+ 201249+ 201248	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM-(5000+3000+2000)	201261+201258+201249	Jan. 17, 2022	Jan. 16, 2023
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFA-515BSN	NA	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208676	NA	NA
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	Jul. 12, 2021	Jul. 11, 2022

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 WM Chamber 9.

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. T 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 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:

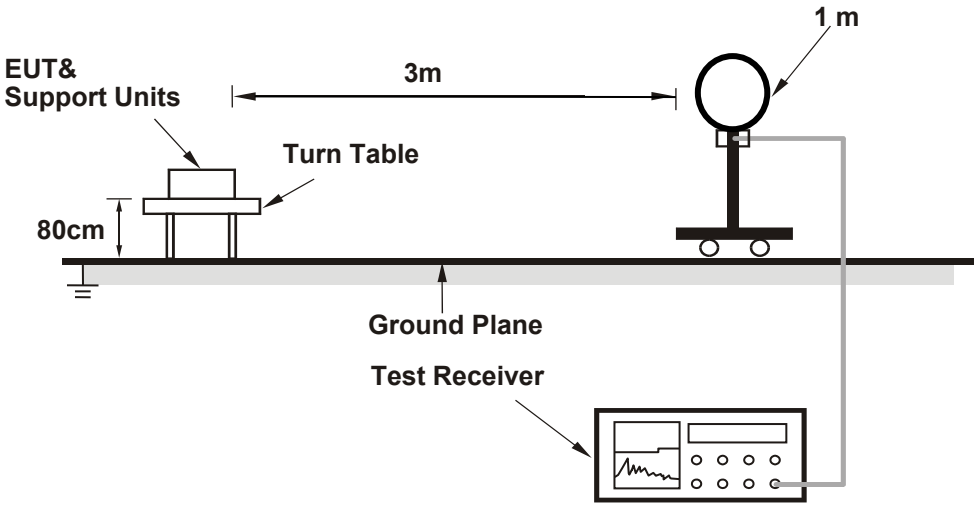
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

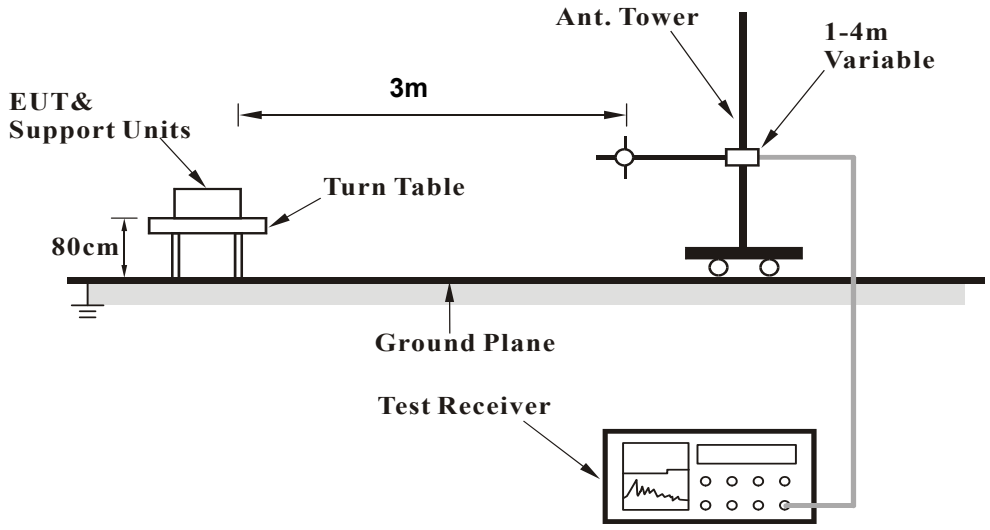
No deviation.

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.
- Open-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

Type A

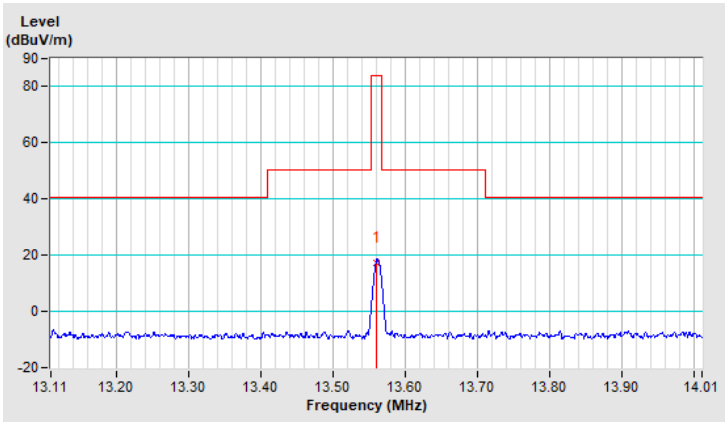
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Loop Antenna Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	17.22 QP	84.00	-66.78	1.00	356	35.21	-17.99

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. “ * “ : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)



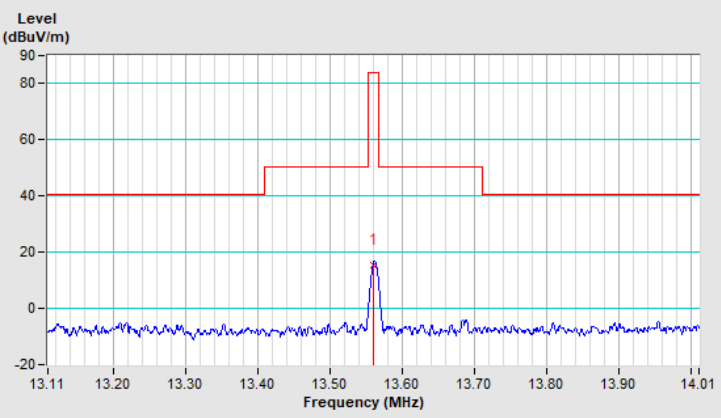
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Loop Antenna Perpendicular At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	15.58 QP	84.00	-68.42	1.00	95	33.57	-17.99

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. " * " : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)



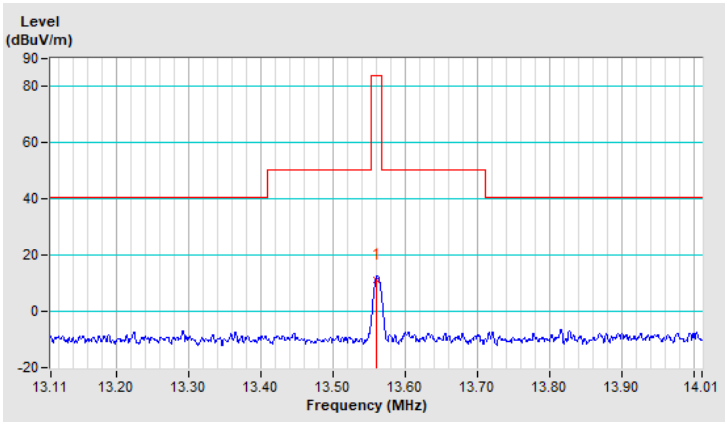
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Loop Antenna Ground Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	11.10 QP	84.00	-72.90	1.00	355	29.09	-17.99

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. " * " : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

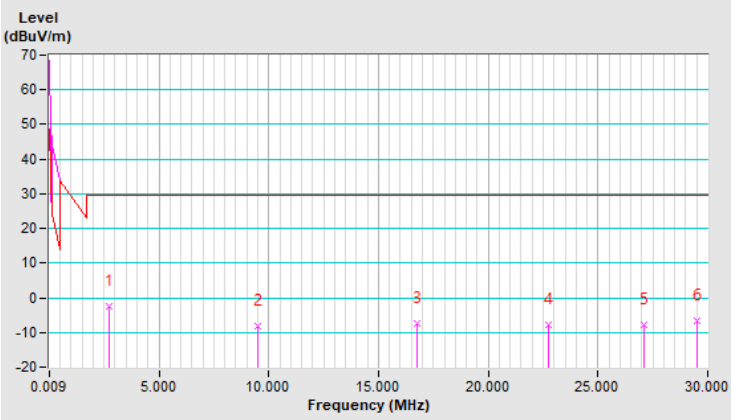


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Loop Antenna Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	2.71	-2.57 QP	29.54	-32.11	1.00	125	17.39	-19.96
2	9.49	-8.30 QP	29.54	-37.84	1.00	33	9.97	-18.27
3	16.74	-7.45 QP	29.54	-36.99	1.00	174	10.45	-17.90
4	22.77	-7.91 QP	29.54	-37.45	1.00	231	9.95	-17.86
5	27.12	-7.67 QP	29.54	-37.21	1.00	168	10.27	-17.94
6	29.49	-6.50 QP	29.54	-36.04	1.00	157	11.49	-17.99

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

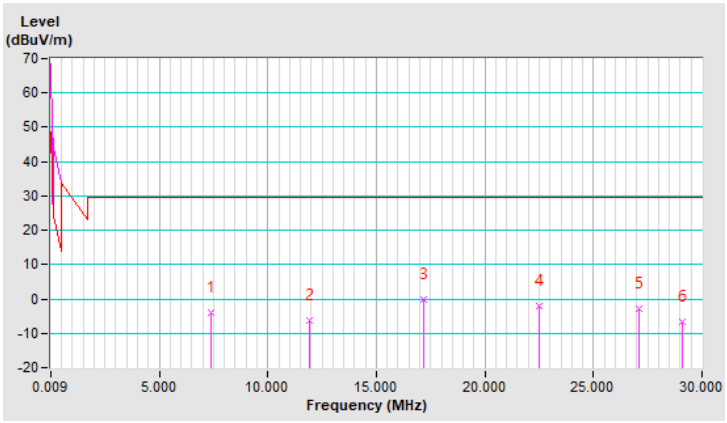


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Loop Antenna Perpendicular At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	7.36	-4.00 QP	29.54	-33.54	1.00	135	15.00	-19.00
2	11.95	-6.09 QP	29.54	-35.63	1.00	306	11.95	-18.04
3	17.16	-0.26 QP	29.54	-29.80	1.00	218	17.63	-17.89
4	22.53	-2.11 QP	29.54	-31.65	1.00	58	15.74	-17.85
5	27.12	-2.70 QP	29.54	-32.24	1.00	167	15.24	-17.94
6	29.07	-6.71 QP	29.54	-36.25	1.00	252	11.27	-17.98

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

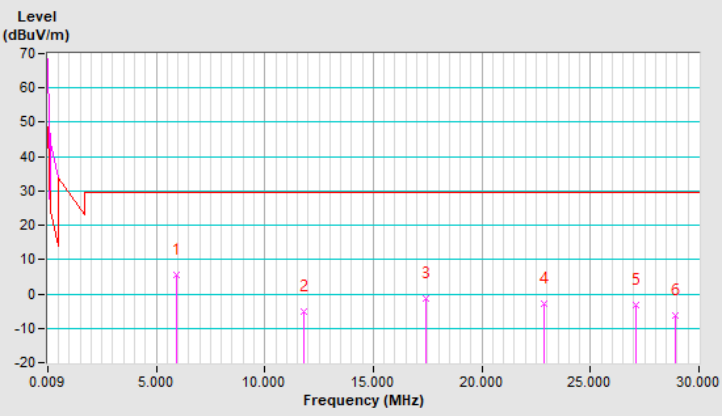


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Loop Antenna Ground Paralle At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	5.92	5.48 QP	29.54	-24.06	1.00	124	24.97	-19.49
2	11.77	-5.24 QP	29.54	-34.78	1.00	221	12.81	-18.05
3	17.43	-1.33 QP	29.54	-30.87	1.00	98	16.55	-17.88
4	22.86	-2.84 QP	29.54	-32.38	1.00	309	15.02	-17.86
5	27.12	-3.16 QP	29.54	-32.70	1.00	12	14.78	-17.94
6	28.92	-6.45 QP	29.54	-35.99	1.00	299	11.53	-17.98

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

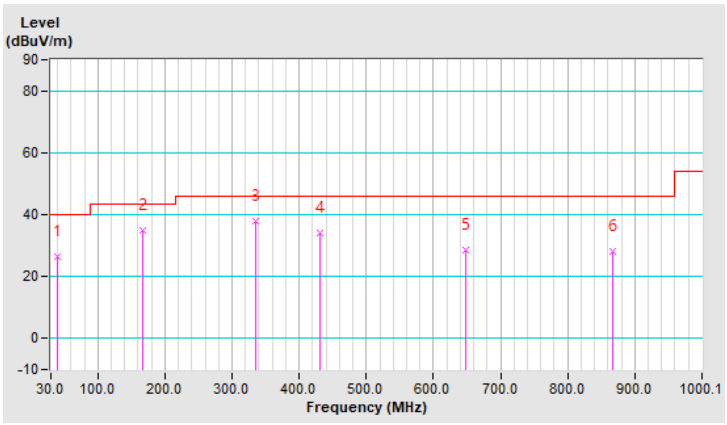


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	26 deg. C, 67% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.68	26.60 QP	40.00	-13.40	2.99 H	328	40.11	-13.51
2	167.75	35.10 QP	43.50	-8.40	1.50 H	56	48.45	-13.35
3	335.58	38.00 QP	46.00	-8.00	1.00 H	107	49.36	-11.36
4	431.62	34.04 QP	46.00	-11.96	1.99 H	190	43.18	-9.14
5	647.95	28.67 QP	46.00	-17.33	1.50 H	290	33.33	-4.66
6	867.20	28.21 QP	46.00	-17.79	1.50 H	153	30.21	-2.00

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.
4. Margin value = Emission Level – Limit value

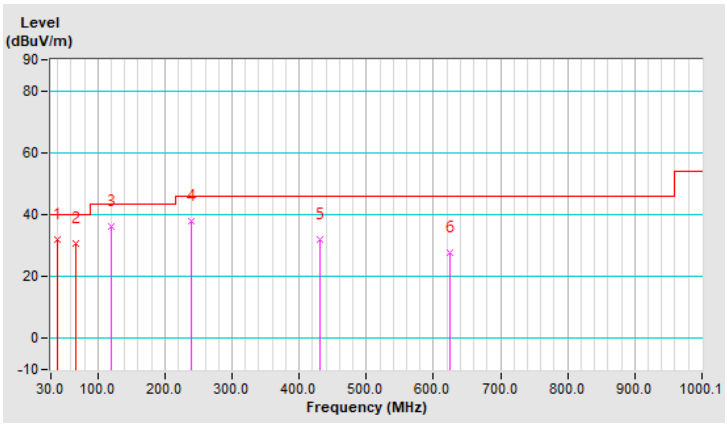


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	26 deg. C, 67% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.68	32.00 QP	40.00	-8.00	1.53 V	167	45.51	-13.51
2	67.80	30.70 QP	40.00	-9.30	3.02 V	80	45.65	-14.95
3	120.22	36.14 QP	43.50	-7.36	1.49 V	202	51.45	-15.31
4	239.54	37.69 QP	46.00	-8.31	1.49 V	86	52.30	-14.61
5	431.62	32.00 QP	46.00	-14.00	1.00 V	251	41.14	-9.14
6	623.70	27.81 QP	46.00	-18.19	1.00 V	303	32.88	-5.07

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.
4. Margin value = Emission Level – Limit value



Type F

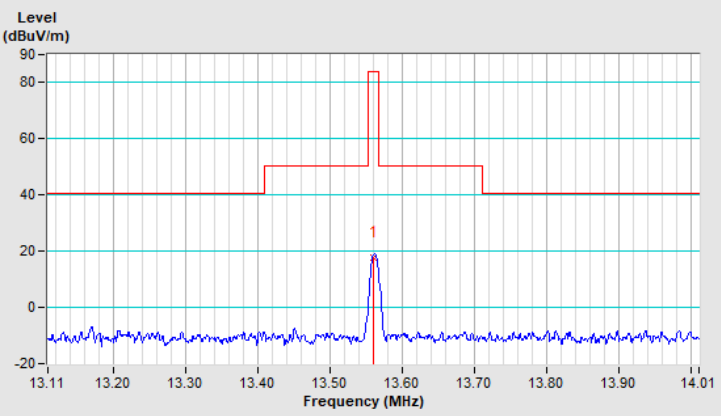
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	17.93 QP	84.00	-66.07	1.00	357	35.92	-17.99

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. " * " : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)



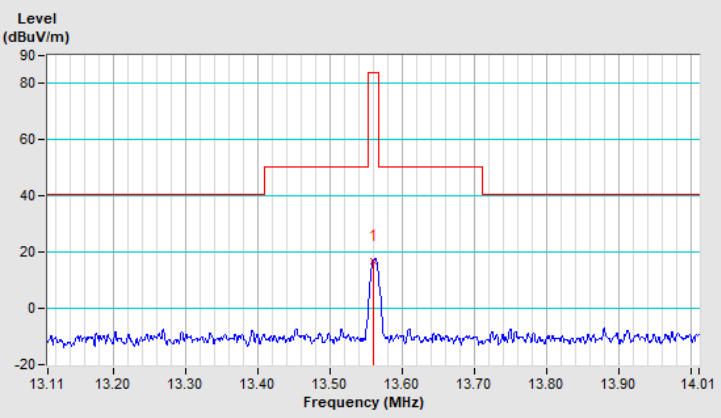
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Perpendicular At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	16.90 QP	84.00	-67.10	1.00	108	34.89	-17.99

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. " * " : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)



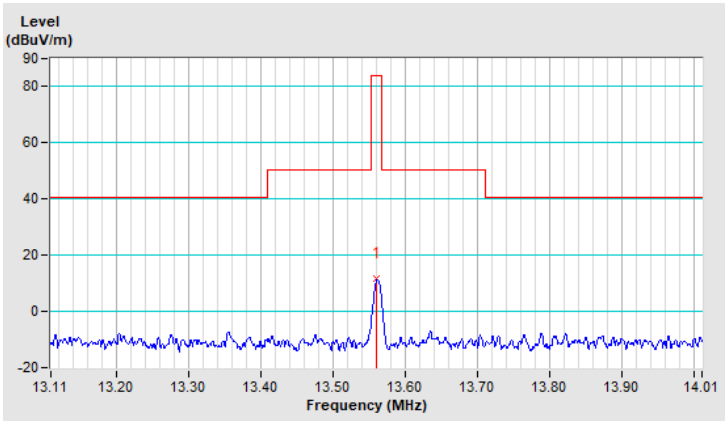
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Ground Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	11.60 QP	84.00	-72.40	1.00	0	29.59	-17.99

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. " * " : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

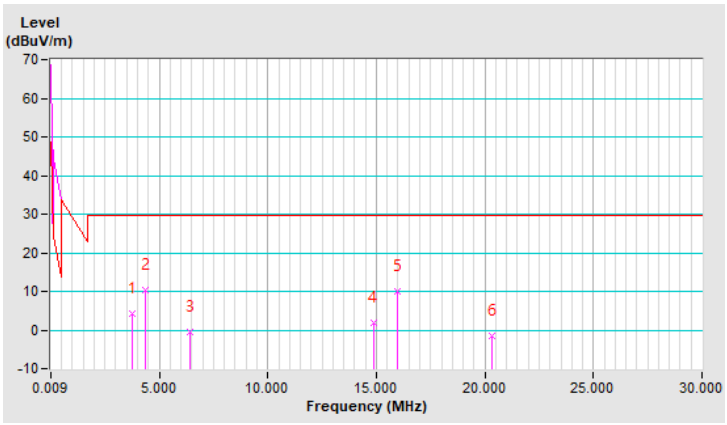


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	3.76	4.32 QP	29.54	-25.22	1.00	248	24.24	-19.92
2	4.36	10.48 QP	29.54	-19.06	1.00	64	30.34	-19.86
3	6.43	-0.46 QP	29.54	-30.00	1.00	273	18.85	-19.31
4	14.85	1.90 QP	29.54	-27.64	1.00	9	19.85	-17.95
5	15.99	9.89 QP	29.54	-19.65	1.00	84	27.81	-17.92
6	20.34	-1.38 QP	29.54	-30.92	1.00	351	16.43	-17.81

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

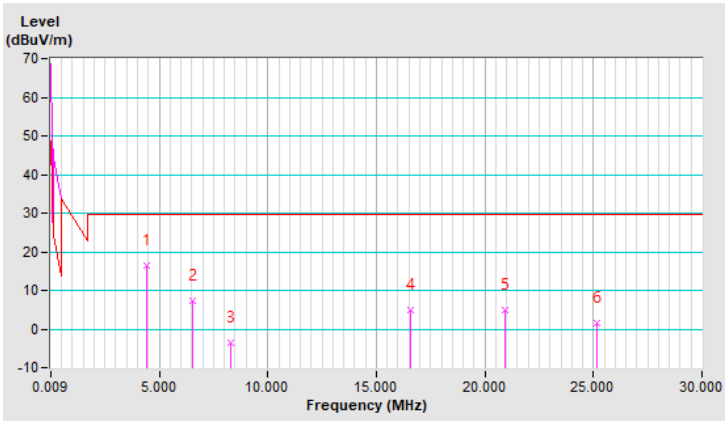


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Perpendicular At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	4.45	16.33 QP	29.54	-13.21	1.00	340	36.19	-19.86
2	6.55	7.30 QP	29.54	-22.24	1.00	326	26.57	-19.27
3	8.32	-3.58 QP	29.54	-33.12	1.00	36	15.09	-18.67
4	16.56	4.89 QP	29.54	-24.65	1.00	75	22.79	-17.90
5	20.94	4.99 QP	29.54	-24.55	1.00	217	22.81	-17.82
6	25.14	1.37 QP	29.54	-28.17	1.00	56	19.27	-17.90

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

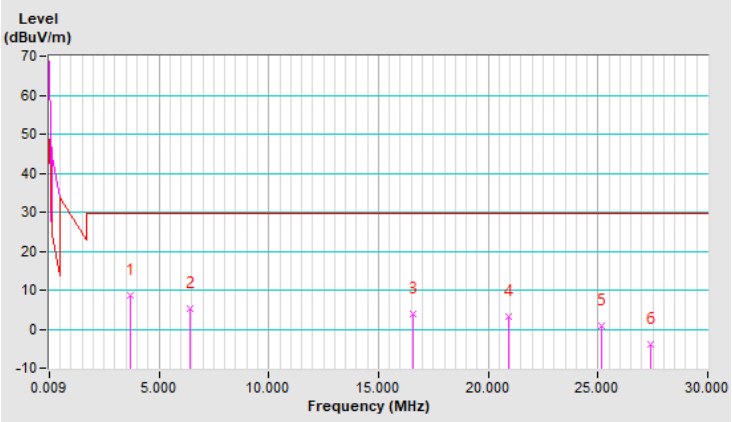


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Ground Paralle At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	3.70	8.64 QP	29.54	-20.90	1.00	248	28.57	-19.93
2	6.43	5.13 QP	29.54	-24.41	1.00	315	24.44	-19.31
3	16.59	4.00 QP	29.54	-25.54	1.00	328	21.90	-17.90
4	20.91	3.16 QP	29.54	-26.38	1.00	187	20.98	-17.82
5	25.14	0.82 QP	29.54	-28.72	1.00	241	18.72	-17.90
6	27.42	-3.92 QP	29.54	-33.46	1.00	265	14.03	-17.95

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

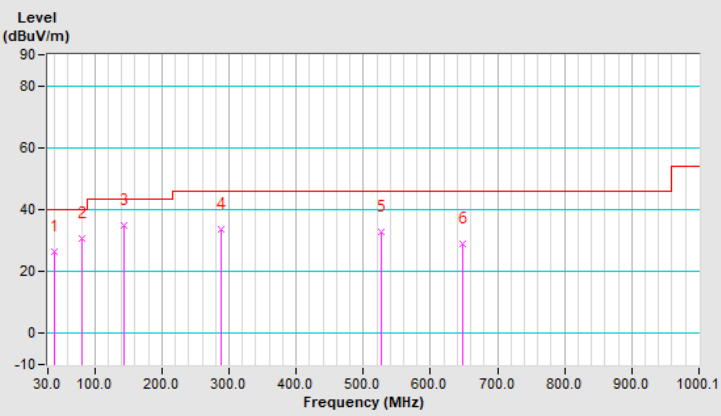


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	26 deg. C, 67% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.68	26.50 QP	40.00	-13.50	2.99 H	2	40.01	-13.51
2	81.42	30.70 QP	40.00	-9.30	2.49 H	150	49.06	-18.36
3	143.50	34.90 QP	43.50	-8.60	1.99 H	191	48.16	-13.26
4	288.05	33.79 QP	46.00	-12.21	1.00 H	233	46.47	-12.68
5	527.66	32.88 QP	46.00	-13.12	1.49 H	196	40.15	-7.27
6	647.95	29.05 QP	46.00	-16.95	1.49 H	298	33.71	-4.66

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.
4. Margin value = Emission Level – Limit value

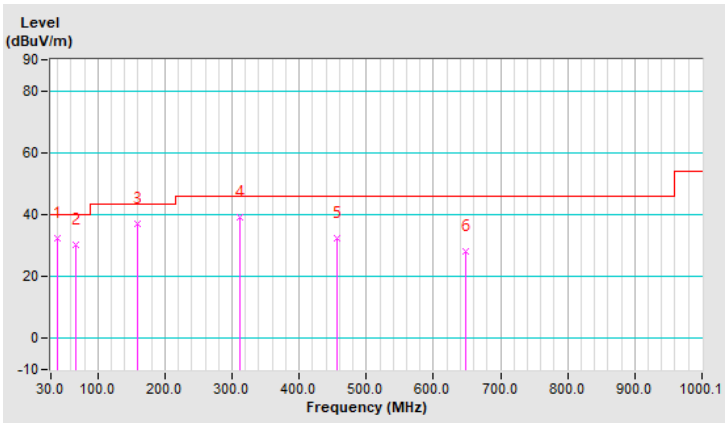


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	26 deg. C, 67% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.68	32.20 QP	40.00	-7.80	2.99 V	18	45.71	-13.51
2	67.80	30.30 QP	40.00	-9.70	2.49 V	198	45.25	-14.95
3	159.02	36.87 QP	43.50	-6.63	1.99 V	16	49.90	-13.03
4	312.30	39.01 QP	46.00	-6.99	1.00 V	114	51.13	-12.12
5	455.87	32.45 QP	46.00	-13.55	1.99 V	197	40.87	-8.42
6	647.95	28.06 QP	46.00	-17.94	1.49 V	301	32.72	-4.66

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.
4. Margin value = Emission Level – Limit value



Type V

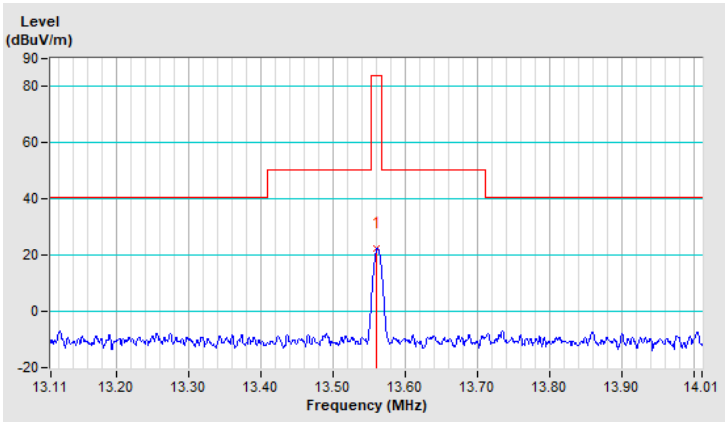
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	22.26 QP	84.00	-61.74	1.00	351	40.25	-17.99

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. " * " : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)



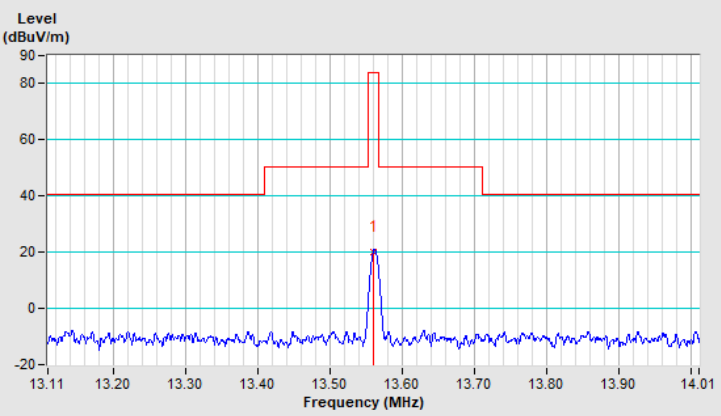
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Perpendicular At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	20.03 QP	84.00	-63.97	1.00	97	38.02	-17.99

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. " * " : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)



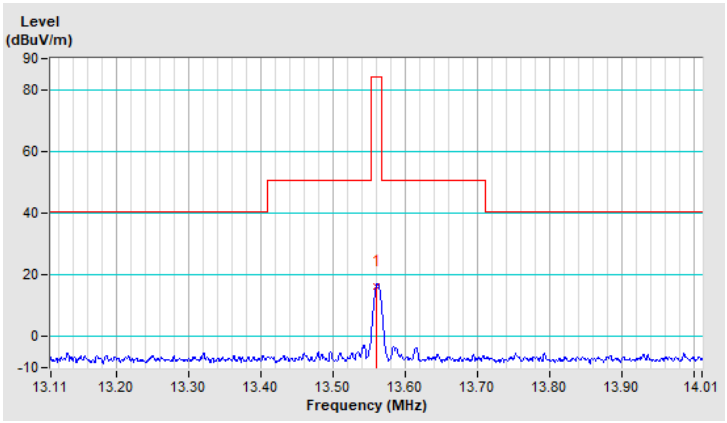
EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Ground Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	*13.56	16.21 QP	84.00	-67.79	1.00	1	34.20	-17.99

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. " * " : Fundamental frequency
5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

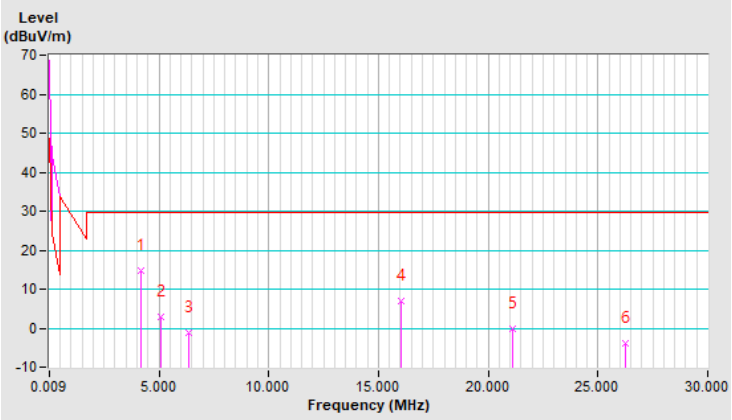


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Parallel At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	4.21	14.66 QP	29.54	-14.88	1.00	357	34.54	-19.88
2	5.11	2.84 QP	29.54	-26.70	1.00	61	22.60	-19.76
3	6.37	-1.34 QP	29.54	-30.88	1.00	340	18.00	-19.34
4	16.02	7.09 QP	29.54	-22.45	1.00	93	25.01	-17.92
5	21.09	-0.22 QP	29.54	-29.76	1.00	16	17.60	-17.82
6	26.28	-3.95 QP	29.54	-33.49	1.00	29	13.98	-17.93

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

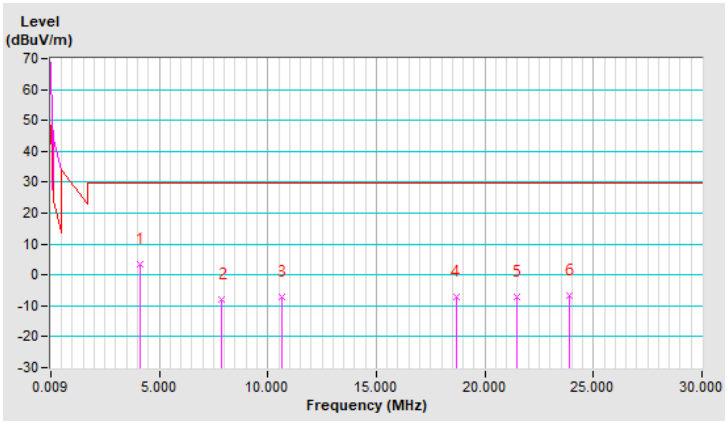


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Perpendicular At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	4.12	3.47 QP	29.54	-26.07	1.00	310	23.36	-19.89
2	7.90	-7.77 QP	29.54	-37.31	1.00	249	11.05	-18.82
3	10.66	-7.08 QP	29.54	-36.62	1.00	356	11.00	-18.08
4	18.66	-7.06 QP	29.54	-36.60	1.00	16	10.78	-17.84
5	21.45	-7.27 QP	29.54	-36.81	1.00	246	10.56	-17.83
6	23.91	-6.77 QP	29.54	-36.31	1.00	180	11.11	-17.88

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

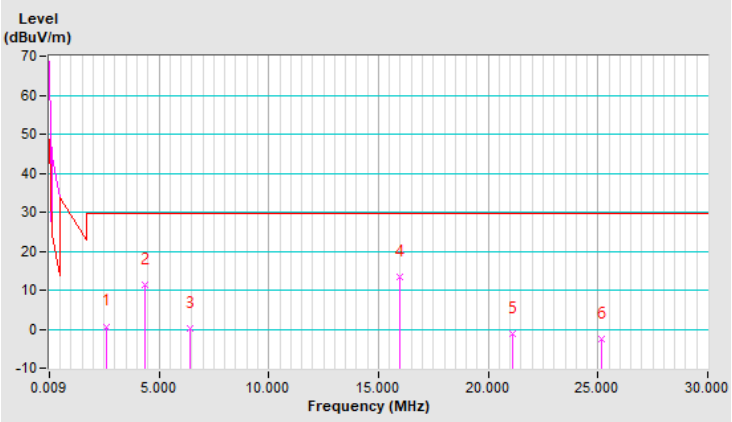


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30mHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	28 deg. C, 66% RH	Tested By	Edison Lee

Antenna Polarity & Test Distance: Loop Antenna Ground Paralle At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m) (30m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV) (3m)	Correction Factor (dB/m)
1	2.62	0.68 QP	29.54	-28.86	1.00	146	20.62	-19.94
2	4.39	11.42 QP	29.54	-18.12	1.00	2	31.28	-19.86
3	6.40	0.16 QP	29.54	-29.38	1.00	94	19.48	-19.32
4	15.99	13.25 QP	29.54	-16.29	1.00	149	31.17	-17.92
5	21.09	-1.15 QP	29.54	-30.69	1.00	44	16.67	-17.82
6	25.14	-2.49 QP	29.54	-32.03	1.00	318	15.41	-17.90

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

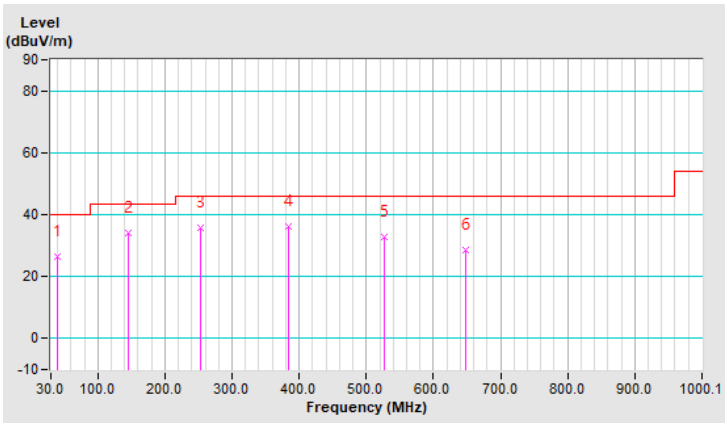


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	26 deg. C, 67% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.68	26.60 QP	40.00	-13.40	2.99 H	18	40.11	-13.51
2	144.47	33.90 QP	43.50	-9.60	2.50 H	169	47.11	-13.21
3	252.15	35.60 QP	46.00	-10.40	1.00 H	147	49.73	-14.13
4	384.09	36.17 QP	46.00	-9.83	1.00 H	231	46.49	-10.32
5	527.66	32.85 QP	46.00	-13.15	1.49 H	202	40.12	-7.27
6	647.95	28.73 QP	46.00	-17.27	1.49 H	295	33.39	-4.66

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.
4. Margin value = Emission Level – Limit value

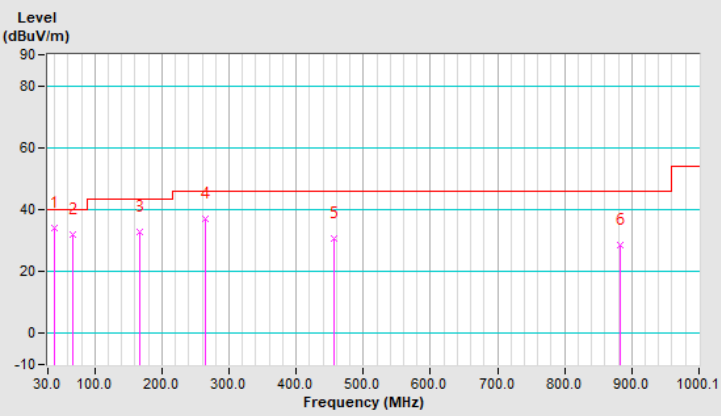


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	26 deg. C, 67% RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**40.68**	**34.18 QP**	**40.00**	**-5.82**	**1.00 V**	**99**	**47.69**	**-13.51**
2	67.80	31.90 QP	40.00	-8.10	1.01 V	274	46.85	-14.95
3	167.75	32.66 QP	43.50	-10.84	2.01 V	104	46.01	-13.35
4	263.79	37.08 QP	46.00	-8.92	1.51 V	127	50.75	-13.67
5	455.87	30.47 QP	46.00	-15.53	1.01 V	249	38.89	-8.42
6	882.72	28.52 QP	46.00	-17.48	2.51 V	304	30.35	-1.83

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.
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	ESCI	100613	Dec. 03, 2021	Dec. 02, 2022
RF signal cable Woken	5D-FB	Cable-cond1-01	Jan. 15, 2022	Jan. 14, 2023
LISN/AMN ROHDE & SCHWARZ (EUT)	ENV216	101826	Mar. 14, 2022	Mar. 13, 2023
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Sep. 07, 2021	Sep. 06, 2022
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 HwaYa Shielded Room 1 (Conduction 1).
3. The VCCI Site Registration No. is C-12040.
4. Teste date: May 18, 2022

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.

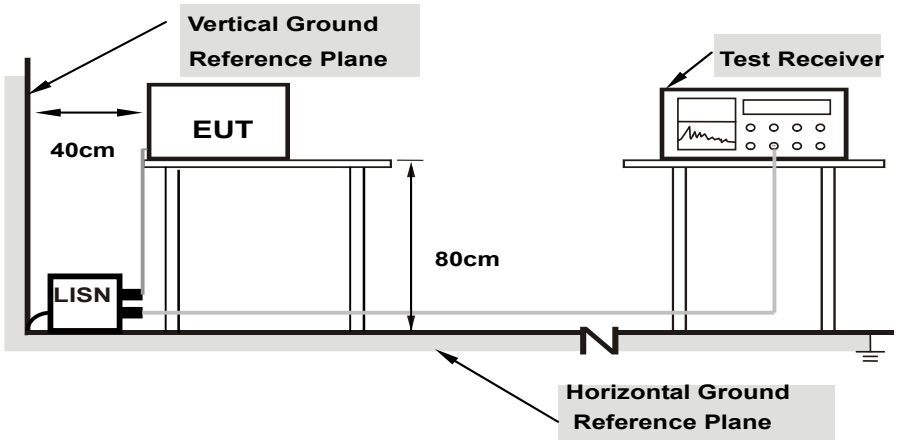
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

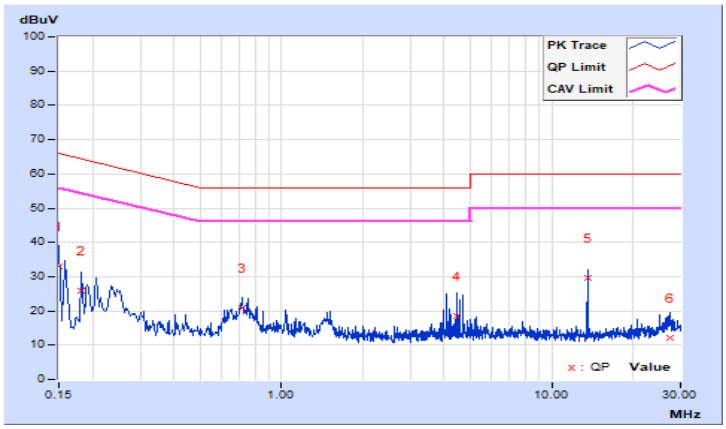
Type A

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.62	23.34	3.77	32.96	13.39	66.00	56.00	-33.04	-42.61
2	0.18200	9.63	16.38	1.65	26.01	11.28	64.39	54.39	-38.38	-43.11
3	0.71800	9.70	11.18	5.40	20.88	15.10	56.00	46.00	-35.12	-30.90
4	4.47400	9.75	8.72	2.21	18.47	11.96	56.00	46.00	-37.53	-34.04
5	13.56200	9.83	19.92	19.79	29.75	29.62	60.00	50.00	-30.25	-20.38
6	27.34600	9.88	2.11	1.05	11.99	10.93	60.00	50.00	-48.01	-39.07

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.

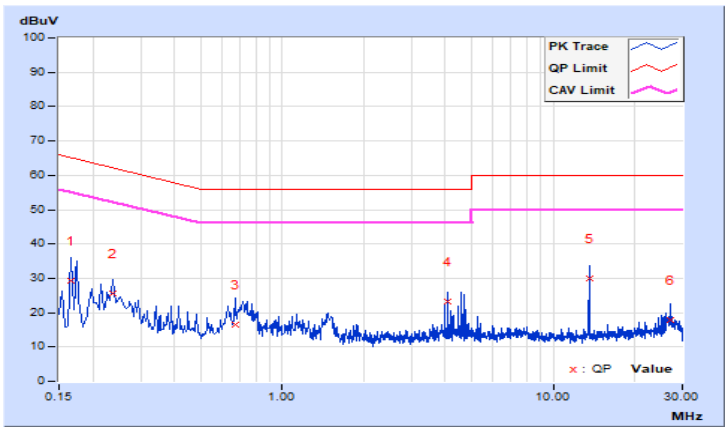


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16600	9.63	19.70	1.05	29.33	10.68	65.16	55.16	-35.83	-44.48
2	0.23785	9.65	16.00	10.50	25.65	20.15	62.17	52.17	-36.52	-32.02
3	0.67000	9.69	6.81	1.49	16.50	11.18	56.00	46.00	-39.50	-34.82
4	4.06600	9.75	13.32	0.91	23.07	10.66	56.00	46.00	-32.93	-35.34
5	13.56200	9.85	20.03	19.92	29.88	29.77	60.00	50.00	-30.12	-20.23
6	27.12200	9.87	7.82	4.97	17.69	14.84	60.00	50.00	-42.31	-35.16

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.



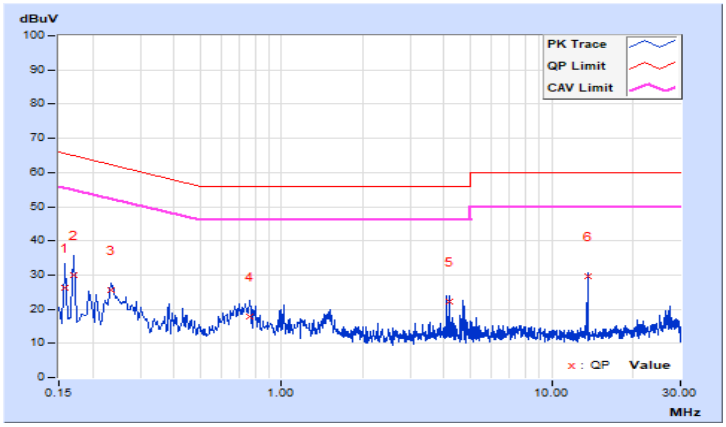
Type F

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15800	9.62	16.52	1.11	26.14	10.73	65.57	55.57	-39.43	-44.84
2	0.17000	9.63	20.42	1.63	30.05	11.26	64.96	54.96	-34.91	-43.70
3	0.23400	9.65	15.93	10.33	25.58	19.98	62.31	52.31	-36.73	-32.33
4	0.75800	9.70	8.12	3.29	17.82	12.99	56.00	46.00	-38.18	-33.01
5	4.16600	9.75	12.64	0.29	22.39	10.04	56.00	46.00	-33.61	-35.96
6	13.56200	9.83	19.95	19.81	29.78	29.64	60.00	50.00	-30.22	-20.36

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.

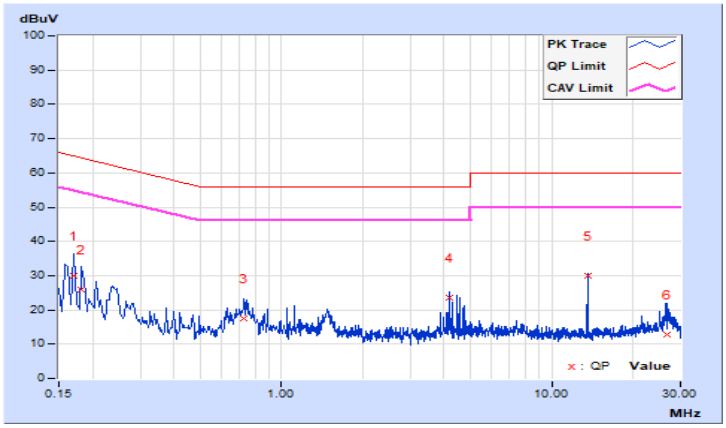


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17000	9.63	20.37	1.98	30.00	11.61	64.96	54.96	-34.96	-43.35
2	0.18200	9.63	16.37	2.14	26.00	11.77	64.39	54.39	-38.39	-42.62
3	0.72600	9.70	7.79	4.24	17.49	13.94	56.00	46.00	-38.51	-32.06
4	4.16600	9.75	13.73	0.92	23.48	10.67	56.00	46.00	-32.52	-35.33
5	13.56200	9.85	20.05	19.94	29.90	29.79	60.00	50.00	-30.10	-20.21
6	26.67800	9.87	2.98	1.53	12.85	11.40	60.00	50.00	-47.15	-38.60

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.



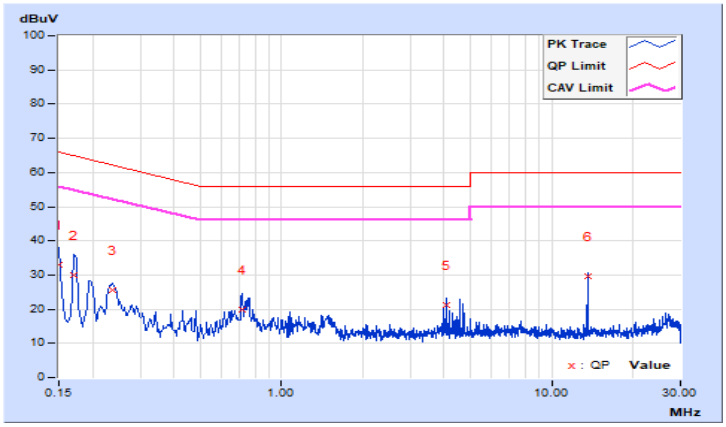
Type V

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.62	23.36	3.78	32.98	13.40	66.00	56.00	-33.02	-42.60
2	0.17000	9.63	20.35	1.67	29.98	11.30	64.96	54.96	-34.98	-43.66
3	0.23660	9.65	16.05	10.72	25.70	20.37	62.21	52.21	-36.51	-31.84
4	0.71800	9.70	10.10	4.06	19.80	13.76	56.00	46.00	-36.20	-32.24
5	4.06200	9.75	11.30	2.26	21.05	12.01	56.00	46.00	-34.95	-33.99
6	13.56200	9.83	19.89	19.76	29.72	29.59	60.00	50.00	-30.28	-20.41

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.

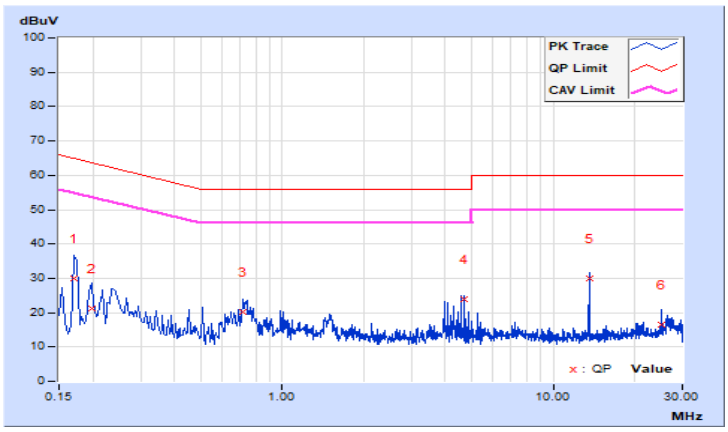


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17000	9.63	20.29	1.95	29.92	11.58	64.96	54.96	-35.04	-43.38
2	0.19780	9.64	11.70	3.43	21.34	13.07	63.70	53.70	-42.36	-40.63
3	0.71800	9.70	10.42	5.29	20.12	14.99	56.00	46.00	-35.88	-31.01
4	4.67400	9.76	14.05	1.53	23.81	11.29	56.00	46.00	-32.19	-34.71
5	**13.56200**	**9.85**	**20.04**	**19.97**	**29.89**	**29.82**	**60.00**	**50.00**	**-30.11**	**-20.18**
6	25.16600	9.87	6.62	2.22	16.49	12.09	60.00	50.00	-43.51	-37.91

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.

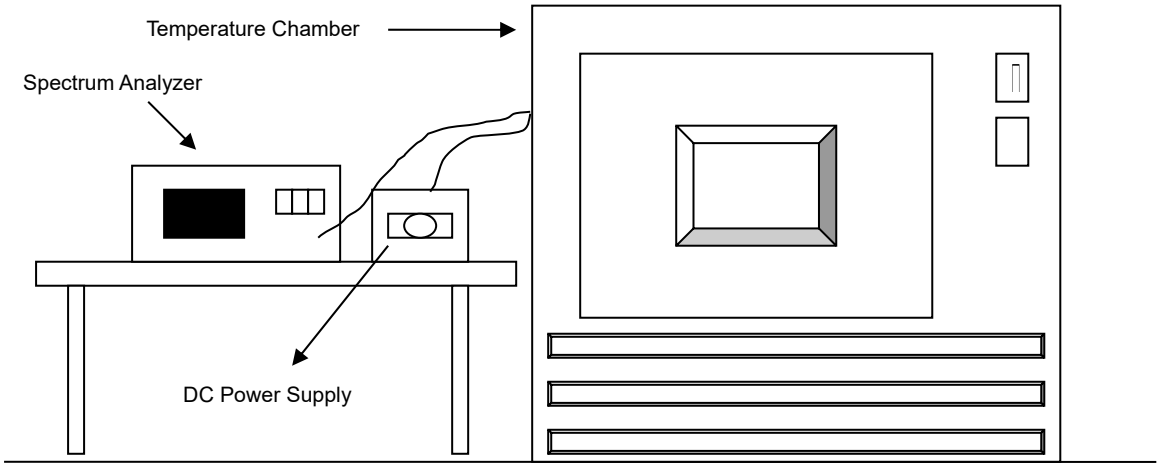


4.3 Frequency Stability

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
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 15, 2021	Sep. 14, 2022
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 01, 2021	May 31, 2022
Digital Multimeter Fluke	87-III	70360755	Jul. 07, 2021	Jul. 06, 2022
DC Power Supply Topward	6306A	727263	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. Test dated: May 08, 2022

4.3.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal DC 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 the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.

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 from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

Same as Item 4.1.6.

4.3.7 Test Result

Type A

Frequency Stability Versus Temp.									
TEMP. (℃)	Power Supply (Vdc)	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	5	13.55994	-0.00044	13.55994	-0.00044	13.55994	-0.00044	13.55994	-0.00044
40	5	13.56002	0.00015	13.56002	0.00015	13.56003	0.00022	13.56003	0.00022
30	5	13.56004	0.00029	13.56005	0.00037	13.56004	0.00029	13.56004	0.00029
20	5	13.55997	-0.00022	13.55998	-0.00015	13.55999	-0.00007	13.55998	-0.00015
10	5	13.56006	0.00044	13.56005	0.00037	13.56004	0.00029	13.56005	0.00037
0	5	13.55994	-0.00044	13.55993	-0.00052	13.55992	-0.00059	13.55993	-0.00052
-10	5	13.55995	-0.00037	13.55995	-0.00037	13.55996	-0.00029	13.55996	-0.00029
-20	5	13.55995	-0.00037	13.55995	-0.00037	13.55994	-0.00044	13.55995	-0.00037

Frequency Stability Versus Voltage									
TEMP. (℃)	Power Supply (Vdc)	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	5.75	13.55997	-0.00022	13.55998	-0.00015	13.55999	-0.00007	13.55998	-0.00015
	5.00	13.55997	-0.00022	13.55998	-0.00015	13.55999	-0.00007	13.55998	-0.00015
	4.25	13.55997	-0.00022	13.55998	-0.00015	13.55999	-0.00007	13.55998	-0.00015

Type F

Frequency Stability Versus Temp.									
TEMP. (℃)	Power Supply (Vdc)	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	5	13.56005	0.00037	13.56004	0.00029	13.56005	0.00037	13.56005	0.00037
40	5	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022	13.56004	0.00029
30	5	13.56006	0.00044	13.56006	0.00044	13.56006	0.00044	13.56006	0.00044
20	5	13.55995	-0.00037	13.55993	-0.00052	13.55994	-0.00044	13.55994	-0.00044
10	5	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029
0	5	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007
-10	5	13.55997	-0.00022	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015
-20	5	13.56005	0.00037	13.56006	0.00044	13.56005	0.00037	13.56005	0.00037

Frequency Stability Versus Voltage									
TEMP. (℃)	Power Supply (Vdc)	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	5.75	13.55995	-0.00037	13.55993	-0.00052	13.55994	-0.00044	13.55994	-0.00044
	5.00	13.55995	-0.00037	13.55993	-0.00052	13.55994	-0.00044	13.55994	-0.00044
	4.25	13.55995	-0.00037	13.55993	-0.00052	13.55994	-0.00044	13.55994	-0.00044

Type V

Frequency Stability Versus Temp.									
TEMP. (℃)	Power Supply (Vdc)	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	5	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007
40	5	13.56003	0.00022	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029
30	5	13.56002	0.00015	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007
20	5	13.55999	-0.00007	13.56000	0.00000	13.55998	-0.00015	13.55998	-0.00015
10	5	13.55999	-0.00007	13.55998	-0.00015	13.55998	-0.00015	13.55999	-0.00007
0	5	13.55994	-0.00044	13.55994	-0.00044	13.55994	-0.00044	13.55993	-0.00052
-10	5	13.56002	0.00015	13.56001	0.00007	13.56002	0.00015	13.56003	0.00022
-20	5	13.56006	0.00044	13.56006	0.00044	13.56006	0.00044	13.56006	0.00044

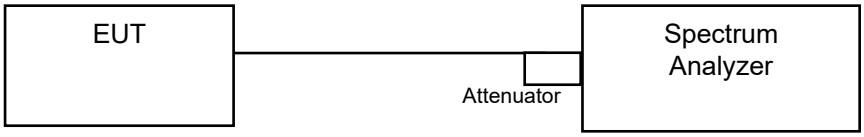
Frequency Stability Versus Voltage									
TEMP. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	5.75	13.55999	-0.00007	13.56	0.00000	13.55998	-0.00015	13.55998	-0.00015
	5.00	13.55999	-0.00007	13.56	0.00000	13.55998	-0.00015	13.55998	-0.00015
	4.25	13.55999	-0.00007	13.56	0.00000	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

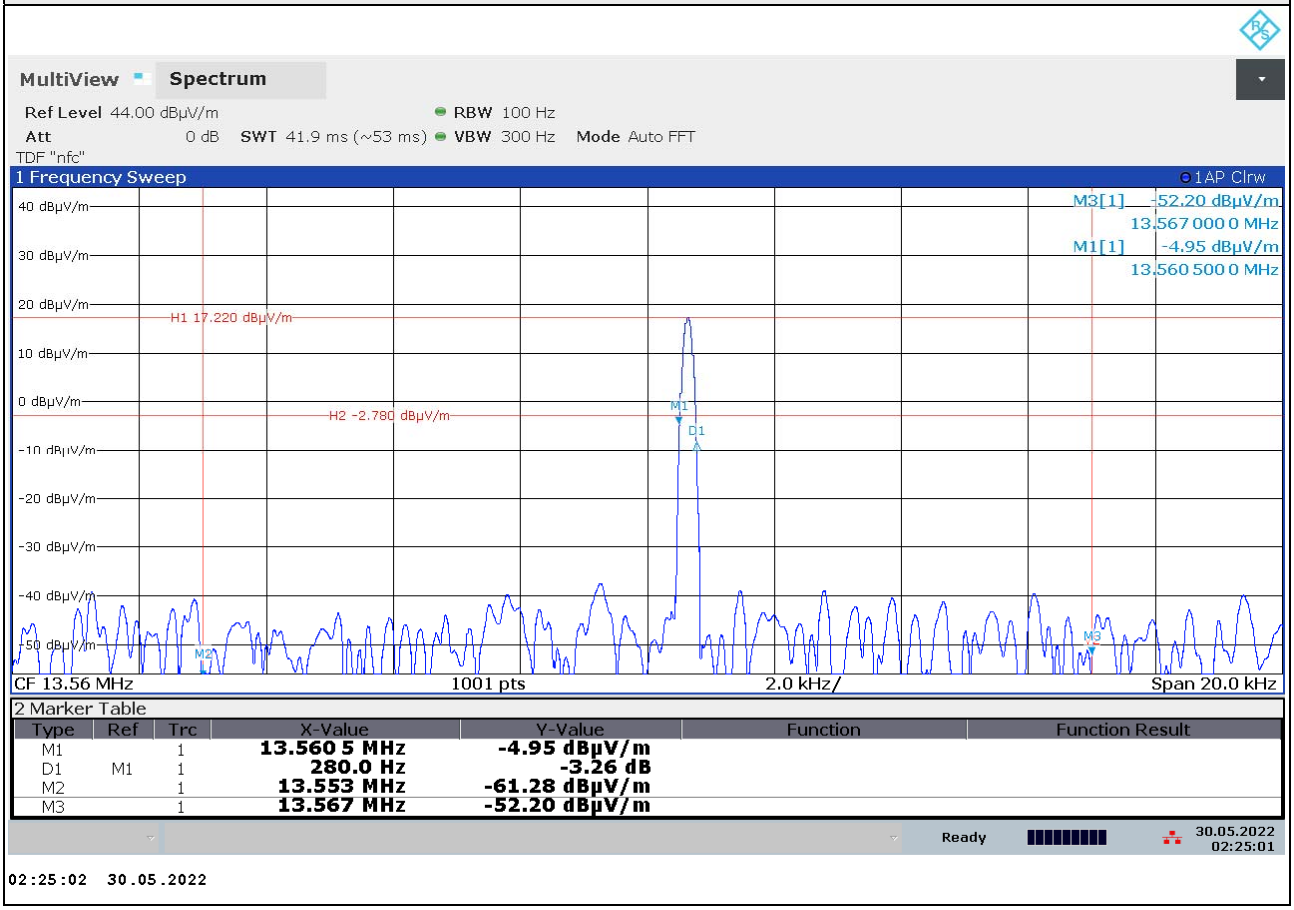
Same as Item 4.1.6.

4.4.7 Test Results

Type A

20dBc Bandwidth (Hz)	Operating frequency band (MHz)	Pass / Fail
280	13.553~13.567	Pass

Spectrum Plot of Value

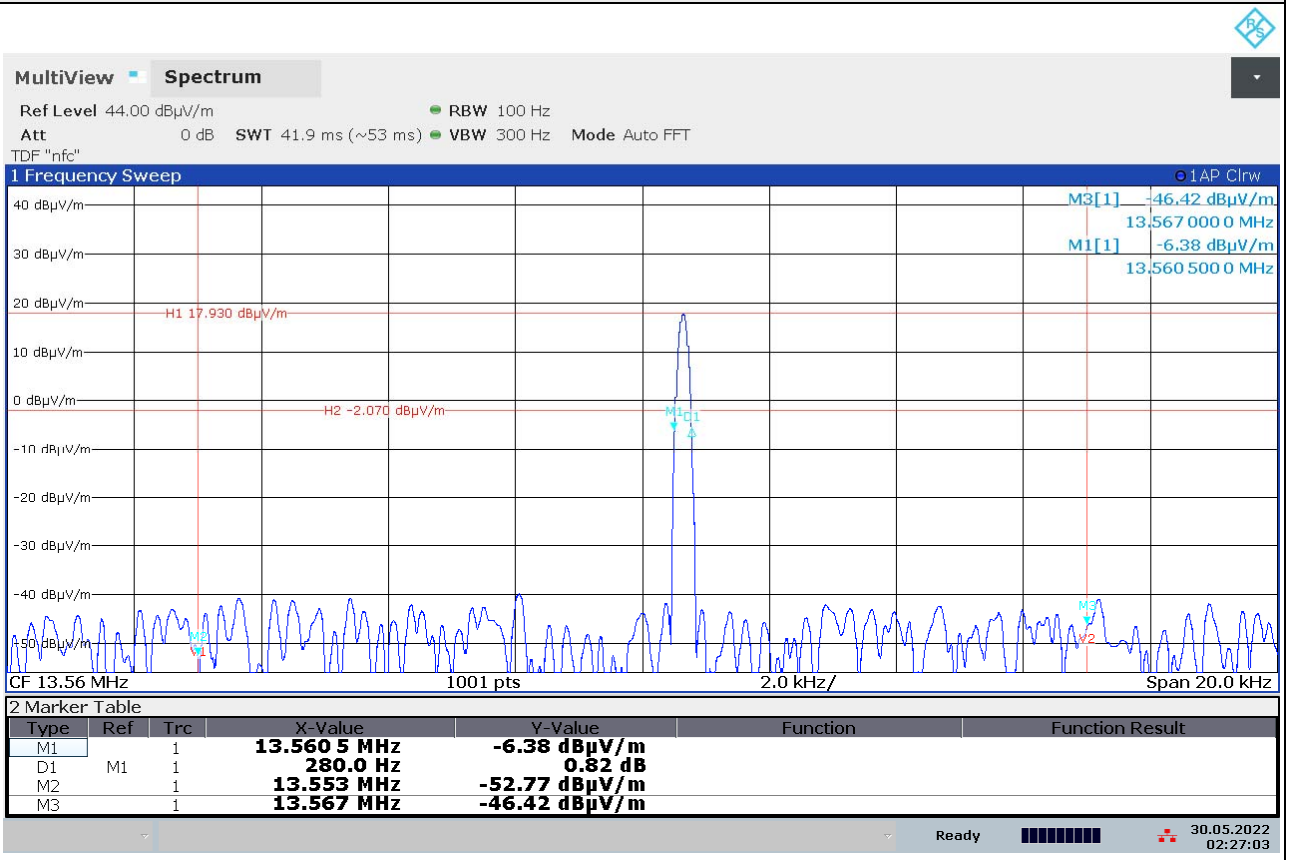


Note: The signal look like CW signal, so RBW can't be match 1~5 % OBW.

Type F

20dBc Bandwidth (Hz)	Operating frequency band (MHz)	Pass / Fail
280	13.553~13.567	Pass

Spectrum Plot of Value

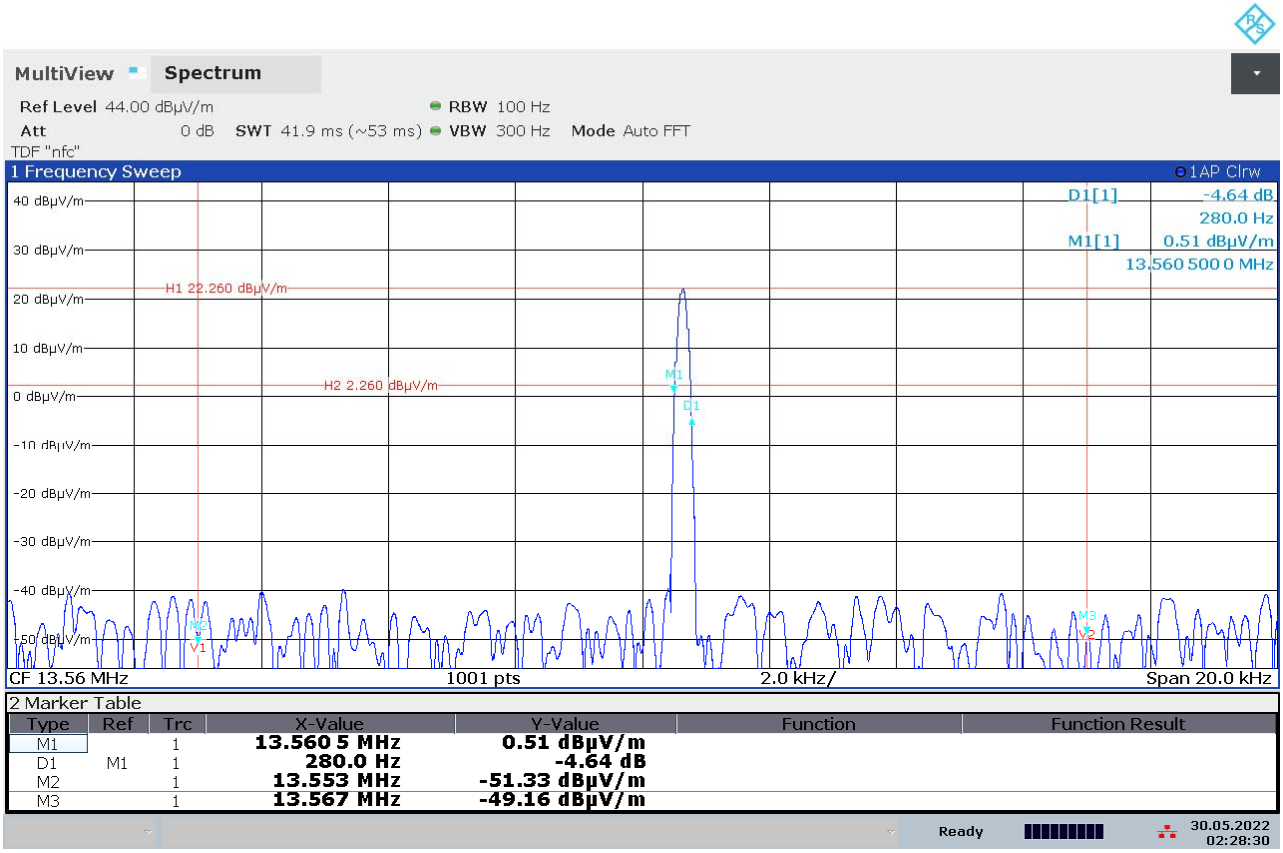


Note: The signal look like CW signal, so RBW can't be match 1~5 % OBW.

Type V

20dBc Bandwidth (Hz)	Operating frequency band (MHz)	Pass / Fail
280	13.553~13.567	Pass

Spectrum Plot of Value



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

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