

FCC Test Report

Report No.: RF181129C30

FCC ID: E2K-DWRFID1804

Test Model: DWRFID1804

Received Date: Nov. 29, 2018

Test Date: Dec. 05 ~ Dec. 18, 2018

Issued Date: Dec. 20, 2018

Applicant: Dell Inc.

Address: One Dell Way, Round Rock, Texas 78682, USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

FCC Registration / 788550 / TW0003
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RF181129C30	Original release	Dec. 20, 2018

1 Certificate of Conformity

Product: RFID13.56MHz Wireless Module

Brand: DELL

Model: DWRFID1804

Sample Status: Engineering sample

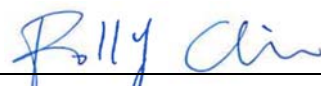
Applicant: Dell Inc.

Test Date: Dec. 05 ~ Dec. 18, 2018

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 :


Polly Chien / Specialist

Date:

Dec. 20, 2018

Approved by :


Bruce Chen / Project Engineer

Date:

Dec. 20, 2018

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 -10.77dB at 9.96000MHz
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 -58.4dB 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 -6.7dB at 934.130MHz.
15.225 (e)	The frequency tolerance	Pass	Meet the requirement of limit.
15.215 (c)	20dB Bandwidth	Pass	Meet the requirement of limit.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.63 dB
	200MHz ~ 1000MHz	3.64 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	RFID13.56MHz Wireless Module
Brand	DELL
Model	DWRFID1804
Sample Status	Engineering sample
Power Supply Rating	19.5Vdc (adapter)
Modulation Type	ASK
Data Rate	Type A: 106 kbit/s Type B: 106 kbit/s Type F: 212 kbit/s, 424 kbit/s
Operating Frequency	13.56MHz
Field Strength	WNC antenna: 24.2dBuV/m (for 30m) Speed antenna: 25.6dBuV/m (for 30m)
Antenna Type	Loop antenna (Brand: WNC, Speed)
Accessory Device	NA
Data Cable Supplied	NA

Note:

- The transmitter module is authorized for using in the following specific End-products.

End-product name	Brand	Model	Antenna vendor	Description
Portable Computer	DELL	P96G	WNC	P96G is a Convertible PC w/o LAN port and P97G is a Regular NB with LAN port. Both models are electrically identical.
			Speed	
		P97G	WNC	
			Speed	

- The EUT consumes power from the following adapter. (for portable computer used)

Adapter	
Brand	Dell
Model	HA65NM130
Input Power	100-240Vac~, 1.7A, 50-60Hz
Output Power	19.5Vdc / 3.34A
Power Line	1.8m DC power cable without core 0.85m AC power cable without core

- After the pretest, the EUT was placed stand alone as the worst case mode for final test.

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 Data

EUT Configure Mode	Applicable to				Description
	RE	PLC	FS	EB	
A	√	√	√	√	End-product: P96G with WNC antenna
B	√	√	√	√	End-product: P96G with Speed antenna
C	√	√	√	√	End-product: P97G with WNC antenna
D	√	√	√	√	End-product: P97G with Speed antenna

Where RE: Radiated Emission
FS: Frequency Stability

PLC: Power Line Conducted Emission
EB: 20dB Bandwidth measurement

Note: The EUT had been pre-tested on Type A, Type B, Type F. The worst case was found when data rate was Type A, Type A was chosen for final test.

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, C, D	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, C, D	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, C, D	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, C, D	1	1	ASK

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE	25 deg. C, 70% RH 25 deg. C, 69% RH	120Vac, 60Hz	Noah Chang
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Noah Chang Jones Chang
FS	25 deg. C, 70% RH	120Vac, 60Hz	Noah Chang
BW	25 deg. C, 70% RH	120Vac, 60Hz	Noah Chang

3.3 Description of Support Units

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

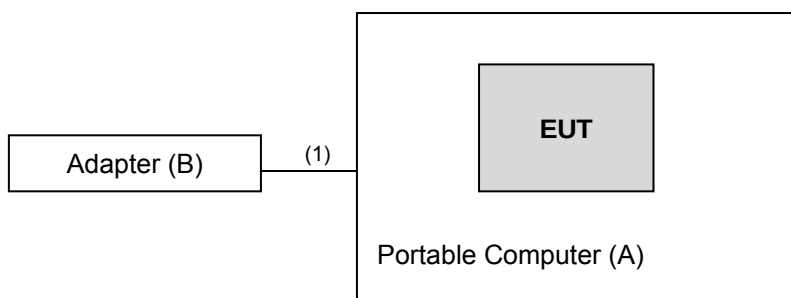
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Portable Computer	DELL	P96G	NA	NA	Provided by client
	Portable Computer	DELL	P97G	NA	NA	Provided by client
B.	Adapter	Dell	HA65NM130	NA	NA	Provided by client

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Power cable	1	1.8	-	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)

KDB 414788 D01 Radiated Test Site v01r01

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	ESIB7	100187	May 29, 2018	May 28, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 25, 2018	Sep. 24, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Dec. 11, 2017	Dec. 10, 2018
			Nov. 21, 2018	Nov. 20, 2019
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna TESEQ	HLA 6121	45745	Jun. 14, 2018	Jun. 13, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Aug. 08, 2018	Aug. 07, 2019
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jul. 02, 2018	Jul. 01, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Aug. 08, 2018	Aug. 07, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Aug. 08, 2018	Aug. 07, 2019
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	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 Chamber 4.
3. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
4. The IC Site Registration No. is IC 7450F-4.

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.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 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.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

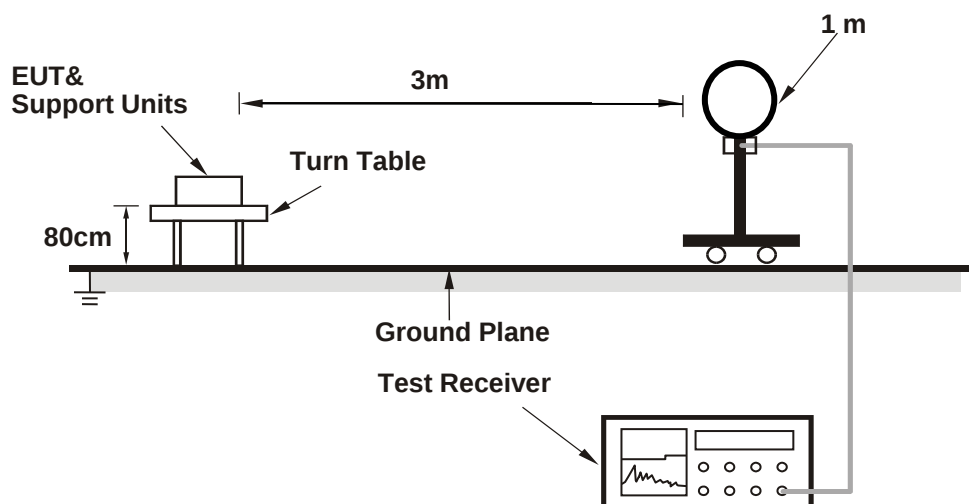
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

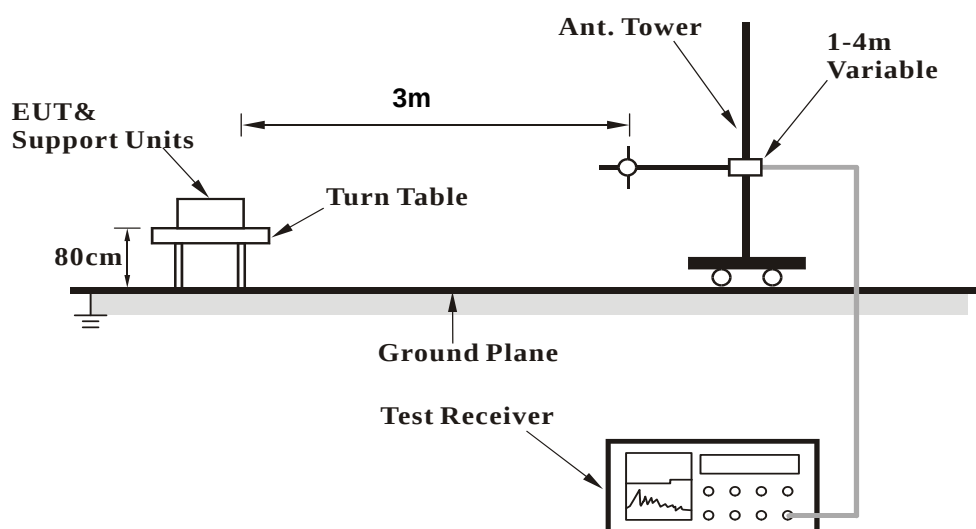
No deviation.

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 OATS 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.
- OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

4.1.6 EUT Operating Conditions

- 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	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	*13.56	52.80 QP	124.00 QP	-71.20	1.00	57	31.00	21.80

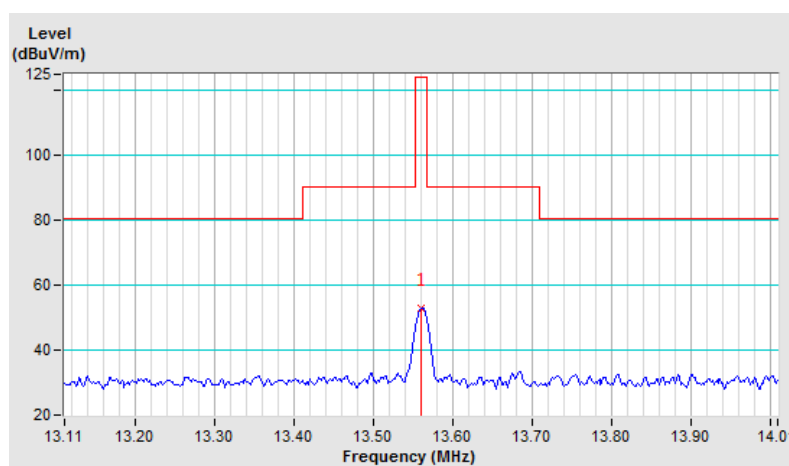
Remarks:

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
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} & 30\text{m} \\
 &= 84\text{dBuV/m} & 30\text{m} \\
 &= 84 + 20\log(30/3)^2 & 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	12.80 QP	84.0 QP	-71.20

Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	*13.56	47.70 QP	124.00 QP	-76.30	1.00	85	25.90	21.80

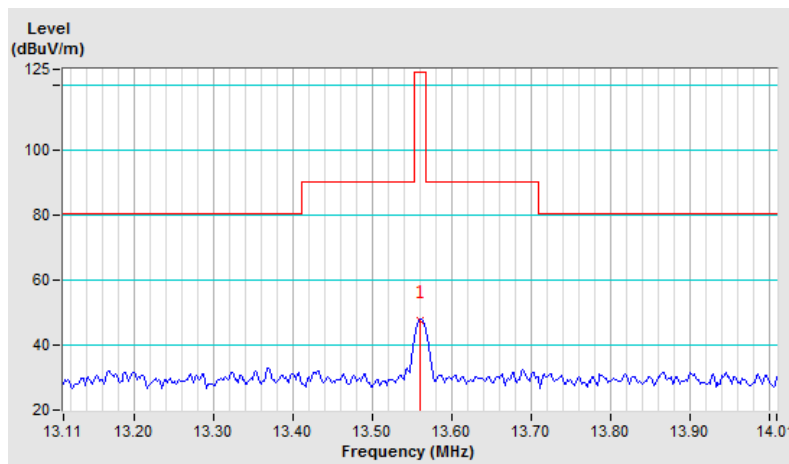
Remarks:

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
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\mu\text{V/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84 + 20\log(30/3)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	7.70 QP	84.0 QP	-76.30

Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	*13.56	64.20 QP	124.00 QP	-59.80	1.00	299	42.40	21.80

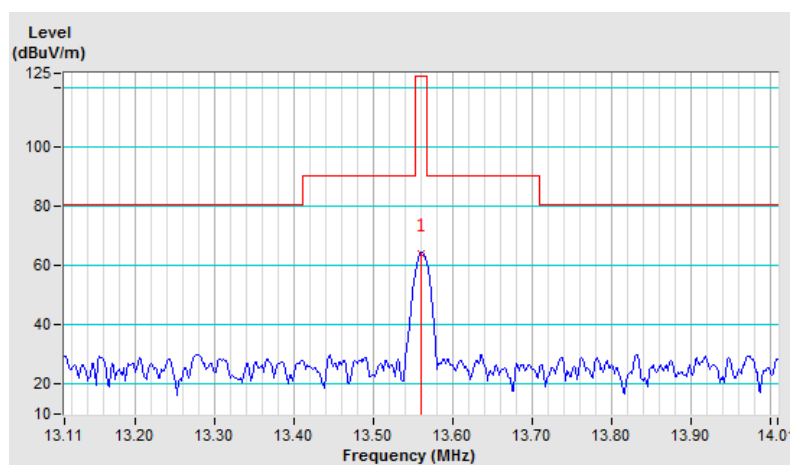
Remarks:

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
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\mu\text{V/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84+20\log(30/3)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	24.20 QP	84.0 QP	-59.80

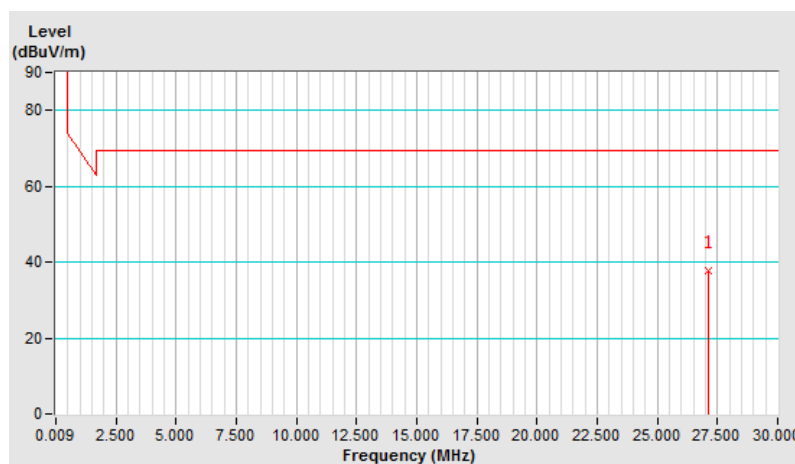
Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	27.12	37.90 QP	69.50 QP	-31.60	1.00	269	15.80	22.10

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-2.1 QP	29.50 QP	-31.60

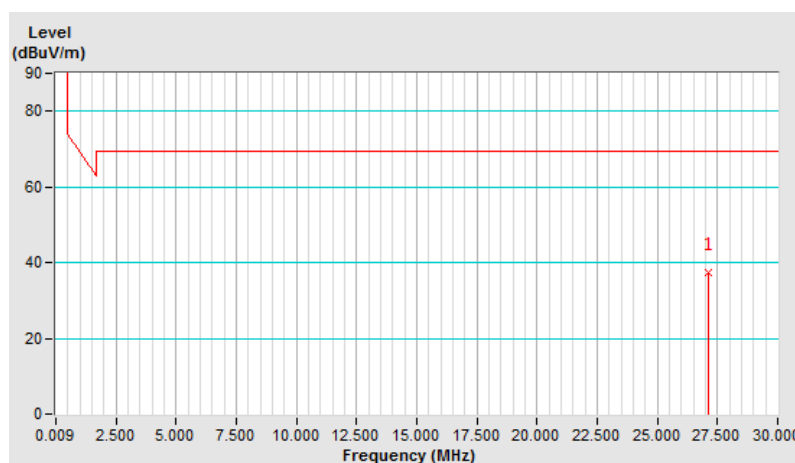
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	27.12	37.20 QP	69.50 QP	-32.30	1.00	15	15.10	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-2.80 QP	29.50 QP	-32.30

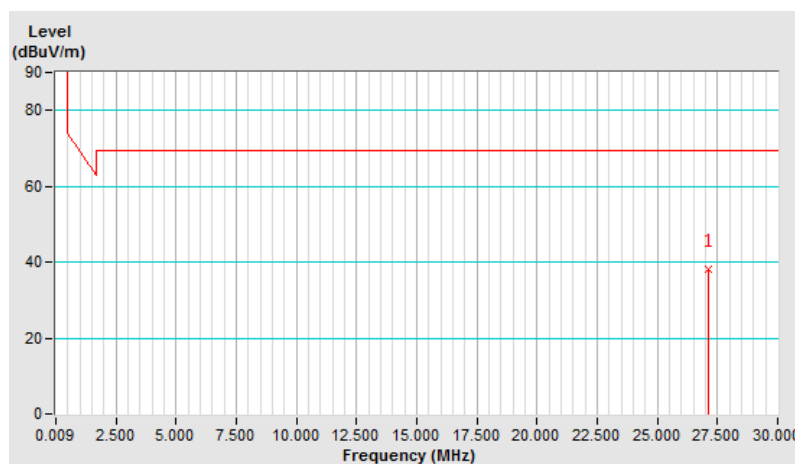
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	27.12	38.30 QP	69.50 QP	-31.20	1.00	110	16.20	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-1.70 QP	29.50 QP	-31.20

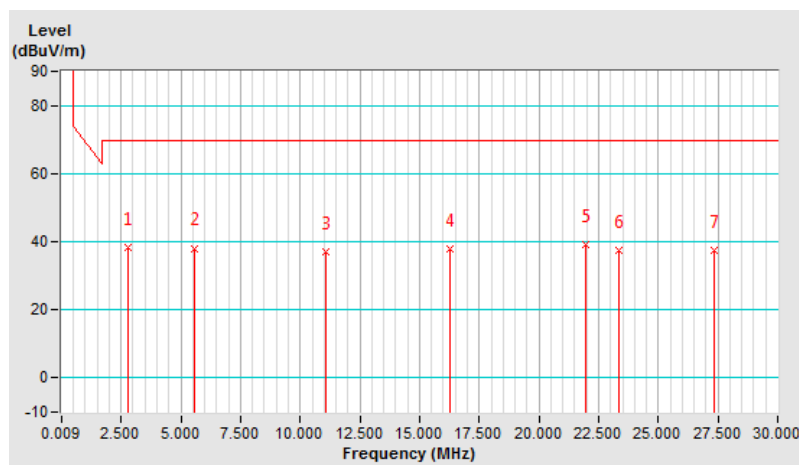
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	2.77	38.20 QP	69.50 QP	-31.30	1.00	138	18.60	19.60
2	5.59	38.10 QP	69.50 QP	-31.40	1.00	80	17.40	20.70
3	11.05	37.20 QP	69.50 QP	-32.30	1.00	77	15.40	21.80
4	16.26	38.00 QP	69.50 QP	-31.50	1.00	46	16.20	21.80
5	21.96	39.30 QP	69.50 QP	-30.20	1.00	103	17.40	21.90
6	23.34	37.30 QP	69.50 QP	-32.20	1.00	347	15.30	22.00

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



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2.77	-1.80 QP	29.50 QP	-31.30
2	5.59	-1.90 QP	29.50 QP	-31.40
3	11.05	-2.80 QP	29.50 QP	-32.30
4	16.26	2.00 QP	29.50 QP	-31.50
5	21.96	-0.70 QP	29.50 QP	-30.20
6	23.34	-2.70 QP	29.50 QP	-32.20

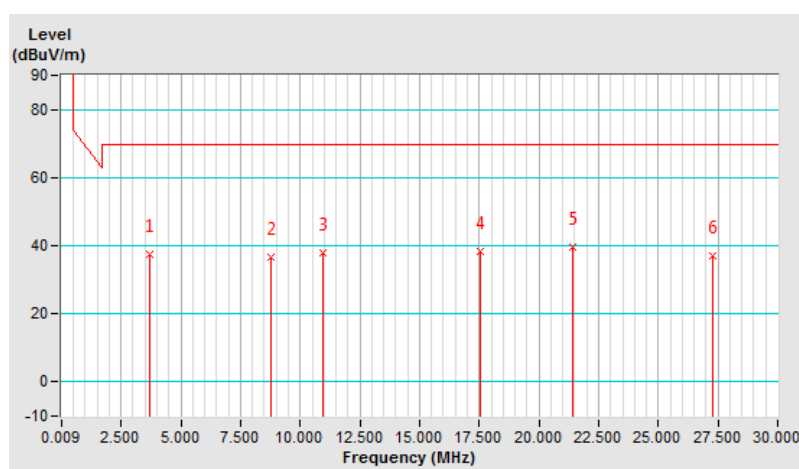
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	3.67	37.50 QP	69.50 QP	-32.00	1.00	73	37.30	0.20
2	8.77	36.80 QP	69.50 QP	-32.70	1.00	186	36.50	0.30
3	10.93	37.90 QP	69.50 QP	-31.60	1.00	49	37.60	0.30
4	17.52	38.10 QP	69.50 QP	-31.40	1.00	323	37.80	0.30
5	21.42	39.50 QP	69.50 QP	-30.00	1.00	23	39.10	0.40
6	27.30	37.20 QP	69.50 QP	-32.30	1.00	112	36.80	0.40

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



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	3.67	-2.50 QP	29.50 QP	-32.00
2	8.77	-3.20 QP	29.50 QP	-32.70
3	10.93	-2.10 QP	29.50 QP	-31.60
4	17.52	-1.90 QP	29.50 QP	-31.40
5	21.42	-0.50 QP	29.50 QP	-30.00
6	27.30	-2.80 QP	29.50 QP	-32.30

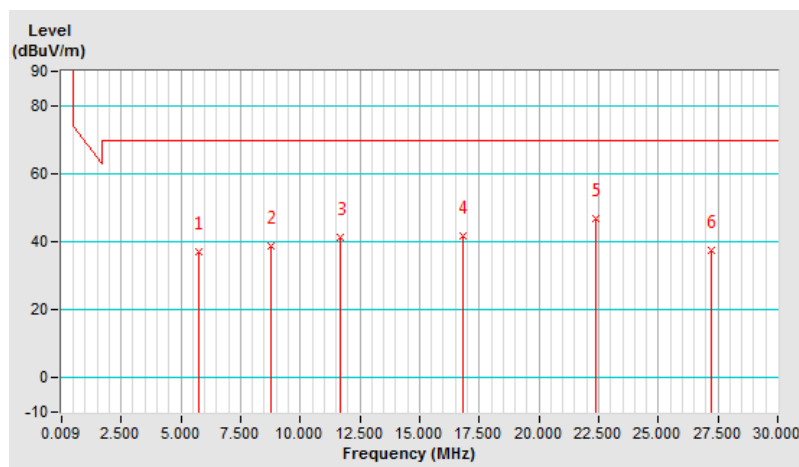
Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	5.77	37.00 QP	69.50 QP	-32.50	1.00	305	16.30	20.70
2	8.77	38.90 QP	69.50 QP	-30.60	1.00	314	17.40	21.50
3	11.71	41.40 QP	69.50 QP	-28.10	1.00	254	19.60	21.80
4	16.80	41.80 QP	69.50 QP	-27.70	1.00	237	20.00	21.80
5	22.38	46.70 QP	69.50 QP	-22.80	1.00	92	24.80	21.90
6	27.24	37.30 QP	69.50 QP	-32.20	1.00	131	15.20	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5.77	-3.00 QP	29.50 QP	-32.50
2	8.77	-1.10 QP	29.50 QP	-30.60
3	11.71	1.40 QP	29.50 QP	-28.10
4	16.80	1.80 QP	29.50 QP	-27.70
5	22.38	6.70 QP	29.50 QP	-22.80
6	27.24	-2.70 QP	29.50 QP	-32.20

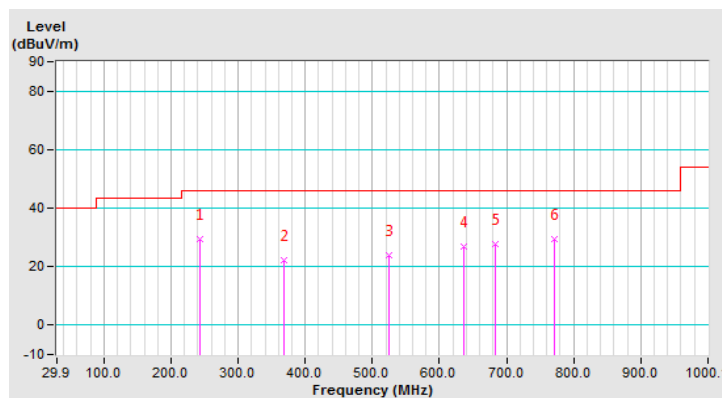
Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

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	243.34	29.6 QP	46.0	-16.4	2.00 H	285	39.2	-9.6
2	367.53	22.1 QP	46.0	-23.9	1.00 H	182	29.1	-7.0
3	524.70	23.8 QP	46.0	-22.2	1.00 H	184	28.3	-4.5
4	637.25	27.0 QP	46.0	-19.0	1.50 H	12	28.7	-1.7
5	683.81	27.8 QP	46.0	-18.2	1.00 H	74	28.7	-0.9
6	771.13	29.4 QP	46.0	-16.6	1.50 H	50	28.0	1.4

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.
4. Margin value = Emission Level – Limit value

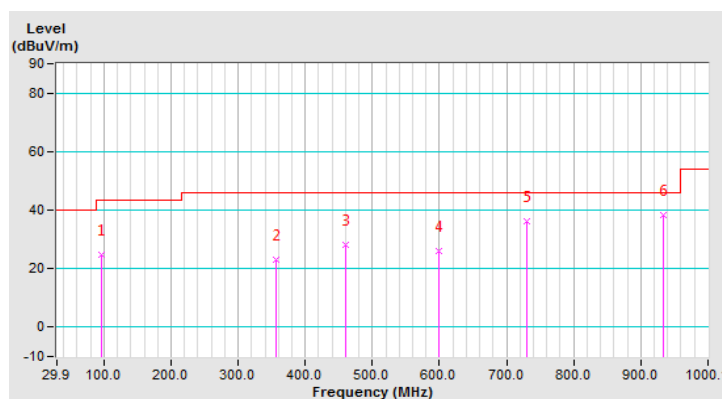


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

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	95.87	24.6 QP	43.5	-18.9	2.00 V	122	38.3	-13.7
2	355.89	23.1 QP	46.0	-22.9	1.00 V	278	30.4	-7.3
3	460.67	28.1 QP	46.0	-17.9	1.50 V	28	33.7	-5.6
4	598.44	25.9 QP	46.0	-20.1	1.00 V	305	28.5	-2.6
5	730.38	36.0 QP	46.0	-10.0	1.00 V	79	35.6	0.4
6	934.13	38.1 QP	46.0	-7.9	1.00 V	272	34.2	3.9

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



Mode B

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	*13.56	53.8 QP	124.0 QP	-70.2	1.0	100	32.0	21.8

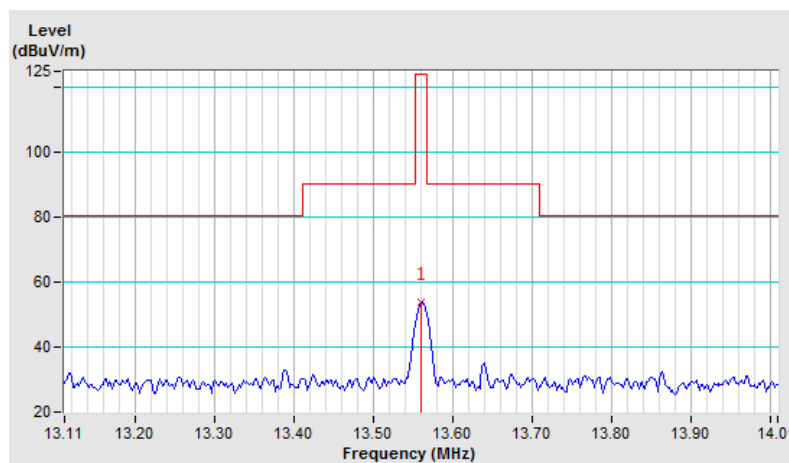
Remarks:

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.
4. Margin value = Emission Level – Limit value
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\mu\text{V/m} & 30\text{m} \\
 &= 84\text{dBuV/m} & 30\text{m} \\
 &= 84+20\log(30/3)^2 & 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	13.8 QP	84.0 QP	-70.2

Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	*13.56	46.8 QP	124.0 QP	-77.2	1.0	299	25.0	21.8

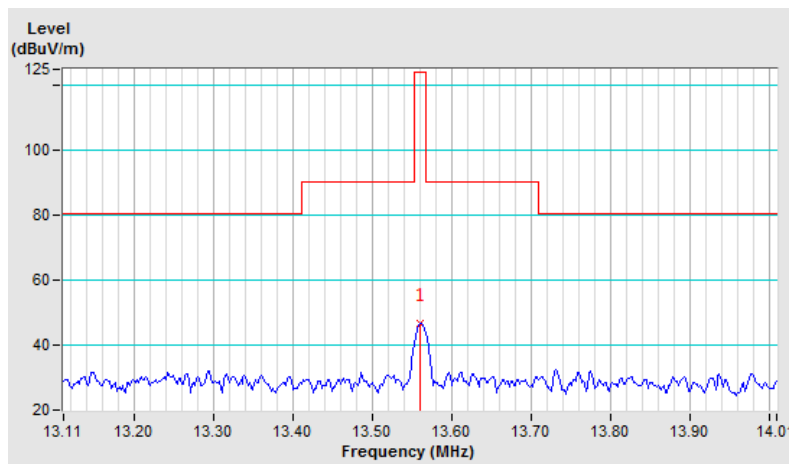
Remarks:

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.
4. Margin value = Emission Level – Limit value
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84 + 20\log(3/30)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	6.8 QP	84.0 QP	-77.2

Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	*13.56	65.6 QP	124.0 QP	-58.4	1.0	123	43.8	21.8

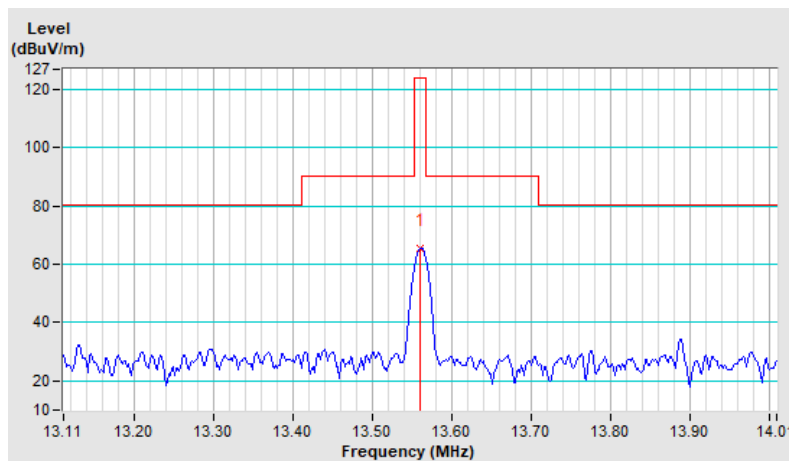
Remarks:

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.
4. Margin value = Emission Level – Limit value
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84 + 20\log(3/30)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	25.6 QP	84.0 QP	-58.4

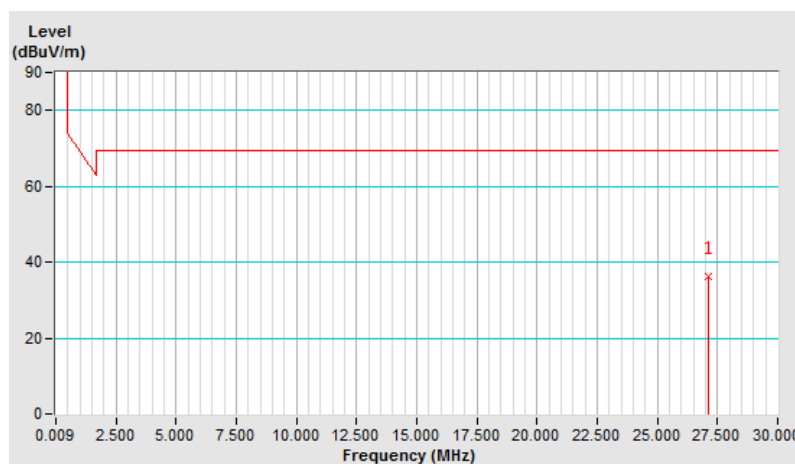
Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	27.12	36.30 QP	69.50 QP	-33.20	1.00	278	14.20	22.10

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-3.70 QP	29.50 QP	-33.20

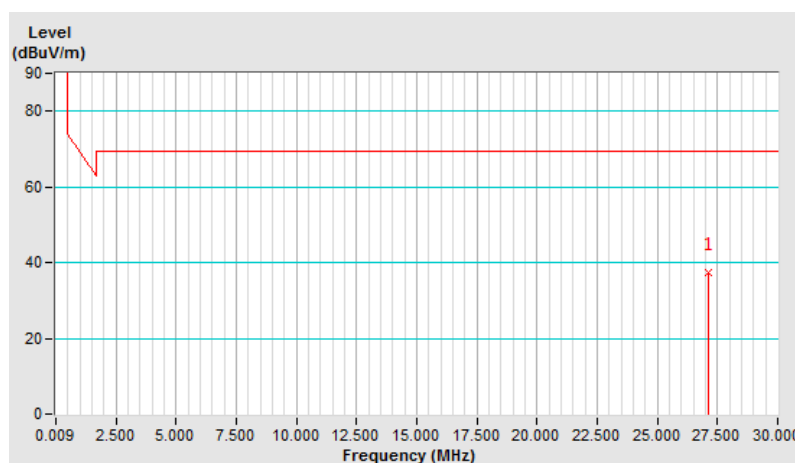
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	27.12	37.20 QP	69.50 QP	-32.30	1.00	51	15.10	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-2.80 QP	29.50 QP	-32.30

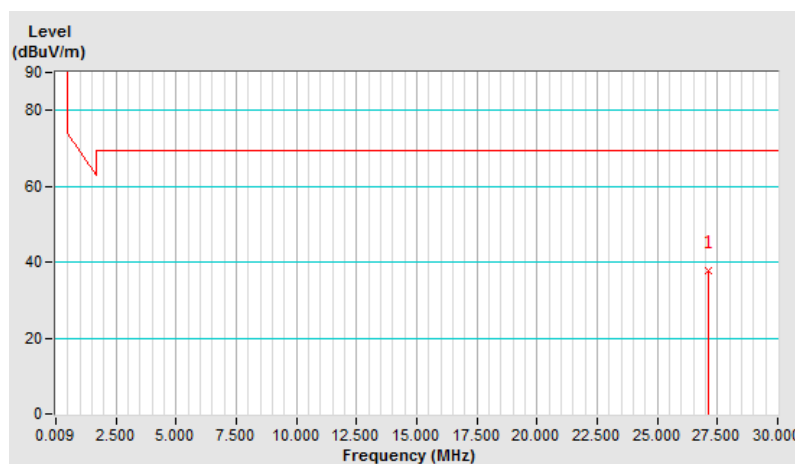
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	27.12	37.90 QP	69.50 QP	-31.60	1.00	321	15.80	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-2.10 QP	29.50 QP	-31.60

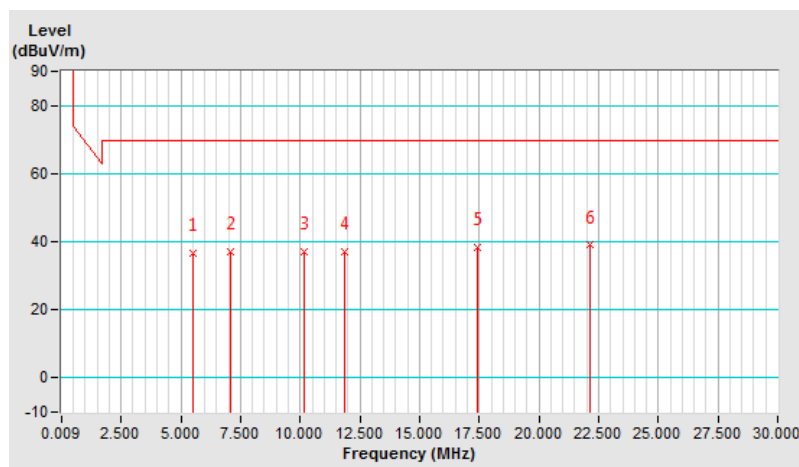
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	5.53	36.80 QP	69.50 QP	-32.70	1.00	239	16.10	20.70
2	7.09	37.20 QP	69.50 QP	-32.30	1.00	23	16.10	21.10
3	10.15	37.20 QP	69.50 QP	-32.30	1.00	9	15.40	21.80
4	11.89	37.00 QP	69.50 QP	-32.50	1.00	55	15.20	21.80
5	17.40	38.40 QP	69.50 QP	-31.10	1.00	9	16.60	21.80
6	22.14	38.90 QP	69.50 QP	-30.60	1.00	180	17.00	21.90

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



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5.53	-3.20 QP	29.50 QP	-32.70
2	7.09	-2.80 QP	29.50 QP	-32.30
3	10.15	-2.80 QP	29.50 QP	-32.30
4	11.89	-3.00 QP	29.50 QP	-32.50
5	17.40	-1.60 QP	29.50 QP	-31.10
6	22.14	-1.10 QP	29.50 QP	-30.60

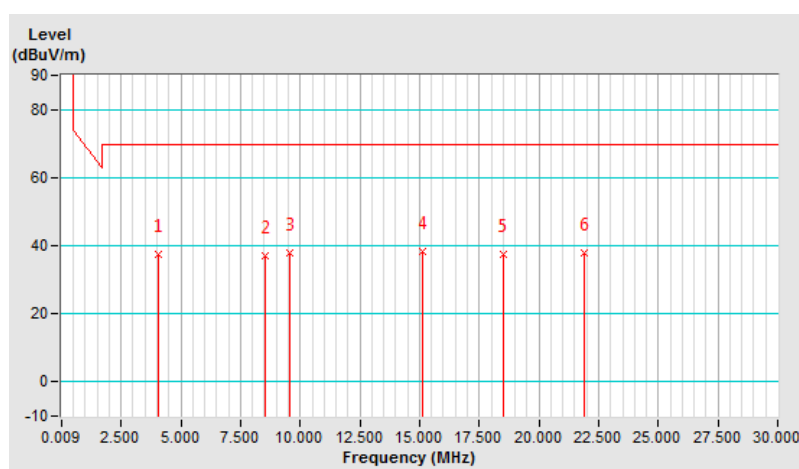
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	4.09	37.30 QP	69.50 QP	-32.20	1.00	172	17.20	20.10
2	8.53	37.00 QP	69.50 QP	-32.50	1.00	10	15.60	21.40
3	9.55	37.80 QP	69.50 QP	-31.70	1.00	155	16.10	21.70
4	15.12	38.20 QP	69.50 QP	-31.30	1.00	56	16.40	21.80
5	18.48	37.40 QP	69.50 QP	-32.10	1.00	6	15.60	21.80
6	21.90	37.90 QP	69.50 QP	-31.60	1.00	10	16.00	21.90

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



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	4.09	-2.70 QP	29.50 QP	-32.20
2	8.53	-3.00 QP	29.50 QP	-32.50
3	9.55	-2.20 QP	29.50 QP	-31.70
4	15.12	-1.80 QP	29.50 QP	-31.30
5	18.48	-2.60 QP	29.50 QP	-32.10
6	21.90	-2.10 QP	29.50 QP	-31.60

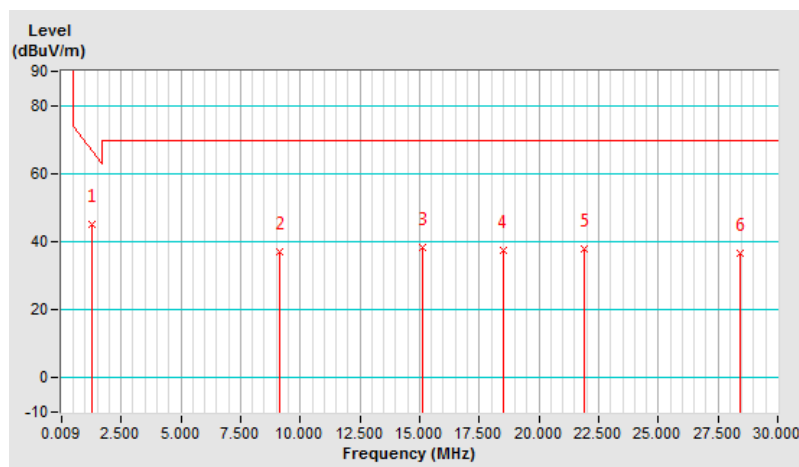
Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	1.27	45.20 QP	65.50 QP	-20.30	1.00	176	25.20	20.00
2	9.13	37.20 QP	69.50 QP	-32.30	1.00	116	15.60	21.60
3	15.12	38.20 QP	69.50 QP	-31.30	1.00	56	16.40	21.80
4	18.48	37.40 QP	69.50 QP	-32.10	1.00	6	15.60	21.80
5	21.90	37.90 QP	69.50 QP	-31.60	1.00	10	16.00	21.90
6	28.44	36.70 QP	69.50 QP	-32.80	1.00	10	14.60	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	1.27	5.20 QP	29.50 QP	-20.30
2	9.13	-2.80 QP	29.50 QP	-32.30
3	15.12	-1.80 QP	29.50 QP	-31.30
4	18.48	-2.60 QP	29.50 QP	-32.10
5	21.90	-2.10 QP	29.50 QP	-31.60
6	28.44	-3.30 QP	29.50 QP	-32.80

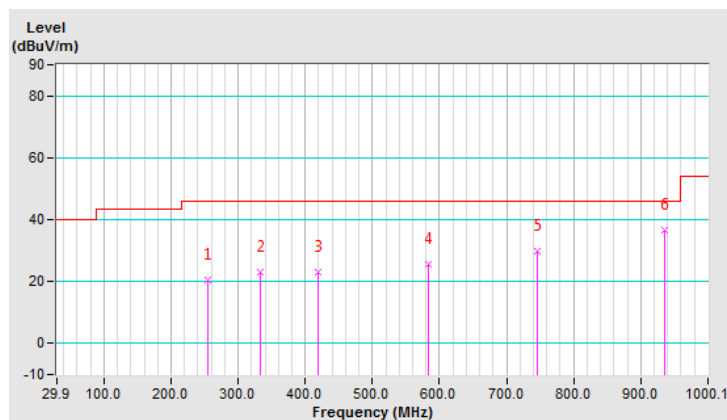
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

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	254.99	20.4 QP	46.0	-25.6	1.50 H	180	29.7	-9.3
2	332.60	23.1 QP	46.0	-22.9	1.00 H	249	30.5	-7.4
3	419.92	23.1 QP	46.0	-22.9	1.00 H	309	29.3	-6.2
4	582.91	25.8 QP	46.0	-20.2	1.00 H	3	28.9	-3.1
5	745.91	29.8 QP	46.0	-16.2	2.00 H	29	29.0	0.8
6	936.07	36.7 QP	46.0	-9.3	1.00 H	154	32.7	4.0

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

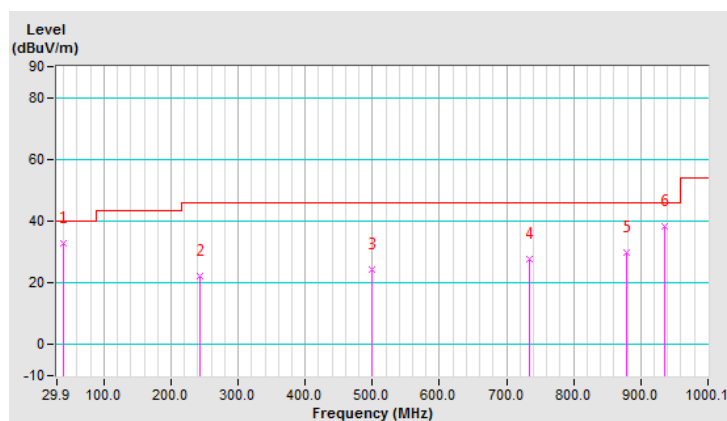


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

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	39.60	33.0 QP	40.0	-7.0	1.50 V	192	42.4	-9.4
2	243.34	22.4 QP	46.0	-23.6	1.00 V	8	32.0	-9.6
3	499.48	24.3 QP	46.0	-21.7	1.00 V	11	29.3	-5.0
4	734.27	27.7 QP	46.0	-18.3	1.00 V	66	27.2	0.5
5	877.85	29.9 QP	46.0	-16.1	1.50 V	80	27.0	2.9
6	936.07	38.1 QP	46.0	-7.9	1.00 V	4	34.1	4.0

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



Mode C

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	*13.56	49.90 QP	124.00 QP	-74.10	1.00	321	28.10	21.80

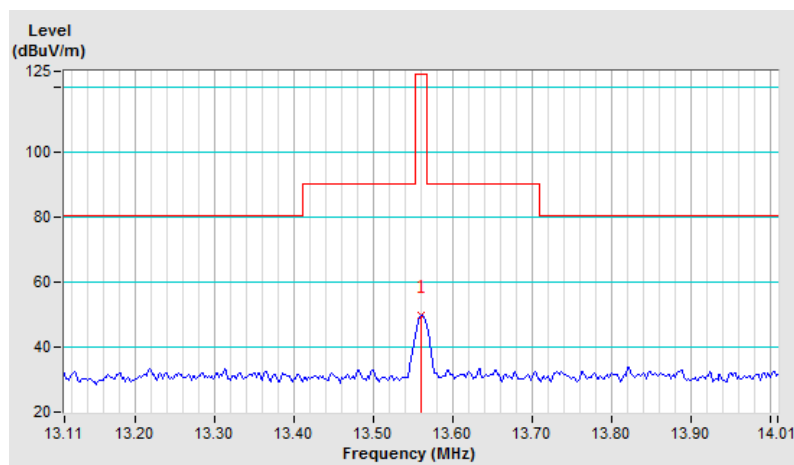
Remarks:

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
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\mu\text{V/m} & 30\text{m} \\
 &= 84\text{dBuV/m} & 30\text{m} \\
 &= 84+20\log(3/30)^2 & 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	9.90 QP	84.0 QP	-74.10

Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	*13.56	43.40 QP	124.00 QP	-80.60	1.00	211	21.60	21.80

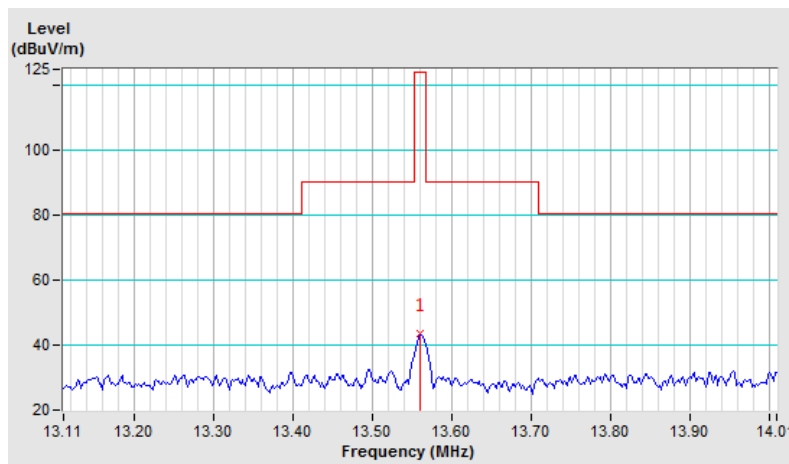
Remarks:

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
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84 + 20\log(3/30)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	3.40 QP	84.0 QP	-80.60

Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	*13.56	60.80 QP	124.00 QP	-63.20	1.00	166	39.00	21.80

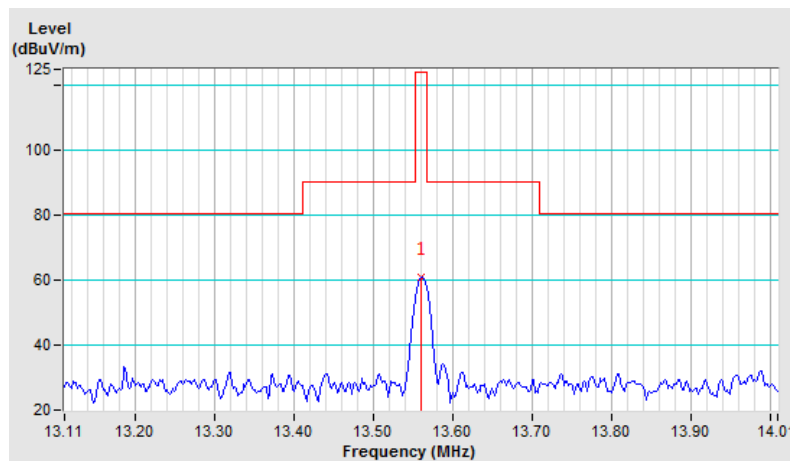
Remarks:

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
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84 + 20\log(3/30)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	20.80 QP	84.0 QP	-63.20

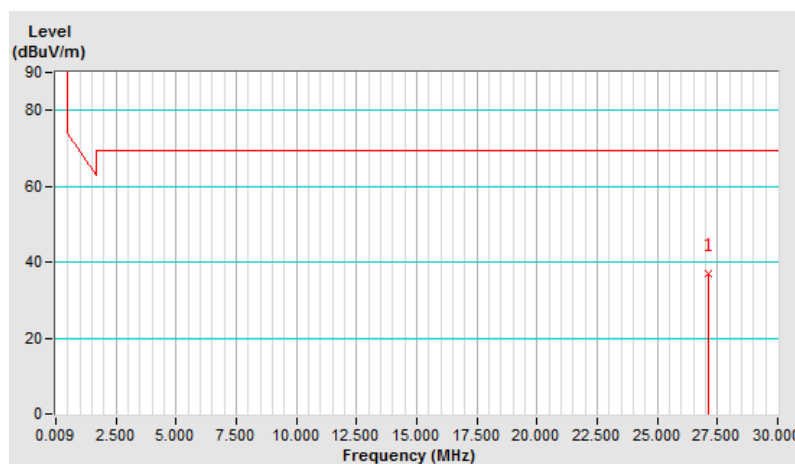
Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	27.12	36.90 QP	69.50 QP	-32.60	1.00	12	14.80	22.10

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-3.10 QP	29.50 QP	-32.60

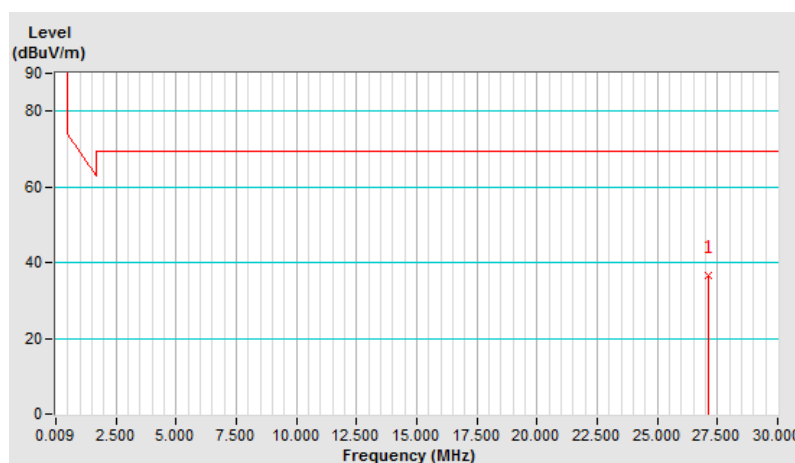
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	27.12	36.60 QP	69.50 QP	-32.90	1.00	277	14.50	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-3.40 QP	29.50 QP	-32.90

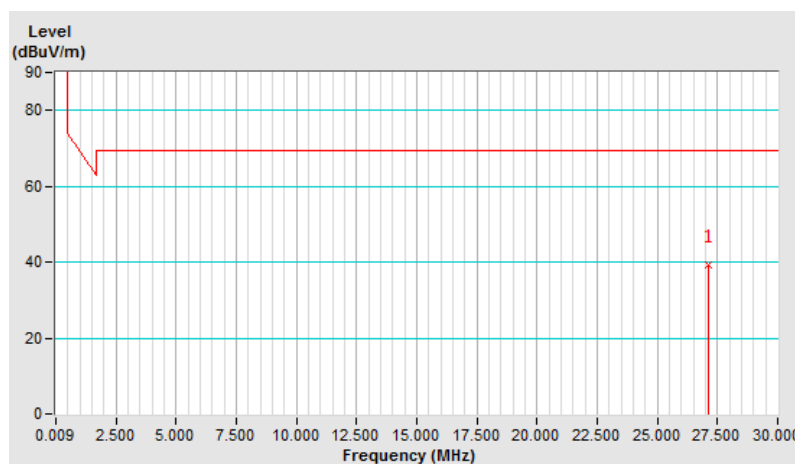
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	27.12	39.30 QP	69.50 QP	-30.20	1.00	230	17.20	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-0.70 QP	29.50 QP	-30.20

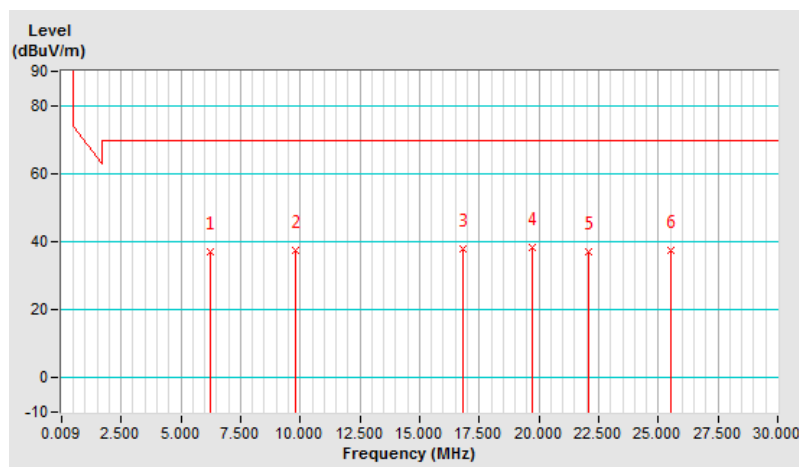
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	6.25	37.20 QP	69.50 QP	-32.30	1.00	52	16.30	20.90
2	9.79	37.30 QP	69.50 QP	-32.20	1.00	60	15.60	21.70
3	16.80	37.80 QP	69.50 QP	-31.70	1.00	29	16.00	21.80
4	19.74	38.40 QP	69.50 QP	-31.10	1.00	45	16.60	21.80
5	22.08	37.10 QP	69.50 QP	-32.40	1.00	214	15.20	21.90
6	25.50	37.30 QP	69.50 QP	-32.20	1.00	205	15.30	22.00

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



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	6.25	-2.80 QP	29.50 QP	-32.30
2	9.79	-2.70 QP	29.50 QP	-32.20
3	16.80	-2.20 QP	29.50 QP	-31.70
4	19.74	-1.60 QP	29.50 QP	-31.10
5	22.08	-2.90 QP	29.50 QP	-32.40
6	25.50	-2.70 QP	29.50 QP	-32.20

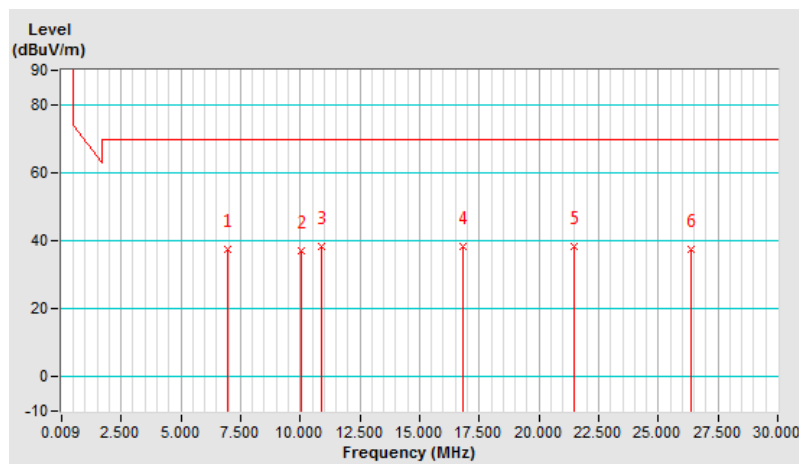
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	6.97	37.40 QP	69.50 QP	-32.10	1.00	224	37.20	0.20
2	10.03	37.00 QP	69.50 QP	-32.50	1.00	235	36.70	0.30
3	10.87	38.10 QP	69.50 QP	-31.40	1.00	154	37.80	0.30
4	16.80	38.10 QP	69.50 QP	-31.40	1.00	169	37.80	0.30
5	21.48	38.10 QP	69.50 QP	-31.40	1.00	231	37.70	0.40
6	26.40	37.30 QP	69.50 QP	-32.20	1.00	10	36.90	0.40

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



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	6.97	-2.60 QP	29.50 QP	-32.10
2	10.03	-3.00 QP	29.50 QP	-32.50
3	10.87	-1.90 QP	29.50 QP	-31.40
4	16.80	-1.90 QP	29.50 QP	-31.40
5	21.48	-1.90 QP	29.50 QP	-31.40
6	26.40	-2.70 QP	29.50 QP	-32.20

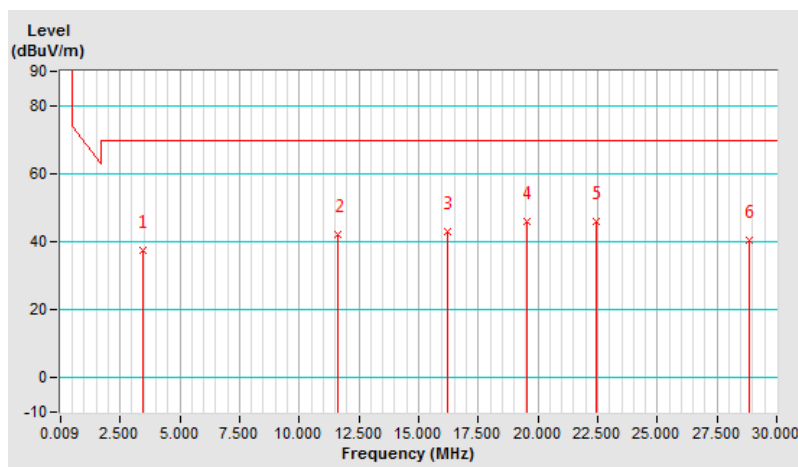
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	3.43	37.50 QP	69.50 QP	-32.00	1.00	252	17.80	19.70
2	11.65	42.00 QP	69.50 QP	-27.50	1.00	315	20.20	21.80
3	16.20	43.10 QP	69.50 QP	-26.40	1.00	145	21.30	21.80
4	19.56	45.90 QP	69.50 QP	-23.60	1.00	30	24.10	21.80
5	22.44	45.90 QP	69.50 QP	-23.60	1.00	156	24.00	21.90
6	28.86	40.60 QP	69.50 QP	-28.90	1.00	94	18.40	22.20

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



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	3.43	-2.50 QP	29.50 QP	-32.00
2	11.65	2.00 QP	29.50 QP	-27.50
3	16.20	3.10 QP	29.50 QP	-26.40
4	19.56	5.90 QP	29.50 QP	-23.60
5	22.44	5.90 QP	29.50 QP	-23.60
6	28.86	0.60 QP	29.50 QP	-28.90

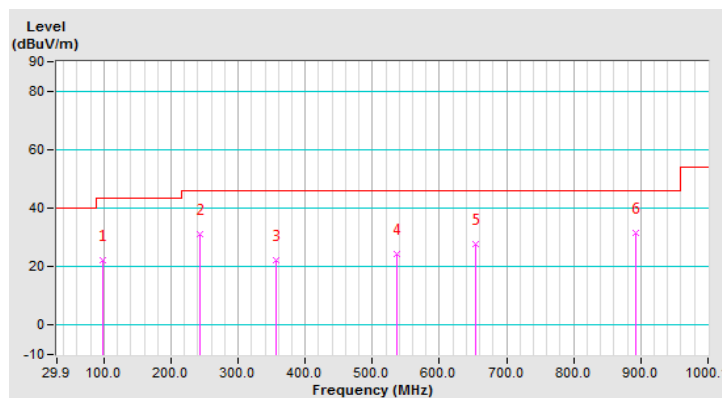
Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

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	97.81	22.3 QP	43.5	-21.2	1.00 H	283	35.9	-13.6
2	243.34	31.0 QP	46.0	-15.0	1.00 H	125	40.6	-9.6
3	355.89	22.4 QP	46.0	-23.6	1.00 H	198	29.7	-7.3
4	536.34	24.3 QP	46.0	-21.7	1.00 H	329	28.7	-4.4
5	654.71	27.8 QP	46.0	-18.2	1.00 H	108	29.3	-1.5
6	893.38	31.4 QP	46.0	-14.6	1.00 H	9	28.1	3.3

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.
4. Margin value = Emission Level – Limit value

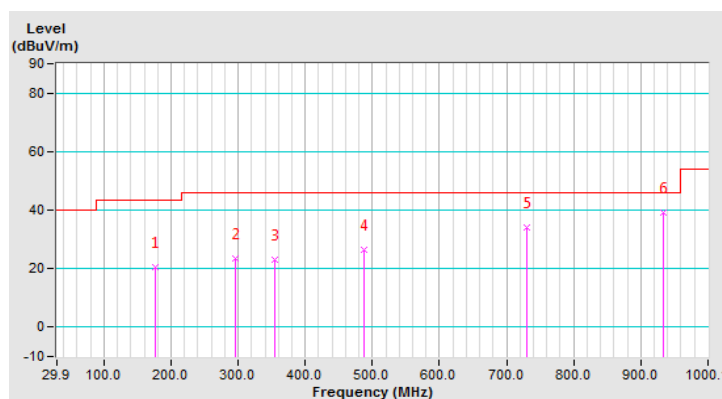


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 69% RH	Tested By	Noah Chang

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	177.37	20.7 QP	43.5	-22.8	1.50 V	193	30.7	-10.0
2	295.73	23.3 QP	46.0	-22.7	1.00 V	223	31.5	-8.2
3	353.95	23.1 QP	46.0	-22.9	1.50 V	285	30.4	-7.3
4	487.83	26.6 QP	46.0	-19.4	1.00 V	79	31.8	-5.2
5	730.38	34.2 QP	46.0	-11.8	1.00 V	21	33.8	0.4
6	934.13	39.3 QP	46.0	-6.7	1.00 V	102	35.4	3.9

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



Mode D

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	*13.56	46.8 QP	124.0 QP	-77.2	1.0	195	25.0	21.8

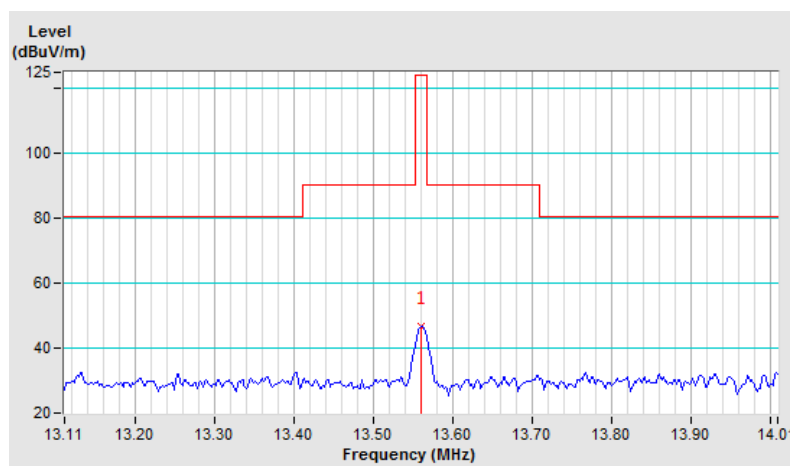
Remarks:

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.
4. Margin value = Emission Level – Limit value
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\mu\text{V/m} & 30\text{m} \\
 &= 84\text{dBuV/m} & 30\text{m} \\
 &= 84+20\log(3/30)^2 & 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	6.8 QP	84.0 QP	-77.2

Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	*13.56	43.6 QP	124.0 QP	-80.4	1.0	211	21.8	21.8

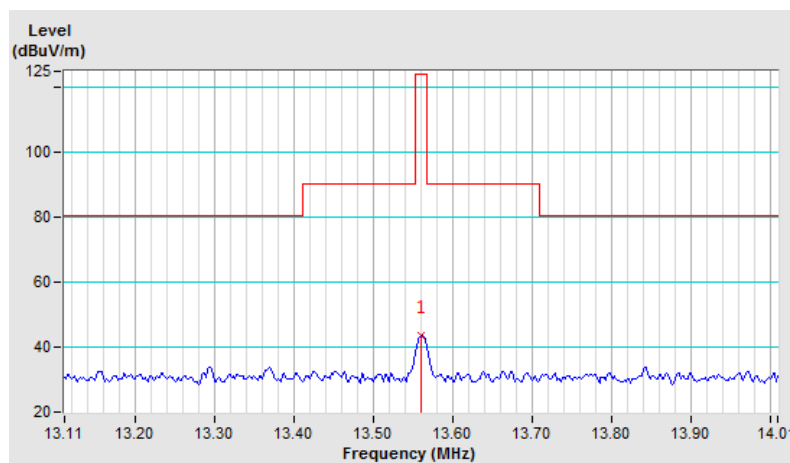
Remarks:

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.
4. Margin value = Emission Level – Limit value
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84 + 20\log(3/30)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	3.6 QP	84.0 QP	-80.4

Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	13.553 ~ 13.567MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	*13.56	57.6 QP	124.0	-66.4	1.0	107	35.8	21.8

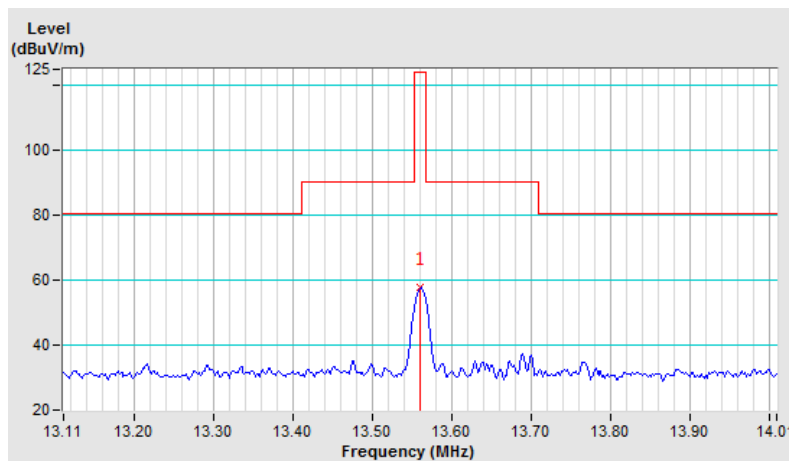
Remarks:

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.
4. Margin value = Emission Level – Limit value
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)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84 + 20\log(3/30)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*13.56	17.6 QP	84.0 QP	-66.4

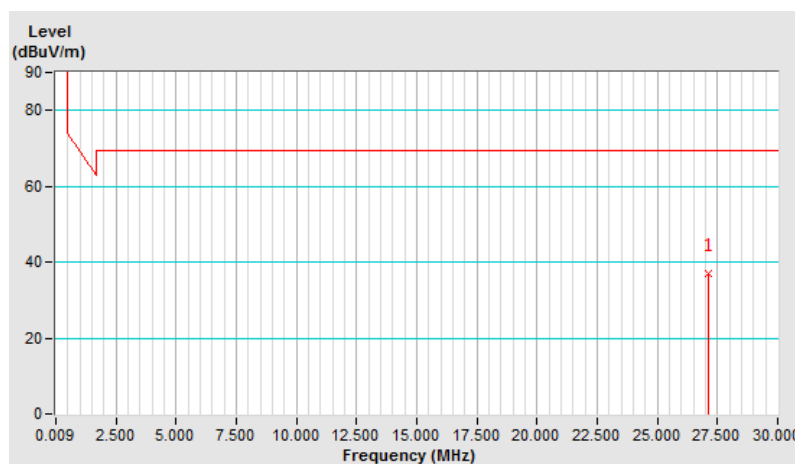
Remarks: Emission Level at 30m = Emission Level at 3m + 20log(3/30)²

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	27.12	36.90 QP	69.50 QP	-32.60	1.00	277	14.80	22.10

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-3.10 QP	29.50 QP	-32.60

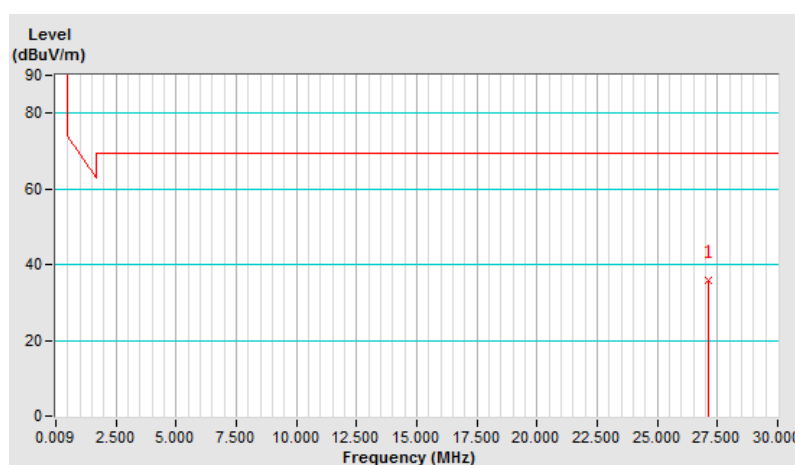
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	27.12	36.00 QP	69.50 QP	-33.50	1.00	300	13.90	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-4.00 QP	29.50 QP	-33.50

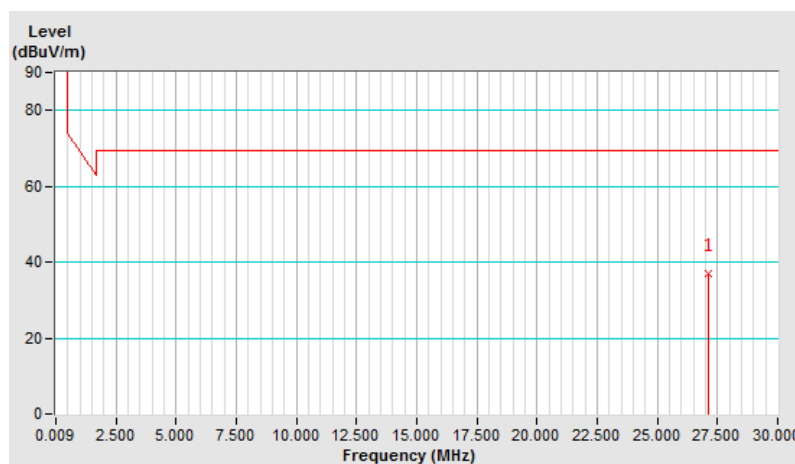
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	27.12	37.00 QP	69.50 QP	-32.50	1.00	108	14.90	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	27.12	-3.00 QP	29.50 QP	-32.50

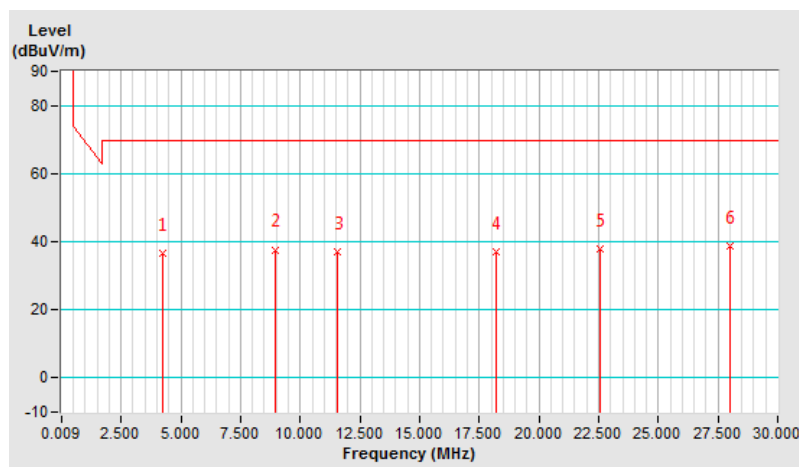
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Open 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	4.27	36.60 QP	69.50 QP	-32.90	1.00	33	16.40	20.20
2	8.95	37.70 QP	69.50 QP	-31.80	1.00	319	16.20	21.50
3	11.59	37.00 QP	69.50 QP	-32.50	1.00	159	15.20	21.80
4	18.18	36.90 QP	69.50 QP	-32.60	1.00	116	15.10	21.80
5	22.56	37.80 QP	69.50 QP	-31.70	1.00	244	15.90	21.90
6	28.02	38.60 QP	69.50 QP	-30.90	1.00	357	16.50	22.10

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



Antenna Polarity & Test Distance: Loop Antenna Open At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	4.27	-3.40 QP	29.50 QP	-32.90
2	8.95	-2.30 QP	29.50 QP	-31.80
3	11.59	-3.00 QP	29.50 QP	-32.50
4	18.18	-3.10 QP	29.50 QP	-32.60
5	22.56	-2.20 QP	29.50 QP	-31.70
6	28.02	-1.40 QP	29.50 QP	-30.90

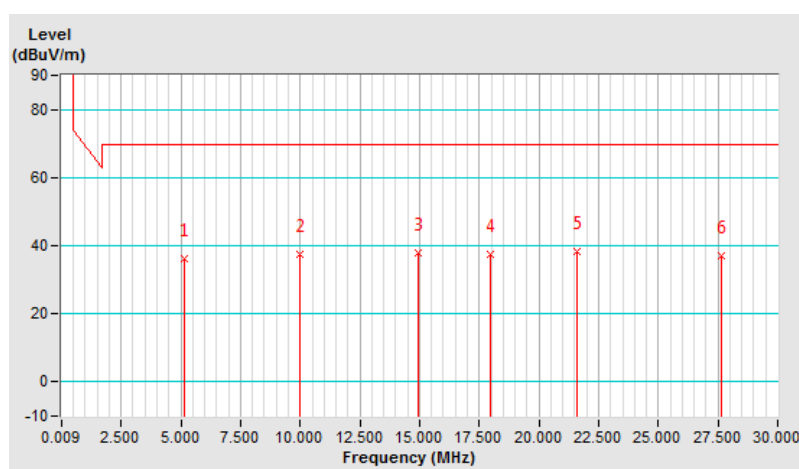
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Close 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	5.17	36.30 QP	69.50 QP	-33.20	1.00	297	15.70	20.60
2	9.97	37.60 QP	69.50 QP	-31.90	1.00	73	15.80	21.80
3	14.94	37.90 QP	69.50 QP	-31.60	1.00	122	16.10	21.80
4	17.94	37.50 QP	69.50 QP	-32.00	1.00	344	15.70	21.80
5	21.60	38.20 QP	69.50 QP	-31.30	1.00	145	16.30	21.90
6	27.66	37.20 QP	69.50 QP	-32.30	1.00	2	15.10	22.10

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



Antenna Polarity & Test Distance: Loop Antenna Close At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5.17	-3.70 QP	29.50 QP	-33.20
2	9.97	-2.40 QP	29.50 QP	-31.90
3	14.94	-2.10 QP	29.50 QP	-31.60
4	17.94	-2.50 QP	29.50 QP	-32.00
5	21.60	-1.80 QP	29.50 QP	-31.30
6	27.66	-2.80 QP	29.50 QP	-32.30

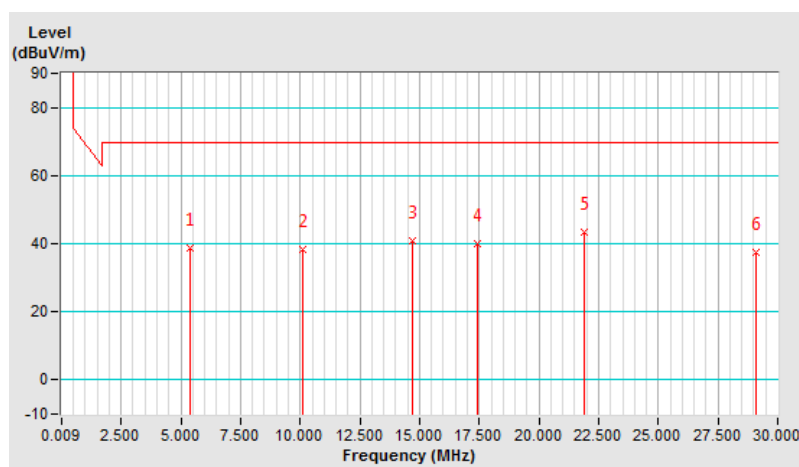
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 30MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel 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	5.41	38.90 QP	69.50 QP	-30.60	1.00	60	18.30	20.60
2	10.09	38.10 QP	69.50 QP	-31.40	1.00	334	16.30	21.80
3	14.70	40.70 QP	69.50 QP	-28.80	1.00	168	18.90	21.80
4	17.40	40.10 QP	69.50 QP	-29.40	1.00	258	18.30	21.80
5	21.90	43.30 QP	69.50 QP	-26.20	1.00	351	21.40	21.90
6	29.10	37.40 QP	69.50 QP	-32.10	1.00	201	15.20	22.20

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



Antenna Polarity & Test Distance: Loop Antenna Ground-Parallel At 30m				
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5.41	-1.10 QP	29.50 QP	-30.60
2	10.09	-1.90 QP	29.50 QP	-31.40
3	14.70	0.70 QP	29.50 QP	-28.80
4	17.40	0.10 QP	29.50 QP	-29.40
5	21.90	3.30 QP	29.50 QP	-26.20
6	29.10	-2.60 QP	29.50 QP	-32.10

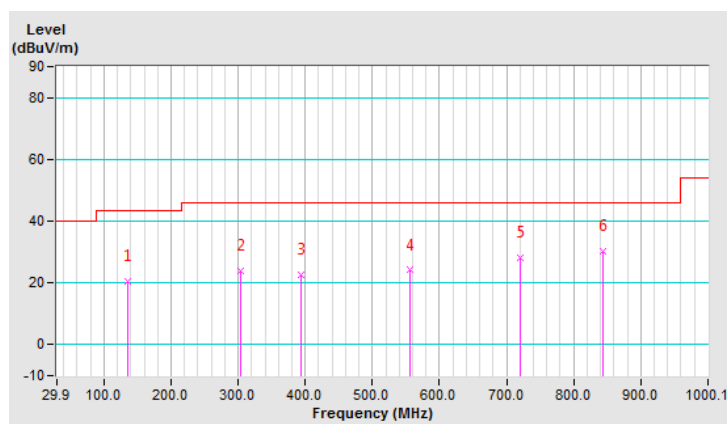
Remarks: Emission Level at 30m = Emission Level at 3m + $20\log(3/30)^2$

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

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	134.68	20.4 QP	43.5	-23.1	2.00 H	284	30.0	-9.6
2	303.50	23.8 QP	46.0	-22.2	1.00 H	136	31.7	-7.9
3	394.70	22.7 QP	46.0	-23.3	1.00 H	10	29.3	-6.6
4	555.75	24.1 QP	46.0	-21.9	1.00 H	157	28.2	-4.1
5	720.68	28.2 QP	46.0	-17.8	2.00 H	121	28.3	-0.1
6	842.93	30.3 QP	46.0	-15.7	1.00 H	247	27.8	2.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

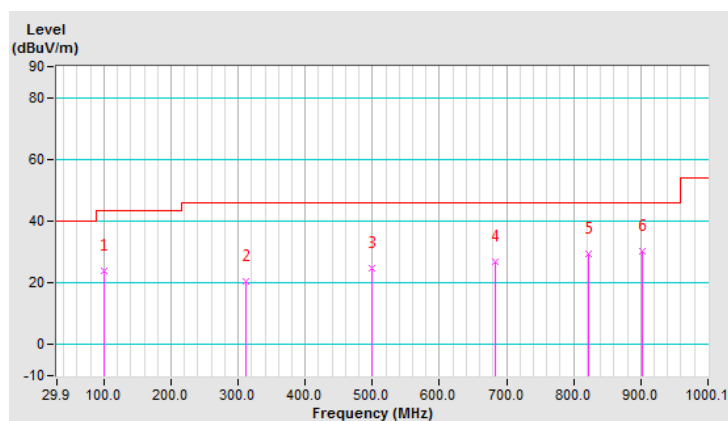


EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	Below 1000MHz
Input Power	120Vac, 60Hz	Detector Function	Quasi-Peak
Environmental Conditions	25 deg. C, 70% RH	Tested By	Noah Chang

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	99.75	24.0 QP	43.5	-19.5	1.50 V	72	37.3	-13.3
2	311.26	20.3 QP	46.0	-25.7	1.00 V	86	28.0	-7.7
3	499.48	24.9 QP	46.0	-21.1	1.00 V	58	29.8	-4.9
4	683.81	26.8 QP	46.0	-19.2	1.00 V	33	27.8	-0.9
5	821.58	29.6 QP	46.0	-16.4	1.00 V	272	27.5	2.2
6	903.08	30.4 QP	46.0	-15.7	1.00 V	41	26.8	3.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
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	ESCS30	100291	Sep. 03, 2018	Sep. 02, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
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.

3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

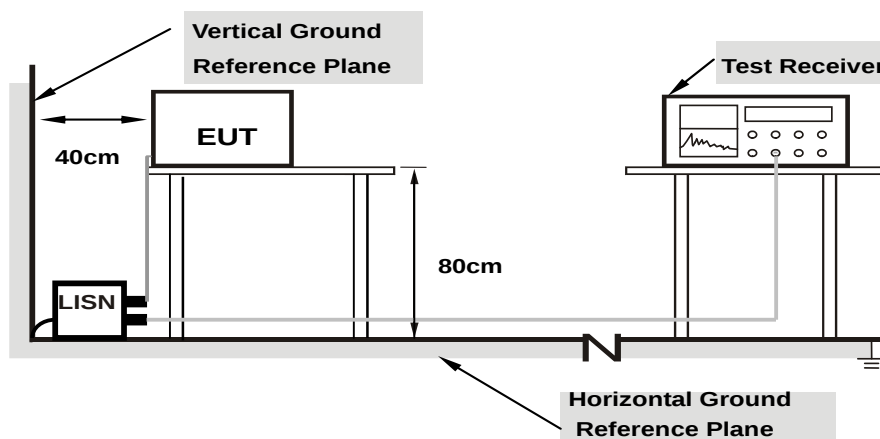
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

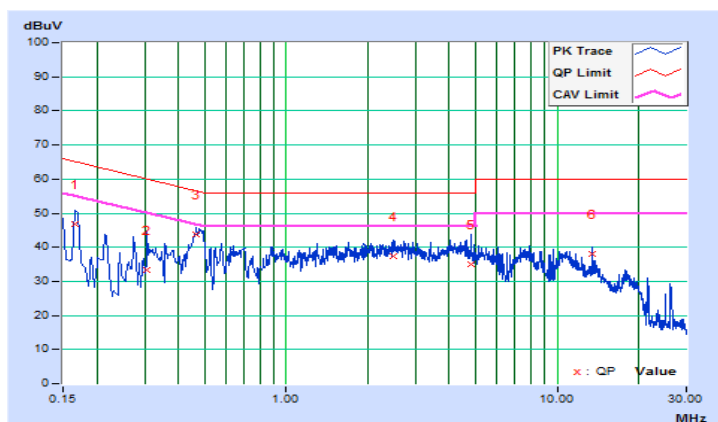
4.2.7 Test Results

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16623	9.67	37.22	23.51	46.89	33.18	65.15	55.15	-18.26	-21.97
2	0.30600	9.66	23.78	13.63	33.44	23.29	60.08	50.08	-26.64	-26.79
3	0.46444	9.66	34.02	23.93	43.68	33.59	56.61	46.61	-12.93	-13.02
4	2.47400	9.69	27.63	21.89	37.32	31.58	56.00	46.00	-18.68	-14.42
5	4.82200	9.75	25.16	19.23	34.91	28.98	56.00	46.00	-21.09	-17.02
6	13.55800	9.87	28.13	25.53	38.00	35.40	60.00	50.00	-22.00	-14.60

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.

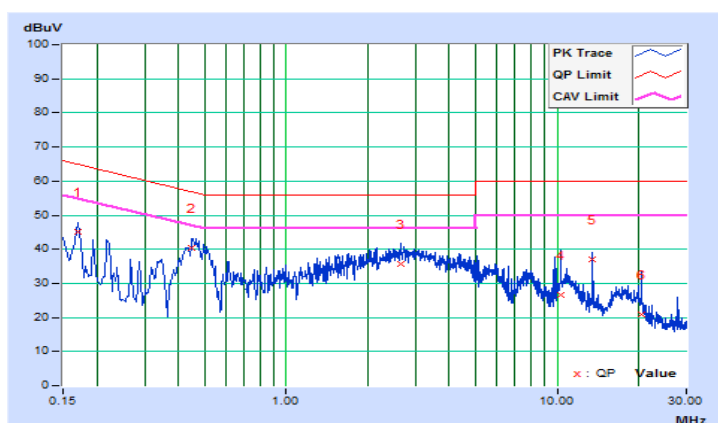


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17000	9.68	35.40	19.74	45.08	29.42	64.96	54.96	-19.88	-25.54
2	0.44881	9.67	30.78	19.79	40.45	29.46	56.90	46.90	-16.45	-17.44
3	2.66600	9.70	26.03	20.51	35.73	30.21	56.00	46.00	-20.27	-15.79
4	10.29000	9.86	16.71	10.91	26.57	20.77	60.00	50.00	-33.43	-29.23
5	13.55800	9.92	27.25	25.87	37.17	35.79	60.00	50.00	-22.83	-14.21
6	20.56600	10.01	10.76	5.42	20.77	15.43	60.00	50.00	-39.23	-34.57

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.

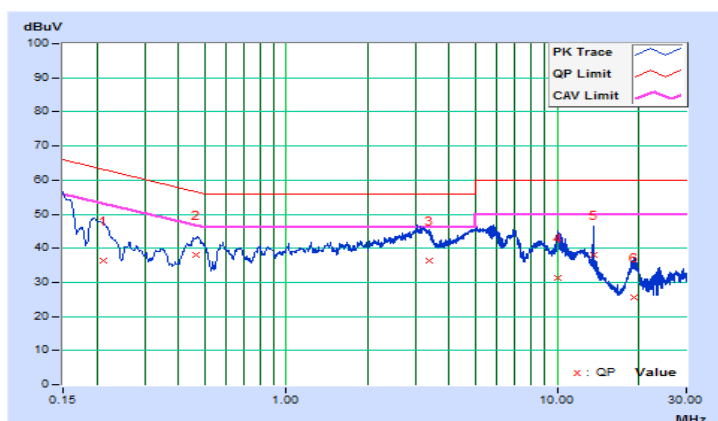


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.21075	10.06	26.40	7.12	36.46	17.18	63.18	53.18	-26.72	-36.00
2	0.46271	10.06	27.94	17.02	38.00	27.08	56.64	46.64	-18.64	-19.56
3	3.39000	10.13	26.17	19.18	36.30	29.31	56.00	46.00	-19.70	-16.69
4	10.02975	10.29	20.98	14.13	31.27	24.42	60.00	50.00	-28.73	-25.58
5	13.56000	10.38	27.59	21.43	37.97	31.81	60.00	50.00	-22.03	-18.19
6	19.23000	10.50	15.14	9.58	25.64	20.08	60.00	50.00	-34.36	-29.92

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.

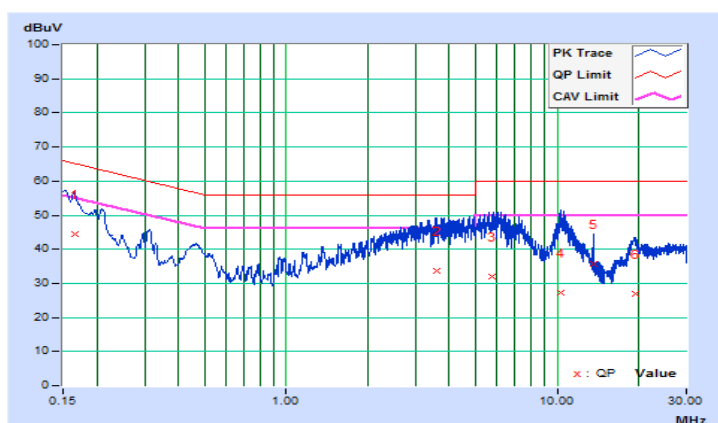


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16567	10.06	34.53	14.24	44.59	24.30	65.17	55.17	-20.58	-30.87
2	3.59475	10.15	23.44	17.31	33.59	27.46	56.00	46.00	-22.41	-18.54
3	5.76600	10.23	21.59	9.36	31.82	19.59	60.00	50.00	-28.18	-30.41
4	10.36050	10.37	17.03	10.50	27.40	20.87	60.00	50.00	-32.60	-29.13
5	13.56000	10.48	25.33	18.20	35.81	28.68	60.00	50.00	-24.19	-21.32
6	19.45950	10.65	16.44	11.03	27.09	21.68	60.00	50.00	-32.91	-28.32

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.

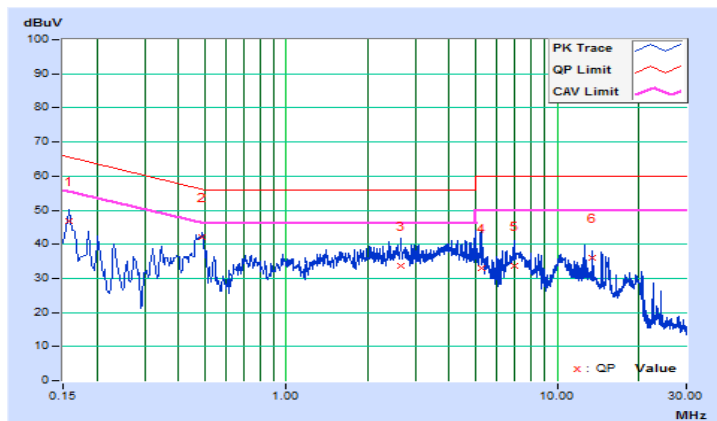


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15811	9.67	37.27	26.94	46.94	36.61	65.56	55.56	-18.62	-18.95
2	0.48829	9.66	32.34	24.55	42.00	34.21	56.20	46.20	-14.20	-11.99
3	2.65696	9.70	23.98	18.67	33.68	28.37	56.00	46.00	-22.32	-17.63
4	5.28600	9.76	23.20	17.19	32.96	26.95	60.00	50.00	-27.04	-23.05
5	6.92600	9.79	23.97	18.93	33.76	28.72	60.00	50.00	-26.24	-21.28
6	13.55800	9.87	26.26	24.83	36.13	34.70	60.00	50.00	-23.87	-15.30

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.

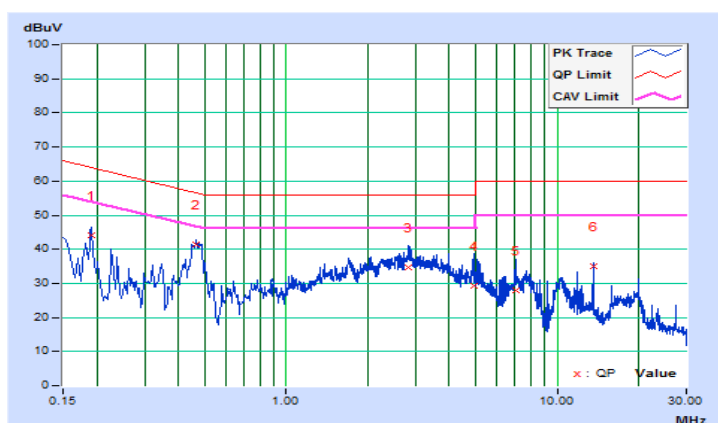


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19000	9.67	34.39	23.06	44.06	32.73	64.04	54.04	-19.98	-21.31
2	0.46567	9.67	31.91	24.87	41.58	34.54	56.59	46.59	-15.01	-12.05
3	2.81800	9.70	25.04	19.93	34.74	29.63	56.00	46.00	-21.26	-16.37
4	4.93400	9.75	19.67	14.29	29.42	24.04	56.00	46.00	-26.58	-21.96
5	7.00600	9.80	18.04	13.07	27.84	22.87	60.00	50.00	-32.16	-27.13
6	13.56200	9.92	24.94	24.73	34.86	34.65	60.00	50.00	-25.14	-15.35

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.

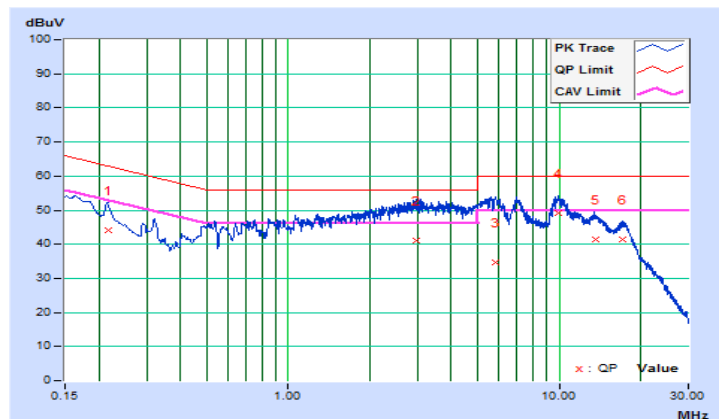


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.21573	10.06	34.15	19.22	44.21	29.28	62.98	52.98	-18.77	-23.70
2	2.95312	10.11	31.03	22.97	41.14	33.08	56.00	46.00	-14.86	-12.92
3	5.78850	10.19	24.46	17.04	34.65	27.23	60.00	50.00	-25.35	-22.77
4	9.96000	10.29	38.94	27.88	49.23	38.17	60.00	50.00	-10.77	-11.83
5	13.56000	10.38	30.91	26.11	41.29	36.49	60.00	50.00	-18.71	-13.51
6	17.20500	10.46	30.99	23.21	41.45	33.67	60.00	50.00	-18.55	-16.33

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.

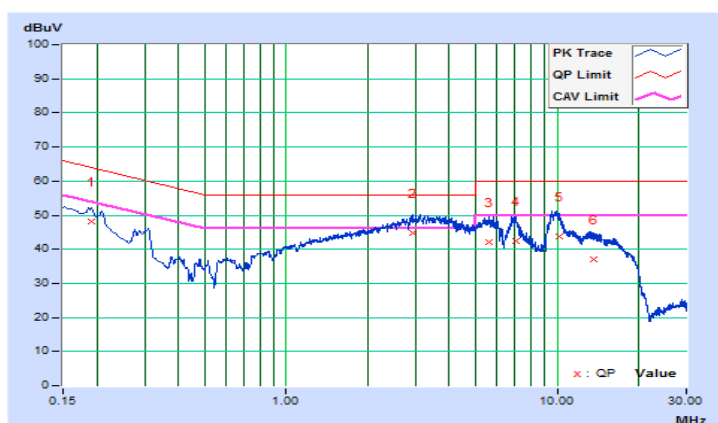


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19056	10.07	38.19	22.58	48.26	32.65	64.01	54.01	-15.75	-21.36
2	2.91750	10.13	34.76	22.59	44.89	32.72	56.00	46.00	-11.11	-13.28
3	5.62200	10.22	31.97	18.81	42.19	29.03	60.00	50.00	-17.81	-20.97
4	7.02600	10.27	32.30	20.22	42.57	30.49	60.00	50.00	-17.43	-19.51
5	10.16025	10.37	33.45	20.67	43.82	31.04	60.00	50.00	-16.18	-18.96
6	13.56000	10.48	26.48	17.72	36.96	28.20	60.00	50.00	-23.04	-21.80

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.

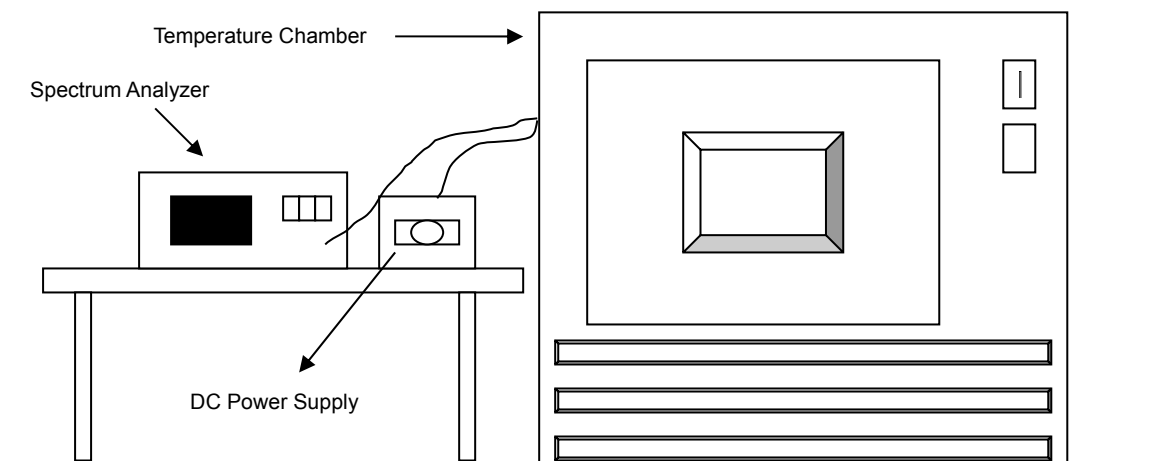


4.3 Frequency Stability

4.3.1 Limits of Frequency Stability Measurement

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ 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	100039	Jun. 11, 2018	Jun. 10, 2019
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 04, 2018	Jun. 03, 2019
Digital Multimeter Fluke	87-III	70360742	Jun. 29, 2018	Jun. 28, 2019
AC Power Supply Extech	CFW-105	E000603	NA	NA

4.3.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turned the EUT on and coupled its output to a spectrum analyzer.
- Turned the EUT off and set the chamber to the highest temperature specified.
- 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.
- Repeated step 2 and 3 with the temperature chamber set to the lowest temperature.
- 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

Mode A

Frequency Stability Versus Temp.									
TEMP. (°C)	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	13.56004	0.00029	13.56005	0.00037	13.56005	0.00037	13.56004	0.00029
40	120	13.56002	0.00015	13.56002	0.00015	13.56003	0.00022	13.56003	0.00022
30	120	13.55997	-0.00022	13.55997	-0.00022	13.55997	-0.00022	13.55997	-0.00022
20	120	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022
10	120	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007
0	120	13.56003	0.00022	13.56003	0.00022	13.56002	0.00015	13.56003	0.00022
-10	120	13.55997	-0.00022	13.55997	-0.00022	13.55997	-0.00022	13.55998	-0.00015
-20	120	13.55997	-0.00022	13.55997	-0.00022	13.55997	-0.00022	13.55997	-0.00022

Frequency Stability Versus Voltage									
TEMP. (°C)	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	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022
	120	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022
	102	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022

Mode B

Frequency Stability Versus Temp.									
TEMP. (°C)	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	13.55995	-0.00037	13.55995	-0.00037	13.55994	-0.00044	13.55995	-0.00037
40	120	13.56001	0.00007	13.56001	0.00007	13.56002	0.00015	13.56002	0.00015
30	120	13.56004	0.00029	13.56005	0.00037	13.56005	0.00037	13.56004	0.00029
20	120	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007
10	120	13.56004	0.00029	13.56002	0.00015	13.56003	0.00022	13.56004	0.00029
0	120	13.56002	0.00015	13.56002	0.00015	13.56002	0.00015	13.56002	0.00015
-10	120	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029
-20	120	13.55997	-0.00022	13.55999	-0.00007	13.55998	-0.00015	13.55997	-0.00022

Frequency Stability Versus Voltage									
TEMP. (°C)	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	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007
	120	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007
	102	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007

Mode C

Frequency Stability Versus Temp.									
TEMP. (°C)	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	13.56004	0.00029	13.56005	0.00037	13.56005	0.00037	13.56005	0.00037
40	120	13.55995	-0.00037	13.55996	-0.00029	13.55994	-0.00044	13.55995	-0.00037
30	120	13.55995	-0.00037	13.55996	-0.00029	13.55996	-0.00029	13.55996	-0.00029
20	120	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015
10	120	13.56003	0.00022	13.56003	0.00022	13.56004	0.00029	13.56002	0.00015
0	120	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007
-10	120	13.56001	0.00007	13.56001	0.00007	13.56	0.00000	13.56001	0.00007
-20	120	13.55995	-0.00037	13.55994	-0.00044	13.55995	-0.00037	13.55995	-0.00037

Frequency Stability Versus Voltage									
TEMP. (°C)	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	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015
	120	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015
	102	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015

Mode D

Frequency Stability Versus Temp.									
TEMP. (°C)	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	13.56006	0.00044	13.56005	0.00037	13.56005	0.00037	13.56005	0.00037
40	120	13.55999	-0.00007	13.55998	-0.00015	13.55999	-0.00007	13.55999	-0.00007
30	120	13.55998	-0.00015	13.55997	-0.00022	13.55999	-0.00007	13.55998	-0.00015
20	120	13.56006	0.00044	13.56005	0.00037	13.56007	0.00052	13.56007	0.00052
10	120	13.55995	-0.00037	13.55994	-0.00044	13.55995	-0.00037	13.55994	-0.00044
0	120	13.56006	0.00044	13.56006	0.00044	13.56006	0.00044	13.56006	0.00044
-10	120	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022
-20	120	13.55999	-0.00007	13.55999	-0.00007	13.55999	-0.00007	13.55998	-0.00015

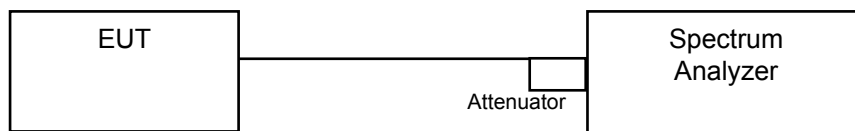
Frequency Stability Versus Voltage									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	138	13.56006	0.00044	13.56005	0.00037	13.56007	0.00052	13.56007	0.00052
	120	13.56006	0.00044	13.56005	0.00037	13.56007	0.00052	13.56007	0.00052
	102	13.56006	0.00044	13.56005	0.00037	13.56007	0.00052	13.56007	0.00052

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.

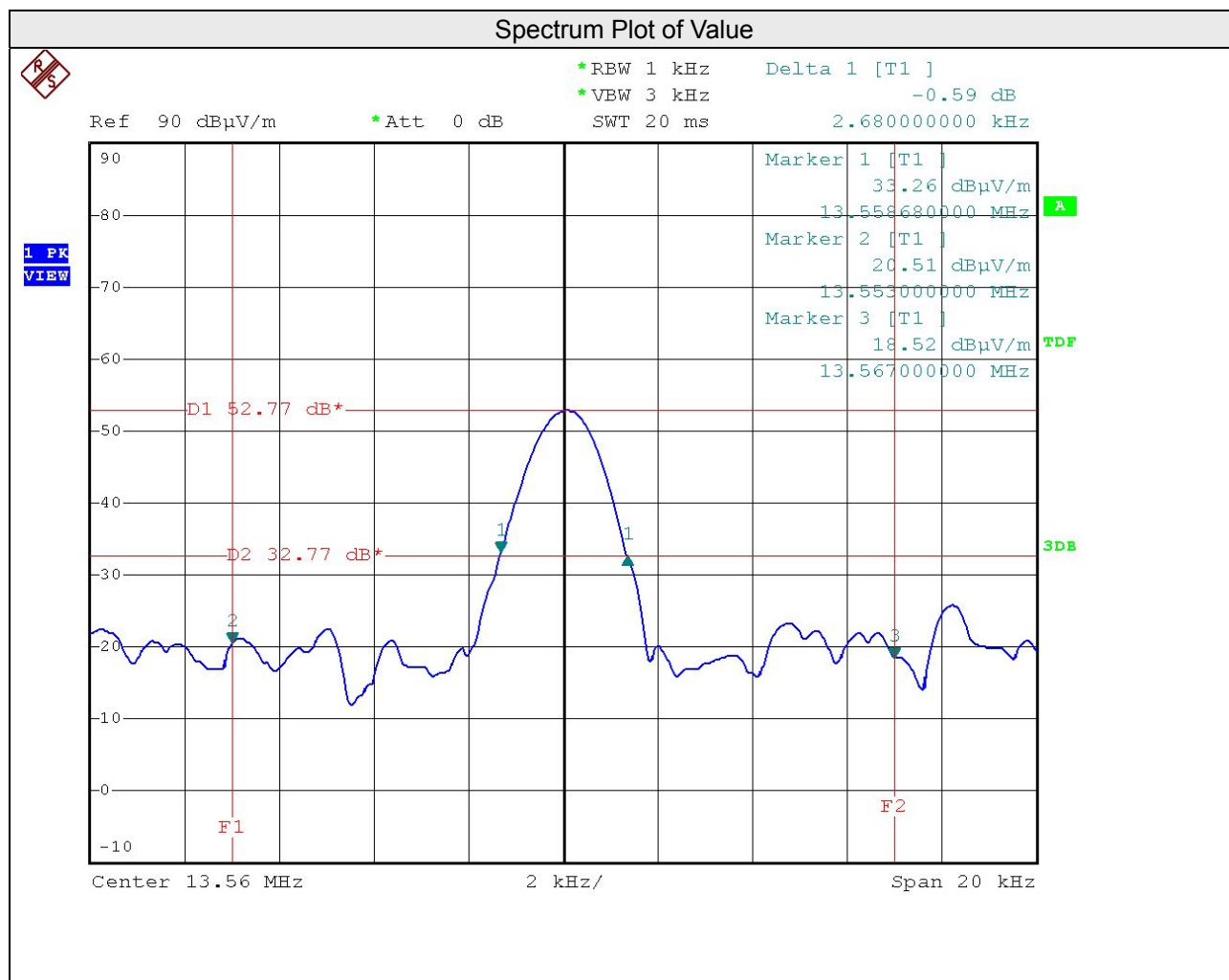
4.4.6 EUT Operating Conditions

Same as Item 4.1.6.

4.4.7 Test Results

Mode A

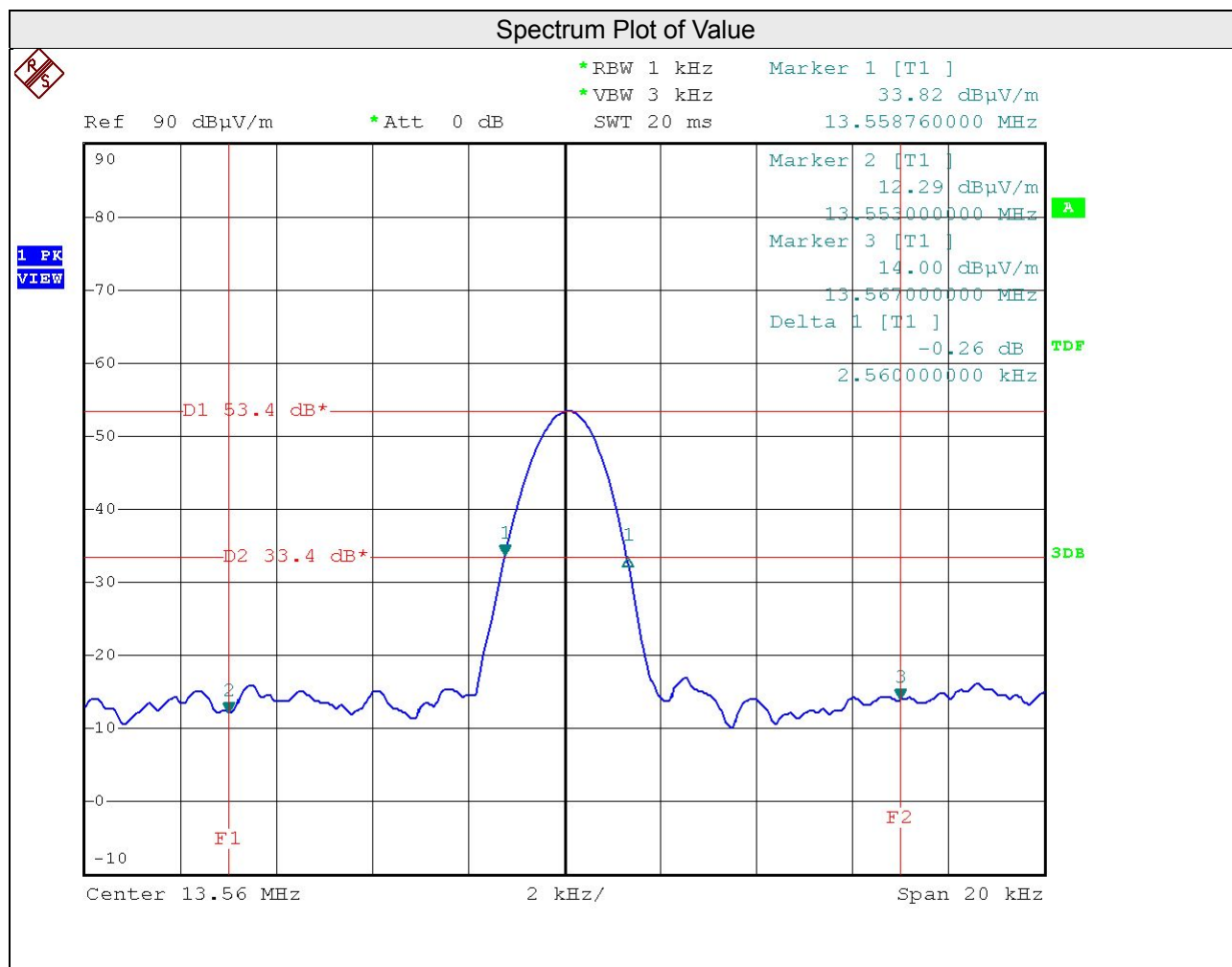
20dBc point (Low)	20dBc point (High)	Operating frequency band (MHz)	Pass / Fail
13.55868	13.56136	13.553~13.567	Pass



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

Mode B

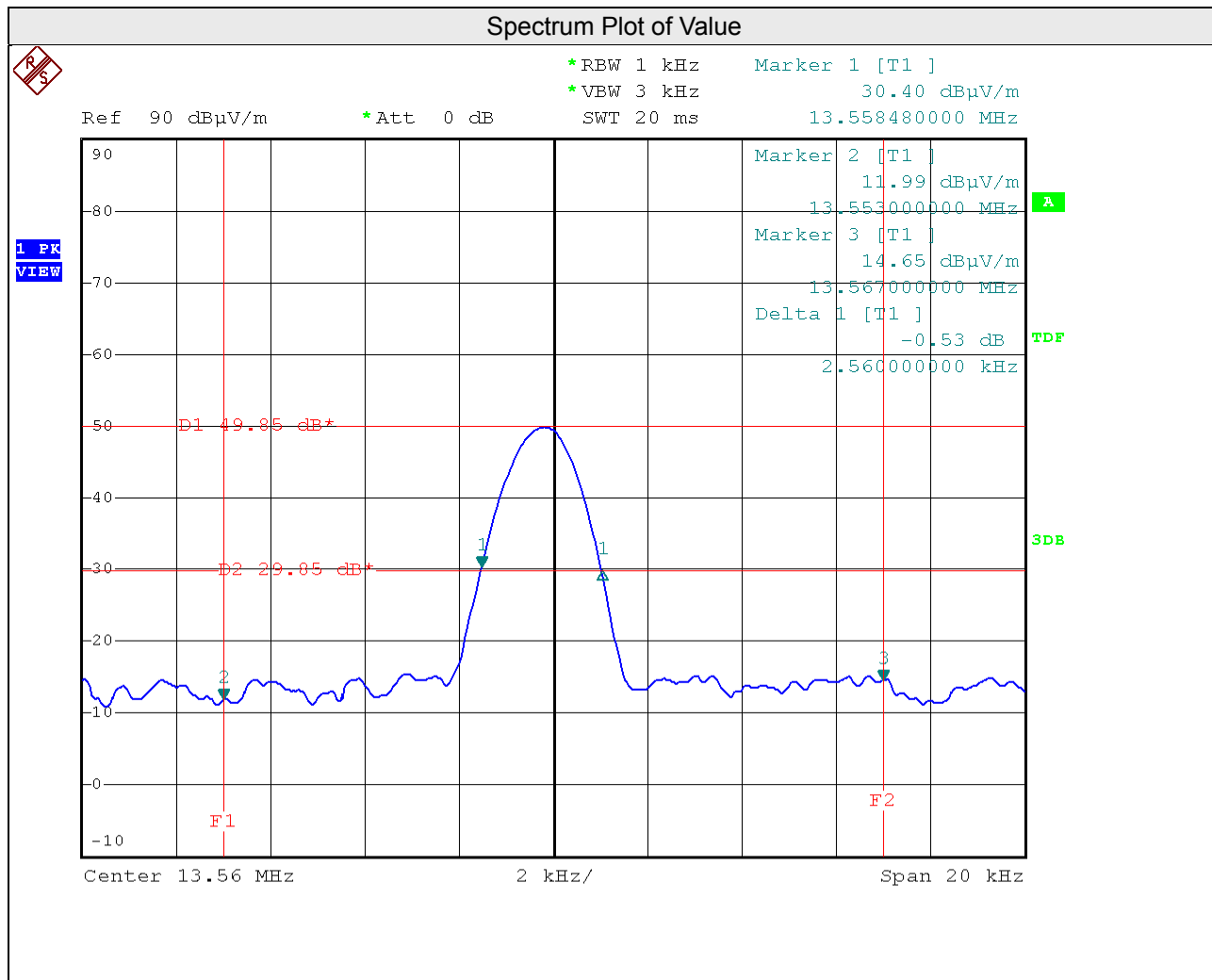
20dBc point (Low)	20dBc point (High)	Operating frequency band (MHz)	Pass / Fail
13.55876	13.56132	13.553~13.567	Pass



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

Mode C

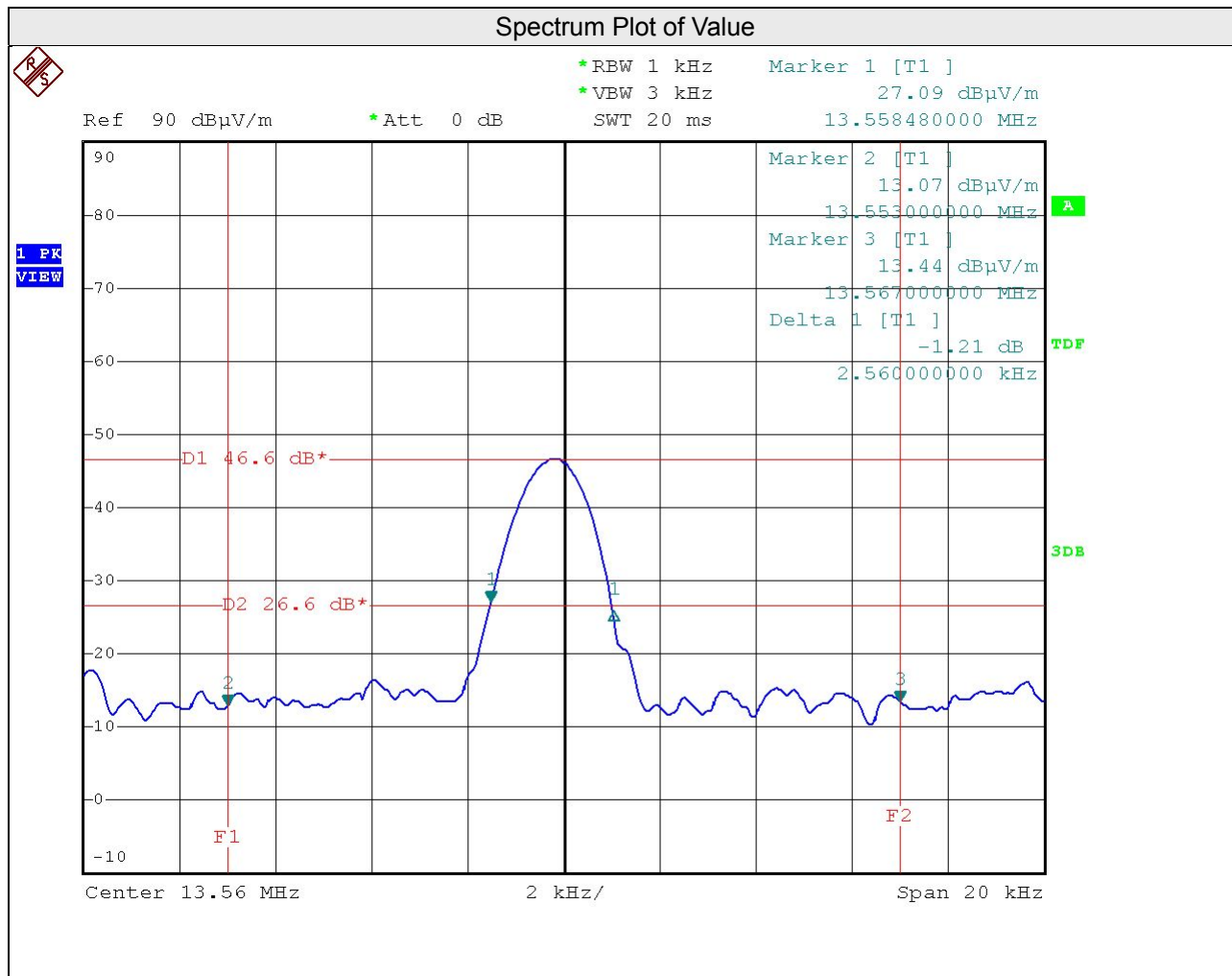
20dBc point (Low)	20dBc point (High)	Operating frequency band (MHz)	Pass / Fail
13.55848	13.56104	13.553~13.567	Pass



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

Mode D

20dBc point (Low)	20dBc point (High)	Operating frequency band (MHz)	Pass / Fail
13.55848	13.56104	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 on 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: www.bureauveritas-adt.com

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

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