

FCC Test Report

FCC ID : 2ABQNFSPWRP
Equipment : Wireless Charging Pad
Model No. : FSPW05-DTXN1
(please refer to item 1.1.1 for more detail)
Brand Name : FSP
(please refer to item 1.1.1 for more detail)
Applicant : FSP GROUP INC
Address : 22 JIANGUO E RD TAOYUAN CITY, 330
TAIWAN
Standard : 47 CFR FCC Part 15.209
Received Date : Jan. 16, 2014
Tested Date : Feb. 11 ~ Feb. 13, 2014

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR411603	Rev. 01	Initial issue	Mar. 04, 2014
FR411603	Rev. 02	Modified product name (page 1, 5).	Mar. 05, 2014

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.276MHz 42.05 (Margin 8.89dB) - AV	Pass
15.209	Radiated Emissions	[dBuV/m at 3m]: 35.82MHz 34.00 (Margin 6.00dB) - QP	Pass

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
FSP	FSPW05-DTXN1	Wireless Charging Pad	Marketing Purpose
Amacrox	AXW05-DTXN1	Wireless Charging Pad	

→ All models are electrically identical, different model names are for marketing purpose.
 → The above models, model **FSPW05-DTXN1** was selected as a representative one for the final test and only its data was recorded in this report.

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information	
Frequency Range (MHz)	Modulation
0.110 – 0.205	ASK

1.1.3 Antenna Details

Ant. No.	Type	Gain (dBi)	Connector	Remark
1	Coil antenna	-	---	---

1.1.4 EUT Operational Condition

Type of power supply	5Vdc from AC adapter
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1.1.5 Accessories

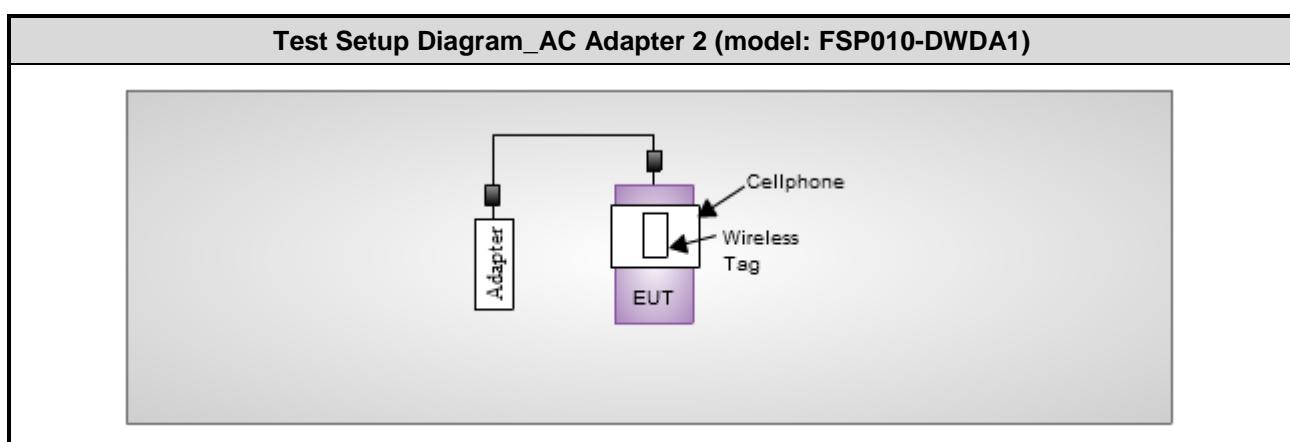
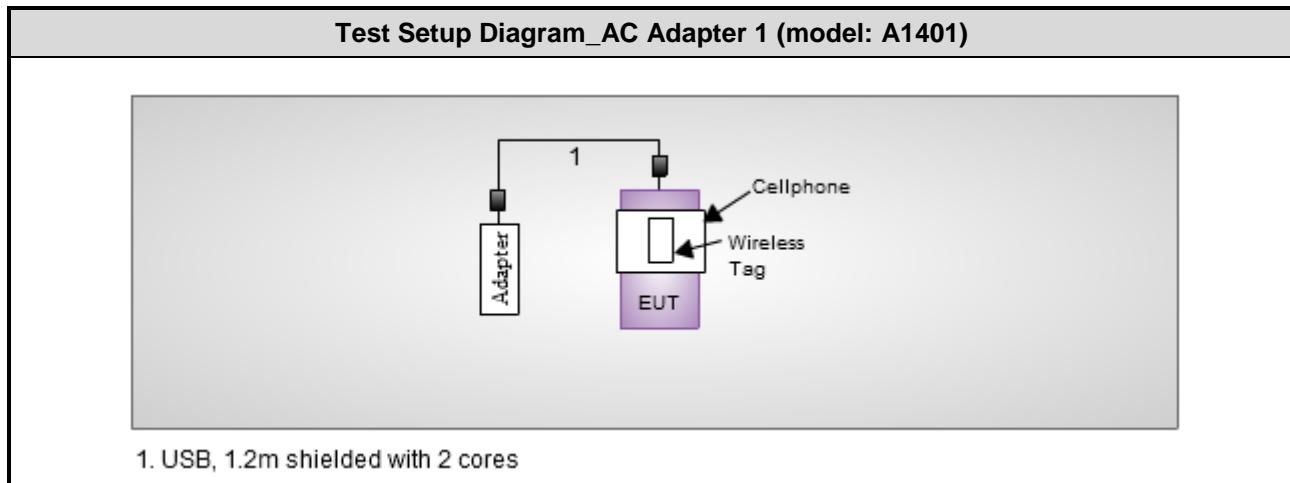
Accessories		
No.	Equipment	Description
1	USB Cable	1.2m shielded with 2 cores

1.2 Local Support Equipment List

Support Equipment List						
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)
1	Cellphone	SAMSUNG	GT-N7100	---	A3LGTN7100	---
2	Wireless Tag	pqi	PB-114	---	---	---
3	AC Adapter	Flextronics Sales & Marketing (A-P) Ltd.	A1401	---	---	---
4	AC Adapter	FSP GROUP INC.	FSP010-D WDA1	---	---	---

Note: No.3~4 were supplied by applicant.

1.3 Test Setup Chart



NOTE: Wireless tag is installed to cellphone to enable wireless charging function of cellphone.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
EMC Receiver	R&S	ESCS 30	100169	Oct. 15, 2013	Oct. 14, 2014
LISN	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-667	Nov. 23, 2013	Nov. 22, 2014
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-666	Dec. 04, 2013	Dec. 03, 2014
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Apr. 24, 2013	Apr. 23, 2014
50 ohm terminal (Support Unit)	NA	50	04	Apr. 22, 2013	Apr. 21, 2014

Note: Calibration Interval of instruments listed above is one year.

Test Item	Radiated Emission				
Test Site	966 chamber 2 / (03CH02-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101499	Feb. 08, 2014	Feb. 07, 2015
Receiver	R&S	ESR3	101657	Jan. 18, 2014	Jan. 17, 2015
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-524	Jan. 08, 2014	Jan. 07, 2015
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1095	Jan. 07, 2014	Jan. 06, 2015
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Dec. 27, 2013	Dec. 26, 2014
Preamplifier	Burgeon	BPA-530	100218	Dec. 09, 2013	Dec. 08, 2014
Preamplifier	Agilent	83017A	MY39501309	Dec. 09, 2013	Dec. 08, 2014
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16140/4	Dec. 17, 2013	Dec. 16, 2014
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Dec. 17, 2013	Dec. 16, 2014
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Dec. 17, 2013	Dec. 16, 2014
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-003	Dec. 17, 2013	Dec. 16, 2014
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-004	Dec. 17, 2013	Dec. 16, 2014

Note: Calibration Interval of instruments listed above is one year.

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Preamplifier	EM	EM18G40G	060572	Jun. 20, 2013	Jun. 19, 2014
Note: Calibration Interval of instruments listed above is two year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.209

ANSI C63.4-2003

Note: The EUT has been tested and complied with FCC part 15B requirement. FCC Part 15B test results are issued to another report.

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±35.286 Hz
Conducted power	±0.536 dB
Frequency error	±35.286 Hz
Temperature	±0.3 °C
Conducted emission	±2.946 dB
AC conducted emission	±2.43 dB
Radiated emission	±2.49 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 69%	Skys Huang
Radiated Emissions	03CH02-WS	18°C / 66%	Anderson Hong

➤ FCC site registration No.: 657002

➤ IC site registration No.: 10807A-2

2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test Configuration
AC Conducted Emissions	ASK	1, 2
Radiated Emissions	ASK	1, 2

NOTE: The EUT had been tested by following test configurations.

- 1) Configuration 1 : AC Adapter 1 (model: A1401)
- 2) Configuration 2 : AC Adapter 2 (model: FSP010-DWDA1)

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

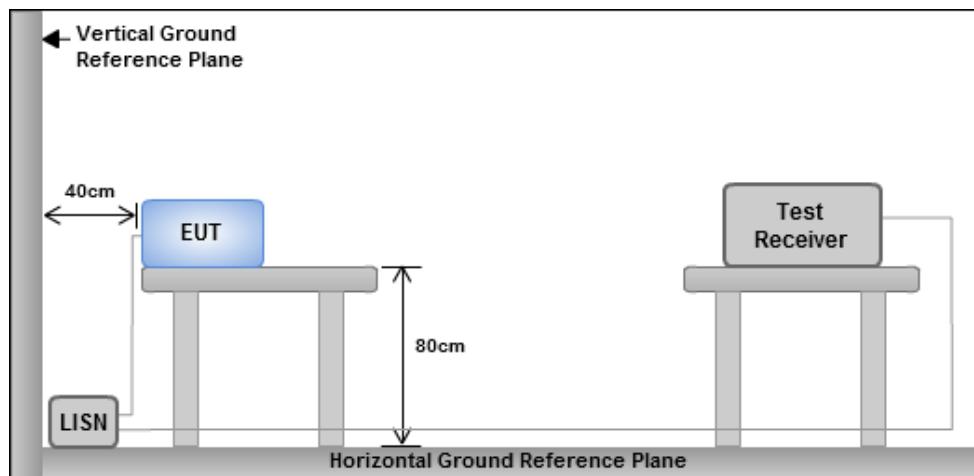
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.1.2 Test Procedures

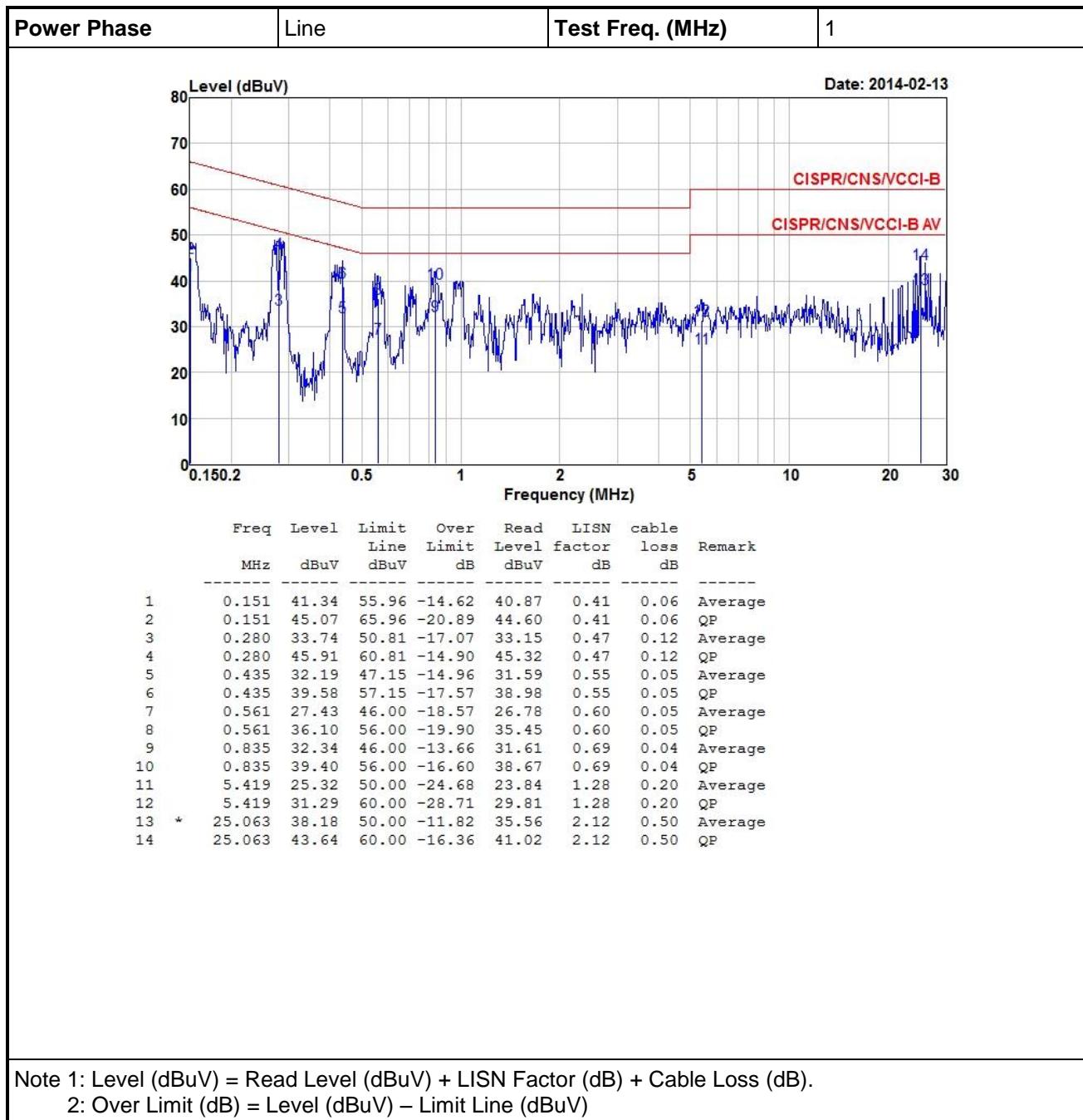
1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

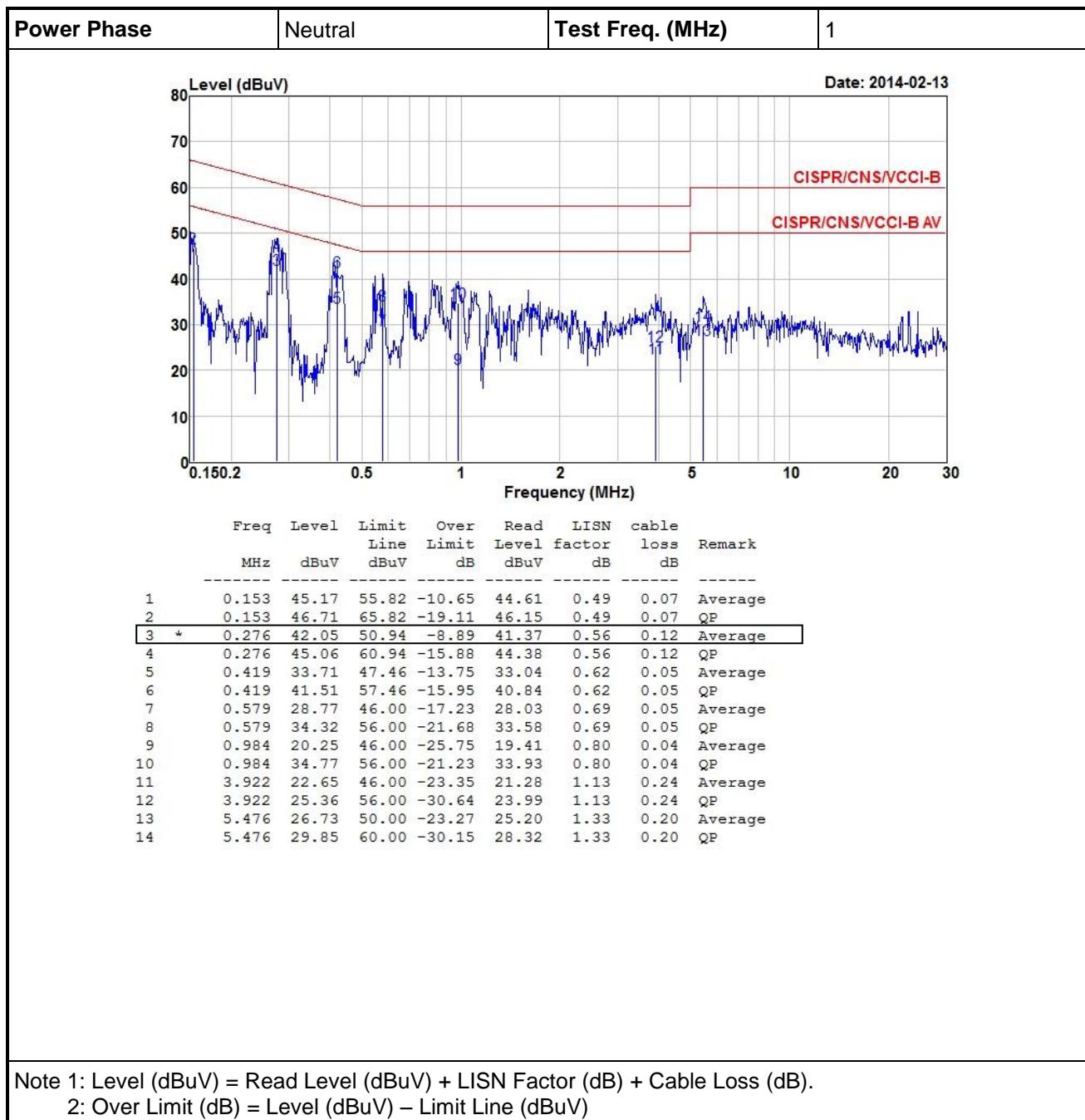
3.1.3 Test Setup



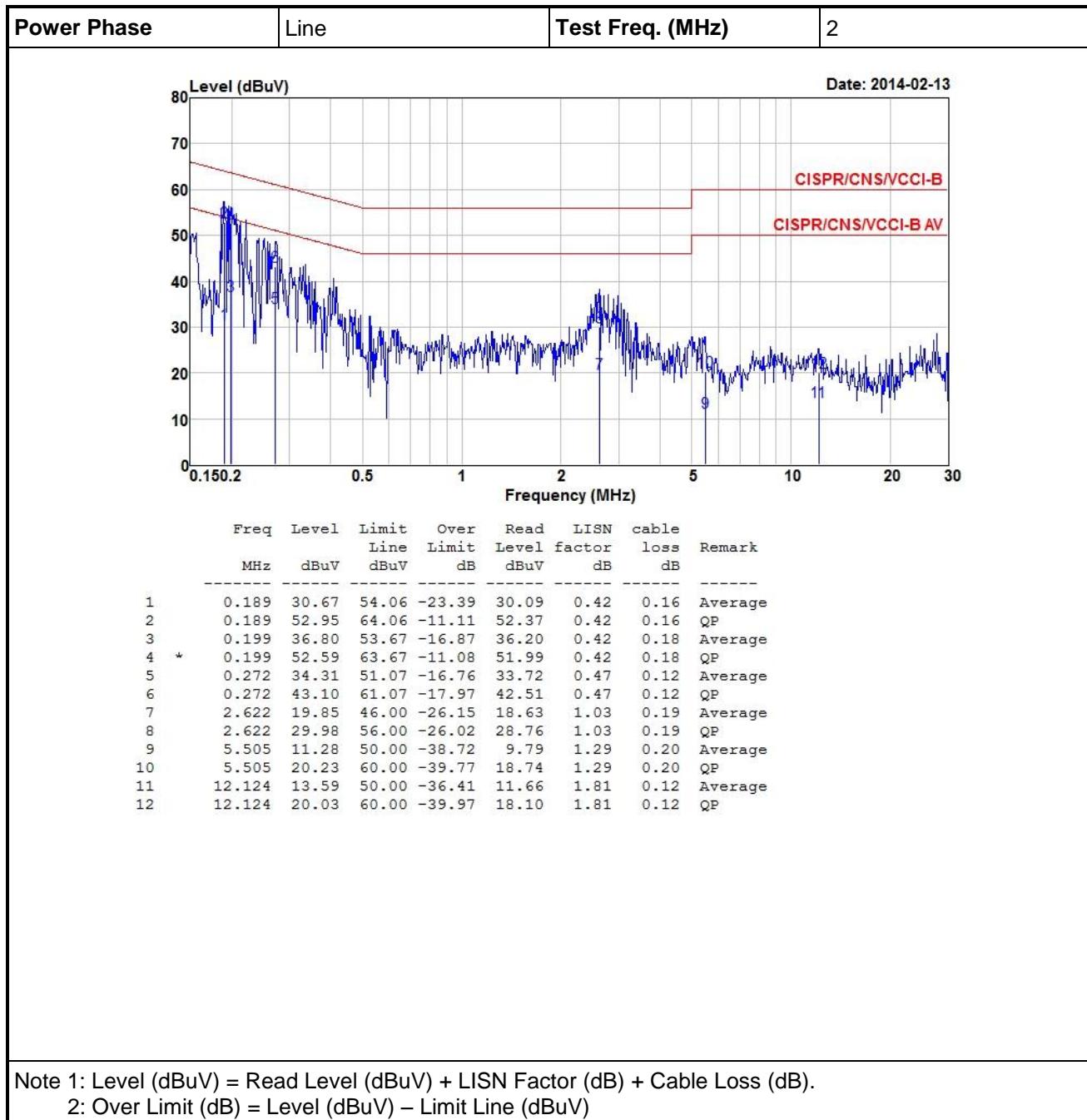
Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

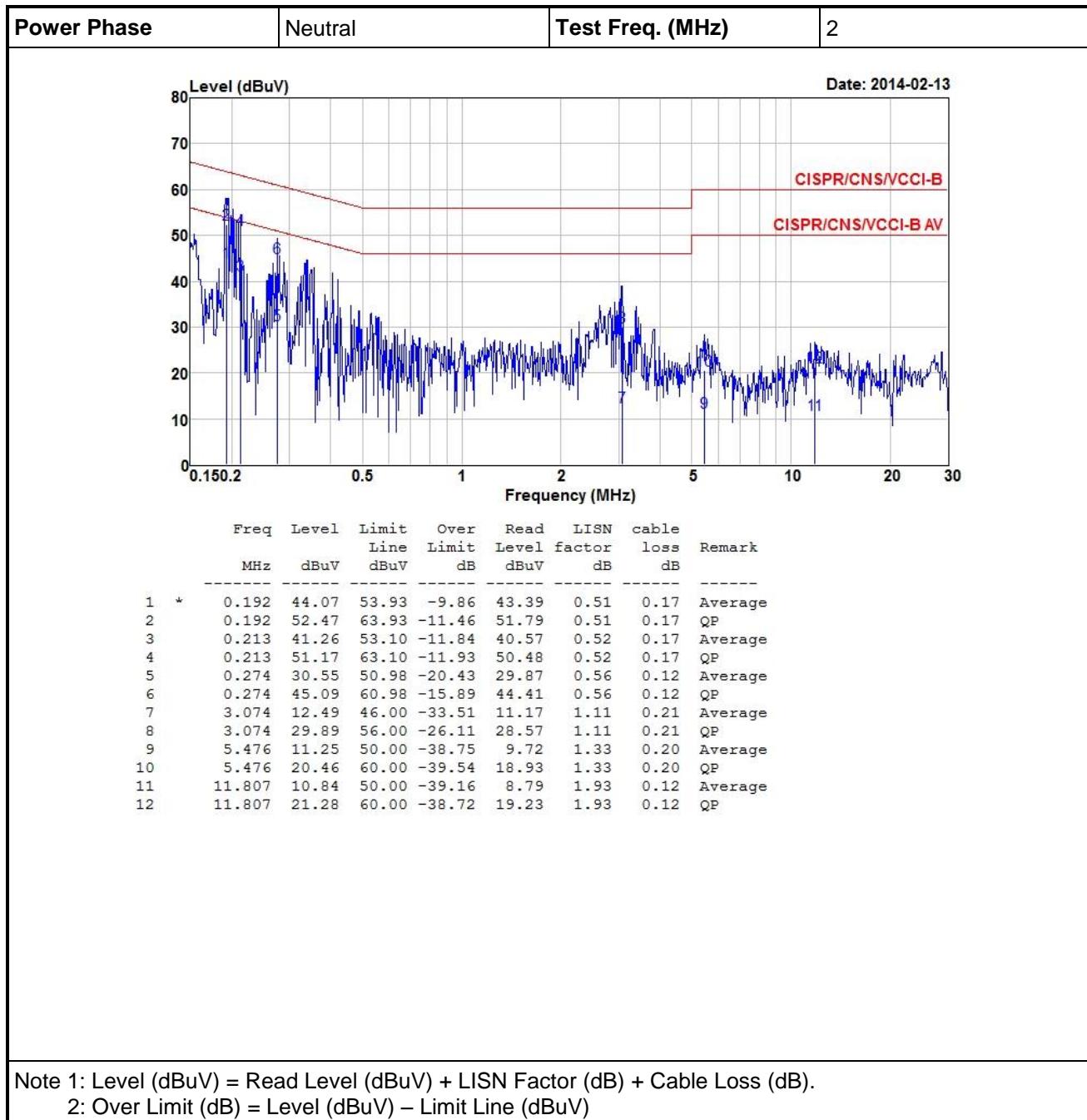
3.1.4 Test Result of Conducted Emissions





Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV)





3.2 Radiated Emissions

3.2.1 Limit of Radiated Emissions

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29.54	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Quasi-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.2.2 Test Procedures

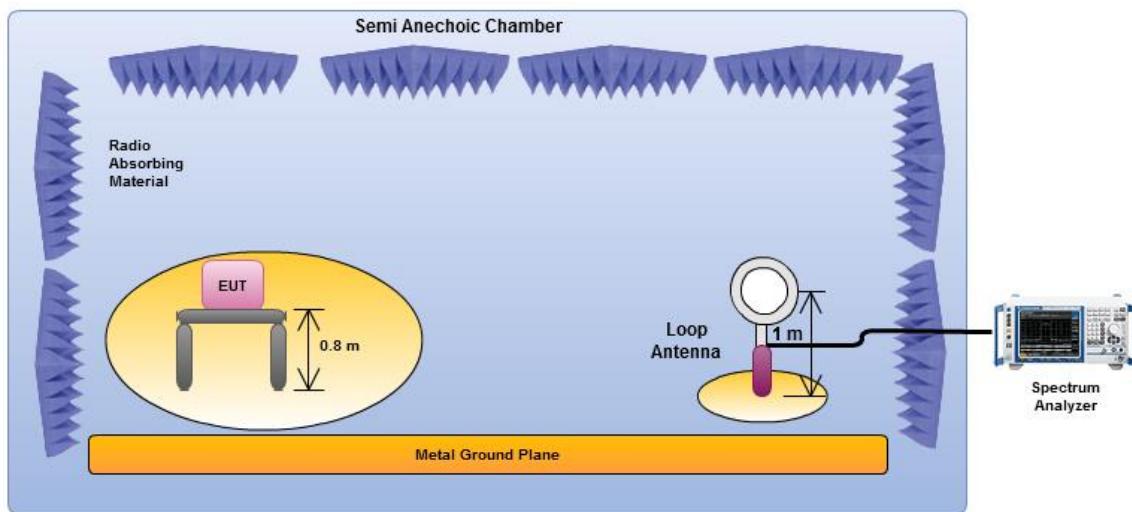
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.

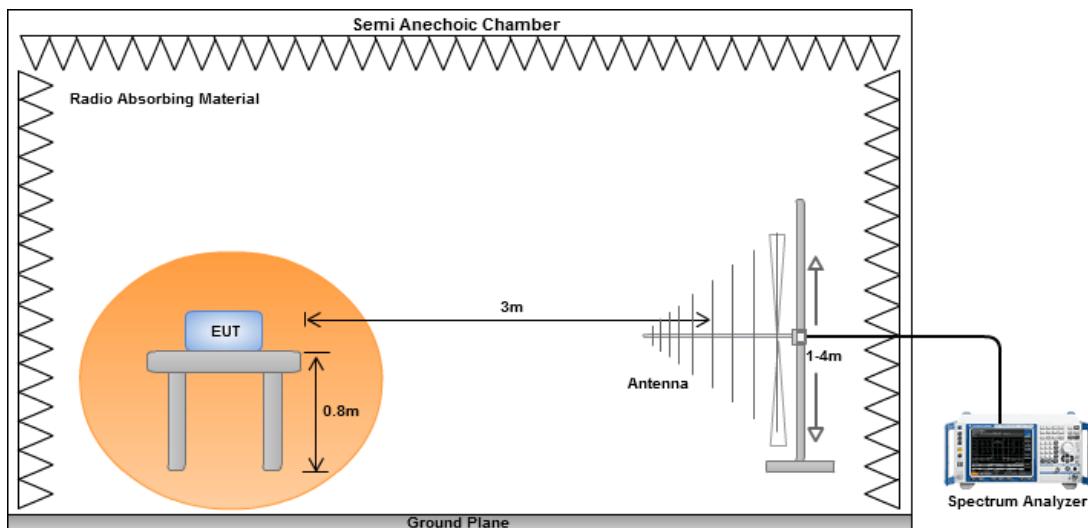
3.2.3 Test Setup

Radiated Emissions below 30MHz



Note: Test distance is 3m

Radiated Emissions below 1 GHz



3.2.4 Transmitter Radiated Unwanted Emissions (9kHz ~ 490kHz)

Polarization		Loop Open					
Mode		1					
	Frequency (MHz)	Level dBuV/m	Limit (dBuV/m)	Margin (dB)	Reading (dBuV/m)	Factor	Remark
1	0.157	74.80	103.69	-28.89	54.80	20.00	Average
2	0.157	76.70	123.69	-46.99	56.70	20.00	Peak
3	0.314	58.10	97.67	-39.57	38.17	19.93	Average
4	0.314	60.83	117.67	-56.84	40.90	19.93	Peak
5	0.471	37.70	94.14	-56.44	17.79	19.91	Average
6	0.471	55.00	114.14	-59.14	35.09	19.91	Peak

Polarization		Loop Close					
Mode		1					
	Frequency (MHz)	Level dBuV/m	Limit (dBuV/m)	Margin (dB)	Reading (dBuV/m)	Factor	Remark
1	0.157	66.00	103.69	-37.69	46.00	20.00	Average
2	0.157	70.30	123.69	-53.39	50.30	20.00	Peak
3	0.314	37.50	97.67	-60.17	17.57	19.93	Average
4	0.314	54.80	117.67	-62.87	34.87	19.93	Peak
5	0.471	35.50	94.14	-58.64	15.59	19.91	Average
6	0.471	51.40	114.14	-62.74	31.49	19.91	Peak

Polarization		Loop Open					
Mode		2					
	Frequency (MHz)	Level dBuV/m	Limit (dBuV/m)	Margin (dB)	Reading (dBuV/m)	Factor	Remark
1	0.157	76.70	103.69	-26.99	56.70	20.00	Average
2	0.157	77.80	123.69	-45.89	57.80	20.00	Peak
3	0.314	56.80	97.67	-40.87	36.87	19.93	Average
4	0.314	60.90	117.67	-56.77	40.97	19.93	Peak
5	0.471	44.20	94.14	-49.94	24.29	19.91	Average
6	0.471	58.90	114.14	-55.24	38.99	19.91	Peak

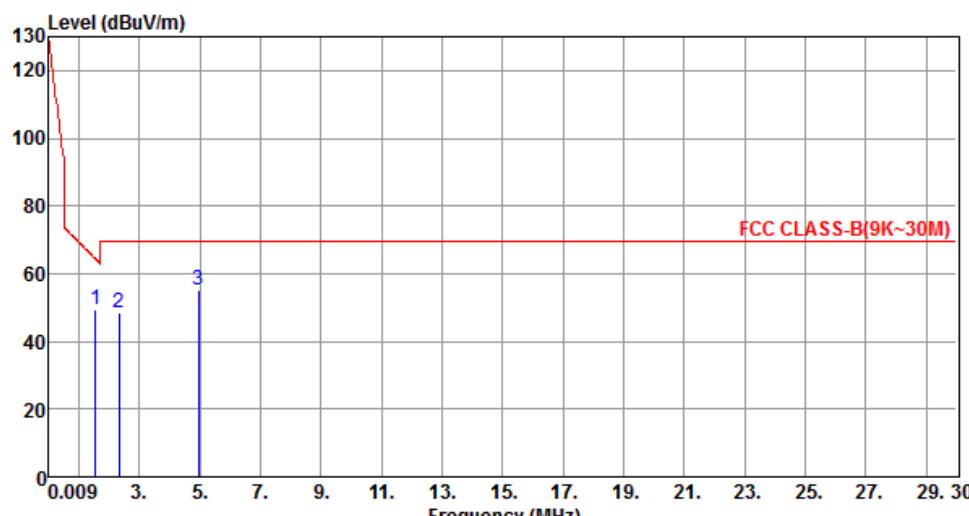
Polarization		Loop Close					
Mode		2					
	Frequency (MHz)	Level dBuV/m	Limit (dBuV/m)	Margin (dB)	Reading (dBuV/m)	Factor	Remark
1	0.157	67.20	103.69	-36.49	47.20	20.00	Average
2	0.157	70.50	123.69	-53.19	50.50	20.00	Peak
3	0.314	39.30	97.67	-58.37	19.37	19.93	Average
4	0.314	55.20	117.67	-62.47	35.27	19.93	Peak
5	0.471	38.30	94.14	-55.84	18.39	19.91	Average
6	0.471	52.90	114.14	-61.24	32.99	19.91	Peak

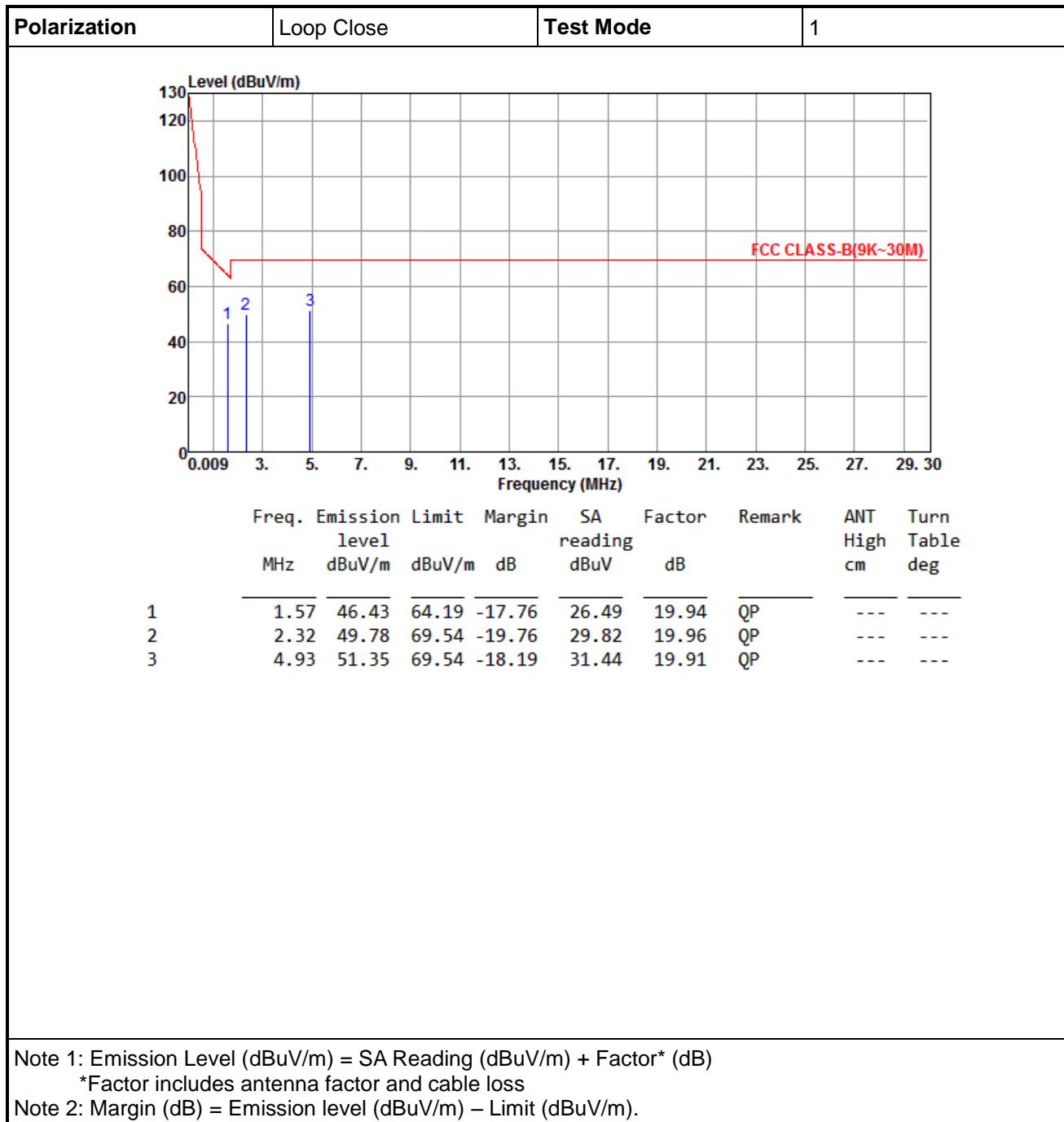
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

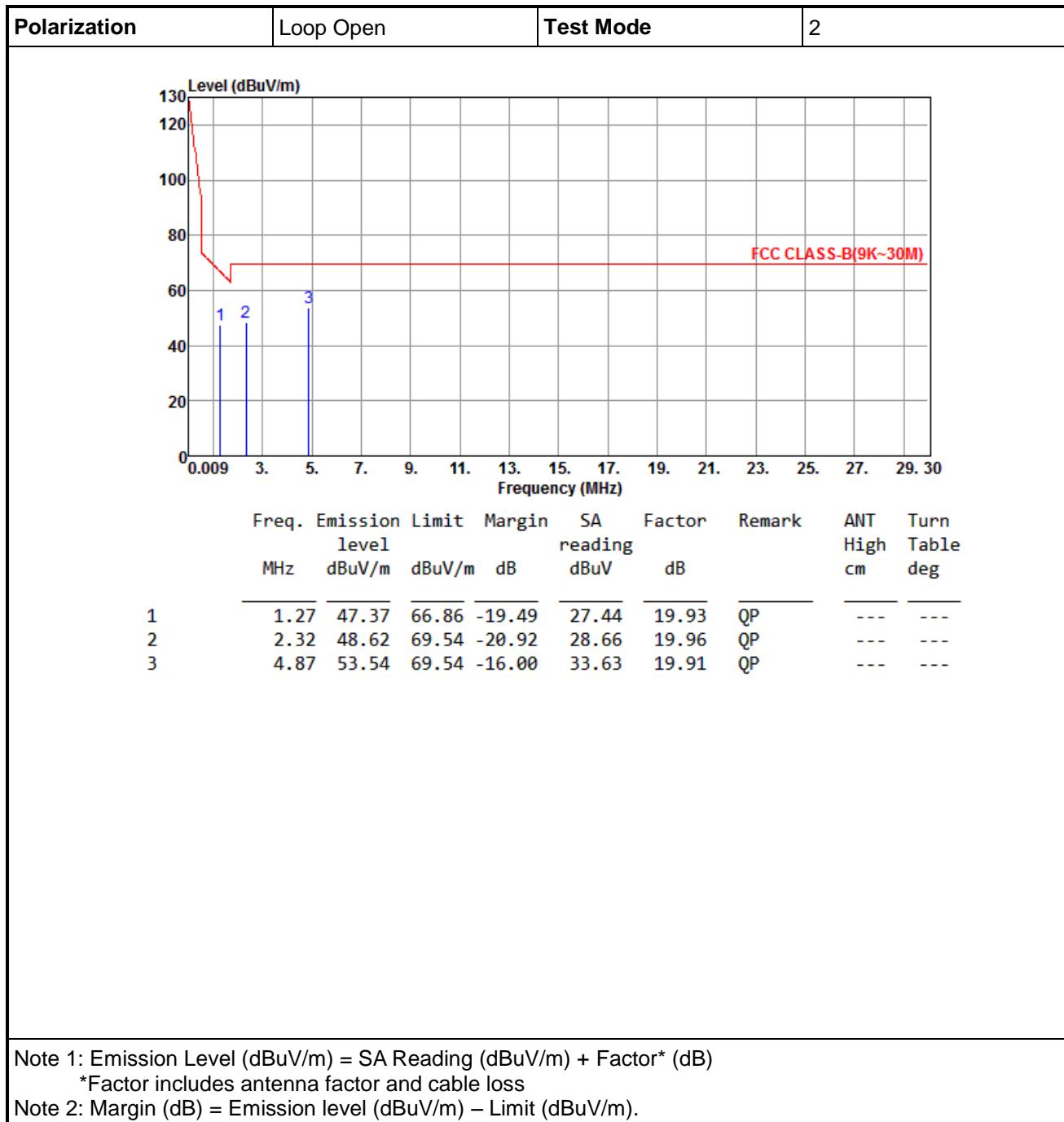
*Factor includes antenna factor and cable loss

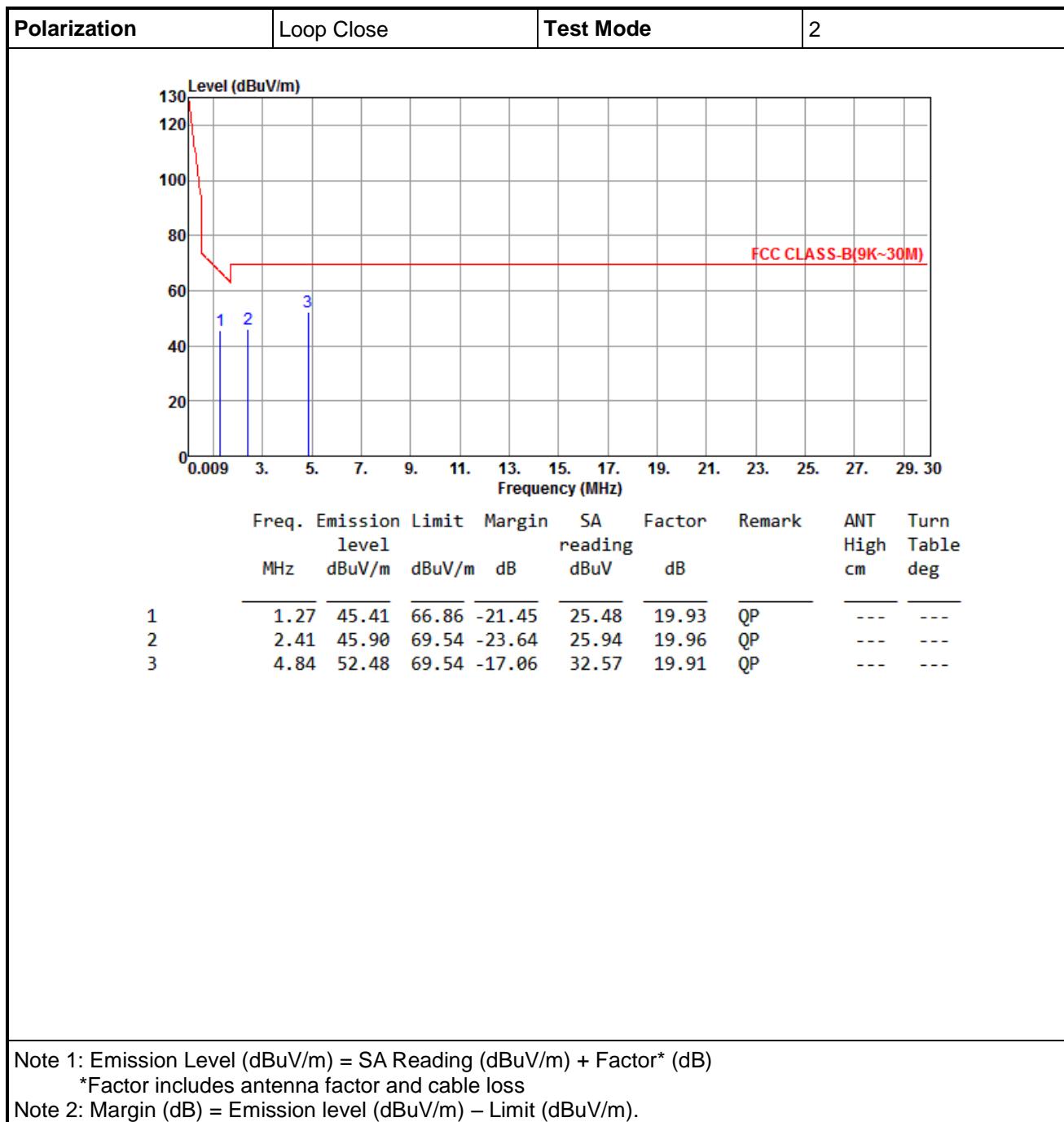
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.2.5 Transmitter Radiated Unwanted Emissions (490kHz~30MHz)

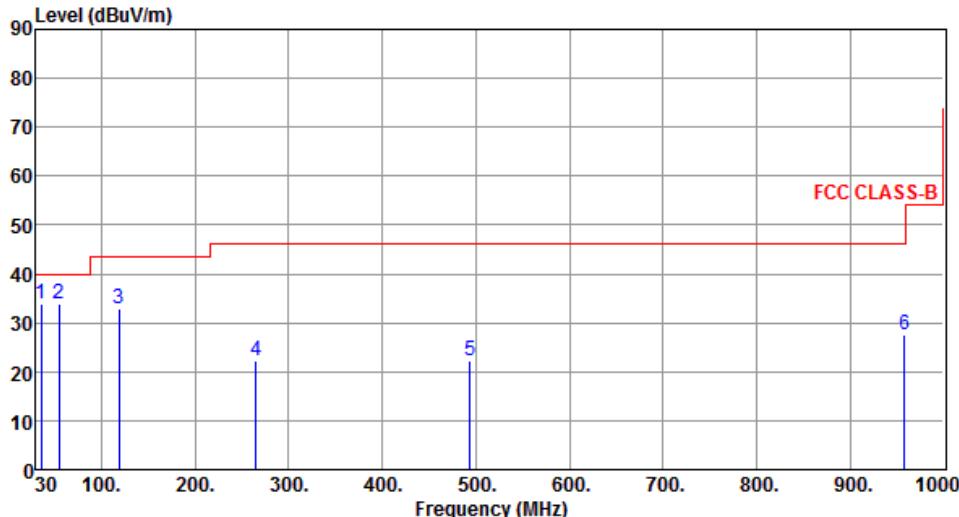
Polarization	Loop Open	Test Mode	1																																																			
																																																						
<table> <thead> <tr> <th>Freq.</th> <th>Emission Limit</th> <th>Margin</th> <th>SA</th> <th>Factor</th> <th>Remark</th> <th>ANT</th> <th>Turn</th> </tr> <tr> <th>level</th> <th>level</th> <th>Margin</th> <th>reading</th> <th></th> <th></th> <th>High</th> <th>Table</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB</th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.54</td> <td>49.24</td> <td>64.45</td> <td>-15.21</td> <td>29.30</td> <td>19.94</td> <td>QP</td> <td>---</td> </tr> <tr> <td>2</td> <td>2.32</td> <td>48.59</td> <td>69.54</td> <td>-20.95</td> <td>28.63</td> <td>19.96</td> <td>QP</td> <td>---</td> </tr> <tr> <td>3</td> <td>4.96</td> <td>55.16</td> <td>69.54</td> <td>-14.38</td> <td>35.26</td> <td>19.90</td> <td>QP</td> <td>---</td> </tr> </tbody> </table>				Freq.	Emission Limit	Margin	SA	Factor	Remark	ANT	Turn	level	level	Margin	reading			High	Table	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	cm	deg	1	1.54	49.24	64.45	-15.21	29.30	19.94	QP	---	2	2.32	48.59	69.54	-20.95	28.63	19.96	QP	---	3	4.96	55.16	69.54	-14.38	35.26	19.90	QP	---
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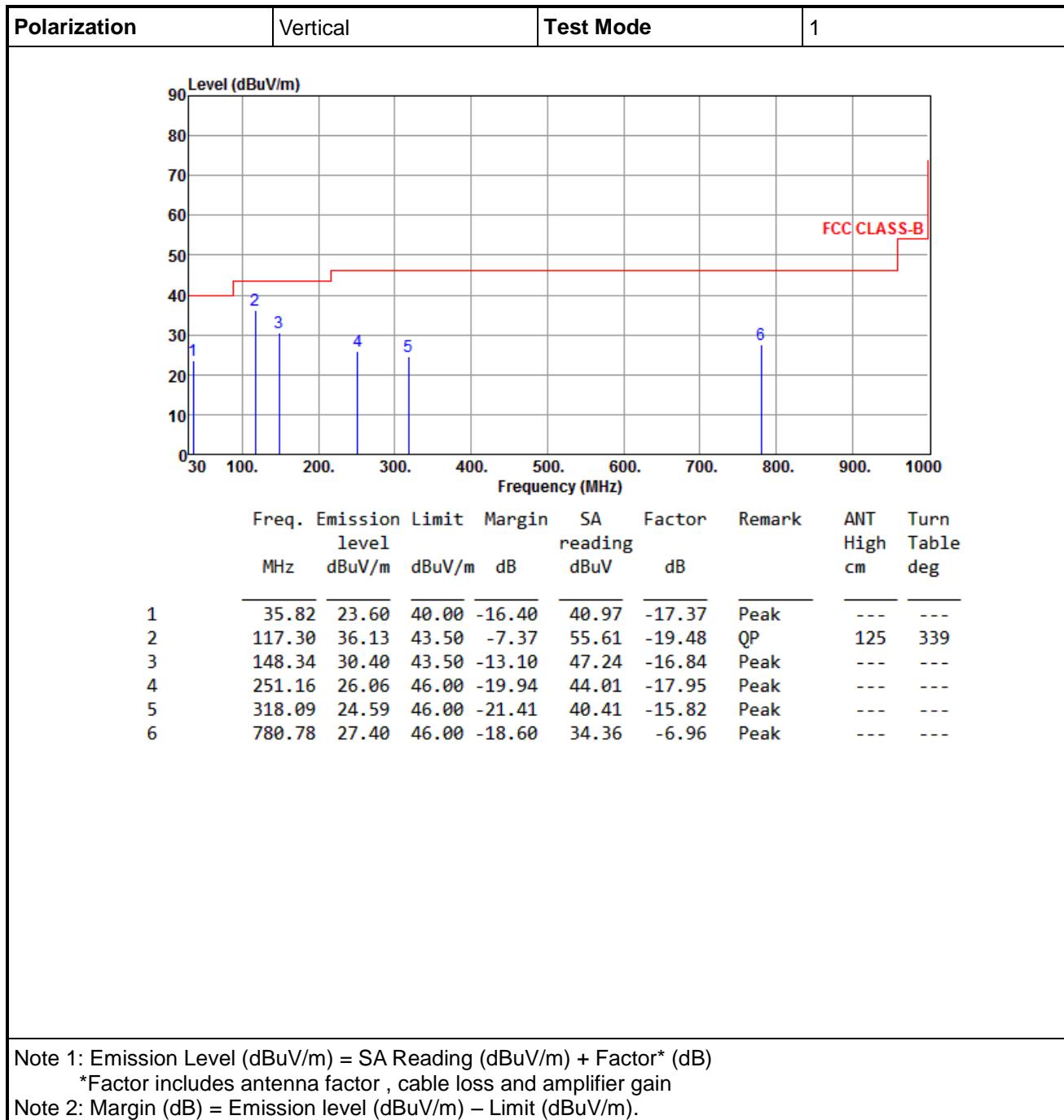


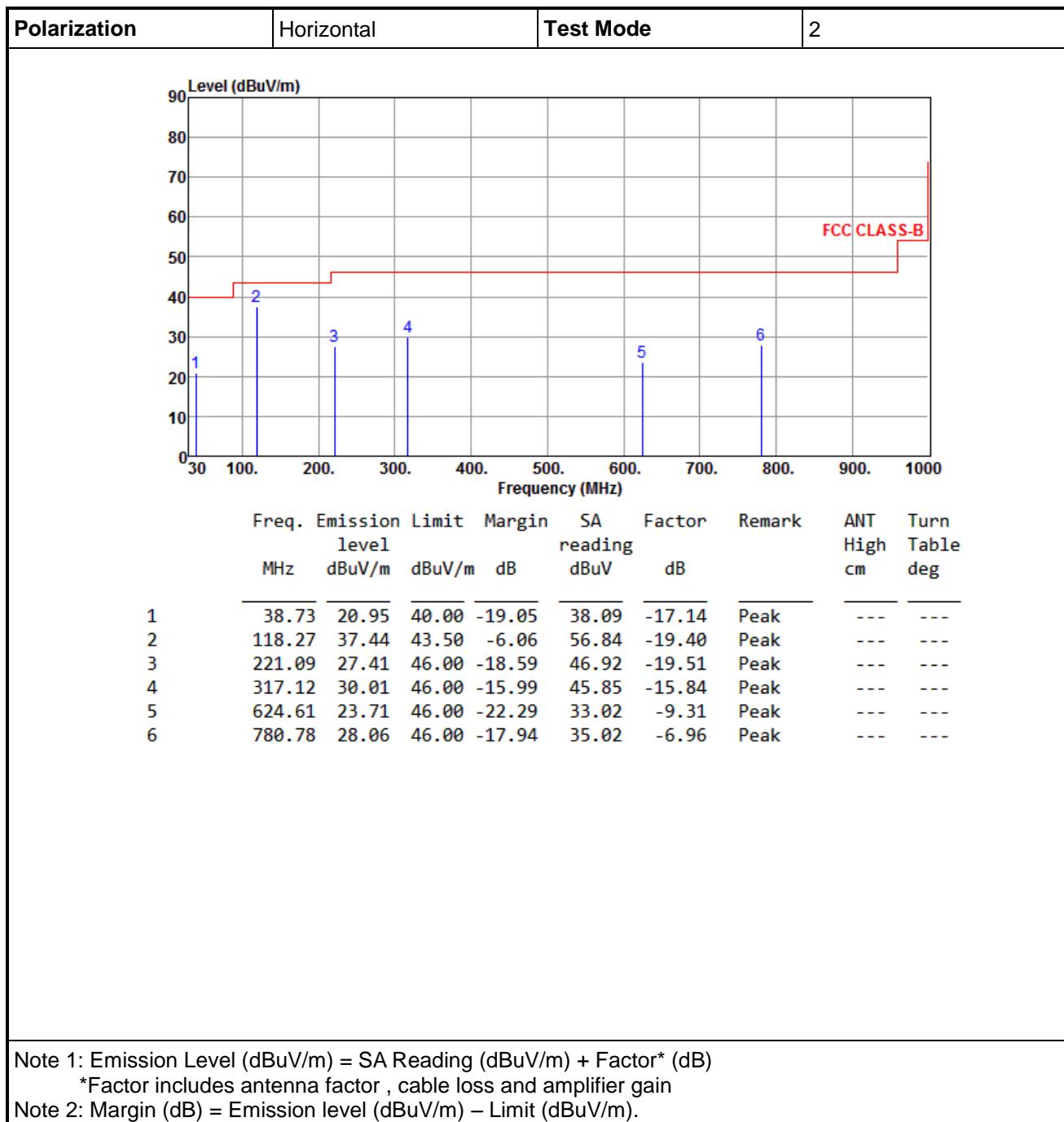


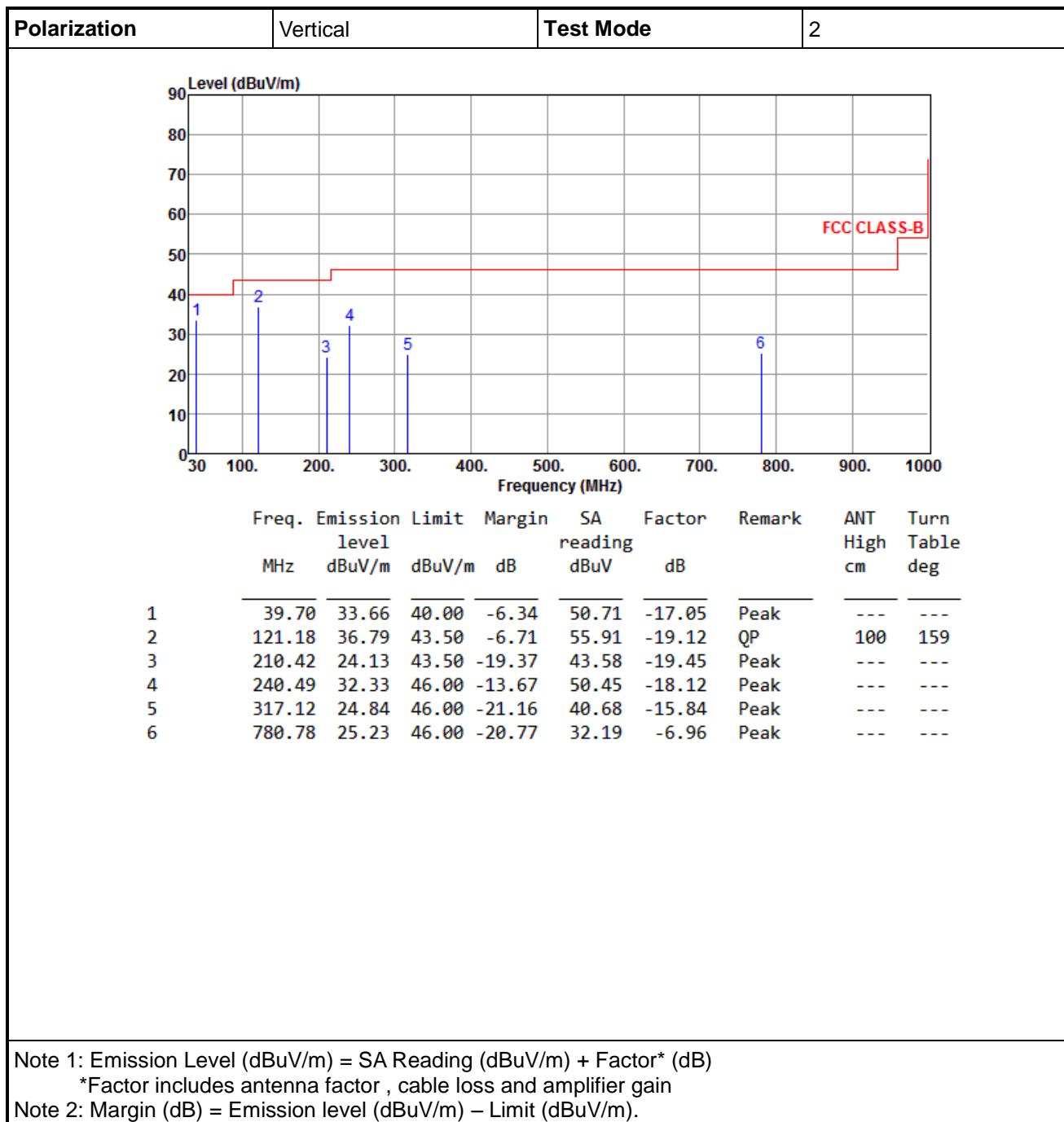


3.2.6 Transmitter Radiated Unwanted Emissions (Above 30MHz)

Polarization	Horizontal	Test Mode	1																																																																												
																																																																															
<table> <thead> <tr> <th>Freq.</th> <th>Emission Limit</th> <th>Margin</th> <th>SA</th> <th>Factor</th> <th>Remark</th> <th>ANT</th> <th>Turn</th> </tr> <tr> <th>MHz</th> <th>level</th> <th>level</th> <th>reading</th> <th>reading</th> <th></th> <th>High</th> <th>Table</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>35.82</td> <td>34.00</td> <td>40.00</td> <td>-6.00</td> <td>51.37</td> <td>-17.37</td> <td>QP</td> <td>100</td> <td>5</td> </tr> <tr> <td>2</td> <td>54.25</td> <td>33.94</td> <td>40.00</td> <td>-6.06</td> <td>50.68</td> <td>-16.74</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>3</td> <td>118.27</td> <td>33.04</td> <td>43.50</td> <td>-10.46</td> <td>52.44</td> <td>-19.40</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>4</td> <td>264.74</td> <td>22.27</td> <td>46.00</td> <td>-23.73</td> <td>39.72</td> <td>-17.45</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>5</td> <td>493.66</td> <td>22.27</td> <td>46.00</td> <td>-23.73</td> <td>34.07</td> <td>-11.80</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>6</td> <td>958.29</td> <td>27.54</td> <td>46.00</td> <td>-18.46</td> <td>32.54</td> <td>-5.00</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> </tbody> </table>				Freq.	Emission Limit	Margin	SA	Factor	Remark	ANT	Turn	MHz	level	level	reading	reading		High	Table	1	35.82	34.00	40.00	-6.00	51.37	-17.37	QP	100	5	2	54.25	33.94	40.00	-6.06	50.68	-16.74	Peak	---	---	3	118.27	33.04	43.50	-10.46	52.44	-19.40	Peak	---	---	4	264.74	22.27	46.00	-23.73	39.72	-17.45	Peak	---	---	5	493.66	22.27	46.00	-23.73	34.07	-11.80	Peak	---	---	6	958.29	27.54	46.00	-18.46	32.54	-5.00	Peak	---	---
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4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-3-271-8666

No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

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