



## FCC Part15 Subpart B

### TEST REPORT

*For*

**LED TV**

**MODEL NUMBER: 65S517, 65S511, 65S513, 65S515, 65S515-MX, 65S517-MX,  
65S515-CA, 65S517-CA**

**FCC ID: W8U65S517**

**REPORT NUMBER: 4788332617.2-1**

**ISSUE DATE: February 28, 2018**

*Prepared for*

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## Revision History

Rev.	Issue Date	Revisions	Revised By
--	2/28/2018	Initial Issue	

Summary of Test Results				
Standard	Test Item	Limit	Result	Remark
FCC Part15, Subpart B ANSI C63.4-2014	Conducted Disturbance	Class B	PASS	
	Radiated Disturbance below 1 GHz	Class B	PASS	
	Radiated Disturbance above 1 GHz	Class B	PASS	NOTE (1)

Note:

(1) If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.

## CONTENTS

<b>1. ATTESTATION OF TEST RESULTS.....</b>	<b>5</b>
<b>2. TEST METHODOLOGY.....</b>	<b>6</b>
<b>3. FACILITIES AND ACCREDITATION.....</b>	<b>6</b>
<b>4. CALIBRATION AND UNCERTAINTY .....</b>	<b>7</b>
4.1. <i>Measuring Instrument Calibration</i> .....	7
4.2. <i>Measurement Uncertainty</i> .....	7
<b>5. EQUIPMENT UNDER TEST .....</b>	<b>8</b>
5.1. <i>Description of EUT</i> .....	8
5.2. <i>Test Mode</i> .....	8
5.3. <i>EUT Accessory</i> .....	8
5.4. <i>Block Diagram Showing the Configuration of System Tested</i> .....	9
<b>6. MEASURING EQUIPMENT AND SOFTWARE USED.....</b>	<b>11</b>
<b>7. EMISSION TEST .....</b>	<b>12</b>
7.1. <i>Conducted Disturbance Measurement</i> .....	12
7.1.1.    Limits of conducted disturbance voltage .....	12
7.1.2.    Test Procedure .....	12
7.1.3.    Test Setup .....	13
7.1.4.    Test Environment.....	13
7.1.5.    Test Mode .....	13
7.1.6.    Test Results.....	14
7.2. <i>Radiated Disturbance Measurement</i> .....	16
7.2.1.    Limits of radiated disturbance measurement.....	16
7.2.2.    Test Procedure .....	17
7.2.3.    Test Setup .....	17
7.2.4.    Test Environment.....	18
7.2.5.    Test Mode .....	18
7.2.6.    Test Results – below 1GHz .....	19
7.2.7.    Test Results – above 1GHz .....	21

## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: TTE Technology, Inc.  
Address: 2455 Anselmo Drive, Suite 101 Corona, CA 92879

### Manufacturer Information

Company Name: TCL King Electrical Appliances (Huizhou) Co., Ltd.  
Address: NO.78 4TH HUIFENG RD ZHONGKAI NEW & HIGH-TECH INDUSTRIES DEVELOPMENT ZONE HUIZHOU GUANGDONG CHINA

### EUT Information

EUT Name: LED TV  
Model: 65S517, 65S511, 65S513, 65S515, 65S515-MX, 65S517-MX, 65S515-CA, 65S517-CA  
Brand: TCL  
Sample Status: Normal  
Sample ID: 1376835  
Sample Received Date: January 19, 2018  
Date of Tested: January 24, 2018 ~ February 7, 2018

APPLICABLE STANDARDS	
STANDARDS	TEST RESULTS
FCC Part15, Subpart B ANSI C63.4-2014	PASS

Prepared By:



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## 2. TEST METHODOLOGY

All tests were performed in accordance with the standard FCC Part15 Subpart B and ANSI C63.4-2014.

## 3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p><b>A2LA (Certificate No.: 4102.01)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p><b>IAS (Lab Code: TL-702)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has demonstrated compliance with ISO/IEC Standard 17025:2005, General requirements for the competence of testing and calibration laboratories</p> <p><b>FCC (FCC Designation No.: CN1187)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules</p> <p><b>IC(Company No.: 21320)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320.</p> <p><b>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793.</p> <p>Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011</p>
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Note: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. Measuring Instrument Calibration

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Measurement Frequency Range	K	U(dB)
Conducted disturbance at mains terminals ports	0.15MHz ~ 30MHz	2	2.9 dB
Radiated disturbance Test	Below 1GHz	2	4.52 dB
Radiated disturbance Test	Above 1GHz	2	5.04 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 5. EQUIPMENT UNDER TEST

### 5.1. Description of EUT

EUT Name	LED TV
EUT Discription	The device LED TV, which can be used as Class B personal computers peripherals
Model	65S517
Series Model	65S511, 65S513, 65S515, 65S515-MX, 65S517-MX, 65S515-CA, 65S517-CA
Model Difference	All models are indentical except the model name which is intended to differentiate sales channels
Rated Input	120V~ 60Hz

### 5.2. Test Mode

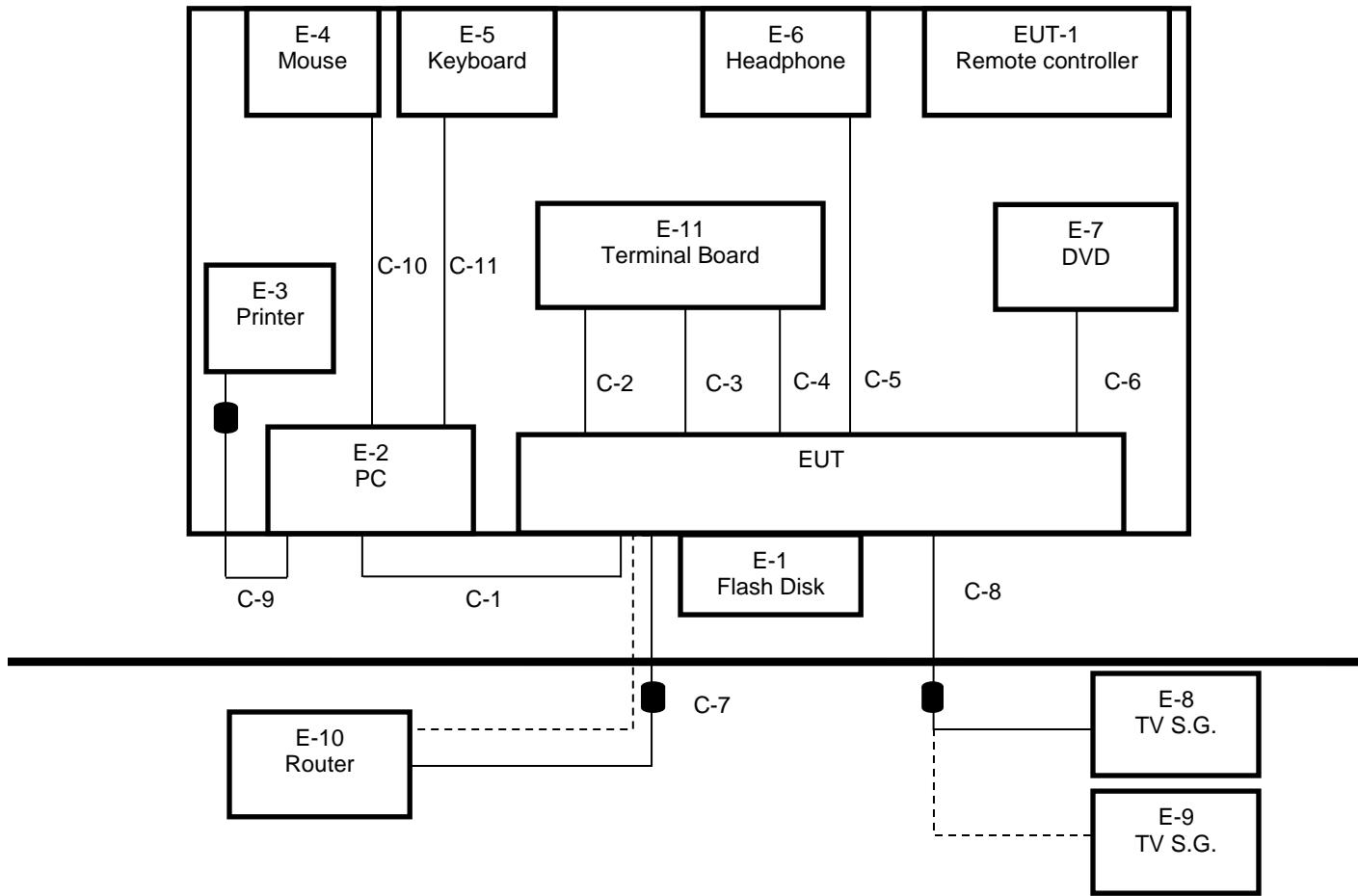
Test Mode	Description
Mode 1	HDMI1 in (4K)
Mode 2	HDMI2 in (4K)
Mode 3	HDMI3 in (4K)
Mode 4	Ethernet Wired Play
Mode 5	WiFi 2.4GHz Play
Mode 6	WiFi 5GHz Play

Note: the EUT was set according to figure 16 as stated in Clause 11.4 of ANSI C63.4.

### 5.3. EUT Accessory

Item	Accessory	Brand Name	Model Name	Description
1	Remote controller	TCL	/	/

#### 5.4. Block Diagram Showing the Configuration of System Tested



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.

Item	Equipment	Mfr/Brand	Model/Type No.	Specification	Series No.
E-1	USB Disk	Kingstone	DTSE9H/8GB	8GB	/
E-2	PC	LENOVO	ThinkCentre E73	/	PC0K9QL4
E-3	Printer	Canon	LBP2900+	/	NDLA530620
E-4	Mouse	Lenovo	MO28UOB	USB port	8SSM50G45918F CCC1545
E-5	Keyboard	Lenovo	LXH-JME2209U	USB port	60804634

E-6	Headphone	Sony	/		/
E-7	DVD	PHILIPS	BDP7750/93	4K output	KX1A1623930542
E-8	TV Signal Generator	Shibasoku	TG39BX	/	3000035889
E-9	MXG vector signal generator	N5182B	Keysight	/	MY56200284
E-10	Router	D-Link	DIR-809	2.4G wifi 5G wifi	RZMP2G4000780
E-11	Terminal load board	/	/	HDMI interface Audio & Video interface	/

Item	Type of cable	Shielded Type	Ferrite Core	Length
C-1	HDMI cable	YES	NO	1.5m
C-2	HDMI cable	YES	NO	1.5m
C-3	HDMI cable	YES	NO	1.5m
C-4	Optical Fiber cable	NO	NO	1.5m
C-5	Headphone cable	NO	NO	1.2m
C-6	AV cable	YES	NO	1.5m
C-7	Ethernet cable	YES	YES	10m
C-8	Coaxial cable	YES	YES	10m
C-9	USB Cable	YES	YES	1.5m

## 6. MEASURING EQUIPMENT AND SOFTWARE USED

Conducted Disturbance						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESR3	101961	Dec. 12, 2017	Dec. 12, 2018
<input checked="" type="checkbox"/>	Two-Line V-Network	R&S	ENV216	101983	Dec. 12, 2017	Dec. 12, 2018
<input checked="" type="checkbox"/>	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec. 12, 2017	Dec. 12, 2018
Software						
Used	Description		Manufacturer	Name	Version	
<input checked="" type="checkbox"/>	Test Software for Conducted Emissions		Farad	EZ-EMC	Ver. UL-3A1	
Radiated Disturbance						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	MXE EMI Receiver	KESIGHT	N9038A	MY56400 036	Dec. 12, 2017	Dec. 12, 2018
<input checked="" type="checkbox"/>	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan. 09, 2016	Jan. 09, 2019
<input checked="" type="checkbox"/>	Preamplifier	HP	8447D	2944A090 99	Dec. 12, 2017	Dec. 12, 2018
<input checked="" type="checkbox"/>	EMI Measurement Receiver	R&S	ESR26	101377	Dec. 12, 2017	Dec. 12, 2018
<input checked="" type="checkbox"/>	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2019
<input checked="" type="checkbox"/>	Horn Antenna	Schwarzbeck	BBHA9170	#691	Jan. 06, 2016	Jan. 06, 2019
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-0118	TRS-305-00067	Dec. 12, 2017	Dec. 12, 2018
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec. 12, 2017	Dec. 12, 2018
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-3	TRS-308-00002	Dec. 12, 2017	Dec. 12, 2018
Software						
Used	Description		Manufacturer	Name	Version	
<input checked="" type="checkbox"/>	Test Software for Radiated Emissions		Farad	EZ-EMC	Ver. UL-3A1	

## 7. EMISSION TEST

### 7.1. Conducted Disturbance Measurement

#### 7.1.1. Limits of conducted disturbance voltage

FREQUENCY (MHz)	<input type="checkbox"/> Class A (dB $\mu$ V)		<input checked="" type="checkbox"/> Class B (dB $\mu$ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor

Margin Level = Measurement Value - Limit Value

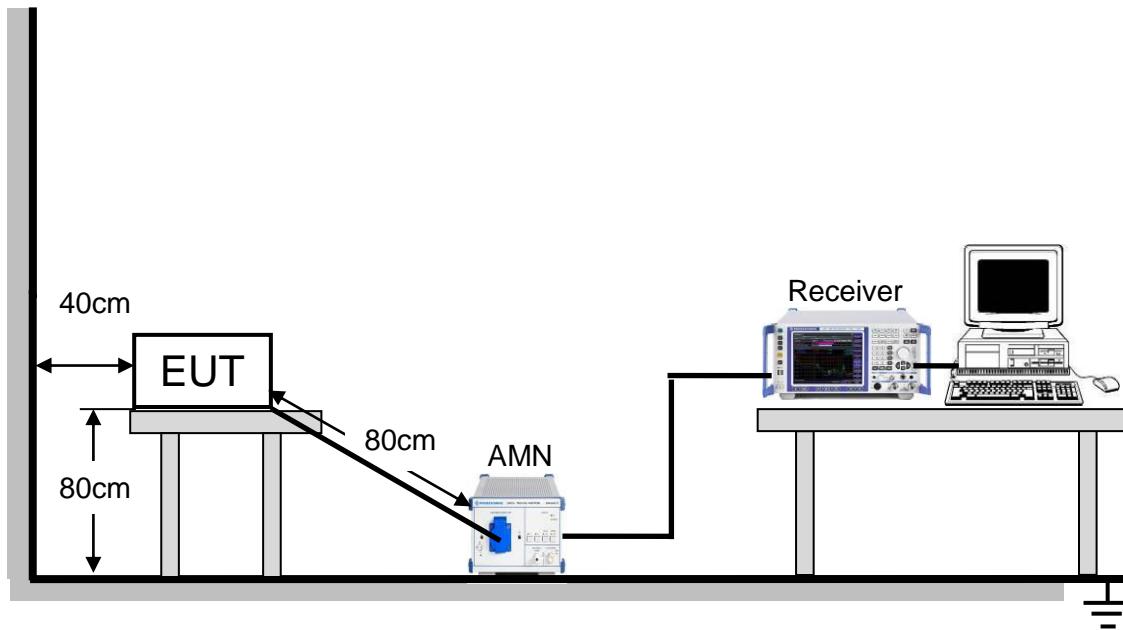
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 7.1.2. Test Procedure

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item:EUT Test Photos.

### 7.1.3. Test Setup



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

### 7.1.4. Test Environment

Temperature:	21.9°C
Humidity:	50%
ATM pressure:	102kPa

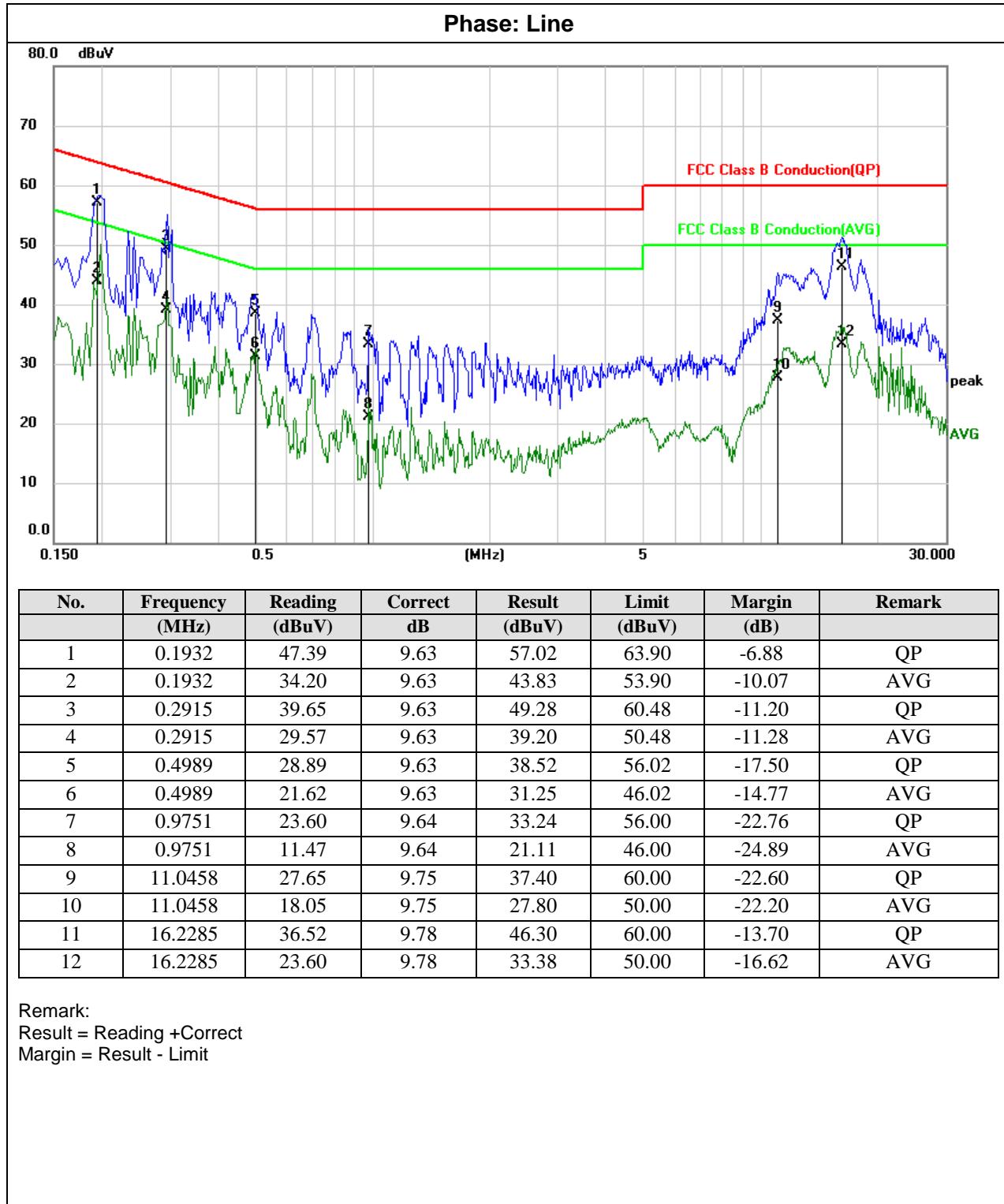
### 7.1.5. Test Mode

Pre-test Mode:	Mode 1, 2 & 3
Final Test Mode:	Mode 2

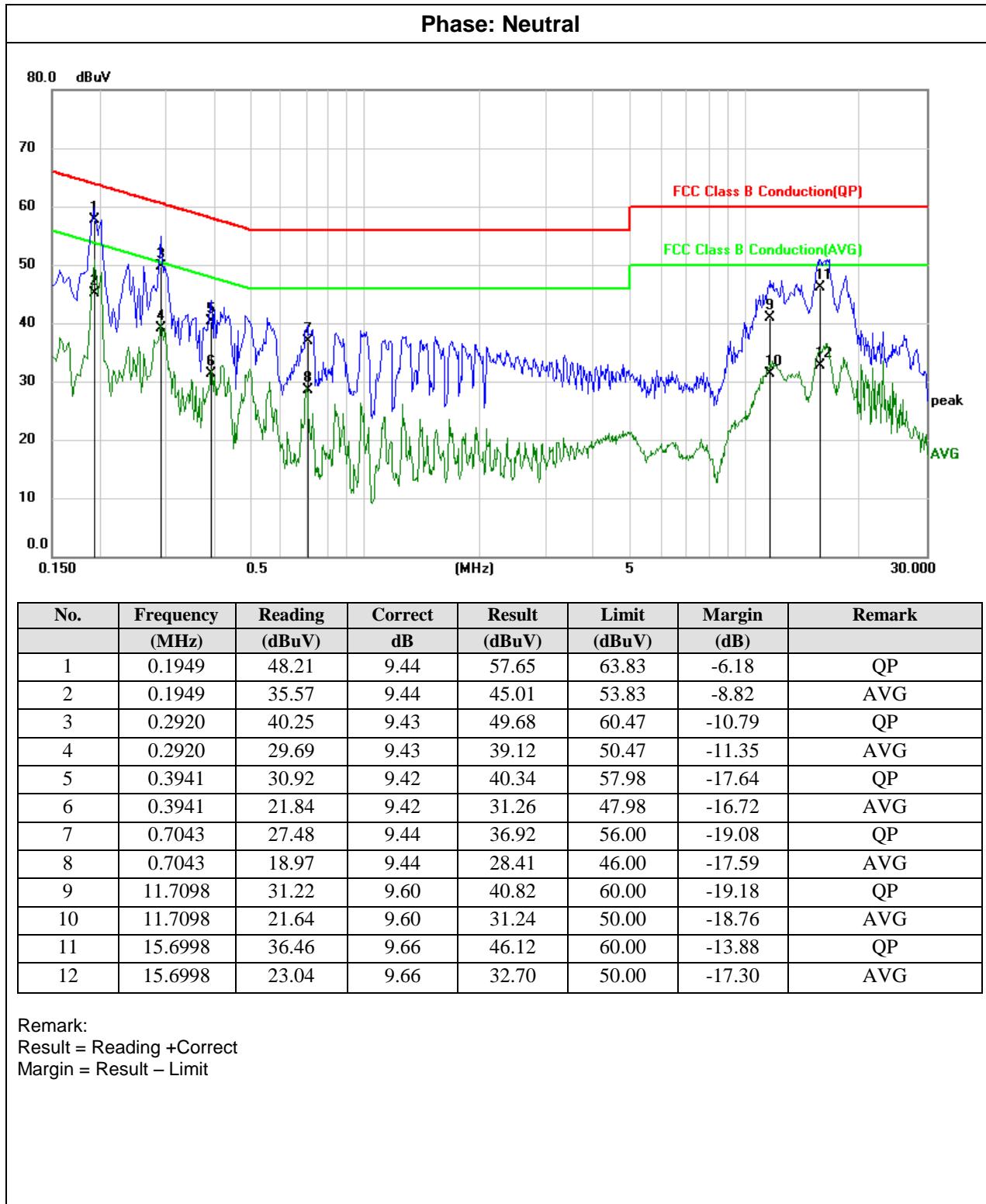
Note: According to pre-test results, the final test mode is each independent function's worst case and only shown in the report.

### 7.1.6. Test Results

Test Mode:	Mode 2
Test Voltage:	AC 120V/60Hz



Test Mode:	Mode 2
Test Voltage:	AC 120V/60Hz



## 7.2. Radiated Disturbance Measurement

### 7.2.1. Limits of radiated disturbance measurement

#### Below 1 GHz

##### Measurement Method and Applied Limits:

##### ANSI C63.4:

Frequency (MHz)	<input type="checkbox"/> Class A		<input checked="" type="checkbox"/> Class B
	Field strength (uV/m) (at 10m)	Field strength (dBuV/m) (at 3m)	Field strength (dBuV/m) (at 3m)
30 - 88	90	49.5	40
88 - 216	150	53.9	43.5
216 - 960	210	56.9	46
Above 960	300	60	54

#### Above 1 GHz

##### Measurement Method and Applied Limits:

##### ANSI C63.4:

Frequency (MHz)	<input type="checkbox"/> Class A				<input checked="" type="checkbox"/> Class B	
	(dBuV/m) (at 3m)		(dBuV/m) (at 10m)		(dBuV/m) (at 3m)	
	Peak	Average	Peak	Average	Peak	Average
Above 1000	80	60	69.5	49.5	74	54

#### Frequency Range of Radiated Disturbance Measurement

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

#### NOTE:

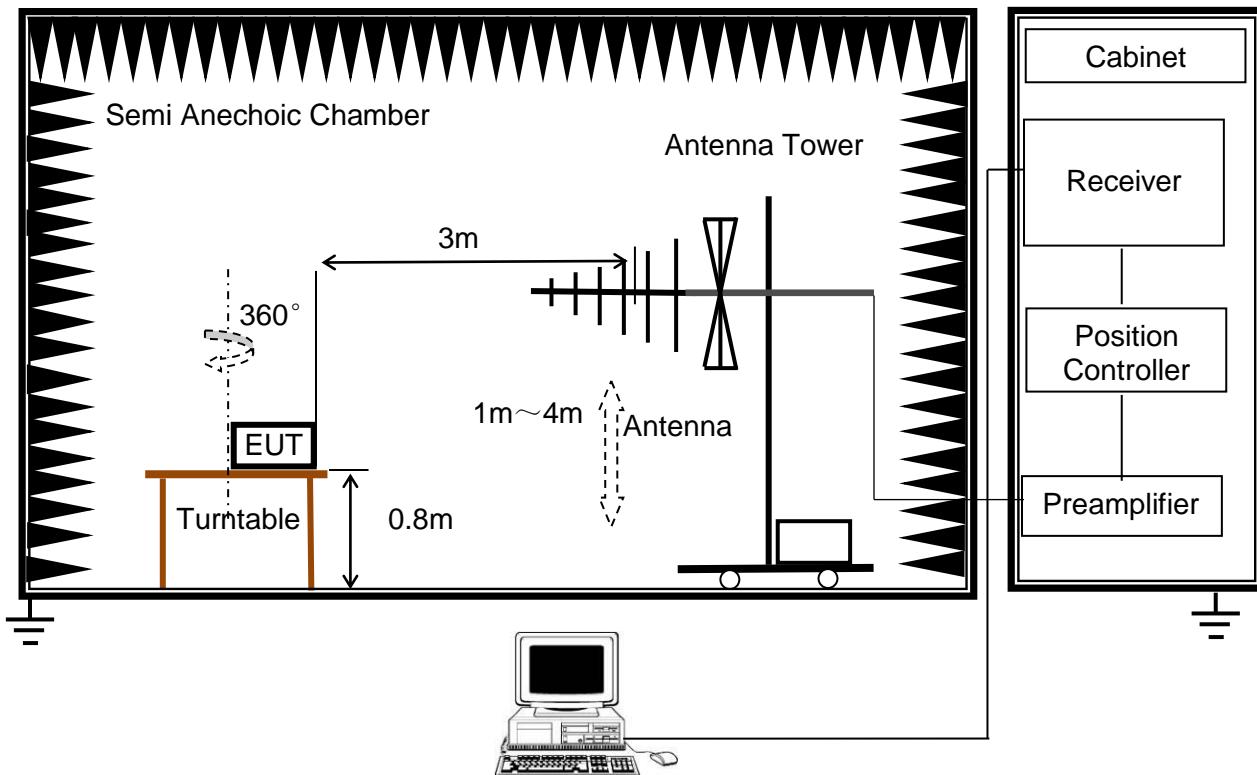
- (1) The limit for radiated test was performed according to FCC Part 15, Subpart B;
- (2) The tighter limit applies at the band edges;
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m),  
3m Emission level = 10m Emission level + 20log(10m/3m);
- (4) The test result calculated as following:  
Measurement Value = Reading Level + Correct Factor,  
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use),  
Margin Level = Measurement Value - Limit Value.

### 7.2.2. Test Procedure

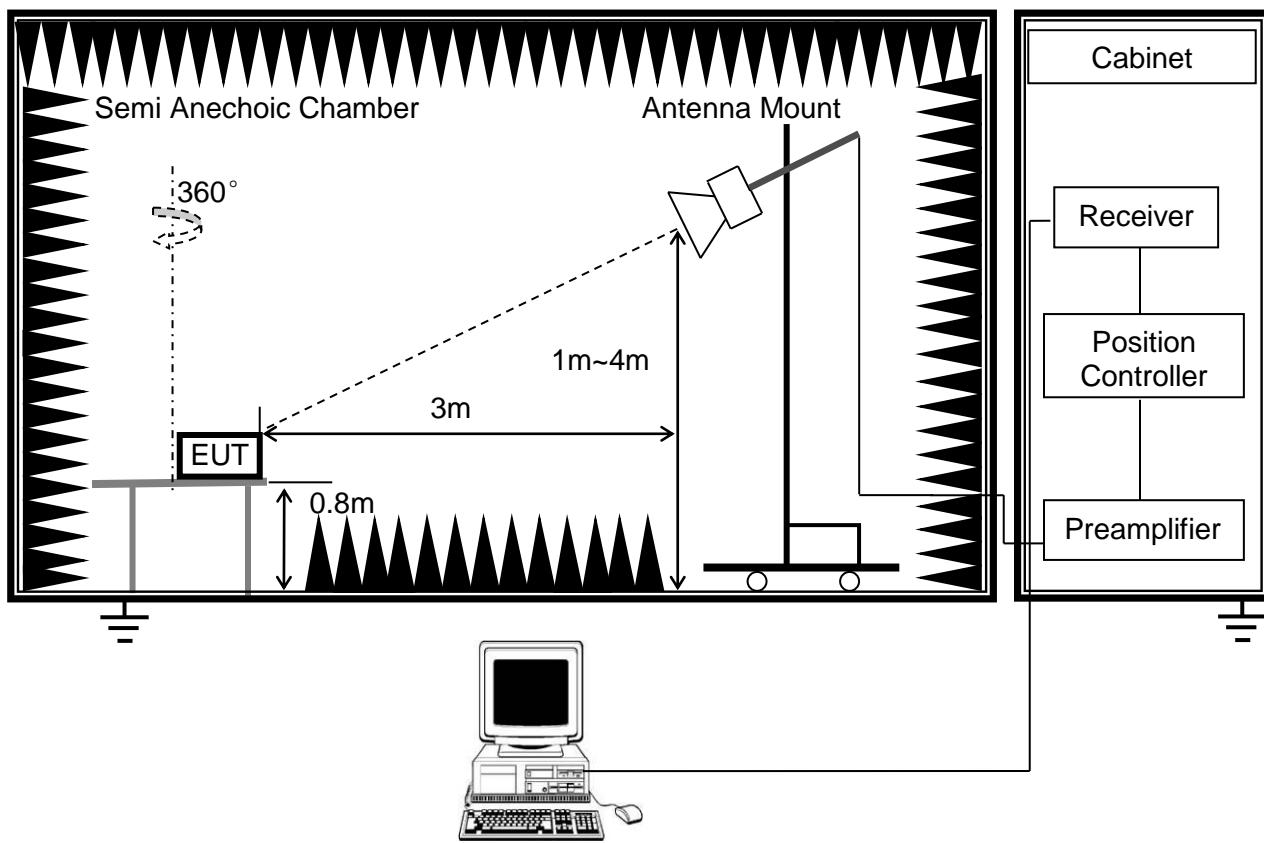
- a. The measuring distance of at 3m shall be used for measurements at frequency up to 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For the actual test configuration, please refer to the related Item:EUT Test Photos.

### 7.2.3. Test Setup

(a) Radiated Disturbance Test Set-Up Frequency 30MHz - 1GHz



## (b) Radiated Disturbance Test Set-Up Frequency above 1GHz



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

#### 7.2.4. Test Environment

Radiated Disturbance - below 1 GHz		Radiated Disturbance - above 1 GHz	
Temperature:	20.8°C	Temperature:	20.4°C
Humidity:	47%	Humidity:	45%
ATM pressure:	102kPa	ATM pressure:	102kPa

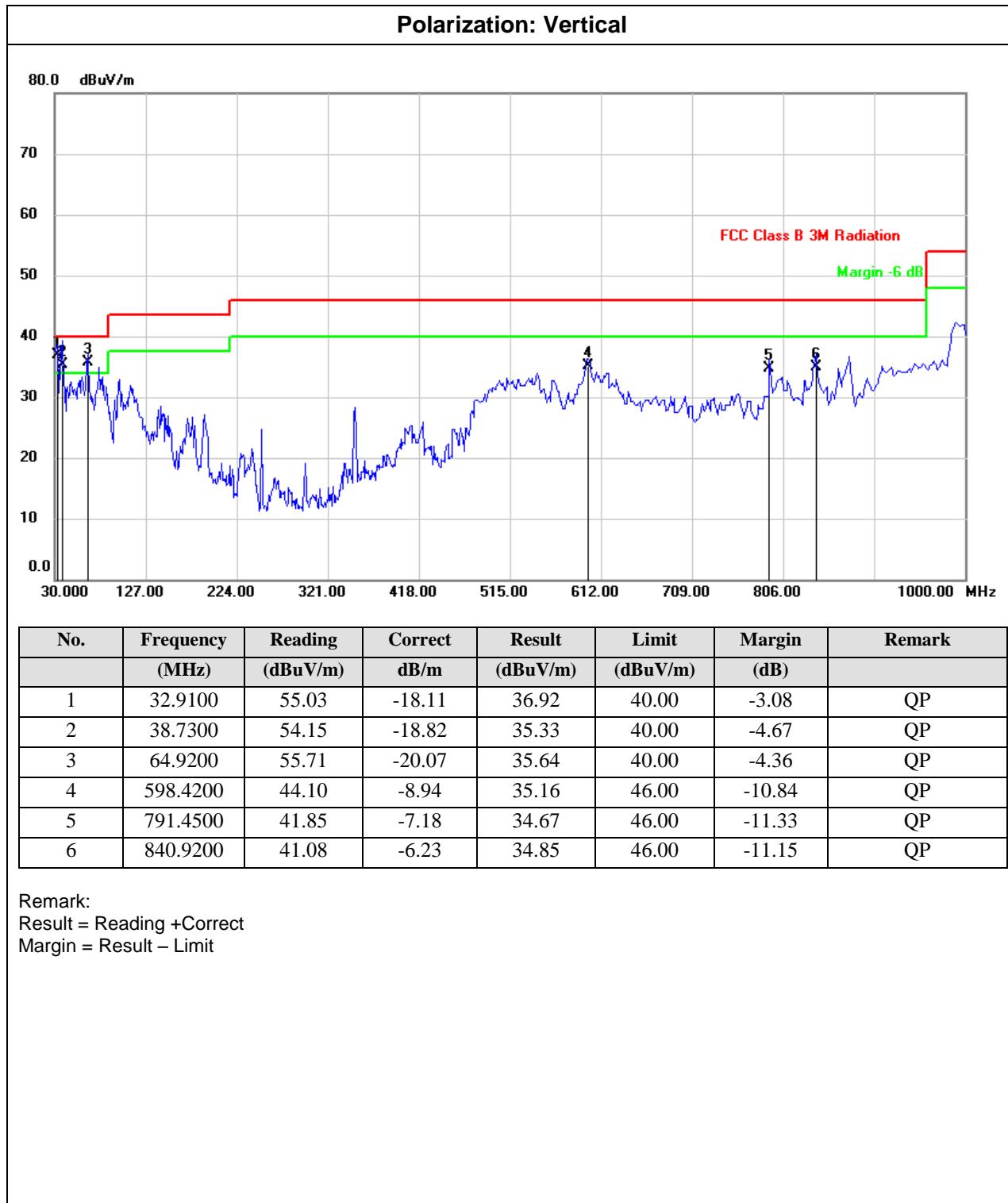
#### 7.2.5. Test Mode

Radiated Disturbance - below 1 GHz		Radiated Disturbance - above 1 GHz	
Pre-test Mode:	Mode 1, 2, 3, 4, 5 & 6	Pre-test Mode:	Mode 1, 2, 3, 4, 5 & 6
Final Test Mode:	Mode 4	Final Test Mode:	Mode 3 & 6

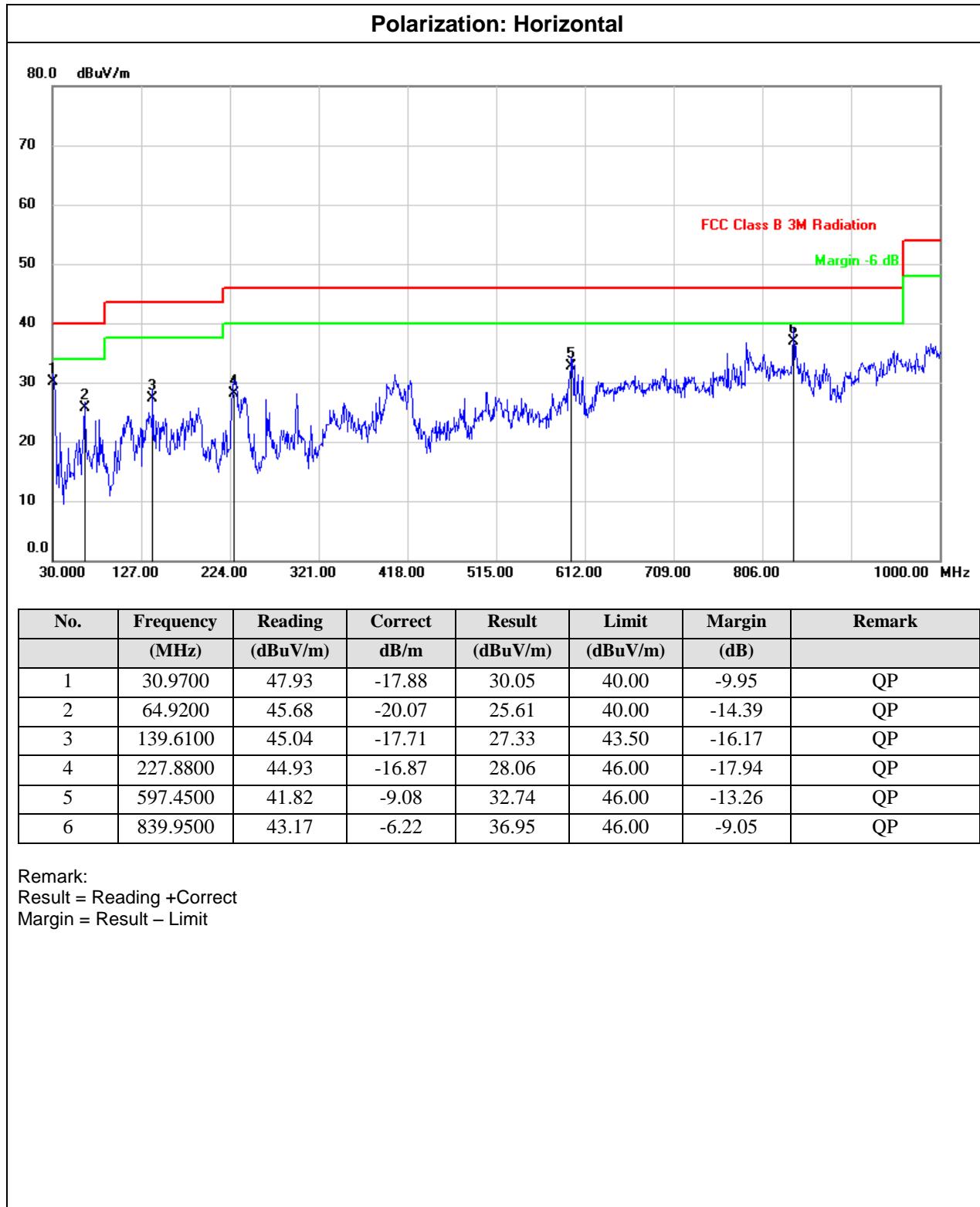
Note: All the modes had been tested, but only the worst data were recorded in the report.

### 7.2.6. Test Results – below 1GHz

Test Mode:	Mode 4
Test Voltage:	AC 120V/60Hz

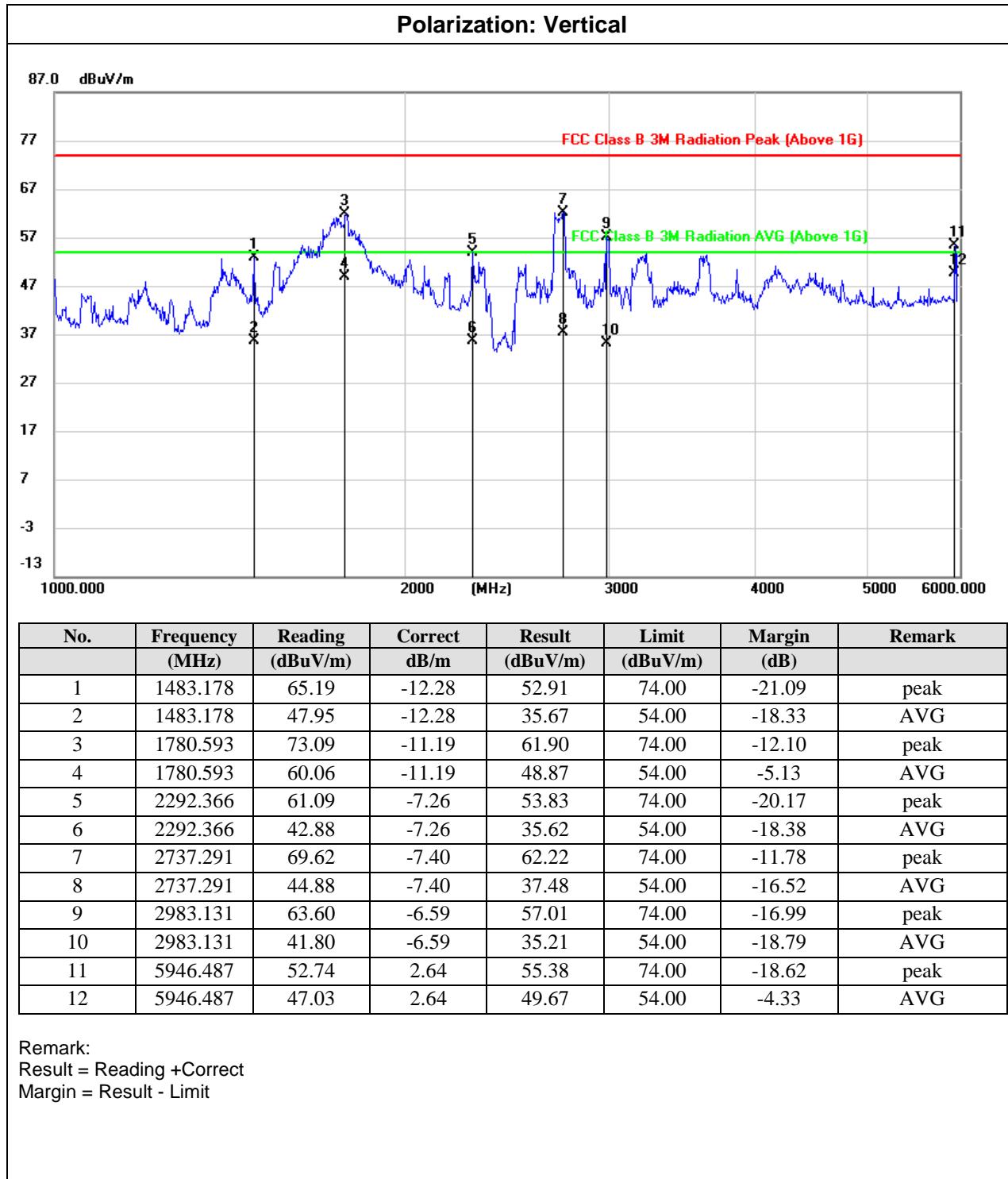


Test Mode:	Mode 4
Test Voltage:	AC 120V/60Hz

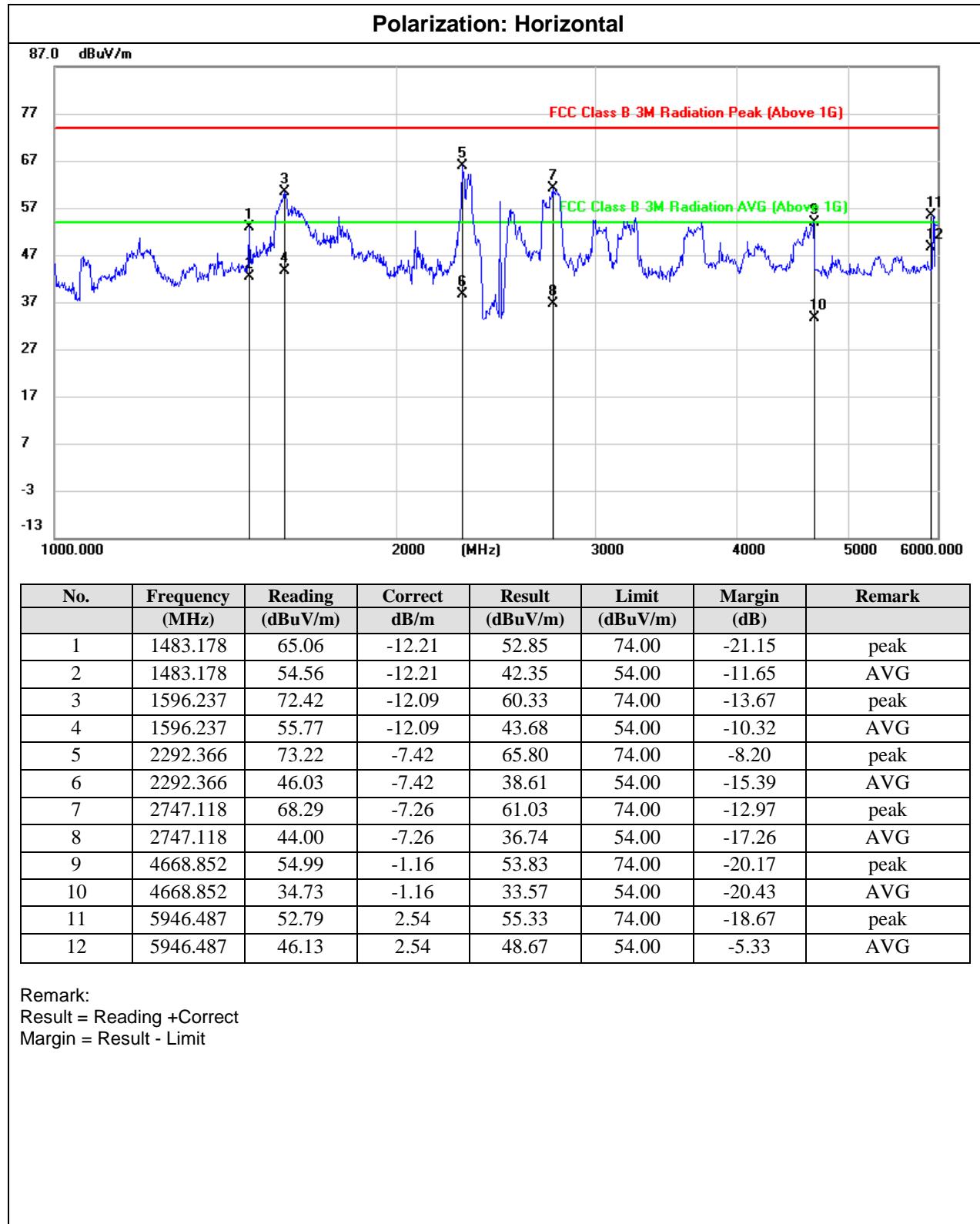


### 7.2.7. Test Results – above 1GHz

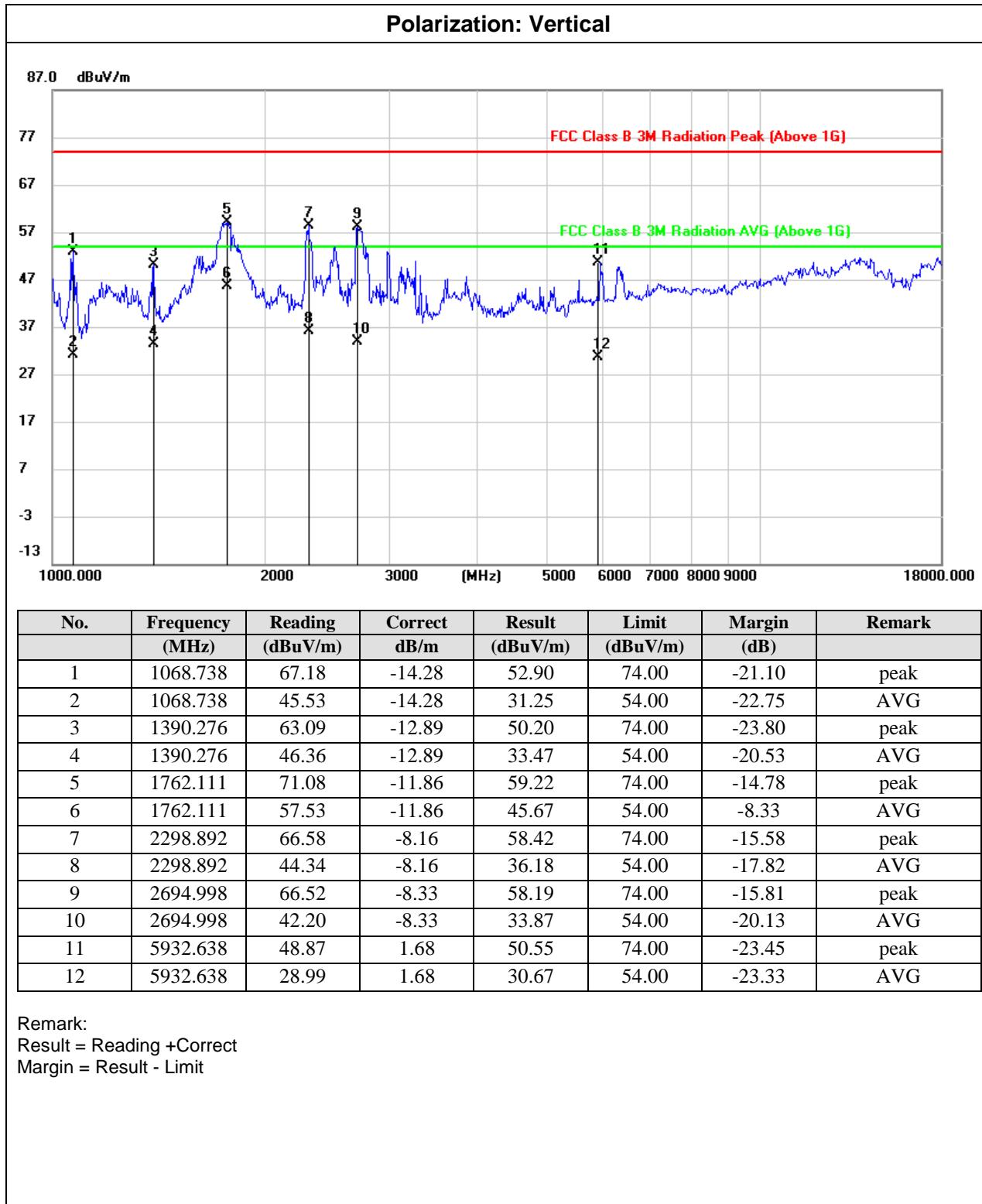
Test Mode:	Mode 3
Test Voltage:	AC 120V/60Hz



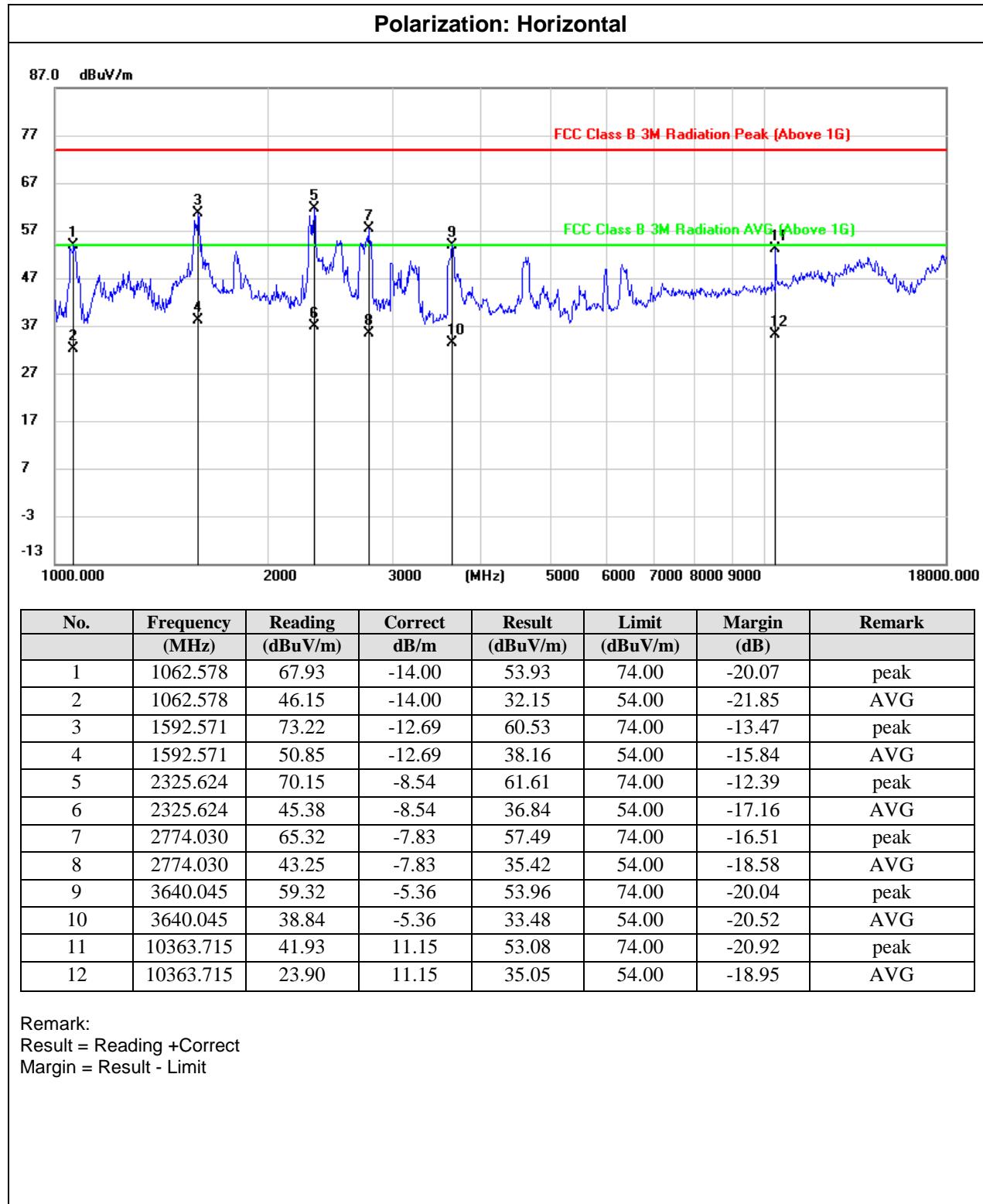
Test Mode:	Mode 3
Test Voltage:	AC 120V/60Hz



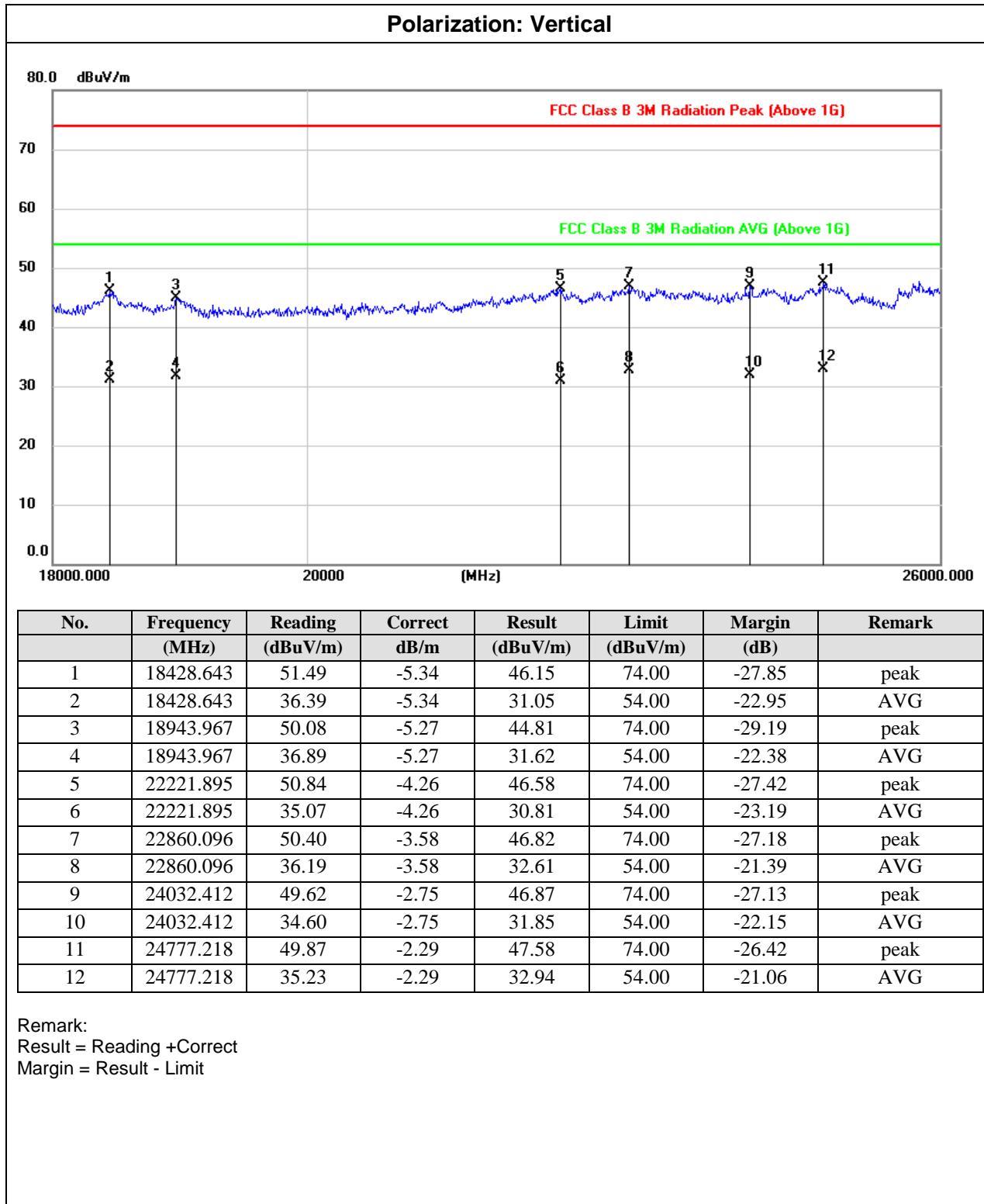
Test Mode:	Mode 6
Test Voltage:	AC 120V/60Hz



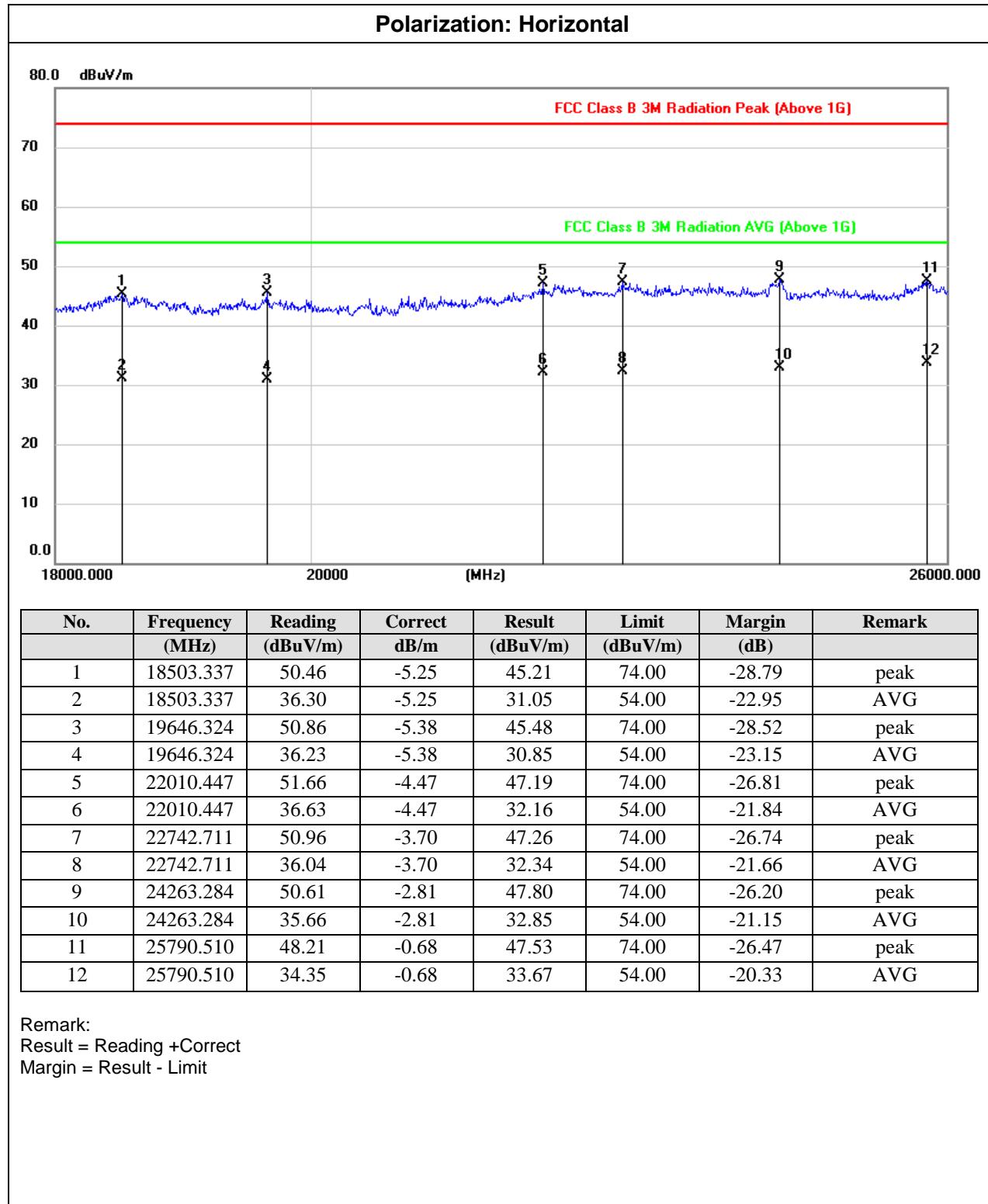
Test Mode:	Mode 6
Test Voltage:	AC 120V/60Hz



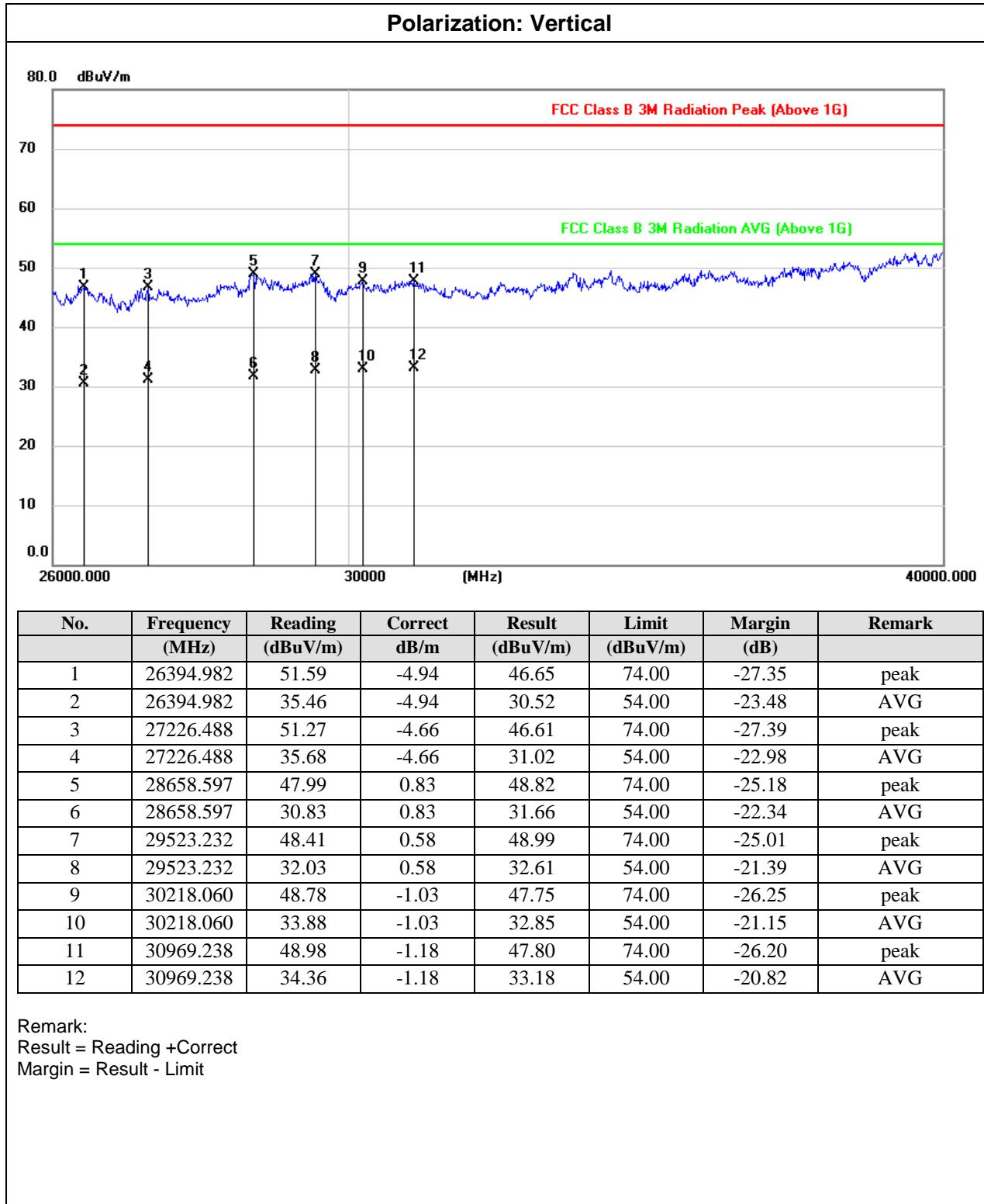
Test Mode:	Mode 6
Test Voltage:	AC 120V/60Hz



Test Mode:	Mode 6
Test Voltage:	AC 120V/60Hz



Test Mode:	Mode 6
Test Voltage:	AC 120V/60Hz



Test Mode:	Mode 6
Test Voltage:	AC 120V/60Hz

