TEST REPORT

Reference No.	:	WTX22X12249022W004
FCC ID	:	RFD-CSX8
Applicant	:	Leica Geosystems AG
Address	:	Heinrich-Wild-Strasse,9435 Heerbrugg,Switzerland
Manufacturer	:	The same as Applicant
Address	:	The same as Applicant
Product Name	:	CSX8
Model No.	:	LGT-08QA-2301
Standards	:	FCC Part 15.407
Date of Receipt sample	:	2022-12-09
Date of Test	:	2022-12-09 to 2023-06-01
Date of Issue	:	2023-06-01
Test Report Form No.	:	WTX_Part 15_407W
Test Result	:	**Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

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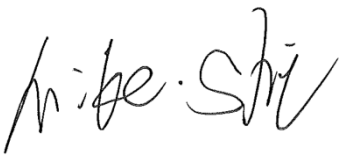
Tested by:



Mike Shi

Approved by:

Silin Chen

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Report version

Version No.	Date of issue	Description
Rev.00	2023-06-01	Original
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	CSX8
Trade Name:	Leica
Model No.:	LGT-08QA-2301
Adding Model(s):	/
Rated Voltage:	DC3.8V
Battery:	8200mAh
Adapter Model:	MODEL:ASUC71w-050912300 Input: AC100-240V 50/60Hz 0.7A Output:DC5.0V3.0A or DC9.0V2.0A or DC12.0V1.5A
Software Version:	RLC00.50.B8.01
Hardware Version:	V1.04
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n(HT20) , 802.11n-HT40, 802.11ac-VHT80
Frequency Range:	5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5850MHz
RF Output Power:	Antenna 1: 14.99dBm (Conducted) Antenna 2: 16.15dBm (Conducted)
Type of Modulation:	QPSK,16QAM,64QAM, 256QAM
Type of Antenna:	FPC Antenna
Antenna Gain:	3.62dBi
Note: The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
KDB789033 D02 v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-Nii) Devices Part 15, Subparte.
KDB662911 D01 Multiple Transmitter Output v02r01: Emissions Testing of Transmitters with Multiple Outputs in the Same Band.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB789033 D02 v02r01
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Table for parameters of Test Software setting

Use “QRCT3.exe” and follow the instructions given by the manufacturer, you can start to test. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180	5200	5240	5260	5300	5320	5500	5580	5700	5720	5745	5785	5825
802.11a 6Mbps	16	16	16	16	16	16	16	16	16	16	16	16	16
802.11n-HT20 MCS0	16	16	16	16	16	16	16	16	16	16	16	16	16
Mode	NCB: 40MHz									
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795
802.11n-HT40 MCS0	15	15	15	15	15	15	15	15	15	15
Mode	NCB: 80MHz					
	5210	5290	5530	5610	5690	5775
802.11ac-VHT80 MCS0/Nss2	14	14	14	14	14	14

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

1.6 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101）

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is mai ntained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11a	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz ,5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz ,5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz,5270MHz,5310MHz,5510MHz,5550MHz,5670MHz ,5755MHz,5795MHz
TM4	802.11ac-VHT80	5210MHz,5290MHz,5530MHz,5610MHz,5775MHz
Note1 : All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report; 802.11ac-VHT20, 802.11ac-VHT40 covered by 802.11n-HT20 and 802.11n-HT40. Note 2: The 5GHz WIFI has two antennas and support Multiple Outputs for 802.11n/ac mode for this report; Antenna 1 Gain is 3.62dBi; Antenna 2 Gain is 3.62dBi; According to KDB 662911, for same directional gain: Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi =3.62+10log(2) dBi=6.63dBi		

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Type-C Cable	1.0	Shielded	With Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Computer	Lenovo	L13 Yoga	/

1.8 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.9 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
WTXE1022A1002	GSM Tester	Rohde & Schwarz	CMU200	114403	2023-02-25	2024-02-24
WTXE1005A1005	Spectrum Analyzer	Agilent	N9020A	US47140102	2023-02-25	2024-02-24
WTXE1084A1001	Spectrum Analyzer	Agilent	N9020A	MY54320548	2023-02-25	2024-02-24
WTXE1044A1001	Signal Generator	Agilent	83752A	3610A01453	2023-02-25	2024-02-24
WTXE1045A1001	Vector Signal Generator	Agilent	N5182A	MY47070202	2023-02-25	2024-02-24
WTXE1018A1001	Power Divider	Weinschel	1506A	PM204	2023-02-25	2024-02-24
WTXE1045A1001	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2023-02-25	2024-02-24
☒Chamber A: Below 1GHz						
WTXE1005A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
WTXE1007A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
WTXE1007A1001	Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
WTXE1010A1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1010A1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☒Chamber A: Above 1GHz						
WTXE1005A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
WTXE1007A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
WTXE1065A1001	Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
WTXE1010A1005	Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
WTXE1010A1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18

WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐Chamber B:Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A101 79	2023-02-25	2024-02-24
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☐Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
☐Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1103A 1005	Horn Antenna	POAM	RTF-11A	LP228060 221	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2023-02-25	2024-02-24
☒Conducted Room 1#						
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-224	2023-02-25	2024-02-24
☐Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
WTXE1003A 1003	LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.405	Antenna Requirement	Compliant
15.407 (c)	Automatically Discontinue Transmission	Compliant
§15.207; §15.407(b)(6)	Conducted Emission	Compliant
§15.407(a)(1),(2)	Power Spectral Density	Compliant
§15.407(e)	Emission Bandwidth and Occupied Bandwidth	Compliant
§15.407(a)(1),(2)	Maximum Conducted Output Power	Compliant
§15.407(b)(1),(2),(3),(4)	Undesirable emission	Compliant
§15.205; §15.407(b)(1),(2),(3)	Radiated Emission	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.407(h)	Dynamic Frequency Selection (DFS)	Compliant

N/A: Not applicable.

3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Evaluation Information

This product has two FPC Antennas, fulfill the requirement of this section.

4. Automatically Discontinue Transmission

4.1 Standard Applicable

According to FCC Part 15.407(c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

4.2 Summary of Test Results

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

5. Power Spectral Density

5.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2 Test Procedure

According to 789033 D02 v02r01 General UNII Test Procedures New Rules v02, the following is the measurement procedure.
For devices operating in the bands 5.15-5.25GHz, 5.25-5.35GHz, and 5.47-5.725GHz, the above procedures make use of 1MHz RBW to satisfy directly the 1MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85GHz, the rules specify a measurement bandwidth of 500kHz. Many spectrum analyzers do not have 500kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1MHz, or 500kHz, “provided that the measured power is integrated over the full

reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1MHz, or 500kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500kHz) and integrated over 1 MHz, or 500kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100kHz for the sections 5.c) and 5.d) above, since RBW=100kHZ is available on nearly all spectrum analyzers.

5.3 Summary of Test Results/Plots

Please refer to Appendix

6. Emission Bandwidth and Occupied Bandwidth

6.1 Standard Applicable

According to 15.407(a) and (e):

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) Within the 5.725-5.85GHz band, the minimum 6dB bandwidth of U-NII devices shall be at least 500kHz.

6.2 Test Procedure

According to 789033 D02 v02r0r section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.

c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85GHz
Section 15.407(e) specifies the minimum 6dB emission bandwidth of at least 500KHz for the band 5.715-5.85GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth
The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v02r01 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 * RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

6.3 Summary of Test Results/Plots

Please refer to Appendix

7. Maximum Conducted Output Power

7.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

7.2 Test Procedure

According to KDB789033 D02 v02r01 section E, the following is the measurement procedure.

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1MHz.

(iii) Set VBW ≥ 3MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that

narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

7.3 Summary of Test Results/Plots

Please refer to Appendix

8. Radiated Spurious Emissions

8.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(2) For transmitters operating in the 5.25-5.35GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(3) For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(4) For transmitters operating in the 5.725-5.85GHz band:

(i) All emissions shall be limited to a level of −27dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6dBm/MHz at 5MHz above or below the band edge, and from 5MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

According to §15.407(b)(6), Unwanted emissions below 1GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.

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If radiated measurements are performed, field strength is then converted to EIRP as follows:

EIRP = ((E*d)^2) / 30

where:

• E is the field strength in V/m;

• d is the measurement distance in meters;

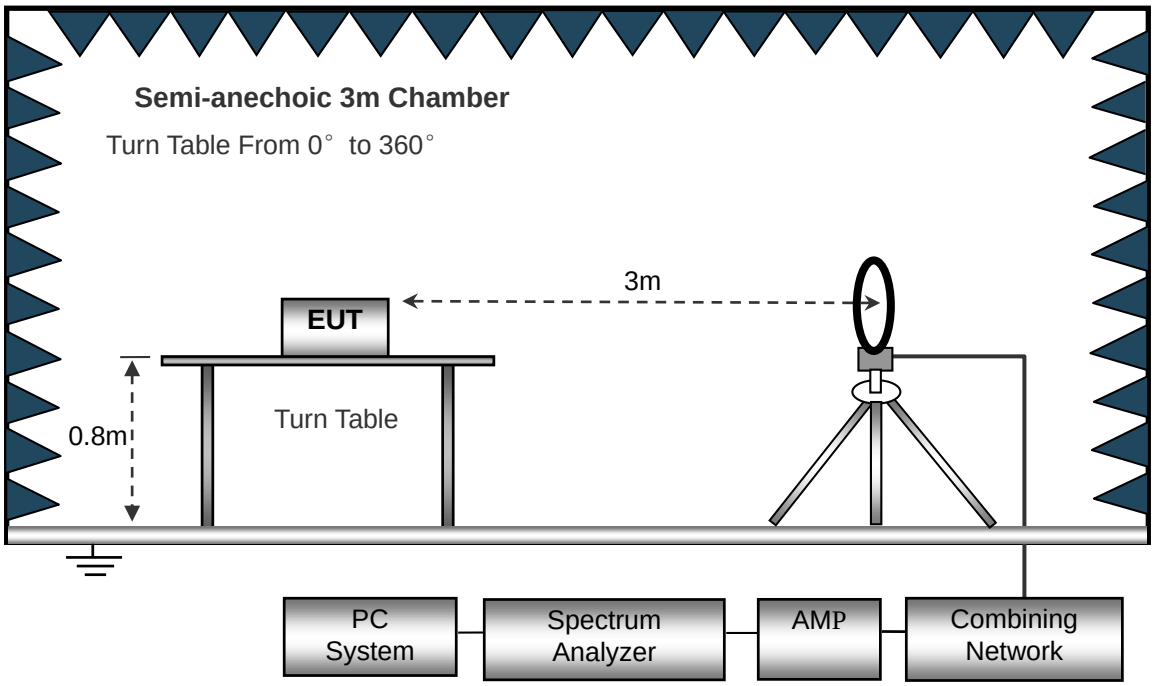
• EIRP is the equivalent isotropically radiated power in watts.

8.2 Test Procedure

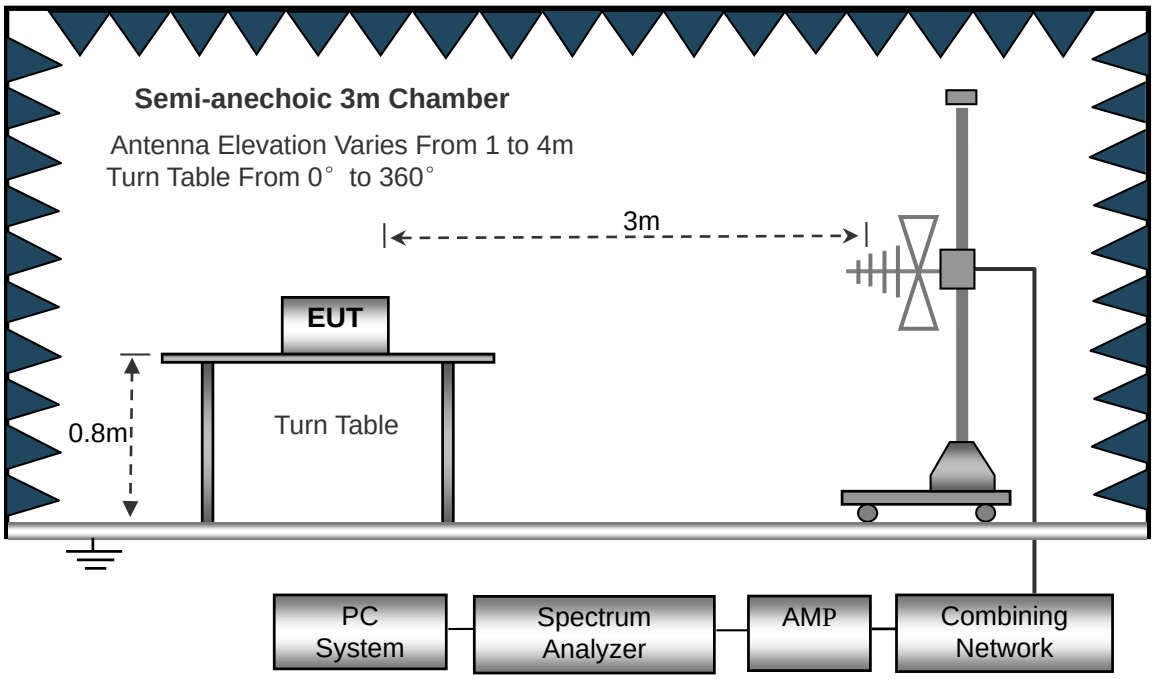
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

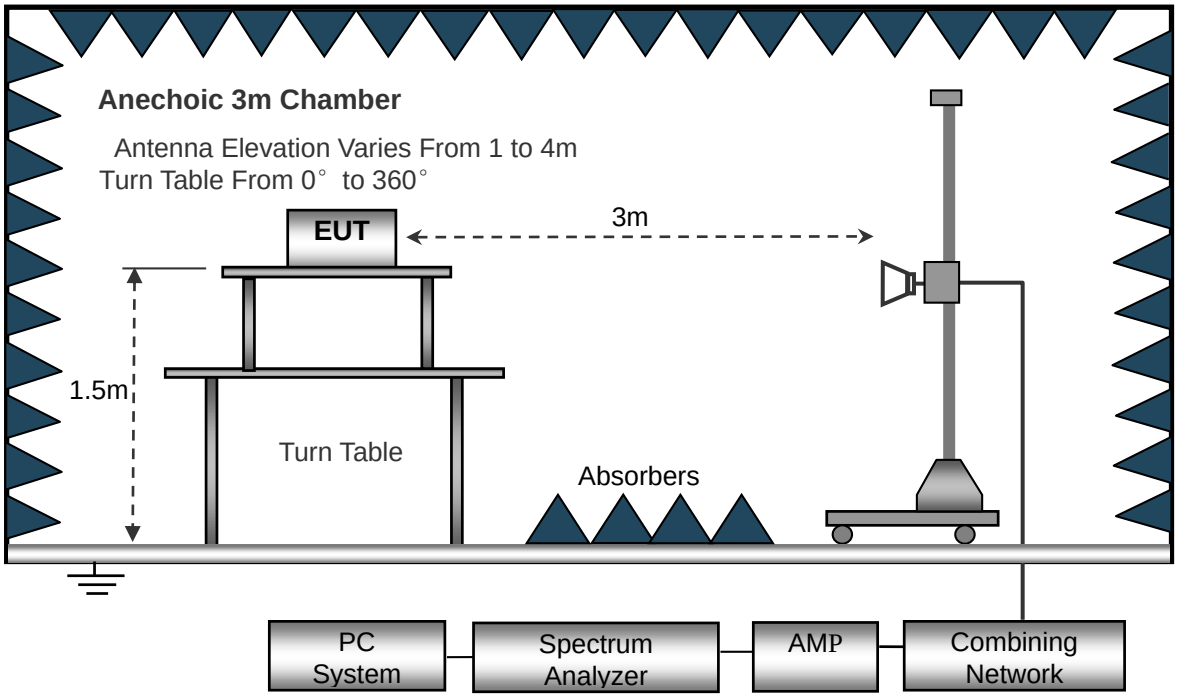
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1GHz.



8.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

8.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15 Limit

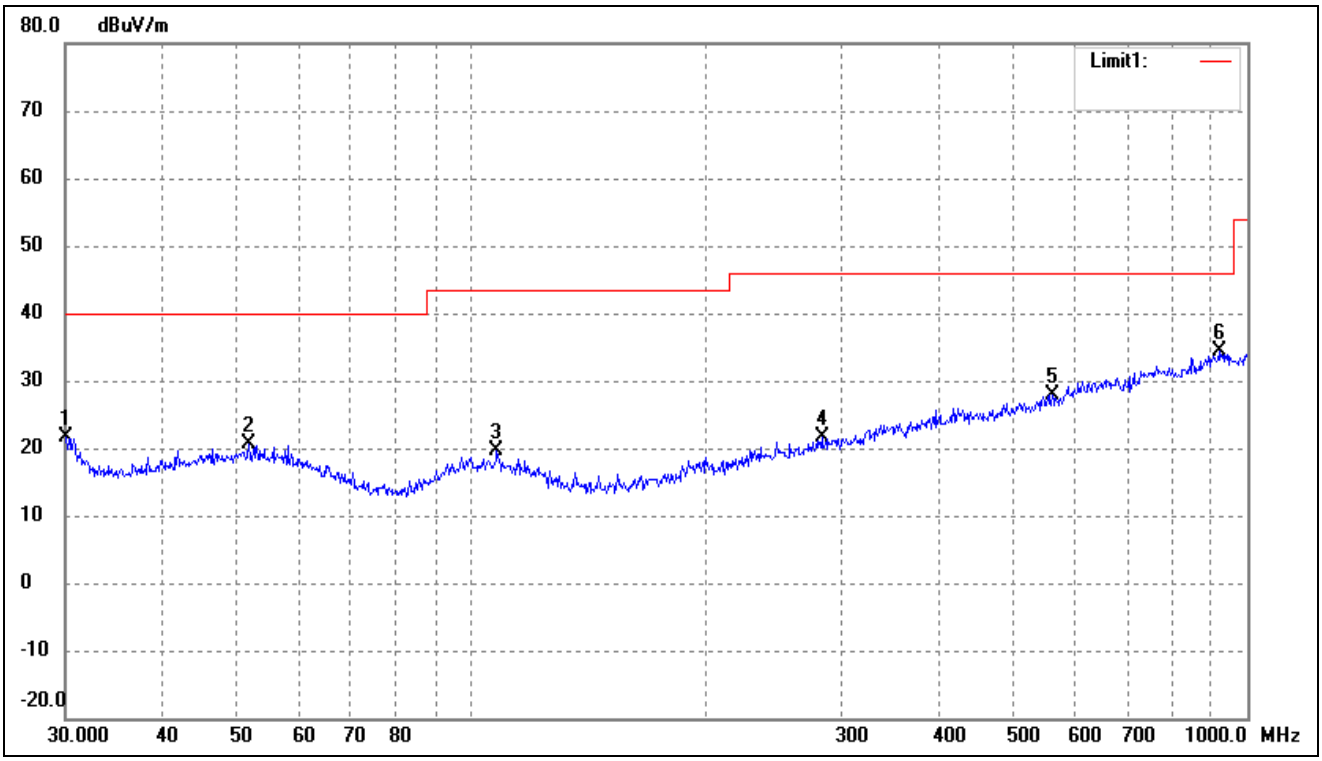
8.5 Summary of Test Results/Plots

Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

- Spurious Emission From 30MHz to 1GHz

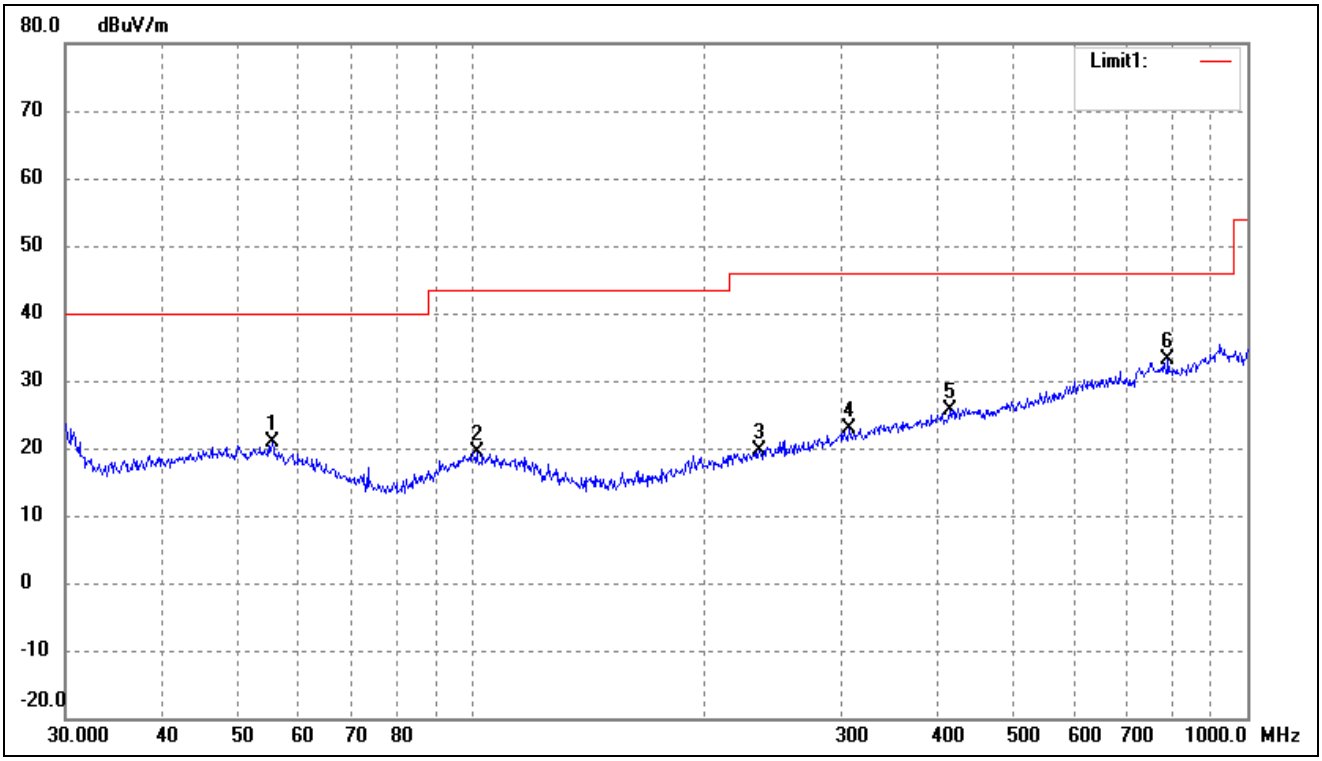
- Antenna 1(Worst case)
- 5150-5250MHz

802.11a(Worst case)			
Test Channel	5180MHz(Worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.1054	32.32	-10.76	21.56	40.00	-18.44	-	-	peak
2	51.6616	28.07	-7.39	20.68	40.00	-19.32	-	-	peak
3	107.8877	28.25	-8.57	19.68	43.50	-23.82	-	-	peak
4	282.9852	26.70	-5.19	21.51	46.00	-24.49	-	-	peak
5	560.6928	27.73	0.07	27.80	46.00	-18.20	-	-	peak
6	919.2866	28.04	6.26	34.30	46.00	-11.70	-	-	peak

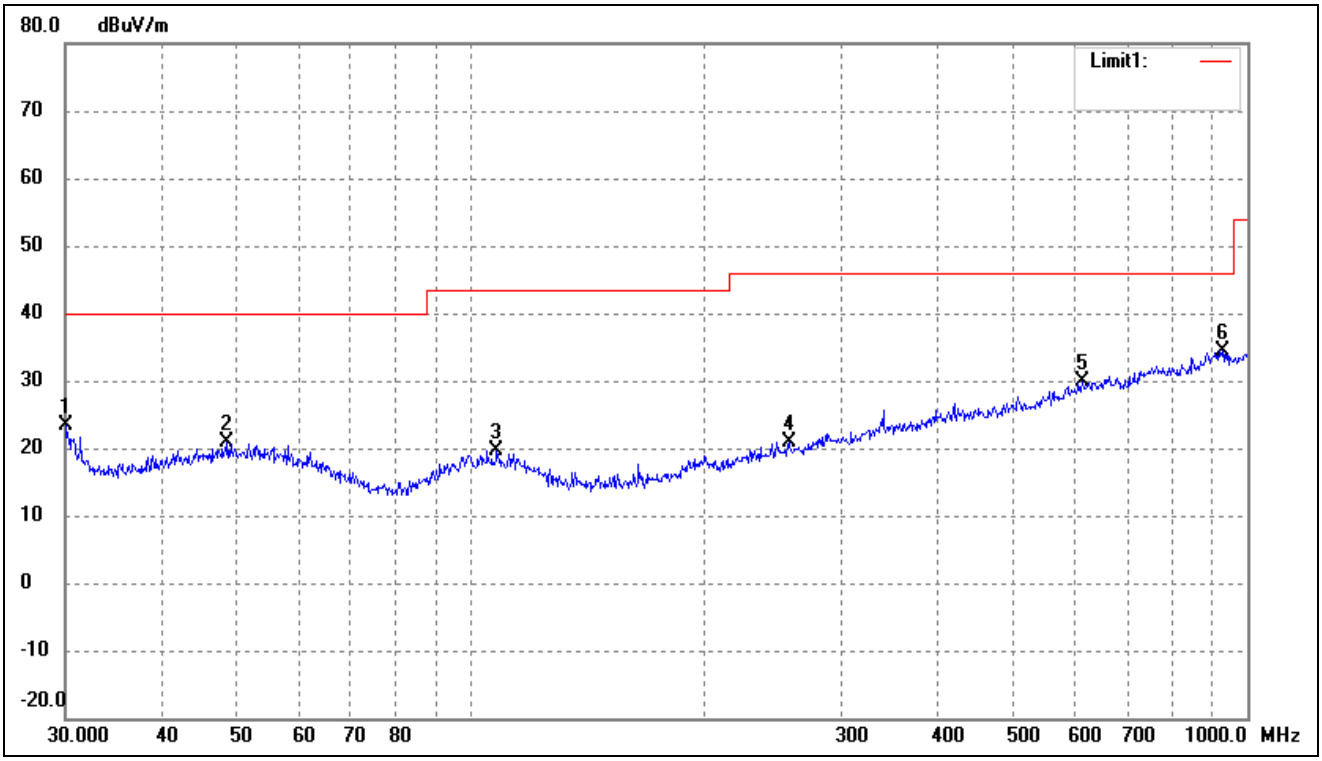
802.11a(Worst case)			
Test Channel	5180MHz(Worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	55.4147	28.55	-7.68	20.87	40.00	-19.13	-	-	peak
2	101.6443	27.94	-8.51	19.43	43.50	-24.07	-	-	peak
3	234.9909	26.41	-6.90	19.51	46.00	-26.49	-	-	peak
4	306.7537	27.59	-4.63	22.96	46.00	-23.04	-	-	peak
5	413.2706	27.97	-2.27	25.70	46.00	-20.30	-	-	peak
6	790.6188	28.87	4.14	33.01	46.00	-12.99	-	-	peak

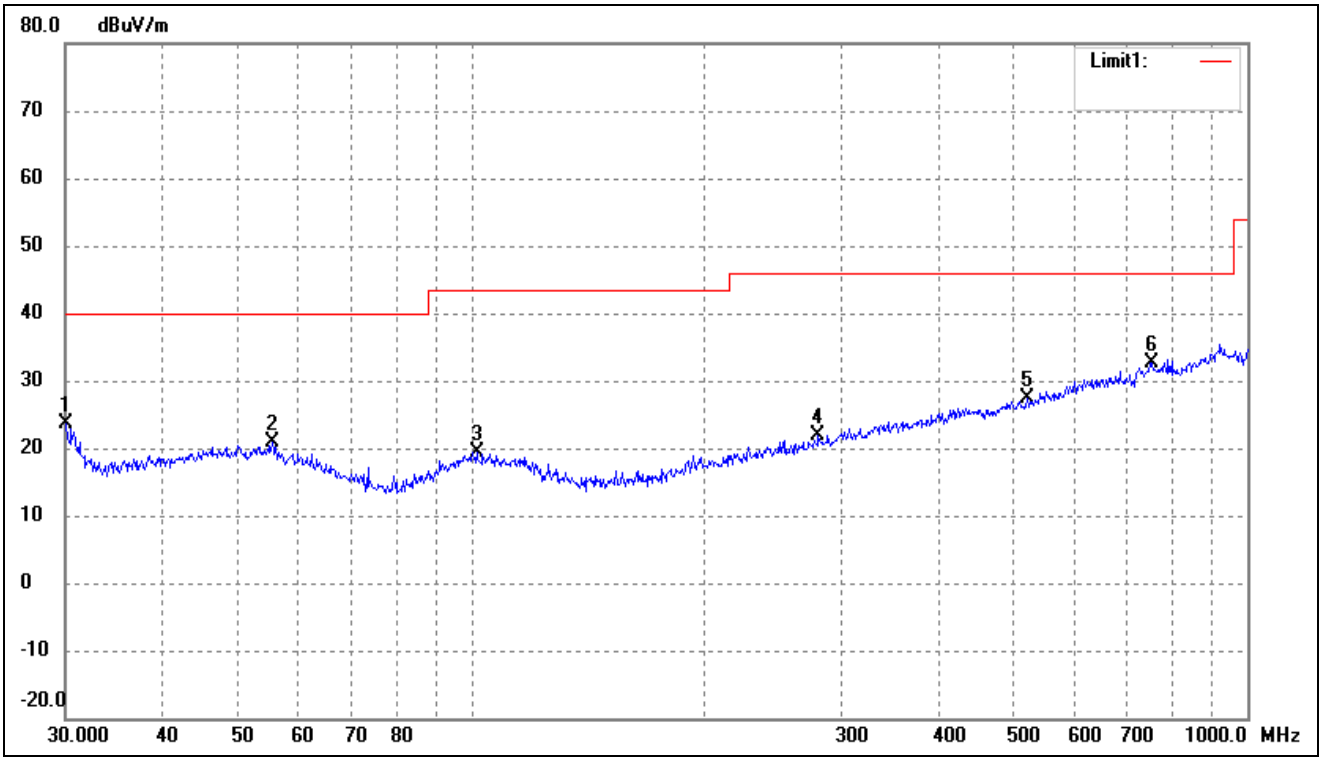
➢ 5250-5350MHz

802.11a(Worst case)			
Test Channel	5260MHz(Worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.1054	34.03	-10.76	23.27	40.00	-16.73	-	-	peak
2	48.5016	28.19	-7.40	20.79	40.00	-19.21	-	-	peak
3	107.8877	28.25	-8.57	19.68	43.50	-23.82	-	-	peak
4	256.5211	27.15	-6.35	20.80	46.00	-25.20	-	-	peak
5	612.0642	28.24	1.52	29.76	46.00	-16.24	-	-	peak
6	929.0082	28.12	6.21	34.33	46.00	-11.67	-	-	peak

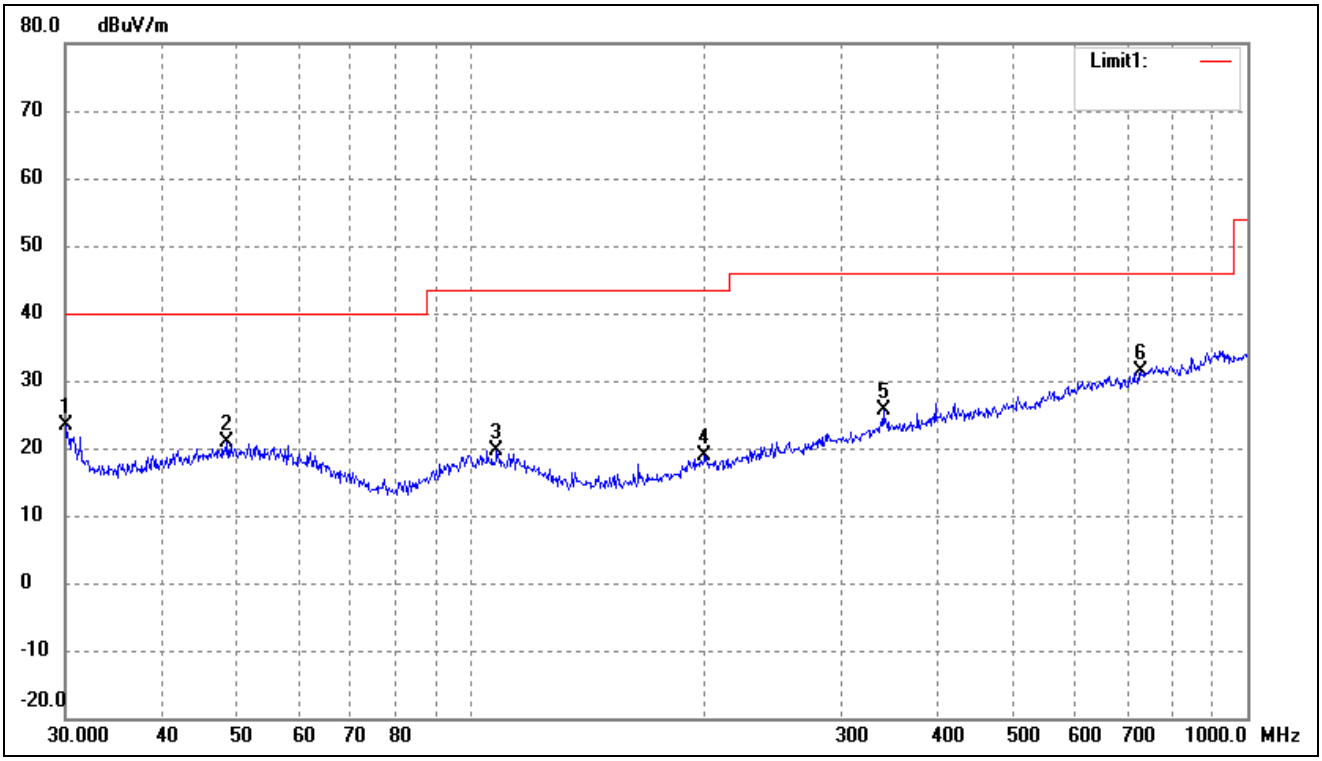
802.11a(Worst case)			
Test Channel	5260MHz(Worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.1054	34.43	-10.76	23.67	40.00	-16.33	-	-	peak
2	55.4147	28.55	-7.68	20.87	40.00	-19.13	-	-	peak
3	101.6443	27.94	-8.51	19.43	43.50	-24.07	-	-	peak
4	280.0238	27.16	-5.31	21.85	46.00	-24.15	-	-	peak
5	520.8882	28.18	-0.87	27.31	46.00	-18.69	-	-	peak
6	752.7432	28.82	3.86	32.68	46.00	-13.32	-	-	peak

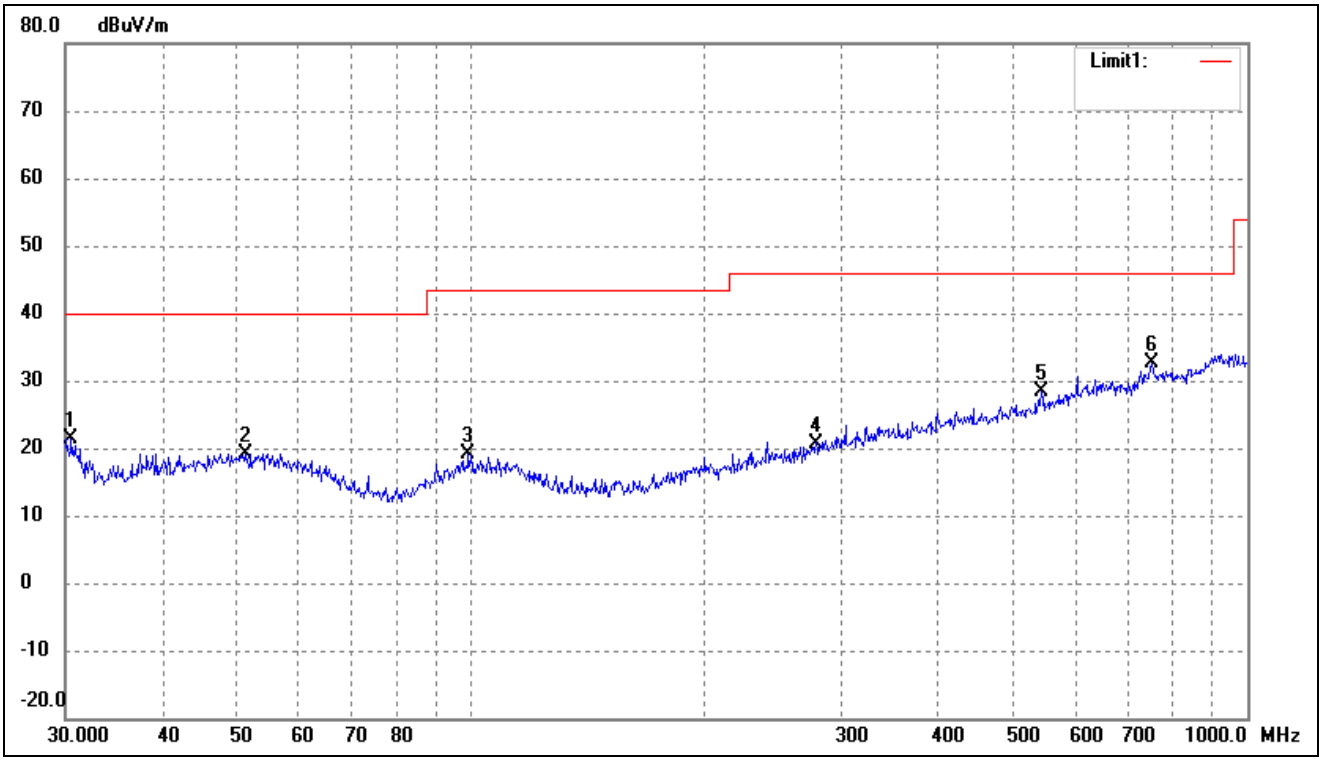
➢ 5470-5725MHz

802.11a(Worst case)			
Test Channel	5500MHz	Polarity:	Horizontal



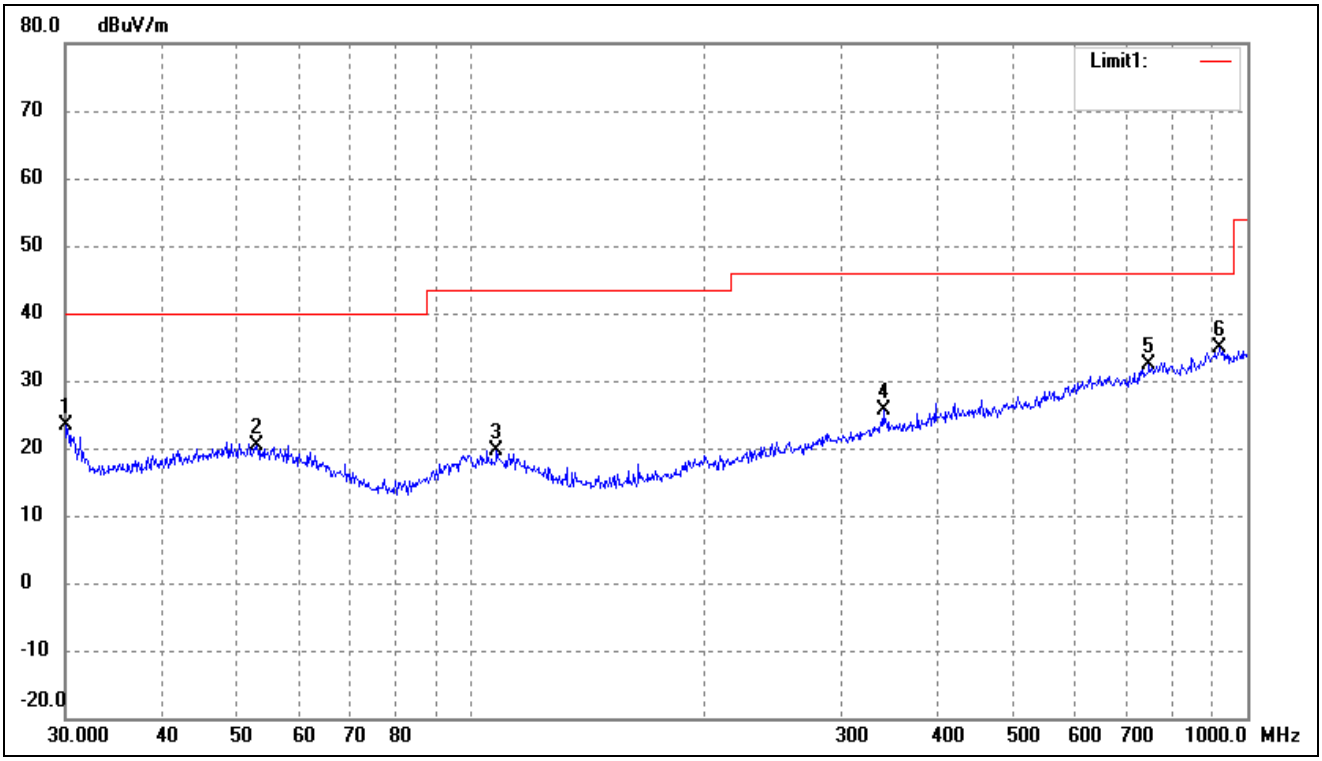
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.1054	34.03	-10.76	23.27	40.00	-16.73	-	-	peak
2	48.5016	28.19	-7.40	20.79	40.00	-19.21	-	-	peak
3	107.8877	28.25	-8.57	19.68	43.50	-23.82	-	-	peak
4	199.9856	26.77	-8.01	18.76	43.50	-24.74	-	-	peak
5	339.5888	28.95	-3.44	25.51	46.00	-20.49	-	-	peak
6	729.3583	28.09	3.33	31.42	46.00	-14.58	-	-	peak

802.11a(Worst case)			
Test Channel	5500MHz	Polarity:	Vertical



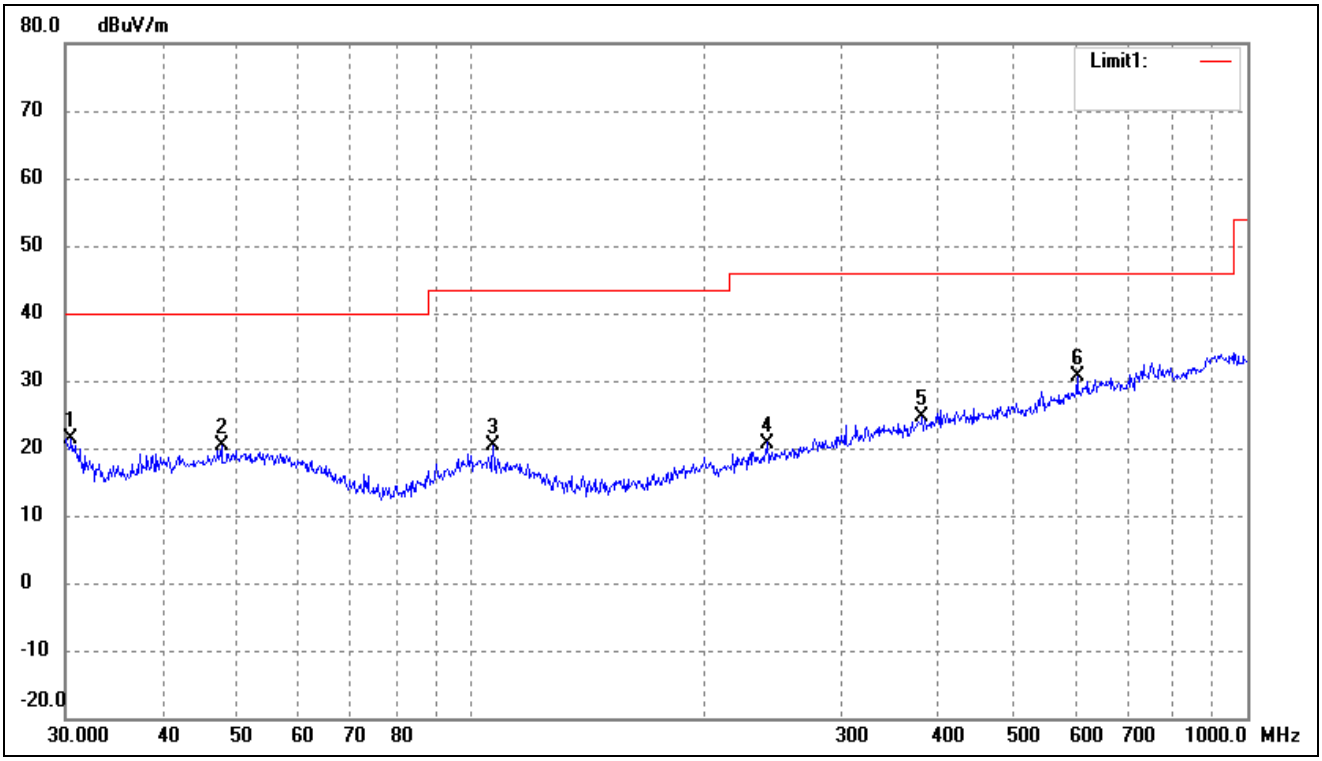
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.5306	32.13	-10.76	21.37	40.00	-18.63	-	-	peak
2	51.1209	26.60	-7.36	19.24	40.00	-20.76	-	-	peak
3	99.1797	27.73	-8.71	19.02	43.50	-24.48	-	-	peak
4	278.0669	26.20	-5.45	20.75	46.00	-25.25	-	-	peak
5	543.2742	28.68	-0.31	28.37	46.00	-17.63	-	-	peak
6	752.7432	28.65	3.86	32.51	46.00	-13.49	-	-	peak

802.11a(Worst case)			
Test Channel	5700MHz	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.1054	34.03	-10.76	23.27	40.00	-16.73	-	-	peak
2	52.9453	27.90	-7.44	20.46	40.00	-19.54	-	-	peak
3	107.8877	28.25	-8.57	19.68	43.50	-23.82	-	-	peak
4	339.5888	28.95	-3.44	25.51	46.00	-20.49	-	-	peak
5	747.4826	28.58	3.85	32.43	46.00	-13.57	-	-	peak
6	922.5157	28.61	6.27	34.88	46.00	-11.12	-	-	peak

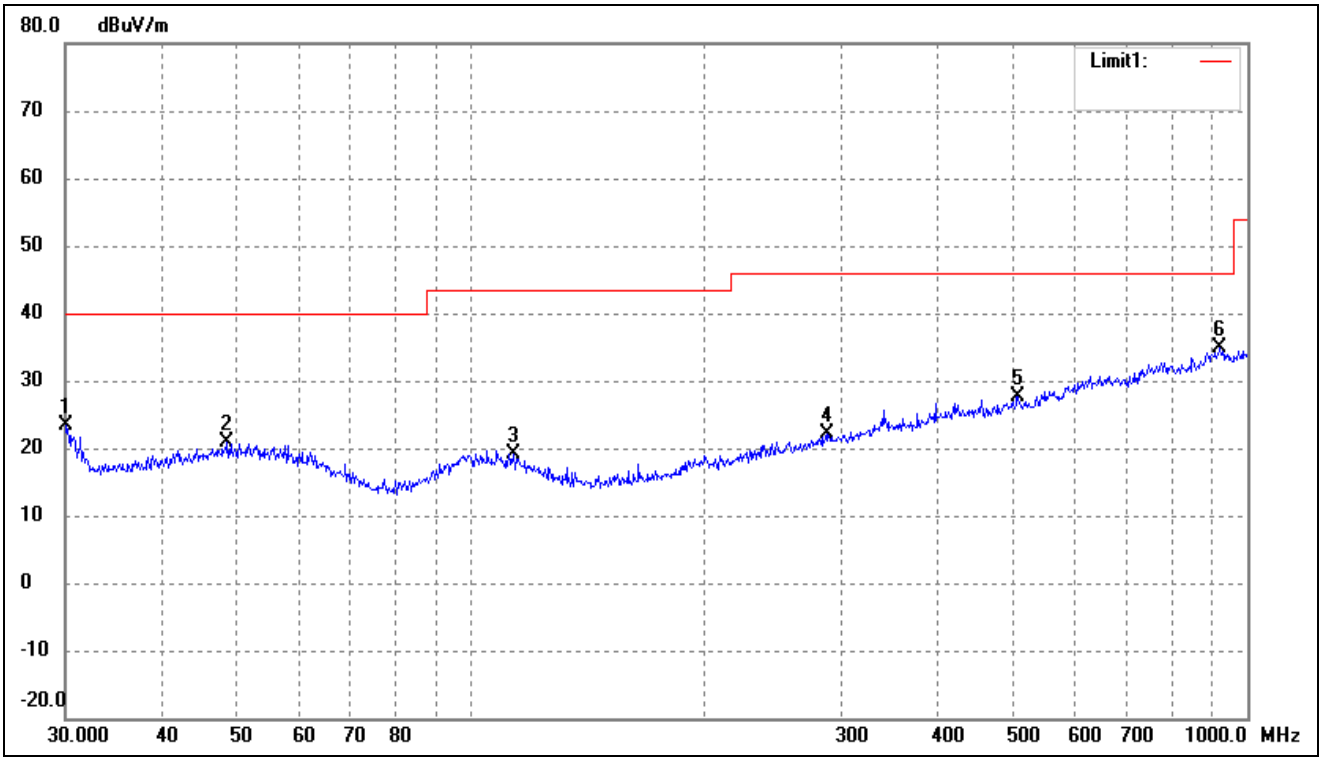
802.11a(Worst case)			
Test Channel	5700MHz	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.5306	32.13	-10.76	21.37	40.00	-18.63	-	-	peak
2	47.6586	27.90	-7.45	20.45	40.00	-19.55	-	-	peak
3	106.7587	28.86	-8.51	20.35	43.50	-23.15	-	-	peak
4	240.8304	27.38	-6.63	20.75	46.00	-25.25	-	-	peak
5	381.2487	27.55	-3.03	24.52	46.00	-21.48	-	-	peak
6	603.5392	29.28	1.44	30.72	46.00	-15.28	-	-	peak

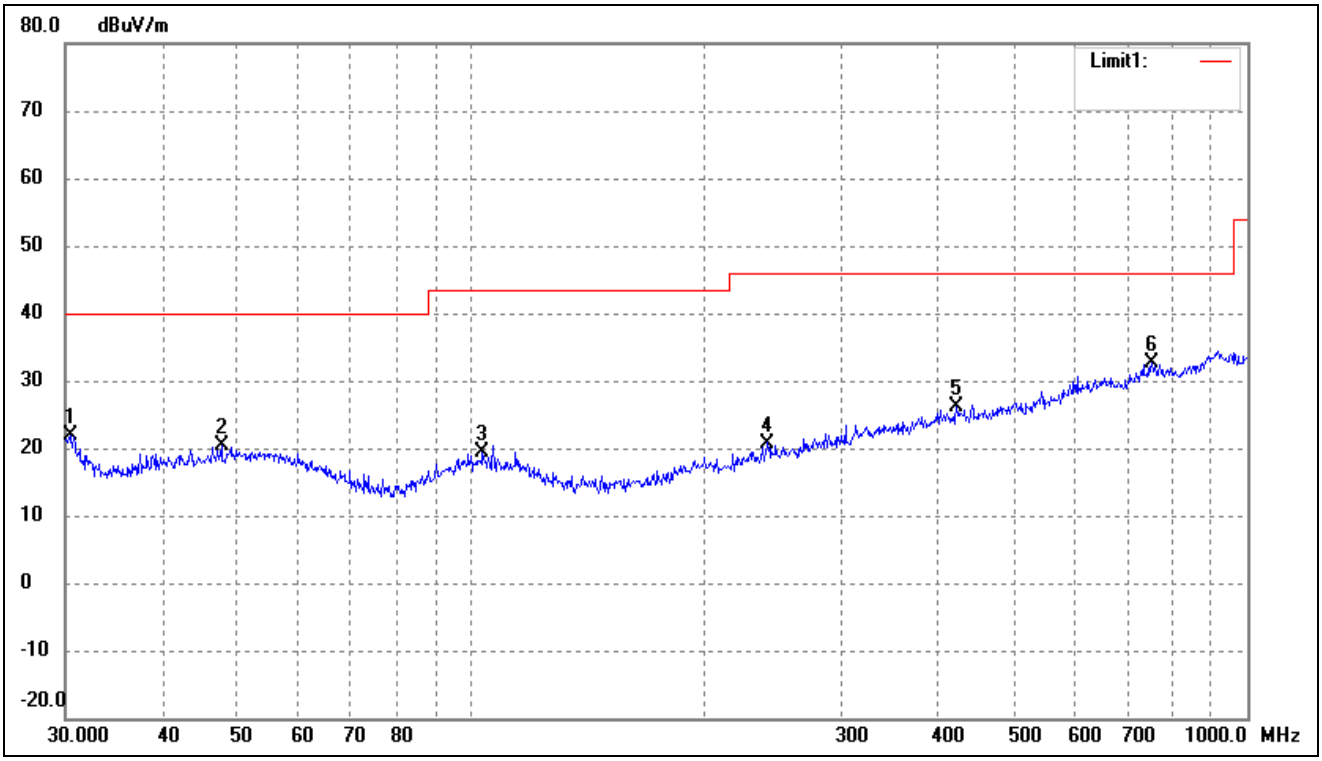
➢ 5725-5850MHz

802.11a(Worst case)			
Test Channel	5745MHz	Polarity:	Horizontal



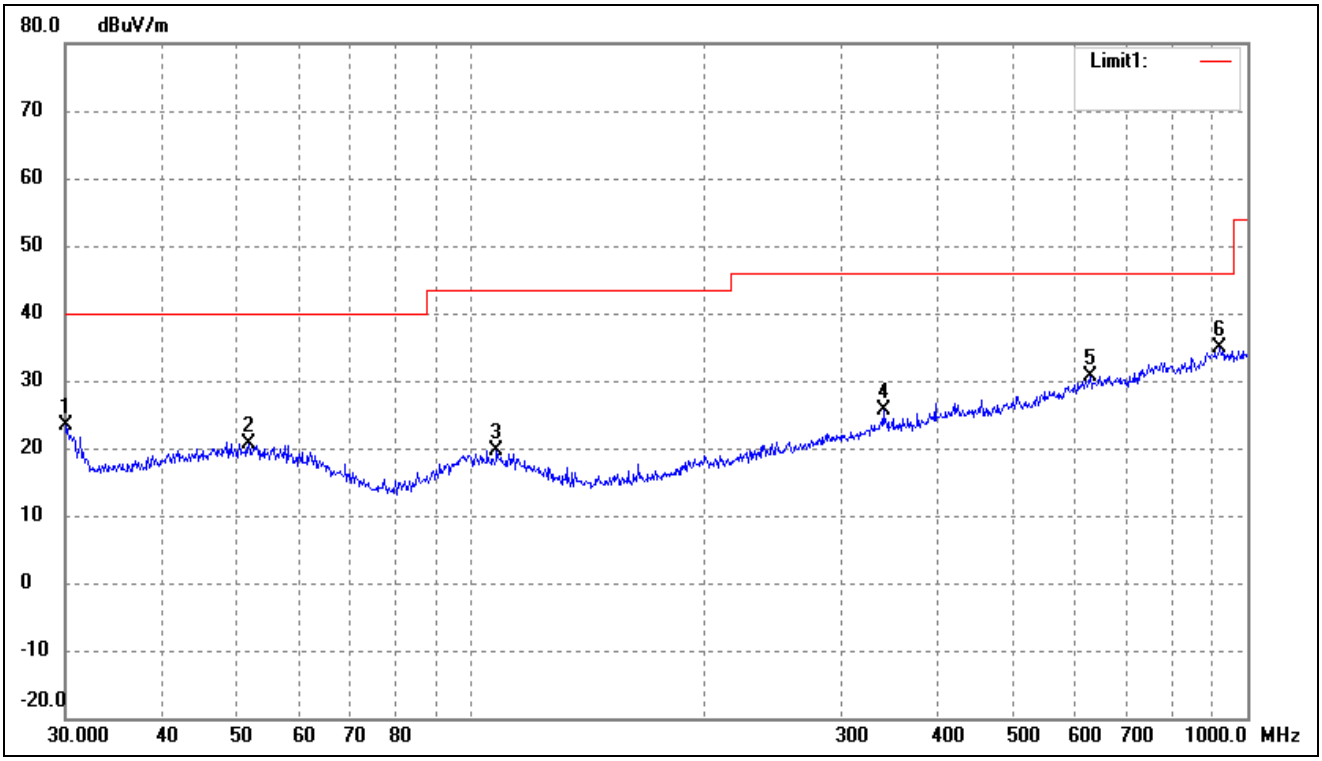
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.1054	34.03	-10.76	23.27	40.00	-16.73	-	-	peak
2	48.5016	28.19	-7.40	20.79	40.00	-19.21	-	-	peak
3	113.3163	28.25	-9.15	19.10	43.50	-24.40	-	-	peak
4	286.9823	27.11	-5.05	22.06	46.00	-23.94	-	-	peak
5	506.4791	28.69	-1.02	27.67	46.00	-18.33	-	-	peak
6	922.5157	28.61	6.27	34.88	46.00	-11.12	-	-	peak

802.11a(Worst case)			
Test Channel	5745MHz	Polarity:	Vertical



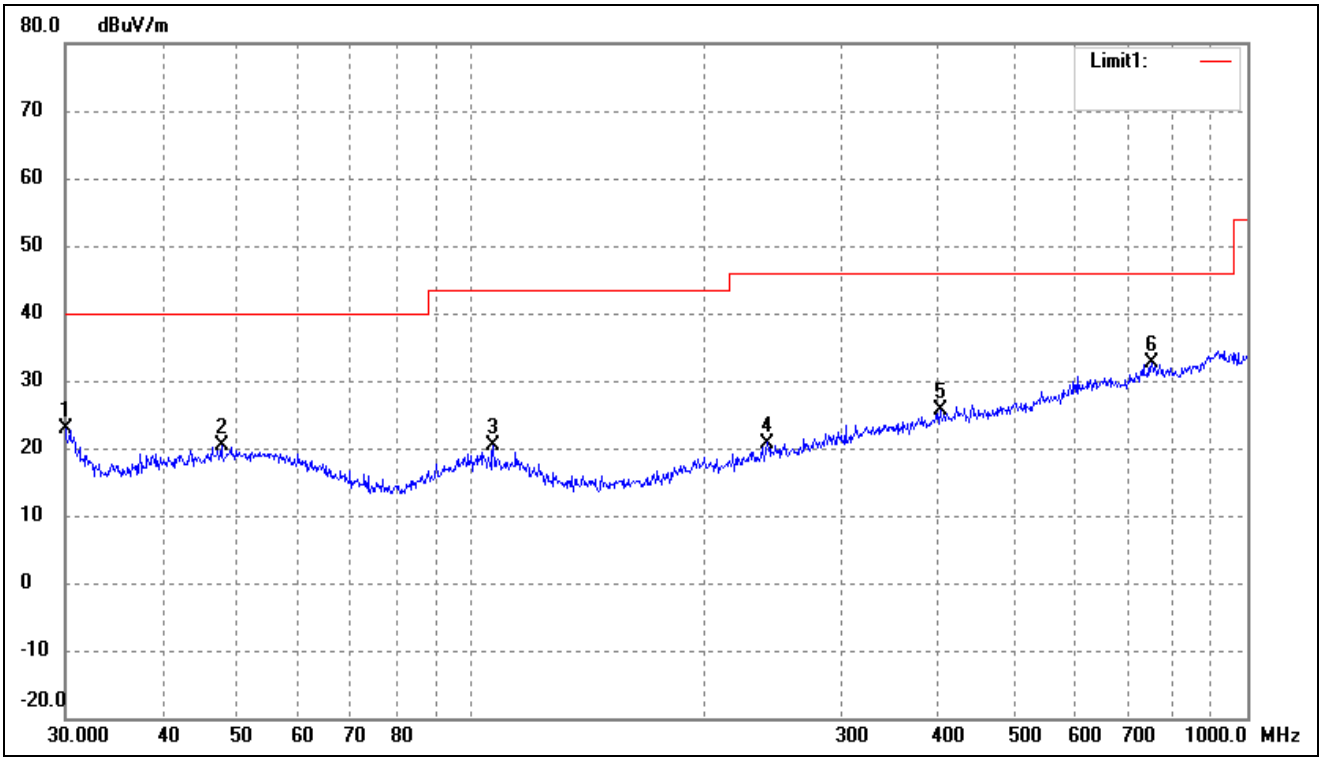
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.4238	32.59	-10.75	21.84	40.00	-18.16	-	-	peak
2	47.6586	27.90	-7.45	20.45	40.00	-19.55	-	-	peak
3	103.4421	27.94	-8.45	19.49	43.50	-24.01	-	-	peak
4	240.8304	27.38	-6.63	20.75	46.00	-25.25	-	-	peak
5	422.0577	28.18	-2.16	26.02	46.00	-19.98	-	-	peak
6	752.7432	28.65	3.86	32.51	46.00	-13.49	-	-	peak

802.11a(Worst case)			
Test Channel	5825MHz	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.1054	34.03	-10.76	23.27	40.00	-16.73	-	-	peak
2	51.6616	28.07	-7.39	20.68	40.00	-19.32	-	-	peak
3	107.8877	28.25	-8.57	19.68	43.50	-23.82	-	-	peak
4	339.5888	28.95	-3.44	25.51	46.00	-20.49	-	-	peak
5	627.2738	29.08	1.50	30.58	46.00	-15.42	-	-	peak
6	922.5157	28.61	6.27	34.88	46.00	-11.12	-	-	peak

802.11a(Worst case)			
Test Channel	5825MHz	Polarity:	Vertical



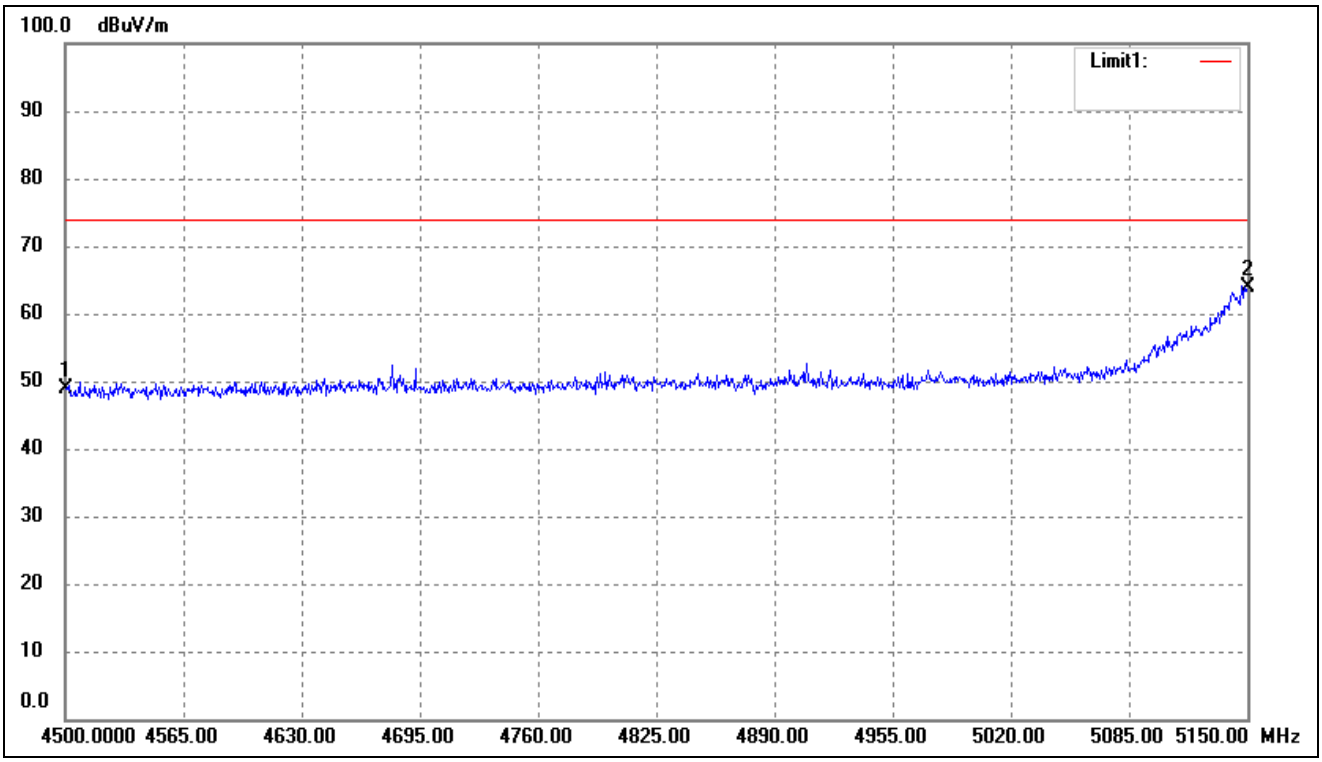
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	30.0000	33.66	-10.76	22.90	40.00	-17.10	-	-	peak
2	47.6586	27.90	-7.45	20.45	40.00	-19.55	-	-	peak
3	106.7587	28.86	-8.51	20.35	43.50	-23.15	-	-	peak
4	240.8304	27.38	-6.63	20.75	46.00	-25.25	-	-	peak
5	401.8385	28.10	-2.48	25.62	46.00	-20.38	-	-	peak
6	752.7432	28.65	3.86	32.51	46.00	-13.49	-	-	peak

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

- Spurious Emission above 1GHz
- Antenna 1(worst case)

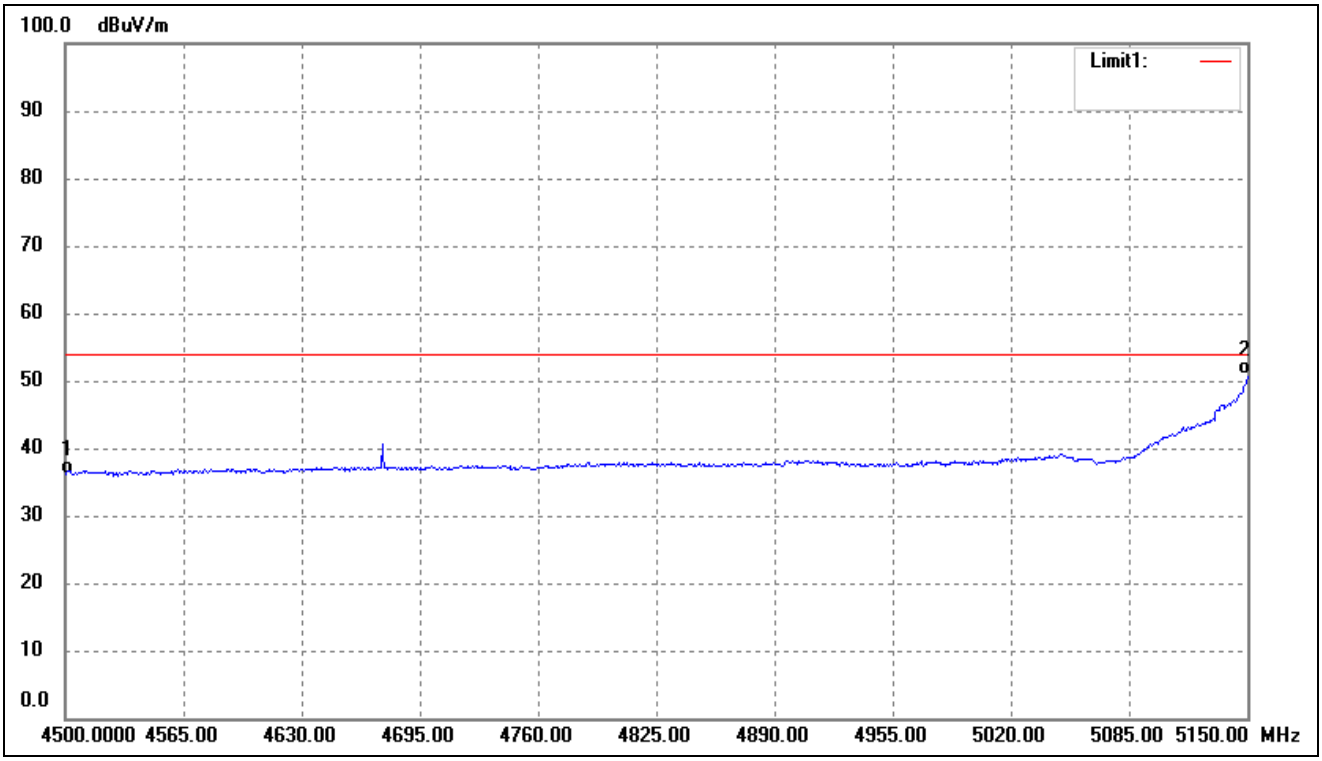
5150-5250MHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.50-5.15GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4500.000	52.36	-3.45	48.91	74.00	-25.09	-	-	peak
2	5150.000	66.15	-2.23	63.92	74.00	-10.08	-	-	peak

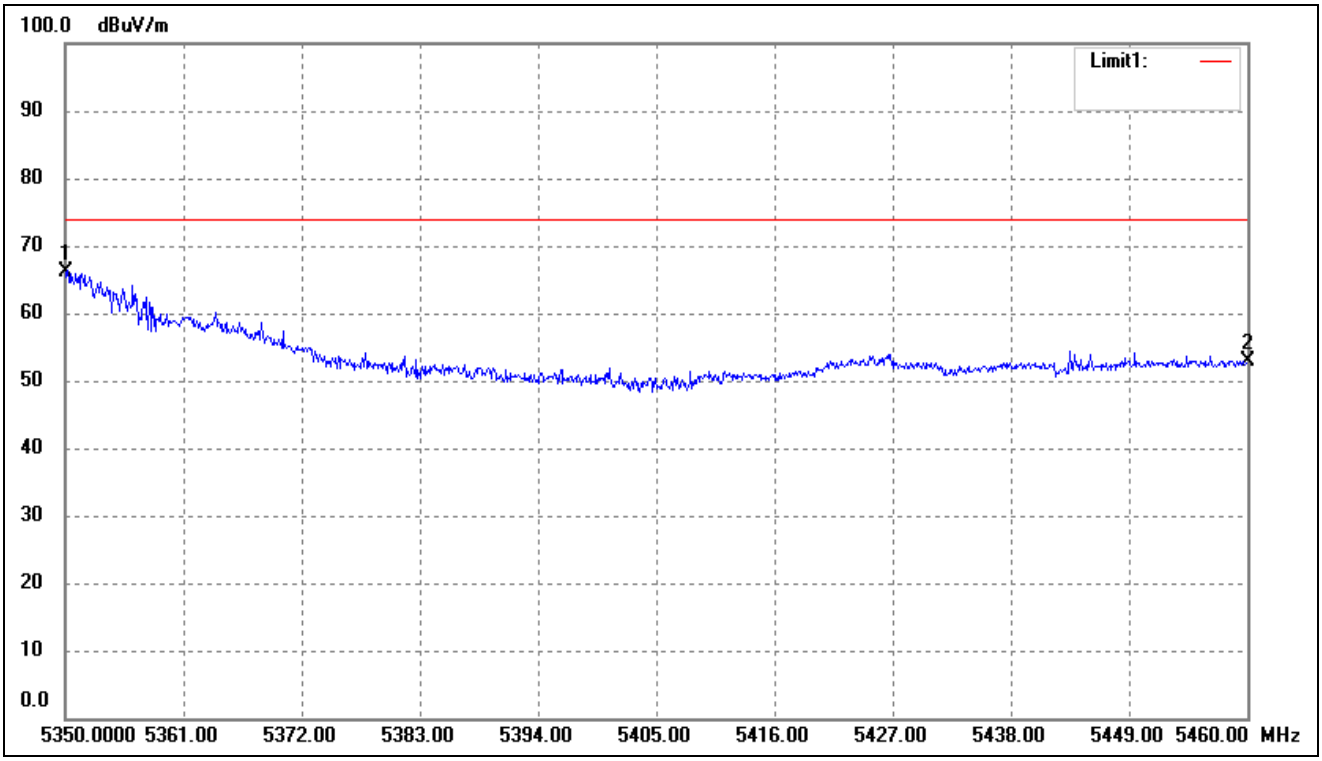
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.50-5.15GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4500.000	39.69	-3.45	36.24	54.00	-17.76	-	-	AVG
2	5150.000	53.01	-2.23	50.78	54.00	-3.22	-	-	AVG

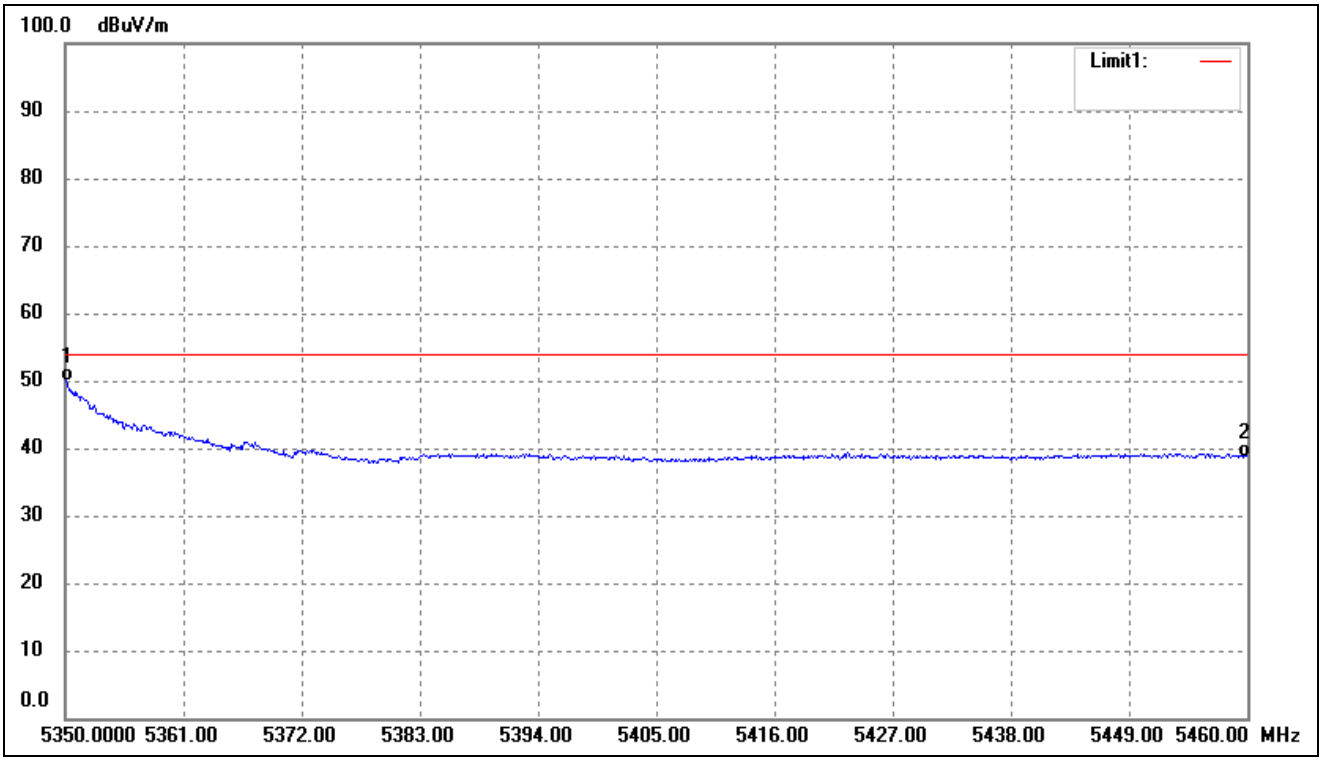
5250-5350MHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	68.00	-1.89	66.11	74.00	-7.89	-	-	peak
2	5460.000	54.59	-1.71	52.88	74.00	-21.12	-	-	peak

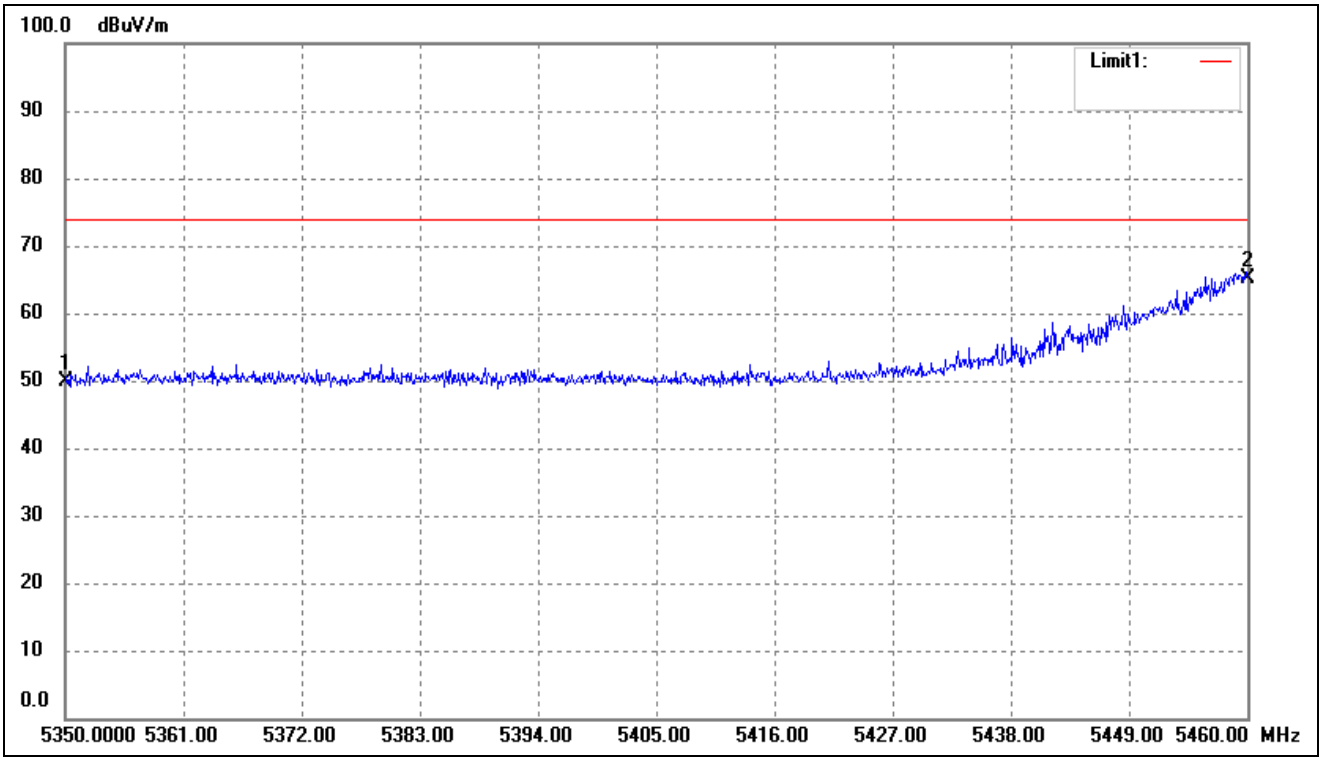
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	51.85	-1.89	49.96	54.00	-4.04	-	-	AVG
2	5460.000	40.33	-1.71	38.62	54.00	-15.38	-	-	AVG

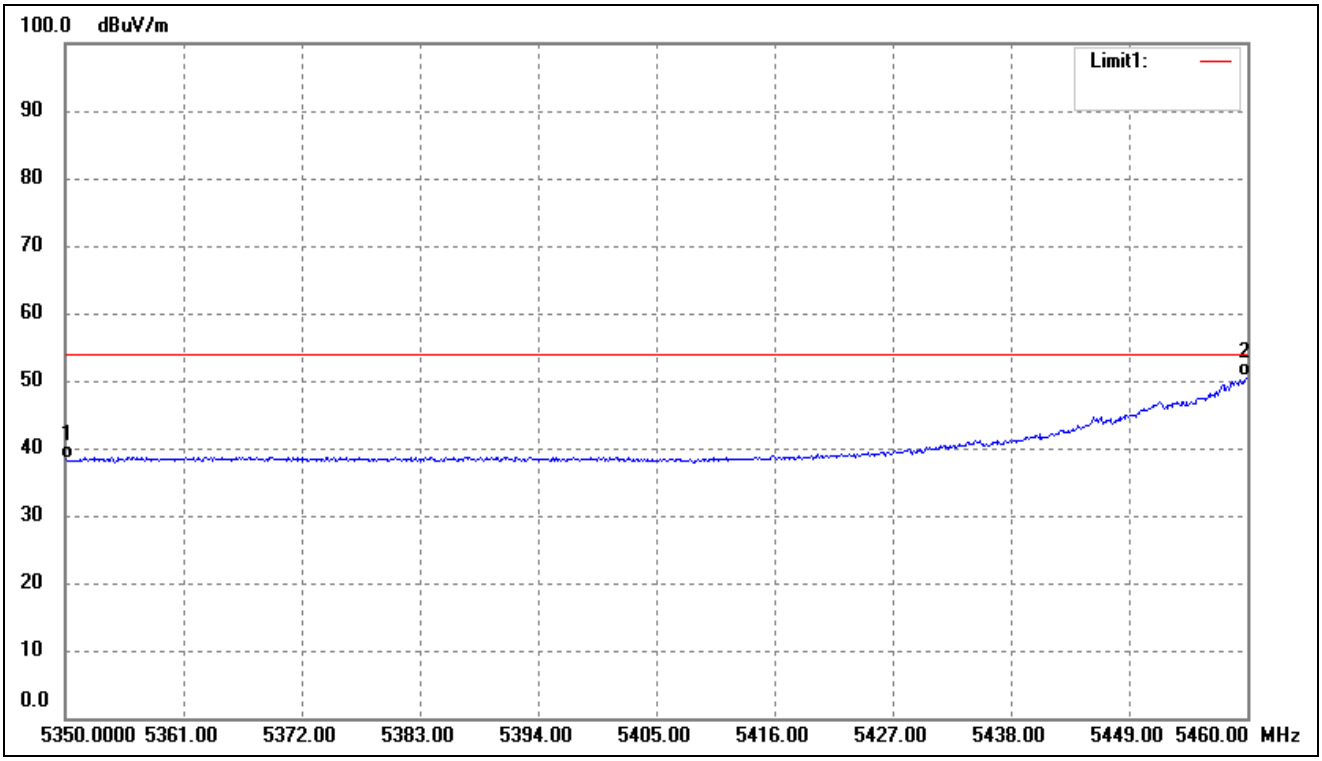
5470-5725MHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	51.73	-1.89	49.84	74.00	-24.16	-	-	peak
2	5460.000	66.82	-1.71	65.11	74.00	-8.89	-	-	peak

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



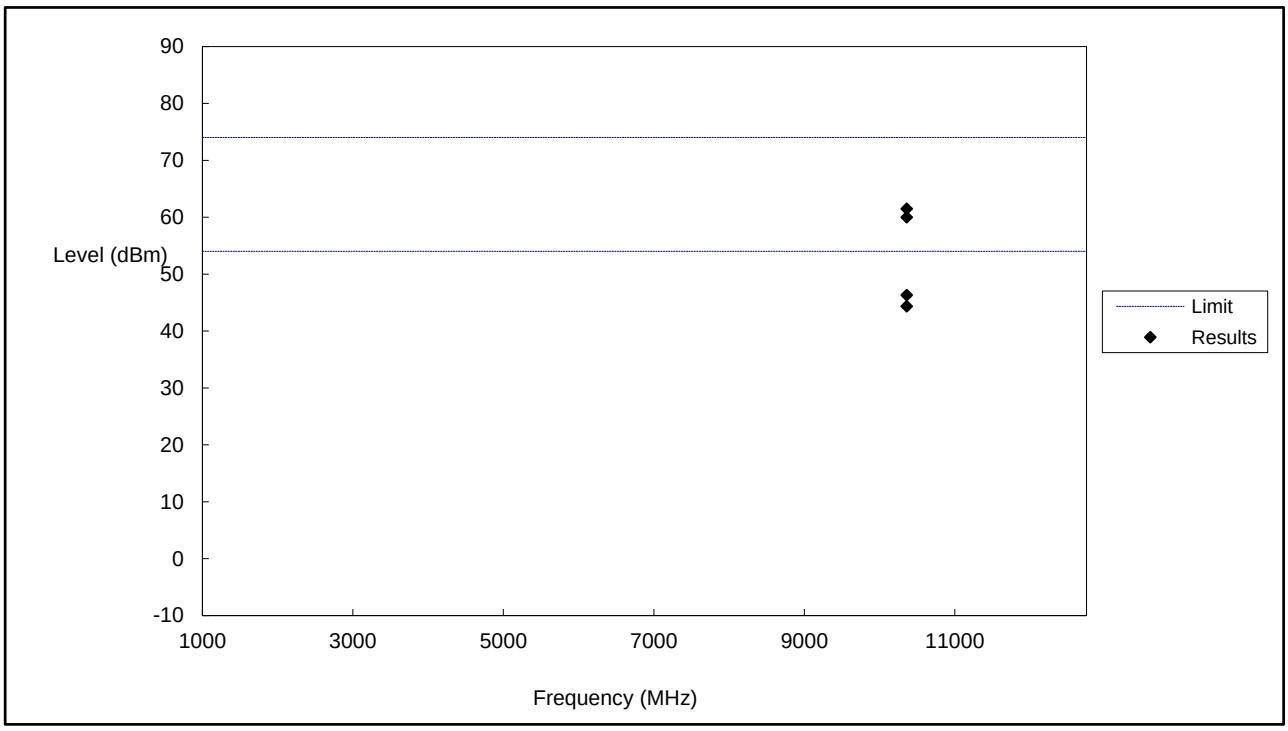
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	40.19	-1.89	38.30	54.00	-15.70	-	-	AVG
2	5460.000	52.35	-1.71	50.64	54.00	-3.36	-	-	AVG

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

Remark: '-'Means' the test Degree and Height is not recorded by the test software and only show the worst case in the test report.

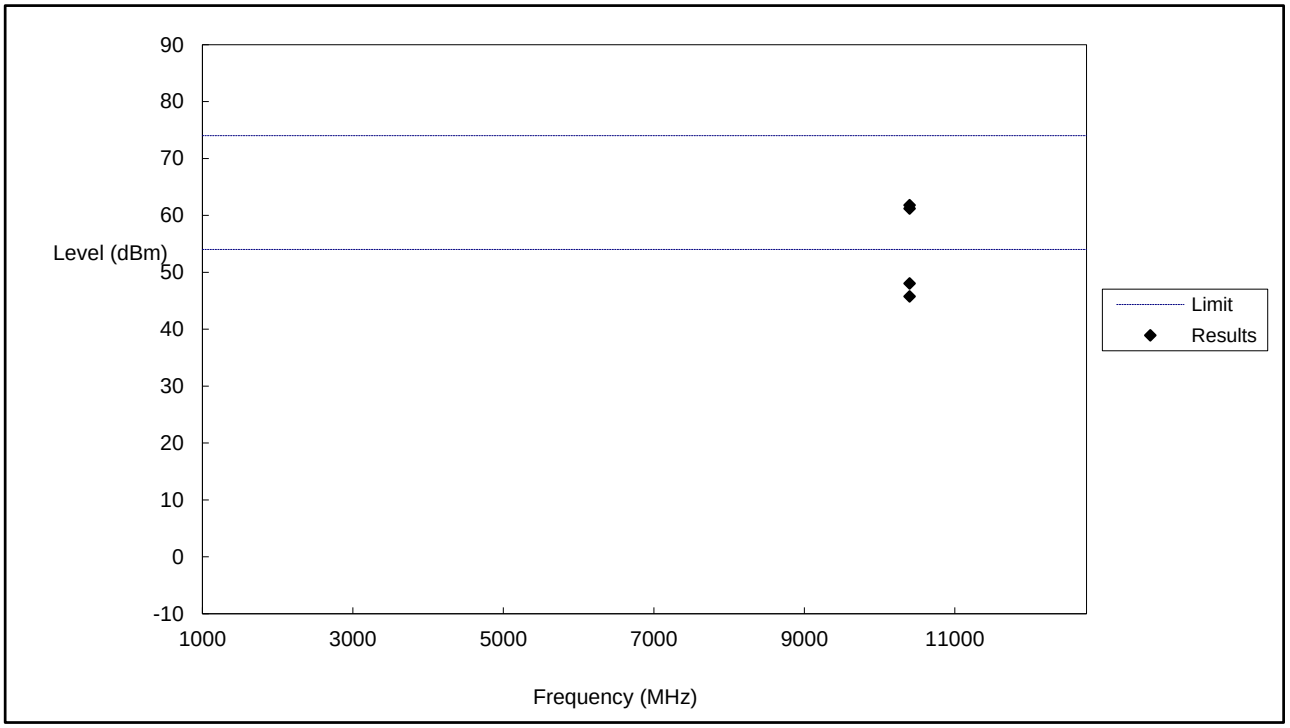
- Antenna 1(worst case)
- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11a)
- Harmonics And Spurious Emissions

Low Channel



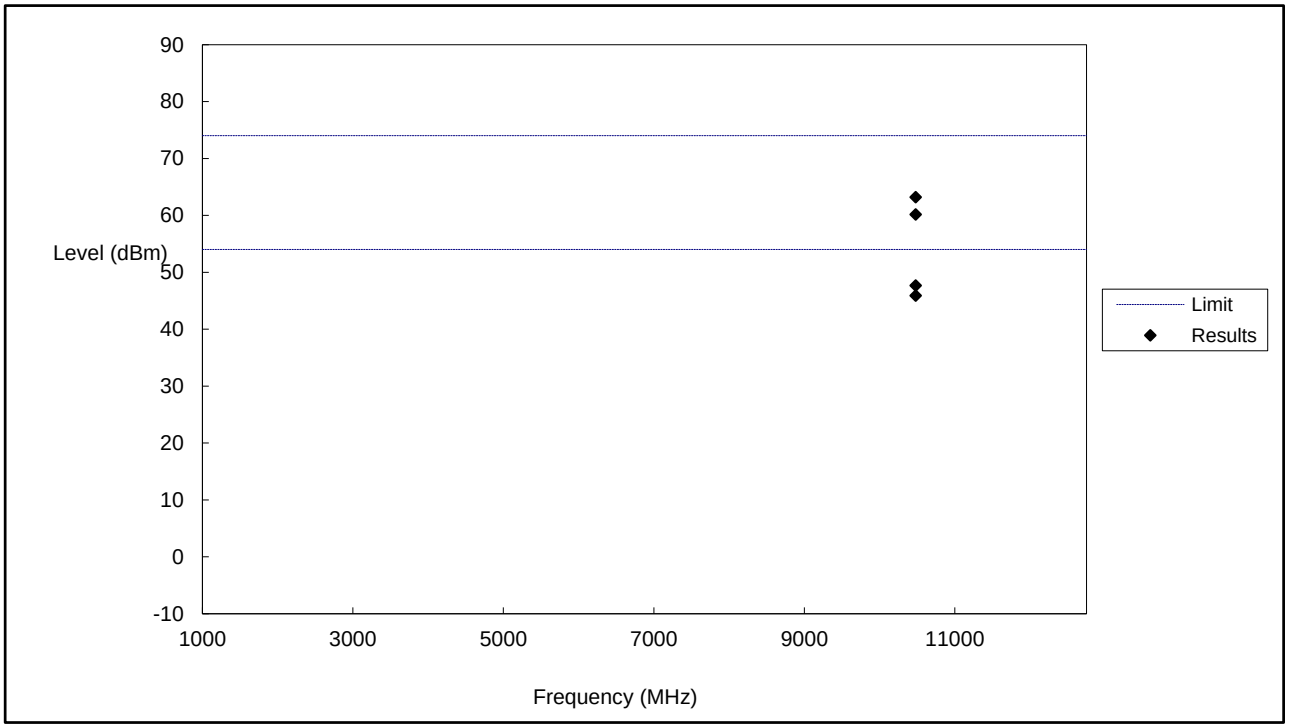
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10360	61.48	74	-12.52	H	RMS
2	10360	46.32	54	-7.68	H	RMS
1	10360	59.98	74	-14.02	V	RMS
2	10360	44.36	54	-9.64	V	RMS

Middle Channel



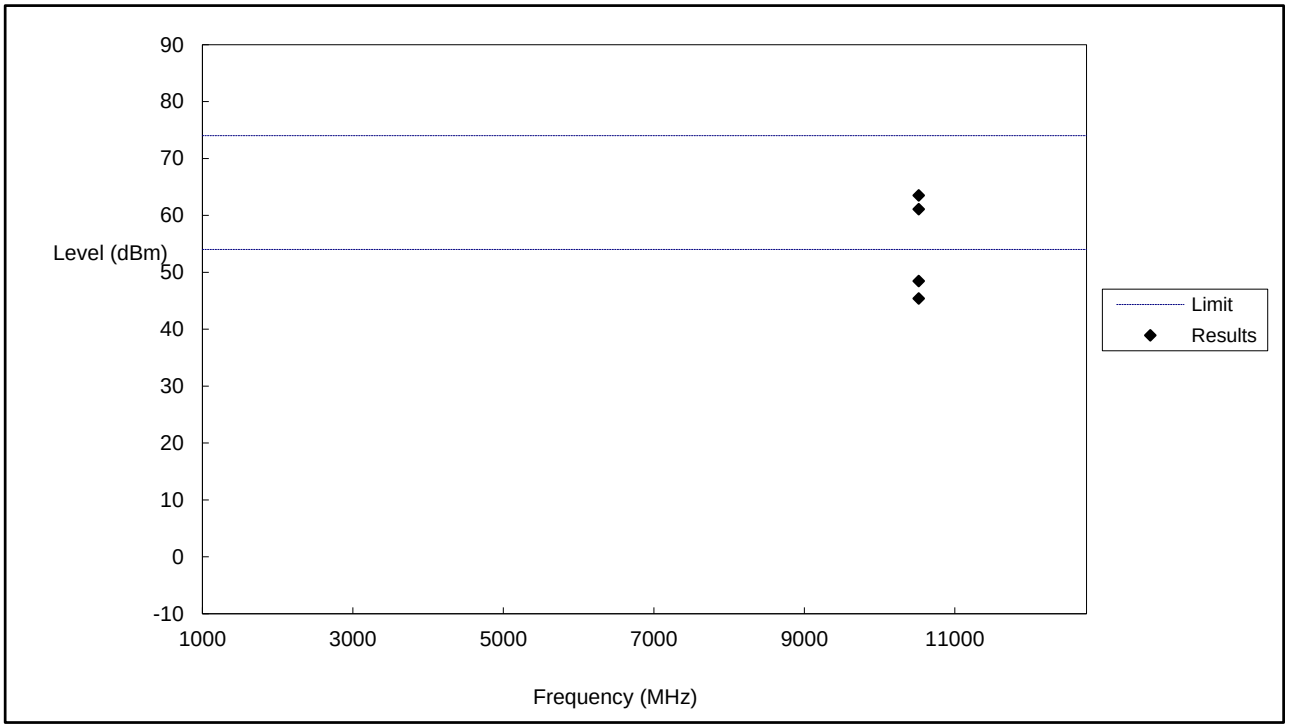
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10400	61.21	74	-12.79	H	RMS
2	10400	45.76	54	-8.24	H	RMS
1	10400	61.78	74	-12.22	V	RMS
2	10400	48.03	54	-5.97	V	RMS

High Channel



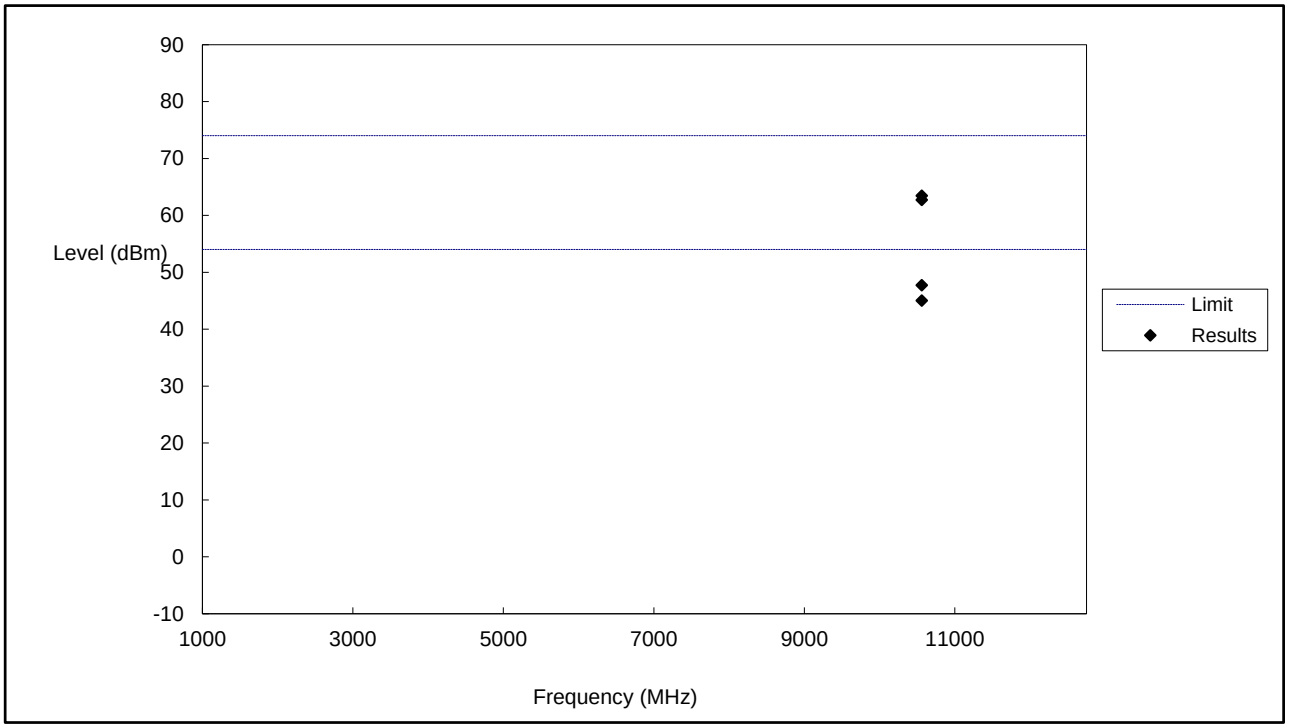
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10480	63.19	74	-10.81	H	RMS
2	10480	45.91	54	-8.09	H	RMS
1	10480	60.17	74	-13.83	V	RMS
2	10480	47.67	54	-6.33	V	RMS

Low Channel



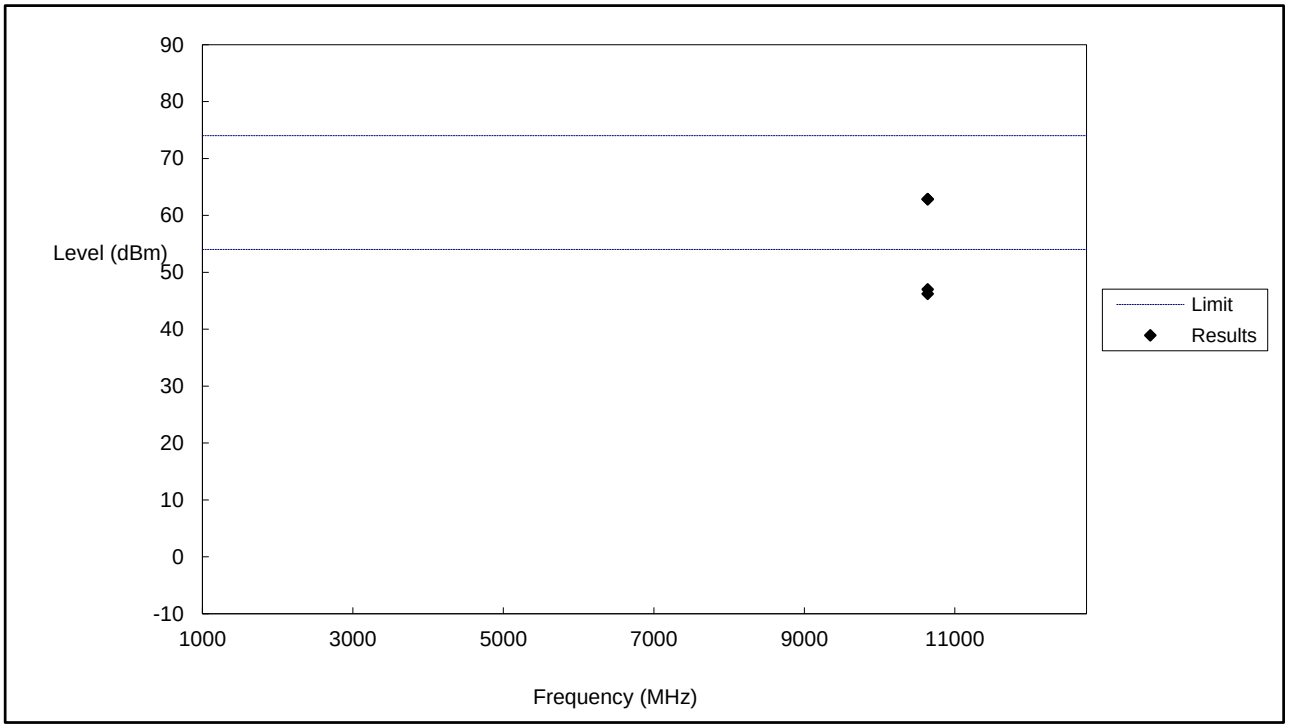
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10520	61.08	74	-12.92	H	RMS
2	10520	48.45	54	-5.55	H	RMS
1	10520	63.52	74	-10.48	V	RMS
2	10520	45.39	54	-8.61	V	RMS

Middle Channel



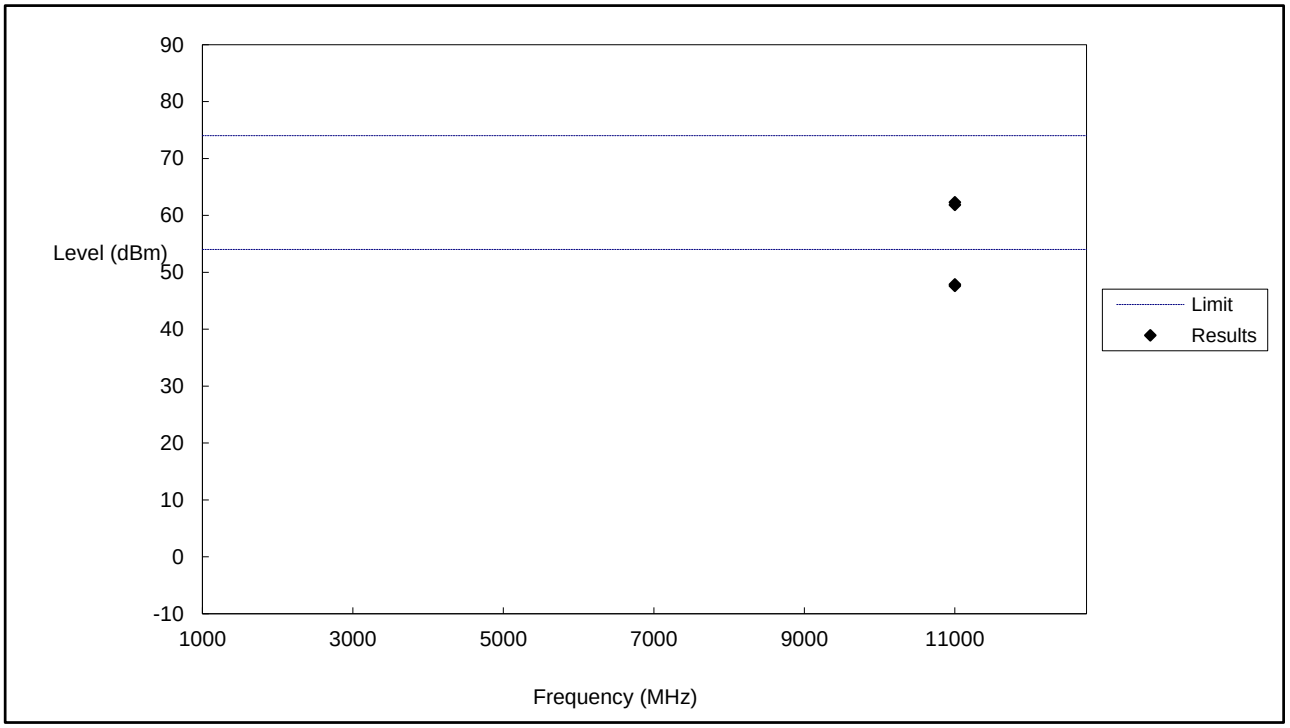
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10560	63.46	74	-10.54	H	RMS
2	10560	45.03	54	-8.97	H	RMS
1	10560	62.71	74	-11.29	V	RMS
2	10560	47.73	54	-6.27	V	RMS

High Channel



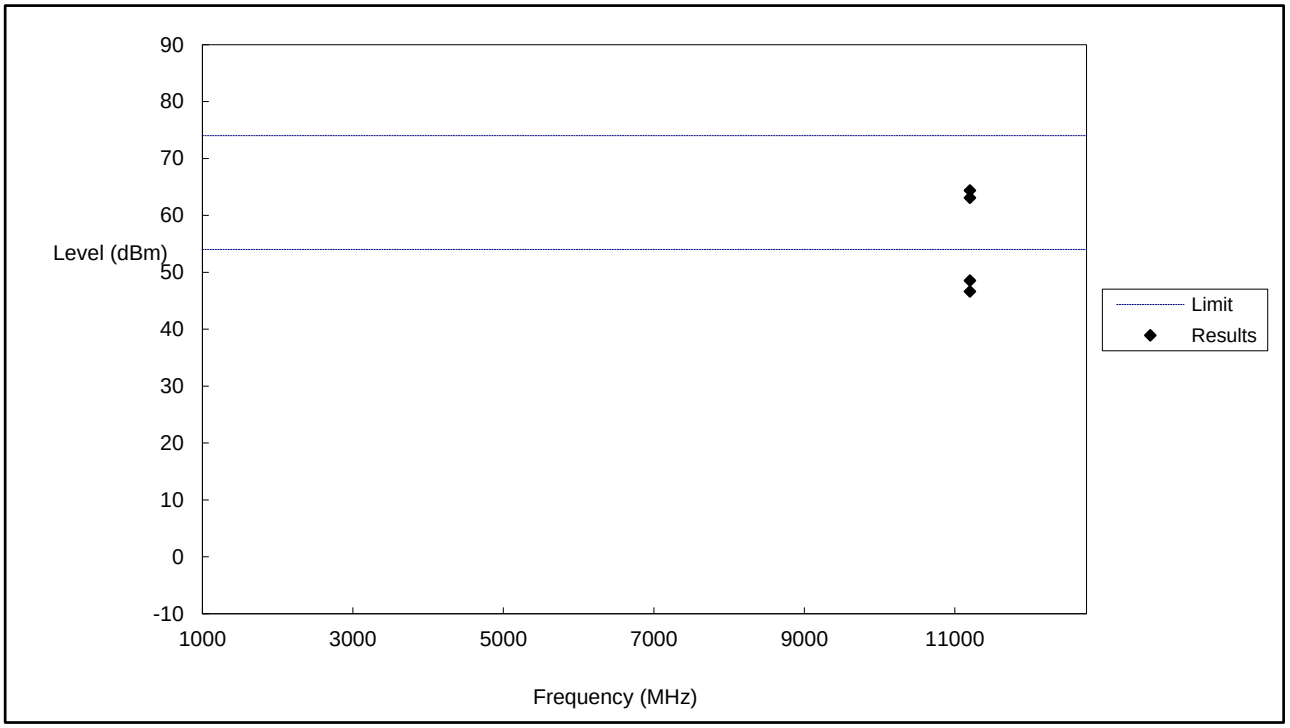
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10640	62.82	74	-11.18	H	RMS
2	10640	46.99	54	-7.01	H	RMS
1	10640	62.85	74	-11.15	V	RMS
2	10640	46.20	54	-7.80	V	RMS

Low Channel



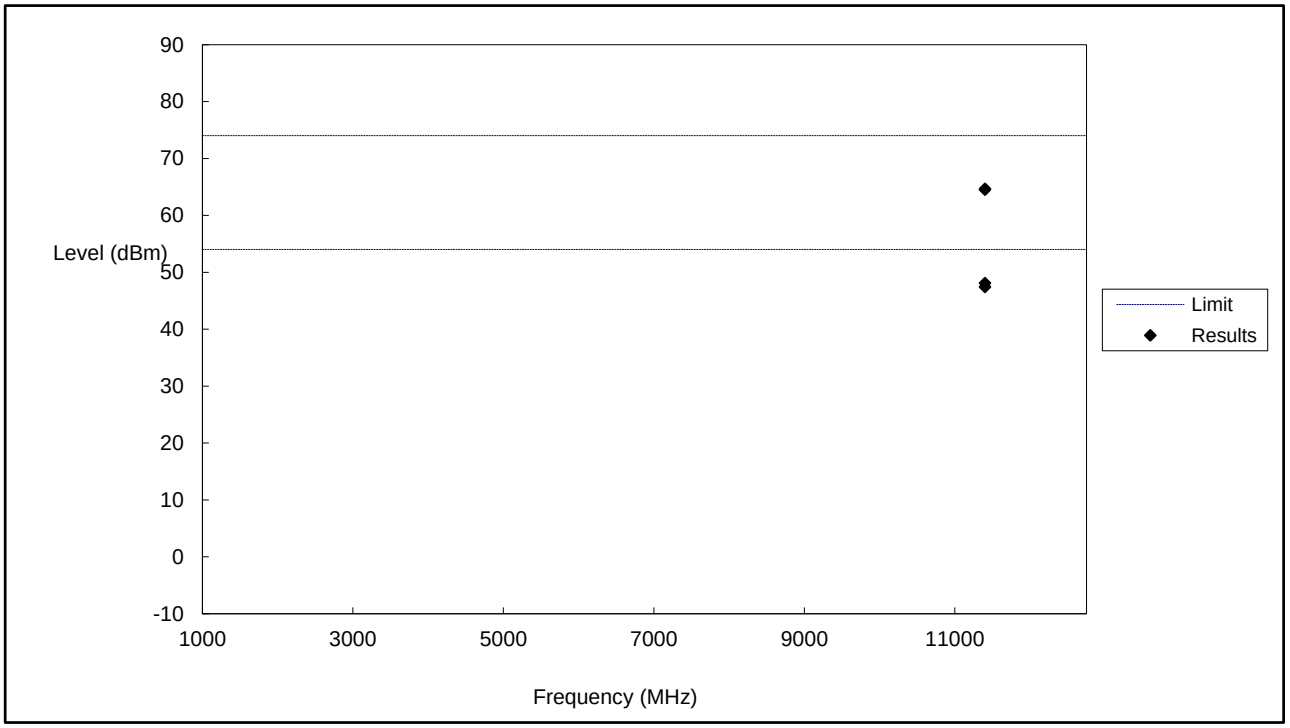
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11000	62.31	74	-11.69	H	RMS
2	11000	47.61	54	-6.39	H	RMS
1	11000	61.85	74	-12.15	V	RMS
2	11000	47.88	54	-6.12	V	RMS

Middle Channel



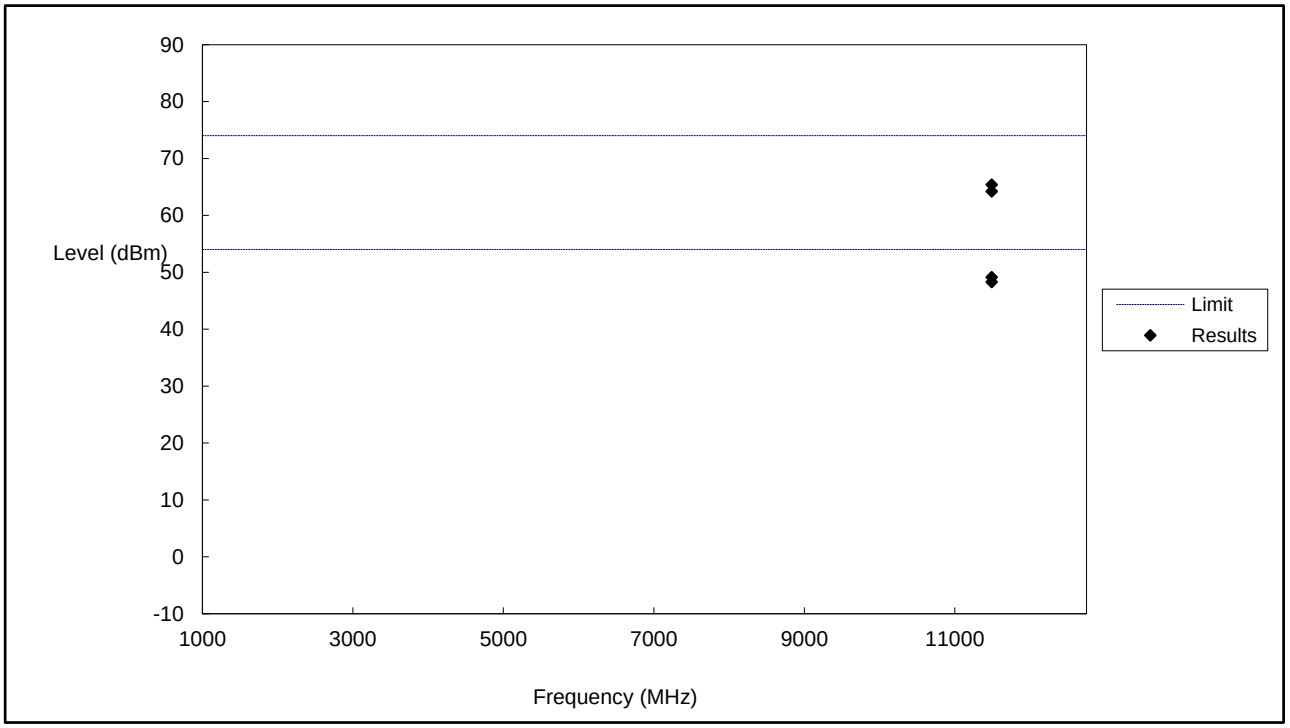
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11200	63.09	74	-10.91	H	RMS
2	11200	48.55	54	-5.45	H	RMS
1	11200	64.37	74	-9.63	V	RMS
2	11200	46.63	54	-7.37	V	RMS

High Channel



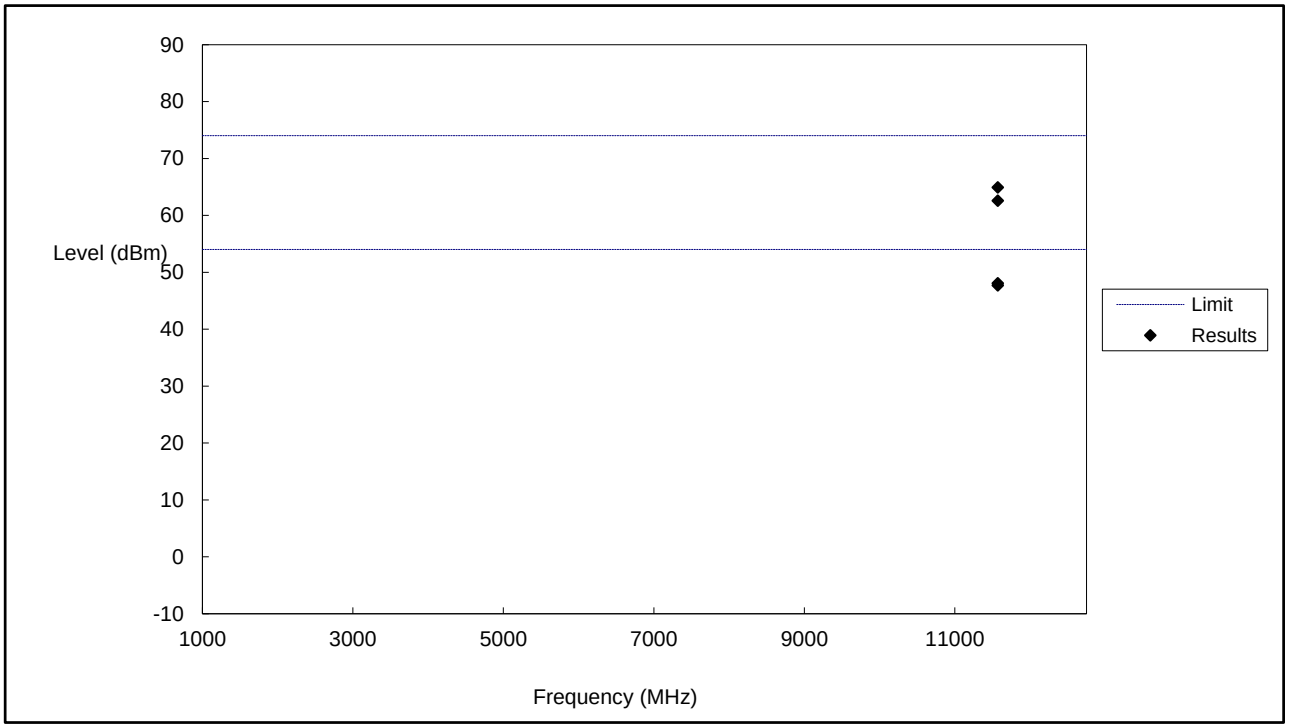
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11400	64.53	74	-9.47	H	RMS
2	11400	48.08	54	-5.92	H	RMS
1	11400	64.66	74	-9.34	V	RMS
2	11400	47.41	54	-6.59	V	RMS

Low Channel



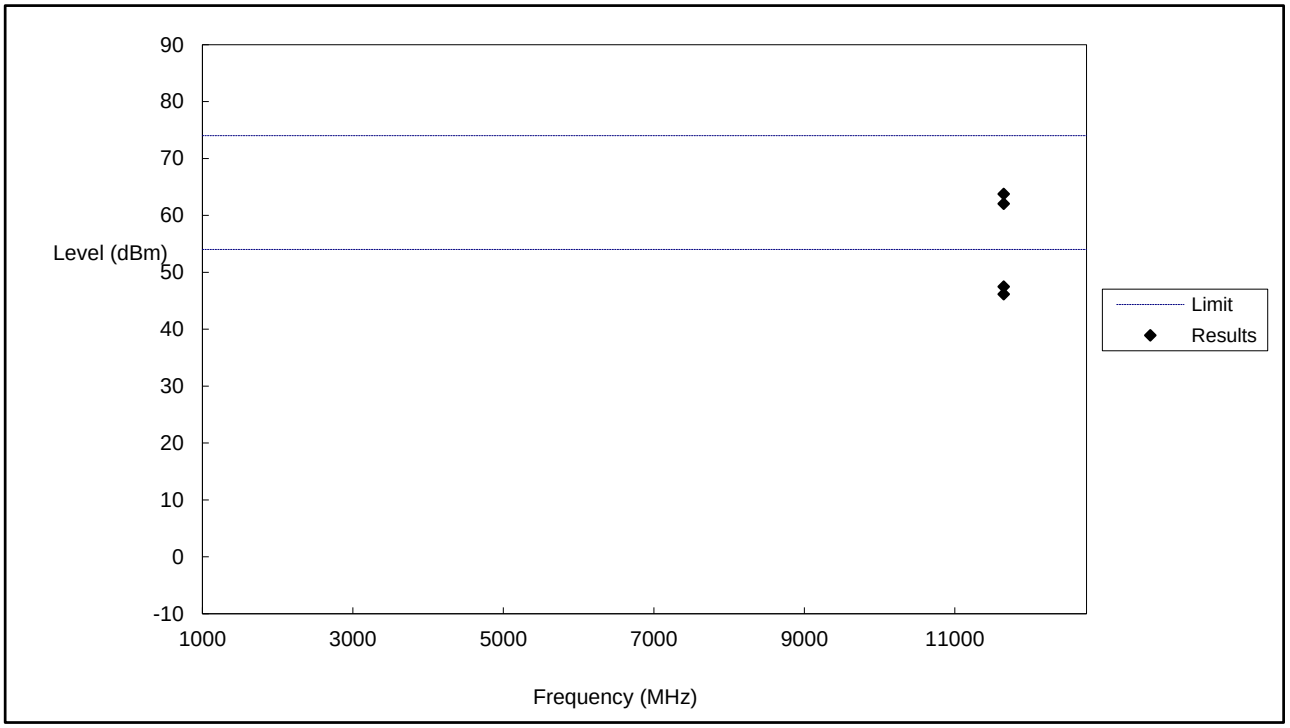
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11490	64.22	74	-9.78	H	RMS
2	11490	48.30	54	-5.70	H	RMS
1	11490	65.39	74	-8.61	V	RMS
2	11490	49.12	54	-4.88	V	RMS

Middle Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11570	62.59	74	-11.41	H	RMS
2	11570	47.69	54	-6.31	H	RMS
1	11570	64.92	74	-9.08	V	RMS
2	11570	48.07	54	-5.93	V	RMS

High Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11650	63.76	74	-10.24	H	RMS
2	11650	46.16	54	-7.84	H	RMS
1	11650	62.04	74	-11.96	V	RMS
2	11650	47.47	54	-6.53	V	RMS

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-42.25	-27
Highest	Above 5350	-41.02	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-43.32	-27
Highest	Above 5350	-41.87	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

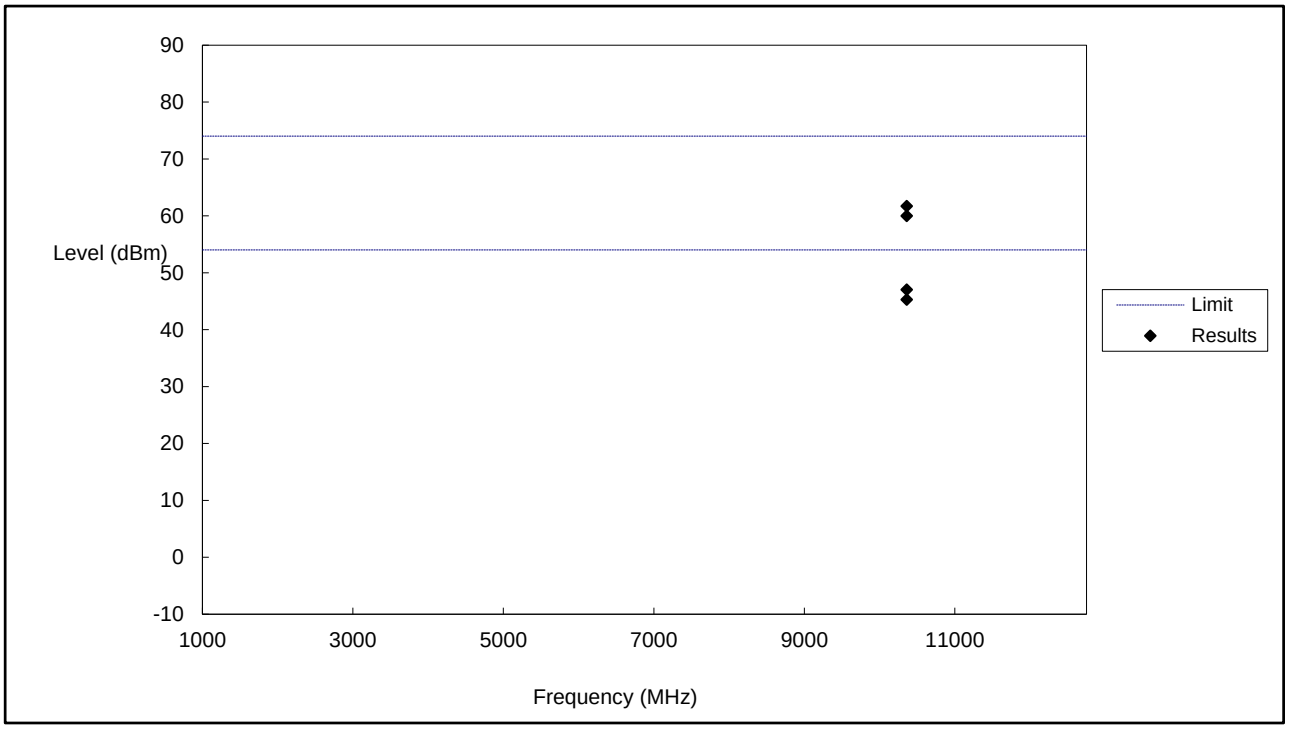
Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-39.62	-27
Highest	Above 5725	-37.12	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5650	-46.45	-27
	5650 to 5700	-36.16	-27 to -17
	5700 to 5720	-28.58	-17 to 15.6
	5720 to 5725	-18.27	15.6 to 27
Highest	5850 to 5855	-14.72	27 to 15.6
	5855 to 5875	-26.47	15.6 to -17
	5875 to 5925	-34.95	-17 to -27
	Above 5925	-40.22	-27
Note: the data just list the worst cases			

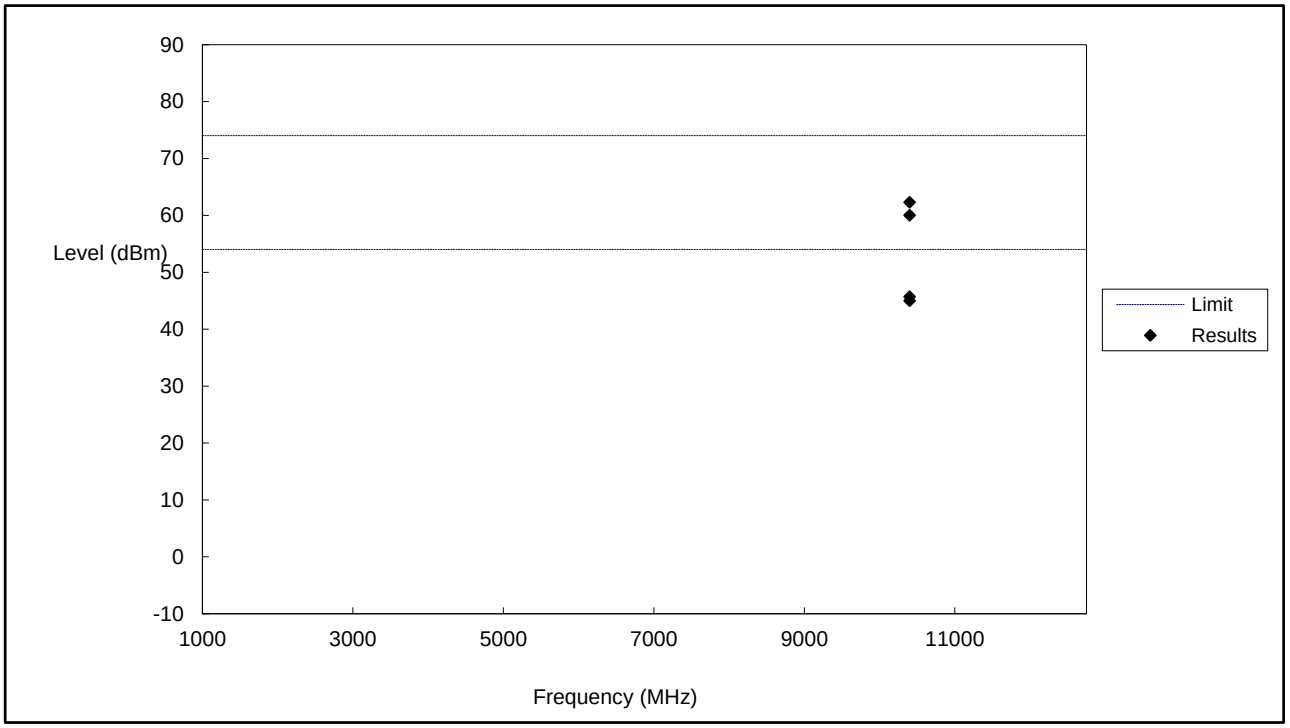
- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11n HT20)
- Harmonics And Spurious Emissions

Low Channel



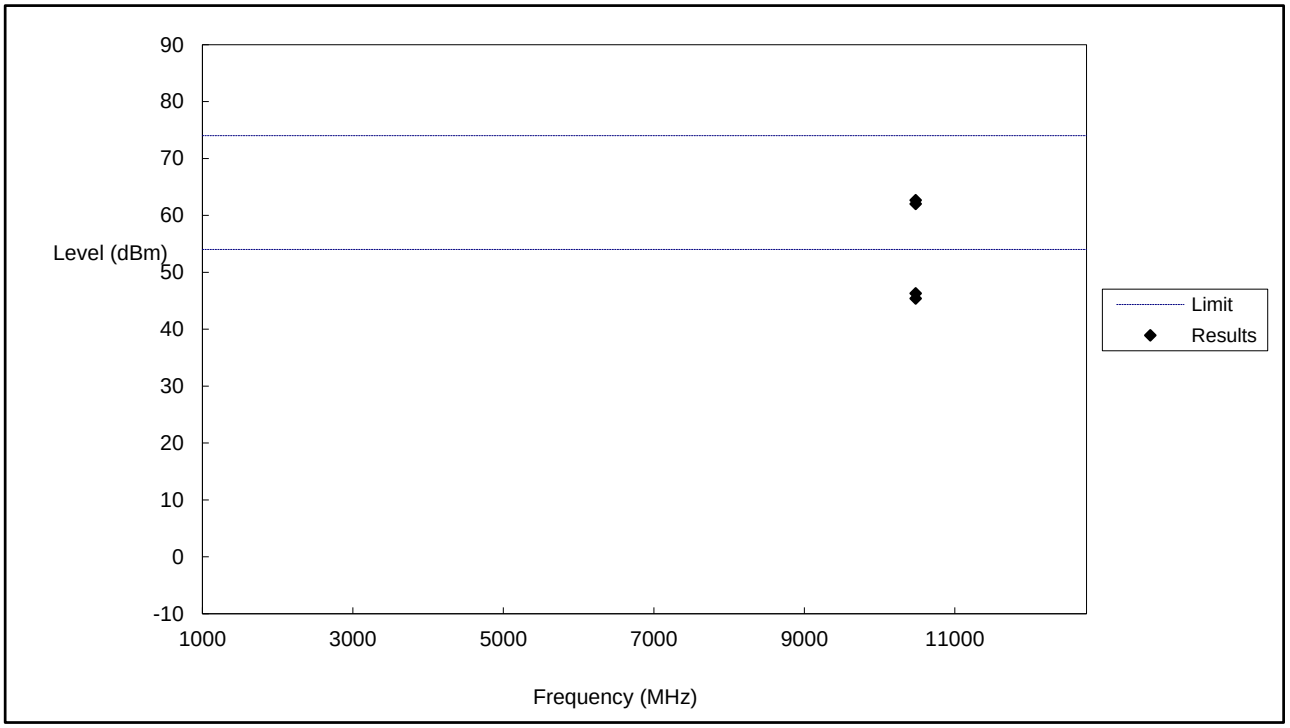
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10360	60.00	74	-14.00	H	RMS
2	10360	45.27	54	-8.73	H	RMS
1	10360	61.71	74	-12.29	V	RMS
2	10360	47.02	54	-6.98	V	RMS

Middle Channel



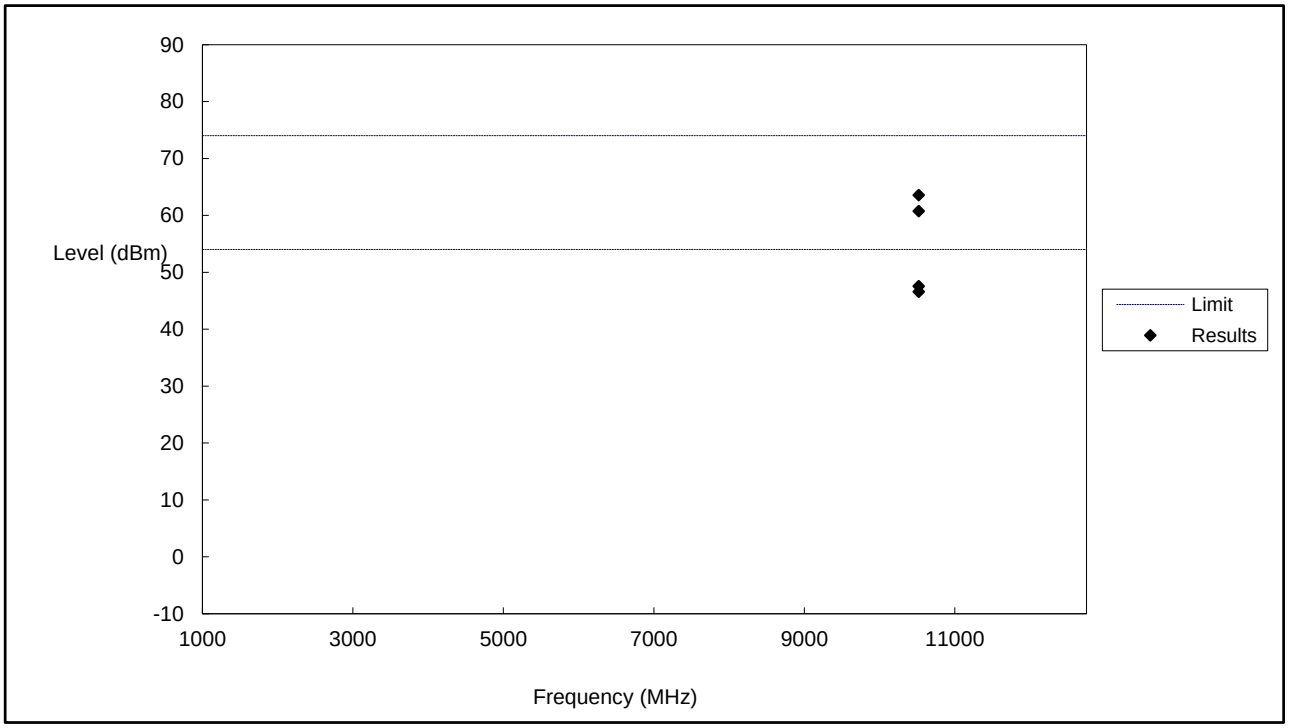
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10400	62.31	74	-11.69	H	RMS
2	10400	45.71	54	-8.29	H	RMS
1	10400	60.03	74	-13.97	V	RMS
2	10400	44.99	54	-9.01	V	RMS

High Channel



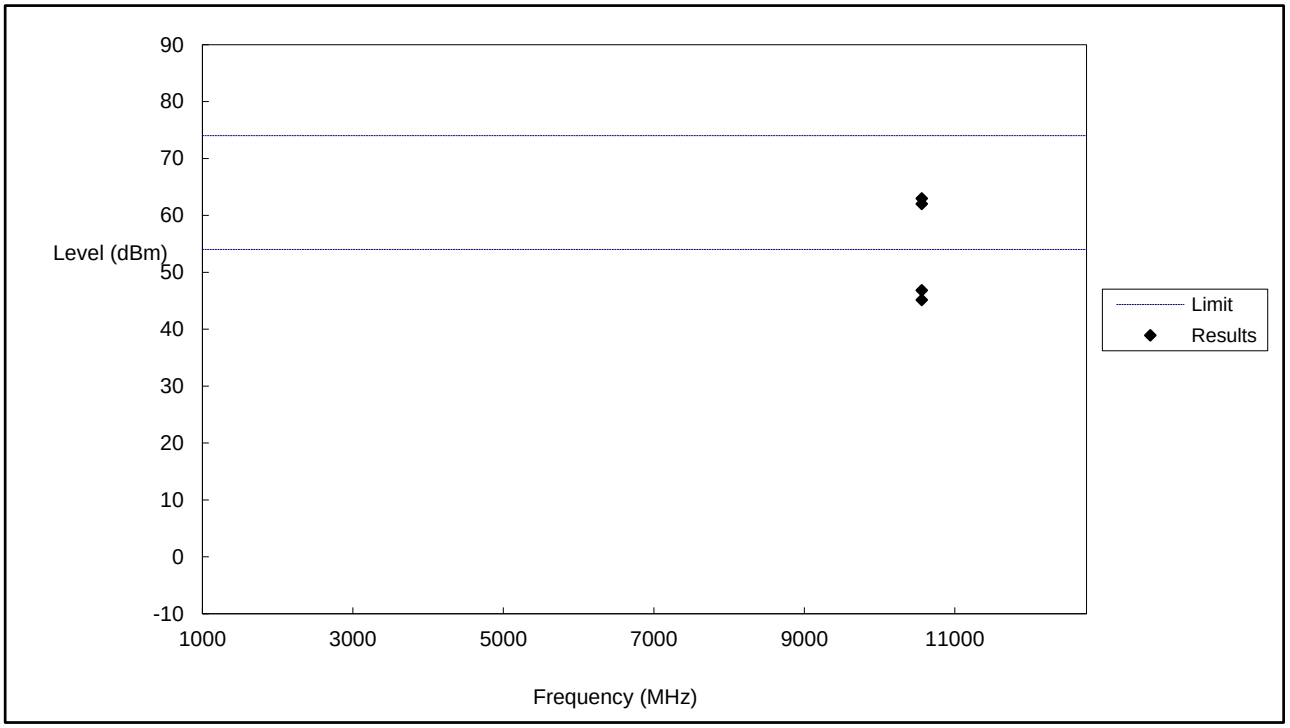
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10480	62.65	74	-11.35	H	RMS
2	10480	46.29	54	-7.71	H	RMS
1	10480	62.02	74	-11.98	V	RMS
2	10480	45.38	54	-8.62	V	RMS

Low Channel



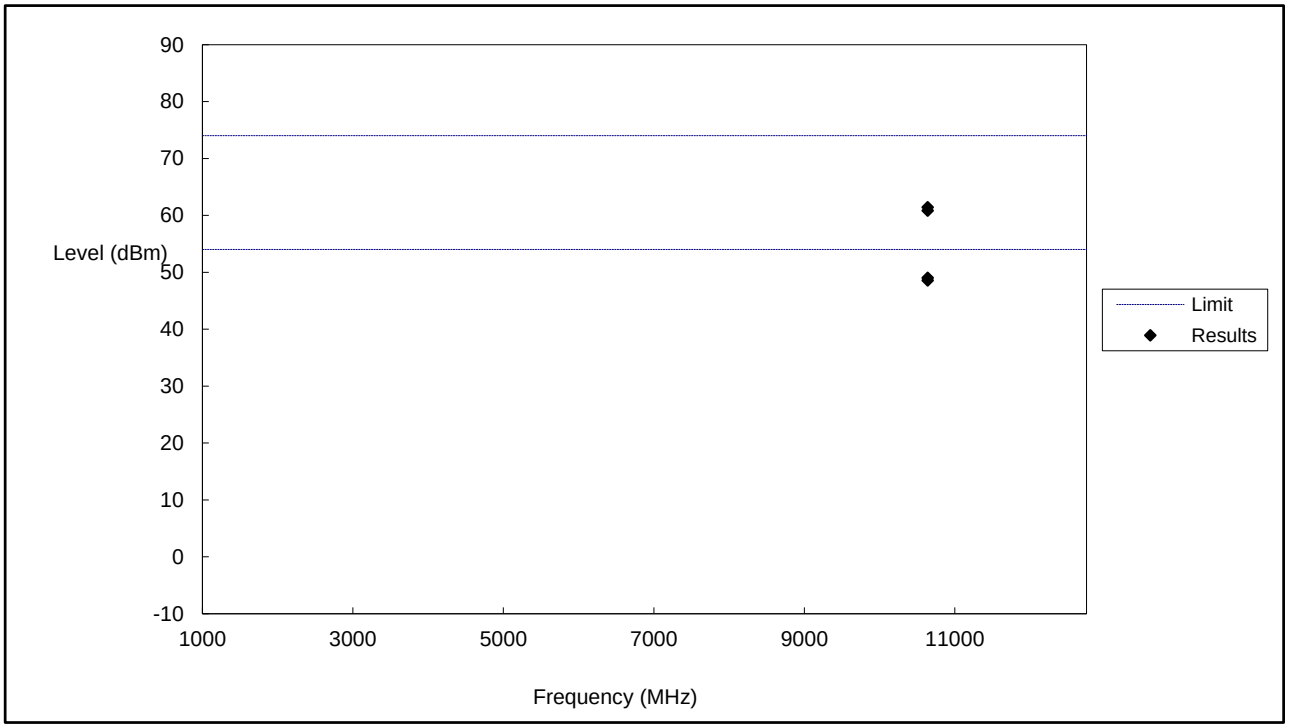
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10520	60.75	74	-13.25	H	RMS
2	10520	47.57	54	-6.43	H	RMS
1	10520	63.56	74	-10.44	V	RMS
2	10520	46.57	54	-7.43	V	RMS

Middle Channel



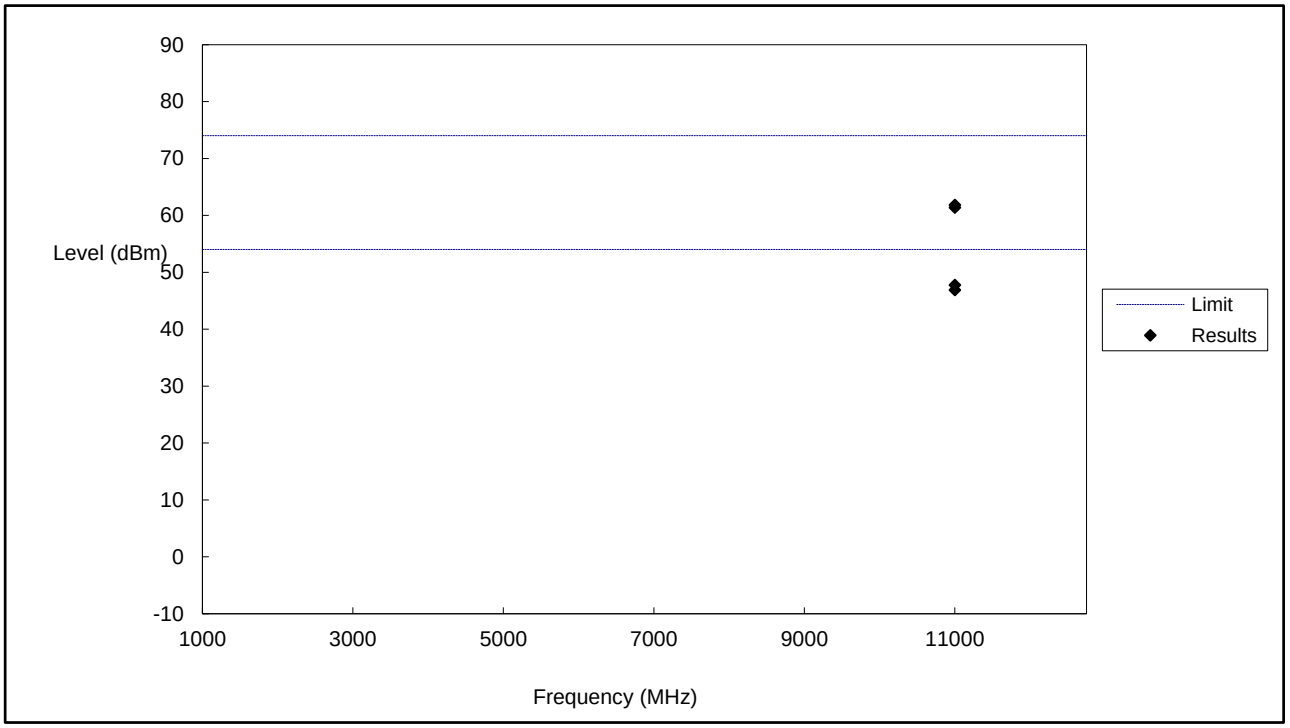
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10560	62.01	74	-11.99	H	RMS
2	10560	46.84	54	-7.16	H	RMS
1	10560	62.96	74	-11.04	V	RMS
2	10560	45.15	54	-8.85	V	RMS

High Channel



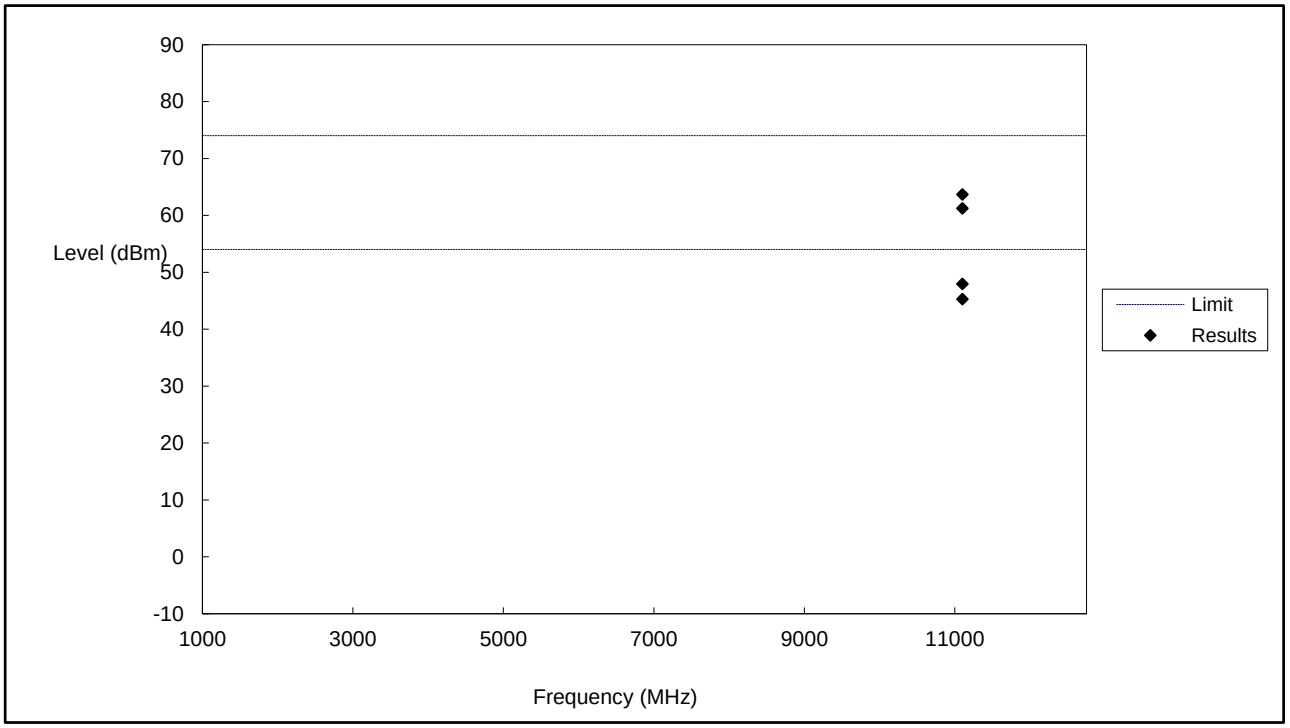
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10640	61.42	74	-12.58	H	RMS
2	10640	48.57	54	-5.43	H	RMS
1	10640	60.84	74	-13.16	V	RMS
2	10640	49.01	54	-4.99	V	RMS

Low Channel



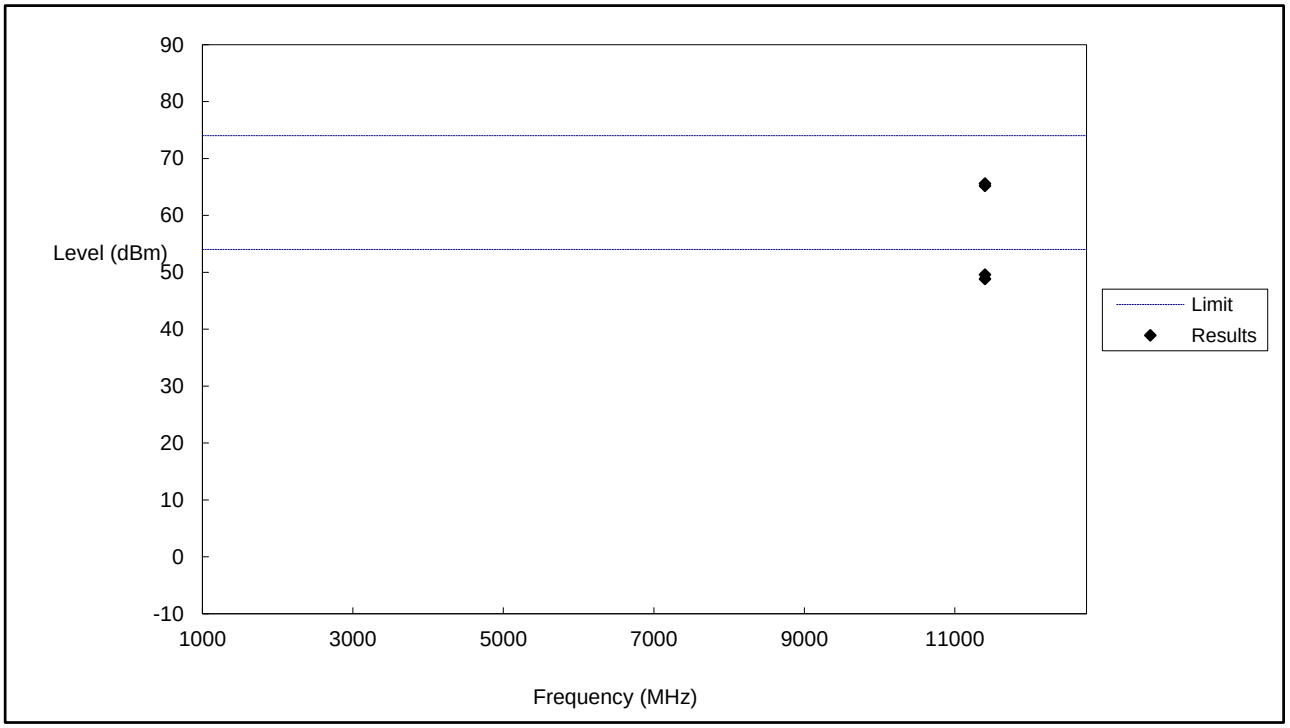
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11000	61.38	74	-12.62	H	RMS
2	11000	46.87	54	-7.13	H	RMS
1	11000	61.81	74	-12.19	V	RMS
2	11000	47.75	54	-6.25	V	RMS

Middle Channel



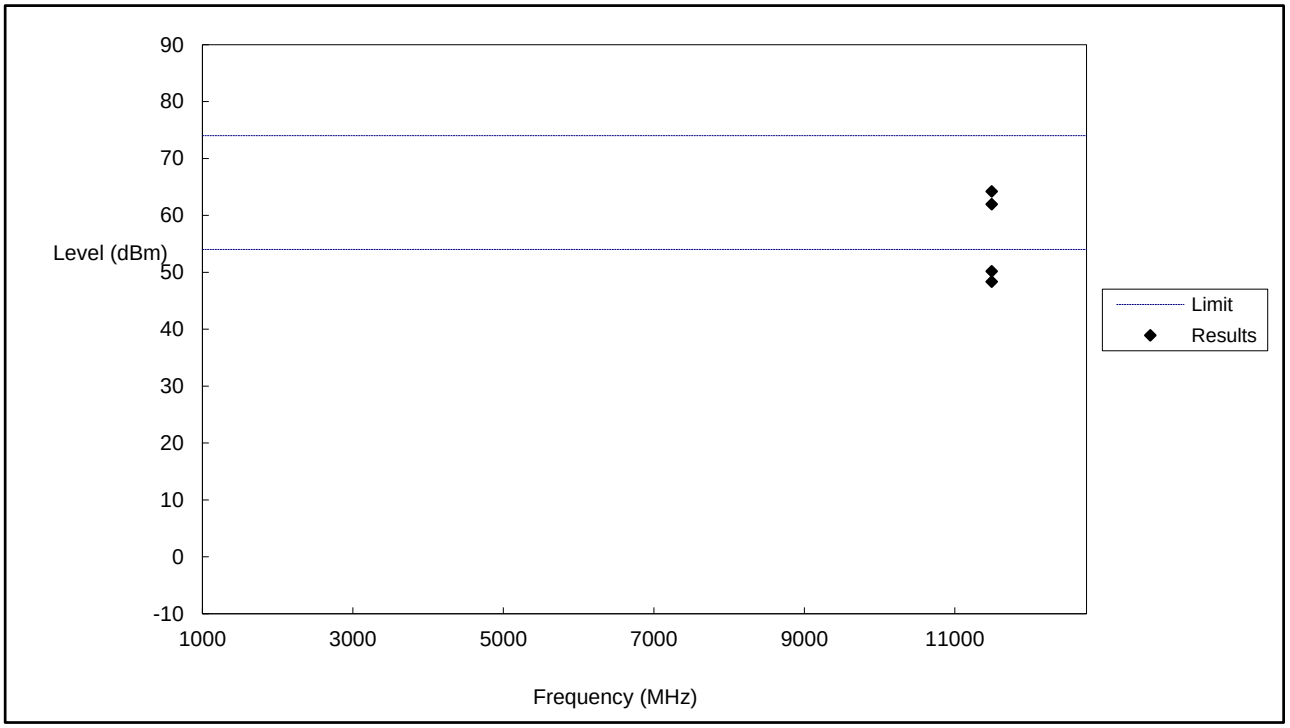
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11100	61.22	74	-12.78	H	RMS
2	11100	47.95	54	-6.05	H	RMS
1	11100	63.67	74	-10.33	V	RMS
2	11100	45.27	54	-8.73	V	RMS

High Channel



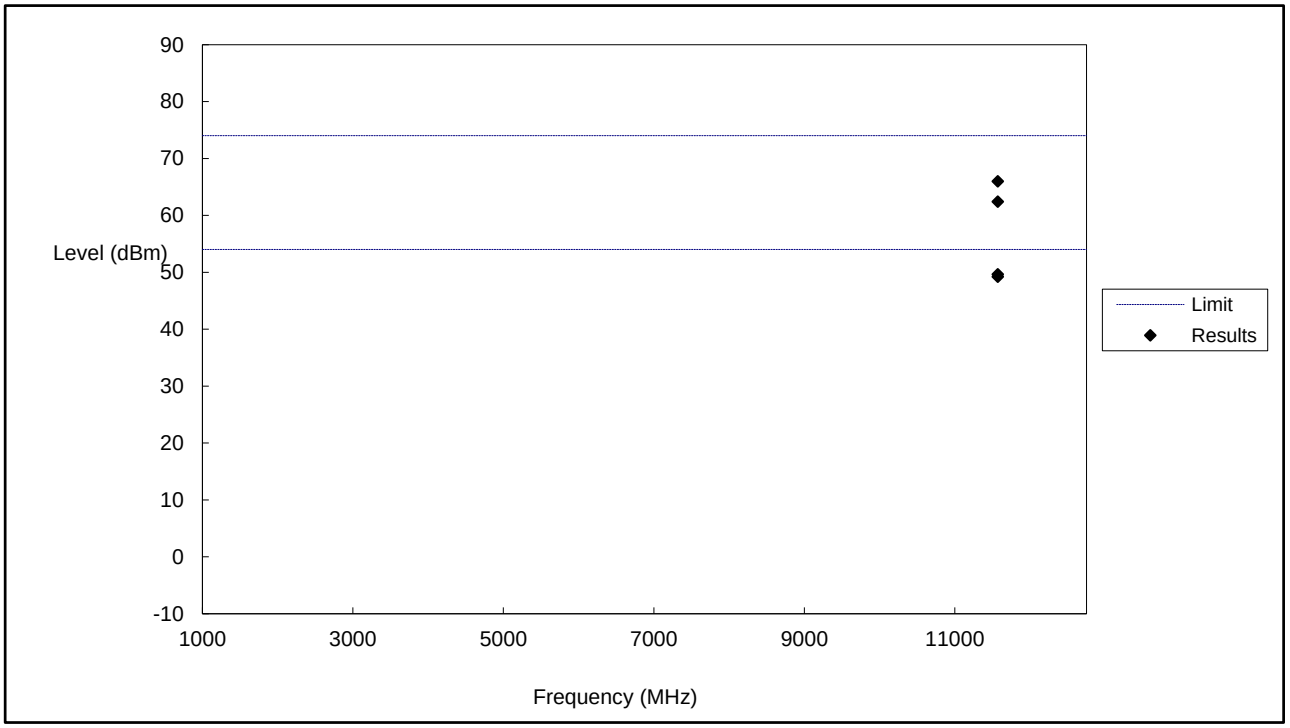
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11400	65.19	74	-8.81	H	RMS
2	11400	48.83	54	-5.17	H	RMS
1	11400	65.60	74	-8.40	V	RMS
2	11400	49.59	54	-4.41	V	RMS

Low Channel



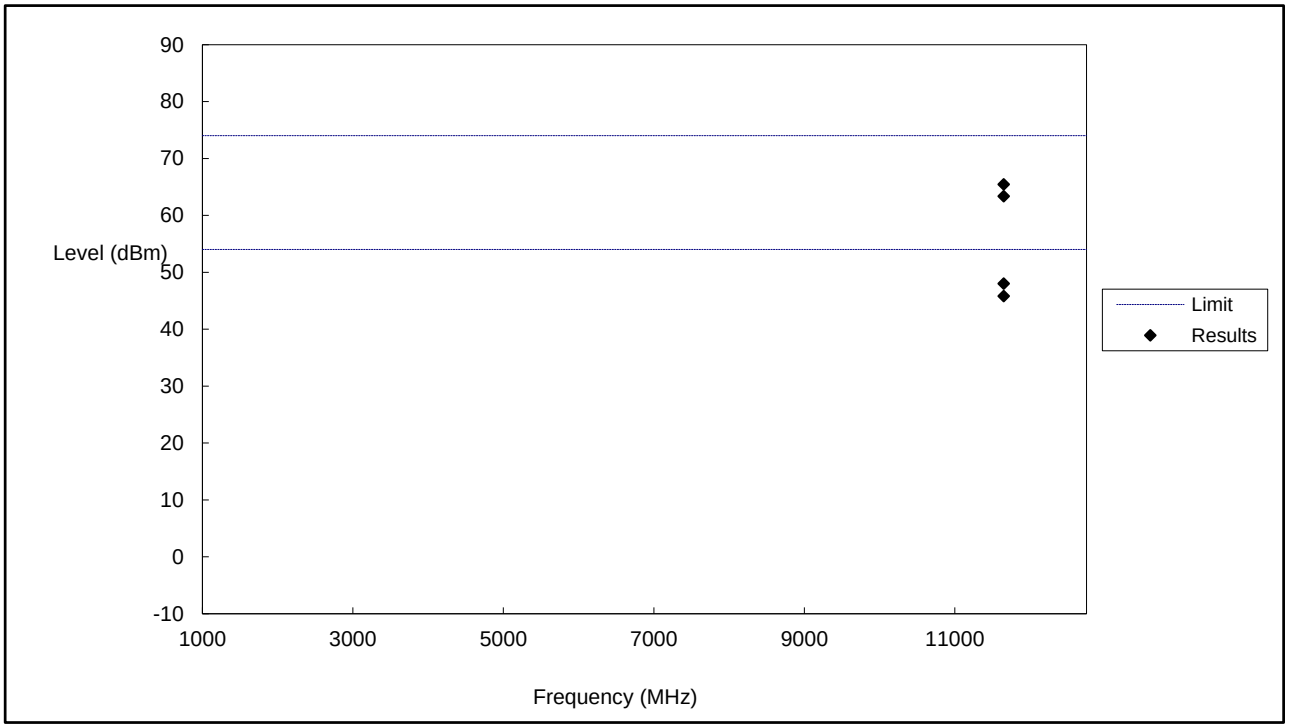
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11490	61.97	74	-12.03	H	RMS
2	11490	50.18	54	-3.82	H	RMS
1	11490	64.20	74	-9.80	V	RMS
2	11490	48.35	54	-5.65	V	RMS

Middle Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11570	65.97	74	-8.03	H	RMS
2	11570	49.65	54	-4.35	H	RMS
1	11570	62.41	74	-11.59	V	RMS
2	11570	49.21	54	-4.79	V	RMS

High Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11650	65.46	74	-8.54	H	RMS
2	11650	48.01	54	-5.99	H	RMS
1	11650	63.36	74	-10.64	V	RMS
2	11650	45.81	54	-8.19	V	RMS

- Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-39.52	-27
Highest	Above 5350	-41.02	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-41.25	-27
Highest	Above 5350	-42.65	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-37.12	-27
Highest	Above 5725	-39.31	-27
Note: the data just list the worst cases			

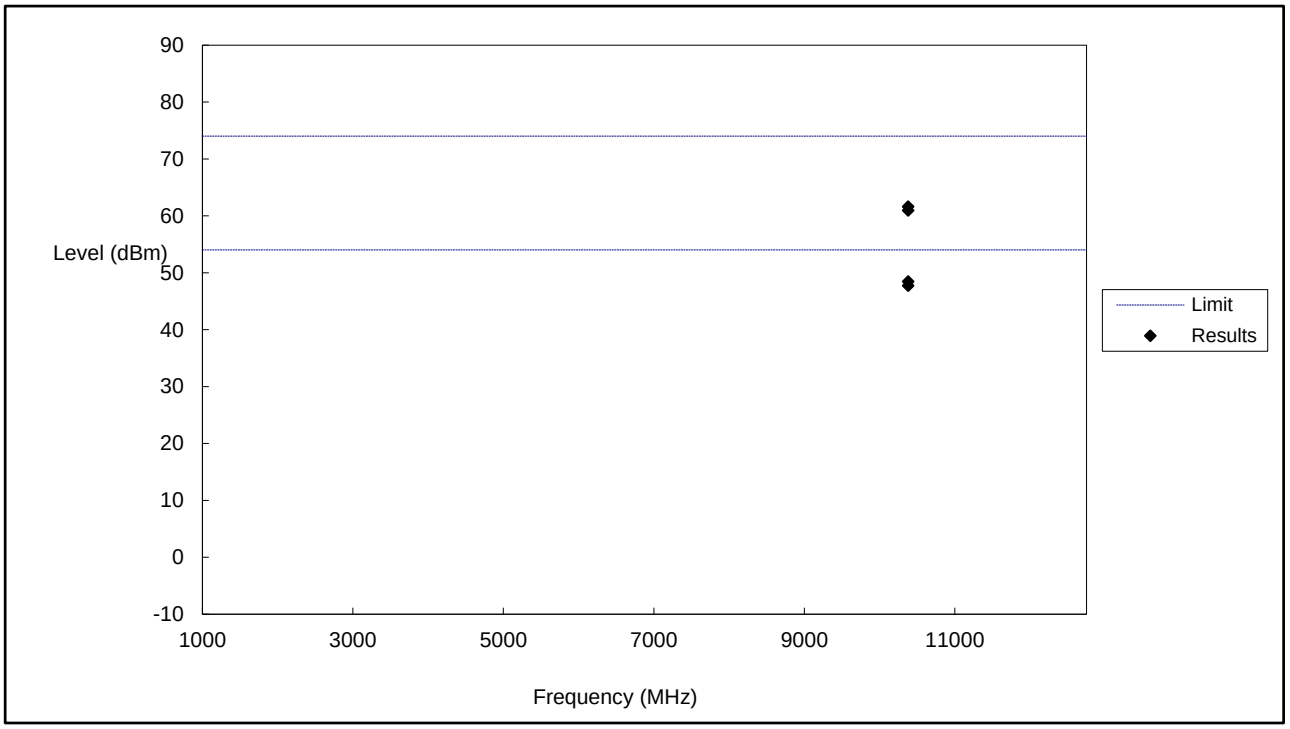
- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5650	-46.45	-27
	5650 to 5700	-36.16	-27 to -17
	5700 to 5720	-28.58	-17 to 15.6
	5720 to 5725	-18.27	15.6 to 27
Highest	5850 to 5855	-14.72	27 to 15.6
	5855 to 5875	-26.47	15.6 to -17
	5875 to 5925	-34.95	-17 to -27
	Above 5925	-40.22	-27
Note: the data just list the worst cases			

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

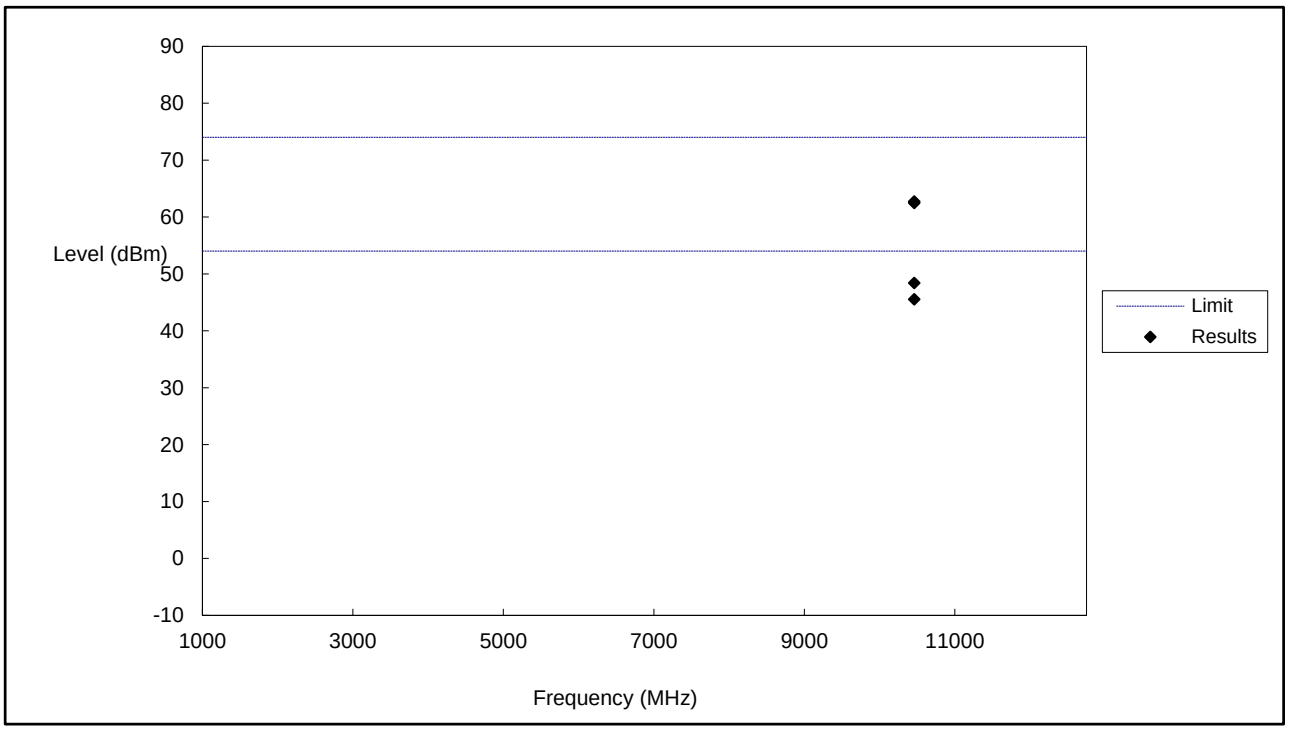
- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11n HT40)
- Harmonics And Spurious Emissions

Low Channel



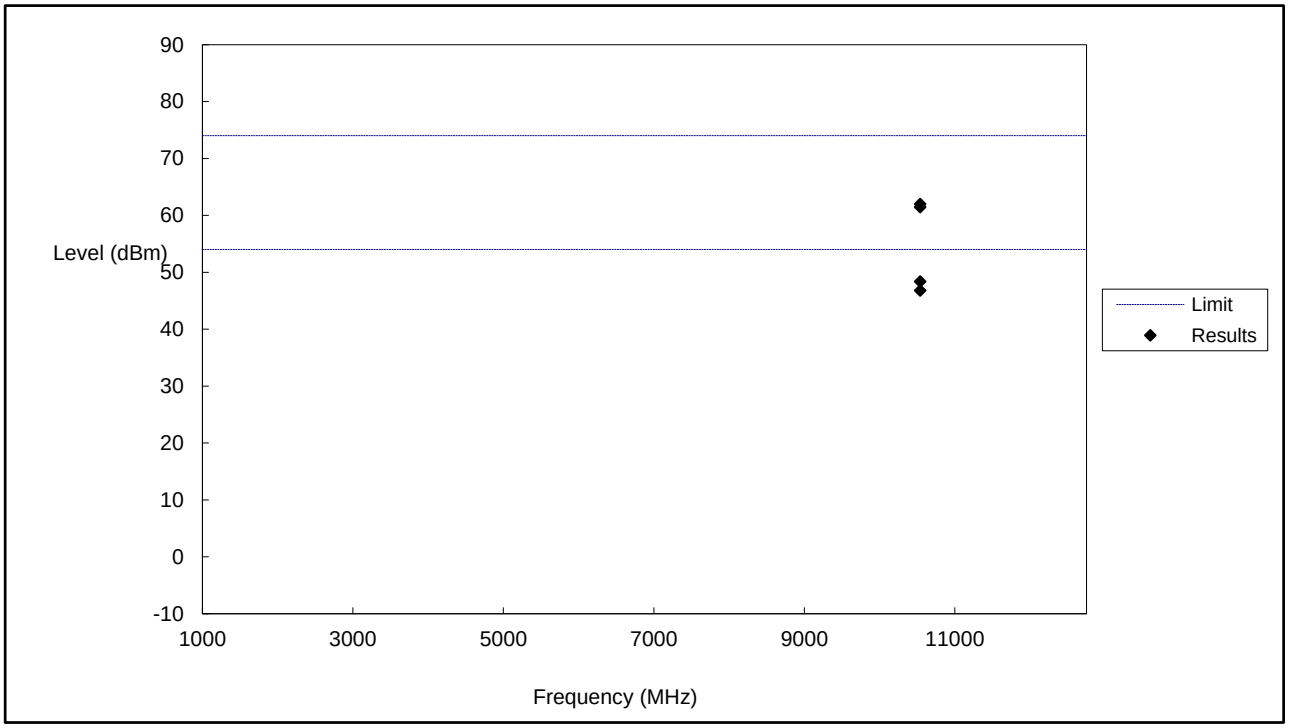
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10380	60.94	74	-13.06	H	RMS
2	10380	47.72	54	-6.28	H	RMS
1	10380	61.63	74	-12.37	V	RMS
2	10380	48.47	54	-5.53	V	RMS

High Channel



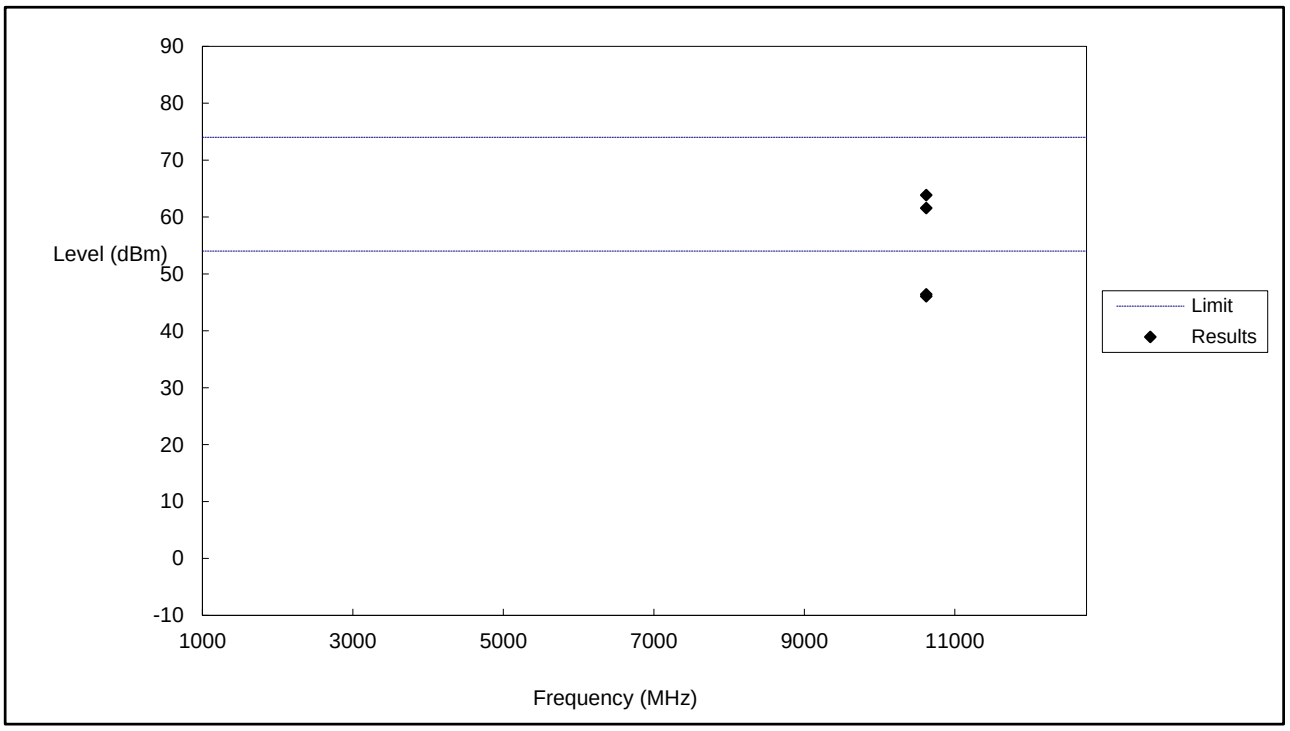
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10460	62.72	74	-11.28	H	RMS
2	10460	48.41	54	-5.59	H	RMS
1	10460	62.46	74	-11.54	V	RMS
2	10460	45.54	54	-8.46	V	RMS

Low Channel



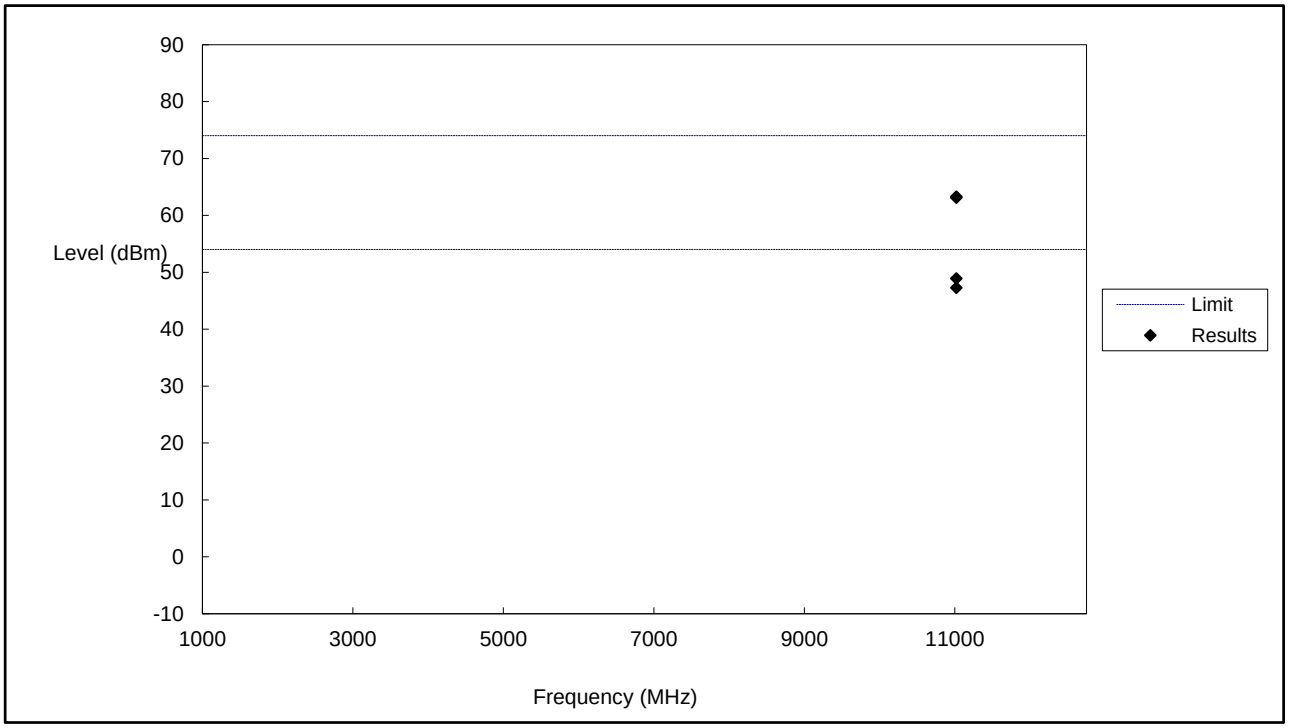
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10540	61.45	74	-12.55	H	RMS
2	10540	46.81	54	-7.19	H	RMS
1	10540	61.99	74	-12.01	V	RMS
2	10540	48.36	54	-5.64	V	RMS

High Channel



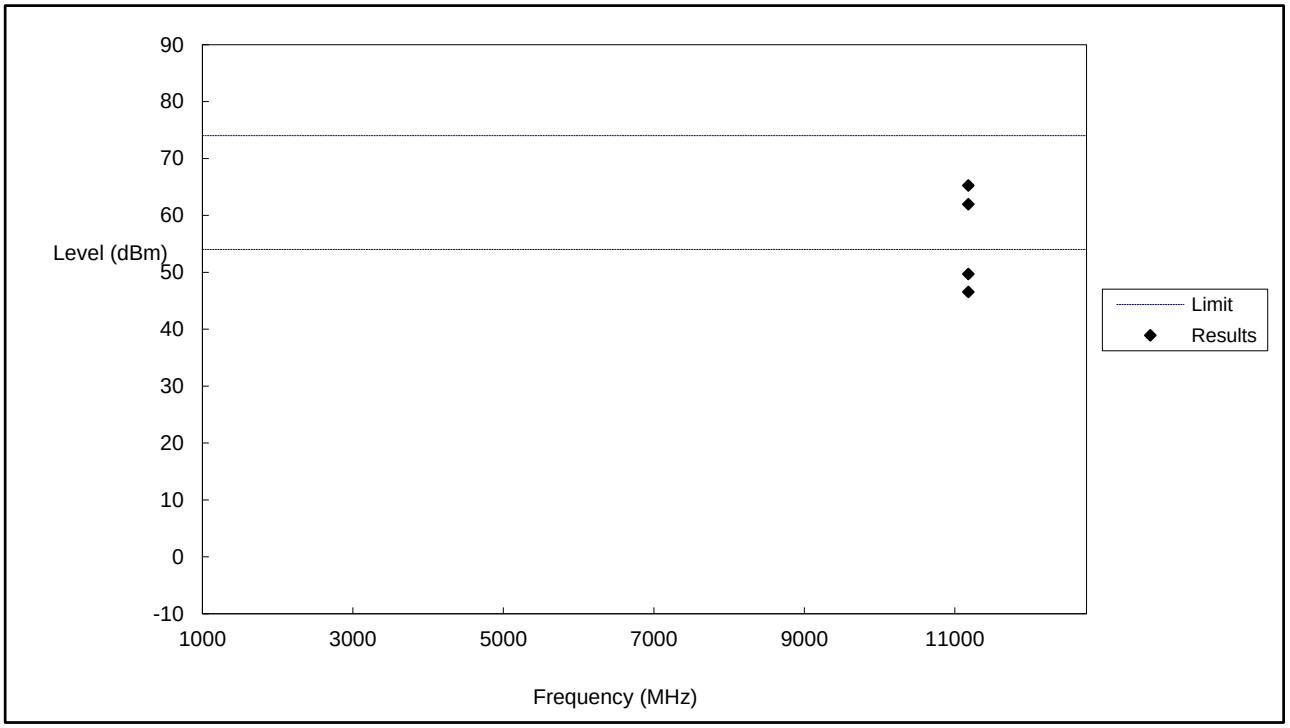
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10620	61.56	74	-12.44	H	RMS
2	10620	46.06	54	-7.94	H	RMS
1	10620	63.84	74	-10.16	V	RMS
2	10620	46.40	54	-7.60	V	RMS

Low Channel



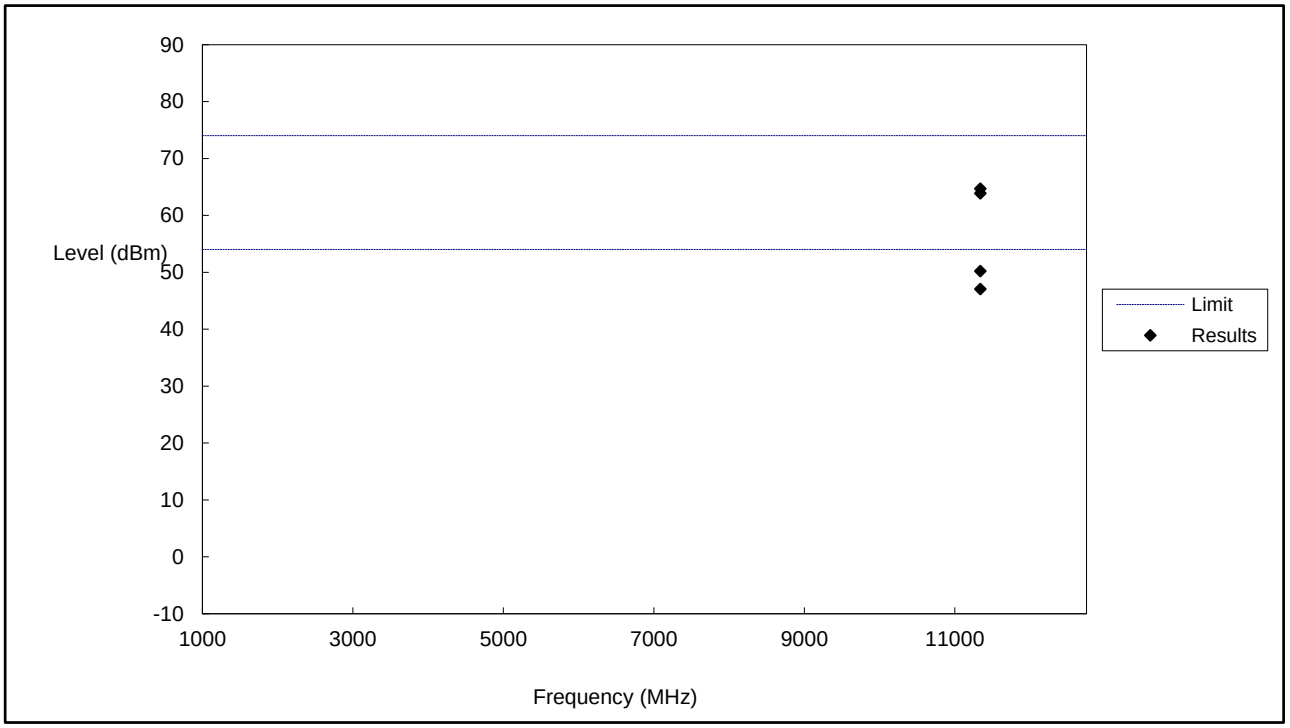
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11020	63.28	74	-10.72	H	RMS
2	11020	47.27	54	-6.73	H	RMS
1	11020	63.12	74	-10.88	V	RMS
2	11020	48.90	54	-5.10	V	RMS

Middle Channel



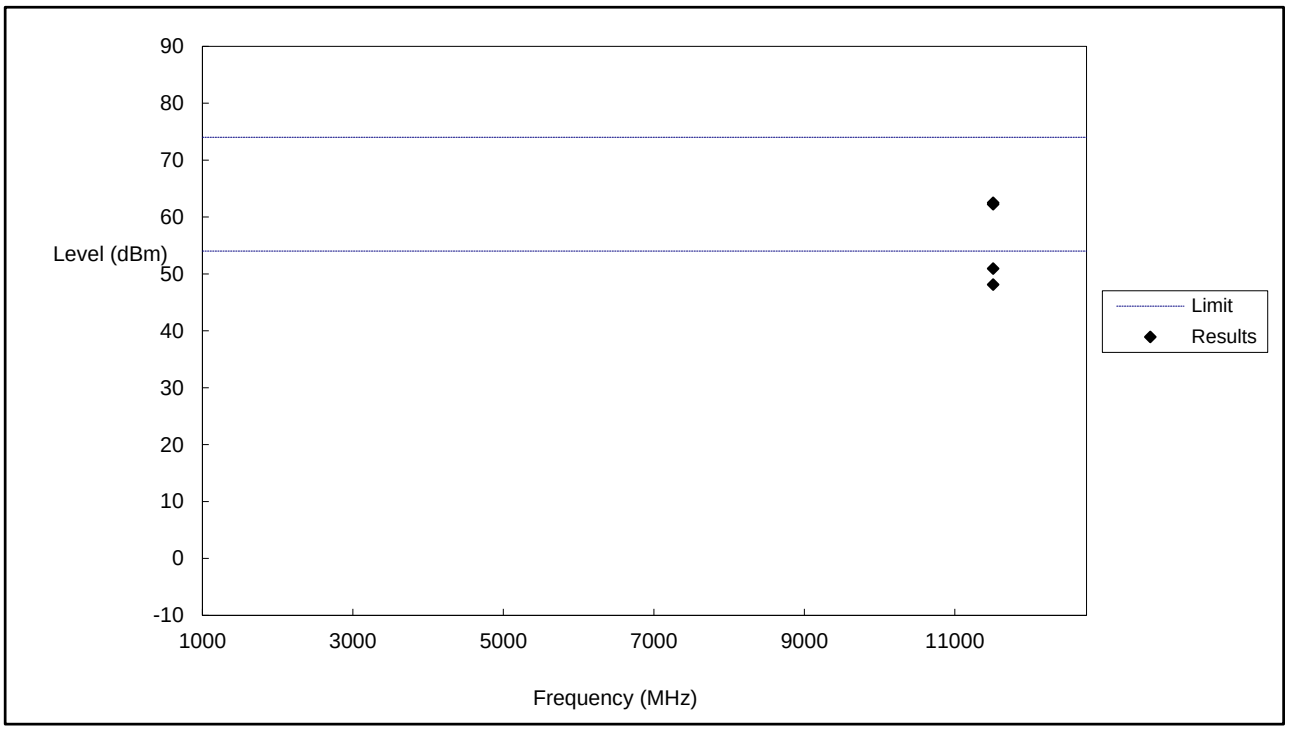
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11180	61.97	74	-12.03	H	RMS
2	11180	49.70	54	-4.30	H	RMS
1	11180	65.24	74	-8.76	V	RMS
2	11180	46.55	54	-7.45	V	RMS

High Channel



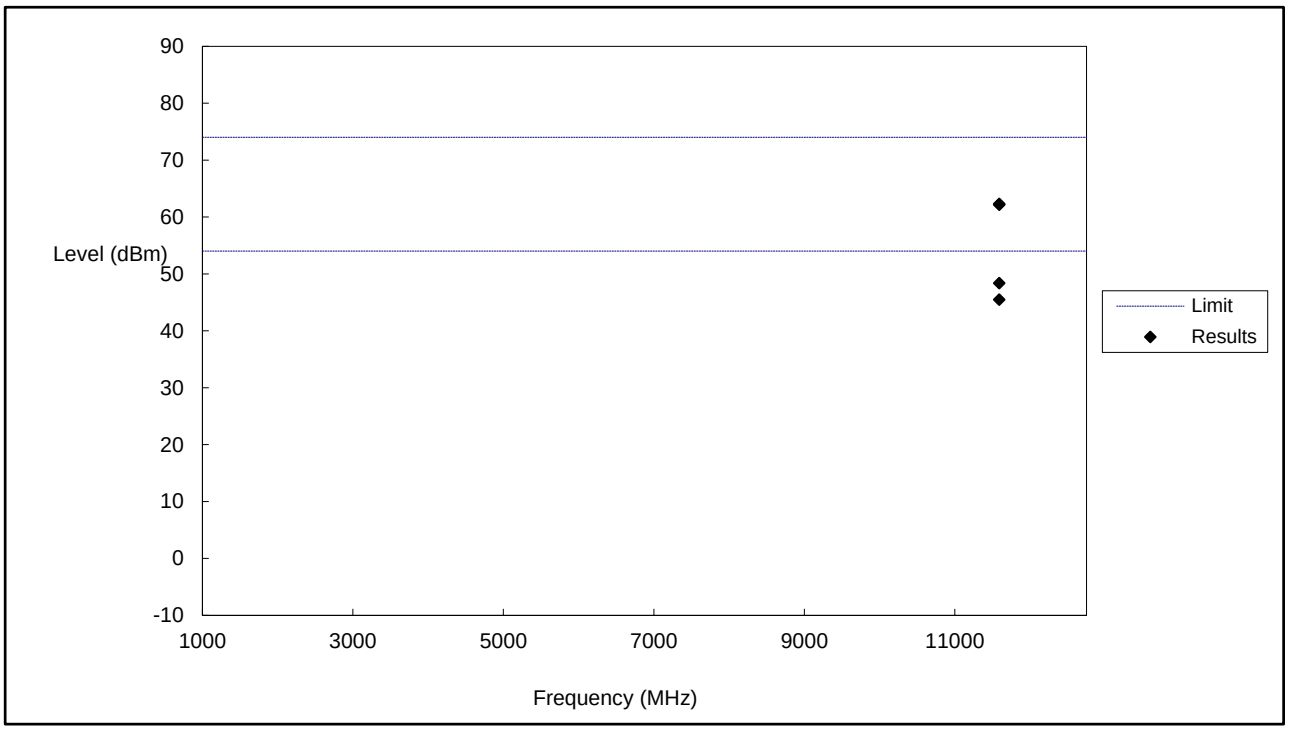
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11340	63.88	74	-10.12	H	RMS
2	11340	47.04	54	-6.96	H	RMS
1	11340	64.69	74	-9.31	V	RMS
2	11340	50.20	54	-3.80	V	RMS

Low Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11510	62.25	74	-11.75	H	RMS
2	11510	48.13	54	-5.87	H	RMS
1	11510	62.48	74	-11.52	V	RMS
2	11510	50.94	54	-3.06	V	RMS

High Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11590	62.17	74	-11.83	H	RMS
2	11590	48.37	54	-5.63	H	RMS
1	11590	62.30	74	-11.70	V	RMS
2	11590	45.47	54	-8.53	V	RMS

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-39.52	-27
Highest	Above 5350	-37.12	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.52	-27
Highest	Above 5350	-37.34	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

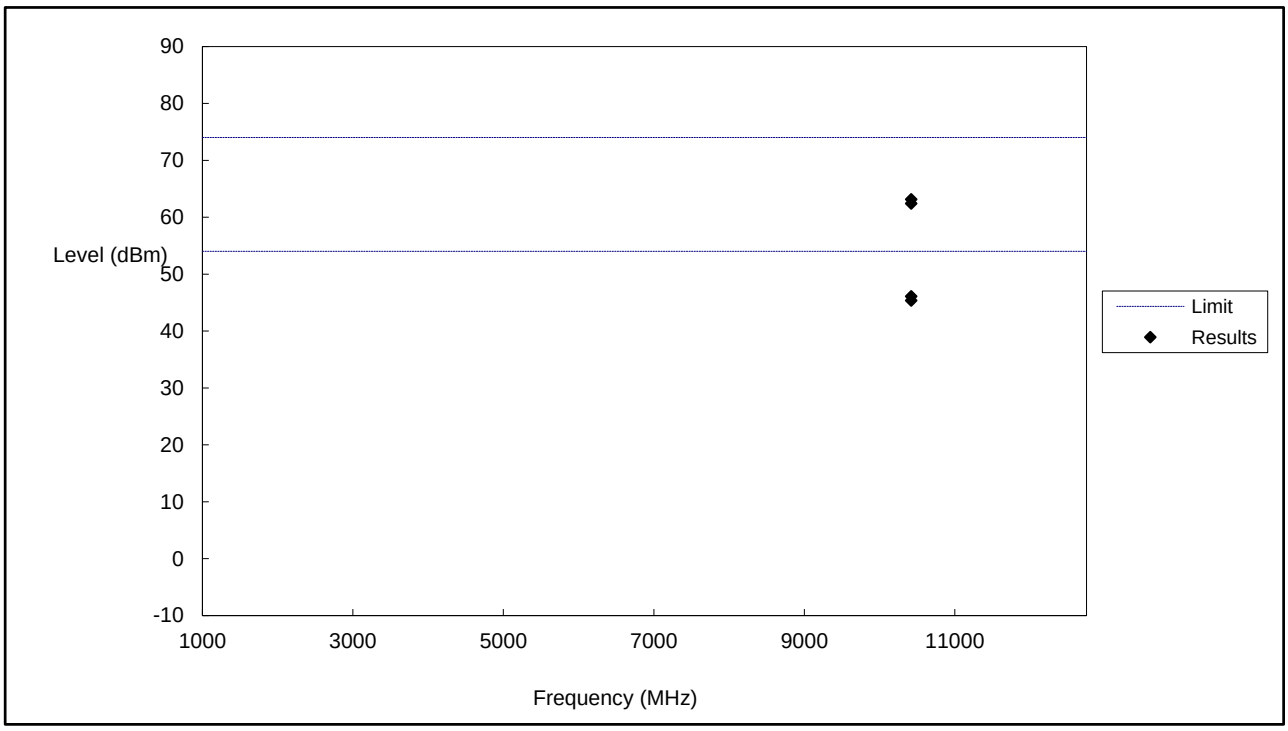
Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-35.96	-27
Highest	Above 5725	-37.04	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5650	-46.45	-27
	5650 to 5700	-36.16	-27 to -17
	5700 to 5720	-28.58	-17 to 15.6
	5720 to 5725	-18.27	15.6 to 27
Highest	5850 to 5855	-14.72	27 to 15.6
	5855 to 5875	-26.47	15.6 to -17
	5875 to 5925	-34.95	-17 to -27
	Above 5925	-40.22	-27
Note: the data just list the worst cases			

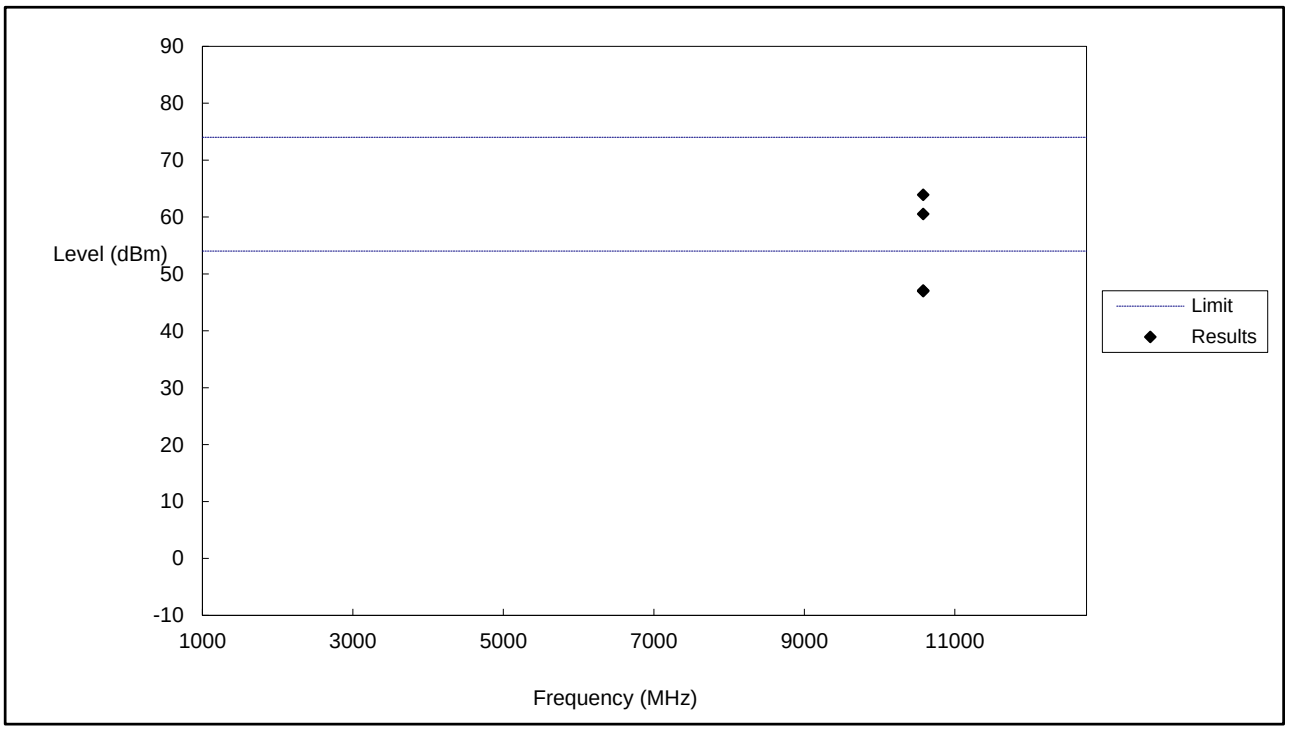
- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11ac-VHT80)
- Harmonics And Spurious Emissions

5210MHz



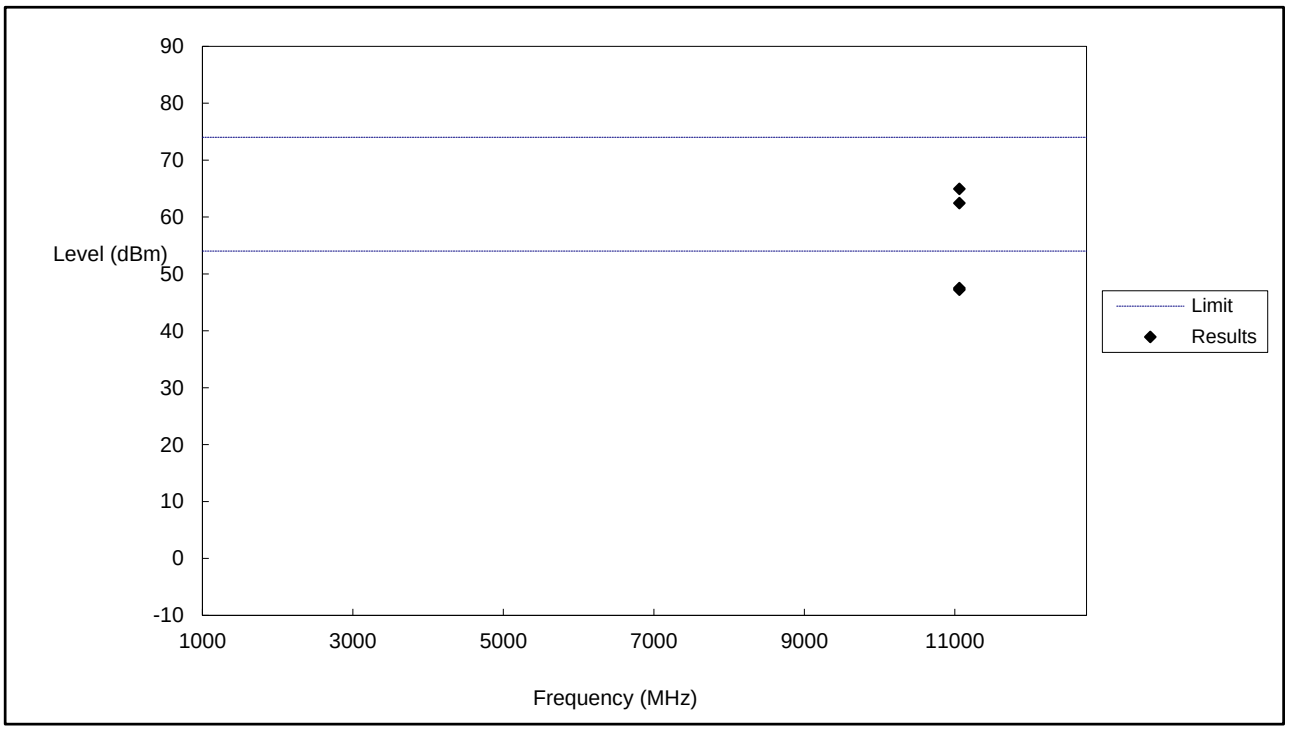
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10420	63.15	74	-10.85	H	RMS
2	10420	46.09	54	-7.91	H	RMS
1	10420	62.42	74	-11.58	V	RMS
2	10420	45.36	54	-8.64	V	RMS

5290MHz



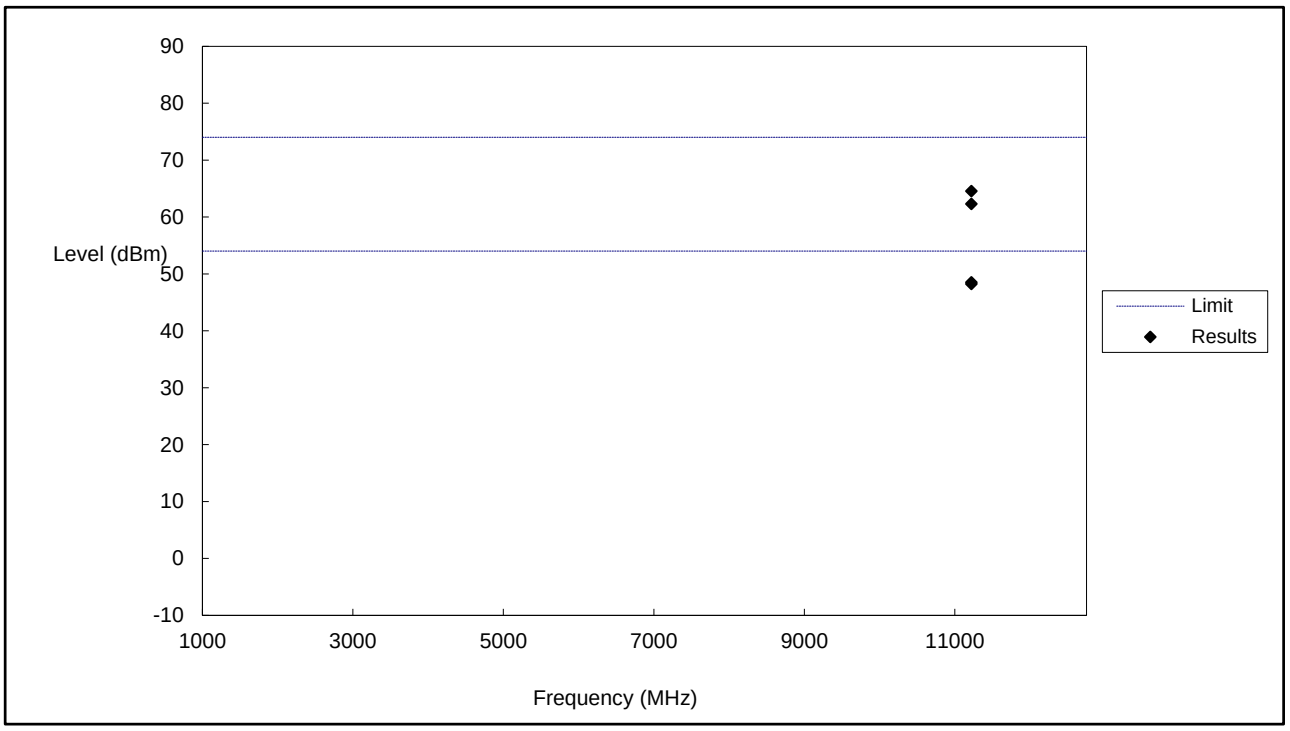
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10580	63.89	74	-10.11	H	RMS
2	10580	47.07	54	-6.93	H	RMS
1	10580	60.53	74	-13.47	V	RMS
2	10580	46.98	54	-7.02	V	RMS

Low Channel



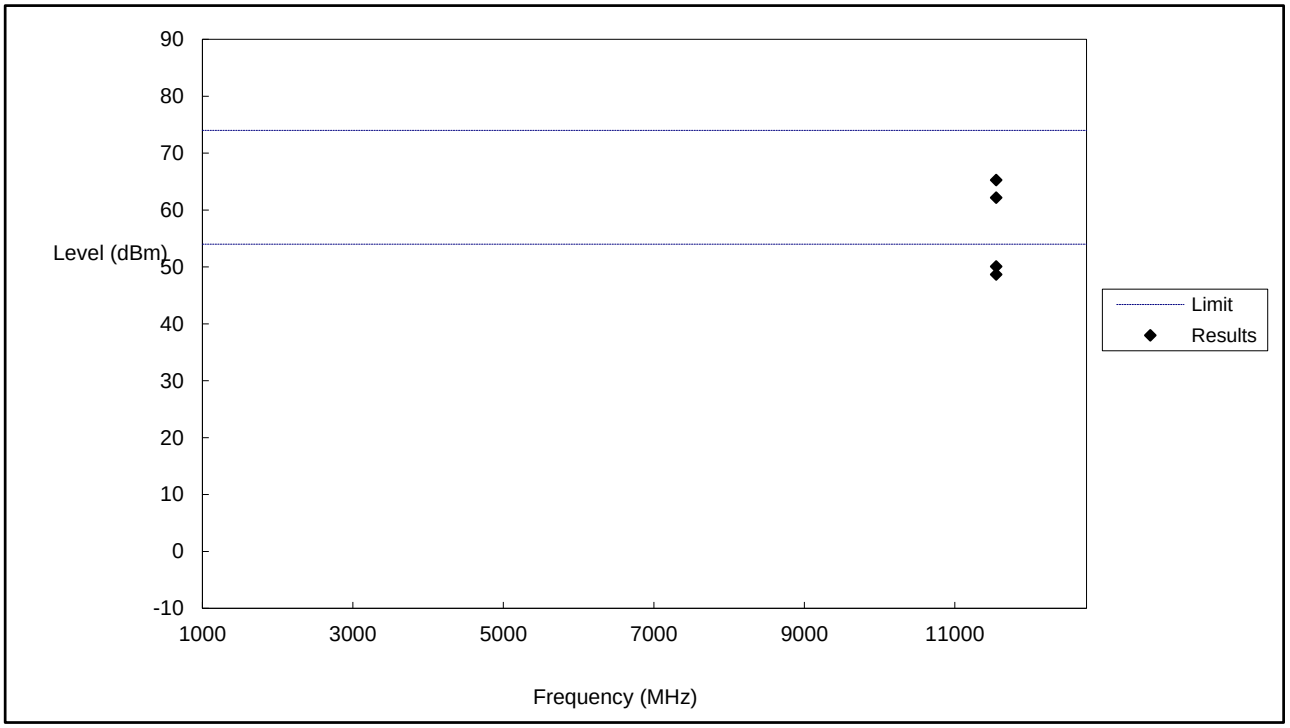
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11060	64.93	74	-9.07	H	RMS
2	11060	47.23	54	-6.77	H	RMS
1	11060	62.45	74	-11.55	V	RMS
2	11060	47.50	54	-6.50	V	RMS

High Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11220	62.29	74	-11.71	H	RMS
2	11220	48.24	54	-5.76	H	RMS
1	11220	64.55	74	-9.45	V	RMS
2	11220	48.50	54	-5.50	V	RMS

5775MHz



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11550	65.28	74	-8.72	H	RMS
2	11550	48.66	54	-5.34	H	RMS
1	11550	62.17	74	-11.83	V	RMS
2	11550	50.07	54	-3.93	V	RMS

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-37.25	-27
Highest	Above 5350	-36.21	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-38.48	-27
Highest	Above 5350	-36.12	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-39.65	-27
Highest	Above 5725	-37.15	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5650	-46.45	-27
	5650 to 5700	-36.16	-27 to -17
	5700 to 5720	-28.58	-17 to 15.6
	5720 to 5725	-18.27	15.6 to 27
Highest	5850 to 5855	-14.72	27 to 15.6
	5855 to 5875	-26.47	15.6 to -17
	5875 to 5925	-34.95	-17 to -27
	Above 5925	-40.22	-27
Note: the data just list the worst cases			

Note: Testing is carried out with frequency rang 9kHz to 40GHz, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

9. Frequency Stability

9.1 Standard Applicable

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

9.2 Test Procedure

According to §2.1055, the following test procedure was performed.
The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.
The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

9.3 Summary of Test Results/Plots

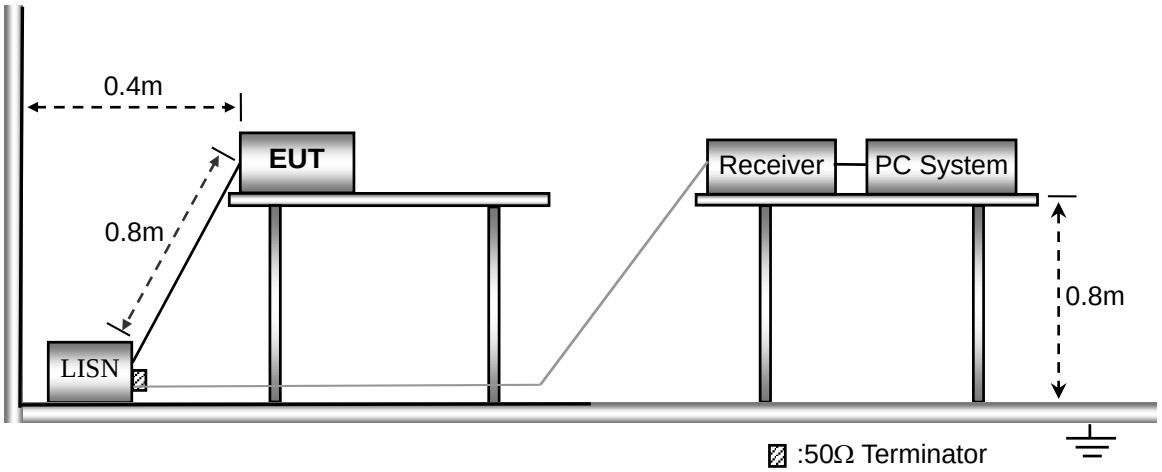
Please refer to Appendix

10 Conducted Emissions

10.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

10.2 Basic Test Setup Block Diagram



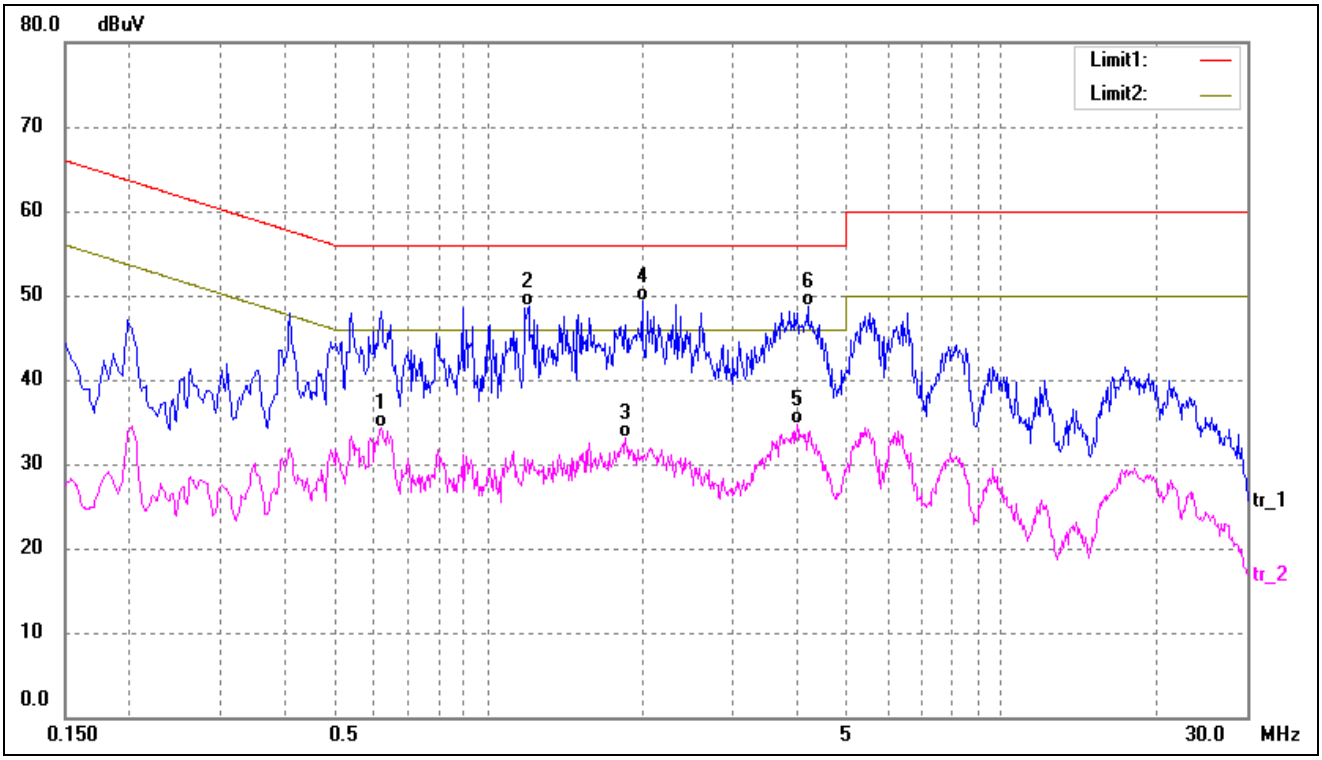
10.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 150kHz
Stop Frequency 30MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Quasi-Peak Adapter Bandwidth 9kHz
Quasi-Peak Adapter Mode ..... Normal

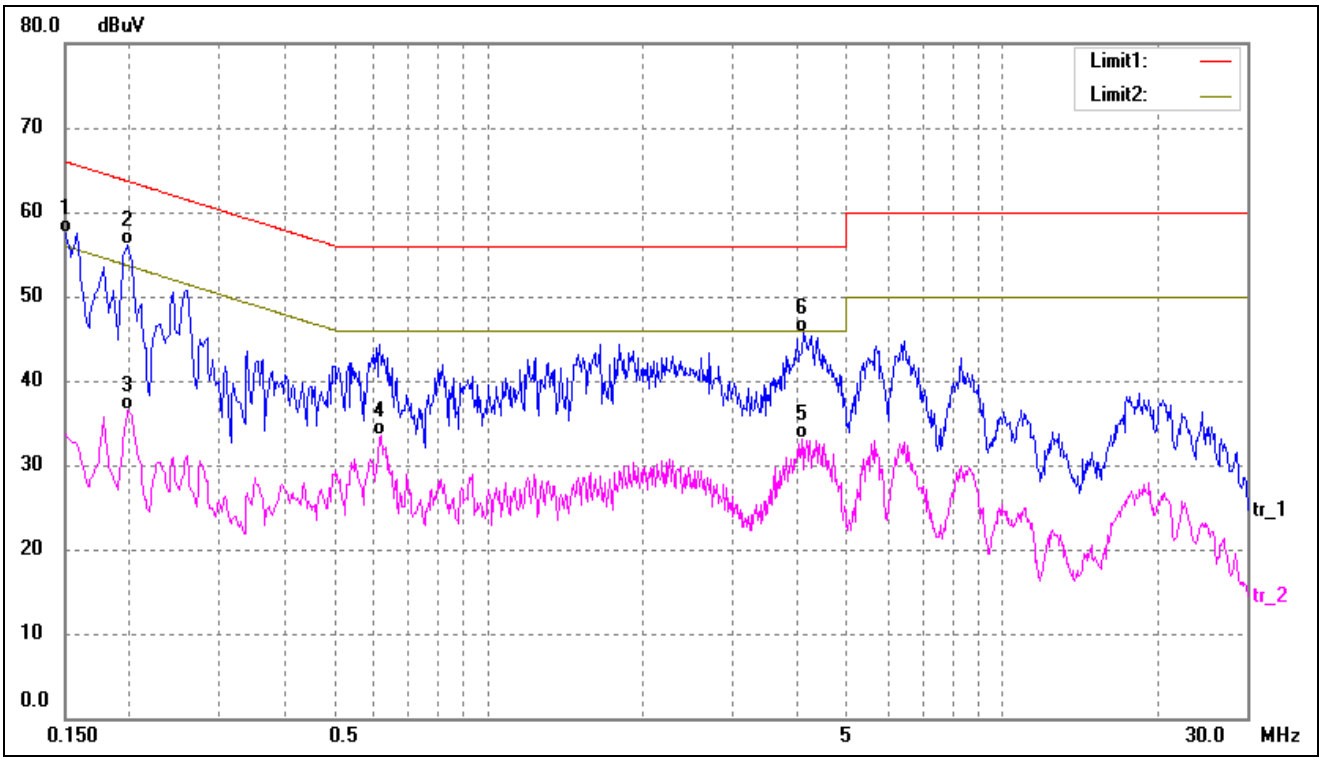
10.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.6180	24.16	10.21	34.37	46.00	-11.63	AVG
2	1.2020	38.55	10.18	48.73	56.00	-7.27	QP
3	1.8500	22.72	10.31	33.03	46.00	-12.97	AVG
4*	1.9980	39.04	10.33	49.37	56.00	-6.63	QP
5	3.9940	24.36	10.36	34.72	46.00	-11.28	AVG
6	4.1940	38.25	10.37	48.62	56.00	-7.38	QP

Test Mode	Communication	AC120V 60Hz	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1500	47.20	10.40	57.60	66.00	-8.40	QP
2*	0.1980	45.63	10.39	56.02	63.69	-7.67	QP
3	0.1980	26.17	10.39	36.56	53.69	-17.13	AVG
4	0.6180	23.25	10.21	33.46	46.00	-12.54	AVG
5	4.0860	22.79	10.36	33.15	46.00	-12.85	AVG
6	4.1100	35.42	10.37	45.79	56.00	-10.21	QP

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

******* END OF REPORT *******