

TEST REPORT

Application No. : KSCR2509001991AT
FCC ID: XMR202401AF68E
Applicant: Quectel Wireless Solutions Co., Ltd.
Address of Applicant: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer: Quectel Wireless Solutions Co., Ltd.
Address of Manufacturer: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Equipment Under Test (EUT):
EUT Name: Wi-Fi & Bluetooth Module
Model No.: AF68E
Trade Mark: QUECTEL
Standards: FCC 47 CFR Part 15, Subpart E
Date of Receipt: 2025-08-31
Date of Test: 2025-09-01 to 2025-09-04
Date of Issue: 2025-09-12

Test Result :	Pass*
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*In the configuration tested, the EUT complied with the standards specified above.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Revision Record			
Version	Description	Date	Remark
00	Add a new antenna	2025-09-12	Based on KSCR240200030906

Authorized for issue by:			
Tested By		Maker Qi	
		Maker_Qi/Project Engineer	
Approved By		Terry Hou	
		Terry Hou /Reviewer	

Contents

1	Test Summary.....	4
2	General Information	6
2.1	Details of Client.....	6
2.2	Test Location	6
2.3	Test Facility	6
2.4	General Description of EUT	7
2.5	Test Environment and Mode	10
2.6	Description of Support Units	10
2.7	Worst-case configuration and mode.....	11
2.8	Power level setting using in test:	11
3	Measurement Uncertainty	12
4	Equipment List	13
5	Test results and Measurement Data	14
5.1	Antenna Requirement	14
5.2	AC Power Line Conducted Emissions.....	16
5.3	Radiated Spurious Emissions	20
5.4	Restricted bands around fundamental frequency.....	83
6	Test Setup Photo	105
7	EUT Constructional Details (EUT Photos)	105

1 Test Summary

Test Item	FCC Rule No.	Test Requirements	Test Result	Result	Test Lab*
Antenna Requirement	15.203/15.407(a)	--	Clause 5.1	PASS	N/A
AC Power Line Conducted Emissions	15.407(b)(8)	< FCC 15.207 limits	Clause 5.2	PASS	B
Duty Cycle	--	No limit.	Clause 5.3	For Report Purpose (Note2)	A
Maximum e.i.r.p.	15.407(a)(7)	< 30dBm over the frequency band of Operation, e.i.r.p.(Controlled by Standard AP)	Clause 5.4	PASS (Note2)	A
26dB Emission Bandwidth	15.407(a)(10)	The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 megahertz.	Clause 5.5	PASS (Note2)	A
99% Occupied Bandwidth	-	No limit..	Clause 5.6	For Report Purpose (Note2)	A
Maximum Power Spectral Density	15.407(a)(7)	< 17dBm/MHz e.i.r.p. (Controlled by Standard AP)	Clause 5.7	PASS (Note2)	A
In-Band Emissions	15.407(b)(5)	EUT must meet the limits detailed in 15.407(b)(6)	Clause 5.8	PASS (Note2)	A
Contention Based Protocol	15.407(d)(6)	If an emission is detected on a channel, the device shall cease transmissions and shall not resume transmissions on this channel while the detected radiofrequency power is at or above the-62 dBm threshold.	Dual Client Standard Client	Not Required (Note2)	A
Dual Client Test	KDB 987594 D02 Section II. K.	-	Dual Client EIRP <24dBm	Not Required (Note2)	A
Unwanted Emissions that fall Out of the Restricted Bands (Radiated)	15.407(b)(6) 15.205, 15.209	< -27dBm/MHz e.i.r.p. outside of the 5.925 – 7.125GHz band	Clause 5.9	PASS	B
Unwanted Emissions in the Restricted Bands (Radiated)	15.407(b)(6) 15.205, 15.209	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Clause 5.10	PASS	B

Note1: Not required means after assessing, test items are not necessary to carry out.

Note2: This report was an additional report copied from the report KSCR240200030906, new report add a new antenna and test items for AC Power Line Conducted Emissions, Unwanted Emissions that fall Out of the Restricted Bands (Radiated) and Unwanted Emissions in the Restricted Bands (Radiated) which fall in the restricted bands. And other test items data refer to original report KSCR240200030906.

2 General Information

2.1 Details of Client

Applicant:	Quectel Wireless Solutions Co., Ltd.
Address of Applicant:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer:	Quectel Wireless Solutions Co., Ltd.
Address of Manufacturer:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

2.2 Test Location

Lab A:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

Lab B:

AC Power Line Conducted Emissions, Unwanted Emissions that fall Out of the Restricted Bands (Radiated) and Unwanted Emissions in the Restricted Bands (Radiated) which fall in the restricted bands test at:

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.

No.2,Tongsheng Road,Wuzhong District,Suzhou,Jiangsu,China

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

2.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

Lab A:

• A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

• VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

Lab B:

• A2LA (Certificate No. 6336.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• Innovation, Science and Economic Development Canada

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• FCC –Designation Number: CN1312

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

2.4 General Description of EUT

Power Supply:	DC 3.3-4.8V,Typ: 3.85V	
IEEE 802.11 WLAN Mode Supported:	☒ 802.11a (20 MHz channel bandwidth), ☒ 802.11ax (20 MHz channel bandwidth) ☒ 802.11ax (40 MHz channel bandwidth) ☒ 802.11ax (80 MHz channel bandwidth) ☒ 802.11ax (160 MHz channel bandwidth)	
Operation Frequency:	IEEE 802.11 a/ax(HE20/40/80/160): 5925 MHz ~ 6425 MHz IEEE 802.11 a/ax(HE20/40/80/160): 6525 MHz ~ 6875 MHz	
Type of Modulation:	OFDM/OFDMA	
Antenna Type:	☒ External, ☐ Integrated	
Antenna Ports:	☒ Ant 1, ☒ Ant 2	
Smart System:	☒ SISO	802.11a/ax
	☒ MIMO	802.11ax: 2Tx & 2Rx
Antenna Gain:	UNII-5: ANT5(WIFI0): 2.0dBi, ANT6(WIFI1): 2.1dBi(Provided by the manufacturer) UNII-7: ANT5(WIFI0): 1.7dBi, ANT6(WIFI1): 1.8dBi(Provided by the manufacturer)	
RF Cable:	1.8dB	
Remark: 1. As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.		

Remark:

In FCC 15.31, for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table, and the selected channel to perform the test as below:

Frequency range over which device operates	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre, 1 near low end

For UNII-5:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/ax 20MHz	The Lowest channel	5955
	The Middle channel	6175
	The Highest channel	6415
IEEE 802.11ax 40MHz	The Lowest channel	5965
	The Middle channel	6165
	The Highest channel	6405
IEEE 802.11ax 80MHz	The Lowest channel	5985
	The Middle channel	6145
	The Highest channel	6385
IEEE 802.11ax160MHz	The Lowest channel	6025
	The Middle channel	6185
	The Highest channel	6345

For UNII-7:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/ax 20MHz	The Lowest channel	6535
	The Middle channel	6695
	The Highest channel	6855
IEEE 802.11ax 40MHz	The Lowest channel	6565
	The Middle channel	6685
	The Highest channel	6845
IEEE 802.11ax 80MHz	The Lowest channel	6625
	The Middle channel	6705
	The Highest channel	6785
IEEE 802.11ax160MHz	The Middle channel	6665

2.5 Test Environment and Mode

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	23-25	3.85
Remark: NV: Normal Voltage NT: Normal Temperature		

2.6 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Router	Smauwave Technology Co.,Ltd	SRT 421	SUWI-04-34-01
Computer	Lenovo	T14	SUWI-03-33-04
Mouse	Lenovo	3D optical Mouse	SUWI-03-33-05
Adaptor	Huawei	HW-050200C02	SUWI-03-33-06
Mouse	Lenovo	3D optical Mouse	SUWI-03-33-05
Bluetooth earphone	Lenovo	Thinplus BH3	SUWI-03-48-01
Remark: all above the information of table are provided by client.			

2.7 Worst-case configuration and mode

Pre-scan / Final test	Mode Code	Description
Final test	12	TX mode (U-NII-5) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11ax 20/40/80/160, Only the data of worst case is recorded in the report.
Final test	14	TX mode (U-NII-7) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11ax 20/40/80/160, Only the data of worst case is recorded in the report.

2.8 Power level setting using in test:

11a			11ax(HEW20)			11ax4(HEW40)		
Channel	ant1	ant2	Channel	ant1	ant2	Channel	ant1	ant2
5955	16.5	16.5	5955	16.5	16.5	5965	16	16
6175	16.5	16.5	6175	16.5	16.5	6165	16	16
6415	16.5	16.5	6415	16.5	16.5	6405	16	16
6535	16.5	16.5	6535	16.5	16.5	6565	16	16
6695	16.5	16.5	6695	16.5	16.5	6685	16	16
6855	16.5	16.5	6855	16.5	16.5	6845	16	16
11ax(HEW80)			11ax(HEW160)					
Channel	ant1	ant2	Channel	ant1	ant2			
5985	15.5	15.5	6025	15	15			
6145	15.5	15.5	6185	15	15			
6385	15.5	15.5	6345	15	15			
6625	15.5	15.5	6825	15	15			
6705	15.5	15.5	6985	15	15			
6785	15.5	15.5						

3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 ⁻⁸
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%
Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.		

4 Equipment List

Lab B:

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals						
1	EMI Test Receive	R&S	ESR7	SUWI-01-10-01	1/15/2025	1/14/2026
2	LISN	R&S	ENV216	SUWI-01-19-03	5/8/2025	5/7/2026
3	LISN	Schwarzbeck	ENV216	SUWI-01-19-04	5/8/2025	5/7/2026
4	Test Software	Tonscend	JS32-CE_4.0.0.2	SUWI-02-09-05	N.C.R	N.C.R
RF Radiated Test						
1	Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	6/3/2023	6/2/2026
2	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	1/20/2025	1/19/2026
3	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-09	11/21/2024	11/20/2025
4	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	1/15/2025	1/14/2026
5	Signal Generator	ROHDE&SCHWARZ	SMW100A	SUWI-01-18-01	1/16/2025	1/15/2026
6	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9168	SUWI-01-11-04	8/22/2024	8/21/2026
7	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	5/7/2025	5/6/2027
8	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	5/7/2025	5/6/2027
9	Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	5/7/2025	5/6/2027
10	Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	1/16/2025	1/15/2026
11	Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	1/16/2025	1/15/2026
12	Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	1/20/2025	1/19/2026
13	Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-26-01	9/10/2024	9/9/2025
14	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	11/19/2024	11/18/2025
15	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-09	9/10/2024	9/9/2025
16	Radio Communication Analyzer	StarPoint	SP9500E	SUWI-01-28-02	11/19/2024	11/18/2025
17	Signal Generator	ROHDE&SCHWARZ	SMB100A	SUWI-01-08-01	1/16/2025	1/15/2026
18	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	1/15/2025	1/14/2026
19	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2/13/2025	2/12/2026
20	Measurement Software	Tonscend	JS32-RE 4.0.0.0	SUWI-02-09-06	NCR	NCR

5 Test results and Measurement Data

5.1 Antenna Requirement

5.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

5.1.2 Conclusion

Standard Requirement:

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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is Internal antenna and no consideration of replacement. The best case gain of the antenna is:

UNII-5: 2.0dBi (WIFI0); 2.1dBi (WIFI1);

UNII-7: 1.7dBi (WIFI0); 1.8dBi (WIFI1);

Antenna location: Refer to internal photo.

Directional Gain Calculations for MIMO:

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

Basic methodology with NANT transmit antennas, each with the same directional gain GANT dBi, being driven by NANT transmitter outputs of equal power. Directional gain is to be computed as follows:

- If any transmit signals are correlated with each other,
Directional gain = $GANT + 10 \log(NANT)$ dBi
- If all transmit signals are completely uncorrelated with each other,
Directional gain = GANT

Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, ..., GN dBi

- If transmit signals are correlated, then
Directional gain = $10 \log[(10G1/20 + 10G2/20 + \dots + 10GN/20)^2 / NANT]$ dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]
- If all transmit signals are completely uncorrelated, then
Directional gain = $10 \log[(10G1/10 + 10G2/10 + \dots + 10GN/10)/NANT]$ dBi

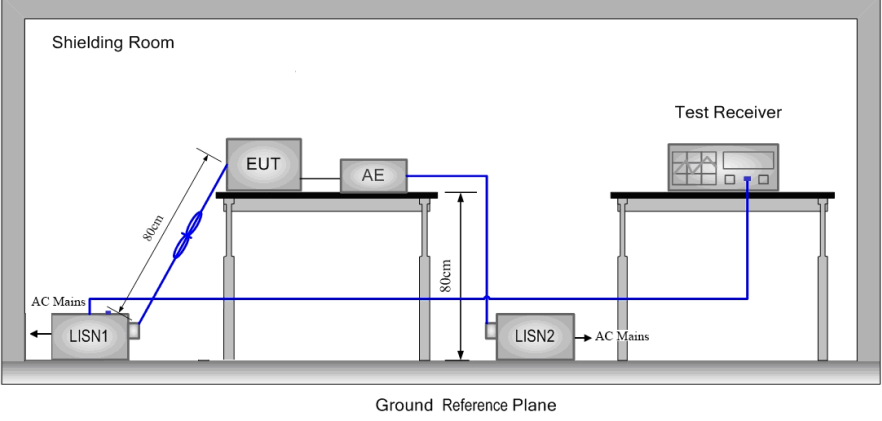
Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT set equal to the gain of the antenna having the highest gain.

All antennas have the same gain:

Operation Frequency	ANT5(WIFI0) (dBi)	ANT6(WIFI1) (dBi)	Directional gain For Power(dBi)	Directional gain For PSD(dBi)
5925 MHz to 6425 MHz	2.0	2.1	2.1	2.1
6525 MHz to 6875 MHz	1.7	1.8	1.8	1.8

5.2 AC Power Line Conducted Emissions

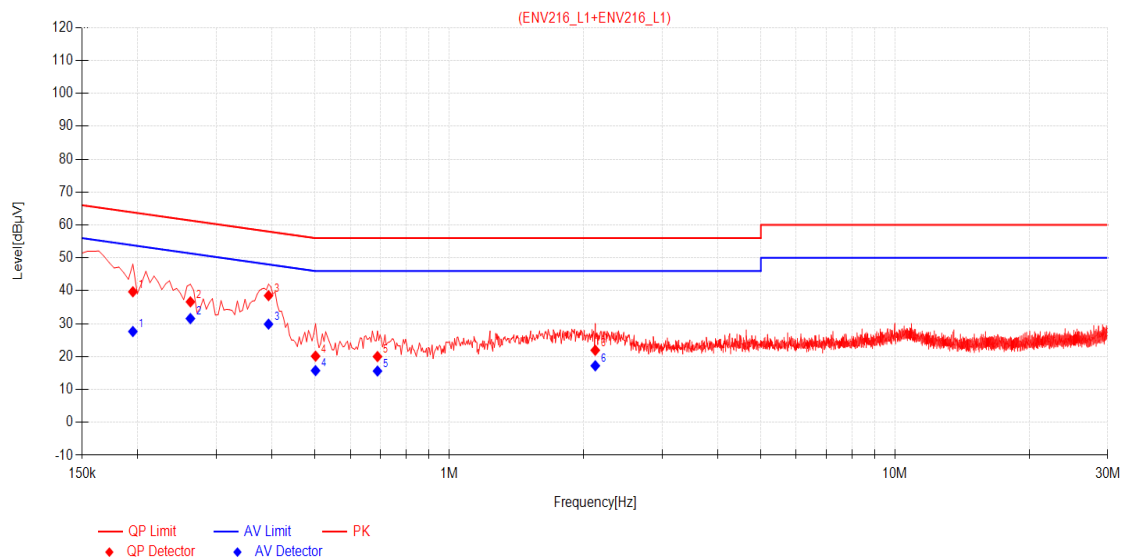
Test Requirement:	47 CFR Part 15 Section 15.407(b)		
Test Method:	ANSI C63.10: 2013 Section 6.2		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		

Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Refer to section 2.7 for details. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 4 for details
Test Results:	Pass

Measurement Data:

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

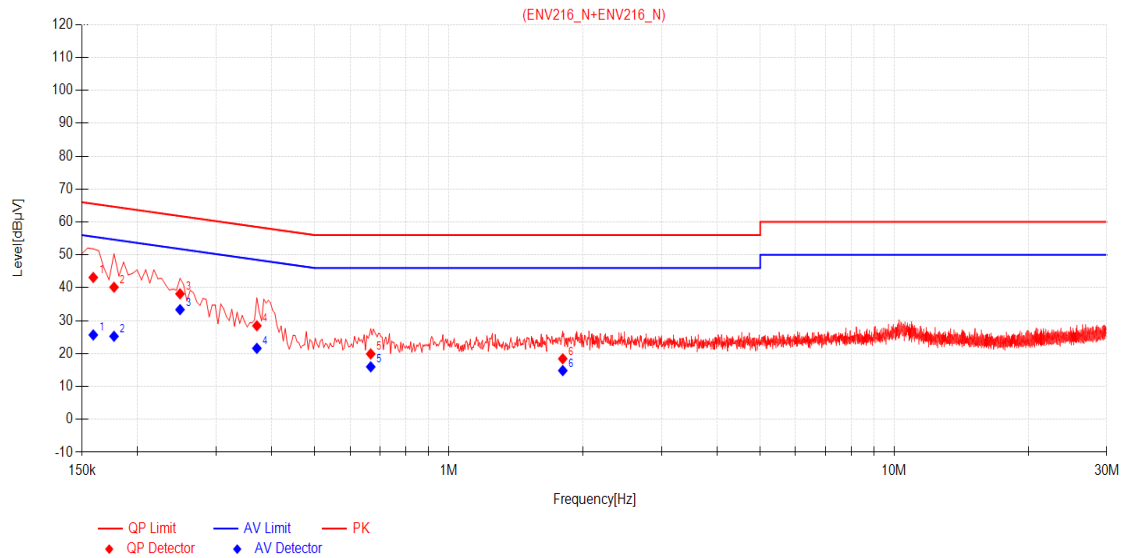
Test Mode: 12; Line: Live line



Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1950	9.97	29.72	39.69	63.82	24.13	17.64	27.61	53.82	26.21	PASS
2	0.2625	9.97	26.66	36.63	61.35	24.72	21.58	31.55	51.35	19.80	PASS
3	0.3930	9.95	28.57	38.52	58.00	19.48	19.91	29.86	48.00	18.14	PASS
4	0.5010	9.94	10.18	20.12	56.00	35.88	5.79	15.73	46.00	30.27	PASS
5	0.6900	9.92	10.09	20.01	56.00	35.99	5.68	15.60	46.00	30.40	PASS
6	2.1255	9.88	12.04	21.92	56.00	34.08	7.33	17.21	46.00	28.79	PASS

Test Mode: 12; Line: Neutral Line



Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1590	9.95	33.18	43.13	65.52	22.39	15.71	25.66	55.52	29.86	PASS
2	0.1770	9.94	30.22	40.16	64.63	24.47	15.31	25.25	54.63	29.38	PASS
3	0.2490	9.97	28.19	38.16	61.79	23.63	23.38	33.35	51.79	18.44	PASS
4	0.3705	9.96	18.49	28.45	58.49	30.04	11.64	21.60	48.49	26.89	PASS
5	0.6675	9.94	9.96	19.90	56.00	36.10	6.04	15.98	46.00	30.02	PASS
6	1.8015	9.92	8.50	18.42	56.00	37.58	4.91	14.83	46.00	31.17	PASS

5.3 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15 Section 15.205 and 15.209
Test Method:	ANSI C63.10: 2013 Section 6.4 / 6.5 / 6.6
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)
Test frequency:	9kHz ~ 40GHz(or 10 Harmonic)

Test Setup:

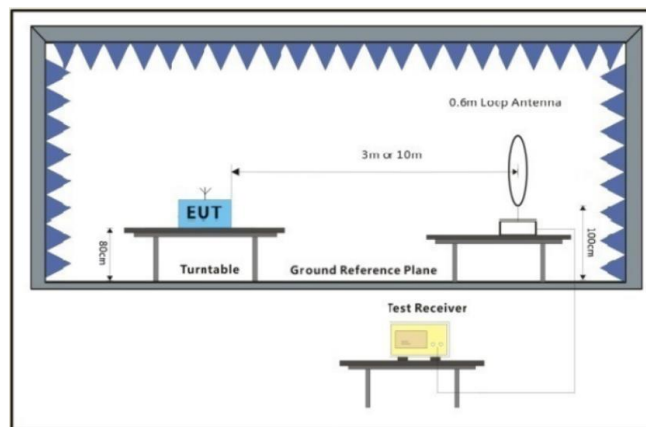


Figure 1. 9kHz to 30MHz

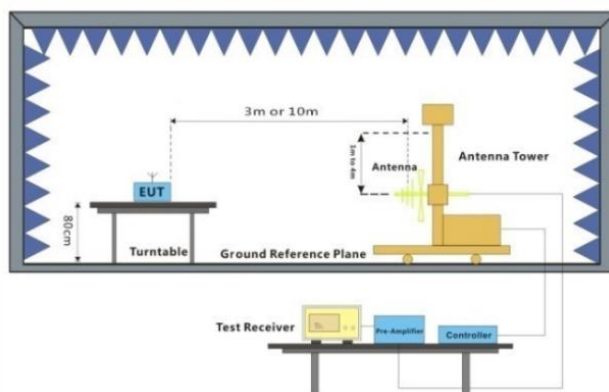


Figure 1. 30MHz to 1GHz

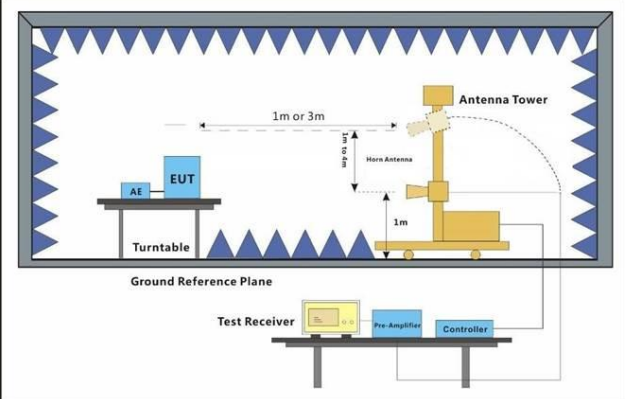


Figure 2. Above 1 GHz

Test Procedure:

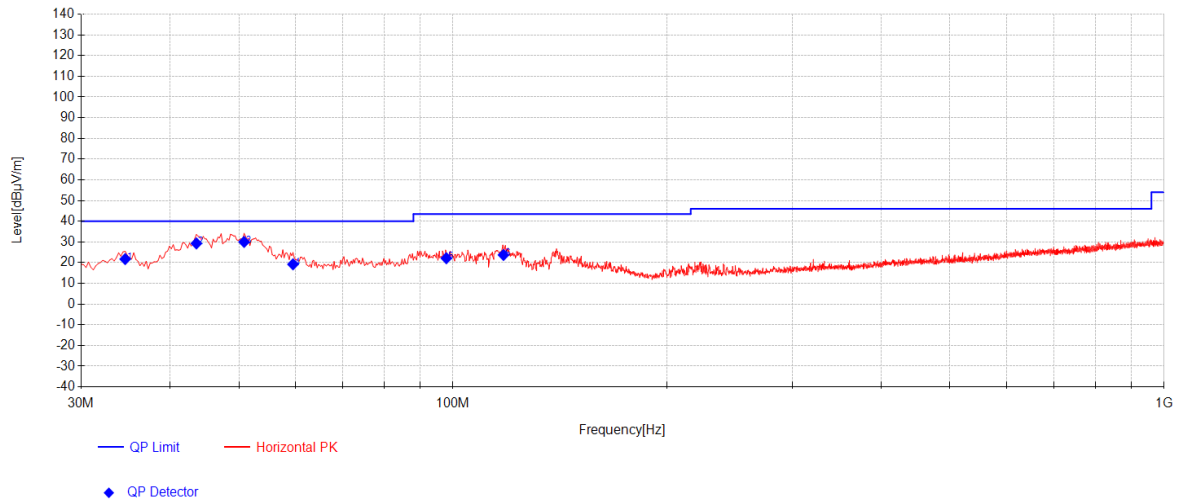
- For below 1GHz test, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz test, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Distance from antenna to EUT is 1m for measurements >18GHz).
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the

	rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. Test the EUT in the outermost channels. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete. j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed. l. At a measurement distance of 1 meter the limit line was increased by $20 \times \text{LOG}(3/1) = 9.54 \text{ dB}$. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel of 802.11a. Only the worst case is recorded in the report. 3. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 4. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. 5. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 6. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 7. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. 8. For devices with multiple operating modes, measurements on the middle channel is used to determine the worst-case mode(s). Only the worst case mode with the highest output power and the mode with the highest output power spectral density for each modulation family (e.g., OFDM and direct sequence spread spectrum) is recorded in the test report. 9. This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for a modulation and MiMO antenna operation for ax modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.
Test Configuration:	Measurements below 30MHz • RBW = 10 kHz

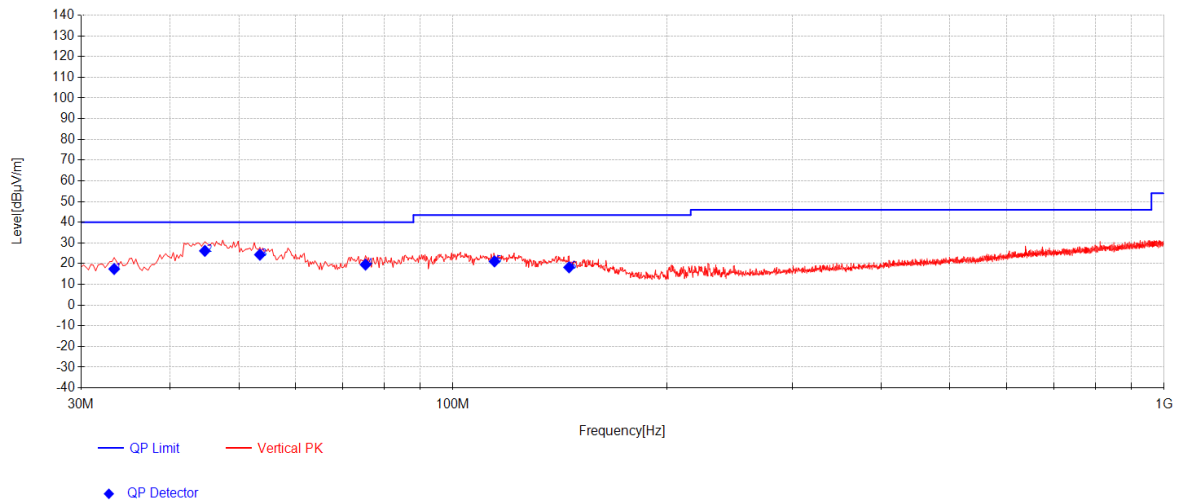
	• VBW = 30 kHz • Detector = Peak & Average & Quasi-peak • Trace mode = max hold Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW $\geq$ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • RBW = 1 MHz • VBW = 10Hz, when duty cycle is no less than 98 percent. • VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.
Final Test Mode:	Refer to section 2.7 for details. For below 1GHz part, through pre-scan all channels, but only the worst case is recorded in the report.
Instruments Used:	Refer to section 4 for details
Test Results:	Pass

Radiated emission below 1GHz

11a_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	34.6075	37.48	18.20	-33.95	21.73	40.00	18.27	157	171	Horizontal
2	43.58	44.29	18.80	-33.80	29.29	40.00	10.71	169	120	Horizontal
3	50.855	45.17	18.51	-33.68	30.01	40.00	9.99	138	16	Horizontal
4	59.585	35.24	17.54	-33.56	19.22	40.00	20.78	187	296	Horizontal
5	97.9	41.09	14.21	-33.15	22.15	43.50	21.35	164	327	Horizontal
6	117.785	40.18	16.46	-32.93	23.71	43.50	19.79	134	161	Horizontal

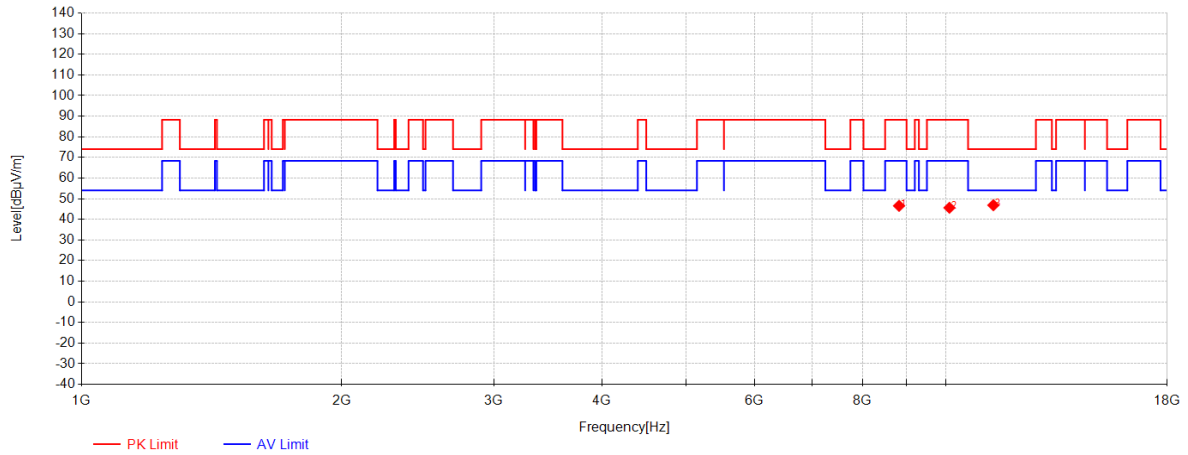


Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	33.395	33.26	18.14	-33.97	17.43	40.00	22.57	191	360	Vertical
2	44.7925	41.07	18.88	-33.78	26.17	40.00	13.83	136	168	Vertical
3	53.5225	39.83	18.15	-33.64	24.34	40.00	15.66	168	84	Vertical
4	75.3475	37.51	15.40	-33.38	19.53	40.00	20.47	177	315	Vertical
5	114.39	38.21	15.86	-32.96	21.11	43.50	22.39	158	210	Vertical
6	145.6725	32.06	18.90	-32.72	18.24	43.50	25.26	169	360	Vertical

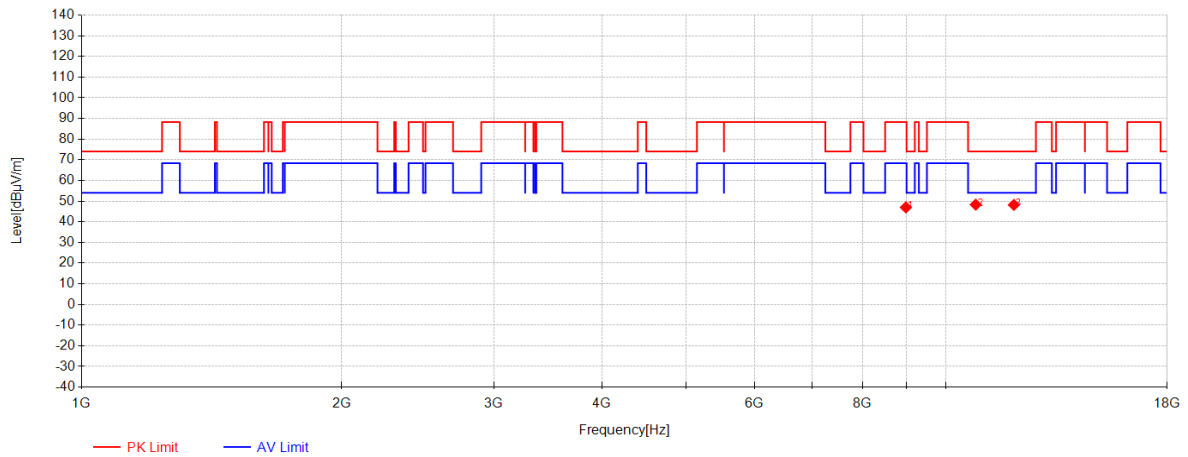
Remark:

All channels have been tested, but only the worst case data displayed in this report.

Transmitter emission Above 1GHz 802.11a_Channel 1

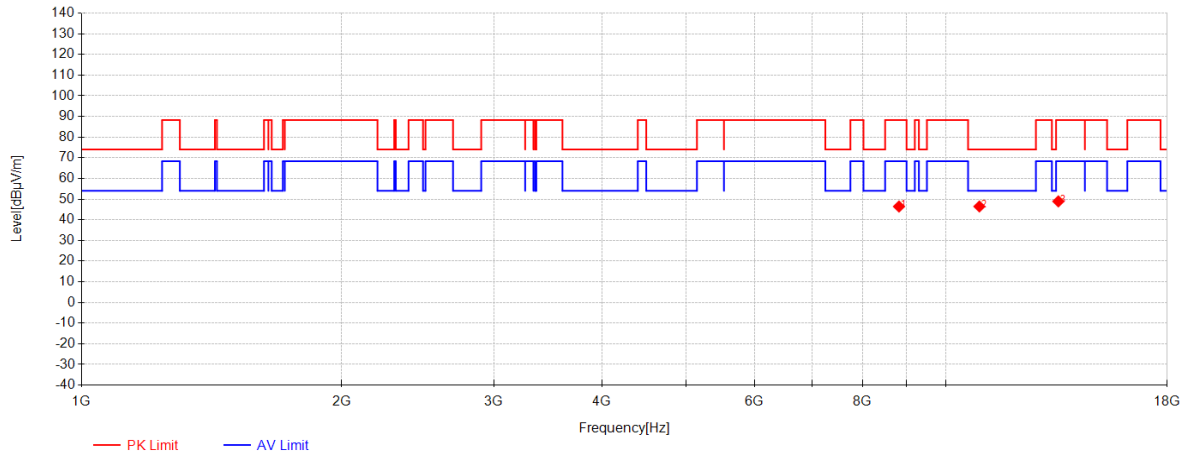


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8820.6667	43.02	37.51	-33.98	46.55	88.30	41.75	Horizontal
2	10087.6667	39.29	37.94	-31.62	45.61	88.30	42.69	Horizontal
3	11339.6667	38.00	38.40	-29.55	46.85	74.00	27.15	Horizontal

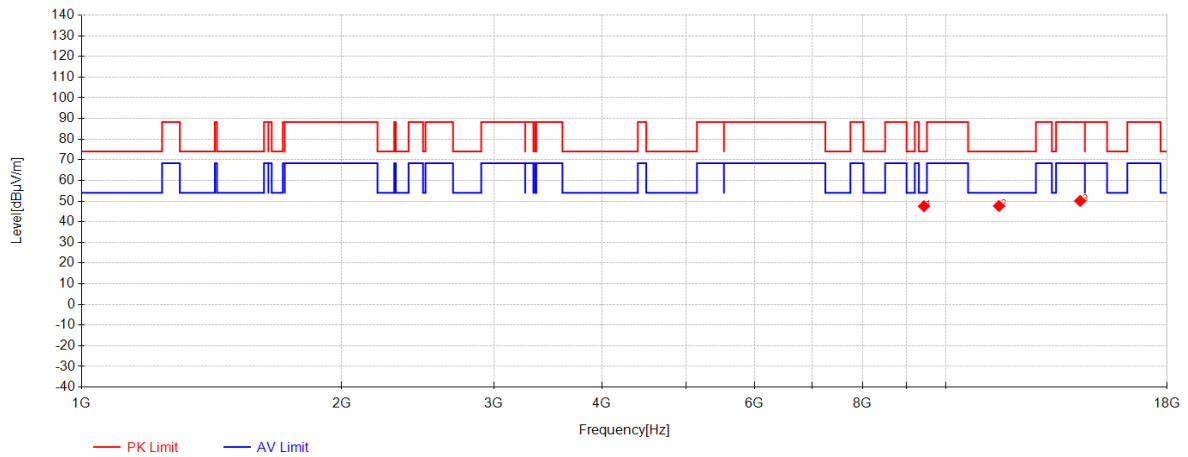


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8982.3333	43.10	37.59	-33.71	46.98	88.30	41.32	Vertical
2	10819	40.04	38.31	-30.06	48.29	74.00	25.71	Vertical
3	11976	38.86	38.40	-29.07	48.19	74.00	25.81	Vertical

802.11a_Channel 45

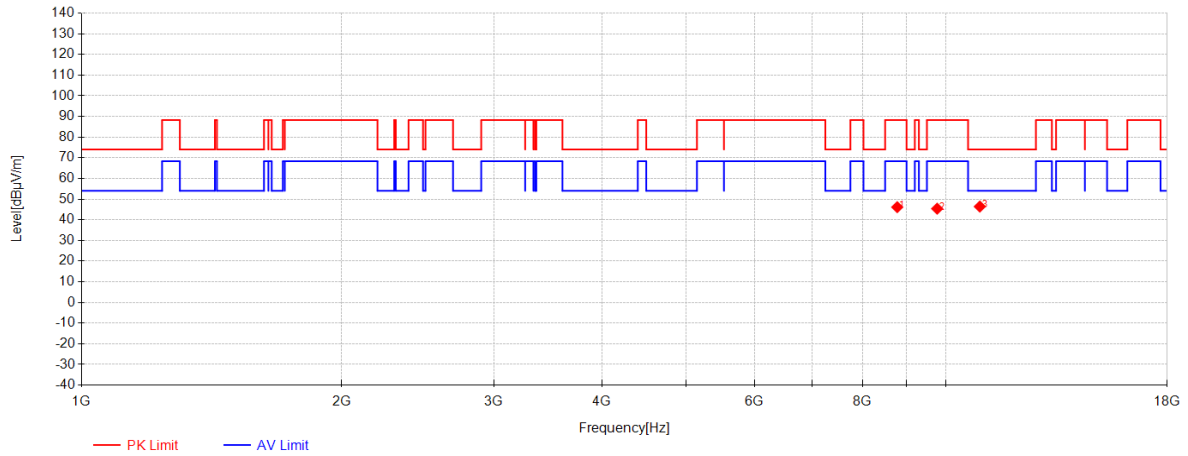


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8820	42.90	37.51	-33.98	46.43	88.30	41.87	Horizontal
2	10924.6667	38.23	38.36	-30.15	46.45	74.00	27.55	Horizontal
3	13481.3333	37.72	39.94	-28.74	48.92	88.30	39.38	Horizontal

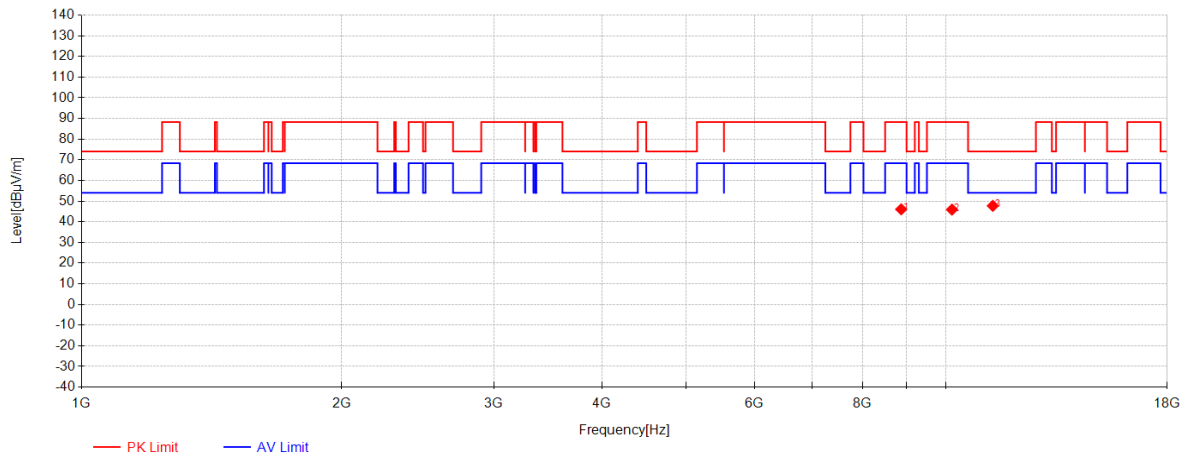


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9425.6667	42.88	37.73	-33.05	47.55	74.00	26.45	Vertical
2	11509.3333	38.65	38.40	-29.40	47.65	74.00	26.35	Vertical
3	14286.6667	38.40	40.24	-28.53	50.11	88.30	38.19	Vertical

802.11a_Channel 93



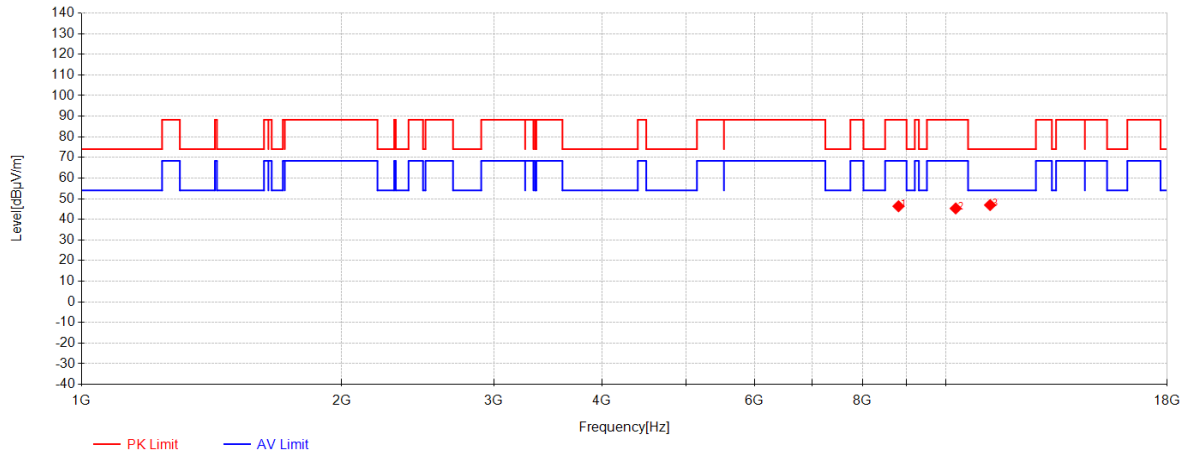
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8778.6667	42.67	37.49	-34.04	46.12	88.30	42.18	Horizontal
2	9763.3333	40.14	37.83	-32.58	45.39	88.30	42.91	Horizontal
3	10937.6667	38.20	38.37	-30.16	46.41	74.00	27.59	Horizontal



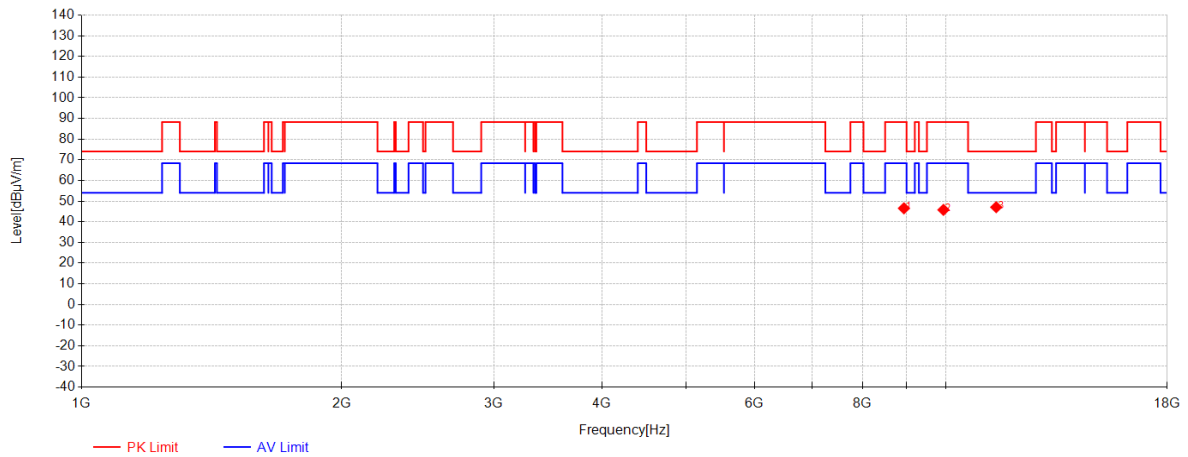
Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8872	42.73	37.54	-34.23	46.04	88.30	42.26	Vertical
2	10156.6667	39.56	37.98	-31.65	45.89	88.30	42.41	Vertical
3	11322.6667	38.78	38.40	-29.45	47.73	74.00	26.27	Vertical

802.11a_Channel 117

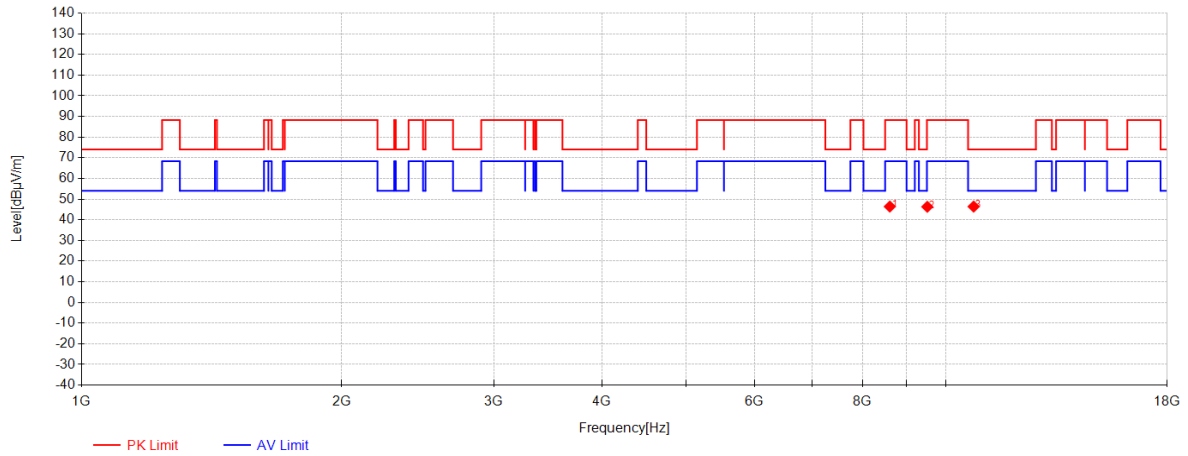


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8809	42.78	37.50	-33.92	46.36	88.30	41.94	Horizontal
2	10258	38.79	38.03	-31.53	45.29	88.30	43.01	Horizontal
3	11240.6667	37.95	38.40	-29.41	46.94	74.00	27.06	Horizontal

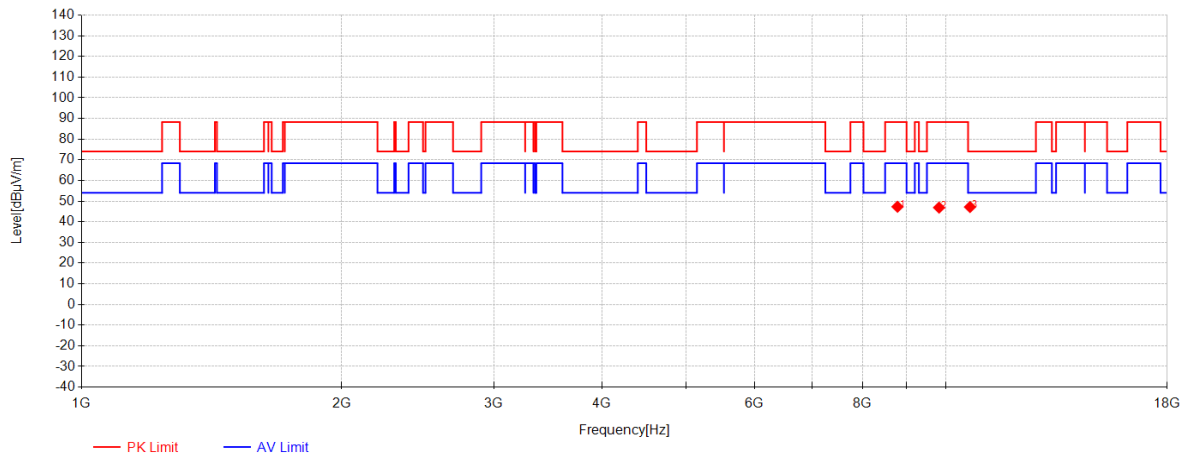


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8936.6667	43.02	37.57	-34.07	46.52	88.30	41.78	Vertical
2	9928.6667	39.94	37.88	-32.04	45.78	88.30	42.52	Vertical
3	11425.6667	38.45	38.40	-29.80	47.05	74.00	26.95	Vertical

802.11a_Channel 149

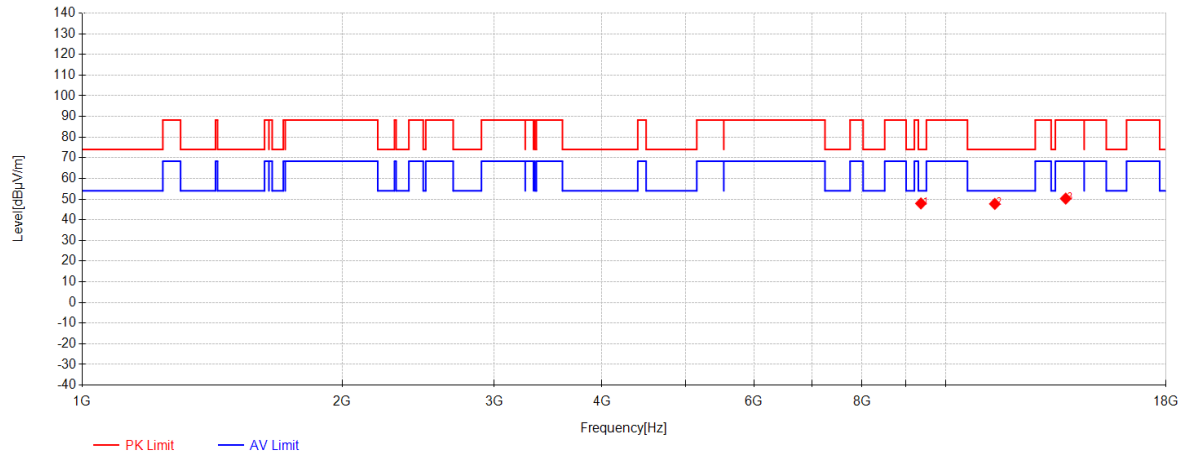


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8607.3333	43.24	37.40	-34.22	46.42	88.30	41.88	Horizontal
2	9510.3333	41.79	37.75	-33.23	46.31	88.30	41.99	Horizontal
3	10759	38.29	38.28	-30.16	46.41	74.00	27.59	Horizontal

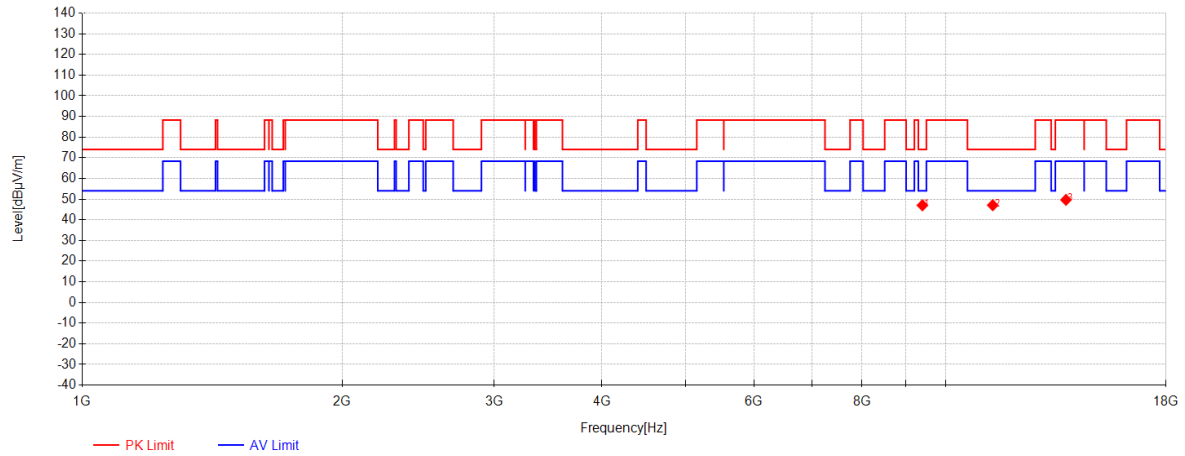


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8784.6667	43.77	37.49	-34.00	47.27	88.30	41.03	Vertical
2	9812.6667	41.55	37.84	-32.52	46.87	88.30	41.43	Vertical
3	10655.3333	39.37	38.23	-30.45	47.15	74.00	26.85	Vertical

802.11a_Channel 181

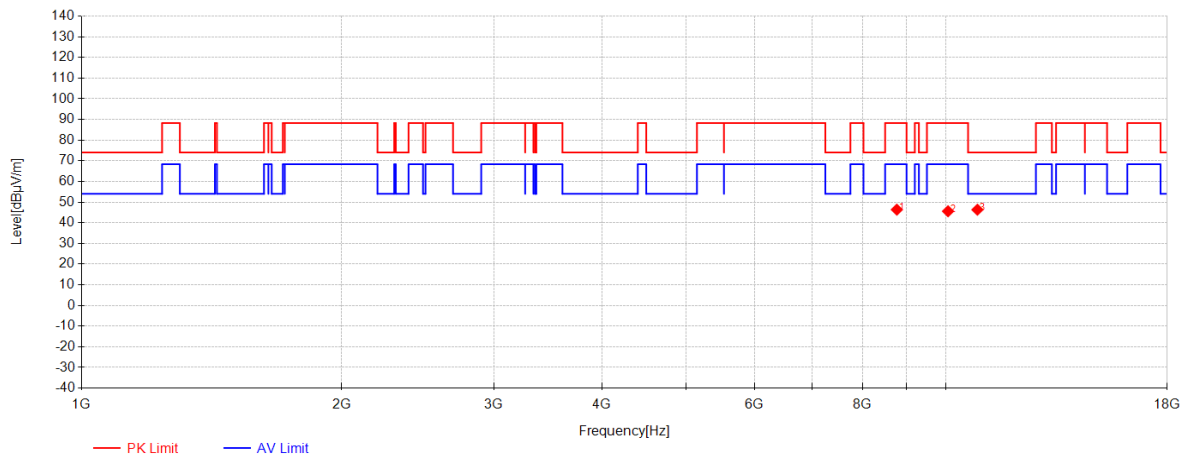


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9362.3333	43.33	37.71	-33.12	47.92	74.00	26.08	Vertical
2	11401.6667	39.19	38.40	-29.91	47.68	74.00	26.32	Vertical
3	13776	38.92	40.14	-28.80	50.26	88.30	38.04	Vertical

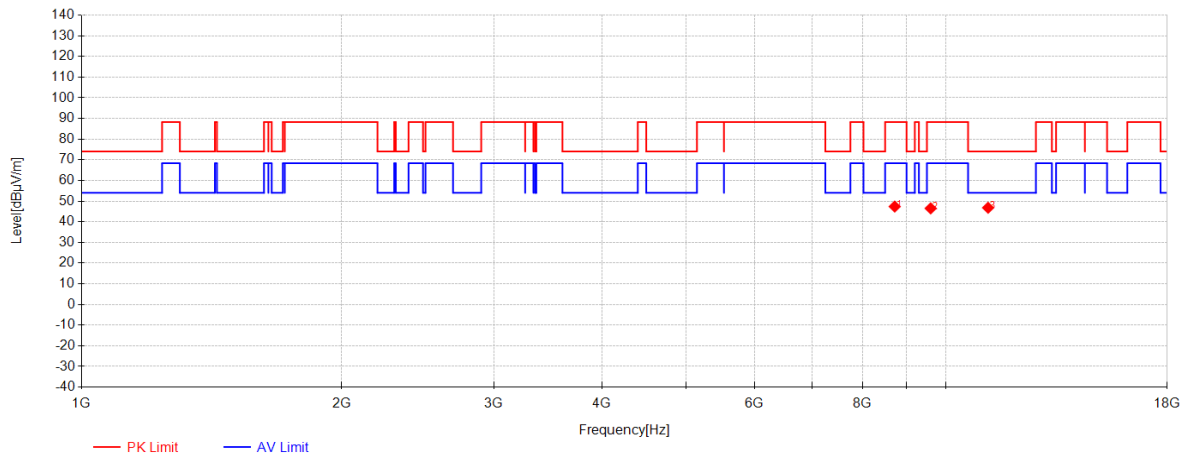


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9400.3333	42.27	37.72	-32.98	47.01	74.00	26.99	Horizontal
2	11338	38.18	38.40	-29.54	47.04	74.00	26.96	Horizontal
3	13784.3333	38.31	40.15	-28.80	49.66	88.30	38.64	Horizontal

802.11ax20_Channel 1

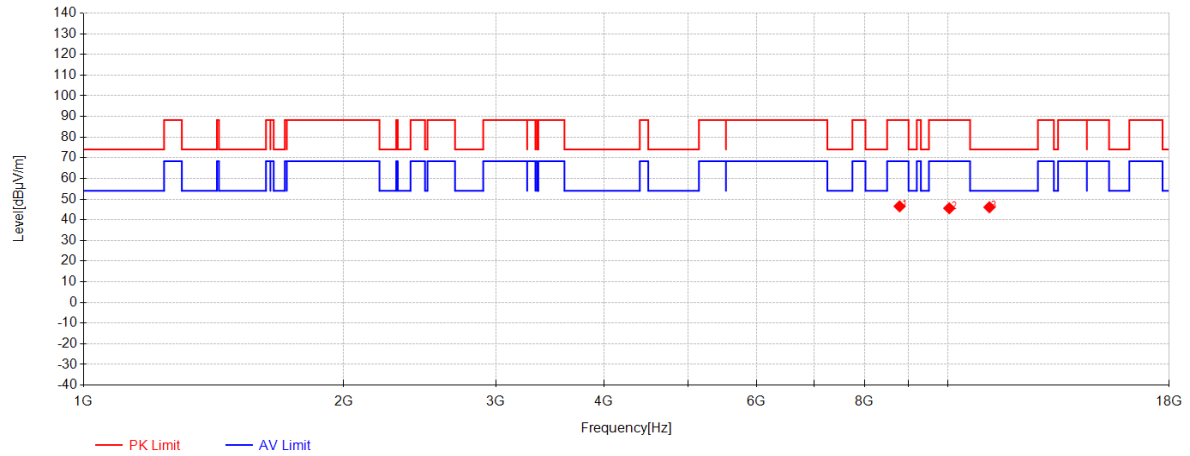


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8769.3333	42.99	37.48	-34.11	46.36	88.30	41.94	Horizontal
2	10050	39.37	37.93	-31.71	45.59	88.30	42.71	Horizontal
3	10868.3333	38.10	38.33	-30.09	46.34	74.00	27.66	Horizontal

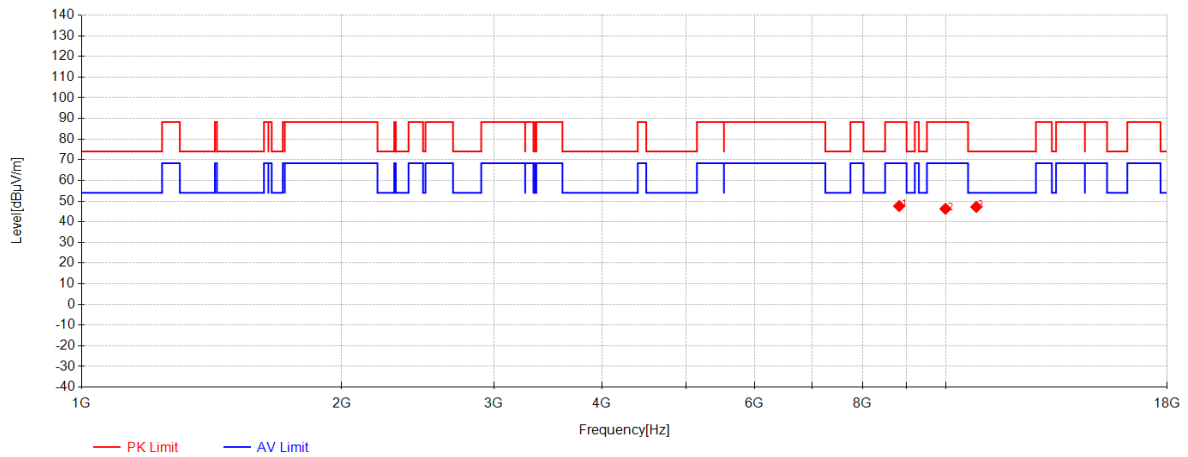


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8719.6667	44.40	37.46	-34.49	47.37	88.30	40.93	Vertical
2	9596.3333	41.66	37.78	-32.94	46.50	88.30	41.80	Vertical
3	11181.3333	37.87	38.40	-29.48	46.79	74.00	27.21	Vertical

802.11ax20_Channel 45

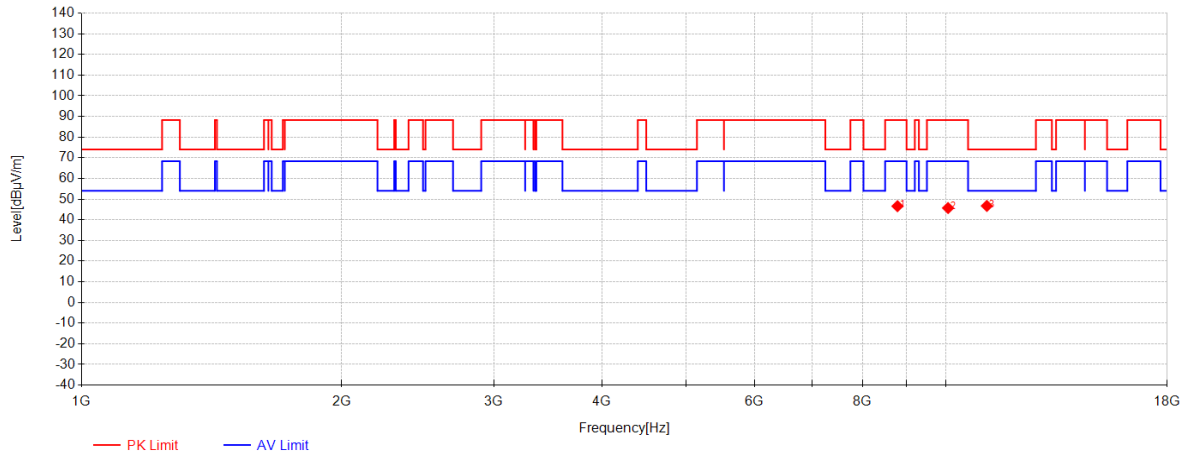


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8786.6667	43.00	37.49	-33.98	46.51	88.30	41.79	Horizontal
2	10029.6667	39.43	37.91	-31.76	45.59	88.30	42.71	Horizontal
3	11160.6667	37.16	38.40	-29.48	46.08	74.00	27.92	Horizontal

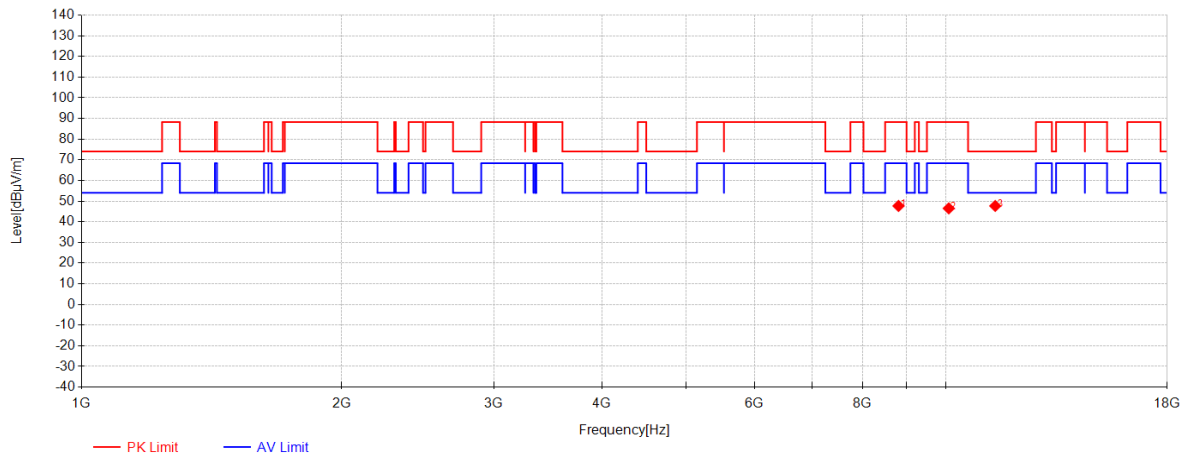


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8824	44.09	37.51	-34.00	47.61	88.30	40.69	Vertical
2	9981.3333	40.26	37.89	-31.88	46.27	88.30	42.03	Vertical
3	10834.6667	38.94	38.32	-30.07	47.19	74.00	26.81	Vertical

802.11ax20_Channel 93

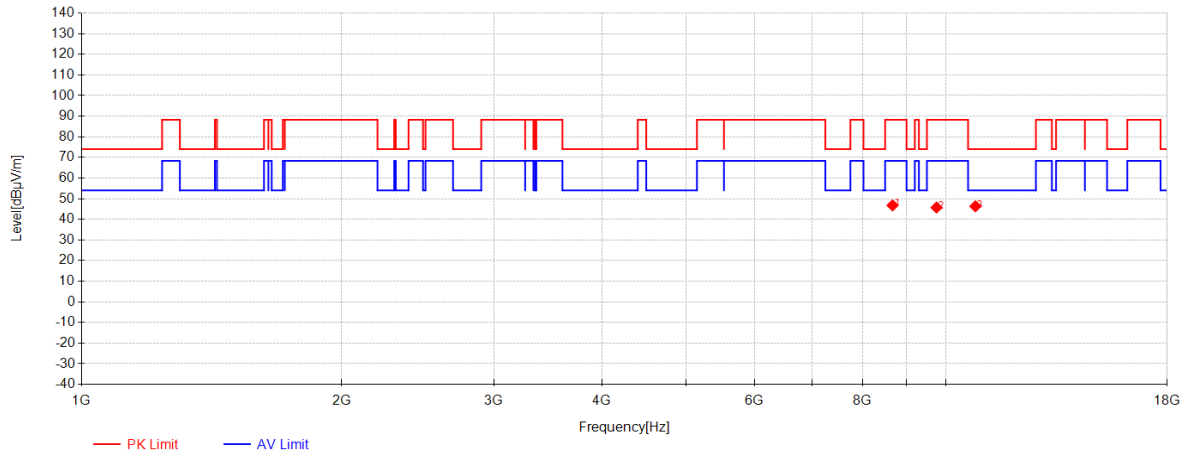


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8784.3333	43.11	37.49	-34.00	46.60	88.30	41.70	Horizontal
2	10050.6667	39.49	37.93	-31.71	45.71	88.30	42.59	Horizontal
3	11144.3333	37.79	38.40	-29.47	46.72	74.00	27.28	Horizontal

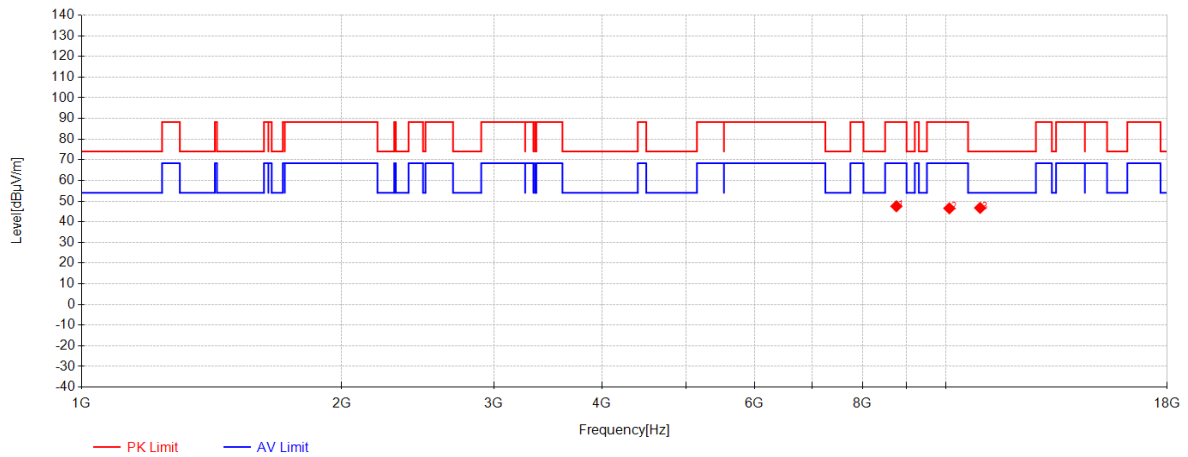


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8808.6667	44.08	37.50	-33.92	47.66	88.30	40.64	Vertical
2	10071.3333	40.22	37.94	-31.66	46.50	88.30	41.80	Vertical
3	11396.3333	39.17	38.40	-29.90	47.67	74.00	26.33	Vertical

802.11ax20_Channel 117

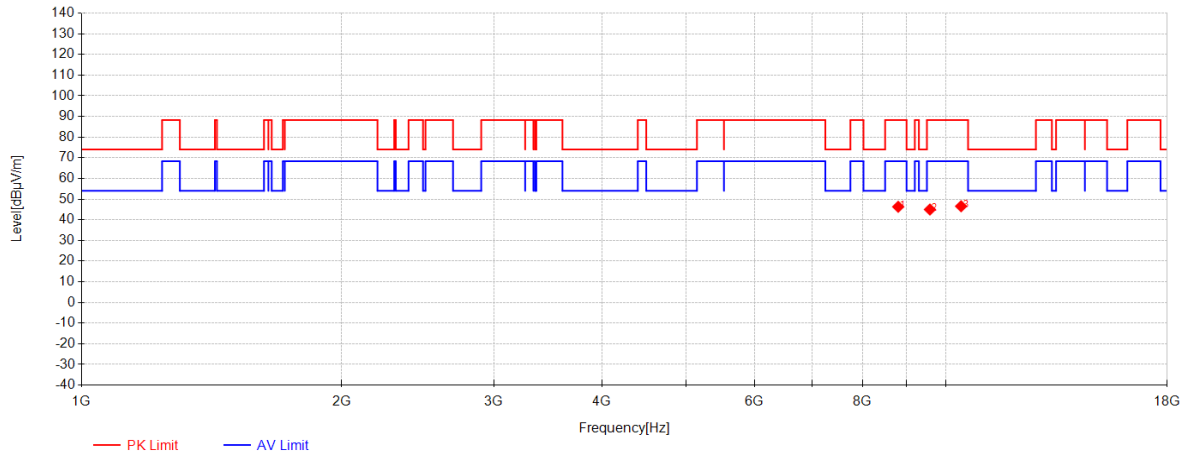


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8671	43.85	37.44	-34.51	46.78	88.30	41.52	Horizontal
2	9747	40.50	37.82	-32.57	45.75	88.30	42.55	Horizontal
3	10810	38.06	38.31	-30.05	46.32	74.00	27.68	Horizontal

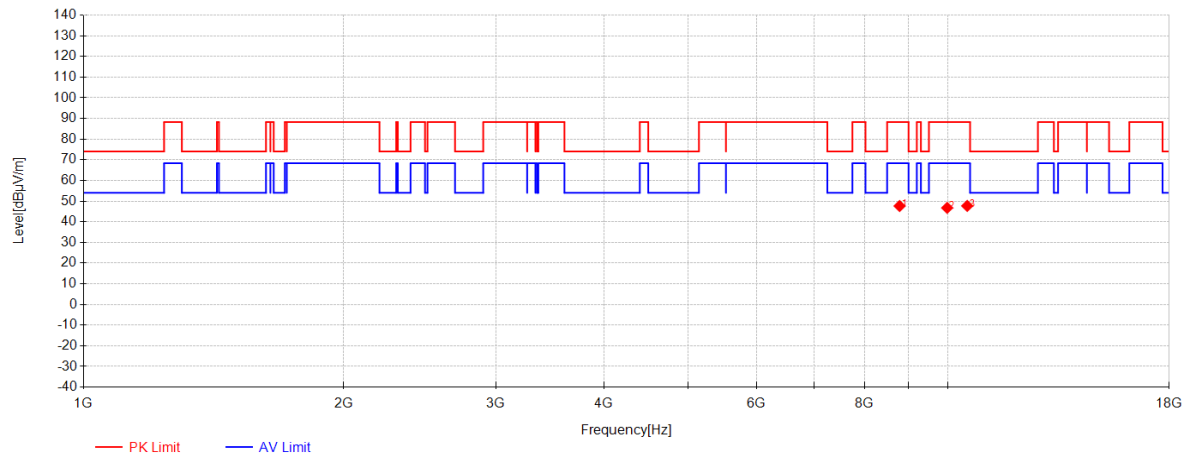


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8758	44.24	37.48	-34.20	47.52	88.30	40.78	Vertical
2	10085.3333	40.20	37.94	-31.63	46.52	88.30	41.78	Vertical
3	10945.6667	38.52	38.37	-30.17	46.72	74.00	27.28	Vertical

802.11ax20_Channel 149

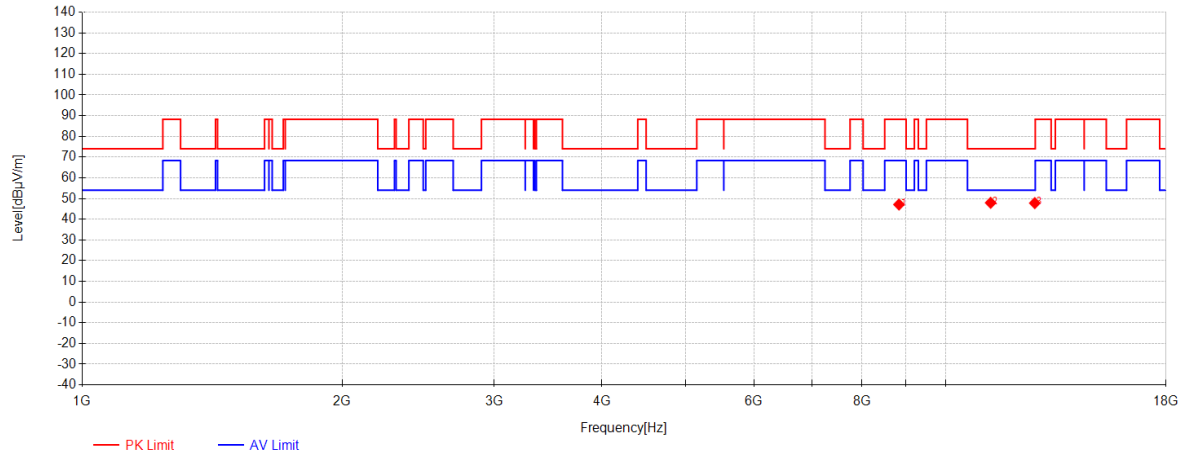


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8800.6667	42.68	37.50	-33.88	46.30	88.30	42.00	Horizontal
2	9578	40.21	37.77	-33.00	44.98	88.30	43.32	Horizontal
3	10405.3333	39.14	38.10	-30.69	46.55	88.30	41.75	Horizontal

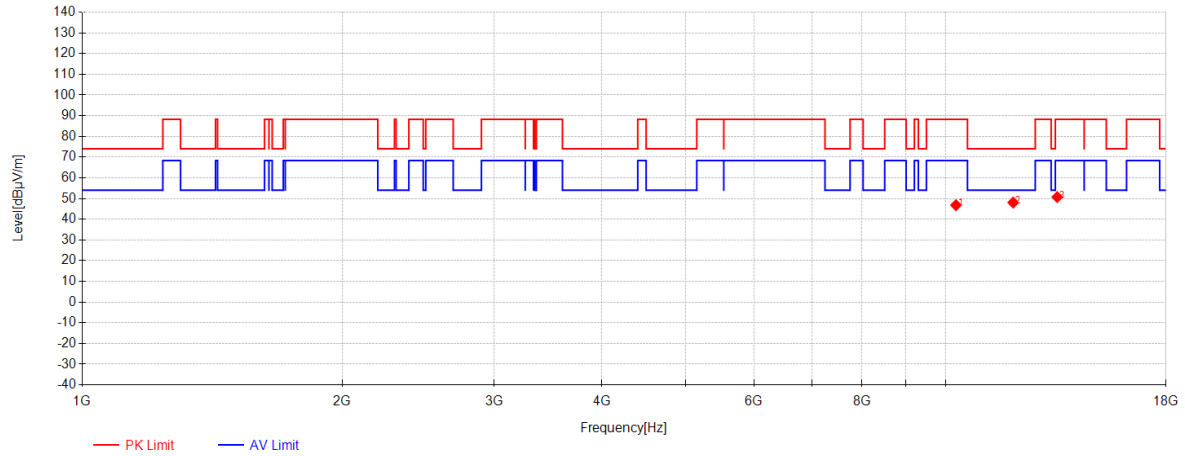


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8787.3333	44.12	37.49	-33.98	47.64	88.30	40.66	Vertical
2	9973.6667	40.76	37.89	-31.91	46.75	88.30	41.55	Vertical
3	10521	40.39	38.16	-30.85	47.70	88.30	40.60	Vertical

802.11ax20_Channel 181

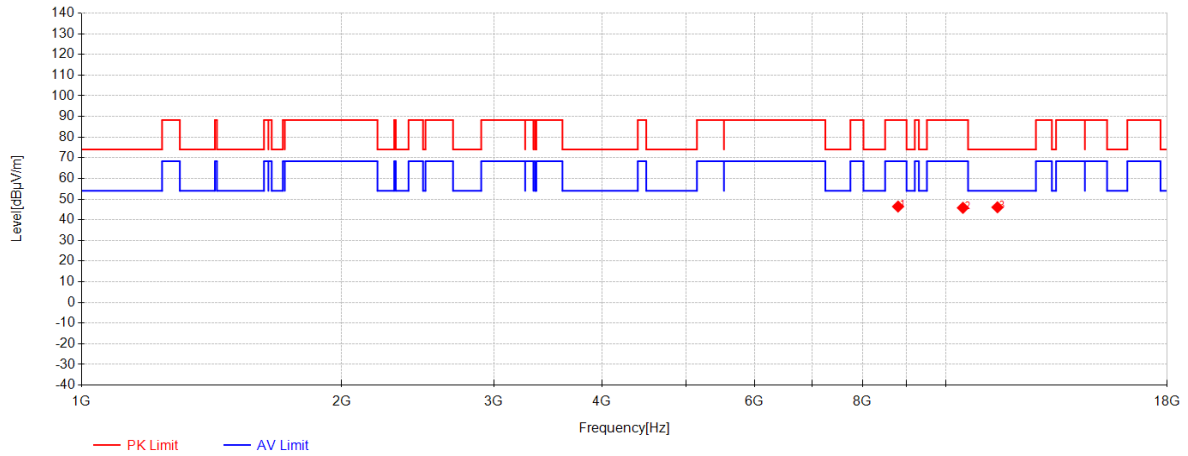


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8830.6667	43.61	37.52	-34.03	47.10	88.30	41.20	Horizontal
2	11275.3333	38.88	38.40	-29.35	47.93	74.00	26.07	Horizontal
3	12683.6667	37.76	39.22	-29.19	47.79	74.00	26.21	Horizontal

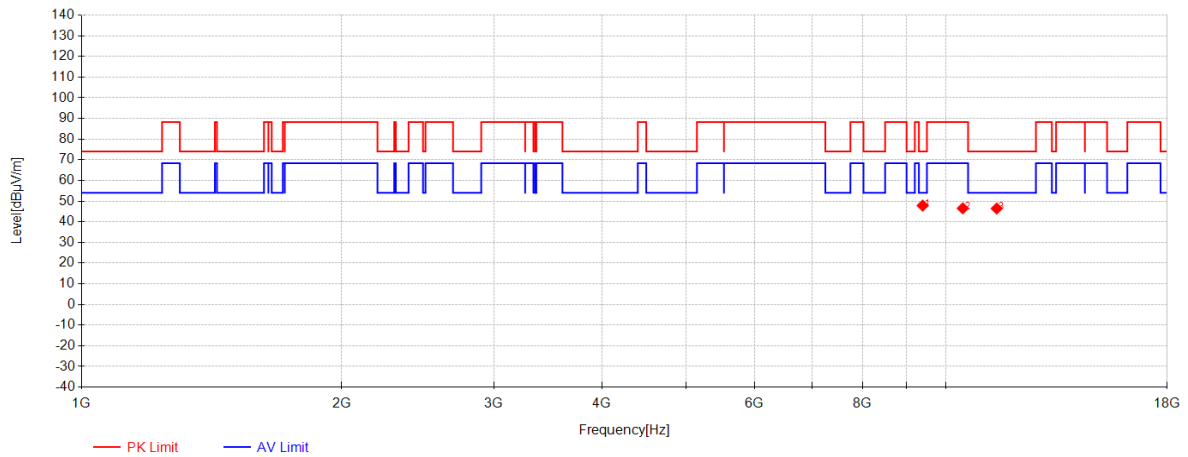


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	10280.3333	40.23	38.04	-31.47	46.81	88.30	41.49	Vertical
2	11973	38.76	38.40	-29.09	48.07	74.00	25.93	Vertical
3	13466	39.60	39.93	-28.82	50.71	88.30	37.59	Vertical

802.11ax40_Channel 3

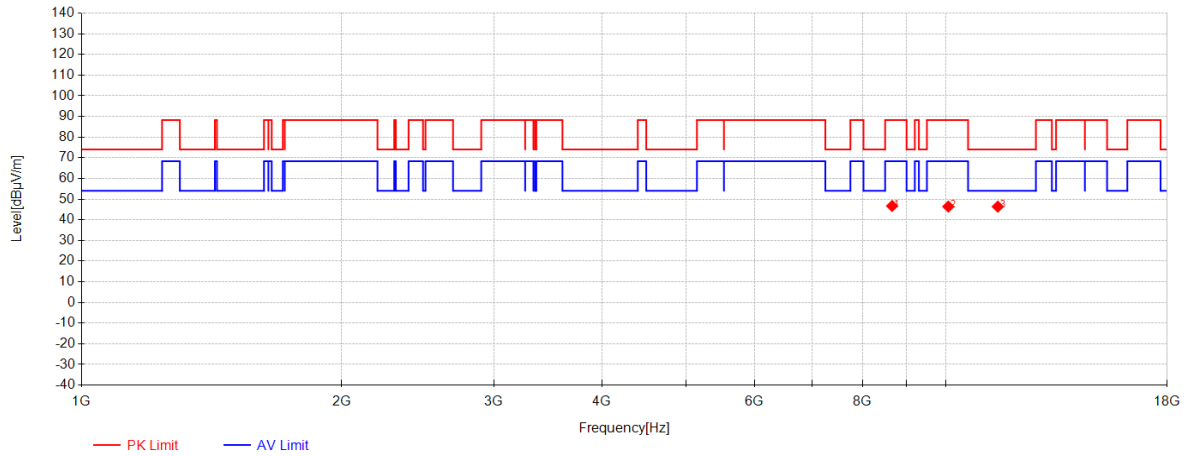


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8798	42.81	37.50	-33.90	46.41	88.30	41.89	Horizontal
2	10457	38.47	38.13	-30.82	45.78	88.30	42.52	Horizontal
3	11463.6667	37.27	38.40	-29.61	46.06	74.00	27.94	Horizontal

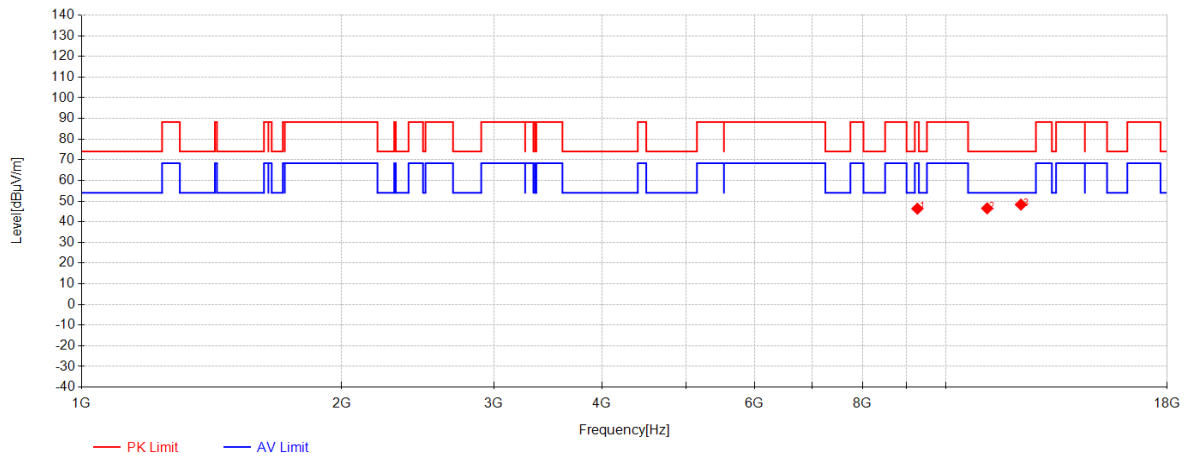


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9395.3333	43.13	37.72	-33.00	47.85	74.00	26.15	Vertical
2	10453	39.19	38.13	-30.81	46.51	88.30	41.79	Vertical
3	11441.3333	37.74	38.40	-29.72	46.42	74.00	27.58	Vertical

802.11ax40_Channel 43

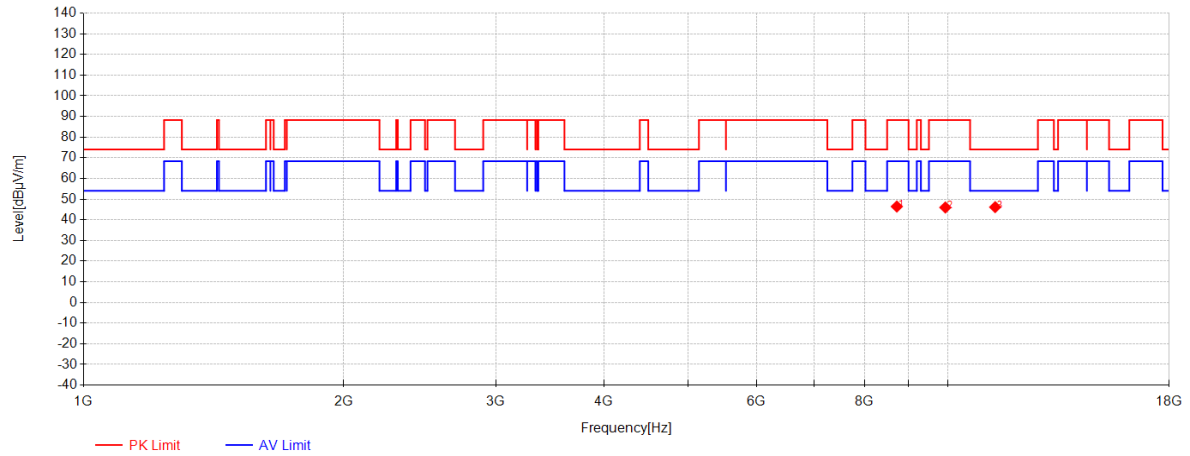


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8660	43.72	37.43	-34.46	46.69	88.30	41.61	Horizontal
2	10058.3333	40.16	37.93	-31.69	46.40	88.30	41.90	Horizontal
3	11474	37.54	38.40	-29.56	46.38	74.00	27.62	Horizontal

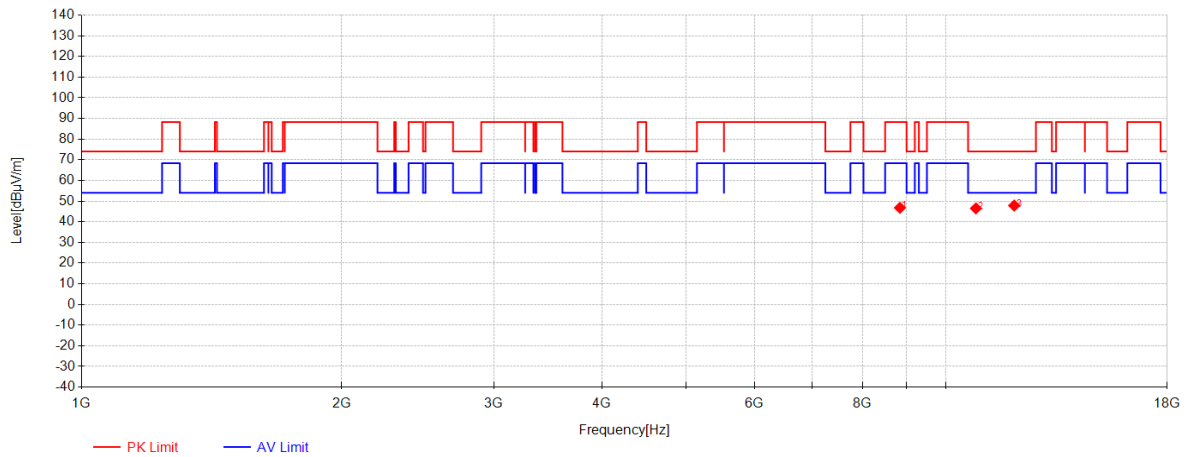


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9262	42.20	37.68	-33.54	46.34	88.30	41.96	Vertical
2	11153	37.59	38.40	-29.48	46.51	74.00	27.49	Vertical
3	12202.3333	38.82	38.64	-29.13	48.33	74.00	25.67	Vertical

802.11ax40_Channel 91

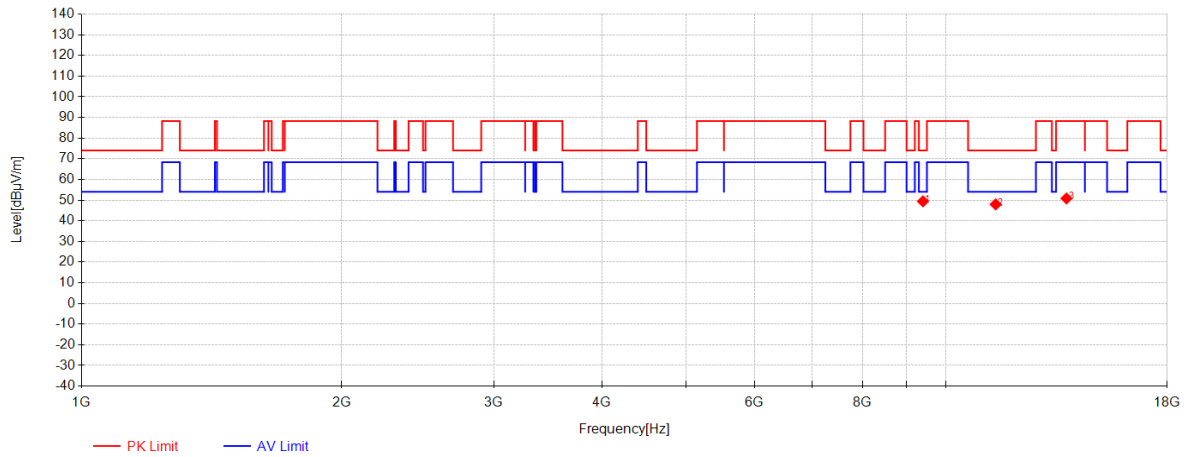


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8722.6667	43.43	37.46	-34.47	46.42	88.30	41.88	Horizontal
2	9926	40.15	37.88	-32.04	45.98	88.30	42.32	Horizontal
3	11333.6667	37.25	38.40	-29.52	46.13	74.00	27.87	Horizontal

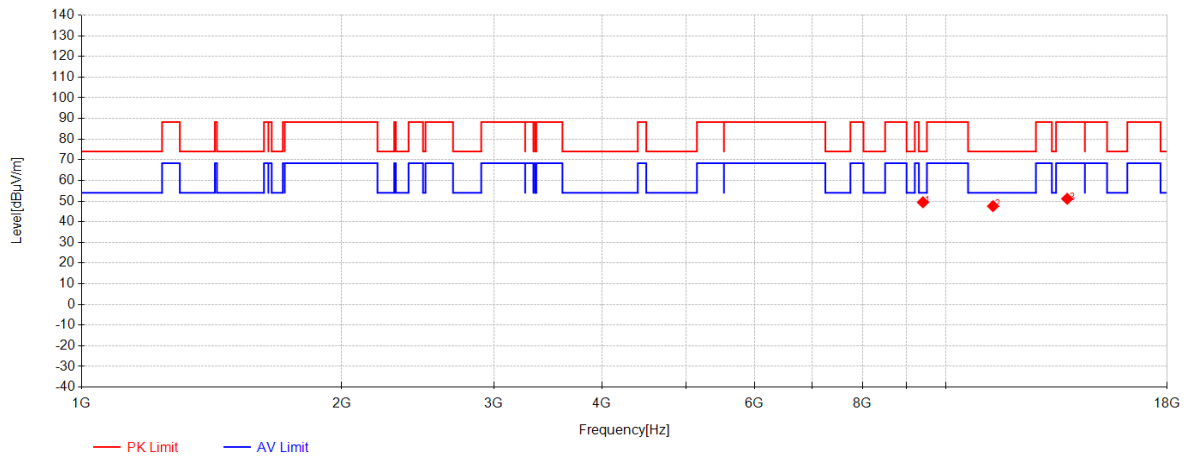


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8841.6667	43.35	37.52	-34.08	46.79	88.30	41.51	Vertical
2	10824.6667	38.24	38.31	-30.06	46.49	74.00	27.51	Vertical
3	11986.6667	38.48	38.40	-29.02	47.86	74.00	26.14	Vertical

802.11ax40_Channel 123

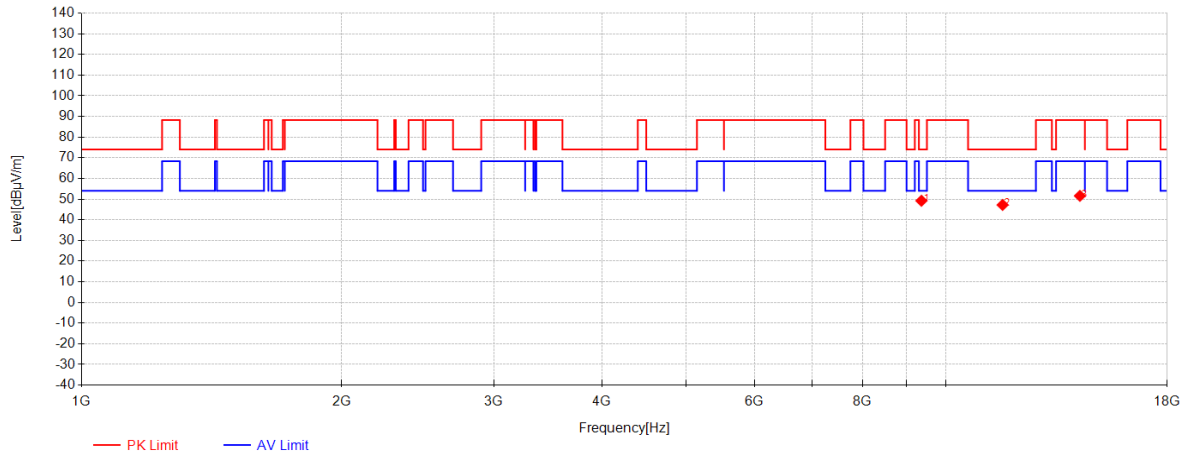


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9401.6667	44.67	37.72	-32.98	49.41	74.00	24.59	Horizontal
2	11409.3333	39.43	38.40	-29.88	47.95	74.00	26.05	Horizontal
3	13777	39.49	40.14	-28.80	50.83	88.30	37.47	Horizontal

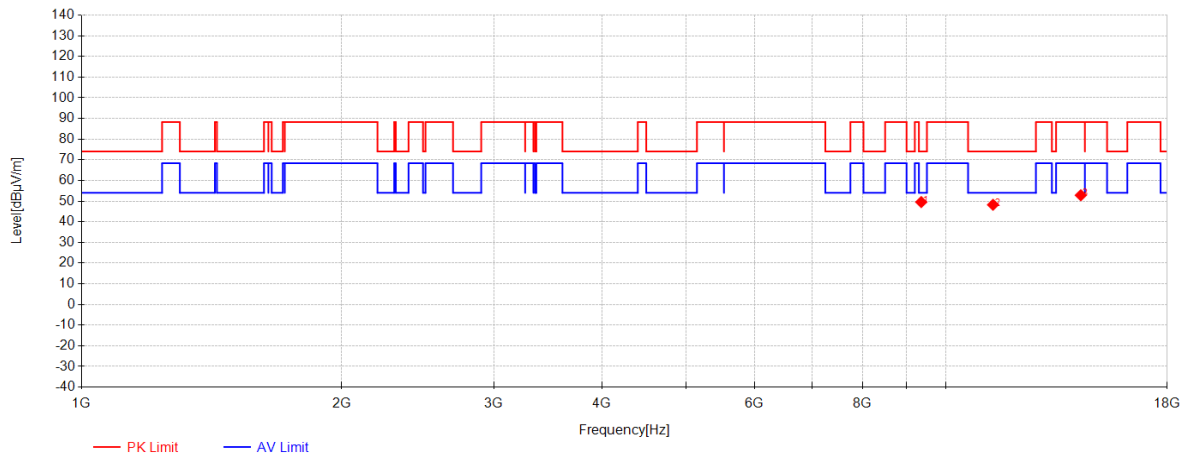


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9400.6667	44.72	37.72	-32.98	49.46	74.00	24.54	Vertical
2	11328.6667	38.66	38.40	-29.48	47.58	74.00	26.42	Vertical
3	13804	39.76	40.16	-28.79	51.13	88.30	37.17	Vertical

802.11ax40_Channel 147

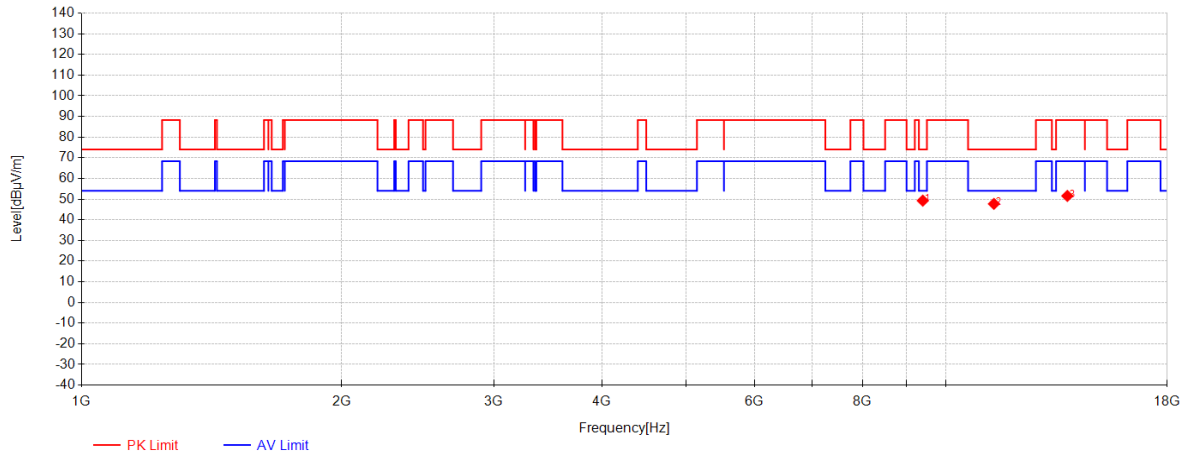


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9363	44.61	37.71	-33.11	49.21	74.00	24.79	Horizontal
2	11621.6667	37.93	38.40	-29.12	47.21	74.00	26.79	Horizontal
3	14277.6667	39.95	40.24	-28.61	51.58	88.30	36.72	Horizontal

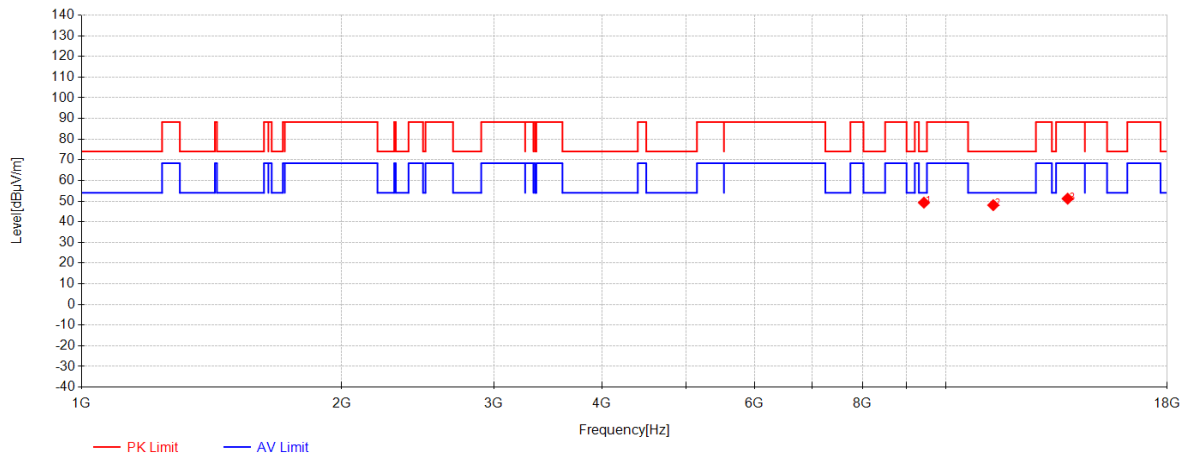


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9358	44.97	37.71	-33.13	49.55	74.00	24.45	Vertical
2	11328.6667	39.32	38.40	-29.48	48.24	74.00	25.76	Vertical
3	14312.3333	40.95	40.24	-28.34	52.84	88.30	35.46	Vertical

802.11ax40_Channel 179

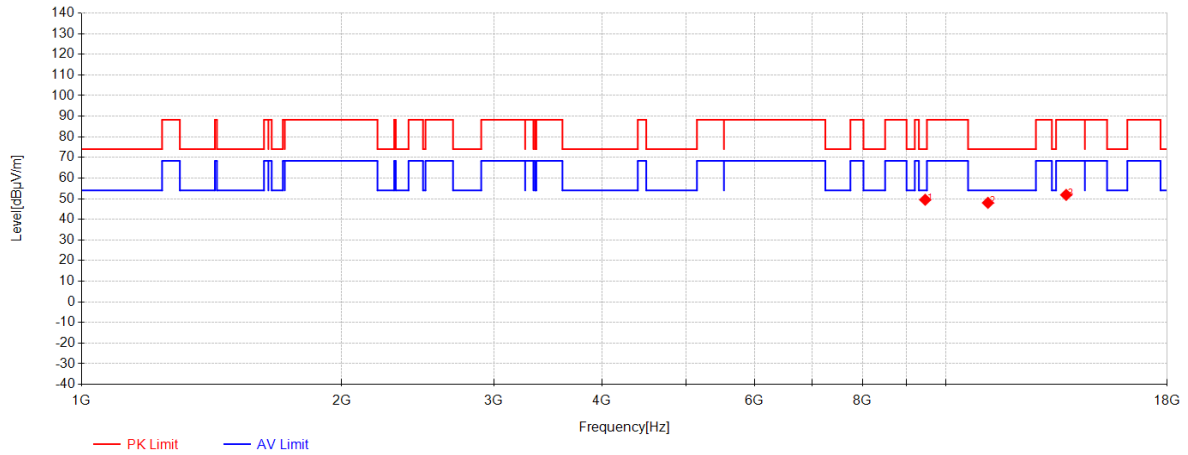


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9398	44.54	37.72	-32.99	49.27	74.00	24.73	Horizontal
2	11356.3333	38.95	38.40	-29.65	47.70	74.00	26.30	Horizontal
3	13808	40.19	40.17	-28.79	51.56	88.30	36.74	Horizontal

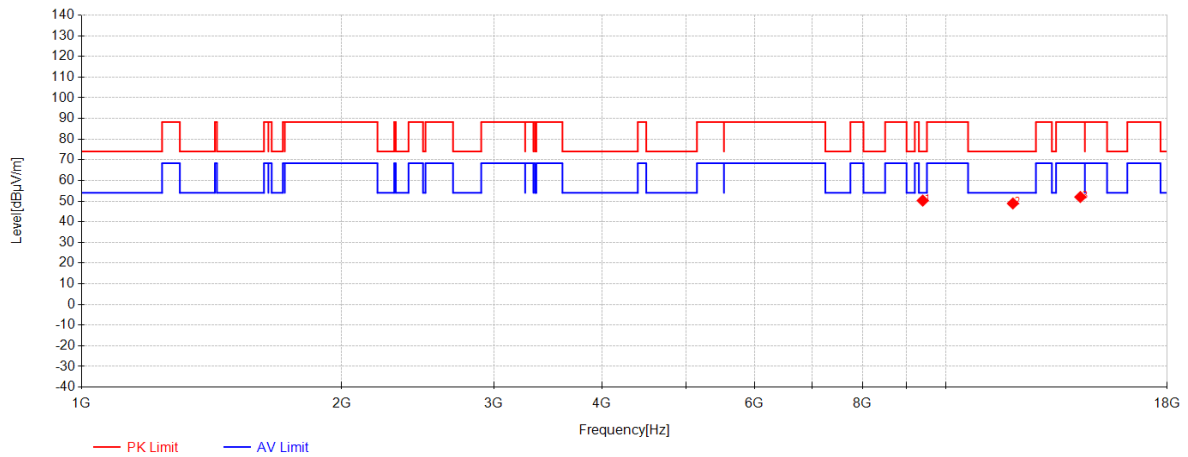


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9425	44.59	37.73	-33.05	49.26	74.00	24.74	Vertical
2	11336.3333	39.17	38.40	-29.53	48.04	74.00	25.96	Vertical
3	13819	39.81	40.17	-28.79	51.19	88.30	37.11	Vertical

802.11ax80_Channel 7

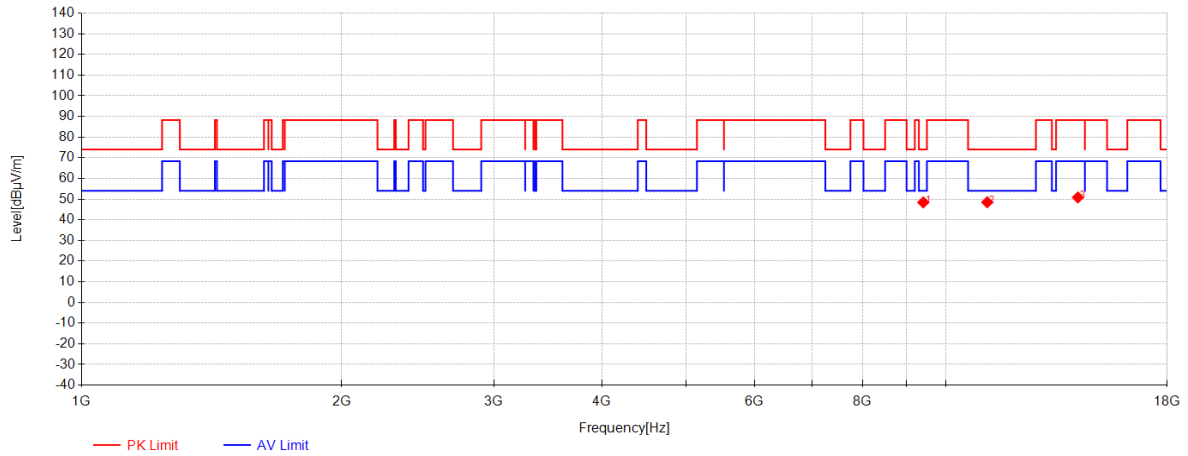


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9456.6667	44.91	37.74	-33.14	49.50	74.00	24.50	Horizontal
2	11176	39.08	38.40	-29.48	48.00	74.00	26.00	Horizontal
3	13764.3333	40.53	40.14	-28.81	51.86	88.30	36.44	Horizontal

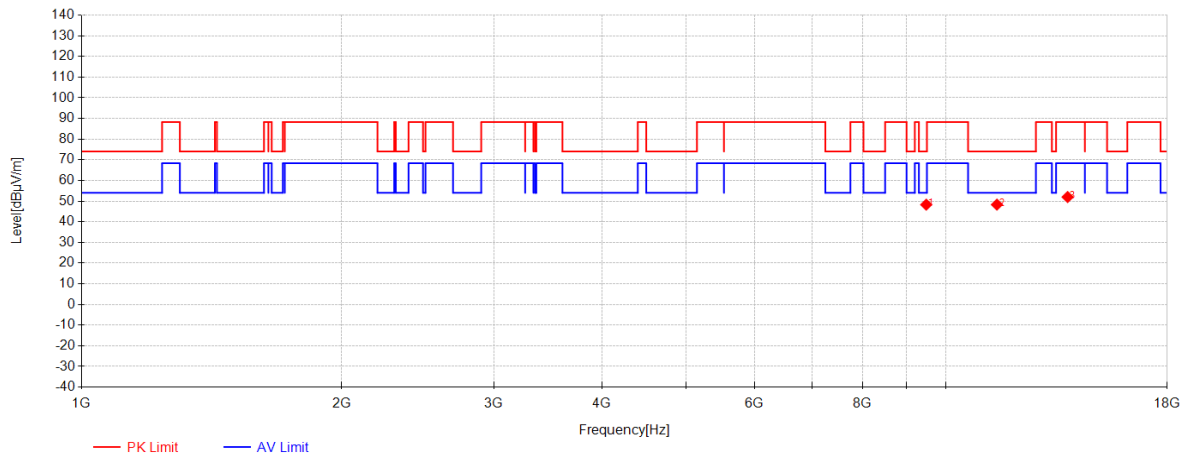


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9395.3333	45.55	37.72	-33.00	50.27	74.00	23.73	Vertical
2	11944.6667	39.71	38.40	-29.23	48.88	74.00	25.12	Vertical
3	14295.3333	40.22	40.24	-28.46	52.00	88.30	36.30	Vertical

802.11ax80_Channel 39

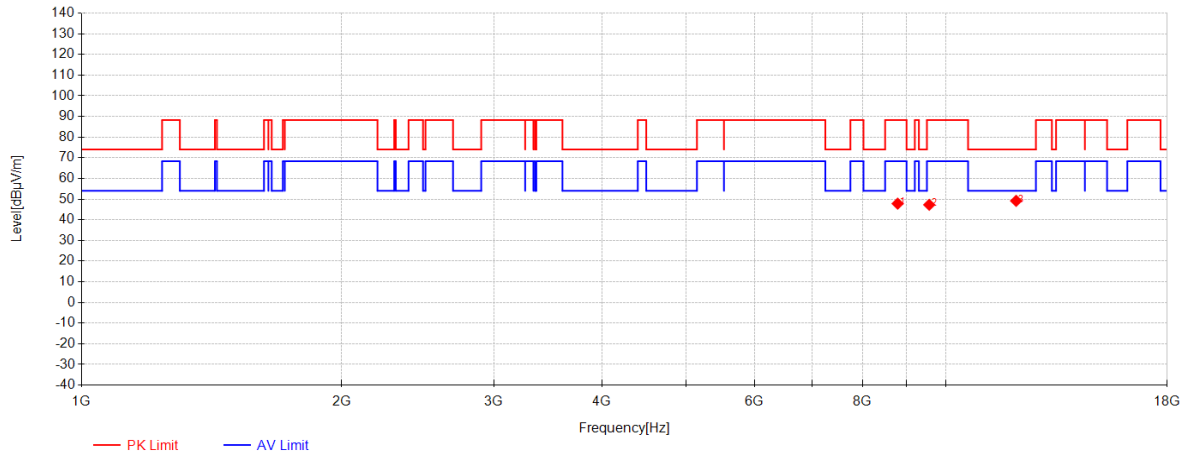


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9410	43.71	37.72	-33.01	48.42	74.00	25.58	Horizontal
2	11156.3333	39.57	38.40	-29.48	48.49	74.00	25.51	Horizontal
3	14201	39.82	40.26	-29.26	50.82	88.30	37.48	Horizontal

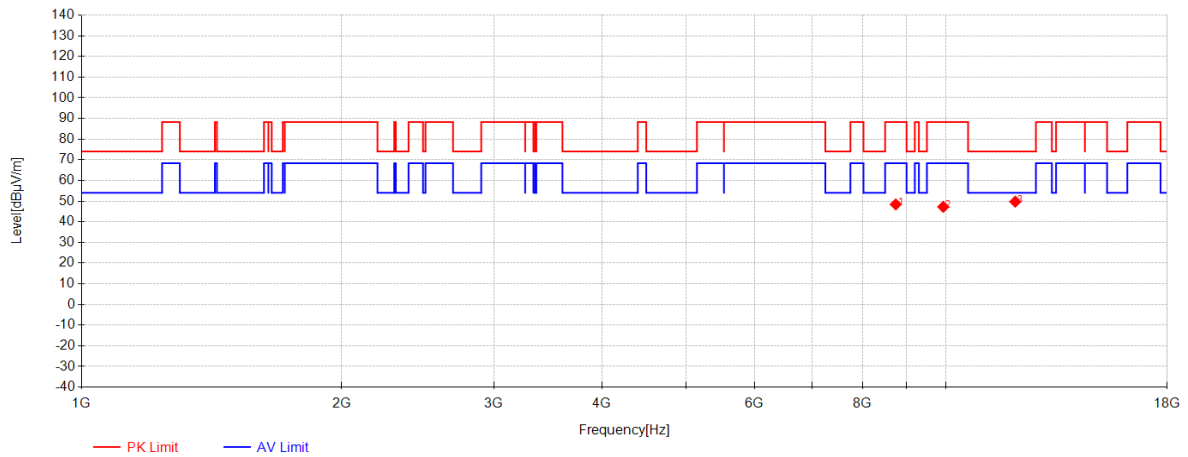


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9483.6667	43.78	37.75	-33.22	48.30	74.00	25.70	Vertical
2	11447	39.61	38.40	-29.69	48.32	74.00	25.68	Vertical
3	13818.3333	40.61	40.17	-28.79	51.99	88.30	36.31	Vertical

802.11ax80_Channel 87

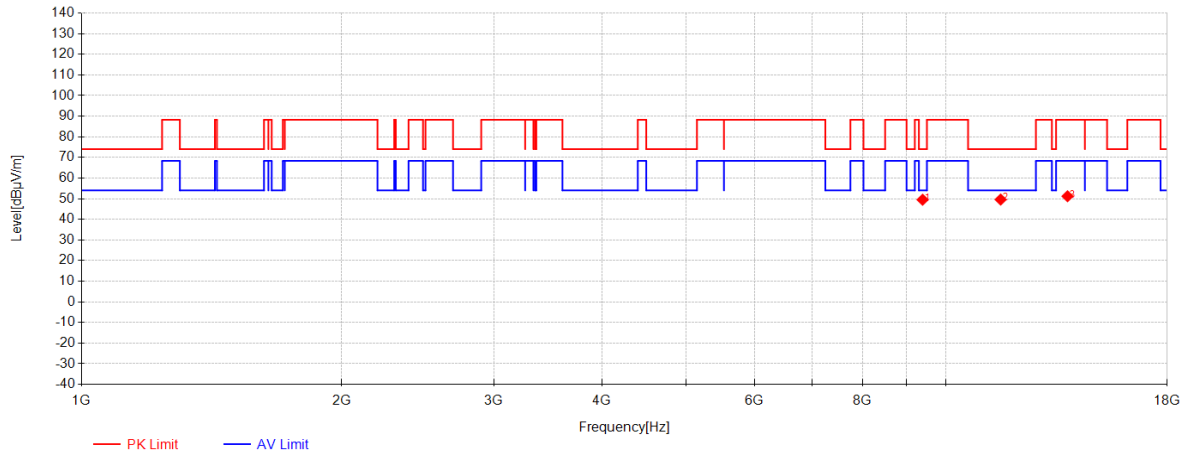


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8788.3333	44.30	37.49	-33.97	47.83	88.30	40.47	Horizontal
2	9559	42.57	37.77	-33.07	47.27	88.30	41.03	Horizontal
3	12048.3333	39.79	38.46	-29.07	49.18	74.00	24.82	Horizontal

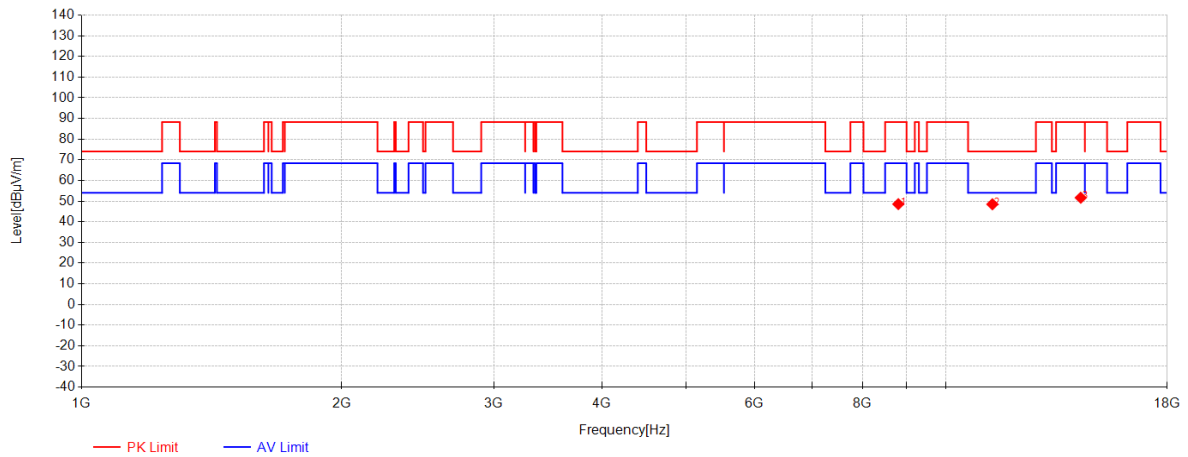


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8743.6667	45.25	37.47	-34.31	48.41	88.30	39.89	Vertical
2	9923	41.43	37.88	-32.05	47.25	88.30	41.05	Vertical
3	12020	40.31	38.42	-29.00	49.74	74.00	24.26	Vertical

802.11ax80_Channel 135

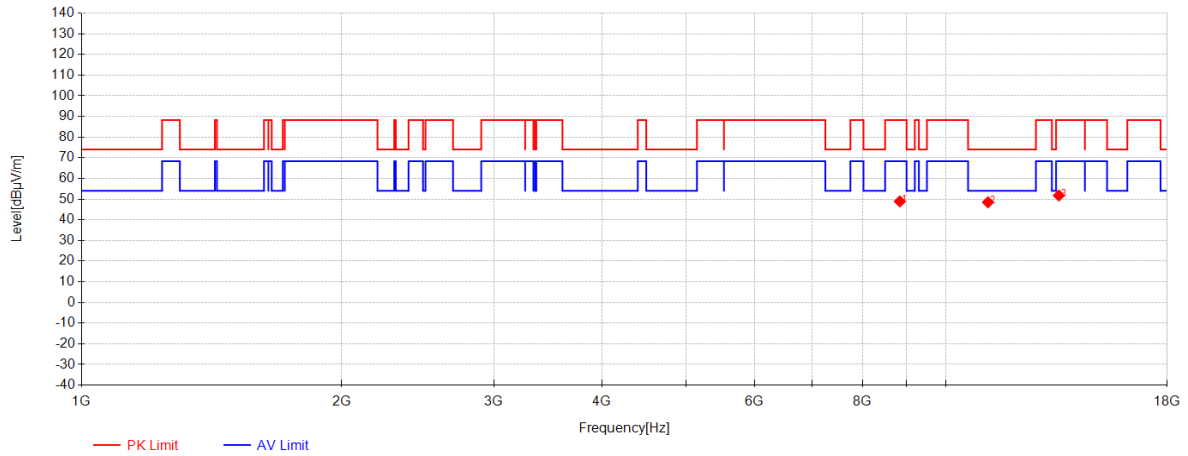


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9392.3333	44.81	37.72	-33.01	49.52	74.00	24.48	Horizontal
2	11561	40.40	38.40	-29.20	49.60	74.00	24.40	Horizontal
3	13814.6667	39.83	40.17	-28.79	51.21	88.30	37.09	Horizontal

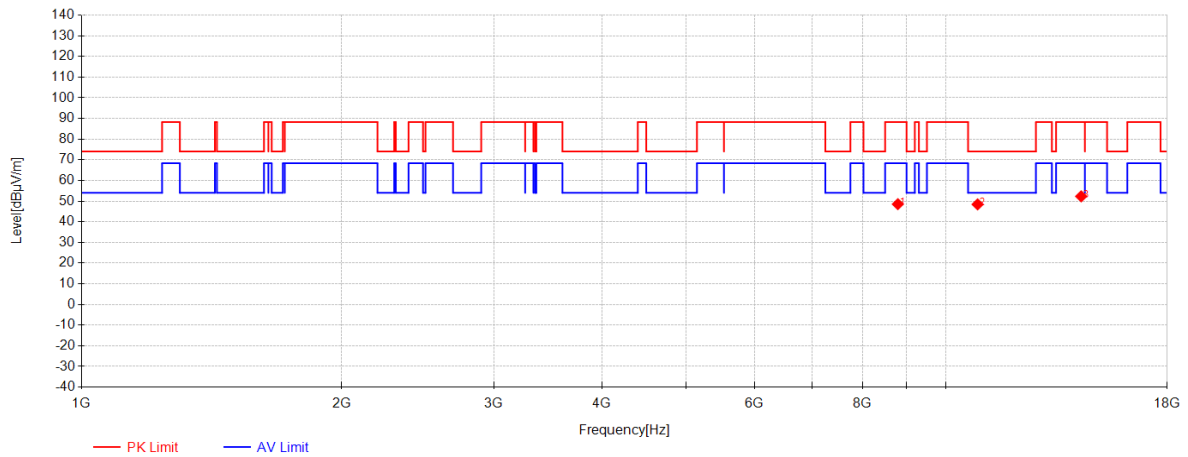


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8803.6667	44.96	37.50	-33.90	48.56	88.30	39.74	Vertical
2	11309	39.44	38.40	-29.36	48.48	74.00	25.52	Vertical
3	14309.6667	39.76	40.24	-28.36	51.64	88.30	36.66	Vertical

802.11ax80_Channel 151

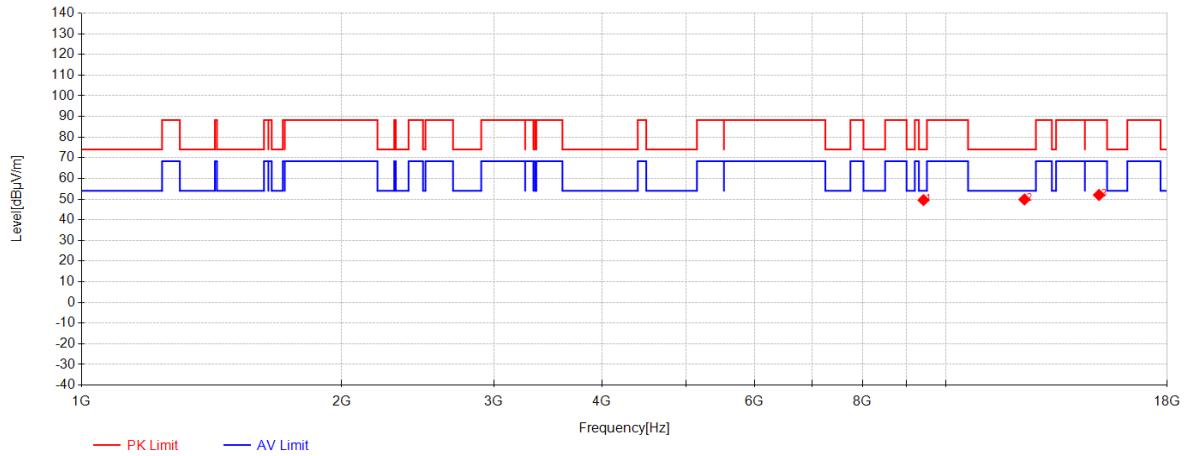


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8839.3333	45.45	37.52	-34.07	48.90	88.30	39.40	Horizontal
2	11178.6667	39.56	38.40	-29.48	48.48	74.00	25.52	Horizontal
3	13500	40.47	39.95	-28.64	51.78	88.30	36.52	Horizontal

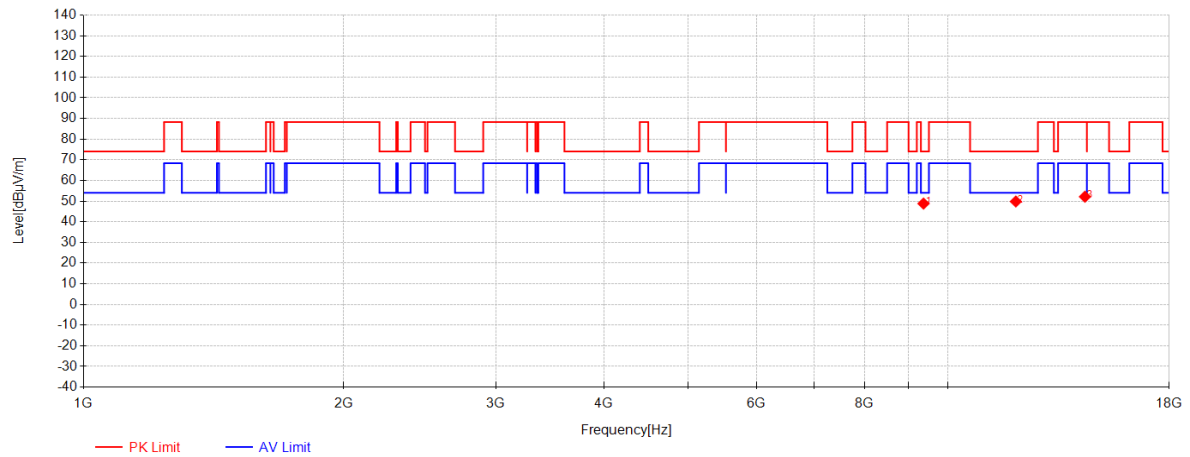


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8793.3333	44.98	37.50	-33.93	48.55	88.30	39.75	Vertical
2	10873.3333	40.18	38.34	-30.10	48.42	74.00	25.58	Vertical
3	14326	40.33	40.23	-28.26	52.31	88.30	35.99	Vertical

802.11ax80_Channel 167

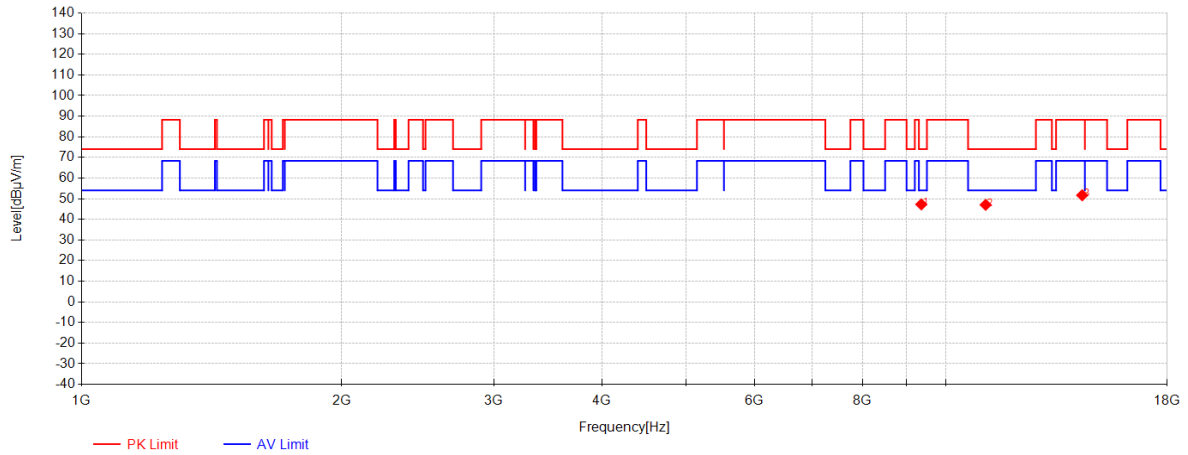


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9415	44.83	37.72	-33.02	49.53	74.00	24.47	Horizontal
2	12318	40.38	38.78	-29.31	49.85	74.00	24.15	Horizontal
3	15021	39.77	40.06	-27.81	52.02	88.30	36.28	Horizontal

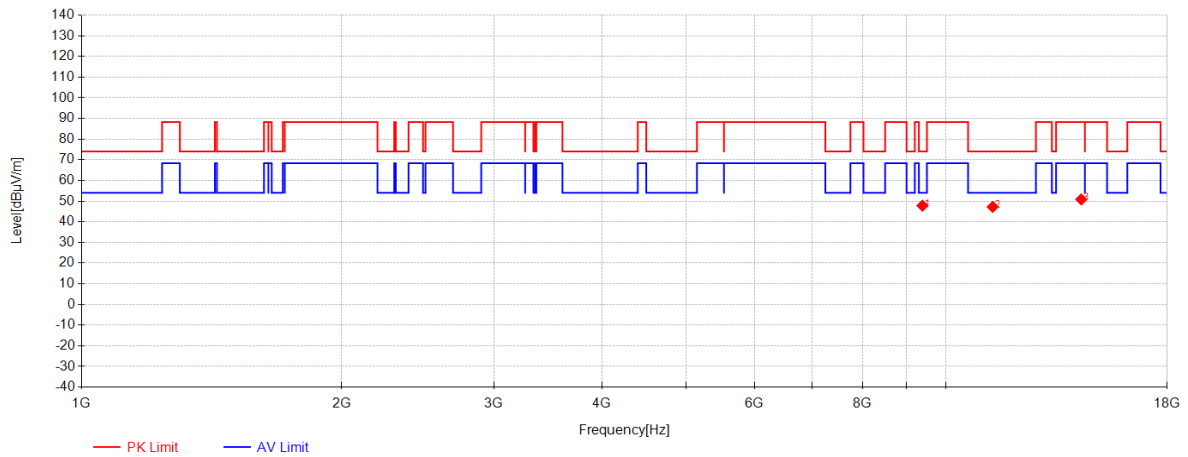


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9365	44.22	37.71	-33.11	48.82	74.00	25.18	Vertical
2	11974.3333	40.52	38.40	-29.08	49.84	74.00	24.16	Vertical
3	14393.6667	39.75	40.22	-27.84	52.13	88.30	36.17	Vertical

802.11ax160_Channel 15

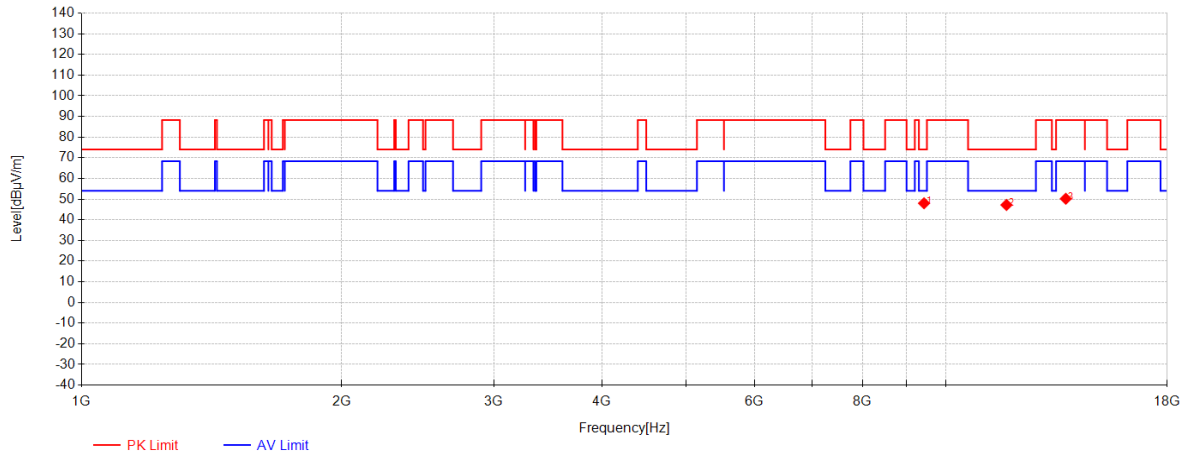


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9360	42.67	37.71	-33.12	47.25	74.00	26.75	Horizontal
2	11108.6667	38.11	38.40	-29.47	47.04	74.00	26.96	Horizontal
3	14365.3333	39.46	40.23	-28.01	51.67	88.30	36.63	Horizontal

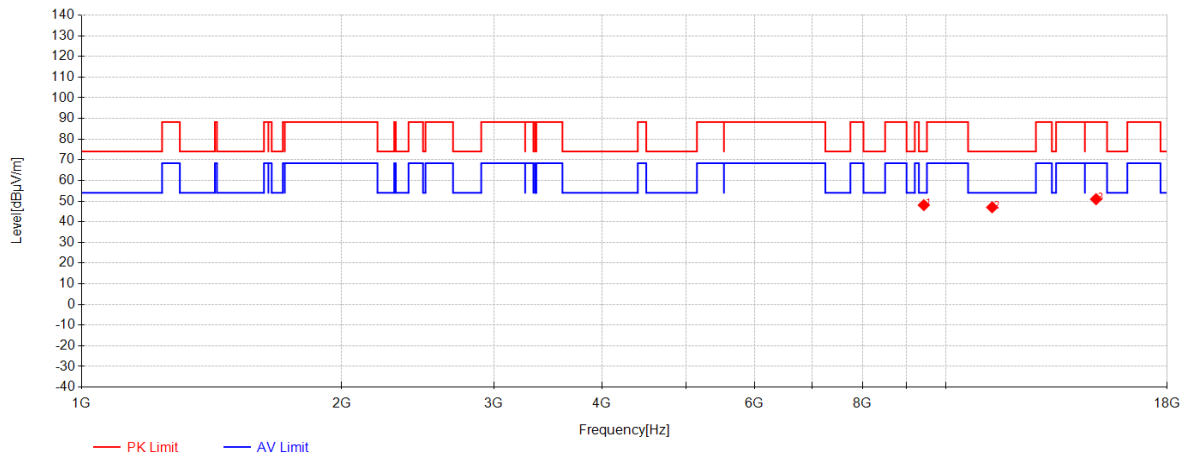


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9388	43.12	37.72	-33.02	47.81	74.00	26.19	Vertical
2	11319.6667	38.25	38.40	-29.43	47.22	74.00	26.78	Vertical
3	14330	38.83	40.23	-28.23	50.83	88.30	37.47	Vertical

802.11ax160_Channel 47

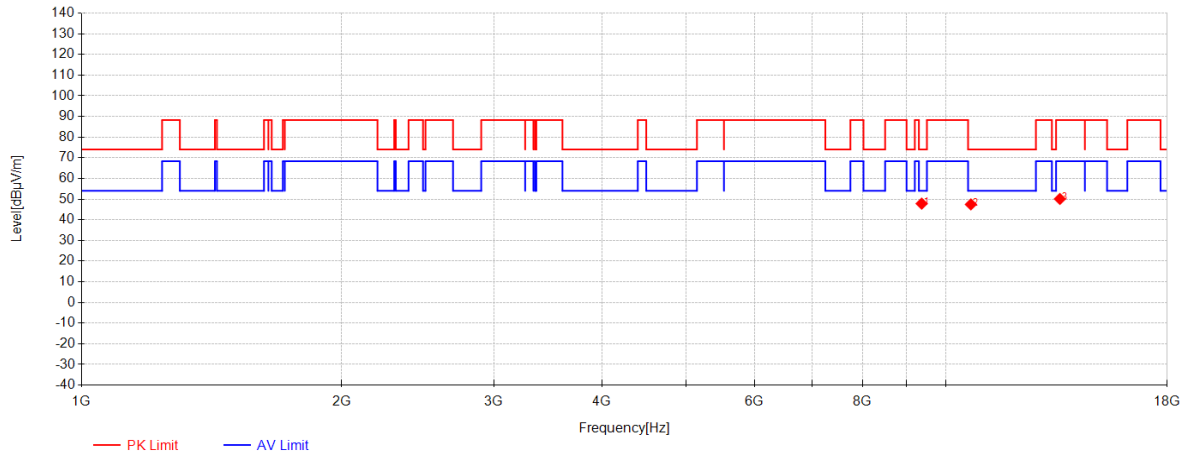


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9427.6667	43.33	37.73	-33.06	48.00	74.00	26.00	Horizontal
2	11742	38.20	38.40	-29.42	47.18	74.00	26.82	Horizontal
3	13752	38.87	40.13	-28.81	50.18	88.30	38.12	Horizontal

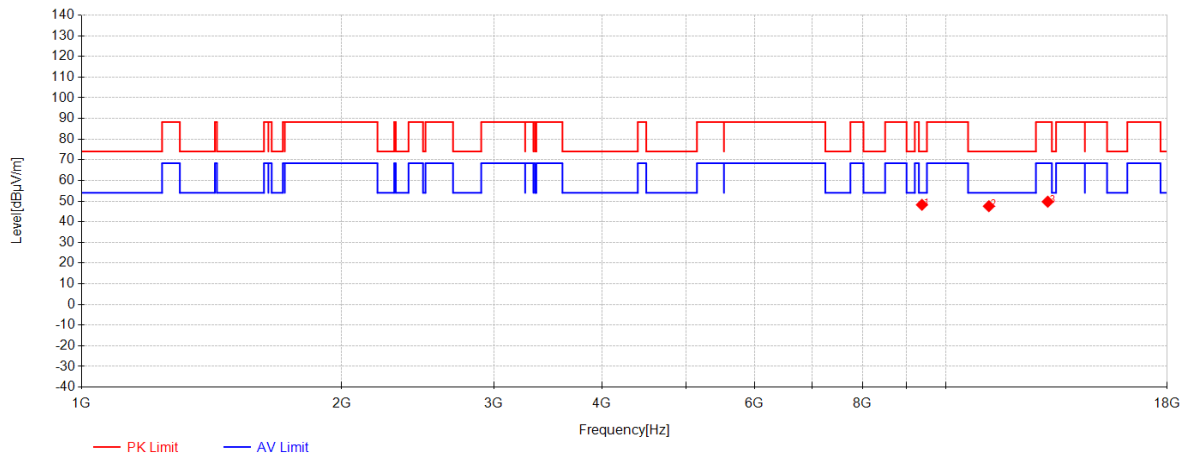


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9422	43.38	37.73	-33.04	48.06	74.00	25.94	Vertical
2	11302.6667	37.95	38.40	-29.33	47.02	74.00	26.98	Vertical
3	14905.3333	38.01	40.12	-27.19	50.94	88.30	37.36	Vertical

802.11ax160_Channel 79

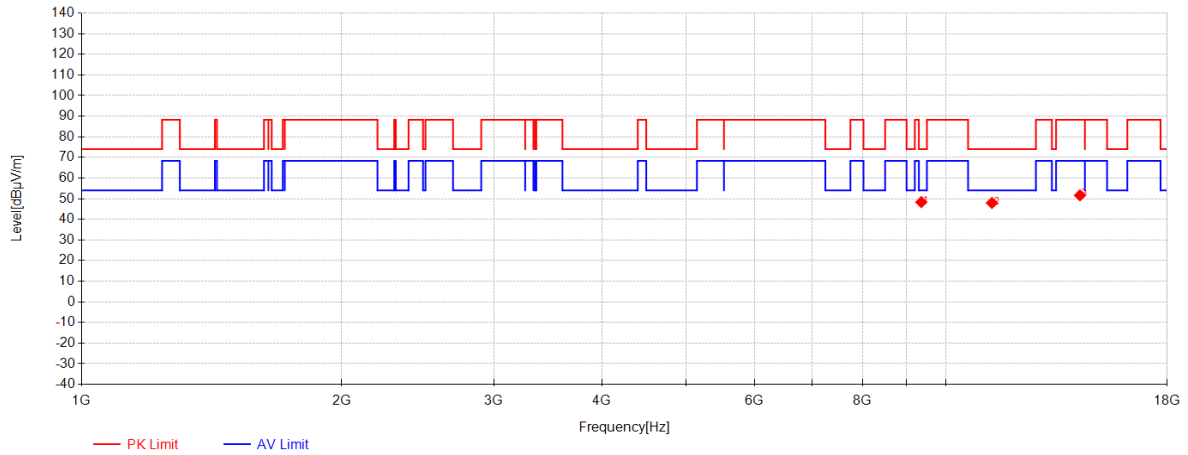


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9368.3333	43.19	37.71	-33.09	47.81	74.00	26.19	Horizontal
2	10681	39.60	38.24	-30.38	47.46	74.00	26.54	Horizontal
3	13536.6667	38.72	39.98	-28.61	50.09	88.30	38.21	Horizontal

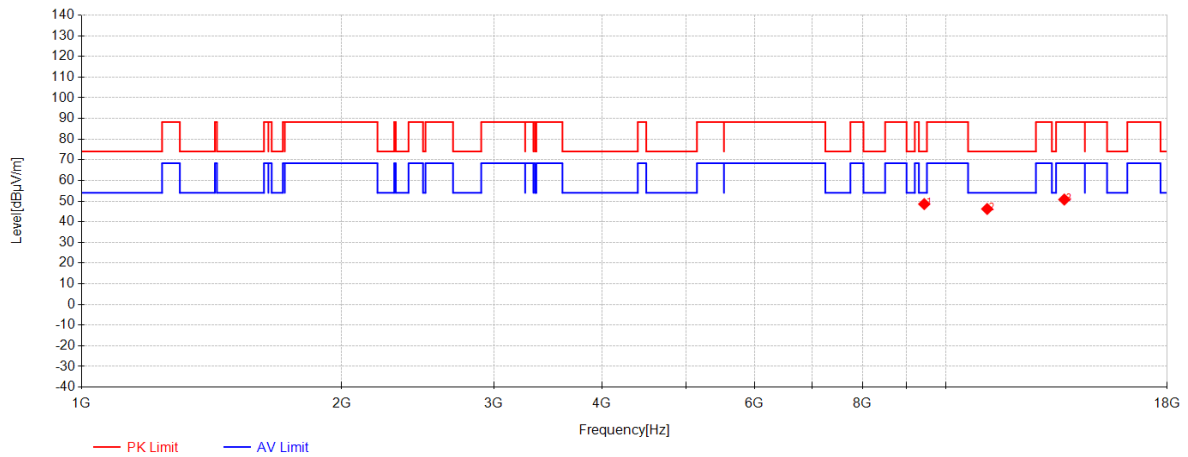


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9375.3333	43.58	37.71	-33.07	48.22	74.00	25.78	Vertical
2	11205.3333	38.63	38.40	-29.47	47.56	74.00	26.44	Vertical
3	13105.3333	39.14	39.67	-29.09	49.73	88.30	38.57	Vertical

802.11ax160_Channel 143



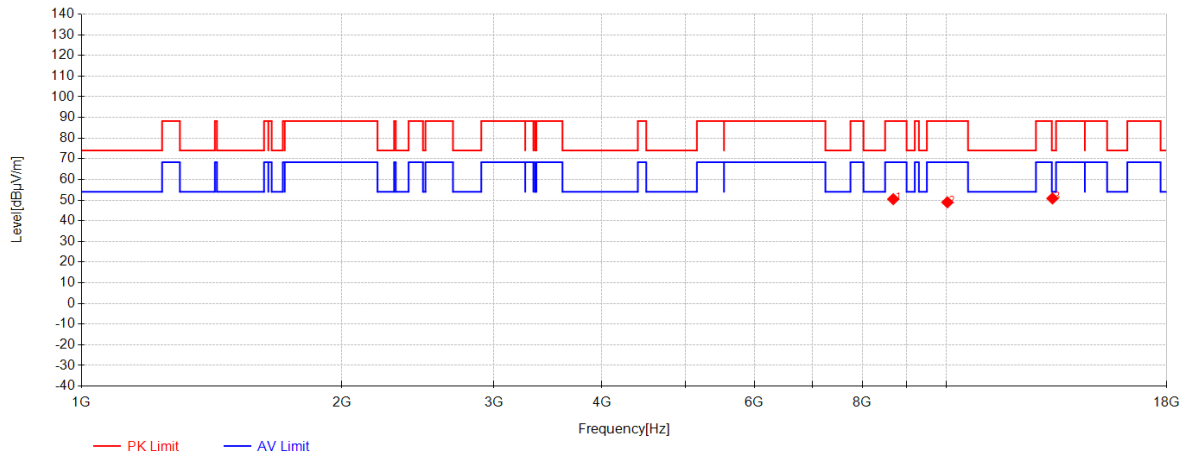
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9359.3333	43.78	37.71	-33.13	48.36	74.00	25.64	Horizontal
2	11295.6667	38.86	38.40	-29.32	47.94	74.00	26.06	Horizontal
3	14278.6667	39.99	40.24	-28.60	51.63	88.30	36.67	Horizontal



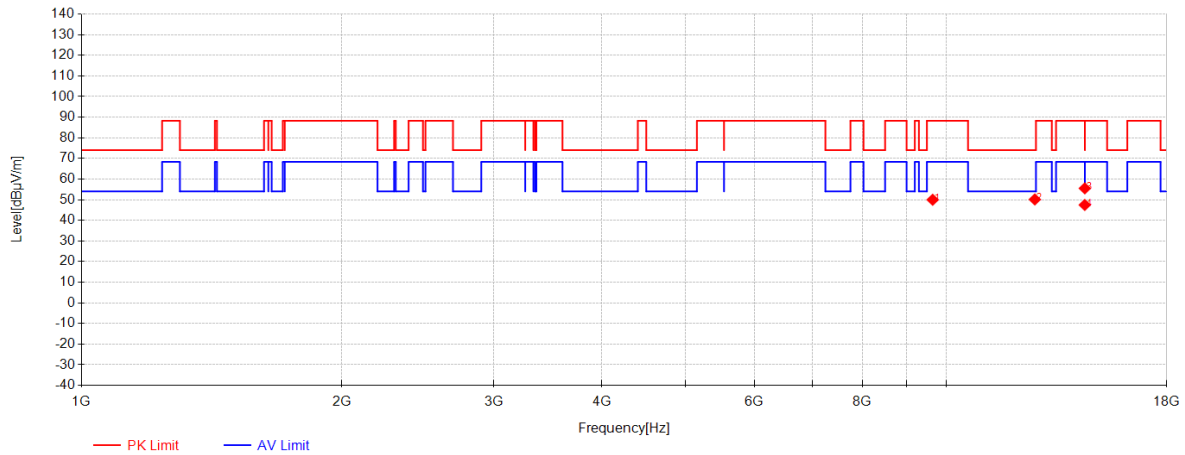
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9433	43.93	37.73	-33.08	48.58	74.00	25.42	Vertical
2	11154	37.29	38.40	-29.48	46.21	74.00	27.79	Vertical
3	13697	39.52	40.09	-28.83	50.78	88.30	37.52	Vertical

Co-location*

802.2.4GWIFI 11n20 CH01+WIFI 6E 11a CH01+LTE B48



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	8686	52.26	37.44	-39.22	50.49	88.30	37.81	Horizontal
2	10033	48.17	37.92	-37.13	48.95	88.30	39.35	Horizontal
3	13273	45.78	39.79	-34.76	50.82	74.00	23.18	Horizontal



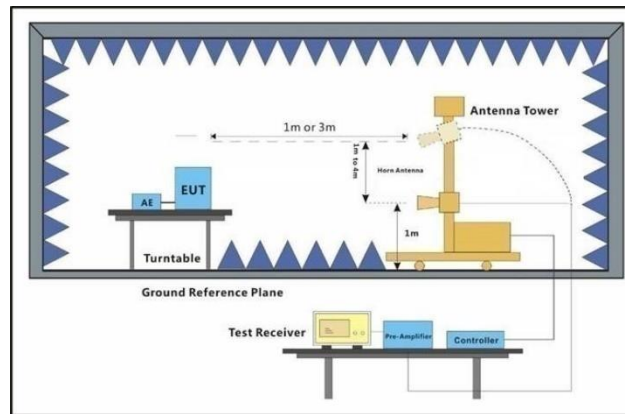
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	9647.6667	49.87	37.79	-37.68	49.98	88.30	38.32	Vertical
2	12662.3333	45.95	39.19	-35.01	50.13	74.00	23.87	Vertical
3	14464	49.62	40.21	-34.33	55.50	88.30	32.80	Vertical
4	14464	41.59	40.21	-34.33	47.47	68.30	20.83	Vertical

Note: * AF68E is a Wi-Fi & Bluetooth Module that only supports Wi-Fi and Bluetooth functions, and needs to be tested with a PCBA board. This PCBA board integrates a WWAN module AG555Q-GL. In this Co-location test, both AF68E and AG555Q-GL have been included in the scope of evaluation and testing.

5.4 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15 Section 15.407(b)		
Test Method:	ANSI C63.10: 2013 Section 11.12		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBUV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

Test Setup:



Test Procedure:

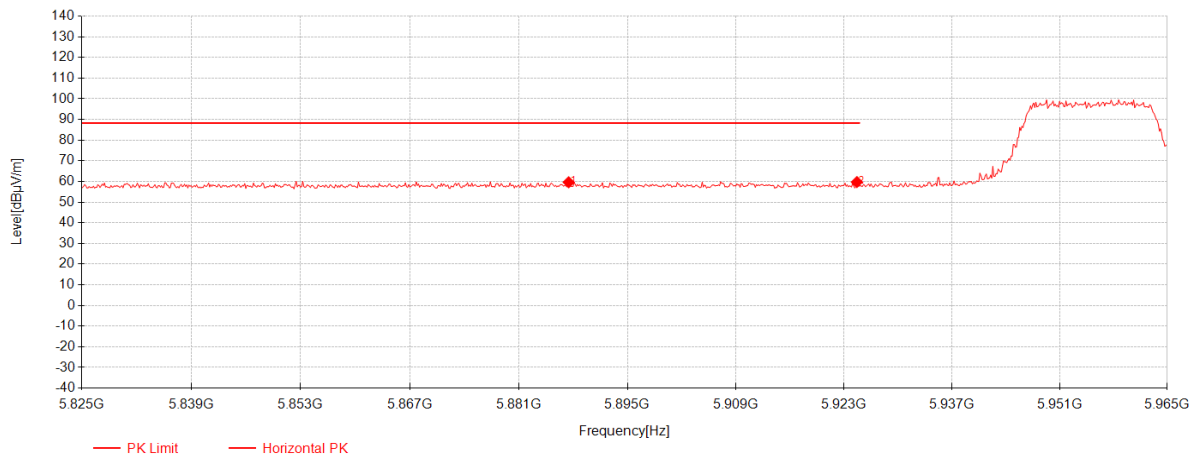
- The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel
- Test the EUT in the outermost channels.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.
- Repeat above procedures until all frequencies measured was complete.

Remark:

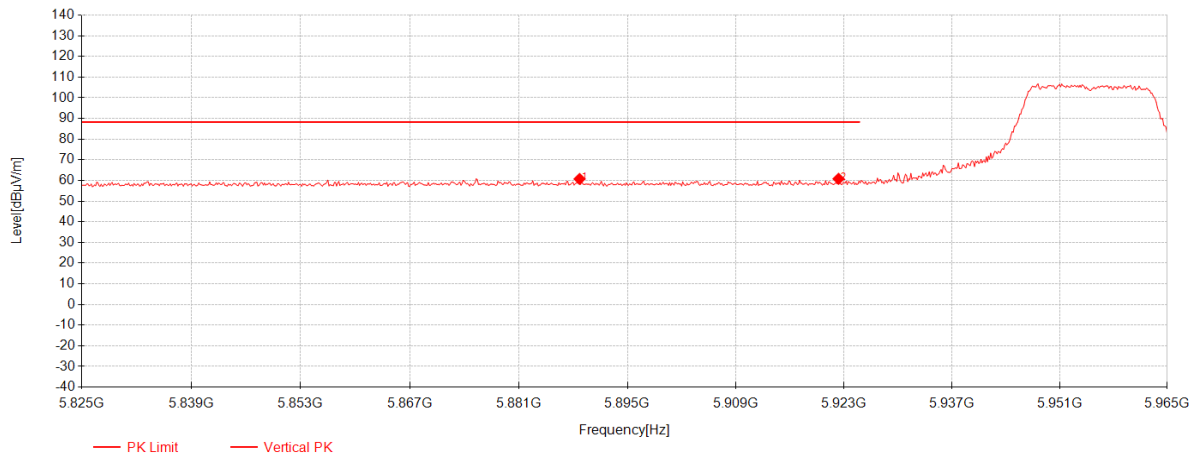
	1.Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for a modulation and MIMO antenna operation for ax modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.
Test Configuration:	Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW $\geq$ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • RBW = 1 MHz • VBW = 10Hz, when duty cycle is no less than 98 percent. • VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.
Final Test Mode:	Refer to section 2.7 for details.
Instruments Used:	Refer to section 4 for details
Test Results:	Pass

Restricted bands around fundamental frequency

11a_Channel 1

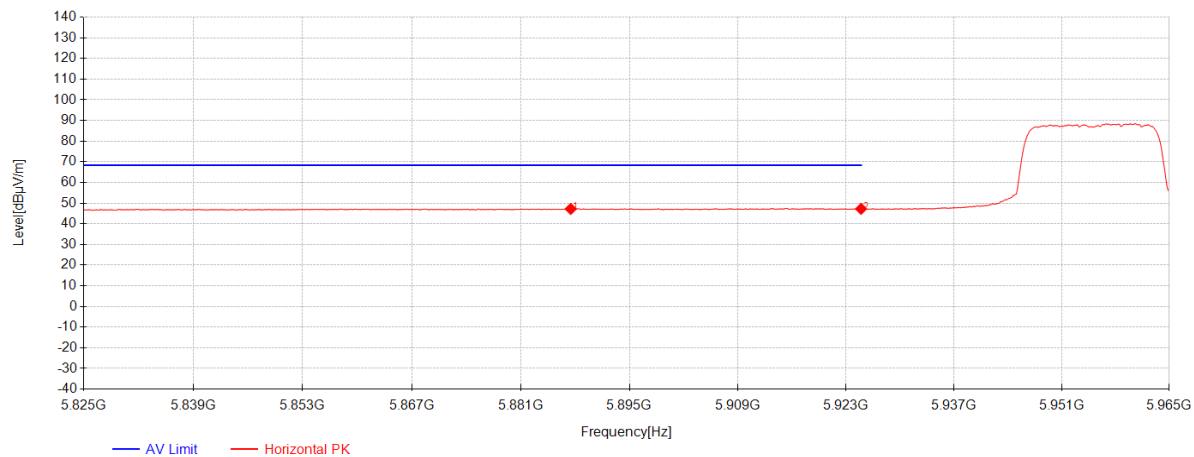


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5887.44	39.71	34.42	-14.52	59.61	88.30	28.69	Horizontal
2	5924.68	39.71	34.54	-14.54	59.72	88.30	28.58	Horizontal

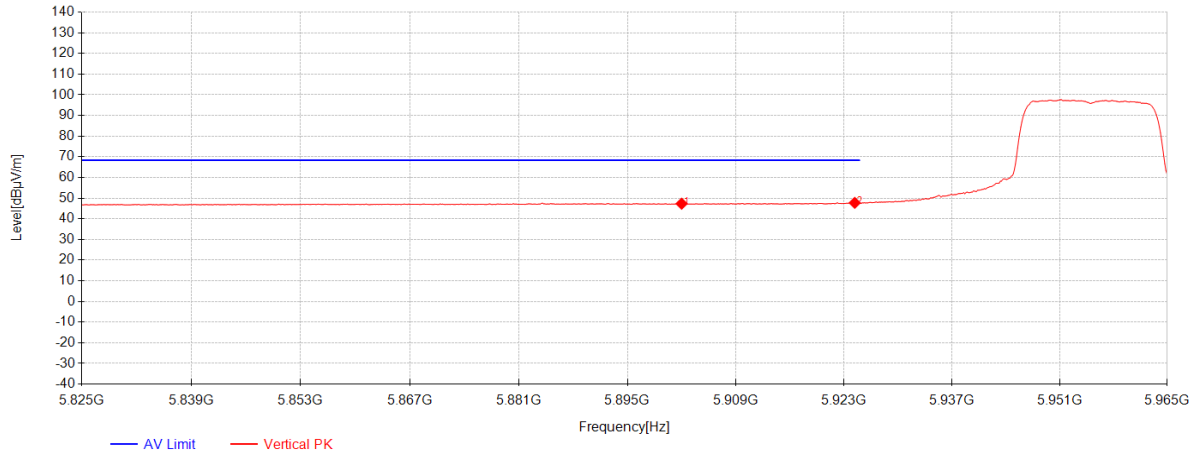


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5888.84	40.84	34.42	-14.52	60.74	88.30	27.56	Vertical
2	5922.3	40.79	34.54	-14.54	60.79	88.30	27.51	Vertical

11a_Channel 1

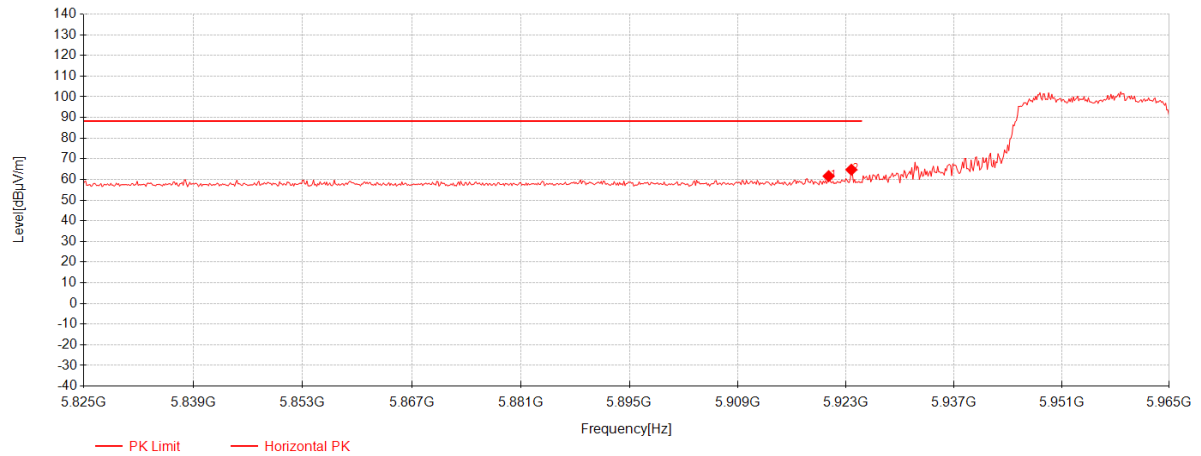


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5887.44	27.29	34.42	-14.52	47.19	68.30	21.11	Horizontal
2	5924.96	27.22	34.54	-14.54	47.23	68.30	21.07	Horizontal

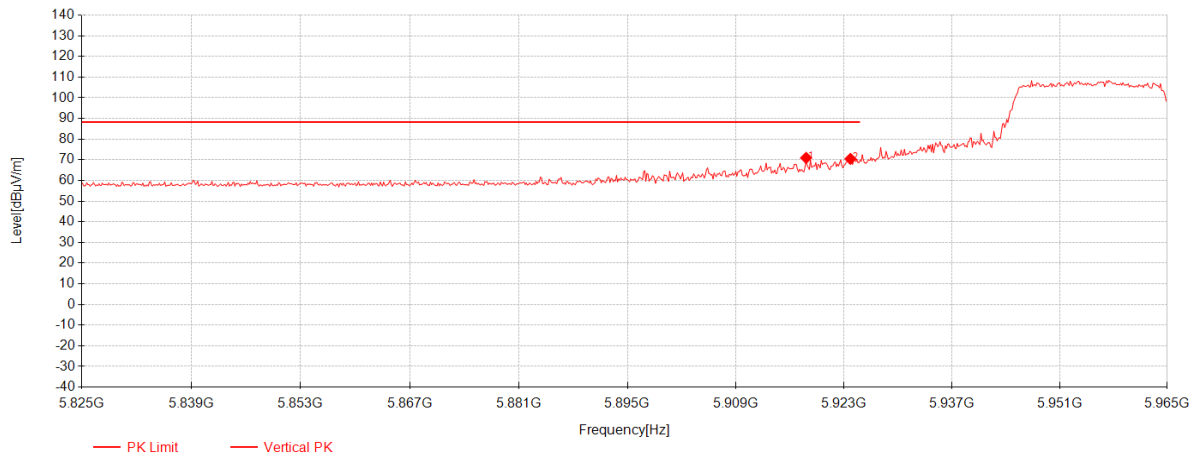


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5902	27.37	34.47	-14.53	47.31	68.30	20.99	Vertical
2	5924.4	27.71	34.54	-14.54	47.72	68.30	20.58	Vertical

11ax20_Channel 1

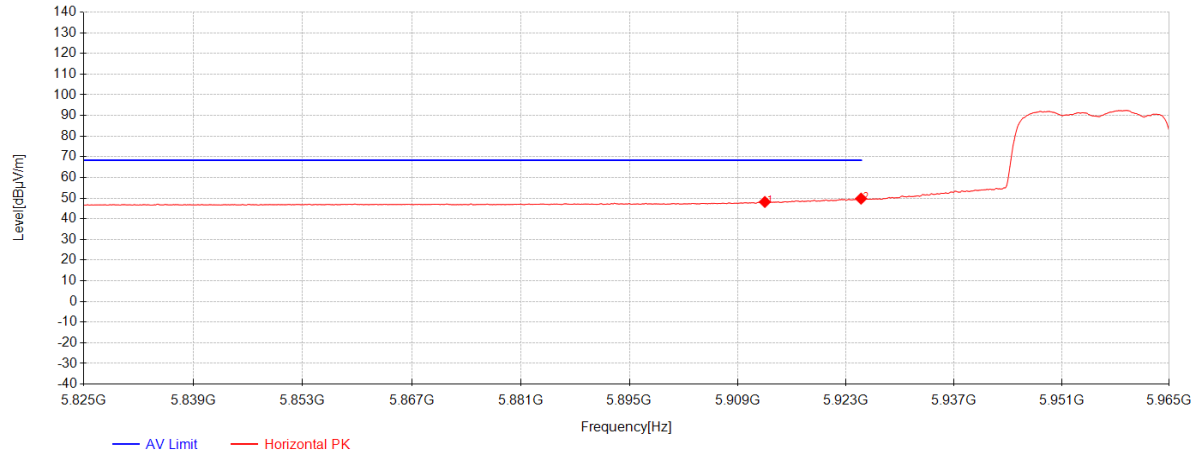


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5920.76	41.64	34.53	-14.54	61.63	88.30	26.67	Horizontal
2	5923.7	44.72	34.54	-14.54	64.72	88.30	23.58	Horizontal

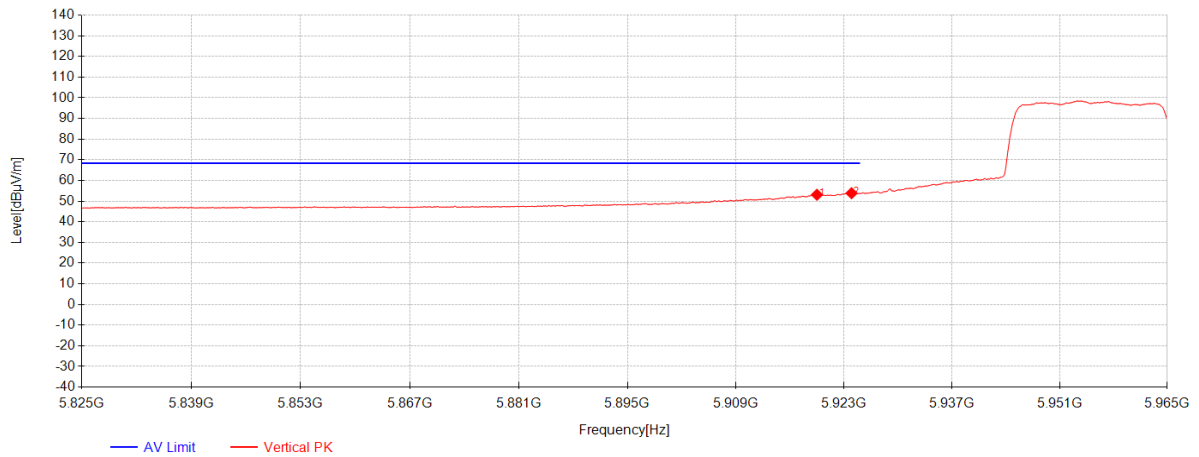


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5918.1	50.95	34.52	-14.54	70.94	88.30	17.36	Vertical
2	5923.84	50.46	34.54	-14.54	70.46	88.30	17.84	Vertical

11ax20_Channel 1

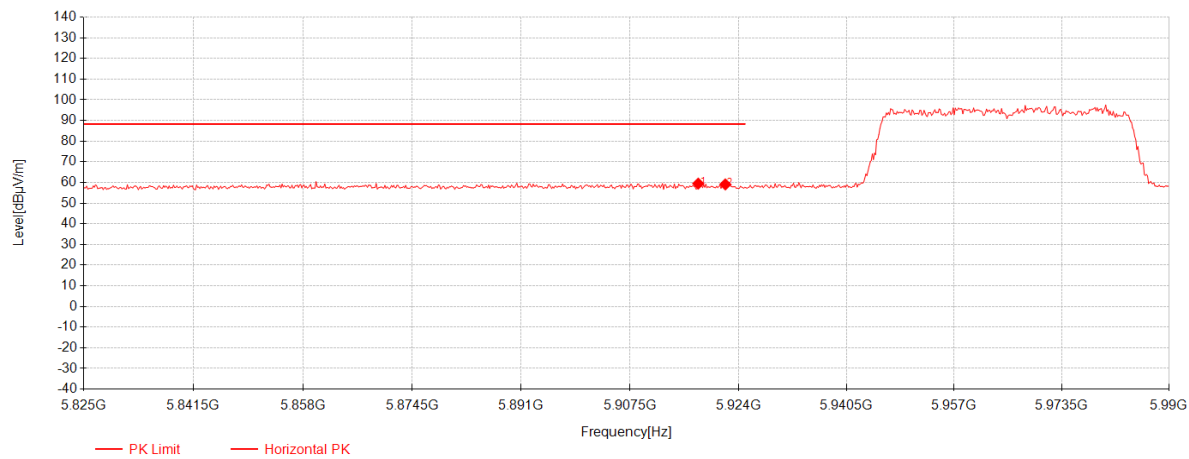


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5912.5	28.19	34.50	-14.53	48.16	68.30	20.14	Horizontal
2	5924.96	29.76	34.54	-14.54	49.77	68.30	18.53	Horizontal

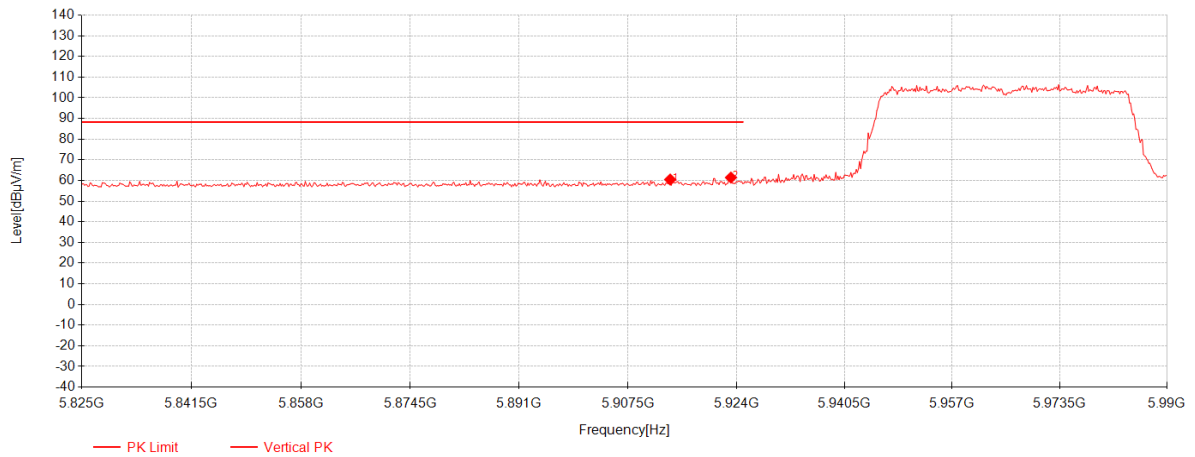


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5919.5	33.11	34.53	-14.54	53.10	68.30	15.20	Vertical
2	5923.98	33.85	34.54	-14.54	53.85	68.30	14.45	Vertical

11ax40_Channel 3

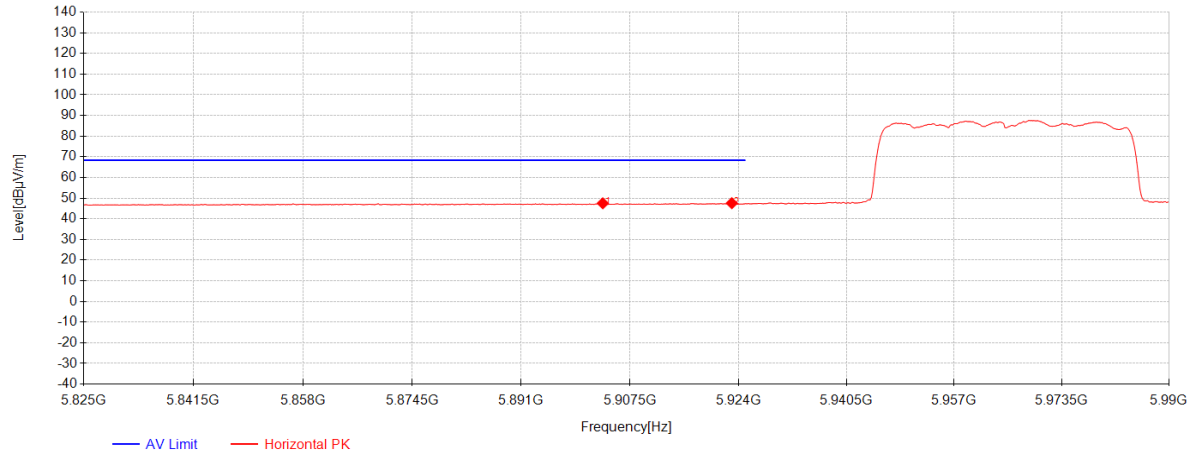


Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	5917.895	39.47	34.52	-14.54	59.46	88.30	28.84	Horizontal
2	5922.02	39.05	34.53	-14.54	59.05	88.30	29.25	Horizontal

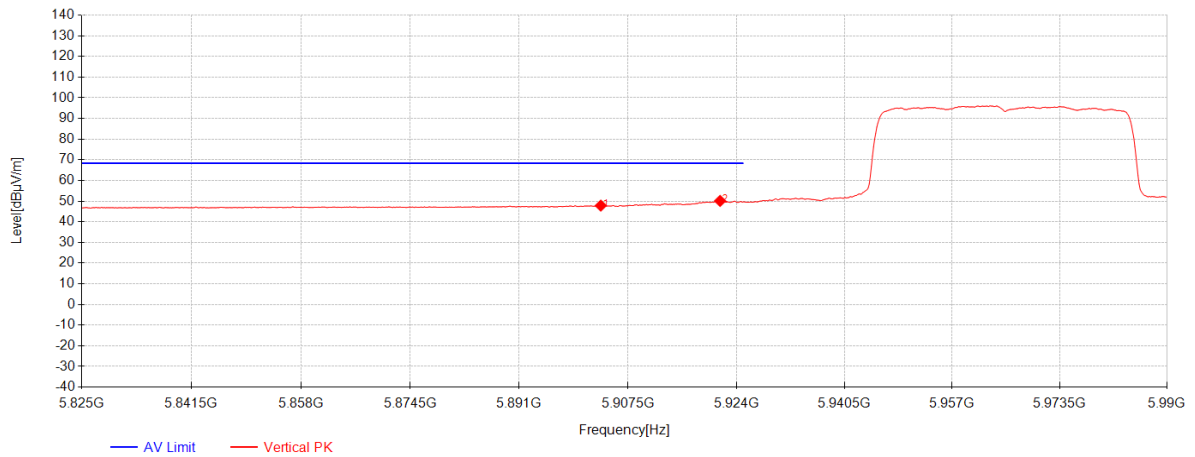


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5913.935	40.47	34.51	-14.53	60.44	88.30	27.86	Vertical
2	5923.175	41.40	34.54	-14.54	61.40	88.30	26.90	Vertical

11ax40_Channel 3

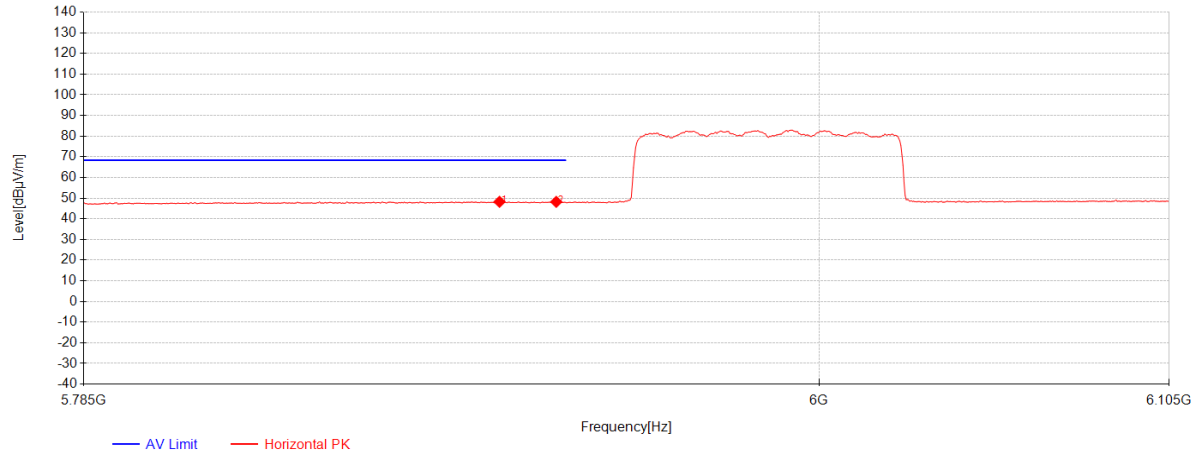


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5903.375	27.57	34.47	-14.53	47.51	68.30	20.79	Horizontal
2	5923.01	27.55	34.54	-14.54	47.55	68.30	20.75	Horizontal

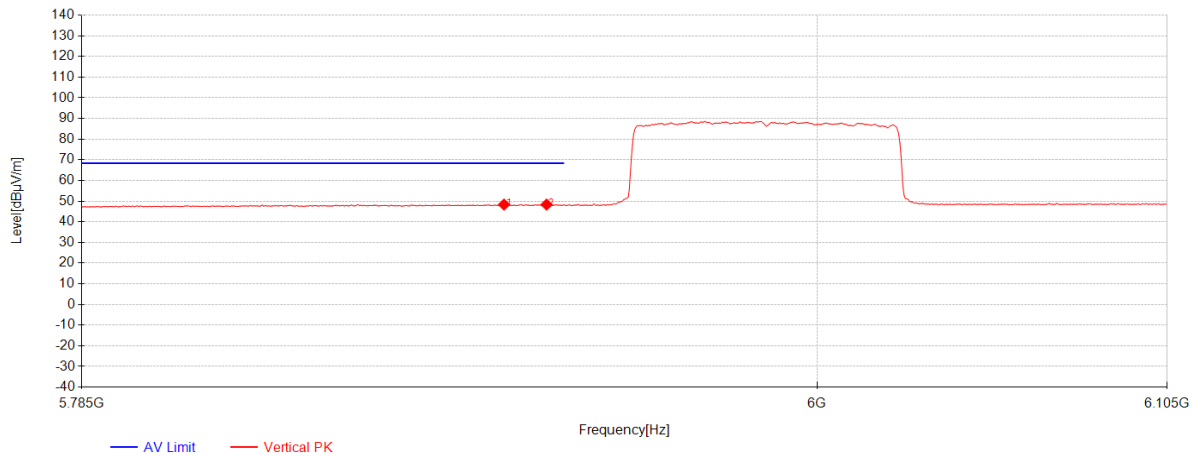


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5903.375	27.90	34.47	-14.53	47.84	68.30	20.46	Vertical
2	5921.525	30.11	34.53	-14.54	50.11	68.30	18.19	Vertical

11ax80_Channel 7

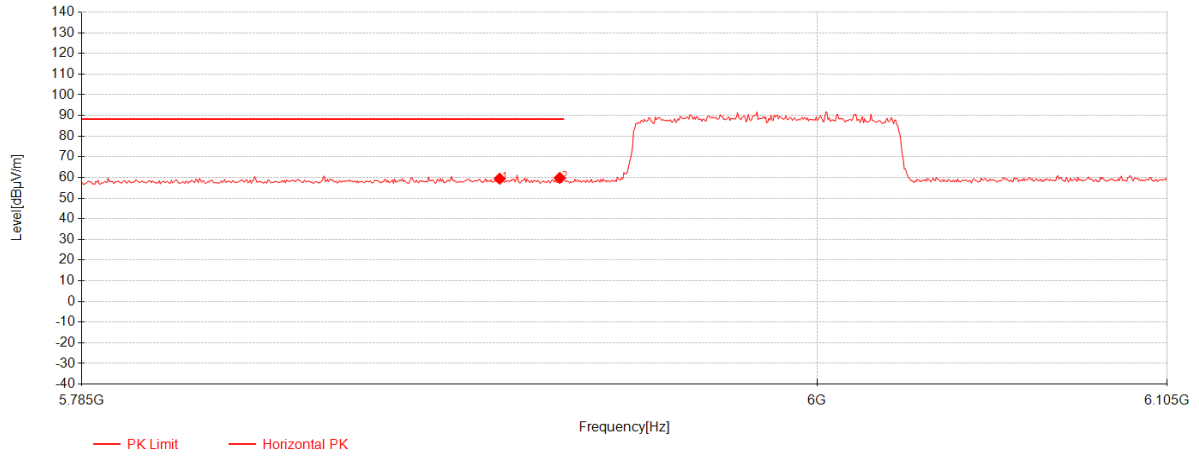


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5905.64	28.28	34.48	-14.53	48.23	68.30	20.07	Horizontal
2	5922.28	28.21	34.54	-14.54	48.21	68.30	20.09	Horizontal

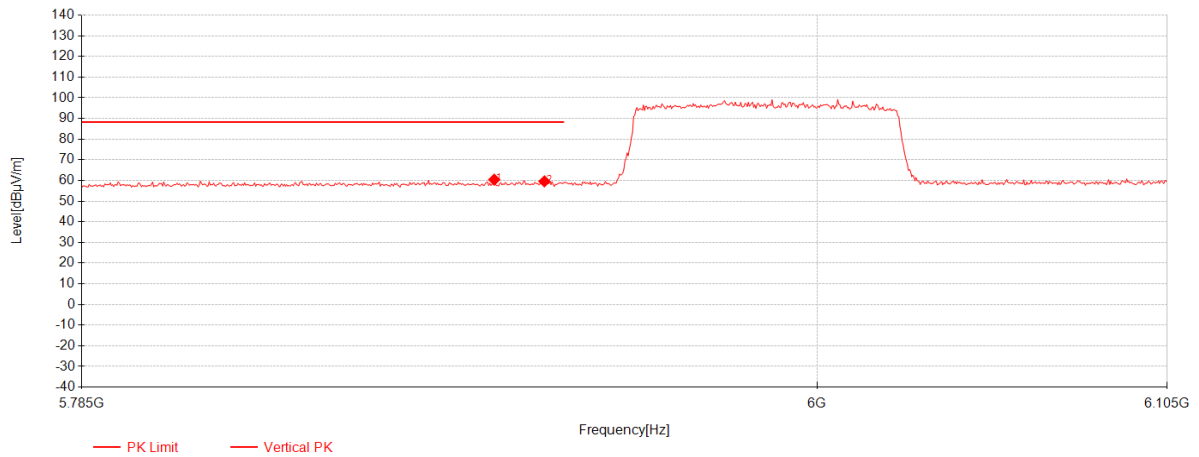


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5907.56	28.38	34.49	-14.53	48.33	68.30	19.97	Vertical
2	5920.04	28.34	34.53	-14.54	48.33	68.30	19.97	Vertical

11ax80_Channel 7

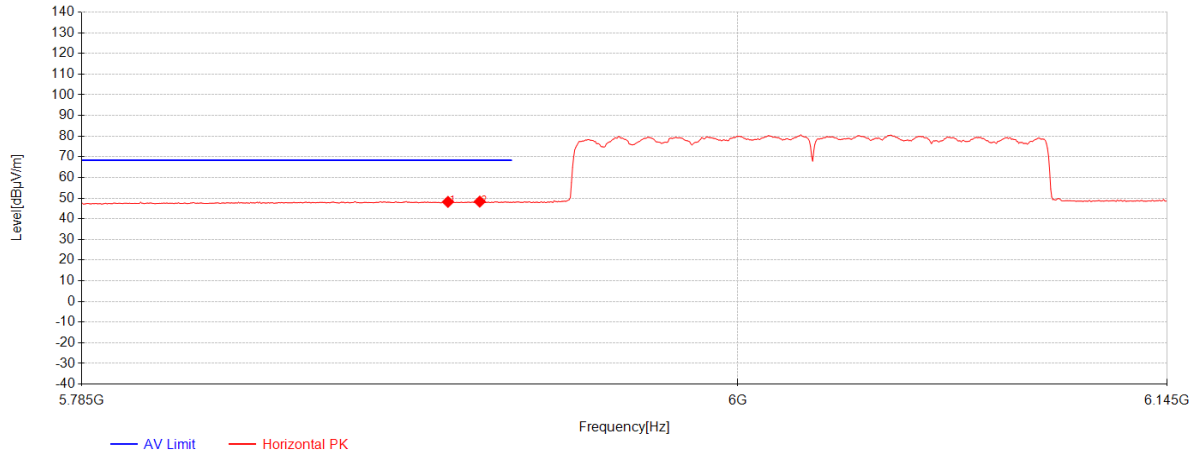


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5906.28	39.46	34.48	-14.53	59.41	88.30	28.89	Horizontal
2	5923.88	39.80	34.54	-14.54	59.80	88.30	28.50	Horizontal

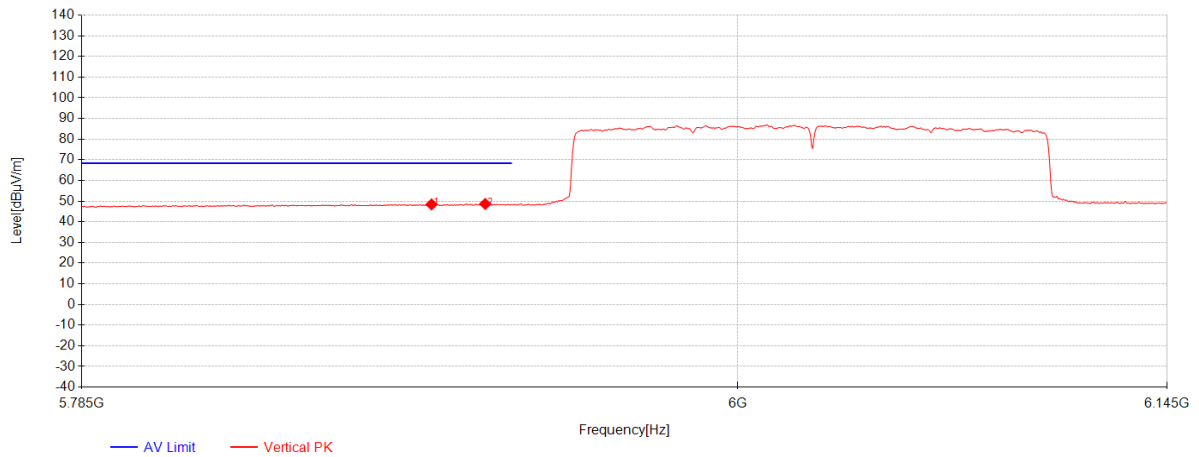


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5904.68	40.46	34.48	-14.53	60.40	88.30	27.90	Vertical
2	5919.4	39.58	34.53	-14.54	59.57	88.30	28.73	Vertical

11ax160_Channel 15

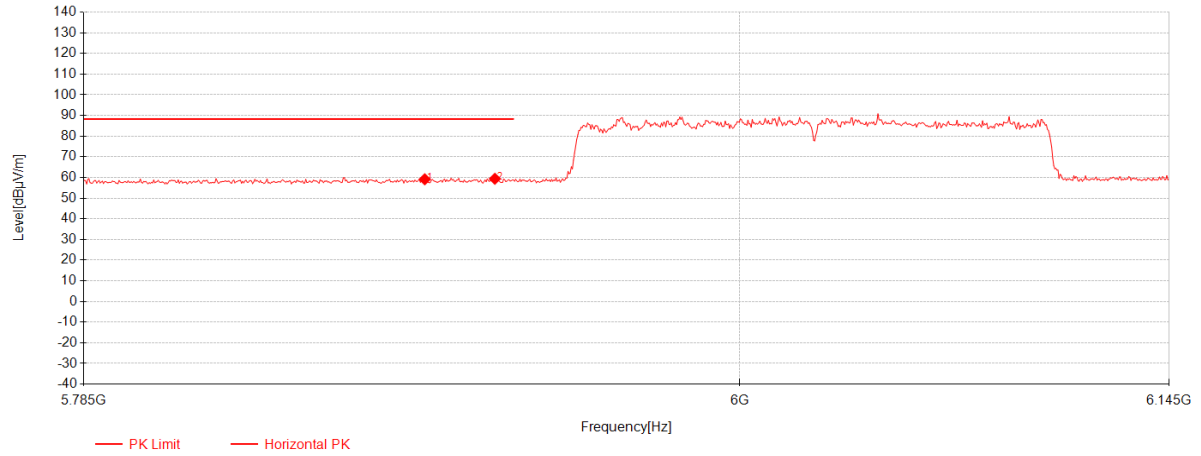


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5904.16	28.26	34.47	-14.53	48.20	68.30	20.10	Horizontal
2	5914.6	28.34	34.51	-14.53	48.32	68.30	19.98	Horizontal

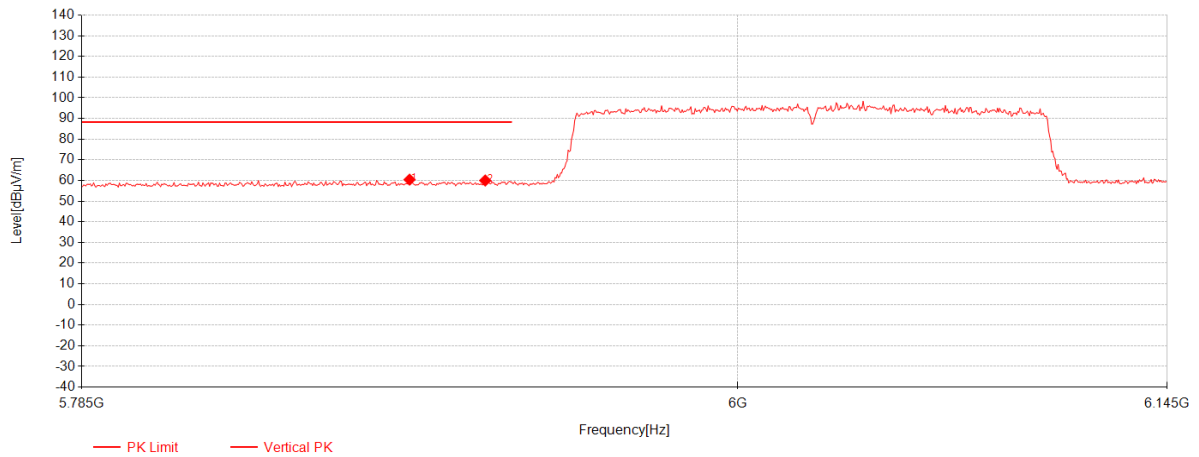


Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5898.76	28.47	34.46	-14.53	48.40	68.30	19.90	Vertical
2	5916.4	28.66	34.52	-14.53	48.64	68.30	19.66	Vertical

11ax160_Channel 15



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5895.88	39.21	34.45	-14.53	59.13	88.30	29.17	Horizontal
2	5918.92	39.37	34.52	-14.54	59.36	88.30	28.94	Horizontal



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	5891.56	40.50	34.43	-14.52	60.41	88.30	27.89	Vertical
2	5916.4	40.00	34.52	-14.53	59.98	88.30	28.32	Vertical

1) All channels have been tested, but only the worst case data displayed in this report.

6 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSCR2509001991AT

7 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2509001991AT

- End of the Report -