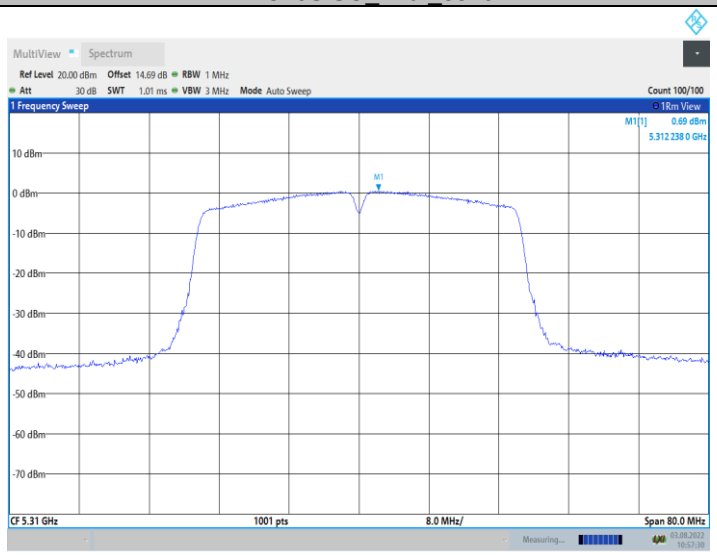
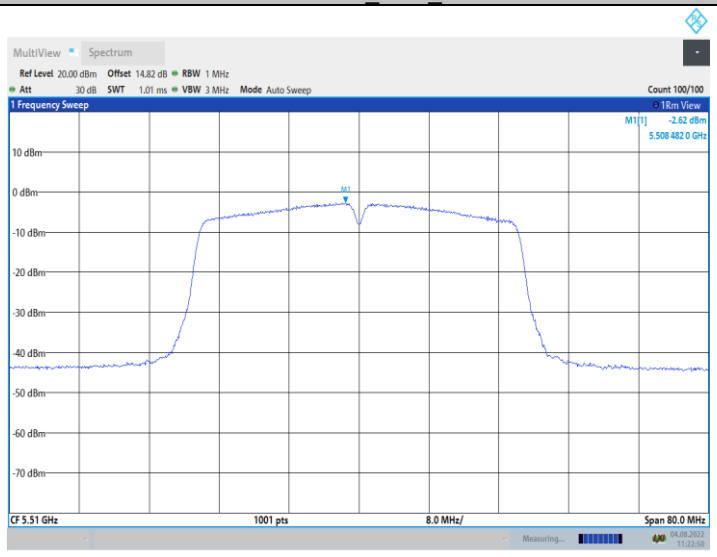
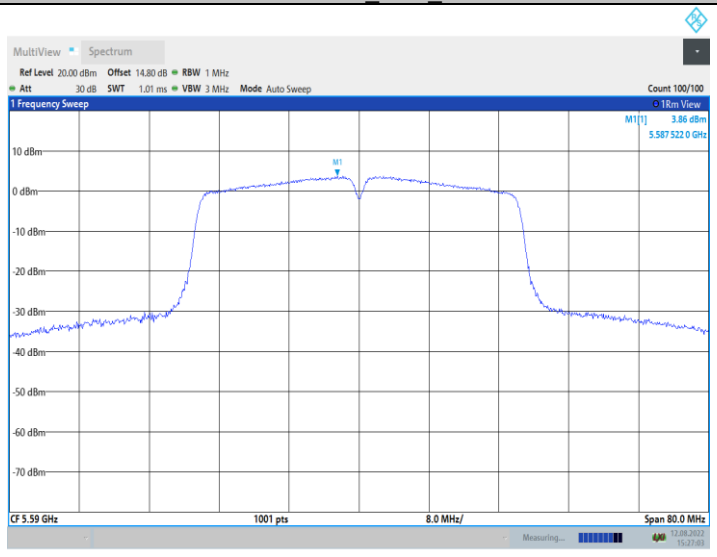
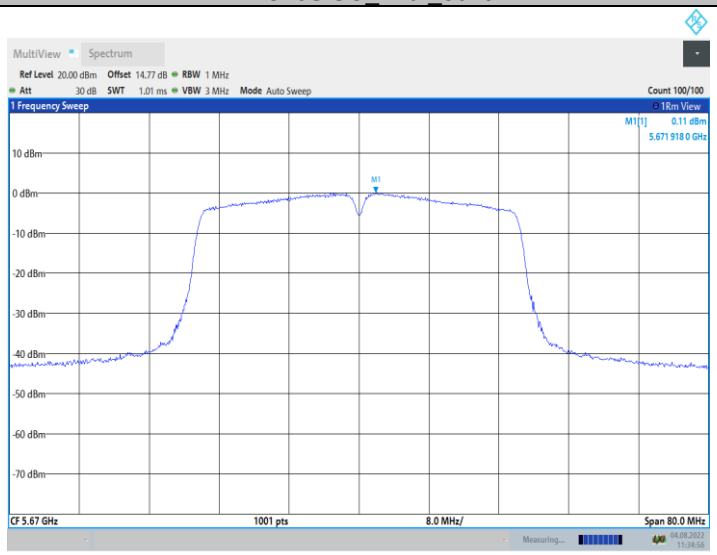
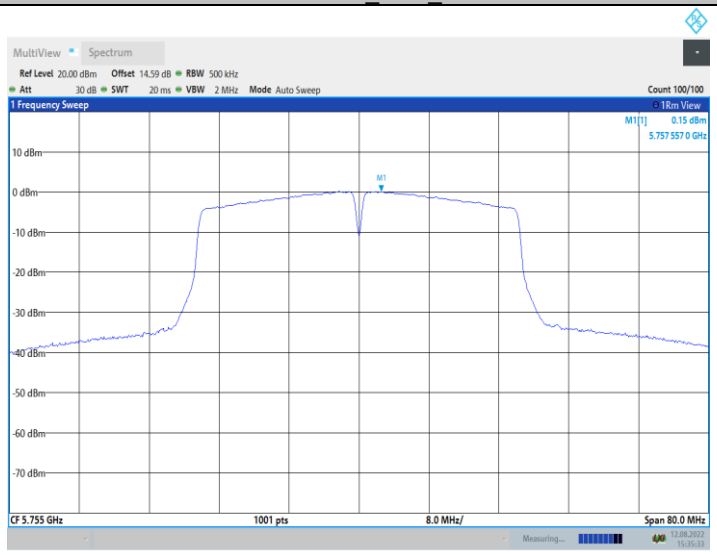
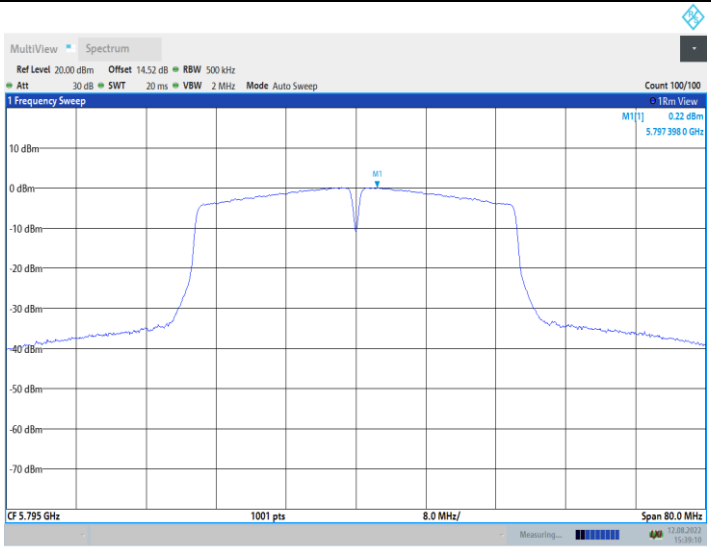
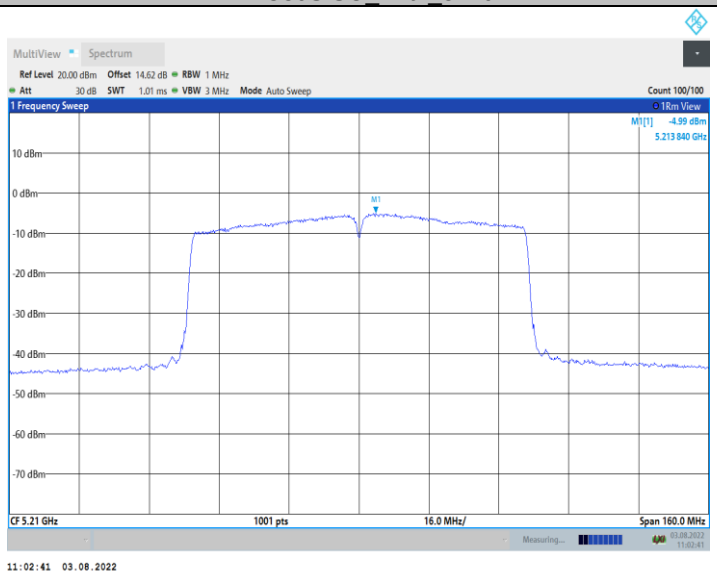
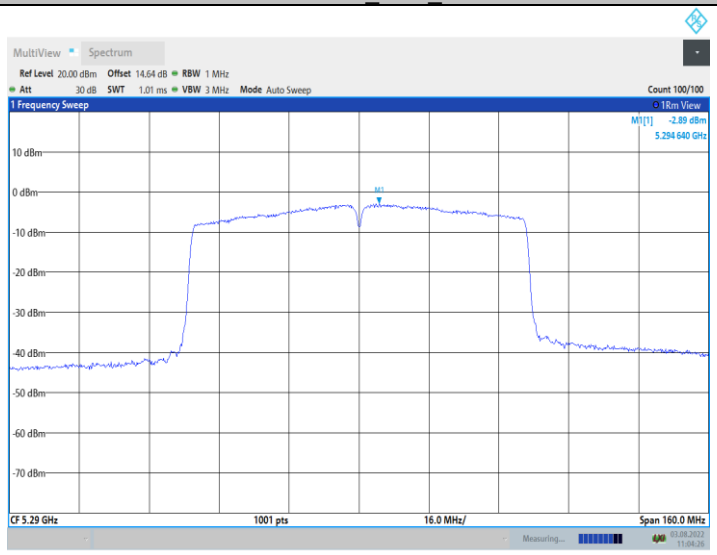
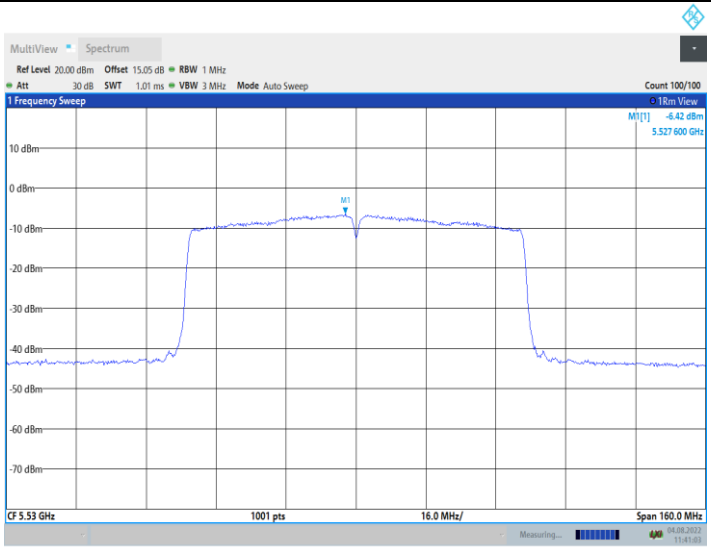
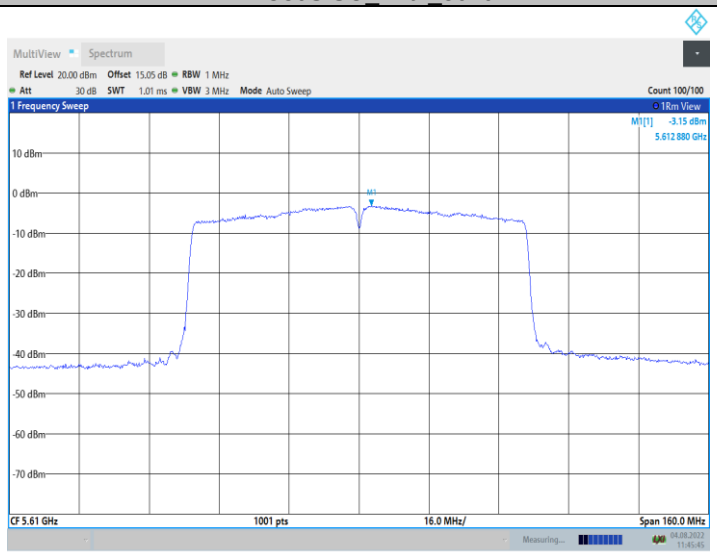
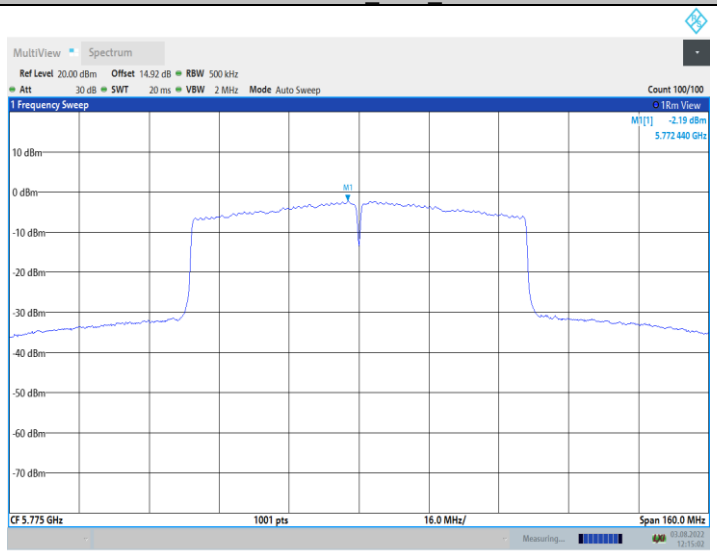
11AC40SISO_Ant1_5310

11AC40SISO_Ant1_5510

11AC40SISO_Ant1_5590


11AC40SISO_Ant1_5670
 11:34:56 04.08.2022
11AC40SISO_Ant1_5755
 15:35:34 12.08.2022
11AC40SISO_Ant1_5795
 15:39:11 12.08.2022

11AC80SISO_Ant1_5210
 11:02:41 03.08.2022
11AC80SISO_Ant1_5290
 11:04:26 03.08.2022
11AC80SISO_Ant1_5530
 11:41:04 04.08.2022

11AC80SISO_Ant1_5610

11AC80SISO_Ant1_5775


10. RADIATED BANDEDGE AND SPURIOUS MEASUREMENT

10.1. LIMITS OF Radiated Bandedge and Spurious Measurement

FCC Part 15.205 and 15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

FCC Part 15.407(b)
For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

10.2. TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.10-2020.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. For measurement below 1GHz, the EUT was placed on a turntable with 0.8 meter,above ground. For measurement above 1 GHz, test at FAR, the EUT is placed on a non-conductive table, which is 1.5 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
(1) Span shall wide enough to fully capture the emission being measured;
(2) Set RBW=100 kHz for f < 1 GHz; VBW >= RBW; Sweep = auto; Detector function = peak; Trace = max hold;
(3) Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement.

Set RBW = 1 MHz, and VBW= 1/T (on time) for average measurement.

10.3.TEST DATA

9 kHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the r esult which was 20dB lower than the limit line per 15.31(o) was not reported.

Table 13 Radiated Emission Test Data 9k Hz-30MHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

30MHz-1GHz

Worst case is shown below for 30MHz-1GHz only.

The emissions don't show in following result tables are more than 20dB below the limits.

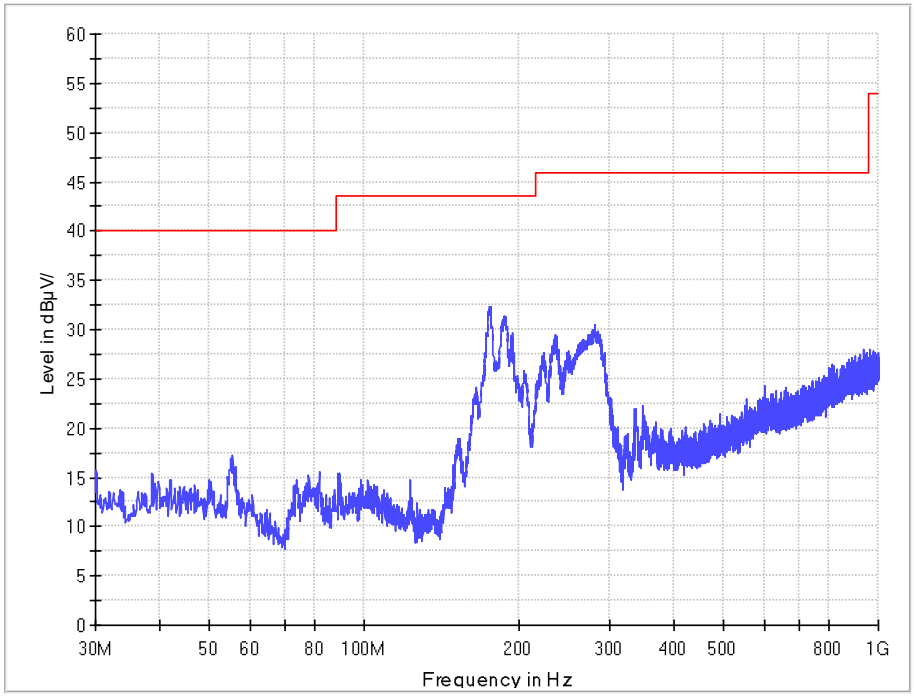
Table 14 Radiated Emission Test Data 30MHz-1GHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
30.000	0.6	12.3	11.2	24.1	Vertical	40	15.9	QP
38.439	0.7	12.3	10.8	23.8	Vertical	40	16.2	QP
54.347	0.8	13.3	10.5	24.6	Vertical	40	15.4	QP
65.502	0.9	10.7	11.5	23.1	Vertical	40	16.9	QP
175.985	1.5	9.0	25.2	35.7	Vertical	43.5	7.8	QP
188.013	1.5	9.7	22.2	33.4	Vertical	43.5	10.1	QP
55.511	0.9	13.0	1.4	15.3	Horizontal	40	24.7	QP
152.317	1.4	8.3	6.8	16.5	Horizontal	43.5	27.0	QP
175.500	1.5	9.0	20.3	30.8	Horizontal	43.5	12.7	QP
186.849	1.5	9.7	18.9	30.1	Horizontal	43.5	13.4	QP
193.833	1.7	10.6	15.6	27.9	Horizontal	43.5	15.6	QP
280.745	1.9	12.7	14.7	29.3	Horizontal	46	16.7	QP

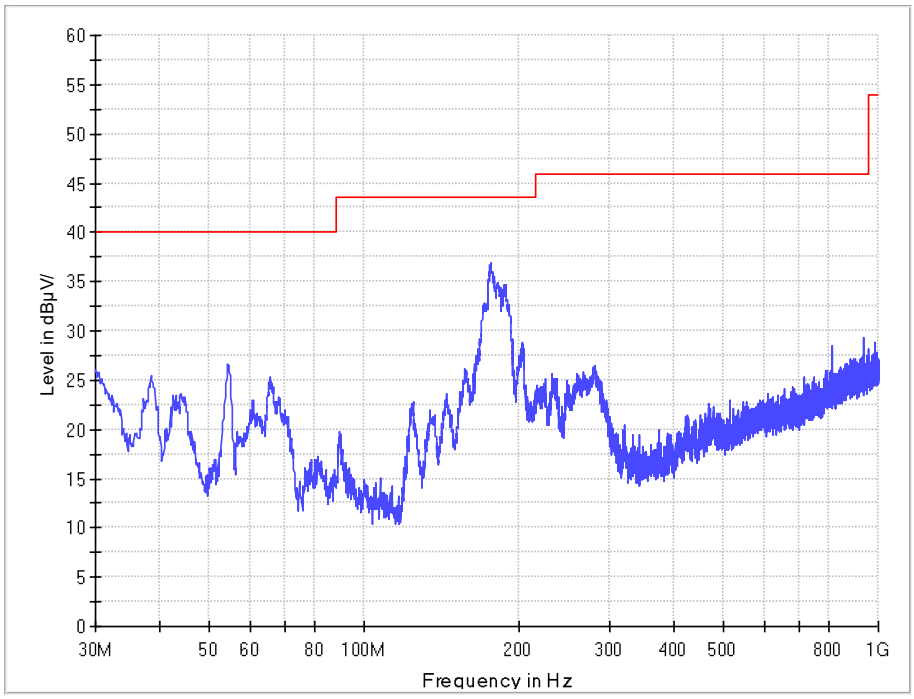
Remark: Emission level (dBμV)=Read Value(dBμV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

30MHz-1GHz

Horizontal



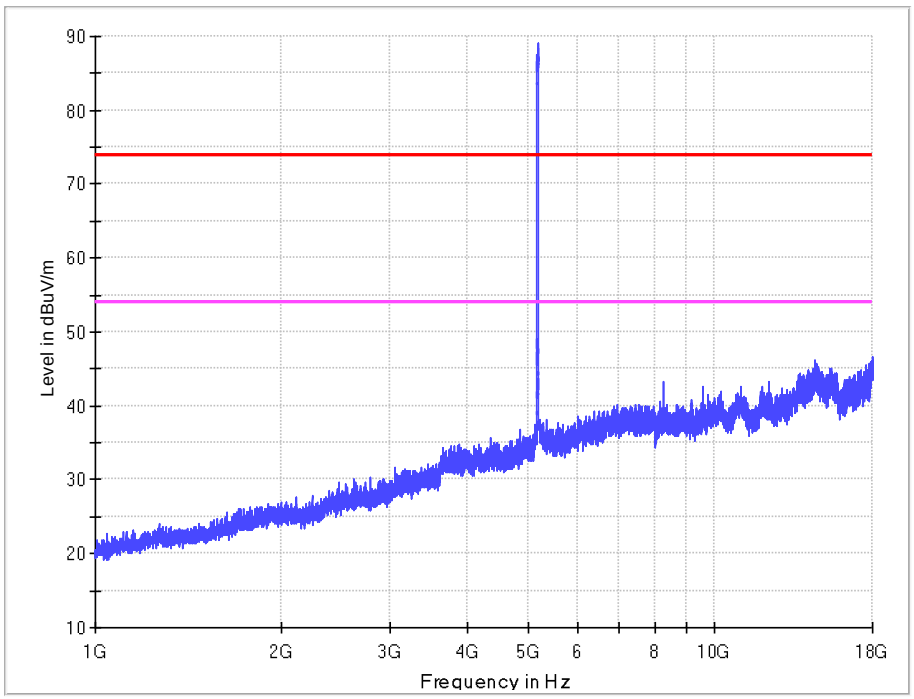
Vertical



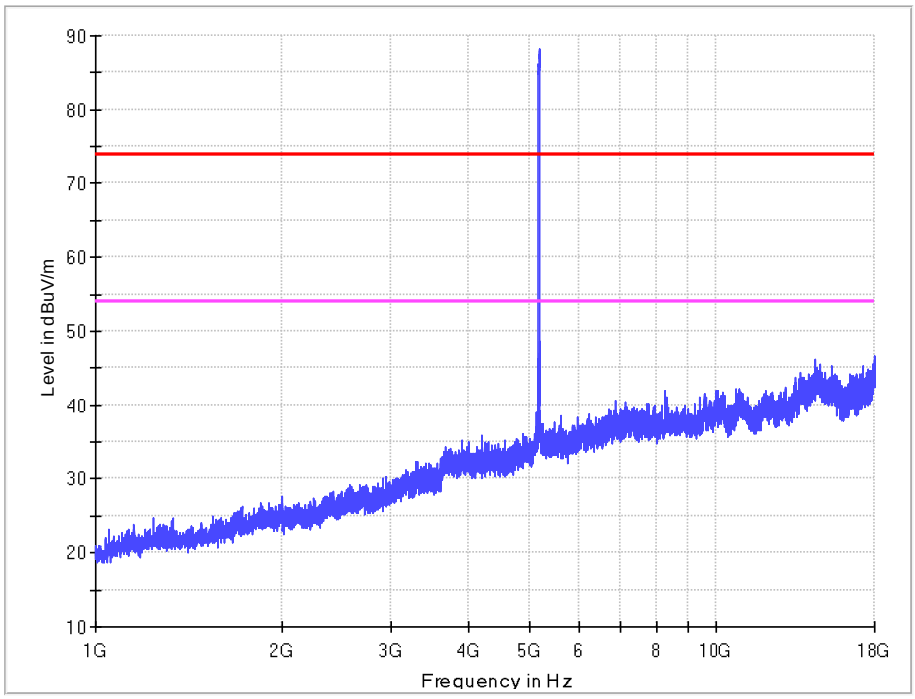
1-18G

11a IN THE 5.2GHz BAND
CH36

Horizontal



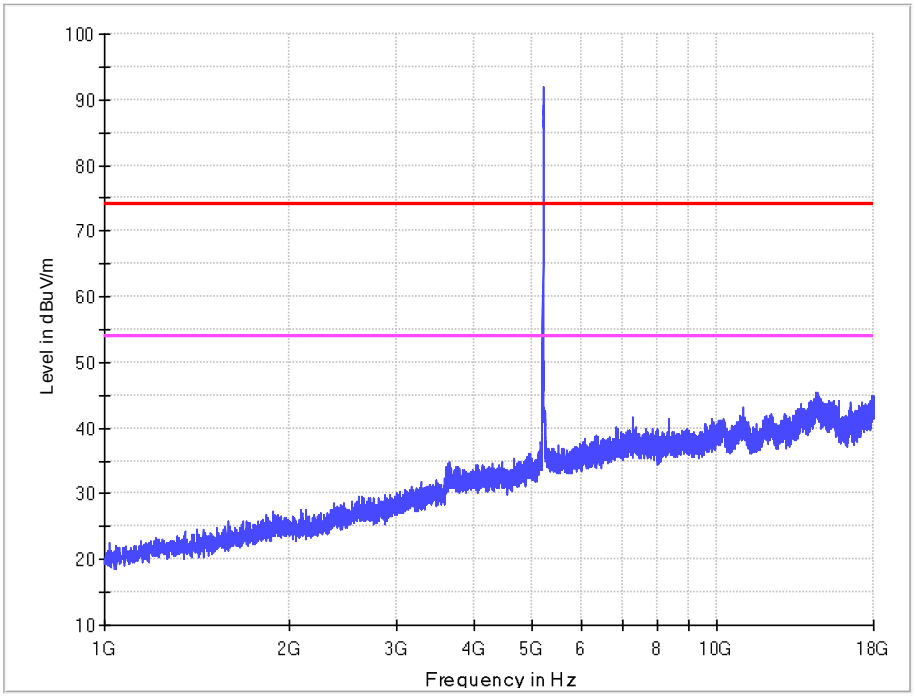
Vertical



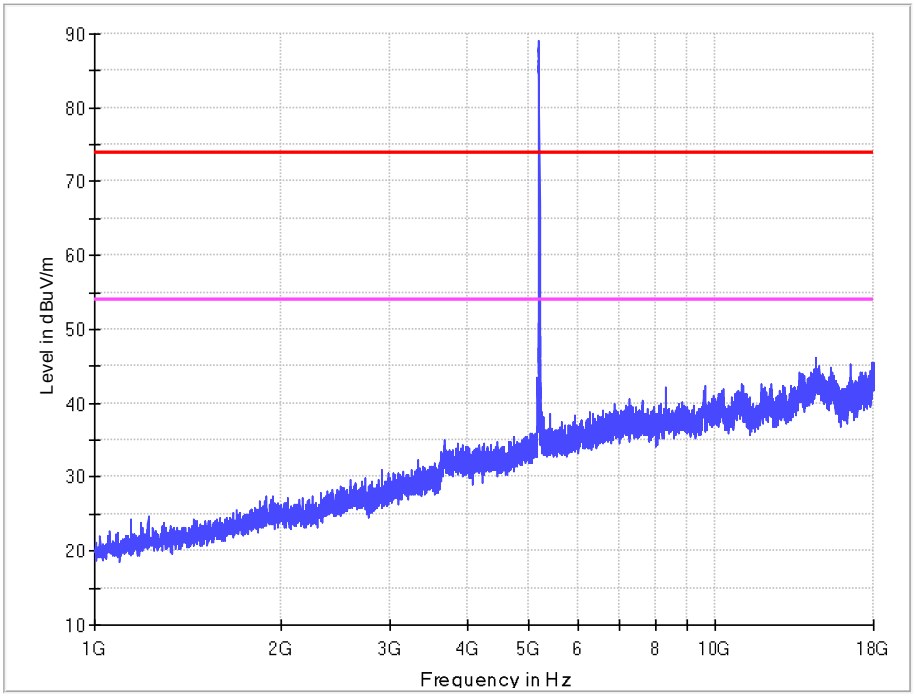
1-18G

11a IN THE 5.2GHz BAND
CH40

Horizontal



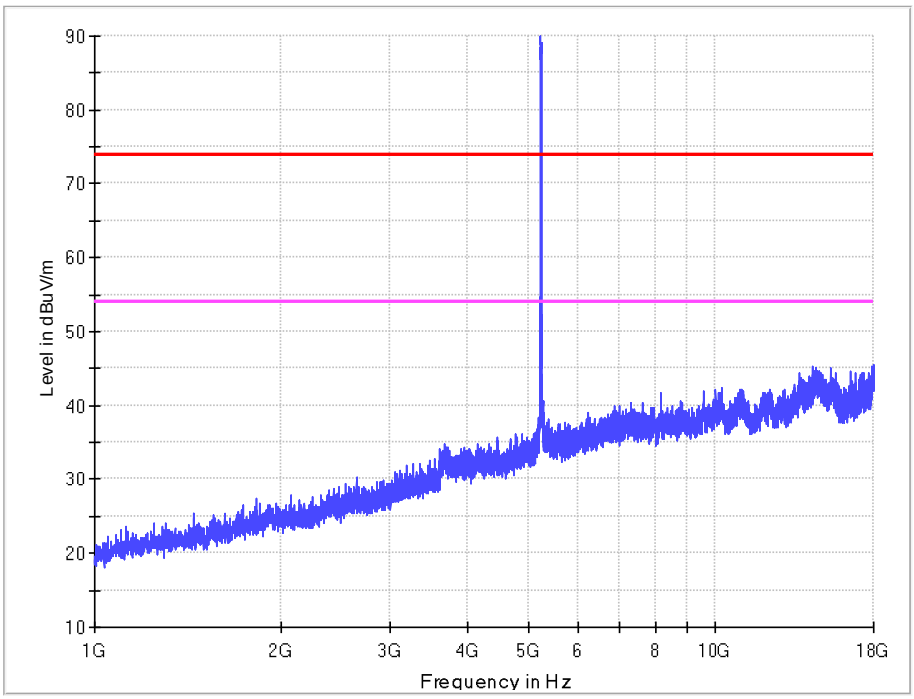
Vertical



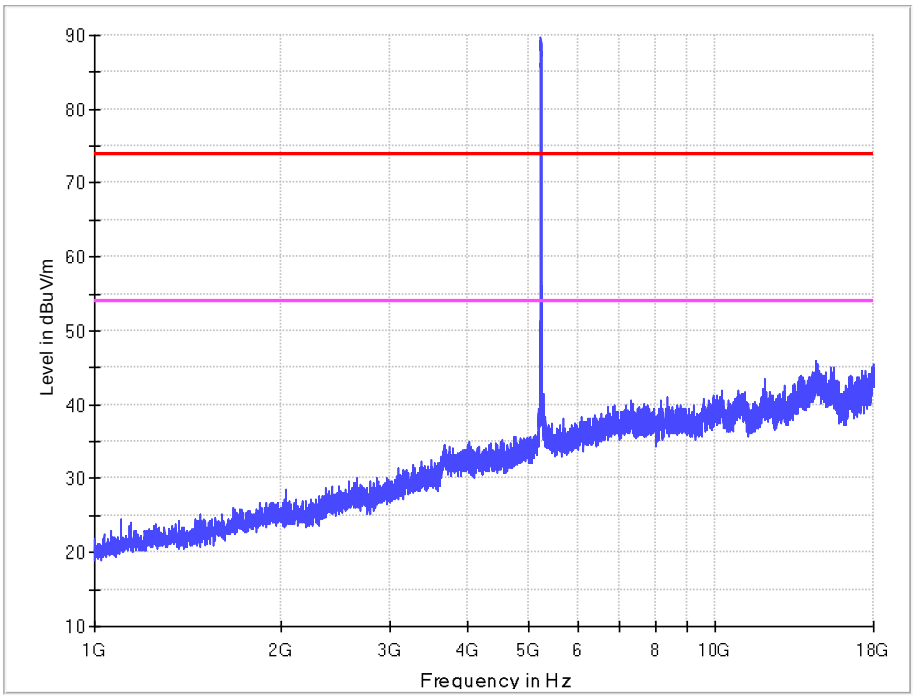
1-18G

11a IN THE 5.2GHz BAND
CH48

Horizontal



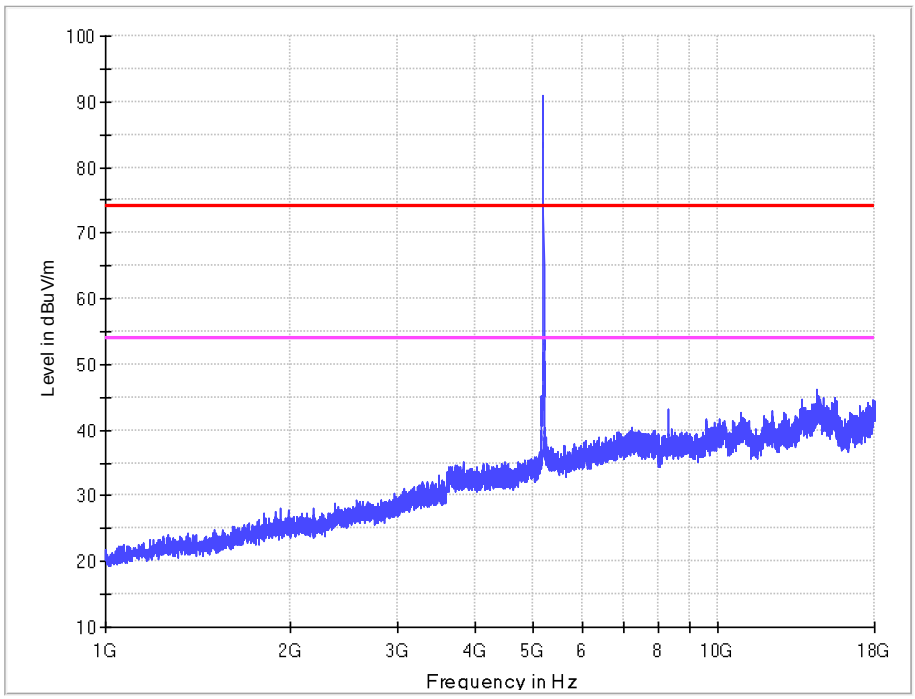
Vertical



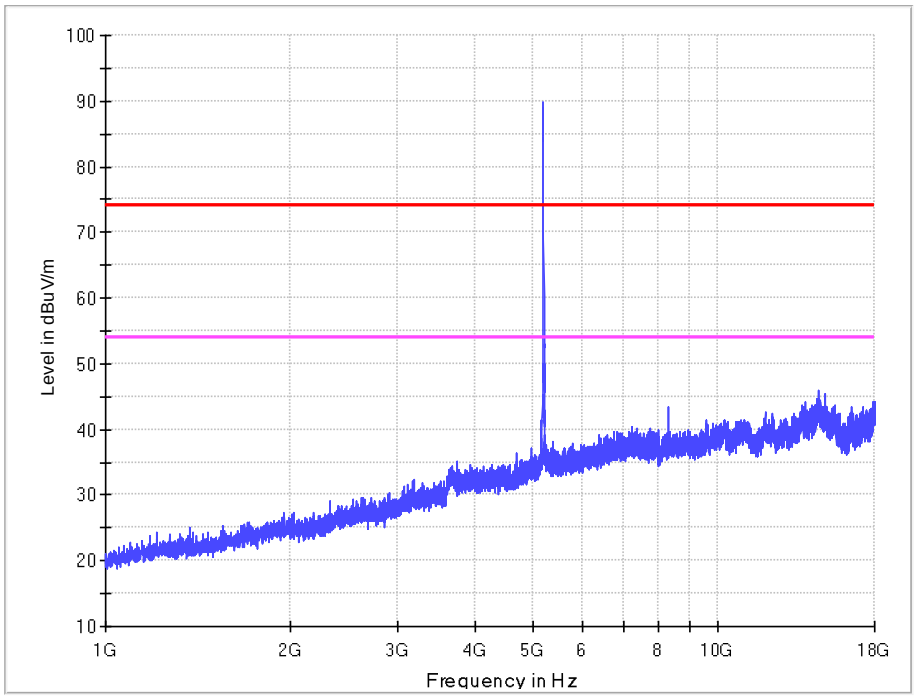
1-18G

11n HT20 IN THE 5.2GHz BAND
CH36

Horizontal



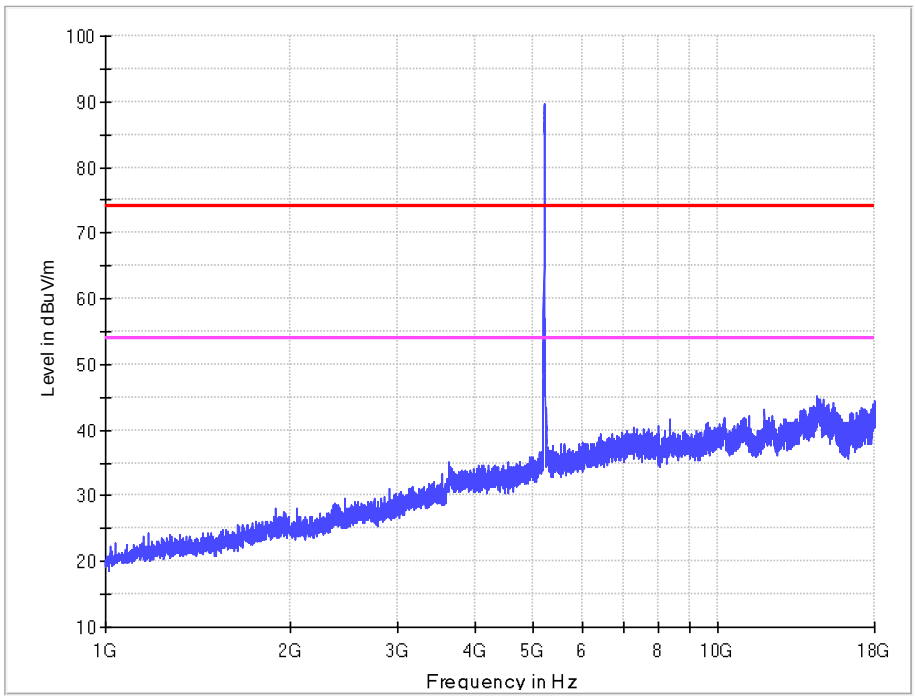
Vertical



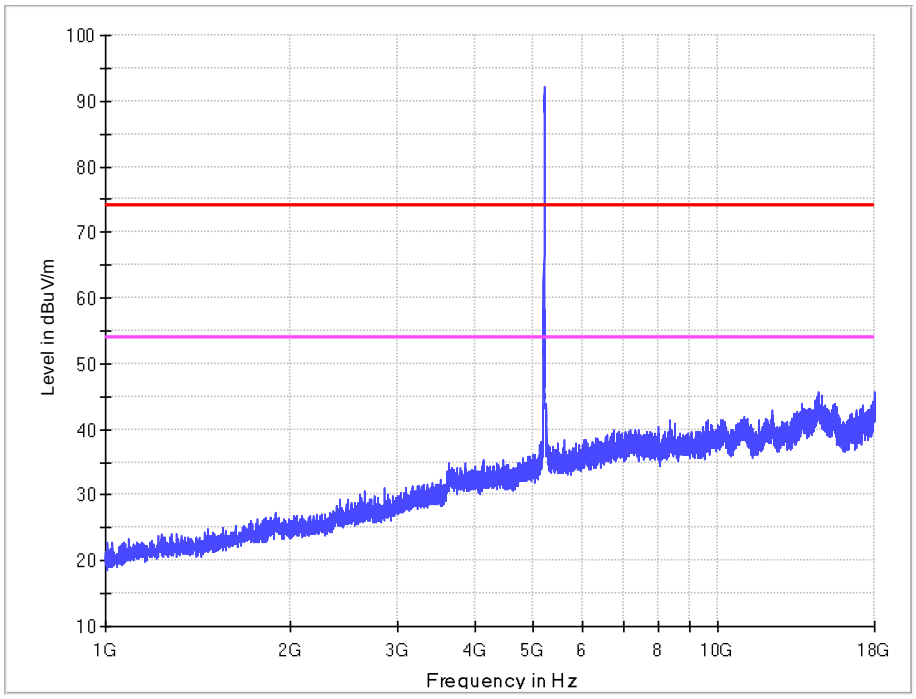
1-18G

11n HT20 IN THE 5.2GHz BAND
CH40

Horizontal



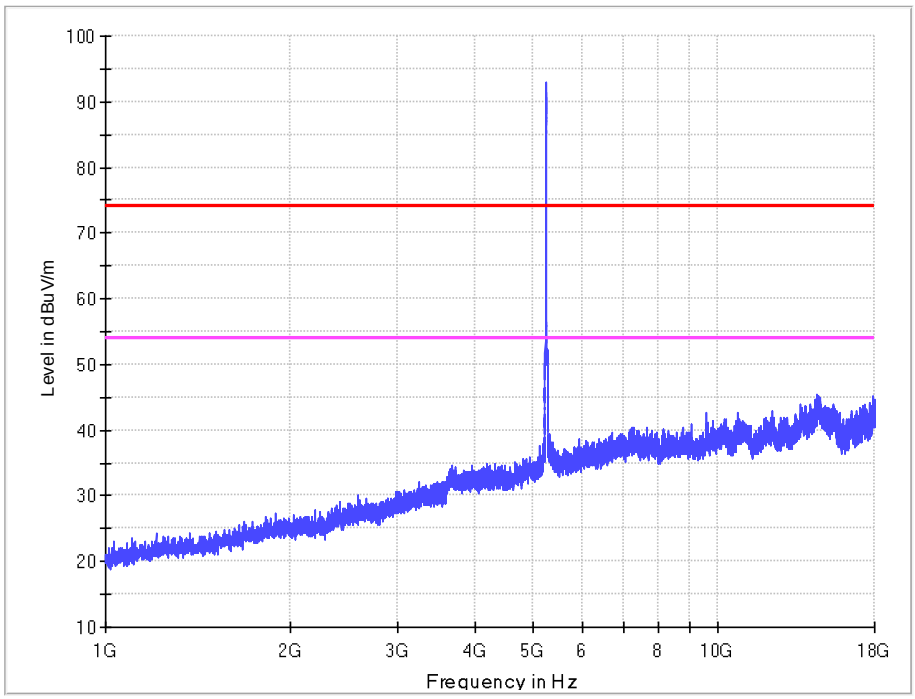
Vertical



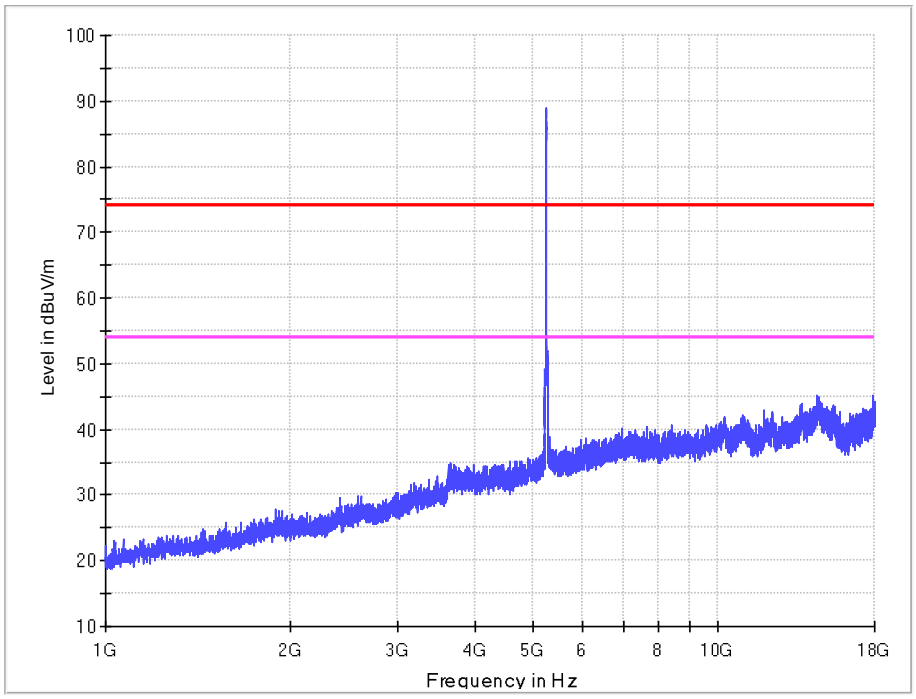
1-18G

11n HT20 IN THE 5.2GHz BAND
CH48

Horizontal



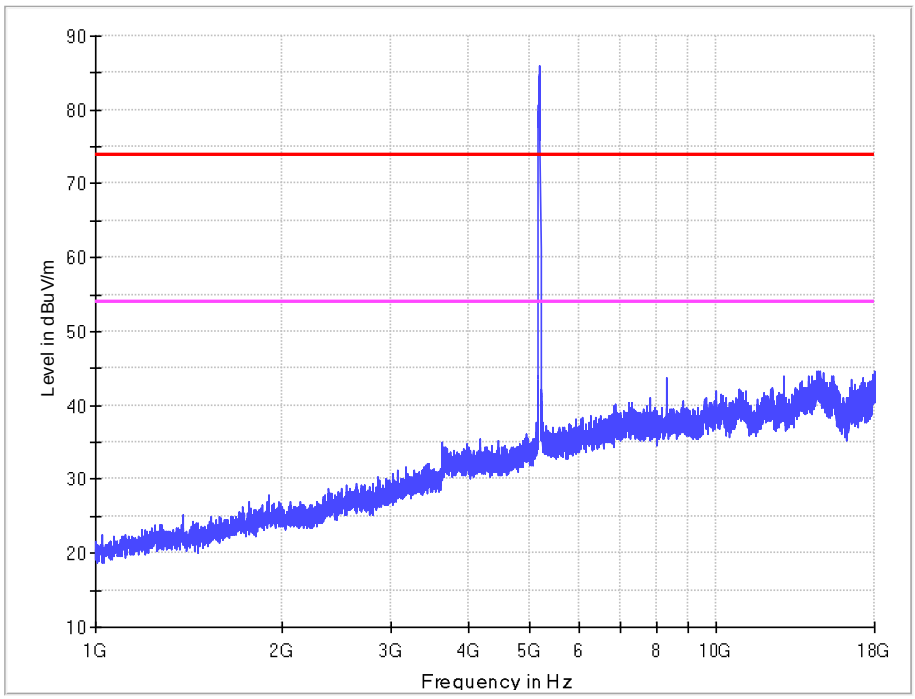
Vertical



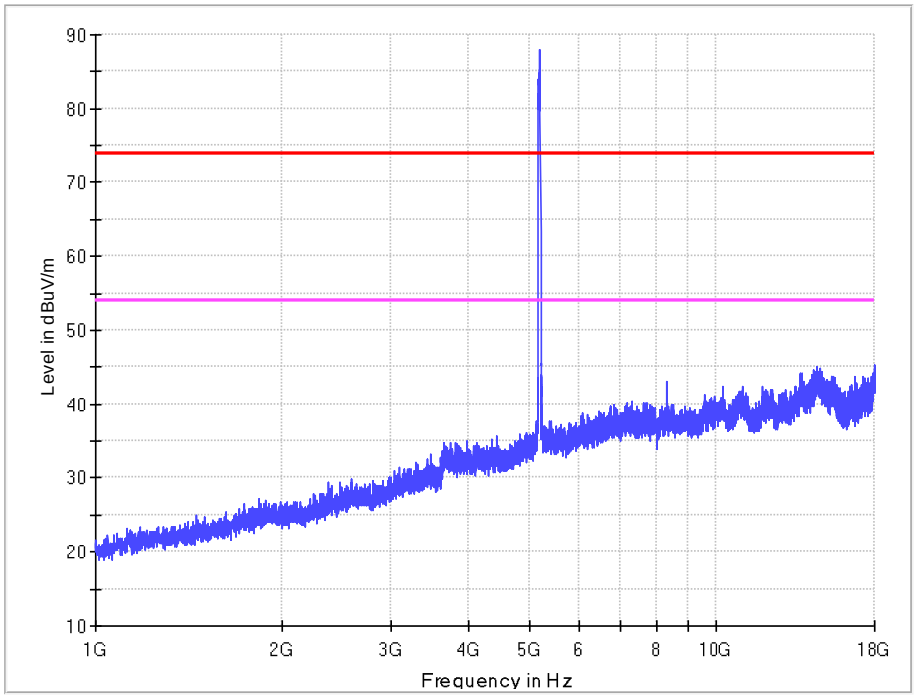
1-18G

11n HT40 IN THE 5.2GHz BAND
CH38

Horizontal



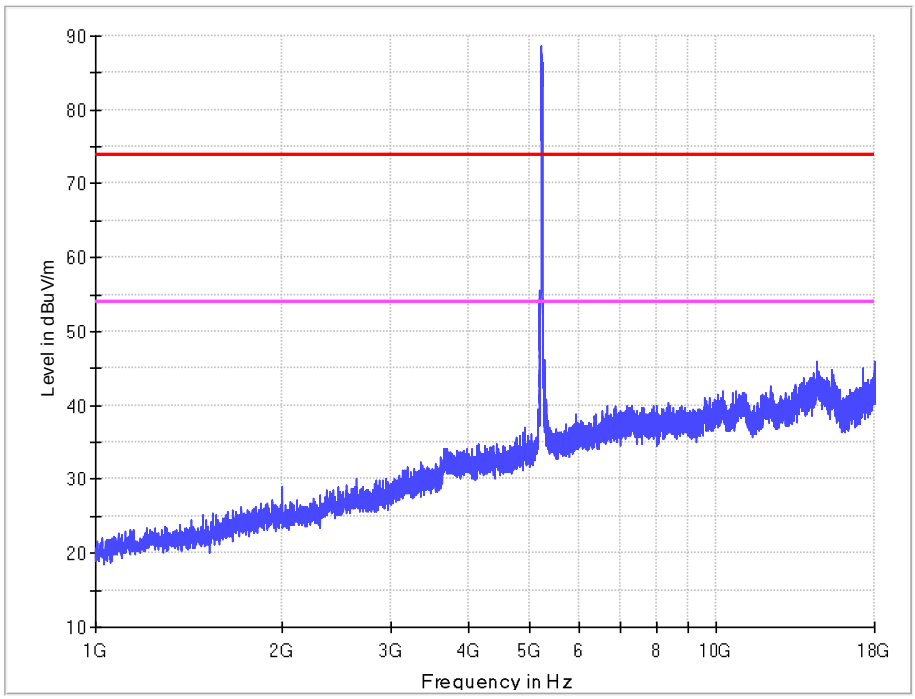
Vertical



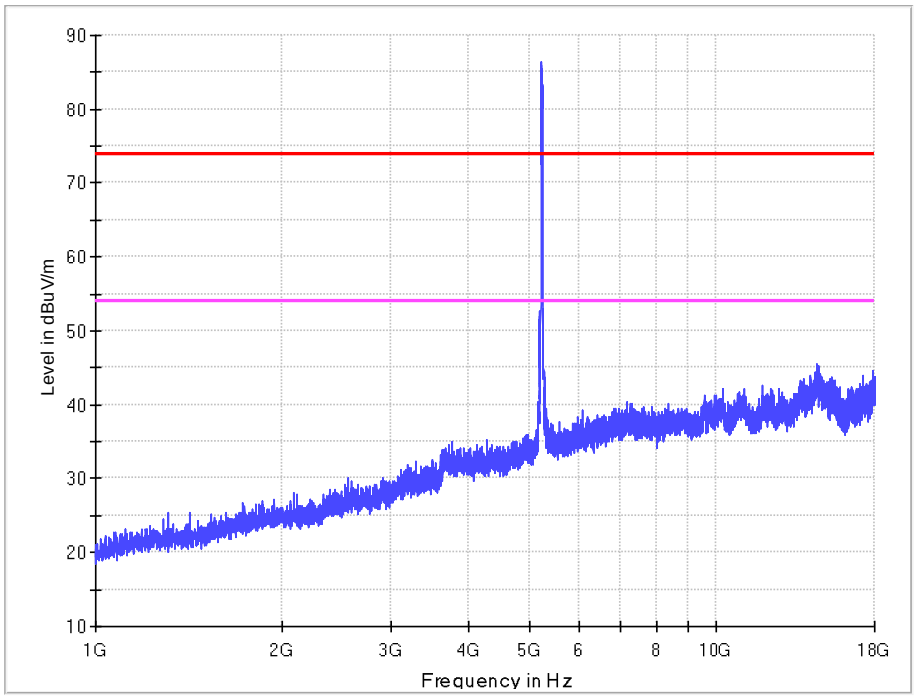
1-18G

11n HT40 IN THE 5.2GHz BAND
CH46

Horizontal



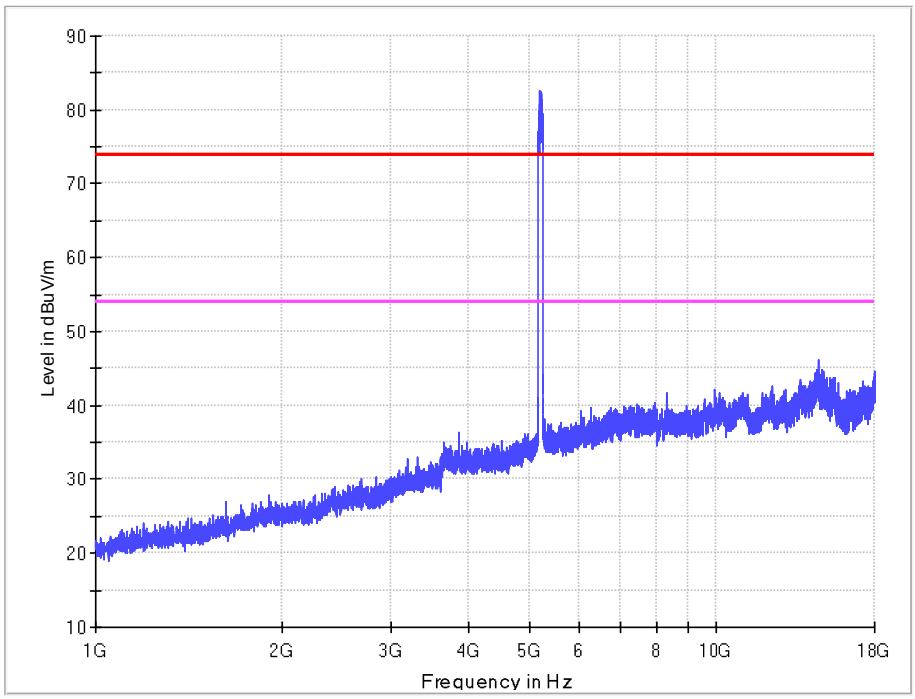
Vertical



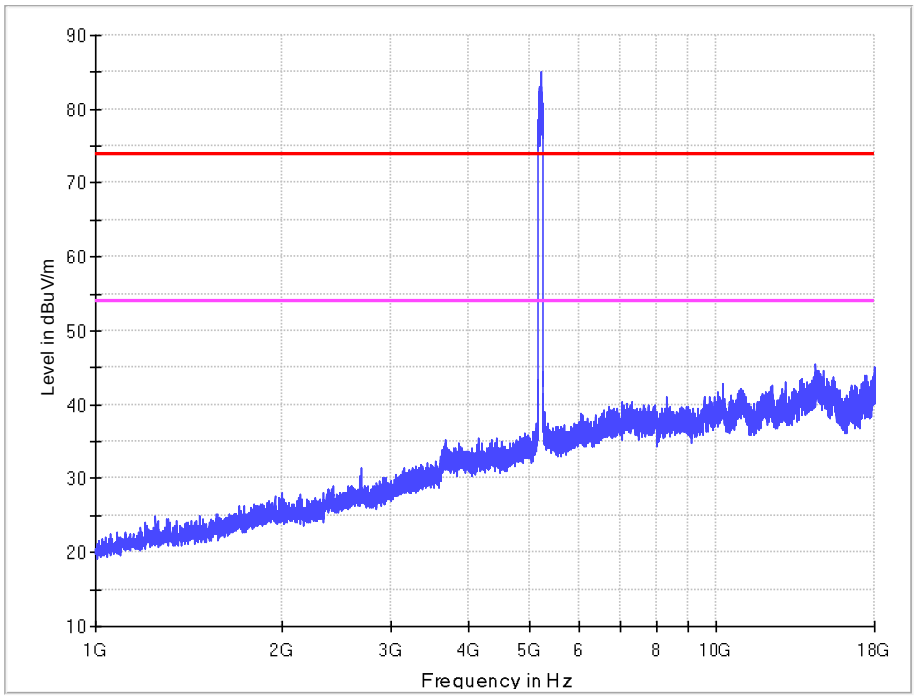
1-18G

11ac VHT80 IN THE 5.2GHz BAND
CH42

Horizontal



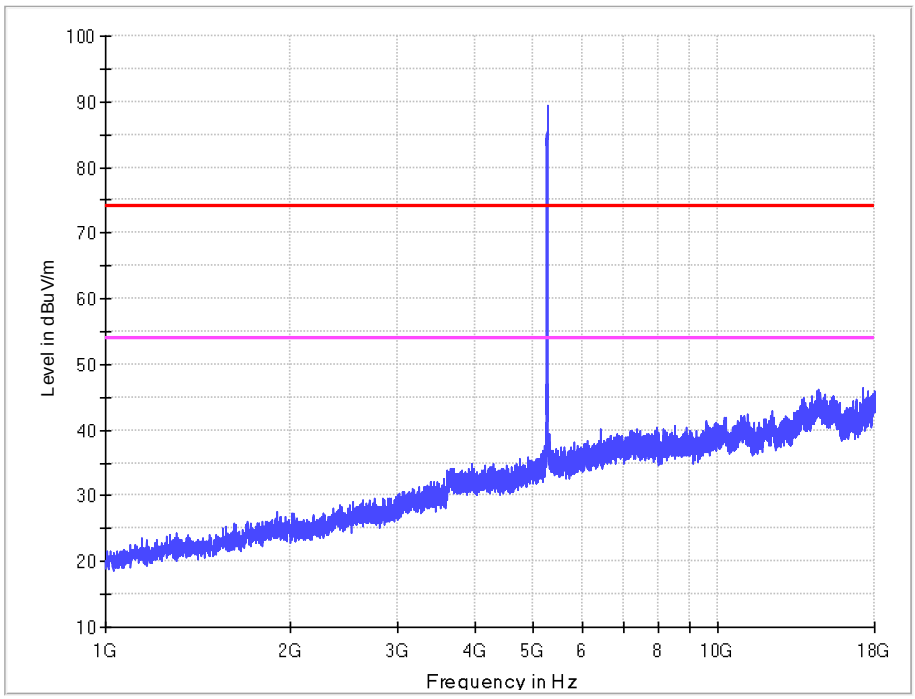
Vertical



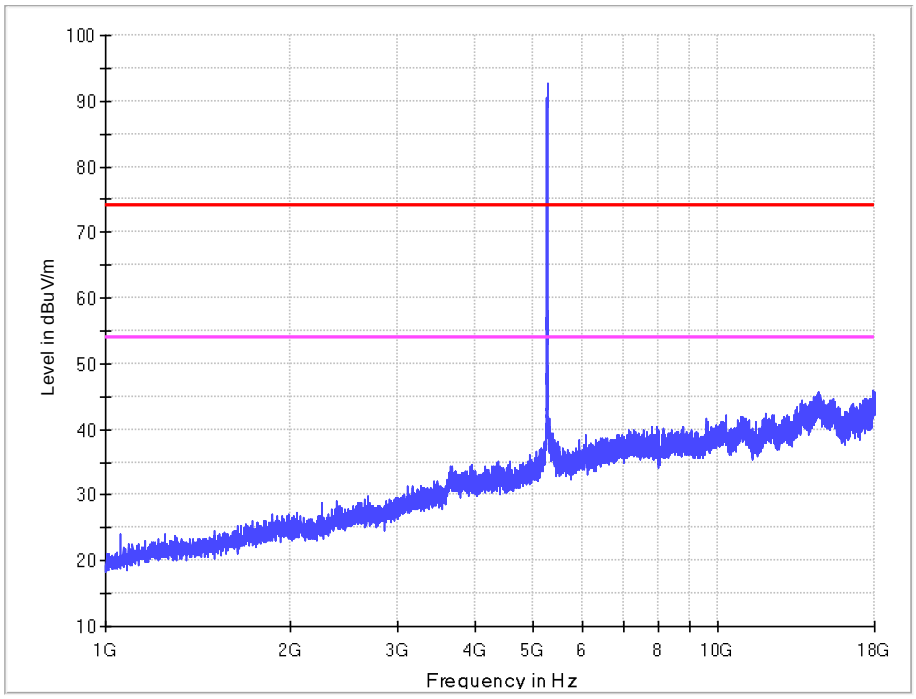
1-18G

11a IN THE 5.3GHz BAND
CH52

Horizontal



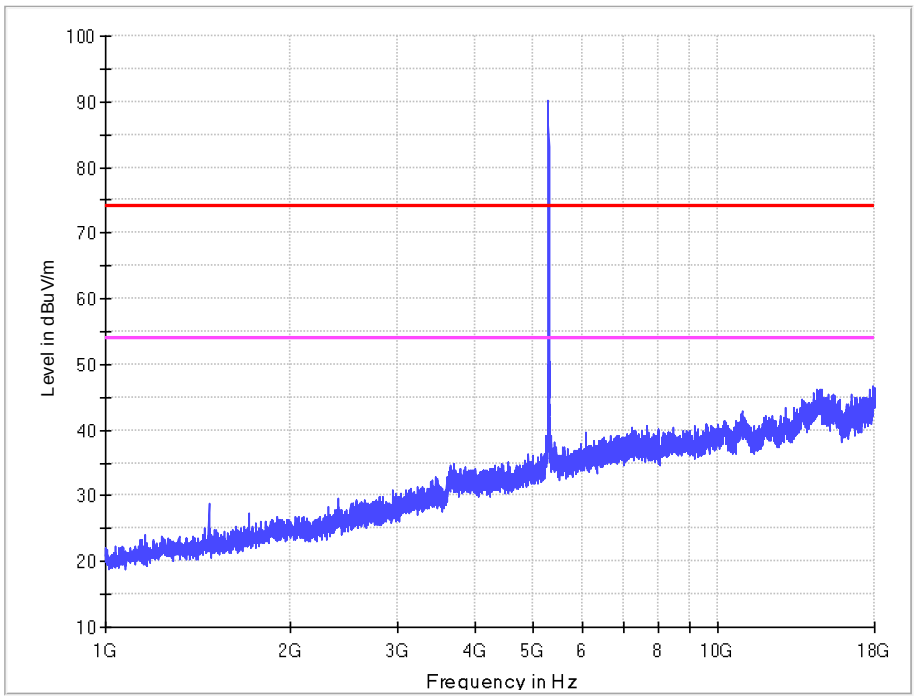
Vertical



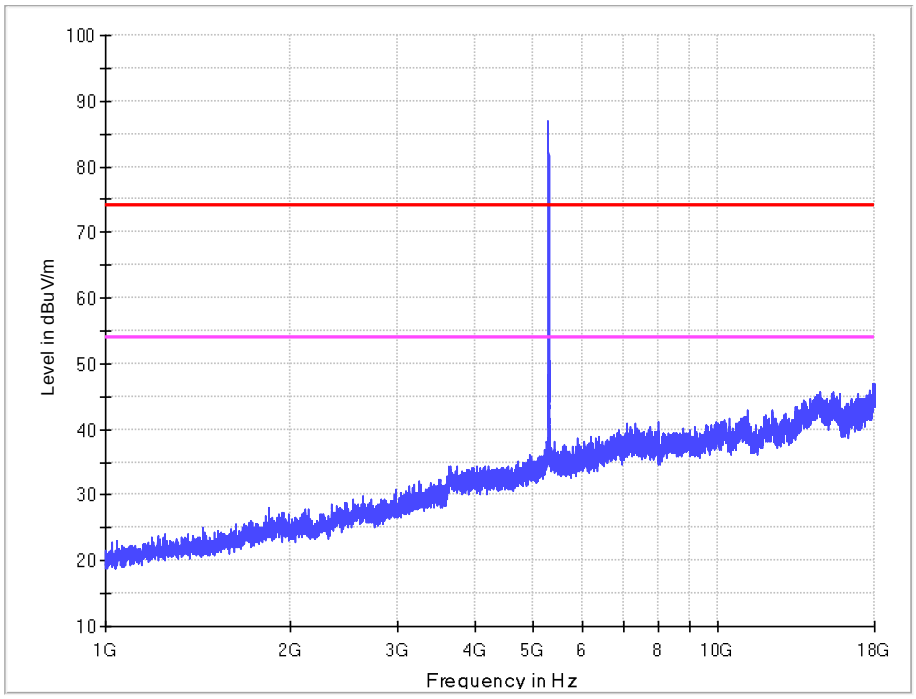
1-18G

11a IN THE 5.3GHz BAND
CH56

Horizontal



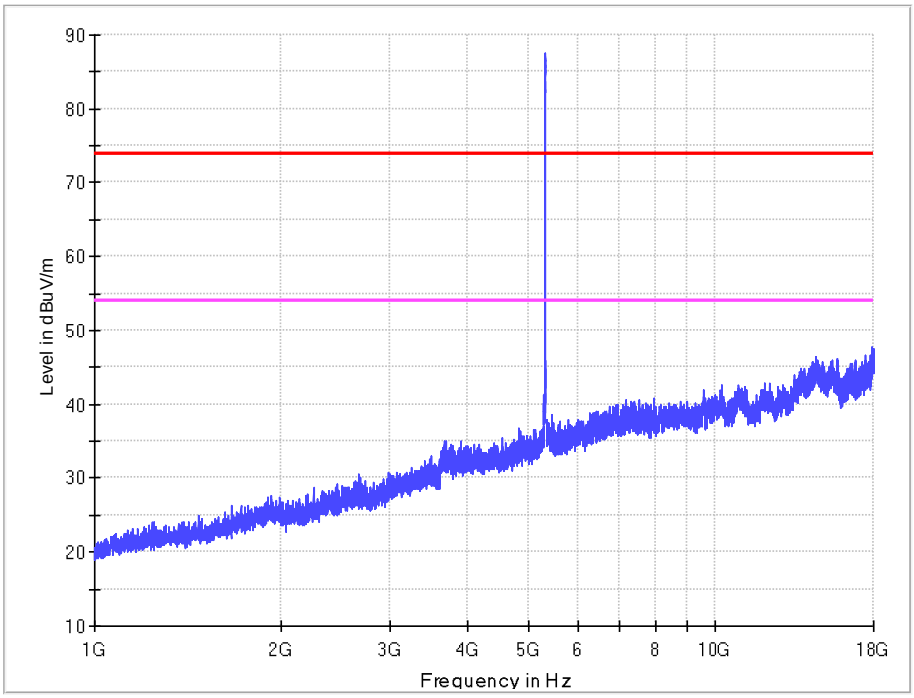
Vertical



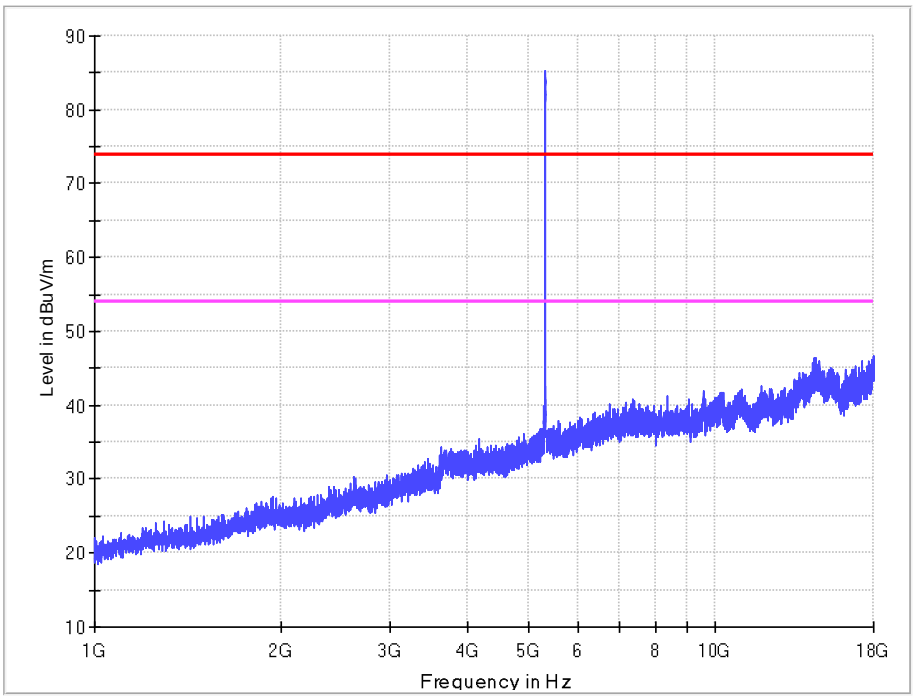
1-18G

11a IN THE 5.3GHz BAND
CH64

Horizontal



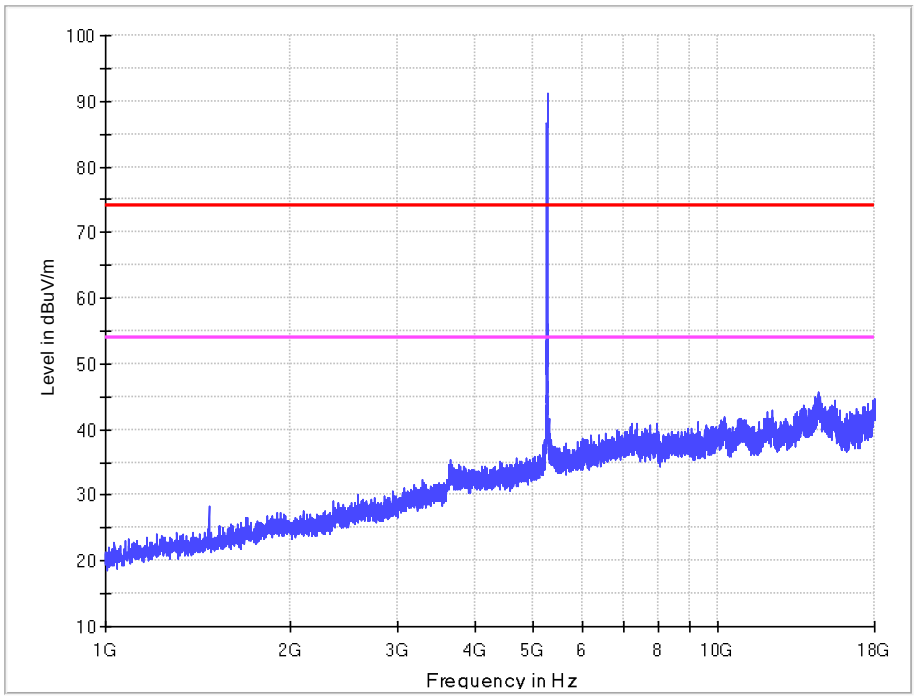
Vertical



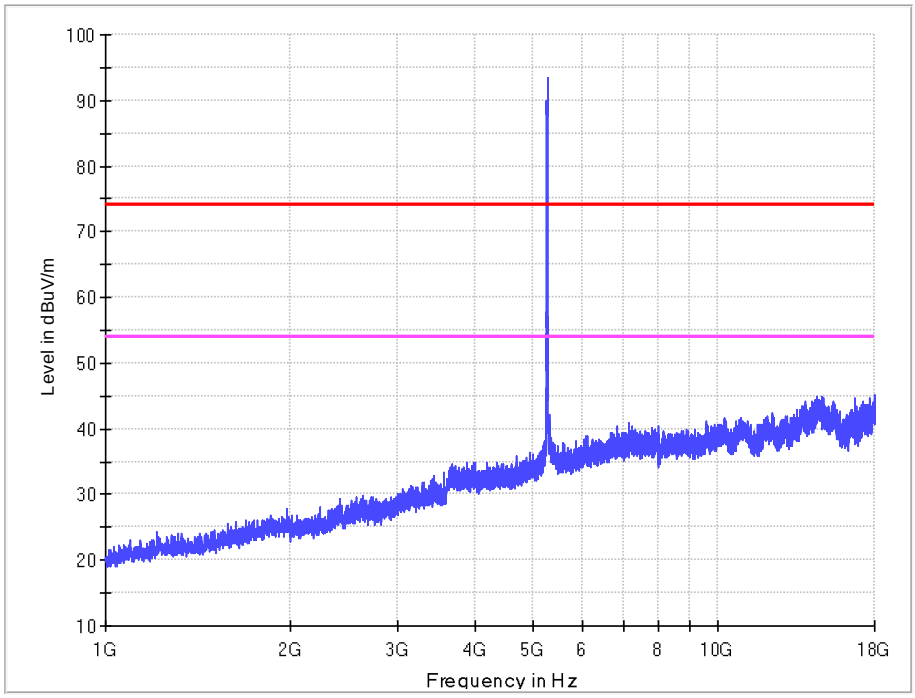
1-18G

11n HT20 IN THE 5.3GHz BAND
CH52

Horizontal



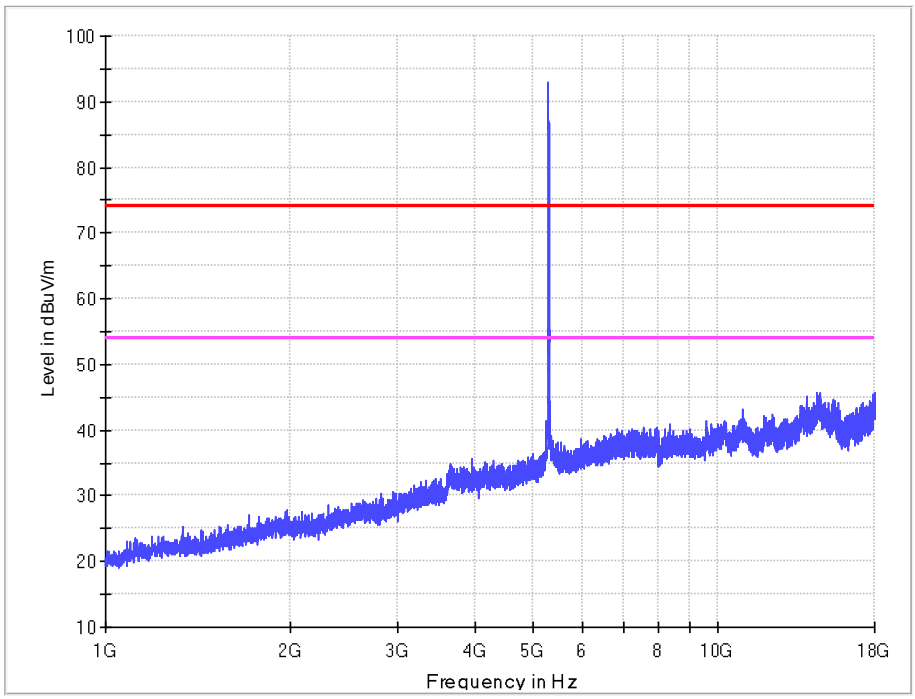
Vertical



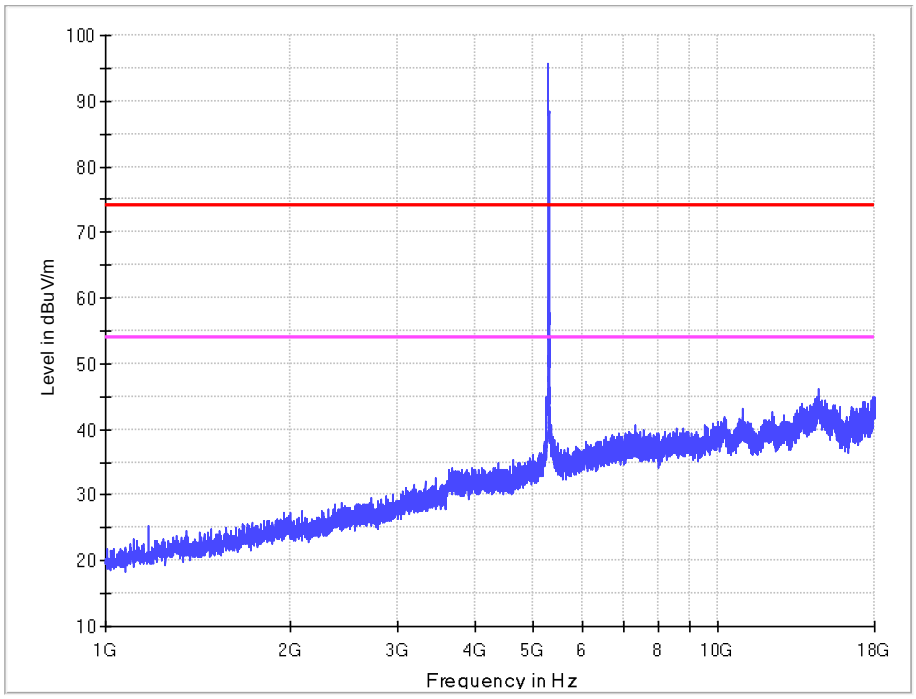
1-18G

11n HT20 IN THE 5.3GHz BAND
CH56

Horizontal



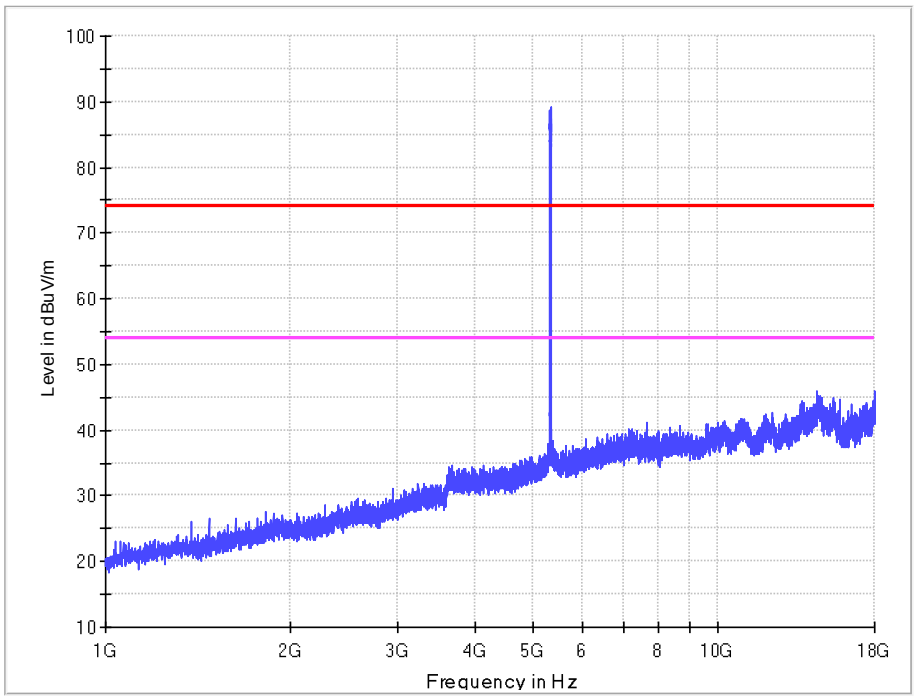
Vertical



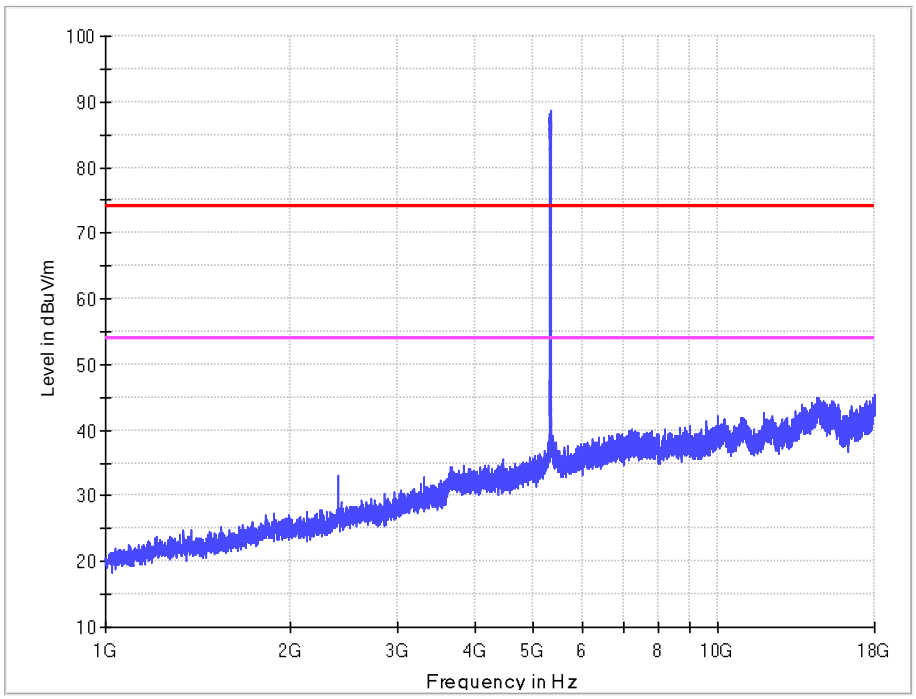
1-18G

11n HT20 IN THE 5.3GHz BAND
CH64

Horizontal



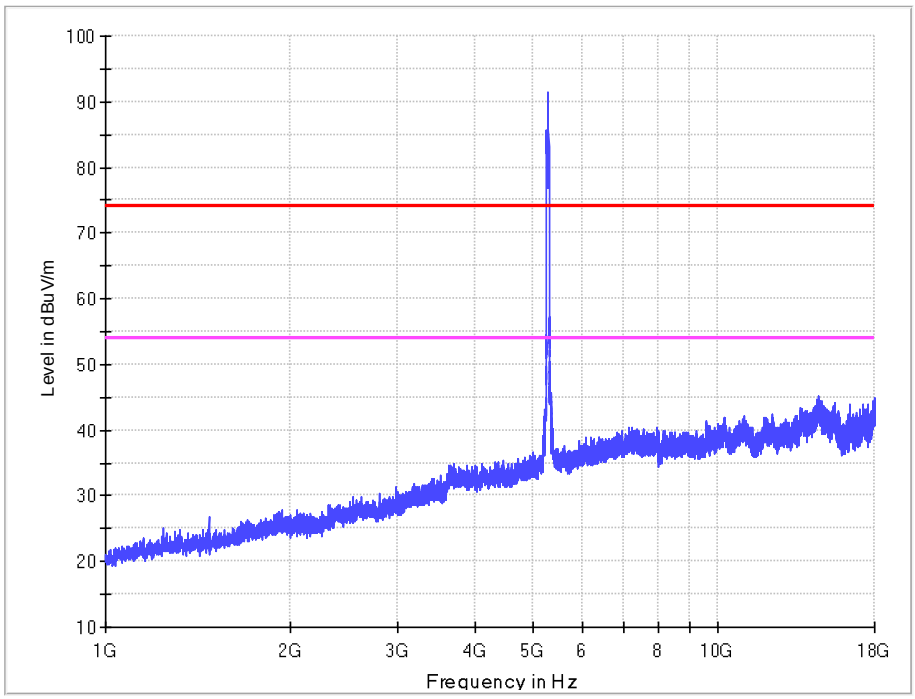
Vertical



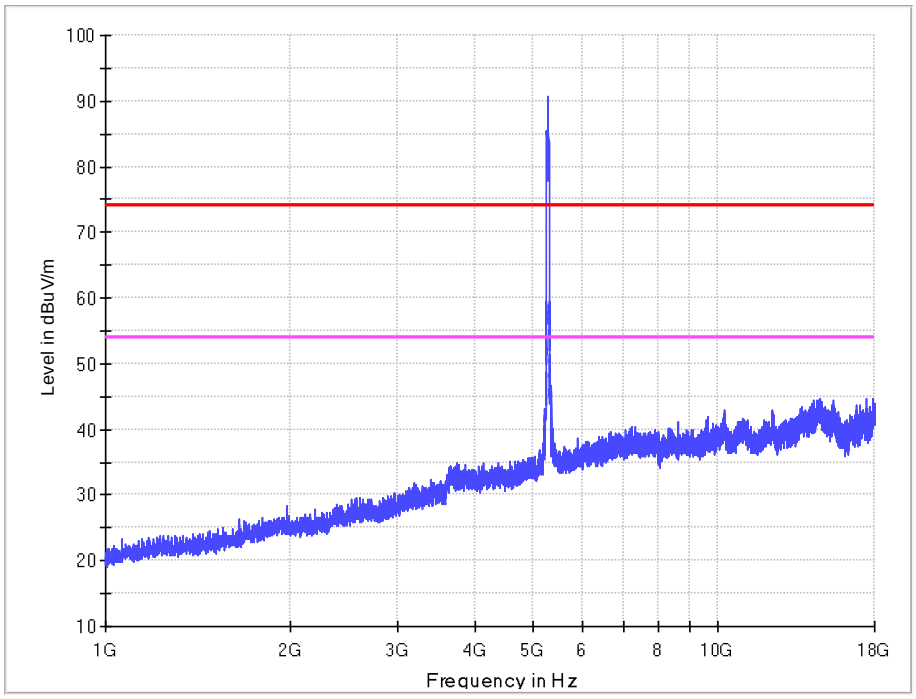
1-18G

11n HT40 IN THE 5.3GHz BAND
CH54

Horizontal



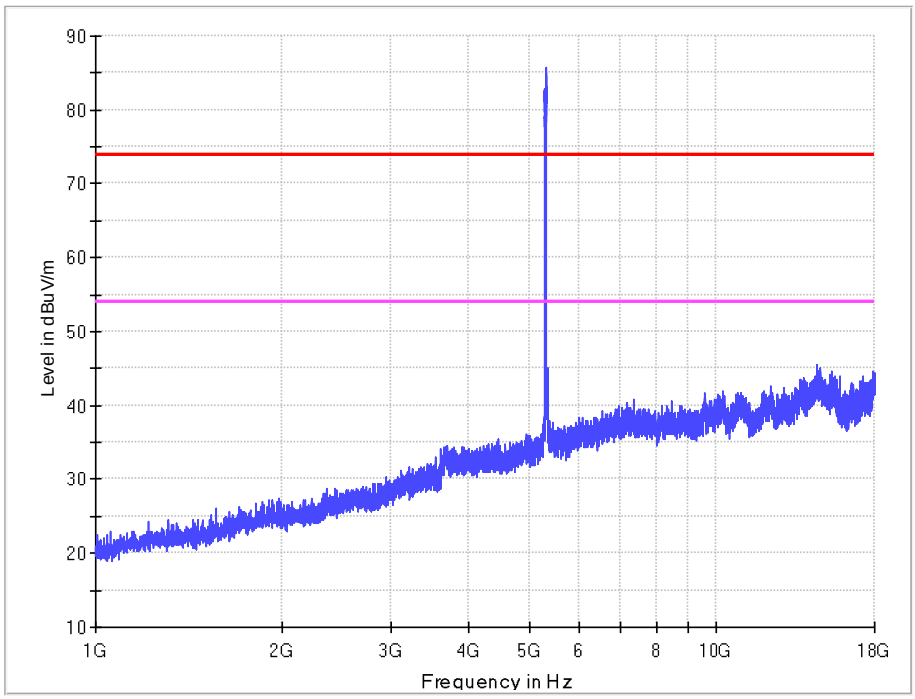
Vertical



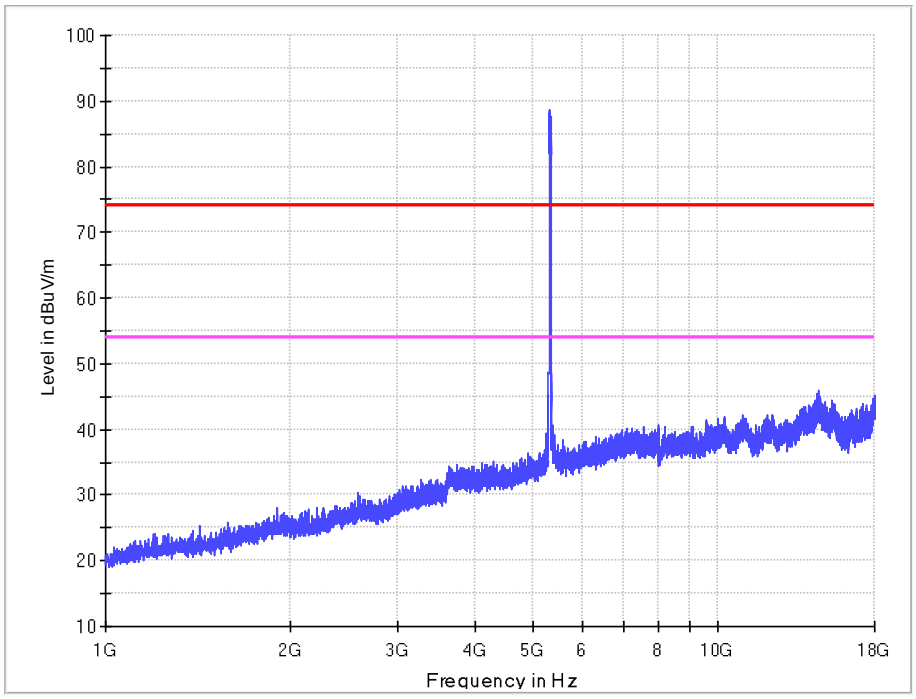
1-18G

11n HT40 IN THE 5.3GHz BAND
CH62

Horizontal



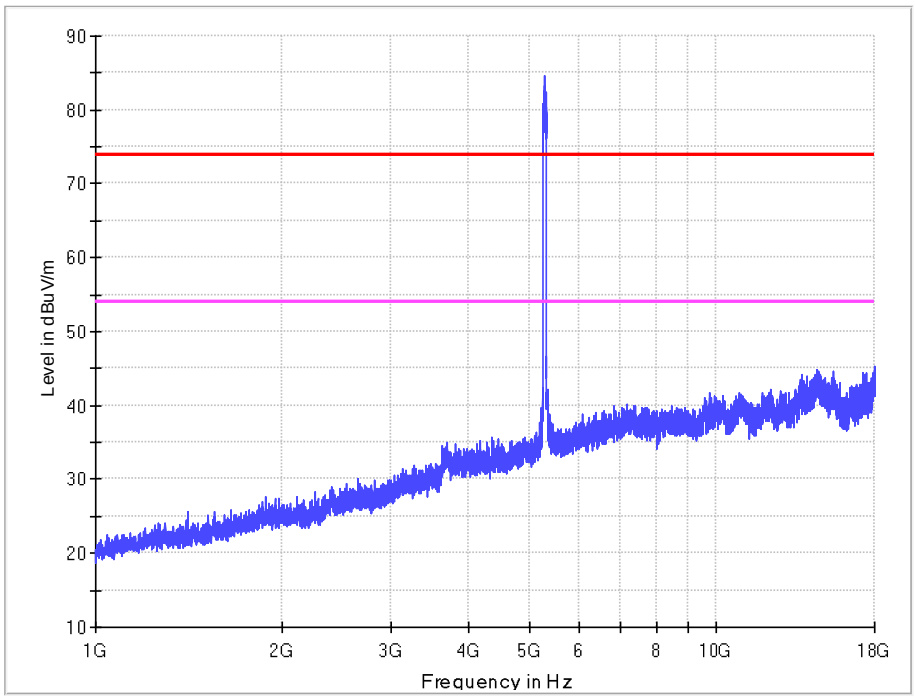
Vertical



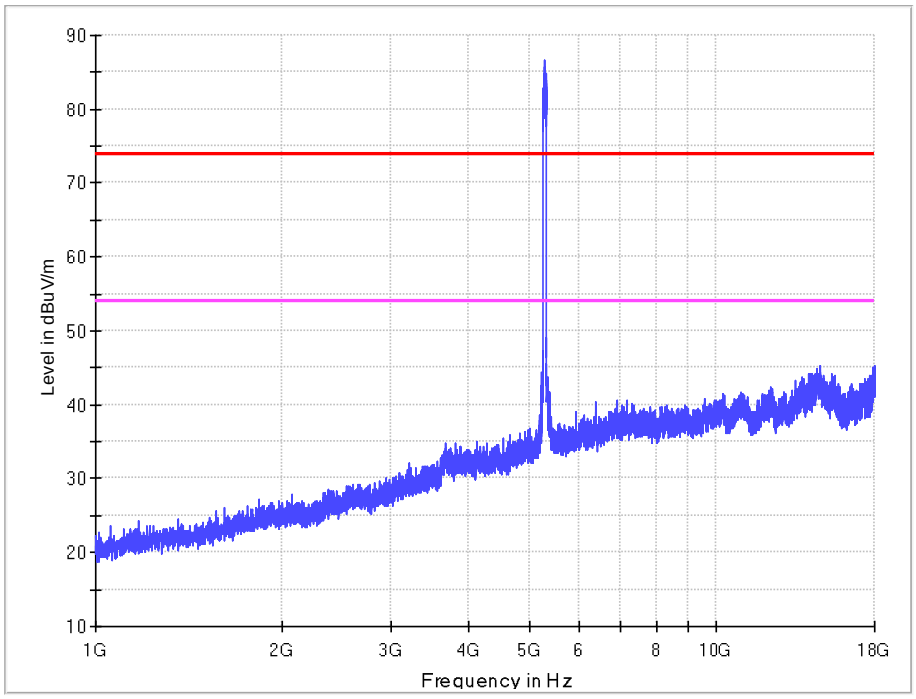
1-18G

11ac VHT80 IN THE 5.3GHz BAND
CH58

Horizontal



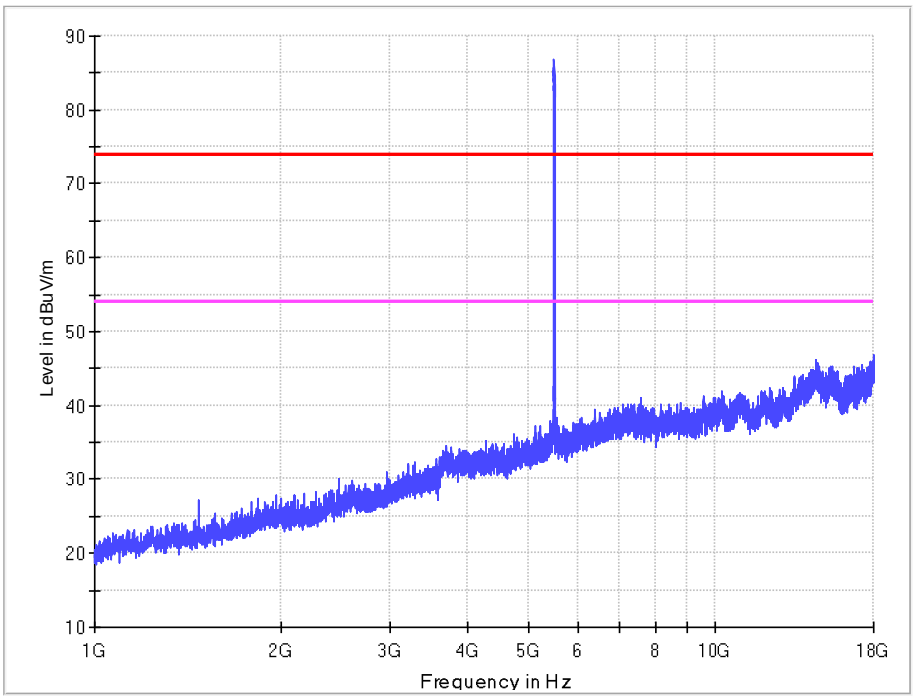
Vertical



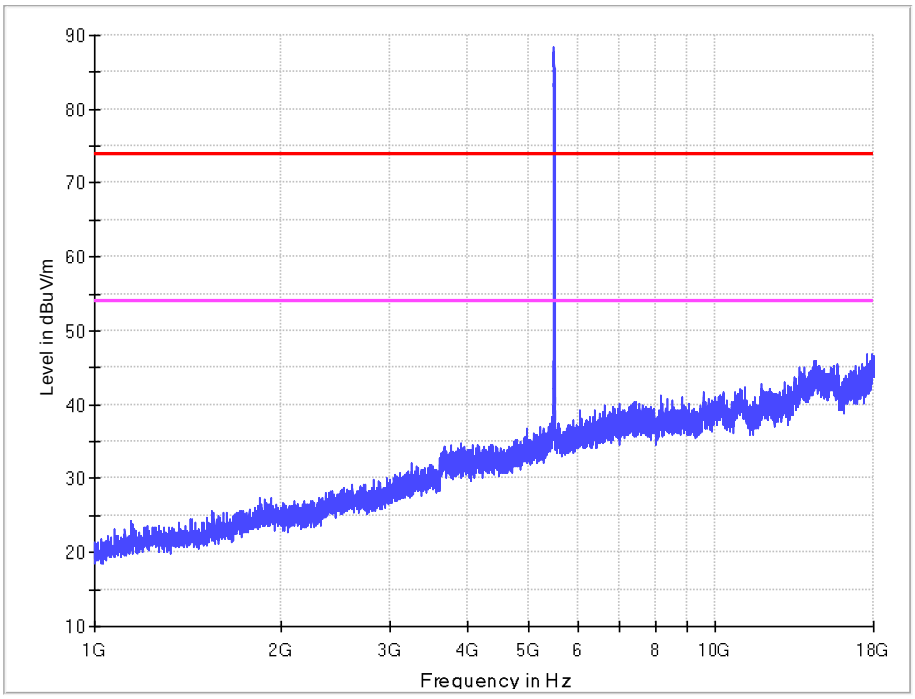
1-18G

11a IN THE 5.6GHz BAND
CH100

Horizontal



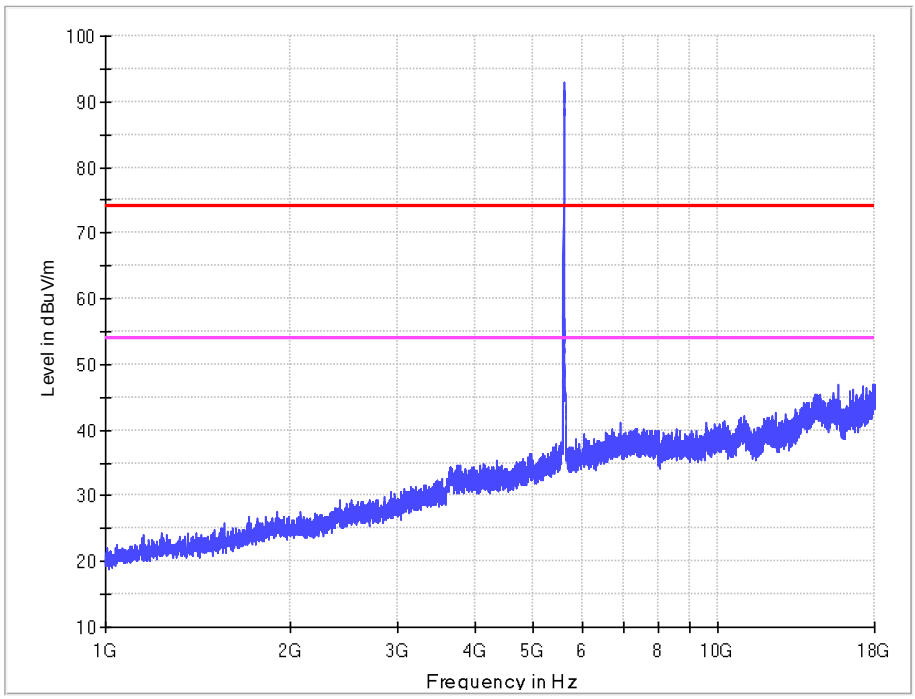
Vertical



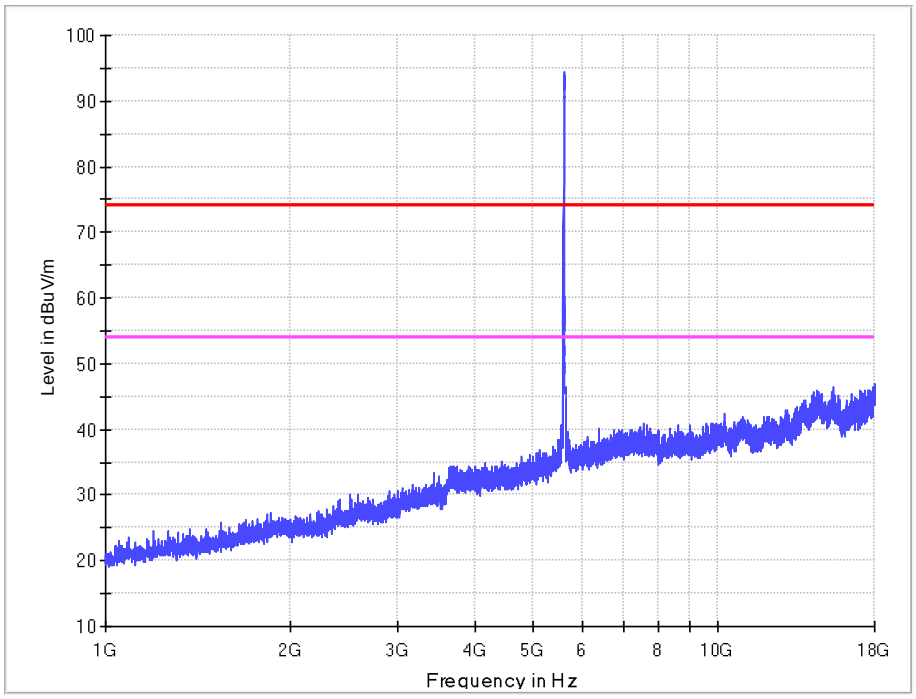
1-18G

11a IN THE 5.6GHz BAND
CH120

Horizontal



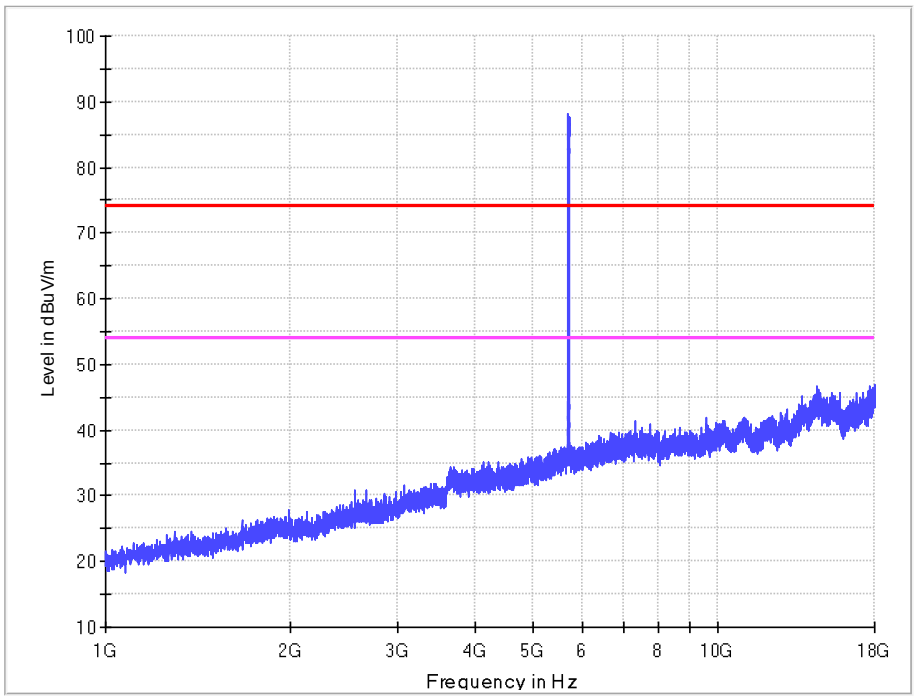
Vertical



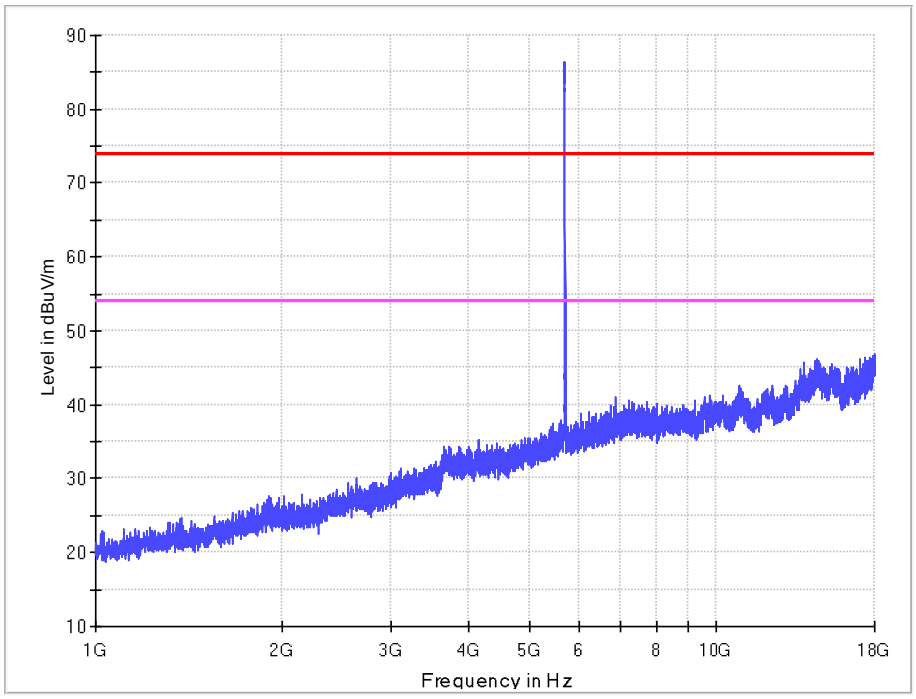
1-18G

11a IN THE 5.6GHz BAND
CH140

Horizontal



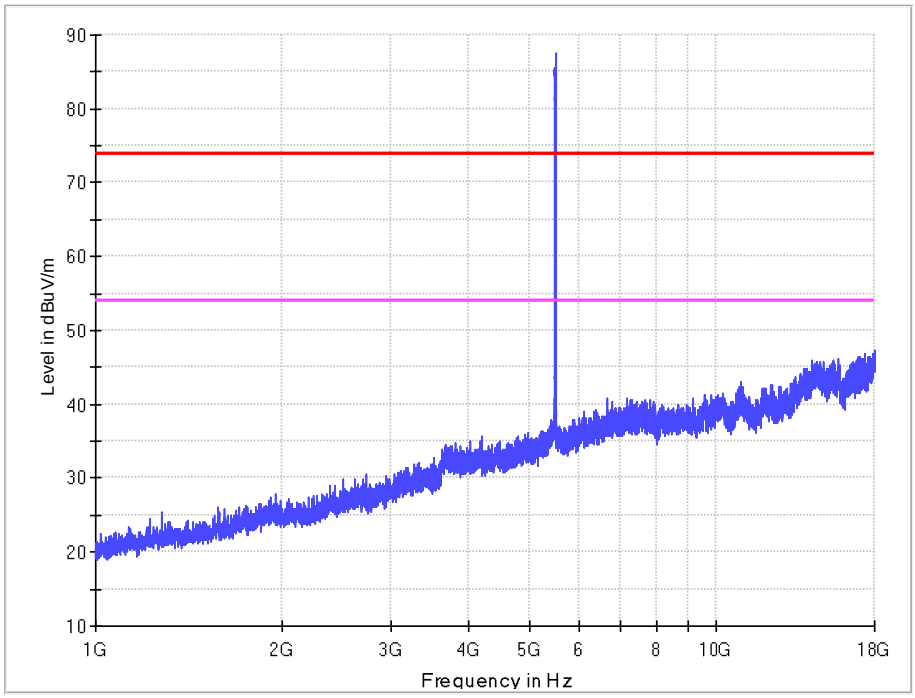
Vertical



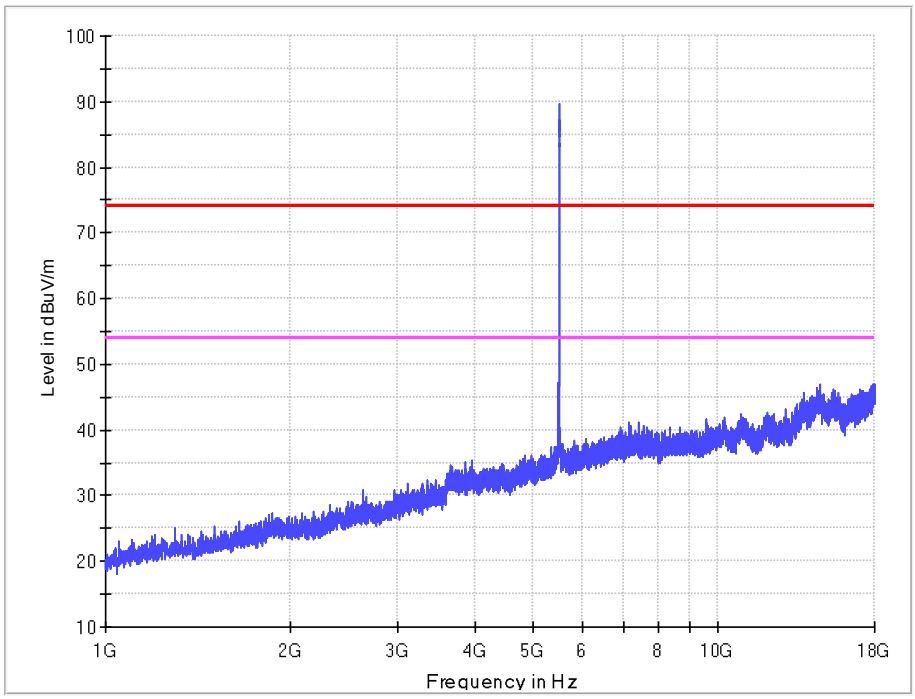
1-18G

11n HT20 IN THE 5.6GHz BAND
CH100

Horizontal



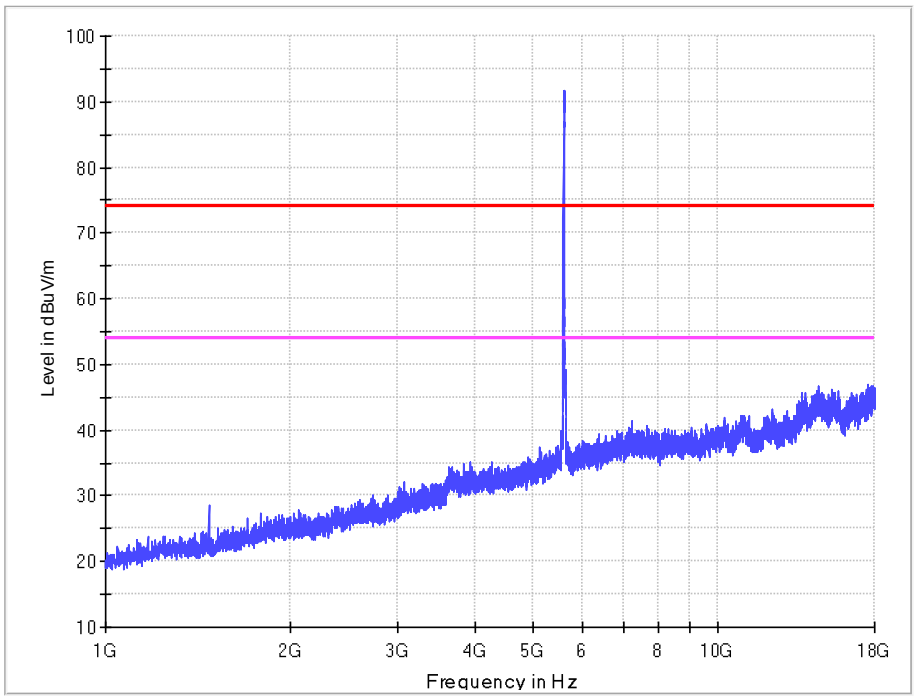
Vertical



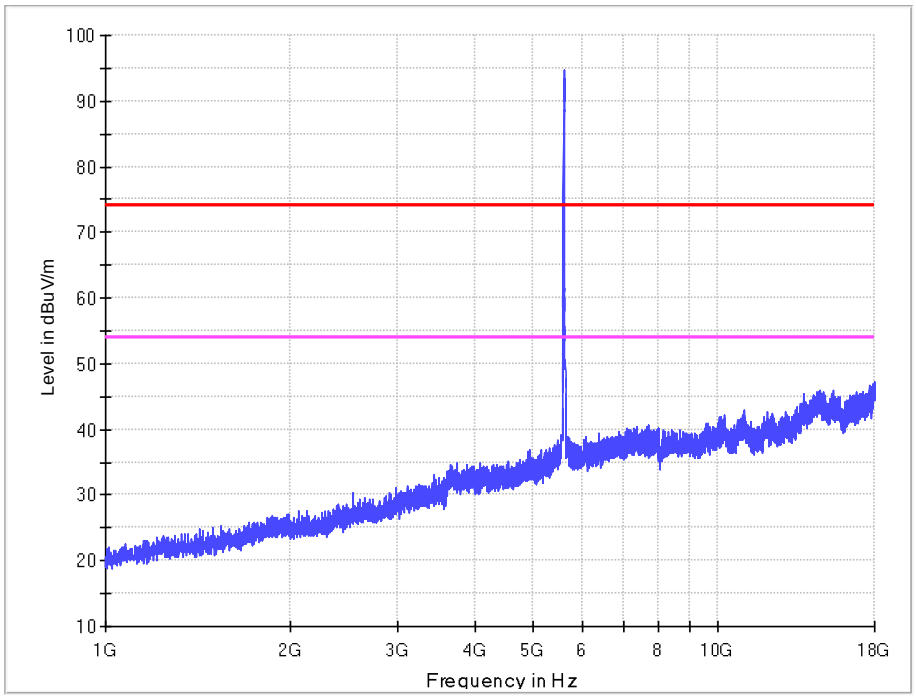
1-18G

11n HT20 IN THE 5.6GHz BAND
CH120

Horizontal



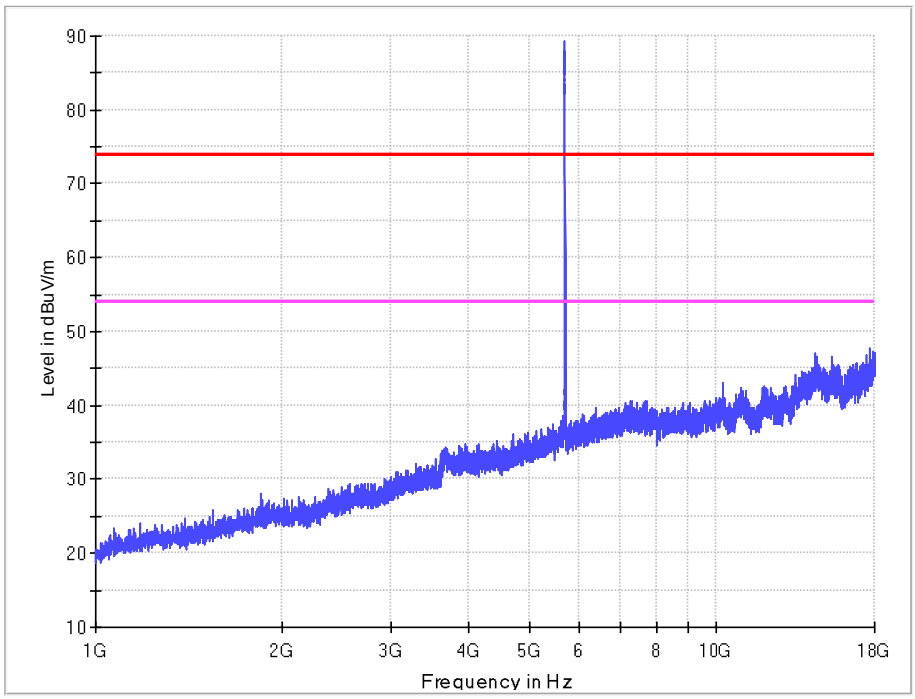
Vertical



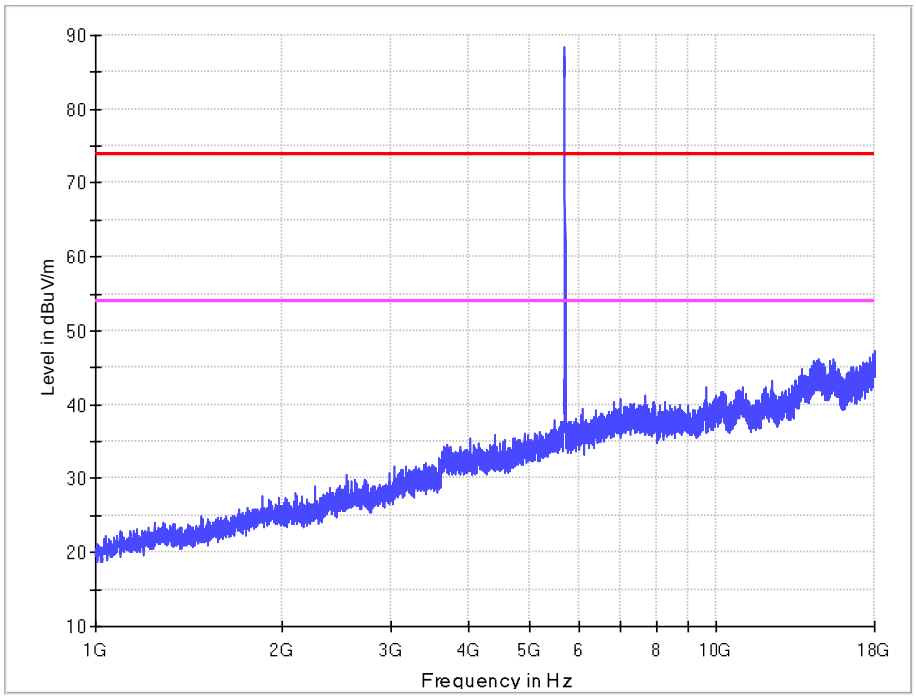
1-18G

11n HT20 IN THE 5.6GHz BAND
CH140

Horizontal



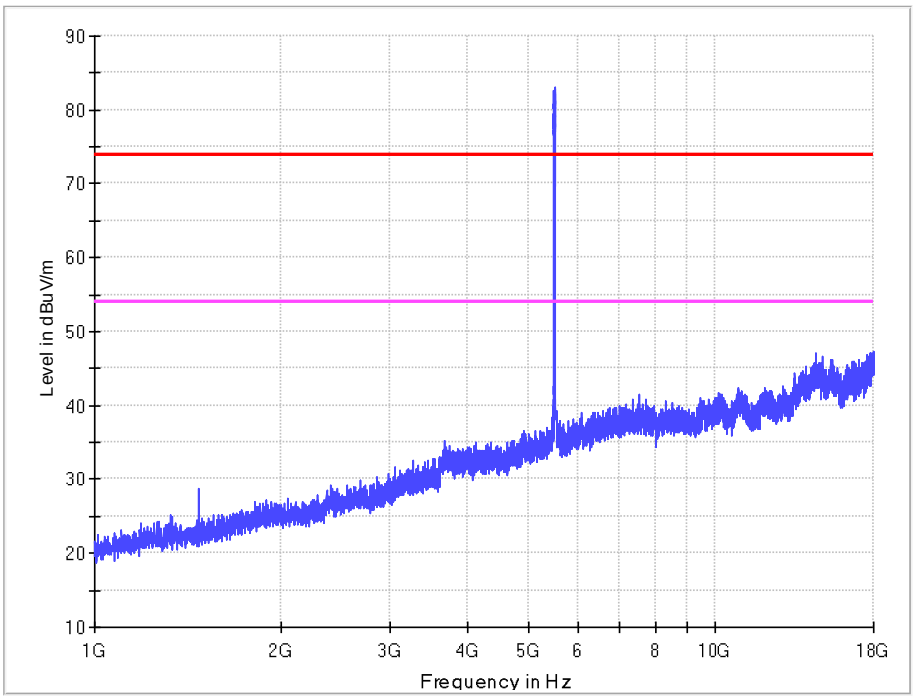
Vertical



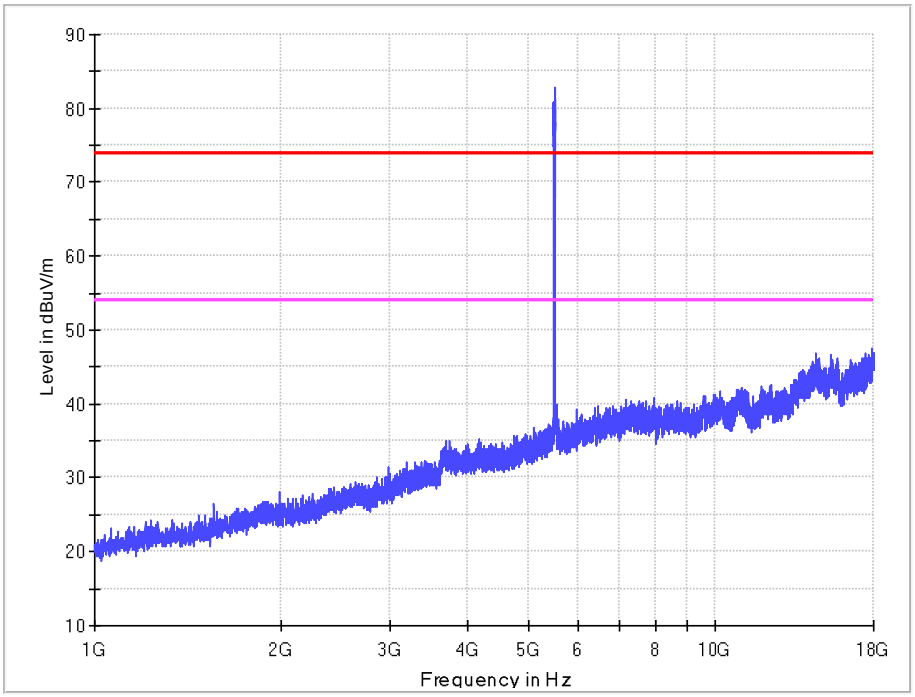
1-18G

11n HT40 IN THE 5.6GHz BAND
CH102

Horizontal



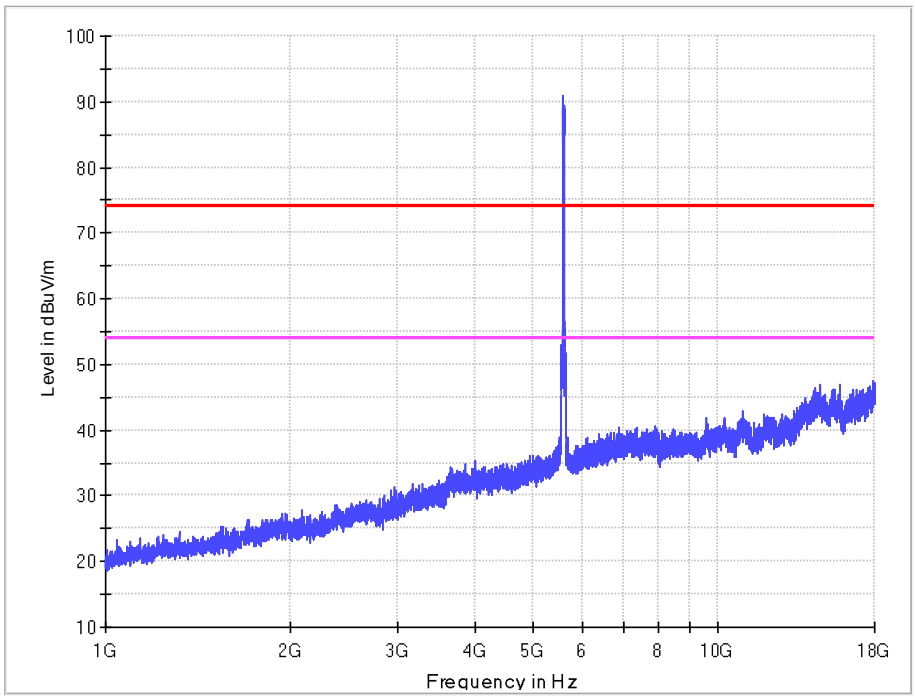
Vertical



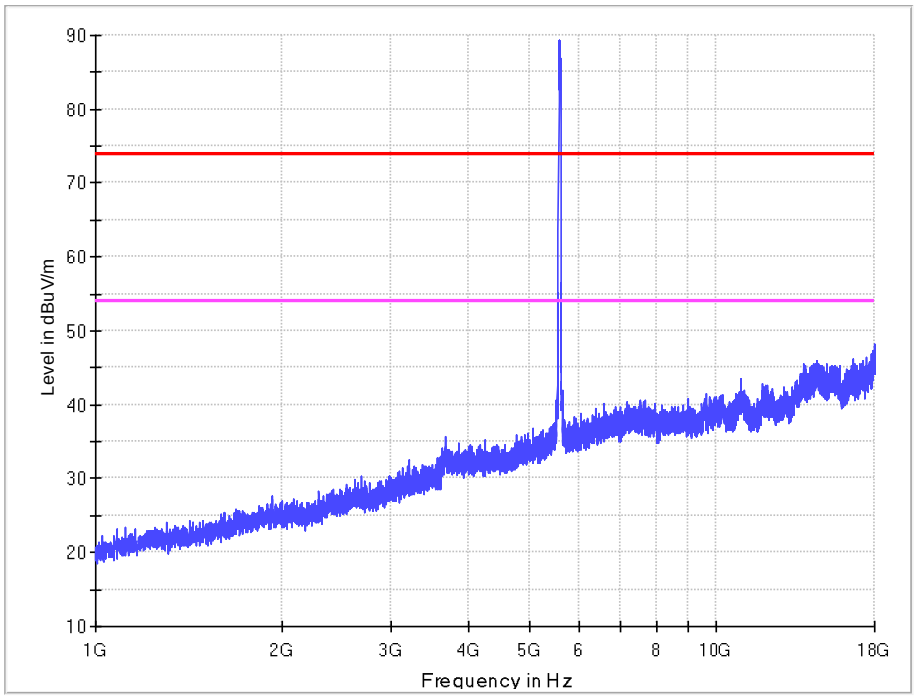
1-18G

11n HT40 IN THE 5.6GHz BAND
CH118

Horizontal



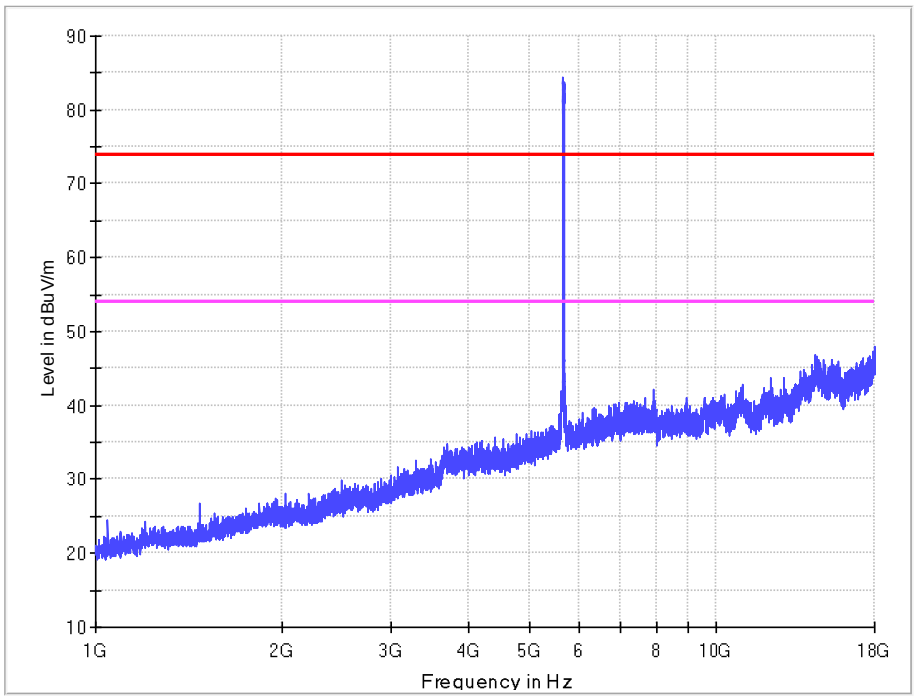
Vertical



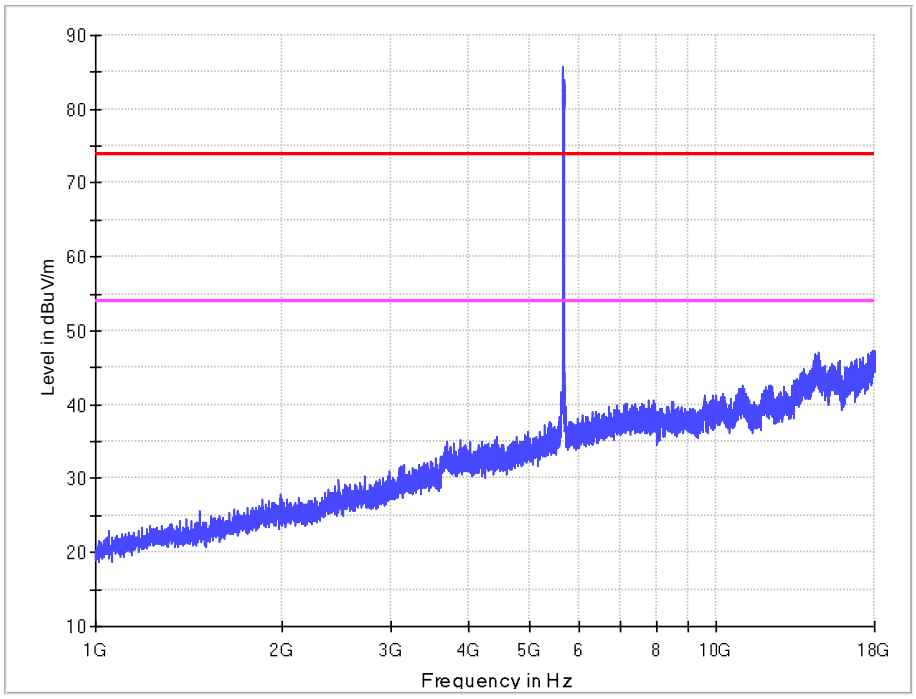
1-18G

11n HT40 IN THE 5.6GHz BAND
CH134

Horizontal



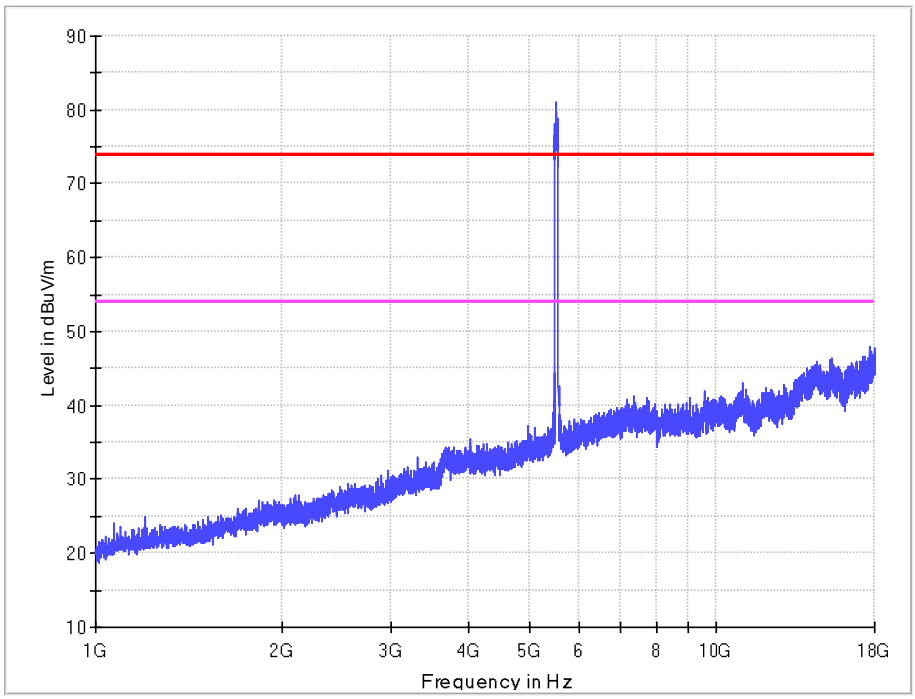
Vertical



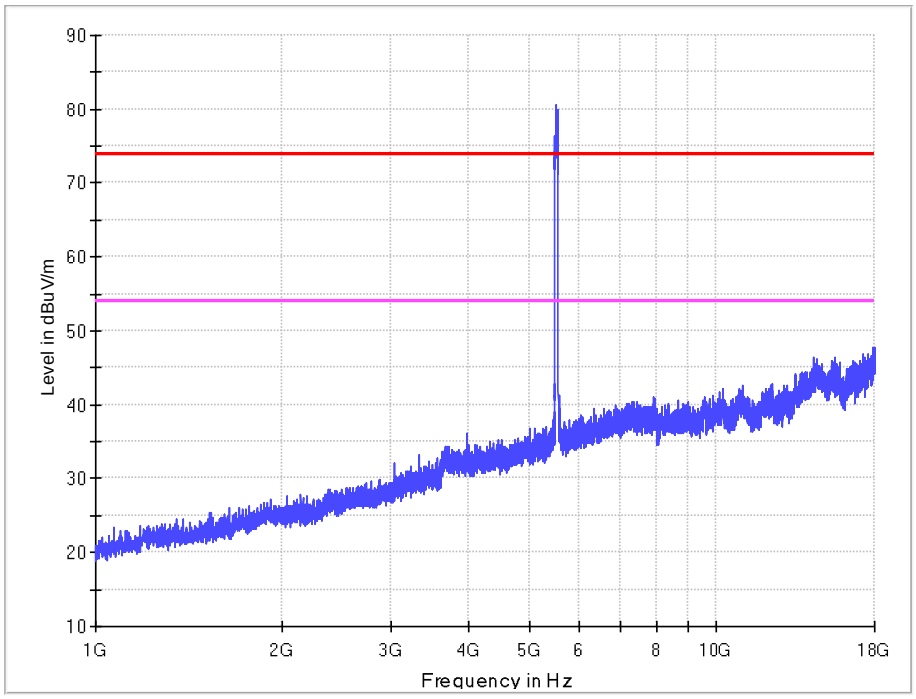
1-18G

11ac VHT80 IN THE 5.6GHz BAND
CH106

Horizontal



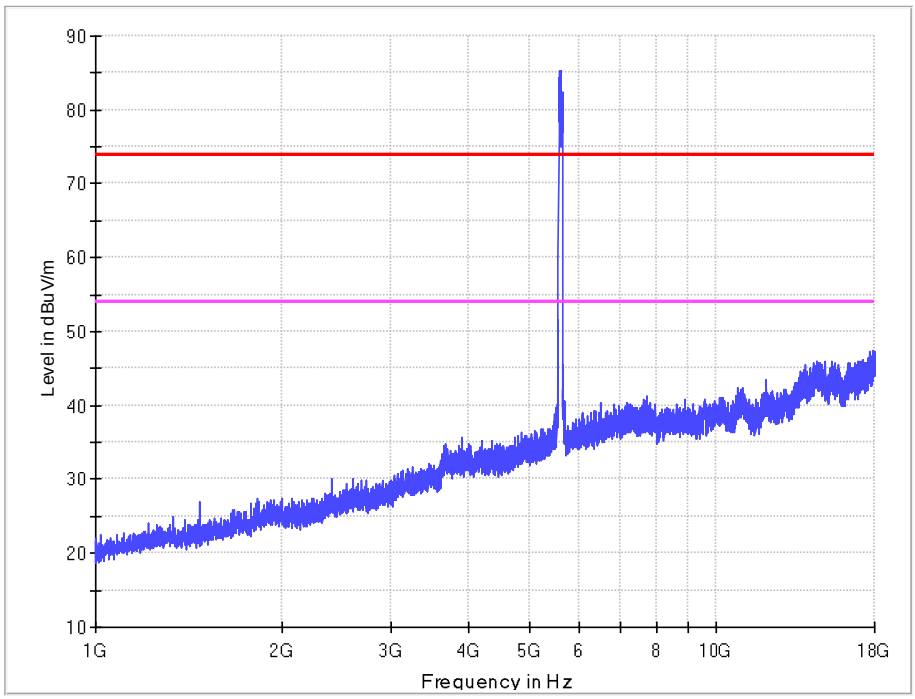
Vertical



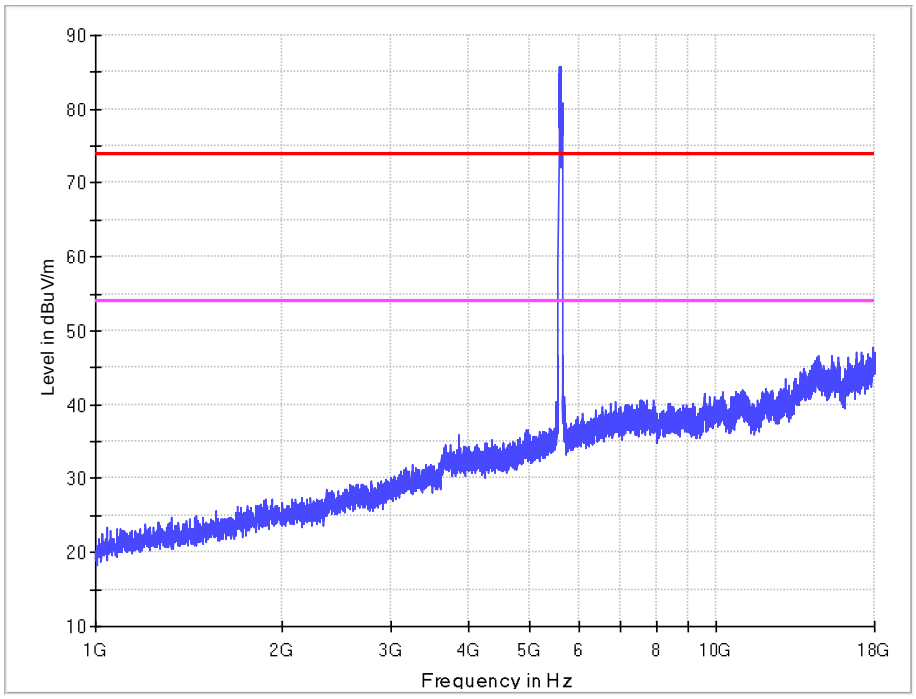
1-18G

11ac VHT80 IN THE 5.6GHz BAND
CH122

Horizontal



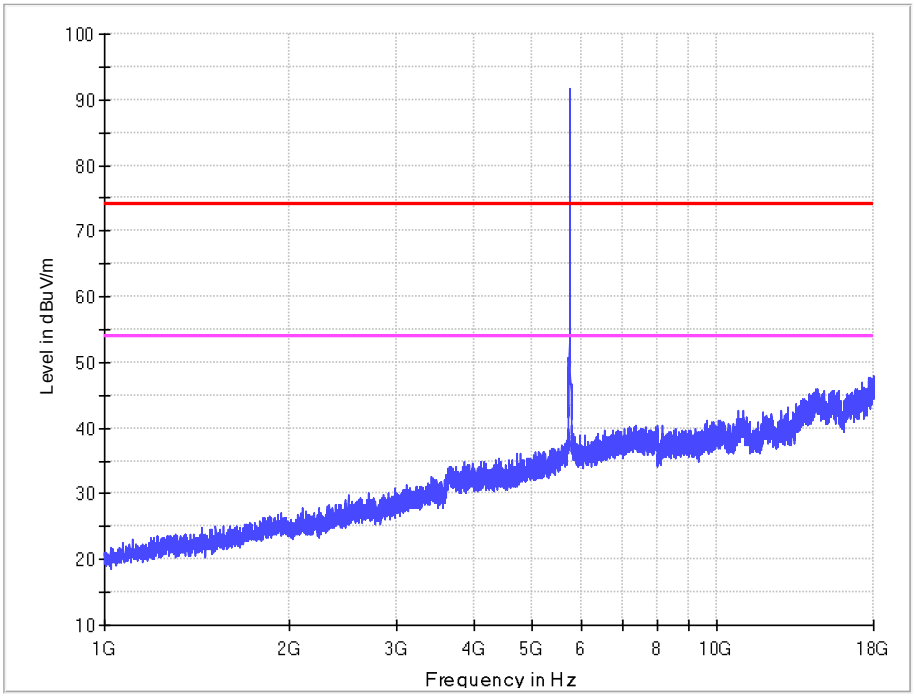
Vertical



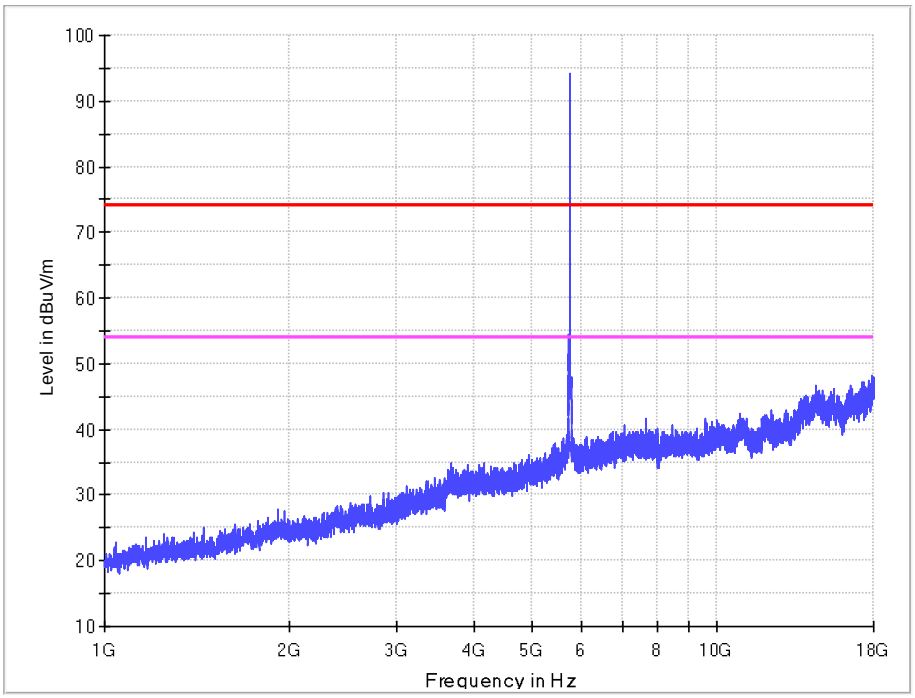
1-18G

11a IN THE 5.8GHz BAND
CH149

Horizontal



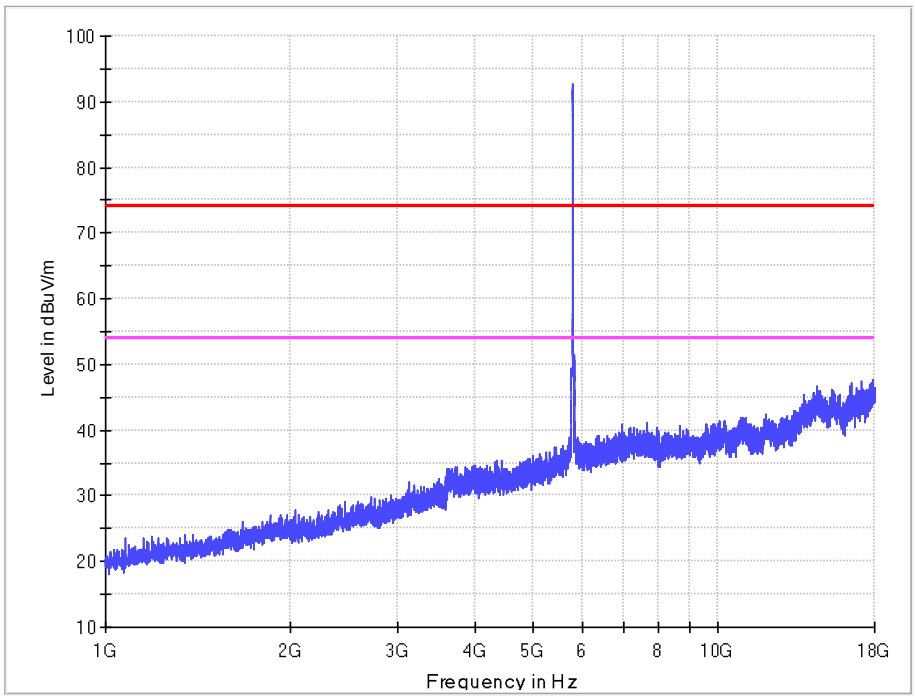
Vertical



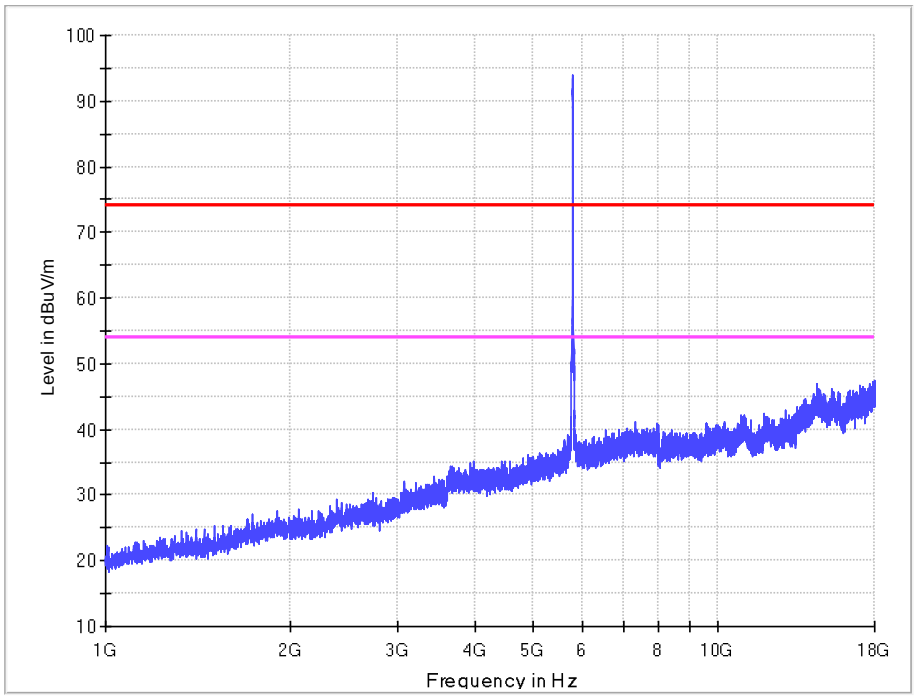
1-18G

11a IN THE 5.8GHz BAND
CH157

Horizontal



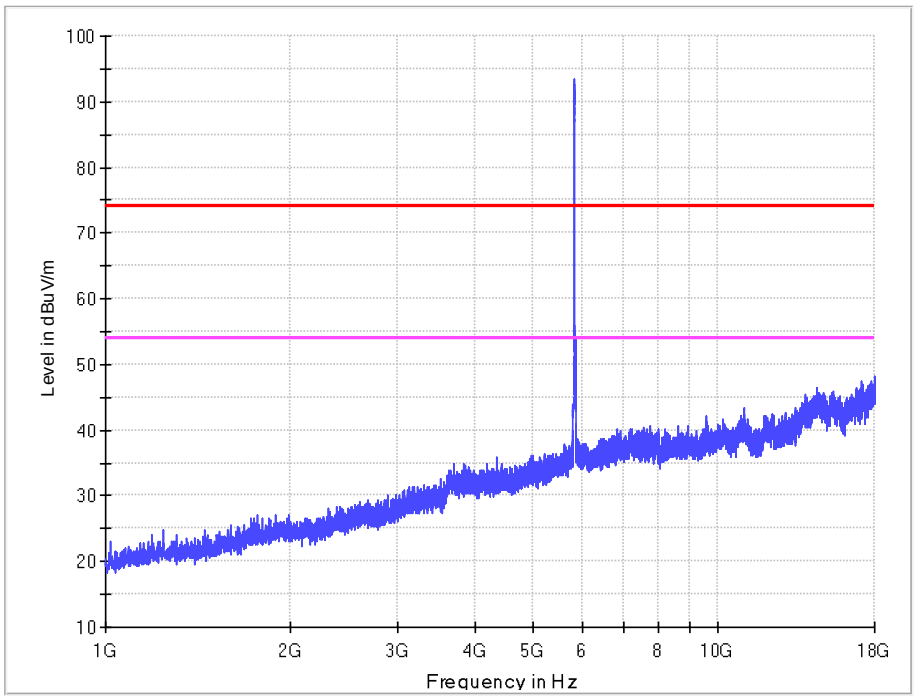
Vertical



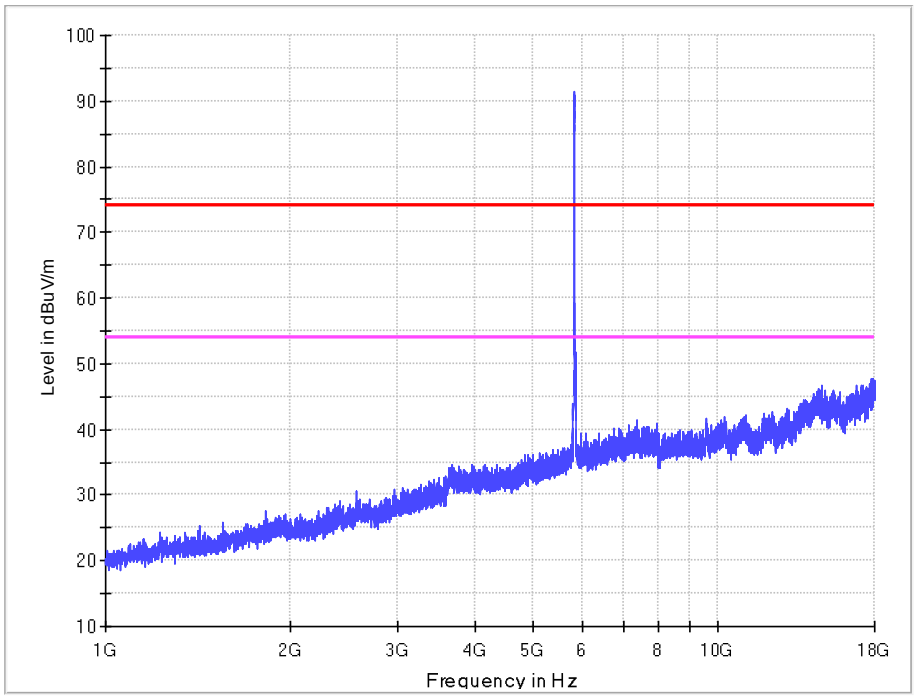
1-18G

11a IN THE 5.8GHz BAND
CH165

Horizontal



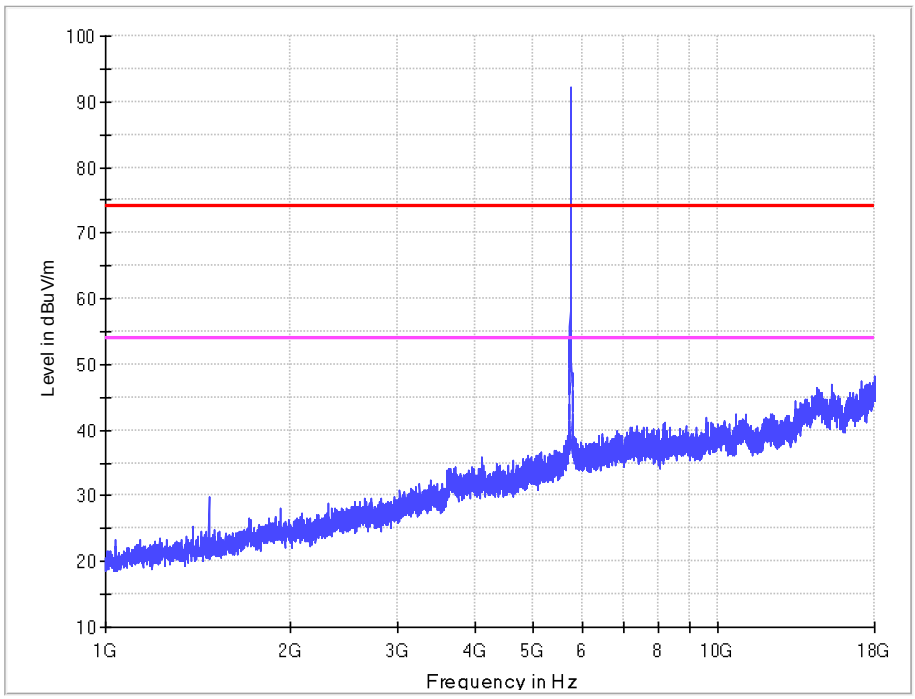
Vertical



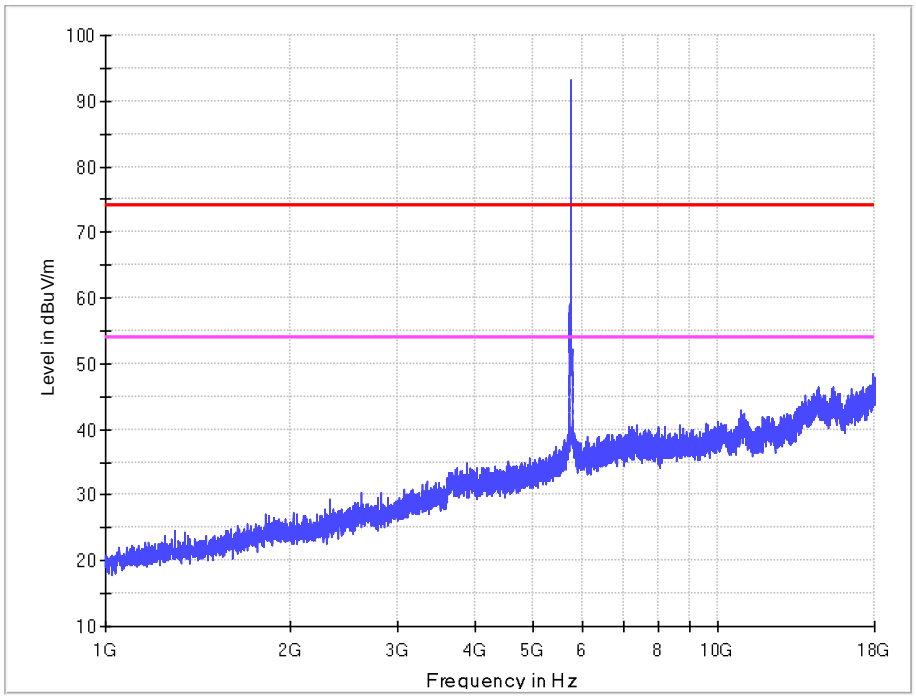
1-18G

11n HT20 IN THE 5.8GHz BAND
CH149

Horizontal



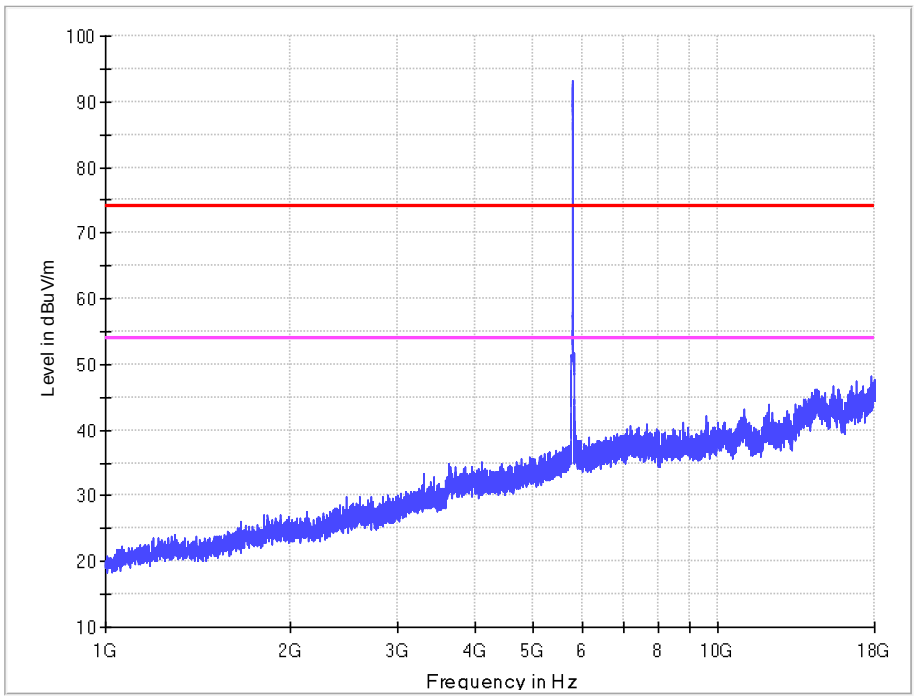
Vertical



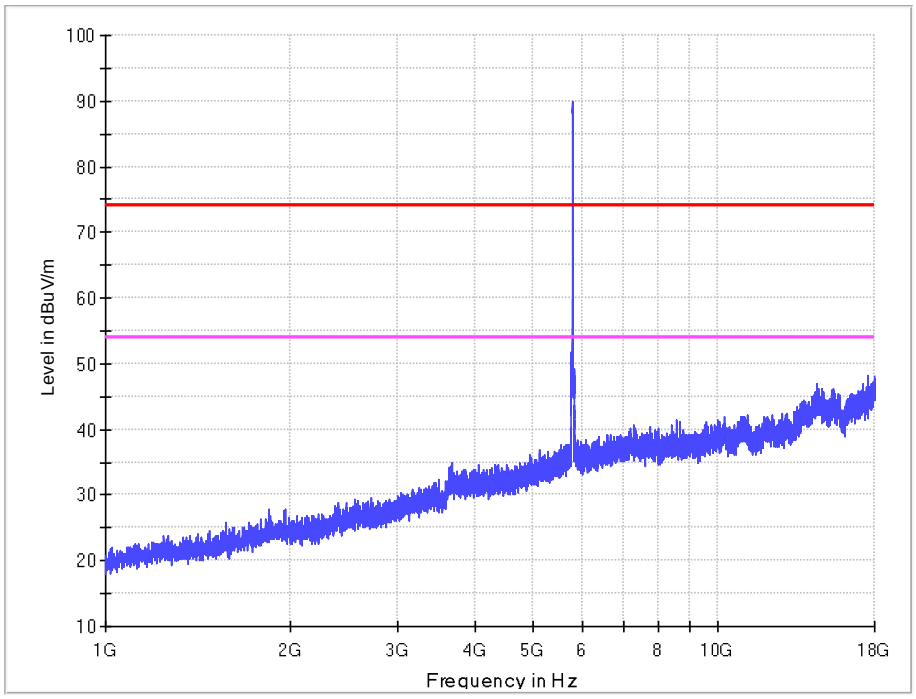
1-18G

11n HT20 IN THE 5.8GHz BAND
CH157

Horizontal



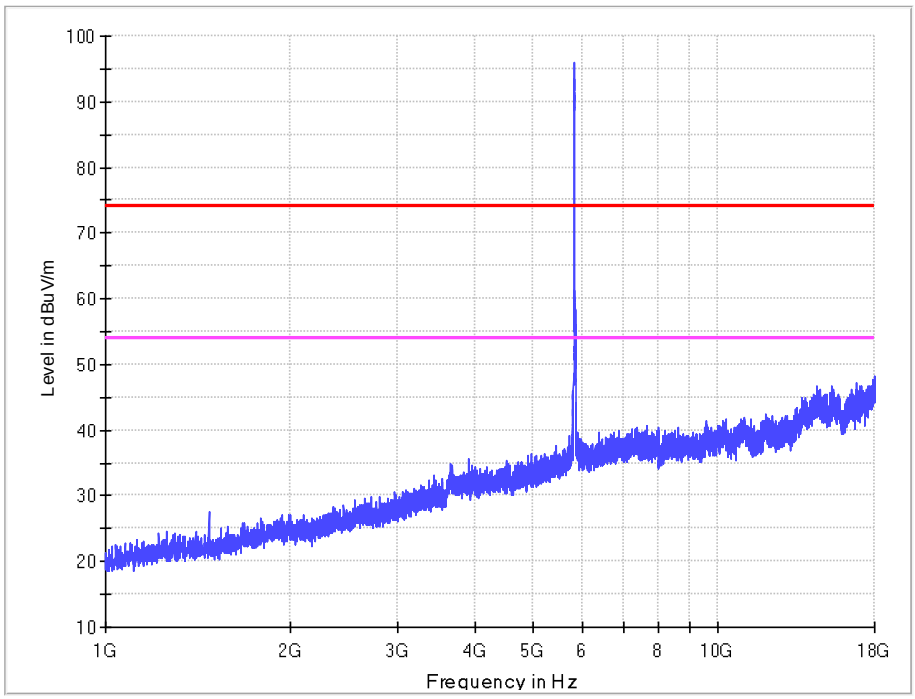
Vertical



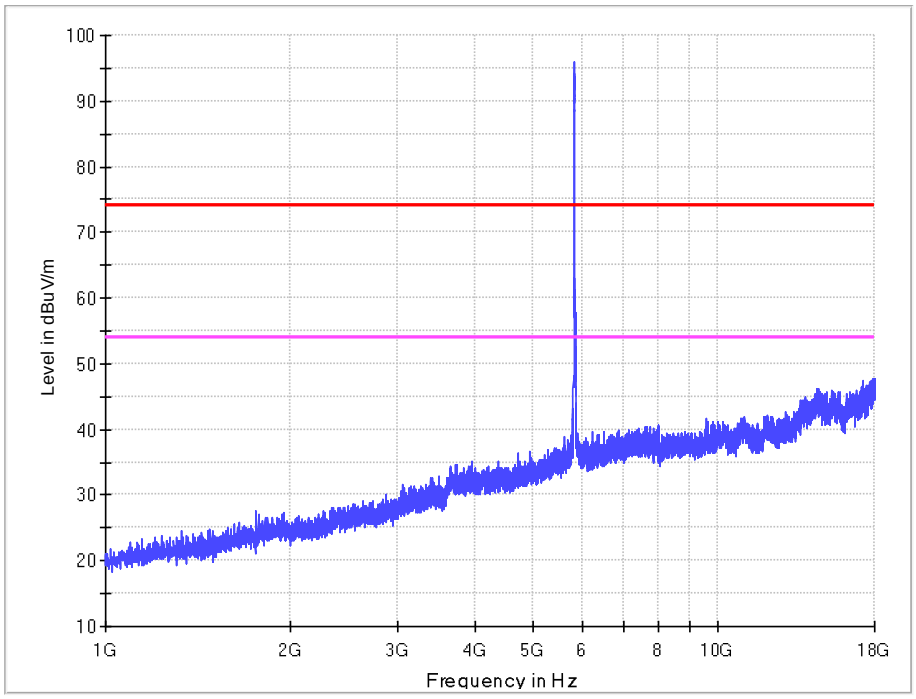
1-18G

11n HT20 IN THE 5.8GHz BAND
CH165

Horizontal



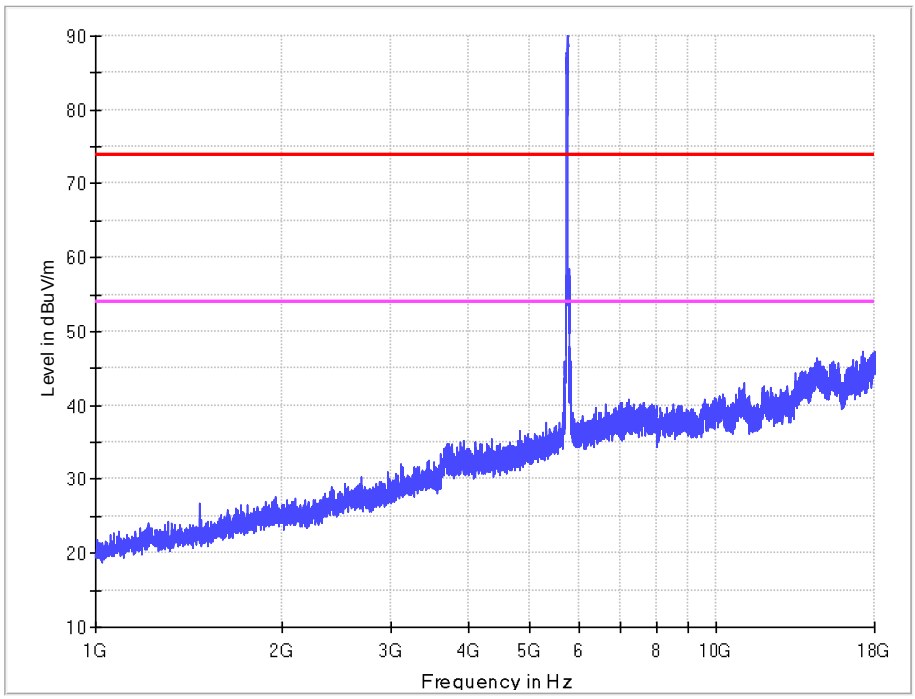
Vertical



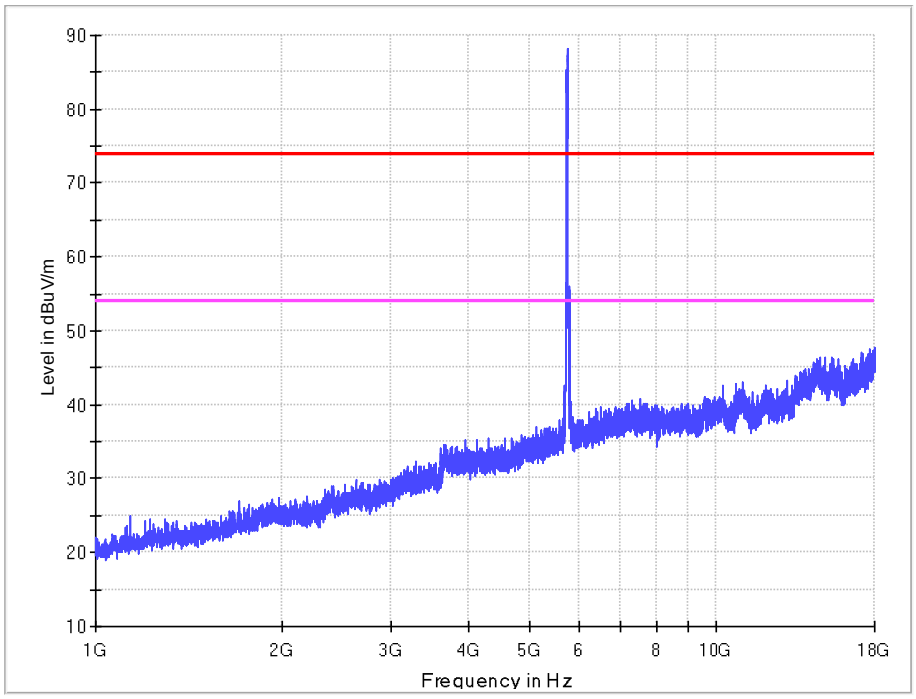
1-18G

11n HT40 IN THE 5.8GHz BAND
CH151

Horizontal



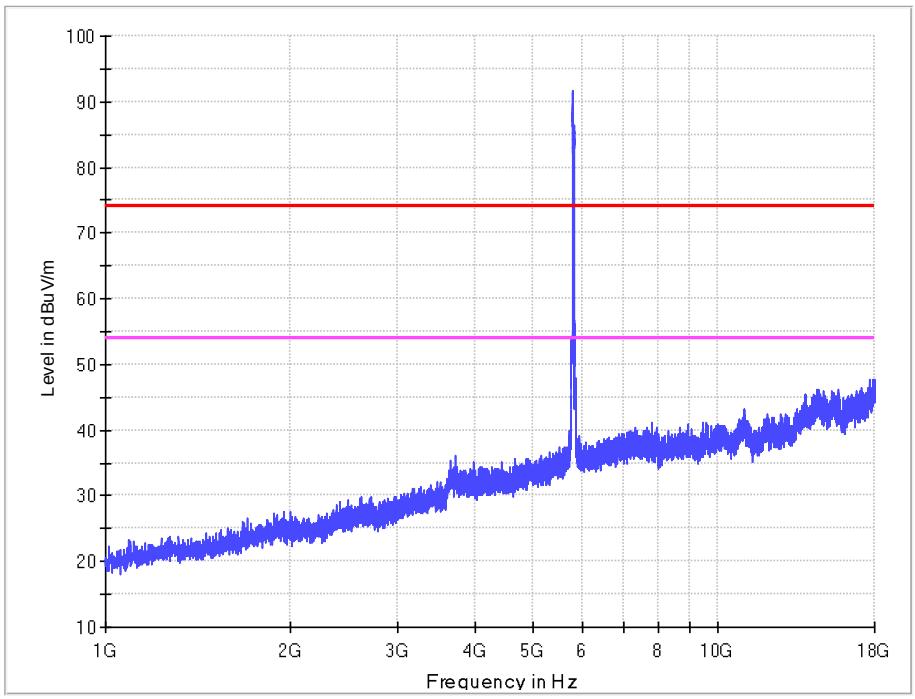
Vertical



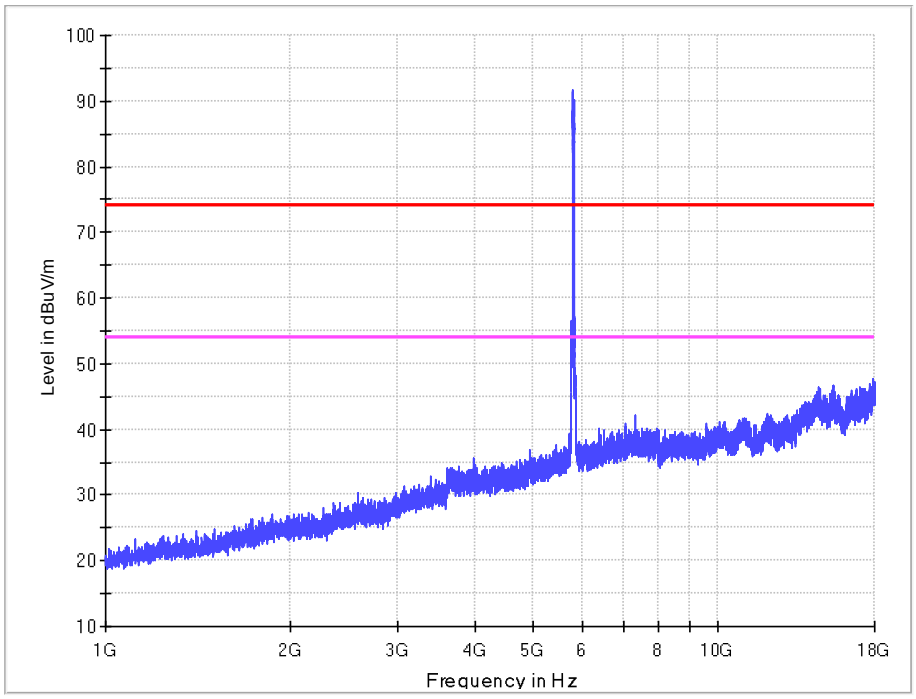
1-18G

11n HT40 IN THE 5.8GHz BAND
CH159

Horizontal



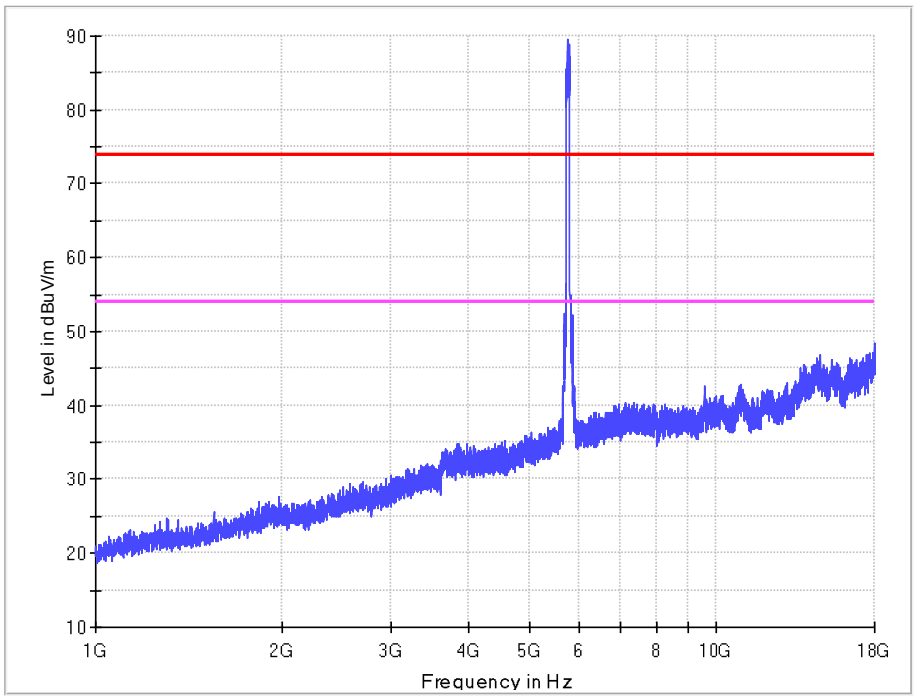
Vertical



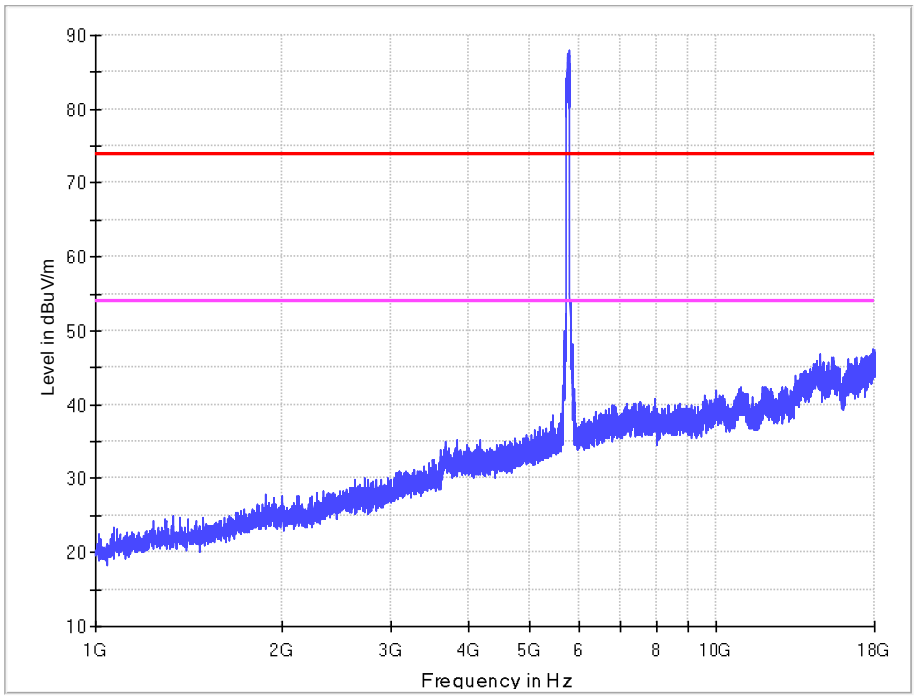
1-18G

11ac VHT80 IN THE 5.8GHz BAND
CH155

Horizontal

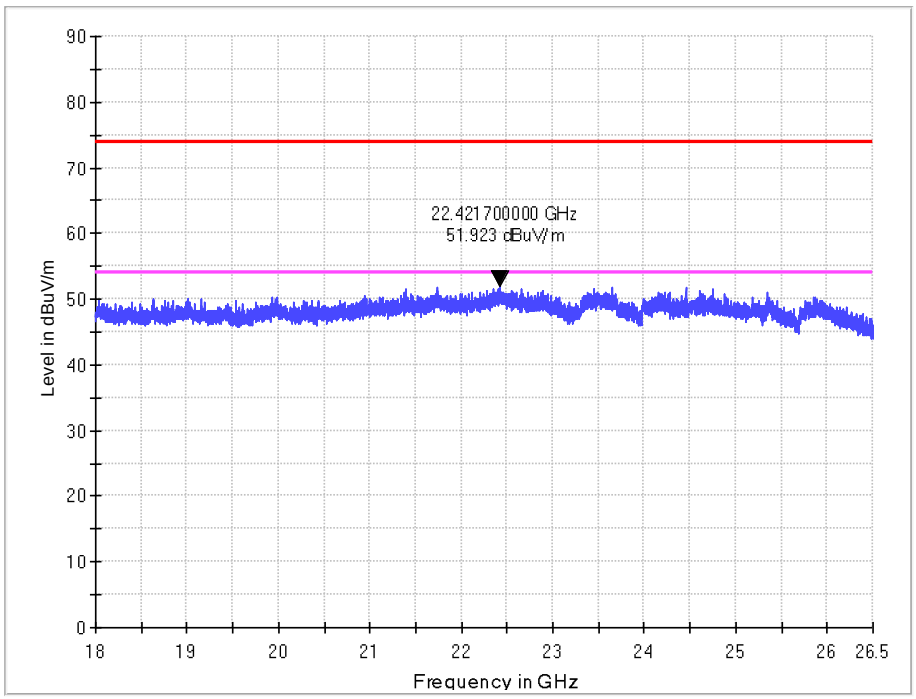


Vertical

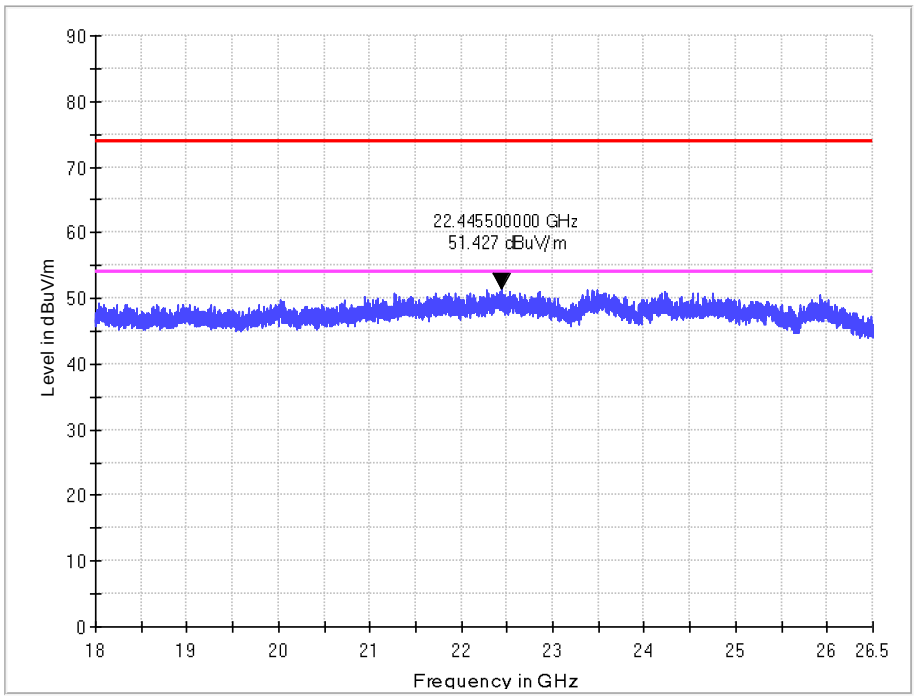


18GHz - 26.5GHz

(Worst Case)
Horizontal

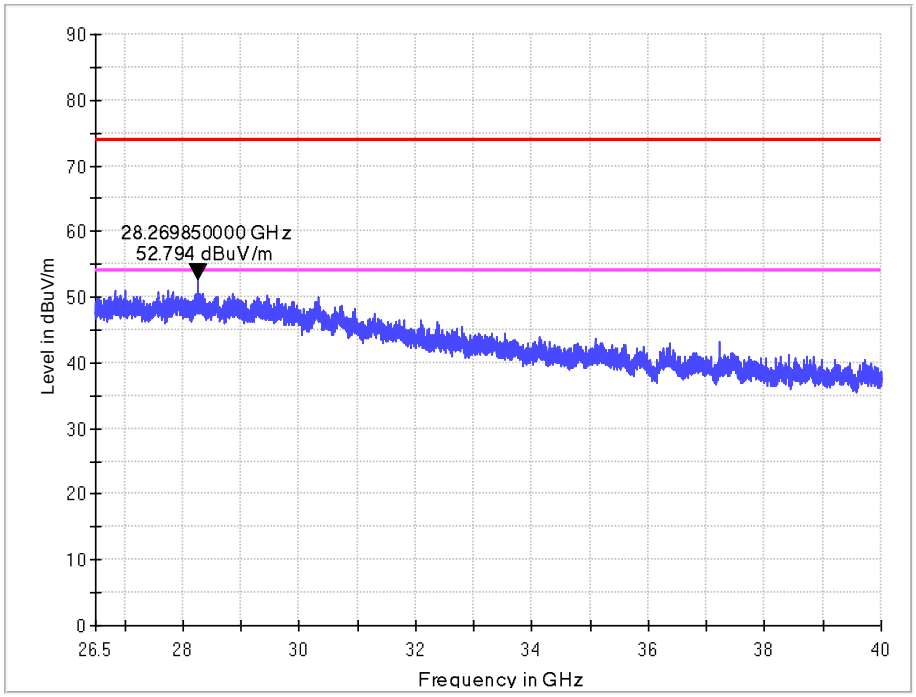


Vertical

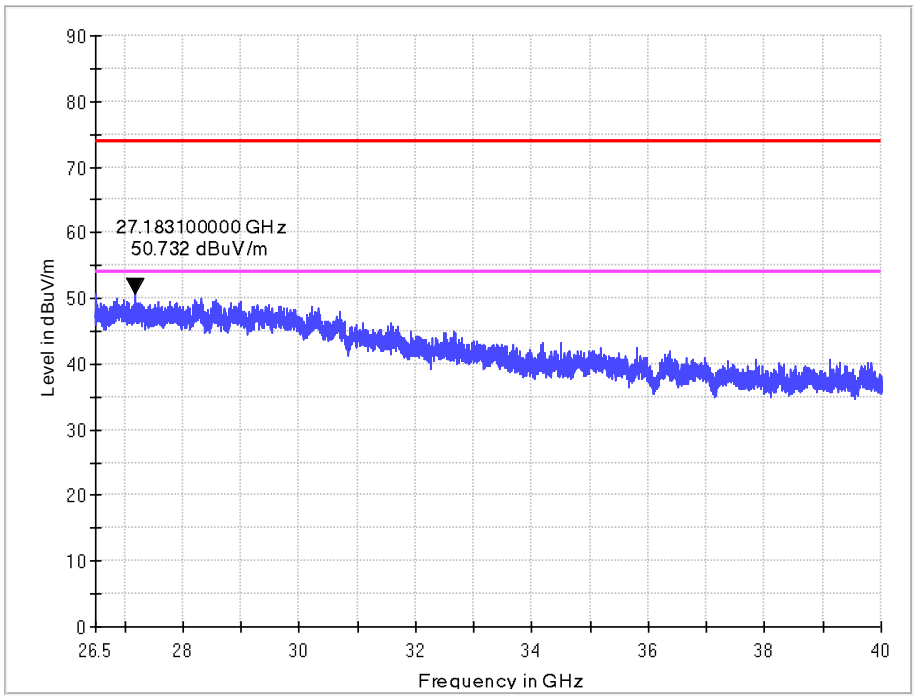


26.5 GHz - 40GHz

(Worst Case)
Horizontals



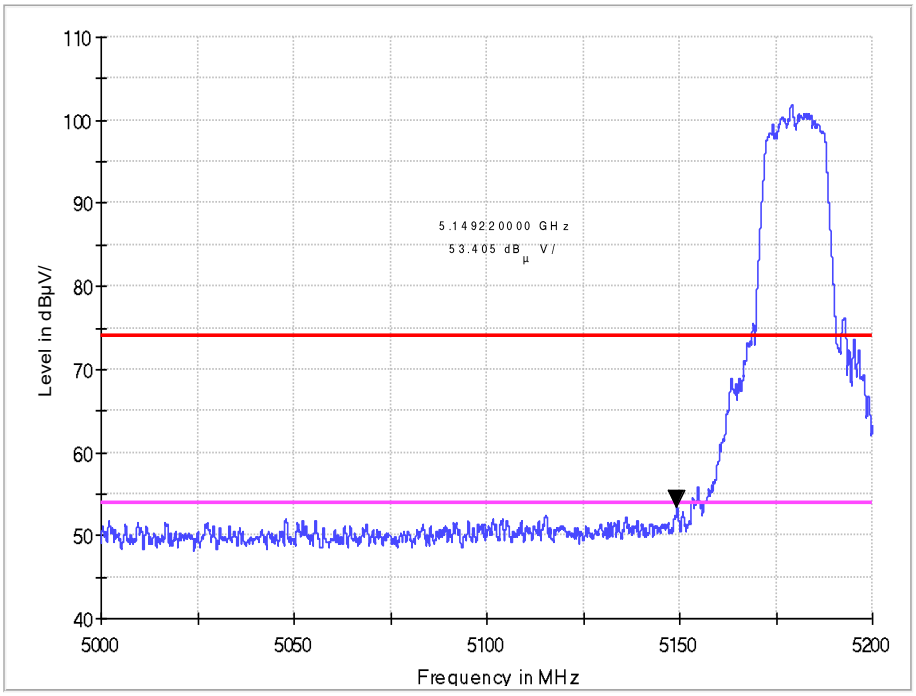
Vertical



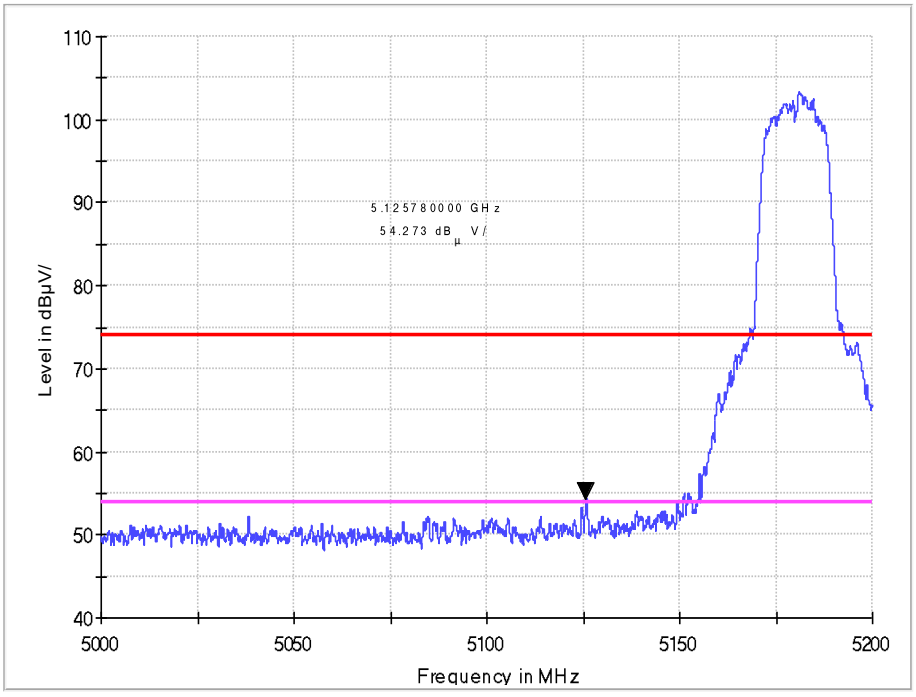
Band edge

11a IN THE 5.2GHz BAND
CH36

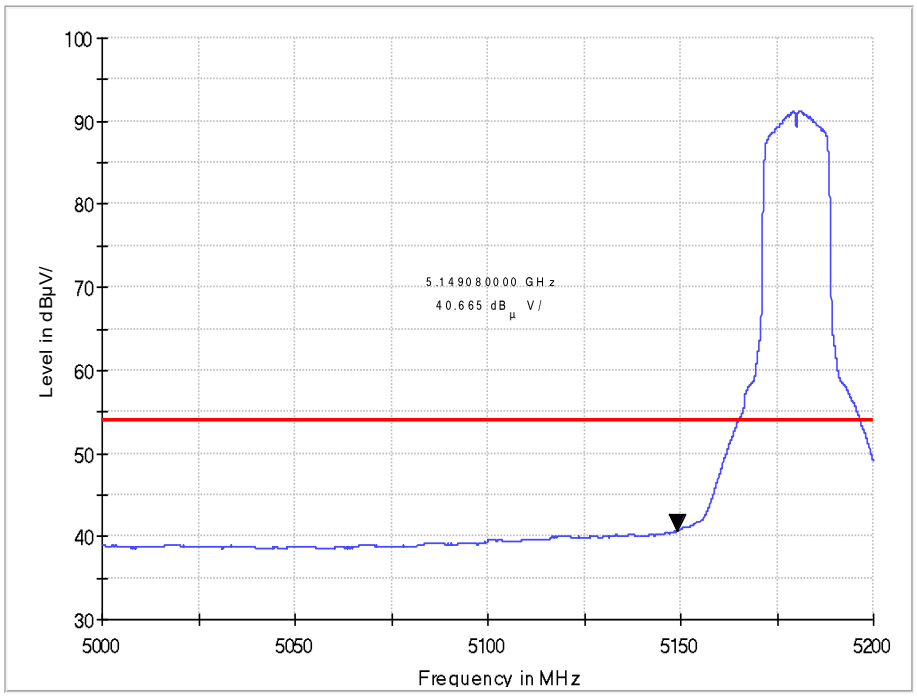
PK
Horizontal



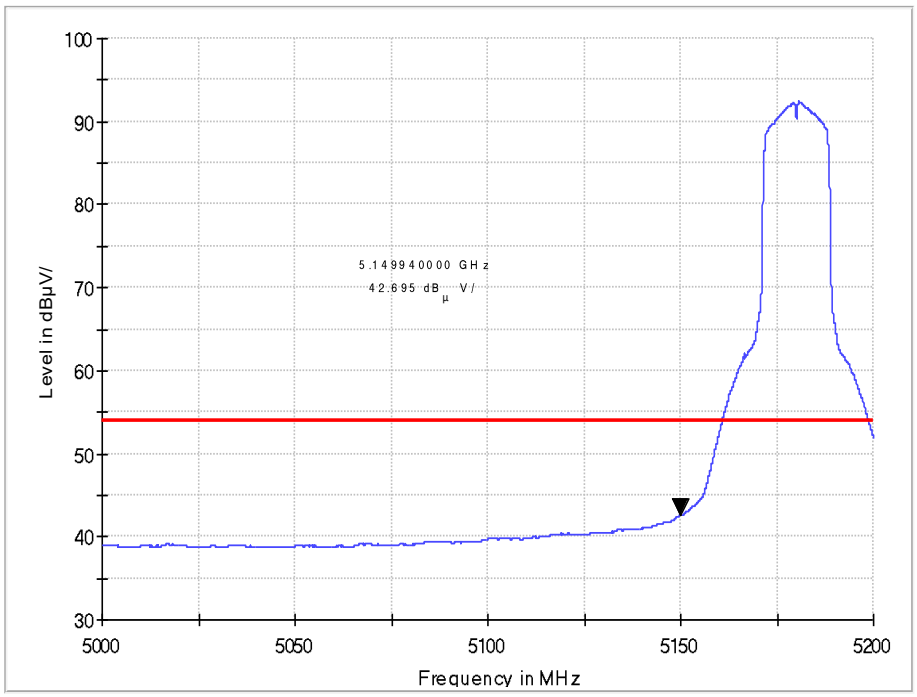
Vertical



AV
Horizontal



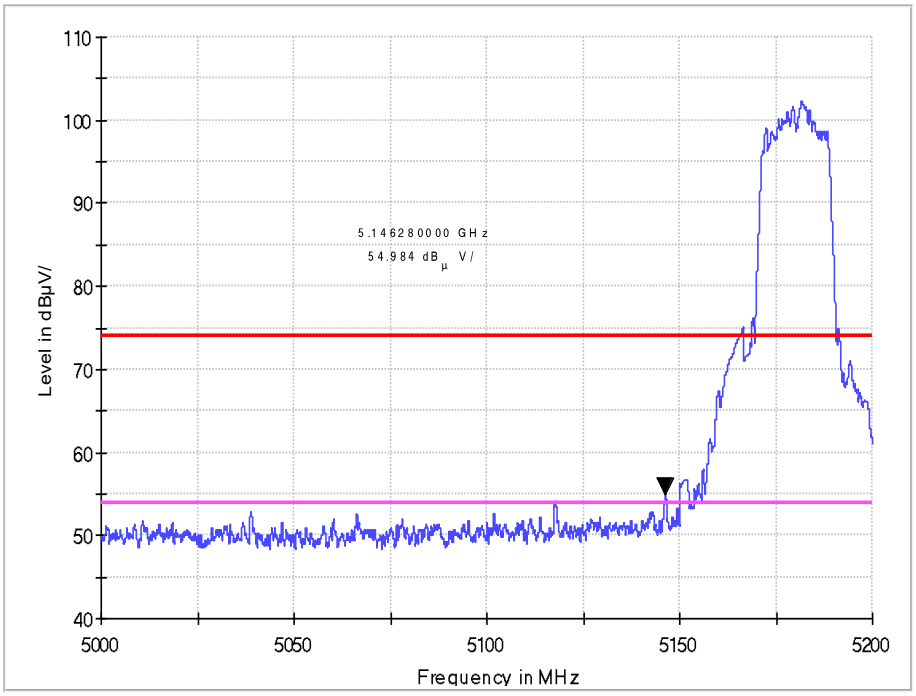
Vertical



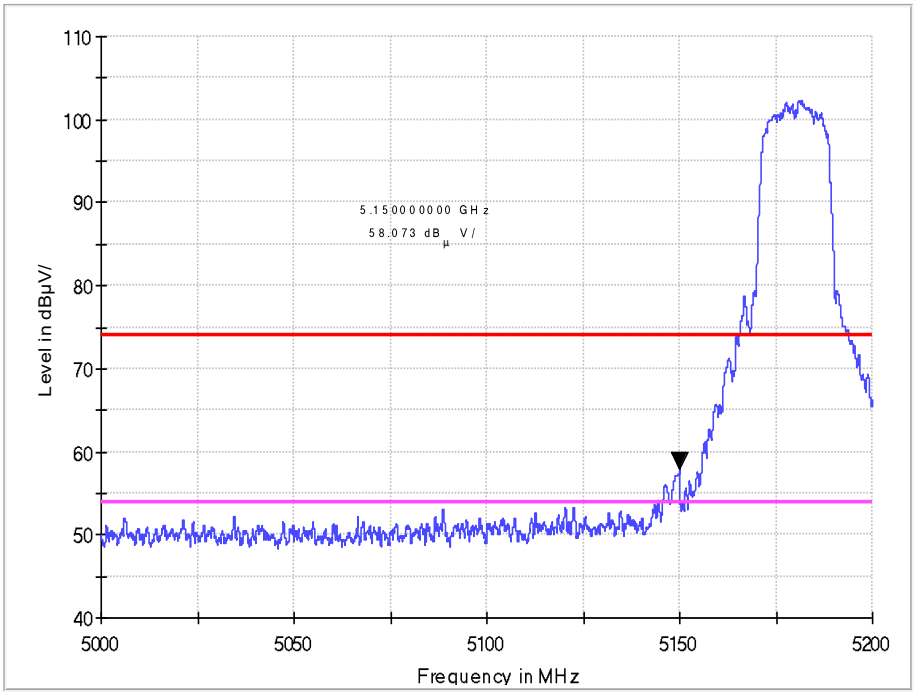
Band edge

11n HT20 IN THE 5.2GHz BAND
CH36

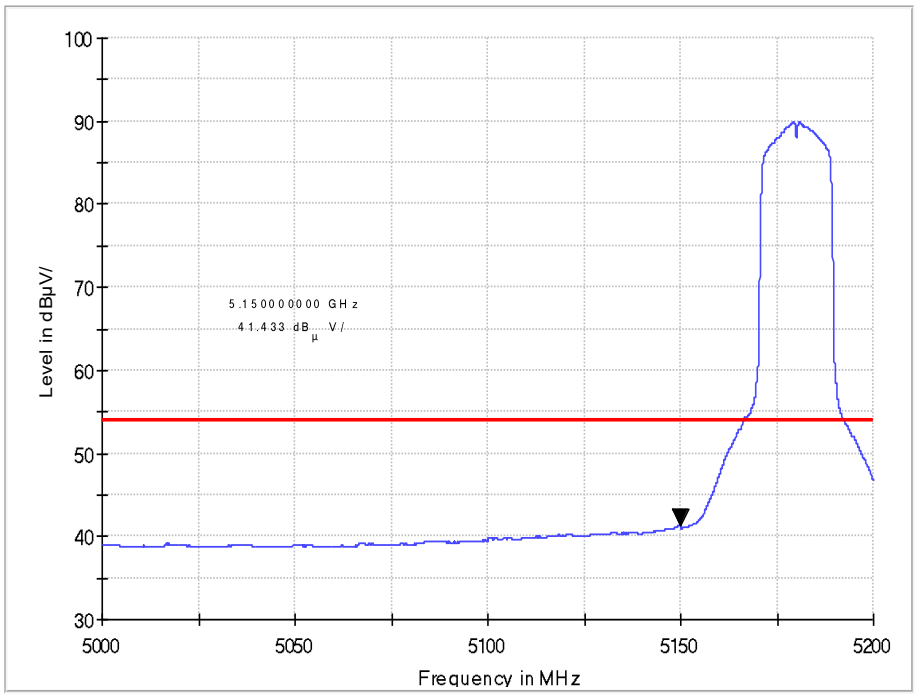
PK
Horizontal



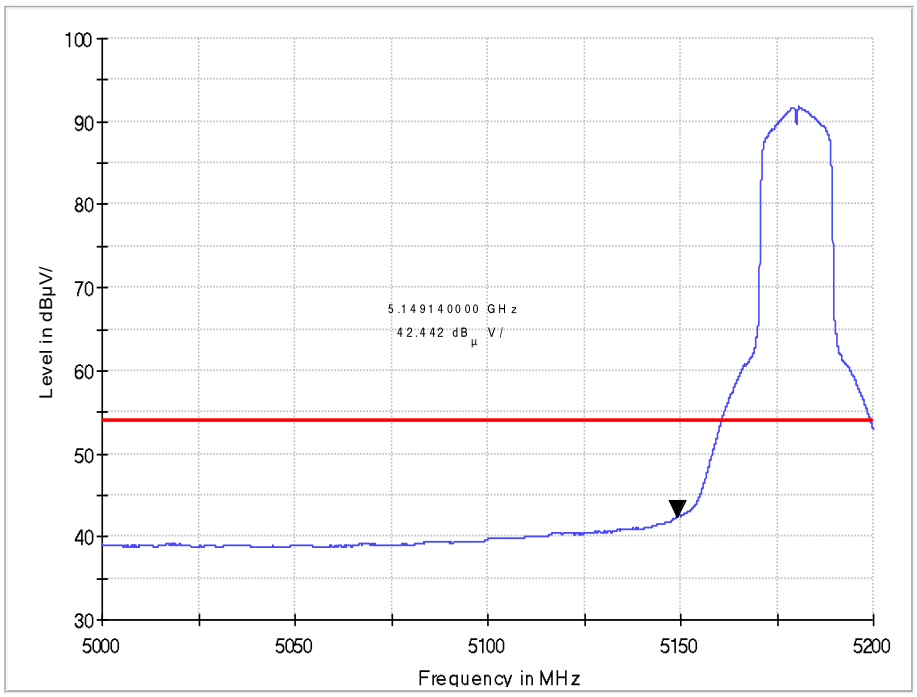
Vertical



AV
Horizontal



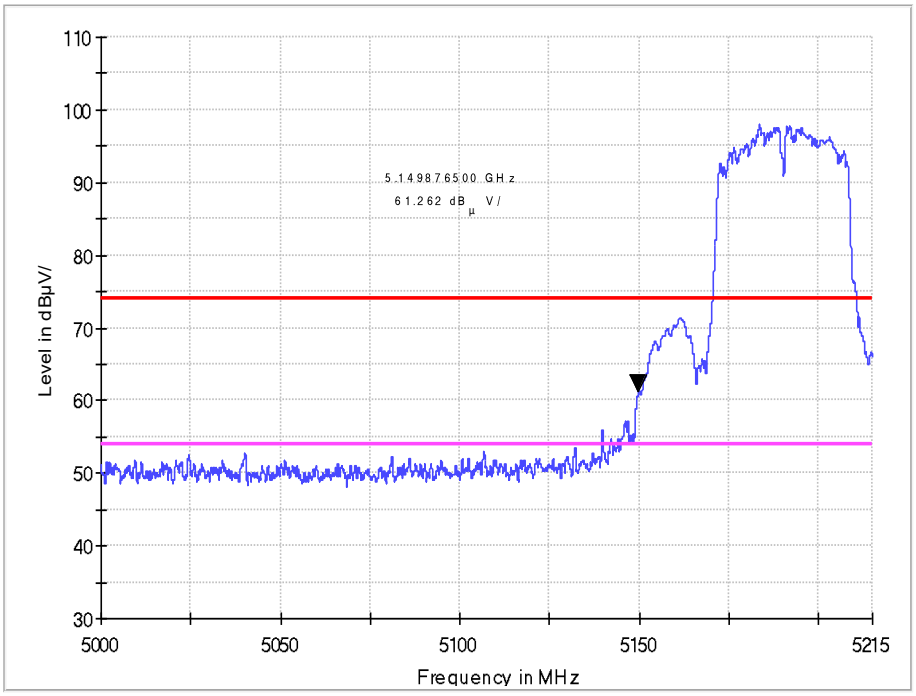
Vertical



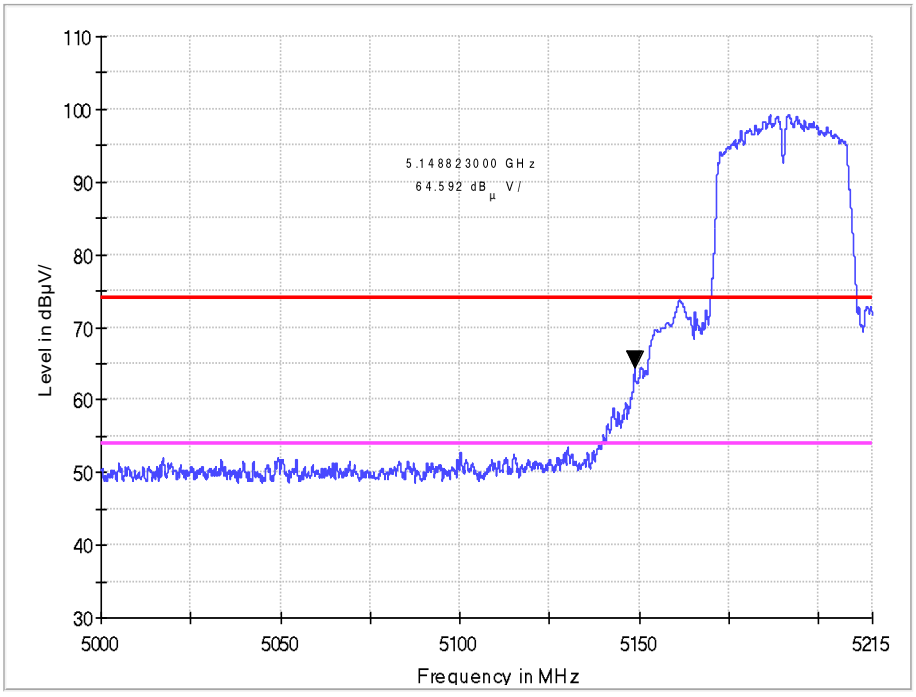
Band edge

11n HT40 IN THE 5.2GHz BAND
CH38

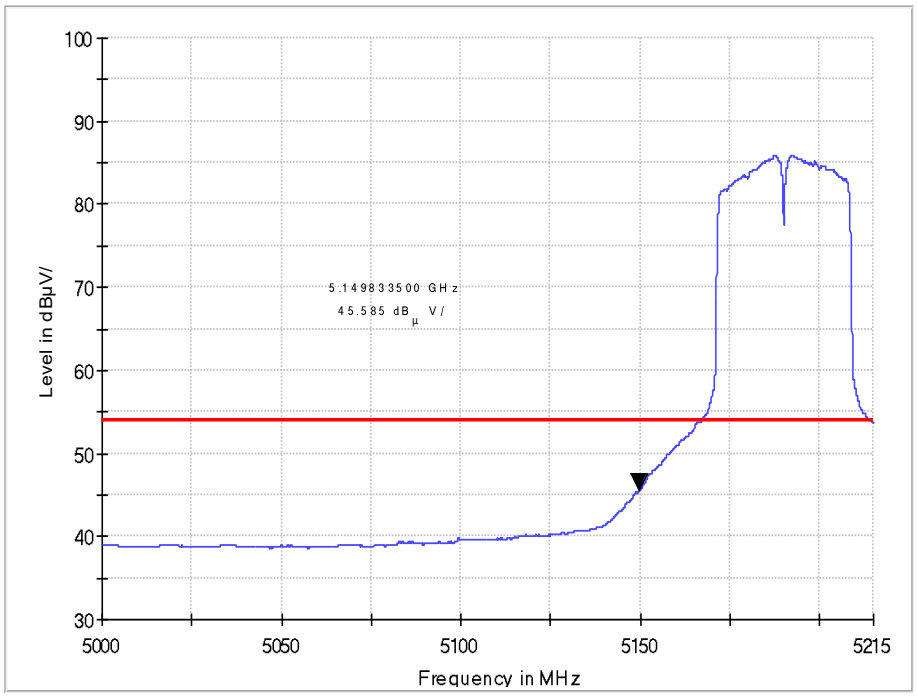
PK
Horizontal



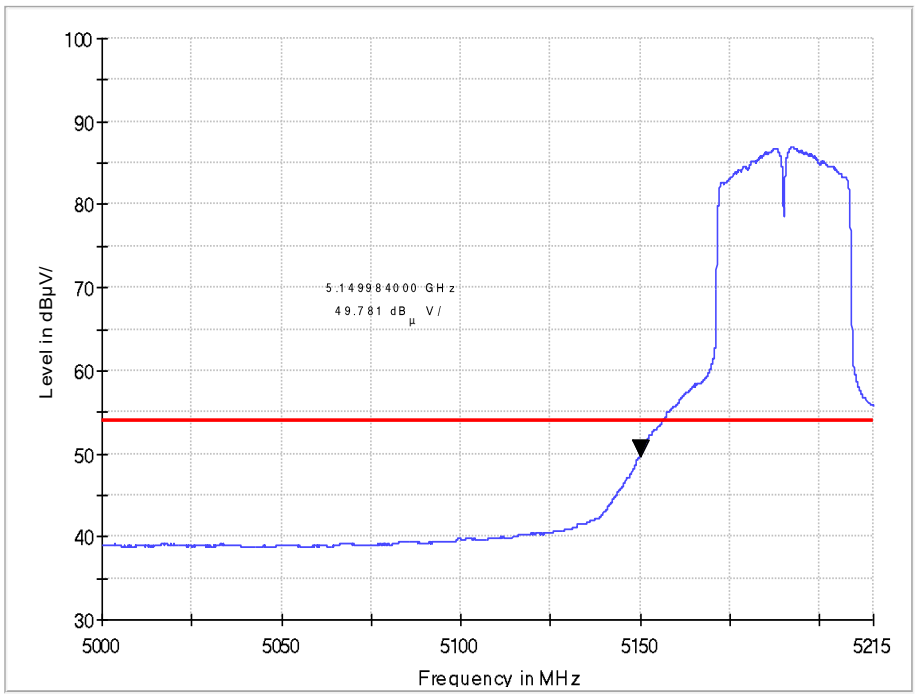
Vertical



AV
Horizontal



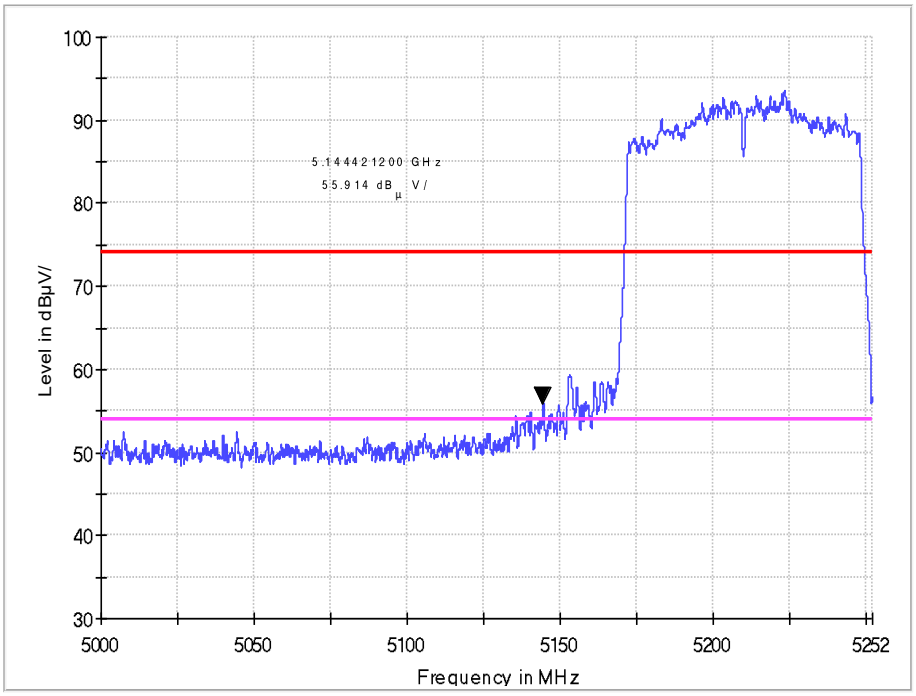
Vertical



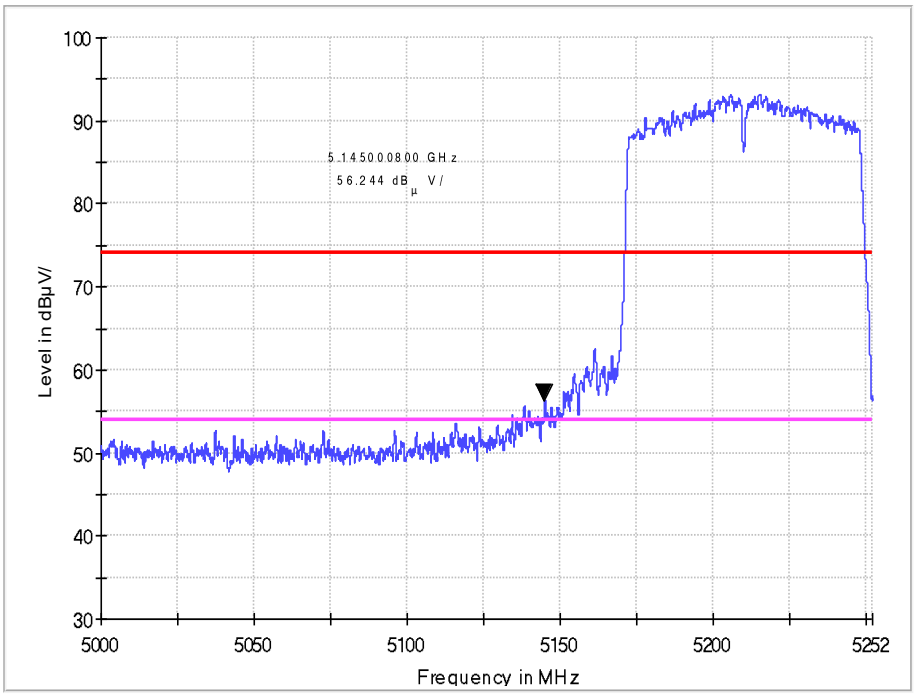
Band edge

11ac VHT80 IN THE 5.2GHz BAND
CH42

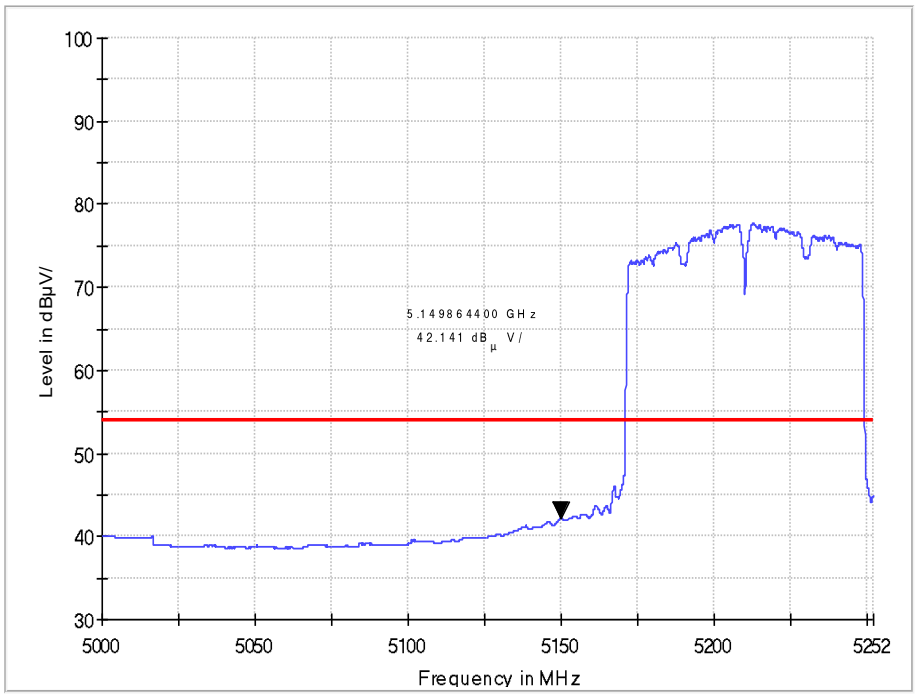
PK
Horizontal



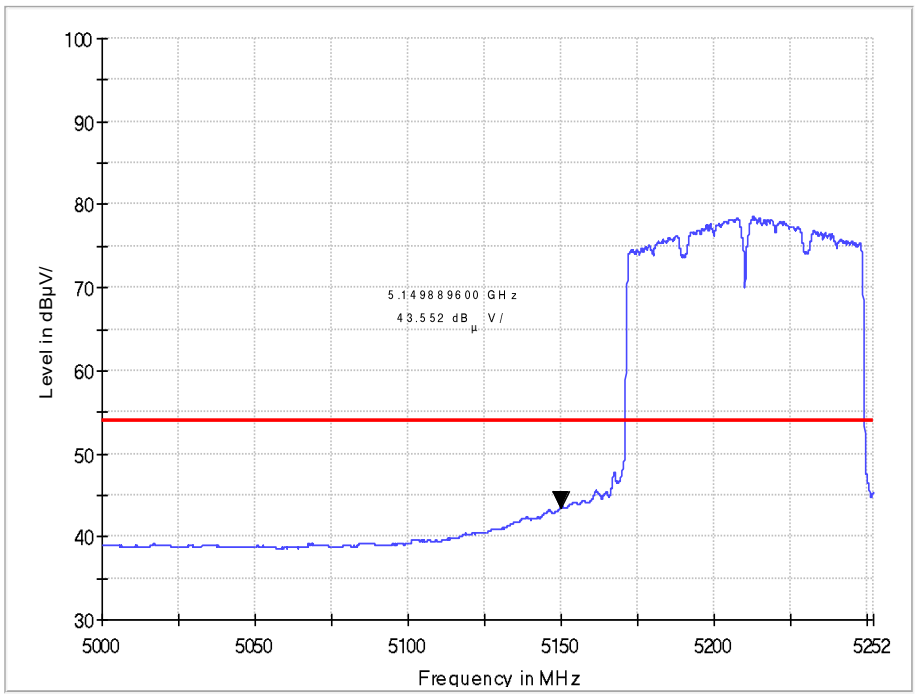
Vertical



AV
Horizontal



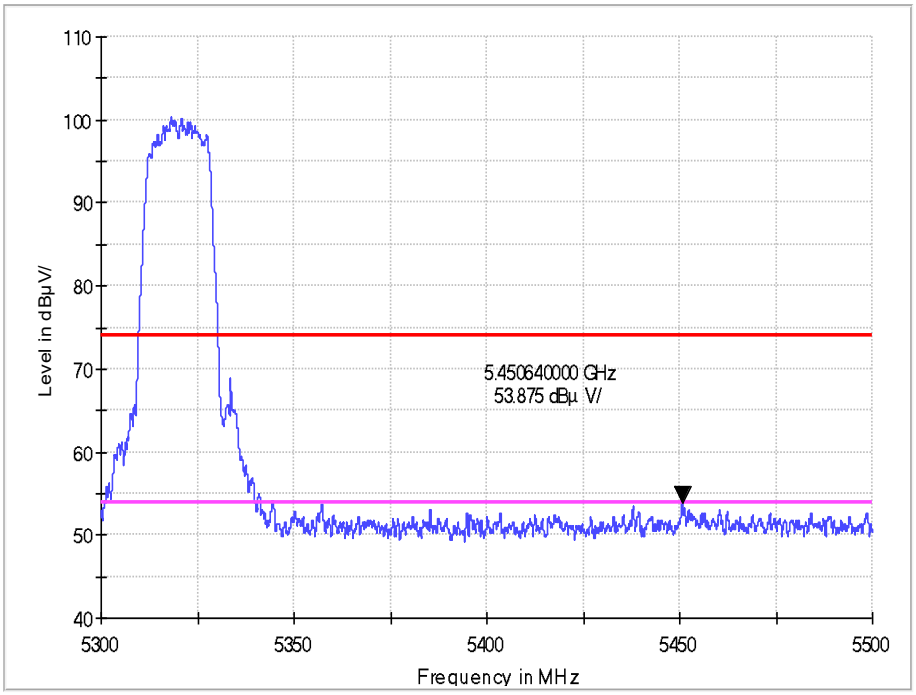
Vertical



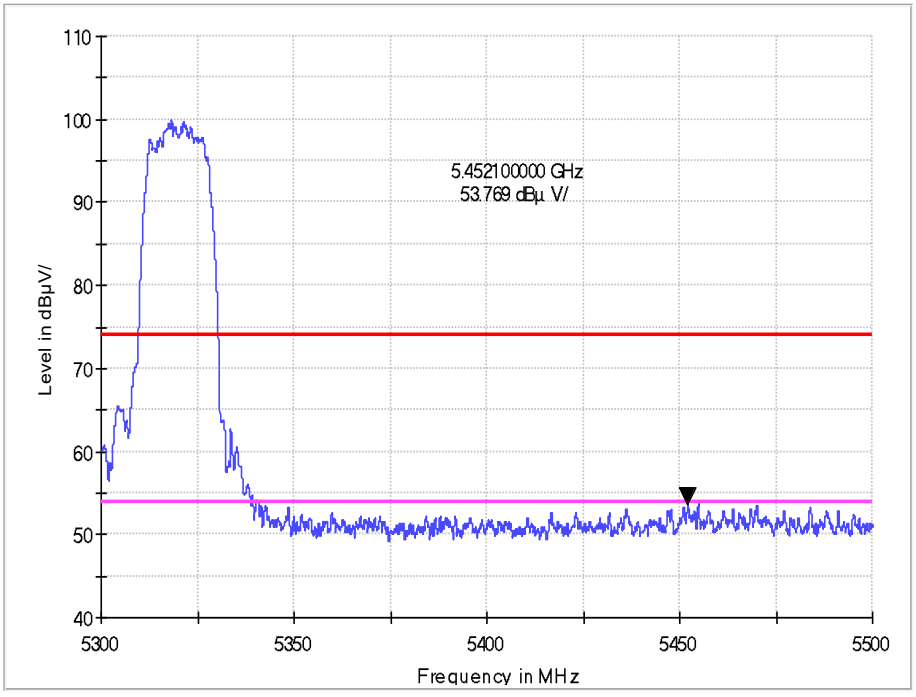
Band edge

11a IN THE 5.3GHz BAND
CH64

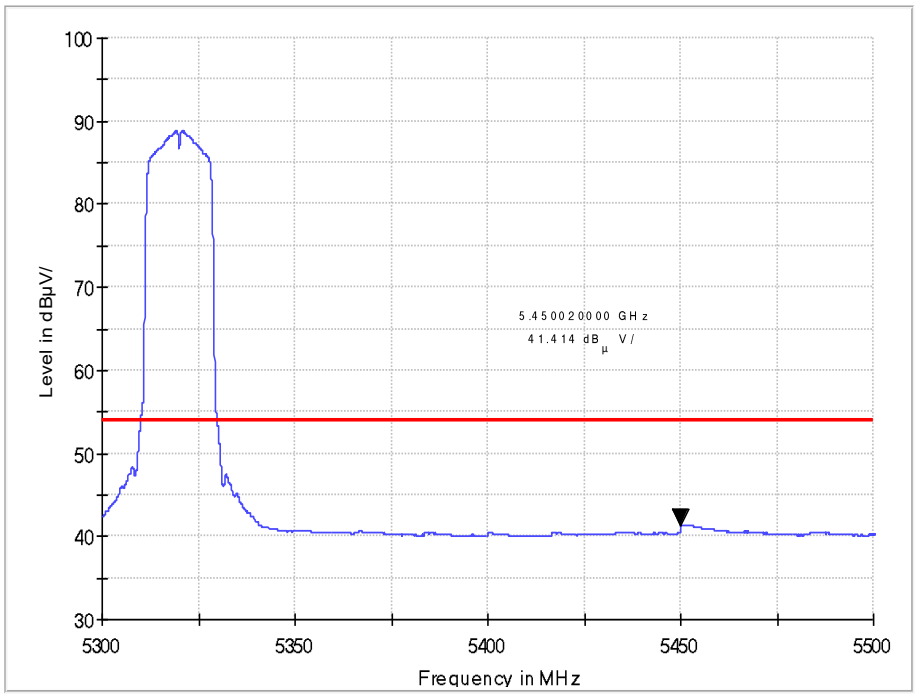
PK
Horizontal



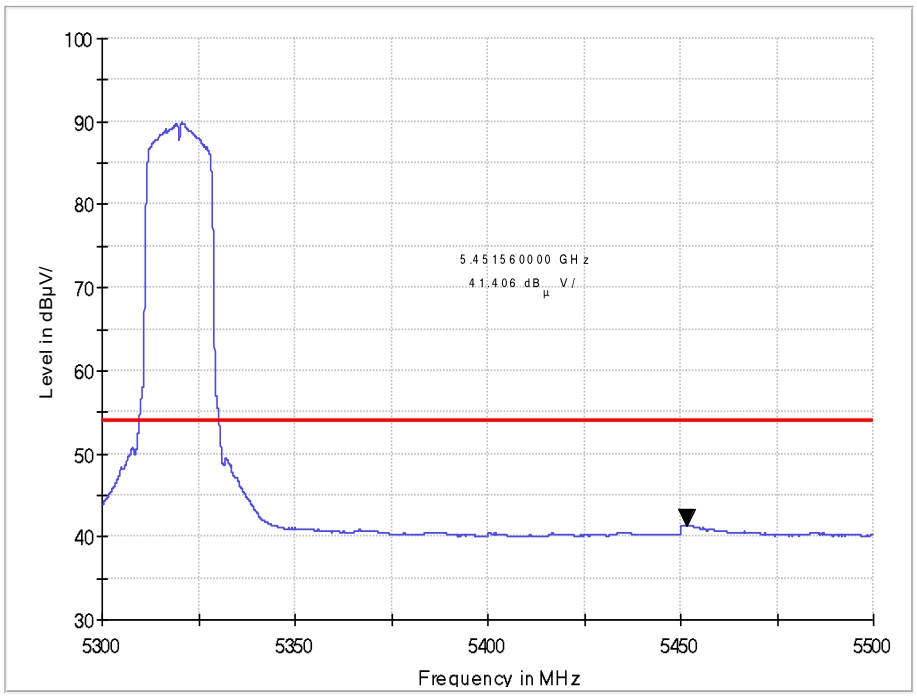
Vertical



AV
Horizontal



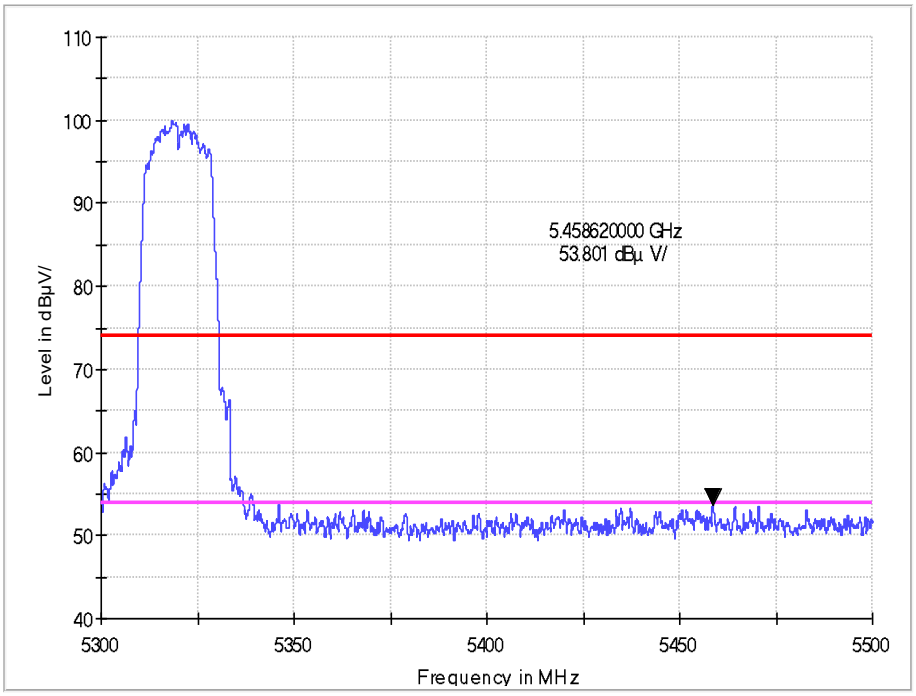
Vertical



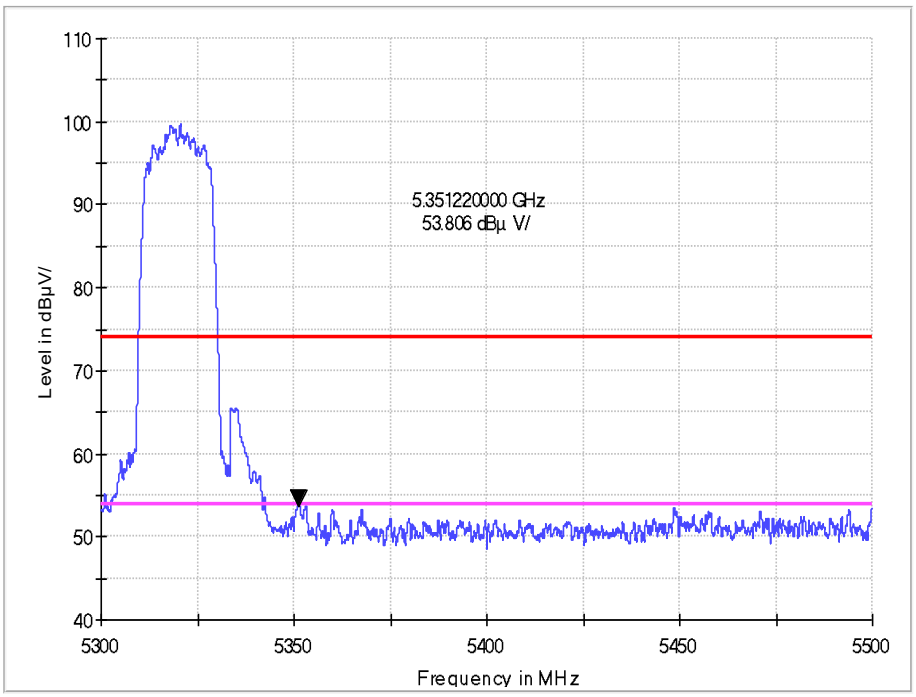
Band edge

11n HT20 IN THE 5.3GHz BAND
CH64

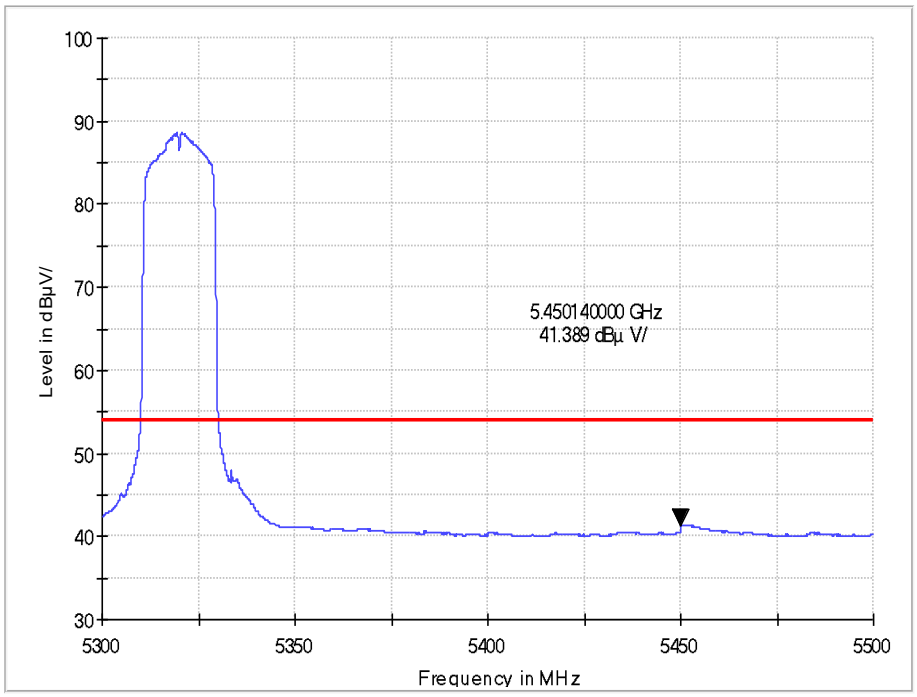
PK
Horizontal



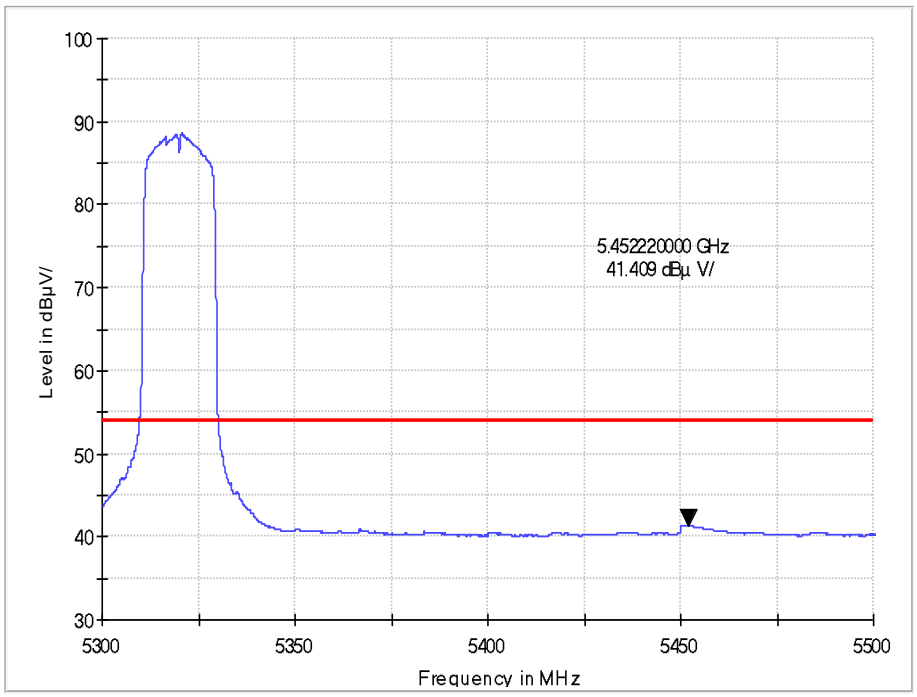
Vertical



AV
Horizontal



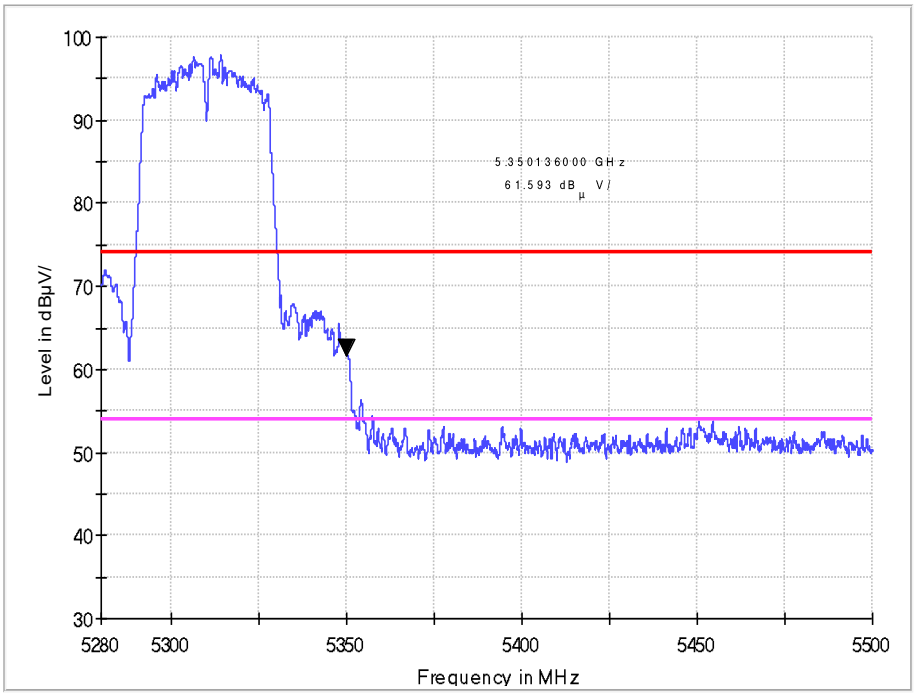
Vertical



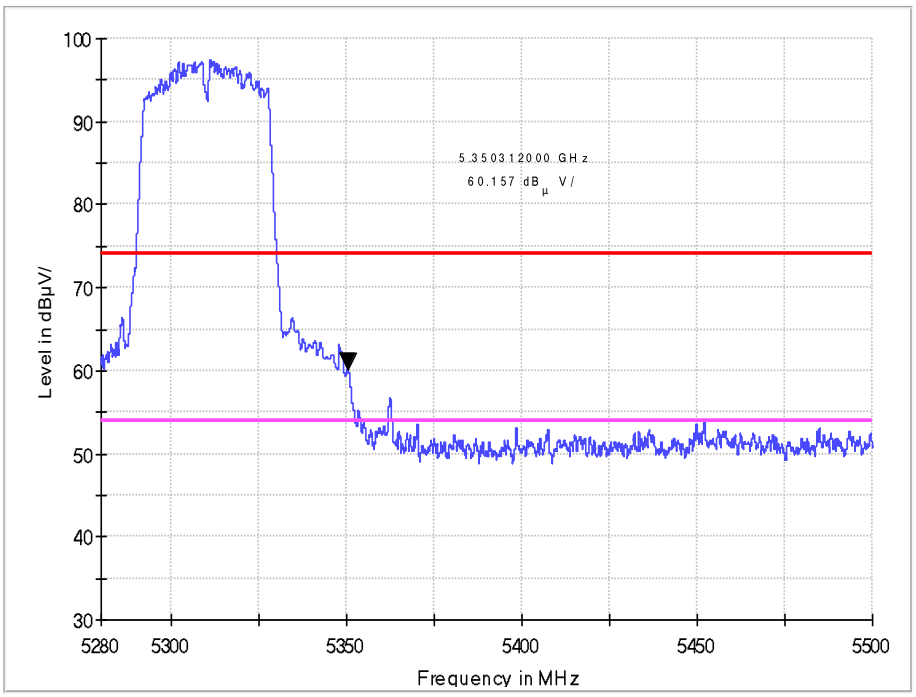
Band edge

11n HT40 IN THE 5.3GHz BAND
CH62

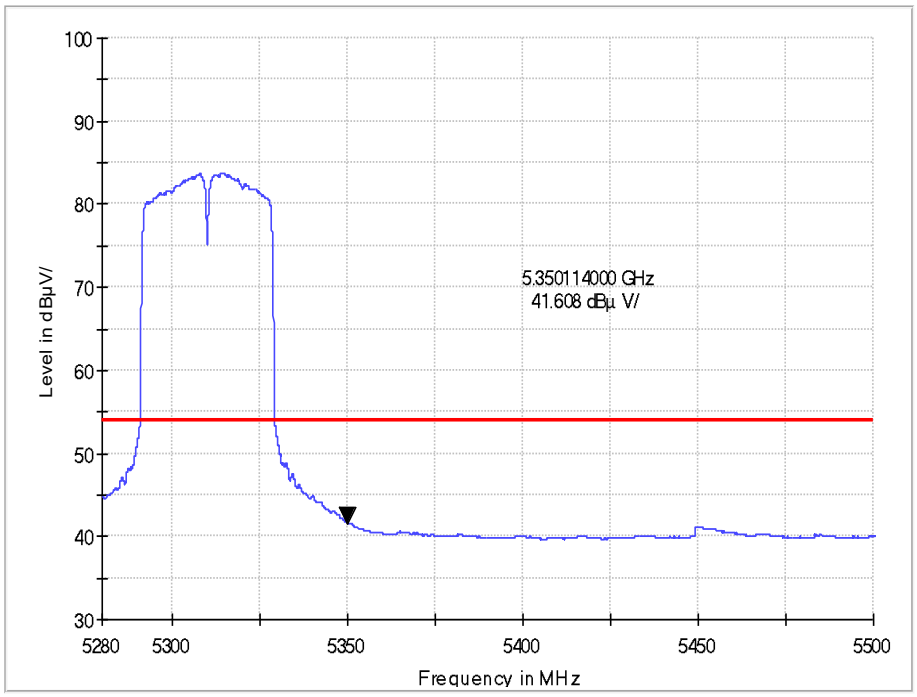
PK
Horizontal



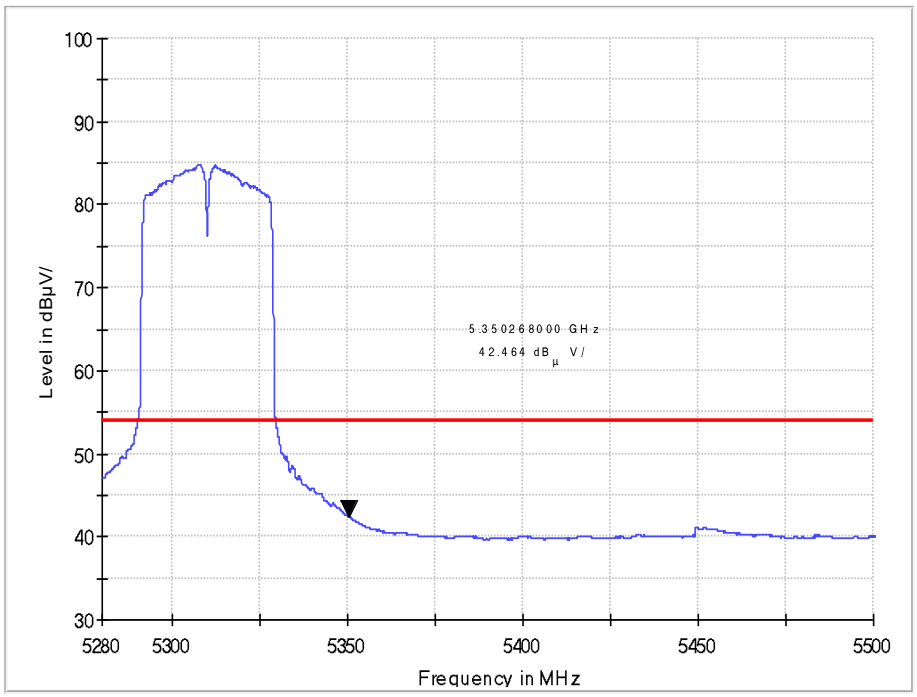
Vertical



AV
Horizontal



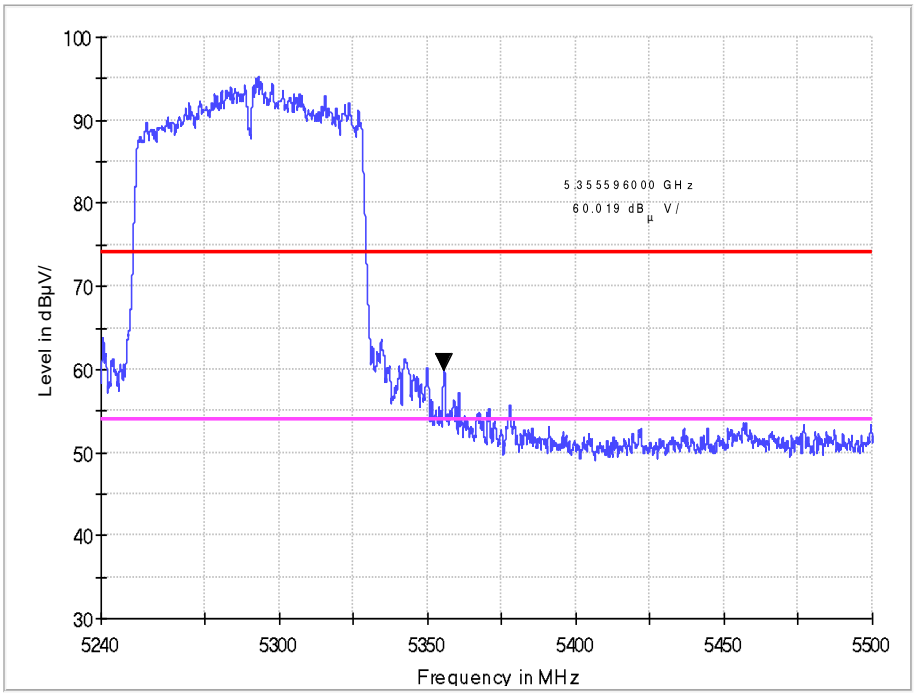
Vertical



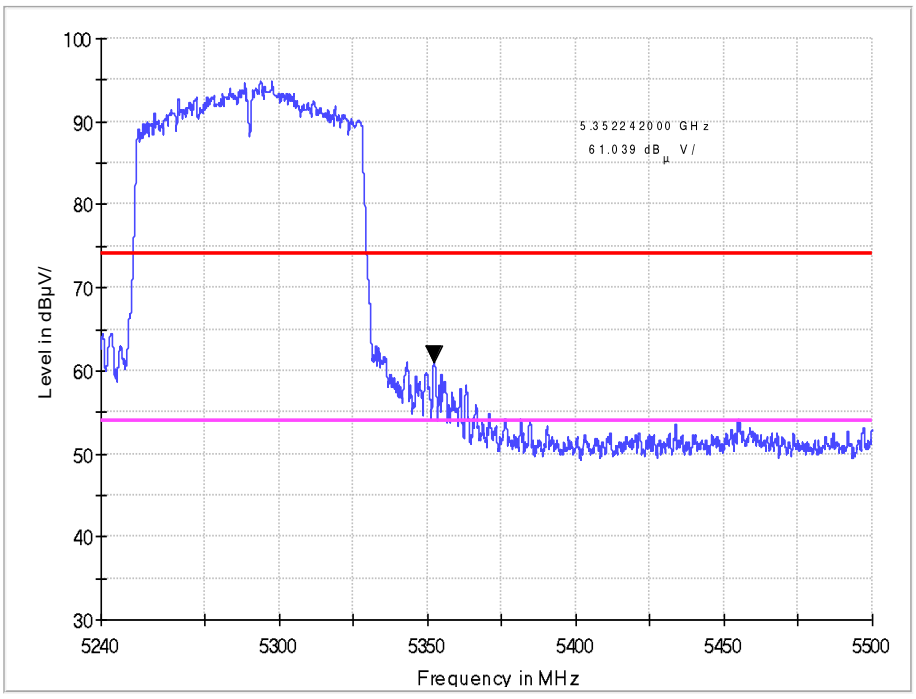
Band edge

11ac VHT80 IN THE 5.3GHz BAND
CH58

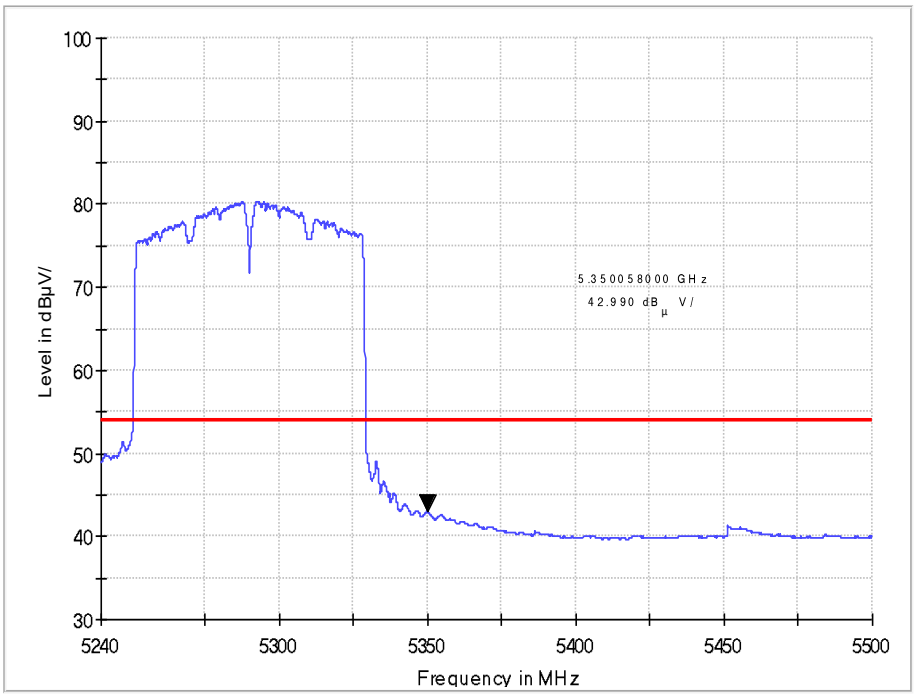
PK
Horizontal



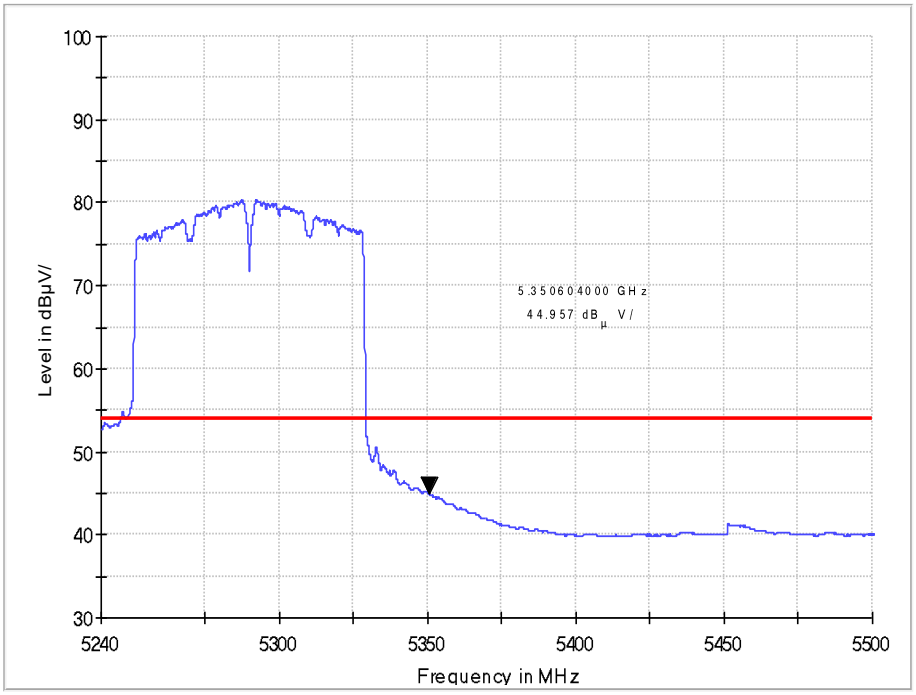
Vertical



AV
Horizontal

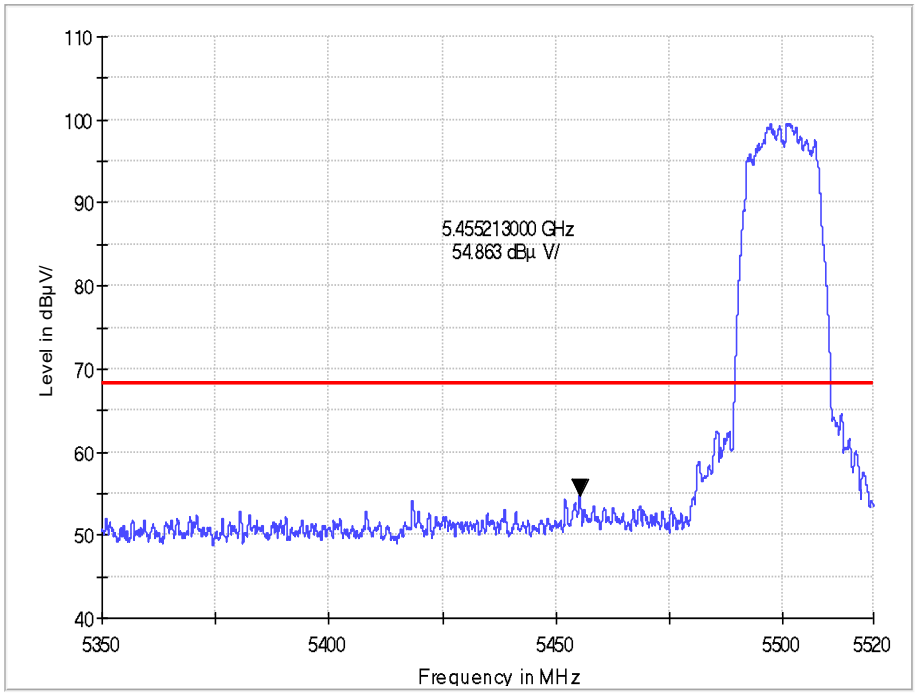


Vertical

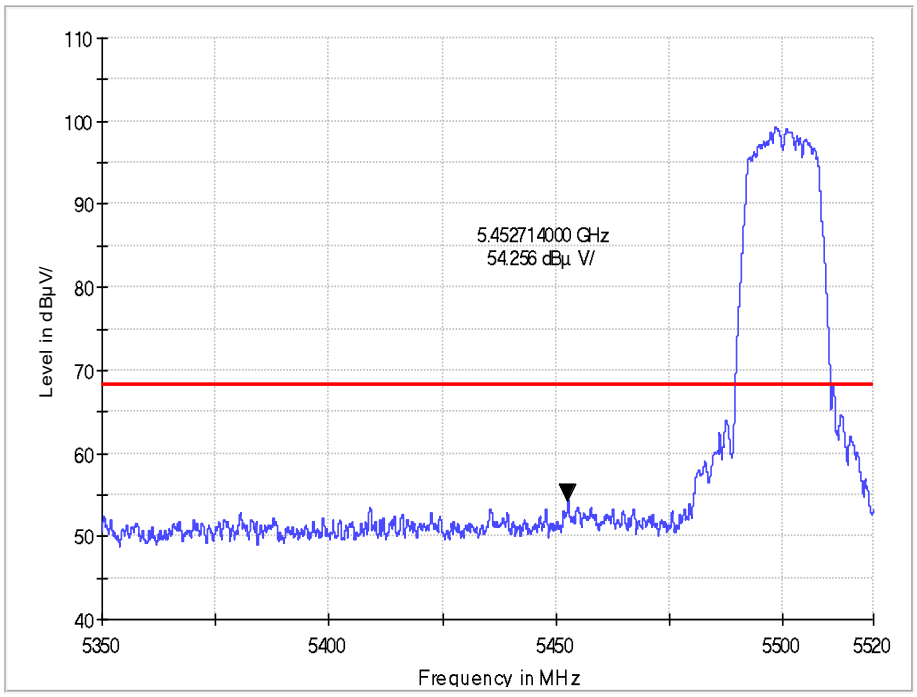


11a IN THE 5.6GHz BAND
CH100

Horizontal



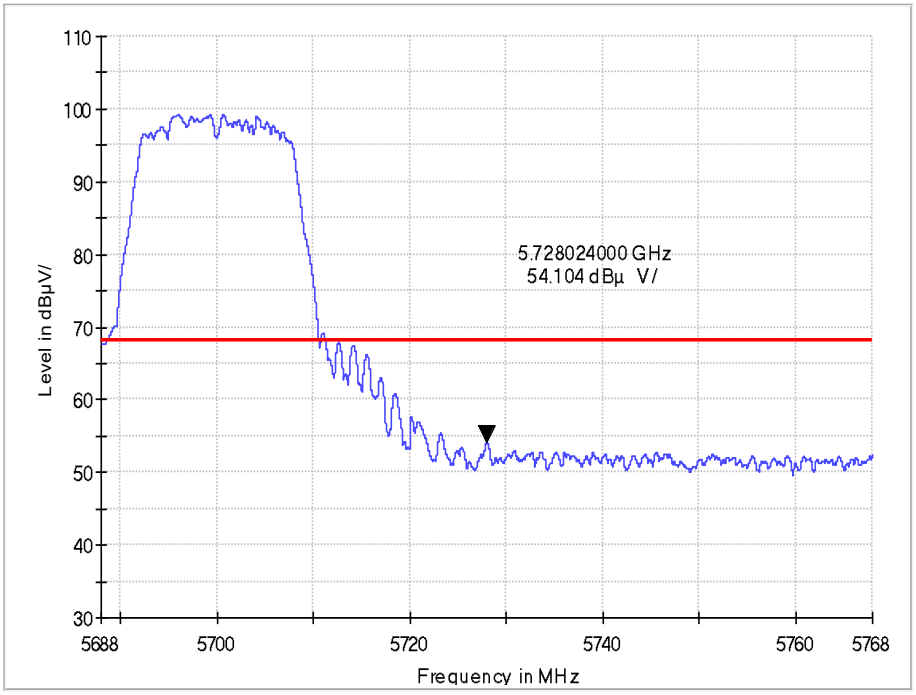
Vertical



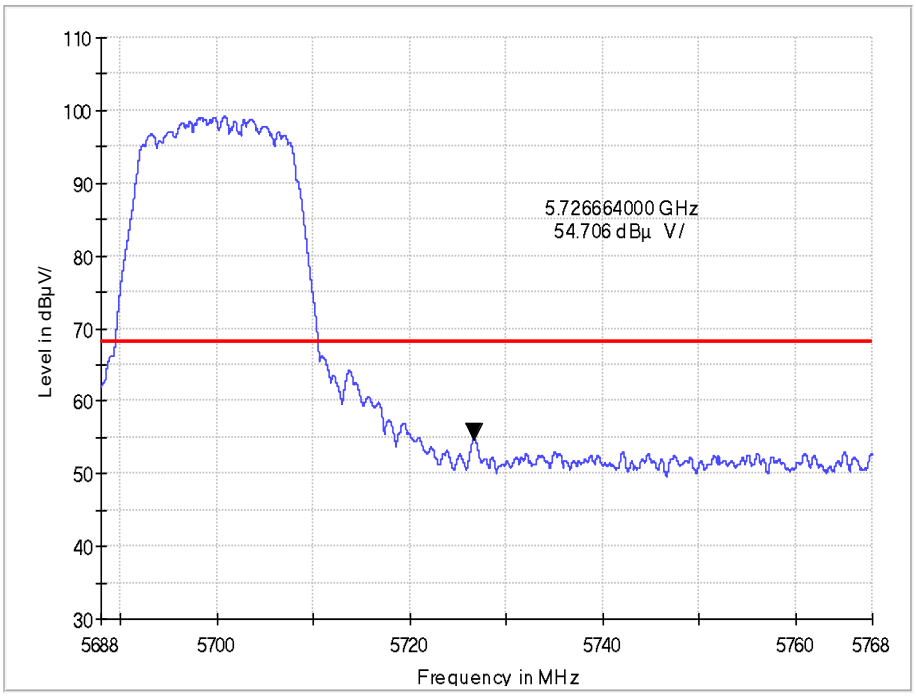
Band edge

11a IN THE 5.6GHz BAND
CH140

Horizontal



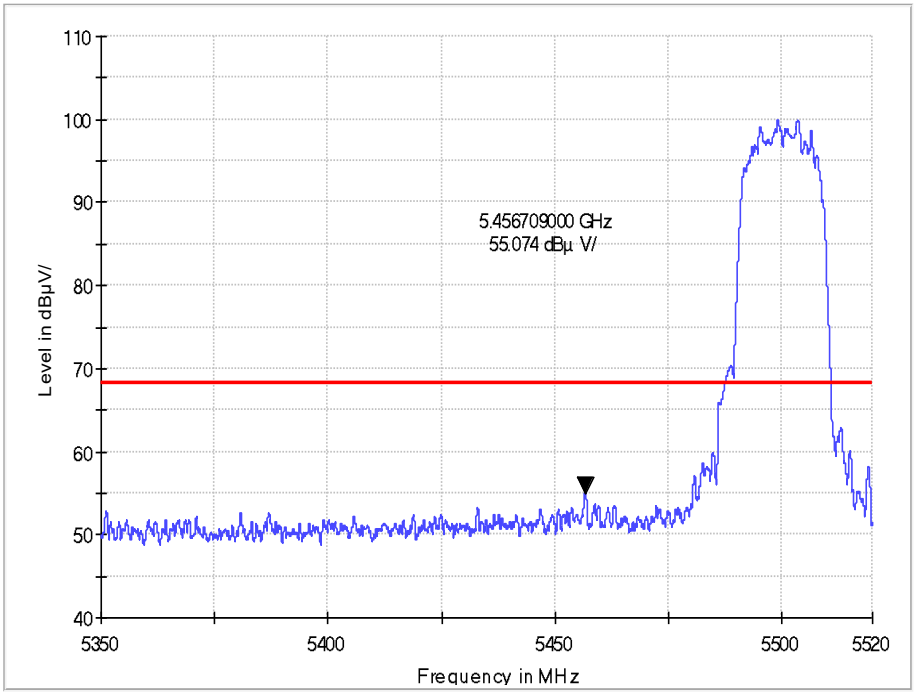
Vertical



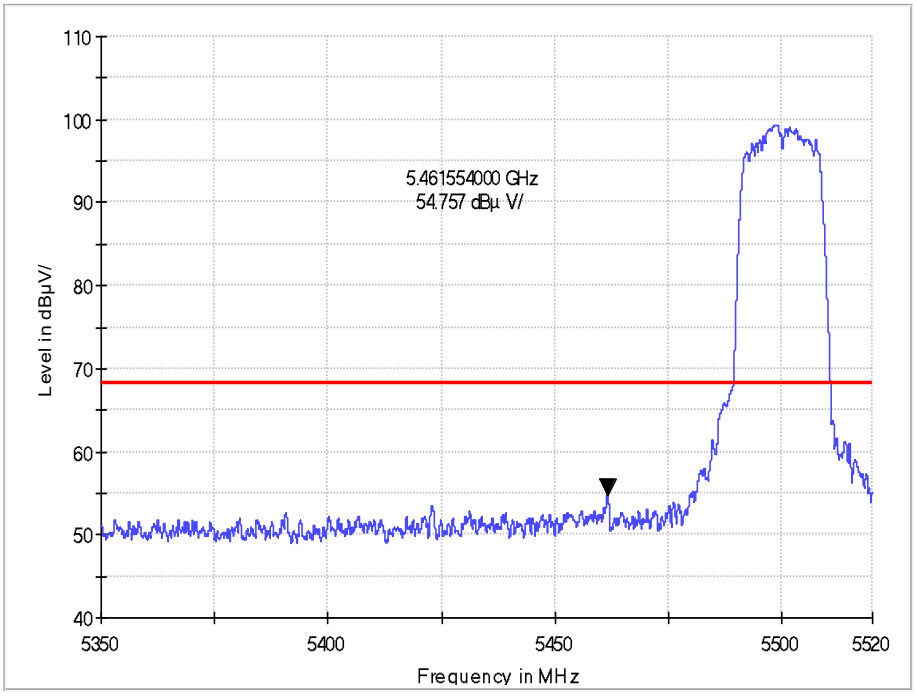
Band edge

11n HT20 IN THE 5.6GHz BAND
CH100

Horizontal



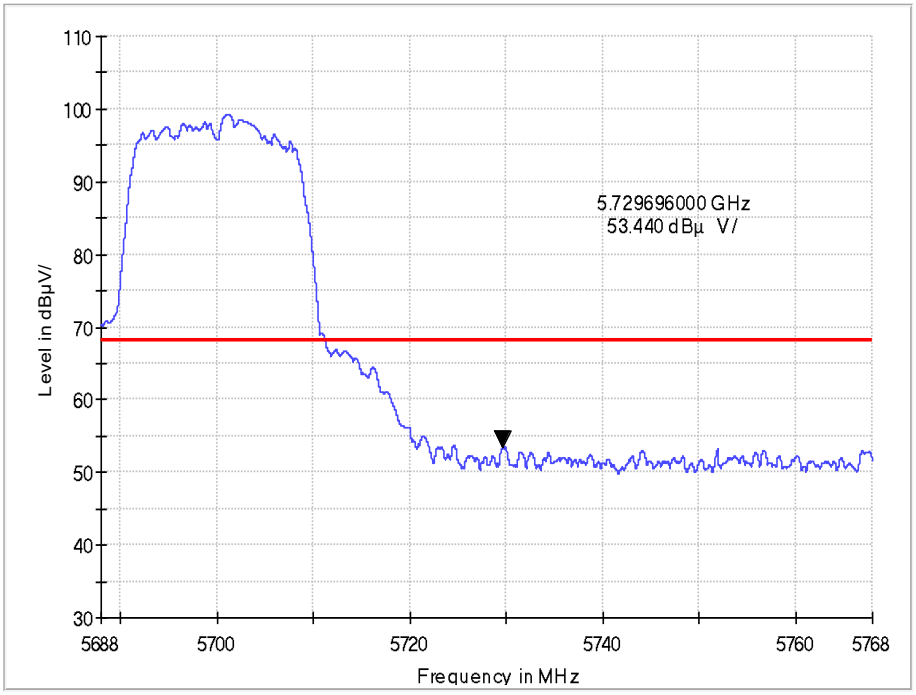
Vertical



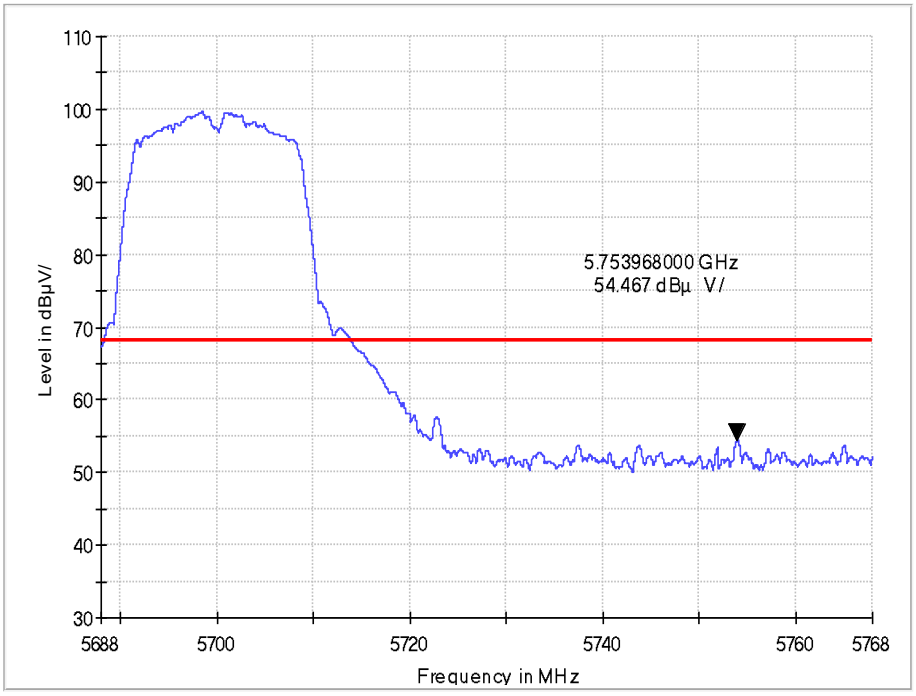
Band edge

11n HT20 IN THE 5.6GHz BAND
CH140

Horizontal



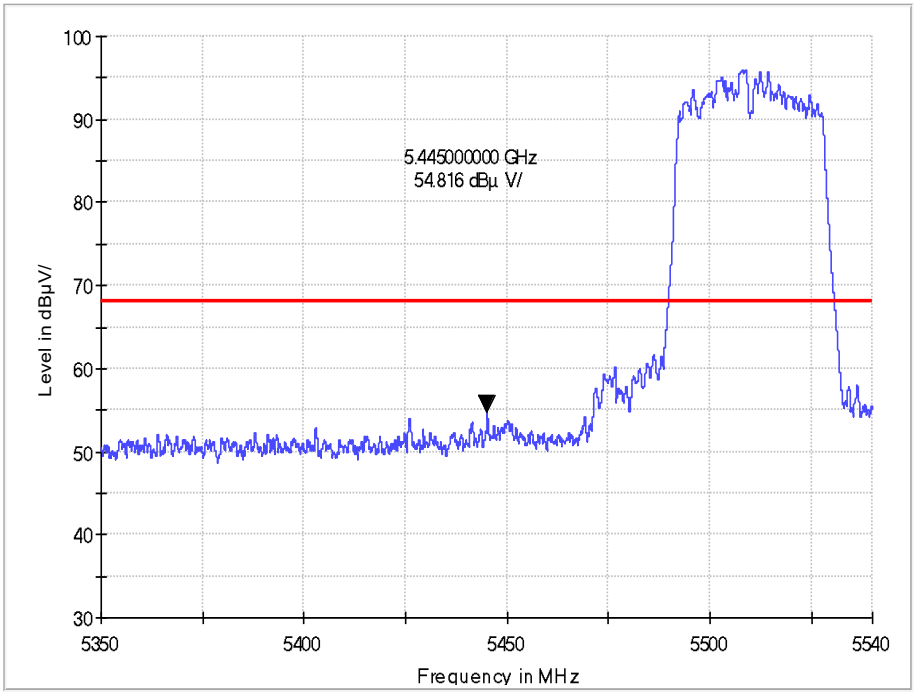
Vertical



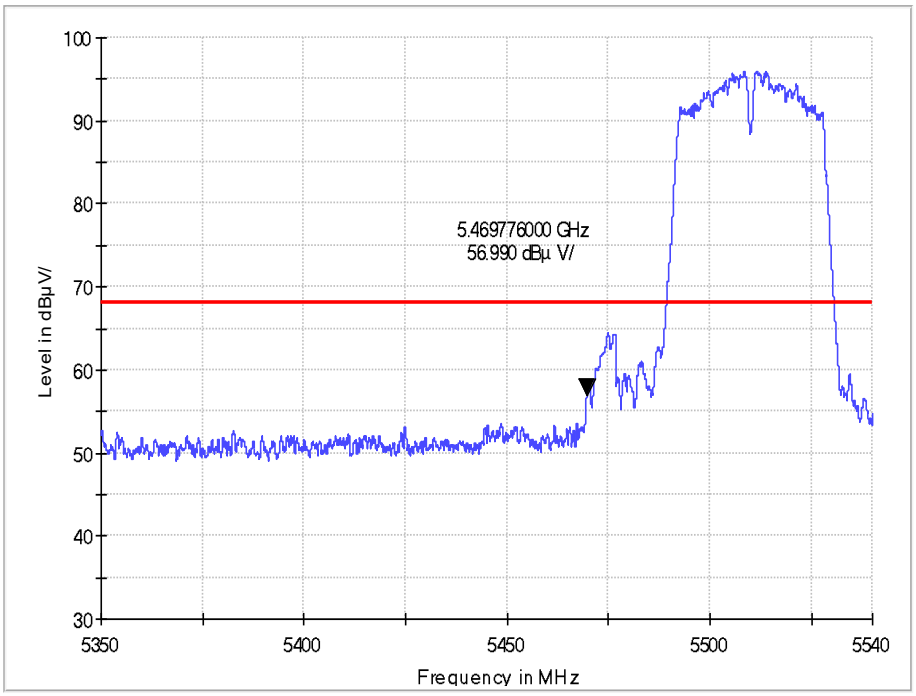
Band edge

11n HT40 IN THE 5.6GHz BAND
CH102

Horizontal



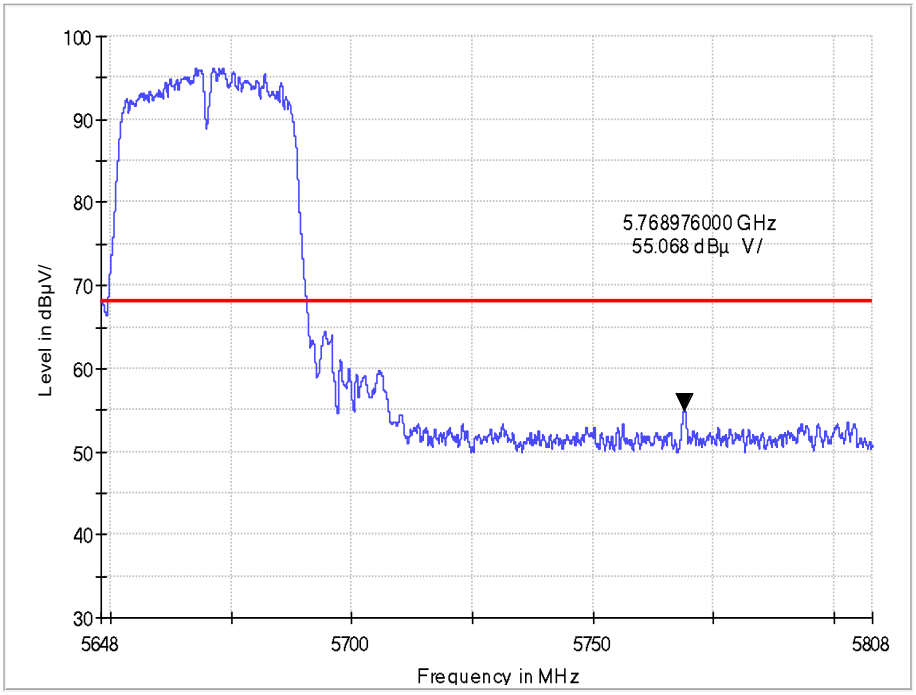
Vertical



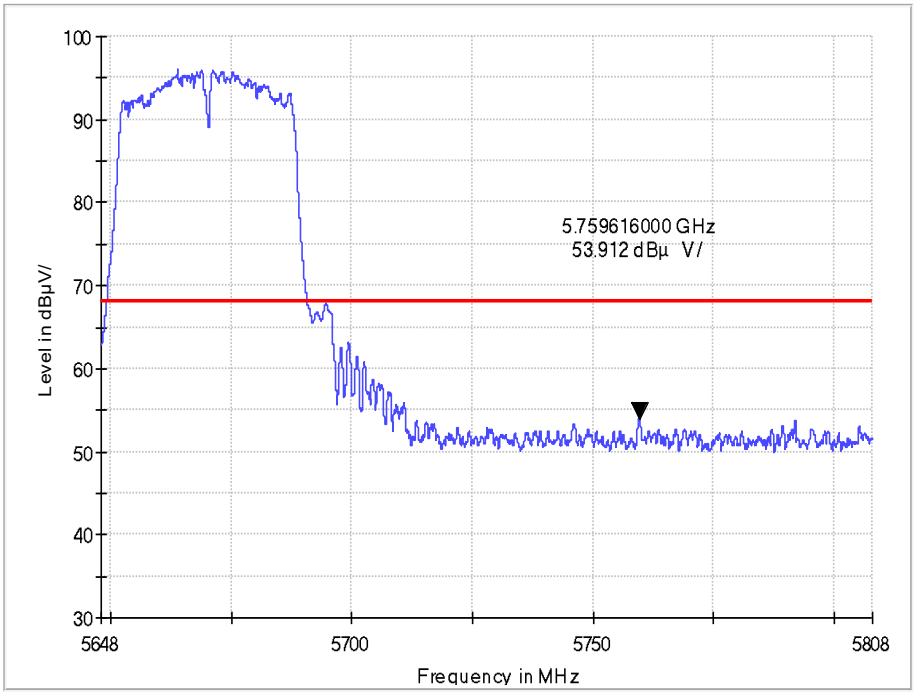
Band edge

11n HT40 IN THE 5.6GHz BAND
CH134

Horizontal



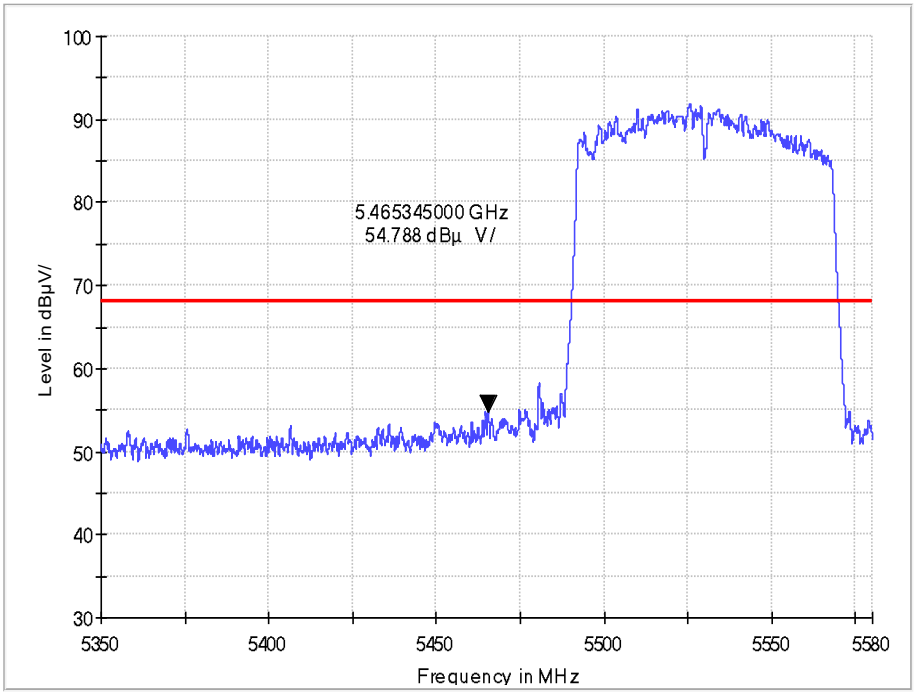
Vertical



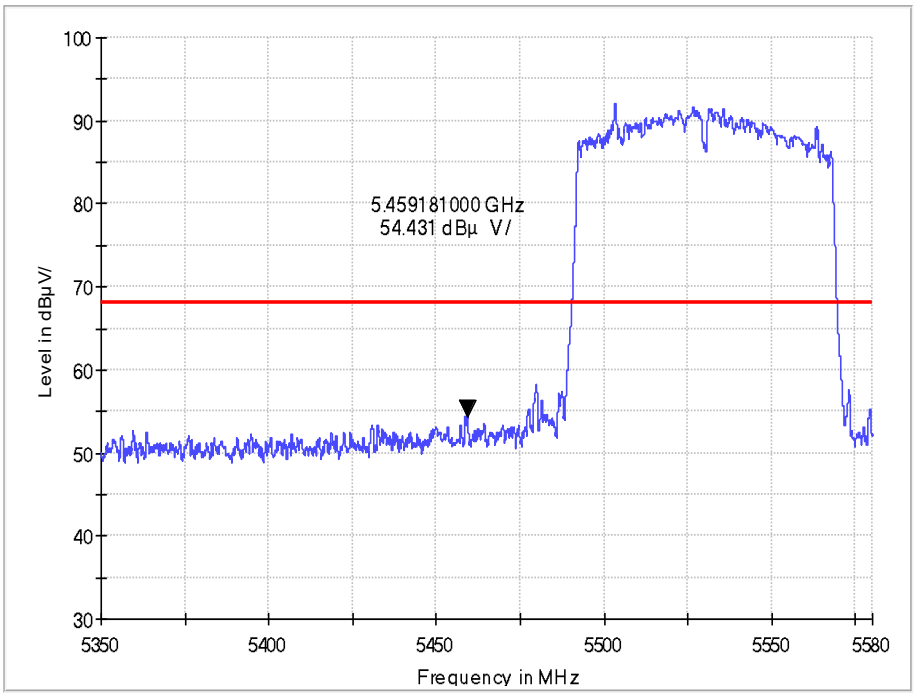
Band edge

11ac VHT80 IN THE 5.6GHz BAND
CH106

Horizontal



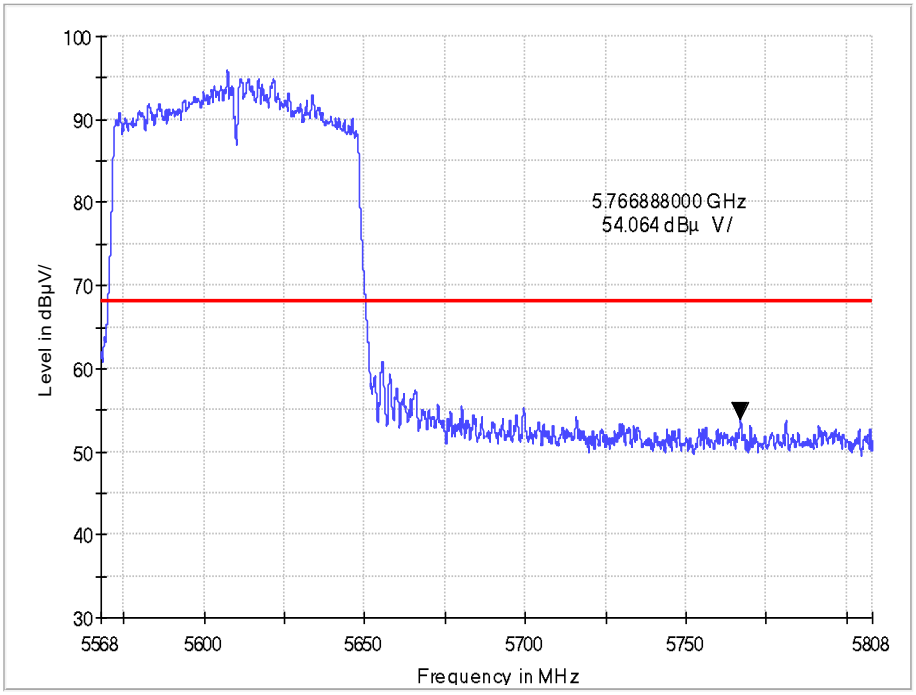
Vertical



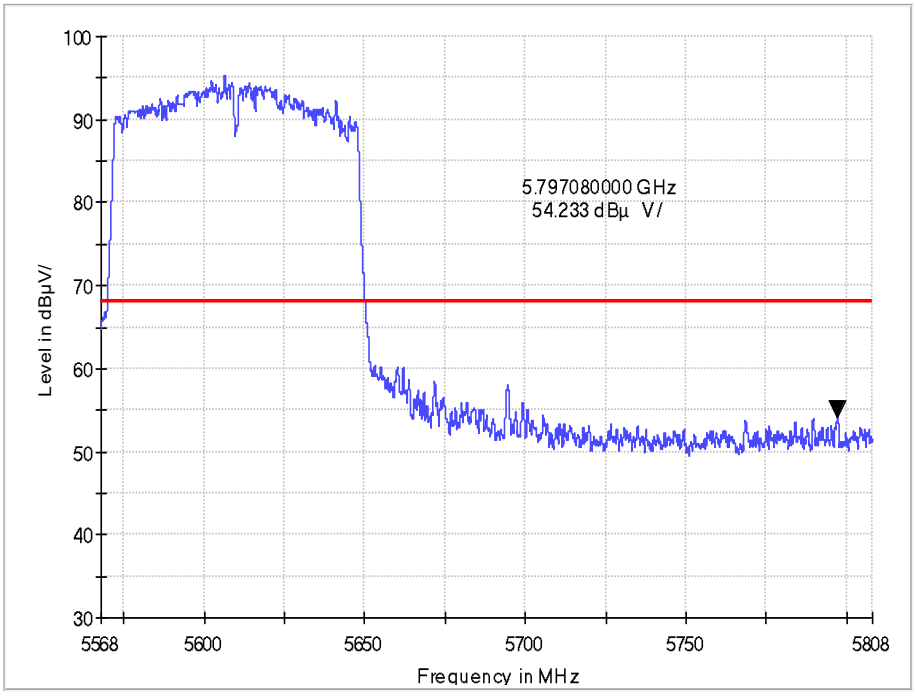
Band edge

11ac VHT80 IN THE 5.6GHz BAND
CH122

Horizontal



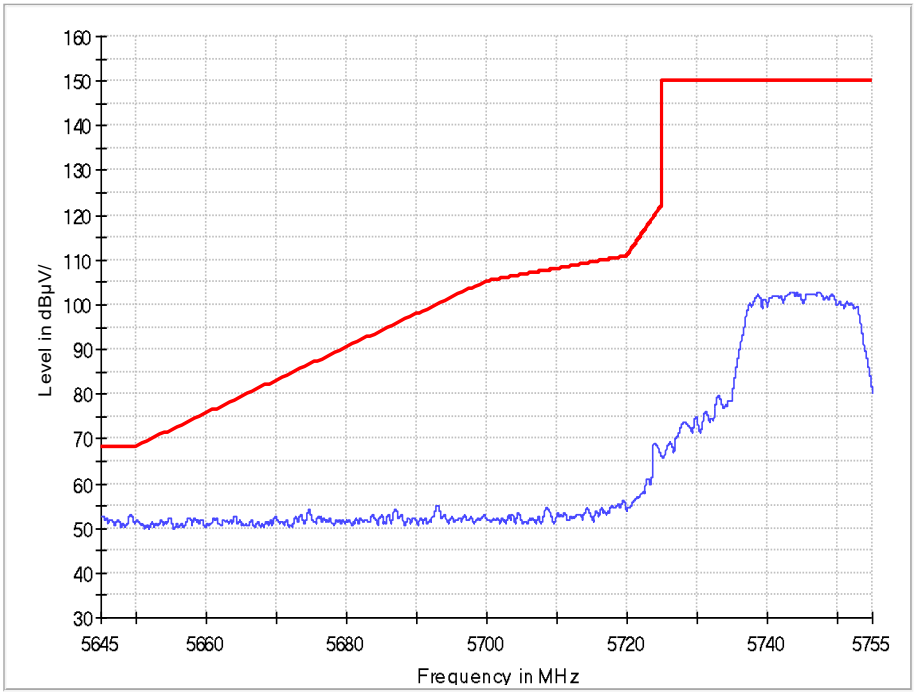
Vertical



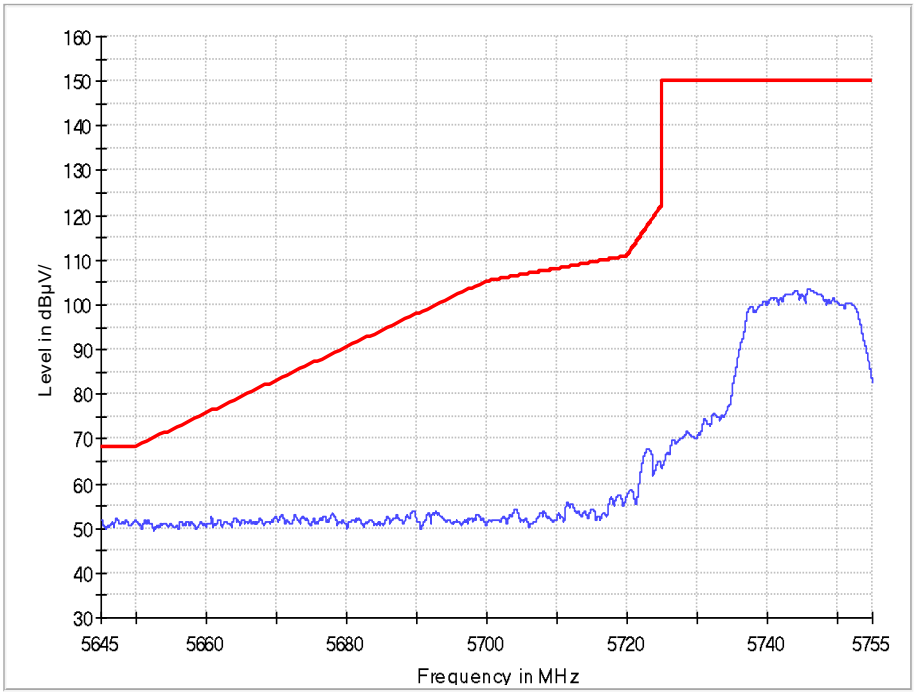
Band edge

11a IN THE 5.8GHz BAND
CH149

Horizontal



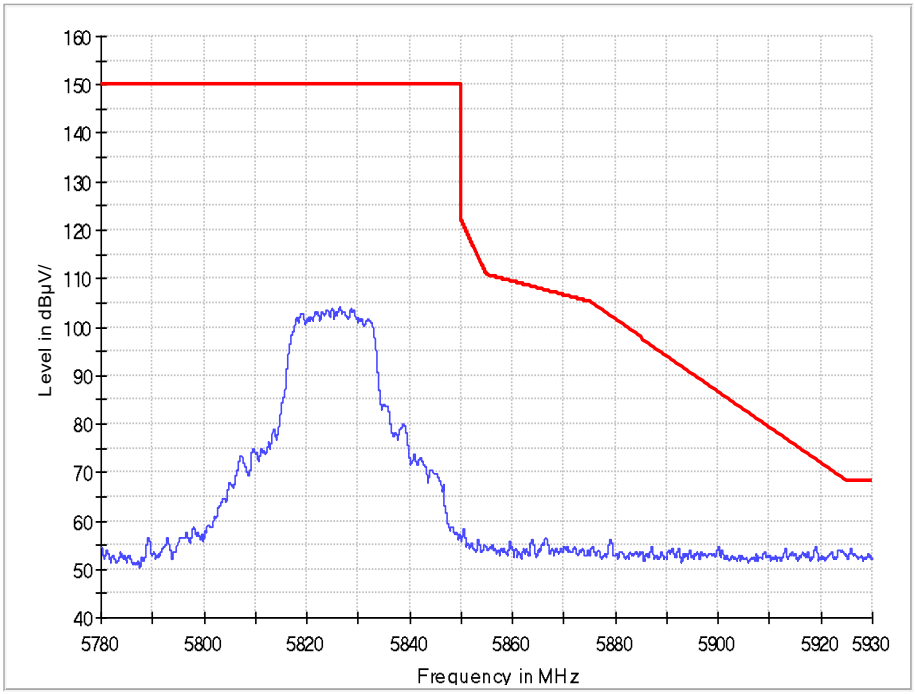
Vertical



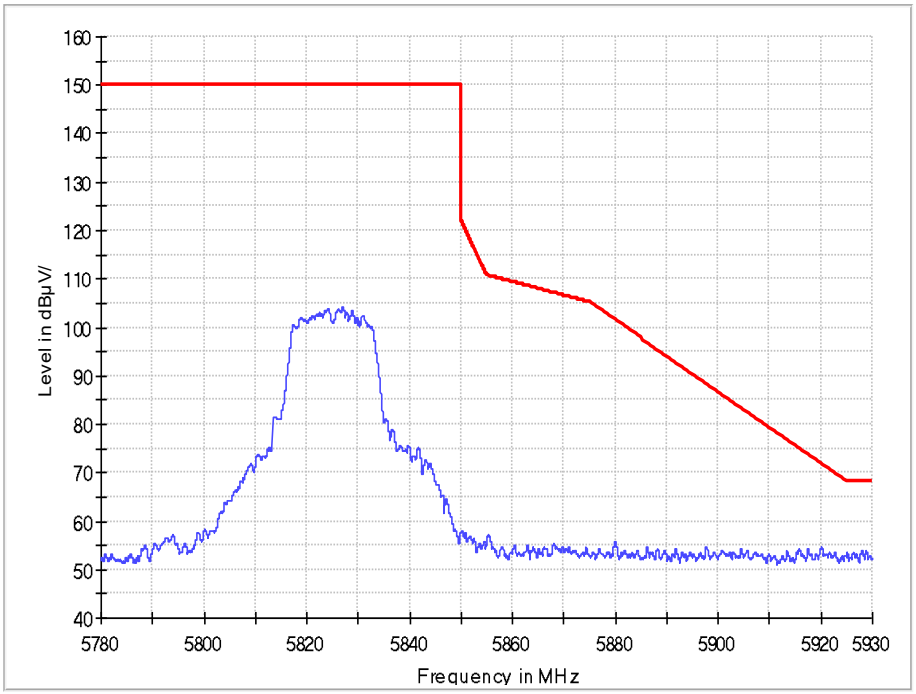
Band edge

11a IN THE 5.8GHz BAND
CH165

Horizontal



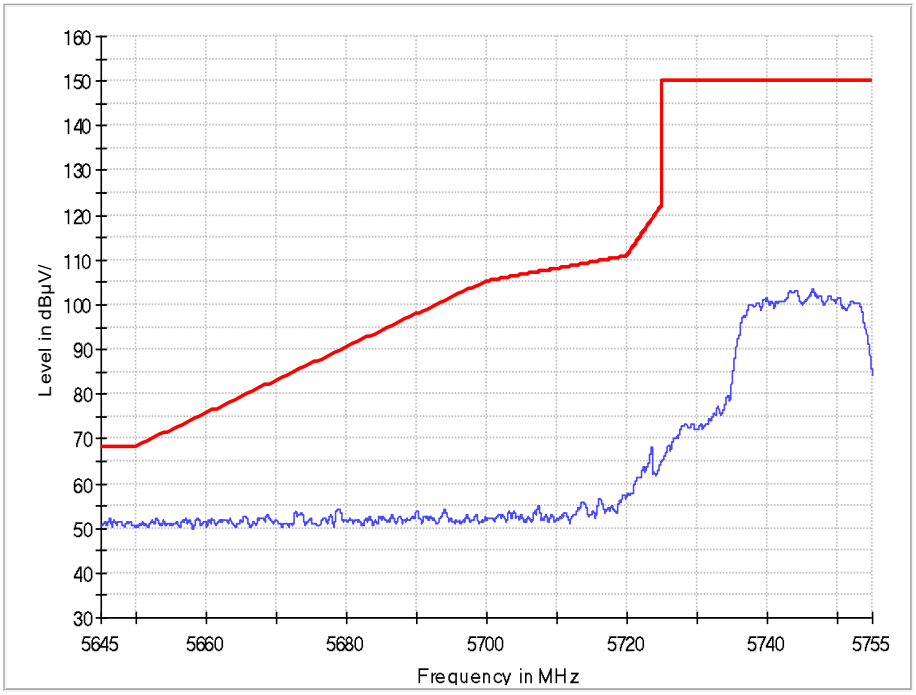
Vertical



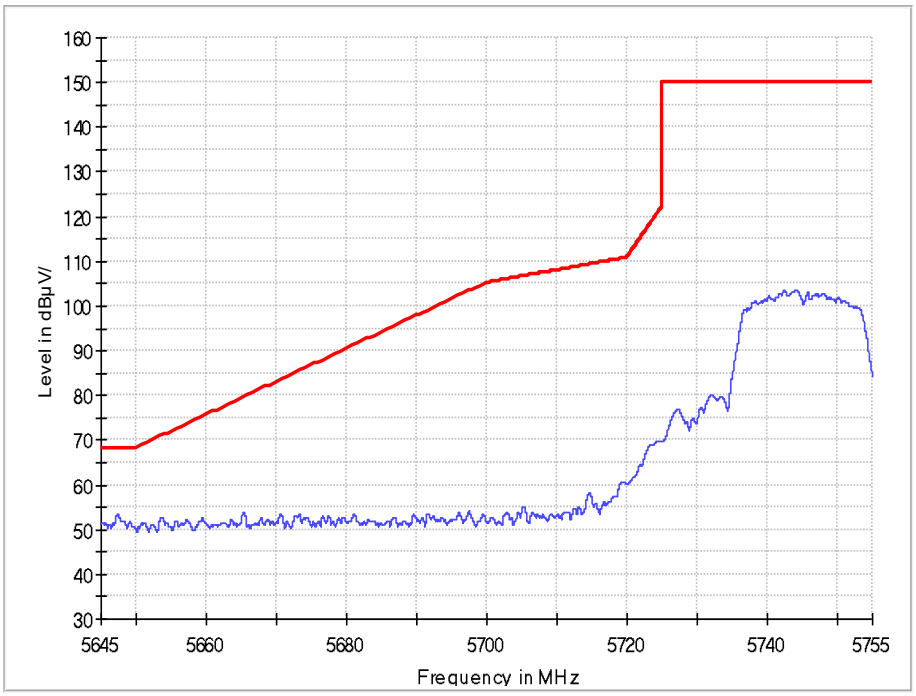
Band edge

11n HT20 IN THE 5.8GHz BAND
CH149

Horizontal



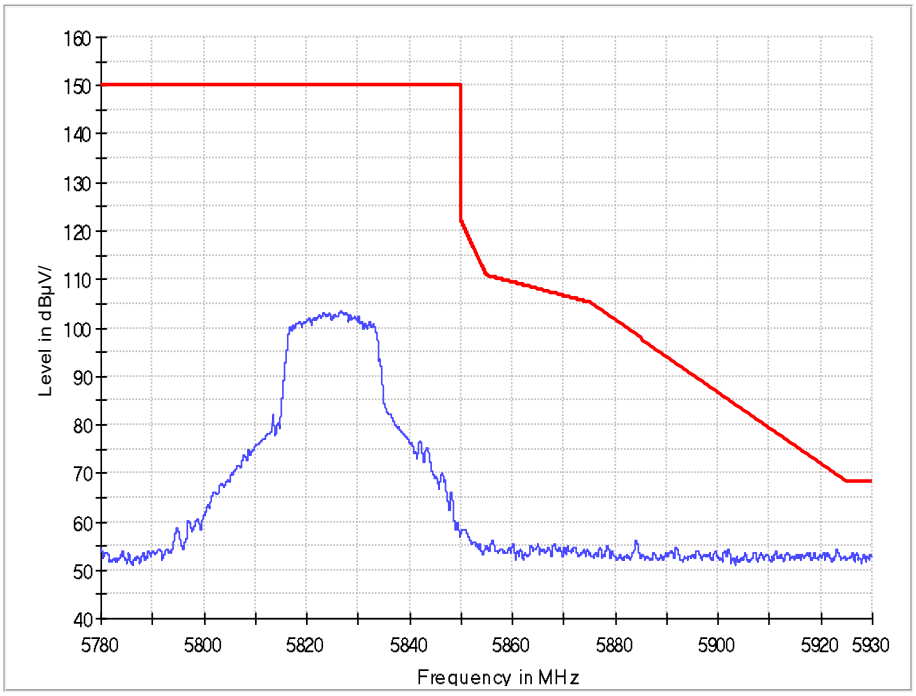
Vertical



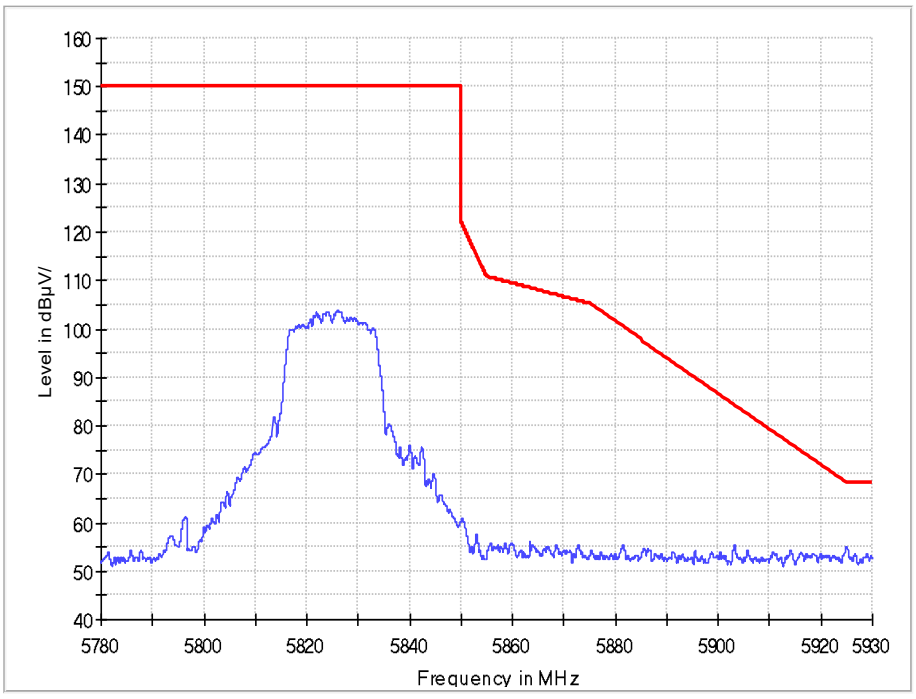
Band edge

11n HT20 IN THE 5.8GHz BAND
CH165

Horizontal



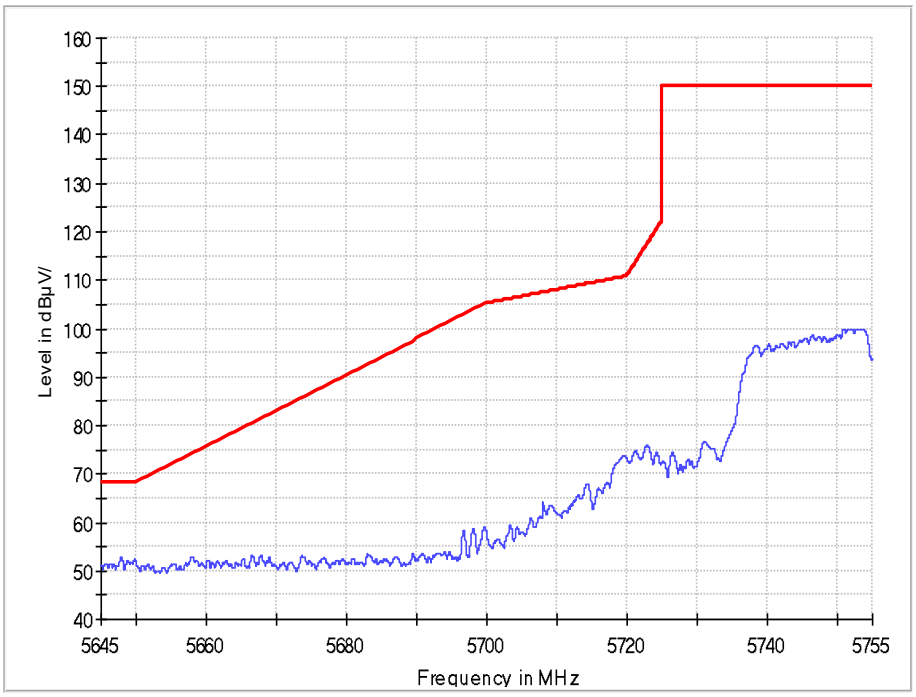
Vertical



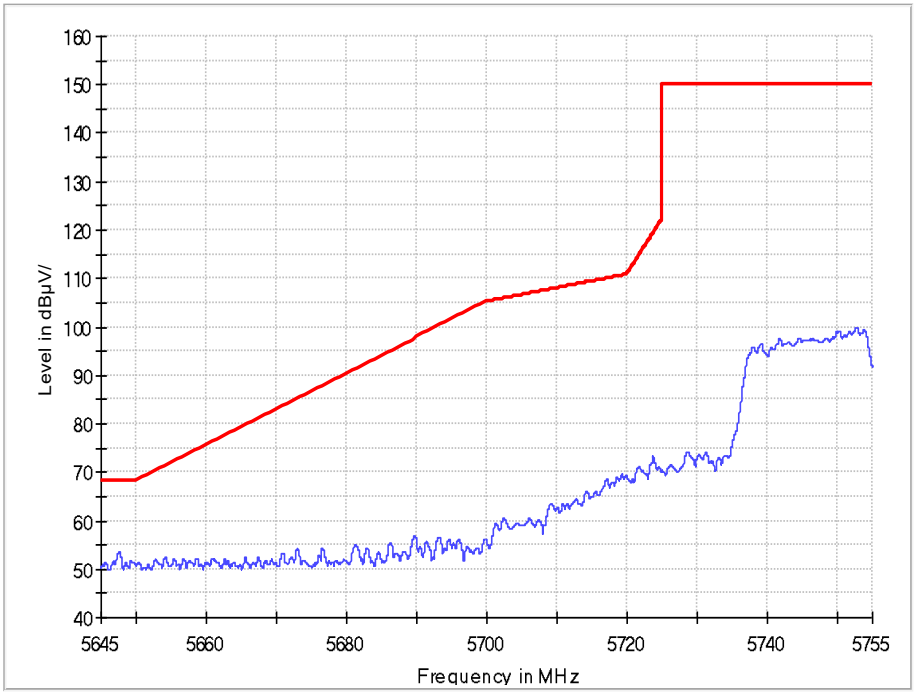
Band edge

11n HT40 IN THE 5.8GHz BAND
CH151

Horizontal



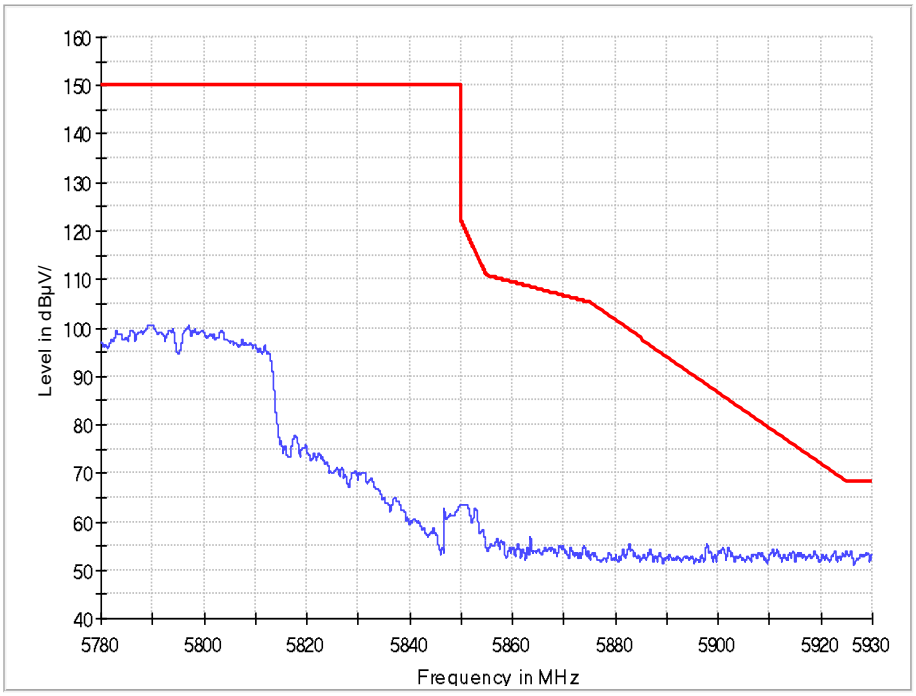
Vertical



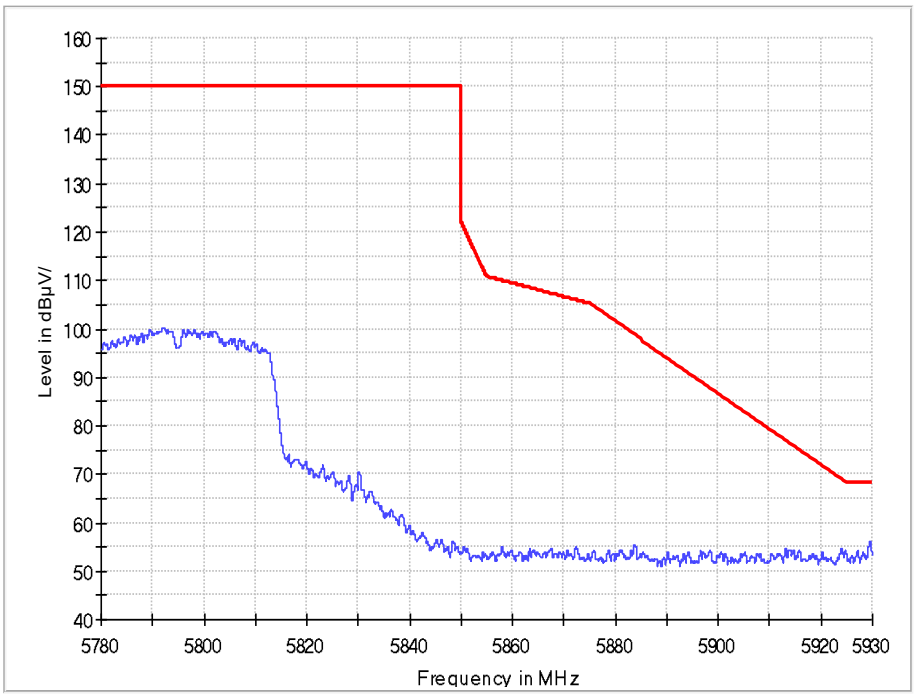
Band edge

11n HT40 IN THE 5.8GHz BAND
CH159

Horizontal



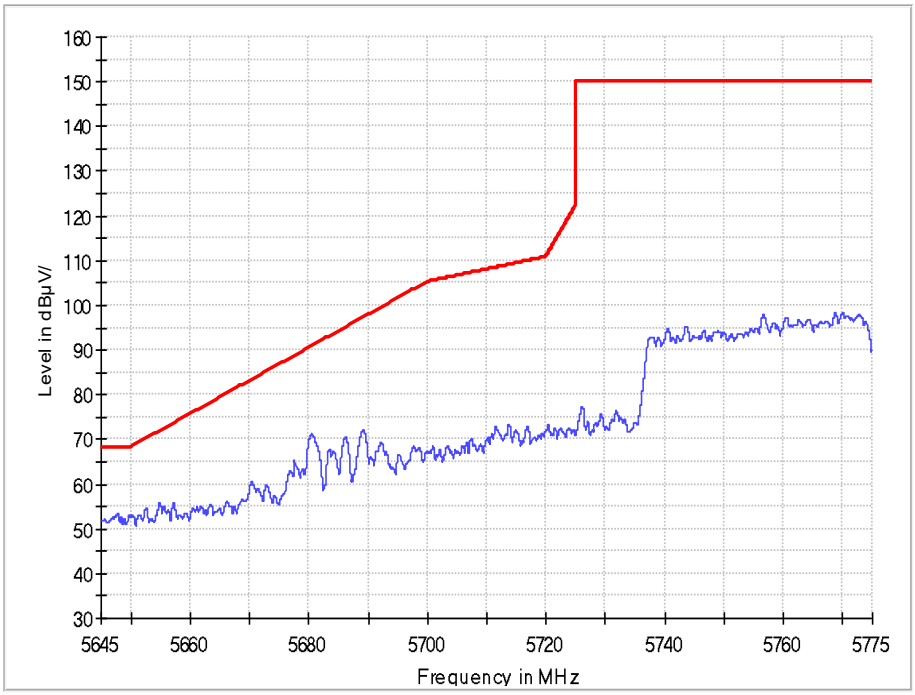
Vertical



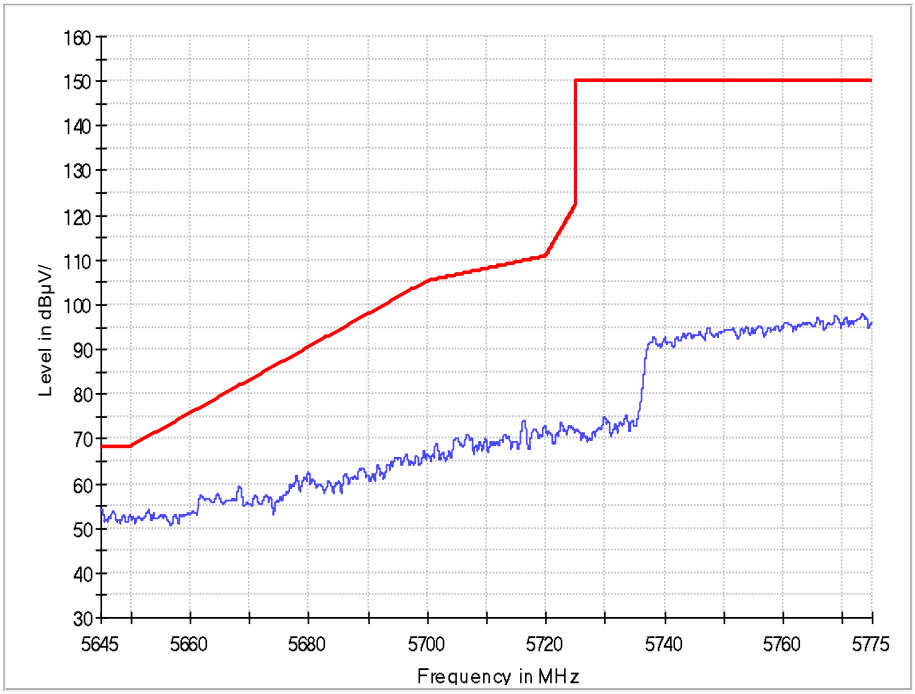
Band edge

11ac VHT80 IN THE 5.8GHz BAND
CH155

Horizontal



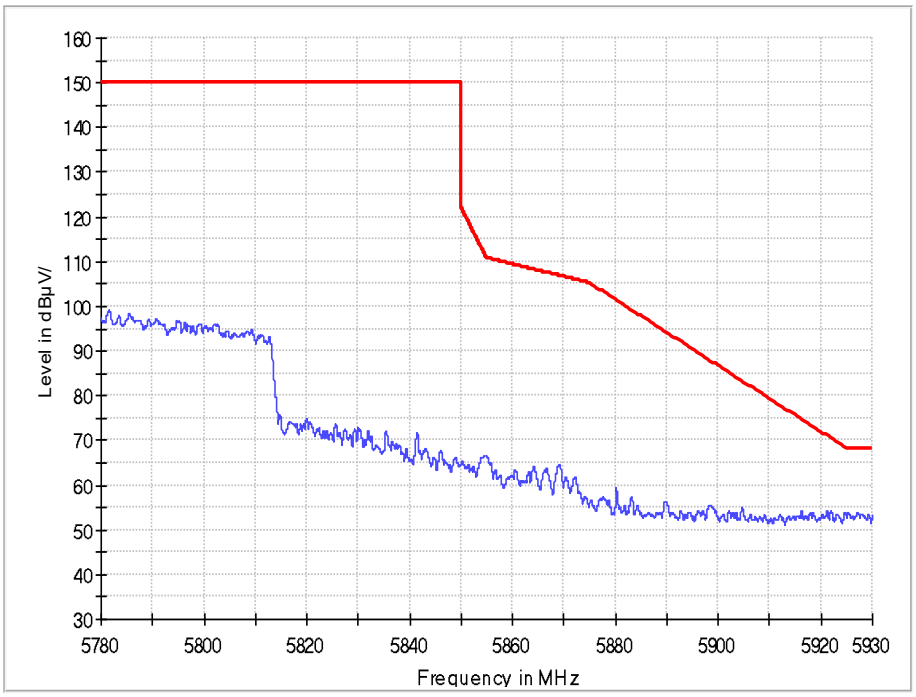
Vertical



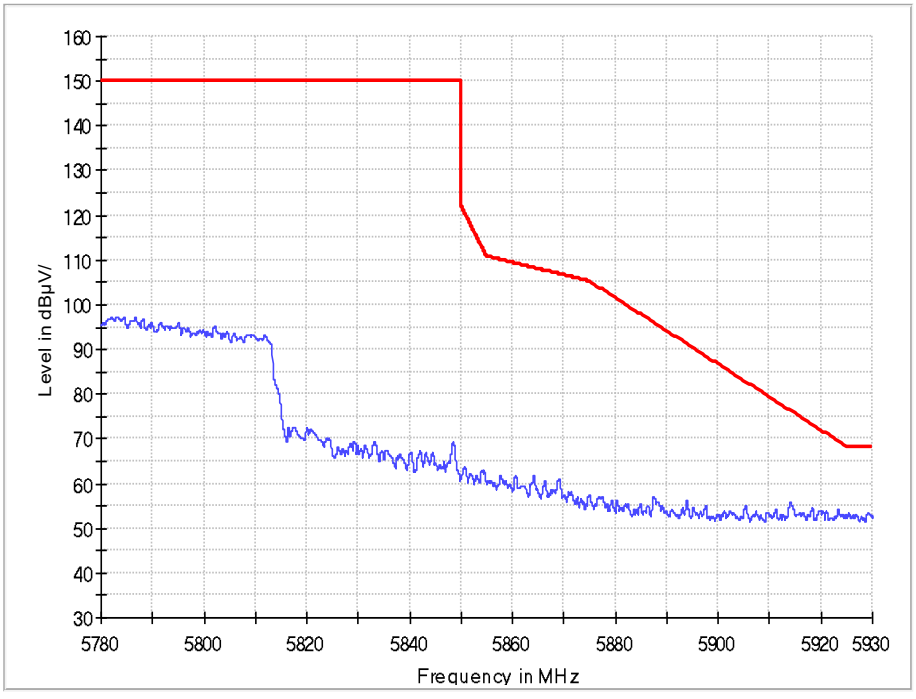
Band edge

11ac VHT80 IN THE 5.8GHz BAND
CH155

Horizontal



Vertical



11. CONDUCTED EMISSION TEST FOR AC POWER PORT MEASUREMENT

11.1.Test Standard and Limit

Test Standard
FCC Part 15 15.207
Test Limit

Table 15 Conducted Disturbance Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency
* The lower limit shall apply at the transition frequency.

11.2.Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line. According to the requirements of ANSI C63.10-2020.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.
The bandwidth of EMI test receiver is set at 9 kHz.

11.3.Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

11.4.Test Data

The emissions don’t show in below are too low against the limits. Refer to the test curves.

Table 16 Conducted Disturbance Test Data

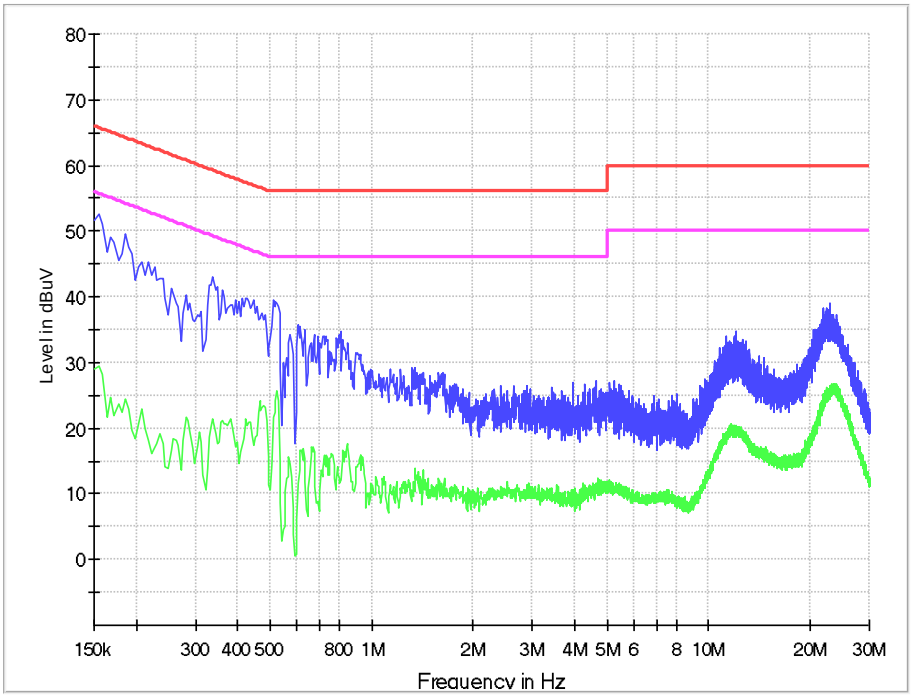
Test mode: Charging and Transmitting								
	Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
			Reading (dBμV)	Emission Level (dBμV)	Limit (dBμV)	Reading (dBμV)	Emission Level (dBμV)	Limit (dBμV)
Line	0.154	9.7	38.4	48.1	65.8	18.1	27.8	55.8
	0.186	9.7	30.4	40.1	64.2	10.2	19.9	54.2
	0.339	9.7	25.5	35.2	59.2	8.5	18.2	49.2
	0.523	9.8	26.0	35.8	56	13.7	23.5	46
	0.807	9.8	17.3	27.1	56	6.0	15.8	46
	22.884	10.2	22.0	32.2	60	15.9	26.1	50
Neutral	0.154	9.7	34.8	44.5	65.8	14.5	24.2	55.8
	0.190	9.7	28.9	38.6	64.0	9.1	18.8	54.0
	0.379	9.7	21.4	31.1	58.3	6.9	16.6	48.3
	0.501	9.8	20.5	30.3	56	8.4	18.2	46
	11.319	9.9	15.2	25.1	60	8.3	18.2	50
	22.983	10.2	21.0	31.2	60	15.4	25.6	50

REMARKS: 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)

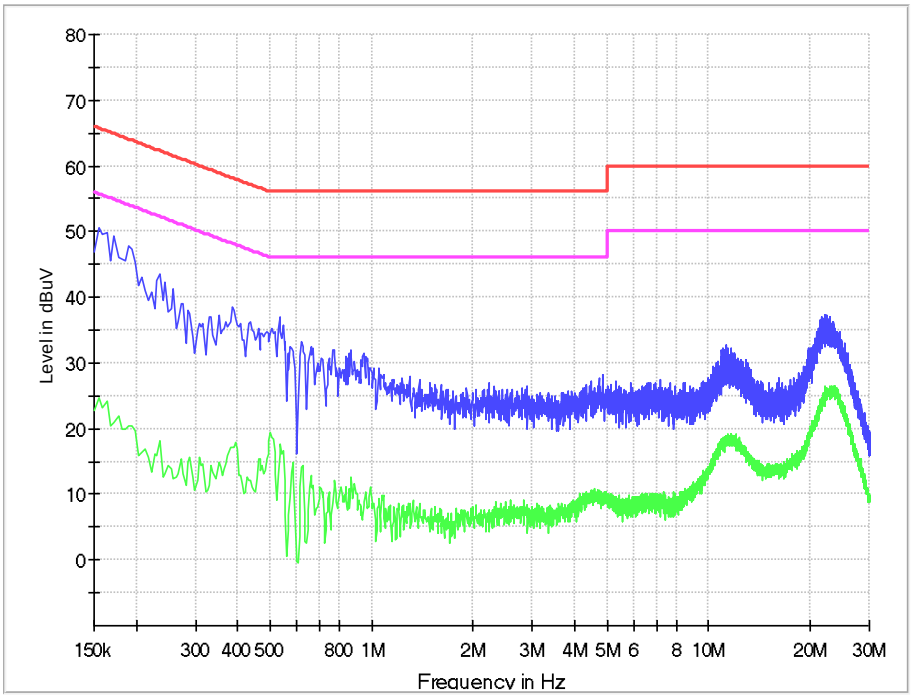
2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)

3. The other emission levels were very low against the limit.

Line



Neutral



12. ANTENNA REQUIREMENTS

15.203 requirements:
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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirements:
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

12.1. Antenna Connector

Antenna Connector is on the PCB within enclosure and not accessible to user.

12.2. Antenna Gain

The antenna gain of EUT is less than 6 dBi.

----------End of Report----------