

REMARKS:

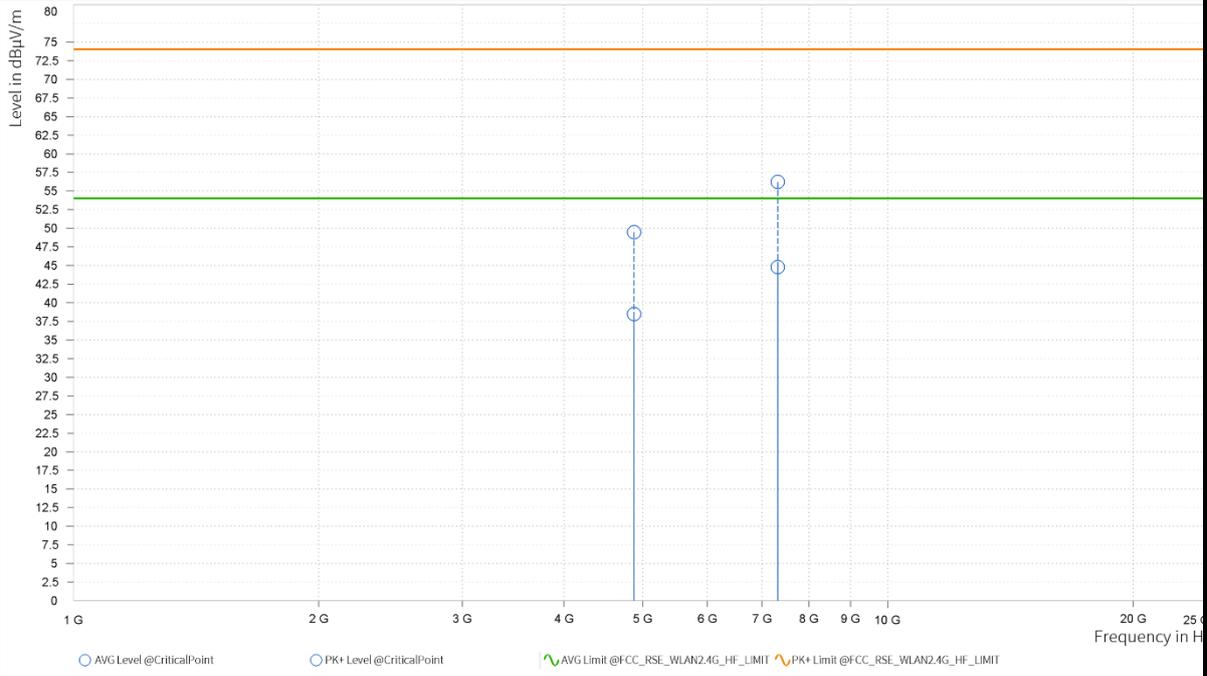
4. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
5. Margin value = Limit value–Emission level.
6. 2404MHz: Fundamental frequency.

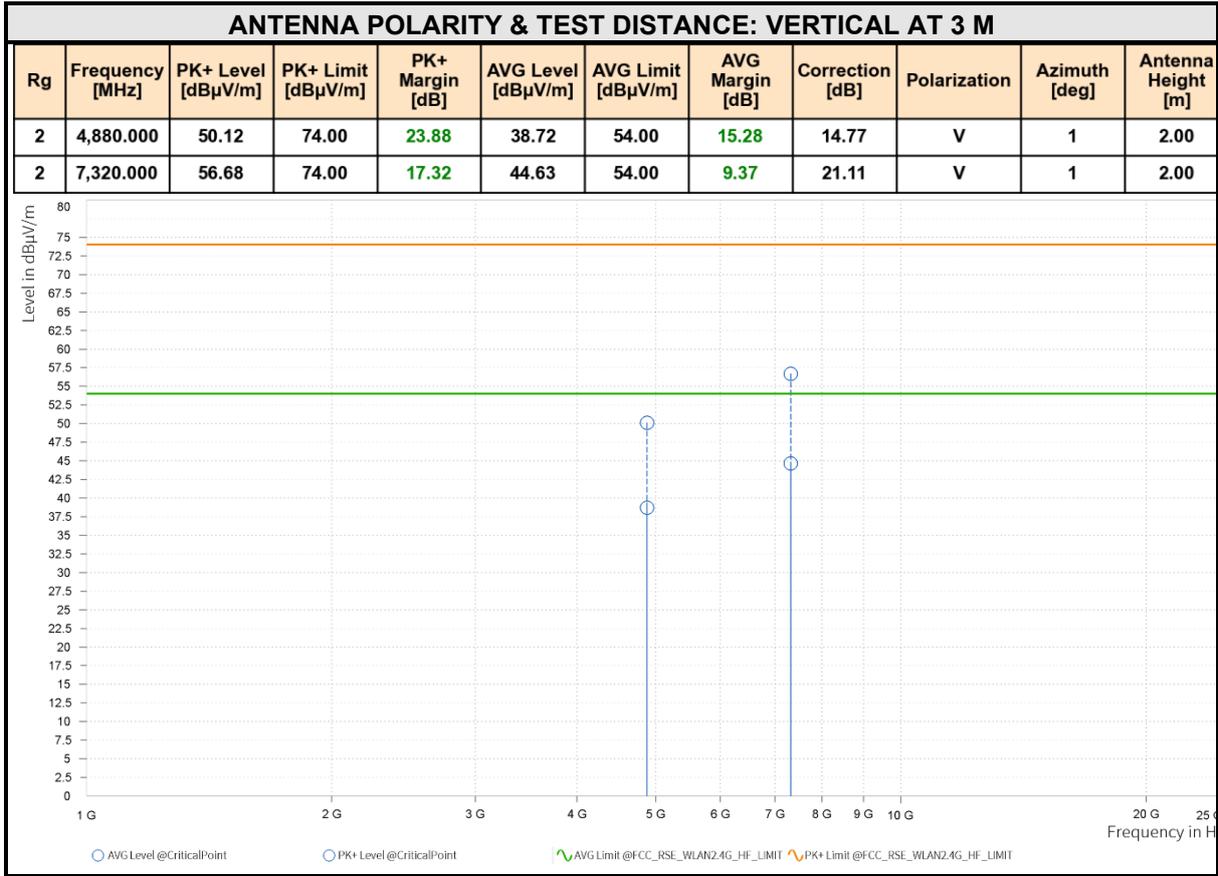


CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,880.000	49.48	74.00	24.52	38.46	54.00	15.54	14.77	H	20.6	2.00
2	7,320.000	56.21	74.00	17.79	44.78	54.00	9.22	21.11	H	269.9	2.00





REMARKS:

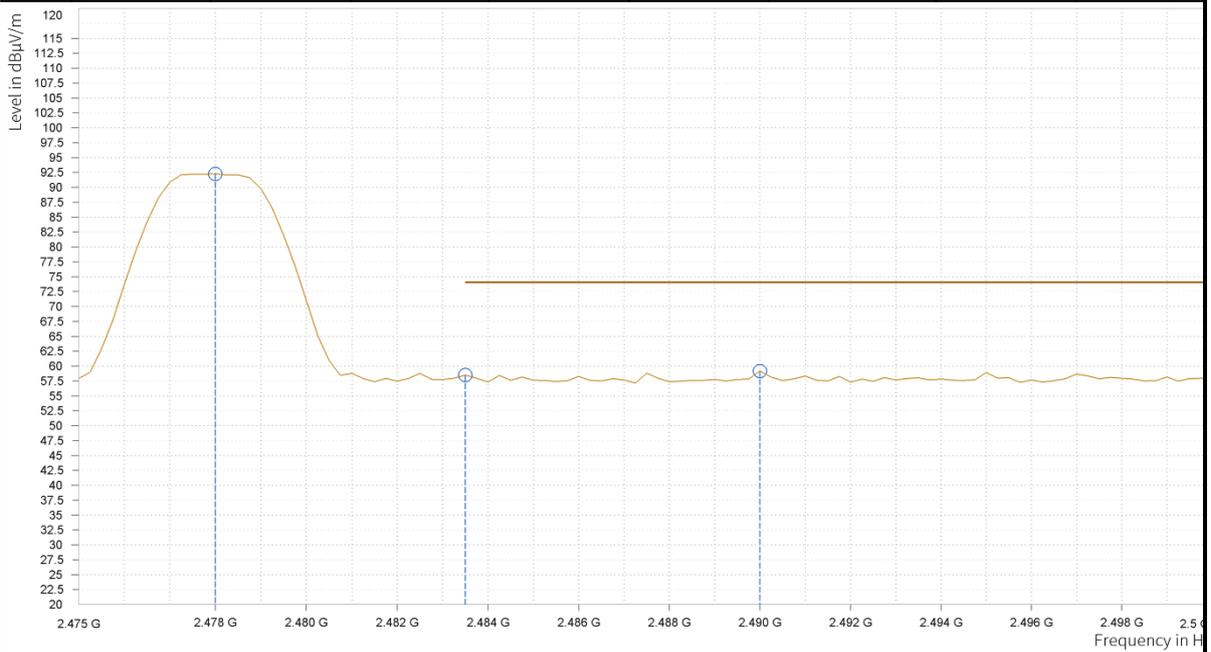
4. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor.
5. Margin value = Limit value–Emission level.
6. 2440MHz: Fundamental frequency.

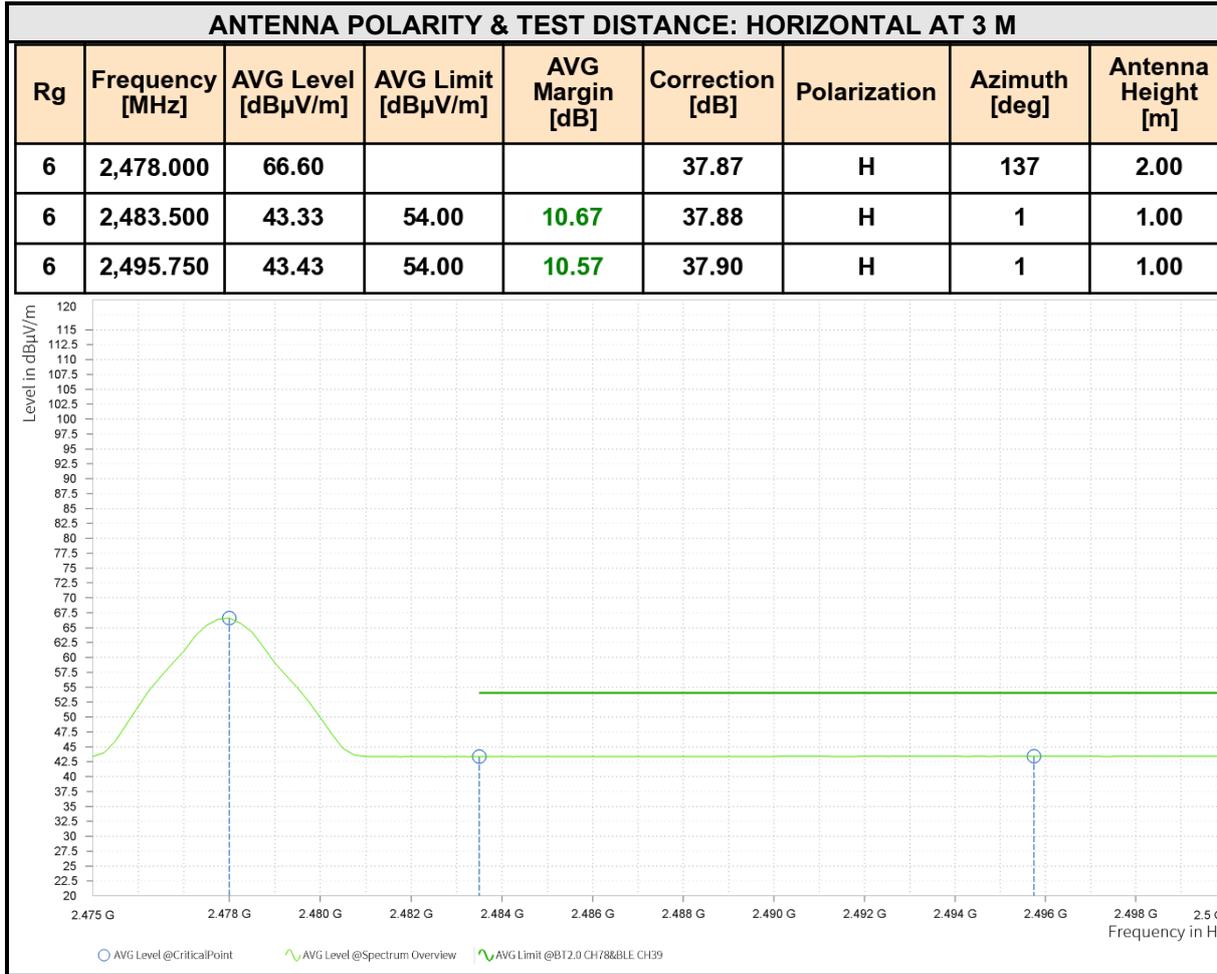


CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,478.000	92.26			37.87	H	137	2.00
6	2,483.500	58.48	74.00	15.52	37.88	H	17.5	1.00
6	2,490.000	59.19	74.00	14.81	37.89	H	46.1	2.00

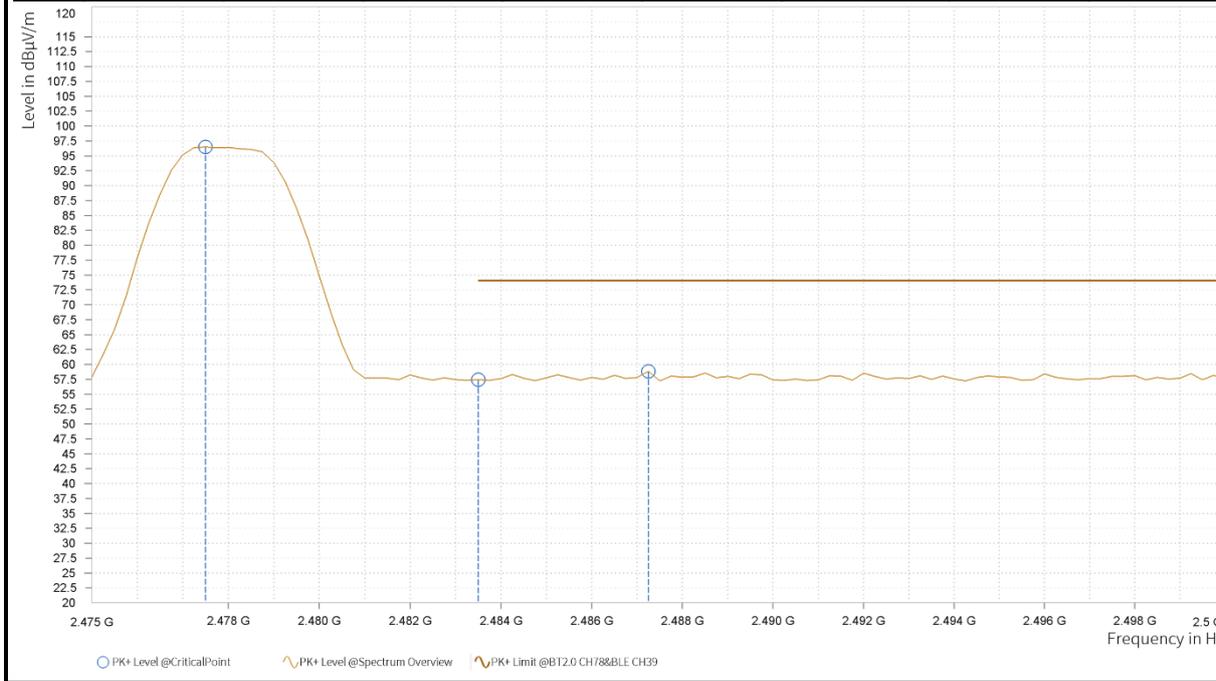


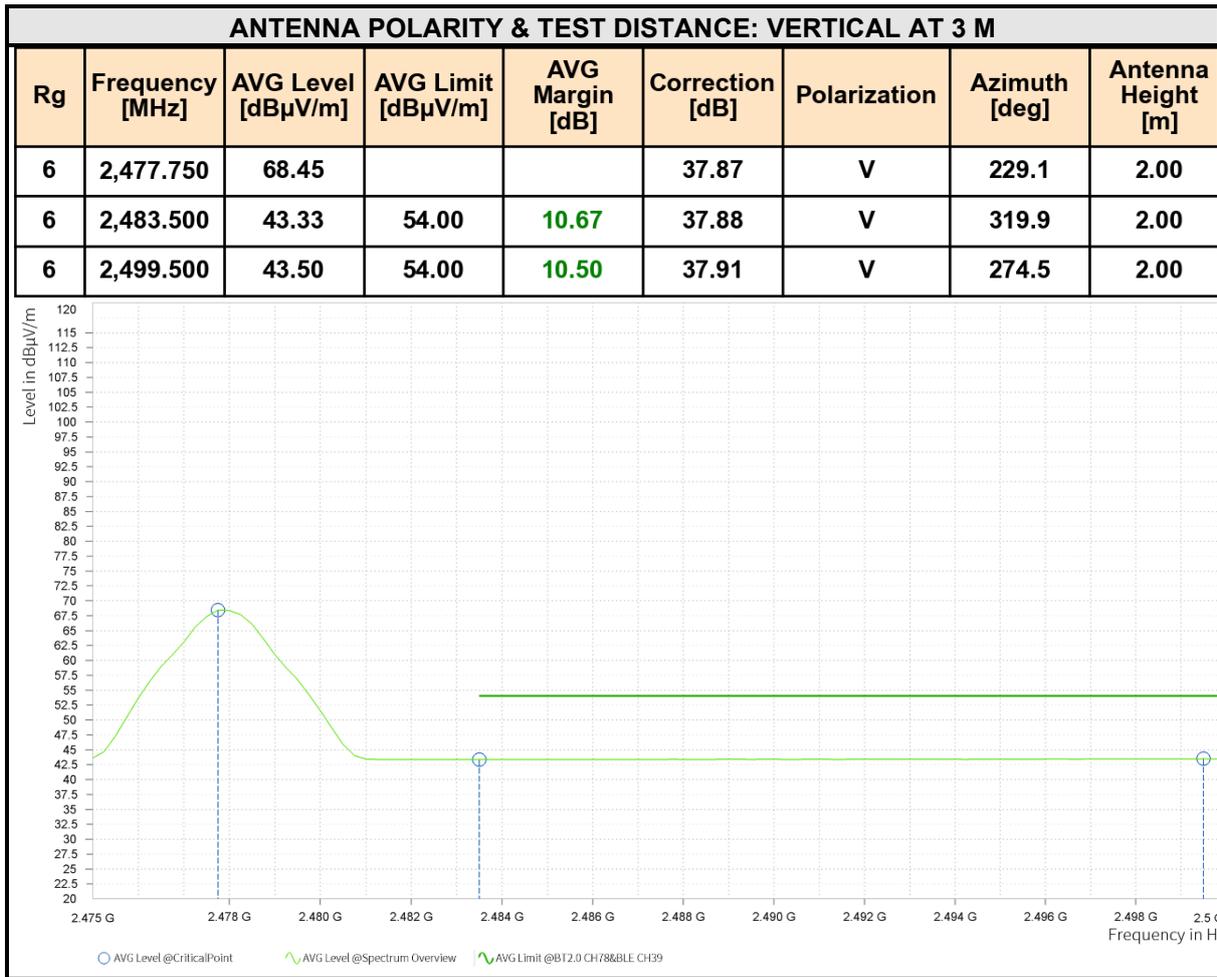




ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

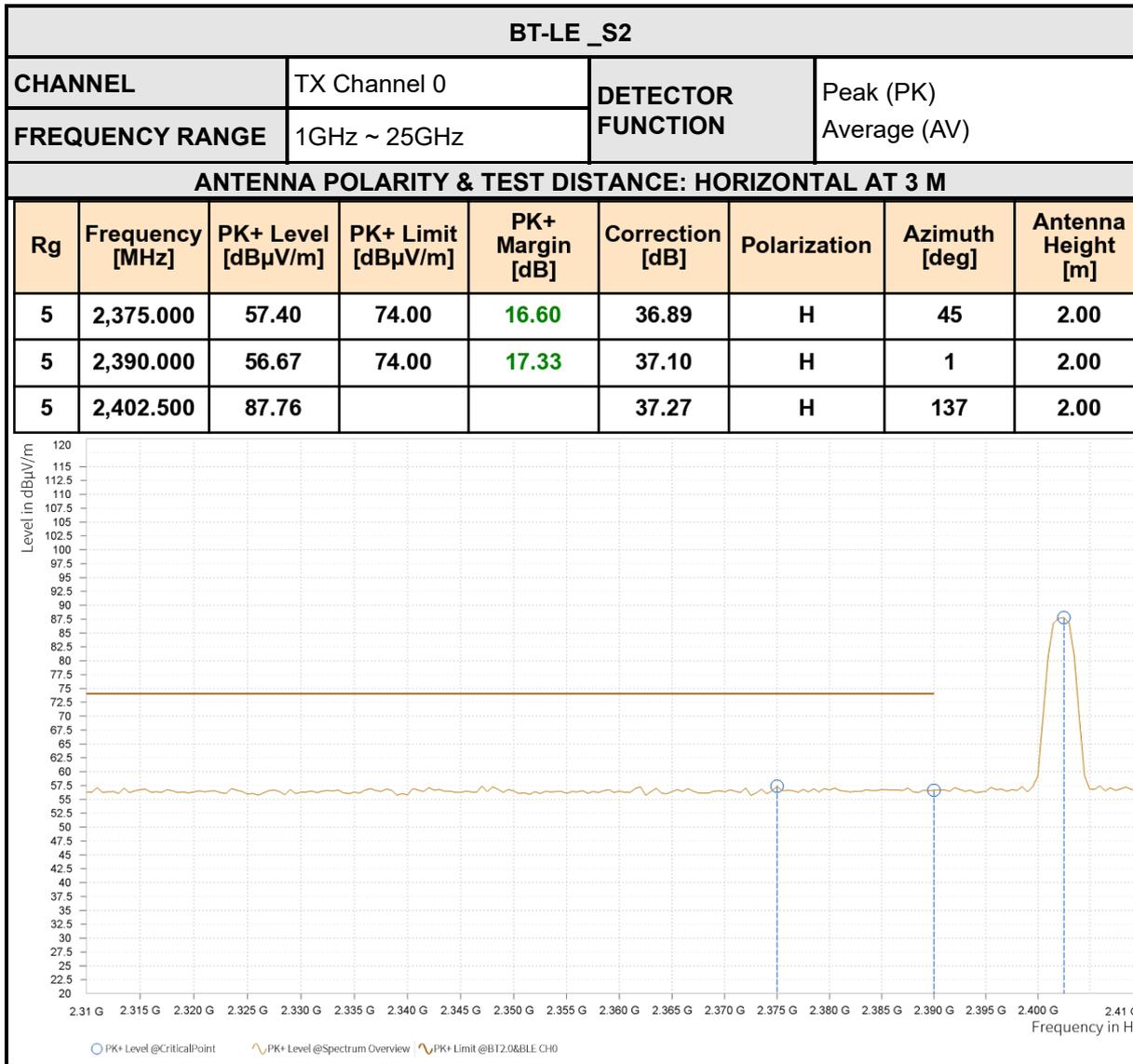
Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,477.500	96.48			37.87	V	266	1.00
6	2,483.500	57.44	74.00	16.56	37.88	V	47.3	2.00
6	2,487.250	58.83	74.00	15.17	37.89	V	311.5	1.00

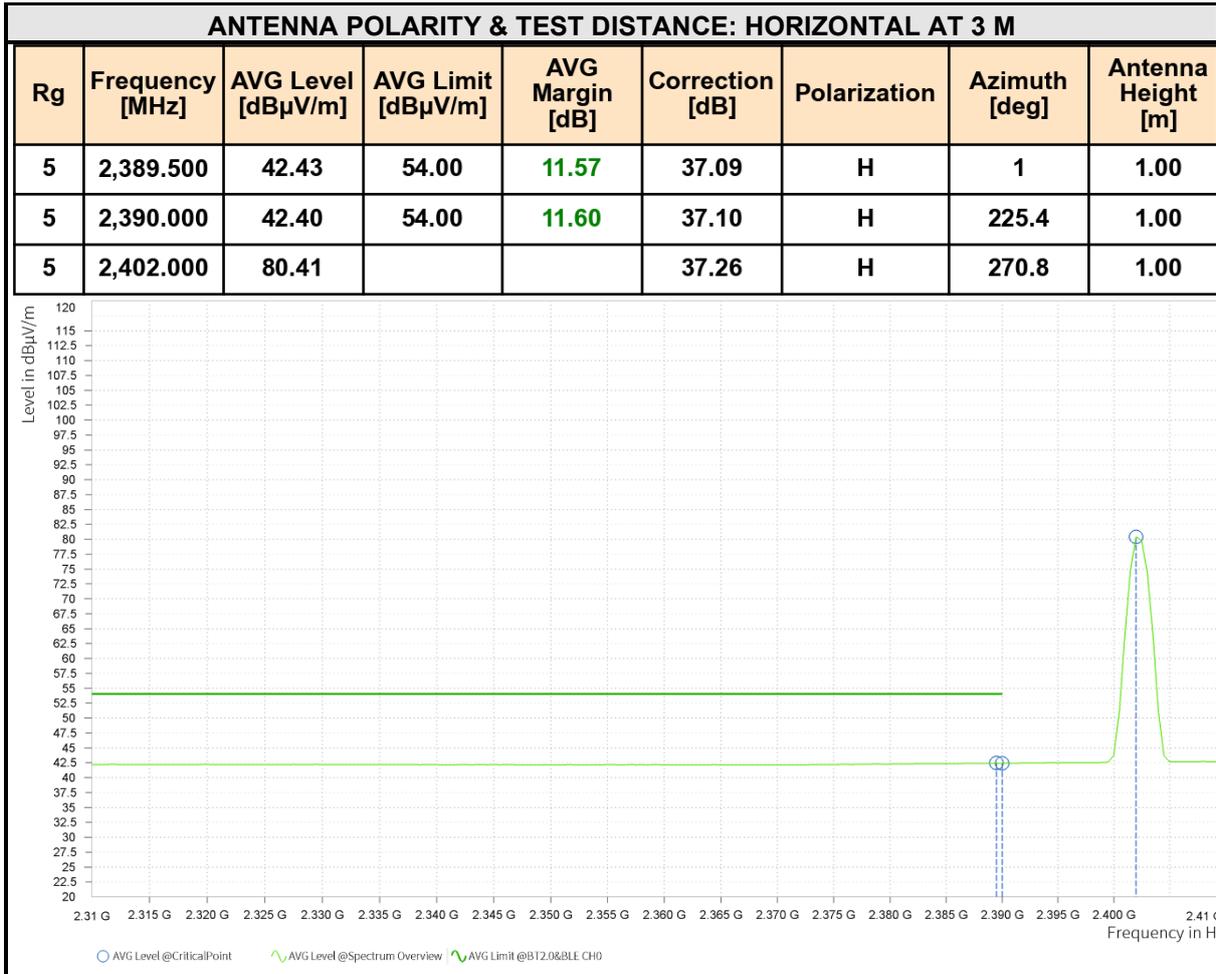




REMARKS:

4. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
5. Margin value = Limit value–Emission level.
6. 2478MHz: Fundamental frequency.

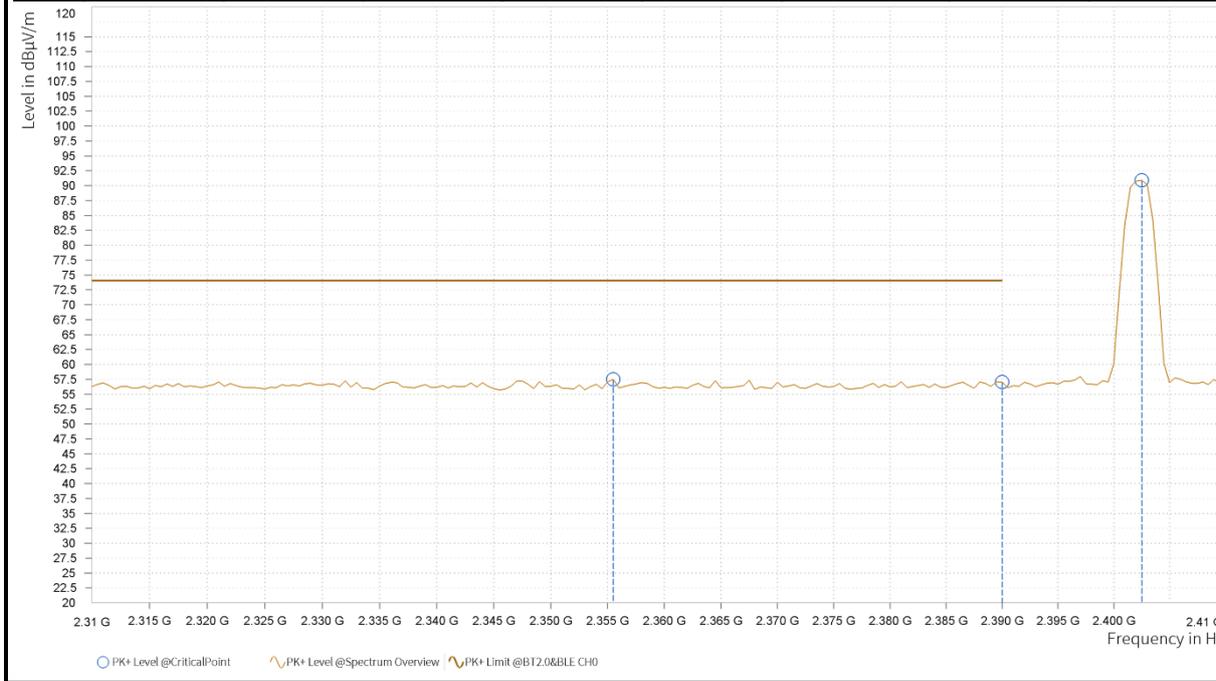


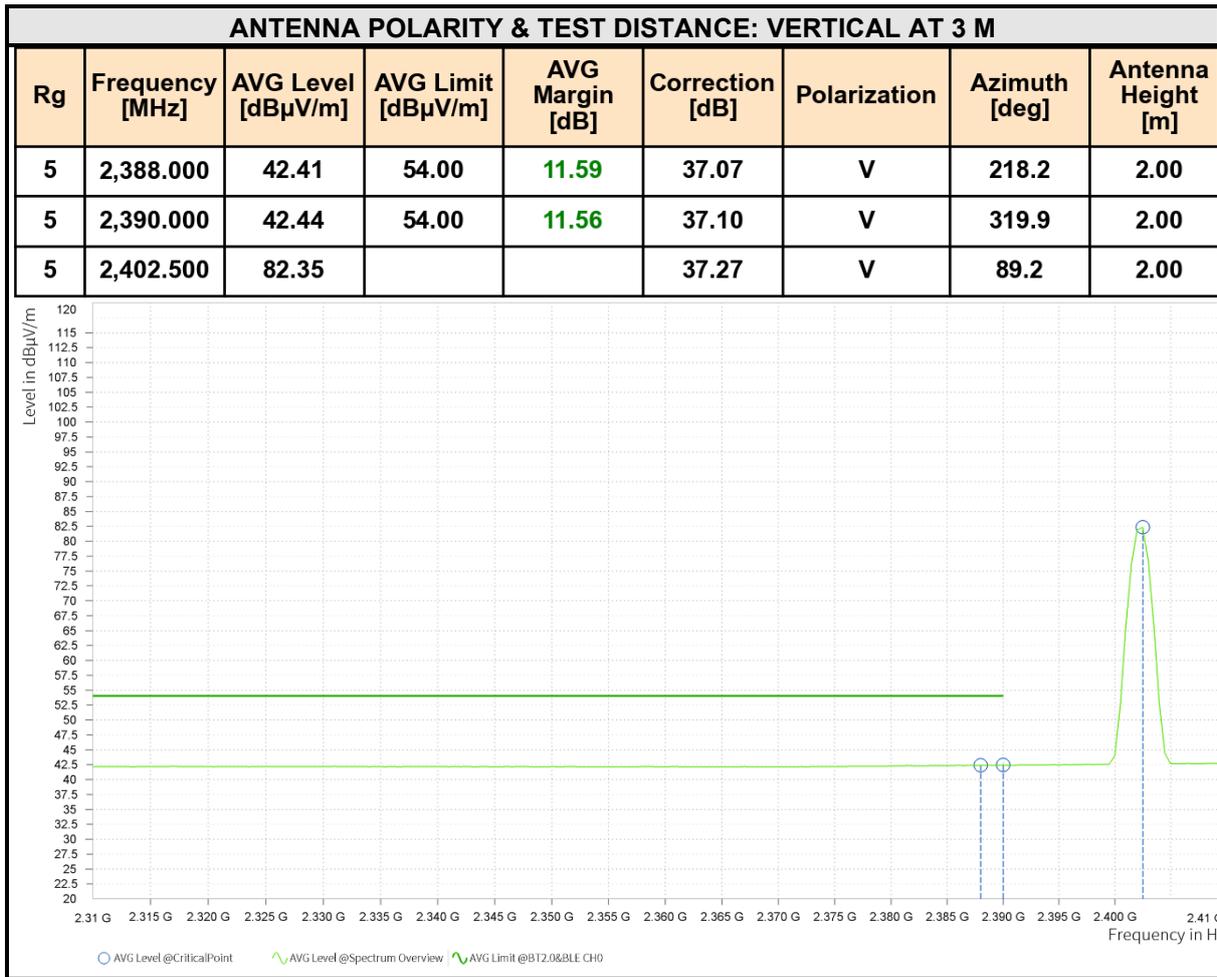




ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,355.500	57.50	74.00	16.50	36.87	V	272.1	2.00
5	2,390.000	57.04	74.00	16.96	37.10	V	359	2.00
5	2,402.500	90.89			37.27	V	91.6	2.00





REMARKS:

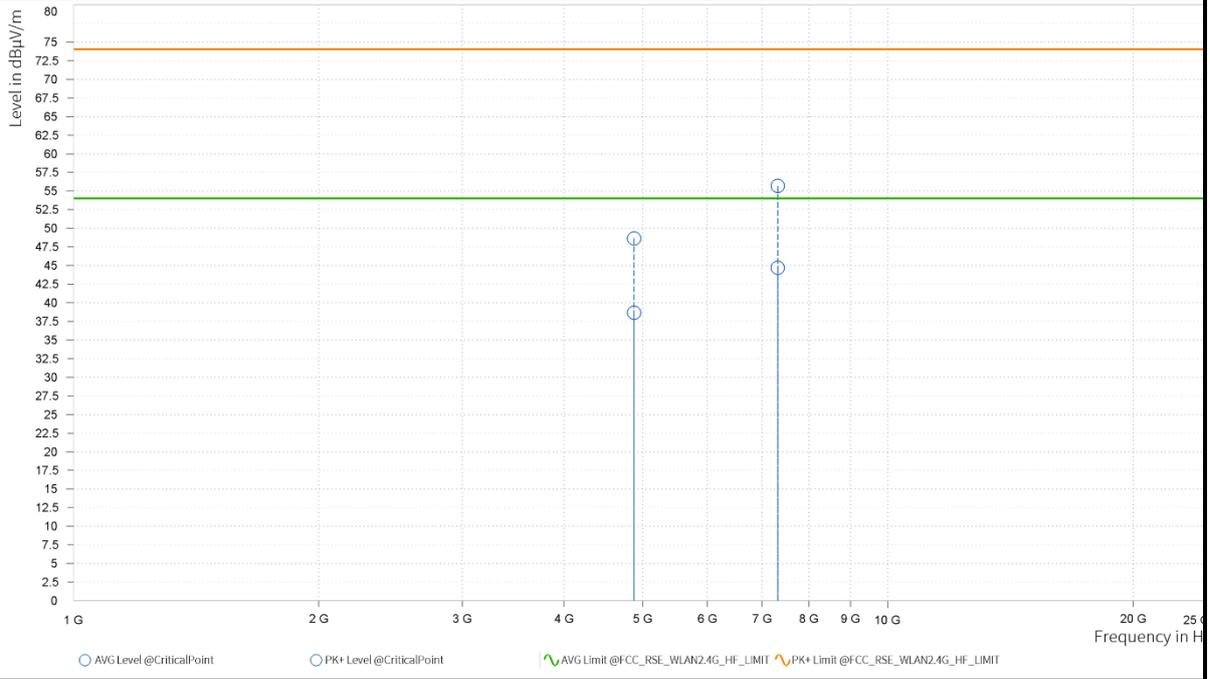
4. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
5. Margin value = Limit value–Emission level.
6. 2402MHz: Fundamental frequency.



CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

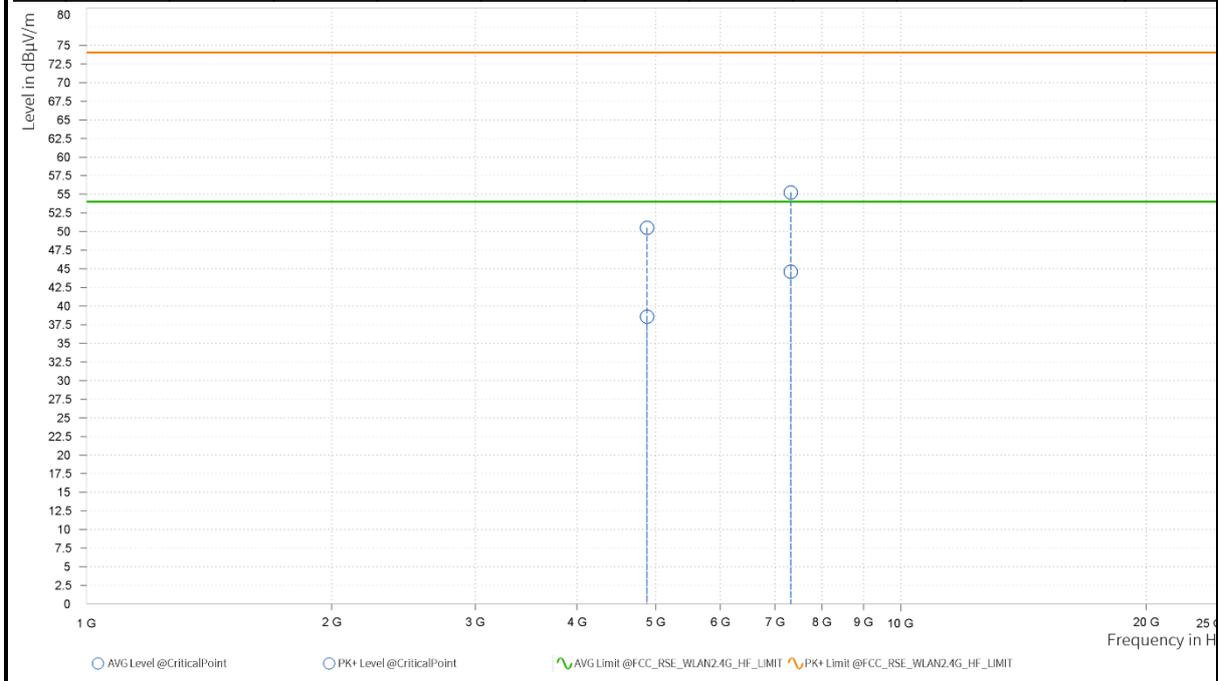
Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,880.000	48.64	74.00	25.36	38.64	54.00	15.36	14.77	H	267.5	2.00
2	7,320.000	55.67	74.00	18.33	44.70	54.00	9.30	21.11	H	267.5	2.00





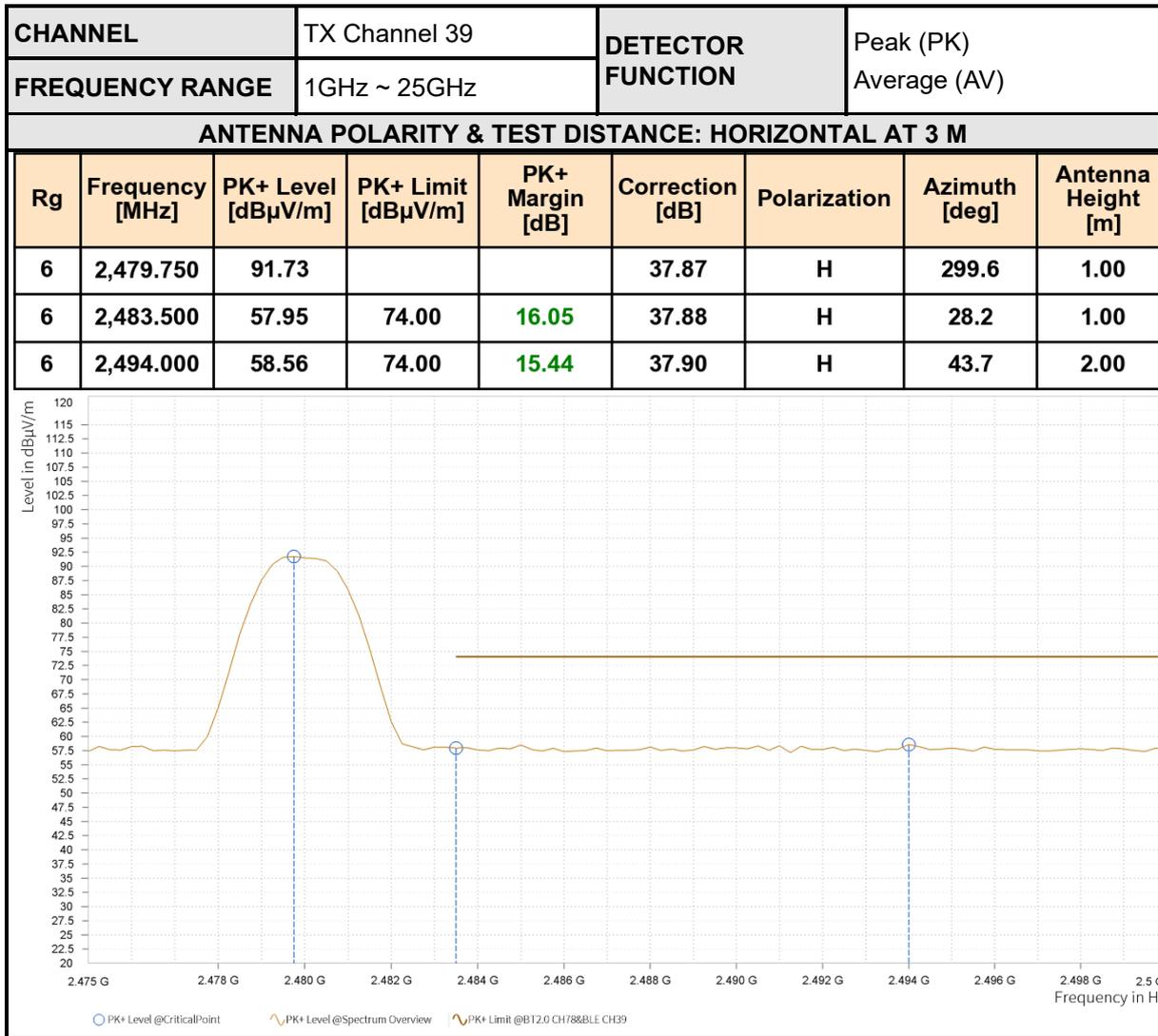
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

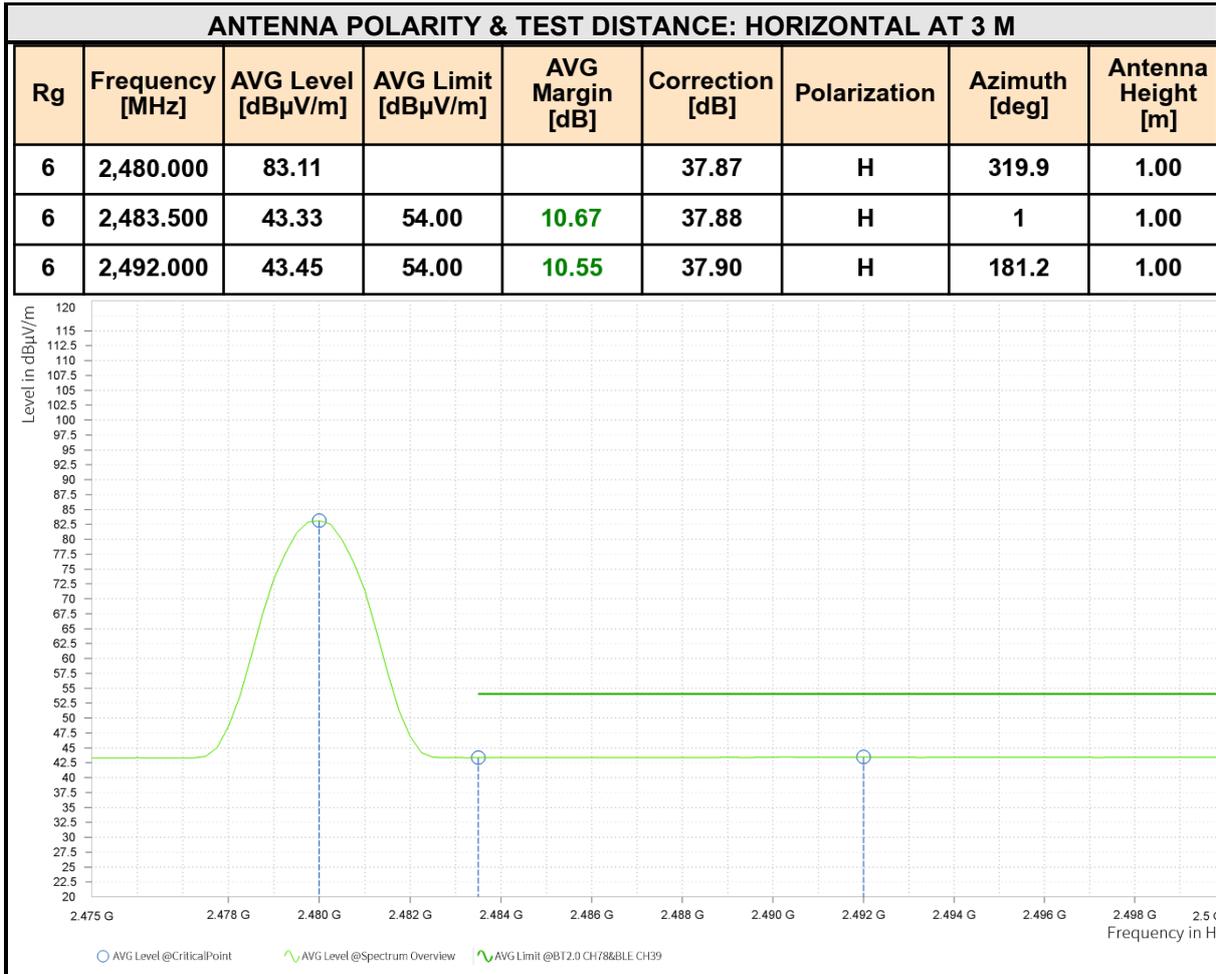
Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,880.000	50.52	74.00	23.48	38.58	54.00	15.42	14.77	V	357.2	1.00
2	7,320.000	55.24	74.00	18.76	44.61	54.00	9.39	21.11	V	266.3	2.00



REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
- Margin value = Limit value–Emission level.
- 2440MHz: Fundamental frequency.

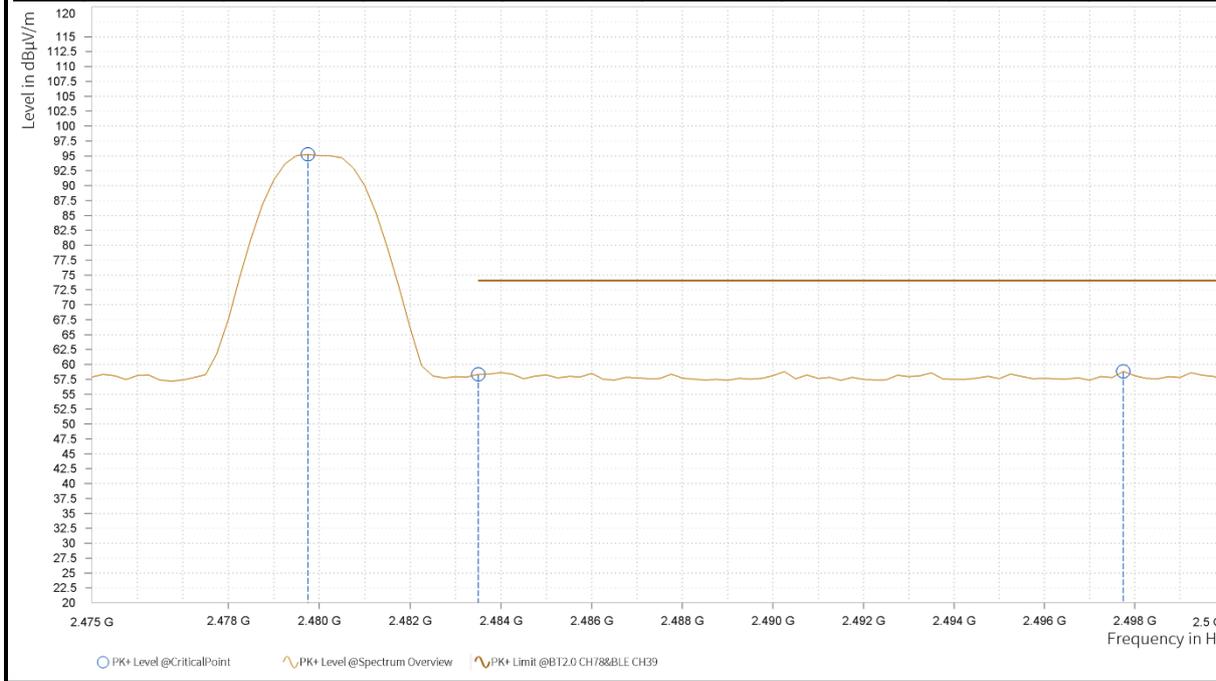


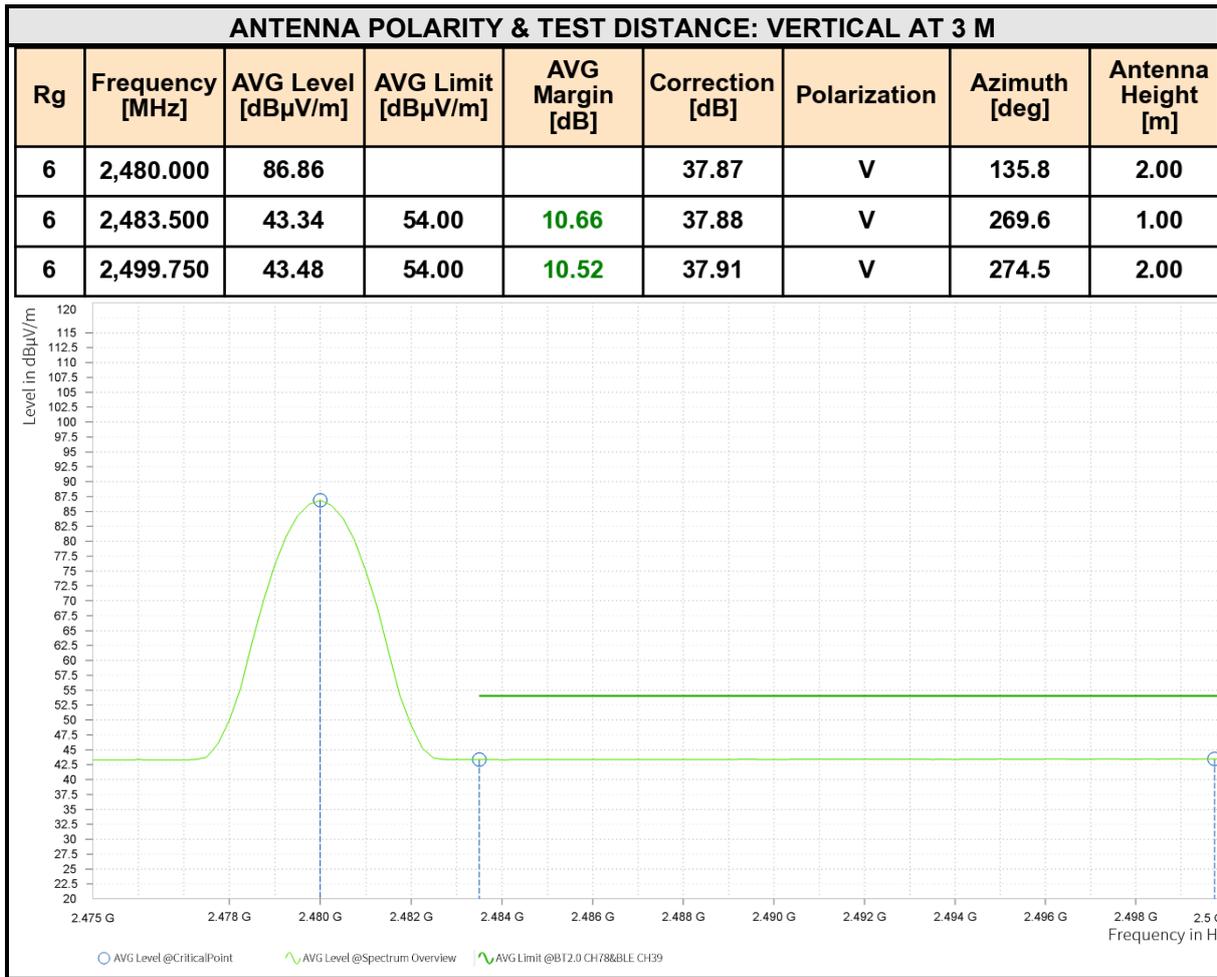




ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

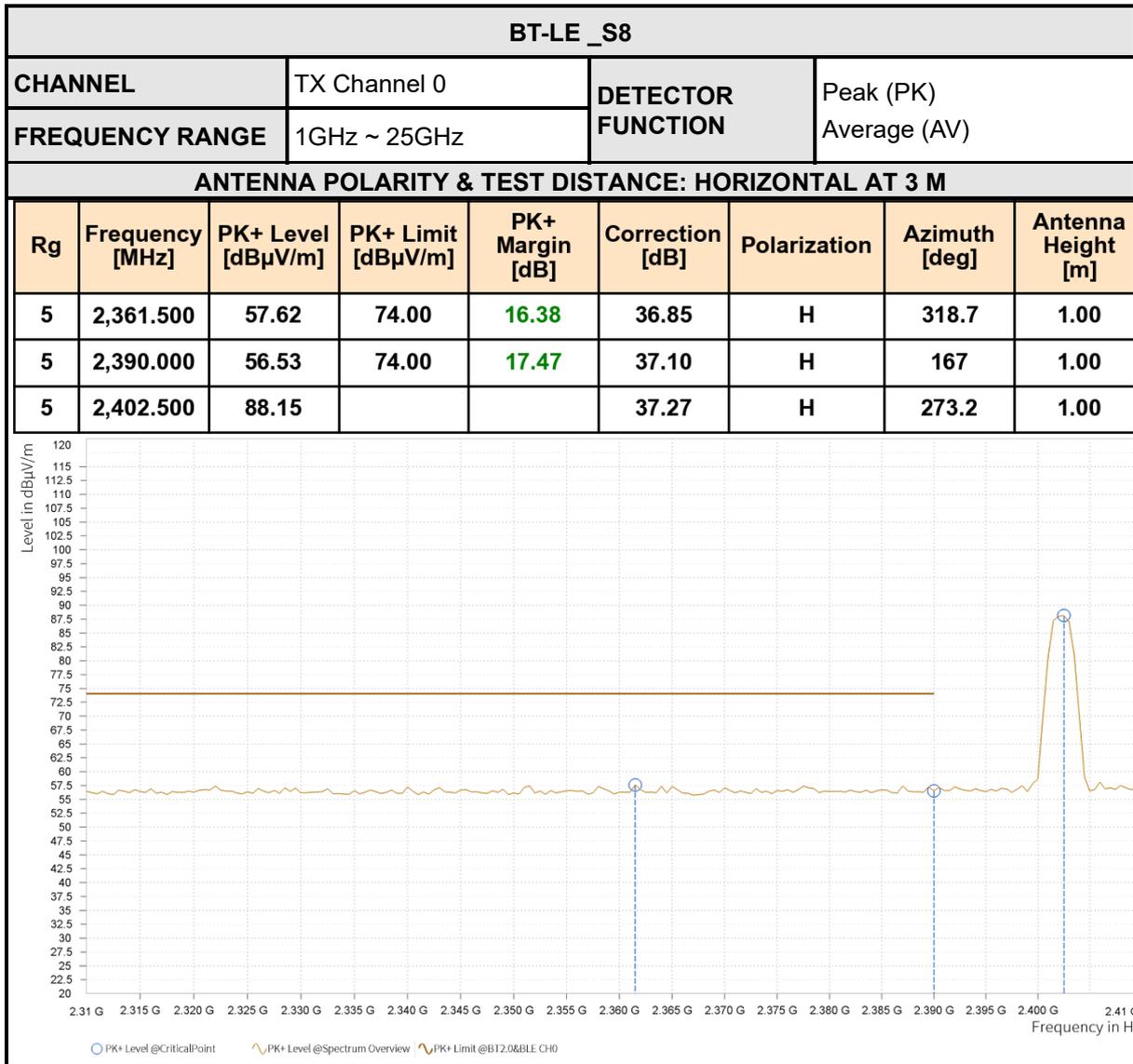
Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.750	95.24			37.87	V	269.7	1.00
6	2,483.500	58.32	74.00	15.68	37.88	V	359.1	1.00
6	2,497.750	58.82	74.00	15.18	37.91	V	312.8	1.00

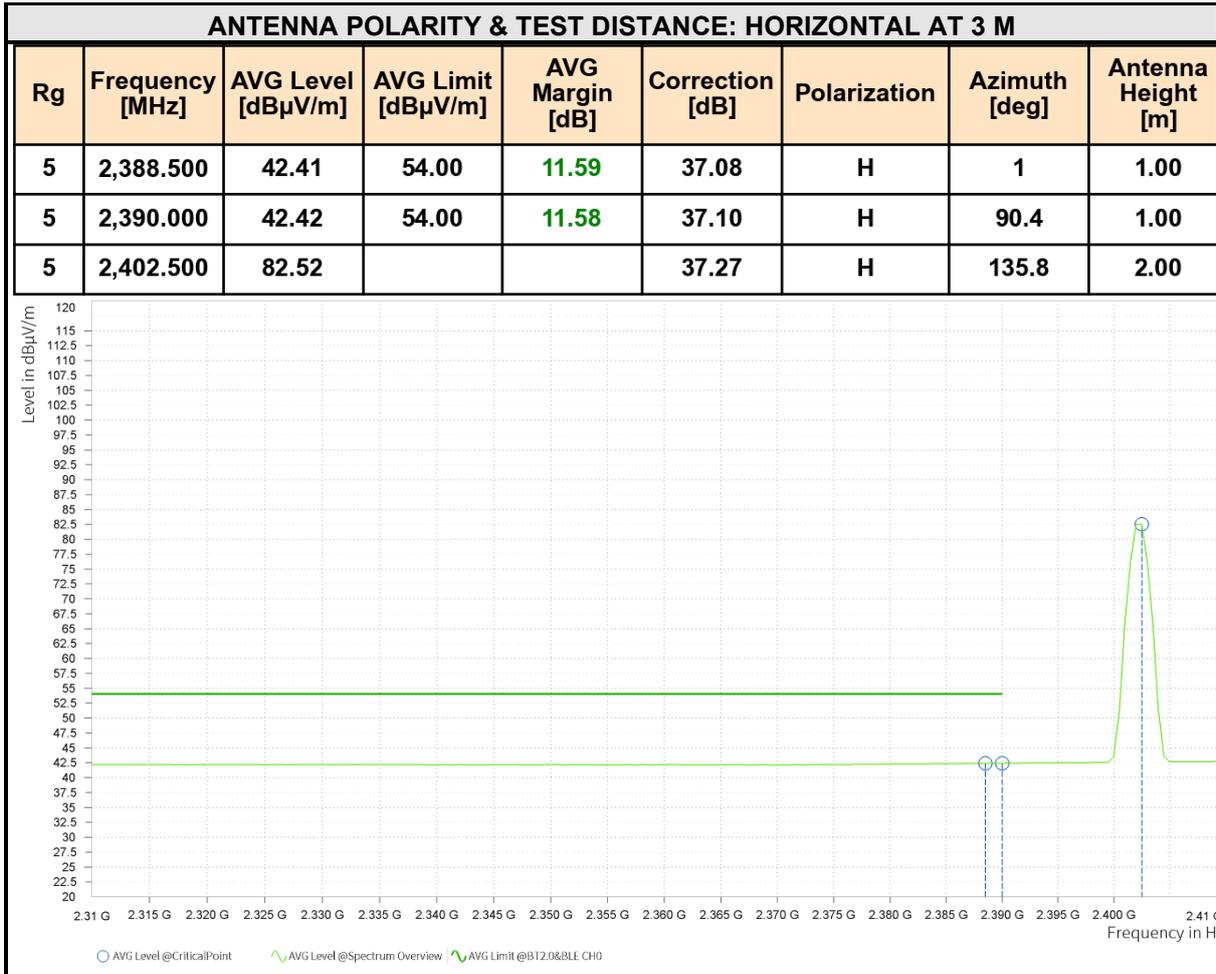


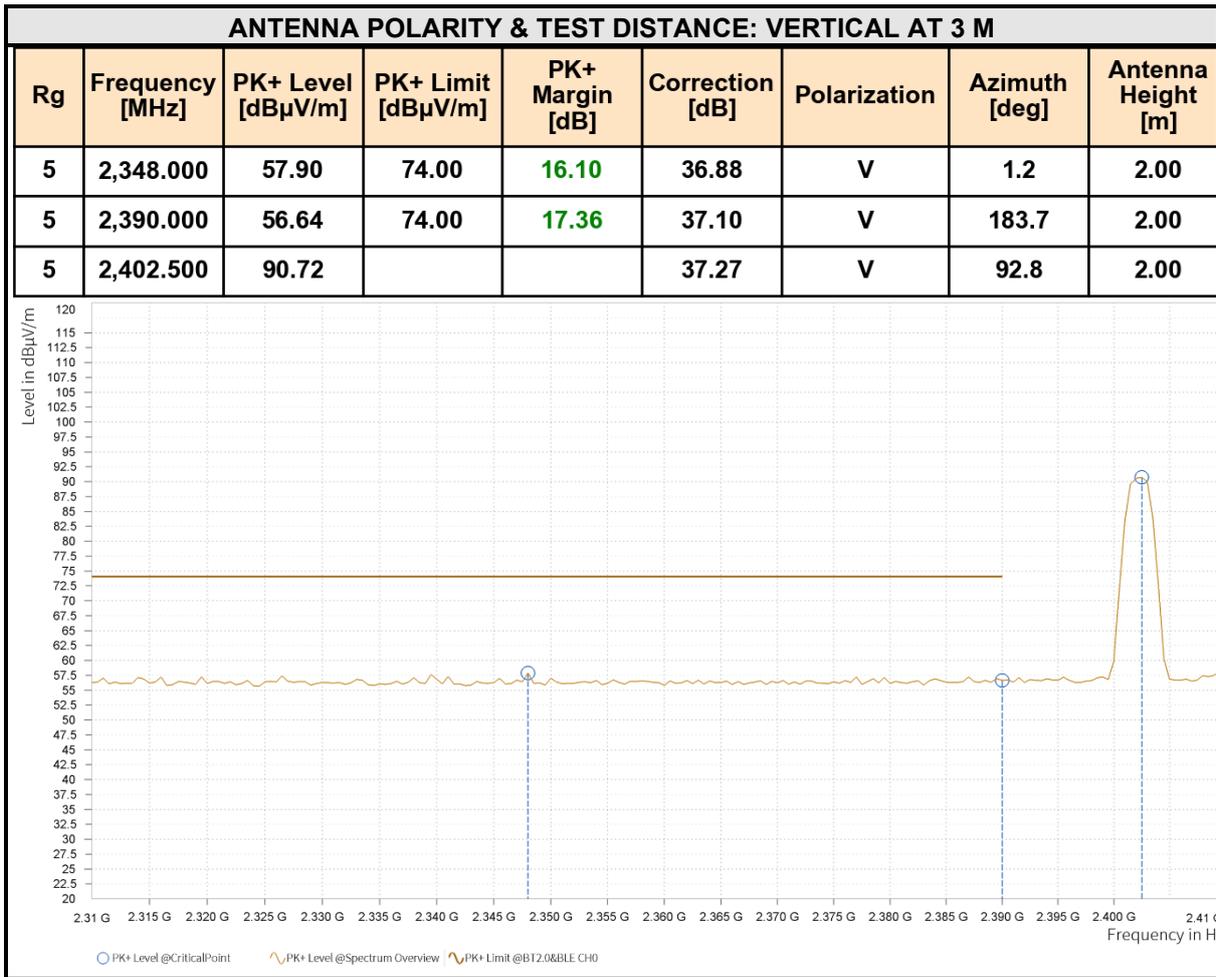


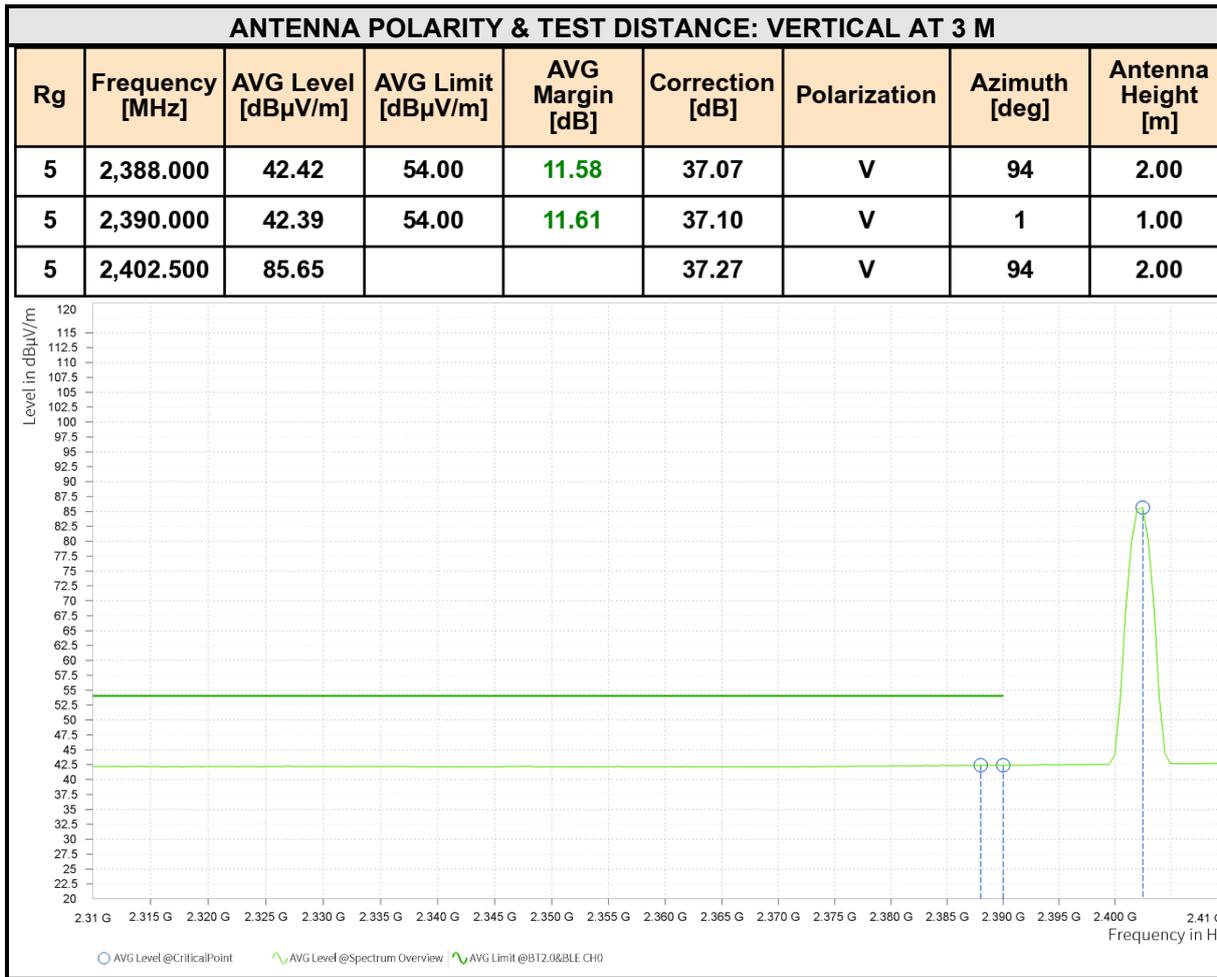
REMARKS:

4. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
5. Margin value = Limit value–Emission level.
6. 2480MHz: Fundamental frequency.









REMARKS:

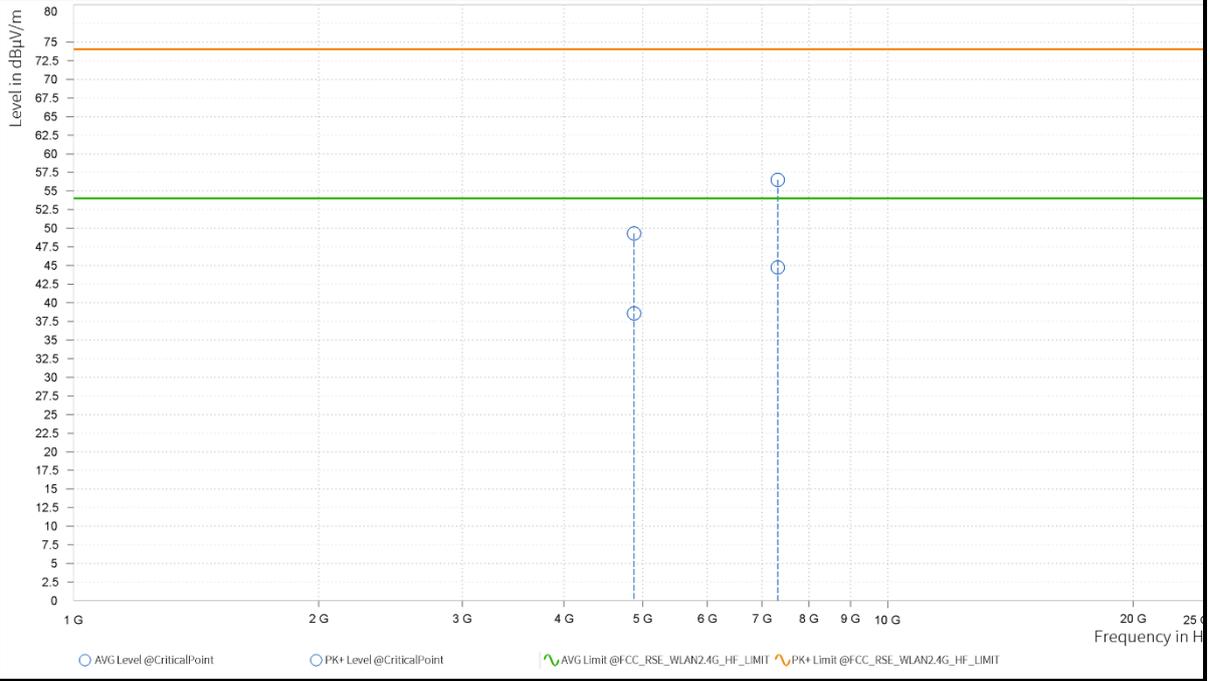
4. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor.
5. Margin value = Limit value–Emission level.
6. 2402MHz: Fundamental frequency.

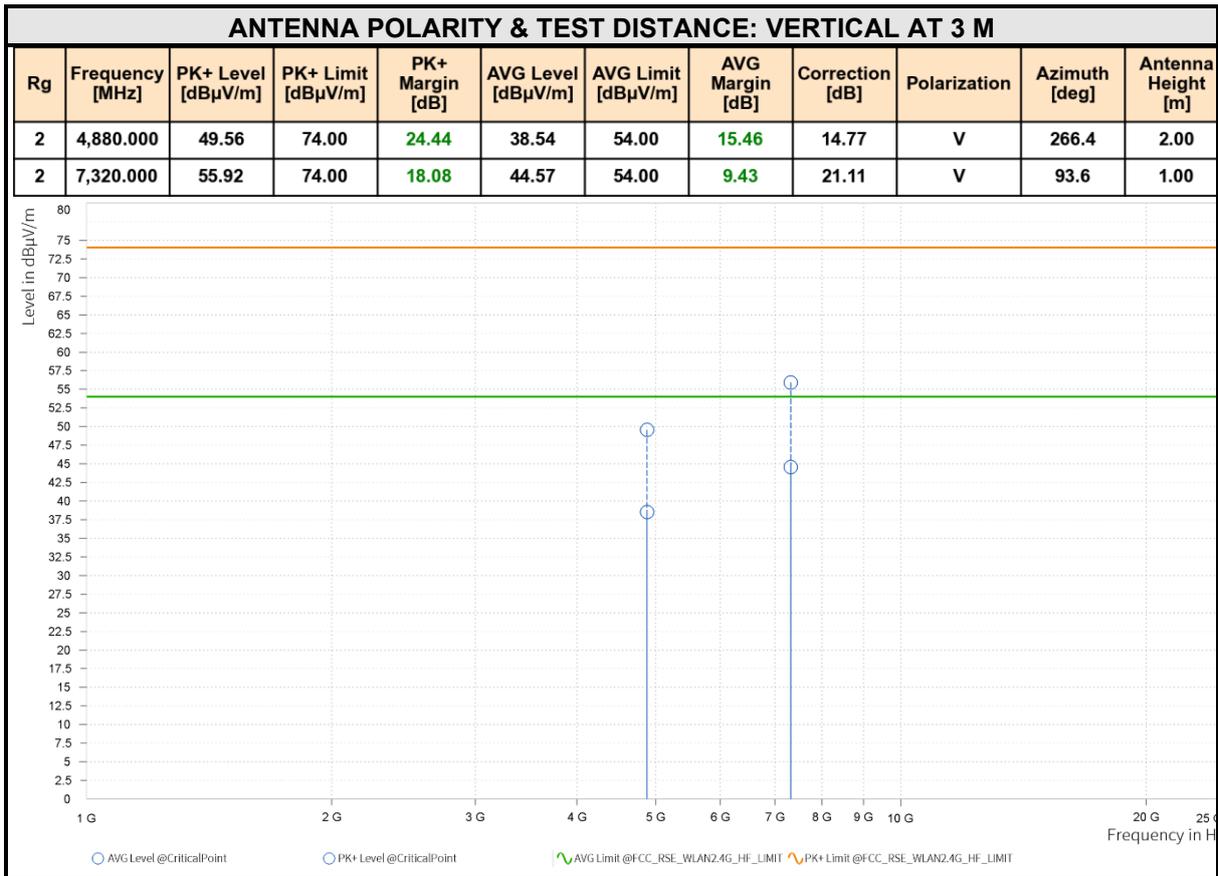


CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

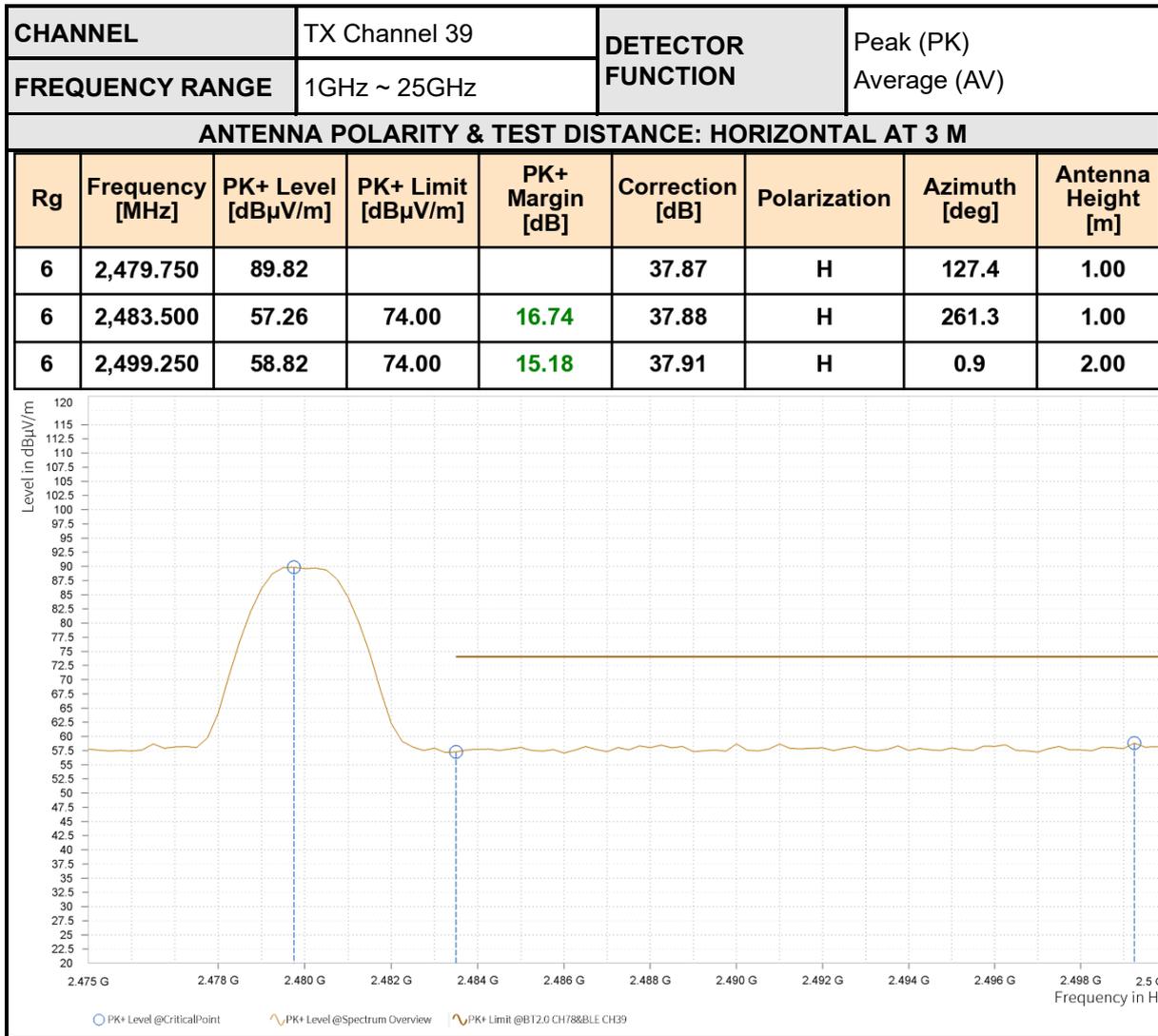
Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,880.000	49.32	74.00	24.68	38.57	54.00	15.43	14.77	H	267.5	2.00
2	7,320.000	56.49	74.00	17.51	44.73	54.00	9.27	21.11	H	267.5	2.00

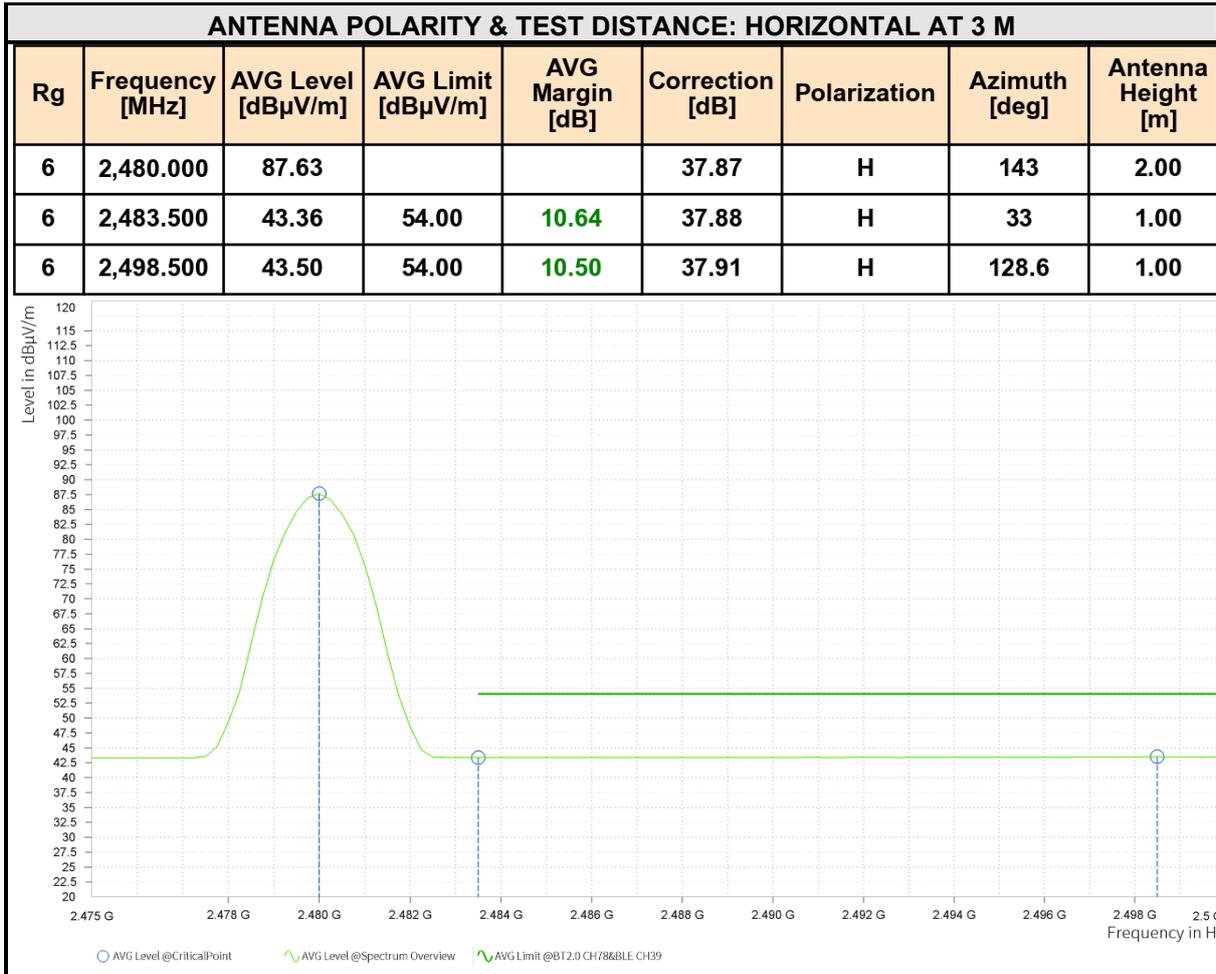




REMARKS:

4. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
5. Margin value = Limit value–Emission level.
6. 2440MHz: Fundamental frequency.

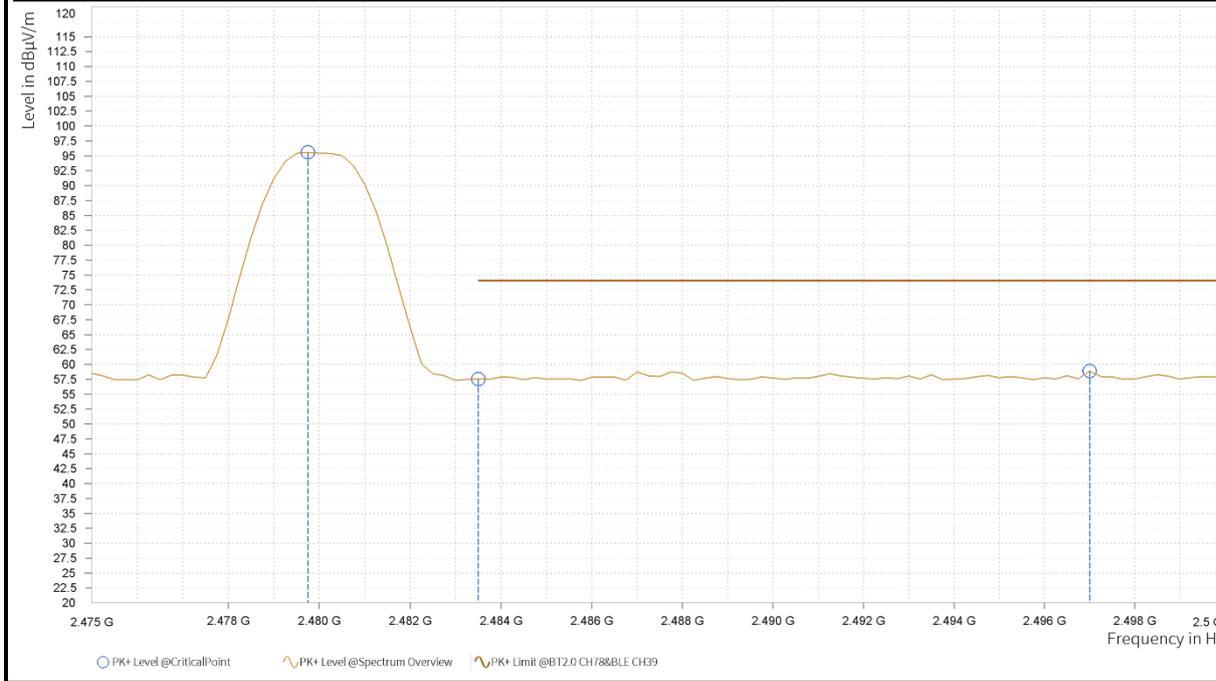


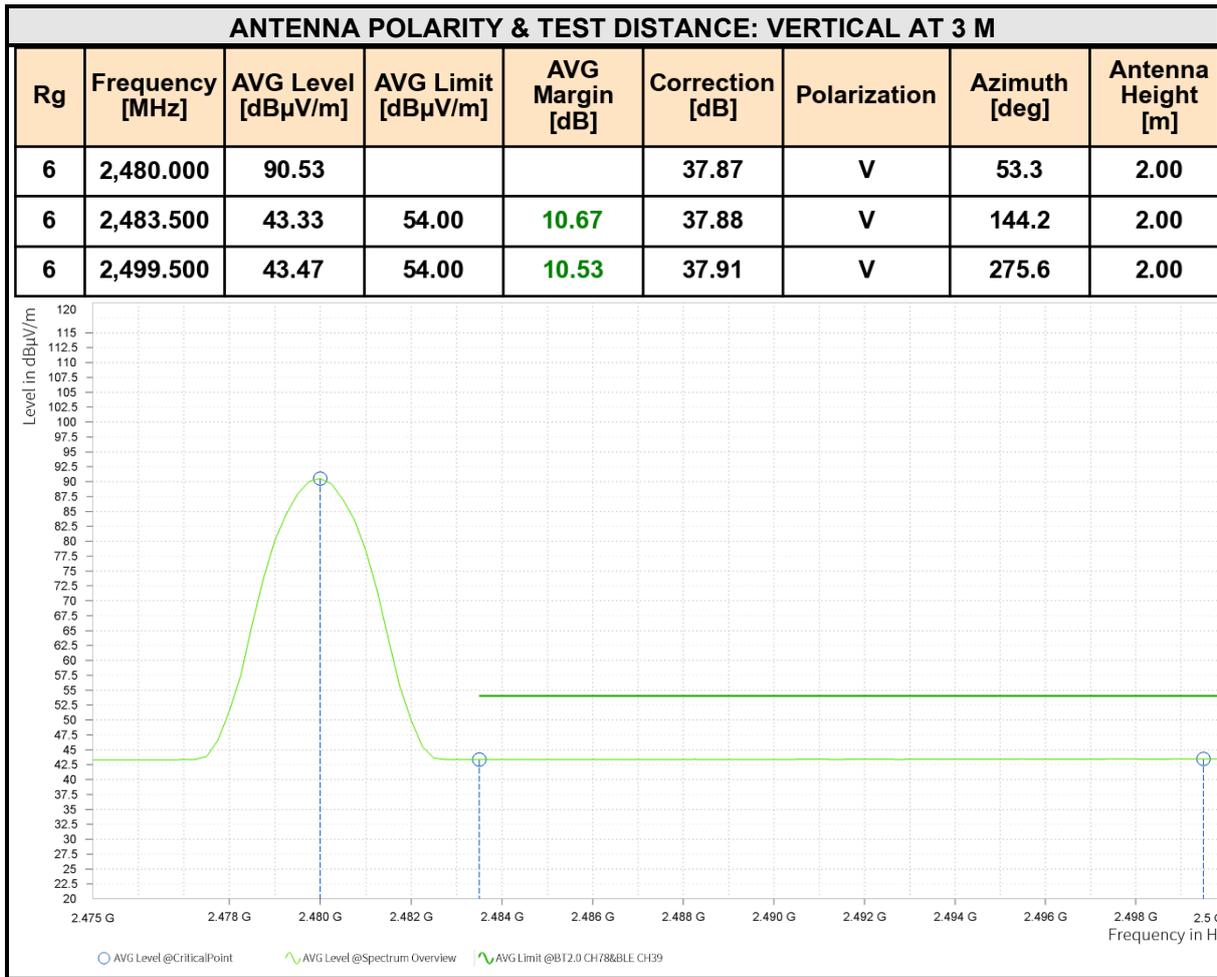




ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.750	95.56			37.87	V	263.6	1.00
6	2,483.500	57.55	74.00	16.45	37.88	V	53.3	2.00
6	2,497.000	58.89	74.00	15.11	37.91	V	358.4	1.00





REMARKS:

4. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
5. Margin value = Limit value–Emission level.
6. 2480MHz: Fundamental frequency.

**3.3 6 dB BANDWIDTH MEASUREMENT****3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT**

The minimum 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	R&S	ESW 44	101973	Mar.28,24	Mar.27,26
Open Switch and Control Unit	R&S	OSP-B157W8	100836	N/A	N/A
Vector Signal Generator	R&S	SMBV100B	102176	Mar.29,24	Mar.28,26
Signal Generator	R&S	SMB100A03	182185	Mar.29,24	Mar.28,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Hygrothermograph	DELI	20210528	SZ015	Mar.18,25	Mar.17,27
PC	LENOVO	E14	HRSW0024	N/A	N/A
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.26,25	Apr.25,26
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.26,25	Apr.25,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26
Power Meter	R&S	NRX	102380	Mar.28,24	Mar.27,26
Power Meter probe	R&S	NRP6A	102942	Mar.28,24	Mar.27,26

NOTE:

1. The calibration interval of the above test instruments is 12/ 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.



3.3.3 TEST PROCEDURE

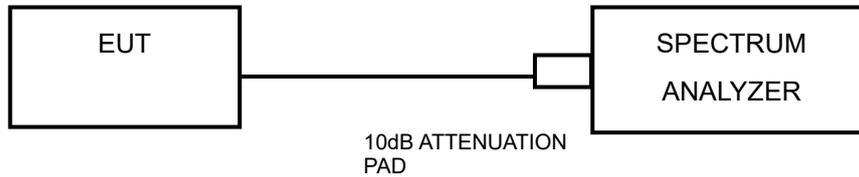
1. Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.3.7 TEST RESULTS

Please Refer to Appendix B Of this test report.

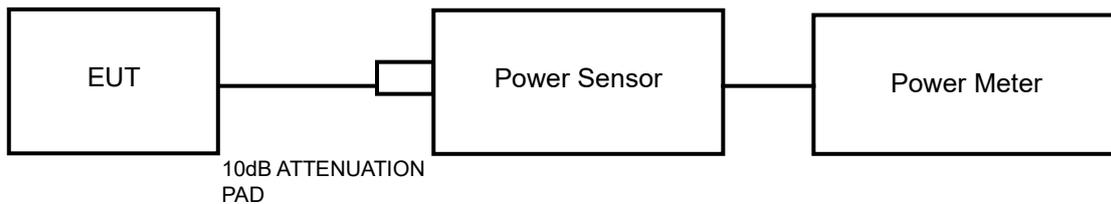


3.4 CONDUCTED OUTPUT POWER

3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



BUREAU VERITAS Test Report No.: PSU-QBJ2507100110RF02

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix B Of this test report.



Test Report No.: PSU-QBJ2507100110RF02

3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

Please Refer to Appendix B Of this test report.

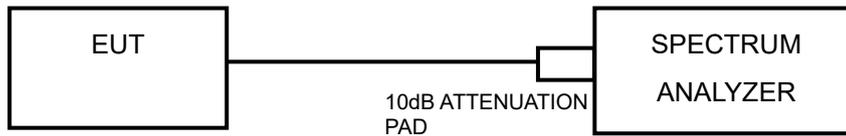


3.5 POWER SPECTRAL DENSITY MEASUREMENT

3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.5.4 TEST PROCEDURE

1. Set the span > 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW ≥ 3 x RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



BUREAU VERITAS Test Report No.: PSU-QBJ2507100110RF02

3.5.7 TEST RESULTS

Please Refer to Appendix B Of this test report.

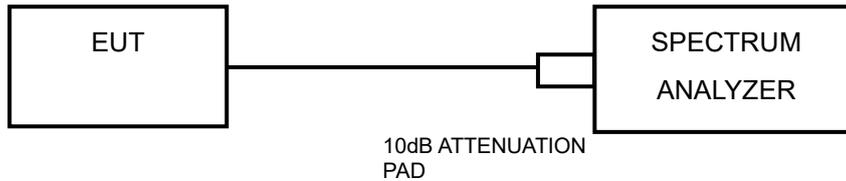


3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix B Of this test report.



3.7 ANTENNA REQUIREMENTS

3.7.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.7.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

3.7.3 ANTENNA GAIN

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit and PSD limit. (单天线用)

According to FCC KDB 662911 D01 Multiple Transmitter Output v02r01 (双天线用)

For CDD transmissions, directional gain is calculated as

Directional gain=GANT +Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain= 10 log(NANT/ Nss) dB;

For power measurements on IEEE 802.11 devices,Array Gain = 0 dB for NANT≤ 4;

The EUT supports Cyclic Delay Diversity (CDD) mode,

For power measurements,the directional GANT is set equal to the antenna having the highest gain as following formulas.

$$\text{Directional Gain} = \text{Max.Gain} + \text{Array Gain.}$$

For PSD measurements,the directional GANT is calculation is following F)2)f)ii of KDB 662911 D01 v02r01.

The directional gain is calculated as following table.

2.4GHz	Ant 9 (dBi)	Ant 10 (dBi)	DG For Power (dBi)	DG For PSD (dBi)	Beamforming Gain	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	-2	-2	-2	1.01	1.01	0.00	0.00

NOTE: DG= directional gain, Power Limit Reduction = DG For Power Gain -6dBi<0
PSD Limit Reduction = DG For PSD - 6dBi<0. Therefore, it is not necessary to reduce maximum peak output power and PSD limit.



4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



Test Report No.: PSU-QBJ2507100110RF02

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.



6 APPENDIX A:WIFI

DTS BANDWIDTH

TEST RESULT

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant10	2412	7.200	2408.400	2415.600	0.5	PASS
11B-CDD	Ant7	2412	7.520	2408.000	2415.520	0.5	PASS
11B-CDD	Ant10	2437	7.480	2433.040	2440.520	0.5	PASS
11B-CDD	Ant7	2437	7.440	2433.040	2440.480	0.5	PASS
11B-CDD	Ant10	2462	7.120	2458.400	2465.520	0.5	PASS
11B-CDD	Ant7	2462	7.680	2458.040	2465.720	0.5	PASS
11G-CDD	Ant10	2412	15.800	2404.080	2419.880	0.5	PASS
11G-CDD	Ant7	2412	15.960	2403.960	2419.920	0.5	PASS
11G-CDD	Ant10	2437	15.480	2429.040	2444.520	0.5	PASS
11G-CDD	Ant7	2437	15.560	2429.400	2444.960	0.5	PASS
11G-CDD	Ant10	2462	16.160	2453.880	2470.040	0.5	PASS
11G-CDD	Ant7	2462	15.760	2453.920	2469.680	0.5	PASS
11N20MIMO	Ant10	2412	16.840	2403.760	2420.600	0.5	PASS
11N20MIMO	Ant7	2412	16.280	2403.720	2420.000	0.5	PASS
11N20MIMO	Ant10	2437	16.880	2428.480	2445.360	0.5	PASS
11N20MIMO	Ant7	2437	17.080	2428.280	2445.360	0.5	PASS
11N20MIMO	Ant10	2462	16.800	2453.600	2470.400	0.5	PASS
11N20MIMO	Ant7	2462	16.760	2453.600	2470.360	0.5	PASS
11N40MIMO	Ant10	2422	35.520	2404.080	2439.600	0.5	PASS
11N40MIMO	Ant7	2422	35.360	2404.080	2439.440	0.5	PASS
11N40MIMO	Ant10	2437	35.600	2419.080	2454.680	0.5	PASS
11N40MIMO	Ant7	2437	34.640	2419.320	2453.960	0.5	PASS
11N40MIMO	Ant10	2452	35.520	2433.920	2469.440	0.5	PASS
11N40MIMO	Ant7	2452	35.040	2434.320	2469.360	0.5	PASS
11AX20MIMO	Ant10	2412	17.880	2403.080	2420.960	0.5	PASS
11AX20MIMO	Ant7	2412	18.200	2403.160	2421.360	0.5	PASS
11AX20MIMO	Ant10	2437	17.400	2427.960	2445.360	0.5	PASS
11AX20MIMO	Ant7	2437	17.960	2427.960	2445.920	0.5	PASS
11AX20MIMO	Ant10	2462	17.600	2452.880	2470.480	0.5	PASS
11AX20MIMO	Ant7	2462	18.080	2452.640	2470.720	0.5	PASS
11AX40MIMO	Ant10	2422	36.480	2403.600	2440.080	0.5	PASS



11AX40MIMO	Ant7	2422	35.920	2404.000	2439.920	0.5	PASS
11AX40MIMO	Ant10	2437	35.440	2419.160	2454.600	0.5	PASS
11AX40MIMO	Ant7	2437	32.880	2419.560	2452.440	0.5	PASS
11AX40MIMO	Ant10	2452	37.120	2433.200	2470.320	0.5	PASS
11AX40MIMO	Ant7	2452	35.920	2433.360	2469.280	0.5	PASS

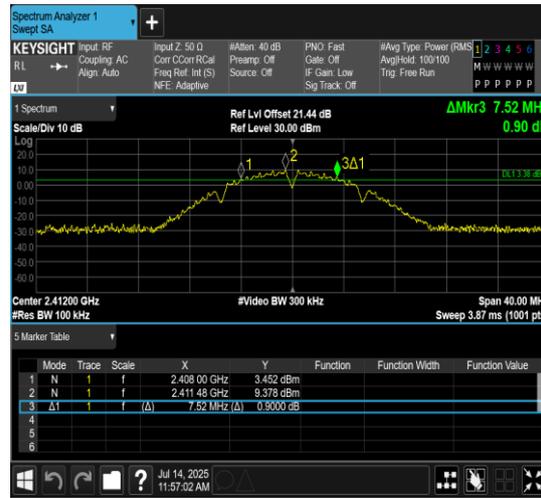


TEST GRAPHS

11B-CDD-Ant10-2412-PASS



11B-CDD-Ant7-2412-PASS



11B-CDD-Ant10-2437-PASS



11B-CDD-Ant7-2437-PASS



11B-CDD-Ant10-2462-PASS



11B-CDD-Ant7-2462-PASS

