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VERITAS

Test Report No.: PSU-NQN2412090110RF08



Certificate #6613.01

# FCC TEST REPORT

## (Part 15, Subpart C)

Applicant:	HMD Global Oy
Address:	Bertel Jungin aukio 9, 02600 Espoo, Finland

Manufacturer or Supplier:	HMD Global Oy
Address:	Bertel Jungin aukio 9, 02600 Espoo, Finland
Product:	Mobile phone
Brand Name:	HMD
Model Name:	H1702V
FCC ID:	2AJOTTA-1702
Date of tests:	Jan, 13, 2025 ~ Mar. 13, 2025

The tests have been carried out according to the requirements of the following standard:

**FCC Part 15, Subpart C, Section 15.247**

**ANSI C63.10-2020**

**CONCLUSION:** The submitted sample was found to COMPLY with the test requirement

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
Date: Mar. 13, 2025	Date: Mar. 13, 2025

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-NQN2412090110RF08	Original release	Mar. 13, 2025



## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C		
STANDARD	TEST TYPE AND LIMIT	RESULT
15.207	AC Power Conducted Emission	Compliance
15.247(a)(1) (iii)	Number of Hopping Frequency Used	Compliance
15.247(a)(1) (iii)	Dwell Time on Each Channel	Compliance
15.247(a)(1)	1. Hopping Channel Separation 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	Compliance
15.247(b)	Maximum Peak Output Power	Compliance
15.247(d)& 15.209	Transmitter Radiated Emissions	Compliance
15.247(d)	Out of band Measurement	Compliance
15.203	Antenna Requirement	Compliance

**NOTE:**

1. If the Frequency Hopping System operating in 2400-2483.5MHz band and the output power less than 125mW. The hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of hopping channel whichever is greater.
2. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

**\*Test Lab Information Reference**

**Lab A:**

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

**Lab Address:**

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

**Accredited Test Lab Cert 6613.01**

The FCC Site Registration No. is 434559; The Designation No. is CN1325.

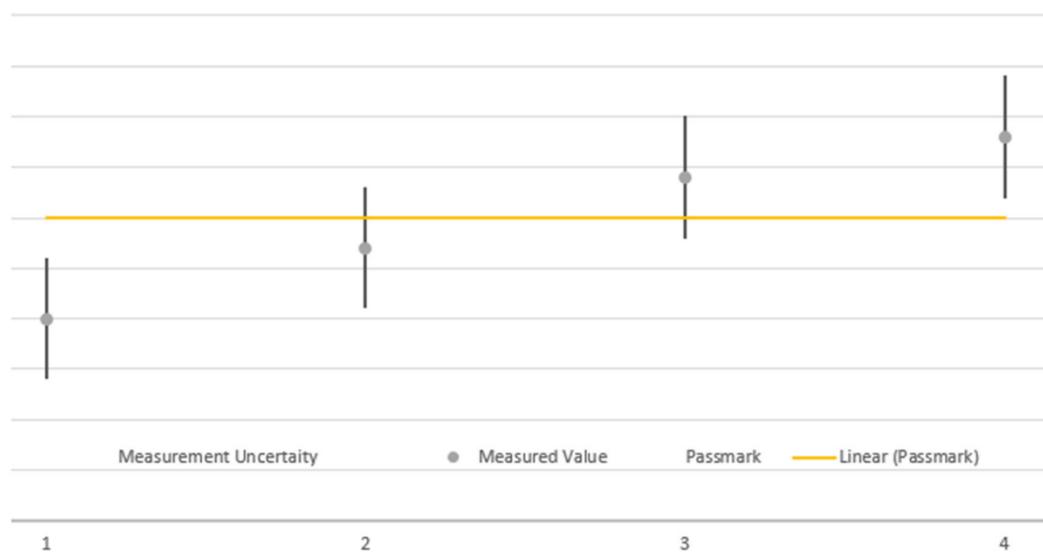


## 1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
AC Power Conducted emissions	$\pm 2.70\text{dB}$
Radiated emissions (9KHz~30MHz)	$\pm 2.68\text{dB}$
Radiated emissions (30MHz~1GHz)	$\pm 4.98\text{dB}$
Radiated emissions (1GHz ~6GHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GHz ~18GHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GHz ~40GHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Conducted Output power	$\pm 2.06\text{dB}$
Power Spectral Density	$\pm 0.85\text{ dB}$

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



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.



## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Mobile phone
BRAND NAME*	HMD
MODEL NAME*	H1702V
NOMINAL VOLTAGE*	3.87Vdc (Li-ion, battery)
MODULATION TECHNOLOGY	FHSS
MODULATION TYPE	GFSK, $\pi/4$ -DQPSK, 8DPSK
OPERATING FREQUENCY	2402MHz~2480MHz
NUMBER OF CHANNEL	79
MAX. OUTPUT POWER	20.04 mW (Max. Measured)
ANTENNA GAIN*	-1.5dBi
ANTENNA TYPE*	PIFA Antenna
HW VERSION*	V1.0
SW VERSION*	000T_0_310
I/O PORTS*	Refer to user's manual
CABLE SUPPLIED*	USB cable: non-shielded cable, with w/o ferrite core, 1.0 meter

#### NOTE:

1. \*Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.



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5. The differences between the sample 1 and sample 2 as Listings below, others are the same. And only the worst case was shown in the test report.

**Raptor 5G(H1702V)**

Object	Sample 1 1 <sup>st</sup> source		Sample 2 2 <sup>nd</sup> source	
	Specifications	Supplier	Specifications	Supplier
Display	Y92232	DZX	TD-TCHJ6615-5D	CDOT
Memory	LPDDR4X 6GB FLXC4006G-49	Longsys	BWCC4X32N2A-48G-X	Biwin
	128GB eMMC5.1 MEMDNN128G-M1D03	Longsys	MEMDNN128G-M1D03	Biwin
Motor	C0830H-C138ZN-021	KunWang	CY0830-05-FPC-182	Chaoying
Mic	SM2718B381YR2-01	Rayking	S150B381-155	Goertek
Charger IC	UPM6720	Unisemi	SC8541CFFR	Southchip

**6. List of Accessory:**

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Battery	HMD	HuiZhou GanFeng LiEnergy Battery Technology Co., Ltd.	HBA-5033AA	Capacity : 3.87Vdc, 4900mAh
USB Cable	Saibao	Saibao (Jiangxi) Industry Co.,Ltd.	SZN-A047A	Signal Line,1.0meter



## 2.2 DESCRIPTION OF TEST MODES

79 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		



## 2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 4 photograph of the test configuration for reference.

## 2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.

The worst case was found when positioned on X axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

### RADIATED EMISSION TEST (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
- The following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	39	FHSS	π/4-DQPSK	2DH5

### RADIATED EMISSION TEST (ABOVE 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
- The following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	0, 39, 78	FHSS	GFSK	1DH5
-	0 to 78	0, 39, 78	FHSS	π/4 DQPSK	2DH5
-	0 to 78	0, 39, 78	FHSS	8DPSK	3DH5



**POWER LINE CONDUCTED EMISSION TEST:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture) and packet type.
- The following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	78	FHSS	$\pi/4$ -DQPSK	2DH5

**ANTENNA PORT CONDUCTED MEASUREMENT:**

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- The following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0, 39, 78	FHSS	GFSK	DH1/DH3/DH5
0 to 78	0, 39, 78	FHSS	$\pi/4$ DQPSK	2DH1/2DH3/2DH5
0 to 78	0, 39, 78	FHSS	8DPSK	3DH1/3DH3/3DH5

<b><u>TEST CONDITION</u></b>			
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE<1G	23deg. C, 70%RH	DC 5.0V By Adapter	Hanwen Xu
RE≥1G	23deg. C, 70%RH	DC 5.0V By Adapter	Hanwen Xu
PLC	25deg. C, 52%RH	DC 5.0V By Adapter	Hanwen Xu
APCM	25deg. C, 60%RH	DC 5.0V By Adapter	Hanwen Xu



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## 2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

### FCC Part 15, Subpart C. Section 15.247

### ANSI C63.10-2020

#### NOTE:

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

## 2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Adapter	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Line: Shielded, Detachable 1.0m;



### 3 TEST TYPES AND RESULTS

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
0.15 ~ 0.5 0.5 ~ 5 5 ~ 30	Quasi-peak	Average
	66 to 56	56 to 46
	56	46
	60	50

##### NOTE:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



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### 3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	102749	Mar.28,24	Mar.27,26
ELEKTRA test software	Rohde&Schwarz	ELEKTRA	NA	N/A	N/A
LISN network	Rohde&Schwarz	ENV216	102640	Mar.28,24	Mar.27,26
CABLE	Rohde&Schwarz	W61.01	N/A	Apr.27,24	Apr.26,25
CABLE	Rohde&Schwarz	W601	N/A	Apr.27,24	Apr.26,25

#### NOTE:

1. The test was performed in CE shielded room.
2. 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.



### 3.1.3 TEST PROCEDURES

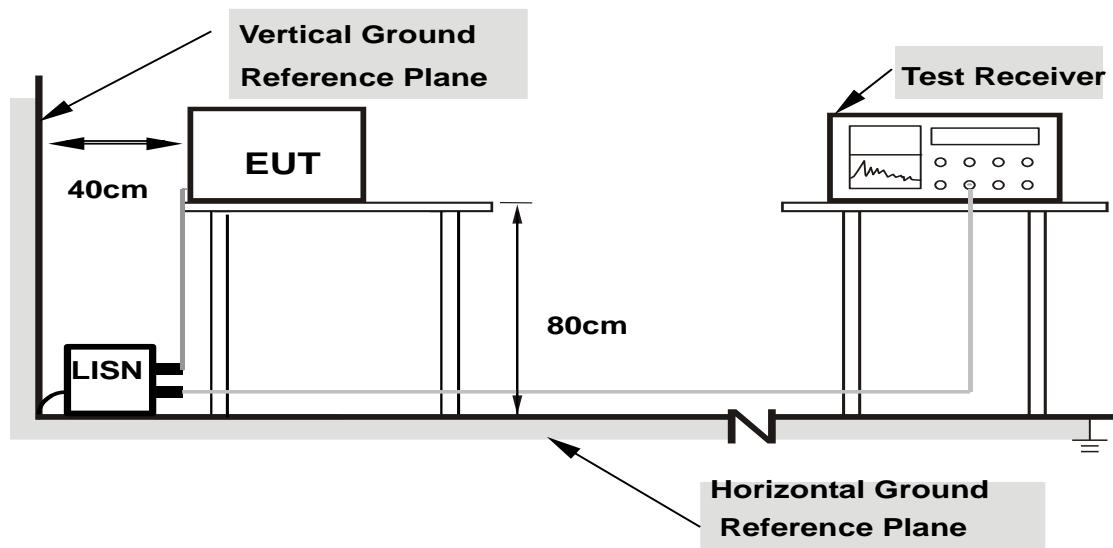
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

### 3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

### 3.1.5 TEST SETUP



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 3.1.6 EUT OPERATING CONDITIONS

- Turned on the power and connected of all equipment.
- EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

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## 3.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA											
FREQUENCY RANGE		150KHz ~ 30MHz			DETECTOR FUNCTION & RESOLUTION BANDWIDTH			Quasi-Peak (QP) / Average (AV), 9 kHz			
INPUT POWER		120Vac, 60Hz			ENVIRONMENTAL CONDITIONS			26deg. C, 51%RH			
TESTED BY		Hanwen Xu									
Rg	Frequency [MHz]	QPK Level [dB $\mu$ V]	QPK Limit [dB $\mu$ V]	QPK Margin [dB]	CAV Level [dB $\mu$ V]	CAV: AVG Limit [dB $\mu$ V]	CAV Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	
1	0.177	35.80	64.63	28.83	24.06	54.63	30.57	12.26	L1	9.000	
1	0.492	42.13	56.13	14.00	25.26	46.13	20.87	11.75	L1	9.000	
1	1.095	34.24	56.00	21.76	19.29	46.00	26.71	11.75	L1	9.000	
1	2.472	31.65	56.00	24.35	22.23	46.00	23.77	11.76	L1	9.000	
1	10.221	42.86	60.00	17.14	35.15	50.00	14.85	11.83	L1	9.000	
1	21.656	41.48	60.00	18.52	30.56	50.00	19.44	11.88	L1	9.000	

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



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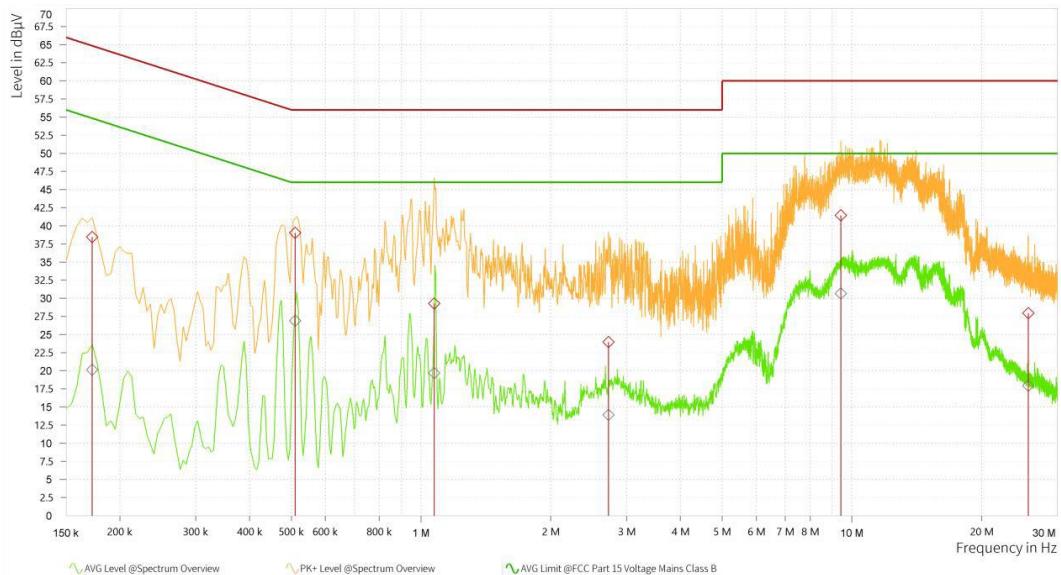
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<b>FREQUENCY RANGE</b>	150KHz ~ 30MHz	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	26deg. C, 51%RH
<b>TESTED BY</b>	Hanwen Xu		

Rg	Frequency [MHz]	QPK Level [dB $\mu$ V]	QPK Limit [dB $\mu$ V]	QPK Margin [dB]	CAV Level [dB $\mu$ V]	CAV AVG Limit [dB $\mu$ V]	CAV Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]
1	0.173	38.45	64.84	26.39	20.14	54.84	34.70	12.21	N	9.000
1	0.510	39.03	56.00	16.97	26.89	46.00	19.11	12.78	N	9.000
1	1.073	29.27	56.00	26.73	19.67	46.00	26.33	12.73	N	9.000
1	2.724	23.96	56.00	32.04	13.92	46.00	32.08	12.74	N	9.000
1	9.429	41.43	60.00	18.57	30.68	50.00	19.32	12.79	N	9.000
1	25.661	27.94	60.00	32.06	17.93	50.00	32.07	12.88	N	9.000

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
7. Emission Level = Correction Factor + Reading Value.





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## 3.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

### 3.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). Other emissions shall be at least 20dB below the highest level of the desired power.

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

#### NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB<sub>u</sub>V/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



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Test Report No.: PSU-NQN2412090110RF08

### 3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,23	Aug.29,25
Pre-Amplifier	R&S	SCU08F1	101028	Jan.22,24	Jan.21,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Dec.26,23	Dec.25,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,23	Aug.21,25
Horn Antenna (18GHz-40GHz)	Stearite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Stearite Q-par Antennas	QMS 00208	23485	Aug.22,23	Aug.21,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,23	Feb.22,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,25	Feb.21,27
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	N/A	N/A
DC Source	HYELEC	HY3010B	551016	Aug.31,23	Aug.30,25
Hygrothermograph	DELI	20210528	SZ014	Sep.06,23	Sep.05,25
6dB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.27,24	Apr.26,25

#### NOTE:

1. The calibration interval of the above test instruments is 12/ 24/ 36 months and the calibrations are traceable to CEPREI/CHINA, GRT/CHINA and NIM/CHINA.
2. The test was performed in 3m Chamber.
3. The FCC Site Registration No. is 434559; The Designation No. is CN1325.



### 3.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

#### NOTE:

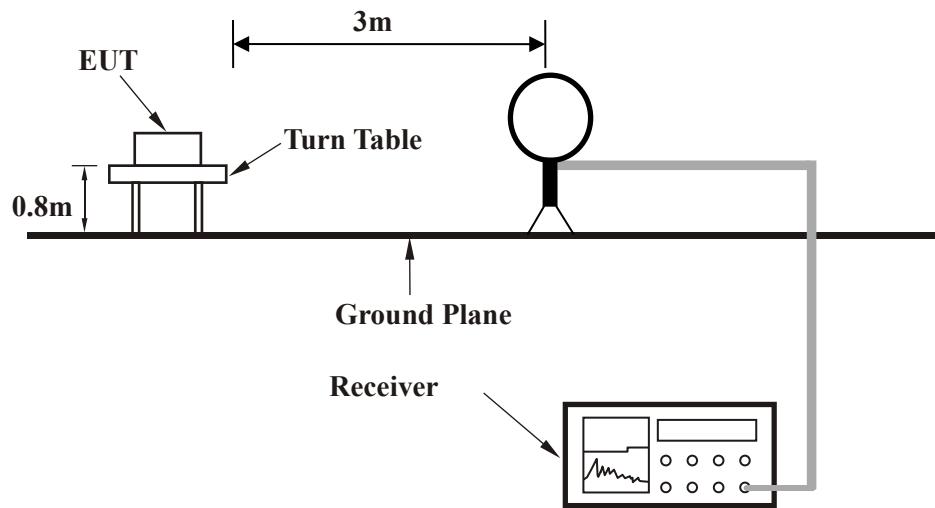
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20\log(\text{dwell time}/100 \text{ ms})$ , in an effort to demonstrate compliance with the 15.209 limit.
5. All modes of operation were investigated and the worst-case emissions are reported.

### 3.2.4 DEVIATION FROM TEST STANDARD

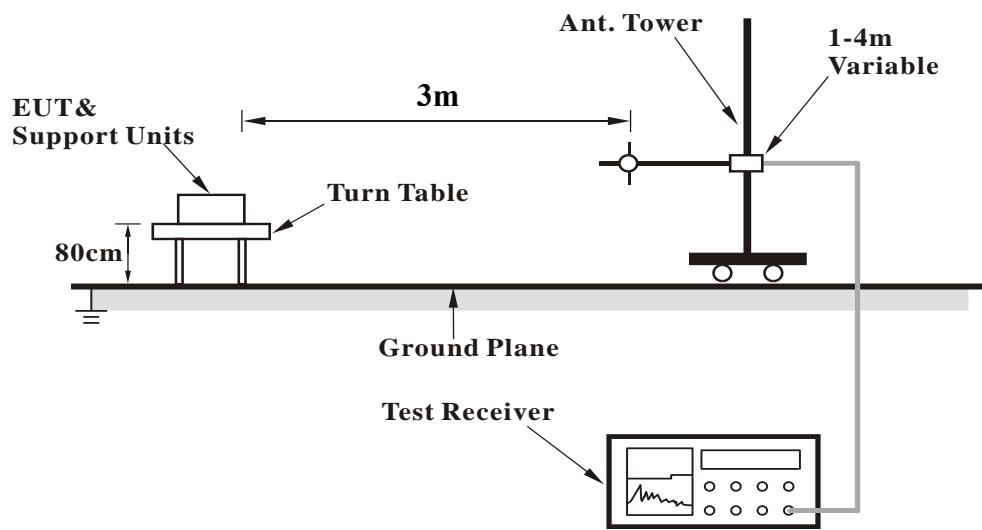
No deviation.

## 3.2.5 TEST SETUP

&lt;Frequency Range 9KHz~30MHz &gt;



&lt; Frequency Range 30MHz~1GHz &gt;

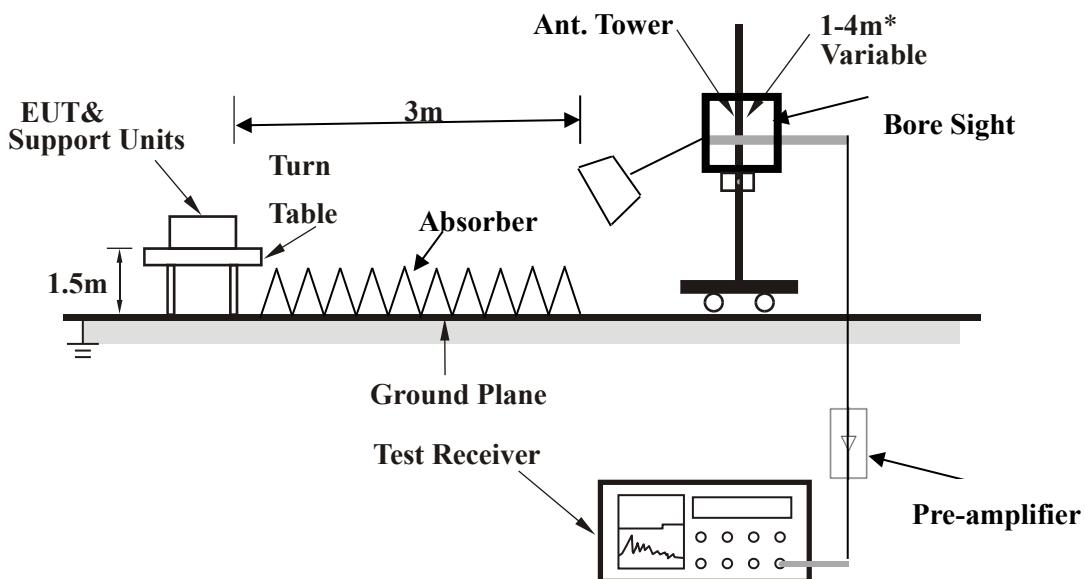




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Test Report No.: PSU-NQN2412090110RF08

### <Frequency Range above 1GHz>



**Note:** Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 3.2.6 EUT OPERATING CONDITIONS

- Set the EUT under full load condition and placed them on a testing table.
- Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.



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Test Report No.: PSU-NQN2412090110RF08

### 3.2.7 TEST RESULTS

**NOTE** : The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

#### BELOW 1GHz WORST-CASE DATA

BT_π/4-DQPSK																
CHANNEL		Channel 39			DETECTOR FUNCTION		Quasi-Peak (QP)									
FREQUENCY RANGE		30MHz ~ 1GHz														
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M																
Rg	Frequency [MHz]	QPK Level [dB $\mu$ V/m]	QPK Limit [dB $\mu$ V/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]							
1	47.024	31.08	40.00	8.92	-2.81	H	1	2.00	120.000							
1	76.997	27.55	40.00	12.45	-10.07	H	1	1.00	120.000							
1	138.931	20.23	43.50	23.27	-8.38	H	25.5	1.00	120.000							
1	219.975	24.25	46.00	21.75	-3.69	H	79.8	2.00	120.000							
1	339.188	26.25	46.00	19.75	1.45	H	25.5	1.00	120.000							
1	494.970	28.35	46.00	17.65	3.11	H	161.8	1.00	120.000							

**REMARKS:**

1. Emission Level(dBuV/m) = Read Level(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission level.

Level in dB $\mu$ V/m

Frequency in Hz

◆ QPK Level @Final Results ▲ QPK Limit @FCC LIMIT



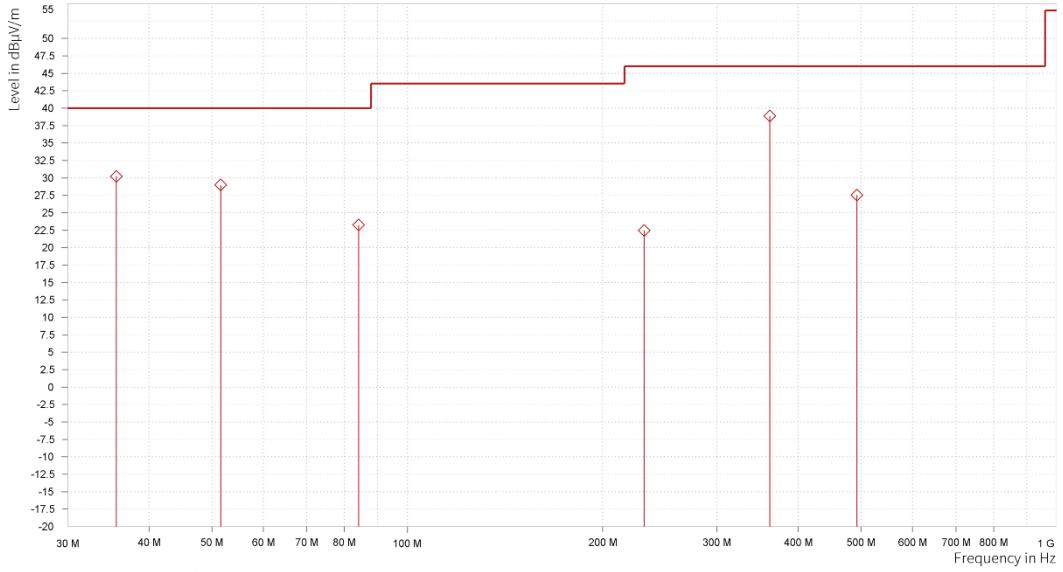
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Test Report No.: PSU-NQN2412090110RF08

CHANNEL		Channel 39		DETECTOR FUNCTION		Quasi-Peak (QP)					
FREQUENCY RANGE		30MHz ~ 1GHz									
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
Rg	Frequency [MHz]	QPK Level [dB $\mu$ V/m]	QPK Limit [dB $\mu$ V/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]		
1	35.626	30.21	40.00	9.79	-7.20	V	78.6	2.00	120.000		
1	51.583	28.97	40.00	11.03	-4.10	V	5.6	1.00	120.000		
1	84.175	23.26	40.00	16.74	-8.26	V	139.1	1.00	120.000		
1	231.712	22.45	46.00	23.55	-3.21	V	5.6	1.00	120.000		
1	361.886	38.88	46.00	7.12	2.00	V	139.1	1.00	120.000		
1	492.884	27.52	46.00	18.48	3.01	V	139.1	1.00	120.000		

**REMARKS:**

1. Emission Level(dBuV/m) = Read Level(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission level.





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### ABOVE 1GHz WORST-CASE DATA

**Note:** All other emissions that greater than 20dB below the limit were not recorded.

BT_GFSK								
CHANNEL		TX Channel 0		DETECTOR FUNCTION		Peak (PK) Average (AV)		
FREQUENCY RANGE		1GHz ~ 25GHz						
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+ Limit [dB $\mu$ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,359.500	46.17	74.00	27.83	5.98	H	159.8	2.00
5	2,390.000	45.18	74.00	28.82	6.39	H	359.1	1.00
5	2,402.500	97.42			6.60	H	159.8	2.00

Level in dB $\mu$ V/m

Frequency in Hz

Legend: ○ PK+ Level @CriticalPoint ^ PK+ Level @Spectrum Overview ▼ PK+ Limit @BT2.0&BLE Ch0



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Test Report No.: PSU-NQN2412090110RF08

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

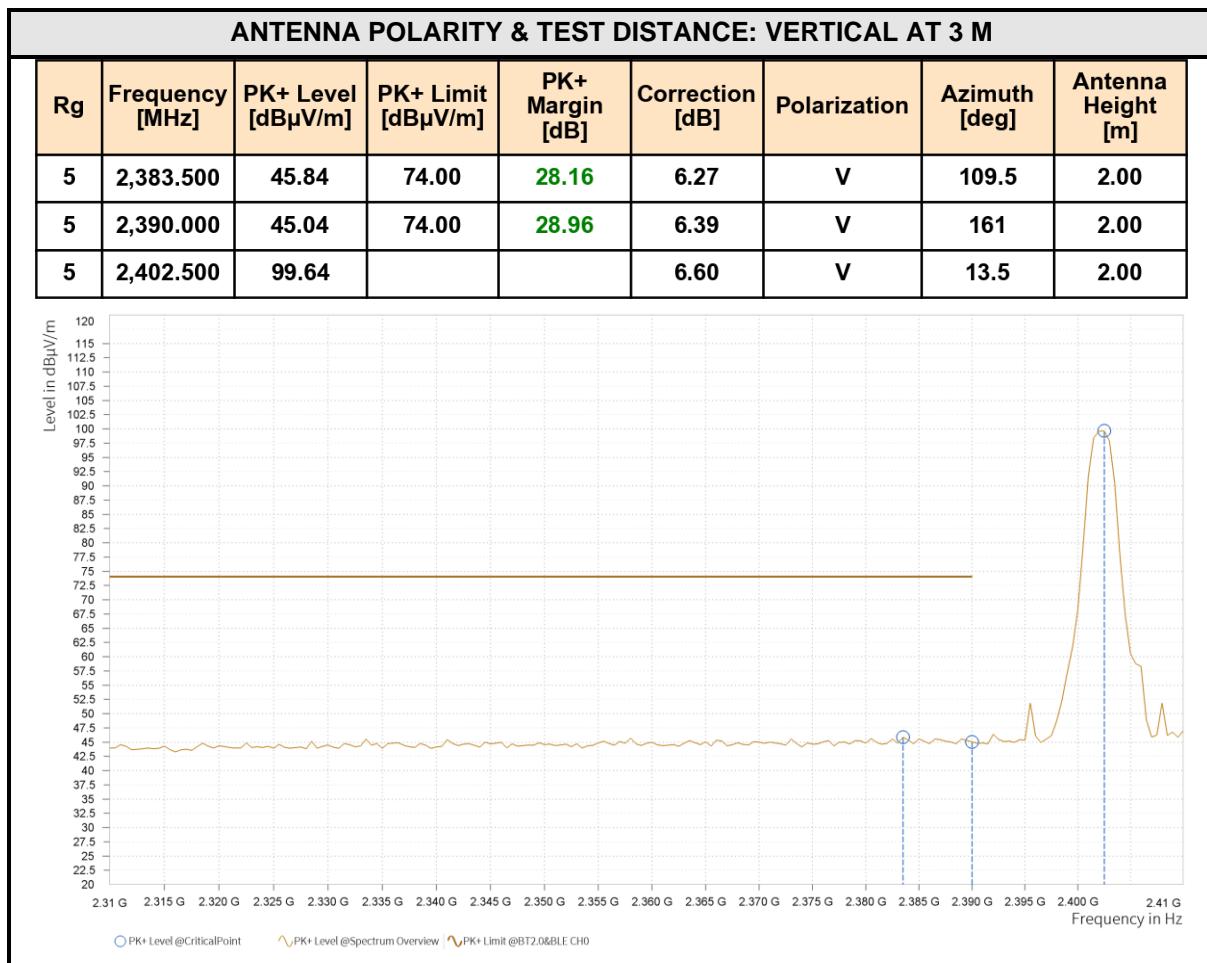
Rg	Frequency [MHz]	AVG Level [dB $\mu$ V/m]	AVG Limit [dB $\mu$ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,350.500	31.50	54.00	22.50	5.93	H	157.4	2.00
5	2,390.000	31.08	54.00	22.92	6.39	H	101.1	1.00
5	2,402.000	85.19			6.59	H	157.4	2.00





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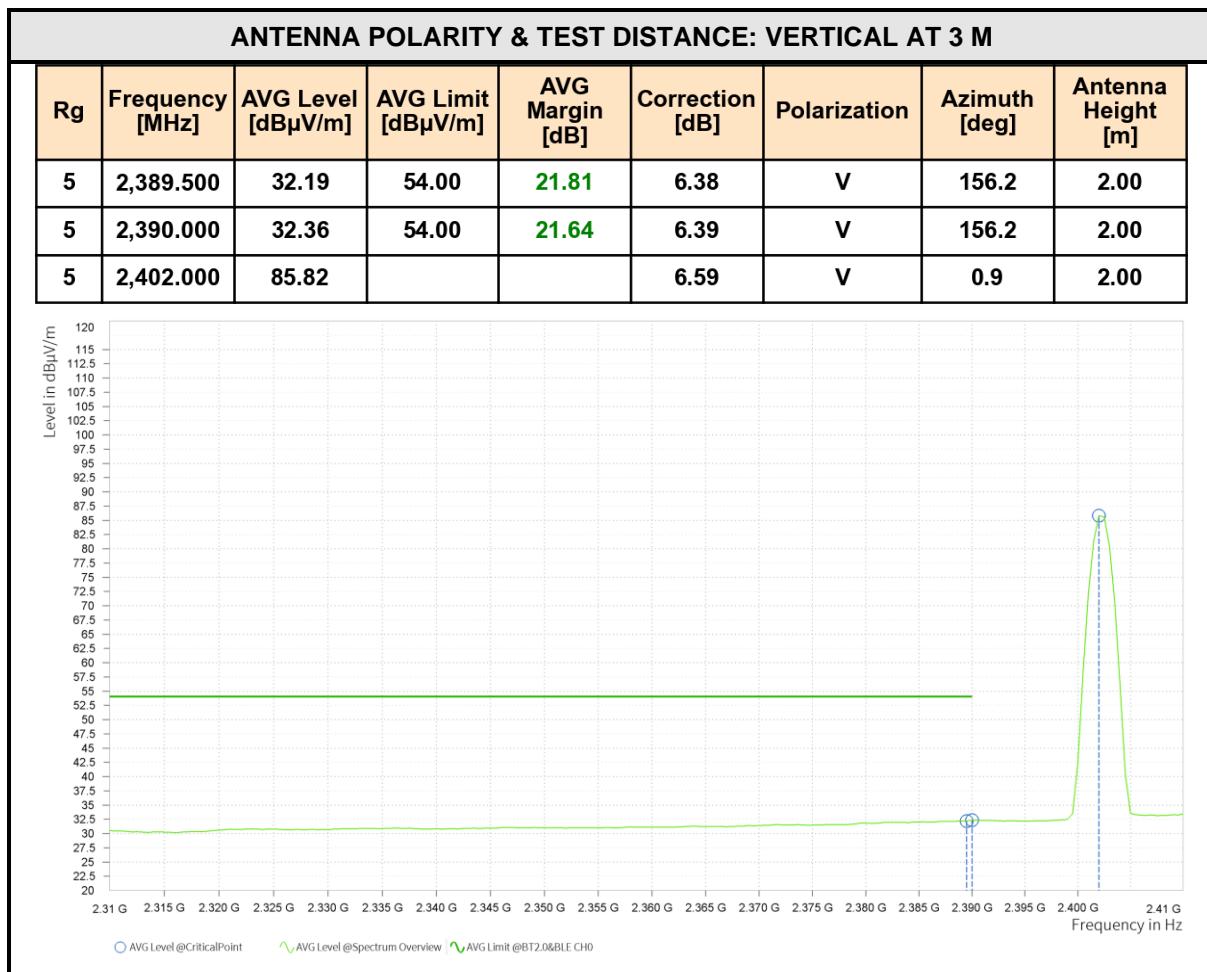
Test Report No.: PSU-NQN2412090110RF08





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#### REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
2. Margin value = Limit value - Emission level.
3. 2402MHz: Fundamental frequency.



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Test Report No.: PSU-NQN2412090110RF08

CHANNEL		TX Channel 39			DETECTOR FUNCTION			Peak (PK)					
FREQUENCY RANGE		1GHz ~ 25GHz						Average (AV)					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M													
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+: QPK Limit [dB $\mu$ V/m]	PK+ Margin [dB]	AVG Level [dB $\mu$ V/m]	AVG Limit [dB $\mu$ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]		
3	4,882.000	48.66	74.00	25.34	38.57	54.00	15.43	13.80	H	359.1	1.00		
3	7,323.000	53.63	74.00	20.37	43.50	54.00	10.50	19.46	H	1	1.00		

Level in dB $\mu$ V/m

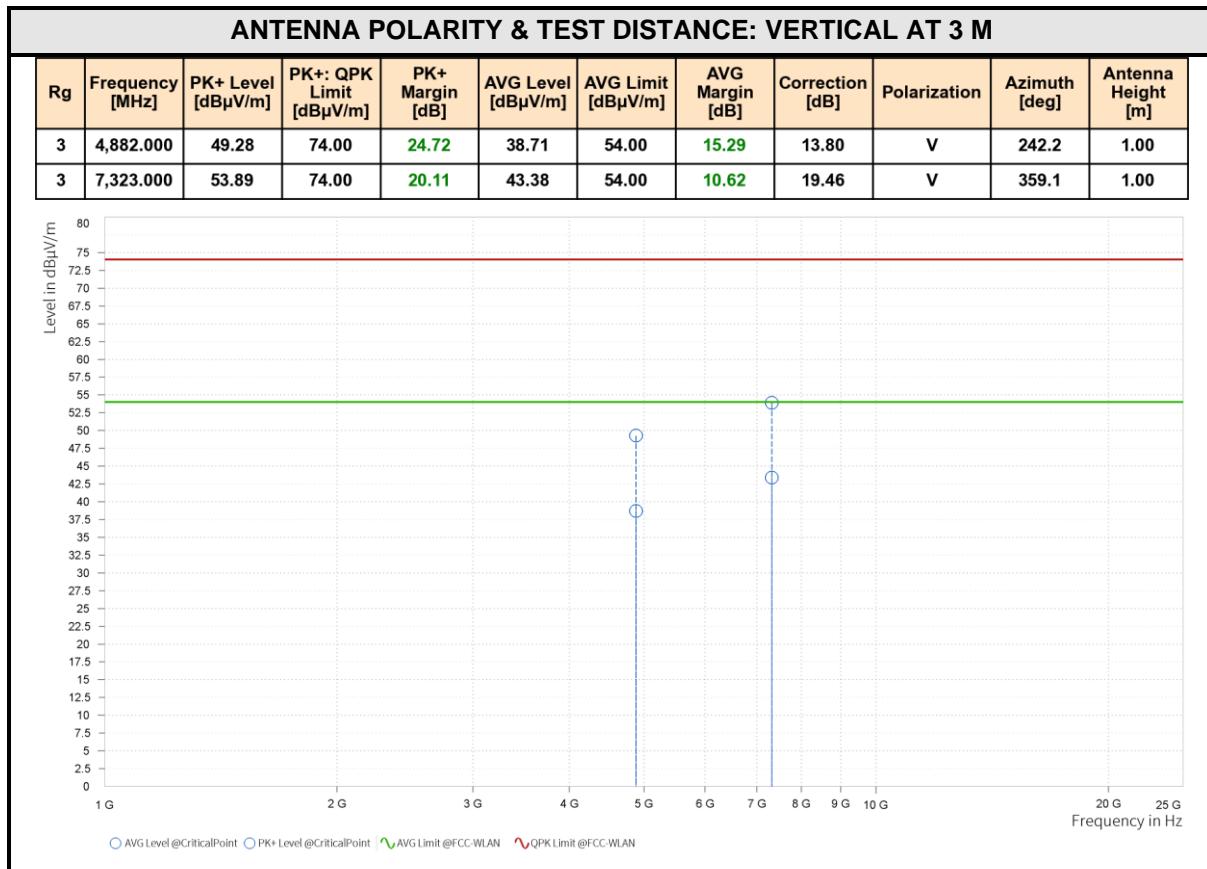
Frequency in Hz

Legend: AVG Level @CriticalPoint, PK+ Level @CriticalPoint, AVG Limit @FCC-WLAN, QPK Limit @FCC-WLAN



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Test Report No.: PSU-NQN2412090110RF08



#### REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value – Emission level.
3. 2402MHz: Fundamental frequency.



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Test Report No.: PSU-NQN2412090110RF08

CHANNEL		TX Channel 78		DETECTOR FUNCTION		Peak (PK) Average (AV)					
FREQUENCY RANGE		1GHz ~ 25GHz									
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+ Limit [dB $\mu$ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]			
6	2,480.200	100.10			7.23	H	215.8	2.00			
6	2,483.500	52.83	74.00	21.17	7.18	H	215.8	2.00			
6	2,484.820	54.53	74.00	19.47	7.16	H	190.7	1.00			

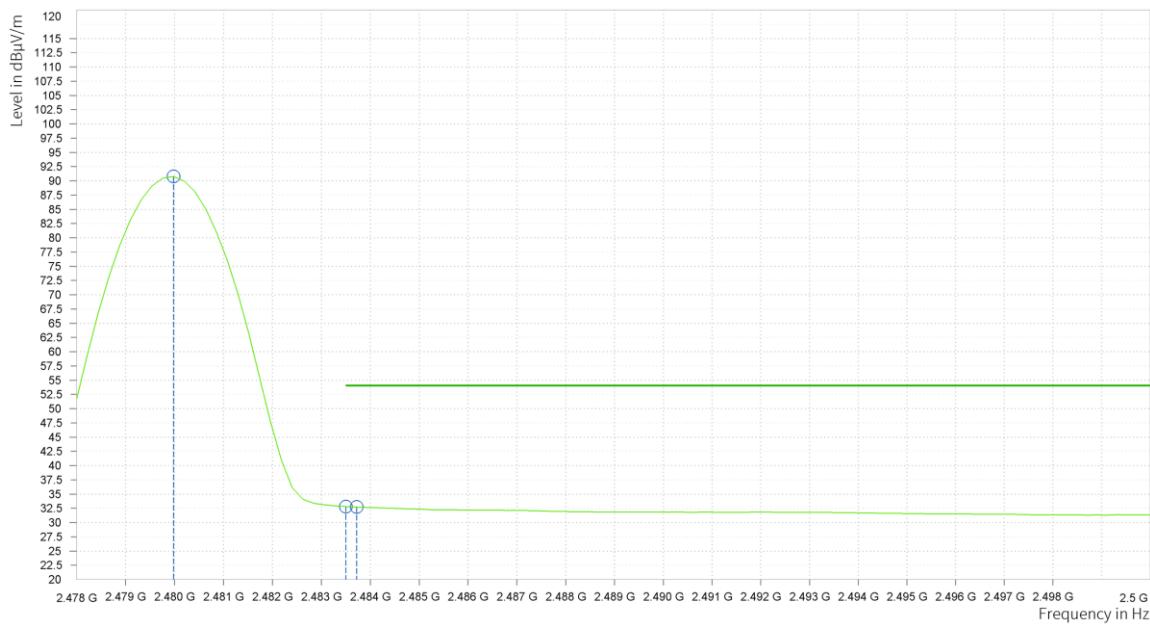


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Test Report No.: PSU-NQN2412090110RF08

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

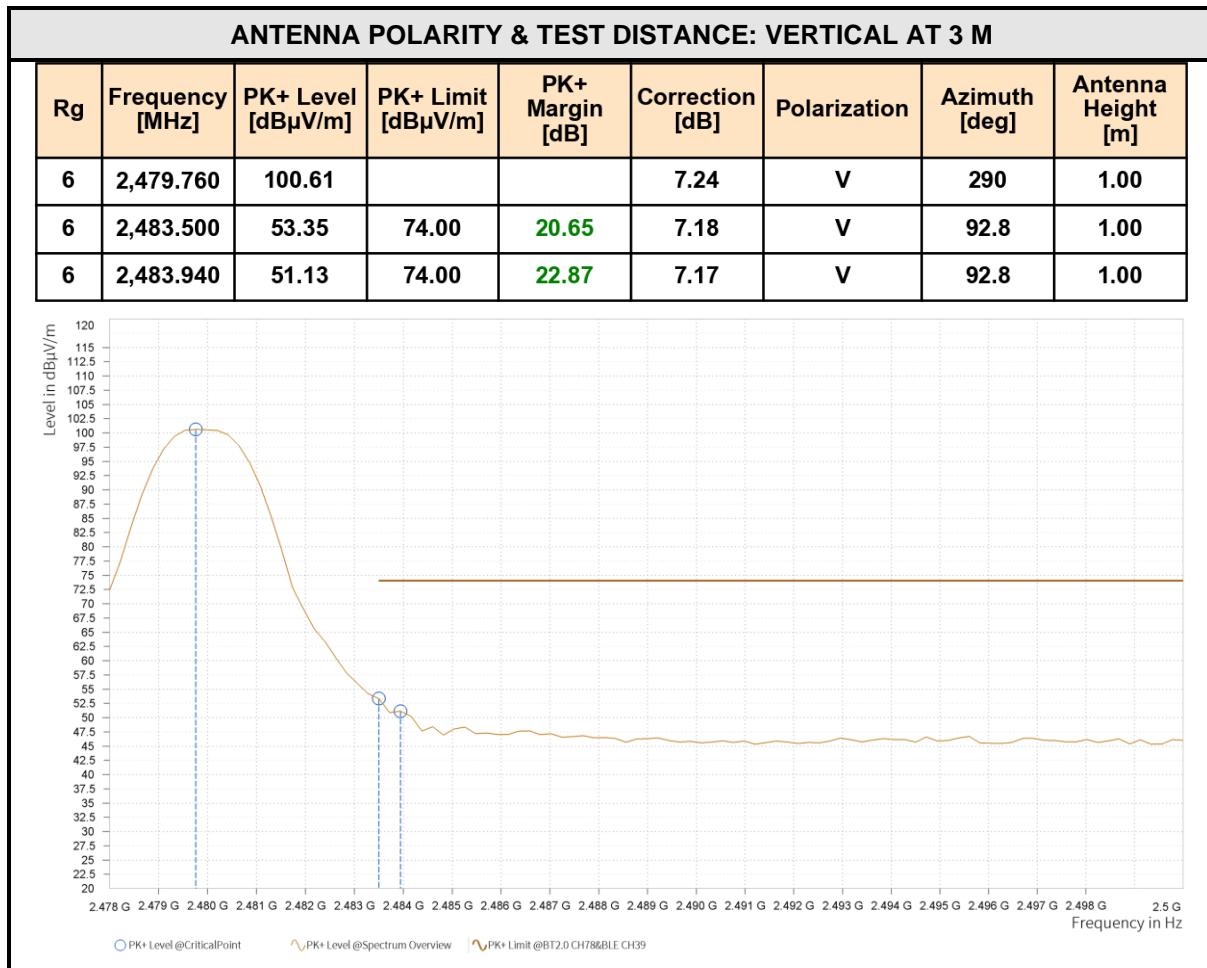
Rg	Frequency [MHz]	AVG Level [dB $\mu$ V/m]	AVG Limit [dB $\mu$ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.980	90.77			7.23	H	214.6	2.00
6	2,483.500	32.80	54.00	21.20	7.18	H	161	1.00
6	2,483.720	32.72	54.00	21.28	7.17	H	161	1.00





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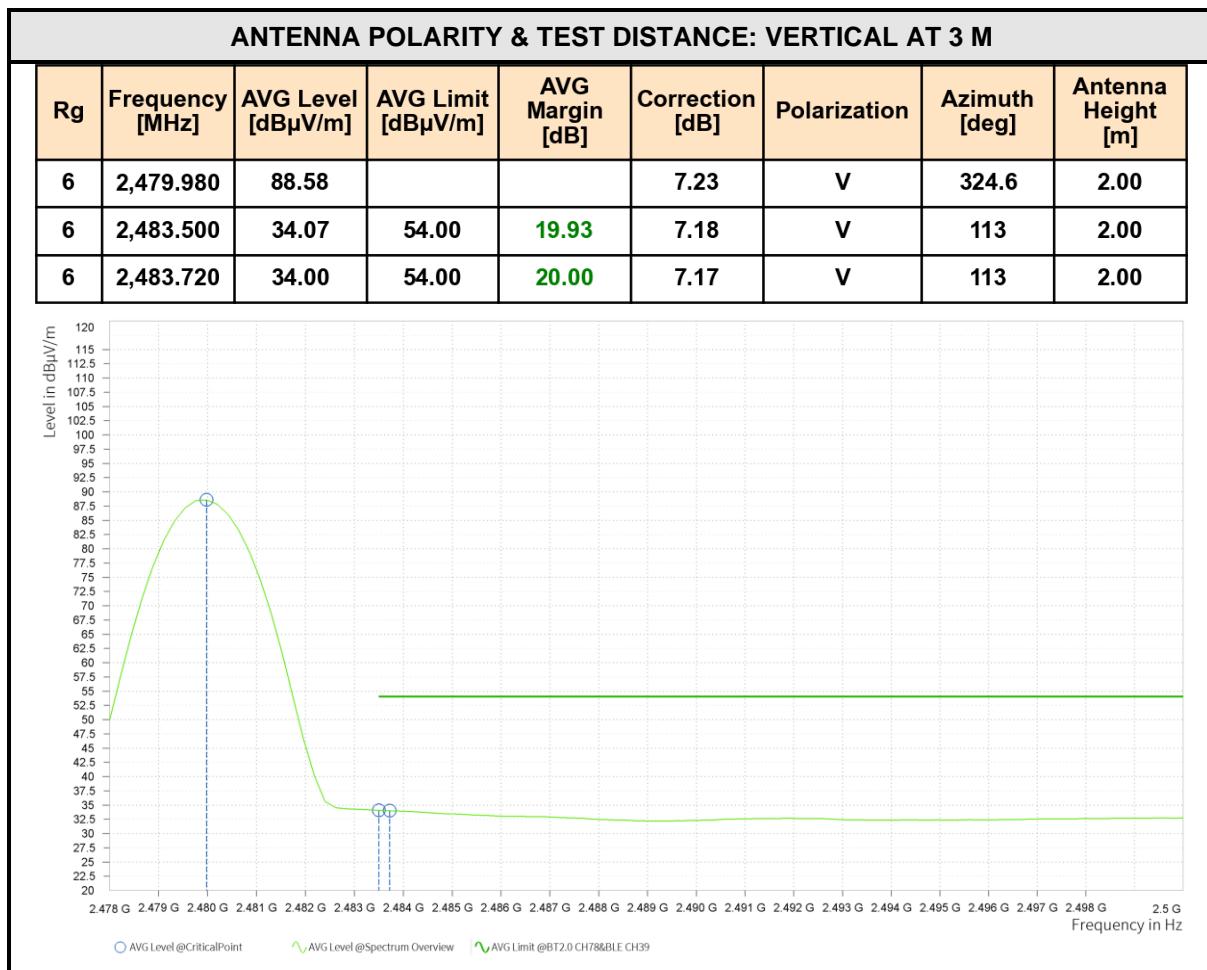
Test Report No.: PSU-NQN2412090110RF08





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Test Report No.: PSU-NQN2412090110RF08



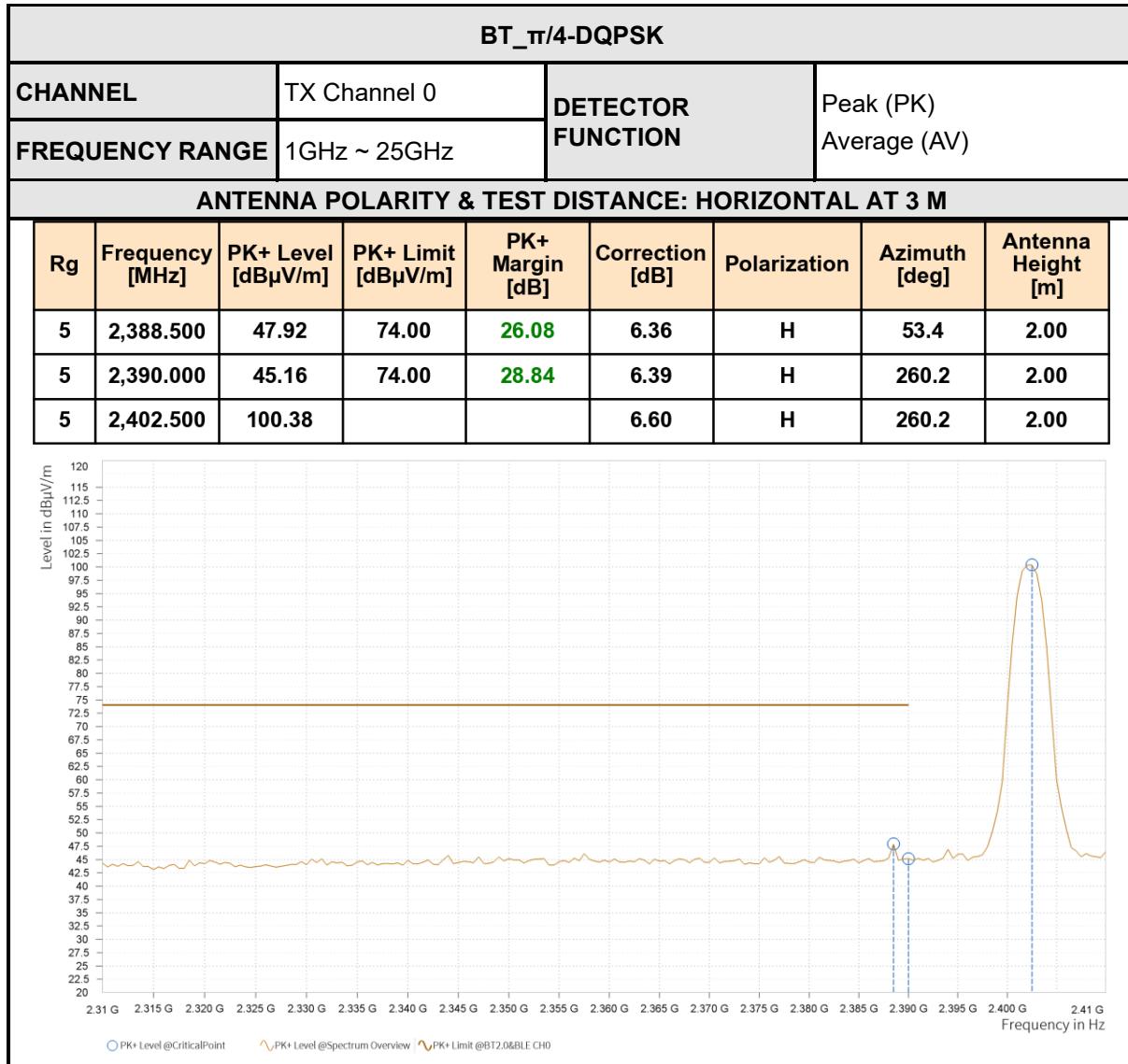
#### REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value – Emission level.
3. 2480MHz: Fundamental frequency.



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Test Report No.: PSU-NQN2412090110RF08



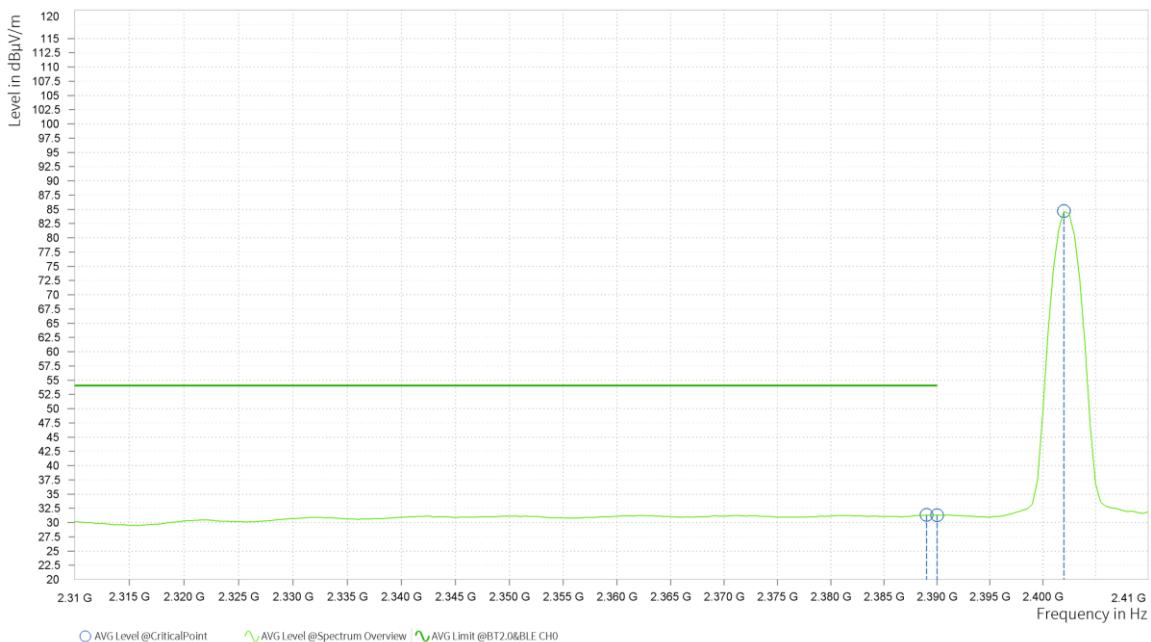


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Test Report No.: PSU-NQN2412090110RF08

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

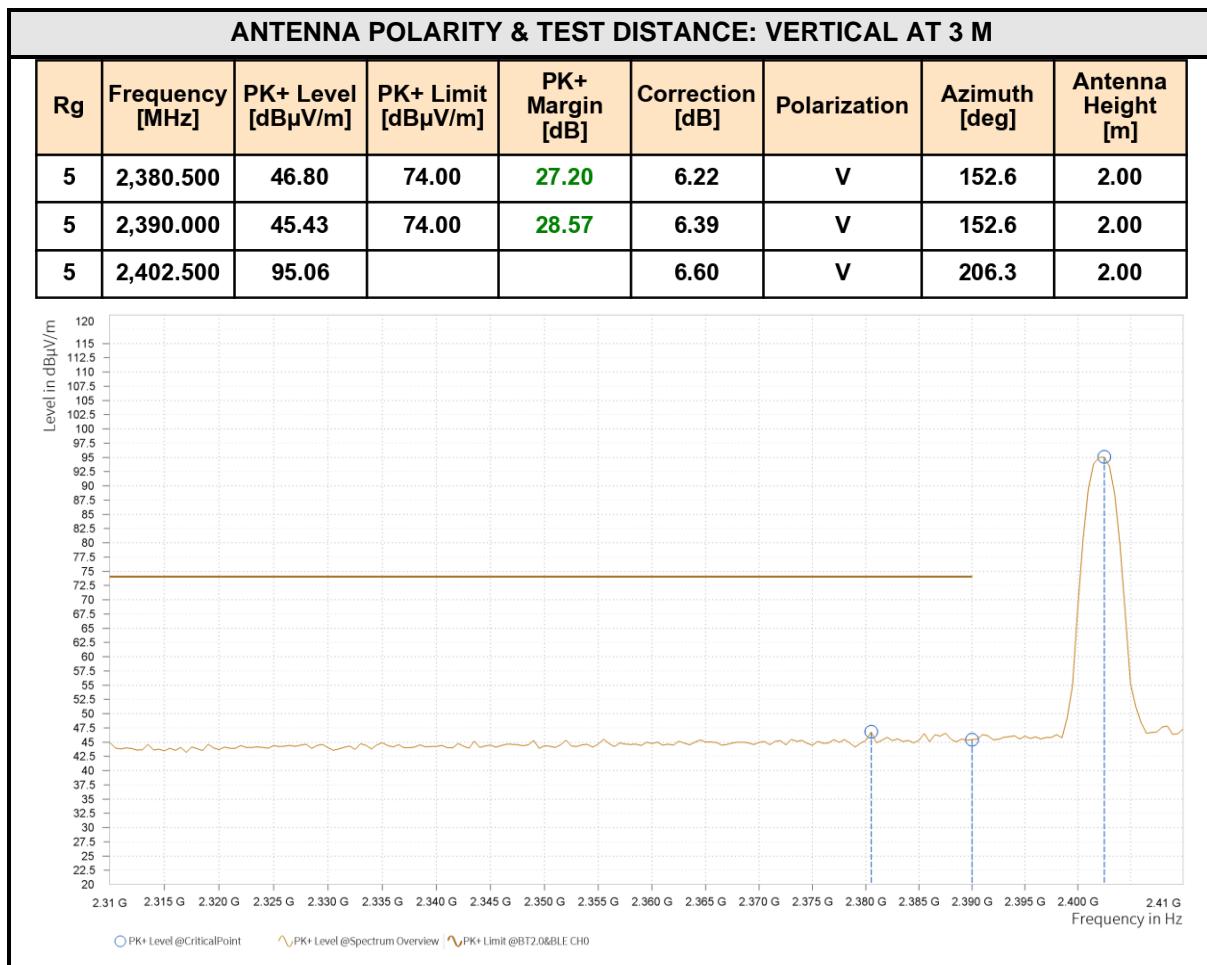
Rg	Frequency [MHz]	AVG Level [dB $\mu$ V/m]	AVG Limit [dB $\mu$ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,389.000	31.32	54.00	22.68	6.37	H	101.2	1.00
5	2,390.000	31.30	54.00	22.70	6.39	H	101.2	1.00
5	2,402.000	84.69			6.59	H	258.9	2.00





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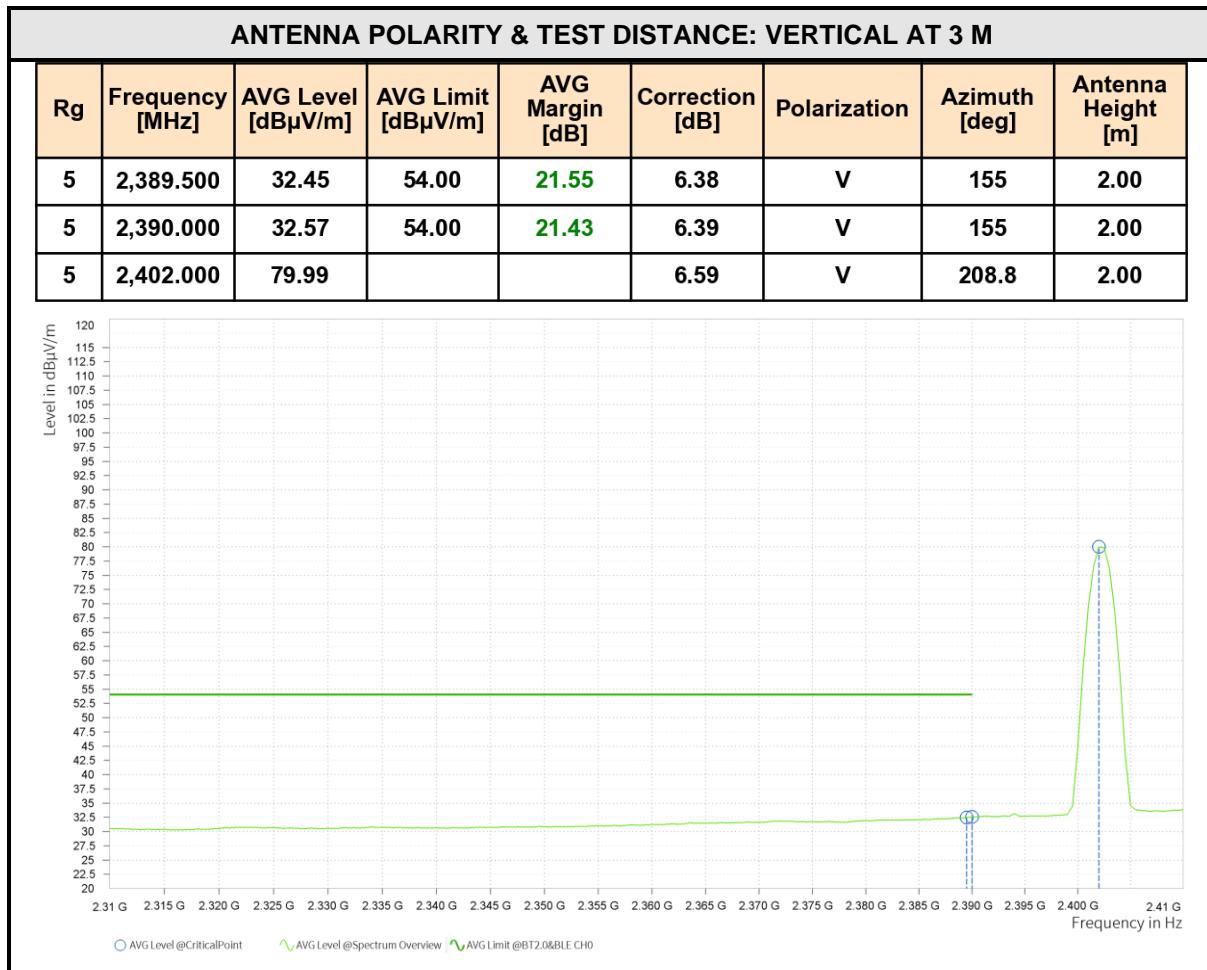
Test Report No.: PSU-NQN2412090110RF08





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Test Report No.: PSU-NQN2412090110RF08



#### REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value – Emission level.
3. 2402MHz: Fundamental frequency.



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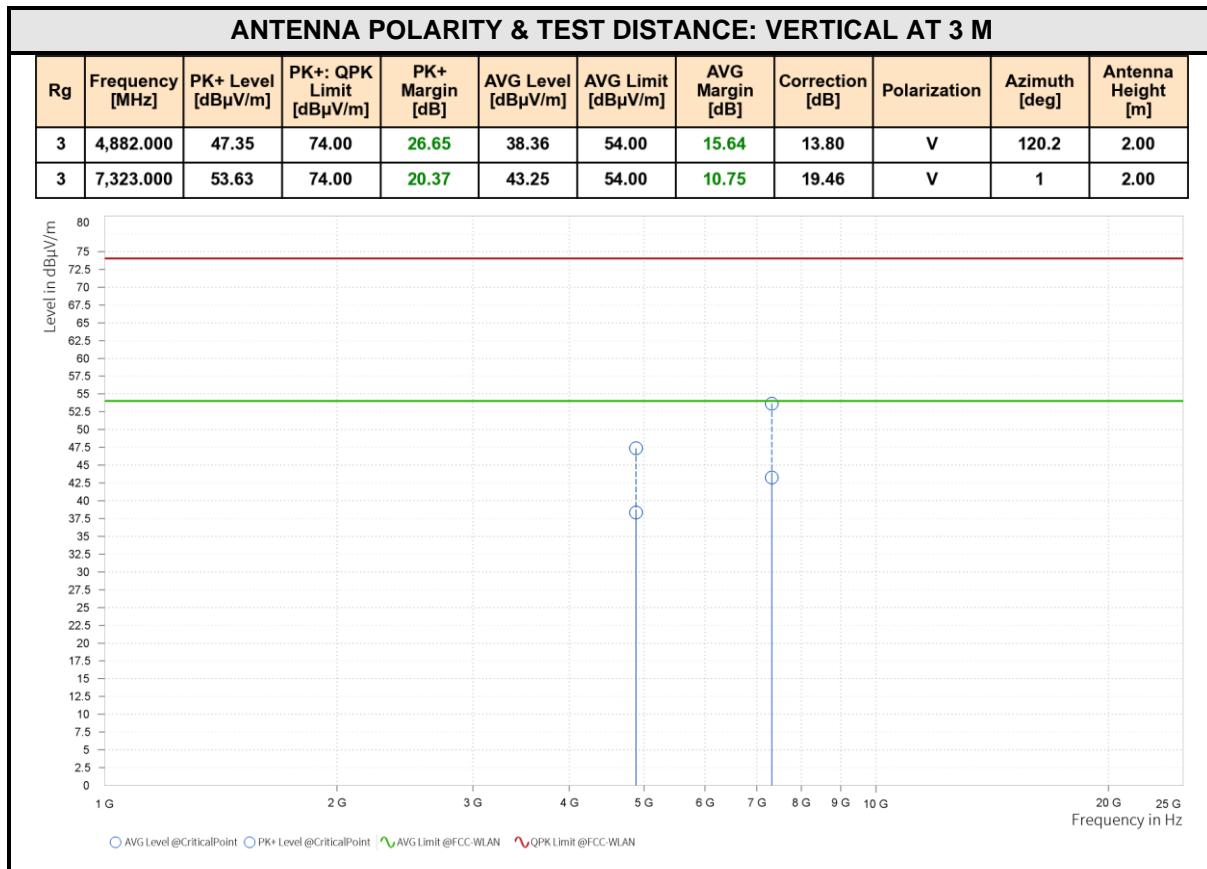
Test Report No.: PSU-NQN2412090110RF08

CHANNEL		TX Channel 39			DETECTOR FUNCTION			Peak (PK)					
FREQUENCY RANGE		1GHz ~ 25GHz						Average (AV)					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M													
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+: QPK Limit [dB $\mu$ V/m]	PK+ Margin [dB]	Avg Level [dB $\mu$ V/m]	Avg Limit [dB $\mu$ V/m]	Avg Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]		
3	4,882.000	48.32	74.00	25.68	38.45	54.00	15.55	13.80	H	0.8	2.00		
3	7,323.000	53.36	74.00	20.64	43.58	54.00	10.42	19.46	H	359.1	1.00		
<p>Legend: <span style="color: blue;">○</span> AVG Level @CriticalPoint <span style="color: blue;">○</span> PK+ Level @CriticalPoint <span style="color: green;">—</span> AVG Limit @FCC-WLAN <span style="color: red;">—</span> QPK Limit @FCC-WLAN</p>													



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Test Report No.: PSU-NQN2412090110RF08



#### REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value – Emission level.
3. 2441MHz: Fundamental frequency.



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Test Report No.: PSU-NQN2412090110RF08

CHANNEL		TX Channel 78		DETECTOR FUNCTION		Peak (PK) Average (AV)					
FREQUENCY RANGE		1GHz ~ 25GHz									
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+ Limit [dB $\mu$ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]			
6	2,479.760	98.07			7.24	H	194.2	1.00			
6	2,483.500	50.55	74.00	23.45	7.18	H	211	2.00			
6	2,483.720	49.68	74.00	24.32	7.17	H	211	2.00			



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Test Report No.: PSU-NQN2412090110RF08

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dB $\mu$ V/m]	AVG Limit [dB $\mu$ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.980	86.95			7.23	H	214.6	2.00
6	2,483.500	32.72	54.00	21.28	7.18	H	214.6	2.00
6	2,483.720	32.54	54.00	21.46	7.17	H	214.6	2.00



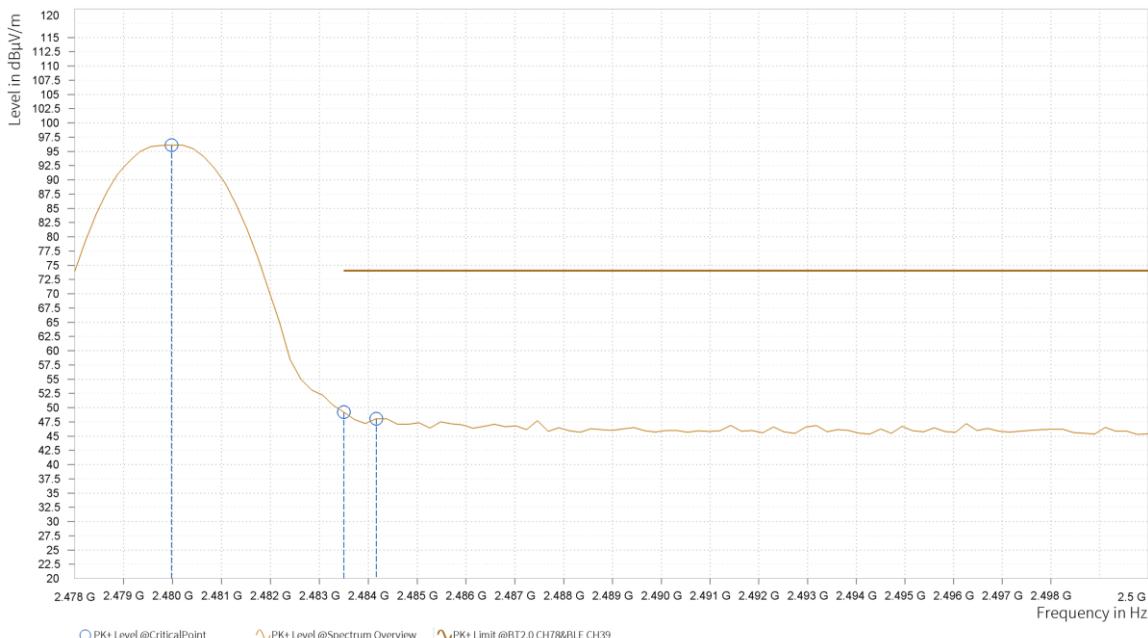


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Test Report No.: PSU-NQN2412090110RF08

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

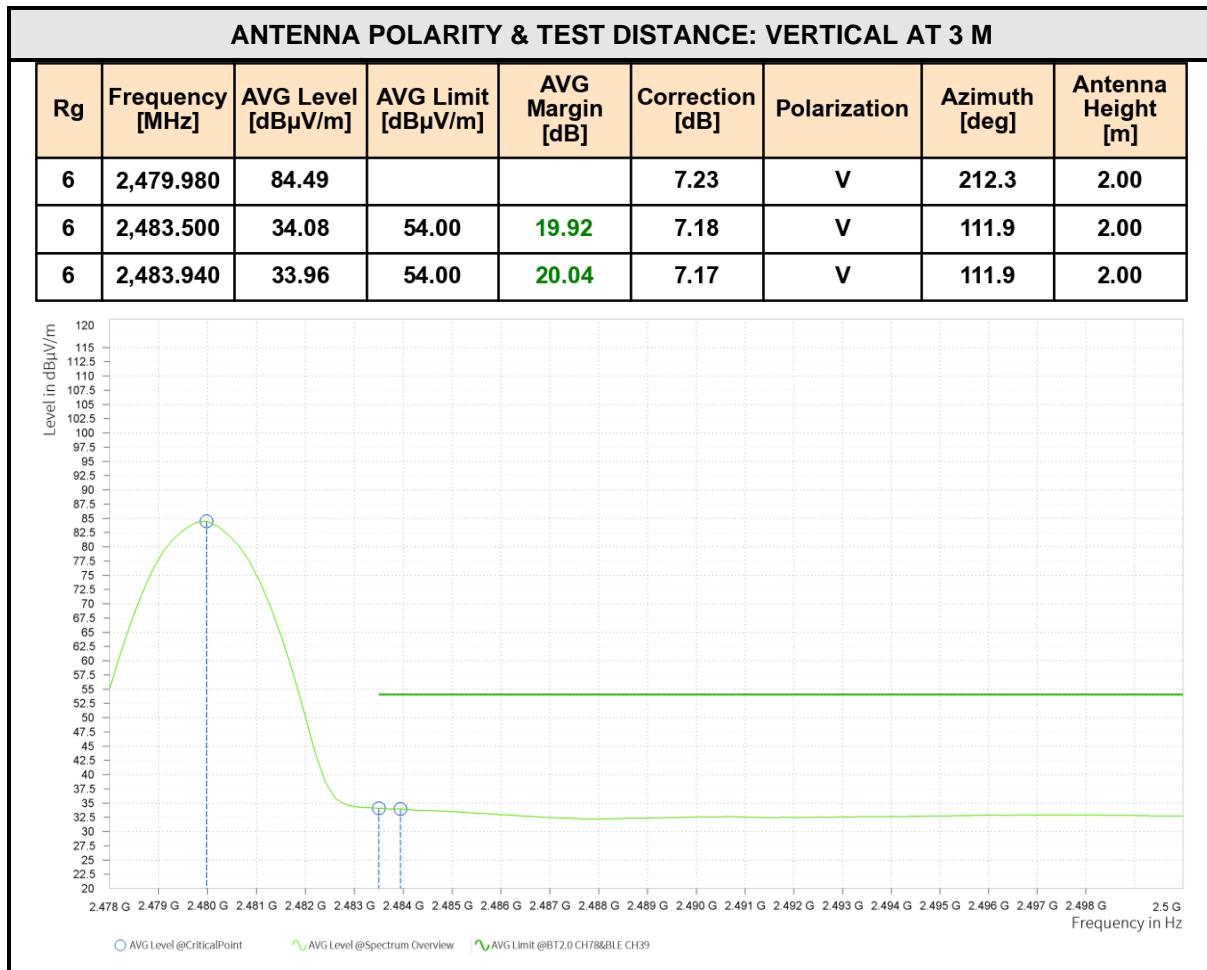
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+ Limit [dB $\mu$ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.980	96.11			7.23	V	214.6	2.00
6	2,483.500	49.20	74.00	24.80	7.18	V	214.6	2.00
6	2,484.160	48.06	74.00	25.94	7.17	V	114.2	2.00





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Test Report No.: PSU-NQN2412090110RF08



#### REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value – Emission level.
3. 2480MHz: Fundamental frequency.



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Test Report No.: PSU-NQN2412090110RF08

BT_8DPSK								
CHANNEL		TX Channel 0		DETECTOR FUNCTION		Peak (PK) Average (AV)		
FREQUENCY RANGE		1GHz ~ 25GHz		ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M				
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+ Limit [dB $\mu$ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,348.000	45.57	74.00	28.43	5.91	H	107.1	1.00
5	2,390.000	44.72	74.00	29.28	6.39	H	355	2.00
5	2,402.500	100.22			6.60	H	260.2	2.00

Level in dB $\mu$ V/m

Frequency in Hz

PK+ Level @CriticalPoint PK+ Level @Spectrum Overview PK+ Limit @BT2.0&BLE CH0

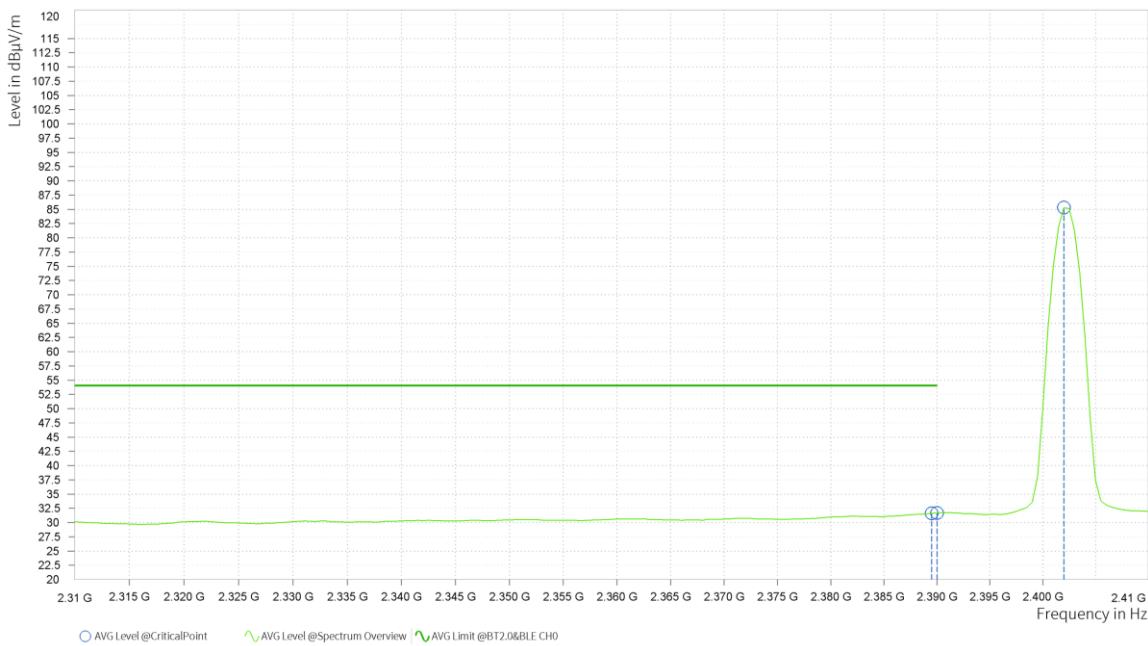


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Test Report No.: PSU-NQN2412090110RF08

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

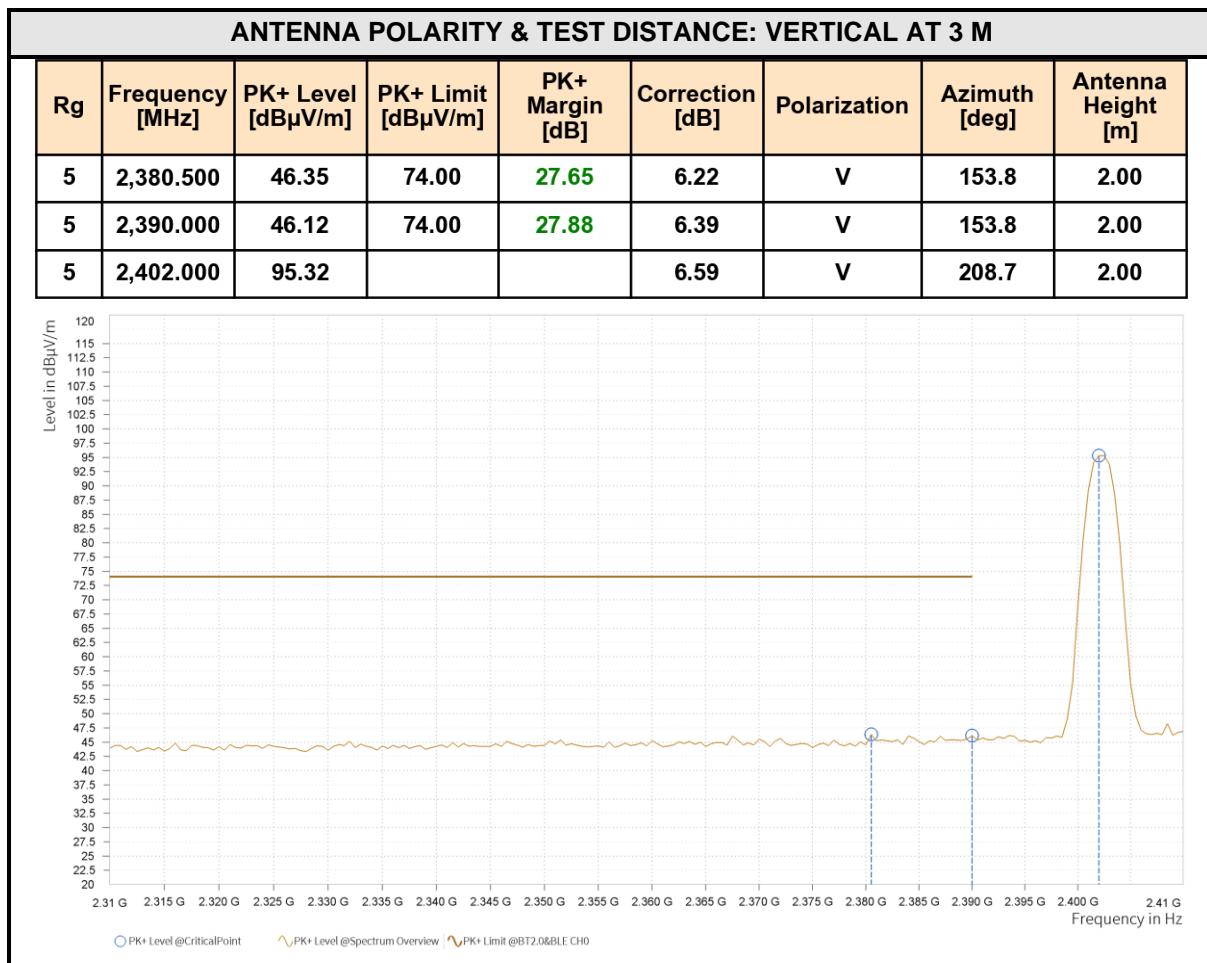
Rg	Frequency [MHz]	AVG Level [dB $\mu$ V/m]	AVG Limit [dB $\mu$ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,389.500	31.64	54.00	22.36	6.38	H	80.8	1.00
5	2,390.000	31.67	54.00	22.33	6.39	H	80.8	1.00
5	2,402.000	85.29			6.59	H	134.6	1.00





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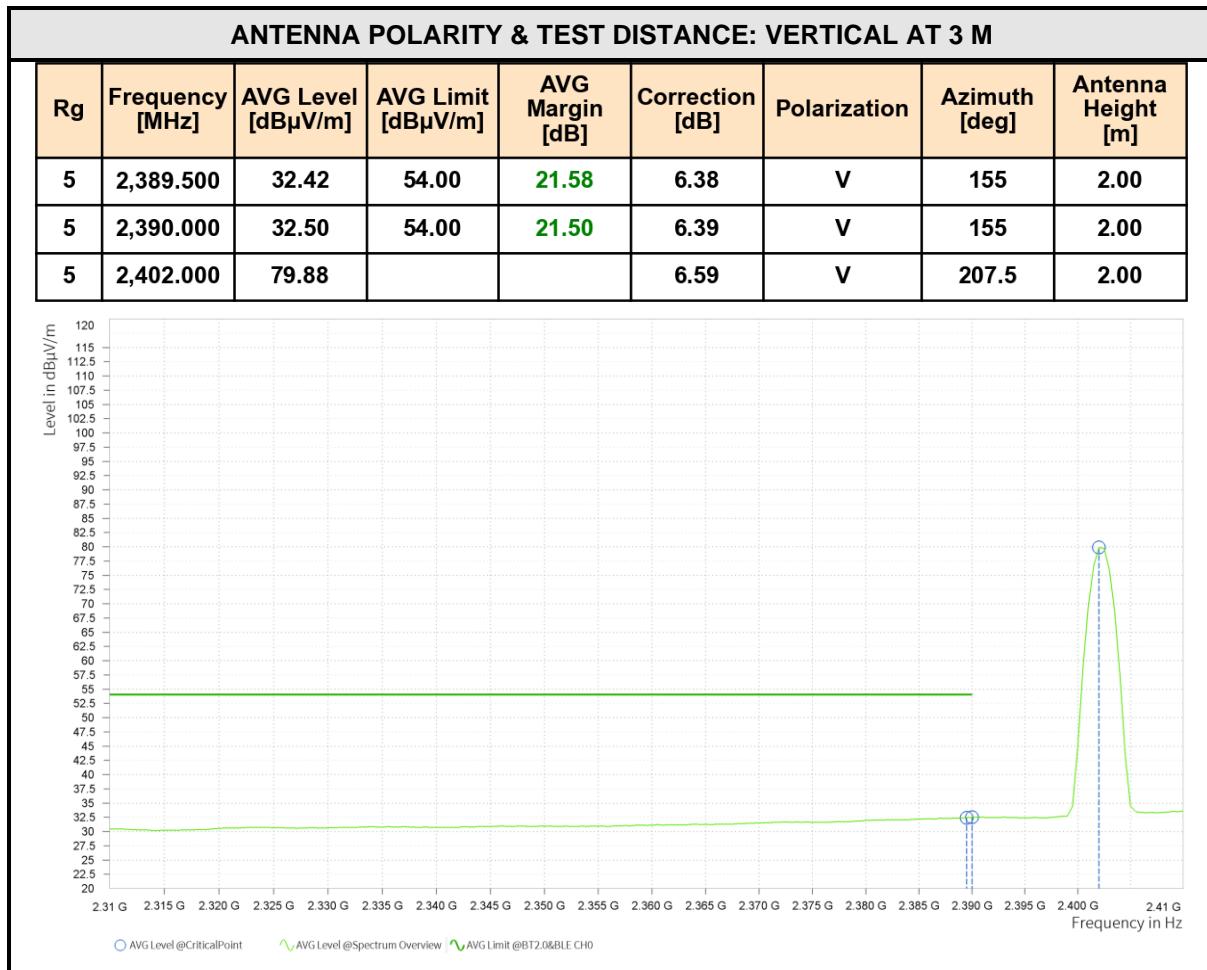
Test Report No.: PSU-NQN2412090110RF08





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#### REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
2. Margin value = Limit value - Emission level.
3. 2402MHz: Fundamental frequency.



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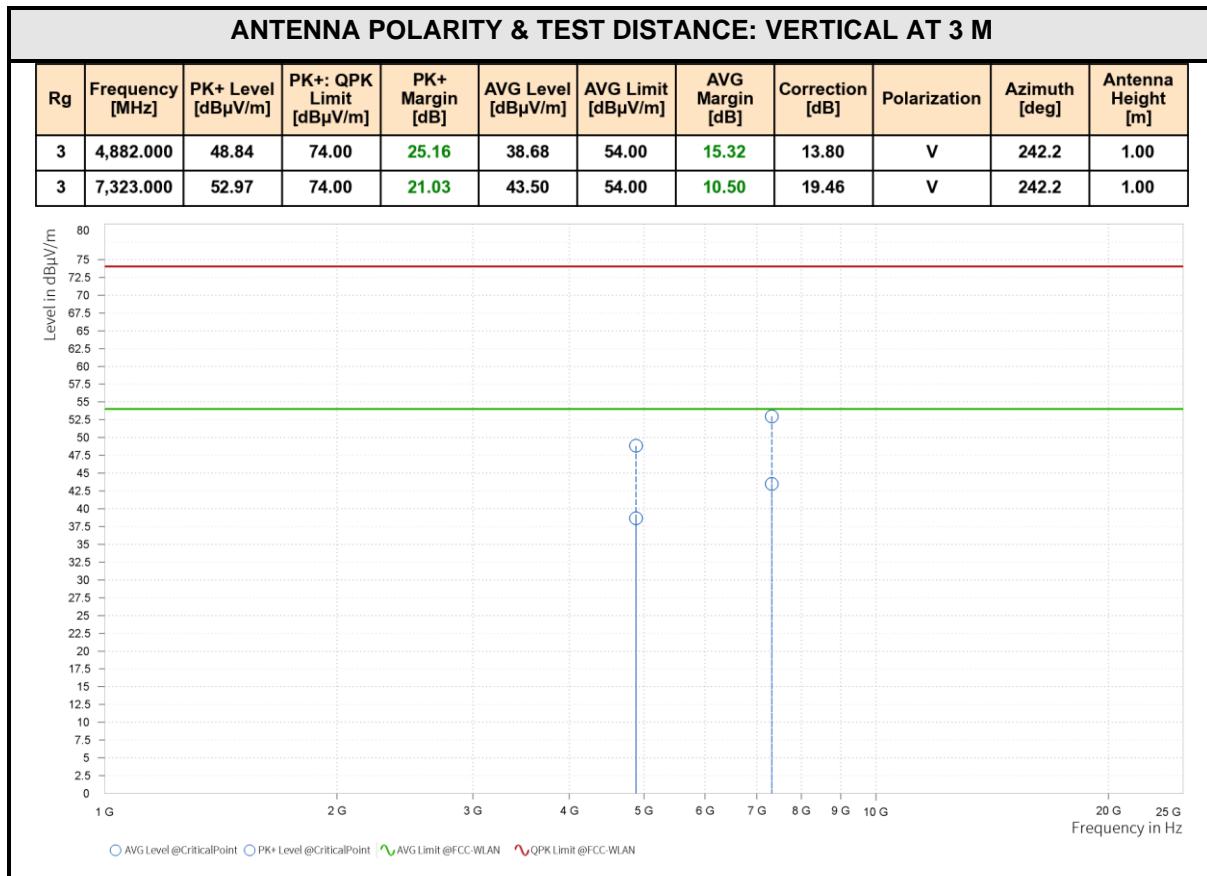
Test Report No.: PSU-NQN2412090110RF08

CHANNEL		TX Channel 39			DETECTOR FUNCTION			Peak (PK) Average (AV)			
FREQUENCY RANGE		1GHz ~ 25GHz									
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+: QPK Limit [dB $\mu$ V/m]	PK+ Margin [dB]	AVG Level [dB $\mu$ V/m]	AVG Limit [dB $\mu$ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,882.000	48.84	74.00	25.16	38.68	54.00	15.32	13.80	V	242.2	1.00
3	7,323.000	52.97	74.00	21.03	43.50	54.00	10.50	19.46	V	242.2	1.00
<p>Legend: <span style="color: blue;">○</span> AVG Level @CriticalPoint <span style="color: blue;">○</span> PK+ Level @CriticalPoint <span style="color: green;">^-</span> AVG Limit @FCC-WLAN <span style="color: red;">^-</span> QPK Limit @FCC-WLAN</p>											



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Test Report No.: PSU-NQN2412090110RF08



#### REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value – Emission level.
3. 2402MHz: Fundamental frequency.



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Test Report No.: PSU-NQN2412090110RF08

CHANNEL		TX Channel 78		DETECTOR FUNCTION		Peak (PK) Average (AV)					
FREQUENCY RANGE		1GHz ~ 25GHz									
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
Rg	Frequency [MHz]	PK+ Level [dB $\mu$ V/m]	PK+ Limit [dB $\mu$ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]			
6	2,479.980	98.55			7.23	H	213.4	2.00			
6	2,483.500	48.32	74.00	25.68	7.18	H	147.8	1.00			
6	2,483.720	47.90	74.00	26.10	7.17	H	197.9	1.00			

Graph showing Level in dB $\mu$ V/m vs Frequency in Hz. The Y-axis ranges from 20 to 120 dB $\mu$ V/m. The X-axis ranges from 2.478 G to 2.498 G. A yellow line represents the spectrum overview, showing a peak at 2.479.980 GHz (98.55 dB $\mu$ V/m) and a lower level at 2.483.500 GHz (48.32 dB $\mu$ V/m). A horizontal brown line represents the PK+ Limit at 74.00 dB $\mu$ V/m. Blue circles mark the PK+ Level at the critical points of 2.479.980 GHz and 2.483.500 GHz.

Legend: ○ PK+ Level @CriticalPoint ^ PK+ Level @Spectrum Overview — PK+ Limit @BT2.0 CH78&BLE CH39



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Test Report No.: PSU-NQN2412090110RF08

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dB $\mu$ V/m]	AVG Limit [dB $\mu$ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.980	87.61			7.23	H	64.1	2.00
6	2,483.500	33.22	54.00	20.78	7.18	H	263.7	2.00
6	2,483.720	33.18	54.00	20.82	7.17	H	263.7	2.00

