



Test Report No.: W7L-P240118W001RF01



Certificate #6613.01

FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	APTIV Services Deutschland GmbH
Address:	Am Technologiepark 1, D-42119 Wuppertal Germany

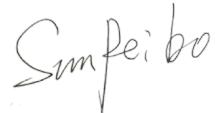
Manufacturer or Supplier:	APTIV Services Deutschland GmbH
Address:	Am Technologiepark 1, D-42119 Wuppertal Germany
Product:	Infotainment Head Unit
Brand Name:	APTIV
Model Name:	IHU 4.2
FCC ID:	LTQIHU42
Date of tests:	Jan. 20, 2024 ~ Jun. 06, 2024

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: Jun. 06, 2024	 Date: Jun. 06, 2024

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



TABLE OF CONTENTS

RELEASE CONTROL RECORD	5
1 SUMMARY OF TEST RESULTS.....	6
1.1 MEASUREMENT UNCERTAINTY	7
2 GENERAL INFORMATION	9
2.1 GENERAL DESCRIPTION OF EUT	9
2.2 DESCRIPTION OF TEST MODES	11
2.2.1 CONFIGURATION OF SYSTEM UNDER TEST	12
2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	12
2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS	14
2.4 DESCRIPTION OF SUPPORT UNITS	14
3 TEST TYPES AND RESULTS.....	15
3.1 CONDUCTED EMISSION MEASUREMENT	15
3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	15
3.1.2 TEST INSTRUMENTS.....	15
3.1.3 TEST PROCEDURES	16
3.1.4 DEVIATION FROM TEST STANDARD	16
3.1.5 TEST SETUP	16
3.1.6 EUT OPERATING CONDITIONS	17
3.1.7 TEST RESULTS	18
3.2 RADIATED EMISSION AND BANDEdge MEASUREMENT.....	20
3.2.1 LIMITS OF RADIATED EMISSION AND BANDEdge MEASUREMENT.....	20
3.2.2 TEST INSTRUMENTS.....	21
3.2.3 TEST PROCEDURES	23
3.2.4 DEVIATION FROM TEST STANDARD	23
3.2.5 TEST SETUP	24
3.2.6 EUT OPERATING CONDITIONS	25
3.2.7 TEST RESULTS	26
3.3 NUMBER OF HOPPING FREQUENCY USED	58
3.3.1 LIMIT OF HOPPING FREQUENCY USED	58
3.3.2 TEST SETUP	58
3.3.3 TEST INSTRUMENTS.....	59
3.3.4 TEST PROCEDURES	60
3.3.5 DEVIATION FROM TEST STANDARD	60



Test Report No.: W7L-P240118W001RF01

3.3.6 TEST RESULTS	60
3.4 DWELL TIME ON EACH CHANNEL	61
3.4.1 LIMIT OF DWELL TIME USED	61
3.4.2 TEST SETUP	61
3.4.3 TEST INSTRUMENTS	61
3.4.4 TEST PROCEDURES	61
3.4.5 DEVIATION FROM TEST STANDARD	62
3.4.6 TEST RESULTS	62
3.5 CHANNEL BANDWIDTH	63
3.5.1 LIMITS OF CHANNEL BANDWIDTH	63
3.5.2 TEST SETUP	63
3.5.3 TEST INSTRUMENTS	63
3.5.4 TEST PROCEDURE	63
3.5.5 DEVIATION FROM TEST STANDARD	63
3.5.6 EUT OPERATING CONDITION	64
3.5.7 TEST RESULTS	64
3.6 HOPPING CHANNEL SEPARATION	65
3.6.1 LIMIT OF HOPPING CHANNEL SEPARATION	65
3.6.2 TEST SETUP	65
3.6.3 TEST INSTRUMENTS	65
3.6.4 TEST PROCEDURES	65
3.6.5 DEVIATION FROM TEST STANDARD	65
3.6.6 TEST RESULTS	66
3.7 MAXIMUM OUTPUT POWER	66
3.7.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT	66
3.7.2 TEST SETUP	66
3.7.3 TEST INSTRUMENTS	66
3.7.4 TEST PROCEDURES	66
3.7.5 DEVIATION FROM TEST STANDARD	67
3.7.6 EUT OPERATING CONDITION	67
3.7.7 TEST RESULTS	67
3.7.7.1 MAXIMUM PEAK OUTPUT POWER	67
3.7.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)	67
3.8 OUT OF BAND MEASUREMENT	68
3.8.1 LIMITS OF OUT OF BAND MEASUREMENT	68
3.8.2 TEST INSTRUMENTS	68



Test Report No.: W7L-P240118W001RF01

3.8.3	TEST PROCEDURE	68
3.8.4	DEVIATION FROM TEST STANDARD	68
3.8.5	EUT OPERATING CONDITION	68
3.8.6	TEST RESULTS	68
4.	PHOTOGRAPHS OF THE TEST CONFIGURATION	69
5.	MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	70
6.	APPENDIX.....	71
	20DB EMISSION BANDWIDTH	71
	TEST RESULT	71
	TEST GRAPHS.....	72
	OCCUPIED CHANNEL BANDWIDTH.....	77
	TEST RESULT	77
	TEST GRAPHS.....	78
	MAXIMUM CONDUCTED OUTPUT POWER.....	83
	TEST RESULT	83
	CARRIER FREQUENCY SEPARATION	84
	TEST RESULT	84
	TEST GRAPHS.....	85
	TIME OF OCCUPANCY	87
	TEST RESULT	87
	TEST GRAPHS.....	88
	NUMBER OF HOPPING CHANNELS.....	98
	TEST RESULT	98
	TEST GRAPHS.....	99
	BAND EDGE MEASUREMENTS	101
	TEST RESULT	101
	TEST GRAPHS.....	102
	CONDUCTED SPURIOUS EMISSION	109
	TEST RESULT	109
	TEST GRAPHS.....	110
	DUTY CYCLE.....	116
	TEST RESULT	116
	TEST GRAPHS.....	117



Test Report No.: W7L-P240118W001RF01

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P240118W001RF01	Original release	Jun. 06, 2024



Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

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 Zhuyi 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.



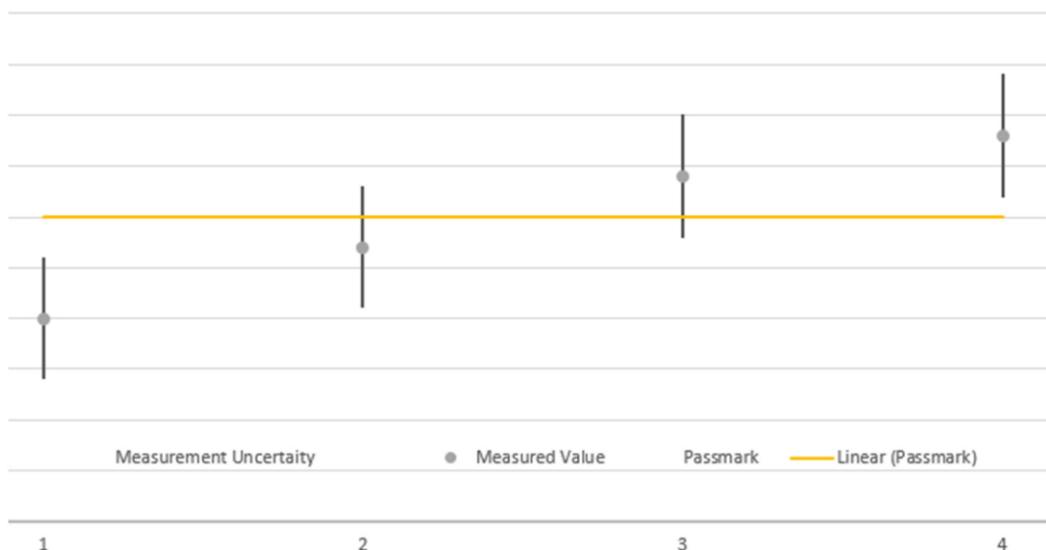
Test Report No.: W7L-P240118W001RF01

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 $k=2$.





Test Report No.: W7L-P240118W001RF01

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.



Test Report No.: W7L-P240118W001RF01

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Infotainment Head Unit
BRAND NAME*	APTIV
MODEL NAME*	IHU 4.2
NOMINAL VOLTAGE*	EUT13.5Vdc
MODULATION TECHNOLOGY	FHSS
MODULATION TYPE	GFSK, 8DPSK, $\pi/4$ DQPSK
OPERATING FREQUENCY	2402MHz~2480MHz
NUMBER OF CHANNEL	79
MAX. OUTPUT POWER	1.74mW (Max. Measured)
ANTENNA TYPE*	PCB Antenna with 1.75dBi gain
HW VERSION*	PF04
SW VERSION*	master_662.0/42000000BE
I/O PORTS*	Refer to user's manual
CABLE SUPPLIED*	N/A

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.



Test Report No.: W7L-P240118W001RF01

5. List of Accessory:

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
IHU 4.2 Units	APTIV	APTIV	IHU 4.2	DAB variant
2 Connectors (USB and HSD)	N/A	N/A	N/A	N/A
USB Cables	N/A	N/A	N/A	both sides, 0.8m
HSD Z-Code Cables 1	N/A	N/A	N/A	100Ω, both sides, 0.4m
HSD Z-Code Cables 2	Rosenberger	N/A	N/A	100Ω, both sides, 0.8m
Ethernet Cables	Rosenberger	N/A	N/A	both sides, 0.8m
DAB/SDARS Cables	Rosenberger	N/A	N/A	FRAKA connector on one side and BNC on the other sides 50Ω, 1.2m
FM Cables	Rosenberger	N/A	N/A	FRAKA connector (2 pins) on one side and 2 BNC's on the other sides. 50Ω, 1.2m
Cables TTL-232R-3V3	N/A	N/A	N/A	USB and D-Sub connector's not shielded; 1.5m
Harness Cables	Wiretronic	N/A	N/A	Several connector's not shielded; 1.2m
D-Sub Connectors	N/A	N/A	N/A	N/A
Load Boxes	N/A	N/A	N/A	N/A
Amplifier	Alpine	N/A	AUD HP 4-8B	N/A
MOST Cable	N/A	N/A	N/A	1.2m
Power Cable	N/A	N/A	N/A	1.0m
Cable for Speakers	N/A	N/A	N/A	1.2m



Test Report No.: W7L-P240118W001RF01

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		



Test Report No.: W7L-P240118W001RF01

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	8DPSK	3DH5

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



Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

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	39	FHSS	8DPSK	3DH5

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE<1G	23deg. C, 70%RH	DC 13.5 By DC Source	Hanwen Xu
RE≥1G	23deg. C, 70%RH	DC 13.5 By DC Source	Hanwen Xu
PLC	25deg. C, 52%RH	DC 13.5 By DC Source	Hanwen Xu
APCM	25deg. C, 60%RH	DC 13.5 By DC Source	Hanwen Xu



Test Report No.: W7L-P240118W001RF01

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	DC Source	HYELEC	HY3010B	551016	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Cable: Unshielded, Detachable 1.0m



Test Report No.: W7L-P240118W001RF01

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 μ 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.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	102749	Feb.25,22	Feb.24,24
EMI Test Receiver	Rohde&Schwarz	ESR3	102749	Feb.24,24	Feb.23,26
ELEKTRA test software	Rohde&Schwarz	ELEKTRA	NA	N/A	N/A
LISN network	Rohde&Schwarz	ENV216	102640	Feb.17,22	Feb.16,24
LISN network	Rohde&Schwarz	ENV216	102640	Feb.16,24	Feb.15,26
CABLE	Rohde&Schwarz	W61.01	N/A	Apr.28,23	Apr.27,24
CABLE	Rohde&Schwarz	W61.01	N/A	Apr.27,24	Apr.26,25
CABLE	Rohde&Schwarz	W601	N/A	Apr.28,23	Apr.27,24
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, GRT/CHINA and NIM/CHINA.

3.1.3 TEST PROCEDURES

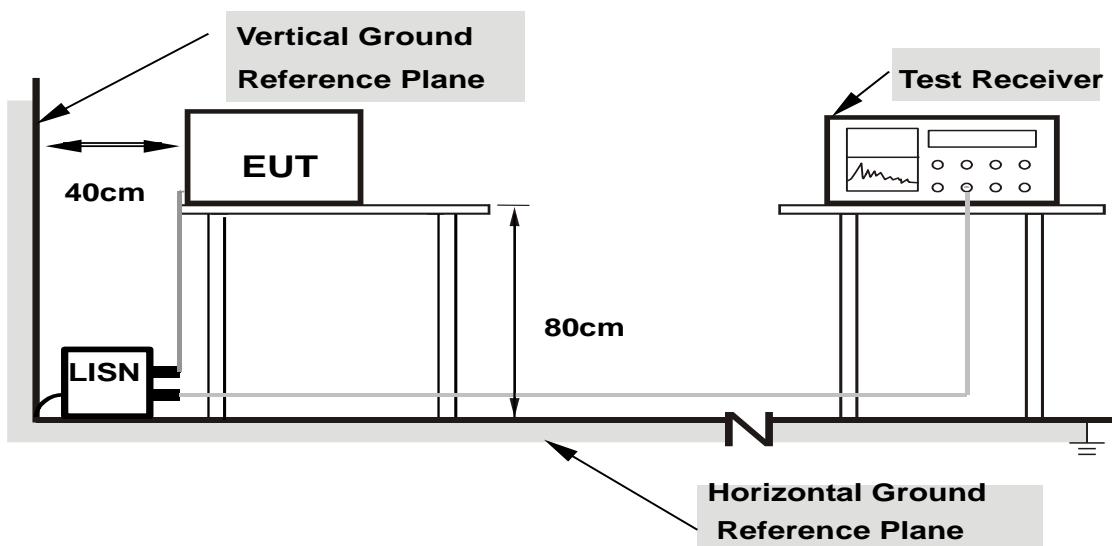
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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 cm from other units and other metal planes

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



Test Report No.: W7L-P240118W001RF01

3.1.6 EUT OPERATING CONDITIONS

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



3.1.7 TEST RESULTS

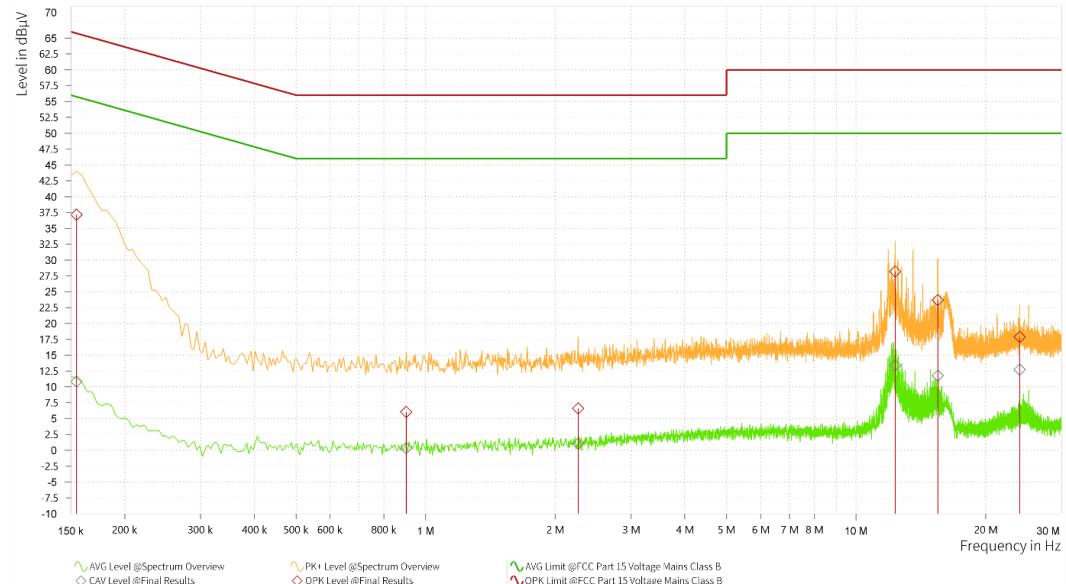
CONDUCTED WORST-CASE DATA:

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	DC 13.5V	Environmental Conditions	26deg. C, 51%RH
Tested By	Hanwen Xu		

Rg	Frequency [MHz]	QPK Level [dB μ V]	QPK Limit [dB μ V]	QPK Margin [dB]	CAV Level [dB μ V]	CAV: AVG Limit [dB μ V]	CAV Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]
1	0.155	37.15	65.75	28.60	10.84	55.75	44.91	12.52	L1	9.000
1	0.902	6.03	56.00	49.97	0.34	46.00	45.66	11.74	L1	9.000
1	2.261	6.59	56.00	49.41	1.03	46.00	44.97	11.76	L1	9.000
1	12.323	28.19	60.00	31.81	13.38	50.00	36.62	11.84	L1	9.000
1	15.477	23.67	60.00	36.33	11.78	50.00	38.22	11.85	L1	9.000
1	24.000	17.88	60.00	42.12	12.74	50.00	37.26	11.89	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.





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	DC 13.5V	Environmental Conditions	26deg. C, 51%RH
Tested By	Hanwen Xu		

Rg	Frequency [MHz]	QPK Level [dB μ V]	QPK Limit [dB μ V]	QPK Margin [dB]	CAV Level [dB μ V]	CAV AVG Limit [dB μ V]	CAV Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]
1	0.155	23.02	65.75	42.73	5.91	55.75	49.84	12.15	N	9.000
1	1.343	7.66	56.00	48.34	1.86	46.00	44.14	12.74	N	9.000
1	4.169	8.92	56.00	47.08	3.28	46.00	42.72	12.75	N	9.000
1	12.323	29.31	60.00	30.69	14.51	50.00	35.49	12.81	N	9.000
1	15.477	25.86	60.00	34.14	11.56	50.00	38.44	12.83	N	9.000
1	24.000	19.82	60.00	40.18	14.92	50.00	35.08	12.87	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

6. Emission Level = Correction Factor + Reading Value.





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

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_uV/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.



3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,22	Aug.29,24
Pre-Amplifier	R&S	SCU08F1	101028	Sep.16,22	Sep.15,24
Signal Generator	R&S	SMB100A	182185	Feb.16,22	Feb.15,24
Signal Generator	R&S	SMB100A	182185	Feb.15,24	Feb.14,26
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	Feb.25,22	Feb.24,24
EMI TEST Receiver	R&S	ESW44	101973	Feb.24,24	Feb.23,26
Bilog Antenna	SCHWARZBEC K	VULB 9163	1264	Feb.28,22	Feb.27,24
Bilog Antenna	SCHWARZBEC K	VULB 9163	1264	Feb.27,24	Feb.26,26
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,22	Aug.21,24
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Feb.23,22	Feb.22,24
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Feb.22,24	Feb.21,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,22	Aug.21,24
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,22	Feb.22,24
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,24	Feb.21,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.27,22	Jun.26,24
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.31,22	Aug.30,24
Hygrothermograph	DELI	20210528	SZ014	Sep.06,22	Sep.05,24
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

**Test Report No.: W7L-P240118W001RF01**

BUREAU VERITAS					
TMC-AMI18843A(CA BLE)	R&S	HF290-NMNM- 4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.28,23	Apr.27,24
CABLE	R&S	W13.02	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.28,23	Apr.27,24
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, GRGT/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.

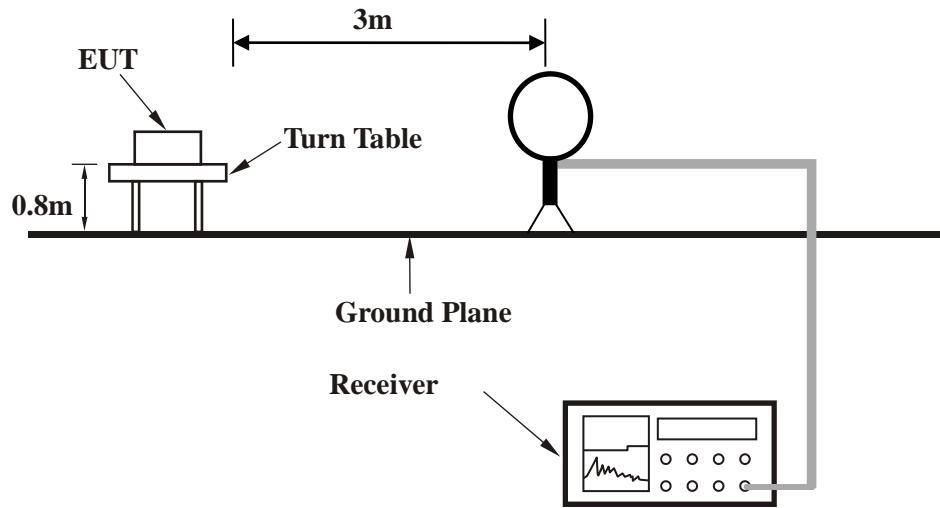


Test Report No.: W7L-P240118W001RF01

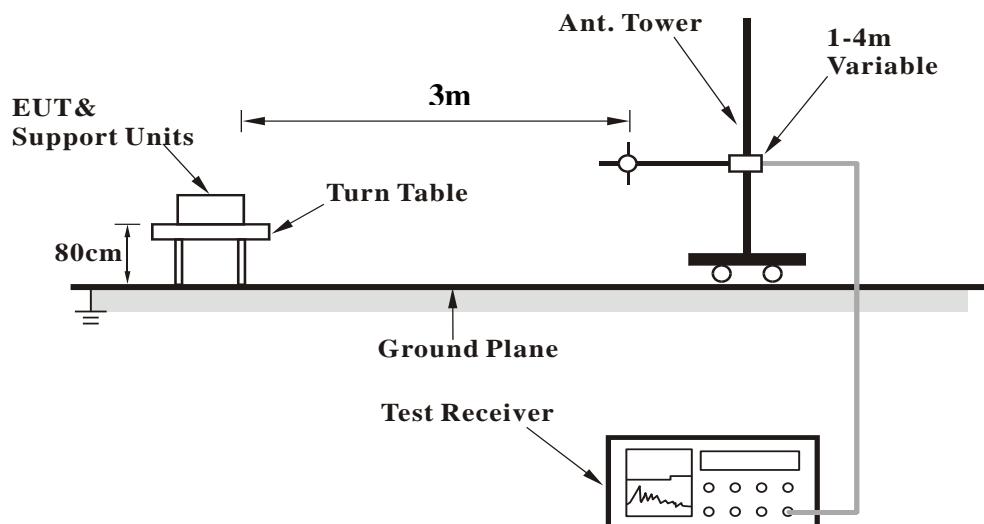
BUREAU
VERITAS

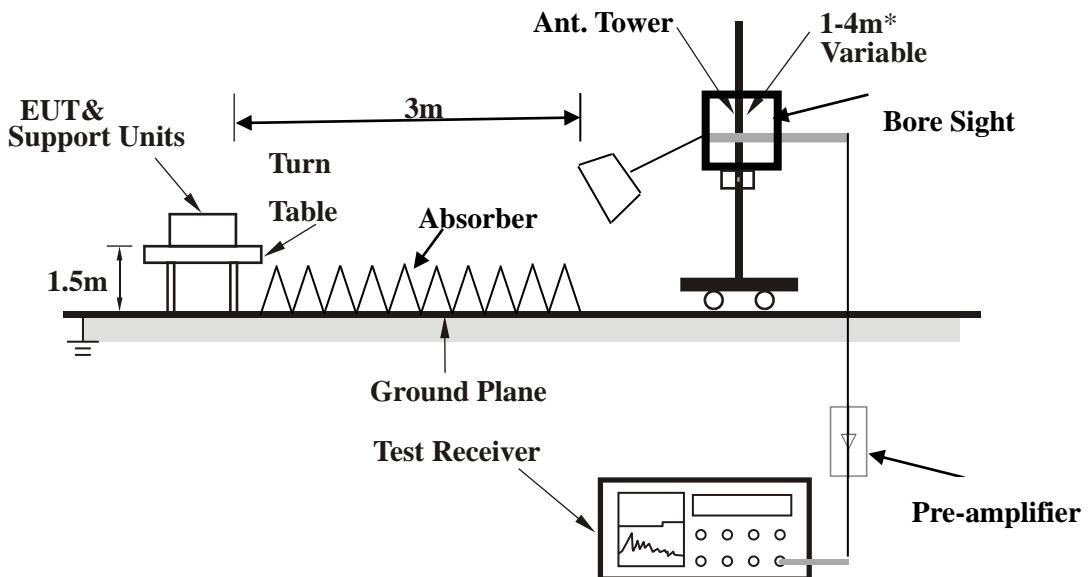
3.2.5 TEST SETUP

<Frequency Range 9KHz~30MHz >



< Frequency Range 30MHz~1GHz >



<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.



Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

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:

30 MHz – 1GHz data:

BT_8DPSK

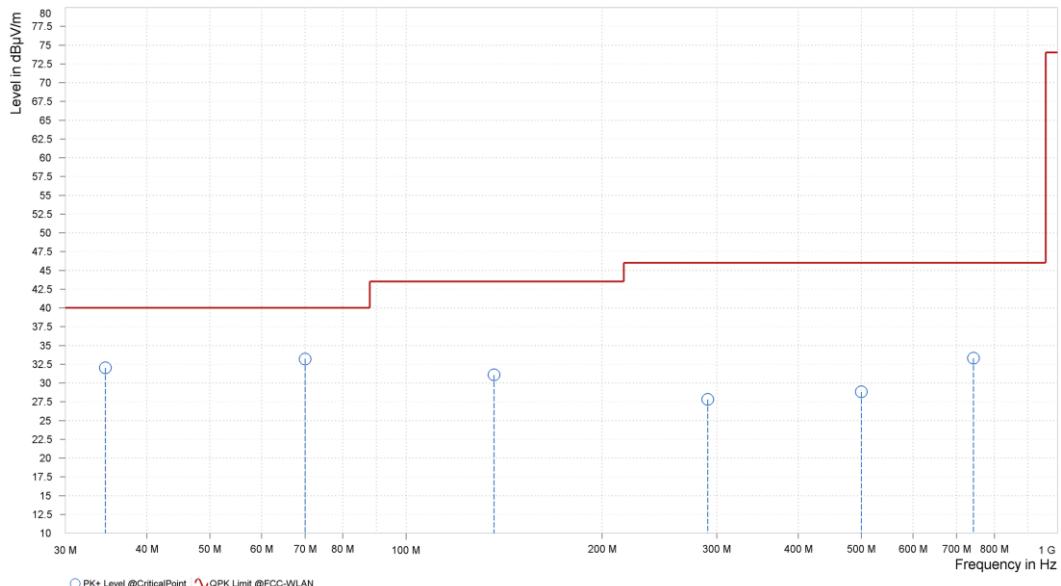
CHANNEL	Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+: QPK Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	34.559	32.02	40.00	7.98	-9.99	H	232.6	2.00
1	69.964	33.21	40.00	6.79	-11.77	H	0.9	2.00
1	136.506	31.08	43.50	12.42	-12.41	H	1.7	2.00
1	290.348	27.80	46.00	18.20	-5.83	H	260.1	1.00
1	500.062	28.83	46.00	17.17	-3.53	H	1.7	2.00
1	742.514	33.30	46.00	12.70	0.51	H	1	1.00

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.





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

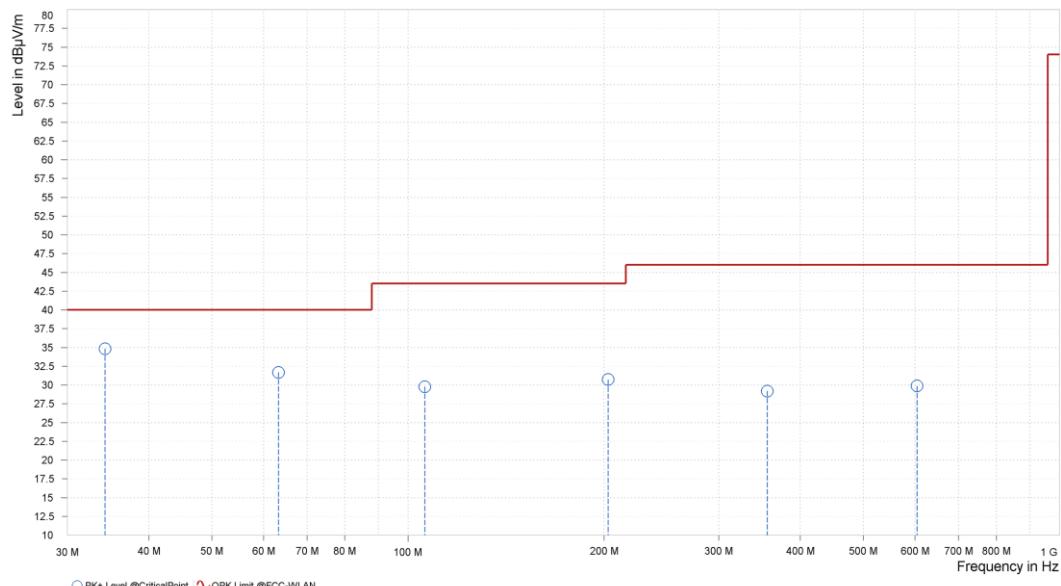
CHANNEL	Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+: QPK Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	34.268	34.84	40.00	5.16	-10.07	V	132.2	1.00
1	63.271	31.69	40.00	8.31	-9.49	V	226.6	2.00
1	106.145	29.78	43.50	13.72	-9.06	V	226.6	2.00
1	202.903	30.73	43.50	12.77	-8.54	V	359	1.00
1	355.775	29.19	46.00	16.81	-3.68	V	1	1.00
1	604.337	29.88	46.00	16.12	-1.73	V	5.1	1.00

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.





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ABOVE 1GHz WORST-CASE DATA:

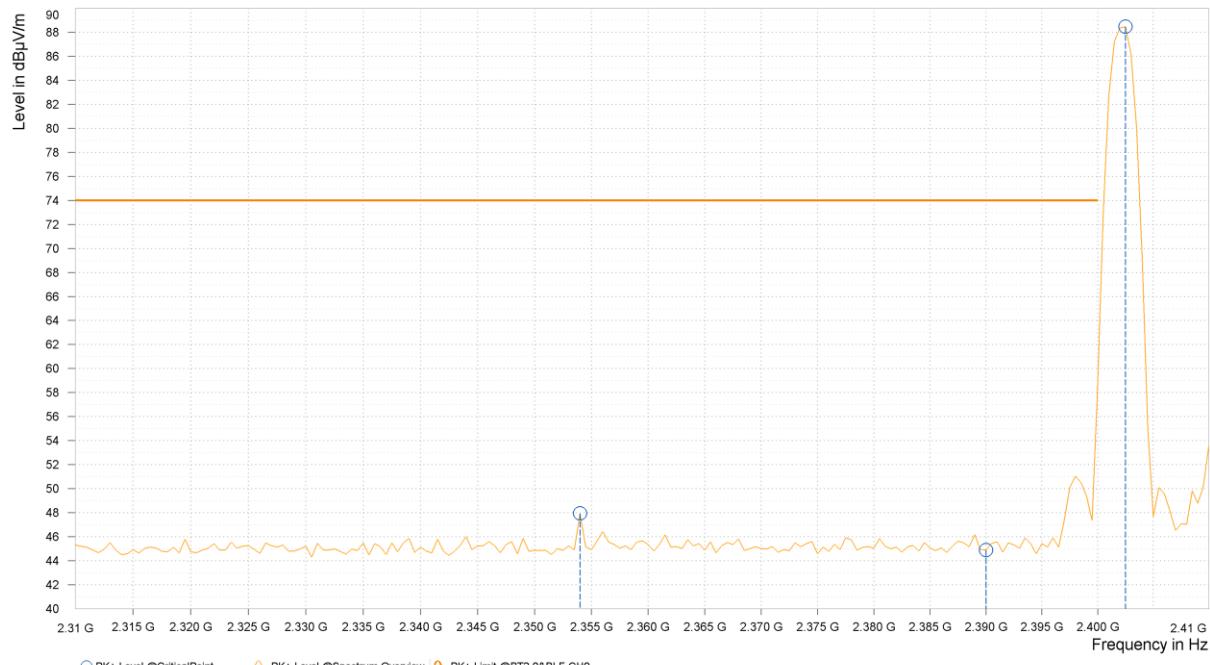
Note: All other emissions that greater than 20dB below the limit were not recorded.

BT_GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,354.000	47.94	74.00	26.06	-1.25	H	316.3	2.00
5	2,390.000	44.90	74.00	29.10	-1.05	H	357.9	1.00
5	2,402.500	88.46			-0.95	H	337.8	1.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,377.500	32.36	54.00	21.64	-1.15	H	267.3	2.00
5	2,390.000	30.86	54.00	23.14	-1.05	H	359.1	1.00
5	2,402.000	83.69			-0.96	H	218.2	2.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,369.500	47.00	74.00	27.00	-1.20	V	4.5	1.00
5	2,390.000	44.90	74.00	29.10	-1.05	V	2.3	2.00
5	2,402.500	91.79			-0.95	V	4.5	1.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,377.500	31.29	54.00	22.71	-1.15	V	355	2.00
5	2,390.000	30.92	54.00	23.08	-1.05	V	0.9	2.00
5	2,402.000	83.98			-0.96	V	90.4	1.00



REMARKS:

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



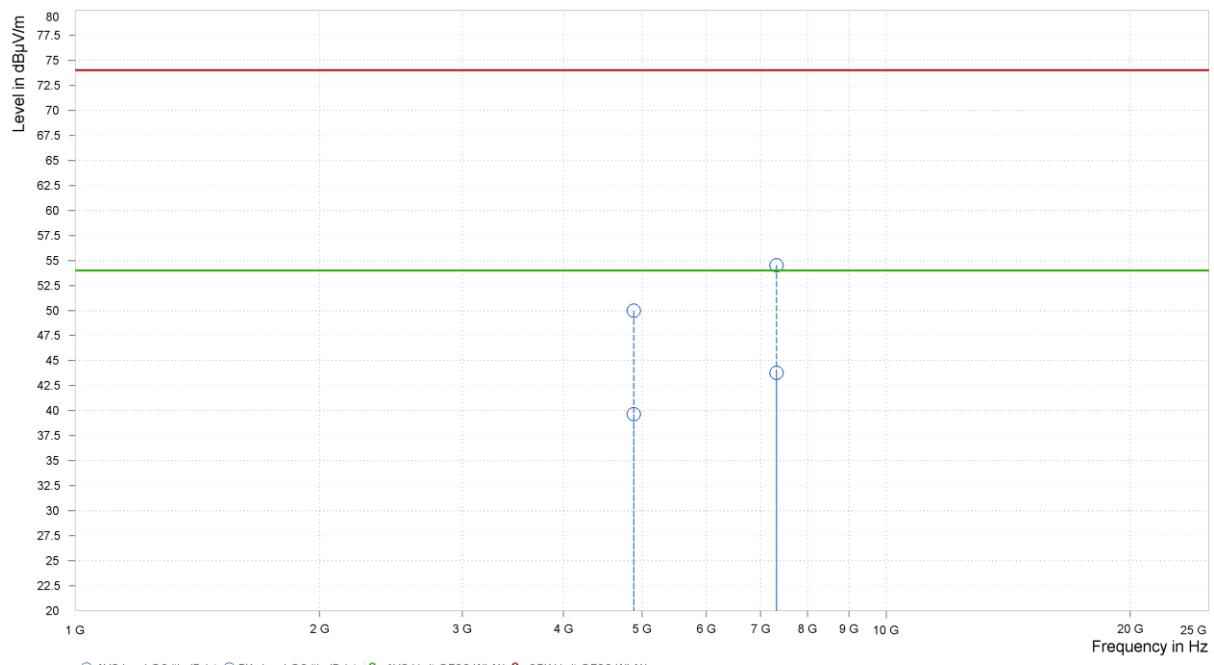
Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

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 μ V/m]	PK+: QPK Limit [dB μ V/m]	PK+ Margin [dB]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,882.000	49.97	74.00	24.03	39.63	54.00	14.37	4.99	H	359.1	1.00
3	7,323.000	54.54	74.00	19.46	43.77	54.00	10.23	11.14	H	0.9	2.00



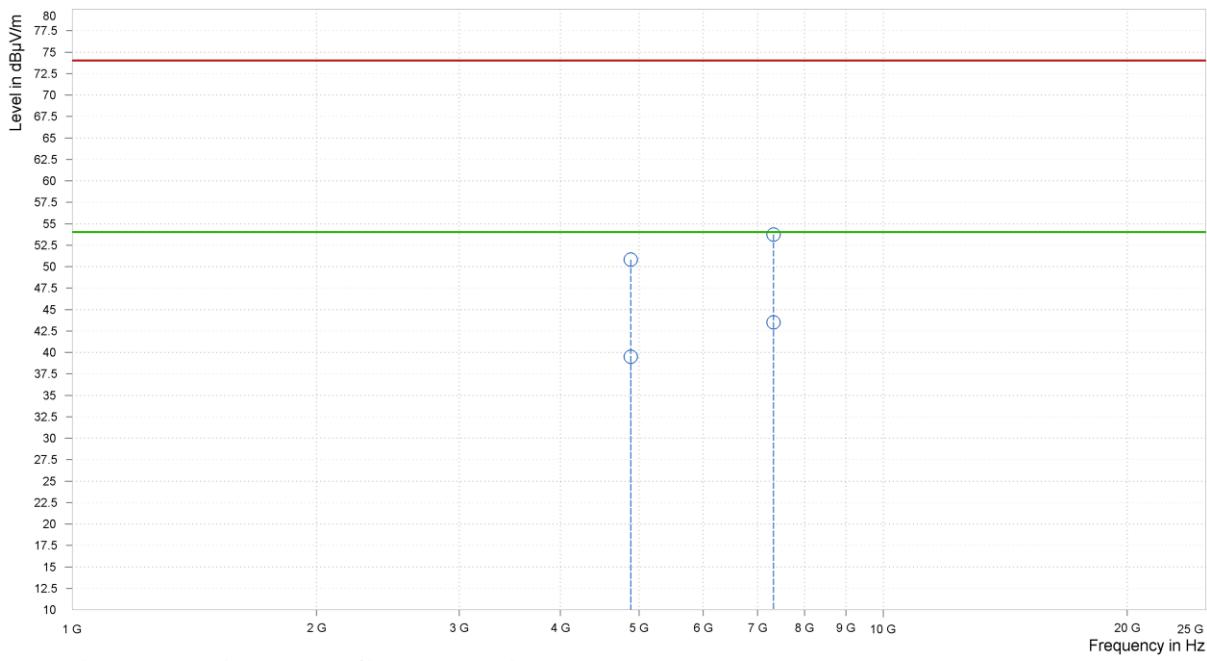


Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+: QPK Limit [dB μ V/m]	PK+ Margin [dB]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,882.000	50.81	74.00	23.19	39.50	54.00	14.50	4.99	V	359.1	1.00
3	7,323.000	53.75	74.00	20.25	43.51	54.00	10.49	11.14	V	0.9	2.00



REMARKS:

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



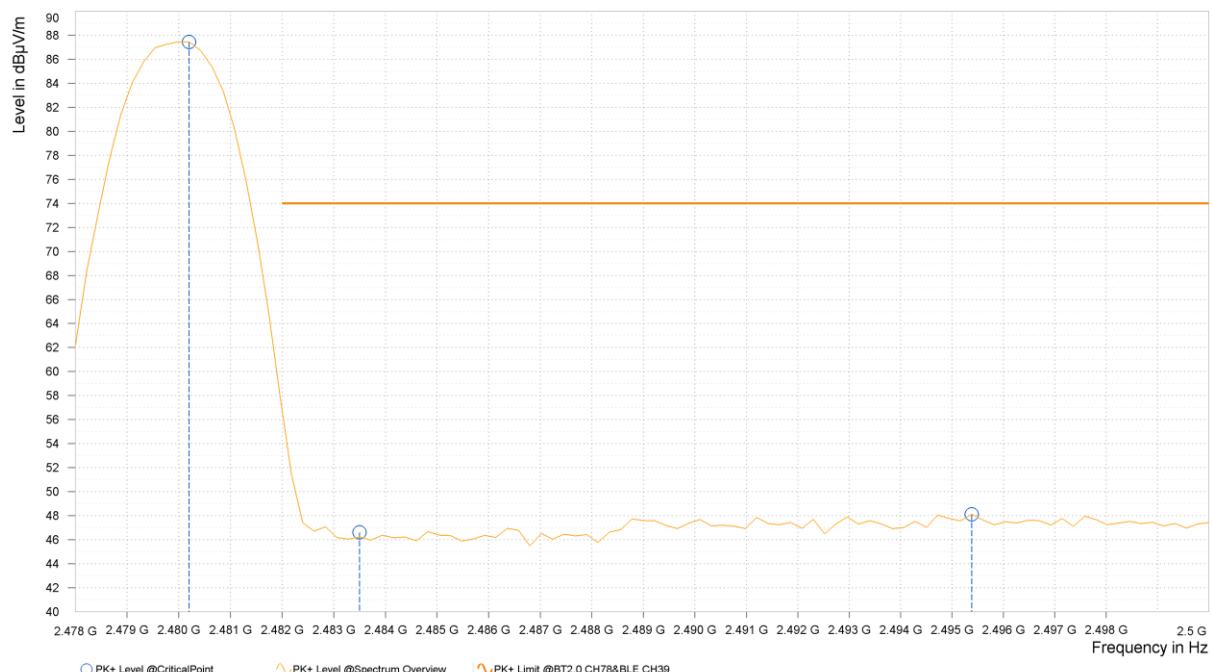
Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.200	87.46			-0.88	H	5.1	1.00
6	2,483.500	46.60	74.00	27.40	-0.87	H	0.9	2.00
6	2,495.380	48.13	74.00	25.87	-0.83	H	0.9	2.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.540	83.28			-0.88	H	194.3	1.00
6	2,483.500	31.37	54.00	22.63	-0.87	H	194.3	1.00
6	2,492.080	32.02	54.00	21.98	-0.84	H	359	2.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

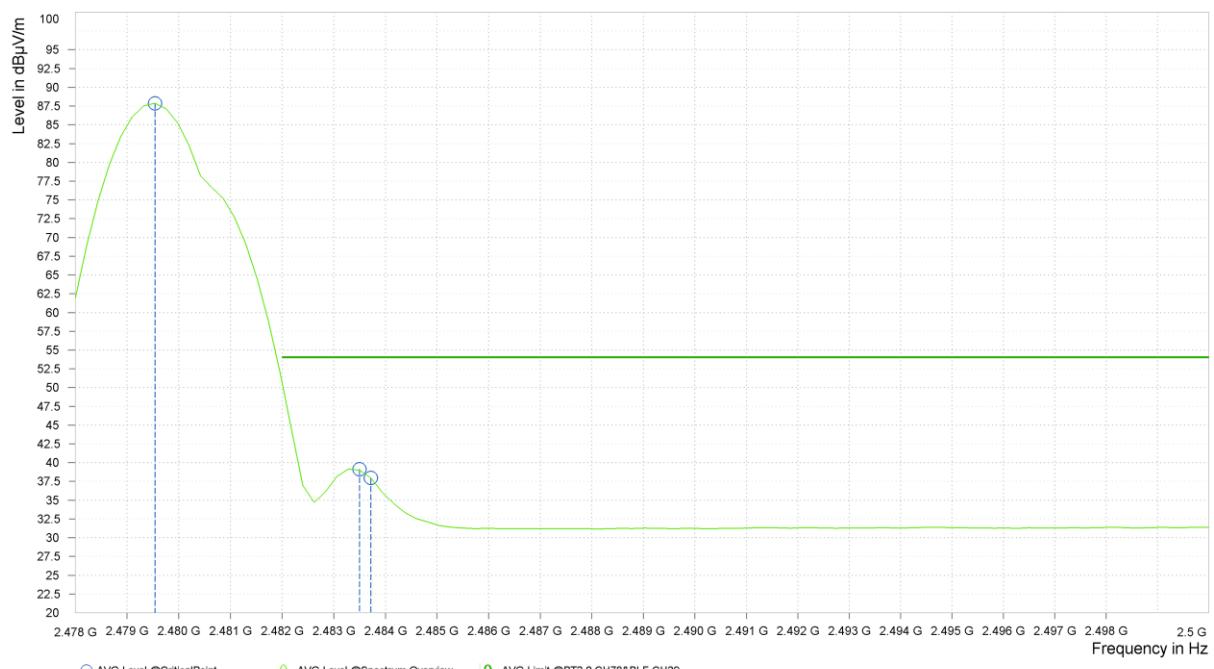
Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.200	95.35			-0.88	V	266.1	2.00
6	2,483.500	50.32	74.00	23.68	-0.87	V	214.7	2.00
6	2,483.720	50.41	74.00	23.59	-0.87	V	266.1	2.00





Test Report No.: W7L-P240118W001RF01

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.540	87.88			-0.88	V	316.4	2.00
6	2,483.500	39.14	54.00	14.86	-0.87	V	316.4	2.00
6	2,483.720	37.95	54.00	16.05	-0.87	V	316.4	2.00



REMARKS:

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



Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

BT_π/4-DQPSK

CHANNEL	TX Channel 0	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]
5	2,314.500	46.80	74.00	27.20	-1.41	H	315.1	2.00
5	2,390.000	45.33	74.00	28.67	-1.05	H	241	1.00
5	2,402.000	93.24			-0.96	H	94	1.00

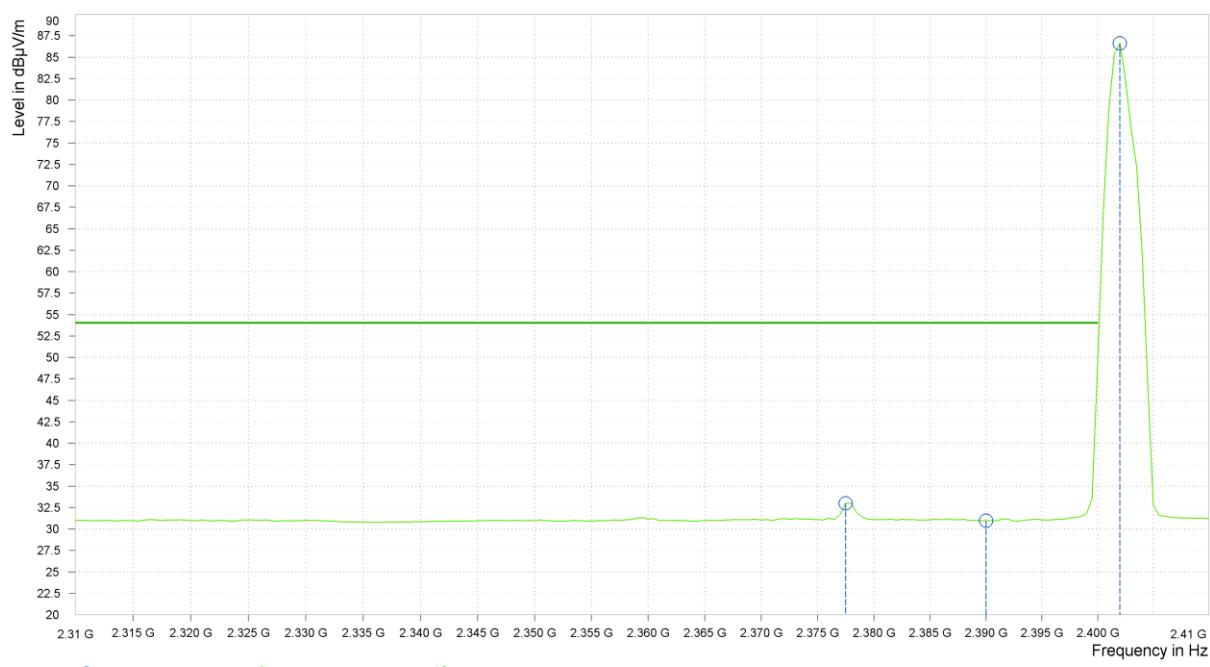




Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,377.500	33.01	54.00	20.99	-1.15	H	266.1	2.00
5	2,390.000	30.96	54.00	23.04	-1.05	H	241	1.00
5	2,402.000	86.63			-0.96	H	91.6	1.00



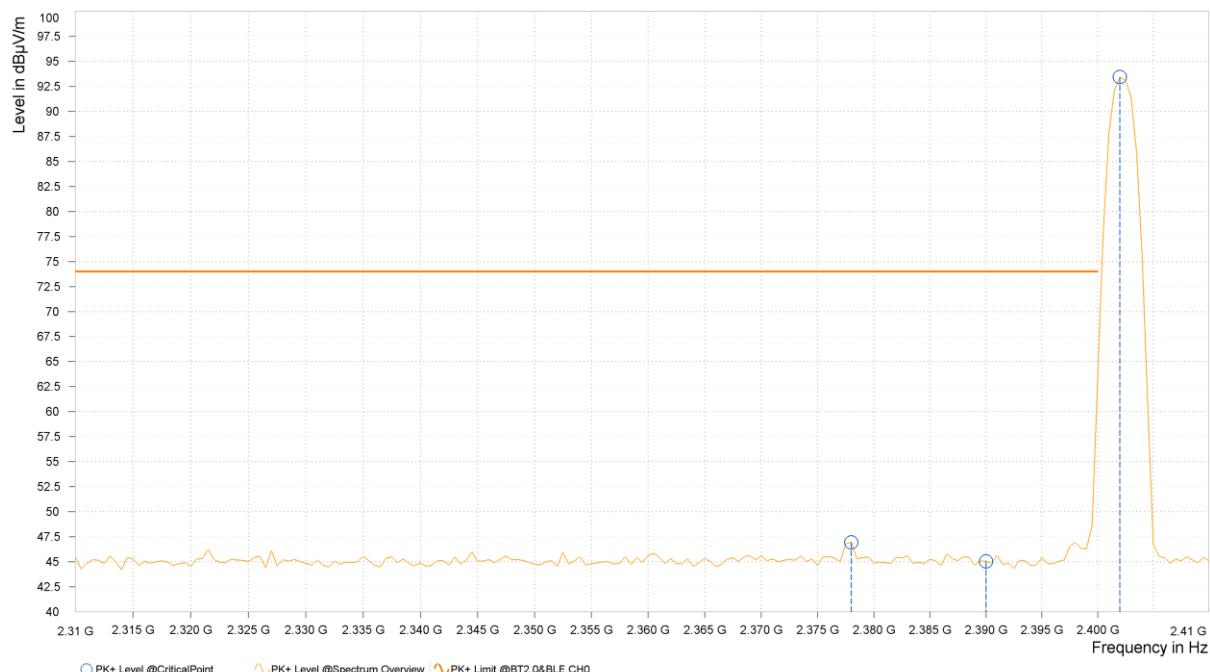


Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,378.000	46.95	74.00	27.05	-1.14	V	218.3	2.00
5	2,390.000	45.03	74.00	28.97	-1.05	V	315.2	2.00
5	2,402.000	93.42			-0.96	V	266.1	2.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,377.500	33.92	54.00	20.08	-1.15	V	217	2.00
5	2,390.000	30.91	54.00	23.09	-1.05	V	217	2.00
5	2,402.000	82.94			-0.96	V	217	2.00



REMARKS:

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



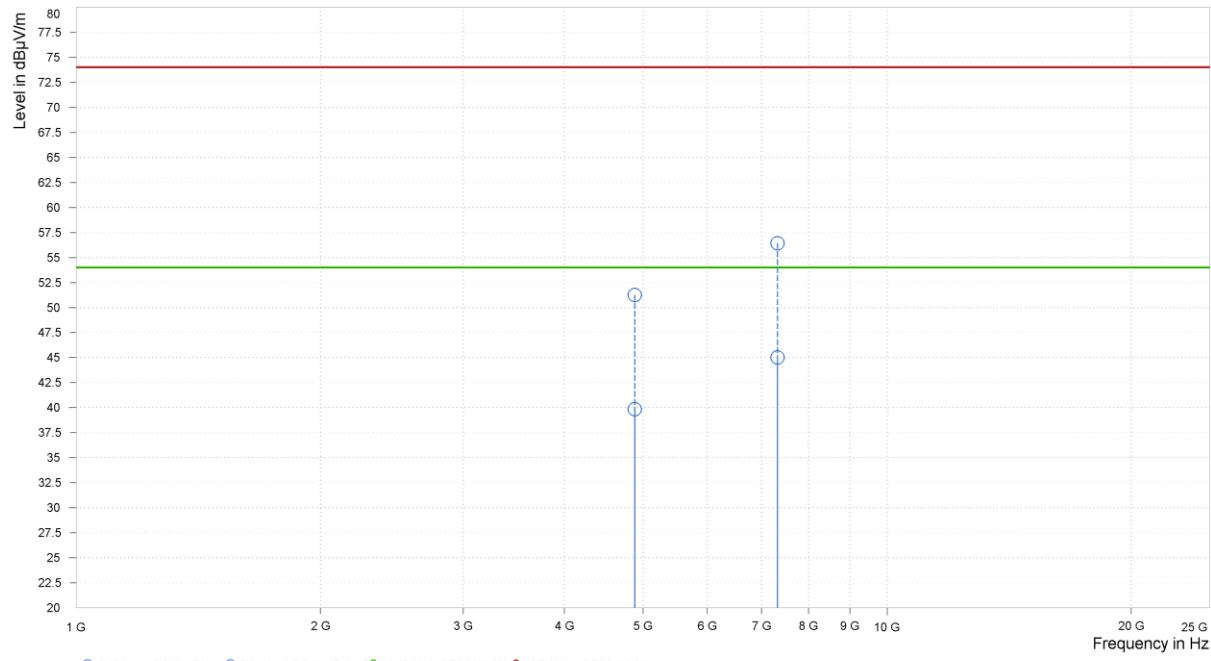
Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

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 μ V/m]	PK+ QPK Limit [dB μ V/m]	PK+ Margin [dB]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,882.000	51.26	74.00	22.74	39.83	54.00	14.17	5.44	H	0.9	2.00
3	7,323.000	56.42	74.00	17.58	45.01	54.00	8.99	12.35	H	0.9	2.00



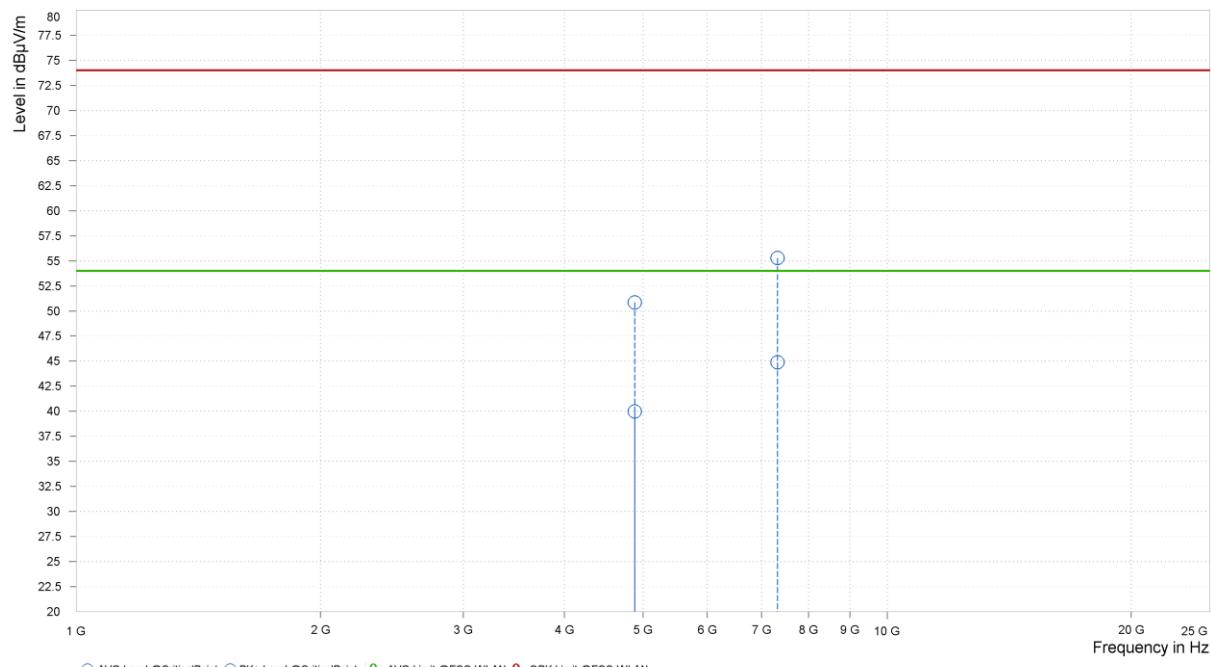


Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+: QPK Limit [dB μ V/m]	PK+ Margin [dB]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,882.000	50.86	74.00	23.14	39.97	54.00	14.03	5.44	V	237.4	1.00
3	7,323.000	55.28	74.00	18.72	44.87	54.00	9.13	12.35	V	131	2.00



REMARKS:

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



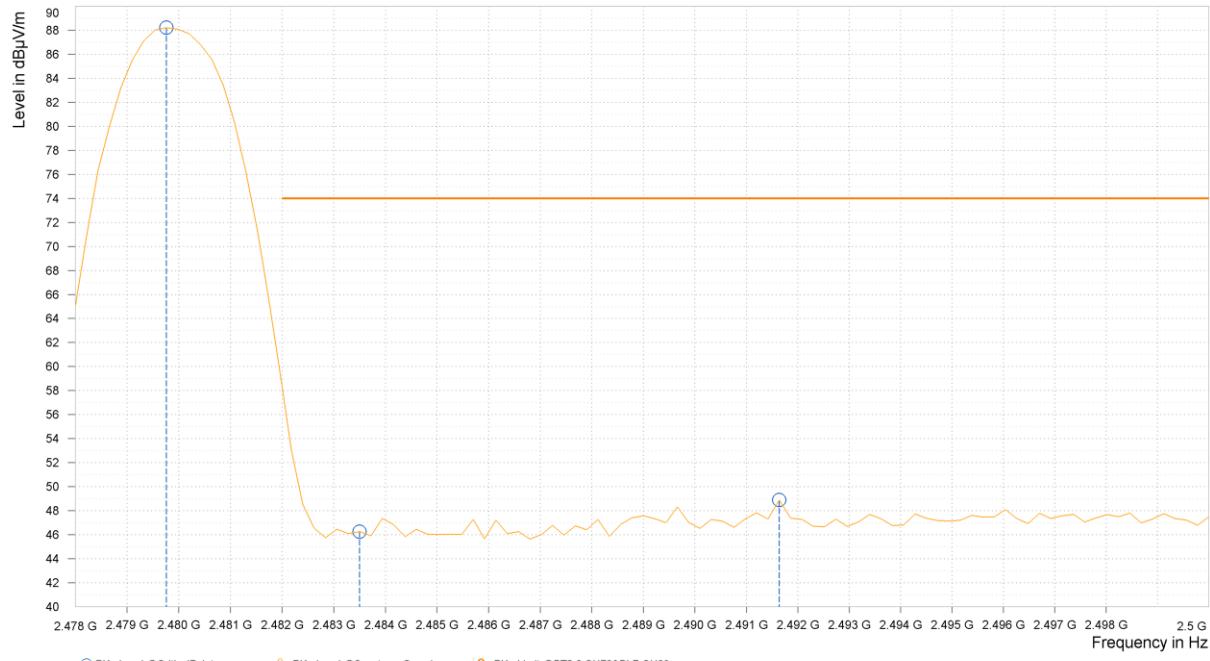
Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.760	88.21			-0.88	H	194.3	1.00
6	2,483.500	46.26	74.00	27.74	-0.87	H	10	2.00
6	2,491.640	48.89	74.00	25.11	-0.84	H	1.3	2.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.540	83.63			-0.88	H	42.6	1.00
6	2,483.500	31.40	54.00	22.60	-0.87	H	359	2.00
6	2,495.600	32.31	54.00	21.70	-0.83	H	267.3	2.00



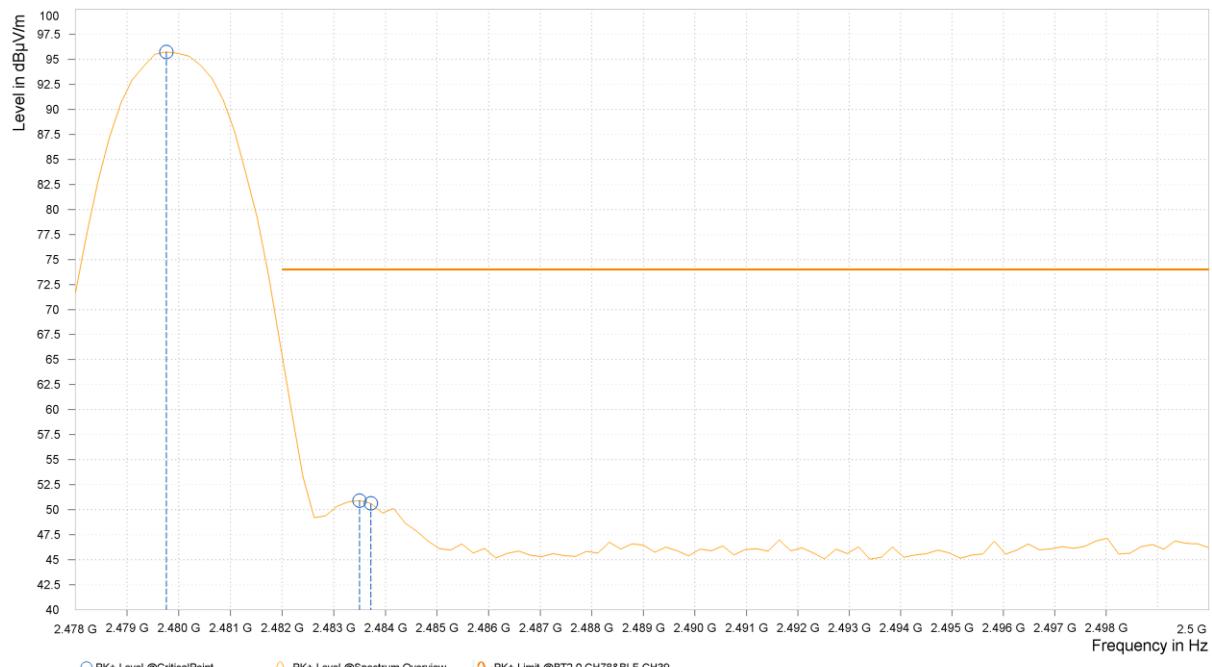


Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.760	95.73			-0.88	V	267.2	2.00
6	2,483.500	50.91	74.00	23.09	-0.87	V	267.2	2.00
6	2,483.720	50.62	74.00	23.38	-0.87	V	267.2	2.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.540	89.34			-0.88	V	355.6	2.00
6	2,483.500	40.63	54.00	13.37	-0.87	V	355.6	2.00
6	2,483.720	39.86	54.00	14.14	-0.87	V	355.6	2.00



REMARKS:

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



Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

BT_8DPSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,318.000	47.42	74.00	26.58	-1.39	H	316.3	2.00
5	2,390.000	45.11	74.00	28.89	-1.05	H	2	2.00
5	2,402.500	92.83			-0.95	H	94	1.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,378.000	33.07	54.00	20.93	-1.14	H	266.1	2.00
5	2,390.000	30.94	54.00	23.06	-1.05	H	266.1	2.00
5	2,402.000	87.08			-0.96	H	95.2	1.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,378.000	33.61	54.00	20.39	-1.14	V	215.8	2.00
5	2,390.000	30.88	54.00	23.12	-1.05	V	165.7	2.00
5	2,402.000	87.82			-0.96	V	215.8	2.00

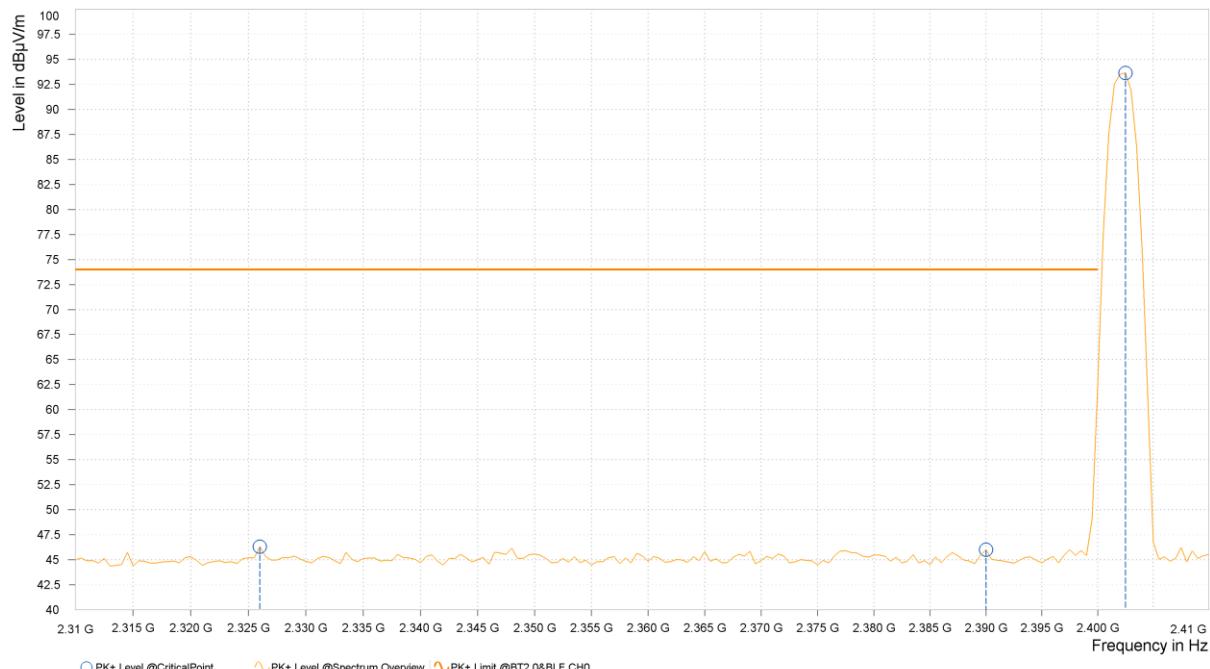




Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,326.000	46.29	74.00	27.71	-1.33	V	354.9	2.00
5	2,390.000	45.99	74.00	28.01	-1.05	V	358.2	1.00
5	2,402.500	93.63			-0.95	V	214.6	2.00



REMARKS:

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



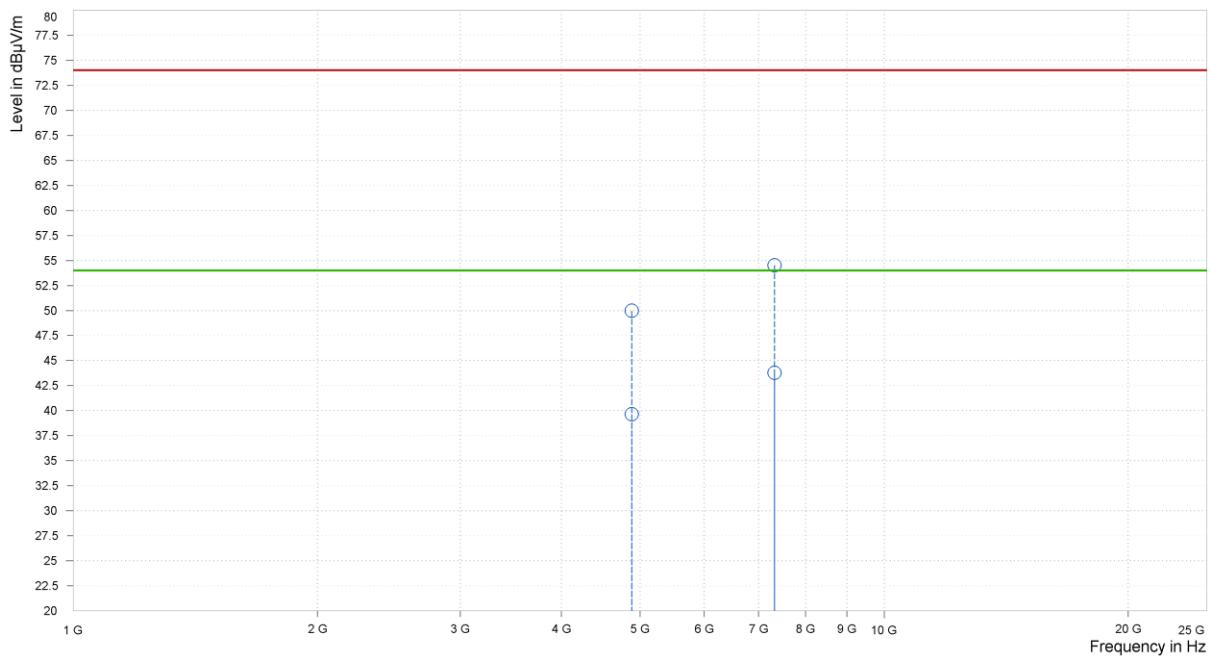
Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

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 μ V/m]	PK+ QPK Limit [dB μ V/m]	PK+ Margin [dB]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,882.000	49.97	74.00	24.03	39.63	54.00	14.37	4.99	H	359.1	1.00
3	7,323.000	54.54	74.00	19.46	43.77	54.00	10.23	11.14	H	0.9	2.00



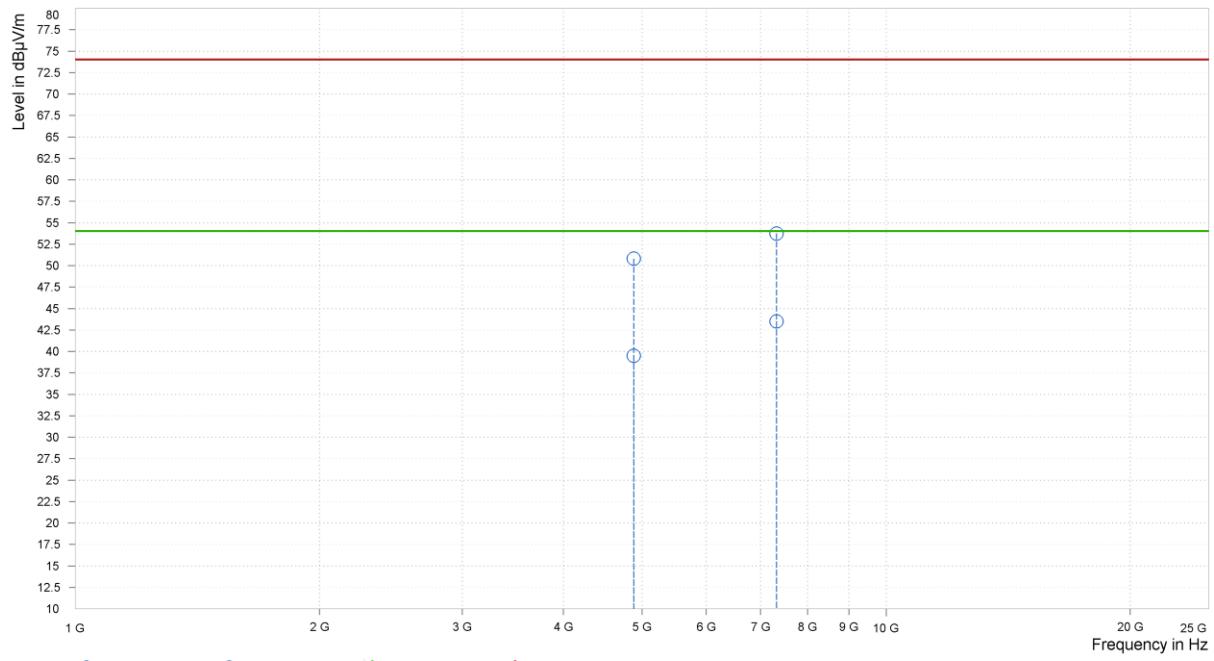


Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+: QPK Limit [dB μ V/m]	PK+ Margin [dB]	Avg Level [dB μ V/m]	Avg Limit [dB μ V/m]	Avg Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,882.000	50.81	74.00	23.19	39.50	54.00	14.50	4.99	V	359.1	1.00
3	7,323.000	53.75	74.00	20.25	43.51	54.00	10.49	11.14	V	0.9	2.00



REMARKS:

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



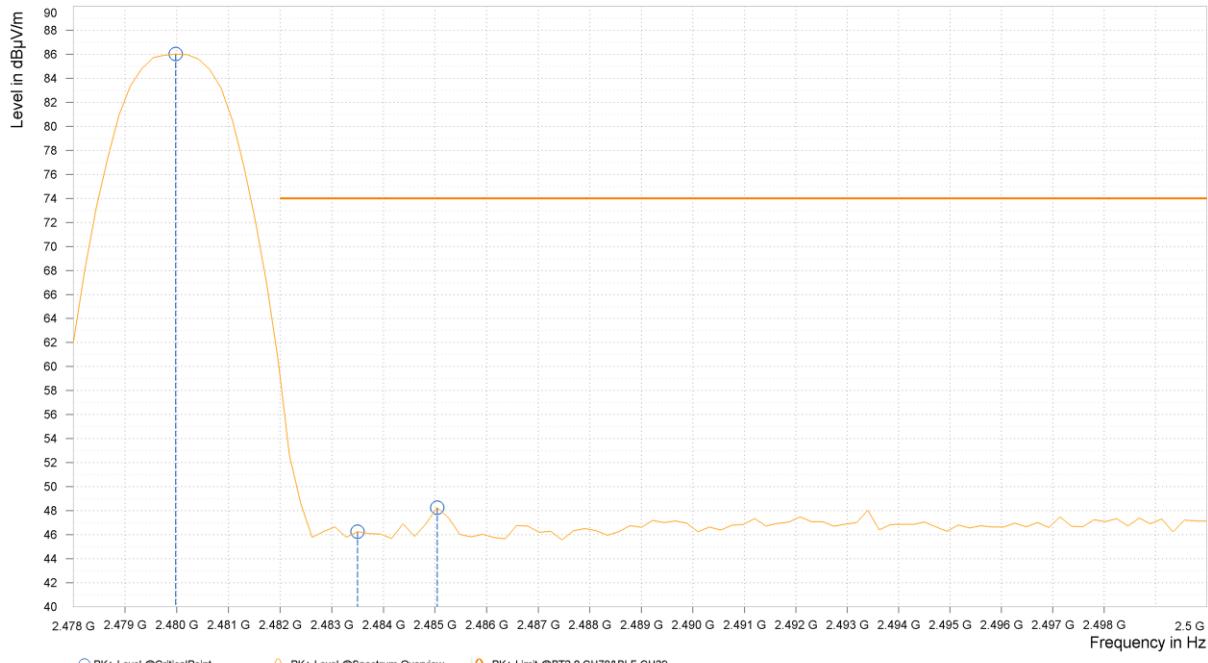
Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.980	86.02			-0.88	H	214.7	2.00
6	2,483.500	46.25	74.00	27.75	-0.87	H	305.6	1.00
6	2,485.040	48.26	74.00	25.74	-0.86	H	305.6	1.00





Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.540	83.08			-0.88	H	335.4	1.00
6	2,483.500	31.44	54.00	22.56	-0.87	H	72.5	2.00
6	2,495.160	32.06	54.00	21.94	-0.83	H	266.1	2.00



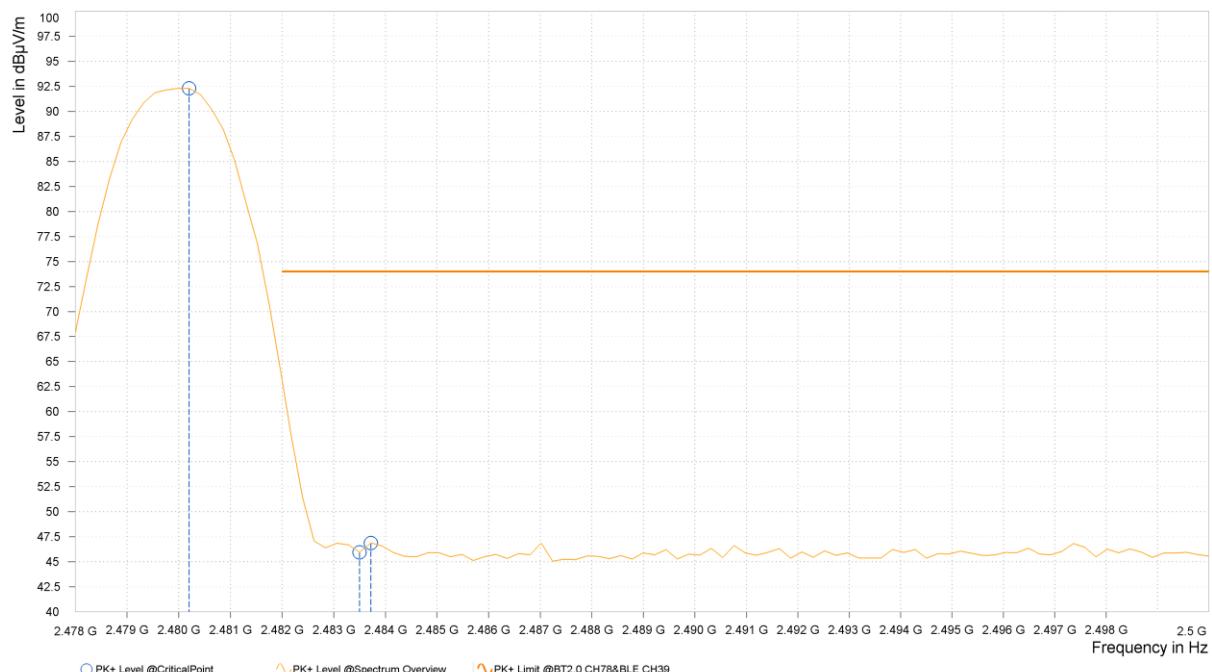


Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dB μ V/m]	PK+ Limit [dB μ V/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.200	92.29			-0.88	V	145.4	1.00
6	2,483.500	45.95	74.00	28.05	-0.87	V	218.2	2.00
6	2,483.720	46.88	74.00	27.12	-0.87	V	218.2	2.00

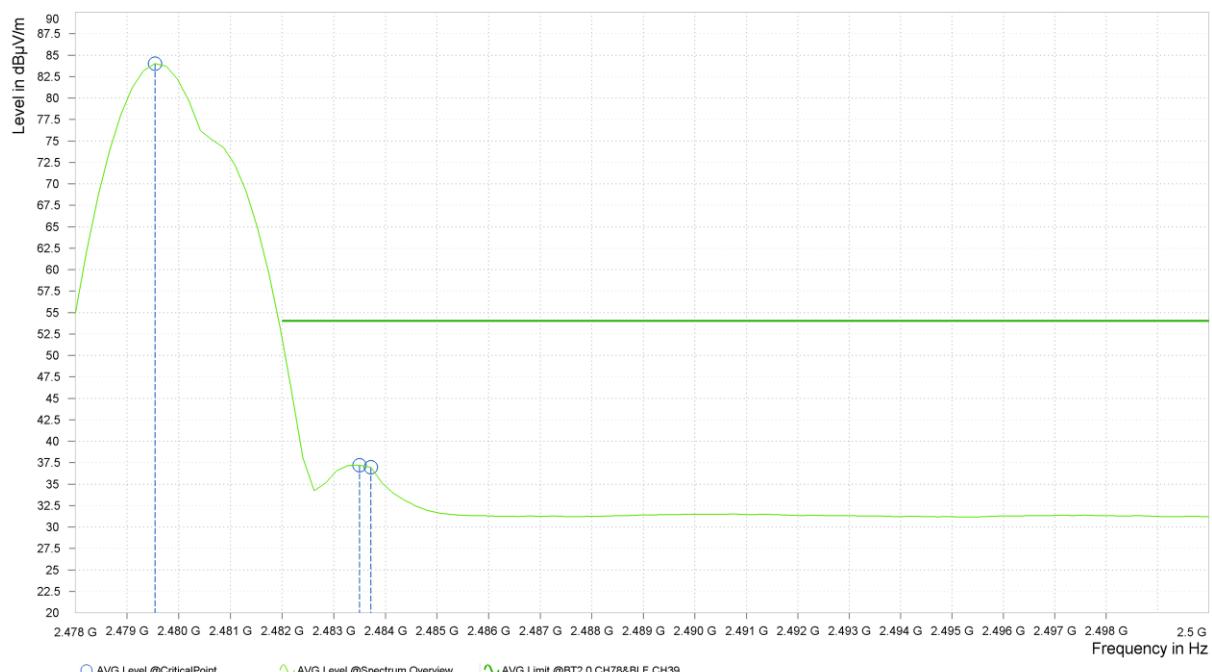




Test Report No.: W7L-P240118W001RF01

BUREAU
VERITAS

Rg	Frequency [MHz]	AVG Level [dB μ V/m]	AVG Limit [dB μ V/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.540	84.02			-0.88	V	355.6	2.00
6	2,483.500	37.20	54.00	16.80	-0.87	V	355.6	2.00
6	2,483.720	36.95	54.00	17.05	-0.87	V	355.6	2.00



REMARKS:

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



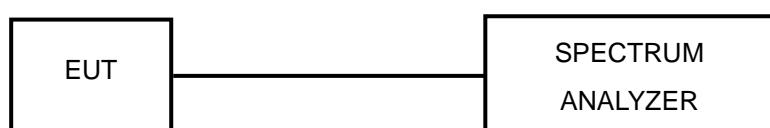
Test Report No.: W7L-P240118W001RF01

3.3 NUMBER OF HOPPING FREQUENCY USED

3.3.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 channels frequencies, and should be equally spaced.

3.3.2 TEST SETUP





Test Report No.: W7L-P240118W001RF01

3.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	R&S	ESW 44	101973	Feb.25,22	Feb.24,24
EMI Test Receiver	R&S	ESW 44	101973	Feb.24,24	Feb.23,26
Open Switch and Control Unit	R&S	OSP-B157W8	100836	N/A	N/A
Vector Signal Generator	R&S	SMBV100B	102176	Feb.16,22	Feb.15,24
Vector Signal Generator	R&S	SMBV100B	102176	Feb.15,24	Feb.14,26
Signal Generator	R&S	SMB100A03	182185	Feb.16,22	Feb.15,24
Signal Generator	R&S	SMB100A03	182185	Feb.15,24	Feb.14,26
Wideband Radio Communication	R&S	CMW500	169399	Jun.26,22	Jun.25,24
Hygrothermograph	DELI	20210528	SZ015	Sep.06,22	Sep.05,24
PC	LENOVO	E14	HRSW0024	N/A	N/A
CABLE	R&S	J12J103539-00 -1	SEP-03-20-0 69	Apr.28,23	Apr.27,24
CABLE	R&S	J12J103539-00 -1	SEP-03-20-0 69	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00 -1	SEP-03-20-0 70	Apr.28,23	Apr.27,24
CABLE	R&S	J12J103539-00 -1	SEP-03-20-0 70	Apr.27,24	Apr.26,25
Test Software	EMC32	EMC32	N/A	N/A	N/A
Temperature Chamber	votsch	VT4002	5856607810 0050	May.31,22	May.30,24
Temperature Chamber	votsch	VT4002	5856607810 0050	May.30,24	May.29,26
Power Meter	R&S	NRX	102380	Feb.15,22	Feb.14,24
Power Meter	R&S	NRX	102380	Feb.14,24	Feb.13,25
Power Meter probe	R&S	NRP6A	102942	Feb.15,22	Feb.14,24
Power Meter probe	R&S	NRP6A	102942	Feb.14,24	Feb.13,25

NOTE:

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