



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179



Certificate # 2951.01

## TEST REPORT

Applicant	NKOK, Inc.
Address	5354 Irwindale Ave Unit A Irwindale CA 91706

Manufacturer or Supplier	NKOK, Inc.
Address	5354 Irwindale Ave Unit A Irwindale CA 91706
Product	R/C Toy
Brand Name	NKOK, Inc.
Model	82541
Additional Models & Model Difference	82542, 82543, 82516, 82517, 82518, 82519, 82521, 82522, 82523; see items 3.1
Date of tests	Mar. 25, 2025 ~ Apr. 11, 2025

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

FCC Part 15, Subpart C, Section 15.235

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

Prepared by Andrew Sha Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department

Date: Apr. 30, 2025

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

<b>RELEASE CONTROL RECORD .....</b>	<b>3</b>
<b>1 SUMMARY OF TEST RESULTS .....</b>	<b>4</b>
<b>2 MEASUREMENT UNCERTAINTY .....</b>	<b>4</b>
<b>3 GENERAL INFORMATION .....</b>	<b>5</b>
3.1 GENERAL DESCRIPTION OF EUT .....	5
3.2 DESCRIPTION OF TEST MODES .....	6
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS .....	6
3.4 DESCRIPTION OF SUPPORT UNITS .....	6
<b>4 TEST TYPES AND RESULTS .....</b>	<b>7</b>
4.1 RADIATED EMISSION MEASUREMENT .....	7
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT .....	7
4.1.2 TEST INSTRUMENTS.....	8
4.1.3 TEST PROCEDURES .....	9
4.1.4 DEVIATION FROM TEST STANDARD .....	9
4.1.5 TEST SETUP.....	10
4.1.6 EUT OPERATING CONDITIONS.....	11
4.1.7 TEST RESULTS .....	11
4.2 BANDWIDTH MEASUREMENT .....	15
4.2.1 LIMITS OF BANDWIDTH MEASUREMENT .....	15
4.2.2 TEST INSTRUMENTS.....	15
4.2.3 TEST PROCEDURE.....	16
4.2.4 DEVIATION FROM TEST STANDARD .....	16
4.2.5 TEST SETUP.....	16
4.2.6 EUT OPERATING CONDITIONS .....	16
4.2.7 TEST RESULTS .....	17
<b>5 PHOTOGRAPHS OF THE TEST CONFIGURATION.....</b>	<b>18</b>
<b>6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....</b>	<b>19</b>



**BUREAU  
VERITAS**

**Test Report No.: RF2503WDG0179**

## **RELEASE CONTROL RECORD**

<b>ISSUE NO.</b>	<b>REASON FOR CHANGE</b>	<b>DATE ISSUED</b>
RF2503WDG0179	Original release	Apr. 30, 2025



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.235)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.207 (a)	Conducted Emission	N/A	EUT is powered by battery
§15.209 §15.235(a)	Radiated Emission	PASS	Compliant
§15.235(b) §15.215(c)	Measured Bandwidth	PASS	Compliant
§15.203	Antenna Requirement	PASS	No antenna connector is used

## 2 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	FREQUENCY	UNCERTAINTY
Radiated emissions	9KHz ~ 30MHz	2.48dB
	30MHz ~ 1GHz	4.32dB

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



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	R/C Toy
MODEL NO.	82541
ADDITIONAL MODEL	82542, 82543, 82516, 82517, 82518, 82519, 82521, 82522, 82523
FCC ID	XQPJH042549TX
NOMINAL VOLTAGE	DC 3V(1.5V*2*AA) From Battery
MODULATION TYPE	FSK
OPERATING FREQUENCY	49.86MHz
NUMBER OF CHANNEL	1
ANTENNA TYPE	Wire Antenna, with 0dBi gain
I/O PORTS	N/A
CABLE SUPPLIED	N/A

#### NOTES:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 2503WDG0179) for detailed product photo.
4. Additional models (see above table) are identical with the test model 82541 except the color of the appearance and model name for trading purpose.



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

### 3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type. The worst case was found when the EUT was positioned on Y axis for radiated emission. The EUT was tested under the following mode.

FREQUENCY	TEST MODE
49.86MHz	Transmitting

### 3.3 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, 15.235**

**ANSI C63.10-2013**

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit without any other necessary accessories or support units.



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

## 4 TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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

According to §15.235(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [ $\mu$ V/m]	Field Strength of Fundamental Emission [Average] [ $\mu$ V/m]
49.82 – 49.90	100,000 (100 dB $\mu$ V/m)	10,000 (80 dB $\mu$ V/m)

#### NOTES:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/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.



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

#### 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Oct. 10, 25
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Oct. 09, 25
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Dec. 25, 25
Horn Antenna	ETS-Lindgren	3117	0085519	Oct. 19, 25
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	N/A
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	May. 20, 25
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A
Test software	ADT	ADT_RF Test Software V6.6.5.3	N/A	N/A
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Apr. 12, 26
Amplifier	Burgeon	BPA-530	100220	Feb. 21, 26
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Feb. 21, 26
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 28 25
Power Sensor	Keysight	U2021XA	MY57320002	Apr. 07, 26
Humid & Temp Programmable Tester	Haida	HD-225T	1108072001	Oct. 10, 25
Oscilloscope	Agilent	DSO9254A	MY51260160	Jul. 07, 25
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Apr. 07, 26
Spectrum Analyzer	Keysight	N9020A	MY55400499	Oct. 09, 25
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Jul. 11, 25
Wireless Connectivity Tester	Rohde&Schwarz	CMW270	102426	Apr. 07, 26
Vector Signal Generator	Rohde&Schwarz	SMBV100A	257579	Oct. 10, 25
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A

#### NOTES:

1. The test was performed in 966 Chamber.
2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation and all tests are conducted within a valid calibration cycle.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 749762. Designation Number: CN1174.



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

#### 4.1.3 TEST PROCEDURES

The basic test procedure was in accordance with ANSI C63.10 (section 6).

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters Semi-anechoic chamber room. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1.3m above the ground.
- g. 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 new battery. The turntable was rotated to maximize the emission level.

#### .NOTES:

1. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz for peak detection (PK) at fundamental frequency below 1GHz; The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at radiated spurious emission frequency below 1GHz.
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
4. Margin value = Emission level – Limit value.
5. Fundamental AV value =PK Emission +AV factor.

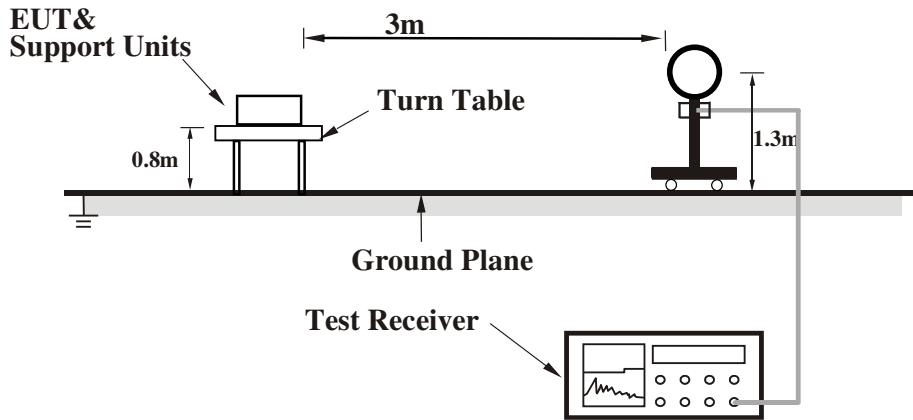
#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

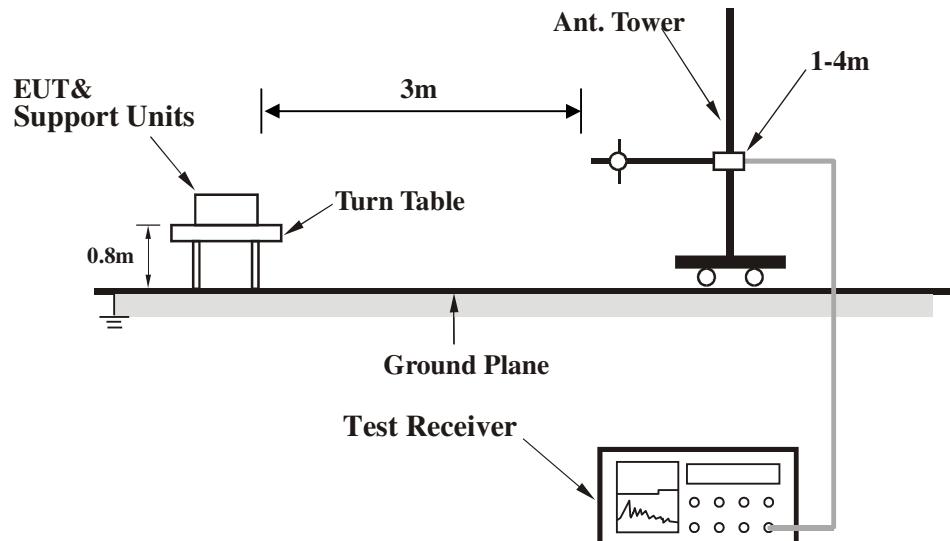


#### 4.1.5 TEST SETUP

##### Below 30MHz test setup



##### Below 1GHz test setup



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



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power of equipment.
- b. Hold down the TX of button, and then the EUT was operating.
- c. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

#### 4.1.7 TEST RESULTS

##### FIELD STRENGTH OF FUNDAMENTAL

No.	Freq. (MHz)	Antenna Polarization	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
*	49.86(PK)	V	-17.62	69.69	52.07	100	-47.93
*	49.86(AV)	V	-	-	47.86	80	-32.14
*	49.86(PK)	H	-17.62	60.33	42.71	100	-57.29
*	49.86(AV)	H	-	-	38.50	80	-41.50

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The emission levels of other frequencies were greater than 20dB margin.
  4. Margin value = Emission level – Limit value.
  5. “\*”: Fundamental frequency.
  6. The average value of fundamental frequency is: Average value = Peak value +AV factor, where the AV factor is calculated from following formula: AV factor=20 log (Duty cycle) = 20 log (61.60%) = -4.21dB.



BUREAU  
VERITAS

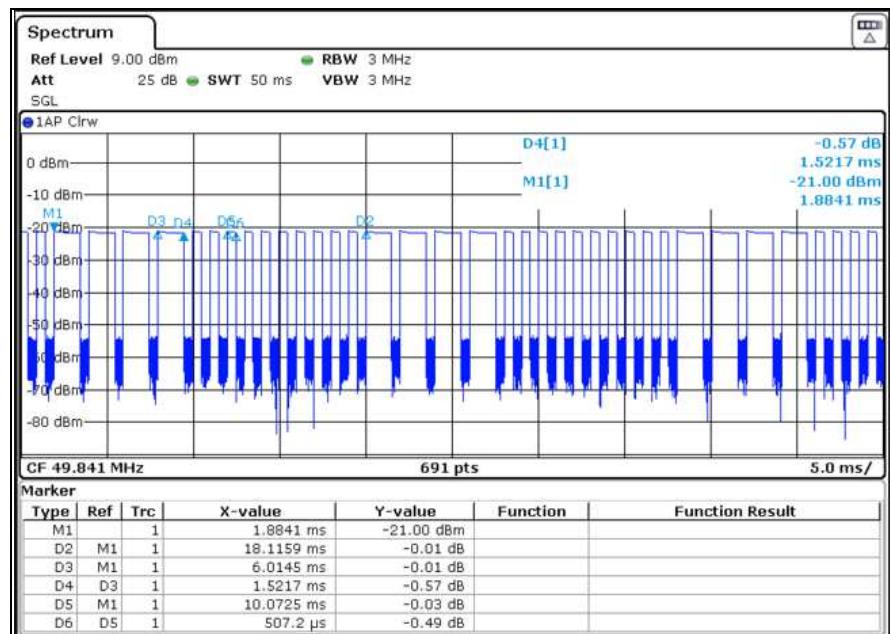
Test Report No.: RF2503WDG0179

Tp = 18.1159ms

Ton = Ton1 \* Number + Ton2 \* Number = 0.5072 \* 10 + 1.5217 \* 4 = 11.1588ms

Duty Cycle = Ton / Tp \* 100% = 11.1588 / 18.1159 = 61.60%

AV factor = 20 log (Duty cycle) = 20 log (61.60%) = -4.21dB





BUREAU  
VERITAS

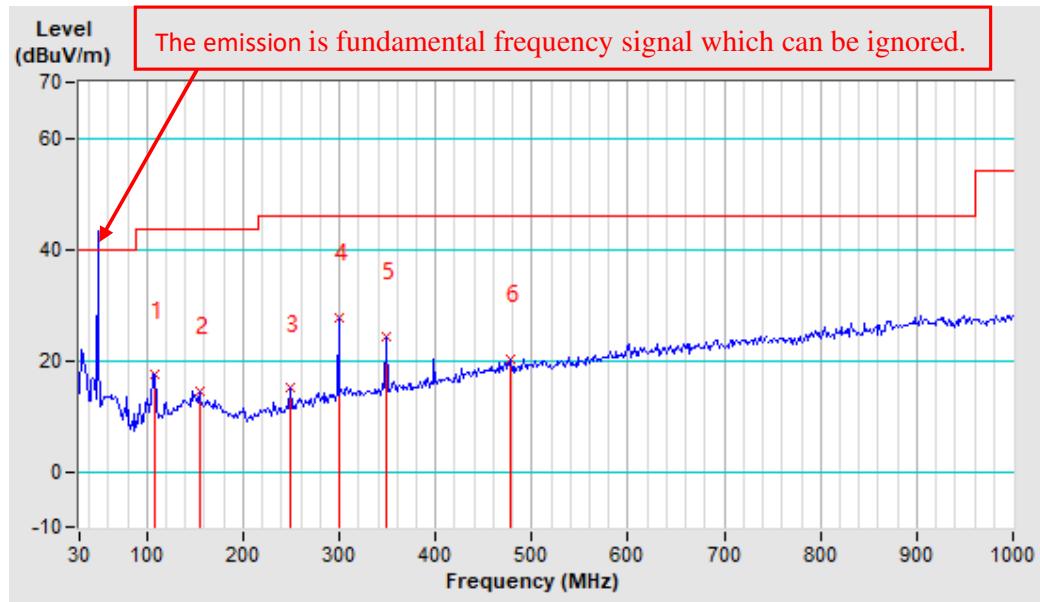
Test Report No.: RF2503WDG0179

<b>FREQUENCY RANGE</b>	9KHz ~ 1GHz	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
------------------------	-------------	--------------------------	-----------------

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	107.72	17.32 QP	43.50	-26.18	1.23 H	56	38.06	-20.74
2	154.36	14.35 QP	43.50	-29.15	2.31 H	5	30.92	-16.57
3	249.18	15.00 QP	46.00	-31.00	3.28 H	78	32.33	-17.33
4	298.93	27.68 QP	46.00	-18.32	3.21 H	1	42.92	-15.24
5	348.67	24.17 QP	46.00	-21.83	1.00 H	0	38.32	-14.15
6	477.69	20.20 QP	46.00	-25.80	4.00 H	78	30.66	-10.46

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.





BUREAU  
VERITAS

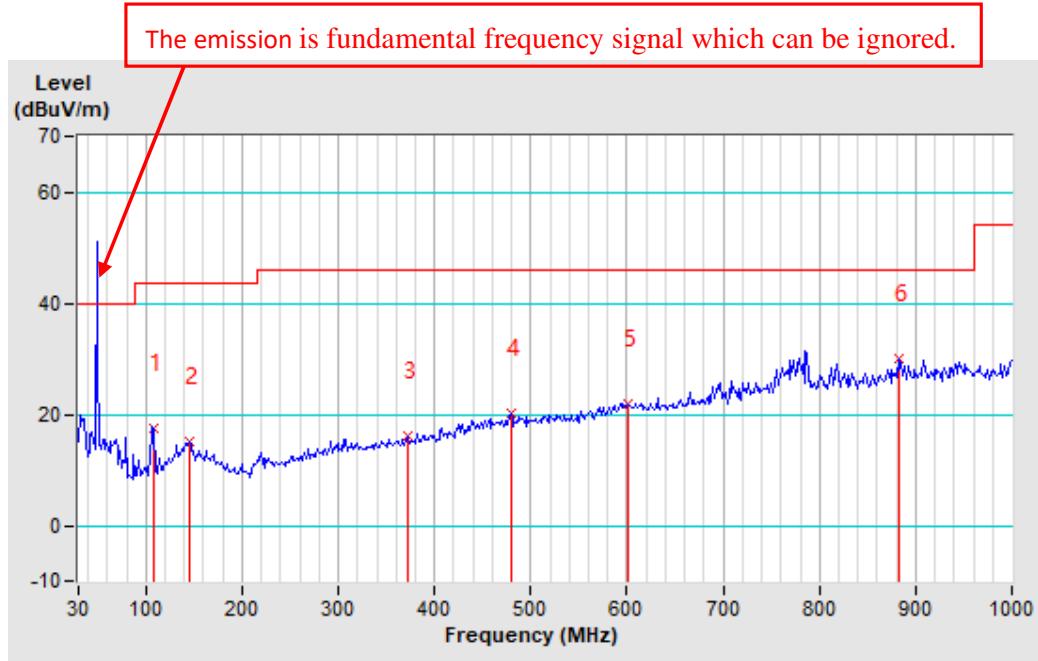
Test Report No.: RF2503WDG0179

FREQUENCY RANGE		9KHz ~ 1GHz		DETECTOR FUNCTION		Quasi-Peak (QP)	
-----------------	--	-------------	--	-------------------	--	-----------------	--

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	107.72	17.59 QP	43.50	-25.91	2.15 V	45	38.33	-20.74
2	145.03	15.03 QP	43.50	-28.47	3.25 V	78	31.81	-16.78
3	371.99	16.09 QP	46.00	-29.91	4.00 V	84	29.59	-13.50
4	479.25	20.11 QP	46.00	-25.89	3.21 V	15	30.55	-10.44
5	600.50	21.99 QP	46.00	-24.01	1.87 V	78	29.91	-7.92
6	881.86	30.15 QP	46.00	-15.85	1.00 V	0	33.13	-2.98

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.





BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

## 4.2 BANDWIDTH MEASUREMENT

### 4.2.1 LIMITS OF BANDWIDTH MEASUREMENT

The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in Section 15.209.

FREQUENCY (MHz)	Limits
	[MHz]
49.86	within 49.81~49.91

### 4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Power Sensor	Keysight	U2021XA	MY57320002	Apr. 07, 26
Digital Multimeter	FLUKE	15B	A1220010DG	N/A
Humid & Temp Programmable Tester	Haida	HD-225T	110807201	Oct. 10, 25
Oscilloscope	Agilent	DSO9254A	MY51260160	Jul. 07, 25
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Oct. 09, 25
Signal Generator	Agilent	N5183A	MY50140980	Jul. 11, 25
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Jul. 11, 25
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	N/A
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Keysight	E3642A	MY56146098	N/A
Test software	ADT	ADT_RF Test Software V6.6.5.3	N/A	N/A

#### NOTES:

1. The test was performed in RF Oven room.
2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation and all tests are conducted within a valid calibration cycle.



BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

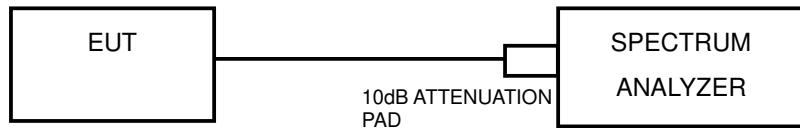
#### 4.2.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 26dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 TEST SETUP



#### 4.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6

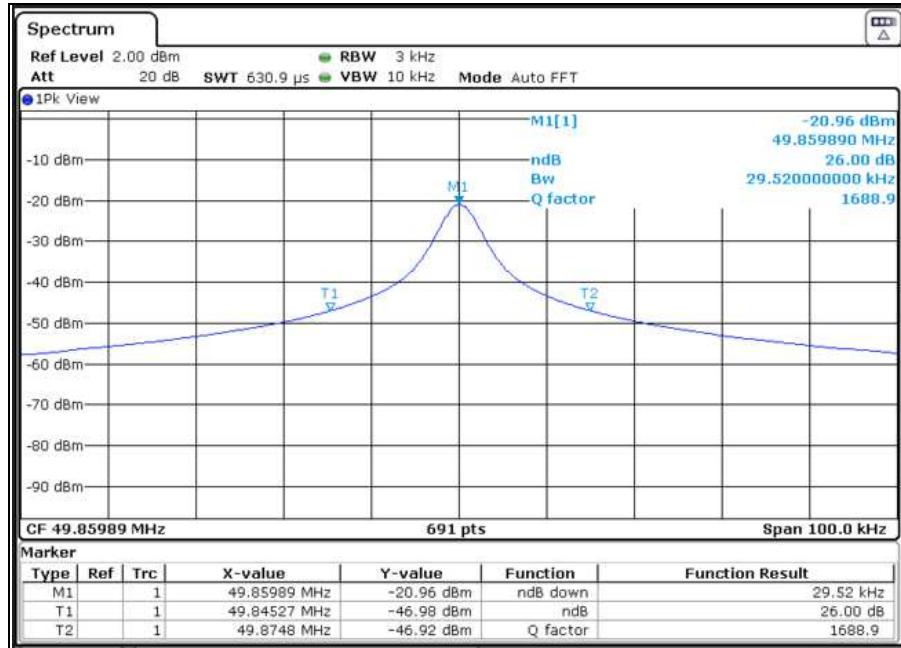


BUREAU  
VERITAS

Test Report No.: RF2503WDG0179

#### 4.2.7 TEST RESULTS

Lower & Upper Test Frequency Point (MHz)	Test Frequency (MHz)	P/F
Lower	49.85989	PASS
Upper	49.87480	PASS





**BUREAU  
VERITAS**

**Test Report No.: RF2503WDG0179**

## **5 PHOTOGRAPHS OF THE TEST CONFIGURATION**

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



**BUREAU  
VERITAS**

**Test Report No.: RF2503WDG0179**

## **6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

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

**---END---**