



**BUREAU  
VERITAS**

**TEST REPORT No: (5220)133-0191**

# TEST REPORT

To:	<b>GRANDEX INTERNATIONAL DEVELOPMENT LTD</b>	To:	-
Attn:	Fannie Fung/ Dickson Chan	Attn:	-
Address:	Unit 2401, 24/F, Million Fortune Industrial Centre, No. 34-36 Chai Wan Kok Str., Tsuen Wan	Address:	-
Fax:	--	Fax:	-
E-mail:	<a href="mailto:sales@grandex.com.hk">sales@grandex.com.hk</a> , <a href="mailto:fannie@grandex.com.hk">fannie@grandex.com.hk</a>	E-mail:	-
Folder No.:	--		
Factory name:	--		
Location:	--		
Product:	R/C VEHICLE Model No.: 61007		
	Sample No:	(5220)133-0191	
	Date of Receipt:	May 15, 2020	
	Test date:	June 26, 2020 to July 06, 2020	
	Test Requested:	FCC Part 15 - 2019	
	Test Method:	ANSI C63.10 - 2013	
	FCC ID:	VC961007240	
	<b>The results given in this report are related to the tested specimen of the described electrical apparatus.</b>		
<b>CONCLUSION: The submitted sample was found to <u>COMPLY</u> with requirement of FCC Part 15 Subpart C.</b>			
Authorized Signature:			
			
Reviewed by: Kinko Wong		Approved by: Sze Tsz Man	
Date: August 04, 2020		Date: August 04, 2020	

**BUREAU VERITAS HONG KONG LIMITED –**  
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**TEST REPORT No: (5220)133-0191**  
**Test Result Summary**

<b>EMISSION TEST</b>			
<b>Test requirement: FCC Part 15 - 2019</b>			
Test Condition	Test Method	Test Result	
		Pass	Failed
Radiated Emission Test, 9kHz to 24GHz	ANSI C63.10	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Frequency range of Fundamental Emission	ANSI C63.10	<input checked="" type="checkbox"/>	<input type="checkbox"/>
26dB Bandwidth of Fundamental Emission	ANSI C63.10	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Duty Cycle Correction During 100msec	ANSI C63.10	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Report Revision & Sample Re-submit History:**

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## TEST REPORT No: (5220)133-0191

### Location of the test laboratory

#### Bureau Veritas Hong Kong Limited

Room 03, 6/F, Westin Centre, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

Radiated measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013. Semi-anechoic Chamber are set up for investigation and located at:

LG1/F., HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong

### List of measuring equipment

#### Radiated Emission

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
EMI TEST RECEIVER	R&S	ESU40	100190	10-OCT-2019	10-OCT-2020
SEMI-ANECHOIC CHAMBER	FRANKONIA	--	--	20-MAR-2020	20-MAR-2021
BICONICAL ANTENNA	R&S	HK116	100242	7-MAR-2019	7-MAR-2021
LOG-PERIODIC ANTENNA	R&S	HL223	841516/019	6-MAR-2019	6-MAR-2021
ACTIVE LOOP ANTENNA	EMCO	6502	9107-2651	30-OCT-2019	30-OCT-2021
STANDARD GAIN HORN (8.2 – 12.4GHZ)	ETS-LINDGREN	3160-07	00205404	04-SEP-2018	04-SEP-2020
STANDARD GAIN HORN (12.4 – 18GHZ)	ETS-LINDGREN	3160-08	002056363	26-SEP-2018	26-SEP-2020
DOUBLE RIDGED HORN (1 – 8.2GHZ)	ETS-LINDGREN	3117	00094998	30-AUG-2018	30-AUG-2020
STANDARD GAIN HORN (26.5 – 40GHZ)	ETS-LINDGREN	3160-10	00205696	03-OCT-2018	03-OCT-2020
DOUBLE RIDGED HORN (18-26.5GHZ)	ETS-LINDGREN	3116	00109210	05-OCT-2018	05-OCT-2020
MICROWAVE PREAMPLIFIER	COM-POWER CORPORATION	PAM-118A	551091	6-MAR-2020	6-MAR-2021
PREAMPLIFIER (18 -40GHZ WITH CABLE)	A.H. Systems, Inc.	Pam-1840VH	168	30-JAN-2020	30-JAN-2021
COAXIAL CABLE	Huber+Suhner	CNM-NMCMILX800-473	A2803 #0001	04-OCT-2018	04-OCT-2020

### Measurement Uncertainty

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz to 200MHz	±5.2dB
	200MHz to 1GHz	±6.1dB
	1GHz to 8.2GHz	±4.9dB
	8.2GHZ to 12.4GHZ	±4.3dB
	12.4GHZ to 18GHZ	±4.6dB

#### Remarks:-

N/A : Not Applicable or Not Available

Measurement uncertainty is calculated in accordance with CISPR 16-4-2.

The statement of compliance is based on a 95% coverage probability for the expanded uncertainty of the measurement result using a coverage factor  $k = 2$ .

Compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

**BUREAU VERITAS HONG KONG LIMITED –**  
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*This report is governed by, and incorporates by reference, CPS Conditions of Service 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. 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.*



**TEST REPORT No: (5220)133-0191**

<b>General Information</b>	
Product:	R/C VEHICLE
Model Number:	61007
Data Cable:	--
Power Line Cable:	--
Accessory Device:	--
Additional Product Name:	--
Additional Model Number:	--
Additional Model Information:	--
Adaptor:	--
Model:	--
Input:	--
Input power line cable:	--
Output:	--
Output power line cable:	--
<b>Technical Information</b>	
Rated Voltage:	3Vd.c. ("AA" size battery x 2)
Power supply:	3Vd.c. ("AA" size battery x 2)
Other information:	--
Disclaimer Note: Technical information stated on this table are provided by client. All tests were conducted base on the technical information provided above.	

## TEST REPORT No: (5220)133-0191

### Description of EUT Operation:

The Equipment Under Test (EUT) is a **GRANDEX INTERNATIONAL DEVELOPMENT LTD** of Remote Control Transmitter. It is a 1 switch and 2 sticks transmitter and operating at 2405MHz to 2475MHz. The lowest, middle and highest frequencies were tested and the results are shown in the report. The EUT transmit while buttons is being pressed or sticks are being pushed or pulled, Modulation by IC, and type is GFSK.

There are total 71 channels and below is the frequency list :

2405	2406	2407	2408	2409	2410	2411	2412	2413	2414
2415	2416	2417	2418	2419	2420	2421	2422	2423	2424
2425	2426	2427	2428	2429	2430	2431	2432	2433	2434
2435	2436	2437	2438	2439	2440	2441	2442	2443	2444
2445	2446	2447	2448	2449	2450	2451	2452	2453	2454
2455	2456	2457	2458	2459	2460	2461	2462	2463	2464
2465	2466	2467	2468	2469	2470	2471	2472	2473	2474
2475									

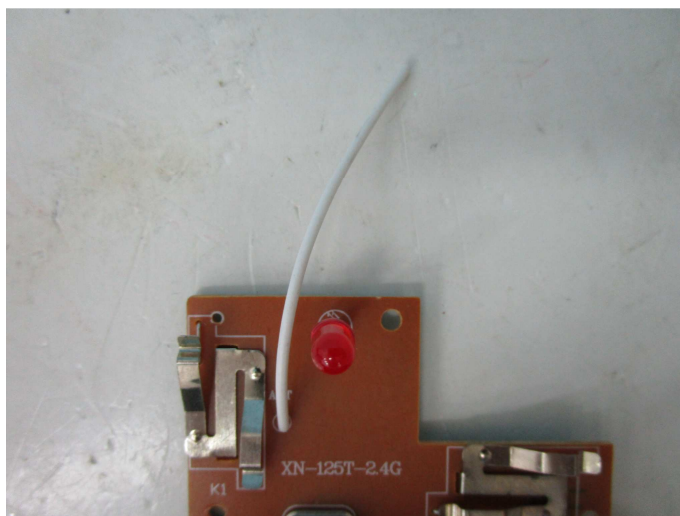
The transmitter has different control:

1. ON/OFF Switch – power control
2. Left Stick – Left motor control
3. Right Stick – Right motor control

### Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. It is soldered on the PCB. The antenna consists of 6cm long wire The antenna is not replaceable or user serviceable. The requirements of S15.203 are met. There are no deviations or exceptions to the specifications.

#### Photo of Antenna



**TEST REPORT No: (5220)133-0191**

**Test Results**

**Radiated Emissions (Fundamental)**

Test Requirement: FCC Part 15 Section 15.249  
 Test Method: ANSI C63.10  
 Test Date(s): 2020-06-26  
 Temperature: 26.0 °C  
 Humidity: 50.0 %  
 Mode of Operation: Transmission mode  
 Tested Voltage: 3Vd.c. ("AA" size battery x 2)

**Test Procedure:**

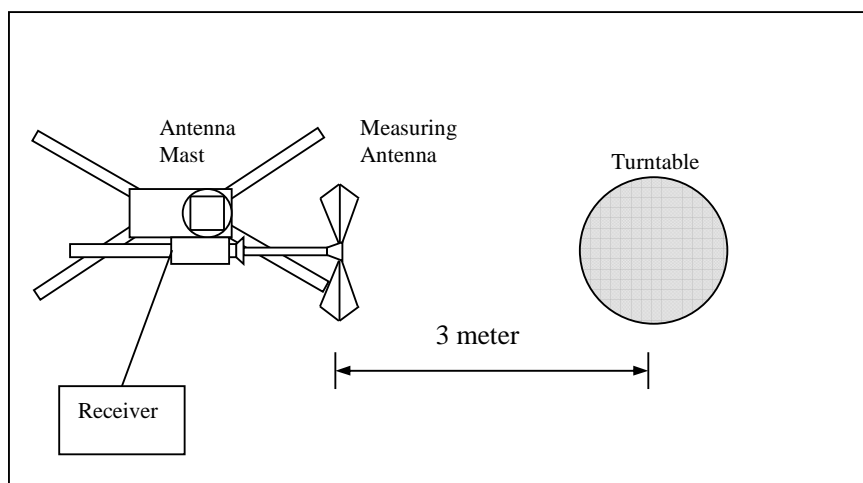
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground for measurement frequency below 1GHz and 1.5m high above the ground for measurement frequency above 1GHz. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. 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. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

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 1m above the ground.

Location: Hong Kong Productivity Council – Electromagnetic Compatibility Centre

**Test Setup: Semi-anechoic chamber**





## TEST REPORT No: (5220)133-0191

### Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission (Average) [mV/m]	Field Strength of Harmonics Emission (Average) [μV/m]
2400-2483.5	50	500

### Measurement Data

#### Test Result of (Transmission mode, Lowest frequency): PASS

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dBμV/m)	Limit at 3m – Peak (dBμV/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dBμV/m)	Limit at 3m – Average (dBμV/m)	Margin - Average (dB)
2404.49	H	-4.3	-15.8	88.1	114.0	-25.9	72.3	94.0	-21.7
2404.49	V	-4.3	-15.8	90.7	114.0	-23.3	74.9	94.0	-19.1

#### Test Result of (Transmission mode, Middle frequency): PASS

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dBμV/m)	Limit at 3m – Peak (dBμV/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dBμV/m)	Limit at 3m – Average (dBμV/m)	Margin - Average (dB)
2444.90	H	-4.3	-15.8	94.2	114.0	-19.8	78.4	94.0	-15.6
2444.90	V	-4.3	-15.8	93.5	114.0	-20.5	77.7	94.0	-16.3

#### Test Result of (Transmission mode, Highest frequency): PASS

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dBμV/m)	Limit at 3m – Peak (dBμV/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dBμV/m)	Limit at 3m – Average (dBμV/m)	Margin - Average (dB)
2475.89	H	-4.3	-15.8	93.9	114.0	-20.1	78.1	94.0	-15.9
2475.89	H	-4.3	-15.8	95.0	114.0	-19.0	79.2	94.0	-14.8

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\log(0.16224) = -15.8\text{dB}$

Note: Field Strength = Receiver Reading + Correction Factor  
 Correction Factor = Antenna Factor + Cable Loss – Preamplifier Gain  
 Margin = Field Strength - Limit  
 Receiver setting: RBW = 1MHz  
 VBW = 1MHz



## TEST REPORT No: (5220)133-0191

### Radiated Emissions (Spurious Emission)

Test Requirement: FCC Part 15 Section 15.249  
 Test Method: ANSI C63.10  
 Test Date(s): 2020-07-06  
 Temperature: 26.0 °C  
 Humidity: 50.0 %  
 Mode of Operation: Transmission mode  
 Tested Voltage: 3Vd.c. ("AA" size battery x 2)

### Measurement Data

#### Test Result of (Transmission mode, Lowest frequency): PASS

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dBμV/m)	Limit at 3m – Peak (dBμV/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dBμV/m)	Limit at 3m – Average (dBμV/m)	Margin - Average (dB)
2400.00	H	-4.3	-15.8	36.3	74.0	-37.7	20.5	54.0	-33.5
4809.79	H	-1.9	-15.8	51.9	74.0	-22.1	36.1	54.0	-17.9
7214.69	H	1.6	-15.8	62.7	74.0	-11.3	46.9	54.0	-7.1
9619.59	H	3.0	-15.8	49.8	74.0	-24.2	34.0	54.0	-20.0
12024.49	H	4.6	-15.8	49.3	74.0	-24.7	33.5	54.0	-20.5
14429.38	H	6.3	-15.8	49.3	74.0	-24.7	33.5	54.0	-20.5
16834.28	H	9.0	-15.8	46.9	74.0	-27.1	31.1	54.0	-22.9
19239.18	H	14.1	-15.8	42.5	74.0	-31.5	26.7	54.0	-27.3
21644.08	H	14.2	-15.8	32.1	74.0	-41.9	16.3	54.0	-37.7
24048.97	H	17.8	-15.8	33.6	74.0	-40.4	17.8	54.0	-36.2

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\log(0.16224) = -15.8\text{dB}$ .

Note: Field Strength = Receiver Reading + Correction Factor  
 Correction Factor = Antenna Factor + Cable Loss – Preamplifier Gain  
 Margin = Field Strength - Limit  
 Receiver setting: RBW = 1MHz  
 VBW = 1MHz





## TEST REPORT No: (5220)133-0191

### Measurement Data

### Test Result of (Transmission mode, Lowest frequency): PASS

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dB $\mu$ V/m)	Limit at 3m – Peak (dB $\mu$ V/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dB $\mu$ V/m)	Limit at 3m – Average (dB $\mu$ V/m)	Margin - Average (dB)
2400.00	V	-4.3	-15.8	37.2	74.0	-36.8	21.4	54.0	-32.6
4809.79	V	-1.9	-15.8	56.1	74.0	-17.9	40.3	54.0	-13.7
7214.69	V	1.6	-15.8	63.8	74.0	-10.2	48.0	54.0	-6.0
9619.59	V	3.0	-15.8	52.0	74.0	-22.0	36.2	54.0	-17.8
12024.49	V	4.6	-15.8	52.0	74.0	-22.0	36.2	54.0	-17.8
14429.38	V	6.3	-15.8	48.6	74.0	-25.4	32.8	54.0	-21.2
16834.28	V	9.0	-15.8	46.6	74.0	-27.4	30.8	54.0	-23.2
19239.18	V	14.1	-15.8	43.1	74.0	-30.9	27.3	54.0	-26.7
21644.08	V	14.2	-15.8	32.1	74.0	-41.9	16.3	54.0	-37.7
24048.97	V	17.8	-15.8	33.4	74.0	-40.6	17.6	54.0	-36.4

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\text{Log}(0.16224) = -15.8\text{dB}$

Note: Field Strength = Receiver Reading + Correction Factor  
 Correction Factor = Antenna Factor + Cable Loss – Preamplifier Gain  
 Margin = Field Strength - Limit  
 Receiver setting: RBW = 1MHz  
 VBW = 1MHz

**TEST REPORT No: (5220)133-0191**

**Measurement Data**

**Test Result of (Transmission mode, Middle frequency): PASS**

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dB $\mu$ V/m)	Limit at 3m – Peak (dB $\mu$ V/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dB $\mu$ V/m)	Limit at 3m – Average (dB $\mu$ V/m)	Margin - Average (dB)
4889.81	H	-1.0	-15.8	56.5	74.0	-17.5	40.7	54.0	-13.3
7334.71	H	1.5	-15.8	60.6	74.0	-13.4	44.8	54.0	-9.2
9779.62	H	2.2	-15.8	49.8	74.0	-24.2	34.0	54.0	-20.0
12224.52	H	4.6	-15.8	47.3	74.0	-26.7	31.5	54.0	-22.5
14669.42	H	6.3	-15.8	47.3	74.0	-26.7	31.5	54.0	-22.5
17114.33	H	9.0	-15.8	47.6	74.0	-26.4	31.8	54.0	-22.2
19559.23	H	14.3	-15.8	42.8	74.0	-31.2	27.0	54.0	-27.0
22004.13	H	14.8	-15.8	31.2	74.0	-42.8	15.4	54.0	-38.6
24449.04	H	19.3	-15.8	31.8	74.0	-42.2	16.0	54.0	-38.0

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\text{Log}(0.16224) = -15.8\text{dB}$

Note: Field Strength = Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss – Preamplifier Gain

Margin = Field Strength - Limit

Receiver setting: RBW = 1MHz

VBW = 1MHz



**TEST REPORT No: (5220)133-0191**

**Measurement Data**

**Test Result of (Transmission mode, Middle frequency): PASS**

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dBμV/m)	Limit at 3m – Peak (dBμV/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dBμV/m)	Limit at 3m – Average (dBμV/m)	Margin - Average (dB)
4889.81	V	-1.0	-15.8	59.2	74.0	-14.8	43.4	54.0	-10.6
7334.71	V	1.5	-15.8	61.1	74.0	-12.9	45.3	54.0	-8.7
9779.62	V	2.2	-15.8	50.6	74.0	-23.4	34.8	54.0	-19.2
12224.52	V	4.6	-15.8	45.8	74.0	-28.2	30.0	54.0	-24.0
14669.42	V	6.3	-15.8	47.2	74.0	-26.8	31.4	54.0	-22.6
17114.33	V	9.0	-15.8	47.8	74.0	-26.2	32.0	54.0	-22.0
19559.23	V	14.3	-15.8	42.9	74.0	-31.1	27.1	54.0	-26.9
22004.13	V	14.8	-15.8	31.2	74.0	-42.8	15.4	54.0	-38.6
24449.04	V	19.3	-15.8	32.5	74.0	-41.5	16.7	54.0	-37.3

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\text{Log}(0.16224) = -15.8\text{dB}$

Note: Field Strength = Receiver Reading + Correction Factor  
 Correction Factor = Antenna Factor + Cable Loss – Preamplifier Gain  
 Margin = Field Strength - Limit  
 Receiver setting: RBW = 1MHz  
 VBW = 1MHz



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## TEST REPORT No: (5220)133-0191

### Measurement Data

Test Result of (Transmission mode, Highest frequency): **PASS**

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dB $\mu$ V/m)	Limit at 3m – Peak (dB $\mu$ V/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dB $\mu$ V/m)	Limit at 3m – Average (dB $\mu$ V/m)	Margin - Average (dB)
2483.50	H	-4.3	-15.8	37.4	74.0	-36.6	21.6	54.0	-32.4
4949.78	H	-1.0	-15.8	55.3	74.0	-18.7	39.5	54.0	-14.5
7424.66	H	1.5	-15.8	60.1	74.0	-13.9	44.3	54.0	-9.7
9899.55	H	2.2	-15.8	48.5	74.0	-25.5	32.7	54.0	-21.3
12374.44	H	4.4	-15.8	47.6	74.0	-26.4	31.8	54.0	-22.2
14849.33	H	9.0	-15.8	48.9	74.0	-25.1	33.1	54.0	-20.9
17324.22	H	9.4	-15.8	48.6	74.0	-25.4	32.8	54.0	-21.2
19799.10	H	13.1	-15.8	34.3	74.0	-39.7	18.5	54.0	-35.5
22273.99	H	14.8	-15.8	31.1	74.0	-42.9	15.3	54.0	-38.7
24748.88	H	18.8	-15.8	34.0	74.0	-40.0	18.2	54.0	-35.8

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\log(0.16224) = -15.8\text{dB}$

Note: Field Strength = Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss – Preamplifier Gain

Margin = Field Strength - Limit

Receiver setting: RBW = 1MHz

VBW = 1MHz



**TEST REPORT No: (5220)133-0191**

**Measurement Data**

**Test Result of (Transmission mode, Highest frequency): PASS**

Frequency (MHz)	Polarity (H/V)	Correction Factor (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dB $\mu$ V/m)	Limit at 3m – Peak (dB $\mu$ V/m)	Margin - Peak (dB)	**Field Strength at 3m – Average (dB $\mu$ V/m)	Limit at 3m – Average (dB $\mu$ V/m)	Margin - Average (dB)
2483.50	V	-4.3	-15.8	36.7	74.0	-37.3	20.9	54.0	-33.1
4949.78	V	-1.0	-15.8	58.6	74.0	-15.4	42.8	54.0	-11.2
7424.66	V	1.5	-15.8	63.8	74.0	-10.2	48.0	54.0	-6.0
9899.55	V	2.2	-15.8	49.1	74.0	-24.9	33.3	54.0	-20.7
12374.44	V	4.4	-15.8	47.2	74.0	-26.8	31.4	54.0	-22.6
14849.33	V	9.0	-15.8	49.2	74.0	-24.8	33.4	54.0	-20.6
17324.22	V	9.4	-15.8	48.7	74.0	-25.3	32.9	54.0	-21.1
19799.10	V	13.1	-15.8	43.2	74.0	-30.8	27.4	54.0	-26.6
22273.99	V	14.8	-15.8	31.1	74.0	-42.9	15.3	54.0	-38.7
24748.88	V	18.8	-15.8	33.1	74.0	-40.9	17.3	54.0	-36.7

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\text{Log}(0.16224) = -15.8\text{dB}$

Note: Field Strength = Receiver Reading + Correction Factor  
 Correction Factor = Antenna Factor + Cable Loss – Preamplifier Gain  
 Margin = Field Strength - Limit  
 Receiver setting: RBW = 1MHz  
 VBW = 1MHz



**TEST REPORT No: (5220)133-0191**

**Radiated Emissions (30MHz – 2.4GHz)**

Test Requirement: FCC Part 15 Section 15.209  
 Test Method: ANSI C63.10  
 Test Date(s): 2020-07-03  
 Temperature: 25.0 °C  
 Humidity: 54.0 %  
 Mode of Operation: Transmission mode  
 Tested Voltage: 3Vd.c. ("AA" size battery x 2)

**Limits for Radiated Emissions [FCC 47 CFR 15.209]:**

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu\text{V/m}$ ]	Measurement Distance m
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above960	500	3

**Measurement Data**

**Test Result of (Transmission mode): PASS**

**Detection mode: Quasi-Peak**

Frequency	Polarity (H/V)	Antenna Factor & Cable Loss (dB/m)	Field Strength (dB $\mu\text{V/m}$ )	Limit (dB $\mu\text{V/m}$ )	Margin (dB)
Emissions detected are more than 20 dB below the limit line(s) in 9kHz to 30MHz					

Note: Field Strength = Receiver Reading + Antenna Factor + Cable Loss  
 Margin = Field Strength - Limit  
 Receiver setting: RBW = 200Hz  
 VBW = 200Hz



**TEST REPORT No: (5220)133-0191**

**Measurement Data**

**Test Result of (Transmission mode): PASS**

**Detection mode: Quasi-Peak**

Frequency (MHz)	Polarity (H/V)	Antenna Factor & Cable Loss (dB/m)	Field Strength at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
153.80	H	13.0	16.5	43.5	-27.0
247.48	H	12.3	19.2	46.0	-26.8
391.60	H	17.1	20.9	46.0	-25.1
452.80	H	18.5	22.0	46.0	-24.0
545.40	H	19.5	24.2	46.0	-21.8
681.60	H	22.5	25.7	46.0	-20.3

Frequency (MHz)	Polarity (H/V)	Antenna Factor & Cable Loss (dB/m)	Field Strength at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
153.80	V	13.0	16.6	43.5	-26.9
247.48	V	12.3	19.3	46.0	-26.7
391.60	V	17.1	20.8	46.0	-25.2
452.80	V	18.5	22.0	46.0	-24.0
545.40	V	19.5	24.1	46.0	-21.9
681.60	V	22.5	25.3	46.0	-20.7

Note: Field Strength = Receiver Reading + Antenna Factor + Cable Loss  
Margin = Field Strength - Limit

Receiver setting: RBW = 120KHz  
VBW = 120KHz



## TEST REPORT No: (5220)133-0191

### Frequency range of Fundamental Emission

Test Requirement: FCC 47 CFR 15.249  
Test Method: ANSI C63.10 Clause 6.10  
Test Date(s): 2020-07-06  
Temperature: 26.0 °C  
Humidity: 50.0 %  
Mode of Operation: Transmission mode  
Tested Voltage: 3Vd.c. ("AA" size battery x 2)

#### Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

#### Limits for Frequency range of Fundamental Emission:

Frequency [MHz]	FCC Limits [MHz]
2404.49 – 2475.89	2400 – 2483.5





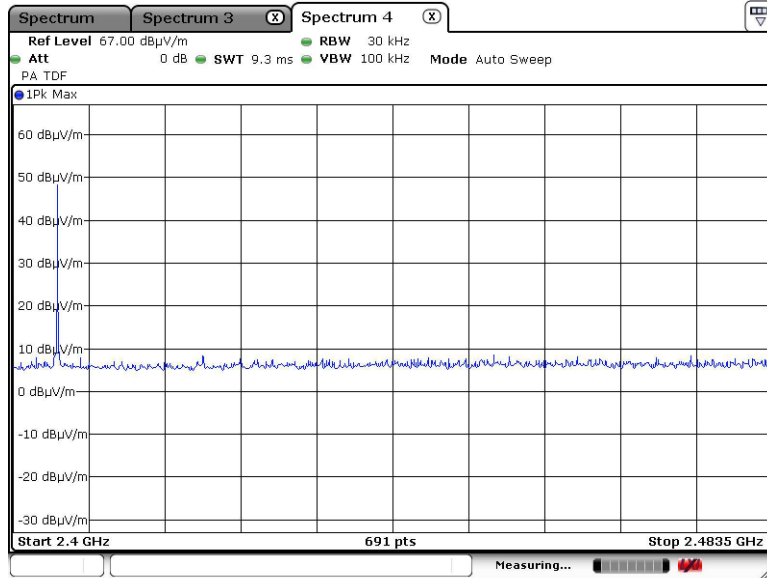
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TEST REPORT No: (5220)133-0191

Measurement Data :

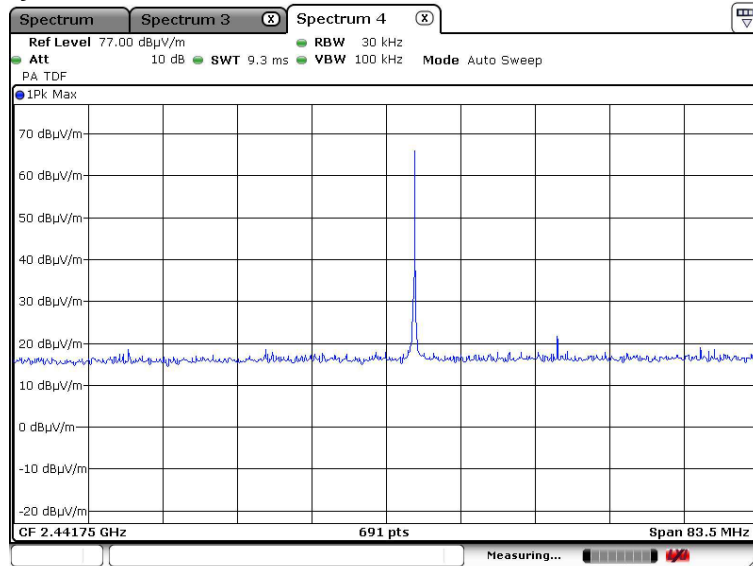
Test Result of Frequency Range of Fundamental Emission: PASS

Lowest Frequency – 2404.49MHz



Date: 6 JUL 2020 12:26:36

Middle Frequency – 2444.90MHz



Date: 6 JUL 2020 12:30:12

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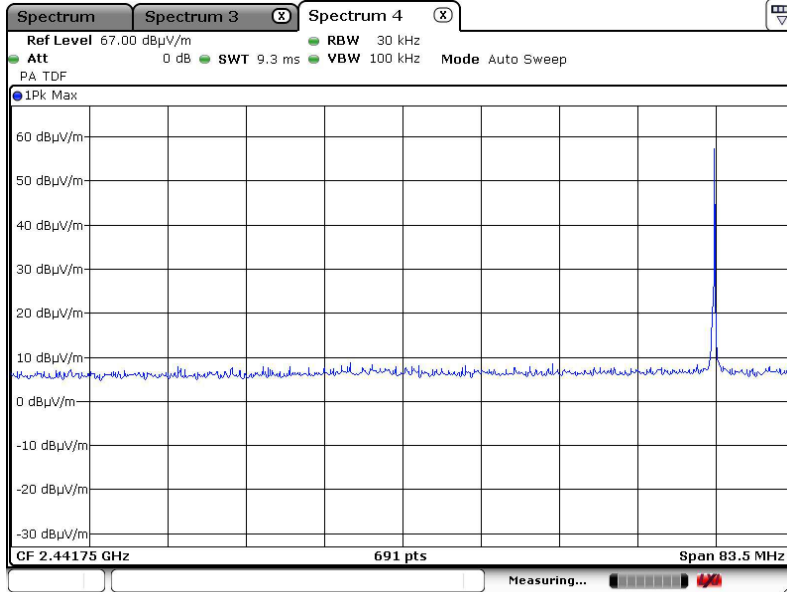
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**TEST REPORT No: (5220)133-0191**

**Highest Frequency – 2475.89MHz**



Date: 6 JUL 2020 12:22:29

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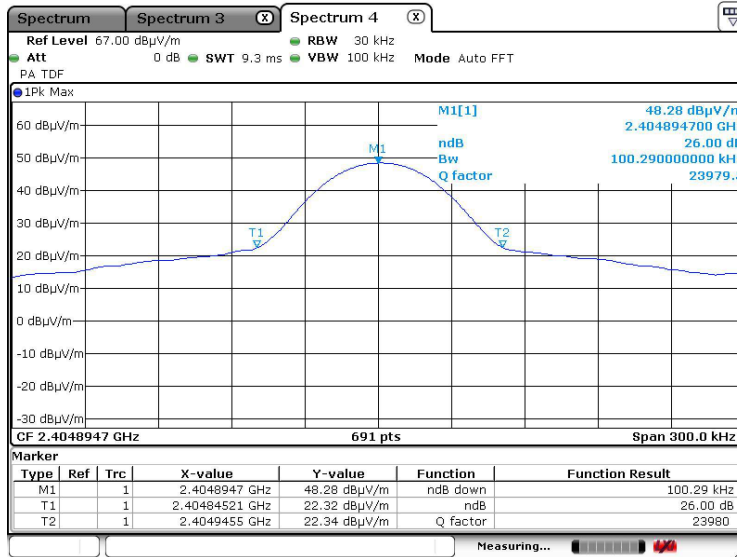


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# TEST REPORT No: (5220)133-0191 Measurement Data :

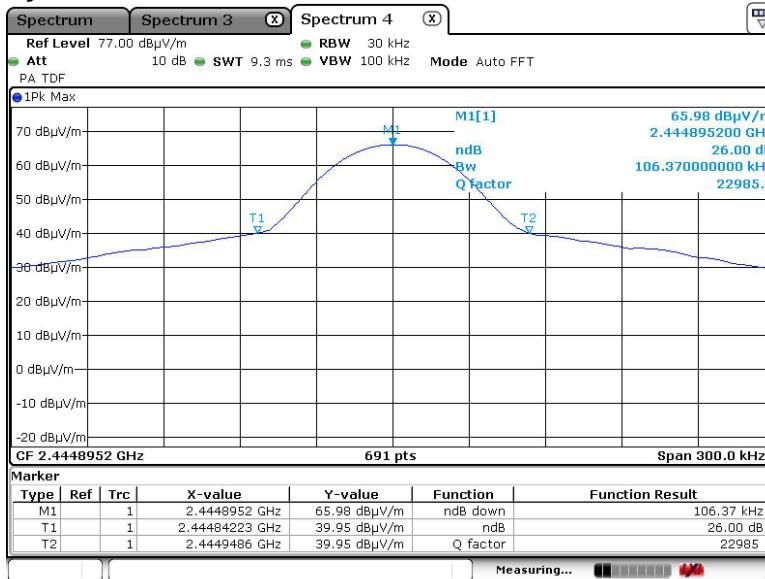
## Test Result of 26dB Bandwidth of Fundamental Emission: PASS

### Lowest Frequency – 2404.49MHz



Date: 6.JUL.2020 12:28:33

### Middle Frequency – 2444.90MHz



Date: 6.JUL.2020 12:31:42

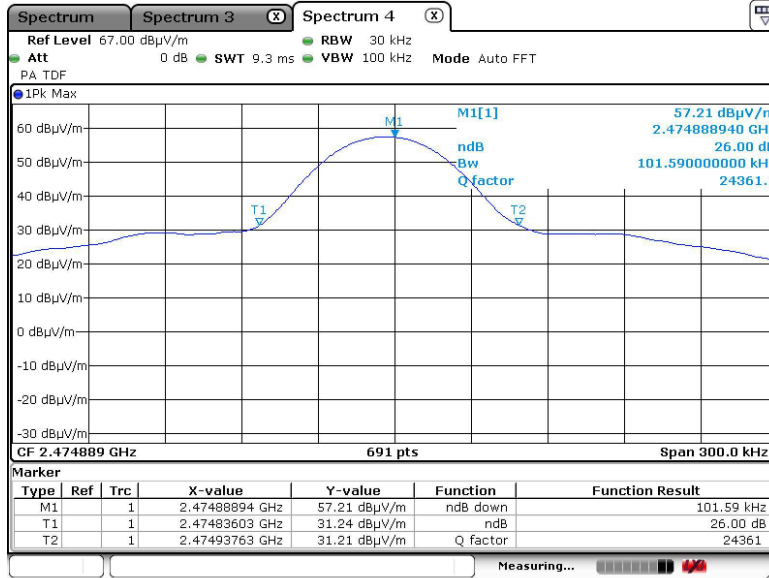
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**TEST REPORT No: (5220)133-0191**  
**Highest Frequency – 2475.89MHz**



Date: 6 JUL 2020 12:25:03

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## TEST REPORT No: (5220)133-0191

### Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (100msec) never exceeds a series of 16 pulses (1.014msec). Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered  $1.014 \times 16$  per 100msec = 16.224% duty cycle.

Remarks:

Duty Cycle Correction =  $20\text{Log}(0.16224) = -15.8\text{dB}$

The following figures [Figure A] show the characteristics of the pulse train for one of these functions.

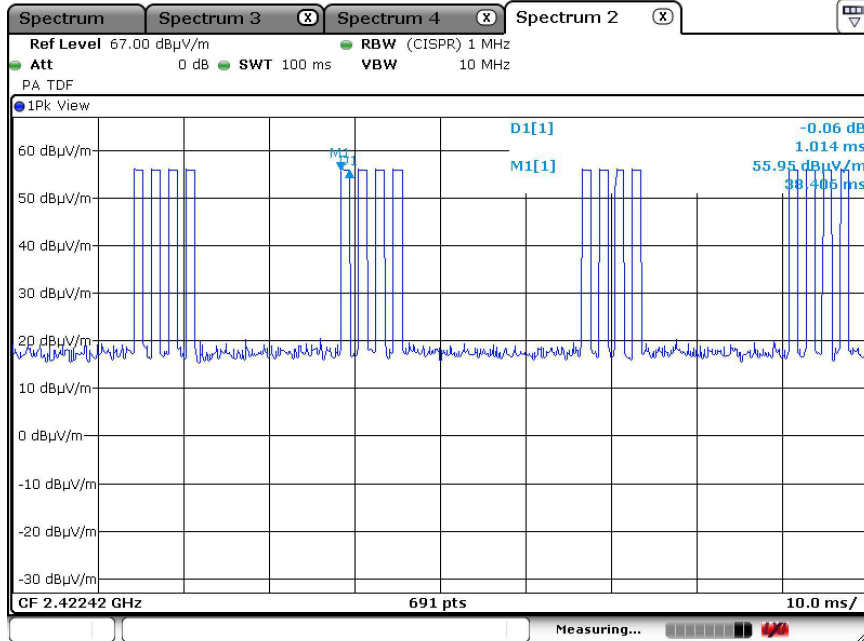


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TEST REPORT No: (5220)133-0191

Measurement Data :

Figure A [Long Pulse]



Date: 6 JUL 2020 12:41:13

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## TEST REPORT No: (5220)133-0191

### Photographs of EUT

**Front View of the product**



**Rear View of the product**



**Top View of the product**



**Bottom View of the product**



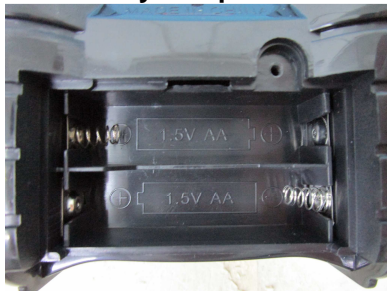
**Side View of the product**



**Side View of the product**



**Battery compartment**



**Battery Cover**



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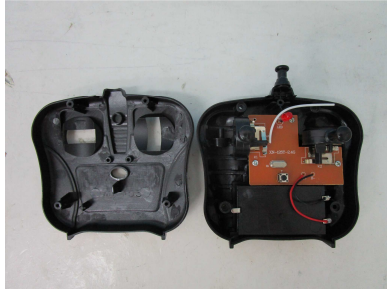


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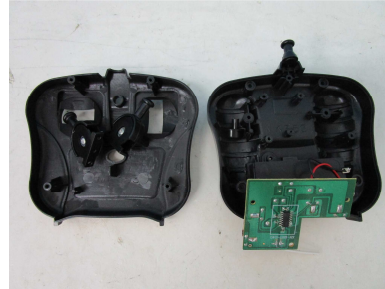
**TEST REPORT No: (5220)133-0191**

### Photographs of EUT

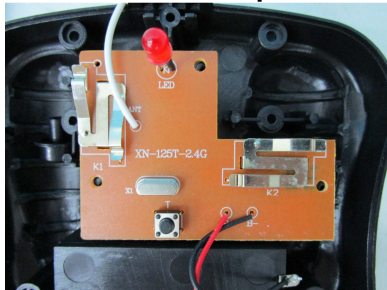
**Internal View of the product**



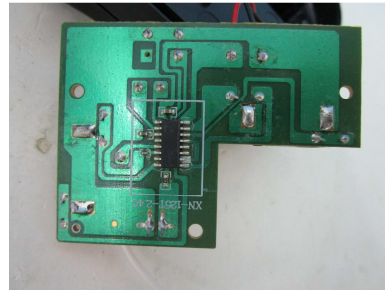
**Internal View of the product**



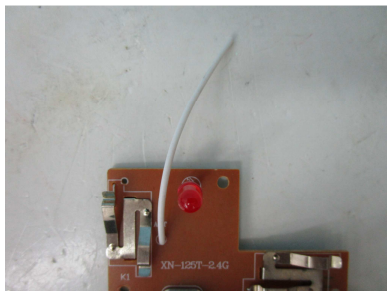
**Inner Circuit Top View**



**Inner Circuit Bottom View**



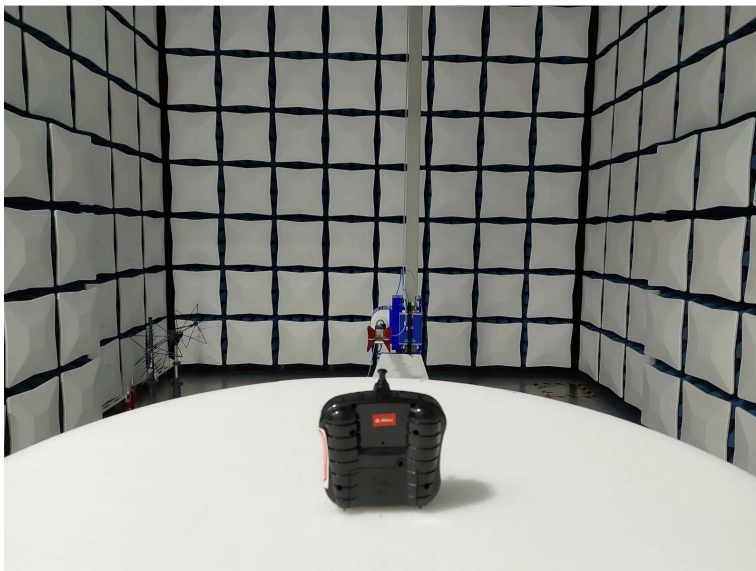
**Antenna**





TEST REPORT No: (5220)133-0191

### Measurement of Radiated Emission Test Set Up



\*\*\*\* End of Report \*\*\*\*