



## Test Report

**Date** : 2019-12-11  
**No.** : HMD19120004

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**Applicant** : Robby Gordon Entertainment/SST, Inc.  
10615 Twin Lakes Pkwy Charlotte NC USA

**Supplier / Manufacturer** : Robby Gordon Entertainment/SST, Inc.  
10615 Twin Lakes Pkwy Charlotte NC USA

**Description of Sample(s)** : Submitted sample(s) said to be  
Product: RC Car  
Brand Name: N/A  
Model No.: 144001  
FCC ID: 2AVCB144001

**Date Samples Received** : 2019-11-28

**Date Tested** : 2019-12-10 to 2019-12-11

**Investigation Requested** : Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 and ANSI C63.10: 2013 for FCC Certification.

**Conclusions** : The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks** : ---

  
  
CHEUNG Chi, Kenneth  
Authorized Signatory



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### **1.0 General Details**

#### **1.1 Test Laboratory**

The Hong Kong Standards and Testing Centre Ltd.  
EMC Laboratory  
10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong Kong  
Telephone: 852 2666 1888  
Fax: 852 2664 4353

#### **1.2 Equipment Under Test [EUT]**

##### **Description of Sample(s)**

Product:	RC Car
Manufacturer:	Robby Gordon Entertainment/SST, Inc. 10615 Twin Lakes Pkwy Charlotte NC USA
Brand Name:	N/A
Model Number:	144001
Rating:	6Vd.c(Battery AA*4)

#### **1.3 Description of EUT Operation**

The Equipment Under Test (EUT) is a RC Car. It is a transceiver operating at 2407MHz~2478MHz and the RF signal was modulated by IC.

#### **1.4 Date of Order**

2019-11-28

#### **1.5 Submitted Sample(s):**

1 Sample

#### **1.6 Test Duration**

2019-12-10 to 2019-12-11

#### **1.7 Country of Origin**

China

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### 2.0 Technical Details

#### **2.1 Investigations Requested**

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10: 2013 for FCC Certification.  
The device was realized by test software.

#### **2.2 Test Standards and Results Summary Tables**

<b>EMISSION Results Summary</b>						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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### **3.0 Test Results**

#### **3.1 Emission**

##### **3.1.1 Radiated Emissions**

Ambient temperature 25°C

Relative humidity 57%

Test Requirement:	FCC 47CFR 15.249 & FCC 47CFR 15.209
Test Method:	ANSI C63.10:2013
Test Date:	2019-12-10
Mode of Operation:	Tx mode

#### **Test Method:**

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. 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, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

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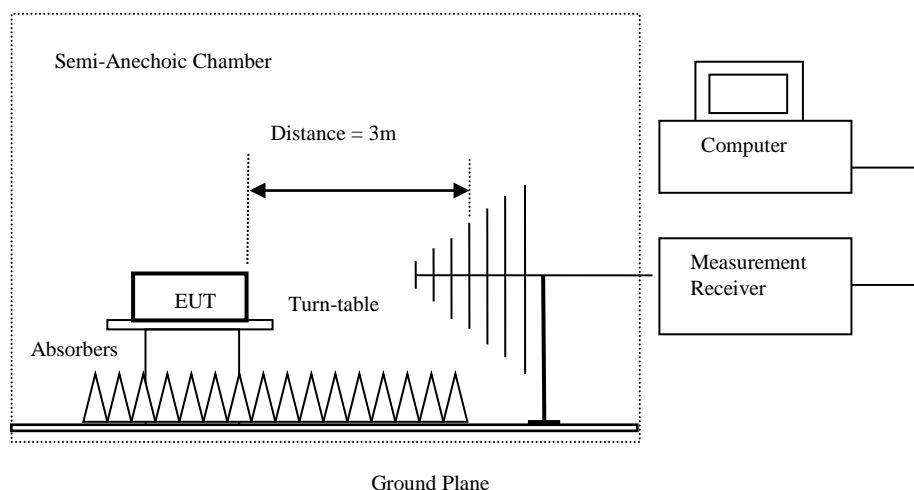
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### **Spectrum Analyzer Setting:**

9KHz – 30MHz (Pk & Av)	RBW: 10kHz VBW: 30kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
30MHz – 1GHz (QP)	RBW: 120kHz VBW: 120kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
Above 1GHz (Pk)	RBW: 1MHz VBW: 1MHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
Above 1GHz (Av)	RBW: 1MHz VBW: 10Hz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold

### **Test Setup:**



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used, 9kHz to 30MHz loop antennas are used.

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

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [microvolts/meter]	Field Strength of Harmonics Emission [microvolts/meter]
902-928	50,000 [Quasi-Peak]	500 [Average]
2400-2483.5	50,000 [Average]	500 [Average]

### Results of Tx mode (Lowest Frequency Channel-2407 MHz): Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2407.00	61.4	36.8	98.2	80,816.5	500,000	Vertical
2407.00	57.0	36.4	93.4	46,935.3	500,000	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2407.00	45.2	36.8	82.0	12,560.3	50,000	Vertical
2407.00	42.4	36.4	78.8	8,709.6	50,000	Horizontal

Field Strength of Harmonics Emission Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
4814.0	14.7	41.5	56.2	648.6	5,000	Vertical
4814.0	13.0	42.4	55.4	590.9	5,000	Horizontal
7221.0	9.8	45.1	54.9	552.7	5,000	Vertical
7221.0	8.8	46.2	55.0	559.8	5,000	Horizontal
9628.0	7.2	48.0	55.2	578.1	5,000	Vertical
9628.0	6.4	48.8	55.2	574.1	5,000	Horizontal
12035.0	4.01	51.8	55.8	617.3	5,000	Vertical
12035.0	3.6	52.4	56.0	632.4	5,000	Horizontal

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Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
4814.0	0.8	41.5	42.3	130.8	500	Vertical
4814.0	-1.7	42.4	40.7	108.6	500	Horizontal
7221.0	-5.3	45.1	39.8	97.3	500	Vertical
7221.0	-5.7	46.2	40.5	105.7	500	Horizontal
9628.0	-8.7	48.0	39.3	92.6	500	Vertical
9628.0	-9.1	48.8	39.8	97.2	500	Horizontal
12035.0	-11.4	51.8	40.5	105.3	500	Vertical
12035.0	-12.3	52.4	40.1	101.5	500	Horizontal

### Results of Tx mode (Middle Frequency Channel- 2442MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
2442.00	61.1	36.8	97.9	78,433.2	500,000	Vertical
2442.00	57.2	36.4	93.6	47,973.3	500,000	Horizontal

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
2442.00	45.6	36.8	82.4	13,137.1	50,000	Vertical
2442.00	42.5	36.4	78.9	8,820.6	50,000	Horizontal

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Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
4884.0	15.1	41.6	56.7	682.3	5,000	Vertical
4884.0	12.4	42.5	54.9	555.3	5,000	Horizontal
7326.0	1.9	45.2	47.1	227.2	5,000	Vertical
7326.0	8.9	46.3	55.2	574.8	5,000	Horizontal
9768.0	7.1	48.1	55.2	574.8	5,000	Vertical
9768.0	6.4	48.9	55.3	579.4	5,000	Horizontal
12210.0	3.7	51.6	55.3	582.8	5,000	Vertical
12210.0	3.5	52.5	56.0	631.0	5,000	Horizontal

Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
4884.0	-1.0	41.6	40.6	107.5	500	Vertical
4884.0	-2.8	42.5	39.7	97.1	500	Horizontal
7326.0	-5.1	45.2	40.1	100.9	500	Vertical
7326.0	-7.0	46.3	39.3	91.9	500	Horizontal
9768.0	-8.7	48.1	39.5	93.9	500	Vertical
9768.0	-8.1	48.9	40.8	109.3	500	Horizontal
12210.0	-11.1	51.6	40.5	106.2	500	Vertical
12210.0	-11.3	52.5	41.2	114.4	500	Horizontal

### Results of Tx mode (Highest Frequency Channel – 2478MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
2478.00	61.5	36.8	98.3	82,224.3	500,000	Vertical
2478.00	58.0	36.4	94.4	52,662.3	500,000	Horizontal

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Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
2478.00	46.0	36.8	82.8	13,819.7	50,000	Vertical
2478.00	42.7	36.4	79.1	8,964.0	50,000	Horizontal

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
4956.0	15.4	41.4	56.8	687.9	5,000	Vertical
4956.0	12.5	42.7	55.2	576.8	5,000	Horizontal
7434.0	9.6	45.6	55.2	576.1	5,000	Vertical
7434.0	8.7	46.5	55.2	572.8	5,000	Horizontal
9912.0	7.3	48.6	55.9	623.0	5,000	Vertical
9912.0	6.1	49.7	55.8	618.0	5,000	Horizontal
12390.0	3.5	51.7	55.2	572.8	5,000	Vertical
12390.0	2.7	52.7	55.4	590.2	5,000	Horizontal

Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
4956.0	0.0	41.4	41.4	117.9	500	Vertical
4956.0	-2.8	42.7	39.9	99.0	500	Horizontal
7434.0	-6.4	45.6	39.3	91.7	500	Vertical
7434.0	-6.2	46.5	40.3	103.2	500	Horizontal
9912.0	-9.2	48.6	39.4	93.8	500	Vertical
9912.0	-9.6	49.7	40.1	100.9	500	Horizontal
12390.0	-11.4	51.7	40.3	103.9	500	Vertical
12390.0	-12.5	52.7	40.2	102.2	500	Horizontal

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Calculated measurement uncertainty (9kHz-30MHz): 2.0dB

(30MHz -1GHz): 4.9dB

(1GHz -6GHz): 4.02dB

(6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### Radiated Emissions Measurement:

#### Limit :

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### Result: RF Radiated Emissions (1GHz-26GHz) (Lowest)-GFSK

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Limit @3m dBμV/m	Margin dBμV/m	E-Field Polarity
2400.0	13.38	36.8	50.18	74.0	23.8	Vertical + Horizontal*

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Limit @3m dBμV/m	Margin dBμV/m	E-Field Polarity
The PK value is less than AV limit, AV value does not need to be tested.						

### Result: RF Radiated Emissions (1GHz-26GHz) (Highest) -GFSK

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Limit @3m dBμV/m	Margin dBμV/m	E-Field Polarity
2,483.5	14.0	36.4	50.4	74.0	23.6	Vertical + Horizontal*

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Limit @3m dBμV/m	Margin dBμV/m	E-Field Polarity
The PK value is less than AV limit, AV value does not need to be tested.						

-\* : The test results are accumulated in both vertical and horizontal directions.

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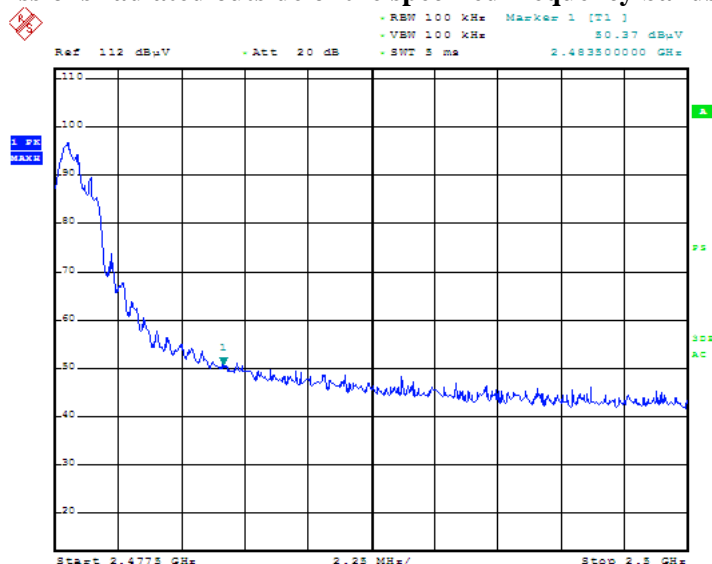
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### Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

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

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

### Results of TX mode (9kHz – 30MHz): PASS

Emissions detected are more than 20 dB below the FCC Limits

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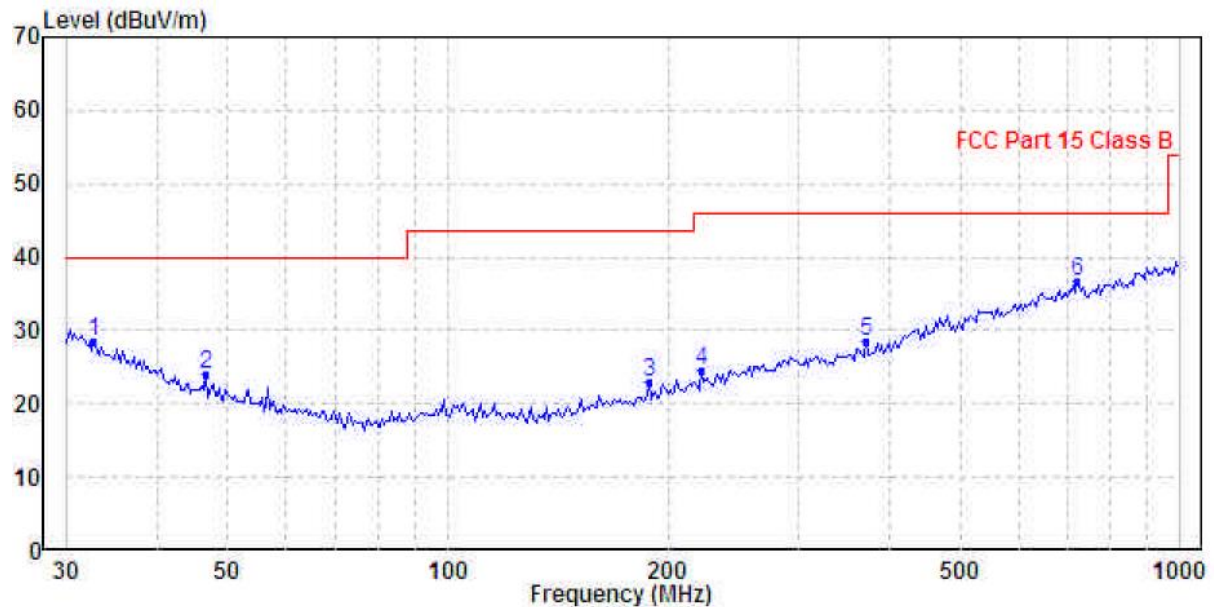
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### Results of TX mode (30MHz – 1GHz)(2407MHz worst case): PASS

Horizontal



Ambient Temperature: 25C

Relative Humidity : 50%

	Freq	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	32.864	28.64	40.00	-11.36	QP	Horizontal
2	46.666	24.15	40.00	-15.85	QP	Horizontal
3	188.413	23.03	43.50	-20.47	QP	Horizontal
4	221.392	24.54	46.00	-21.46	QP	Horizontal
5	372.005	28.40	46.00	-17.60	QP	Horizontal
6	724.261	36.73	46.00	-9.27	QP	Horizontal

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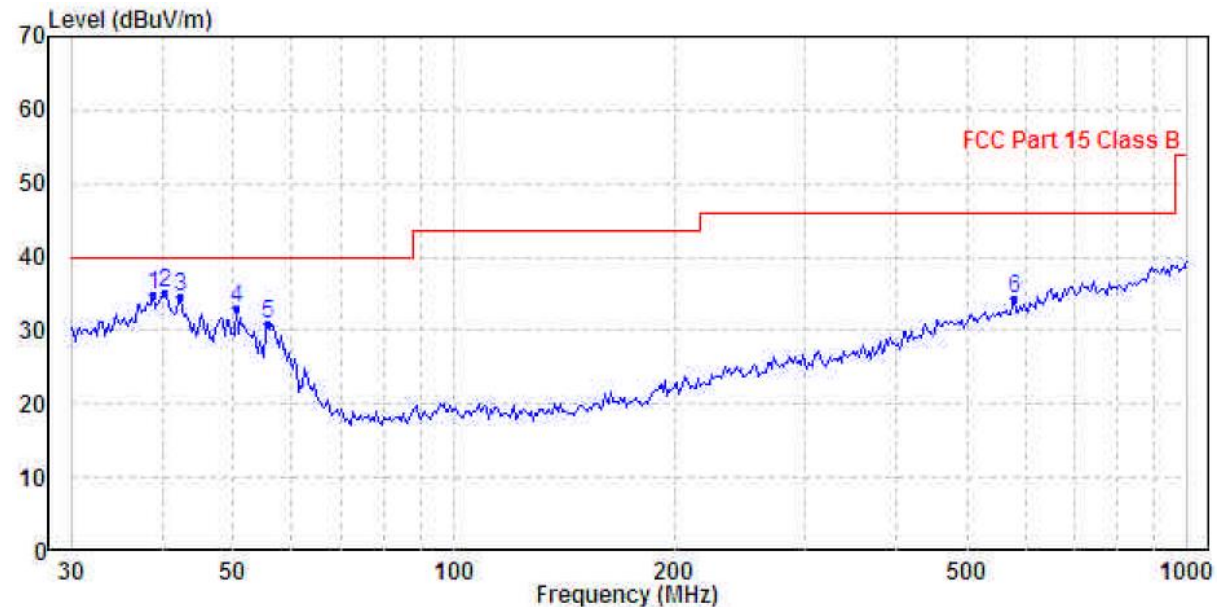
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**Results of TX mode (30MHz – 1GHz) (2407MHz worst case): PASS**

Vertical



Ambient Temperature: 25C  
Relative Humidity : 50%

	Freq	Level	Limit	Over		
	MHz	dBuV/m	Line	Limit	Remark	Pol/Phase
1	38.888	34.88	40.00	-5.12	QP	Vertical
2	40.276	35.17	40.00	-4.83	QP	Vertical
3	42.302	34.72	40.00	-5.28	QP	Vertical
4	50.409	33.13	40.00	-6.87	QP	Vertical
5	55.609	30.88	40.00	-9.12	QP	Vertical
6	578.670	34.21	46.00	-11.79	QP	Vertical

Remarks:

Calculated measurement uncertainty (30MHz – 1GHz): 4.9dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### **3.1.2 Antenna Requirement**

Ambient temperature 25°C

Relative humidity 57%

**Test Requirements: § 15.203**

#### **Test Specification:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### **Test Results:**

This is copper pipe antenna. There is no external antenna, the antenna gain =2dBi. User is unable to remove or changed the Antenna.

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### **3.1.3 20dB Bandwidth of Fundamental Emission**

Ambient temperature 25°C

Relative humidity 57%

Test Requirement: FCC 47 CFR 15.249  
Test Method: ANSI C63.10:2013  
Test Date: 2019-12-11  
Mode of Operation: Tx mode

#### **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.

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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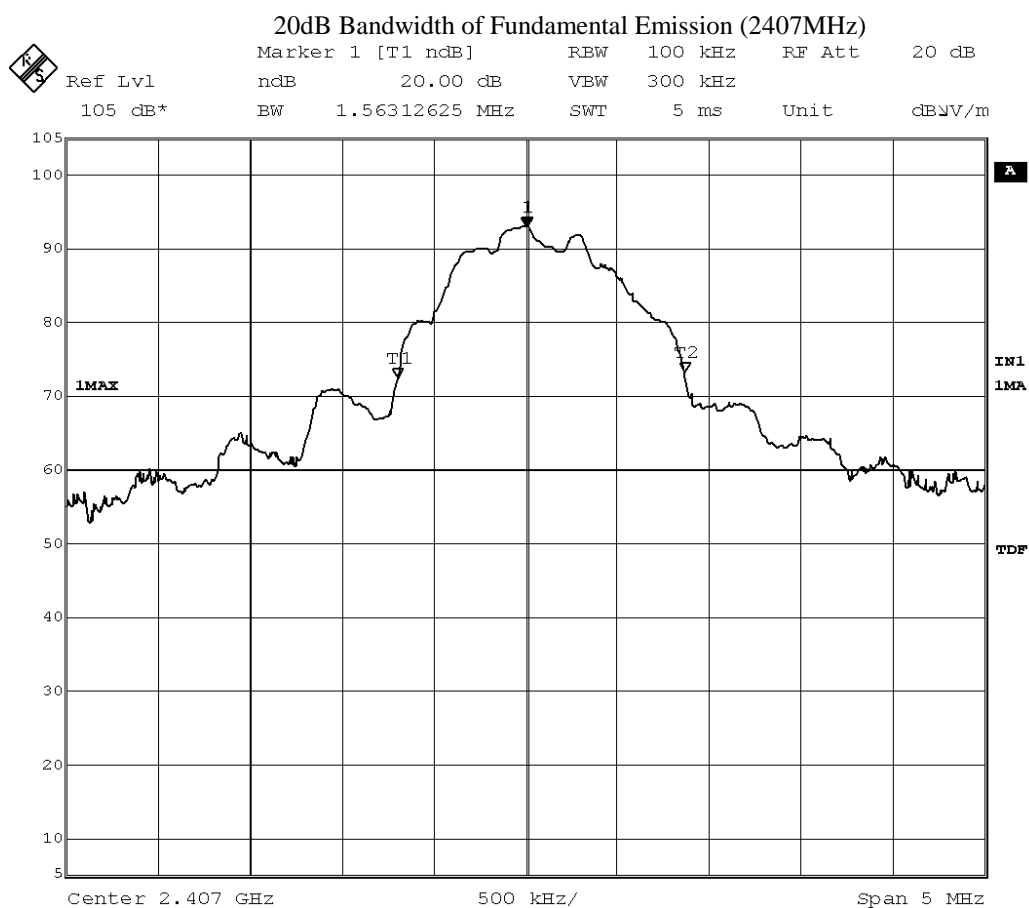
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### Limits for 20dB Bandwidth of Fundamental Emission (Low Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2407.0	1.56



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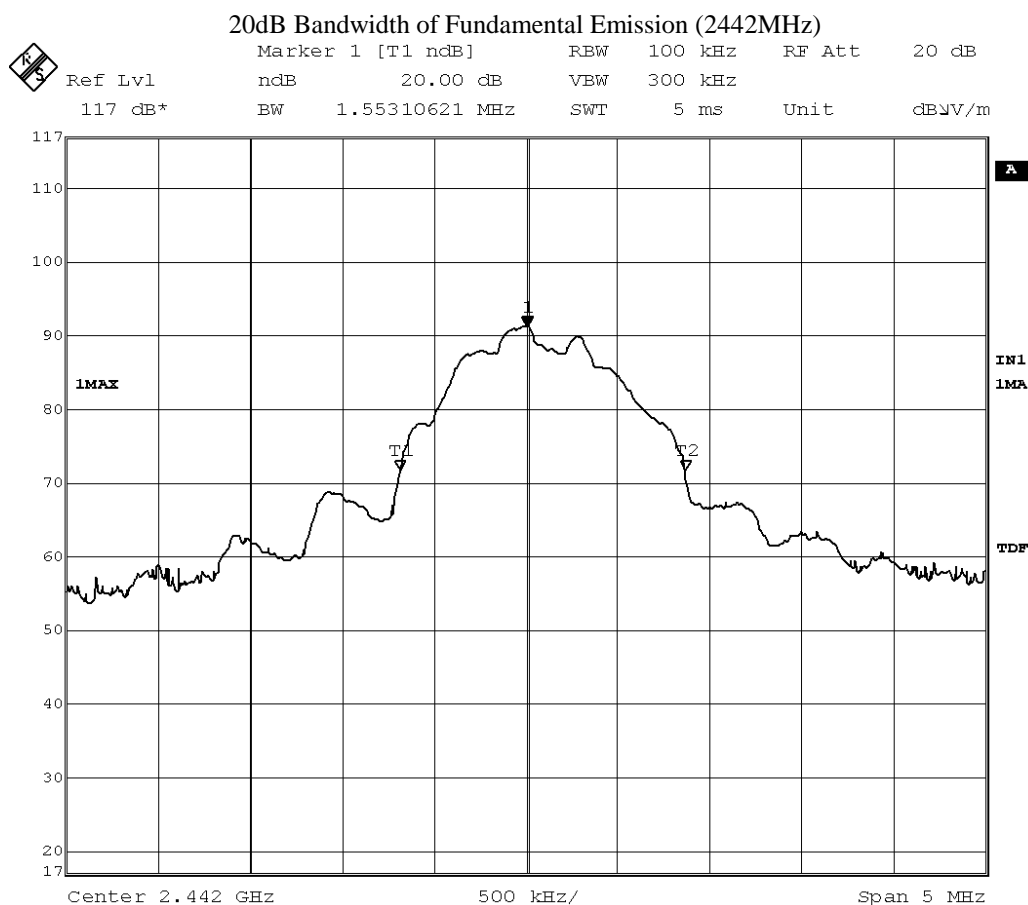
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### Limits for 20dB Bandwidth of Fundamental Emission (Middle Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2442.0	1.55



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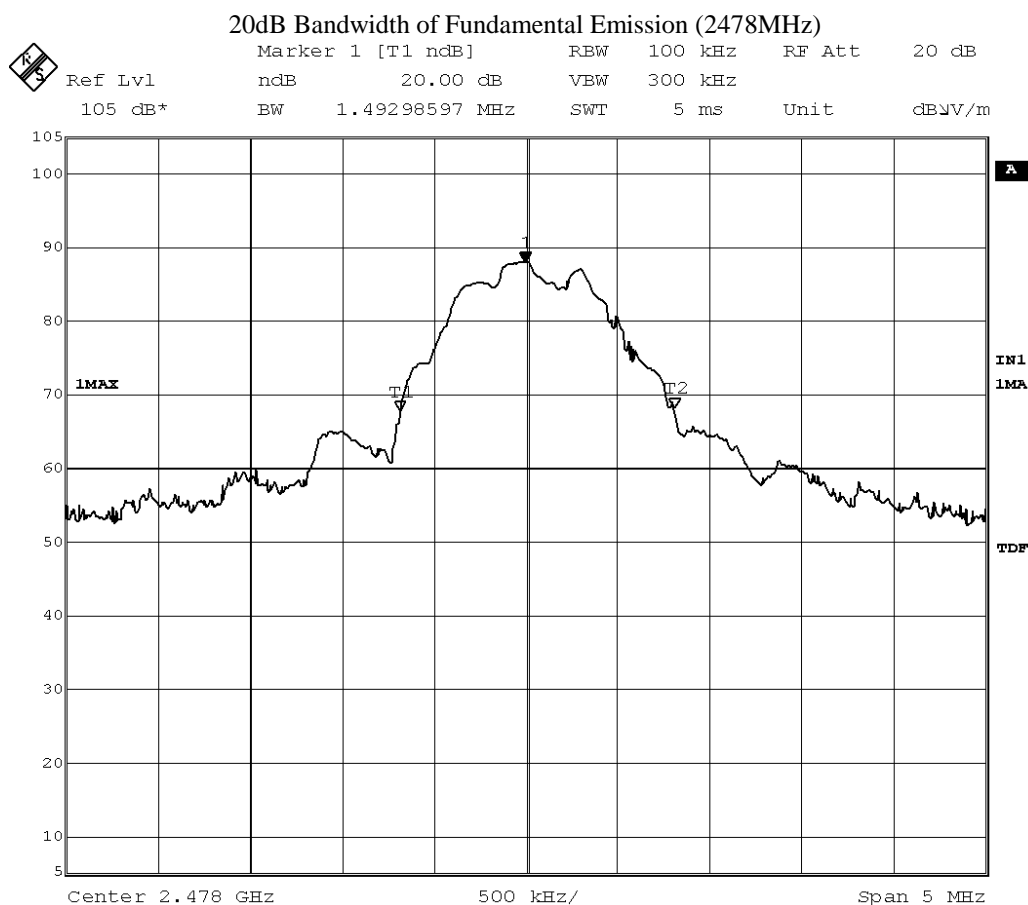
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### Limits for 20dB Bandwidth of Fundamental Emission (High Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2478.0	1.49



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### Appendix A

#### List of Measurement Equipment

##### Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2018/04/20	2020/04/20
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2018/05/24	2020/05/24
EM229	EMI TEST RECEIVER	R&S	ESIB40	100248	2018/06/01	2020/06/01
EM276	BROADBAND HORN ANTENNA	A-INFOMW	JXTXLB- 10180-SF	J203109090300 7	2018/04/27	2020/04/27
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2018/05/13	2020/05/13
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2018/05/13	2020/05/13
EM302	PRECISION OMNIDIRECTIONAL DIPOLE (1 – 6GHZ)	SEIBERSDORF LABORATORIES	POD 16	161806/L	2018/05/11	2020/05/11
EM303	PRECISION OMNIDIRECTIONAL DIPOLE (6 – 18GHZ)	SEIBERSDORF LABORATORIES	POD 618	6181908/L	2018/05/11	2020/05/11
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2018/04/16	2020/04/16
EM045	POWER METER	ROHDE & SCHWARZ	NRVD	843246/028	2018/06/01	2020/06/01

Remarks:-

N/A Not Applicable or Not Available

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### Appendix B

#### Photographs of EUT

View of the product



View of the product



View of the product



View of the product



Inner Circuit Bottom View



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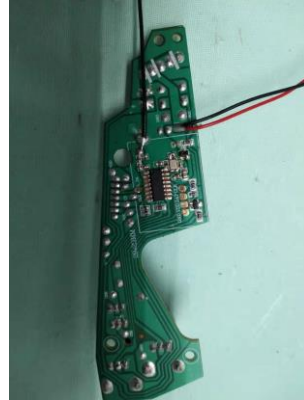
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### Photographs of EUT

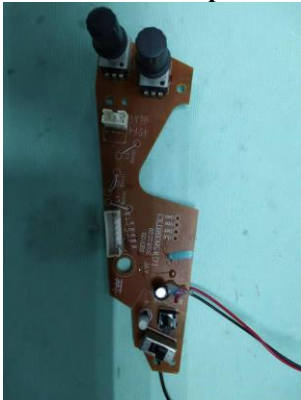
Inner Circuit Top View



Inner Circuit Bottom View



Inner Circuit Top View



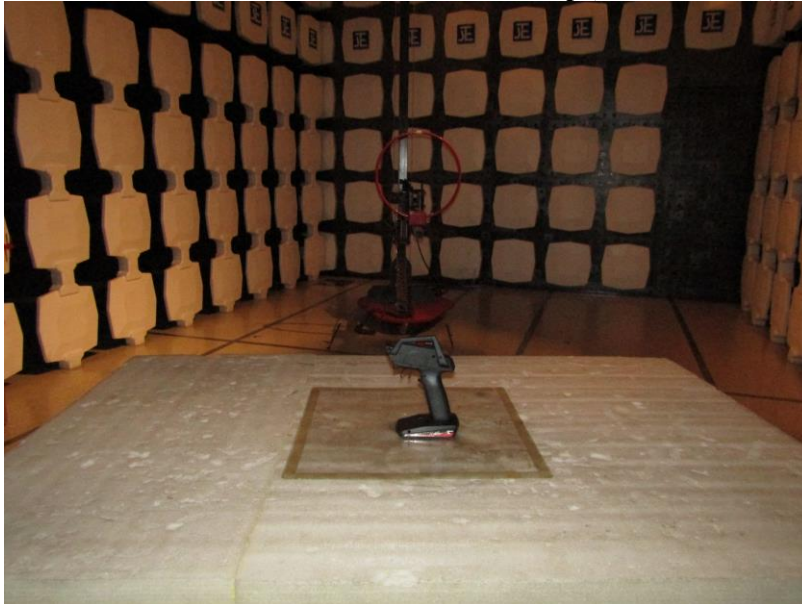
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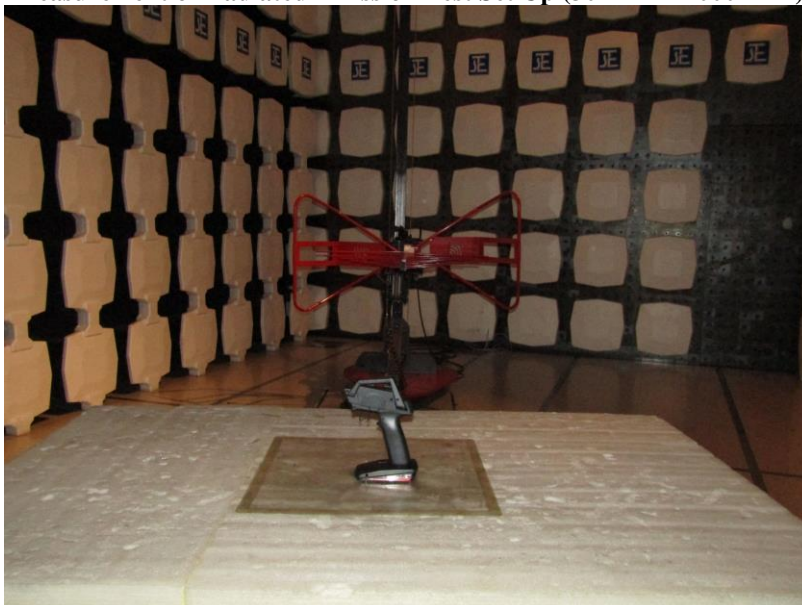
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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up (9kHz – 30MHz)**



**Measurement of Radiated Emission Test Set Up (30MHz – 1000MHz)**



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### Photographs of EUT

Measurement of Radiated Emission Test Set Up (above 1000MHz)



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

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