

TEST REPORT

Product Name : Remote Control of Dasher Twister Stunt Car
Model Number : 804634
FCC ID : 2A7HA804634T27M

Prepared for : SHANTOU HONGHU PLASTICS CO., LIMITED
Address : FLOOR,2ND.BUILDING,YIFAYUAN,SOUTH TONGYI
ROAD,CHENGHAI

Prepared by : EMTEK (DONGGUAN) CO., LTD.
Address : -1&2/F.,Building 2, Zone A, Zhongda Marine Biotechnology
Research and Development Base, No.9, Xincheng Avenue,
Songshanhu High-technology Industrial Development Zone,
Dongguan, Guangdong, China

TEL: +86-0769-22807078
FAX: +86-0769-22807079

Report Number : EDG2206200094E00201R
Date(s) of Tests : June 14, 2022 to June 28, 2022
Date of issue : June 28, 2022

TEST REPORT DESCRIPTION

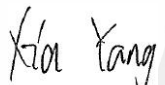
Applicant : SHANTOU HONGHU PLASTICS CO., LIMITED
Address : FLOOR,2ND.BUILDING,YIFAYUAN,SOUTH TONGYI ROAD,CHENGHAI DISTRICT,SHANTOU CITY, GUANGDONG PROVINCE, CHINA
Trade Mark : N/A
EUT : Remote Control of Dasher Twister Stunt Car
Model Number : 804634
Input Voltage : DC 3V from battery

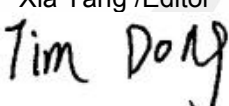
Measurement Procedure Used:



| APPLICABLE STANDARDS | |
|---|-------------|
| STANDARD | TEST RESULT |
| FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C | PASS |

The above equipment was tested by EMTEK(DONGGUAN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.227.

Date of Test : June 14, 2022 to June 28, 2022

Prepared by : 
Xia Yang /Editor

Reviewer : 
Tim Dong/ Supervisor

Approved & Authorized Signer : 

Sam Lv / Manager

Modified Information

| Version | Summary | Revision Date | Report No. |
|---------|-----------------|---------------|----------------------|
| | Original Report | June 28, 2022 | EDG2206200094E00201R |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Table of Contents

| | |
|--|-----------|
| 1. GENERAL INFORMATION | 5 |
| 1.1 PRODUCT DESCRIPTION | 5 |
| 2. SYSTEM TEST CONFIGURATION | 6 |
| 2.1 EUT CONFIGURATION | 6 |
| 2.2 EUT EXERCISE | 6 |
| 2.3 TEST PROCEDURE | 6 |
| 2.4 LIMITATION | 7 |
| 2.5 CONFIGURATION OF TESTED SYSTEM | 8 |
| 3. SUMMARY OF TEST RESULTS | 9 |
| 4. DESCRIPTION OF TEST MODES | 10 |
| 5. TEST FACILITY | 11 |
| 6. TEST SYSTEM UNCERTAINTY | 12 |
| 7. CONDUCTED EMISSIONS TEST | 13 |
| 7.1 MEASUREMENT PROCEDURE: | 13 |
| 7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 13 |
| 7.3 MEASUREMENT EQUIPMENT USED: | 13 |
| 7.4 MEASUREMENT RESULT: | 13 |
| 7.5 CONDUCTED MEASUREMENT PHOTOS: | 13 |
| 8. RADIATED EMISSION TEST | 14 |
| 8.1 MEASUREMENT PROCEDURE | 14 |
| 8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 14 |
| 8.3 MEASUREMENT EQUIPMENT USED: | 15 |
| 8.4 RADIATED EMISSION LIMIT | 16 |
| 8.5 MEASUREMENT RESULTS | 17 |
| 8.6 RADIATED MEASUREMENT PHOTOS: | 18 |
| 9. OCCUPIED BANDWIDTH | 19 |
| 9.1 MEASUREMENT PROCEDURE | 19 |
| 9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 19 |
| 9.3 MEASUREMENT EQUIPMENT USED: | 19 |
| 9.4 MEASUREMENT REQUIREMENTS: | 19 |
| 10. ANTENNA APPLICATION | 21 |
| 10.1 ANTENNA REQUIREMENT | 21 |
| 10.2 RESULT | 21 |

1. GENERAL INFORMATION

1.1 Product Description

| Characteristics | Description |
|--|--|
| Product Name | Remote Control of Dasher Twister Stunt Car |
| Model number | 804634 |
| Power Supply | DC 3V from Battery |
| Operating Frequency Range | 27.145MHz |
| Number of Channels | 1 channel |
| Antenna Type | External Antenna |
| Antenna gain | 3 dBi |
| Remark: The EUT continues to transmit while button is being pressed. Modulation by IC, and type is pulse modulation. | |

Note: for more details, please refer to the User's manual of the EUT.

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the **frequency range between 0.15 MHz and 30MHz** using **CISPR Quasi-Peak and average detector mode**.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013

2.4 Limitation

(1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

| Frequency range MHz | Limits dB(uV) | |
|---|------------------|----------|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |
| Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. | | |

(2) Radiated Emission

- The field strength of any emission within this band (26.96-27.28 MHz.) shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in § 15.35 for limiting peak emissions apply.
- The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in § 15.209.

| Frequency (MHz) | Field strength $\mu\text{V/m}$ | Distance(m) | Field strength at 3m $\text{dB}\mu\text{V/m}$ |
|--------------------|-----------------------------------|-------------|--|
| 1.705-30 | 30 | 30 | 69.54 |
| 30-88 | 100 | 3 | 40 |
| 88-216 | 150 | 3 | 43.5 |
| 216-960 | 200 | 3 | 46 |
| Above 960 | 500 | 3 | 54 |

- Remark:
- Emission level in $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$
 - Measurement was performed at an antenna to the closed point of EUT distance of meters.
 - Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205
 - Emission spurious frequency which appearing within the Restricted Bands specified in provision of §15.205, then the general radiated emission limits in § 15.209 apply.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

EUT

Table 2-1 Equipment Used in Tested System

| Item | Equipment | Trademark | Model No. | FCC ID | Series No. | Note |
|------|--|-----------|-----------|---------------------|------------|------------|
| 1 | Remote Control of Dasher Twister Stunt Car | N/A | 804634 | 2A7HA804634T 27M | N/A | EUT |

Note:

- (1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.

3. Summary of Test Results

| FCC Rules | Description Of Test | Result |
|-----------|---------------------|-----------|
| §15.207 | Conducted Emission | N/A |
| §15.225 | Radiated Emission | Compliant |
| §15.225 | Bandwidth Test | Compliant |
| §15.203 | Antenna Requirement | Compliant |



4. Description of test modes

The EUT (Remote Control of Dasher Twister Stunt Car) has been tested under normal operating condition.

The EUT stay in continuous transmitting mode. The Frequency 27.145MHz is chosen for testing.

For Radiated: The EUT's antenna was pre-tested under the following modes:

| Test Mode | Description |
|---------------|-----------------|
| Mode A | X-Y axis |
| Mode B | Y-Z axis |
| Mode C | X-Z axis |

From the above modes, the worst case was found in Mode A. Therefore only the test data of the mode was recorded in this report.



5. Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2020.08.27
The certificate is valid until 2024.07.05
The Laboratory has been assessed and proved to be in compliance
with CNAS/CL01:2018
The Certificate Registration Number is L3150

Accredited by FCC
Designation Number: CN1300
Test Firm Registration Number: 945551

Accredited by A2LA, April 05, 2021
The Certificate Registration Number is 4321.02

Accredited by Industry Canada
The Certificate Registration Number is CN0113

Name of Firm : EMTEK (DONGGUAN) CO., LTD.
Site Location : -1&2/F., Building 2, Zone A, Zhongda Marine Biotechnology
Research and Development Base, No.9, Xincheng Avenue,
Songshanhu High-technology Industrial Development Zone,
Dongguan, Guangdong, China

6. TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Parameter | Uncertainty |
|--------------------------------|---------------------------|
| Radio Frequency | $\pm 1 \times 10^{-5}$ |
| Maximum Peak Output Power Test | $\pm 1.0\text{dB}$ |
| Conducted Emissions Test | $\pm 2.0\text{dB}$ |
| Radiated Emission Test | $\pm 2.0\text{dB}$ |
| Power Density | $\pm 2.0\text{dB}$ |
| Occupied Bandwidth Test | $\pm 1.0\text{dB}$ |
| Band Edge Test | $\pm 3\text{dB}$ |
| All emission, radiated | $\pm 3\text{dB}$ |
| Antenna Port Emission | $\pm 3\text{dB}$ |
| Temperature | $\pm 0.5^{\circ}\text{C}$ |
| Humidity | $\pm 3\%$ |

Measurement Uncertainty for a level of Confidence of 95%

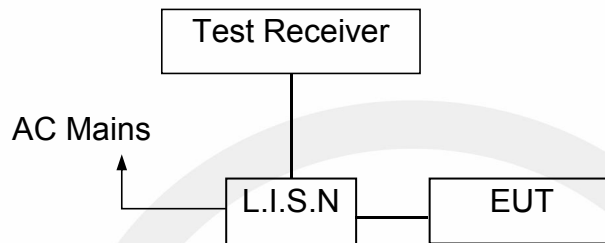


7. Conducted Emissions Test

7.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

7.2 Test SET-UP (Block Diagram of Configuration)



7.3 Measurement Equipment Used:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------|---------------|-----------|------------|--------------|---------------|
| 1. | Test Receiver | Rohde&Schwarz | ESCS30 | 100018 | May 20, 2022 | 1 Year |
| 2. | L.I.S.N. | Rohde&Schwarz | ENV216 | 100017 | May 20, 2022 | 1Year |
| 3. | RF Switching Unit | CDS | RSU-M2 | 38401 | May 20, 2022 | 1Year |

7.4 Measurement Result:

N/A.

7.5 Conducted Measurement Photos:

N/A

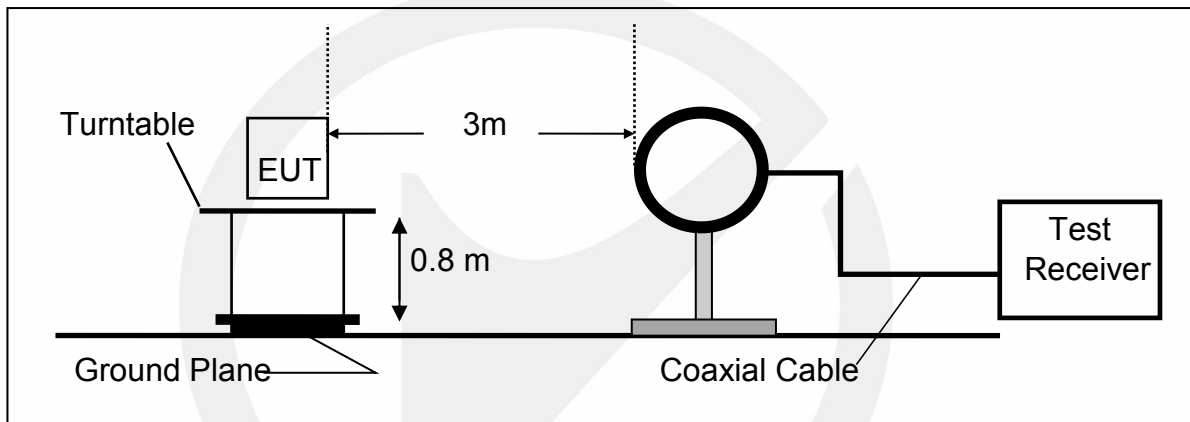
8. Radiated Emission Test

8.1 Measurement Procedure

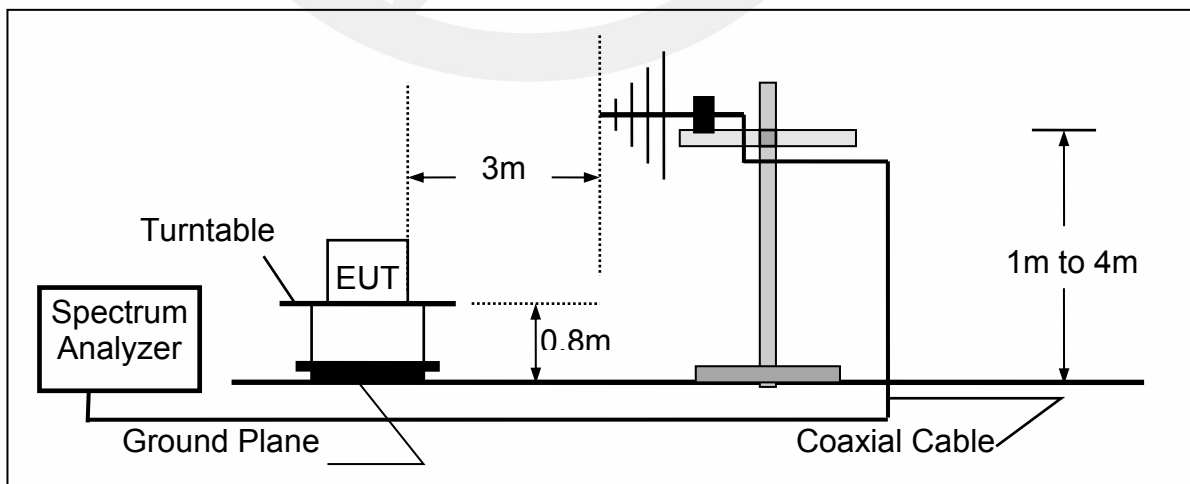
1. The EUT was placed on a turntable which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

8.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Above 30MHz



8.3 Measurement Equipment Used:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|--------------------------------|-----------------|------------|--------------|--------------|---------------|
| 1. | Test Receiver | Rohde & Schwarz | ESCI | 1166.5950.03 | May 20, 2022 | 1 Year |
| 2. | Bilog Antenna | Schwarzbeck | VULB9163 | 000141 | May 20, 2022 | 1 Year |
| 3. | Power Amplifier | CDS | RSU-M352 | 818 | May 20, 2022 | 1 Year |
| 4. | Power Amplifier | HP | 8447F | OPT H64 | May 20, 2022 | 1 Year |
| 5. | Color Monitor | SUNSP0 | SP-140A | N/A | May 20, 2022 | 1 Year |
| 6. | Single Line Filter | JIANLI | XL-3 | N/A | May 20, 2022 | 1 Year |
| 7. | Single Phase Power Line Filter | JIANLI | DL-2X100B | N/A | May 20, 2022 | 1 Year |
| 8. | 3 Phase Power Line Filter | JIANLI | DL-4X100B | N/A | May 20, 2022 | 1 Year |
| 9. | DC Power Filter | JIANLI | DL-2X50B | N/A | May 20, 2022 | 1 Year |
| 10. | Cable | Schwarzbeck | PLF-100 | 549489 | May 20, 2022 | 1 Year |
| 11. | Cable | Rosenberger | CIL02 | A0783566 | May 20, 2022 | 1 Year |
| 12. | Cable | Rosenberger | RG 233/U | 525178 | May 20, 2022 | 1 Year |
| 13. | Signal Analyzer | Rohde & Schwarz | FSV30 | 103040 | May 20, 2022 | 1 Year |
| 14. | Horn Antenna | Schwarzbeck | BBHA9120D | 9120D-1272 | May 20, 2022 | 1 Year |
| 15. | Power Amplifier | LUNAR EM | LNA1G18-40 | J10100000081 | May 20, 2022 | 1 Year |
| 16. | Cable | H+S | CBL-26 | N/A | May 20, 2022 | 1 Year |
| 17. | Cable | H+S | CBL-26 | N/A | May 20, 2022 | 1 Year |
| 18. | Cable | H+S | CBL-26 | N/A | May 20, 2022 | 1 Year |
| 19. | Loop Antenna | Schwarzbeck | FMZB | 1513-60 | May 20, 2022 | 1 Year |

8.4 Radiated Emission Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

| Frequencies (MHz) | Field Strength (micorvolts/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 |

Restricted bands of operation

| MHz | MHz | MHz | GHz |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | (²) |

Remark 1. Emission level in dBuV/m=20 log (uV/m)

- :
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
 3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

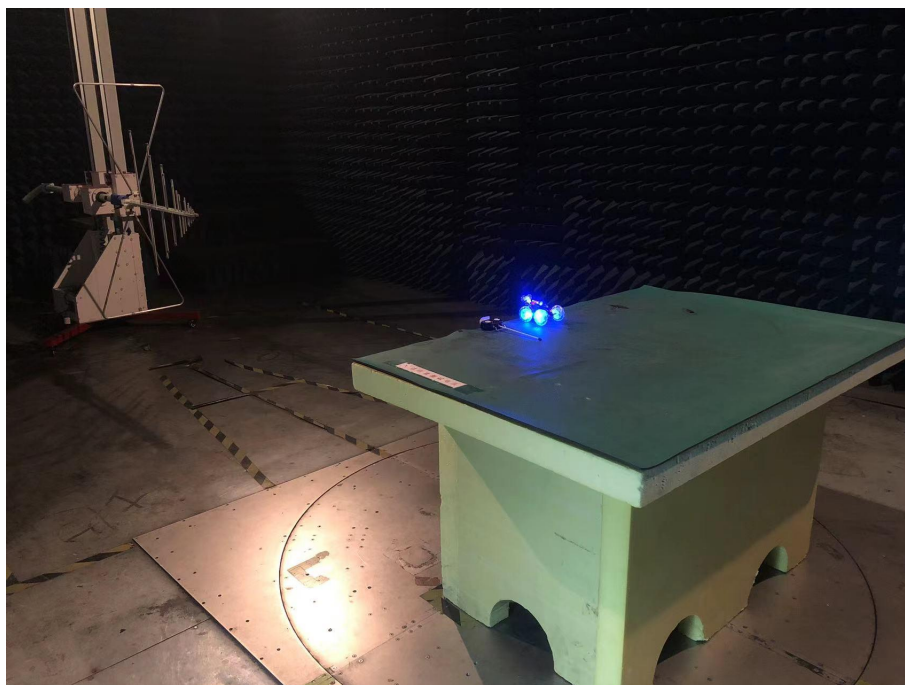
8.5 Measurement Results

Test Result: PASS Test By: Xia
Frequency Range: 20M-1GHz Fundamental Frequency: 27.145 MHz

| Frequency (MHz) | Ant.Pol. (V/H) | Emission Level (dBuV/m) | Limit 3m (dBuV/m) | Margin (dB) | Note |
|-----------------|----------------|-------------------------|-------------------|-------------|------|
| 27.145 | H | 60.71 | 100.00 | -39.29 | Peak |
| 27.145 | H | 45.48 | 80.00 | -34.52 | AV |
| 227.6906 | H | 38.56 | 46.00 | -7.44 | QP |
| 244.2321 | H | 33.36 | 46.00 | -12.64 | QP |
| 334.8588 | H | 30.90 | 46.00 | -15.10 | QP |
| 377.259 | H | 30.83 | 46.00 | -15.17 | QP |
| 912.862 | H | 40.05 | 46.00 | -5.95 | QP |
| 27.145 | V | 60.39 | 100.00 | -39.61 | Peak |
| 27.145 | V | 45.75 | 80.00 | -34.25 | AV |
| 226.8936 | V | 27.41 | 46.00 | -18.59 | QP |
| 244.2321 | V | 39.88 | 46.00 | -6.12 | QP |
| 375.9385 | V | 35.00 | 46.00 | -11.00 | QP |
| 796.183 | V | 40.40 | 46.00 | -5.60 | QP |
| 958.7943 | V | 32.50 | 46.00 | -13.50 | QP |

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.209.

8.6 Radiated Measurement Photos:

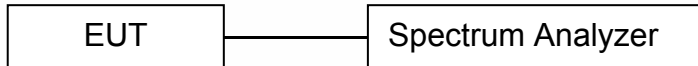


9. Occupied Bandwidth

9.1 Measurement Procedure

1. Set EUT as normal operation
2. Set SPA Center Frequency = fundamental frequency, RBW=3KHz,VBW= 3KHz
3. Set SPA Max hold. Mark peak.

9.2 Test SET-UP (Block Diagram of Configuration)



9.3 Measurement Equipment Used:

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
|-------------------|-----------------|--------------|---------------|--------------|----------|
| Spectrum Analyzer | Rohde & Schwarz | FSV30 | 1321.3008K | May 20, 2022 | 1 year |
| Coaxial Cable | CDS | 79254 | 46107086 | May 20, 2022 | 1 year |

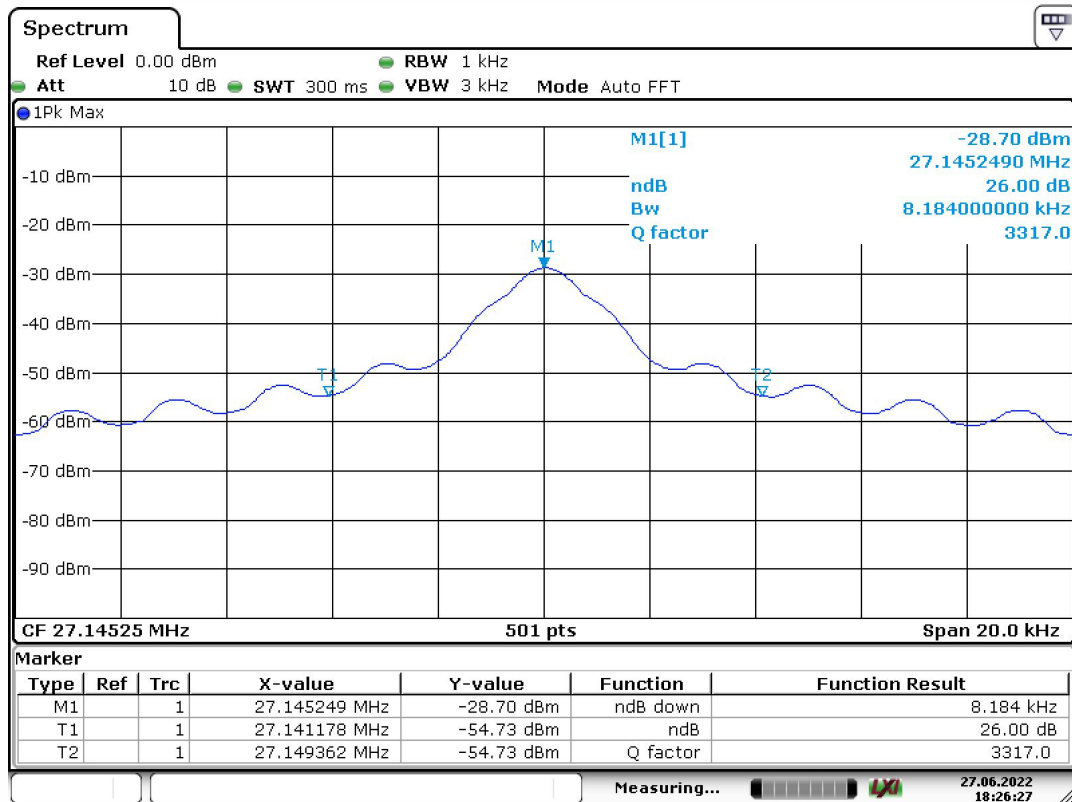
9.4 Measurement Requirements:

Pass.

Limits for 26dB Bandwidth of Fundamental Emission:

| Frequency (MHz) | 26dB Bandwidth (KHz) | Limits (MHz) |
|-----------------|----------------------|----------------------|
| 27.145 | 8.184 | Within 27.141-27.150 |

Refer to attached data chart.



10. Antenna Application

10.1 Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C section 15.203.

Systems operating in the 27.145MHz that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

10.2 Result

The EUT's antenna is permanent attached antenna, external antenna. The antenna is not replaceable or user serviceable. The requirement of FCC part 15C section 15.203 is met.

*** End of Report ***