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October 19, 2011

Gary DeWitt Traxxas, LLP 1100 Klein Road Plano, TX 75074

Dear Gary:

Enclosed is the Wireless Test Report for the Traxxas, LLP Vehicle Transceiver. This report can be used to demonstrate compliance with FCC requirements for wireless devices in the United States.

If you have any questions, please contact me.

Sincerely,

Jeffrey A. Lenk President

Enclosure

Project 12769-10

Traxxas, LLP Vehicle Transceiver

Wireless Certification Report

Prepared for: Traxxas, LLP 1100 Klein Road Plano, TX 75074

By

Professional Testing (EMI), Inc. 1601 N. A.W. Grimes Blvd., Suite B Round Rock, Texas 78665

> October 19, 2011 Revised November 2, 2011

Reviewed by

Jeffrey A. Lenk President Written by

Layne Lueckemeyer Product Development Engineer

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⁽³⁾ The significance of this report is dependent on the representative character of the test sample submitted for evaluation and the results apply only in reference to the sample tested. The manufacturer must continuously implement the changes shown herein to attain and maintain the required degree of compliance.



Applicant: Traxxas, LLP

Applicant's Address: 1100 Klein Road

Plano, TX 75074

FCC ID: XVE-SA10046

Project Number: 12769-10

Test Dates: July 14 – 18, 2011

The **Traxxas Vehicle Transceiver** was tested to and found to be in compliance with FCC 47 CFR Part 15.

The highest emissions generated by the above equipment are listed below:

| Parameter Frequency (MHz) | | | Level | Limit | Margin (dB) | |
|---|-------|-----------|--------------|-------------------|-------------|--|
| 1 m | | | Bm Conducted | 30 dBm | -26.36 | |
| Transmitter: Radiated Spurious 841.6 30.1 d | | | BμV/m @ 10 m | $35.6 dB\mu V/m$ | -5.5 | |
| | Occup | oied Band | lwidth | | | |
| 6 dB | | | 20 dB | | | |
| 960 kHz | · | | 1.55 MHz | | | |

I, Layne Lueckemeyer, for Professional Testing (EMI), Inc., being familiar with the FCC rules and test procedures have reviewed the test setup, measured data, and this report. I believe them to be true and accurate.

Layne Lueckemeyer

Product Development Engineer

This report has been reviewed and accepted by Traxxas, LLP The undersigned is responsible for ensuring that this device will continue to comply with the FCC rules.

Representative of Traxxas, LLP

1.0 Introduction

1.2 Scope

This report describes the extent of the equipment under test (EUT) conformance to the intentional radiator requirements of the United States.

Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty calculations, estimates, and expressions thereof for EMC testing. The procedure of ANSI C63.4: 2009 were utilized for making all emissions measurements.

1.3 EUT Description

The Traxxas 2.4GHz transceiver is a single board system with an 8 bit micro controller used to control the Cypress CYRF6936/7936 radio module. The radio module has an integrated power amplifier (PA) that is firmware selectable from -35dbm to +4dbm in 8 steps. The radio operates in the unlicensed Worldwide Industrial, Scientific, and medical (ISM) band (2.400GHz to 2.438Ghz), in Direct Sequence Spread Spectrum (DSSS) mode.

The EUT was tested while in a continuous transmit mode. The EUT was tuned to a low, middle, and high channel to perform power, occupied bandwidth, and harmonic tests. The EUT was tuned to a middle channel to perform spurious tests. The EUT continuously transmitted at maximum power. The system tested consisted of the following:

| Manufacturer | Model | FCC ID Number |
|---------------|---------------------|---------------|
| Traxxas, Inc. | Vehicle Transceiver | XVE-SA10046 |

The following rules apply to the operation of the EUT:

| Guidelines | FCC Rules Part 15 |
|-----------------------------|-------------------|
| Transmitter Characteristics | 15.247 |
| Spurious Radiated Power | 15.209 |
| Antenna Requirement | 15.203 |

1.4 Modifications

No modifications were made to the EUT during the performance of the test program.

1.5 Test Site

Measurements were made at the PTI semi-anechoic facility designated Site 45 (FCC 459644, IC 3036B-1) in Austin, Texas. This site is registered with the FCC under Section 2.948 and Industry Canada per RS-212, and is subsequently confirmed by laboratory accreditation (NVLAP). The test site is located at 11400 Burnet Road, Austin, Texas, 78758, while the main office is located at 1601 N. A.W. Grimes Blvd., Suite B, Round Rock, Texas, 78665.

1.6 Applicable Documents

| Document | Title | Release |
|------------------------|---|---------|
| ANSI C63.4 | American National Standard for Methods of Measurement of Radio- | 2009 |
| | Noise Emissions from Low Voltage Electrical and Electronic Equipment | |
| ANSI C63.10 | American National Standard for Testing Unlicensed Wireless Devices | 2009 |
| 47 CFR | Part 15 – Radio Frequency Devices Subpart C -Intentional Radiators | |
| KDB Publication No. | Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247) | 2011 |
| 718828 | | |

1.7 Applicable Tests

| Test | Rule |
|---|---------------------------------|
| Output Power | 15.247(b)(3) |
| Occupied Bandwidth | 15.247(a)(2) |
| Power Spectral Density | 15.247(e) |
| Radiated Emissions, Harmonic, Spurious, Fundamental, Band Edge | 15.205(a), 15.209(a), 15.247(d) |
| Antenna Requirements | 15.203 |

2.0 Output Power

Output power measurements were made on selected fundamental transmit frequencies of the EUT for the lowest, most center, and highest transmit frequency.

2.2 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable, which allows 360-degree rotation. For measurements of the fundamental signal, the output antenna was connected directly to the input of a spectrum analyzer. When necessary, external attenuation was utilized. A spectrum analyzer with peak detection was used to find the maximum output power. The Measurement Procedure PK1 from KDB718828 was used to measure output power of the fundamental.

A diagram showing the test setup is given as Figure 2.1.1.

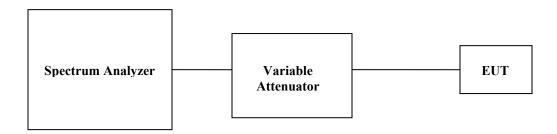


Figure 2.1.1: Ouptut Power Test Setup

2.3 Test Criteria

The maximum output power is 1 W for devices operating in the frequency range 2400 -2483.5 MHz according to FCC 15.247.

2.4 **Test Results**

Conducted measurements of the output power level for the EUT were taken on July 18, 2011, and the EUT was found to be in compliance with applicable requirements.

Calculations:

Cable Loss (dB) = 1.87External Attenuation (dB) = 0Antenna gain (dBi) = 0.5

Total = 2.37

E.I.R.P. calculated by adding Cable Loss + External Attenuation + Antenna gain to Measured Power

| Table 2.3 | .1: Output Po | wer, Occupied | d Bandwi | idth, PSD Measuro | ements Test Ed | quipment |
|--|-------------------|--|-------------|------------------------|-----------------|-------------------------|
| | | Profess | ional Te | esting, EMI, Inc. | | |
| In accord | ance with: FCC | 47 CFR 15 Subpar | t C | | | |
| | Sectio | n 15.247 | | | | |
| Test Date(s) | 7/15/2 | 011 | | EUT Serial #: | N/A | |
| Customer: | fustomer: Traxxas | | EUT Part #: | N/A | | |
| Project Nun | nber: 12769 | -10 | | Test Technician: | Layne Lueckemey | er |
| Purchase Order #: GMD110707-1 Supervisor | | | | Supervisor: | Larry Finn | |
| Equip. Und | er Test: Receiv | ver Remote | | Witness' Name: | Chris Russell | |
| | | 769-10 Test Technician: Layne Lueckemeyer MD110707-1 Supervisor: Larry Finn ceiver Remote Witness' Name: Chris Russell Test Equipment List Page: 1 of 1 Calibration Due | | | | |
| Asset# | Manufacturer | Model | Equip | oment Nomenclature | Serial Number | Calibration Due Date |
| C117 | Times Microwave | SLU18-SMSM- 05.00F | Cable, RF | , SMA-SMA, 60", Brown | none | 9/22/2011 |
| 856 | Narda | 702-60 | Attenuator, | Step, 60dB, DC-12.4GHz | 4105 | CBU |
| ALN-077 | Rohde & Schwarz | FSP30 | Sŗ | oectrum Analyzer | 100218 | 12/22/2012 |
| C046 | N/A | N/A | Cable | Coax, SMA-N, 0.9m | none | CBU |

Table 2.3.2: Output Power Test Results

| Table 2.3.2: Output Po | wer Test Results | | | | | | | |
|------------------------|-------------------------|--------------|---------------------|-------------------|----------|-------------|---------|---|
| | Profession | al Testi | ng, EMI | l, Inc. | | | | |
| In accordance with: | FCC 47 CFR 15 Subpa | art C | | | | | | |
| | Section 15.247 | | | | | | | |
| Test Date(s): | 7/15/2011 | | EUT Serial | I#: N/A | | | | |
| Customer: | Traxxas | | EUT Part # | #: N/A | | | | |
| Project Number: | 12769-10 | | Test Techn | ician: Layn | e Lueck | emeyer | | |
| Purchase Order #: | GMD110707-1 | | Supervisor | : Larr | y Finn | | | |
| Equip. Under Test: | Vehicle Transceiver | | Witness' N | ame: Chris | s Russel | l | | |
| | | | | | | | | |
| Tr | ansmit Power Test Resul | ts Data Shee | t | | Page | : 1 | of | 1 |
| EUT Line Voltage: | 6.1 VDC EUT Line Fr | | | ne Frequency: | N/A | L. | Hz | |
| EUT Mode | e of Operation: | | | Lowest Freque | ency 240 | 7 MHz | | |
| Test Conditions | Measured Power (dBm) | E.I.R.P | . (dBm) Limit (dBm) | |) | Margin (dB) | | |
| Tnom +20 °C | 1.27 | 3. | 64 | 30 | | -26.36 | | |
| EUT Mod | e of Operation: | | | Middle Freque | ency 242 | 6 MHz | | |
| Test Conditions | Measured Power (dBm) | E.I.R.P | . (dBm) | E.I.R.P. Limit (d | IBm) | Marg | in (dB) | |
| Tnom +20 °C | 0.84 | 3. | 21 | 30 | | -20 | 5.79 | |
| EUT Mode | e of Operation: | | | Highest Freque | ency 245 | 3 MHz | | |
| Test Conditions | Measured Power (dBm) | E.I.R.P | . (dBm) | E.I.R.P. Limit (d | lBm) | Marg | in (dB) | |
| | | | | | | | | |

3.0 Occupied Bandwidth

Occupied bandwidth measurements were performed on the EUT to determine compliance with FCC 15.247.

3.2 Test Procedure

The occupied bandwidth was measured with a spectrum analyzer connected to a double-ridged guide horn while the EUT was operating in continuous transmit mode at the appropriate center frequency. The analyzer center frequency was set to the EUT carrier frequency.

Display line and marker delta functions were used to measure the occupied bandwidth of the EUT. However, the 20 dB bandwidth is referenced to a peak power measurement taken at the entire bandwidth or more for RBW, then using 1% RBW for the 20 dB bandwidth. A diagram showing the test setup is given as Figure 2.1.1.

3.3 Test Criteria

The minimum 6 dB occupied bandwidth for the EUT is 500 kHz as stated in 15.247(a)(2). The 20 dB bandwidth must be measured and reported for the FCC.

3.4 Test Results

Occupied bandwidth measurements were taken on July 18, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Tables 2.3.1.

 Table 3.3.1: Low Channel 6 dB Occupied Bandwidth Test Results

| | 3.3.1. LUW | Channer | o ab O | ccupiea i | Danu | lwidth T | est Res | uits | | | | |
|--------|-------------------|--|--|--------------|---------|--|-------------|---------------|--------------|-------|----|---|
| | | | Profe | ssional | Tes | ting, E | MI, In | c. | | | | |
| In acc | cordance with: | FCC 47 C | CFR 15 Su | bpart C | | | | | | | | |
| | | Section 1: | | | | | | | | | | |
| | ate(s): | 7/18/2011 | | | | EUT Serial | | n/a | | | | |
| uston | ner: t Number: | Traxxas 12769-10 | | | | EUT Part # Test Techn | | n/a | Lueckem | OTION | | |
| | se Order #: | GMD110 | 707-1 | | | Supervisor | | Jason | | eyer | | |
| | Under Test: | | ranceiver | | | Vitness' Na | | | Russell | | | |
| | | | | | | | | | | | | |
| Rac | diated Emissions | s Test Resu | lts Data Sh | eet - Horizo | ontal A | Antenna Po | larity > 10 | GHz | Page: | 1 | of | 1 |
| EU | UT Line Voltage | : : | 6 | VDC | | EUT Li | ne Freque | ncy: | N/A | | Hz | |
| | EUT 1 | Mode of Op | eration: | | | | Tra | nsmit Lo | w Channel | | | |
| | | | | | | 100 kHz 100 kHz | Delta | 2 [T1] -1 | .65 dB | | | |
| R | Ref 117 dBμV | 7 | Att 40 | | | 20 ms | | .000000 | | | | |
| _ | 110 | | | | | | Marker | 100. |] 99 dBµV | | | |
| _ | | | | 1 | \sim | | 2 | -405540 | 000 GHz | A | | |
| PK | 100 D1 99 | .53 dBµV− | | 7 | | | | | | | | |
| _: | 90 | | <u> </u> | | | | | | | | | |
| | | | الممين | | | \ \bu | | | | | | |
| H | 80 | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | AND TO SERVICE AND | | | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | my | | | | | |
| | Month of the same | | | | | | _ | ~~ <u>~</u> | | | | |
| | | | | | | | | | 4 | | | |
| F | -60 | | | | | | | | | | | |
| -: | -50 | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| L. | 40 | | | | | | | | | | | |
| | 30 | | | | | | | | | | | |
| -: | | | | | | | | | | | | |

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Table 3.3.2: Low Channel 20 dB Occupied Bandwidth Test Results

| | | | | <u> 1 1 es</u> | ung, E | MI, Ir | ic. | | | | |
|-----------------------------|------------------|--|------------|----------------|--------------------|--------------|--------------|--------------|-------|----|---|
| In accordance with: | | | bpart C | | | | | | | | |
| | Section 1: | | | - I- | | | | | | | |
| est Date(s): | 7/18/2011 | L | | | UT Seria | | n/a | | | | |
| fustomer: roject Number: | Traxxas 12769-10 | | | | UT Part | | n/a | Lueckem | OXIOM | | |
| urchase Order #: | GMD110 | | | | upervisor | | | Haley | eyer | | _ |
| quip. Under Test: | | ranceiver | | | Vitness' N | | | Russell | | | |
| quipt cause a test | , , , , , | | | | | | | | | | _ |
| Radiated Emission | ıs Test Resu | lts Data Sh | eet - Hori | izontal A | ntenna Po | olarity > 10 | GHz | Page: | 1 | of | 1 |
| EUT Line Voltag | e: | 6 | VDC | | EUT Li | ine Freque | ency: | N/A | | Hz | |
| EUT | Mode of Op | peration: | | | | Tr | ansmit Lo | w Channel | | | |
| | | | | | 100 kHz 100 kHz | Delta | 2 [T1] 0 | .40 dB | | | |
| Ref 117 dBµ | V | Att 40 |) dB | * SWT | 20 ms | | | 000 MHz | | | |
| -110- | | | | | | Marker | 1 [T1 85. |] B3 dBµV | | | |
| | | | ~~ | ~ | | 2 | .405250 | 000 GHz | A | | |
| PK XH | | + | <i></i> | \ | 1 | | | | | | |
| | | | | | 1 | | | | | | |
| -90 D1 85 | .53 dBµV- | 1 | | | | | | | | | |
| -80 | | AND THE STATE OF T | | | ~~~~ | \ | | | | | |
| | www | | | | | many | | | | | |
| Man | | | | | | | ~ ~~ | - war | | | |
| -60- | | | | | | | | | | | |
| | | | | | | | | | | | |
| -50- | | | | | | | | | | | |
| | | | | | | | | | | | |
| -40 | | | | | | | | | | | |
| -30- | | | | | | - | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

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Table 3.3.3: Mid Channel 6 dB Occupied Bandwidth Test Results

| | | | | esting. | EMI, Iı | nc. | | | | |
|-----------------------------------|--------------------|-------------|---------------|-------------|----------------|---------------|-------------------|------|----|---|
| In accordance with: | FCC 47 C | CFR 15 Su | bpart C | | | | | | | |
| | Section 1 | | | | | | | | | |
| Cest Date(s): | 7/18/2011 | | | EUT Se | | n/a | | | | |
| Customer: | Traxxas | | | EUT Pa | | n/a | · · | | | |
| Project Number: Purchase Order #: | 12769-10 GMD110 | 707 1 | | Superv | chnician: | | Lueckeme Haley | eyer | | |
| Equip. Under Test: | Vehicle T | | | | s' Name: | Chris | Russell | | | |
| quip: Onuci Test. | v chiefe 1 | Tancerver | | vv renes | y italic: | CIIIIs | Russen | | | |
| Radiated Emission | s Test Resu | lts Data Sh | eet - Horizon | tal Antenna | a Polarity > 1 | GHz | Page: | 1 | of | 1 |
| EUT Line Voltag | : : | 6 | VDC | EU' | Γ Line Frequ | ency: | N/A | | Hz | |
| EUT | Mode of Op | eration: | | | Tı | ransmit M | id Channel | | | |
| | | | | RBW 100 k | | 2 [T1] -0 | .06 dB | | | |
| Ref 117 dBµ | J | Att 40 |) dB * 5 | SWT 20 ms | | 0.00000 | 000 kHz | | | |
| -110- | | | | | Marker | | | | | |
| | | | | ✓ | 2 | 2 425530 | 000 GHz | A | | |
| PK XH 100 D1 99 | .68 dBµV- | | | | | | | | | |
| -90 | | | | | | | | | | |
| | | MANAN | | ેપ | | | | | | |
| -80 | \ | | | | Lunv Th | | | | | |
| and the same | The same | | | | La Company | www. | | | | |
| 70 | | | | | | | m | | | |
| -60- | | | | | | | | | | |
| | | | | | | | | | | |
| -50 | | | | | | | | | | |
| -50 | | | | | | | | | | |
| -40 | | 1 1 | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| -40 | | | | | | | | | | |

Table 3.3.4: Mid Channel 20 dB Occupied Bandwidth Test Results

| est Date(s): ustomer: roject Number: urchase Order #: | Section 15,247 1/18/2011 Fraxxas 2769-10 GMD110707-1 Vehicle Trance | iver | EUT Serial #: EUT Part #: Test Technician: Supervisor: Witness' Name: | Jason | e Lueckeme Haley Russell | yer | | |
|--|--|--------------------------|---|-------|--------------------------------|-----|----------|---|
| Radiated Emissions 7 EUT Line Voltage: | Test Results Dat | a Sheet - Horizonta VDC | Antenna Polarity > EUT Line Freq | | Page: | 1 | of Hz |] |
| | ode of Operatio | n: | | | Iid Channel | | | |
| -110 -100 -90 -90 -80 -60 -50 -40 | 0 dbuv | | Mark | 86 | 50 dBpV | A | | |
| 2.025 MHz te: 18.JUL.2011 | 08:29:17 | | | | | | | |

Table 3.3.5: High Channel 6 dB Occupied Bandwidth Test Results

| | | | | 1 1 es | ting, E | IVII, In | ic. | | | | |
|---------------------------------------|------------------------|---------------------|-------------|----------|--------------------------|-------------|---------------|-----------------|------|----|---|
| In accordance with: | | | ıbpart C | | | | | | | | |
| | Section 1 | | | | | | | | | | |
| est Date(s): | 7/18/2011 | | | | EUT Serial | | n/a | | | | |
| Customer: | Traxxas | | | | EUT Part | | n/a | · , | | | |
| roject Number: | 12769-10 | 707.1 | | | est Techn | | | Lueckem | eyer | | |
| urchase Order #: quip. Under Test: | GMD110 | 707-1 Tranceiver | | | Supervisor Vitness' N | | Jason | Russell | | | |
| quip. Onder Test. | v enicie i | Tanceivei | | ' | VILITESS IN | aine. | CIII IS | Kussen | | | |
| Radiated Emission | ıs Test Resu | lts Data Sh | neet - Hori | zontal A | Antenna Po | larity > 10 | GHz | Page: | 1 | of | 1 |
| EUT Line Voltag | e: | 6 | VDC | | EUT Li | ne Freque | ncy: | N/A | | Hz | |
| EUT | Mode of O _l | eration: | | | | Tra | ansmit Hi | gh Channel | | | |
| | | | | | 100 kHz 100 kHz | Delta | 2 [T1] -0 | .53 dB | | | |
| Ref 120 dBu | V | Att 5 | 0 dB | * SWT | 20 ms | | .000000 | 000 kHz | | | |
| 120 | | | | | | Marker | | 55 dBμV | | | |
| -110- | | | | | | 2 | 452530 | DOO GHZ | A | | |
| рк жн | | | · | ~~~ | 4 | | | | | | |
| -100 | . /≥ œµv- | 1 | | | 1 | | | | | | |
| -90 | | | | | - | | | | | | |
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| -80 | Ja markhane | ~~~~ | | | | Thu. | | | | | |
| 70 | CI MOOD IF | | | | | W.M. | ~~~ | Maryan | | | |
| | | | | | | | | ψ <u>ν</u> μι . | | | |
| -60 | | | | | | | | | | | |
| | | | | | | | | | | | |
| -50- | | | | | | | | | | | |
| -40 | | | | | | | | | | | |
| | | | | | | | | | | | |
| -30 | | | | | | | | | | | |
| -30 | | | | | | | | | | | |

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Table 3.3.6: High Channel 20 dB Occupied Bandwidth Test Results

| | e 3.3.6: Hig | пСпа | ше | | | | | | | | | | |
|------|---------------------|---------------|---------------|------------|--------------|-----------|---|-------------|---------------|-------------------|------|----|---|
| | | | | | | l Tes | ting, E | MI, Ir | ic. | | | | |
| In a | ccordance wit | | | | ıbpart C | | | | | | | | |
| | | | on 15 | .247 | | | | | | | | | |
| | Date(s): | 7/18/ | - | | | | EUT Serial | | n/a | | | | |
| | omer: ct Number: | Trax 1276 | | | | | EUT Part # Fest Techn | | n/a | Lueckeme | | | |
| | nase Order #: | | 9-10 01107 | /07_1 | | | Supervisor | | Jason | | eyer | | |
| | p. Under Test: | | | canceive | <u> </u> | | Witness' N | | | Russell | | | |
| 1-1 | | , , | | | | | .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | | | | |
| R | Radiated Emissi | ons Test | Result | ts Data Sl | heet - Hor | izontal . | Antenna Po | larity > 10 | GHz | Page: | 1 | of | 1 |
|] | EUT Line Volta | age: | | 6 | VDC | | EUT Li | ne Freque | ncy: | N/A | | Hz | |
| | EU | T Mode | of Ope | eration: | | | | Tra | ansmit Hig | gh Channel | | | |
| | | | | | | | 100 kHz | Delta | 2 [T1] | 25.00 | | | |
| | Ref 120 dE | вμ∨ | | Att 5 | 0 dB | | 100 kHz 20 ms | 1 | -0 .550000 | .36 dB 000 MHz | | | |
| | 120 | | | | | | | Marker | | 17. 17 | | | |
| | -110- | | | | | | | 2 | | 98 dBµV | A | | |
| PK | | | | | | ~~ | | | | | | | |
| n | -100 | | | | / | | 1 | | | | | | |
| | -90 | | | 1.00 | | | 1 | | | | | | |
| | D1 : | 85.72 d | BμV— | n-m | | | - August | | | | | | |
| | -80 | \sim \sim | مملسلم | ~ | | | | w | | | | | |
| | 70 | w | | | | | | ~~ | www.vv~ v | January 1 | | | |
| | | | | | | | | | | | | | |
| | -60 | | | | | | | | | | | | |
| | -50- | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | -40 | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | -30 | | | | | | | | | | | | |
| | -30 | | | | | | | | | | | | |

4.0 Power Spectral Density

Power spectral density measurements were performed on the EUT to determine compliance with FCC 15.247(e) and RSS-210.

4.2 Test Procedure

The fundamental emission of the EUT is maximized and the spectrum analyzer is tuned to the highest point as measured in max-hold with peak detection. The analyzer is then centered on the maximum peak and set with the following parameters: RBW = 3 kHz, VBW > RBW, span = 300 kHz, and sweep time = 100s. The peak level is obtained after the sweep completes. The Measurement Procedure PKPSD from KDB718828 was used to measure the PSD. A diagram showing the test setup is given as Figure 2.1.1.

4.3 Test Criteria and Methodology

According to section FCC 15.247(d) the maximum power spectral density is +8 dBm in any 3 kHz bandwidth.

The calculation for deriving power spectral density is as follows:

Calculations:

Cable Loss (dB) = 1.87External Attenuation (dB) = 0Antenna gain (dBi) = 0.5Total = 2.37

E.I.R.P. calculated by adding Cable Loss + External Attenuation + Antenna gain to Measured Power

4.4 Test Results

Power spectral density measurements were taken on July 18, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Table 2.3.1.

Table 4.3.1 Power Spectral Density – Low Channel - Test Results

| | | | essional ' | Testing | , EMI, 1 | nc. | | | | |
|-----------------------------------|------------|----------------|----------------|------------------------------------|--------------|----------------|--------------|--------------|----|---|
| In accordance with | | | ubpart C | | | | | | | |
| | | n 15.247 | | | | | | | | |
| Test Date(s): | 7/18/2 | | | | erial #: | n/a | | | | |
| Customer: | Traxx | | | EUT P | | n/a | · , | | | |
| Project Number: Purchase Order #: | 12769 | 110707-1 | | Superv | echnician: | Layne Jason | Lueckeme | eyer | | |
| Equip. Under Test: | | le Tranceive | ar | | s' Name: | | Russell | | | |
| quip. Onuci Test. | V CITIC | ic Tranceive | .1 | Withes | 5 Italic. | CIII IS | Russen | | | |
| Radiated Emission | ons Test R | Results Data S | sheet - Horizo | ntal Antenn | a Polarity > | 1GHz | Page: | 1 | of | 1 |
| EUT Line Volta | ge: | 6 | VDC | EU | T Line Freq | uency: | N/A | | Hz | |
| EU' | Γ Mode of | f Operation: | | | | Fransmit Lo | w Channel | | | |
| | | | | RBW 3 kH ₂ VBW 300 } | | er 1 [T1 |] 88 dBµV | | | |
| Ref 110 dB | μV | Att 4 | | SWT 100 s | | 2.406124 | | | | |
| 110 | | | | | | | | * | | |
| -100 | | | | | | | 1 | A | | |
| PK XH | Λ | ۸ | | | ٨ | Δ | /\ | | | |
| 90 | 1 m | Mar | | ~_/h | 7/_ | N 1 | hum | | | |
| 80 | <u> </u> | 1 00 | \w\ \ | W | W | | | | | |
| | | | | | | W | | | | |
| -70 | | | | | | | | | | |
| -60- | | | | | | | | | | |
| | | | | | | | | | | |
| -50- | | | | | | | | | | |
| | | | | | | | | | | |
| -40 | | | | | | | | | | |
| -30- | | | | | | | | | | |
| | | | | | | | | | | |
| -20- | | | | | | | | | | |
| 10 | | | | | | | | | | |

| Frequency (MHz) | E.I.R.P (dBm / 3 kHz) | Limit (dBm / 3 kHz) |
|-----------------|-----------------------|---------------------|
| 2406 | -7.7 | 8 |

| Tabl | e 4.3.2 I | Power S | spectral | Densi | ty – Mic | d Cha | annel - Te | est Resu | ılts | | | | |
|------|-----------------------|------------|--------------------|--------------|--|----------|--------------------------|-------------|----------------|-----------|-------|----|---|
| | | | | Profe | essiona | l Te | sting, E | MI, In | ıc. | | | | |
| In a | ccordance | with: F | CC 47 C | FR 15 S | ubpart C | | | • | | | | | |
| | | | ection 15 | 5.247 | | | | | | | | | |
| | Date(s): | | /18/2011 | | | | EUT Serial | | n/a | | | | |
| | omer: | | raxxas | | | | EUT Part | | n/a | * , | | | |
| | ct Numbe nase Orde | | 2769-10 GMD1107 | 707 1 | | | Test Techn Supervisor | | Layne Jason | Lueckem | ieyer | | |
| | p. Under | | ehicle Ti | | r | | Witness' N | | | Russell | | | |
| | | | | | _ | | | | 0 | | | | |
| F | Radiated E | missions T | Test Resul | ts Data S | heet - Hor | izontal | Antenna Po | larity > 10 | GHz | Page: | 1 | of | 1 |
| | EUT Line | Voltage: | | 6 | VDC | | EUT Li | ne Freque | ency: | N/A | | Hz | |
| | | EUT M | ode of Op | eration: | | | | Tr | ansmit M | id Channe | | | |
| | Ref 11 | 0 dBuV | | Att 4 | 10 dB | * VBV | 3 kHz 300 kHz | | 1 [T1 96. | 88 dBµV | | | |
| | 110 | о ши | | ACC 4 | | <u> </u> | 100 3 | | .420120 | l l | * | | |
| | -100 | | | | | | | | | 1 | A | | |
| L PK | | Λ | ۸ | | , | | | ٨ | Δ | /\ | | | |
| | -90 /__\ | M | my ! | \/ | M 1 1 | m | /h / | my 1 | 11 ~ | / ham | | | |
| | -80- | w 😘 | V | ~ | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | <u> </u> | July J | ├ | - Wash | | | | |
| | -70 | | | | | | | | | | | | |
| | -70 | | | | | | | | | | | | |
| | -60 | | | | | | | | | | | | |
| | -50 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | -40 | | | | | | | | | | | | |
| | -30 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | -20 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 62. | 025 MHz | | | | | | | | | | | | |
| Date | : 18.JU | L.2011 | 08:32 | 2:15 | | | | | | | | | |
| | | | | | | PSD | Mid | | | | | | |
| | | | | | | | | | | | | | |

| Frequency (MHz) | E.I.R.P (dBm / 3 kHz) | Limit (dBm / 3 kHz) |
|-----------------|-----------------------|---------------------|
| 2426 | -7.7 | 8 |

Table 4.3.3 Power Spectral Density - High Channel - Test Results

| Professional Testing, EMI, Inc. In accordance with: FCC 47 CFR 15 Subpart C Section 15.247 Test Date(s): 7/18/2011 EUT Serial #: n/a Customer: Traxxas EUT Part #: n/a Project Number: 12769-10 Test Technician: Layne Lueckemeyer Purchase Order #: GMD110707-1 Supervisor: Jason Haley Equip. Under Test: Vehicle Tranceiver Witness' Name: Chris Russell Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz Page: 1 of EUT Line Voltage: 6 VDC EUT Line Frequency: N/A Hz EUT Mode of Operation: Transmit High Channel **Ref 110 dBmV Att 40 dB **SWT 100 s 2.453126000 GHz | |
|--|------------|
| Section 15.247 Fest Date(s): 7/18/2011 EUT Serial #: n/a Customer: Traxxas EUT Part #: n/a Project Number: 12769-10 Test Technician: Layne Lueckemeyer Purchase Order #: GMD110707-1 Supervisor: Jason Haley Equip. Under Test: Vehicle Tranceiver Witness' Name: Chris Russell Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz Page: 1 of EUT Line Voltage: 6 VDC EUT Line Frequency: N/A Hz EUT Mode of Operation: Transmit High Channel **RBW 3 kHz Marker 1 [T1] **VBW 300 kHz 96.64 dBµV 96.64 dBµV 96.64 dBµV 2.453126000 GHz **SWT 100 s 2.453126000 GHz | |
| Eust Date(s): 7/18/2011 EUT Serial #: n/a Customer: Traxxas EUT Part #: n/a Project Number: 12769-10 Test Technician: Layne Lueckemeyer Purchase Order #: GMD110707-1 Supervisor: Jason Haley Equip. Under Test: Vehicle Tranceiver Witness' Name: Chris Russell Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz Page: 1 of EUT Line Voltage: 6 VDC EUT Line Frequency: N/A Hz EUT Mode of Operation: Transmit High Channel **RBW 3 kHz *VBW 300 | |
| EUT Part #: n/a Project Number: 12769-10 Purchase Order #: GMD110707-1 Equip. Under Test: Vehicle Tranceiver Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz EUT Line Voltage: 6 VDC EUT Line Frequency: N/A EUT Mode of Operation: **RBW 3 KHZ Marker 1 [T1] 96.64 dBµV 96.64 dBµ | |
| Project Number: 12769-10 Test Technician: Layne Lueckemeyer Purchase Order #: GMD110707-1 Supervisor: Jason Haley Equip. Under Test: Vehicle Tranceiver Witness' Name: Chris Russell Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz Page: 1 of EUT Line Voltage: 6 VDC EUT Line Frequency: N/A Hz EUT Mode of Operation: Transmit High Channel **RBW 3 kHz Marker 1 [T1] **VBW 3000 kHz 96.64 dBµV **SWT 100 s 2.453126000 GHz **SWT 100 s 2.453126000 GHz **PROM 3 kHz Marker 1 [T1] **VBW 3000 kHz 96.64 dBµV **SWT 100 s 2.453126000 GHz **SWT 100 s 2.453126000 GHz | |
| Purchase Order #: GMD110707-1 Equip. Under Test: Vehicle Tranceiver Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz Page: 1 of EUT Line Voltage: 6 VDC EUT Line Frequency: N/A Hz EUT Mode of Operation: Transmit High Channel **RBW 3 kHz Marker 1 [T1] 96.64 dBpV **VBW 3000 kHz 96.64 dBpV **SWT 100 s 2.453126000 GHz **PREM 3 kHz Marker 1 [T1] 96.64 dBpV **SWT 100 s 2.453126000 GHz **PREM 3 kHz Marker 1 [T1] 96.64 dBpV **SWT 100 s 2.453126000 GHz **PREM 3 kHz Marker 1 [T1] 96.64 dBpV **SWT 100 s 2.453126000 GHz **TRANSMIT NOT SHOW TO SHOW T | |
| Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz Page: 1 of EUT Line Voltage: 6 VDC EUT Line Frequency: N/A Hz EUT Mode of Operation: Transmit High Channel * RBW 3 kHz Marker 1 [T1] * VBW 300 kHz 96.64 dBµV Ref 110 dBµV Att 40 dB * SWT 100 s 2.453126000 GHz ** RBW 3 kHz Marker 1 [T1] ** VBW 300 kHz 96.64 dBµV ** SWT 100 s 2.453126000 GHz ** SWT 100 s 2.453126000 GHz | |
| Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz Page: 1 of EUT Line Voltage: 6 VDC EUT Line Frequency: N/A Hz EUT Mode of Operation: Transmit High Channel * RBW 3 kHz Marker 1 [T1] * VBW 300 kHz 96.64 dBμV Ref 110 dBμV Att 40 dB * SWT 100 s 2.453126000 GHz | |
| EUT Line Voltage: 6 VDC EUT Line Frequency: N/A Hz EUT Mode of Operation: Transmit High Channel * RBW 3 kHz Marker 1 [T1] * VBW 300 kHz 96.64 dBμV Ref 110 dBμV Att 40 dB * SWT 100 s 2.453126000 GHz | |
| EUT Mode of Operation: * RBW 3 kHz Marker 1 [T1] * VBW 300 kHz 96.64 dBμV Ref 110 dBμV Att 40 dB * SWT 100 s 2.453126000 GHz ** RBW 3 kHz Marker 1 [T1] * VBW 300 kHz 96.64 dBμV * SWT 100 s 2.453126000 GHz | 1 |
| *RBW 3 kHz Marker 1 [T1] *VBW 300 kHz 96.64 dBµV Ref 110 dBµV Att 40 dB *SWT 100 s 2.453126000 GHz | |
| *VBW 300 kHz 96.64 dBμV Ref 110 dBμV Att 40 dB *SWT 100 s 2.453126000 GHz | |
| Ref 110 dBµV Att 40 dB *SWT 100 s 2.453126000 GHz | |
| 100 90 80 | |
| 90 90 90 90 90 90 90 90 90 90 90 90 90 9 | |
| *** | |
| so was a solution of the solut | |
| | |
| -70 | |
| -70 | |
| | |
| -60 | |
| | |
| -50 | |
| -40 | |
| | |
| -30 | |
| -20 | |
| 10 | |
| | |
| | |
| | |
| 62.025 MHz | |
| ate: 18.JUL.2011 08:42:53 | |
| | |
| PSD High | · <u>—</u> |

| Frequency | E.I.R.P | Limit |
|-----------|---------------|---------------|
| (MHz) | (dBm / 3 kHz) | (dBm / 3 kHz) |
| 2453 | -8.0 | 8 |

5.0 Band Edge Spurious Emissions

Band edge spurious emissions measurements were performed on the EUT to determine compliance to FCC 15.247(d).

5.2 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable, which allows 360-degree rotation. For measurements of the fundamental signal, a measurement antenna was positioned at a distance of 1 meter as measured from the closest point of the EUT. Rotating the EUT maximized the emissions.

The spectrum analyzer was set for peak detection using a 300 kHz resolution bandwidth. The span is set wide enough to show the band edge and the edge of the emission of the screen. Measurement is made at the band edge using the marker delta method while transmitting on the channels nearest the band edge to determine if the EUT meets the test criteria. A diagram showing the test setup is given as Figure 2.1.1.

5.3 Test Criteria

According to FCC 15.247(d) and RSS-210 the band edge spurious emissions must be 20 dB below the highest peak in the operating band in any 100 kHz bandwidth. If the frequency falls in the restricted bands of 15.205 the maximum permitted average must be below the field strength listed in 15.209.

Alternatively, the band edge spurious emissions will meet criteria if they are attenuated below the limits specified in FCC 15.209.

5.4 Test Results

Band edge spurious emissions measurements were taken on July 15, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Tables 2.3.1.

Table 6.3.1 Rand Edge Spurious Emissions Test Results Data Sheet

| Table 6.3.1 Band Edge Spurious Emissions Test Results Data Sheet | | | | | | | | | |
|--|---------------------------------|-------------------------------------|---|-----------|----------------------|-------------------|--|--|--|
| | Professional Testing, EMI, Inc. | | | | | | | | |
| In acco | rdance with: | FCC 47 CFR 15 Subp | art C | | | | | | |
| | | Section 15.247 | | | | | | | |
| Test Date(s): | | 7/18/2011 | | EUT Seria | l#: n/a | | | | |
| Customer: Traxxas EUT Part #: n/a | | | | | | | | | |
| Project Numbe | r: | 12769-10 | 9-10 Test Technician: Layne Lueckemeyer | | | | | | |
| Purchase Order #: GMD110707-1 Supervisor: Jason Haley | | | | | n Haley | | | | |
| Equip. Under Test: Vehicle Tranceiver Witness' Name: Chris Russell | | | | | s Russell | | | | |
| Band Edge Spurious Emissions | | | | | | | | | |
| EU | T Line Voltage: | 6 | VDC | EUT Li | ne Frequency | n/a Hz | | | |
| | EUT Mode of | Operation: | | | Transm | it | | | |
| Frequency Measured (MHz) | Recorded Level (dB) | Limit (dB) down from fundamental | Margi | in (dB) | Detector Function | RBW / VBW | | | |
| 2400 | -30.59 | -20 | -10 |).59 | Peak | 300 kHz / 300 kHz | | | |
| 2483.5 | -37.58 | -20 | -17 | 7.58 | Peak | 300 kHz / 300 kHz | | | |

| Table 6.3.2 Band Edge Spurious Emissions (Restricted Bands) Test Results Data Sheet | | | | | | | | | | | |
|---|--|------------------------|-----------------------------|--------------------|--------------------------------|-------------------------|----------------|-------------------|--|--|--|
| | Professional Testing, EMI, Inc. | | | | | | | | | | |
| In accordance with: FCC 47 CFR 15 Subpart C | | | | | | | | | | | |
| Section 15.247 | | | | | | | | | | | |
| Test Date(s | s): | 7/18/2011 | | | EUT Serial #: n/a | | | | | | |
| Customer: | | Traxxas | | | EUT Part # | #: | n/a | | | | |
| Project Number: 12769-10 Test Technician: Layne Lueckemeyer | | | | | | ckemeyer | | | | | |
| Purchase Order #: GMD110707-1 | | | | | Supervisor | : | Jason Hale | y | | | |
| Equip. Under Test: Vehicle Tranceiver Witness' Name: Chris Russell | | | | | | ell | | | | | |
| EUT I | Band Edge Spurious Emissions (Investigated Restricted Bands at 2390 and 2483.5 MHz) EUT Line Voltage: 6 VDC EUT Line Frequency n/a Hz | | | | | | | | | | |
| | EUT N | Mode of Ope | ration: | | Transmit | | | | | | |
| Frequency Measured (MHz) | Recorded Level (dBuV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Detector Function | | | |
| 2390 | 45.6 | 26.4 | 28.1 | 2.8 | 50.1 | 83.5 | -33.4 | Peak Hold | | | |
| 2390 | 35.7 | 26.4 | 28.1 | 2.8 | 40.2 | 63.5 | -23.3 | Average | | | |
| 2483.5 | 44.9 | 24.4 | 29.0 | 2.8 | 52.3 | 83.5 | -31.2 | Peak Hold | | | |
| 2483.5 | 35.9 | 24.4 | 29.0 | 2.8 | 43.3 | 63.5 | -20.2 | Average | | | |

6.0 Out of Band Spurious Emissions

Out of band spurious/harmonic emissions measurements were performed on the EUT to determine compliance to FCC sections 15.247(d), 15.209.

6.2 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a rotating turntable at a distance of 10 meters from the measurement antenna.

For spurious emissions below 1 GHz, quasi-peak detection was used with a resolution bandwidth of 120 kHz. All measurements below 1 GHz were normalized to 3 meters using a 20 dB/decade distance extrapolation. The emissions were maximized by rotating the EUT and raising and lowering the measurement antenna from 1 to 4 meters.

Spurious/harmonic emissions above 1 GHz peak were measured with average and peak detection with a resolution bandwidth of 1 MHz and measured at a distance of 1 meter. Average detection was used to determine compliance of the EUT if the peak did not meet the average limit. Non-harmonic emissions must satisfy the average limit and the peak limit (20 dB above average). Above 1 GHz, testing was completed at the transmit frequency to determine compliance. A diagram showing the test setup is given as Figure 6.1.1.

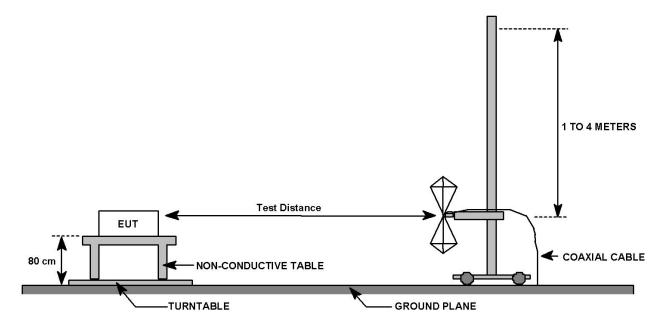


Figure 6.1.1 Radiated Emissions Test Setup

12769-10 October 19, 2011 Page 23 of 36

6.3 Test Criteria

The radiated limits of FCC 15.209 are shown below. The limits specified are at 3 meters. The limits are quasi-peak for emissions below 1 GHz and average for emissions above 1 GHz. Also above 1 GHz, the peak limit is 20 dB above the average limit.

| Frequency MHz | Specification Distance (Meters) | Field Strength (dBuV/m) | Test Distance (Meters) | Field Strength (dBuV/m) |
|------------------|---------------------------------|----------------------------|---------------------------|-------------------------|
| 30 to 88 | 3 | 40.0 | 10 | 29.5 |
| 88 to 216 | 3 | 43.5 | 10 | 33 |
| 216 to 960 | 3 | 46.0 | 10 | 35.5 |
| Above 960 | 3 | 54.0 | 1 | 63.5 |

6.4 Test Results

Out of band spurious emissions measurements were taken on July 14, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Tables 6.3.1.

| Table 6.3 | Fable 6.3.1 Out of Band Spurious Emissions Test Equipment | | | | | | | | |
|---|---|--------------------|--------------------------------------|----------------------|-------------------------|--|--|--|--|
| | | Profess | ional Testing, EMI, Inc. | | | | | | |
| Test Metho | ANSI | C63.4–2003: "Met | hods of Measurement of Radio-Noise | e Emissions from L | ow-Voltage | | | | |
| 1 est Metho | Electi | | c Equipment in the Range of 9 kHz to | | | | | | |
| | | | of Federal Regulations Part 47, Subj | part B - Unintention | nal Radiators, | | | | |
| In accordar Section: | ice with: Radia | nted Emissions Lim | nits | | | | | | |
| Test Date(s) | | | EUT Serial #: | n/a | | | | | |
| Customer: | Trax | | EUT Part #: | n/a | | | | | |
| Project Number: 12769-10 Test Technician: Layne Lueckemeyer Purchase Order #: GMD110707-1 Supervisor: Jason Haley | | | | | | | | | |
| Purchase O | Jason Haley | | | | | | | | |
| Equip. Und | er Test: Vehic | le Tranceiver | Witness' Name: | Chris Russell | | | | | |
| Radiated Emissions Test Equipment List Page: 1 of | | | | | | | | | |
| Т | ile! Software Versio | n: 3.4.K. | 11, June 7, 2006, 07:49:00 PM | | | | | | |
| | Test Profile: | Radia | ted Emissions_updated_12-16-10.til | | | | | | |
| Asset# | Manufacturer | Model | Equipment Nomenclature | Serial Number | Calibration Due Date | | | | |
| 1509A | Braden | N/A | TDK 10M Chamber, NSA < 1 GHz | DAC-012915-005 | 8/10/2011 | | | | |
| 1278 | HP | 85650A | Quasi Peak Adapter | 2811A01147 | 7/28/2011 | | | | |
| 1834 | HP | 85662A | Spec Anal Dsply | 2349A06182 | N/A | | | | |
| 1145 | HP | 8568B | Spectrum Analyzer 100Hz-1.5GHz | 2517A01821 | 7/28/2011 | | | | |
| 0238 | HP | 85685A | RF Preselector | 2887A00841 | 7/27/2011 | | | | |
| 1497 | EMCO | 3108 | Antenna, Bi Con, 30-300MHz | 2121 | 8/4/2011 | | | | |
| 0085 | HP | 85650A | Quasi-Peak Adapter CISPR | 3033A01458 | 7/28/2011 | | | | |
| 1526 | HP | 85662A | Spec Anal Dsply for AN 1525 | 2403A07220 | N/A | | | | |
| 1525 | HP | 8566B | Spectrum Analyzer 100Hz-22GHz | 2532A02126 | 6/7/2012 | | | | |
| 1035 | HP | 85685A | RF Preselector | 2901A00891 | 4/13/2012 | | | | |
| 1486 | EMCO | 3147 | Antenna, Log Periodic, .2-5GHz | 9112-1052 | 8/4/2011 | | | | |
| C026 | N/A | RG214 | Cable Coax, N-N, 25m | none | 8/10/2011 | | | | |
| C027 | N/A | RG214 | Cable Coax, N-N, 25m | none | 8/10/2011 | | | | |
| 1455 | HP | 8447D | Preamp | 2944A06787 | 5/8/2012 | | | | |
| 0586 | HP | 8447D | Preamp | 1726A011364 | 12/14/2011 | | | | |
| 1509B | Braden | N/A | TDK 10M Chamber, VSWR > 1 GHz | DAC-012915-005 | 4/7/2012 | | | | |
| 1594 | Miteq | AFS4-01001800 | Amplifier, 1-26.5GHz, 42dB | none | 1/28/2012 | | | | |
| 1529 | Miteq | AFS4-01001800 | Amplifier, 1-26.5GHz, 36dB | none | 7/16/2011 | | | | |
| C030 | N/A | 0 | Cable Coax, N-N, 30m | none | 3/21/2012 | | | | |
| 1780 | ETS-Lindgren | 3117 | Antenna, DRG Horn, 1 - 18 GHz | 1110313 | 1/14/2012 | | | | |
| 948 | EMCO | 3301B | Antenna, Rod, Active, 30Hz-50MHz | 29784 | 9/15/2011 | | | | |

Table 6.3.2: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Horizontal Polarization

| | tion | | D 4 4 | | | | | | | |
|--------------------------------------|--|-------------------------------|-------------------------------|--|--|--------------------------------|--|---------------------------------------|--------------------------|------------------------|
| | | | Professi | onal Te | sting, E | MI, Inc | • | | | |
| est Metho | od. | | .4–2003: "M | | | | | | | _ • |
| CSt Wictin | <i>,</i> | | ectrical and | | | | | | | |
| In accord | lance with: | | 15.109 - Coo | | _ | ns Part 47, | Subpa | rt B - 1 | Unintenti | onal |
| ection: | | | Radiated E | missions Li | mits | | | | | |
| est Date(s | e). | 15.109 7/14/2011 | | | EUT Serial | 1 #• | n/a | | | |
| Eustomer: | | Traxxas | | | EUT Part # | | n/a | | | |
| roject Nu | | 12769-10 | | | Test Techn | - | | Luec | kemeyer | |
| urchase (| | GMD1107 | 07-1 | | Supervisor | | | Haley | | |
| quip. Un | der Test: | Vehicle Tr | | | Witness' N | | | Russe | | |
| | | | | | | | | | | |
| Radiat | ed Emissions | Test Result | s Data Sheet | - Horizontal | Antenna Po | larity≤1GH | Iz | Pag | e: 1 | of 1 |
| EUT I | Line Voltage: | : Bat | ttery | Vrms | EUT Li | ne Frequenc | y: | n/a | l | Hz |
| | EUT N | Mode of Ope | eration: | | | Transı | mit Mic | ldle Ch | annel | |
| Frequency Measured (MHz) | Test Distance (Meters) | EUT Direction (Degrees) | Antenna Height (Meters) | Detector Function | Recorded Amplitude (dBµV) | Corrected Level (dBµV/m) | Limit (dBµ' | | Margin (dB) | Test Results |
| 31.53 | 10 | 1 | 1 | Quasi-peak | 21.8 | 9.4 | 29 | .5 | -20.1 | Pass |
| 156.31 | 10 | 1 | 1 | Quasi-peak | 21.6 | 10.7 | 33 | .1 | -22.4 | Pass |
| 199.83 | 10 | 1 | 1 | Quasi-peak | 21.4 | 12.1 | 33 | .1 | -21.0 | Pass |
| 566.4 | 10 | 1 | 1 | Quasi-peak | 26.8 | 25.0 | 35 | .6 | -10.6 | Pass |
| 841.6 | 10 | 1 | 1 | Quasi-peak | 26.1 | 30.1 | 35 | - | -5.5 | Pass |
| 993.6 | 10 | 1 | 1 | Quasi-peak | 26.5 | 31.8 | 43 | .5 | -11.7 | Pass |
| | | | • | Profession 10 Meter Radiate 0-1000MHz Class | ed Emissions | ing , | Company - Model # - V Descriptio Project # - /oltage - B | ehicle Tra n - 2.4 GH: 12769-10 | z Transceiver | |
| eo o - | PROFESSIONAL TESTING | | | | | ' | rollage - L | | | _ |
| 60.0- | PROFESSIONAL TESTING | | | | | | rokage - E | | | |
| 60.0 - 50.0 - | PROFESSIONAL TESTING | | | | | | TORAGE - L | | | |
| 50.0- | PROFESSIONAL TESTING | | | | | | John Marie - L | | | - |
| 50.0- | PROFESSIONAL TO STATE OF THE ST | | | | | | ionage - L | | | |
| 50.0- (EU/V/VI) (GE) | PROFESSIONAL 1 S T I N B | | | | | | onage - L | | and the second | |
| 50.0- (EU/V/II) (GIB) | PROFESSIONAL | | | | | | and the state of t | and the second | , ald in the same | |
| 50.0- (A.00- | PROFESSIONAL | | Markey manage | | all the state of t | all harman | and the state of t | arida malikumin | politic and a second | |
| 50.0- (L.//\radio) | PROFESSIONAL | | mennen | and the same of th | allower by a discourse of the second | | Market Market | apid miles | , dda - su-o-o-o-o | |
| Ampailt (dB.LV/m) -0.05 -0.00 | PROFESSIONAL | | Marinana | and by the state of the state o | and the state of t | | and the state of t | and a second | , dd e see e see e see e | |
| -0.01 Ambigraph -0.02 -0.01 | PROFESSIONAL | | Markey | 100 Frequen | | | and the state of t | and the second | | .0G or izontal Data |

Table 6.3.3: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Vertical Polarization

| | ion | | | | | | | | | |
|--|------------------------------|-------------------------------|--|--|--|---|--|--|--|-----------------|
| | | | Professi | ional Te | sting, E | MI, Inc | • | | | |
| est Metho | nd• | ANSI C63 | .4–2003: "M | lethods of M | Ieasuremen | t of Radio- | Noise I | Emissi | ons from L | ow- |
| est Mieth | ou. | | | Electronic | | | | | | |
| In accord | ance with: | | | de of Federa | ~ | ns Part 47, | Subpa | rt B - | Unintentio | nal |
| 4. | | | Radiated E | Emissions Li | mits | | | | | |
| ection: est Date(s | a). | 15.109 | | | EUT Serial | 1 4. | /- | | | |
| ustomer: | 8): | 7/14/2011 Traxxas | | | EUT Part # | | n/a n/a | | | |
| roject Nu | mher: | 12769-10 | | | Test Techn | | | e Luec | kemeyer | |
| urchase (| | GMD1107 | 07-1 | | Supervisor | | Jason | | | |
| quip. Un | der Test: | Vehicle Tr | | | Witness' N | | | Russe | | |
| | | | | | | | | | | |
| Radia | ted Emission | ns Test Resu | lts Data Shee | et - Vertical A | Antenna Pola | rity ≤ 1GHz | | Pag | ge: 1 | of i |
| EUT 1 | Line Voltage | : Ba | ttery | Vrms | EUT Li | ne Frequenc | y: | n/ | a | Hz |
| | EUT I | Mode of Ope | eration: | | | Transı | mit Mic | ddle Cl | nannel | |
| requency Measured (MHz) | Test Distance (Meters) | EUT Direction (Degrees) | Antenna Height (Meters) | Detector Function | Recorded Amplitude (dBµV) | Corrected Level (dBµV/m) | Limit (dBµ' | | Margin (dB) | Test Result |
| 31.53 | 10 | 1 | 1 | Quasi-peak | 21.8 | 9.4 | 29 | .5 | -20.1 | Pass |
| 156.31 | 10 | 1 | 1 | Quasi-peak | 21.6 | 10.7 | 33 | .1 | -22.4 | Pass |
| 199.83 | 10 | 1 | 1 | Quasi-peak | 21.4 | 12.1 | 33 | .1 | -21.0 | Pass |
| 566.4 | 10 | 1 | 1 | Quasi-peak | 26.8 | 25.0 | 35 | | -10.6 | Pass |
| 841.6 | 10 | 1 | 1 | Quasi-peak | 26.1 | 30.1 | 35 | | -5.5 | Pass |
| 993.6 | 10 | 1 | 1 | Quasi-peak | 26.5 | 31.8 | 43 | .5 | -11.7 | Pass |
| 60.0 - | PROFESSIONAL | | 1 | Professio 10 Meter Radiate 30-1000MHz Class | ed Emissions | ng _N | Company - Model # - Vo Description Project # - ' Voltage - B | ehicle Tra n - 2.4 GH 12769-10 | z Transceiver | |
| | | | | | | | | | | |
| 50.0 | İ | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | مراديون | |
| | | | | | | | | Litter | Andread and the state of the st | |
| | | | | | | | بلحث المقدادين | and the state of t | John Company of the Little of | |
| (u | | | - who had a factor of the same | Andrews III | Landine Market Street Street | pinta Marin managan da da da | فللمنا المتلف المتلف المتاول والم | and the state of t | John Market Market | |
| | | | - Marie Mari | A property and the | | printed Albertaneous and a state of the second | on the state of th | and the late of th | John of the state | |
| 40.0- 40.0- 40.0- 40.0- 40.0- 40.0- 40.0- | | | - Andrew Contract | Andrew State of the state of th | handra series de la constitució de la constituci | Maria Ma | and the state of t | and the same of th | John Marie M | |
| - 0.00 - 0.00 - 0.00 - 0.00 - 0.00 - 0.00 - 0.00 - 0.00 | | | - Andrewson and | 100. Frequen | | Marie | and the state of t | and the second second | 1.0 | G Sical Data |

Table 6.3.4: Out of Band Spurious Emissions Test Results, 1 GHz to 18 GHz, Horizontal Polarization

| | | | Professi | onal Te | sting, E | MI, Inc | • | | | | | | |
|--------------------------------|------------------------------|---------------------------------------|-------------------------------|---|---------------------------------|--------------------------------|---|-------------------------------|-----------------|--|--|--|--|
| Fest Metho | od: | | | | | | | sions from L to 40 GHz" | ow- | | | | |
| In accord | ance with: | FCC Part | | de of Federa | l Regulatio | | | - Unintentio | nal | | | | |
| Section: | | 15.109 | | | | | | | | | | | |
| Test Date(s | s): | 7/14/2011 | | | EUT Serial | l #: | n/a | | | | | | |
| Customer: | | Traxxas | | | EUT Part # | | n/a | | | | | | |
| roject Nu | | ı ı | | | | | | | | | | | |
| urchase (| | GMD1107 | | | Supervisor | | Jason Hale | | | | | | |
| Equip. Und | der Test: | Vehicle Tr | anceiver | | Witness' N | ame: | Chris Russ | sell | | | | | |
| Radiat | ed Emissions | s Test Result | s Data Sheet | - Horizontal | Antenna Po | larity > 1GH | Iz Pa | ige: 1 | of 1 | | | | |
| EUT I | Line Voltage | : | 6 | VDC | EUT Li | ne Frequenc | y: n | ı/a | Hz | | | | |
| | EUT I | Mode of Ope | ration: | | | Transı | nit Middle (| Channel | | | | | |
| Frequency Measured (MHz) | Test Distance (Meters) | EUT Direction (Degrees) | Antenna Height (Meters) | Detector Function | Recorded Amplitude (dBµV) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Test Results | | | | |
| 1324.475 | 3 | 72 | 1 | Average | 66.8 | 30.3 | 54.0 | -23.6 | Pass | | | | |
| 3527.195 | 3 | 49 | 1 | Average | 64 | 34.1 | 54.0 | -19.8 | Pass | | | | |
| 3749 | 3 | 27 | 1 | Average | 64.5 | 35.6 | 54.0 | -18.3 | Pass | | | | |
| 4852.675 | 3 | 49 | 1 | Average | 64.1 | 37.3 | 54.0 | -16.7 | Pass | | | | |
| 9122 | 3 | 1 | 1 | Average | 31.3 | 11.3 | 54.0 | -42.7 | Pass | | | | |
| | PROFESSIONAL | e e e e e e e e e e e e e e e e e e e | | Professio 3 Meter Radiate 1-18GHz Class B | | ng , | Company - Traxxa Model# - Vehicle T Description - 2.4 C Project# - 12769- Voltage - Battery | ransceiver GHz Transceiver | | | | | |
| 70.0- 70.0- | | | | | | | | | | | | | |
| 30.0- 30.0- 30.0- | A distantial speed | | | | | <u> </u> | ~~~ | | | | | | |
| 20.0 - 1. | | | | | | | | | | | | | |
| 1 | .0G 2.7G | 4.4G | 6.1G | 7.8G 9.5 | 5G 11.2G | 12.9G | 14.6G | 16.3G 18. | 0G | | | | |

Table 6.3.5: Out of Band Spurious Emissions Test Results, 1 GHz to 18 GHz, Vertical Polarization

| Polarizati | ion | | | | | | | | | | | |
|---|--|-------------------------|-------------------------------|--|---------------------------------|--------------------------------|--|-----------------------------|---------------------------|--|--|--|
| | |] | Professi | onal Te | sting, E | MI, Inc | • | | | | | |
| Test Metho | od: | 121 102 0001 | 0 0 0 0 1 1 1 2 | | | 01 11 | Noise Emiss ge of 9 kHz 1 | | ow- | | | |
| In accorda | ance with: | | | le of Federa missions Li | | ns Part 47, | Subpart B - | Unintentio | nal | | | |
| Section: | | 15.109 | | | | | | | | | | |
| Test Date(s | s): | 7/14/2011 | | | EUT Serial | | n/a | | | | | |
| Customer: Traxxas EUT Part #: n/a | | | | | | | | | | | | |
| Project Number: 12769-10 Test Technician: Layne Lueckemeyer | | | | | | | | | | | | |
| Purchase C | | GMD11070 | | | Supervisor Witness' N | | Jason Hale | | | | | |
| Equip. Und | ier rest: | Vehicle Tra | anceiver | | witness N | ame: | Chris Russ | en | | | | |
| Radia | ted Emissior | ıs Test Resul | ts Data Shee | t - Vertical A | Antenna Pola | arity > 1GHz | Pa | ge: 1 | of 1 | | | |
| EUT I | Line Voltage: | : (| 5 | VDC | EUT Li | ne Frequenc | y: n | 'a | Hz | | | |
| | EUT N | Mode of Ope | ration: | | | Transı | nit Middle C | hannel | | | | |
| Frequency Measured (MHz) | Test Distance (Meters) | EUT Direction (Degrees) | Antenna Height (Meters) | Detector Function | Recorded Amplitude (dBµV) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Test Results | | | |
| 1324.475 | 3 | 83 | 1 | Average | 67.4 | 30.9 | 54.0 | -23.0 | Pass | | | |
| 3527.195 | 3 | 203 | 1 | Average | 64.5 | 34.6 | 54.0 | -19.3 | Pass | | | |
| 3749 | 3 | 116 | 1 | Average | 64.1 | 35.2 | 54.0 | -18.7 | Pass | | | |
| 4852.675 | 3 | 130 | 1 | Average | 64.3 | 37.5 | 54.0 | -16.5 | Pass | | | |
| 9122 | 3 | 1 | 1 | Average | 31.3 | 11.3 | 54.0 | -42.7 | Pass | | | |
| 80.05 | PROFESSIONAL 7 E S 7 I N G | | | rofessio 3 Meter Radiate 1-18GHz Class | ed Emissions | ng , | Company - Traxxa Vlodel # - Vehicle Tr Description - 2.4 G Project # - 12769-1 Voltage - Battery | ansceiver Hz Transceiver | | | | |
| 70.0 (W.W.W.) 50.0 | | | | | | | | | | | | |
| 30.0- | | | | | indengahilah pagganggabilah | <u> </u> | ~~ | ~~~ | | | | |
| 20.0 |)G 2.7G | 4.4G | 6.1G | 7.8G 9.5 | 5G 11.2G | 12.9G | 14.6G | 16.3G 18.0 | ms | | | |
| | r: Layne Lueckem I PM, Thursday, Ju | neyer | | Frequen | ncy (Hz) | 12.93 | 14.00 | — Ver | tical Data C B 1-18GHz | | | |
| | | | 1GH | z to 18GHz, | Vertical Pol | arity | | | | | | |

Table 6.3.6: Out of Band Spurious Emissions Test Results, 18 GHz to 25 GHz, Horizontal and Vertical Polarizations

| PROJECT # | D | ATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|-----------|------|----------|-------------------------------|-------------------|---------|-------|-------|----------|
| 12769-10 | July | 14, 2011 | FCC B | 1 m | Horn | 1 MHz | 1 MHz | Average |
| COMMENT | | | ng 2406 MHz and spurious i | nvestigated up to | 25 GHz | | | |

Horizontal Polarization

| Frequency Measured (MHz) | EUT Direction (Degrees) | Antenna Height (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Detector Function |
|--------------------------------|-------------------------------|-------------------------------|-----------------------------|------------------------|-----------------------------|-----------------------|--------------------------------|----------------------------|----------------|----------------------|
| 19.248 | Noise | Floor | 39.7 | 43.2 | 36.6 | 8.8 | 41.9 | 63.5 | -21.6 | Avg |
| 21.654 | Noise | Floor | 40.3 | 41.8 | 36.9 | 9.5 | 44.9 | 63.5 | -18.6 | Avg |
| 24.060 | Noise | Floor | 42.6 | 42.2 | 37.1 | 10.4 | 47.9 | 63.5 | -15.6 | Avg |

Vertical Polarization

| Frequency Measured (MHz) | EUT Direction (Degrees) | Antenna Height (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Detector Function |
|--------------------------------|-------------------------------|-------------------------------|-----------------------------|------------------------|-----------------------------|-----------------------|--------------------------------|----------------------------|----------------|----------------------|
| 19.248 | Noise | Floor | 39.7 | 43.2 | 36.6 | 8.8 | 41.9 | 63.5 | -21.6 | Avg |
| 21.654 | Noise | Floor | 40.3 | 41.8 | 36.9 | 9.5 | 44.9 | 63.5 | -18.6 | Avg |
| 24.060 | Noise | Floor | 42.6 | 42.2 | 37.1 | 10.4 | 47.9 | 63.5 | -15.6 | Avg |

Result = Pass

Table 6.3.7: Out of Band Spurious Emissions Test Results, 18 GHz to 25 GHz, Horizontal and Vertical Polarizations

| PROJECT # | DA | TE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|-----------|--------|---------|-----------------------|----------|----------------|-------|-------|----------|
| 12769-10 | July 1 | 4, 2011 | FCC B | 1 m | Horn | 1 MHz | 1 MHz | Average |
| COMMENT | | | ting 2426 cs and spur | | d up to 25 GHz | | | |

Horizontal Polarization

| Frequency Measured (MHz) | EUT Direction (Degrees) | Antenna Height (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Detector Function |
|--------------------------------|-------------------------------|-------------------------------|-----------------------------|------------------------|-----------------------------|-----------------------|--------------------------------|----------------------------|----------------|----------------------|
| 19.408 | Noise | Floor | 39.7 | 43.5 | 36.5 | 6.7 | 39.4 | 63.5 | -24.1 | Avg |
| 21.834 | Noise | Floor | 40.3 | 40.6 | 36.9 | 10.4 | 46.9 | 63.5 | -16.6 | Avg |
| 24.26 | Noise | Floor | 42.6 | 42.2 | 37.2 | 10.3 | 47.8 | 63.5 | -15.7 | Avg |

Vertical Polarization

| Frequency Measured (MHz) | EUT Direction (Degrees) | Antenna Height (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Detector Function |
|--------------------------------|-------------------------------|-------------------------------|-----------------------------|------------------------|-----------------------------|-----------------------|--------------------------------|----------------------------|----------------|----------------------|
| 19.408 | Noise | Floor | 39.7 | 43.5 | 36.5 | 6.7 | 39.4 | 63.5 | -24.1 | Avg |
| 21.834 | Noise | Floor | 40.3 | 40.6 | 36.9 | 10.4 | 46.9 | 63.5 | -16.6 | Avg |
| 24.26 | Noise | Floor | 42.6 | 42.2 | 37.2 | 10.3 | 47.8 | 63.5 | -15.7 | Avg |

Result = Pass

Table 6.3.8: Out of Band Spurious Emissions Test Results, 18 GHz to 25 GHz, Horizontal and Vertical Polarizations

| PROJECT # | DA | TE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|-----------|--------|---------|-----------------------|----------|----------------|-------|-------|----------|
| 12769-10 | July 1 | 4, 2011 | FCC B | 1 m | Horn | 1 MHz | 1 MHz | Average |
| COMMENT | | | ting 2453 cs and spur | | d up to 25 GHz | | | |

Horizontal Polarization

| Frequency Measured (MHz) | EUT Direction (Degrees) | Antenna Height (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Detector Function |
|--------------------------------|-------------------------------|-------------------------------|-----------------------------|------------------------|-----------------------------|-----------------------|--------------------------------|----------------------------|----------------|----------------------|
| 19.624 | Noise | Floor | 39.7 | 43.7 | 36.5 | 8.2 | 40.8 | 63.5 | -22.7 | Avg |
| 22.077 | Noise | Floor | 40.3 | 40.5 | 37.1 | 9.4 | 46.3 | 63.5 | -17.2 | Avg |
| 24.530 | Noise | Floor | 42.6 | 42.1 | 37.2 | 10.1 | 47.8 | 63.5 | -15.7 | Avg |

Vertical Polarization

| Frequency Measured (MHz) | EUT Direction (Degrees) | Antenna Height (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV/m) | Limit Level (dBµV/m) | Margin (dB) | Detector Function |
|--------------------------------|-------------------------------|-------------------------------|-----------------------------|------------------------|-----------------------------|-----------------------|--------------------------------|----------------------------|----------------|----------------------|
| 19.624 | Noise | Floor | 39.7 | 43.7 | 36.5 | 8.2 | 40.8 | 63.5 | -22.7 | Avg |
| 22.077 | Noise | Floor | 40.3 | 40.5 | 37.1 | 9.4 | 46.3 | 63.5 | -17.2 | Avg |
| 24.530 | Noise | Floor | 42.6 | 42.1 | 37.2 | 10.1 | 47.8 | 63.5 | -15.7 | Avg |

Result = Pass

Table 6.3.9: Antenna Port Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz

| Professional Testing, EMI, In In accordance with: FCC 47 CFR 15 Subpart C Section 15.247 Test Date(s): 7/18/2011 EUT Serial #: Customer: Traxxas EUT Part #: Project Number: 12769-10 Test Technician: Purchase Order #: GMD110707-1 Supervisor: Equip. Under Test: Vehicle Tranceiver Witness' Name: | n/a n/a Layne | | | | | | |
|--|---------------------|------------|-----|----|---|--|--|
| Section 15.247 Test Date(s): 7/18/2011 EUT Serial #: Customer: Traxxas EUT Part #: Project Number: 12769-10 Test Technician: Purchase Order #: GMD110707-1 Supervisor: | n/a Layne | | | | | | |
| Test Date(s): 7/18/2011 EUT Serial #: Customer: Traxxas EUT Part #: Project Number: 12769-10 Test Technician: Purchase Order #: GMD110707-1 Supervisor: | n/a Layne | | | | | | |
| Customer:TraxxasEUT Part #:Project Number:12769-10Test Technician:Purchase Order #:GMD110707-1Supervisor: | n/a Layne | | | | | | |
| Project Number: 12769-10 Test Technician: Purchase Order #: GMD110707-1 Supervisor: | Layne | | | | | | |
| Purchase Order #: GMD110707-1 Supervisor: | | | | | | | |
| | | | | | | | |
| Equip. Onder rest. Venice tranceiver writings (value) | | | | | | | |
| | CIII IS | Kussen | | | | | |
| Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity $\leq 10^{-1}$ | GHz | Page: | 1 | of | 1 | | |
| EUT Line Voltage: 6 VDC EUT Line Freque | ency: | n/a | | Hz | | | |
| EUT Mode of Operation: | nsmit Mid | ddle Chanı | ıel | | | | |
| * RBW 100 kHz * VBW 100 kHz * VBW 100 kHz Ref 10 dBm Att 40 dB * SWT 5 s | | | A | | | | |
| 20 30 40 | | | | | | | |
| 50 60 | Johnson | hounderson | | | | | |
| 70 | | | | | | | |
| -90 | | | | | | | |

12769-10 October 19, 2011 Page 33 of 36

Table 6.3.10: Antenna Port Out of Band Spurious Emissions Test Results, 1 to 25 GHz

| | | | | 1 1 016 | 551U11A | 1 1 6 | sung, l | EMI, Iı | iiC. | | | | |
|---|------------------|--|----------|-----------|-------------|-------------------|-----------|--------------|---------------------------|---------------------------|-----|----|--|
| n acco | rdance v | vith: FC | | | bpart C | | | | | | | | |
| . 5 | () | | tion 15. | 247 | | | THE C | | , | | | | |
| est Date(s): 7/18/2011 ustomer: Traxxas roject Number: 12769-10 | | | | | | Supervisor: Jasor | | | | | | | |
| | | | | | | | | | ne Lueckemeyer n Haley | | | | |
| urchase Order #: GMD110707-1 | | | | | | | | | | | | | |
| uip. U | J nder Te | est: Vel | nicle Tr | anceiver | • | | Witness' | Name: | Chris | Russell | | | |
| Radi | iated Emi | issions Tes | t Result | s Data Sh | neet - Hori | zontal | Antenna l | Polarity ≤ 1 | GHz | Page: | 1 | of | |
| EU' | T Line V | oltage: | | 6 | VDC | | EUT 1 | Line Frequ | ency: | n/a | | Hz | |
| | | EUT Mode | of Ope | ration: | | · | | Tra | nsmit Mi | ddle Chann | iel | | |
| Re | | dBm | | Att 4 | 0 dB | * VBW | 100 kH: | z | |] 2.58 dBm 0000 GHz | ı | | |
| | , | | | | | | | | | | A | | |
| -0- | Ť | | | | | | | | | | | | |
| K W 1 | 10 | | | | | | | | | | | | |
| L | 20 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| - 3 | 30 D | 1 -30 dB | m | | | | | | | | | | |
| | 40 | | | | | Par | maner | mym | Who have | my m | | | |
| | 1.4 | | ander | L July | where | ل ا | | | | | | | |
| 5 | 50 | - The state of the | W/00-0 | W | | | | | | | | | |
| | 50 | | | | | | | | | | | | |
| | | I . | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | 70 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |

7.0 Antenna Requirements

An antenna evaluation was performed on the EUT to determine compliance with FCC section 15 203

7.2 Evaluation Procedure

The design of the EUT antenna was evaluated for conformance to engineering requirements for gain and to prevent substitution of unapproved antennae. Gain of the antenna was assessed by reviewing the antenna manufacturer's data sheet.

7.3 Evaluation Criteria

The antenna design must meet at least one of the following criteria:

- a) Antenna is permanently attached to the unit.
- b) Antenna must use a unique type of connector to attach to the EUT.
- c) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

7.4 Evaluation Results

The Traxxas Vehicle Transceiver met the criteria of this rule by virtue of having an internal antenna inaccessible to the user. Therefore, the EUT is compliant.

| End | of | Re | n | or | t |
|-----|----|----|---|----|---|
| | | | | | |

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