

Test report

236227-1TRFWL

Date of issue: October 27, 2014

Applicant:

Griffin Technology Inc

Product:

MOD-36237 Moto TC Racer

Model:

MOD-36237

FCC ID:

PAV36237

IC Registration number:

6384A-36237

Specifications:

◆ **FCC 47 CFR Part 15 Subpart E, §15.249**


Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz

◆ **RSS-210, Issue 8 Annex 2**

Frequency Hopping and Digital Modulation Systems Operating in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz Bands

Test location

Company name:	Nemko Canada Inc.
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Country:	Canada
Telephone:	+1 613 737 9680
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Website:	www.nemko.com
Site number:	FCC: 176392; IC: 2040A-4 (3 m semi anechoic chamber)

Tested by:	Kevin Rose, Wireless/EMC Specialist
Signature:	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Table of contents

Table of contents	3
Section 1. Report summary	4
1.1 Applicant	4
1.2 Test specifications	4
1.3 Test methods.....	4
Section 2. Equipment under test (EUT) details	5
2.1 EUT information	5
2.2 Technical information	5
Section 3. Test equipment	6
3.1 Test equipment list.....	6
Section 4. Testing data	7
4.1 Clause 15.249(a) RSS 210 A2.9(a) Field strength of emissions	7
Section 5. Block diagrams of test set-ups	10
5.1 Radiated emissions set-up.....	10
Section 6. EUT photos.....	11
6.1 External photos	11
6.2 Internal photos.....	12

Section 1. Report summary

1.1 Applicant

Company name:	Griffen Technology Inc.
Address:	2030 Lindell Ave
City:	Nashville
Province/State:	TN
Postal/Zip code:	37203
Country:	USA

1.2 Test specifications

FCC 47 CFR Part 15, Subpart C, Clause 15.249	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz
RSS-210, Issue 8 Annex 2	Frequency Hopping and Digital Modulation Systems Operating in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz Bands

1.3 Test methods

Guidance for compliance measurements	DA 00-705 Released March 30, 2000
ANSI C64.3 v 2003	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Section 2. Equipment under test (EUT) details

2.1 EUT information

Product name	Moto TC Racer
Model	MOD-36237

2.2 Technical information

Operating band	2400 to 2483.5 MHz
Operating frequency	2402 to 2475 MHz
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

Section 3. Test equipment

3.1 Test equipment list

Table 3.1-1: Equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Mar. 18/15
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	Oct. 24/14
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	Mar. 12/15
Horn antenna (1–18 GHz)	EMCO	3115	FA000825	1 year	Mar. 10/15
Pre-amplifier (1–18 GHz)	JCA	JCA118-503	FA002091	1 year	June 23/15

Note: NCR - no calibration required, VOU - verify on use

Section 4. Testing data

4.1 Clause 15.249(a) RSS 210 A2.9(a) Field strength of emissions

4.1.1 Definitions and limits

In addition to the provisions of §15.205 RSS Gen the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Table 3.1-1: Field strength – Radiated emission limits

Fundamental frequency, MHz	Field strength of fundamental Average, dBµV/m	Field strength of Harmonics Average, dBµV/m	Distance, meters
2475	94	54	3

Notes: In the emission table above, the tighter limit applies at the band edges.

4.1.2 Test summary

Test date:	September 30, 2014	Temperature:	22 °C
Test engineer:	Kevin Rose	Air pressure:	1003 mbar
Verdict:	Pass	Relative humidity:	44 %

4.1.3 Observations, settings and special notes

The spectrum was searched from 30 MHz 18 GHz

EUT was set to transmit with 100 % duty cycle.

All measurement were performed radiated at 3m distance

Duty cycle correction was used for the average measurement as the transmitter was not transmitting greater than 98%

Spectrum analyser settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	Peak
Trace mode:	Max Hold

4.1.4 Test data

Table 3.1-2: Fundamental field strength measurement results for Peak

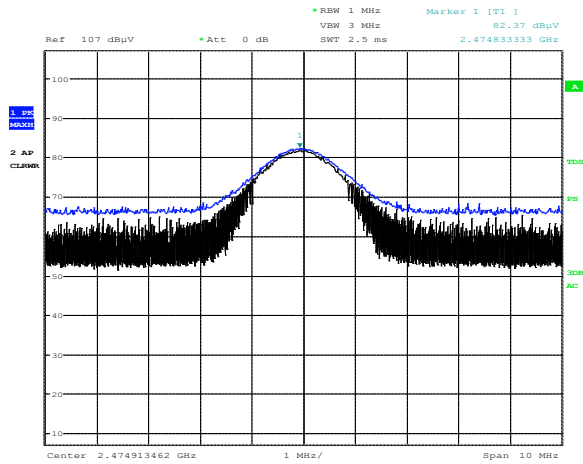
Frequency, MHz	Peak Field strength, dB μ V/m	Limit, Avg	Margin, dB
2475	82.37	94	11.63

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

Table 3.1-3: Radiated field strength measurement results for Average

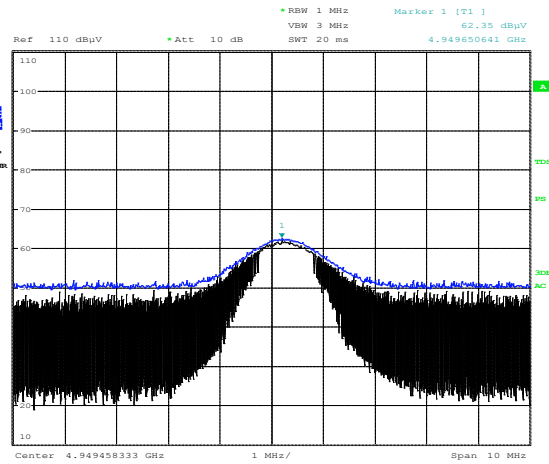
Frequency, MHz	Average field strength, dB μ V/m				Margin, dB
	Measured peak	Duty cycle correction, dB	Corrected average	Limit	
2483.5	55.60	30.98	24.62	54	29.38
4950	62.35	30.98	31.37	54	22.63
7425	56.99	30.98	26.01	54	27.99

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable. All other Harmonics were noise floor.



Date: 23.SEP.2014 20:23:10

Plot 3.1-1: Fundamental field strength example



Date: 23.SEP.2014 20:10:22

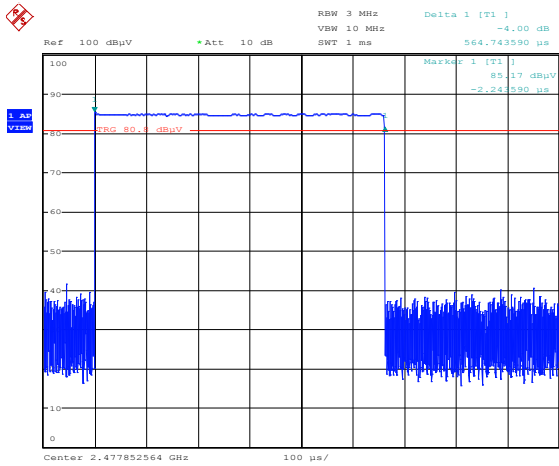
Plot 3.1-2: Harmonics field strength example

4.1.4 Test data continued

Duty cycle/average factor calculations

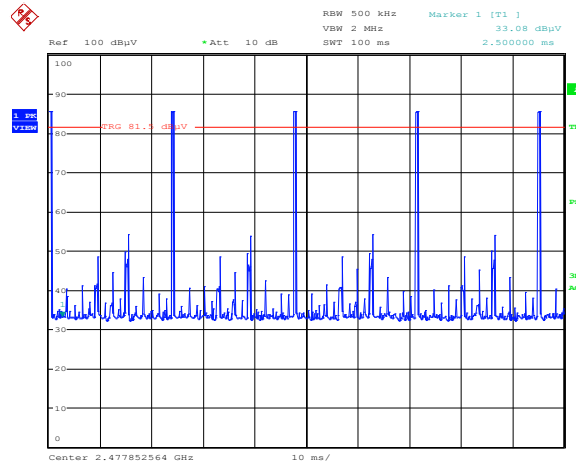
§15.35(c) When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed; the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds.

$$Duty\ cycle / average\ factor = 20 \times \log_{10} \left(\frac{T_{x100ms}}{100ms} \right) = 20 \times \log_{10} (2.8235ms/100ms) = 30.98\text{ dB correction}$$



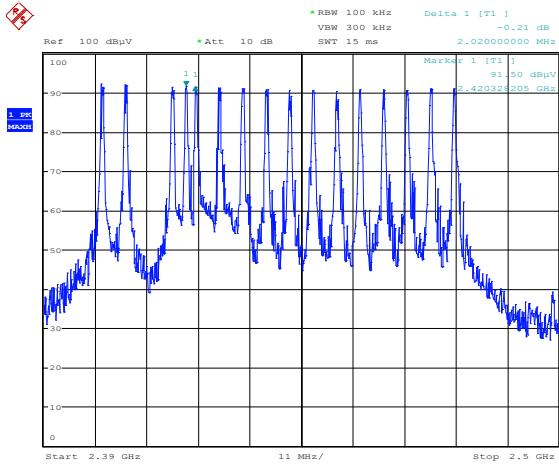
Date: 30.SEP.2014 14:58:00

Plot 3.1-3: Pulse width, 564.7 μs



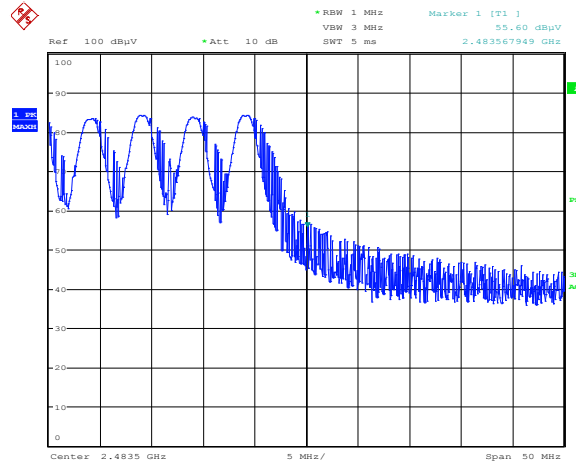
Date: 30.SEP.2014 14:56:17

Plot 3.1-4: Number of pulses in 100ms, 5



Date: 30.SEP.2014 15:12:01

Plot 3.1-5: Number of channels, 16

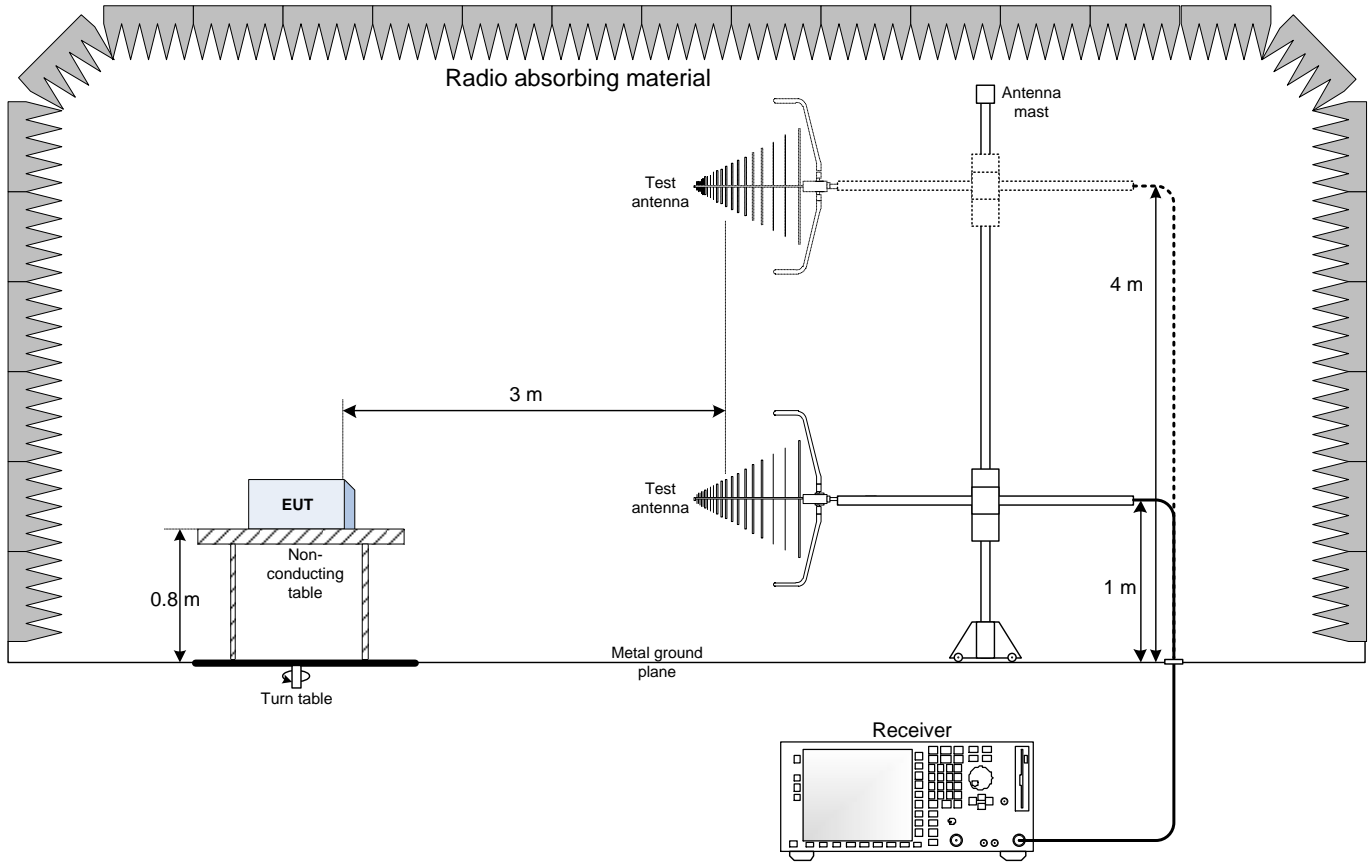


Date: 30.SEP.2014 15:08:57

Plot 3.1-6: upper band edge

Section 5. Block diagrams of test set-ups

5.1 Radiated emissions set-up



Section 6. EUT photos

6.1 External photos



Figure 6.1-1: back view photo



Figure 6.1-2: Front view photo

6.2 Internal photos



Figure 6.2-1: internal photo

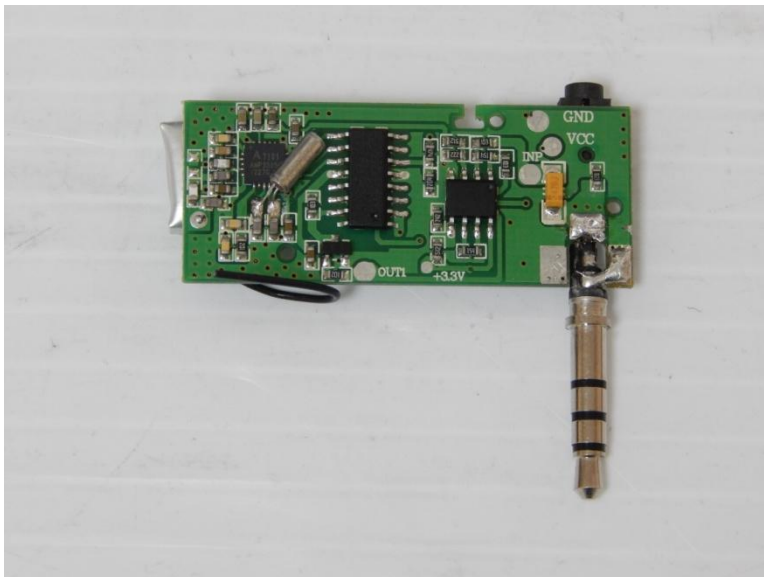


Figure 6.2-2: internal photo