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Test report

271097-1TRFWL

Date of issue: October 30, 2014

Applicant:

Tait Limited

Product:

Portable Transceiver (with Bluetooth Module)

Model:

TPDK5B

FCC ID: CASTPDK5B

IC Registration number: 737A-TPDK5B

Specifications:

- FCC 47 CFR Part 15 Subpart E, §15.247 - **Partial**

  Operation in the 902–928 MHz, 2400–2483.5 MHz, 5725–5850 MHz

- RSS-210, Issue 8, December 2010, Annex 8 - **Partial**

  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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City	Ottawa
Province	Ontario
Postal code	K1V 1H2
Country	Canada
Telephone	+1 613 737 9680
Facsimile	+1 613 737 9691
Toll free	+1 800 563 6336
Website	www.nemko.com
Site number	FCC: 176392; IC: 2040A-4 (3 m semi anechoic chamber)

Tested by	Kevin Rose, Wireless/EMC Specialist
Reviewed by	Andrey Adelberg, Senior Wireless/EMC Specialist
Date	October 30, 2014
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.

Copyright notification

Table of Contents

Section 1 Report summary

1.1 Applicant and manufacturer

Company name	Tait Limited
Address	558 Wairakei Rd, PO Box 1645, Burnside, Christchurch 8053
Country	New Zealand

1.2 Test specifications

FCC 47 CFR Part 15, Subpart C, Clause 15.247	Operation in the 902–928 MHz, 2400–2483.5 MHz, 5725–5850 MHz
RSS-210, Issue 8 Annex 8	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

DA 00-705 March 30, 2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.5 Exclusions

Only output power and spurious emissions were assessed in accordance with the quote number 12058950.

1.6 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

Section 2 Summary of test results

2.1 FCC Part 15 Subpart C – general requirements, test results

Part	Test description	Verdict
§15.207(a)	Conducted limits	Not tested
§15.31(e)	Variation of power source	Not tested[1]
§15.203	Antenna requirement	Not tested

Notes:

[1] Measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, was performed with the supply voltage varied between 85 % and 115 % of the nominal rated supply voltage. No noticeable output power variation was observed

[1] For battery-operated mode, the equipment tests shall be performed using a new/fully charged battery.

Only partial testing is completed per customer request. All other tests are based on the test report number 215392-1TRFWL

2.2 FCC Part 15 Subpart C – Intentional Radiators, test results

Part	Test description	Verdict
§15.247(a)(1)	Frequency hopping systems	
§15.247(a)(1)(i)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
§15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Pass
§15.247(a)(2)	Minimum 6 dB bandwidth for systems using digital modulation techniques	Not applicable
§15.247(b)	Maximum conducted peak output power and EIRP	
§15.247(b)(1)	Maximum peak output power of frequency hopping systems operating in the 2400–2483.5 MHz band and 5725–5850 MHz band	Pass
§15.247(b)(2)	Maximum peak output power of frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands	Not applicable
§15.247(b)(4)	Conducted peak output power limitations	
§15.247(b)(4)(i)	Maximum peak output power for systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations.	Not tested
§15.247(b)(4)(ii)	Maximum peak output power for systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations.	Not applicable
§15.247(c)(1)	Fixed point-to-point operation with directional antenna gains greater than 6 dBi	Not applicable
§15.247(c)(2)	Transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams	Not applicable
§15.247(d)	Spurious emissions	Pass
§15.247(e)	Power spectral density for digitally modulated devices	Not applicable
§15.247(f)	Time of occupancy and power spectral density for hybrid systems	Not applicable

Notes: [1] Only partial testing is completed per customer request. All other tests are based on the test report number 215392-1TRFWL

2.3 IC RSS-GEN, Issue 3, test results

Part	Test description	Verdict
4.6.1	Occupied bandwidth	Not tested
6.1	Receiver spurious emissions limits (radiated)	Not applicable
6.2	Receiver spurious emissions limits (antenna conducted)	Not applicable
7.2.4	AC power lines conducted emission limits	Not tested

Notes: [1] According to Notice 2012-DRS0126 (from January 2012) section 2.2 of RSS-Gen, Issue 3 has been revised. The EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

Only partial testing is completed per customer request. All other tests are based on the test report number 215392-1TRFWL

2.4 IC RSS-210, Issue 8, test results

Part	Test description	Verdict
A8.1	Frequency hopping systems	
A8.1 (a)	Bandwidth of a frequency hopping channel	Not tested
A8.1 (b)	Minimum channel spacing for frequency hopping systems	Not tested
A8.1 (c)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
A8.1 (d)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Pass
A8.1 (e)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
A8.2	Digital modulation systems	
A8.2 (a)	Minimum 6 dB bandwidth	Not applicable
A8.2 (b)	Maximum power spectral density	Not applicable
A8.3	Hybrid systems	
A8.3 (1)	Digital modulation turned off	Not applicable
A8.3 (2)	Frequency hopping turned off	Not applicable
A8.4	Transmitter output power and e.i.r.p. requirements	
A8.4 (1)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
A8.4 (2)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Pass
A8.4 (3)	Frequency hopping systems operating in the 5725–5850 MHz	Not applicable
A8.4 (4)	Systems employing digital modulation techniques	Not applicable
A8.4 (5)	Point-to-point systems in 2400–2483.5 MHz and 5725–5850 MHz band	Not tested
A8.4 (6)	Transmitters which operate in the 2400–2483.5 MHz band with multiple directional beams	Not applicable
A8.5	Out-of-band emissions	Pass

Notes: Only partial testing is completed per customer request. All other tests are based on the test report number 215392-1TRFWL

Section 3 Equipment under test (EUT) details

3.1 Sample information

Receipt date	October 16, 2014
Nemko sample ID number	1 and 2

3.2 EUT information

Product name	Bluetooth Module (within Portable Transceiver)
Model	TPDK5B
Serial number	256218587 and 25618591

3.3 Technical information

Operating band	2.400–2.4835 GHz
Operating frequency	2.402–2.480 GHz
Modulation type	GFSK
Occupied bandwidth (99 %)	1.04 MHz (please refer to test report 215392-1TRFWL)
Emission designator	1M04F1E
Power requirements	(All tests were performed with fully charged battery.) the charger uses 115 V_{AC} 60 Hz.
Antenna information	Surface Mount Ceramic Isolated Magnetic Dipole, Gain: 1.39 dBi The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

3.4 Product description and theory of operation

Internal Bluetooth is provided in the TP9300 (DMR) and TP9400 (P25) hand-portable terminals.
The internal Bluetooth capability of the portable shall be limited to using the Bluetooth Headset and Handsfree profiles for connection to a single monophonic Bluetooth audio headset. In this way, Bluetooth technology is being used to provision for a wireless audio connection between the TPD radio and Bluetooth headset. No data will be passed across the Bluetooth link between the TPD radio and Bluetooth headset. The Bluetooth audio link, once enabled, will maintain a continuous Bluetooth audio link between the TPD radio and headset, and audio transmitted will be controlled either by the TPD radio or a wired-PTT tethered to the TPD radio. Operation of a wireless PTT hosted on the Bluetooth headset or elsewhere shall not be compatible with the TPD radio at first release.

3.5 EUT exercise details

EUT was controlled from the laptop via USB to proprietary connector on the side of the hand-held device. Test software was used to select various modes of operation. Conducted measurements were performed on the specially prepared sample with the external SMA antenna connector instead of Bluetooth dedicated internal antenna.

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

The following modifications were performed by client: external SMA connector was introduced on a specially prepared sample for conducted measurements

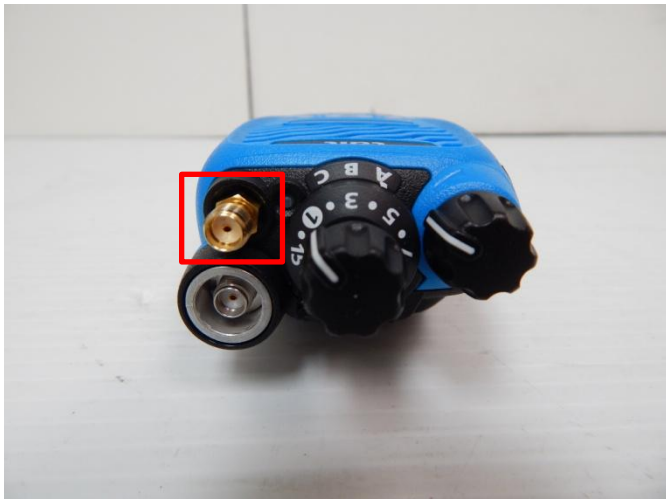


Figure 4.1-1: Modification details

4.2 Technical judgment

The portable transceiver TPDK5B has the same Bluetooth module as TPDB1A transceiver has which is covered in the report number 215392-1TRFWL. As per customer request and quote number Q10267658R1 only output power and spurious emissions were tested. For the rest measurements please refer to test report number 215392-1TRFWL.

Declaration of Equivalence of the Battery Types for TPDK5B intrinsically Safe Radio
Tait Limited declares that for Radio Performance and EMC purposes, the T03-22001-ADAA IECEx battery for Australasia, and T03-22001-AAAA AEx battery for the USA and Canada are electrically identical
The different model designations are solely to satisfy labelling requirement for a number of geographic regions. The same design is used in all cases.

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko Canada Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 “Uncertainty in EMC measurements.” Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Section 7 Test equipment

7.1 Test equipment list

Table 7.1-1: 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
Spectrum analyzer	Rohde & Schwarz	FSP	FA001920	1 year	July 08/15
Horn antenna (1–18 GHz)	EMCO	3115	FA000825	1 year	Mar. 10/15
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	Mar. 12/15
50 Ω coax cable	C.C.A.	None	FA002555	1 year	June 23/15
50 Ω coax cable	Huber + Suhner	None	FA002074	1 year	June 23/15
Pre-amplifier (1–18 GHz)	JCA	JCA118-503	FA002091	1 year	June 23/15
Pre-amplifier (18–26 GHz)	Narda	BBS-1826N612	FA001550	—	VOU
Horn antenna 18–26.5 GHz	Electro-metrics	SH-50/60-1	FA000479	—	VOU

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

Section 8 Testing data

8.1 Transmitter output power and EIRP requirements for frequency hopping systems

8.1.1 Definitions and limits

FCC Clause 15.247(b) and RSS-210 Clause A8.4 (2) Transmitter output power and e.i.r.p. requirements for frequency hopping systems

FCC:

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(1) For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 W (30 dBm). For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 W (21 dBm).

(2) For frequency hopping systems operating in the 902–928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 W (24 dBm) for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Fixed, point-to-point operation, as used in paragraph (b)(4)(i) of this section, excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

IC:

With the digital modulation operation of the hybrid system turned off, the frequency hopping operation shall have an average time of occupancy on any frequency not exceeding 0.4 seconds within a duration in seconds equal to the number of hopping frequencies multiplied by 0.4.

A8.4 (2) Transmitter Output Power and e.i.r.p. Requirements for Frequency hopping systems operating in the 2400–2483.5 MHz band

For frequency hopping systems operating in the band 2400–2483.5 MHz employing at least 75 hopping channels, the maximum peak conducted output power shall not exceed 1 W; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 W (21 dBm). Except as provided in Section A8.4(5), the e.i.r.p. shall not exceed 4 W (36 dBm).

A8.4 (5) Point-to-point systems in the bands 2400–2483.5 MHz and 5725–5850 MHz.

Point-to-point systems in the bands 2400–2483.5 MHz and 5725–5850 MHz are permitted to have an e.i.r.p. higher than 4 W (36 dBm) provided that the higher e.i.r.p. is achieved by employing higher gain directional antennas and not higher transmitter output powers. Point-to-multipoint systems, omnidirectional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W (36 dBm) e.i.r.p. However, remote stations of point-to-multipoint systems shall be allowed to operate at greater than 4 W (36 dBm) e.i.r.p. under the same conditions as for point-to-point systems.

8.1.2 Test summary

Test date	October 16, 2014	Temperature	26 °C
Test engineer	Kevin Rose	Air pressure	990 mbar
Verdict	Pass	Relative humidity	47 %

8.1.3 Observations, special notes and procedures

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
RBW > the 20 dB bandwidth of the emission being measured
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (see the NOTE above regarding external attenuation and cable loss). The limit is specified in one of the subparagraphs of this Section. Submit this plot. A peak responding power meter may be used instead of a spectrum analyzer.

Describe how the EUT complies with the de facto EIRP limit for every antenna proposed for use with the EUT. This includes those devices that will be used in point-to-point applications. If the peak output power, as measured above, must be reduced so that the de facto EIRP limit may be met for a particular antenna, describe exactly how much it will be reduced for that antenna. If the peak output power level is raised above the limit in order to compensate for cable loss between the EUT and the antenna, specify the minimum length of cable which will always be used, the type of cable, and its loss, in dB per unit length, for the frequency of the emission. The limit is specified in one of the subparagraphs of this Section. Also, specify who will be responsible for ensuring that compliant operation is maintained for every antenna that will be used with the EUT.

Point-to-Point Operation

If the EIRP relaxation for point-to-point operation is proposed for any particular antenna, describe who will be responsible for ensuring that the EUT is only used in such an application.

8.1.4 Test data,

Table 8.1-1: Conducted output power results

Frequency (MHz)	Conducted output power (dBm)	Limit (dBm)	Margin (dB)
2402	-6.97	30	36.97
2444	-5.26	30	35.26
2480	-5.08	30	35.08

Table 8.1-2: EIRP calculation results

Frequency (MHz)	Conducted output power (dBm)	Antenna gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2402	-6.97	1.39	-5.58	36	41.58
2444	-5.26	1.39	-3.87	36	39.87
2480	-5.08	1.39	-3.69	36	39.69

EIRP = Conducted output power [dBm] + antenna gain [dBi]

Maximum conducted output power = −5.08 dBm = 0.310 mW Limit = 30 dBm
Maximum EIRP = −1.88 dBm = 0.427 mW Limit = 36 dBm

8.1.4 Test data, continued

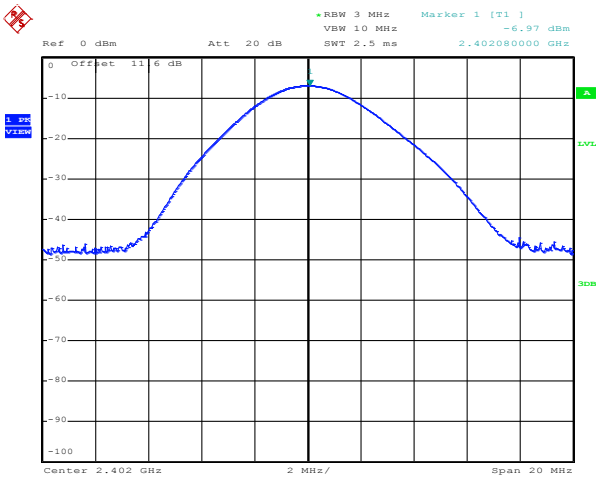


Figure 8.1-1: Peak output power on low channel

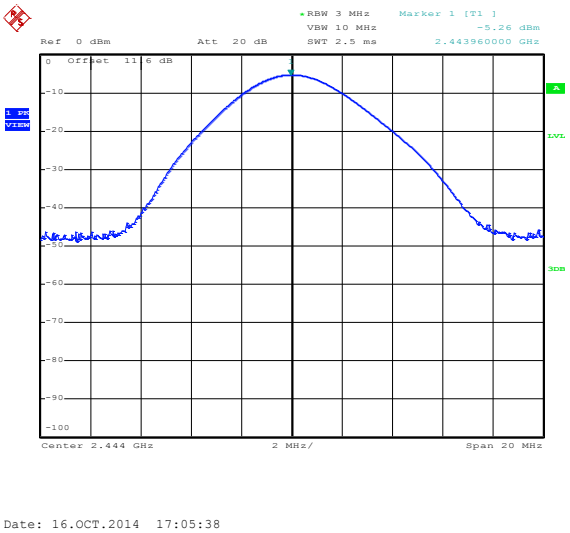


Figure 8.1-2: Peak output power on mid channel

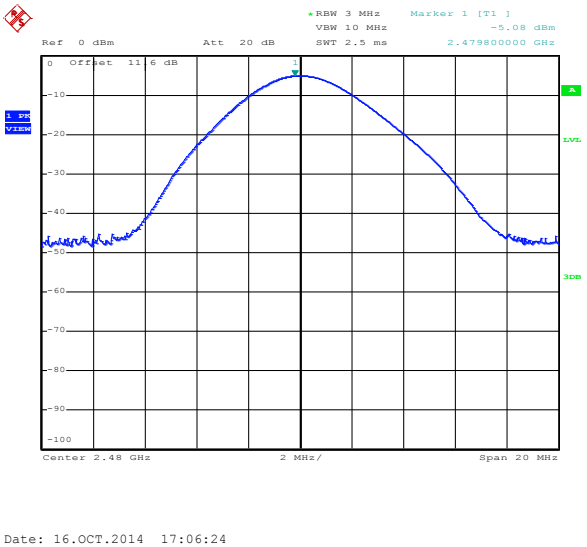


Figure 8.1-3: Peak output power on high channel

8.2 Spurious (out-of-band) emissions

8.2.1 Definitions and limits

FCC Clause 15.247(d): Spurious emissions
RSS-210 Clause A8.5 Out-of-band emissions

FCC:
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

IC:
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Table 8.2-1 is not required.

Table 8.2-1: FCC §15.209 and RSS-Gen – Radiated emission limits

Frequency (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009–0.490*	2400/F	67.6−20×log$_{10}$(F)	300
0.490–1.705*	24000/F	87.6−20×log$_{10}$(F)	30
1.705–30.0*	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Note:*– applicable only to FCC requirements

Table 8.2-2: FCC Restricted bands of operation

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
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	Above 38.6
13.36–13.41			

8.2.1 Definitions and limits, continued

Table 8.2-3: IC Restricted bands of operation

MHz	MHz	MHz	GHz
0.090–0.110	12.51975–12.52025	399.9–410	5.35–5.46
2.1735–2.1905	12.57675–12.57725	608–614	7.25–7.75
3.020–3.026	13.36–13.41	960–1427	8.025–8.5
4.125–4.128	16.42–16.423	1435–1626.5	9.0–9.2
4.17725–4.17775	16.69475–16.69525	1645.5–1646.5	9.3–9.5
4.20725–4.20775	16.80425–16.80475	1660–1710	10.6–12.7
5.677-5.683	25.5–25.67	1718.8–1722.2	13.25–13.4
6.215–6.218	37.5–38.25	2200–2300	14.47–14.5
6.26775–6.26825	73–74.6	2310–2390	15.35–16.2
6.31175–6.31225	74.8–75.2	2655–2900	17.7–21.4
8.291–8.294	108–138	3260–3267	22.01–23.12
8.362–8.366	156.52475–156.52525	3332–3339	23.6–24.0
8.37625–8.38675	156.7–156.9	3345.8–3358	31.2–31.8
8.41425–8.41475	240–285	3500–4400	36.43–36.5
12.29–12.293	322–335.4	4500–5150	Above 38.6

Note: Certain frequency bands listed in Table 8.2-3 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard

8.2.2 Test summary

Test date	October 16, 2014	Temperature	26 °C
Test engineer	Kevin Rose	Air pressure	990 mbar
Verdict	Pass	Relative humidity	47 %

8.2.3 Observations, special notes and procedures

Measurement Procedure – Reference Level

a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Set the span to 5–30 % greater than the EBW.
d. Detector = peak.
e. Sweep time = auto couple.
f. Trace mode = max hold.
g. Allow trace to fully stabilize.
h. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

Next, determine the power in 100 kHz band segments outside of the authorized frequency band using the following measurement:

Measurement Procedure - Unwanted Emissions

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified above.

8.2.4 Test data

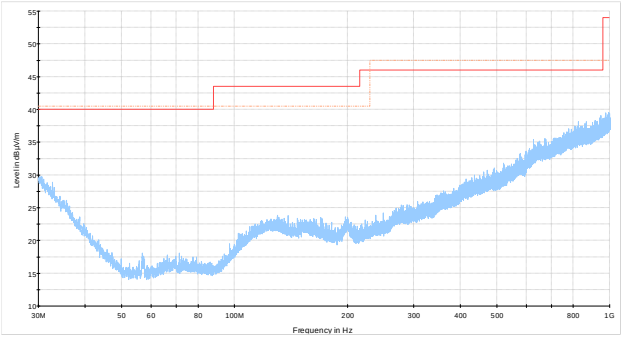


Figure 8.2-1: Radiated spurious emissions on low channel

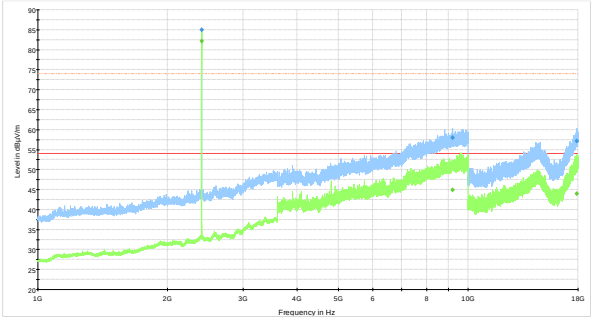


Figure 8.2-2: Radiated spurious emissions on low channel

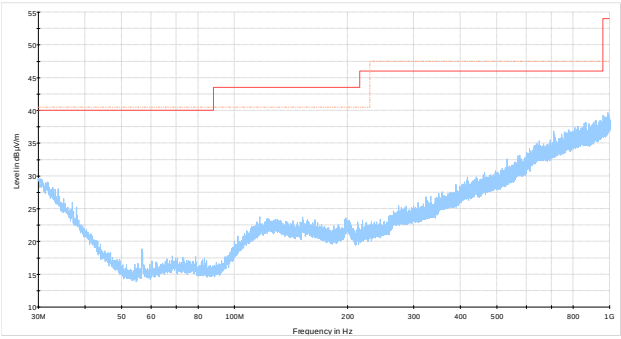


Figure 8.2-3: Radiated spurious emissions on mid channel

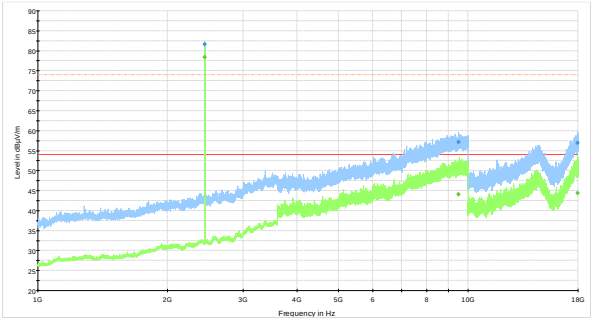


Figure 8.2-4: Radiated spurious emissions on mid channel

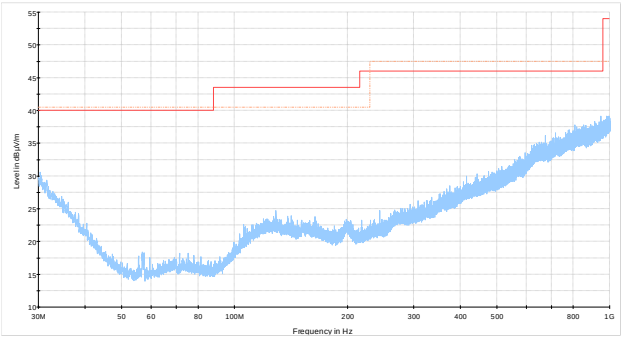


Figure 8.2-5: Radiated spurious emissions on high channel

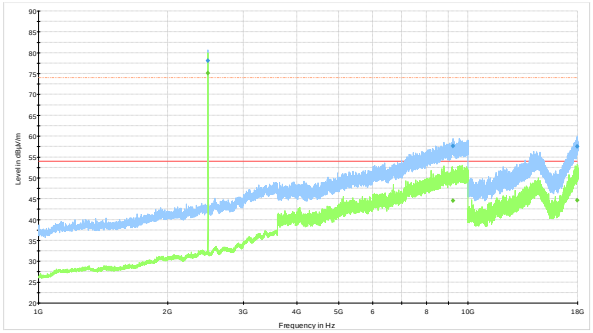


Figure 8.2-6: Radiated spurious emissions on high channel

No emissions were detected within 10 dB of limit.
Spectrum was searched from 30 MHz up to the 10th harmonic of the fundamental frequency.

- All measurements were performed at a distance of 3 m.
- All measurements performed:
  - within 30–1000 MHz range: using a peak detector with 100 kHz/300 kHz RBW/VBW,
  - above 1 GHz: using peak detector with 1 MHz/3 MHz RBW/VBW for peak results
  - and using average detector with 1 MHz/3 MHz RBW/VBW for average results

8.2.4 Test data, continued

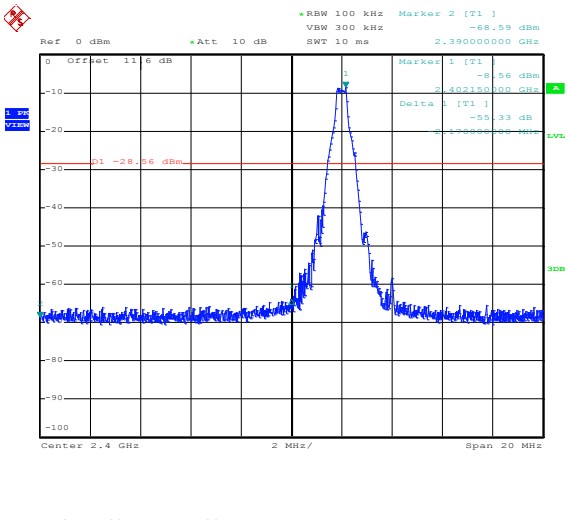


Figure 8.2-7: Conducted lower band edge emissions on low channel, no hop

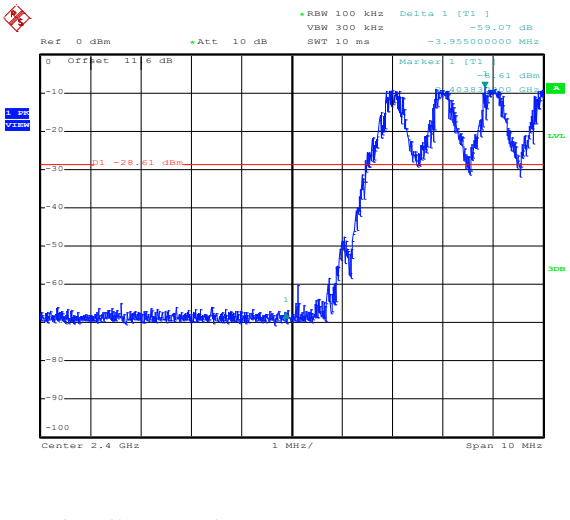


Figure 8.2-8: Conducted lower band edge emissions on low channel, with hop

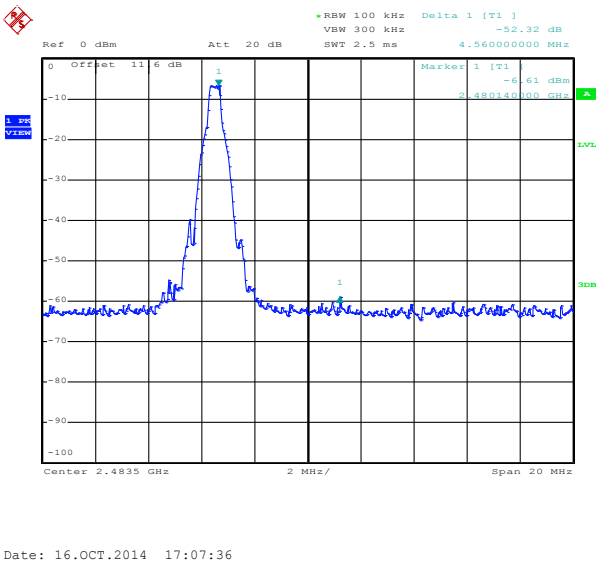


Figure 8.2-9: Conducted upper band edge emissions on high channel, no hop

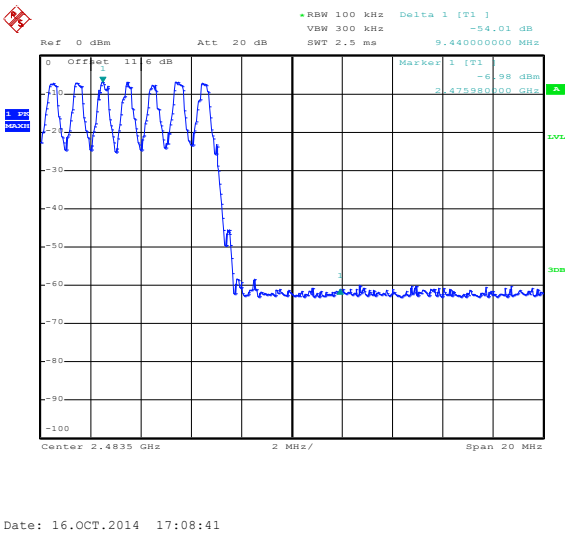


Figure 8.2-10: Conducted upper band edge emissions on high channel, with hop

8.2.4 Test data, continued

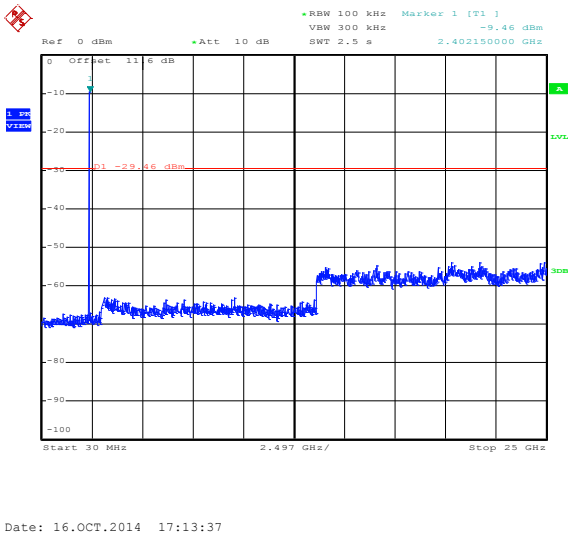


Figure 8.2-11: Conducted spurious emissions on low channel

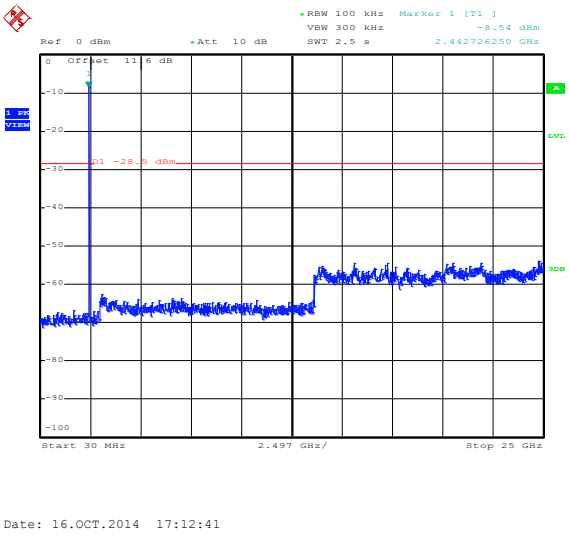


Figure 8.2-12: Conducted spurious emissions on mid channel

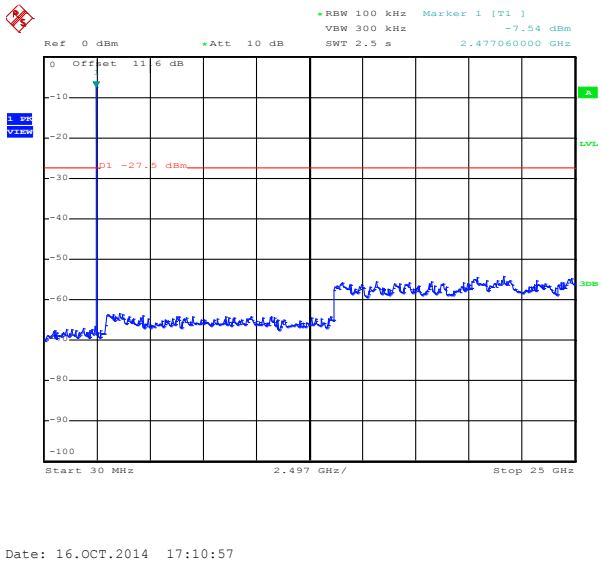


Figure 8.2-13: Conducted spurious emissions on high channel

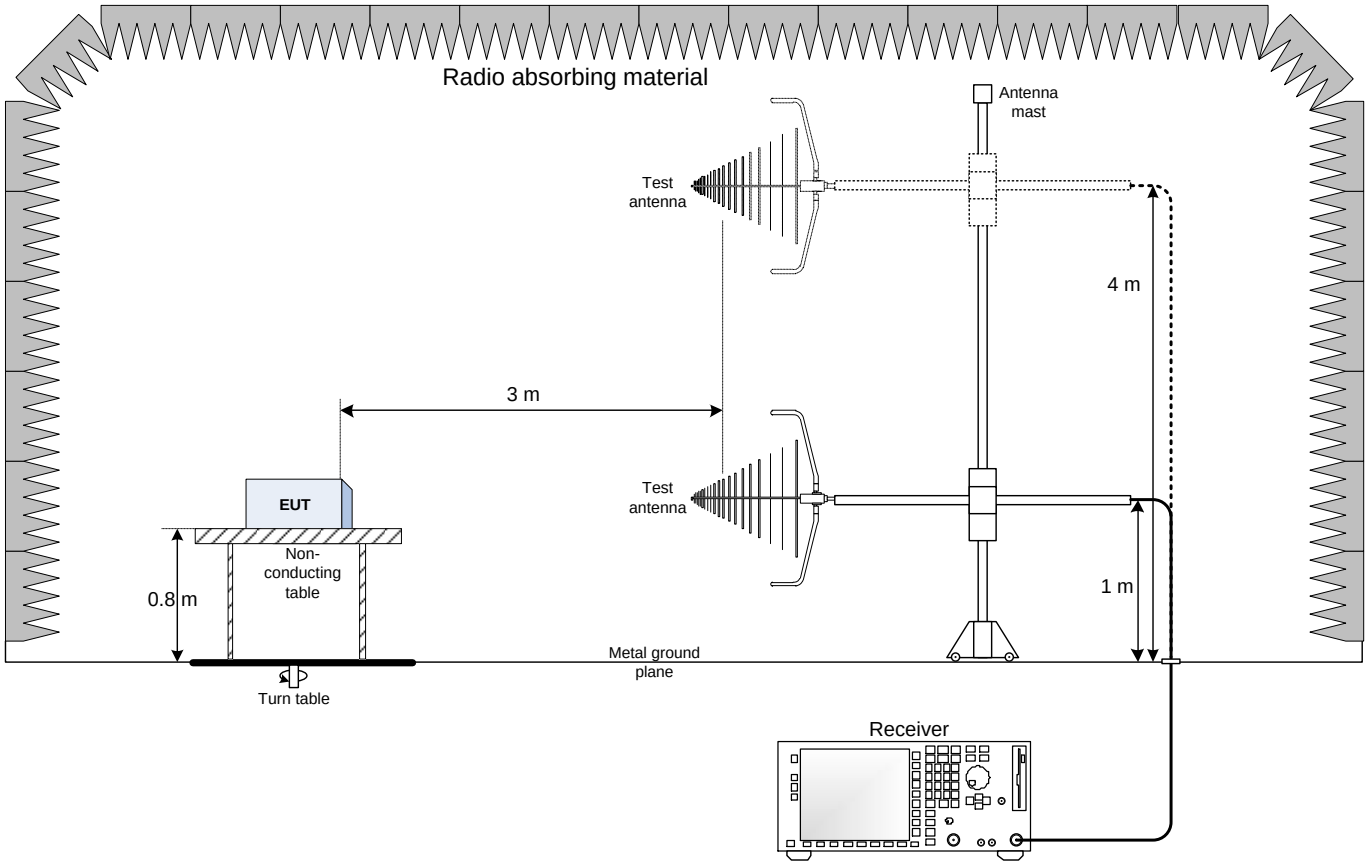
Table 8.2-4: Radiated spurious emissions results

Frequency (MHz)	Peak field strength (dBµV/m)	Average limit (dBµV/m)	Margin (dB)
2390.0	44.61	54.00	9.39
2483.5	42.55	54.00	11.45

Note: Peak measurement results were below the average limit line.

Section 9 Block diagrams of test set-ups

9.1 Radiated emissions set-up



Section 10 EUT photos

10.1 External photos

10.1.1 EUT top view

10.1.2 EUT front and sides views

10.1.3 EUT rear view