ENGINEERING TEST REPORT

Yapalong4000
Model: Yapalong4000
FCC ID: UJW-4000

Applicant:

Nautic Devices Inc.
12 Bram Court, Unit 10
Brampton, Ontario L6W 3V1
Canada

In Accordance With

Federal Communications Commission (FCC)
Part 15, Subpart C, Section 15.247 Digital Modulation Systems (DTS)

UltraTech's File No.: NATC-007F15C247

This Test report is Issued under the Authority of
Tri M. Luu
Vice President of Engineering
UltraTech Group of Labs

Date: February 4, 2014

Report Prepared by: Dan Huynh Issued Date: February 4, 2014	Tested by: Mr. Hung Trinh December 18, 2013 Test Dates: December 3 - 5, 2013 January 8, 2014

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Part 15, Subpart C, Section 15.247
Title:	Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15 – Radio Frequency Devices
Purpose of Test:	Equipment Certification for Digital Modulation Systems (DTS) Transmitter.
Test Procedures:	▪ ANSI C63.4 ▪ ANSI C63.10 ▪ FCC, KDB Publication No. 558074 D01
Environmental Classification:	[x] Commercial, industrial or business environment [x] Residential environment

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

1.3. NORMATIVE REFERENCES

Publication	Year	Title
47 CFR Parts 0-19	2013	Code of Federal Regulations (CFR), Title 47 – Telecommunication
ANSI C63.4	2009	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
ANSI C63.10	2009	American National Standard for Testing Unlicensed Wireless Devices
CISPR 22 & EN 55022	2008-09, Edition 6.0 2006	Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement
CISPR 16-1-1 +A1 +A2	2006 2006 2007	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-1-2 +A1 +A2	2003 2004 2006	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Conducted disturbances
FCC, KDB Publication No. 558074 D01 DTS Meas Guidance v03r01	2013	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

APPLICANT	
Name:	Nautic Devices Inc.
Address:	12 Bram Court, Unit 10 Brampton, Ontario L6W 3V1 Canada
Contact Person:	Mr. Shawn Zhou Phone #: 905 457 8498 Fax #: 905 457 6607 Email Address: szhou@nauticdevices.com

MANUFACTURER	
Name:	Nautic Devices Inc.
Address:	12 Bram Court, Unit 10 Brampton, Ontario L6W 3V1 Canada
Contact Person:	Mr. Shawn Zhou Phone #: 905 457 8498 Fax #: 905 457 6607 Email Address: szhou@nauticdevices.com

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	Nautic Devices Inc.
Product Name:	Yapalong4000
Model Name or Number:	Yapalong4000
Serial Number:	Test Sample
Type of Equipment:	Digital Transmission System (DTS)
Input Power Supply Type:	Battery operated 3.7V Lithium Polymer, battery charger adaptor 5V 1A. Device fully functional during charging.
Primary User Functions of EUT:	Handheld mobile voice communication with each other.

2.3. EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER	
Equipment Type:	Portable
Intended Operating Environment:	▪ Commercial, industrial or business environment ▪ Residential environment
Power Supply Requirement:	3.7V Lithium Polymer battery / 5V 1A from battery charger adaptor
RF Output Power Rating:	25.79 dBm, 0.379 W (conducted)
Operating Frequency Range:	903.401 to 926.651 MHz
RF Output Impedance:	50 Ohm
Duty Cycle:	85% for testing purpose
Modulation Type:	FSK
Antenna Connector Type:	Integral

2.4. ASSOCIATED ANTENNA DESCRIPTIONS

Manufacturer:	Jin Chang
Type:	¼ wave dipole whip antenna
Model:	JCG110
Frequency Range:	902-928 MHz
Impedance:	50 ohm
Gain:	2 dBi

2.5. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	Battery charge port 5V 1A rating	1	Barrel 2.5/0.7 mm	General purpose, length 0.5m minimum, non-shielded
2	Audio 3.5mm and 2.5mm combo jack	1	Audio jack	Shielded audio cable, length 0.5m minimum

2.6. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

1) Nautic Device Inc. headset
2) Nautic Device Inc. battery charger adaptor, Model 1128

EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21 to 23 ^{o}C
Humidity:	45 to 58%
Pressure:	102 kPa
Power Input Source:	3.7 V Lithium polymer battery / 5 V 1A from battery charger adaptor

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

Operating Modes:	Each of lowest, middle and highest channel frequencies transmits continuously for emissions measurements.
Special Test Software:	Special software provided by the Applicant to operate the EUT at each channel frequency continuously. For example, the transmitter will be operated at each of the lowest, middle and highest frequencies individually continuously during testing.
Special Hardware Used:	N/A
Transmitter Test Antenna:	The EUT is tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment as described with the test results.

Transmitter Test Signals	
Frequency Band(s):	903.401 - 926.651 MHz
Frequency(ies) Tested:	903.401 MHz, 915.401 MHz and 926.651 MHz
RF Power Output: (measured maximum output power at antenna terminals)	25.79 dBm, 0.379 W (conducted)
Normal Test Modulation:	FSK
Modulating Signal Source:	Internal

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).

- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2014-04-04.

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Compliance (Yes/No)
15.203	Antenna requirements	Yes
15.207(a)	AC Power Line Conducted Emissions	Yes
15.247(a)(2)	6 dB Bandwidth	Yes
15.247(b)(3)	Peak Conducted Output Power - DTS	Yes
15.247(d)	Band-Edge and RF Conducted Spurious Emissions at the Transmitter Antenna Terminal	Yes
15.247(d), 15.209 & 15.205	Transmitter Spurious Radiated Emissions	Yes
15.247(e)	Power Spectral Density	Yes
15.247(i), 1.1307, 1.1310, 2.1091	RF Exposure	Yes

* The EUT complies with the requirement; it employs an integral antenna.

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.

EXHIBIT 5. TEST DATA

5.1. POWER LINE CONDUCTED EMISSIONS [47 CFR 15.107(a)]

5.1.1. Limit(s)

The equipment shall meet the limits of the following table:

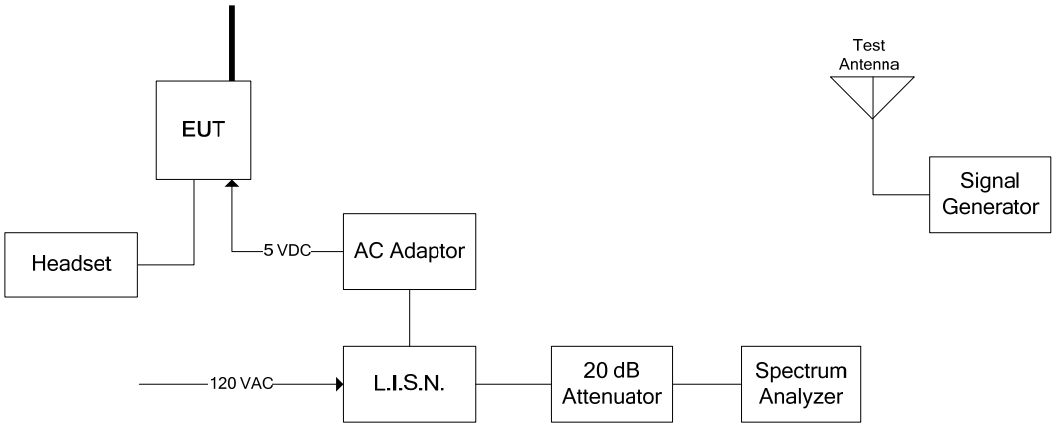
Frequency of emission (MHz)	Conducted Limits (dBμV)	
	Quasi-peak	Average
0.15–0.5 .....……..	66 to 56*	56 to 46*
0.5–5 .....……..	56	46
5-30 ……..	60 ..……..	50

*Decreases with the logarithm of the frequency

5.1.2. Method of Measurements

ANSI C63.4-2009

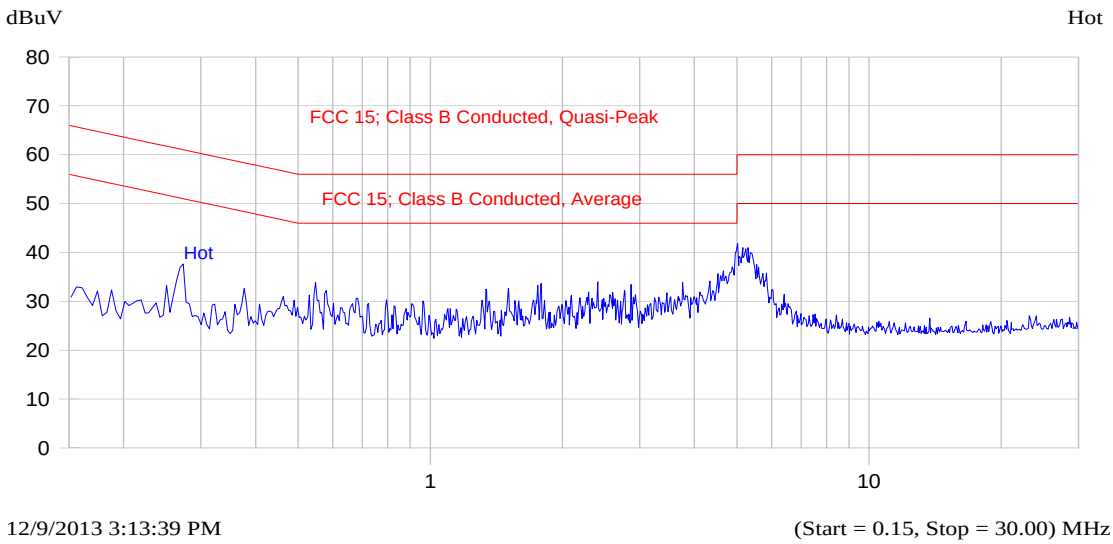
5.1.3. Test Arrangement



5.1.4. Test Data

Plot 5.1.4.1. Power Line Conducted Emissions, Tx Mode, Line Voltage: 120 VAC, Line Tested: Hot

Current Graph

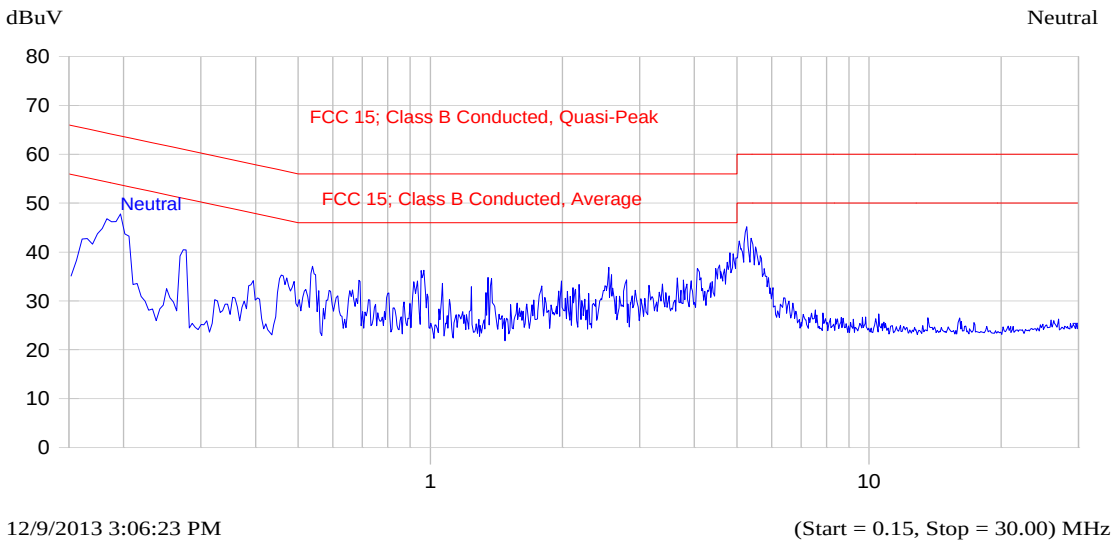


Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.270	44.8	38.6	-23.9	29.5	-23.1	Hot
5.025	42.5	37.3	-22.7	29.6	-20.4	Hot

Plot 5.1.4.2. Power Line Conducted Emissions, Tx Mode, Line Voltage: 120 VAC, Line Tested: Neutral

Current Graph

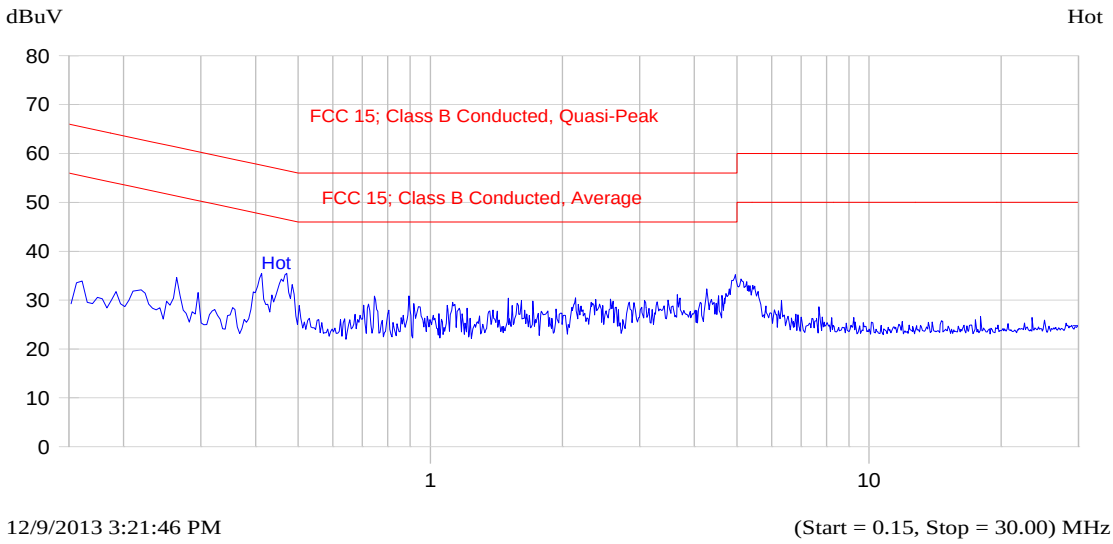


Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.185	50.5	45.5	-19.5	33.0	-22.0	Neutral
5.267	44.2	38.9	-21.1	30.9	-19.1	Neutral

Plot 5.1.4.3. Power Line Conducted Emissions, Rx Mode, Line Voltage: 120 VAC, Line Tested: Hot

Current Graph

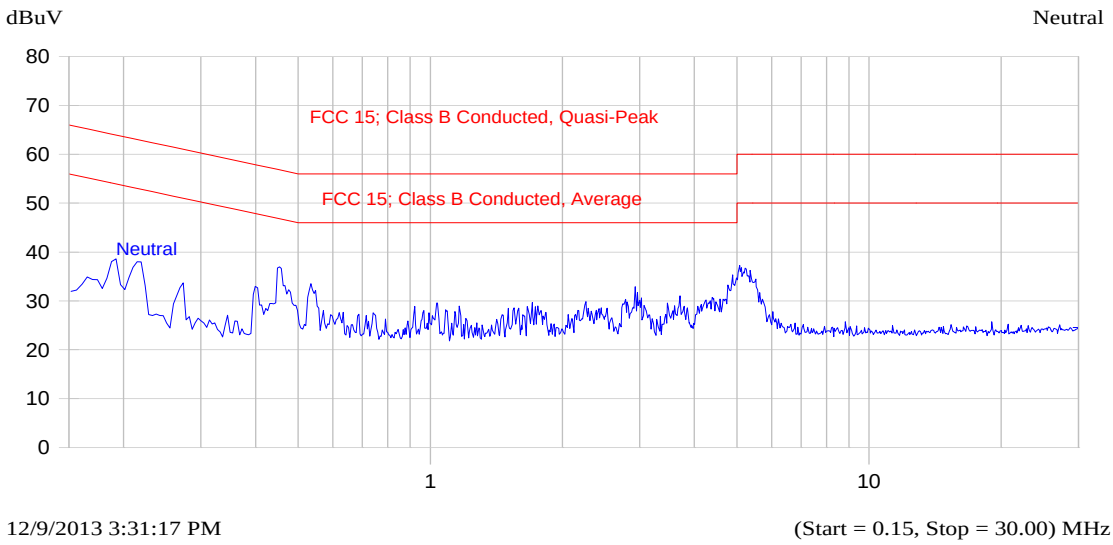


Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.394	38.8	33.2	-25.8	26.6	-22.4	Hot
0.471	39.4	32.8	-24.0	26.5	-20.3	Hot
4.954	38.3	33.3	-22.7	27.2	-18.8	Hot

Plot 5.1.4.4. Power Line Conducted Emissions, Rx Mode, Line Voltage: 120 VAC, Line Tested: Neutral

Current Graph



Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.210	44.2	39.9	-24.3	33.6	-20.6	Neutral
0.450	41.2	36.9	-20.5	29.9	-17.5	Neutral
5.058	38.9	34.7	-25.3	28.7	-21.3	Neutral

5.2. OCCUPIED BANDWIDTH [§ 15.247(a)(2)]

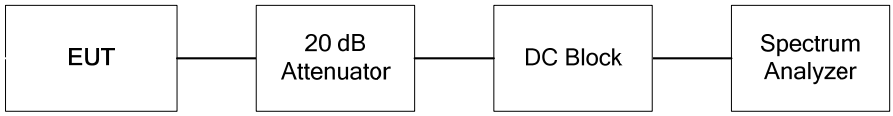
5.2.1. Limit(s)

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.2.2. Method of Measurements

KDB Publication No. 558074 D01 DTS Meas Guidance v03r01, Section 8.1 DTS Bandwidth Option 1.

5.2.3. Test Arrangement

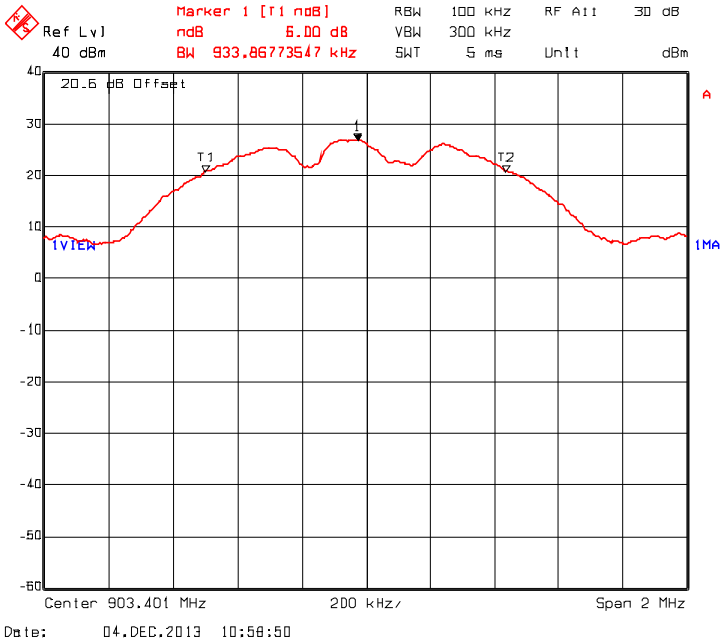


5.2.4. Test Data

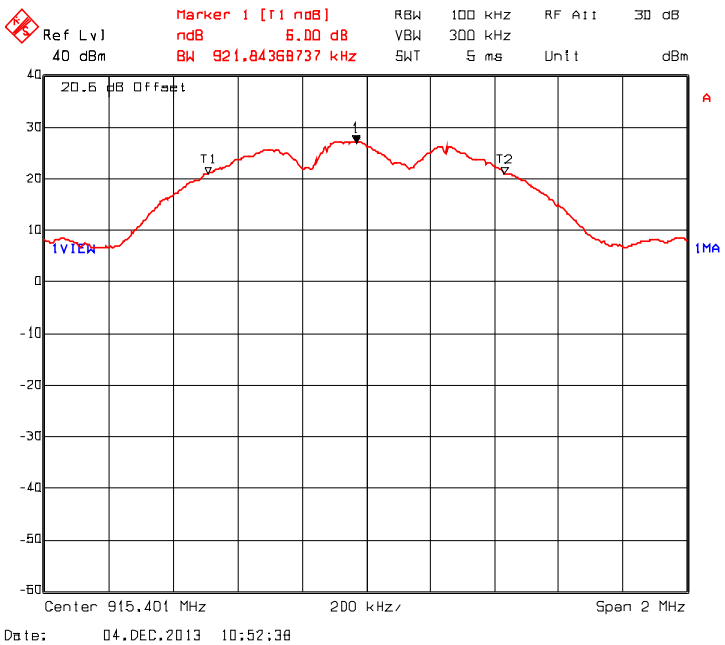
Frequency (MHz)	6 dB Bandwidth (kHz)	99% Occupied Bandwidth (MHz)
903.401	933.87	1.83
915.401	921.84	1.80
926.651	941.88	1.83

See the following plots for detailed measurements.

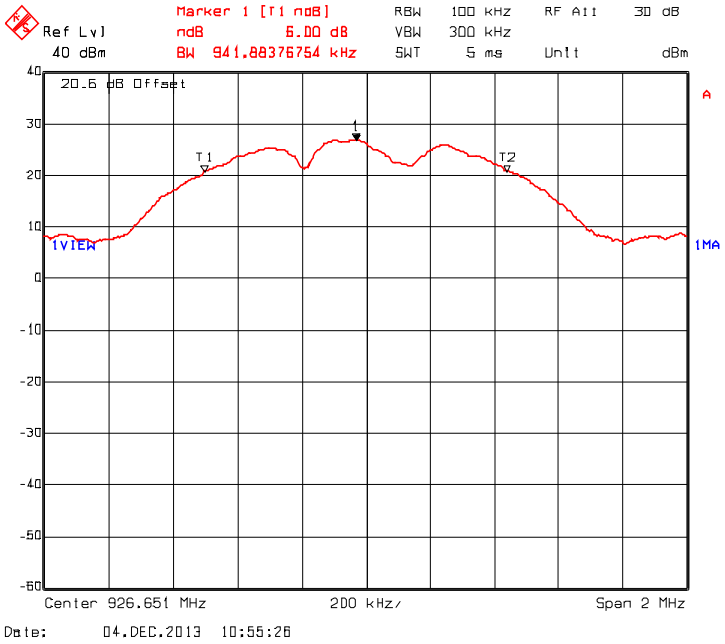
Plot 5.2.4.1. 6 dB Bandwidth, 903.401 MHz



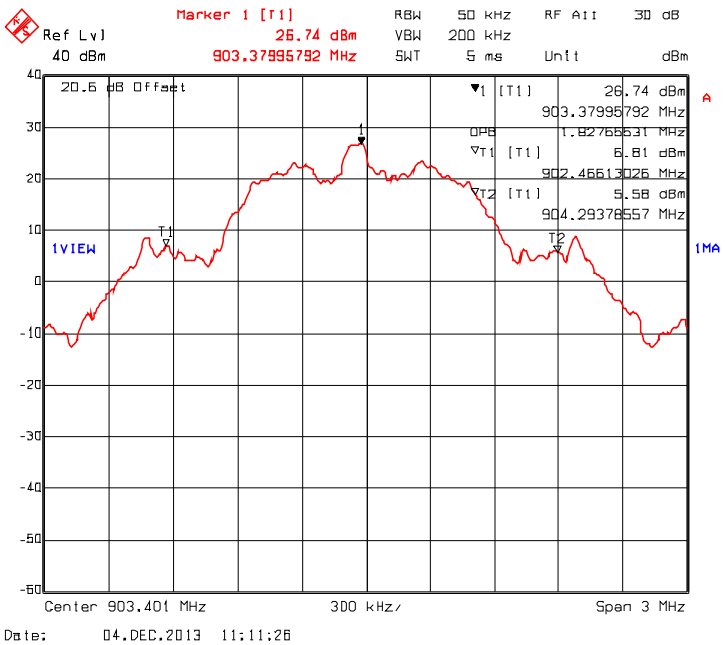
Plot 5.2.4.2. 6 dB Bandwidth, 915.401 MHz



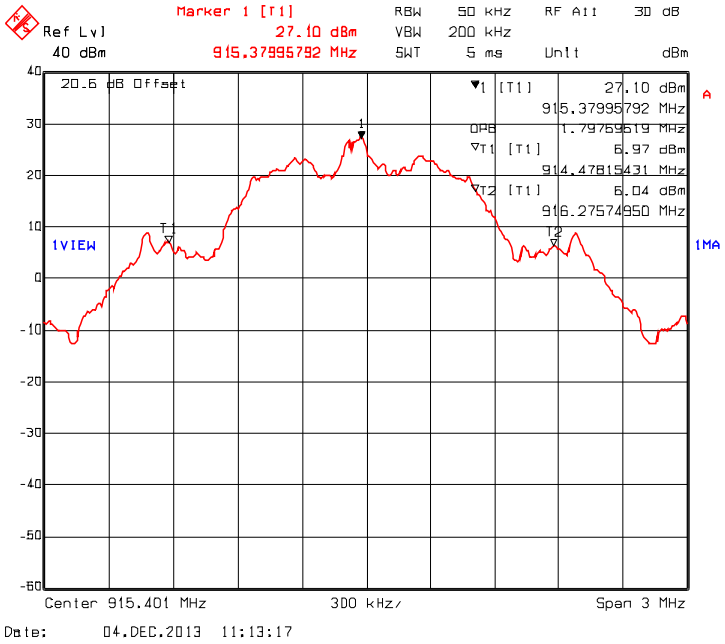
Plot 5.2.4.3. 6 dB Bandwidth, 926.651 MHz



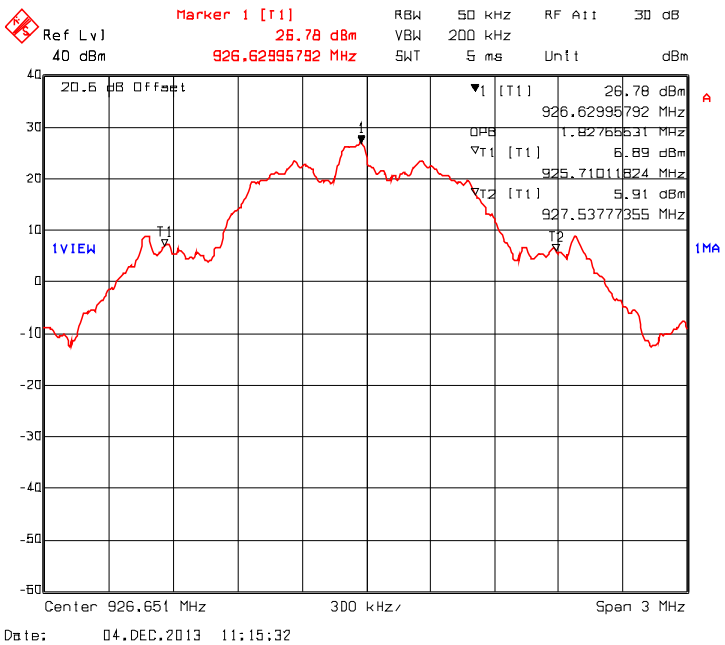
Plot 5.2.4.4. 99% Occupied Bandwidth, 903.401 MHz



Plot 5.2.4.5. 99% Occupied Bandwidth, 915.401 MHz



Plot 5.2.4.6. 99% Occupied Bandwidth, 926.651 MHz



5.3. PEAK CONDUCTED OUTPUT POWER - DTS [§ 15.247(b)(3)]

5.3.1. Limit(s)

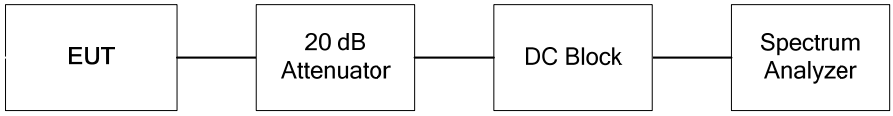
§ 15.247(b)(3): For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

§15.247(b)(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.

5.3.2. Method of Measurements & Test Arrangement

KDB Publication No. 558074 D01 DTS Meas Guidance v03r01, Section 9.2.2.2 Method AVGSA-1.

5.3.3. Test Arrangement

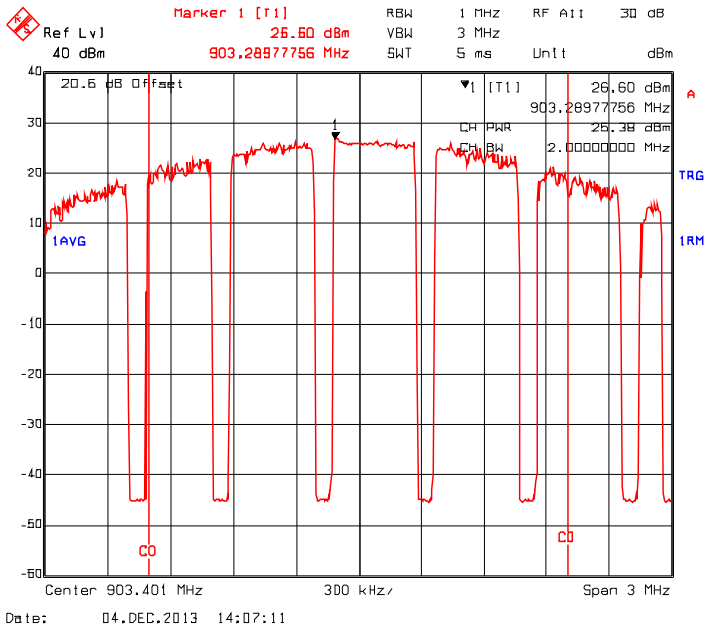


5.3.4. Test Data

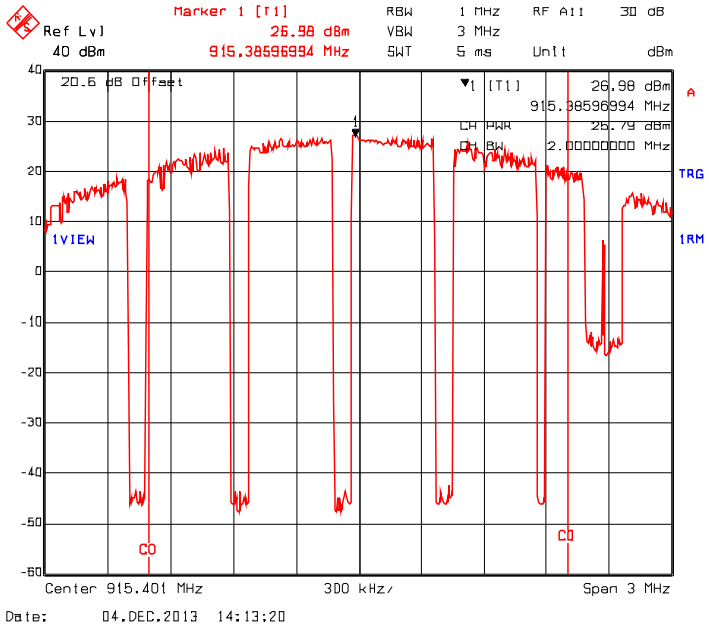
Frequency (MHz)	Maximum conducted (average) output power (dBm)	*EIRP (dBm)	Conducted Power Limit (dBm)	EIRP Limit (dBm)
903.401	25.38	27.38	30	36
915.401	25.79	27.79	30	36
926.651	25.44	27.44	30	36
Note: The EIRP shall be calculated based on the transmitter antenna gain (G_{dBi}), cable loss (CL_{dB}) and maximum output power at antenna terminal (P_{dBm}). Calculated EIRP = $P_{dBm} + G_{dBi} - CL_{dB}$				

*Maximun antenna gain: 2 dBi

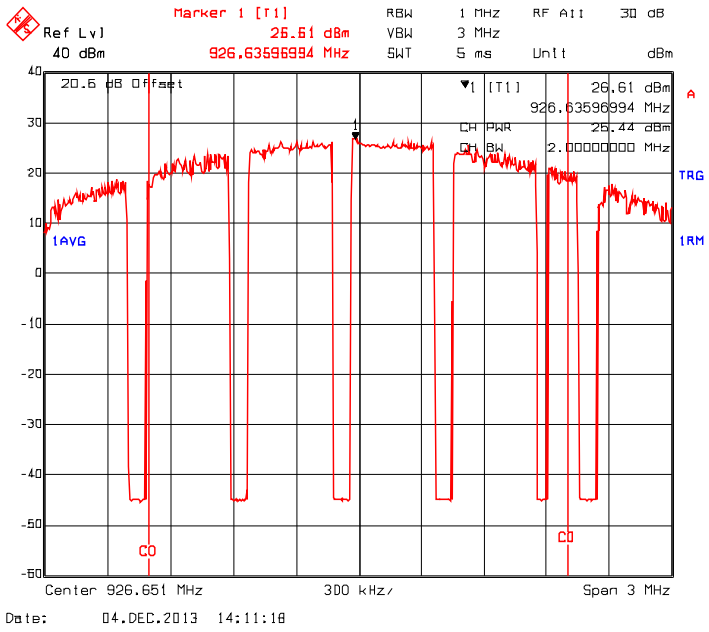
Plot 5.3.4.1. Maximum Conducted Output Power, 903.401 MHz
Detector RMS, Video Trace Averaging with 100 traces, Trigger RF power Duty cycle for test mode is 85%



Plot 5.3.4.2. Maximum Conducted Output Power, 915.401 MHz
Detector RMS, Video Trace Averaging with 100 traces, Trigger RF power Duty cycle for test mode is 85%



Plot 5.3.4.3. Maximum Conducted Output Power, 926.651 MHz
Detector RMS, Video Trace Averaging with 100 traces, Trigger RF power Duty cycle for test mode is 85%



5.4. TRANSMITTER BAND-EDGE & SPURIOUS CONDUCTED EMISSIONS [§ 15.247(d)]

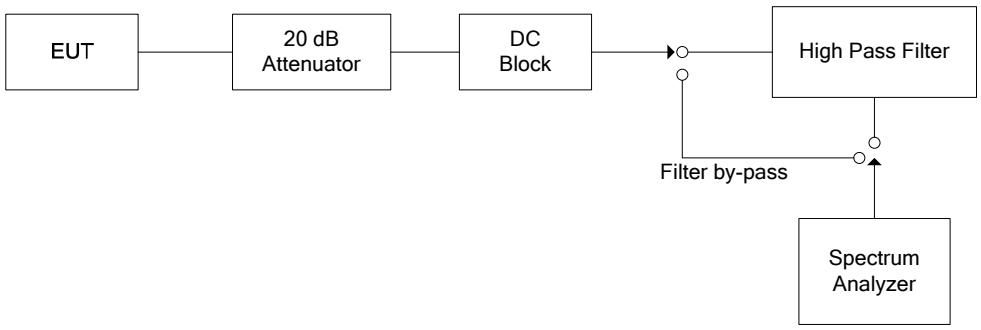
5.4.1. Limit(s)

§ 15.247 (d): 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.

5.4.2. Method of Measurements

KDB Publication No. 558074 D01 DTS Meas Guidance v03r01, Sections 11 Antenna Port Conducted and 13.0 Band-Edge Conducted.

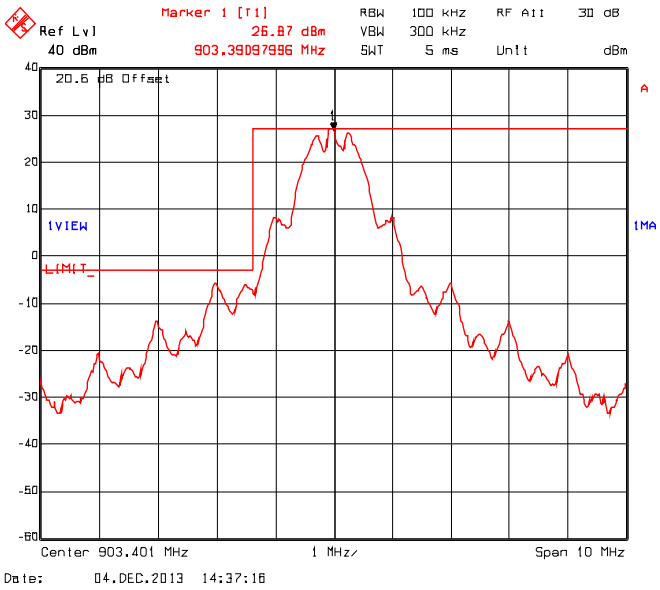
5.4.3. Test Arrangement



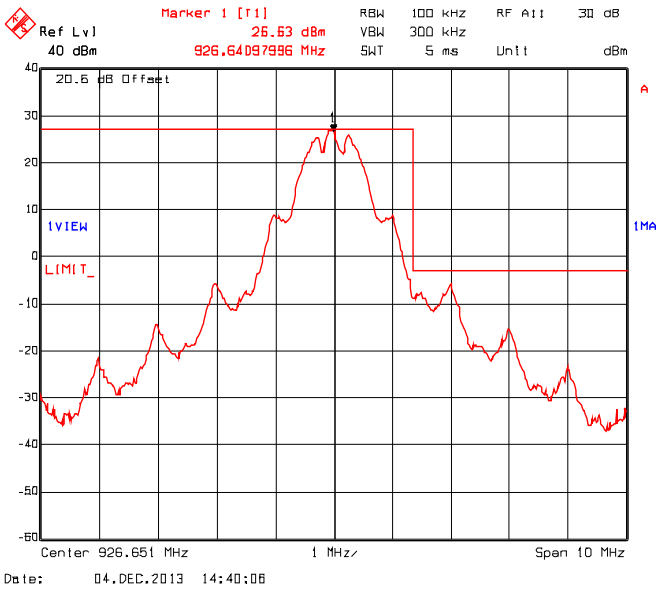
5.4.4. Test Data

5.4.4.1. Band-Edge RF Conducted Emissions

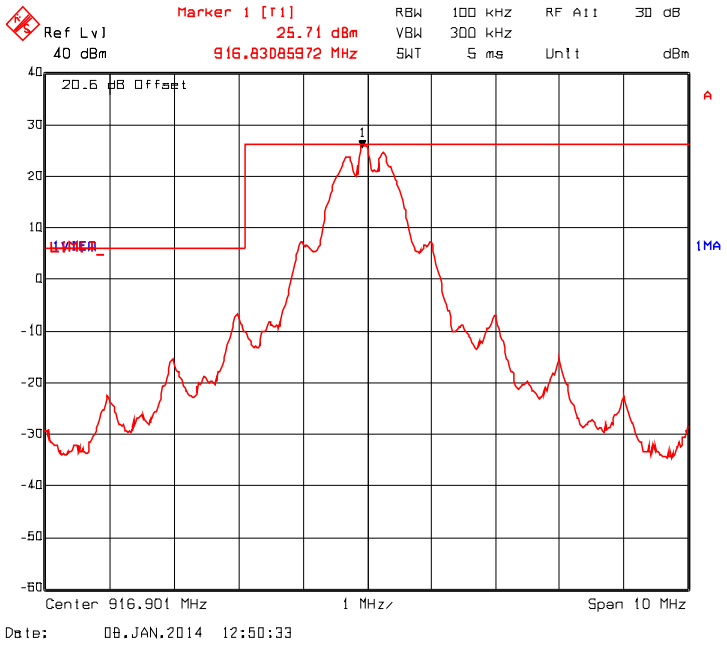
Plot 5.4.4.1.1. Band-Edge RF Conducted Emissions, 903.401 MHz



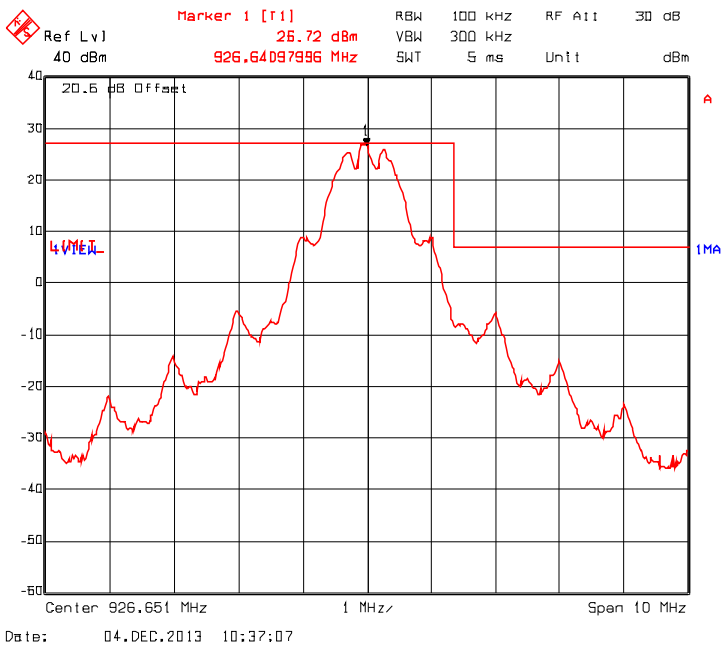
Plot 5.4.4.1.2. Band-Edge RF Conducted Emissions, 926.651 MHz,



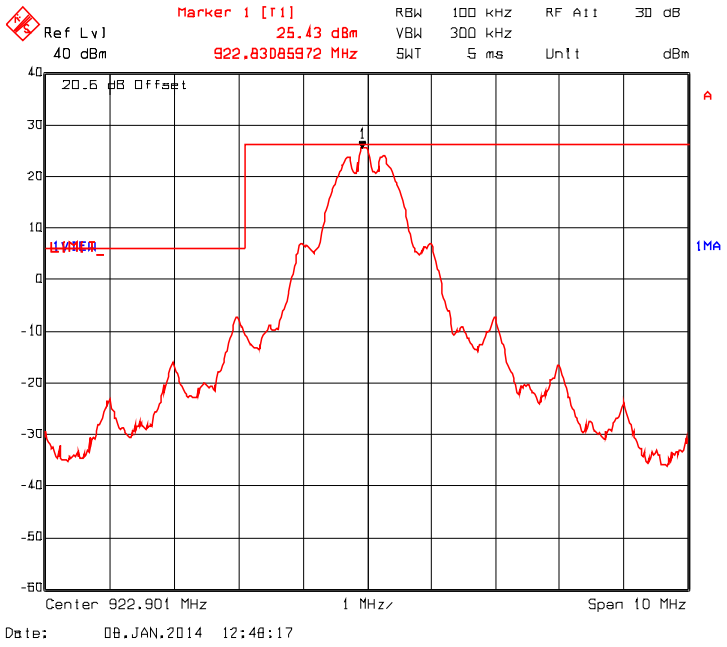
Plot 5.4.4.1.3. Band-Edge RF Conducted Emissions for Australia Band 915 – 928 MHz , 916.901 MHz



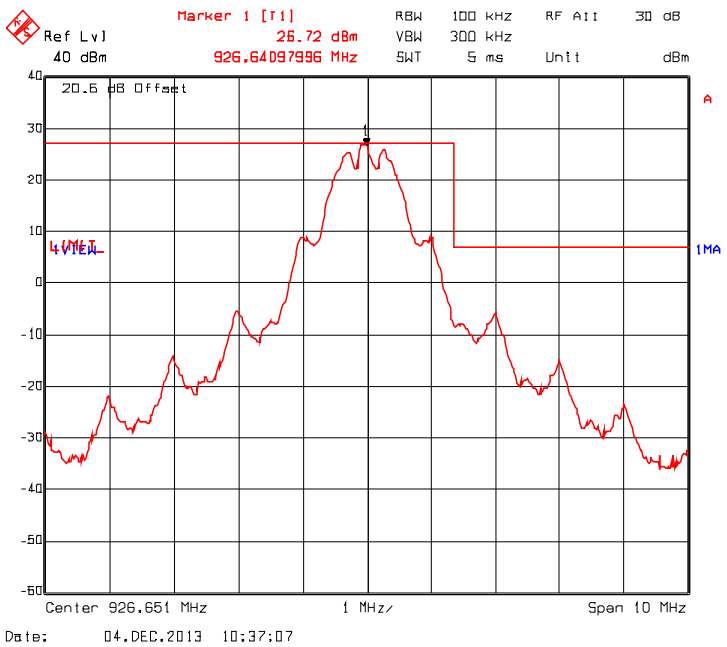
Plot 5.4.4.1.4. Band-Edge RF Conducted Emissions for Australia Band 915 – 928 MHz, 926.651 MHz



Plot 5.4.4.1.5. Band-Edge RF Conducted Emissions for New Zealand Band 921 – 928 MHz , 922.901 MHz

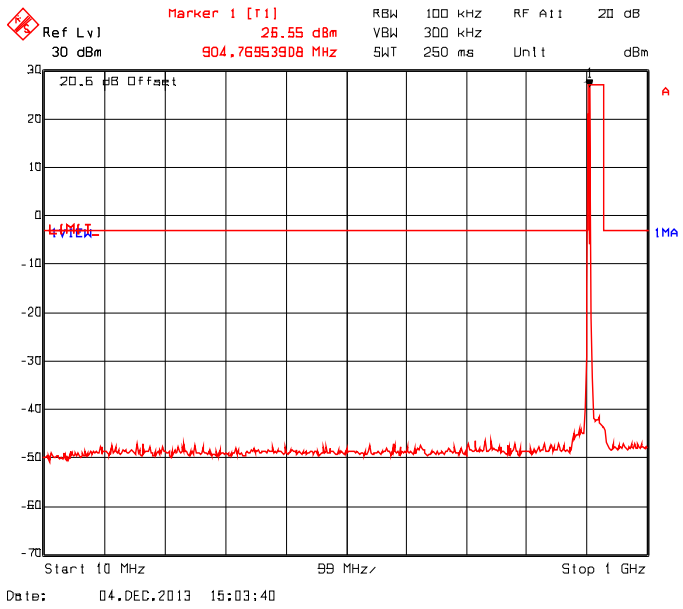


Plot 5.4.4.1.6. Band-Edge RF Conducted Emissions for New Zealand Band 921 – 928 MHz, 926.651 MHz

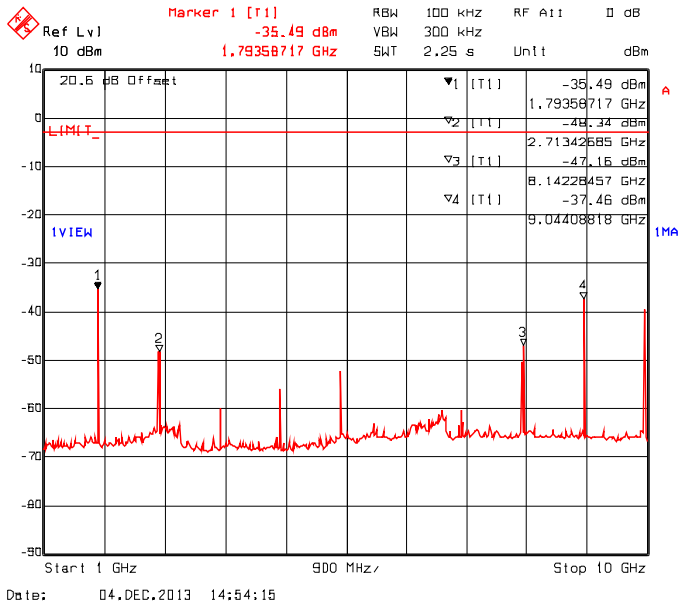


5.4.4.2. Conducted Spurious Emissions

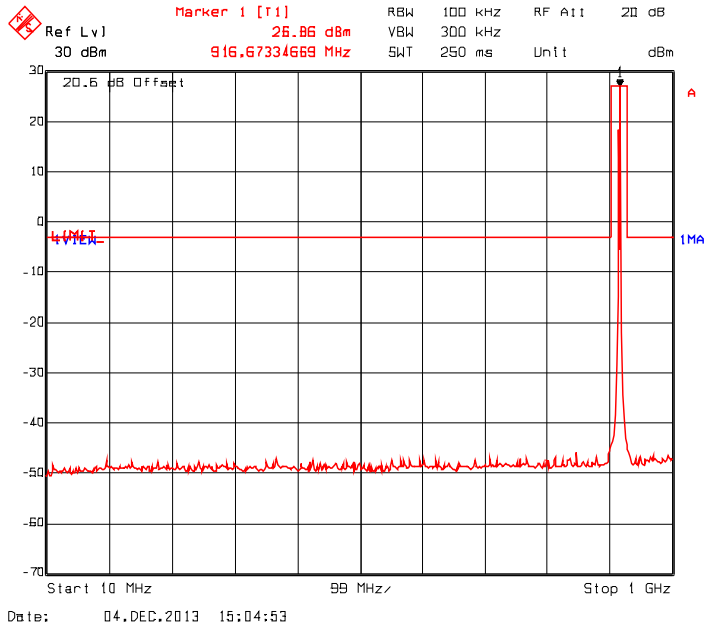
Plot 5.4.4.2.1. Conducted Spurious Emissions, 903.401 MHz, 10 MHz – 1 GHz



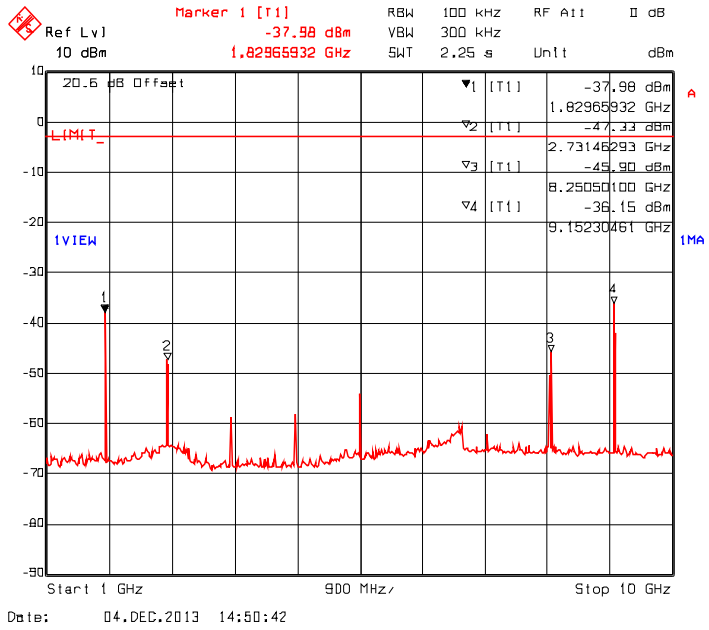
Plot 5.4.4.2.2. Conducted Spurious Emissions, 903.401 MHz, 1 GHz – 10 GHz



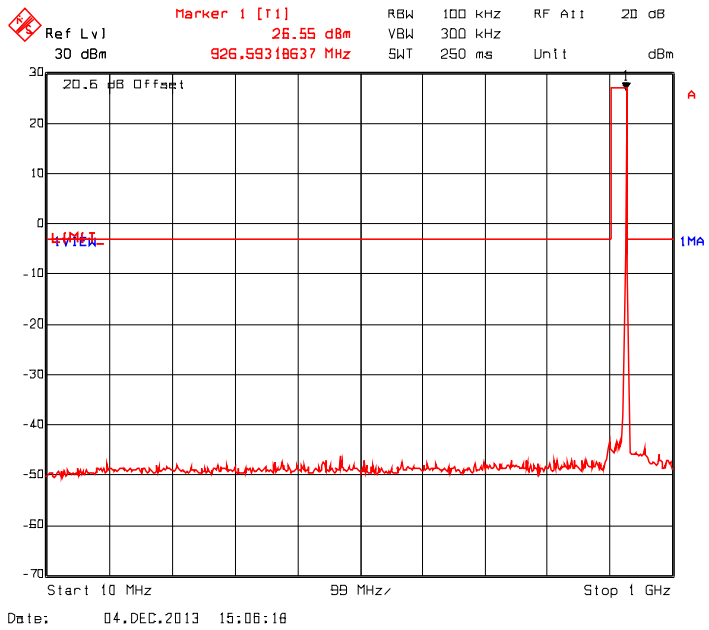
Plot 5.4.4.2.3. Conducted Spurious Emissions, 915.401 MHz, 10 MHz – 1 GHz



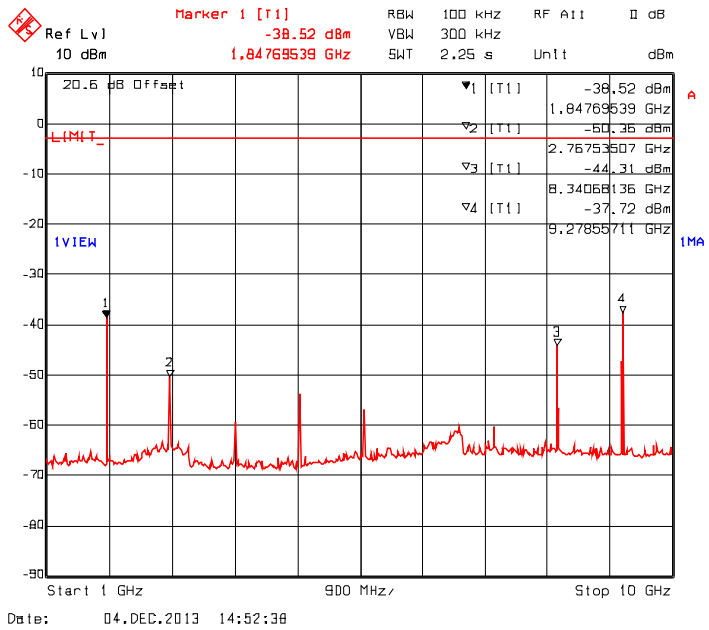
Plot 5.4.4.2.4. Conducted Spurious Emissions, 915.401 MHz, 1 GHz – 10 GHz



Plot 5.4.4.2.5. Conducted Spurious Emissions, 926.651 MHz, 10 MHz – 1 GHz



Plot 5.4.4.2.6. Conducted Spurious Emissions, 926.651 MHz, 1 GHz – 10 GHz



5.5. TRANSMITTER SPURIOUS RADIATED EMISSIONS AT 3 METERS [§§ 15.247(d), 15.209 & 15.205]

5.5.1. Limit

§ 15.247 (d): 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Section 15.205(a) - Restricted Bands of Operation

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
[1] 0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2655–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	([2])
13.36–13.41.			

[1] Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.
[2] Above 38.6

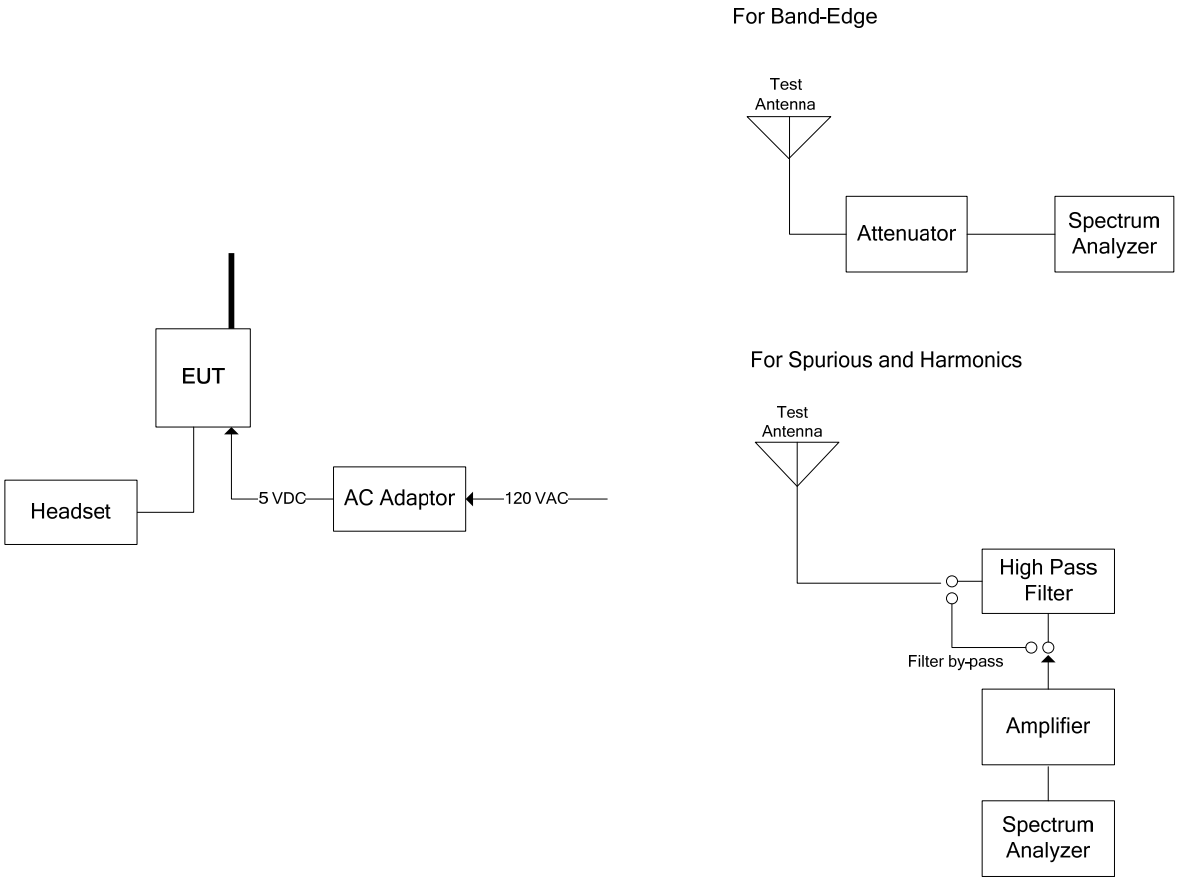
Section 15.209(a) - Field Strength Limits within Restricted Frequency Bands

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2,400 / F (kHz)	300
0.490 - 1.705	24,000 / F (kHz)	30
1.705 - 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

5.5.2. Method of Measurements

ANSI C63.10, ANSI 63.4 and KDB Publication No. 558074 D01 DTS Meas Guidance v03r01, Section 13.0 Band-Edge Radiated.

5.5.3. Test Arrangement

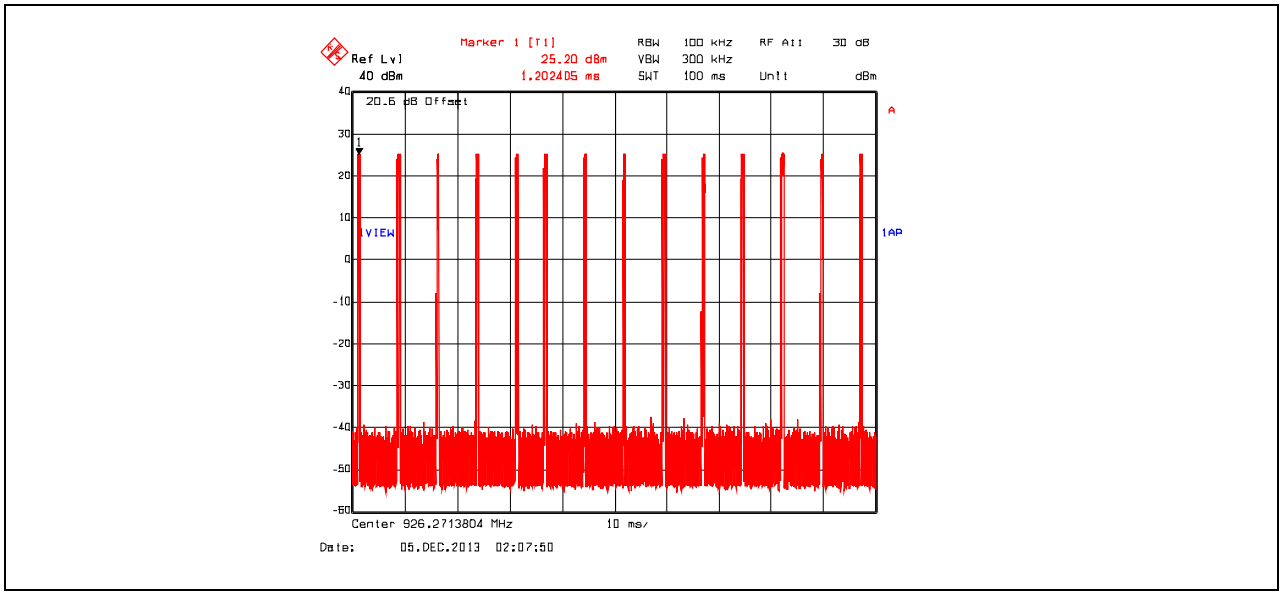


5.5.4. Test Data

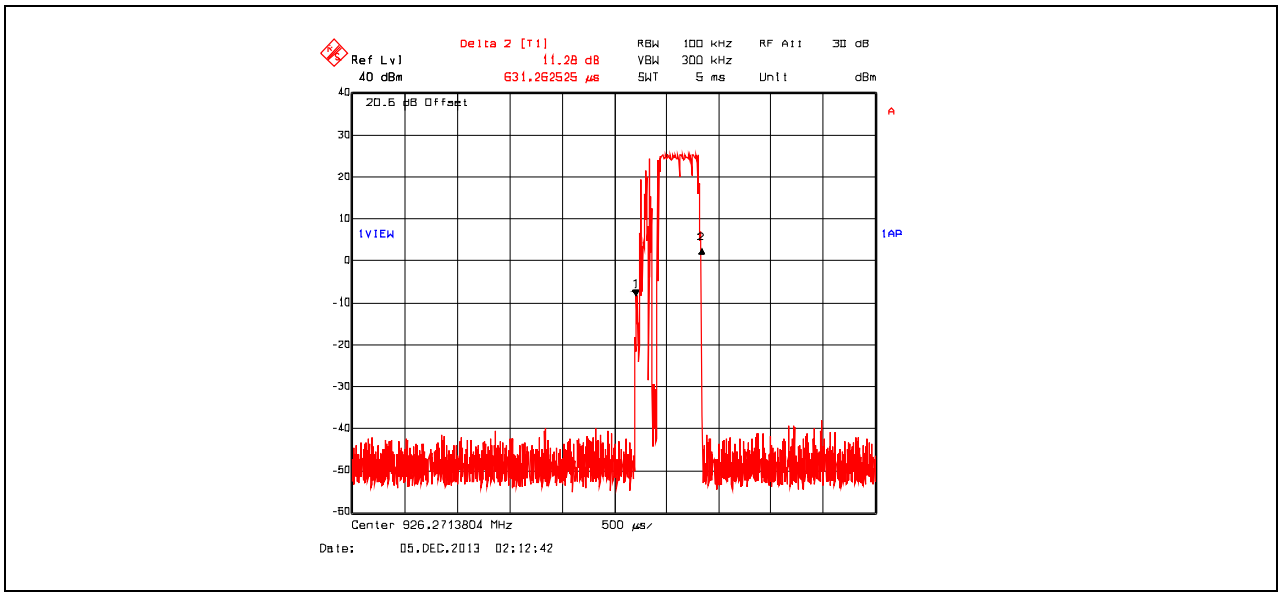
Remark(s):

- All spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- EUT shall be tested in three orthogonal positions.
- The EUT is unable to be configured for 100 % duty cycle, it was configured for the longest duration duty cycle supported the system at 85 % duty cycle.
- Under normal mode of operation the duty cycle is 8.84 %, a duty cycle correction factor of -21.07 dB [20*log (14 * 0.631.263/100)] shall be applied to emissions detected with an average detector.

Plot 5.5.4.1. Duty Cycle in 100 ms (pulse train), 14 pulses



Plot 5.5.4.2. Duty Cycle (pulse durationis 631.262525 µs = 0.631263 ms)



5.5.4.3. Spurious Radiated Emissions

Fundamental Frequency:	903.401 MHz						
Test Frequency Range:	30 MHz – 10 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
903.401	126.82	--	V	--	--		--
903.401	126.73	--	H	--	--		--
2710.203	70.12	34.28	V	54.0	96.8	-19.7	Pass*
2710.203	71.50	35.84	H	54.0	96.8	-18.2	Pass*
All other spurious emissions and harmonics are more than 20 dB below the applicable limit.							

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

Fundamental Frequency:	915.401 MHz						
Test Frequency Range:	30 MHz – 10 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
915.401	125.87	--	V	--	--		--
915.401	125.55	--	H	--	--		--
30 - 10000	*	*	H/V	54.0	95.9	*	Pass

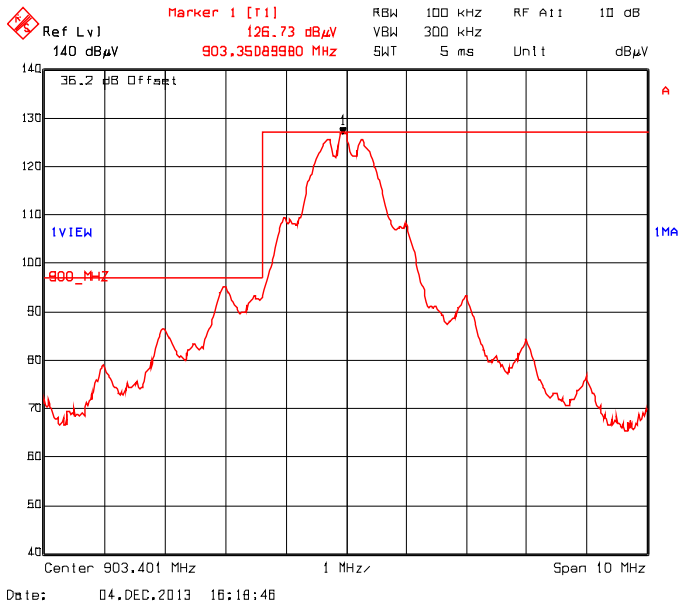
* Spurious emissions and harmonics are more than 20 dB below the applicable limit.

Fundamental Frequency:	926.651 MHz						
Test Frequency Range:	30 MHz – 10 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
926.651	125.35	--	V	--	--		--
926.651	125.01	--	H	--	--		--
2779.953	71.02	35.15	H	54.0	95.4	-18.9	Pass*
All other spurious emissions and harmonics are more than 20 dB below the applicable limit.							

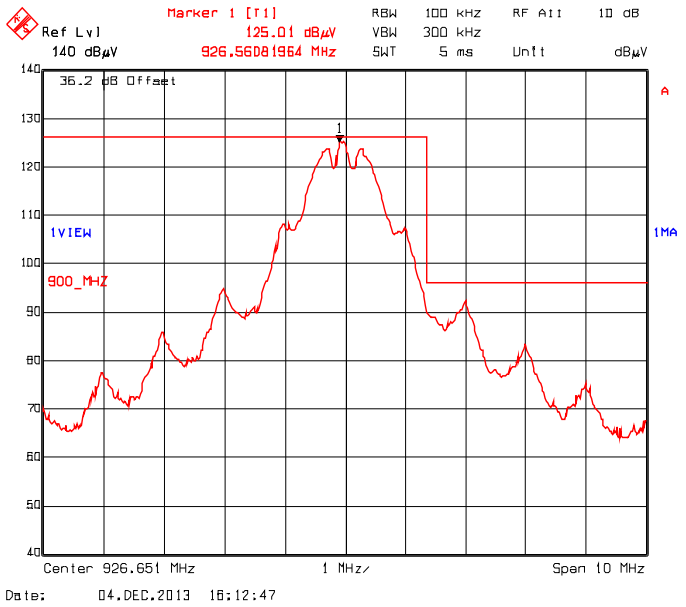
*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

5.5.4.4. Band-Edge RF Radiated Emissions

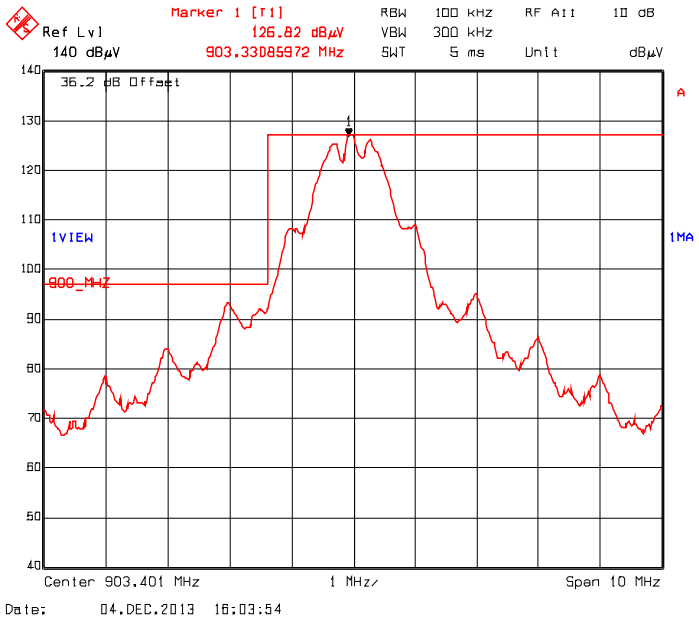
Plot 5.5.4.4.1. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization
Low End of Frequency Band



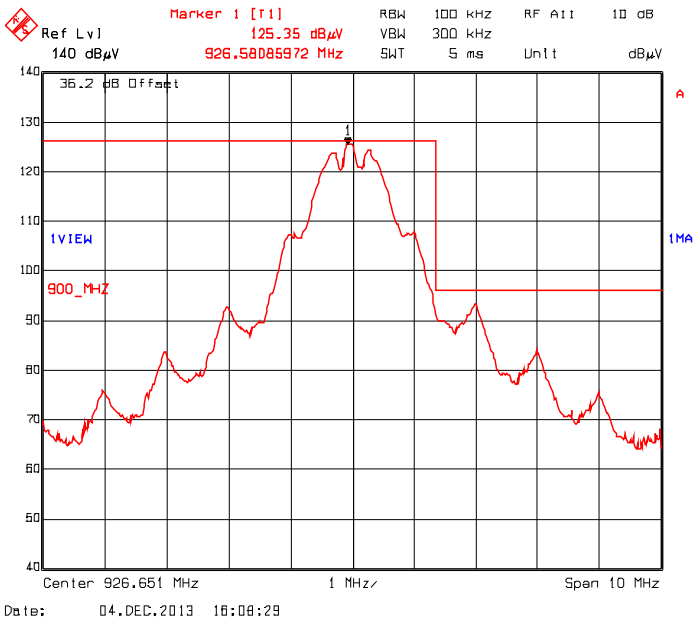
Plot 5.5.4.4.2. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization
High End of Frequency Band



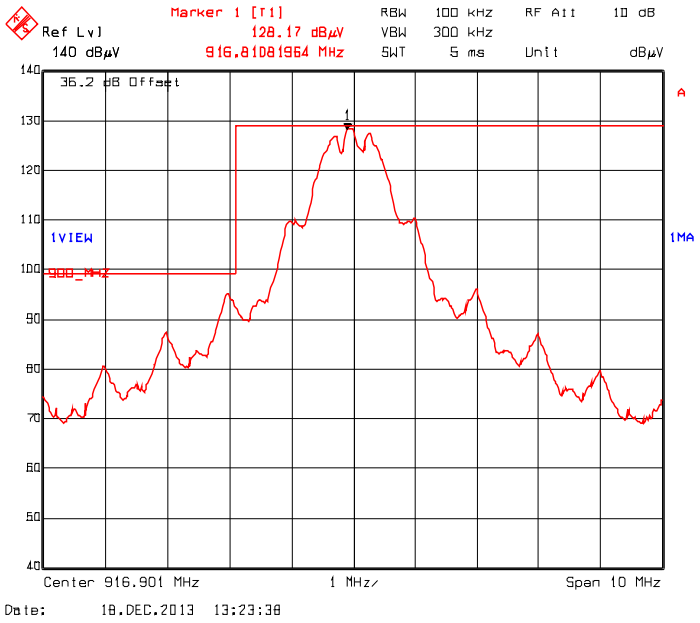
Plot 5.5.4.4.3. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization
Low End of Frequency Band



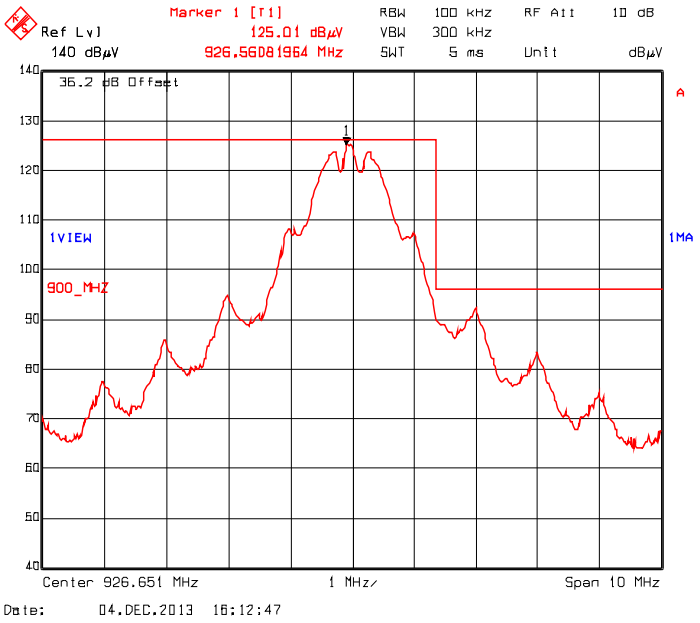
Plot 5.5.4.4.4. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization
High End of Frequency Band



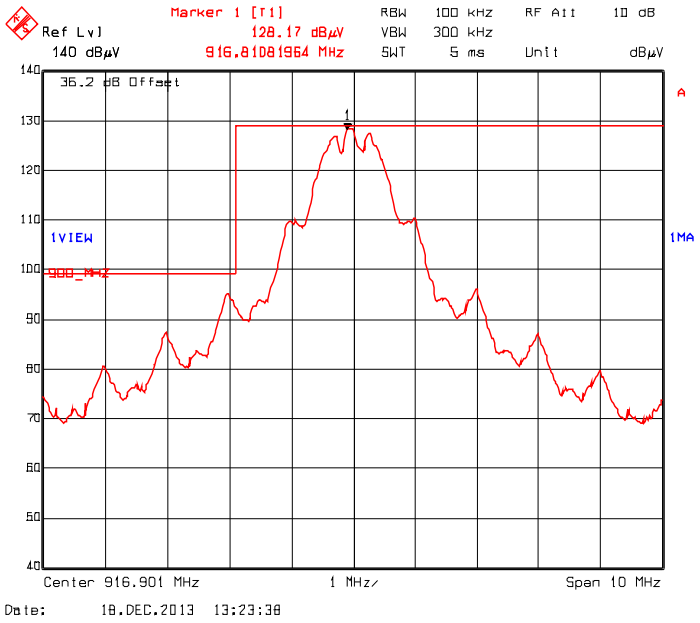
Plot 5.5.4.4.5. Band-Edge RF Radiated Emissions at 3 m, for Australia Band 915 – 928 MHz , 916.901 MHz
Horizontal Polarization, Low End of Frequency Band



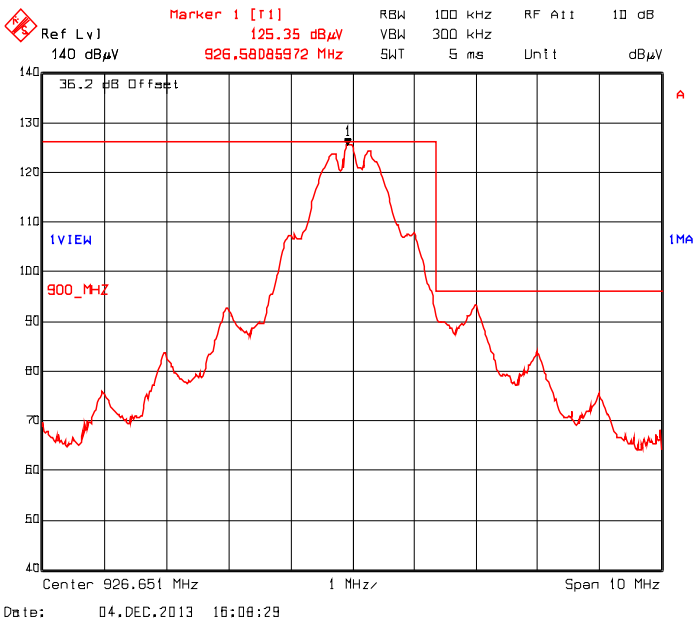
Plot 5.5.4.4.6. Band-Edge RF Radiated Emissions at 3 m for Australia Band 915 – 928 MHz, 926.651 MHz
Horizontal Polarization, High End of Frequency Band



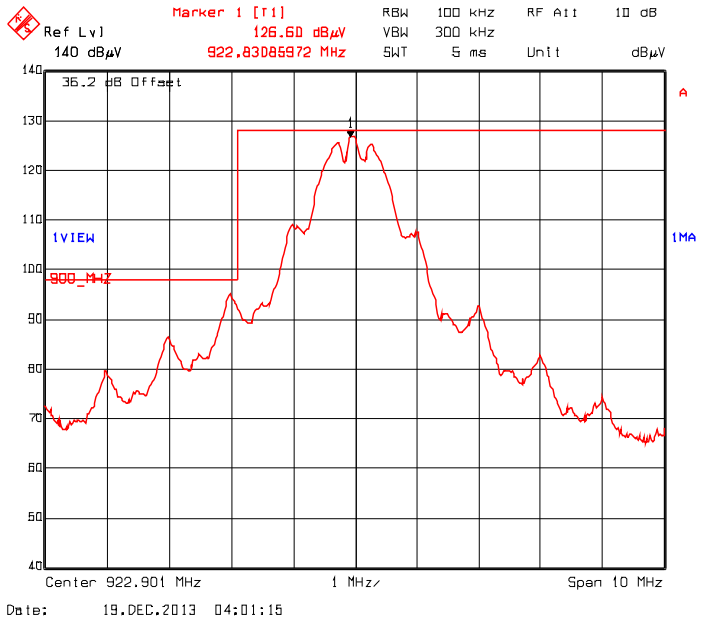
Plot 5.5.4.4.7. Band-Edge RF Radiated Emissions at 3 m for Australia Band 915 – 928 MHz , 916.901 MHz
Vertical Polarization, Low End of Frequency Band



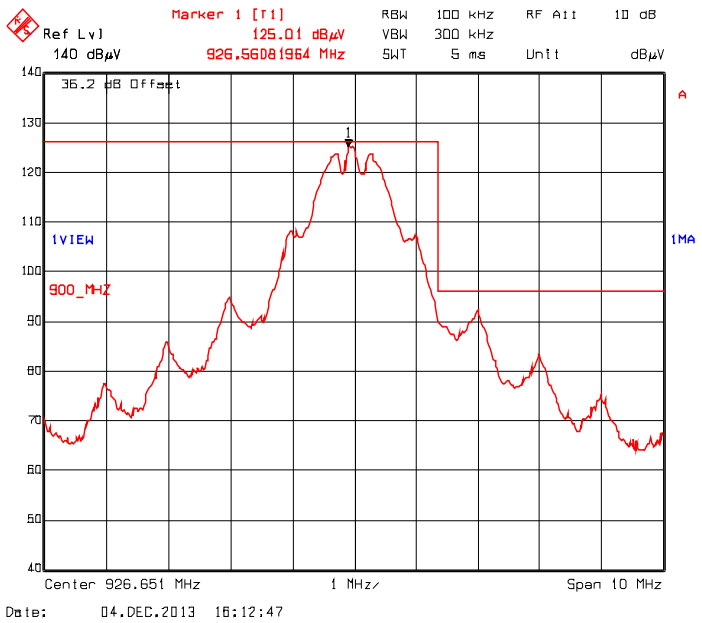
Plot 5.5.4.4.8. Band-Edge RF Radiated Emissions at 3 m for Australia Band 915 – 928 MHz, 926.651 MHz
Vertical Polarization, High End of Frequency Band



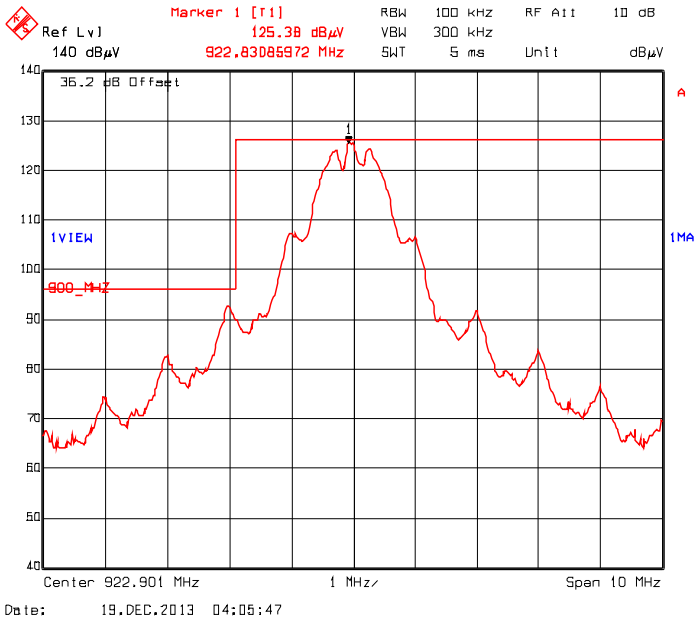
Plot 5.5.4.4.9. Band-Edge RF Radiated Emissions at 3 m for New Zealand Band 921 – 928 MHz , 922.901 MHz
Horizontal Polarization, Low End of Frequency Band



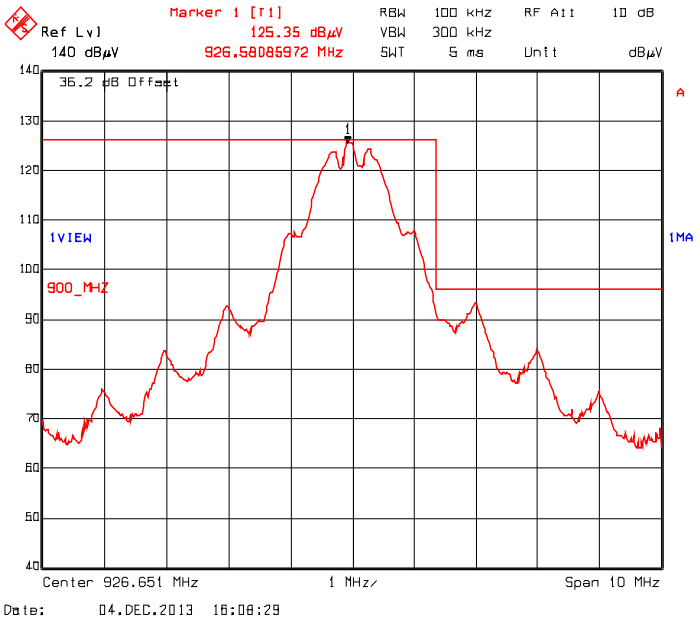
Plot 5.5.4.4.10. Band-Edge RF Radiated Emissions at 3 m for New Zealand Band 921 – 928 MHz, 926.651 MHz
Horizontal Polarization, High End of Frequency Band



Plot 5.5.4.4.11. Band-Edge RF Radiated Emissions at 3 m for New Zealand Band 921 – 928 MHz , 922.901 MHz
Vertical Polarization, Low End of Frequency Band



Plot 5.5.4.4.12. Band-Edge RF Radiated Emissions at 3 m for New Zealand Band 921 – 928 MHz, 926.651 MHz
Vertical Polarization, High End of Frequency Band



5.6. POWER SPECTRAL DENSITY [§ 15.247(e)]

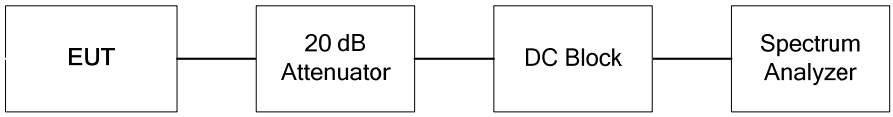
5.6.1. Limit(s)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.6.2. Method of Measurements

KDB 558074 D01 DTS Meas Guidance v03r01 Section 10.3 Method AVGPSD-1.

5.6.3. Test Arrangement

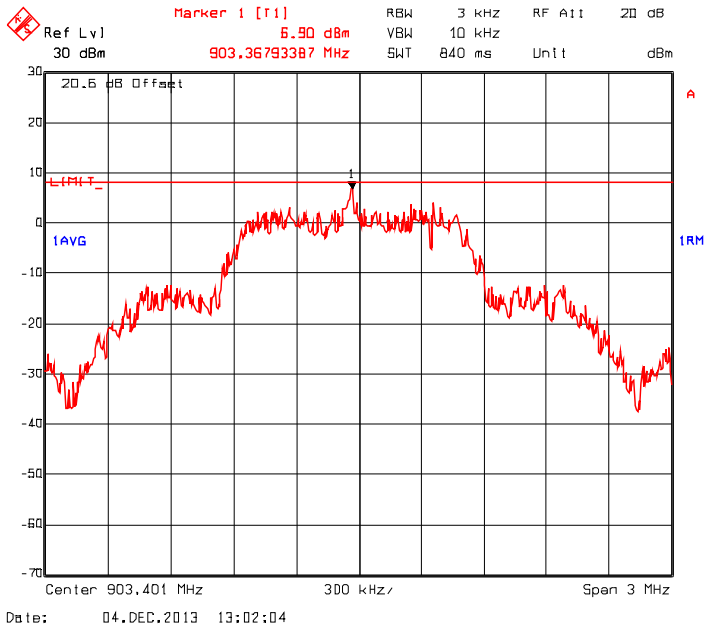


5.6.4. Test Data

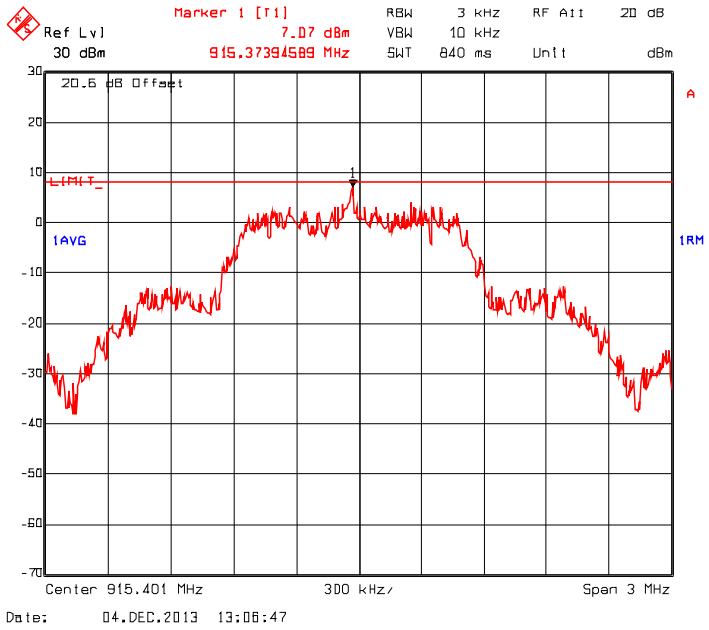
Frequency (MHz)	*PSD in 3 kHz BW (dBm)	Limit (dBm)	Margin (dB)
903.401	6.90	8	-1.10
915.401	7.07	8	-0.93
926.651	7.40	8	-0.60

See the following plots for measurement details.

Plot 5.6.4.1. Power Spectral Density, 903.401 MHz
Detector RMS, Video Trace Averaging with 100 traces



Plot 5.6.4.2. Power Spectral Density, 915.401 MHz
Detector RMS, Video Trace Averaging with 100 traces



Plot 5.6.4.3. Power Spectral Density, 926.651 MHz
Detector RMS, Video Trace Averaging with 100 traces

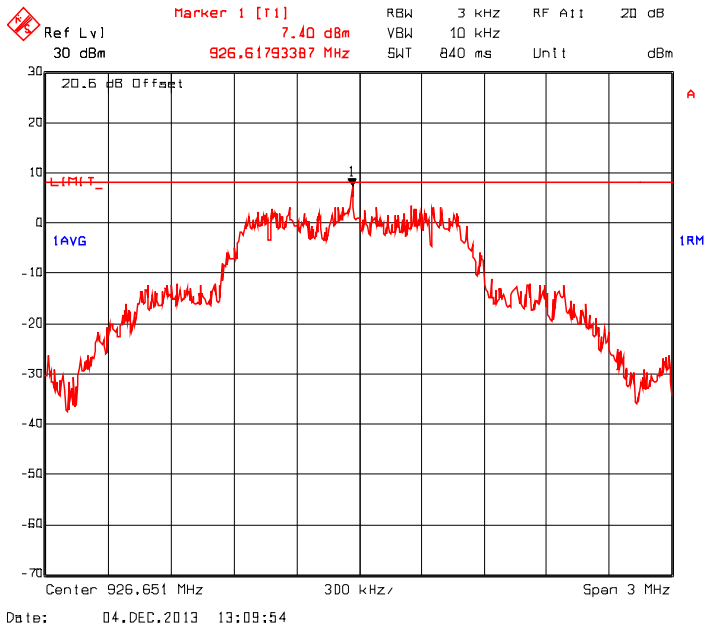


EXHIBIT 6. TEST EQUIPMENT LIST

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Cal. Due Date
Spectrum Analyzer	Hewlett Packard	HP 8593EM	3412A00103	9 kHz–26.5 GHz	06 Feb 2014
Attenuator	Pasternack	PE7010-20	-	DC–2 GHz	11 Jan 2014
L.I.S.N	EMCO	3825/2	8907-1531	0.01 -100 MHz	14 May 2014
Signal Generator	Hewlett Packard	8648C	3443U00391	100 kHz – 3200 MHz	03 Jan 2014
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100077	20 Hz - 40 GHz	08 Nov 2014
Attenuator	Pasternack	PE7024-20	6	DC – 26.5 GHz	Cal on use
DC Block	Hewlett Packard	11742A	12460	0.045 - 26.5 GHz	Cal on use
High Pass Filter	K & L	11SH10-1500/T8000	2	Cut off 900 MHz	Cal on use
Spectrum Analyzer	Rohde & Schwarz	ESU40	100033	20 Hz – 40 GHz	07 Mar 2014
RF Amplifier	AH System	PAM-0118	225	20 MHz – 18 GHz	25 Mar 2014
RF Amplifier	Hewlett Packard	84498	3008A00769	1 – 26.5 GHz	25 Jun 2014
Biconi-Log Antenna	ETS Lindgren	3142B	1575	26 – 3000 MHz	26 Jun 2014
Horn Antenna	ETS Lindgren	3115	5061	1 -18 GHz	08 Oct 2014
Band Reject Filter	Micro-Tronics	BRC50722	001	Cut off 902-928 MHz	Cal on use

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

	Line Conducted Emission Measurement Uncertainty (9 kHz – 30 MHz):	**Measured**	**Limit**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{i=1}^{m} u_i^2(y)}$	**± 1.44**	**± 1.8**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 2.89**	**± 3.6**

7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{i=1}^{m} u_i^2(y)}$	**± 2.39**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.79**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{i=1}^{m} u_i^2(y)}$	**± 2.39**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.78**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{i=1}^{m} u_i^2(y)}$	**± 1.87**	**Under consideration**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 3.75**	**Under consideration**