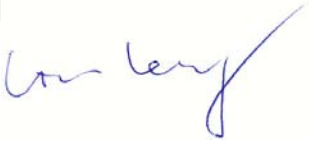
Nemko Test Report:	108544-1TRFWL
Applicant:	Load Systems International, Inc. 4495 Blvd Hamel, suite 110 Québec, QC, G1P 2J7 Canada
Apparatus:	GS075
FCC ID:	QVBGS075
In Accordance With:	FCC Part 15 Subpart C, 15.247 FHSS System and Digitally Modulated Radiators 902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz
Authorized By:	 Heng Lin, EMC/Wireless Specialist
Date:	June 16, 2008
Total Number of Pages:	23

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Section 1 : Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003.

The assessment summary is as follows:

Apparatus Assessed:	GS075
Specification:	FCC Part 15 Subpart C, 15.247
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release
Test Location:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Tests Performed By:	Andrey Adelberg EMC/Wireless Specialist
Test Dates:	June 11, 2008

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.

Section 2 : Equipment Under Test

2.1 Identification of Equipment Under Test (EUT)

The following information identifies the EUT under test:

Type of Equipment:	Anti-Two-Block Switch
Model Name or Number:	GS075
Serial Number:	252
Nemko Sample Number:	3
FCC ID:	QVBGS075
Date of Receipt:	June 9, 2008

2.2 Accessories

The following information identifies accessories used to exercise the EUT during testing:

Description:	Radio Display Unit
Model Name or Number:	GS550
Serial Number:	40600
Nemko Sample Number:	1
Connection Port:	Wireless
Cable Length and Type:	N/A

2.3 EUT Description

The EUT is an Anti-Two-Block sensor. This sensor send alarm mode to display unit by RF (in 902-928 MHz frequency range) when the hook comes too near of the boom tip. Otherwise it's safe mode. The function of the sensor is to send a measured value to the display by RF. Every sensor work with the same pattern: when the CPU detects a variation of the measured value, this value is treated and immediately sent to the display. The difference between the sensor models is the type of the value to measure. From an electronic point of view, only the circuit that read the input will change.

2.4 Technical Specifications of the EUT

Operating Band: 902 – 928 MHz

Operating Frequency: 903 – 927 MHz

Modulation: FSK

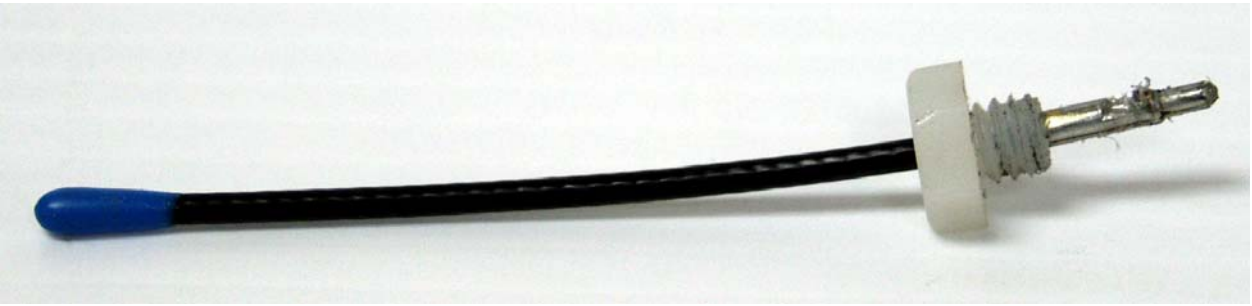
Occupied Bandwidth: 889.4 MHz

Emission Designator: F1D

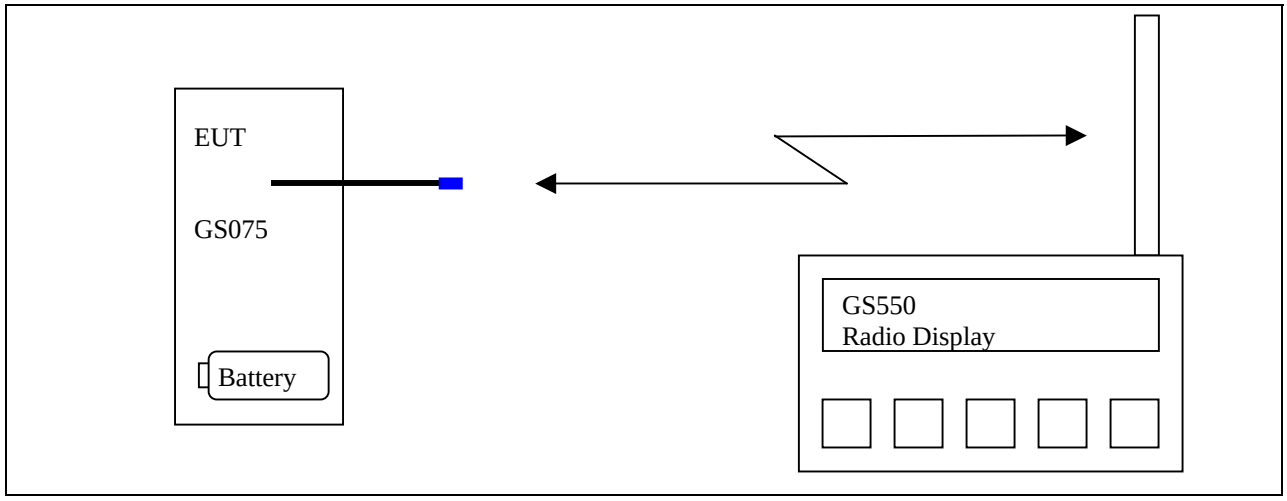
Antenna Data: 0.5 dBi

Antenna Connector: Detachable (see photo below)

Antenna Connector Photo:



2.5 EUT Setup diagram



2.6 Operation of the EUT during testing

Radio Display Unit controlled the EUT operation in terms of changing frequency of transmission and continuous transmission mode.

2.7 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

Section 3 : Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.247
FHSS System and Digitally Modulated Radiators
902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz

3.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 ^{o}C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

3.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95% and can be found in Nemko Canada document MU-003.

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. Date	Next Cal.
Electro-Magnetic Interference Test Chamber	TDK	SAC-3	FA002047	May 06/08	May 06/09
Bilog	Sunol	JB3	FA002108	Jan. 21/08	Jan. 21/09
Flush Mount Turntable	Sunol	FM2022	FA002082	NCR	NCR
Controller	Sunol	SC104V	FA002060	NCR	NCR
Mast	Sunol	TLT2	FA002061	NCR	NCR
50 Coax cable	HUBER + SUHNER	None	FA002022	Sept. 19/07	Sept. 19/08
50 Coax cable	HUBER + SUHNER	None	FA002015	Sept. 19/07	Sept. 19/08
1 – 18 GHz Amplifier	JCA	JCA118-503	FA002091	Oct 2/07	Oct 2/08
Horn Antenna #2	EMCO	3115	FA000825	Jan. 15/08	Jan. 15/09
Spectrum Analyzer	Rohde & Schwarz	FSU46	FA001877	Jan 23/08	Jan 23/09

COU – Calibrate on Use
NCR – No Calibration Required

Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart C : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No : not applicable / not relevant.

Y Yes : Mandatory i.e. the apparatus shall conform to these tests.

N/T Not Tested, mandatory but not assessed. (See Report Summary)

4.1 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of power supply	N	
15.207(a)	Powerline Conducted Emissions	N	
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.247(a)(1)	Frequency hopping systems	N	
15.247(a)(1)(i)	Frequency hopping systems operating in the 902-928 MHz band	N	
15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725-5850 MHz band	N	
15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400-2483.5 MHz band	N	
15.247(a)(2)	Minimum 6 dB Bandwidth	Y	PASS
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	N	
15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902-928 MHz band	N	
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	Y	PASS
15.247(b)(4)	Maximum peak output power	Y	PASS
15.247(c)(1)	Fixed point-to-point Operation with directional antenna gains greater than 6 dBi	N	
15.247(c)(2)	Transmitters operating in the 2400-2483.5 MHz band that emit multiple directional beams	N	
15.247(d)	Conducted Spurious Emissions	Y	PASS
15.247(e)	Power Spectral Density for Digitally Modulated Devices	Y	PASS
15.247(f)	Time of Occupancy for Hybrid Systems	N	

Appendix A : Test Results

Clause 15.209(a) Radiated Emissions within Restricted Bands

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvoltsmeter)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Results: Pass

Additional Observations:

The Spectrum was searched from 30MHz to the 10th Harmonic.

These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.

All measurements for spurious emissions were performed using a Quasi Peak detector with 100 kHz RBW below 1GHz and a Peak Detector with 1 MHz RBW above 1 GHz.

The EUT was measured on three orthogonal axis.

All radiated measurements were performed at 3m distance.

No Radiated Spurious Emissions were observed within 20 dB below the limit line within the restricted bands.

Clause 15.247(a)(2) Minimum 6 dB Bandwidth

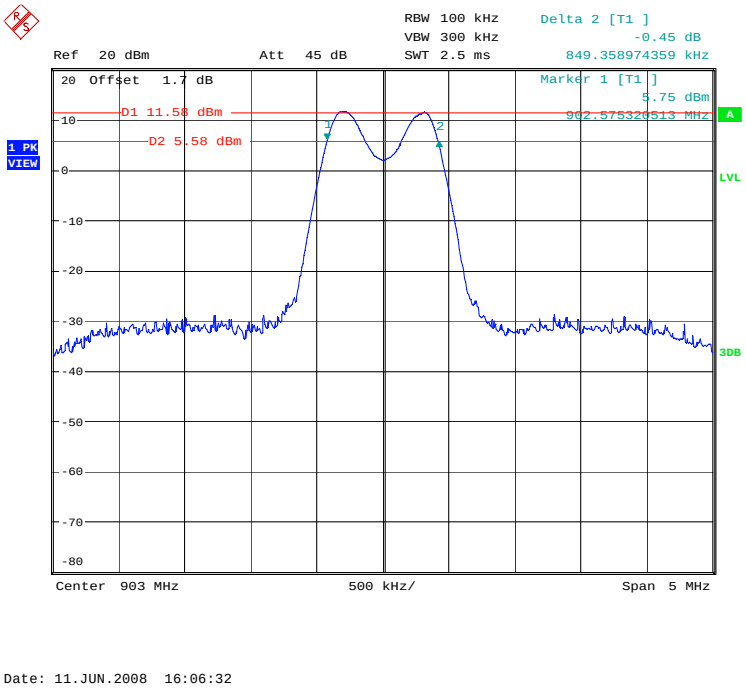
Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

Test Results: Pass

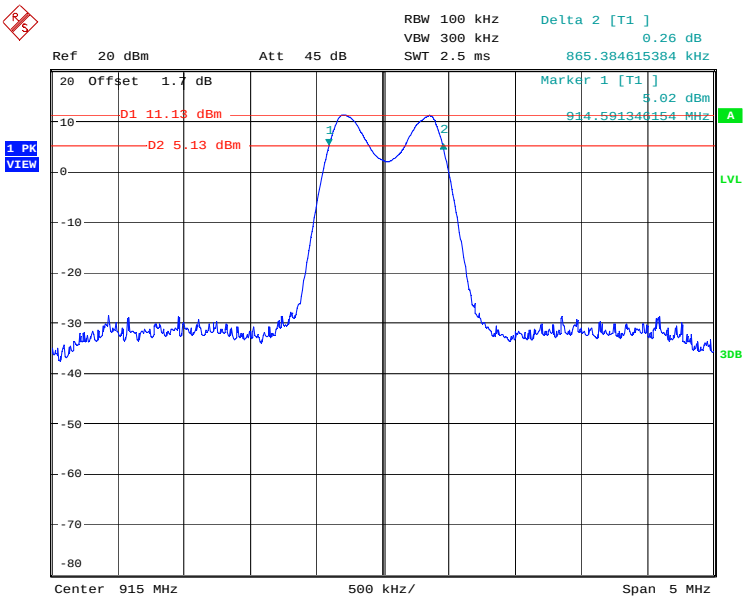
6dB Bandwidth:

Channel	Frequency, MHz	6 dB Bandwidth, kHz	Limit, kHz	Margin, kHz
Low	903	849.35	500	349.35
Mid	915	865.38	500	365.38
High	927	889.42	500	389.42

Low channel:



Mid channel:



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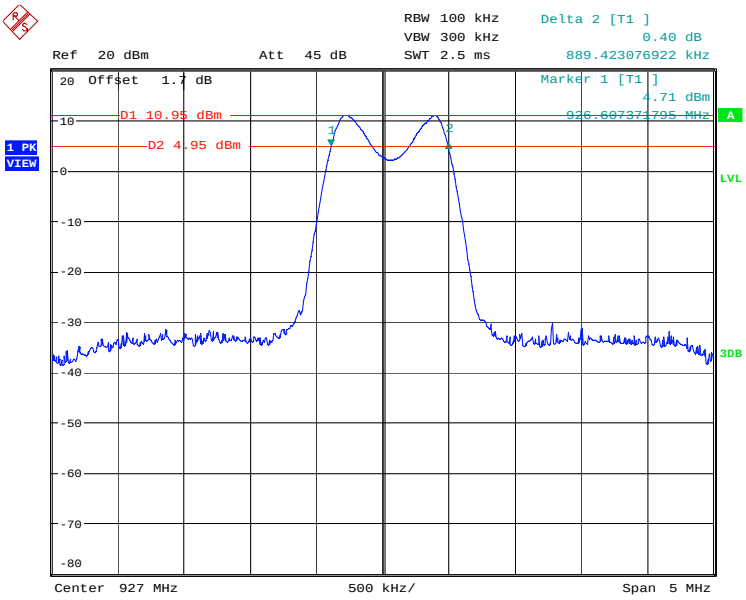
High channel:



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Clause 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

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 signalling 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.

Clause 15.247(b)(4) Maximum peak output power

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.

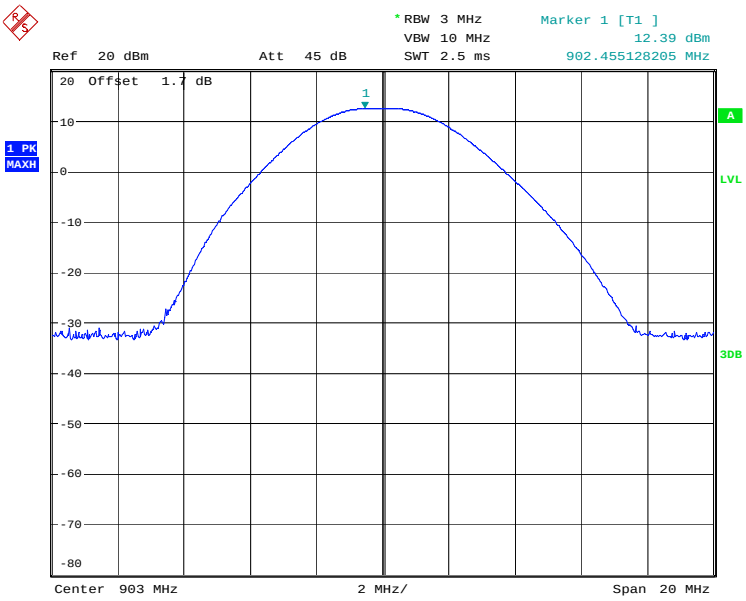
Test Results: Pass

Conducted Output Power:

Channel Range	Measured Output Power		Output Power Limit		Margin	
	dBm	W	dBm	W	dBm	W
Low	12.39	0.01733804	30	1	17.61	0.9826620
Mid	12.16	0.01644372	30	1	17.84	0.9835563
High	11.99	0.01581248	30	1	18.01	0.9841875

Channel range	Output power, dBm	Antenna Gain, dBi	EIRP, dBm	EIRP Limit, dBm	Margin, dBm
Low	12.39	0.5	12.89	36.0	23.11
Mid	12.16	0.5	12.66	36.0	23.34
High	11.99	0.5	12.49	36.0	23.51

Low Channel:



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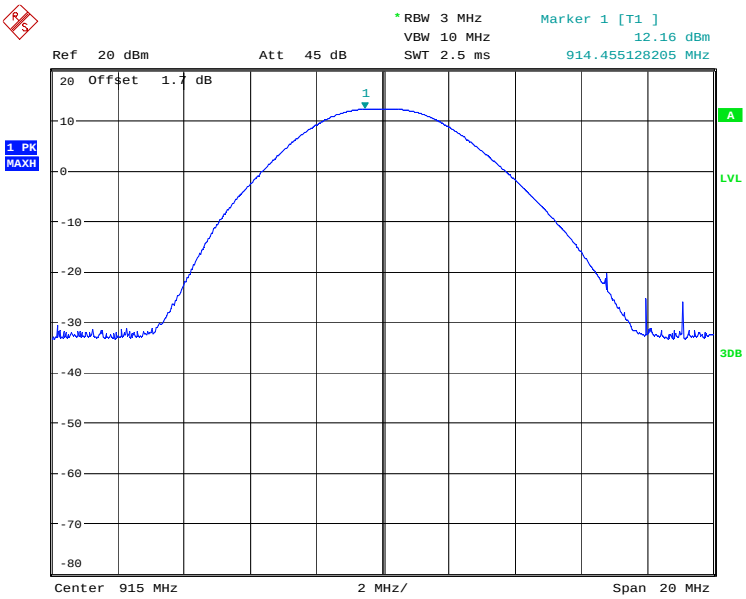
Mid Channel:



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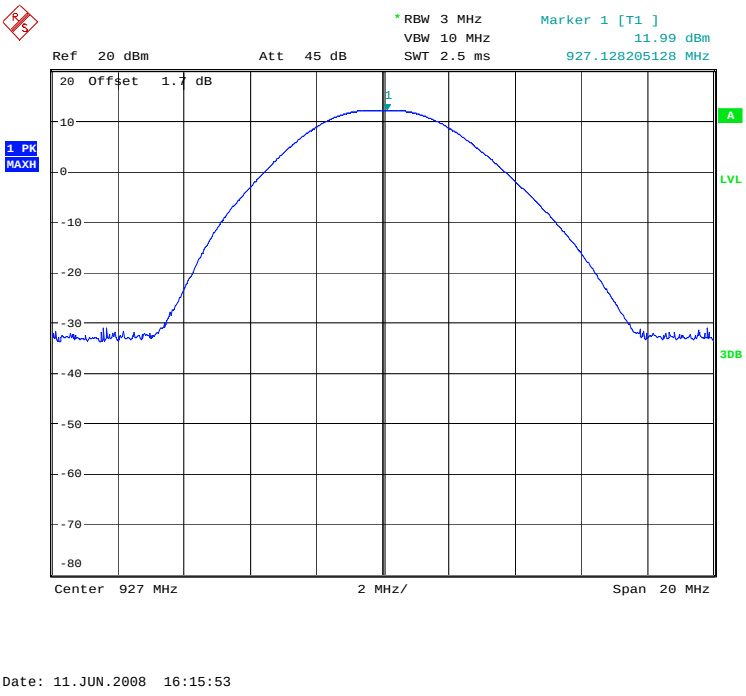
High Channel:



Clause 15.247(d) Conducted Spurious Emissions

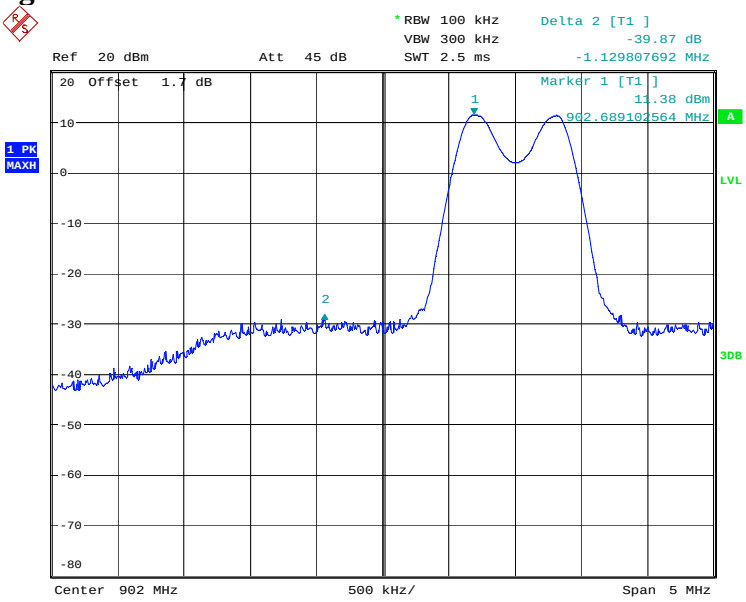
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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)).

Test Results: Pass

Conducted Spurious Emissions:

Frequency, MHz	RF Power below carrier, dB	Limit, dB	Margin, dB
Low Channel			
901.559	39.87	20.00	19.87
1803.509	56.98	20.00	36.98
Mid Channel			
1819.487	57.96	20.00	37.96
High Channel			
928.721	41.74	20.00	21.74
1851.442	59.43	20.00	39.43

Lower Band Edge:



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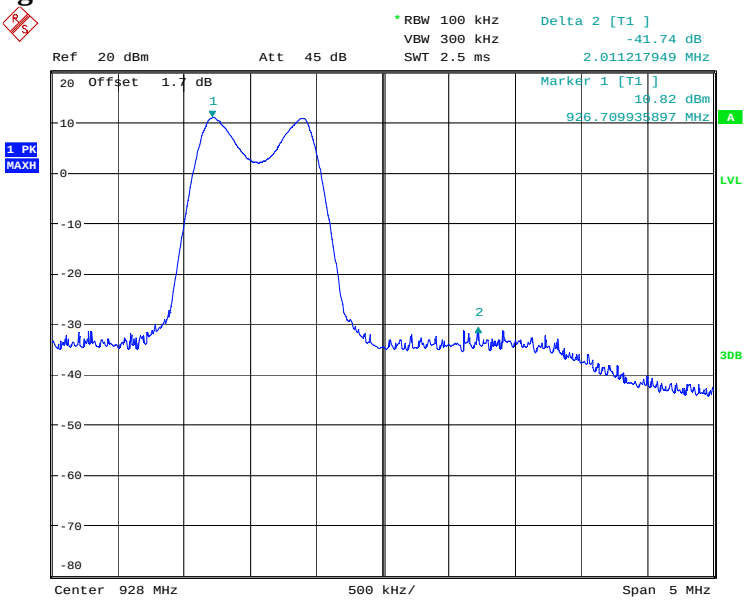
Upper Band Edge:



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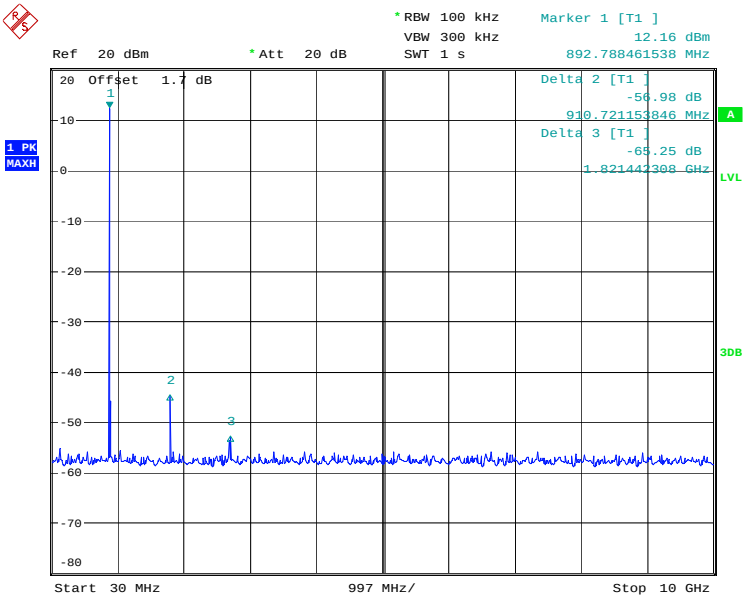
Conducted Spurious Emissions
Low Channel:



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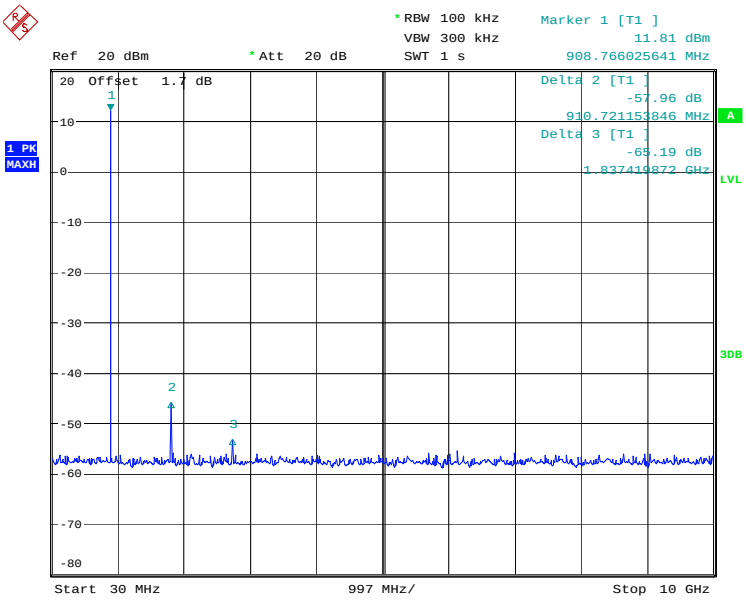
Conducted Spurious Emissions
Mid Channel:



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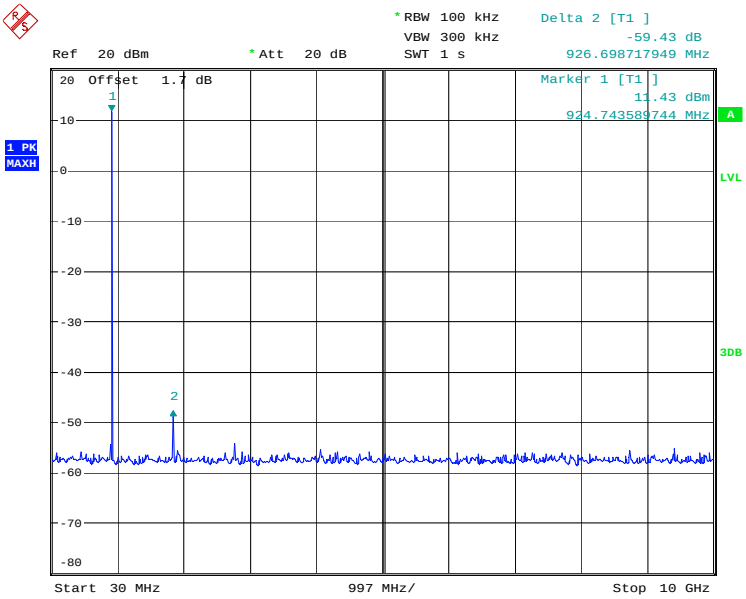
Conducted Spurious Emissions
High Channel:



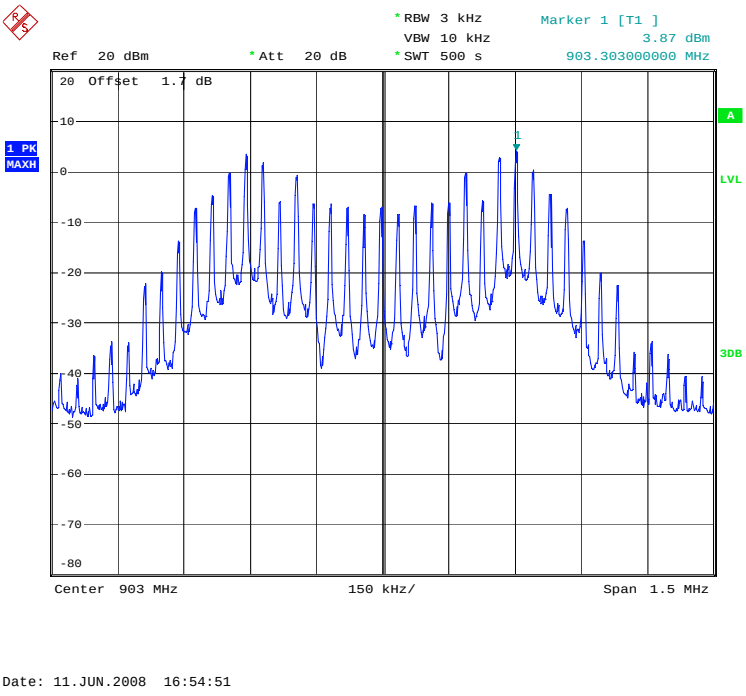
Clause 15.247(e) Power Spectral Density for Digitally Modulated Devices

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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

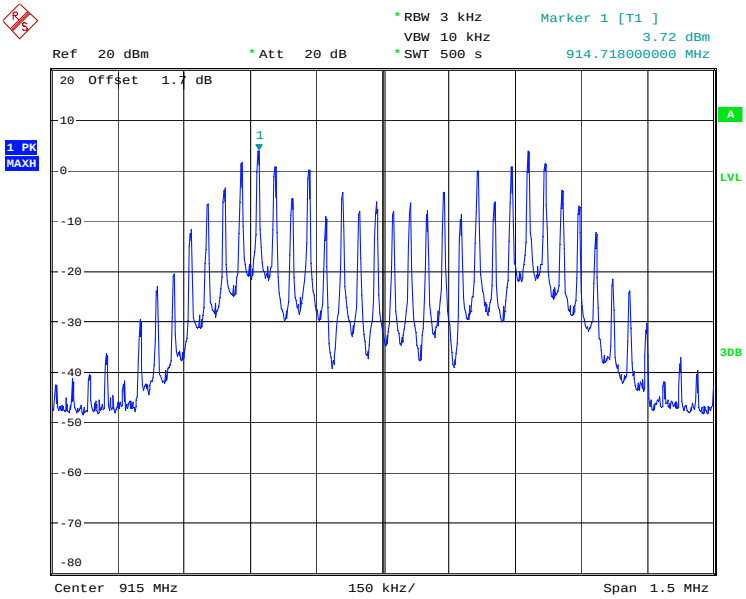
Test Results: Pass

Channel	Frequency, MHz	Power Spectral Density, dBm/3kHz	Limit, dBm/3kHz	Margin, dB
Low	903	3.87	8.00	4.13
Mid	915	3.72	8.00	4.28
High	927	4.01	8.00	3.99

Power Spectral Density
Low Channel



Power Spectral Density
Mid Channel



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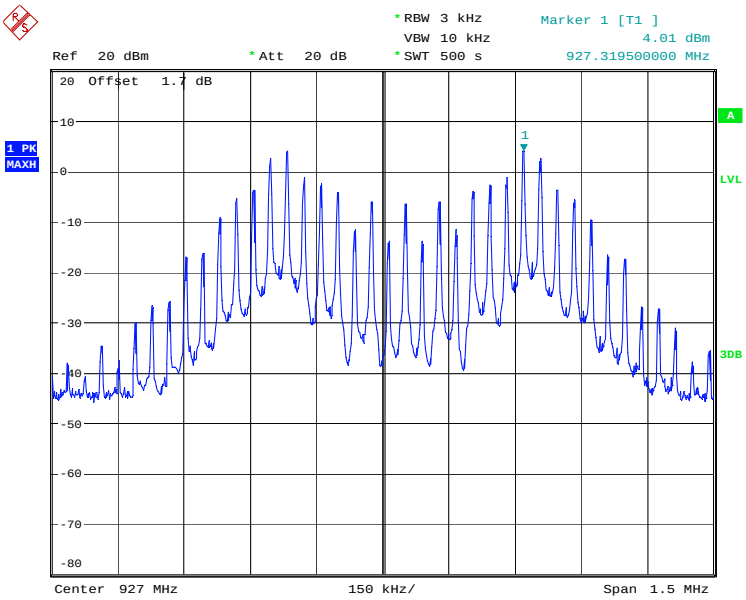
Power Spectral Density
High Channel



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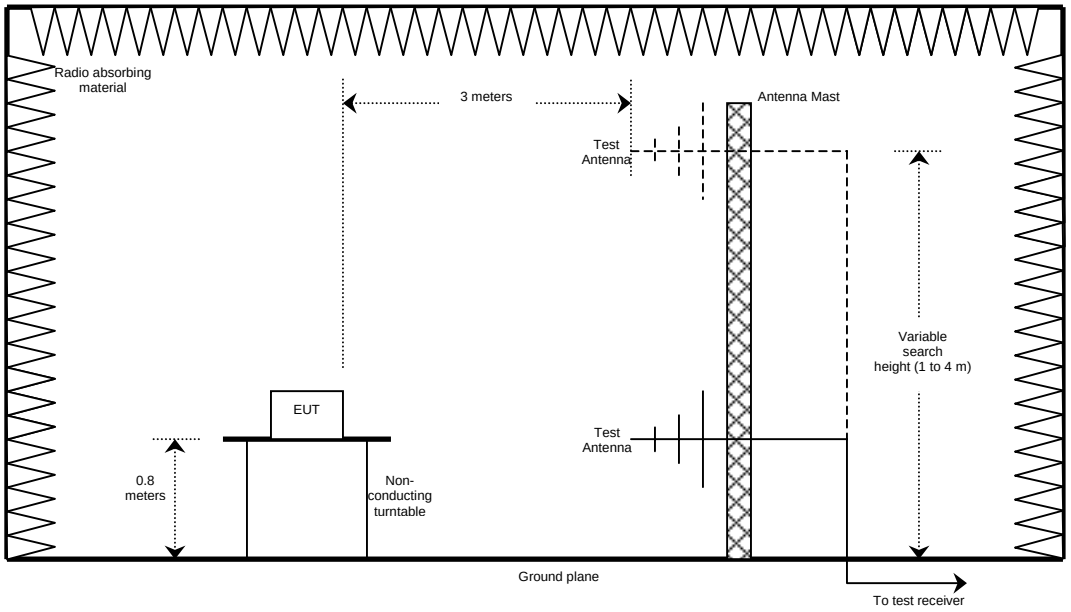
Appendix B : Setup Photographs

Spurious Emissions Setup:

Transmitter power, PSD, Occupied Bandwidth, Conducted Spurious emissions, frequency hopping Setup:

Appendix C : Block Diagram of Test Setups

Radiated Emissions above 30MHz Test Site



Transmitter power, PSD, Occupied Bandwidth, Conducted Spurious emissions, frequency hopping Setup