Nemko Test Report: 10217368RUS1rev3

Applicant:
Overhead Door
TREQ Center, Suite B2170 French Settlement Road
Dallas, TX 75212
USA

Equipment Under Test: (E.U.T.)
GM3T and OM3T

FCC ID.: B8Q-315390U
IC: 2133A-315390U

In Accordance With:
FCC Part 15, Subpart C 15.231 and
Industry Canada RSS-210, Issue 8
For Low Power Transmitters Operating Periodically
In The Band 40.66 - 40.77 MHz And Above 70 MHz

Tested By:
Nemko USA, Inc.
802 N. Kealy
Lewisville, TX 75057-3136

TESTED BY: _____ **DATE:** **05 March 2012**
David Light, Senior Wireless Engineer

APPROVED BY: _____ **DATE:** **6 March 2012**
Mike Cantwell

Total Number of Pages: 20

TABLE OF CONTENTS

Section 1. Summary of Test Results

Manufacturer: Overhead Door

Model No.: GM3T and OM3T

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.231 and Industry Canada RSS-210. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC and Industry Canada.

☒	New Submission	☒	Production Unit
☐	Class II Permissive Change	☐	Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

NVLAP®
LAB CODE: 100426-0

Summary Of Test Data

Name of Test	Paragraph No.	Results
Transmission Requirements	15.231(a) / A1.1.1	Complies
Radiated Emissions	15.231(b) / A1.1 Table A	Complies
Occupied Bandwidth	15.231(c) / A1.1.3	Complies
Frequency Tolerance	15.231(d) / A1.1.4	NA
Alternate Field Strength Requirements	15.231(e) / A1.1 Table B	NA
Powerline Conducted Emissions	15.207 & RSS-Gen 7.2.4	NA

Footnotes:

1) The device does not operate between 40.66 to 40.70 MHz
2) The device does not operate at a pre-determined periodic rate.
3) The device is battery powered.

Revisions:

Rev1 – Added test data for 315 MHz mode.
Rev2 – Changed model name.

Section 2. Equipment Under Test (E.U.T.)

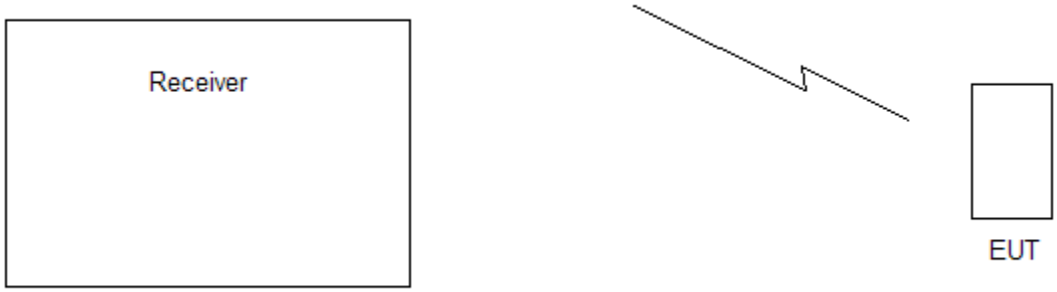
General Equipment Information

Frequency Range:	315 and 390 MHz
Operating Frequency(ies) of Sample:	315 and 390 MHz
Type of Emission:	OOK
Emission Designator:	128KL1D
Supply Power Requirement:	3 Vdc (lithium battery)

Description of E.U.T.

Hand held or visor mounted wireless door opener.

System Diagram



Section 3. Transmission Requirements

NAME OF TEST: Transmission Requirements	PARA. NO.: 15.231(a) / A1.1.1
TESTED BY: David Light	DATE: 09 January 2012

Minimum Standard:

15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.

15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.

15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.

15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

15.231(a)(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm.

Test Results: Complies.

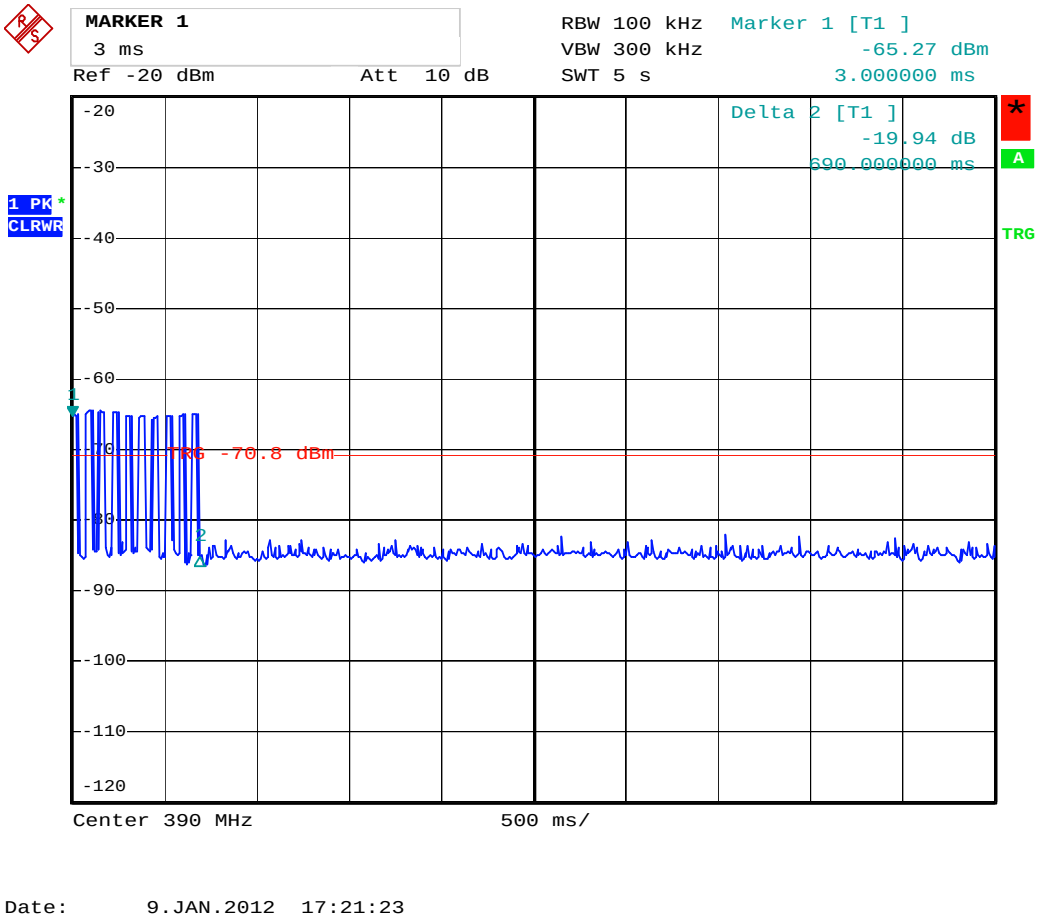
Test Data: Compliance was determined by verification of technical specifications and a functional test on the equipment.

Rationale for Compliance with Transmission Requirements

15.231(a)(1) **15.231(a)(2) :**	☒ Manual activation ☐ Automatic activation	TX deactivation time:690 ms
15.231(a)(3) :	☐ Regular, predetermined transmissions ☐ Polling or supervisory transmissions	TX rate and duration: N/A
15.231(a)(4) :	☐ Alarm device operating during the pendancy of alarm condition ☒ Non-alarm device	

Test Data – Transmission Requirements

Tx Deactivation Time



Section 4. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.231(b) / A1.1
TESTED BY: David Light	DATE: 09 January 2012 05 March 2012

Minimum Standard:

Permissible Field Strength Limits (Momentarily Operated Devices

Fundamental Frequency (MHz)	Field Strength of Fundamental Microvolts/Meter at 3 meters; (watts)	Field Strength of Unwanted Emissions Microvolts/Meter at 3 meters; (watts)
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

Notes:

# Use quasi-peak or averaging meter. ** Linear interpolation with frequency F in MHz*	*For 130 - 174 MHz: FS (microvolts/m) = (56.82 x F) - 6136* *For 260 - 470 MHz: FS (microvolts/m) = (41.67 x F) - 7083*

Any emissions that fall within the restricted bands of 15.205 shall not exceed the following limits:

Frequency (MHz)	Field Strength (μV/m @ 3m)	Field Strength (dBμV/m @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Test Results: Complies. The worst-case emission level is 74.5 dBμV/m @ 3m at 315 MHz. This is 1.1 dB below the specification limit.

Test Data: See attached table.

Above 1 GHz a spectrum analyzer and low noise amplifier are used to measure emission levels. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was 1 MHz, Peak detector.

Test Data - Radiated Emissions (09 January 2012)

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Duty Cycle (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
390	V	-6.0	63.9	16.3	2.3	0.0	76.5	79.2	-2.7	Pass	Carrier
390	H	-6.0	59.7	16.3	2.3	0.0	72.3	79.2	-6.9	Pass	Carrier
780	V	-6.0	31.6	21.9	3.3	0.0	50.8	59.2	-8.4	Pass	
780	H	-6.0	35.9	21.9	3.3	0.0	55.1	59.2	-4.1	Pass	
1170	V	-6.0	57.9	24.9	3.3	30.0	50.1	54.0	-3.9	Pass	
1170	H	-6.0	50.7	24.9	3.3	30.0	42.9	54.0	-11.1	Pass	
1560	V	-6.0	46.9	25.6	3.7	31.4	38.8	54.0	-15.2	Pass	
1560	H	-6.0	52.5	25.6	3.7	31.4	44.4	54.0	-9.6	Pass	
1950	V	-6.0	50.5	28.7	4.1	32.2	45.1	59.2	-14.1	Pass	
1950	H	-6.0	48.0	28.7	4.1	32.2	42.6	59.2	-16.6	Pass	
2340	V	-6.0	42.6	28.8	6.0	32.1	39.3	54.0	-14.7	Pass	Noise floor
2340	H	-6.0	42.6	28.8	6.0	32.1	39.3	54.0	-14.7	Pass	Noise floor
2730	V	-6.0	43.0	29.6	6.4	32.6	40.4	54.0	-13.6	Pass	**Noise floor**
2730	H	-6.0	43.0	29.6	6.4	32.6	40.4	54.0	-13.6	Pass	Noise floor
3120	V	-6.0	42.0	31.6	6.4	32.3	41.7	59.2	-17.5	Pass	Noise floor
3120	H	-6.0	42.0	31.6	6.4	32.3	41.7	59.2	-17.5	Pass	Noise floor
3510	V	-6.0	42.0	32.0	7.0	32.2	42.8	59.2	-16.4	Pass	Noise floor
3510	H	-6.0	42.0	32.0	7.0	32.2	42.8	59.2	-16.4	Pass	Noise floor
3900	V	-6.0	44.0	32.9	7.6	32.0	46.5	54.0	-7.5	Pass	
3900	H	-6.0	44.3	32.9	7.6	32.0	46.8	54.0	-7.2	Pass	

The spectrum was searched from 30 MHz to 4 GHz.
The device was tested in three orthogonal axes to determine worst-case spurious emissions.
The device was tested with a fresh battery.

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
1016	Preamplifier	Hewlett Packard	8449A	2749A00159	20-Jul-2011	20-Jul-2012
1025	Preamplifier, 25dB	Nemko USA, Inc.	LNA25	399	23-Feb-2012	23-Feb-2013
1061	Filter, Tunable Notch	K&L	3TNF-200/400-N/N	81	N/R	
1304	Antenna, Horn	Electro Metrics	RGA-60	6151	24-Nov-2010	24-Nov-2012
1763	Antenna, Bilog	Schaffner	CBL 6111D	22926	11-Feb-2011	11-Feb-2012
1767	Receiver	Rohde & Schwartz	ESIB26	837491/0002	09-Dec-2011	09-Dec-2012
1783	Cable Assy, 3m Chamber	Nemko	Chamber		26-Sep-2011	26-Sep-2012

Test Data - Radiated Emissions (05 March 2012)

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Det. Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
315	V	-6.0	45.6	14.1	2.3	0.0	56.0	75.6	-19.6	Pass	
315	H	-6.0	64.1	14.1	2.3	0.0	74.5	75.6	-1.1	Pass	
630	V	-6.0	17.0	20.1	3.3	0.0	34.4	55.6	-21.2	Pass	Noise Floor
630	H	-6.0	20.6	20.1	3.3	0.0	38.0	55.6	-17.6	Pass	
945	V	-6.0	19.0	24.3	3.3	0.0	40.6	55.6	-15.0	Pass	Noise Floor
945	H	-6.0	22.0	24.3	3.3	0.0	43.6	55.6	-12.0	Pass	
1260	V	-6.0	47.8	25.6	3.7	31.4	39.7	55.6	-15.9	Pass	
1260	H	-6.0	53.5	25.6	3.7	31.4	45.4	55.6	-10.2	Pass	
1575	V	-6.0	46.3	25.6	4.1	32.2	37.8	54.0	-16.2	Pass	
1575	H	-6.0	53.0	25.6	4.1	32.2	44.5	54.0	-9.5	Pass	
1890	V	-6.0	44.0	28.4	6.0	32.1	40.3	55.6	-15.3	Pass	Noise Floor
1890	H	-6.0	47.1	28.4	6.0	32.1	43.4	55.6	-12.2	Pass	
2205	V	-6.0	43.6	28.7	6.4	32.6	40.1	54.0	-13.9	Pass	Noise Floor
2205	H	-6.0	50.0	28.7	6.4	32.6	46.5	54.0	-7.5	Pass	
2520	V	-6.0	47.5	29.8	6.4	32.3	45.4	55.6	-10.2	Pass	
2520	H	-6.0	46.3	29.8	6.4	32.3	44.2	55.6	-11.4	Pass	
2835	V	-6.0	42.0	29.8	7.0	32.2	40.6	54.0	-13.4	Pass	Noise Floor
2835	H	-6.0	42.0	29.8	7.0	32.2	40.6	54.0	-13.4	Pass	Noise Floor
3150	V	-6.0	43.0	31.6	7.6	32.0	44.2	55.6	-11.4	Pass	Noise Floor
3150	H	-6.0	43.0	31.6	7.6	32.0	44.2	55.6	-11.4	Pass	Noise Floor

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
1016	Preamplifier	Hewlett Packard	8449A	2749A00159	20-Jul-2011	20-Jul-2012
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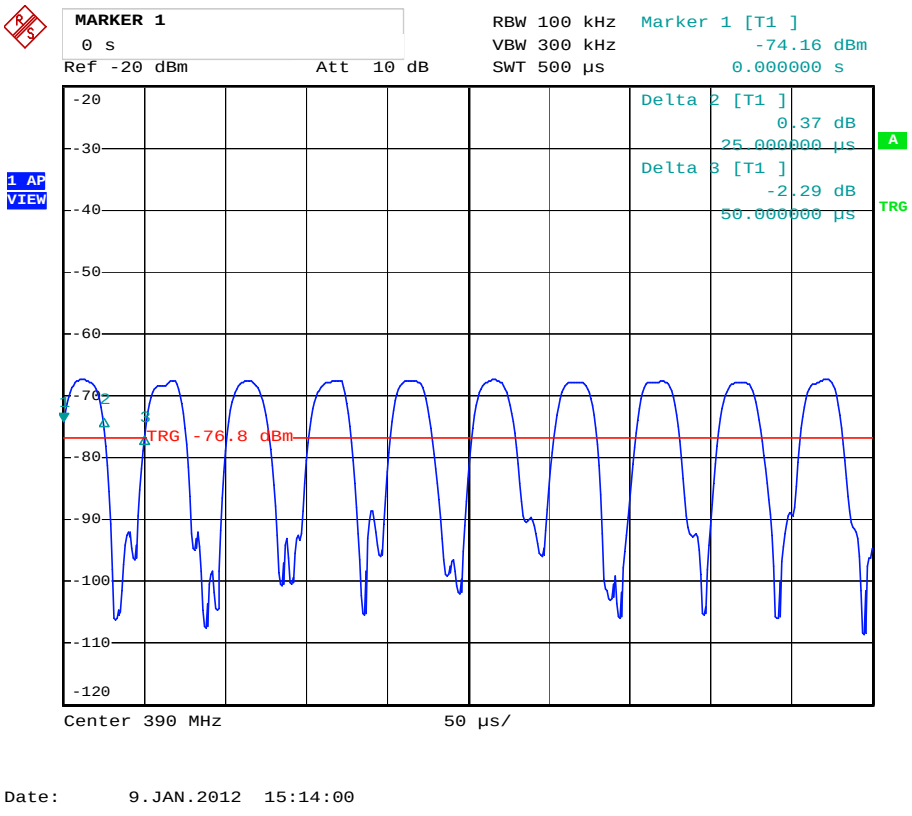
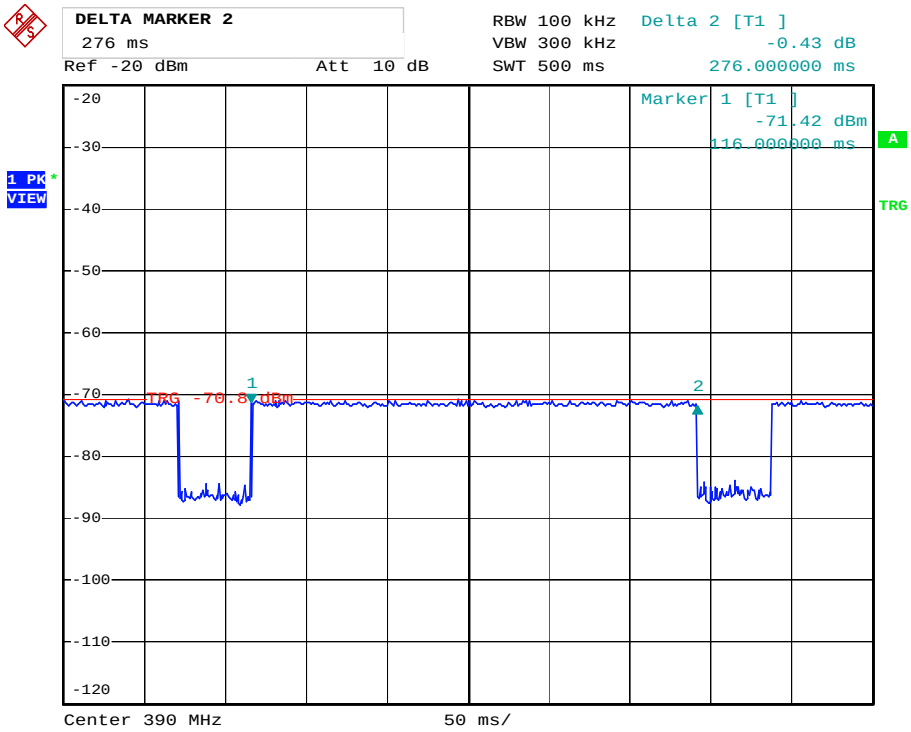
The spectrum was searched from 30 MHz to 4 GHz.
The device was tested with a fresh battery.

Duty Cycle Calculation



Duty Cycle Calculation



Duty Cycle = 20 log (T_{ON}/100 ms) = 20 log (50/100) = -6 dB

Section 5. Occupied Bandwidth

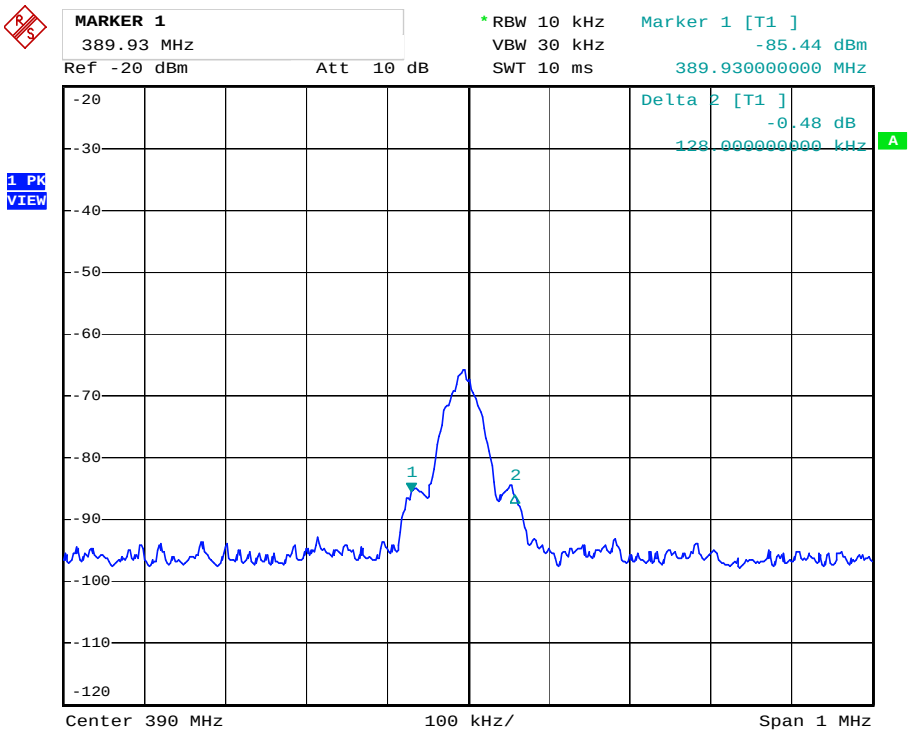
NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.231(c) / A1.1.3
TESTED BY: David Light	DATE: 09 January 2012 05 March 2012

Minimum Standard: The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Results: Complies. See attached graph.

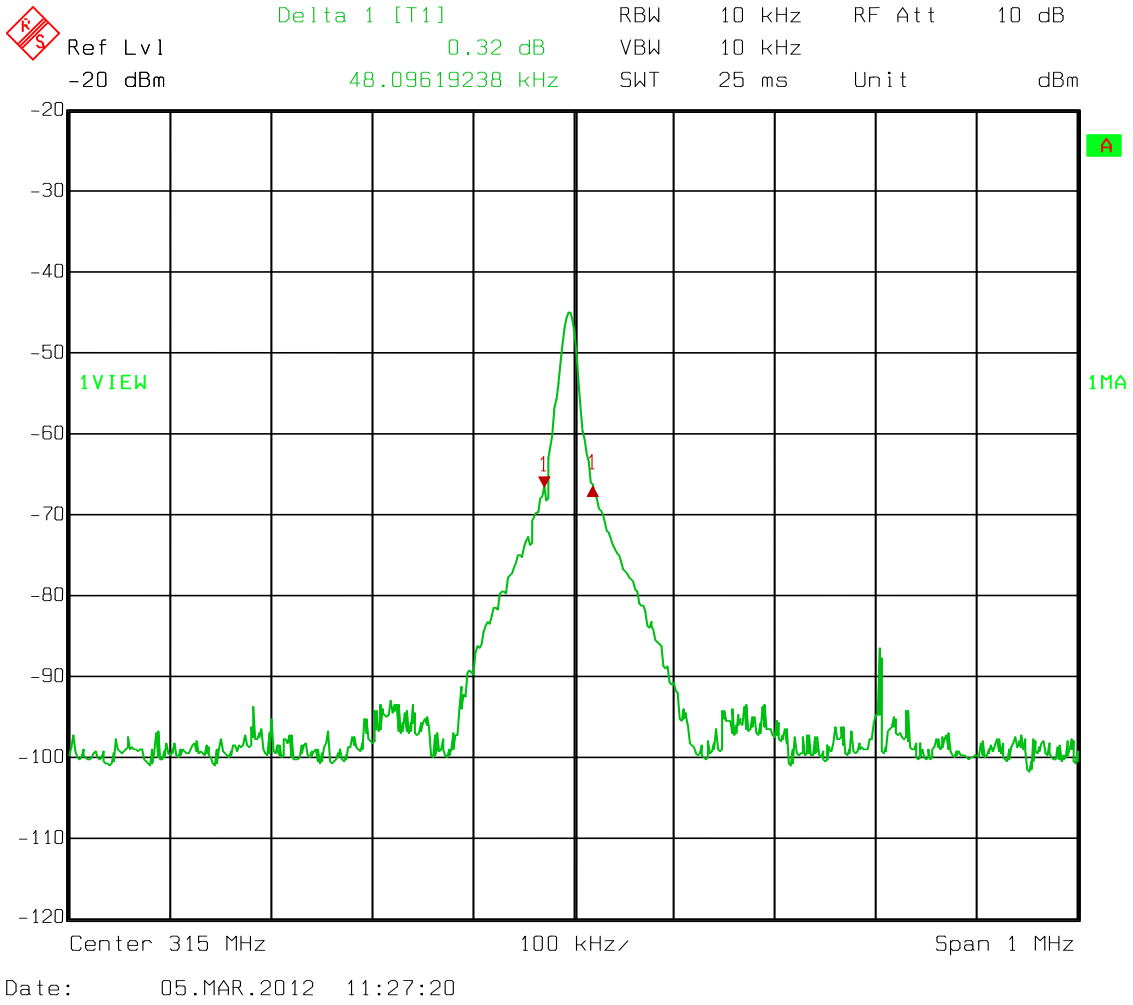
Test Data: See attached graph.

Test Data – Occupied Bandwidth (09 January 2012)



Limit = 975 kHz

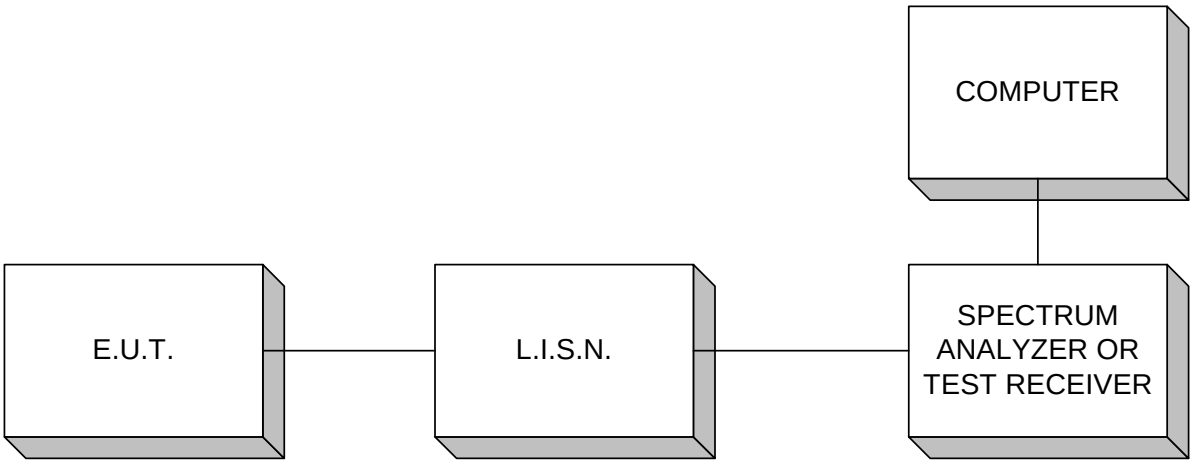
Test Data – Occupied Bandwidth (05 March 2012)



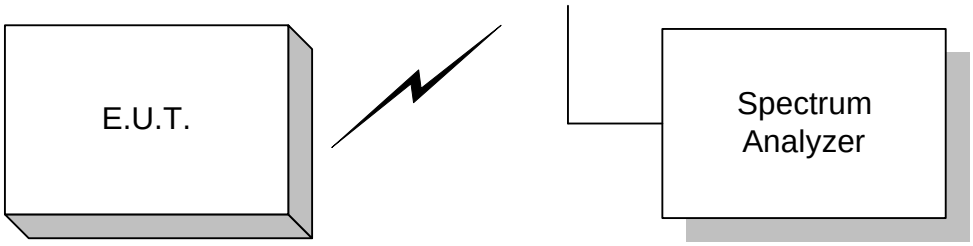
Limit = 787.5 kHz

Section 6. Block Diagrams

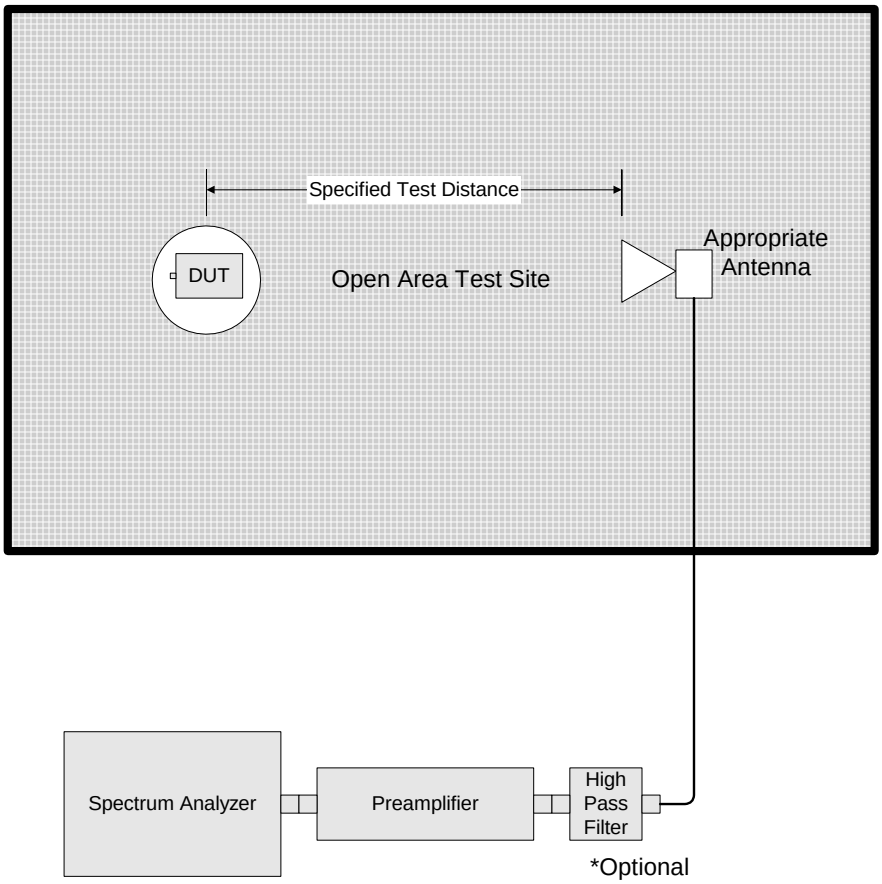
Conducted Emissions



Occupied Bandwidth, Duty Cycle



Outdoor Test Site For Radiated Emissions



Radiated Emissions

The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.

ANNEX A - RESTRICTED BANDS

Annex A Restricted Bands of Operation

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	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	Above 38.6
13.36 - 13.41			