

Nemko Test Report: 4L0778RUS1

Applicant: Foundton Company LTD
Room 1729, 17/F., Star House
3 Salisbury Road, Tsim Sha Tsui
Kowloon, Hong Kong

**Equipment Under Test:
(E.U.T.)** Radio Remote Lantern

In Accordance With: **FCC Part 15, Subpart C, Paragraph 15.231**
For Low Power Transmitters Operating Periodically
In The Band 40.66 - 40.77 MHz And Above 70 MHz

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

Authorized By: 
Tom Tidwell, Frontline Group Manager

Date: 17 Feb. 2005

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EQUIPMENT: **Radio Remote Lantern**Test Report Number: **4L0778RUS1****Section 1. Summary of Test Results**

Manufacturer: Foundton Company LTD

Model No.: Radio Remote Lantern

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. All tests were conducted using measurement procedure ANSI C63.4-2001. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.



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. NONE
See " Summary of Test Data".

**NVLAP LAB CODE: 100426-0**

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This report applies only to the items tested.

Summary Of Test Data

Name of Test	Paragraph No.	Results
Transmission Requirements	15.231(a)	Complies
Radiated Emissions	15.231(b)	Complies
Occupied Bandwidth	15.231(c)	Complies
Frequency Tolerance	15.231(d)	NA
Alternate Field Strength Requirements	15.231(e)	NA
Powerline Conducted Emissions	15.207	NA

Footnotes:

- 1) The device operates at 318 MHz
- 2) The device is not designed for periodic transmissions at pre-determined intervals.
- 3) The device is battery powered.

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

General Equipment Information

Frequency Range:	318 MHz Nominal
Operating Frequency(ies) of Sample:	317.64 MHz
Supply Power Requirement:	3 Vdc
Duty Cycle Correction Factor:	-5.2 dB

Description of E.U.T.

Short range control of camping lantern

Justification

The E.U.T. was configured for testing as per typical installation.

The following combinations were investigated to establish worst case configuration:

- (1) Lying flat (worst case)
- (2) Lying on long edge
- (3) Upright on short edge

Exercise Mode

The E.U.T. exercise mode used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

Exercise mode:

Transmit

Section 3. Transmission Requirements

NAME OF TEST: Transmission Requirements	PARA. NO.: 15.231(a)
TESTED BY: David Light	DATE: 1/12/2005

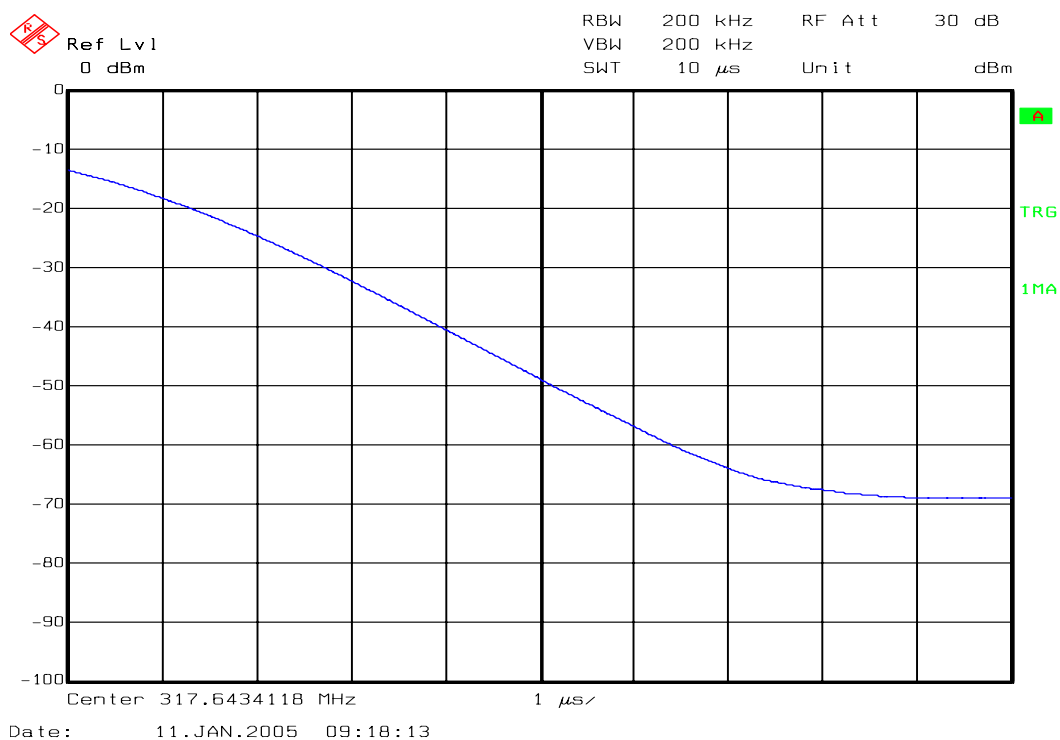
- Minimum Standard:**
- 15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.
- 15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.
- 15.231(a)(2) 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.**

EQUIPMENT: **Radio Remote Lantern**Test Report Number: **4L0778RUS1****Rationale for Compliance with Transmission Requirements**

15.231(a)(1)	☒ Manual activation	TX deactivation time: 8 μ S
15.231(a)(2) :	☐ Automatic activation	
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 pendency of alarm condition ☒ Non-alarm device	



The transmitter is manually activated and transmits a unique ID code to activate the lantern.

EQUIPMENT: **Radio Remote Lantern**Test Report Number: **4L0778RUS1****Section 4. Radiated Emissions**

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.231(b)
TESTED BY: David Light	DATE: 1/12/2005

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.	For 130 - 174 MHz: $FS \text{ (microvolts/m)} = (56.82 \times F) - 6136$
* Linear interpolation with frequency F in MHz	For 260 - 470 MHz: $FS \text{ (microvolts/m)} = (41.67 \times F) - 7083$

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

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ @ 3m)	Field Strength (dB @ 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 53.2 dB $\mu\text{V/m}$ @ 3m at 955.5 MHz. This is 2.5 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.

In the case of handheld equipment, the E.U.T. is rotated in three planes to obtain worst-case results.

The device was tested with new batteries.

The spectrum was searched from 30 MHz to 3200 MHz.

EQUIPMENT: **Radio Remote Lantern**Test Report Number: **4L0778RUS1**

Test Data - Radiated Emissions



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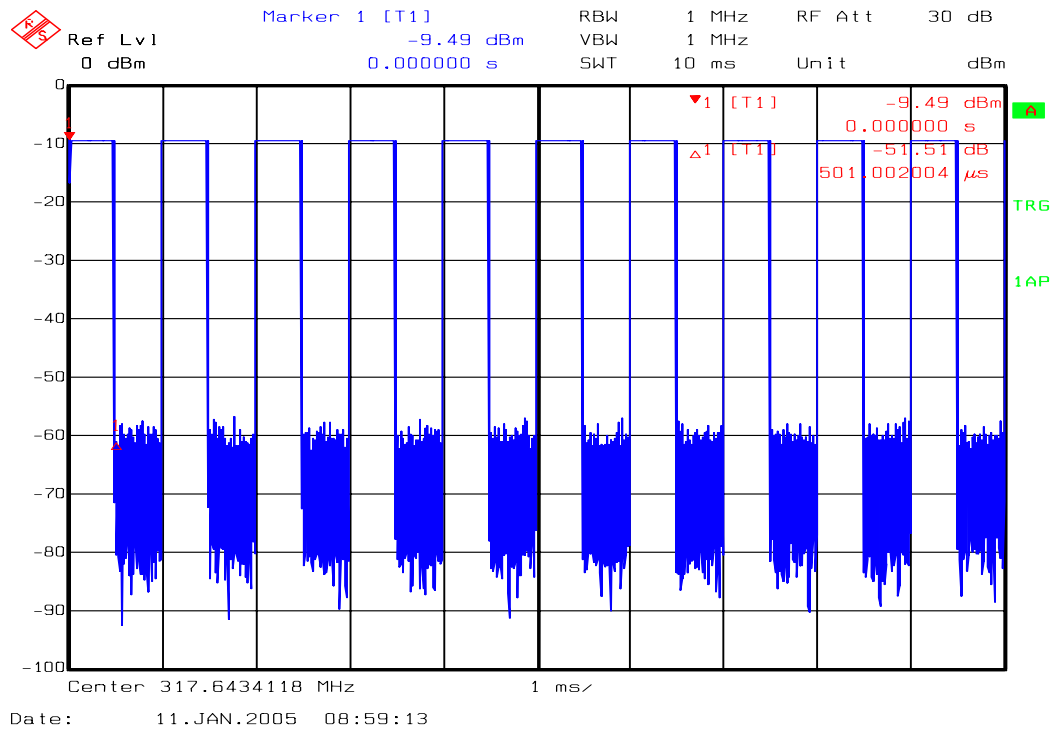
Radiated Emissions Data

Complete	<u> X </u>	Job #:	<u>4L0778R</u>	Test #:	<u>REHE-01</u>
Preliminary	<u> </u>		Page <u> 1 </u>	of	<u> 1 </u>
Client Name : <u>Foundton Company LTD</u>					
EUT Name : <u>Radio Remote Lantern</u>					
EUT Model # : <u>None</u>					
EUT Part # : <u>None</u>					
EUT Serial # : <u>None</u>					
EUT Config : <u>Lying flat - Tx mode</u>					
Specification : <u>15.231</u>					
Rod. Ant. #:	<u> </u>	Temp. (deg. C) :	<u> 23 </u>	Reference :	<u> </u>
Bicon Ant. #:	<u> 760 </u>	Humidity (%) :	<u> 55 </u>	Date :	<u>01/11/05</u>
Log Ant. #:	<u> 1311 </u>	EUT Voltage :	<u> 3 </u>	Time :	<u>13:00</u>
Horn Ant. #:	<u> 1304 </u>	EUT Frequency :	<u> DC </u>	Staff :	<u>D. Light</u>
		Phase:	<u> </u>	Photo ID:	<u>4L0778R RE-01</u>
Cable#:	<u> 1983 </u>	Location:	<u>A OATS</u>	Peak Bandwidth:	<u>100 KHz</u>
Preamplifier#:	<u> 791 </u>	Distance:	<u> 3 </u>	Video Bandwidth:	<u>100 KHz</u>
Limiter#:	<u> NA </u>				
Atten #:	<u> NA </u>				
Detector#:	<u> 1036 </u>				

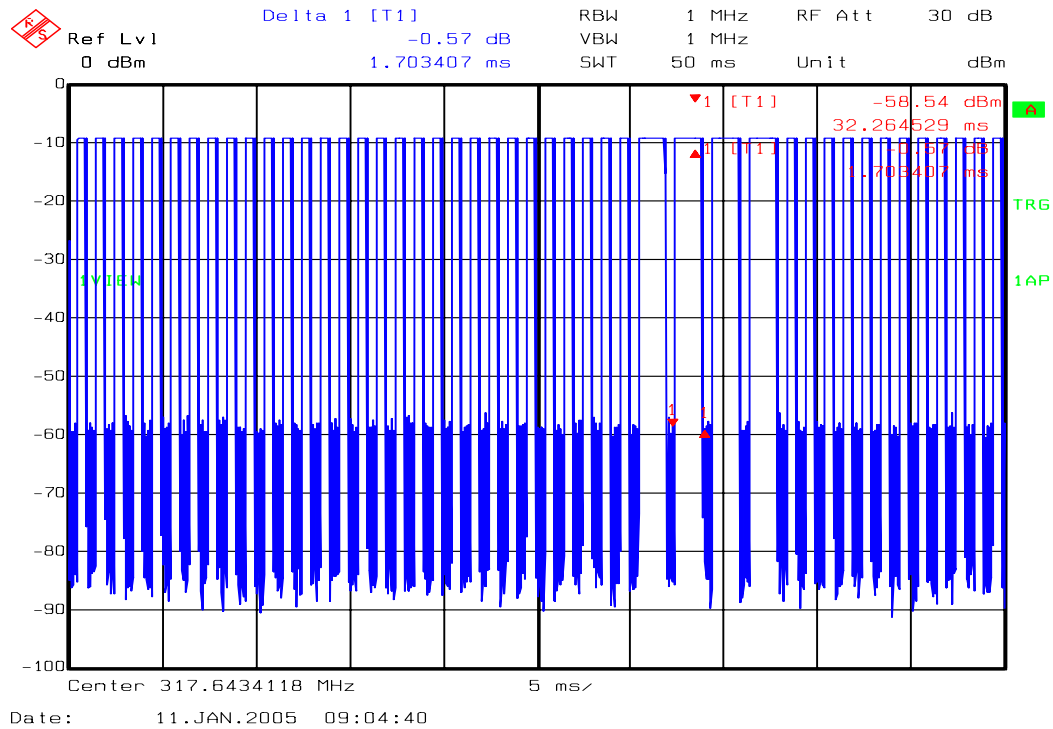
Meas. Freq. (MHz)	Ant. Pol. (H/V)	Duty Cycle (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	QP readings Comment
318.5	V	-5.2	61.2	14.7	4.4	24.4	50.7	75.7	-25.0	Pass	Carrier
318.5	H	-5.2	75	14.7	4.4	24.4	64.5	75.7	-11.2	Pass	Carrier
955.5	H	-5.2	51.2	23.7	8.2	24.7	53.2	55.7	-2.5	Pass	
955.5	V	-5.2	44.6	23.7	8.2	24.7	46.6	55.7	-9.1	Pass	
1274	V	-5.2	57.3	23.8	1.6	31.3	46.2	55.7	-9.5	Pass	
1592.5	V	-5.2	61.2	25	2.5	32.0	51.5	55.7	-4.2	Pass	
1911	V	-5.2	51.7	27.3	2.8	32.3	44.3	55.7	-11.4	Pass	
2229.5	V	-5.2	50.5	28	2.8	33.0	43.1	55.7	-12.6	Pass	
2548	V	-5.2	48.2	28.4	3.2	32.8	41.8	55.7	-13.9	Pass	
2866.5	V	-5.2	45.2	29.5	3.6	32.6	40.5	55.7	-15.2	Pass	
3185	V	-5.2	45.5	30.1	3.6	33.0	41.0	55.7	-14.7	Pass	
1274	H	-5.2	62.8	23.8	1.6	31.3	51.7	55.7	-4.0	Pass	
1592.5	H	-5.2	61	25	2.5	32.0	51.3	55.7	-4.4	Pass	
1911	H	-5.2	53.6	27.3	2.8	32.3	46.2	55.7	-9.5	Pass	
2229.5	H	-5.2	48.8	28	2.8	33.0	41.4	55.7	-14.3	Pass	
2548	H	-5.2	50.6	28.4	3.2	32.8	44.2	55.7	-11.5	Pass	
2866.5	H	-5.2	45	29.5	3.6	32.6	40.3	55.7	-15.4	Pass	
3185	H	-5.2	43	30.1	3.6	33.0	38.5	55.7	-17.2	Pass	

NOTE: Above 1000 MHz, RBW and VBW were both set to 1 MHz.

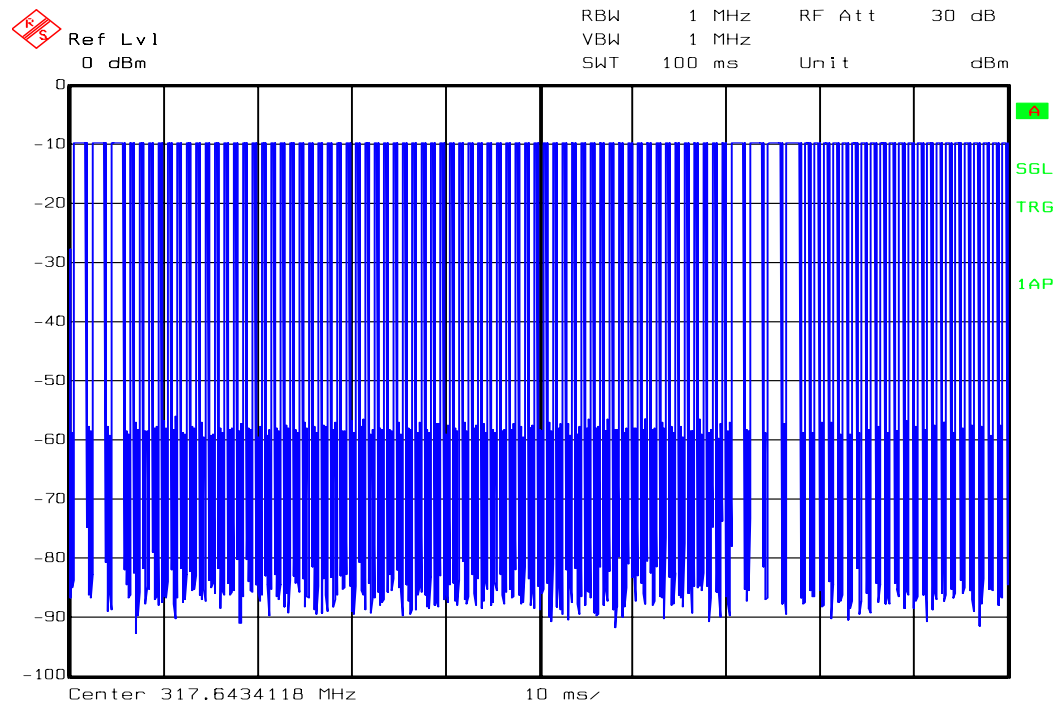
All measurements above are Peak. Where Peak measured values do not exceed the Average limit, only an Average measurement is taken.

EQUIPMENT: **Radio Remote Lantern**Test Report Number: **4L0778RUS1**

Narrow pulse 501 uS per pulse

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Wide pulse 1.7 mS per pulse

EQUIPMENT: **Radio Remote Lantern**Test Report Number: **4L0778RUS1**

Date: 11.JAN.2005 09:06:15

7 Wide pulses and 86 narrow pulses

55 mS per 100 mS

-5.2 Duty cycle correction

Radiated Photographs



EQUIPMENT: **Radio Remote Lantern**Test Report Number: **4L0778RUS1**

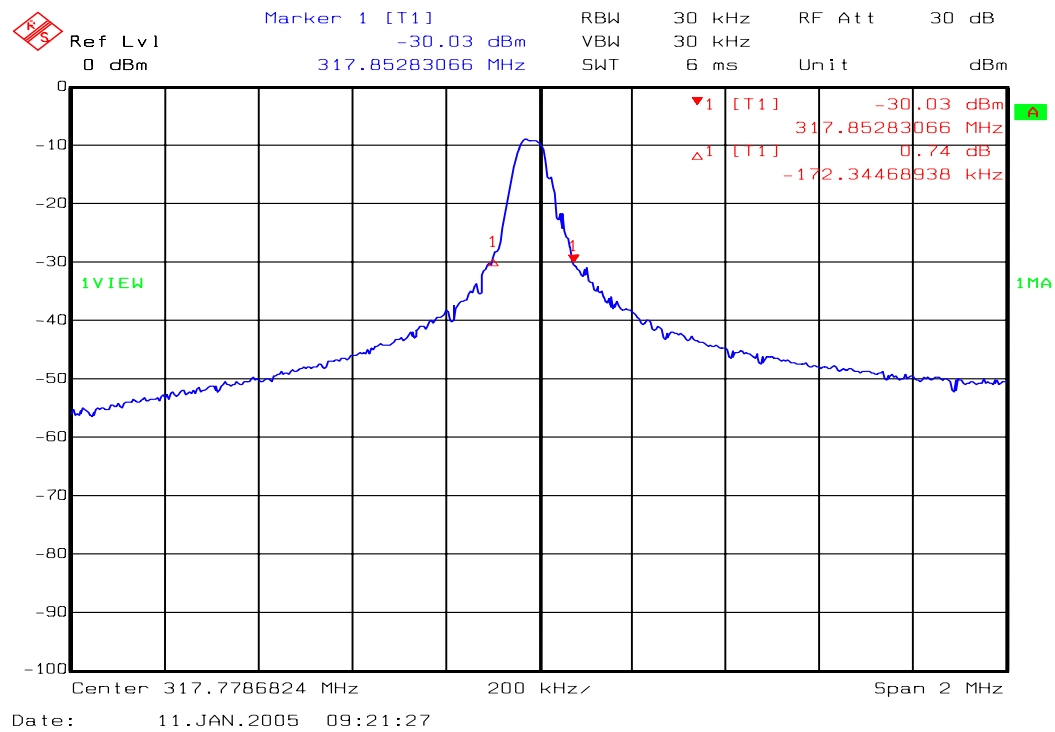
Section 5. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.231(c)
TESTED BY: David Light	DATE: 1/12/2005

Minimum Standard: 15.231(c) 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.

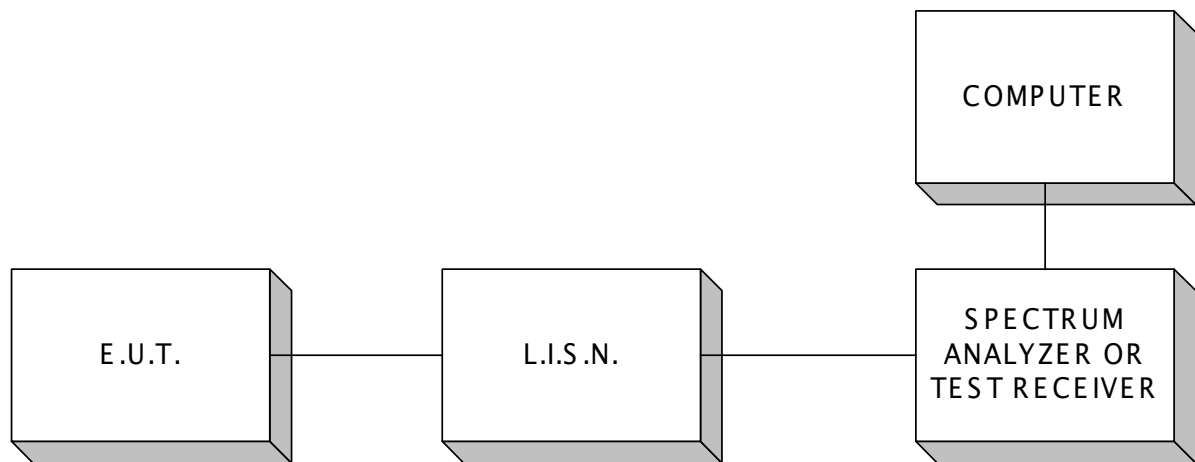
Test Results: [Complies. See attached graph.](#)

Test Data: See attached graph.

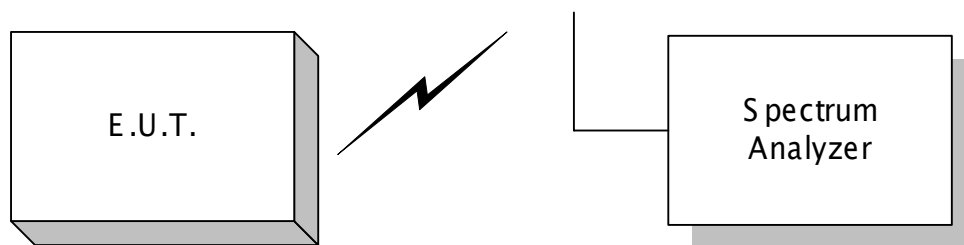
EQUIPMENT: **Radio Remote Lantern**Test Report Number: **4L0778RUS1****Test Data – Occupied Bandwidth**

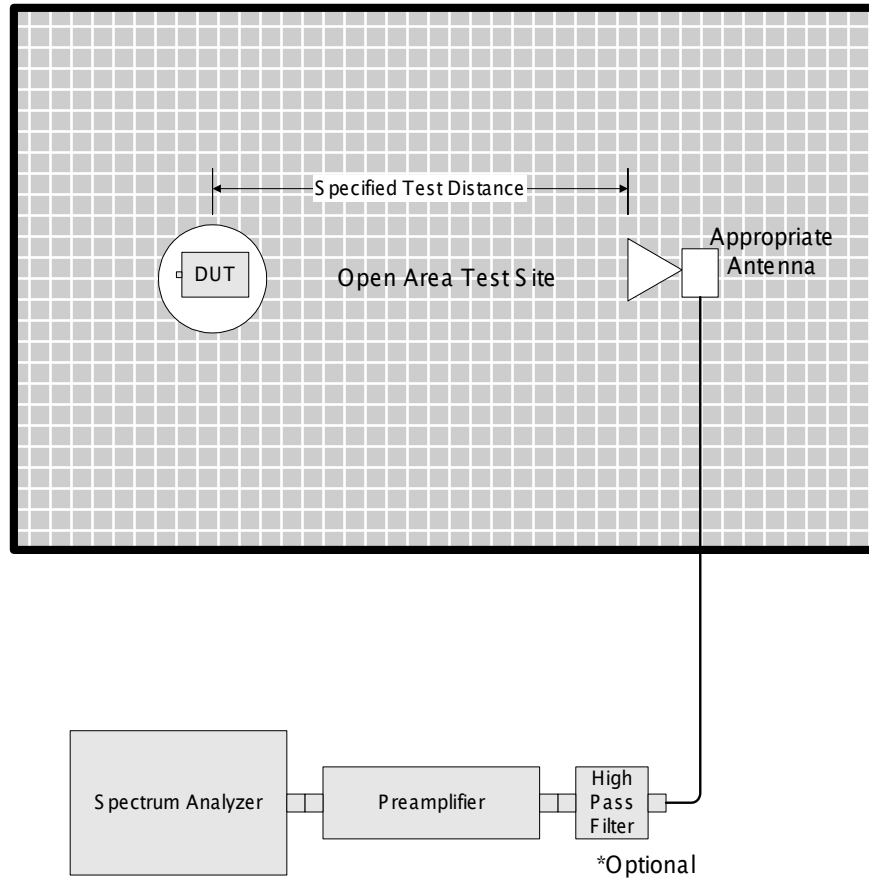
Section 6. Block Diagrams

Conducted Emissions

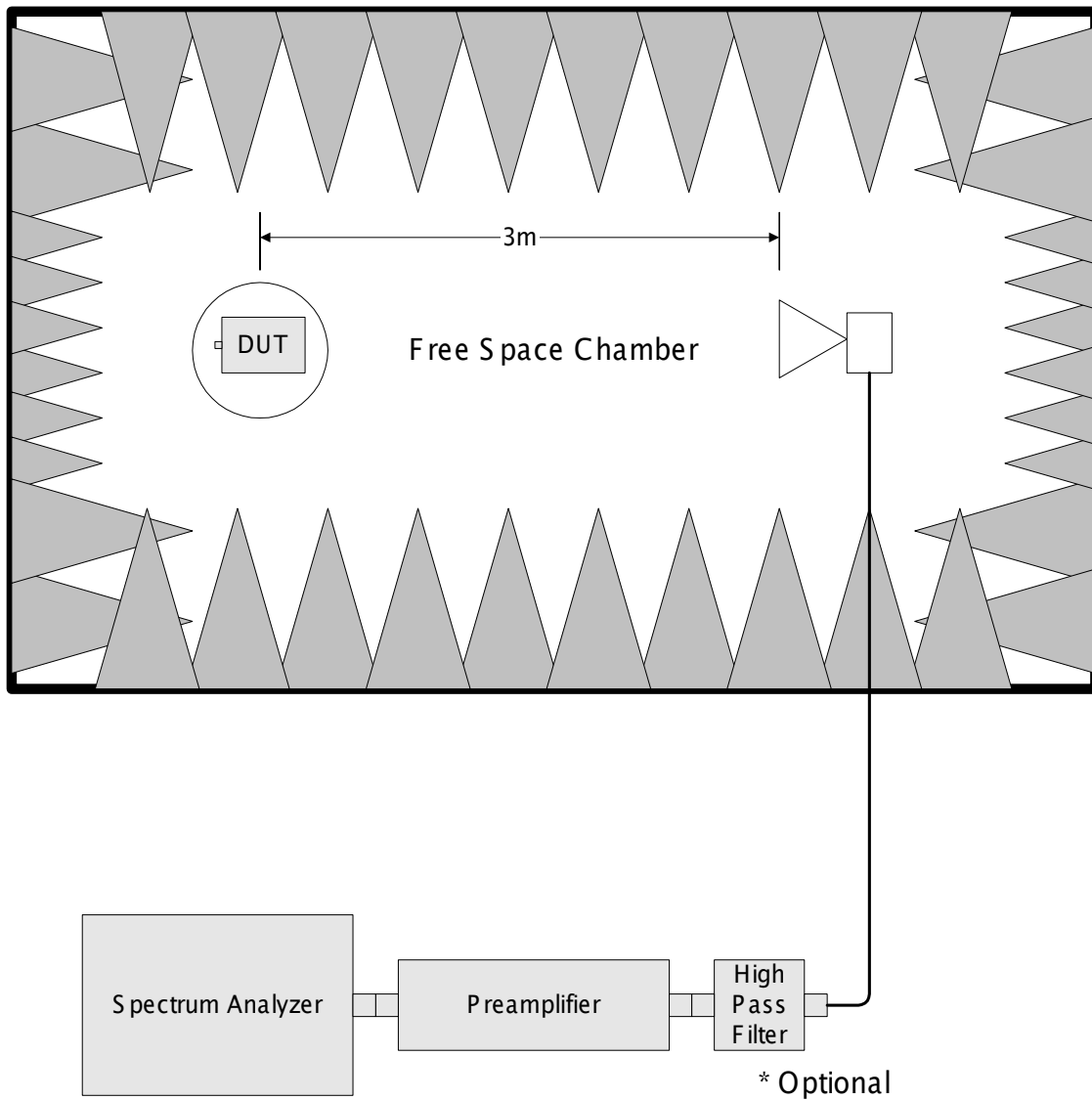


Occupied Bandwidth, Duty Cycle



Outdoor Test Site For Radiated Emissions**Radiated Emissions 30 MHz - 1 GHz**

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



Radiated Emissions above 1 GHz

EQUIPMENT: **Radio Remote Lantern**

Test Report Number: 4L0778RUS1

Section 7. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
760	Antenna biconical	Electro Metrics MFC-25	477	06/22/04	06/22/05
1311	ANTENNA, LOG PERIODIC	EMCO 3146	1753	06/04/04	06/04/05
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1983	CABLE	KTL Site A OATS	N/A	03/11/04	03/11/05
791	PREAMP, 25dB	ICC LNA25	398	11/12/04	11/12/05
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	03/22/04	03/23/06
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	08/26/04	08/26/05
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	08/02/04	08/02/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	11/12/04	11/12/05