

**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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**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

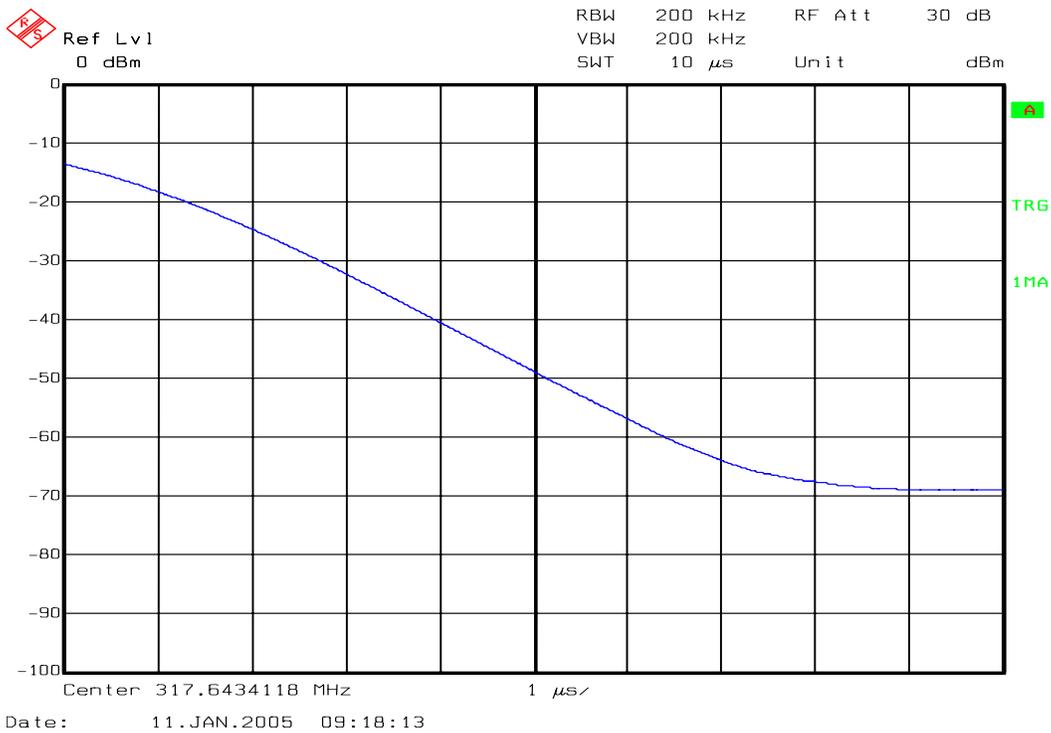
- Minimum Standard:**
- 15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.
  - 15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.
  - 15.231(a)(2)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

**Rationale for Compliance with Transmission Requirements**

15.231(a)(1)	<input checked="" type="checkbox"/> Manual activation	TX deactivation time: 8 $\mu$ S
15.231(a)(2) :	<input type="checkbox"/> Automatic activation	
15.231(a)(3) :	<input type="checkbox"/> Regular, predetermined transmissions <input type="checkbox"/> Polling or supervisory transmissions	TX rate and duration: N/A
15.231(a)(4) :	<input type="checkbox"/> Alarm device operating during the pendency of alarm condition <input checked="" type="checkbox"/> 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.**

**Test Data - Radiated Emissions**



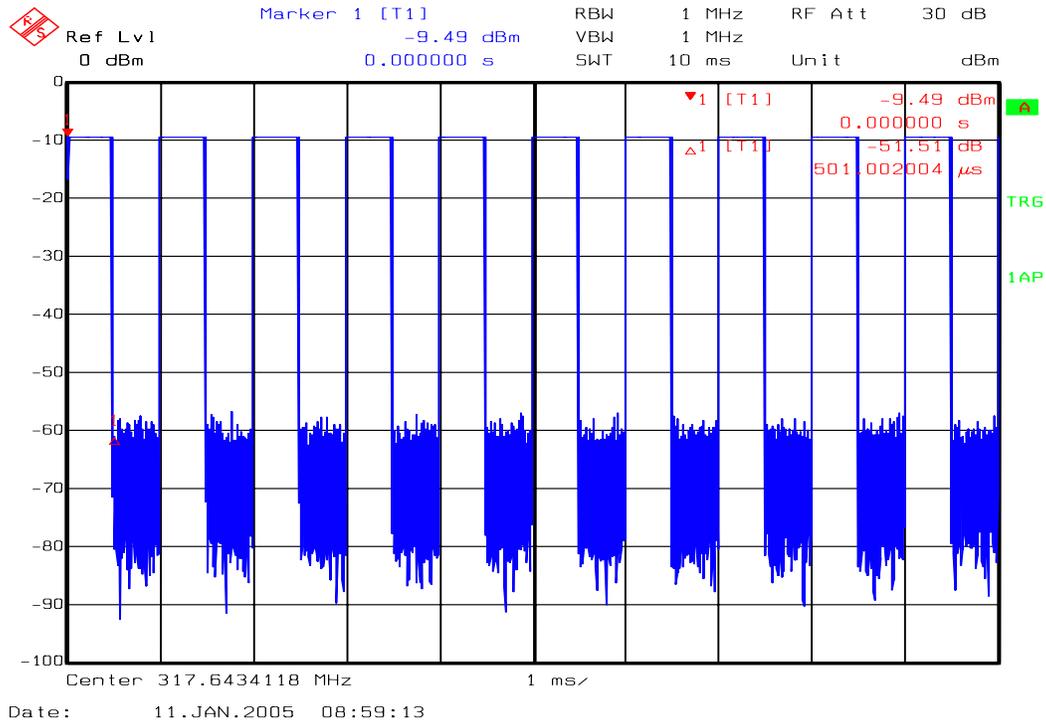
**Dallas Headquarters:**  
 802 N. Kealy  
 Lewisville, TX 75057  
 Tel: (972) 436-9600  
 Fax: (972) 436-2667

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>					Reference :	<u>      </u>					
Rod. Ant. #:	<u>      </u>	Temp. (deg. C) :	<u>  23  </u>		Date :	<u>01/11/05</u>						
Bicon Ant.#:	<u>  760  </u>	Humidity (%) :	<u>  55  </u>		Time :	<u>  13:00  </u>						
Log Ant.#:	<u>  1311  </u>	EUT Voltage :	<u>  3  </u>		Staff :	<u>D. Light</u>						
Horn Ant.#:	<u>  1304  </u>	EUT Frequency :	<u>  DC  </u>		Photo ID:	<u>4L0778R RE-01</u>						
		Phase:	<u>      </u>		Peak Bandwidth:	<u>  100 KHz  </u>						
Cable#:	<u>  1983  </u>	Location:	<u>  A OATS  </u>		Video Bandwidth:	<u>  100 KHz  </u>						
Preamp#:	<u>  791  </u>	Distance:	<u>  3  </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		

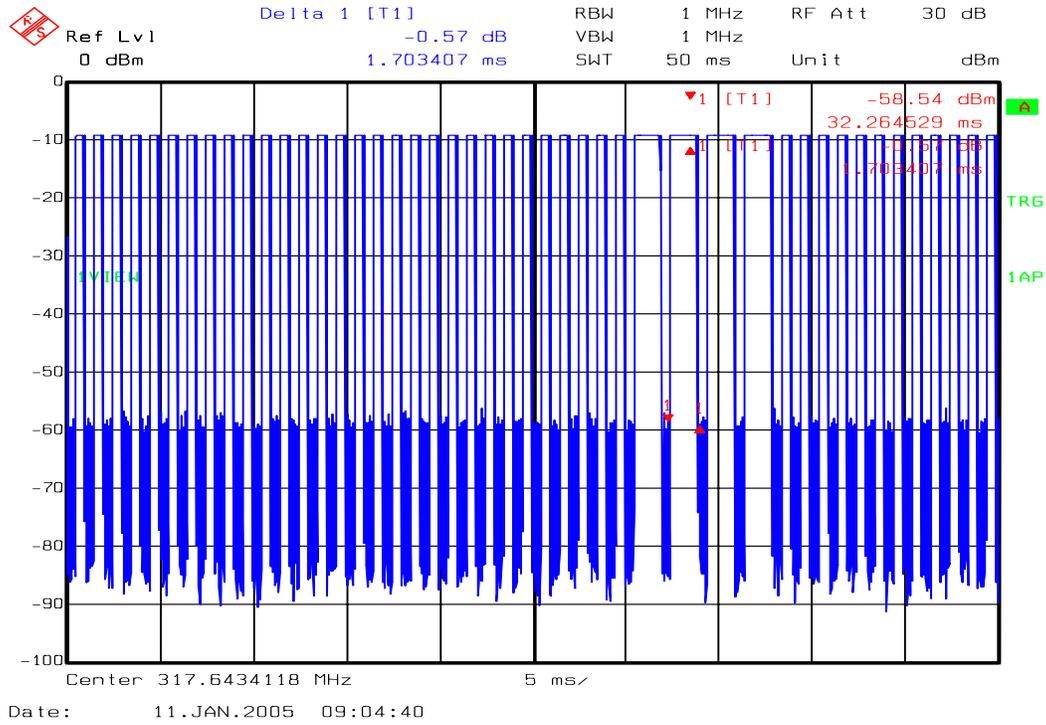
**NOTE: Above 1000 MHz, RBW and VBW were both set to 1 MHz.**  
**All measurements above are Peak. Where Peak measured values do not exceed the Average limit, only an Average measurement is taken.**

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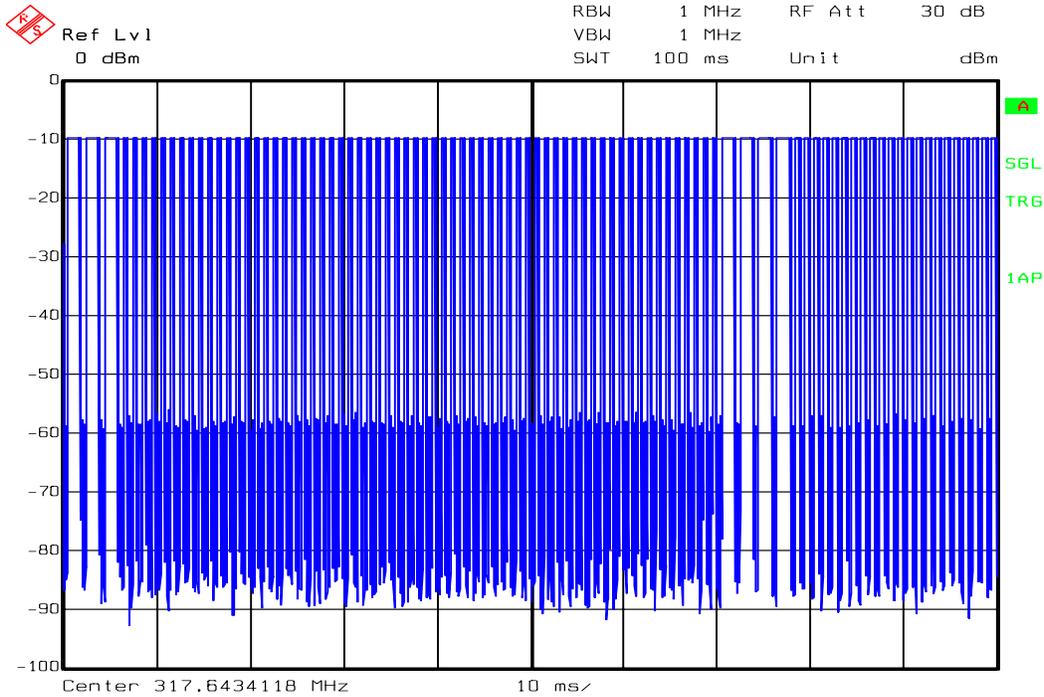
Narrow pulse 501 uS per pulse



Wide pulse 1.7 mS per pulse

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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**



## Section 5. Occupied Bandwidth

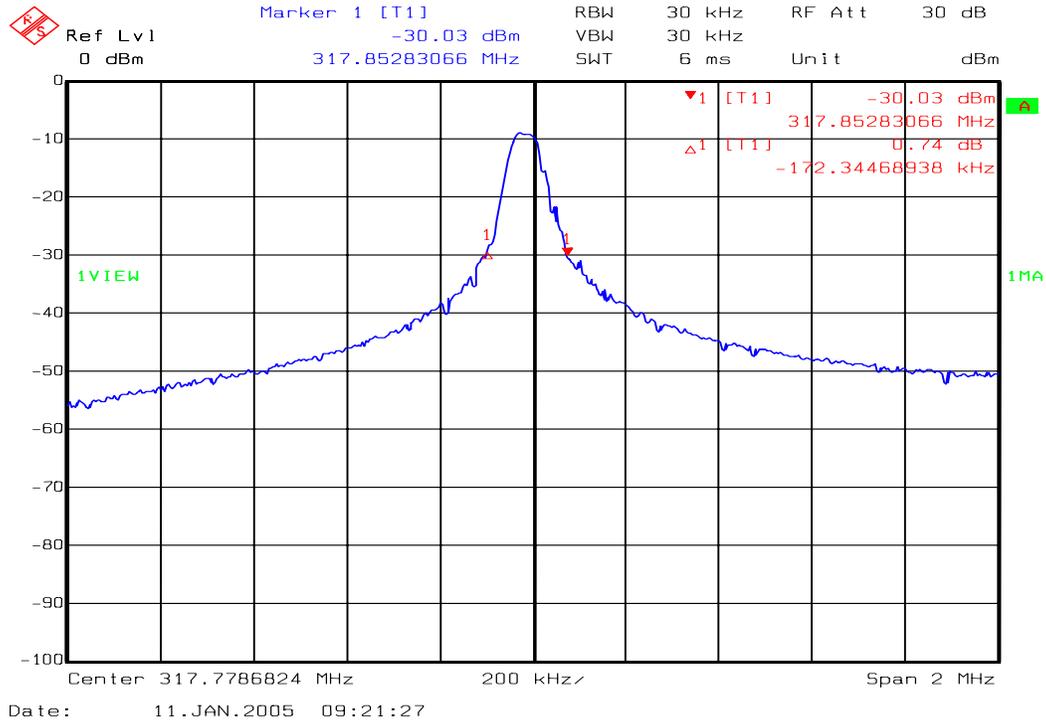
NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.231(c)
TESTED BY: David Light	DATE: 1/12/2005

**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.](#)

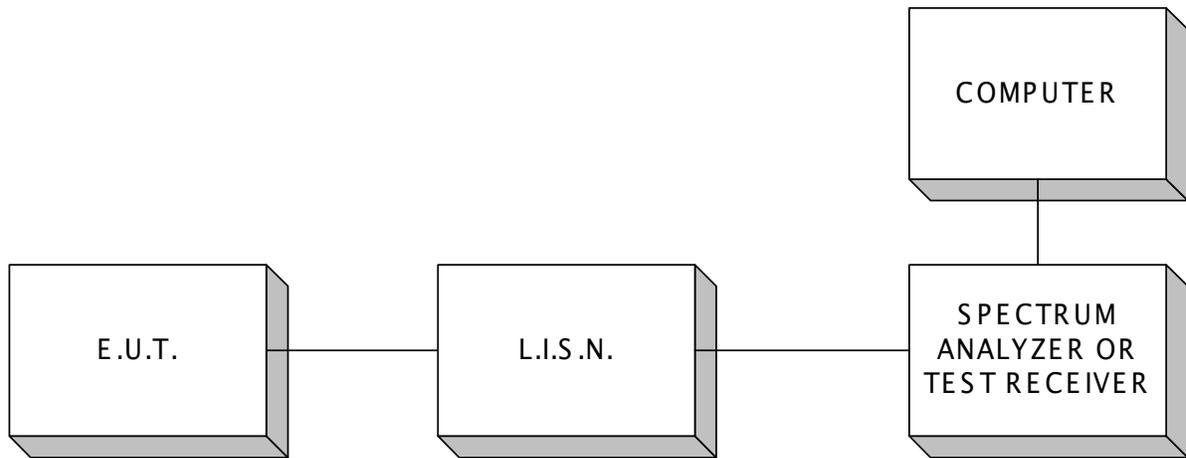
**Test Data:** See attached graph.

**Test Data – Occupied Bandwidth**

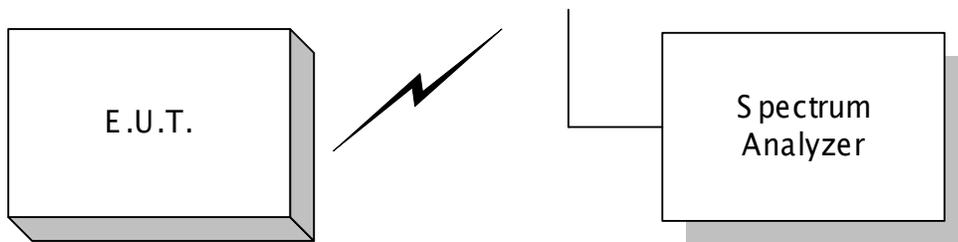


## Section 6. Block Diagrams

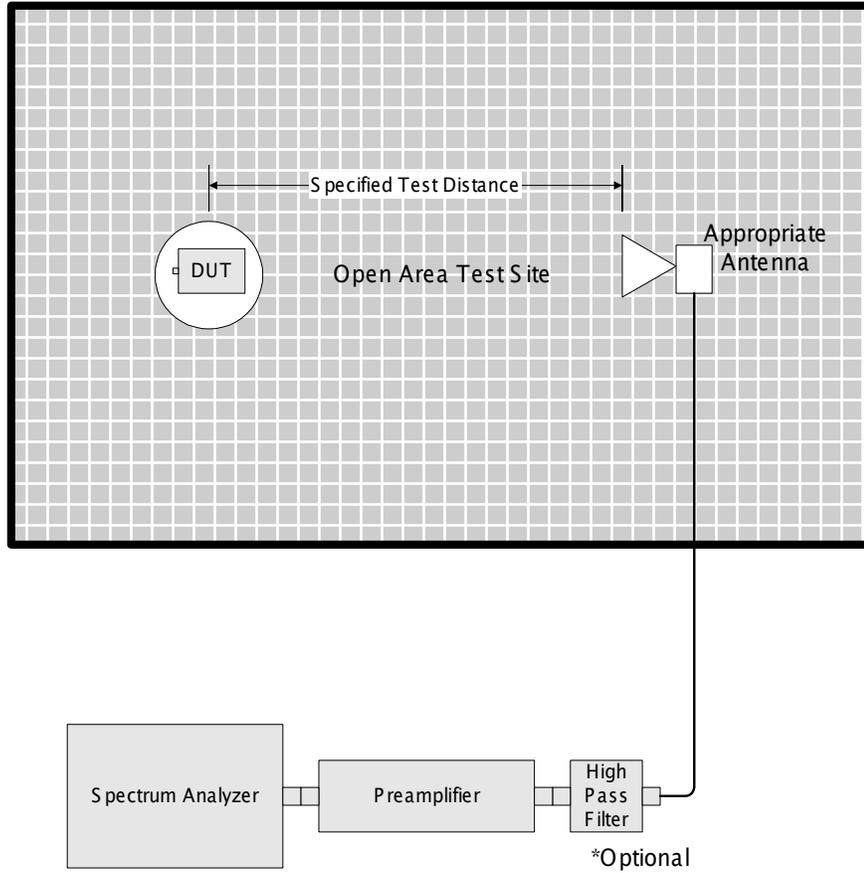
### Conducted Emissions



### Occupied Bandwidth, Duty Cycle

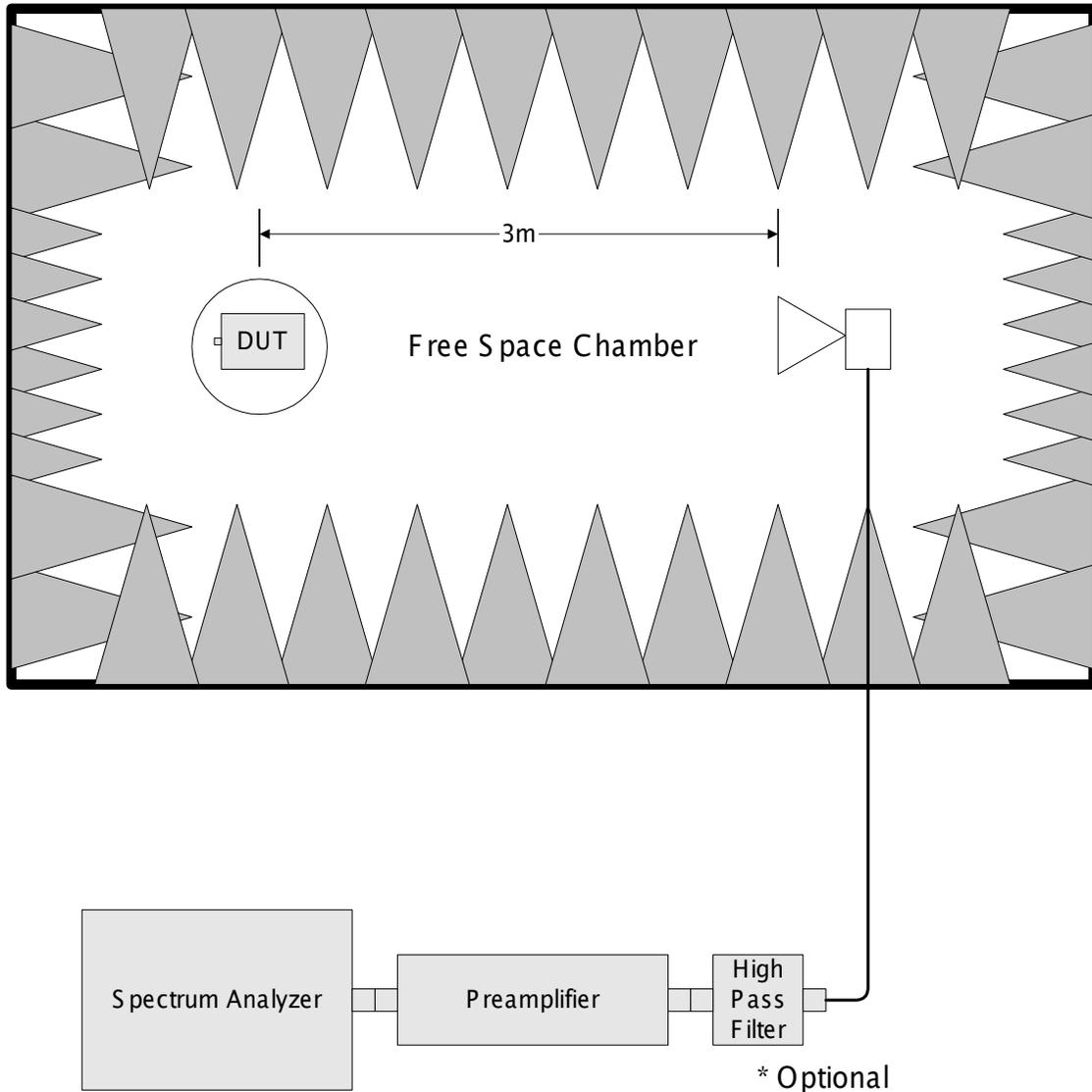


**Outdoor Test Site For Radiated Emissions**



**Radiated Emissions 30 MHz - 1 GHz**

The spectrum was searched up to the 10<sup>th</sup> 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	S storm PR90-010-072	N/A	08/26/04	08/26/05
1485	Cable 2.0-18.0 Ghz	S 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