

Nemko Test Report: 2L0452RUS1

Applicant: L.R. Nelson Corp.
One Sprinkler Lane
Peoria, IL 61615-9544

**Equipment Under Test:
(E.U.T.)** EZ Pro, Model 8602

In Accordance With: **FCC Part 15, Subpart C, 15.247**
Frequency Hopping Transmitters

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

Authorized By:

Tom Tidwell, RF Group Manager

Date: 12/12/02

Total Number of Pages: 56

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EQUIPMENT: **EZ Pro, Model 8602***PROJECT NO.:* **2L0452RUS1**

Section 1. Summary of Test Results

Manufacturer: L.R. Nelson Corp.

Model No.: EZ Pro, Model 8602

Serial No.: None

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 15.247 for Frequency Hopping Spread Spectrum devices. Radiated tests were conducted in accordance with ANSI C63.4-1992. 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



Family Listing

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**

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Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	MEAS.	RESULT
Powerline Conducted Emissions	15.207(a)	48 dB μ V	23.05 dBuV	Complies
Channel Separation	15.247(a)(1)	Greater of 25 kHz or 20 dB Bandwidth	85 kHz	Complies
Pseudorandom Hopping Algorithm	15.247(a)(1)	Customer Supplied	Customer Supplied	Customer Supplied
Time of Occupancy	15.247(a)(1)(ii)	≤ 0.4 sec in 30 sec	0.3 sec in 30 sec.	Complies
20 dB Occupied Bandwidth	15.247(a)(1)	≤ 1 MHz		Complies
Peak Power Output	15.247(b)	4 Watts EIRP	29.5 mW	Complies
Spurious Emissions (Antenna Conducted)	15.247(c)	-20 dBc	N/A	N/A
Spurious Emissions (Radiated)	15.247(c)	Table 15.209(a)	See Data	Complies

Footnotes:

The device does not have a detachable antenna.

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

General Equipment Information

Frequency Band: 2455 to 2467 MHz

Number of Channels: 75

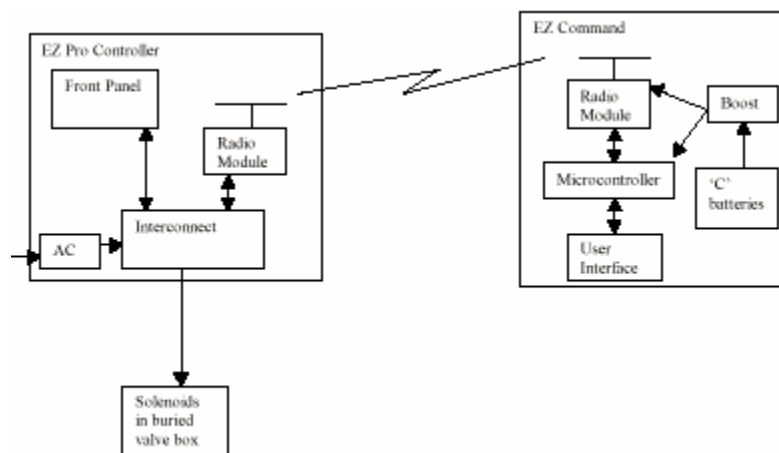
Channel Spacing: 85 kHz

User Frequency Adjustment: Software controlled

Theory of Operation

The 8602 module was designed for point to point operation between a pair of modules, one designated as master and the other designated as slave. Point to multi-point is not supported.

System Diagram



Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)
TESTED BY: David Light	DATE: 12/9/2002

Test Results: Complies.

Measurement Data: See attached plots.

Measurement Uncertainty: ± 1.7 dB

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

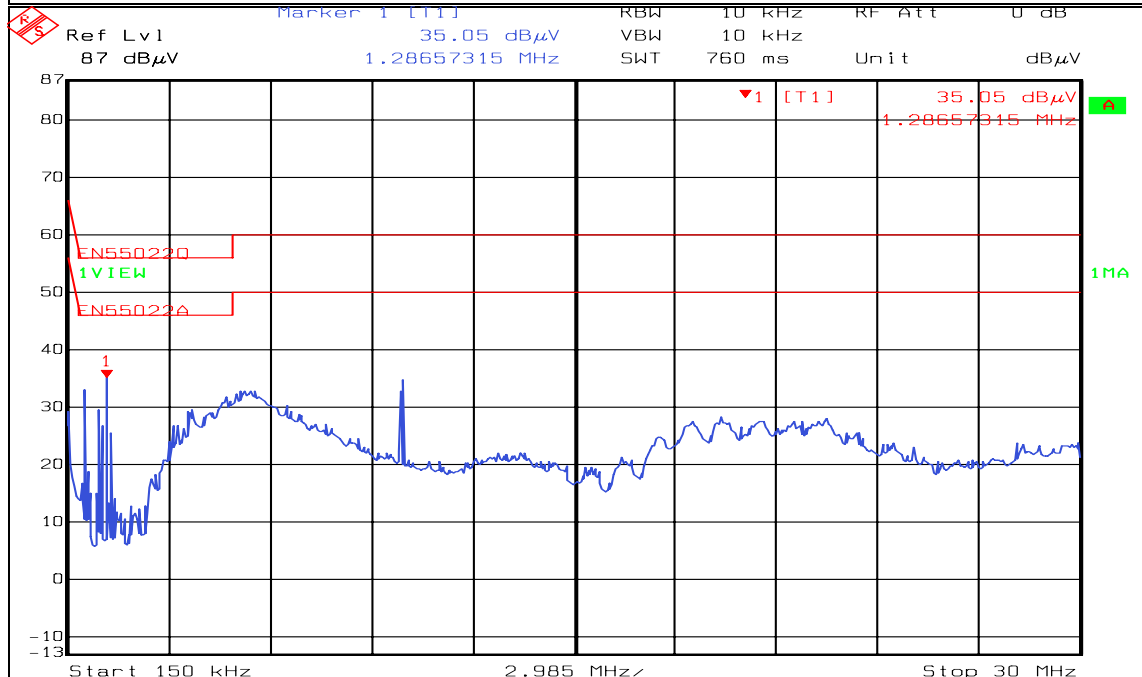
Test Data - Powerline Conducted Emissions



Nemko Dallas, Inc.

Dallas Headquarters:

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Data Plot		Powerline Conducted Emissions	
Page <u>1</u> of <u>2</u>		Complete <u>X</u>	
Job No.: 2L0452R	Date: 12/9/2002	Preliminary: _____	
Specification: 15.207	Temperature(°C): 22		
Tested By: David Light	Relative Humidity(%): 40		
E.U.T.: EZ PRO MODULE			
Configuration: TX FULL POWER			
Sample Number: 1			
Location: Lab 2	RBW: 10 kHz	Measurement	
Detector Type: Peak	VBW: 10 kHz	Distance: <u>NA</u> m	
Test Equipment Used			
Antenna: _____	L.I.S.N.: 1258		
Pre-Amp: _____	Cable #1: 1547		
Filter: 1555	Cable #2: 1129		
Receiver: 1036	Cable #3: _____		
Attenuator #1: _____	Cable #4: _____		
Attenuator #2: _____	Mixer: _____		
Additional equipment used: _____			
Measurement Uncertainty: +/-1.7 dB			
			
Date: 09.DEC.2002 13:40:57			
Notes: Hot side			
Worst case emission 35.05 dBuV at 1.2 MHz (10.95 dB below AVERAGE spec)			

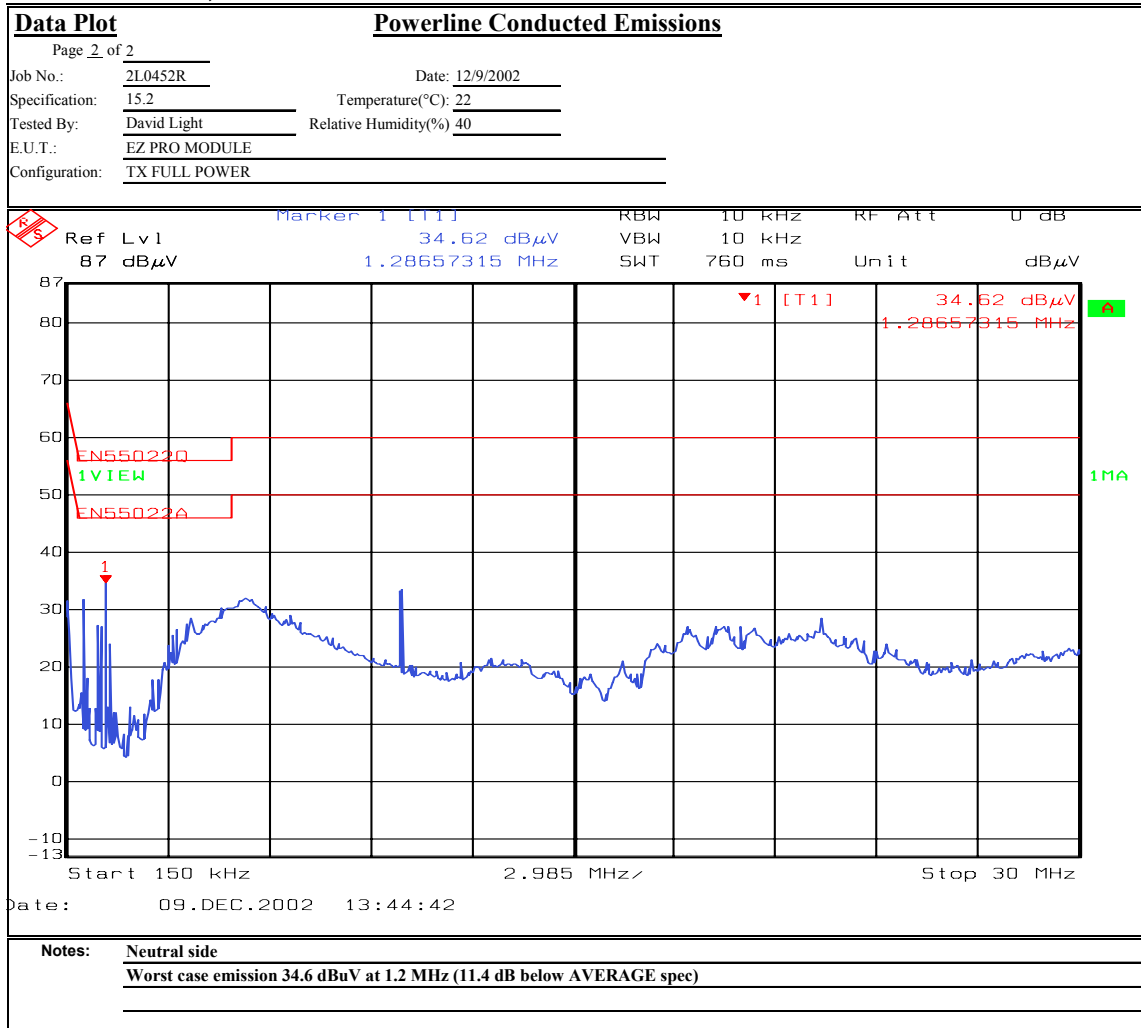
EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Test Data - Powerline Conducted Emissions

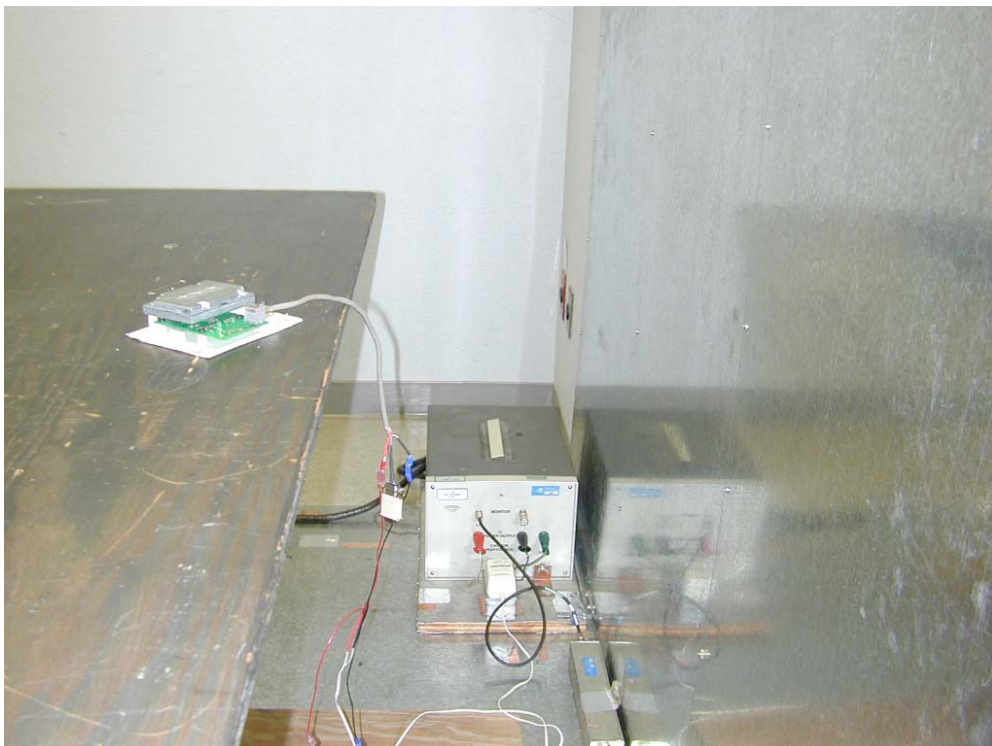


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Photographs - Powerline Conducted Emissions



EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Section 4. Channel Separation

NAME OF TEST: Channel Separation	PARA. NO.: 15.247(a)(1)
TESTED BY: David Light	DATE:3/16/01

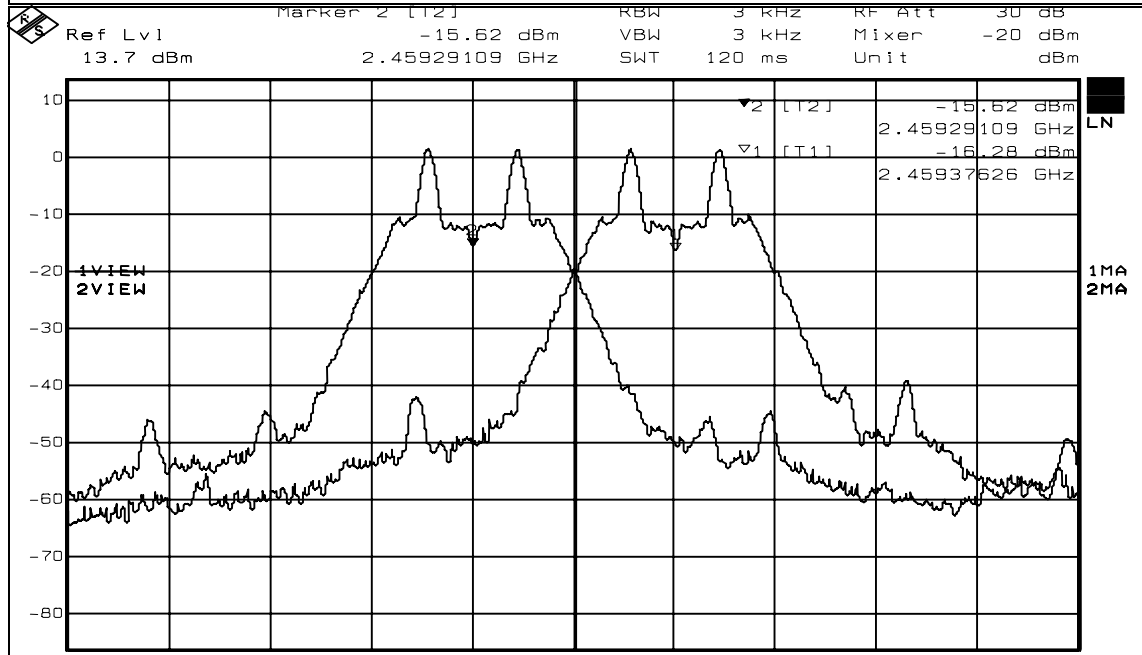
Test Results: Complies.

Measurement Data: Measured 20 dB bandwidth: 82.7 kHz max
Channel Separation: 85 kHz

Measurement Uncertainty: +/-1.7 dB

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Test Data - Channel Separation

Data Plot		CHANNEL SEPARATION	
Page 1 of 1		Complete <u>X</u>	
Job No.: 0L0528R	Date: 3/16/01	Preliminary <u> </u>	
Specification: 15.247	Temperature(°C): 22		
Tested By: David Light	Relative Humidity(%) 50		
E.U.T.: EZ Pro			
Configuration: Transmit modulated data			
Sample Number: S08			
Location: Lab 1	RBW: 3 kHz		
Detector Type: Peak	VBW: 3 kHz		
Test Equipment Used			
Antenna: <u> </u>	Directional Coupler: <u> </u>		
Pre-Amp: <u> </u>	Cable #1: 1043		
Filter: <u> </u>	Cable #2: <u> </u>		
Receiver: 1036	Cable #3: <u> </u>		
Attenuator #1: <u> </u>	Cable #4: <u> </u>		
Attenuator #2: <u> </u>	Mixer: <u> </u>		
Additional equipment used: #802 Near Field Probe Set			
Measurement Uncertainty: +/-3.6 dB			
			
Title: CONDUCTED EMISSIONS - L2			
Date: 16.MAR.2001 11:49:08			
Notes: HOP GROUP 1 - CHANNELS 39 & 40			
CHANNEL SEPERATION = 85 kHz			

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Section 5. Pseudorandom Hopping Algorithm

NAME OF TEST: Pseudorandom Hopping Algorithm	PARA. NO.: 15.247(a)(1)
TESTED BY: Supplied by Customer	DATE:

Test Results: Complies.**Measurement Data:** See sample hopping sequence.

Number of Hopping Frequencies: 75

Number of Hopping Patterns: 8

Proposal for modification of the Nelson EZ-Pro radio system firmware to comply with pseudo-random hopping requirements of the FCC.

The Nelson EZ-Pro radio system is installed into two different types of host units: The Pro Controller (fixed, AC powered) and the EZ Programmer (mobile, battery powered). The radios are strapped by the connector wiring of the host unit into either a Master or Slave configuration. The Pro Controller contains the Master radio, and the EZ Programmer contains the Slave.

Prior to a connection attempt, a unique four-byte ID is loaded into each by the operator through the front panel user interface. This ID is used for radio addressing and connection authentication.

The Master radio is placed into a listen-only state in which it slowly hops through all available channels listening for a valid packet from a Slave radio. If one is received but does not match the stored ID, it is ignored and the radio remains in a listen-only state. The radio does not transmit during this time.

When a connection is desired, the operator activates the Slave radio, which causes it to start a transmit/receive sequence attempting to contact a Master radio. Each short transmit burst is followed immediately by a longer listen window, then the radio hops to the next channel and repeats this sequence.

When the Master radio hears a valid packet from the Slave, it validates the received ID against its own. If they match, the Master replies immediately to the Slave and is placed into "connected" mode. Upon receipt of a valid message from the Master, the Slave is now also in "connected" mode. The two radios hop in sync and continue to exchange data for the duration of the connection. This connection can be continuous, but in the interest of power savings, the Slave may terminate the connection at any time. In this case, the Master radio reverts to listen-only mode and slowly hops through all available channels listening for a valid packet from a Slave radio.

For the hopping scheme, we propose to implement a two-table lookup system. The end result is that the overall hopping pattern is much longer than the number of channels in the system.

One table, the "synthesizer table", contains the synthesizer register values for each of the 75 channels, numbered 0-74, and the other table, the "pr pattern table" contains a long list pseudo-randomly arranged pointers to entries in the synthesizer table. This table's length is a multiple of 75, guaranteeing that each channel is occupied an equal amount of time.

The Slave radio data header contains a pointer indicating the current index into the pr pattern table. The Master then uses this information to determine where it should hop next. The following diagram illustrates the new lookup scheme.

EQUIPMENT: **EZ Pro, Model 8602****PROJECT NO.:** **2L0452RUS1**

Synthesizer Table

```
;Hop group 0 :  
    retlw 12h    ; LO= 2084  
;Hop group 1 :  
    retlw 16h    ; LO= 2085  
;Hop group 2 :  
    retlw 1ah    ; LO= 2086  
;Hop group 3 :  
    retlw 1eh    ; LO= 2087  
;Hop group 4 :  
    retlw 12h    ; LO= 2084  
;Hop group 5 :  
    retlw 16h    ; LO= 2085  
;Hop group 6 :  
    retlw 1ah    ; LO= 2086  
;Hop group 7 :  
    retlw 1eh    ; LO= 2087
```

```
;TX channel 0 :  
    retlw 012h  
    retlw 08Ch  
    retlw 033h  ; Freq= 370.9775 MHz  
;TX channel 1 :  
    retlw 012h  
    retlw 08Dh  
    retlw 04Ah  ; Freq= 371.0625 MHz  
;TX channel 2 :  
    retlw 012h  
    retlw 08Eh  
    retlw 060h  ; Freq= 371.1475 MHz  
;TX channel 3 :  
    retlw 012h  
    retlw 08Fh  
    retlw 077h  ; Freq= 371.2325 MHz  
;TX channel 4 :  
    retlw 012h  
    retlw 090h  
    retlw 08Dh  ; Freq= 371.3175 MHz  
;TX channel 5 :  
    retlw 012h  
    retlw 091h
```

EQUIPMENT: **EZ Pro, Model 8602***PROJECT NO.:* **2L0452RUS1**

```
    retlw    0A4h  ; Freq= 371.4025 MHz
;TX channel 6 :
    retlw    012h
    retlw    092h
    retlw    0BAh  ; Freq= 371.4875 MHz
;TX channel 7 :
    retlw    012h
    retlw    093h
    retlw    0D1h  ; Freq= 371.5725 MHz
;TX channel 8 :
    retlw    012h
    retlw    094h
    retlw    0E7h  ; Freq= 371.6575 MHz
;TX channel 9 :
    retlw    012h
    retlw    095h
    retlw    0FEh  ; Freq= 371.7425 MHz
;TX channel 10 :
    retlw    012h
    retlw    097h
    retlw    014h  ; Freq= 371.8275 MHz
;TX channel 11 :
    retlw    012h
    retlw    098h
    retlw    02Bh  ; Freq= 371.9125 MHz
;TX channel 12 :
    retlw    012h
    retlw    099h
    retlw    041h  ; Freq= 371.9975 MHz
;TX channel 13 :
    retlw    012h
    retlw    09Ah
    retlw    058h  ; Freq= 372.0825 MHz
;TX channel 14 :
    retlw    012h
    retlw    09Bh
    retlw    06Eh  ; Freq= 372.1675 MHz
;TX channel 15 :
    retlw    012h
    retlw    09Ch
    retlw    085h  ; Freq= 372.2525 MHz
;TX channel 16 :
    retlw    012h
```

EQUIPMENT: **EZ Pro, Model 8602***PROJECT NO.:* **2L0452RUS1**

```
        retlw    09Dh
        retlw    09Ch ; Freq= 372.3375 MHz
;TX channel 17 :
        retlw    012h
        retlw    09Eh
        retlw    0B2h ; Freq= 372.4225 MHz
;TX channel 18 :
        retlw    012h
        retlw    09Fh
        retlw    0C8h ; Freq= 372.5075 MHz
;TX channel 19 :
        retlw    012h
        retlw    0A0h
        retlw    0DFh ; Freq= 372.5925 MHz
;TX channel 20 :
        retlw    012h
        retlw    0A1h
        retlw    0F6h ; Freq= 372.6775 MHz
;TX channel 21 :
        retlw    012h
        retlw    0A3h
        retlw    00Ch ; Freq= 372.7625 MHz
;TX channel 22 :
        retlw    012h
        retlw    0A4h
        retlw    023h ; Freq= 372.8475 MHz
;TX channel 23 :
        retlw    012h
        retlw    0A5h
        retlw    039h ; Freq= 372.9325 MHz
;TX channel 24 :
        retlw    012h
        retlw    0A6h
        retlw    050h ; Freq= 373.0175 MHz
;TX channel 25 :
        retlw    012h
        retlw    0A7h
        retlw    066h ; Freq= 373.1025 MHz
;TX channel 26 :
        retlw    012h
        retlw    0A8h
        retlw    07Dh ; Freq= 373.1875 MHz
;TX channel 27 :
```

EQUIPMENT: **EZ Pro, Model 8602***PROJECT NO.:* **2L0452RUS1**

```
retlw 012h
retlw 0A9h
retlw 093h ; Freq= 373.2725 MHz
;TX channel 28 :
retlw 012h
retlw 0AAh
retlw 0AAh ; Freq= 373.3575 MHz
;TX channel 29 :
retlw 012h
retlw 0ABh
retlw 0C0h ; Freq= 373.4425 MHz
;TX channel 30 :
retlw 012h
retlw 0ACh
retlw 0D7h ; Freq= 373.5275 MHz
;TX channel 31 :
retlw 012h
retlw 0ADh
retlw 0EEh ; Freq= 373.6125 MHz
;TX channel 32 :
retlw 012h
retlw 0AFh
retlw 004h ; Freq= 373.6975 MHz
;TX channel 33 :
retlw 012h
retlw 0B0h
retlw 01Ah ; Freq= 373.7825 MHz
;TX channel 34 :
retlw 012h
retlw 0B1h
retlw 031h ; Freq= 373.8675 MHz
;TX channel 35 :
retlw 012h
retlw 0B2h
retlw 048h ; Freq= 373.9525 MHz
;TX channel 36 :
retlw 012h
retlw 0B3h
retlw 05Eh ; Freq= 374.0375 MHz
;TX channel 37 :
retlw 012h
retlw 0B4h
retlw 075h ; Freq= 374.1225 MHz
```

EQUIPMENT: **EZ Pro, Model 8602***PROJECT NO.:* **2L0452RUS1**

```
;TX channel 38 :  
    retlw    012h  
    retlw    0B5h  
    retlw    08Bh ; Freq= 374.2075 MHz  
;TX channel 39 :  
    retlw    012h  
    retlw    0B6h  
    retlw    0A2h ; Freq= 374.2925 MHz  
;TX channel 40 :  
    retlw    012h  
    retlw    0B7h  
    retlw    0B8h ; Freq= 374.3775 MHz  
;TX channel 41 :  
    retlw    012h  
    retlw    0B8h  
    retlw    0CFh ; Freq= 374.4625 MHz  
;TX channel 42 :  
    retlw    012h  
    retlw    0B9h  
    retlw    0E5h ; Freq= 374.5475 MHz  
;TX channel 43 :  
    retlw    012h  
    retlw    0BAh  
    retlw    0FCh ; Freq= 374.6325 MHz  
;TX channel 44 :  
    retlw    012h  
    retlw    0BCh  
    retlw    012h ; Freq= 374.7175 MHz  
;TX channel 45 :  
    retlw    012h  
    retlw    0E3h  
    retlw    03Dh ; Freq= 377.7775 MHz  
;TX channel 46 :  
    retlw    012h  
    retlw    0E4h  
    retlw    054h ; Freq= 377.8625 MHz  
;TX channel 47 :  
    retlw    012h  
    retlw    0E5h  
    retlw    06Ah ; Freq= 377.9475 MHz  
;TX channel 48 :  
    retlw    012h  
    retlw    0E6h
```

EQUIPMENT: **EZ Pro, Model 8602****PROJECT NO.:** **2L0452RUS1**

```
        retlw    081h ; Freq= 378.0325 MHz
;TX channel 49 :
        retlw    012h
        retlw    0E7h
        retlw    097h ; Freq= 378.1175 MHz
;TX channel 50 :
        retlw    012h
        retlw    0E8h
        retlw    0AEh ; Freq= 378.2025 MHz
;TX channel 51 :
        retlw    012h
        retlw    0E9h
        retlw    0C4h ; Freq= 378.2875 MHz
;TX channel 52 :
        retlw    012h
        retlw    0EAh
        retlw    0DBh ; Freq= 378.3725 MHz
;TX channel 53 :
        retlw    012h
        retlw    0EBh
        retlw    0F2h ; Freq= 378.4575 MHz
;TX channel 54 :
        retlw    012h
        retlw    0EDh
        retlw    008h ; Freq= 378.5425 MHz
;TX channel 55 :
        retlw    012h
        retlw    0EEh
        retlw    01Eh ; Freq= 378.6275 MHz
;TX channel 56 :
        retlw    012h
        retlw    0EFh
        retlw    035h ; Freq= 378.7125 MHz
;TX channel 57 :
        retlw    012h
        retlw    0F0h
        retlw    04Ch ; Freq= 378.7975 MHz
;TX channel 58 :
        retlw    012h
        retlw    0F1h
        retlw    062h ; Freq= 378.8825 MHz
;TX channel 59 :
        retlw    012h
```

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

```
        retlw    0F2h
        retlw    079h ; Freq= 378.9675 MHz
;TX channel 60 :
        retlw    012h
        retlw    0F3h
        retlw    08Fh ; Freq= 379.0525 MHz
;TX channel 61 :
        retlw    012h
        retlw    0F4h
        retlw    0A6h ; Freq= 379.1375 MHz
;TX channel 62 :
        retlw    012h
        retlw    0F5h
        retlw    0BCh ; Freq= 379.2225 MHz
;TX channel 63 :
        retlw    012h
        retlw    0F6h
        retlw    0D3h ; Freq= 379.3075 MHz
;TX channel 64 :
        retlw    012h
        retlw    0F7h
        retlw    0E9h ; Freq= 379.3925 MHz
;TX channel 65 :
        retlw    012h
        retlw    0F9h
        retlw    000h ; Freq= 379.4775 MHz
;TX channel 66 :
        retlw    012h
        retlw    0FAh
        retlw    016h ; Freq= 379.5625 MHz
;TX channel 67 :
        retlw    012h
        retlw    0FBh
        retlw    02Dh ; Freq= 379.6475 MHz
;TX channel 68 :
        retlw    012h
        retlw    0FCh
        retlw    044h ; Freq= 379.7325 MHz
;TX channel 69 :
        retlw    012h
        retlw    0FDh
        retlw    05Ah ; Freq= 379.8175 MHz
;TX channel 70 :
```

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

```
retlw 012h
retlw 0FEh
retlw 070h ; Freq= 379.9025 MHz
;TX channel 71 :
retlw 012h
retlw 0FFh
retlw 087h ; Freq= 379.9875 MHz
;TX channel 72 :
retlw 013h
retlw 000h
retlw 09Eh ; Freq= 380.0725 MHz
;TX channel 73 :
retlw 013h
retlw 001h
retlw 0B4h ; Freq= 380.1575 MHz
;TX channel 74 :
retlw 013h
retlw 002h
retlw 0CBh ; Freq= 380.2425 MHz
```

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1****Pseudo-random Table**

prtable

movlw	prtbl2<
movwf	pclath
movf	tall,w
addwf	2,1

prtbl2

;seed = 6826

retlw	25	;0
retlw	64	;1
retlw	29	;2
retlw	12	;3
retlw	45	;4
retlw	16	;5
retlw	5	;6
retlw	26	;7
retlw	59	;8
retlw	7	;9
retlw	0	;a
retlw	60	;b
retlw	2	;c
retlw	70	;d
retlw	9	;e
retlw	54	;f
retlw	46	;10
retlw	23	;11
retlw	65	;12
retlw	11	;13
retlw	44	;14
retlw	69	;15
retlw	48	;16
retlw	14	;17
retlw	47	;18
retlw	40	;19
retlw	57	;1a
retlw	51	;1b
retlw	15	;1c
retlw	21	;1d
retlw	53	;1e
retlw	20	;1f
retlw	50	;20
retlw	63	;21

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

```

retlw    71      ;22
retlw    66      ;23
retlw    52      ;24
retlw    13      ;25
retlw    67      ;26
retlw    24      ;27
retlw    73      ;28
retlw    19      ;29
retlw    30      ;2a
retlw    3 ;2b
retlw    35      ;2c
retlw    38      ;2d
retlw    74      ;2e
retlw    41      ;2f
retlw    27      ;30
retlw    1 ;31
retlw    68      ;32
retlw    72      ;33
retlw    28      ;34
retlw    36      ;35
retlw    49      ;36
retlw    18      ;37
retlw    43      ;38
retlw    31      ;39
retlw    58      ;3a
retlw    42      ;3b
retlw    8 ;3c
retlw    34      ;3d
retlw    32      ;3e
retlw    4 ;3f
retlw    62      ;40
retlw    6 ;41
retlw    37      ;42
retlw    17      ;43
retlw    10      ;44
retlw    55      ;45
retlw    61      ;46
retlw    56      ;47
retlw    22      ;48
retlw    39      ;49
retlw    33      ;4a
;seed = 8866
retlw    39      ;4b

```

EQUIPMENT: **EZ Pro, Model 8602****PROJECT NO.:** **2L0452RUS1**

retlw	60	;4c
retlw	32	;4d
retlw	68	;4e
retlw	26	;4f
retlw	45	;50
retlw	42	;51
retlw	15	;52
retlw	46	;53
retlw	29	;54
retlw	25	;55
retlw	63	;56
retlw	54	;57
retlw	40	;58
retlw	9	;59
retlw	66	;5a
retlw	50	;5b
retlw	65	;5c
retlw	20	;5d
retlw	30	;5e
retlw	11	;5f
retlw	72	;60
retlw	7	;61
retlw	18	;62
retlw	34	;63
retlw	38	;64
retlw	19	;65
retlw	49	;66
retlw	10	;67
retlw	74	;68
retlw	52	;69
retlw	12	;6a
retlw	53	;6b
retlw	13	;6c
retlw	44	;6d
retlw	14	;6e
retlw	43	;6f
retlw	48	;70
retlw	70	;71
retlw	57	;72
retlw	21	;73
retlw	62	;74
retlw	28	;75
retlw	69	;76

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

```

retlw    37      ;77
retlw    47      ;78
retlw    56      ;79
retlw    5 ;7a
retlw    73      ;7b
retlw    6 ;7c
retlw    41      ;7d
retlw    59      ;7e
retlw    67      ;7f
retlw    33      ;80
retlw    24      ;81
retlw    61      ;82
retlw    17      ;83
retlw    3 ;84
retlw    27      ;85
retlw    23      ;86
retlw    58      ;87
retlw    71      ;88
retlw    51      ;89
retlw    1 ;8a
retlw    4 ;8b
retlw    22      ;8c
retlw    36      ;8d
retlw    16      ;8e
retlw    35      ;8f
retlw    2 ;90
retlw    8 ;91
retlw    64      ;92
retlw    0 ;93
retlw    31      ;94
retlw    55      ;95
;seed = 4596
retlw    17      ;96
retlw    26      ;97
retlw    23      ;98
retlw    13      ;99
retlw    19      ;9a
retlw    16      ;9b
retlw    10      ;9c
retlw    51      ;9d
retlw    9 ;9e
retlw    56      ;9f
retlw    34      ;a0

```

EQUIPMENT: **EZ Pro, Model 8602***PROJECT NO.:* **2L0452RUS1**

```
retlw 2 ;a1
retlw 61 ;a2
retlw 64 ;a3
retlw 31 ;a4
retlw 46 ;a5
retlw 63 ;a6
retlw 41 ;a7
retlw 36 ;a8
retlw 68 ;a9
retlw 47 ;aa
retlw 32 ;ab
retlw 28 ;ac
retlw 54 ;ad
retlw 70 ;ae
retlw 52 ;af
retlw 48 ;b0
retlw 18 ;b1
retlw 20 ;b2
retlw 25 ;b3
retlw 71 ;b4
retlw 6 ;b5
retlw 24 ;b6
retlw 53 ;b7
retlw 58 ;b8
retlw 4 ;b9
retlw 74 ;ba
retlw 38 ;bb
retlw 69 ;bc
retlw 66 ;bd
retlw 15 ;be
retlw 44 ;bf
retlw 5 ;c0
retlw 1 ;c1
retlw 8 ;c2
retlw 33 ;c3
retlw 60 ;c4
retlw 30 ;c5
retlw 7 ;c6
retlw 73 ;c7
retlw 29 ;c8
retlw 11 ;c9
retlw 27 ;ca
retlw 3 ;cb
```

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

retlw	42	;cc
retlw	45	;cd
retlw	22	;ce
retlw	40	;cf
retlw	43	;d0
retlw	14	;d1
retlw	0	;d2
retlw	37	;d3
retlw	49	;d4
retlw	55	;d5
retlw	21	;d6
retlw	62	;d7
retlw	65	;d8
retlw	57	;d9
retlw	12	;da
retlw	72	;db
retlw	35	;dc
retlw	59	;dd
retlw	67	;de
retlw	39	;df
retlw	50	;e0

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Section 6. Time of Occupancy

NAME OF TEST: Time of Occupancy	PARA. NO.: 15.247(a)(1)
TESTED BY: David Light	DATE:3/19/01

Test Results: Complies.**Measurement Data:**

Maximum Dwell Time On Any Channel: 300 mS in 30 seconds

See Plot

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Test Data-Time of Occupancy

Data Plot		Time of Occupancy	
Page <u>1</u> of <u>2</u>		Complete <u>X</u>	
Job No.: 0L0528R	Date: 3/19/01	Preliminary <u> </u>	
Specification: 15.247	Temperature(°C): <u>22</u>		
Tested By: David Light	Relative Humidity(%) <u>50</u>		
E.U.T.: EZ Pro			
Configuration: Transmit modulated data			
Sample Number: S08			
Location: Lab 1	RBW: Refer to Plots		
Detector Type: Peak	VBW: Refer to Plots		
Test Equipment Used			
Antenna: <u> </u>	Directional Coupler: <u> </u>		
Pre-Amp: <u> </u>	Cable #1: 1043		
Filter: <u> </u>	Cable #2: <u> </u>		
Receiver: 1036	Cable #3: <u> </u>		
Attenuator #1: <u> </u>	Cable #4: <u> </u>		
Attenuator #2: <u> </u>	Mixer: <u> </u>		
Additional equipment used: #802 Near Field Probe Set			
Measurement Uncertainty: +/-3.6 dB			

Ref	Lvl	Marker	3 [T1]	RBW	30 kHz	RF Att	40 dB
27	dBm	27.955912	s	SWT	30 s	Mixer	-20 dBm
						Unit	dBm

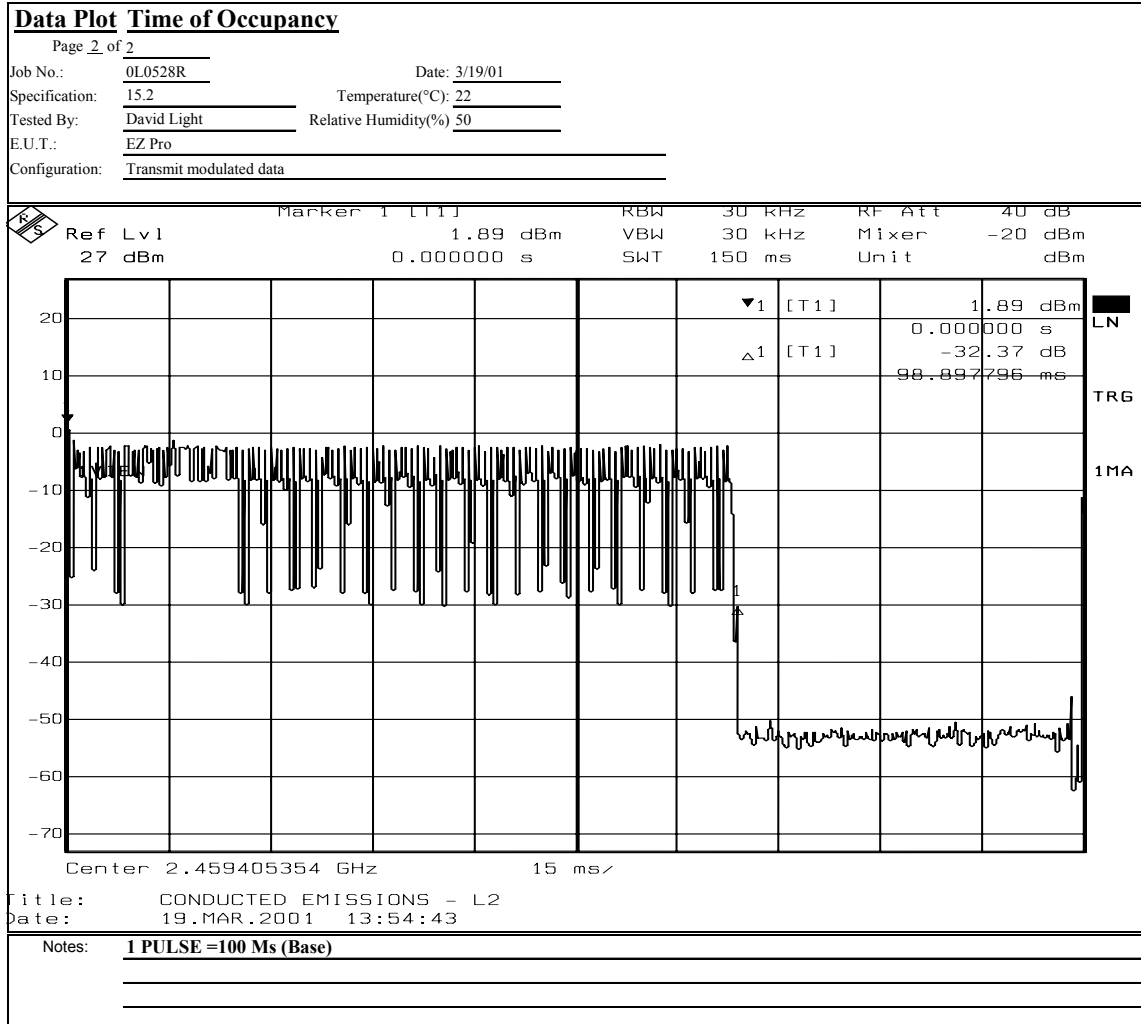
Center 2.459405354 GHz 3 s

Title: CONDUCTED EMISSIONS - L2
Date: 19.MAR.2001 13:36:36

Notes: **3 PULSES IN 30 SECOND PERIOD**
100 mS / pulse

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Test Data-Time of Occupancy



EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Section 7. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.247(a)(1)(i)
TESTED BY: David Light	DATE:12/9/20021

Test Results: Complies.**Measurement Data:** See attached plots.**Measurement Uncertainty:** +/- 1.7 dB

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

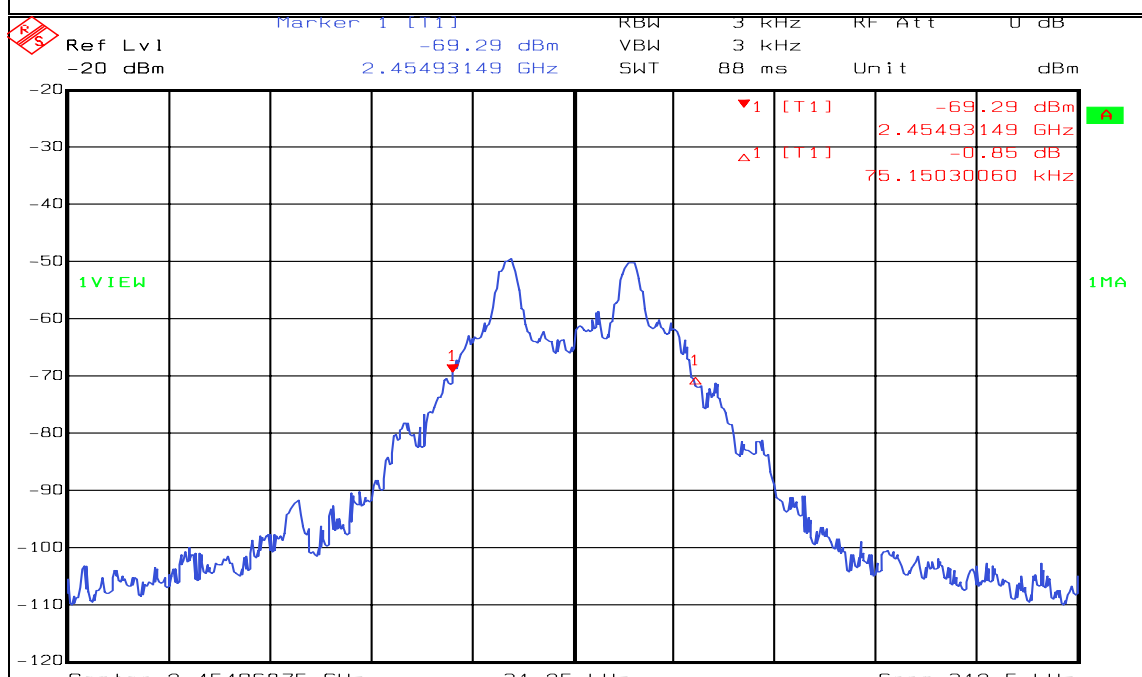
Test Data – Occupied Bandwidth



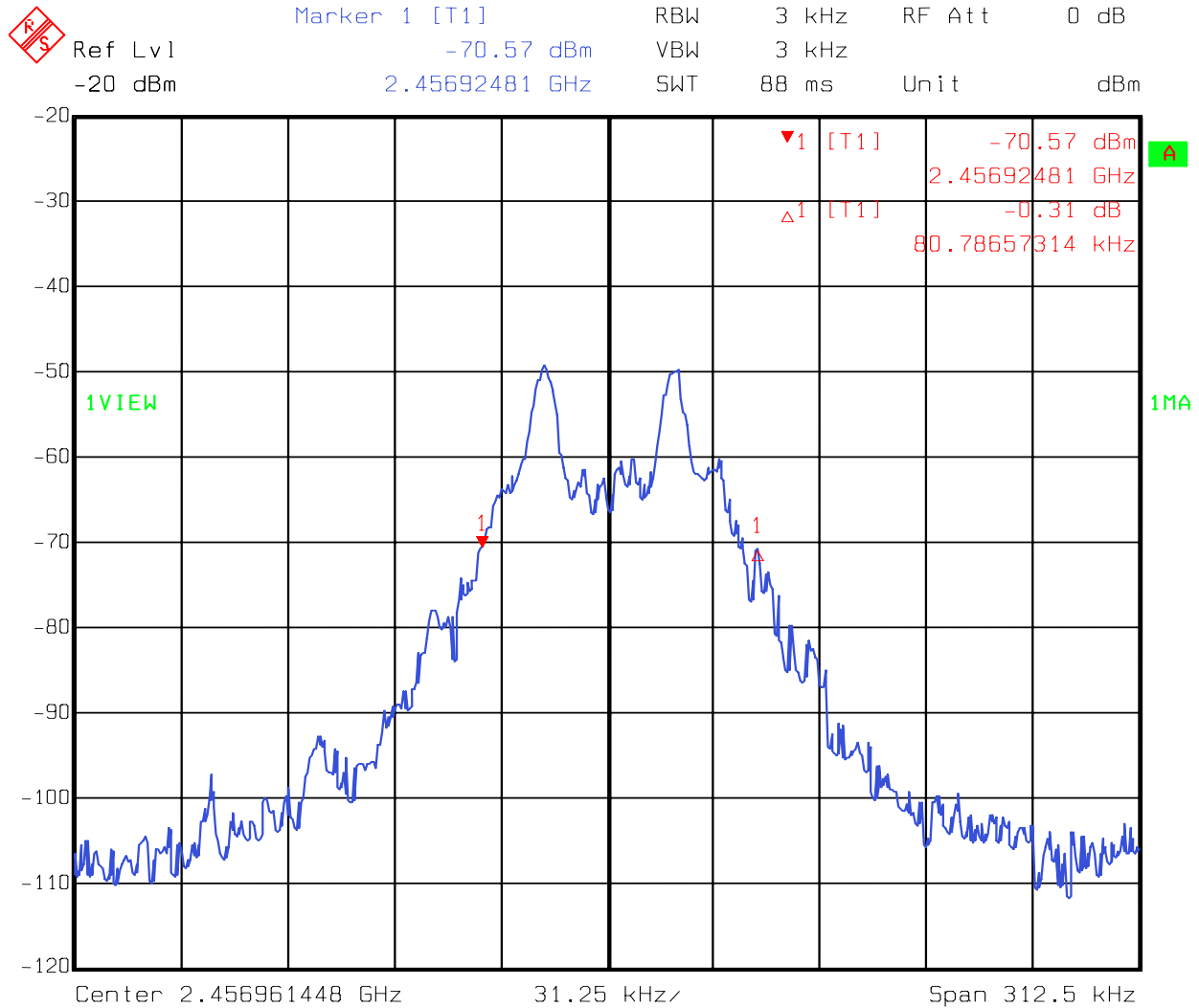
Nemko Dallas, Inc.

Dallas Headquarters:

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Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

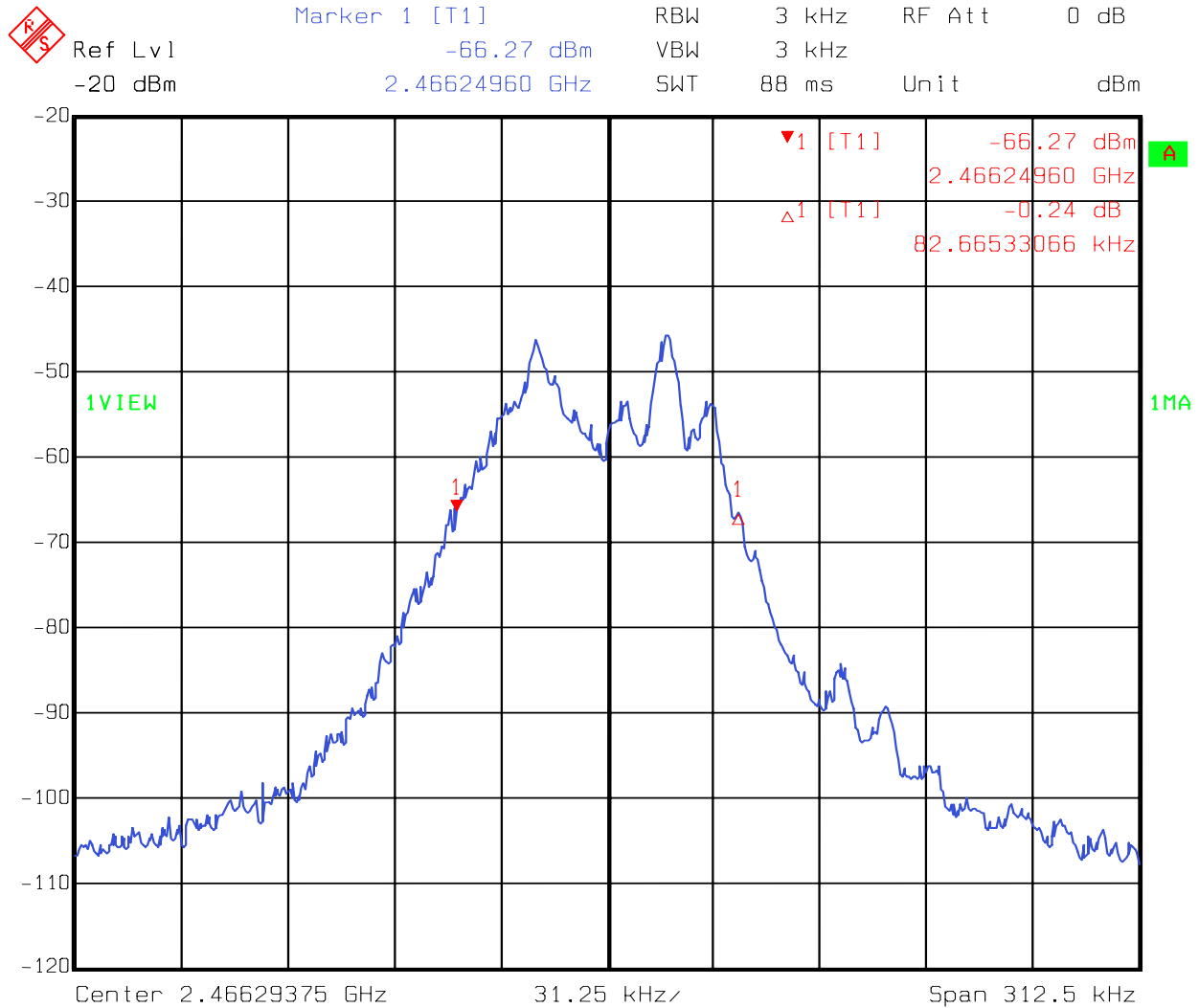
Data Plot		Occupied Bandwidth	
Page <u>1</u> of <u>1</u>		Complete <u>x</u>	
Job No.: 2L0452R	Date: 12/9/2002	Preliminary: _____	
Specification: 15.247	Temperature(°C): 22		
Tested By: David Light	Relative Humidity(%): 40		
E.U.T.: _____			
Configuration: TX FULL POWER			
Sample Number: 1			
Location: AC 3	RBW: 100 kHz	Measurement	
Detector Type: Peak	VBW: 100 kHz	Distance: 3 m	
Test Equipment Used			
Antenna: 1304	Directional Coupler: _____		
Pre-Amp: _____	Cable #1: 1484		
Filter: _____	Cable #2: 1485		
Receiver: 1036	Cable #3: _____		
Attenuator #1: _____	Cable #4: _____		
Attenuator #2: _____	Mixer: _____		
Additional equipment used: _____			
Measurement Uncertainty: +/-1.7 dB			
			
Ref Lvl -20 dBm Marker 1 [T1] RBW 3 kHz RF Att 0 dB Unit dBm			
-69.29 dBm 2.45493149 GHz VBW 3 kHz 88 ms Unit dBm			
-75.15030060 kHz			
Center 2.45496875 GHz 31.25 kHz/ Span 312.5 kHz			
Date: 09.DEC.2002 11:40:31			
Notes: 20 dB Bandwidth = 75.2 kHz			
Plot shows lowest operating channel to be compliant at lower band edge			

Lowest channel

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1****Test Data – Occupied Bandwidth**

Date: 09.DEC.2002 12:24:47

Mid band

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1****Test Data – Occupied Bandwidth**

Date: 09.DEC.2002 12:31:20

Highest channel

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Section 8. Peak Power Output

NAME OF TEST: Peak Power Output	PARA. NO.: 15.247 (b)
TESTED BY: David Light	DATE: 12/9/2002

Test Results: Complies.**Measurement Data:** See attached plots.Detachable antenna? ☐ Yes ☒ No

If yes, state the type of non-standard connector used:

Maximum Peak eirp: 29.5 mW.

Antennas: The only antenna used with the product is a non-detachable antenna that is integrated on the PWB.

Note:

- 1) The unit was tested at +/- 15% supply voltage with no change in output power.
- 2) The unit was tested on three axis'.

Measurement Uncertainty: +/-1.7 dB

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Test Data – Peak Power Output



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EIRP Substitution Method

Page 1 of 1
 Job No.: 2L0452R Date: 12/5/02 Complete X
 Specification: 15.247 Temperature(°C): 22 Preliminary _____
 Tested By: David Light Relative Humidity(%) 40
 E.U.T.: _____
 Configuration: TX FULL POWER - LYING FLAT (WORST CASE)
 Sample No: 1
 Location: AC 3 RBW: 100 kHz Measurement _____
 Detector Type: Peak VBW: 100 kHz Distance: 3 m

Test Equipment Used

Antenna: 1304 Directional Coupler: _____
 Pre-Amp: 1016 Cable #1: 1484
 Filter: _____ Cable #2: 1485
 Receiver: 1036 Cable #3: _____
 Attenuator #1: _____ Cable #4: _____
 Attenuator #2: _____ Mixer: _____
 Additional equipment used: _____
 Measurement Uncertainty: +/-1.7 dB

Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBi)	Limit (dBm)	EIRP (dBm)	EIRP (mW)	Polarity	Comments
2455	-31.2	37.0		0	8.9	36	14.7	29.5121	H	Lowest channel
2455	-37.8	34.2		0	8.9	36	5.3	3.3625	V	
2457	-39.8	34.2		0	8.9	36	3.3	2.1216	V	Mid band
2457	-32.5	37.0		0	8.9	36	13.4	21.8776	H	
2467	-31.2	37.0		0	8.9	36	14.7	29.5121	H	Highest channel
2467	-38.8	34.2		0	8.9	36	4.3	2.6710	V	

Notes: _____

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Section 9. Spurious Emissions (Radiated)

NAME OF TEST: Spurious Emissions (Radiated)	PARA. NO.: 15.247(c)
TESTED BY: David Light	DATE:12/9/2002

Test Results: Complies.**Measurement Data:** See attached table.**Duty Cycle Calculation:** None**Measurement Uncertainty:** +/-1.7 dB

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1****Test Data - Radiated Emissions (Restricted Bands)**

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Radiated Emissions								
Page <u>1</u> of <u>2</u>								
Job No.: 2L0452R		Date: 12/5/2002						
Specification: 15.247		Temperature(°C): 22						
Tested By: David Light		Relative Humidity(%) 40						
E.U.T.: _____		EZ Pro module						
Configuration: _____		Lying flat (worst case) - Tx full power						
Sample Number: 1								
Location: AC 3		RBW: 1 MHz						
Detector Type: Peak		Peak VBW: 1 MHz						
		Avg VBW: 10 MHz						
Test Equipment Used								
Antenna: 1304		Directional Coupler: #N/A						
Pre-Amp: 1016		Cable #1: 1484						
Filter: 1482		Cable #2: 1485						
Receiver: 1036		Cable #3: #N/A						
Attenuator #1: #N/A		Cable #4: #N/A						
Attenuator #2: #N/A		Mixer: #N/A						
Additional equipment used: _____								
Measurement								
Uncertainty: +/- .7 dB								
Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Comment
Lowest Channel								
4.9100	47	33.9	4.3	32.7	52.5	54	-1.5	Horizontal
7.3650	46.5	36.3	5.3	32.9	55.2	74	-18.8	
7.365	39.3	36.3	5.3	32.9	48.0	54	-6.0	Average
12.275	44.8	39.9	7.3	35.1	56.9	74	-17.1	
12.275	31.8	39.9	7.3	35.1	43.9	54	-10.1	Average
Vertical								
4.9100	50.7	33.9	4.3	32.7	56.2	74	-17.8	
4.9100	45.8	33.9	4.3	32.7	51.3	54	-2.7	Average
7.3650	46.8	36.3	5.3	32.9	55.5	74	-18.5	Average
7.365	36.8	36.3	5.3	32.9	45.5	54	-8.5	
12.275	44	39.9	7.3	35.1	56.1	74	-17.9	Average
12.275	33.2	39.9	7.3	35.1	45.3	54	-8.7	
Notes: Continued on next page								

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

Test Data - Radiated Emissions



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Page <u>2</u> of <u>2</u>		<u>Radiated Spurious Emissions</u>						
Continuation Page								
Job No.:		Date: 12/9/2002						
Specification: CFR 47, Part 15		Temperature(°F): <u>22</u>						
Tested By: #N/A		Relative Humidity(%) <u>40</u>						
E.U.T.: EZ Pro module								
Configuration: Lying flat (worst case) - Tx full power								
Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Comment
Mid band								Vertical
4.914	50.5	33.9	4.3	32.7	56.0	74	-18.0	
4.914	47.2	33.9	4.3	32.7	52.7	54	-1.3	Average
7.371	45.6	36.3	5.3	32.9	54.3	74	-19.7	
7.371	41.4	36.3	5.3	32.9	50.1	54	-3.9	Average
12.285	44.6	39.9	7.3	35.1	56.7	74	-17.3	
12.285	35.3	39.9	7.3	35.1	47.4	54	-6.6	Average
								Horizontal
4.914	45.5	33.9	4.3	32.7	51.0	54	-3.0	
7.371	36.3	36.3	5.3	32.9	45.0	54	-9.0	
12.285	43.8	39.9	7.3	35.1	55.9	74	-18.1	
12.285	35.7	39.9	7.3	35.1	47.8	54	-6.2	Average
High channel								Horizontal
4.933	44.4	33.9	4.3	32.7	49.9	54	-4.1	
7.399	43.2	36.3	5.3	32.9	51.9	54	-2.1	
12.331	44.2	39.9	7.3	35.1	56.3	74	-17.7	
12.331	35.4	39.9	7.3	35.1	47.5	54	-6.5	Average
								Vertical
4.933	49.8	33.9	4.3	32.7	55.3	74	-18.7	
4.933	45.7	33.9	4.3	32.7	51.2	54	-2.8	Average
7.399	45.6	36.3	5.3	32.9	54.3	74	-19.7	
7.399	39.8	36.3	5.3	32.9	48.5	54	-5.5	Average
12.331	44.1	39.9	7.3	35.1	56.2	74	-17.8	
12.331	35.4	39.9	7.3	35.1	47.5	54	-6.5	Average
Notes:	All measurements are PEAK unless otherwise noted							
	Searched spectrum to the 10th harmonic of highest channel							

Radiated Photographs (Worst Case Configuration)

FRONT VIEW



REAR VIEW



EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1****Section 10. Test Equipment List**

Calibration list for tests done March 2001

ASSET	Description	Manufacturer Model Number	Serial Number	Cal. Date	Cal. Due
993	Horn antenna	A.H. Systems SAS-200/571	XXX	07/16/99	07/16/01
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	06/14/99	06/14/01
1043	Flexible cable 1m	Astrolab Inc. 32027-2-29094K-1M	0	01/29/01	01/29/02
802	Near Field Probe Set	EMCO 7405	103	CNR	CNR
1482	Band Pass Filter	K & L 11SH10-4000/T12000-0/0	2	Cal B4 Use	N/A
1016	AMPLIFIER	HEWLETT PACKARD 8449A	2749A00159	05/24/00	05/24/01
968	Filter, High pass 5khz	Solartron 7930-5.0	933124	08/04/00	08/04/01
674	LIMITER	HP 11947A	3107A02200	11/04/00	11/04/01
1328	CABLE, .5m	KTL RG223	N/A	03/12/01	03/12/02
1534	CABLE, 9M	KTL RG223	NA	08/30/00	08/30/01
969	lism	Schwarzbeck 8120	8120281	07/01/00	07/01/01
1578	50 Ohm Load	Mini-Circuits MCLBTRM-50	920513	01/12/01	01/12/02
1578	50 Ohm Load	Mini-Circuits MCLBTRM-50	920513	01/12/01	01/12/02
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	05/25/00	05/25/01
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	05/25/00	05/25/01

Calibration list for tests done December 2002

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/02/01	01/03/03
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	12/18/01	12/19/03
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	07/15/02	07/15/03
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	07/15/02	07/15/03
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	07/15/02	07/15/03
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	07/30/01	07/31/03
1555	Filter high pass 5KHz	Solar Electronics 7930-5.0	933125	06/06/02	06/06/03
1258	LISN .15mhz-30mhz	EMCO 0	1305	07/09/02	07/09/03
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	12/18/01	12/19/03
1547	CABLE .6m	KTL RG223	N/A	08/06/02	08/06/03
1129	CABLE, 9.5m	KTL RG58	N/A	06/06/02	06/06/03

ANNEX A - TEST DETAILS

EQUIPMENT: **EZ Pro, Model 8602**

PROJECT NO.: **2L0452RUS1**

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)
---	----------------------

Minimum Standard:

The R.F. that is conducted back onto the AC power line on any frequency within the band 0.45 to 30 MHz shall not exceed 250 μ V (48 dB μ V) across 50 ohms.

EQUIPMENT: **EZ Pro, Model 8602**

PROJECT NO.: **2L0452RUS1**

NAME OF TEST: Channel Separation	PARA. NO.: 15.247(a)(1)
----------------------------------	-------------------------

Minimum Standard:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

NAME OF TEST: Pseudorandom Hopping Algorithm	PARA. NO.: 15.247(a)(1)
--	-------------------------

Minimum Standard:

The system shall hop to channel frequencies that are selected from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their transmitters and shall shift frequencies in synchronization with the transmitted signals.

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

NAME OF TEST: Time of Occupancy

PARA. NO.: 15.247(a)(1)(ii)

Minimum Standard:

Frequency Band (MHz)	20 dB Bandwidth	No. of Hopping Channels	Average Time of Occupancy
902 - 928	<250 kHz	50	=<0.4 sec. in 20 sec.
902 - 928	=>250 kHz	25	=<0.4 sec. in 10 sec.
2400 - 2483.5	-----	75	=<0.4 sec. in 30 sec.
5725 - 5850	-----	75	=<0.4 sec. in 30 sec.

Method Of Measurement:

The spectrum analyzer is set as follows:

RBW: 1 MHz

VBW: = RBW

Span: 0 Hz

LOG dB/div.: 10 dB

Sweep: Sufficient to see one hop time sequence.

Trigger: Video

The occupancy time of one hop is measured as above. The average time of occupancy is calculated over the appropriate period of time from above table (10, 20, or 30 seconds).

Avg. time of occupancy = (period from table/duration of one hop)/no. of channels multiplied by the duration of one hop.

For instance:

If a 2.4 GHz system has a measured hop duration time of 1 msec. and uses 75 channels, then the average time of occupancy would be:

$(30 \text{ sec.} / .001 \text{ sec.}) / 75 \text{ chan.} = 400 \times 1 \text{ msec.} = 400 \text{ msec. or } 0.4 \text{ sec. in } 30 \text{ sec.}$

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 15.247(a)(2)

Minimum Standard:

Frequency Band (MHz)	Maximum 20 dB Bandwidth
902 - 928	500 kHz
2400 – 2483.5	1 MHz
5725 – 5850	1 MHz

Method Of Measurement:

The spectrum analyzer is set as follows:

RBW: At least 1% of span/div.

VBW: >RBW

Span: Sufficient to display 20 dB bandwidth

LOG dB/div.: 10 dB

Sweep: Auto

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

EQUIPMENT: **EZ Pro, Model 8602**

PROJECT NO.: **2L0452RUS1**

NAME OF TEST: Peak Power Output

PARA. NO.: 15.247(b)

Minimum Standard:

Frequency Band (MHz)	No. of Hopping Channels	Maximum Peak Power Output at Antenna Port
902 - 928	at least 50	1 watt
902 – 928	25 - 49	0.25 watts
2400 – 2483.5	75	1 watt
5725 – 5850	75	1 watt

If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point to point operation may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceed 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operation may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Direct Measurement Method For Detachable Antennas:

If the antenna is detachable, a peak power meter is used to measure the power output with the transmitter operating into a 50 ohm load. The dBi gain of the antenna(s) employed shall be reported.

Calculation Of EIRP For Integral Antenna:**Test Method:** TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

The RBW of the spectrum analyzer shall be set to a value greater than the measured 20 dB occupied bandwidth of the E.U.T.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

NAME OF TEST: Spurious Emissions at Antenna Terminals PARA. NO.: 15.247(c)

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength 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

THE SPECTRUM WAS SEARCHED TO THE 10th HARMONIC**Method Of Measurement:**30 MHz - 10th harmonic plot

RBW: 100 kHz

VBW: 300 kHz

Sweep: Auto

Display line: -20 dBc

Lower Band Edge

RBW: At least 1% of span/div.

VBW: >RBW

Span: As necessary to display any spurious at band edge.

Sweep: Auto

Center Frequency: 902 MHz, 2400 MHz, or 5725 MHz

Marker: Peak of fundamental emission

Marker Δ : Peak of highest spurious level below center frequency.Upper Band Edge

RBW: At least 1% of span/div.

VBW: >RBW

Span: As necessary to display any spurious at band edge.

Sweep: Auto

Center Frequency: 928 MHz, 2483.5 MHz, or 5850 MHz

Marker: Peak of fundamental emission

Marker Δ : Peak of highest spurious level above center frequency.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

EQUIPMENT: **EZ Pro, Model 8602**PROJECT NO.: **2L0452RUS1**

NAME OF TEST: Radiated Spurious Emissions

PARA. NO.: 15.247(c)

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits:

Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength 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

THE SPECTRUM WAS SEARCHED TO THE 10th HARMONIC**15.205 Restricted Bands**

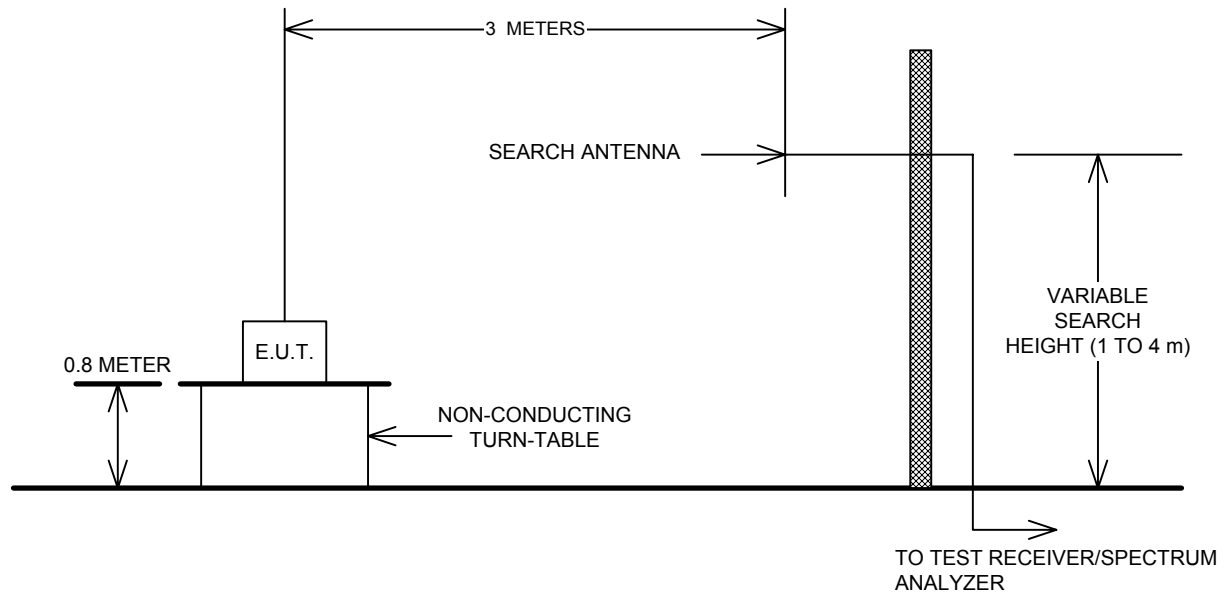
MHz	MHz	MHz	GHz
0.09-0.11	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.125-6.218	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	Above 38.6
13.36-13.41	1718		

Number of channels tested:

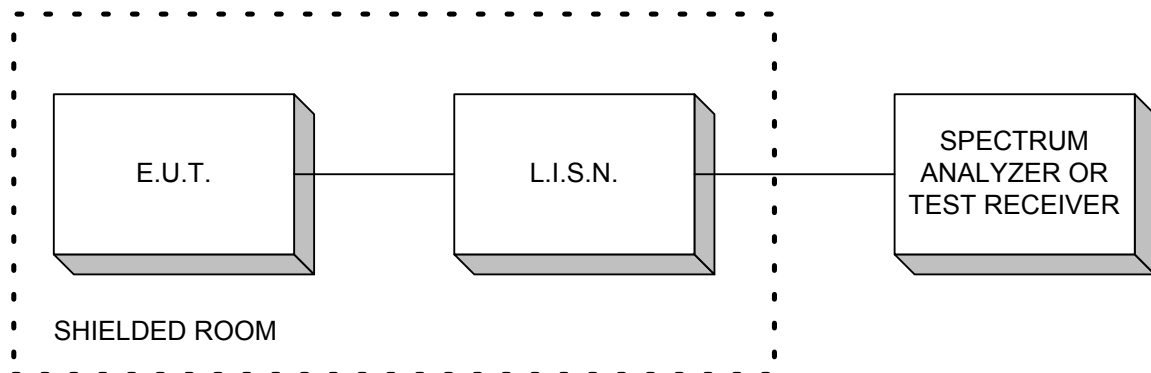
Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

ANNEX B - TEST DIAGRAMS

Test Site For Radiated Emissions



Conducted Emissions



Peak Power At Antenna Terminals

