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COMPLIANCE TEST REPORT

PER FCC PART 15.247 FHSS

APPLICANT	Pyramid Technologies
ADDRESS	45 Gracey Ave. Meriden CT 06451 USA
FCC ID	WC7H9DIG1
MODEL NUMBER	LWPWRDIGI
PRODUCT DESCRIPTION	Digital Clock Module
DATE SAMPLE RECEIVED	March 27, 2008
DATE TESTED	April 11, 2008
TESTED BY	Joe Scoglio
APPROVED BY	Mario de Aranzeta C.E.T.
TIMCO REPORT NO	606UT8TestReport.pdf
TEST RESULTS	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Certificate # 0955-01

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ATTESTATION

The test results relate only to the items tested.

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.



Certificate #0955-01

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made by me or under my supervision, at Timco Engineering, Inc. located at 849 N.W. State Road 45, Newberry, Florida 32669 USA.

Authorized By: Mario de Aranzeta
Signature: On File
Function: Lab Supervisor / Engineer
Date: June 18, 2008

REPORT SUMMARY

Purpose of Test:	To show the DUT in compliance with Limited Modular Approval requirements
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TEST ENVIRONMENT AND SYSTEM

Test Facility	The test sites used by Timco Engineering Inc. are located at 849 NW State Road 45 Newberry, FL 32669 USA.
Laboratory Test Condition:	Temperature: 26°C , Humidity: 55%
Test Exercise (e.g software description, test signal, etc.):	The DUT was set in continuous transmit mode of operation.
Supporting Peripheral Equipment	Not applicable. The device is a stand-alone device.
Deviation to the standard(s)	No deviation from the standard(s)
Modification to the DUT:	No modification was made to the DUT.

TEST SAMPLE DESCRIPTION

Product Description:	Digital Clock Module
FCC ID:	WC7H9DIG1
Model Number:	LWPWRDIGI
Brand Name:	Pyramid
Operating Frequency:	902.2 – 927.6 MHz
Type of Modulation:	FSK
EUT Power Source:	Primary Power – 110-120Vac/50-60 MHz
	Secondary Power – N/A
Test Item:	Prototype
Type of Equipment	Mobile
Antennas	Internal
Antenna Connector	N/A

EMC EQUIPMENT LIST

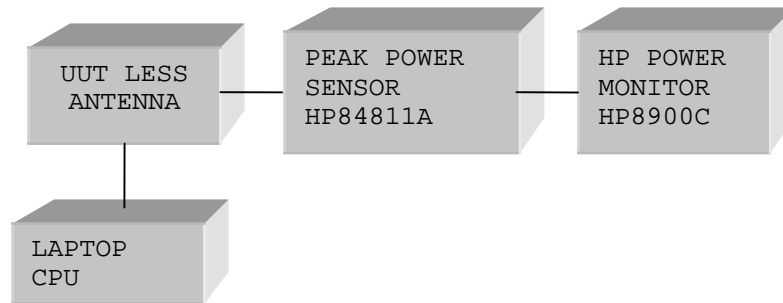
Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Antenna: Biconnical	Eaton	94455-1	1057	CAL 12/12/07	12/12/09
Antenna: Biconnical	Eaton	94455-1	1096	CAL 10/11/06	10/11/08
Antenna: Biconnical	Electro-Metrics	BIA-25	1171	CAL 7/18/07	7/18/09
Analyzer Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 5/17/07	5/17/09
Analyzer Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 5/17/07	5/17/09
Analyzer Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 5/17/07	5/17/09
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/5/06	10/5/08
LISN	Electro-Metrics	EM-7820	2682	CAL 7/23/07	7/23/09
Antenna: Log-Periodic	Eaton	96005	1243	CAL 12/14/07	12/14/09

TEST PROCEDURES

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI C63.4-2003 using a 50uH LISN. Both lines were observed with the DUT transmitting. The resolution bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

BANDWIDTH 20 dB: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

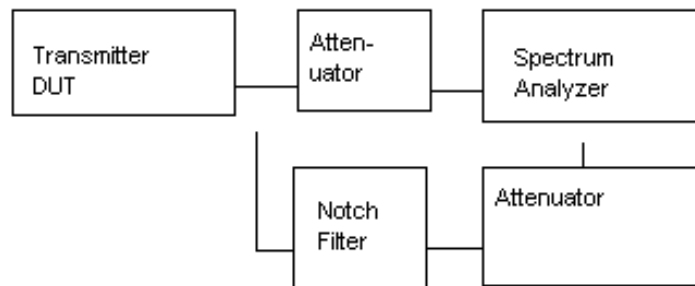
POWER OUTPUT: The Power was measured by disconnecting the antennas and measuring across a 50 ohm load as recommended by the manufacturer using a HP peak power meter Model 8900C. The antenna is non-directional and doesn't exceed 6 dBi gain. The power output was measured at three places in the band highest is reported below.



[Continued]

ANTENNA CONDUCTED EMISSIONS: The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10th Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

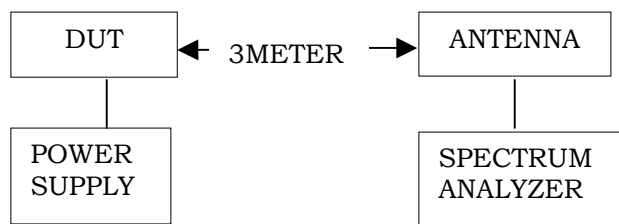
Spurious Emissions at
Antenna Terminals



The spectrum was scanned to the tenth harmonic.

RADIATION INTERFERENCE: The test procedure used was ANSI C63.4-2003 using an Agilent spectrum receiver with preselector. The bandwidth (RBW) of the spectrum receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

RADIATED SPURIOUS EMISSIONS: The procedure used was ANSI standard C63.4-2003 & the FCC/OET Guidance on Measurements for Spread Spectrum Systems – Public Notice DA 00-705 dated Mrch 30th, 2000.



Equipment placed 80cm above ground on a rotatable platform.

POWER LINE CONDUCTED INTERFERENCE

Rules Part No.: 15.107(a)

Requirements:

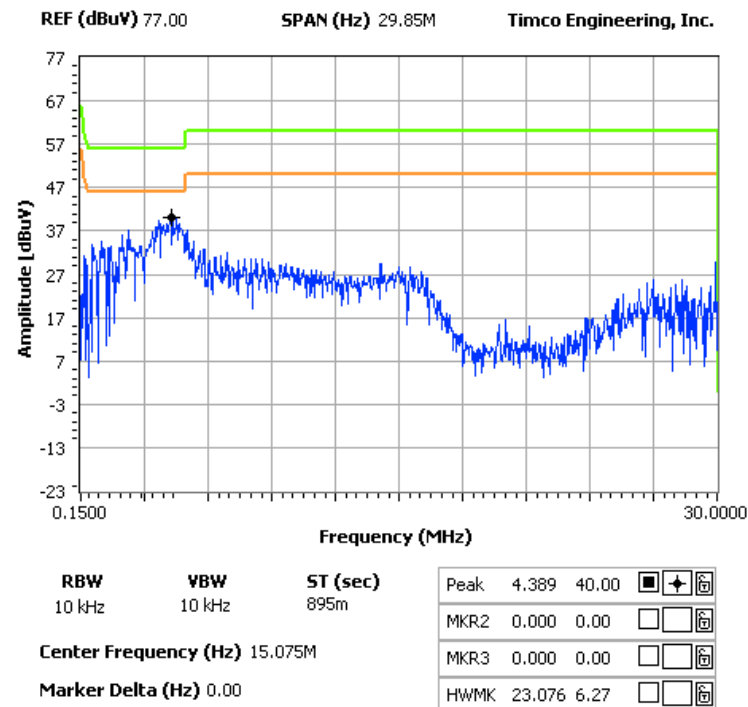
Emission Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-peak (QP)	Average (AV)
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50
* Decreases with the logarithm of the frequency.		

Test Data:

NOTES:

606ut8 ac line conducted line 1

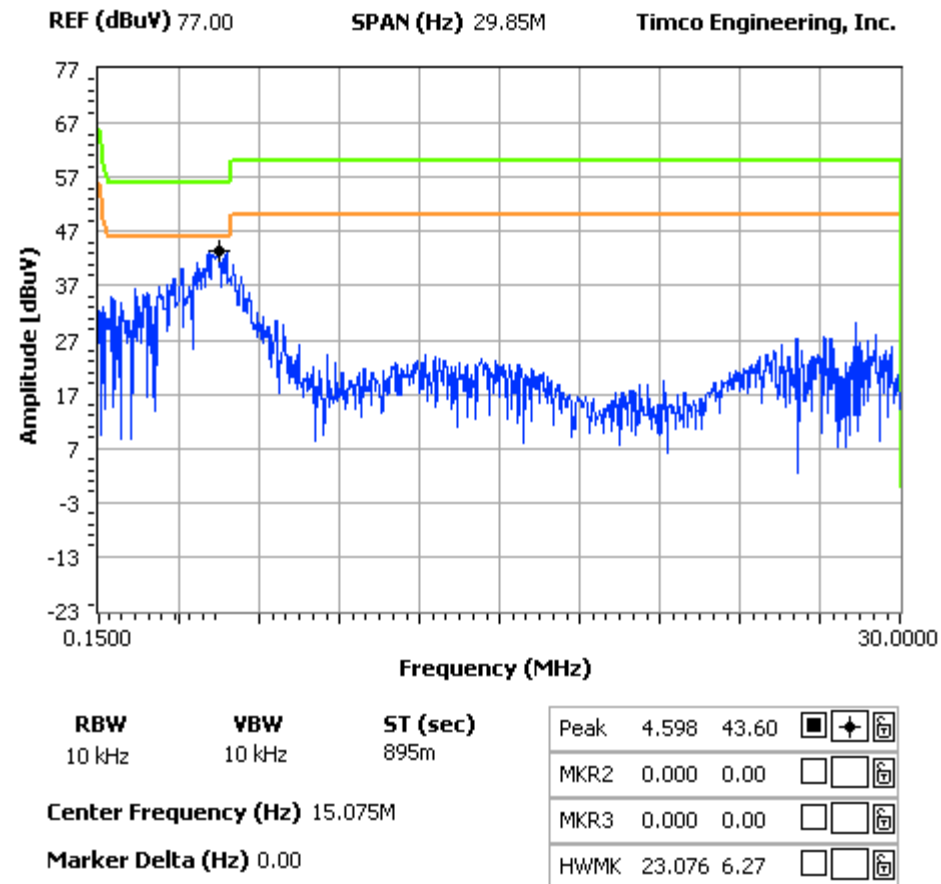
FCC 15.107 Mask Class B



NOTES:

606ut8 ac line conducted line 2

FCC 15.107 Mask Class B



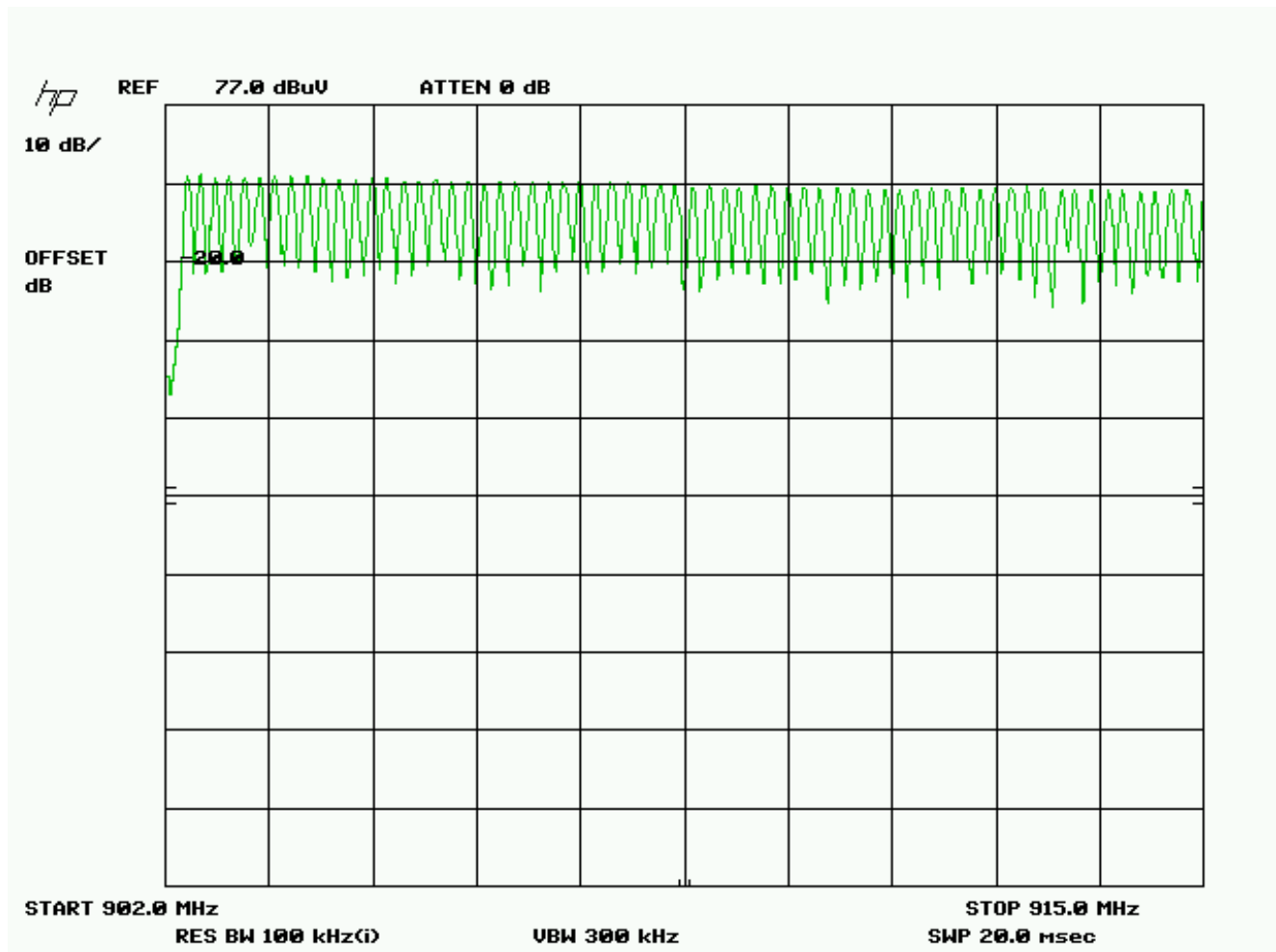
NUMBER OF HOPPING CHANNELS

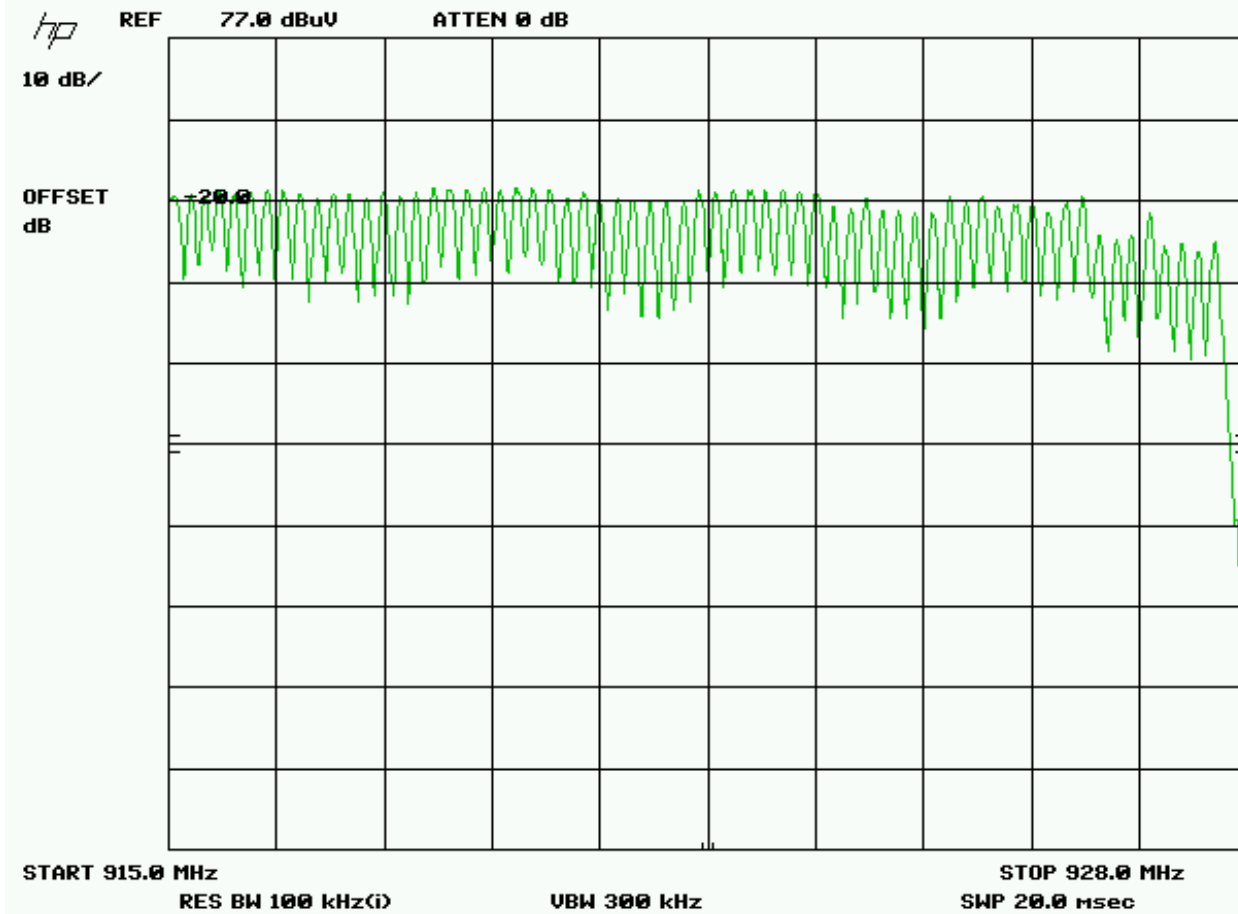
Rules Part No.: 15.247(a)(1)

Requirements:

902-928 MHz	If the 20 dB bandwidth is less than 250 kHz, the system shall use at least 50 hopping frequencies.
	If the 20 dB bandwidth is 250 kHz or greater, the system shall use at least 25 hopping frequencies.
2400-2483.5 MHz	At least 15 channels
5725-5850 MHz	At least 75 channels

Test Data: There are 128 channels





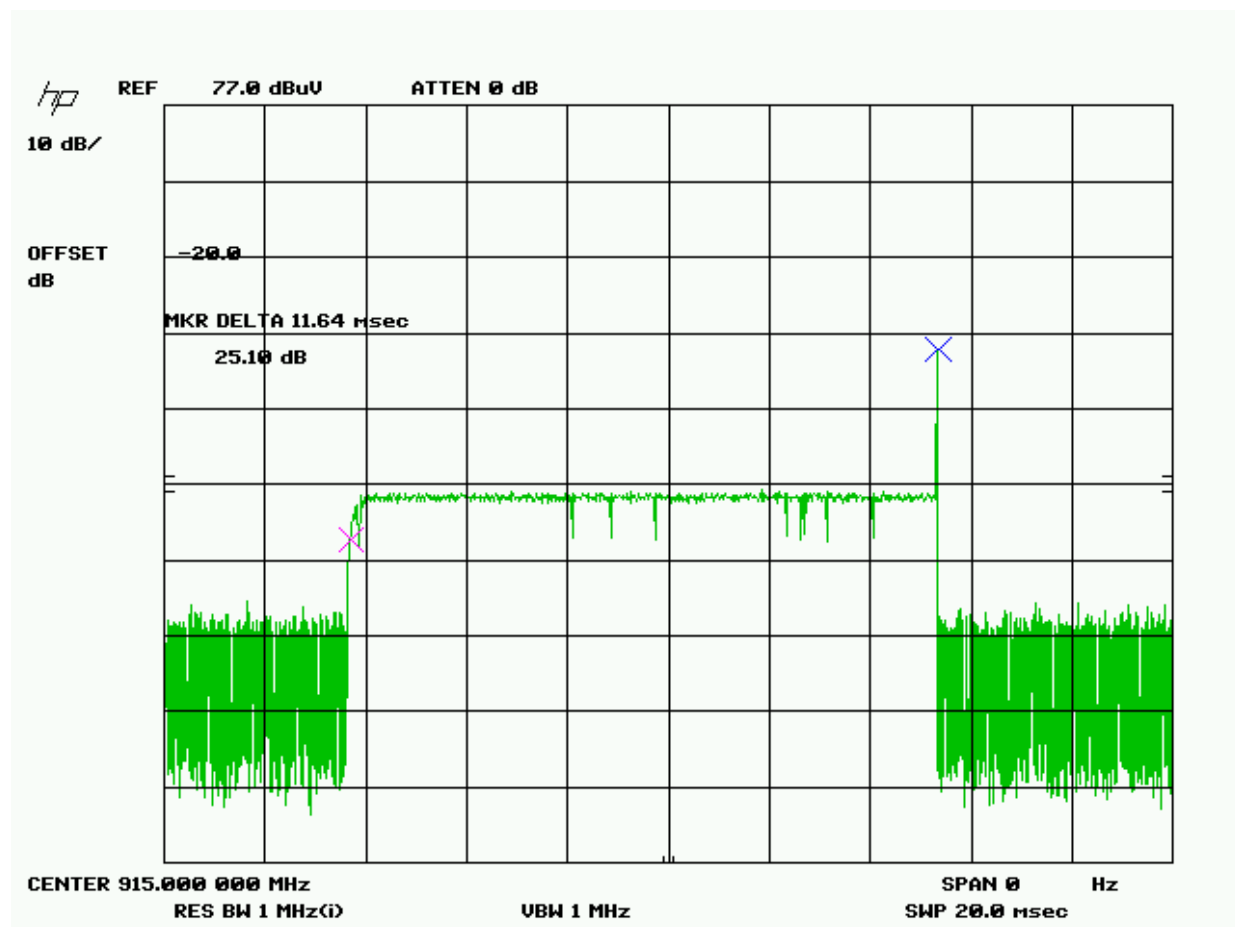
DWELL TIME OF A HOPPING CHANNEL

Rules Part No.: 15.247(a)(1)(i)

Requirements:

902-928 MHz	If 20 dB bandwidth is less than 250 kHz, Dwell time ≤ 0.4 seconds in a 20 second period.
	If 20 dB bandwidth is 250 kHz or greater, Dwell time ≤ 0.4 seconds in a 10 second period.
2400-2483.5 MHz	≤ 0.4 seconds in a 0.4 seconds multiplied the number of hopping channels employed.
5725-5850 MHz	≤ 0.4 seconds in a 30 second period.

Test Data: The dwell time is 11.64 msec.



Three places in the band were measured and the worst case presented above.

APPLICANT: Pyramid Technolgoies

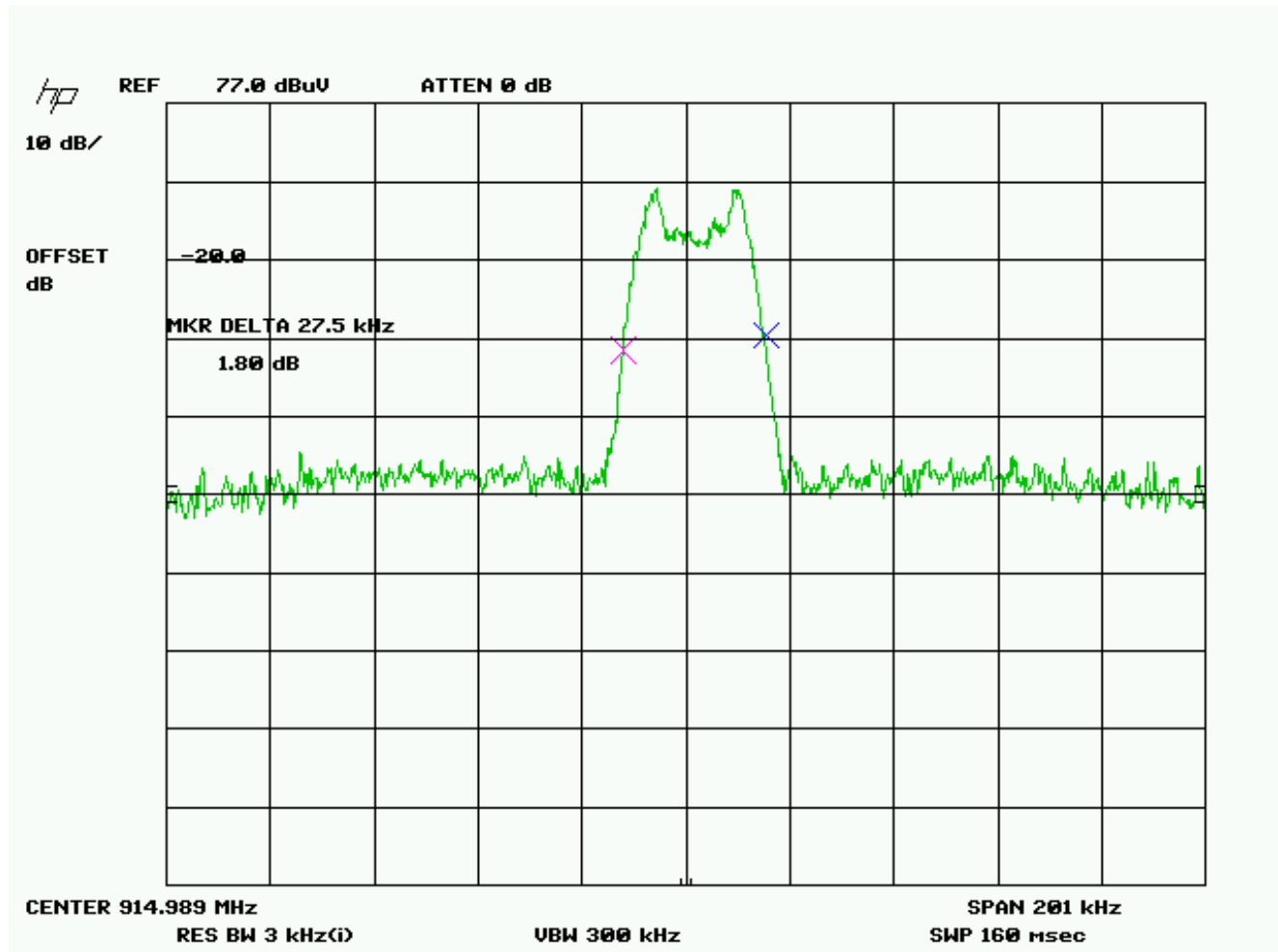
FCC ID: WC7H9DIG1

REPORT: X:\P\PYRAMID\606UT8\606UT8TestReport.doc

20 dB BANDWIDTH

Rules Part No.: 15.247(a)(2)

Test Data: See the following plots



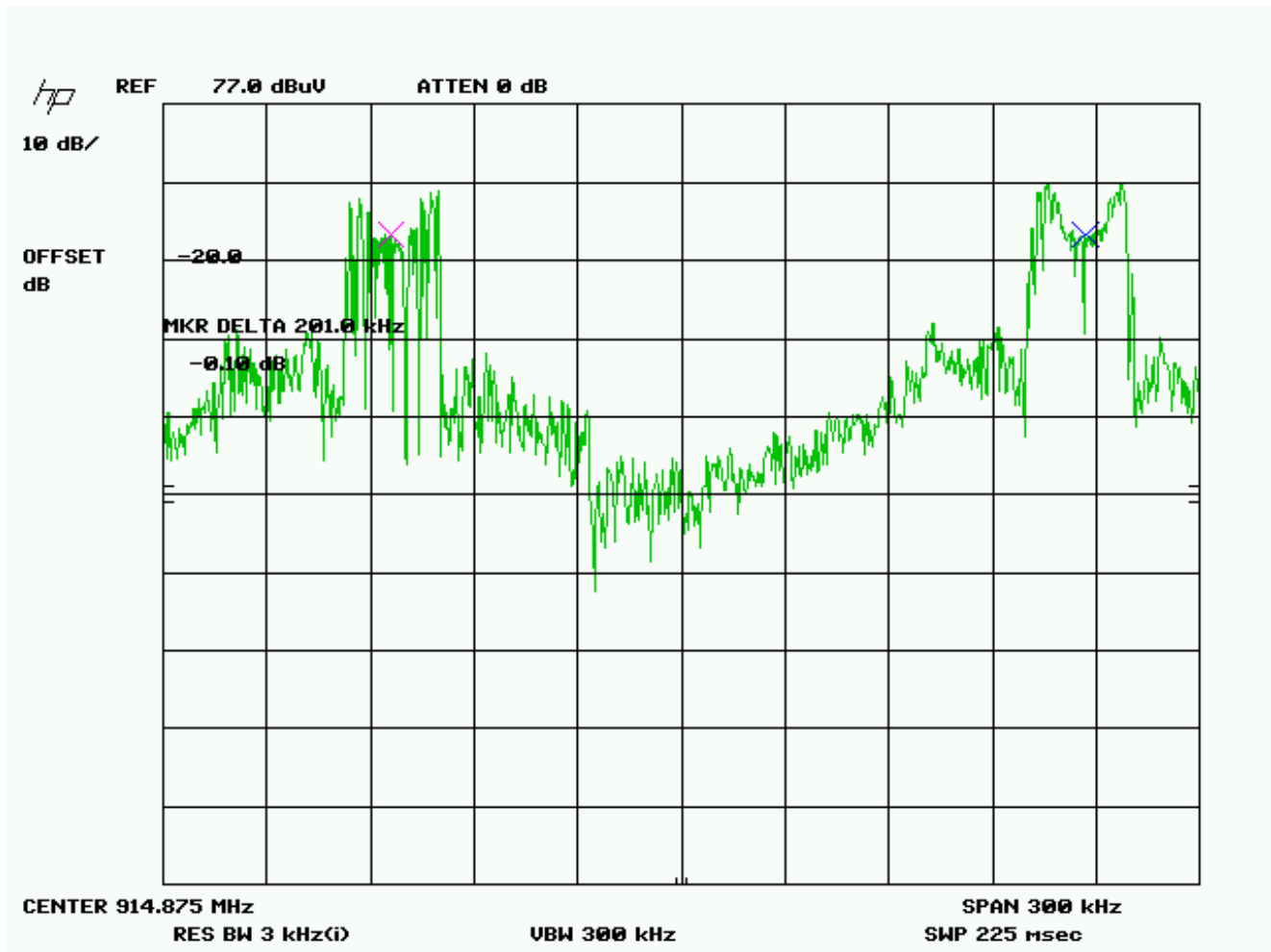
Three places in the band were measured and the worst case presented above.

CARRIER FREQUENCY SEPARATION

Rules Part No.: 15.247(a)(2)

Requirements: The hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Test Data: See the following plot
201 kHz



POWER OUTPUT

Rules Part No.: 15.247(b)

Requirements: The maximum peak output power shall not exceed 1 watt (30 dBm). If directional transmitting antennas with a gain of more 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.

Test Data: 0.020W @ 915 MHz

Three places in the band were measured and the highest power is shown above.

Frequency MHz	Power Output W
903	0.018
915	0.020
927	0.019

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Rules Part No.: 15.247(c)

Requirements: Emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

Test Data: N/A. The antenna is permanently installed.

FIELD STRENGTH OF SPURIOUS EMISSIONS

RULES PART NO.: 15.247(c), 15.205 & 15.209(b)

REQUIREMENTS:

§15.247(c) & §15.205	
(Fundamental) Frequency	(Field Strength) Limits
902 – 928 MHz 2.4 – 2.4835 GHz	127.37 dBuV/m
	54 dBuV/m @3m
§15.209	
30 - 88 MHz	40 dBuV/m @3M
88 - 216 MHz	43.5 dBuV/m @3M
216 - 960 MHz	46 dBuV/m @3M
ABOVE 960 MHz	54 dBuV/m

Emissions that fall in the restricted bands (15.205) must be less than or equal to 500 uV/m (54 dBuV/m). Spurious not in a restricted band must be 20 dBc.

Harmonics were measured to the 10th harmonic.

TEST DATA:

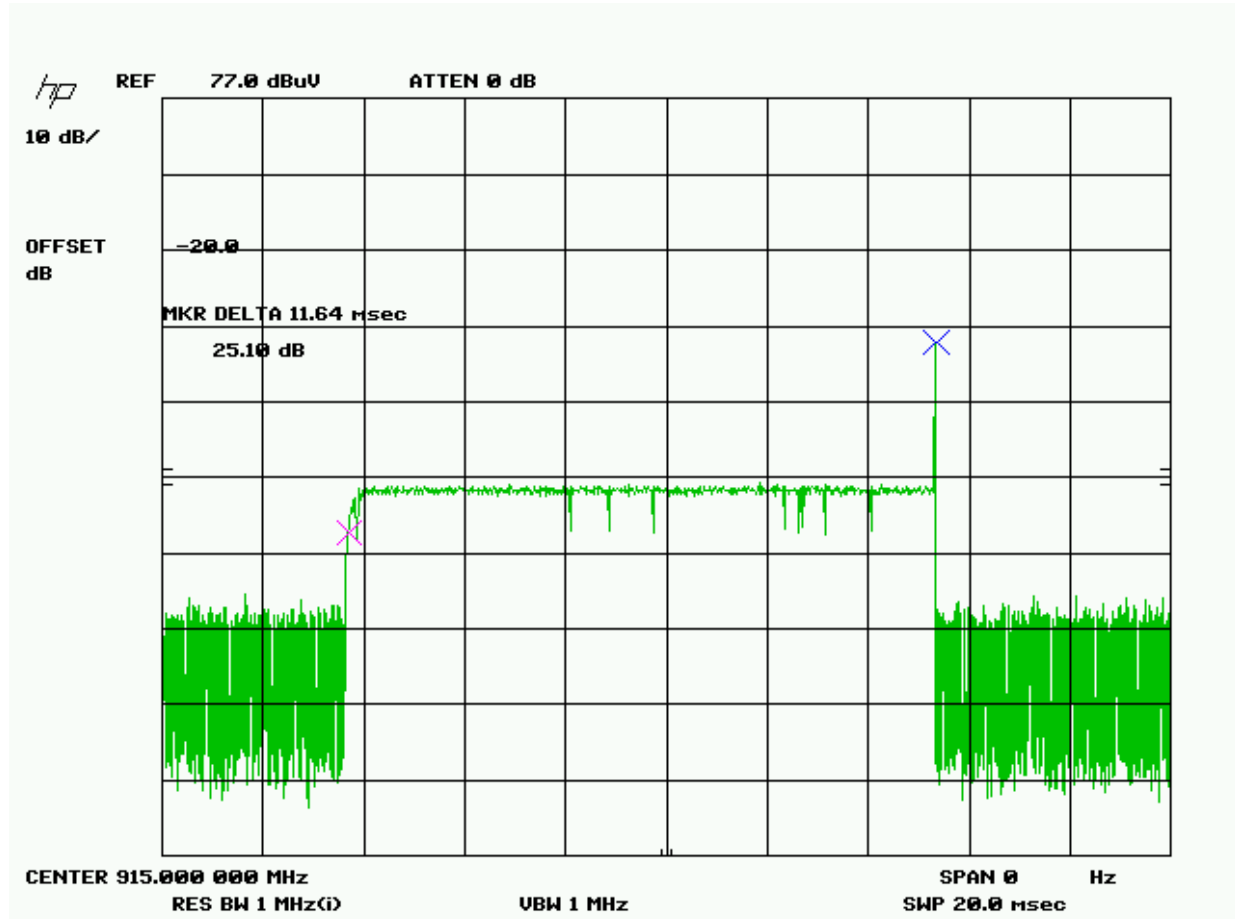
Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Duty cycle dB	Field Strength dBuV/m	Margin dB
902.1	902.1	64	H	4.82	23.96	18.58	74.2	
902.1	902.1	65.7	V	4.82	23.16	18.58	75.1	
902.1	1,804.00	27.5	V	1.6	30.33	18.58	40.85	13.15
902.1	1,804.00	32.7	H	1.6	30.33	18.58	46.05	7.95
902.1	2,706.50	31.3	V	1.98	32.68	18.58	47.38	6.62
902.1	2,706.50	31.7	H	1.98	32.68	18.58	47.78	6.22
902.1	3,608.70	34.8	H	2.28	33.19	18.58	51.69	2.31
902.1	3,608.70	35.4	V	2.28	33.19	18.58	52.29	1.71
902.1	4,510.90	3.7	V	2.55	33.9	18.58	21.57	32.43
902.1	4,510.90	9.2	H	2.55	33.9	18.58	27.07	26.93
902.1	5,413.00	6.7	H	2.87	34.5	18.58	25.49	28.51
902.1	5,413.00	10.6	V	2.87	34.5	18.58	29.39	24.61
902.1	6,315.20	15.2	H	3.16	35.55	18.58	35.33	18.67
902.1	6,315.20	17.6	V	3.16	35.55	18.58	37.73	16.27
902.1	7,217.40	15.6	H	3.37	35.56	18.58	35.95	18.05
902.1	7,217.40	19.8	V	3.37	35.56	18.58	40.15	13.85
902.1	8,119.60	13.1	V	3.62	35.72	18.58	33.86	20.14
902.1	8,119.60	17.2	H	3.62	35.72	18.58	37.96	16.04
902.1	9,021.80	5.2	H	3.8	36.02	18.58	26.44	27.56
902.1	9,021.80	6.2	V	3.8	36.02	18.58	27.44	26.56
915	915	63.5	H	4.35	24.85	18.58	74.12	
915	915	66.4	V	4.35	23.6	18.58	75.77	
915	1,830.00	28.1	V	1.62	30.54	18.58	41.68	12.32
915	1,830.00	31.7	H	1.62	30.54	18.58	45.28	8.72
915	2,745.00	34.3	V	2	32.7	18.58	50.42	3.58
915	2,745.00	34.3	H	2	32.7	18.58	50.42	3.58
915	3,660.00	32.7	V	2.3	33.23	18.58	49.65	4.35
915	3,660.00	33.5	H	2.3	33.23	18.58	50.45	3.55
915	4,575.00	2.7	V	2.57	33.92	18.58	20.61	33.39
915	4,575.00	3.7	H	2.57	33.92	18.58	21.61	32.39
915	5,490.00	6	H	2.9	34.59	18.58	24.91	29.09
915	5,490.00	10.4	V	2.9	34.59	18.58	29.31	24.69
915	6,405.00	17.6	H	3.18	35.62	18.58	37.82	16.18
915	6,405.00	19.1	V	3.18	35.62	18.58	39.32	14.68
915	7,320.00	18.2	H	3.4	35.54	18.58	38.56	15.44
915	7,320.00	18.7	V	3.4	35.54	18.58	39.06	14.94

[Continued]

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Duty cycle dB	Field Strength dBuV/m	Margin dB
915	8,235.00	14.3	V	3.65	35.75	18.58	35.12	18.88
915	8,235.00	18.2	H	3.65	35.75	18.58	39.02	14.98
915	9,150.00	6.1	H	3.82	36.15	18.58	27.49	26.51
915	9,150.00	7.4	V	3.82	36.15	18.58	28.79	25.21
927.6	927.6	64.1	H	3.88	26.64	18.58	76.04	
927.6	927.6	65.5	V	3.88	25.24	18.58	76.04	
927.6	1,855.20	25.8	V	1.63	30.74	18.58	39.59	14.41
927.6	1,855.20	29.4	H	1.63	30.74	18.58	43.19	10.81
927.6	2,782.80	35.3	V	2.01	32.71	18.58	51.44	2.56
927.6	2,782.80	35.7	H	2.01	32.71	18.58	51.84	2.16
927.6	3,710.40	33.6	H	2.31	33.27	18.58	50.60	3.40
927.6	3,710.40	33.9	V	2.31	33.27	18.58	50.90	3.10
927.6	4,638.00	9.5	H	2.59	33.93	18.58	27.44	26.56
927.6	4,638.00	9.8	V	2.59	33.93	18.58	27.74	26.26
927.6	5,565.60	7.5	H	2.93	34.69	18.58	26.54	27.46
927.6	5,565.60	14.2	V	2.93	34.69	18.58	33.24	20.76
927.6	6,493.20	17.6	H	3.2	35.69	18.58	37.91	16.09
927.6	6,493.20	17.7	V	3.2	35.69	18.58	38.01	15.99
927.6	7,420.80	17.5	H	3.43	35.52	18.58	37.87	16.13

DUTY CYCLE

Duration of pulse: $20 \cdot \log \left(\frac{11.64}{100} \right) = 20 \cdot \log (0.93) = 18.6 \text{ dB}$



RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

Rules Part No.: **Pt 15.205**

Requirements: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54dBuV/m). Emissions not in the restricted band must be 20 dBc.

Test Data: The plots are presented below.

