Test of Altitude 350-2 Access Point

To: FCC 47 CFR Part 15.407 + MO&O 06-96

Report Serial No: ULTG03-A3 Rev A

TEST REPORT

FROM

Test of Altitude 350-2 Access Point

To: FCC 47 CFR Part 15.407 + MO&O 06-96

Test Report Serial No.: ULTG03-A3 Rev A

This report supersedes None

Manufacturer: Extreme Networks Inc
3585 Monroe Street
Santa Clara
California, CA 95051, USA

Product Function: 802.11a/b/g Wireless Access Point

Copy No: pdf **Issue Date:** 26th April 2007

This Test Report is Issued Under the Authority of;

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CERTIFICATE #2381.01

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ACCREDITATION & LISTINGS

MiCOM Labs, Inc. an accredited laboratory complies with the international standard BS EN ISO/IEC 17025. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-01.pdf

THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

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MICOM LABS
Pleasanton, CA

for technical competence in the field of

Electrical Testing

The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories" and any additional program requirements in the identified field of testing.

Presented this 14th day of September 2005.

American Association for Laboratory Accreditation
Corporate SEAL 1978 District of Columbia
A2LA

President
For the Accreditation Council
Certificate Number 2381.01
Valid to: November 30, 2007

For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

LISTINGS

MiCOM Labs test facilities are listed by the following organizations;

North America

United States of America
Federal Communications Commission (FCC) Listing #: 102167

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DOCUMENT HISTORY

Document History		
Revision	**Date**	**Comments**
Draft		
Rev A	26th April 2007	First issue.

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1. TEST RESULT CERTIFICATE

Manufacturer	Extreme Networks Inc 3585 Monroe Street Santa Clara California, CA 95051, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	802.11a/b/g Wireless Access Point	Telephone:	+1 925 462 0304
Model:	Altitude 350-2 Access Point	Fax:	+1 925 462 0306
S/N:	2000006392051015		
Test Date(s):	22nd March to 2nd April 2007	Website:	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part 15.407 + MO&O 06-96	EQUIPMENT COMPLIES
FCC 06-96 Memorandum Opinion and Order	

MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

ACCREDITED
CERTIFICATE #2381.01

Approved & Released for MiCOM Labs, Inc. by:

Graeme Grieve
Quality Manager MiCOM Labs,

Gordon Hurst
President & CEO MiCOM Labs, Inc.

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2. REFERENCES AND MEASUREMENT UNCERTAINTY

2.1. Normative References

Ref.	Publication	Year	Title
(i)	FCC 47 CFR Part 15.407	Feb 2006	Code of Federal Regulations
(ii)	FCC 06-96	June 2006	Memorandum Opinion and Order
(iii)	Industry Canada RSS-210	Issue 6 Sept. 2005	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment
(iv)	Industry Canada RSS-Gen	Issue 1 Sept. 2005	General Requirements and Information for the Certification of Radiocommunication Equipment
(v)	ANSI C63.4	2003	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
(vi)	CISPR 22/ EN 55022	1997 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
(vii)	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
(viii)	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
(ix)	ETSI TR 100 028	2001	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
(x)	A2LA	14th September 2005	Reference to A2LA Accreditation Status – A2LA Advertising Policy
(xi)	FCC Public Notice – DA 02-2138	2002	Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices

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2.2. Test and Uncertainty Procedures

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.

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3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

Details	Description
Purpose:	Test of the Extreme Networks Inc Altitude 350-2 in the frequency range 5250 to 5350 MHz to FCC Part 15.407 DFS regulations and Memorandum Opinion and Order 06-96.
Applicant:	As Manufacturer
Manufacturer:	Extreme Networks Inc 3585 Monroe Street Santa Clara California, CA 95051, USA
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	ULTG03-A3 Rev A
Date EUT received:	21st March 2007
Standard(s) applied:	FCC 47 CFR Part 15.407 + MO&O 06-96
Dates of test (from - to):	22nd March to 2nd April 2007
No of Units Tested:	1
Type of Equipment:	802.11a/b/g Wireless Access Point
Manufacturers Trade Name:	Altitude 350-2 Access Point
Model:	Altitude 350-2 (Configurable as versions Integ 15938 or Detach 15939)
Location for use:	Indoor
Declared Frequency Range(s):	5,150 – 5,350 MHz
Type of Modulation:	BPSK, QPSK, CCK, & OFDM
Declared Nominal Output Power:	802.11a: +20dBm
EUT Modes of Operation:	802.11a/b/g
Transmit/Receive Operation:	TDD – Time Division Duplex
Rated Input Voltage and Current:	6 Vdc@ 1.5 A or P.O.E. 48 Vdc 250mA
Operating Temperature Range:	Declared range 0 to 40ºC
Frequency Stability:	±20 ppm max
Equipment Dimensions:	8.4 “ x 6.3 “ x 1.6 “
Weight:	22.4 oz
Primary function of equipment:	802.11 a/b/g Wireless Access Point

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3.2. Scope of Test Program

The scope of the test program was to test the Extreme Networks Inc Altitude 350-2 Access Point in the frequency ranges 5250 - 5350 for compliance against DFS requirements of FCC 47 CFR Part 15.407 and the FCC specification Memorandum Opinion and Order FCC 06-96.

U-NII devices operating in the 5.25-5.35 GHz band shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

The Extreme Networks Inc Altitude 350-2 operates as a Master device with full radar detection and Dynamic Frequency Selection (DFS) capability.

System testing was performed with the Master device continuously transmitting the designated FCC MPEG (Testfile.mpg) streaming video test file to the client device using the NTIA specified media player (klcodec261f.exe).

For the 5250-5350 MHz band, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm.

NOTE

1. The test results for RF measurement to FCC Section 15.407 in the frequency range 5,150 to 5,350 MHz are reported in UltraTech Group of Labs test report file no: CNI-080FCC15CE-020707.

2. Product FCC ID: RJF-A3502A

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Extreme Networks Inc Altitude 350-2 Systems
802.11 a/b/g Wireless Access Point

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3.3. Equipment Model(s) and Serial Number(s)

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT (Master)	Wireless Access Point	Extreme Networks Inc.	ALTITUDE 350-2	2000006392051015
Support	Summit WLAN Controller	Extreme Networks Inc.	WM2000	SK778070240033
Support	PXI Chassis	Aeroflex	PXI - 1042	300001/004
Support	PXI RF Synthesizer module	Aeroflex	3011	301001/027
Support	PXI SigGen module	Aeroflex	3025	302004/009
Support	8 Port Ethernet Switch	Netgear	FS108P	IDL1693F001B9

3.4. Antenna Details

1. Minimum antenna gain 5 dBi

3.5. Cabling and I/O Ports

Number and type of I/O ports;-

1. Ethernet 10/100BT

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3.6. Test Configurations

Matrix of test configurations

Operational Mode (802.11)	Frequencies (MHz)	Transmission Type
a	5300	Continuous MPEG Transmission

3.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:

1. NONE

3.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:

1. NONE

3.9. Subcontracted Testing or Third Party Data

1. NONE

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4. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407(h)(2)** and **FCC Memorandum Opinion and Order FCC 06-96 (Compliance Measurement procedures for unlicensed national information infrastructure devices operating in the 5250-5350 MHz band incorporating dynamic frequency selection).**

Section	Test Items	Description	Condition	Result	Test Report Section
7.8.1	Detection Bandwidth	UNII Detection Bandwidth	Conducted	Complies	5.1.8
7.8.2.1	Performance Requirements Check	Initial Channel Availability Check Time	Conducted	Complies	5.1.9
7.8.2.2		Radar Burst at the Beginning of the Channel Availability Check Time	Conducted	Complies	5.1.10
7.8.2.3		Radar Burst at the End of the Channel Availability Check Time	Conducted	Complies	5.1.11
7.8.3	In-Service Monitoring	In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Conducted	Complies	5.1.12
7.8.4	Radar Detection	Statistical Performance Check	Conducted	Complies	5.1.13

Note 1: *Test results reported in this document relate only to the items tested*
Note 2: *The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria*

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5. TEST RESULTS

5.1. Dynamic Frequency Selection (DFS)

Test Procedure

The Master requires 79.06 seconds to complete its power-on cycle.

For the frequency bands 5,250 – 5,350 MHz, and 5,470-5,725 MHz the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm.

Extreme Networks Inc declared a minimum gain antenna of 5 dBi. ;

Radar receive signal level = -62 dBm + minimum antenna gain + 1 dB

= -62 + 5 + 1

Radar receive signal level = -56 dBm

Measurement Results - Dynamic Frequency Selection (DFS)

Ambient conditions.
Temperature: 17 to 23 °C Relative humidity: 31 to 57% Pressure: 999 to 1012 mbar

Radio parameters.
Test methodology: Conducted
Device Type: Master

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5.1.1. Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna	

5.1.2. DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 80% of the 99% power bandwidth See Note 3.

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short pulse radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate *Channel* changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

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5.1.3. Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per *Burst*	Number of *Bursts*	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse radar test signal. If more than 30 waveforms are used for the Long Pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.

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Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 *Bursts* in the 12 second period, with the number of *Bursts* being randomly chosen. This number is *Burst Count*.
3) Each *Burst* consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each *Burst* within the 12 second sequence may have a different number of pulses.
4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a *Burst* will have the same pulse width. Pulses in different *Bursts* may have different pulse widths.
5) Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a *Burst* will have the same chirp width. Pulses in different *Bursts* may have different chirp widths. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
6) If more than one pulse is present in a *Burst*, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a *Burst*, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to *Burst_Count*. Each interval is of length (12,000,000 / *Burst_Count*) microseconds. Each interval contains one *Burst*. The start time for the *Burst*, relative to the beginning of the interval, is between 1 and [(12,000,000 / *Burst_Count*) – (Total *Burst* Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each *Burst* is chosen independently.

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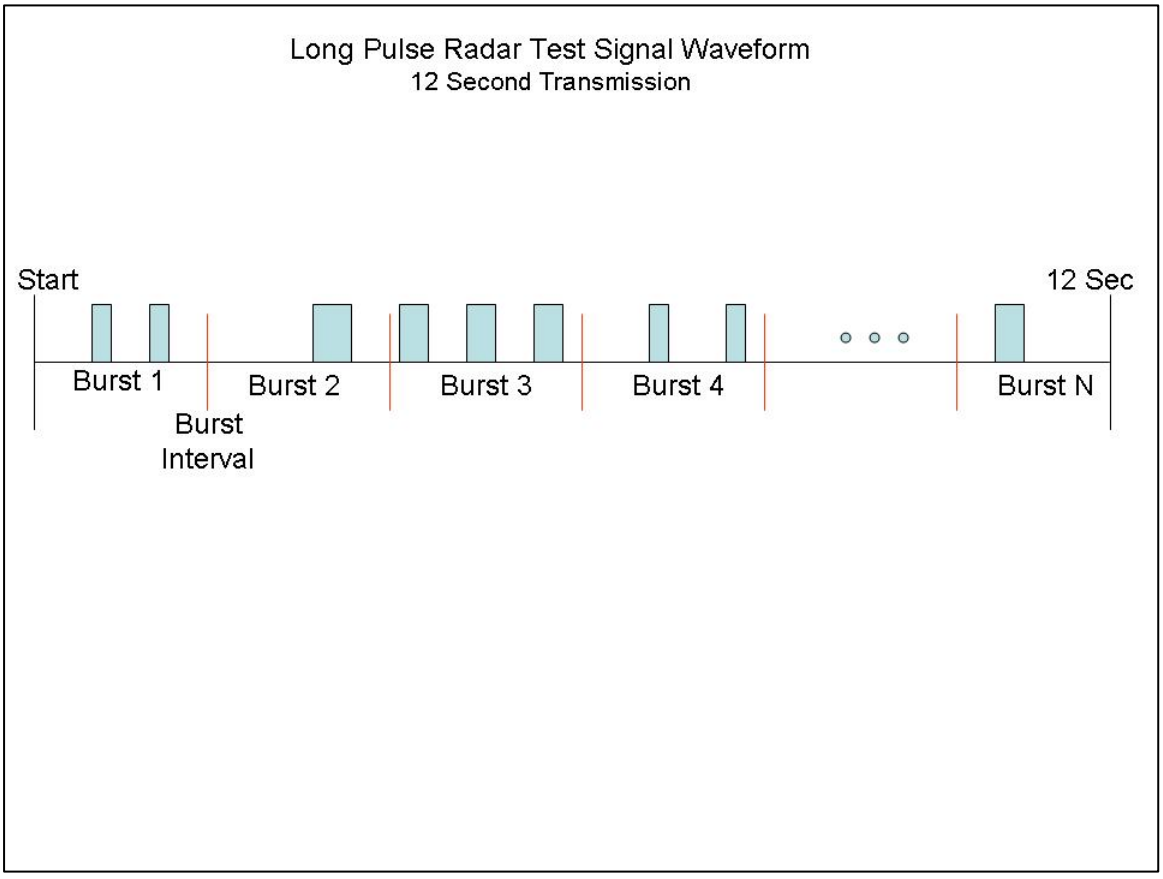
A representative example of a Long Pulse radar test waveform:

1) The total test signal length is 12 seconds.
2) 8 *Bursts* are randomly generated for the *Burst_Count*.
3) *Burst* 1 has 2 randomly generated pulses.
4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5) The PRI is randomly selected to be at 1213 microseconds.
6) *Bursts* 2 through 8 are generated using steps 3 – 5.
7) Each *Burst* is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, *Burst* 1 is randomly generated (1 to 1,500,000 minus the total *Burst* 1 length + 1 random PRI interval) at the 325,001 microsecond step. *Bursts* 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. *Burst* 2 falls in the 1,500,001 – 3,000,000 microsecond range).

Graphical representation of the Long Pulse radar Test Waveform.



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5.1.4. Frequency Hopping Radar Test Waveform

Frequency Hopping Radar Test Waveform

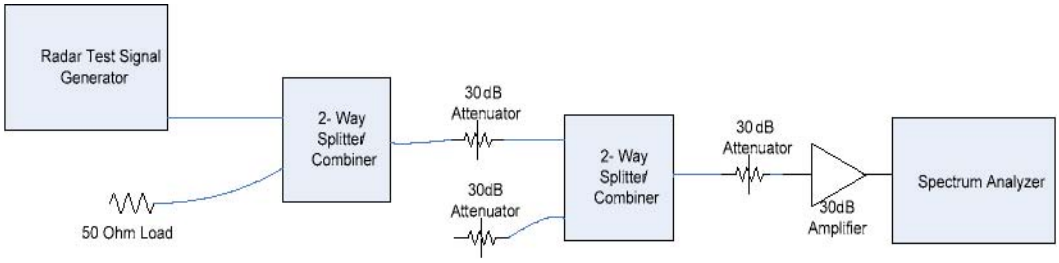
Radar Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	.333	300	70%	30

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

5.1.5. Radar Waveform Calibration

The following equipment setup was used to calibrate the conducted Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz.
The signal generator amplitude was set so that the power level measured at the spectrum analyzer was -56dBm (Ref Section 5.1). The 30dB amplifier gain was entered as an amplitude offset on the spectrum analyzer.

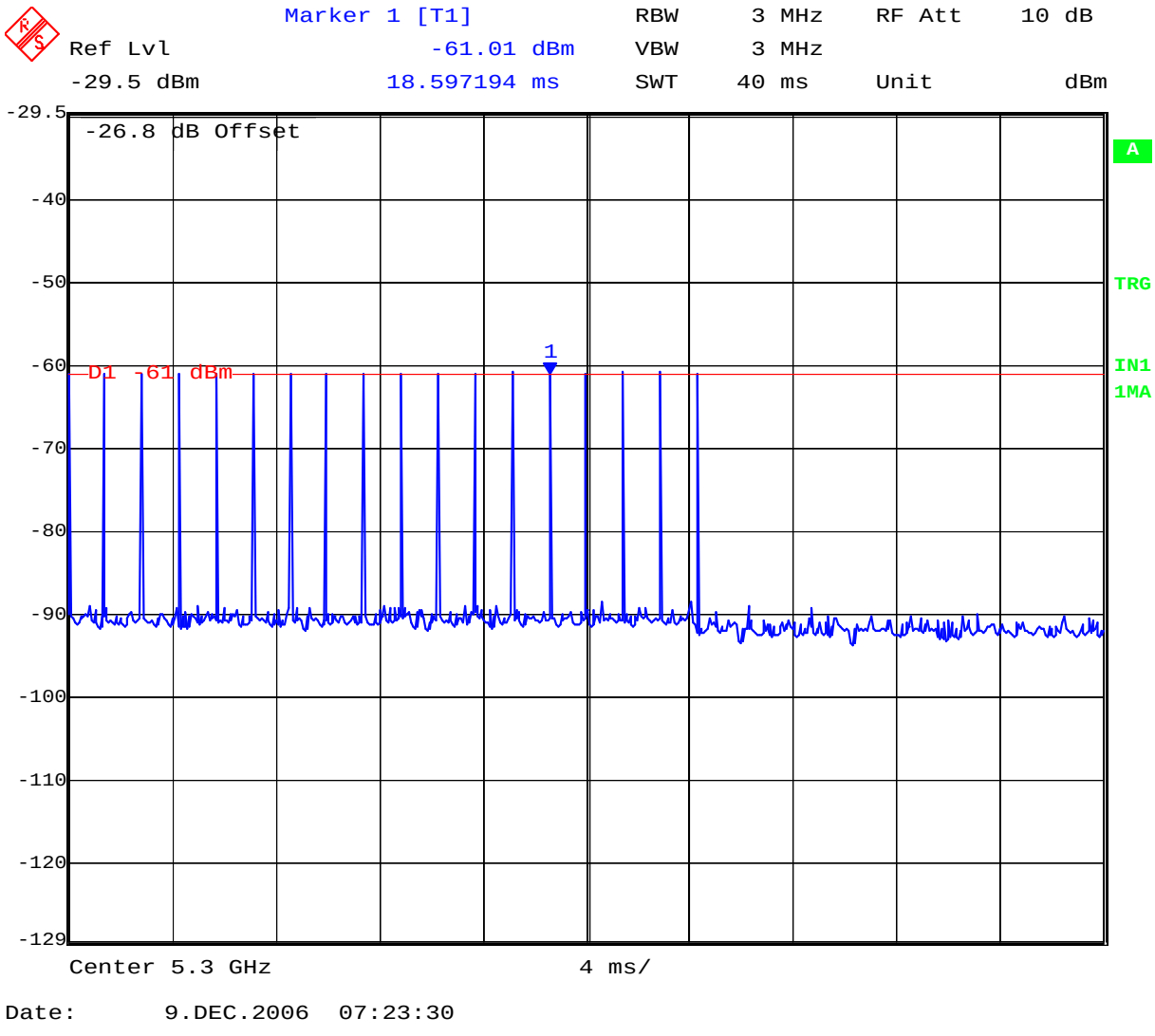


Conducted Calibration Setup

5.1.6. Radar Waveform Calibration Plots

The following are the calibration plots for required radar waveforms

Radar Type 1 - 1uSec Pulse, 700prf, 18 pulses



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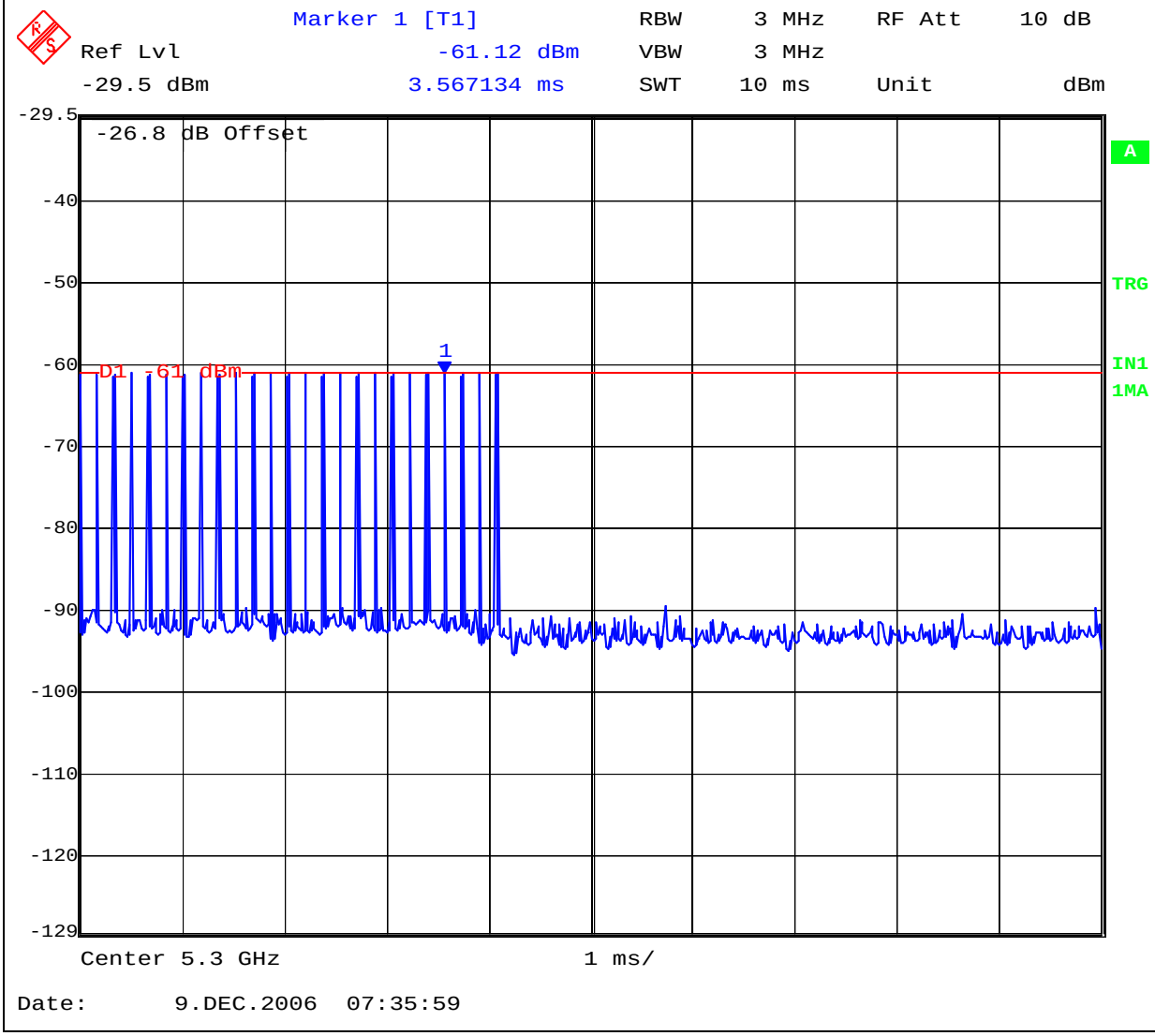
Radar Type 2 - 2.1uSec Pulse Width, 170prf, 25 pulses



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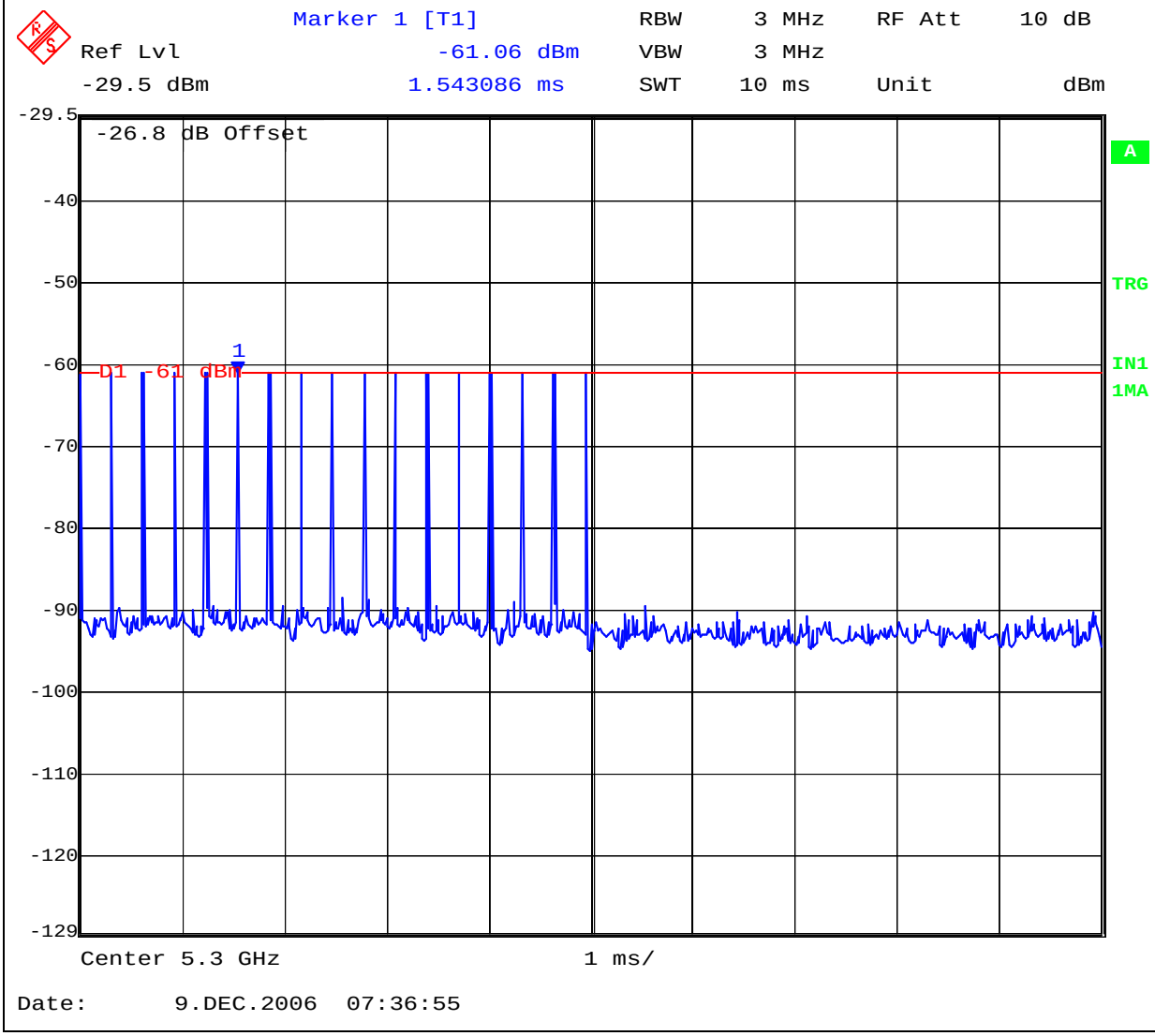
Radar Type 3 - 7.5uSec Pulse Width, 309prf, 17 pulses



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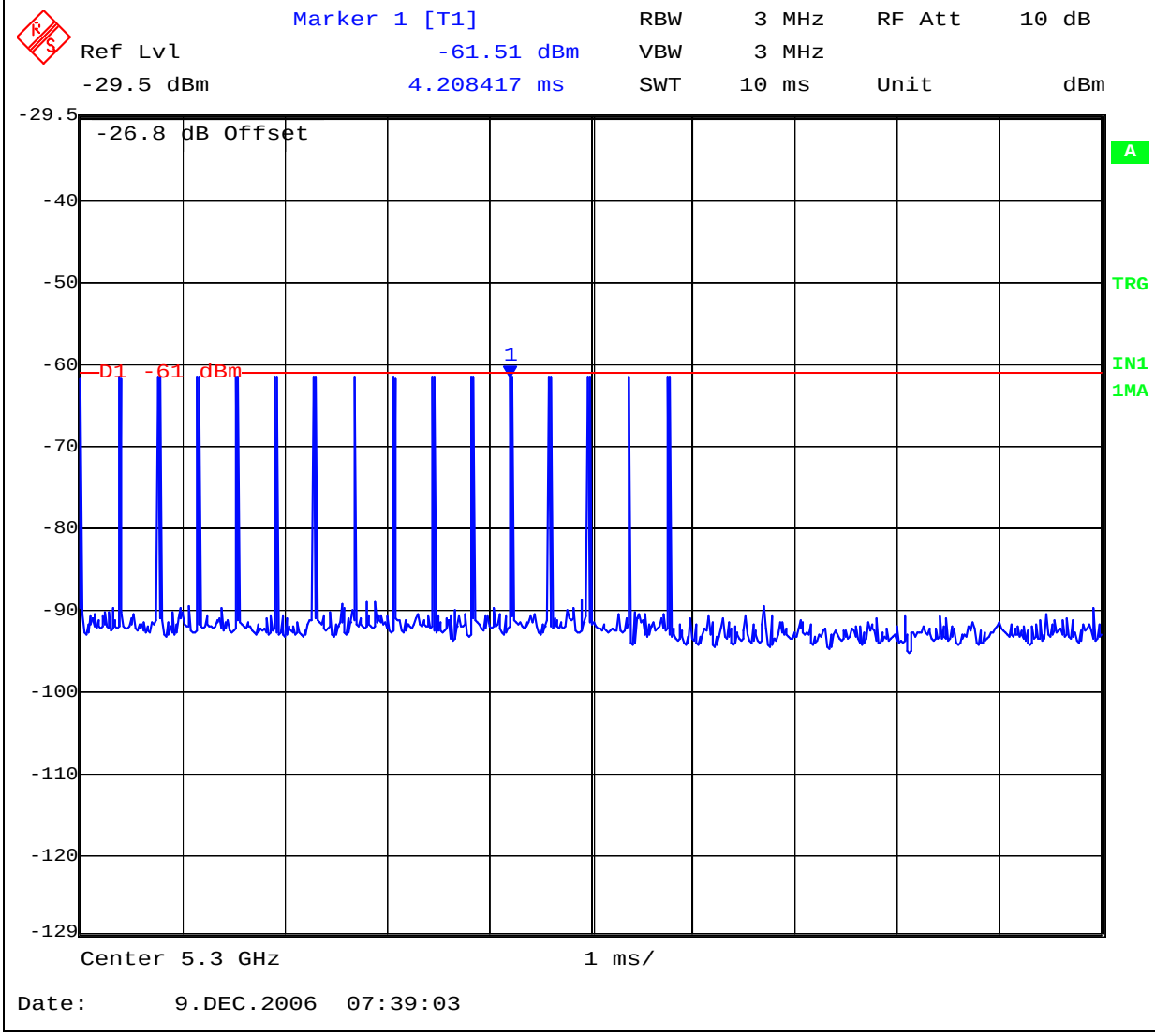
Radar Type 4 - 17.9uSec Pulse Width, 383prf, 16 pulses



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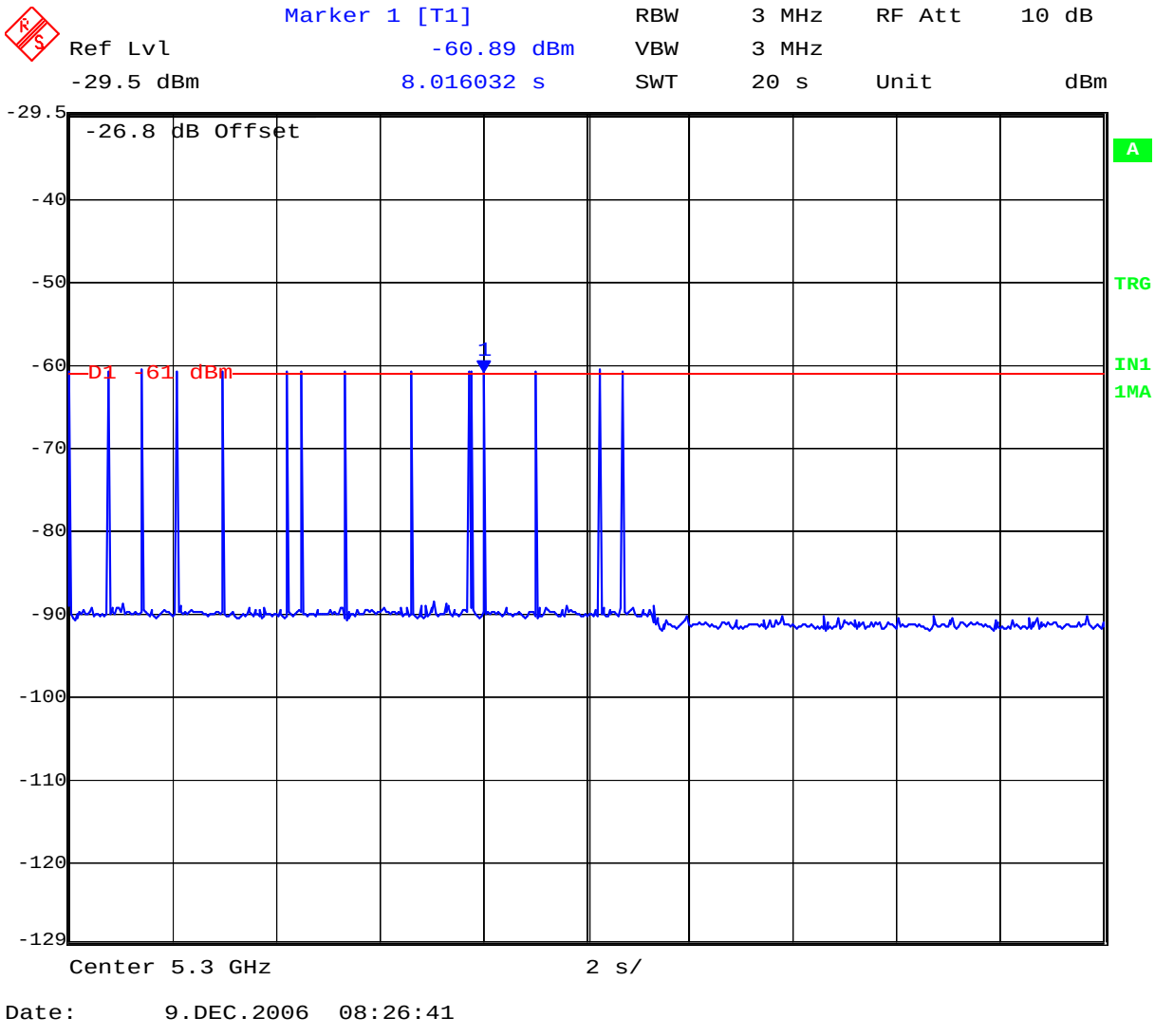
Radar Type 5



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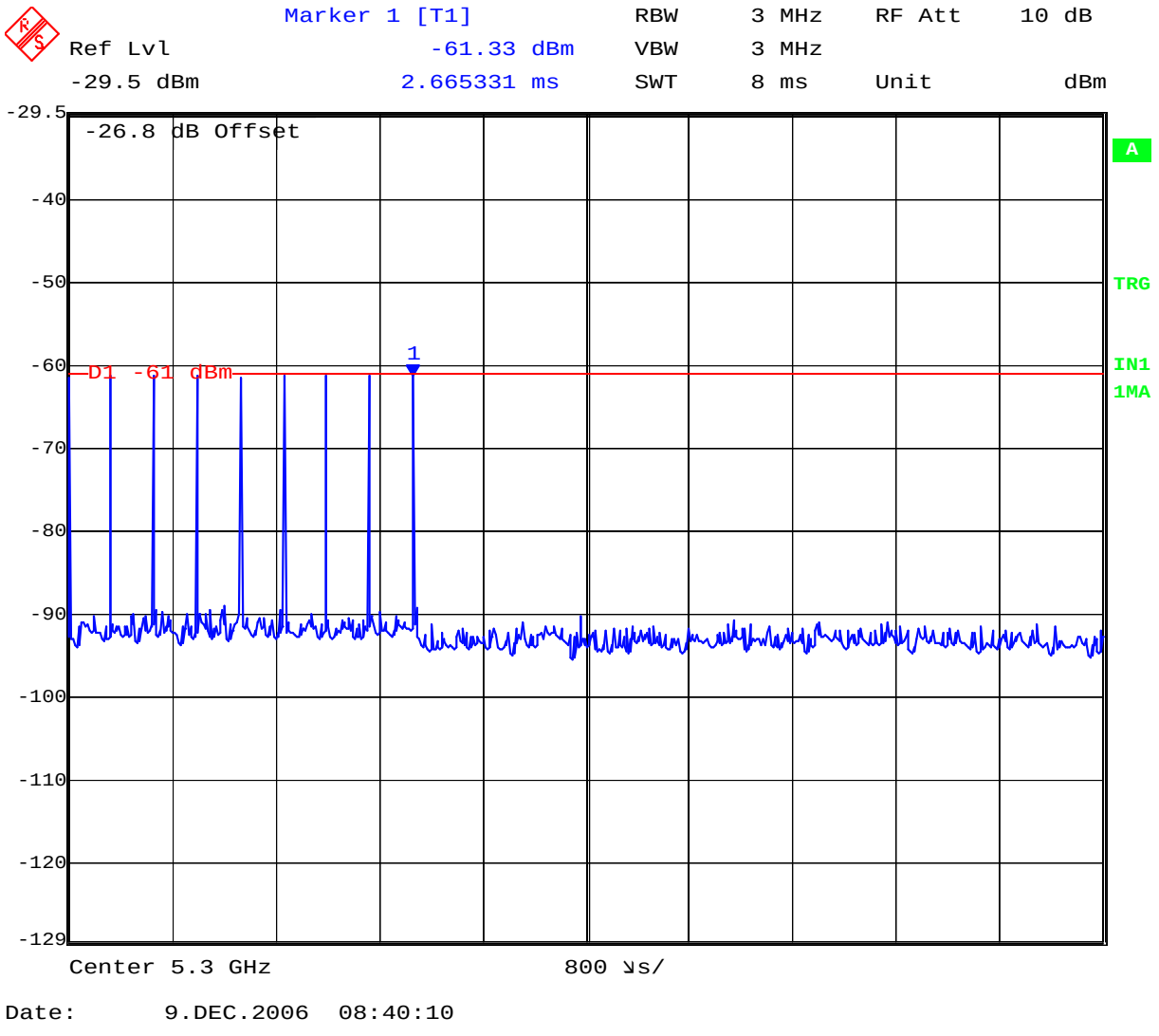
Radar Type 6



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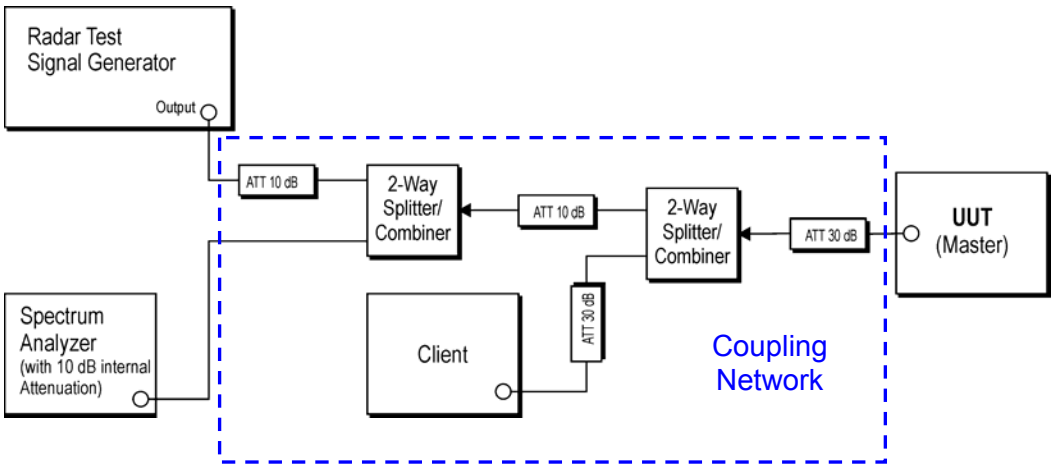
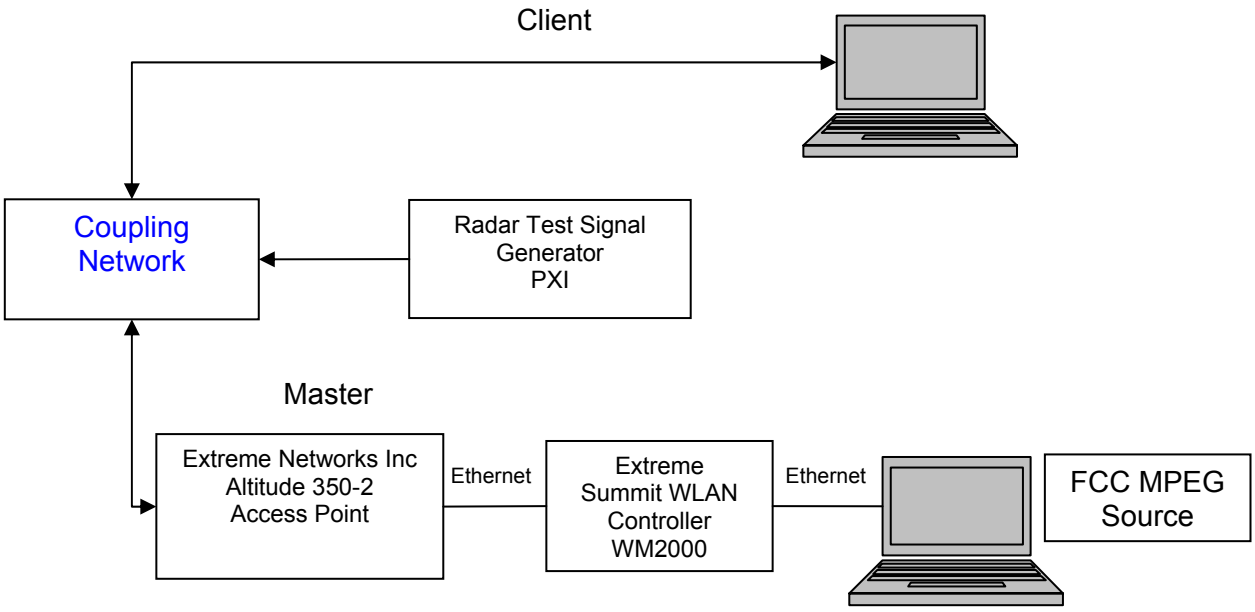
5.1.7. Test Set Up:

Block Diagram(s) of Test Setup

Setup for Conducted Measurements where the EUT is the Master with injection of Radar Test Waveforms at the Master.



Support Equipment Configuration



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5.1.8. UNII Detection Bandwidth:

All UNII channels for this device have identical channel bandwidths and DFS testing was completed in the 5250 - 5350 MHz.

The generating equipment is configured as shown in the Conducted Test Setup above. A single Burst of the short pulse radar Type 1 through 6 was produced at 5300 MHz at a level of -56dBm (Ref Section 5.1). The EUT is set up as a standalone device (no associated Client and no traffic).

A single radar Burst is generated for a minimum of 10 trials, and the response of the EUT is noted. The EUT must detect the Radar Waveform 90% or more of the time.

The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 90% is denoted as F_H.

The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 90% is denoted as F_L.

The U-NII Detection Bandwidth is calculated as follows:

U-NII Detection Bandwidth = $F_H - F_L$

The U-NII Detection Bandwidth must be at least 80% of the EUT transmitter 99% power, otherwise, the EUT does not comply with DFS requirements.

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EUT Frequency=5300MHz											
Radar Frequency (MHz)	**DFS Detection Trials (1=Detection, Blank= No Detection)**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**
											0%
5290	1	0	1	0	1	1	0	0	0	1	50%
5291	0	1	1	1	1	1	1	0	1	1	80%
5292 (F_L)	1	1	1	1	1	1	1	1	1	1	100%
5293	1	1	1	1	1	1	1	1	1	1	100%
5294	1	1	1	1	1	1	1	1	1	1	100%
5295	1	1	1	1	1	1	1	1	1	1	100%
5296	1	1	1	1	1	1	1	1	1	1	100%
5297	1	1	1	1	1	1	1	1	1	1	100%
5298	1	1	1	1	1	1	1	1	1	1	100%
5299	1	1	1	1	1	1	1	1	1	1	100%
5300	1	1	1	1	1	1	1	1	1	1	100%
5301	1	1	1	1	1	1	1	1	1	1	100%
5302	1	1	1	1	1	1	1	1	1	1	100%
5303	1	1	1	1	1	1	1	1	1	1	100%
5304	1	1	1	1	1	1	1	1	1	1	100%
5305	1	1	1	1	1	1	1	1	1	1	100%
5306	1	1	1	1	1	1	1	1	1	1	100%
5307	1	1	1	1	1	1	1	1	1	1	100%
5308	1	1	1	1	1	1	1	1	1	1	100%
5309	1	1	1	1	1	1	1	1	1	1	100%
5310 (F_H)	1	0	1	1	1	1	1	1	1	1	90%
5311	1	0	0	0	0	0	0	0	1	0	20%
Detection Bandwidth = F_H-F_L = 5310 MHz-5292 MHz = 18 MHz											
EUT 99% Bandwidth = 17.2 MHz											
17.2 MHz *80% = 13.76 MHz											

For each frequency step the minimum percentage detection is 90%

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5.1.9. Initial Channel Availability Check Time

This test verifies that the EUT does not emit pulse, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms.

The U-NII device is powered on and be instructed to operate at 5300 MHz. At the same time the EUT is powered on, the spectrum analyzer is set for zero span with a 3 MHz resolution bandwidth at 5300 MHz with a 150 second sweep time. The analyzer's sweep will be started the same time power is applied to the U-NII device.

The EUT should not transmit any pulse or data transmissions until at least 1 minute after the completion of the power-on cycle.

The EUT is powered on at T0. T1 denotes the instant when the EUT has completed its power-up sequence denoted by the analyzer's first vertical red time line (T2) on the following plot. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds.

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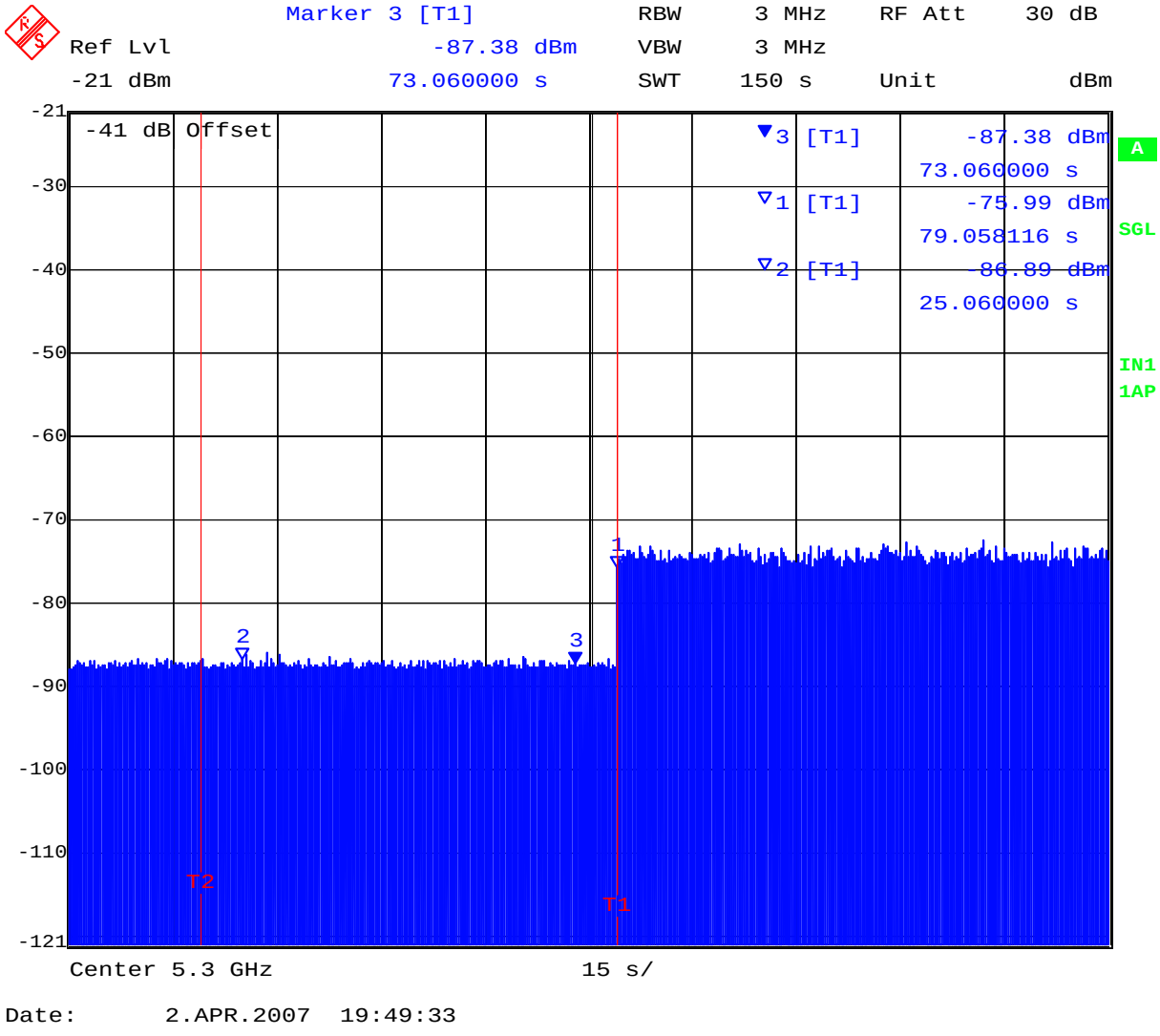
Initial Channel Availability Check Time during power up of EUT
Ch 5300 MHz



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5.1.10. Radar Burst at the Beginning of the Channel Availability Check Time:

The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB (-56 dBm Ref Section 5.1) occurs at the beginning of the Channel Availability Check Time.

A single Burst of short pulse of radar type 1 will commence within a 6 second window starting at T1.

Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5300MHz will continue for 2.5 minutes after the radar burst has been generated.

Verify that during the 2.5 minute measurement window no EUT transmissions have occurred at 5300MHz.

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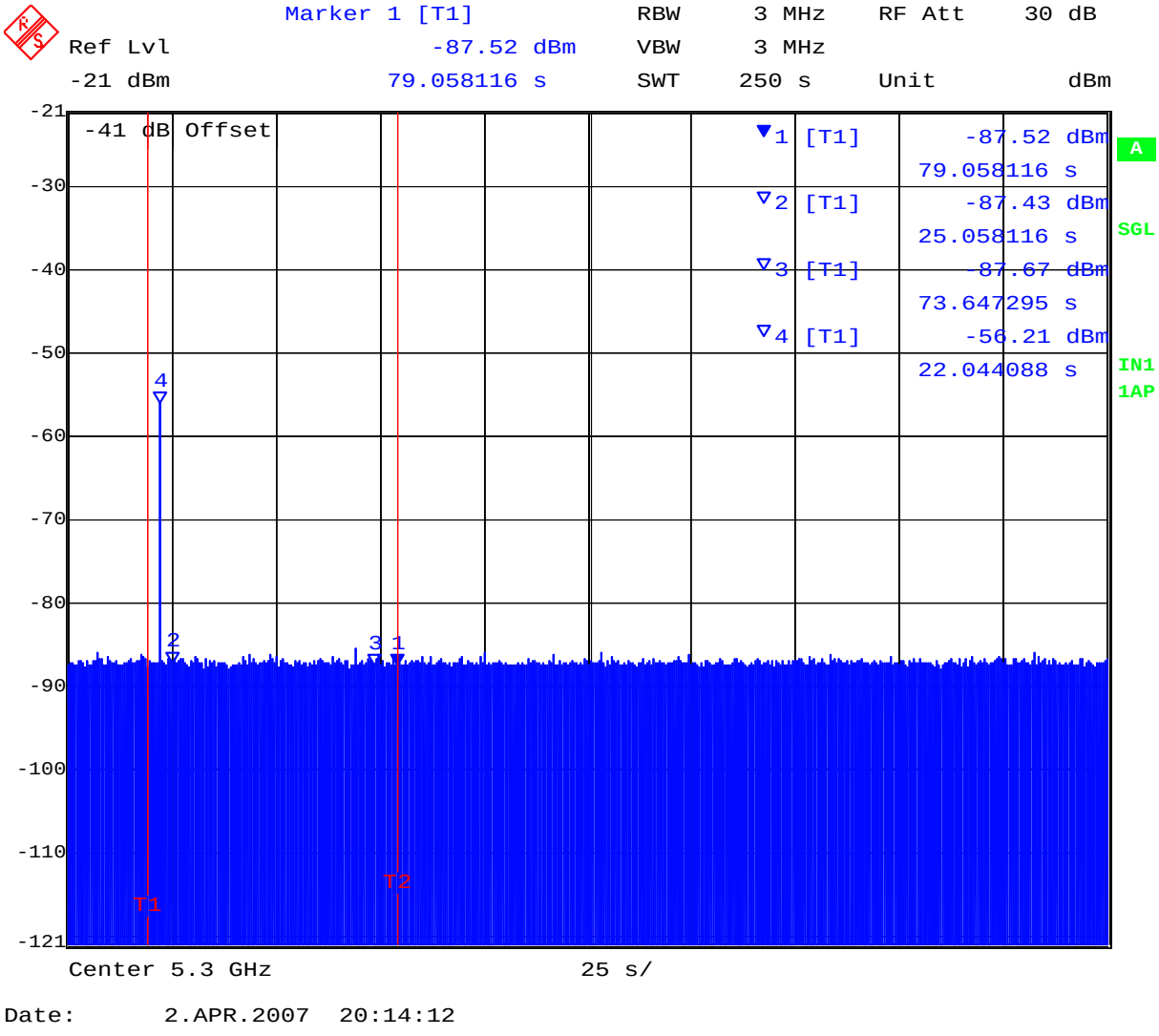
Channel Availability Check Time at the start of the 60 second Check Time
Ch 5300 MHz



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5.1.11. Radar Burst at the End of the Channel Availability Check Time:

The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold occurs at the end of the Channel Availability Check Time.

The EUT is powered on at T0. T1 denotes the instant when the EUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds.

A single Burst of short pulse of radar type 1 will commence within a 6 second window starting at T1+ 54 seconds.

Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5300MHz will continue for 2.5 minutes after the radar burst has been generated.

Verify that during the 2.5 minute measurement window no EUT transmissions occurred at 5300MHz.

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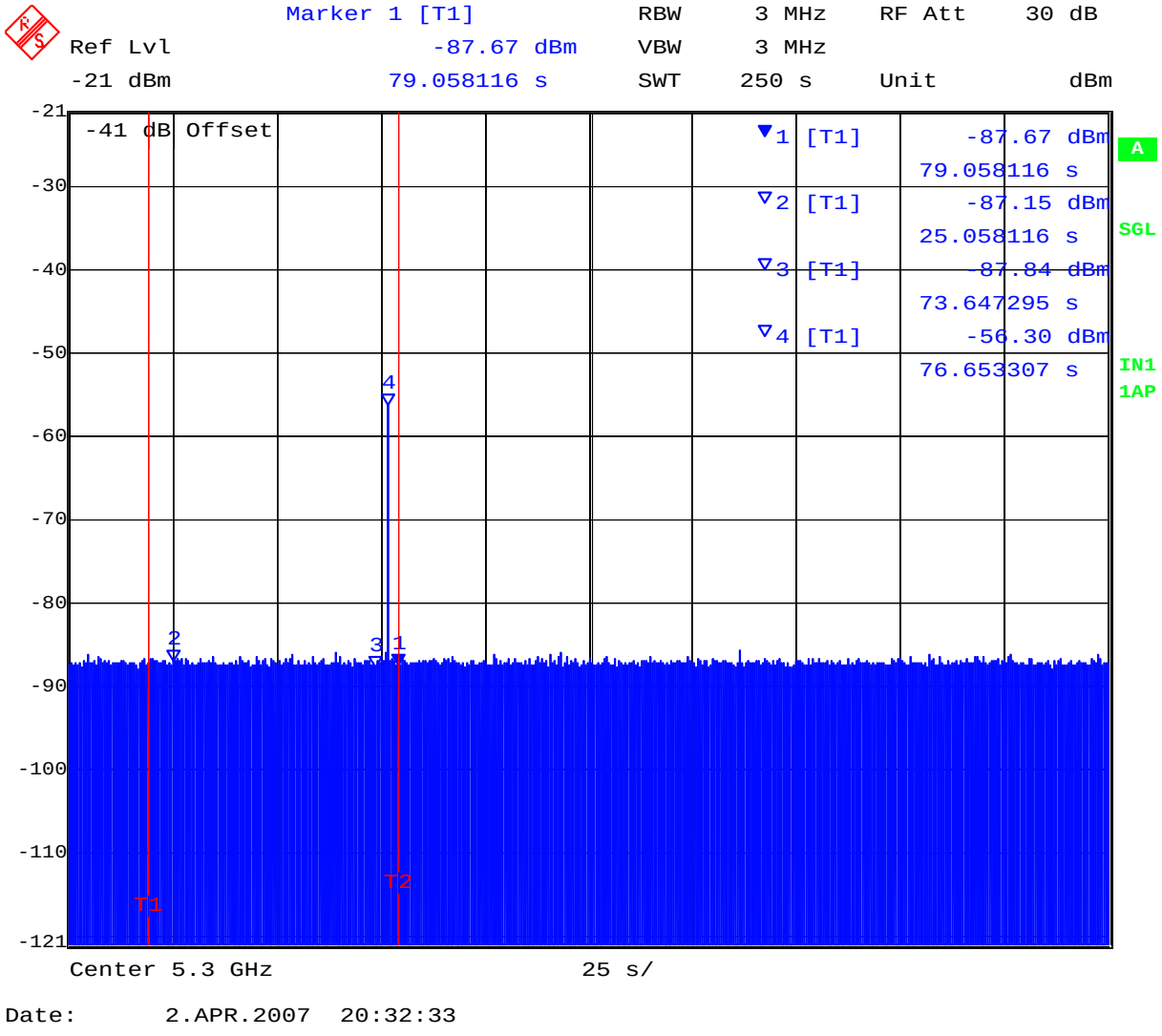
Channel Availability Check Time at the end of the 60 second Check Time
Ch 5300 MHz



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5.1.12. In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

FCC §15.407(h)(2)(iii)

The steps below define the procedure to determine the above mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold is generated on the Operating Channel of the U-NII device.

A U-NII device operating as a Client Device will associate with the EUT (Master). The requisite MPEG video file ("TestFile.mpg" available on the NTIA website at the following link http://ntiacsd.ntia.doc.gov/dfs/) is streamed from the master device (AP) to the client.

Channel Closing Transmission Time - Measurement

A Type 1 waveform was introduced to the EUT, from which a 12 second transmission record was captured, collecting nearly 250M samples of data, which included 60ms of pre-trigger data. This Type 1 waveform had an integral marker built into its construction, marking the start of the waveform play, which directly triggered the PXI digitizer's data capture via the PXI backplane trigger bus.

The Aeroflex PXI was setup to capture data for all transmission events above a threshold level of -65dBm. The PXI time stamps all captured events with respect to T_0 (zero time indicating the start of the measurements sequence) starting the 60 ms pre-trigger period followed by the radar type 1 burst period.

Radar (Type 1) Pre-trigger period 60ms

Type 1 burst period 24.277ms

(The period of the 18 pulse burst includes [17 pulses *1.428mS PRI] = 24.276ms. Then add 1µs pulse width for the final pulse.)

Channel Closing Transmission Time starts immediately after the last radar pulse is transmitted i.e. 84.277ms after the start of the trace capture period.

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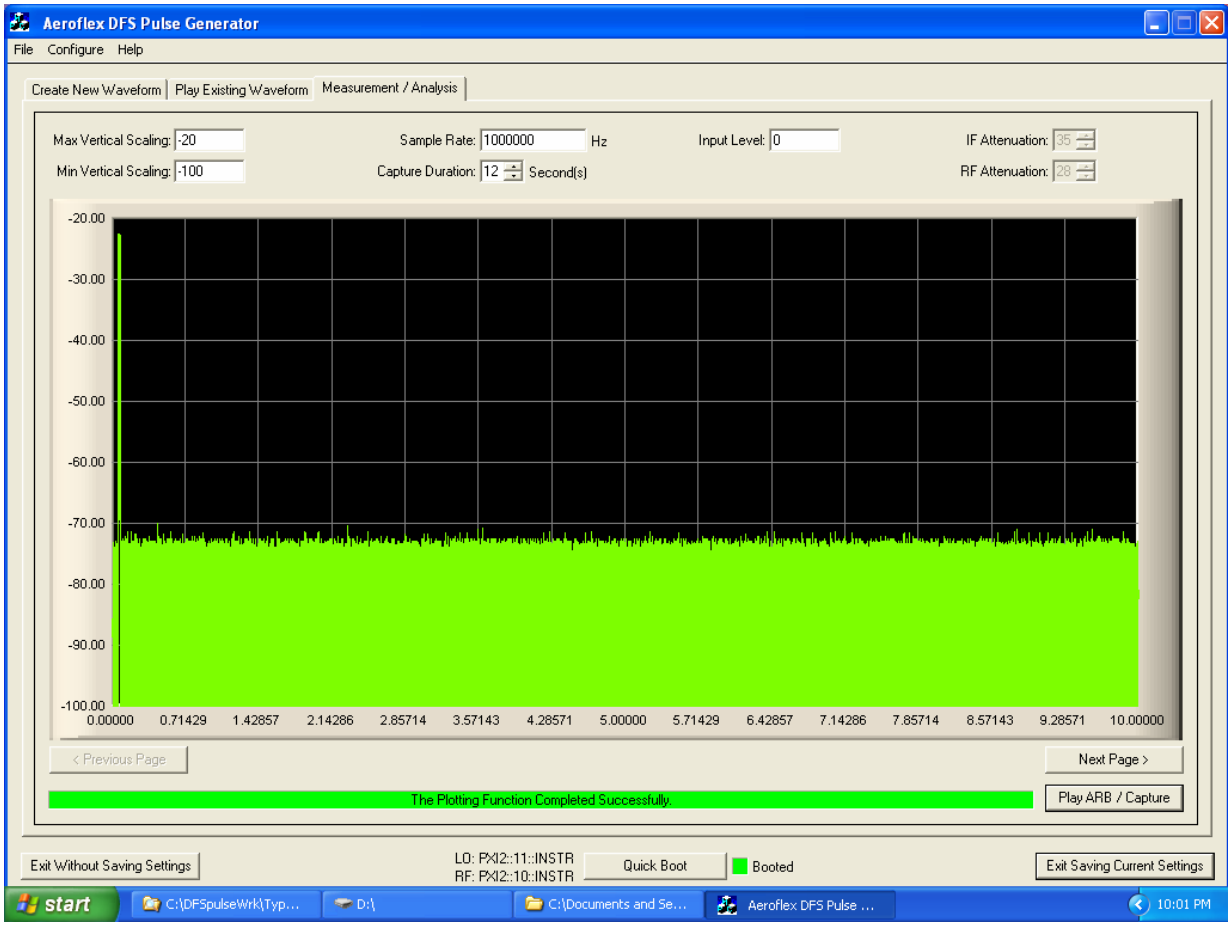
Therefore, pulses seen after this 84.277ms boundary are identified and totaled to provide an aggregate total of transmissions in order to determine whether the EUT is compliant with the Channel Closing Transmission Time requirements as described in MO&O FCC 06-96. In this case, it was found that an aggregate total of 0.298 mSecs of transmission time accrued.

Channel Closing Transmission Time = 0.298 mSecs (limit 260 mSecs)

Channel Move Time, Channel Closing Time for Type 1 Radar
Captured by Aeroflex PXI Test System



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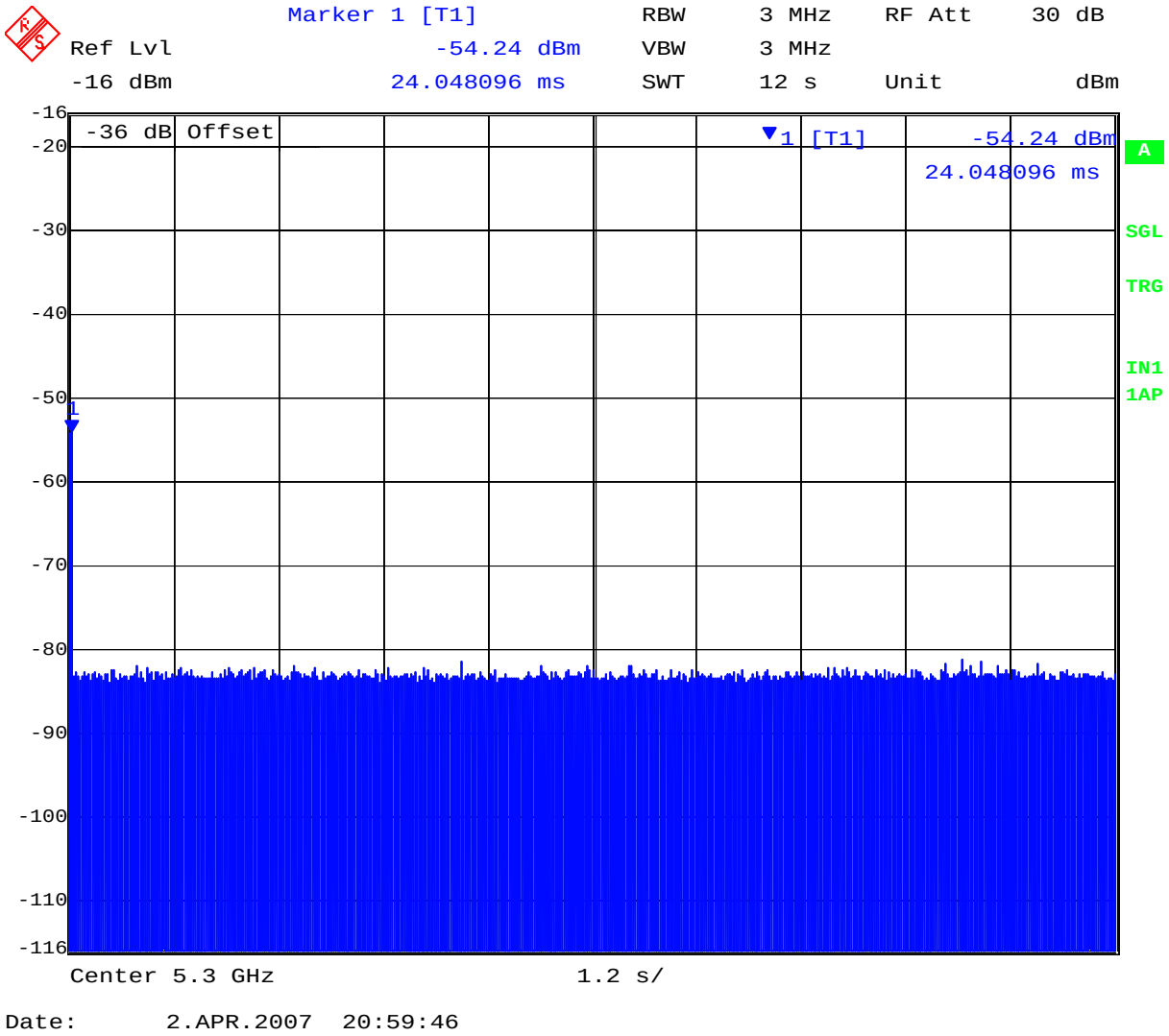
Additionally, a redundant conventional spectrum analyzer screen capture is provided to correlate against the digitizer screen capture for verification purposes.

Note;- no pre-trigger data interval (60 mSecs) was included in the following Spectrum Analyzer plot

Channel Move Time, Channel Closing Time for Type 1 Radar
Captured by Spectrum Analyzer



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The following data was captured by the Aeroflex PXI test System and is used to calculate the Channel Closing Transmission Time for the EUT with the intervention of Radar Type 1.

Sample	Number:	84270	Rising	Edge, Sample	Time	Stamp	=	0.084277	2E-06
Sample	Number:	84279	Falling	Edge, Sample	Time	Stamp	=	0.084279	
Sample	Number:	84289	Rising	Edge, Sample	Time	Stamp	=	0.084289	1E-06
Sample	Number:	84290	Falling	Edge, Sample	Time	Stamp	=	0.08429	
Sample	Number:	84292	Rising	Edge, Sample	Time	Stamp	=	0.084292	1E-06
Sample	Number:	84293	Falling	Edge, Sample	Time	Stamp	=	0.084293	
Sample	Number:	84294	Rising	Edge, Sample	Time	Stamp	=	0.084294	2E-06
Sample	Number:	84296	Falling	Edge, Sample	Time	Stamp	=	0.084296	
Sample	Number:	84309	Rising	Edge, Sample	Time	Stamp	=	0.084309	1E-06
Sample	Number:	84310	Falling	Edge, Sample	Time	Stamp	=	0.08431	
Sample	Number:	84321	Rising	Edge, Sample	Time	Stamp	=	0.084321	1E-06
Sample	Number:	84322	Falling	Edge, Sample	Time	Stamp	=	0.084322	
Sample	Number:	84326	Rising	Edge, Sample	Time	Stamp	=	0.084326	1E-06
Sample	Number:	84327	Falling	Edge, Sample	Time	Stamp	=	0.084327	
Sample	Number:	84330	Rising	Edge, Sample	Time	Stamp	=	0.08433	1E-06
Sample	Number:	84331	Falling	Edge, Sample	Time	Stamp	=	0.084331	
Sample	Number:	84336	Rising	Edge, Sample	Time	Stamp	=	0.084336	1E-06
Sample	Number:	84337	Falling	Edge, Sample	Time	Stamp	=	0.084337	
Sample	Number:	84338	Rising	Edge, Sample	Time	Stamp	=	0.084338	2E-06
Sample	Number:	84340	Falling	Edge, Sample	Time	Stamp	=	0.08434	
Sample	Number:	84342	Rising	Edge, Sample	Time	Stamp	=	0.084342	1E-06
Sample	Number:	84343	Falling	Edge, Sample	Time	Stamp	=	0.084343	
Sample	Number:	84344	Rising	Edge, Sample	Time	Stamp	=	0.084344	1E-06
Sample	Number:	84345	Falling	Edge, Sample	Time	Stamp	=	0.084345	
Sample	Number:	84355	Rising	Edge, Sample	Time	Stamp	=	0.084355	1E-06
Sample	Number:	84356	Falling	Edge, Sample	Time	Stamp	=	0.084356	
Sample	Number:	84359	Rising	Edge, Sample	Time	Stamp	=	0.084359	1E-06
Sample	Number:	84360	Falling	Edge, Sample	Time	Stamp	=	0.08436	
Sample	Number:	84362	Rising	Edge, Sample	Time	Stamp	=	0.084362	2E-06
Sample	Number:	84364	Falling	Edge, Sample	Time	Stamp	=	0.084364	
Sample	Number:	84380	Rising	Edge, Sample	Time	Stamp	=	0.08438	1E-06

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Sample	Number:	84381	Falling	Edge, Sample	Time	Stamp	=	0.084381	
Sample	Number:	84383	Rising	Edge, Sample	Time	Stamp	=	0.084383	1E-06
Sample	Number:	84384	Falling	Edge, Sample	Time	Stamp	=	0.084384	
Sample	Number:	84385	Rising	Edge, Sample	Time	Stamp	=	0.084385	1E-06
Sample	Number:	84386	Falling	Edge, Sample	Time	Stamp	=	0.084386	
Sample	Number:	84388	Rising	Edge, Sample	Time	Stamp	=	0.084388	1E-06
Sample	Number:	84389	Falling	Edge, Sample	Time	Stamp	=	0.084389	
Sample	Number:	84396	Rising	Edge, Sample	Time	Stamp	=	0.084396	1E-06
Sample	Number:	84397	Falling	Edge, Sample	Time	Stamp	=	0.084397	
Sample	Number:	84399	Rising	Edge, Sample	Time	Stamp	=	0.084399	3E-06
Sample	Number:	84402	Falling	Edge, Sample	Time	Stamp	=	0.084402	
Sample	Number:	84417	Rising	Edge, Sample	Time	Stamp	=	0.084417	1E-06
Sample	Number:	84418	Falling	Edge, Sample	Time	Stamp	=	0.084418	
Sample	Number:	84420	Rising	Edge, Sample	Time	Stamp	=	0.08442	1E-06
Sample	Number:	84421	Falling	Edge, Sample	Time	Stamp	=	0.084421	
Sample	Number:	84423	Rising	Edge, Sample	Time	Stamp	=	0.084423	1E-06
Sample	Number:	84424	Falling	Edge, Sample	Time	Stamp	=	0.084424	
Sample	Number:	84427	Rising	Edge, Sample	Time	Stamp	=	0.084427	1E-06
Sample	Number:	84428	Falling	Edge, Sample	Time	Stamp	=	0.084428	
Sample	Number:	84430	Rising	Edge, Sample	Time	Stamp	=	0.08443	1E-06
Sample	Number:	84431	Falling	Edge, Sample	Time	Stamp	=	0.084431	
Sample	Number:	84435	Rising	Edge, Sample	Time	Stamp	=	0.084435	1E-06
Sample	Number:	84436	Falling	Edge, Sample	Time	Stamp	=	0.084436	
Sample	Number:	84443	Rising	Edge, Sample	Time	Stamp	=	0.084443	2E-06
Sample	Number:	84445	Falling	Edge, Sample	Time	Stamp	=	0.084445	
Sample	Number:	84453	Rising	Edge, Sample	Time	Stamp	=	0.084453	1E-06
Sample	Number:	84454	Falling	Edge, Sample	Time	Stamp	=	0.084454	
Sample	Number:	84455	Rising	Edge, Sample	Time	Stamp	=	0.084455	1E-06
Sample	Number:	84456	Falling	Edge, Sample	Time	Stamp	=	0.084456	
Sample	Number:	84458	Rising	Edge, Sample	Time	Stamp	=	0.084458	1E-06
Sample	Number:	84459	Falling	Edge, Sample	Time	Stamp	=	0.084459	
Sample	Number:	84461	Rising	Edge, Sample	Time	Stamp	=	0.084461	1E-06

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Sample	Number:	84462	Falling	Edge, Sample	Time	Stamp	=	0.084462	
Sample	Number:	84466	Rising	Edge, Sample	Time	Stamp	=	0.084466	1E-06
Sample	Number:	84467	Falling	Edge, Sample	Time	Stamp	=	0.084467	
Sample	Number:	84469	Rising	Edge, Sample	Time	Stamp	=	0.084469	1E-06
Sample	Number:	84470	Falling	Edge, Sample	Time	Stamp	=	0.08447	
Sample	Number:	84482	Rising	Edge, Sample	Time	Stamp	=	0.084482	2E-06
Sample	Number:	84484	Falling	Edge, Sample	Time	Stamp	=	0.084484	
Sample	Number:	84492	Rising	Edge, Sample	Time	Stamp	=	0.084492	1E-06
Sample	Number:	84493	Falling	Edge, Sample	Time	Stamp	=	0.084493	
Sample	Number:	84499	Rising	Edge, Sample	Time	Stamp	=	0.084499	1E-06
Sample	Number:	84500	Falling	Edge, Sample	Time	Stamp	=	0.0845	
Sample	Number:	84502	Rising	Edge, Sample	Time	Stamp	=	0.084502	1E-06
Sample	Number:	84503	Falling	Edge, Sample	Time	Stamp	=	0.084503	
Sample	Number:	84511	Rising	Edge, Sample	Time	Stamp	=	0.084511	1E-06
Sample	Number:	84512	Falling	Edge, Sample	Time	Stamp	=	0.084512	
Sample	Number:	84513	Rising	Edge, Sample	Time	Stamp	=	0.084513	1E-06
Sample	Number:	84514	Falling	Edge, Sample	Time	Stamp	=	0.084514	
Sample	Number:	84516	Rising	Edge, Sample	Time	Stamp	=	0.084516	1E-06
Sample	Number:	84517	Falling	Edge, Sample	Time	Stamp	=	0.084517	
Sample	Number:	84521	Rising	Edge, Sample	Time	Stamp	=	0.084521	1E-06
Sample	Number:	84522	Falling	Edge, Sample	Time	Stamp	=	0.084522	
Sample	Number:	84523	Rising	Edge, Sample	Time	Stamp	=	0.084523	1E-06
Sample	Number:	84524	Falling	Edge, Sample	Time	Stamp	=	0.084524	
Sample	Number:	84525	Rising	Edge, Sample	Time	Stamp	=	0.084525	1E-06
Sample	Number:	84526	Falling	Edge, Sample	Time	Stamp	=	0.084526	
Sample	Number:	84535	Rising	Edge, Sample	Time	Stamp	=	0.084535	1E-06
Sample	Number:	84536	Falling	Edge, Sample	Time	Stamp	=	0.084536	
Sample	Number:	84537	Rising	Edge, Sample	Time	Stamp	=	0.084537	3E-06
Sample	Number:	84540	Falling	Edge, Sample	Time	Stamp	=	0.08454	
Sample	Number:	84548	Rising	Edge, Sample	Time	Stamp	=	0.084548	2E-06
Sample	Number:	84550	Falling	Edge, Sample	Time	Stamp	=	0.08455	
Sample	Number:	84554	Rising	Edge, Sample	Time	Stamp	=	0.084554	2E-06

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Sample	Number:	84556	Falling	Edge, Sample	Time	Stamp	=	0.084556	
Sample	Number:	84571	Rising	Edge, Sample	Time	Stamp	=	0.084571	1E-06
Sample	Number:	84572	Falling	Edge, Sample	Time	Stamp	=	0.084572	
Sample	Number:	84573	Rising	Edge, Sample	Time	Stamp	=	0.084573	1E-06
Sample	Number:	84574	Falling	Edge, Sample	Time	Stamp	=	0.084574	
Sample	Number:	84583	Rising	Edge, Sample	Time	Stamp	=	0.084583	1E-06
Sample	Number:	84584	Falling	Edge, Sample	Time	Stamp	=	0.084584	
Sample	Number:	84599	Rising	Edge, Sample	Time	Stamp	=	0.084599	2E-06
Sample	Number:	84601	Falling	Edge, Sample	Time	Stamp	=	0.084601	
Sample	Number:	84603	Rising	Edge, Sample	Time	Stamp	=	0.084603	1E-06
Sample	Number:	84604	Falling	Edge, Sample	Time	Stamp	=	0.084604	
Sample	Number:	84607	Rising	Edge, Sample	Time	Stamp	=	0.084607	1E-06
Sample	Number:	84608	Falling	Edge, Sample	Time	Stamp	=	0.084608	
Sample	Number:	84610	Rising	Edge, Sample	Time	Stamp	=	0.08461	1E-06
Sample	Number:	84611	Falling	Edge, Sample	Time	Stamp	=	0.084611	
Sample	Number:	84618	Rising	Edge, Sample	Time	Stamp	=	0.084618	1E-06
Sample	Number:	84619	Falling	Edge, Sample	Time	Stamp	=	0.084619	
Sample	Number:	84621	Rising	Edge, Sample	Time	Stamp	=	0.084621	1E-06
Sample	Number:	84622	Falling	Edge, Sample	Time	Stamp	=	0.084622	
Sample	Number:	84632	Rising	Edge, Sample	Time	Stamp	=	0.084632	1E-06
Sample	Number:	84633	Falling	Edge, Sample	Time	Stamp	=	0.084633	
Sample	Number:	84638	Rising	Edge, Sample	Time	Stamp	=	0.084638	1E-06
Sample	Number:	84639	Falling	Edge, Sample	Time	Stamp	=	0.084639	
Sample	Number:	84645	Rising	Edge, Sample	Time	Stamp	=	0.084645	3E-06
Sample	Number:	84648	Falling	Edge, Sample	Time	Stamp	=	0.084648	
Sample	Number:	84649	Rising	Edge, Sample	Time	Stamp	=	0.084649	1E-06
Sample	Number:	84650	Falling	Edge, Sample	Time	Stamp	=	0.08465	
Sample	Number:	84651	Rising	Edge, Sample	Time	Stamp	=	0.084651	1E-06
Sample	Number:	84652	Falling	Edge, Sample	Time	Stamp	=	0.084652	
Sample	Number:	84658	Rising	Edge, Sample	Time	Stamp	=	0.084658	1E-06
Sample	Number:	84659	Falling	Edge, Sample	Time	Stamp	=	0.084659	
Sample	Number:	84661	Rising	Edge, Sample	Time	Stamp	=	0.084661	1E-06

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Sample	Number:	84662	Falling	Edge, Sample	Time	Stamp	=	0.084662	
Sample	Number:	84668	Rising	Edge, Sample	Time	Stamp	=	0.084668	1E-06
Sample	Number:	84669	Falling	Edge, Sample	Time	Stamp	=	0.084669	
Sample	Number:	84683	Rising	Edge, Sample	Time	Stamp	=	0.084683	1E-06
Sample	Number:	84684	Falling	Edge, Sample	Time	Stamp	=	0.084684	
Sample	Number:	84695	Rising	Edge, Sample	Time	Stamp	=	0.084695	1E-06
Sample	Number:	84696	Falling	Edge, Sample	Time	Stamp	=	0.084696	
Sample	Number:	84699	Rising	Edge, Sample	Time	Stamp	=	0.084699	3E-06
Sample	Number:	84702	Falling	Edge, Sample	Time	Stamp	=	0.084702	
Sample	Number:	84710	Rising	Edge, Sample	Time	Stamp	=	0.08471	1E-06
Sample	Number:	84711	Falling	Edge, Sample	Time	Stamp	=	0.084711	
Sample	Number:	84713	Rising	Edge, Sample	Time	Stamp	=	0.084713	1E-06
Sample	Number:	84714	Falling	Edge, Sample	Time	Stamp	=	0.084714	
Sample	Number:	84727	Rising	Edge, Sample	Time	Stamp	=	0.084727	1E-06
Sample	Number:	84728	Falling	Edge, Sample	Time	Stamp	=	0.084728	
Sample	Number:	84729	Rising	Edge, Sample	Time	Stamp	=	0.084729	1E-06
Sample	Number:	84730	Falling	Edge, Sample	Time	Stamp	=	0.08473	
Sample	Number:	84737	Rising	Edge, Sample	Time	Stamp	=	0.084737	1E-06
Sample	Number:	84738	Falling	Edge, Sample	Time	Stamp	=	0.084738	
Sample	Number:	84742	Rising	Edge, Sample	Time	Stamp	=	0.084742	2E-06
Sample	Number:	84744	Falling	Edge, Sample	Time	Stamp	=	0.084744	
Sample	Number:	84745	Rising	Edge, Sample	Time	Stamp	=	0.084745	1E-06
Sample	Number:	84746	Falling	Edge, Sample	Time	Stamp	=	0.084746	
Sample	Number:	84759	Rising	Edge, Sample	Time	Stamp	=	0.084759	3E-06
Sample	Number:	84762	Falling	Edge, Sample	Time	Stamp	=	0.084762	
Sample	Number:	84763	Rising	Edge, Sample	Time	Stamp	=	0.084763	1E-06
Sample	Number:	84764	Falling	Edge, Sample	Time	Stamp	=	0.084764	
Sample	Number:	84769	Rising	Edge, Sample	Time	Stamp	=	0.084769	1E-06
Sample	Number:	84770	Falling	Edge, Sample	Time	Stamp	=	0.08477	
Sample	Number:	84772	Rising	Edge, Sample	Time	Stamp	=	0.084772	1E-06
Sample	Number:	84773	Falling	Edge, Sample	Time	Stamp	=	0.084773	
Sample	Number:	84778	Rising	Edge, Sample	Time	Stamp	=	0.084778	1E-06

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Sample	Number:	84779	Falling	Edge, Sample	Time	Stamp	=	0.084779	
Sample	Number:	84782	Rising	Edge, Sample	Time	Stamp	=	0.084782	2E-06
Sample	Number:	84784	Falling	Edge, Sample	Time	Stamp	=	0.084784	
Sample	Number:	84800	Rising	Edge, Sample	Time	Stamp	=	0.0848	1E-06
Sample	Number:	84801	Falling	Edge, Sample	Time	Stamp	=	0.084801	
Sample	Number:	84804	Rising	Edge, Sample	Time	Stamp	=	0.084804	1E-06
Sample	Number:	84805	Falling	Edge, Sample	Time	Stamp	=	0.084805	
Sample	Number:	84806	Rising	Edge, Sample	Time	Stamp	=	0.084806	1E-06
Sample	Number:	84807	Falling	Edge, Sample	Time	Stamp	=	0.084807	
Sample	Number:	84816	Rising	Edge, Sample	Time	Stamp	=	0.084816	2E-06
Sample	Number:	84818	Falling	Edge, Sample	Time	Stamp	=	0.084818	
Sample	Number:	84819	Rising	Edge, Sample	Time	Stamp	=	0.084819	1E-06
Sample	Number:	84820	Falling	Edge, Sample	Time	Stamp	=	0.08482	
Sample	Number:	84827	Rising	Edge, Sample	Time	Stamp	=	0.084827	1E-06
Sample	Number:	84828	Falling	Edge, Sample	Time	Stamp	=	0.084828	
Sample	Number:	84831	Rising	Edge, Sample	Time	Stamp	=	0.084831	3E-06
Sample	Number:	84834	Falling	Edge, Sample	Time	Stamp	=	0.084834	
Sample	Number:	84837	Rising	Edge, Sample	Time	Stamp	=	0.084837	2E-06
Sample	Number:	84839	Falling	Edge, Sample	Time	Stamp	=	0.084839	
Sample	Number:	84843	Rising	Edge, Sample	Time	Stamp	=	0.084843	1E-06
Sample	Number:	84844	Falling	Edge, Sample	Time	Stamp	=	0.084844	
Sample	Number:	84846	Rising	Edge, Sample	Time	Stamp	=	0.084846	1E-06
Sample	Number:	84847	Falling	Edge, Sample	Time	Stamp	=	0.084847	
Sample	Number:	84851	Rising	Edge, Sample	Time	Stamp	=	0.084851	1E-06
Sample	Number:	84852	Falling	Edge, Sample	Time	Stamp	=	0.084852	
Sample	Number:	84854	Rising	Edge, Sample	Time	Stamp	=	0.084854	1E-06
Sample	Number:	84855	Falling	Edge, Sample	Time	Stamp	=	0.084855	
Sample	Number:	84868	Rising	Edge, Sample	Time	Stamp	=	0.084868	1E-06
Sample	Number:	84869	Falling	Edge, Sample	Time	Stamp	=	0.084869	
Sample	Number:	84870	Rising	Edge, Sample	Time	Stamp	=	0.08487	1E-06
Sample	Number:	84871	Falling	Edge, Sample	Time	Stamp	=	0.084871	
Sample	Number:	84873	Rising	Edge, Sample	Time	Stamp	=	0.084873	1E-06

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Sample	Number:	84874	Falling	Edge, Sample	Time	Stamp	=	0.084874	
Sample	Number:	84898	Rising	Edge, Sample	Time	Stamp	=	0.084898	1E-06
Sample	Number:	84899	Falling	Edge, Sample	Time	Stamp	=	0.084899	
Sample	Number:	84920	Rising	Edge, Sample	Time	Stamp	=	0.08492	1E-06
Sample	Number:	84921	Falling	Edge, Sample	Time	Stamp	=	0.084921	
Sample	Number:	84923	Rising	Edge, Sample	Time	Stamp	=	0.084923	2E-06
Sample	Number:	84925	Falling	Edge, Sample	Time	Stamp	=	0.084925	
Sample	Number:	84926	Rising	Edge, Sample	Time	Stamp	=	0.084926	1E-06
Sample	Number:	84927	Falling	Edge, Sample	Time	Stamp	=	0.084927	
Sample	Number:	84932	Rising	Edge, Sample	Time	Stamp	=	0.084932	1E-06
Sample	Number:	84933	Falling	Edge, Sample	Time	Stamp	=	0.084933	
Sample	Number:	84942	Rising	Edge, Sample	Time	Stamp	=	0.084942	1E-06
Sample	Number:	84943	Falling	Edge, Sample	Time	Stamp	=	0.084943	
Sample	Number:	84951	Rising	Edge, Sample	Time	Stamp	=	0.084951	1E-06
Sample	Number:	84952	Falling	Edge, Sample	Time	Stamp	=	0.084952	
Sample	Number:	84958	Rising	Edge, Sample	Time	Stamp	=	0.084958	1E-06
Sample	Number:	84959	Falling	Edge, Sample	Time	Stamp	=	0.084959	
Sample	Number:	84962	Rising	Edge, Sample	Time	Stamp	=	0.084962	1E-06
Sample	Number:	84963	Falling	Edge, Sample	Time	Stamp	=	0.084963	
Sample	Number:	84970	Rising	Edge, Sample	Time	Stamp	=	0.08497	1E-06
Sample	Number:	84971	Falling	Edge, Sample	Time	Stamp	=	0.084971	
Sample	Number:	84988	Rising	Edge, Sample	Time	Stamp	=	0.084988	1E-06
Sample	Number:	84989	Falling	Edge, Sample	Time	Stamp	=	0.084989	
Sample	Number:	84997	Rising	Edge, Sample	Time	Stamp	=	0.084997	1E-06
Sample	Number:	84998	Falling	Edge, Sample	Time	Stamp	=	0.084998	
Sample	Number:	84999	Rising	Edge, Sample	Time	Stamp	=	0.084999	2E-06
Sample	Number:	85001	Falling	Edge, Sample	Time	Stamp	=	0.085001	
Sample	Number:	85005	Rising	Edge, Sample	Time	Stamp	=	0.085005	1E-06
Sample	Number:	85006	Falling	Edge, Sample	Time	Stamp	=	0.085006	
Sample	Number:	85007	Rising	Edge, Sample	Time	Stamp	=	0.085007	1E-06
Sample	Number:	85008	Falling	Edge, Sample	Time	Stamp	=	0.085008	
Sample	Number:	85009	Rising	Edge, Sample	Time	Stamp	=	0.085009	1E-06

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Sample	Number:	85010	Falling	Edge, Sample	Time	Stamp	=	0.08501	
Sample	Number:	85012	Rising	Edge, Sample	Time	Stamp	=	0.085012	1E-06
Sample	Number:	85013	Falling	Edge, Sample	Time	Stamp	=	0.085013	
Sample	Number:	85016	Rising	Edge, Sample	Time	Stamp	=	0.085016	1E-06
Sample	Number:	85017	Falling	Edge, Sample	Time	Stamp	=	0.085017	
Sample	Number:	85020	Rising	Edge, Sample	Time	Stamp	=	0.08502	1E-06
Sample	Number:	85021	Falling	Edge, Sample	Time	Stamp	=	0.085021	
Sample	Number:	85025	Rising	Edge, Sample	Time	Stamp	=	0.085025	1E-06
Sample	Number:	85026	Falling	Edge, Sample	Time	Stamp	=	0.085026	
Sample	Number:	85029	Rising	Edge, Sample	Time	Stamp	=	0.085029	2E-06
Sample	Number:	85031	Falling	Edge, Sample	Time	Stamp	=	0.085031	
Sample	Number:	85033	Rising	Edge, Sample	Time	Stamp	=	0.085033	1E-06
Sample	Number:	85034	Falling	Edge, Sample	Time	Stamp	=	0.085034	
Sample	Number:	85041	Rising	Edge, Sample	Time	Stamp	=	0.085041	1E-06
Sample	Number:	85042	Falling	Edge, Sample	Time	Stamp	=	0.085042	
Sample	Number:	85045	Rising	Edge, Sample	Time	Stamp	=	0.085045	2E-06
Sample	Number:	85047	Falling	Edge, Sample	Time	Stamp	=	0.085047	
Sample	Number:	85052	Rising	Edge, Sample	Time	Stamp	=	0.085052	2E-06
Sample	Number:	85054	Falling	Edge, Sample	Time	Stamp	=	0.085054	
Sample	Number:	85070	Rising	Edge, Sample	Time	Stamp	=	0.08507	1E-06
Sample	Number:	85071	Falling	Edge, Sample	Time	Stamp	=	0.085071	
Sample	Number:	85073	Rising	Edge, Sample	Time	Stamp	=	0.085073	1E-06
Sample	Number:	85074	Falling	Edge, Sample	Time	Stamp	=	0.085074	
Sample	Number:	85081	Rising	Edge, Sample	Time	Stamp	=	0.085081	1E-06
Sample	Number:	85082	Falling	Edge, Sample	Time	Stamp	=	0.085082	
Sample	Number:	85093	Rising	Edge, Sample	Time	Stamp	=	0.085093	1E-06
Sample	Number:	85094	Falling	Edge, Sample	Time	Stamp	=	0.085094	
Sample	Number:	85103	Rising	Edge, Sample	Time	Stamp	=	0.085103	1E-06
Sample	Number:	85104	Falling	Edge, Sample	Time	Stamp	=	0.085104	
Sample	Number:	85106	Rising	Edge, Sample	Time	Stamp	=	0.085106	1E-06
Sample	Number:	85107	Falling	Edge, Sample	Time	Stamp	=	0.085107	
Sample	Number:	85118	Rising	Edge, Sample	Time	Stamp	=	0.085118	2E-06

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Sample	Number:	85120	Falling	Edge, Sample	Time	Stamp	=	0.08512	
Sample	Number:	85121	Rising	Edge, Sample	Time	Stamp	=	0.085121	1E-06
Sample	Number:	85122	Falling	Edge, Sample	Time	Stamp	=	0.085122	
Sample	Number:	85125	Rising	Edge, Sample	Time	Stamp	=	0.085125	1E-06
Sample	Number:	85126	Falling	Edge, Sample	Time	Stamp	=	0.085126	
Sample	Number:	85132	Rising	Edge, Sample	Time	Stamp	=	0.085132	1E-06
Sample	Number:	85133	Falling	Edge, Sample	Time	Stamp	=	0.085133	
Sample	Number:	85137	Rising	Edge, Sample	Time	Stamp	=	0.085137	2E-06
Sample	Number:	85139	Falling	Edge, Sample	Time	Stamp	=	0.085139	
Sample	Number:	85148	Rising	Edge, Sample	Time	Stamp	=	0.085148	1E-06
Sample	Number:	85149	Falling	Edge, Sample	Time	Stamp	=	0.085149	
Sample	Number:	85163	Rising	Edge, Sample	Time	Stamp	=	0.085163	1E-06
Sample	Number:	85164	Falling	Edge, Sample	Time	Stamp	=	0.085164	
Sample	Number:	85165	Rising	Edge, Sample	Time	Stamp	=	0.085165	2E-06
Sample	Number:	85167	Falling	Edge, Sample	Time	Stamp	=	0.085167	
Sample	Number:	85171	Rising	Edge, Sample	Time	Stamp	=	0.085171	1E-06
Sample	Number:	85172	Falling	Edge, Sample	Time	Stamp	=	0.085172	
Sample	Number:	85173	Rising	Edge, Sample	Time	Stamp	=	0.085173	1E-06
Sample	Number:	85174	Falling	Edge, Sample	Time	Stamp	=	0.085174	
Sample	Number:	85175	Rising	Edge, Sample	Time	Stamp	=	0.085175	1E-06
Sample	Number:	85176	Falling	Edge, Sample	Time	Stamp	=	0.085176	
Sample	Number:	85177	Rising	Edge, Sample	Time	Stamp	=	0.085177	1E-06
Sample	Number:	85178	Falling	Edge, Sample	Time	Stamp	=	0.085178	
Sample	Number:	85179	Rising	Edge, Sample	Time	Stamp	=	0.085179	1E-06
Sample	Number:	85180	Falling	Edge, Sample	Time	Stamp	=	0.08518	
Sample	Number:	85182	Rising	Edge, Sample	Time	Stamp	=	0.085182	1E-06
Sample	Number:	85183	Falling	Edge, Sample	Time	Stamp	=	0.085183	
Sample	Number:	85190	Rising	Edge, Sample	Time	Stamp	=	0.08519	3E-06
Sample	Number:	85193	Falling	Edge, Sample	Time	Stamp	=	0.085193	
Sample	Number:	85196	Rising	Edge, Sample	Time	Stamp	=	0.085196	1E-06
Sample	Number:	85197	Falling	Edge, Sample	Time	Stamp	=	0.085197	
Sample	Number:	85199	Rising	Edge, Sample	Time	Stamp	=	0.085199	4E-06

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Sample	Number:	85203	Falling	Edge, Sample	Time	Stamp	=	0.085203	
Sample	Number:	85204	Rising	Edge, Sample	Time	Stamp	=	0.085204	1E-06
Sample	Number:	85205	Falling	Edge, Sample	Time	Stamp	=	0.085205	
Sample	Number:	85206	Rising	Edge, Sample	Time	Stamp	=	0.085206	1E-06
Sample	Number:	85207	Falling	Edge, Sample	Time	Stamp	=	0.085207	
Sample	Number:	85212	Rising	Edge, Sample	Time	Stamp	=	0.085212	2E-06
Sample	Number:	85214	Falling	Edge, Sample	Time	Stamp	=	0.085214	
Sample	Number:	85216	Rising	Edge, Sample	Time	Stamp	=	0.085216	1E-06
Sample	Number:	85217	Falling	Edge, Sample	Time	Stamp	=	0.085217	
Sample	Number:	85219	Rising	Edge, Sample	Time	Stamp	=	0.085219	1E-06
Sample	Number:	85220	Falling	Edge, Sample	Time	Stamp	=	0.08522	
Sample	Number:	85222	Rising	Edge, Sample	Time	Stamp	=	0.085222	2E-06
Sample	Number:	85224	Falling	Edge, Sample	Time	Stamp	=	0.085224	
Sample	Number:	85228	Rising	Edge, Sample	Time	Stamp	=	0.085228	1E-06
Sample	Number:	85229	Falling	Edge, Sample	Time	Stamp	=	0.085229	
Sample	Number:	85231	Rising	Edge, Sample	Time	Stamp	=	0.085231	1E-06
Sample	Number:	85232	Falling	Edge, Sample	Time	Stamp	=	0.085232	
Sample	Number:	85234	Rising	Edge, Sample	Time	Stamp	=	0.085234	1E-06
Sample	Number:	85235	Falling	Edge, Sample	Time	Stamp	=	0.085235	
Sample	Number:	85236	Rising	Edge, Sample	Time	Stamp	=	0.085236	2E-06
Sample	Number:	85238	Falling	Edge, Sample	Time	Stamp	=	0.085238	
Sample	Number:	85243	Rising	Edge, Sample	Time	Stamp	=	0.085243	1E-06
Sample	Number:	85244	Falling	Edge, Sample	Time	Stamp	=	0.085244	
Sample	Number:	85247	Rising	Edge, Sample	Time	Stamp	=	0.085247	1E-06
Sample	Number:	85248	Falling	Edge, Sample	Time	Stamp	=	0.085248	
Sample	Number:	85249	Rising	Edge, Sample	Time	Stamp	=	0.085249	1E-06
Sample	Number:	85250	Falling	Edge, Sample	Time	Stamp	=	0.08525	
Sample	Number:	85267	Rising	Edge, Sample	Time	Stamp	=	0.085267	1E-06
Sample	Number:	85268	Falling	Edge, Sample	Time	Stamp	=	0.085268	
Sample	Number:	85271	Rising	Edge, Sample	Time	Stamp	=	0.085271	1E-06
Sample	Number:	85272	Falling	Edge, Sample	Time	Stamp	=	0.085272	
Sample	Number:	85277	Rising	Edge, Sample	Time	Stamp	=	0.085277	1E-06

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Sample	Number:	85278	Falling	Edge, Sample	Time	Stamp	=	0.085278	
Sample	Number:	85280	Rising	Edge, Sample	Time	Stamp	=	0.08528	1E-06
Sample	Number:	85281	Falling	Edge, Sample	Time	Stamp	=	0.085281	
Sample	Number:	85285	Rising	Edge, Sample	Time	Stamp	=	0.085285	1E-06
Sample	Number:	85286	Falling	Edge, Sample	Time	Stamp	=	0.085286	
Sample	Number:	85303	Rising	Edge, Sample	Time	Stamp	=	0.085303	1E-06
Sample	Number:	85304	Falling	Edge, Sample	Time	Stamp	=	0.085304	
Sample	Number:	85320	Rising	Edge, Sample	Time	Stamp	=	0.08532	2E-06
Sample	Number:	85322	Falling	Edge, Sample	Time	Stamp	=	0.085322	
Sample	Number:	85331	Rising	Edge, Sample	Time	Stamp	=	0.085331	1E-06
Sample	Number:	85332	Falling	Edge, Sample	Time	Stamp	=	0.085332	
Sample	Number:	85338	Rising	Edge, Sample	Time	Stamp	=	0.085338	2E-06
Sample	Number:	85340	Falling	Edge, Sample	Time	Stamp	=	0.08534	
Sample	Number:	85348	Rising	Edge, Sample	Time	Stamp	=	0.085348	1E-06
Sample	Number:	85349	Falling	Edge, Sample	Time	Stamp	=	0.085349	
Sample	Number:	85359	Rising	Edge, Sample	Time	Stamp	=	0.085359	1E-06
Sample	Number:	85360	Falling	Edge, Sample	Time	Stamp	=	0.08536	
Sample	Number:	85362	Rising	Edge, Sample	Time	Stamp	=	0.085362	1E-06
Sample	Number:	85363	Falling	Edge, Sample	Time	Stamp	=	0.085363	
Sample	Number:	85379	Rising	Edge, Sample	Time	Stamp	=	0.085379	1E-06
Sample	Number:	85380	Falling	Edge, Sample	Time	Stamp	=	0.08538	
Sample	Number:	85384	Rising	Edge, Sample	Time	Stamp	=	0.085384	2E-06
Sample	Number:	85386	Falling	Edge, Sample	Time	Stamp	=	0.085386	
Sample	Number:	85391	Rising	Edge, Sample	Time	Stamp	=	0.085391	1E-06
Sample	Number:	85392	Falling	Edge, Sample	Time	Stamp	=	0.085392	
Sample	Number:	85404	Rising	Edge, Sample	Time	Stamp	=	0.085404	1E-06
Sample	Number:	85405	Falling	Edge, Sample	Time	Stamp	=	0.085405	
Sample	Number:	85407	Rising	Edge, Sample	Time	Stamp	=	0.085407	1E-06
Sample	Number:	85408	Falling	Edge, Sample	Time	Stamp	=	0.085408	
Sample	Number:	85415	Rising	Edge, Sample	Time	Stamp	=	0.085415	1E-06
Sample	Number:	85416	Falling	Edge, Sample	Time	Stamp	=	0.085416	
Sample	Number:	85418	Rising	Edge, Sample	Time	Stamp	=	0.085418	1E-06

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Sample	Number:	85419	Falling	Edge, Sample	Time	Stamp	=	0.085419	
Sample	Number:	85421	Rising	Edge, Sample	Time	Stamp	=	0.085421	2E-06
Sample	Number:	85423	Falling	Edge, Sample	Time	Stamp	=	0.085423	
Sample	Number:	85425	Rising	Edge, Sample	Time	Stamp	=	0.085425	1E-06
Sample	Number:	85426	Falling	Edge, Sample	Time	Stamp	=	0.085426	
Sample	Number:	85428	Rising	Edge, Sample	Time	Stamp	=	0.085428	1E-06
Sample	Number:	85429	Falling	Edge, Sample	Time	Stamp	=	0.085429	
Sample	Number:	85433	Rising	Edge, Sample	Time	Stamp	=	0.085433	1E-06
Sample	Number:	85434	Falling	Edge, Sample	Time	Stamp	=	0.085434	
Sample	Number:	85440	Rising	Edge, Sample	Time	Stamp	=	0.08544	1E-06
Sample	Number:	85441	Falling	Edge, Sample	Time	Stamp	=	0.085441	
Sample	Number:	85444	Rising	Edge, Sample	Time	Stamp	=	0.085444	1E-06
Sample	Number:	85445	Falling	Edge, Sample	Time	Stamp	=	0.085445	
Sample	Number:	85446	Rising	Edge, Sample	Time	Stamp	=	0.085446	2E-06
Sample	Number:	85448	Falling	Edge, Sample	Time	Stamp	=	0.085448	
Sample	Number:	85458	Rising	Edge, Sample	Time	Stamp	=	0.085458	2E-06
Sample	Number:	85460	Falling	Edge, Sample	Time	Stamp	=	0.08546	
Sample	Number:	85461	Rising	Edge, Sample	Time	Stamp	=	0.085461	2E-06
Sample	Number:	85463	Falling	Edge, Sample	Time	Stamp	=	0.085463	
Sample	Number:	85464	Rising	Edge, Sample	Time	Stamp	=	0.085464	1E-06
Sample	Number:	85465	Falling	Edge, Sample	Time	Stamp	=	0.085465	
Sample	Number:	85468	Rising	Edge, Sample	Time	Stamp	=	0.085468	2E-06
Sample	Number:	85470	Falling	Edge, Sample	Time	Stamp	=	0.08547	
Sample	Number:	85474	Rising	Edge, Sample	Time	Stamp	=	0.085474	1E-06
Sample	Number:	85475	Falling	Edge, Sample	Time	Stamp	=	0.085475	
Sample	Number:	85478	Rising	Edge, Sample	Time	Stamp	=	0.085478	1E-06
Sample	Number:	85479	Falling	Edge, Sample	Time	Stamp	=	0.085479	
Sample	Number:	85480	Rising	Edge, Sample	Time	Stamp	=	0.08548	1E-06
Sample	Number:	85481	Falling	Edge, Sample	Time	Stamp	=	0.085481	
Sample	Number:	85484	Rising	Edge, Sample	Time	Stamp	=	0.085484	1E-06
Sample	Number:	85485	Falling	Edge, Sample	Time	Stamp	=	0.085485	
Sample	Number:	85491	Rising	Edge, Sample	Time	Stamp	=	0.085491	3E-06

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Sample	Number:	85494	Falling	Edge, Sample	Time	Stamp	=	0.085494	
Sample	Number:	85504	Rising	Edge, Sample	Time	Stamp	=	0.085504	2E-06
Sample	Number:	85506	Falling	Edge, Sample	Time	Stamp	=	0.085506	
Sample	Number:	85507	Rising	Edge, Sample	Time	Stamp	=	0.085507	2E-06
Sample	Number:	85509	Falling	Edge, Sample	Time	Stamp	=	0.085509	
Sample	Number:	85513	Rising	Edge, Sample	Time	Stamp	=	0.085513	1E-06
Sample	Number:	85514	Falling	Edge, Sample	Time	Stamp	=	0.085514	
Sample	Number:	85517	Rising	Edge, Sample	Time	Stamp	=	0.085517	1E-06
Sample	Number:	85518	Falling	Edge, Sample	Time	Stamp	=	0.085518	
Sample	Number:	85520	Rising	Edge, Sample	Time	Stamp	=	0.08552	1E-06
Sample	Number:	85521	Falling	Edge, Sample	Time	Stamp	=	0.085521	
Sample	Number:	85523	Rising	Edge, Sample	Time	Stamp	=	0.085523	2E-06
Sample	Number:	85525	Falling	Edge, Sample	Time	Stamp	=	0.085525	
Sample	Number:	85532	Rising	Edge, Sample	Time	Stamp	=	0.085532	1E-06
Sample	Number:	85533	Falling	Edge, Sample	Time	Stamp	=	0.085533	
Sample	Number:	85536	Rising	Edge, Sample	Time	Stamp	=	0.085536	1E-06
Sample	Number:	85537	Falling	Edge, Sample	Time	Stamp	=	0.085537	
Sample	Number:	85541	Rising	Edge, Sample	Time	Stamp	=	0.085541	1E-06
Sample	Number:	85542	Falling	Edge, Sample	Time	Stamp	=	0.085542	
Sample	Number:	85543	Rising	Edge, Sample	Time	Stamp	=	0.085543	2E-06
Sample	Number:	85545	Falling	Edge, Sample	Time	Stamp	=	0.085545	
Sample	Number:	85548	Rising	Edge, Sample	Time	Stamp	=	0.085548	1E-06
Sample	Number:	85549	Falling	Edge, Sample	Time	Stamp	=	0.085549	
Sample	Number:	85562	Rising	Edge, Sample	Time	Stamp	=	0.085562	1E-06
Sample	Number:	85563	Falling	Edge, Sample	Time	Stamp	=	0.085563	
Sample	Number:	85582	Rising	Edge, Sample	Time	Stamp	=	0.085582	1E-06
Sample	Number:	85583	Falling	Edge, Sample	Time	Stamp	=	0.085583	
Sample	Number:	85589	Rising	Edge, Sample	Time	Stamp	=	0.085589	1E-06
Sample	Number:	85590	Falling	Edge, Sample	Time	Stamp	=	0.08559	
Sample	Number:	85594	Rising	Edge, Sample	Time	Stamp	=	0.085594	1E-06
Sample	Number:	85595	Falling	Edge, Sample	Time	Stamp	=	0.085595	
Sample	Number:	85597	Rising	Edge, Sample	Time	Stamp	=	0.085597	1E-06

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Sample	Number:	85598	Falling	Edge, Sample	Time	Stamp	=	0.085598	
Sample	Number:	85602	Rising	Edge, Sample	Time	Stamp	=	0.085602	1E-06
Sample	Number:	85603	Falling	Edge, Sample	Time	Stamp	=	0.085603	
Sample	Number:	85605	Rising	Edge, Sample	Time	Stamp	=	0.085605	1E-06
Sample	Number:	85606	Falling	Edge, Sample	Time	Stamp	=	0.085606	
Sample	Number:	85607	Rising	Edge, Sample	Time	Stamp	=	0.085607	2E-06
Sample	Number:	85609	Falling	Edge, Sample	Time	Stamp	=	0.085609	
Sample	Number:	85610	Rising	Edge, Sample	Time	Stamp	=	0.08561	1E-06
Sample	Number:	85611	Falling	Edge, Sample	Time	Stamp	=	0.085611	
Sample	Number:	85613	Rising	Edge, Sample	Time	Stamp	=	0.085613	1E-06
Sample	Number:	85614	Falling	Edge, Sample	Time	Stamp	=	0.085614	
Sample	Number:	85618	Rising	Edge, Sample	Time	Stamp	=	0.085618	1E-06
Sample	Number:	85619	Falling	Edge, Sample	Time	Stamp	=	0.085619	
Sample	Number:	85622	Rising	Edge, Sample	Time	Stamp	=	0.085622	1E-06
Sample	Number:	85623	Falling	Edge, Sample	Time	Stamp	=	0.085623	
Sample	Number:	85626	Rising	Edge, Sample	Time	Stamp	=	0.085626	1E-06
Sample	Number:	85627	Falling	Edge, Sample	Time	Stamp	=	0.085627	
Sample	Number:	85629	Rising	Edge, Sample	Time	Stamp	=	0.085629	1E-06
Sample	Number:	85630	Falling	Edge, Sample	Time	Stamp	=	0.08563	
Sample	Number:	85636	Rising	Edge, Sample	Time	Stamp	=	0.085636	1E-06
Sample	Number:	85637	Falling	Edge, Sample	Time	Stamp	=	0.085637	
Sample	Number:	85642	Rising	Edge, Sample	Time	Stamp	=	0.085642	2E-06
Sample	Number:	85644	Falling	Edge, Sample	Time	Stamp	=	0.085644	
Sample	Number:	85646	Rising	Edge, Sample	Time	Stamp	=	0.085646	1E-06
Sample	Number:	85647	Falling	Edge, Sample	Time	Stamp	=	0.085647	
Sample	Number:	85651	Rising	Edge, Sample	Time	Stamp	=	0.085651	1E-06
Sample	Number:	85652	Falling	Edge, Sample	Time	Stamp	=	0.085652	
Sample	Number:	85654	Rising	Edge, Sample	Time	Stamp	=	0.085654	1E-06
Sample	Number:	85655	Falling	Edge, Sample	Time	Stamp	=	0.085655	
Sample	Number:	85658	Rising	Edge, Sample	Time	Stamp	=	0.085658	1E-06
Sample	Number:	85659	Falling	Edge, Sample	Time	Stamp	=	0.085659	
Sample	Number:	85663	Rising	Edge, Sample	Time	Stamp	=	0.085663	1E-06

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Sample	Number:	85664	Falling	Edge, Sample	Time	Stamp	=	0.085664		
Sample	Number:	85666	Rising	Edge, Sample	Time	Stamp	=	0.085666	1E-06	
Sample	Number:	85667	Falling	Edge, Sample	Time	Stamp	=	0.085667		
Sample	Number:	85669	Rising	Edge, Sample	Time	Stamp	=	0.085669	1E-06	
Sample	Number:	85670	Falling	Edge, Sample	Time	Stamp	=	0.08567		
Sample	Number:	85674	Rising	Edge, Sample	Time	Stamp	=	0.085674	2E-06	
Sample	Number:	85676	Falling	Edge, Sample	Time	Stamp	=	0.085676		
Sample	Number:	85679	Rising	Edge, Sample	Time	Stamp	=	0.085679	1E-06	
Sample	Number:	85680	Falling	Edge, Sample	Time	Stamp	=	0.08568		
Sample	Number:	85683	Rising	Edge, Sample	Time	Stamp	=	0.085683	1E-06	
Sample	Number:	85684	Falling	Edge, Sample	Time	Stamp	=	0.085684		
Sample	Number:	85685	Rising	Edge, Sample	Time	Stamp	=	0.085685	1E-06	
Sample	Number:	85686	Falling	Edge, Sample	Time	Stamp	=	0.085686		
Sample	Number:	85689	Rising	Edge, Sample	Time	Stamp	=	0.085689	1E-06	
Sample	Number:	85690	Falling	Edge, Sample	Time	Stamp	=	0.08569		
Sample	Number:	85695	Rising	Edge, Sample	Time	Stamp	=	0.085695	1E-06	
Sample	Number:	85696	Falling	Edge, Sample	Time	Stamp	=	0.085696		
Sample	Number:	85699	Rising	Edge, Sample	Time	Stamp	=	0.085699	8E-06	
Sample	Number:	85707	Falling	Edge, Sample	Time	Stamp	=	0.085707*		
	Total	Burst	Count	Detected:	3674			Total+	0.000298	Secs

* Represents the last transmission activity of the EUT. The 0.085707*second time stamp is used to calculate Channel Move Time.

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Channel Move Time – Measurement & Calculation Type 1 Radar

The Channel Move Time is calculated using the data captured for the Channel Closing time as follows;-

Channel Move Time = Ft – Pt - Rt

Where;-

Ft = Final transmission activity occurred at 85.707 mSeconds

Pt = Pre-trigger information 60 mS

Rt = Type 1 burst period 24.277 mS

(Rt is the period of the 18 pulse burst includes [17 pulses *1.428mS PRI] = 24.276ms. Then add 1µs pulse width for the final pulse.)

Channel Move Time = 85.707 – 60 – 24.277 = 1.43 mSecs

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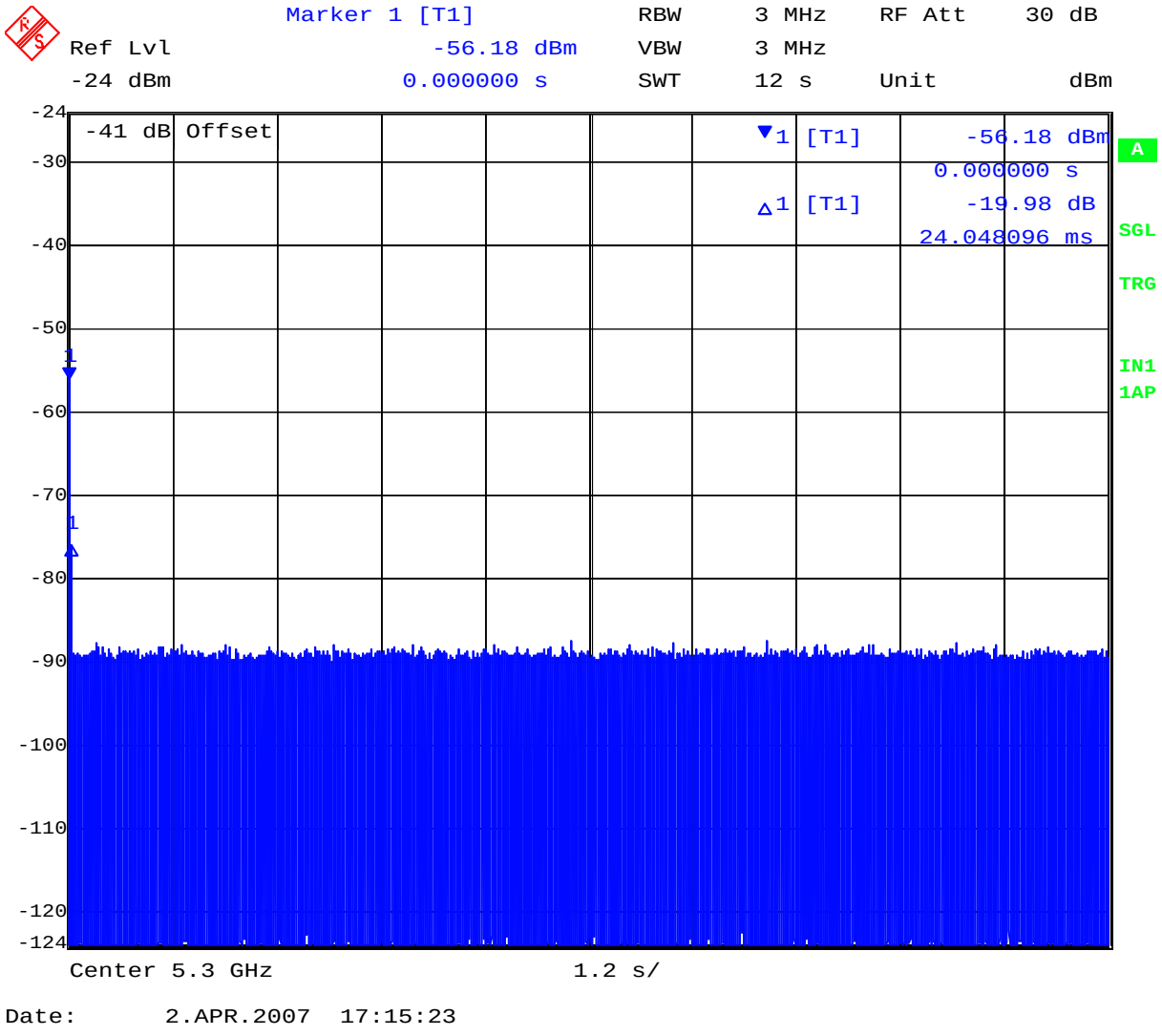
Channel Move Time, Channel closing Transmission Time for Type 2 Radar 1.1µs, 197 prf, 24 pulses



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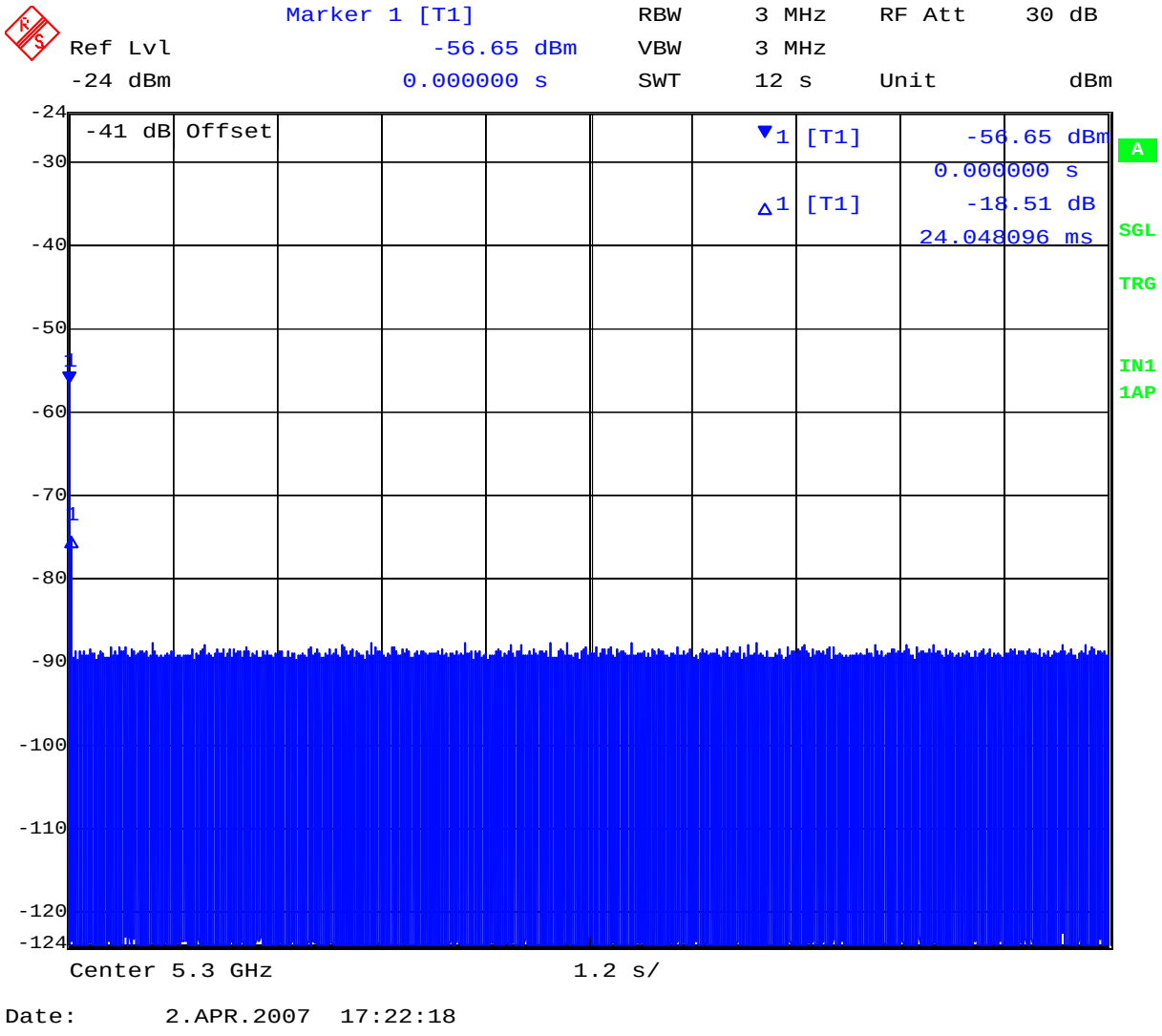
Channel Move Time, Channel closing Transmission Time for Type 3 Radar 6.2 µs, 259 prf, 17 pulses



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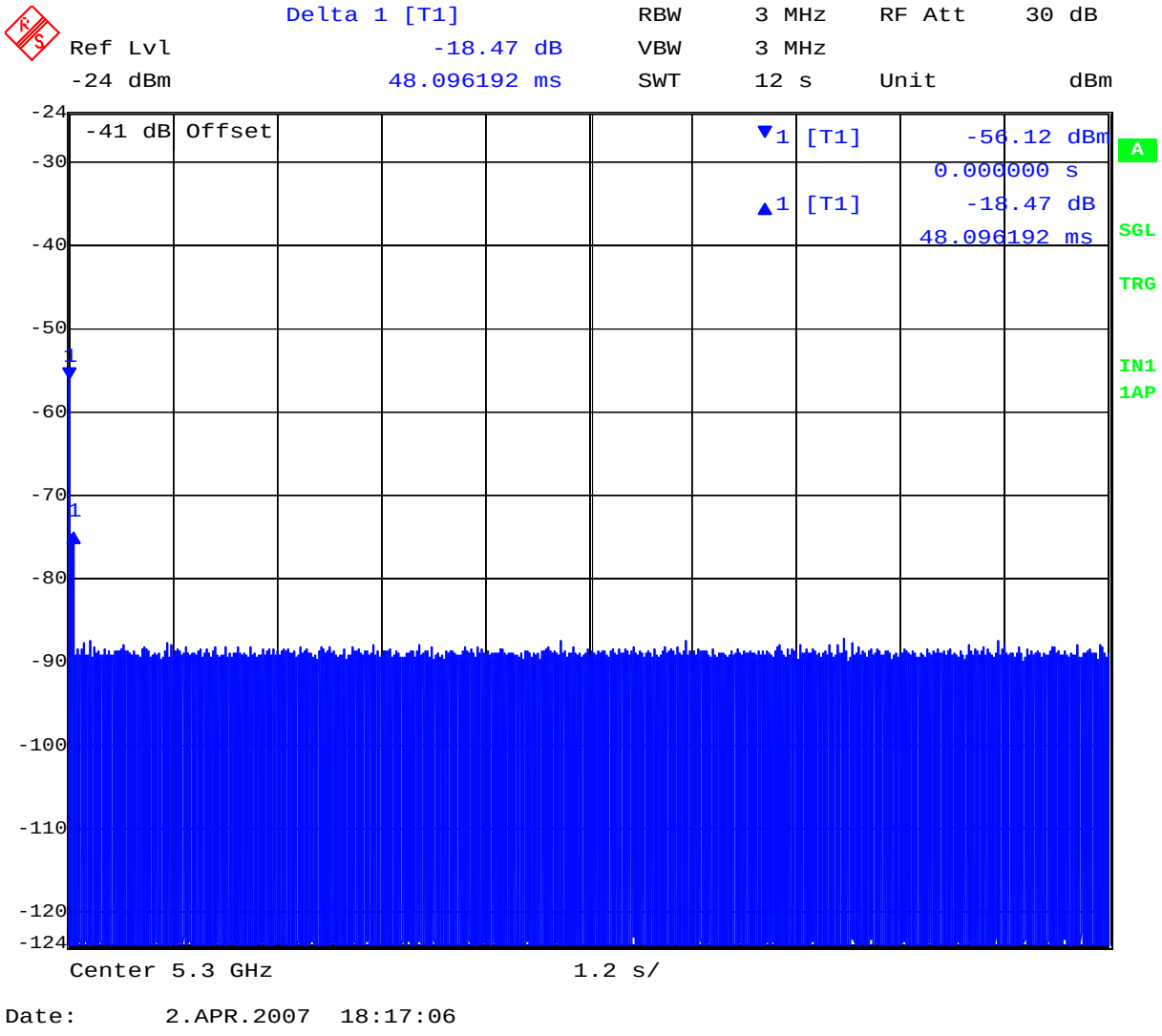
Channel Move Time, Channel closing Transmission Time for Type 4 Radar
11.6 µs, 283 prf, 13 pulses



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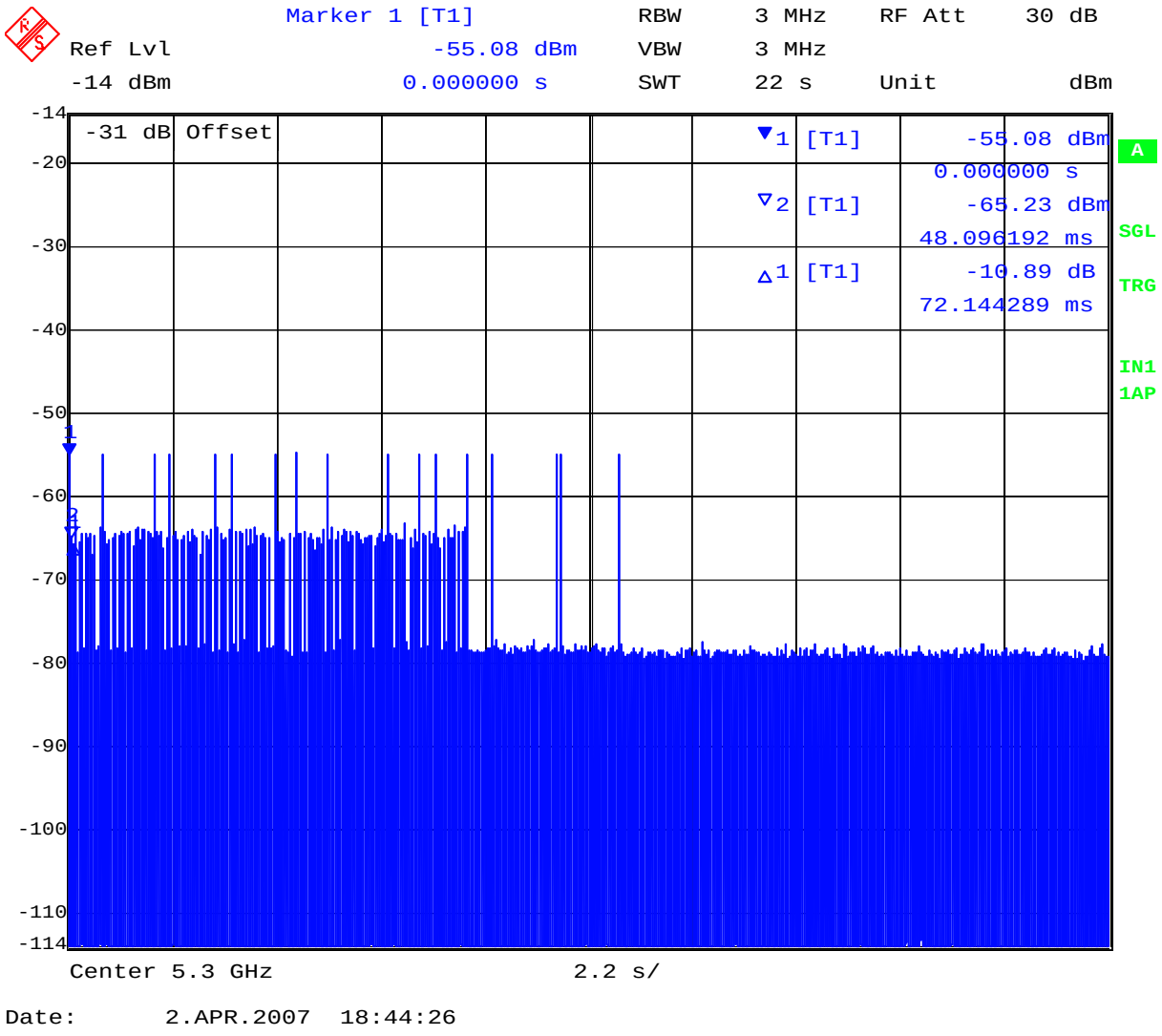
Channel Move Time, Channel closing Transmission Time for Type 5 Radar



With reference to the requirements of FCC MO & O 06-96;- The instant that the Chanel Move Time and Channel Closing Time begins for the long Pulse Radar Test Signal is the instant at the end of the 12 Second period defining the Radar Waveform. From the above plot is can be seen that the EUT stopped transmitting data before completion of the Radar Test Signal, therefore the Channel Closing Time and Channel Move time complies with the requirements.

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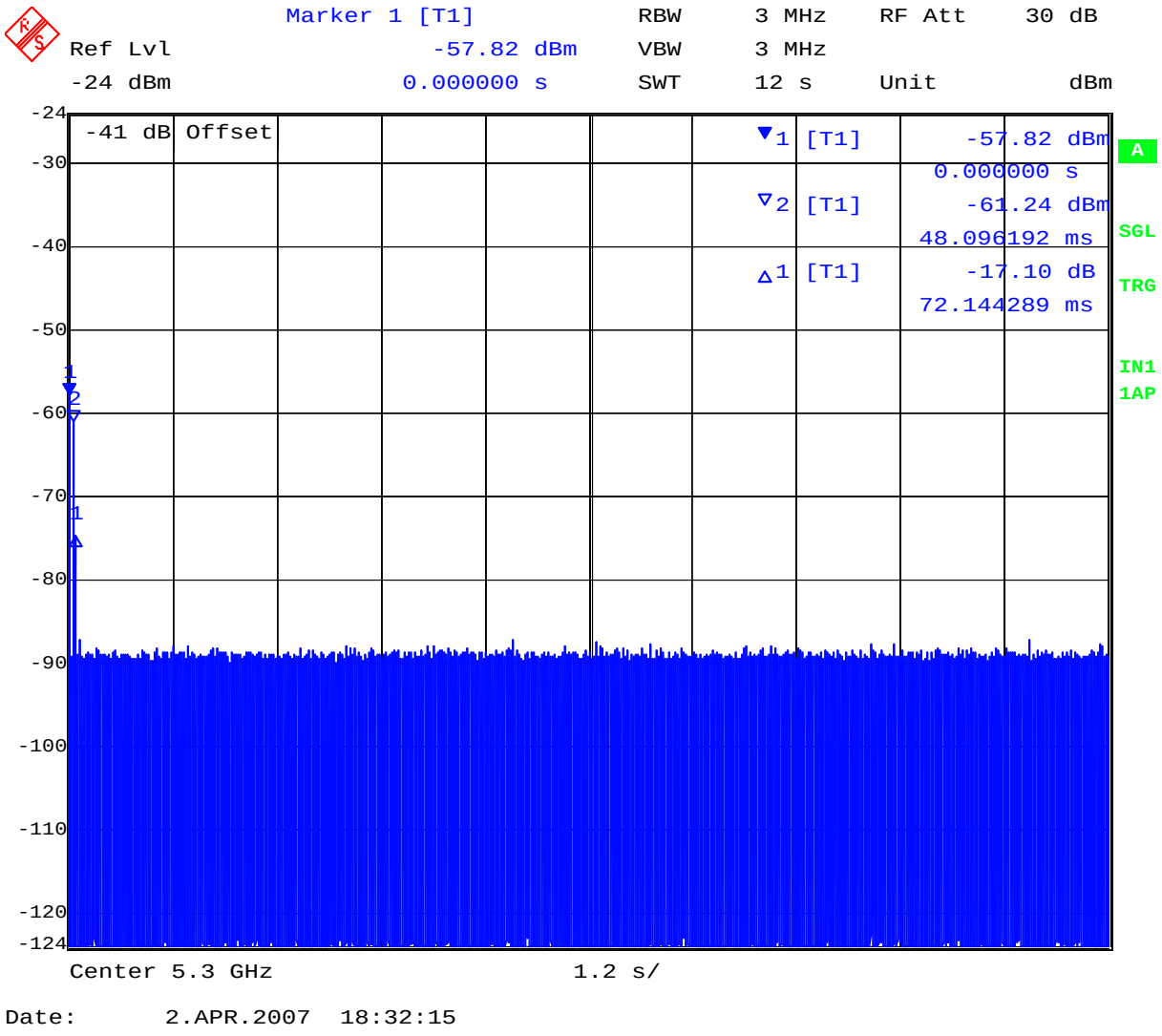
Channel Move Time, Channel closing Transmission Time for Type 6 Radar



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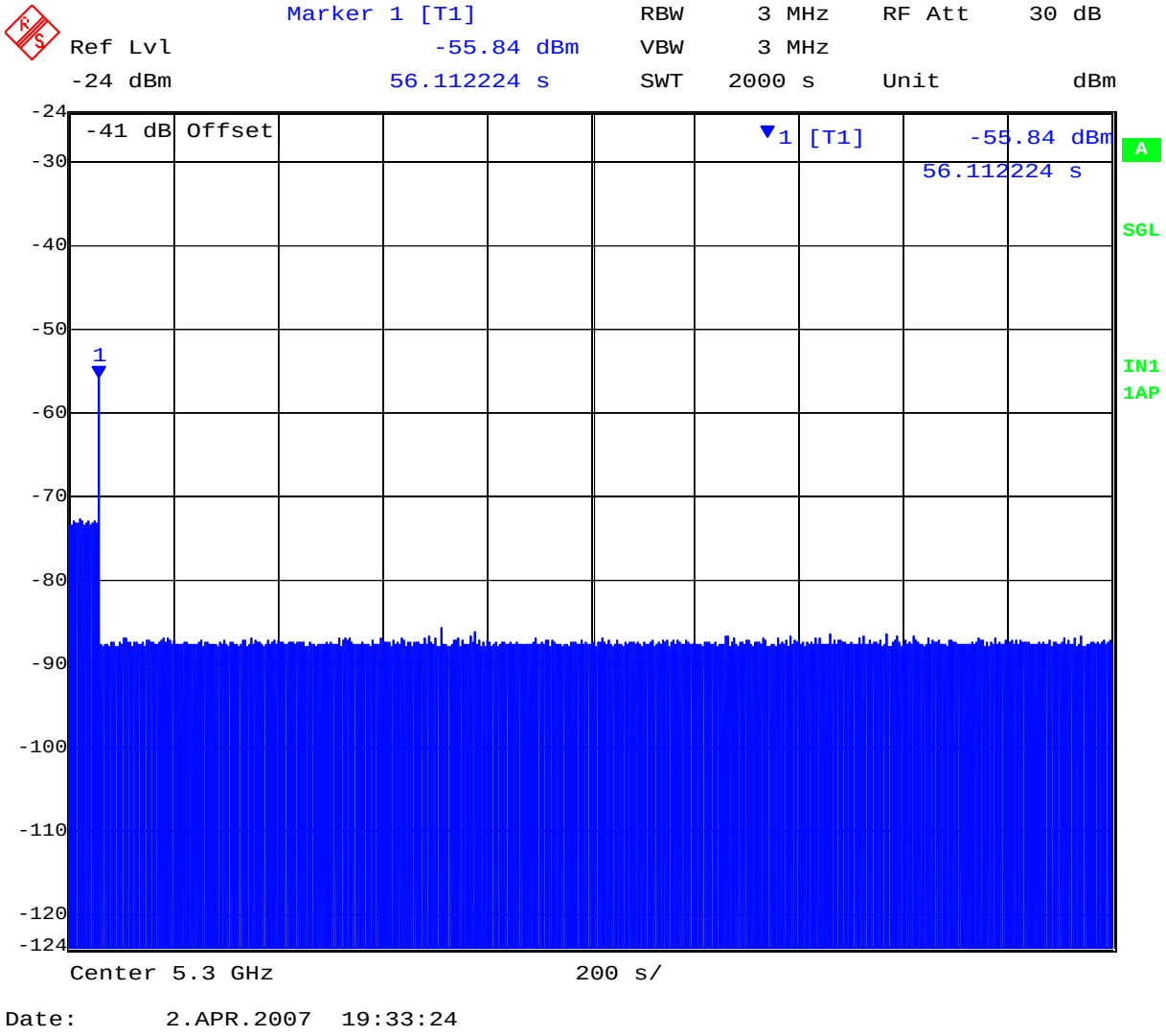
30 Minute Non-Occupancy Period

The EUT is monitored for more than 30 minutes following the channel close/move time to verify no transmissions resume on this Channel.

30 Minute Non-Occupancy Period Type 1 Radar
Ch 5300 MHz



5.1.13. Statistical Performance Check

The steps below define the procedure to determine the minimum percentage of detection when a radar burst with a level equal to the DFS Detection Threshold is generated on the Operating Channel of the U-NII device.

A U-NII device operating as a Client Device will associate with the UUT (Master) at 5300 MHz. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test.

The Radar Waveform generator sends the individual waveform for each of the radar types 1-6. Statistical data will be gathered to determine the ability of the device to detect the radar test waveforms. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs. The percentage of successful detection is calculated by:

Total # of detections ÷ Total # of Trials × 100 = Probability of Detection

The Minimum number of trails, minimum percentage of successful detection and the average minimum percentage of successful detection are found in the Radar Test Waveforms section.

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Radar Type 2 - Verification of Detection

Trail #	Detection = 1, No Detection = 0			
	Type 1	Type 2	Type 3	Type 4
1	1	1	1	0
2	1	1	1	1
3	1	0	1	1
4	1	1	1	1
5	0	1	1	1
6	1	1	0	1
7	1	0	1	0
8	1	1	1	1
9	1	1	1	1
10	1	1	1	1
11	1	1	1	1
12	1	1	1	1
13	1	1	1	1
14	1	1	1	1
15	1	1	1	1
16	0	1	1	1
17	1	1	1	1
18	1	1	1	1
19	1	1	1	1
20	1	1	1	0
21	1	1	0	1
22	1	1	1	1
23	1	1	0	1
24	1	1	1	0
25	1	1	1	1
26	1	1	0	1
27	1	1	1	1
28	1	1	1	1
29	1	1	1	1
30	1	1	1	1
Detection Percentage	93% (>60%)	93% (>60%)	87% (>60%)	87% (>60%)

In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is required and calculated as follows;

$P_d1 + P_d2 + P_d3 + P_d4$ = (93% + 93% + 87% + 87%) = 90% (> 80%)

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Radar Type 5 - Verification of Detection

Trail #	Detection = 1 No Detection = 0
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
23	1
24	1
25	1
26	0
27	1
28	1
29	1
30	1
Detection Percentage	97% (>60%)

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Radar Type 6 - Verification of Detection

Trail #	Detection = 1 No Detection = 0
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	0
9	1
10	0
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	0
19	1
20	1
21	1
22	1
23	1
24	1
25	0
26	1
27	0
28	1
29	1
30	1
Detection Percentage	83% (>60%)

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Measurement Uncertainty Time/Power

Measurement uncertainty	
- Time	4%
- Power	1.33dB

Traceability

Test Equipment Used
0072, 0083, 0098, 0116, 0132, 0158, 0313, 0314, 0193, 0223, 0252, 0253, 0251, 0256, 0328, 0329

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6. PHOTOGRAPHS

6.1. Dynamic Frequency Selection Test Set-Up

General DFS Test Setup

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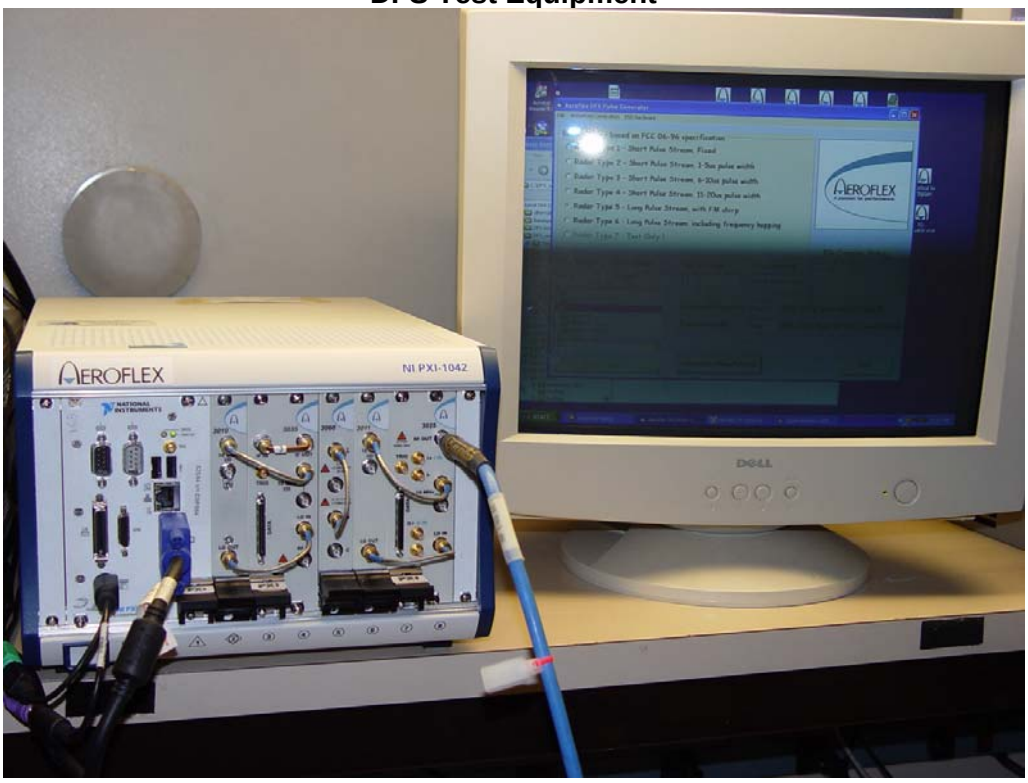
DFS Test Equipment



DFS Test Equipment

Assembly Top View

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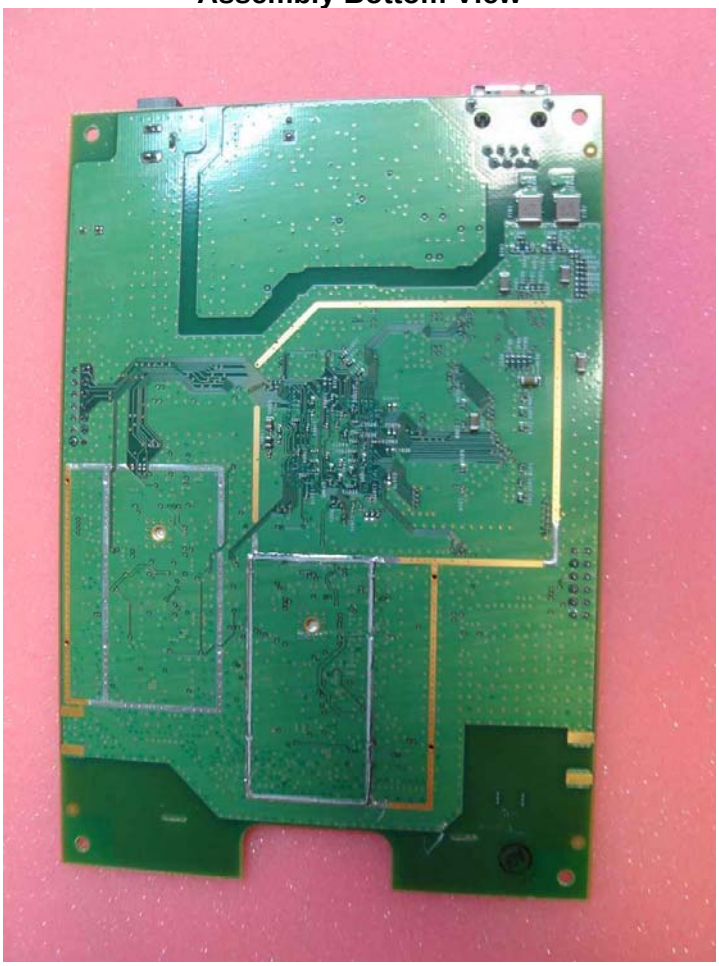
Assembly Bottom View



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7. TEST EQUIPMENT DETAILS

Asset #	Instrument	Manufacturer	Part #	Serial #
0134	Amplifier	Com Power	PA 122	181910
0158	Barometer /Thermometer	Control Co.	4196	E2846
0193	EMI Receiver	Rhode & Schwartz	ESI 7	838496/007
0252	SMA Cable	Megaphase	Sucoflex 104	None
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181-3G0300	209092-001
0313	Coupler	Hewlett Packard	86205A	3140A01285
0314	30dB N-Type Attenuator	ARRA	N9444-30	1623
0070	Power Meter	Hewlett Packard	437B	3125U11552
0116	Power Sensor	Hewlett Packard	8485A	3318A19694
0117	Power Sensor	Hewlett Packard	8487D	3318A00371
	Radar Signal Generator	Aeroflex	3025, 3010, 3010/11 Opt 1	
	Analyzer	Aeroflex	3035, 3011, 3010/11 Opt 1	
	PXI Chassis	Aeroflex	82536	
	Coupler	Mini-Circuits		
	30dB N-Type Attenuator			
	10dB N-Type Attenuator			
	10dB N-Type Attenuator			

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