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Job Number:	1001332966
Project Number:	11CA02898 Rev.1
File Number:	MC3181
Date:	February 4, 2011
Model:	1D7359-2

Electromagnetic Compatibility Test Report

For

Chamberlain Group Inc.

Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc.** **333 Pfingsten Rd.** **Northbrook, IL 60062**
Tests Performed For:	**Chamberlain Group Inc.** **845 Larch Av** **Elmhurst, IL 60126**
Applicant Contact: Phone: E-mail:	**Hank Sieradzki** **(630) 993-6564** **Hank.Sieradzki@chamberlaingroup.com**
Test Report Date:	**February 4, 2011**
Product Type:	**Periodic Transmitter**
Product standards	**FCC Part 15, Subpart C, 15.231 & RSS-210**
Model Number:	**1D7359-2**
EUT Category:	**Periodic Low Power 3 channel Transmitter**
Testing Start Date:	**January 4, 2011**
Date Testing Complete:	**January 10, 2011**
Overall Results:	**Compliant**

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

Report Directory

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
March 3, 2011	Rev.1 - Corrected model number	BM	MF

1.0 G E N E R A L - Product Description

1.1 Equipment Description

The equipment under test (EUT) is a 3 channel GDO transmitter operating at 310MHz, 315MHz, and 390MHz sequentially.

1.2 Device Configuration During Test

1.2.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Periodic Transmitter	Chamberlain Group Inc.	1D7359-2	None

Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test)

1.2.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

1.2.3 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	6.0	-	-	DC	-	Battery Operated

1.3 EUT Configurations

Mode #	Description
1	EUT with fresh batteries set to transmit.

1.4 EUT Operation Modes

Mode #	Description
1	EUT transmitting sequentially on three channels.

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Standard Number	Standard Name	Standard Date
FCC Part 15, Subpart C, 15.231	Code of Federal Regulations, Part 15, Radio Frequency Devices	2010
RSS-210	License - exempt Radio Apparatus (All Frequency Bands): Category I Equipment	Issue 8

2.4 Results Summary

This product is considered Class B

Requirement – Test	Result (Compliant / Non-Compliant)*
Occupied Bandwidth	Compliant
Cease Operation	Compliant
Pulse Train and Duty Cycle	Compliant
Spurious Radiated Emissions	Compliant

Test Engineer:

Bartlomiej Mucha (Ext.41216)
Staff Engineer
International EMC Services
Conformity Assessment Services-

Reviewer:

Michael Ferrer(Ext.41312)
Senior Project Engineer
International EMC Services
Conformity Assessment Services

Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

---------- United States ----------

Code of Federal Regulations Title 47	Part 15, Subpart C, Radio Frequency Devices

---------- Canada ----------

Radio Standards specifications	RSS-210 — Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150

Sample Calculations

Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)
Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)
Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

4.1 Test Conditions and Results – Occupied Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	47 CFR Part 15.231(c)
Occupied Bandwidth Limits	
0.25% of Center Frequency	

Table 1 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 2 Occupied Bandwidth Spectrum Analyzer Settings

Resolution Bandwidth	Occupied Bandwidth Requirements	
	dBc	%
10kHz	-20	99
Supplementary information: None		

Table 3 Occupied Bandwidth Test Result Summary

Center Frequency	20dB BW Measured (kHz)	99% BW Measured (kHz)
310MHz	61.25	97.500
315MHz	58.75	105.00
390MHz	65.00	108.75

Table 4 Occupied Bandwidth Test Equipment

Test Equipment Used				
Description	Manufacturer	Model	Identifier	Cal Due Date
Spectrum Analyzer	Agilent	E7405	EMC4242	Jan 2012
*Loop Antenna	-	-	-	

* Generic Loop antenna used. Measurement conducted is relative and value of measurement will not change between different antennas. Calibration is not required.

Figure 1 – 20dB Bandwidth Graph for 310MHz

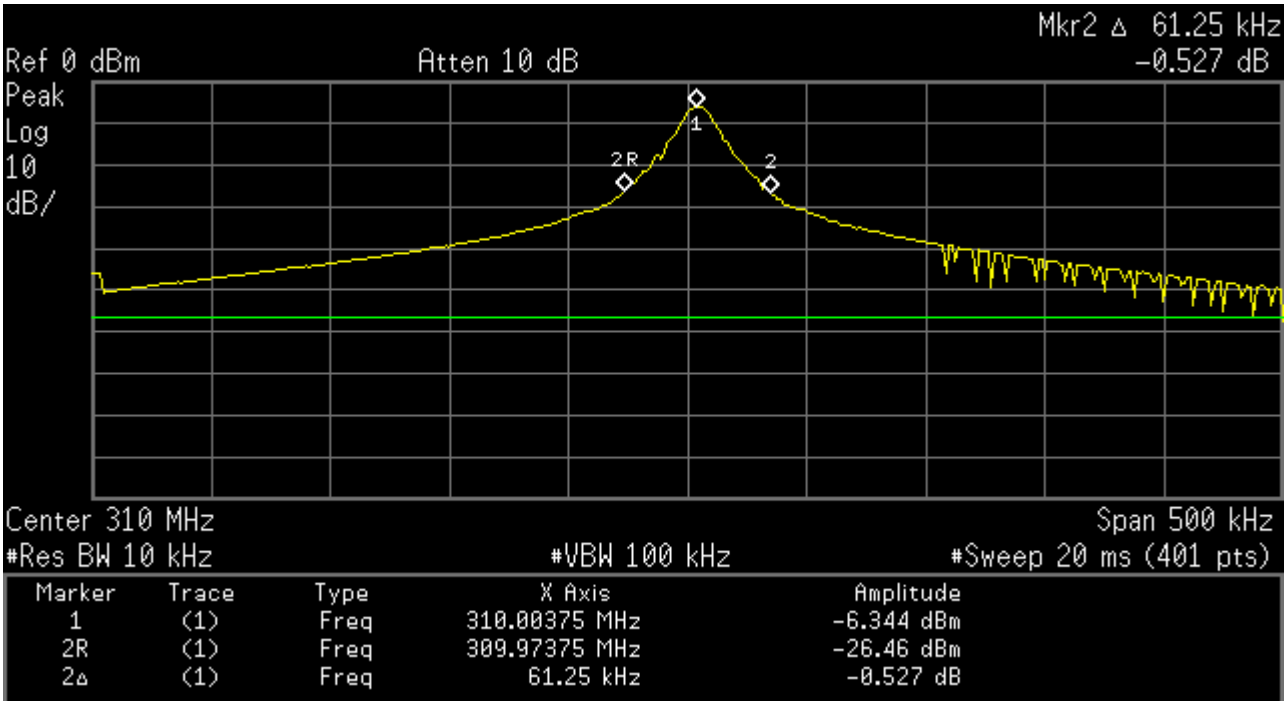


Figure 2 – 20dB Bandwidth Graph for 315MHz

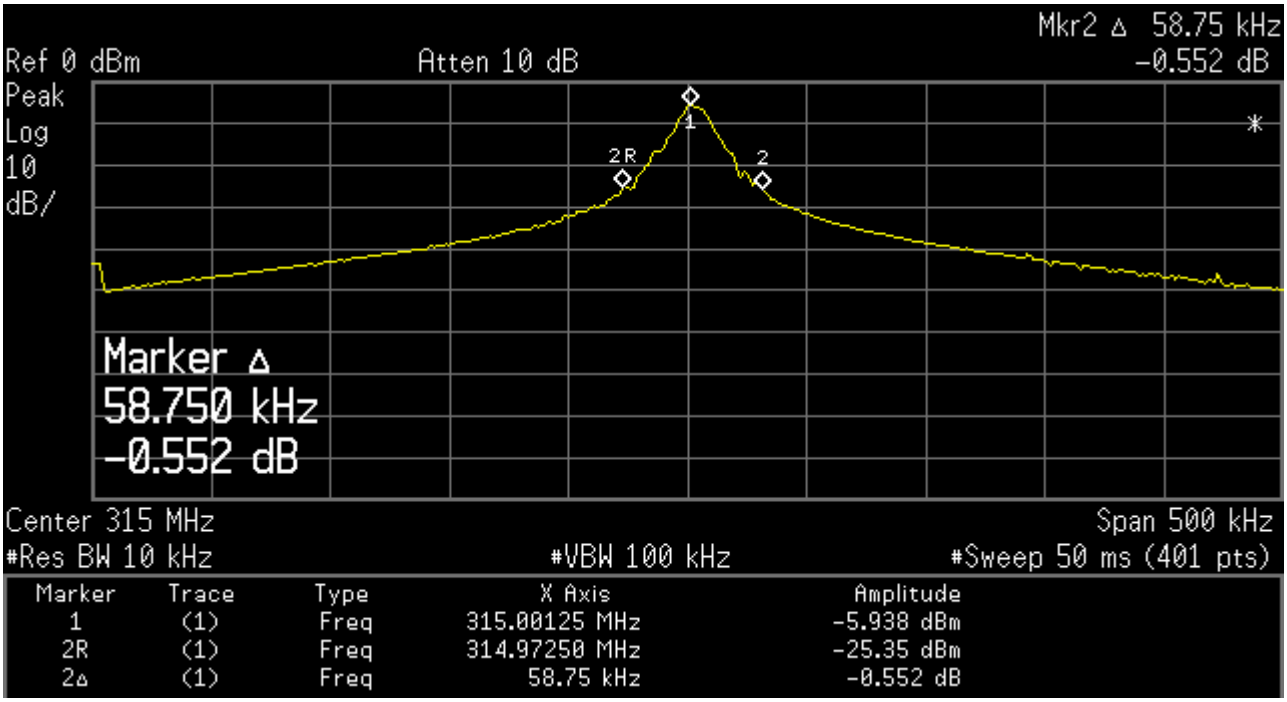


Figure 3 – 20dB Bandwidth Graph for 390MHz

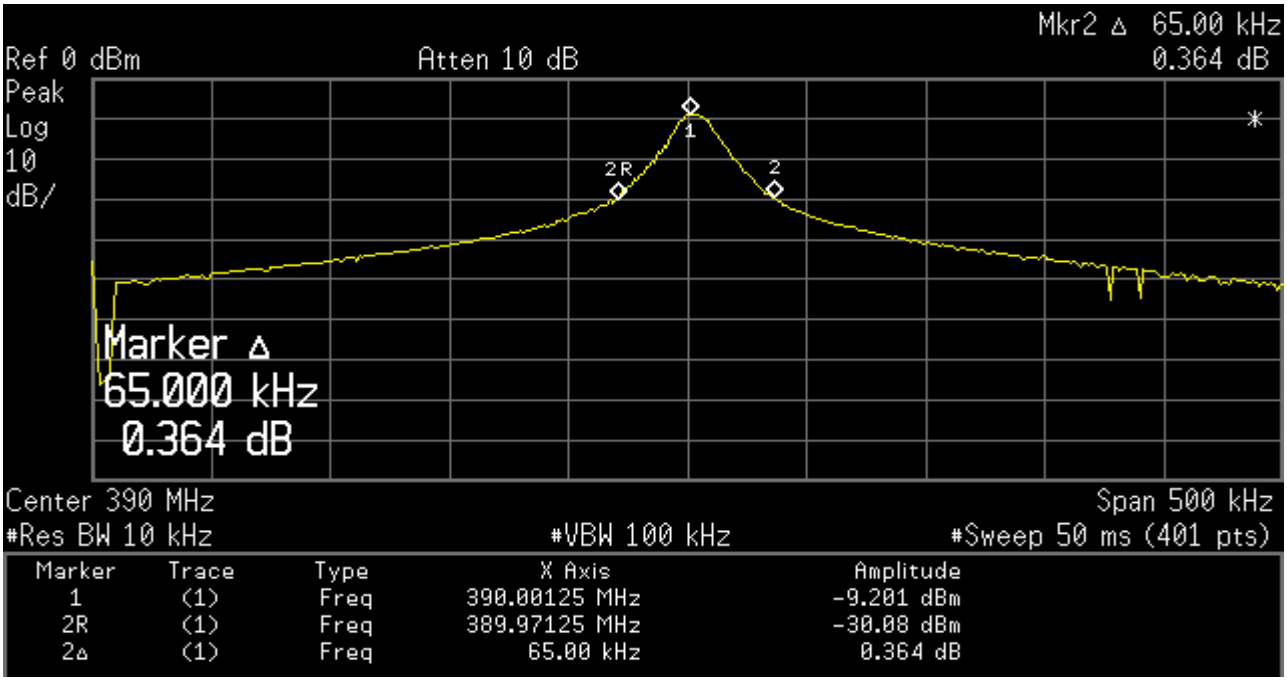


Figure 4 – 99% Bandwidth Graph for 310MHz

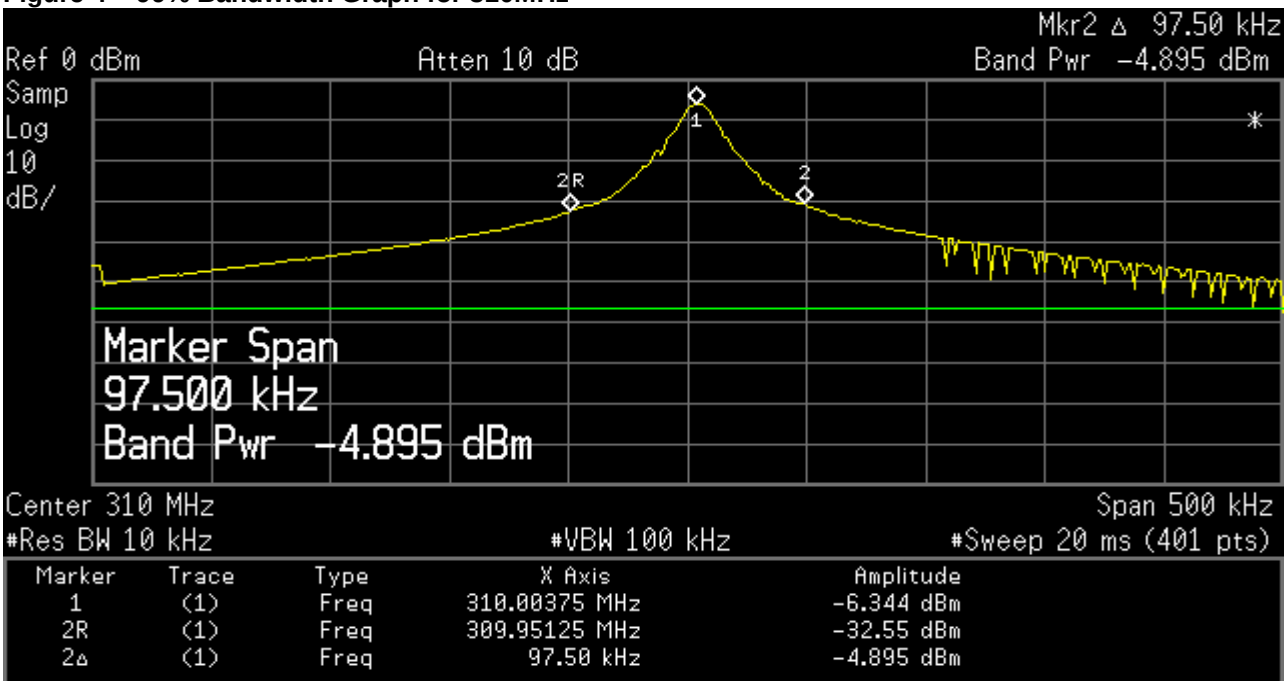


Figure 5 – 99% Bandwidth Graph for 315MHz

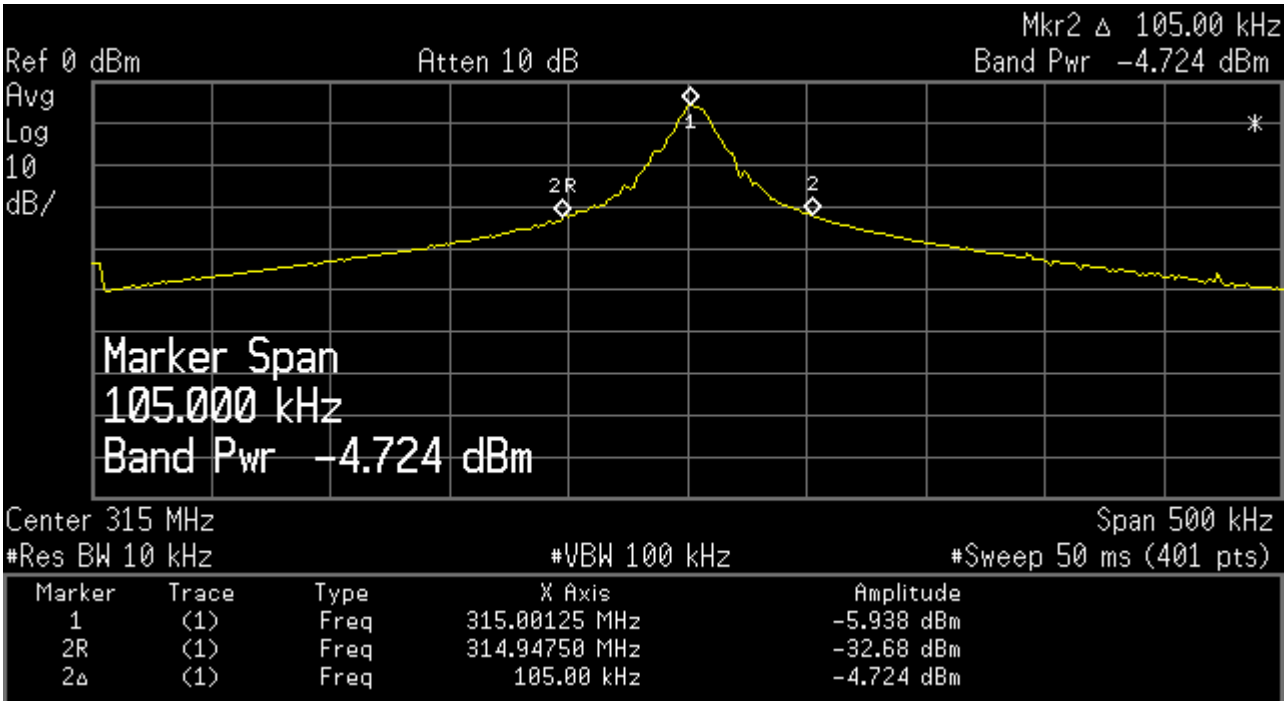
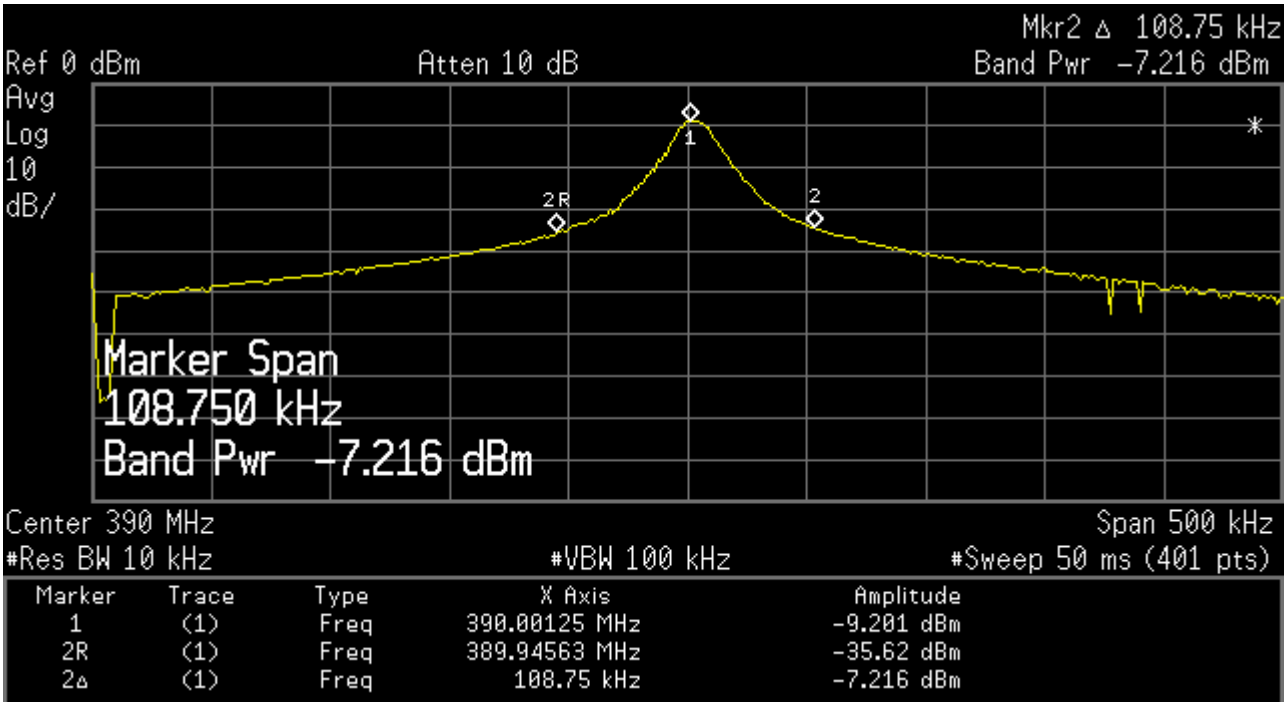


Figure 6 – 99% Bandwidth Graph for 390MHz



4.2 Test Conditions and Results – Cease Operation

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	
Cease Operation Limits	
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.	

Table 5 Cease Operation Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 6 Cease Operation Test Equipment

Test Equipment Used				
Description	Manufacturer	Model	Identifier	Cal Due Date
Spectrum Analyzer	Rohde & Schwarz	ESCI	EMC4328	Dec 2011
*Loop Antenna	-	-	-	

* Generic Loop antenna used. Measurement conducted is relative and value of measurement will not change between different antennas. Calibration is not required.

Figure 7 Cease Operation Graph for 310MHz

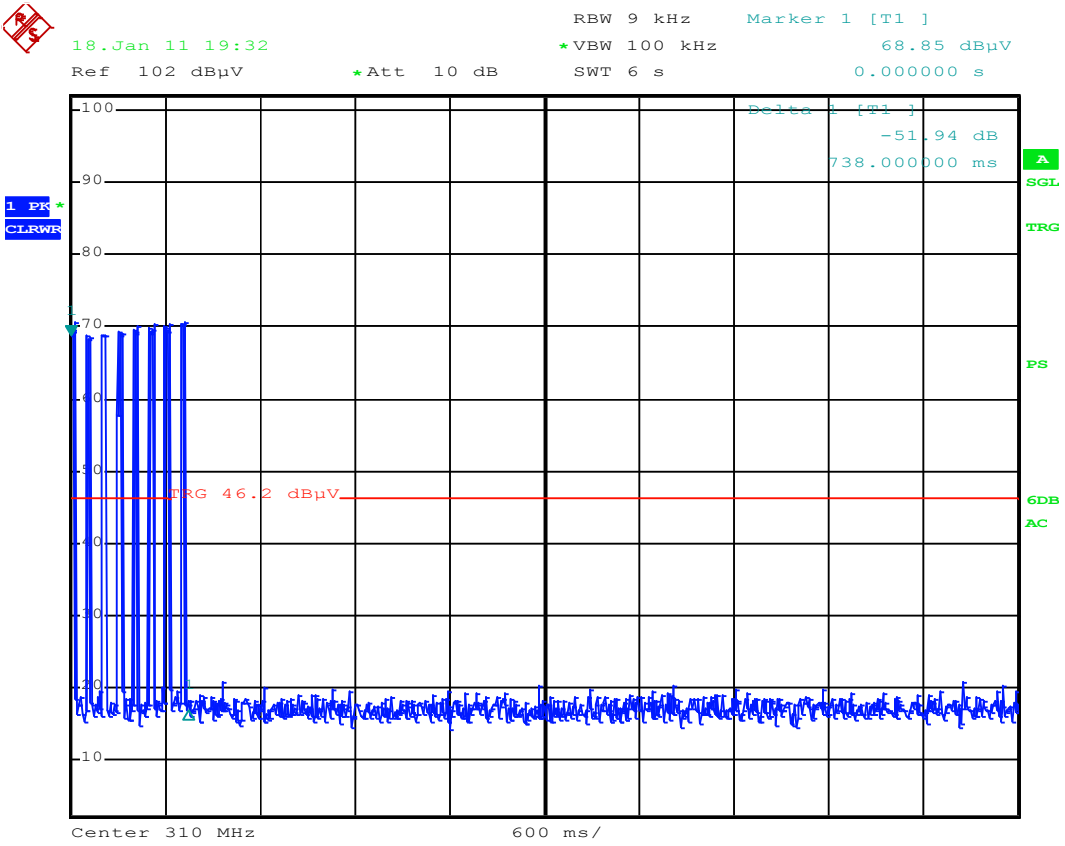


Figure 8 Cease Operation Graph for 315MHz

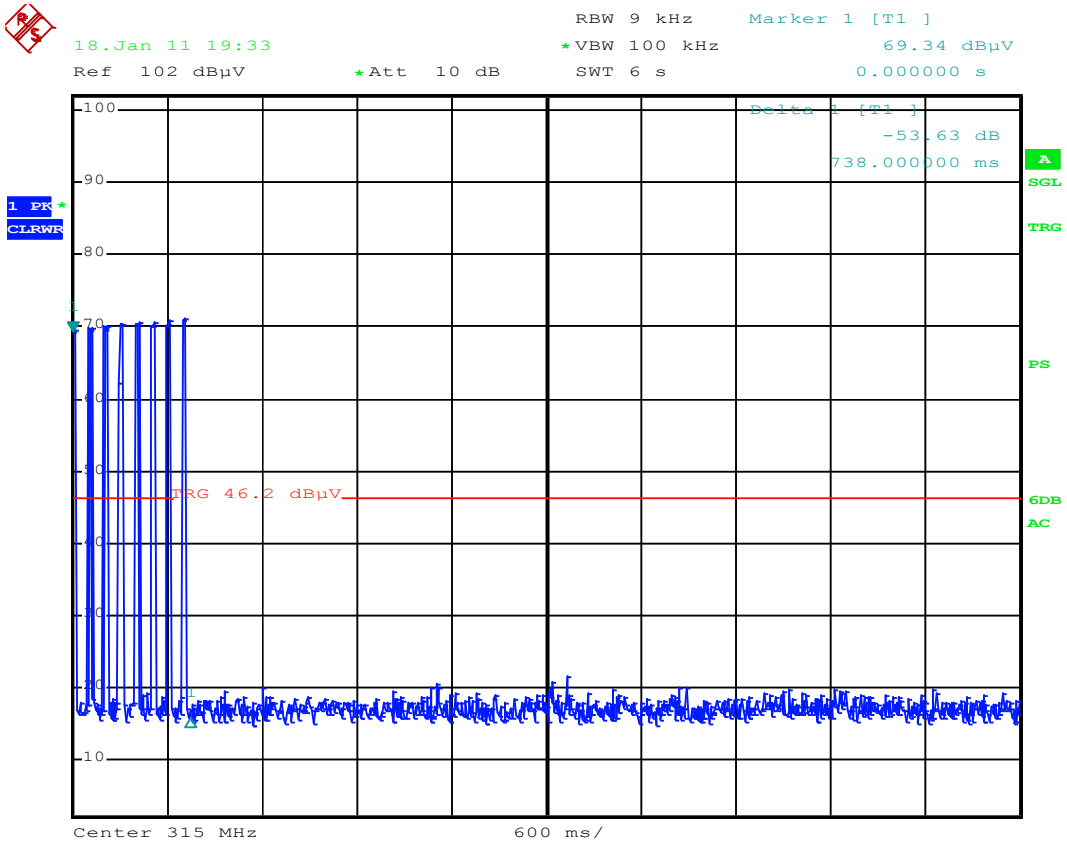
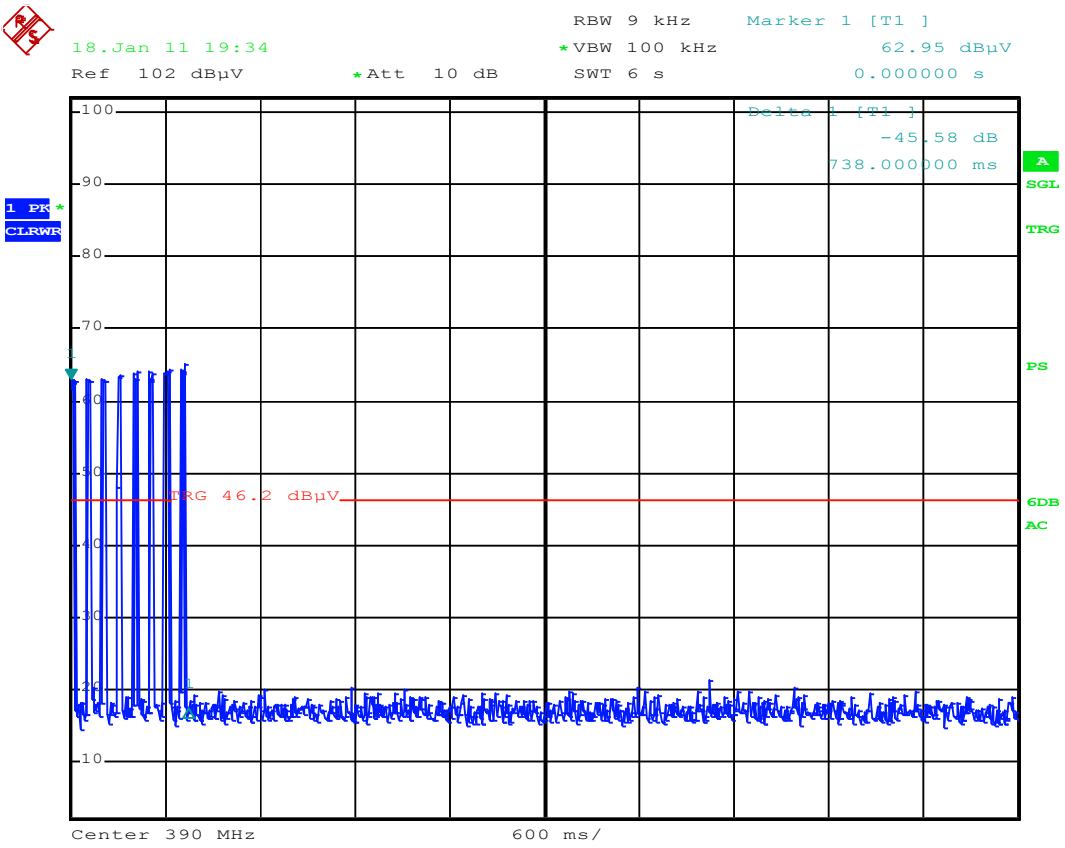


Figure 9 Cease Operation Graph for 390MHz



4.3 Test Conditions and Results – Pulse Train

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	FCC Part 15 Subpart A, 15.35
Pulse Train Limits	
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.	

Table 7 Pulse Train Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 8 Pulse Train Calculation

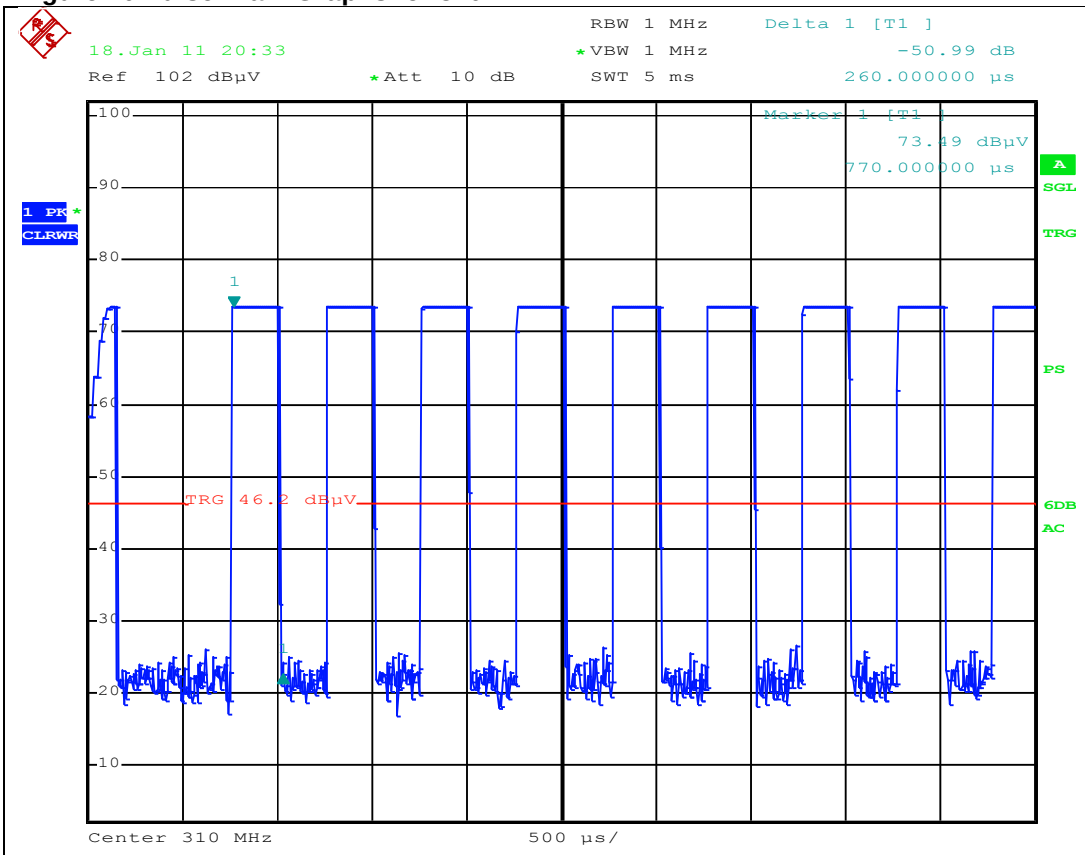
TX Frequency	Short Pulse duration (mS)	Number of short pulses	Long Pulse duration (mS)	Number of long pulses	Total Transmission time or 100ms whichever is lesser	DC Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$
310MHz	0.260	45	0.515	8	100mS	-16.02
315MHz	0.260	51	0.510	6	100mS	-15.76
390MHz	0.260	39	0.505	12	100mS	-15.78
Notes: none						

Table 9 Pulse Train Test Equipment

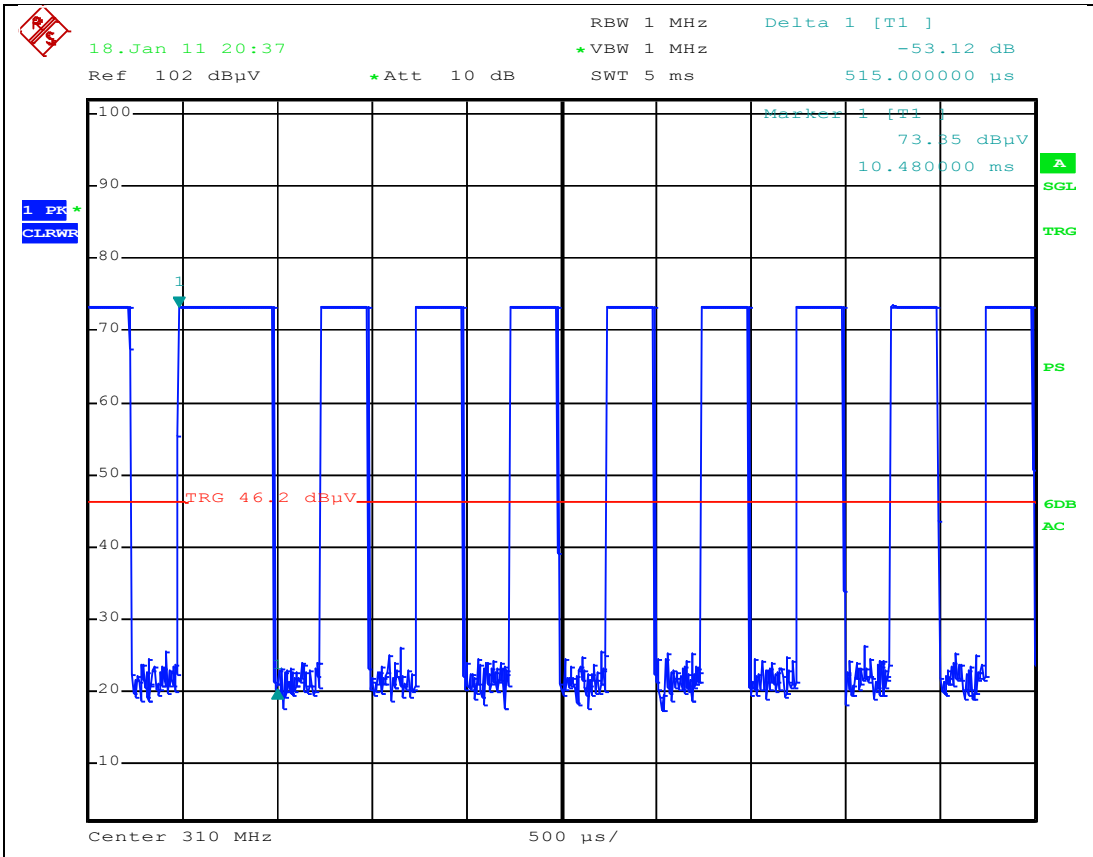
Test Equipment Used				
Description	Manufacturer	Model	Identifier	Cal Due Date
Spectrum Analyzer	Rohde & Schwarz	ESCI	EMC4328	Dec 2011
*Loop Antenna	-	-		

* Generic Loop antenna used. Measurement conducted is relative and value of measurement will not change between different antennas. Calibration is not required.

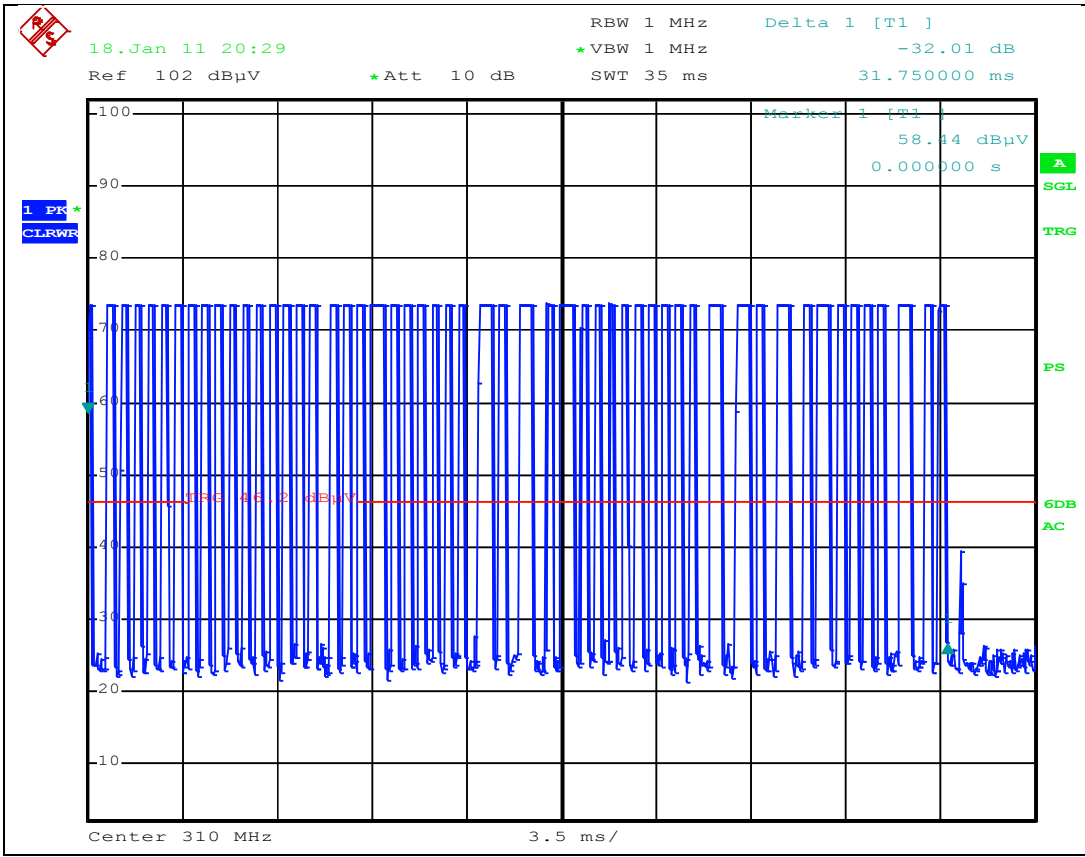
Figure 10 Pulse Train Graphs for 310MHz



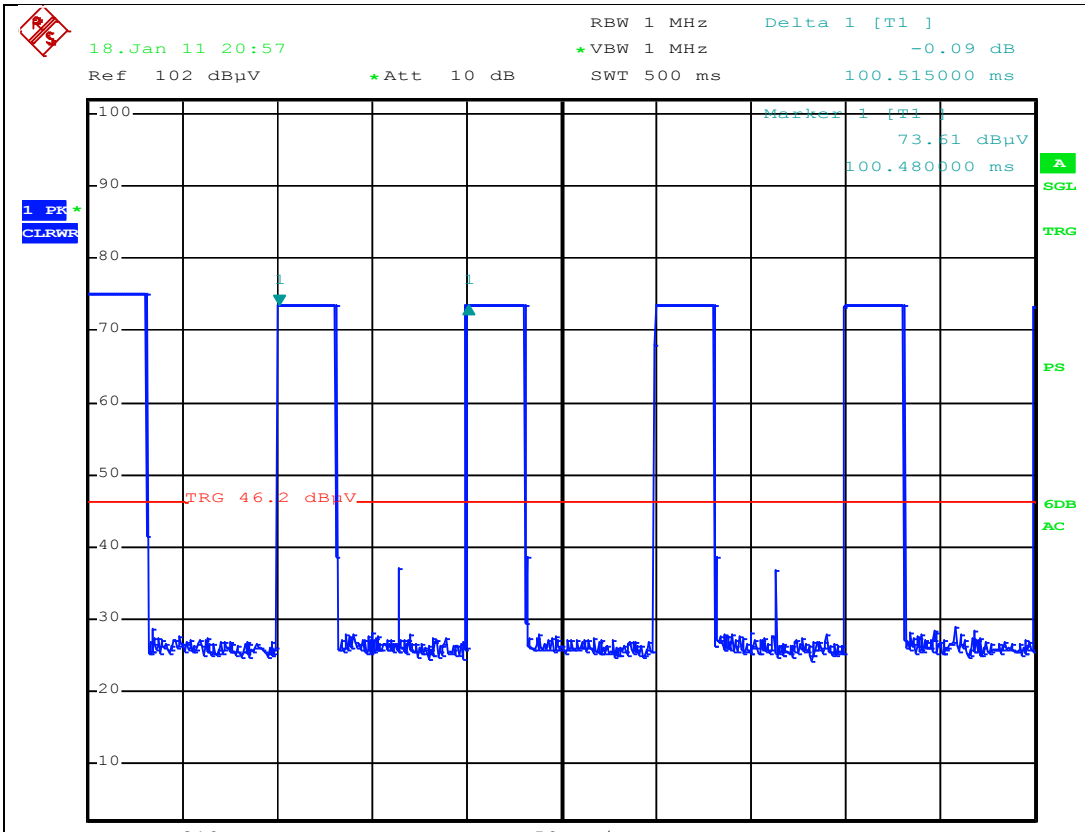
Short Pulse Duration



Long Pulse Duration

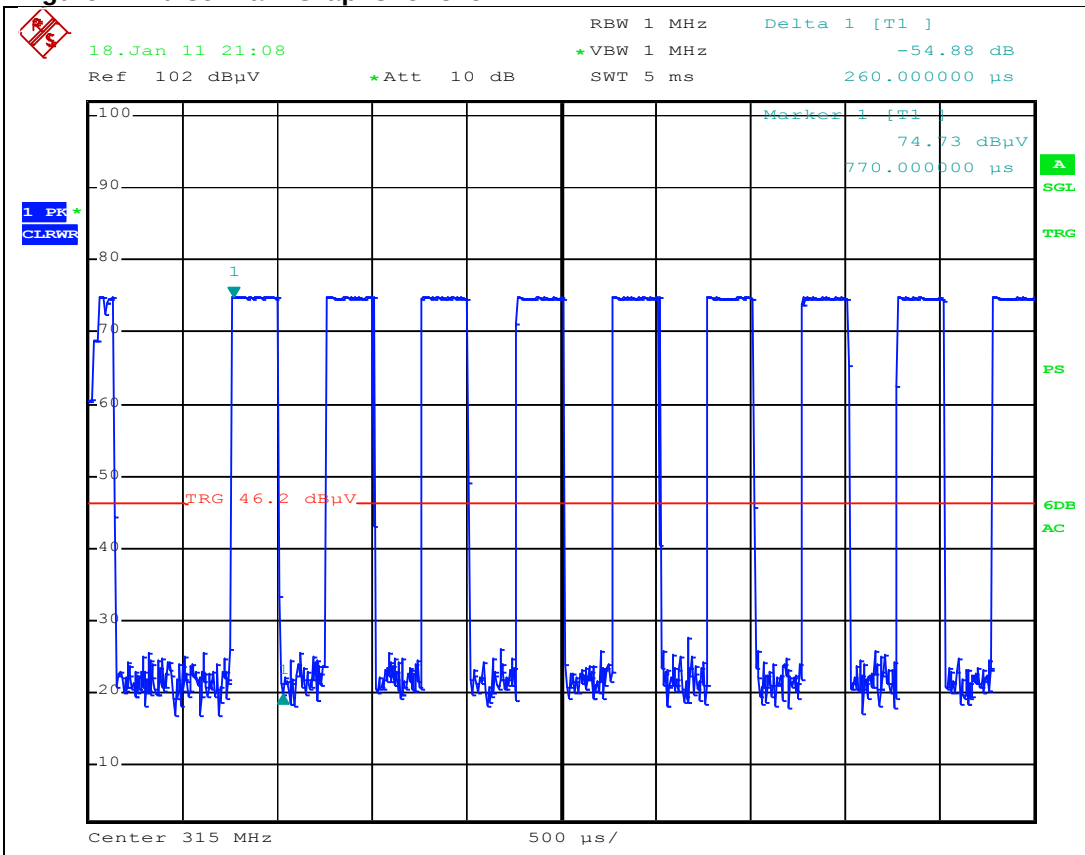

RBW 1 MHz
Delta 1 [T1]
18.Jan 11 20:29
*VBW 1 MHz
-32.01 dB
Ref 102 dBµV
*Att 10 dB
SWT 35 ms
31.750000 ms
Marker 1 [T1]
58.44 dBµV
0.000000 s
1 PK
CLRWR
A
SGL
TRG
PS
6DB
AC
100
90
80
70
60
50
40
30
20
10
Center 310 MHz
3.5 ms/

Pulse Train

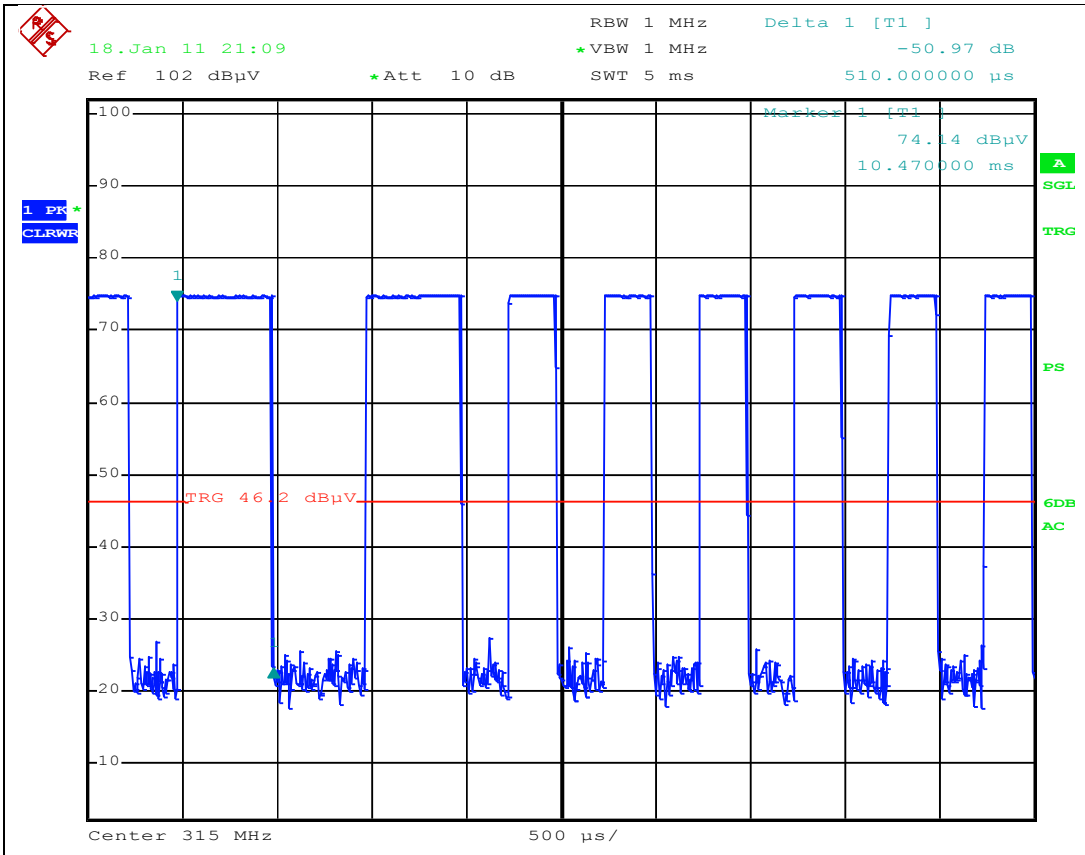


Burst Period

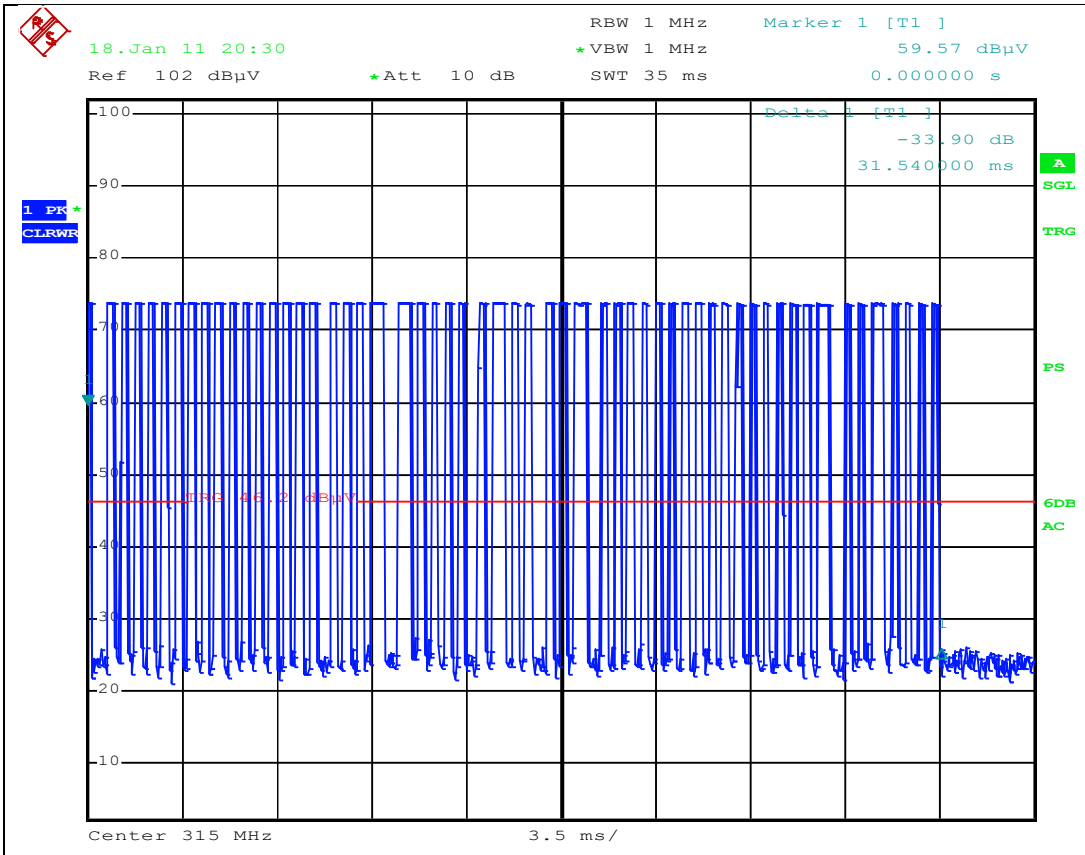
Figure 11 Pulse Train Graphs for 315MHz



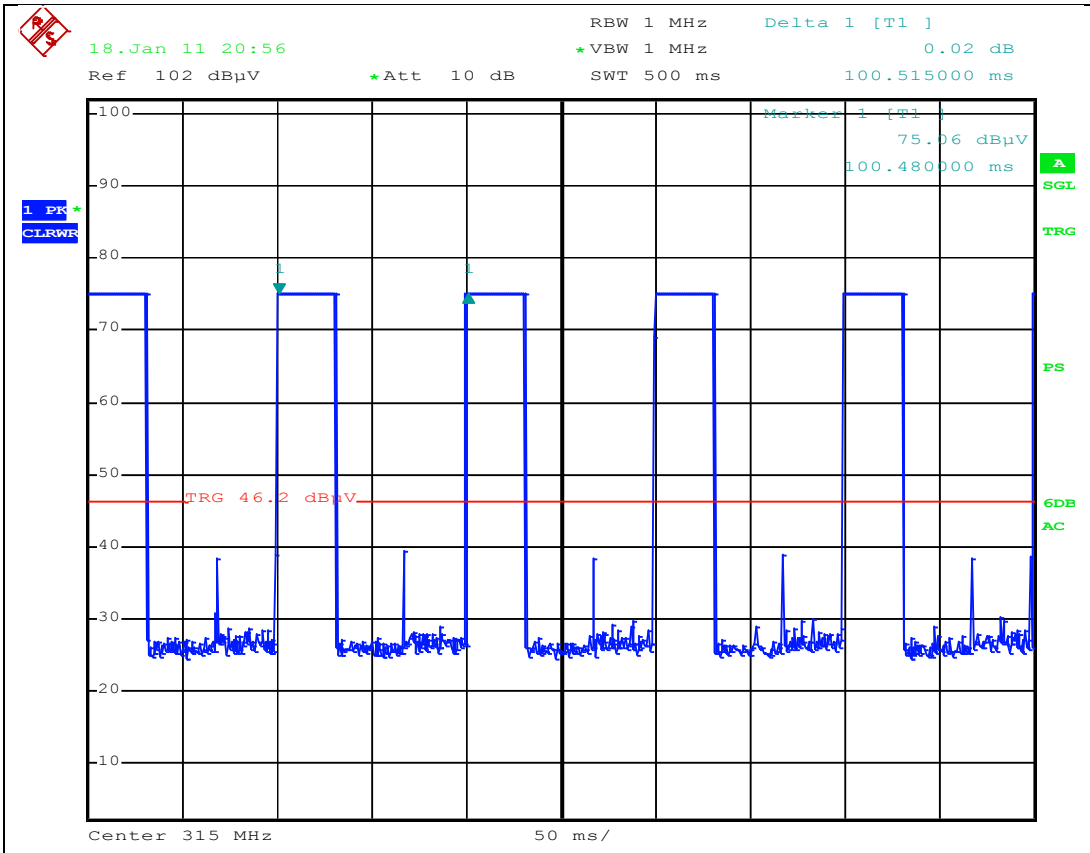
Short Pulse Duration



Long Pulse Duration

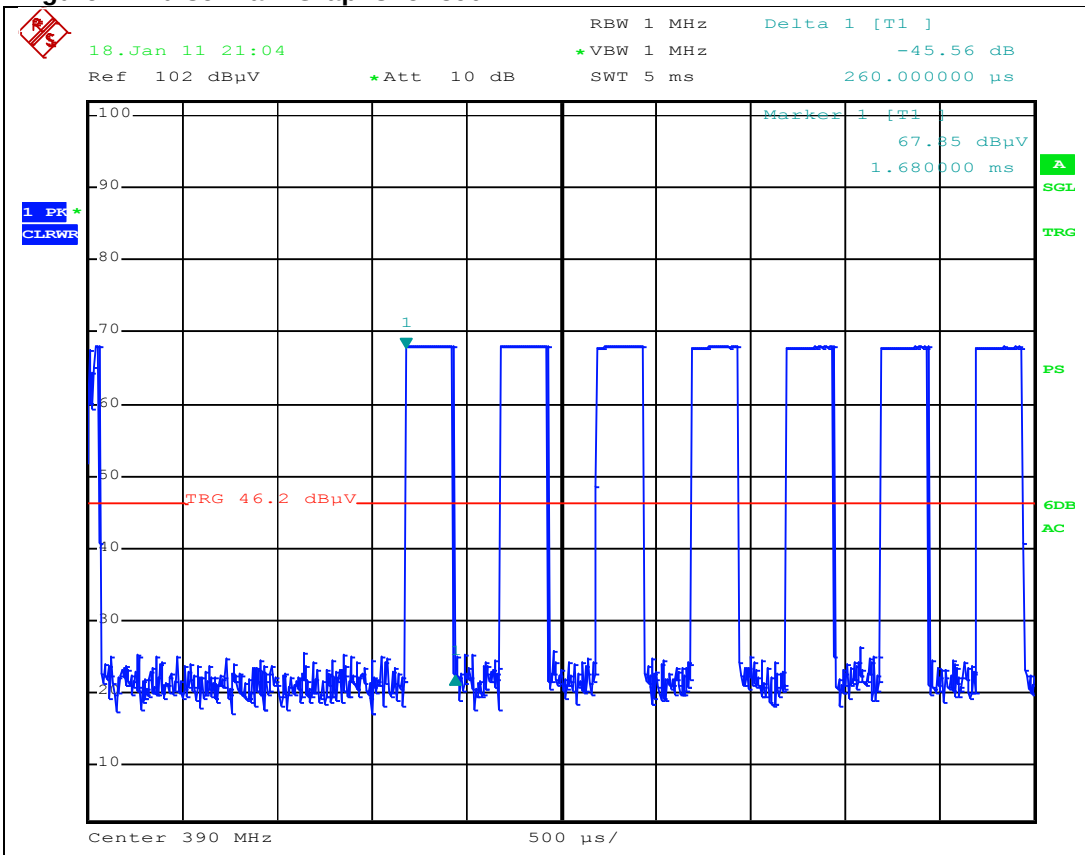

RBW 1 MHz
Marker 1 [T1]
18.Jan 11 20:30
*VBW 1 MHz
59.57 dBµV
Ref 102 dBµV
*Att 10 dB
SWT 35 ms
0.000000 s
Delta 1 [T1]
-33.90 dB
31.540000 ms
A
SGL
TRG
PS
6DB
AC
1 PK
CLRWR
100
90
80
70
60
50
40
30
20
10
dBµV
Center 315 MHz
3.5 ms/

Pulse Train

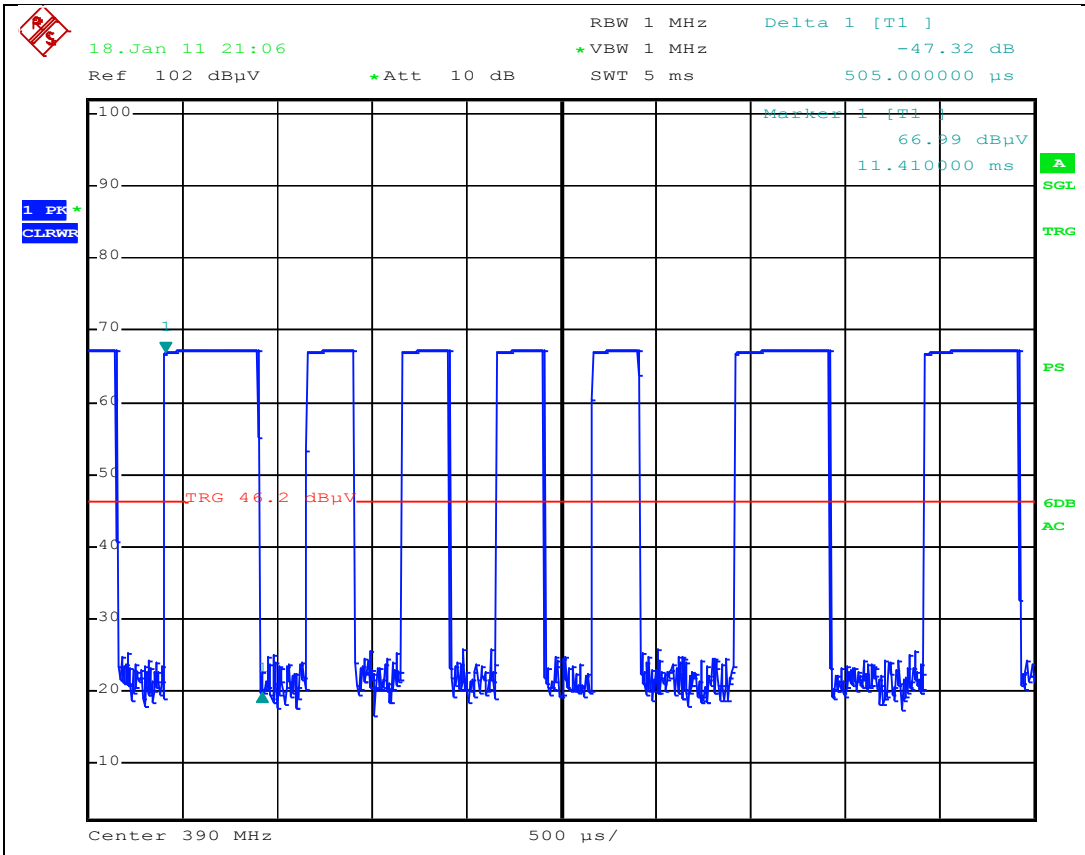


Burst Period

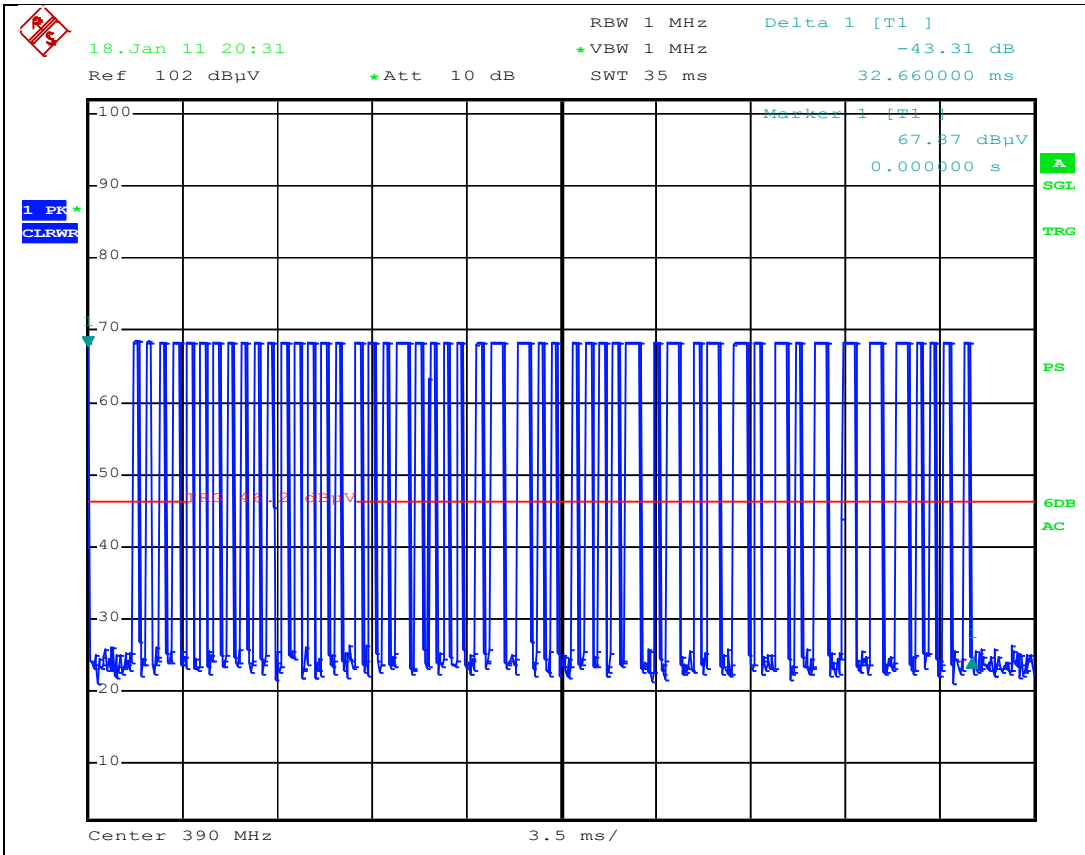
Figure 12 Pulse Train Graphs for 390MHz



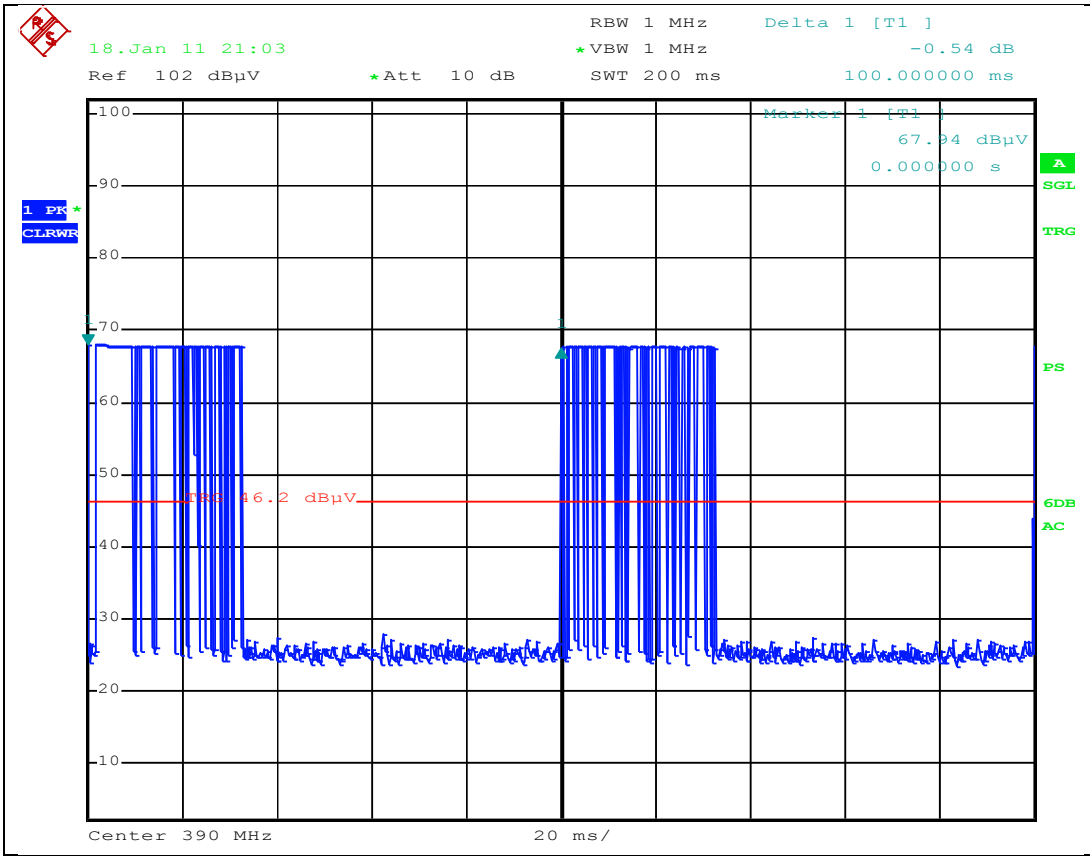
Short Pulse Duration



Long Pulse Duration


RBW 1 MHz
Delta 1 [T1]
18.Jan 11 20:31
*VBW 1 MHz
-43.31 dB
Ref 102 dBµV
*Att 10 dB
SWT 35 ms
32.660000 ms
Marker 1 [T1]
67.87 dBµV
0.000000 s
A
SGL
TRG
1 PK
CLRWR
PS
6DB
AC
100
90
80
70
60
50
40
30
20
10
Center 390 MHz
3.5 ms/

Pulse Train



Burst Period

4.4 Test Conditions and Results – RADIATED EMISSIONS Fundamental and Spurious

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.		
Basic Standard			
UL LPG		80-EM-S0029	
		Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range		30MHz – 1GHz	10 meter distance
		1GHz – 4GHz	3 meter distance

General and Restricted Band Limits

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
30 - 88	29.54	NA
88 - 216	33.04	NA
216 - 960	35.54	NA
960 - 1000	43.54	NA
Above 1000 (FCC)	NA	54 (at 3-meter)

Fundamental Frequency Limits

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
310	64.1	NA
315	64.4	NA
390	68.2	NA

Supplementary information: None

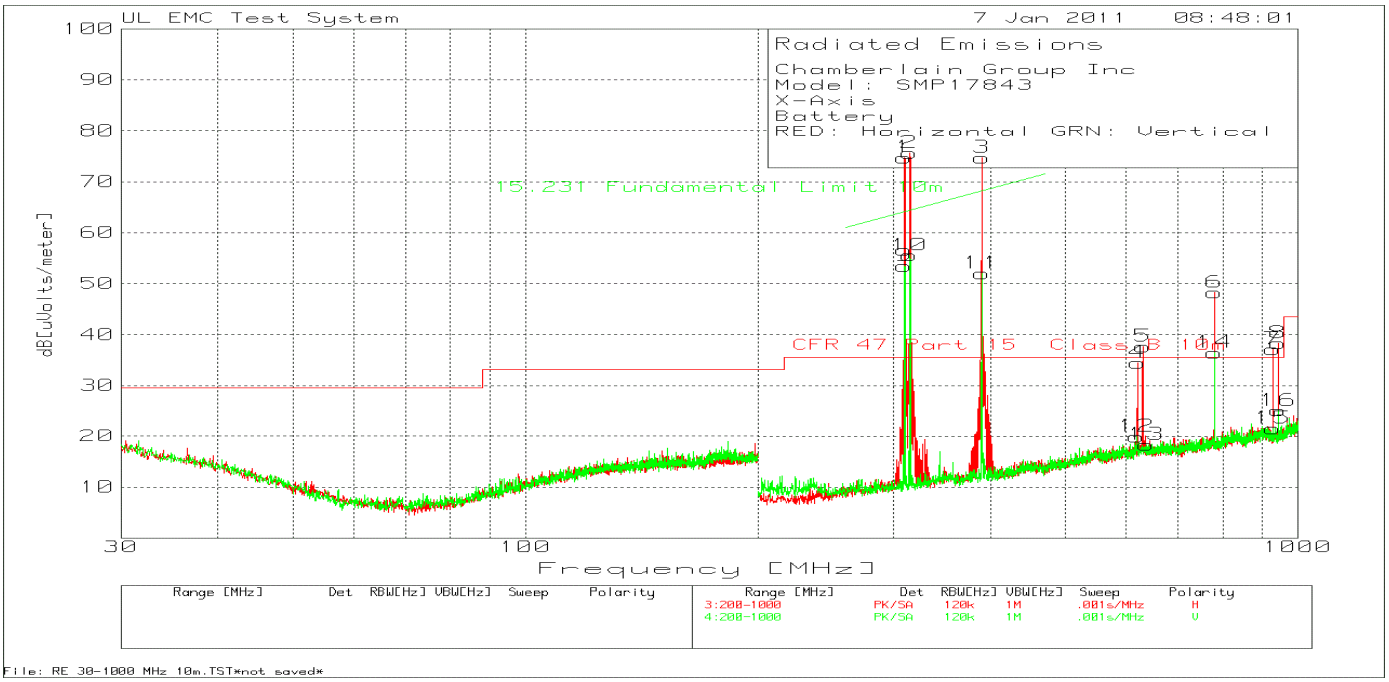
Table 10 Radiated Emissions EUT Configuration Settings

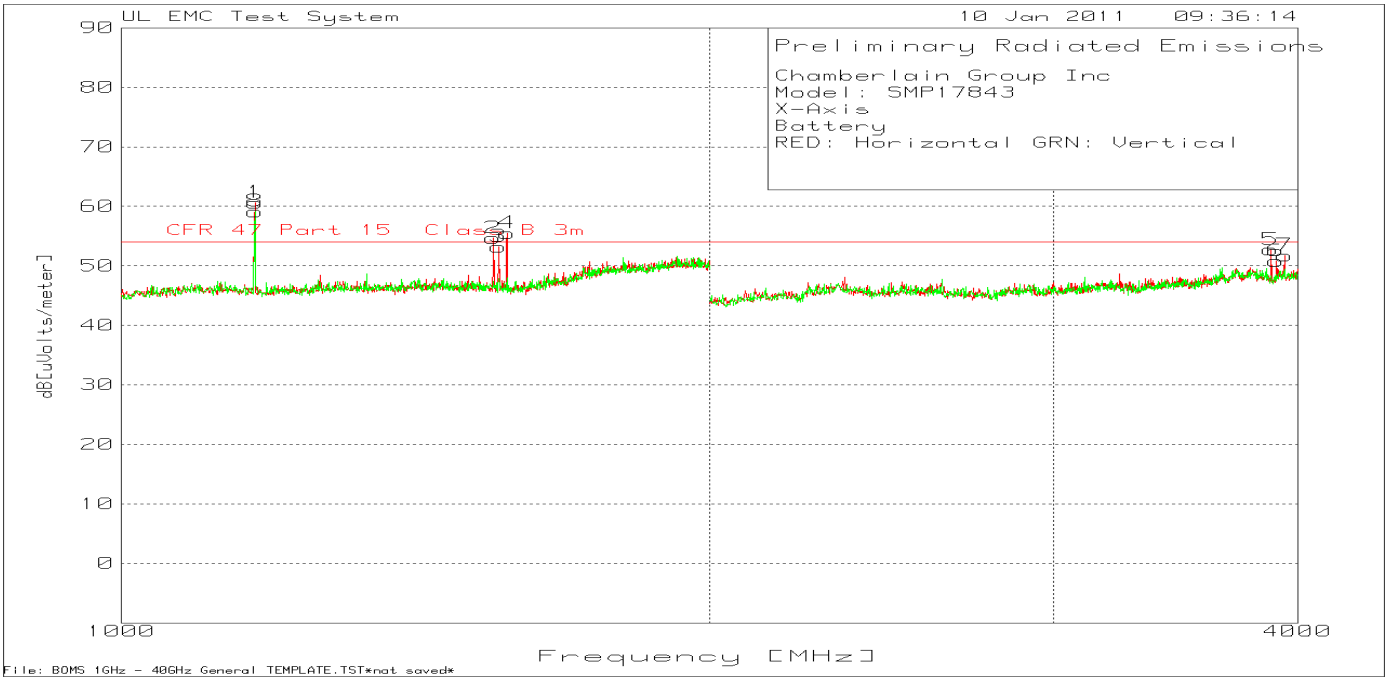
Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 11 Radiated Emissions Test Equipment

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	Jan 2010	Jan 2011
Bicon Antenna	Chase	VBA6106A	EMC4078	Jun 2010	Jun 2011
Log-P Antenna	Chase	UPA6109	EMC4313	Dec 2010	Dec 2011
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	Dec 2010	Dec 2011
Antenna Array	UL	BOMS	EMC4276	Aug 2010	Aug 2011

Figure 13 Radiated Emissions Graphs





* Above plots show data for X-Axis only. All measurements were conducted at three axis. See data below

Table 12 Radiated Emissions Data Points for 310MHz

	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBuV/m	Polarity	Limit dBu/v/m	Duty Cycle dB	Margin dB With Duty Cycle
X-Axis	310.0028	98.41	PK	-32.7	13.3	79.01	Horz	64.1	-16.02	-1.11
	310.0028	74.37	PK	-32.7	13.3	54.97	Vert	64.1	-16.02	-25.15
Y-Axis	310.0008	85.89	PK	-32.7	13.3	66.49	Horz	64.1	-16.02	-13.63
	310.0008	97.86	PK	-32.7	13.3	78.46	Vert	64.1	-16.02	-1.66
Z-Axis	310.0042	90.6	PK	-32.7	13.3	71.2	Horz	64.1	-16.02	-8.92
	310.0042	96.64	PK	-32.7	13.3	77.24	Vert	64.1	-16.02	-2.88
X-Axis	620.0058	56.18	PK	-31.3	20.4	45.28	Horz	44.1	-16.02	-14.84
	620.0058	40.2	PK	-31.3	20.4	29.3	Vert	44.1	-16.02	-30.82
Y-Axis	619.9985	55.7	PK	-31.3	20.4	44.8	Vert	44.1	-16.02	-15.32
	619.9985	45.83	PK	-31.3	20.4	34.93	Horz	44.1	-16.02	-25.19
Z-Axis	620.0001	54.01	PK	-31.3	20.4	43.11	Vert	44.1	-16.02	-17.01
	620.0001	44.93	PK	-31.3	20.4	34.03	Horz	44.1	-16.02	-26.09
X-Axis	930.0145	48.58	PK	-31.7	22.7	39.58	Horz	44.1	-16.02	-20.54
	930.0145	42.57	PK	-31.7	22.7	33.57	Vert	44.1	-16.02	-26.55
Y-Axis	929.9997	49.86	PK	-31.7	22.7	40.86	Vert	44.1	-16.02	-19.26
	929.9997	47.34	PK	-31.7	22.7	38.34	Horz	44.1	-16.02	-21.78
Z-Axis	930.0037	50.88	PK	-31.7	22.7	41.88	Vert	44.1	-16.02	-18.24
	930.0037	48.21	PK	-31.7	22.7	39.21	Horz	44.1	-16.02	-20.91
X-Axis	1550.551	26.27	pk	3.38	25	54.65	Horz	54	-16.02	-15.37
Y-Axis	1551.102	25.17	pk	3.39	25	53.56	Horz	54	-16.02	-16.46
	1551.102	22.86	pk	3.39	25	51.25	Vert	54	-16.02	-18.77
Z-Axis	1551.102	21.44	pk	3.39	25	49.83	Horz	54	-16.02	-20.19
	1551.102	26.08	pk	3.39	25	54.47	Vert	54	-16.02	-15.55

Table 13 Radiated Emissions Data Points for 315MHz

	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBuV/m	Polarity	Limit dBuV/m	Duty Cycle dB	Margin dB with Duty Cycle
X-Axis	315.0022	99.09	PK	-32.7	13.4	79.79	Horz	64.4	-15.76	-0.37
	315.0022	76.31	PK	-32.7	13.4	57.01	Vert	64.4	-15.76	-23.15
Y-Axis	315.004	86.88	PK	-32.7	13.4	67.58	Horz	64.4	-15.76	-12.58
	315.004	98.28	PK	-32.7	13.4	78.98	Vert	64.4	-15.76	-1.18
Z-Axis	315.0064	98.22	PK	-32.7	13.4	78.92	Vert	64.4	-15.76	-1.24
	315.0064	90.72	PK	-32.7	13.4	71.42	Horz	64.4	-15.76	-8.74
X-Axis	630.0072	57.48	PK	-31.1	20.4	46.78	Horz	44.4	-15.76	-13.38
	630.0072	40.32	PK	-31.1	20.4	29.62	Vert	44.4	-15.76	-30.54
Y-Axis	630.0067	57.02	PK	-31.1	20.4	46.32	Vert	44.4	-15.76	-13.84
	630.0067	44.82	PK	-31.1	20.4	34.12	Horz	44.4	-15.76	-26.04
Z-Axis	630.0033	56.25	PK	-31.1	20.4	45.55	Vert	44.4	-15.76	-14.61
	630.0033	45.58	PK	-31.1	20.4	34.88	Horz	44.4	-15.76	-25.28
X-Axis	945.0066	49.37	PK	-31.5	22.8	40.67	Horz	44.4	-15.76	-19.49
	945.0066	43.42	PK	-31.5	22.8	34.72	Vert	44.4	-15.76	-25.44
Y-Axis	945	48.15	PK	-31.5	22.8	39.45	Horz	44.4	-15.76	-20.71
	945	49.95	PK	-31.5	22.8	41.25	Vert	44.4	-15.76	-18.91
Z-Axis	945.001	49.93	PK	-31.5	22.8	41.23	Horz	44.4	-15.76	-18.93
	945.001	51.2	PK	-31.5	22.8	42.5	Vert	44.4	-15.76	-17.66
X-Axis	1575.576	27.21	pk	3.32	25	55.53	Horz	54	-15.76	-14.23
Y-Axis	1575.15	27.67	pk	3.33	25	56	Horz	54	-15.76	-13.76
	1575.15	23.69	pk	3.33	25	52.02	Vert	54	-15.76	-17.74
Z-Axis	1575.15	22.61	pk	3.33	25	50.94	Horz	54	-15.76	-18.82
	1575.15	27.16	pk	3.33	25	55.49	Vert	54	-15.76	-14.27

Table 14 Radiated Emissions Data Points for 390MHz

	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBuV/m	Polarity	Limit dBuV/m	Duty Cycle dB	Margin dB with Duty Cycle
X-Axis	389.9996	95.03	PK	-32.1	15.3	78.23	Horz	68.2	-15.78	-5.75
	389.9996	75.07	PK	-32.1	15.3	58.27	Vert	68.2	-15.78	-25.71
Y-Axis	389.9999	82.93	PK	-32.1	15.3	66.13	Horz	68.2	-15.78	-17.85
	389.9999	90.81	PK	-32.1	15.3	74.01	Vert	68.2	-15.78	-9.97
Z-Axis	390.0034	84.69	PK	-32.1	15.3	67.89	Horz	68.2	-15.78	-16.09
	390.0034	92.89	PK	-32.1	15.3	76.09	Vert	68.2	-15.78	-7.89
X-Axis	780.003	59.36	PK	-31.5	21.4	49.26	Horz	48.2	-15.78	-14.72
	780.003	52.34	PK	-31.5	21.4	42.24	Vert	48.2	-15.78	-21.74
Y-Axis	779.9963	60.61	PK	-31.5	21.4	50.51	Horz	48.2	-15.78	-13.47
	779.9963	52.27	PK	-31.5	21.4	42.17	Vert	48.2	-15.78	-21.81
Z-Axis	780.0037	51.73	PK	-31.5	21.4	41.63	Horz	48.2	-15.78	-22.35
	780.0037	60.27	PK	-31.5	21.4	50.17	Vert	48.2	-15.78	-13.81
X-Axis	1170.17	33.1	pk	2.92	24.6	60.62	Horz	54	-15.78	-9.16
	1170.17	31.63	pk	2.92	24.6	59.15	Vert	54	-15.78	-10.63
Y-Axis	1170.341	28.93	pk	2.92	24.6	56.45	Horz	54	-15.78	-13.33
	1170.341	28.53	pk	2.92	24.6	56.05	Vert	54	-15.78	-13.73
Z-Axis	1170.341	30.23	pk	2.92	24.6	57.75	Horz	54	-15.78	-12.03
	1170.341	33.74	pk	2.92	24.6	61.26	Vert	54	-15.78	-8.52
X-Axis	1560.561	24.82	pk	3.43	25	53.25	Horz	54	-15.78	-16.53
Y-Axis	1561.122	26.69	pk	3.43	25	55.12	Horz	54	-15.78	-14.66
	1561.122	22.33	pk	3.43	25	50.76	Vert	54	-15.78	-19.02
Z-Axis	1561.122	19.64	pk	3.43	25	48.07	Horz	54	-15.78	-21.71
	1561.122	26.65	pk	3.43	25	55.08	Vert	54	-15.78	-14.7
X-Axis	3901.902	21.54	pk	5.44	23.8	50.78	Horz	54	-15.78	-19
Y-Axis	3903.808	22.54	pk	5.47	23.8	51.81	Horz	54	-15.78	-17.97
Z-Axis	3903.808	24.98	pk	5.47	23.8	54.25	Vert	54	-15.78	-15.53

Appendix A - Accreditations and Authorizations

NVLAP Lab code: 100414-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see http://ts.nist.gov/ts/htdocs/210/214/scopes/1004140.htm

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91044).

Industry Canada Industrie Canada

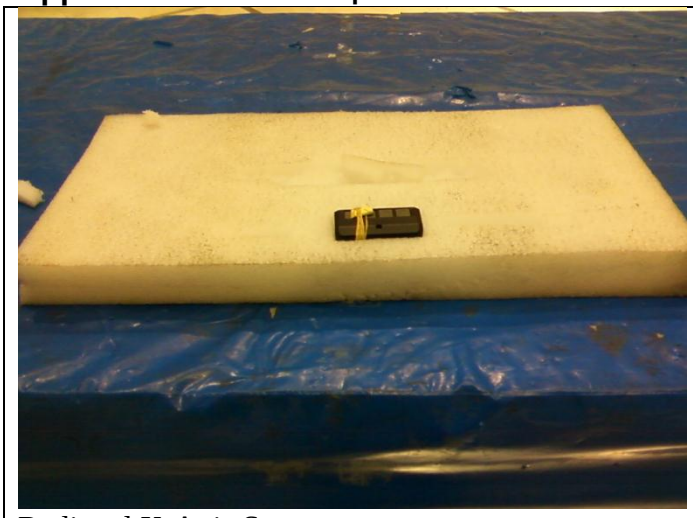
Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2180

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: Radiated Emissions R-621, Conducted Emissions C-642.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

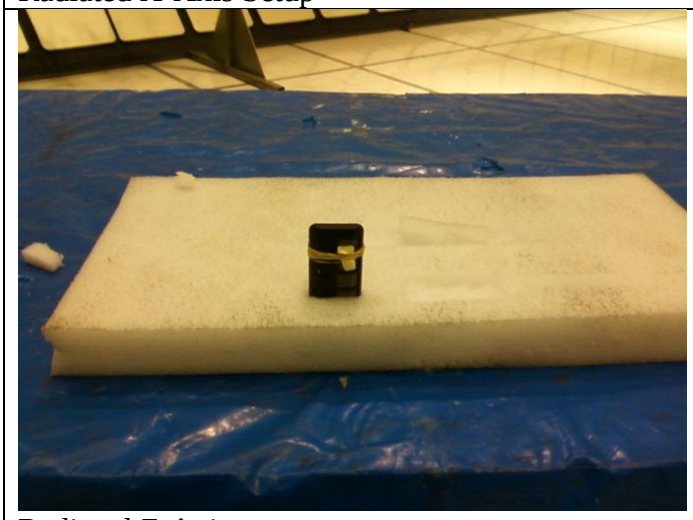
NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 2004/108/EC, Annex III (2-3). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6

Appendix B – Test Setup Photos

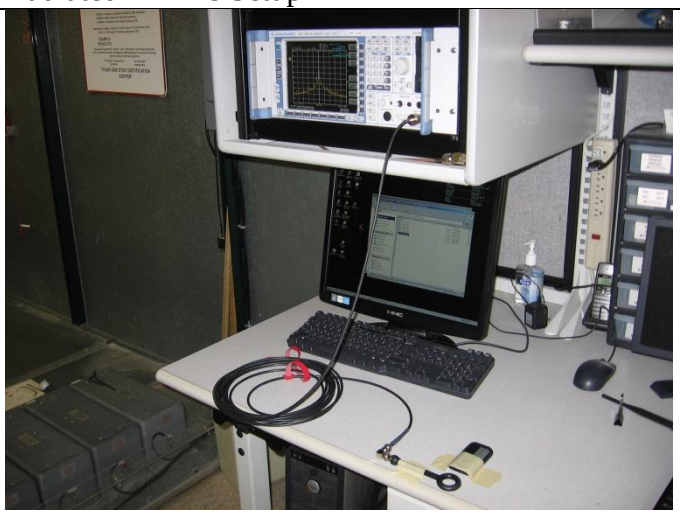


Radiated X-Axis Setup

Radiated Y-Axis Setup



Radiated Z-Axis



BW & DC Test Setup