NVLAP LAB CODE 200707-0

FCC PART 15.231

MEASUREMENT AND TEST REPORT

For

Pro-Lite, Inc.

3505 Cadillac Ave. Building D,

Costa Mesa, CA92626, USA.

FCC ID: TWNDTR920-FC

Report Type:	Product Type:
Original Report	Wireless Transceiver Module

Test Engineer:	Alvin Huang
Report Number:	RSZ08031101
Report Date:	2008-11-07
Reviewed By:	Simon Mo EMC Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

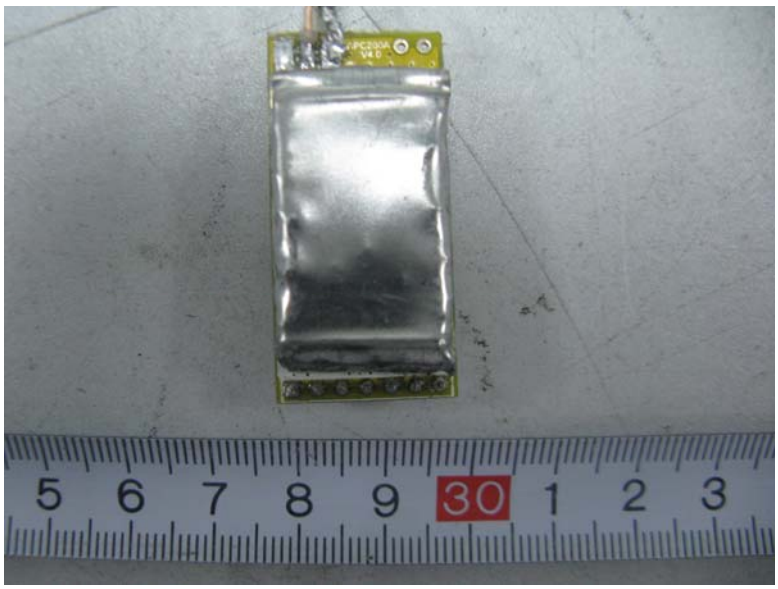
The *Pro-Lite, Inc.'s* product, model: *DTR920* or the "EUT" as referred to in this report is a Wireless transceiver module, rated input voltage: DC 5V.

Mechanical Description of EUT

The Pro-Lite, Inc.'s product, model number: *DTR920*, measures approximately 9.1 cm L x 1.9 cm W x 0.8 cm H

** All measurement and test data in this report was gathered from production sample serial number: 0803025(Assigned by BACL, Shenzhen). The EUT was received on 2008-03-11.*

EUT Photograph



Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4-2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.231 rules.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at
http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Special Accessories

The special accessories were provided by Bay Area Compliance Laboratories Corp. (Shenzhen).

Equipment Modifications

No modifications were made to the unit tested.

The Test Configuration Description and Supported Board

The EUT DC 5V is supplied by the supported board.

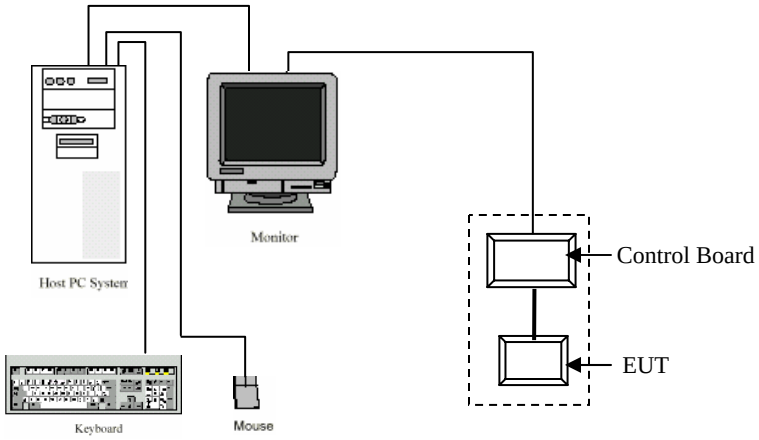
The PC Controls the EUT transmitting data by software with the supported board.

The supported Board only has the conterminous Function.

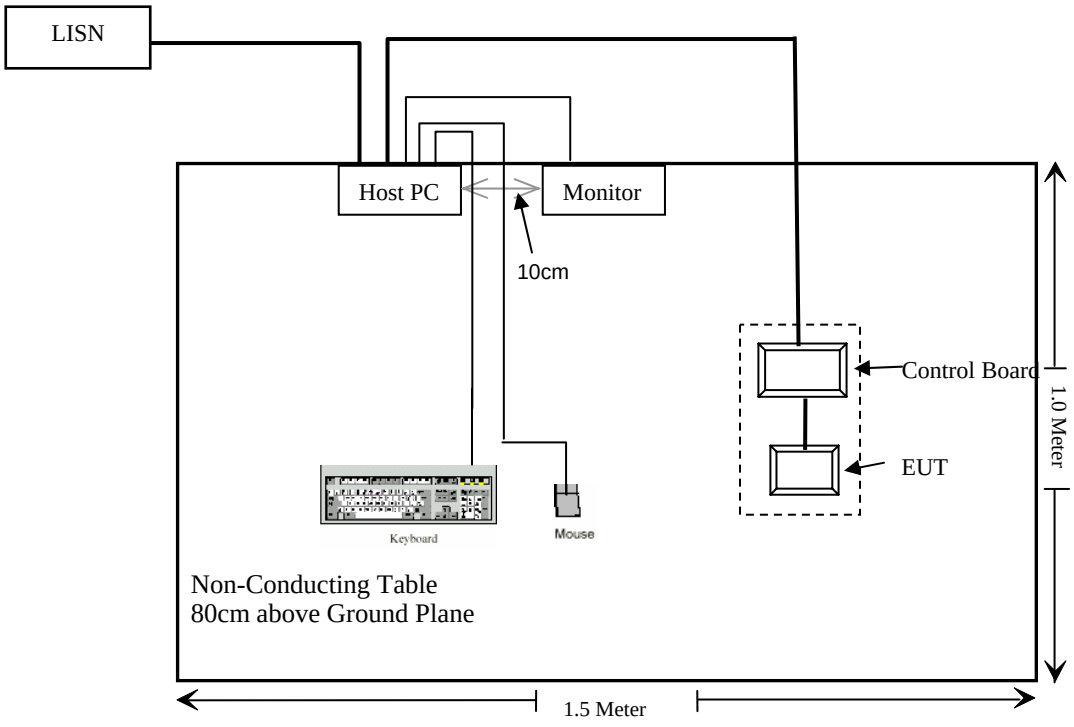
The Supported Board Photograph

Refer to the Internal Photos.

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.209	General Requirement	Compliant
§15.207 (a)	Conducted Emissions	Compliant
§15.231 (b)	Radiated Emissions	Compliant
§15.231 (c)	20dB Band Width Testing	Compliant
§15.231 (a)(1)	Deactivation Testing	Compliant
§15.231	Duty Cycle	Compliant

CFR47 §15.203 - ANTENNA REQUIREMENT

Standard Applicable

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The antenna of the EUT was solder antenna. The maximum gain is 2.0 dBi. The EUT use permanently attached antenna.

Result: Compliant.

Please refer to the EUT Internal photos.

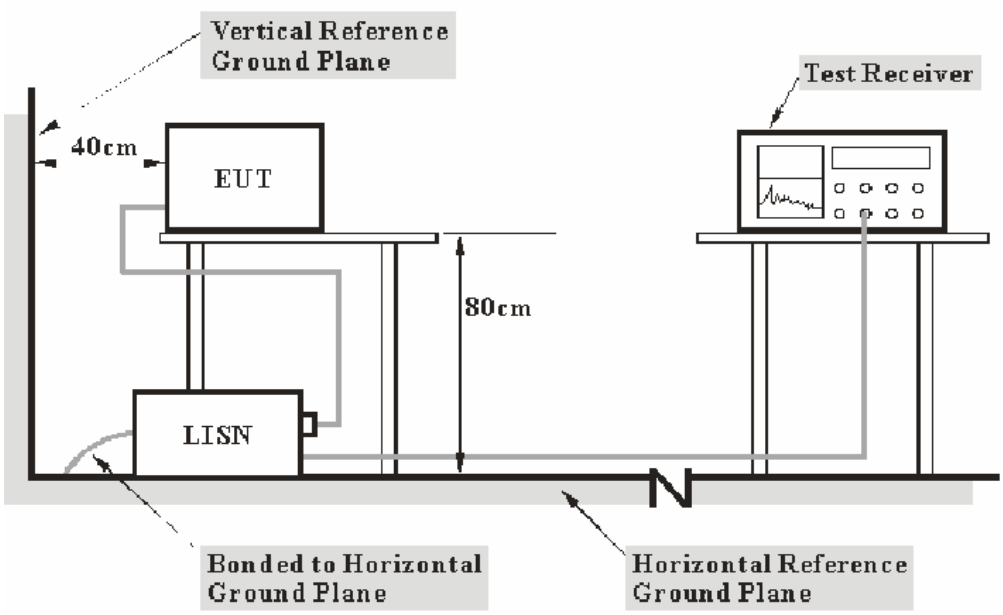
CFR47 §15.207 (a) - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp.(Shenzhen) is ±2.4 dB.

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	***IF B/W***
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330	2008-03-25	2009-03-25
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2008-03-25	2009-03-25

***** Com-Power's LISN were used as the supporting equipment.
*** Statement of Traceability:** Bay Area Compliance Laboratories Corp.(Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the host PC connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

16.60 dB at **3.185 MHz** in the **Line** conductor mode

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

** The testing was performed by Chris Peng on 2008-10-22.*

Test Mode: Transmitting

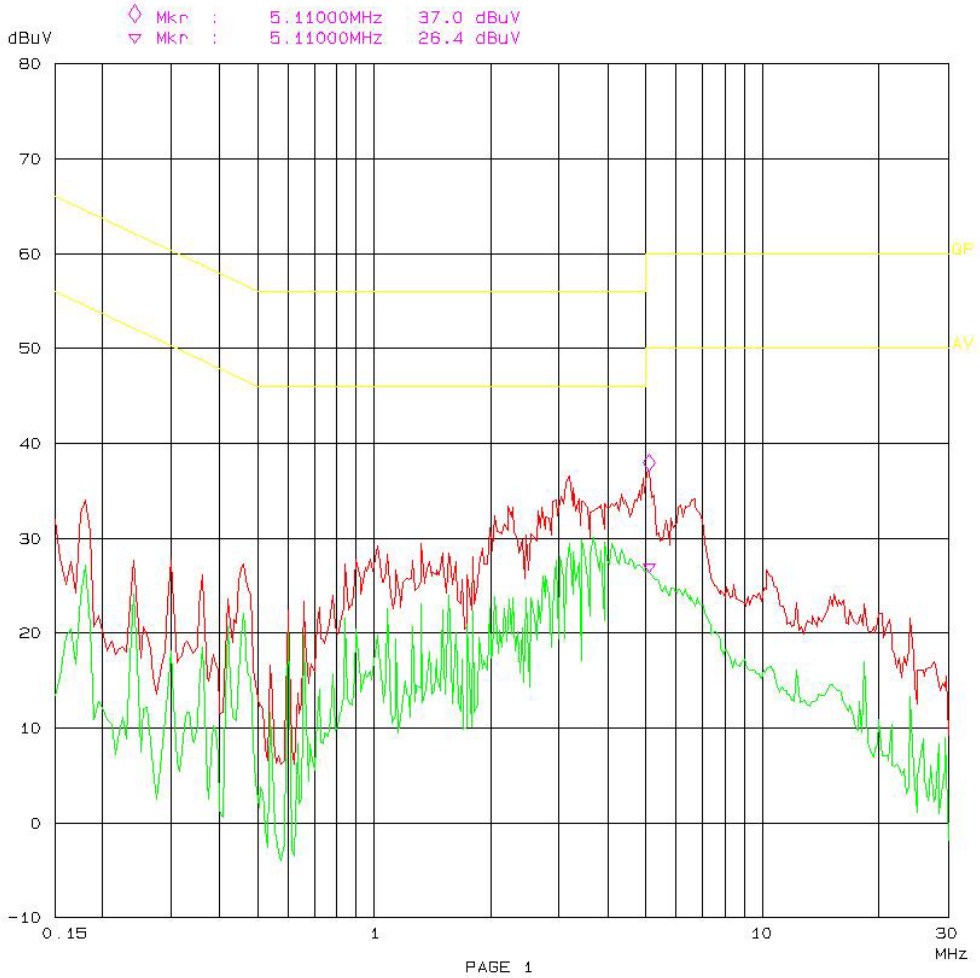
Line Conducted Emissions				**FCC Part 15.207**	
Frequency (MHz)	**Amplitude (dBμV)**	**Detector (QP/AV)**	**Phase (Line/Neutral)**	**Limit (dBμV)**	**Margin (dB)**
3.185	29.40	AV	Line	46.00	16.60
0.180	36.90	AV	Neutral	54.50	17.60
0.963	27.90	AV	Neutral	46.00	18.10
3.020	26.90	AV	Neutral	46.00	19.10
3.185	36.60	QP	Line	56.00	19.40
3.020	36.50	QP	Neutral	56.00	19.50
0.300	29.40	AV	Neutral	50.20	20.80
0.965	34.90	QP	Neutral	56.00	21.10
5.110	37.00	QP	Line	60.00	23.00
5.110	26.40	AV	Line	50.00	23.60
0.180	38.80	QP	Neutral	64.50	25.70
5.335	34.20	QP	Neutral	60.00	25.80
1.020	19.80	AV	Line	46.00	26.20
1.020	29.20	QP	Line	56.00	26.80
0.300	33.30	QP	Neutral	60.20	26.90
0.180	27.10	AV	Line	54.50	27.40
0.180	34.10	QP	Line	64.50	30.40
5.320	19.10	AV	Neutral	50.00	30.90
0.300	18.10	AV	Line	50.20	32.10
0.300	27.60	QP	Line	60.20	32.60
10.285	26.70	QP	Line	60.00	33.30
10.285	16.30	AV	Line	50.00	33.70
10.580	25.40	QP	Neutral	60.00	34.60
10.580	14.80	AV	Neutral	50.00	35.20

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Conduction Emission
FCC 15.207

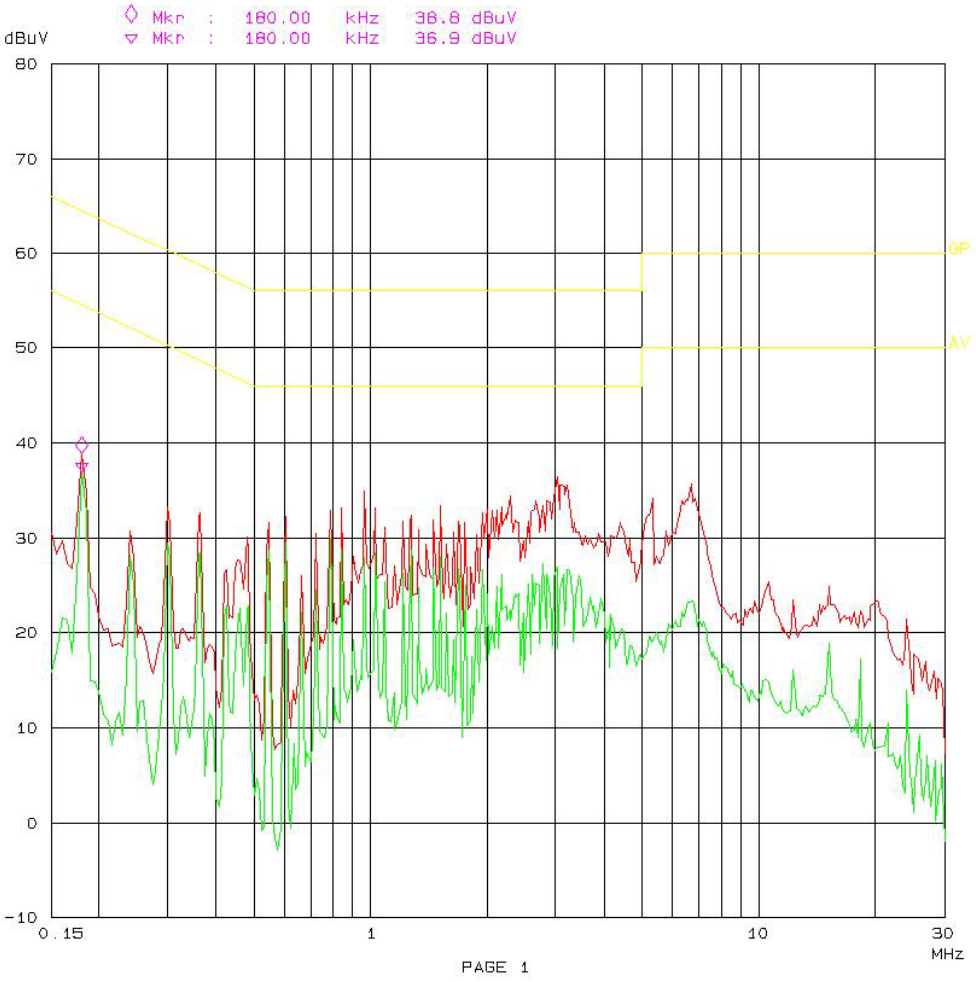
EUT:	Wireless transceiver module DTR920
Op Cond:	Transmitting
Operator:	Chris
Test Spec:	AC120V 60Hz line
Comment:	Temp: 25 Hum: 56%



Conduction Emission
FCC Part 15B

EUT: Wireless transceiver module DTR920

Op Cond: Transmitting
Operator: Chris
Test Spec: AC 120V/60HZ Neutral
Comment: Temp: 25 Hum: 56%



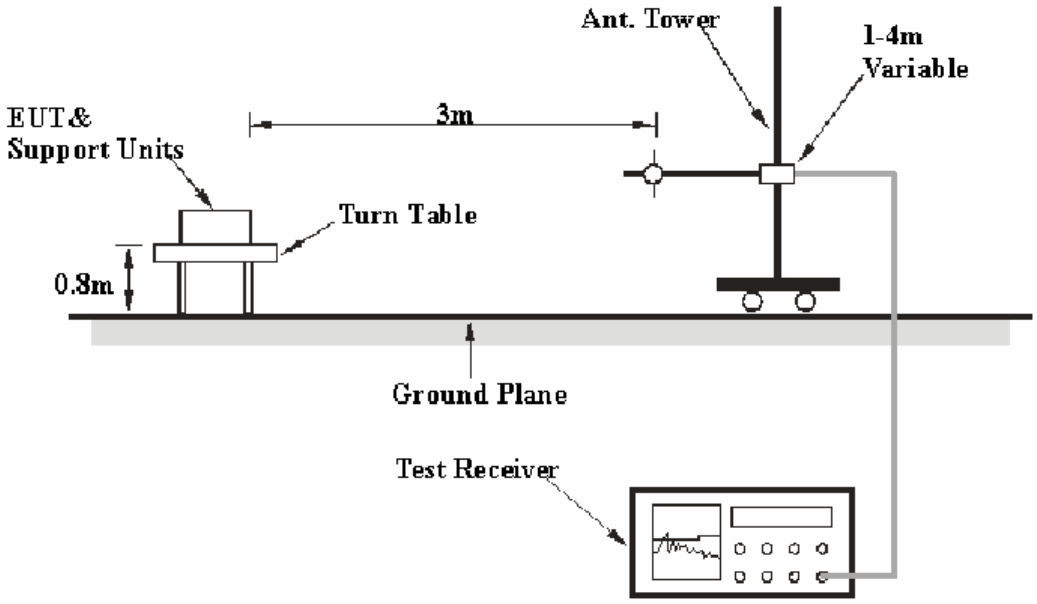
CFR47 §15.205, §15.209, §15.231 (b) - RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is±4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15 § 15.209 and 15.231.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 5 GHz.

During the radiated emission test, the test receiver was set with the following configurations:

Frequency Range	***RBW***	***VBW***
30 – 1000 MHz	100 kHz	300 kHz
1000 MHz –5 GHz	1 MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2007-11-15	2008-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2008-08-14	2009-08-14
HP	Amplifier	8449B	3008A00277	2008-09-29	2009-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Peak and Average detection mode.

Standard Applicable

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (Microvolts /meter)	Field Strength of spurious emissions ((Microvolts /meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,370 *	125 to 375 *
174-260	3,750	375
260-470	3,750 to 12, 500*	375 to 1,250*
Above 470	12,500	1,250

Linear interpolations for frequency ranges 130 - 174 MHz and 260 - 470 MHz.

The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 5.8dB means the emission is 5.8dB below the limit. The equation for margin calculation is as follows:

Margin = Limit –Corrected Amplitude

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

** The testing was performed by Alvin Huang on 2008-10-21.*

Test Mode: Transmitting

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Direction (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Duty Cycle Factor (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.231	
				Height (m)	Polar. (H/V)	Factor (dB/m)					Limits (dBµV/m)	Margin (dB)
434	*	AV	145	1.0	V	14.50	1.25	0	-3.60	76.87	80.8	3.93
434	*	AV	218	1.5	H	14.50	1.25	0	-3.60	75.46	80.8	5.34
868	*	AV	245	1.0	V	20.00	1.76	32.72	-3.60	54.86	60.8	5.94
1302	*	AV	267	1.2	V	24.80	5.11	34.80	-3.60	47.17	54.0	6.83
1302	*	AV	234	1.0	H	24.80	5.11	34.80	-3.60	45.60	54.0	8.40
868	*	AV	120	1.4	H	20.00	1.76	32.72	-3.60	52.30	60.8	8.50
2170	*	AV	260	1.5	V	29.80	6.32	34.00	-3.60	50.30	60.8	10.50
3038	*	AV	266	1.0	V	31.00	8.07	33.80	-3.60	48.32	60.8	12.48
2170	*	AV	164	1.0	H	29.80	6.32	34.00	-3.60	48.04	60.8	12.76
3038	*	AV	167	1.5	H	31.00	8.07	33.80	-3.60	47.09	60.8	13.71
1736	*	AV	262	1.2	V	27.80	5.62	34.40	-3.60	44.94	60.8	15.86
1736	*	AV	254	1.0	H	27.80	5.62	34.40	-3.60	43.53	60.8	17.27
434	64.72	PK	145	1.0	V	14.50	1.25	0	/	80.47	100.8	20.33
434	63.31	PK	218	1.5	H	14.50	1.25	0	/	79.06	100.8	21.74
868	69.42	PK	245	1.0	V	20.00	1.76	32.72	/	58.46	80.8	22.34
1302	55.66	PK	267	1.2	V	24.80	5.11	34.80	/	50.77	74.0	23.23
1302	54.09	PK	234	1.0	H	24.80	5.11	34.80	/	49.20	74.0	24.80
868	66.86	PK	120	1.4	H	20.00	1.76	32.72	/	55.90	80.8	24.90
2170	51.78	PK	260	1.5	V	29.80	6.32	34.00	/	53.90	80.8	26.90
3038	46.65	PK	266	1.0	V	31.00	8.07	33.80	/	51.92	80.8	28.88
2170	49.52	PK	164	1.0	H	29.80	6.32	34.00	/	51.64	80.8	29.16
3038	45.42	PK	167	1.5	H	31.00	8.07	33.80	/	50.69	80.8	30.11
1736	49.52	PK	262	1.2	V	27.80	5.62	34.40	/	48.54	80.8	32.26
1736	48.11	PK	254	1.0	H	27.80	5.62	34.40	/	47.13	80.8	33.67

Note: *Calculate Average value based on Duty Cycle correction factor

AV=PK-Duty Cycle

CFR47 §15.231(c) - 20dB BANDWIDTH TESTING

Requirement

Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
HP	Amplifier	8447E	1937A01046	2007-11-15	2008-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2008-08-14	2009-08-14

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

With the EUT's antenna attached, the waveform was received by the test antenna which was connected to the spectrum analyzer, plot the 20 dB bandwidth.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50 %
ATM Pressure:	100.9 kPa

** The testing was performed by Alvin Huang on 2008-10-21.*

Test Mode: Transmitting

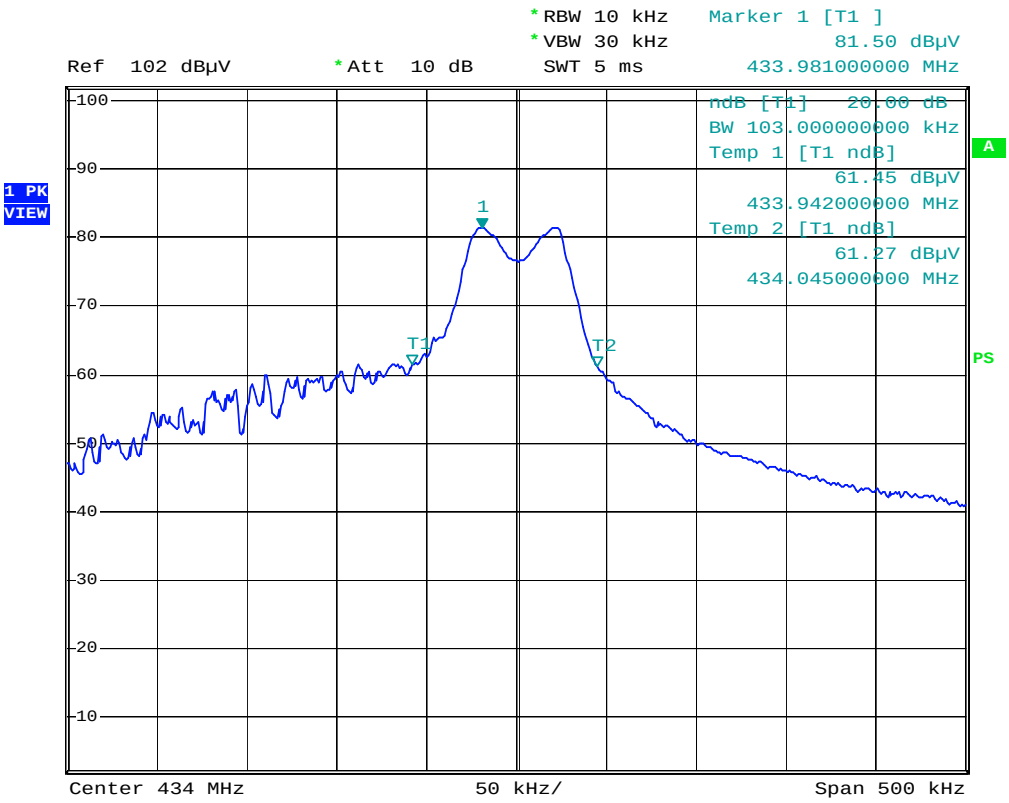
Test Result: Compliant.

Please refer to following table and plot.

Frequency (MHz)	Measured 20 dB BW (kHz)	Limit (MHz)	Result
434	103	1.085*	Pass

Note: *20 dB Bandwidth Limit = 0.25% * center frequency = 0.25% * 434MHz =1.085 MHz*

20 dB Bandwidth



20DB bandwidth

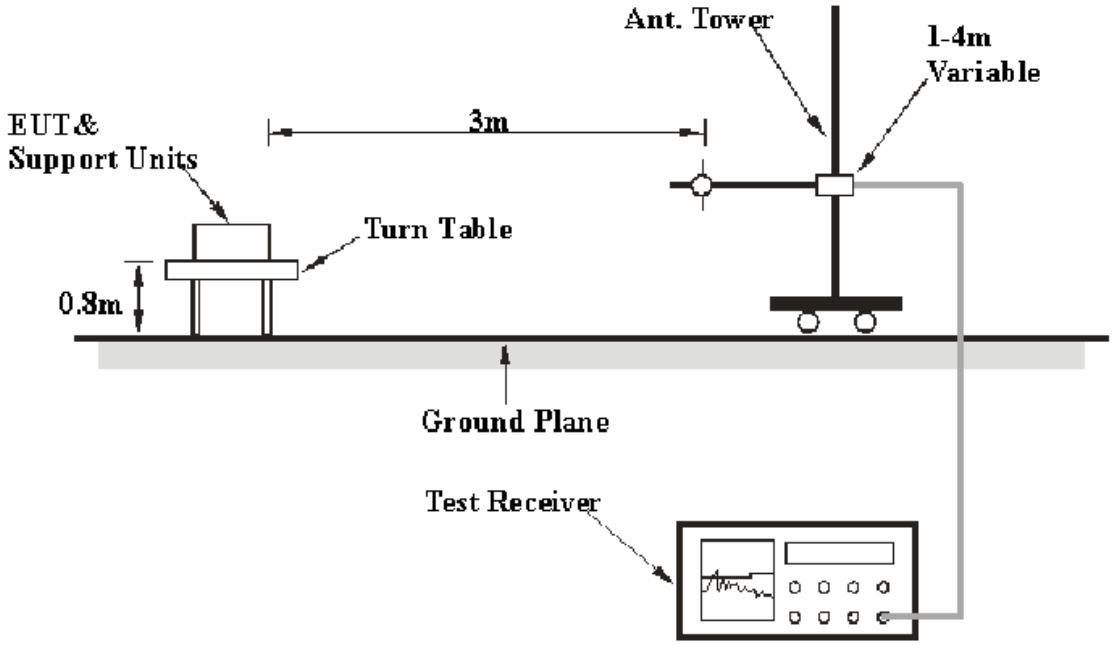
Date: 21.OCT.2008 22:57:07

CFR47 §15.231(a) - DEACTIVATION TESTING

Requirement

Per 15.231(a) (1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

EUT Setup



The deactivation test was performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15.231(a) limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
HP	Amplifier	8447E	1937A01046	2007-11-15	2008-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2008-08-14	2009-08-14

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Data

Environmental Conditions

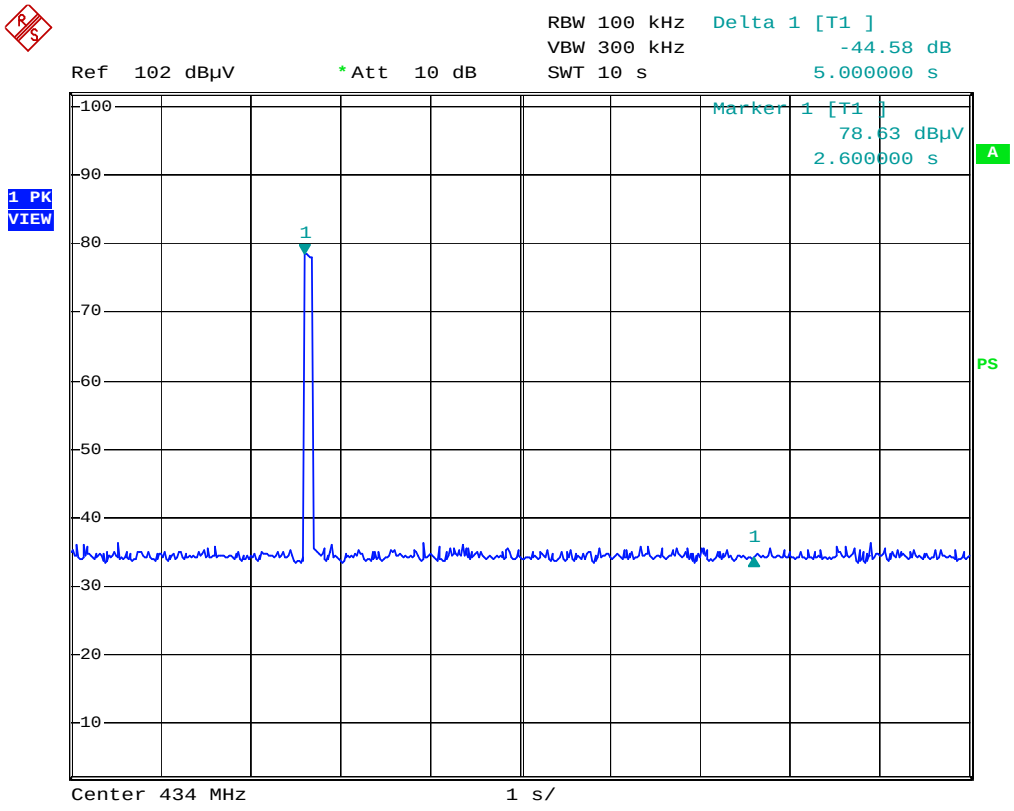
Temperature:	25 ° C
Relative Humidity:	50 %
ATM Pressure:	103.2 kPa

** The testing was performed by Alvin Huang on 2008-10-21.*

Test Mode: Transmitting

Test Result: Compliant.

Please refer to following plot



Deactive time

Date: 21.OCT.2008 23:35:04

CFR47 §15.231- DUTY CYCLE

Limit

Nil (No dedicated limit specified in the Rules).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2008-10-16	2009-10-16

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer=operating frequency.
4. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Span=0Hz.
5. Repeat above procedures until all frequency measured was complete.

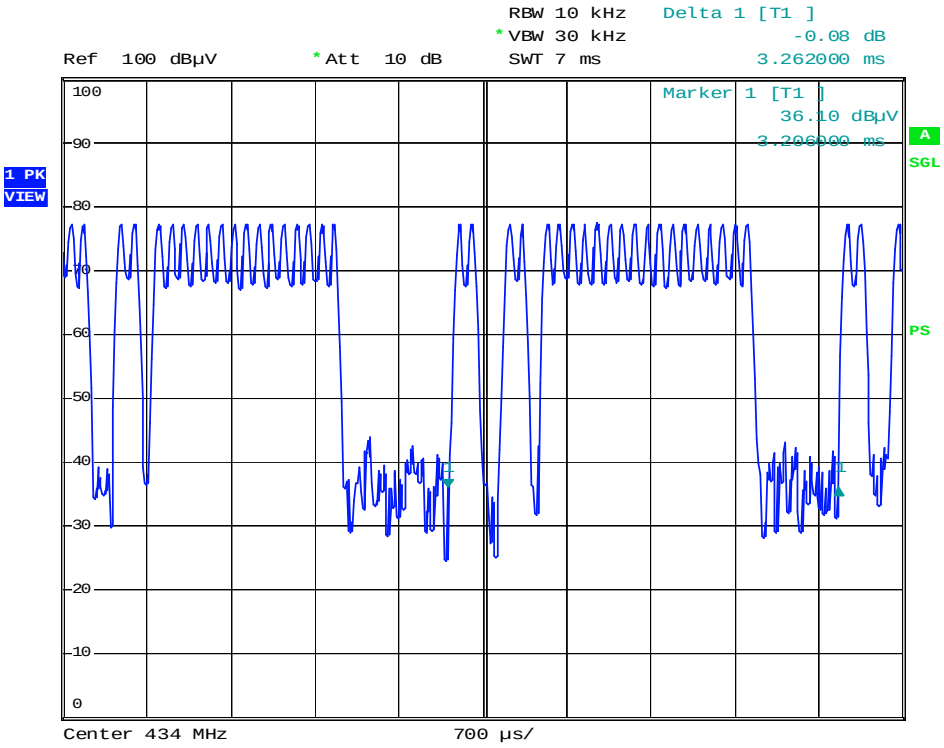
Test Data

Tp = 3.262ms

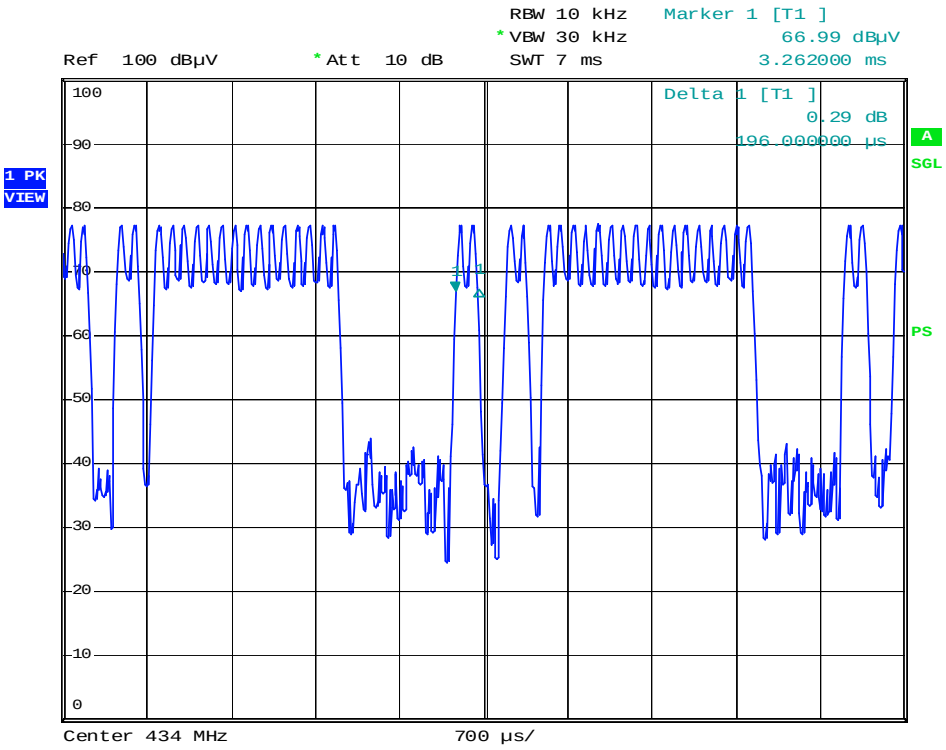
Ton = 0.196*2+1.764 (ms)=2.156 ms

Factor = 20 * log (Ton / Tp) = 20 * log (2.156/3.262) = -3.60 dB

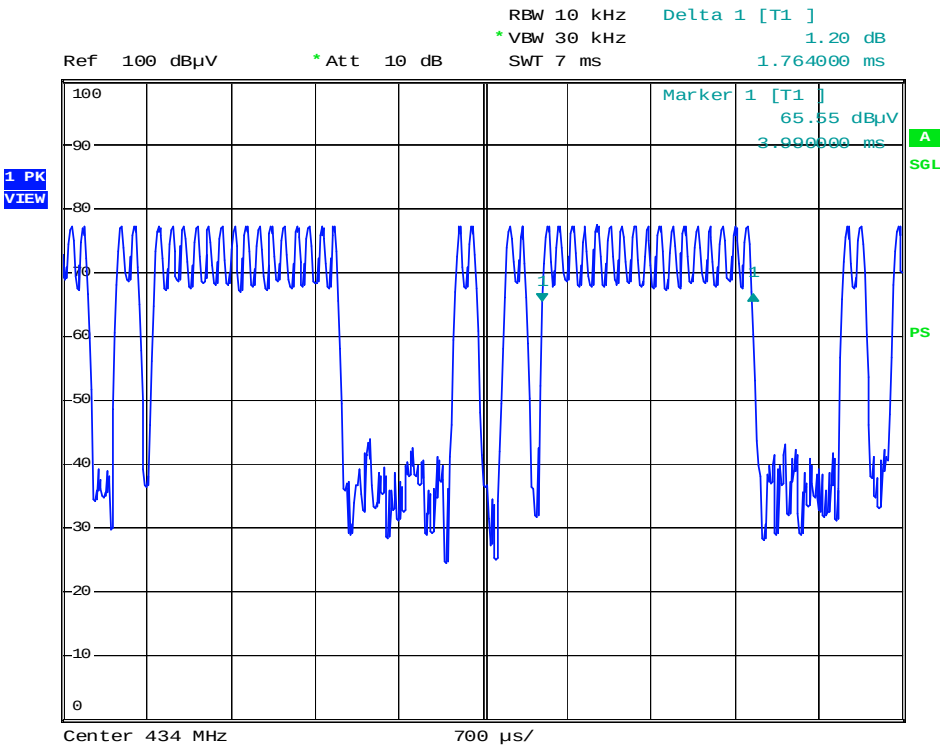
T_p:


RBW 10 kHz
*VBW 30 kHz
SWT 7 ms
Delta 1 [T1]
-0.08 dB
3.262000 ms
Ref 100 dBµV
*Att 10 dB
Marker 1 [T1]
36.10 dBµV
3.206000 ms
1 PK
VIEW
A
SGL
PS
100
90
80
70
60
50
40
30
20
10
0
Center 434 MHz
700 µs/

T_{on-1}:


RBW 10 kHz
*VBW 30 kHz
SWT 7 ms
Marker 1 [T1]
66.99 dBµV
3.262000 ms
Delta 1 [T1]
0.29 dB
196.000000 µs
Ref 100 dBµV
*Att 10 dB
1 PK
VIEW
A
SGL
PS
100
90
80
70
60
50
40
30
20
10
0
Center 434 MHz
700 µs/

T_{on-2}:



******* END OF REPORT *******