FCC Test Report

for

Industrial Radio Remote Control

Trade Name	:	**Fomotech**
Model No.	:	**8 buttons:Alpha 4008 series**
		12 buttons:Alpha 4012 series
FCC ID.	:	**LZ6A4000SERIES**
IC ID.	:	**28381A4000**
Report No.	:	**RF-B15-0606-228**
Date of Receipt	:	**July 17, 2006**
Date of Report	:	**July 22, 2006**

Prepared for

Fomotech International Corp.

2F-1, 286-3, Hsin Ya Road,Chien Chen District, Kaohsiung, Taiwan, R.O.C.

Prepared by

Central Research Technology Co.
EMC Test Laboratory

No.11, Lane41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Certification of Compliance

Equipment under Test	**: Industrial Radio Remote Control**
Trade Name	**: Fomotech**
Model No.	**: 8 buttons:Alpha 4008 series**
	12 buttons:Alpha 4012 series
FCC ID	**: LZ6A4000SERIES**
IC ID.	**: 28381A4000**
Manufacturer	**: Fomotech International Corp.**
Applicant	**: Fomotech International Corp.**
Address	**: 2F-1, 286-3, Hsin Ya Road,Chien Chen District,**
	Kaohsiung, Taiwan, R.O.C.
Applicable Standards	**: 47 CFR part 15, Subpart C**
	RSS-210 Issue 6
Date of Testing	**: July 20~21, 2006**
Deviation	**: N/A**
Condition of Test Sample	**: Prototype**

We, **Central Research Technology Co**., hereby certify that one sample of the designated product was tested in our facility during the period mentioned above. The test records, data evaluation and Equipment Under Test (EUT) configurations shown in the present report are true and accurate representation of the measurements of the sample's RF characteristics under the conditions herein specified.

The test results show that the EUT as described in the present report is in compliance with the requirements set forth in the standards mentioned above and apply to the tested sample identified in the present report only. The test report shall not be reproduced, except in its entirety, without the written approval of Central Research Technology Co.

PREPARED BY : Cathy Chen (Cathy Chen/ Technical Manager) , **DATE :** July 22, 2006

APPROVED BY : J. Y. Shih (Tsun-Yu Shih/Laboratory Head) , **DATE :** July 22, 2006

Contents

1 General Description

1.1 General Description of EUT

Equipment underTest	:	Industrial Radio Remote Control
Model No.	:	8 buttons:Alpha 4008 series 12 buttons:Alpha 4012 series
FCC ID	:	LZ6A4000SERIES
IC ID.	:	28381A4000
Power in	:	8 buttons:DC 4.2V; 12 buttons:DC 4.2V
Test Voltage	:	8 buttons:DC 4.2V(rechargeable battery*1); 12 buttons:DC 4.2V(rechargeable battery*1)

1.2 Characteristic of E.U.T.

Frequency Range : 433.075~434.050MHz

Channel Numbers : 20

Function Modulation : FSK

The EUT contains a FSK function is used to transmit both control command and data. Please refer to the user's manual for the details.

Perform the function of EUT continuously by executing the test program supplied by manufacturer.

1.3 Test Methodology

For Industrial Radio Remote Control, both conducted and radiated emissions were performed according to the procrdures illustrated in ANSI C63.4 and other required measurements were illustrated in separate sections of this test report for detail.

Since the EUT is considered a potable unit, it was pre-tested on the positioned of each 3 axis. There for only the test data of the worse case- y axiz was used for Radiated test.

There are two types of EUT and which are shown as below.

Test Mode	Test Description
EUT 1	8 buttons
EUT 2	12 buttons

The channel and the operation frequency are listed below:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	433.075	02	433.100	03	433.125
04	433.150	05	433.175	06	433.200
07	433.225	08	433.250	09	433.275
10	433.300	11	433.825	12	433.850
13	433.875	14	433.900	15	433.925
16	433.950	17	433.975	18	434.000
19	434.025	20	434.050		

1.4 Requirement for Compliance

(1) Radiated Emission Requirement

In addition to the provisions of Section 15.205, 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 3,750 **	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

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

(2) Bandwidth

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. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

(3) Dwell Time

A transmitter activated automatically shall cease transmission within 5 seconds after activation.

(4) Restricted Band

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
[2]1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(2)
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

1.5 Layout of Setup

(Transmitter)

The Support Units :

No.	Unit	Model No./ Serial No.	Teade Name	PowerCode	Supported by lab.
NA	*	*	*	*	*

Connecting Cables :

No.	Cable	Length	Shielded	Core	Shielded Backshell	Supported by lab.	Note
NA	*	*	*	*	*	*	*

Justification:

For both conducted and radiated emission below 1GHz, the system was configured for typical fashion as a customer could normal use it.

For radiated emission, measurement of radiated emission from digital circuit is performed with normal transmitting.

1.6 Test Facility

Test Room	Type of Test Room	Descriptions
☑ TR1	10m semi-anechoic chamber (23m×14m×9m)	Complying with the NSA requirements in documents CISPR 22 and ANSI C63.4. for the radiated emission measurement.
☑ TR4	Shielding Room (5m×3m×3m)	For the RF conducted emission measurement.
☐ TR5	Shielding Room (8m×5m×4m)	For the Line conducted emission measurement.

Test Laboratory Competence Information

Central Research Technology Co. has been accredited/filed/authorized by the agencies listed in the following table.

Certificate	Nation	Agency	Code	Mark
Accreditation Certificate	USA	NVLAP	200575-0	ISO/IEC 17025
	R.O.C. (Taiwan)	CNLA	0905	ISO/IEC 17025
	R.O.C. (Taiwan)	BSMI	SL2-IN-E-0033, SL2-IS-E-0033, SL2-R1/R2-E-0033, SL2-A1-E-0033	ISO/IEC 17025
Site Filing Document	USA	FCC	474046	Test facility list & NSA Data
	Canada	IC	4699A	Test facility list & NSA Data
	Japan	VCCI	R-1527,C-1609,T-131	Test facility list & NSA Data
Authorization Certificate	Norway	Nemko	ELA 212	ISO/IEC 17025

The copy of each certificate can be downloaded from our web site: www.crc-lab.com

1.7 Measurement Uncertainty

All the measurement uncertainty evaluation procedures in this report are base on ETSI TR 100 028-1, 100 028-2,and ETSI TR 102 273-3. The assessed measurement uncertainties are:

Test Item	Measurement Uncertainty
Radiated Emission: (below 1GHz)	Horizontal 3.7dB；Vertical 3.7dB
Radiated Emission: (above 1GHz)	Horizontal 4.44dB；Vertical 4.41dB
Bandwidth	25Hz

2 Radiated Emission

Test Result: Pass

2.1 Applied standard

According to 15.231(b), In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundament (uV/m)	Field Strength of Spurious Emission (uV/m)
40.66 - 40.70	2250	225
70 – 130	1250	125
130 – 174	1250 to 3750**	125 to 375**
174 – 260	3750	375
260 – 470	3750 to 12500**	375 to 1250**
Above 470	12500	1250

** linear interpolations

The formula for calculating the limit of field strength of fundament is 41.6667*433.30-7083.3333=10970.84uV/m= 80.8dBuV/m, the limit of spurious emission is 60.8dBuV/m(Average)

Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in Section 15.209, whichever limit permits a higher field strength.

2.2 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

c. If the EUT is tabletop equipment, it was placed on a wooden table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.

d. The EUT was set 3m away from the interference receiving antenna.

e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.

f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine at least six frequencies associated with higher emission levels and record them.

g. Then measure each frequency found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.

h. For measurement of frequency below 1000MHz, set the receiver detector to be Quasi-Peak per CISPR 16-1 to find out the maximum level occurred.

i. For measurement of frequency above 1000MHz, set the spectrum detector to be Peak or Average to find out the maximum level occurred, if any.

j. Record frequency, azimuth angle of the turntable, height, and polarization of the receiving antenna and compare the maximum level with the required limit.

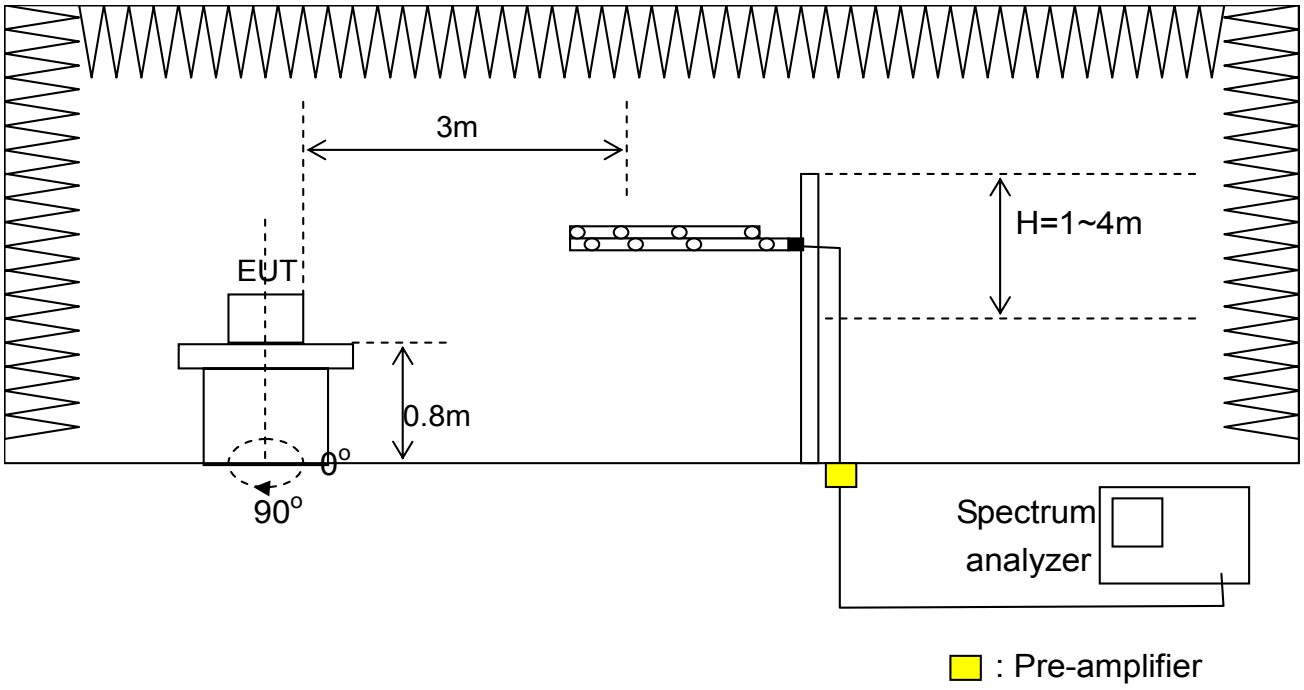
k. Change the receiving antenna to another polarization to measure radiated emission by following step e. to j. again.

l. If the peak emission level below 1000MHz measured from step f. is 4dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate Q.P. value will be measured and presented.

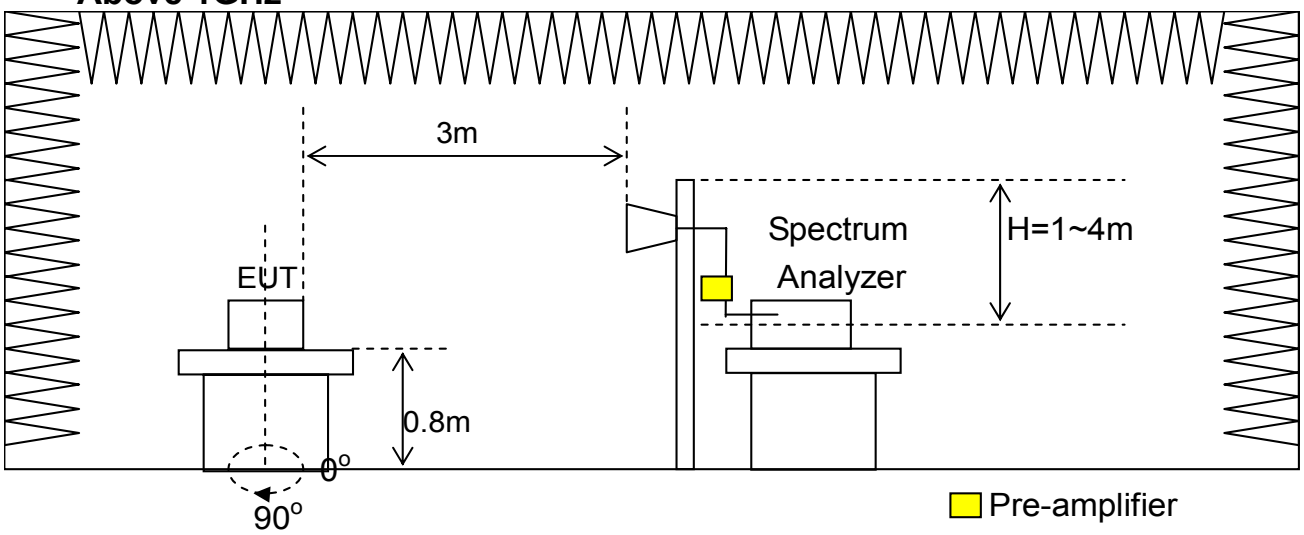
m. If the peak emission level above 1000MHz measured from step f. is 20dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate A.V. value will be measured and presented.

2.3 Test configuration

Below 1GHz



Above 1GHz



2.4 Test Instruments

Test Site and Equipment	Manufacturer	Model No./Serial No.	Last Calibration Data	Calibration Due Data
Semi-anechoic Chamber	ETS.LINDGREN	TR1/**17627-B**	April 9, 2006	April 12, 2007
Test Receiver	R&S	ESCS30/ **836858/020**	July 30,2005	July 30, 2006
Spectrum Analyzer*	R&S	FSP40/ **100031**	June 16, 2006	June 16, 2007
Antenna	R&S	HL562/**360543/010**	July 7, 2006	July 7, 2007
Antenna*	R&S	HF906/**359287/001**	Aug. 11, 2005	Aug. 11, 2006
Antenna*	EMCO	3116/ **20552**	Dec. 10, 2005	Dec. 10, 2006
Pre-amplifier*	MITEQ	AMF-4D-005180-24-10P/**1072962**	May 19, 2006	May 19, 2007
Pre-amplifier*	MITEQ	JS4-18002600-30-5A/ **741923**	June 27, 2006	June 27, 2007
Pre-amplifier*	MITEQ	AMF-6F-260400-33-8P/ **928336**	June 27, 2006	June 27, 2007
Pre-amplifier	Mini Circuit	ZKL-2/ **002**	April 9, 2006	April 9, 2007

Note:

1. "*" : These instruments are used only for the measurement of emission frequency above 1000MHz.
2. The calibrations are traceable to NML/ROC.
3. NCR : No Calibration Required.
4. The calibration date of the semi-anechoic chamber listed above is the date of NSA measurement.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
100KHz	N/A	Peak/Average	Maxhold	Field Strength of Fundament
120kHz	N/A	Quasi-Peak	Maxhold	Below 1GHz
1MHz	1MHz	Peak	Maxhold	Above 1GHz Peak

Climatic Condition

Ambient Temperature：28°C ; Relative Humidity : 64%

2.5 Test Data

Field Strength of Fundament

Test Mode **: EUT 1**
Test Distance **:** 3m **Tester** **:** Bill

Frequency (MHz)	Polarization	Reading Data (dBuV)		Correction Factor (dB/m)	Field Strength (dBμV/m)		Limit (dBμV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
433.30	V	94.82	85.82	-10.79	84.03	75.03	100.80	80.80	16.77	5.77
433.30	H	82.47	73.47	-10.79	71.68	62.68	100.80	80.80	29.12	18.12

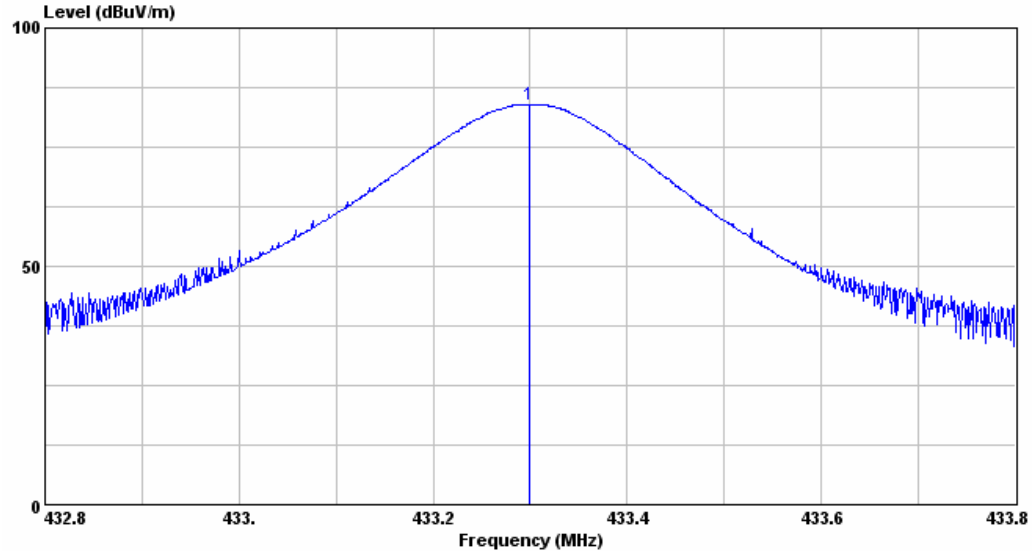
Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Field Strength (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Field Strength
4. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
   Where the duty factor is calculated from following formula:

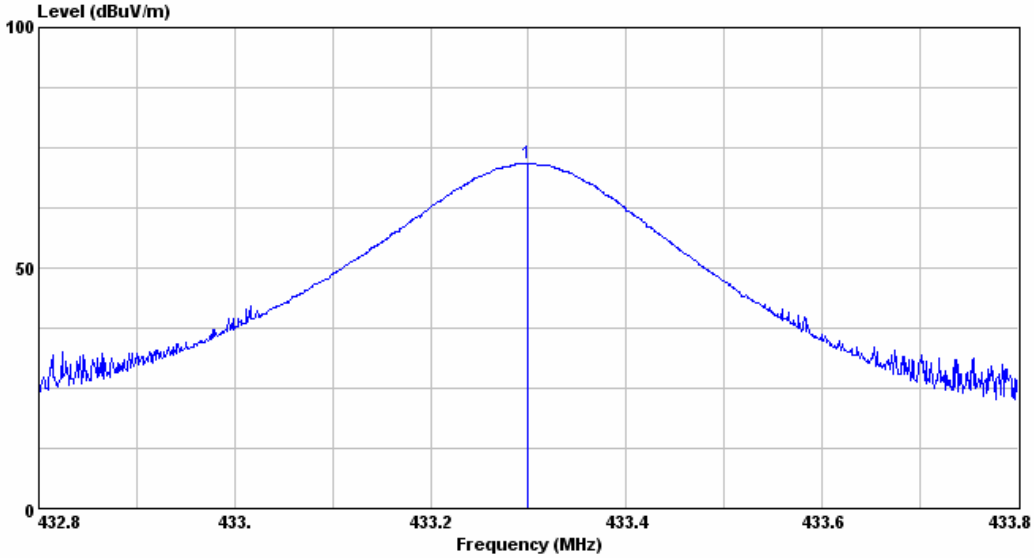
   20log(Duty cycle) = 20log $\frac{35}{100}$ = -9dB

   please see page 17 for plotted duty cycle.

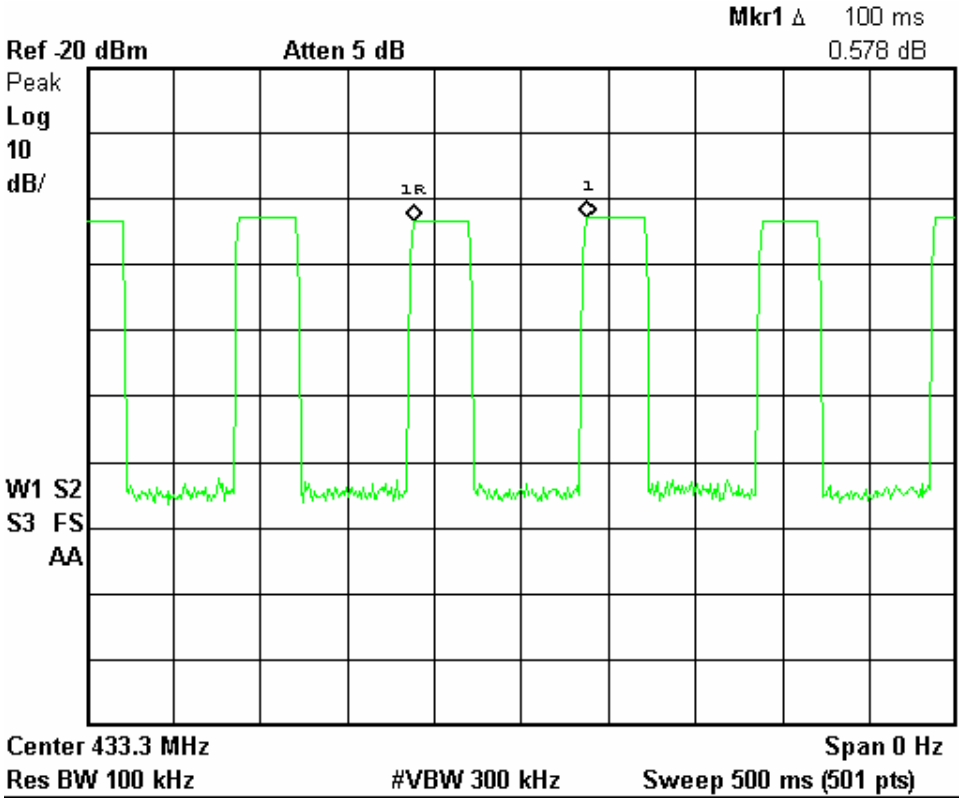
V Polarization, PK

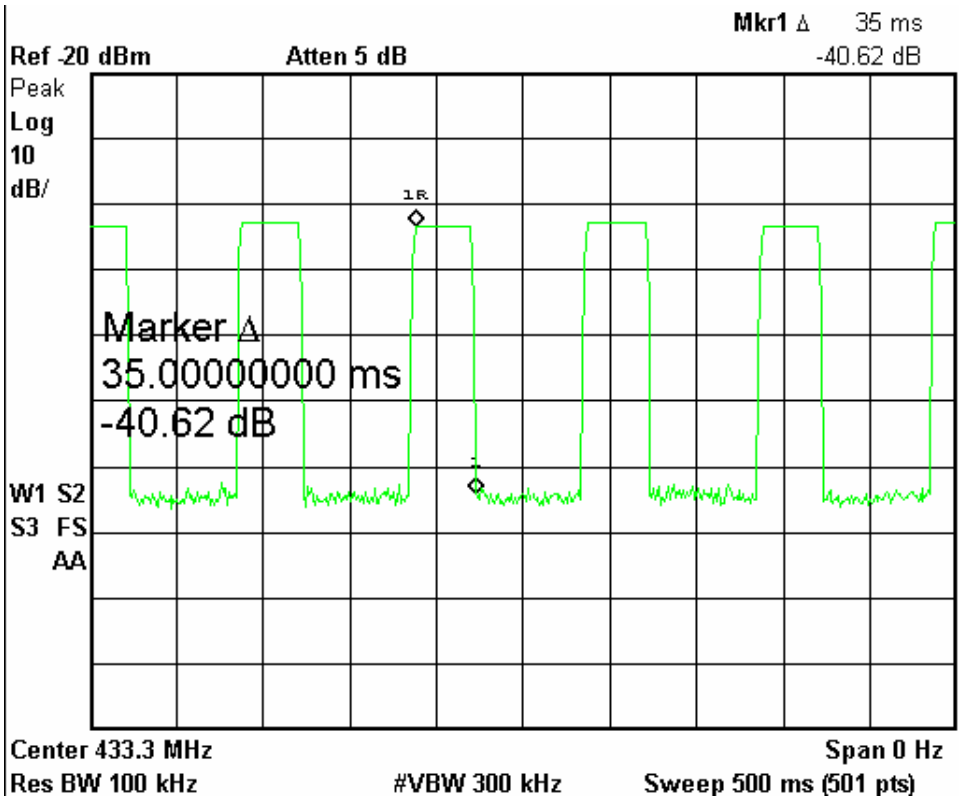


H Polarization, PK



Duty cycle


Mkr1 Δ 100 ms
Ref -20 dBm
Atten 5 dB
0.578 dB
Peak
Log
10
dB/
1R
1
W1 S2
S3 FS
AA
Center 433.3 MHz
Span 0 Hz
Res BW 100 kHz
#VBW 300 kHz
Sweep 500 ms (501 pts)


Mkr1 Δ 35 ms
Ref -20 dBm
Atten 5 dB
-40.62 dB
Peak
Log
10
dB/
1R
Marker Δ
35.00000000 ms
-40.62 dB
W1 S2
S3 FS
AA
Center 433.3 MHz
Span 0 Hz
Res BW 100 kHz
#VBW 300 kHz
Sweep 500 ms (501 pts)

Test Mode **: EUT 2**
Test Distance **:** 3m **Tester** **:** Bill

Frequency (MHz)	Polarization	Reading Data (dBuV)		Correction Factor (dB/m)	Field Strength (dBμV/m)		Limit (dBμV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
433.30	V	90.83	81.83	-10.79	80.04	71.04	100.80	80.80	20.76	9.76
433.30	H	81.14	72.14	-10.79	70.35	61.35	100.80	80.80	30.45	19.45

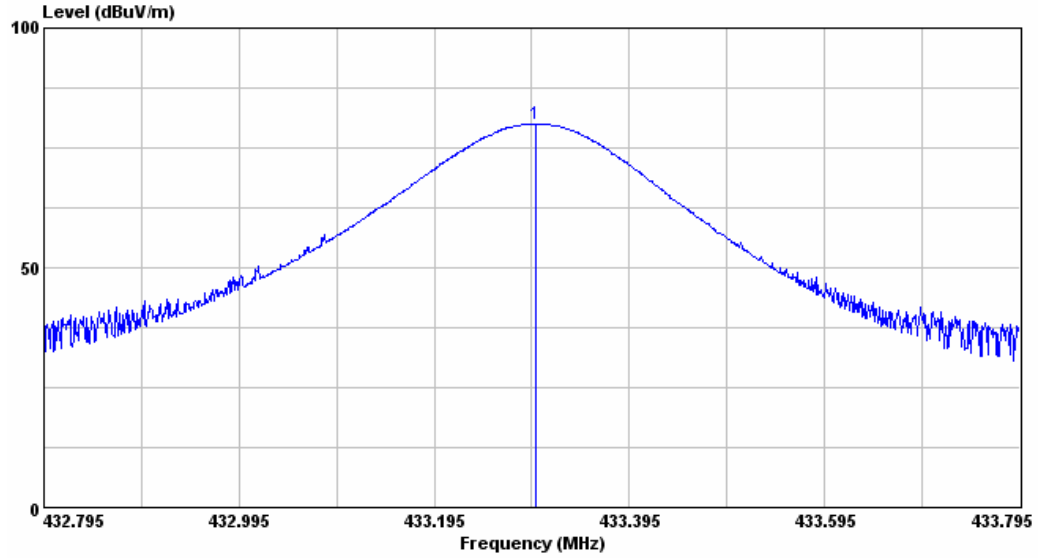
Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Field Strength (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Field Strength
4. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
   Where the duty factor is calculated from following formula:

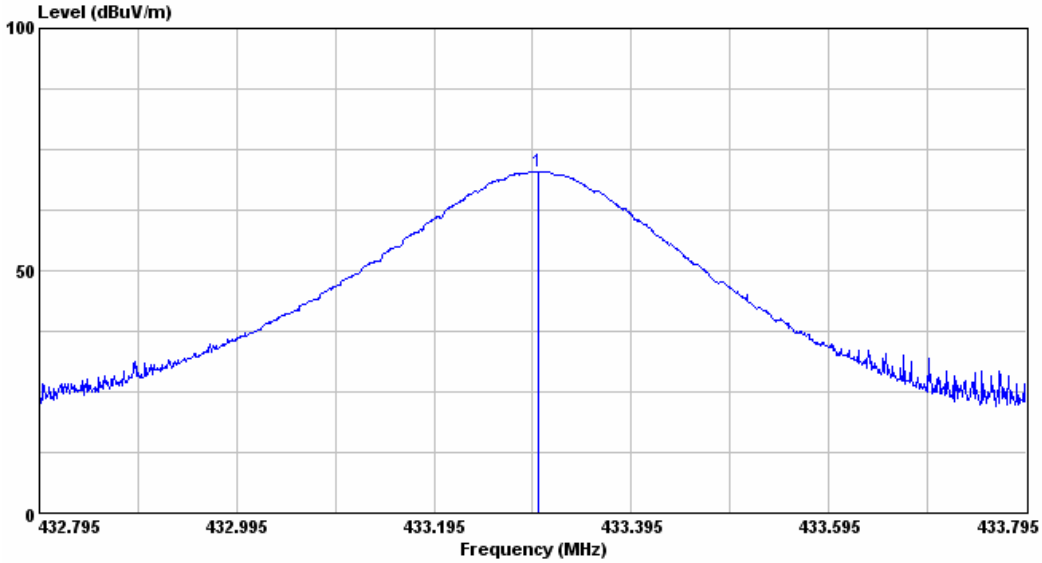
   20log(Duty cycle) = 20log $\frac{35}{100}$ = -9dB

   please see page 20 for plotted duty cycle.

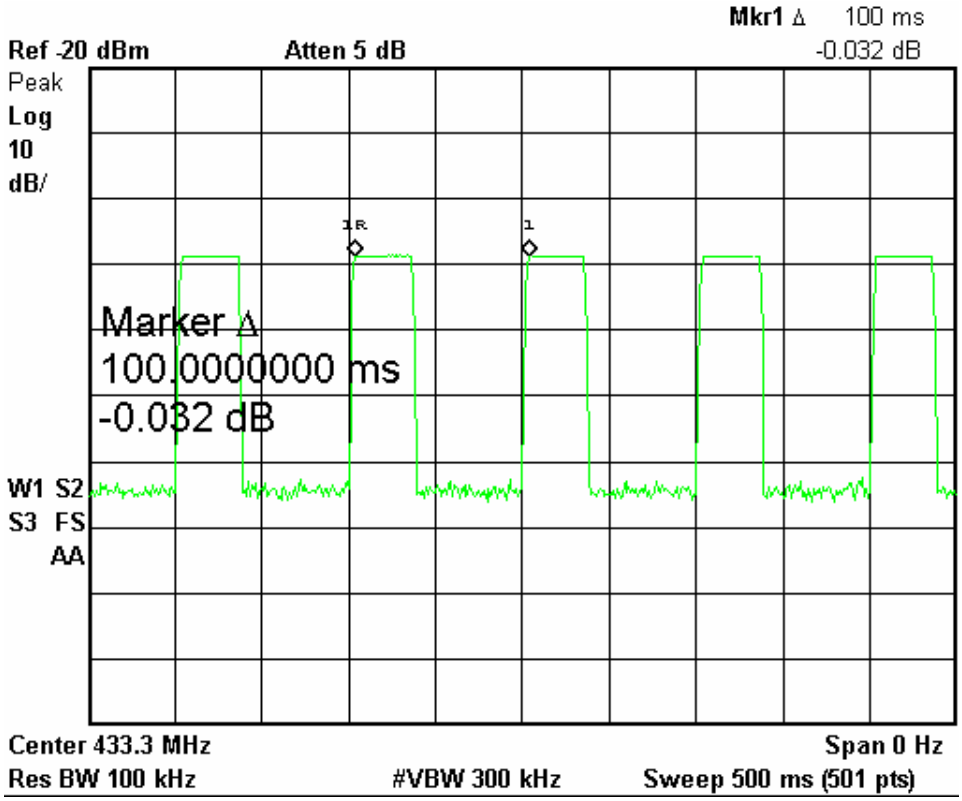
V Polarization, PK

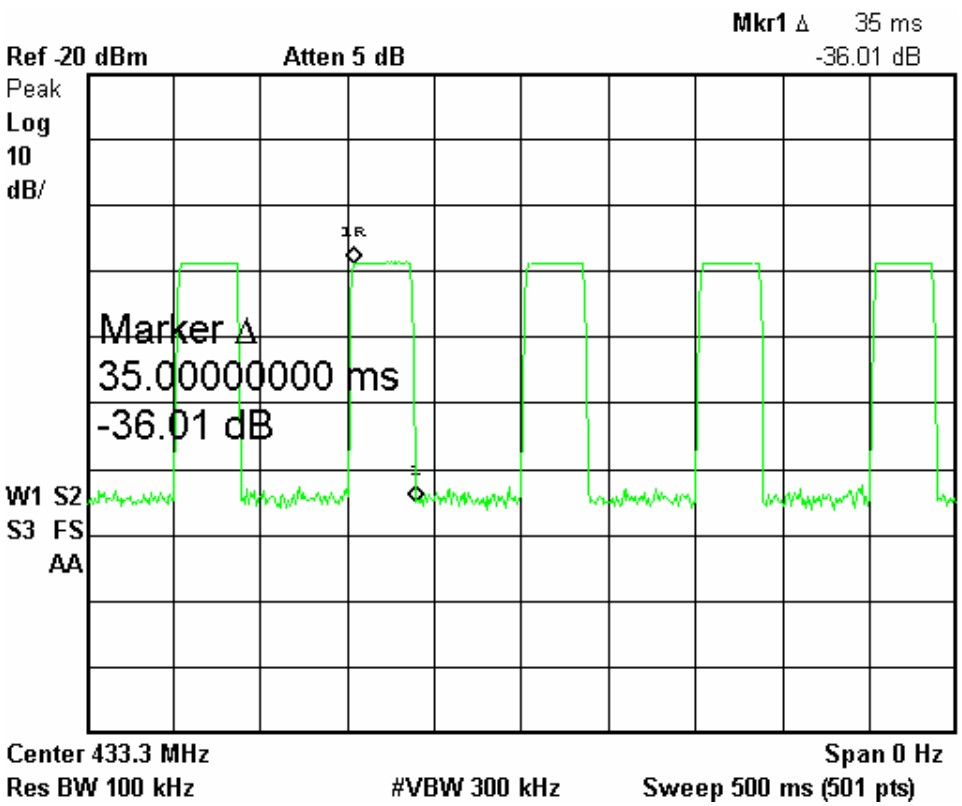


H Polarization, PK



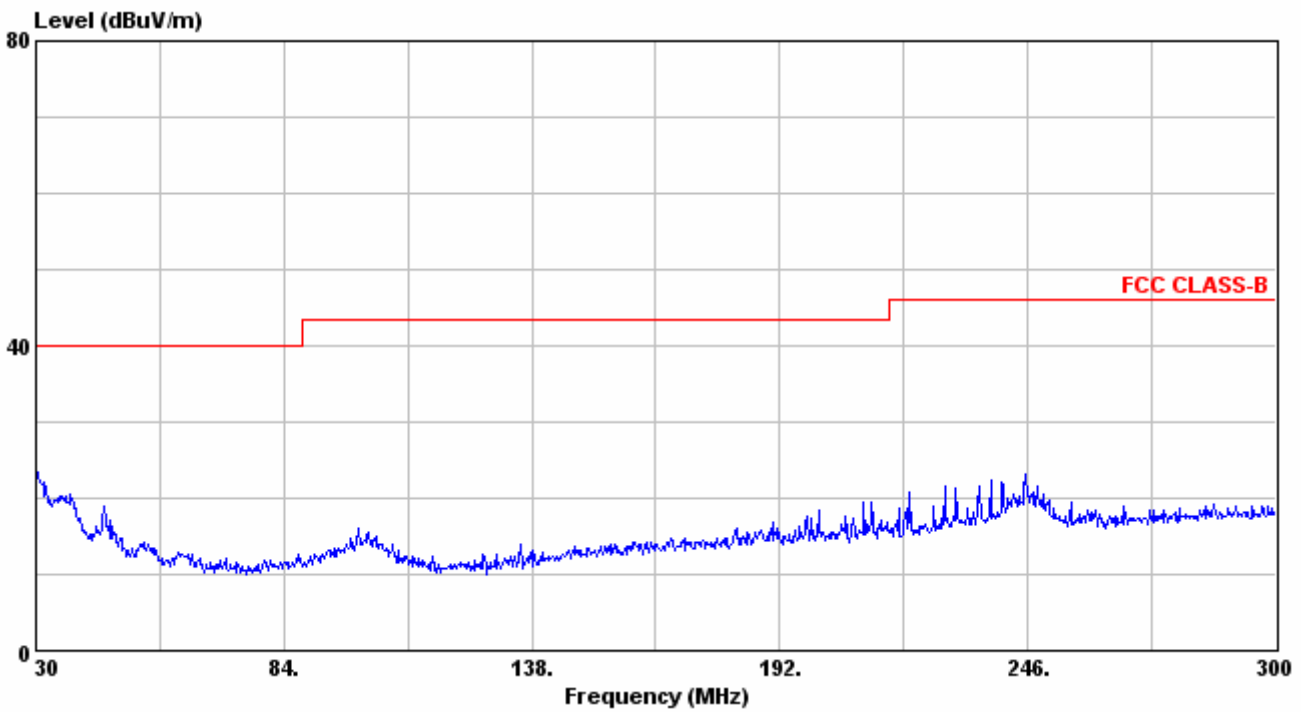
Duty cycle


Mkr1 Δ 100 ms
Ref -20 dBm
Atten 5 dB
-0.032 dB
Peak
Log
10
dB/
Marker Δ
100.0000000 ms
-0.032 dB
W1 S2
S3 FS
AA
Center 433.3 MHz
Span 0 Hz
Res BW 100 kHz
#VBW 300 kHz
Sweep 500 ms (501 pts)


Mkr1 Δ 35 ms
Ref -20 dBm
Atten 5 dB
-36.01 dB
Peak
Log
10
dB/
Marker Δ
35.00000000 ms
-36.01 dB
W1 S2
S3 FS
AA
Center 433.3 MHz
Span 0 Hz
Res BW 100 kHz
#VBW 300 kHz
Sweep 500 ms (501 pts)

Radiated Emission Measurement below 1000MHz

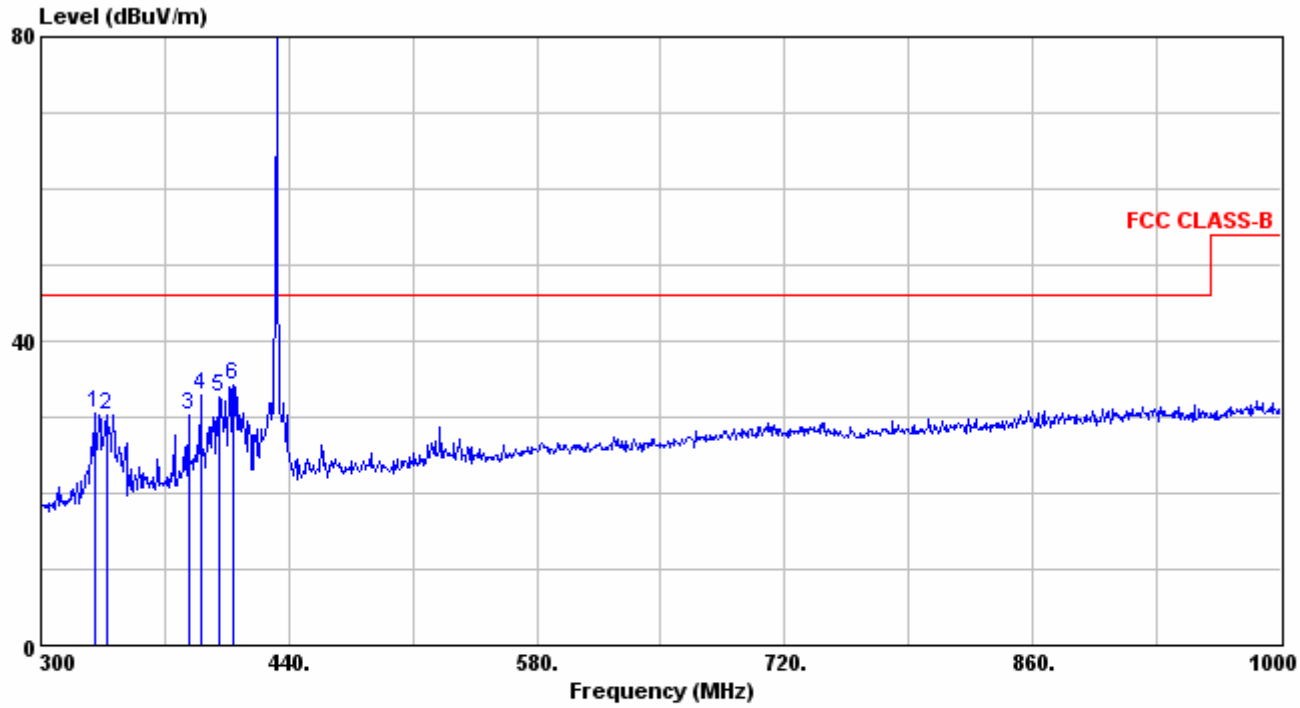
Test Mode	**: EUT 1, Continuous Transmitting**		
Test Distance	: 3m	**Tester**	: Bill
Polarization	: Vertical	**Frequency Range**	: 30MHz~300MHz



Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode	**: EUT 1, Continuous Transmitting**		
Test Distance	**:** 3m	**Tester**	**:** Bill
Polarization	**:** Vertical	**Frequency Range**	**:** 300MHz~1GHz

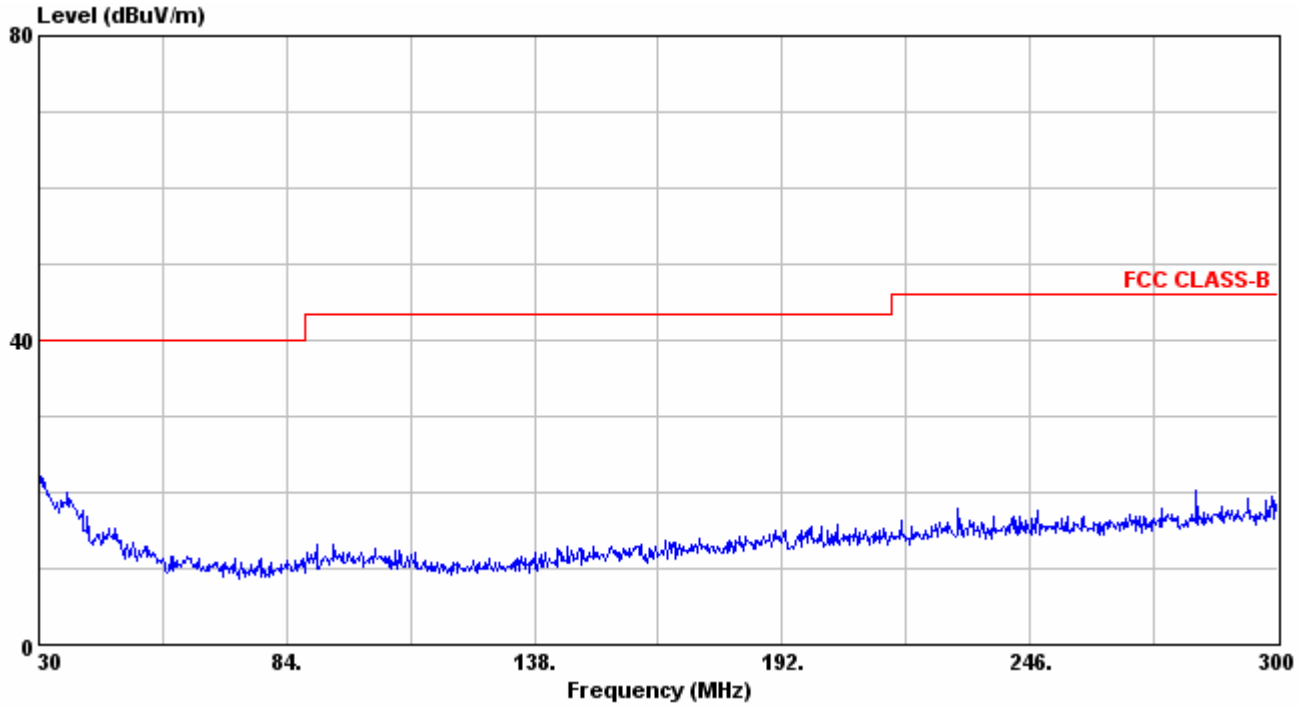


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	330.100	30.61	-13.41	44.02	46.00	-15.39	---	---	VERTICAL	
2 !	337.100	30.35	-13.10	43.45	46.00	-15.65	---	---	VERTICAL	
3 !	383.300	30.38	-11.87	42.25	46.00	-15.62	---	---	VERTICAL	
4 !	390.300	32.99	-11.65	44.64	46.00	-13.01	---	---	VERTICAL	
5 !	400.800	32.59	-11.34	43.93	46.00	-13.41	---	---	VERTICAL	
6 !	408.500	34.23	-11.21	45.44	46.00	-11.77	---	---	VERTICAL	

Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

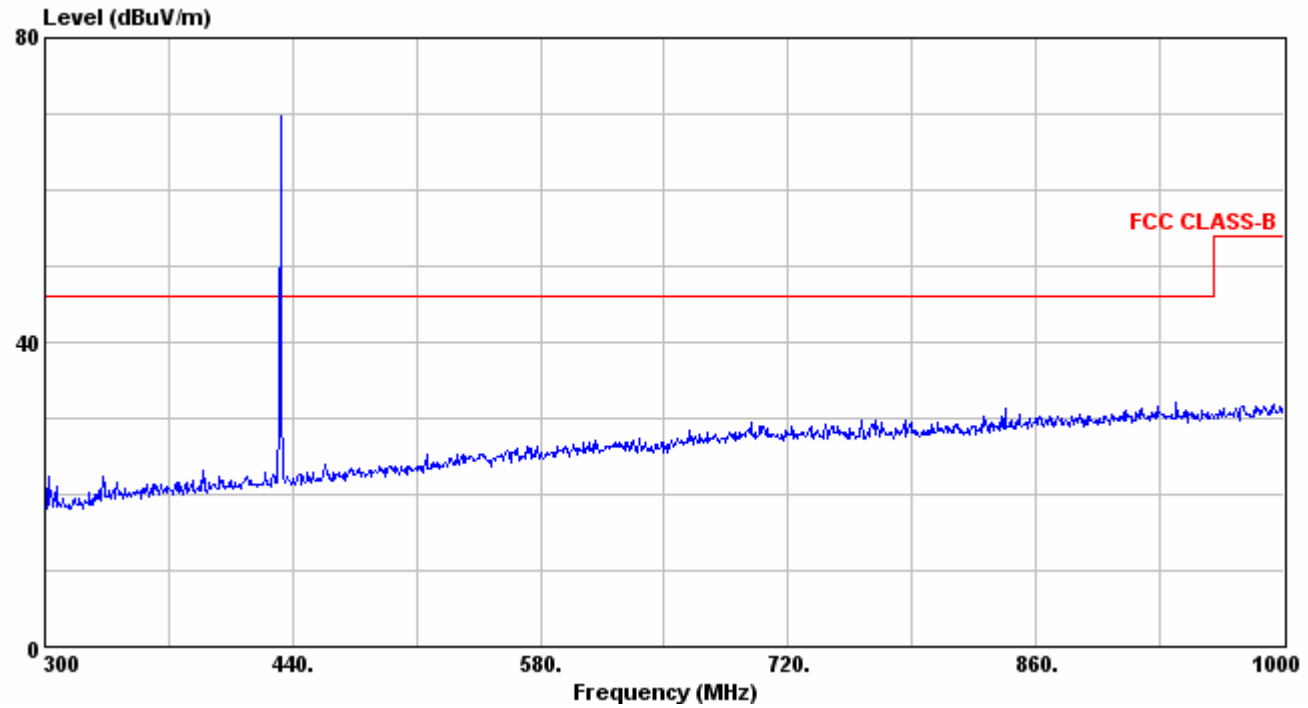
Test Mode	**: EUT 1, Continuous Transmitting**		
Test Distance	: 3m	**Tester**	: Bill
Polarization	: Horizontal	**Frequency Range**	: 30MHz~300MHz



Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode	**: EUT 1, Continuous Transmitting**		
Test Distance	: 3m	**Tester**	: Bill
Polarization	: Horizontal	**Frequency Range**	: 300MHz~1GHz



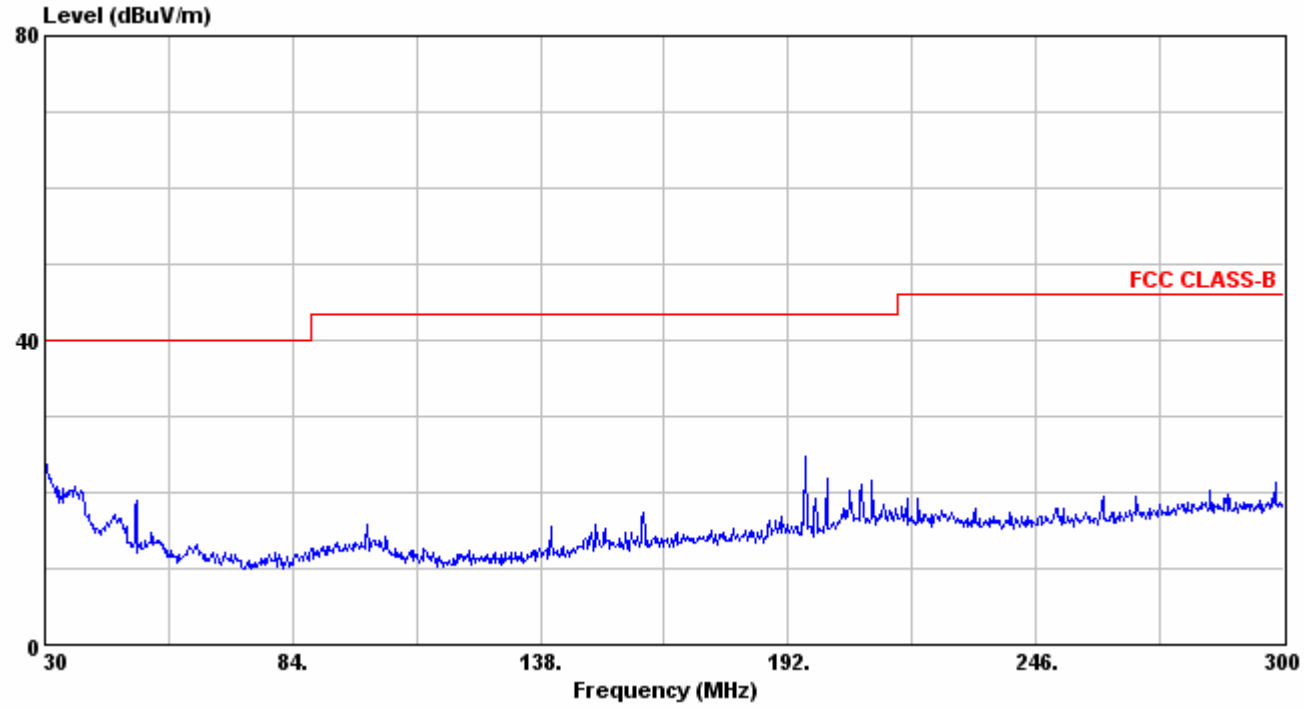
Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Model : **EUT 2, Continuous Transmitting**

Test Distance : 3m **Tester** : Bill

Antenna Polarization: Vertical **Frequency Range** : 30MHz~300MHz



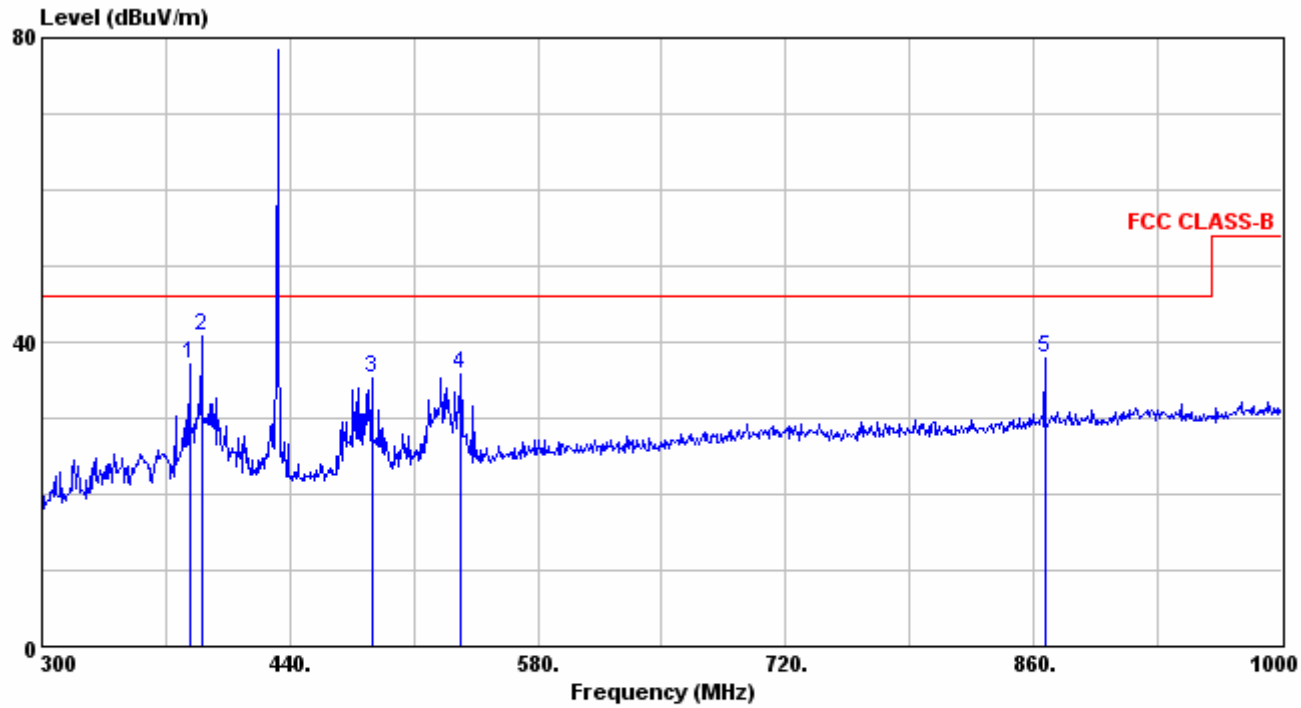
Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Model : **EUT 2, Continuous Transmitting**

Test Distance : 3m **Tester** : Bill

Antenna Polarization: Vertical **Frequency Range** : 300MHz~1GHz

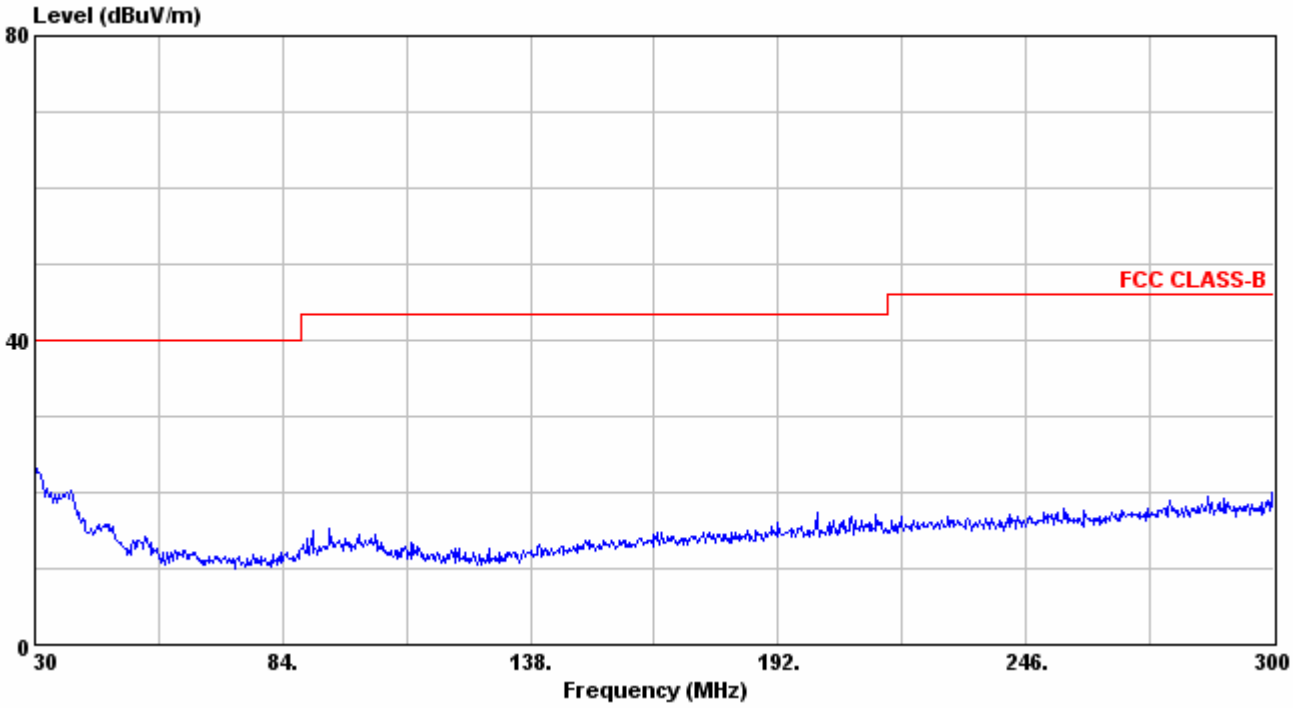


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	383.300	37.14	-11.87	49.01	46.00	-8.86	---	---	VERTICAL	
2 !	390.300	40.67	-11.65	52.32	46.00	-5.33	---	---	VERTICAL	
3 !	486.200	35.15	-9.61	44.76	46.00	-10.85	---	---	VERTICAL	
4 !	536.600	35.83	-8.11	43.94	46.00	-10.17	---	---	VERTICAL	
5 !	866.300	37.89	-2.85	40.74	46.00	-8.11	---	---	VERTICAL	

Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

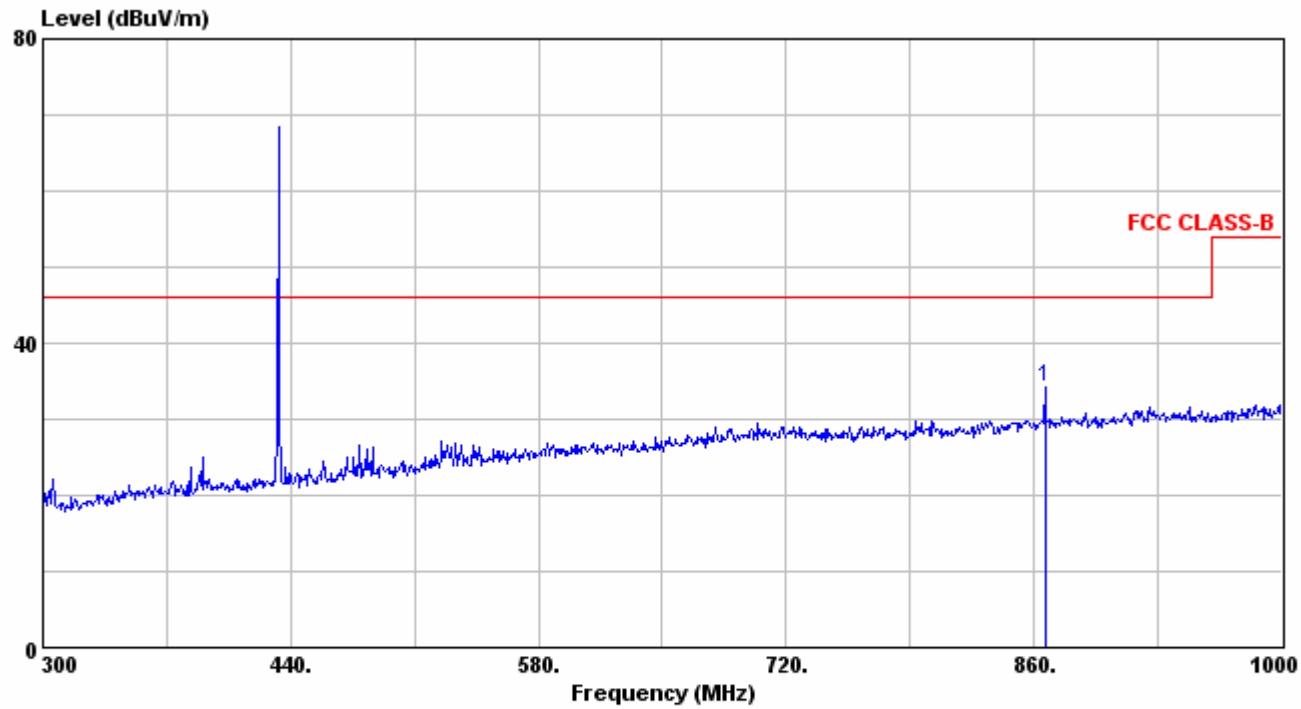
Test Mode	**: EUT 2, Continuous Transmitting**		
Test Distance	: 3m	**Tester**	: Bill
Polarization	: Horizontal	**Frequency Range**	: 30MHz~300MHz



Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode	**: EUT 2, Continuous Transmitting**				
Test Distance	: 3m		**Tester**	:	Bill
Polarization	: Horizontal		**Frequency Range**	:	300MHz~1GHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	866.300	34.24	-2.85	37.09	46.00	-11.76	---	---	HORIZONTAL	

Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

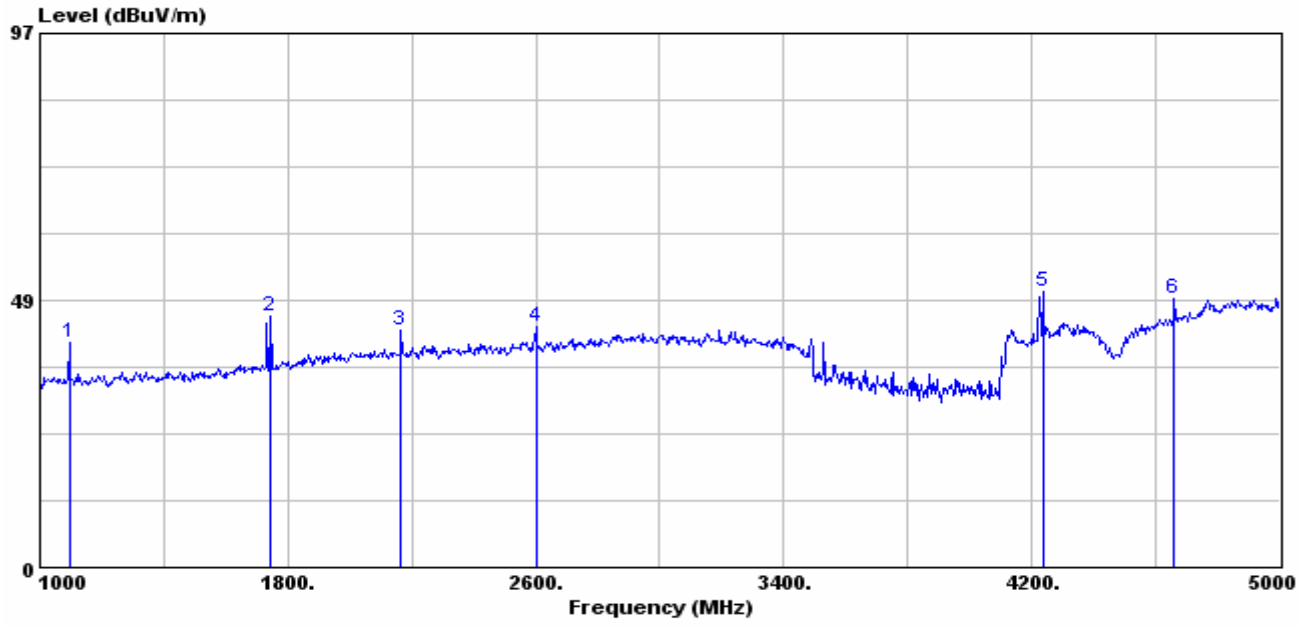
Radiated Emission Measurement above 1000MHz

Test Model : **EUT 1, Continuous Transmitting**
Test Distance : 3m **Tester** : Bill
Antenna Polarization : Vertical **Frequency Range** :1GHz~5GHz

	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
1	1096	48.12	*	-7.15	40.97	*	80.80	60.80	39.83	*
2	1744	49.44	*	-3.91	45.53	*	80.80	60.80	35.27	*
3	2164	44.41	*	-1.33	43.08	*	80.80	60.80	37.72	*
4	2600	43.97	*	-0.31	43.66	*	80.80	60.80	37.14	*
5	4236	47.70	*	2.43	50.13	*	80.80	60.80	30.67	*
6	4660	44.61	*	4.34	48.95	*	80.80	60.80	31.85	*

Note:

1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier.
3. Margin (dB) = Limit–Emission Level.
4. "*": The emission is too low to be measured.



Test Model **: EUT 1, Continuous Transmitting**

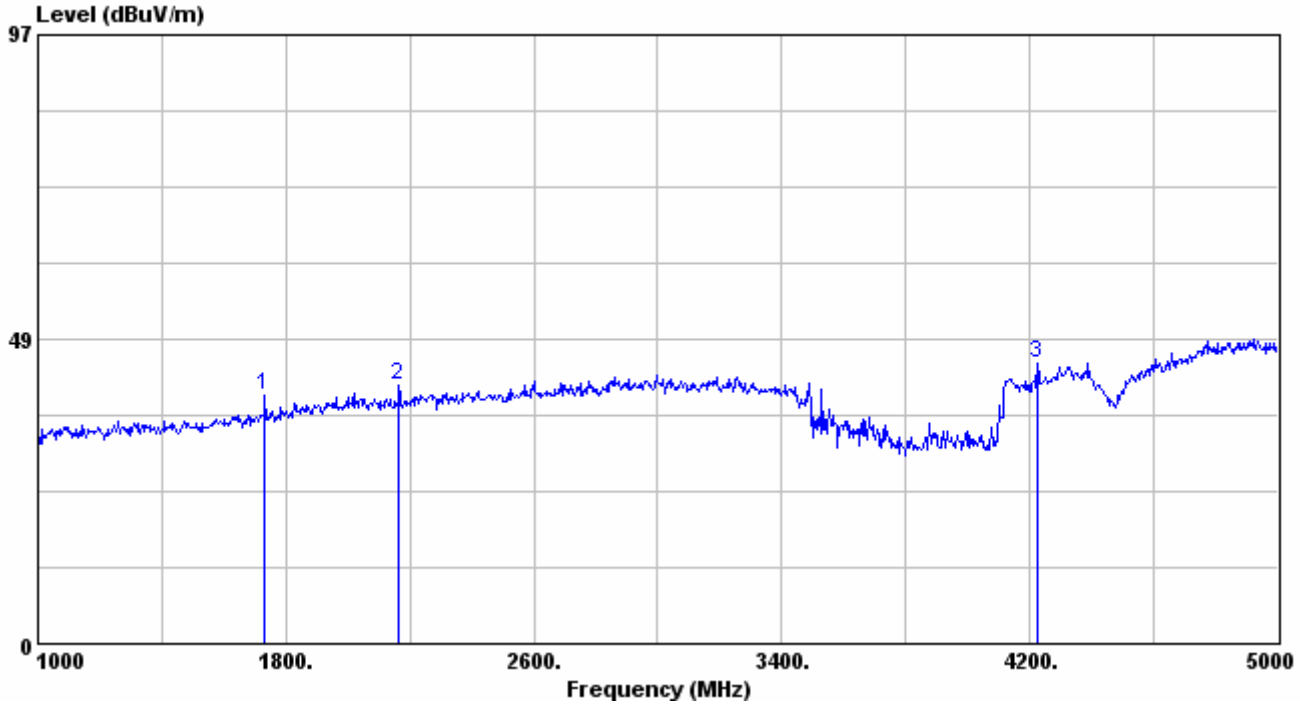
Test Distance **:** 3m **Tester** **:** Bill

Antenna Polarization **:** Horizontal **Frequency Range :**1GHz~5GHz

	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
1	1732	43.66	*	-4.01	39.65	*	80.80	60.80	41.15	*
2	2164	42.38	*	-1.33	41.05	*	80.80	60.80	39.75	*
3	4224	42.37	*	2.39	44.76	*	80.80	60.80	36.04	*

Note:

1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier.
3. Margin (dB) = Limit–Emission Level.
4. "*": The emission is too low to be measured.

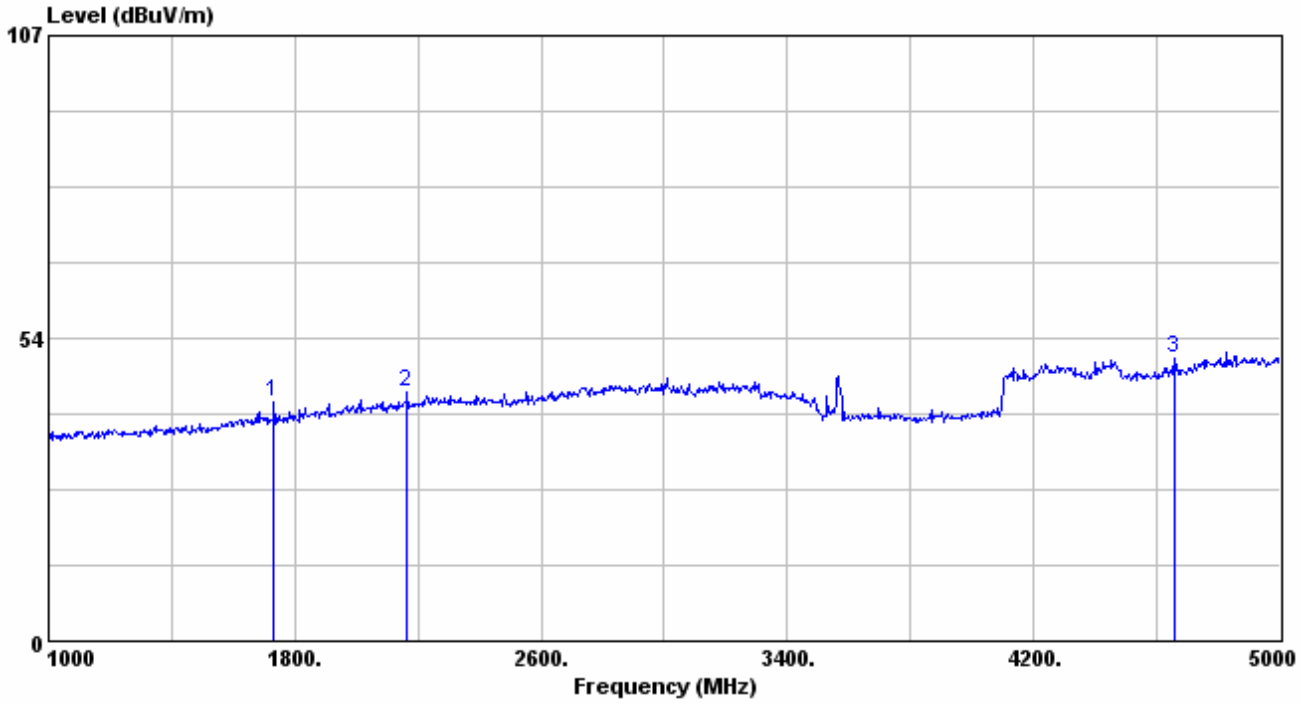


Test Model : **EUT 2, Continuous Transmitting**
Test Distance : 3m **Tester** : Bill
Antenna Polarization : Vertical **Frequency Range** :1GHz~5GHz

	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
1	1732	46.20	*	-4.01	42.19	*	80.80	60.80	38.61	*
2	2164	45.48	*	-1.33	44.15	*	80.80	60.80	36.65	*
3	4660	45.54	*	4.34	49.88	*	80.80	60.80	30.92	*

Note:

1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier.
3. Margin (dB) = Limit–Emission Level.
4. "*": The emission is too low to be measured.

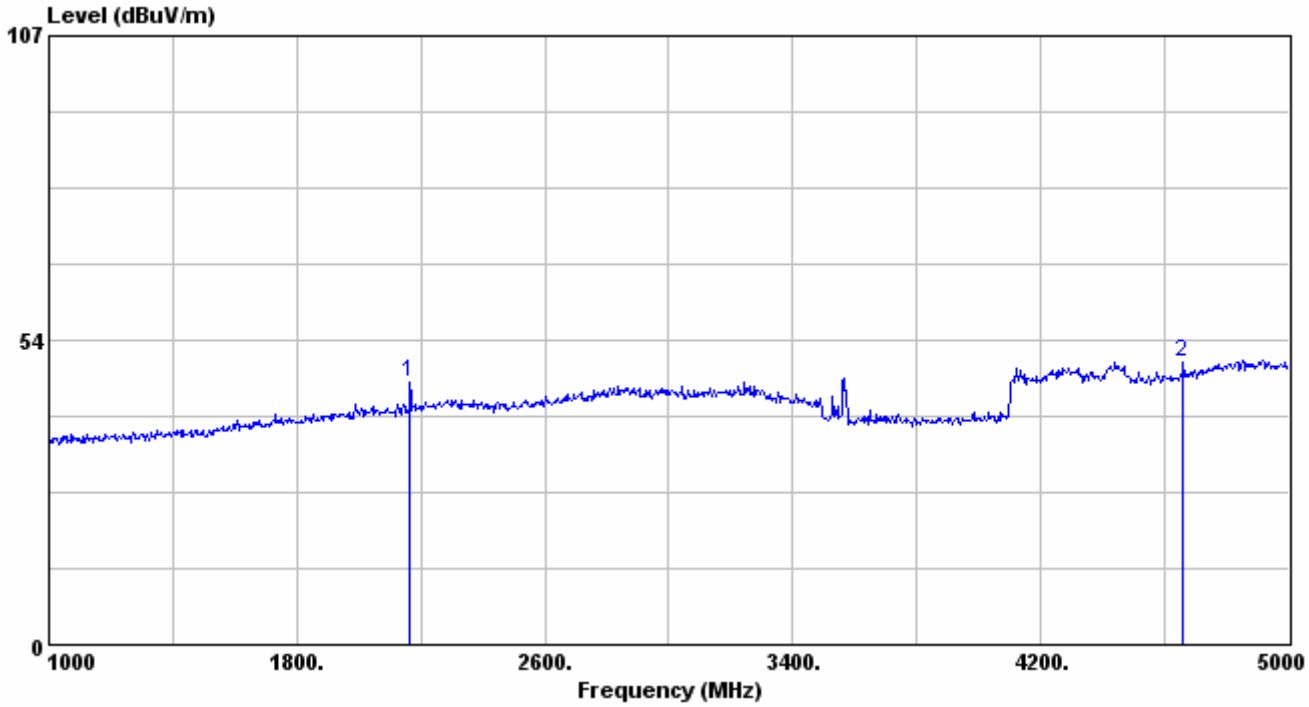


Test Model : **EUT 2, Continuous Transmitting**
Test Distance : 3m **Tester** : Bill
Antenna Polarization : Horizontal **Frequency Range** :1GHz~5GHz

	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
1	2164	47.38	*	-1.33	46.05	*	80.80	60.80	34.75	*
2	4660	45.18	*	4.34	49.52	*	80.80	60.80	31.28	*

Note:

1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier.
3. Margin (dB) = Limit–Emission Level.
4. "*": The emission is too low to be measured.



3 Bandwidth

Test Result: Pass

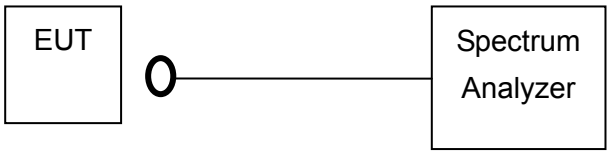
3.1 Applied standard

According to 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. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

3.2 Measurement Procedure

1. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
2. The Transmitter output of EUT was connected to the spectrum analyzer.
3. Measure the 20dB bandwidth and compare with the required limit.

3.3 Test configuration



3.4 Test Instruments

Test Site and Equipment	Manufacturer	Model No./Serial No.	Last Calibration Data	Calibration Due Data
Shielded Room	ETS.LINDGREN	TR4/ **15353-E**	NCR	NCR
Spectrum Analyzer	Advantest	R3132/ **103082587**	Sep. 7,2005	Sept. 7, 2006

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Instrument Setting

RBW	VBW	Span	Detector	Comment
100Hz	300Hz	Peak	Maxhold	

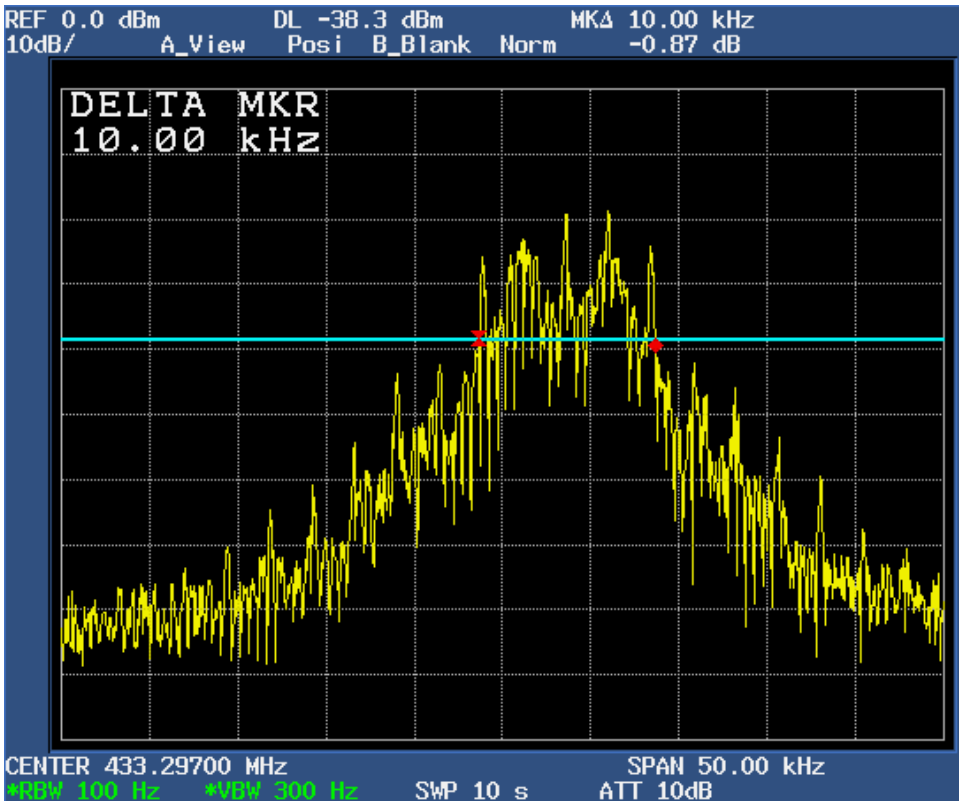
Climatic Condition

Ambient Temperature：28°C ; Relative Humidity : 64%

3.5 Test Data

Test Mode : EUT 1

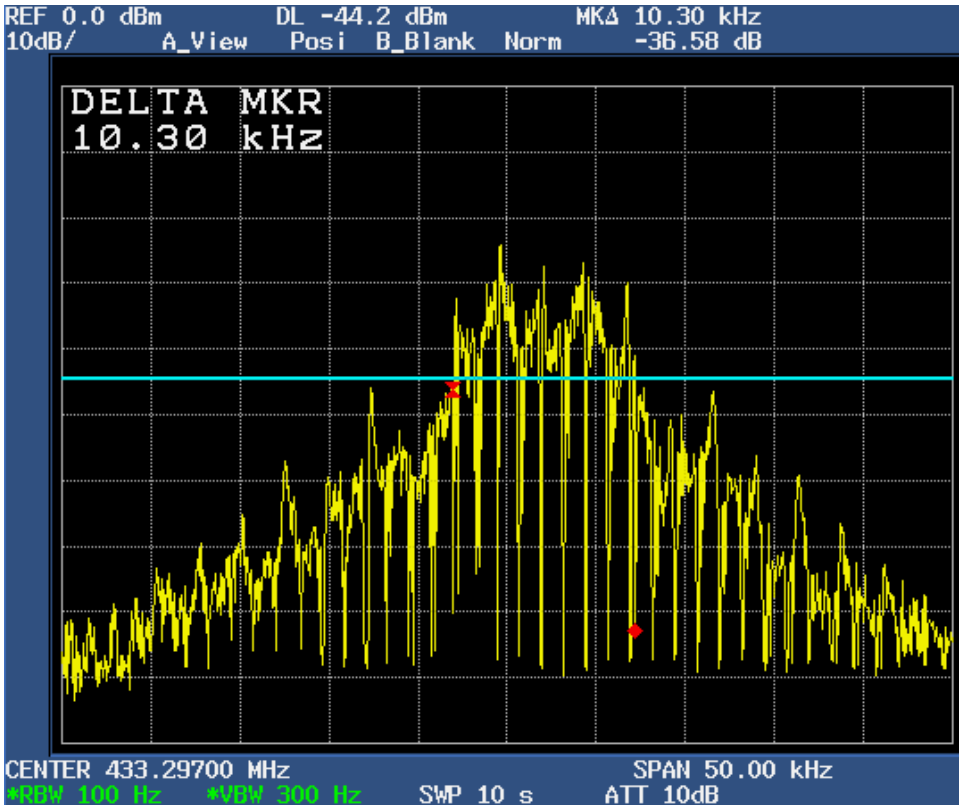
Emission Freq. : 433.30MHz **Tester** : Bill



Measured 20dB bandwidth is 10 kHz < 433.30MHzX0.25% = 1083.25kHz.

Test Mode : EUT 2

Emission Freq. : 433.30MHz **Tester : Bill**



Measured 20dB bandwidth is 10.3 kHz < 433.30MHzX0.25% = 1083.25kHz.

4 Dwell Time

Test Result: Pass

4.1 Applied standard

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

4.2 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. The Transmitter output of EUT was connected to the spectrum analyzer through an attenuator.

c. Measure the dwell time and compare with the required limit.

4.3 Test configuration

4.4 Test Instruments

Test Site and Equipment	Manufacturer	Model No./Serial No.	Last Calibration Data	Calibration Due Data
Shielded Room	ETS.LINDGREN	TR4/ **15353-E**	NCR	NCR
Spectrum Analyzer	Advantest	R3132/ **103082587**	Sep. 7,2005	Sept. 7, 2006

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Instrument Setting

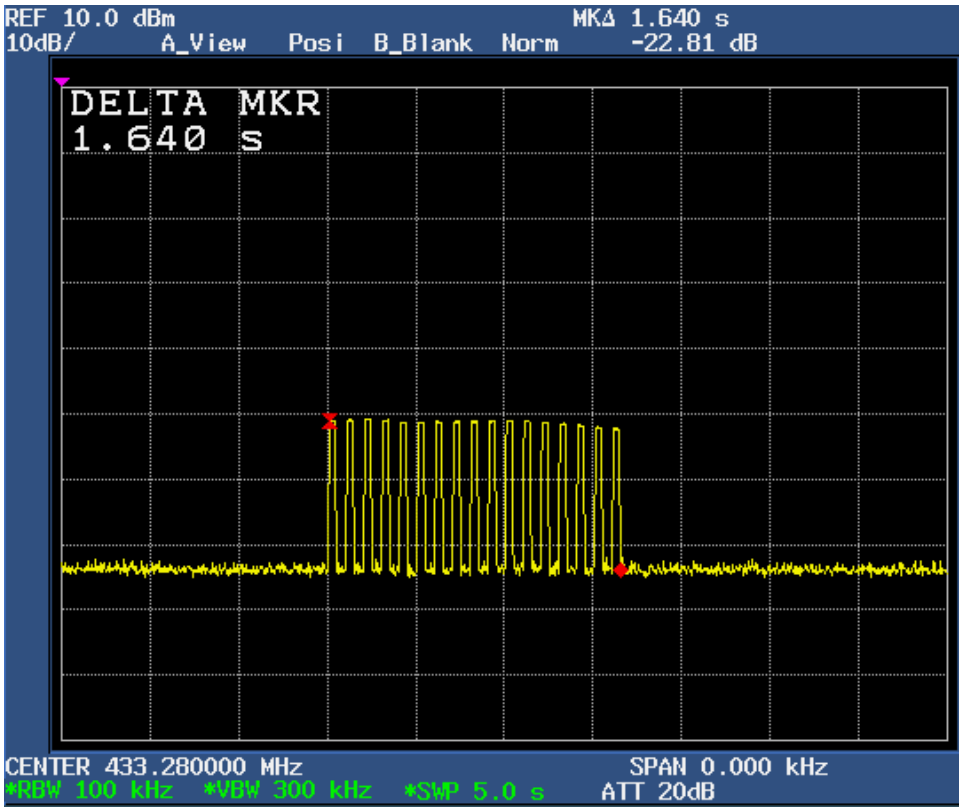
RBW	VBW	Detector	Trace	Comment
100KHz	3MHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：28°C ; Relative Humidity : 64%

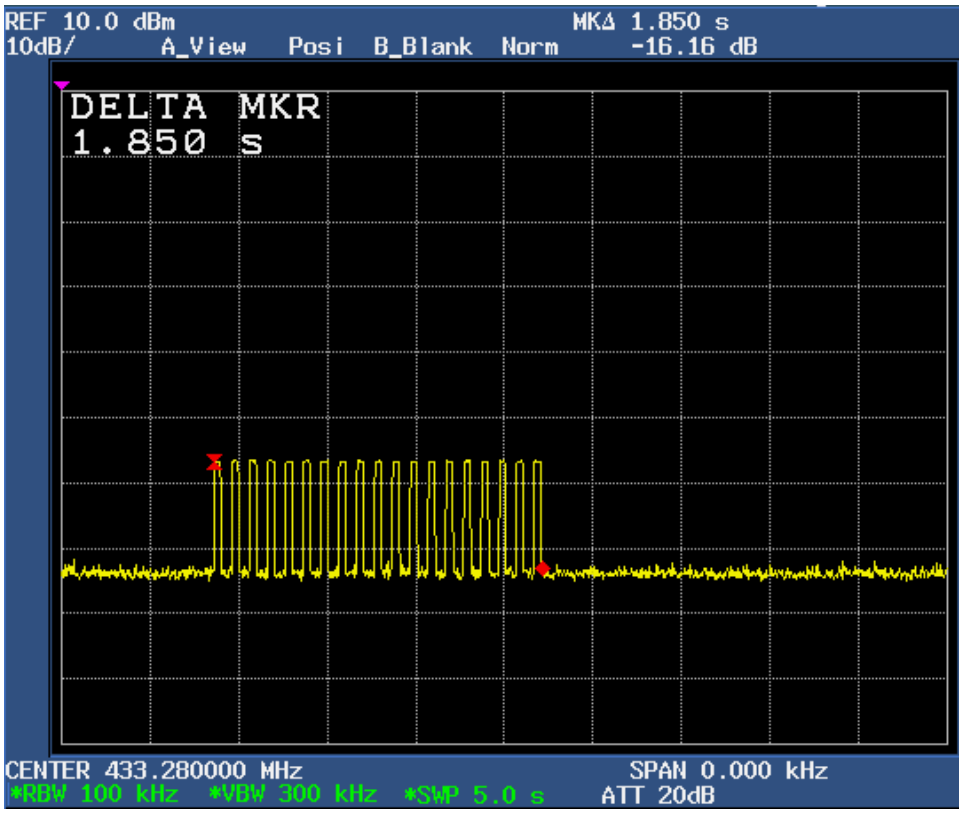
4.5 Test Data

Test Mode **: EUT 1** **Tester** **:** Bill



The transmitter will automatically deactivate within 1.64 second after release the button of the transmitter.

Test Mode : EUT 2 **Tester : Bill**



The transmitter will automatically deactivate within 1.85 second after release the button of the transmitter.

5 Antenna Requirement

5.1 Applied standard

According to 15.247(4), The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi

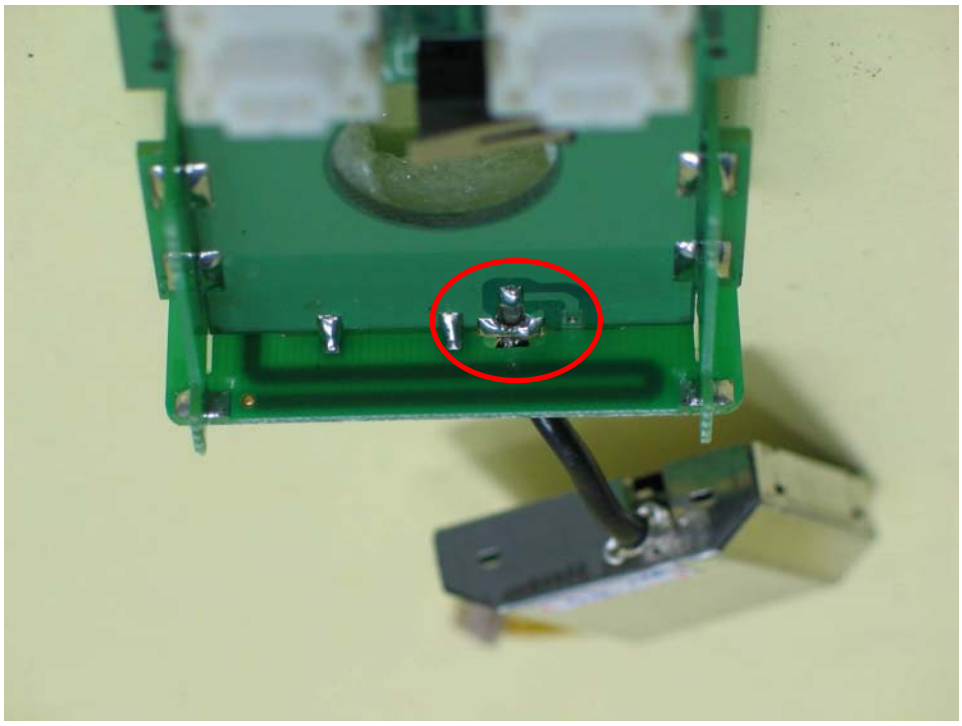
5.2 Antenna Information

This antenna's relative information as follow:

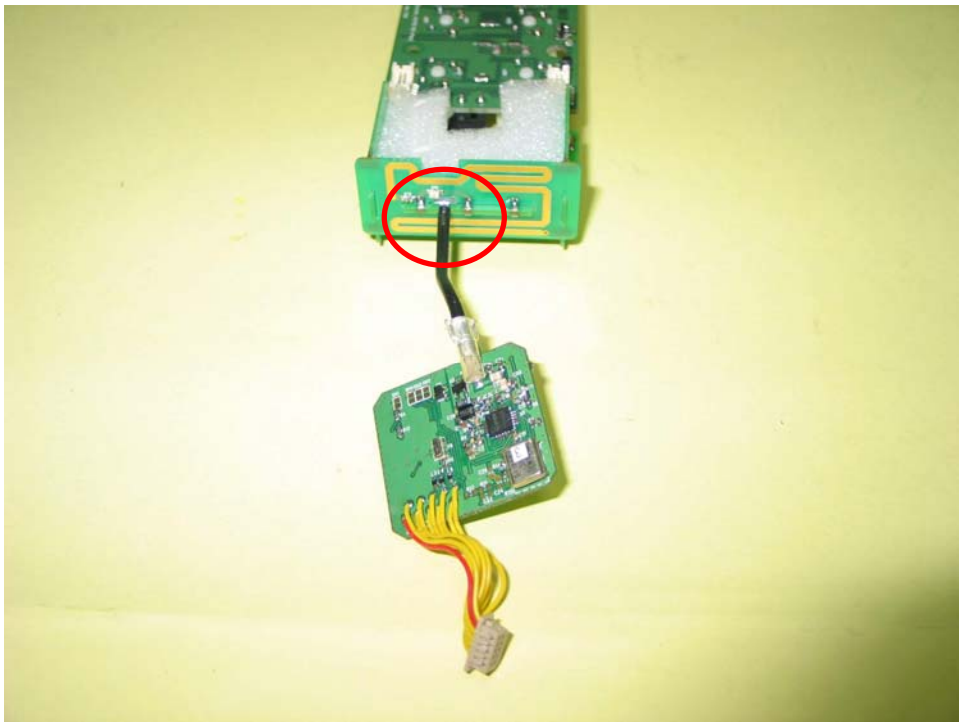
Brand	Model	Frequency Range (MHz)	Gain (dBi)	Comment
NA	NA	433.075~434.050	0	

Antenna Position:

EUT 1



EUT 2



5.3 Result

Gain of the antenn is less than 6dBi.