FCC Test Report

E.U.T.	:	Wireless Window Sensor
Trade Name	:	Doberman
Model	:	SE-0107
FCC ID	:	S88-SE0107
IC ID	:	5835A-SE0107
Report No.	:	RF-A42-0504-067
Date of Report	:	April 27, 2005

Prepared for

Doberman Security Products, Inc.

11 Rhode Island, Irvine, CA, 92606, USA

Prepared by

Central Research Technology Co.

EMC Test Laboratory

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Total : 27 Pages

Certification of Compliance

E.U.T.	**:** Wireless Window Sensor
Trade Name	**:** Doberman
Model	**:** SE-0107
FCC ID	**:** S88-SE0107
IC ID	**:** 5835A-SE0107
Manufacturer	**:** Wellmike Enterprise Co., Ltd.
Applicant	**:** Doberman Security Products, Inc.
Address	**:** 11 Rhode Island, Irvine, CA, 92606, USA
Arrival of Sample(s)	**:** April 22 , 2005
Date of Test	**:** April 25, 2005
Applicable Standards	**:** 47 CFR part 15, Subpart C IC RSS-210 ISSUE 5
Deviation	**:** None
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/RF Engineer)	**DATE :**	Apr. 27, 2005
CHECKED BY	:	Sam Chien (Sam Chien/Technical Manager)	**DATE :**	4. 27. 2005
APPROVED BY	:	J. Y. Shih (Tsun-Yu Shih/Laboratory Head)	**DATE :**	Apr. 27, 2005

Contents

1 General Description

1.1 General Description of EUT

E.U.T.	: Wireless Window Sensor
Model No.	: SE-0107
FCC ID	: S88-SE0107
IC ID	: 5835A-SE0107
Brand	: Doberman
Power in	: DC 12V (Battery)
Test Voltage	: DC 12V (Battery)
Applicant	: Doberman Security Products, Inc.
Manufacturer	: Wellmike Enterprise Co., Ltd.

1.2 Characteristic of E.U.T.

Frequency Range : 315MHz

Function Modulation: ASK

The EUT is used to transmit control command only. Please refer to the user's manual for the details.

1.3 Test Methodology

For this E.U.T., the radiated emissions measurement performed according to the processes illustrated in ANSI C63.4 and other required 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 was used for Radiated test.

1.4 Requirement for Compliance

(1) Radiated Emission Requirement

For intentional device, according to §15.209, the general requirement of the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

Table 3 Limit			
Frequency (MHz)	**Measurement Distance (m)**	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**
30 – 88	3	100	40.0
88 – 216	3	150	43.5
216 – 960	3	200	46.0
960 – 1610	3	500	54.0
above 1610	3	500	54.0

Note 1- The lower limit shall apply at the transition frequency.

(2) Dwell Time

According to 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.

(3) Field Strength of Emissions

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

(4) Emission Bandwidth

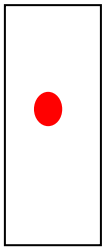
According to 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

(5) Restricted Band

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)
0.090 - 0.110	37.475 - 38.275	1435.0 - 1626.5	8025.0 - 8500.0
[1] 0.490 - 0.510	73.500 - 75.400	1660.0 - 1755.0	9000.0 - 9200.0
2.172 - 2.198	108.00 - 138.00	1805.0 - 1850.0	9300.0 - 9500.0
3.013 - 3.033	149.90 - 150.05	2200.0 - 2300.0	10600 - 12700
4.115 - 4.198	156.70 - 156.90	2310.0 - 2390.0	13250 - 13400
5.670 - 5.690	162.01 - 167.17	2483.5 - 2500.0	14470 - 14500
6.200 - 6.300	167.72 - 173.20	2655.0 - 2900.0	15350 - 16200
8.230 - 8.400	240.00 - 285.00	3260.0 - 3267.0	17700 - 21400
12.265 - 12.600	322.00 - 335.40	3332.0 - 3339.0	22010 - 23120
13.340 - 13.430	399.90 - 410.00	3345.8 - 3358.0	23600 - 24000
14.965 - 15.020	608.00 - 614.00	3500.0 - 4400.0	31200 - 31800
16.700 - 16.755	825.00 - 915.00	4500.0 - 5250.0	36430 - 36500
19.965 - 20.020	935.00 - 1240.0	5350.0 - 5460.0	38600 以上
25.500 - 25.700	1300.0 - 1427.0	7250.0 - 7750.0	

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

1.5 Layout of Setup



(Transmitter)

Connecting Cables :

No.	Cable	Length	Shielded	Core	Shielded Backshell	Supported by lab.	Note
N/A	*	*	*	*	*	*	*

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.

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**
Dwell Time	2%
Radiated Emission: (below 1GHz)	Horizontal 4.06dB；Vertical 4.08dB
Radiated Emission: (above 1GHz)	Horizontal 4.56dB；Vertical 4.62dB
Bandwidth	4.56 Hz

2 Dwell Time

Result: Pass

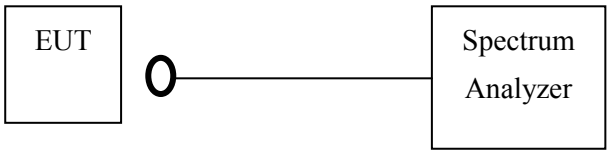
2.1 Applied standard

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.

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. The Transmitter output of EUT was connected to the spectrum analyzer through an attenuator.
c. Set the the spectrum analyzer into zero span and performs the dwell time measurement.
d. Record the dwell time and compare with the required limit.

2.3 Test configuration



2.4 Test Instruments

Test Site and Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Shielded Room	ETS.LINDGREN	TR4/15353-F	NCR
Spectrum Analyzer	R&S	FSP40/100031	2004/6/8

Note:

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Instrument Setting

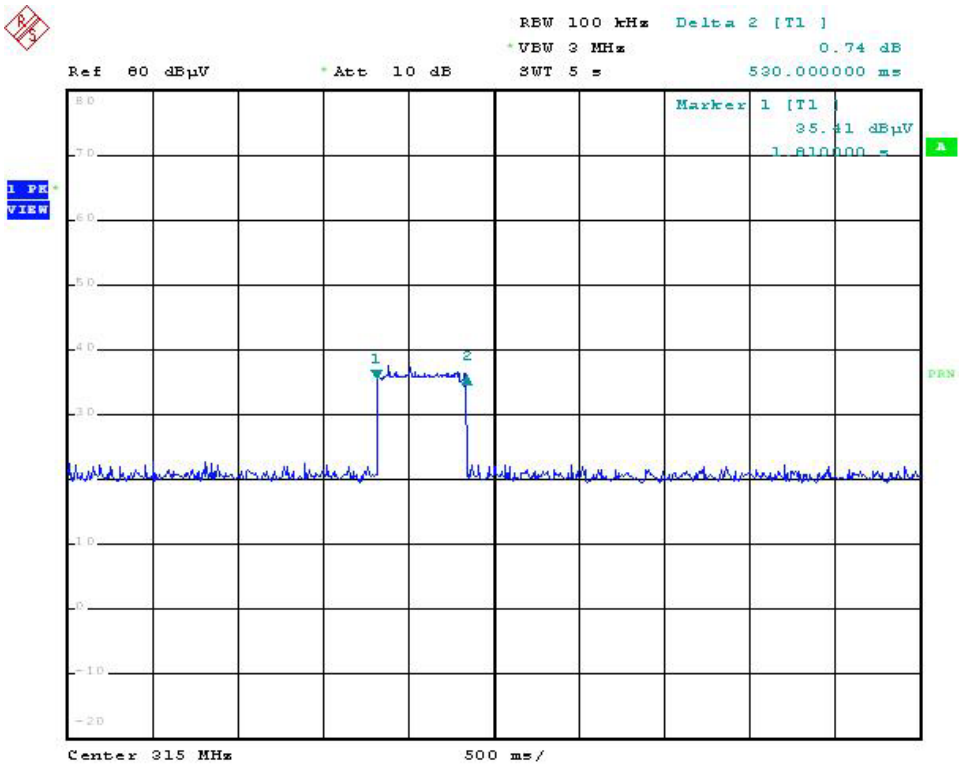
RBW	VBW	Detector	Trace	Comment
100KHz	3MHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：24°C; Relative Humidity : 55%

2.5 Test Data

Test Site : TR4 **Tester** : Bill



The transmitter will automatically deactivate within 530 minisecond after release the button of the transmitter.

3 Radiated Emission

Result: Pass

3.1 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

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.

3.2 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. 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 mm above the reference ground plane in the semi-anechoic chamber.

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

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

e. 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 the fundamental frequency and frequencies associated with higher emission levels and record them.

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

g. Finely tune the antenna and turntable around the recorded position of each frequency found from step f.

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.

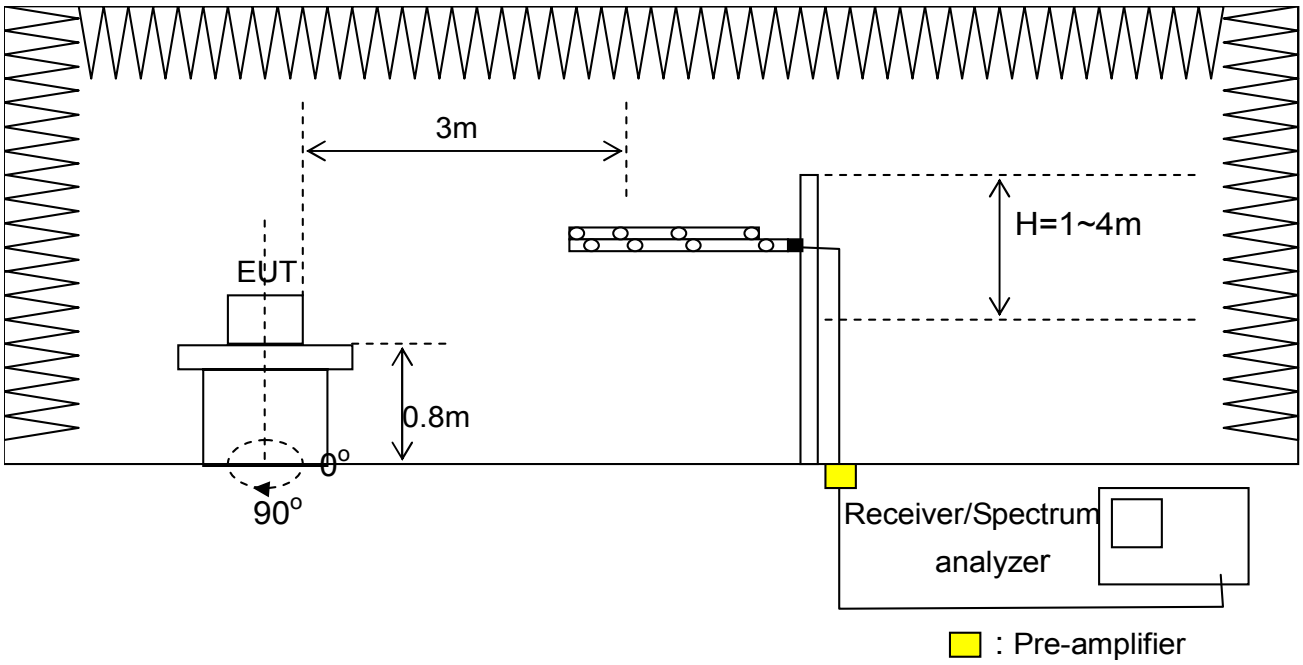
j. Record the frequency and polarization of the receiving antenna and compare the maximum level with the required limit.

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

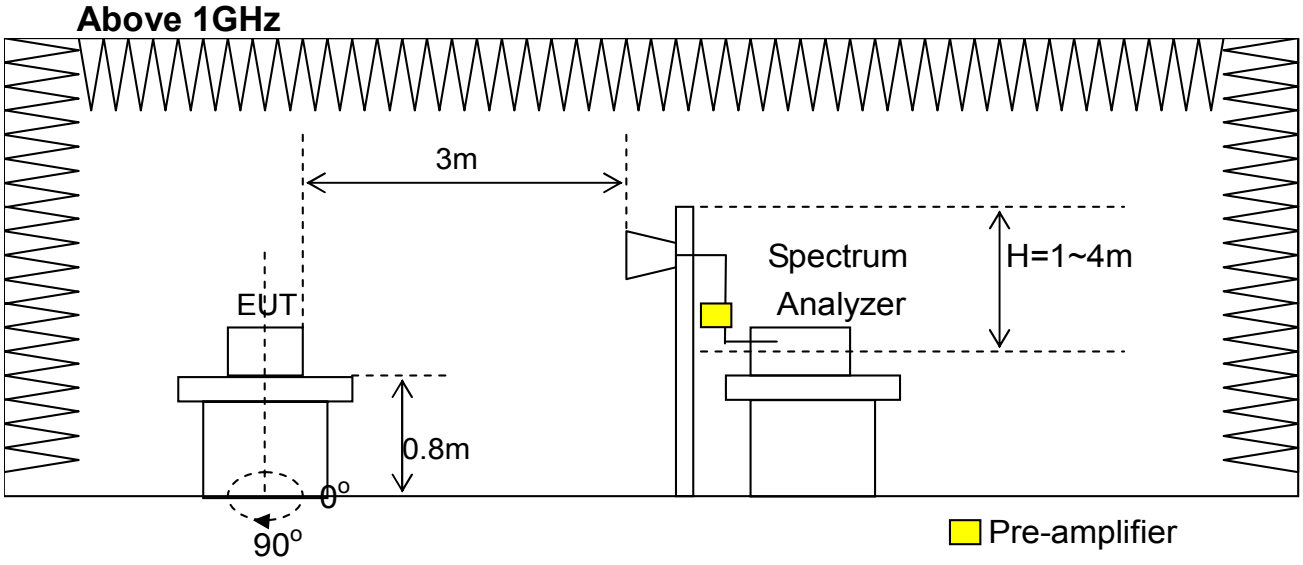
l. If the peak emission level measured from step e. is 10dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate Q.P. value will be measured and presented.

3.3 Test configuration

30MHz ~ 1GHz



Above 1GHz



3.4 Test Instruments

Test Site and Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Semi-anechoic Chamber	ETS.LINDGREN	TR1/17627-B	2005/4/12
Test Receiver	R&S	ESCS30/ 836858/020	2004/7/21
Spectrum Analyzer	R&S	FSP40/100031	2004/6/8
Antenna	R&S	HL562/ 360543/006	2004/5/27
Antenna	R&S	HF906/ 359287/001	2005/3/22
Pre-amplifier	MITEQ	JS4-00101800-28-5A/ 742229	2004/6/9
Pre-amplifier	Mini Circuit	ZKL-2/ 001	2005/4/11

Note：

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required

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：24°C; Relative Humidity ：55%

3.5 Test Data

Field Strength of Fundament

Test Distance : 3m **Tester** : Hata
Worse Case Mode : Z-axis

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
314.998	V	67.15	60.76	-15.46	51.69	45.3	95.62	75.62	43.93	30.32
314.996	H	60.62	54.23	-15.46	45.16	38.77	95.62	75.62	50.46	36.85

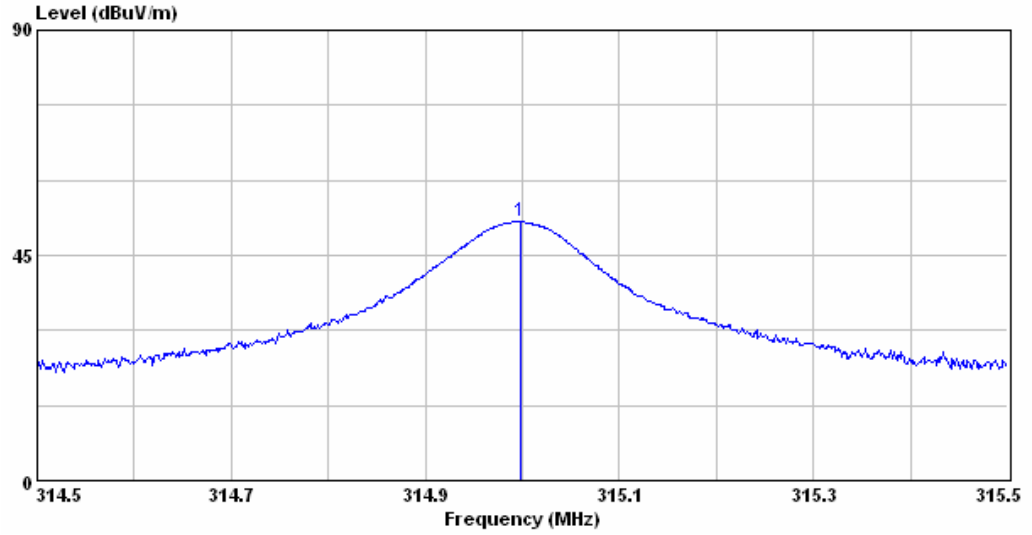
Note：

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:

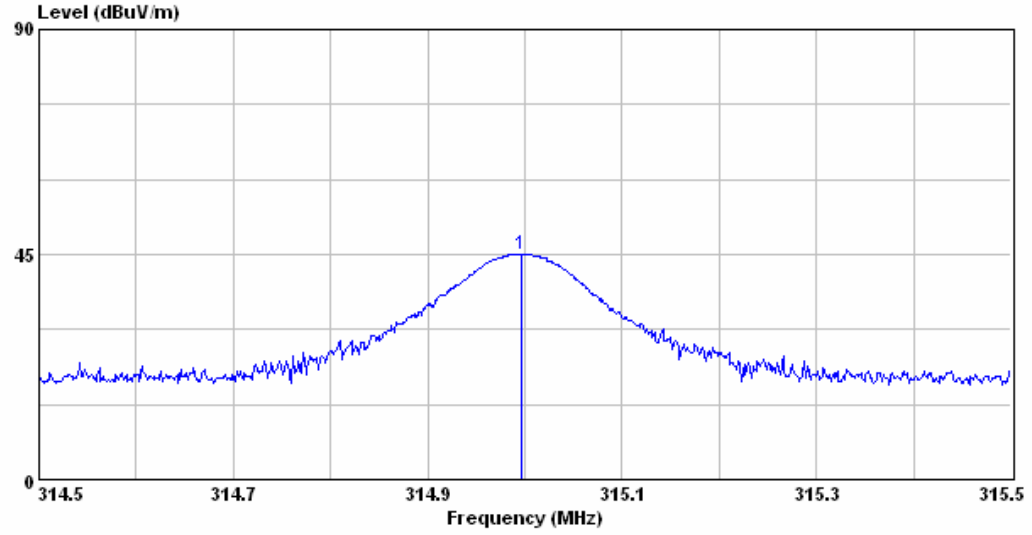
   20log(Duty cycle) = 20log $\frac{0.36\times 5 + 0.84\times 6 + 0.52\times 1}{15.36}$ = -6.39dB

   please see page 18,19 for plotted duty cycle.

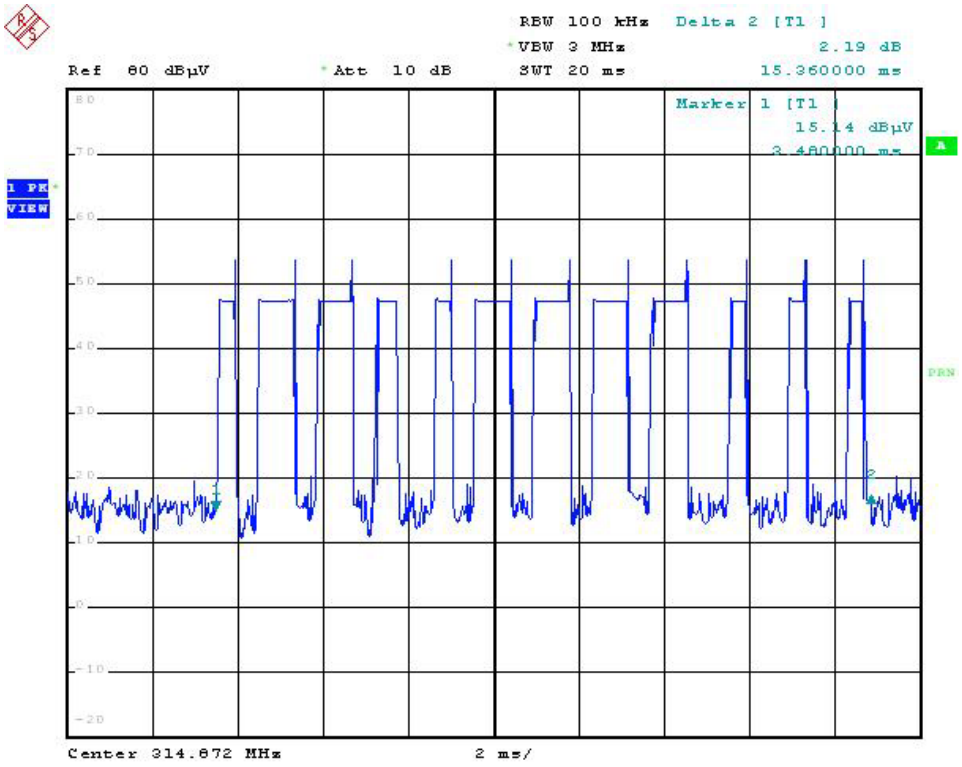
V Polarization, PK

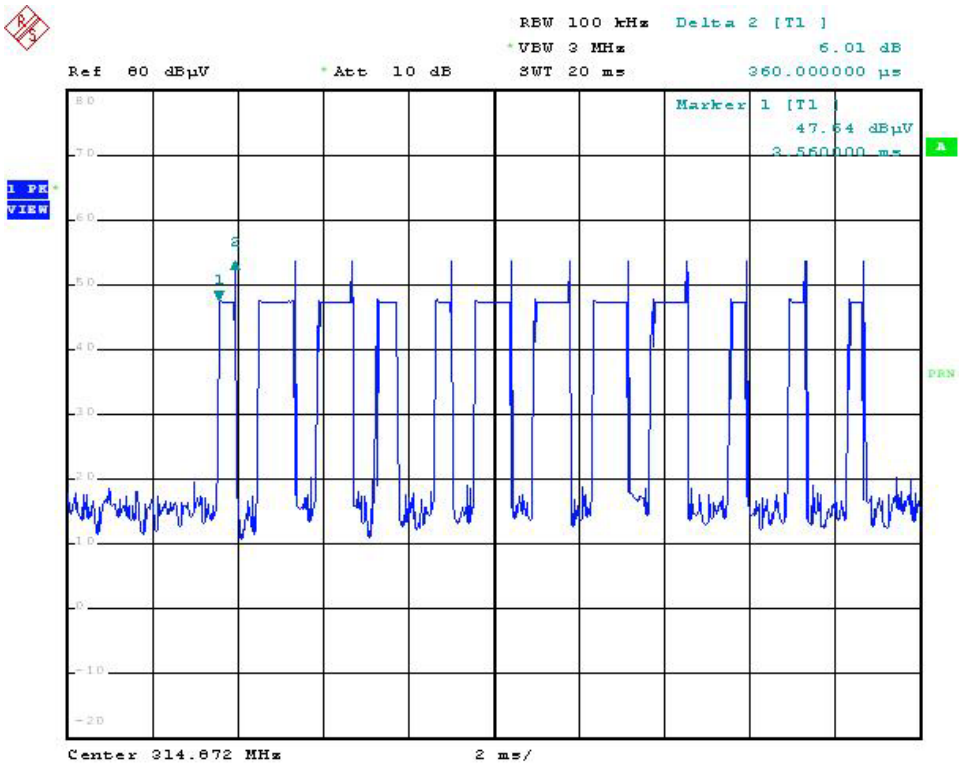


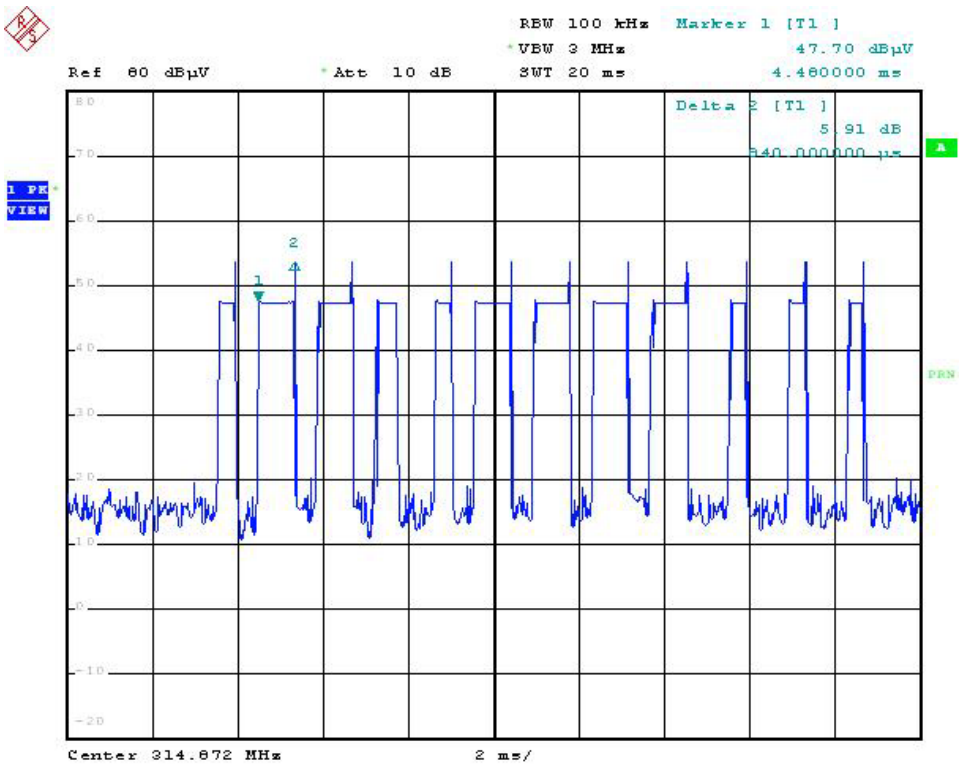
H Polarization, PK

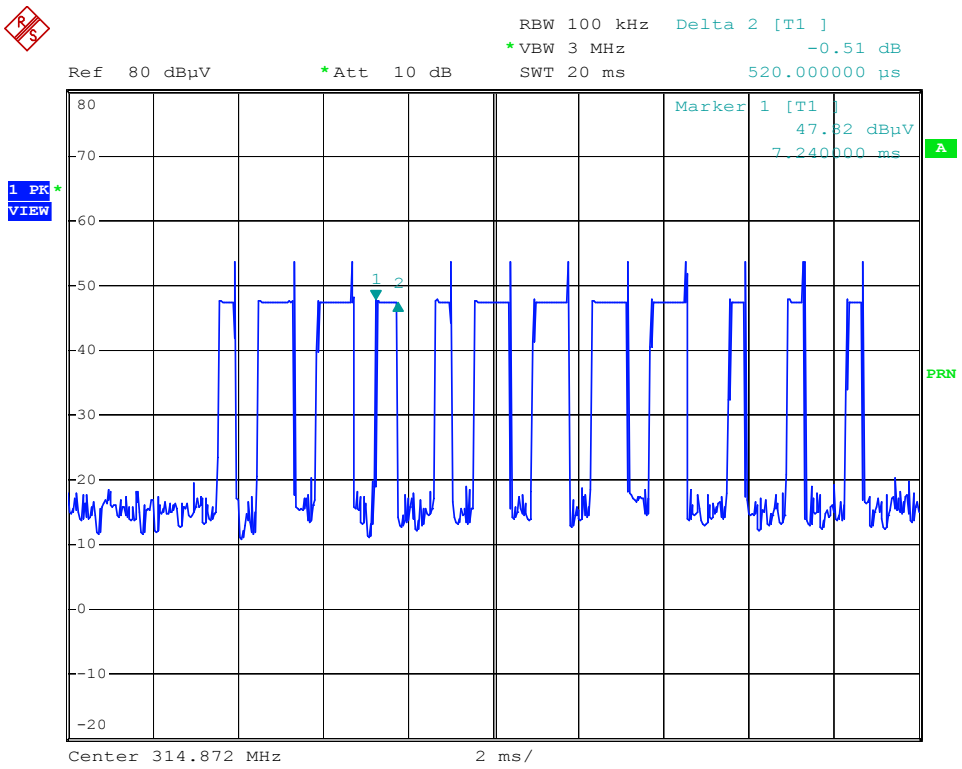


Duty cycle


RBW 100 kHz
Delta 2 [T1]
VBW 3 MHz
2.19 dB
Ref 60 dBµV
Att 10 dB
SWT 20 ms
15.360000 ms
Marker 1 [T1]
15.14 dBµV
1 PK VIEW
Center 314.872 MHz
2 ms/


RBW 100 kHz
Delta 2 [T1]
VBW 3 MHz
6.01 dB
Ref 60 dBµV
Att 10 dB
SWT 20 ms
360.000000 µs
Marker 1 [T1]
47.64 dBµV
1 PK VIEW
Center 314.872 MHz
2 ms/





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Field Strength of Spurious Emission

Below 1GHz

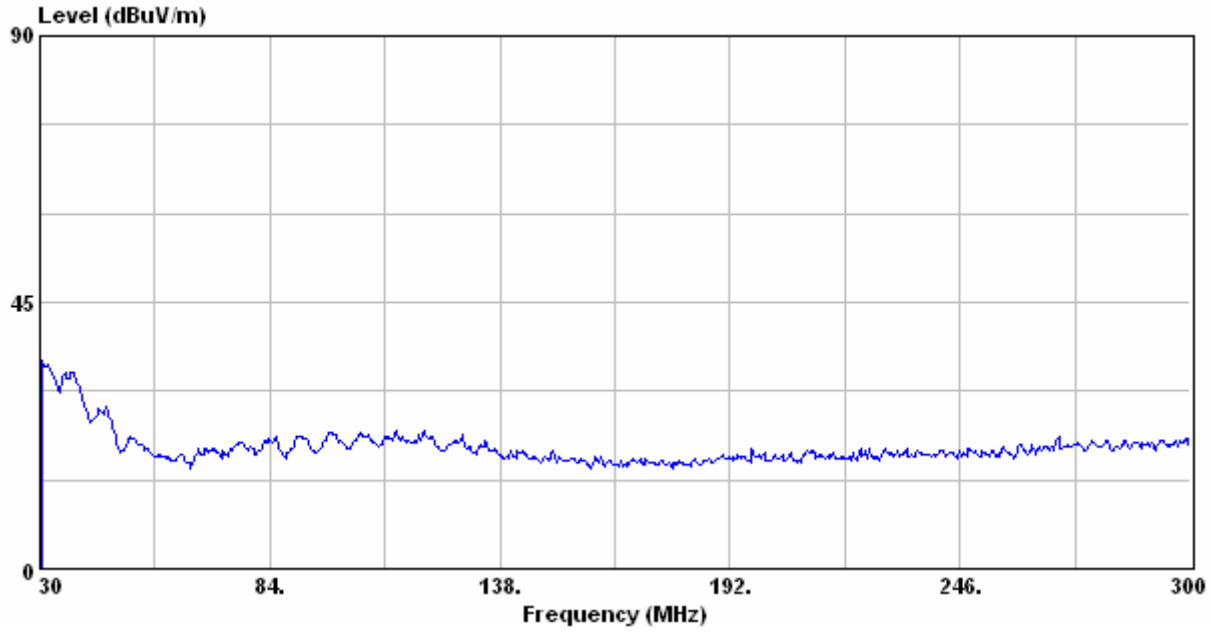
Test Distance : 3m
Polarization : Vertical
Worse Case Mode : Z- axis

Tester : Hata
Frequency Range : 30MHz~300MHz

	Freq. (MHz)	Reading Data (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.54	45.83	-10.65	35.18	40.00	4.82

Note：

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

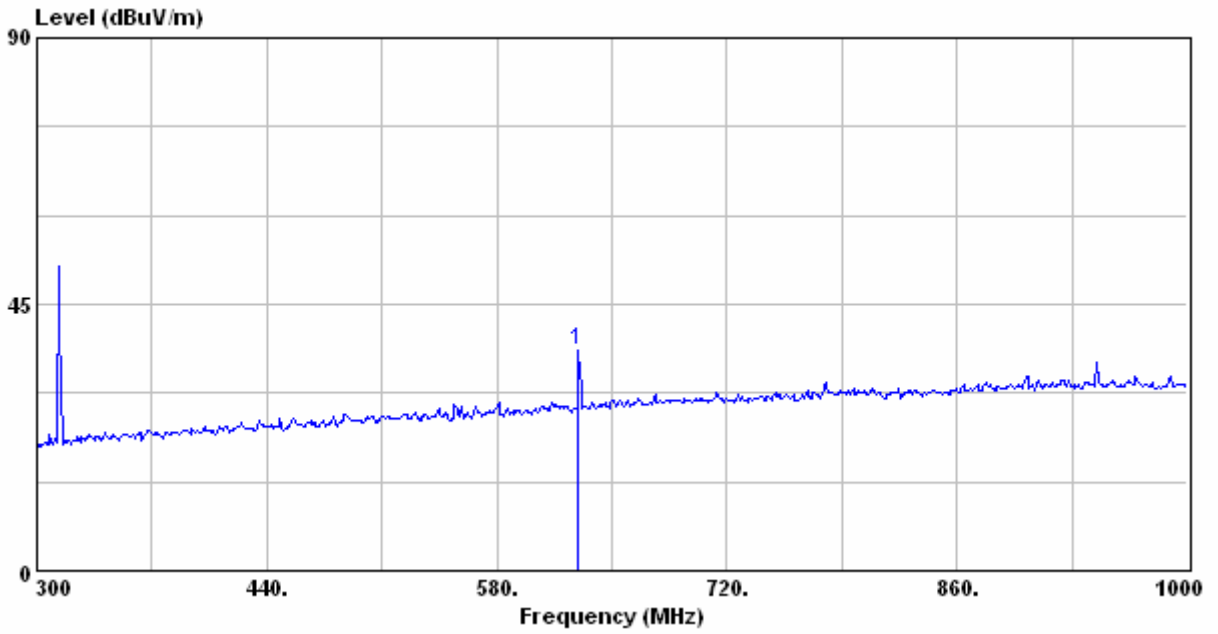


Test Distance	: 3m	**Tester**	: Hata
Polarization	: Vertical	**Frequency Range**	: 300MHz~1GHz
Worse Case Mode	: Z- axis		

	Freq. (MHz)	Reading Data (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	629.70	44.83	-7.67	37.16	55.62	18.46

Note：

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

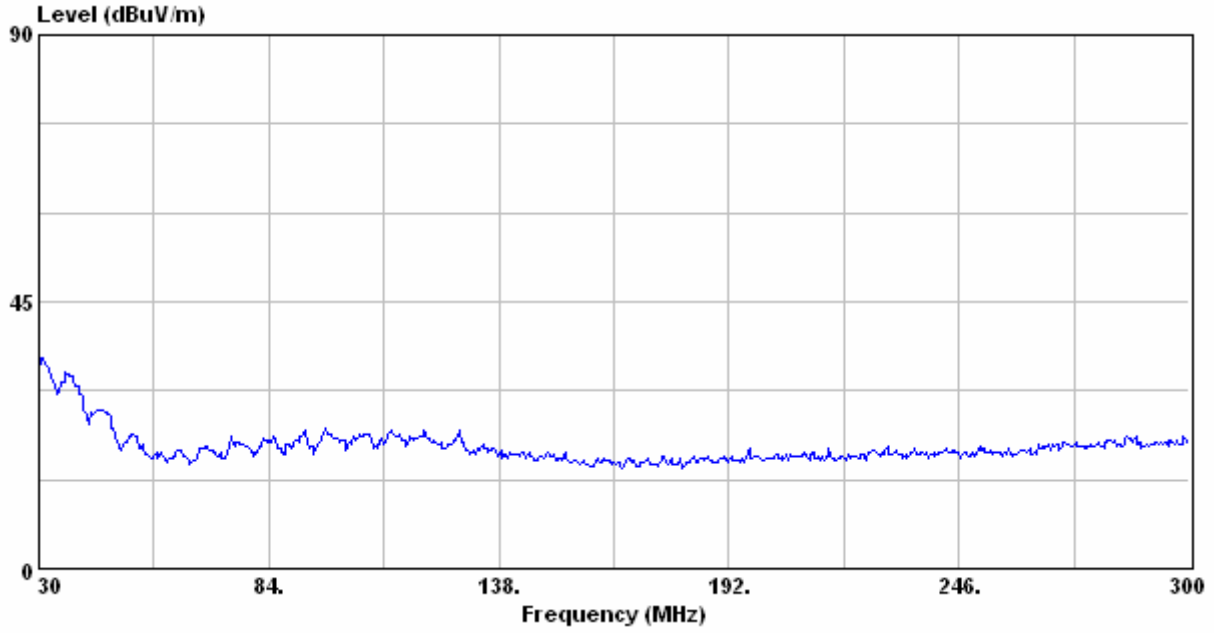


Test Distance	**:** 3m	**Tester**	**:** Hata
Polarization	**:** Horizontal	**Frequency Range**	**:** 30MHz~300MHz
Worse Case Mode	**:** Z- axis		

	Freq. (MHz)	Reading Data (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.00	46.76	-10.65	36.11	40.00	3.89

Note：

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

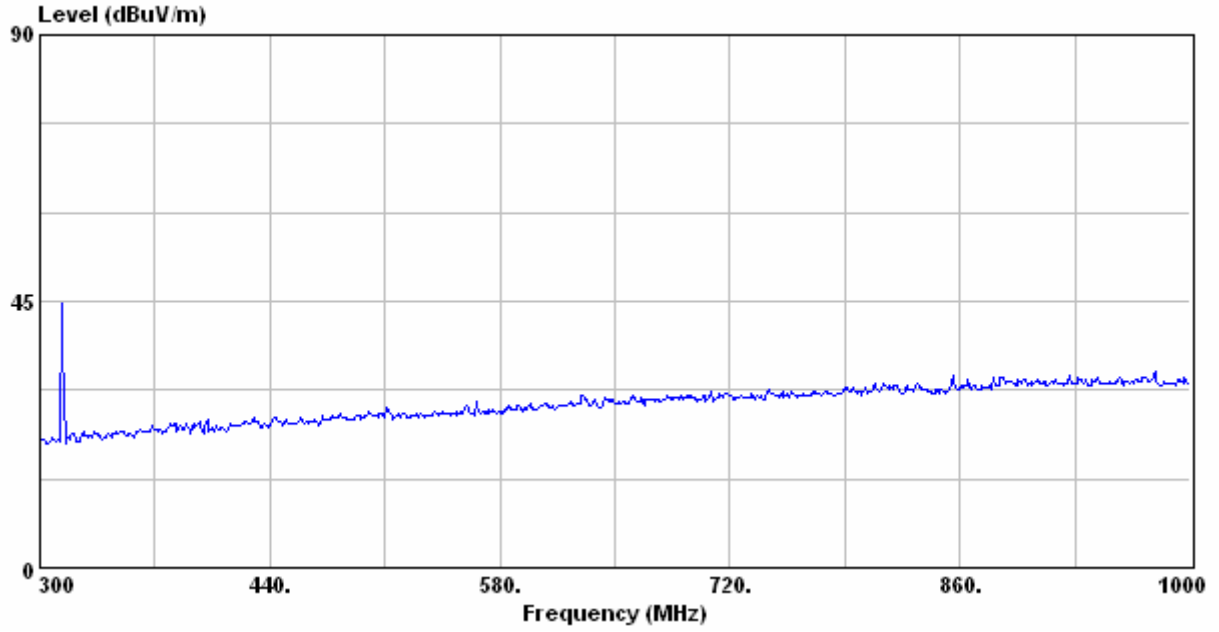


Test Distance : 3m **Tester** : **Hata**
Polarization : Horizontal **Frequency Range** : 300MHz~1GHz
Worse Case Mode : Z-axis

	Freq. (MHz)	Reading Data (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*	*	*	*	*	*

Note :

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



Above 1GHz

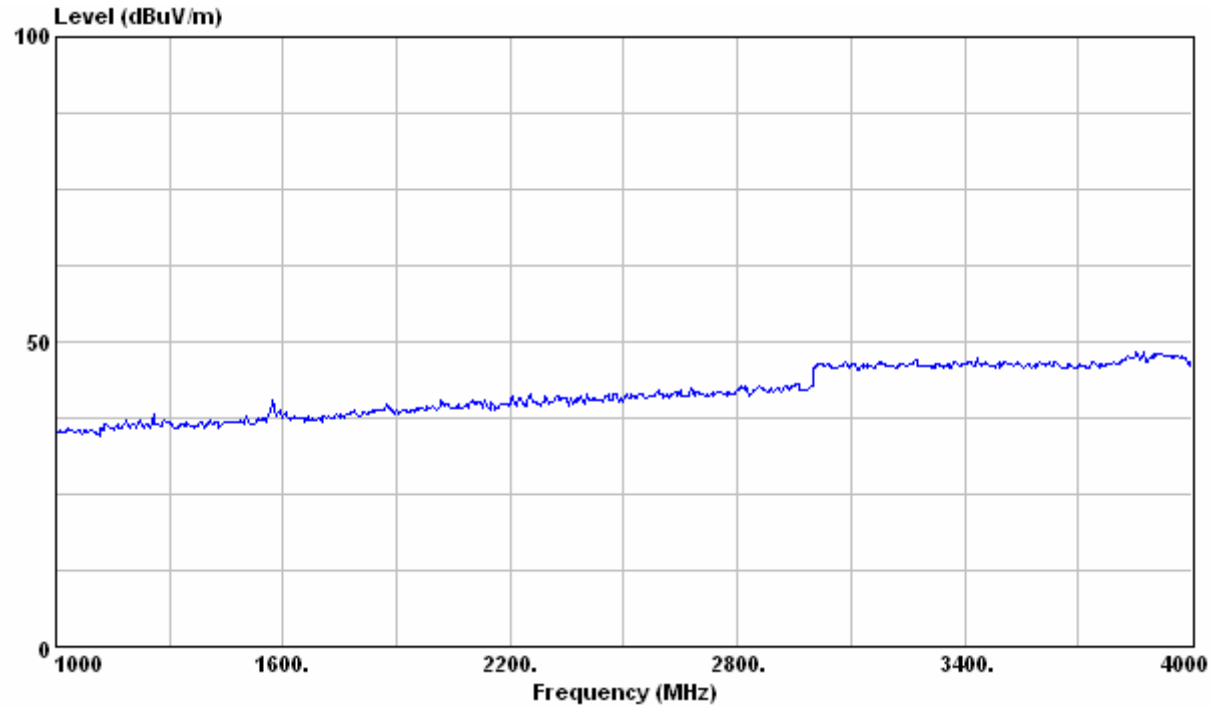
Test Distance : 3m
Polarization : Vertical
Worse Case Mode : Z-axis

Tester : **Hata**
Frequency Range : 1GHz ~ 4.5GHz

Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
*	*	*	*	*	*	74.00	54.00	*	*

Note:

1. Emission Level (dBuV/m) = Reading Data + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Margin (dB) = Limit–Emission Level.
4. PK. and AV. are abbreviation of peak and average respectively.
5. "*": The emission is too low to be measured.
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) please see page 16 for 20log(Duty cycle).



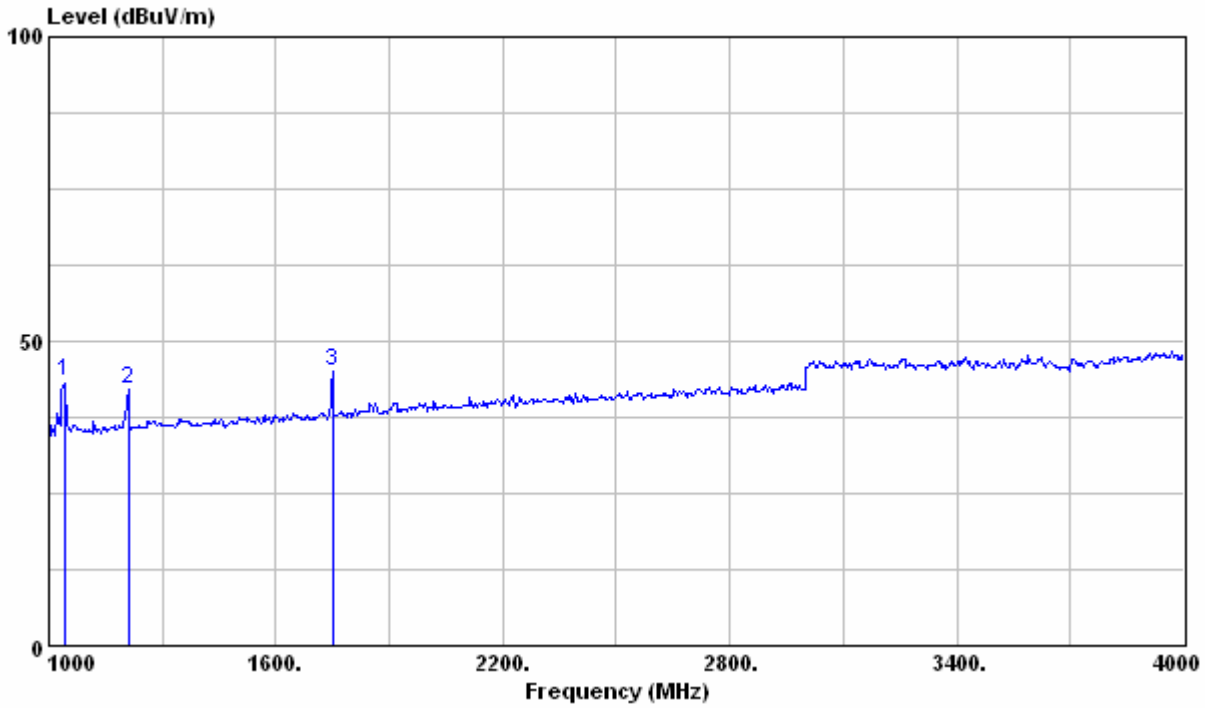
Test Distance : 3m
Polarization : Horizontal
Worse Case Mode : Z-axis

Tester : **Hata**
Frequency Range : 1GHz ~ 4.5GHz

Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
1042.00	48.16	41.77	-4.90	43.26	36.87	74.00	54.00	30.74	17.13
1210.00	46.21	39.82	-4.23	41.98	35.59	74.00	54.00	32.02	18.41
1750.00	47.21	41.46	-2.12	45.09	39.34	74.00	54.00	28.91	14.66

Note:

1. Emission Level (dBuV/m) = Reading Data + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Margin (dB) = Limit–Emission Level.
4. PK. and AV. are abbreviation of peak and average respectively.
5. "*": The emission is too low to be measured.
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) please see page 16 for 20log(Duty cycle).



4 Bandwidth

Result: Pass

4.1 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.

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 20dB bandwidth and compare with the required limit.

4.3 Test configuration

As stated in the section 2.3

4.4 Test Instruments

As stated in the section 2.4

Instrument Setting

RBW	VBW	Detector	Trace	Comment
30Hz	100Hz	Peak	Maxhold	

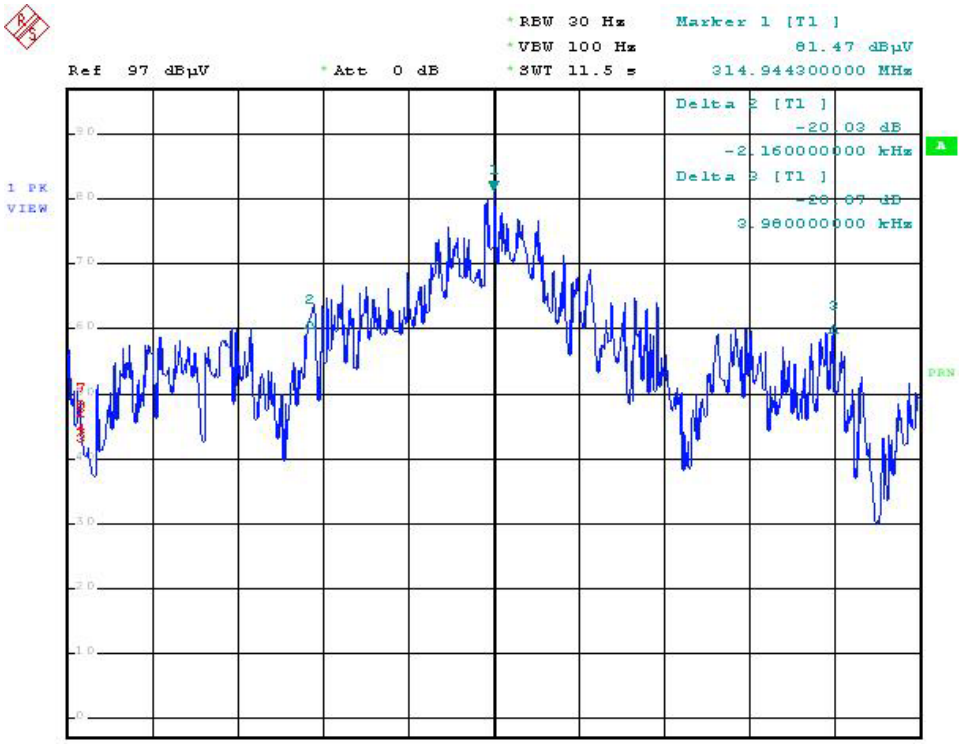
Climatic Condition

Ambient Temperature：24°C; Relative Humidity ：55%

4.5 Test Data

20dB Bandwidth

Emission Freq. : 314.9MHz **Tester** **:** Bill



Measured 20dB bandwidth is 6.14 kHz < 314.9MHzX0.25% = 787.25kHz.

參照頁 (非報告一部分,列印時不列印此參照頁)

報告編號 : RF-A42-0504-067
受測產品 : Wireless Window Sensor
廠牌 : Doberman 型號 : SE-0107
製造者 : Wellmike Enterprise Co., Ltd.
申請者 : Doberman Security Products, Inc.
申請者地址 : 11 Rhode Island, Irvine, CA, 92606, USA
申請者電話 : 323-6278325
收件日期 : April 22 , 2005
測試日期 : April 25, 2005
報告日期 : April 27, 2005
發射功率(電場強度) : 60.22dBuV/m
工作頻率 : 見第 5 頁
天線規格 : 見第 18 頁
額定輸入電壓 : 6Vdc
測試輸入電壓 : 6Vdc(4 顆 AAA 電池)
頻道數量 : 1
頻率範圍 : 315MHz
調變技術 : ASK
溫度 : 25°C
溼度 : 60%
TR1 測試員 : Hata
TR4 測試員 : Bill
TR5 測試員 : Bill

設備名稱	製造商	型號/**序號**	上次校驗日期
TR1			2005/4/12
TR4			NCR
TR5			NCR
頻譜分析儀	R&S	FSP40/**100031**	2004/6/8
接收機	R&S	ESCS30/ **836858/020**	2004/7/21
天線	R&S	HL562/ **360543/006**	2004/5/27
天線 906	R&S	HF906/ **359287/001**	2005/3/22
天線 3116	EMCO	3116/ **20552**	2004/5/27
前置放大器	MITEQ	JS4-00101800-28-5A/ **742229**	2004/6/9
前置放大器	MITEQ	JS4-18002600-30-5A/ **741923**	2004/4/13
前置放大器	MITEQ	ZKL-2/ **001**	2005/4/11
高通濾波器	MCI	H04G13G1/**2467-01**	2004/3/1
衰減器	HP	8495B/ **2814A13358**	2003/12/29
接收機	R&S	ESCS30/ **836858/021**	2004/1/1
電源阻抗模擬網路	R&S	ESH2-Z5/ **836613/001**	2003/12/31
電源阻抗模擬網路	R&S	ENV4200/ **833209**	2003/12/29

量測項目	**量測不確定度**
峰值輸出功率	水平極化 4.62 dB；垂直極化 4.56 dB
頻帶邊緣	水平極化 4.62dB；垂直極化 4.56dB

載波頻率頻道間隔	4.56 Hz
不必要之發射: 輻射發射測試 (1GHz 以下)	水平極化 4.06dB；垂直極化 4.08dB
不必要之發射: 輻射發射測試 (1GHz 以上)	水平極化 4.56 dB；垂直極化 4.62 dB
交流電力線傳導發射測試	2.26 dB