

**DATE: 11 December 2008**

**I.T.L. (PRODUCT TESTING) LTD.  
FCC EMC/Radio Test Report  
for  
Visonic Ltd.**

**Equipment under test:**

**Anti Masking PIR and Dual Technology  
Mirror Detectors**

**Tower 12 AM**

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This report relates only to items tested.



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# 1. General Information

## 1.1 Administrative Information

Manufacturer:	Visonic Ltd.
Manufacturer's Address:	Habarzel 24 Tel Aviv Israel 69710 Tel: +936-03-6456789 Fax: +936-03-6456788
Manufacturer's Representative:	Arik Elshtein
Equipment Under Test (E.U.T):	Anti Masking PIR and Dual Technology Mirror Detectors
Equipment Model No.:	Tower 12 AM
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	19/10/2008
Start of Test:	10/11/2008
End of Test:	13/11/2008
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	See Section 2

## **1.2 List of Accreditations**

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.
7. Nemko (Norway), Authorization No. ELA 207.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

### **1.1 Product Description**

The TOWER 12 AM PIR is a professional vandal resistance Anti-Masking detector designed for large commercial and industrial applications providing wide coverage with superior resistance to harsh environment, employing several revolutionary patented technologies.

### **1.2 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

### **1.3 Test Facility**

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing August 22, 2006).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

### **1.4 Measurement Uncertainty**

#### **Conducted Emission**

The uncertainty for this test is  $\pm 2$  dB.

#### **Radiated Emission**

The Open Site complies with the  $\pm 4$  dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

## 2. Product Labeling



Figure 1. FCC Label

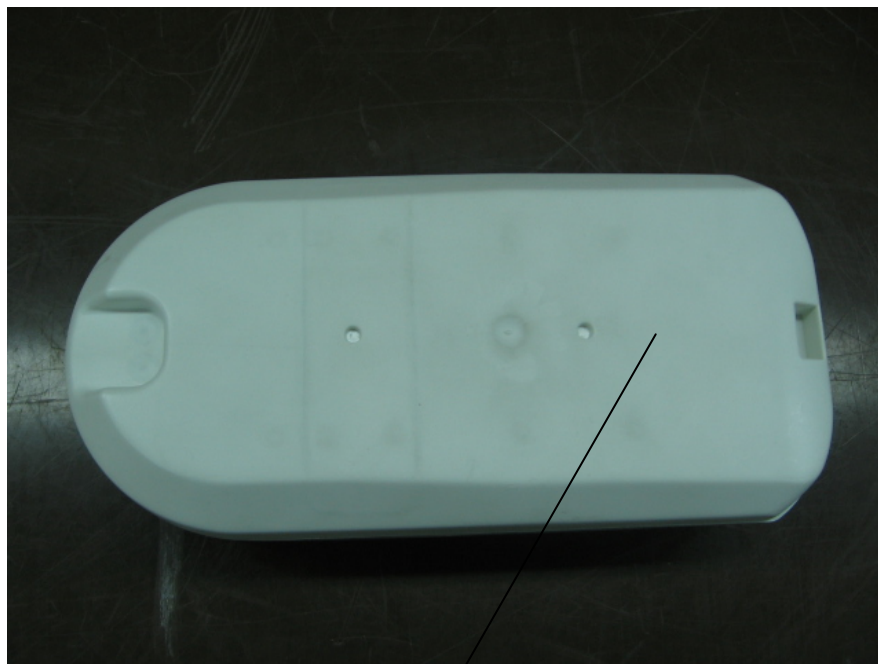


Figure 2. Location of Label on EUT



## 3. System Test Configuration

### 3.1 *Justification*

The TOWER 12 AM PIR is a professional vandal resistance Anti-Masking detector designed for large commercial and industrial applications providing wide coverage with superior resistance to harsh environment, employing several revolutionary patented technologies. The unit has a PIR sensor - dual element low noise pyroelectric sensor; MW: X-Band Doppler module (10.525 GHz).

The unit is a wall mounted so the tests were at vertical position.

### 3.2 *EUT Exercise Software*

Manufacturing software was used for the tests.

### 3.3 *Special Accessories*

No special accessories were needed.

### 3.4 *Equipment Modifications*

No modifications were needed in order to achieve compliance

### 3.5 *Configuration of Tested System*

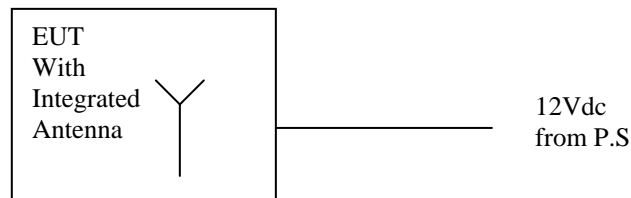


Figure 3. Configuration of Tested System

## 4. Theory of Operation

### 4.1 Theory of Operation

The TOWER 12 AM PIR is a professional vandal resistance Anti-Masking detector designed for large commercial and industrial applications providing wide coverage with superior resistance to harsh environment, employing several revolutionary patented technologies.

The EUT contains the following features:

- Microprocessor controlled, digital TMR signal processing with dual-slope digital temperature compensation.
- Built in auto diagnostic for both PIR and microwave detectors.
- Adaptive active Infra-Red Anti-Masking technology providing the most advanced reliable protection against intentional masking attempts.
- PIR sensor - dual element low noise pyroelectric sensor.
- MW: X-Band Doppler module (10.525 GHz).

The EUT was set with the following internal conditions (Dip switches):

- RANG = 25
- TST.POL = 0V
- LED = ON
- AM SENS = NORM,
- ALMOUT = ALM
- CONT= 1
- EOL TAMPER= 0
- EOL TRUBLE = 0,
- EOL ALARM = 0.

## 5. Set Up Photographs



Figure 4. Conducted Emission



Figure 5. Radiated Emission

## 6. Conducted Emission Data

### 6.1 Test Specification

F.C.C., Part 15, Subpart C

### 6.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 3. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall.

The E.U.T was powered from 115 V AC / 60 Hz via a 50 Ohm / 50  $\mu$ Hn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, and using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

### 6.3 Measured Data

JUDGEMENT: Passed by 20.9 dB

The margin between the emission levels and the specification limit is, in the worst case, 20.9 dB for the phase line at 0.388 MHz and 21.6 dB at 0.382 MHz for the neutral line.

The EUT met the F.C.C. Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 6* to *Figure 9*.

TEST PERSONNEL:

Tester Signature: 

Date: 28/12/2008

Typed/Printed Name: A. Sharabi

## Conducted Emission

E.U.T Description      Anti Masking PIR and Dual  
Technology Mirror Detectors  
Type                      Tower 12 AM  
Serial Number:         Not Designated

Specification:    F.C.C., Part 15, Subpart C  
Lead:              Phase  
Detectors:        Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 1 (dB)	Corr (dB)
1	0.156020	46.7	41.1	-24.6	22.0	-43.7	0.0
2	0.387517	43.4	37.2	-20.9	24.1	-34.1	0.0
3	0.757285	30.4	25.6	-30.4	11.2	-44.8	0.0
4	2.476084	28.7	21.6	-34.4	5.0	-51.0	0.0
5	9.979399	27.3	23.0	-37.0	9.9	-50.1	0.0
6	26.596482	21.2	16.1	-43.9	4.0	-56.0	0.0

**Figure 6. Detectors: Peak, Quasi-peak, AVERAGE .**

*Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*



## Conducted Emission

E.U.T Description    Anti Masking PIR and Dual  
Technology Mirror Detectors  
Type                    Tower 12 AM  
Serial Number:        Not Designated

Specification:    F.C.C., Part 15, Subpart C  
Lead:                Neutral  
Detectors:         Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 1 (dB)	Corr (dB)
1	0.183802	43.2	34.3	-30.0	18.1	-46.3	0.0
2	0.382180	43.1	36.6	-21.6	23.2	-35.1	0.0
3	0.598234	28.0	21.6	-34.4	5.3	-50.7	0.0
4	1.165136	30.2	23.6	-32.4	7.2	-48.8	0.0
5	8.695253	25.6	20.9	-39.2	7.3	-52.7	0.0
6	27.079149	27.3	22.1	-37.9	9.7	-50.3	0.0

**Figure 8. Detectors: Peak, Quasi-peak, AVERAGE**

*Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*





#### 6.4 Test Instrumentation Used, Conducted Measurement

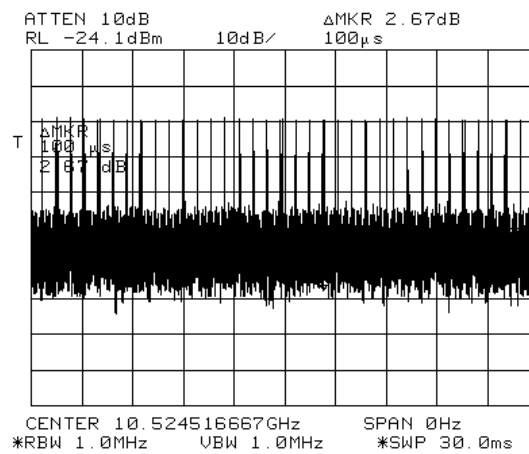
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Last Calibration Date</b>	<b>Period</b>
LISN	Fischer	FCC-LISN-2A	127	March 8, 2008	1 Year
LISN	Fischer	FCC-LISN-2A	128	March 8, 2008	1 Year
EMI Receiver	HP	85422E	3906A00276	November 17, 2008	1 Year
RF Filter Section	HP	85420E	3705A00248	November 16, 2008	1 Year
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A

## 7. Average Factor Calculation

	Pulse duration	Pule period	Burst duration	No. Of bursts within 100msec
Result	100μsec	900μsec	>100msec	1
Figure No.	5	6	7	-

**Average Factor Formula:**  $20 \log (\text{Pulse Duration}/\text{Pulse Period})$

**Average Factor (A.F.)** =  $20 \log (100/900) = -19.1 \text{ dB}$



**Figure 10. Pulse duration: = 100usec**





## 8. Field Strength of Fundamental

### 8.1 Test Specification

F.C.C., Part 15, Subpart C, Section 15.245 (b)

### 8.2 Test Procedure

The E.U.T was placed on a non-metallic table, 0.8 meters above the ground plane, on a remote-controlled turntable in the OATS. The test distance was 3 meters. The transmitter unit operated with normal modulation. The EMI receiver was set to 1 MHz resolution BW. The EUT was set up as shown in *Figure 3*, and its proper operation was checked.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

The EMI receiver was set to the E.U.T. Fundamental Frequency (10.5 GHz).

### 8.3 Measured Data


JUDGEMENT: Passed by 42.1 dB

The EUT met the FCC Part 15, Subpart C, Section 15.245 (b) requirements.

Operation Frequency (MHz)	Antenna Polarization (H/V)	Peak Amp. (dBuV/m)	Peck Specification (dBuV/m)	Average Factor (dB)	Average Result (dBuV/m)	Average Specification (dBuV/m)	Margin (dB)
10.52	V	95.7	148.0	-19.1	76.6	128.0	-51.4
10.52	H	105.0	148.0	-19.1	85.9	128.0	-42.1

The details of the highest emissions are given in *Figure 13* to *Figure 14*.

TEST PERSONNEL:

Tester Signature:  Date: 11/12/2008

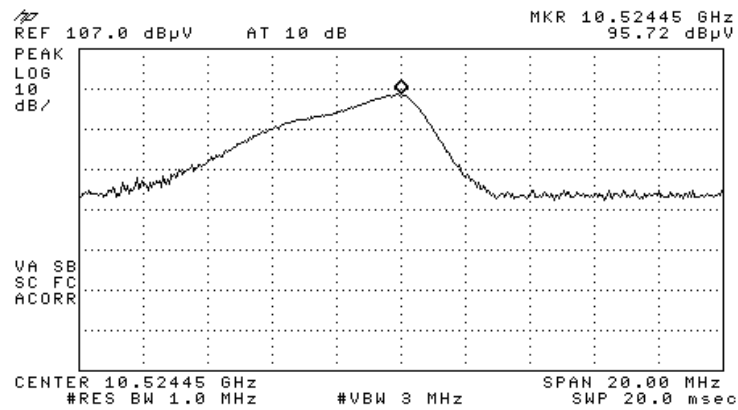
Typed/Printed Name: A. Sharabi

# Field Strength of Fundamental

E.U.T Description    Anti Masking PIR and Dual  
 Technology Mirror Detectors

Model Number        Tower 12 AM

Serial Number:       Not Designated



**Figure 13. Field Strength of Fundamental (Vertical)  
 Detector: Peak**



#### 8.4 Test Instrumentation Used

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Spectrum Analyzer	HP	8592L	3926A01204	March 5, 2008	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	November 2, 2007	1 year
Low Noise Amplifier	Sophia Wireless	LNA-28-B	0232	January 9, 2008	1 year
Low Noise Amplifier	MK Milliwave`	MKT6-30004000-30-13P	0399	January 9, 2008	1 year
RF Cable	KPS	KPS-1501-500-KPS	A1674	October 20, 2008	1 year
Horn Antenna	A.H.System	SAS-200/511	253	February 4, 2007	2 years



## 9. Spurious Radiated Emission in the Restricted Band, Below 1 GHz

### 9.1 Test Specification

9kHz-1000 MHz, F.C.C., Part 15, Subpart C

### 9.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.1.

The frequency range 9 kHz-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30 MHz, the loop antenna was rotated on its vertical axis, The antenna height (center of loop) was 1 meter.

In the frequency range 30-1000 MHz, the readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.



#### 9.4 Test Instrumentation Used

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 12, 2007	1 year
RF Section	HP	85420E	3705A00248	November 12, 2007	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 15, 2007	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Antenna Bioconical	ARA	BCD 235/B	1041	March 23, 2008	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 22, 2007	1 year
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A

## 9.5 **Field Strength Calculation**

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{v}/\text{m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF}$$

- FS: Field Strength [dB $\mu$ v/m]
- RA: Receiver Amplitude [dB $\mu$ v]
- AF: Receiving Antenna Correction Factor [dB/m]
- CF: Cable Attenuation Factor [dB]

No external pre-amplifiers are used.

## 10. Spurious Radiated Emission Above 1 GHz

### 10.1 Radiated Emission Above 1 GHz

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.1.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

In the frequency range 1-2.9 GHz, a computerized EMI receiver complying to CISPR 16 requirements was used.

In the frequency range 2.9-40.0 GHz, a spectrum analyzer including a low noise amplifier was used. During average measurements, the IF bandwidth was 1 MHz and the video bandwidth was 100Hz. During peak measurements, the IF bandwidth was 1 MHz and the video bandwidth was 3 MHz.

The test distance was 3 meters.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

## 10.2 Test Data

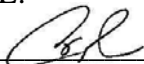
E.U.T. Description: Anti Masking PIR and Dual Technology Mirror Detectors  
Model No.: Tower 12 AM  
Serial Number: Not Designated  
Specification: F.C.C. Part 15, Subpart C, Section 15.245 (b)(1)(ii)

JUDGEMENT: Passed by 16.9 dB

The margin between the emission level and the specification limit is 16.9 dB in the worst case at the frequency of 31.57 GHz, horizontal polarization.

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 15.245 (b)(1)(iii) specification.

### TEST PERSONNEL:

Tester Signature:  Date: 11/12/2008

Typed/Printed Name: A. Sharabi

## Radiated Emission Above 1 GHz

E.U.T Description    Anti Masking PIR and Dual Technology  
Mirror Detectors

Type                      Tower 12 AM

Serial Number:        Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical      Frequency range: 1.0 GHz to 40.0 GHz  
Test Distance: 3 meters                              Detector: Peak

<b>Freq.</b> (GHz)	<b>Pol.</b> V/H	<b>Peak Amp</b> (dBμV/m)	<b>Peak Specification</b> (dBμV/m)	<b>Margin</b> (dB)
21.05	V	70.9*	97.5	-26.6
21.05	H	75.3*	97.5	-22.2
31.57	V	75.9*	97.5	-21.6
31.57	H	79.7*	97.5	-17.8

**Figure 15. Radiated Emission, Antenna Polarization:  
HORIZONTAL / VERTICAL, Detector: Peak**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss + FilterLoss- Preamplifier Gain

## Radiated Emission Above 1 GHz

E.U.T Description    Anti Masking PIR and Dual Technology  
Mirror Detectors  
Type                      Tower 12 AM  
Serial Number:        Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical    Frequency range: 1.0 GHz to 40.0 GHz  
Test Distance: 3 meters                            Detector: Peak, Average

<b>Freq.</b> (GHz)	<b>Pol.</b> V/H	<b>Peak Amp</b> (dB $\mu$ V/m)	<b>Average Factor</b> (dB)	<b>Average Amp</b> (dB $\mu$ V/m)	<b>Average Limit</b> (dB $\mu$ V/m)	<b>Margin</b> (dB)
21.05	V	70.9*	-19.1	51.8	77.5	-25.7
21.05	H	75.3*	-19.1	56.2	77.5	-21.3
31.57	V	75.9*	-19.1	56.8	77.5	-20.7
31.57	H	79.7*	-19.1	60.6	77.5	-16.9

**Figure 16. Radiated Emission, Antenna Polarization:  
HORIZONTAL / VERTICAL, Detector: Peak, Average**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss + FilterLoss- Preamplifier Gain



### 10.3 Test Instrumentation Used

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85422E	3411A00102	November 12, 2007	1 year
RF Section	HP	85420E	3427A00103	November 12, 2007	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet2225	2738508357	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	February 4,2007	2 year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 16, 2008	2 year
Horn Antenna	ARA	SWH-28	1008	December 8, 2006	2 year
Horn Antenna	Narda	V637	0410	December 8, 2006	2 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	November 2, 2007	1 year
Low Noise Amplifier	Sophia Wireless	LNA-28-B	0232	January 9, 2008	1 year
Low Noise Amplifier	MK Milliwave`	MKT6-30004000-30-13P	0399	January 9, 2008	1 year
RF Cable	KPS	KPS-1501-500-KPS	A1674	October 20,2008	1 year
Spectrum Analyzer	HP	8592E	3442A00275	November 14, 2007	1 year
Spectrum Analyzer	HP	8592L	3926A01204	March 5, 2008	1 year

## 11. APPENDIX A - Band Edges

### 11.1 *Test procedure*

The E.U.T was placed on a non-metallic table, 0.8 meters above the ground plane, on a remote-controlled turntable in the OATS. The test distance was 3 meters.

The transmitter unit operated with normal modulation. The EMI receiver was set to 1 MHz resolution BW. The EUT was set up as shown in Figure 3, and its proper operation was checked.

The EMI receiver was adjusted to the transmission channel at the maximum radiated level. The display line was set to 20 dBc and the EMI receiver was set to the band edge frequencies.

## Band Edges

E.U.T Description    Anti Masking PIR and Dual  
Technology Mirror Detectors

Model Number        Tower 12 AM

Serial Number:      Not Designated

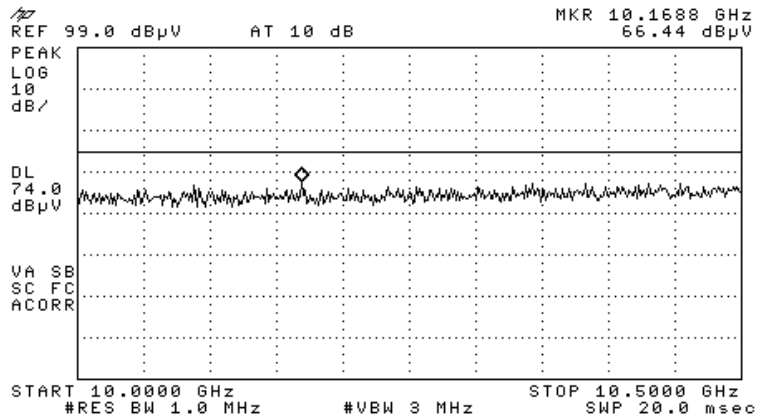


Figure 17 — 10.00 GHz to 10.50 GHz (vertical)

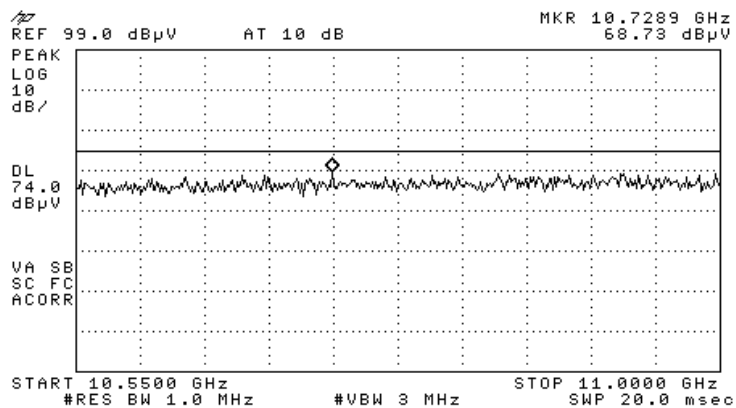


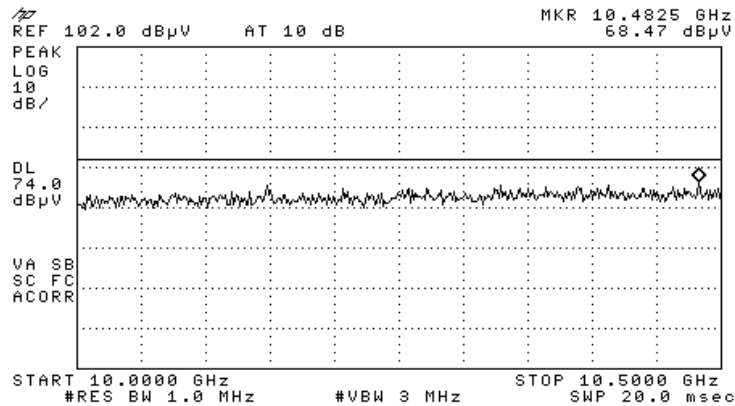
Figure 18 — 10.55 GHz to 11.00 GHz (vertical)

## Band Edges

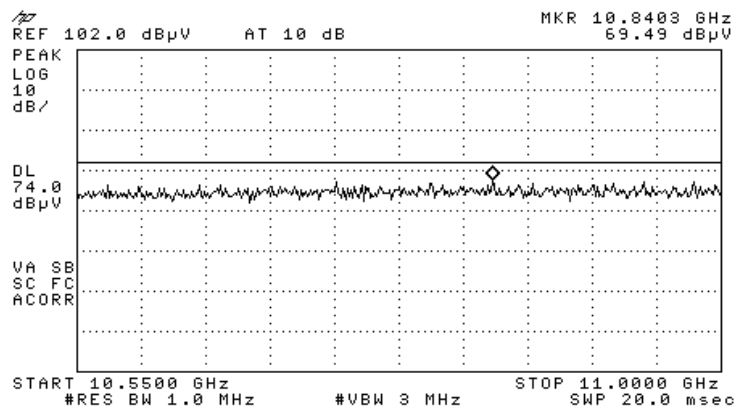
E.U.T Description    Anti Masking PIR and Dual  
Technology Mirror Detectors

Model Number        Tower 12 AM

Serial Number:        Not Designated



**Figure 19 — 10.00 GHz to 10.50 GHz (horizontal)**



**Figure 20 — 10.55 GHz to 11.00 GHz (horizontal)**

## Band Edges

E.U.T Description    Anti Masking PIR and Dual  
 Technology Mirror Detectors

Model Number        Tower 12 AM

Serial Number:        Not Designated

Band Edge Frequency (MHz)	Polarity V/H (MHz)	Peak Level (dBuV/m)	Peak Specification (dBuV/m)	Margin (dB)
10.17	V	66.4*	74.0	-7.6
10.73	V	68.8*	74.0	-5.2
10.48	H	68.5*	74.0	-5.5
10.84	H	69.5*	74.0	-4.5

**Figure 21 — Peak Results**

Band Edge Frequency (MHz)	Polarity V/H (MHz)	Average Level (dBuV/m)	Average Factor (dB)	Average Level (dB)	Average Specification (dBuV/m)	Margin (dB)
10.17	V	66.4	-19.1	47.3	54.0	-6.7
10.73	V	68.8	-19.1	49.7	54.0	-4.3
10.48	H	68.5	-19.1	49.4	54.0	-4.6
10.84	H	69.5	-19.1	50.4	54.0	-3.6

**Figure 22 — Average Results**

**Notes:**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss + FilterLoss- Preamplifier Gain


## 11.2 Results table

E.U.T. Description: Anti Masking PIR and Dual Technology Mirror Detectors  
Model No.: Tower 12 AM  
Serial Number: Not Designated

JUDGEMENT: Passed by 3.6 dB

Typed/Printed Name: A. Sharabi

TEST PERSONNEL:

Tester Signature: 

Date: 11/12/2008

Typed/Printed Name: A. Sharabi

### 11.3 Test Equipment Used.

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85422E	3411A00102	November 12, 2007	1 year
RF Section	HP	85420E	3427A00103	November 12, 2007	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet2225	2738508357	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	February 4,2007	2 year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 16, 2008	2 year
Horn Antenna	ARA	SWH-28	1008	December 8, 2006	2 year
Horn Antenna	Narda	V637	0410	December 8, 2006	2 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	November 2, 2007	1 year
Low Noise Amplifier	Sophia Wireless	LNA-28-B	0232	January 9, 2008	1 year
Low Noise Amplifier	MK Milliwave	MKT6-30004000-30-13P	0399	January 9, 2008	1 year
RF Cable	KPS	KPS-1501-500-KPS	A1674	October 20,2008	1 year
Spectrum Analyzer	HP	8592E	3442A00275	November 14, 2007	1 year
Spectrum Analyzer	HP	8592L	3926A01204	March 5, 2008	1 year

## 12. APPENDIX B - Comparison requirement FCC with Industry Canada

<b>EUT</b>	<b>FCC Specification</b>	<b>According FCC Standard</b>	<b>IC Standard</b>
Tower 12 AM	<b>Conducted Emissions</b>	<b>FCC Part 15 Subpart C, Class B</b>	<b>ICES-003, Issue 4; 2004, Class B</b>
	<b>Field Strength of Fundamental</b>	<b>FCC Part 15.245 (b)</b>	<b>RSS- 210 Section 2.6 Annex2 A2.9</b>
	<b>Spurious Radiated Emissions below 1 GHz</b>	<b>FCC Part 15.245 (b)(1)(ii)</b>	<b>RSS- 210 Section 2.6</b>
	<b>Spurious Radiated Emissions above 1 GHz</b>	<b>FCC Part 15.245 (b)(1)(ii)</b>	<b>RSS- 210 Section 2.6 Annex2 A2.9</b>
	<b>Band Edges</b>	<b>FCC Part 15.247 (d)</b>	<b>RSS-210 A8.5</b>



# 13. APPENDIX C - CORRECTION FACTORS

## 13.1 Correction factors for CABLE from EMI receiver to test antenna at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	7.3
20.0	0.6	1400.0	7.8
30.0	0.8	1600.0	8.4
40.0	0.9	1800.0	9.1
50.0	1.1	2000.0	9.9
60.0	1.2	2300.0	11.2
70.0	1.3	2600.0	12.2
80.0	1.4	2900.0	13.0
90.0	1.6		
100.0	1.7		
150.0	2.0		
200.0	2.3		
250.0	2.7		
300.0	3.1		
350.0	3.4		
400.0	3.7		
450.0	4.0		
500.0	4.3		
600.0	4.7		
700.0	5.3		
800.0	5.9		
900.0	6.3		
1000.0	6.7		

**NOTES:**

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

**13.2 Correction factors for CABLE**  
**from EMI receiver**  
**to test antenna**  
**at 3 meter range.**

<b>FREQUENCY</b> <b>(GHz)</b>	<b>CORRECTION</b> <b>FACTOR</b> <b>(dB)</b>
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

*NOTES:*

- 1. The cable type is RG-8.*
- 2. The overall length of the cable is 10 meters.*

**13.3 Correction factors for CABLE**  
**from spectrum analyzer**  
**to test antenna above 2.9 GHz**

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

*NOTES:*

- 1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.*
- 2. The cable is used for measurements above 2.9 GHz.*
- 3. The overall length of the cable is 10 meters.*

**12.6 Correction factors for LOG PERIODIC ANTENNA**

**Type LPD 2010/A  
at 3 and 10 meter ranges.**

**Distance of 3 meters**

<b>FREQUENCY (MHz)</b>	<b>AFE (dB/m)</b>
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

**Distance of 10 meters**

<b>FREQUENCY (MHz)</b>	<b>AFE (dB/m)</b>
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

*NOTES:*

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range,  
and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission  
Test EMI Receiver".

**13.4 Correction factors for**

**LOG PERIODIC ANTENNA**

**Type SAS-200/511  
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

*NOTES:*

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".

**13.5 Correction factors for BICONICAL ANTENNA  
Type BCD-235/B,  
at 3 meter range**

<b>FREQUENCY (MHz)</b>	<b>AFE (dB/m)</b>
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

**NOTES:**

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

**13.6 Correction factors for Double-Ridged Waveguide Horn**

**Model: 3115, S/N 29845  
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENN A Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			

**13.7 Correction factors for**

**Horn Antenna  
Model: SWH-28  
at 1 meter range.**

<b>FREQUENCY (GHz)</b>	<b>AFE (dB /m)</b>	<b>Gain (dB1)</b>
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4



**13.8 Correction factors for ACTIVE LOOP ANTENNA**

**Model 6502  
S/N 9506-2950**

<b>FREQUENCY</b> (MHz)	<b>Magnetic Antenna Factor</b> (dB)	<b>Electric Antenna Factor</b> (dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2