

DATE: 16 March 2008

I.T.L. (PRODUCT TESTING) LTD.
FCC EMC/Radio Test Report
for
GO Networks Inc.
Equipment under test:
Module

5 GHz Module

Written by:



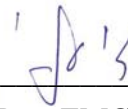
D. Shidlowsky, Documentation

Approved by:



I. Raz, Test Engineer

Approved by:



I. Raz, EMC Laboratory Manager

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This report relates only to items tested.

Measurement/Technical Report for GO Networks Inc.

Module

5 GHz Module

FCC ID: T3G-IFC-1502

16 March 2008

This report concerns: Original Grant ☐ Class II change ☒ X

Class B verification ☐ Class A verification ☐ Class I change ☐

Equipment type: Radio Transmitter

Request Issue of Grant:

☒ x Immediately upon completion of review

Limits used:

CISPR 22 ☐

Part 15 ☒ x

Measurement procedure used is ANSI C63.4-2003.

Application for Certification

prepared by:

Ishaishou Raz

ITL (Product Testing) Ltd.

Kfar Bin Nun

D.N. Shimshon 99780

Israel

e-mail Sraz@itl.co.il

Applicant for this device:

(different from "prepared by")

Ronen Akerman

GO Networks Inc.

1943 Landings Drive

Mountain View California

USA

Tel: 650-962-2000

Fax: 650-962-2010

e-mail: RonenA@gonetworks.com

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1. General Information

1.1 Administrative Information

Manufacturer:	GO Networks Inc.
Manufacturer's Address:	1943 Landings Drive Mountain View, California 94043 USA Tel: 650-962-2000 Fax: 650-962-2010
Manufacturer's Representative:	Ronen Akerman
Equipment Under Test (E.U.T):	Module
Equipment Model No.:	5 GHz Module
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	04.02.08
Start of Test:	24.02.08
End of Test:	24.02.08
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.

1.3 *Product Description*

See original application.

1.4 *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.

1.5 *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.

1.6 *Measurement Uncertainty*

Radiated Emission

The Open Site complies with the ± 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. System Test Configuration

2.1 *Justification*

Spurious radiated emission and band edges tests were performed due to the addition of an omni antenna with 10 dBi gain.

2.2 *EUT Exercise Software*

The EUT exercise program used during radiated testing was designed to exercise the module in a manner similar to a typical use. The software contained a command line that gave the tester an option to select rates and frequencies he needed for the tests.

2.3 *Special Accessories*

No special accessories were needed to achieve compliance.

2.4 *Equipment Modifications*

No modifications were needed to achieve compliance.

2.5 Configuration of Tested System

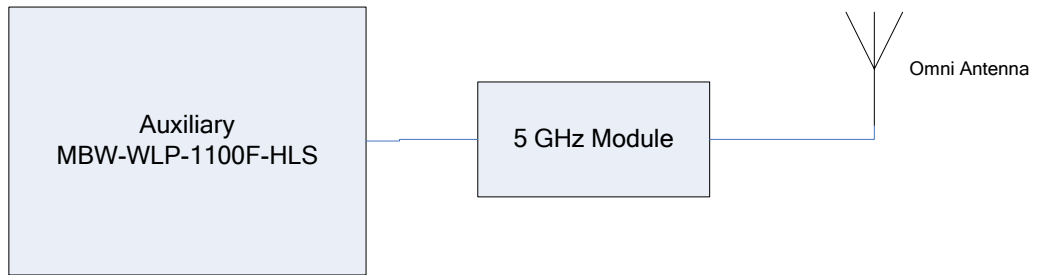


Figure 1. Configuration of Tested System

3. Spurious Radiated Emission Below 1 GHz

3.1 Test Specification

9 kHz-1000 MHz, FCC Part 15, Subpart C

3.2 Test Procedure

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

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 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-30MHz, 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.

The E.U.T. was operated in the frequencies of 5745, 5785, and 5825 MHz.

3.3 **Test Results**

JUDGEMENT: Passed.

No signals were found in the frequency range of 9 kHz- 1000 MHz.

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

The results for all three operating frequencies and modulations were the same.

TEST PERSONNEL:

Tester Signature: _____

Date: 16.03.08

Typed/Printed Name: I. Raz

3.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 12, 2007	1 year
RF Filter Section	HP	85420E	3705A00248	November 12, 2007	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	March 22, 2007	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 22, 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
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	JPKGC19982	N/A	N/A

3.5 Field Strength Calculation

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

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

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

No external pre-amplifiers are used.

4. Spurious Radiated Emission Above 1 GHz

4.1 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 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 2.9-25.0 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 1.5 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.

The E.U.T. was operated in the frequencies 5745, 5785, and 5825 MHz.

4.2 Test Data

JUDGEMENT: Passed by 0.4 dB

For the operation frequency of 5745 MHz, the margin between the emission level and the specification limit is 3.7 dB in the worst case at the frequency of 11490.00 MHz, vertical polarization.

For the operation frequency of 5785 MHz, the margin between the emission level and the specification limit is 3.8 dB in the worst case at the frequency of 11571.00 MHz, horizontal polarization.

For the operation frequency of 5825 MHz, the margin between the emission level and the specification limit is 0.4 dB in the worst case at the frequency of 11650.00 MHz, horizontal polarization.

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

TEST PERSONNEL:

Tester Signature: _____

Date: 16.03.08

Typed/Printed Name: I. Raz

Radiated Emission Above 1 GHz

E.U.T Description Module
Type 5 GHz Module
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: 1.5 meters Detector: Peak
Operation Frequency: 5745 MHz

Freq.	Polarity	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
11490.00	H	65.4*	80.0	-14.6
11490.00	V	68.1*	80.0	-11.9

**Figure 2. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Peak**

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- Low Noise Amplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description Module
Type 5 GHz Module
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: 1.5 meters Detector: Average
Operation Frequency: 5745 MHz

Freq.	Polarity	Average Amp	Average Specification	Peak. Margin
(MHz)	(H/V)	(dB μ V/m)	(dB μ V/m)	(dB)
11490.00	H	54.5*	60.0	-5.5
11490.00	V	56.3*	60.0	-3.7

**Figure 3. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: 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.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description Module
Type 5 GHz Module
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: 1.5 meters Detector: Peak
Operation Frequency: 5785 MHz

Freq.	Polarity	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
11571.00	H	70.9*	80.0	-9.1
11571.00	V	70.3*	80.0	-9.7

**Figure 4. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Peak**

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- Low Noise Amplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description Module
Type 5 GHz Module
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: 1.5 meters Detector: Average
Operation Frequency: 5785 MHz

Freq.	Polarity	Average Amp	Average Specification	Peak. Margin
(MHz)	(H/V)	(dB μ V/m)	(dB μ V/m)	(dB)
11571.00	H	56.2*	60.0	-3.8
11571.00	V	55.3*	60.0	-4.7

**Figure 5. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: 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.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description Module
Type 5 GHz Module
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: 1.5 meters Detector: Peak
Operation Frequency: 5825 MHz

Freq.	Polarity	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
11650.00	H	73.3*	80.0	-6.7
11650.00	V	72.8*	80.0	-7.2

**Figure 6. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Peak**

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- Low Noise Amplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description Module
Type 5 GHz Module
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: 1.5 meters Detector: Average
Operation Frequency: 5825 MHz

Freq.	Polarity	Average Amp	Average Specification	Peak. Margin
(MHz)	(H/V)	(dB μ V/m)	(dB μ V/m)	(dB)
11650.00	H	59.6*	60.0	-0.4
11650.00	V	58.3*	60.0	-1.7

**Figure 7. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: 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.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

4.3 Test Instrumentation Used, Radiated Measurements Above 1 GHz

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	LaserJet 2200	JPKGC19982	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	February 4, 2007	2 years
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 15, 2006	2 years
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	232	January 9, 2008	1 year
Low Noise Amplifier	MK Milliwave	MKT6-3000 400-30-13P	399	January 9, 2008	1 year
Spectrum Analyzer	HP	8593EM	3536A00120	February 26, 2008	1 year
Spectrum Analyzer	HP	8546E	3442A00275	November 14, 2007	1 year
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

5. Band Edge Spectrum 5GHz Transmitter

[In Accordance with section 15.247

5.1 Test procedure

The E.U.T. was operated with a 10dBi omni antenna.

The spectrum analyzer was connected to an auxiliary antenna receiving the E.U.T. signal.

The E.U.T. operation frequency was set to 5745 and 5825 MHz.

The spectrum analyzer was set to the center frequency of the band edges (5725 and 5850 MHz respectively).

The differences between the peak level of the transmitted signal and the level at the band edge frequency were recorded.

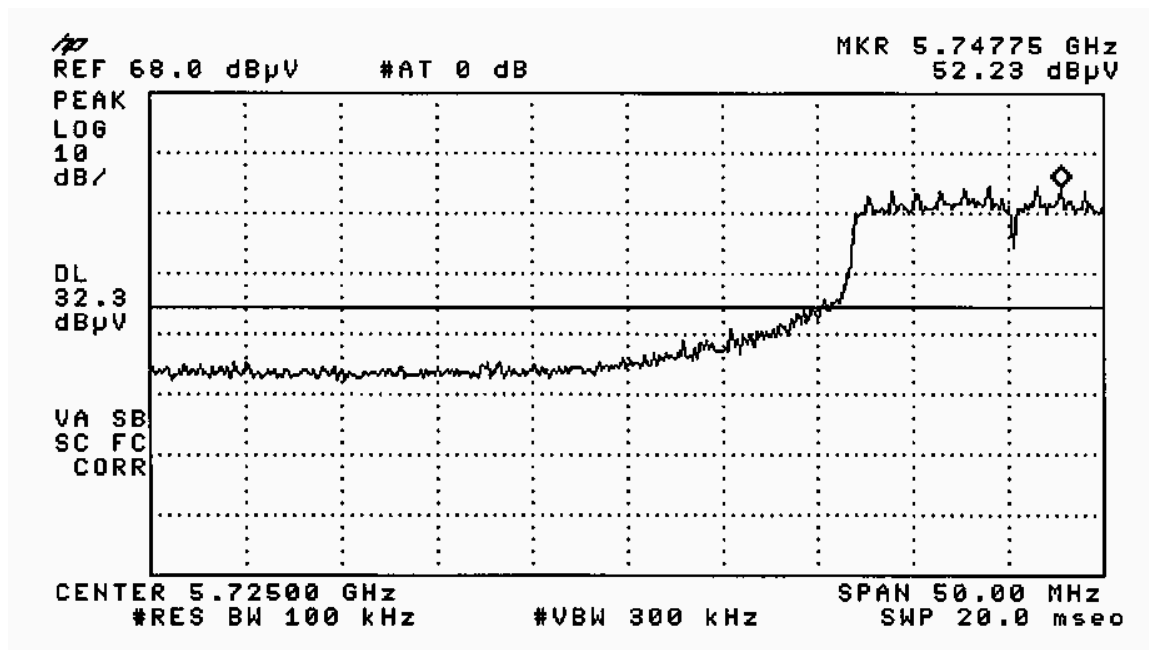


Figure 8 —5745 MHz

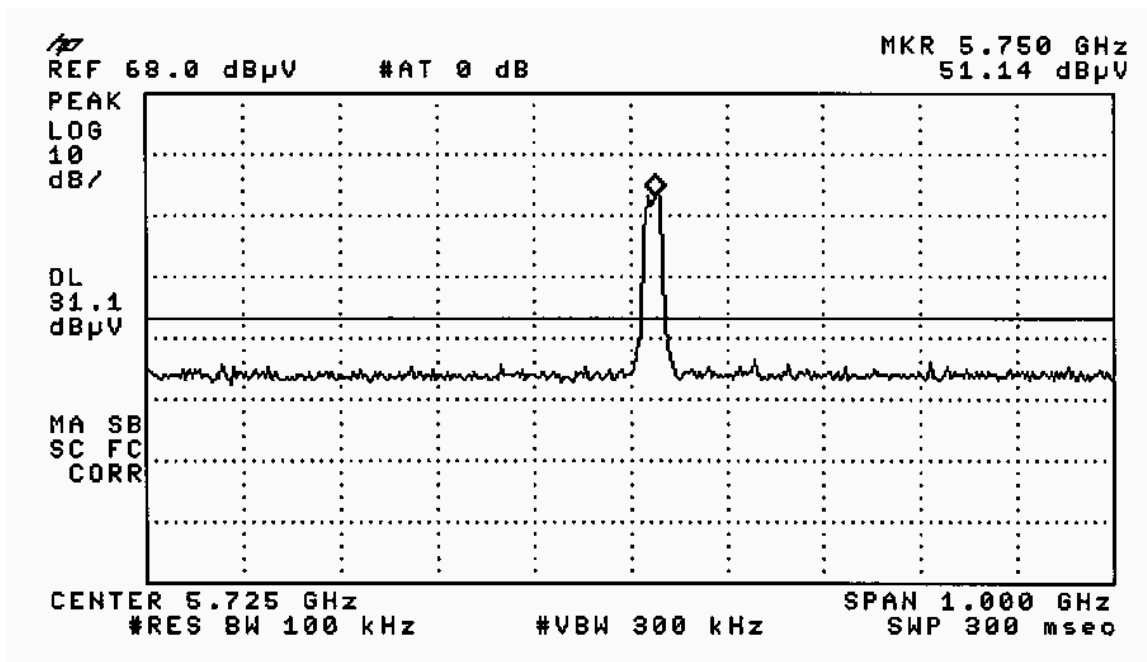


Figure 9 —5745 MHz

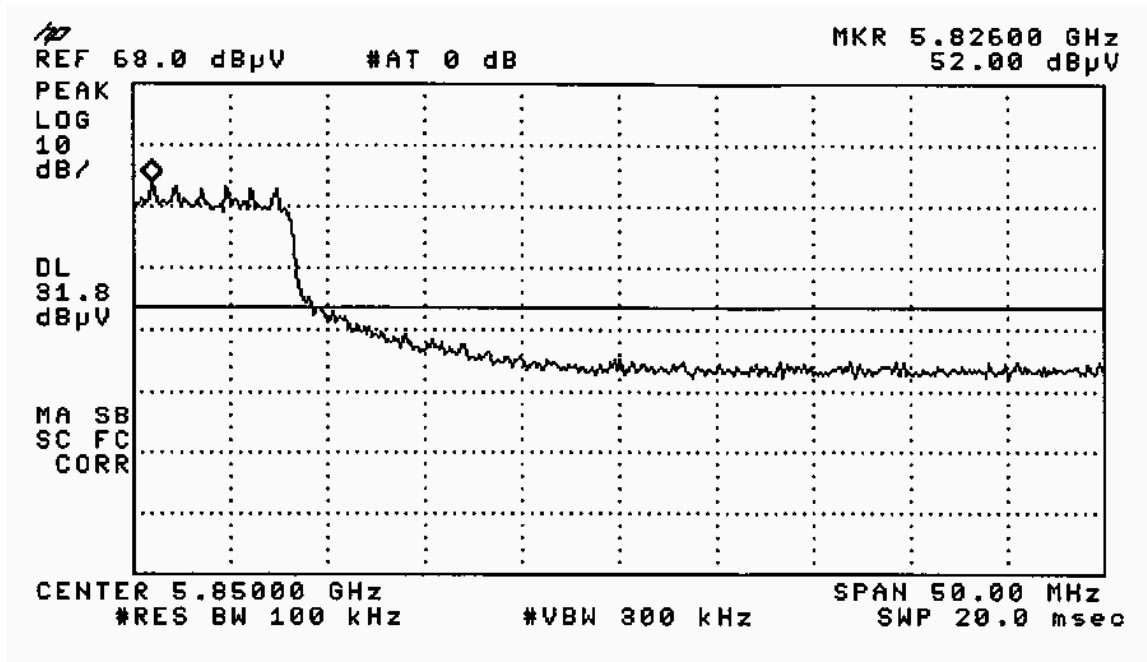


Figure 10 —5825 MHz

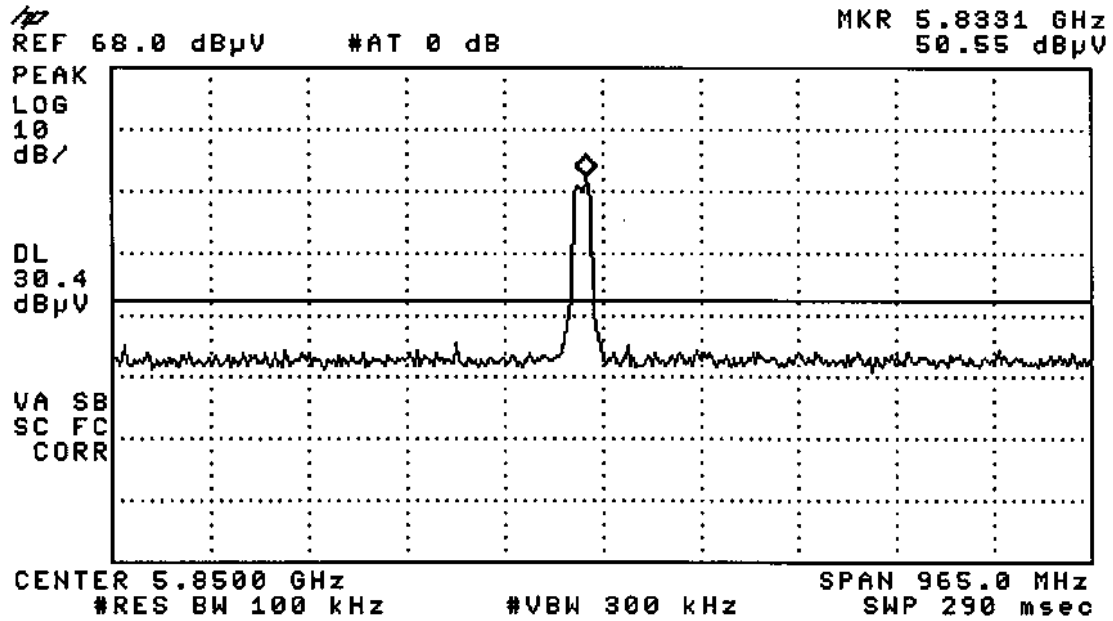


Figure 11 —5825 MHz

5.2 Results table

E.U.T. Description: Module
 Model No.: 5 GHz Module
 Serial Number: Not designated
 Specification: F.C.C. Part 15, Subpart C (15.247)

Operation Frequency (MHz)	Band Edge Frequency (MHz)	Spectrum Level (dBc)	Specification (dBc)	Margin (dB)
5745	5725	29.2	20.0	-9.2
5825	5850	29.0	20.0	-9.0

Figure 12 Band Edge Spectrum

JUDGEMENT: Passed by 9.0 dB

TEST PERSONNEL:

Tester Signature: _____

Date: 16.03.08

Typed/Printed Name: I. Raz

5.3 Test Equipment Used.

Band edge Spectrum

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	February 26, 2008	1 year
Antenna-Log Periodic	A.H.System	SAS-200/511	253	February 4, 2007	2 years

Figure 13 Test Equipment Used

6. Antenna Gain

The antenna gain is 10 dBi.

7. Radiated Emission Test Data Per FCC Part 15 Sub-part B

7.1 Test Specification

30-40000 MHz, FCC Part 15, Subpart B, CLASS A

7.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 4.

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 effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in *Figure 1*.

The E.U.T. highest frequency source or used frequency is 5.825 GHz.

The frequency range 30-40000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

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 2.9-40 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.)

The emissions were measured at a distance of 3 meters.

7.3 Test Data

JUDGEMENT: Passed by 4.1 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart B, Class A specification.

The margin between the emission level and the specification limit is 4.1 dB in the worst case at the frequency of 266.65 MHz, horizontal and vertical polarization.

The signals in the band 1.0 – 40.0 GHz were 20 dB below the specification limit.

The details of the highest emissions are given in Figure 14 to Figure 15.

TEST PERSONNEL:

Tester Signature: I. Raz

Date: 16.03.08

Typed/Printed Name: I. Raz

Radiated Emission

E.U.T Description Module
Type 5 GHz Module
Serial Number: Not Designated

Specification: FCC Part 15, Subpart B, Class A

Antenna Polarization: Horizontal
Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
Detectors: Peak, Quasi-peak

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)	(dB μ V/m)	(dB)
216.40	39.7	31.7	18.6	56.9	-25.2
265.60	43.5	37.3	21.7	56.9	-19.6
266.65	55.7	52.8	21.7	56.9	-4.1
299.98	49.8	45.8	23.4	56.9	-11.1
366.63	40.3	36.2	18.4	56.9	-20.7
431.60	41.9	33.6	20.1	56.9	-23.3
499.96	40.7	38.0	21.0	56.9	-18.9

**Figure 14. Radiated Emission. Antenna Polarization: HORIZONTAL.
Detectors: Peak, Quasi-peak**

Note: QP 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.

Radiated Emission

E.U.T Description Module
Type 5 GHz Module
Serial Number: Not Designated

Specification: FCC Part 15, Subpart B, Class A

Antenna Polarization: Vertical
Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
Detectors: Peak, Quasi-peak

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)	(dB μ V/m)	(dB)
216.40	39.7	31.7	18.6	56.9	-25.2
265.60	43.5	37.3	21.7	56.9	-19.6
266.65	55.7	52.8	21.7	56.9	-4.1
299.98	49.8	45.8	23.4	56.9	-11.1

**Figure 15. Radiated Emission. Antenna Polarization: VERTICAL.
Detectors: Peak, Quasi-peak**

Note: QP 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.

7.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial No.	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 12, 2007	1 Year
RF Filter Section	HP	85420E	3705A00248	November 12, 2007	1 Year
Antenna Biconical	ARA	BCD 235/B	1041	March 22, 2007	1 Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 22, 2007	1 Year
Antenna Log Periodic	A.H. Systems	SAS-200/511	253	February 4, 2007	2 Years
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 15, 2006	2 Years
Horn Antenna	ARA	SWH-28	1008	December 8, 2006	2 Years
Horn Antenna	Narda	V637	0410	December 8, 2006	2 Years
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	November 2, 2007	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	February 8, 2007	1 Year
Low Noise Amplifier	MK Milliwave	MKT6-3000 4000-30-13P	399	February 8, 2007	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 22, 2007	1 Year
Spectrum Analyzer	HP	8546E	3442A00275	November 14, 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	LaserJet 2200	JPKG19982	N/A	N/A

7.5 Field Strength Calculation

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

$$FS = RA + AF + CF$$

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

No external pre-amplifiers are used.

8. APPENDIX A - CORRECTION FACTORS

8.1 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".

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

FREQUENCY	CORRECTION
(GHz)	FACTOR
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.*

8.3 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

FREQUENCY (MHz)	AFE (dB/m)
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

FREQUENCY (MHz)	AFE (dB/m)
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".*

8.4 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".

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

FREQUENCY (MHz)	AFE (dB/m)
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".

8.6 Correction factors for BICONICAL ANTENNA
Type BCD-235/B,
10 meter range

FREQUENCY (MHz)	AFE (dB/m)
30.0	12.1
40.0	10.6
50.0	10.6
60.0	8.9
70.0	8.5
80.0	9.6
90.0	9.4
100.0	9.6
110.0	10.3
120.0	10.7
130.0	12.6
140.0	12.7
150.0	12.7
160.0	13.8
170.0	13.7
180.0	14.9
190.0	13.4
200.0	13.1
210.0	14.0
220.0	14.5
230.0	15.8
240.0	16.0
250.0	16.6
260.0	16.7
270.0	18.3
280.0	18.5
290.0	19.3
300.0	20.9

NOTES:

- 1. Antenna serial number is 1041.*
- 2. The above list is located in file 41BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".*

8.7 Correction factors for Double-Ridged Waveguide Horn

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

FREQUENCY	ANTENNA	ANTENN	FREQUENCY	ANTENNA	ANTENNA
(GHz)	FACTOR	A Gain	(GHz)	FACTOR	Gain
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			

8.8 Correction factors for

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

FREQUENCY (GHz)	AFE (dB /m)	Gain (dBi)
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

8.9 Correction factors for

Horn Antenna Model: V637

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
26.0	43.6	14.9
27.0	43.7	15.1
28.0	43.8	15.3
29.0	43.9	15.5
30.0	43.9	15.8
31.0	44.0	16.0
32.0	44.1	16.2
33.0	44.1	16.4
34.0	44.1	16.7
35.0	44.2	16.9
36.0	44.2	17.1
37.0	44.2	17.4
38.0	44.2	17.6
39.0	44.2	17.8
40.0	44.2	18.0

8.10 Correction factors for ACTIVE LOOP ANTENNA

Model 6502

S/N 9506-2950

FREQUENCY	Magnetic Antenna Factor	Electric Antenna Factor
(MHz)	(dB)	(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