

DATE: 07 October 2008

I.T.L. (PRODUCT TESTING) LTD.
FCC Radio Test Report
for
Precyse Technologies Inc

Equipment under test:

PBC Beacon

BC24/403000

Written by:



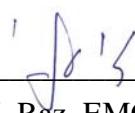
D. Shidlowsky, Documentation

Approved by:



A. Sharabi, Test Engineer

Approved by:



I. Raz, EMC Laboratory Manager

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This report relates only to items tested.

Measurement/Technical Report for Precyse Technologies Inc

PBC Beacon

BC24/403000

FCC ID: WONBC24403000

07 October 2008

This report concerns: Original Grant:

Class I Change:

Class II Change:

Equipment type: Spread Spectrum Transmitter

Limits used:

47CFR15 Section 15.247

Measurement procedure used is ANSI C63.4-2003.

Application for Certification
prepared by:

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1. General Information

1.1 Administrative Information

Manufacturer: Precyse Technologies Inc

Manufacturer's Address: 94 Em Hamoshavot St.
Petach Tikva 49527
Israel
Tel: +972-3-922-7093
Fax: +972-3-922-7515

Manufacturer's Representative: Lior Bilia

Equipment Under Test (E.U.T): PBC Beacon

Equipment Model No.: BC24/403000

Equipment Serial No.: Not Designated

Date of Receipt of E.U.T: 14.08.08

Start of Test: 14.08.08

End of Test: 26.08.08

Test Laboratory Location: I.T.L (Product Testing) Ltd.
Kfar Bin Nun,
ISRAEL 99780

Test Specifications: 47CFR15 Section 15.247

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*

The PBC Beacon is used to define a location zone. It is based on a microcontroller and 4 RF transceivers. It uses the iLocate proprietary protocol which provides a 2 way, half duplex communication with the base station and to transmit its ID to the SATs. The unit is DC powered, 12 – 24Vdc, up to 100mA.

1.4 *Test Methodology*

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***

The E.U.T. is a wall-mounted unit and was tested in the vertical position simulating wall-mounting.

2.2 ***EUT Exercise Software***

The unit was configured for normal operation. In this mode the beacon transmits its ID packet continuously, with 20% duty cycle.

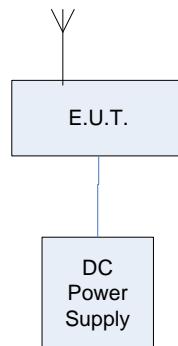
2.3 ***Special Accessories***

No special accessories were needed to achieve compliance.

2.4 ***Equipment Modifications***

No modifications were necessary in order to achieve compliance.

2.5 ***Configuration of Tested System***



Note: Intermodulation test was performed with 4 antennas connected.

Figure 1. Configuration of Tested System

3. Theory of Operation

3.1 *Theory of Operation*

The Beacon transmits its ID continuously, thus defining a location zone. When a tag receives this ID, it reports to the base station and the user application knows the SAT's location.

4. 6 dB Minimum Bandwidth

4.1 Test procedure

The E.U.T. was set to the applicable test frequency. The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (20 dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 100 kHz resolution BW. The spectrum bandwidth of the E.U.T. at the point of 6 dB below maximum peak power was measured and recorded.

The E.U.T. was tested at 2410, 2445, and 2475 MHz with QPSK modulation.

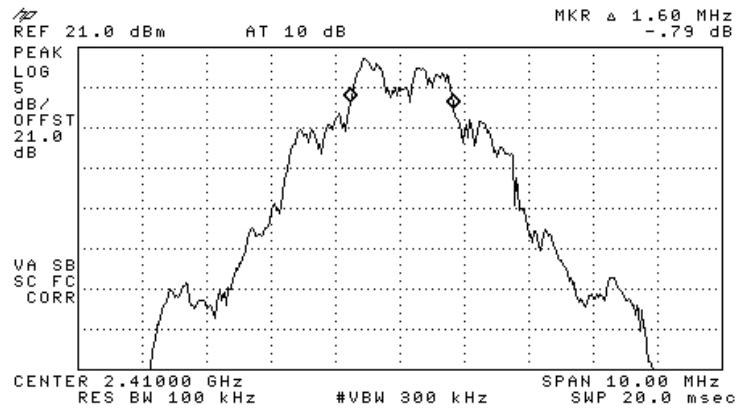


Figure 2 — Port 1 2410 MHz

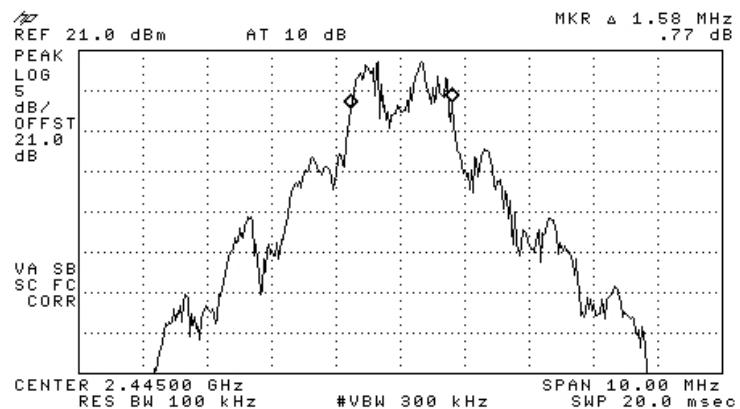


Figure 3 — Port 1 2445 MHz

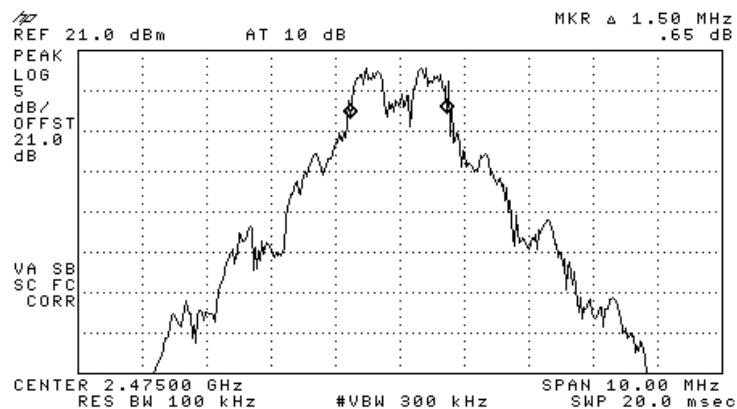


Figure 4 — Port 1 2475 MHz

4.2 Results table

E.U.T Description: PBC Beacon

Model No.: BC24/403000

Serial Number: Not Designated

Specification: F.C.C. Part 15, Subpart C: (15.247-a2)

Operation Frequency (MHz)	Reading (MHz)	Specification (MHz)
2410.00	1.60	0.5
2445.00	1.58	0.5
2475.00	1.50	0.5

Figure 5 6 dB Minimum Bandwidth

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature:  Date: 12.10.08

Typed/Printed Name: A. Sharabi

4.3 **Test Equipment Used.**

6 dB Minimum Bandwidth

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8592L	3826A01204	March 5, 2008	1 year
Attenuator	Jyebao	-	FAT-AM5AF5G6G2W20	August 14, 2008	1 year
Cable	Rhophase	KPS-5000-KPS	A1675	August 14, 2008	1 year

Figure 6 Test Equipment Used

5. Maximum Transmitted Peak Power Output

5.1 Test procedure

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator (20 dB) and an appropriate coaxial cable (cable loss = 1 dB). The Spectrum Analyzer was set to 1.0 MHz resolution BW. Peak power level was measured at selected operation frequencies.

The E.U.T. was tested at 2410, 2445, and 2475 MHz with QPSK modulation.

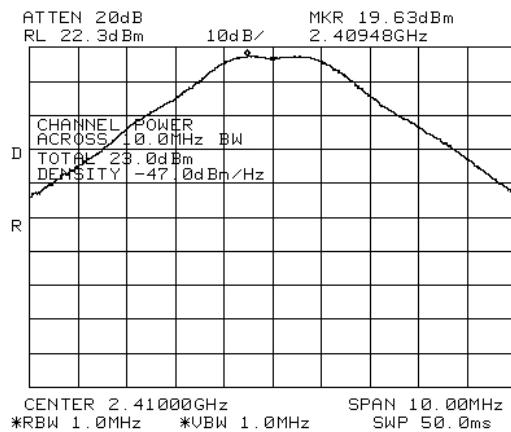


Figure 7 2410 MHz

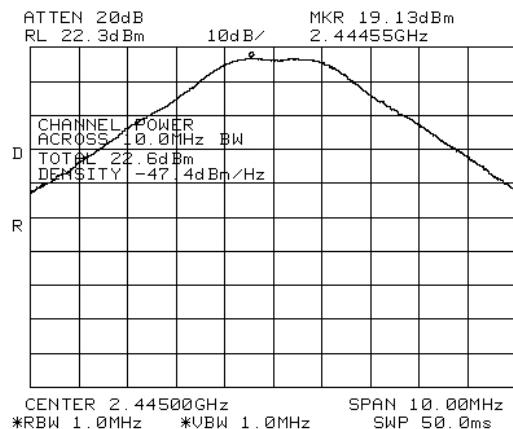


Figure 8 2445 MHz

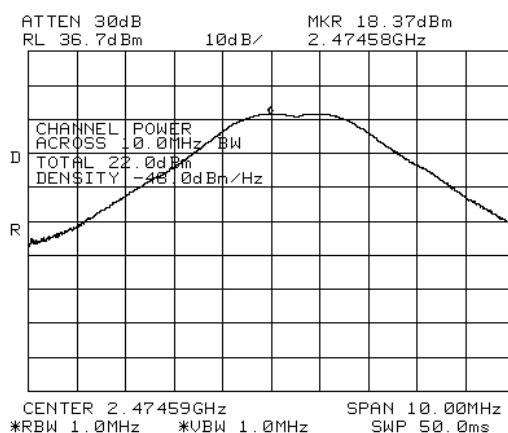


Figure 9 2475 MHz

5.2 Results table

E.U.T. Description: PBC Beacon
 Model No.: BC24/403000
 Serial Number: Not Designated
 Specification: F.C.C. Part 15, Subpart C Section 15.247(b)

Operation Frequency (MHz)	Power (dBm)	Specification (dBm)	Margin (dB)
2410.00	23.0	30.0	-7.0
2445.00	22.6	30.0	-7.4
2475.00	22.0	30.0	-8.0

Figure 10 Maximum Peak Power Output

JUDGEMENT: Passed by 7.0 dB

TEST PERSONNEL:

Tester Signature:  Date: 12.10.08

Typed/Printed Name: A. Sharabi

5.3 Test Equipment Used.

Peak Power Output

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8564E	3442A00275	November 14, 2007	1 year
Attenuator	Jyebao	-	FAT-AM5AF5G6G2W20	August 14, 2008	1 year
Cable	Rhophase	KPS-5000-KPS	A1675	August 14, 2008	1 year

Figure 11 Test Equipment Used

6. Peak Power Output Out of 2400-2483.5 MHz Band

6.1 *Test procedure*

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (20 dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 100 kHz resolution BW except for the frequency range 9 kHz-150 kHz where the RBW was set to 1kHz and the frequency range 150 kHz-10 MHz where the RBW was set to 10kHz. The frequency range from 9 kHz to 25 GHz was scanned. Level of spectrum components out of the 2400-2483.5 MHz was measured at the selected operation frequencies.

The E.U.T. was tested at 2410, 2445, and 2475 MHz with QPSK modulation.

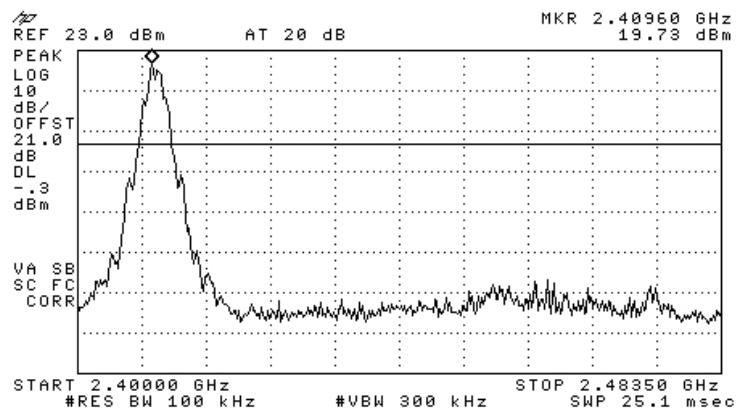


Figure 12 — 2410 MHz

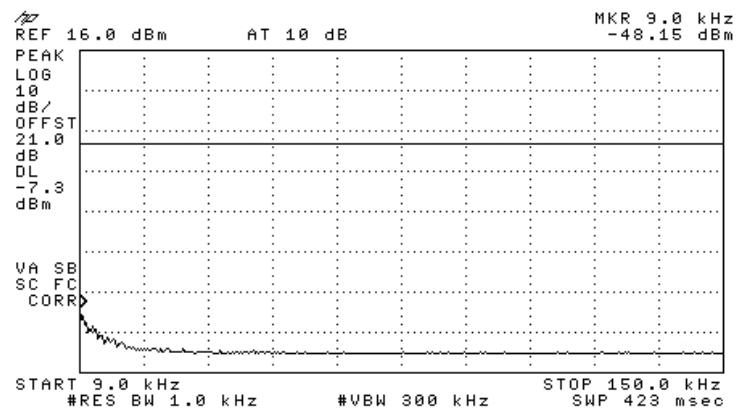


Figure 13 — 2410 MHz

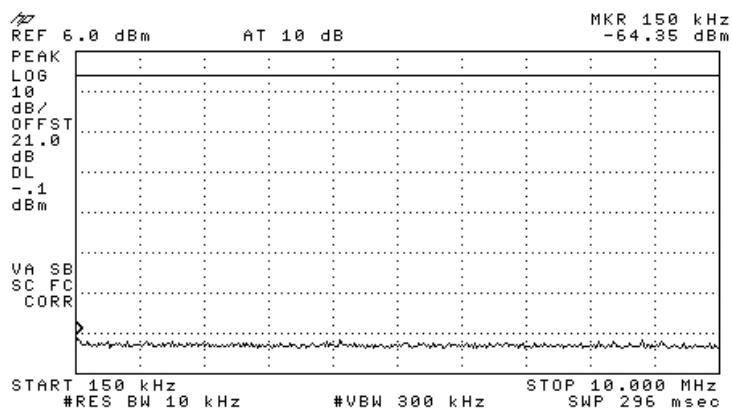


Figure 14 — 2410 MHz

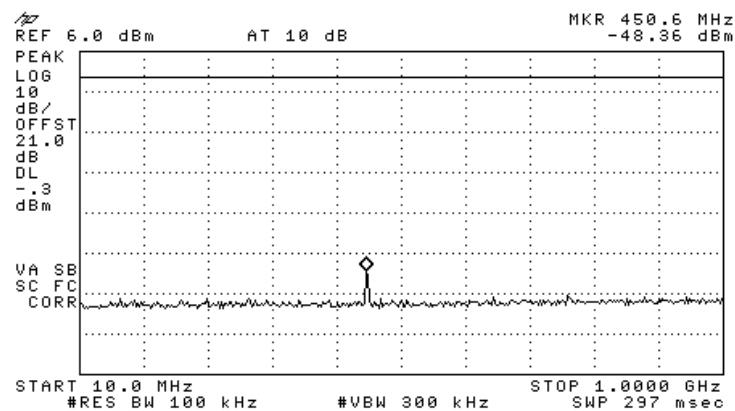


Figure 15 — 2410 MHz

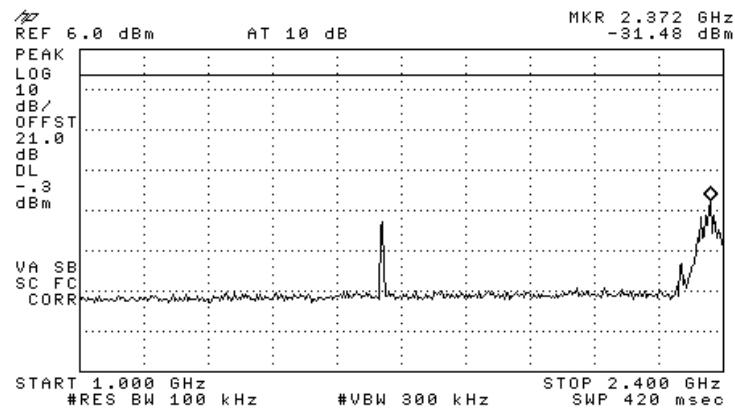


Figure 16 — 2410 MHz

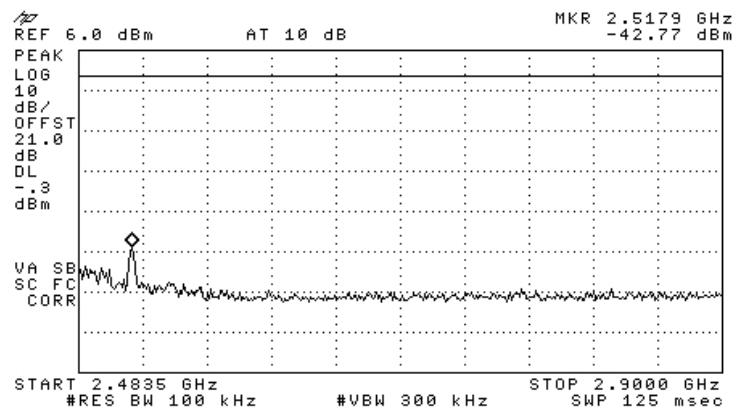


Figure 17 — 2410 MHz

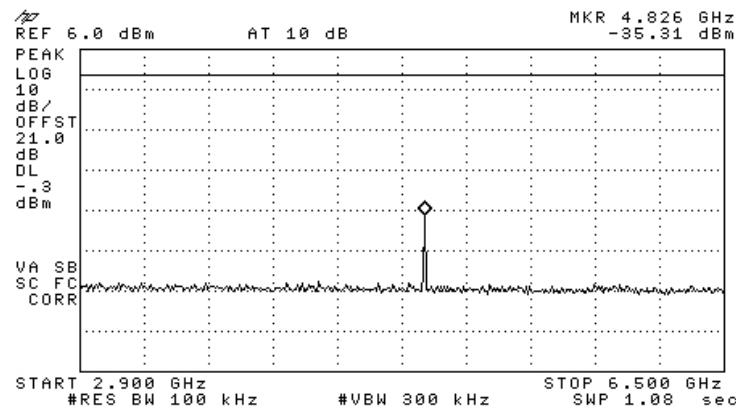


Figure 18 — 2410 MHz

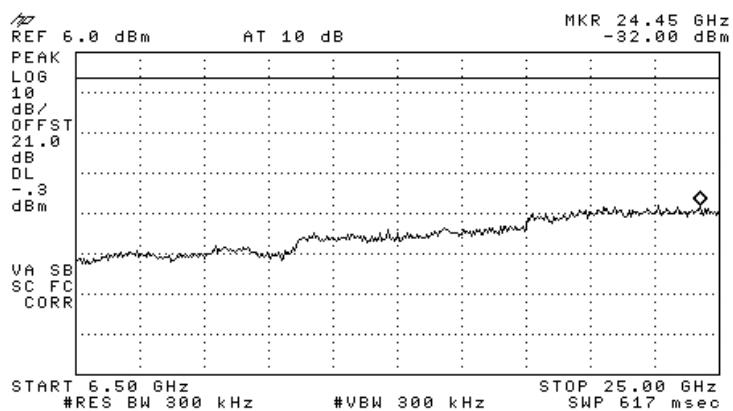


Figure 19 — 2410 MHz

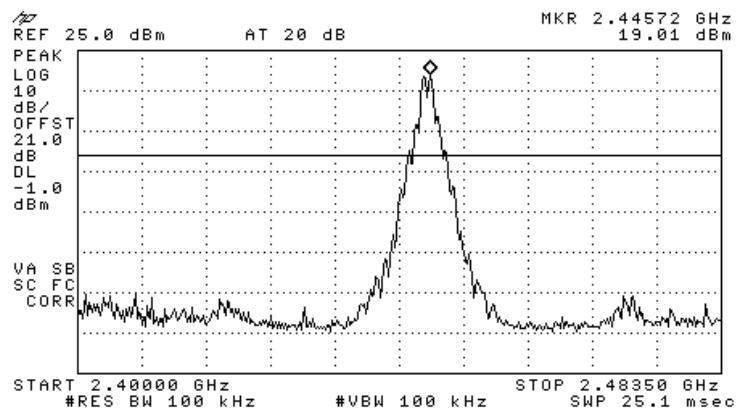


Figure 20 — 2445 MHz

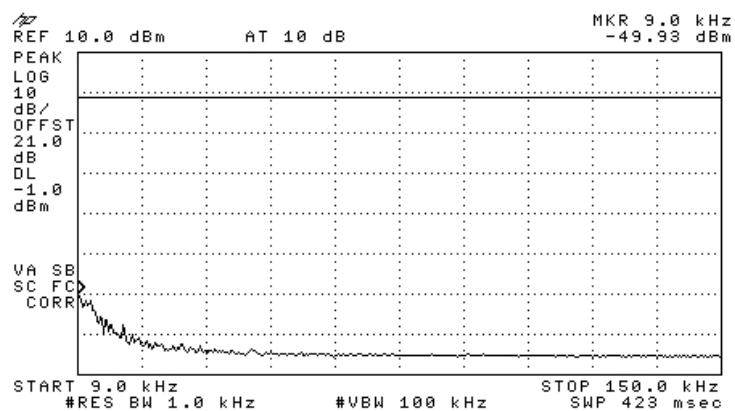


Figure 21 — 2445 MHz

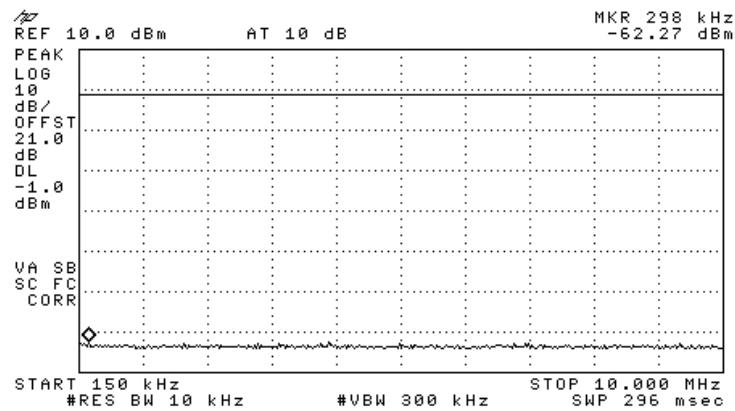


Figure 22 — 2445 MHz

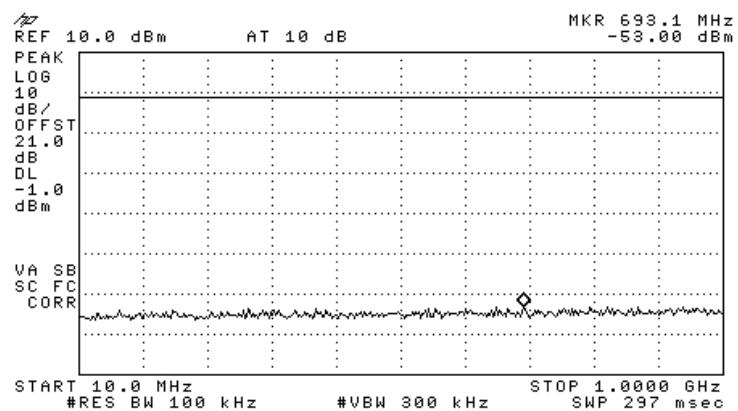


Figure 23 — 2445 MHz

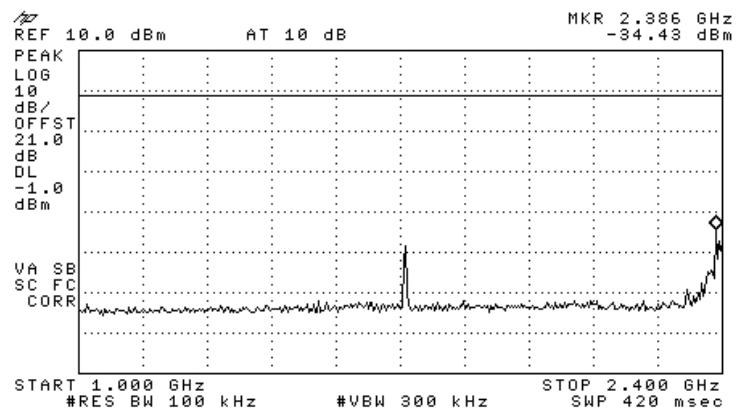


Figure 24 — 2445 MHz

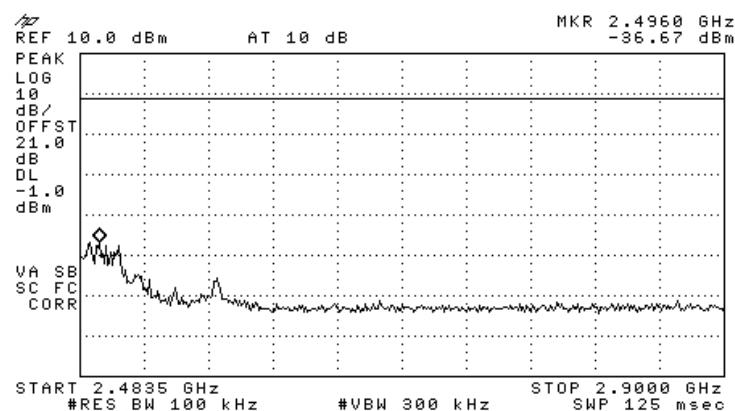


Figure 25 — 2445 MHz

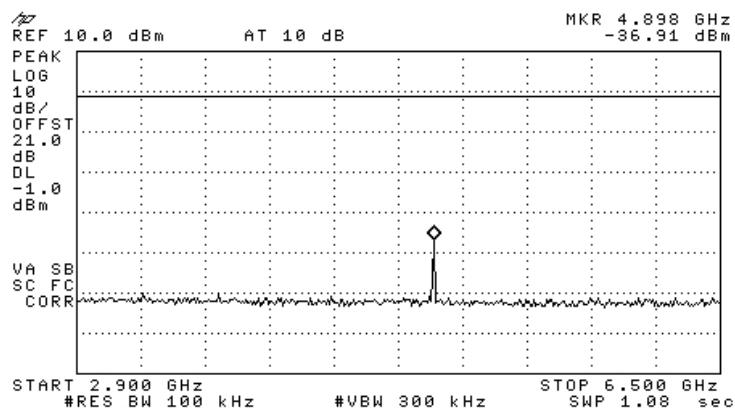


Figure 26 — 2445 MHz

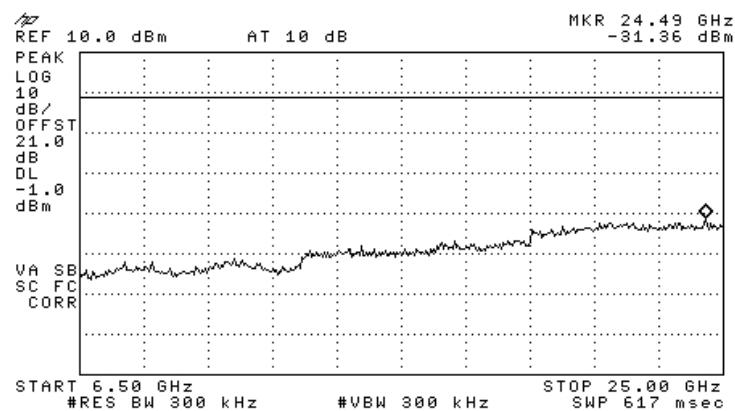


Figure 27 — 2445 MHz

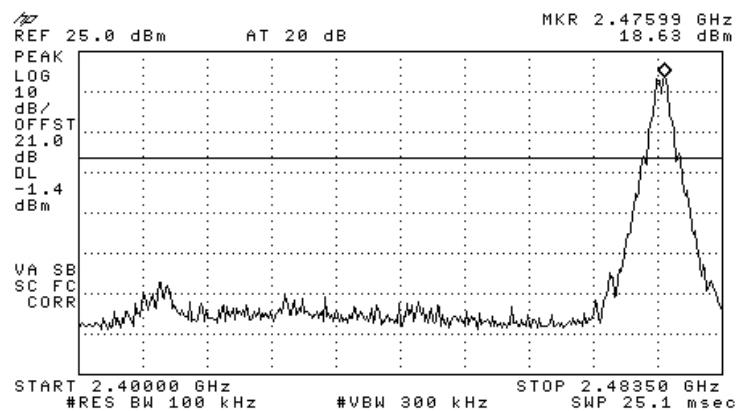


Figure 28 — 2475 MHz

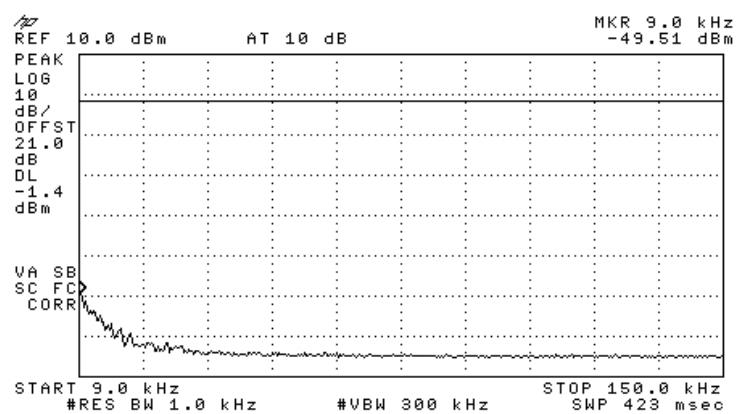


Figure 29 — 2475 MHz

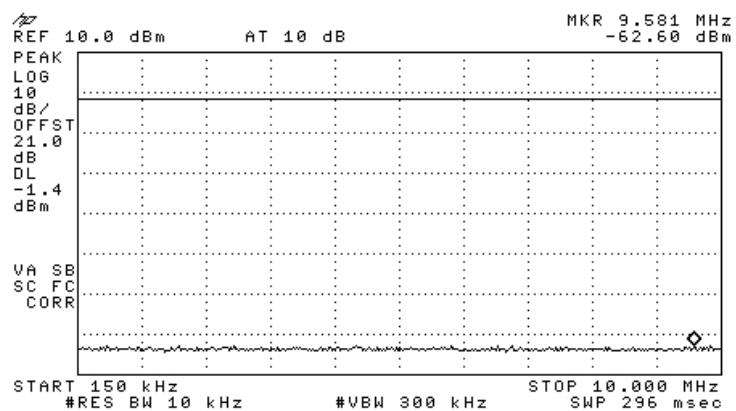


Figure 30 — 2475 MHz

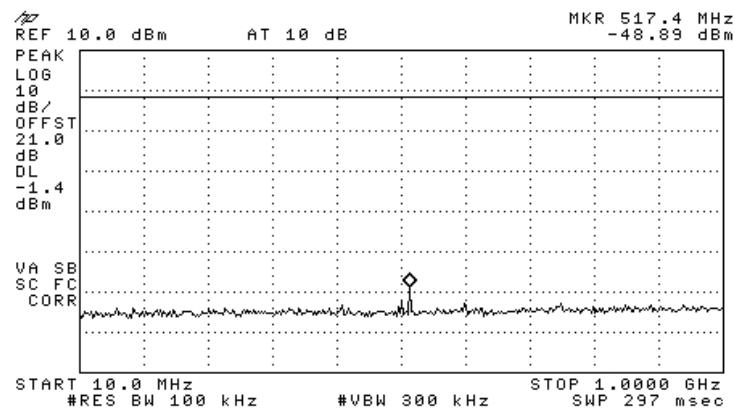


Figure 31 — 2475 MHz

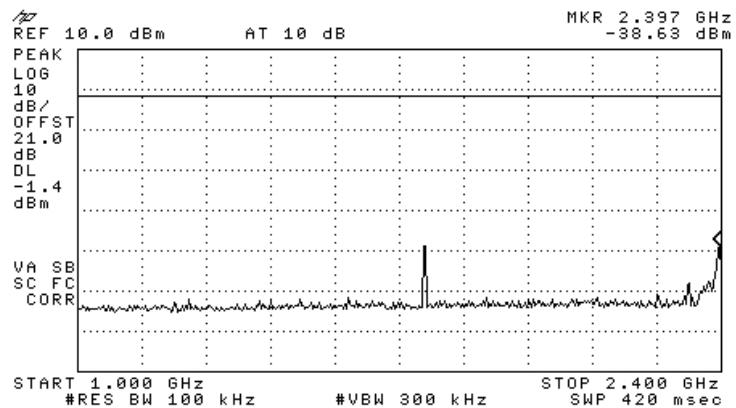


Figure 32 — 2475 MHz

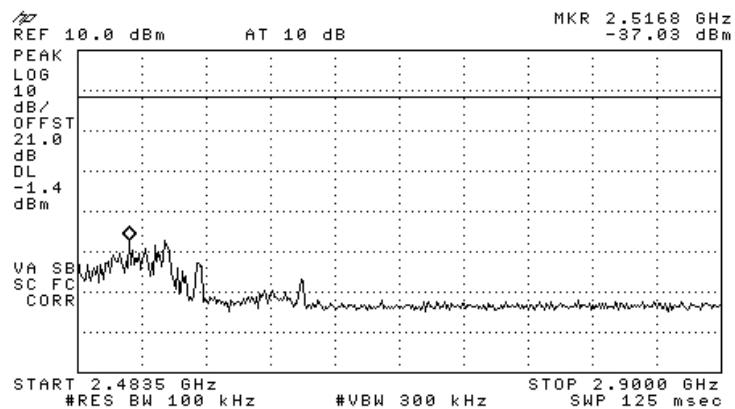


Figure 33 — 2475 MHz

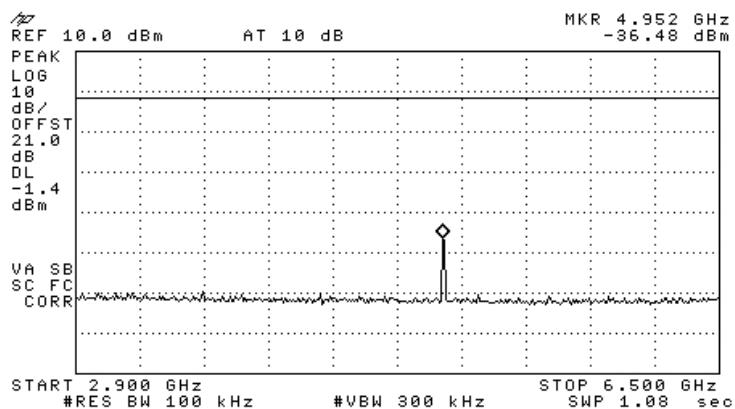


Figure 34 — 2475 MHz

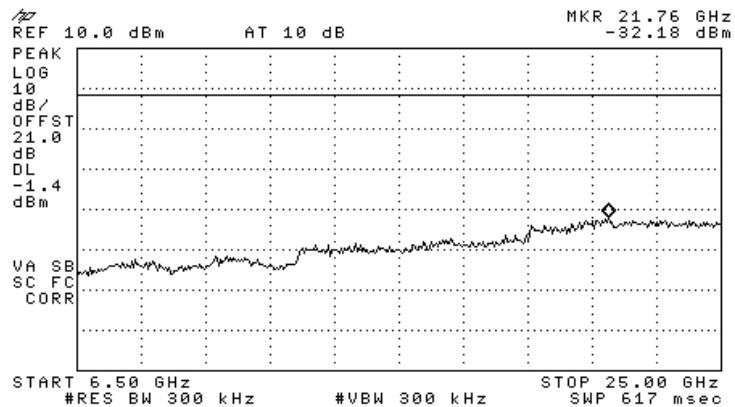


Figure 35 — 2475 MHz

6.2 Results table

E.U.T Description: PBC Beacon
 Model No.: BC24/403000
 Serial Number: Not Designated
 Specification: F.C.C. Part 15, Subpart C (15.247)

Operation Frequency (MHz)	Reading (dBc)	Specification (dBc)	Margin (dB)
2410.00	51.18	20.0	-31.18
2445.00	50.36	20.0	-30.36
2475.00	50.78	20.0	-30.78

Figure 36 Peak Power Output of 2400-2483.5 MHz Band

JUDGEMENT: Passed by 30.36 dB

TEST PERSONNEL:

Tester Signature:  Date: 12.10.08

Typed/Printed Name: A. Sharabi

6.3 **Test Equipment Used.**

Peak Power Output of 2400-2438.5 MHz Band

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8592L	3826A01204	March 5, 2008	1 year
Attenuator	Jyebao	-	FAT-AM5AF5G6G2W20	August 14, 2008	1 year
Cable	Rhophase	KPS-5000-KPS	A1675	August 14, 2008	1 year

Figure 37 Test Equipment Used

7. Band Edge Spectrum

7.1 Test procedure

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (20 dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 100 kHz resolution BW. Maximum power level below 2400 MHz and above 2483.5 MHz was measured relative to power level at 2399.50 MHz, and 2483.50 MHz correspondingly.

The E.U.T. was tested using QPSK modulation.

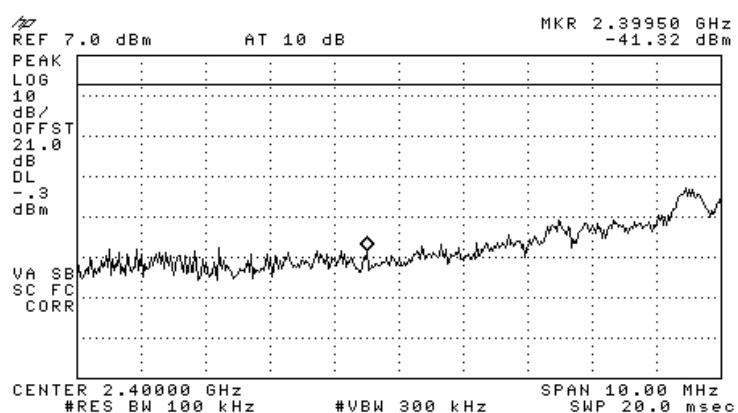


Figure 38 — 2410 MHz

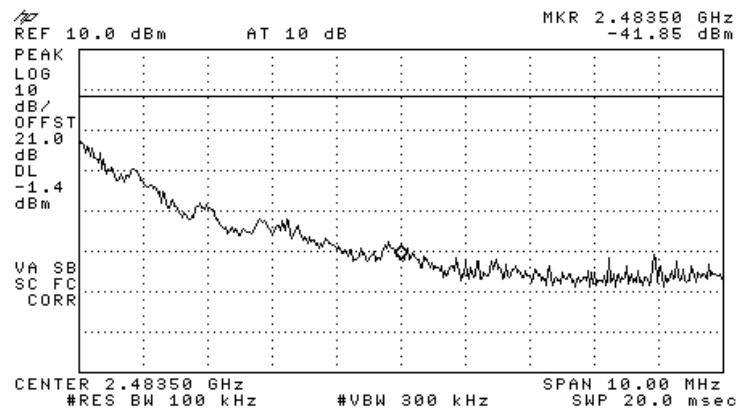


Figure 39 —

7.2 Results table

E.U.T. Description: PBC Beacon
 Model No.: BC24/403000
 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)
2410.00	2399.50	61.02	20.0	-41.02
2475.00	2483.50	60.45	20.0	-40.45

Figure 40 Band Edge Spectrum

JUDGEMENT: Passed by 40.45 dB

TEST PERSONNEL:

Tester Signature: A. Sharabi Date: 12.10.08

Typed/Printed Name: A. Sharabi

7.3 **Test Equipment Used.**

Band edge Spectrum

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8592L	3826A01204	March 5, 2008	1 year
Attenuator	Jyebao	-	FAT-AM5AF5G6G2W20	August 14, 2008	1 year
Cable	Rhophase	KPS-5000-KPS	A1675	August 14, 2008	1 year

Figure 41 Test Equipment Used

8. Radiated Emission, 9 kHz – 30 MHz

8.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

8.2 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-30 MHz was scanned.

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 at a distance of 3 meters.

The E.U.T. was tested at the operating frequencies of 2410, 2445, and 2475 MHz using QPSK modulation.

8.3 Measured Data

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 specification.

The results for all three operating frequencies were the same.

No signals were detected in the frequency range of 9 kHz – 30 MHz.

TEST PERSONNEL:

Tester Signature: 

Date: 12.10.08

Typed/Printed Name: A. Sharabi

8.4 Test Instrumentation Used, Radiated Measurements

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
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

8.5 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.

9. Spurious Radiated Emission 30 – 1000 MHz

9.1 ***Test Specification***

30 MHz-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 1.

The frequency range 30 MHz-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 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 tested at the operating frequencies of 2410, 2445, and 2475 MHz using QPSK modulation.

9.3 **Test Data**

JUDGEMENT: Passed by 7.3 dB

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

The results for all three operating frequencies were the same.

The margin between the emission level and the specification limit was 7.3 dB in the worst case at the frequency of 277.72 MHz, horizontal polarization.

The details of the highest emissions are given in *Figure 42* to *Figure 43*.

TEST PERSONNEL:

Tester Signature:  Date: 12.10.08

Typed/Printed Name: A. Sharabi

Radiated Emission

E.U.T Description PBC Beacon
 Type BC24/403000
 Serial Number: Not Designated

Specification: FCC Part 15, Subpart C

Antenna Polarization: Horizontal Frequency range: 30 MHz to 1000 MHz
 Antenna: 3 meters distance Detectors: Peak, Quasi-peak

Signal Number	Frequency (MHz)	Peak dBuV/m	QP dBuV/m	QP Delta L 1 (dB)	Av Delta L 2 (dB)	Corr (dB)
1	120.018525	32.4	26.6	-16.9		13.6
2	202.962500	32.3	26.7	-16.8		17.8
3	258.491850	36.0	31.0	-15.0		21.4
4	260.935025	36.9	31.5	-14.5		21.6
5	273.079375	41.9	38.2	-7.8		21.9
6	277.716388	41.7	38.7	-7.3		22.0

**Figure 42. 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 PBC Beacon
Type BC24/403000
Serial Number: Not Designated

Specification: FCC Part 15, Subpart C

Antenna Polarization: Vertical
Antenna: 3 meters distance

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

Signal Number	Frequency (MHz)	Peak dBuV/m	QP dBuV/m	QP Delta L 1 (dB)	Av Delta L 2 (dB)	Corr (dB)
1	120.011325	32.0	27.3	-16.2		13.6
2	203.021528	32.7	26.7	-16.8		17.8
3	258.675550	37.2	31.0	-14.9		21.4
4	261.290637	37.1	31.1	-14.9		21.6
5	273.427800	37.8	31.4	-14.6		21.9
6	278.116688	37.2	31.4	-14.6		22.1

Figure 43. 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.

9.4 Test Instrumentation Used, Radiated Measurements

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
Antenna Bi-conical	ARA	BCD 235/B	1041	March 23, 2008	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 22, 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

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 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.

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 2.9-25.0 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 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 E.U.T. was tested at the operating frequencies of 2410, 2445, and 2475 MHz using QPSK modulation.

10.2 Test Data

JUDGEMENT: Passed by 6.4 dB

For the operation frequency of 2410.00 MHz, the margin between the emission level and the specification limit is 7.1 in the worst case at the frequency of 2400.00 MHz, vertical polarization.

For the operation frequency of 2445.00 MHz, the margin between the emission level and the specification limit is 14.2 in the worst case at the frequency of 4889.00 MHz, horizontal polarization.

For the operation frequency of 2475.00 MHz, the margin between the emission level and the specification limit is 6.4 in the worst case at the frequency of 2485.00 MHz, horizontal polarization.

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

The details of the highest emissions are given in *Figure 44* to *Figure 49*.

TEST PERSONNEL:

Tester Signature: 

Date: 12.10.08

Typed/Printed Name: A. Sharabi

Radiated Emission Above 1 GHz

E.U.T Description PBC Beacon
 Type BC24/403000
 Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1.0 GHz to 25.0 GHz
 Test Distance: 3 meters Detector: Peak
 Operation Frequency: 2410.00 MHz

Freq. (MHz)	Polarity (H/V)	Peak Amp (dB μ V/m)	Peak. Specification (dB μ V/m)	Peak. Margin (dB)
2400.00	H	56.3**	74.0	-17.7
4820.00	H	57.4*	74.0	-16.6
2400.00	V	57.8**	74.0	-16.2
4820.00	V	62.6*	74.0	-11.4

**Figure 44. 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

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission Above 1 GHz

E.U.T Description PBC Beacon
 Type BC24/403000
 Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1.0 GHz to 25.0 GHz
 Test Distance: 3 meters Detector: Average
 Operation Frequency: 2410.00 MHz

Freq. (MHz)	Polarity (H/V)	Average Amp (dB μ V/m)	Average Specification (dB μ V/m)	Peak. Margin (dB)
2400.00	H	43.5**	54.0	-10.5
4820.00	H	38.6*	54.0	-15.4
2400.00	V	46.9**	54.0	-7.1
4820.00	V	39.6*	54.0	-14.4

**Figure 45. 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

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission Above 1 GHz

E.U.T Description PBC Beacon
Type BC24/403000
Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1.0 GHz to 25.0 GHz
Test Distance: 3 meters Detector: Peak
Operation Frequency: 2445.00 MHz

Freq.	Polarity	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(H/V)	(dB μ V/m)	(dB μ V/m)	(dB)
4889.00	H	55.4*	74.0	-18.6
4889.00	V	56.1*	74.0	-17.9

Figure 46. 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 PBC Beacon
 Type BC24/403000
 Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1.0 GHz to 25.0 GHz
 Test Distance: 3 meters Detector: Average
 Operation Frequency: 2445 MHz

Freq. (MHz)	Polarity (H/V)	Average Amp (dB μ V/m)	Average Specification (dB μ V/m)	Peak. Margin (dB)
4889.00	H	39.8*	54.0	-14.2
4889.00	V	38.9*	54.0	-15.1

**Figure 47. 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

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission Above 1 GHz

E.U.T Description PBC Beacon
 Type BC24/403000
 Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1.0 GHz to 25.0 GHz
 Test Distance: 3 meters Detector: Peak
 Operation Frequency: 2475.00 MHz

Freq. (MHz)	Polarity (H/V)	Peak Amp (dB μ V/m)	Peak. Specification (dB μ V/m)	Peak. Margin (dB)
2485.00	H	57.2**	74.0	-16.8
4948.00	H	47.3*	74.0	-26.7
2485.00	V	58.3**	74.0	-15.7
4948.00	V	50.0*	74.0	-24.0

**Figure 48. 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

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission Above 1 GHz

E.U.T Description PBC Beacon
 Type BC24/403000
 Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1.0 GHz to 25.0 GHz
 Test Distance: 3 meters Detector: Average
 Operation Frequency: 2475 MHz

Freq. (MHz)	Polarity (H/V)	Average Amp (dB μ V/m)	Average Specification (dB μ V/m)	Peak. Margin (dB)
2485.00	H	46.3**	54.0	-7.7
4948.00	H	33.4*	54.0	-20.6
2485.00	V	47.6**	54.0	-6.4
4948.00	V	37.8*	54.0	-16.2

**Figure 49. 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

** “Correction Factor” = Antenna Factor + Cable Loss

10.3 Test Instrumentation Used, Radiated Measurements Above 1 GHz

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	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 23, 2008	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 16, 2008	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	January 9, 2008	1 Year
Low Noise Amplifier	MK Milliwave	MKT6-3000 4000-30-13P	399	January 9, 2008	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	March 5, 2008	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	JPKGC19982	N/A	N/A

11. Transmitted Power Density

[In accordance with section 15.247(d)]

11.1 Test procedure

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (20dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 3 kHz resolution BW. and sweep time of 1 second for each 3 kHz “window”. The spectrum peaks were located at each of the 3 operating frequencies.

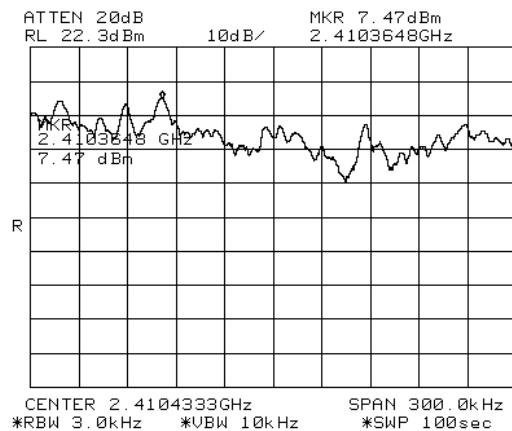


Figure 50 — 2410 MHz

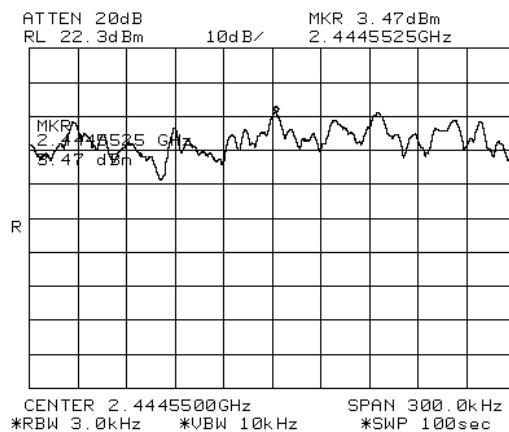


Figure 51 — 2445 MHz

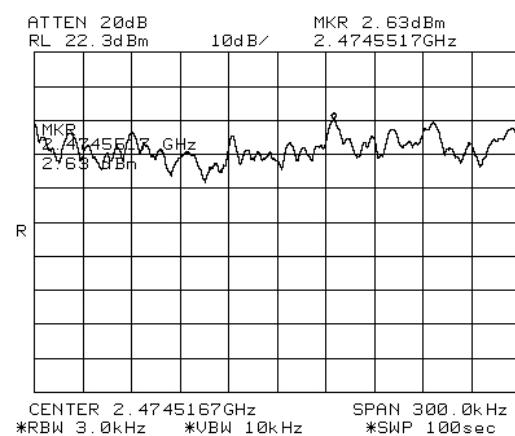


Figure 52 — 2475 MHz

11.2 Results table

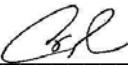
E.U.T. Description: PBC Beacon
 Model No.: BC24/403000
 Serial Number: Not Designated
 Specification: F.C.C. Part 15, Subpart C (15.247(d))

Operation Frequency (MHz)	Reading Spectrum Analyzer (dBm)	Specification (dBm)	Margin (dB)
2410.00	7.47	8.0	-0.53
2445.00	3.47	8.0	-4.53
2475.00	2.63	8.0	-5.37

Figure 53 Test Results

JUDGEMENT: Passed by 0.53 dB

TEST PERSONNEL:

Tester Signature:  Date: 12.10.08

Typed/Printed Name: A. Sharabi

11.3 Test Equipment Used.

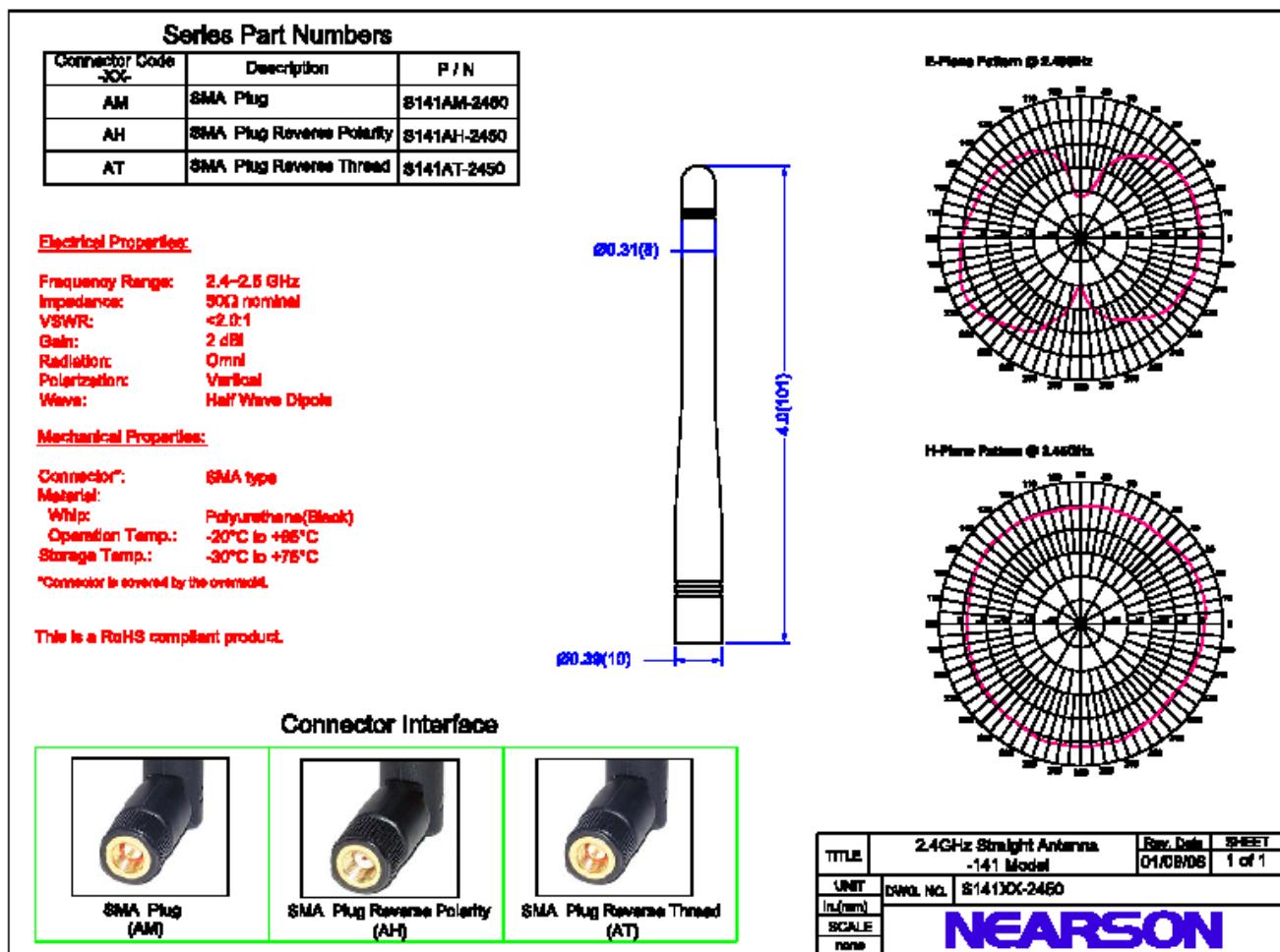
Transmitted Power Density

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8564E	3442A00275	November 14, 2007	1 year
Attenuator	Jyebao	-	FAT-AM5AF5G6G2W20	August 14, 2008	1 year
Cable	Rhophase	KPS-5000-KPS	A1675	August 14, 2008	1 year

Figure 54 Test Equipment Used

12. Antenna Gain/Information

The antenna gain is 2 dBi.



13. R.F Exposure/Safety

Typical use of the E.U.T. is defining a location zone. The typical placement of the E.U.T. is wall mounted. The typical distance between the E.U.T. and the user is 1 m.

Calculation of Maximum Permissible Exposure (MPE)

Based on Section 1.1307(b)(1) Requirements

(a) FCC limits at 2445 MHz is: $1 \frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) The power density produced by the E.U.T. is

$$S = \frac{P_t G_t}{4\pi R^2}$$

P_t- Transmitted Power 23.0 dBm Peak = 199.5 mw

G_T- Antenna Gain, 2 dBi = 1.58 (Numeric)

R- Distance from Transmitter using 1 m

(c) Transmitter peak power using source based time averaging of 20 % maximum, 20 msec “ON” time, “OFF” + “ON” time 100 msec:

$$Pt = \frac{199.5 \times 20}{100} = 39.9mW$$

(d) The peak power density (time averaging) is :

$$S_p = \frac{39.9 \times 1.58}{4\pi(100)^2} = 0.5 \times 10^{-3} \frac{mW}{cm^2}$$

(e) In the worst case, 4 transceivers transmitting at the same time, the peak power density (time averaging) is :

$$S_p = 0.5 \times 10^{-3} \times 4 = 2 \times 10^{-3} \frac{mW}{cm^2}$$

14. Intermodulation

14.1 ***Test Specification***

3rd Order Product

14.2 ***Test Procedure***

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

The E.U.T was placed in the open site on a non-conductive table, 0.8 meters above the ground. The table azimuth was controlled by a remote positioner.

The emissions below 2.9 GHz 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 above 2.9 GHz, a spectrum analyzer including a low noise amplifier was used. During peak measurements, the I.F. bandwidth was 1 MHz, and video bandwidth 3 MHz. During average measurements, the I.F. bandwidth was 1 MHz and video bandwidth was 100 Hz.

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 receiver and/or spectrum analyzer center frequency was set to 3rd order intermodulation products, resulting from the transmitters' operation frequencies below.

The emissions were measured at a distance of 3 meters.

The configurations tested included 4 transmitters operating at the following channels and frequencies:

Channel 7, 2435.00 MHz

Channel 9, 2445.00 MHz

Channel 10, 2450.00 MHz

Channel 13, 2465.00 MHz

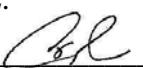
The gain of each antenna is: 2 dBi

14.3 **Test Data**

JUDGEMENT: Passed by 12.0 dB

The margin between the emission level and the specification limit is 12.0 in the worst case at the frequency of 2495.26 MHz, vertical polarization.

TEST PERSONNEL:

Tester Signature:  Date: 12.10.08

Typed/Printed Name: A. Sharabi

Intermodulation

E.U.T Description PBC Beacon
 Type BC24/403000
 Serial Number: Not Designated

Antenna Polarization: Horizontal/Vertical Frequency range: 30 MHz to 25.0 GHz
 Test Distance: 3 meters Detector: Peak

Freq.	Polarity	Peak Reading	Peak Specification	Margin
(MHz)	(H/V)	(dB μ V/m)	(dB μ V/m)	(dB)
2386.28	V	56.5	74.0	-17.5
2381.28	V	58.6	74.0	-15.4
2495.26	V	58.8	74.0	-15.2
2386.28	H	52.0	74.0	-22.0
2381.28	H	52.1	74.0	-21.9
2495.26	H	53.1	74.0	-20.9

**Figure 55. intermodulation. 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

Intermodulation

E.U.T Description PBC Beacon
 Type BC24/403000
 Serial Number: Not Designated

Antenna Polarization: Horizontal/Vertical Frequency range: 30 MHz to 25.0 GHz
 Test Distance: 3 meters Detector: Average

Freq. (MHz)	Polarity (H/V)	Average Reading (dB μ V/m)	Average Specification (dB μ V/m)	Margin (dB)
2386.28	V	41.0	54.0	-13.0
2381.28	V	41.4	54.0	-12.6
2495.26	V	42.0	54.0	-12.0
23.86.28	H	39.1	54.0	-14.9
2381.28	H	39.8	54.0	-14.2
2495.26	H	39.2	54.0	-14.8

**Figure 56. intermodulation. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Average**

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 Reading” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

14.4 Test Instrumentation Used, Intermodulation 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 23, 2008	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 16, 2008	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

15. APPENDIX A - CORRECTION FACTORS

15.1 *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".

15.2 Correction factors for

CABLE

from EMI receiver
to test antenna
at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
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.

15.3 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".

15.4 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".

15.5 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".

15.6 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			

15.7 Correction factors for

Horn Antenna

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

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
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

15.8 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

15.9 Correction factors for ACTIVE LOOP ANTENNA

Model 6502
S/N 9506-2950

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