

DATE: 10 December 2008

I.T.L. (PRODUCT TESTING) LTD.

FCC Radio Test Report

for

Precyse Technologies Inc

Equipment under test:

PBS Base Station

BS24/103000

Written by:



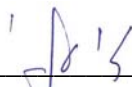
D. Shidlowsky, Documentation

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 PBS Base Station

BS24/103000

FCC ID: WONBS24103000

10 December 2008

This report concerns:	Original Grant:	X
	Class I Change:	
	Class II Change:	
Equipment type:	Digital Transmission System	

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):	PBS Base Station
Equipment Model No.:	BS24/103000
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	01.10.08
Start of Test:	26.10.08
End of Test:	27.10.08; 10.12.08*
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	47CFR15 Section 15.247

* Conducted emission from AC mains and radiated emission at 2390 MHz and below were performed on 12 December 2008.

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 PBS is used to communicate between the SATs and a personal computer. It also provides synchronization signal for the system. It uses the iLocate proprietary protocol which provides a 2 way, half duplex communication with the tags and beacons. The unit is DC powered, 12 - 24Vdc, up to 500mA.

The GPS receiver in the PBS is used as an absolute timing and clock source. Amplifier block: The amplifier box is connected to the PBS via a proprietary control protocol. Two of the four RF connectors are used as transmit and receive channels to the amplifier. The other two SMA connectors are disabled (Internally, physically disconnected). The fifth RF port is for the GPS receiver.

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.

The GPS receiver in the PBS is used as an absolute timing and clock source. Amplifier block: The amplifier box is connected to the PBS via a proprietary control protocol. Two of the four RF connectors are used as transmit and receive channels to the amplifier. The other two SMA connectors are disabled (Internally, physically disconnected). The fifth RF port is for the GPS receiver.

Radiated emission tests were performed with only one antenna which was connected to the amplifier block..

2.2 EUT Exercise Software

The unit was configured for continuous .transmission to transmit continuously (20% duty cycle), in order to ease emissions measurements. Normal duty cycle is 0.5% (One synchronization and downlink packet per second).

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

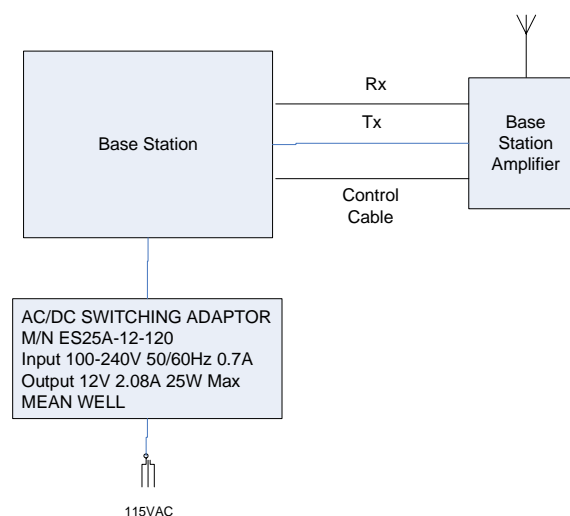


Figure 1. Configuration of Tested System

3. Theory of Operation

3.1 *Theory of Operation*

The PBS base station is responsible for synchronizing all the other parts of the system and transmitting data to and from the PC connected to it. The GPS receiver in the PBS is used as an absolute timing and clock source.

Amplifier block: The amplifier box is connected to the PBS via a proprietary control protocol. Two of the four RF connectors are used as transmit and receive channels to the amplifier. The other two SMA connectors are disabled (Internally, physically disconnected). The fifth RF port is for the GPS receiver.

4. Conducted Emission Data

4.1 Test Specification

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

4.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 3.1. 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 μ 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.

4.3 Measured Data

JUDGEMENT: Passed by 8.9 dB

The margin between the emission levels and the specification limit is, in the worst case, 8.9 dB for the phase line at 0.19 MHz and 9.4 dB at 0.19 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 2* to *Figure 5*.

TEST PERSONNEL:

Tester Signature: For/ 

Date: 15.12.08

Typed/Printed Name: A. Sharabi

Conducted Emission

E.U.T Description PBS Base Station
Type BS24/103000
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 2 (dB)	Corr (dB)
1	0.189805	56.6	55.2	-8.9	44.3	-9.8	0.0
2	0.286319	46.0	44.6	-16.1	38.1	-12.6	0.0
3	0.522237	35.1	33.6	-22.4	30.5	-15.4	0.0
4	5.697267	36.7	34.2	-25.8	22.8	-27.2	0.0
5	13.584321	32.2	30.1	-29.9	22.3	-27.7	0.0
6	25.939063	38.9	35.3	-24.7	26.2	-23.8	0.0


Figure 2. Detectors: Peak, Quasi-peak, AVERAGE .

Note: QP Delta/Av Delta refer 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 PBS Base Station
Type BS24/103000
Serial Number: Not Designated

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

 09:32:06 DEC 10, 2008

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKA 190 kHz
55.79 dBμV

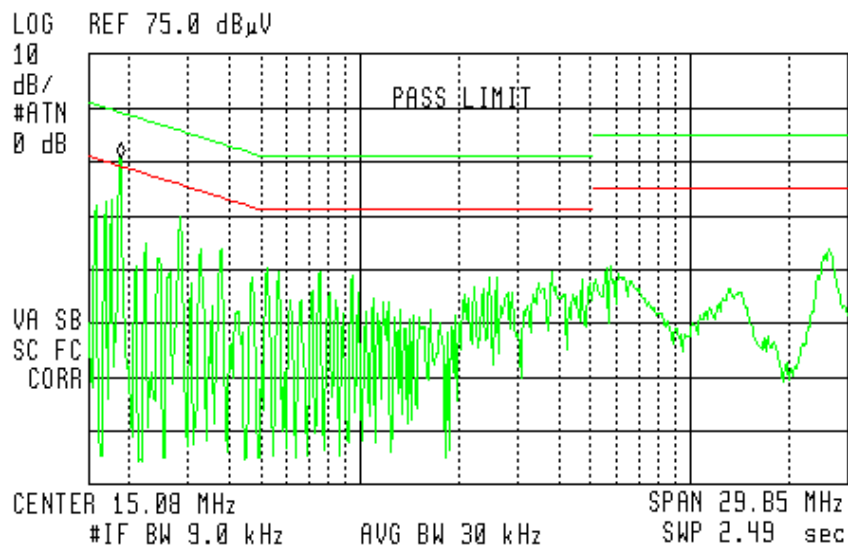


Figure 3. Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description PBS Base Station
Type BS24/103000
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 2 (dB)	Corr (dB)
1	0.190801	55.5	54.6	-9.4	43.4	-10.6	0.0
2	0.239048	47.5	45.7	-16.4	34.4	-17.8	0.0
3	0.287144	45.2	43.9	-16.8	35.0	-15.7	0.0
4	3.140906	32.0	30.8	-25.2	25.4	-20.6	0.0
5	6.996254	29.8	27.6	-32.4	19.4	-30.6	0.0
6	25.950020	41.7	37.4	-22.6	27.4	-22.6	0.0


Figure 4. Detectors: Peak, Quasi-peak, AVERAGE

Note: QP Delta/Av Delta refer 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 PBS Base Station
 Type BS24/103000
 Serial Number: Not Designated

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

 09:37:29 DEC 10, 2008

ACTV DET: PEAK
 MEAS DET: PEAK QP AVG
 MKR 190 kHz
 55.15 dB μ V

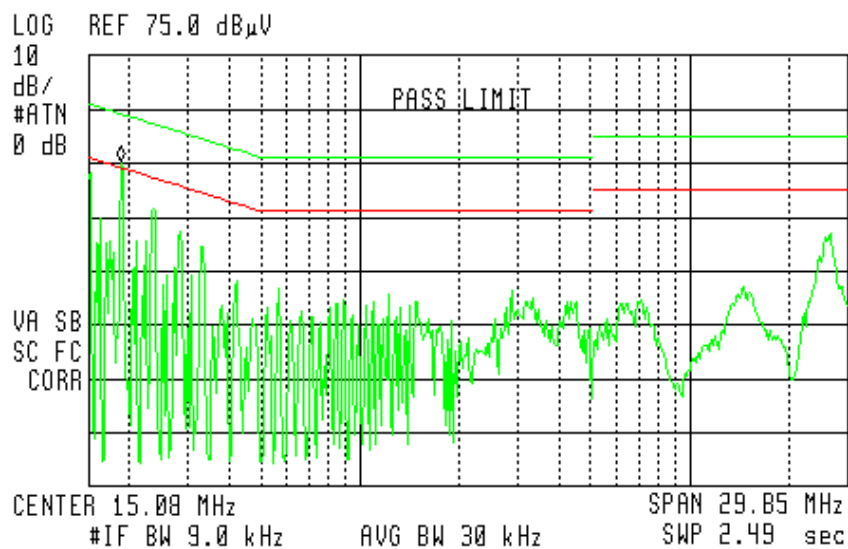


Figure 5 Conducted Emission: NEUTRAL
Detectors: Peak, Quasi-peak, Average

4.4 Test Instrumentation Used, Conducted Measurement

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
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

5. 6 dB Minimum Bandwidth

5.1 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.

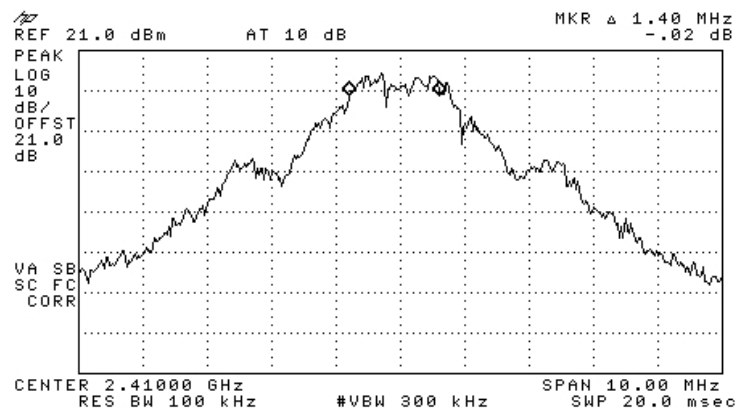


Figure 6 — 2410 MHz

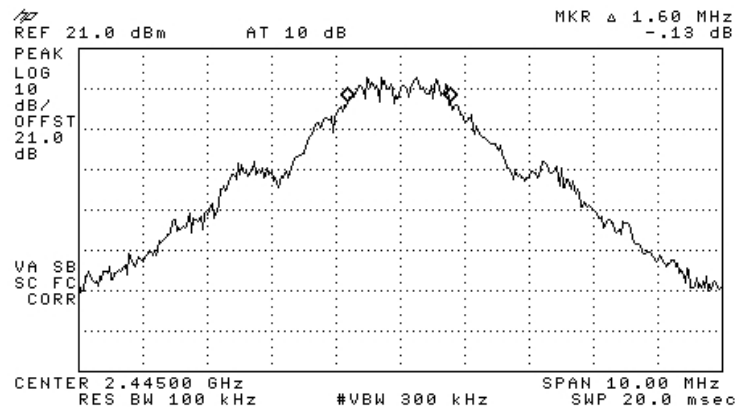


Figure 7 — 2445 MHz

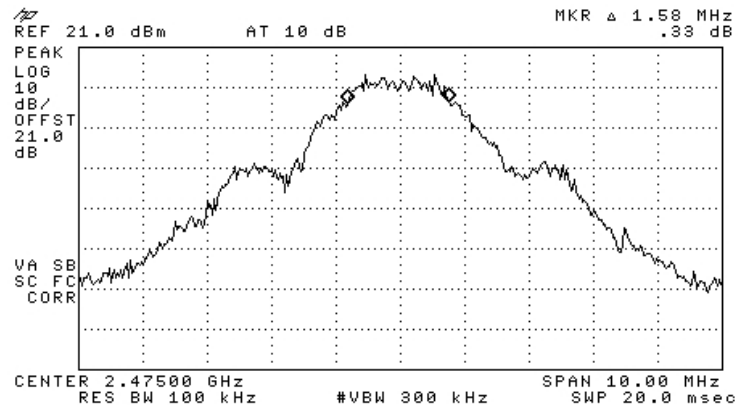


Figure 8 — 2475 MHz

5.2 Results table

E.U.T Description: PBS Base Station

Model No.: BS24/103000

Serial Number: Not Designated

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

Operation Frequency (MHz)	Reading (MHz)	Specification (MHz)
2410.00	1.40	0.5
2445.00	1.60	0.5
2475.00	1.58	0.5

Figure 9 6 dB Minimum Bandwidth

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: 

Date: 26.11.08

Typed/Printed Name: A. Sharabi

5.3 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 10 Test Equipment Used

6. Maximum Transmitted Peak Power Output

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 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.

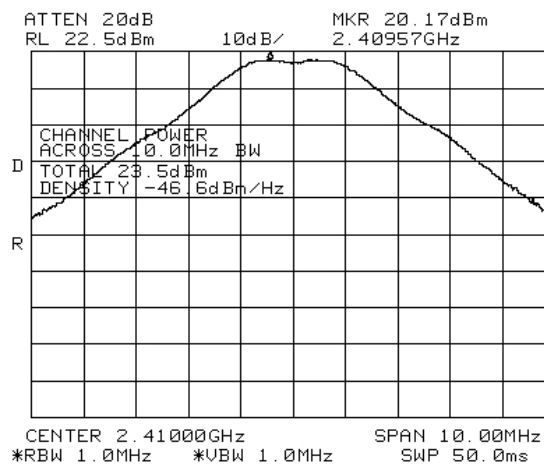


Figure 11 2410 MHz

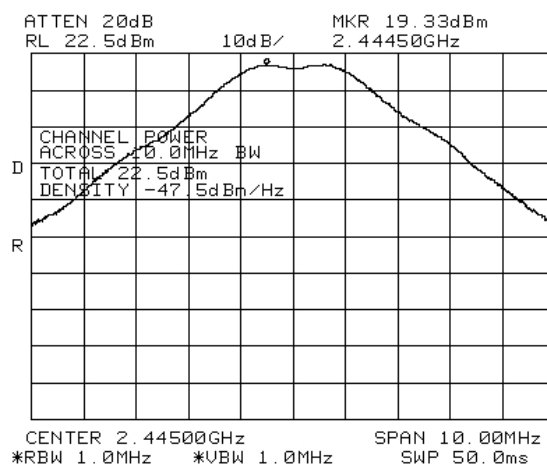


Figure 12 2445 MHz

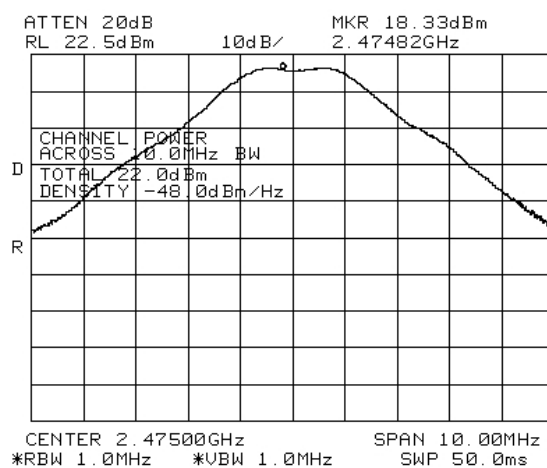


Figure 13 2475 MHz

6.2 Results table

E.U.T. Description: PBS Base Station

Model No.: BS24/103000

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	23.5	30.0	-6.5
2445.00	22.5	30.0	-7.5
2475.00	22.0	30.0	-8.0

Figure 14 Maximum Peak Power Output

JUDGEMENT: Passed by 6.5 dB

TEST PERSONNEL:

Tester Signature: 

Date: 26.11.08

Typed/Printed Name: A. Sharabi

6.3 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 15 Test Equipment Used

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

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 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.

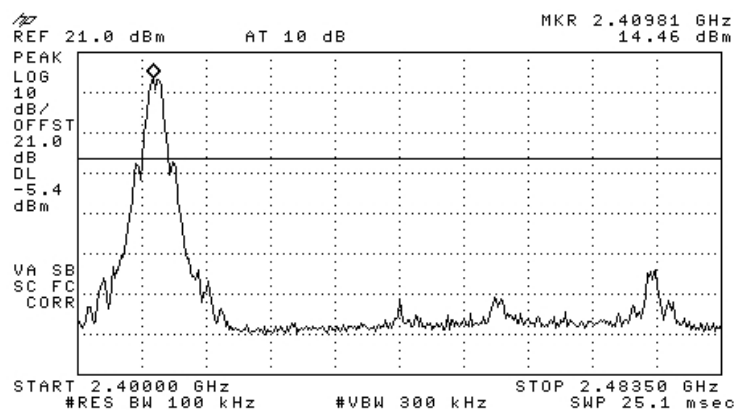


Figure 16 — 2410 MHz

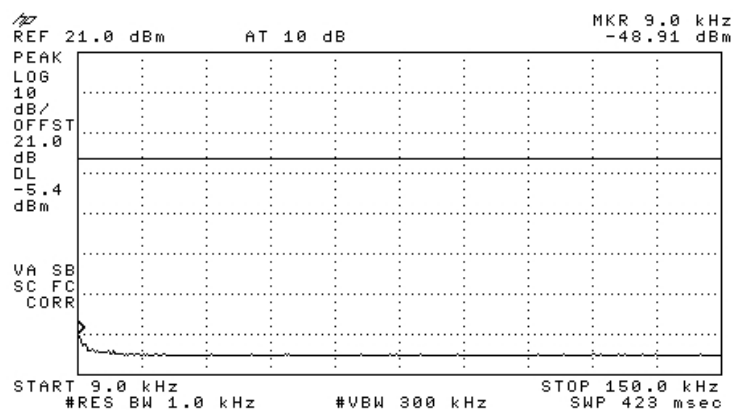


Figure 17 — 2410 MHz

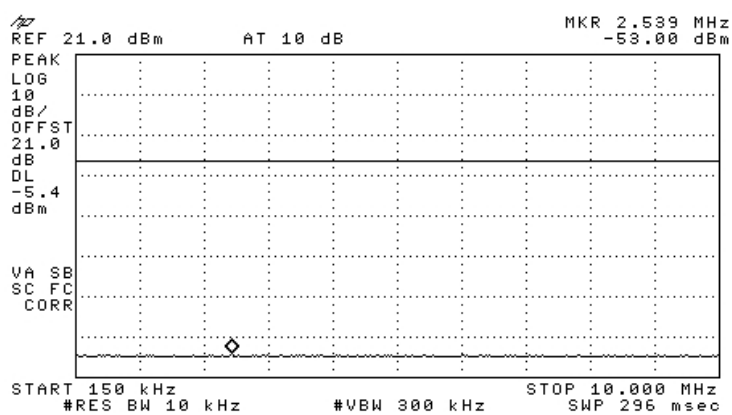


Figure 18 — 2410 MHz

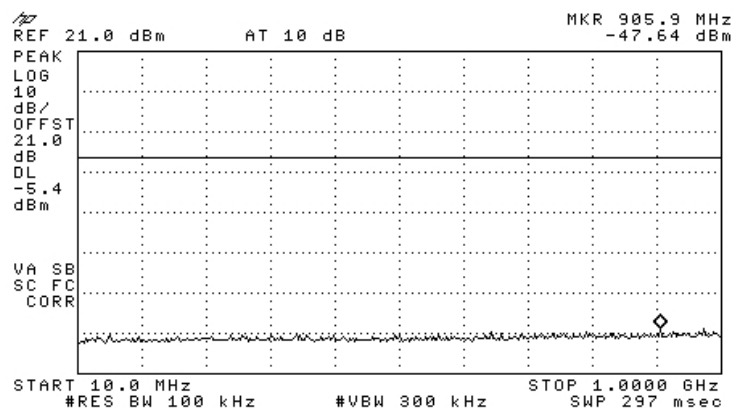


Figure 19 — 2410 MHz

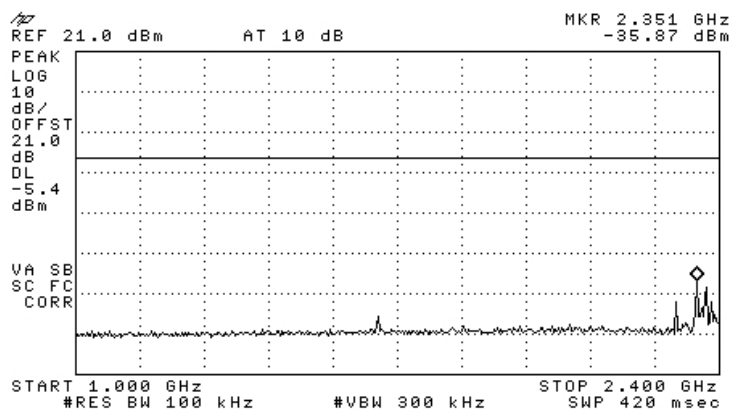


Figure 20 — 2410 MHz

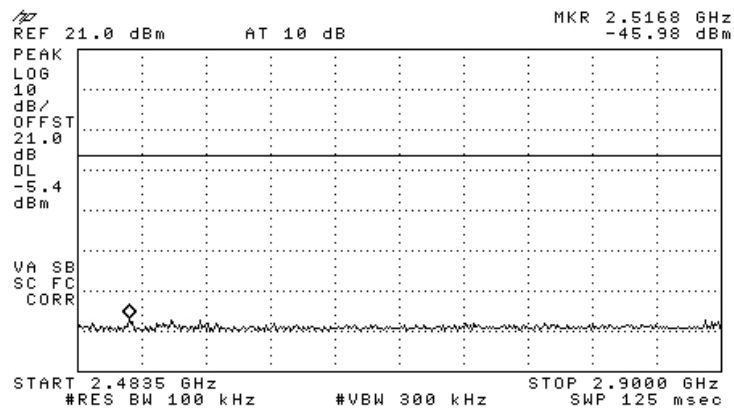


Figure 21 — 2410 MHz

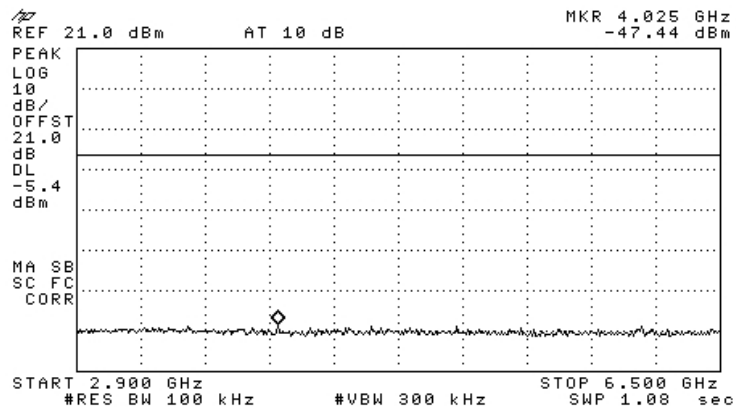


Figure 22 — 2410 MHz

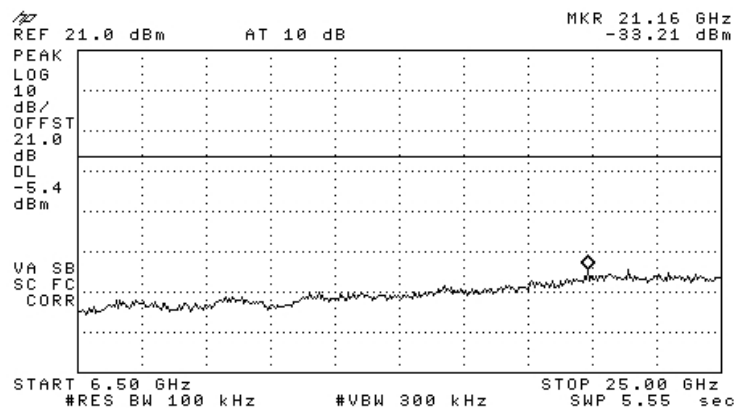


Figure 23 — 2410 MHz

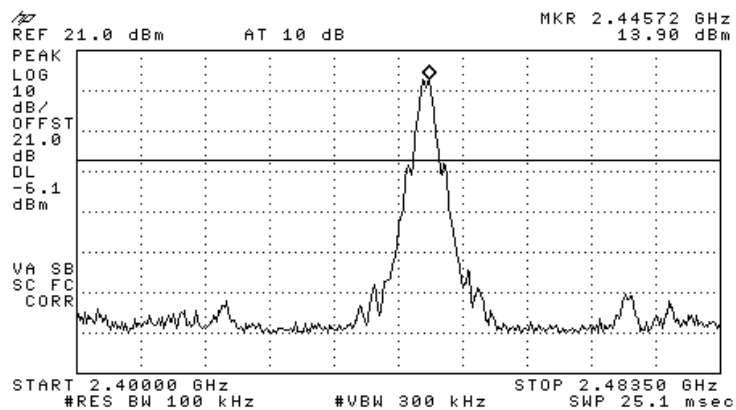


Figure 24 — 2445 MHz

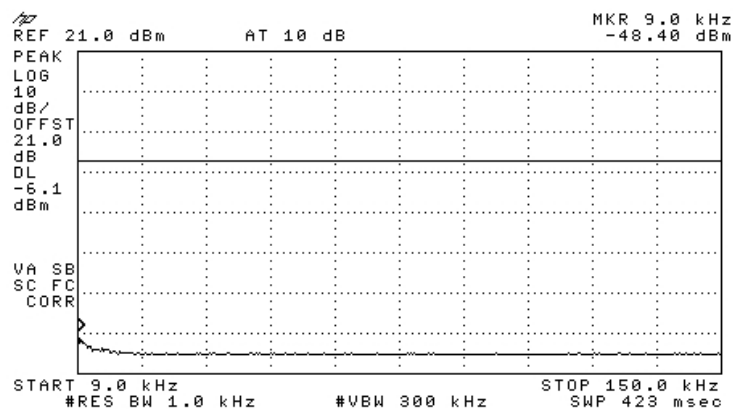


Figure 25 — 2445 MHz

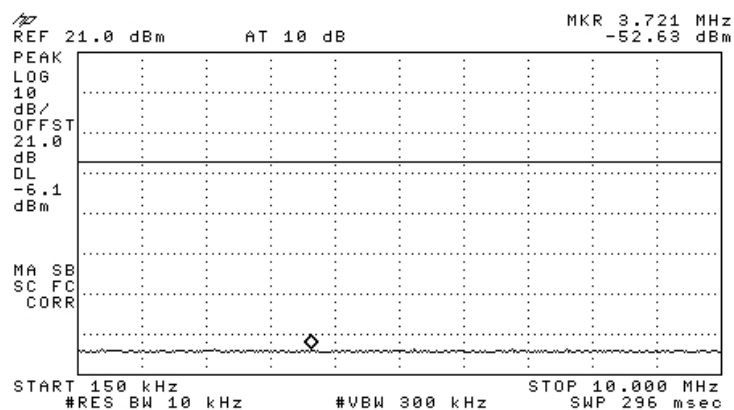


Figure 26 — 2445 MHz

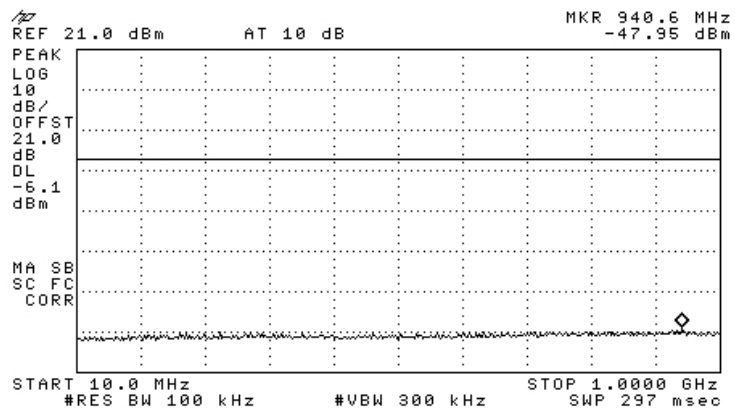


Figure 27 — 2445 MHz

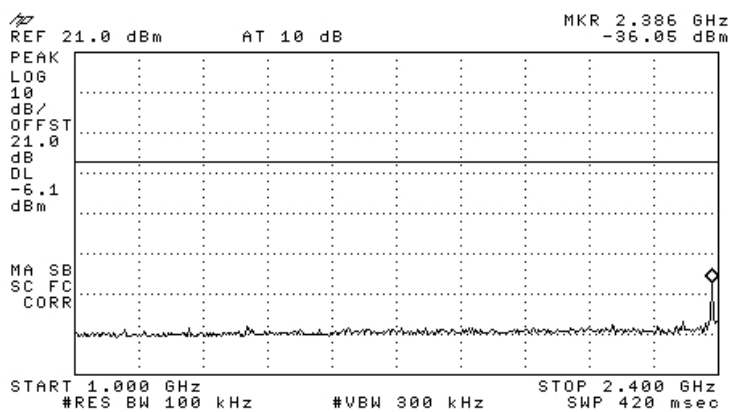


Figure 28 — 2445 MHz

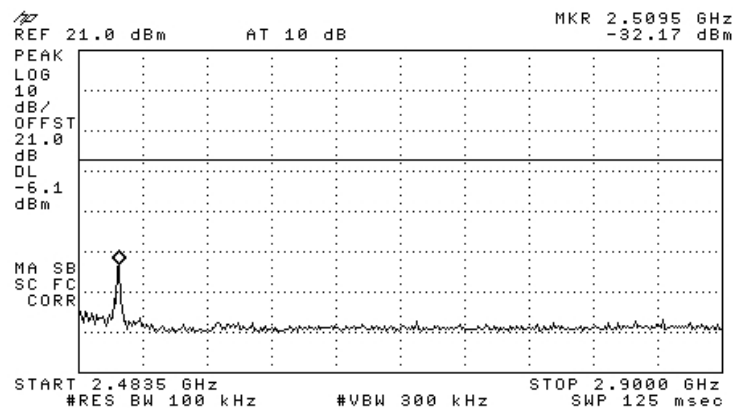


Figure 29 — 2445 MHz

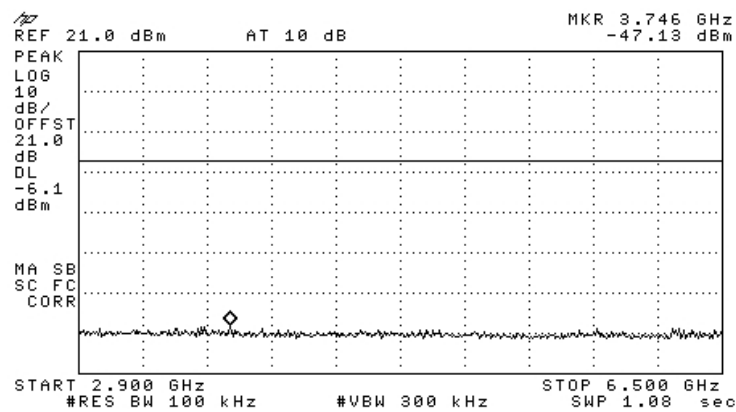


Figure 30 — 2445 MHz

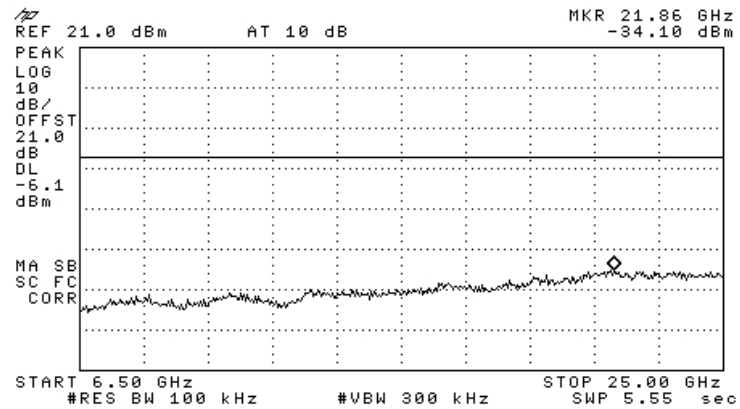


Figure 31 — 2445 MHz

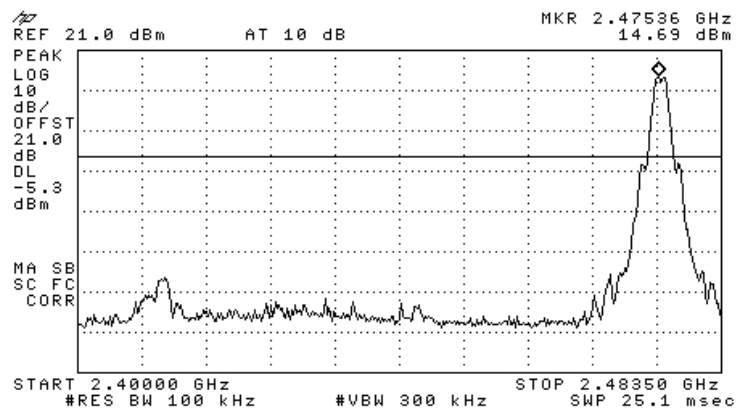


Figure 32 — 2475 MHz

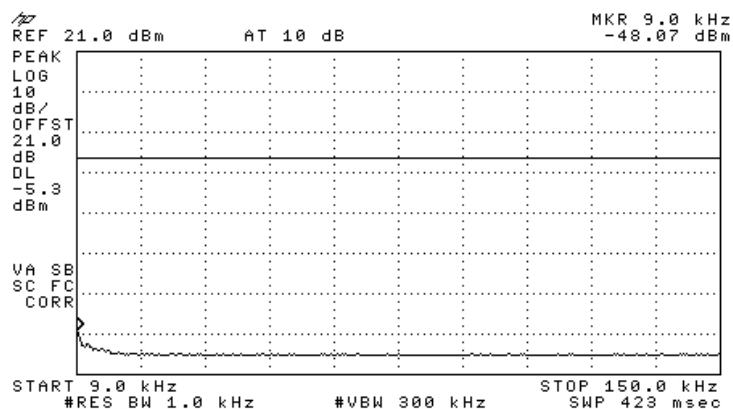


Figure 33 — 2475 MHz

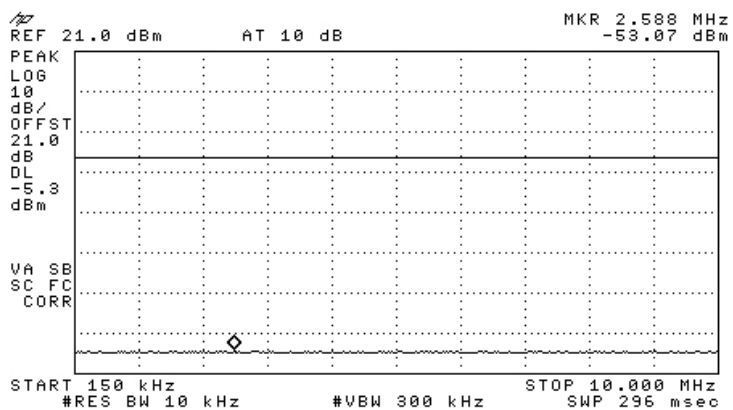


Figure 34 — 2475 MHz

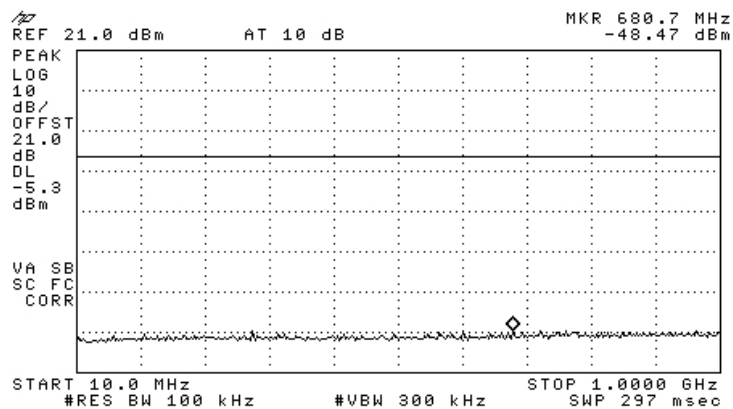


Figure 35 — 2475 MHz

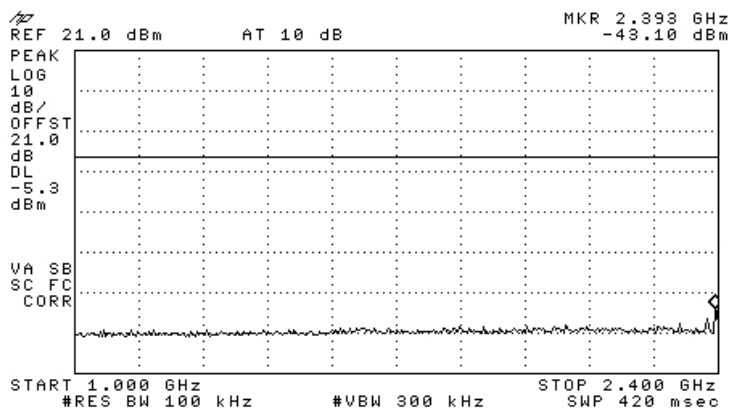


Figure 36 — 2475 MHz

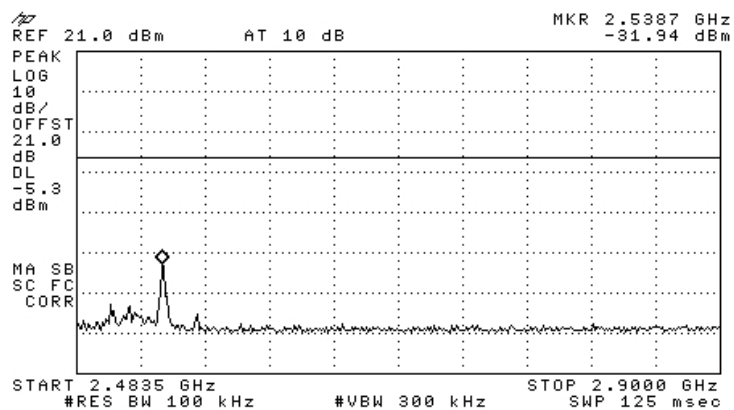


Figure 37 — 2475 MHz

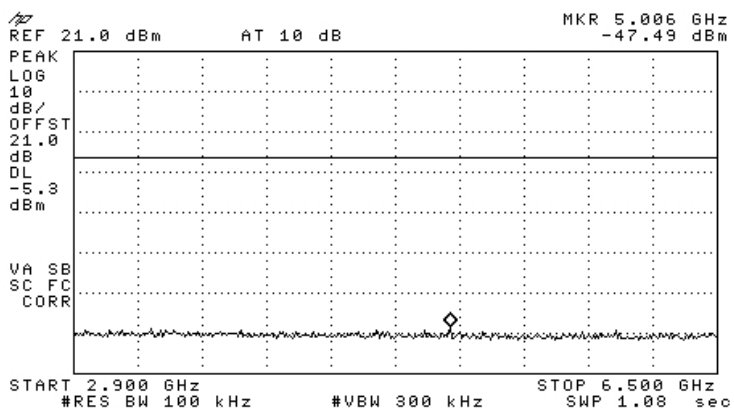


Figure 38 — 2475 MHz

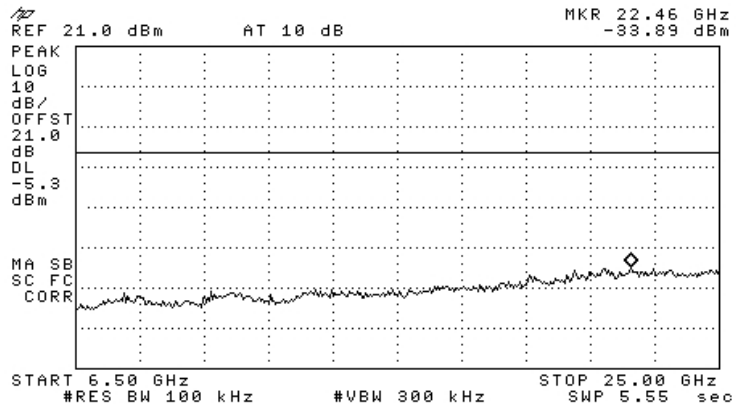


Figure 39 — 2475 MHz

7.2 Results table

E.U.T Description: PBS Base Station
Model No.: BS24/103000
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	47.8	20.0	-27.8
2445.00	46.1	20.0	-26.1
2475.00	46.6	20.0	-26.6

Figure 40 Peak Power Output of 2400-2483.5 MHz Band

JUDGEMENT: Passed by 26.1 dB

TEST PERSONNEL:

Tester Signature: 

Date: 26.11.08

Typed/Printed Name: A. Sharabi

7.3 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 41 Test Equipment Used

8. Band Edge Spectrum

8.1 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.

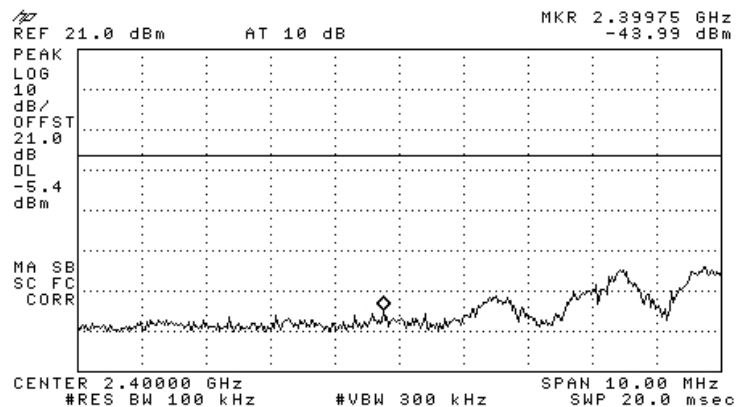


Figure 42 — 2410 MHz

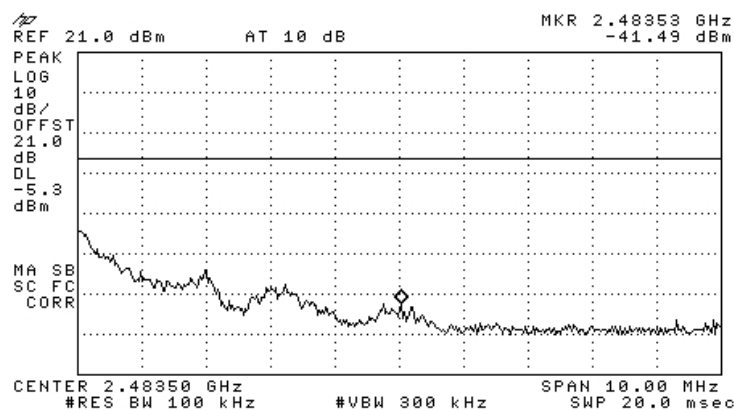


Figure 43 — 2475 MHz

8.2 Results table

E.U.T. Description: PBS Base Station

Model No.: BS24/103000

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	2399.75	-43.99	-5.4	-38.59
2475.00	2483.53	-41.49	-5.3	-36.19

Figure 44 Band Edge Spectrum

JUDGEMENT: Passed by 36.19 dB

TEST PERSONNEL:

Tester Signature: 

Date: 26.11.08

Typed/Printed Name: A. Sharabi

8.3 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 45 Test Equipment Used

9. Radiated Emission, 9 kHz – 30 MHz

9.1 Test Specification

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

9.2 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.

9.3 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: 26.11.08

Typed/Printed Name: A. Sharabi

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
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

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:

$$FS = RA + AF + CF$$

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.

10. Spurious Radiated Emission 30 – 1000 MHz

10.1 Test Specification

30 MHz-1000 MHz, F.C.C., Part 15, Subpart C

10.2 Test Procedure

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

See Section 2.1 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.

10.3 Test Data

JUDGEMENT: Passed by 5.9 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 5.9 dB in the worst case at the frequency of 36.40 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 46* to *Figure 49*.

TEST PERSONNEL:

Tester Signature:  _____

Date: 26.11.08

Typed/Printed Name: A. Sharabi

Radiated Emission

E.U.T Description PBS Base Station
Type BS24/103000
Serial Number: Not Designated

Specification: FCC Part 15, Subpart C

Antenna Polarization: Horizontal
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	36.383600	25.6	18.1	-21.9		14.3
2	57.960880	23.8	17.3	-22.7		10.7
3	356.242700	28.8	23.7	-22.3		18.1
4	374.526900	30.1	24.4	-21.6		18.7
5	576.859580	34.0	28.1	-17.9		23.7
6	579.439840	34.7	28.1	-17.9		23.8

**Figure 46. 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 PBS Base Station
Type BS24/103000
Serial Number: Not Designated

Specification: FCC Part 15, Subpart C

Antenna Polarization: Vertical

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	36.398700	37.6	34.1	-5.9		14.3
2	57.891900	29.6	25.2	-14.8		10.7
3	356.270700	29.8	23.7	-22.3		18.1
4	374.360200	30.1	24.1	-21.9		18.7
5	577.021600	35.7	30.6	-15.4		23.7
6	579.656000	34.0	27.8	-18.2		23.8

**Figure 48. 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.

10.4 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 Bioconical	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

10.5 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.

11. Spurious Radiated Emission Above 1 GHz

11.1 Radiated Emission Above 1 GHz

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

See Section 2.1 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 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.

11.2 Test Data

JUDGEMENT: Passed by 2.9 dB

For the operation frequency of 2410.00 MHz, the margin between the emission level and the specification limit is 3.7 in the worst case at the frequency of 2400.00 MHz, vertical polarization.

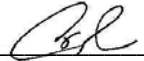
For the operation frequency of 2445.00 MHz, the margin between the emission level and the specification limit is 20.2 in the worst case at the frequency of 4889.00 MHz, vertical polarization.

For the operation frequency of 2475.00 MHz, the margin between the emission level and the specification limit is 2.9 in the worst case at the frequency of 2483.50 MHz, horizontal and vertical polarizations.

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 50* to *Figure 55*.

TEST PERSONNEL:

Tester Signature: 

Date: 26.11.08

Typed/Printed Name: A. Sharabi

Radiated Emission Above 1 GHz

E.U.T Description PBS Base Station
Type BS24/103000
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.	Polarity	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
2400.00	H	62.8**	74.0	-11.2
4819.90	H	45.8*	74.0	-28.2
2400.00	V	63.1**	74.0	-10.9
4819.90	V	46.0*	74.0	-28.0

**Figure 50. 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 PBS Base Station
Type BS24/103000
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.	Polarity	Average Amp	Average Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
2400.00	H	49.7**	54.0	-4.3
4819.90	H	33.6*	54.0	-20.4
2400.00	V	50.3**	54.0	-3.7
4819.90	V	34.4*	54.0	-19.6

**Figure 51. 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 PBS Base Station
Type BS24/103000
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)	(dBμV/m)	(dB μV/m)	(dB)
4889.00	H	45.5*	74.0	-28.5
4889.00	V	46.8*	74.0	-27.2

**Figure 52. 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 PBS Base Station
Type BS24/103000
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.	Polarity	Average Amp	Average Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
4889.00	H	33.3*	54.0	-20.7
4889.00	V	33.8*	54.0	-20.2

**Figure 53. 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 PBS Base Station
Type BS24/103000
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.	Polarity	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
2483.50	H	63.2**	74.0	-10.8
4949.00	H	45.7*	74.0	-28.3
2483.50	V	63.6**	74.0	-10.4
4949.00	V	46.9*	74.0	-27.1

**Figure 54. 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 PBS Base Station
Type BS24/103000
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.	Polarity	Average Amp	Average Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
2483.50	H	51.1**	54.0	-2.9
4949.00	H	33.7*	54.0	-20.3
2483.50	V	51.1**	54.0	-2.9
4949.00	V	34.6*	54.0	-19.4

**Figure 55. 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

11.3 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

12. Spurious Radiated Emission Above 1 GHz (Additional Tests)

12.1 Radiated Emission Above 1 GHz

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

See Section 2.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

The E.U.T was placed on a remote-controlled turntable on the open area test site. 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 E.U.T. was operated at the lowest frequency (2410 MHz) and spurious emission in the 2310 – 2390 MHz and 2390 - 2400 MHz bands was measured.

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 test distance was 3 meters.

The E.U.T. was tested at the operating frequency of 2410 MHz using QPSK modulation.

12.2 Test Data

JUDGEMENT: Passed by 5.2 dB

For the operation frequency of 2410.00 MHz, the margin between the emission level and the specification limit is 5.2 dB in the worst case at the frequency of 2400.00 MHz, vertical 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 56* to *Figure 57*.

TEST PERSONNEL:

Tester Signature: For/ 

Date: 15.12.08

Typed/Printed Name: A. Sharabi

Radiated Emission Above 1 GHz

E.U.T Description PBS Base Station
Type BS24/103000
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.	Polarity	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
2310.00	H	54.2	74.0	-19.8
2390.00	H	61.1	74.0	-12.9
2400.00	H	61.4	74.0	-12.6
2310.00	V	53.7	74.0	-20.3
2390.00	V	64.3	74.0	-9.7
2400.00	V	68.8	74.0	-5.2

**Figure 56. 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

Radiated Emission Above 1 GHz

E.U.T Description PBS Base Station
Type BS24/103000
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.	Polarity	Average Amp	Average Specification	Average Margin
(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
2310.00	H	40.5	54.0	-13.5
2390.00	H	40.0	54.0	-14.0
2400.00	H	40.3	54.0	-13.7
2310.00	V	40.6	54.0	-13.4
2390.00	V	39.9	54.0	-14.1
2400.00	V	38.9	54.0	-15.1

**Figure 57. 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

12.3 Test Instrumentation Used, Radiated Measurements Above 1 GHz

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	November 17, 2008	1 Year
RF Filter Section	HP	85420E	3705A00248	November 16, 2008	1 Year
Antenna Biconical	ARA	BCD 235/B	1041	March 23, 2008	1 Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 06, 2008	1 Year
Antenna Log Periodic	A.H. Systems	SAS-200/511	253	February 4, 2007	2 Years
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

13. Transmitted Power Density

[In accordance with section 15.247(d)]

13.1 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.

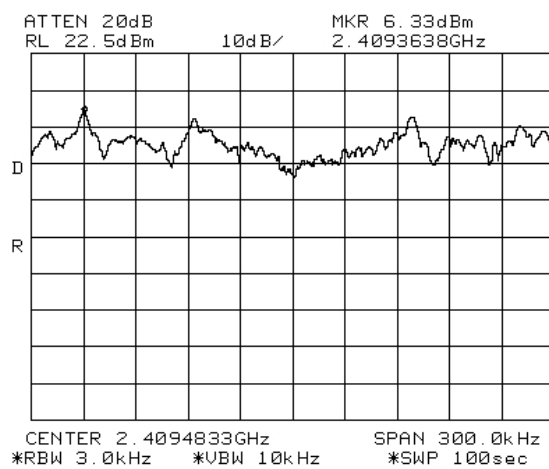


Figure 58 — 2410 MHz

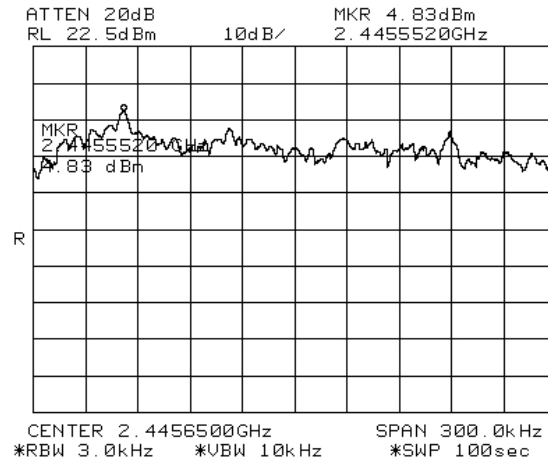


Figure 59 — 2445 MHz

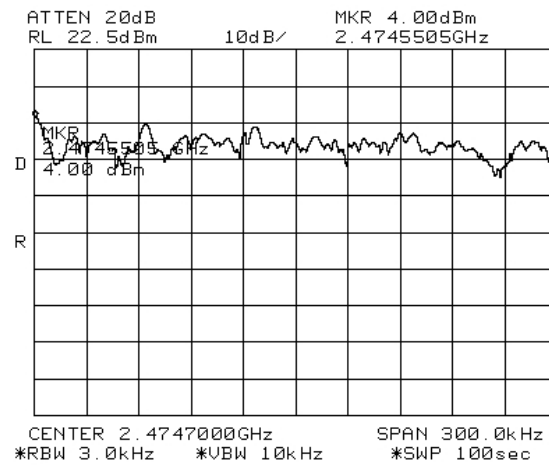


Figure 60 — 2475 MHz

13.2 Results table

E.U.T. Description: PBS Base Station

Model No.: BS24/103000

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	6.3	8.0	-1.7
2445.00	4.8	8.0	-3.2
2475.00	4.0	8.0	-4.0

Figure 61 Test Results

JUDGEMENT: Passed by 1.7 dB

TEST PERSONNEL:

Tester Signature: 

Date: 26.11.08

Typed/Printed Name: A. Sharabi

13.3 Test Equipment Used.

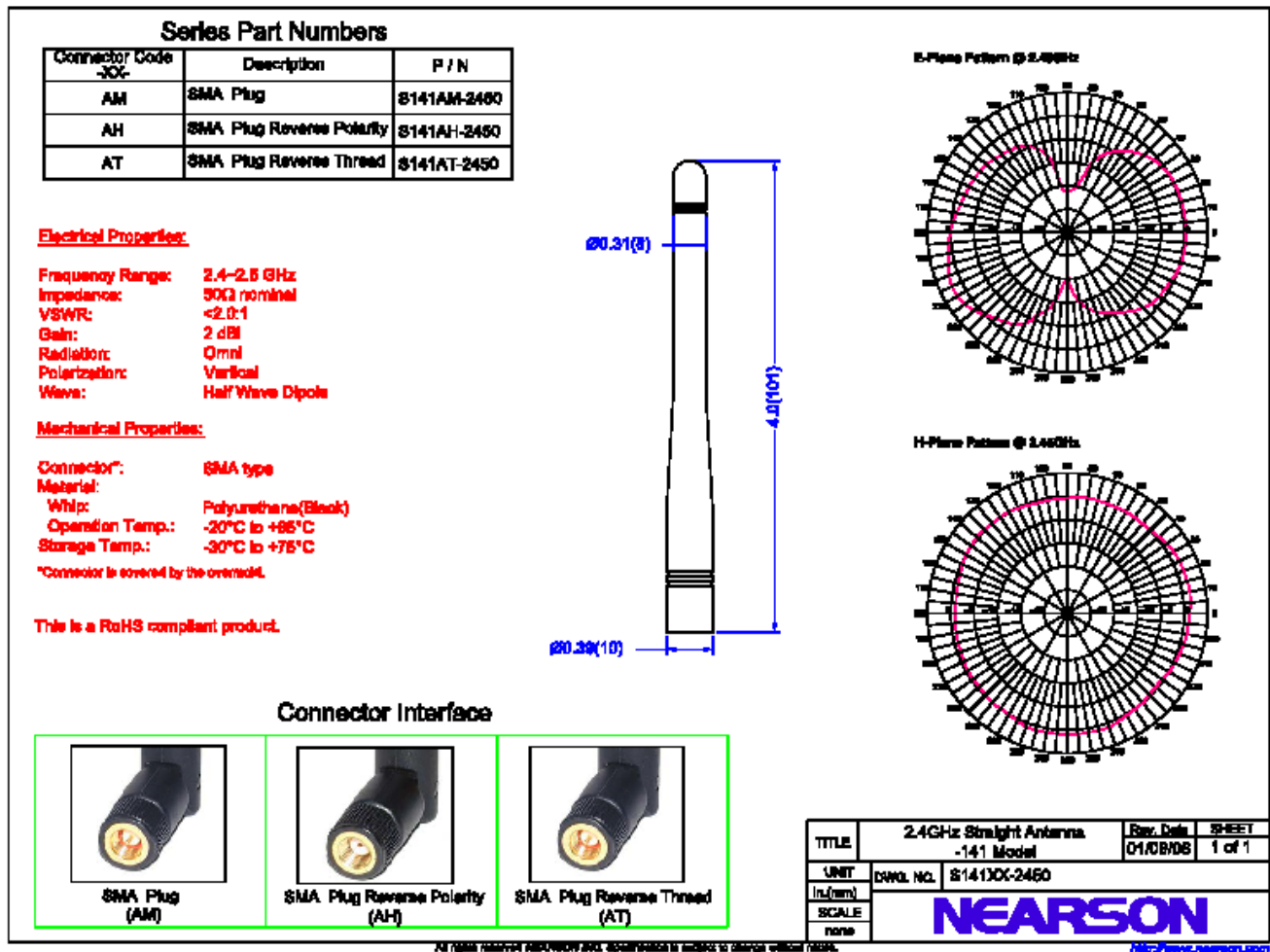
Transmitted Power Density

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 62 Test Equipment Used

14. Antenna Gain/Information

The antenna gain is 2 dBi.



15. 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 23.5 dBm Peak = 223.9 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:

$$P_t = \frac{223.9 \times 20}{100} = 44.7 mW$$

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

$$S_p = \frac{44.7 \times 1.58}{4\pi(100)^2} = 0.5 \times 10^{-3} \frac{mW}{cm^2}$$

- (e) This is 3 orders of magnitude below the FCC requirement.

16. APPENDIX A - CORRECTION FACTORS

16.1 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".

16.2 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.*

16.3 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".*

16.4 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".

**16.5 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".

16.6 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			

16.7 Correction factors for

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

FREQUENCY (GHz)	APE (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

16.8 Correction factors for

Horn Antenna Model: V637

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

16.9 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