TEST REPORT

Report Number: 3116499LEX-004
Project Number: 3116499

Evaluation of the WorkAbout Pro
Model Number: 7525S

FCC ID: GM37525SG1AC860

Tested to the Criteria in
FCC Part 15 Subparts B, 22H and 24E

For

Psion Teklogix

Test Performed by:	Test Authorized by:
Intertek	Psion Teklogix
731 Enterprise Drive	2100 Meadowvale Boulevard
Lexington, KY 40510	Mississauga, Canada L5N 7J9

Prepared By: _____ **Date:** 16-April-07

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Approved By: _____ **Date:** 16-April-07

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1 JOB DESCRIPTION

1.1 Rationale

This report is intended to show compliance of the Psion Teklogix WorkAbout Pro model 7525S to the requirements of FCC Part 15, 22H, and 24E.

The 7525S integrates three radio modules listed in the table below. The Bluetooth and RLAN modules are both manufactured by Psion Teklogix for specific use in the 7525S. The GSM/WCDMA module is manufactured by Sierra Wireless. These modules, have all been certified with limited modular approval and are un-modified from the original granted devices according to Psion Teklogix.

While the RLAN module was physically installed in the 7525S during the testing, it was not actually powered or evaluated. According to Psion Teklogix, software on the 7525S does not allow simultaneous operation of the RLAN module and GSM/WCDMA module so they are not considered to be co-located.

Considering the modules are un-modified from the original granted devices, and the RLAN and Bluetooth modules were certified specifically for the 7525S, the only tests that were required (and performed) appear in the following test results summary.

1.2 Test Result Summary

Sample Receive Date: 22-Feb-07

Test Start Date: 5-Mar-07

Test End Date: 7-Mar-07

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
22.913, 24.232	Conducted Output Power	**Compliant**	8
22.913, 24.232	Radiated Output Power	**Compliant**	9
2.1053	Radiated Spurious Emissions	**Compliant**	12
15.109	Radiated Emissions	**Compliant**	16
15.107	AC Line Conducted Emissions	**Compliant**	18

1.3 Test Sample Information

Company Information	
Manufacturer:	Psion Teklogix
Address:	2100 Meadowvale Boulevard Mississauga Canada L5N 7J9
Contact Name:	Sada Dharwarkar
Telephone Number:	905-812-6200
Fax Number:	905-812-6301
Email Address:	sada.dharwarkar@psionteklogix.com

Test sample			
Model Number:	7525S		
Serial Number:	A26BK000205		
FCC ID:	GM37525SG1AC860		
Device Category:	Portable		
RF Exposure Category:	General Population/Uncontrolled Environment		
Radio Modules			
Module Description	GSM / WCDMA	Bluetooth	RLAN[1]
Module Manufacturer	Sierra Wireless	Psion Teklogix	Psion Teklogix
Module Model Number	AC860	7525BTB	RA80211G
Module FCCID	N7NAC860	GM37525BTB	GM3RA80211G
Type of Transmission	GSM(EDGE), GSM GPRS, WCDMA (II and V)	FHSS	DSSS
Frequency Range, MHz:	1852.4 – 1907.6 MHz 1850.2 – 1909.8 MHz 826.4 – 846.6 MHz 824.2 – 848.8 MHz	2402 – 2480 MHz	2412 – 2462 MHz

Test Signal Mode	
Test Commands:	
Base Station Simulator:	X

[1] The RLAN module was not actually powered during the evaluation at the request of Psion Teklogix.

1.4 System Support Equipment

No support equipment was used for this evaluation.

1.5 Cables associated with EUT

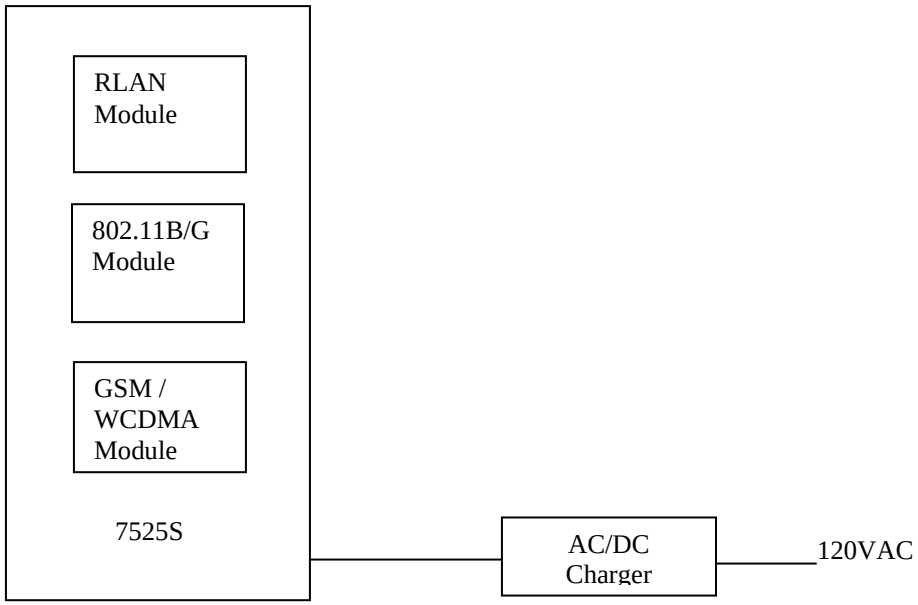
Table 1-1 contains the details of the cables associated with the EUT.

Table 1-1: Cables Used in the Test Setup

Cables					
Description	**Length**	**Shielding**	**Ferrites**	**Connection**	
				From	**To**
DC Cable	4 ft	None	None	Onboard Battery Charger Connection	AC / DC Battery Charger
AC Power Cable	6.5 ft	None	None	AC Power Source	AC / DC Battery Charger

1.6 System Block Diagram

The diagram shown below details the interconnection of the EUT and its accessories during the testing.



1.7 Modifications required for compliance

No modifications were implemented by Intertek. All results in this report pertain to the un-modified sample provided to Intertek.

1.8 Related Submittal(s) Grants

None

2 TEST FACILITY

The INTERTEK-Lexington is located at 731 Enterprise Drive, Lexington Kentucky, 40510. The radiated emission test site is a 10-meter semi-anechoic chamber. The chamber meets the characteristics of CISPR 16-1 and ANSI C63.4. For measurements, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters.

The test site is listed with the FCC under registration number 485103.

The test site is listed with Industry Canada under site number IC 2055.

The conducted emissions for mains ports, radiated emissions, and telco ports conducted emissions sites are listed with the VCCI under registration numbers C-2214, R2056, and T-195.

2.1 Test Equipment

Description	Manufacturer	Model Number	Serial Number	Calibration due date
Signal Generator	Hewlett Packard	83620B	3614A00199	8/15/2007
EMI Receiver	Rohde & Schwarz	ESI 26	1088.7490	9/6/2007
Horn Antenna	Antenna Research	DRG-118/A	1086	7/20/2007
Horn Antenna	EMCO	3115	6556	7/28/2007
Horn Antenna	EMCO	3116	9310-2222	3/22/2007
Bilog Antenna	ETS	3142C	00051864	11/14/2007
High Pass Filter	Microwave Circuits	H3G020G2	3986-01 DC0408	Verify at Time of Use
LISN	Fischer Custom Communication	FCC-LISN-50-50-2M	1026	5/9/2007
Base Station Simulator	Rohde & Schwarz	CMU-200	1100.0008.02	8/18/2007

3 CONDUCTED RF POWER

3.1 Test Procedure

- Conducted power measurements for the 7525S were made using a base station simulator.
- Cable loss was accounted for within the test set by offsetting the readings by the appropriate amounts.
- Readings were taken at the RF port that was present on the transmitter module housing.
- Measurements are provided in the table below for the 7525S operating in GSM (GPRS), GSM (EDGE), and WCDMA Bands II and V.
- The in each transmit mode, the base station simulator was used to force transmission at maximum output power.

3.2 Test Results

The 7525S met the RF power output requirements of FCC Part 22 Subpart H and FCC Part FCC Part 24 Subpart E. The test results are located in Table 3-1.

Table 3-1 Conducted RF Power

Transmit Mode		**Max Power (dBm)**	
Tx Band	**Tx Channel**	**GSM-GPRS**	**GSM-EDGE**
GSM 850 Band	**128**	31.48	26.46
	190	31.5	26.7
	251	31.6	26.7
GSM 1900 Band	**512**	28.0	25.1
	661	28.2	25.1
	810	28.1	25.2
Tx Band	**Tx Channel**	**WCDMA Max Power (dBm)**	
WCDMA Band V	**4132**	26.48	
	4183	26.60	
	4233	26.59	
WCDMA Band II	**9262**	26.65	
	9400	27.1	
	9538	26.0	

4 RADIATED RF POWER

4.1 Test Procedure

- The 7525S was tested in an anechoic chamber with a 2-axis position system that permits taking complete spherical scans of the EUT's radiation patterns.
- The chamber was pre-calibrated using a substitution method to yield radiated power results referenced to an isotropic radiator (EIRP).
- For all tests, the 7525S was installed in a laptop placed on top of a non-conductive support.
- Tests were performed with the 7525S transmitting in CDMA Cell and PCS bands on low, mid, and high channels.
- During the tests the 7525S was weakly coupled to the test set and configured to transmit in full data rate mode.
- Radiated power was measured at each 15 degree step.
- From these measurements, the software calculates the angle at which maximum radiated power occurs and the radiated power at this angle is extracted.

4.2 Radiated Output Power Criteria

FCC Rule §22.913: The Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC Rule §24.232; The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

4.3 Test Results

The 7525S met the radiated power requirements of FCC Rule §22.913 and §24.232. The radiated power measurements appear in the following two tables.

Table 4-1 Radiated RF Power (GSM-GPRS, and GSM-EDGE Transmissions)

Technology/Band	Channel	GPRS EIRP (dBi)			EDGE EIRP (dBi)		
		FS	SAM		FS	SAM	
GSM 850	128	29.69	L		23.56	L	
			R			R	
GSM 850	190	30.24	L		24.10	L	
			R			R	
GSM 850	251	30.21	L		24.18	L	
			R			R	
GSM 1900	512	26.36	L		23.36	L	
			R			R	
GSM 1900	661	27.00	L		24.03	L	
			R			R	
GSM 1900	810	26.87	L		23.90	L	
			R			R	

Table 4-2 Radiated RF Power (WCDMA II and V Transmissions)

Technology/Band	Channel	EIRP (dBi)		
		FS	SAM	
WCDMA II	9262	26.66	L	
			R	
WCDMA II	9400	26.93	L	
			R	
WCDMA II	9538	25.37	L	
			R	
WCDMA V	4132	26.03	L	
			R	
WCDMA V	4183	25.85	L	
			R	
WCDMA V	4233	26.26	L	
			R	

5 SPURIOUS RADIATED EMISSION MEASUREMENTS

5.1 Test Procedure (FCC Rule §2.1053, 22.901(d), and 24.238(a))

The EUT was placed on a non-conductive turntable. The measurement antenna was placed at a distance of 3 meters from the EUT. The Base Station Simulator was set to force the EUT to its maximum power setting. During the tests, the antenna height and EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle, and high channels) in each operating band. Once spurious emissions were identified, the power of the emission was determined using the substitution method described in TIA-603-B section 2.2.12 (Radiated Spurious Emissions).

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and at the spurious emissions frequency.

5.2 Spurious Radiated Emission Requirement

Out of Band Emissions: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. For all measured spurious emissions, the limit calculates to be -13dBm.

5.3 Test Results

All spurious emissions met the -13dBm limit. The worst case emission occurred when the 7525S was transmitting in GPRS mode on the middle channel at a spurious emission frequency of 2.509GHz. This worst case level was -18.92dBm which is 5.92dB below the limit.

Table 5-1 Spurious Radiated Emissions (GSM-GPRS Transmission)

EUT Mode	TX Channel	Polarity	Measured Frequency (GHz)	Device Reading (dBuV)	Sub. Reading (dBuV)	Cable Loss (dB)	Tx Antenna Gain (dBi)	Signal Generator Output (dBm)	EIRP (dBm)
GSM GPRS (1900)	High	V	3.819	56.5	82.39	5.7	12	-20	-39.59
GSM GPRS (1900)	High	H	3.819	54.3	82.75	5.7	11.7	-20	-42.45
GSM GPRS (1900)	High	V	13.36	38.1	60.8	13	13.5	-20	-42.2
GSM GPRS (1900)	High	H	13.36	30.7	58.05	13	13.8	-20	-46.55
GSM GPRS (1900)	Mid	V	3.759	50.2	83.1	5.7	12	-20	-46.6
GSM GPRS (1900)	Mid	H	3.759	52.7	82.67	5.7	11.7	-20	-43.97
GSM GPRS (1900)	Mid	V	13.159	35.4	58.38	13	13.5	-20	-42.48
GSM GPRS (1900)	Mid	H	13.159	32.2	55.7	13	14.7	-20	-41.8
GSM GPRS (1900)	Low	V	3.7	49.3	83.2	5.7	12	-20	-47.6
GSM GPRS (1900)	Low	H	3.7	53.4	82.8	5.7	11.7	-20	-43.4
GSM GPRS (1900)	Low	V	12.95	35.6	59.85	13	13.7	-20	-43.55
GSM GPRS (1900)	Low	H	12.95	34.9	57.84	13	14.7	-20	-41.24
GSM GPRS (850)	High	V	1.697	30.2	68.5	3.78	6.5	0	-35.58
GSM GPRS (850)	High	H	1.697	27.5	68.8	3.78	6.5	0	-38.58
GSM GPRS (850)	High	V	2.5461	37.8	59.3	4.6	9.4	0	-16.7
GSM GPRS (850)	High	H	2.5461	26.9	61.4	4.6	8.5	0	-30.6
GSM GPRS (850)	Mid	V	1.6727	32.8	68.4	3.8	6.5	0	-32.9
GSM GPRS (850)	Mid	H	1.6727	30.1	68.9	3.8	6.5	0	-36.1
GSM GPRS (850)	Mid	V	2.509	35.5	59.6	4.6	9.4	0	-19.3
GSM GPRS (850)	Mid	H	2.509	24.3	61.5	4.6	8.7	0	-33.1
GSM GPRS (850)	Low	V	1.648	34.7	68.8	3.7	6.5	0	-31.3
GSM GPRS (850)	Low	H	1.648	27.3	69.4	3.7	6.5	0	-39.3
GSM GPRS (850)	Low	V	2.472	35.9	61.1	4.5	9.4	0	-20.3
GSM GPRS (850)	Low	H	2.472	26.3	61.9	4.5	8.7	0	-31.4

Table 5-2 Spurious Radiated Emissions (GSM-EDGE Transmission)

EUT Mode	TX Channel	Polarity	Measured Frequency (GHz)	Device Reading (dBuV)	Sub. Reading (dBuV)	Cable Loss (dB)	Tx Antenna Gain (dBi)	Signal Generator Output (dBm)	EIRP (dBm)
GSM EDGE (1900)	High	V	3.819	55.9	82.39	5.7	12	-20	-40.19
GSM EDGE (1900)	High	H	3.819	56.6	82.75	5.7	11.7	-20	-40.15
GSM EDGE (1900)	High	V	13.36	37.1	60.8	13	13.5	-20	-43.2
GSM EDGE (1900)	High	H	13.36	32.7	58.05	13	13.8	-20	-44.55
GSM EDGE (1900)	Mid	V	3.759	54.6	83.1	5.7	12	-20	-42.2
GSM EDGE (1900)	Mid	H	3.759	50.2	82.67	5.7	11.7	-20	-46.47
GSM EDGE (1900)	Mid	V	13.159	37.2	58.38	13	13.5	-20	-40.68
GSM EDGE (1900)	Mid	H	13.159	34.3	55.7	13	14.7	-20	-39.7
GSM EDGE (1900)	Low	V	3.7	49.4	83.2	5.7	12	-20	-47.5
GSM EDGE (1900)	Low	H	3.7	53.2	82.8	5.7	11.7	-20	-43.6
GSM EDGE (1900)	Low	V	12.95	36.8	59.85	13	13.7	-20	-42.35
GSM EDGE (1900)	Low	H	12.95	35.4	57.84	13	14.7	-20	-40.74
GSM EDGE (850)	High	V	1.697	32.8	68.5	3.78	6.5	0	-32.98
GSM EDGE (850)	High	H	1.697	31.9	68.8	3.78	6.5	0	-34.18
GSM EDGE (850)	High	V	2.5461	33.7	59.3	4.6	9.4	0	-20.8
GSM EDGE (850)	High	H	2.5461	36.7	61.4	4.6	8.5	0	-20.8
GSM EDGE (850)	Mid	V	1.6727	32.7	68.4	3.8	6.5	0	-33
GSM EDGE (850)	Mid	H	1.6727	35.6	68.9	3.8	6.5	0	-30.6
GSM EDGE (850)	Mid	V	2.509	33.5	59.6	4.6	9.4	0	-21.3
GSM EDGE (850)	Mid	H	2.509	35.5	61.5	4.6	8.7	0	-21.9
GSM EDGE (850)	Low	V	1.648	39.9	68.8	3.7	6.5	0	-26.1
GSM EDGE (850)	Low	H	1.648	34.7	69.4	3.7	6.5	0	-31.9
GSM EDGE (850)	Low	V	2.472	38.8	61.1	4.5	9.4	0	-17.4
GSM EDGE (850)	Low	H	2.472	29.5	61.9	4.5	8.7	0	-28.2

Table 5-3 Spurious Radiated Emissions (WCDMA Transmission)

EUT Mode	TX Channel	Polarity	Measured Frequency (GHz)	Device Reading (dBuV)	Sub. Reading (dBuV)	Cable Loss (dB)	Tx Antenna Gain (dBi)	Signal Generator Output (dBm)	EIRP (dBm)
WCDMA II	9262	V	3.7062	47.5	83.2	5.7	12	-20	-49.4
WCDMA II	9262	H	3.7062	48.2	82.8	5.7	11.7	-20	-48.6
WCDMA II	9400	V	3.76	55.7	83.1	5.7	12	-20	-41.1
WCDMA II	9400	H	3.76	46.2	82.67	5.7	11.7	-20	-50.47
WCDMA II	9538	V	3.815	55.9	82.39	5.7	12	-20	-40.19
WCDMA II	9538	H	3.815	47.5	82.75	5.7	11.7	-20	-49.25
WCDMA V	4132	V	1.6528	28.6	68.8	3.7	6.5	0	-37.4
WCDMA V	4132	H	1.6528	27.4	69.4	3.7	6.5	0	-39.2
WCDMA V	4183	V	1.673	29.1	68.4	3.8	6.5	0	-36.6
WCDMA V	4183	H	1.673	28.8	68.9	3.8	6.5	0	-37.4
WCDMA V	4233	V	1.693	27.9	68.5	3.78	6.5	0	-37.88
WCDMA V	4233	H	1.693	28.3	68.8	3.78	6.5	0	-37.78

6 RECEIVER SPURIOUS EMISSIONS

6.1 Test Procedure (FCC §15.109)

Measurements are made over the frequency range of 30 MHz to five times the highest frequency operating within the device. The measuring receiver meets the requirements of Section One of CISPR 16 and the measuring antenna correlates to a balanced dipole. From 30 to 1000 MHz, a quasi-peak detector was used for measurement. Above 1000 MHz, average measurements were performed.

Measurements of the radiated field are made with the antenna located at a distance of 3 meters from the EUT. If the field-strength measurements at 3m cannot be made because of high ambient noise level or for other reasons, measurements may be made at a closer distance, for example 1m. An inverse proportionality factor of 20 dB per decade should be used to normalize the measured data to the specified distance for determining compliance.

The antenna is adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.

The antenna-to-EUT azimuth is varied during the measurement to find the maximum field-strength readings.

The antenna-to-EUT polarization (horizontal and vertical) is varied during the measurements to find the maximum field-strength readings.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Equipment setup for radiated disturbance tests followed the guidelines of ANSI C63.4.

6.2 Receiver Spurious Emissions Criteria

Table 6-1 Radiated Emission Limit for FCC §15.109

Radiated Emission Limits at 3 meters	
Frequency (MHz)	**Quasi-Peak limits, dB (µV/m)**
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
960 and up	54.0

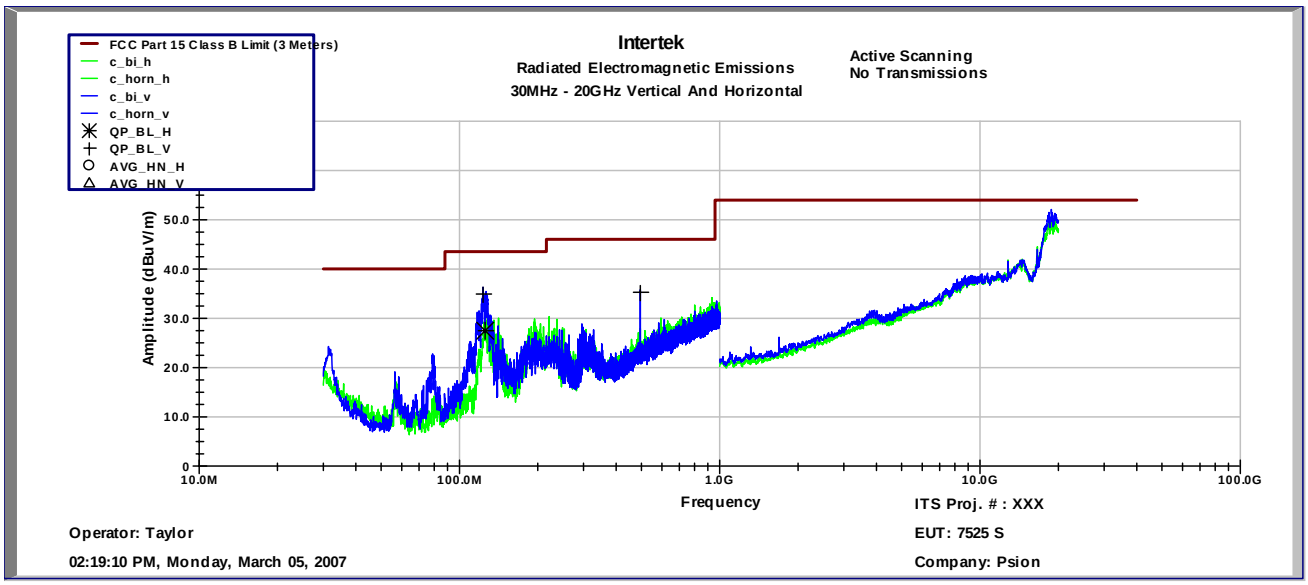
6.3 Test Results

The 7525S is **compliant** with the radiated disturbance requirements of FCC §15.109 for a class B device. The table in Figure 6-1 and the graph in Figure 6-2 show that there are no emissions above the limits specified in §15.109.

Figure 6-1 FCC §15.109 Receiver Spurious Emission (Quasi-Peak Readings)

Frequency (MHz)	Polarity (H/V)	Cab. (dB)	Ant. (dB)	Corr. Reading. (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Detector	Results
125.6 MHz	H	1.73	7.31	27.45	43.52	-16.07	QP	**Compliant**
123.3 MHz	V	1.69	7.6	34.92	43.52	-8.6	QP	**Compliant**
495.26 MHz	V	3.36	17.69	35.27	46.02	-10.75	QP	**Compliant**

Figure 6-2 FCC §15.109 Receiver Spurious Emission (Vertical and Horizontal)



7 POWER LINE CONDUCTED EMISSIONS

7.1 Test Procedure (FCC §15.207)

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Floor standing EUTs are placed on a horizontal metal ground plane and isolated from the ground plane by 3 to 12 mm of insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

Equipment setup for conducted disturbance tests followed the guidelines of ANSI C63.4.

7.2 Power Line Conducted Emissions Criteria

The RF energy radiated back onto the public utility (AC Power Lines) shall not exceed the values in the following table when measured with the corresponding detector function.

Table 7-1 Conducted Emission Limit for FCC §15.207(a)

Frequency Range (MHz)	FCC Part 15.207(a) Quasi Peak Limit (dBuV)	FCC Part 15.207(a) Average Limit (dBuV)
0.15 – 0.5 MHz	66 to 56	56 to 46
0.5 – 5.0 MHz	56	46
5.0 - 30 MHz	60	50

7.3 Test Results

The 7525S met the power line conducted emission requirements of §15.107. The graphical data, measured with peak detection, was all below the class B quasi-peak and average limits. The test was performed on the AC input to the power supply providing the DC voltage that the 7525S was using.

Figure 7-1: FCC §15.107 Power Line Conducted Emissions