
TEST REPORT

Limited FCC Parts 15 C and E Testing in Support of a Class 2 Permissive Change
Application for a Symbol WSAP-5030 Access Port and WSM-5030 RF Module
using a SKYNET SNP-Q31T Power Supply
FCC ID: H9PWSAP5030

Report Number: OR610776/08/Issue1

October 2003

REPORT ON

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Permissive Change Application for a Symbol WSAP-5030 Access Port
and WSM-5030 RF Module using a Skynet SNP-Q31T Power Supply

Report No OR610776/08/Issue1

October 2003

EQUIPMENT:

WSAP-5030 Access Port Host Unit

FCC ID:

H9PWSAP5030

SPECIFICATION:

47 CFR 15 Subparts C & E

PREPARED FOR:

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United States of America

**MANUFACTURERS
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C Gould
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DATED:

17/10/03

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STATUS

OBJECTIVE	To undertake measurements to determine the Equipment Under Test's (EUT's) compliance with the specification.
MANUFACTURING DESCRIPTION	Access Port and RLAN Radio Module
APPLICANT	Symbol Technologies Symbol Place Winnersh Triangle Berkshire RG41 5TP
MANUFACTURERS TYPE NUMBER	WSAP-5030 and WSM-5030
MANUFACTURERS PART NUMBER	WSAP-5030 and WSM-5030
SERIAL NUMBER	No 5
HARDWARE REVISION	DVT3.1
TEST SPECIFICATION NUMBER	FCC Part 15 Subparts C and E, 2002-08
REGISTRATION NUMBER	OR610776
QUANTITY OF ITEMS TESTED	One
SECURITY CLASSIFICATION OF EUT	Unclassified
INCOMING RELEASE SERIAL NUMBER DATE	Declaration of Build Status 610776 29 th June 2003
DISPOSAL REFERENCE NUMBER DATE	Held pending disposal N/A N/A
START OF TEST FINISH OF TEST	30 th August 2003 25 th September 2003
TEST ENGINEERS	R A Bennett S C Hartley P J Harrison
RELATED DOCUMENTS	ANSI C63.4 2001. Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. FCC Public Notice document (DA 00-705 released 30 March 2000)



TEST RATIONALE

The information contained within this report is intended to show verification of limited compliance of the Symbol Technologies Inc WSAP-5030 Access Port Host Unit and WSM-5030 RLAN Radio Module as co-located transmitters to the requirements of FCC Specification Part 15 C and E for a Class 2 Permissive Change Application.

FCC ID H9PWSAP5030 & H9PWSM5030

The unit supplied for testing was a WSAP-5030 Access Port, which offers 5GHz 802.11a Wireless LAN connectivity fitted with a WSM-5030 RLAN Radio Module, which offers 2.4GHz 802.11b Wireless LAN connectivity.

Spurious Conducted Emissions testing was carried out on the Power Lines using the WSAP-5030 Access Port and WSM-5030 RLAN Radio Module fitted with Dipole (Rubber Duck) Antennas and a 120V, 60Hz Power Supply Unit Symbol Part No SNP-Q31T.

Spurious Radiated/Undesirable Emissions were carried out using the WSAP-5030 Access Port and WSM-5030 RLAN Radio Module fitted with Patch Antennas on the WSAP-5030 and Dipole (Rubber Duck) Antennas on the WSM-5030 and a 120V, 60Hz Power Supply Unit Symbol Part No SNP-Q31T. These antennas were selected because they were found to produce the worst-case emissions during previous testing.

This report details testing carried out in accordance with:

- FCC: Part 15.109, Spurious Radiated Emissions
- FCC: Part 15.207, Spurious Conducted Emissions Power Line
- FCC: Part 15.247(c), Spurious Radiated Emissions
- FCC: Part 15.407(b)(5)(6), Undesirable Emission Limits

All tests were performed using the SNP-Q31T Power Supply Unit.

Location Of Testing

BABT Engineers Steve Hartley and Phil Harrison, conducted all testing (except Spurious Radiated Emissions from 30MHz to 1GHz, which were performed at our Bearley Site) at the premises BABT, Segensworth Road, Fareham, Hampshire, PO15 5RH. Spurious Radiated Emissions measurements were performed in a 3 metre Anechoic Chamber. A complete site description is on file with the FCC Laboratory Division, Registration Number: 90987. See Annex A.

BABT Engineer Bob Bennett conducted all Spurious Radiated Emissions (from 30MHz to 1GHz) testing at the premises BABT, Snitterfield Road, Bearley, Stratford upon Avon, Warwickshire, CV37 0EX. A complete site description is on file with the FCC Laboratory Division, Registration Number: 90986. See Annex A.



SYSTEM CONFIGURATION DURING EMC TESTING

The EUT was set-up simulating a typical user installation on the Alternative Open Field Test Site identified in Annex A, and tested in accordance with the specification.

The test software in the EUT enabled the Test Engineer to select full power on the following channels;

2.4GHz and 5GHz functionality

Conducted Emissions

TX on 2412MHz and 5825MHz

TX on 2437MHz and 5350MHz

TX on 2462MHz and 5150MHz

The Output Power level (controlled by application software) was set to 1 (max power).

Spurious Radiated/Undesirable Emissions

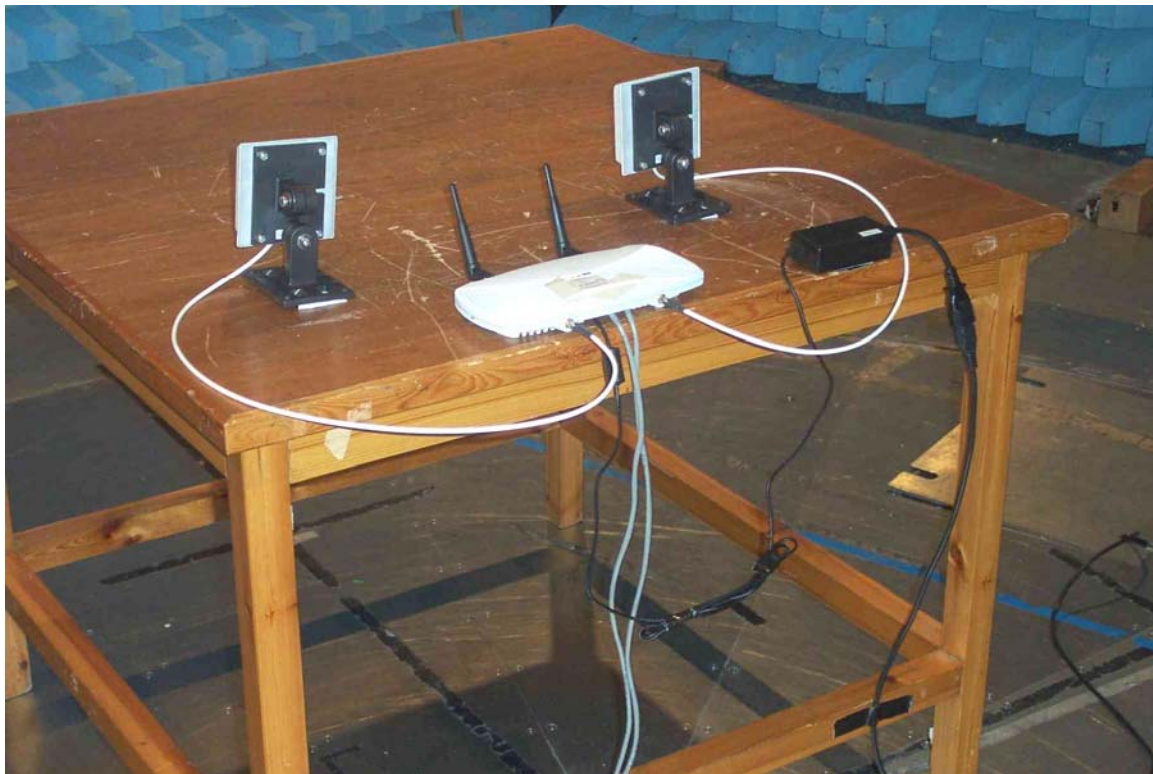
TX on 2437MHz and 5215MHz

RX on 2437MHz and 5215MHz

The Output Power level (controlled by application software) was set to 1 (max power).

TEST SETUP PHOTOGRAPH

The photograph below shows the EUT configuration during Radiated Emission testing.



Photograph 1



EQUIPMENT INFORMATION

Equipment under Test (EUT):

Equipment	Access Port Host Unit	RLAN Module for use with host unit WSAP-5030	100-250V AC Power Supply Unit
Manufacturer	Symbol Technologies Inc	Symbol Technologies Inc	Skynet
Country of origin	Taiwan	Taiwan	Taiwan
UK Agent	Symbol Technologies Ltd	Symbol Technologies Ltd	Symbol Technologies Ltd
Type No	WSAP-5030	WSM-5030	SNP-Q31T
Part No	WSAP-5030	WSM-5030	Not Applicable
Serial No	No 5	Not Applicable	2101202
Build Status	DVT3.1	DVT3.1	Not Applicable
Software Issue	Not Applicable	Not Applicable	Not Applicable
Equipment	Dipole Rubber Duck Antenna 2.4GHz	Dipole Rubber Duck Antenna 5GHz	Patch Antenna 5GHz
Manufacturer	Cushcraft	Cushcraft	Cushcraft
Country of origin	Taiwan	Taiwan	Taiwan
UK Agent	Symbol Technologies Ltd	Symbol Technologies Ltd	Symbol Technologies Ltd
Type No	ML 2499-APA	ML 5499-APA	ML 5499-SD3
Part No	Not Applicable	Not Applicable	Not Applicable
Serial No	Not Applicable	Not Applicable	Not Applicable
Build Status	Not Applicable	Not Applicable	Not Applicable
Software Issue	Not Applicable	Not Applicable	Not Applicable



EQUIPMENT INFORMATION - continued

Test Equipment and Ancillaries Used For Test

Instrument	Manufacturer	Type No	EMC	Cal. Due
Esvp Test Receiver	ROH	ESVP	1807	24 July 04
Bilog Antenna	YRK	CBL6111B	2451	07 Oct 03
Turntable Controller	VAR	RH253	1858	TU
Mast Controller	EMC	1050	1844	TU
Antenna Mast	EMC	1050	1845	TU
Open Area Site 2	ASS	OATS2	2280	28 Nov 05
Aneroid Barometer	VAR	750-1210-02	1932	TU
High Pass Filter	LOR	9HP7-7000-SR	INV4903	TU
Signal Generator	HEW	8673B	953	05 June 04
Emi Test Receiver	ROH	ESIB40	2917	04 Feb 02
Turntable Controller	H-D	HD 050	2528	TU
DRG Ant	EMC	3115	2397	04 July 04
Horn Ant	EMC	3115	2297	04 July 04
EMI Receiver	ROH	8542E	2286	13 Dec 03
Bilog Antenna	CHA	CBL 6143	2860	11Apr 04
Turntable & Controller	HD	HD 050	2528	TU
Antenna Mast	EMC	2070	-	TU
Antenna Mast Controller	EMC	2090	-	TU
Screened Room 5	SIE	EAC 54300	2533	TU
Low Noise Amplifier (1-8GHz)	MIT	AMF-3D-001080-18-13P	2457	TU
Signal Generator	HEW	8672A	411	26 Feb 04
Transient Limiter	HEW	11947A	2243	23 Jan 04
Three Phase LISN	ROH	ESH2-Z5	2380	09 Jan 04
Amplifier (8-18GHz)	AVA	AWT-18036	1081	26 June 04
Horn (18-40GHz)	ADV	AM180HA-K-TU2	2945	15 May 05
Amplifier (18-40GHz)	NAR	DB02-0447	2936	23 Apr 04
Test Receiver	ROH	ESVP	1807	24 July 04
Spectrum Monitor	ROH	EZM	1811	TU
Bilog Antenna	CHA	CBL6111B	2451	7 Oct 04
Turntable & Controller	BRI	RH253	1858	TU
Mast Controller	EMC	1050	1844/5	TU
Printer	EPS	Colour 660	7023	TU
Open Area Test Site	ASS	OATS 2	2280	28 Nov 05
Barometer	DIP	-	1938	TU
Hygrometer	RTC	A1	INV4066	28 Oct 03
Thermohydrograph	RTC	A1 Hygromer	3162	15 Nov 03
HPA Monitor	DIP	-	1932	TU

Note(s)

All items are calibrated annually, except where labelled TU (Traceability Unscheduled). These items are calibrated within the test configurations using calibrated equipment.

Instrumentation Used For Exercising The EUT

Instrument	Manufacturer	Type No	INV No
Laptop Computer	Dell	Latitude CPI	N/A
Laptop Computer	Dell	Latitude C400	N/A



EQUIPMENT INFORMATION - continued

Key To Manufacturers

ADV	Advanced Microtek
ASS	Assessment Services
AVA	Avantek
BRI	British Turntables
CHA	Chase
DIP	Diplex
EMC	Emco
EPS	Epson
HEW	Hewlett Packard
LOR	Lorch
H-D	No Data
MIT	Miteq
NAR	Narda
SIE	Siemens
ROH	Rohde & Schwarz
RTC	Rotronic
VAR	Various
YRK	York Electronics



Test Case : Spurious Conducted Emissions on Power Lines
Test Date : 16th September 2003
Rule Parts : 15.207& 15.407(b)(5)

Test Procedure

In accordance with Part 15 Subpart C, Section 15.207 and Part 15 Subpart E Section 15.407(b)(5), for Conducted Emissions was carried out on the Measurement Test Facility detailed in Annex A.

Conducted Emission Measurements were undertaken within the semi-anechoic chamber. Emissions were measured on the Live and Neutral Lines.

Emissions were formally measured using a Quasi-Peak Detector, which meets the CISPR requirements. The details of the worst-case emissions for the Live and Neutral Lines are presented in the tables below.

The EUT was connected to a 120V 60Hz supply.

The Conducted Emission measurements were made using a Hewlett Packard 8542E EMI Receiver.

The test was performed in accordance with ANSI C63.4.



Test Case : Spurious Conducted Emissions on Power Lines - continued
Test Date : 16 September 2003
Rule Parts : 15.207& 15.407(b)(5)

Test Results

The EUT met the Class B requirements of 47 CFR 15.207 and 15.407(b)(5) for Conducted Emissions on the Live and Neutral Lines.

EUT Tx on 2.412GHz and 5.825GHz

Conducted Emissions - Live Line

Emission Frequency (MHz)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0.150	44.2	66.0	29.6	56.0
0.183	56.7	64.3	47.9	54.3
0.210	44.7	63.2	41.9	53.2
0.250	44.9	61.8	42.1	51.8
3.644	41.4	56.0	38.2	46.0
4.639	39.6	56.0	34.9	46.0

The margin between the specification requirements and all other emissions were 21.8dB or more below the specified Quasi-Peak limit and 26.3 or more below the Average limit.

Conducted Emissions Neutral Line

Emission Frequency (MHz)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0.184	55.5	64.3	48.0	54.3
0.210	43.6	63.2	42.0	53.2
0.250	43.5	61.8	41.7	51.8
3.530	38.6	56.0	34.7	46.0
3.602	38.7	56.0	35.0	46.0
4.678	38.8	56.0	33.4	46.0

The margin between the specification requirements and all other emissions were 21.8dB or more below the specified Quasi-peak limit and 26.7dB or more below the specified Average limit.

Procedure: Test performed in accordance with ANSI C63.4.

Performed by: P J Harrison, EMC Engineer.



Test Case : Spurious Conducted Emissions on Power Lines - continued
Test Date : 16 September 2003
Rule Parts : 15.207& 15.407(b)(5)

Test Results

The EUT met the Class B requirements of 47 CFR 15.207 and 15.407(b)(5) for Conducted Emissions on the Live and Neutral Lines.

EUT Tx on 2.437GHz and 5.350GHz

Conducted Emissions - Live Line

Emission Frequency (MHz)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Average Level (dB μ V)	Average Limit (dB μ V)
0.184	55.5	64.3	46.9	54.3
0.250	44.1	61.8	41.6	51.8
3.643	40.3	56.0	37.4	46.0
3.571	41.5	56.0	37.8	46.0
3.638	41.4	56.0	38.4	46.0
4.316	38.9	56.0	35.4	46.0

The margin between the specification requirements and all other emissions were 18.9dB or more below the specified Quasi-Peak limit and 11.2 or more below the Average limit.

Conducted Emissions Neutral Line

Emission Frequency (MHz)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Average Level (dB μ V)	Average Limit (dB μ V)
0.150	44.0	66.0	29.1	56.0
0.183	55.4	64.3	47.8	54.3
0.210	43.2	63.2	41.7	53.2
3.638	38.8	56.0	35.4	46.0
4.678	38.7	56.0	33.4	46.0
4.896	38.2	56.0	33.7	46.0

The margin between the specification requirements and all other emissions were 22.0dB or more below the specified Quasi-peak limit and 26.8dB or more below the specified Average limit.

Procedure: Test performed in accordance with ANSI C63.4.

Performed by: P J Harrison, EMC Engineer.



Test Case : Spurious Conducted Emissions on Power Lines - continued
Test Date : 16 September 2003
Rule Parts : 15.207& 15.407(b)(5)

Test Results

The EUT met the Class B requirements of 47 CFR 15.207 and 15.407(b)(5) for Conducted Emissions on the Live and Neutral Lines.

EUT Tx on 2.462GHz and 5.150GHz

Conducted Emissions - Live Line

Emission Frequency (MHz)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0.183	55.4	64.3	46.8	54.3
3.397	39.6	56.0	36.6	46.0
3.571	42.0	56.0	38.7	46.0
3.678	41.9	56.0	38.2	46.0
4.356	41.0	56.0	36.2	46.0
4.749	39.5	56.0	34.6	46.0

The margin between the specification requirements and all other emissions were 18.3dB or more below the specified Quasi-Peak limit and 10.6 or more below the Average limit.

Conducted Emissions Neutral Line :

Emission Frequency (MHz)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0.150	43.9	66.0	29.1	56.0
0.183	55.3	64.3	47.7	54.3
0.210	42.8	63.2	41.4	53.2
0.250	42.6	56.0	41.2	46.0
3.603	39.1	56.0	34.9	46.0
4.531	37.2	56.0	32.7	46.0

The margin between the specification requirements and all other emissions were 24.1dB or more below the specified Quasi-peak limit and 28.5dB or more below the specified Average limit.

Procedure: Test performed in accordance with ANSI C63.4.

Performed by: P J Harrison, EMC Engineer.



Test Case : Spurious Radiated/Undesirable Emissions
Test Date : 30th August and 25th September 2003
Rule Parts : 15.247 (c) and 15.407(b)(5) (6)

Measurement Method

Testing to the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c) and Subpart E, Section 15.407 (b)(5) (6) for Spurious Radiated/Undesirable Emissions was carried out on the Measurement Test Facility detailed in Annex A. Section 15.247(c) also requires Rule parts 15.205 and 15.209 to be applied.

A preliminary profile of the Spurious Radiated/Undesirable Emissions was obtained by operating the Equipment Under Test (EUT) on a remotely controlled turntable within a semi-anechoic chamber; measurements were taken at a 3m distance unless otherwise stated. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, a search was made in the frequency range 30MHz to 25GHz. The list of worst-case emissions was then confirmed or updated under Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

30MHz – 1GHz emissions levels were then formally measured using a CISPR Quasi-Peak detector. 1GHz – 40GHz emissions levels were then formally measured using Peak and Average detectors.

(Note: Peak measurements performed using a Resolution and Video Bandwidth of 1MHz, Average measurements performed using a Resolution Bandwidth of 1MHz and a Video Bandwidth of 10Hz)

The EUT was connected to a 120V 60Hz supply.

Measurements were made with the EUT transmitting simultaneously on the following channels.

2437MHz and 5215MHz

Spurious Radiated Emissions from 30MHz to 1GHz were made using a HP 8542E Test Receiver.

Spurious Radiated Emissions from 1GHz to 40GHz were made using a Rhode and Schwarz ESIB 40 Test Receiver.

The test was performed in accordance with ANSI C63.4.

The measurements were performed at a 3m distance unless otherwise stated.



Test Case : Spurious Radiated/Undesirable Emissions - continued
Test Date : 30th August and 25th September 2003
Rule Parts : 15.247 (c) and 15.407(b)(5) (6)

30MHz - 1GHz Frequency Range

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: The EUT met the requirements of FCC Parts 15.247 (c) and 15.407(b)(5) (6), 15.205 and 15.209 for Spurious Radiated/Undesirable Emissions (30MHz – 1GHz).

EUT Tx on 2.437GHz and 5.215GHz

30MHz – 1GHz Alternative Open Area Test Site Results: The levels of the six highest emissions measured in accordance with the specification are presented below: -

Table of Results for Radiated Emissions

Emission Frequency	Pol	Hgt	Azm	Field Strength at 3m		Specification Limit	
MHz	H/V	cm	deg	dBµV/m	µV/m	dBµV/m	µV/m
36.1379	V	100	144	37.7	76.7	40.0	100.0
37.4600	V	100	128	35.9	62.4	40.0	100.0
38.9181	V	100	144	39.5	94.4	40.0	100.0
39.5603	V	100	150	38.4	83.2	40.0	100.0
40.3381	V	100	201	37.1	71.6	40.0	100.0
41.6155	V	100	165	34.3	52.5	40.0	100.0

ABBREVIATIONS FOR ABOVE TABLES

H Horizontal Polarisation
Pol Polarisation
deg degree

V Vertical Polarisation
Hgt Height
Azm Azimuth

Procedure: Test Performed in accordance with ANSI C63.4.

Performed by: R A Bennett, EMC Engineer.



Test Case : Spurious Radiated/Undesirable Emissions - continued
Test Date : 30th August and 25th September 2003
Rule Parts : 15.247 (c) and 15.407(b)(5) (6)

1GHz - 40GHz Frequency Range

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC Parts 15.247 (c) and 15.407(b)(5) (6), 15.205 and 15.209 for Spurious Radiated/Undesirable Emissions (1GHz – 40GHz).

EUT Tx on 2.437GHz and 5.215GHz

1GHz – 40GHz Alternative Open Area Test Site Results: The levels of the six highest emissions measured in accordance with the specification are presented below: -

Table of Results for Radiated Emissions

Frequency	Antenna		Turntable	Peak Field Strength	Peak Limit	Average Field Strength	Average Limit
	Polarisation	Height	Azimuth				
GHz	H/V	cm	deg	dBµV/m	dBµV/m	dBµV/m	dBµV/m
4.126	V	120	207	70.0	74.0	44.7	54.0
5.056*	V	100	15	68.7	84.0	59.3	64.0
5.088*	V	101	15	69.0	84.0	56.1	64.0
5.120*	V	100	19	68.7	84.0	58.3	64.0
5.175*	V	100	6	69.1	84.0	/	64.0
5.408*	V	100	13	70.0	84.0	51.7	64.0

* Measurement made at 1m, limit raised 10dB.

ABBREVIATIONS FOR ABOVE TABLES

H Horizontal Polarisation
deg degree

V Vertical Polarisation

Procedure: Test Performed in accordance with ANSI C63.4.

Performed by: S C Hartley, EMC Engineer.



Test Case : Spurious Radiated Emissions
Test Date : 25th September 2003
Rule Parts : 15.109

Measurement Method

Testing to the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.109, for Radiated Electric Field Emissions was carried out on the Measurement Test Facility detailed in Annex A.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the Equipment Under Test (EUT) on a remotely controlled turntable within a semi-anechoic chamber; measurements were taken at a 3m distance unless otherwise stated. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, a search was made in the frequency range 30MHz to 1GHz. The list of worst-case emissions was then confirmed or updated under Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

30MHz – 1GHz emissions levels were then formally measured using a CISPR Quasi-Peak detector.

The EUT was connected to a 120V 60Hz supply.

Measurements were made with the EUT receiving on the following channels.

2437MHz and 5215MHz

Spurious Radiated Emissions from 30MHz to 1GHz were made using a HP 8542E Test Receiver.

The measurements were performed at a 3m distance unless otherwise stated.



Test Case : Spurious Radiated Emissions - continued
Test Date : 25th September 2003
Rule Parts : Part 15.109

30MHz - 1GHz Frequency Range

Equipment Designation: Unintentional Radiator.

The EUT met the requirements of Part 15.109 for Spurious Radiated Emissions (30MHz – 1GHz).

EUT Rx on 2.437GHz and 5.215GHz

30MHz – 1GHz Open Area Test Site Results: The levels of the six highest emissions measured in accordance with the specification are presented below: -

Emission Frequency	Pol	Hgt	Azm	Field Strength at 3m		Specification Limit	
MHz	H/V	cm	deg	dBµV/m	µV/m	dBµV/m	µV/m
33.452	V	100	0	36.3	65.3	40.0	100.0
35.346	V	100	148	36.0	63.1	40.0	100.0
37.460	V	100	128	36.4	66.1	40.0	100.0
39.560	V	100	150	37.6	75.9	40.0	100.0
38.918	V	100	144	38.7	86.1	40.0	100.0
40.338	V	100	201	37.0	70.8	40.0	100.0

ABBREVIATIONS FOR ABOVE TABLES

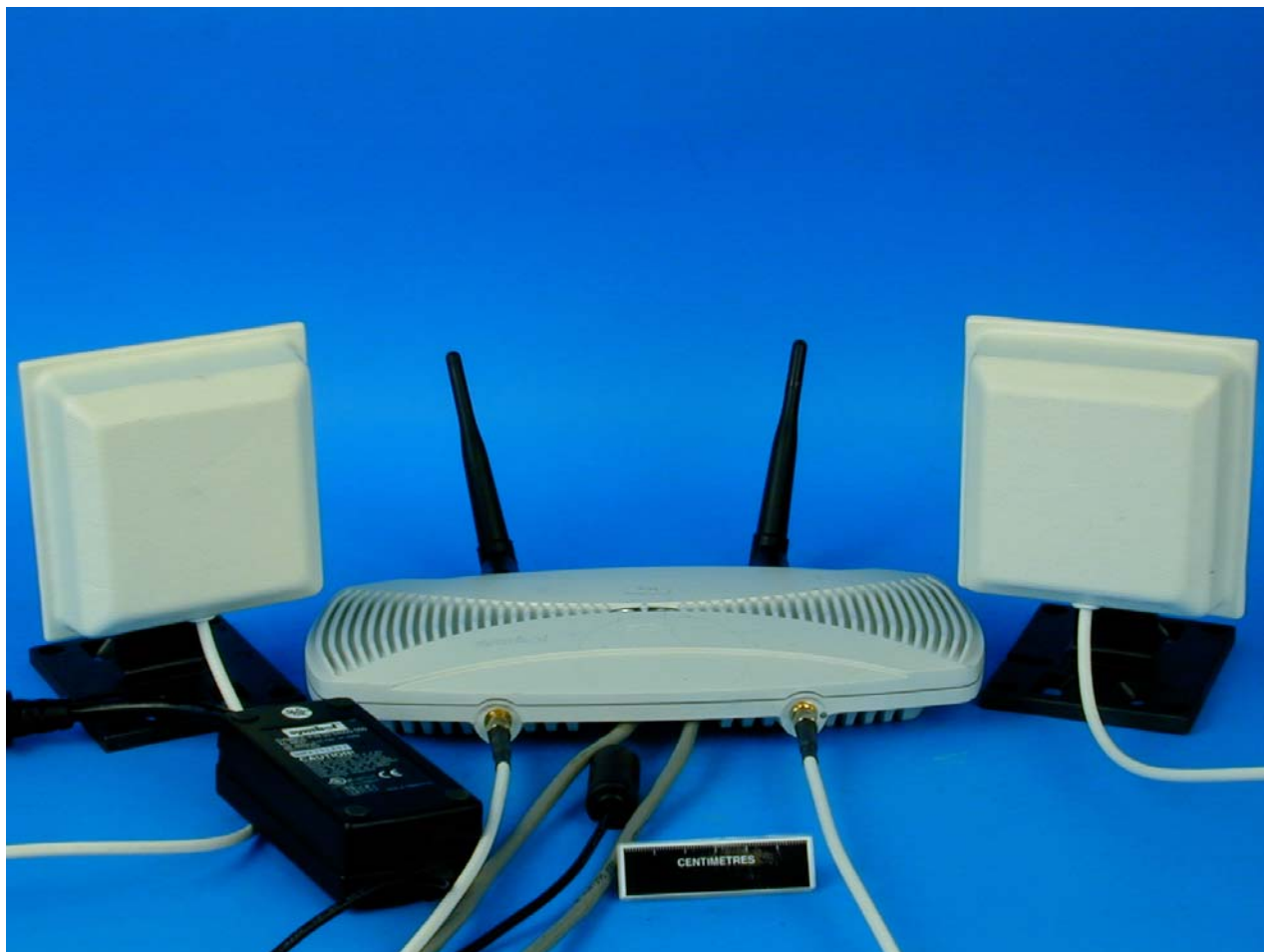
H Horizontal Polarisation
Pol Polarisation
deg degree

V Vertical Polarisation
Hgt Height
Azm Azimuth

Procedure: Test Performed in accordance with ANSI C63.4.

Performed by: R A Bennett, EMC Engineer.

PHOTOGRAPHS OF EQUIPMENT



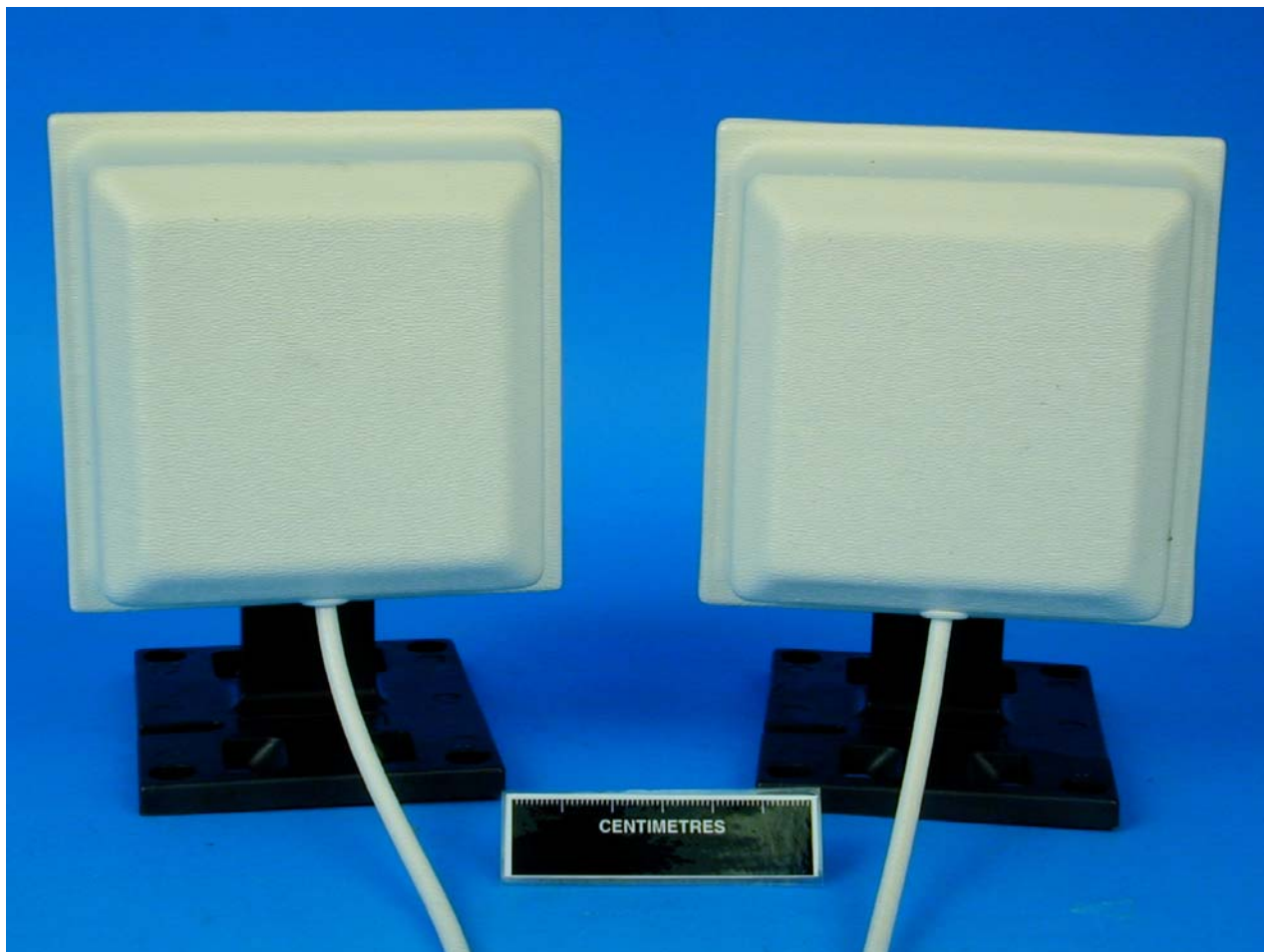
Photograph 2
Front View Symbol WSAP 5030 Access Port with WSM 5030 RF Module and
 Dipole (Rubber Duck) Antennas (2.4GHz), Patch Antennas (5GHz) and Power Supply Unit SNP-Q31T

PHOTOGRAPHS OF EQUIPMENT



Photograph 3
Rear View Symbol WSAP 5030 Access Port with WSM 5030 RF Module and
 Dipole (Rubber Duck) Antennas (2.4GHz), Patch Antennas (5GHz) and Power Supply Unit SNP-Q31T

PHOTOGRAPHS OF EQUIPMENT



Photograph 4
View of 5GHz Patch Antennas Symbol WSAP 5030 Access Port

PHOTOGRAPHS OF EQUIPMENT



Photograph 5
Front View Symbol WSAP 5030 Access Port with WSM 5030 RF Module and
Dipole (Rubber Duck) Antennas (2.4GHz & 5GHz)

PHOTOGRAPHS OF EQUIPMENT



Photograph 6
Rear View Symbol WSAP 5030 Access Port with WSM 5030 RF Module and
Antenna connectors (2.4GHz & 5GHz)

PHOTOGRAPHS OF EQUIPMENT



Photograph 7
View of 2.4GHz and 5GHz Dipole (Rubber Duck) Antennas Symbol WSAP 5030 Access Port

PHOTOGRAPHS OF EQUIPMENT



Photograph 8
View of SNP-Q31T Power Supply Unit Symbol WSAP 5030 Access Port

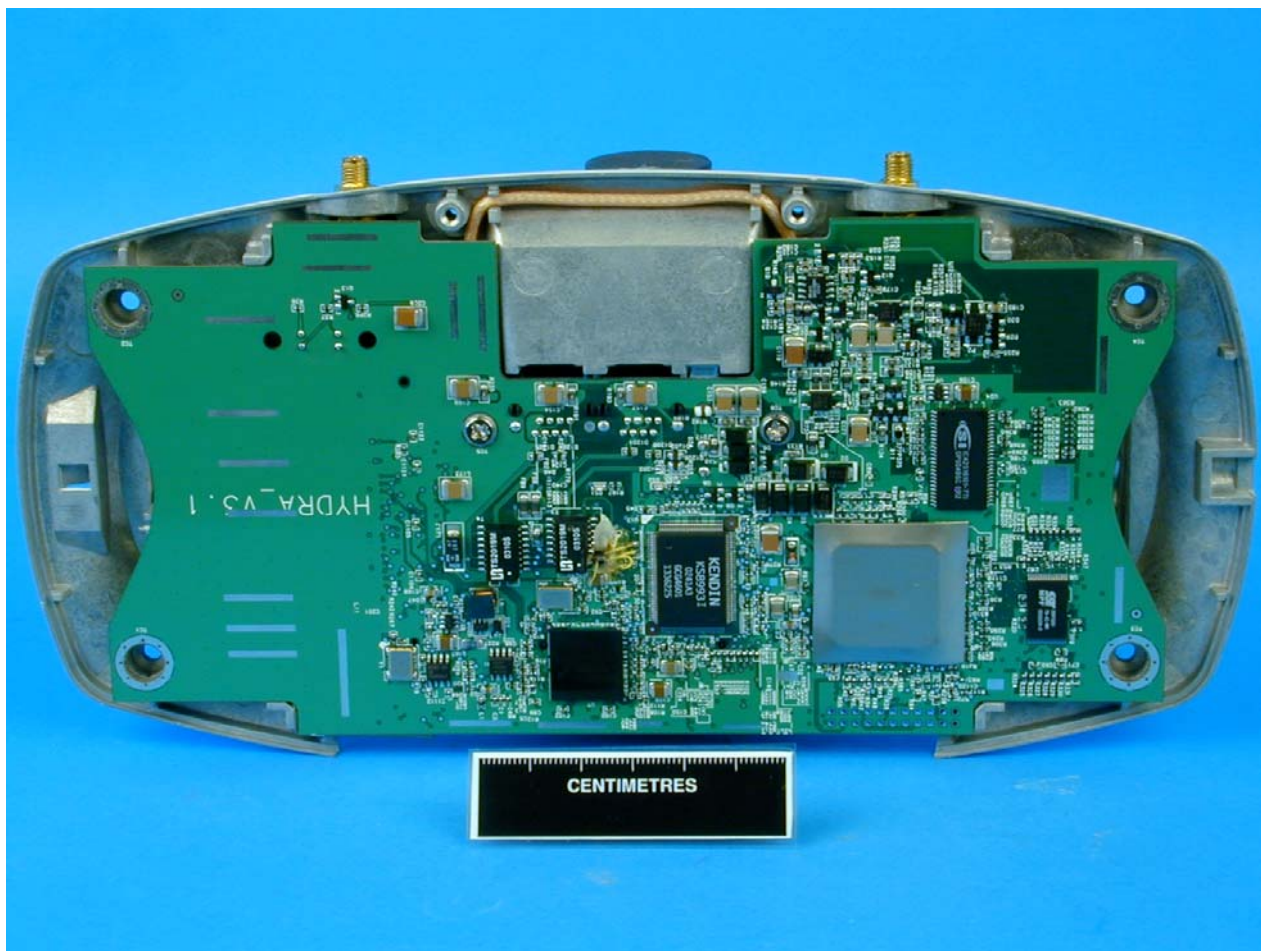


PHOTOGRAPHS OF EQUIPMENT



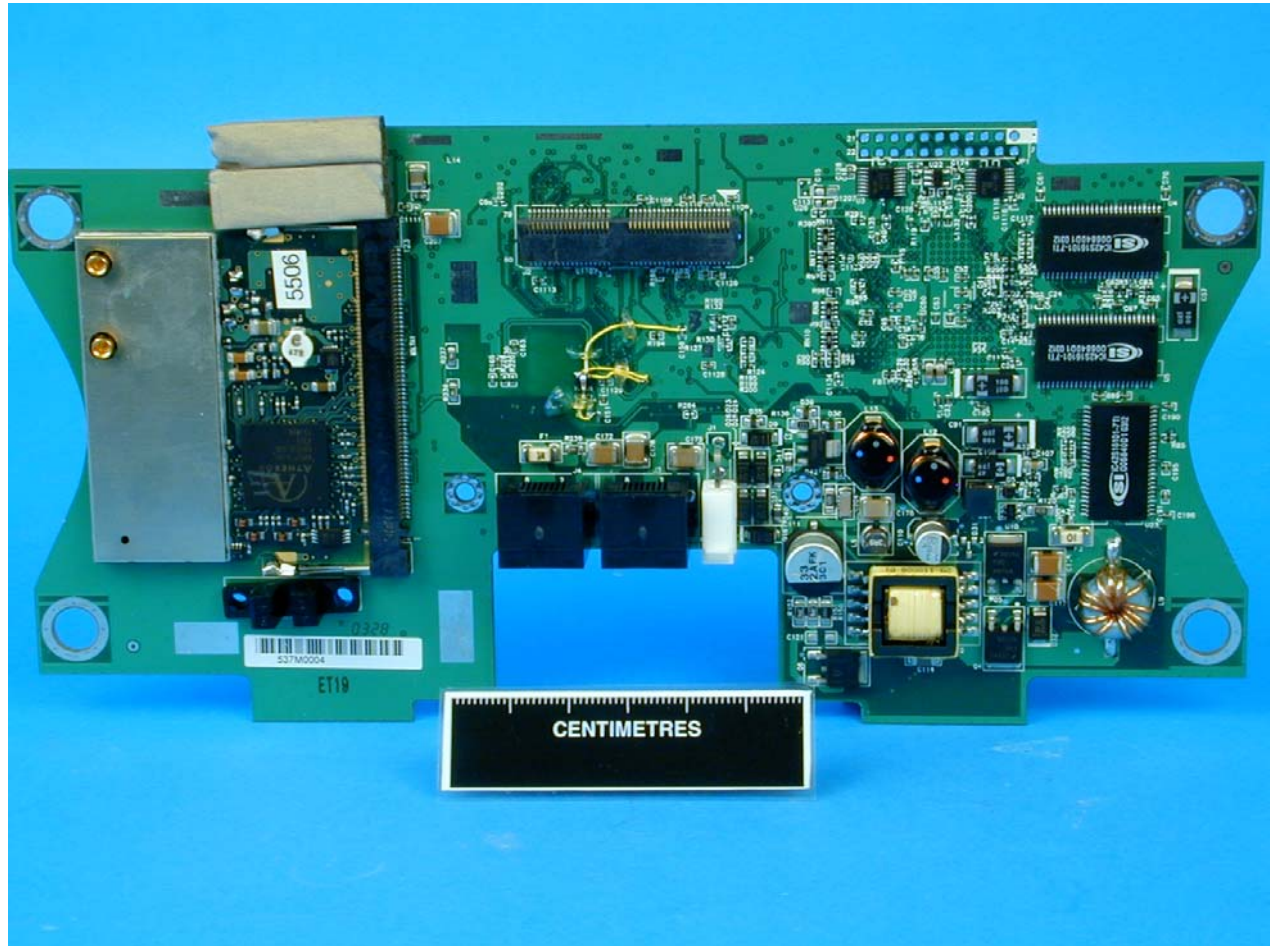
Photograph 9
Label View of SNP-Q31T Power Supply Unit Symbol WSAP 5030 Access Port

PHOTOGRAPHS OF EQUIPMENT



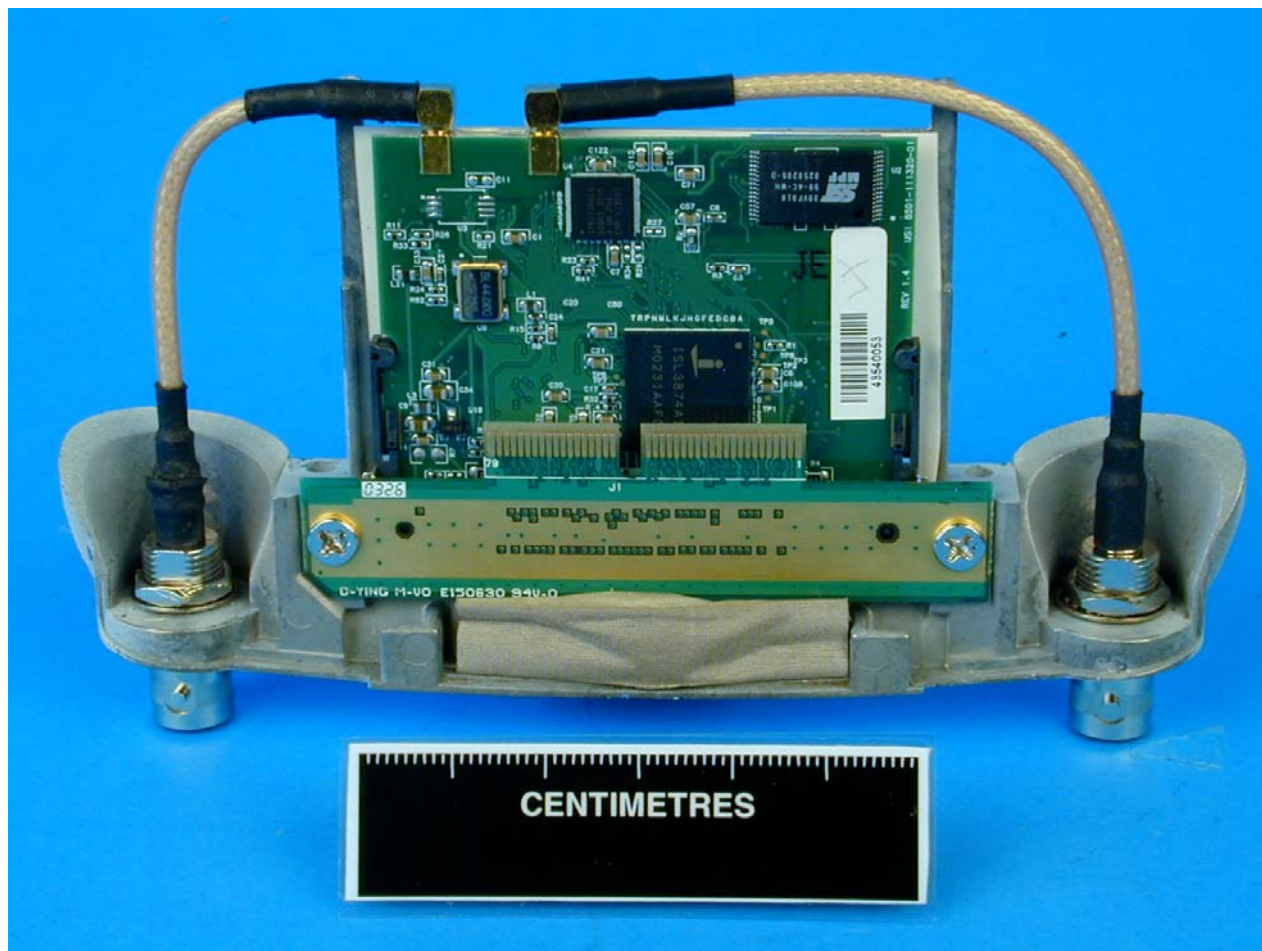
Photograph 10
Internal View Symbol WSAP 5030 Access Port

PHOTOGRAPHS OF EQUIPMENT



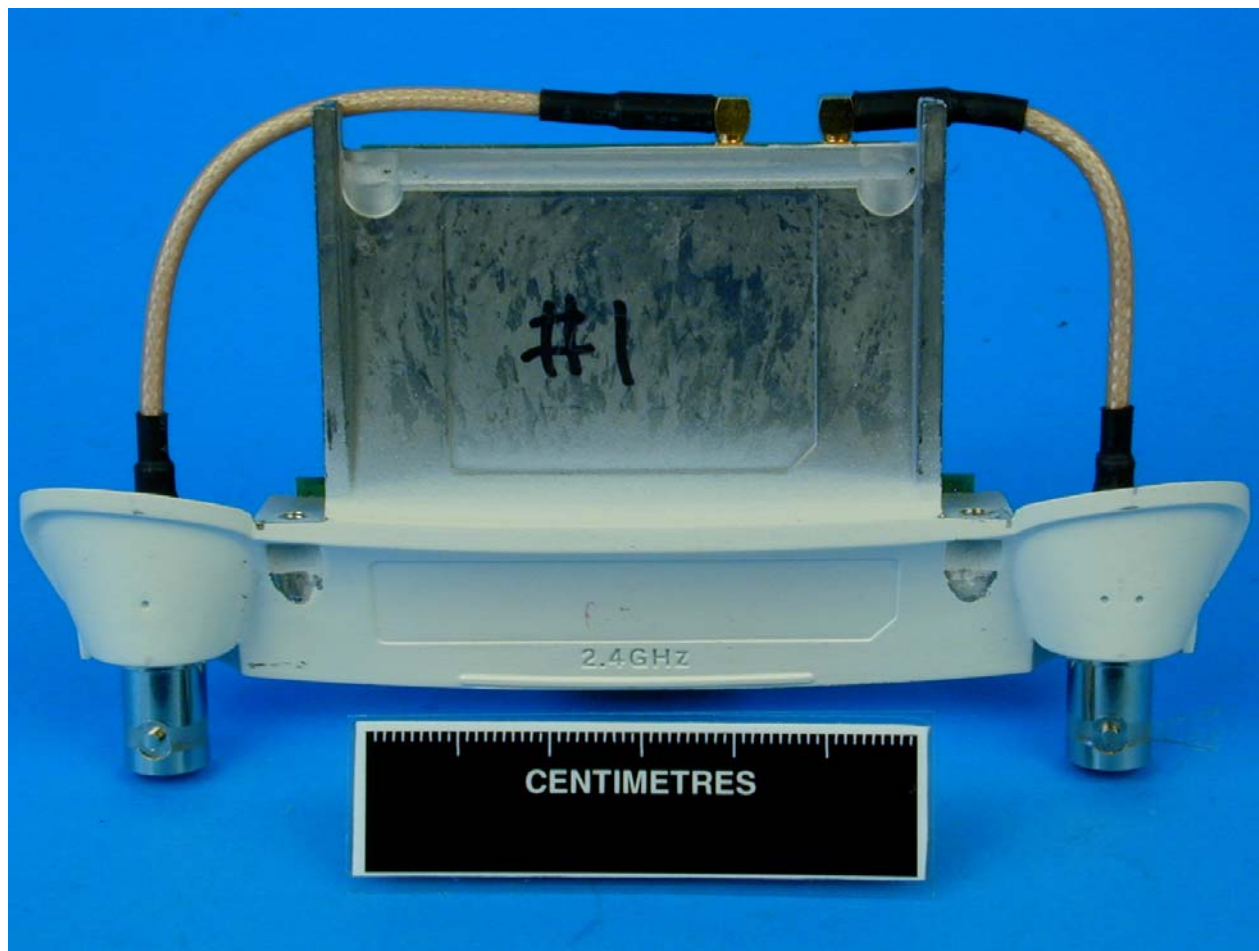
Photograph 11
Internal View Symbol WSAP 5030 Access Port

PHOTOGRAPHS OF EQUIPMENT



Photograph 12
Internal View Symbol WSM 5030 RLAN Radio Module

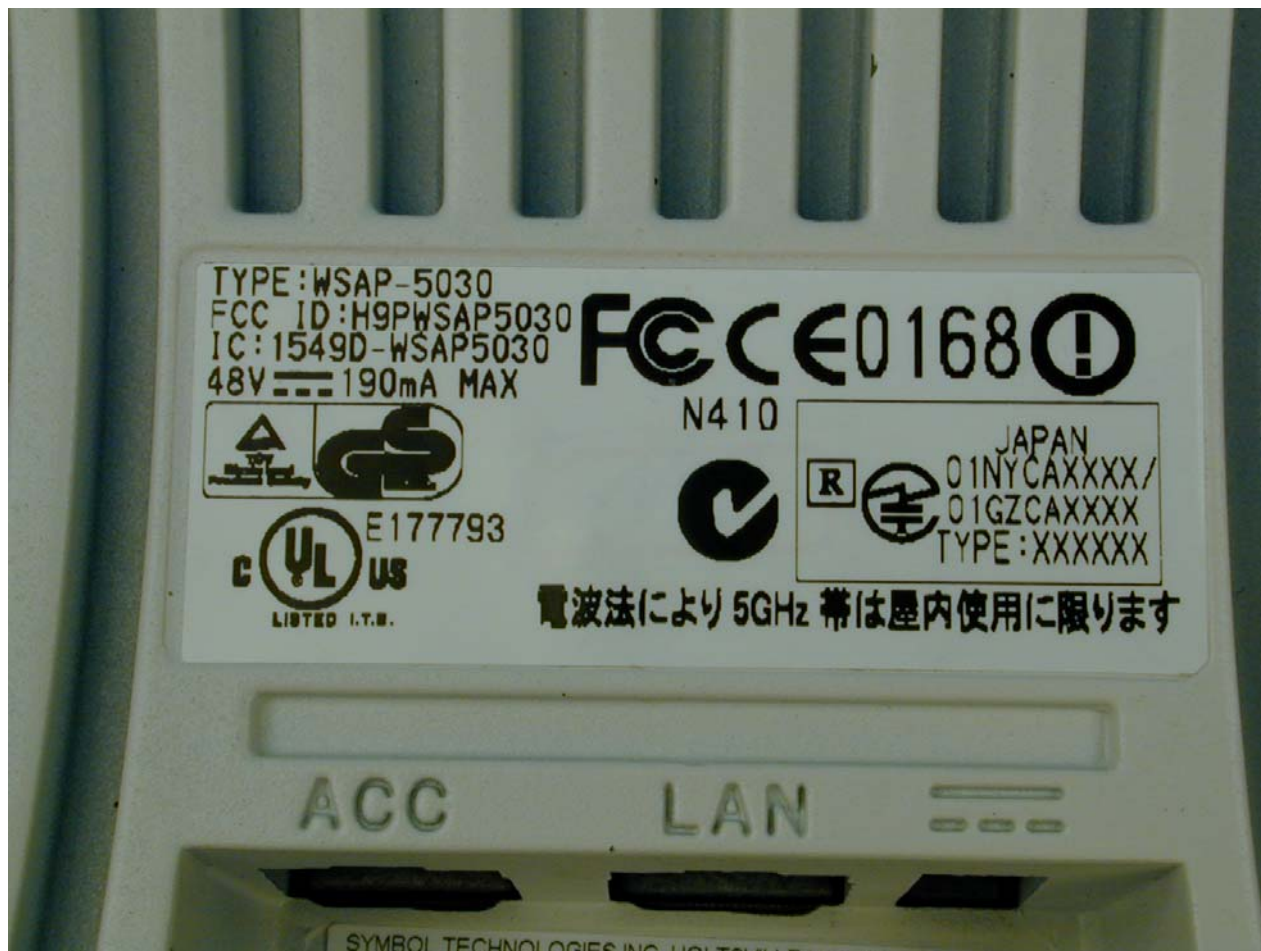
PHOTOGRAPHS OF EQUIPMENT



Photograph 13
Internal View Symbol WSM 5030 RLAN Radio Module



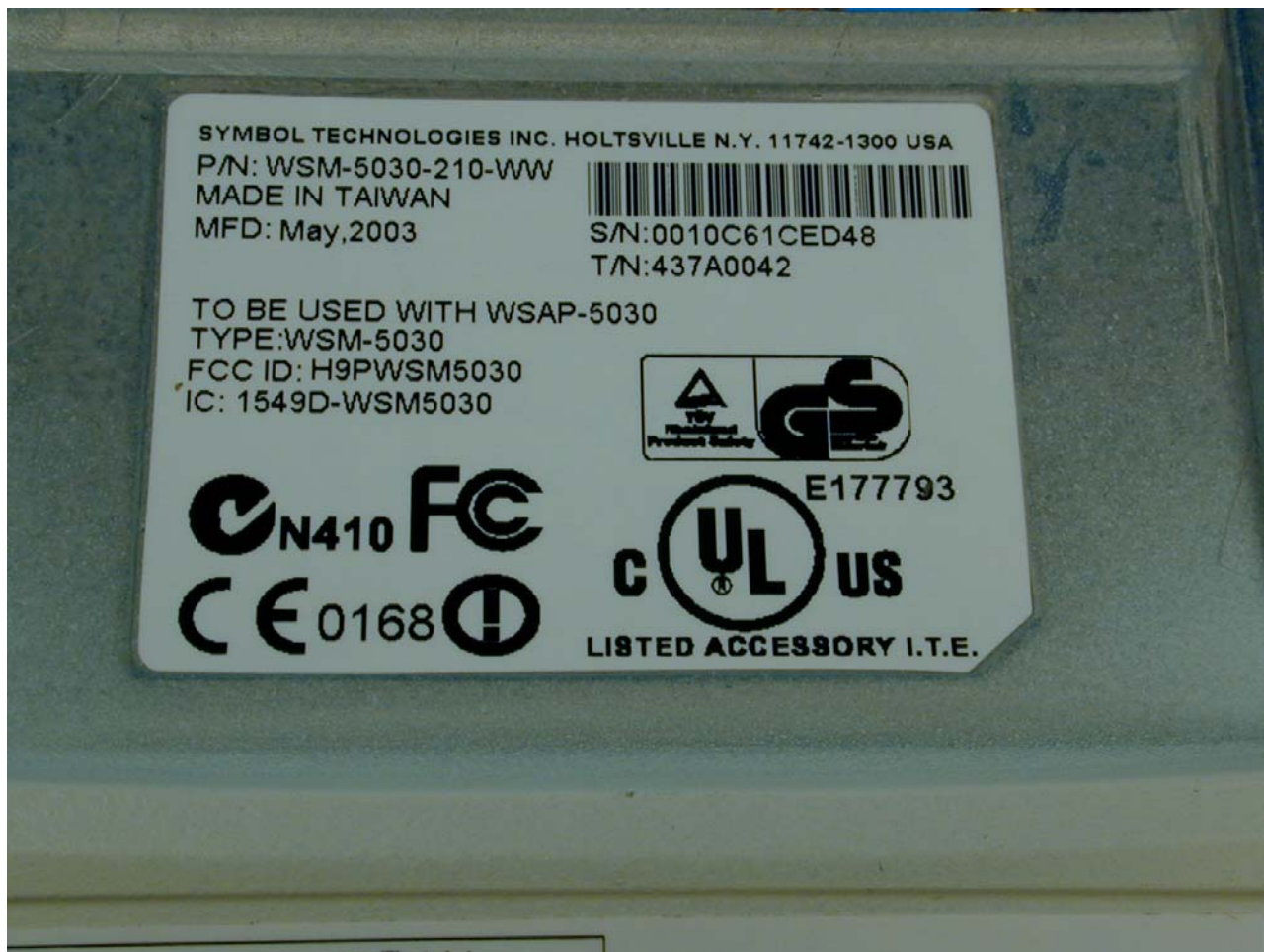
PHOTOGRAPHS OF EQUIPMENT



Photograph 14
Label View Symbol WSAP 5030 Access Port



PHOTOGRAPHS OF EQUIPMENT



Photograph 15
Label View Symbol WSM-5030 RLAN Radio Module



MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are: -

In the frequency range 30MHz to 1000MHz

For Spurious Radiated/Undesirable Emissions, Quasi-Peak Measurements using the ESVP Test Receiver and Bilog Antenna:

Frequency	$\pm 5\text{ppm} + 500\text{Hz}$
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Amplitude	$\pm 4.1\text{dB}$
-----------	--------------------

Conducted Emissions Tests using a Hewlett Packard 8542E EMI Receiver:

Frequency	$15\text{ppm} + 50\text{kHz}$
-----------	-------------------------------

Amplitude	$\pm 2.7\text{dB}$
-----------	--------------------

In the frequency range 1GHz to 25GHz

For Radiated Emissions, using the Rohde and Schwarz ESIB 40 Test Receiver: -

Frequency	$\pm 2 \times 10^{-7} \times \text{Centre Frequency}$
-----------	---

Amplitude	$\pm 3.4\text{dB}$
-----------	--------------------



This report relates only to the actual item/items tested.

UKAS Accreditation's do not cover opinions and interpretations and any expressed herein are outside the scope of any UKAS Accreditation.

Results of tests not yet included in our UKAS Accreditation Schedule are marked NUA
(Not UKAS Accredited).

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ANNEX A
FCC SITE COMPLIANCE LETTERS

FEDERAL COMMUNICATIONS COMMISSION

**Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046**

October 18, 2002

Registration Number: 90987

TUV Product Service Ltd
Segensworth Road
Titchfield
Fareham, Hampshire, PO15 5RH
United Kingdom
Attention: Kevan Adsetts

Re: Measurement facility located at Titchfield
Anechoic chamber (3 meters) and 3 & 10 meter OATS
Date of Listing: October 18, 2002

Gentlemen:

Your request for registration of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC rules. The information has, therefore, been placed on file and the name of your organization added to the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,



Thomas W Phillips
Electronics Engineer

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD. 21046

September 08, 2000

Registration Number: 90986

BABT Product Service
Snitterfield Road
Bearley, Stratford-upon-Avon
Warwickshire CV37 0EX
United Kingdom
Attention: Jensen Adams

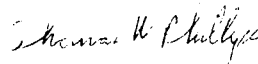
Re: Measurement facility located at Bearley
3 & 10 meter site
Date of Listing: September 08, 2000

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that this filing must be updated for any changes made to the facility, and at least every three years from the date of listing the data on file must be certified as current.

If requested, the above mentioned facility has been added to our list of those who perform these measurement services for the public on a fee basis. An up-to-date list of such public test facilities is available on the Internet on the FCC Website at WWW.FCC.GOV, E-Filing, OET Equipment Authorization Electronic Filing.

Sincerely,



Thomas W Phillips
Electronics Engineer