

RC-032-GTC-09-100663-1-A

"This report cancels and replaces the test report N°RC-032-GTC-09-100663-1-A Edition 0"

E.M.C. TESTS REPORT

According to the standard:

FCC Part 15 édition 2008

ANSI C 63.4 (2003)

Equipment under test:

WORKABOUT PRO (7527C-G2)

+ WA9005 (Scanner) + BT + RA2041 (WiFi)

+ RFID Module UHF-CA3-A5-G2

+ Docking station (WA4003- G2)

+ AC Wall Adaptor – PSA15R-050P

Company:

PSION TEKLOGIX

FCC Listed: 910 701

Distribution: Mr PORTE

(Company: PSION TEKLOGIX)

Number of pages: 21 with 1 annex

Ed.	Date	Modified page	Written by		Technical Verification and Quality	
			Name	Visa	Name	Visa
1	08/04//09	12	L. BOMBA LB.		JC BOGA JBoga	

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This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole production of the item tested.



NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : WORKABOUT PRO (7527C-G2)
+ WA9005 (Scanner) + BT + RA2041 (WiFi)
+ RFID Module UHF-CA3-A5-G2
+ Docking station (WA4003- G2)
+ AC Wall Adaptor – PSA15R-050P

Serial number : EMEA RFID 82777700777

Part number : Not communicated

Software Version : Not communicated

MANUFACTURER'S NAME : PSION TEKLOGIX

APPLICANT'S ADDRESS:

Company : PSION TEKLOGIX

Address : Parc de la Duranne
135, rue René Descartes
BP 421000
13591 AIX EN PROVENCE CEDEX 3

Person present during the tests : Mr FORNIER

Responsible : Mr PORTE

DATES OF TESTS : 2009, 16th, 18th and 19th of February

TESTS LOCATIONS : Laboratory EMITECH of Montigny-Le-Bretonneux (78) and open area test site of Aunainville (28) - FRANCE

TESTS SUPERVISOR : E. COEURET

TESTS OPERATOR : L. BOMBA

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ANNEX: PHOTOGRAPHIES

1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment «WORKABOUT PRO (7527C-G2) + WA9005 (Scanner) + BT + RA2041 (WiFi) + RFID Module UHF-CA3-A5-G2 + Docking station (WA4003- G2) + AC Wall Adaptor – PSA15R-050P» (denominated hereafter E.U.T.: equipment under test) according to documents listed below.

2. REFERENCE DOCUMENTS

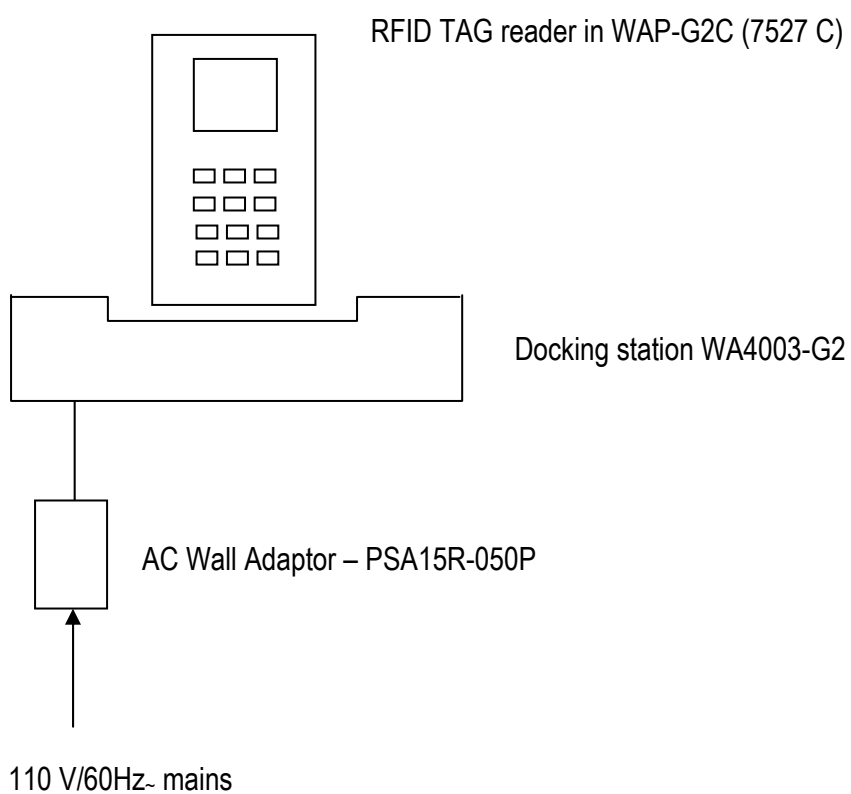
FCC Part 15 édition 2008	Code of Federal Regulations Title 47 – Telecommunications Chapter 1 – Federal Communications Commission Part 15 – Radio frequency devices Subpart C – Intentional Radiators
ANSI C 63.4 (2003)	American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3. EQUIPMENT UNDER TEST CONFIGURATION

Product description:

FCC ID: RFID Module UHF-CA3-A5-G2
Utilization: RFID TAG reader
Antenna type: Incorporated antenna
Antenna gain: Unknown
Operating frequency range: 902 MHz (Rfid), 2402 MHz (Bluetooth), 2462 MHz (Wifi)
Number of channels: 50 for RFID, 75 for Bluetooth and Wifi
Channel spacing: 200 kHz for RFID
Power source: 5 Vdc (stand alone) or mains voltage (with docking)
Power level and frequency range are not user adjustable

Equipment modifications applied during tests: No

4. EQUIPMENT UNDER TEST CONFIGURATION SCHEME

5. SUMMARY OF TESTS RESULTS

Tests designation	Results satisfying?	Comments
EMISSION		
Conducted emissions – section 15.207	YES	
Radiated emissions – sections 15.209 and 15.247	YES	

N.P.: Not Performed.

N.A.: Not Applicable.

To declare or not compliance with the specification, it has not been given explicit account of the uncertainty associated with results.

6. CONDUCTED EMISSION

Standard: FCC Part 15.207: 2008

Test method: Section: 15.207 for FCC Part 15

Test configuration:

Tested cables	Measure with	E.U.T. height
Power supply 110Vac	L.I.S.N	80 cm

Frequency band	Tested cable	Resolution bandwidth	Video bandwidth	Detection mode
150 kHz - 1 MHz	Power supply 110Vac (60Hz)	10 kHz	30 kHz	Peak
1 MHz - 30 MHz	Power supply 110Vac (60Hz)	10 kHz	30 kHz	Peak
150 kHz 30 MHz	Power supply 110Vac (60Hz) (QP)	9 kHz	Auto	Average

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	TYPE	Nº EMITECH
Cable	-	N-4m	2809
Limiter	Hewlett Packard	11947A	1094
LISN	Rohde & Schwarz	ESH2-Z5	3290
QP Adapter	Hewlett Packard	HP 85650 A	0826
Receiver	Hewlett Packard	HP 8568 A	0822
Shielding enclosure	Emitech	JD	1804
Software	Nexio	BAT EMC v3.5.0.2	0000

Limit: The EUT must satisfy requirements of the standard for class B as shown in table below.

Frequency range (MHz)	Limit for class B (dB μ V)	
	Quasi-peak	Average
0.15 to 0.5	66 - 56	56 - 46
0.5 to 5	56	46
5 to 30	60	50

Results:

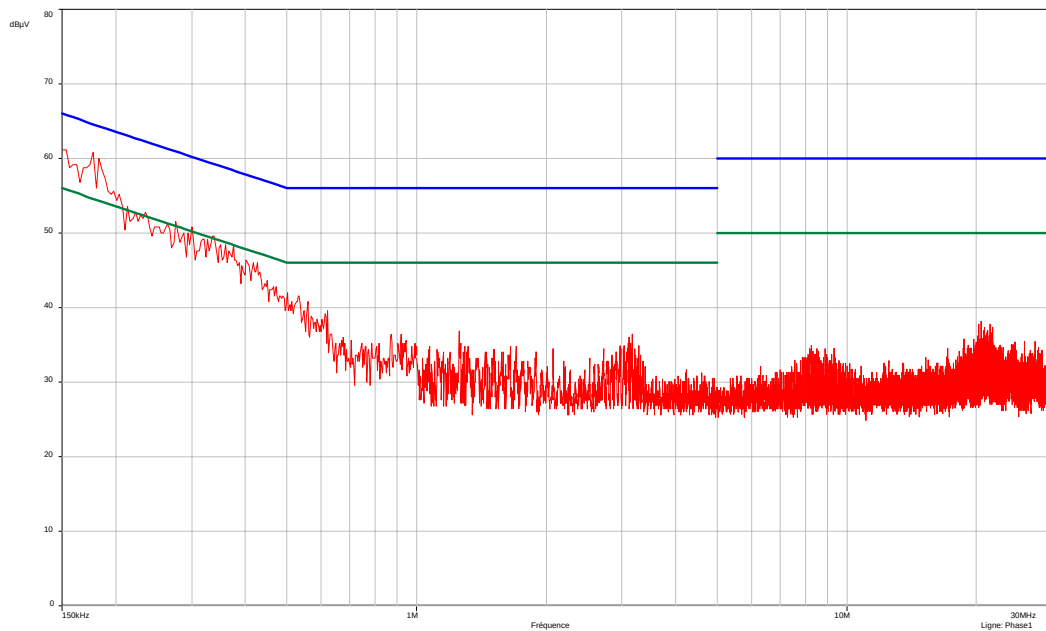
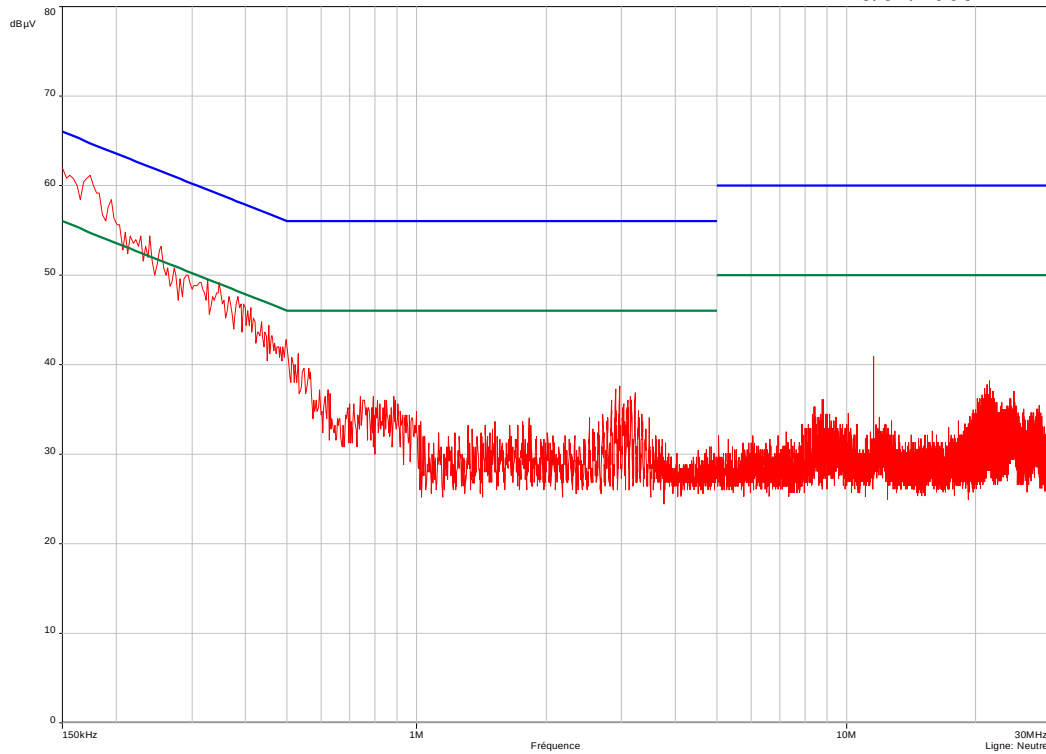
See curves hereafter. Limits on the curves are average limit (green) and quasi-peak limit (blue).

Curves 1 and 2

WORKABOUT PRO: Bluetooth (2402 MHz) RFID (915 MHz) WIFI (2462 MHz)

Conducted voltage emission (measurement): Power supply 110Vac in peak detection.

18/02/2009



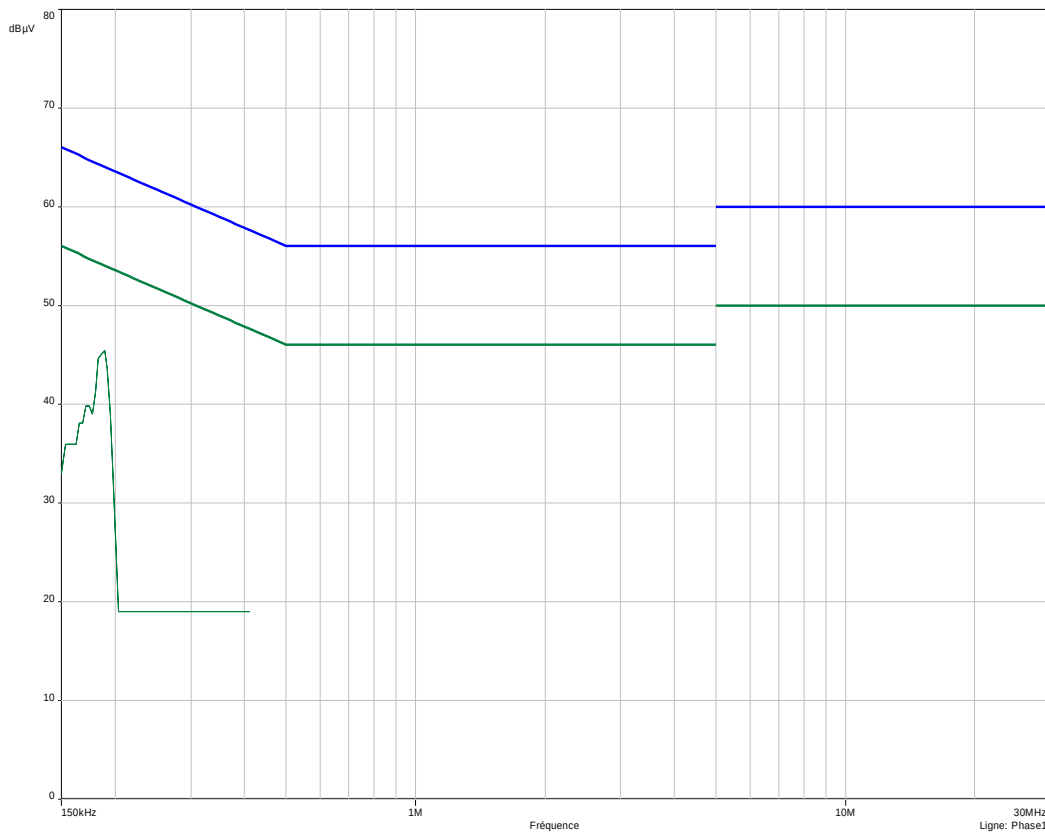
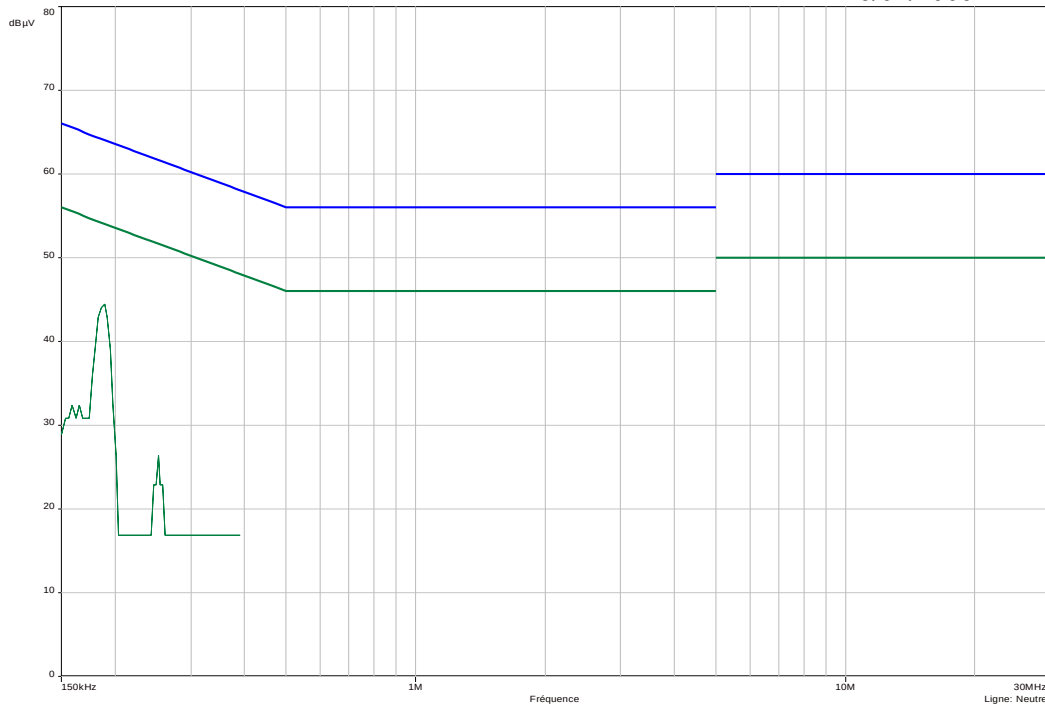
Class: B of the standard

Curves 3 and 4

WORKABOUT PRO: Bluetooth (2402 MHz) RFID (915 MHz) WIFI (2462 MHz)

Conducted voltage emission (measurement): Power supply 110Vac in Average detection.

18/02/2009



Class: B of the standard

7. RADIATED EMISSIONS - SECTION 15-209 AND 15-247

Radiated emissions (above 30MHz)

Standard: FCC part 15.247 and 15.209: 2008

Test method: ANSI C63.4:2003

Test configuration:

Frequency band	Configuration	Resolution bandwidth	Detection mode	E.U.T. height
30 MHz – 1 GHz	Open area measurement	120 kHz	Quasi- Peak	80 cm
1 GHz – 25 GHz	Open area measurement	1 MHz	Average	80 cm

Open area measurement configuration:

For each measured frequency, receiving antenna height varies between 1 m and 4 m, E.U.T. is set on a turntable in order to find the highest level. E.U.T. internal functions are all active (Wifi is active, Bluetooth is active, Rfid is active).

Test method deviation:

Wifi and Bluetooth are in permanent emission, measurements are done in peak detection (worst case).

Measuring distance: 3 m

Test equipment list:

Nr Emitech	Category	Marque	Type
3106	Antenna	Schwarzbeck	UHALP 9108
3374	Antenna	Emco	3115
2341	Antenna mast	HD GmbH	MA 240
0317	Biconical antenna	Schwarzbeck	VHA 9103
2450	Cable	Cables & Connectiques	HF 12m
2451	Cable	Cables & Connectiques	HF 2m
2452	Cable	Cables & Connectiques	HF 13m
2896	Cable	Cables & Connectiques	N-13m
1097	High pass filter	Trilithic	6HC1300-2.5-KK
1529	High pass filter	Trilitic	5EHLX500-3-KK
4691	High pass filter	Micro-tronics	5175
2342	Mast controller	HD GmbH	HD 100
187	Open site	Emitech	Aunainville
2102	Power supply	Secas	CF1000 50/60
3588	Preamplifier	Miteq	AMF-6D-010250-70-7P
1057	Receiver	Rohde & Schwarz	ESVP
5175	Spectrum analyzer	Rohde & Schwarz	FSP40

Results:

1) Spurious radiated emissions on Open Area Test Site at 3m:

Frequency (MHz)	Polar.	Azimut (degrees)	Antenna height (cm)	Peak Measure (dBμV/m)	Standard limit (dBμV/m)	Average Value (dBμV/m)	Standard limit (dBμV/m)	Com.
113.147	Vertical	99	100	32.1	43.5			C
3611.2	Horizontal	0	100	48.72	74	46.52	54	C
4924.0	Vertical	0	100	48.78	74	42.48	54	C
4924.0	Horizontal	302	100	49.97	74	43.63	54	C

C= Compliant

NC= Not compliant

All other radiated emissions are more than 20 dB below the limit.

2) Rfid UHF Radiated field strenght on Open Area Test Site at 3m:

Frequency (MHz)	Polarization	Azimut (degrees)	Antenna height (cm)	Measure (dBμV/m)	Standard limit (dBμV/m)	Comments
Channel 25						
915.249	Vertical	139	113	84.2	125.2 (*)	C
915.249	Horizontal	170	131	94.5	125.2 (*)	C
Channel 0						
902.749	Vertical	113	139	84.9	125.2 (*)	C
902.749	Horizontal	176	130	94.3	125.2 (*)	C
Channel 49						
927.250	Vertical	123	111	85.5	125.2 (*)	C
927.250	Horizontal	207	136	95.3	125.2 (*)	C

C= Compliant

NC= Not compliant

(*) This limit is a theoretical conversion of standard limit given for 1W conducted power. E.U.T. antenna gain is less than 6dBi. Limit is reached by the following calculation:

$$E = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{with} \quad \begin{array}{l} P \text{ in Watt (conducted power limit)} \\ G = 1 \text{ (dipole antenna theoretical gain)} \\ d = 3 \text{ m (test distance)} \\ E = \text{equivalent radiated electric field (V/m)} \end{array}$$

The maximum radiated power is then: $(E \times d)^2 / 30$. For 95.3dBμV/m we find 0.001W.

3) Wifi radiated field strength:

Frequency (MHz)	Polarization	Azimut (degrees)	Antenna height (cm)	Peak Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
2462.00	Vertical	185	169	101	125.2 (*)	C
2462.00	Horizontal	182	155	101	125.2 (*)	C

C= Compliant

NC= Not compliant

4) Bluetooth radiated field strength:

Frequency (MHz)	Polarization	Azimut (degrees)	Antenna height (cm)	Peak Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
2402.00	Vertical	264	111	92.86	125.2 (*)	C
2402.00	Horizontal	121	137	85.80	125.2 (*)	C

C= Compliant

NC= Not compliant

- (*) This limit is a theoretical conversion of standard limit given for 1W conducted power. E.U.T. antenna gain is less than 6dBi. Limit is reached by the following calculation:

$$E = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{with} \quad \begin{array}{l} P \text{ in Watt (conducted power limit)} \\ G = 1 \text{ (dipole antenna theoretical gain)} \\ d = 3 \text{ m (test distance)} \\ E = \text{Equivalent radiated electric field (V/m)} \end{array}$$

□□□ End of report – 1 annex to be forwarded □□□

ANNEX: PHOTOGRAPHIES

EQUIPMENT UNDER TEST (E.U.T.) PHOTOGRAPHIES

WORKABOUT PRO (7527C-G2) + WA9005 (Scanner) + BT + RA2041 (WiFi)
+ RFID Module UHF-CA3-A5-G2 + Docking station (WA4003- G2)
+ AC Wall Adaptor – PSA15R-050P

E.U.T. Photographies :



E.U.T. Photographies :

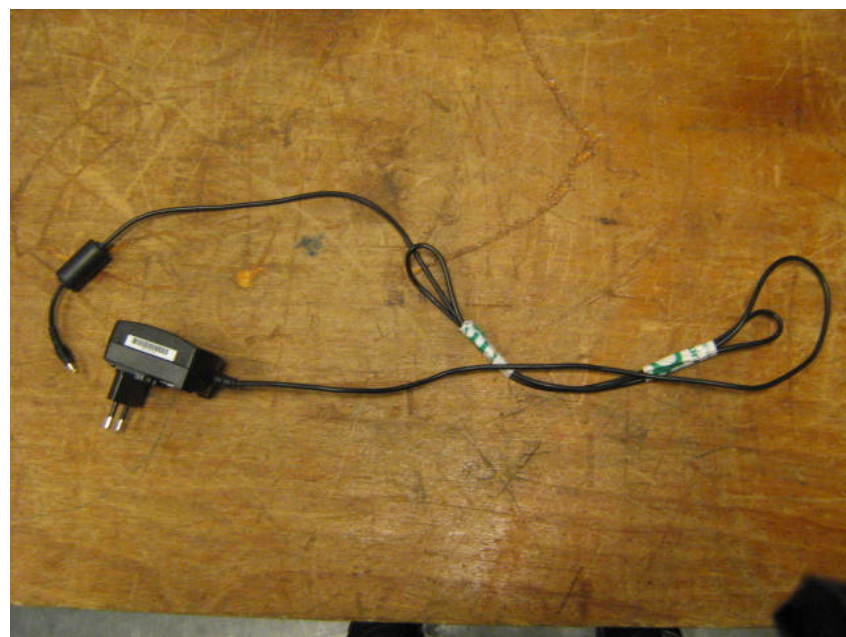


Front side



Back side

E.U.T. Photographies :



AC Wall Adaptor – PSA15R-050P

E.U.T. Photographies :



AC Wall Adaptor – PSA15R-050P

Measurement of electromagnetic field in open area test site :



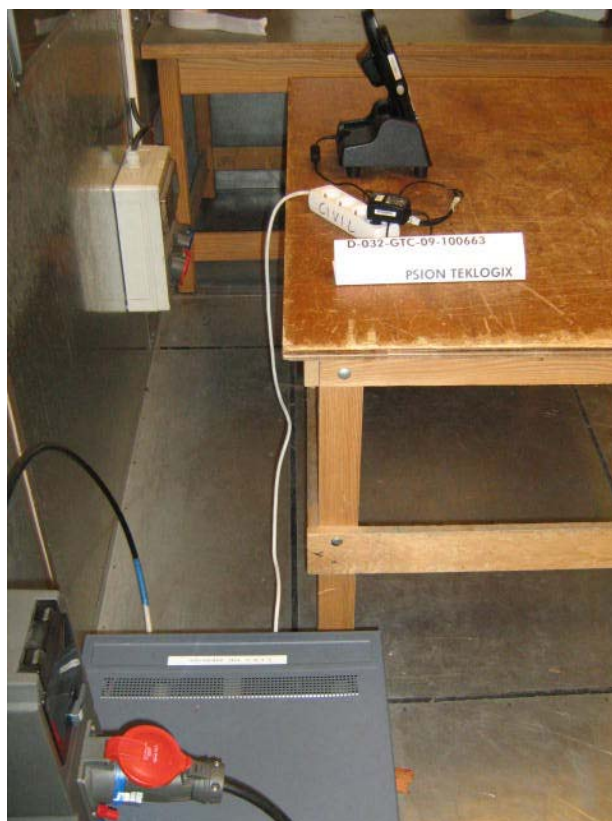
Measurement of electromagnetic field in open area test site :



Measurement of electromagnetic field in open area test site :



Conducted emissions:



Power supply 110Vac