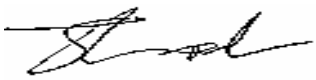
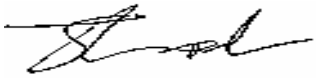
TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Connexion2 Ltd
i770

To: OET Bulletin 65 Supplement C: (2001-01)

Test Report Serial No:
RFI/SARE1/RP49684JD01A

This Test Report Is Issued Under The Authority Of Steve Flooks, Service Leader RPG:  **pp**	
Checked By: Joe Lomako 	**Report Copy No: PDF01**
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Test of: Connexion2 Ltd
i770
To: OET Bulletin 65 Supplement C: (2001-01)

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1. Customer Information

Company Name:	Connexion2 Ltd
Address:	Momentum House Church Lane Dinnington Sheffield S25 2RG
Contact Name:	Mr. C Swallow

2. Equipment Under Test (EUT)

The following information (with the exception of the date of receipt) has been supplied by the customer:

2.1. Description of EUT

The equipment under test is a Tri-Band GSM based ID card holder for lone workers. It operates at GSM850 and PCS1900 bands.

2.2. Identification of Equipment Under Test (EUT)

Description:	GSM based ID holder
Brand Name:	identicom
Model Name or Number:	i770
Serial Number:	S10607001414
IMEI Number:	35202300460213 8
Hardware Version Number:	None Stated
Software Version Number:	V3.07
Hardware Revision of GSM Module:	Not Applicable
Software Revision of GSM Module:	Not Applicable
FCC ID Number:	VTJS10611
Country of Manufacture:	United Kingdom
Date of Receipt:	04 December 2007

2.3. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

2.4. Accessories

The following accessories were supplied with the EUT during testing:

Description:	Lanyard
Brand Name:	None Stated
Model Name or Number:	None Stated
Serial Number:	Not Applicable
Cable Length and Type:	1m Mixed Fiber and Plastic
Country of Manufacture:	None Stated
Connected to Port	Lanyard Attachment Plugs

Description:	Lanyard
Brand Name:	None Stated
Model Name or Number:	None Stated
Serial Number:	Not Applicable
Cable Length and Type:	1m Mixed Fabric and Plastic
Country of Manufacture:	None Stated
Connected to Port	Lanyard Attachment Plugs

2.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	GSM Communication Test Set
Brand Name:	Rohde & Schwarz
Model Name or Number:	CMU200
Serial Number:	1100.0008.02
Cable Length and Type:	2m Rosenberger Cable
Connected to Port:	RF Input/Output Port

2.6. Additional Information Related to Testing

Equipment Category	GSM850 / PCS1900		
Type of Unit	Portable Standalone Battery Powered		
Intended Operating Environment:	Within GSM coverage		
Transmitter Maximum Output Power Characteristics:	GSM850	33 dBm	
	PCS1900	30 dBm	
Transmitter Frequency Range:	GSM850	(824 to 849) MHz	
	PCS1900	(1850 to 1910) MHz	
Transmitter Frequency Allocation of EUT When Under Test:	**Channel Number**	**Channel Description**	**Frequency (MHz)**
	128	Low	824.2
	189	Middle	836.4
	251	High	848.8
	512	Low	1850.2
	660	Middle	1879.8
	810	High	1909.8
Modulation(s):	217 Hz		
Modulation Scheme (Crest Factor):	8.3		
Antenna Type:	Internal		
Antenna Length:	Unknown		
Number of Antenna Positions:	1 Fixed		
Power Supply Requirement:	4v DC Nominal		
Battery Type(s):	None Stated		

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	OET Bulletin 65 Supplement C: (2001-01)
Title:	Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
Purpose of Test:	To determine whether the equipment met the basic restrictions as defined in OET Bulletin 65 Supplement C: (2001-01) using the SAR averaging method as described in the test specification above.

3.2. Methods and Procedures Reference Documentation

The methods and procedures used were as detailed in:

Federal Communications Commission, “Evaluating compliance with FCC Guidelines for human exposure to radio frequency electromagnetic fields”, OET Bulletin 65 Supplement C, FCC, Washington, D.C, 20554, 2001.

Thomas Schmid, Oliver Egger and Neils Kuster, “Automated E-field scanning system for dosimetric assessments”, IEEE Transaction on microwave theory and techniques,
Vol. 44, pp. 105-113, January 1996.

Neils Kuster, Ralph Kastle and Thomas Schmid, “Dosimetric evaluation of mobile communications equipment with know precision”, IEICE Transactions of communications, Vol. E80-B, No.5, pp. 645-652, May 1997.

3.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Appendix 1 contains a list of the test equipment used.

4. Deviations from the Test Specification

There were no deviations from the test specification. The EUT was test in the body configuration only.

5. Operation and Configuration of the EUT during Testing

5.1. Operating Modes

The EUT was tested in the following operating mode(s) unless otherwise stated:

- PCS1900 call allocated mode.
- GSM850 call allocated mode.

The reason for choosing this configuration was that it has been defined by the customer as being typical of normal use and likely to be worst case.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration(s) unless otherwise stated:

- Standalone battery powered, full transmit.

Body Configuration

a) The EUT was placed in a normal operating position where the centre of EUT was aligned with the centre reference point on the flat section of the 'SAM' phantom.

b) With the EUT touching the phantom at an imaginary centre line. The EUT was aligned with a marked plane (X and Y axis) consisting of two lines.

c) For the touch-safe position the handset was gradually moved towards the flat section of the 'SAM' phantom until any point of the EUT touched the phantom.

d) For position(s) greater then 0mm separation the EUT was positioned as per the touch-safe position, and then the vertical height was decreased/adjusted as required.

e) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimise the drift.

f) The device was keyed to operate continuously in the transmit mode for the duration of the test.

g) The location of the maximum spatial SAR distribution (hot spot) was determined relative to the handset and its antenna.

h) The EUT was transmitting at full power throughout the duration of the test powered by a fully charged battery.

6. Summary of Test Results

Test Name	Specification Reference	Compliancy Status
Specific Absorption Rate-GSM850 Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-PCS1900 Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied

6.1. Location of Tests

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ.

7. Measurements, Examinations and Derived Results

7.1. General Comments

This section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to section 8 for details of measurement uncertainties.

7.2. Test Results

7.2.1.Specific Absorption Rate - GSM850 Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	1.290

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 23.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Front of EUT Facing Phantom	Flat (SAM)	189	0.991	1.600	0.609	1	Complied
Rear of EUT Facing Phantom	Flat (SAM)	189	0.341	1.600	1.259	1	Complied
Front of EUT Facing Phantom	Flat (SAM)	189	1.070	1.600	0.530	1, 2	Complied
Front of EUT Facing Phantom	Flat (SAM)	128	0.911	1.600	0.689	1, 2	Complied
Front of EUT Facing Phantom	Flat (SAM)	251	1.250	1.600	0.350	1, 2	Complied
Front of EUT Facing Phantom	Flat (SAM)	128	1.030	1.600	0.570	1	Complied
Front of EUT Facing Phantom	Flat (SAM)	251	1.290	1.600	0.310	1	Complied

Note(s):

1. *SAR measurements were performed with the EUT at a separation distance of 0mm from the 'SAM' phantom flat section.*
2. *Lanyard Attached & Lapel Clip*

7.2.2.Specific Absorption Rate - PCS1900 Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	1.170

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 23.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Front of EUT Facing Phantom	Flat (SAM)	660	0.908	1.600	0.692	1	Complied
Rear of EUT Facing Phantom	Flat (SAM)	660	0.403	1.600	1.197	1	Complied
Front of EUT Facing Phantom	Flat (SAM)	660	0.900	1.600	0.700	1, 2	Complied
Front of EUT Facing Phantom	Flat (SAM)	512	1.170	1.600	0.430	1, 2	Complied
Front of EUT Facing Phantom	Flat (SAM)	810	0.734	1.600	0.866	1, 2	Complied
Front of EUT Facing Phantom	Flat (SAM)	512	1.170	1.600	0.430	1	Complied
Front of EUT Facing Phantom	Flat (SAM)	810	0.773	1.600	0.827	1	Complied

Note(s):

1. *SAR measurements were performed with the EUT at a separation distance of 0mm from the 'SAM' phantom flat section.*
2. *Lanyard Attached & Lapel Clip*

7.2.3. EIRP/ERP Measurement

Channel Number	Frequency (MHZ)	TX Power before Test (dBm)	Note
128	Low	18.2	ERP
189	Middle	19.7	ERP
251	High	20.1	ERP
512	Low	23.6	EIRP
660	Middle	22.9	EIRP
810	High	21.9	EIRP

7.2.4. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Test Name	Confidence Level	Calculated Uncertainty
Specific Absorption Rate - GSM850 Body Configuration 1g	95%	18.03
Specific Absorption Rate - PCS1900 Body Configuration 1g	95%	18.30

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

Measurement Uncertainty (Continued)

7.3. Specific Absorption Rate Uncertainty at GSM850 Body 1g, EGSM Modulation Scheme calculated in accordance with IEC 62209-1 & IEEE 1528

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\ (10g)}$	Standard Uncertainty		υ_i or υ_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	11.000	11.000	normal (k=2)	2.0000	1.0000	5.500	5.500	∞
B	Axial Isotropy	0.500	0.500	normal (k=2)	2.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	2.600	2.600	normal (k=2)	2.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.560	0.560	normal (k=2)	2.0000	1.0000	0.280	0.280	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	0.584	0.584	normal (k=1)	1.0000	1.0000	0.584	0.584	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	3.600	3.600	normal (k=1)	1.0000	0.6400	2.304	2.304	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	4.000	4.000	normal (k=1)	1.0000	0.6000	2.400	2.400	5
	Combined standard uncertainty			t-distribution			9.20	9.20	>500
	Expanded uncertainty			k = 1.96			18.03	18.03	>500

7.4. Specific Absorption Rate Uncertainty at PCS1900 Body 1g, EGSM Modulation Scheme calculated in accordance with IEC 62209-1 & IEEE 1528

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\ (10g)}$	Standard Uncertainty		υ_i or υ_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	11.000	11.000	normal (k=2)	2.0000	1.0000	5.500	5.500	∞
B	Axial Isotropy	0.500	0.500	normal (k=2)	2.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	2.600	2.600	normal (k=2)	2.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.560	0.560	normal (k=2)	2.0000	1.0000	0.280	0.280	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	0.584	0.584	normal (k=1)	1.0000	1.0000	0.584	0.584	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	4.170	4.170	normal (k=1)	1.0000	0.6400	2.669	2.669	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	4.230	4.230	normal (k=1)	1.0000	0.6000	2.538	2.538	5
	Combined standard uncertainty			t-distribution			9.34	9.34	>400
	Expanded uncertainty			k = 1.96			18.30	18.30	>400