

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: GE Security
ActiveKey

To: OET Bulletin 65 Supplement C:2001-01

Test Report Serial No:
RFI/SARE2/RP72510JD03A

Supersedes Test Report Serial No:
RFI/SARE1/RP72510JD03A

**This Test Report Is Issued Under The Authority
Of Michael Derby, Wireless Radio Performance Group Leader:**

A handwritten signature in blue ink, appearing to read 'M Derby', enclosed within a faint rectangular border.

Tested By: Richelieu Quoi

A handwritten signature in blue ink, appearing to read 'R. Quoi', enclosed within a faint rectangular border.

Checked By: Michael Derby

A handwritten signature in blue ink, appearing to read 'M Derby', enclosed within a faint rectangular border.

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Test Dates: 26 July 2007

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1. Customer Information

Company Name:	GE Security
Address:	4001 Fairview Industrial Drive Salem OR 97302 USA
Contact Name:	Mr J Speir

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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 Dual-Band single mode portable Real Estate Key with GPRS data modem, operating at GSM850 and PCS1900 band.

2.2. Identification of Equipment Under Test (EUT)

Description:	Real Estate Key with GPRS data modem
Brand Name:	GE Security
Model Name or Number:	ActiveKey
Serial Number:	1059096-08 (Test Sample 1)
IMEI Number:	01100200
FCC ID Number:	TCZ-1059822
Country of Manufacture:	USA
Date of Receipt:	26 June 2007

2.3. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

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2.4. Accessories

The following accessories were supplied with the EUT during testing:

Description:	Rechargeable Batteries
Brand Name:	ActiveKey Battery
Type:	LP694659
Serial Number:	None
Cable Length and Type:	Not Applicable
Connected to Port	Positive and Negative Contact Pin

2.5. Support Equipment

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

Description:	Laptop
Brand Name:	Dell
Model Name or Number:	Latitude D600
Serial Number:	BFYSM51
Cable Length and Type:	1 meter, multi-core
Connected to Port:	USB port (Detached After Configuration)
Test Software Name:	HyperTerminal
Test Software Version:	v5.1

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2.6. Additional Information Related to Testing

Equipment Category	GSM850 / PCS1900		
Type of Unit	Portable (Standalone battery powered device)		
Intended Operating Environment:	Within GSM coverage		
Transmitter Maximum Output Power Declared:	GSM850: 33 dBm		
	PCS1900: 30 dBm		
Transmitter Maximum Output Power Measured:	GSM850: 30.8 dBm		
	PCS1900: 25.8 dBm		
Transmitter Frequency Range:	GSM850: 824 MHz to 849 MHz		
	PCS1900: 1850 MHz to 1910 MHz		
Transmitter Frequency Allocation of EUT When Under Test:	Channel Number	Channel Description	Frequency (MHz)
	189	Middle	836.4
	660	Middle	1879.8
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:	Internal Battery Supply 3.6 V DC		
Battery Type(s):	Li-ion		

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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:

EN 62209-1: 2006

Title: Basic standard for the measurement of specific absorption rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz).

ANSI/IEEE C95.1: 1999

IEEE standard for safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz.

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.

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4. Deviations from the Test Specification

At the request of GE Security; the EUT was tested at the middle channel only, as the EUT only operates in the middle channel of the GSM850 and PCS1900 bands.

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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:

GSM850 Test Mode: fully powered in transmit mode at the middle channel only.

PCS1900 Test Mode: fully powered in transmit mode at the middle channel only.

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.

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5.2. Configuration and Peripherals

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

Standalone battery powered with the front and rear of the EUT in the Body-worn configuration only facing the 'SAM' phantom flat section.

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 than 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.
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6. Summary of Test Results

Test Name	Specification Reference	Compliance Status
Specific Absorption Rate (SAR) GSM850 – Body Configuration	OET Bulletin 65 Supplement C: 2001-01	Complied
Specific Absorption Rate (SAR) PCS1900 – Body Configuration	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, UK.

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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.

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7.2. Test Results

7.2.1. Specific Absorption Rate – GSM850 – Body Configuration

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.047

Environmental Conditions:

Temperature Variation in Lab (°C):	24 to 24
Temperature Variation in Liquid (°C):	23.0 to 24.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Rear of EUT Facing Phantom	Flat (SAM)	189	0.047	1.600	1.553	1	Complied
Front of EUT Facing Phantom	Flat (SAM)	189	0.031	1.600	1.569	1	Complied

Note(s):

1. SAR measurement was performed with the EUT at a separation distance of 15 mm from the 'SAM' phantom flat section.

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7.2.2. Specific Absorption Rate – PCS1900 – Body Configuration

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.182

Environmental Conditions:

Temperature Variation in Lab (°C):	24 to 24
Temperature Variation in Liquid (°C):	23to 24.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Rear of EUT Facing Phantom	Flat (SAM)	660	0.182	1.600	1.418	1	Complied
Front of EUT Facing Phantom	Flat (SAM)	660	0.111	1.600	1.489	1	Complied

Note(s):

1. SAR measurement was performed with the EUT at a separation distance of 15 mm from the 'SAM' phantom flat section.
-

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7.2.3. ERP Measurement – GSM850

Channel	Frequency (MHz)	TX Power before Test (dBm)
Middle	836.4	30.8

7.2.4. EIRP Measurement – PCS1900

Channel	Frequency (MHz)	TX Power before Test (dBm)
Middle	1879.8	25.8

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8. 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 Uncertainty at 850 MHz Body 1g, GSM Modulation Scheme calculated in accordance with IEC 62209-1 & IEEE 1528	95%	±18.03%
Specific Absorption Rate Uncertainty at 1900 MHz Body 1g, PCS Modulation Scheme calculated in accordance with IEC 62209-1 & IEEE 1528	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.

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Measurement Uncertainty (Continued)

8.1. GSM850 – Body Configuration

**Specific Absorption Rate Uncertainty at 850 MHz Body 1g, PCS Modulation Scheme
calculated in accordance with IEC 62209-1 & IEEE 1528**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		U _i or U _{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

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Measurement Uncertainty (Continued)

8.2. PCS1900 – Body Configuration

**Specific Absorption Rate Uncertainty at 1900 MHz Body 1g, PCS Modulation Scheme
calculated in accordance with IEC 62209-1 & IEEE 1528**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		U _i or U _{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