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Report On

Specific Absorption Rate Testing of the
Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS

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REPORT ON

Specific Absorption Rate Testing of the
Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS

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DATED 06 January 2015

This report has been up-issued to add in additional information relating to ANT+.

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SECTION 1

REPORT SUMMARY

Specific Absorption Rate Testing of the
Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM
(GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP
(TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Specific Absorption Rate Testing of the SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS to the requirements of KDB 447498 – D01 v05 General RF Exposure Guidance.

Objective	To perform Specific Absorption Rate Testing to determine the Equipment Under Test's (EUT's) compliance with the requirements specified of KDB 447498 – D01 v05 General RF Exposure Guidance, for the series of tests carried out.
Applicant	Sharp Communication Compliance Ltd
Manufacturer	Sharp Corporation
Manufacturing Description	Mobile Handset
Model Number	SHV31
Serial/IMEI Number(s)	004401115314730 (SAR Test: GSM850&1900/WCDMA FDDV/LTE Band 17) 004401115315612 (SAR Test: WLAN 2.4/5GHz) 004401115315372 (Conducted: GSM850/1900) 004401115315869 (Conducted: WCDMA FDDV) 004401115315885 (Conducted: LTE Band 17) 004401115315968 (Conducted: Bluetooth) 004401115316065 (Conducted: WLAN – 2.4GHz) 004401115316073 (Conducted: WLAN – 5GHz)
Number of Samples Tested	2
Hardware Version	PP1
Software Version	C9222
Battery Cell Manufacturer	Sharp Corporation
Battery Model Number	Integral Battery; Non Removable
Test Specification/Issue/Date	KDB 447498 – D01 v05 General RF Exposure Guidance
Start of Test	17 November 2014
Finish of Test	26 November 2014
Related Document(s)	FCC 47CFR 2.1093: 2013 KDB 248227 - v01r02 (Rev 1.2) KDB 865664 – D01 v01r03 KDB 865664 – D02 v01r01 KDB 648474 – D04 v01r02 KDB 941225 - D01 v03 KDB 941225 – D06 v02 KDB 941225 - D05 v02r03 IEEE 1528-2013
Name of Engineer(s)	Nigel Grigsby

1.2 BRIEF SUMMARY OF RESULTS

The measurements shown in this report were made in accordance with the procedures specified KDB 447498 – D01 v05r02.

The maximum 1g volume averaged SAR found during this Assessment

Max 1g SAR (W/kg) Body	0.67 (Measured)	0.84 (Scaled)
Max 1g SAR (W/kg) Hotspot	0.67 (Measured)	0.84 (Scaled)
Max 1g SAR (W/kg) Head	0.53 (Measured)	0.79 (Scaled)
The maximum 1g volume averaged SAR level measured for all the tests performed did not exceed the limits for General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg.		

The maximum 1g volume averaged Stand-alone Reported SAR found during this Assessment for each supported mode, including highest simultaneous transmission results;

Band	Test Configuration	Max Reported Scaled SAR (W/kg)	Highest Simultaneous Transmission Scaled SAR (W/kg)
GSM/GPRS 850	Head	0.51	1.52
	Body/Hotspot	0.74	
PCS/GPRS 1900	Head	0.79	
	Body/Hotspot	0.76	
WCDMA FDD V	Head	0.55	
	Body/Hotspot	0.84	
LTE Band 17	Body/Hotspot	0.67	
WLAN 2.4GHz	Head	0.27	1.52
	Body/Hotspot	0.68	
WLAN 5.180GHz	Head	0.13	n/a
	Body/Hotspot	0.32	
WLAN 5.260GHz	Head	0.16	
	Body/Hotspot	0.41	
WLAN 5.580GHz	Head	0.23	
	Body/Hotspot	0.17	
The maximum 1g volume averaged SAR level measured for all the tests performed (including simultaneous transmission analysis results) did not exceed the limits for General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg.			

1.3 TEST RESULTS SUMMARY

1.3.1 System Performance / Validation Check Results

Prior to formal testing being performed a System Check was performed in accordance with KDB 865664 and the results were compared against published data in Standard IEEE 1528-2003. The following results were obtained: -

System performance / Validation results

Date	Dipole Used	Frequency (MHz)	Max 1g SAR (W/kg)*	Percentage Drift on Reference
25/11/2014	700	700	7.93	0.33%
26/11/2014	700	700	8.03	1.69%
17/11/2014	835	835	9.96	-1.83%
24/11/2014	835	835	10.48	2.97%
18/11/2014	1900	1900	39.30	-2.03%
25/11/2014	1900	1900	35.83	-5.90%
19/11/2014	2450	2450	51.77	-3.05%
25/11/2014	2450	2450	53.47	-0.82%
19/11/2014	5200	5200	78.25	2.29%
19/11/2014	5200	5200	78.12	-6.21%
20/11/2014	5500	5500	69.76	-8.81%
20/11/2014	5500	5500	76.28	-8.97%

*Normalised to a forward power of 1W

1.3.2 Results Summary Tables

GSM 850MHz Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	128	824.2	32.02	33.5	0.36	0.51	Figure 6
Left 15°	128	824.2	32.02	33.5	0.24	0.34	Figure 7
Right Cheek	128	824.2	32.02	33.5	0.35	0.49	Figure 8
Right 15°	128	824.2	32.02	33.5	0.25	0.35	Figure 9
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz							

GSM 850MHz GPRS Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	128	824.2	26.82	28.1	0.31	0.42	Figure 10
Left 15°	128	824.2	26.82	28.1	0.20	0.27	Figure 11
Right Cheek	128	824.2	26.82	28.1	0.29	0.39	Figure 12
Right 15°	128	824.2	26.82	28.1	0.19	0.26	Figure 13
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz							

GSM 850MHz GPRS Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	128	824.2	26.82	28.1	0.37	0.50	Figure 14
10mm	Rear Facing	128	824.2	26.82	28.1	0.55	0.74	Figure 15
10mm	Left Edge	128	824.2	26.82	28.1	0.30	0.40	Figure 16
10mm	Right Edge	128	824.2	26.82	28.1	0.30	0.40	Figure 17
10mm	Bottom Edge	128	824.2	26.82	28.1	0.12	0.16	Figure 18

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06

KDB – 648474 D04 - When the reported SAR for body-worn accessory, measured without a headset connected to the handset, is >1.2W/kg, the highest reported SAR configuration for that wireless mode and frequency band is repeated for that body worn accessory with a headset attached to the handset.

WCDMA FDDV Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	4132	826.4	23.23	24.2	0.44	0.55	Figure 19
Left 15°	4132	826.4	23.23	24.2	0.31	0.39	Figure 20
Right Cheek	4132	826.4	23.23	24.2	0.42	0.53	Figure 21
Right 15°	4132	826.4	23.23	24.2	0.30	0.38	Figure 22

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

WCDMA FDDV Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	4132	826.4	23.23	24.2	0.52	0.65	Figure 23
10mm	Rear Facing	4132	826.4	23.23	24.2	0.67	0.84	Figure 24
10mm	Left Edge	4132	826.4	23.23	24.2	0.41	0.51	Figure 25
10mm	Right Edge	4132	826.4	23.23	24.2	0.38	0.48	Figure 26
10mm	Bottom Edge	4132	826.4	23.23	24.2	0.15	0.19	Figure 27
10mm	Rear Facing	*4175*	*835.0*	23.23	24.2	0.64	0.80	Figure 28
10mm	Rear Facing	*4233*	*846.6*	23.23	24.2	0.57	0.71	Figure 29

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06

KDB – 648474 D04 - When the reported SAR for body-worn accessory, measured without a headset connected to the handset, is >1.2W/kg, the highest reported SAR configuration for that wireless mode and frequency band is repeated for that body worn accessory with a headset attached to the handset.

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LTE Band 17 Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	23800	711.0	23.79	24.5	0.42	0.49	Figure 30
10mm	Rear Facing	23800	711.0	23.79	24.5	0.57	0.67	Figure 31
10mm	Left Edge	23800	711.0	23.79	24.5	0.25	0.29	Figure 32
10mm	Right Edge	23800	711.0	23.79	24.5	0.15	0.18	Figure 33
10mm	Bottom Edge	23800	711.0	23.79	24.5	0.12	0.14	Figure 34

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

Configuration Used : 10MHz BW 1RB Low Offset

KDB 941225 D05:

Testing was carried out using a 1RB allocation positioned at the low offset as this was the test channel combination which gave the highest maximum output power.

Testing was not required for other RB allocations and offsets as the reported 1g SAR for the highest output combination was ≤ 0.8W/kg.

SAR was not required for 100% RB allocation as the maximum power output was less than that measured in 1RB and 50% RB allocations and the reported 1g SAR for 1RB and 50% RB allocations was ≤ 0.8W/kg.

SAR was not required for other modulations as the measured maximum output power for other modulations was not > ½dB higher than the same configuration in QPSK.

SAR measurements were not required on other channel bandwidth(s) (5MHz) as the measured maximum output power of the smaller bandwidth(s) was not > ½dB higher than the equivalent channel configurations in the largest channel bandwidth configuration.

Product Service

LTE Band 17 Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	23800	711.0	22.74	23.5	0.34	0.41	Figure 35
10mm	Rear Facing	23800	711.0	22.74	23.5	0.46	0.55	Figure 36
10mm	Left Edge	23800	711.0	22.74	23.5	0.21	0.25	Figure 37
10mm	Right Edge	23800	711.0	22.74	23.5	0.12	0.14	Figure 38
10mm	Bottom Edge	23800	711.0	22.74	23.5	0.10	0.12	Figure 39

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

Configuration Used : 10MHz BW 25RB Low Offset

KDB 941225 D05:

Testing was carried out using a 25RB allocation positioned at the low offset as this was the test channel combination which gave the highest maximum output power.

Testing was not required for other RB allocations and offsets as the reported 1g SAR for the highest output combination was ≤ 0.8W/kg.

SAR was not required for 100% RB allocation as the maximum power output was less than that measured in 1RB and 50% RB allocations and the reported 1g SAR for 1RB and 50% RB allocations was ≤ 0.8W/kg.

SAR was not required for other modulations as the measured maximum output power for other modulations was not > ½dB higher than the same configuration in QPSK.

SAR measurements were not required on other channel bandwidth(s) (5MHz) as the measured maximum output power of the smaller bandwidth(s) was not > ½dB higher than the equivalent channel configurations in the largest channel bandwidth configuration.

PCS 1900MHz Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	661	1880	29.22	30.5	0.37	0.50	Figure 40
Left 15°	661	1880	29.22	30.5	0.18	0.24	Figure 41
Right Cheek	661	1880	29.22	30.5	0.57	0.77	Figure 42
Right 15°	661	1880	29.22	30.5	0.22	0.30	Figure 43
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz							

PCS 1900MHz GPRS Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	810	1909.8	23.19	24.9	0.35	0.52	Figure 44
Left 15°	810	1909.8	23.19	24.9	0.15	0.22	Figure 45
Right Cheek	810	1909.8	23.19	24.9	0.53	0.79	Figure 46
Right 15°	810	1909.8	23.19	24.9	0.19	0.28	Figure 47
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz							

PCS 1900MHz GPRS Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	810	1909.8	23.19	24.9	0.50	0.74	Figure 48
10mm	Rear Facing	810	1909.8	23.19	24.9	0.51	0.76	Figure 49
10mm	Left Edge	810	1909.8	23.19	24.9	0.28	0.42	Figure 50
10mm	Bottom Edge	810	1909.8	23.19	24.9	0.26	0.39	Figure 51

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06

KDB – 648474 D04 - When the reported SAR for body-worn accessory, measured without a headset connected to the handset, is >1.2W/kg, the highest reported SAR configuration for that wireless mode and frequency band is repeated for that body worn accessory with a headset attached to the handset.

WLAN 2450MHz Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	11	2462.0	15.65	16.5	0.22	0.27	Figure 52
Left 15°	11	2462.0	15.65	16.5	0.17	0.21	Figure 53
Right Cheek	11	2462.0	15.65	16.5	0.09	0.11	Figure 54
Right 15°	11	2462.0	15.65	16.5	0.08	0.10	Figure 55

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

Product Service

WLAN 2450MHz Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS.

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	11	2462.0	15.65	16.5	0.08	0.10	Figure 56
10mm	Rear Facing	11	2462.0	15.65	16.5	0.56	0.68	Figure 57
10mm	Left Edge	11	2462.0	15.65	16.5	0.47	0.57	Figure 58
10mm	Top Edge	11	2462.0	15.65	16.5	0.06	0.07	Figure 59

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06

KDB – 648474 D04 - When the reported SAR for body-worn accessory, measured without a headset connected to the handset, is >1.2W/kg, the highest reported SAR configuration for that wireless mode and frequency band is repeated for that body worn accessory with a headset attached to the handset.

WLAN 5180MHz Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS. (NUA)*

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	36	5180.0	14.06	14.5	0.12	0.13*	Figure 60
Left 15°	36	5180.0	14.06	14.5	0.09	0.10*	Figure 61
Right Cheek	36	5180.0	14.06	14.5	0.03	0.03*	Figure 62
Right 15°	36	5180.0	14.06	14.5	0.06	0.07*	Figure 63

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

KDB 248227 - v01r02 (Rev 1.2) – Testing was carried out on the default Channel 36 as this was the channel with the maximum output power.

*(NUA) Not UKAS Accredited

Product Service

WLAN 5180MHz Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS. (NUA)*

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	36	5180.0	14.06	14.5	0.04	0.04*	Figure 64
10mm	Rear Facing	36	5180.0	14.06	14.5	0.29	0.32*	Figure 65
10mm	Left Edge	36	5180.0	14.06	14.5	0.18	0.20*	Figure 66
10mm	Top Edge	36	5180.0	14.06	14.5	0.04	0.04*	Figure 67

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

KDB 248227 - v01r02 (Rev 1.2) – Testing was carried out on the default Channel 36 as this was the channel with the maximum output power.

Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06

KDB – 648474 D04 - When the reported SAR for body-worn accessory, measured without a headset connected to the handset, is >1.2W/kg, the highest reported SAR configuration for that wireless mode and frequency band is repeated for that body worn accessory with a headset attached to the handset.

*(NUA) Not UKAS Accredited

** No data was recorded for this position due to SAR levels being below the SAR measurement system capability.

WLAN 5260MHz Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS. (NUA)*

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	52	5260.0	13.73	14.5	0.12	0.14*	Figure 68
Left 15°	52	5260.0	13.73	14.5	0.13	0.16*	Figure 69
Right Cheek	52	5260.0	13.73	14.5	0.05	0.06*	Figure 70
Right 15°	52	5260.0	13.73	14.5	0.07	0.08*	Figure 71

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

KDB 248227 - v01r02 (Rev 1.2) – Testing was carried out on the default Channel 52 as this was the channel with the maximum output power.

*(NUA) Not UKAS Accredited

WLAN 5260MHz Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS. (NUA)*

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	52	5260.0	13.73	14.5	0.02	0.02*	Figure 72
10mm	Rear Facing	52	5260.0	13.73	14.5	0.34	0.41*	Figure 73
10mm	Left Edge	52	5260.0	13.73	14.5	0.18	0.21*	Figure 74
10mm	Top Edge	52	5260.0	13.73	14.5	0.03	0.04*	Figure 75

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06

KDB – 648474 D04 - When the reported SAR for body-worn accessory, measured without a headset connected to the handset, is >1.2W/kg, the highest reported SAR configuration for that wireless mode and frequency band is repeated for that body worn accessory with a headset attached to the handset.

KDB 248227 - v01r02 (Rev 1.2) – Testing was carried out on the default Channel 52 as this was the channel with the maximum output power.

*(NUA) Not UKAS Accredited

WLAN 5640MHz Head Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS. (NUA)*

Test Position	Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Left Cheek	128	5640.0	13.39	14.5	0.18	0.23*	Figure 76
Left 15°	128	5640.0	13.39	14.5	0.05	0.06*	Figure 77
Right Cheek	128	5640.0	13.39	14.5	0.04	0.05*	Figure 78
Right 15°	128	5640.0	13.39	14.5	0.03	0.04*	Figure 79

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

KDB 248227 - v01r02 (Rev 1.2) – Testing was carried out on Channel 128 instead of the default test channel as this was the channel with the maximum output power.

*(NUA) Not UKAS Accredited

WLAN 5640MHz Body & Hotspot Configuration Specific Absorption Rate (Maximum SAR) 1g Results for the Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS. (NUA)*

Position		Channel Number	Frequency (MHz)	Measured Conducted Power (dBm)	Tune Up limit (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Area scan (Figure number)
Spacing	Position							
10mm	Front Facing	128	5640.0	13.39	14.5	0.04	0.05*	Figure 80
10mm	Rear Facing	128	5640.0	13.39	14.5	0.13	0.17*	Figure 81
10mm	Left Edge	128	5640.0	13.39	14.5	0.13	0.17*	Figure 82
10mm	Top Edge	128	5640.0	13.39	14.5	0.05	0.06*	Figure 83

Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)

KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:

≤ 0.8W/kg when the transmission band is ≤ 100MHz
≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz
≤ 0.4W/kg when the transmission band is ≥ 200MHz

Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06

KDB 248227 - v01r02 (Rev 1.2) – Testing was carried out on Channel 128 instead of the default test channel as this was the channel with the maximum output power.

KDB – 648474 D04 - When the reported SAR for body-worn accessory, measured without a headset connected to the handset, is >1.2W/kg, the highest reported SAR configuration for that wireless mode and frequency band is repeated for that body worn accessory with a headset attached to the handset.

*(NUA) Not UKAS Accredited

1.3.3 Simultaneous Transmission

Position Head	GPRS 850MHz 1g SAR (W/kg) CH 128 (Scaled SAR values)	WLAN 2.4GHz 1g SAR (W/kg) CH 11 (Scaled SAR values)	∑ 1g SAR (W/kg)
Left Cheek	0.42	0.27	0.69
Left 15°	0.27	0.21	0.48
Right Cheek	0.39	0.11	0.50
Right 15°	0.26	0.10	0.36
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	GPRS 850MHz 1g SAR (W/kg) CH 128 (Scaled SAR values)	WLAN 2.4GHz 1g SAR (W/kg) CH 11 (Scaled SAR values)	∑ 1g SAR (W/kg)
Front Face	0.50	0.10	0.60
Rear Face	0.74	0.68	1.42
Top Edge	n/a	0.07	n/a
Bottom Edge	0.16	n/a	n/a
Left edge	0.40	0.57	0.97
Right Edge	0.40	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Head	WCDMA FDDV 1g SAR (W/kg) CH 4133 (Scaled SAR values)	WLAN 2.4GHz 1g SAR (W/kg) CH 11 (Scaled SAR values)	∑ 1g SAR (W/kg)
Left Cheek	0.55	0.27	0.82
Left 15°	0.39	0.21	0.60
Right Cheek	0.53	0.11	0.64
Right 15°	0.38	0.10	0.48
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	WCDMA FDDV 1g SAR (W/kg) CH 4133 (Scaled SAR values)	WLAN 2.4GHz 1g SAR (W/kg) CH 11 (Scaled SAR values)	∑ 1g SAR (W/kg)
Front Face	0.65	0.10	0.75
Rear Face	0.84	0.68	**1.52**
Top Edge	n/a	0.07	n/a
Bottom Edge	0.19	n/a	n/a
Left edge	0.51	0.57	1.08
Right Edge	0.48	n/a	n/a
Rear Face	0.80*	0.68	1.48
Rear Face	0.71**	0.68	1.39
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06 *Channel 4175 *Channel 4233			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	LTE Band 17 1g SAR (W/kg) CH 23800 (Scaled SAR values)	WLAN 2.4GHz 1g SAR (W/kg) CH 11 (Scaled SAR values)	∑ 1g SAR (W/kg)
Front Face	0.49	0.10	0.59
Rear Face	0.67	0.68	1.35
Top Edge	n/a	0.07	n/a
Bottom Edge	0.14	n/a	n/a
Left edge	0.29	0.57	0.86
Right Edge	0.18	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Configuration Used: 10MHz BW 1RB Low Offset Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	LTE Band 17 1g SAR (W/kg) CH 23800 (Scaled SAR values)	WLAN 2.4GHz 1g SAR (W/kg) CH 11 (Scaled SAR values)	∑ 1g SAR (W/kg)
Front Face	0.41	0.10	0.51
Rear Face	0.55	0.68	1.23
Top Edge	n/a	0.07	n/a
Bottom Edge	0.12	n/a	n/a
Left edge	0.25	0.57	0.82
Right Edge	0.14	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Configuration Used: 10MHz BW 25RB Low Offset Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Head	GPRS 1900MHz 1g SAR (W/kg) CH 810 (Scaled SAR values)	WLAN 2.4GHz 1g SAR (W/kg) CH 11 (Scaled SAR values)	∑ 1g SAR (W/kg)
Left Cheek	0.52	0.27	0.79
Left 15°	0.22	0.21	0.43
Right Cheek	0.79	0.11	0.90
Right 15°	0.28	0.10	0.38
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	GPRS 1900MHz 1g SAR (W/kg) CH 810 (Scaled SAR values)	WLAN 2.4GHz 1g SAR (W/kg) CH 11 (Scaled SAR values)	∑ 1g SAR (W/kg)
Front Face	0.74	0.10	0.84
Rear Face	0.76	0.68	1.44
Top Edge	n/a	0.07	n/a
Bottom Edge	0.39	n/a	n/a
Left edge	0.42	0.57	0.99
Right Edge	n/a	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

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Position Body	GPRS 850MHz 1g SAR (W/kg) CH 128 (Scaled SAR values)	Bluetooth 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.50	0.10	0.6
Rear Face	0.74	0.10	0.84
Top Edge	n/a	0.10	n/a
Bottom Edge	0.16	n/a	n/a
Left edge	0.40	0.10	0.5
Right Edge	0.40	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	WCDMA FDDV 1g SAR (W/kg) CH 4133 (Scaled SAR values)	Bluetooth 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.65	0.10	0.75
Rear Face	0.84	0.10	0.94
Top Edge	n/a	0.10	n/a
Bottom Edge	0.19	n/a	n/a
Left edge	0.51	0.10	0.61
Right Edge	0.48	n/a	n/a
Rear Face	0.80*	0.10	0.9
Rear Face	0.71**	0.10	0.81
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06 *Channel 4175 *Channel 4233			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg

Position Body	LTE Band 17 1g SAR (W/kg) CH 23800 (Scaled SAR values)	Bluetooth 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.49	0.10	0.59
Rear Face	0.67	0.10	0.77
Top Edge	n/a	0.10	n/a
Bottom Edge	0.14	n/a	n/a
Left edge	0.29	0.10	0.39
Right Edge	0.18	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Configuration Used: 10MHz BW 1RB Low Offset Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	LTE Band 17 1g SAR (W/kg) CH 23800 (Scaled SAR values)	Bluetooth 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.41	0.10	0.51
Rear Face	0.55	0.10	0.65
Top Edge	n/a	0.10	n/a
Bottom Edge	0.12	n/a	n/a
Left edge	0.25	0.10	0.35
Right Edge	0.14	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Configuration Used: 10MHz BW 25RB Low Offset Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	GPRS 1900MHz 1g SAR (W/kg) CH 810 (Scaled SAR values)	Bluetooth 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.74	0.10	0.84
Rear Face	0.76	0.10	0.86
Top Edge	n/a	0.10	n/a
Bottom Edge	0.39	n/a	n/a
Left edge	0.42	0.10	0.52
Right Edge	n/a	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	GPRS 850MHz 1g SAR (W/kg) CH 128 (Scaled SAR values)	ANT+ 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.50	0.05	0.55
Rear Face	0.74	0.05	0.79
Top Edge	n/a	0.05	n/a
Bottom Edge	0.16	n/a	n/a
Left edge	0.40	0.05	0.45
Right Edge	0.40	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	WCDMA FDDV 1g SAR (W/kg) CH 4133 (Scaled SAR values)	ANT+ 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.65	0.05	0.7
Rear Face	0.84	0.05	0.89
Top Edge	n/a	0.05	n/a
Bottom Edge	0.19	n/a	n/a
Left edge	0.51	0.05	0.56
Right Edge	0.48	n/a	n/a
Rear Face	0.80*	0.05	0.85
Rear Face	0.71**	0.05	0.76
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06 *Channel 4175 *Channel 4233			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	LTE Band 17 1g SAR (W/kg) CH 23800 (Scaled SAR values)	ANT+ 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.49	0.05	0.54
Rear Face	0.67	0.05	0.72
Top Edge	n/a	0.05	n/a
Bottom Edge	0.14	n/a	n/a
Left edge	0.29	0.05	0.34
Right Edge	0.18	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Configuration Used: 10MHz BW 1RB Low Offset Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	LTE Band 17 1g SAR (W/kg) CH 23800 (Scaled SAR values)	ANT+ 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.41	0.05	0.46
Rear Face	0.55	0.05	0.6
Top Edge	n/a	0.05	n/a
Bottom Edge	0.12	n/a	n/a
Left edge	0.25	0.05	0.3
Right Edge	0.14	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Configuration Used: 10MHz BW 25RB Low Offset Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Position Body	GPRS 1900MHz 1g SAR (W/kg) CH 810 (Scaled SAR values)	ANT+ 2.4GHz 1g SAR (W/kg) CH 39 (Estimated SAR values)	∑ 1g SAR (W/kg)
Front Face	0.74	0.05	0.79
Rear Face	0.76	0.05	0.81
Top Edge	n/a	0.05	n/a
Bottom Edge	0.39	n/a	n/a
Left edge	0.42	0.05	0.47
Right Edge	n/a	n/a	n/a
Simultaneous Transmission KDB 447498 D01 Testing was carried out with a 10mm separation distance to meet the requirements of KDB 941225 D06			

Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg.

Product Service

1.3.4 Standalone SAR Estimation

When the standalone SAR test exclusion of section 4.3.1 is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion. The estimated SAR is only used to determine simultaneous transmission SAR test exclusion; When SAR is estimated, it must be applied to determine the sum of 1-g SAR test exclusion. When SAR to peak location separation ratio test exclusion is applied, the highest reported SAR for simultaneous transmission can be an estimated standalone SAR if the estimated SAR is the highest among the simultaneously transmitting antennas (see KDB 690783).

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/7.5] W/kg for test separation distances ≤ 50 mm;

where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR

when the minimum test separation distance is <5mm, a distance of 5mm is applied.

Bluetooth Head SAR Estimation

Frequency (MHz)	Maximum Power (mW)	Distance (mm)	Estimated SAR (W/kg)
2441	5.01	5	0.21

Bluetooth Body SAR Estimation

Frequency (MHz)	Maximum Power (mW)	Distance (mm)	Estimated SAR (W/kg)
2441	5.01	10	0.10

ANT+ Head SAR Estimation

Frequency (MHz)	Maximum Power (mW)	Distance (mm)	Estimated SAR (W/kg)
2441	2.51	5	0.11

ANT+ Body SAR Estimation

Frequency (MHz)	Maximum Power (mW)	Distance (mm)	Estimated SAR (W/kg)
2441	2.51	10	0.05

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The equipment under test (EUT) was a Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP (TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS. A full technical description can be found in the manufacturer's documentation.

1.4.2 Test Configuration and Modes of Operation

The testing was performed with an integral battery supplied and manufactured by Sharp Corporation. The battery was fully charged before each measurement and there were no external connections.

For head SAR assessment, testing was performed with the device in the declared normal position of operation for GSM 850MHz, PCS 1900MHz, WCDMA FDDV, LTE FDD Band 17, WLAN 2.4GHz and WLAN 5GHz frequency bands at maximum power. The device was placed against a Specific Anthropomorphic Mannequin (SAM) phantom. The phantom was filled with simulant liquid appropriate to the frequency band. The dielectric properties were measured and found to be in accordance with the requirements for the dielectric properties specified KDB 865665. Testing was performed at both the left and right ear of the phantom at both handset positions stated in the applied specification.

For body SAR assessment, testing was performed for GSM 850MHz, PCS 1900MHz, WCDMA FDDV, LTE FDD Band 17, WLAN 2.4GHz and WLAN 5GHz frequency bands at maximum power. The device was placed at a distance of 10 mm from the bottom of the flat phantom for all body testing. The Flat Phantom dimensions were 245mm x 195mm x 200mm with a sidewall thickness of 2.00mm. The phantom was filled to a minimum depth of 150mm with the appropriate Body simulant liquid. The dielectric properties were in accordance with the requirements specified in KDB 865665. As the device is capable of hotspot configuration a 10mm separation distance was used to meet the requirements of KDB 941225 D06 Hotspot.

Test procedures for LTE SAR assessment were as described in KDB 941225 D05. From analysis of conducted RF output power measurements it was determined that SAR was only required on the largest channel bandwidth (10MHz) using QPSK modulation with 1 RB and 50% RB allocations with the RB offset configured to that which resulted in the highest conducted RF output power. The RB configuration determined by TUV was 1 RB Low Offset and 25 RB Low offset on the relevant test channel. All SAR levels were found to be <0.8 W/kg therefore no additional testing was required at the relevant frequencies / RB configurations. All SAR results were found to be less than 1.45 W/kg there SAR was not required for other channel bandwidths or higher order modulation schemes.

Testing was performed in each position at the frequency that gave the highest output power for each band. Within the WCDMA FDDV band one position the scaled SAR was found to be >0.80 W/kg therefore the two remaining channels were also assessed for this band, For all other bands all scaled SAR levels were found to be <0.80 W/kg (KDB 447498 D01) therefore no additional testing was required at the relevant frequencies / channels of the bands. WLAN testing was achieved using the devices internal software, customer supplied software and settings supplied by the customer. The worst case data rate for WLAN testing was obtained from data provided by TUV. The worst case was deemed as the data rate which produced the highest level of conducted average power. For 2.4GHz WLAN this was 11Mbps for 802.11b. For 5GHz WLAN this was 9Mbps for 802.11a.

Product Service

Included in this report are descriptions of the test method; the equipment used and an analysis of the test uncertainties applicable and diagrams indicating the locations of maximum SAR for each test position along with photographs indicating the positioning of the handset against the body as appropriate.

1.5 FCC POWER MEASUREMENTS

1.5.1 Method

Conducted power measurements were made using a power meter.

1.5.2 Conducted Power Measurements

GSM 850

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
GMSK - Voice	824.2	32.50	**32.02**
	836.4	32.16	31.69
	848.8	32.13	31.72
GMSK - GPRS	824.2	26.94	**26.82**
	836.4	26.36	26.14
	848.8	26.42	26.26

PCS 1900

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
GMSK - Voice	1850.2	29.23	29.04
	1880.0	29.32	**29.22**
	1909.8	29.38	29.21
GMSK - GPRS	1850.2	23.05	22.51
	1880.0	23.56	23.02
	1909.8	23.55	**23.19**

Product Service

WCDMA FDD V

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
WCDMA - 12.2kbps RMC	826.4	26.68	**23.23**
	835.0	26.74	22.92
	846.6	25.70	22.86
WCDMA - 12.2kbps AMR with 3.4kbps SRB*	826.4	26.77	23.21
	835.0	26.40	22.87
	846.6	25.66	22.82
WCDMA - HSDPA (Subtest #1)	826.4	25.96	22.23
	835.0	25.63	21.91
	846.6	25.51	21.57
WCDMA - HSDPA (Subtest #2)	826.4	27.43	21.65
	835.0	27.10	21.36
	846.6	26.09	21.29
WCDMA - HSDPA (Subtest #3)	826.4	27.21	20.79
	835.0	26.63	20.73
	846.6	25.72	20.70
WCDMA - HSDPA (Subtest #4)	826.4	27.52	21.06
	835.0	26.91	20.76
	846.6	25.87	20.73
WCDMA - HSUPA (Subtest #1)	826.4	27.98	21.98
	835.0	27.29	21.60
	846.6	26.33	21.53
WCDMA - HSUPA (Subtest #2)	826.4	27.87	21.63
	835.0	27.40	21.20
	846.6	26.24	21.39

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
WCDMA - 12.2kbps RMC WCDMA - HSUPA (Subtest #3)	826.4	27.33	21.54
	835.0	27.29	21.41
	846.6	26.24	21.47
WCDMA - HSUPA (Subtest #4)	826.4	27.27	22.13
	835.0	26.85	21.67
	846.6	26.13	21.79
WCDMA - HSUPA (Subtest #5)	826.4	27.55	21.79
	835.0	27.18	21.37
	846.6	26.41	21.57
* The measured Conducted power for 12.2kbps AMR is <0.25dB higher than 12.2kbps RMC, therefore, testing was carried out using 12.2kbps RMC.			

LTE

Channel Bandwidth (MHz)	Modulation	Resource Block Allocation	Resource Block Offset	Measured Average Output Power dBm)		
				Bottom 706.5MHz	Middle 710.0MHz	Top 713.5MHz
5	QPSK	1	Low	23.71	23.66	23.66
		1	Mid	23.70	23.63	23.51
		1	High	23.69	23.62	23.59
		12	Low	22.73	22.71	22.71
		12	Mid	22.70	22.65	22.57
		12	High	22.70	22.69	22.59
		25	N/A	22.62	22.65	22.67
	16QAM	1	Low	22.69	22.77	22.73
		1	Mid	22.73	22.70	22.70
		1	High	22.56	22.61	22.66
		12	Low	21.58	21.68	21.66
		12	Mid	21.60	21.70	21.72
		12	High	21.64	21.61	21.66
		25	N/A	21.68	21.74	21.66

Channel Bandwidth (MHz)	Modulation	Resource Block Allocation	Resource Block Offset	Measured Average Output Power dBm)		
				Bottom 709.0MHz	Middle 710.0MHz	Top 711.0MHz
10	QPSK	1	Low	23.63	23.45	**23.79**
		1	Mid	23.60	23.39	23.70
		1	High	23.56	23.40	23.65
		25	Low	22.66	22.54	**22.74**
		25	Mid	22.77	22.70	22.68
		25	High	22.74	22.76	22.62
		50	N/A	22.67	22.61	22.76
	16QAM	1	Low	22.88	22.72	22.57
		1	Mid	22.82	22.73	22.52
		1	High	22.72	22.71	22.52
		25	Low	21.64	21.58	21.65
		25	Mid	21.66	21.68	21.70
		25	High	21.61	21.61	21.64
		50	N/A	21.65	21.72	21.74

WLAN

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
802.11(b) - 2.4 GHz – 11Mbps	2412	18.46	15.12
	2437	18.40	15.16
	2462	18.60	**15.65**
802.11(g) - 2.4 GHz - 12Mbps	2412	21.75	12.41
	2437	21.58	12.19
	2462	21.79	12.57
802.11 (n) - 2.4 GHz – MCS2	2412	21.21	11.76
	2437	21.45	11.52
	2462	21.43	11.93
802.11a - 5GHz - 9Mbps	5180	24.22	**14.06**
	5200	23.79	13.68
	5220	23.89	13.57
	5240	23.77	13.67
	5260	24.31	**13.73**
	5280	23.72	13.50
	5300	23.53	13.51
	5320	23.78	13.56

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
802.11a - 5GHz - 9Mbps	5500	22.80	13.29
	5520	22.94	13.23
	5540	22.63	13.22
	5560	22.35	13.08
	5580	22.72	13.14
	5600	22.82	13.38
	5620	22.81	13.16
	5640	22.93	**13.39**
	5660	22.33	13.01
	5680	22.35	12.80
	5700	22.37	12.82

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
802.11n20 - 5GHz – MCS0	5180	21.93	12.31
	5200	23.09	12.15
	5220	23.07	11.96
	5240	22.41	12.21
	5260	22.15	12.31
	5280	21.86	11.96
	5300	23.02	12.16
	5320	22.86	11.82
	5500	22.99	11.84
	5520	22.48	11.84
	5540	22.38	11.68
	5560	22.24	11.52
	5580	21.94	11.59
	5600	22.07	11.76
	5620	22.37	11.67
	5640	22.83	11.84
	5660	21.79	11.58
	5680	21.80	11.44
	5700	22.07	11.57

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
802.11n40 - 5GHz – MCS0	5190	23.51	12.26
	5230	23.06	12.13
	5270	22.25	12.15
	5310	23.22	12.08
	5510	22.87	11.81
	5550	22.85	11.48
	5590	22.99	11.78
	5630	22.57	11.84
	5670	21.60	10.81
* Channel not available			

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
802.11ac20 - 5GHz – MCS0	5180	22.81	12.45
	5200	22.93	12.42
	5220	21.83	11.85
	5240	22.51	12.23
	5260	22.22	12.04
	5280	22.03	11.78
	5300	21.93	11.90
	5320	21.63	11.65
	5500	22.00	11.74
	5520	22.01	11.74
	5540	21.74	11.64
	5560	21.84	11.63
	5580	21.64	11.42
	5600	21.86	11.60
	5620	21.89	11.70
	5640	21.88	11.70
	5660	21.54	11.44
	5680	21.43	11.32
	5700	21.54	11.40

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
802.11ac40 - 5GHz – MCS1	5190	21.77	11.89
	5230	22.22	11.91
	5270	22.12	12.10
	5310	22.08	11.80
	5510	21.36	11.30
	5550	21.52	11.44
	5590	21.83	11.51
	5630	21.80	11.52
	5670	20.80	10.68

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
802.11ac80 – 5GHz – MCS0	5210	22.28	11.68
	5290	22.40	11.75
	5530	21.84	11.04
	5610	21.90	11.45

Bluetooth

Modulation	Frequency (MHz)	Conducted Carrier Power (dBm)	
		Peak	Average
DH5	2402	8.11	2.08
	2441	2.08	2.13
	2480	6.03	3.03

Product Service

1.5.3 Standalone SAR Test Exclusion Considerations (KDB 447498 D01)

The 1g SAR Test exclusion thresholds for 100 MHz to 6 GHz *test separation distances* ≤ 50 mm are determined by:

[(*max power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] [√f ($_{GHz}$)]* ≤ 3.0, where

- f ($_{GHz}$) is the RF channel transmit frequency in GHz.
- Power and distance are rounded to the nearest mW and mm before calculation.
- The result is rounded to one decimal place for comparison.
- When the maximum test separation distance is < 5 mm, a distance of 5 mm is applied.

Band	Frequency (MHz)	Max Power		Test Position	Distance (mm)	Threshold	Test Exclusion
		(dBm)	(mW)				
GSM 850MHz	824.2	33.5	2238.72	Head	< 5	406.5	No
GPRS 850MHz	824.2	28.1	645.65	Head	< 5	117.2	No
GPRS 850MHz	824.2	28.1	645.65	Body	10	58.6	No
FDD V	826.6	24.2	263.03	Head	< 5	47.8	No
				Body	10	23.9	No
LTE Band 17	711.0	24.5	281.84	Body	10	23.8	No
GSM 1900	1880.0	30.5	1122.02	Head	< 5	307.7	No
GPRS 1900MHz		24.9	309.03	Head	< 5	84.7	No
GPRS 1900MHz		24.9	309.03	Body	10	42.4	No
WLAN 2.4 GHz	2462.0	17.0	50.12	Head	< 5	15.7	No
				Body	10	7.9	No
WLAN 5GHz	5180.0	14.5	28.18	Head	< 5	12.8	No
				Body	10	6.4	No
WLAN 5GHz	5260.0	14.5	28.18	Head	< 5	12.9	No
				Body	10	6.5	No
WLAN 5GHz	5640.0	14.5	28.18	Head	< 5	13.4	No
				Body	10	6.7	No
Bluetooth	2441	7.0	5.01	Head	< 5	1.6	Yes
				Body	10	0.8	Yes
ANT+	2441	4.0	2.51	Head	< 5	0.8	Yes
				Body	10	0.4	Yes

Product Service

SECTION 2

TEST DETAILS

Specific Absorption Rate Testing of the
Sharp SHV31 Dual-band UMTS (FDDI, FDDV) & Quad-band GSM
(GSM850/GSM900/DCS1800/PCS1900) & Quad-band LTE (B1, B3, B17, B26) & AXGP
(TDD41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS

2.1 SARA-C SAR MEASUREMENT SYSTEM

2.1.1 Robot System Specification

The SAR measurement system being used is the IndexSAR SARA-C system, which consists of a cartestian 6-axis robot jig, a dedicated robot controller, a straight IndexSAR probe, an L-shaped Indexsar probe, a fast amplifier, and two phantoms: an upside-down SAM phantom, and a rectangular box phantom,

Figure 1. The L-probe is used in connection with measurements on DUTs held against the SAM phantom, while the straight probe is used exclusively in the box phantom. The robot is used to articulate the probe to programmed positions inside the phantom head to obtain SAR readings from the DUT.

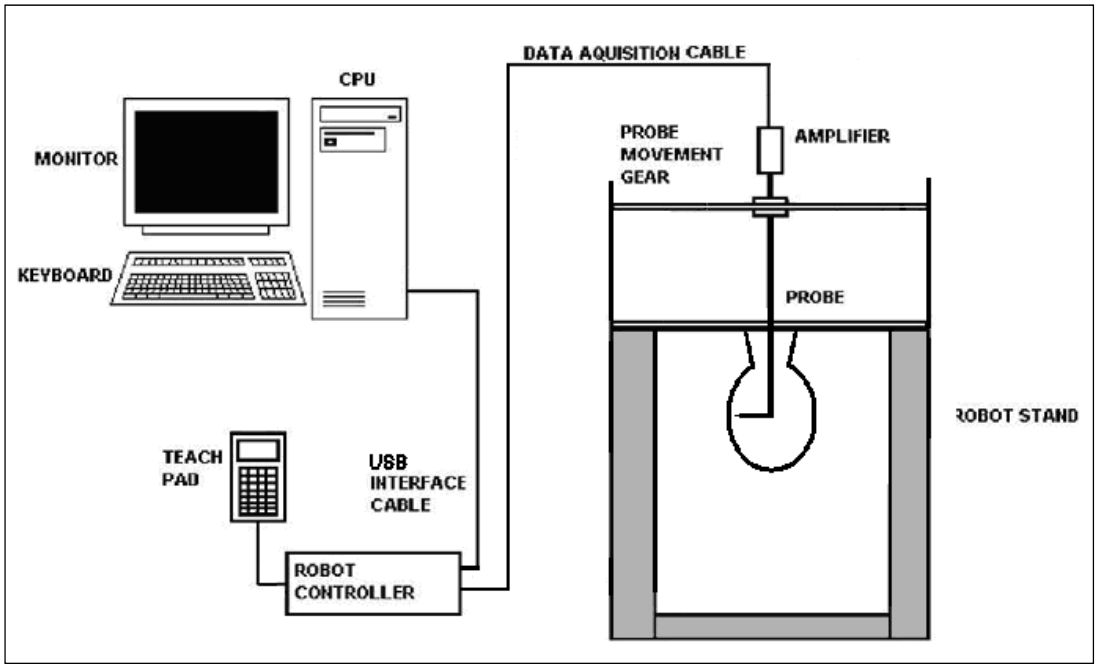

Figure 1 Schematic diagram of the SARA-C measurement system showing the L-probe and upside-down SAM phantom

The system is controlled remotely from a PC, which contains the software to drive the robot and data acquisition equipment. The software also displays the data obtained from test scans.

The position and digitised shape of the phantom heads are made available to the software for accurate positioning of the probe and reduction of set-up time. The SAM phantom heads are individually digitised using a Mitutoyo CMM machine to a precision of 0.001mm. The data is then converted into a shape format for the software, providing an accurate description of the phantom shell. Even with this accuracy, registration errors and deformation of the phantom when filled with 7 litres of fluid, can lead to probe placement errors of 1mm or more. For this reason, the L-probes house a 2-axis strain gauge unit, which allow the actual phantom wall position to be sensed to an accuracy of 0.3mm during probe movements.

In operation, the system first does an area (2D) scan within the liquid following the curve of the phantom wall at a fixed distance. When the maximum SAR point has been found, the system will then carry out a 3D scan centred at that point to determine volume averaged SAR level.

2.1.2 Probe and Amplifier Specification

IndexSAR isotropic immersible straight SAR probes

Straight probes are constructed using three orthogonal dipole sensors arranged on an interlocking, triangular prism core. The probes have built-in shielding against static charges and are contained within a PEEK cylindrical enclosure material at the tip. The tips come in either 5mm (typically for use up to 3GHz) or 2.5mm (above 3GHz) versions, model types IXP-050 and IXP-025 respectively.

Straight probes are calibrated by NPL in the UK.

Straight probes are used exclusively in the box phantom, to measure SAR from DUTs placed against the phantom base. In SARA2, straight probes were also used in the SAM phantom, but this is forbidden in SARA-C, where L-probes are demanded. NB the reverse is not true: L-probes can be used in the box phantom.

IndexSAR L-probes

The L-shaped probe is so designed to ensure the probe tip can remain perpendicular to the SAM phantom wall during scans. To allow for greater probe articulation freedom, the SAM phantom head has been turned upside down and the probe is inserted through the throat aperture, rather than through a small hole at the top of the head in the old SARA2 SAR measurement system.

Like the straight probes, L-probes also come in the same two tip sizes: IXP-020 (5mm) and IXP-021 (2.5mm).

L-probes are calibrated to national standards in-house by IndexSAR.

L-probes can be used either in the SAM head, or against the side wall of the box phantom.

IFA-020 Fast Amplifier

A block diagram of the fast probe amplifier electronics is shown below.

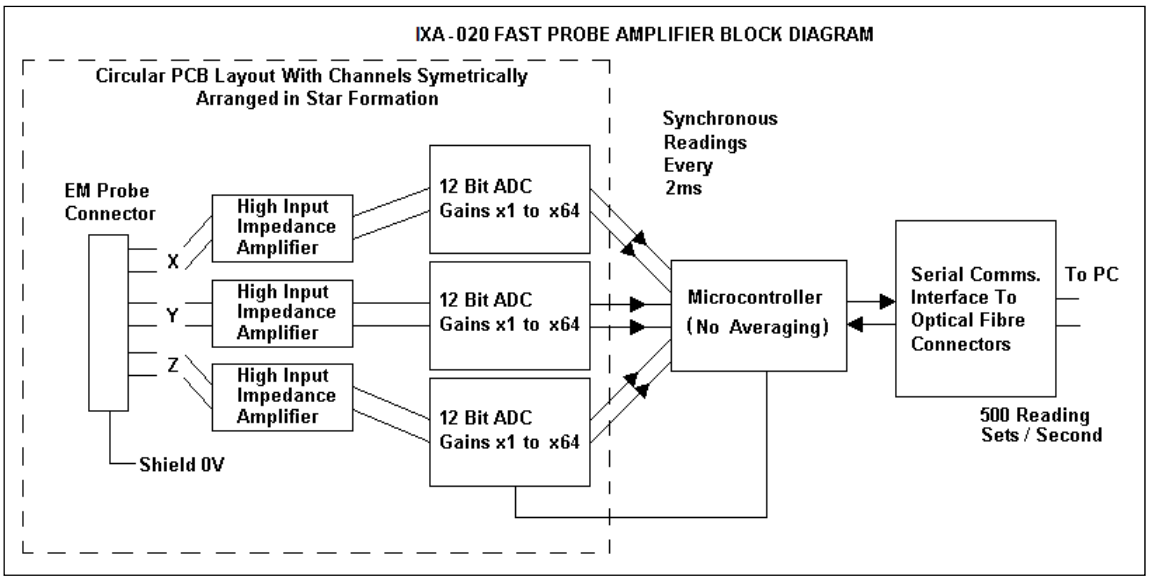

Figure 2 Schematic diagram of the fast amplifier

This amplifier has a time constant of approx. 50µs, which is much faster than the SAR probe response time. The overall system time constant is therefore that of the probe (<1ms) and a reading containing data for all three channels is returned to the PC every 2ms. The conversion period is approx. 1 µs at the start of each 2ms period. This enables the probe to follow pulse modulated signals of periods >>2ms. The PC software applies the linearisation procedure separately to each reading, so no linearisation corrections for the averaging of modulated signals are needed in this case.

The fast amplifier sampling rate can be adjusted via the SARA-C user interface from 1.7ms to 2.3ms. When not measuring CW signals, it is important to ensure that this probe reading rate and the modulated signal's pulse repetition rate are not unintentionally synchronised since this can lead to aliasing and a gross reduction in accuracy. For GSM signals, the default amplifier sampling rate of 2ms is entirely satisfactory, whereas changing it to 2.3ms (almost exactly half the GSM frame rate) could mean GSM bursts are always missed.

When aggregating 2ms samples to reduce the stochastic noise, it is equally important to match the number of samples with the longer-term timing structure of the modulation scheme. Taking GSM as an example again, since 120ms is the precise length of a GSM traffic channel multiframe, best practice would dictate that aggregated samples should cover exact multiples of this timescale. In this case, setting the number of samples to be aggregated to 120 (2 multiframes), or 240 samples (4 multiframes) should be ideal. Other signalling protocols would require changing these numbers as appropriate.

Phantoms

The Flat phantom used is a rectangular Perspex Box IndexSAR item IXB-2HF, dimensions 240 x 190 x 195mm (w x d x h). The base and one side wall are made of FR4 material which has specific dielectric properties and a tightly-controlled thickness. The base is used in tandem with straight probes, measuring either a DUT or a validation dipole, while the side wall is for performing validations with the L-probe. It is also feasible to perform measurements on body-worn devices with the L-probe against the side window, but only if the L-probe is suitably calibrated (ie if the measurement standard demands body and head fluids have the same dielectric properties).

The Specific Anthropomorphic Mannequin (SAM) Upright Phantom is fabricated using moulds generated from the CAD files as specified by CENELEC EN 62209-1: 2006.

2.1.3 SAR Measurement Procedure

Detailed measurement procedures for SARA-C are set out in a separate IndexSAR technical document ("SARA-C Operational Procedures"

A test set and dipole antenna control the handset via an air link and a low-mass phone holder can position the phone at either ear. Graduated scales are provided to set the phone in the 15 degree position. The upright phantom head holds approx. 7 litres of simulant liquid. The phantom is filled and emptied through the 110mm diameter penetration hole in the neck.

An area scan is performed inside the head at a fixed distance of 5mm from the curved surface on the source side. An algorithm presents the user with the location of any local hotspots and allows one to be selected for a follow-up 3D scan, looking at how the signal absorption varies with depth. A comparison between the start and end readings at a fixed distance from the DUT also enables the power drift during measurement to be assessed.

SARA-C Interpolation and Extrapolation schemes

SARA-C software contains support for both 2D cubic B-spline interpolation as well as 3D cubic B-spline interpolation. In addition, for extrapolation purposes, a proprietary curve-fitting routine is implemented as a weighted average of 3 different polynomial fits. The polynomial fitting procedures have been extensively tested by comparing the fitting coefficients generated by the SARA-C procedures with those obtained using the polynomial fit functions of Microsoft Excel when applied to the same test input data.

Interpolation of 2D area scan

The 2D cubic B-spline interpolation is used after the initial area scan at fixed distance from the phantom shell wall. The initial scan data are collected with approx. 115mm spatial resolution and spline interpolation is used to find the location of the local maximum to within a 1mm resolution for positioning the subsequent 3D scanning.

Extrapolation of 3D scan

For the 3D scan, data are collected on a spatially regular, but conformal, 3D grid having (by default) 6.4 mm steps in the lateral dimensions and 3.5 mm steps in the depth direction (away from the source). SARA-C enables full control over the selection of alternative step sizes in all directions.

The overall accuracy of the 1g and 10g SAR volume average depends largely on the accuracy with which the probe can be re-positioned in the head. Although the digitised shape of the head is available to the SARA-C software, a better positioning solution is to use strain gauges attached to the L-probe to feel for the actual surface and to base all movements relative to this positive detection. An even more precise, but time-consuming, method is to place the probe tip in positive contact against the phantom wall, then step backwards 0.01mm at a time while monitoring the recorded SAR reading. At the exact moment that the probe detaches from contact, the SAR reading will suddenly fall.

After the data collection, the data are extrapolated up to the shell wall in the depth direction to assign values to points in the 3D array which cannot be measured in practice because of the finite size of the sensor tip. For automated measurements inside the head, the distance of the closest plane from the wall cannot be less than 2.7mm (for 5mm probes) and 1.39mm (for 2.5mm probes), this being the distance of the probe sensors behind the front edge of the probe tip.

Interpolation of 3D scan and volume averaging

The procedure used in SARA-C for defining the volumes used in SAR averaging follow the method of adapting the surface of the 'cube' to conform with the curved inner surface of the phantom (see Appendix C.2.2.1 in EN 62209-1: 2006). This is called, here, the conformal scheme.

For each row of data in the depth direction, the data are extrapolated to the phantom wall, and interpolated to less than 1mm spacing and average values are calculated from the phantom surface for the row of data over distances corresponding to the requisite depth for 10g and 1g cubes. This results in two 2D arrays of data, one for 1g and the other for 10g masses, which are then cubic B-spline interpolated to sub mm lateral resolution. A search routine then moves an averaging square around through the 2D array and records the maximum value of the corresponding 1g and 10g volume averages.

The default step size is 3.5mm, but this is under user-control. The compromise is with time of scan, so it is not practical to make it much smaller or scan times become long and power-drop influences become larger.
The robot positioning system specification for the repeatability of the positioning (**dss** in EN 62209-1: 2006) is +/- 0.04mm.

2.1.4 Head Test Positions

This recommended practice specifies exactly two test positions for the handset against the head phantom, the “Cheek” position and the “tilted” position. The handset should be tested in both positions on the left and right sides of the SAM phantom. In each test position the centre of the earpiece of the device is placed directly at the entrance of the auditory canal. The angles mentioned in the test positions used are referenced to the line connecting both auditory canal openings. The plane this line is on is known as the reference plane. Testing is performed on the right and left-hand sides of the generic phantom head.

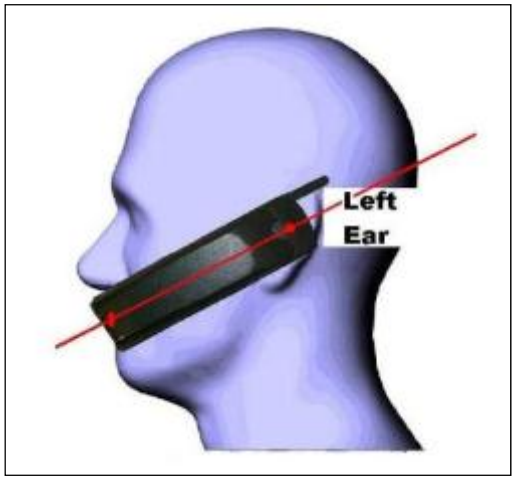

Figure 3 Side view of mobile next to head showing alignment

<u>The Cheek Position</u>

The Cheek Position is where the mobile is in the reference plane and the line between the mobile and the line connecting both auditory canal openings is reduced until any part of the mobile touches any part of the generic twin phantom head.

<u>The 15° Position</u>

The 15° Position is where the mobile is in the reference Cheek position and the phone is kept in contact with the auditory canal at the earpiece; the bottom of the phone is then tilted away from the phantom mouth by 15°.

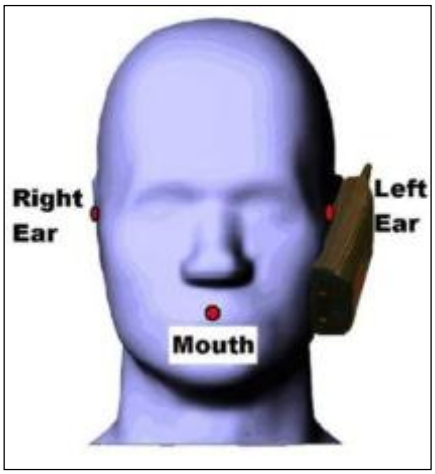

Figure 4 Cheek position

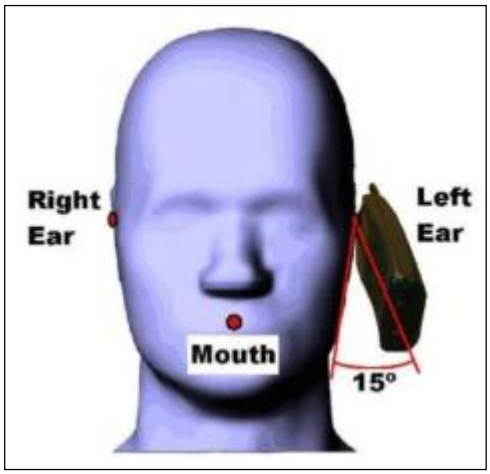

Figure 5 15º Tilt Position

2.2 GSM 850MHz HEAD SAR TEST RESULTS AND COURSE AREA SCANS – 2D

.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	17/11/2014-11:24:03	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	43.30%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	59.80mm
DUT POSITION:	Left-Cheek	MAX SAR Z-AXIS LOCATION:	-112.80mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	18.340
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.36 W/kg
TYPE OF MODULATION:	GMSK (Voice Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	12.5%	SAR START:	0.346 W/kg
INPUT POWER LEVEL:	33.5dBm	SAR END:	0.341 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	-1.400 %

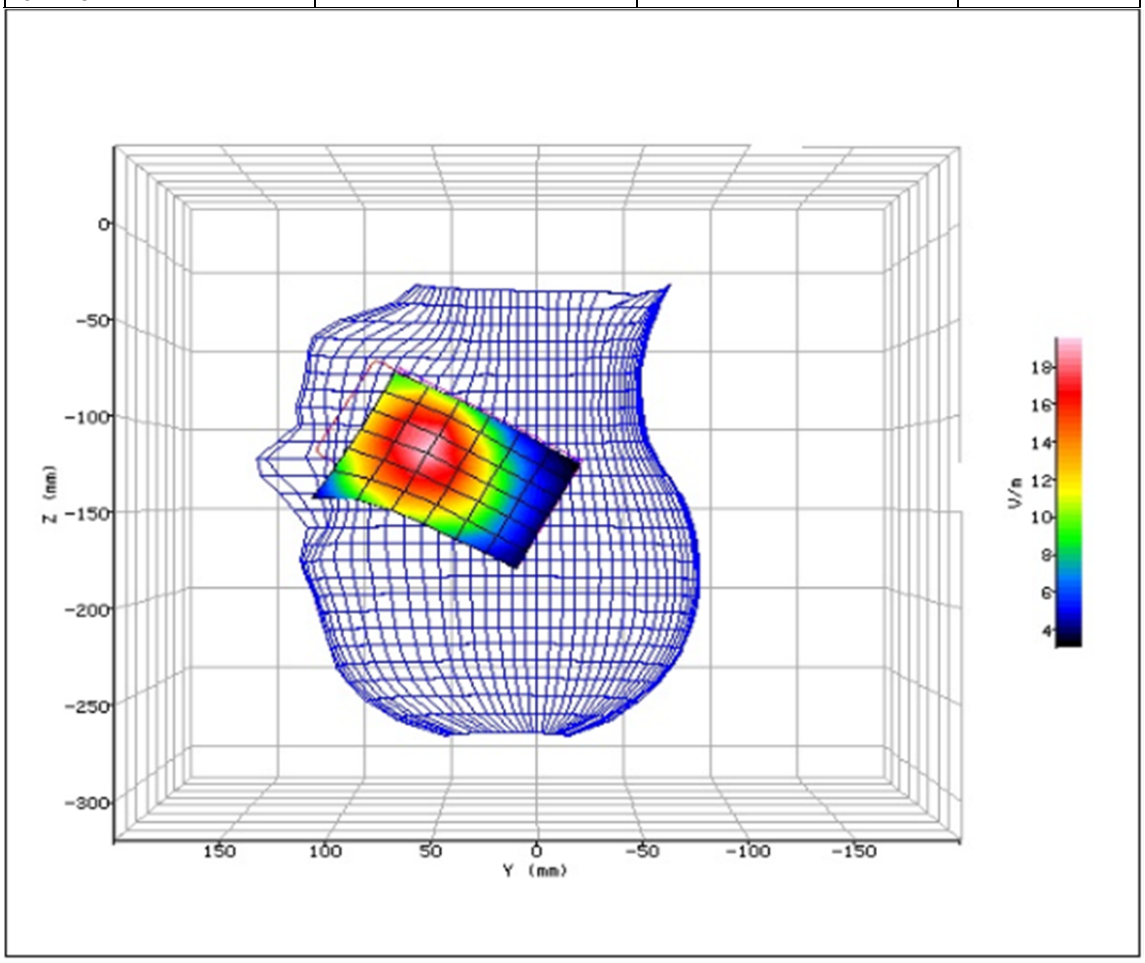

Figure 6: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	17/11/2014-11:49:28	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	43.30%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	45.20mm
DUT POSITION:	Left-15°	MAX SAR Z-AXIS LOCATION:	-125.20mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	14.441
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.24 W/kg
TYPE OF MODULATION:	GMSK (Voice Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	12.5%	SAR START:	0.216 W/kg
INPUT POWER LEVEL:	33.5dBm	SAR END:	0.221 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	2.200 %

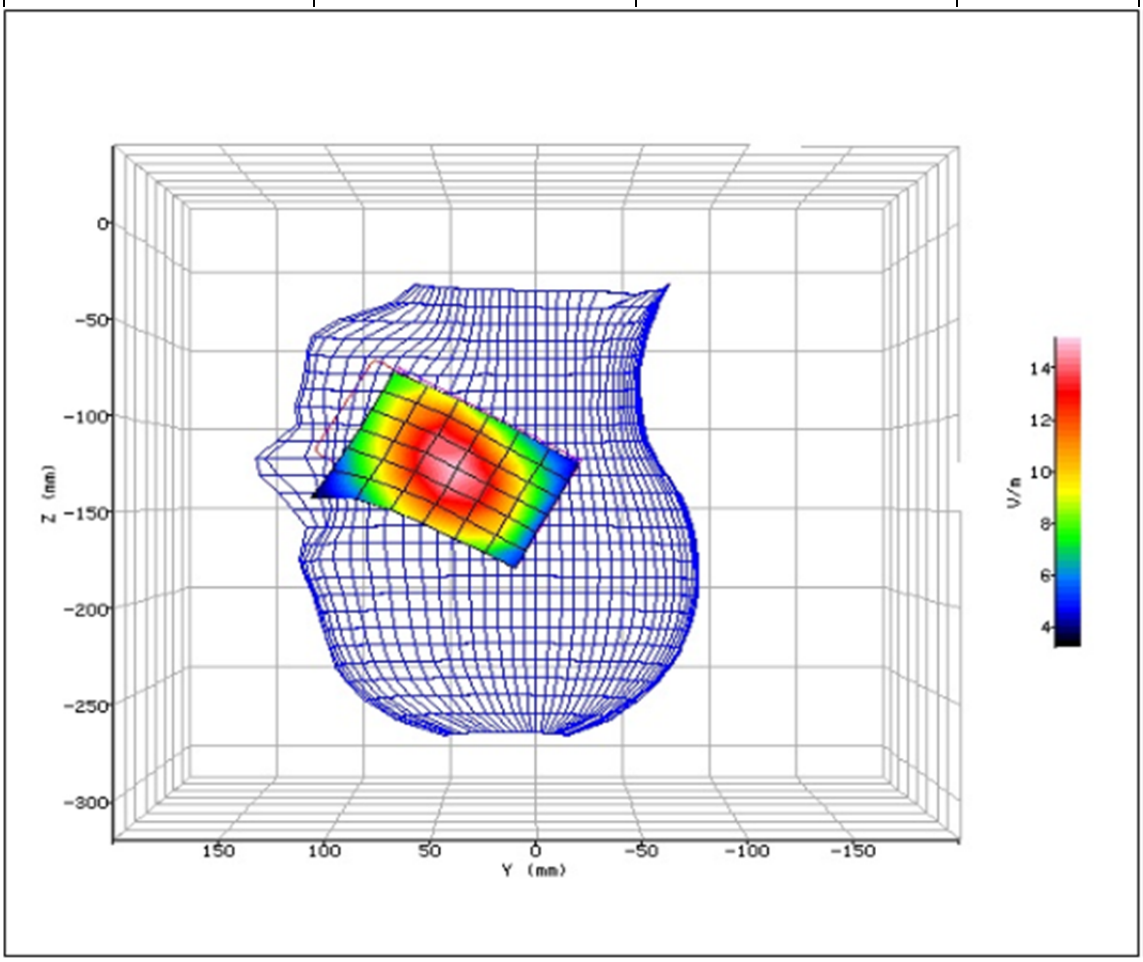

Figure 7: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	17/11/2014-12:39:12	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	43.30%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	59.90mm
DUT POSITION:	Right-Cheek	MAX SAR Z-AXIS LOCATION:	-119.10mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	19.117
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.35 W/kg
TYPE OF MODULATION:	GMSK (Voice Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	12.5%	SAR START:	0.347 W/kg
INPUT POWER LEVEL:	33.5dBm	SAR END:	0.376 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	8.400 %

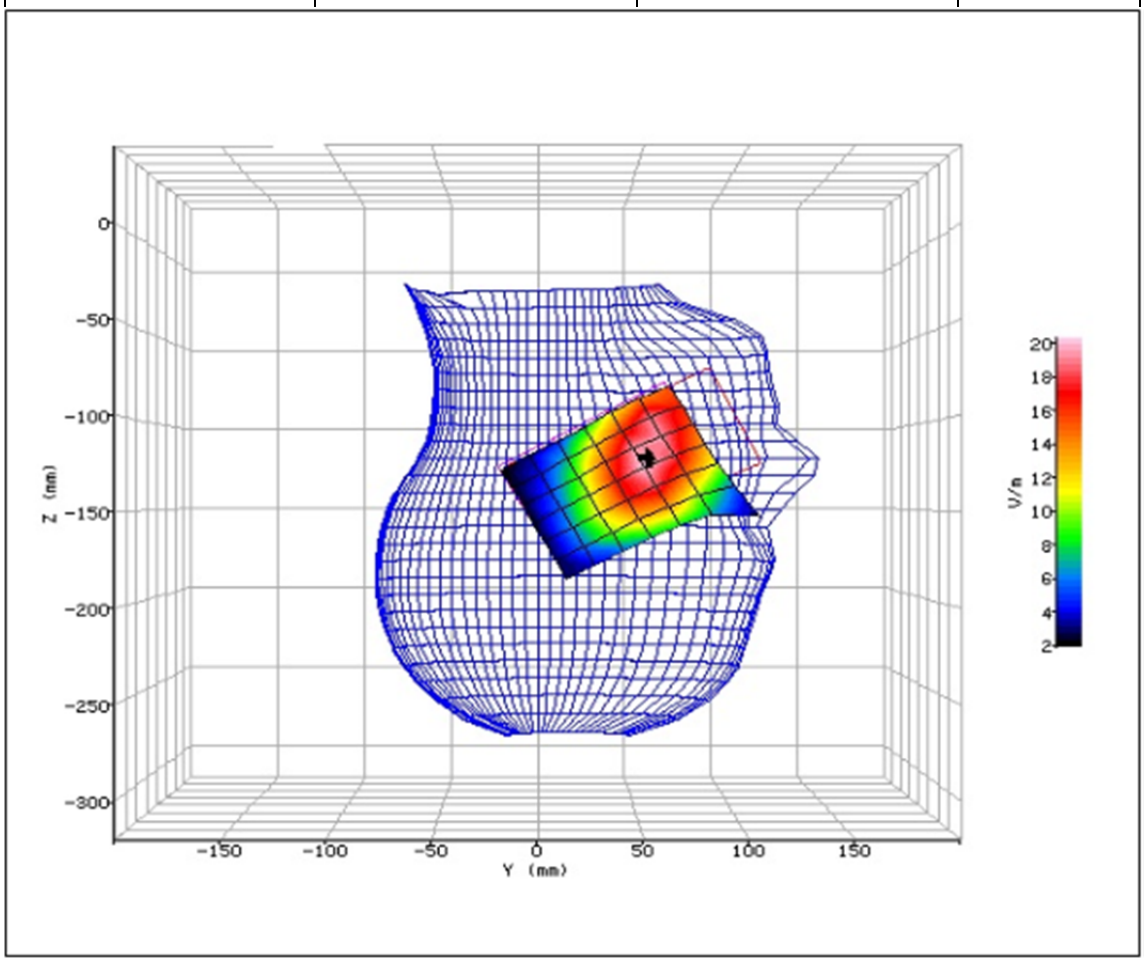

Figure 8: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	17/11/2014-13:06:43	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	43.30%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	46.60mm
DUT POSITION:	Right-15°	MAX SAR Z-AXIS LOCATION:	-130.90mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	15.528
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.25 W/kg
TYPE OF MODULATION:	GMSK (Voice Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	12.5%	SAR START:	0.235 W/kg
INPUT POWER LEVEL:	33.5dBm	SAR END:	0.226 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	-3.900 %

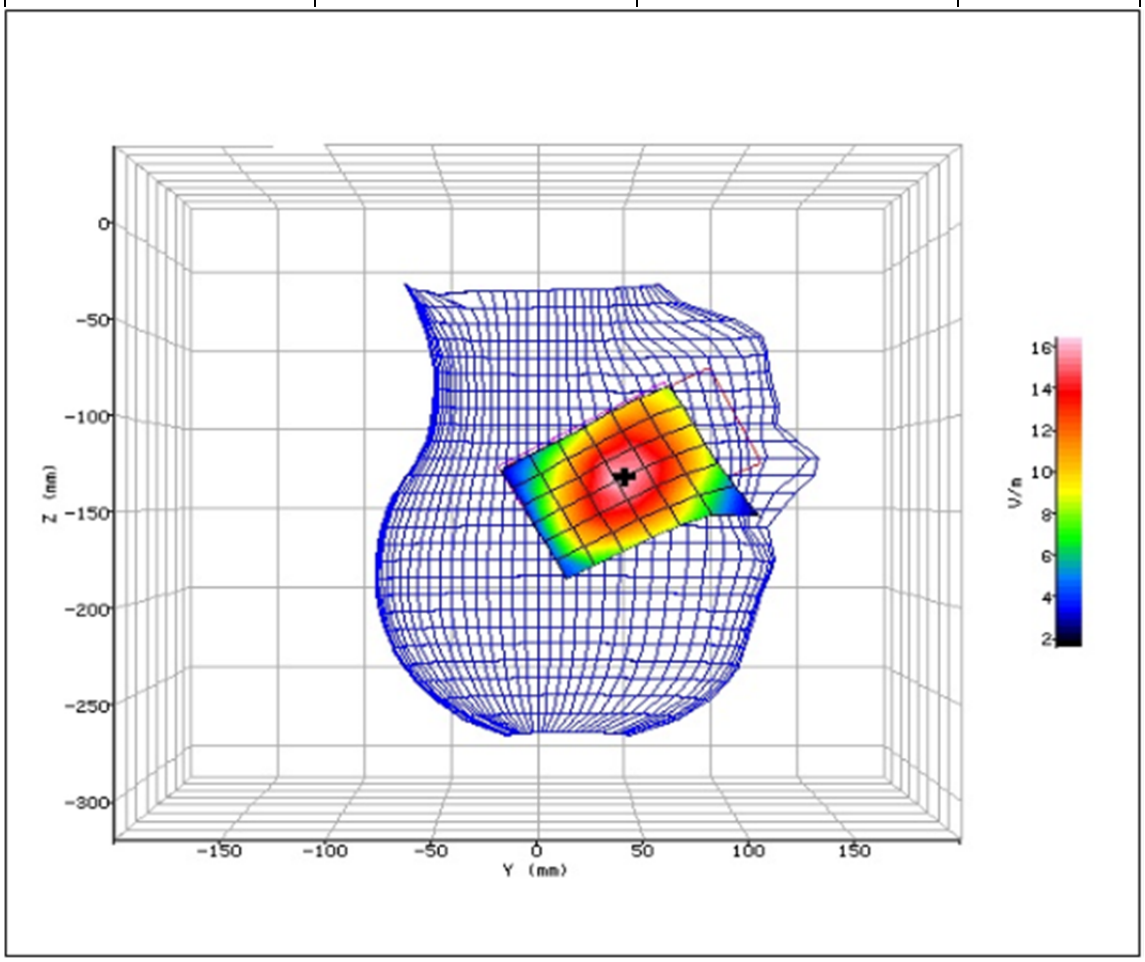

Figure 9: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

2.3 GSM 850MHz HEAD SAR TEST RESULTS AND COURSE AREA SCANS – 2D

.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	17/11/2014-15:19:26	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	43.30%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	60.10mm
DUT POSITION:	Left-Cheek	MAX SAR Z-AXIS LOCATION:	-114.40mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	17.788
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.31 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.321 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.292 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	-9.000 %

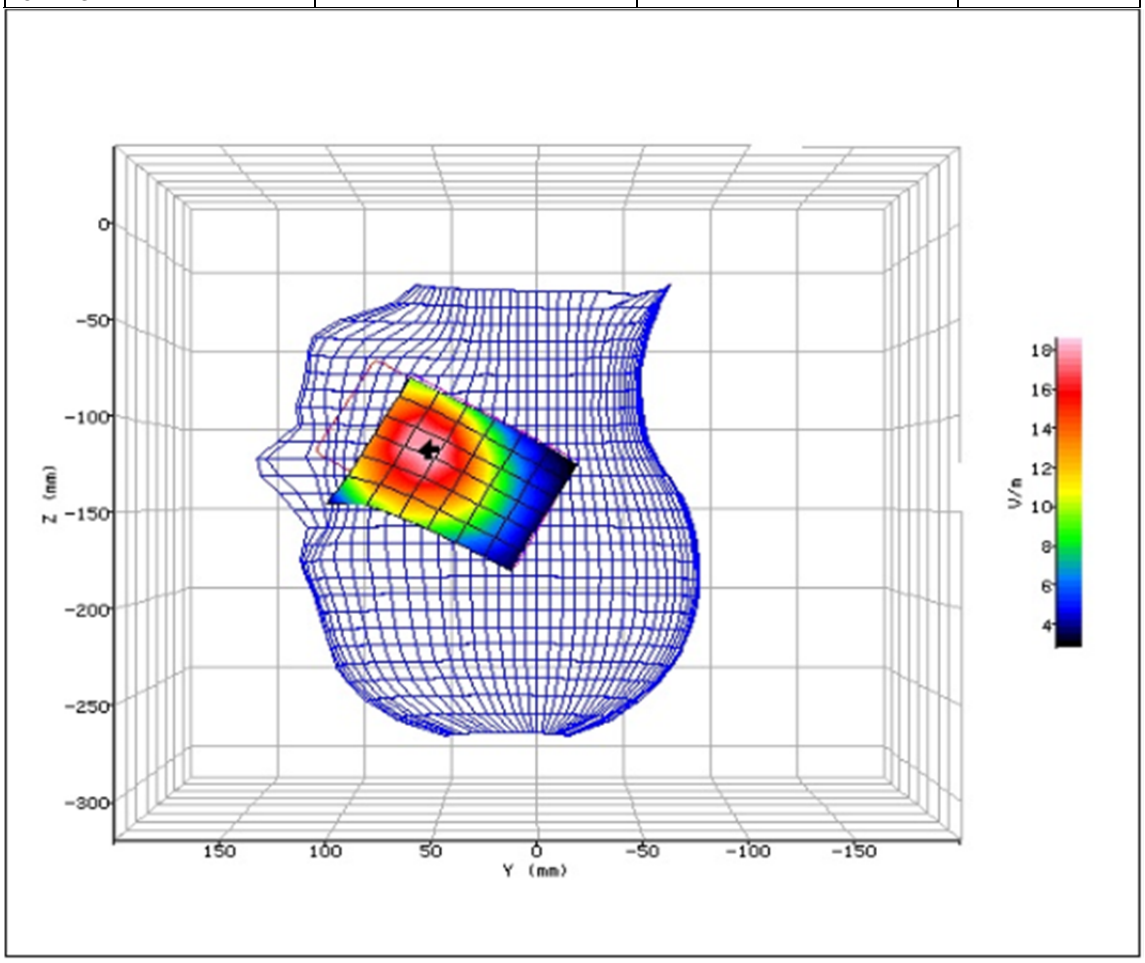

Figure 10: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	17/11/2014-15:45:40	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	43.30%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	45.60mm
DUT POSITION:	Left-15°	MAX SAR Z-AXIS LOCATION:	-125.50mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	13.629
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.20 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.184 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.186 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	0.900 %

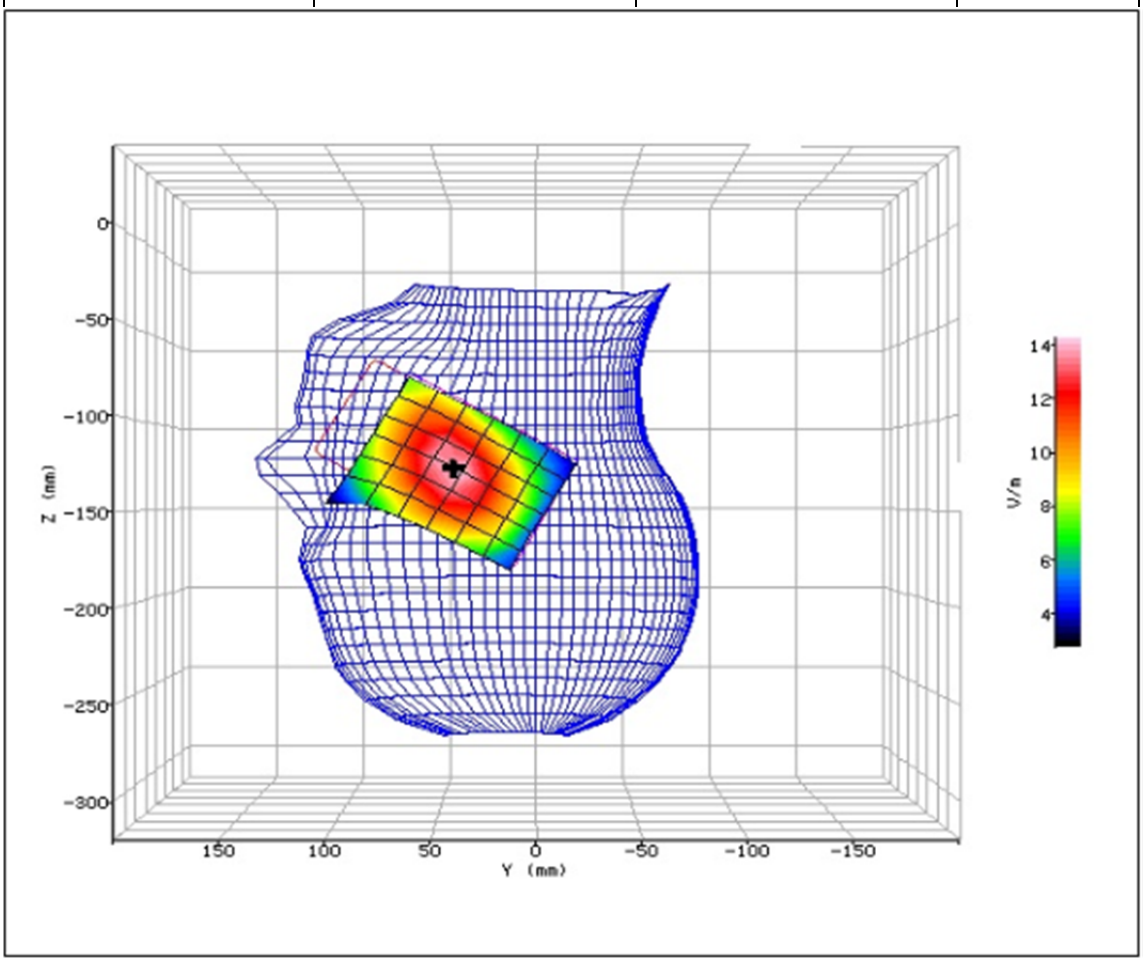

Figure 11: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	17/11/2014-14:03:10	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	43.30%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	59.40mm
DUT POSITION:	Right-Cheek	MAX SAR Z-AXIS LOCATION:	-116.50mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	17.748
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.29 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.319 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.292 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	-8.500 %

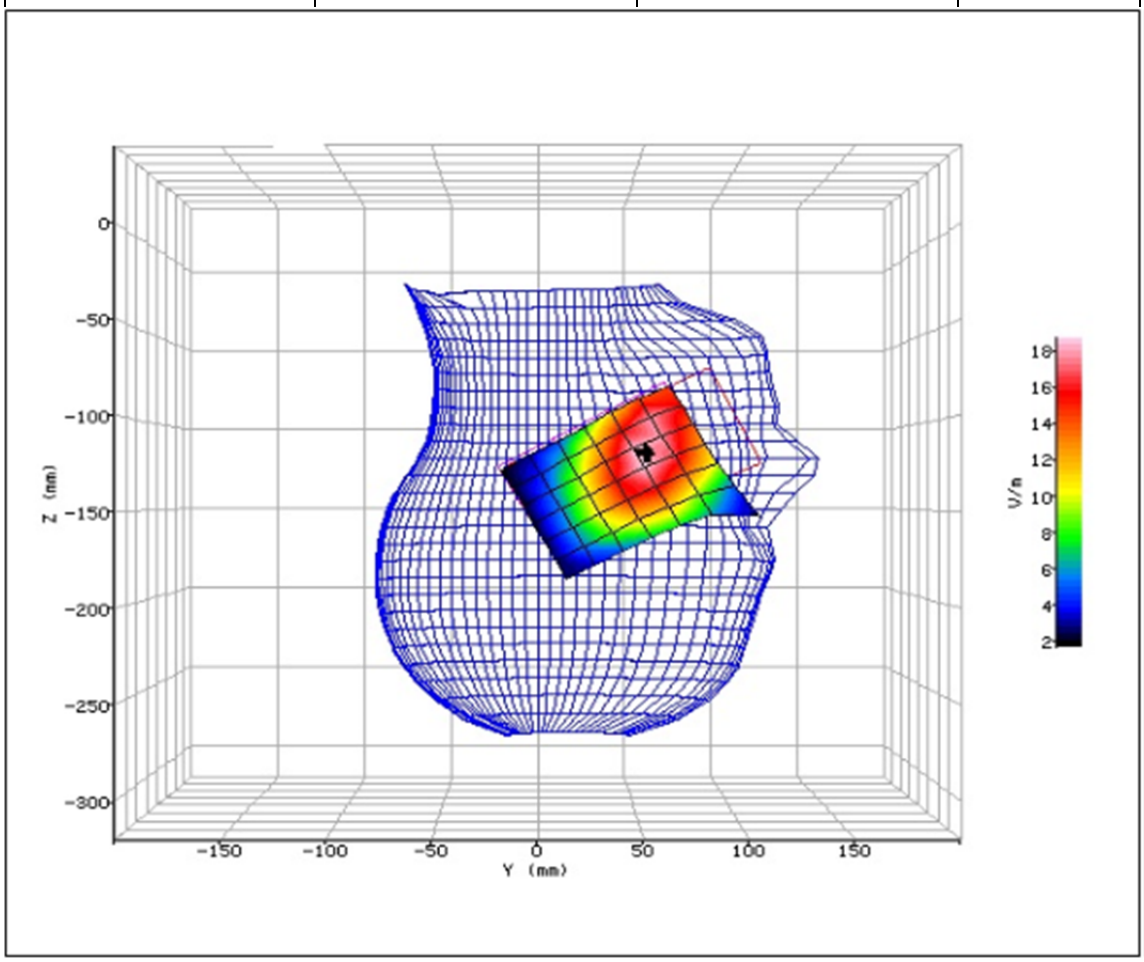

Figure 12: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	17/11/2014-14:28:23	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	43.30%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	47.10mm
DUT POSITION:	Right-15°	MAX SAR Z-AXIS LOCATION:	-129.90mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	13.694
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.19 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.187 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.186 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	-0.200 %

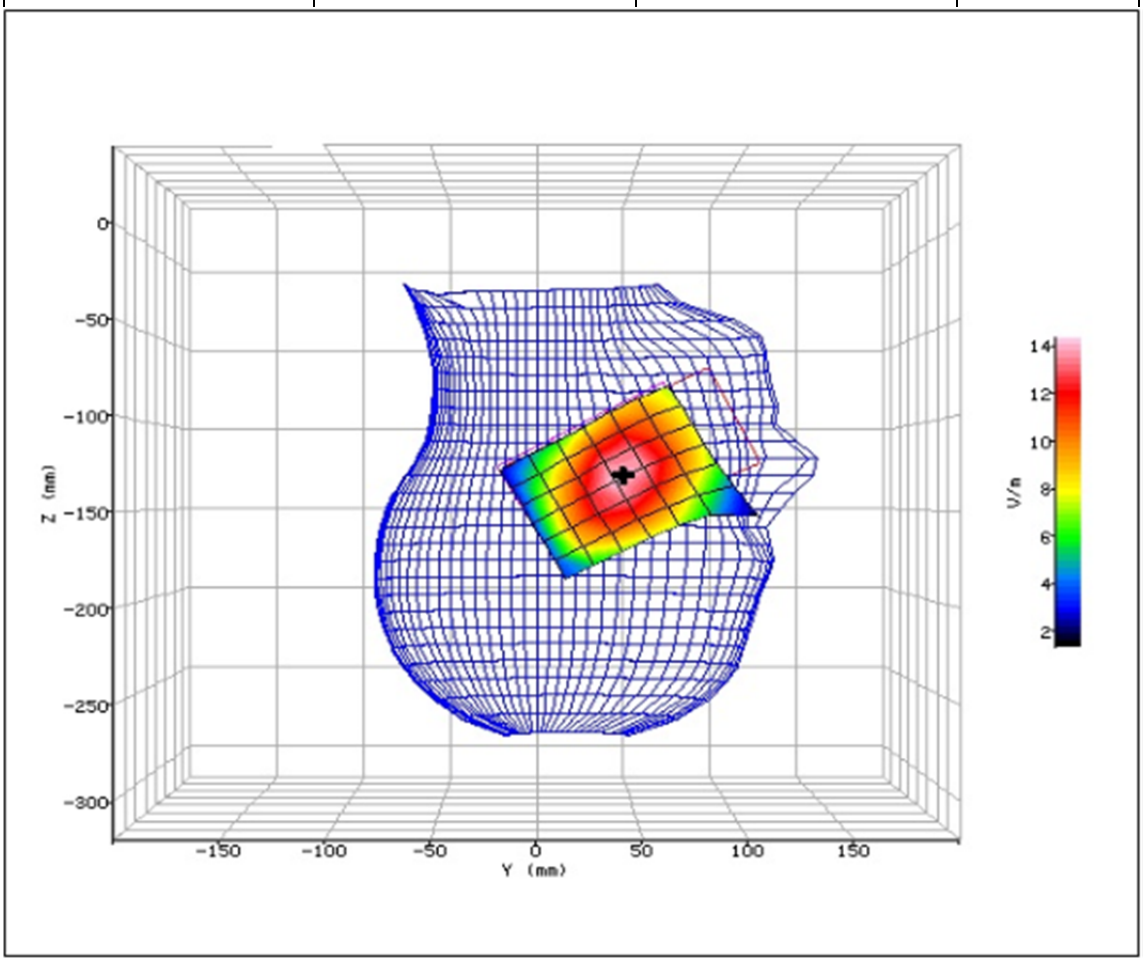

Figure 13: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

2.4 GSM 850MHz BODY SAR TEST RESULTS AND COURSE AREA SCANS – 2D

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-09:43:04	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	27.00mm
DUT POSITION:	10mm-Front Facing	MAX SAR Y-AXIS LOCATION:	7.70mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	19.534
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.37 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.389 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.366 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-5.900 %

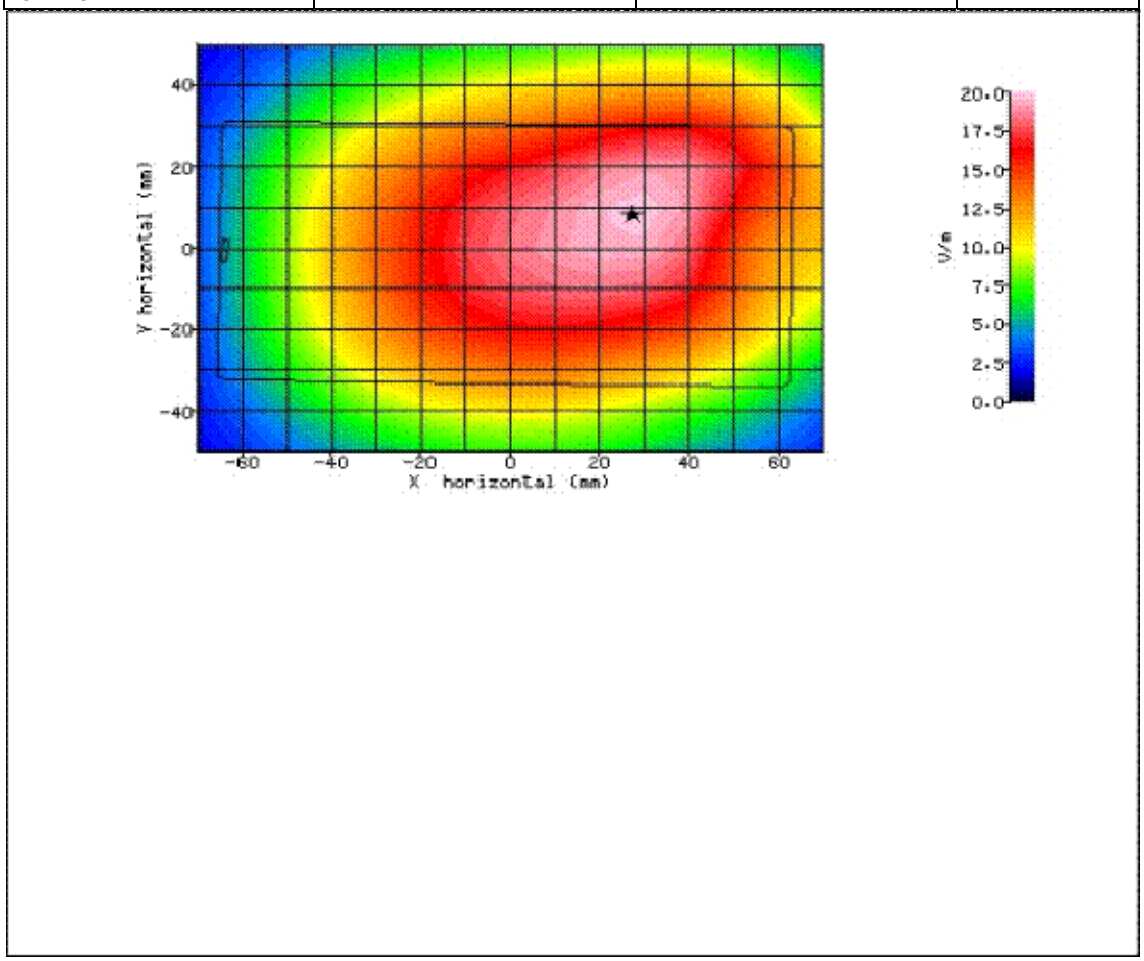

Figure 14: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-10:27:10	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	27.10mm
DUT POSITION:	10mm-Rear Facing	MAX SAR Y-AXIS LOCATION:	-9.90mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	23.702
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.55 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.568 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.519 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-8.500 %

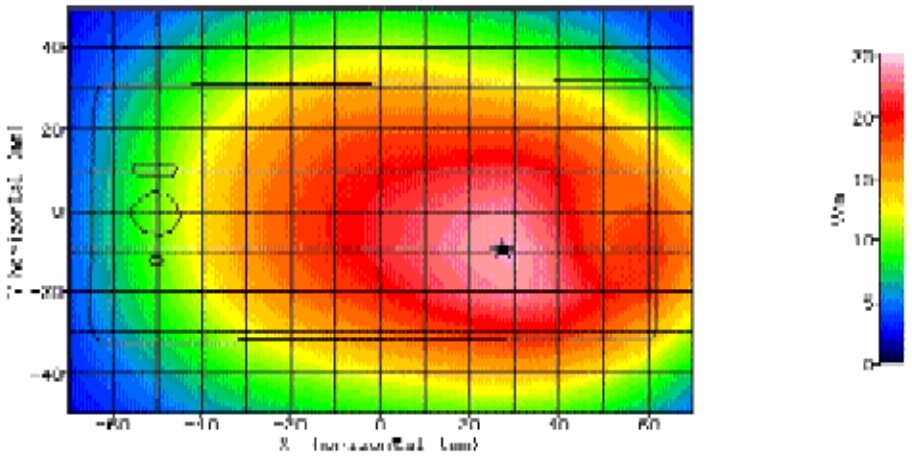

Figure 15: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-10:48:23	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	4.60mm
DUT POSITION:	10mm-Left Edge	MAX SAR Y-AXIS LOCATION:	1.80mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	16.835
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.30 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.305 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.303 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-0.800 %

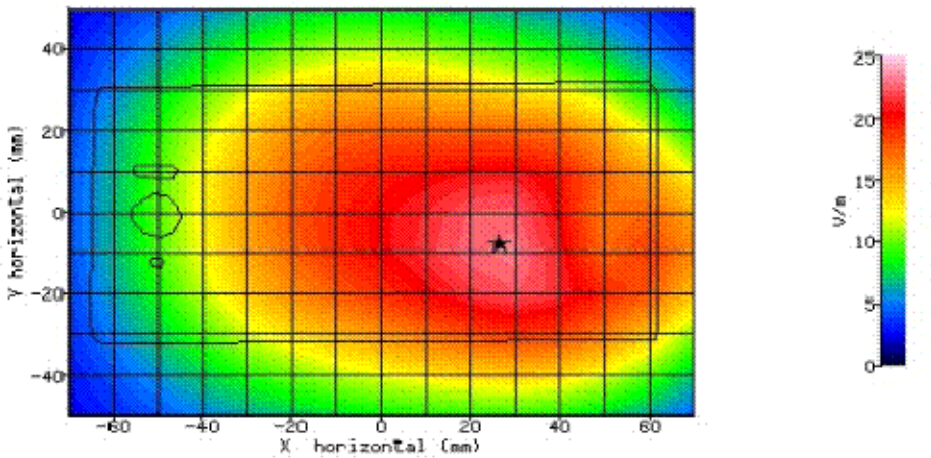

Figure 16: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-11:34:37	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	5.10mm
DUT POSITION:	10mm-Right Edge	MAX SAR Y-AXIS LOCATION:	2.70mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	17.181
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.30 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.308 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.297 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-3.500 %

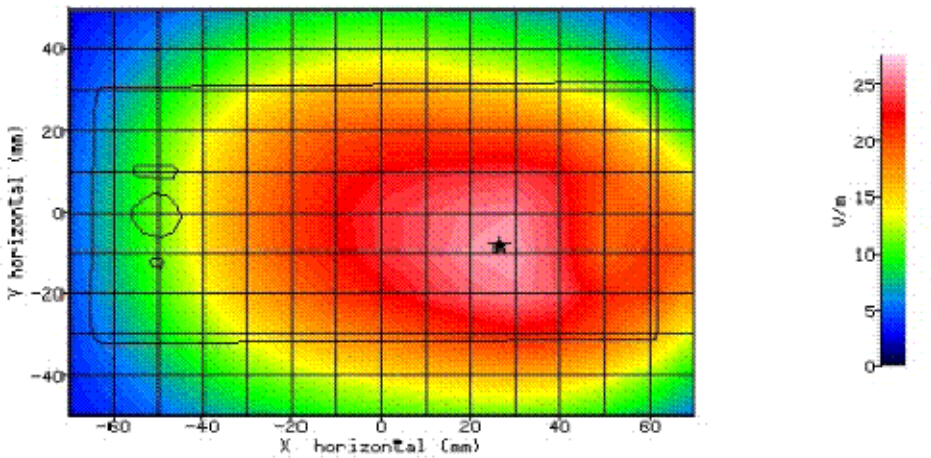

Figure 17: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-08:37:24	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	-6.30mm
DUT POSITION:	10mm-Bottom Edge	MAX SAR Y-AXIS LOCATION:	5.20mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	10.070
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.12 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.128 W/kg
INPUT POWER LEVEL:	28.1dBm	SAR END:	0.121 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-5.400 %

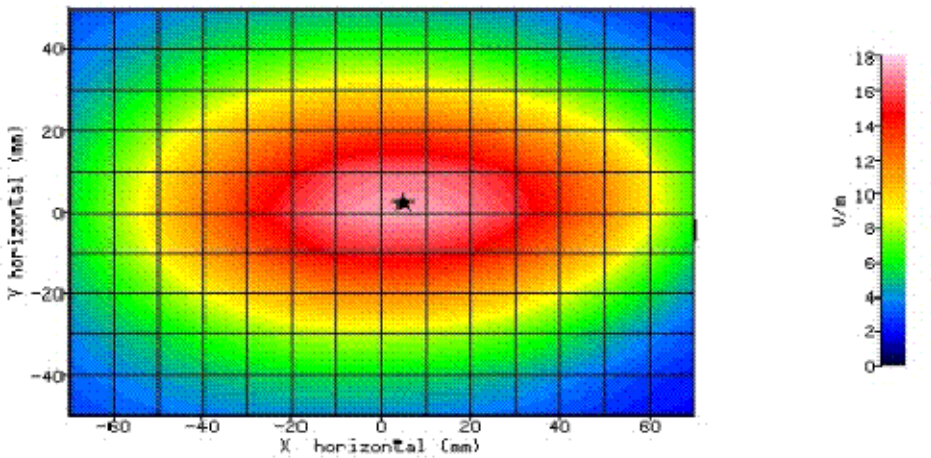

Figure 18: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 824.2MHz.
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2.5 WCDMA FDDV HEAD SAR TEST RESULTS AND COURSE AREA SCANS – 2D

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-06:46:33	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	32.40%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	59.50mm
DUT POSITION:	Left-Cheek	MAX SAR Z-AXIS LOCATION:	-113.30mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	19.816
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.44 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.404 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.404 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	-0.100 %

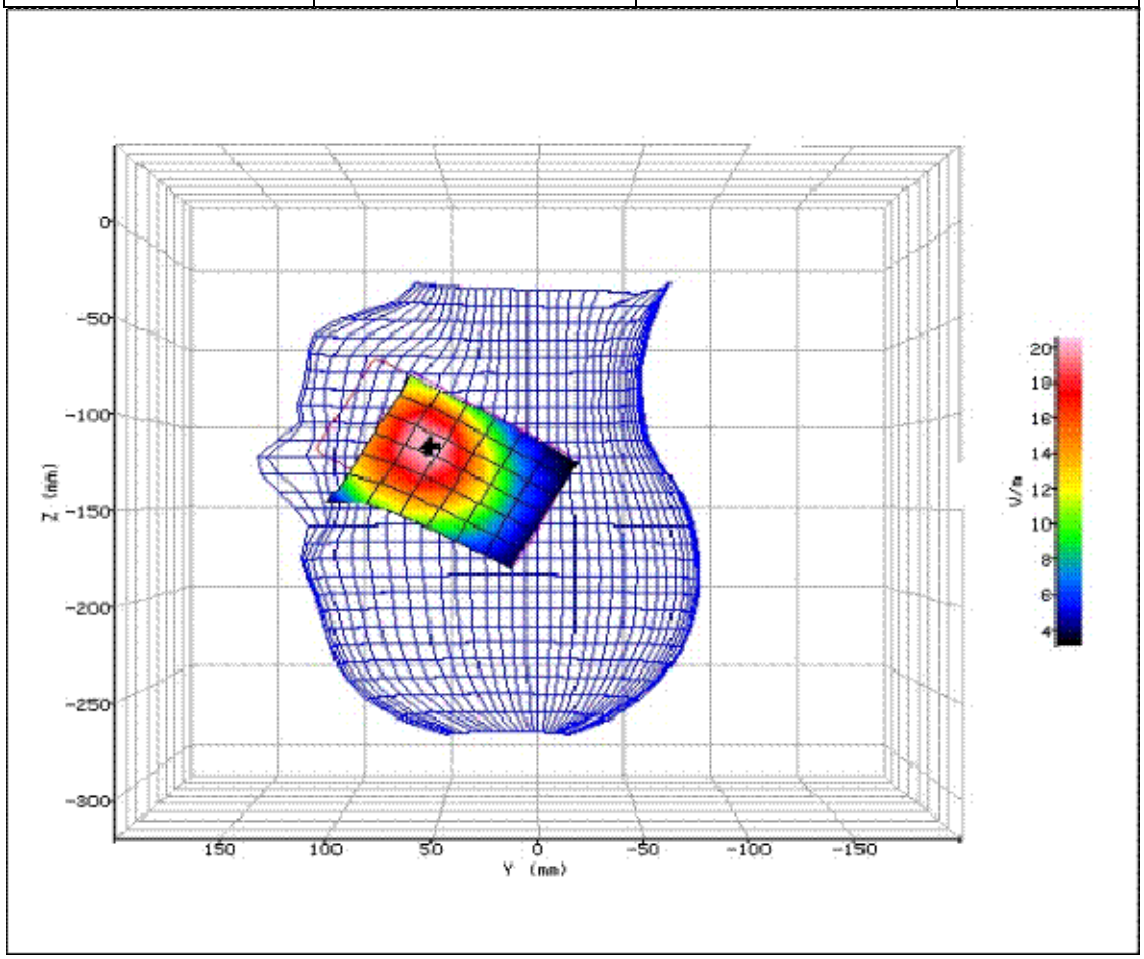

Figure 19: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-07:11:30	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	32.40%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	46.40mm
DUT POSITION:	Left-15°	MAX SAR Z-AXIS LOCATION:	-125.10mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	16.594
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.31 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.276 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.279 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	1.200 %

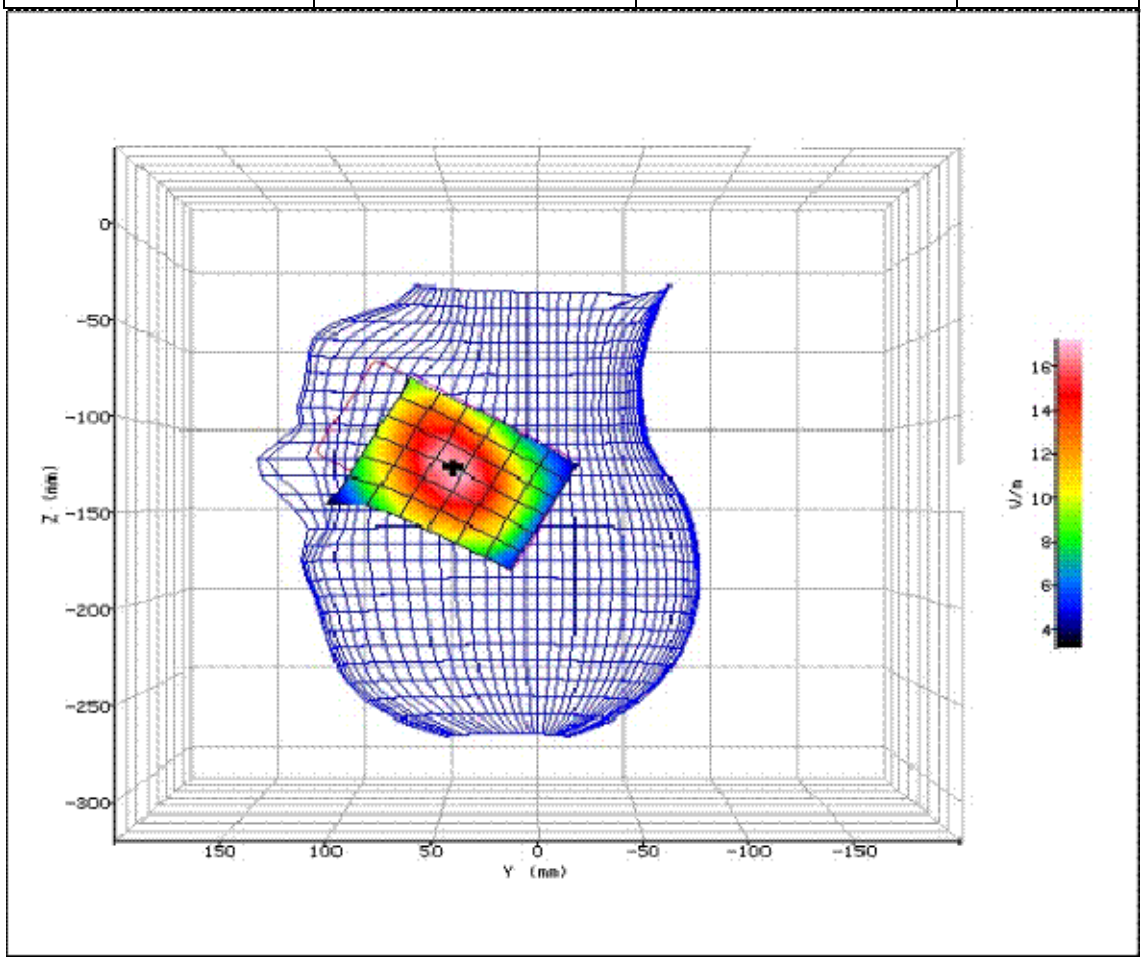

Figure 20: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-07:59:37	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	32.40%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	59.10mm
DUT POSITION:	Right-Cheek	MAX SAR Z-AXIS LOCATION:	-120.10mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	20.839
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.42 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.443 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.438 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	-1.100 %

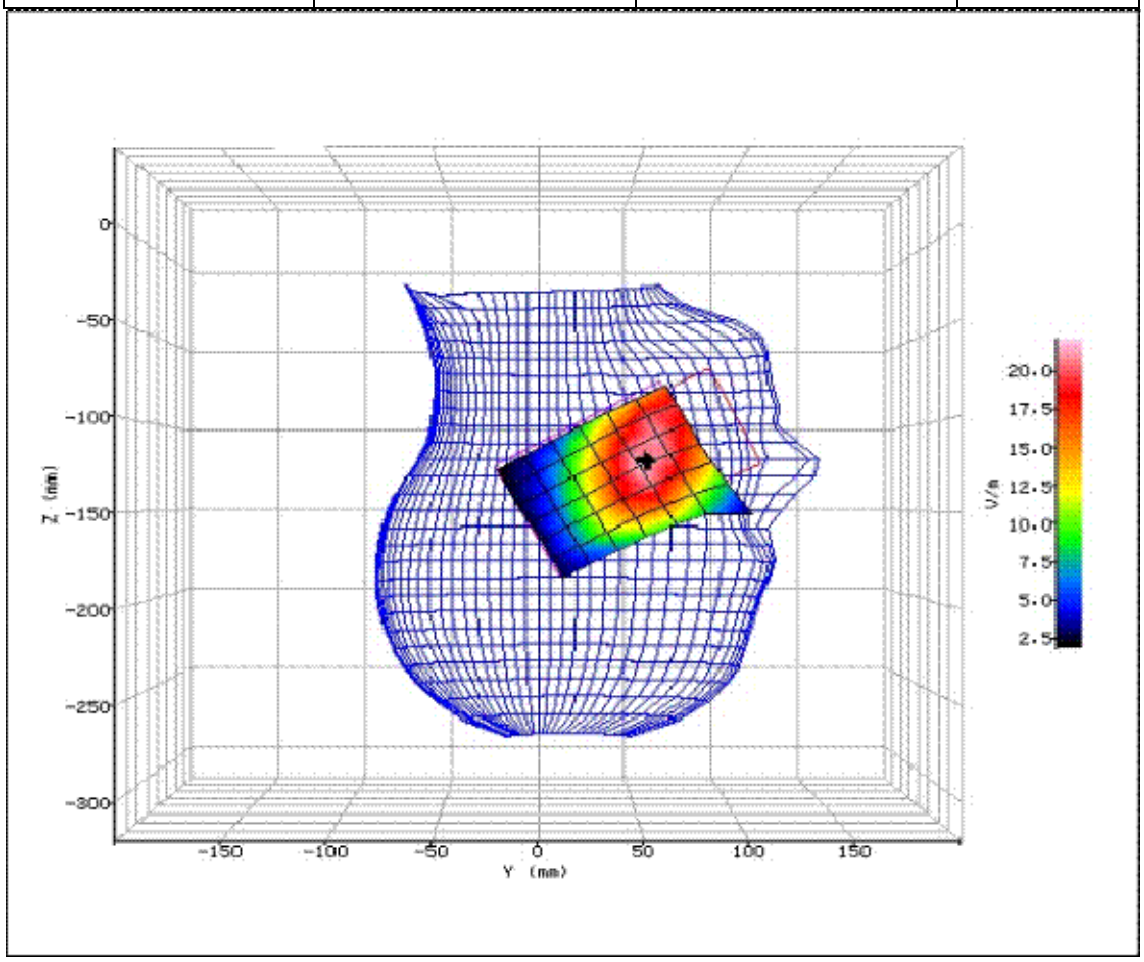

Figure 21: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-08:24:53	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	850 Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	43.43
RELATIVE HUMIDITY:	32.40%	CONDUCTIVITY:	0.918
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	48.60mm
DUT POSITION:	Right-15°	MAX SAR Z-AXIS LOCATION:	-129.70mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	17.273
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.30 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.297 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.290 W/kg
PROBE BATTERY LAST CHANGED:	17/11/2014	SAR DRIFT DURING SCAN:	-2.300 %

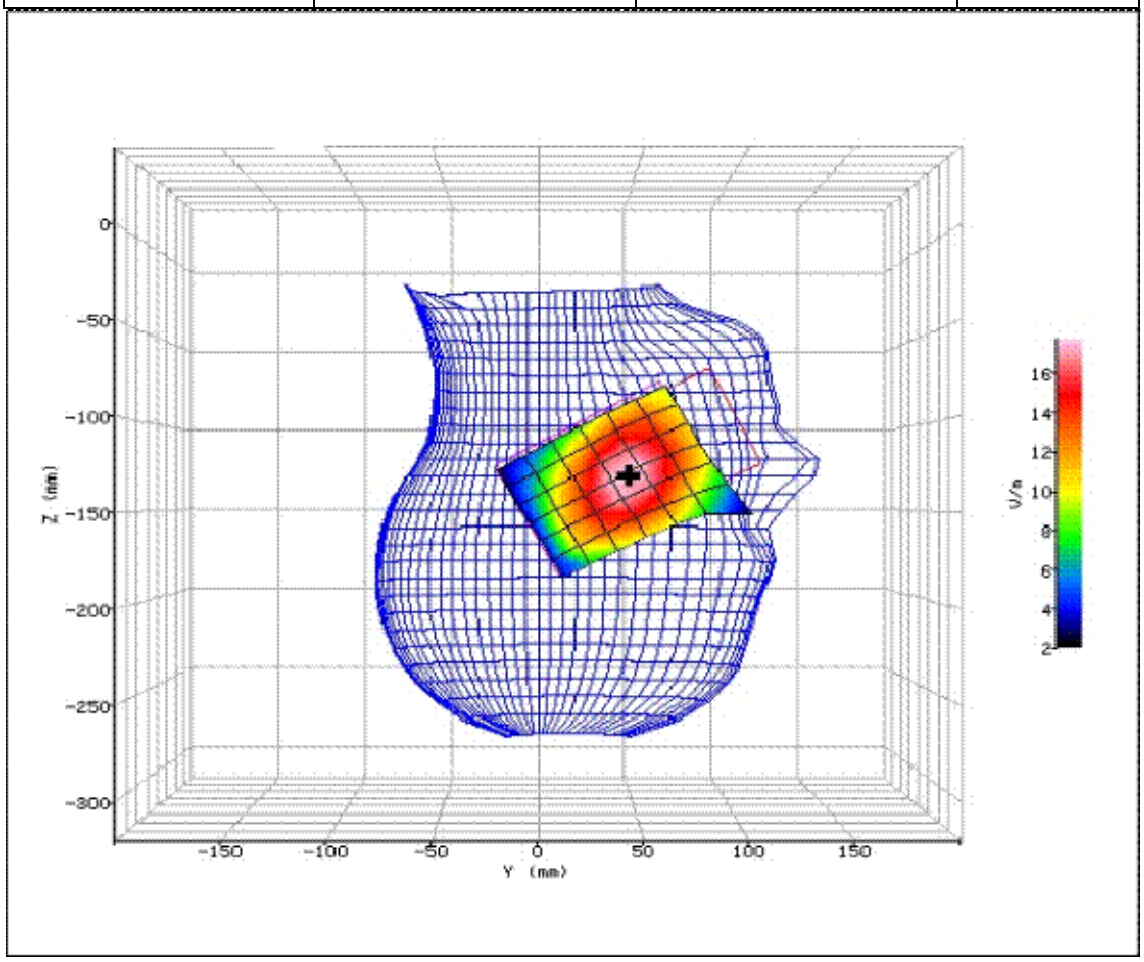

Figure 22: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.
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2.6 WCDMA FDDV BODY SAR TEST RESULTS AND COURSE AREA SCANS – 2D

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SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-12:47:17	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	21.20mm
DUT POSITION:	10mm-Front Facing	MAX SAR Y-AXIS LOCATION:	7.60mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	22.942
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.52 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.540 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.538 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-0.300 %

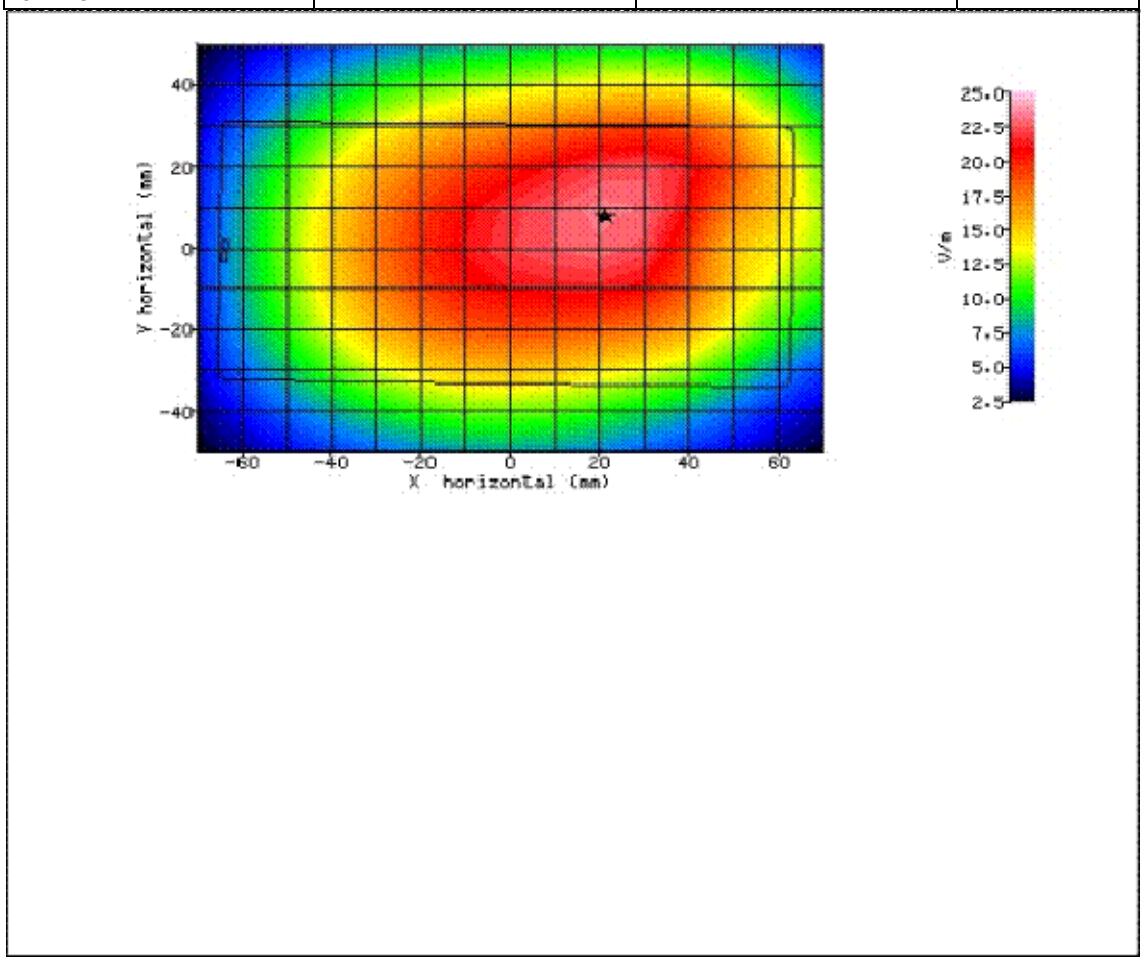

Figure 23: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-13:07:25	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	27.10mm
DUT POSITION:	10mm-Rear Facing	MAX SAR Y-AXIS LOCATION:	-10.80mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	25.740
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.67 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.691 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.685 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-0.900 %

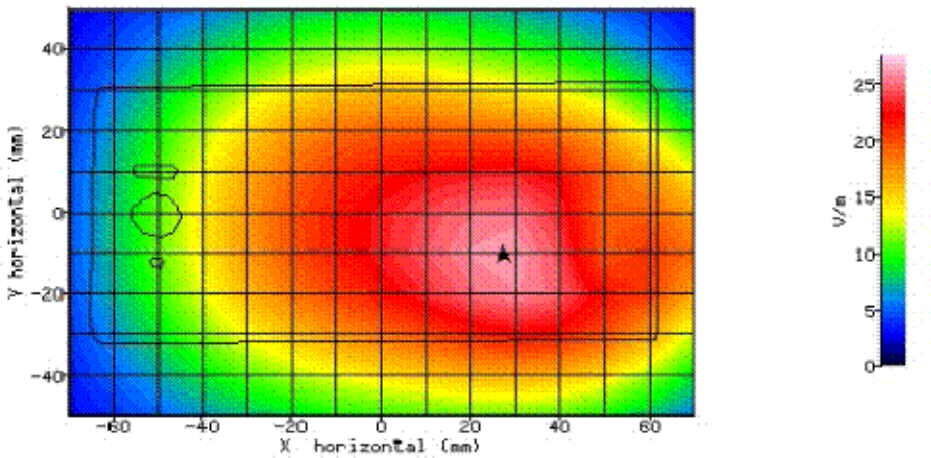

Figure 24: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-16:11:19	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	8.30mm
DUT POSITION:	10mm-Left Edge	MAX SAR Y-AXIS LOCATION:	1.40mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	20.219
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.41 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.437 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.432 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-1.200 %

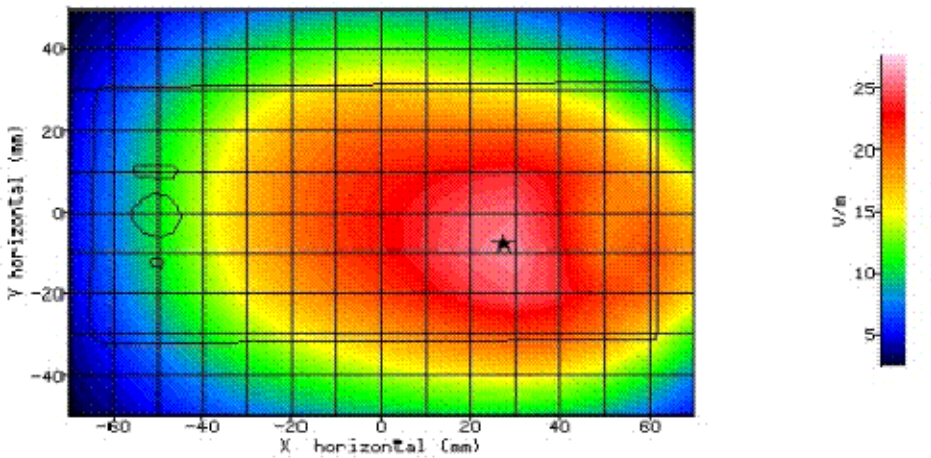

Figure 25: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-16:30:06	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	5.80mm
DUT POSITION:	10mm-Right Edge	MAX SAR Y-AXIS LOCATION:	3.10mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	19.485
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.38 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.407 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.407 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	0.400 %

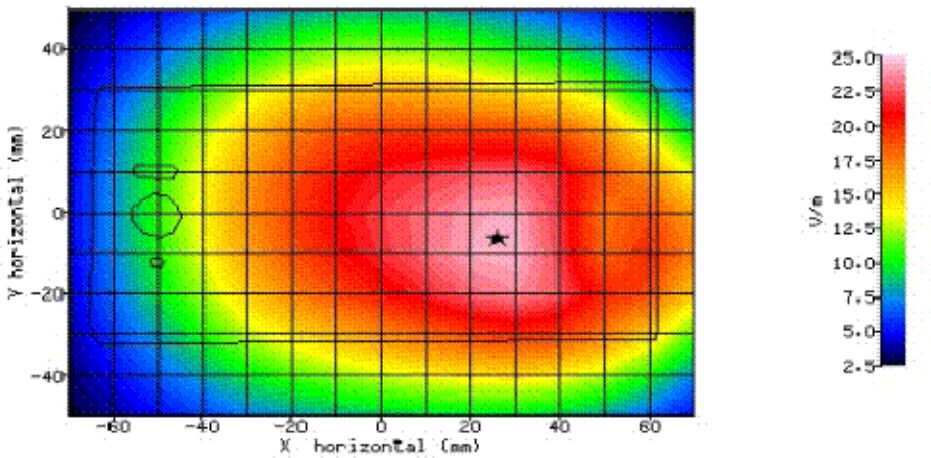

Figure 26: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-14:04:28	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	-5.50mm
DUT POSITION:	10mm-Bottom Edge	MAX SAR Y-AXIS LOCATION:	3.70mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	11.040
TEST FREQUENCY:	826.6MHz	SAR 1g:	0.15 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.161 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.158 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-1.500 %

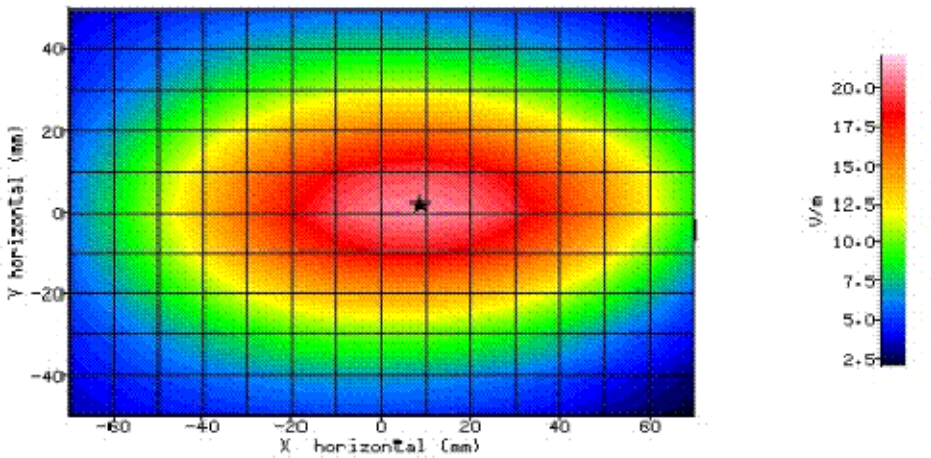

Figure 27: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 826.4MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-14:25:04	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	26.90mm
DUT POSITION:	10mm-Rear Facing	MAX SAR Y-AXIS LOCATION:	-8.40mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	25.260
TEST FREQUENCY:	835MHz	SAR 1g:	0.64 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.678 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.673 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-0.800 %

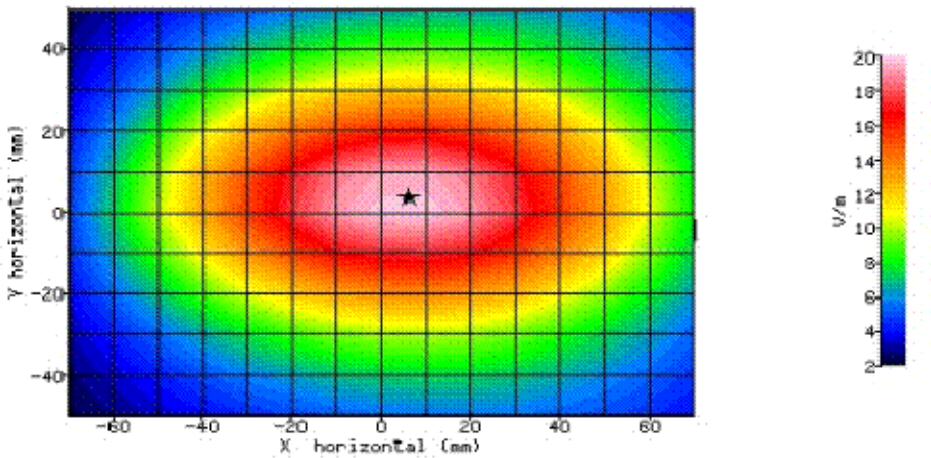

Figure 28: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 835MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	24/11/2014-15:10:40	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	850 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.91
RELATIVE HUMIDITY:	32.50%	CONDUCTIVITY:	0.999
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	25.90mm
DUT POSITION:	10mm-Rear Facing	MAX SAR Y-AXIS LOCATION:	-6.90mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	24.060
TEST FREQUENCY:	846.6MHz	SAR 1g:	0.57 W/kg
TYPE OF MODULATION:	QPSK (RMC Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.599 W/kg
INPUT POWER LEVEL:	24.2dBm	SAR END:	0.597 W/kg
PROBE BATTERY LAST CHANGED:	24/11/2014	SAR DRIFT DURING SCAN:	-0.300 %

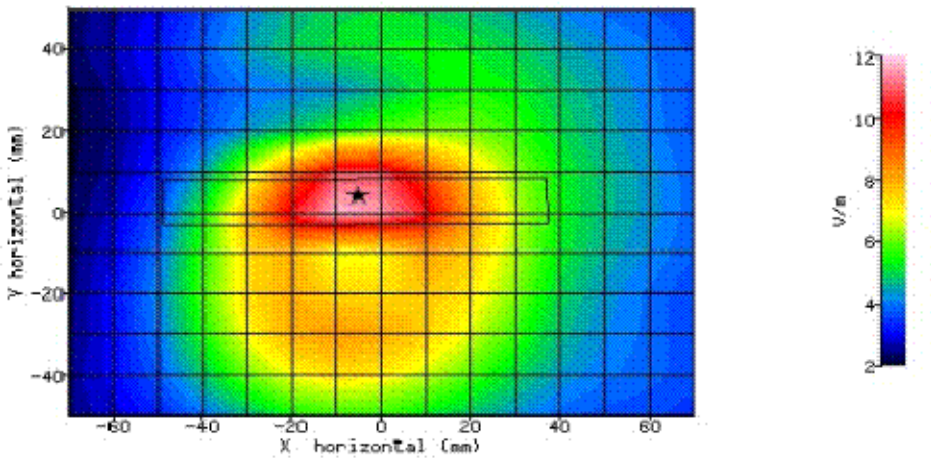

Figure 29: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 846.6MHz.

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2.7 LTE BAND 17 BODY SAR TEST RESULTS AND COURSE AREA SCANS – 2D

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	26/11/2014-08:58:15	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	23.80°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.20%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	35.40mm
DUT POSITION:	10mm-Front Facing	MAX SAR Y-AXIS LOCATION:	16.90mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	20.923
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.42 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.458 W/kg
INPUT POWER LEVEL:	24.5dBm	SAR END:	0.455 W/kg
PROBE BATTERY LAST CHANGED:	26/11/2014	SAR DRIFT DURING SCAN:	-0.800 %

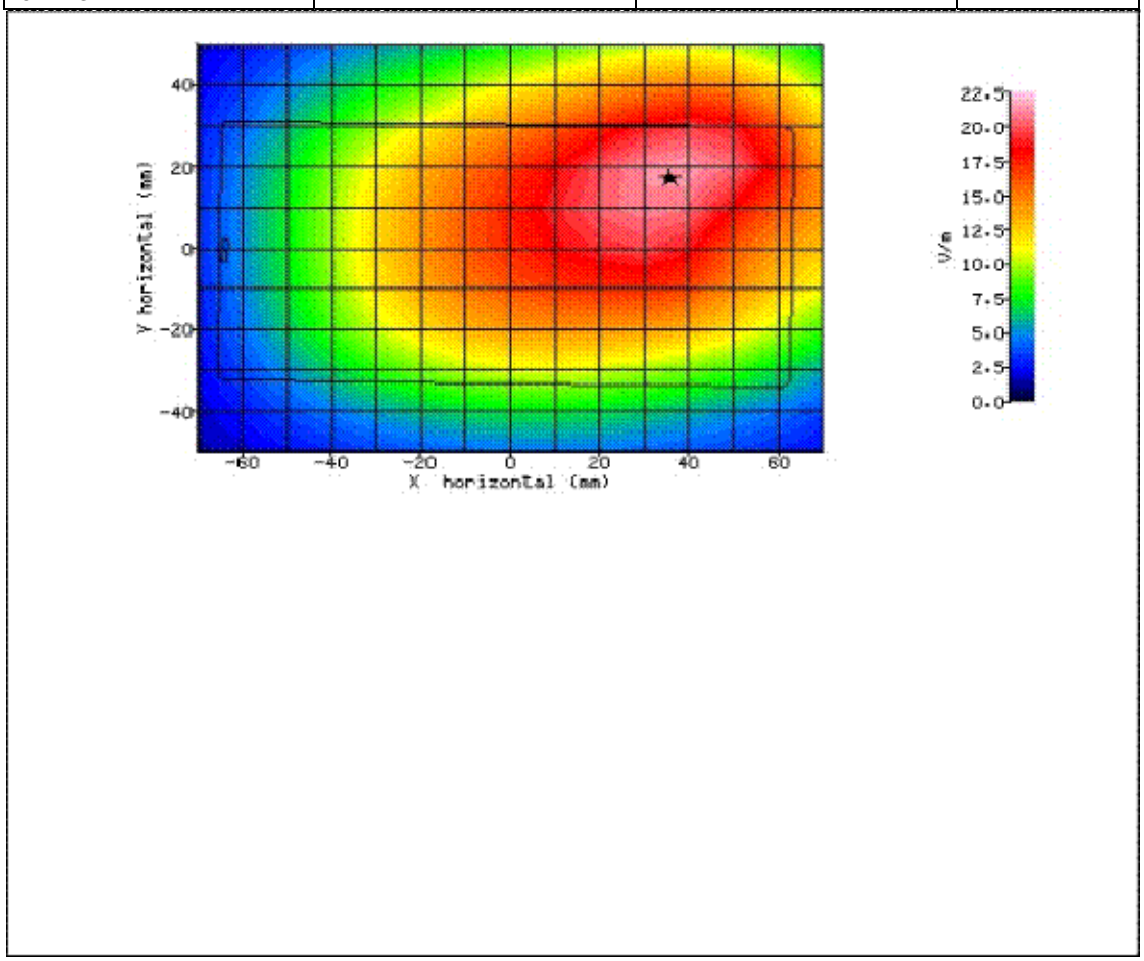

Figure 30: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	26/11/2014-10:00:38	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	23.80°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.20%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	29.20mm
DUT POSITION:	10mm-Rear Facing	MAX SAR Y-AXIS LOCATION:	-10.50mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	24.349
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.57 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.620 W/kg
INPUT POWER LEVEL:	24.5dBm	SAR END:	0.623 W/kg
PROBE BATTERY LAST CHANGED:	26/11/2014	SAR DRIFT DURING SCAN:	0.996 %

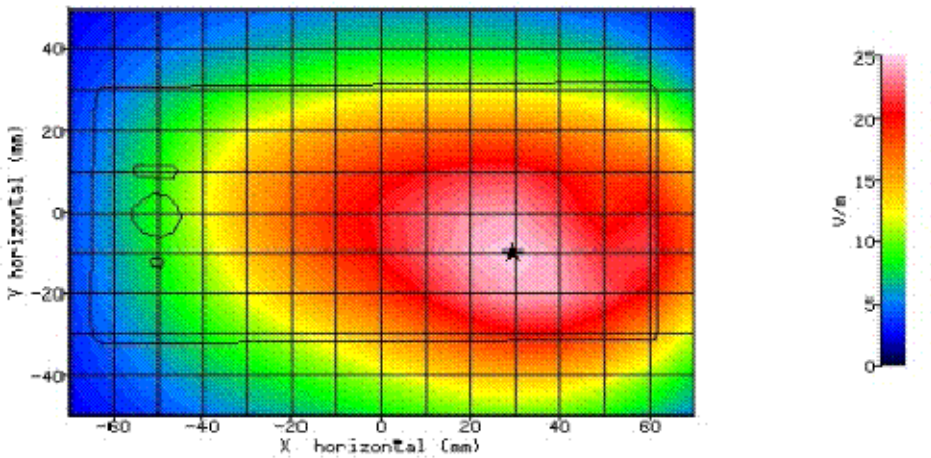

Figure 31: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-14:18:25	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.50%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	18.40mm
DUT POSITION:	10mm-Left Edge	MAX SAR Y-AXIS LOCATION:	2.20mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	15.831
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.25 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.269 W/kg
INPUT POWER LEVEL:	24.5dBm	SAR END:	0.266 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-1.200 %

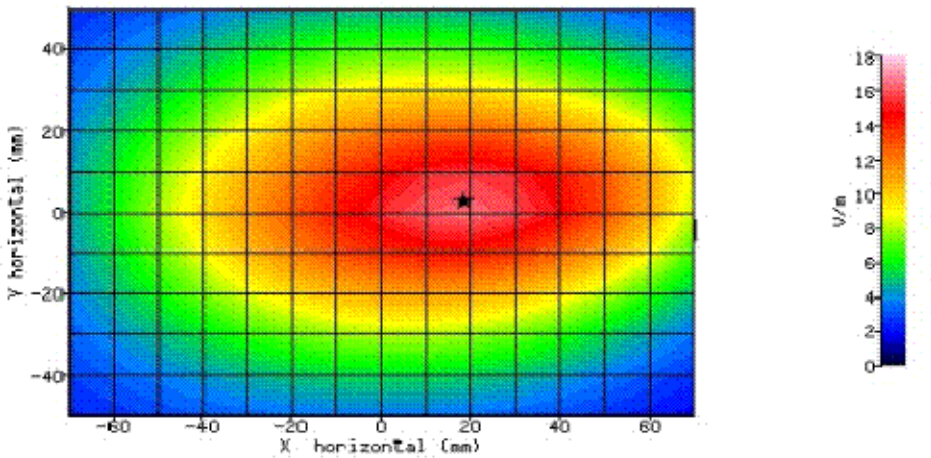

Figure 32: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-14:38:01	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.50%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	9.80mm
DUT POSITION:	10mm-Right Edge	MAX SAR Y-AXIS LOCATION:	12.60mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	12.210
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.15 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.157 W/kg
INPUT POWER LEVEL:	24.5dBm	SAR END:	0.157 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-0.400 %

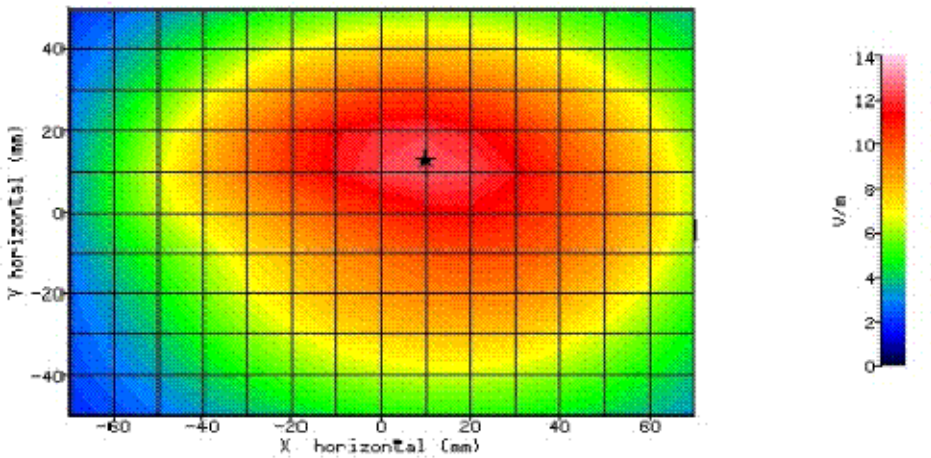

Figure 33: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-15:14:20	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.50%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	-1.40mm
DUT POSITION:	10mm-Bottom Edge	MAX SAR Y-AXIS LOCATION:	5.20mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	10.268
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.12 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.129 W/kg
INPUT POWER LEVEL:	24.5dBm	SAR END:	0.129 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	0.300 %

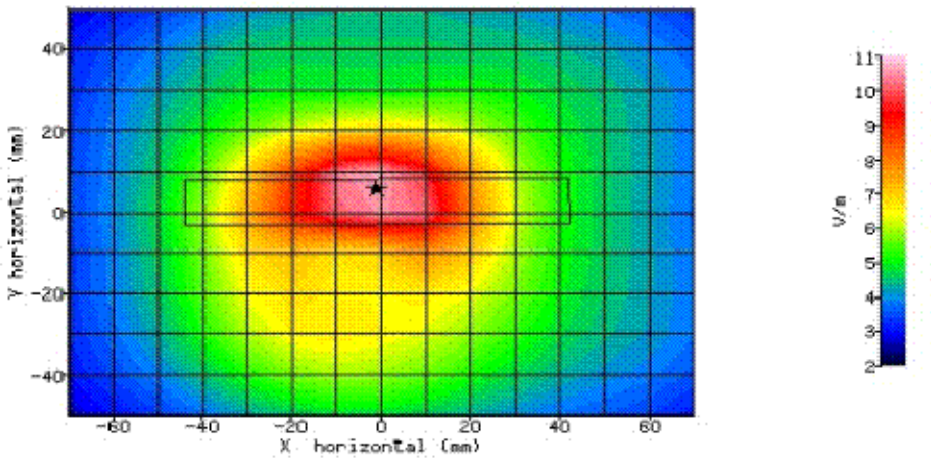

Figure 34: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.
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2.8 LTE BAND 17 BODY SAR TEST RESULTS AND COURSE AREA SCANS – 2D

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SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	26/11/2014-09:16:59	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	23.80°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.20%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	35.50mm
DUT POSITION:	10mm-Front Facing	MAX SAR Y-AXIS LOCATION:	16.60mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	18.871
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.34 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.372 W/kg
INPUT POWER LEVEL:	23.5dBm	SAR END:	0.370 W/kg
PROBE BATTERY LAST CHANGED:	26/11/2014	SAR DRIFT DURING SCAN:	-0.600 %

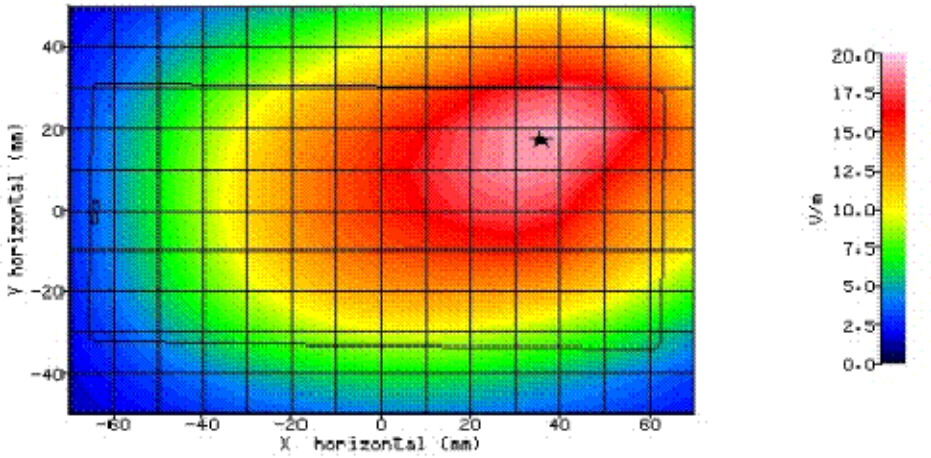

Figure 35: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	26/11/2014-10:19:56	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	23.80°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.20%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.00°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	29.70mm
DUT POSITION:	10mm-Rear Facing	MAX SAR Y-AXIS LOCATION:	-10.90mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	21.806
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.46 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.495 W/kg
INPUT POWER LEVEL:	23.5dBm	SAR END:	0.496 W/kg
PROBE BATTERY LAST CHANGED:	26/11/2014	SAR DRIFT DURING SCAN:	0.200 %

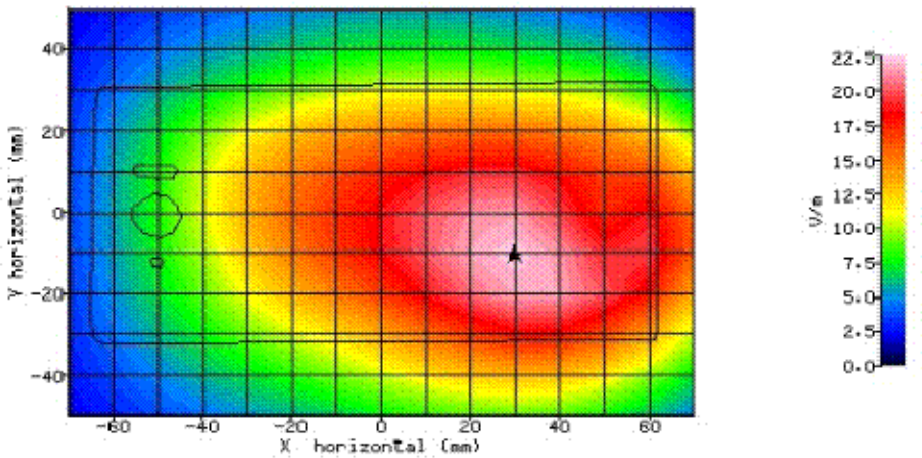

Figure 36: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-16:16:47	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.50%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	18.30mm
DUT POSITION:	10mm-Left Edge	MAX SAR Y-AXIS LOCATION:	3.00mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	14.610
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.21 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.227 W/kg
INPUT POWER LEVEL:	23.5dBm	SAR END:	0.226 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-0.700 %

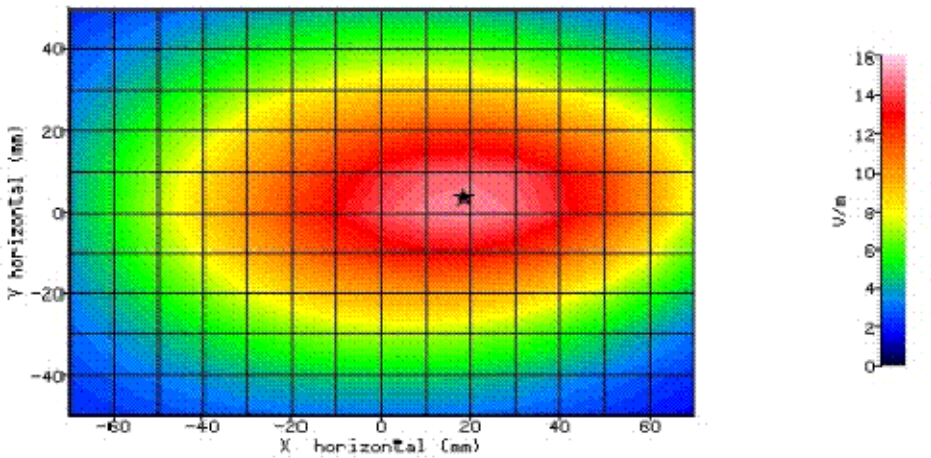

Figure 37: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-16:35:10	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.50%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	9.70mm
DUT POSITION:	10mm-Right Edge	MAX SAR Y-AXIS LOCATION:	13.50mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	11.079
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.12 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.130 W/kg
INPUT POWER LEVEL:	23.5dBm	SAR END:	0.132 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	1.500 %

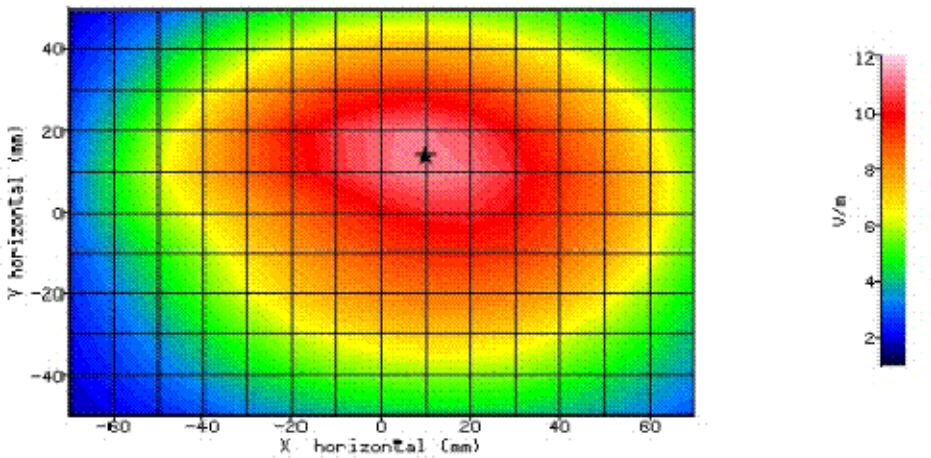

Figure 38: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-15:32:20	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.90°C	LIQUID SIMULANT:	700 Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	55.45
RELATIVE HUMIDITY:	34.50%	CONDUCTIVITY:	0.995
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	-1.50mm
DUT POSITION:	10mm-Bottom Edge	MAX SAR Y-AXIS LOCATION:	4.80mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	9.287
TEST FREQUENCY:	711.0MHz	SAR 1g:	0.10 W/kg
TYPE OF MODULATION:	QPSK (LTE)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.106 W/kg
INPUT POWER LEVEL:	23.5dBm	SAR END:	0.107 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	0.300 %

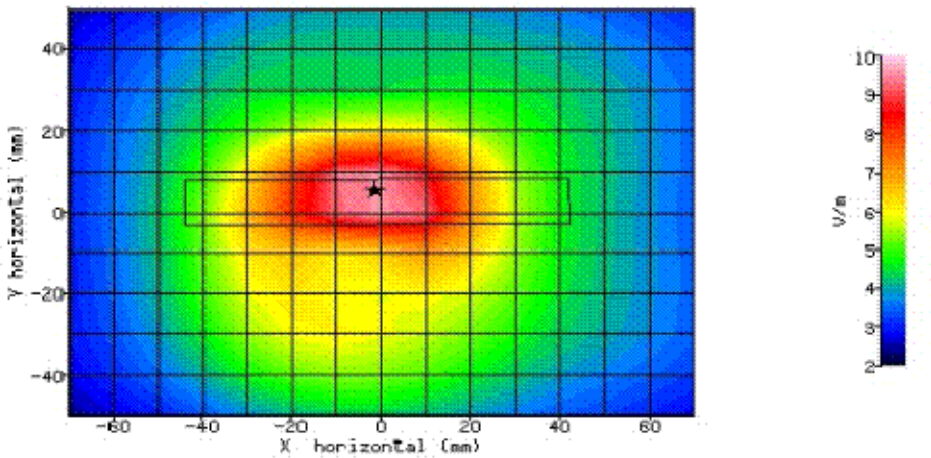

Figure 39: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 711.0MHz.

2.9 PCS 1900MHz HEAD SAR TEST RESULTS AND COURSE AREA SCANS – 2D

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-13:39:16	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	1900Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	41.41
RELATIVE HUMIDITY:	37.40%	CONDUCTIVITY:	1.456
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	58.90mm
DUT POSITION:	Left-Cheek	MAX SAR Z-AXIS LOCATION:	-103.40mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	14.277
TEST FREQUENCY:	1880MHz	SAR 1g:	0.37 W/kg
TYPE OF MODULATION:	GMSK (Voice Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	12.5%	SAR START:	0.359 W/kg
INPUT POWER LEVEL:	30.5dBm	SAR END:	0.347 W/kg
PROBE BATTERY LAST CHANGED:	18/11/2014	SAR DRIFT DURING SCAN:	-3.300 %

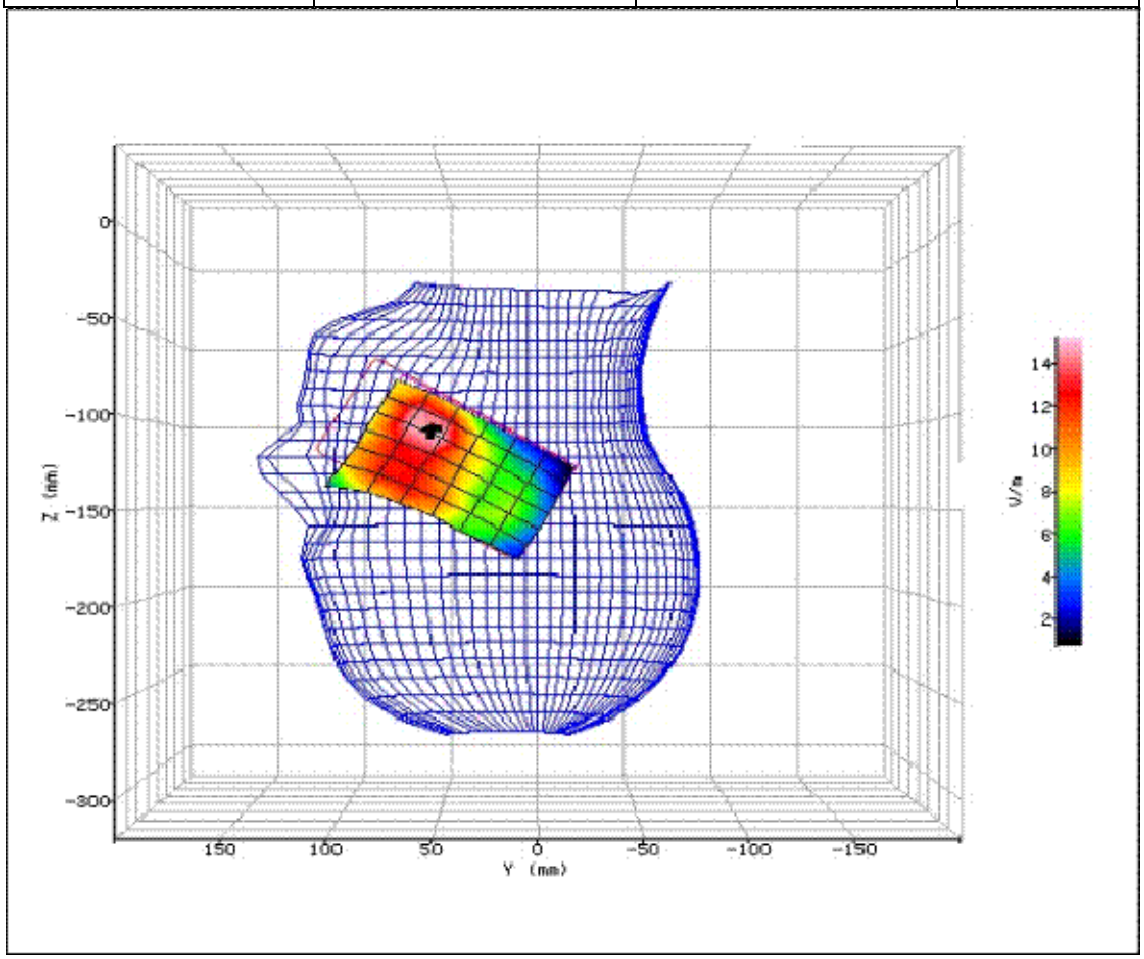

Figure 40: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 1880MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-14:04:44	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	1900Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	41.41
RELATIVE HUMIDITY:	37.40%	CONDUCTIVITY:	1.456
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	15.40mm
DUT POSITION:	Left-15°	MAX SAR Z-AXIS LOCATION:	-143.20mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	8.166
TEST FREQUENCY:	1880MHz	SAR 1g:	0.18 W/kg
TYPE OF MODULATION:	GMSK (Voice Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	12.5%	SAR START:	0.137 W/kg
INPUT POWER LEVEL:	30.5dBm	SAR END:	0.128 W/kg
PROBE BATTERY LAST CHANGED:	18/11/2014	SAR DRIFT DURING SCAN:	-6.800 %

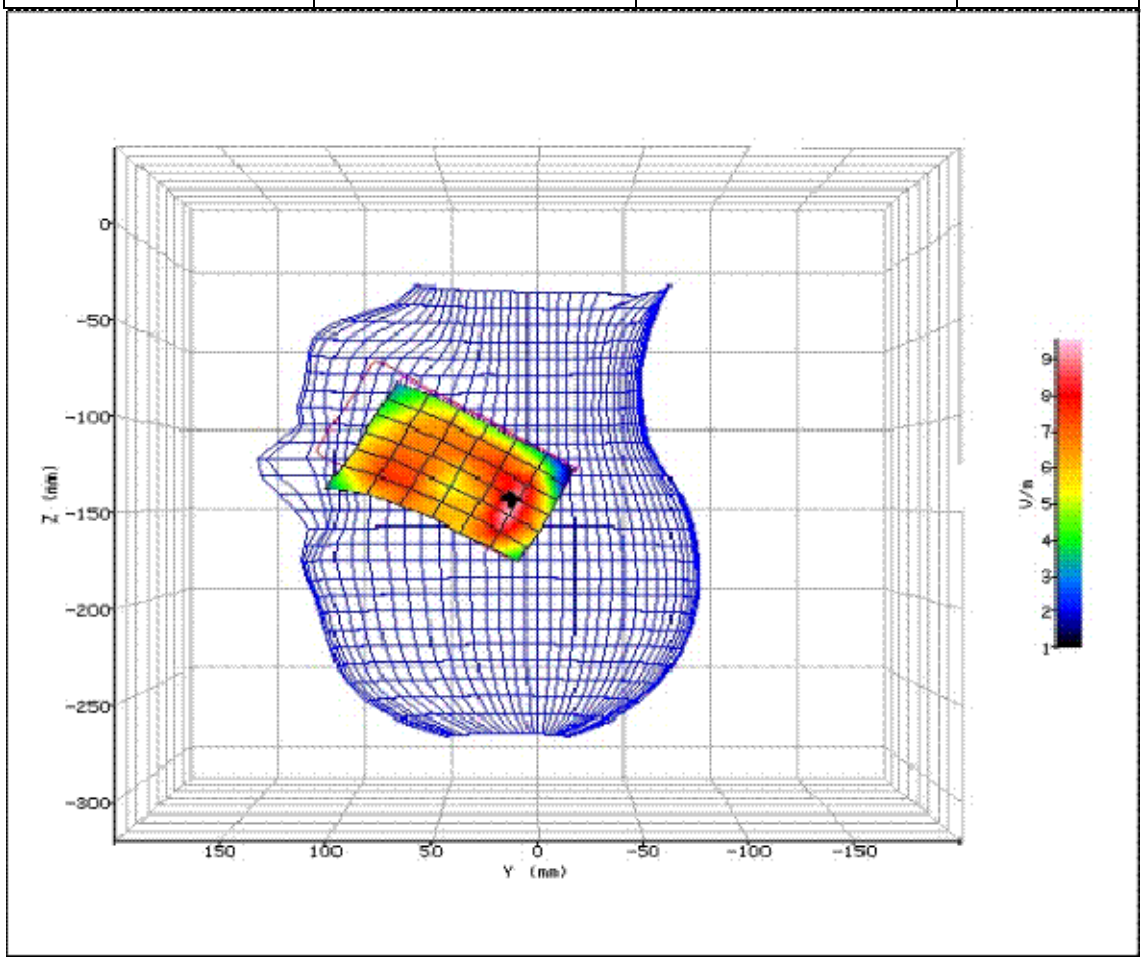

Figure 41: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 1880MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-14:52:41	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	1900Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	41.41
RELATIVE HUMIDITY:	37.40%	CONDUCTIVITY:	1.456
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	63.00mm
DUT POSITION:	Right-Cheek	MAX SAR Z-AXIS LOCATION:	-100.90mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	18.861
TEST FREQUENCY:	1880MHz	SAR 1g:	0.57 W/kg
TYPE OF MODULATION:	GMSK (Voice Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	12.5%	SAR START:	0.565 W/kg
INPUT POWER LEVEL:	30.5dBm	SAR END:	0.601 W/kg
PROBE BATTERY LAST CHANGED:	18/11/2014	SAR DRIFT DURING SCAN:	6.400 %

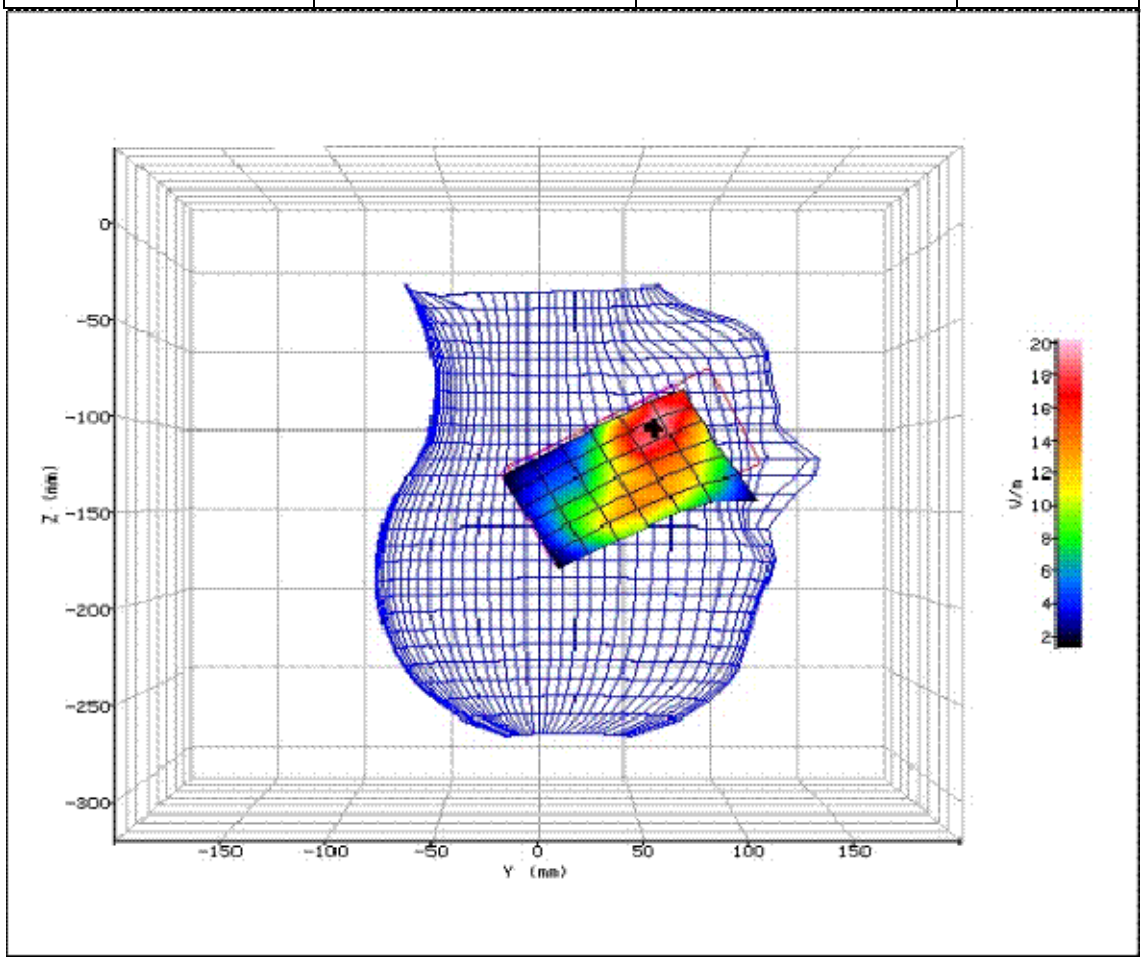

Figure 42: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 1880MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-15:18:40	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	1900Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	41.41
RELATIVE HUMIDITY:	37.40%	CONDUCTIVITY:	1.456
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	35.80mm
DUT POSITION:	Right-15°	MAX SAR Z-AXIS LOCATION:	-155.60mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	11.312
TEST FREQUENCY:	1880MHz	SAR 1g:	0.22 W/kg
TYPE OF MODULATION:	GMSK (Voice Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	12.5%	SAR START:	0.238 W/kg
INPUT POWER LEVEL:	30.5dBm	SAR END:	0.233 W/kg
PROBE BATTERY LAST CHANGED:	18/11/2014	SAR DRIFT DURING SCAN:	-2.000 %

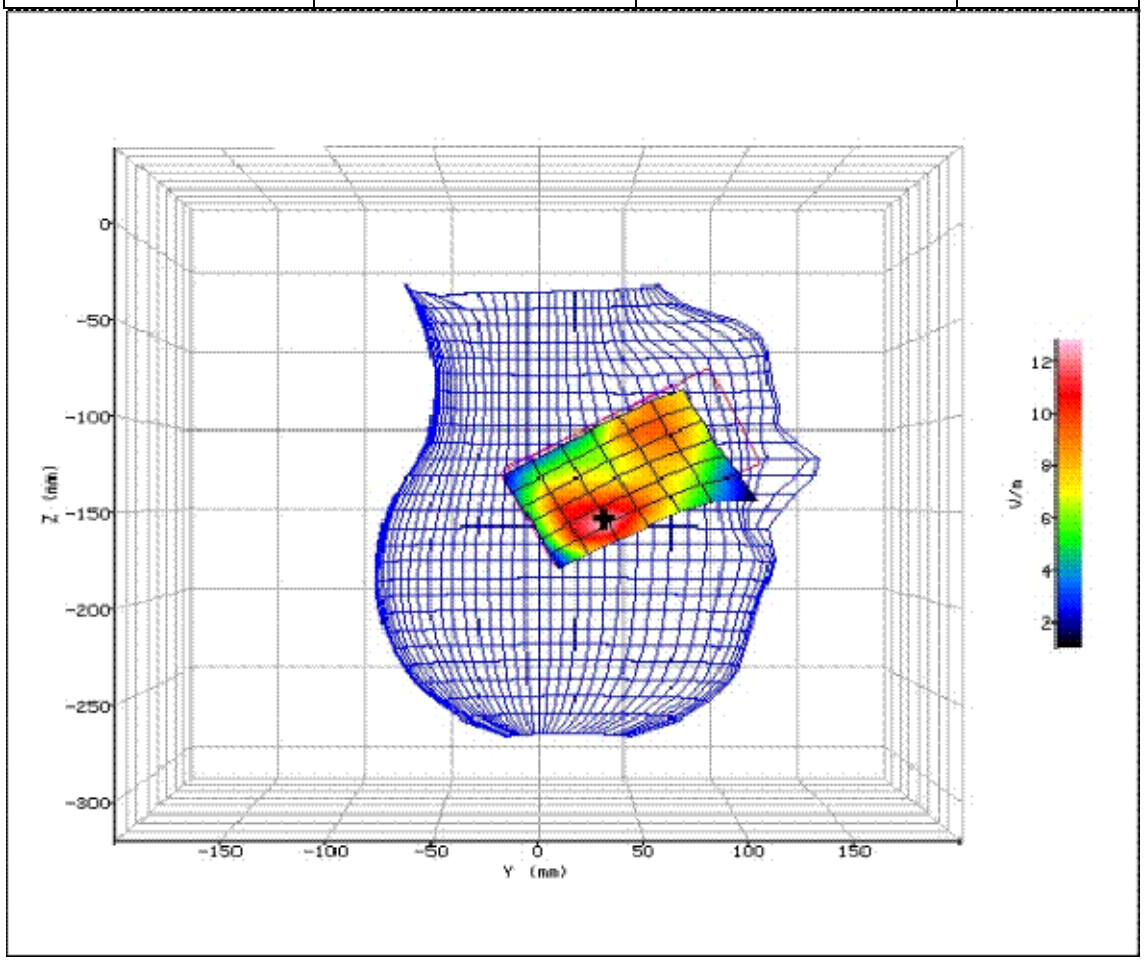

Figure 43: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 1880MHz..

2.10 PCS 1900MHz HEAD SAR TEST RESULTS AND COURSE AREA SCANS – 2D

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-17:17:29	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	1900Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	41.41
RELATIVE HUMIDITY:	37.40%	CONDUCTIVITY:	1.456
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	58.40mm
DUT POSITION:	Left-Cheek	MAX SAR Z-AXIS LOCATION:	-102.30mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	13.973
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.35 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.345 W/kg
INPUT POWER LEVEL:	24.9dBm	SAR END:	0.329 W/kg
PROBE BATTERY LAST CHANGED:	18/11/2014	SAR DRIFT DURING SCAN:	-4.700 %

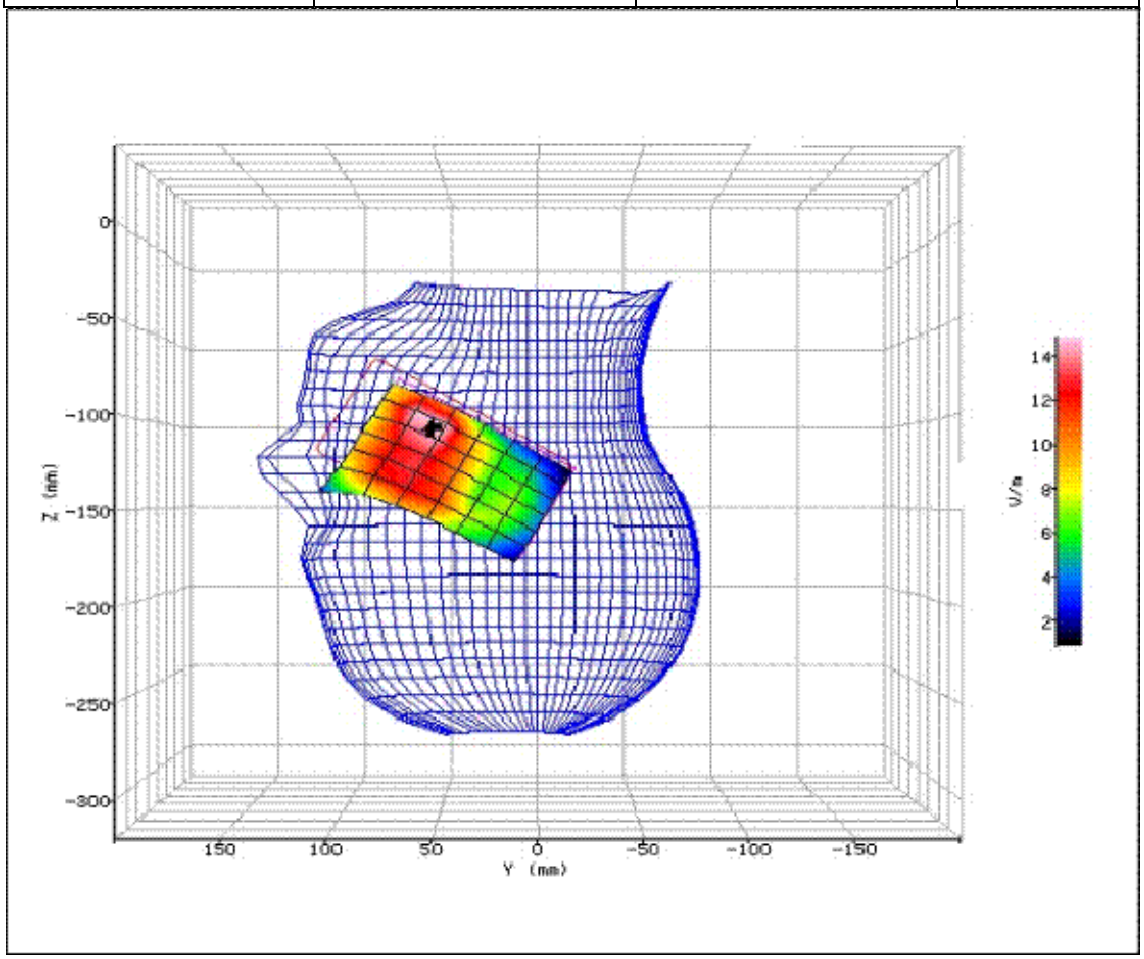

Figure 44: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 1909.8MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-17:42:55	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	1900Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	41.41
RELATIVE HUMIDITY:	37.40%	CONDUCTIVITY:	1.456
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	13.80mm
DUT POSITION:	Left-15°	MAX SAR Z-AXIS LOCATION:	-140.20mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	8.051
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.15 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.128 W/kg
INPUT POWER LEVEL:	24.9dBm	SAR END:	0.127 W/kg
PROBE BATTERY LAST CHANGED:	18/11/2014	SAR DRIFT DURING SCAN:	-1.000 %

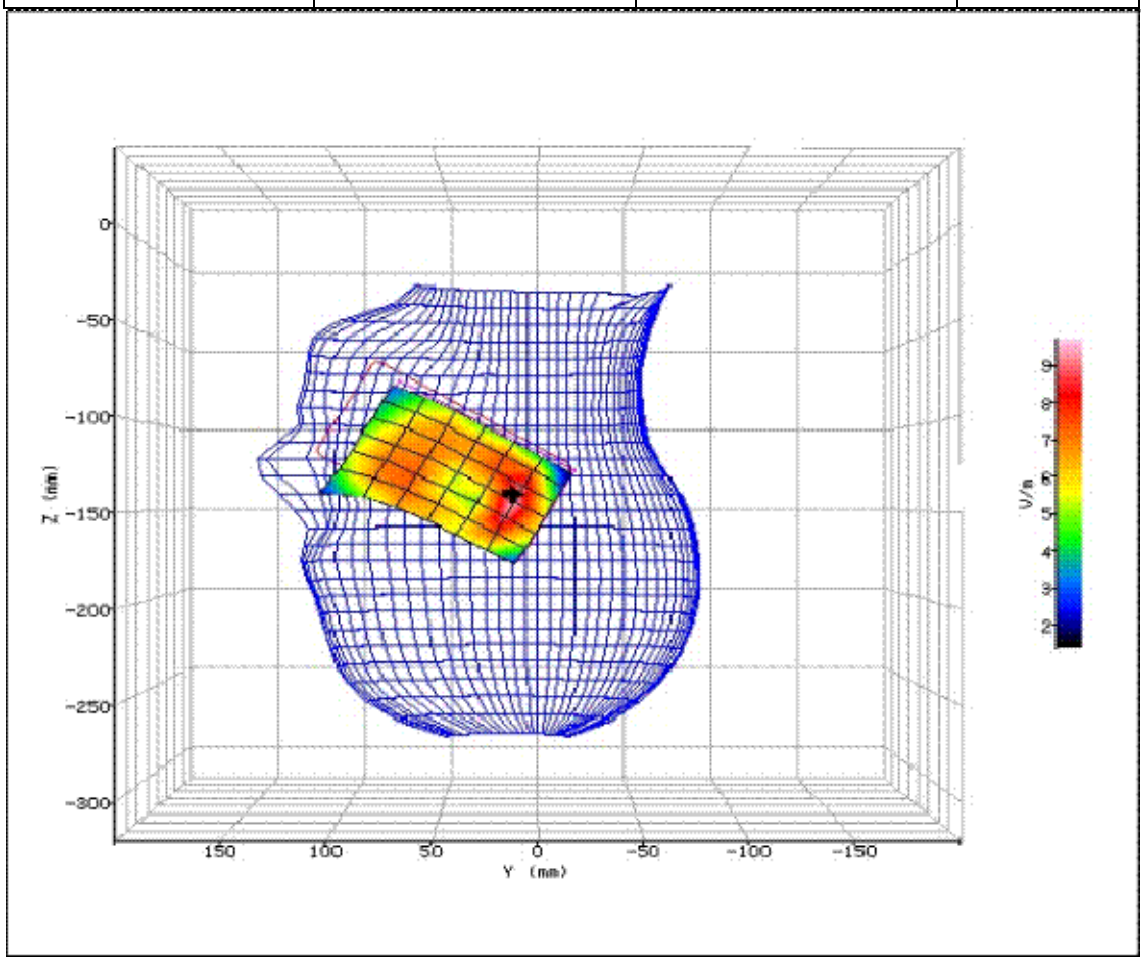

Figure 45: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 1909.8MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-16:04:26	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	1900Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	41.41
RELATIVE HUMIDITY:	37.40%	CONDUCTIVITY:	1.456
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	63.00mm
DUT POSITION:	Right-Cheek	MAX SAR Z-AXIS LOCATION:	-100.90mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	18.757
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.53 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.606 W/kg
INPUT POWER LEVEL:	24.9dBm	SAR END:	0.593 W/kg
PROBE BATTERY LAST CHANGED:	18/11/2014	SAR DRIFT DURING SCAN:	-2.100 %

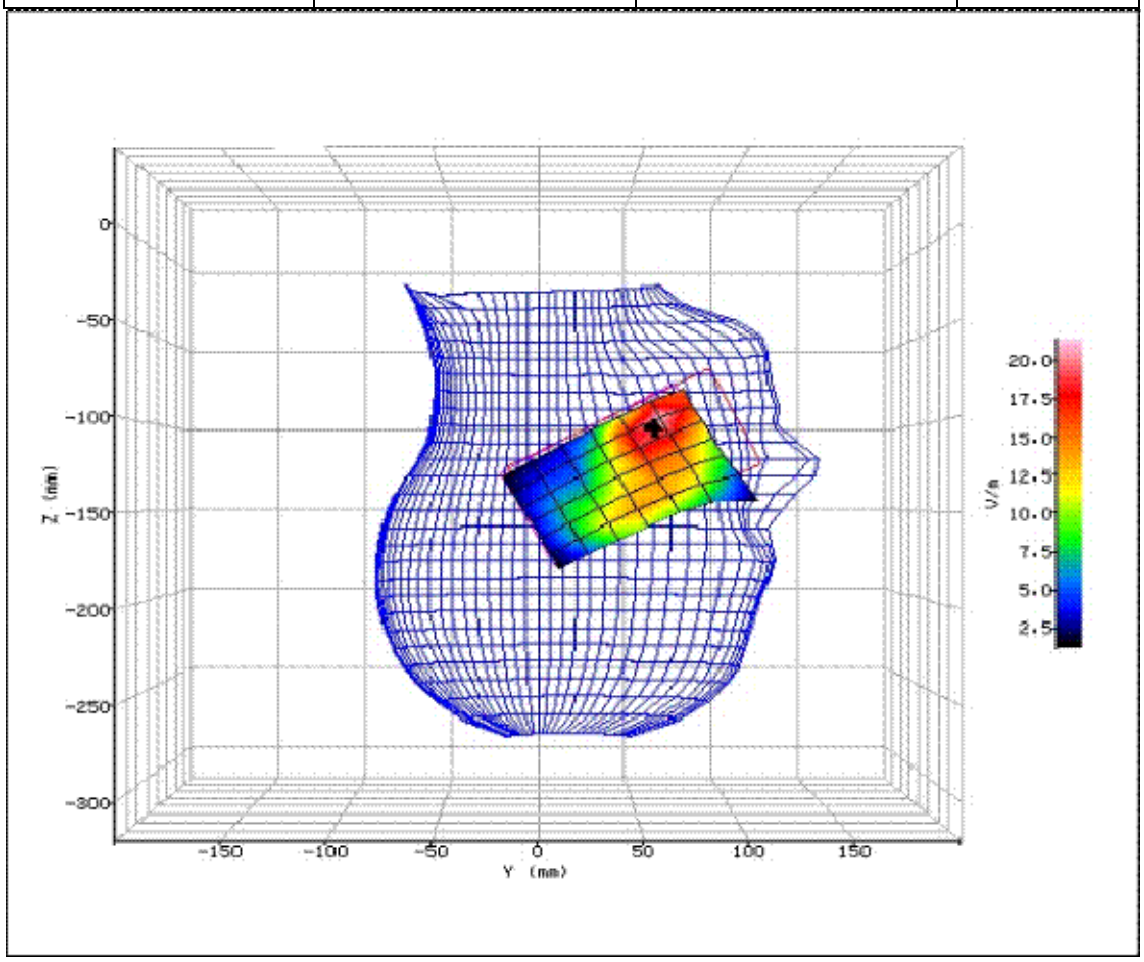

Figure 46: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 1909.8MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	18/11/2014-16:29:10	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	1900Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	41.41
RELATIVE HUMIDITY:	37.40%	CONDUCTIVITY:	1.456
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	23.10°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	35.00mm
DUT POSITION:	Right-15°	MAX SAR Z-AXIS LOCATION:	-156.00mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	10.865
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.19 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.217 W/kg
INPUT POWER LEVEL:	24.9dBm	SAR END:	0.212 W/kg
PROBE BATTERY LAST CHANGED:	18/11/2014	SAR DRIFT DURING SCAN:	-2.200 %

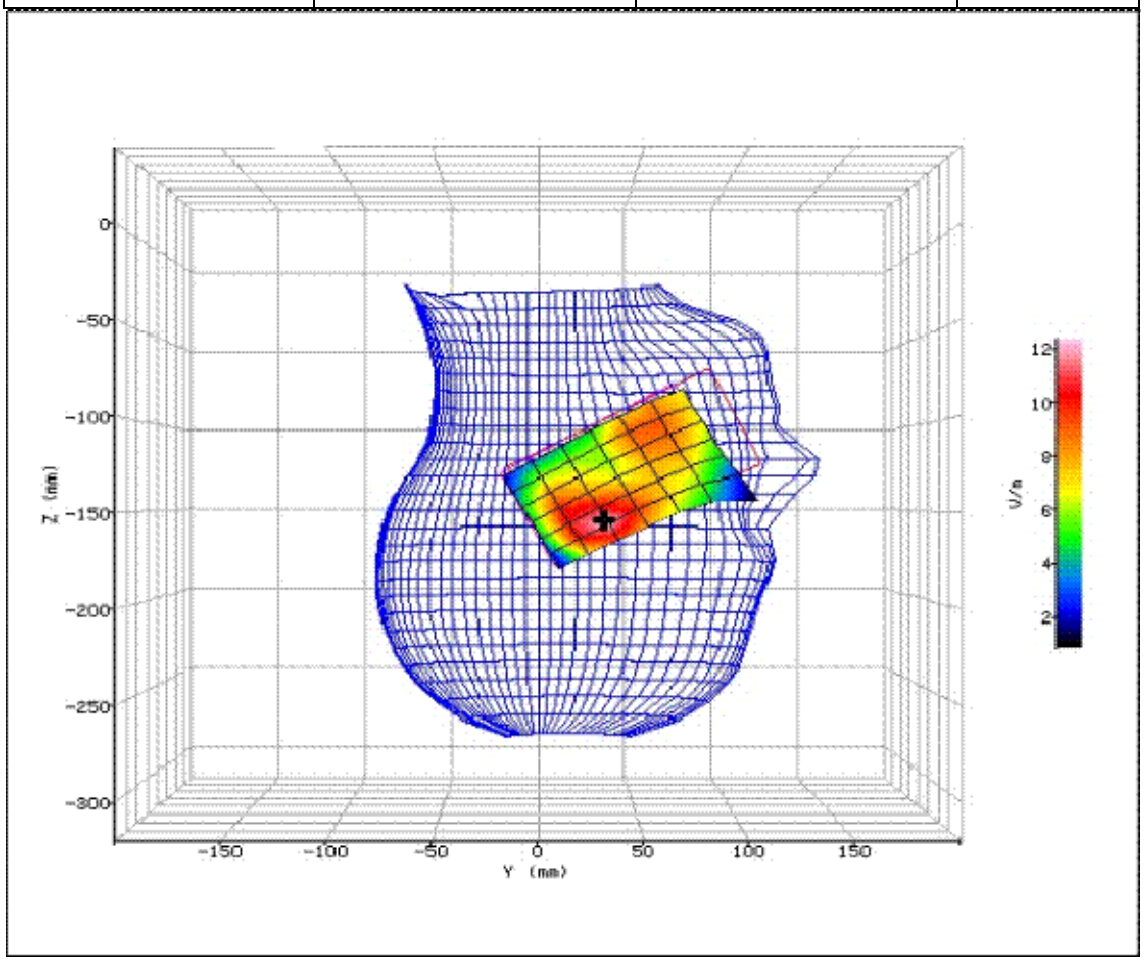

Figure 47: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 1909.8MHz.
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Product Service

2.11 PCS 1900MHz BODY SAR TEST RESULTS AND COURSE AREA SCANS – 2D

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-08:26:11	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	23.10°C	LIQUID SIMULANT:	1900Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	52.80
RELATIVE HUMIDITY:	23.40%	CONDUCTIVITY:	1.590
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	1.59°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	34.80mm
DUT POSITION:	10mm-Front Facing	MAX SAR Y-AXIS LOCATION:	3.20mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	18.051
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.50 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.542 W/kg
INPUT POWER LEVEL:	24.9dBm	SAR END:	0.525 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-3.200 %

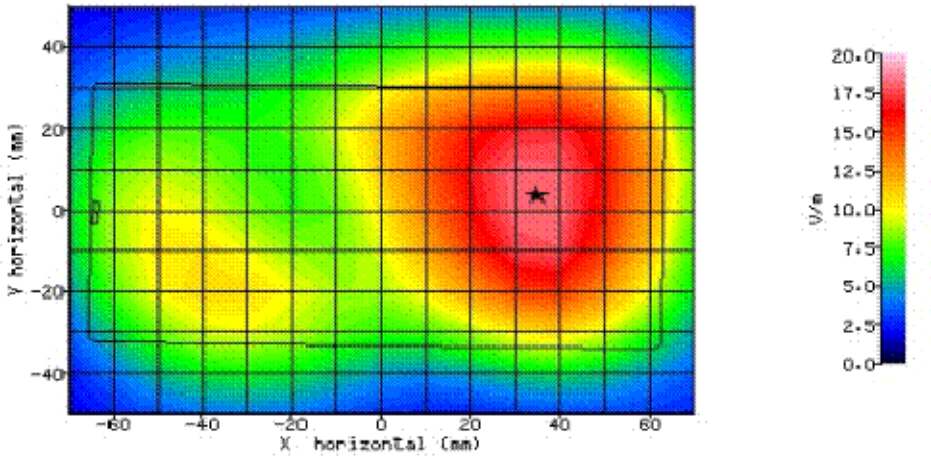

Figure 48: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 1909.8MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-08:50:03	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	23.10°C	LIQUID SIMULANT:	1900Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	52.80
RELATIVE HUMIDITY:	23.40%	CONDUCTIVITY:	1.590
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	1.59°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	36.50mm
DUT POSITION:	10mm-Rear Facing	MAX SAR Y-AXIS LOCATION:	-5.20mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	17.902
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.51 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.549 W/kg
INPUT POWER LEVEL:	24.9dBm	SAR END:	0.530 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-3.400 %

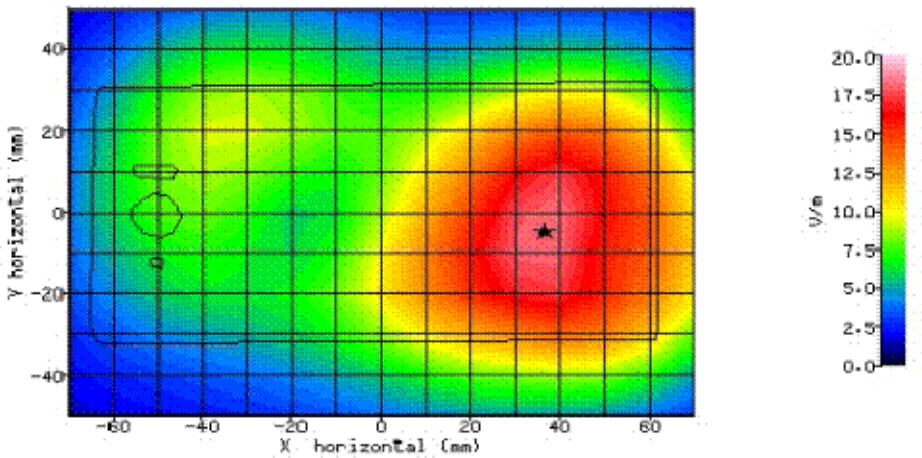

Figure 49: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 1909.8MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-07:24:33	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	23.10°C	LIQUID SIMULANT:	1900Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	52.80
RELATIVE HUMIDITY:	23.40%	CONDUCTIVITY:	1.590
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	1.59°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	43.30mm
DUT POSITION:	10mm-Left Edge	MAX SAR Y-AXIS LOCATION:	7.60mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	12.795
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.28 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.307 W/kg
INPUT POWER LEVEL:	24.9dBm	SAR END:	0.301 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-1.800 %

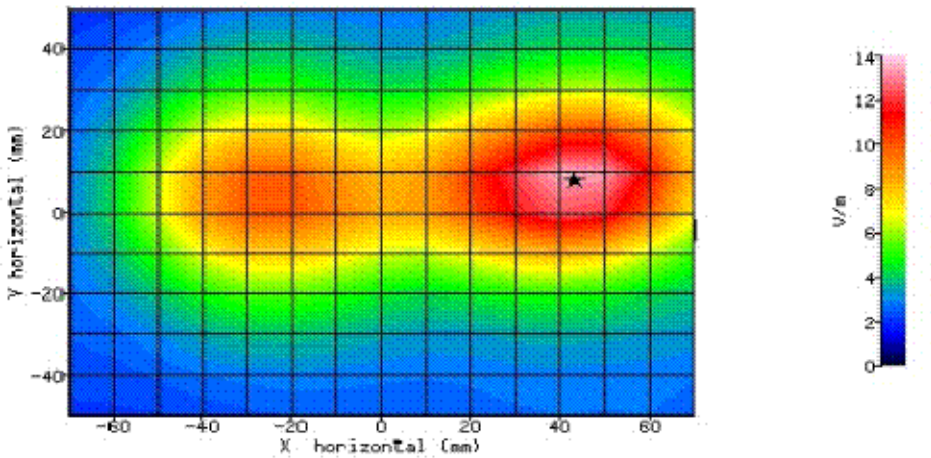

Figure 50: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 1909.8MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-07:44:52	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	23.10°C	LIQUID SIMULANT:	1900Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	52.80
RELATIVE HUMIDITY:	23.40%	CONDUCTIVITY:	1.590
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	1.59°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	6.00mm
DUT POSITION:	10mm-Bottom Edge	MAX SAR Y-AXIS LOCATION:	2.60mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	12.524
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.26 W/kg
TYPE OF MODULATION:	GMSK (GPRS Mode)	SAR 10g:	N/A
MODN. DUTY CYCLE:	50%	SAR START:	0.290 W/kg
INPUT POWER LEVEL:	24.9dBm	SAR END:	0.291 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	0.400 %

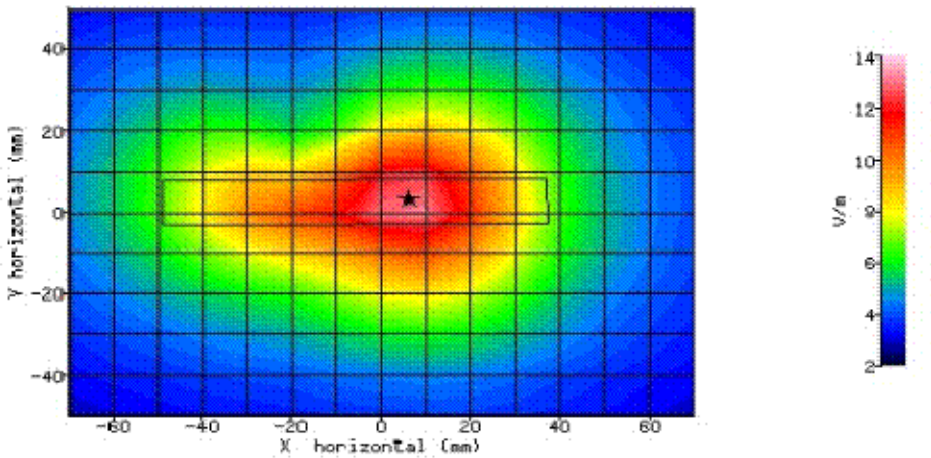

Figure 51: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 1909.8MHz..

2.12 WLAN 2450MHz HEAD SAR TEST RESULTS AND COURSE AREA SCANS – 2D

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	19/11/2014-08:07:55	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.70°C	LIQUID SIMULANT:	2450Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	37.88
RELATIVE HUMIDITY:	33.10%	CONDUCTIVITY:	1.780
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	22.90°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	32.60mm
DUT POSITION:	Left-Cheek	MAX SAR Z-AXIS LOCATION:	-175.30mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	8.771
TEST FREQUENCY:	2462.0MHz	SAR 1g:	0.22 W/kg
TYPE OF MODULATION:	WLAN (DSSS)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.218 W/kg
INPUT POWER LEVEL:	17dBm	SAR END:	0.229 W/kg
PROBE BATTERY LAST CHANGED:	19/11/2014	SAR DRIFT DURING SCAN:	5.000 %

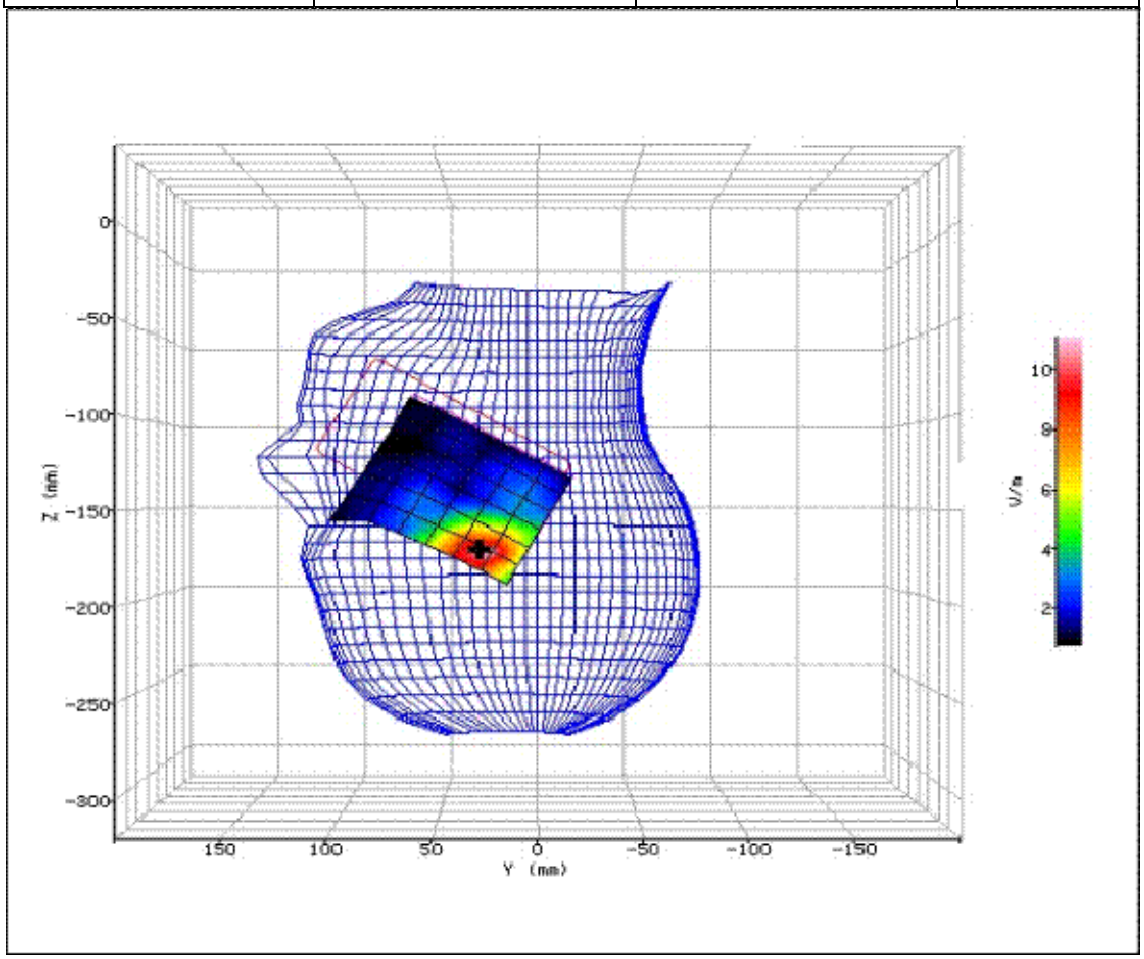

Figure 52: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 2462.0MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	19/11/2014-08:34:18	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.70°C	LIQUID SIMULANT:	2450Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	37.88
RELATIVE HUMIDITY:	33.10%	CONDUCTIVITY:	1.780
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	22.90°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	29.40mm
DUT POSITION:	Left-15°	MAX SAR Z-AXIS LOCATION:	-176.30mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	7.529
TEST FREQUENCY:	2462.0MHz	SAR 1g:	0.17 W/kg
TYPE OF MODULATION:	WLAN (DSSS)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.170 W/kg
INPUT POWER LEVEL:	17dBm	SAR END:	0.164 W/kg
PROBE BATTERY LAST CHANGED:	19/11/2014	SAR DRIFT DURING SCAN:	-3.200 %

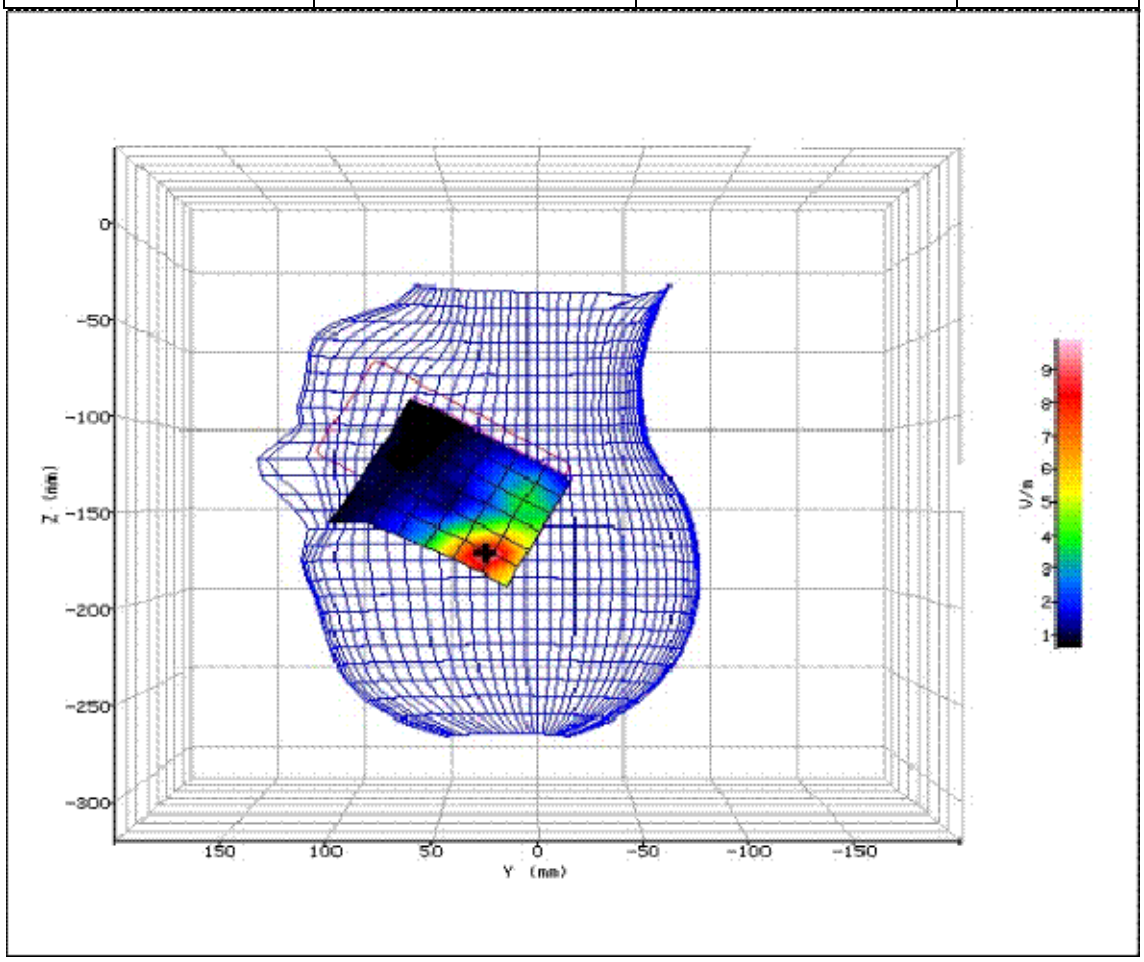

Figure 53: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 2462.0MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	19/11/2014-10:05:16	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.70°C	LIQUID SIMULANT:	2450Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	37.88
RELATIVE HUMIDITY:	33.10%	CONDUCTIVITY:	1.780
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	22.90°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	1.80mm
DUT POSITION:	Right-Cheek	MAX SAR Z-AXIS LOCATION:	-123.10mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	5.531
TEST FREQUENCY:	2462.0MHz	SAR 1g:	0.09 W/kg
TYPE OF MODULATION:	WLAN (DSSS)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.077 W/kg
INPUT POWER LEVEL:	17dBm	SAR END:	0.081 W/kg
PROBE BATTERY LAST CHANGED:	19/11/2014	SAR DRIFT DURING SCAN:	5.500 %

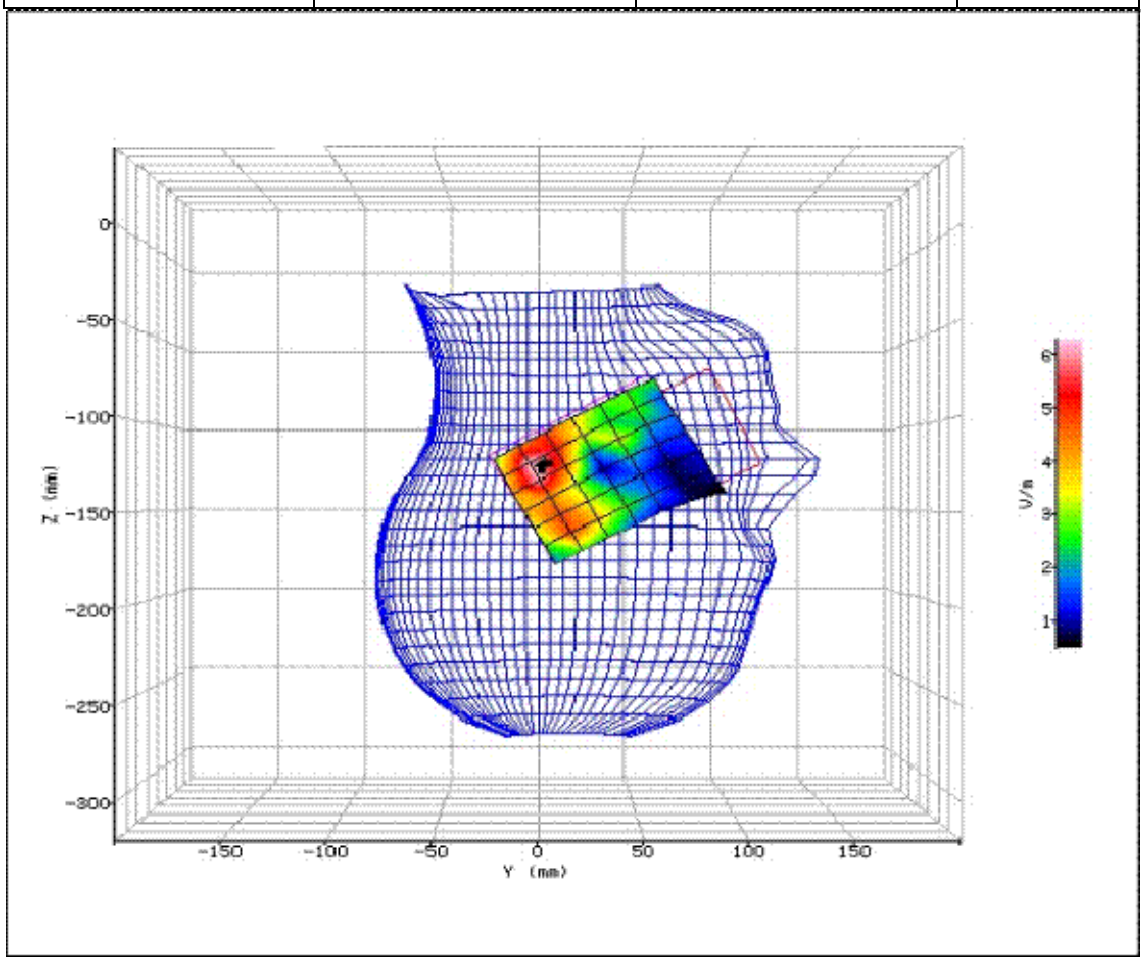

Figure 54: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 2462.0MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	19/11/2014-10:32:36	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.70°C	LIQUID SIMULANT:	2450Head
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	37.88
RELATIVE HUMIDITY:	33.10%	CONDUCTIVITY:	1.780
PHANTOM S/NO:	IXB-040	LIQUID TEMPERATURE:	22.90°C
PHANTOM ROTATION:	N/A	MAX SAR Y-AXIS LOCATION:	0.60mm
DUT POSITION:	Right-15°	MAX SAR Z-AXIS LOCATION:	-124.40mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	4.923
TEST FREQUENCY:	2462.0MHz	SAR 1g:	0.08 W/kg
TYPE OF MODULATION:	WLAN (DSSS)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.069 W/kg
INPUT POWER LEVEL:	17dBm	SAR END:	0.065 W/kg
PROBE BATTERY LAST CHANGED:	19/11/2014	SAR DRIFT DURING SCAN:	-5.000 %

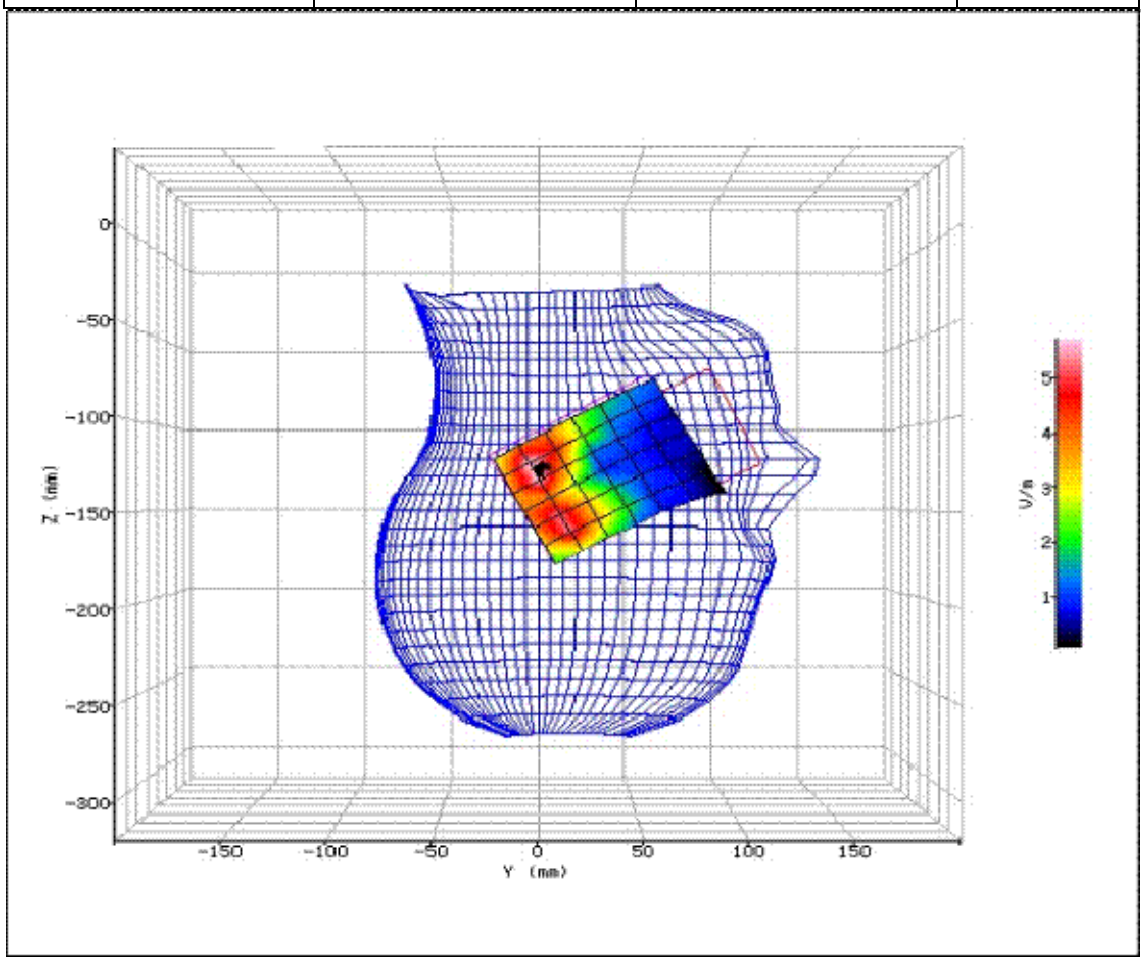

Figure 55: SAR Head Testing Results for the Sharp SHV31 Mobile Handset at 2462.0MHz.
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2.13 WLAN 2450MHz BODY SAR TEST RESULTS AND COURSE AREA SCANS – 2D

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-11:42:44	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	2450Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	50.73
RELATIVE HUMIDITY:	33.20%	CONDUCTIVITY:	1.994
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	22.90°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	-51.600mm
DUT POSITION:	10mm-Front Facing	MAX SAR Y-AXIS LOCATION:	36.600mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	5.920
TEST FREQUENCY:	2462.0MHz	SAR 1g:	0.08 W/kg
TYPE OF MODULATION:	WLAN (DSSS)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.086 W/kg
INPUT POWER LEVEL:	17dBm	SAR END:	0.086 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-1.000 %

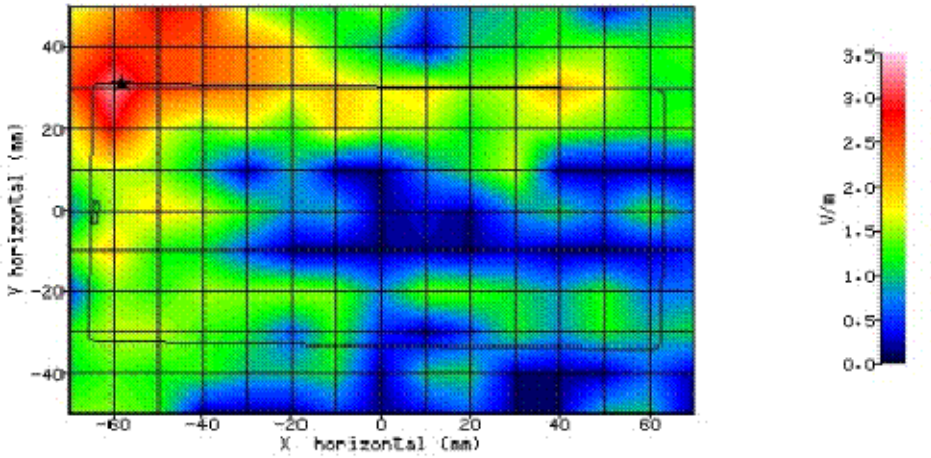

Figure 56: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 2462.0MHz.

Product Service

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-12:11:03	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	2450Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	50.73
RELATIVE HUMIDITY:	33.20%	CONDUCTIVITY:	1.994
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	22.90°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	-49.000mm
DUT POSITION:	10mm-Rear Facing	MAX SAR Y-AXIS LOCATION:	-28.600mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	14.544
TEST FREQUENCY:	2462.0MHz	SAR 1g:	0.56 W/kg
TYPE OF MODULATION:	WLAN (DSSS)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.612 W/kg
INPUT POWER LEVEL:	17dBm	SAR END:	0.613 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	0.100 %

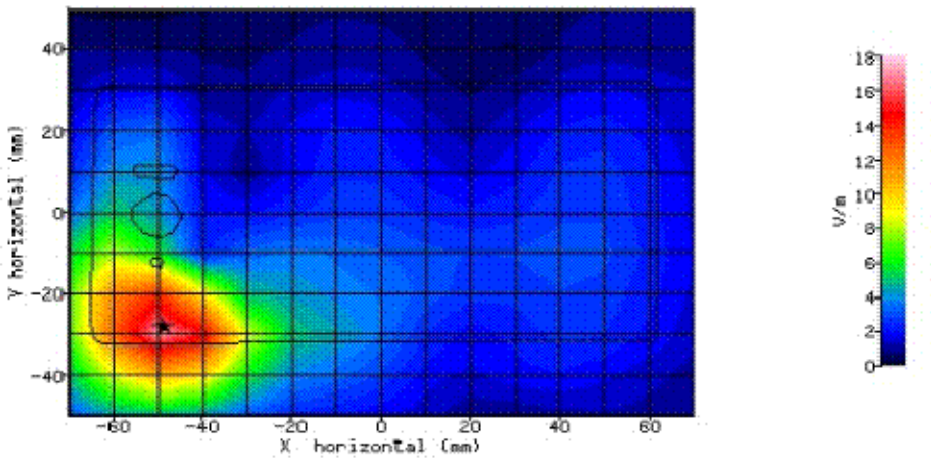

Figure 57: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 2462.0MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-10:41:27	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	2450Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	50.73
RELATIVE HUMIDITY:	33.20%	CONDUCTIVITY:	1.994
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	22.90°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	-49.700mm
DUT POSITION:	10mm-Left Edge	MAX SAR Y-AXIS LOCATION:	4.400mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	13.456
TEST FREQUENCY:	2462.0MHz	SAR 1g:	0.47 W/kg
TYPE OF MODULATION:	WLAN (DSSS)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.514 W/kg
INPUT POWER LEVEL:	17dBm	SAR END:	0.510 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-0.800 %

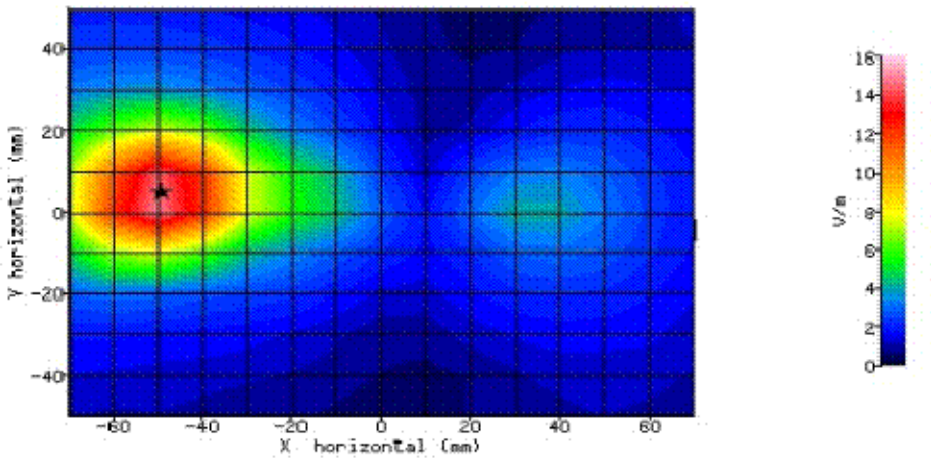

Figure 58: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 2462.0MHz.

SYSTEM / SOFTWARE:	SARA-C / v6.09.08	INPUT POWER DRIFT:	0 dB
DATE / TIME:	25/11/2014-11:00:55	DUT BATTERY MODEL/NO:	Integral
AMBIENT TEMPERATURE:	22.80°C	LIQUID SIMULANT:	2450Body
DEVICE UNDER TEST:	SHV31	RELATIVE PERMITTIVITY:	50.73
RELATIVE HUMIDITY:	33.20%	CONDUCTIVITY:	1.994
PHANTOM S/NO:	IXB-2HF	LIQUID TEMPERATURE:	22.90°C
PHANTOM ROTATION:	N/A	MAX SAR X-AXIS LOCATION:	38.400mm
DUT POSITION:	10mm-Top Edge	MAX SAR Y-AXIS LOCATION:	13.200mm
ANTENNA CONFIGURATION:	N/A	MAX E FIELD:	5.083
TEST FREQUENCY:	2462.0MHz	SAR 1g:	0.06 W/kg
TYPE OF MODULATION:	WLAN (DSSS)	SAR 10g:	N/A
MODN. DUTY CYCLE:	100%	SAR START:	0.058 W/kg
INPUT POWER LEVEL:	17dBm	SAR END:	0.058 W/kg
PROBE BATTERY LAST CHANGED:	25/11/2014	SAR DRIFT DURING SCAN:	-0.700 %

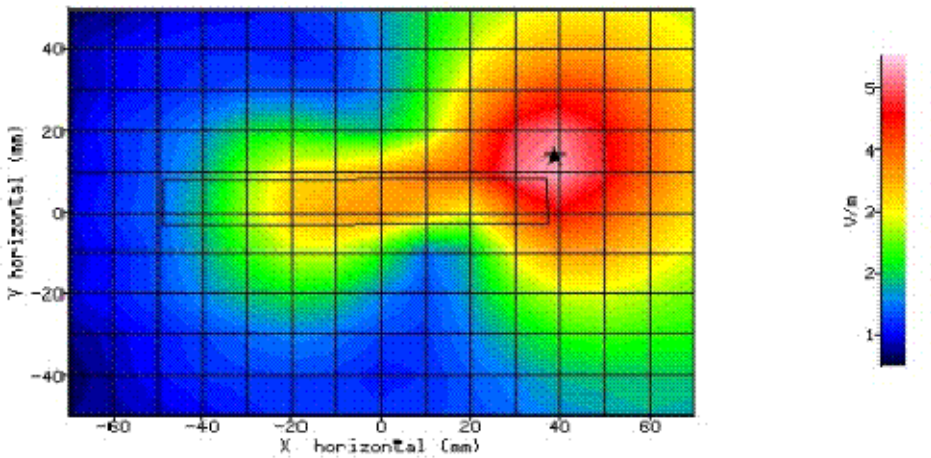

Figure 59: SAR Body Testing Results for the Sharp SHV31 Mobile Handset at 2462.0MHz..