



5.4 Simulated Tissue

The recipes used to make the simulated tissue were developed by APREL Laboratories using the epsilon and sigma as presented in OET Supplement C. Upon request further information shall be presented.

The density used to determine SAR from the measurements was the recommended 1.0 kg/m^3 found in Appendix C of "Supplement C OET Bulletin 65, Edition 01-01".

Dielectric parameters of the simulated tissue material were determined using an Anritsu 37347A Vector Network Analyzer, a Hewlett Packard 809B Slotted Line Carriage, and an APREL SLP-001 Slotted Line Probe.

Table 3: Properties of the Tissue

BODY Tissue	APREL	Target Value	D (%)
Dielectric constant, ϵ_r	46.1	48.2	+4.4
Conductivity, σ [S/m]	6.9	6.0	+15.0
Tissue Conversion Factor,	2.5	-	-

Table 4: Tissue Calibration Instrumentation

Instrument	Calibration Due	Asset Number/Serial Number
Anritsu VNA	7 August 2002	Z0107643 TEMP
HP Slotted Line	NA	100195
APREL Slotted Line Probe	December 2002	APL-SLP-001



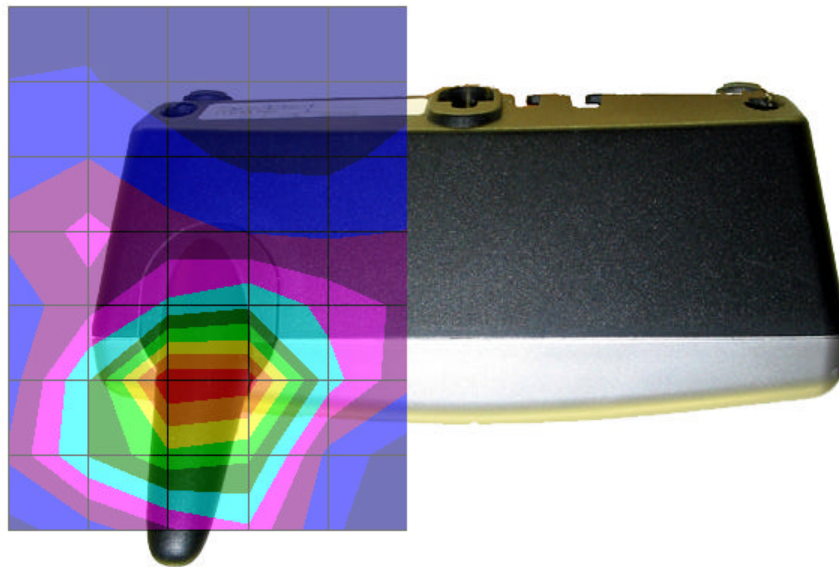
Appendix A: TEST DATA AND GRAPHIC PLOTS

GRAPH 1 (SCAN20)

TOP SIDE UP

Distance 0 mm

Frequency: 5744.736 MHz



SAR Data Report Vtech scan20

START : 21-MAY-02 05:05:05 PM
END : 21-MAY-02 05:10:47 PM
CODE VERSION : 4.12
ROBOT VERSION: 4.08

PRODUCT DATA:

TYPE : VTECH BASE
MODEL NUMBER : VT5831
SERIAL NUMBER : 360000030004407
FREQUENCY : 5744.736 MHZ
ANTENNA TYPE : 1/2 WAVE
ANTENNA POSN. : OUT

MEASUREMENT DATA:

PHANTOM NAME : APREL-UNI
PHANTOM TYPE : UNIPHANTOM
TISSUE TYPE : MUSCLE
TISSUE DIELECTRIC : 46.100
TISSUE CONDUCTIVITY : 6.900
TISSUE DENSITY : 1.000
CREST FACTOR : 3.500
ROBOT NAME : CRS

PROBE DATA:

PROBE NAME : 163
PROBE TYPE : E FLD TRIANGLE
FREQUENCY : 5800 MHZ
TISSUE TYPE : MUSCLE
CALIBRATED DIELECTRIC : 46.100
CALIBRATED CONDUCTIVITY : 6.900
PROBE OFFSET : 2.500 MM
CONVERSION FACTOR : 2.500
DIODE COMPRESSION PT : 76.0 MV
PROBE SENSITIVITY : 0.580 0.580 0.580 MV/(MW/CM^2)
AMPLIFIER GAINS : 20.00 20.00 20.00
CHAN. OFFSET (MV) : 1.42 1.51 1.32

SAMPLE:

RATE: 6000 SAMPLES/SEC
COUNT: 1000 SAMPLES
NIDAQ GAIN: 5
SCAN TIME: 166.7 MSEC

COMMENTS:

TOP SIDE UP
0 SEPARATION

AREA SCAN - MAX LOCAL SAR VALUE AT X=4.0 Y=-11.0 = 2.27 W/KG

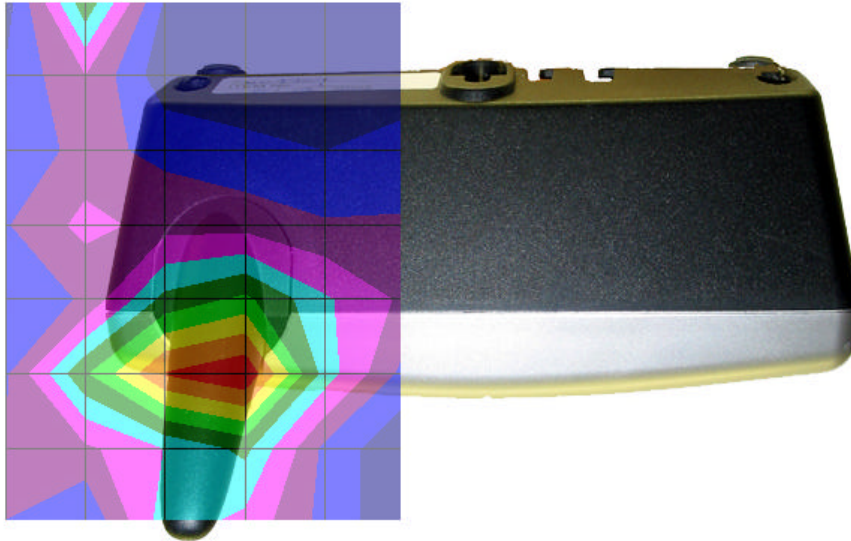
ZOOM SCAN - MAX LOCAL SAR VALUE AT X=5.0 Y=-11.0 Z=0.0 = 8.64 W/KG

MAX 1G SAR AT X=6.0 Y=-11.0 Z=0.0 = 3.23 W/KG

MAX 10G SAR AT X=5.0 Y=-12.0 Z=0.0 = 1.22 W/KG



GRAPH 2 (SCAN21)
TOP SIDE UP
Distance 0 mm
Frequency: 5785.344 MHz



SAR DATA REPORT VTECH SCAN21

START : 21-MAY-02 05:12:42 PM
END : 21-MAY-02 05:18:24 PM
CODE VERSION : 4.12
ROBOT VERSION: 4.08

PRODUCT DATA:

TYPE : VTECH BASE
MODEL NUMBER : VT5831
SERIAL NUMBER : 360000030004407
FREQUENCY : 5785.344 MHZ
ANTENNA TYPE : 1/2 WAVE
ANTENNA POSN. : OUT

MEASUREMENT DATA:

PHANTOM NAME : APREL-UNI
PHANTOM TYPE : UNIPHANTOM
TISSUE TYPE : MUSCLE
TISSUE DIELECTRIC : 46.100
TISSUE CONDUCTIVITY : 6.900
TISSUE DENSITY : 1.000
CREST FACTOR : 3.500
ROBOT NAME : CRS

PROBE DATA:

PROBE NAME : 163
PROBE TYPE : E FLD TRIANGLE
FREQUENCY : 5800 MHZ
TISSUE TYPE : MUSCLE
CALIBRATED DIELECTRIC : 46.100
CALIBRATED CONDUCTIVITY : 6.900
PROBE OFFSET : 2.500 MM
CONVERSION FACTOR : 2.500
DIODE COMPRESSION PT : 76.0 MV
PROBE SENSITIVITY : 0.580 0.580 0.580 MV/(MW/CM^2)
AMPLIFIER GAINS : 20.00 20.00 20.00
CHAN. OFFSET (MV) : 1.42 1.51 1.32

SAMPLE:

RATE: 6000 SAMPLES/SEC
COUNT: 1000 SAMPLES
NIDAQ GAIN: 5
SCAN TIME: 166.7 MSEC

COMMENTS:

TOP SIDE UP
0 SEPARATION

AREA SCAN - MAX LOCAL SAR VALUE AT X=7.0 Y=-9.0 = 1.83 W/KG

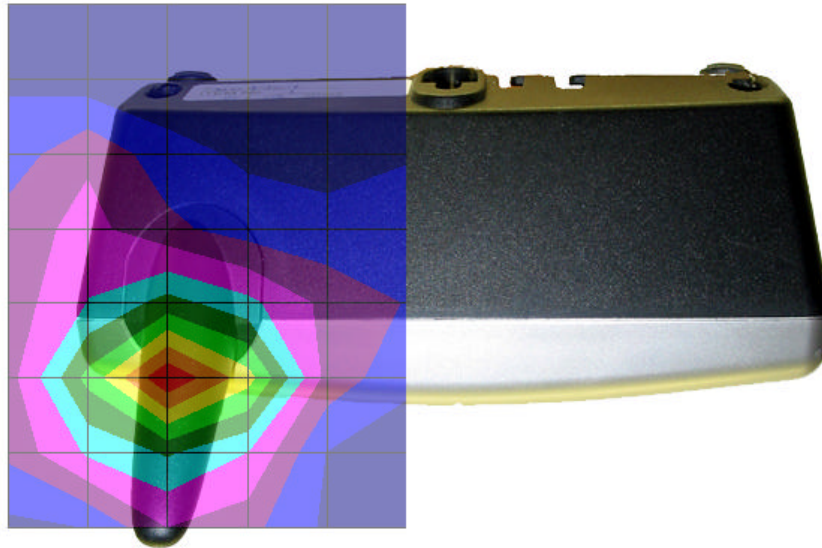
ZOOM SCAN - MAX LOCAL SAR VALUE AT X=7.0 Y=-9.0 Z=0.0 = 6.90 W/KG

MAX 1G SAR AT X=8.0 Y=-8.0 Z=0.0 = 2.55 W/KG

MAX 10G SAR AT X=7.0 Y=-8.0 Z=0.0 = 0.96 W/KG



GRAPH 3 (SCAN22)
TOP SIDE UP
Distance 0 mm
Frequency: 5825.952 MHz



SAR DATA REPORT VTECH SCAN22

START : 21-MAY-02 05:19:45 PM
END : 21-MAY-02 05:25:27 PM
CODE VERSION : 4.12
ROBOT VERSION: 4.08

PRODUCT DATA:

TYPE : VTECH BASE
MODEL NUMBER : VT5831
SERIAL NUMBER : 360000030004407
FREQUENCY : 5825.952 MHZ
ANTENNA TYPE : 1/2 WAVE
ANTENNA POSN. : OUT

MEASUREMENT DATA:

PHANTOM NAME : APREL-UNI
PHANTOM TYPE : UNIPHANTOM
TISSUE TYPE : MUSCLE
TISSUE DIELECTRIC : 46.100
TISSUE CONDUCTIVITY : 6.900
TISSUE DENSITY : 1.000
CREST FACTOR : 3.500
ROBOT NAME : CRS

PROBE DATA:

PROBE NAME : 163
PROBE TYPE : E FLD TRIANGLE
FREQUENCY : 5800 MHZ
TISSUE TYPE : MUSCLE
CALIBRATED DIELECTRIC : 46.100
CALIBRATED CONDUCTIVITY : 6.900
PROBE OFFSET : 2.500 MM
CONVERSION FACTOR : 2.500
DIODE COMPRESSION PT : 76.0 MV
PROBE SENSITIVITY : 0.580 0.580 0.580 MV/(MW/CM^2)
AMPLIFIER GAINS : 20.00 20.00 20.00
CHAN. OFFSET (MV) : 1.42 1.51 1.32

SAMPLE:

RATE: 6000 SAMPLES/SEC
COUNT: 1000 SAMPLES
NIDAQ GAIN: 5
SCAN TIME: 166.7 MSEC

COMMENTS:

TOP SIDE UP
0 SEPARATION

AREA SCAN - MAX LOCAL SAR VALUE AT X=1.0 Y=-10.0 = 1.75 W/KG

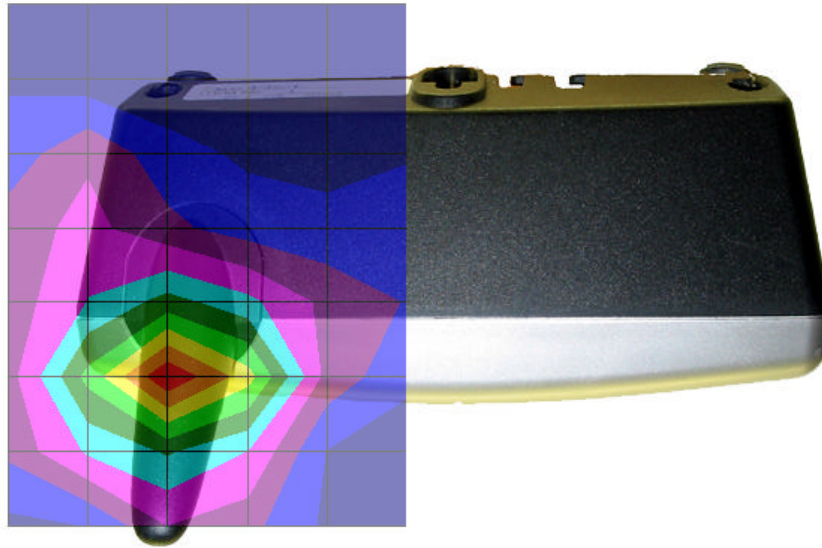
ZOOM SCAN - MAX LOCAL SAR VALUE AT X=2.0 Y=-10.0 Z=0.0 = 6.34 W/KG

MAX 1G SAR AT X=2.0 Y=-9.0 Z=0.0 = 2.41 W/KG

MAX 10G SAR AT X=1.0 Y=-10.0 Z=0.0 = 0.90 W/KG



GRAPH 4 (SCAN23)
TOP SIDE UP
Distance 15 mm
Frequency: 5744.736 MHz



SAR DATA REPORT VTECH SCAN23

START : 22-MAY-02 09:06:30 AM
END : 22-MAY-02 09:12:12 AM
CODE VERSION : 4.12
ROBOT VERSION: 4.08

PRODUCT DATA:

TYPE : VTECH BASE
MODEL NUMBER : VT5831
SERIAL NUMBER : 360000030004407
FREQUENCY : 5744.736 MHZ
ANTENNA TYPE : 1/2 WAVE
ANTENNA POSN. : OUT

MEASUREMENT DATA:

PHANTOM NAME : APREL-UNI
PHANTOM TYPE : UNIPHANTOM
TISSUE TYPE : MUSCLE
TISSUE DIELECTRIC : 46.100
TISSUE CONDUCTIVITY : 6.900
TISSUE DENSITY : 1.000
CREST FACTOR : 3.500
ROBOT NAME : CRS

PROBE DATA:

PROBE NAME : 163
PROBE TYPE : E FLD TRIANGLE
FREQUENCY : 5800 MHZ
TISSUE TYPE : MUSCLE
CALIBRATED DIELECTRIC : 46.100
CALIBRATED CONDUCTIVITY : 6.900
PROBE OFFSET : 2.500 MM
CONVERSION FACTOR : 2.500
DIODE COMPRESSION PT : 76.0 MV
PROBE SENSITIVITY : 0.580 0.580 0.580 MV/(MW/CM^2)
AMPLIFIER GAINS : 20.00 20.00 20.00
CHAN. OFFSET (MV) : 1.20 1.30 1.04

SAMPLE:

RATE: 6000 SAMPLES/SEC
COUNT: 1000 SAMPLES
NIDAQ GAIN: 5
SCAN TIME: 166.7 MSEC

COMMENTS:

TOP SIDE UP
15MM SEPARATION

AREA SCAN - MAX LOCAL SAR VALUE AT X=1.0 Y=-10.0 = 0.86 W/KG

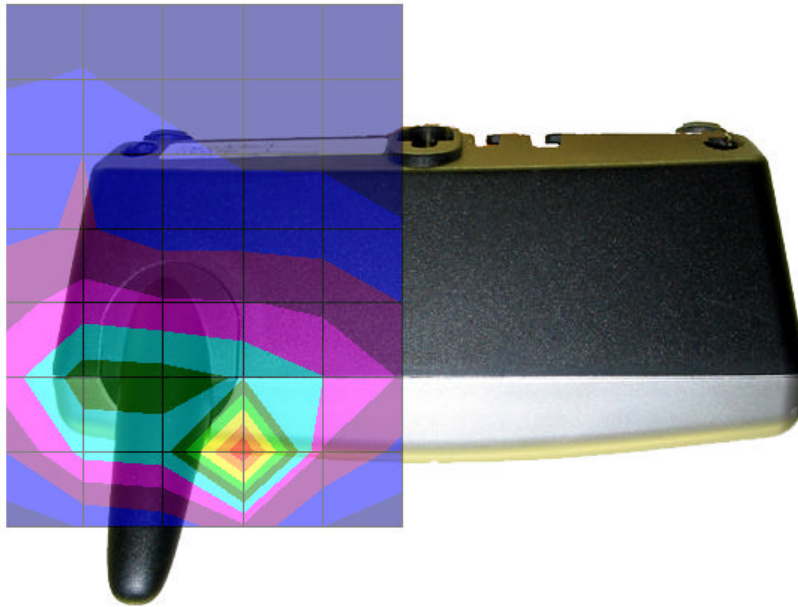
ZOOM SCAN - MAX LOCAL SAR VALUE AT X=6.0 Y=-9.0 Z=0.0 = 2.78 W/KG

MAX 1G SAR AT X=5.0 Y=-9.0 Z=0.0 = 1.18 W/KG

MAX 10G SAR AT X=4.0 Y=-9.0 Z=0.0 = 0.58 W/KG



GRAPH 5
TOP SIDE UP
Distance 15 mm
Frequency: 5785.344 MHz



SAR DATA REPORT VTECH SCAN24

START : 22-MAY-02 09:13:49 AM
END : 22-MAY-02 09:19:31 AM
CODE VERSION : 4.12
ROBOT VERSION: 4.08

PRODUCT DATA:

TYPE : VTECH BASE
MODEL NUMBER : VT5831
SERIAL NUMBER : 360000030004407
FREQUENCY : 5785.344 MHZ
ANTENNA TYPE : 1/2 WAVE
ANTENNA POSN. : OUT

MEASUREMENT DATA:

PHANTOM NAME : APREL-UNI
PHANTOM TYPE : UNIPHANTOM
TISSUE TYPE : MUSCLE
TISSUE DIELECTRIC : 46.100
TISSUE CONDUCTIVITY : 6.900
TISSUE DENSITY : 1.000
CREST FACTOR : 3.500
ROBOT NAME : CRS

PROBE DATA:

PROBE NAME : 163
PROBE TYPE : E FLD TRIANGLE
FREQUENCY : 5800 MHZ
TISSUE TYPE : MUSCLE
CALIBRATED DIELECTRIC : 46.100
CALIBRATED CONDUCTIVITY : 6.900
PROBE OFFSET : 2.500 MM
CONVERSION FACTOR : 2.500
DIODE COMPRESSION PT : 76.0 MV
PROBE SENSITIVITY : 0.580 0.580 0.580 MV/(MW/CM^2)
AMPLIFIER GAINS : 20.00 20.00 20.00
CHAN. OFFSET (MV) : 1.20 1.30 1.04

SAMPLE:

RATE: 6000 SAMPLES/SEC
COUNT: 1000 SAMPLES
NIDAQ GAIN: 5
SCAN TIME: 166.7 MSEC

COMMENTS:

TOP SIDE UP
15MM SEPARATION

AREA SCAN - MAX LOCAL SAR VALUE AT X=10.0 Y=-20.0 = 1.30 W/KG

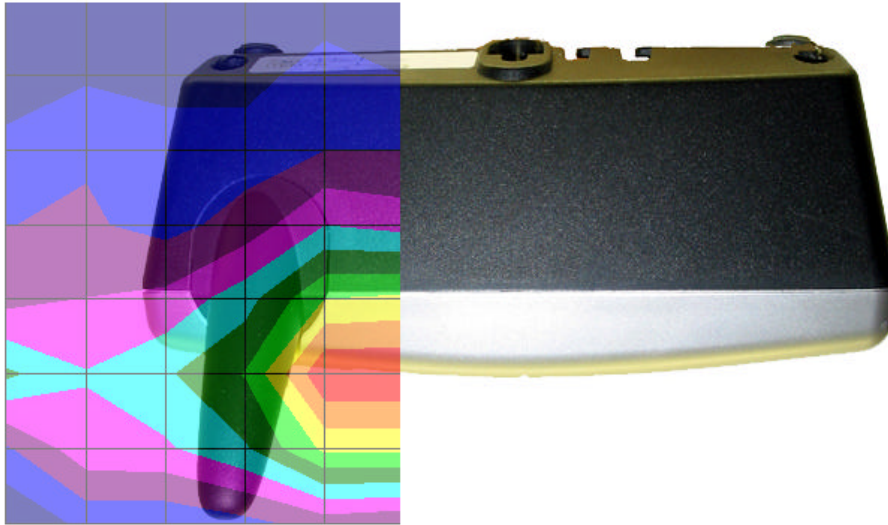
ZOOM SCAN - MAX LOCAL SAR VALUE AT X=-6.0 Y=-13.0 Z=0.0 = 2.84 W/KG

MAX 1G SAR AT X=-1.0 Y=-13.0 Z=0.0 = 1.14 W/KG

MAX 10G SAR AT X=5.0 Y=-15.0 Z=0.0 = 0.52 W/KG



GRAPH 6
TOP SIDE UP
Distance 15 mm
Frequency: 5825.952 MHz



SAR Data Report Vtech scan25

START : 22-MAY-02 09:37:01 AM
END : 22-MAY-02 09:42:49 AM
CODE VERSION : 4.12
ROBOT VERSION: 4.08

PRODUCT DATA:

TYPE : VTECH BASE
MODEL NUMBER : VT5831
SERIAL NUMBER : 360000030004407
FREQUENCY : 5825.952 MHZ
ANTENNA TYPE : 1/2 WAVE
ANTENNA POSN. : OUT

MEASUREMENT DATA:

PHANTOM NAME : APREL-UNI
PHANTOM TYPE : UNIPHANTOM
TISSUE TYPE : MUSCLE
TISSUE DIELECTRIC : 46.100
TISSUE CONDUCTIVITY : 6.900
TISSUE DENSITY : 1.000
CREST FACTOR : 3.500
ROBOT NAME : CRS

PROBE DATA:

PROBE NAME : 163
PROBE TYPE : E FLD TRIANGLE
FREQUENCY : 5800 MHZ
TISSUE TYPE : MUSCLE
CALIBRATED DIELECTRIC : 46.100
CALIBRATED CONDUCTIVITY : 6.900
PROBE OFFSET : 2.500 MM
CONVERSION FACTOR : 2.500
DIODE COMPRESSION PT : 76.0 MV
PROBE SENSITIVITY : 0.580 0.580 0.580 MV/(MW/CM^2)
AMPLIFIER GAINS : 20.00 20.00 20.00
CHAN. OFFSET (MV) : 1.20 1.30 1.04

SAMPLE:

RATE: 6000 SAMPLES/SEC
COUNT: 1000 SAMPLES
NIDAQ GAIN: 5
SCAN TIME: 166.7 MSEC

COMMENTS:

TOP SIDE UP
15MM SEPARATION

AREA SCAN - MAX LOCAL SAR VALUE AT X=24.0 Y=-10.0 = 0.72 W/KG

ZOOM SCAN - MAX LOCAL SAR VALUE AT X=30.0 Y=-10.0 Z=0.0 = 2.31 W/KG

MAX 1G SAR AT X=28.0 Y=-10.0 Z=0.0 = 0.98 W/KG

MAX 10G SAR AT X=26.0 Y=-10.0 Z=0.0 = 0.50 W/KG

