6.3. PRESCAN DATA FOR WORST CONFIGURATION OF RF EXPSOSURE

6.3.1. Body-worn (By Stander) Configuration

Configuration	Antenna	Peak Spatial-average SAR (W/kg)
Laptop #5, 54Mbps, Back side of the host PC in contact with the phantom, 5260MHz, 22dBm conducted	Main (Left) antenna	0.79 (1)
Laptop #5, 6Mbps, Back side of the host PC in contact with the phantom, 5260MHz, 22dBm conducted	Main (Left) antenna	1.17 (1)
Laptop #5, 6Mbps, Top side of the host PC in contact with the phantom,5260MHz, 22dBm conducted	Main (Left) antenna	Less than 0.01 (2)
Laptop #5, 6Mbps, Back side of the host PC in contact with the phantom, 5260MHz, 22dBm conducted, Bluetooth Enabled (2402 MHz)	Main (Left) antenna	1.17 (3)
Laptop #6, 6Mbps, Left side of the host PC in contact with the phantom, 5260MHz, 22dBm conducted	Aux (Left) antenna	0.60 (2)
Laptop #6, 6Mbps, Top side of the host PC in contact with the phantom, 5260MHz, 22dBm conducted	Aux (Left) antenna	Less than 0.01 (2)
Laptop #6, 6Mbps, Bottom side of the host PC in contact with the phantom, 5260MHz, 22dBm conducted	Aux (Left) antenna	Less than 0.01 (2)

Prescans for the feasible configurations had been performed in order to determine the worst case under the specific configurations as described in the table.

Through the prescans, the followings were determined,

1) SAR at the data rate other than 6 Mbps were found to be less.

2) A significant exposure was identified only at the side of the host PC, where the antenna is located for both the main antenna and the aux antenna.

3) SAR affected by co-location of the DUT and the Bluetooth transmitter was found to be negligible at 5GHz band (U-NII).

EXHIBIT 7. SAR MEASUREMENT

7.1. BODY-WORN (BY STANDER) CONFIGURATION

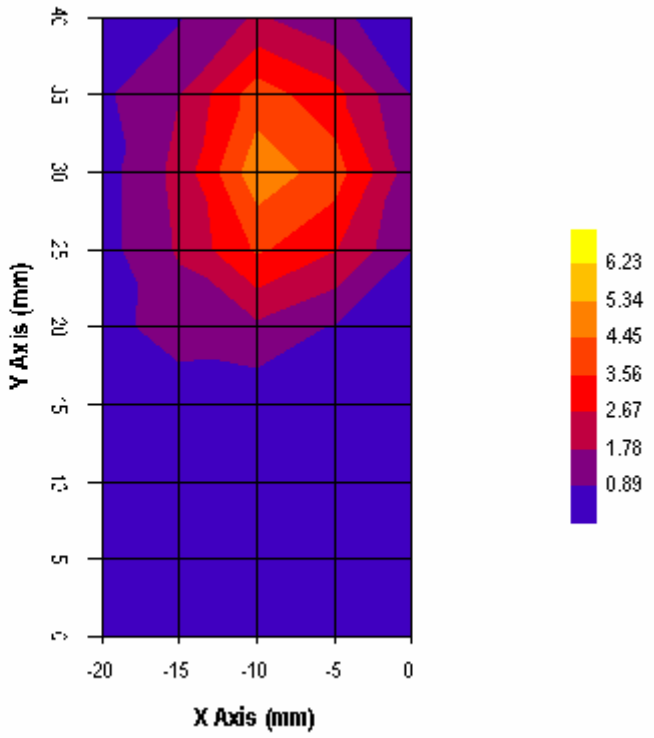
7.1.1. Laptop #5 (M/N: PPT, Wistron NeWeb Corp. Antenna)

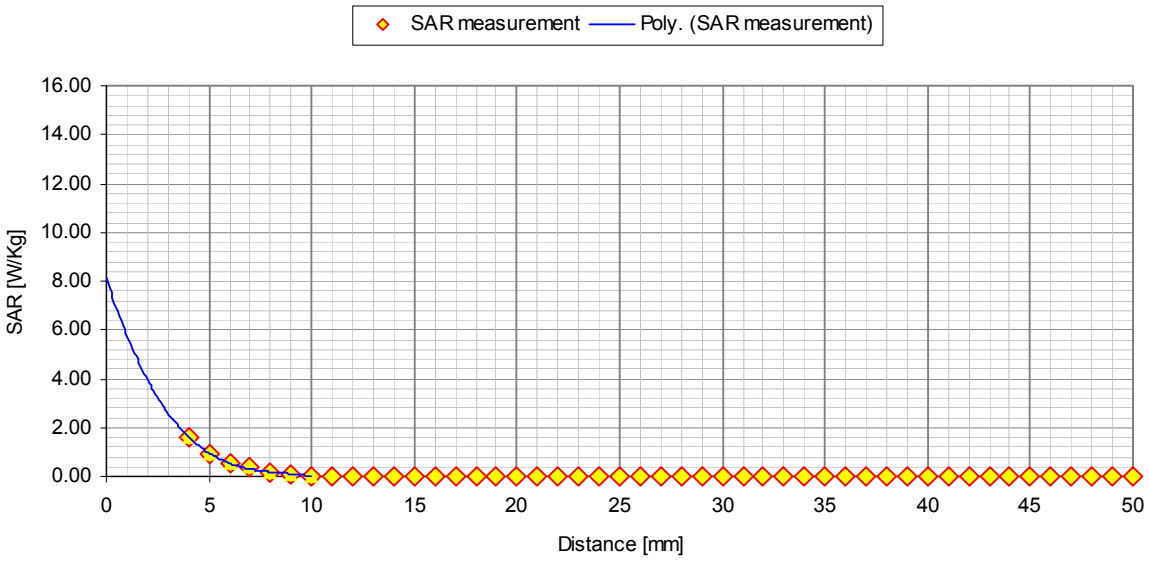
7.1.1.1. Main antenna (left antenna)

#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	Power reference before [dBm]	Power reference after [dBm]	MAX SAR [W/Kg]
01	Back side of the host PC toward the phantom 6 MBPS data rate	0 mm separation	Main antenna (left) – Fixed	5180	CH36	22.0 pk	21.8 pk	1.12
02				5260	CH52	22.0 pk	21.8 pk	1.17
03				5320	CH64	22.0 pk	21.8 pk	1.08

7.1.1.1.1. CH 36, 5180 MHz

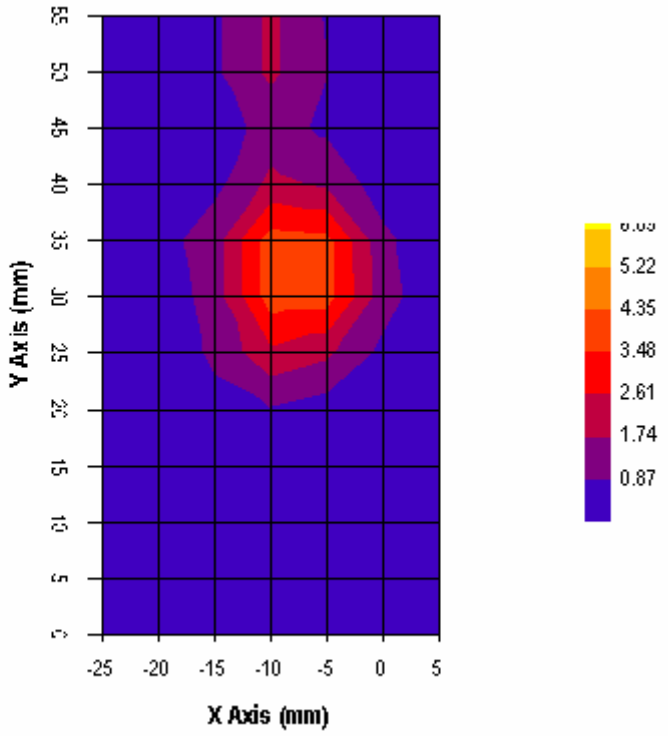
Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5180
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	1.12

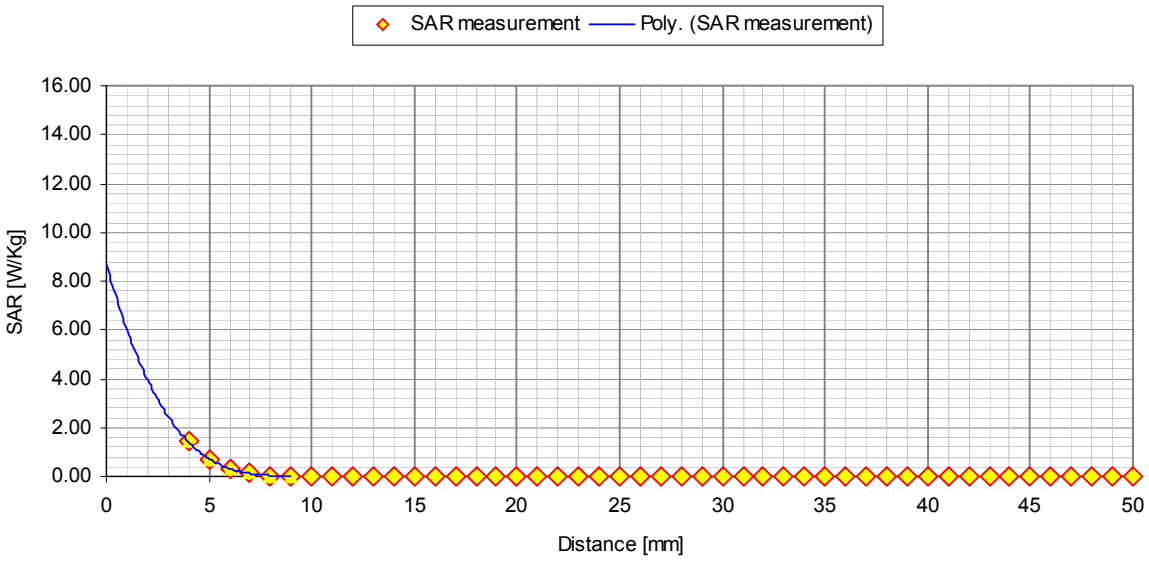



SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

7.1.1.1.2. CH 52, 5260 MHz

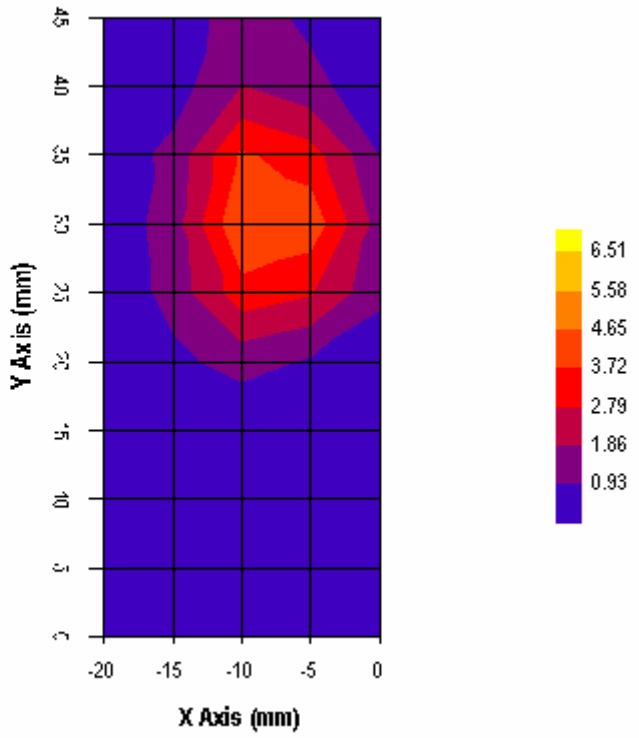
Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5260
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	1.17

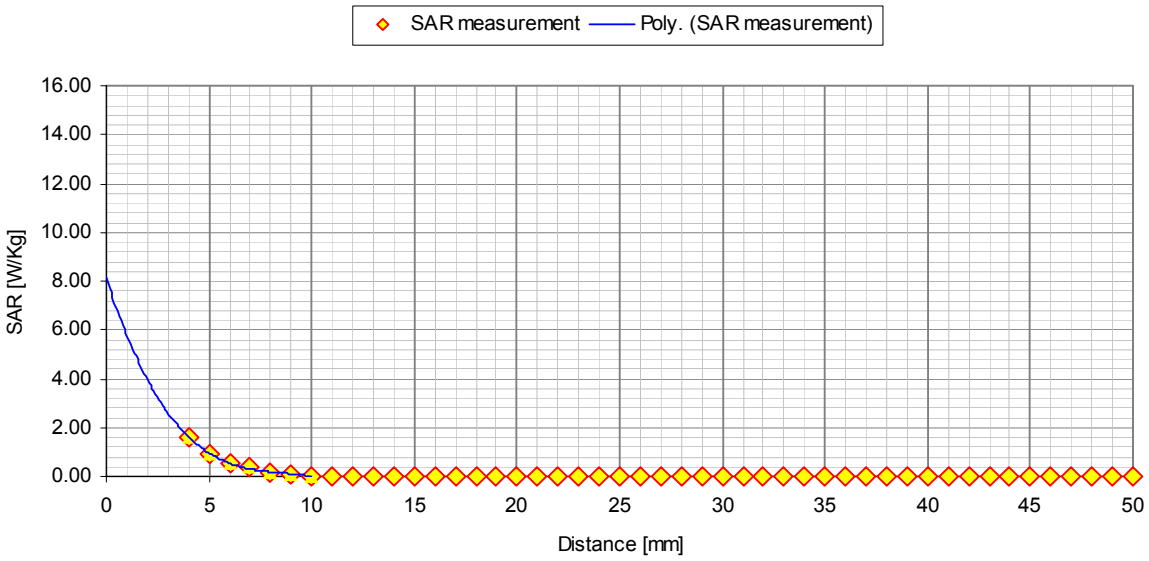



SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

7.1.1.1.3. CH64, 5320 MHz

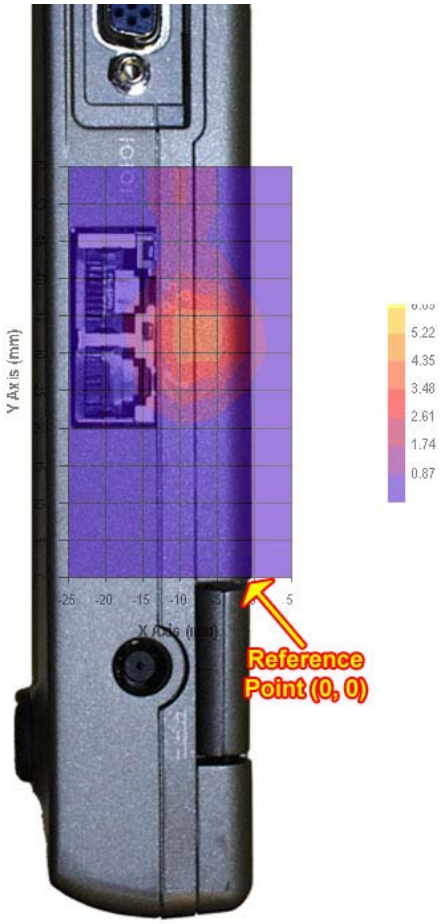
Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5320
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	1.08




SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

7.1.1.2. Aux antenna (right)

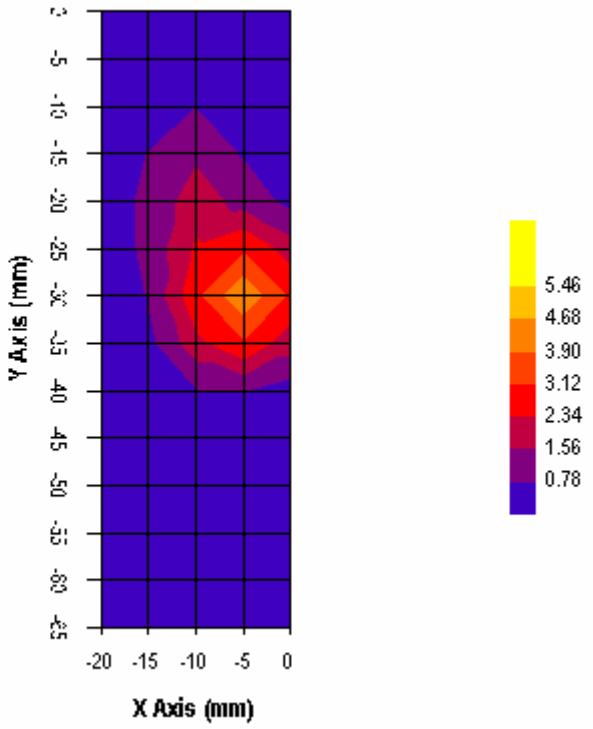
#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	Power reference before [dBm]	Power reference after [dBm]	MAX SAR [W/Kg]
04	Back side of the host PC toward the phantom 6 MBPS data rate	0 mm separation	Aux antenna (right) - Fixed	5180	CH36			*note)
05				5260	CH52	22.0 pk	21.8 pk	0.71
06				5320	CH64			*note)

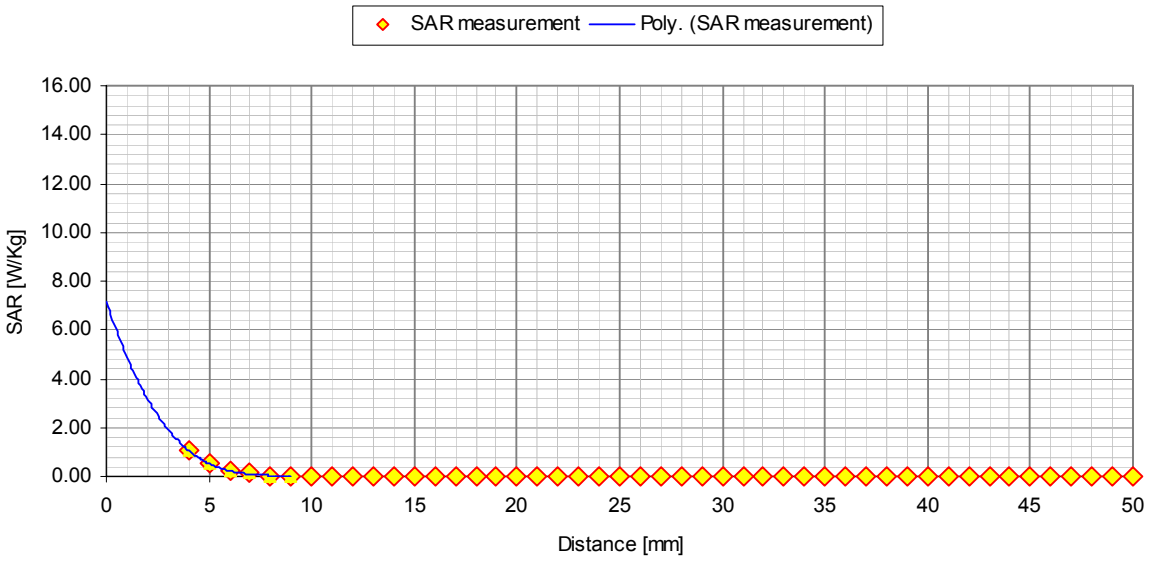


* If the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

7.1.1.2.1. CH 52, 5260 MHz

Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5260
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	0.71

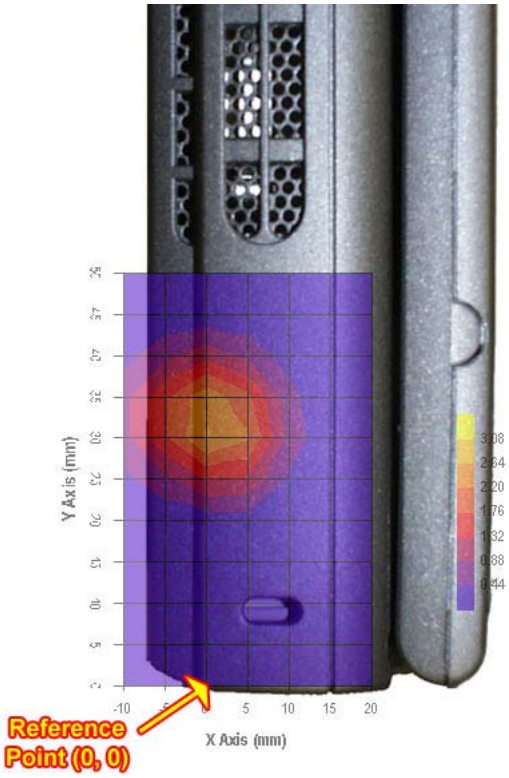



SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

7.1.2. Laptop #6 (M/N: PP07L, Wistron NeWeb Corp. Antenna)

7.1.2.1. Main antenna (right side)

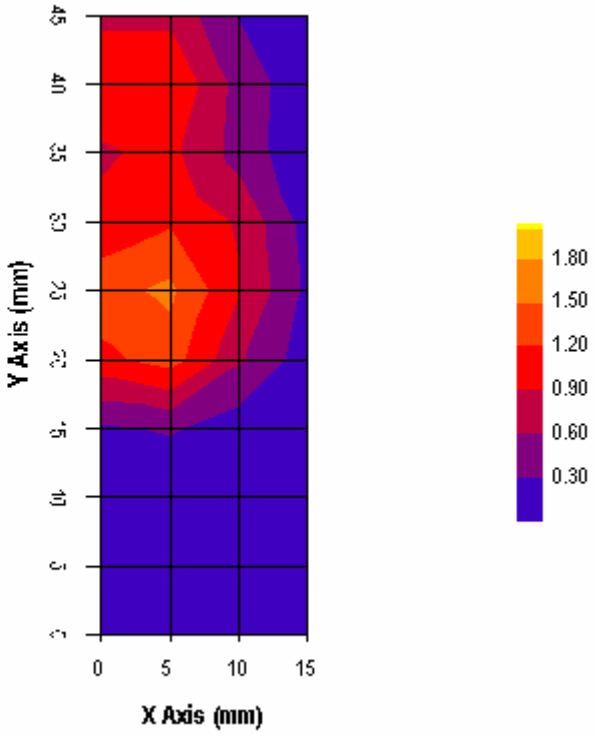
#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	Power reference before [dBm]	Power reference after [dBm]	MAX SAR [W/Kg]
07	Back side of the host PC toward the phantom 6 MBPS data rate	0 mm separation	Main antenna (right side) – Fixed	5180	CH36			*note)
08				5260	CH52	22.0 pk	21.8 pk	0.10
09				5320	CH64			*note)

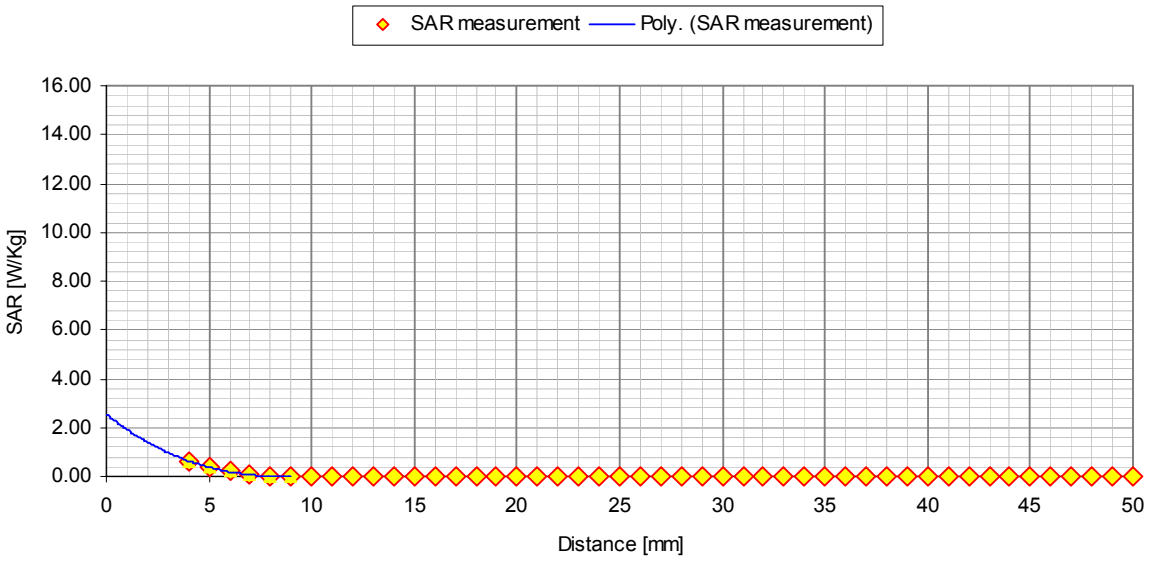


* If the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

7.1.2.1.1. CH 52, 5260 MHz

Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5260
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	0.10




SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

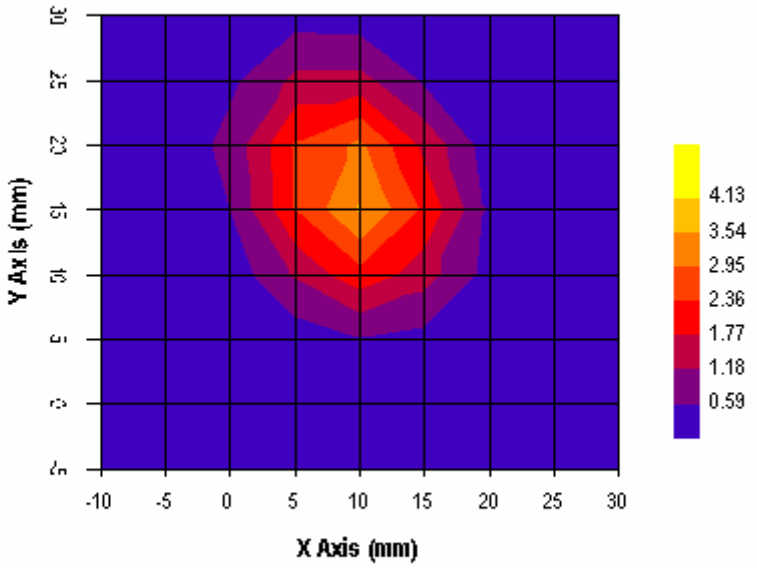
7.1.2.2. Aux antenna (left side)

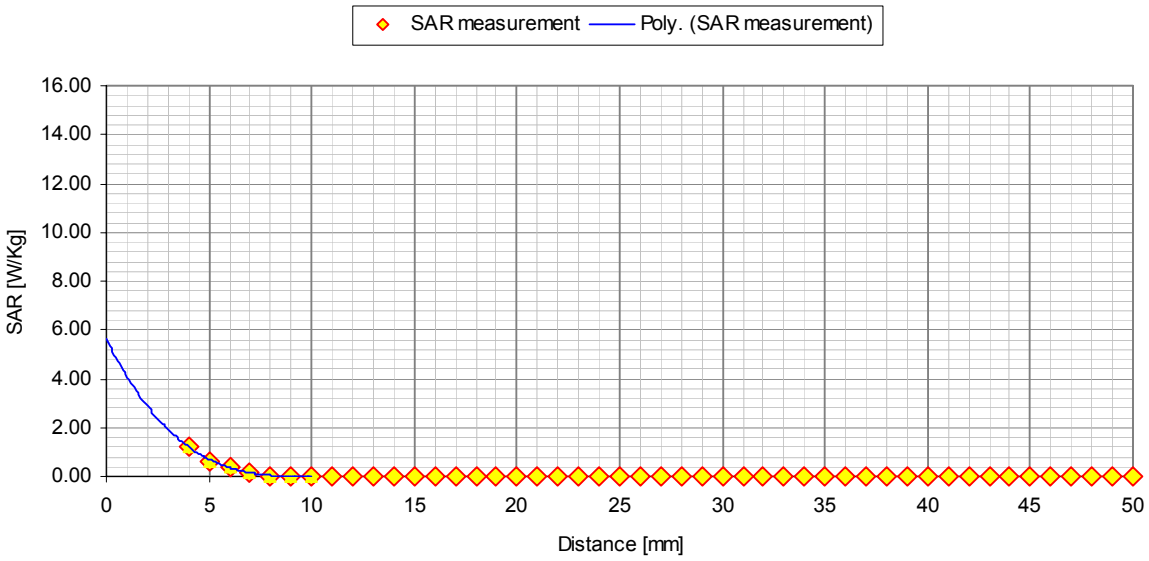
#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	Power reference before [dBm]	Power reference after [dBm]	MAX SAR [W/Kg]
10	Right side of the host PC toward the phantom 6 MBPS data rate	0 mm separation	Aux antenna (left side) – Fixed	5180	CH36			*note)
11				5260	CH52	22.0 pk	21.8 pk	0.60
12				5320	CH64			*note)

* If the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

7.1.2.2.1. CH 52, 5260 MHz

Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5260
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	0.60

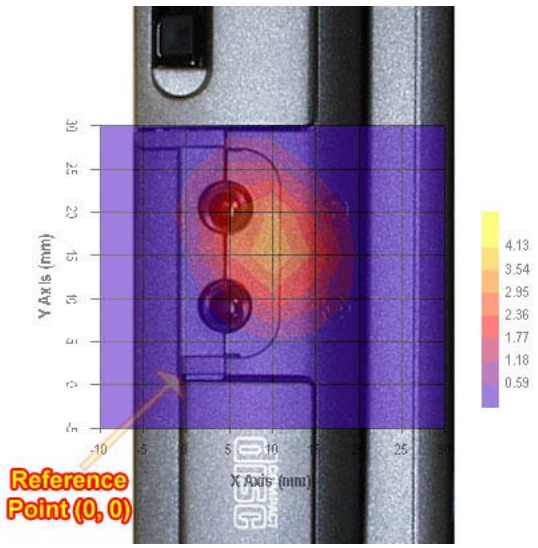



SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

7.1.3. Laptop #7 (M/N: PP07L, Phicomp Antenna)

7.1.3.1. Main antenna (Left side)

#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	Power reference before [dBm]	Power reference after [dBm]	MAX SAR [W/Kg]
13	Right side of the host PC toward the phantom 6 MBPS data rate	0 mm separation	Main antenna (right side) – Fixed	5180	CH36			*note)
14				5260	CH52	22.0 pk	21.8 pk	less than 0.01**
15				5320	CH64			*note)

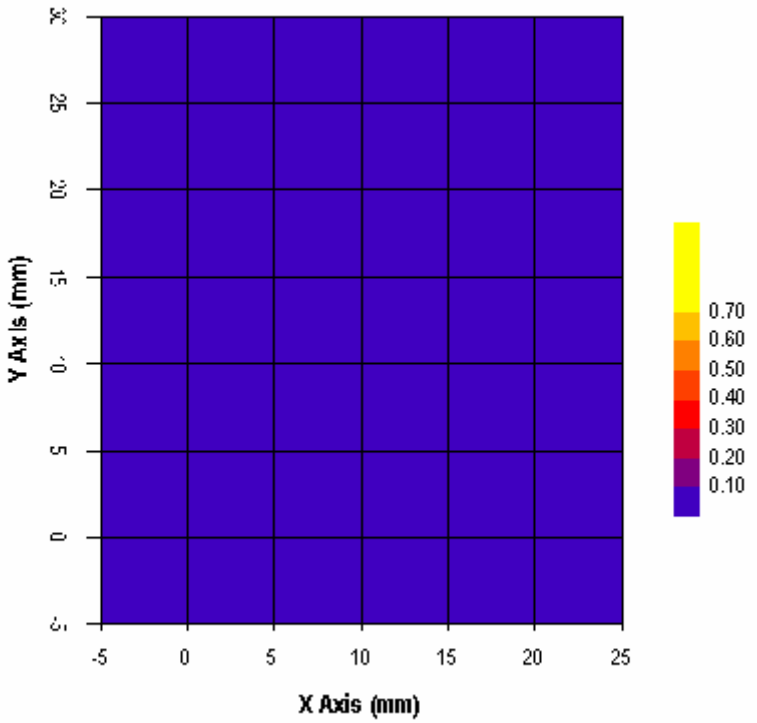


* If the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

** It was found to be below the SAR measurement system's sensitivity (less than 0.01[W/Kg]).

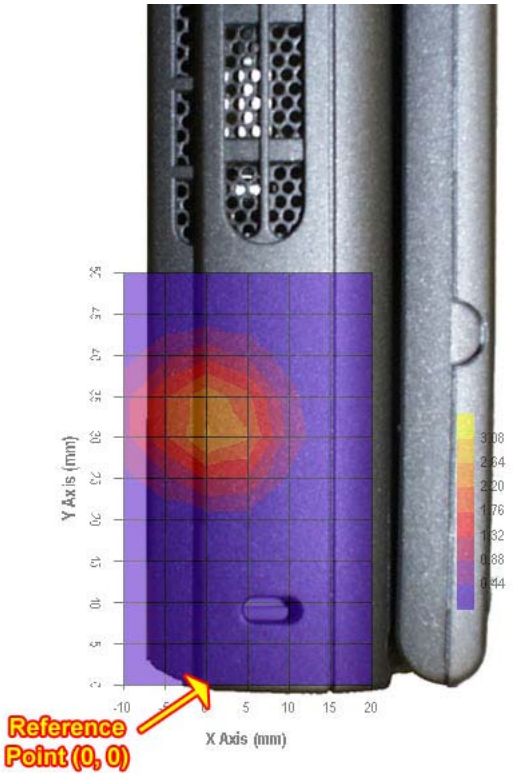
7.1.3.1.1. CH 52, 5260 MHz

Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5260
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	Less than 0.01



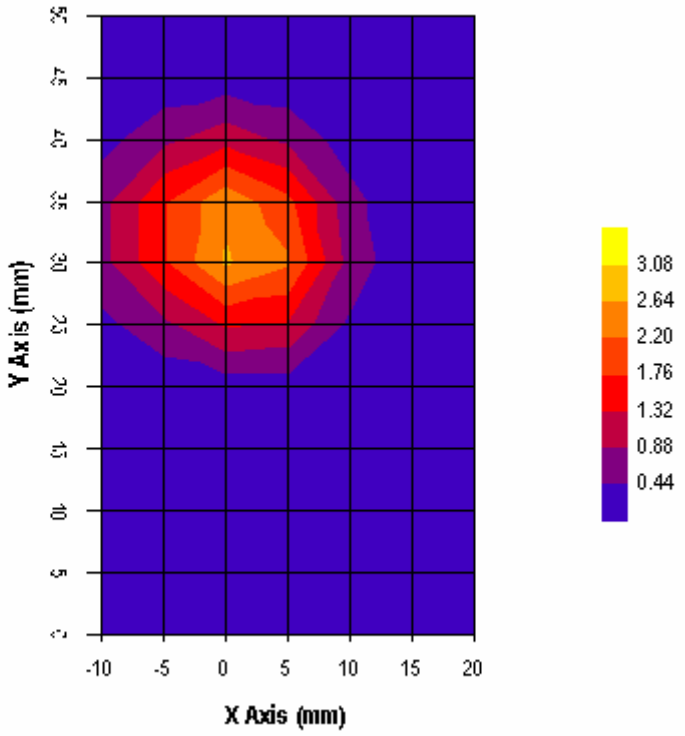
7.1.3.2. Aux antenna (right side)

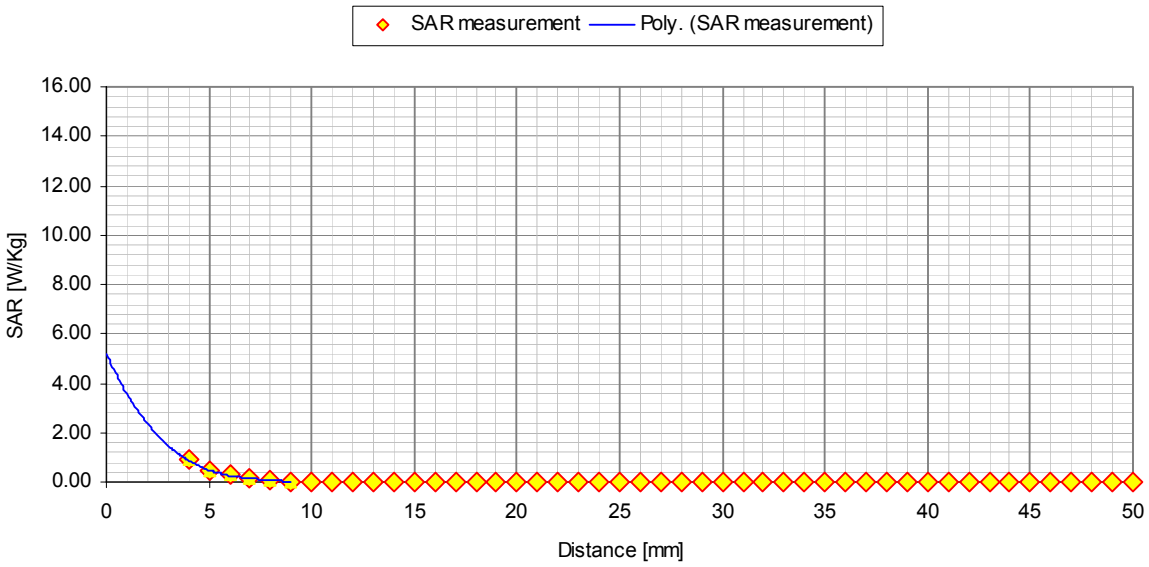
#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	Power reference before [dBm]	Power reference after [dBm]	MAX SAR [W/Kg]
16	Right side of the host PC toward the phantom 6 MBPS data rate	0 mm separation	Aux antenna (right side) – Fixed	5180	CH36	22.0 pk	21.8 pk	0.90
17				5260	CH52	22.0 pk	21.8 pk	0.84
18				5320	CH64	22.0 pk	21.8 pk	0.65



7.1.3.2.1. CH 36, 5180 MHz

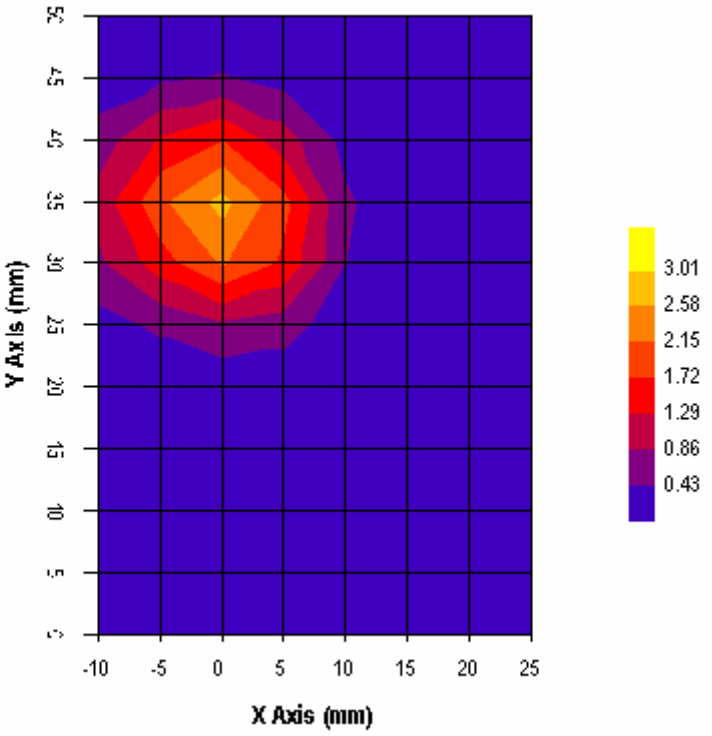
Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5180
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	0.90

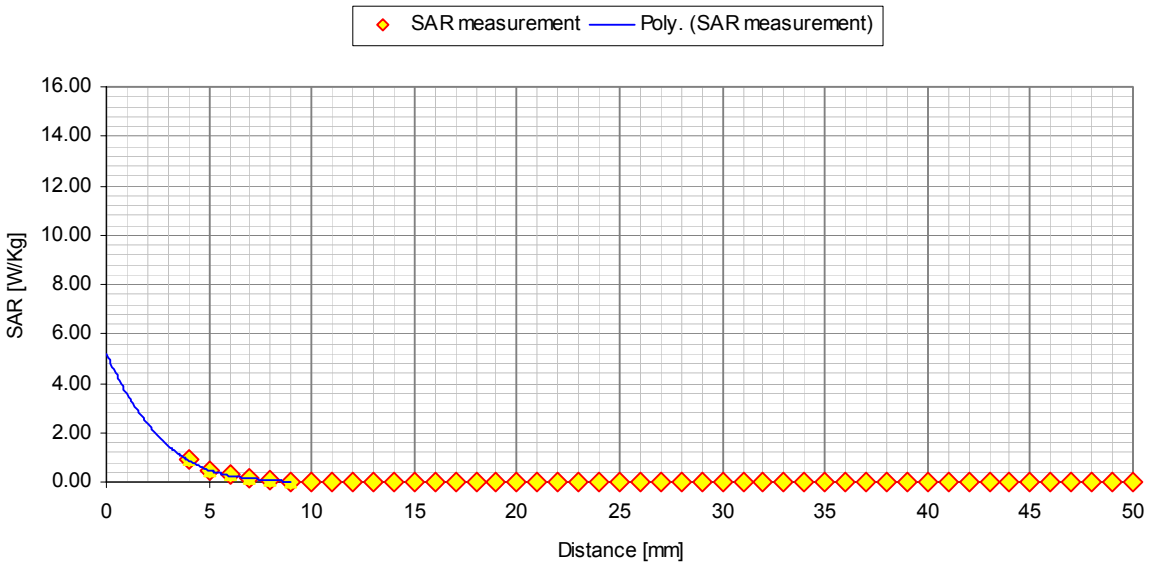



SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

7.1.3.2.2. CH 52, 5260 MHz

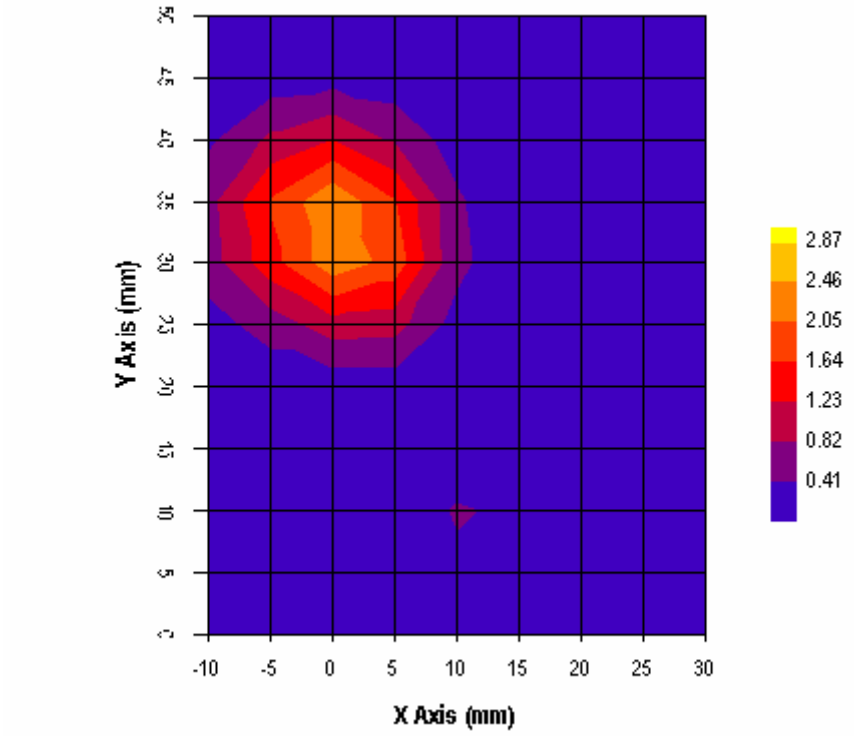
Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5260
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	0.84




SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

7.1.3.2.3. CH 64, 5320 MHz

Test date [MM/DD/YYYY]	04/04/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	0
Test frequency [MHz]	5320
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [dBm]	22.0 peak conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm; Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	0.65



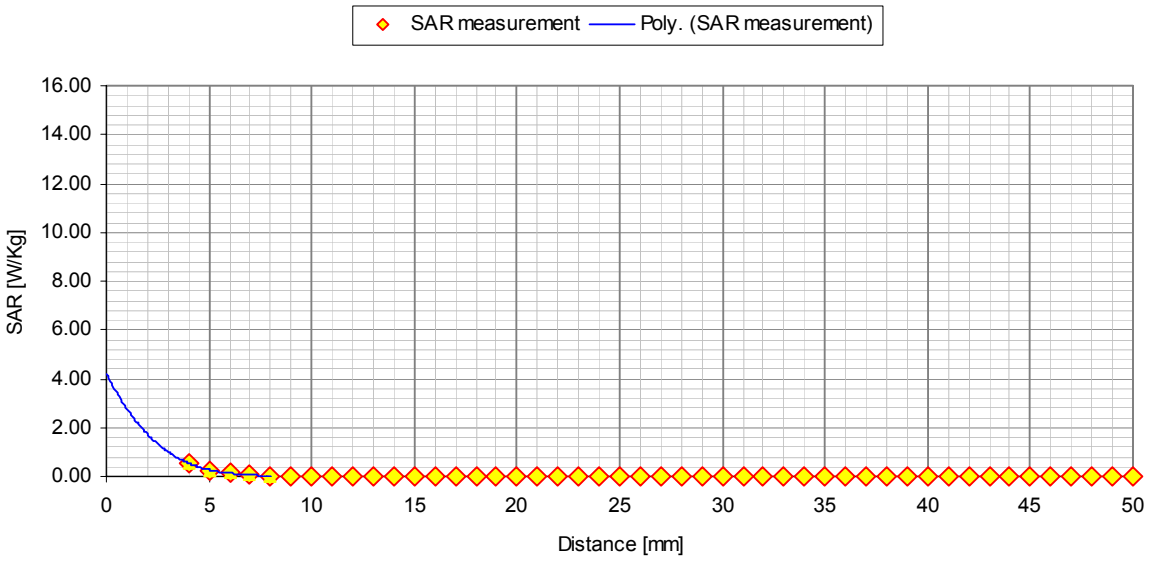

SAR measurement
Poly. (SAR measurement)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

EXHIBIT 8. TISSUE DIELECTRIC PARAMETER CALIBRATION

The tissue conductivity was calibrated in accordance with IEEE Std 1528-200X, Draft 6.1 November 14, 2000, Sponsor IEEE SCC 34

Tissue calibration type	HP Dielectric Strength Probe System (M/N: 85070C)
Tissue calibration date [MM/DD/YYYY]	04/01/2003
Tissue calibrated by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Tissue calibration frequency [MHz]	5240
Tissue Type	Muscle
Target conductivity [S/m]	5.35
Target dielectric constant	49.0
Composition (by weight) [%]	DI Water (77.67 %) DGBE (2.91 %) Triton X-100 (19.42 %)
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Penetration depth (plane wave excitation) [mm]	6.69

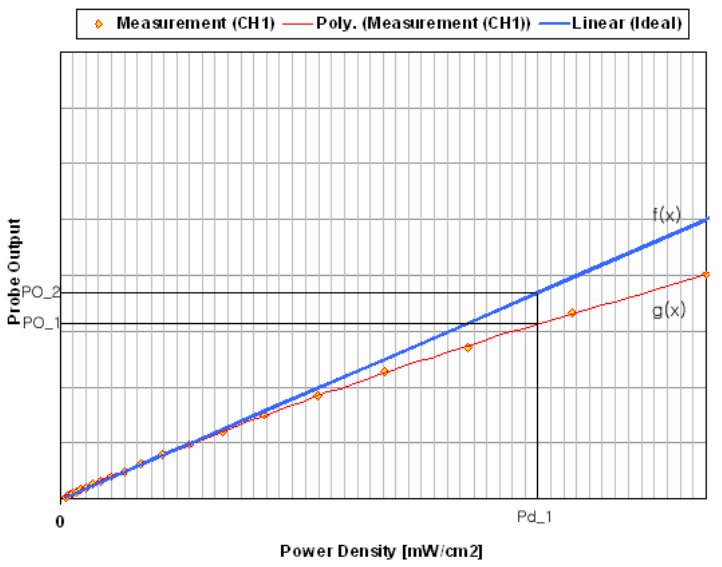
EXHIBIT 9. SAR SYSTEM CALIBRATION

9.1. GENERAL INFORMATION OF THE PROBE

Probe Type	E-Field Triangle, Isotropic
Model Number	E-TR
Serial Number	UT-0200-01
Manufacturer	3D-EMC Laboratory Inc.
Manufactured Date	February 2000
Probe Length [mm]	270
Probe offset [mm]	2.0
Probe Tip diameter [mm]	4.0
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Sensor Factor (η_{E2}) [mV/(V/m)^2]	10.8 / 3770

9.2. PROBE LINEARITY AND DYNAMIC RANGE

Each channel of the probe output over the range of the generated field's power density is recorded and stored as a diode compensation table to yield the polynomial equations, using the curve fitting algorithm, for the ideal diode response (linear) and the saturated diode response (the 3rd order). The linear equation and the inverse of the 3rd order polynomial equation are used to compensate for the saturated diode response to the ideal diode response.

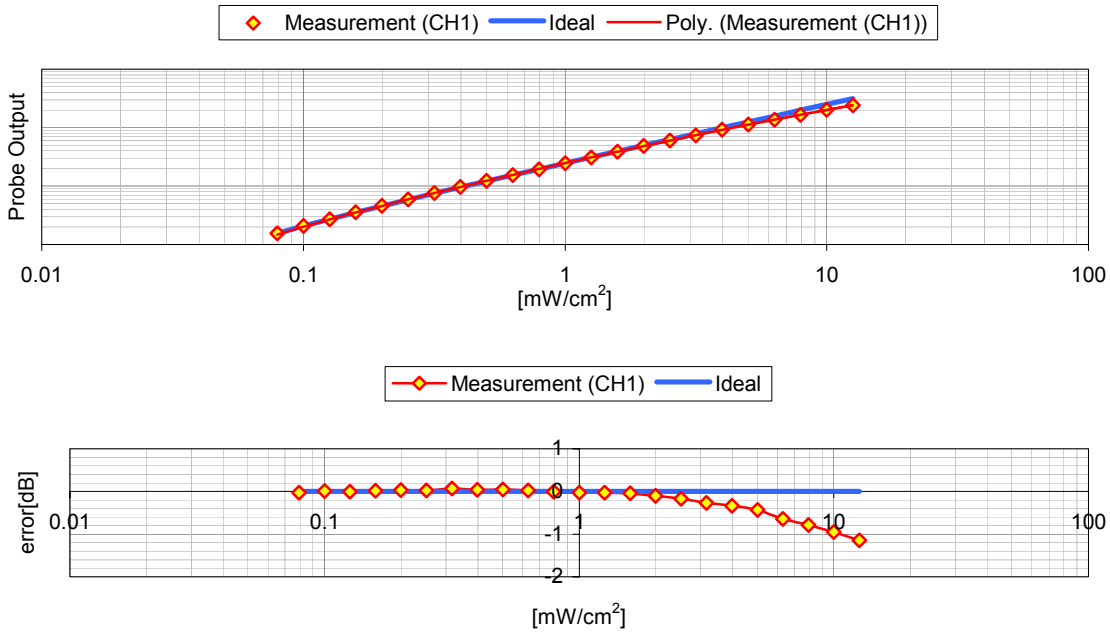


For example, Provided that linear equation, f, the 3rd order polynomial equation, g, and its inverse, g^{-1}, the saturated diode output $PO_{\_1}$ can be compensated to the ideal diode output $PO_{\_2}$ by the calculation as shown below.

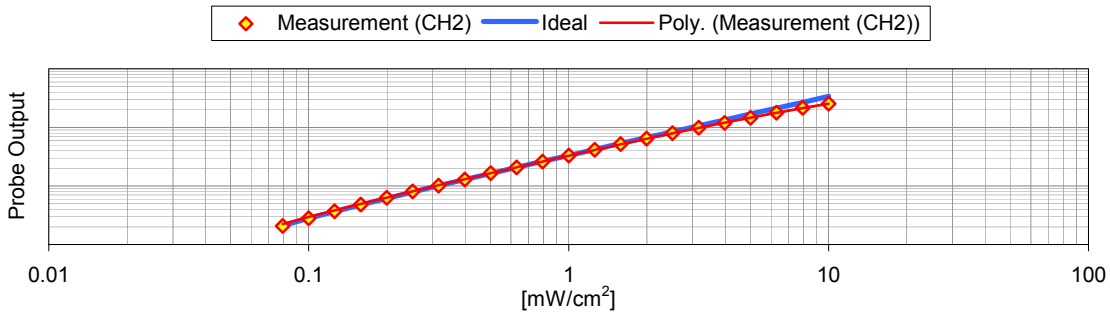
$$Pd_{\_1} = g^{-1}(PO_{\_1}),$$

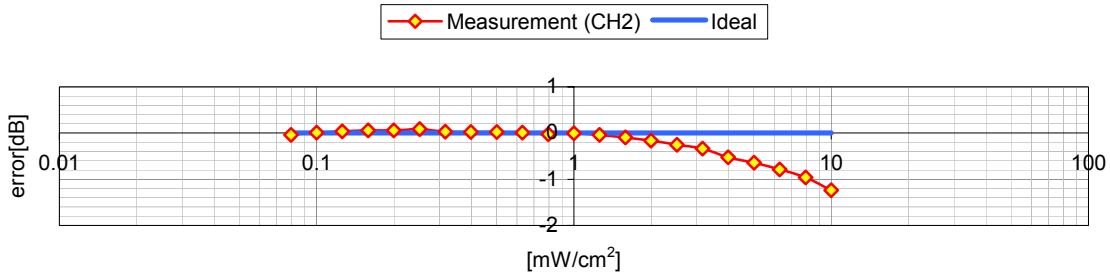
$$PO\_2 = f(Pd\_1) = f(g^{-1}(PO\_1))$$

9.2.1. Channel 1

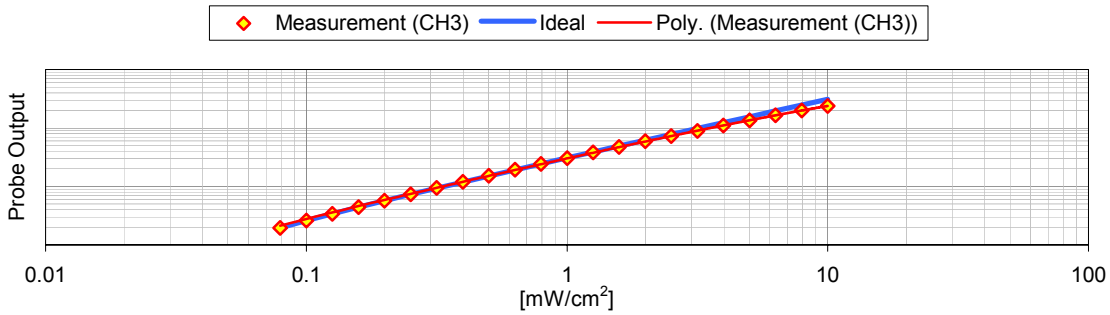


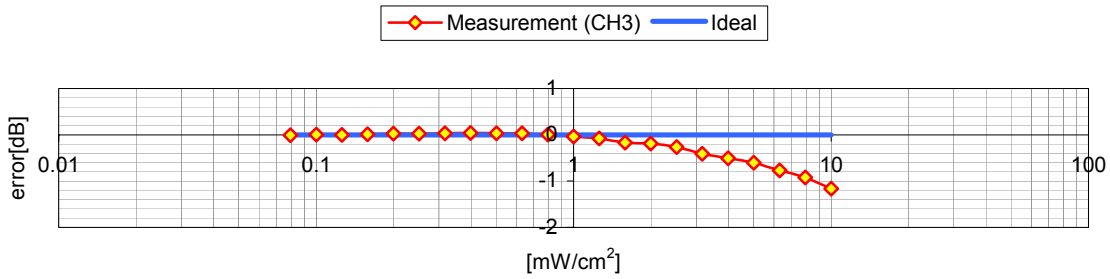
9.2.2. Channel 2





9.2.3. Channel 3





9.3. PROBE FREE SPACE CALIBRATION

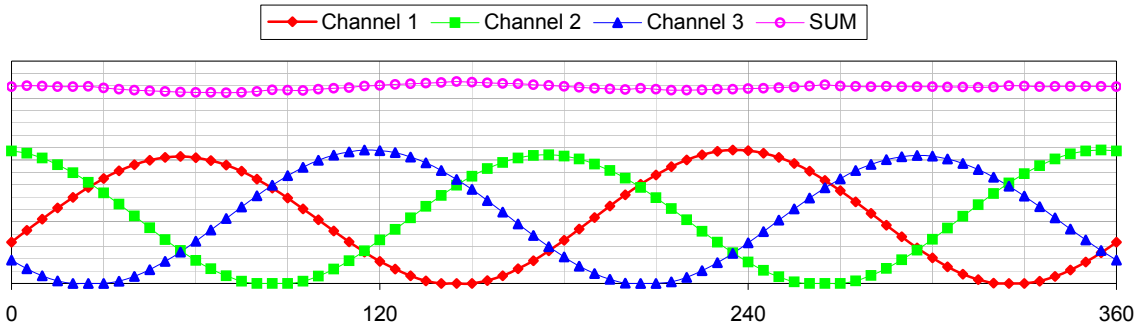
9.3.1. Calibration Setup

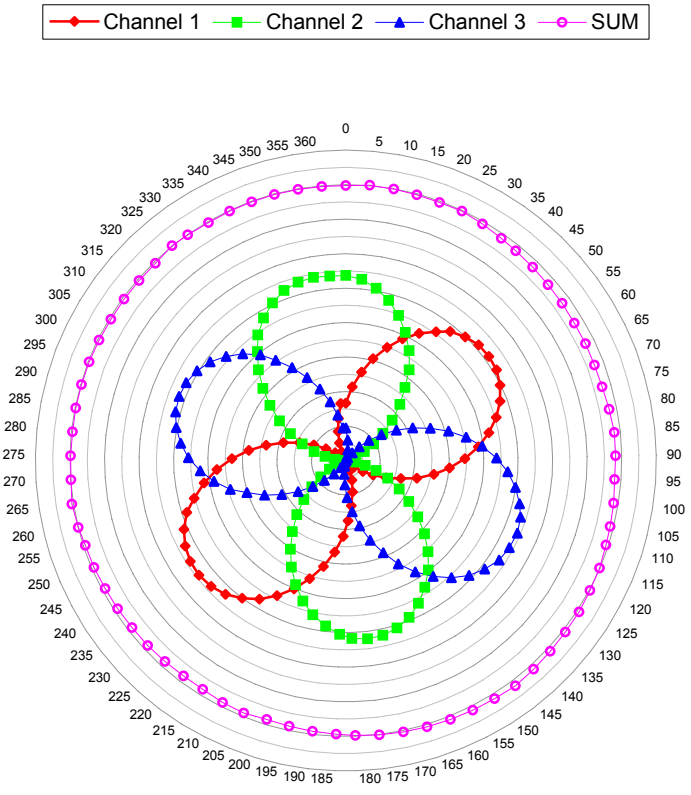
Calibration cell type	Waveguide
Model Number	11457-2
Serial Number	CO-05721-01
Manufacturer	APOLLO
Cross-sectional dimension (W × H) [mm]	40 × 20
Input Power / Power Density [mW/(mW/cm^2)] @ 5,240 [MHz]	2.794

9.3.2. Amplifier Settings

Calibration Date [MM/DD/YYYY]	07/31/2002
Calibrated by	JaeWook Choi
Calibration Frequency [MHz]	5,240
Room Temperature [°C]	24
Room Humidity [%]	30
φ [°]	90
θ_1, θ_2, θ_3 [°]	54.7, 54.7, 54.7
Pd [mW/cm^2]	2.0
V_{max1}	2413
V_{max2}	2557
V_{max3}	1848
AS_1	0.00596768
AS_2	0.00563160
AS_3	0.00779221

9.3.3. Isotropic response





9.4. PROBE THERMAL TRANSFER CALIBRATION

9.4.1. Calibration Setup

Calibration type	Thermal transfer calibration
Flat phantom dimension (W × L × H) [mm]	420 × 700 × 200
Flat phantom shell thickness (d_3) [mm]	2.0
Flat phantom shell permittivity	2.98
Calibration dipole dimension (L × h × d) [mm]	25.1 × 13.4 × 3.6
Sensor-to-Phantom (d_1) [mm]	5.0
Dipole-to-Phantom (d_2) [mm]	8.0
Sensor-to-Dipole ($d_1 + d_2 + d_3$) [mm]	15.0 (5.0 + 8.0 + 2.0)
Return Loss (at test frequency) [dB]	-21.0

9.4.2. Simulated Tissue

Tissue calibration type	HP Dielectric Strength Probe System
Tissue calibration date [MM/DD/YYYY]	07/31/2002
Tissue calibrated by	JaeWook Choi
Room temperature [°C]	24
Room humidity [%]	30
Simulated tissue temperature [°C]	24
Tissue calibration frequency [MHz]	5240
Tissue Type	Muscle
Target conductivity [S/m]	5.40
Target dielectric constant	48.5
Measured conductivity [S/m]	5.43 (+0.6 %)
Measured dielectric constant	48.8 (+0.6 %)
Penetration depth (plane wave excitation) [mm]	6.95

9.4.3. Conversion Factor

Calibration Date [MM/DD/YYYY]	07/31/2002
Calibration by	JaeWook Choi
Calibration Frequency [MHz]	5,240
Room Temperature [°C]	24
Room Humidity [%]	30
Simulated Tissue Temperature [°C]	23
PO_{tot_tissue} [mV]	6.668 @ 0.28 [W] 11.609 @ 0.49 [W] 16.193 @ 0.70 [W] 23.278 @ 0.99 [W]
$\delta(PO_{tot\_tissue})/\delta P$ [mV/W]	23.44599
$\Delta T/\Delta t$ [°C/ sec]	0.01525 @ 4.0 [W] 0.01940 @ 5.0 [W] 0.02343 @ 6.0 [W] 0.02732 @ 7.0 [W] 0.03152 @ 8.0 [W] 0.03549 @ 9.0 [W] 0.03943 @ 10.0 [W]
$\delta(\Delta T/\Delta t)/\delta P$ [°C/sec/W]	0.004029
Conversion Factor (γ)	2.721

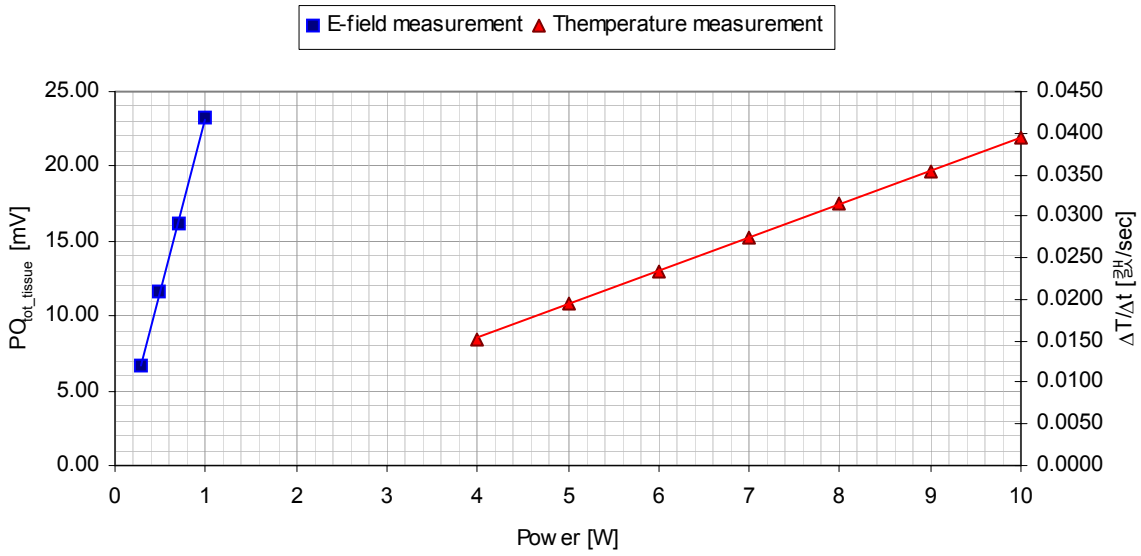


EXHIBIT 10. SAR SYSTEM VERIFICATION USING DIPOLE REFERENCE

10.1.1. Verification Setup

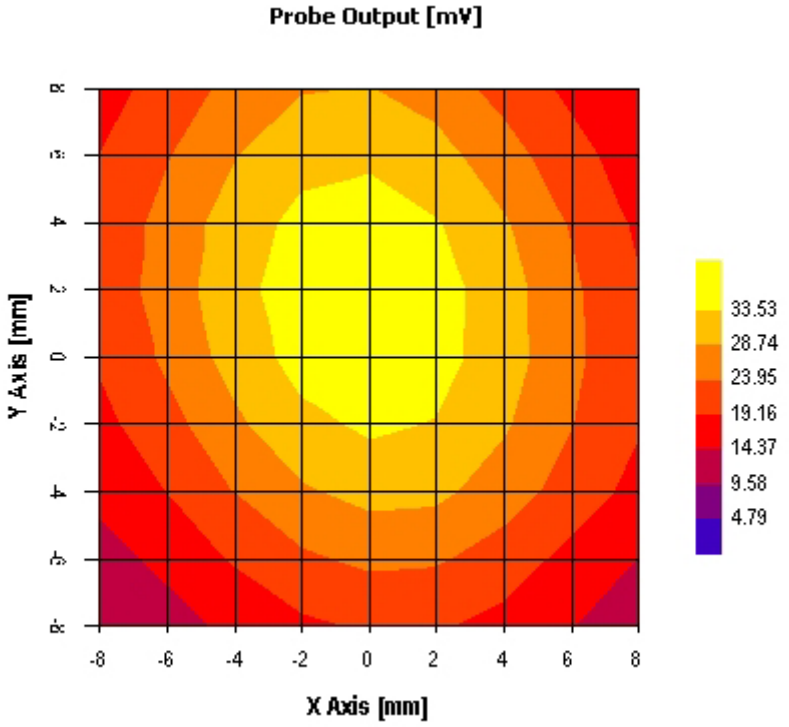
Flat phantom dimension (W × L × H) [mm]	420 × 700 × 200
Flat phantom shell thickness (d_3) [mm]	2.0
Flat phantom shell permittivity	2.98
Reference dipole dimension (L × h × d) [mm]	25.1 × 13.4 × 3.6
Dipole-to-Phantom (d_2) [mm]	8.0
Dipole-to-Liquid ($d_2 + d_3$) [mm]	10.0 (8.0 + 2.0)
Return Loss (at test frequency) [dB]	-21.0

10.1.2. Simulated Tissue

Tissue calibration type	HP Dielectric Strength Probe System
Tissue calibration date [MM/DD/YYYY]	04/01/2003
Tissue calibrated by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Tissue calibration frequency [MHz]	5240
Tissue Type	Muscle
Target conductivity [S/m]	5.35
Target dielectric constant	49.0
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Penetration depth (plane wave excitation) [mm]	6.69

10.1.3. Verification Result

Test date [MM/DD/YYYY]	04/01/2003
Test by	JaeWook Choi
Room temperature [°C]	21
Room humidity [%]	30
Simulated tissue temperature [°C]	21
Separation distance, d [mm]	10 (8 + 2)
Test frequency [MHz]	5240
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00596768, 0.00563160, 0.00779221
Tissue Type	Muscle
Measured conductivity [S/m]	5.56 (+3.9 %)
Measured dielectric constant	47.3 (-3.5 %)
Conversion Factor (γ)	2.721
Sensitivity (ζ) [W/Kg/mV]	0.713
Power [mW]	250 (forward power)
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 13 pts, 12 mm × 12 mm × 12 mm, Resolution: 3 mm × 3 mm × 1 mm
SAR_{1g} [W/Kg]	12.80
SAR_s [W/Kg]	61.36
Penetration Depth [mm]	5.22



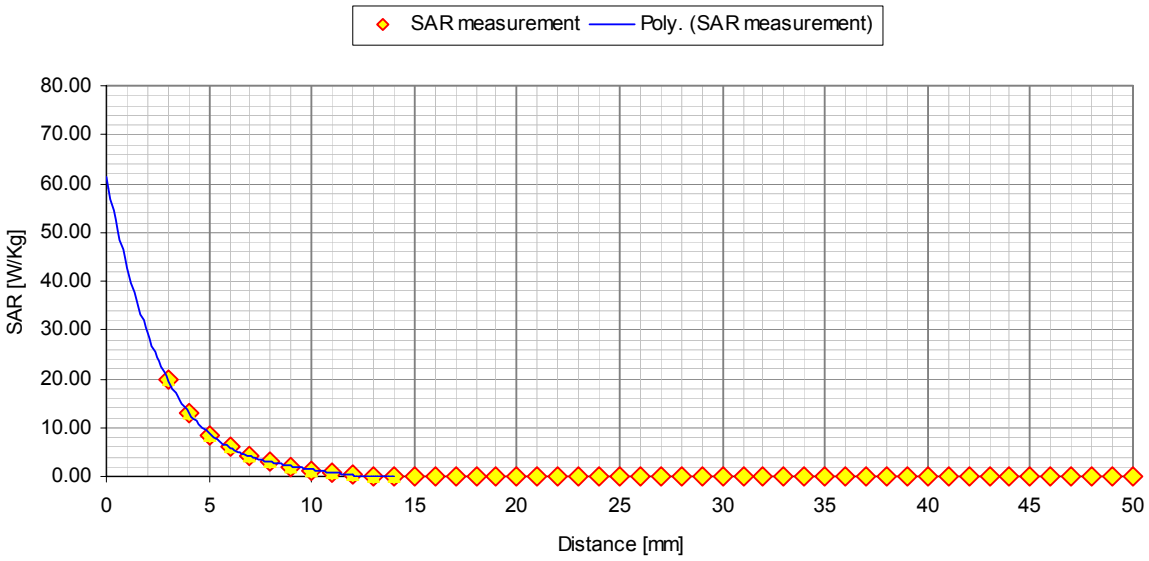

SAR measurement
Poly. (SAR measurement)
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
SAR [W/Kg]
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

EXHIBIT 11. MANUFACTURER'S DECLARATION POWER LEVELS SAR

190 Mathilda Place, Sunnyvale, CA 94086. Tel: 408 543 3300, Fax 408 543 3399

We

Broadcom Corporation
190 Mathilda Place
Sunnyvale
California CA 94086
USA

Contact: Mr Chris McGough
Tel: +1 408-922-5810
Fax: +1 408-543-3399

Hereby declare under our sole responsibility, that the product

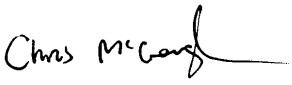
Model Name: BROADCOM BCM94309MP Wireless LAN Mini PCI Card
Model No. BCM94309MP

Had power level settings as follows for SAR and FCC measurements.

Channel Freq. [MHz]	Rated power for FCC testing	Rated power for SAR testing	RF conducted power measured @6Mbps (FCC)	RF conducted power measured @6Mbps (SAR)
5180.0	10dBm Average power in packet	15dBm Average power in packet	15.9 dBm	22.0
5260.0	15dBm Average power in packet	15dBm Average power in packet	21.9 dBm	22.0
5320.0	15dBm Average power in packet	15dBm Average power in packet	22.0 dBm	22.0

Notes:
For FCC testing the rated power for channel 5180MHz was set to lower rated power than the higher frequency channels to ensure compliance with the lower FCC power limits in the 5150-5250MHz band. For SAR measurements all channels/antennas were measured at the worse case 15dBm Average Power in Packet rated power. This was to ensure compliance with both FCC and Canadian SAR requirements (where the 5150-5250MHz RS-210 power limit in Canada is 23dBm).
The worse case data rate for SAR measurements was identified as being 6Mbps.This has a duty cycle of 98%.

19th February 2003



Chris McGough
Broadcom Corporation

EXHIBIT 12. SAR CALCULATION SUMMARY

12.1. TERMINOLOGY

AS_i	Amplifier Setting for channel i (i = 1, 2, 3)
Pd	Power density at the measurement point [mW/cm^2]
PO_{tot_air}	Probe Output in the air [mV]
PO_{tot_tissue}	Probe Output in the simulated tissue [mV]
η_{E2}	Sensor Factor to the $\|E\|^2$, an arbitrary value 10.8/3,770 [mV/(V/m)^2]
η_{pd}	Sensor Factor to the uniform power density, an arbitrary value 10.8 [mV/(mW/cm^2)]
γ	Conversion factor; ratio of sensor response in air to response in the dielectric media
ζ	Sensitivity of the probe in the simulated tissue [W/Kg/mV]
c	Specific heat capacity of the simulated tissue [J/Kg/ ^{o}C]
$\sigma_{@cal}$	Conductivity of the simulated tissue during the thermal transfer calibration [S/m]
$\sigma_{@meas}$	Conductivity of the simulated tissue during the SAR measurement [S/m]
ρ	Mass density of the simulated tissue [Kg/m^3]
$\Delta T/\Delta t$	Initial rate of tissue heating, before thermal diffusion takes place [^{o}C /sec]

12.1.1. Sensor factor(η_{pd} and η_{E2}) in the air ($Z_0 = 377[\Omega]$)

$$\eta_{Pd} = 10.8[mV/(mW/cm)^2] \equiv \eta_{E2} = \frac{10.8}{3{,}770}[mV/(V/m)^2]$$

$$Pd[mW/cm^2] = \frac{PO_{tot}}{\eta_{Pd}}\ ,\ |E|^2[(V/m)^2] = \frac{PO_{tot}}{\eta_{E2}} \text{ and } SAR[W/Kg] = \frac{\sigma \times \frac{PO_{tot}}{\eta_{E2}}}{\rho}$$

12.1.2. Amplifier settings(AS_i) and probe output

$$AS_i = \frac{\eta_{Pd}}{V_{\max_i} - DC_i} \times \cos^2(\varphi - \theta_i) \times Pd$$

$$PO_1[mV] = (V_1 - DC_1) \times AS_1 \equiv |E_1|^2 \times \eta_{E2}$$
$$PO_2[mV] = (V_2 - DC_2) \times AS_2 \equiv |E_2|^2 \times \eta_{E2}$$
$$PO_3[mV] = (V_3 - DC_3) \times AS_3 \equiv |E_3|^2 \times \eta_{E2}$$
$$PO_{tot}[mV] \equiv |E|^2 \times \eta_{E2} = \left(|E_1|^2 + |E_2|^2 + |E_3|^2\right) \times \eta_{E2} = |E_1|^2 \times \eta_{E2} + |E_2|^2 \times \eta_{E2} + |E_3|^2 \times \eta_{E2}$$
$$\equiv PO_1 + PO_2 + PO_3$$

12.1.3. Conversion factor (γ) in the simulated tissue (Thermal Transfer Calibration)

$$SAR_t = SAR_{solution} = \frac{\sigma_{@cal} \times \left|E_{solution}\right|^2}{\rho_{solution}} \text{, thus } \left|E_{solution}\right|^2 = \frac{SAR_t \times \rho_{solution}}{\sigma_{@cal}} = \frac{PO_{tot\_solution}}{\eta_{E2}} \times \frac{1}{\gamma}$$

$$\gamma = \frac{PO_{tot\_solution}}{\eta_{E2}} \times \frac{\sigma_{@cal}}{SAR_t \times \rho_{solution}} = \frac{PO_{tot\_solution}}{\eta_{E2}} \times \frac{\sigma_{@cal}}{\left(c \times \frac{\Delta T}{\Delta t}\right) \times \rho_{solution}}$$

$$= \frac{\sigma_{@cal}}{\eta_{E2} \times c \times \rho_{solution}} \times \frac{PO_{tot\_solution}}{\left(\frac{\Delta T}{\Delta t}\right)} = \frac{\sigma_{@cal}}{\eta_{E2} \times c \times \rho_{solution}} \times \frac{\frac{\delta}{\delta P} PO_{tot\_solution}}{\frac{\delta}{\delta P}\left(\frac{\Delta T}{\Delta t}\right)}$$

12.1.4. Conversion factor (γ) in the simulated tissue (Calculable Waveguide Calibration)

$$SAR(z) = SAR_{solution} = \frac{\sigma_{@cal} \times \left|E_{solution}\right|^2}{\rho_{solution}} \text{, thus } \left|E_{solution}\right|^2 = \frac{SAR(z) \times \rho_{solution}}{\sigma_{@cal}} = \frac{PO_{tot\_solution}}{\eta_{E2}} \times \frac{1}{\gamma}$$

$$\gamma = \frac{PO_{tot\_solution}}{\eta_{E2}} \times \frac{\sigma_{@cal}}{SAR(z) \times \rho_{solution}} = \frac{PO_{tot\_solution}}{\eta_{E2}} \times \frac{\sigma_{@cal}}{\frac{4(P_f - P_b)}{\rho_{solution} ab \delta_{measured}} e^{-2z/\ \delta_{measured}} \times \rho_{solution}}$$

$$= \frac{PO_{tot\_solution} \times \sigma_{@cal} \times a \times b \times \delta_{measured}}{\eta_{E2} \times 4(P_f - P_b) \times e^{-2z/\ \delta_{measured}}}$$

12.1.5. Sensitivity (ζ) in the simulated tissue

$$\zeta[W/Kg/mV] = \frac{\sigma_{@meas}[S/m]}{\rho_{head}[Kg/m^3]} \times \frac{1}{\eta_{E2}[mV/(V/m)^2] \times \gamma}$$

12.1.6. SAR calculation

$$SAR[W/Kg] = \zeta[W/Kg/mV] \times PO_{tot\_solution}[mV]$$