Nov. 19, 2002

To: Steve Dayhoff
FCC Application Processing Branch

Re: FCC ID OSZ37704C
Applicant: Intersil Corporation
Correspondence Reference Number: 24350
731 Confirmation Number: EA153277

1) SAR pg 49 - only 1g avg SAR should be reported. Please revise.

A1) Unless otherwise specified, all the SAR values in the report were 1 gram average SAR value.

2) SAR pg 49 shows 0mm and 5mm. Is 0mm with entire notebook base touching phantom (no tilt)? Normal use position should be tested.

A2) Providing normal usage situation, the PCMCIA slots are located a certain distance from either bottom or top of the notebook, thus it was not possible testing the entire EUT in contact and parallel to the bottom of the phantom. When the entire bottom of the notebook is in contact and parallel to the phantom, the distance between the EUT and the bottom of the phantom was found to be 13 mm and it was also found to be 15 mm when the entire top of the notebook was in contact and parallel to the phantom. As listed in page 49 of the SAR test report, the SAR values with these configurations were found to be lower than the other configurations investigated so that the rest of the SAR measurement was carried out with those found to be the worst case configuration.

3) What is distance from bottom of PCMCIA slot to bottom of notebook?

A3) The distance between the bottom of PCMCIA slot and the bottom of the notebook was 13 mm and the distance between the top of PCMCIA slot and the top of the notebook was 15 mm.

4) SAR section 7 - z-axis scans show 8 W/kg surface SAR decaying to 0 in less than 1cm. Are all units and results correct?

A4) At 5.2GHz the decay in the tissue was very fast so that the penetration depth in the test tissue was found to be 6.95 mm assuming plane wave excitation. Thus under plane wave conditions the SAR at the surface will decay down to about 1 W/Kg (13% of the surface value) at 7 mm above from the surface of the phantom. Under close field antenna exposure, the SAR decays even faster than plane wave conditions so the high fall off of SAR with depth is entirely expected and we do see this phenomena occur during dipole validations and other measurements involving near field SAR testing. (Refer to 10.1.3. in the SAR report)

5) Please show derivation of target liquid parameters.

A5) The target liquid parameters (ε=48.5, σ=5.40) were obtained using the linear interpolation of target liquid parameters at 3000MHz (ε=52.0, σ=2.73) and 5800MHz (ε=48.2, σ=6.00) as recommended in FCC OET 65 supplement C ed 01-01.

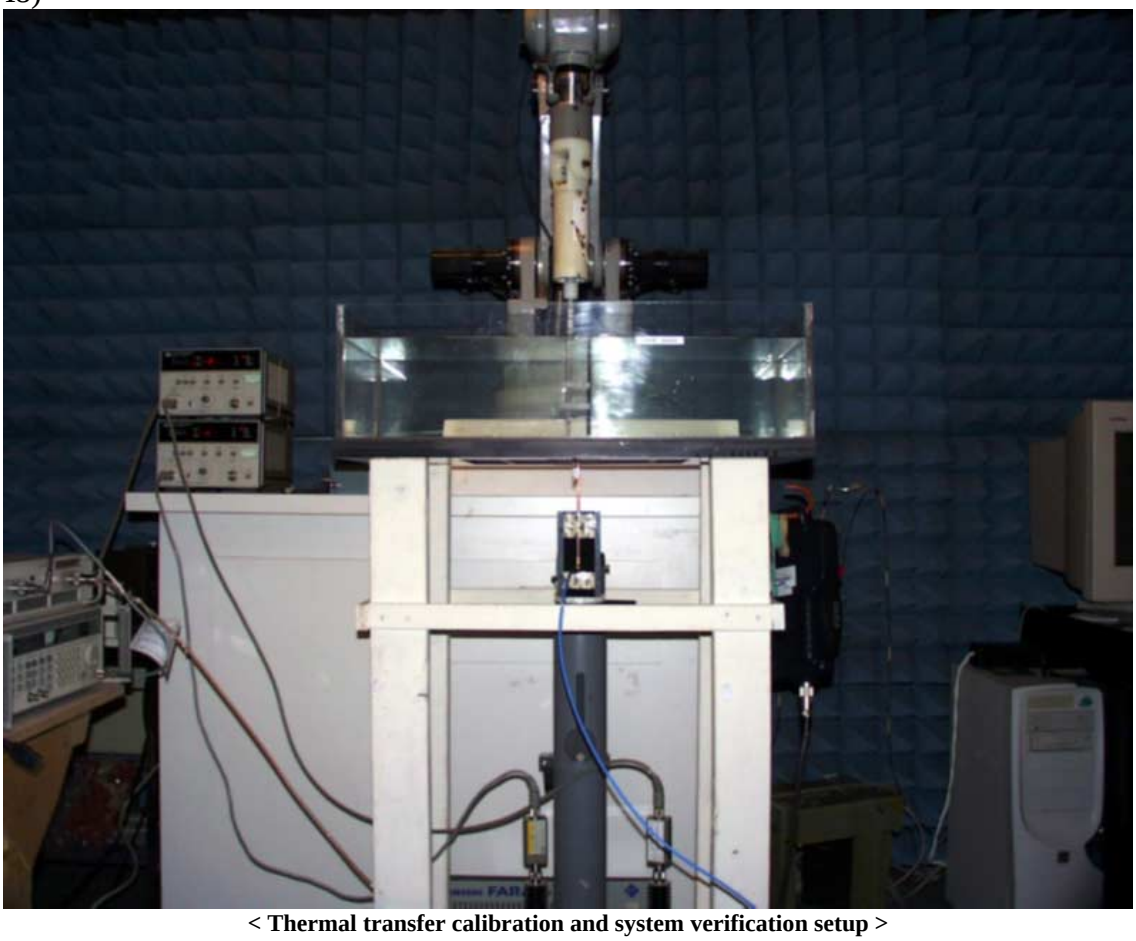
6) SAR section 9.2 what is frequency and liquid parameters?

A6) Dynamic range of the probe was presented in free space in terms of power density (mW/cm^2), since the characteristics of the specific probe can be specified as a function of diode voltage of its each channel and this is independent of frequency and tissue parameters. Thus probe output voltages versus the range of the input power density in the waveguide were recorded as a table for the diode compensation. In addition, the dynamic range test in the free space is preferred since the test involves high RF power that can cause the thermal run-away problems in the simulated tissue due to convection currents arising from heated tissue. Dynamic range measurements for SAR in tissue is dependent on the frequency and the tissue parameters used and is a meaningless number unless specified with the tissue and frequency used to determine dynamic range. If dynamic range is specified in Watt/Kg, it would be different for each tissue used and for each frequency being measured. Determining dynamic range in free space is frequency and tissue independent.

7) Max conducted in SAR is 52mW. Form 731 has 71mW. Grant power cannot exceed SAR and EMC tested levels.
A7) A revised form 731 will be provided.

8) Please submit photos of 5.2 GHz dipole and temp. cal. and validation setups.

A8)



< Thermal transfer calibration and system verification setup >

Key steps of probe calibration process and system verification are described in the chapter 5.6 and chapter 5.7 of the report

9) How was 5.2ghz validation dipole target value obtained?

A9) We have requested from Tim Harrington the 5.2GHz target validation values which is currently not provided in any papers that we are aware of. Tim has forwarded this request to the SCC 34-2 committee and we are still awaiting for these figures to be provided. Dipole validations at 2.45GHz using this SAR system were recently filed with the FCC under Application FCC ID: GM3WLP24HN and may be used to determine the integrity of this system to measure SAR correctly. Following is the 2.45GHz validation measurements.

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]	51.7 × 30.4 × 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]	-24.0

Simulated Tissue

BRAIN TISSUE

Tissue calibration type	HP Dielectric Strength Probe System
Tissue calibration date [MM/DD/YYYY]	09/23/2002
Tissue calibrated by	JaeWook Choi
Room temperature [°C]	24
Room humidity [%]	50
Simulated tissue temperature [°C]	24
Tissue calibration frequency [MHz]	2450
Tissue Type	Brain
Target conductivity [S/m]	1.80
Target dielectric constant	39.2
Specific Heat Capacity [J/Kg/°C]	3,702
Mass Density [Kg/m3]	1,016
Measured conductivity [S/m]	1.88 (+4.6 %)
Measured dielectric constant	37.6 (-4.0 %)
Penetration depth (plane wave excitation) [mm]	17.6

Muscle Tissue

Tissue calibration type	HP Dielectric Strength Probe System
Tissue calibration date [MM/DD/YYYY]	09/23/2002
Tissue calibrated by	JaeWook Choi
Room temperature [°C]	24
Room humidity [%]	50
Simulated tissue temperature [°C]	24
Tissue calibration frequency [MHz]	2450
Tissue Type	Muscle
Target conductivity [S/m]	1.95
Target dielectric constant	52.7
Specific Heat Capacity [J/Kg/°C]	3,979
Mass Density [Kg/m3]	1,004
Measured conductivity [S/m]	1.91 (-2.1 %)
Measured dielectric constant	55.5 (+5.0 %)
Penetration depth (plane wave excitation) [mm]	20.9

Verification Result

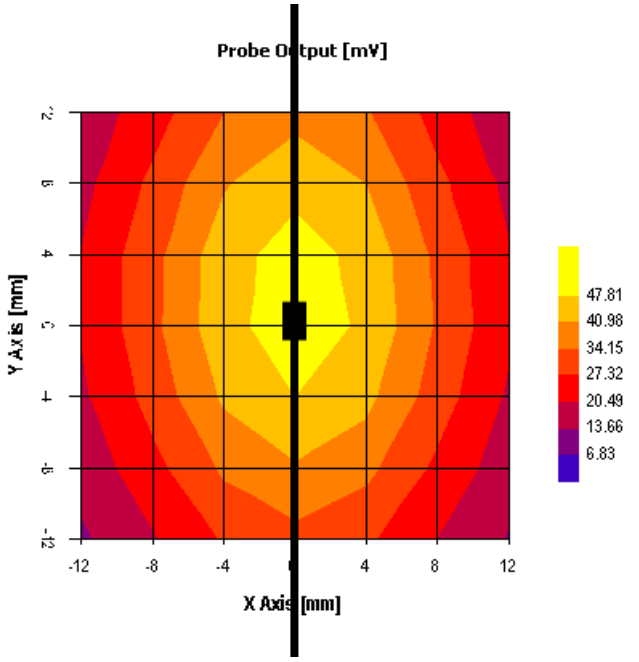
Reference SAR values

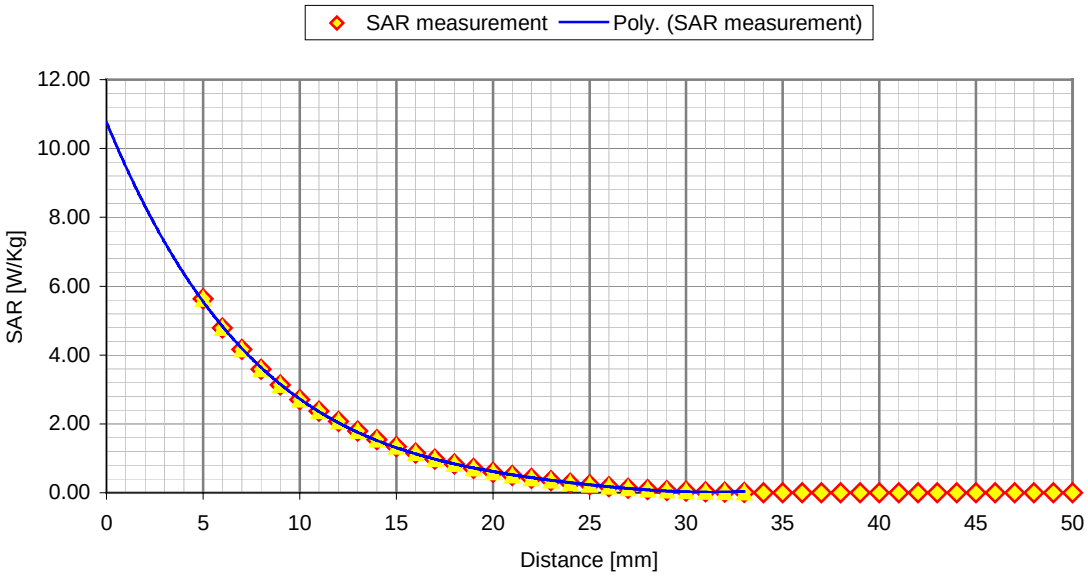
Reference SAR_{1g} [W/Kg]	52.4
Reference SAR_s [W/Kg]	104.2
Measured SAR_{1g} [W/Kg]	51.92
Measured SAR_s [W/Kg]	107.65

* All the SAR values in the above table are normalized to a forward power of 1 W.

Brain tissue

Test date [MM/DD/YYYY]	09/25/2002
Test by	JaeWook Choi
Room temperature [°C]	24
Room humidity [%]	50
Simulated tissue temperature [°C]	24
Test frequency [MHz]	2450
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)	0.00660854, 0.00622568, 0.008540925
Tissue Type	Brain
Measured conductivity [S/m]	1.88 (+4.6 %)
Measured dielectric constant	37.6 (-4.0 %)
Specific Heat Capacity [J/Kg/°C]	3,702
Mass Density [Kg/m3]	1,016
Conversion Factor (γ)	3.653
Sensitivity (ζ) [W/Kg/mV]	0.180
Power [mW]	100 (forward power)
Measurement Volume Specification ($X \times Y \times Z$)	5 pts × 5 pts × 9 pts, 16 mm × 16 mm × 32 mm; Resolution: 4 mm × 4 mm × 4 mm
SAR_{1g} [W/Kg]	5.192
SAR_s [W/Kg]	10.765
Penetration Depth [mm]	14.6


Probe Output [mV]
47.81
40.98
34.15
27.32
20.49
13.66
6.83
-12
-8
-4
4
8
12
X Axis [mm]


SAR measurement
Poly. (SAR measurement)
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]

10) User manual statement to maintain 20cm is not practical for PCMCIA in notebook computer. Please revise.

A10) A revised user manual will be provided.

Please feel free to contact us if you have any questions

Best Regards
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