

Millennium Product Inc.

Cell Shield / Zorb



Prepared by PCTEST LAB
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Report Version 2.6

NOTE: SAR results only apply to the device tested. Although the device may have had different modes, a single operating mode (4G mode) evaluated. Other modes were not evaluated. The SAR reduction may be higher or lower for other modes used and environmental conditions.



Model: Cell Shield / Zorb		SAR TEST REPORT	Reviewed by: Quality Manager
Company: Millennium Products Inc.	Test Date: Oct. 13 2015	EUT Type: Shielding Product on iPhone 6	Page 1 of 10

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1 INTRODUCTION

1.1 Specific Absorption Rate (SAR)

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-2005 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. (c) 2005 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [3] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

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2.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

2.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.


Table 2-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT <i>General Population</i> (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT <i>Occupational</i> (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

1 The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

2 The Spatial Average value of the SAR averaged over the whole body.

3 The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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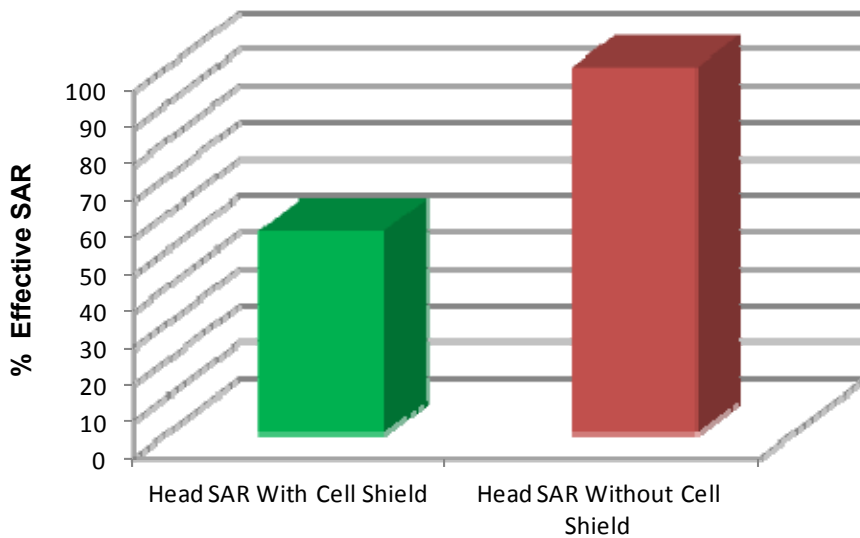
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DATA SUMMARY

3.1 Test Results


		<i>Phone Model:</i> iPhone 6		With Cell Shield / Zorb	
Configuration	Mode	Band (MHz)	Original SAR (W/Kg)	SAR with Cell Shield (W/Kg)	% Effective SAR
Body	LTE	1700	0.265	0.142	53.6
Head	LTE	1700	0.159	0.088	55.3

NOTE: SAR results only apply to the device tested. Although the device may have had different modes, a single operating mode (4G mode) evaluated. Other modes were not evaluated. The SAR reduction may be higher or lower for other modes used and environmental conditions.



Explanation:

% Effective SAR	Description
100%	Wireless Device Operating Without Cell Shield/ Zorb
50% - 60%	Wireless Device Operating with Cell Shield/Zorb; energy absorbed by human tissue is reduced during normal wireless device operation
0%	Wireless Device Not Transmitting

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3.2 SAR Test Plots

Figure 3.2-1
Original Body SAR without Cell Shield / Zorb device attached

0.265 W/kg

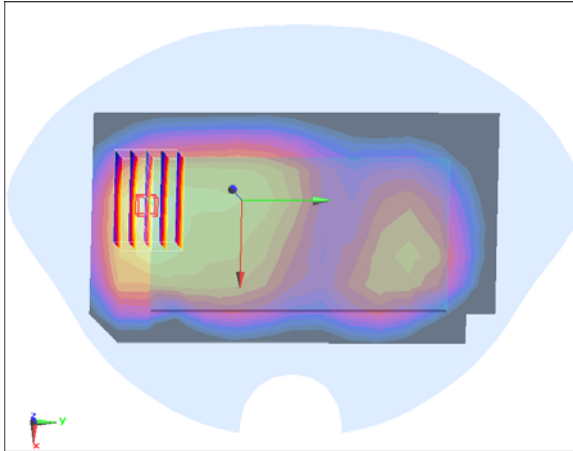
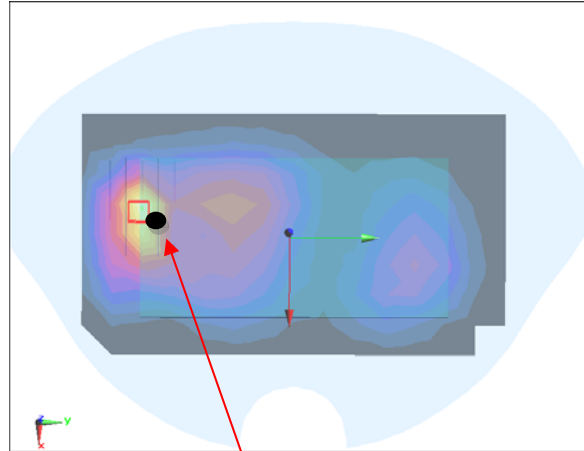


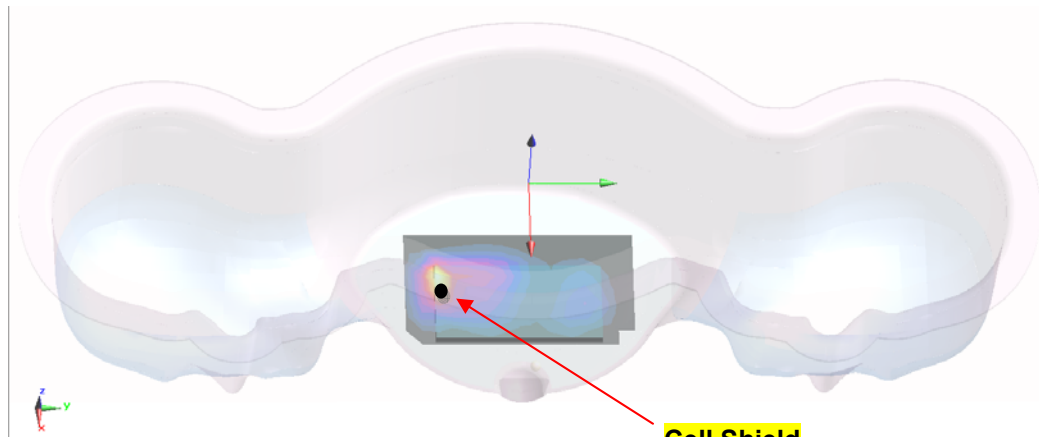
Figure 3.2-2
Body SAR with Cell Shield / Zorb device attached

0.142 W/kg



Cell Shield

Figure 3.2-3
CAD Model of body back side view with Cell Shield / Zorb placed on iPhone 6



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Figure 3.2-4
Original Head SAR without Cell Shield / Zorb device attached

0.159 W/kg

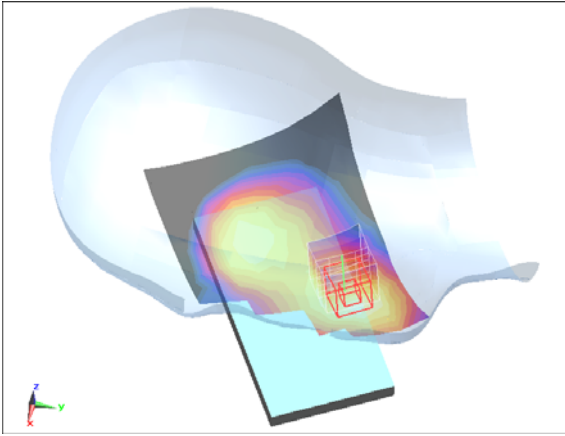
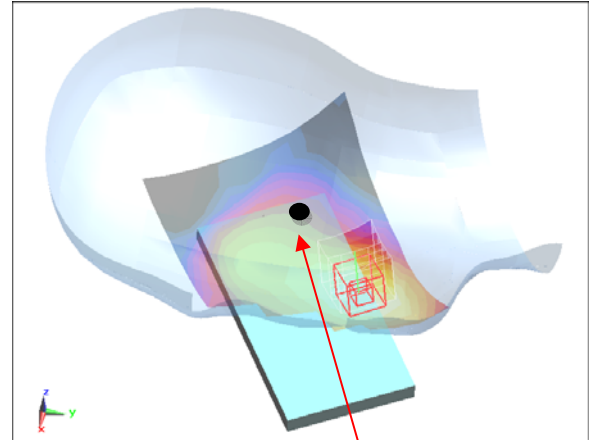


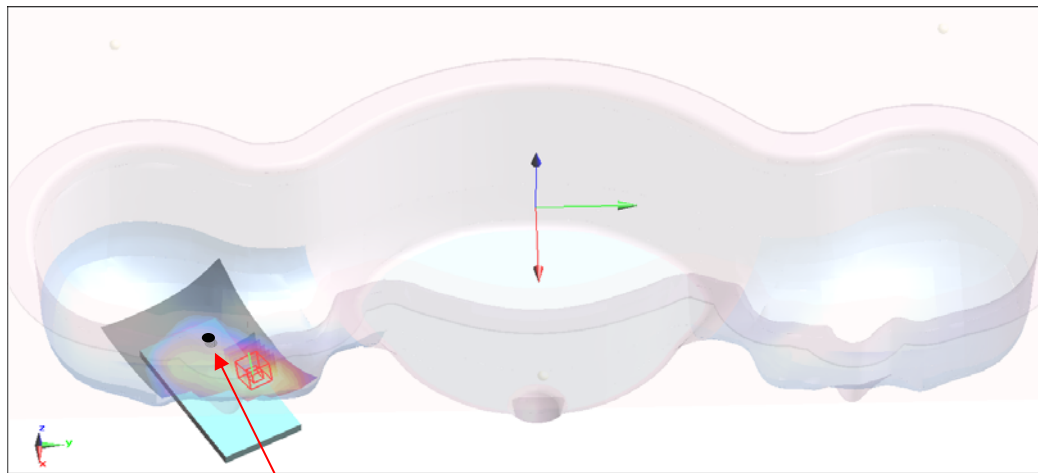
Figure 3.2-5
Head SAR with Cell Shield / Zorb device attached

0.088 W/kg




Cell Shield

Figure 3.2-6
CAD Model of Head view with Cell Shield / Zorb placed on iPhone 6



Cell Shield


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REFERENCES

- [1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, Aug. 1996.
- [2] ANSI/IEEE C95.1-1992, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 100GHz, New York: IEEE, Sept. 1992.
- [3] ANSI/IEEE C95.3-2002, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave, New York: IEEE, December 2002.
- [4] Federal Communications Commission, OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, June 2001.
- [5] IEEE Standards Coordinating Committee 34 – IEEE Std. 1528-2003, Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices.

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PHOTOGRAGHS

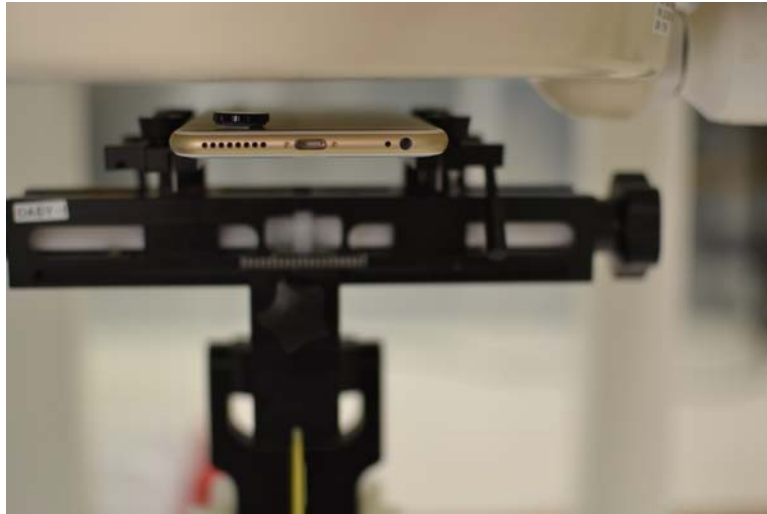


Figure 1: Body Back side view with Cell Shield / Zorb with DASYS Test System

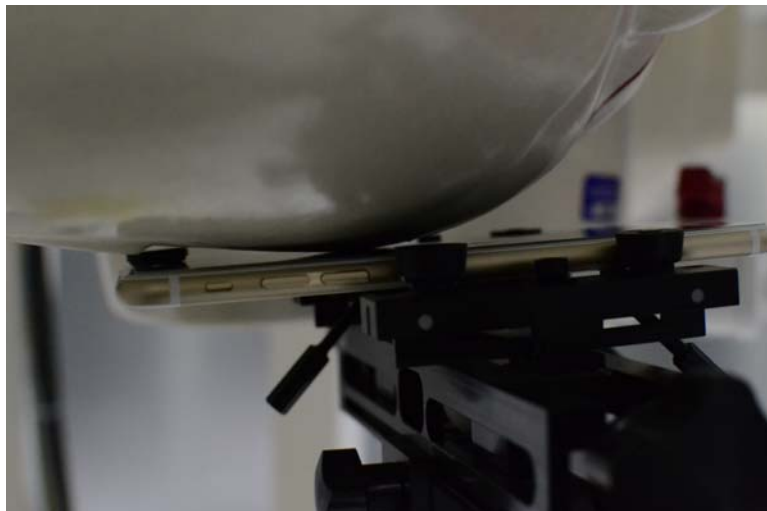


Figure 2: Head Right side View with Cell Shield / Zorb with DASYS Test System



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Figure 3: Full SAR Setup

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