MOTOROLA

ACCREDITED

CGISS EME Test Laboratory
8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

S.A.R. EME Compliance Test Report
Part 1 of 2

Attention:	FCC
Date of Report:	April 7, 2003
Report Revision:	Rev. O
Manufacturer:	Motorola
Product Description:	1:6, 2:6, 81:120 TDM; 64 QAM, 16 QAM & QPSK Modulation; 0.6 W Pulse average
FCC ID:	**AZ489FT5808**
Device Model:	H59UAH6RR5AN

Test Period:	3/13/03 – 3/27/03
EME Tech:	Clint Miller
EME Eng.:	Kim Uong (Lead EME Eng.)
Author:	Michael Sailsman Global EME Regulatory Affairs Liaison

Note: Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 2.0 of this report.

Signature on File — 4/7/03

Ken Enger
Senior Resource Manager, Laboratory Director, CGISS EME Lab

Date Approved

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REVISION HISTORY

Date	Revision	Comments
4/7/03	O	Pilot results

1.0 Introduction

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (S.A.R.) measurements performed at the CGISS EME Test Lab for model number H59UAH6RR5AN, FCC ID: AZ489FT5808. New results are presented herein to reflect design changes made to the DUT RF front-end circuitry. Changes were made to the RFPA, RF attenuator, LNA, and mixer sections.

The applicable exposure environment is General Population/Uncontrolled.

The test results included herein represent the highest S.A.R. levels applicable to this product and clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of 1.6 mW/g per the requirements of 47 CFR 2.1093(d).

2.0 Reference Standards and Guidelines

This product is designed to comply with the following national and international standards and guidelines.

- United States Federal Communications Commission, Code of Federal Regulations; 47CFR part 2 sub-part J
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Terminal frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Terminal communications (Electromagnetic Radiation - Human Exposure) Standard 2001
- ANATEL, Brazil Regulatory Authority, Resolution 256 (April 11, 2001) "additional requirements for SMR, cellular and PCS product certification."

3.0 Description of Test Sample

FCC ID: AZ489FT5808 is a digital multi-service data capable device that employs time division multiplexing transmission technology with a duty cycle ranging from 16.67% to 33.33% using 16-QAM modulation for voice or circuit data transmission. Packet data transmission is also supported up to a maximum duty cycle of 67.5% using quad QPSK modulation.
This device will be marketed to and used by the general population. This device may be used while held against the head in voice mode, in front of the face in PTT mode, and against the body in both voice and data modes.
FCC ID: AZ489FT5808 is capable of operating in the 806-825 MHz. The rated power is0.6 watts. The maximum output is 0.7 watts as defined by the upper limit of the production line final test station.

FCC ID: AZ489FT5808 is offered with the following options and accessories:

Antenna

8585890C01	Retractable whip ¼ wave antenna; 806-825 MHz; -3.4 to -1.35 dBd

Batteries

SNN5705B	750 mAh Lithium Ion
SNN5717C	450 mAh Lithium Ion
SNN5704A	600 mAh Lithium Ion

Body-worn Accessories

NTN9687A	Plastic Carry Holster w/ swivel belt clip
NNTN4126A	Plaxtic Carry Holster w/ swivel belt clip
RLN5334B	Leather flip-style carry case
RLN5336B	Leather Carry Pouch

Other Attachments

NTN8496A	Light-weight headset w/ mic
SYN7875C	Hearing Aid Neck loop (incl. SYN8608C, SNN5536A battery)
SYN8390B	Privacy Earpiece and Microphone
SYN8146C	Over the Ear headset w/ boom microphone
NTN8513A	Heavy duty headset w/ boom microphone
NNTN4305A	Standard battery cover, 750 mAh
NNTN4306A	Optional battery cover, 450 mAh
NKN6544B	RS232 Data cable
NKN6540A	Y Data cable
SKN6311A	USB Data cable
NNTN4007A	USB Data cable
NNTN4049A	USB Data cable

3.1 Test Signal

Test Signal mode:

Test Mode	X	Base Station		Simulator	

Transmission Mode:

CW	
Native Transmission	**X**
TDMA: 1:6, 1:3, 81:120	**X**
Other:	

3.2 Test Output Power

A table of the characteristic power slump versus time is provided in Appendix A for all tested batteries.

4.0 Description of Test Equipment

4.1 Descriptions of S.A.R. Measurement System

The laboratory utilizes a Dosimetric Assessment System (DASY3™) S.A.R. measurement system manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot with an ET3DV6 E-Field probe. Please reference the following websites for detailed specifications of the robot and E-Field probe: http://www.speag.com/robot_acc.html, http://www.speag.com/probes.html.
The S.A.R. measurements were conducted with probe model/serial number ET3DV6/SN1547. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the system performance test results and the probe/dipole calibration certificates are included in appendices C and D respectively. The table below summarizes the system performance check results normalized to 1W.

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	System Perf. Result when normalized to 1W (mW/g)	Reference S.A.R @ 1W (mW/g)	Test Date(s)
1547	FCC Body	9/28/02	D835V2/426	10.67 +/- 0.15	10.65 +/- 10%	3/13/03-3/27/03 8 test days
1547	IEEE Head	9/28/02	D835V2/426	10.315 +/- 0.185	10.04 +/- 10%	3/24/03-3/27/03 4 test days

The DASY3™ system is operated per the instructions in the DASY3™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess EME S.A.R. compliance was calibrated according to 17025 A2LA guidelines.

4.2 Description of Phantom

4.2.1 Flat Phantom

A rectangular shaped box made of low loss acrylic material. The phantom is mounted on a wooden supporting structure that has a loss tangent of < 0.05. The structure has a 60.96 cm x 15.24 cm opening at its center to allow positioning the DUT to the phantom's surface. The table below shows the flat phantom dimensions used for S.A.R. performance assessment.

Length	40cm
Width	23cm
Height	20cm
Surface Thickness	0.2cm

4.2.2 SAM Phantom

A SAM TP1021 phantom supplied by SPEAG was used to assess S.A.R. performance at the head.

4.3 Simulated Tissue Properties

4.3.1 Type of Simulated Tissue

The simulated tissue used is compliant to that specified in FCC Supplement C (Edition 01 – 01) to OET Bulletin 65 (Edition 97 - 01).

Simulated Tissue	Body Position
FCC Body	Abdomen
IEEE Head	Head/Face

4.3.2 Simulated Tissue Composition

	Tissue Ingredients (%)					
	835MHz		NA		NA	
	Head	Body	Head	Body	Head	Body
Sugar	57	44.9	NA	NA	NA	NA
DGBE (Glycol)	NA	NA	NA	NA	NA	NA
De ionized -Water	40.45	53.06	NA	NA	NA	NA
Salt	1.45	0.94	NA	NA	NA	NA
HEC	1	1	NA	NA	NA	NA
Bact.	0.1	0.1	NA	NA	NA	NA

Characterization of Simulated tissue materials and ambient conditions:

Simulated tissue prepared for S.A.R. measurements is measured daily and within 24 hours prior to actual S.A.R. testing to verify that the tissue is within 5% of target parameters at the center of the transmit band. This measurement is done using the Agilent (HP) probe kit model 85070C and a HP8753D Network Analyzer.

Target tissue parameters

FCC Body				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
835	55.2	52.93-54.0	0.97	0.97-0.99
813	55.3	53.12-54.3	0.97	0.95-0.97

IEEE Head				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
835	41.5	40.7-40.98	0.90	0.89-0.93
813	41.6	41.0-41.26	0.90	0.87-0.90

4.4 Test conditions

The EME Laboratory ambient environment is well controlled resulting in very stable simulated tissue temperature and therefore stable dielectric properties. Simulated tissue temperature is measured prior to each scan to insure it is within +/ - 2°C of the temperature at which the dielectric properties were determined. Additional precautions are routinely taken to ensure the stability of the simulated tissue such as covering the phantoms when scans are not actively in process in order to minimize evaporation. The lab environment is continuously monitored. The table below presents the range and average environmental conditions during the S.A.R. tests reported herein:

	Target	**Measured**
Ambient Temperature	20 - 25 ˚C	Range: 21.5-24.1˚C Avg. 22.9˚C
Relative Humidity	30 - 70 %	Range: 45.0-65.2% Avg. 53.3%
Tissue Temperature	NA	Range: 20.5-22.0˚C Avg. 21.17˚C

The EME Lab RF environment uses a Spectrum Analyzer to monitor for extraneous large signal RF contaminants that could possibly affect the test results. If such unwanted signals are discovered the S.A.R scans are repeated. However, the lab environment is sufficiently protected such that no S.A.R. impacting interference has been experienced to date.

5.0 Description of Test Procedure

All options and accessories listed in section 3.0 were considered in order to develop the S.A.R. test plan for this product. S.A.R. measurements were performed using a flat phantom to assess performance at the abdomen and a Sam phantom to assess performance at the side of the head and in front of the face using the applicable transmission modes.

The DUT was assessed against the flat phantom, in the 81:120 transmission mode, with antenna in and out, using the configuration that produced the highest S.A.R. results from previous development assessments, along with each of the offered batteries.

The DUT was assessed against the flat phantom, in the 81:120 transmission mode, with antenna in and out, using the configuration from above that produced the highest S.A.R. results, along with the applicable carry case accessories.

The DUT was assessed against the flat phantom, with antenna in and out, in the 81:120 transmission mode, using the configuration from above that produced the highest S.A.R., along with each applicable data cable attachments.

The DUT was assessed against the flat phantom, with antenna in and out, in the 1:3 transmission mode, using the configuration from above that produced the highest S.A.R., along with each applicable audio attachments.

The DUT was assessed against the flat phantom, in the 81:120 transmission mode, with antenna in and out, at the transmission band edges, using the configuration from above that produced the highest S.A.R. results.

The DUT was assessed at 2.5cm separation from the flat phantom, w/o carry case accessory, in the 81:120 transmission mode, using the configuration from the abdomen assessments above that produced the highest S.A.R. results.

The DUT was assessed at the TX center frequency, with the antenna in and out, at the left ear of the SAM phantom, in the 1:3 transmission mode, in the cheek touch position, using the offered batteries.

The DUT was assessed with the antenna in and out, at the left ear of the SAM phantom, in 1:3 transmission mode, in the 15 degree tilt position, using the configuration from above that produced the highest S.A.R. results.

The DUT was assessed at the TX center frequency, with the antenna in and out, at the right ear of the SAM phantom, in the 1:3 transmission mode, in the cheek touch position, using the offered batteries.

The DUT was assessed with the antenna in and out, at the right ear of the SAM phantom, in 1:3 transmission mode, in the 15 degree tilt position, using the battery that produced the highest S.A.R. results at the right ear.

The DUT was assessed with antenna in and out, at the transmission band edges, using the test configuration that produced the highest S.A.R. results at the side of the head as well as with carry case model RLN5334B.

The DUT was assessed with the antenna in and out, flip open, at the front of the face, in 1:6 transmission mode, using the battery that produced the highest S.A.R. results from the head

assessments.
The DUT was assessed with the antenna in and out, with the flip closed, at the front of the face, in 1:6 transmission mode, using the battery that produced the highest S.A.R. results from the head assessments.
The DUT was assessed with the antenna in and out, at the transmission band edges, with the flip closed, at the front of the face, in 1:6 transmission mode, using the battery that produced the highest S.A.R. results from the head assessments above.
A shortened scan was performed using the battery from above that produced largest power slump and the highest S.A.R. results.

5.1 Device Test Positions

Reference figure 1 for the device orientation and position which exhibited the highest S.A.R. performance.

5.1.1 Abdomen

The DUT was positioned such that it was centered against the flat phantom with and the applicable carry case and other attachment accessories. The front side and backside of the DUT were positioned with 2.5cm separation distance from the flat phantom.

5.1.2 Head

The DUT was placed in the cheek touch and 15 degrees tilt positions at the left and right ears of the SAM phantom

5.1.3 Face

The DUT was placed 2.5cm in front of the flat section of the SAM phantom with the flip open and closed.

5.2 Test Position Photographs

Figure 1: Highest S.A.R. Test Position
(DUT with carry case model RLN5334B, battery model SNN5717C, and antenna extended)

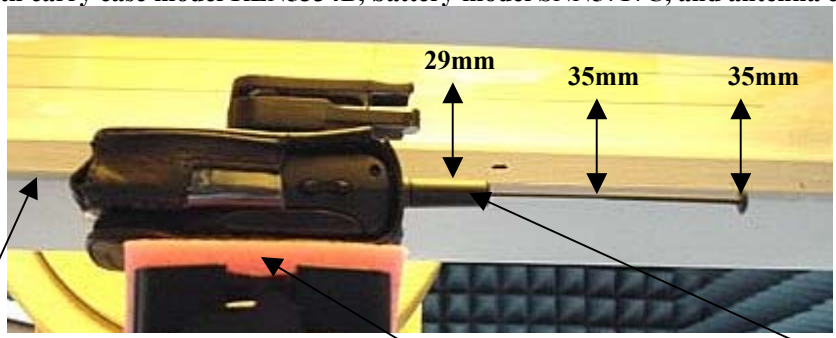

Figure 2. Assessment @ the Abdomen; with carry case model NNTN4126A and attached data cable model SKN6311A. Same position used to assess data cable models NKN6540A, NNTN4007A, NNTN4049A, NKN6544B,

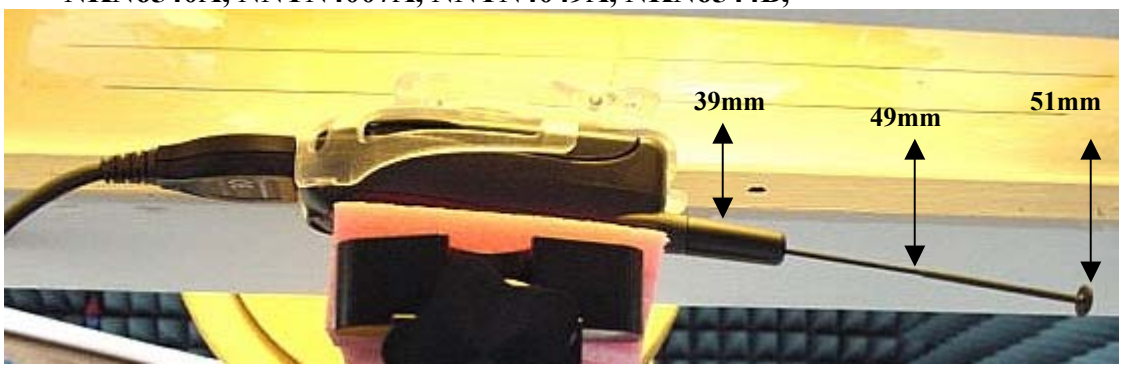

Figure 3. Assessment @ the Abdomen; with carry case model NNTN4126A and audio accessory model SYN8146C. Same position used to assess audio accessory models NTN8513A, SYSN7875C, and NTN8496A

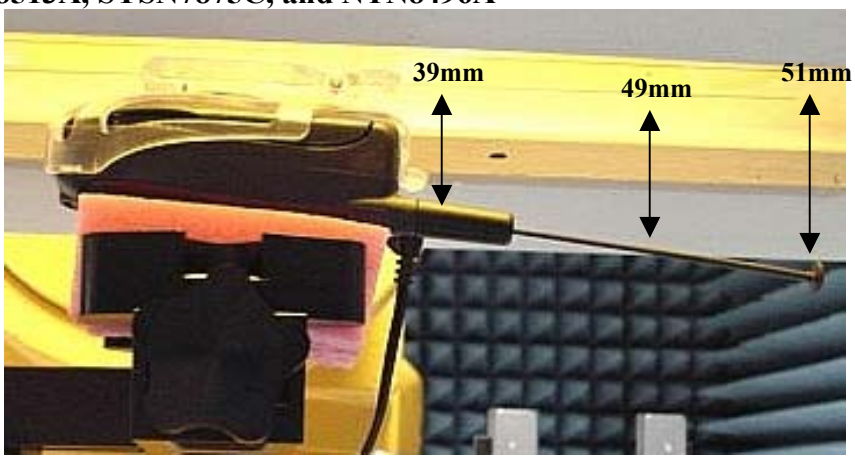

Figure 4. Assessment @ the Abdomen; with carry case RLN5336B

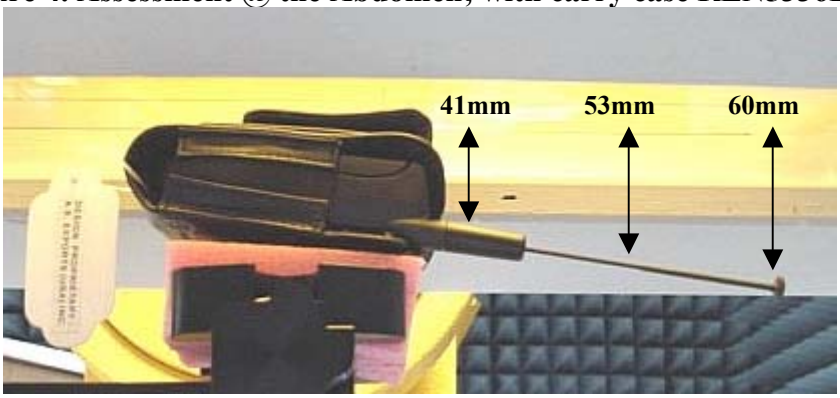

Figure 5. Assessment @ the Left ear; Cheek touch position with antenna extended. Same position used for antenna retracted.

Figure 6. Assessment @ the Left ear; 15 degrees tilt position with antenna extended. Same position used for antenna retracted.

Figure 7. Assessment @ the Right ear; Cheek touch position with antenna extended. Same position used for antenna retracted.

Figure 8. Assessment @ the Right ear; 15 degrees tilt position with antenna extended. Same position used for antenna retracted.

Figure 9. Assessment @ the Abdomen; DUT back 2.5cm separation distance

Figure 10. Assessment @ abdomen; DUT front 2.5cm separation distance.

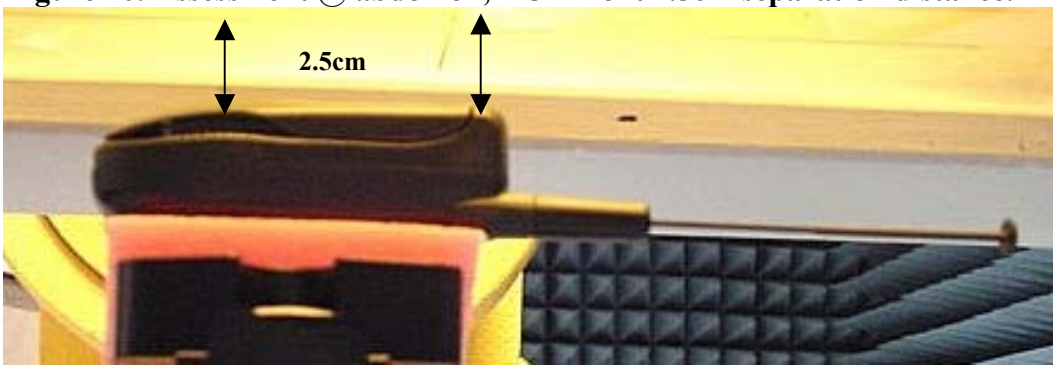

Figure 11. Assessment @ the Face; Flip closed; DUT front 2.5cm separation. Same position used for antenna retracted.

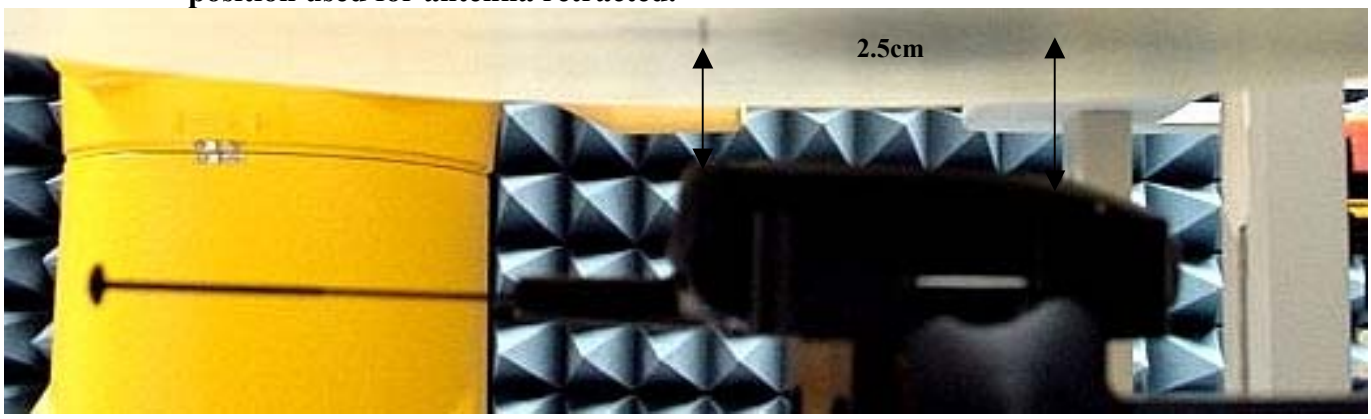

Figure 12. Assessment @ Face; Flip open; DUT front with top of flip and bottom end 2.5cm separation from the flat section of the SAM phantom. Same position used for antenna retracted.

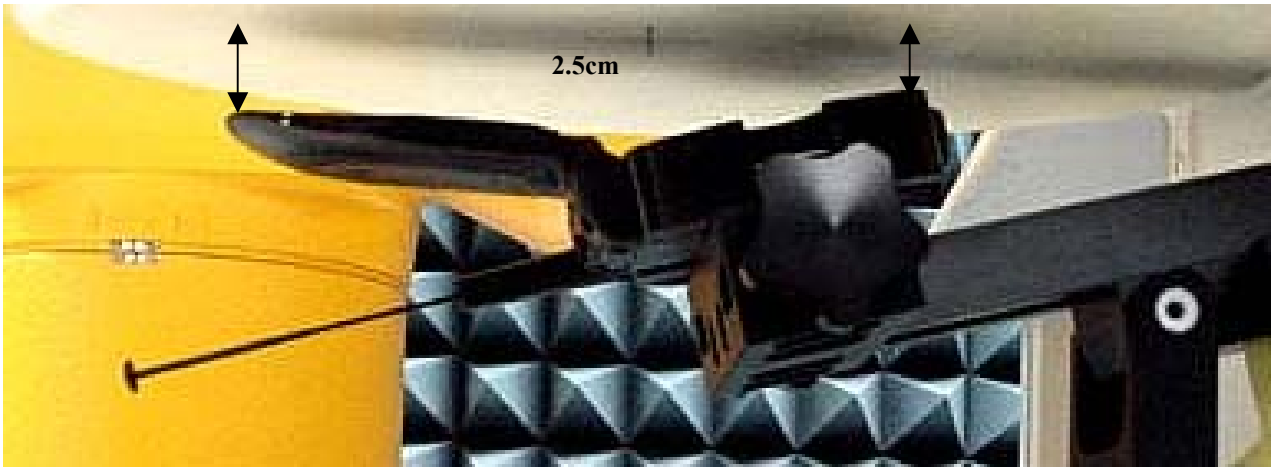

Figure 13: Robot Test System (Flat Phantom)

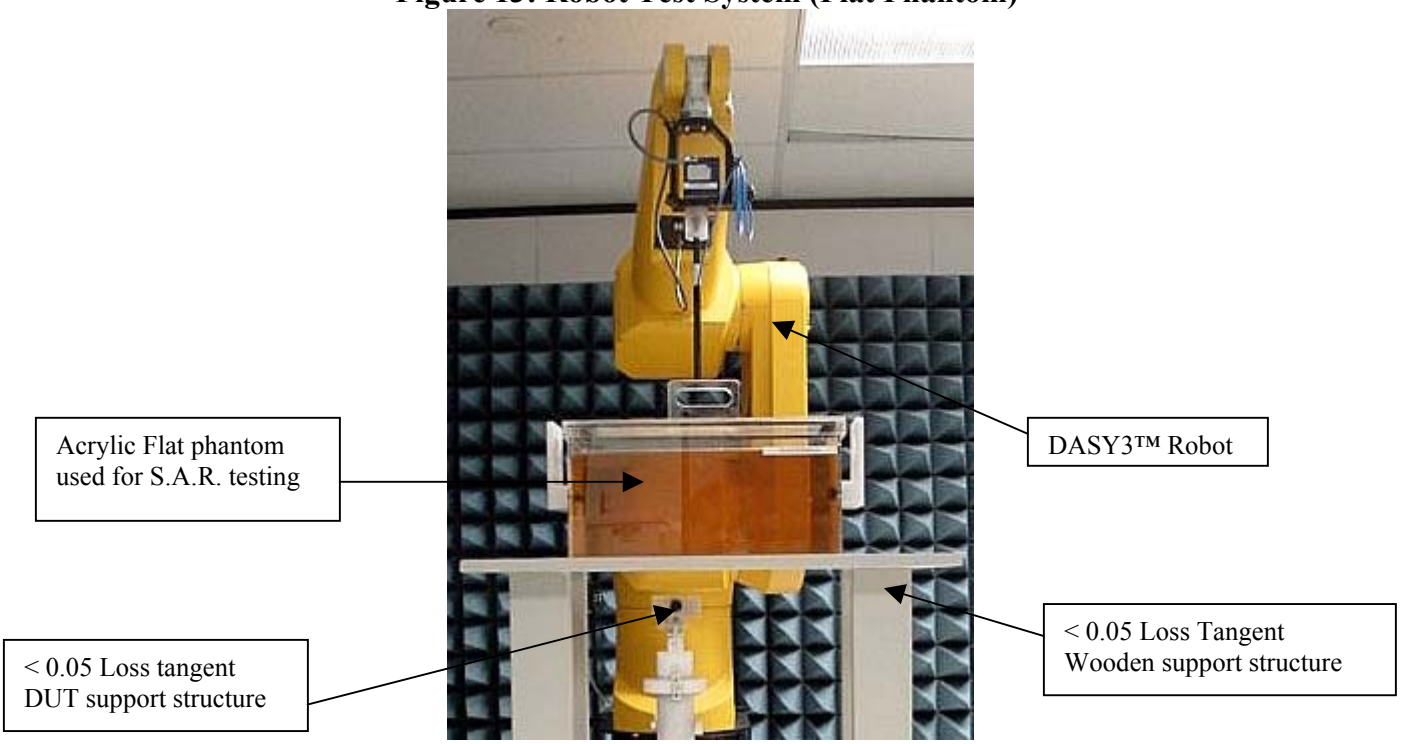

Figure 13: Robot Test System (SAM phantom)

5.3 Probe Scan Procedures

The E-field probe is first scanned in a coarse grid over a large area inside the phantom in order to locate the interpolated maximum S.A.R. distribution. After the coarse scan measurement, the probe is automatically moved to a position at the interpolated maximum. The subsequent scan can directly use this position as reference for the cube evaluations.

6.0 Measurement Uncertainty

Table 1: Uncertainty Budget for Device Under Test

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**Section of IEEE P1528**	**Tol. (± %)**	**Prob. Dist.**	**Divisor**	c_i **(1 g)**	c_i **(10 g)**	**1 g** u_i **(±%)**	**10 g** u_i **(±%)**	v_i
Measurement System									
Probe Calibration	E.2.1	4.8	N	1.00	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	1.3	R	1.73	1	1	0.8	0.8	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.6	N	1.00	1	1	3.6	3.6	29
Device Holder Uncertainty	E.4.1	2.8	N	1.00	1	1	2.8	2.8	8
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				11.72	11.09	1363
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				22.98	21.75	

Table 2: Uncertainty Budget for System Performance Check

a	*b*	*c*	*d*	*e* = *f(d,k)*	*f*	*g*	*h* = *c x f / e*	*i* = *c x g / e*	*k*
Uncertainty Component	**Section of IEEE P1528**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	c_i **(1 g)**	c_i **(10 g)**	**1 g** u_i **(±%)**	**10 g** u_i **(±%)**	v_i
Measurement System									
Probe Calibration	E.2.1	4.8	N	1.00	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.0	R	1.73	1	1	0.0	0.0	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	1.0	R	1.73	1	1	0.6	0.6	∞
Input Power and SAR Drift Measurement	8, 6.6.2	4.7	R	1.73	1	1	2.7	2.7	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				10.16	9.43	∞
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				19.92	18.48	

Notes for Tables 1 and 2
a) Column headings *a-k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty.

7.0 S.A.R. Test Results

All S.A.R. results obtained by the tests described in Section 5.0 are listed in section 7.1 below. The bolded result indicates the highest observed S.A.R. performance. DASY3™ S.A.R. measurement scans are provided in APPENDIX B for the highest observed S.A.R.
Appendix A presents a shortened S.A.R. cube scan to assess the validity of the calculated results presented herein.
Note: The results of the shortened cube scans presented in Appendix A demonstrate that the scaling methodology used to determine the calculated S.A.R. results presented herein are valid.

7.1 S.A.R. results

Compliance assessment at the abdomen; Offered batteries and carry case; 81:120 mode												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030313-05-KU/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	None	0.640	0.590	0.958	1.14	0.672	0.80
R2-030313-02-KU/ 919ADC0643	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	None	0.630	0.590	0.935	1.11	0.662	0.79
R2-030313-06-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	None	0.656	0.589	0.763	0.91	0.534	0.63
R2-030314-02-KU/ 919ADC061W	813.5125	Out	SNN5704A (NNTN4306A)	Against phantom	NNTN4126A	None	0.670	0.640	0.987	1.08	0.691	0.76
R2-030313-07-CM/ 919ADC061W	813.5125	In	SNN5704A (NNTN4306A)	Against phantom	NNTN4126A	None	0.661	0.676	0.841	0.87	0.594	0.62
R2-030314-04-KU/ 919ADC061W	813.5125	Out	SNN5705B (NNTN4305A)	Against phantom	NNTN4126A	None	0.665	0.680	0.981	1.01	0.687	0.71
R2-030314-05-KU/ 919ADC061W	813.5125	In	SNN5705B (NNTN4306A)	Against phantom	NNTN4126A	None	0.680	0.700	0.827	0.83	0.583	0.58
R2-030321-12-CM/ 919ADC0643	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	RLN5334B	None	0.660	0.570	0.977	**1.20**	0.662	**0.81**
R2-030314-06-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	RLN5334B	None	0.675	0.600	0.913	1.07	0.652	0.76
R2-030314-07-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	RLN5334B	None	0.680	0.605	0.779	0.90	0.539	0.62
R2-030314-09-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	RLN5336B	None	0.675	0.610	0.959	1.10	0.644	0.74
R2-030314-08-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	RLN5336B	None	0.695	0.625	0.683	0.76	0.506	0.57

Compliance assessment at the abdomen; w/ applicable data cable attachments; 81:120 mode (Continued)												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030317-02-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	SKN6311A	0.670	0.610	0.544	0.62	0.383	0.44
R2-030317-03-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	SKN6311A	0.695	0.625	0.467	0.52	0.355	0.40
R2-030319-04-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NKN6540A	0.670	0.620	0.779	**0.88**	0.540	**0.61**
R2-030317-05-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NKN6540A	0.675	0.635	0.604	0.67	0.423	0.47
R2-030320-05-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NNTN4007A	0.665	0.615	0.634	0.72	0.451	0.51
R2-030317-07-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NNTN4007A	0.680	0.590	0.418	0.50	0.297	0.35
R2-030317-08-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NNTN4049A	0.660	0.625	0.492	0.55	0.340	0.38
R2-030317-09-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NNTN4049	0.670	0.605	0.349	0.40	0.252	0.29
R2-030320-03-KU/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NKN6544B	0.665	0.625	0.624	0.70	0.444	0.50
R2-030318-03-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NKN6544B	0.675	0.640	0.596	0.65	0.425	0.46

Compliance assessment at the abdomen; w/ applicable audio accessory attachments; 1:3 mode												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030319-11-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	SYN8390B	0.667	0.704	0.451	0.45	0.328	0.33
R2-030318-06-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	SYN8390B	0.654	0.678	0.382	0.39	0.276	0.28
R2-030318-09-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	SYN8146C	0.651	0.701	0.419	0.42	0.303	0.30
R2-030318-08-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	SYN8146C	0.663	0.699	0.362	0.36	0.263	0.26
R2-030320-07-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NTN8513A	0.667	0.651	0.432	**0.46**	0.309	**0.33**
R2-030318-10-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NTN8513A	0.661	0.699	0.350	0.35	0.254	0.25
R2-030320-09-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	SYN7875C	0.661	0.701	0.415	0.42	0.303	0.30
R2-030320-08-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	SYN7875C	0.659	0.703	0.357	0.36	0.258	0.26

R2-030320-11-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NTN8496A	0.664	0.706	0.422	0.42	0.305	0.31
R2-030320-10-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	NTN8496A	0.665	0.704	0.338	0.34	0.244	0.24

Compliance assessment at the abdomen; Band edges; 81:120 mode												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030321-03-KU/ 919ADC061W	806.0125	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	None	0.665	0.640	0.972	**1.06**	0.701	**0.77**
R2-030321-04-KU/ 919ADC061W	806.0125	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	None	0.660	0.660	0.750	0.80	0.536	0.57
R2-030321-05-KU/ 919ADC061W	824.9875	Out	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	None	0.640	0.600	0.910	1.06	0.636	0.74
R2-030321-06-KU/ 919ADC061W	824.9875	In	SNN5717C (NNTN4306A)	Against phantom	NNTN4126A	None	0.640	0.590	0.808	0.96	0.586	0.70

Compliance assessment at the abdomen; DUT back and front 2.5cm separation; 81:120 mode												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030321-07-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	DUT Front 2.5cm	None	None	0.660	0.590	0.581	0.69	0.419	0.50
R2-030321-08-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	DUT Back 2.5cm	None	None	0.660	0.590	0.932	**1.11**	0.638	**0.76**

Compliance assessment at the Left ear; Touch and Tilt; 1:3 mode												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030324-03-KU/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Cheek touch	None	None	0.675	0.680	0.611	**0.63**	0.434	**0.45**
R2-030324-02-KU/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Cheek touch	None	None	0.675	0.718	0.561	0.56	0.393	0.39
R2-030324-05-KU/ 919ADC061W	813.5125	Out	SNN5704A (NNTN4306A)	Cheek touch	None	None	0.673	0.714	0.594	0.59	0.423	0.42
R2-030324-04-KU/ 919ADC061W	813.5125	In	SNN5704A (NNTN4306A)	Cheek touch	None	None	0.679	0.720	0.534	0.53	0.378	0.38
R2-030324-07-CM/ 919ADC061W	813.5125	Out	SNN5705B (NNTN4306A)	Cheek touch	None	None	0.690	0.683	0.510	0.52	0.358	0.37
R2-030324-06-KU/ 919ADC061W	813.5125	In	SNN5705B (NNTN4306A)	Cheek touch	None	None	0.692	0.719	0.510	0.51	0.362	0.36
R2-030324-09-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	15° Tilt	None	None	0.678	0.720	0.292	0.29	0.218	0.22
R2-030324-08-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	15° Tilt	None	None	0.679	0.720	0.230	0.23	0.170	0.17

Compliance assessment at the Right ear; Touch and Tilt; 1:3 mode												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030324-11-CM/ 919ADC061W	813.5125	Out	SNN5705B (NNTN4305A)	Cheek touch	None	None	0.679	0.722	0.607	0.61	0.427	0.43
R2-030325-02-CM/ 919ADC061W	813.5125	In	SNN5705B (NNTN4305A)	Cheek touch	None	None	0.686	0.721	0.568	0.57	0.394	0.39
R2-030324-13-CM/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Cheek touch	None	None	0.682	0.720	0.590	0.59	0.413	0.41
R2-030324-12-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Cheek touch	None	None	0.682	0.721	0.555	0.56	0.386	0.39
R2-030324-15-CM/ 919ADC061W	813.5125	Out	SNN5704A (NNTN4306A)	Cheek touch	None	None	0.686	0.721	0.608	**0.61**	0.429	**0.43**
R2-030324-14-CM/ 919ADC061W	813.5125	In	SNN5704A (NNTN4306A)	Cheek touch	None	None	0.672	0.723	0.534	0.53	0.375	0.38
R2-030325-04-CM/ 919ADC061W	813.5125	Out	SNN5704A (NNTN4306A)	15˚ Tilt	None	None	0.679	0.719	0.316	0.32	0.238	0.24
R2-030325-03-CM/ 919ADC061W	813.5125	In	SNN5704A (NNTN4306A)	15˚ Tilt	None	None	0.681	0.721	0.255	0.26	0.193	0.19

Compliance assessment at the Head; band edges; 1:3 mode												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030325-05-CM/ 919ADC061W	806.0125	Out	SNN5717C (NNTN4306A)	Left Cheek touch	None	None	0.670	0.716	0.440	0.44	0.316	0.32
R2-030326-02-KU/ 919ADC061W	806.0125	In	SNN5717C (NNTN4306A)	Left Cheek touch	None	None	0.663	0.706	0.475	0.48	0.338	0.34
R2-030325-08-CM/ 919ADC061W	824.9875	Out	SNN5717C (NNTN4306A)	Left Cheek touch	None	None	0.649	0.676	0.648	0.67	0.458	0.47
R2-030325-07-CM/ 919ADC061W	824.9875	In	SNN5717C (NNTN4306A)	Left Cheek touch	None	None	0.651	0.671	0.615	0.64	0.437	0.46
R2-030325-10-CM/ 919ADC061W	824.9875	Out	SNN5717C (NNTN4306A)	Left Cheek touch	RLN5334B	None	0.661	0.672	0.652	**0.68**	0.465	**0.48**
R2-030325-09-CM/ 919ADC061W	824.9875	In	SNN5717C (NNTN4306A)	Left Cheek touch	RLN5334B	None	0.650	0.677	0.658	0.68	0.456	0.47

Compliance assessment at the Face; 1:6 mode												
Run Number/ SN	**Freq. (MHz)**	**Antenna Position**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**End Power (W)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
R2-030327-02-KU/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Flip closed 2.5cm	None	None	0.673	0.686	0.146	0.07	0.105	0.05
R2-030327-03-KU/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Flip closed 2.5cm	None	None	0.670	0.669	0.122	0.06	0.088	0.05
R2-030327-05-KU/ 919ADC061W	813.5125	Out	SNN5717C (NNTN4306A)	Flip open 2.5cm	None	None	0.680	0.675	0.113	0.06	0.080	0.04
R2-030327-06-CM/ 919ADC061W	813.5125	In	SNN5717C (NNTN4306A)	Flip open 2.5cm	None	None	0.683	0.666	0.104	0.05	0.075	0.04
R2-030327-04-CM/ 919ADC061W	806.0125	Out	SNN5717C (NNTN4306A)	Flip closed 2.5cm	None	None	0.680	0.685	0.153	**0.08**	0.110	**0.06**
R2-030326-07-CM/ 919ADC061W	806.0125	In	SNN5717C (NNTN4306A)	Flip closed 2.5cm	None	None	0.664	0.687	0.109	0.06	0.078	0.04
R2-030326-10-CM/ 919ADC061W	824.9875	Out	SNN5717C (NNTN4306A)	Flip closed 2.5cm	None	None	0.654	0.673	0.136	0.07	0.096	0.05
R2-030326-09-CM/ 919ADC061W	824.9875	In	SNN5717C (NNTN4306A)	Flip closed 2.5cm	None	None	0.650	0.675	0.122	0.06	0.087	0.05

7.2 Peak S.A.R. location

Refer to APPENDIX B for detailed S.A.R. scan distributions.

7.3 Highest S.A.R. results calculation methodology

The calculated maximum 1-gram and 10-gram averaged S.A.R. value is determined by scaling the measured S.A.R. to account for power leveling variations and power output slump below the reported maximum power during the S.A.R. measurements. For this device the Maximum Calculated 1-gram and 10-gram averaged peak S.A.R. is calculated using the following formula:

Max. Calc. Avg. SAR = (S.A.R. meas. *(Pmax/Pend))
P_{max} = Maximum Power (mW)
P_{int} = Initial Power (mW)
Pend = End Power (mW)
$SAR_{meas.}$ = Measured 1 or 10 gram averaged peak S.A.R. (mW/g)

Note: For Ab and head assessments, if Pend is > Pmax then Max. Calc. Avg. S.A.R. = S.A.R. measured;
For the face assessment, if Pend is > Pmax then Max. Calc. Avg. S.A.R. = S.A.R. measured/2

8.0 Conclusion

The highest Operational Maximum Calculated 1-gram and 10-gram average S.A.R. values found for FCC ID: AZ489FT5808 model H59UAH6RR5AN.

At the abdomen: 1-g Avg. = 1.20 mW/g; 10-g Avg. = 0.81mW/g
At the Face: 1-g Avg. = 0.08 mW/g; 10-g Avg. = 0.06 mW/g
At the Head: 1-g Avg. = 0.68 mW/g; 10-g Avg. = 0.48 mW/g

These test results clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of **1.6 mW/g** per the requirements of 47 CFR 2.1093(d)