SAR COLLOCATED REPORT

-simultaneously Voice and data mode

REPORT NO.: SA981105L04-5
MODEL NO.: MC75A6
RECEIVED: Nov. 06, 2009
TESTED: May 05, 2010
ISSUED: Jun. 14, 2010

APPLICANT: Symbol Technologies, Inc.

ADDRESS: One Motorola Plaza, Holtsville, NY-11742-1300, U.S.A.

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien 244, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

Testing Laboratory
2021

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1. CERTIFICATION

PRODUCT: EDA (Enterprise Digital Assistant)
MODEL: MC75A6
BRAND: Symbol
APPLICANT: Symbol Technologies, Inc.
TESTED: May 05, 2010
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 2 (Section 2.1093)**
FCC OET Bulletin 65, Supplement C (01-01)
RSS-102

The above equipment (model: MC75A6) have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Pettie Chen / Specialist , **DATE :** Jun. 14, 2010

TECHNICAL ACCEPTANCE : Mason Chang / Engineer , **DATE :** Jun. 14, 2010
Responsible for RF

APPROVED BY : Gary Chang / Assistant Manager , **DATE :** Jun. 14, 2010

REVISED VERSION	REVISED DATE	DESCRIPTION
Ver. 1	Jun. 09, 2010	Modified the general information
Ver. 2	Jun. 14, 2010	Modified the type error
Ver. 3	Jun. 14, 2010	Modified the description about test mode and test report

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT	EDA (Enterprise Digital Assistant)	
MODEL NO.	MC75A6	
FCC ID	H9PMC75A6	
POWER SUPPLY	3.7Vdc (Li-ion battery) 5.4Vdc (Adapter)	
CLASSIFICATION	Portable device, production unit	
MODULATION TYPE	GMSK / 8PSK / BPSK	
FREQUENCY RANGE	Tx Frequency: 824MHz ~ 849MHz 1850MHz ~ 1910MHz Rx Frequency: 869MHz ~ 894MHz 1930MHz ~ 1990MHz	
CHANNEL FREQUENCIES UNDER TEST AND ITS CONDUCTED OUTPUT POWER	**1900 band** **WCDMA+HSDPA Mode** 23.02dBm/CH 9262: 1852.4MHz 23.34dBm/CH 9400: 1880.0MHz 22.95dBm/CH 9538: 1907.6MHz	
MAX. AVERAGE SAR (1g)	**Head:** 1.27W/kg	
ANTENNA TYPE	Monopole antenna	
MAX. ANTENNA GAIN	**850MHz:** -0.54dBi	**1900MHz:** 1.28dBi
DATA CABLE	Refer to NOTE as below	
I/O PORTS	Refer to user's manual	
ACCESSORY DEVICES	Battery	

NOTE:

1. The EUT is an EDA (Enterprise Digital Assistant). The test data are separated into following test reports.

	REFERENCE REPORT
SAR test report-247 2.4G WLAN	SA981105L04
SAR test report-247 5G WLAN	SA981105L04
SAR test report-407 5G WLAN	SA981105L04-1
SAR test report-247 BLUETOOTH	SA981105L04-2
SAR test report-GSM 850 / WCDMA 850	SA981105L04-3
SAR test report-GSM 1900 / WCDMA 1900	SA981105L04-3
SAR collocated report-WLAN 802.11a + MOBILE	SA981105L04-4
SAR collocated report-simultaneously Voice and data mode	SA981105L04-5
SAR collocated report- simultaneously WLAN 802.11 a + Voice and data mode	SA981105L04-6
SAR supplement report-preliminary and worst case finding supplement data	SA981105L04-7

2. The models identified below are identical to each other except of the following options:
   - Keypad: Numeric / QWERTY
   - Barcode reader: 1D laser scanner / BB Imager

BRAND	MODEL	DESCRIPTION
Symbol	MC75A6	HSDPA 1D Numeric
Symbol	MC75A6	HSDPA 1D QWERTY
Symbol	MC75A6	HSDPA BB Numeric
Symbol	MC75A6	HSDPA BB QWERTY

3. The EUT uses the following Li-ion batteries:

BATTERY 1 (1.5X)	
BRAND:	MOTOROLA
PART NUMBER:	82-71364-05 Rev D
RATING:	3.7Vdc, 3600mAh, 13.3Wh

BATTERY 2 (2.5X)	
BRAND:	MOTOROLA
PART NUMBER:	82-71364-06 Rev C
RATING:	3.7Vdc, 4800mAh, 17.7Wh

*The applicant defined the normal working voltage of the battery is from 3.7Vdc to 4.2Vdc.
*The EUT have been pre-tested and found "BB / QWERTY + 1.5X battery" was the worst case configuration for final test.

4. The communicated functions of EUT listed as below:

		850MHz	1900MHz	
2G	GSM	√	√	With 802.11a/b/g + Bluetooth
	GPRS	√	√	
	E-GPRS	√	√	
3G	WCDMA	√	√	
	Release 5 HSDPA	√	√	

5. The following accessories are for support units only.

PRODUCT	BRAND	MODEL	DESCRIPTION
RS232 charging cable	Motorola	25-102776-01R	1.2m non-shielded cable with one core
USB charging cable	Motorola	25-102775-01R	1.5m shielded cable with one core
Headset	Motorola	50-11300-050R	VR10 headset 0.8m non-shielded cable with one core
Power Supply Adaptor	Motorola	EADP-16BB A	I/P: 100-240Vac, 50-60Hz, 0.4A O/P: 5.4Vdc, 3A 1.8m non-shielded cable without core
Fabric holster	Motorola	SG-MC7521215-01R	Contain metal
Ridged holster	Motorola	SG-MC7011110-02R	Contain metal

6. Hardware version: EVT1A.
7. Software version: BSP_21.03.
8. IMEI Code: 35528203000001x to 35528203999999x (x=0~9)
9. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

2.2 SAR MEASUREMENT CONDITIONS FOR WCDMA

The following procedures were followed according to FCC "SAR Measurement Procedure for 3G Devices", October 2007.

➢ **Output Power Verification**

GSM MODE

Find the worst data rate which has max output power to measure power of L/M/H channel.

Test channel	Ch190 of 850 band	Ch661of 1900 band
Data rates	**Output power(dBm)**	**Output power(dBm)**
FULL RATE VERSION 1	32.64	29.74
FULL RATE VERSION 2	32.45	29.64
HALF RATE VERSION 1	32.44	29.65
FULL RATE DATA 4800	32.34	29.54
FULL RATE DATA 9600	32.53	29.62
FULL RATE DATA 14400	32.54	29.51
HALF RATE DATA 2400	32.35	29.63
HALF RATE DATA 4800	32.42	29.51

According to above table, data rate seems not affecting the RF output power. Full rate version 1 was selected for worst-case power measurement as tabulated below:

Band	Channel No.	Frequency(MHz)	Output power(dBm)
850	128	824.2	32.62
	190	836.6	32.64
	251	848.8	32.51
1900	512	1850.2	29.63
	661	1880.0	29.74
	810	1909.8	29.52

GPRS MODE

Find the worst data rate which has max output power to measure power of L/M/H channel.

Test channel	Ch190 of 850 band	Ch661of 1900 band
Data rates (kbs)	**Output power of time slot 1 (dBm)**	**Output power of time slot 1 (dBm)**
9.05	32.41	29.55
13.4	32.34	29.43
15.6	32.32	29.44
21.4	32.25	29.32

Again data rate seems not affecting the RF output power. 9.05kb/s was selected to measure output power as tabulated below:

Band	Channel No.	Frequency(MHz)	1 Time slot (dBm)	2 Time slots (dBm)
850	128	824.2	32.33	30.82
	190	836.6	32.41	30.84
	251	848.8	32.32	30.91
1900	512	1850.2	29.53	27.92
	661	1880	29.55	27.93
	810	1909.8	29.42	27.81

EGPRS MODE

Find the worst data rate which has max output power to measure power of L/M/H channel

Test channel	Ch190 of 850 band	Ch661of 1900 band
Data rates (kbs)	**Output power of time slot 1 (dBm)**	**Output power of time slot 1 (dBm)**
22.4	27.72	26.13
29.6	27.64	26.05
4.8	27.45	25.93
54.4	27.53	26.14
59.2	27.44	26.06

Again data rate seems not affecting the RF output power. 22.4kb/s was selected to measure output power as tabulated below:

Band	Channel No.	Frequency(MHz)	1 Time slot (dBm)	2 Time slots (dBm)
850	128	824.2	27.54	25.81
	190	836.6	27.72	25.62
	251	848.8	27.63	25.53
1900	512	1850.2	25.92	23.83
	661	1880.0	26.13	24.24
	810	1909.8	25.84	23.91

WCDMA – RMC

Find the worst data rate which has max output power to measure power of L/M/H channel

WCDMA/RMC 12.2K/Loop 1/ TPC all "1 / M channel

Test channel	Ch4182of 850 band	Ch9400 of 1900 band
Data rates	**Output power(dBm)**	**Output power(dBm)**
12.2k Downlink/Uplink	23.15	23.42
64k Downlink/Uplink	22.84	23.35
144k Downlink/Uplink	22.89	23.33
384k Downlink/Uplink	22.72	23.31
64k Downlink/ 12.2k Uplink	22.81	23.29
144k Downlink/ 12.2k Uplink	22.89	23.31
144k Downlink/ 64k Uplink	22.87	23.34
384k Downlink/ 12.2k Uplink	22.79	23.27
384k Downlink/ 64k Uplink	22.83	23.29
384k Downlink/ 144k Uplink	22.78	23.32
BTFD	22.73	23.31
12.2k + HSDPA 34.108	22.59	23.24
12.2k HSDPA	22.82	23.35

Lowest data rate was selected for the test.

Maximum output power is verified on the High, Middle and Low channels according to the procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1’s” for WCDMA using a 12.2kbps RMC with TP C set to all "1's" in test loop mode 1

Conducted power should meet the requirement of 3GPP 34.121 Table 5.2.2 (Output power = 24dBm, tolerance = +1.7dB ~-3.7dB)

Conducted power is tabulated as below table. All measured values comply with the limitation range.

Conducted power table of WCDMA –RMC

BAND	CHANNEL NO.	FREQUENCY (MHz)	OUTPUT POWER (dBm)	LIMITATION RANGE
850	4132	826.4	**23.24**	20.3~25.7
	4182	836.4	23.15	
	4233	846.6	23.13	
1900	9262	1852.40	23.25	
	9400	1880.00	**23.42**	
	9538	1907.60	23.13	

WCDMA – AMR

Maximum output power is verified on the High, Middle and Low channels according to the procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1's" for WCDMA using a 4.75~12.2kbps AMR with TPC set to all "1's" in test loop mode 1

Conducted power should meet the requirement of 3GPP 34.121 Table 5.2.2 (Output power = 24dBm, tolerance = +1.7dB ~-3.7dB)

Conducted power is tabulated as below table. All measured values comply with the limitation range.

WCDMA-AMR 850

Codec mode	Source codec bit-rate	Frequency (MHz)			Limitation Range
		826.4	836.4	846.6	
AMR_12.20	12,20 kbps	23.10	22.90	23.00	20.3~25.7
AMR_10.20	10,20 kbps	22.95	22.82	22.89	
AMR_7.95	7,95 kbps	22.92	22.97	22.92	
AMR_7.40	7,40 kbps	22.98	22.91	22.97	
AMR_6.70	6,70 kbps	22.96	22.92	22.98	
AMR_5.90	5,90 kbps	23.02	22.94	22.91	
AMR_5.15	5,15 kbps	23.11	22.98	**23.12**	
AMR_4.75	4,75 kbps	23.06	22.89	23.03	

WCDMA-AMR 1900

Codec mode	Source codec bit-rate	Frequency (MHz)			Limitation Range
		1852.4	1880	1907.6	
AMR_12.20	12,20 kbps	23.10	23.30	23.00	20.3~25.7
AMR_10.20	10,20 kbps	23.08	23.34	23.04	
AMR_7.95	7,95 kbps	23.11	23.35	23.12	
AMR_7.40	7,40 kbps	23.09	23.32	23.03	
AMR_6.70	6,70 kbps	23.02	23.31	23.02	
AMR_5.90	5,90 kbps	23.07	23.36	23.08	
AMR_5.15	5,15 kbps	23.13	**23.38**	23.14	
AMR_4.75	4,75 kbps	22.97	23.34	23.09	

Lowest data rate was selected for the test.

Max power of WCDMA-AMR is less than 1/4 dB higher than WCDMA-RMC Therefore, SAR of WCDMA-AMR is not required.

BAND	Max power of WCDMA-RMC	Max power of WCDMA-AMR
850	23.24	23.12
1900	23.42	23.38

HSDPA

Conducted power of HSDPA is measured with the parameters shown below as described in KDB 941225, using an FRC with H-set 1 and a 12.2 kbps RMC with TPC set to all "1's"

Sub-Test 1 Setup for Release 5 HSDPA

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM (dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ $A_{hs} = \beta_{hs}/\beta_c = 30/15$ ⇔ $\beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Conducted power should meet the requirement of 3GPP 34.121 table 5.2A.2
Power class of this EUT is class 3.

Maximum Output Powers with HS-DPCCH for test

Ratio of β_c to β_d for all values of β_{hs}	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
β_c / β_d = 2/15, 12/15	+24	+1.7/-3.7	+21	+2.7/-2.7
β_c / β_d = 15/8	+23	+2.7/-3.7	+20	+3.7/-2.7
β_c / β_d = 15/4	+22	+3.7/-3.7	+19	+4.7/-2.7

Note: For the purpose of the test Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} =30/15 * β_c

Note: The above table is from standard for reference only

Conducted power is tabulated below. All measured values comply with the limitation range.

RMC 12.2K/Loop 1/TPC all "1"/ FRC with H-set 1 to 4

Conducted power of HSPDA Release 5 850 band					
H-set	Sub-test	826.4	8363.4	846.4	Limitation range (dBm)
1	1	22.62	22.74	22.78	20.3 ~ 25.7
	2	21.69	21.74	21.86	20.3 ~ 25.7
	3	21.34	21.28	21.42	19.3 ~ 25.7
	4	20.12	20.14	20.36	18.3 ~ 25.7
2	1	22.67	22.45	22.83	20.3 ~ 25.7
	2	21.45	21.13	21.48	20.3 ~ 25.7
	3	21.16	20.78	21.25	19.3 ~ 25.7
	4	19.53	19.72	19.83	18.3 ~ 25.7
3	1	22.73	22.68	22.84	20.3 ~ 25.7
	2	21.68	21.63	21.79	20.3 ~ 25.7
	3	21.66	21.57	21.64	19.3 ~ 25.7
	4	20.64	20.46	21.05	18.3 ~ 25.7
4	1	22.79	22.76	22.87	20.3 ~ 25.7
	2	21.63	21.54	21.67	20.3 ~ 25.7
	3	21.15	21.04	21.13	19.3 ~ 25.7
	4	19.98	19.92	20.18	18.3 ~ 25.7

Conducted power of HSPDA Release 5 1900 band					
H-set	Sub-test	18524	1880.00	1907.60	Limitation range (dBm)
1	1	22.83	23.32	22.96	20.3 ~ 25.7
	2	21.51	21.98	21.54	20.3 ~ 25.7
	3	21.02	21.46	21.07	19.3 ~ 25.7
	4	19.96	20.25	19.98	18.3 ~ 25.7
2	1	22.95	23.41	23.02	20.3 ~ 25.7
	2	21.79	22.16	21.86	20.3 ~ 25.7
	3	20.95	21.81	21.42	19.3 ~ 25.7
	4	20.11	20.29	20.23	18.3 ~ 25.7
3	1	23.04	23.47	23.08	20.3 ~ 25.7
	2	21.92	22.42	21.95	20.3 ~ 25.7
	3	21.86	22.35	21.91	19.3 ~ 25.7
	4	20.92	21.33	21.06	18.3 ~ 25.7
4	1	23.11	23.54	23.09	20.3 ~ 25.7
	2	21.96	22.42	21.92	20.3 ~ 25.7
	3	21.24	21.93	21.54	19.3 ~ 25.7
	4	20.23	20.68	20.16	18.3 ~ 25.7

2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to the specifications of the manufacturer, this product must comply with the requirements of the following standards:

FCC 47 CFR Part 2 (2.1093)

FCC OET Bulletin 65, Supplement C (01- 01)

RSS-102

IEEE 1528-2003

All test items have been performed and recorded as per the above standards.

2.4 GENERAL INOFRMATION OF THE SAR SYSTEM

DASY5 (software 5.0 Build 125) consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY5 software defined. The DASY5 software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

EX3DV3 ISOTROPIC E-FIELD PROBE

CONSTRUCTION	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
FREQUENCY	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
DIRECTIVITY	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
DYNAMIC RANGE	10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
DIMENSIONS	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
APPLICATION	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

NOTE

1. The Probe parameters have been calibrated by the SPEAG. Please reference “APPENDIX D” for the Calibration Certification Report.
2. For frequencies above 800MHz, calibration in a rectangular wave-guide is used, because wave-guide size is manageable.
3. For frequencies below 800MHz, temperature transfer calibration is used because the wave-guide size becomes relatively large.

TWIN SAM V4.0

CONSTRUCTION	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2003, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.
SHELL THICKNESS	2 ± 0.2 mm
FILLING VOLUME	Approx. 25 liters
DIMENSIONS	Height: 810 mm; Length: 1000 mm; Width: 500 mm

SYSTEM VALIDATION KITS:

CONSTRUCTION	Symmetrical dipole with l/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor
CALIBRATION	Calibrated SAR value for specified position and input power at the flat phantom in brain simulating solutions
FREQUENCY	835, 1900
RETURN LOSS	> 20 dB at specified validation position
POWER CAPABILITY	> 100 W (f < 1GHz); > 40 W (f > 1GHz)
OPTIONS	Dipoles for other frequencies or solutions and other calibration conditions upon request

DEVICE HOLDER FOR SAM TWIN PHANTOM

CONSTRUCTION The device holder for the GSM900/DCS1800/PCS1900 GSM/GPRS/CDMA Mobile Phone device is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles. The holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε =3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered. The device holder for the portable device makes up of the polyethylene foam. The dielectric parameters of material close to the dielectric parameters of the air.

DATA ACQUISITION ELECTRONICS

CONSTRUCTION The data acquisition electronics (DAE3) consists of a highly sensitive electrometer grade preamplifier with auto-zeroing, a channel and gain-switching multiplex, a fast 16 bit AD converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The mechanical probe is mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

2.5 TEST EQUIPMENT

FOR SAR MEASURENENT

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	SAM Phantom	S & P	QD000 P40 CA	TP-1485	NA	NA
2	Signal Generator	Anritsu	68247B	984703	May 21, 2009	May 20, 2010
3	E-Field Probe	S & P	EX3DV3	3504	Jan. 26, 2010	Jan. 25, 2011
4	DAE	S & P	DAE	510	Dec. 16, 2009	Dec. 15, 2010
5	Robot Positioner	Staubli Unimation	NA	NA	NA	NA
6	Validation Dipole	S & P	D1900V2	5d036	Feb. 23, 2010	Feb. 22, 2011
7	Power Meter	Agilent	E4416A	GB41291763	Sep. 30, 2009	Sep. 29, 2010
8	Power Sensor	Agilent	E9327A	US40441181	Sep. 30, 2009	Sep. 29, 2010

NOTE: Before starting the measurement, all test equipment shall be warmed up for 30min.

FOR TISSUE PROPERTY

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	Network Analyzer	Agilent	E8358A	US41480538	Dec. 03, 2009	Dec. 02, 2010
2	Dielectric Probe	Agilent	85070D	US01440176	NA	NA

NOTE:

1. Before starting, all test equipment shall be warmed up for 30min.
2. The tolerance (k=1) specified by Agilent for general dielectric measurements, deriving from inaccuracies in the calibration data, analyzer drift, and random errors, are usually ±2.5% and ±5% for measured permittivity and conductivity, respectively. However, the tolerances for the conductivity is smaller for material with large loss tangents, i.e., less than ±2.5% (k=1). It can be substantially smaller if more accurate methods are applied.

2.6 GENERAL DESCRIPTION OF THE SPATIAL PEAK SAR EVALUATION

The DASY5 post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the micro-volt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	dcp_i
Device parameters:	- Frequency	F
	- Crest factor	Cf
Media parameters:	- Conductivity	σ
	- Density	ρ

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \bullet \frac{cf}{dcp_i}$$

V_i	=compensated signal of channel i	(i = x, y, z)
U_i	=input signal of channel I	(i = x, y, z)
Cf	=crest factor of exciting field	(DASY parameter)
dcp_i	=diode compression point	(DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$\text{E-fieldprobes: } E_i = \sqrt{\frac{V_1}{Norm_i \cdot ConvF}}$$

$$\text{H-fieldprobes: } H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

V_i	=compensated signal of channel I	(i = x, y, z)
$Norm_i$	=sensor sensitivity of channel i μV/(V/m)2 for E-field Probes	(i = x, y, z)
ConvF	= sensitivity enhancement in solution	
a_{ij}	= sensor sensitivity factors for H-field probes	
F	= carrier frequency [GHz]	
E_i	= electric field strength of channel i in V/m	
H_i	= magnetic field strength of channel i in A/m	

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

SAR	= local specific absorption rate in mW/g
E_{tot}	= total field strength in V/m
σ	= conductivity in [mho/m] or [Siemens/m]
ρ	= equivalent tissue density in g/cm3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid. The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. The generation of a high-resolution mesh within the measured volume
4. The interpolation of all measured values from the measurement grid to the high-resolution grid
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. The calculation of the averaged SAR within masses of 1 g and 10 g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7 x 7 x 7 scans. The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30 x 30 x 30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume in a 1mm grid (42875 points). In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

3. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

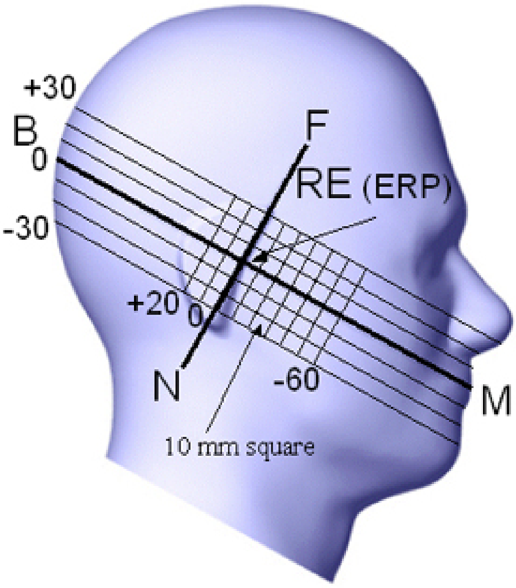
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.
1	Universal Radio Communication Tester	R&S	CMU200	104484

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

4. DESCRIPTION OF TEST POSITION

4.1 DESCRIPTION OF TEST POSITION



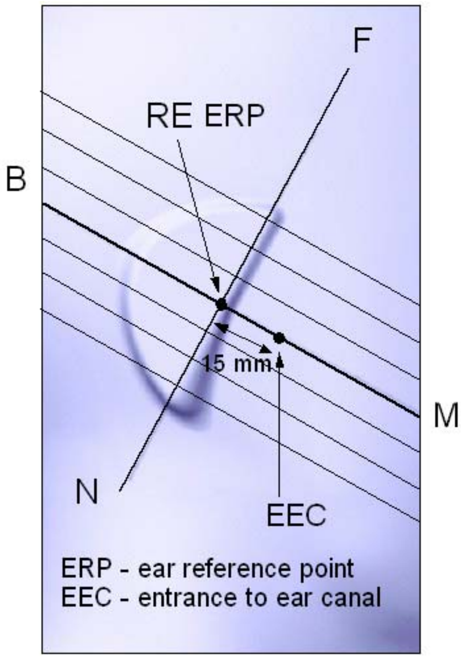


FIGURE 3.1

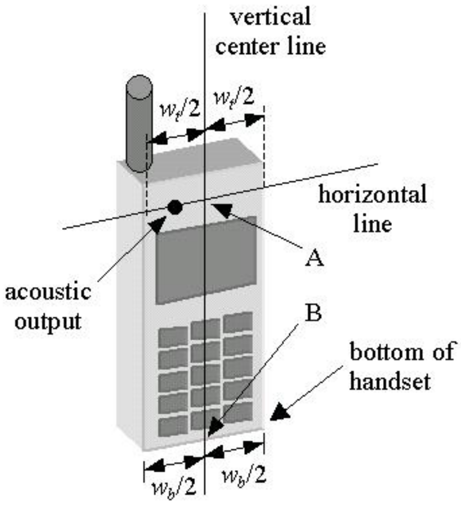


FIGURE 3.1a

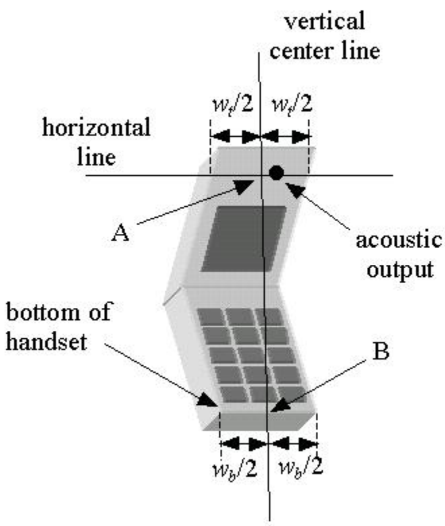
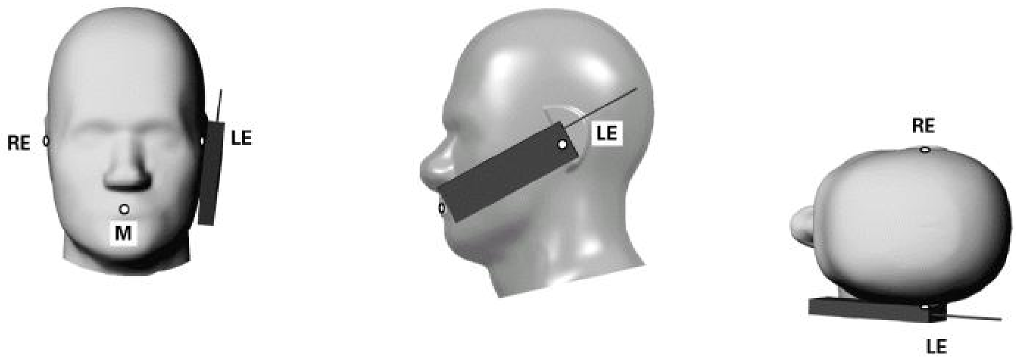


FIGURE 3.1b

4.1.1 TOUCH/CHEEK TEST POSITION

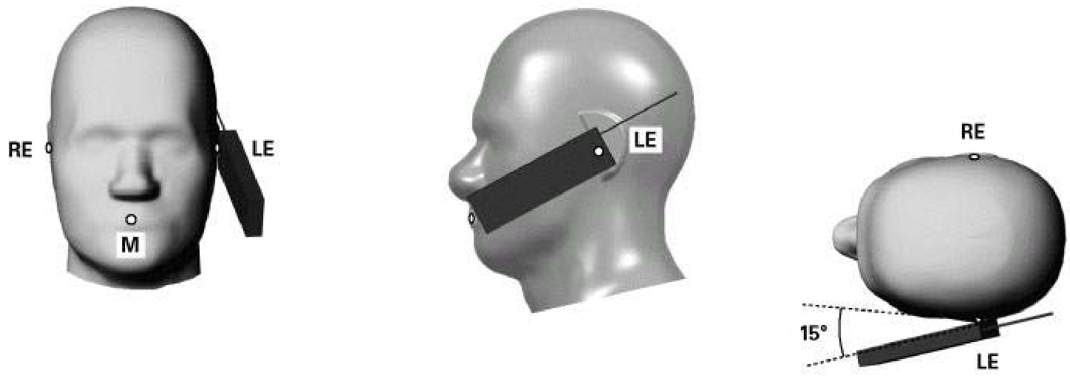
The head position in Figure 3.1, the ear reference points ERP are 15mm above entrance to ear canal along the B-M line. The line N-F (Neck-Front) is perpendicular to the B-M (Back Mouth) line. The handset device in Figure 3.1a and 3.1b,The vertical centerline pass through two points on the front side of handset: the midpoint of the width wt of the handset at the level of the acoustic output (point A) and the midpoint of the width Wb of the bottom of the handset (point B). The vertical centerline is perpendicular to the horizontal line and pass through the center of the acoustic output. The point A touches the ERP and the vertical centerline of the handset is parallel to the B-M line. While maintaining the point A contact with the ear(ERP), rotate the handset about the line NF until any point on handset is in contact with the cheek of the phantom



TOUCH/CHEEK POSITION FIGURE

4.1.2 TILT TEST POSITION

Adjust the device in the cheek position. While maintaining a point of the handset contact in the ear, move the bottom of the handset away from the mouth by an angle of 15 degrees.



TILT POSITION FIGURE

4.1.3 BODY-WORN CONFIGURATION

The handset device attached the belt clip or the holster. The keypad face of the handset is against with the bottom of the flat phantom face and the bottom of the keypad face contact to the bottom of the flat phantom.

When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only accessory that dictates the closest spacing to the body must be tested.

5. RECIPES FOR TISSUE SIMULATING LIQUIDS

For the measurement of the field distribution inside the SAM phantom, the phantom must be filled with 25 litters of tissue simulation liquid.

The following ingredients are used：

- **WATER-** Deionized water (pure H20), resistivity _16 M - as basis for the liquid
- **SUGAR-** Refined sugar in crystals, as available in food shops - to reduce relative permittivity
- **SALT-** Pure NaCl - to increase conductivity
- **CELLULOSE-** Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20_C),
  CAS # 54290 - to increase viscosity and to keep sugar in solution
- **PRESERVATIVE-** Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 - to prevent the spread of bacteria and molds
- **DGMBE-** Diethylenglycol-monobuthyl ether (DGMBE), Fluka Chemie GmbH, CAS # 112-34-5 - to reduce relative permittivity

THE RECIPES FOR 835MHz SIMULATING LIQUID TABLE

INGREDIENT	HEAD SIMULATING LIQUID 835MHz (HSL-835)	MUSCLE SIMULATING LIQUID 835MHz (MSL-835)
Water	40.28%	50.07%
Cellulose	02.41%	NA
Salt	01.38%	0.94%
Preventtol D-7	00.18%	0.09%
Sugar	57.97%	48.2%
Dielectric Parameters at 22℃	f = 835MHz ε= 41.5 ± 5% σ= 0.9 ± 5% S/m	f= 835MHz ε= 55.2 ± 5% σ= 0.97 ± 5% S/m

THE RECIPES FOR 1900MHz SIMULATING LIQUID TABLE

INGREDIENT	HEAD SIMULATING LIQUID 1900MHz (HSL-1900)	MUSCLE SIMULATING LIQUID 1900MHz (MSL-1900)
Water	55.24%	70.16%
DGMBE	44.45%	29.44%
Salt	0.306%	00.39%
Dielectric Parameters at 22℃	f= 1900MHz ε= 40.0 ± 5% σ= 1.40 ± 5% S/m	f= 1900MHz ε= 53.3 ± 5% σ= 1.52 ± 5% S/m

Testing the liquids using the Agilent Network Analyzer E8358A and Agilent Dielectric Probe Kit 85070D.The testing procedure is following as

1. Turn Network Analyzer on and allow at least 30 min. warm up.
2. Mount dielectric probe kit so that interconnecting cable to Network Analyzer will not be moved during measurements or calibration.
3. Pour de-ionized water and measure water temperature (±1°).
4. Set water temperature in Agilent-Software (Calibration Setup).
5. Perform calibration.
6. Validate calibration with dielectric material of known properties (e.g. polished ceramic slab with >8mm thickness ε'=10.0, ε''=0.0). If measured parameters do not fit within tolerance, repeat calibration (±0.2 for ε': ±0.1 for ε'').
7. Conductivity can be calculated from ε'' by $\sigma = \omega\ \varepsilon_0\ \varepsilon'' = \varepsilon''\ f\ [GHz] / 18$.
8. Measure liquid shortly after calibration. Repeat calibration every hour.
9. Stir the liquid to be measured. Take a sample (~50ml) with a syringe from the center of the liquid container.
10. Pour the liquid into a small glass flask. Hold the syringe at the bottom of the flask to avoid air bubbles.
11. Put the dielectric probe in the glass flask. Check that there are no air bubbles in front of the opening in the dielectric probe kit.
12. Perform measurements.
13. Adjust medium parameters in DASY5 for the frequencies necessary for the measurements ('Setup Config', select medium (e.g. Brain 900 MHz) and press 'Option'-button.

Select the current medium for the frequency of the validation (e.g. Setup Medium Brain 900 MHz).

FOR PCS 1900 & WCDMA 1900 BAND SIMULATING LIQUID

LIQUID TYPE		HSL-1900		
SIMULATING LIQUID TEMP.		22.9		
TEST DATE		May 05, 2010		
TESTED BY		Dylan Chiou		
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)
1852.4	Permitivity (ε)	40.00	40.7	1.75
1880.0		40.00	40.8	2.00
1900.0		40.00	40.8	2.00
1907.6		40.00	40.8	2.00
1852.4	Conductivity (σ) S/m	1.40	1.38	-1.43
1880.0		1.40	1.42	1.43
1900.0		1.40	1.43	2.14
1907.6		1.40	1.44	2.86
Dielectric Parameters Required at 22℃		**f= 1900MHz** **ε= 40.0 ± 5%** **σ= 1.40 ± 5% S/m**		

6. SYSTEM VALIDATION

The system validation was performed in the flat phantom with equipment listed in the following table. Since the SAR value is calculated from the measured electric field, dielectric constant and conductivity of the body tissue and the SAR is proportional to the square of the electric field. So, the SAR value will be also proportional to the RF power input to the system validation dipole under the same test environment. In our system validation test, 250mW RF input power was used.

6.1 TEST PROCEDURE

Before you start the system performance check, need only to tell the system with which components (probe, medium, and device) are performing the system performance check; the system will take care of all parameters. The dipole must be placed beneath the flat phantom section of the SAM Twin Phantom with the correct distance holder in place. The distance holder should touch the phantom surface with a light pressure at the reference marking (little cross) and be oriented parallel to the long side of the phantom. Accurate positioning is not necessary, since the system will search for the peak SAR location, except that the dipole arms should be parallel to the surface. The device holder for the EUT can be left in place but should be rotated away from the dipole.

1.The ”Power Reference Measurement” and ”Power Drift Measurement” jobs are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the amplifier output power. If it is too high (above ±0.1 dB), the system performance check should be repeated; some amplifiers have very high drift during warm-up. A stable amplifier gives drift results in the DASY system below ±0.02 dB.

2.The ”Surface Check” job tests the optical surface detection system of the DASY system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ±0.1mm). In that case it is better to abort the system performance check and stir the liquid.

3. The ”Area Scan” job measures the SAR above the dipole on a plane parallel to the surface. It is used to locate the approximate location of the peak SAR. The proposed scan uses large grid spacing for faster measurement; due to the symmetric field, the peak detection is reliable. If a finer graphic is desired, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result.

4. The ”Zoom Scan” job measures the field in a volume around the peak SAR value assessed in the previous ”Area Scan” job (for more information see the application note on SAR evaluation).

About the validation dipole positioning uncertainty, the constant and low loss dielectric spacer is used to establish the correct distance between the top surface of the dipole and the bottom surface of the phantom, the error component introduced by the uncertainty of the distance between the liquid (i.e., phantom shell) and the validation dipole in the DASY5 system is less than ±0.1mm.

$$SAR_{tolerance}[\%] = 100 \times \left(\frac{(a+d)^2}{a^2} - 1\right)$$

As the closest distance is 10mm, the resulting tolerance $SAR_{tolerance}[\%]$ is <2%.

6.2 VALIDATION RESULTS

SYSTEM VALIDATION TEST OF SIMULATING LIQUID					
FREQUENCY (MHz)	**REQUIRED SAR (mW/g)**	**MEASURED SAR (mW/g)**	**DEVIATION (%)**	**SEPARATION DISTANCE**	**TESTED DATE**
HSL 1900	10.00 (1g)	10.39	3.90	10mm	May 05, 2010
TESTED BY	Dylan Chiou				

NOTE: Please see Appendix for the photo of system validation test.

6.3 SYSTEM VALIDATION UNCERTAINTIES

In the table below, the system validation uncertainty with respect to the analytically assessed SAR value of a dipole source as given in the IEEE 1528 standard is given. This uncertainty is smaller than the expected uncertainty for mobile phone measurements due to the simplified setup and the symmetric field distribution.

Error Description	Tolerance (±%)	Probability Distribution	Divisor	(C_i)		Standard Uncertainty (±%)		(v_i)
				(1g)	(10g)	(1g)	(10g)	
Measurement System								
Probe Calibration	5.50	Normal	1	1	1	5.50	5.50	∞
Axial Isotropy	0.50	Rectangular	$\sqrt{3}$	0.7	0.7	0.20	0.20	∞
Hemispherical Isotropy	2.60	Rectangular	$\sqrt{3}$	0.7	0.7	1.05	1.05	∞
Boundary effects	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	0.60	Rectangular	$\sqrt{3}$	1	1	0.35	0.35	∞
System Detection Limits	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	0.30	Normal	1	1	1	0.30	0.30	∞
Response Time	0.80	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration Time	2.60	Rectangular	$\sqrt{3}$	1	1	1.50	1.50	∞
RF Ambient Noise	3.00	Rectangular	$\sqrt{3}$	1	1	1.73	1.73	∞
RF Ambient Reflections	3.00	Rectangular	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe Positioner	0.40	Rectangular	$\sqrt{3}$	1	1	0.23	0.23	∞
Probe Positioning	2.90	Rectangular	$\sqrt{3}$	1	1	1.67	1.67	∞
Max. SAR Eval.	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Dipole Related								
Dipole Axis to Liquid Distance	2.00	Rectangular	$\sqrt{3}$	1	1	1.15	1.15	145
Input Power Drift	5.00	Rectangular	$\sqrt{3}$	1	1	2.89	2.89	∞
Phantom and Tissue parameters								
Phantom Uncertainty	4.00	Rectangular	$\sqrt{3}$	1	1	2.31	2.31	∞
Liquid Conductivity (target)	5.00	Rectangular	$\sqrt{3}$	0.64	0.43	1.85	1.24	∞
Liquid Conductivity (measurement)	2.86	Normal	1	0.64	0.43	1.83	1.23	∞
Liquid Permittivity (target)	5.00	Rectangular	$\sqrt{3}$	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (measurement)	2.00	Normal	1	0.6	0.49	1.20	0.98	∞
Combined Standard Uncertainty						**8.37**	**8.06**	
Coverage Factor for 95%						**Kp=2**		
Expanded Uncertainty (K=2)						**16.75**	**16.12**	

NOTE: About the system validation uncertainty assessment, please reference the section 7.

7. TEST RESULTS

7.1 TEST PROCEDURES

The EUT (EDA (Enterprise Digital Assistant)) makes a phone call to the communication simulator station. Establish the simulation communication configuration rather the actual communication. Then the EUT could continuous the transmission mode. Adjust the PCL of the base station could controlled the EUT to transmitted the maximum output power. The base station also could control the transmission channel. The SAR value was calculated via the 3D spline interpolation algorithm that has been implemented in the software of DASY5 SAR measurement system manufactured and calibrated by SPEAG. According to the IEEE 1528 / EN 50361, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- Power reference measurement
- Verification of the power reference measurement
- Area scan
- Zoom scan
- Power reference measurement

The area scan with 15mm x 15mm grid was performed for the highest spatial SAR location. Consist of 11 x 13 points while the scan size is the 150mm x 180mm. The zoom scan with 30mm x 30mm x 30mm volume was performed for SAR value averaged over 1g and 10g spatial volumes.

In the zoom scan, the distance between the measurement point at the probe sensor location (geometric center behind the probe tip) and the phantom surface is 4.0 mm and maintained at a constant distance of ±1.0 mm during a zoom scan to determine peak SAR locations. The distance is 4mm between the first measurement point and the bottom surface of the phantom. The secondary measurement point to the bottom surface of the phantom is with 9mm separation distance. The cube size is 7 x 7 x 7 points consist of 343 points and the grid space is 5mm.

The measurement time is 0.5 s at each point of the zoom scan. The probe boundary effect compensation shall be applied during the SAR test. Because of the tip of the probe to the Phantom surface separated distances are longer than half a tip probe diameter.

In the area scan, the separation distance is 4mm between the each measurement point and the phantom surface. The scan size shall be included the transmission portion of the EUT. The measurement time is the same as the zoom scan. At last the reference power drift shall be less than ±5%.

7.2 MEASURED SAR RESULTS

Since the device is capable of simultaneous transmitting of voice and data in WCDMA and HSDPA mode. We add following test to verify if SAR value get increased.

HEAD POSITION

Configuration: Barcode reader: BB Imager, 1.5x Battery

Stand-alone SAR (1g)		
HEAD	**LEFT**	
	CHEEK	**TILT**
WCDMA 1900 + HSDPA 1900 MODE		
Ch 9262: 1852.4MHz	NOTE 7	1.11
Ch 9400: 1880.0MHz	1.13	1.27
Ch 9538: 1907.6MHz	NOTE 7	1.18

NOTE:

1. Test configuration of each mode is described in section 4.1.
2. In this testing, the limit for General Population Spatial Peak averaged over **1g, 1.6W/kg**, is applied.
3. Please see the Appendix A for the data.
4. The variation of the EUT conducted power measured before and after SAR testing should not over 5%.
5. Temperature of Liquid is 22±1°C
6. The EUT have been pre-tested and found “BB / QWERTY + 1.5X battery” was the worst case configuration for final test.
7. WCDMA 1900 SAR value of ch 9262 and 9538 at Left cheek position is less than 1.2 W/kg. Therefore, test for HSDPA channel 9262 and 9538 at left cheek position is not necessary.

7.3 SAR LIMITS

HUMAN EXPOSURE	**SAR (W/kg)**	
	(General Population / Uncontrolled Exposure Environment)	**(Occupational / controlled Exposure Environment)**
Spatial Average (whole body)	0.08	0.4
Spatial Peak (averaged over 1 g)	**1.6**	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

NOTE:

1. This limits accord to 47 CFR 2.1093 – Safety Limit.
2. The EUT property been complied with the partial body exposure limit under the general population environment.

8. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

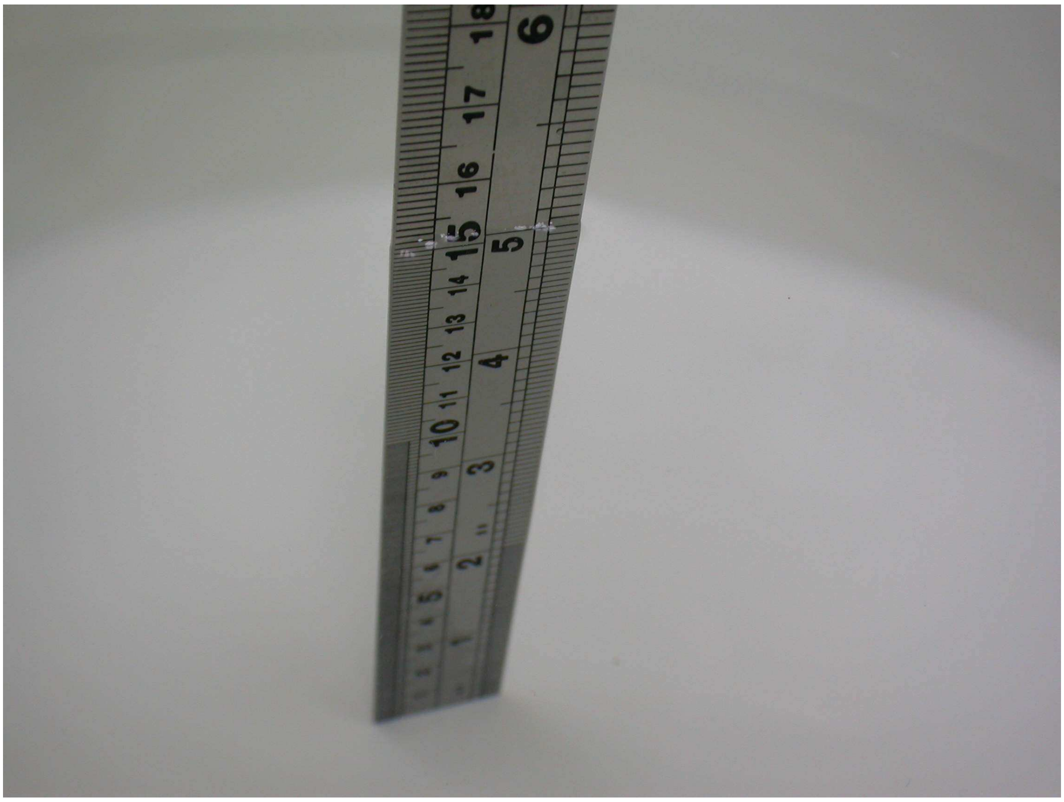
Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

APPENDIX A: TEST DATA

Liquid Level Photo

Tissue HSL1900MHz D=152mm – 5/5



Date/Time: 2010/5/5 01:21:50

Test Laboratory: Bureau Veritas ADT

M01-A6_2D-Left Head Cheek WCDMA+HSDPA1900 Ch9400 / 1.5x Batt

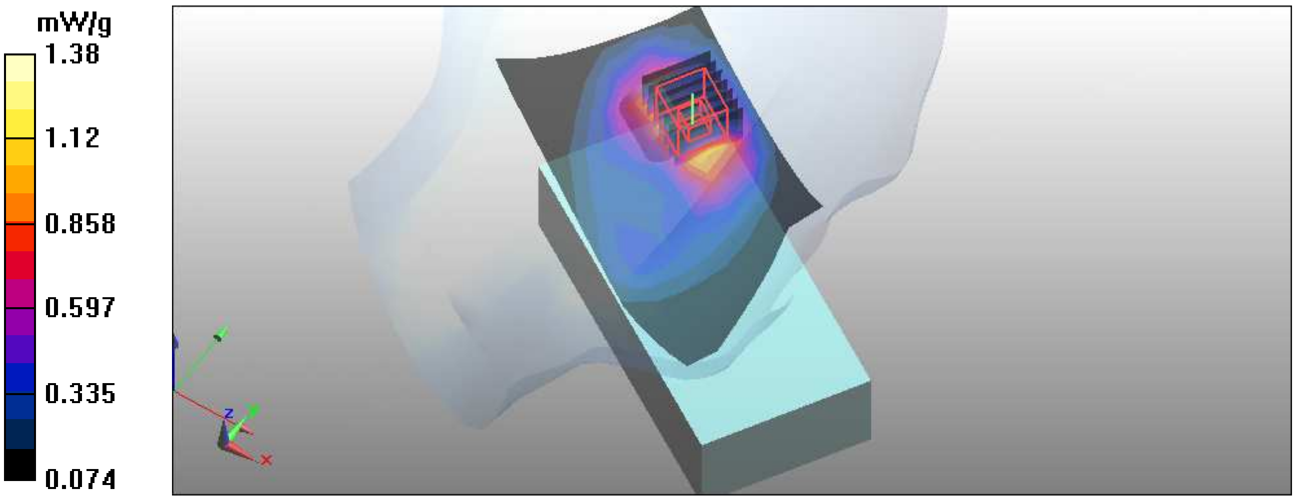
DUT: EDA ; Type: MC75A6
Communication System: WCDMA1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.42 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Touch Position - Mid Ch9400/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.28 mW/g

Touch Position - Mid Ch9400/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 19.3 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.649 mW/g
Maximum value of SAR (measured) = 1.38 mW/g



Date/Time: 2010/5/5 02:26:35

Test Laboratory: Bureau Veritas ADT

M02-A6_2D-Left Head Tilt WCDMA+HSDPA1900 Ch9262 / 1.5x Batt

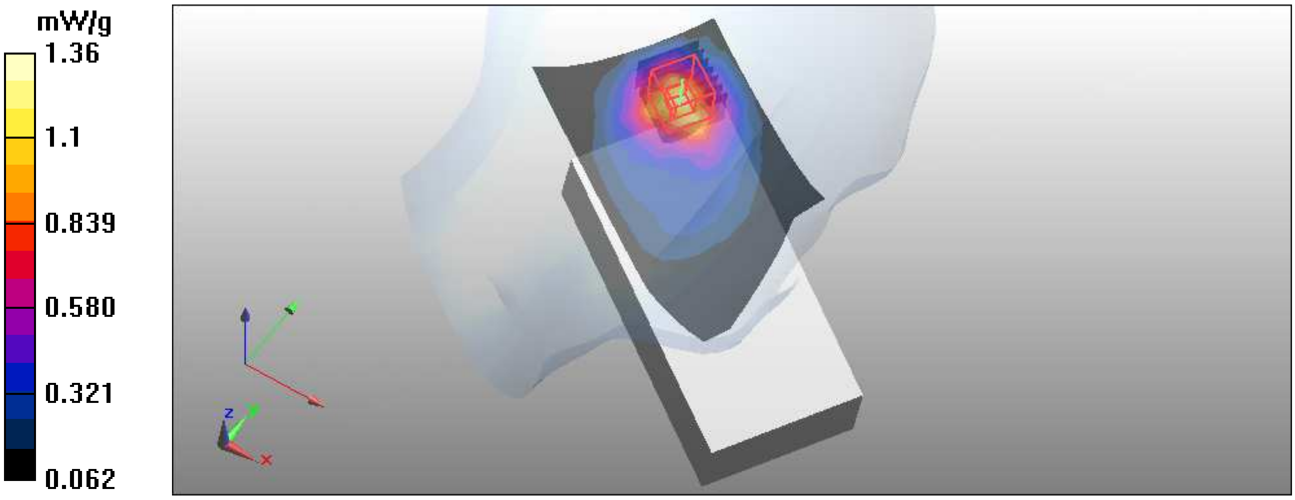
DUT: EDA ; Type: MC75A6
Communication System: WCDMA1900 ; Frequency: 1852.4 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used (extrapolated): f = 1852.4 MHz; σ = 1.38 mho/m; ε_r = 40.7; ρ = 1000 kg/m^3 Phantom section: Left Section ; DUT test position : Tilt; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Tilt Position - Low Ch9262/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.32 mW/g

Tilt Position - Low Ch9262/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 19.4 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.636 mW/g
Maximum value of SAR (measured) = 1.36 mW/g



Date/Time: 2010/5/5   03:22:05

Test Laboratory: Bureau Veritas ADT

M03-A6_2D-Left Head Tilt WCDMA+HSDPA1900 Ch9400 / 1.5x Batt

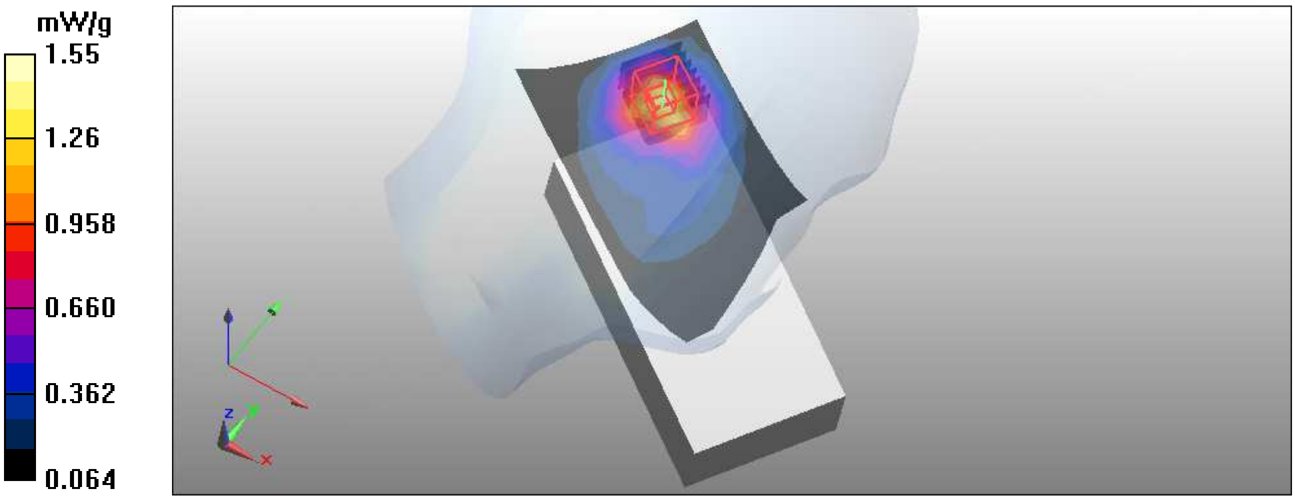
DUT: EDA ; Type: MC75A6
Communication System: UMTS_3G ; Frequency: 1880 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.42 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Tilt Position - Mid Ch9400/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.49 mW/g

Tilt Position - Mid Ch9400/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 19.6 V/m; Power Drift = 0.068 dB
Peak SAR (extrapolated) = 2.15 W/kg
SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.719 mW/g
Maximum value of SAR (measured) = 1.55 mW/g



Date/Time: 2010/5/5 04:25:26

Test Laboratory: Bureau Veritas ADT

M04-A6_2D-Left Head Tilt WCDMA+HSDPA1900 Ch9538 / 1.5x Batt

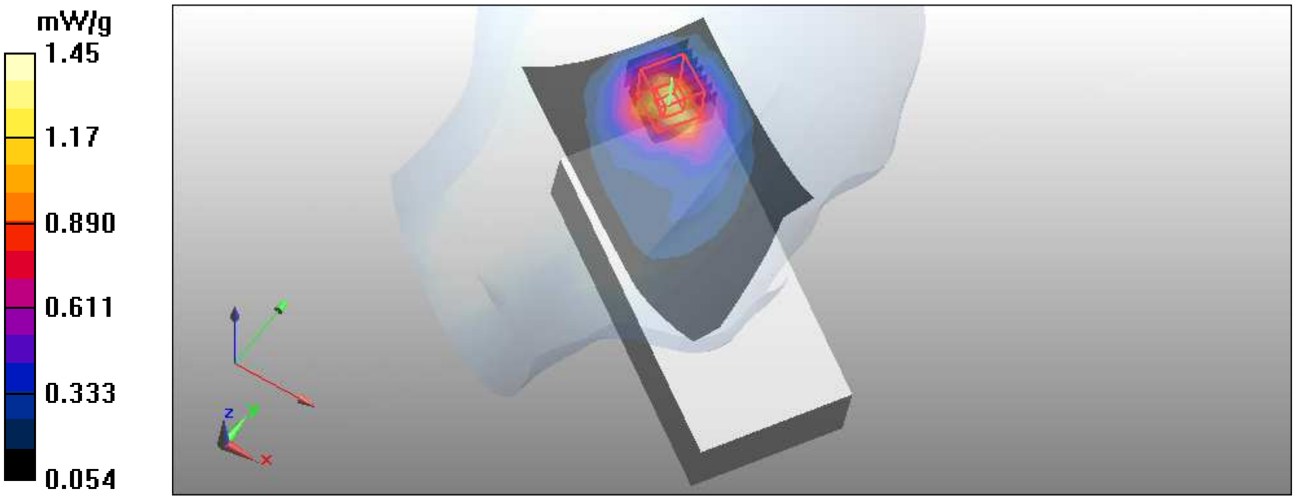
DUT: EDA ; Type: MC75A6
Communication System: WCDMA1900 ; Frequency: 1907.6 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used (extrapolated): f = 1907.6 MHz; σ = 1.44 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3 Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Tilt Position - High Ch9538/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.38 mW/g

Tilt Position - High Ch9538/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 18.3 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 1.99 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.670 mW/g
Maximum value of SAR (measured) = 1.45 mW/g



Date/Time: 2010/5/5 00:24:41

Test Laboratory: Bureau Veritas ADT

System Performance Check-HSL1900MHz 5-5

DUT: Dipole 1900 MHz ; Type: D1900V2 ; Serial: 5d036 ; Test Frequency: 1900 MHz

Communication System: CW ; Frequency: 1900 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: HSL1900;Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3 ;
Liquid level : 152 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feetpoint of the dipole to the Phantom)Air temp. : 23.2 degrees ; Liquid temp. : 22.9 degrees

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

d=10mm, Pin=250 mW, dist=3.0mm/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 13.1 mW/g

d=10mm, Pin=250 mW, dist=3.0mm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.7 V/m; Power Drift = -0.0235 dB
Peak SAR (extrapolated) = 19.3 W/kg
SAR(1 g) = 10.39 mW/g; SAR(10 g) = 5.38 mW/g