

SITE ACCEPTANCE TEST REPORT SAR SYSTEM

Document No: SAR-280-1-08-SATB-A

Subject: Test of conformity of the equipment.

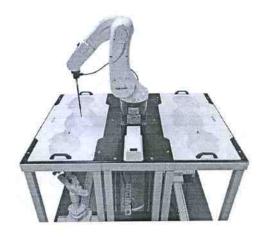
Specification of the equipment:

Type:

SAR

Name:

Specific Absorption Rate system



Delivered to:

MORLAB Communication Technology

Contract Number:

PF2130108b_SAR_Morlab

	Name and Function	Date and Signature
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Approved by:	Hervé LATTARD	

Distribution	Nb.
SATIMO	1
Shenzhen Morlab Communication Technology	



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Issue: A

Date: 2008/10/06

		RECORD OF MODIFICATION
Issue	Date	Modifications/Pages changed
A	2008/10/06	Initial release
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1. INTRODUCTION

1.1. Scope of Operation

This document describes the various tests used during the acceptance trials of the SAR Test System as proposed in § 8.3 – System Validation from IEEE standard 1528 (2003) "recommended practice for determining the peak spatial average specific absorption rate (SAR) in the human head from wireless communication devices: measurement techniques" and HAC Test System as proposed in in § 4.1 – Validation Procedure from ANSI C63.19 (2007) "American National Standard Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids"

The Acceptance Test Procedure includes the initial calibration performed by SATIMO, the System Validation performed in MORLAB in Shenzhen.

1.2. Test Procedure

The Initial calibration is done at SATIMO without the customer.

The Acceptance test procedure performed in MORLAB in Shenzhen is to demonstrate the safety and the functional operation of the SAR&HAC Test System. The tests are divided into System check and System Validation.

1.3. System Validation

For SAR, the System Validation procedure evaluates the system against reference SAR values and the performance of the probe, readout electronics, and software. The test setup utilizes the flat part of a Semi Anthropomorphic Mannequin (SAM) phantom and a reference dipole. Thus, the System Validation process doesn't include uncertainty due to handset positioning variability.

For HAC, the System Validation procedure evaluates the system against reference E-field and H-field values and the performance of the probe, readout electronics, and software. The test setup utilizes the broadband reference dipole. Thus, the System Validation process doesn't include uncertainty due to handset positioning variability.

System Validation has to be performed with a probe preliminary calibrated.

1.4. System Check

System check includes mechanical inspection, electrical safety tests, functional tests (hardware), operational tests (hardware and software) and system tests (hardware and software) on a mobile phone.

This mobile phone delivered by MORLAB has to be compliance to the used frequency bands.



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2. DOCUMENTATION

2.1. Reference Documents

PJF_213_01_08b_SATH A.xls

2.2. Abbreviations

ATP

acceptance test procedure

EUT

equipment under test

FAT

final acceptance test

GPIB

general purpose interface bus

HAC

Hearing Aids Compatibility

IEEE

Institute of Electrical and Electronic Engineers

IPL

Input Power Level

SAM

Specific Anthropomorphic Mannequin

SAR

Specific Absorption Rate

3. LISTED OF MANDATORY EQUIPMENT REQUIRED

System validation has to be performed with the input power measurement test setup described in §8.2.4-IEEE 1528-page 65.

AMP

Amplifier 435 MHz-2450 MHz - 1 Watt - MORLAB

CBL1

Coaxial câble 1- SATIMO

CBL2

Coaxial câble 2- MORLAB

RAD

Radiocommunication tester - MORLAB

CPL

Coaxial Directional Coupler - MORLAB

PMR

Power meter - MORLAB

SIM

SIM card - MORLAB

GEN

Signal generator - MORLAB

Mandatory Instruments necessary to performed acceptance tests are provided by MORLAB except CBL1.



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4. DELIVERED ITEMS

Pos	Type / Item Description	Supplier	Serial No.	Qty	DELIVERED (y/n)
1	PROBE E SAR E FIELD PROBE	SATIMO	SN 37/08 EP80	1	
2	DIPOLE 435 435 MHz REFERENCE DIPOLE	SATIMO	SN 36/08 DIPB98	1	
3	DIPOLE 835 835 MHz REFERENCE DIPOLE	SATIMO	SN 36/08 DIPC99	1	
4	DIPOLE 900 900 MHz REFERENCE DIPOLE	SATIMO	SN 36/08 DIPD100	1	
5	DIPOLE 1800 1800 MHz REFERENCE DIPOLE	SATIMO	SN 36/08 DIPF101	1	
7	DIPOLE 2000 1800 MHz REFERENCE DIPOLE	SATIMO	SN 36/08 DIPI102	1	
8	DIPOLE 2450 2450 MHz REFERENCE DIPOLE	SATIMO	SN 36/08 DIPJ103	1	
9	POSITIONING DEVICE MOBILE PHONE POSITIONING DEVICE	SATIMO	SN 36/08 MSH56	1	
10	DUMMY PROBE	SATIMO	SN 36/08 DP31	1	
11	SAM PHANTOM	SATIMO	SN 36/08 SAM62	1	
12	TABLE 1 SAM PHANTOM TABLE	SATIMO	SN 36/08 TABP44	1	
13	TABLE 2 KUKA ROBOT TABLE	SATIMO	SN 36/08 TABR29	1	
14	KR5 6 AXIS ROBOT	KUKA		1	
15	KRC2 ROBOT CONTROL CABINET	KUKA		1	
16	MILLIVOLTMETER KEITHLEY 2000	KEITHLEY		1	
17	SCAN CARD 10 CHANELS SCANCARD	KEITHLEY		1	
18	PCI-GPIB CARD	SATIMO		1	
19	AXIS DEVICE PROBE/ ROBOT POSITIONING DEVICE	SATIMO	SN 36/08 SUPR31	1	
20	SHIELDED CABLE PROBE / KEITHLEY SHIELDED CABLE	SATIMO		1	
21	PHANTOM & TABLE SCREW NILON SCREW	SATIMO			
22	CABLE GPIB KEITHLEY TO PC GPIB LINK	SATIMO		1	
23	CABLE TCP/IP ROBOT CABINET TO PC LINK	SATIMO		1	
24	RG214U SIGNAL GENERATOR / DIPOLE CABLE	SATIMO		1	
25	COM ANTENNA 800-2500 COM TESTER ANTENNA	SATIMO	SN 36/08 ANTA24	1	
26	OPENSAR SAR MEASUREMENT SOFTWARE	SATIMO		1	



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28	OCP LIQUID CALIBRATION KIT	SATIMO	SN 42/07 OCP26	1
30	LIQUID 900 HEAD TISSU LIQUID 835-900 MHz	SATIMO	SN 36/08 HLD123	251
31	LIQUID 1800 HEAD TISSU LIQUID 1800 MHz	SATIMO	SN 36/08 HLF124	251
31	LIQUID 1900 HEAD TISSU LIQUID 1900 MHz	SATIMO	SN 36/08 HLG125	251
31	LIQUID 2450 HEAD TISSU LIQUID 2450 MHz	SATIMO	SN 36/08 HLJ126	251
41	Video Positioning System	SATIMO	SN 36/08 VPS18	1
42	Reference Tools for VPS	SATIMO	SN 36/08 RT12	1
40	PROBE E HAC E FIELD PROBE	SATIMO	SN 41/08 EPH17	1
41	PROBE H HAC H FIELD PROBE	SATIMO	SN 41/08 HPH18	1
42	PROBE T-Coil HAC E FIELD PROBE	SATIMO	SN 39/08 TCP11	11
43	Broadband Dipole 800-950 HAC DIPOLE	SATIMO	SN 36/08 DHA16	1
44	Broadband Dipole 1700-2000 HAC DIPOLE	SATIMO	SN 36/08 DHB16	111
44	Broadband Dipole 2400-2500 HAC DIPOLE	SATIMO	SN 36/08 DHC11	1
45	AUDIO DAQ	SATIMO		1
46	HAC Positioning System	SATIMO	SN 36/08 SUPH16	11.
	Helmholtz Coil	SATIMO	SN 36/08 HC06	
47	BNC Cable	SATIMO		1

5. INITIAL TEST ON SYSTEM

5.1. Preliminary Test

The preliminary tests of SAR&HAC Test System are confined to power on tests, delivery and assembly inspections. These tests are performed by SATIMO after assembly of the SAR&HAC Test System. Morlab is present.

The SAR&HAC Test System must be fully fitted with all the measuring instruments and equipment as defined in the list of mandatory and delivered equipments.



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5.1.1.List of Equipment delivered

Cf § 4 - Delivered Items

5.1.2. Mechanical Inspection

The SAR&HAC test system is to be visually checked for good workmanship in the following points:

(2)	Manufacturing: Shipment condition, M	lechanical condition	n of equi	pment/		
	is a second	Compliance:	YES		NOT	
25	Assembly:					
		Compliance:	YES		NOT	

5.1.3. Power on test

		POWE	R ON	
Acceptance		VALIDATION	EQUIPMENT	ACTION
Y [/]	N[]			
YIV	N[]		PC from Morlab	PC on
N.JY	NI 1	OpenSAR Software		Run OpenSAR software
YI	N[]	OpenHAC Software		Close OpenSAR software Run OpenHAC software
YE	N[]	Robot	Material	Power On

5.2. Functional Tests

The functional tests of SAR&HAC Test System are confined to make reference points and path inspections on SAM phantom. These tests are performed by SATIMO after assembly of the SAR&HAC Test System. HONHER is present.



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The SAR Test System must be fully fitted with all the measuring instruments and equipment as defined in the list of mandatory and delivered equipments. Tests have to be made with dummy probe.

		MECHANICAL VALIDATI	ON (Using Dui	nmy probe)
Accer	tance	VALIDATION	EQUIPMENT	ACTION
N. IY	N [1	Probe holder	Robot	Connect dummy probe
YIV	NI 1	OpenSAR software		Take manual reference point
YIJ	N[]	Right head surface path & automatic return to ref point		
Y[]	N[]	Left head surface path & automatic return to ref point	OpenSAR	Take manual reference point OpenSAR Take manual reference point
Y [\sqrt{j}	N[]	Flat phantom surface path & automatic return to ref point		
YIJI	NI 1	OpenHAC software	OpenHAC	Take manual reference point
YIV	NI 1	Surface path 50*50 mm	Оренняс	OpenHAC
YIJ	N[]	Flat phantom surface path & Emergency stop	Robot	Manual Emergency stop

6. SYSTEM VALIDATION

6.1. Introduction to System validation

The System Validation is divided into 3 main sections: calibration, environmental and system validation.

The Calibration refers to some of the delivered equipment, namely:

- E-Field Probe 1
- Dipole 435
- Dipole 835
- Dipole 900
- Dipole 1800
- Dipole 2000
- Dipole 2450
- Positioning device
- SAM Phantom
- Communication antenna
- Open Coaxial Probe
- Liquid HL900
- Liquid HL1800
- Liquid HL1900
- Liquid HL2450
- E-Field Probe 2
- H-Field Probe
- T-Coil Probe
- Broadband Dipole 800-950
- Broadband Dipole 1700-2000
- Broadband Dipole 2000-2600



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- SAR measurement uncertainties
- HAC measurement uncertainties

The sections covering calibration of the system demonstrates the techniques used in the SATIMO factory and cover measurements results.

The System Validation procedure for SAR evaluates the system against reference SAR values and the performance of the probe, readout electronics, and software. The test setup utilizes the flat part of a Specific Anthropomorphic Model (SAM) phantom and a reference dipole.

The System Validation procedure for HAC evaluates the system against reference E and H values and the performance of the probe, readout electronics, and software. The test setup utilizes a broadband reference dipole.



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6.2. Calibration

0.2. Campiation					
6.2.1. E-FIELD PROBE 1	Compliance:	YES		NOT	
6.2.2. DIPOLE 435	Compliance :	YES		NOT	
6.2.3. DIPOLE 835	Compliance :	YES		NOT	
6.2.4. DIPOLE 900	Compliance:	YES	\Box	NOT	
6.2.5. DIPOLE 1800	Compliance:	YES		NOT	
6.2.6. DIPOLE 2000	Compliance:	YES	U /	NOT	
6.2.7. DIPOLE 2450	Compliance :	YES		NOT	
6.2.8. MOBILE PHONE HOLDER	Compliance :	YES		NOT	
6.2.9. SAM PHANTOM	Compliance :	YES	Ø	NOT	
6.2.10. COMMUNICATION ANTENNA	Compliance :	YES	ď	NOT	
6.2.11. OPEN COAXIAL PROBE	Compliance :	YES	Ø	NOT	
6.2.12. HEAD LIQUID 900	Compliance :	YES	Ø	NOT	
6.2.13. HEAD LIQUID 1800	Compliance :	YES		NOT	



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6.2.14. HEAD LIQUID 1900	Compliance :	YES		NOT	
6.2.15. HEAD LIQUID 2450	Compliance:	YES	\square'	NOT	
6.2.16. E-FIELD PROBE 2	Compliance :	YES	V	NOT	
6.2.17. H-FIELD PROBE	Compliance :	YES		NOT	
6.2.18. T-COIL PROBE	Compliance :	YES	ď	NOT	
6.2.19. BROADBAND DIPOLE 800-950	Compliance:	YES		NOT	
6.2.20. BROADBAND DIPOLE 1700-2000	Compliance :	YES	\Box	NOT	
6.2.21. BROADBAND DIPOLE 2000-2600	Compliance :	YES		NOT	
6.2.22. SAR SYSTEM VALIDATION UNCERTAINTIES	Compliance :	YES		NOT	
6.2.23. SAR MEASUREMENT UNCERTAINTIES	Compliance :	YES		NOT	
6.2.24. HAC MEASUREMENT UNCERTAINTIES	Compliance:	YES	U	NOT	



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6.3. SAR System Validation

6.3.1.SAR Noise measurement

In compliance to the IEEE 1528 standard -§ 6.1.1, the Systems Validation has to be performed in a noise free environment. The first step of System Validation is therefore to perform a noise measurement. The result of noise measurement (if the SAR local noise is > 0.012 W/Kg) has a direct influence on the validity of CW System Validation measurements done below 0.5 W/Kg.

This test is performed in System Validation configuration with Signal Generator and Amplifier powered off.

Environmental Conditions

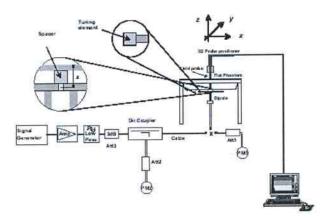
SAR Local < 12 mW/Kg

W

SAR Local > 12 mW/Kg

6.3.2.SAR System Validation Setup

System validation has to be performed with the below input power measurement test setup described in §8.2.4-IEEE 1528-page 65.



System Validation is used for verifying the accuracy of the probe and readout electronics, and performance of the software.

6.3.3.SAR System Validation Uncertainty

Differences between System Validation values and references values should be less than the tolerance specified for the SAR measurement system by SATIMO. Considering that the device positioning and head phantom shape errors are not considered, uncertainties for System Validation become:



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SAR	Full Expended Uncertainty (95% Confidence interval)	Test Sample related uncertainty	SYSTEM VALIDATION UNCERTAINTY
1g (W/Kg)	18.93 %	6 50 8/	15.86 %
10g (W/Kg)	18.67 %	6,50 %	15.54 %

6.3.4.SAR evaluation

A complete 1g or 10g average SAR measurement is performed. The 1g and 10g averaged SAR is measured at frequencies 900 and 1800 MHz. The results are normalized to 1W forward input power and compared with the reference SAR value below.

	1g SAR	(W/Kg)	10g SAR	(W/Kg)
Frequency (MHz)	REF	SV	REF	sv
450	4.6	4,59	3.06	3.06
835	9.5	951	6.2	6.19
900	10.8	10.79	6.9	6,91
1800	38.1	38.09	19.8	19.8
2000	41.1	41.1	21.1	21,08
2450	52.4	52,390	24.0	240

		SAR EVALUA	TION @ 450	19
Accer	otance	VALIDATION	EQUIPMENT	ACTION
YIV	INI 1	0.55.0.7	Phantom	Fill up 450 MHz liquid
YIJ	NI I	Probe holder	Robot	Connect E-field probe
YIM	NII	OpenSAR software	OpenSAR	Take ref. point
YIV	I IN		Device holder	Position dipole at 9.8 mm
YIV	NI I	Validation Dipole 450	RF Cable 1	Connect dipole
YI	I IN		RF Cable 1	Connect coupler
YIV	NI 1		Coupler	Connect to amplifier
YIV	I IN		Coupler	Connect to Power meter
YIV	NI 1		RF Cable 2	Signal generator to amplifier
YIV	NI 1	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Power level to 1 W
YIV	NI 1	Signal generator & Amplifier		Frequency to 450 MHz
YIV	NI 1	Flat phantom path	OpenSAR	Path & SAR measurement
YIJ	NI 1	1g SAR	1 2	94.6W/Kg +/- 10.0 %
YIV	NI 1	10g SAR		3.06 W/Kg +/- 10.0 %



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		SAR EVALUA	TION @ 835	
Acceptance		VALIDATION	EQUIPMENT	ACTION
Y[V]	[] N		Phantom	Fill up 900 MHz liquid
YIVI	I IN	Probe holder	Robot	Connect E-field probe
YIV	I IN	OpenSAR software	OpenSAR	Take ref. point
Y [-\]	1 10		Device holder	Position dipole at 11.2 mm
YIV	NI 1	Validation Dipole 835	RF Cable 1	Connect dipole
YIJ	NI 1		RF Cable 1	Connect coupler
YIV	I IN		Coupler	Connect to amplifier
YIVI	NI 1		Coupler	Connect to Power meter
Y IVI	N []		RF Cable 2	Signal generator to amplifier
YIV	NII			Power level to 1 W
YIV	NI 1	Signal generator & Amplifier		Frequency to 835 MHz
Y	NI 1	Flat phantom path	OpenSAR	Path & SAR measurement
Y[V]	NI 1	1g SAR	to Protect 1985	9.5 W/Kg +/- 10.0 %
YIJ	NI I	10g SAR		6.2 W/Kg +/- 10.0 %

Acceptance		VALIDATION	TION @ 900	ACTION
YIV	I NI 1		Phantom	Fill up 900 MHz liquid
YIVI	NII	Probe holder	Robot	Connect E-field probe
YIM	NI 1	OpenSAR software	OpenSAR	Take ref. point
YIV	I IN	•	Device holder	Position dipole at 11.2 mm
Y	NI I	Validation Dipole 900	RF Cable 1	Connect dipole
YIV	NI I		RF Cable 1	Connect coupler
YIVI	NI 1		Coupler	Connect to amplifier
YIVI	NI I		Coupler	Connect to Power meter
YIV	NI 1		RF Cable 2	Signal generator to amplifier
YIJ	NI 1	Page and American State and Amer		Power level to 1 W
YIV	NI 1	Signal generator & Amplifier		Frequency to 900 MHz
YIV	i in	Flat phantom path	OpenSAR	Path & SAR measurement
YIJ	T IN	1g SAR	Production Make	10.8 W/Kg +/- 10.0 %
VIV	NI 1	10g SAR		6.9 W/Kg +/- 10.0 %



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		SAR EVALUA	TION @ 1800	0
Acceptance		VALIDATION	EQUIPMENT	ACTION
VIV.	NI I	(A) 1 Prophysical 24 () 3 () 2 ()	Phantom	Fill up 1800 MHz liquid
YIV	NI I	Probe holder	Robot	Connect E-field probe
YIV	N I I	OpenSAR software	OpenSAR	Take ref. point
112	I IN		Device holder	Position dipole at 6.2 mm
YIU	i in	Validation Dipole 1800	RF Cable 1	Connect dipole
	i in		RF Cable 1	Connect coupler
/ [V]	NI 1		Coupler	Connect to amplifier
111	NI I		Coupler	Connect to Power meter
	N I	1	RF Cable 2	Signal generator to amplifier
	NI 1	3200 G G LOG ENGRADA		Power level to 1 W
	NI 1	Signal generator & Amplifier		Frequency to 1800 MHz
	NI 1	Flat phantom path	OpenSAR	Path & SAR measurement
	NI 1	1g SAR	ETHINESCOURSE ON THERE	38.1 W/Kg +/- 10.0 %
110	NI 1	10g SAR	4	19.8 W/Kg +/- 10.0 %

		SAR EVALUA	TION @ 2000	
Acceptance		VALIDATION	EQUIPMENT	ACTION
Y[V]	INI 1		Phantom	Fill up 2000 MHz liquid
Y	I IN	Probe holder	Robot	Connect E-field probe
YIX	I IN	OpenSAR software	OpenSAR	Take ref. point
YW	TNI 1		Device holder	Position dipole at 6.2 mm
YIV	TIN	Validation Dipole 2000	RF Cable 1	Connect dipole
YV	T IN		RF Cable 1	Connect coupler
Y[V]	T IN		Coupler	Connect to amplifier
YIU	NI 1		Coupler	Connect to Power meter
YW	NI 1		RF Cable 2	Signal generator to amplifier
YIVI	NI 1	Constitution of the consti	3.00. 32.30.30.30.20.2	Power level to 1 W
YIVI	T IN	Signal generator & Amplifier		Frequency to 2000 MHz
Y[J]	NI I	Flat phantom path	OpenSAR	Path & SAR measurement
Y[V]	NI I	1g SAR	AFOROTATORS SVS	41.1 W/Kg +/- 10.0 %
VIVI	NI I	10g SAR		21.1 W/Kg +/- 10.0 %



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		SAR EVALUA	TION @ 2450	
Acceptance		VALIDATION	EQUIPMENT	ACTION
YIM	NI 1		Phantom	Fill up 2450 MHz liquid
YIV	NII	Probe holder	Robot	Connect E-field probe
YIVI	I IN	OpenSAR software	OpenSAR	Take ref. point
YIV	I IN		Device holder	Position dipole at 6.2 mm
YIJ	NI 1	Validation Dipole 2450	RF Cable 1	Connect dipole
YIVI	NI 1		RF Cable 1	Connect coupler
YV	NI 1		Coupler	Connect to amplifier
YV	NI 1		Coupler	Connect to Power meter
YIJ	NI I		RF Cable 2	Signal generator to amplifier
YIX	NI 1			Power level to 1 W
YIJ	NI 1	Signal generator & Amplifier		Frequency to 2450 MHz
Y[V]	NI 1	Flat phantom path	h OpenSAR	Path & SAR measurement
YIVI	NI 1	1g SAR		52.4 W/Kg +/- 10.0 %
YV	NI 1	10g SAR		24.0 W/Kg +/- 10.0 %

6.4. HAC System Validation

6.4.1.HAC System Validation Setup

System validation has to be performed by following the procedure described in §4.3.2-ANSI C63.19-page 17.

System Validation is used for verifying the accuracy of the probe and readout electronics, and performance of the software.

6.4.2.HAC evaluation

A complete scan along the length of the broadband dipole is performed. The maximum values of E-Field and H-field is measured at frequencies 900 and 1800 MHz. The results are normalized to 1W forward input power and compared with the reference E-Field and H-Field value below.

	E-Field	d (V/m)	H-Field	d (A/m)
Frequency (MHz)	REF	sv	REF	SV
900	205	205	0.448	0,44)
1800	165	165	0.452	0.45
2450	142	141	0.105	0.106



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Acceptance		VALIDATION	EQUIPMENT	ACTION
YIU	N I	Probe holder	Robot	Connect E-field probe
YIJ	NI 1	HAC software	OpenHAC	Take manual ref. point
Y []	NI I		Device holder	Position dipole
YIV	NI 1		RF Cable 1	Connect dipole
Y []	NI I	Broadband Dipole 800-950	RF Cable 1	Connect coupler
YIVI	NI I		Coupler	Connect to amplifier
Y [V]	N I		Coupler	Connect to Power meter
YIV	I IN		RF Cable 2	Signal generator to amplifier
YIV.	NI 1	outstand made there executive a transfer a service process of		Power level to 20 dBm
Y[V]	NI 1	Signal generator & Amplifier		Frequency to 900 MHz
Y[V]	NI 1	Probe path	OpenHAC	RF measurement
YM	N[]	E-Field value		Record Maximum E-field@900 MHz

		E-Field EVALU		
Accep	otance	VALIDATION	EQUIPMENT	ACTION
YIJ	I NI I	Probe holder	Robot	Connect E-field probe
YIV	I IN	HAC software	OpenHAC	Take manual ref. point
Y []	NI 1		Device holder	Position dipole
	NII	Broadband Dipole 1700-2000	RF Cable 1	Connect dipole
YIV	NI 1		RF Cable 1	Connect coupler
Y	NI T		Coupler	Connect to amplifier
Y []	NII		Coupler	Connect to Power meter
YIJ	NI I		RF Cable 2	Signal generator to amplifier
7 [3]	NI 1			Power level to 20 dBm
Y [\sqrt{1}]	NI I	Signal generator & Amplifier		Frequency to 1800 MHz
YIU	T IN	Probe path	OpenHAC	RF measurement
YIM	N[]	E-Field value	Орения	Record Maximum E-field@1800 MHz

Acceptance		VALIDATION	EQUIPMENT	ACTION
YIVI	NI 1	Probe holder	Robot	Connect E-field probe
111	NI 1	HAC software	OpenHAC	Take manual ref. point
([V]	I IN		Device holder	Position dipole
	NI 1		RF Cable 1	Connect dipole
110	NI I	Broadband Dipole 2000-2600	RF Cable 1	Connect coupler
101	NI I		Coupler	Connect to amplifier
	NI 1		Coupler	Connect to Power meter
([V]	NI 1		RF Cable 2	Signal generator to amplifier
	NI 1	A CONTROL OF THE CONT		Power level to 20 dBm
711	NI I	Signal generator & Amplifier		Frequency to 2450 MHz
(VI)	NI 1	Probe path	OpenHAC	RF measurement
YIVI	N[]	E-Field value	Орениле	Record Maximum E-field@2450 MHz



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		H-Field EVALU	IATION @ 900	705
Accer	otance	VALIDATION	EQUIPMENT	ACTION
YIM	TNI 1	Probe holder	Robot	Connect E-field probe
YIVI	NI 1	HAC software	OpenHAC	Take manual ref. point
YV	NI I		Device holder	Position dipole
Y[V]	I IN		RF Cable 1	Connect dipole
Y[V]	TNI	D	RF Cable 1	Connect coupler
YV	NI I	Broadband Dipole 800-950	Coupler	Connect to amplifier
Y[V]	I IN	,	Coupler	Connect to Power meter
Y [J]	NI 1		RF Cable 2	Signal generator to amplifier
YIV	Î ÎN			Power level to 20 dBm
YIVI	NI I	Signal generator & Amplifier		Frequency to 900 MHz
YIV	T IN	Probe path	OpenHAC	RF measurement
Y[V]	N[]	H-Field value		Record Maximum H-field@900 MHz

	7	H-Field EVALU	EQUIPMENT	ACTION
Accep	otance	VALIDATION		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Y[/]	NI 1	Probe holder	Robot	Connect E-field probe
YIVI	NI I	HAC software	OpenHAC	Take manual ref. point
YIVI	I IN		Device holder	Position dipole
YIJ	I IN		RF Cable 1	Connect dipole
Y[V]	N[]		RF Cable 1	Connect coupler
YIV	NI 1	Broadband Dipole 1700-2000	Coupler	Connect to amplifier
Y[V]	I IN		Coupler	Connect to Power meter
YIV	NI I		RF Cable 2	Signal generator to amplifier
Y[V]	NI I			Power level to 20 dBm
YV	NI 1	Signal generator & Amplifier		Frequency to 1800 MHz
YIVI	NI I	Probe path	OpenHAC	RF measurement
YIVI	N[]	H-Field value		Record Maximum H-field@1800 MHz

		H-Field EVALU	ATION @ 2450	
Accep	tance	VALIDATION	EQUIPMENT	ACTION
YIVI	I NI I	Probe holder	Robot	Connect E-field probe
YIJ	I IN	HAC software	OpenHAC	Take manual ref. point
YIV	I IN		Device holder	Position dipole
YIVI	NI I		RF Cable 1	Connect dipole
YIJ	NI 1		RF Cable 1	Connect coupler
YIV	NI I	Broadband Dipole 2000-2600	Coupler	Connect to amplifier
YIVI	NI 1	-	Coupler	Connect to Power meter
YIVI	NI 1		RF Cable 2	Signal generator to amplifier
YIVI	NI 1			Power level to 20 dBm
Y[V]	NI 1	Signal generator & Amplifier		Frequency to 2450 MHz
Y[V]	NI 1	Probe path	OpenHAC	RF measurement
YIJ	N[]	H-Field value	2	Record Maximum H-field@2450 MHz



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7. SAR SYSTEM CHECK

7.1. Introduction

The System Check Test of SAR Test System will be carried out at the MORLAB site. The purpose of the tests is to finalize the full compliance of the SAR test system with the specification as defined in the offer.

System check includes functional tests (hardware), operational tests (hardware and software) and system tests (hardware and software) on a mobile phone. This mobile phone delivered by MORLAB has to be compliance to tested frequency bands

7.2. Remote Mobile Phone Emulation

This test has to demonstrate the accurac	of OPENSAR software for piloting r	emotely the GSM TEST SET.
--	------------------------------------	---------------------------

A SIM card is place	e on the mobile phore Compliance:	ne and ti	ne software emu	lates the	e local network.
The mobile phone	is remotely control a	and OPE	NSAR emulate	frequenc NOT	by hoping.

7.3. SAR measurement on Mobile Phone @ 900 MHz

Acceptance		VALIDATION	EQUIPMENT	ACTION
11/1	INI 1		Mobile	Integrate SIM card
110	NI I	Network emulator	OpenSAR	Set GSM900 band
'IV	NI 1	10.000	Mobile	Take the call
11	NI I	Mobile holder		Position mobile
YIVI	NI 1	Right ear phantom path	OpenSAR	Adaptative path
YIJ	NI 1	OpenSAR		Report generation



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7.4. SAR measurement on Mobile Phone @ 1800 MHz

Accer	tance	VALIDATION	JREMENT @ 180 EQUIPMENT	ACTION	
111	NI 1	T. C. Torrandor C. P. R. C. Collins	Mobile	Integrate SIM card	
VIV	NI I	Network emulator	OpenSAR	Set GSM1800 band	
	N []		Mobile	Take the call	
YIM	NI 1	Mobile holder		Position mobile	
YIM	NI 1	Right ear phantom path	OpenSAR	Adaptative path	
YIO	1 1 1 1	OpenSAR		Report generation	

8. HAC SYSTEM CHECK

8.1. Introduction

The System Check Test of HAC Test System will be carried out at the HONHER site. The purpose of the tests is to finalize the full compliance of the HAC test system with the specification as defined in the offer.

System check includes functional tests (hardware), operational tests (hardware and software) and system tests (hardware and software) on a mobile phone. This mobile phone delivered by HONHER has to be compliance to 900/1800 MHz frequency bands

8.2. Remote Mobile Phone Emulation

This test has to demonstrate the accu	racy of HAC s	oftware fo	or piloting remote	ely the GSM TEST SET.
A SIM card is place on the mo	obile phone ar	d the soft	ware emulates th	ne local network.
Complia	nce: YE	s 🗹	NOT	
SI M. STATE OF THE		DENIGAD	lata fassion	any haning
The mobile phone is remotely	control and C	PENSAR	emulate frequer	icy hoping.
Complia	nce: YE	s 🗹	NOT	



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8.3. E-Field measurement

Acceptance	VALIDATION	EQUIPMENT	ACTION
I IN MIY		Mobile	Integrate SIM card
YIN NI	Network emulator	HAC	Set GSM900 band
(IJ NI)	0.0000000000000000000000000000000000000	Mobile	Take the call
VI NI	Mobile holder		Position mobile
Y N N I	50*50 mm grid	HAC	2D scan
YIV NI I	HAC		Report generation

MOBILE MEASUREMENT @ 1800						
Acceptance		VALIDATION	EQUIPMENT	ACTION		
YIV	I N I		Mobile	Integrate SIM card		
VIV	i in	Network emulator	HAC	Set GSM1800 band		
71 /	I IN		Mobile	Take the call		
101	I IN	Mobile holder		Position mobile		
Y[J]	I IN	50*50 mm grid	HAC	Adaptative path		
VIV	NET	OpenSAR		Report generation		

8.4. H-Field measurement

MOBILE MEASUREMENT @ 900						
Acceptance		VALIDATION	EQUIPMENT	ACTION		
YIU	NI 1		Mobile	Integrate SIM card		
YIJ	NI I	Network emulator	OpenHAC	Set GSM900 band		
717	NI I	10.502-533-540-540-540-540-540-540-540-540-540-540	Mobile	Take the call		
	NI 1	Mobile holder		Position mobile		
YIV	NI I	50*50 mm grid	OpenHAC	2D scan		
YV	I IN	HAC		Report generation		

Acceptance		MOBILE MEASO VALIDATION	EQUIPMENT	ACTION
YV	N[]	(1.50° 1.50°	Mobile	Integrate SIM card
YIV	NI 1	Network emulator	HAC	Set GSM1800 band
YIJ	I IN	1 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 -	Mobile	Take the call
Y 1. /	I IN	Mobile holder		Position mobile
Y [V] Y [V]	I IN	50*50 mm grid	OpenHAC	Adaptative path
YIJ	I IN	OpenSAR		Report generation



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8.5. T-Coil measurement

		MOBILE MEAS	UREMENT @ 90	00		
Acceptance		VALIDATION	EQUIPMENT	ACTION		
YW	I IN		Mobile	Integrate SIM card		
YIJ	NII	Network emulator	OpenHAC	Set GSM900 band		
YIJ	NI I	110111011111111111111111111111111111111	Mobile	Take the call		
YIV	NI I	Mobile holder		Position mobile		
YVI	NI I	50*50 mm grid	OpenHAC	2D scan		
YIV	NI 1	HAC		Report generation		

Acceptance		VALIDATION	EQUIPMENT	ACTION		
Y[V]N[]			Mobile	Integrate SIM card		
VIV	NT I	Network emulator	OpenHAC	Set GSM1800 band		
YIJ	I IN		Mobile	Take the call		
11/	I IN	Mobile holder		Position mobile		
YIVI	NI I	50*50 mm grid	OpenHAC	Adaptative path		
Y	NII	OpenSAR		Report generation		



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Date: 2008/10/06

INITIAL TEST ON SYSTEM								
We hereby certify the correct functioning of the SAR test system. The initial test of the test system is regarded as being (please mark): Accepted without open points Accepted with the following open points:								
2us 11.19								
FOR SATIMO: FOR MORLAB: FOR MORLAB:								
SYSTEM VALIDATION								
We hereby certify the correct functioning of the SAR test system. The initial test of the test system is regarded as being (please mark): Accepted without open points Accepted with the following open points:								
2w8.11.14								
FOR SATIMO: FOR MORLAB:								



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Date: 2008/10/06

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SY	J			I	П	U	г	1		u	r	١

We hereby certify the correct functioning of the SAR test system.

The initial test of the test system is regarded as being (please mark):

Accepted without open points

Accepted with the following open points:

Ju8,11.19

Date

FOR SATIMO:

FOR MORLAB: