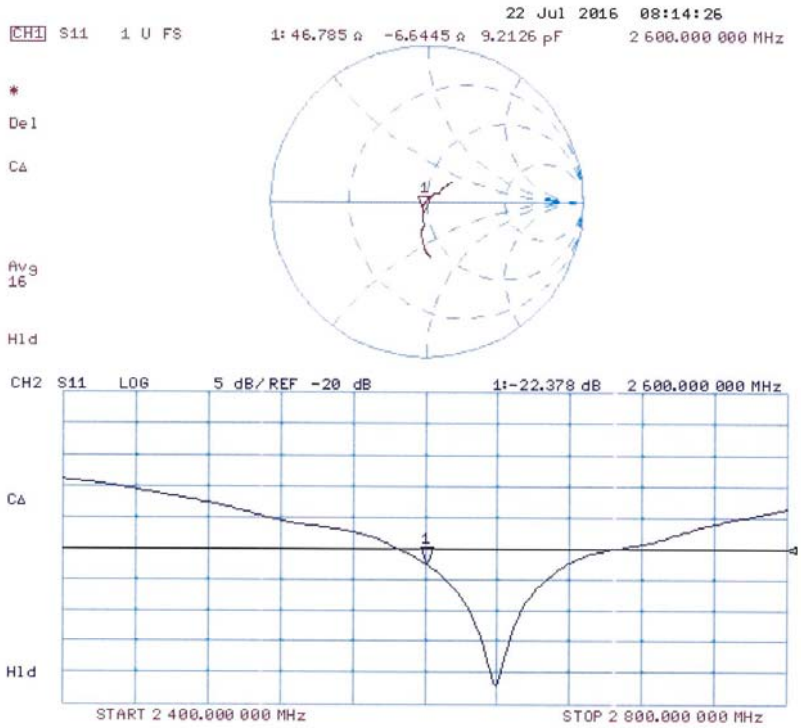
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 22.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz D2600V2; Type: D2600V2; Serial: D2600V2 - SN:1012

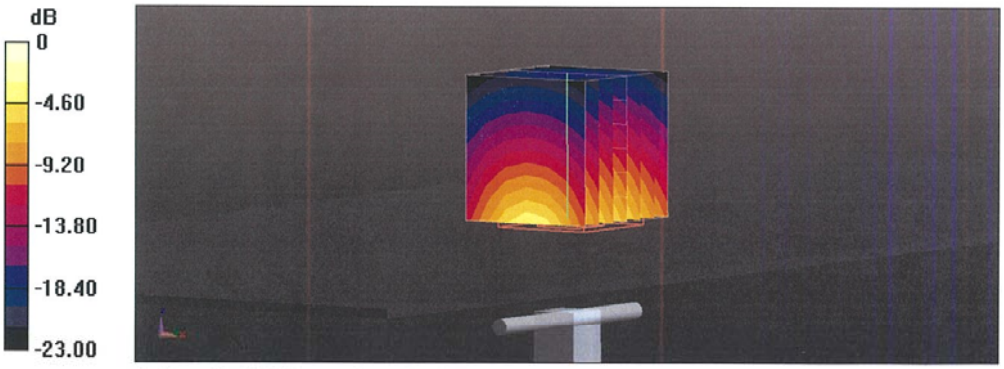
Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.2 S/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.48, 7.48, 7.48); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.8 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 28.9 W/kg
SAR(1 g) = 14 W/kg; SAR(10 g) = 6.25 W/kg
Maximum value of SAR (measured) = 23.5 W/kg



0 dB = 23.5 W/kg = 13.71 dBW/kg

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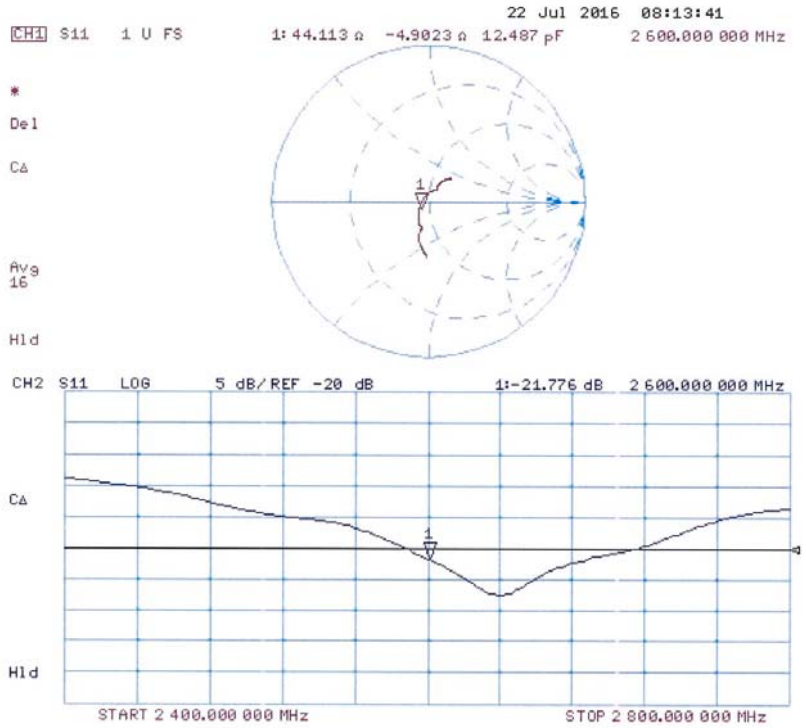
Impedance Measurement Plot for Body TSL



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ANNEX I SPOT CHECK TEST

As the test lab for VFD502 from TCL Communication Ltd, we, CTTL (Shouxiang), declare on our sole responsibility that, according to "Declaration of changes" provided by applicant, only the Spot check test should be performed. The test results are as below.

I.1 Conducted power of selected case

Table I.1-1: The conducted Power for GSM/GPRS

GSM850				
		Measured Power (dBm)		
Config	Tune-up	CH25 1 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz
GSM Speech	33.30	31.52	31.59	31.62
GPRS 1 Txslot	32.80	31.52	31.60	31.64

PCS1900				
		Measured Power (dBm)		
Config	Tune-up	CH810 1909.8 MHz	CH661 1880 MHz	CH512 1850.2 MHz
GSM Speech	30.30	28.82	29.19	29.33
GPRS 4 Txslots	26.00	24.04	24.40	24.52

Table I.1-2: The conducted Power for WCDMA

WCDMA1900					
			Measured Power (dBm)		
Item		Tune-up	CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz
WCDMA	RMC	24.00	22.60	22.45	22.25

WCDMA850					
			Measured Power (dBm)		
Item		Tune-up	CH4233 846.6 MHz	CH4715 835.4 MHz	CH4132 826.4 MHz
WCDMA	RMC	24.00	23.24	23.19	23.17

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Table I.1-3: The conducted Power for LTE

LTE band7				
BandWidth	RB Number/Start	Channel/Frequency	Tune-up	Measured Power
20MHz	1H	21350	/	/
		21100	22.9	21.95
		20850	/	/
	1L	21350	22.9	21.45
		21100	/	/
		20850	/	/

I.2 Measurement results

Test Band	Channel	Frequncy	Tune-Up	Measured Power	Test Poisition	Measrued 10g SAR	Measued 1g SAR	Report 10g SAR	Report 1g SAR	Power Drift	Figure
GSM850	251	848.8	33.3	31.52	Right Cheek	0.203	0.268	0.31	0.40	0.02	Fig.I.1
GSM850	190	836.6	32.8	31.60	Rear	0.231	0.298	0.30	0.39	0	Fig.I.2
GSM1900	512	1850.2	30.3	29.33	Left Cheek	0.081	0.128	0.10	0.16	0.01	Fig.I.3
GSM1900	512	1850.2	26	24.52	Bottom	0.465	0.865	0.65	1.22	-0.01	Fig.I.4
WCDMA850	4233	846.6	24	23.17	Right Cheek	0.167	0.219	0.20	0.27	-0.08	Fig.I.5
WCDMA850	4132	826.4	24	23.24	Rear	0.277	0.357	0.33	0.43	-0.04	Fig.I.6
WCDMA1900	9938	1907.6	24	22.60	Left Cheek	0.073	0.118	0.10	0.16	0.02	Fig.I.7
WCDMA1900	9938	1907.6	24	22.60	Bottom	0.37	0.68	0.51	0.94	0.09	Fig.I.8
LTE band7	21350	2560	22.9	21.45	Right Cheek	0.142	0.275	0.20	0.38	0.03	Fig.I.9
LTE band7	21100	2535	22.9	21.95	Bottom	0.371	0.775	0.46	0.96	0.08	Fig.I.10
GSM1900	512	1850.2	26	24.52	Bottom H2	0.361	0.727	0.36	0.73	-0.08	
GSM1900	512	1850.2	26	24.52	Bottom H3	0.341	0.668	0.34	0.67	0.11	
LTE band7	21100	2535	22.9	21.95	Bottom H2	0.353	0.742	0.44	0.92	0.08	
LTE band7	21100	2535	22.9	21.95	Bottom H3	0.342	0.745	0.43	0.93	0.11	

Note：H2：CCB0005A13C1 H3: CCB0005A16C6

I.3 Reported SAR Comparison

Exposure Configuration	Technology Band	Reported SAR 1g (W/Kg): spot check	Reported SAR 1g (W/Kg): original
Head	GSM850	0.40	0.28
	GSM1900	0.16	0.16
	WCDMA 850	0.27	0.15
	WCDMA 1900	0.16	0.16
	LTE Band7	0.38	0.62
Body	GSM850	0.39	0.37
	GSM1900	1.22	1.3
	WCDMA 850	0.43	0.27
	WCDMA 1900	0.94	0.98
	LTE Band7	0.96	1.43

Note: The spot check results of Head for GSM850, WCDMA850，and body of GSM850, WCDMA850 are larger than the original result. So they replace the original results and others are shared.

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GSM850_CH251 Right Cheek
Date: 1/1/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 848.8; σ = 0.886 mho/m; εr = 41.16; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: GSM850 848.8 Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7307 ConvF(10.01,10.01,10.01)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.297 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.245 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.348 W/kg
SAR(1 g) = 0.268 W/kg; SAR(10 g) = 0.203 W/kg
Maximum value of SAR (measured) = 0.294 W/kg

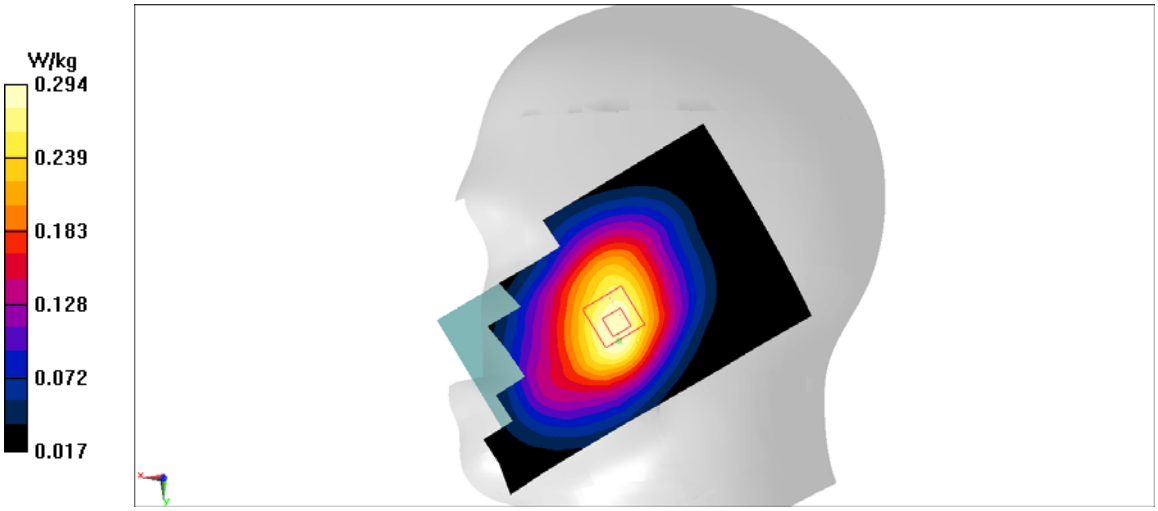

Figure I.1

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GSM850_CH190 Rear
Date: 1/1/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 836.6; σ = 0.972 mho/m; εr = 54.33; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: GSM850 836.6 Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7307 ConvF(9.83,9.83,9.83)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.323 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18 V/m; Power Drift = 0 dB
Peak SAR (extrapolated) = 0.358 W/kg
SAR(1 g) = 0.298 W/kg; SAR(10 g) = 0.231 W/kg
Maximum value of SAR (measured) = 0.324 W/kg

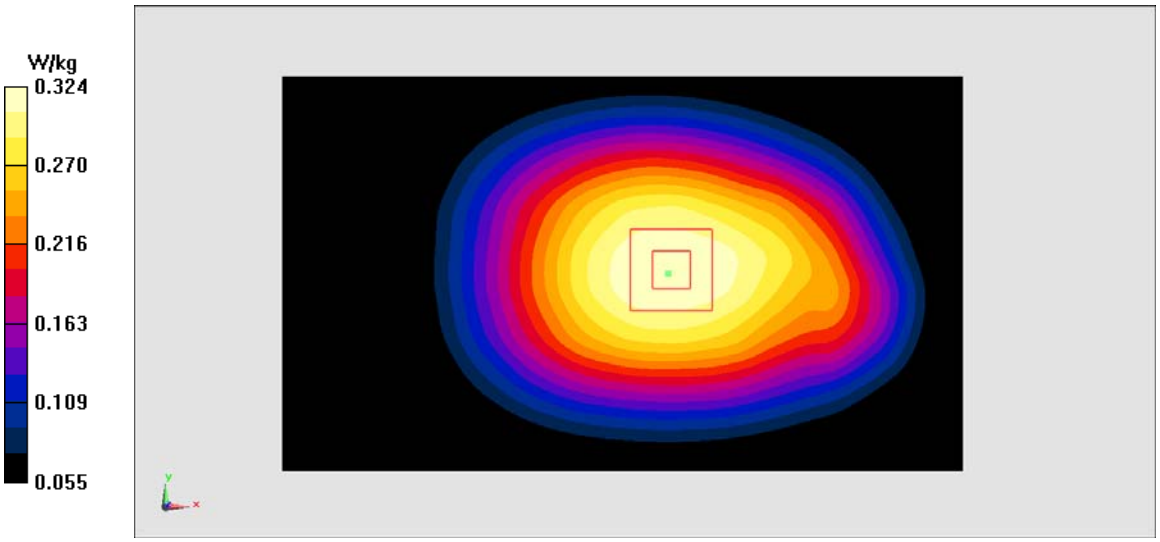

Figure I.2

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GSM1900_CH512 Left Cheek
Date: 1/2/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1850.2; σ = 1.416 mho/m; εr = 40.731; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: GSM1900 1850.2 Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7307 ConvF(8.1,8.1,8.1)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.142 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.575 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.191 W/kg
SAR(1 g) = 0.128 W/kg; SAR(10 g) = 0.081 W/kg
Maximum value of SAR (measured) = 0.149 W/kg

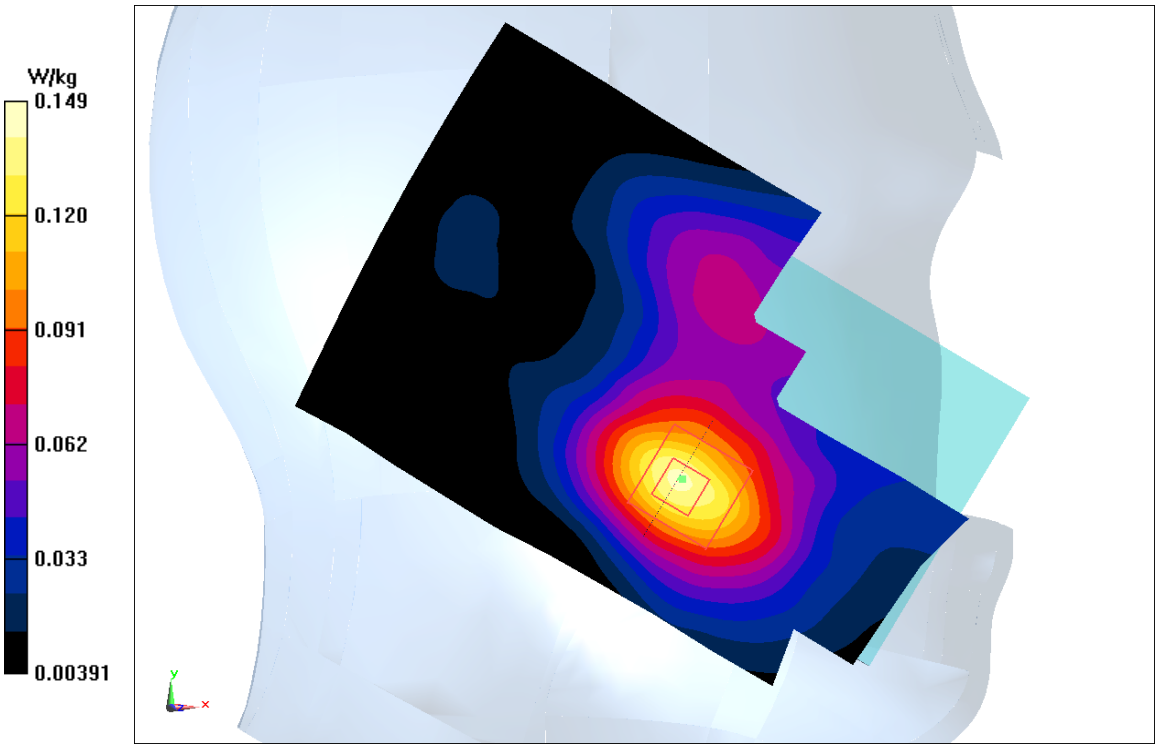

Figure I.3

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GSM1900_CH512 Bottom
Date: 1/2/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1850.2; σ = 1.523 mho/m; εr = 52.322; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: GSM1900 1850.2 Duty Cycle: 1:2
Probe: EX3DV4 – SN7307 ConvF(7.67,7.67,7.67)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.07 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.19 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.865 W/kg; SAR(10 g) = 0.465 W/kg
Maximum value of SAR (measured) = 1.08 W/kg

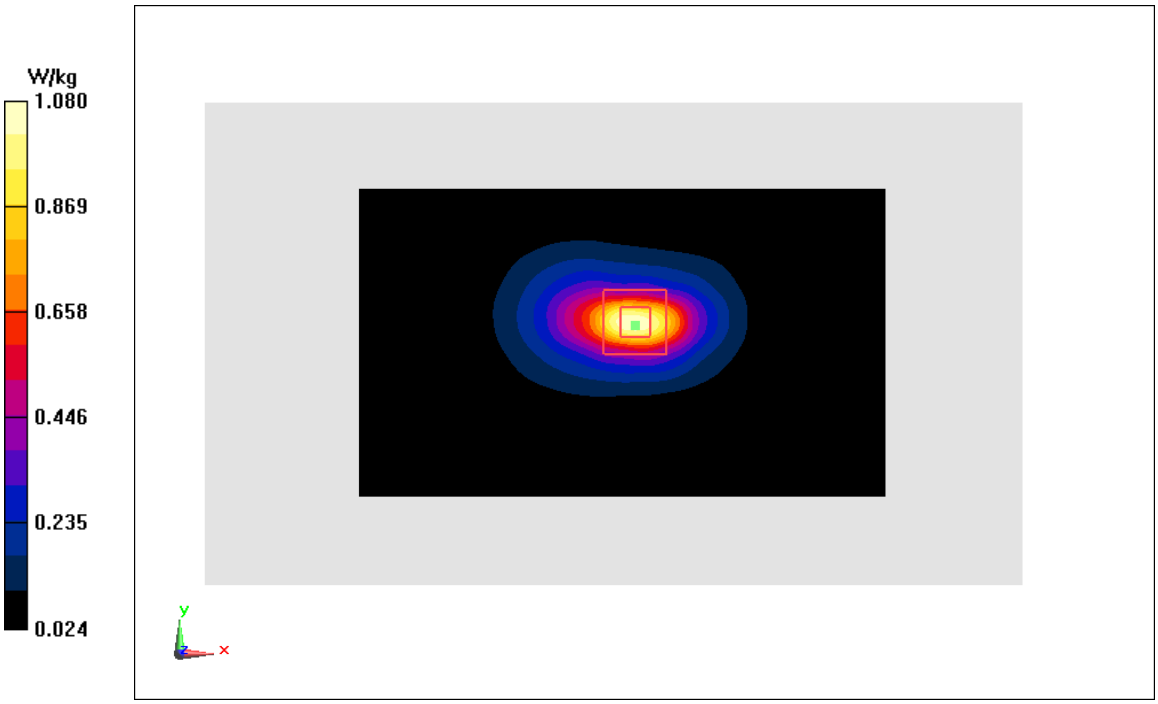

Figure I.4

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WCDMA850_CH4233 Right Cheek
Date: 1/1/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 846.6; σ = 0.888 mho/m; εr = 41.14; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: WCDMA850 846.6 Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(10.01,10.01,10.01)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.264 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.816 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.281 W/kg
SAR(1 g) = 0.219 W/kg; SAR(10 g) = 0.167 W/kg
Maximum value of SAR (measured) = 0.238 W/kg

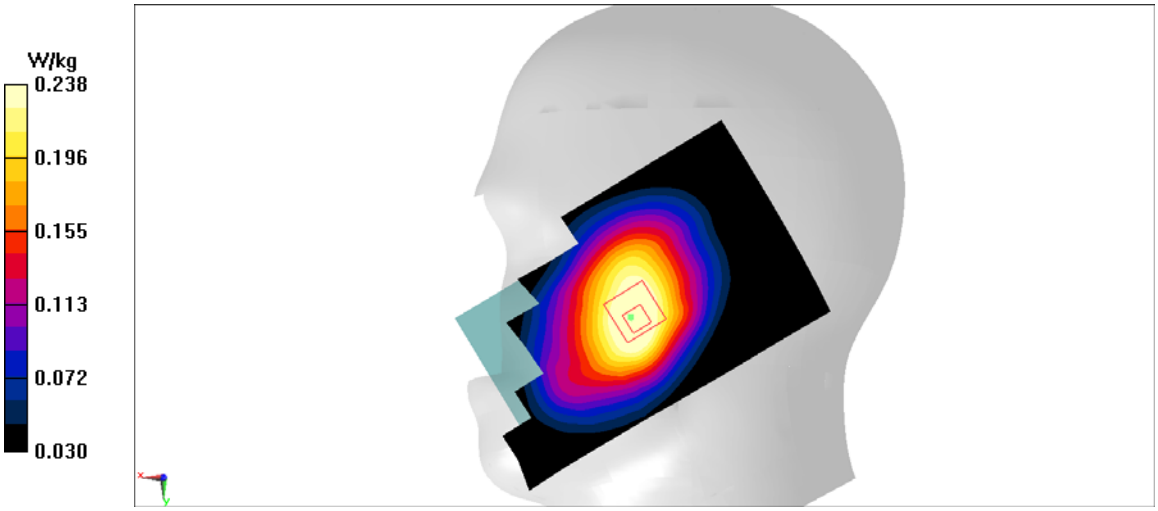

Figure I.5

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WCDMA850_CH4132 Rear
Date: 1/1/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 826.4; σ = 0.979 mho/m; εr = 54.268; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: WCDMA850 826.4 Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(9.83,9.83,9.83)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.394 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.77 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.436 W/kg
SAR(1 g) = 0.357 W/kg; SAR(10 g) = 0.277 W/kg
Maximum value of SAR (measured) = 0.388 W/kg

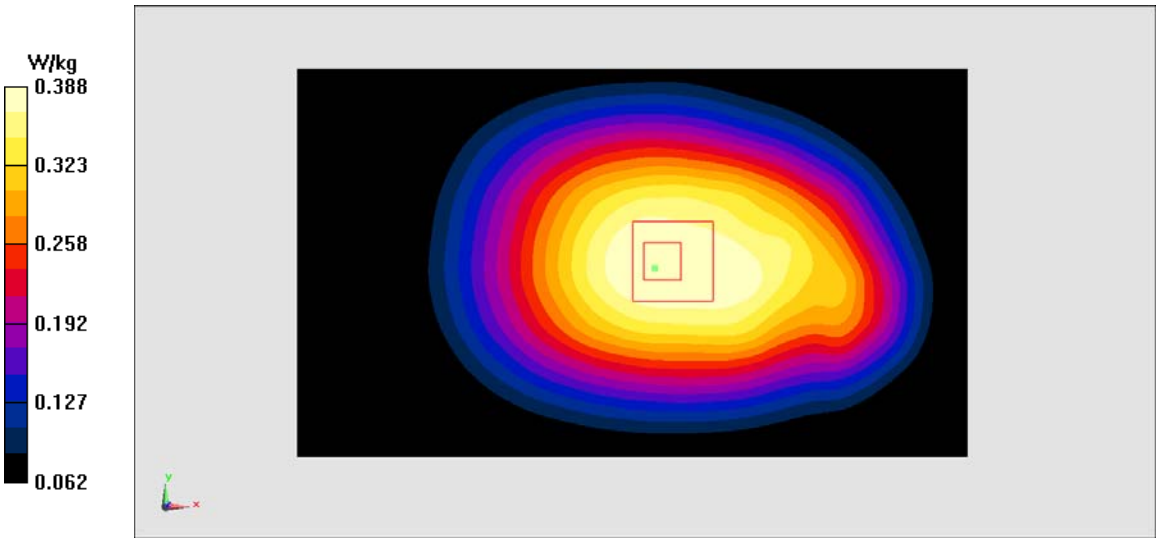

Figure I.6

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WCDMA1900_CH9938 Left Cheek
Date: 1/2/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1907.6; σ = 1.401 mho/m; εr = 40.749; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: WCDMA1900 1907.6 Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(8.1,8.1,8.1)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.136 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.785 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.18 W/kg
SAR(1 g) = 0.118 W/kg; SAR(10 g) = 0.073 W/kg
Maximum value of SAR (measured) = 0.141 W/kg

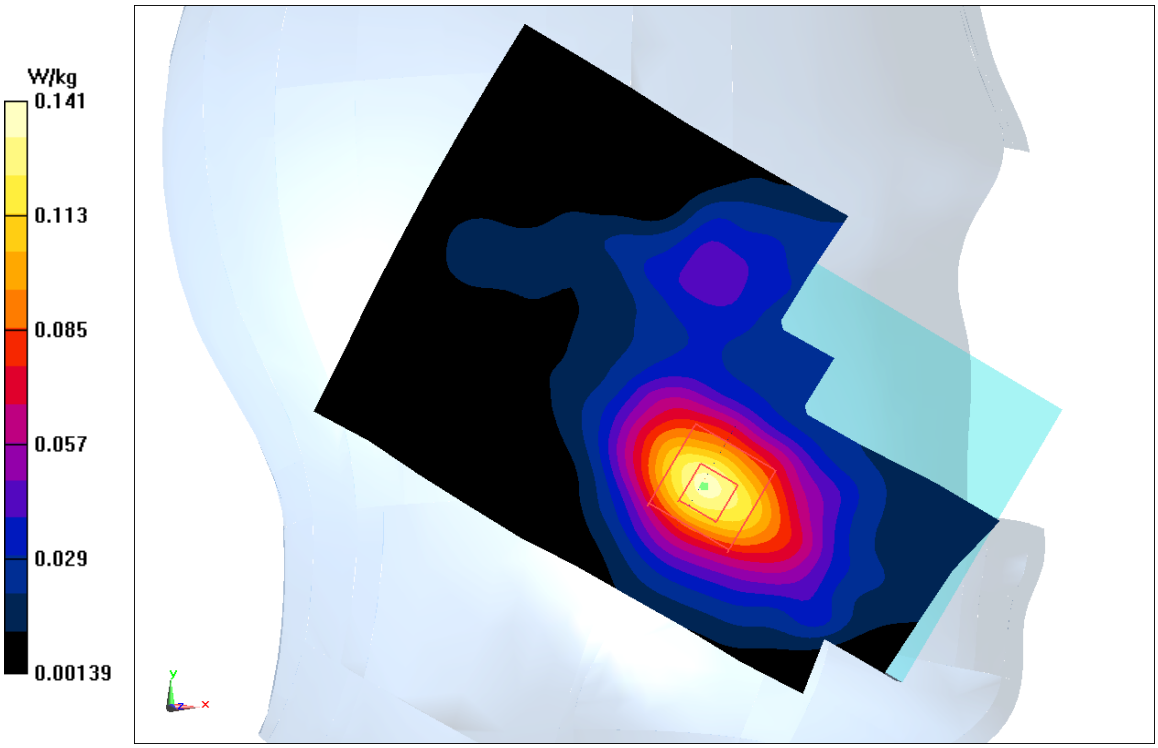

Figure I.7

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WCDMA1900_CH9938 Bottom
Date: 1/2/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1907.6; σ = 1.504 mho/m; εr = 52.512; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: WCDMA1900 1907.6 Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.67,7.67,7.67)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.729 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.8 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.68 W/kg; SAR(10 g) = 0.37 W/kg
Maximum value of SAR (measured) = 0.829 W/kg

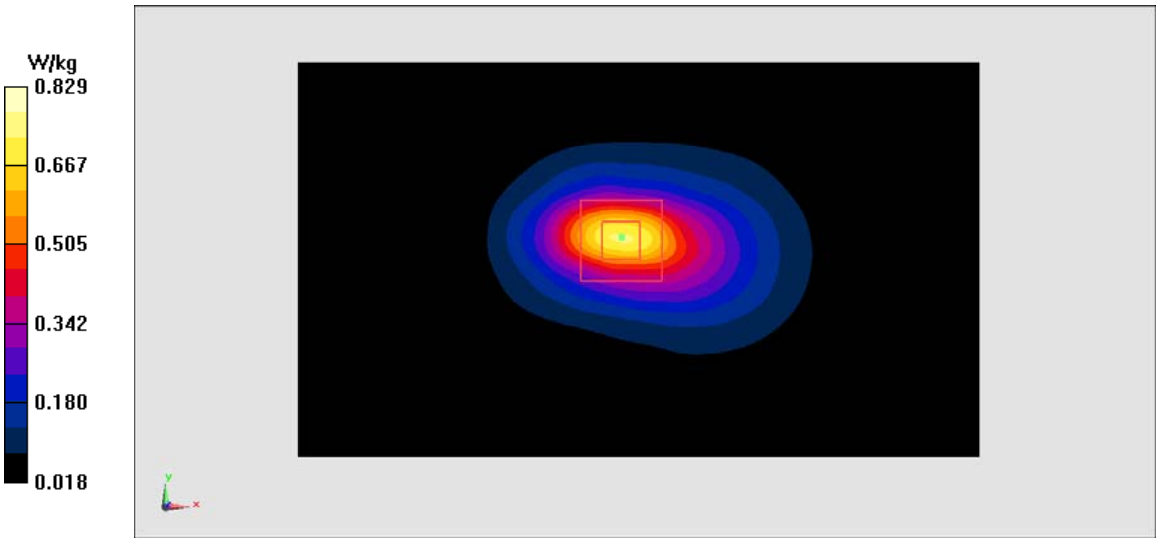

Figure I.8

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LTE band7_CH21350 Right Cheek
Date: 1/4/2017
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2560; σ = 1.942 mho/m; εr = 38.59; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: LTEband7 2560 Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.21,7.21,7.21)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.368 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.773 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.526 W/kg
SAR(1 g) = 0.275 W/kg; SAR(10 g) = 0.142 W/kg
Maximum value of SAR (measured) = 0.347 W/kg

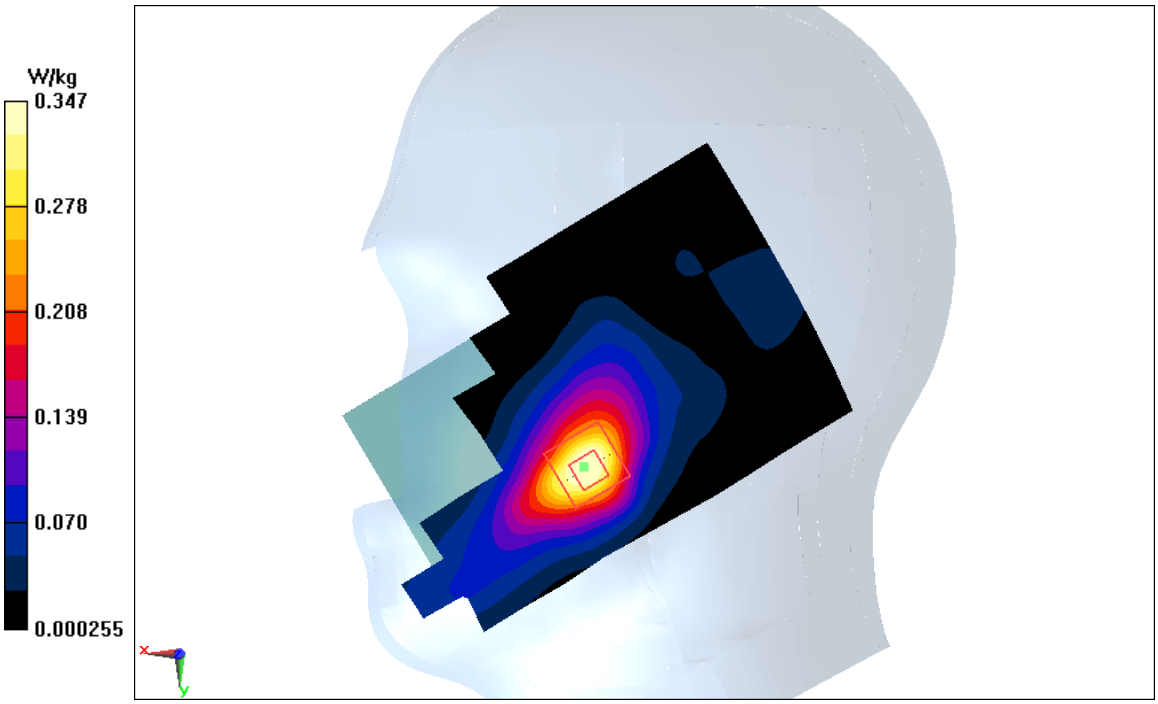

Figure I.9

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LTE band7_CH21100 Bottom
Date: 1/4/2017
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2535; σ = 2.177 mho/m; εr = 53.104; ρ = 1000 kg/m^3
Ambient Temperature: 22.4ºC, Liquid Temperature: 22.2ºC
Communication System: LTEband7 2535 Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.03,7.03,7.03)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.971 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.74 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.51 W/kg
SAR(1 g) = 0.775 W/kg; SAR(10 g) = 0.371 W/kg
Maximum value of SAR (measured) = 0.959 W/kg

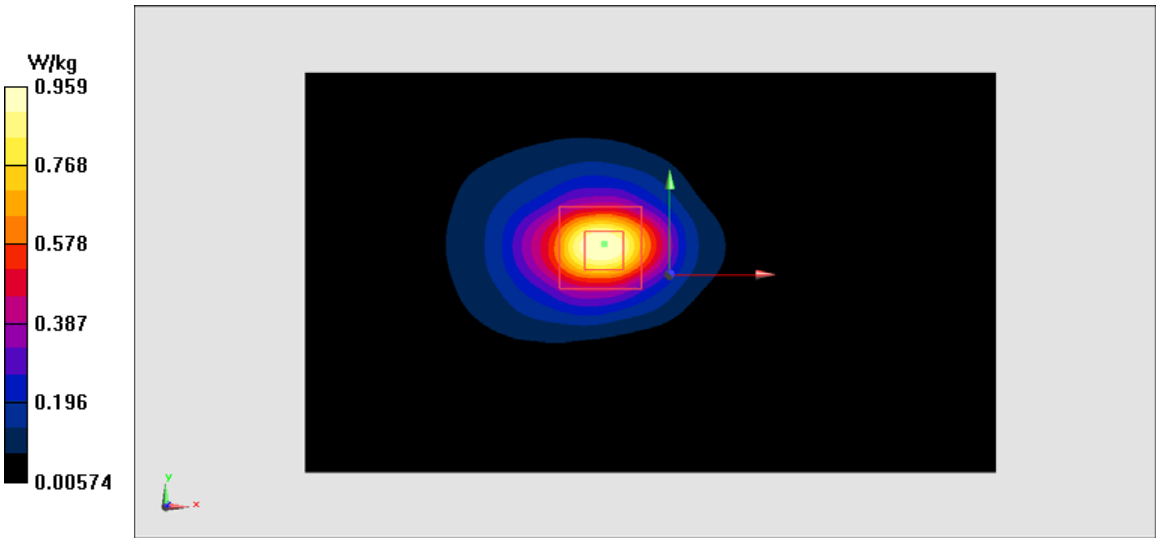

Figure I.10

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ANNEX J Accreditation Certificate

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(Registration No. CNAS L0570)

Telecommunication Technology Labs,

Academy of Telecommunication Research, MIIT

No.52, Huayuan North Road, Haidian District, Beijing, China

No.51, Xueyuan Road, Haidian District, Beijing, China

TCL International E City, No. 1001 Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province

is accredited in accordance with ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence to undertake testing and calibration service as described in the schedule attached to this certificate.

The scope of accreditation is detailed in the attached schedule bearing the same registration number as above. The schedule form an integral part of this certificate.

Date of Issue：2015-11-13

Date of Expiry：2017-06-19

Date of Initial Accreditation：1998-07-03

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment(CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is a signatory of the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) and the Asia Pacific Laboratory Accreditation Cooperation Mutual Recognition Arrangement (APLAC MRA).
The validity of the certificate can be checked on CNAS website at http://www.cnas.org.cn/english/findanaccreditedbody/index.shtml

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