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CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com http://www.chinattl.cn

DASY5 Validation Report for Head TSL

Date: 09.20.2018

Test Laboratory: CCTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 973

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.851$ S/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7514; ConvF(6.95, 6.95, 6.95) @ 2450 MHz; Calibrated: 8/27/2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1555; Calibrated: 8/20/2018
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

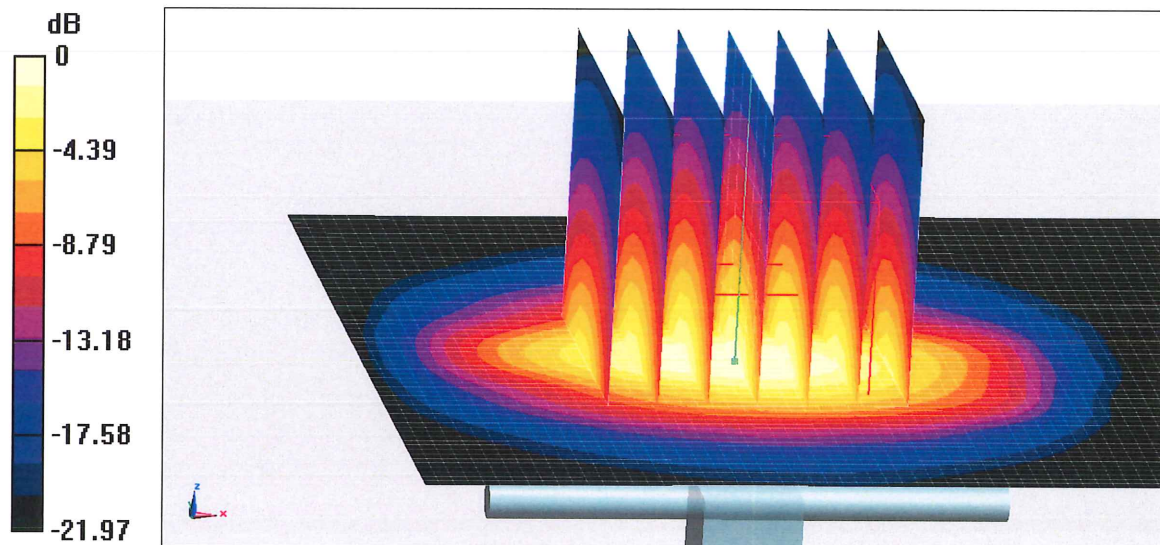
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.86 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 27.0 W/kg

SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.12 W/kg

Maximum value of SAR (measured) = 21.9 W/kg



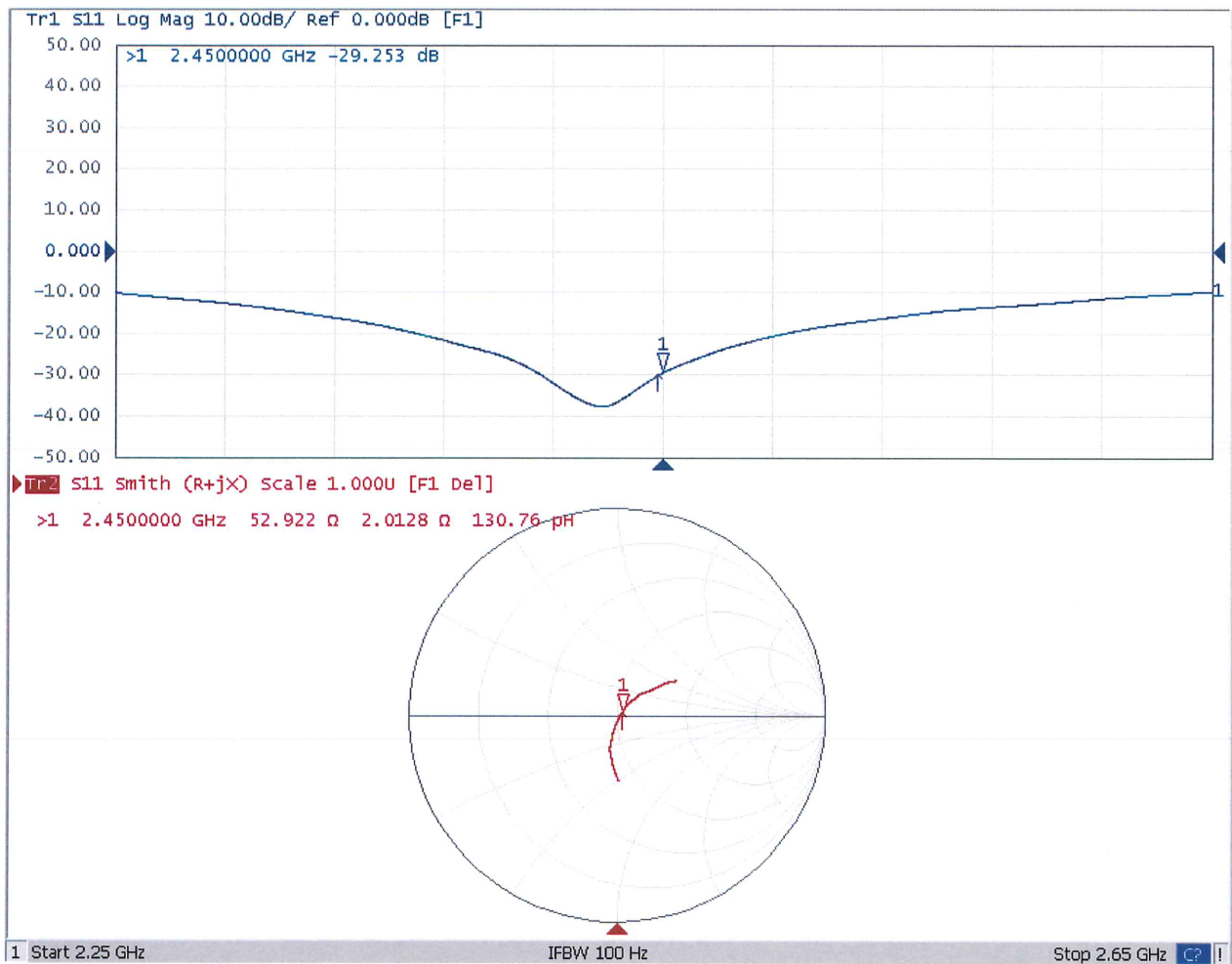
0 dB = 21.9 W/kg = 13.40 dBW/kg



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Impedance Measurement Plot for Head TSL





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DASY5 Validation Report for Body TSL

Date: 09.21.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 973

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.003$ S/m; $\epsilon_r = 54.24$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7514; ConvF(7.13, 7.13, 7.13) @ 2450 MHz; Calibrated: 8/27/2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1555; Calibrated: 8/20/2018
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

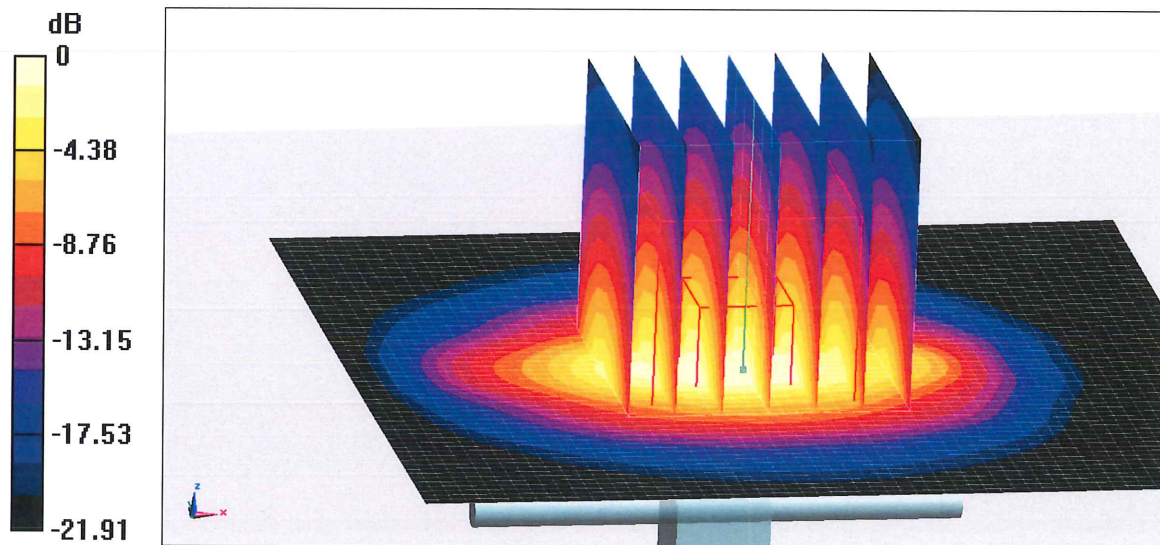
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.27 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 26.5 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.93 W/kg

Maximum value of SAR (measured) = 21.3 W/kg

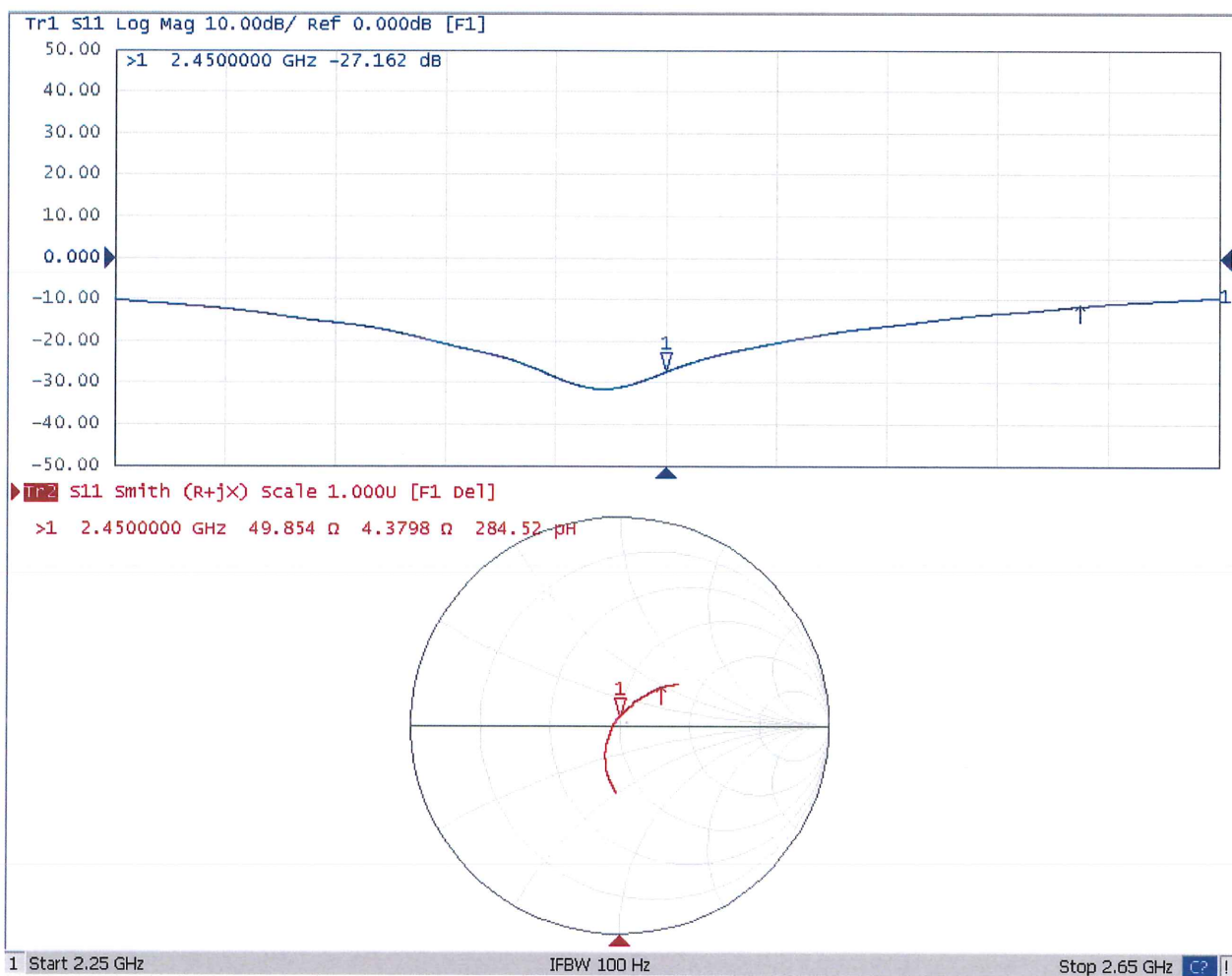


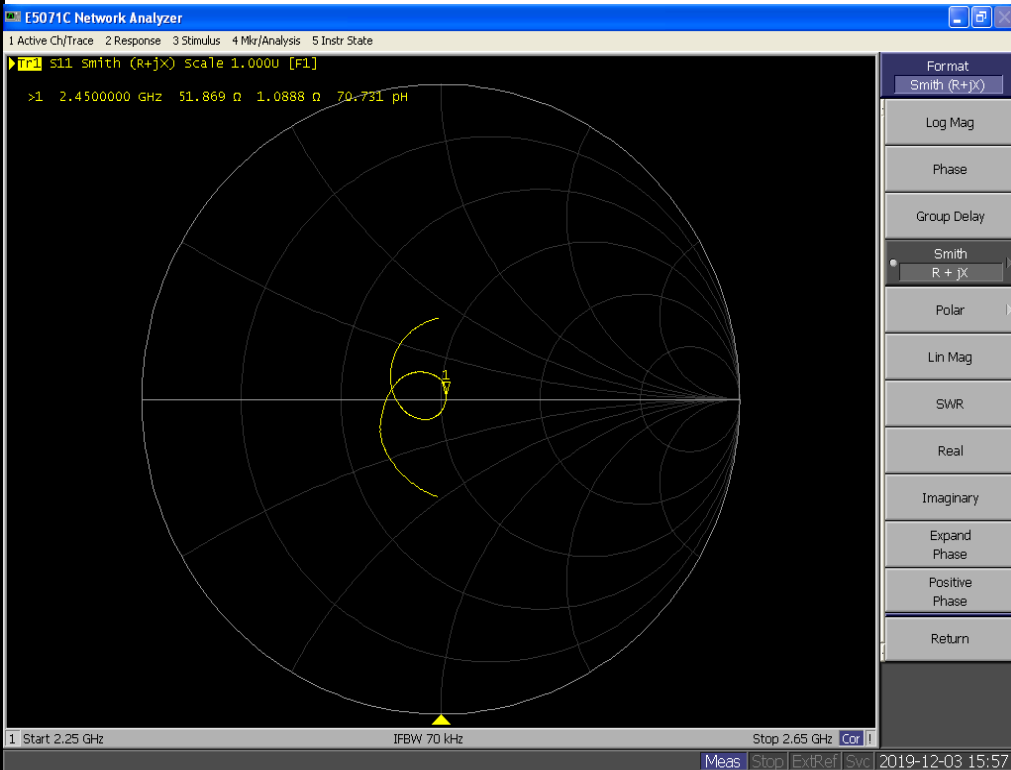
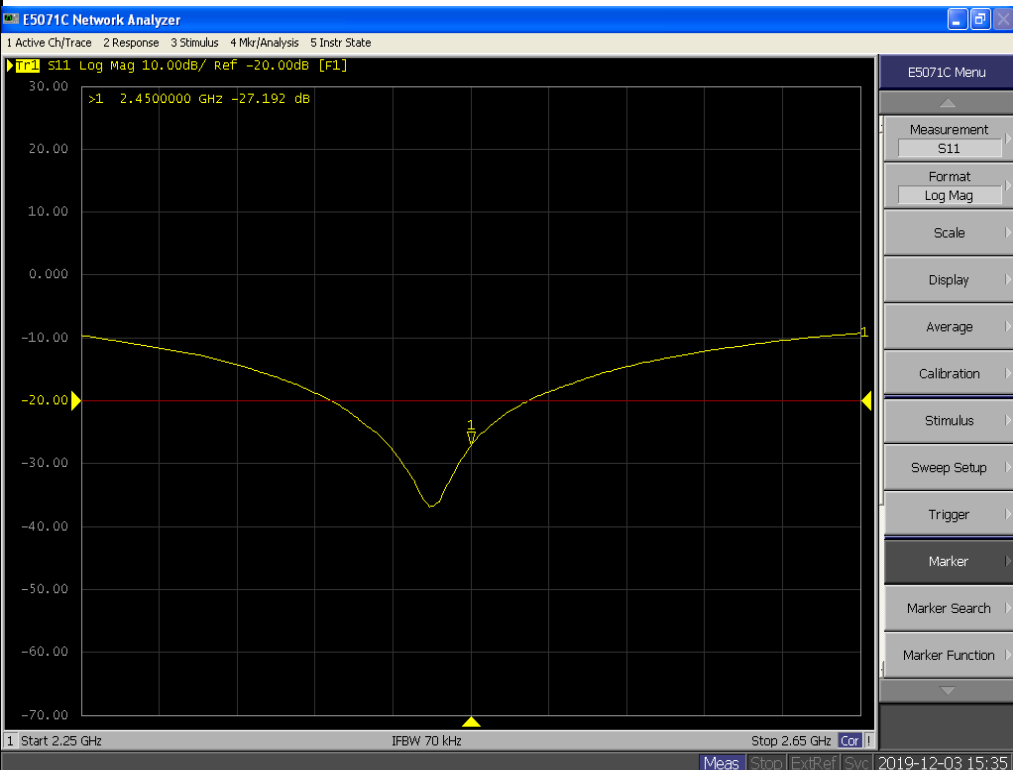
0 dB = 21.3 W/kg = 13.28 dBW/kg

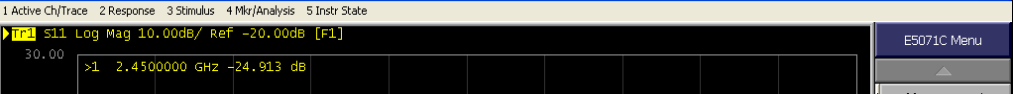


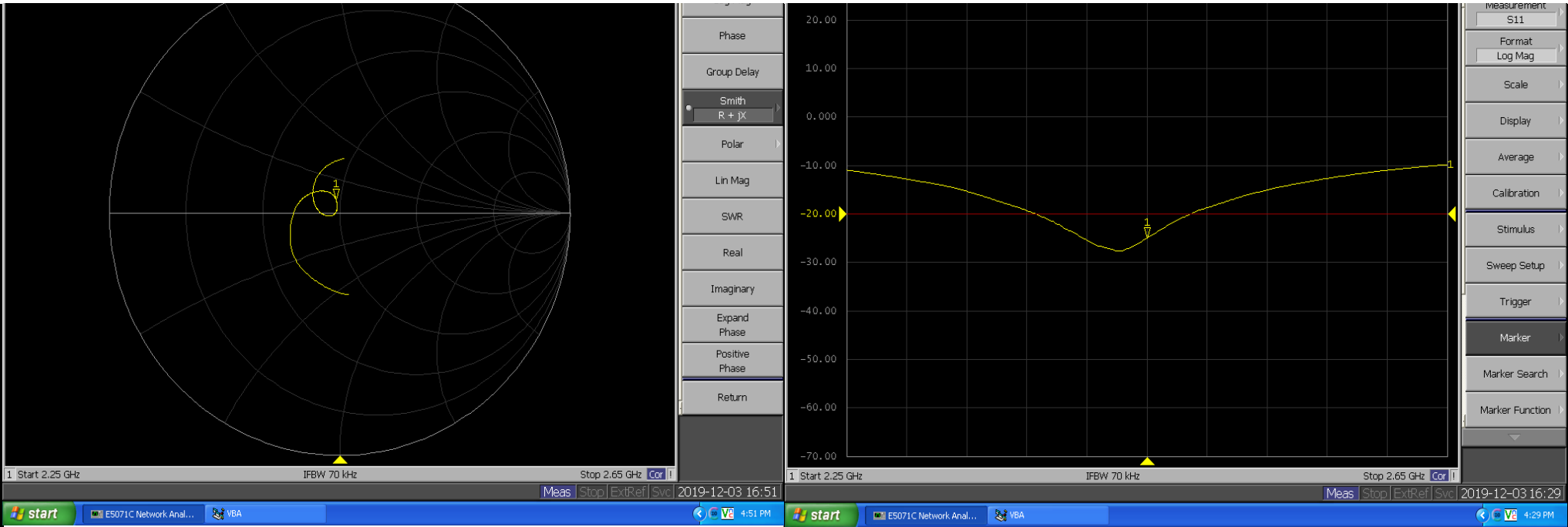
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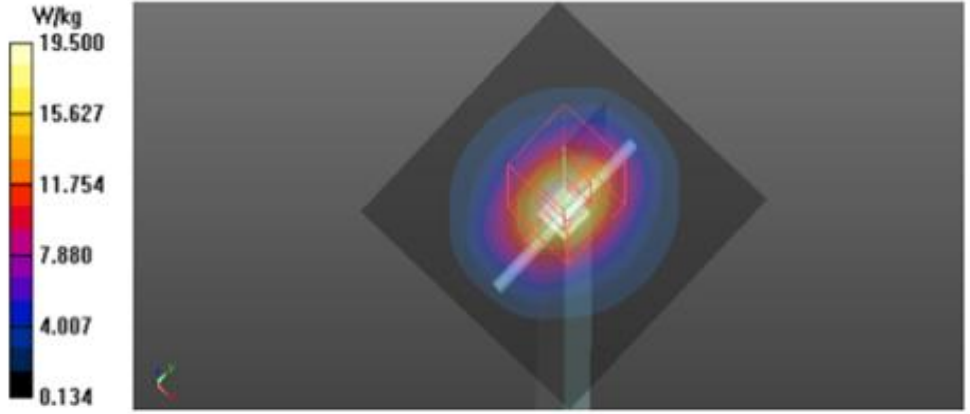
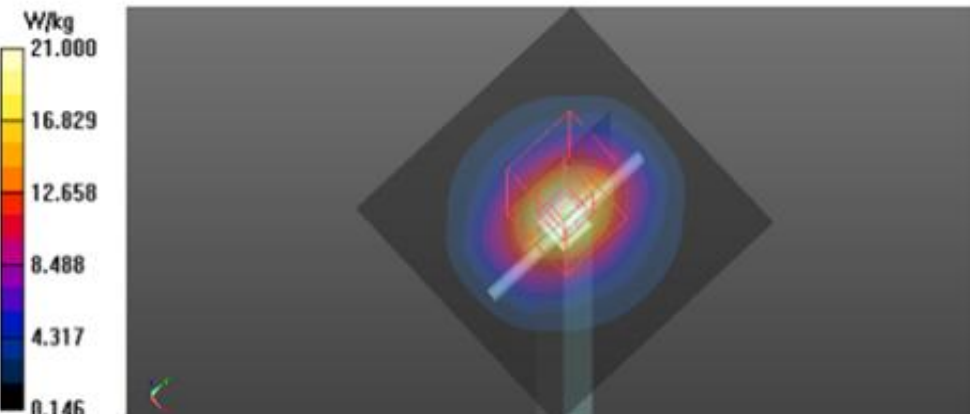
Impedance Measurement Plot for Body TSL



Dipole Internal Calibration Record					
Asset No. :	E-434	Model No. :	D2450V2	Serial No. :	937
Environmental	23.1°C, 51 %	Original Cal. Date :	September 21, 2018	Next Cal. Date :	September 20, 2021
Standard List					
1	IEEE Std 1528-2013	IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorpton Rate(SAR) in the Human Head from Wireless Communication Devices: Measurement Texhniques, June 2013			
2	IEC 62209-2	Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body(frequency range of 30 MHz to 6 GHz), March 2010			
3	KDB865664	SAR Measurement Requirements for 100 MHz to 6 GHz			
Equipment Information					
Equipment :	Manufacturer :	Model No. :	Serial No. :	Cal.Organization :	Cal. Date :
Power Amplifier	Mini-Circuits	ZHL-42W+	QA1333003	NA	February 25, 2019
DC Source	Iteck	OT6154	M00157	NA	August 3, 2019
P-series power meter	Agilent	N1911A	MY45100473	NA	September 23, 2019
wideband power sensor	Agilent	N1921A	MY51100041	NA	September 23, 2019
Smart Power Sensor	R&S	NRP-Z21	102209	NA	March 1, 2019
Dual directional coupler	Woken	TS-PCC0M-05	107090019	NA	March 10, 2019
Signal Generator	Agilent	E4438C	MY4907131	NA	Mar. 10, 2019
ENA Network Analyzer	Agilent	E5071C	MY46102965	NA	March 10, 2019
Model No	For Head Tissue				
D2450V2	Item	Originak Cal. Result	Verified on 2019/12/3	Deviation	Result
	Impedance, transformed to feed point	52.9Ω+2.01jΩ	51.869Ω+1.09jΩ	<5Ω	Pass
	Return Loss(dB)	-29.3	-27.192	-7.2%	Pass
	SAR Value for 1g(mW/g)	13.1	12.9	-1.5%	Pass
	SAR Value for 10α(mW/α)	6.12	5.99	-2.1%	Pass
	For Body Tissue				
	Item	Originak Cal. Result	Verified on 2019/12/3	Deviation	Result
	Impedance, transformed to feed point	49.9Ω+4.38jΩ	48.100Ω+5.29jΩ	<5Ω	Pass
	Return Loss(dB)	-27.2	-24.913	-8.4%	Pass
	SAR Value for 1g(mW/g)	12.8	13.1	2.3%	Pass
	SAR Value for 10α(mW/α)	5.93	6.12	3.2%	Pass
Impedance Test-Head			Return Loss-Head		
					

Impedance Test-Body	Return Loss-Body
	



Validation Report for Head TSL	Validation Report for Body TSL
Test Laboratory: BTL Inc. Date: 2019/12/03 System Check_H2450_1203 DUT: Dipole 2450 MHz D2450V2; Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used (interpolated): $f = 2450 \text{ MHz}$; $\sigma = 1.874 \text{ S/m}$; $\epsilon_r = 38.311$; $\rho = 1000 \text{ kg/m}^3$ Ambient Temperature : 23.1 °C; Liquid Temperature : 22.4 °C DASY Configuration: - Probe: EX3DV4 - SN7544; ConvF(7.58, 7.58, 7.58) @ 2450 MHz; Calibrated: 2019/9/9 - Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$ - Electronics: DAE4 Sn1390; Calibrated: 2019/10/29 - Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1222 - DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450) Area Scan (7x7x1): Interpolated grid: $dx=12 \text{ mm}$, $dy=12 \text{ mm}$ Maximum value of SAR (interpolated) = 21.3 W/kg Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 106.2 V/m; Power Drift = 0.00 dB Peak SAR (extrapolated) = 23.5 W/kg SAR(1 g) = 12.4 W/kg; SAR(10 g) = 6.2 W/kg Maximum value of SAR (measured) = 19.5 W/kg 	Test Laboratory: BTL Inc. Date: 2019/12/03 System Check_B2450_1203 DUT: Dipole 2450 MHz D2450V2; Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used (interpolated): $f = 2450 \text{ MHz}$; $\sigma = 2.036 \text{ S/m}$; $\epsilon_r = 52.015$; $\rho = 1000 \text{ kg/m}^3$ Ambient Temperature : 23.1 °C; Liquid Temperature : 22.4 °C DASY Configuration: - Probe: EX3DV4 - SN7544; ConvF(7.57, 7.57, 7.57) @ 2450 MHz; Calibrated: 2019/9/9 - Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$ - Electronics: DAE4 Sn1390; Calibrated: 2019/10/29 - Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1222 - DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450) Area Scan (7x7x1): Interpolated grid: $dx=12 \text{ mm}$, $dy=12 \text{ mm}$ Maximum value of SAR (interpolated) = 22.9 W/kg Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 106.3 V/m; Power Drift = 0.00 dB Peak SAR (extrapolated) = 25.2 W/kg SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.12 W/kg Maximum value of SAR (measured) = 21.0 W/kg 

Calibrator: *Rot - Liang*

Approver: *Herbert Lin*