



FCC OET BULLETIN 65 SUPPLEMENT C

SAR EVALUATION REPORT

For

10.1 Inches Netbook

with CDMA2000 1x/1x-EVDO, WCDMA/HSPA & GSM/GPRS/EDGE

MODEL: Toshiba NB300 / NB305

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Prepared for

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NVLAP LAB CODE 200065-0

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<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	December 7, 2009	Initial Issue	--

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: TOSHIBA CORPORATION
DIGITAL MEDIA NETWORK COMPANY
OME COMPLEX, 2-9, SUEHIRO-CHO
TOKYO, 198-8710, JAPAN

EUT DESCRIPTION: 10.1 Inches Netbook
with CDMA2000 1x/1x-EVDO, WCDMA/HSPA & GSM/GPRS/EDGE

MODEL NUMBER: Toshiba NB300/NB305

DEVICE CATEGORY: Portable

EXPOSURE CATEGORY: General Population/Uncontrolled Exposure

DATE TESTED: December 5 – 6, 2009

THE HIGHEST SAR VALUES:

FCC / IC Rule Parts	Frequency Range [MHz]	The Highest 1g SAR (1g_mW/g)	Limit (mW/g)
22H / RSS-132	824 - 849	0.050	1.6
24E / RSS-133	1850 - 1910	0.153	

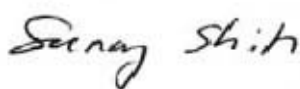
APPLICABLE STANDARDS AND TEST PROCEDURES:

STANDARDS AND TEST PROCEDURES	TEST RESULTS
- FCC OET Bulletin 65 Supplement C and the following specific Test Procedures: - KDB 941225 D01 SAR test for 3G devices v02 - KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE vo1 - KDB 248227 SAR Measurement Procedure for 820.11abg Transmitters v0r02 - KDB 447498 D01 Mobile Portable RF Exposure v04 - KDB 616217 D01 SAR for Laptop with Screen Ant v01r01	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:



SUNNY SHIH
ENGINEERING SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C, and the following specific FCC Test Procedures.

- KDB 941225 D01 SAR test for 3G devices v02
- KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE vo1
- KDB 248227 SAR Measurement Procedure for 820.11abg Transmitters v0r02
- KDB 447498 D01 Mobile Portable RF Exposure v04
- KDB 616217 D01 SAR for Laptop with Screen Ant v01r01

EUT is 10.1 inches Netbook computer with antennas installed at the display section. As indicated in KDB 616217, for screen size less than 12 inches, KDB 447498 procedure should follow. However, based upon previous instructions given by FCC, for Netbook computer with screen size less than 12 inches, KDB 616217 procedure can be applied. SAR evaluation test configuration as documented in this report was following the instructions given in KDB 616217.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date		
				MM	DD	Year
Robot - Six Axes	Stäubli	RX90BL	N/A			N/A
Robot Remote Control	Stäubli	CS7MB	3403-91535			N/A
DASY4 Measurement Server	SPEAG	SEUMS001BA	1041			N/A
Probe Alignment Unit	SPEAG	LB (V2)	261			N/A
SAM Phantom (SAM1)	SPEAG	QD000P40CA	1185			N/A
SAM Phantom (SAM2)	SPEAG	QD000P40CA	1050			N/A
Oval Flat Phantom (ELI 4.0)	SPEAG	QD OVA001 B	1003			N/A
Electronic Probe kit	HP	85070C	N/A			N/A
S-Parameter Network Analyzer	Agilent	8753ES-6	MY40001647	11	22	2010
Signal Generator	Agilent	8753ES-6	MY40001647	11	22	2010
E-Field Probe	SPEAG	EX3DV4	3686	3	23	1010
Thermometer	ERTCO	639-1S	1718	9	15	2010
Data Acquisition Electronics	SPEAG	DAE3 V1	500	10	20	2009
System Validation Dipole	SPEAG	D835V2	4d002	4	23	2011
System Validation Dipole	SPEAG	D1900V2	5d043	1	29	2010
ESG Vector Signal Generator	Agilent	E4438C	US44271090	9	17	2010
Power Meter	Giga-tronics	8651A	8651404	1	11	2010
Power Sensor	Giga-tronics	80701A	1834588	1	11	2010
Amplifier	Mini-Circuits	ZVE-8G	90606			N/A
Amplifier	Mini-Circuits	ZHL-42W	D072701-5			N/A
Simulating Liquid	CCS	M1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M835	N/A	Within 24 hrs of first test		

4.2. MEASUREMENT UNCERTAINTY

Measurement uncertainty for 300 MHz – 3000 MHz

Uncertainty component	Tol. (±%)	Probe Dist.	Div.	Ci (1g)	Ci (10g)	Std. Unc.(±%)	
						Ui (1g)	Ui(10g)
Measurement System							
Probe Calibration	4.80	N	1	1	1	4.80	4.80
Axial Isotropy	4.70	R	1.732	0.707	0.707	1.92	1.92
Hemispherical Isotropy	9.60	R	1.732	0.707	0.707	3.92	3.92
Boundary Effects	1.00	R	1.732	1	1	0.58	0.58
Linearity	4.70	R	1.732	1	1	2.71	2.71
System Detection Limits	1.00	R	1.732	1	1	0.58	0.58
Readout Electronics	1.00	N	1	1	1	1.00	1.00
Response Time	0.80	R	1.732	1	1	0.46	0.46
Integration Time	2.60	R	1.732	1	1	1.50	1.50
RF Ambient Conditions - Noise	1.59	R	1.732	1	1	0.92	0.92
RF Ambient Conditions - Reflections	0.00	R	1.732	1	1	0.00	0.00
Probe Positioner Mechanical Tolerance	0.40	R	1.732	1	1	0.23	0.23
Probe Positioning With Respect to Phantom Shell	2.90	R	1.732	1	1	1.67	1.67
algorithms for max. SAR evaluation	3.90	R	1.732	1	1	2.25	2.25
Test sample Related							
Test Sample Positioning	1.10	N	1	1	1	1.10	1.10
Device Holder Uncertainty	3.60	N	1	1	1	3.60	3.60
Power and SAR Drift Measurement	5.00	R	1.732	1	1	2.89	2.89
Phantom and Tissue Parameters							
Phantom Uncertainty	4.00	R	1.732	1	1	2.31	2.31
Liquid Conductivity - Target	5.00	R	1.732	0.64	0.43	1.85	1.24
Liquid Conductivity - Meas.	8.60	N	1	0.64	0.43	5.50	3.70
Liquid Permittivity - Target	5.00	R	1.732	0.6	0.49	1.73	1.41
Liquid Permittivity - Meas.	3.30	N	1	0.6	0.49	1.98	1.62
Combined Standard Uncertainty	RSS					11.44	10.49
Expanded Uncertainty (95% Confidence Interval)	K=2					22.87	20.98
Notesfor table							
1. Tol. - tolerance in influence quaitity							
2. N - Nomal							
3. R - Rectangular							
4. Div. - Divisor used to obtain standard uncertainty							
5. Ci - is te sensitivity coefficient							

5. EQUIPMENT UNDER TEST

10.1 Inches Netbook with BT2.0+EDR, 802.11bgn 20/40 MHz 1x1, CDMA2000 1x / 1x-EVDO, WCDMA / HSPA & GSM/GPRS/EDGE

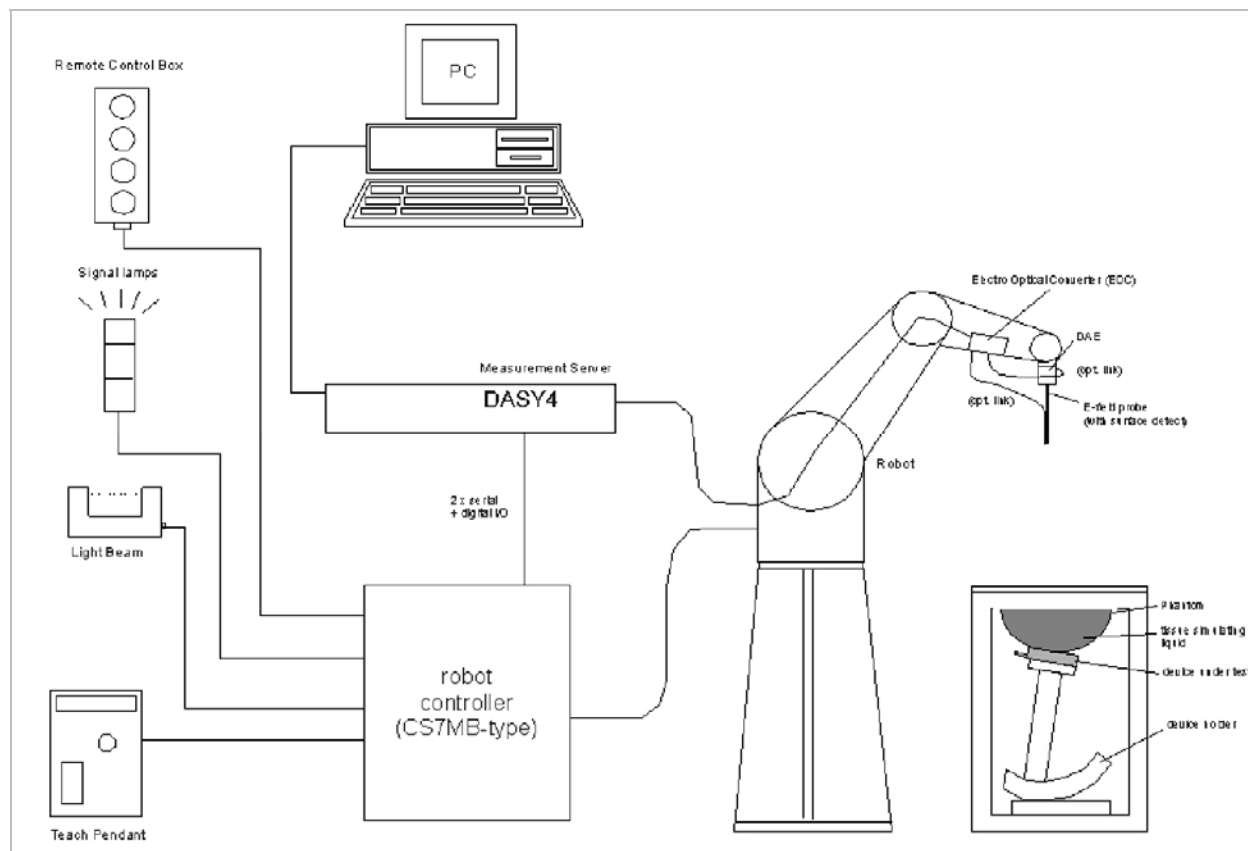
Model: NB300 / NB305

<u>Radio</u>	<u>FCC ID</u>
BT2.0+EDR	RYYEYTFXCS (BT2.0+EDR)
WLAN (WiFi)	CJ6UPA3722WL (802.11abg)
WWAN	N7NGOBI2 (CDMA2000 1x /1x-EVDO, WCDMA / HSPA & GSM/GPRS/EDGE)

Normal operation:	Lap-held only SAR test with display open at 90° to the keyboard
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Antenna tested:	<u>Radio</u>	<u>Manufactured</u>	<u>Model Number</u>	<u>Max Peak Gain (dBi)</u>
	WiFi	Hitachi	HFT60	-0.25
	WWAN	Hitachi	HCG17	-0.97 (Cell band) 0.68 (PCS band)

6. SYSTEM SPECIFICATIONS



The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.
- Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

7. COMPOSITION OF INGREDIENTS FOR TISSUE SIMULATING LIQUIDS

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99+% Pure Sodium Chloride

Sugar: 98+% Pure Sucrose

Water: De-ionized, 16 MΩ+ resistivity

HEC: Hydroxyethyl Cellulose

DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

8. LIQUID PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values. The relative permittivity and conductivity of the tissue material should be within $\pm 5\%$ of the values given in the table below.

Reference Values of Tissue Dielectric Parameters for Head and Body Phantom (for 150 – 3000 MHz and 5800 MHz)

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in IEEE Standard 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in IEEE Standard 1528.

Target Frequency (MHz)	Head		Body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
150	52.3	0.76	61.9	0.8
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.9	55.2	0.97
900	41.5	0.97	55	1.05
915	41.5	0.98	55	1.06
1450	40.5	1.2	54	1.3
1610	40.3	1.29	53.8	1.4
1800 – 2000	40	1.4	53.3	1.52
2450	39.2	1.8	52.7	1.95
3000	38.5	2.4	52	2.73
5800	35.3	5.27	48.2	6

(ϵ_r = relative permittivity, σ = conductivity and $\rho = 1000 \text{ kg/m}^3$)

8.1. LIQUID CHECK RESULTS FOR 1900 MHZ

Simulating Liquid Dielectric Parameters for Muscle 1900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Sunny Shih

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	52.774	Relative Permittivity (ϵ_r):	52.7742	53.3	-0.99	± 5
	e''	14.876	Conductivity (σ):	1.57241	1.52	3.45	± 5

Liquid temperature: 23 deg. C

December 05, 2009 03:27 PM

Frequency	e'	e''
1710000000.	54.0804	13.9386
1720000000.	54.0318	13.8408
1730000000.	53.9699	13.7920
1740000000.	53.8932	13.8376
1750000000.	53.7642	14.0055
1760000000.	53.5589	14.2096
1770000000.	53.3890	14.3514
1780000000.	53.3096	14.4576
1790000000.	53.3358	14.5251
1800000000.	53.3754	14.5586
1810000000.	53.4002	14.5054
1820000000.	53.4118	14.3570
1830000000.	53.4632	14.2538
1840000000.	53.4673	14.3022
1850000000.	53.3216	14.4264
1860000000.	53.0370	14.5593
1870000000.	52.7903	14.6124
1880000000.	52.6902	14.6557
1890000000.	52.7113	14.7504
1900000000.	52.7742	14.8762
1910000000.	52.8039	14.9189

The conductivity (σ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

8.2. LIQUID CHECK RESULTS FOR 835 MHZ

Simulating Liquid Dielectric Parameters for Muscle 900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 40%

Measured by: Sunny Shih

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	55.91	Relative Permittivity (ϵ_r):	55.912	55.2	1.29	± 5
	e''	20.99	Conductivity (σ):	0.975	0.97	0.51	± 5

Liquid Check

Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C

December 06, 2009 10:54 AM

Frequency	e'	e''
800000000.	56.2122	21.3324
805000000.	56.1623	21.2714
810000000.	56.1439	21.2163
815000000.	56.0908	21.1576
820000000.	56.0455	21.1022
825000000.	55.9949	21.0604
830000000.	55.9258	21.0261
835000000.	55.9119	20.9880
840000000.	55.8875	20.9208
845000000.	55.8210	20.9143
850000000.	55.7879	20.9060
855000000.	55.7478	20.9332
860000000.	55.7109	20.9373
865000000.	55.6300	20.9368
870000000.	55.5932	20.9624
875000000.	55.5222	20.9799
880000000.	55.4544	20.9748
885000000.	55.3731	20.9860
890000000.	55.2876	21.0097
895000000.	55.2670	20.9545
900000000.	55.2108	20.8879
905000000.	55.1944	20.8529
910000000.	55.1819	20.8007
915000000.	55.1734	20.7316
920000000.	55.1202	20.6916
925000000.	55.0972	20.6601
930000000.	55.1201	20.6508
935000000.	55.1295	20.6569
940000000.	55.0801	20.6672
945000000.	55.0453	20.6612
950000000.	54.9855	20.6658

The conductivity (σ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

9. SYSTEM CHECK

The system performance check is performed prior to any usage of the system in order to guarantee reproducible results. The system performance check verifies that the system operates within its specifications of $\pm 10\%$.

System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with Head or Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV4 SN3686 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 fine cube was chosen for cube
- Distance between probe sensors and phantom surface was set to 3 mm.
For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 250 mW $\pm 3\%$.
- The results are normalized to 1 W input power.

450 to 2450 MHz Reference SAR Values for Body-tissue (From SPEAG)

Dipole Type	Distance	Frequency	SAR (1g)	SAR (10g)	SAR (peak)
	(mm)	(MHz)	[W/kg]	[W/kg]	[W/kg]
D450V2	15	450	5.01	3.36	7.22
D835V2	15	835	9.71	6.38	14.1
D900V2	15	900	11.1	7.17	16.3
D1450V2	10	1450	29.6	16.6	49.8
D1800V2	10	1800	38.5	20.3	67.5
D1900V2	10	1900	39.8	20.8	69.6
D2000V2	10	2000	40.9	21.2	71.5
D2450V2	10	2450	51.2	23.7	97.6

9.1. SYSTEM CHECK RESULTS FOR D1900V2

Date: December 5, 2009

Ambient Temperature = 24°C; Relative humidity = 40%

Measured by: Sunny Shih

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	1900	250	1g SAR:	42.1	39.8	5.78	±10
			10g SAR:	21.9	20.8	5.29	

9.2. SYSTEM CHECK RESULTS FOR D835V2

System Validation Dipole: D835V2 SN:4d002

Date: December 6, 2009

Ambient Temperature = 24°C; Relative humidity = 40%

Measured by: Sunny Shih

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	835	250	1g SAR:	9.32	9.71	-4.02	±10
			10g SAR:	6.11	6.38	-4.23	

10.2. CDMA200 1xEv-Do

10.2.1. Rel 0

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
 - Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
 - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
 - Cell Power > -105.5 dBm/1.23 MHz
 - Cell Band > (Select US Cellular or US PCS)
 - Channel > (Enter channel number)
 - Application Config > Enhanced Test Application Protocol > RTAP
 - RTAP Rate > 153.6 kbps
 - Rvs Power Ctrl > Active bits
 - Protocol Rel > 0 (1xEV-DO)
- Press "Start Data Connection" when "Session Open" appear in "Active Cell"
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
 - Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
 - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
 - Cell Power > -105.5 dBm/1.23 MHz
 - Cell Band > (Select US Cellular or US PCS)
 - Channel > (Enter channel number)
 - Application Config > Enhanced Test Application Protocol > FTAP (default)
 - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
 - Rvs Power Ctrl > Active bits
 - Protocol Rel > 0 (1xEV-DO)
- Press "Start Data Connection" when "Session Open" appear in "Active Cell"
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RF Power Output for EV-DO Rel 0

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)	
					Average	Peak
Cellular	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	24.22	
			384	836.52	24.30	
			777	848.31	24.22	
PCS	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	24.15	
			600	1880.00	24.37	
			1175	1908.75	24.22	

10.2.2. Rev A

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

<u>Application</u>	<u>Rev, License</u>
1xEV-DO Terminal Test	A.09.13

EVDO Release A – RETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Release A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
					Average	Peak
Cellular	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	23.82	
			384	836.52	24.10	
			777	848.31	23.90	
PCS	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	23.97	
			600	1880.00	24.42	
			1175	1908.75	23.84	

10.3. (E)GPRS

GPRS (GMSK) - Coding Scheme: MCS4

Band	Ch No.	Frequency	Conducted output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GSM850	128	824.2	32.30	32.30	n/a	n/a
	190	836.6	32.50	32.50	n/a	n/a
	251	848.8	32.40	32.40	n/a	n/a
GSM1900	512	1850.2	29.50	29.50	n/a	n/a
	661	1880	29.50	29.50	n/a	n/a
	810	1909.8	29.30	29.30	n/a	n/a

EGPRS (8PSK) - Coding Scheme: MCS9

Band	Ch No.	Frequency	Conducted output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GSM850	128	824.2	27.50	27.50	n/a	n/a
	190	836.6	27.60	27.60	n/a	n/a
	251	848.8	27.50	27.50	n/a	n/a
GSM1900	512	1850.2	26.60	26.60	n/a	n/a
	661	1880	26.70	26.70	n/a	n/a
	810	1909.8	26.50	26.50	n/a	n/a

10.4. UMTS RELEASE 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V7.5.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). A summary of these settings are illustrated below:

WCDMA General Settings	Mode	Rel99
	Subtest	-
	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	β_c	Not Applicable
	β_d	Not Applicable
	β_{ec}	Not Applicable
	β_c/β_d	8/15
	β_{hs}	Not Applicable
	β_{ed}	Not Applicable

Results

Rel 99 (12.2kps RMC)

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	O/P Power (dBm)
UMTS850 (Band V)	Rel 99 12.2kps RMC	4132	4357	826.4	24.60
		4182	4407	836.4	24.60
		4233	4458	846.6	24.50
UMTS1900 (Band II)	Rel 99 12.2kps RMC	9262	9662	1852.4	24.70
		9400	9800	1880.0	25.00
		9538	9938	1907.6	24.60

10.5. UMTS HSDPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	HSUPA Test	Not Applicable			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_{ec}	-	-	-	-
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	β_{ed}	Not Applicable			
	CM (dB)	0	1	1.5	1.5
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs = β_{hs}/β_c	30/15			

Results

Rel 6 HSDPA

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	O/P Power (dBm)
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	24.40
		4182	4407	836.4	24.45
		4233	4458	846.6	24.30
	Subtest 2	4132	4357	826.4	23.90
		4182	4407	836.4	23.90
		4233	4458	846.6	23.80
	Subtest 3	4132	4357	826.4	23.90
		4182	4407	836.4	23.95
		4233	4458	846.6	23.80
	Subtest 4	4132	4357	826.4	23.40
		4182	4407	836.4	23.40
		4233	4458	846.6	23.30
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	24.50
		9400	9800	1880.0	24.50
		9538	9938	1907.6	24.40
	Subtest 2	9262	9662	1852.4	24.50
		9400	9800	1880.0	24.50
		9538	9938	1907.6	24.00
	Subtest 3	9262	9662	1852.4	24.00
		9400	9800	1880.0	24.00
		9538	9938	1907.6	23.90
	Subtest 4	9262	9662	1852.4	24.00
		9400	9800	1880.0	24.00
		9538	9938	1907.6	23.50

10.6. UMTS Rel 6 HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	Rel6 HSPA		Rel6 HSPA	Rel6 HSPA	Rel6 HSPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	15/15
	β_{ec}	209/225	12/15	30/15	2/15	24/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	β_{hs}	22/15	12/15	30/15	4/15	30/15
	β_{ed}	1309/225	94/75	47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = β_{hs}/β_c	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

Results

Rel 6 HSPA

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	O/P Power (dBm)
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	24.25
		4182	4407	836.4	24.21
		4233	4458	846.6	24.10
	Subtest 2	4132	4357	826.4	22.25
		4182	4407	836.4	22.21
		4233	4458	846.6	22.10
	Subtest 3	4132	4357	826.4	23.25
		4182	4407	836.4	23.21
		4233	4458	846.6	23.10
	Subtest 4	4132	4357	826.4	21.25
		4182	4407	836.4	21.21
		4233	4458	846.6	21.10
	Subtest 5	4132	4357	826.4	24.20
		4182	4407	836.4	24.30
		4233	4458	846.6	24.20
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	24.25
		9400	9800	1880.0	24.30
		9538	9938	1907.6	24.20
	Subtest 2	9262	9662	1852.4	22.25
		9400	9800	1880.0	22.30
		9538	9938	1907.6	22.20
	Subtest 3	9262	9662	1852.4	23.25
		9400	9800	1880.0	23.30
		9538	9938	1907.6	23.20
	Subtest 4	9262	9662	1852.4	21.25
		9400	9800	1880.0	21.30
		9538	9938	1907.6	21.20
	Subtest 5	9262	9662	1852.4	24.40
		9400	9800	1880.0	24.30
		9538	9938	1907.6	24.20

11. SUMMARY OF TEST RESULTS

Test configuration: Lap-held with display open at 90° to the keyboard

11.1. GSM

Band	Mode	Ch No.	f (MHz)	SAR (mW/g)	
				1-g	10-g
GSM850	GPRS 2 slots	128	824.2		
		190	836.6	0.050	0.037
		251	848.8		
GSM1900	GPRS 2 slots	512	1850.2		
		661	1880.0	0.091	0.056
		810	1909.8		

11.2. UMTS (WCDMA)

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
Band V	R99	4132	4357	826.4		
		4182	4407	836.4	0.047	0.034
		4233	4458	846.6		
Band II	R99	9262	9662	1850.2		
		9400	9800	1880.0	0.153	0.093
		9538	9938	1909.8		

11.3. CDMA2000

Band	Mode	Ch No.	f (MHz)	SAR (mW/g)	
				1-g	10-g
Cellular	1xRTT (RC3, SO32)	1013	824.70		
		384	836.52	0.046	0.0336
		777	848.31		
PCS	1xRTT (RC3, SO32)	25	1851.25		
		600	1880.00	0.143	0.088
		1175	1908.75		

11.4. WiFi (802.11bg)

Please see separate FCC application filed under WLAN application for SAR data.

12. KDB 616217 LAPTOP COMPUTER SIMULTANEOUSLY TX SAR ASSESSMENT

Multiple transmitters and antennas transmit simultaneously:	WWAN can transmit simultaneously with WLAN WWAN can transmit simultaneously with Bluetooth WLAN can transmit simultaneously with Bluetooth								
Antenna-to-user distance	WWAN TX (main) antenna-to-user: 16.7 cm WLAN TX (main) antenna-to-user: 9.5 cm								
Antenna-to-antenna distance:	WWAN TX (main) antenna-to-WLAN TX (main) antenna : 5.4 cm WLAN-to-Bluetooth main antenna: > 18 cm								
Highest 1-g SAR:	<table><tr><td><u>WWAN</u></td><td><u>WLAN</u></td><td><u>BT</u></td><td><u>Sum of the 1-g SAR</u></td></tr><tr><td>0.153 mW/g (Part 22)</td><td>0.014 mW/g</td><td>n/a</td><td>0.167 mW/g</td></tr></table> Note: Bluetooth’s conducted average power is below Pref/12mW, stand alone SAR evaluation is not required.	<u>WWAN</u>	<u>WLAN</u>	<u>BT</u>	<u>Sum of the 1-g SAR</u>	0.153 mW/g (Part 22)	0.014 mW/g	n/a	0.167 mW/g
<u>WWAN</u>	<u>WLAN</u>	<u>BT</u>	<u>Sum of the 1-g SAR</u>						
0.153 mW/g (Part 22)	0.014 mW/g	n/a	0.167 mW/g						
Simultaneous TX SAR:	Not required, due to 1. Antennas are separated sufficiently from each other and there is little and no SAR overlap. 2. The Sum of the 1g SAR < SAR limit								

13. WORST-CASE SAR TEST PLOTS

WORST-CASE SAR PLOT for Part 22H

Date/Time: 12/6/2009 2:17:59 PM

Test Laboratory: Compliance Certification Services

GSM835

DUT: Toshiba; Type: NB205; Serial: n/a

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.976$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3686; ConvF(8.7, 8.7, 8.7); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:XXXX
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid-ch/Area Scan (9x11x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.057 mW/g

Mid-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

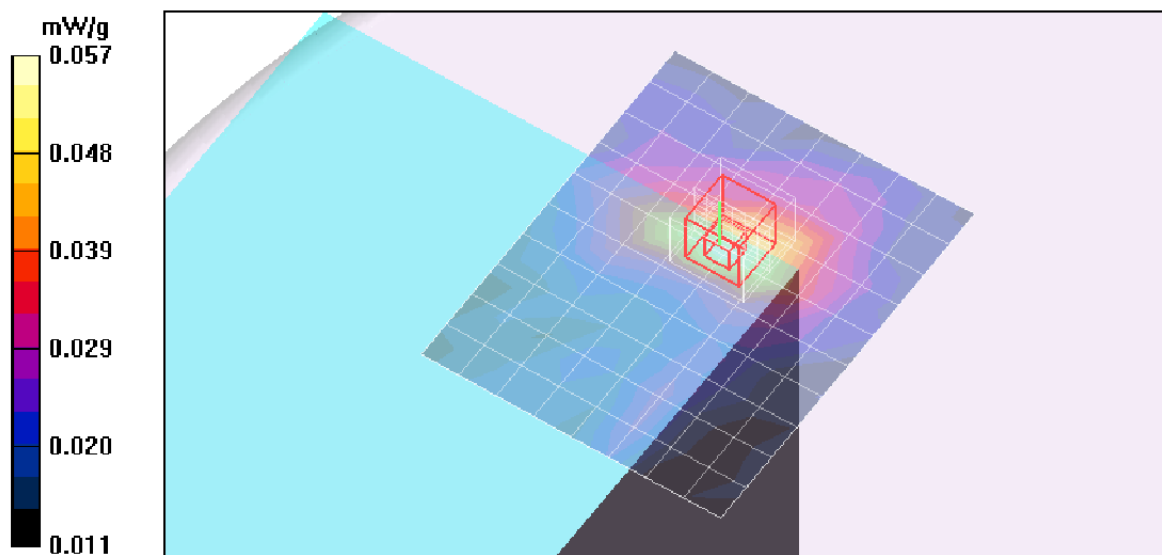
Reference Value = 7.47 V/m; Power Drift = -0.725 dB

Peak SAR (extrapolated) = 0.077 W/kg

SAR(1 g) = 0.050 mW/g; SAR(10 g) = 0.037 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.058 mW/g



WORST-CASE SAR PLOT for Part 24E

Date/Time: 12/5/2009 6:21:06 PM

Test Laboratory: Compliance Certification Services

UMTS1900

DUT: Toshiba; Type: NB300; Serial: n/a

Communication System: PCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3686; ConvF(6.85, 6.85, 6.85); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:XXXX
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Lapheld - Mid-ch_R99/Area Scan (10x14x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.170 mW/g

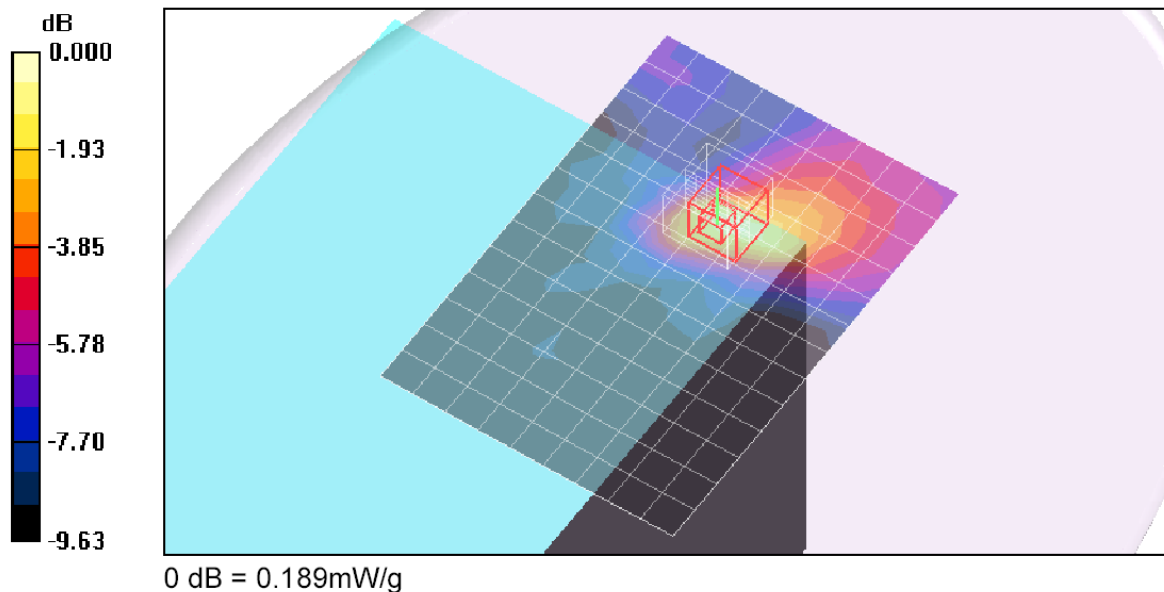
Lapheld - Mid-ch_R99/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 3.38 V/m; Power Drift = 0.138 dB

Peak SAR (extrapolated) = 0.255 W/kg

SAR(1 g) = 0.153 mW/g; SAR(10 g) = 0.093 mW/g

Maximum value of SAR (measured) = 0.189 mW/g



14. ATTACHMENTS

<u>No.</u>	<u>Contents</u>	<u>No. of page (s)</u>
1	System Check Plots	2
2	SAR Test Plots	7
3	Certificate of E-Field Probe EX3DV4 SN3686	10
4	Certificate of System Validation Dipole D835V2 SN:4d002	9
5	Certificate of System Validation Dipole D1900V2 SN:5d043	9