FCC OET BULLETIN 65 SUPPLEMENT C

SAR EVALUATION REPORT

For

Medical Telemetry Transmitter

MODEL: ZM-531PA
FCC ID: B6BZM-531PA

REPORT NUMBER: 31JE0091-HO-B

ISSUE DATE: June 3, 2011

Prepared for

NIHON KOHDEN CORPORATION
1-31-4 NISHIOCHIAI, SHINJUKU-KU
TOKYO 161-8560, JAPAN

Prepared by

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NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

Revision History

Rev.	Issue Date	Revisions	Revised By
--	June 3, 2011	Initial Issue	--

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	NIHON KOHDEN CORPORATION 1-31-4, NISHIOCHIAI SHINJUKU-KU TOKYO 161-8560, JAPAN
EUT DESCRIPTION:	TRANSMITTER FOR MEDICAL
MODEL NUMBER:	ZM-531PA
DEVICE CATEGORY:	Portable
EXPOSURE CATEGORY:	General Population/Uncontrolled Exposure
DATE TESTED:	May 23, 2011

THE HIGHEST SAR VALUES:

FCC / IC Rule Parts	Frequency Range [MHz]	The Highest SAR Values (1g_mW/g)	Limit (mW/g)
95 H	1395 - 1400 MHz 1427 - 1432 MHz	0.018	1.6

APPLICABLE STANDARDS AND TEST PROCEDURES:

STANDARD	TEST RESULTS
FCC OET BULLETIN 65 SUPPLEMENT C	Pass

UL Japan Inc. (UL Japan) 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 UL Japan 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 UL Japan and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Japan 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 UL Japan By:

Mitsuru Fujimura
Leader of WiSE Japan
UL Verification Service

Tested By:

Miyo Kishimoto
Engineer of WiSE Japan
UL Verification Service

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C.

3. FACILITIES AND ACCREDITATION

*Shielded room for SAR testings
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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.

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MCC-67	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	AT	2011/04/22 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2011/03/14 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2011/04/08 * 12
MPM-01	Power Meter	Agilent	E4417A	GB41290639	SAR	2011/02/01 * 12
MPSE-01	Power Sensor	Agilent	E9300B	US40010300	SAR	2011/01/28 * 12
MPSE-03	Power sensor	Agilent	E9327A	US40440576	SAR	2011/02/02 * 12
MAT-15	Attenuator(30dB)	Agilent	8498A	US40010300	SAR	2011/02/16 * 12
MSG-10	Signal Generator	Agilent	N5181A	MY47421098	SAR	2010/09/08 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	SAR	2011/03/10 * 12
MHDC-11	Dual Directional Coupler	Hewlett Packard	778D	16605	SAR	Pre Check
MNA-01	Network Analyzer	Agilent/HP	E8358A	US41080381	SAR	2010/08/19 * 12
MDPK-01	Dielectric probe kit	Agilent	85070D	702	SAR	2010/10/25 * 36
MNCK-01	Type N Calibration Kit	Agilent	85032F	MY41495257	SAR	2010/08/10 * 12
MRENT-94	Isotropic field Probe	Schmid&Partner Engineering AG	ET3DV6	1750	SAR	2011/03/15 * 12
MDAE-01	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE3 V1	509	SAR	2010/07/07 * 12
COTS-MSAR-03	Dasy5	Schmid&Partner Engineering AG	DASY52.6.1.408	-	SAR	-
COTS-MSAR-03	Robot - Six Axes	Stäubli	TX60L	F10/5E3LA1/A/01	SAR	-
COTS-MSAR-03	Robot Remote Control	Stäubli	CS8	(F10/5E3LA1/B/01	SAR	-
COTS-MSAR-03	DASY5 Measurement Server	Schmid&Partner Engineering AG	CS8	(F10/5E3LA1/C/01	SAR	-
COTS-MSAR-02	S-Parameter Network Analyzer	Agilent	―	―	SAR	-
MDA-12	Dipole Antenna	Schmid&Partner Engineering AG	D1450V2	1024	SAR	2009/06/23 * 36
MPF-02	2mmOval Flat Phantom ERI 4.0	Schmid&Partner Engineering AG	QD VA 001B (ERI4.0)	1045	SAR	2011/04/01 * 12
MDH-01	Device holder	Schmid&Partner Engineering AG	Mounting device for transmitter	-	SAR	Pre Check
MOS-24	Thermo-Hygrometer	Custom	CTH-201	0005	SAR	2011/02/23 * 12
MOS-10	Digtal thermometer	HANNA	Checktemp-2	MOS-10	SAR	2010/08/02 * 12
MBM-13	Barometer	Sunoh	SBR121	837	SAR	2011/03/14 * 36
MSL1450				Daily check Target value ± 5%		
SAR room				Daily check Ambient Noise<0.012W/kg		

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibration
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4.2. MEASUREMENT UNCERTAINTY

Measurement uncertainty for 300 MHz – 3000 MHz

The uncertainty budget has been determined for the DASY5 measurement system according to the SPEAG documents and is given in the following Table.

Uncertainty component	Tol. (±%)	Probe Dist.	Div.	Ci (1g)	Ci (10g)	Std. Unc.(±%)	
						Ui (1g)	Ui(10g)
Measurement System							
Probe Calibration	6.55	N	1	1	1	6.55	6.55
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	2.00	R	1.732	1	1	1.15	1.15
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	0.30	N	1	1	1	0.30	0.30
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	3.00	R	1.732	1	1	1.73	1.73
RF Ambient Conditions - Reflections	3.00	R	1.732	1	1	1.73	1.73
Probe Positioner Mechnical Tolerance	0.80	R	1.732	1	1	0.46	0.46
Probe Positioning With Respect to Phantom Shell	9.90	R	1.732	1	1	5.72	5.72
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	4.00	R	1.732	1	1	2.31	2.31
Test sample Related							
Test Sample Positioning	2.90	N	1	1	1	2.90	2.90
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.	5.00	N	1	0.64	0.43	3.20	2.15
Liquid Permittivity - Target	5.00	R	1.732	0.6	0.49	1.73	1.41
Liquid Permittivity - Meas.	5.00	N	1	0.6	0.49	3.00	2.45
Combined Standard Uncertainty	RSS					13.36	12.92
Expanded Uncertainty (95% Confidence Interval)	K=2					26.72	25.84

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

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5. EQUIPMENT UNDER TEST

Medical Telemetry Transmitter

Normal operation:	Worn on body
Battery:	Two AA (LR6)
Frequency Bands:	1395-1400 MHz and 1427-1432 MHz
Channel Number:	1395.0250 MHz (Ch. no E002) to 1399.9750 MHz (Ch. no E398) 1427.0250 MHz (Ch. no E502) to 1431.9750 MHz (Ch. no E898)

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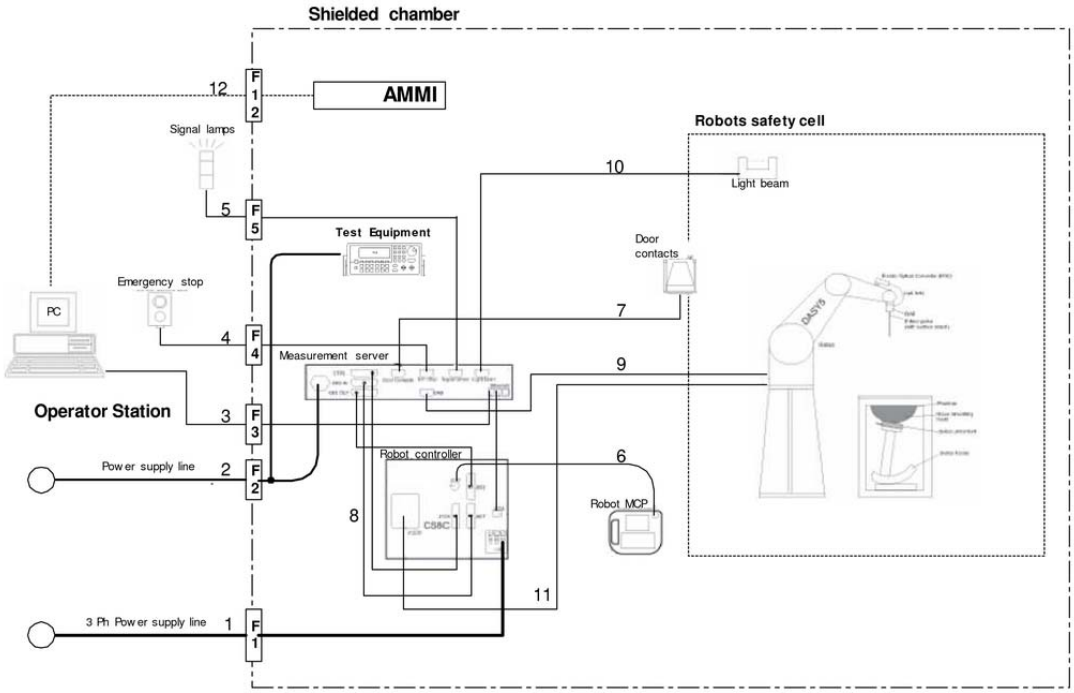
SYSTEM SPECIFICATIONS



The DASY5 system for performing compliance tests consist of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software.
An arm extension for accommodating the data acquisition electronics (DAE).

2. An isotropic field probe optimized and calibrated for the targeted measurement.

3. A data acquisition electronic (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.

4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for
the digital communication to the DAE and for the analog signal from the optical surface detection.
The EOC is connected to the measurement server.

5. 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.

6. The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.

7. A computer running WinXP and the DASY5 software.

8. Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.

9. The phantom, the device holder and other accessories according to the targeted measurement.

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6. 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

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7. LIQUID PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values. The relative permittivity and conductivity of the tissue material should be within ± 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 ρ = 1000 kg/m^3)

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7.1. LIQUID CHECK RESULTS FOR 1450 MHZ

Simulating Liquid Dielectric Parameters for Muscle 1450 MHz

Room Ambient Temperature = 24°C; Relative humidity = 40% Measured by: Miyo Kishimoto

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1450	e'	54.42	Relative Permittivity (ϵ_r):	54.420	54.0	0.78	± 5
	e"	16.33	Conductivity (σ):	1.317	1.30	1.31	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 22.5 deg. C
May 23, 2011 09:53 AM

frequency	e'	e"
1380000000	54.6896	16.1868
1385000000	54.6752	16.1936
1390000000	54.6605	16.2029
1395000000	54.6391	16.2097
1400000000	54.6158	16.2175
1405000000	54.5964	16.2259
1410000000	54.5812	16.2405
1415000000	54.5783	16.2520
1420000000	54.5788	16.2649
1425000000	54.5654	16.2772
1430000000	54.5396	16.2880
1435000000	54.5134	16.2985
1440000000	54.4885	16.3092
1445000000	54.4605	16.3168
1450000000	**54.4215**	**16.3274**
1455000000	54.3918	16.3319
1460000000	54.3745	16.3395
1465000000	54.3662	16.3480
1470000000	54.3530	16.3535
1475000000	54.3328	16.3575
1480000000	54.3061	16.3598

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

ε_0 = 8.854 * 10^{-12}

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8. 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 ±10%.

System Performance Check Measurement Conditions

- The measurements were performed in the flat phantom filled with Head or Body simulating liquid of the following parameters.
- The DASY5 system with an Isotropic E-Field Probe ET3DV6 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.
- Special 7x7x7 fine cube (minimum) was chosen for cube
- Distance between probe sensors and phantom surface was set to 4 mm.

- The dipole input power (forward power) was 250 mW±3%.
- The results are normalized to 1 W input power.

Reference SAR Values for BODY-tissue from calibration certificate of SPEAG. Certificate no: D1450V2-1024_June09

Dipole Type	Distance	Frequency	SAR (1g)	SAR (10g)	SAR (peak)
	(mm)	(MHz)	[W/kg]	[W/kg]	[W/kg]
D1450V2	10	1450	29.7	17	24

8.1. SYSTEM CHECK RESULTS FOR D1450V2

System Validation Dipole: D1450V2 SN:1024

Date: May 23, 2011

Ambient Temperature = 24°C; Relative humidity = 40% Measured by: Miyo Kishimoto

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	1450	250	1g SAR:	27.04	29.7	-8.96	±10
			10g SAR:	15.56	17.0	-8.47	

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9. OUTPUT POWER VERIFICATION

The cable assembly insertion loss of 11.1dB (including 9.99dB pad and 1.11dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
E002	1395.025	6.24
E398	1399.975	6.46
E502	1427.025	6.82
E898	1431.975	6.86

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10. SUMMARY OF TEST RESULTS

10.1. FACE UP LEFT SIDE POSITION

Band	Channel	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Low	E002	1395.025	0.015	1.6
	E398	1399.975	0.015	
High	E502	1427.025	0.018	
	E898	1431.975	0.018	

10.2. FACE UP RIGHT SIDE POSITION

This position was skipped due to low SAR values.

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11. WORST-CASE SAR TEST PLOTS

SAR Plots & Data (Ch no E002 / 1395.025 MHz)

Test Laboratory: UL Japan, Inc. Date: 2011/05/23

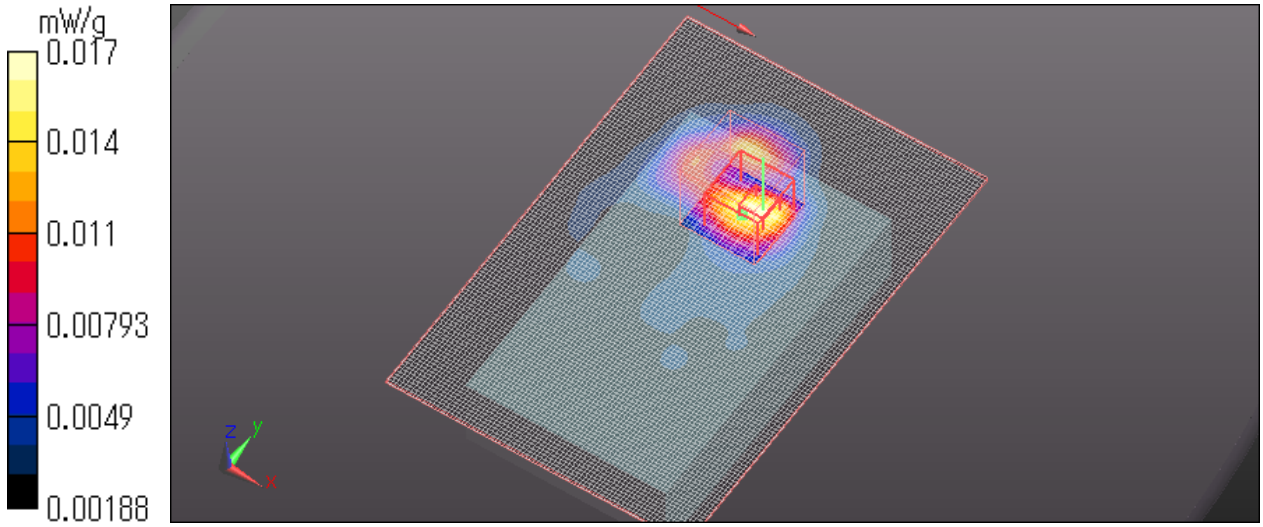
Body Worn Face up Low Band E002

DUT: Nihon Kohden; Type: Medical Telemery Transmitter; Model: ZM-531PA
Communication System: 1400 Low Band; Communication System Band: Low band; Frequency: 1395.03 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1395.03 MHz; σ = 1.258 mho/m; ε_r = 54.639; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:
Probe: ET3DV6 - SN1705; ConvF(4.97, 4.97, 4.97); Calibrated: 2011/03/15
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE3 Sn509; Calibrated: 2010/07/07
Phantom: ELI 4.0; Type: QDOVA001BA;
Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.015 mW/g

Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.610 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.040 W/kg
SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00876 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.017 mW/g

Ambient Temperature = 24.0 degree.c
Liquid Temperature = Before22.0 degree.C , After 22.0 degree.C



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SAR Plots & Data (Ch no E398 / 1399.975 MHz)

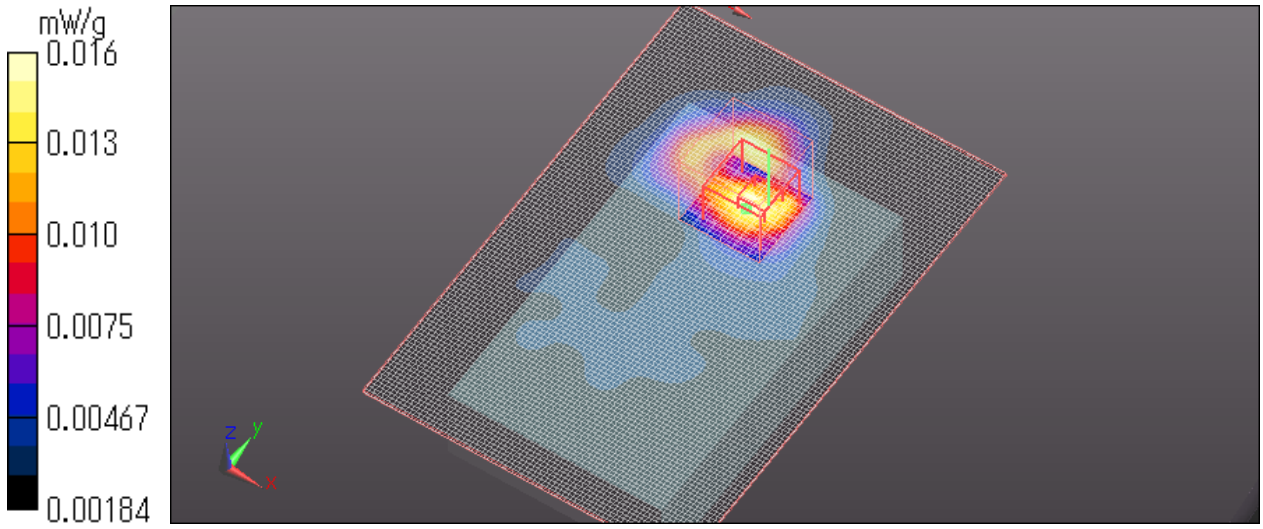
Test Laboratory: UL Japan, Inc. Date: 2011/05/23

Body Worn Face up Low Band E398
DUT: Nihon Kohden; Type: Medical Telemery Transmitter; Model: ZM-531PA
Communication System: 1400 Low Band; Communication System Band: Low band; Frequency: 1399.97 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1400 MHz; σ = 1.263 mho/m; ε_r = 54.616; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:
Probe: ET3DV6 - SN1705; ConvF(4.97, 4.97, 4.97); Calibrated: 2011/03/15
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE3 Sn509; Calibrated: 2010/07/07
Phantom: ELI 4.0; Type: QDOVA001BA;
Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.015 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.722 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.036 W/kg
SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00864 mW/g
Maximum value of SAR (measured) = 0.016 mW/g

Ambient Temperature = 24.0 degree.c
Liquid Temperature = Before22.0 degree.C , After 22.0 degree.C



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SAR Plots & Data (Ch no E502 / 1427.025 MHz)

Test Laboratory: UL Japan, Inc. Date: 2011/05/23

Body Worn Face up High Band E502

DUT: Nihon Kohden; Type: Medical Telemery Transmitter; Model: ZM-531PA
Communication System: 1400 High Band; Communication System Band: High Band; Frequency: 1427.03 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1427.03 MHz; σ = 1.293 mho/m; ε_r = 54.555; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:
Probe: ET3DV6 - SN1705; ConvF(4.97, 4.97, 4.97); Calibrated: 2011/03/15
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE3 Sn509; Calibrated: 2010/07/07
Phantom: ELI 4.0; Type: QDOVA001BA;
Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

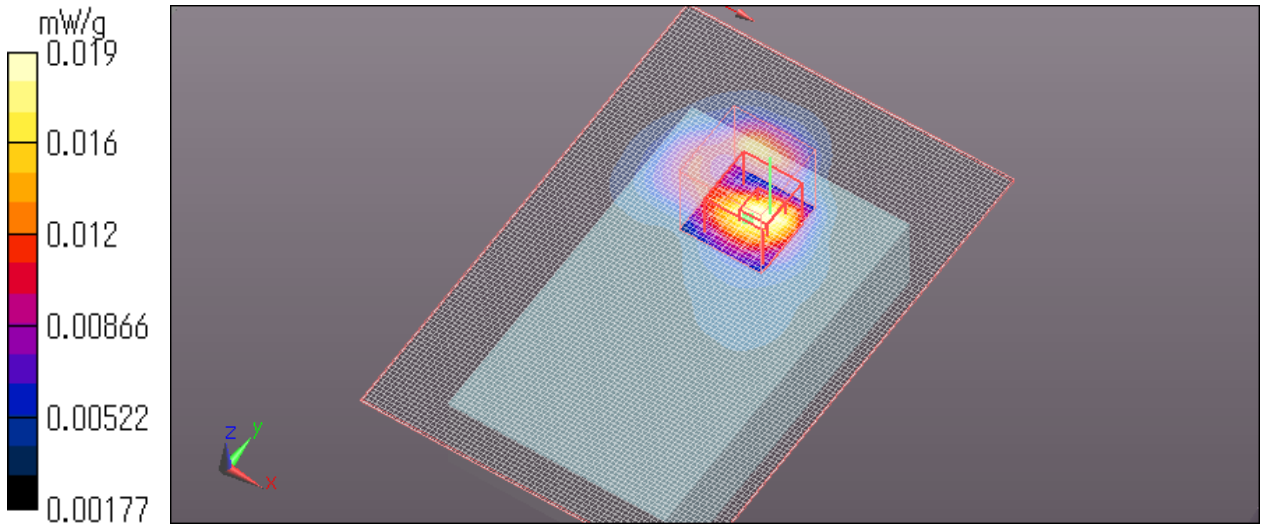
Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.017 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.617 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 0.041 W/kg
SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.00985 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.019 mW/g

Ambient Temperature = 24.0 degree.c
Liquid Temperature = Before22.0 degree.C , After 22.0 degree.C



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SAR Plots & Data (Ch no E898 / 1431.975 MHz)

Test Laboratory: UL Japan, Inc. Date: 2011/05/23

Body Worn Face up High Band E898

DUT: Nihon Kohden; Type: Medical Telemery Transmitter; Model: ZM-531PA
Communication System: 1400 High Band; Communication System Band: High Band; Frequency: 1431.97 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1431.97 MHz; σ = 1.298 mho/m; ε_r = 54.529; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:
Probe: ET3DV6 - SN1705; ConvF(4.97, 4.97, 4.97); Calibrated: 2011/03/15
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE3 Sn509; Calibrated: 2010/07/07
Phantom: ELI 4.0; Type: QDOVA001BA;
Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

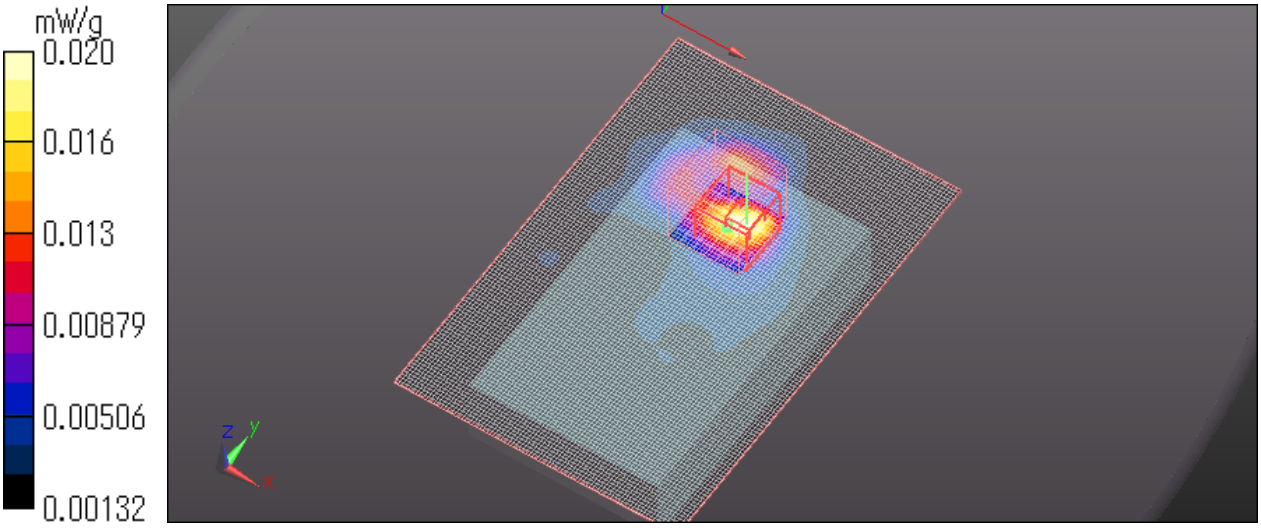
Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.018 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.609 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.043 W/kg
SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.00992 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.020 mW/g

Ambient Temperature = 24.0 degree.c
Liquid Temperature = Before22.0 degree.C , After 22.0 degree.C



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Zscan for worst position

Test Laboratory: UL Japan, Inc. Date: 2011/05/23

Body Worn Face up High Band E898

DUT: Nihon Kohden; Type: Medical Telemery Transmitter; Model: ZM-531PA

Communication System: 1400 High Band; Communication System Band: High Band; Frequency: 1431.97 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1431.97 MHz; σ = 1.298 mho/m; ε_r = 54.529; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ET3DV6 - SN1705; ConvF(4.97, 4.97, 4.97); Calibrated: 2011/03/15

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE3 Sn509; Calibrated: 2010/07/07

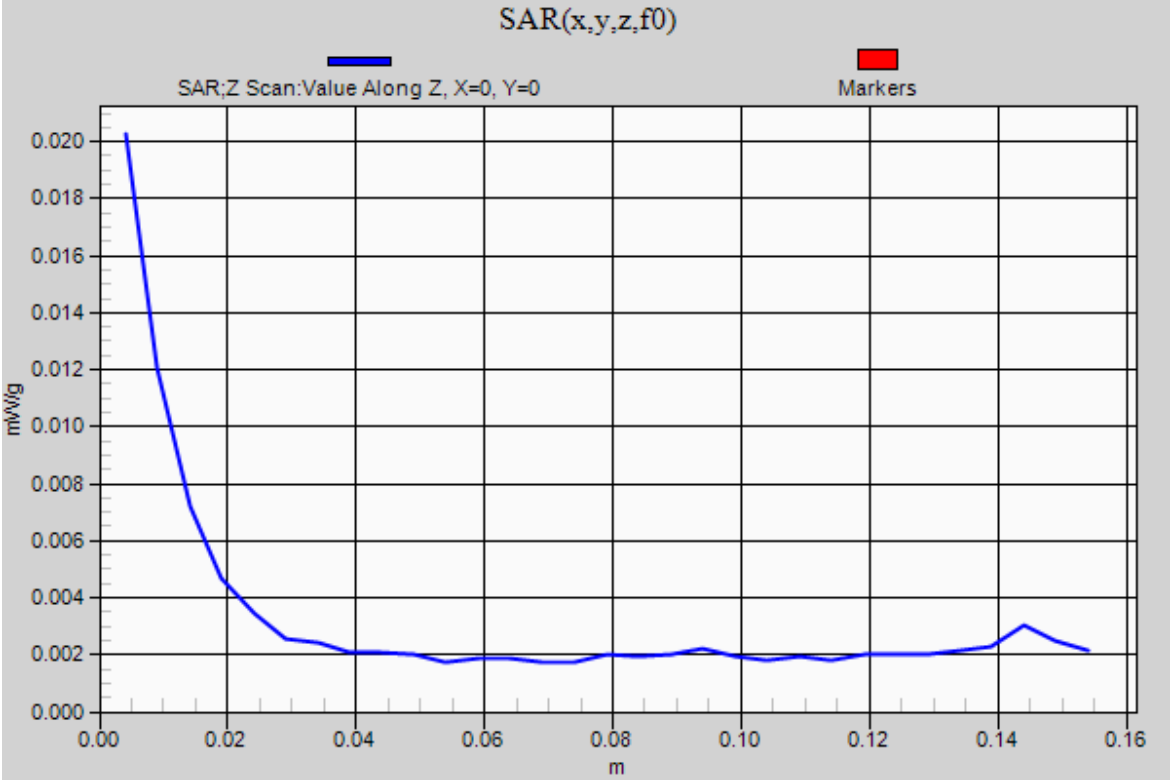
Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Z Scan (1x1x31): Measurement grid: dz=5mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.020 mW/g



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12. ATTACHMENTS

No.	Contents	No. of page (s)
1	System Performance Check Plots	1
2	Certificate of E-Field Probe – ET3DV6 SN 1075	13
3	Certificate of System Validation Dipole – D1450 SN1024	9

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