

# TEST REPORT

**KCTL Inc.**

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Report No.: KCTL16-SFA0010

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**KCTL**  
<http://www.kctl.co.kr>

## 1. Client

Name : STARNEX CO.LTD  
Address : #710, Kolon Digital Tower Aston Bldg., 212, Gasan Digital  
1-ro Geumcheon-gu, Seoul 153-708, KOREA

## 2. Sample Description

Type of equipment : ROLLTS RADIO  
Model : DOMINO E1



3. Date of Receipt : 2016. 05. 13.

4. Date of Test : 2016. 06. 02.

5. Test method used: IEEE 1528-2013, ANSI/IEEE C95.1, KDB Publication

6. Test Results  
Complied (Refer to page 19)  
(Measurement uncertainty : Refer to test result)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

Affirmation	Tested by	Technical Manager
	 Name : Dong-Kyu, Kim	 Name : Cheon-Sig, Choi

2016. 06. 30.

**KCTL Inc.**

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## 1. Applicant information

**Applicant:** STARNEX CO.LTD

**Address:** #710, Kolon Digital Tower Aston Bldg., 212, Gasan Digital 1-ro Geumcheon-gu, Seoul 153-708,KOREA

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**Contact name:** Seok-Woo Choi

## 2. Laboratory information

### Address

#### **KCTL Inc.**

65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea

TEL: 82 70 5008 1021 FAX: 82 505 299 8311

### Certificate

KOLAS No.: KT231

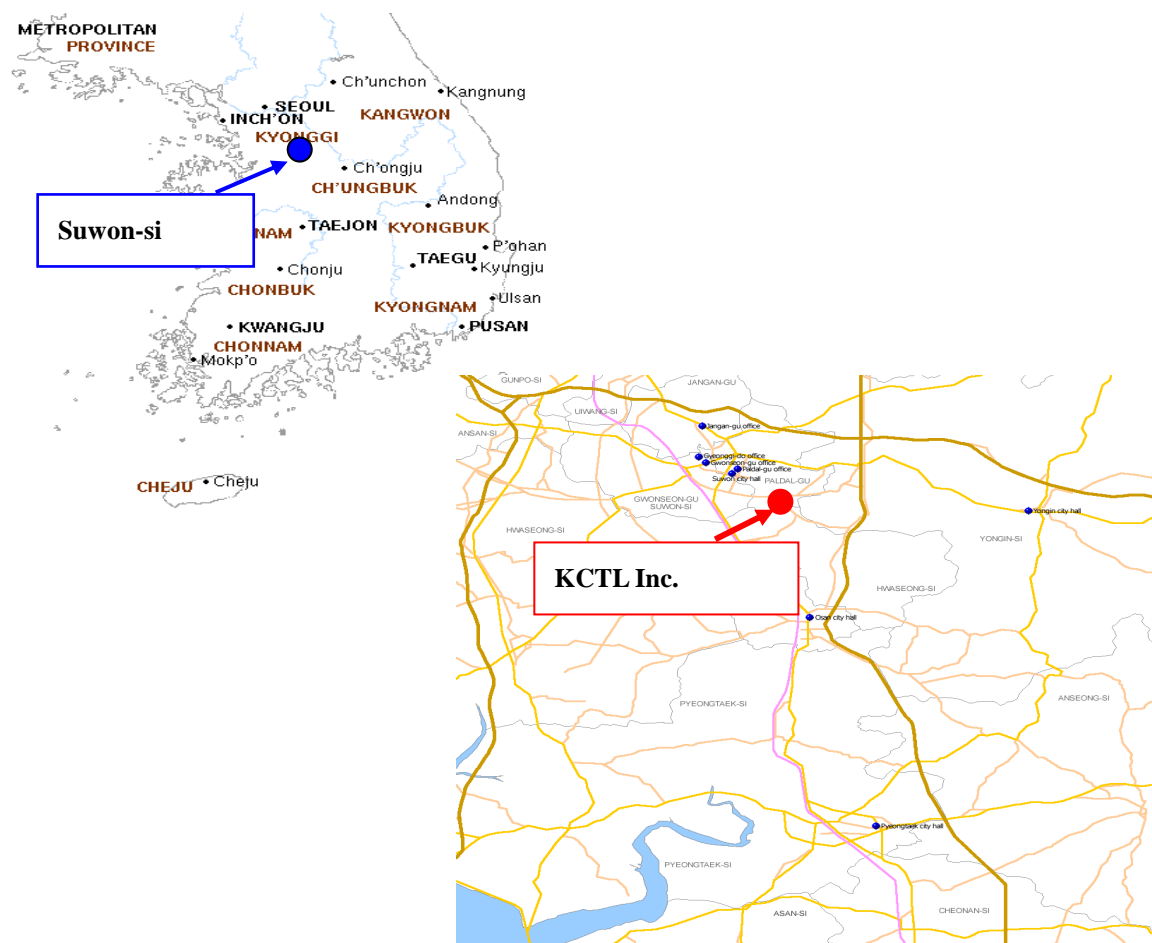
FCC Site Designation No.: KR0040

FCC Site Registration No.: 687132

VCCI Site Registration No.: R-3327, G-198, C-3706, T-1849

IC Site Registration No.: 8035A-2

### SITE MAP



### 3. Identification of Sample

EUT Type	ROLLTS RADIO
Brand Name	STARTEX CO.LTD
Mode of Operation	Half, Hi-fi
Model Number	DOMINO E1
Serial Number	245d670555cb1e67
Max. Power	20 dBm
Tx Freq.Range	902.6 MHz ~ 927.5 MHz
Rx Freq.Range	902.6 MHz ~ 927.5 MHz
Antenna Type	Integral Antenna
Normal Voltage	DC 5 V
H/W Version	V07
S/W Version	01.02.04

## 4. Test Result Summary

### 4.1 Body SAR

Frequency (MHz)	Average Power (dBm)	Max. tune up power (dBm)	Scaling Factor	EUT Position	Distance (mm)	Measured 1 g SAR (W/kg) Duty 100 %	Measured 1 g SAR (W/kg) Duty 50 %	Scaled 1 g SAR (W/kg)
903	18.49	20	1.42	Front	0	0.452	0.226	0.320

\* Contain the results of the worst test SAR including battery.

## 5. Report Overview

This report details the results of testing carried out on the samples listed in section 3, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this test report is used in any configuration other than that detailed in the test report, the manufacturer must ensure the new configuration complies with all relevant standards and certification requirements. Any mention of KCTL Inc. Wireless lab or testing done by KCTL Inc. Wireless lab made in connection with the distribution or use of the tested product must be approved in writing by KCTL Inc. Wireless lab.

## 6. Test Lab Declaration or Comments

None

## 7. Applicant Declaration or Comments

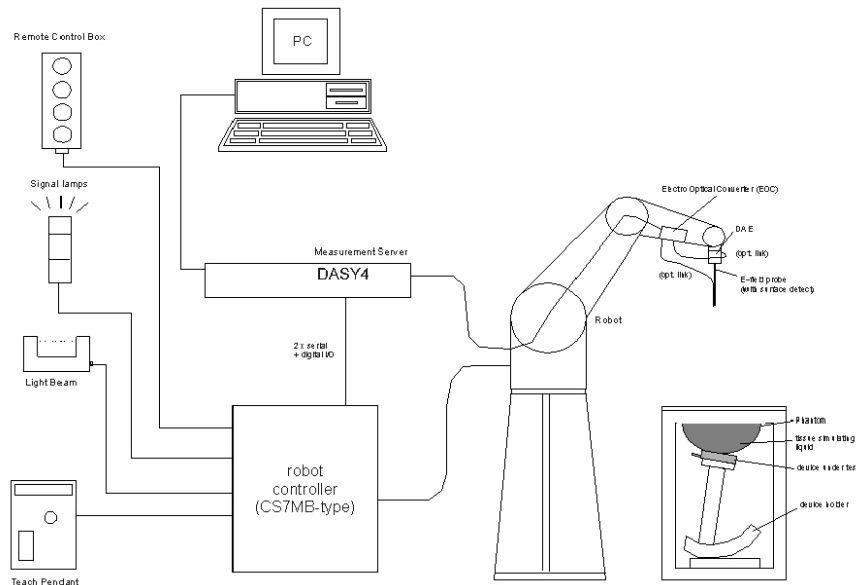
None

## 8. Measurement Uncertainty

All measurements and results are recorded and maintained at the laboratory performing the tests and measurement uncertainties are taken into account when comparing measurements to pass/ fail criteria.

A	b	c	D	$e = f(d,k)$	g	$i = c \times g / e$	k
Source of Uncertainty	Description IEEE P1528	Tolerance/ Uncertainty value	Probability Distribution	Div.	Ci	Standard uncertainty	Vi or Veff
	(0.3 ~ 3 GHz)	± %			(1 g)	± %, (1 g)	
Measurement System							
Probe calibration(k=1)	E.2.1	6.30	N	1	1	6.30	∞
Axial isotropy	E.2.2	0.50	R	1.73	0.71	0.20	∞
Hemispherical isotropy	E.2.2	2.60	R	1.73	0.71	1.06	∞
Linearity	E.2.4	0.60	R	1.73	1	0.35	∞
Boundary effect	E.2.3	1.00	R	1.73	1	0.58	∞
System detection limits	E.2.5	1.00	R	1.73	1	0.58	∞
Readout electronics	E.2.6	0.30	N	1	1	0.30	∞
Response time	E.2.7	0.80	R	1.73	1	0.46	∞
Integration time	E.2.8	2.60	R	1.73	1	1.50	∞
RF ambient conditions—noise	E.6.1	3.00	R	1.73	1	1.73	∞
RF ambient conditions—reflections	E.6.1	3.00	R	1.73	1	1.73	∞
Probe positioner mechanical tolerance	E.6.2	0.40	R	1.73	1	0.23	∞
Probe positioning with respect to phantom shell	E.6.3	2.90	R	1.73	1	1.67	∞
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	E.5	2.00	R	1.73	1	1.15	∞
Test Sample Related							
Test sample positioning	E.4.2	4.71	N	1	1	4.71	9
Device holder uncertainty	E.4.1	3.60	N	1	1	3.60	5
Output power variation—SAR drift measurement	6.6.2	5.00	R	1.73	1	2.89	∞
Phantom and Tissue Parameters							
Phantom uncertainty (shape and thickness tolerances)	E.3.1	7.50	R	1.73	1	4.33	∞
Liquid conductivity (meas.)	E.3.3	1.53	N	1	0.64	0.98	5
Liquid permittivity (meas.)	E.3.3	3.07	N	1	0.6	1.84	5
Liquid conductivity(target)	E.3.2	5.00	R	1.73	0.64	1.85	∞
Liquid permittivity(target)	E.3.2	5.00	R	1.73	0.6	1.73	∞
Combined standard uncertainty				RSS		11.29	183
Expanded uncertainty				K=2		22.57	
(95% CONFIDENCE INTERVAL)							

## 9. The SAR Measurement System





### <SAR System Configuration>

- A standard high precision 6-axis robot (Staubli 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 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.
- 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 control 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.




## 9.1 Isotropic E-field Probe

<b>ES3DV3</b> <b>Isotropic E-Field Probe for Dosimetric Measurements</b>	
	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 <a href="#">calibration service</a> available.
Frequency	10 MHz to 4 GHz; Linearity: $\pm 0.2$ dB (30 MHz to 4 GHz)
Directivity	$\pm 0.2$ dB in TSL (rotation around probe axis) $\pm 0.3$ dB in TSL (rotation normal to probe axis)
Dynamic Range	5 $\mu$ W/g to > 100 mW/g; Linearity: $\pm 0.2$ dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

<b>EX3DV4</b> <b>Smallest Isotropic E-Field Probe for Dosimetric Measurements</b> <b>(Preliminary Specifications)</b>	
	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 <a href="#">calibration service</a> available.
Frequency	10 MHz to > 6 GHz Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)
Directivity	$\pm 0.3$ dB in TSL (rotation around probe axis) $\pm 0.5$ dB in TSL (rotation normal to probe axis)
Dynamic Range	10 $\mu$ W/g to > 100 mW/g Linearity: $\pm 0.2$ dB (noise: typically < 1 $\mu$ W/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

## 9.2 Phantom

Twin SAM	
	<p>The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.</p> <p>Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.</p>
Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Wooden Support	SPEAG standard phantom table
Accessories	<a href="#">Mounting Device and Adaptors</a>

ELI	
	<p>Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.</p> <p>ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure. ELI V6.0, released in August 2014, has the same shell geometry as ELI4 but offers increased longterm stability.</p>
Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2.0 ± 0.2 mm (bottom plate)
Dimensions	Major axis: 600 mm Minor axis: 400 mm
Filling Volume	approx. 30 liters
Wooden Support	SPEAG standard phantom table
Accessories	<a href="#">Mounting Device and Adaptors</a>

### 9.3 Device Holder for Transmitters

#### Mounting Devices and Adaptors



Mounting Device for Hand-Held Transmitters

##### **MD4HHTV5 - Mounting Device for Hand-Held Transmitters**

In combination with the Twin SAM V5.0/V5.0c or ELI Phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).

**Material:** Polyoxymethylene (POM)



Mounting Device for Laptops

##### **MD4LAPV5 - Mounting Device for Laptops and other Body-Worn Transmitters**

In combination with the Twin SAM V5.0/V5.0c or ELI Phantoms, the Mounting Device (Body-Worn) enables testing of transmitter devices according to IEC 62209-2 specifications. The device holder can be locked for positioning at flat phantom section.

**Material:** Polyoxymethylene (POM), PET-G, Foam

## 10. System Verification

### 10.1 Tissue Verification

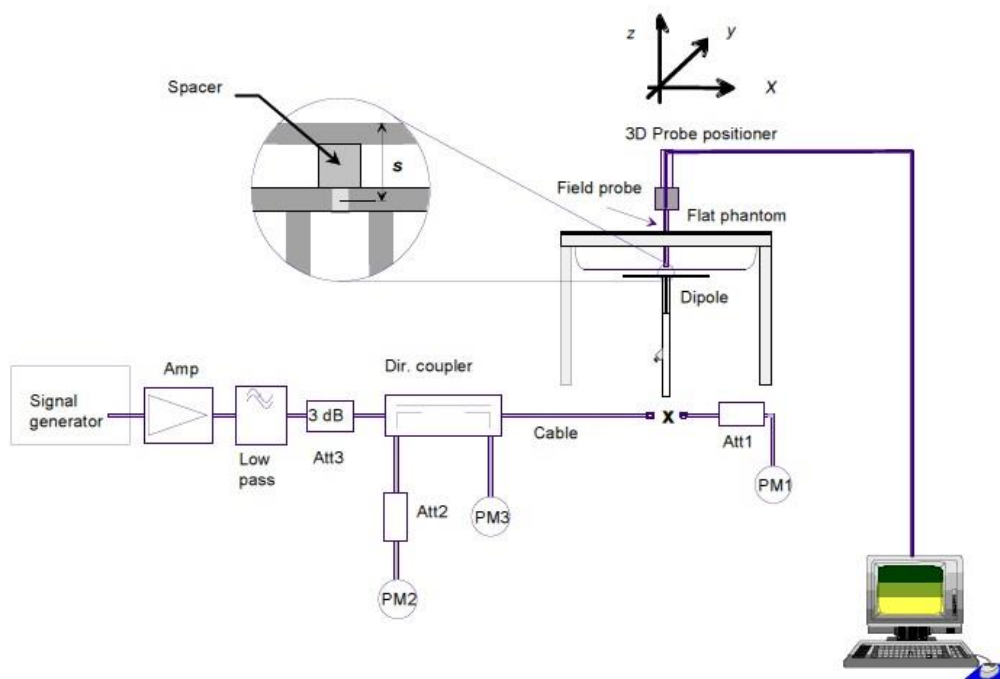
The dielectric properties for this Tissue Simulant Liquids were measured by using the SPEAG Model DAK3.5 Dielectric Probe in conjunction with Agilent E5071B Network Analyzer (300 kHz – 8 500 MHz). The Conductivity ( $\sigma$ ) and Permittivity ( $\rho$ ) are listed in Table 1. For the SAR measurement given in this report.

Freq. (MHz)	Tissue Type	Limit/Measured	Permittivity ( $\rho$ )	Conductivity ( $\sigma$ )	Temp (°C)
850	MSL	Recommended Limit	$55.15 \pm 5 \%$ (52.39 ~ 57.91)	$0.99 \pm 5 \%$ (0.94 ~ 1.04)	$22 \pm 2$
		Measured, 2016-06-02	56.86	0.98	21.3
902.6	MSL	Recommended Limit	$55.00 \pm 5 \%$ (52.25 ~ 57.75)	$1.05 \pm 5 \%$ (1.00 ~ 1.10)	$22 \pm 2$
		Measured, 2016-06-02	56.60	1.04	21.3
903	MSL	Recommended Limit	$55.00 \pm 5 \%$ (52.25 ~ 57.75)	$1.05 \pm 5 \%$ (1.00 ~ 1.10)	$22 \pm 2$
		Measured, 2016-06-02	56.63	1.04	21.3
915	MSL	Recommended Limit	$55.00 \pm 5 \%$ (52.25 ~ 57.75)	$1.06 \pm 5 \%$ (1.01 ~ 1.11)	$22 \pm 2$
		Measured, 2016-06-02	56.49	1.05	21.3
927.5	MSL	Recommended Limit	$54.98 \pm 5 \%$ (52.23 ~ 57.73)	$1.07 \pm 5 \%$ (1.02 ~ 1.12)	$22 \pm 2$
		Measured, 2016-06-02	56.31	1.06	21.3

<Table 1.Measurement result of Tissue electric parameters>

## 10.2 Test System Verification

The microwave circuit arrangement for system verification is sketched below picture. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within  $\pm 10\%$  from the target SAR values. These tests were done at 850 MHz. The tests were conducted on the samedays as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the table Table 2 (A power level of 250mW was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range ( $22 \pm 2$ ) °C, the relative humidity was in the range ( $50 \pm 20$ )% and the liquid depth above the ear/grid reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



Validation Kit	Dipole Ant. S/N	Frequency (MHz)	Tissue Type	Limit/Measurement (Normalized to 1 W)		
					1 g	10 g
D850V2	1006	850	MSL	Recommended Limit (Normalized)	$9.75 \pm 10\%$ (8.78 ~ 10.73)	$6.43 \pm 10\%$ (5.79 ~ 7.07)
				Measured, 2016-06-02	8.96	5.96

<Table 2. Test System Verification Result>

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## 11. Operation Configurations

Measurements were performed at the lowest, middle and highest channels of the operating band. The EUT was set to maximum power level during all tests and at the beginning of each test the battery was fully charged.

## 12. SAR Measurement Procedures

### Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

### Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

### Step 3: Zoom Scan



Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures 5x5x7 points within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04.

			$\leq 3 \text{ GHz}$	$> 3 \text{ GHz}$
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			$\leq 2 \text{ GHz: } \leq 8 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz: } \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz: } \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 4 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 3 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2 \text{ mm}$
	graded grid	$\Delta z_{\text{Zoom}}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 3 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2 \text{ mm}$
		$\Delta z_{\text{Zoom}}(n>1)$ : between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz: } \geq 28 \text{ mm}$ $4 - 5 \text{ GHz: } \geq 25 \text{ mm}$ $5 - 6 \text{ GHz: } \geq 22 \text{ mm}$
Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.				
* When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4 \text{ W/kg}$ , $\leq 8 \text{ mm}$ , $\leq 7 \text{ mm}$ and $\leq 5 \text{ mm}$ zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

#### Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

#### Step 5: Z-Scan

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

\* Z Scan Report on Liquid Measure the height Annex C Liquid Depth photo to replace



### 13. Test Equipment Information

Test Platform	SPEAG DASY4 System			
Description	SAR Test System			
Software Reference	DASY4: V4.7,Build80 SEMCAD: V1.8,Build 186			
Hardware Reference				
Equipment	Model	Serial Number	Date of Calibration	Due date of next Calibration
Shield Room	Shield Room	None	N/A	N/A
DASY4 Robot	RX90BL Speag	F05/51E0A1/A01	N/A	N/A
DASY4 Controller	RX90BL Speag	F05/51E0A1/C/01	N/A	N/A
Phantom	Twin SAM Phantom	1363	N/A	N/A
Mounting Device	Mounting Device	None	N/A	N/A
DAE	DAE4	666	2016-05-11	2017-05-11
Probe	EX3DV4	3865	2015-08-28	2016-08-28
Dipole Validation Kits	D850V2	1006	2016-04-20	2018-04-20
Network Analyzer	E5071B	MY42403524	2016-02-11	2017-02-11
Dual Directional Coupler	778D	16059	2015-07-14	2016-07-14
Signal Generator	E4438C	MY42080486	2016-01-08	2017-01-08
Power Amplifier	2055BBS3Q7E9I	1005D/C0521	2016-05-18	2017-05-18
LP Filter	LA-30N	40058	2015-07-14	2016-07-14
Dual Power Meter	E4419B	GB43312301	2015-07-14	2016-07-14
Power Sensor	8481H	3318A19377	2015-07-15	2016-07-15
Power Sensor	8481H	3318A19379	2015-07-15	2016-07-15
Dielectric Assessment Kit	DAK-3.5	1078	2015-08-19	2016-08-19
Humidity/Baro/Temp. Data Recorder	MHB-382SD	23107	2016-02-11	2017-02-11

## 14. RF Average Conducted Output Power

### 14.1 Average Conducted Output Power

Channel	1	125	250
Frequency(MHz)	902.6	915	927.5
Half	19.57	19.65	19.52

Channel	5	125	250
Frequency(MHz)	903	915	927.5
Hi-fi	18.49	18.52	18.40

### 14.2 Max. tune up power

Mode	Target Power	Tolerance	Max. Allowed Power
Half, Hi-fi	19 dBm	$\pm 1$ dB	20 dBm

## 15. SAR Test Results

### 15.1 Body SAR Test Results

Mode	Frequency (MHz)	Average Power (dBm)	Max. tune up power (dBm)	Scaling Factor	EUT Position	Distance (mm)	Measured 1 g SAR (W/kg) Duty 100 %	Measured 1 g SAR (W/kg) Duty 50 %	Scaled 1 g SAR (W/kg)
Half	Clip								
	915	19.65	20	1.08	Rear	0	0.144	0.072	0.078
	Magnet								
	915	19.65	20	1.08	Rear	0	0.215	0.108	0.117
	915	19.65	20	1.08	Front	0	0.498	0.249	0.270
	915	19.65	20	1.08	Left	0	0.031	0.016	0.017
	915	19.65	20	1.08	Right	0	0.185	0.093	0.100
	915	19.65	20	1.08	Top	0	0.149	0.075	0.081
	915	19.65	20	1.08	Bottom	0	0.249	0.125	0.135
	902.6	19.57	20	1.10	Front	0	0.533	0.267	0.294
	927.5	19.52	20	1.12	Front	0	0.497	0.249	0.278
Hi-fi	903	18.49	20	1.42	Front	0	0.452	0.226	<b>0.320</b>

<Note>

\* SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.

## 16. Test System Verification Results

**Procedure Name: d=15mm, Pin=250mW**

Frequency: 850 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 850$  MHz;  $\sigma = 0.977$  mho/m;  $\epsilon_r = 56.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.25, 10.25, 10.25); Calibrated: 2015-08-28
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2016-05-11
- Phantom: SAM B; Type: SAM; Serial: 1363
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**d=15mm, Pin=250mW/Area Scan (81x151x1):** Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (interpolated) = 2.81 mW/g

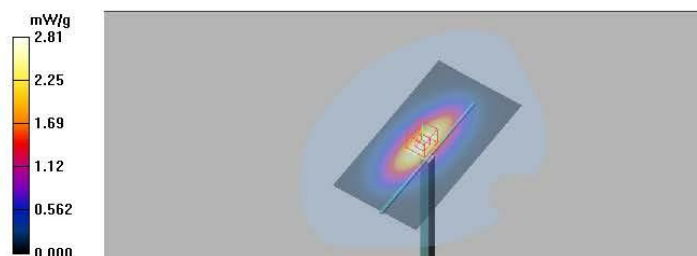
**d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.9 V/m; Power Drift = 0.072 dB

Peak SAR (extrapolated) = 3.23 W/kg

**SAR(1 g) = 2.24 mW/g; SAR(10 g) = 1.49 mW/g**

Maximum value of SAR (measured) = 2.81 mW/g



## 17. Test Results

**Procedure Name: Hi-fi\_Magnet\_f.903\_Front\_0 mm**

Frequency: 903 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 903 \text{ MHz}$ ;  $\sigma = 1.04 \text{ mho/m}$ ;  $\epsilon_r = 56.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.05, 10.05, 10.05); Calibrated: 2015-08-28
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2016-05-11
- Phantom: SAM B; Type: SAM; Serial: 1363
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Hi-fi\_Magnet\_f.903\_Front\_0 mm/Area Scan (71x81x1):** Measurement grid:  $dx=12\text{mm}$ ,  $dy=12\text{mm}$

Maximum value of SAR (interpolated) = 0.741 mW/g

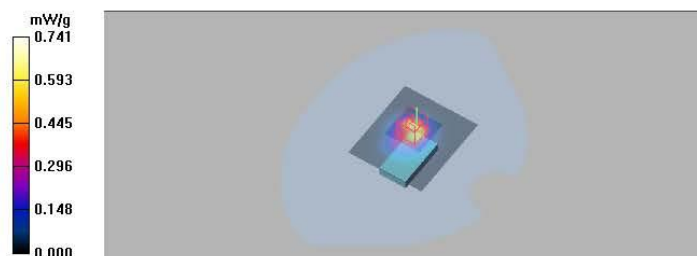
**Hi-fi\_Magnet\_f.903\_Front\_0 mm/Zoom Scan (9x9x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 18.5 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 1.42 W/kg

**SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.226 mW/g**

Maximum value of SAR (measured) = 0.864 mW/g



**- END OF REPORT -**