
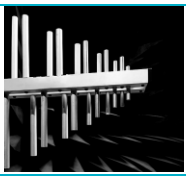
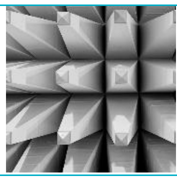

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TEST REPORT

Test Report No.: 1-1899/16-01-16

DAkkS
Deutsche Akkreditierungsstelle
D-PL-12076-01-01

Testing Laboratory

CTC advanced GmbH
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Accredited Test Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

Applicant

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31670 Labège/FRANCE

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Fax: ---

Manufacturer

SIGFOX
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31670 Labège/FRANCE

Test Standard/s

RSS - 102 Issue 5	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
47 CFR Subpart I	§1.1310 Radiofrequency radiation exposure limits

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	Base station
Model name:	**SBS-T3-902**
S/N serial number:	Base station: 5F15 FCC pre serie LNA: S16100003 LNAC: S16100001
FCC-ID:	2ACK7SBST3902
IC:	12204A-SBST3902
PMN	SBS-T3
HVIN	SBS-T3-902
FVIN	TAPOS v4.2
Hardware status:	V3.0_0.a, V3.0_1.a (second mother board V3.0_0.b, V3.0_1.b)
Software status:	TAPOS v4.2
Frequency:	902-928MHz
Antenna:	Omnidirectional antenna (5dBi)
DC Supply:	110 or 220V
Type identification:	SBS-T3-902 in combination with WEVERCOMM FH-915B-LNA-N01 / WEVERCOMM FHWV-905LNA-S-01(WOSF)
Test sample status:	identical prototype
Exposure category:	general population / uncontrolled environment

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test Report authorised:

DN: cn=Thomas Vogler, o=CTC advanced GmbH, ou=VOG-161125, email=thomas.vogler@ctcadvanced.com, c=DE
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Alexander Hnatovskiy
Lab Manager
Radio Communications & EMC

1 Table of contents

2 General information

2.1 Notes and disclaimer

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2.2 Application details

Date of receipt of order:	2016-06-28
Date of receipt of test item:	2017-01-23
Start of test:	2017-01-23
End of test:	2017-01-24
Person(s) present during the test:	

2.3 Statement of compliance

The EMF values found for the SBS-T3-902 Base station are below the maximum allowed levels according to the standards listed in section 3.

3 Test standard/s:

Test Standard	Version	Test Standard Description
RSS - 102 Issue 5	March 2015	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
47 CFR Subpart I	June 2016	§1.1310 Radiofrequency radiation exposure limits

3.1 RF exposure limits

Reference levels for general public (uncontrolled environment) exposure to time-varying electric and magnetic fields

According to: RSS 102-ISSUE 05		
Frequency Range (MHz)	**Electric Field** (V/m rms)	**Magnetic Field** (A/m rms)
0.003-1021	83	90
0.1-10	--	$0.73/ f$
1.1-10	$87/ f^{0.5}$	--
10-20	27.46	0.0728
20-48	$58.07/ f^{0.25}$	$0.1540/ f^{0.25}$
48-300	22.06	0.05852
300-6000	**$3.142 f^{0.3417}$**	**$0.008335 f^{0.3417}$**
6000-15000	61.4	0.163
15000-150000	61.4	0.163
150000-300000	0.158 f 0.5	4.21 x 10-4 f 0.5

According to: CFR47, Subpart I - §1.1310 Radiofrequency radiation exposure limits				
Frequency Range (MHz)	**Electric Field** (V/m)	**Magnetic Field** (A/m)	**Power density** (mW/cm^2)	**Averaging time** (minutes)
Occupational / Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	$4.89/ f$	*900/f^2	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100000	--	--	5	6
General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f^2	30
30-300	27.5	0.073	0.2	30
300-1500	**--**	**--**	**f/1500**	**30**
1500-100000	--	--	1.0	30

4 Summary of Measurement Results

☒	**No deviations from the technical specifications ascertained**
☐	Deviations from the technical specifications ascertained

For a safety distance of **20 cm** the field strengths of the device exhaust the limits for **RSS-102 by 61.85%** and for **§1.1310 by 16.92%**.

5 Test Environment

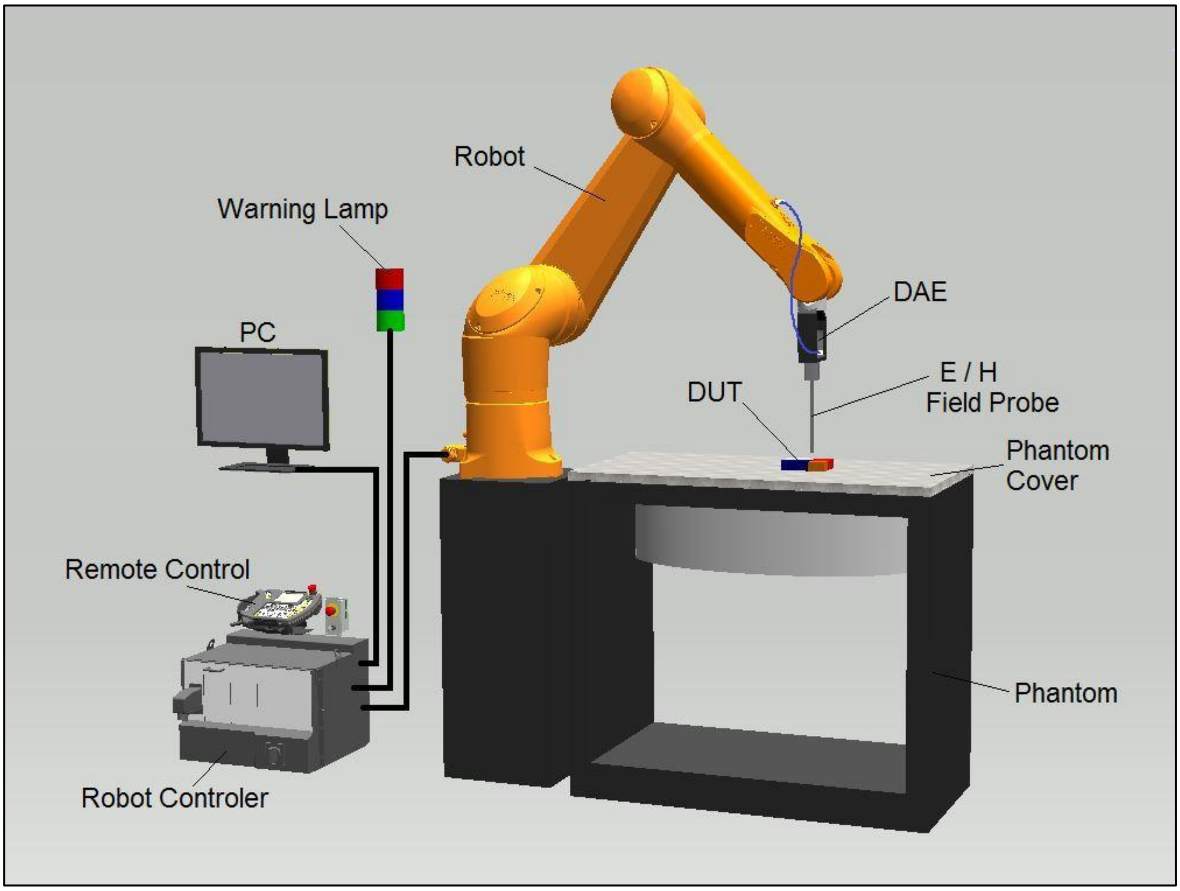
Ambient temperature:	20 – 24 °C
Relative humidity content:	40 – 50 %
Air pressure:	not relevant for this kind of testing
Power supply:	230 V / 50 Hz

6 Test Set-up

6.1 Measurement system

6.1.1 Broadband Electromagnetic Field Test system

For performing EMF measurements the Schmid & Partner DASY52 dosimetric assessment system is used which is described below. Instead of dosimetric probes E-field and H-field probes for measurement in air are in use.



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

- A standard high precision 6-axis robot (Stäubli RX family) with controller 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 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.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
- The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 7
- DASY5 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System validation dipoles allowing to validate the proper functioning of the system.

6.1.2 Probe description

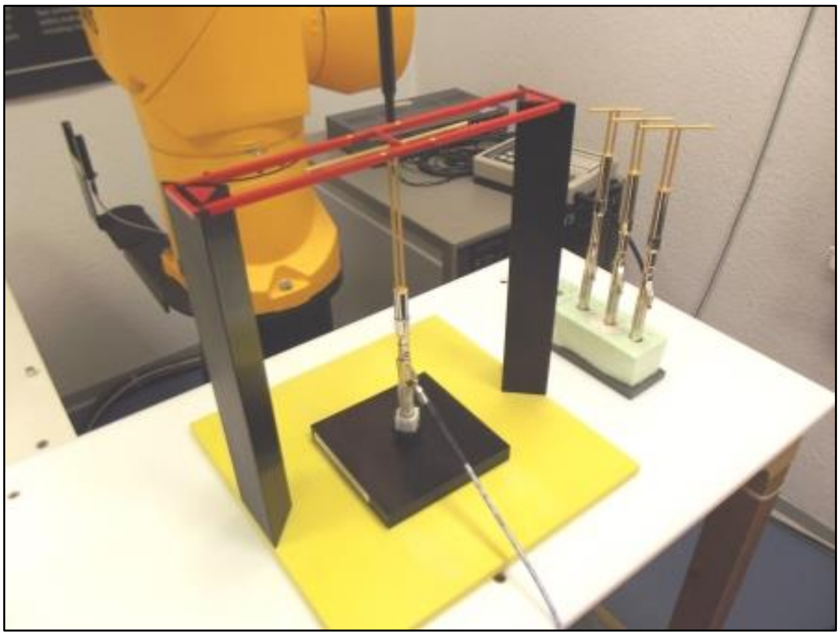
E-Field Probe ER3DV6 (Technical data according to manufacturer information)	
Construction	One dipole parallel and two dipoles normal to probe axis Built-in shielding against static charges
Calibration	In air from 100 MHz to 3 GHz (absolute accuracy ± 6.0%; k=2)
Frequency	100 MHz to >6 GHz; Linearity: ± 0.2 dB (100MHz to 3 GHz)
Directivity	± 0.2 dB in air (rotation around probe axis) ± 0.4 dB in air (rotation normal to probe axis)
Dynamic range	2 V/m to > 1000 V/m (M3/M4 device readings fall well below diode compression point)
Dimensions	Overall length: 330 mm; Tip length: 16 mm Body diameter: 12 mm; Tip diameter: 8 mm Distance from probe tip to dipole centers: 2.5mm

H-Field Probe H3DV6 (Technical data according to manufacturer information)	
Construction	Three concentric loop sensors with 3.8 mm loop diameters. Resistively loaded detector diodes for linear response Built-in shielding against static charges
Calibration	In air from 100 MHz to 3 GHz (absolute accuracy ± 6.0%; k=2)
Frequency	200 MHz to 3 GHz; Linearity: ± 0.2 dB (100MHz to 3 GHz)
Directivity	± 0.25 dB (spherical isotropy error)
Dynamic range	10 mA/m to 2 A/m at 1 GHz (M3/M4 device readings fall well below diode compression point)
Dimensions	Overall length: 330 mm; Tip length: 40 mm Body diameter: 12 mm; Tip diameter: 6 mm Distance from probe tip to loop centers: 3 mm
E-Field Interference	< 10% at 3 GHz (for plane wave)

6.1.3 HAC test arch description

The HAC test arch is especially designed for performing measurements according to the requirements of ANSI C63.19. It allows centring the wireless device inside a 5 x 5 cm control area marked with 4 points for position adjustment. Plastic bridges allow an exact adjustment of the measurement distance to 1 cm from the DUT, which also includes the distance of the dipole center to the probe tip.

The HAC test arch is only used to perform the validation of the system with a validation dipole that could be exactly positioned inside the HAC test arch (see picture).



6.1.4 Scanning procedure

The DASY52 system is used to perform a highly reproducible and accurate EMF measurement in different steps:

- System check same as described in ANSI C63.19 to verify the functionality and accuracy of the E and H field measurement.
- Performance of different measurement steps to locate maximum field positions and values for a defined distance towards the DUT.

System check procedure:

1. The HAC test setup is placed at the pre-defined position on top of the SAR phantom cover.
2. A phantom adjustment and verification is performed, which allows checking the borders and centre position of the 5 x 5 cm² control area. The probe tip touches down on the 4 points at the corners of the control area
3. The system check measurement is performed to check if the read out of the DASY52 system works accurate in a range of +/- 10% for E and H field measurements.

Measurement procedure:

1. The DUT is placed on the cover of the DASY5 SAM phantom oriented in its intended test position (see photo documentation). A reference point above the DUT is defined. This Point is the centre of the area scan, multimeter and all other following measurements and is placed with the corresponding distance.
2. The DUT is set to transmit at maximum output power at the desired test channel(s).
3. The „area scan“ measures the electrical or magnetic field strength above the DUT on a parallel plane to the cover of the DASY5 SAM phantom. It is used to locate the approximate location of the peak field strength with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical or magnetic field strength is measured by the probe. The probe is moving at the defined distance above the DUT during acquisition of measurement values. The grid spacing is quite large as it is only a pre-measurement step to locate the area with the greatest E or H field.
4. At the maximum interpolated position of the “area scan” a “fine scan” with a size of 200 x 200 mm and a fine grid that uses a step size of 10 mm is used to measure and interpolate the absolute maximum of the E/H field and find its precise position.

6.1.5 Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA52". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf/dcp_i$$

with	V_i	= compensated signal of channel i	(i = x, y, z)
	U_i	= input signal of channel i	(i = x, y, z)
	cf	= crest factor of exciting field	(DASY parameter)
	dcp_i	= diode compression point	(DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $$E_i = (V_i \,/\, Norm_i \cdot ConvF)^{1/2}$$

H-field probes: $$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2)/f$$

with	V_i	= compensated signal of channel i	(i = x, y, z)
	$Norm_i$	= sensor sensitivity of channel i [mV/(V/m)^2] for E-field Probes	(i = x, y, z)
	ConvF	= sensitivity enhancement in solution	
	a_{ij}	= sensor sensitivity factors for H-field probes	
	f	= carrier frequency [GHz]	
	E_i	= electric field strength of channel i in V/m	
	H_i	= magnetic field strength of channel i in A/m	

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_X^2 + E_Y^2 + E_Z^2)^{1/2}$$

with	P_{pwe}	= equivalent power density of a plane wave in mW/cm^2
	E_{tot}	= total electric field strength in V/m
	H_{tot}	= total magnetic field strength in A/m

6.1.6 Measurement uncertainty evaluation for HAC measurements

This measurement uncertainty budget is suggested by ANSI-C63.19 and determined by Schmid & Partner Engineering AG. The breakdown of the individual uncertainties is as follows:

Error Sources	Uncertainty Value	Probability Distribution	Divi -sor	c_i E	Standard Uncertainty E
Measurement System					
Probe calibration	± 5.1%	Normal	1	1	± 5.1%
Axial isotropy)*	± 4.7%	Rectangular	√3	1	± 2.7%
Sensor displacement	±16.5%	Rectangular	√3	1	± 9.5%
Boundary effects	± 2.4%	Rectangular	√3	1	± 1.4%
Phantom Boundary Effect	± 7.2%	Rectangular	√3	1	± 4.1%
Probe linearity	± 4.7%	Rectangular	√3	1	± 2.7%
Scaling with PMR calibration	± 10.0%	Rectangular	√3	1	± 1.2%
System detection limits	± 1.0%	Rectangular	√3	1	± 0.6%
Readout electronics	± 0.3%	Normal	1	1	± 0.3%
Response time	± 0.8%	Rectangular	√3	1	± 0.5%
Integration time	± 2.6%	Rectangular	√3	1	± 1.5%
RF ambient conditions)*	± 3.0%	Rectangular	√3	1	± 1.7%
RF reflections)*	± 7.5%	Rectangular	√3	1	± 4.3%
Probe positioner	± 1.2%	Rectangular	√3	1	± 0.7%
Probe positioning	± 4.7%	Rectangular	√3	1	± 2.7%
Extrapolation and Interpolation	± 1.0%	Rectangular	√3	1	± 0.6%
Test sample related					
Device positioning vertical	± 4.7%	Rectangular	√3	1	± 2.7%
Device positioning lateral	± 1.0%	Rectangular	√3	1	± 0.6%
Device holder and Phantom	± 2.4%	Rectangular	√3	1	± 1.4%
Power drift	± 5.0%	Rectangular	√3	1	± 2.9%
Phantom and Setup Related					
Phantom Thickness	± 2.4%	Rectangular	√3	1	± 1.4%
Combined Uncertainty					**± 14.3%**
Expanded Std. Uncertainty on Power					**± 28.6%**

)* : site specific

Table 1: Measurement uncertainties

6.1.7 Measurement uncertainty evaluation for system validation

This measurement uncertainty budget is suggested by ANSI-C63.19 and determined by Schmid & Partner Engineering AG. The breakdown of the individual uncertainties is as follows:

Error Sources	**Uncertainty Value**	**Probability Distribution**	**Divi -sor**	**c_i E**	**Standard Uncertainty E**
Measurement System					
Probe calibration	± 5.1%	Normal	1	1	± 5.1%
Axial isotropy)*	± 4.7%	Rectangular	√3	1	± 2.7%
Sensor displacement	±16.5%	Rectangular	√3	1	± 9.5%
Boundary effects	± 2.4%	Rectangular	√3	1	± 1.4%
Phantom Boundary Effect	± 7.2%	Rectangular	√3	1	± 4.1%
Probe linearity	± 4.7%	Rectangular	√3	1	± 2.7%
Scaling with PMR calibration	± 10.0%	Rectangular	√3	1	± 1.2%
System detection limits	± 1.0%	Rectangular	√3	1	± 0.6%
Readout electronics	± 0.3%	Normal	1	1	± 0.3%
Response time	± 0.8%	Rectangular	√3	1	± 0.5%
Integration time	± 2.6%	Rectangular	√3	1	± 1.5%
RF ambient conditions)*	± 3.0%	Rectangular	√3	1	± 1.7%
RF reflections)*	± 7.5%	Rectangular	√3	1	± 4.3%
Probe positioner	± 1.2%	Rectangular	√3	1	± 0.7%
Probe positioning	± 4.7%	Rectangular	√3	1	± 2.7%
Extrapolation and Interpolation	± 1.0%	Rectangular	√3	1	± 0.6%
Dipole related					
Distance dipole – scanning plane	± 5.2%	Rectangular	√3	1	± 3.0%
Input power	± 4.7%	Normal	1	1	± 4.7%
Phantom and Setup Related					
Phantom Thickness	± 2.4%	Rectangular	√3	1	± 1.4%
Combined Uncertainty					**± 14.7%**
Expanded Std. Uncertainty on Power					**± 29.4%**

)* : site specific

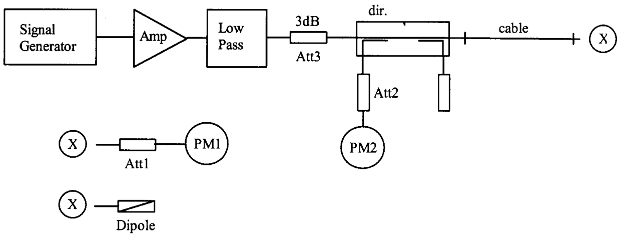
Table 2: Measurement uncertainties

6.1.8 System check

The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The following table shows system check results for all frequency bands and both for E- and H-fields. (graphic plot(s) see annex A).

6.1.9 System check procedure

According to the requirements of ANSI C63.19 chapter 4.3.2.1.1 the system check is performed by using a validation dipole which is positioned parallel to the nylon fibre of the HAC test arch. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 100 mW (20 dBm). To adjust this power a power meter is used. The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).
During the system check the measurement system scans a grid along the length of the dipole and the maximum value is recorded.
This system check is performed periodically both with E and H field probes on the center frequencies of the frequency bands used by the DUT.
System check results have to be equal or near the values determined during dipole calibration (target HAC in table below) with the same test system set-up.



Freq.(MHz)	Signal type	Distance (mm)	Peak output power (dBm)	Target field strength (+/- 10%)	Measured field strength
835	CW	10	20	165.6 V/m	159.3 V/m
835	CW	10	20	0.462 A/m	0.421 A/m

Table 3: Results system check

6.2 Test results

During testing the device was set to CW-transmit mode with a Duty Cycle of 100% on 915.1 MHz (CH44).

Detailed measurement results and plots from the DASY52 System can be viewed in Annex B: Plots for SBS-T3-902 on page 18.

6.2.1 Test results according RSS 102-ISSUE 05

CH 44 / 915.1 MHz					
	distance (cm)	measured	limit*	field type	margin (% of limit)
LNA-N	20	**19.41 V/m**	32.30 V/m	E	60.09
		0.053 A/m	0.086 A/m	H	**61.85**
LNA-S	20	15.99 V/m	32.30 V/m	E	49.50
		0.042 A/m	0.086 A/m	H	48.95

Table 4: Test results E- and H-Field **SBS-T3-902**

*) Limit according RSS 102-ISSUE 05

6.2.2 Test results according 47 CFR, Subpart I - §1.1310 (Power Density)

CH 44 / 915.1 MHz					
	distance (cm)	measured	calculated*** (mW/cm²)	limit** (mW/cm²)	margin (% of limit)
LNA-N	20	19.41 V/m	**0.10**	**0.61**	**16.92**
		0.053 A/m			
LNA-S	20	15.99 V/m	**0.07**	**0.61**	**11.04**
		0.042 A/m			

Table 5: Test results **SBS-T3-902** for power density

**) Limit according 47 CFR, Subpart I - §1.1310 Radiofrequency radiation exposure limits.

***) $|\vec{S}| = |\vec{E}| \times |\vec{H}|$

$|S| = |E| \cdot |H| \cdot \sin \alpha$

for $\alpha = 90°$ it could be assumed that E and H result in the largest possible $|S|$ = $|S|_{Max}$ for ($\sin 90° = 1$)
this leads to the following worst case consideration:

$|S|_{Max} = |E| \cdot |H|$

6.3 Final verdict

For a safety distance of **20 cm** the field strengths of the device exhaust the limits for **RSS-102 by 61.85%** and for **§1.1310 by 16.92%**.

Annex A: System performance check

Date/Time: 24.01.2017 14:13:59

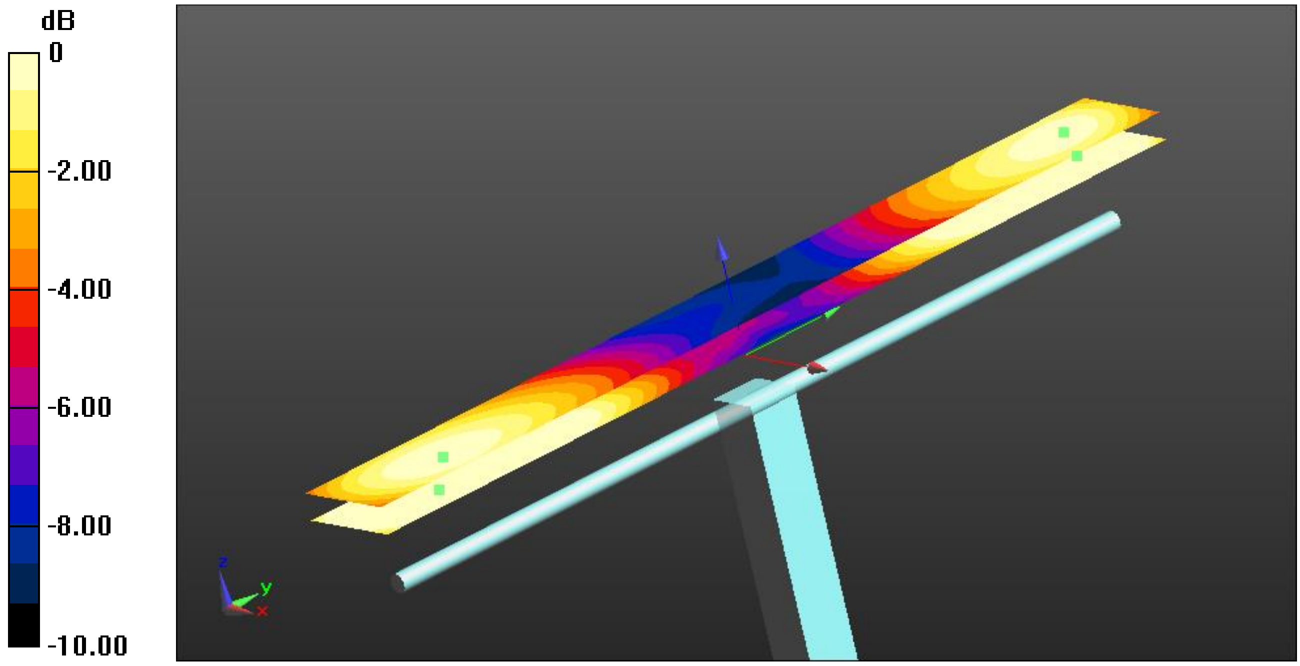
SystemCheck

DUT: HAC-Dipole 835 MHz; Type: D835V3; Serial: 1027

Communication System: UID 0, CW; Communication System Band: CD835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: ER3DV6 - SN2262; ConvF(1, 1, 1); Calibrated: 16.01.2017;
- Sensor-Surface: 0mm (Fix Surface), z = 4.7, 9.7
- Electronics: DAE3 Sn413; Calibrated: 11.01.2017
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole E-Field 835 measurement/E Scan - measurement distance from the probe sensor center to CD835 = 10mm/Hearing Aid Compatibility Test at 10mm distance (41x361x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 102.9 V/m; Power Drift = 0.05 dB
PMR not calibrated. PMF = 1.000 is applied.
Maximum value of Total (interpolated) = 159.3 V/m

Dipole E-Field 835 measurement/E Scan - measurement distance from the probe sensor center to CD835 = 15mm/Hearing Aid Compatibility Test at 15mm distance (41x361x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 102.9 V/m; Power Drift = 0.05 dB
PMR not calibrated. PMF = 1.000 is applied.
Maximum value of Total (interpolated) = 106.6 V/m



0 dB = 106.6 V/m = 40.56 dBV/m

Date/Time: 24.01.2017 13:55:58

SystemCheck

DUT: HAC-Dipole 835 MHz; Type: D835V3; Serial: 1027

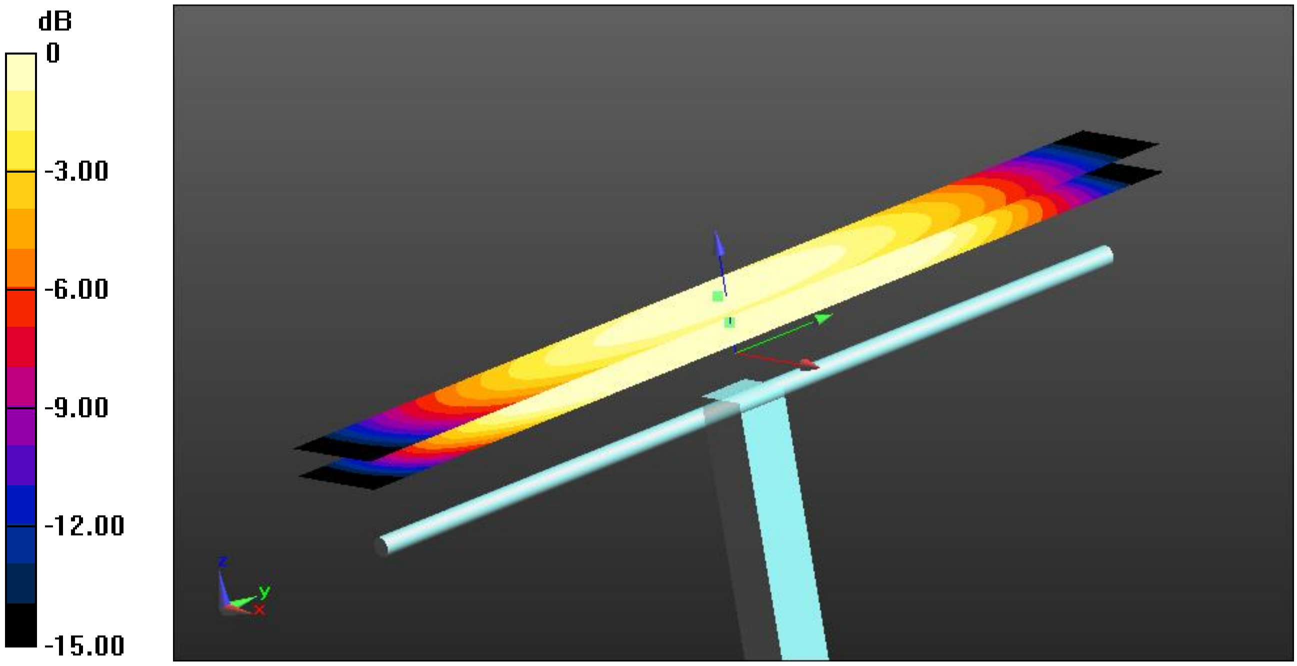
Communication System: UID 0, CW; Communication System Band: CD835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: H3DV6 - SN6086; ; Calibrated: 16.01.2017
- Sensor-Surface: 0mm (Fix Surface), z = 5.2, 10.2
- Electronics: DAE3 Sn413; Calibrated: 11.01.2017
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole H-Field 835 measurement/H Scan - measurement distance from the probe sensor center to CD835 = 10mm & 15mm/Hearing Aid Compatibility Test at 10mm distance (41x361x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.3580 V/m; Power Drift = 0.06 dB
PMR not calibrated. PMF = 1.000 is applied.
Maximum value of Total (interpolated) = 0.4211 A/m

Dipole H-Field 835 measurement/H Scan - measurement distance from the probe sensor center to CD835 = 10mm & 15mm/Hearing Aid Compatibility Test at 15mm distance (41x361x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.3580 V/m; Power Drift = 0.06 dB
PMR not calibrated. PMF = 1.000 is applied.
Maximum value of Total (interpolated) = 0.3039 A/m



0 dB = 0.3039 A/m = -10.35 dBA/m

Annex B: Plots for SBS-T3-902

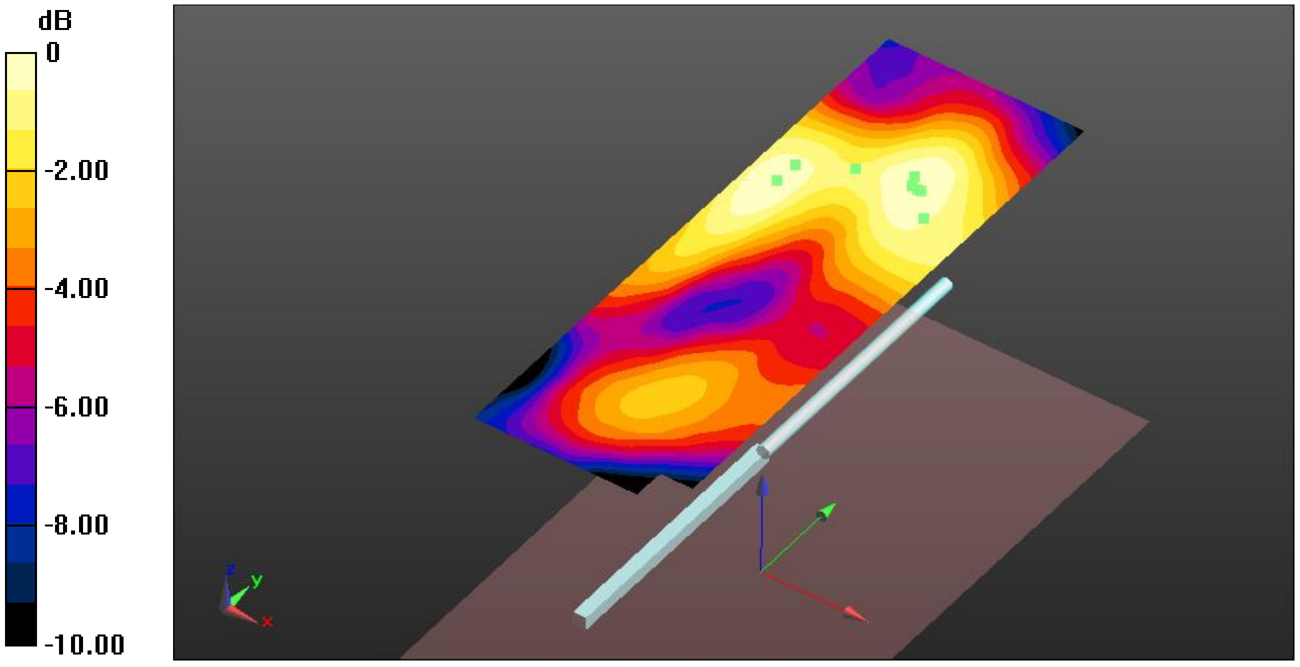
Date/Time: 24.01.2017 12:03:22

EMF with LNA-N

DUT: SIGFOX; Type: SBS-T3-902; Serial: 5F15FCC
Communication System: UID 0, CW (0); Communication System Band: 910; Frequency: 915.1 MHz;
Communication System PAR: 0 dB; PMF: 1.12202e-005
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: Table Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: ER3DV6 - SN2262; ConvF(1, 1, 1); Calibrated: 16.01.2017;
- Sensor-Surface: 0mm (Fix Surface), z = 2.5
- Electronics: DAE3 Sn413; Calibrated: 11.01.2017
- Phantom: Cover; Type: SPEAG Phantom Cover;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

E-Field with FH-915B-LNA-N-01 SN_ S16100003/Ch44/Generic Scan (61x181x1): Interpolated grid: dx=5.000 mm, dy=5.000 mm, dz=10.00 mm
Maximum value of Total (interpolated) = 19.67 V/m

E-Field with FH-915B-LNA-N-01 SN_ S16100003/Ch44/Fine Scan (201x201x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm, dz=10.00 mm
Maximum value of Total (interpolated) = 19.41 V/m



0 dB = 19.41 V/m = 25.76 dBV/m

Additional information:
measurement distance: 20 cm
ambient temperature: 23.2°C

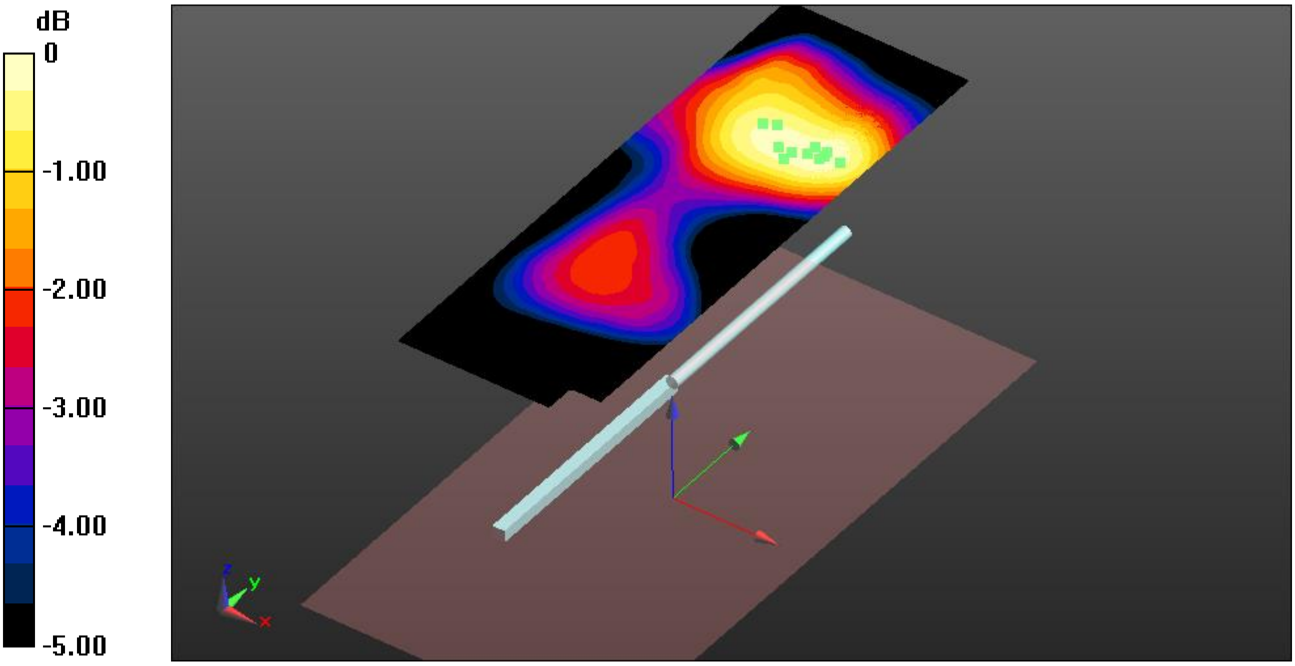
Date/Time: 24.01.2017 12:38:43

EMF with LNA-N

DUT: SIGFOX; Type: SBS-T3-902; Serial: 5F15FCC
Communication System: UID 0, CW (0); Communication System Band: 910; Frequency: 915.1 MHz;
Communication System PAR: 0 dB; PMF: 1.12202e-005
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 0 kg/m^3
Phantom section: Table Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: H3DV6 - SN6086; ; Calibrated: 16.01.2017
- Sensor-Surface: 0mm (Fix Surface), z = 3.0
- Electronics: DAE3 Sn413; Calibrated: 11.01.2017
- Phantom: Cover; Type: SPEAG Phantom Cover;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

H-Field with FH-915B-LNA-N-01 SN_ S16100003/Ch44/Generic Scan (61x181x1):
Interpolated grid: dx=5.000 mm, dy=5.000 mm, dz=10.00 mm
Maximum value of Total (interpolated) = 0.05329 A/m

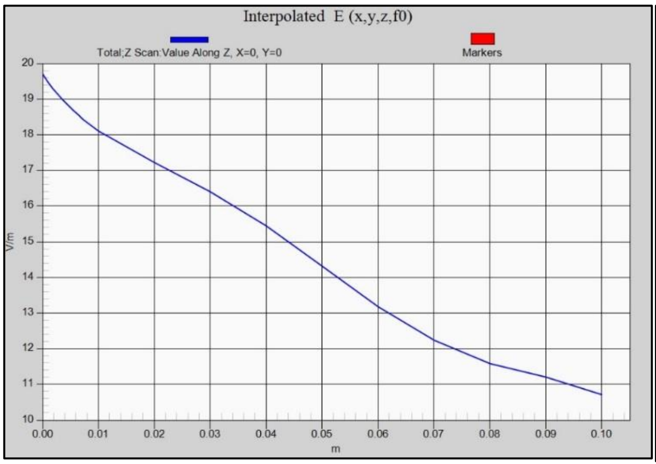
H-Field with FH-915B-LNA-N-01 SN_ S16100003/Ch44/Fine Scan (201x201x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm, dz=10.00 mm
Maximum value of Total (interpolated) = 0.05319 A/m

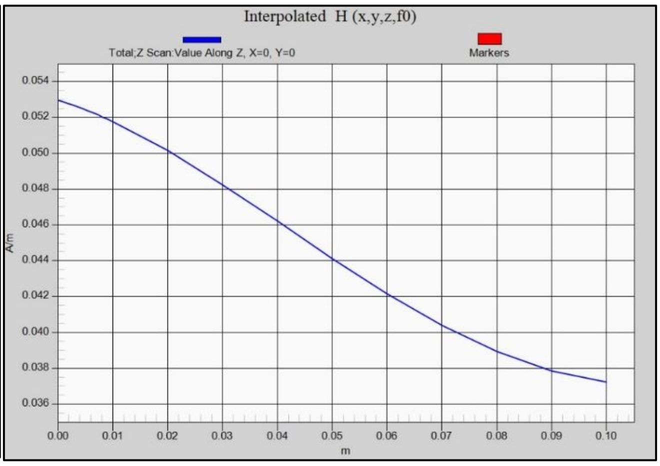


0 dB = 0.05319 A/m = -25.48 dBA/m

Additional information:
measurement distance: 20 cm
ambient temperature: 23.2°C

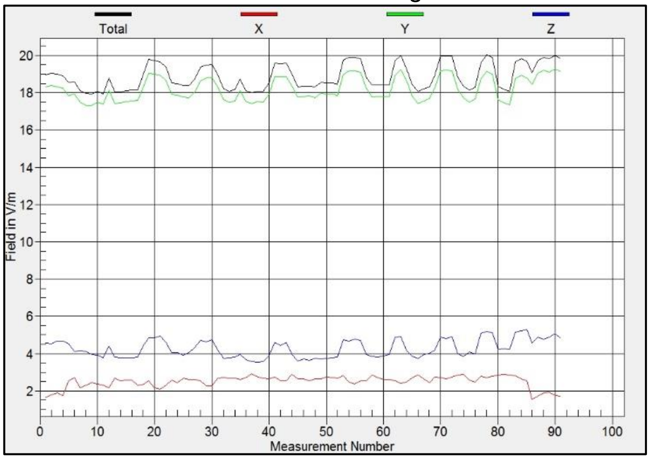
Z-Scans for SBS-T3-902 with LNA-N

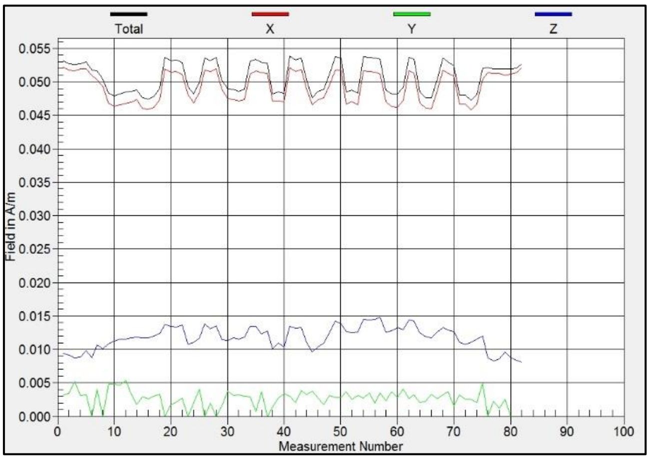




Rotation of the Antenna

A slight variation of the field strength was observed during the rotation from 0 to 360°. The following traced plots show the amount of variation during a full rotation of the DUT.





Annex C: Photo documentation

Photo documentation is described in the additional document:

Appendix to test report no. 1-1899/16-01-16 Photo documentation

Annex D: Calibration parameters

Calibration parameters are described in the additional document:

**Appendix to test report no. 1-1899/16-01-16
Calibration data, Phantom certificate
and detail information of the DASY5 System**

Annex E: Document History

Version	Applied Changes	Date of Release
	Initial Release	2017-01-26

Annex F: Further Information

Glossary

DUT	-	Device under Test
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
OET	-	Office of Engineering and Technology
S/N	-	Serial Number
SW	-	Software