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Hearing Aid Compatibility
RF Near Field Emissions Test Report

Product Name / Model: RM-845
FCC ID: QMNRM-845
Intertek Report Number: 100835064LEX-001

Tested in accordance with:

ANSI C63.19-2007
FCC Rule Parts: §20.19(b), §6.3(v), §7.3(v)

Testing Performed By:	**Testing Authorized By:**
Intertek	Nokia
731 Enterprise Drive	16620 West Bernardo Drive
Lexington	San Diego
KY 40510	CA 92127

Prepared By: _____ **Date:** 8/10/12

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Approved By: _____ **Date:** 8/10/12

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SECTION 1: INTRODUCTION

The RM-845 was evaluated for HAC RF (E and H Field Emissions) in accordance with the requirements for RF Near Field Emissions compliance testing defined in ANSI C63.19-2007. Testing was performed at the Intertek facility in Lexington, Kentucky.

Per ANSI C63.19, testing that is performed on a wireless device establishes categories, which, when coupled with those of a hearing aid, can indicate to healthcare practitioners and hearing aid users which hearing aids are compatible with which wireless devices. The ANSI standard provides tests that can be used to assess the electromagnetic characteristics of hearing aids and wireless devices, and assigns them to these categories.

The aim of this report, therefore, is to provide RF measurements of the near-field electric and magnetic fields emitted by a wireless device to categorize these emissions for correlation with the RF immunity of a hearing aid.

For this evaluation, the SPEAG DASY52 HAC extension was used. This near-field measurement system is comprised of a high-precision robot, HAC Test Arch, calibration dipoles, electric field probes (ER3DV4R), magnetic field probes (H3DV6), dipole holder, EUT holder and DASY52 software with SEMCAD post-processor for generating test plots.

Electric and magnetic fields of a wireless device are scanned with the free-space probes in a 5 x 5 cm area located 15 mm above its acoustic or T-Coil output. The maximum field values in 9 sub-grids of the electrical and magnetic field scans are evaluated automatically according to the rules defined in the standard and assigned a classification.

The specially designed Test Arch allows a high precision positioning of both the device and any of the calibration dipoles. The broadband dipoles are calibrated at a single frequency and are used for system performance checks.

This report demonstrates compliance for near-field emissions only and not for T-coil HAC performance compliance.

SECTION 2: SUMMARY OF TEST RESULTS

The minimum HAC RF ("M") ratings that were obtained for the RM-845 are summarized below:

Table 1: Summary of Test Results with Overall Rating

RF Test	Band	Call Mode	Channel	M-Rating
E-Field	CDMA Cell	Full Rate	384	M4
	CDMA Cell	1/8th Rate	384	M4
	CDMA PCS	Full Rate	25	M4
	CDMA PCS	1/8th Rate	25	M4
H-Field	CDMA Cell	Full Rate	777	M4
	CDMA Cell	1/8th Rate	777	M4
	CDMA PCS	Full Rate	1175	M4
	CDMA PCS	1/8th Rate	1175	M4
Overall M Rating				M4

SECTION 3: EQUIPMENT UNDER TEST

3.1 Test Sample Photographs

Photographs of the RM-845 can be found in a separate exhibit..

3.2 Test Sample Description

TEST SAMPLE			
NAME/MODEL	RM-845		
FCC ID	**QMNRM-845**		
ESN/SERIAL NUMBER	0x8029958C		
SAMPLE TYPE	Prototype		
MODE(S) OF OPERATION	GSM, WCDMA, CDMA		
FREQUENCY RANGE	GSM 850 – 824.2 – 848.6 MHz GSM 1900 – 1850.2 – 1909.8 MHz WCDMA 850 – 826.4 – 846.6 MHz WCDMA 1900 – 1852.4 – 1907.6 MHz CDMA Cell – 824.7 – 848.31 MHz CDMA PCS – 1851.2 – 1908.75 MHz		
ANTENNA DESCRIPTION			
TYPE	Internal fixed antenna		
TEST SAMPLE ACCESSORIES			
BATTERY TYPE	Nokia BP-4W, Li-Ion 3.7Vdc		
OTHER ACCESSORIES	None		
JOB DESCRIPTION			
MANUFACTURER Nokia, 16620 West Bernardo Drive, San Diego, CA, 92127			
CONTACT PERSON Nancy Linstead	**PHONE** (858) 371-1797	**FAX** NA	
EUT RECEIVE DATE 7/27/12	**TEST START DATE** 8/1/12	**TEST END DATE** 8/3/12	
EUT CONDITION Good condition		**EUT TESTED BY** Jason Centers, Senior Project Engineer	

Air-Interface	Band (MHz)	Type	C63.19/Tested	Simultaneous Transmissions Note: Not to be tested	Reduced Power 20.19(c)(1)	Voice over Digital Transport
GSM	850	Voice	Yes	Yes BT, WLAN	No	NA
	1900	Voice	Yes		No	
	GPRS/EDGE	Data	N/A	Yes BT, WLAN	No	Yes
WCDMA	850	Voice/Data	Yes	Yes BT, WLAN	No	Yes
	1900	Voice/Data	Yes		No	
CDMA	850	Voice/Data	Yes	Yes BT, WLAN	No	Yes
	1900	Voice/Data	Yes		No	
LTE	700 (Band 13)	Voice/Data	NA	Yes BT, WLAN	No	Yes
BT	2450	Data	NA	Yes GSM, GPRS/EDGE, WCDMA, LTE	No	No
WLAN	2450	Data	NA	Yes GSM, GPRS/EDGE, WCDMA, LTE	No	Yes

Note: this report only contains data for CDMA modes.

3.3 Sample Modification

No modifications were made to the test sample during this evaluation.

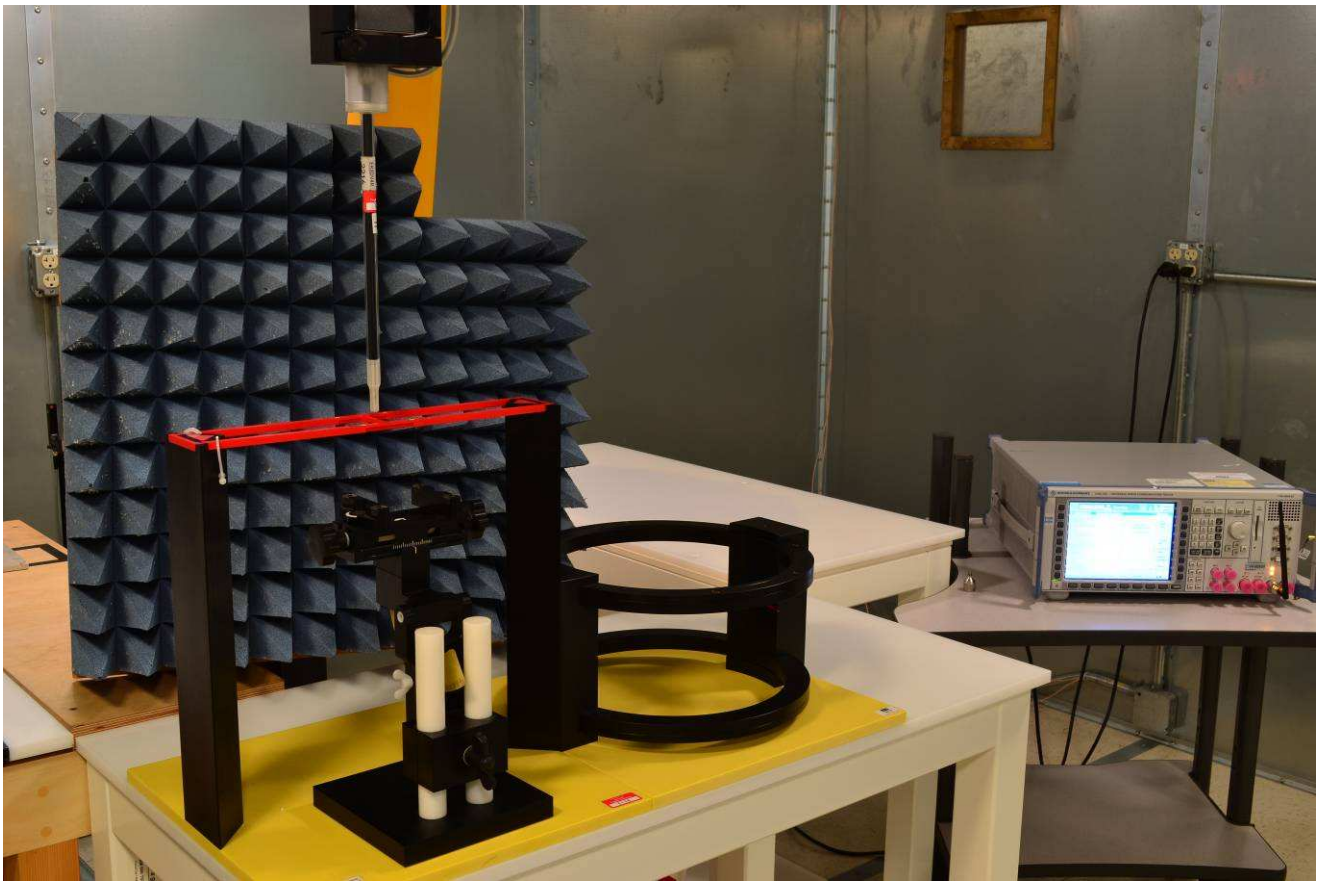
SECTION 4: TEST SITE DESCRIPTION

The Intertek HAC test site is located at 731 Enterprise Drive, Lexington, KY 40510, USA.

The HAC RF Setup is comprised of the SPEAG DASY 52 Hearing Aid Compatibility extension, which is used to measure electric and magnetic fields generated by wireless communication devices in the region controlled for use by a hearing aid in accordance with ANSI C63.19.

This system is installed in an ambient-free shielded chamber. During each day of testing, the ambient temperature was verified to be 23.0 $\pm 5^{O}$C.

Figure 1: Intertek HAC RF Test Site



SECTION 5: VALIDATION PROCEDURES

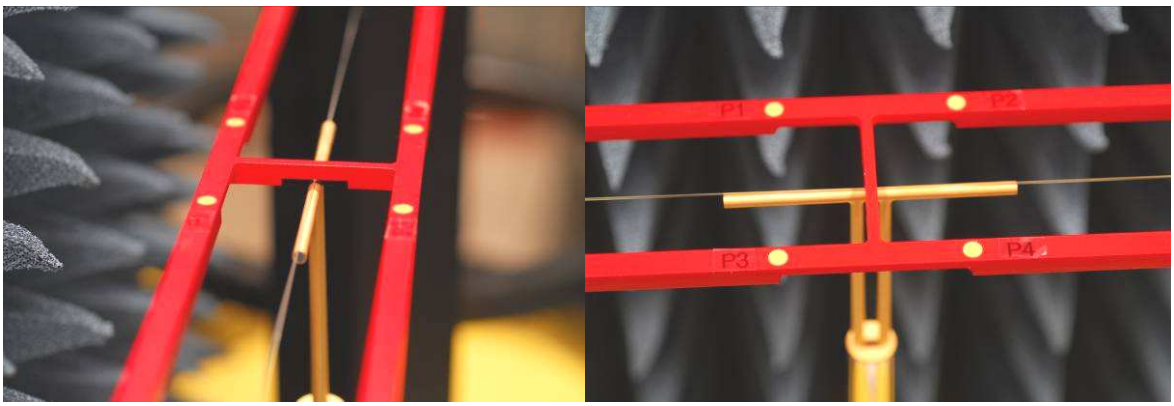
5.1 System Validation with Calibration Dipole

As part of the SPEAG HAC extension, calibration dipoles (CD835V3 and CD1880V3) are provided to validate the test setup prior to any measurements at the frequency of interest. The dipoles are calibrated to a known electric and magnetic field at a specified forward power.

A E or H field calibration was performed on each day prior to the start of testing to verify the correct operation of the setup.

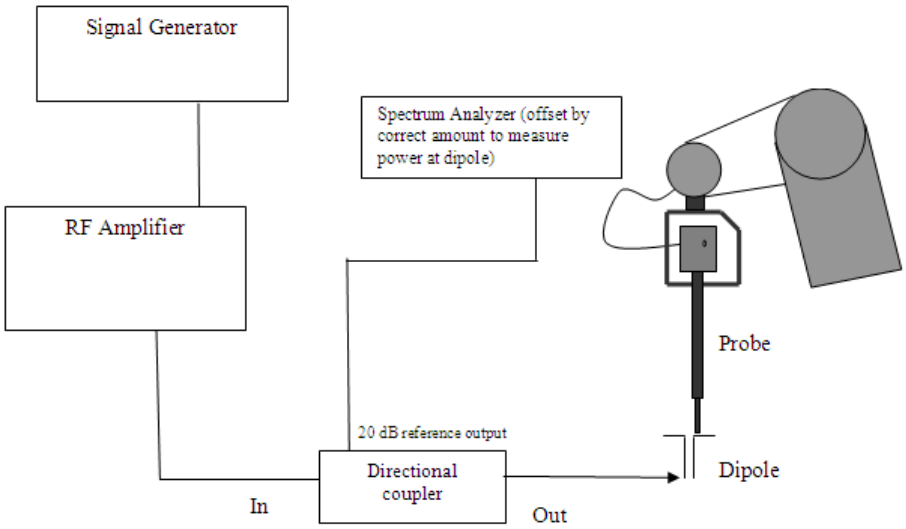
a. The appropriate SPEAG probe (ER3DV4R for E-Field, H3DV6 for H-field) was installed into the DAE.
b. The correct position of the HAC Test Arch's four reference points was verified using the DASY52 software.
c. The appropriate dipole (CD835V3 or CD1880V3) was selected, depending on the desired frequency range to be validated.
d. The calibration dipole was placed in the position that is normally occupied by the wireless device, as shown below.

Figure 2: Dipole Mounted under Test Arch



e. The test bed shown in Figure 3 was used to illuminate the CD835V3 or CD1880V3 validation dipole with 20 dBm (100 mW) of forward power. This is the same input power used during the manufacturer's calibration of the dipole. The CW input signal was set to the appropriate frequency.

Figure 3: Setup for Dipole Validation



f. The DASY52 profile was used to measure the maximum field strength along the length of the dipole arm. A separation distance of 10 mm was maintained between the **center** of the probe sensor and the **top** of the dipole. Note: This is how the manufacturer's dipole calibration was performed.

g. Once the scan was complete, the E-field and H-field results were verified to be within 10% of the calibration lab's result.

h. Dipole validation plots are shown in a appendix at the end of this report. Results from the most recent dipole validation are shown in Table 2 and Table 3.

Table 2: Dipole Validation Results – 835 MHz

CD835V3 Dipole Validation Results					
Date	**Input Power (mW) with f = 835 MHz**	**H-field (A/m)**	**H-field Deviation From Calibration (%)**	**Ave. Maximum E-field (V/m)**	**E-field Deviation From Calibration (%)**
7/31/2012	100	-	-	174.5	8.45
8/1/2012	100	0.482	6.64	-	-

Table 3: Dipole Validation Results – 1880 MHz

CD1880V3 Dipole Validation Results					
Date	**Input Power (mW) with f = 1880 MHz**	**H-field (A/m)**	**H-field Deviation From Calibration (%)**	**Ave. Maximum E-field (V/m)**	**E-field Deviation From Calibration (%)**
8/1/2012	100	0.462	1.28	-	-
8/2/2012	100	0.449	4.06	133.5	4.78

5.2 Probe Modulation Factor

ANSI C63.19 requires the measurement of the peak envelope E and H Fields of the wireless device. However, the SPEAG E-field free space probes (ER3DVx) and H-field probes (H3DVx) are calibrated for power averaged reading of un-modulated (CW) fields.

PMF is the linear ratio of the responses to fields produced by CW and modulated sources having equal peak amplitudes. Once the field measurements have been taken, the DASY52/SEMCAD software multiplies the user-derived PMF by the probe reading in order to determine the E and H Field Envelope Peak per ANSI C63.19.

PMF was determined as follows:

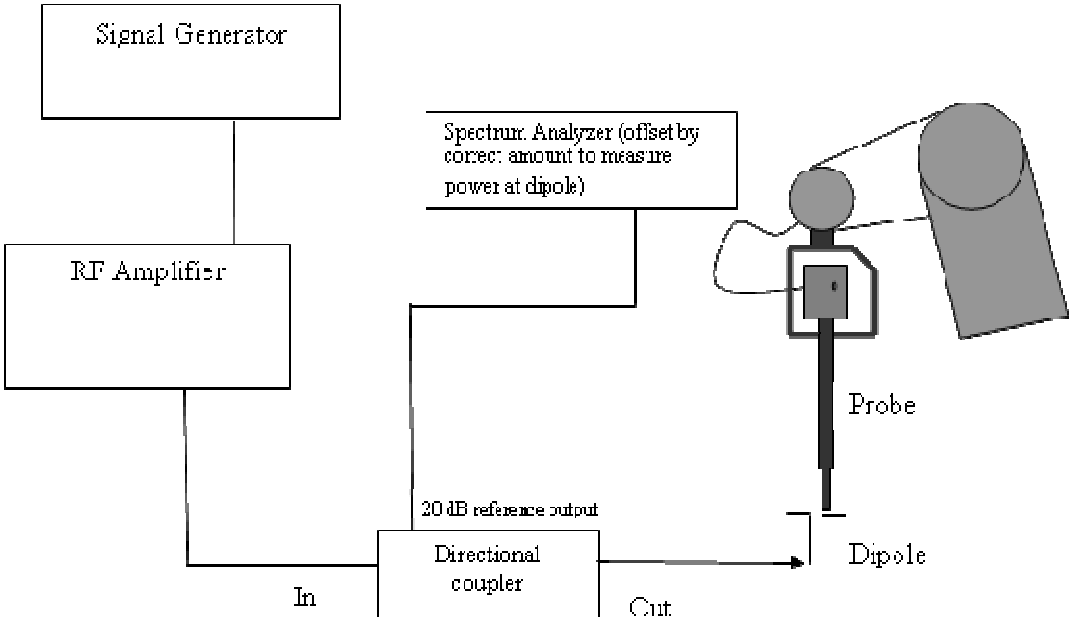
5.2.1 Initial Setup

a. The appropriate field probe was selected and installed in the DASY52 window setup.
b. The validation dipole, valid for the frequency range of interest, was installed under the HAC Test Arch. The probe was then moved manually to a point of field strength equal to M3 classification.
c. The following procedures compared the peak amplitudes of the modulated and CW signal. The same spectrum analyzer settings were maintained during both evaluations. The signal path (and setup geometry) between spectrum analyzer and probe were not changed during the evaluation of the PMF.

5.2.2 Measurement of Continuous Wave (CW) Signal

a. The test bed for CW source measurements was set up, as shown in Figure 4
b. The spectrum analyzer was set up as follows:
   • Center Frequency: nominal center frequency of channel
   • Span: zero
   • Resolution bandwidth >= emission bandwidth
   • Video bandwidth >= 20kHz
   • Detection: RMS detection
   • Trigger: Video or IF trigger, adjusted to give a stable display of the transmission
   • Sweep rate: Set to show a complete transmission cycle
c. An appropriate amplifier was used for the selected center frequency range.
d. The signal generator was set to transmit a CW signal at the required frequency. Modulation was turned off.
e. The CW signal amplitude was adjusted such that a range of field values were achieved in the DASY52 field display window.
f. The signal peak on the spectrum analyzer (i.e. power delivered to dipole) was recorded for each field value.

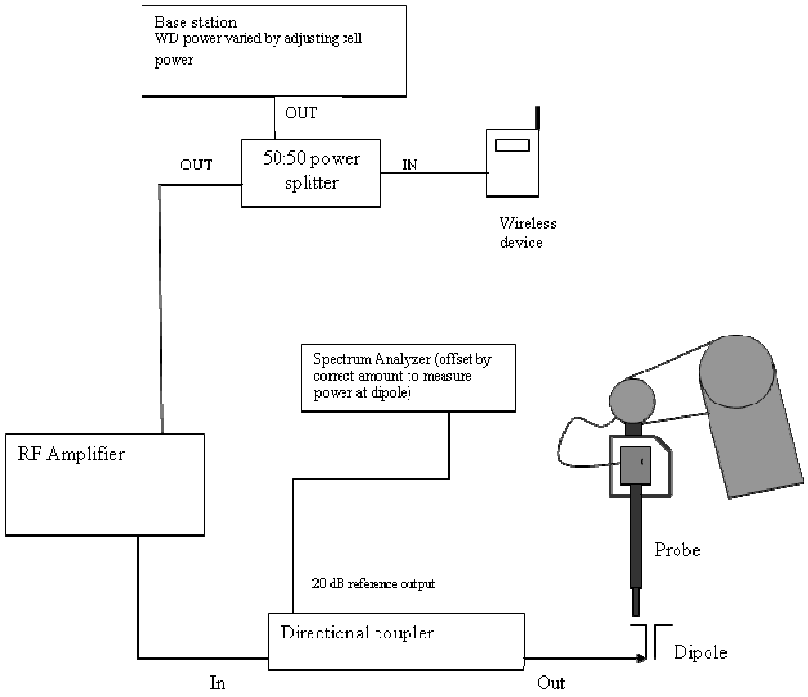
Figure 4: Setup to Deliver and Measure CW Power to Dipole



5.2.3 Measurement of Modulated Signal

a. The dipole, probe and spectrum analyzer were maintained in the same positions and settings as before.
b. The test bed for Modulated source measurements is shown in Figure 5. The modulation source was a wireless device (WD) or signal generator capable of generating the required modulations.
c. The modulated signal was adjusted to reach approximately the same peak spectrum analyzer readings as in CW mode.
d. The total field for the modulated signal (DASY52 Multimeter display) and peak envelope signal on the spectrum analyzer were recorded.

Figure 5: Setup to Deliver and Measure CW Power to Dipole



5.2.4 Calculation of Probe Modulation Factor

a. PMF was then calculated as follows:

$$PMF = \frac{MeasuredCWFieldStrength}{MeasuredModulatedFieldStrength}$$

b. The measured PMF Values are shown in Table 4.
c. Zero Span Plots of the PMF Calibration are shown in Section 15: at end of this repot.

Table 4: Probe Modulation Factors

Frequency (MHz)	Modulation	E-Field Probe SN:2216		H-Field Probe SN:6220	
		E-Field (V/m)	E-Field PMF Factor	H-Field (A/m)	H-Field PMF Factor
835	CW	272.1		0.8	
	80%AM	163.3	1.67	0.513	1.56
	GSM	97.9	2.78	0.3	2.74
	W-CDMA	235.1	1.16	0.796	1.01
	CDMA - 1/8 Rate	98.2	2.77	0.297	2.69
	CDMA	267.7	1.02	0.881	0.91
1730	CW	101.6		0.2412	
	80%AM	63.85	1.59	0.1571	1.54
	W-CDMA	85.5	1.19	0.2252	1.07
1880	CW	93.48		0.3034	
	80%AM	58.89	1.59	0.1949	1.56
	GSM	32.52	2.87	0.1065	2.85
	W-CDMA	77.98	1.20	0.266	1.14
	CDMA - 1/8 Rate	33.1	2.82	0.103	2.95
	CDMA	88.11	1.06	0.279	1.09

SECTION 6: MEASUREMENT PROCEDURES

Near-field E and H Field emissions measurements were taken by following the procedures outlined below. A complete evaluation was performed per the guidelines provided by ANSI C63.19.

6.1 ANSI Near-Field Categories

The procedures outlined in ANSI C63.19 for measuring near-field RF Emissions from a wireless device (WD) were followed. The test criteria (categories) to be met are stated in Table 7-4 of ANSI C63.19-2007 (see Table 5, below). This table was used to assign the wireless device's "M" rating based on the AWF shown in Table 6.

Table 5: ANSI Near-Field Categories in Linear Units

Category		Telephone RF parameters < 960 MHz			
Near field	AWF	E-field emissions		H-field emissions	
Category M1/T1	0	631.0 to 1122.0	V/m	1.91 to 3.39	A/m
	–5	473.2 to 841.4	V/m	1.43 to 2.54	A/m
Category M2/T2	0	354.8 to 631.0	V/m	1.07 to 1.91	A/m
	–5	266.1 to 473.2	V/m	0.80 to 1.43	A/m
Category M3/T3	0	199.5 to 354.8	V/m	0.60 to 1.07	A/m
	–5	149.6 to 266.1	V/m	0.45 to 0.80	A/m
Category M4/T4	0	< 199.5	V/m	< 0.60	A/m
	–5	< 149.6	V/m	< 0.45	A/m

Category		Telephone RF parameters > 960 MHz			
Near field	AWF	E-field emissions		H-field emissions	
Category M1/T1	0	199.5 to 354.8	V/m	0.60 to 1.07	A/m
	–5	149.6 to 266.1	V/m	0.45 to 0.80	A/m
Category M2/T2	0	112.2 to 199.5	V/m	0.34 to 0.60	A/m
	–5	84.1 to 149.6	V/m	0.25 to 0.45	A/m
Category M3/T3	0	63.1 to 112.2	V/m	0.19 to 0.34	A/m
	–5	47.3 to 84.1	V/m	0.14 to 0.25	A/m
Category M4/T4	0	< 63.1	V/m	< 0.19	A/m
	–5	< 47.3	V/m	< 0.14	A/m

Table 6: Articulation Weighting Factor

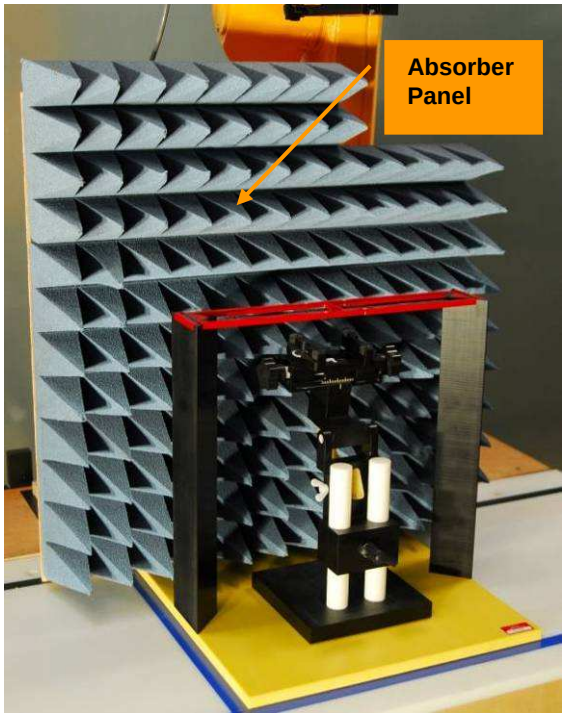
Standard	Technology	AWF (dB)
TIA/EIA/IS-2000	CDMA	0
TIA/EIA-136	TDMA (50 Hz)	0
J-STD-007	GSM (217)	–5
T1/T1P1/3GPP	UMTS (WCDMA)	0
iDEN	TDMA (22 Hz and 11 Hz)	0

6.2 Wireless Device – Positioning and Call Setup

6.2.1 Device Positioning

a. The DASY52 HAC RF test arch was installed on the phantom cover.
b. A foam absorber panel, shown in Figure 6, was placed between the robot and the test arch in order to mitigate RF reflections from the robot during E-Field measurements.

Figure 6: Absorber Panel

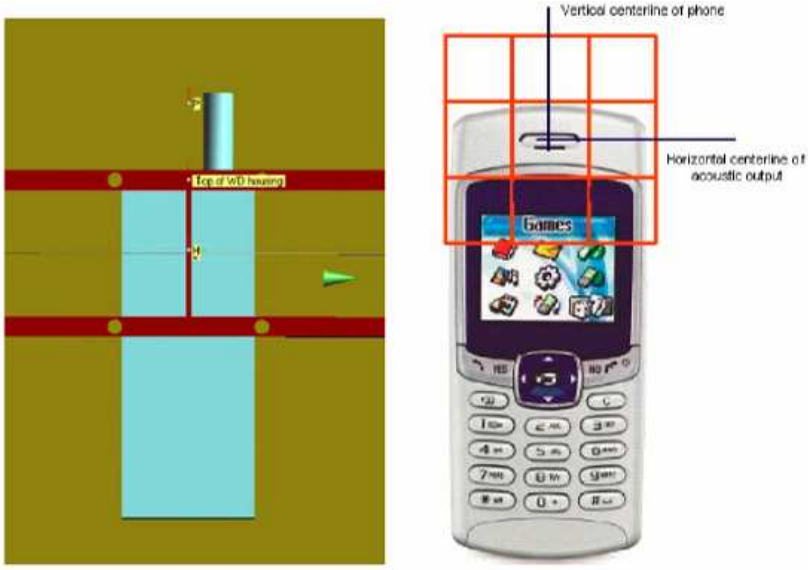


c. The correct position of the test arch was verified by moving the free-space probe to its 4 reference points using the DASY52 software. If any variations were seen, the reference points were re-taught.
d. The wireless device was mounted in the device holder shown in Figure 7.

Figure 7: Device Holder

e. The wireless device was then centered under the test arch as shown in Figure 8. The acoustic output (or T-Coil location, as required) of the WD coincided with the center point of the area formed by the dielectric wire and the middle bar of the arch's top frame.

Figure 8: Centering the WD under the Test Arch



f. The reference plane of the wireless device was then positioned as follows: After the phone was centered, it was adjusted until the reference plane was parallel to, and touching the bottom of the test arch. The reference plane is the planar area that contains the highest point in the area of the WD that normally rests against the user's ear. The measurement plane is 15 mm parallel to, and above the reference plane, and is measured to the center of the probe sensor per ANSI C63.19-2007.

6.3 Wireless Device (WD) Call Procedure

a. A fully charged battery was installed in the phone.
b. The WD was placed into a call using a base station simulator.
c. The WD was configured for normal operation at maximum rated output power.
d. Since the presence of wires or conductors close to the WD will disturb the RF field, the WD was operated under its own power source, with no external connections unless specifically required by the manufacturer for normal operation.

6.4 Near-Field RF Emissions Procedure

6.4.1 RF Scans

a. All system parameters in the DASY52 software (phantom section, communication system, crest factor, type of probe, etc) were verified to be correct.
b. The Phantom adjustment and Verification steps were run to guarantee the proper placement and separation of the test arch in relation to the RF probe.
c. The scan height of the free-space probe was verified. Different gauge blocks were used to verify the gap between the probe and the top of the test arch. This guaranteed a proper 15 mm separation between the device reference plane and the probe's measurement plane.
d. The Hearing Aid Compatibility test was then run. A 5 cm x 5 cm area, divided into 9 sub-grids and centered on the device acoustic (or T-coil) output was evaluated with a 5 mm resolution (step size).
e. The HAC procedure calculates power drift from the field strength at a reference point before and after each scan. If the power drift was greater than ± 0.20 dB, then the scan was repeated.

6.5 Interpretation and Post-Processing of Data

a. The "M" rating of the wireless device was determined once a complete set of E-field scans and corresponding H-field scans for the same scan area and WD test modes was collected.
b. Per ANSI C63.19, three contiguous blocks containing the highest field values may be excluded from either the E or H-field scans, but not to exceed 5 in total. The center sub-grid cannot be excluded. Therefore, 4 blocks will be common to both measurements.
c. The SEMCAD post-processor uses the pre-determined PMF values to convert the average probe readings to peak field readings.
d. The center of the 5 cm x 5 cm grid plus 3 other blocks that are common to the E and H-field scans were selected, per the ANSI standard.
e. The "M" rating for the scan was assigned based on the criteria shown in Table 5 and Table 6.

SECTION 7: TABULAR TEST DATA

7.1 Conducted Output Power

The conducted output power of the RM-845 was measured and summarized in Table 7. Conducted power measurements were taken with an base station simulator. Cable loss was accounted for within the test set by offsetting the readings by the appropriate amounts. Readings were taken at the RF port that was present on the RM-845's internal radio.

Table 7: Conducted Output Power - CDMA

Band	Channel	Frequency (MHz)	Avg Power (dBm)				
			RC1/SO2	RC1/SO55	RC1/SO3	RC3/SO2	RC3/SO55
Cellular	1013	824.7	23.41	23.36	23.36	23.37	23.37
	384	836.52	23.4	23.36	23.37	23.36	23.31
	777	848.31	23.42	23.39	23.46	23.36	23.36
PCS	25	1851.25	23.22	23.12	23.01	22.9	22.91
	600	1880	23.05	23.02	23.04	22.99	23
	1175	1908.75	23	22.98	23.1	23.05	22.11

SECTION 8: RF EMISSIONS TEST DATA

The results in the tables below summarize the data obtained when the device was tested in the operating conditions described previously. Detailed measurement data and plots are shown in Section 13: of this report.

Table 8: E-Field Test Data

E-Field Emissions Data									
Band	**Call Mode**	**Channel**	**Backlight**	**Measurement Plane Center (Acoustic/T-Coil)**	**Modulation Factor**	**Drift (dB)**	**Excluded Cells**	**Peak E-Field (V/m)**	**M-Rating**
CDMA Cell	Full Rate	1013	On	Accoustic	1.02	-0.06	None	59.8	M4
CDMA Cell	Full Rate	384	On	Accoustic	1.02	0.09	None	65.5	M4
CDMA Cell	Full Rate	777	On	Accoustic	2.77	-0.02	None	61.94	M4
CDMA Cell	1/8th Rate	1013	On	Accoustic	2.77	0.06	None	66.7	M4
CDMA Cell	1/8th Rate	384	On	Accoustic	2.77	0.11	None	73.1	M4
CDMA Cell	1/8th Rate	777	On	Accoustic	2.77	0.11	None	64.4	M4
CDMA PCS	Full Rate	25	On	Accoustic	1.06	-0.18	None	54.1	M4
CDMA PCS	Full Rate	600	On	Accoustic	1.06	-0.05	None	50.7	M4
CDMA PCS	Full Rate	1175	On	Accoustic	1.06	-0.07	None	49.3	M4
CDMA PCS	1/8th Rate	25	On	Accoustic	2.82	-0.1	None	54.2	M4
CDMA PCS	1/8th Rate	600	On	Accoustic	2.82	-0.16	None	52.5	M4
CDMA PCS	1/8th Rate	1175	On	Accoustic	2.82	-0.09	None	52.6	M4
								Overall E-Field M Rating	M4

Table 9: H-Field Test Data

H-Field Emissions Data									
Band	Call Mode	Channel	Backlight	Measurement Plane Center (Accoustic /T-Coil)	Modulation Factor	Drift (dB)	Excluded Cells	Peak H-Field (A/m)	M-Rating
CDMA Cell	Full Rate	1013	On	Accoustic	0.91	0.01	None	0.144	M4
CDMA Cell	Full Rate	384	On	Accoustic	0.91	0.04	None	0.166	M4
CDMA Cell	Full Rate	777	On	Accoustic	0.91	-0.17	None	0.167	M4
CDMA Cell	1/8th Rate	1013	On	Accoustic	2.69	-0.13	None	0.13	M4
CDMA Cell	1/8th Rate	384	On	Accoustic	2.69	0.09	None	0.156	M4
CDMA Cell	1/8th Rate	777	On	Accoustic	2.69	0.04	None	0.157	M4
CDMA PCS	Full Rate	25	On	Accoustic	1.09	0.13	None	0.137	M4
CDMA PCS	Full Rate	600	On	Accoustic	1.09	0.09	None	0.143	M4
CDMA PCS	Full Rate	1175	On	Accoustic	1.09	0.18	None	0.147	M4
CDMA PCS	1/8th Rate	25	On	Accoustic	2.95	0.15	None	0.141	M4
CDMA PCS	1/8th Rate	600	On	Accoustic	2.95	0.11	None	0.166	M4
CDMA PCS	1/8th Rate	1175	On	Accoustic	2.95	-0.08	None	0.184	M4
								Overall H-Field M Rating	M4

SECTION 9: TEST EQUIPMENT

The following major equipment/components were used for the HAC RF evaluation:

9.1 HAC RF Measurement System

Table 10: HAC Measurement Equipment

Model	Manufacturer	Type of Equipment	Serial Number	Calibration Due
RX-90	Stäubli	Robot	F11/5H1YA/A/01	N/A
ER3DV4R	SPEAG	Free-space E-field probe	2216	9/16/2012
H3DV6	SPEAG	Free-space H-field probe	6220	9/19/2012
CD835V3	SPEAG	Validation Dipole	1049	9/20/2012
CD1880V3	SPEAG	Validation Dipole	1042	9/20/2012
DAE4	SPEAG	Data Acquisition Electronics	258	9/15/2012
SD HC P01BA	SPEAG	HAC RF Test Arch	1046	N/A

9.2 Support Equipment

Table 11: Test Support Equipment

Model	Manufacturer	Type of Equipment	Serial Number	Calibration Date	Calibration Due
CMU200	Rohde and Schwarz	Wireless Communications Test Set	119978	6/29/2012	6/29/2013
8960	Agilent	Wireless Communications Test Set	G843344835	3/20/2012	3/20/2013
ZHL-4240	Mini-Circuits	Amplifier	012012	Time of Use	Time of Use
DSG-D3000A	Agilent	Signal Generator	US37040988	3/20/2012	3/20/2013
8651A	Gigatronics	Power Meter	8650456	6/29/2012	6/29/2013
80701A	Gigatronics	Power Sensor	1834169	6/29/2012	6/29/2013
NRP-Z51	Rohde and Schwarz	Thermal Power Sensor	100705	9/9/2011	9/9/2012

SECTION 10: MEASUREMENT UNCERTAINTY

10.1 Equipment Uncertainty

Table 12 shows the uncertainty budget provided by SPEAG for the HAC RF extension. The budget is valid for the frequency range 800 MHz – 3 GHz and represents a worst-case analysis.

Table 12: SPEAG HAC Uncertainty Budget

Error Description	Uncertainty Value	Prob. Dist.	Div.	(c_i) E	(c_i) H	Std.Unc. E	Std.Unc. H
Measurement System							
Probe Calibration	±5.1%	N	1	1	1	±5.1%	±6.55%
Axial Isotropy	±4.7%	R	√3	1	1	±2.7%	±2.7%
Sensor Displacement	±16.5%	R	√3	1	0.145	±9.5%	±1.4%
Boundary Effects	±2.4%	R	√3	1	1	±1.4%	±1.4%
Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%
Scaling to Peak Envelope Power	±2.0%	R	√3	1	1	±1.2%	±1.2%
System Detection Limit	±1.0%	R	√3	1	1	±0.6%	±0.6%
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%
Response Time	±0.8%	R	√3	1	1	±0.5%	±0.5%
Integration Time	±2.6%	R	√3	1	1	±1.5%	±1.5%
RF Ambient Conditions	±6.0%	R	√3	1	1	±1.7%	±1.7%
RF Reflections	±8.4%	R	√3	1	1	±4.9%	±4.9%
Probe Positioner	±1.2%	R	√3	1	0.67	±0.7%	±0.5%
Probe Positioning	±4.7%	R	√3	1	1	±0.6%	±0.6%
Test Sample Related							
Device Positioning Vertical	±3.9%	R	√3	1	0.67	±2.7%	±1.8%
Device Positioning Lateral	±1.0%	R	√3	1	1	±0.6%	±0.6%
Device Holder & Test Arch	±2.4%	R	√3	1	1	±1.4%	±1.4%
Power Drift	±5.0%	R	√3	1	1	±2.9%	±2.9%
Phantom And Setup Related							
Test Arch Thickness	±2.5%	R	√3	1	0.67	±1.4%	±0.9%
					Combined Standard Uncertainty	13.5%	10.3%
					Expanded Std. Uncertainty On Power	27%	20.3%
					Expanded Std. Uncertainty on Field	13.5%	10.3%

SECTION 11: DOCUMENT HISTORY

Revision/ Project Number	Writer Initials	Date	Change
1.0 /G100835064	JC	8/10/12	Original document

SECTION 12: REFERENCES

[1] *ANSI/IEEE C63.19-2007: American National Standard Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.*

[2] *SPEAG DASY5 V5.2 User Manual, August 2010*

SECTION 13: HAC RF EMISSIONS TEST PLOTS

Date/Time: 7/31/2012 2:34:49 PM

Test Laboratory: Intertek

HAC RF Cell Band CDMA

DUT: Nokia RM-845; Type: Candybar; Serial: 30612

Communication System: Generic CDMA; Communication System Band: CDMA Cell Band; Frequency: 836.52 MHz;Communication System PAR: 0 dB; PMF:
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

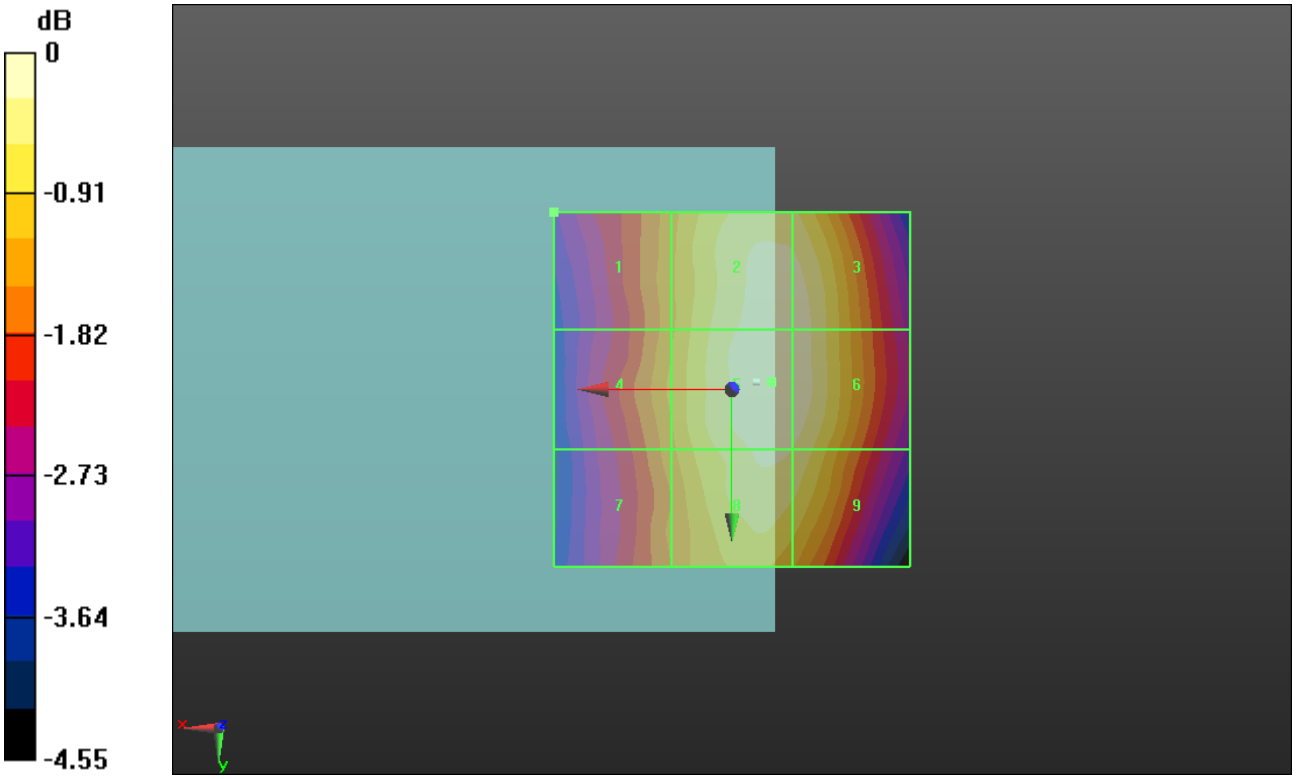
- Probe: ER3DV4R - SN2216; ConvF(1, 1, 1); Calibrated: 9/16/2011;
- Sensor-Surface: (Fix Surface), z = 8.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

CDMA Device E-Field measurement (E-field scan for ANSI C63.19-2007 & -2011 compliance)/E Scan - ER3D: 15 mm from Probe Center to the Device - Mid Channel/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 79.32 V/m; Power Drift = 0.09 dB
PMR not calibrated. PMF = 1.000 is applied.
E-field emissions = 65.54 V/m
Near-field category: M4 (AWF 0 dB)

PMF scaled E-field

Grid 1 **M4** **56.71 V/m**	Grid 2 **M4** **64.84 V/m**	Grid 3 **M4** **64.81 V/m**
Grid 4 **M4** **57.57 V/m**	Grid 5 **M4** **65.54 V/m**	Grid 6 **M4** **65.21 V/m**
Grid 7 **M4** **56.45 V/m**	Grid 8 **M4** **63.93 V/m**	Grid 9 **M4** **63.26 V/m**

Cursor:
Total = 45.91 V/m
E Category: M4
Location: 25, -25, 8.7 mm



0 dB = 65.54 V/m = 36.33 dB V/m

Date/Time: 8/1/2012 11:19:06 AM

Test Laboratory: Intertek

HAC RF Cell Band CDMA

DUT: Nokia RM-845; Type: Candybar; Serial: 30612

Communication System: Generic CDMA; Communication System Band: CDMA Cell Band; Frequency: 836.52 MHz;Communication System PAR: 0 dB; PMF:
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

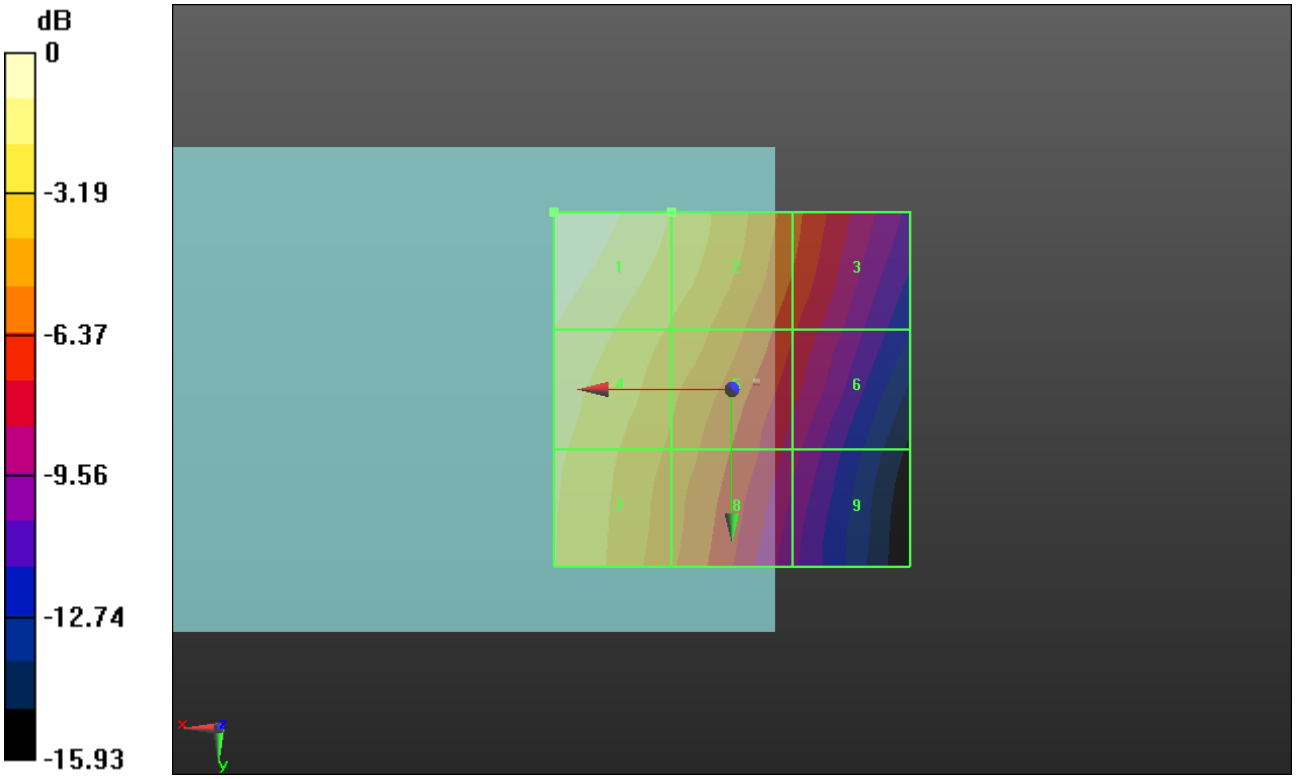
- Probe: H3DV6 - SN6220; ; Calibrated: 9/19/2011
- Sensor-Surface: (Fix Surface), z = 8.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

CDMA Device H-Field measurement with H3DV6 probe (H-field scan for ANSI C63.19-2007 compliance)/H Scan - H3DV6: 15 mm from Probe Center to the Device - Mid Channel/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.09100 A/m; Power Drift = 0.04 dB
PMR not calibrated. PMF = 1.000 is applied.
H-field emissions = 0.1659 A/m
Near-field category: M4 (AWF 0 dB)

PMF scaled H-field

Grid 1 **M4** **0.166 A/m**	Grid 2 **M4** **0.129 A/m**	Grid 3 **M4** **0.084 A/m**
Grid 4 **M4** **0.147 A/m**	Grid 5 **M4** **0.114 A/m**	Grid 6 **M4** **0.072 A/m**
Grid 7 **M4** **0.133 A/m**	Grid 8 **M4** **0.099 A/m**	Grid 9 **M4** **0.059 A/m**

Cursor:
Total = 0.1658 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.1658 A/m = -15.61 dB A/m

Date/Time: 7/31/2012 3:56:29 PM

Test Laboratory: Intertek

HAC RF Cell Band CDMA RC1 SO3

DUT: Nokia RM-845; Type: Candybar; Serial: 30612

Communication System: Generic CDMA RC1_SO3; Communication System Band: Cell Band; Frequency: 836.52 MHz;Communication System PAR: 9.04 dB; PMF: 2.83139
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

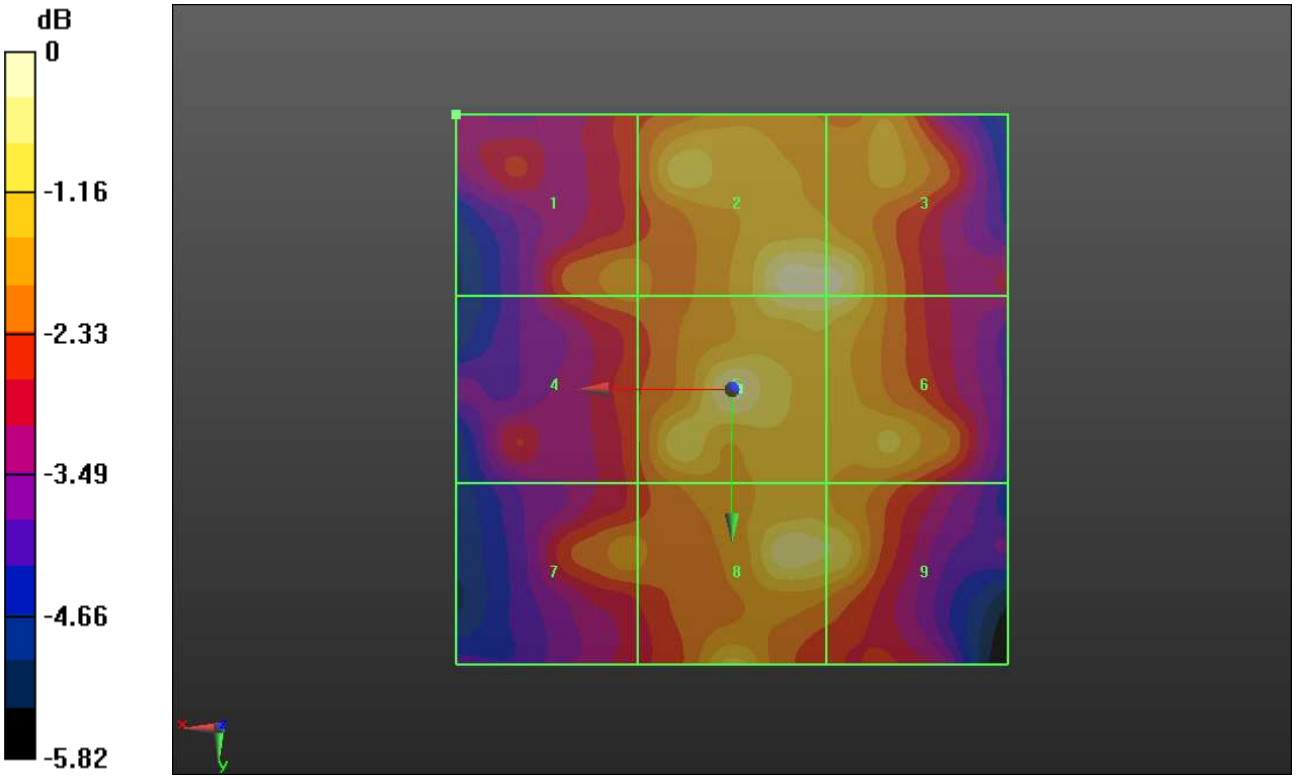
- Probe: ER3DV4R - SN2216; ConvF(1, 1, 1); Calibrated: 9/16/2011;
- Sensor-Surface: (Fix Surface), z = 8.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

CDMA Device E-Field measurement (E-field scan for ANSI C63.19-2007 & -2011 compliance)/E Scan - ER3D: 15 mm from Probe Center to the Device - Mid Channel/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 28.22 V/m; Power Drift = 0.11 dB
PMR not calibrated. PMF = 2.770 is applied.
E-field emissions = 73.08 V/m
Near-field category: M4 (AWF 0 dB)

PMF scaled E-field

Grid 1 **M4** **62.41 V/m**	Grid 2 **M4** **73.08 V/m**	Grid 3 **M4** **72.55 V/m**
Grid 4 **M4** **60.91 V/m**	Grid 5 **M4** **72.15 V/m**	Grid 6 **M4** **71.28 V/m**
Grid 7 **M4** **61.51 V/m**	Grid 8 **M4** **70.52 V/m**	Grid 9 **M4** **68.72 V/m**

Cursor:
Total = 50.76 V/m
E Category: M4
Location: 25, -25, 8.7 mm



0 dB = 74.70 V/m = 37.47 dB V/m

Date/Time: 8/1/2012 11:45:46 AM

Test Laboratory: Intertek

HAC RF Cell Band CDMA RC1 SO3

DUT: Nokia RM-845; Type: Candybar; Serial: 30612

Communication System: Generic CDMA RC1_SO3; Communication System Band: Cell Band; Frequency: 836.52 MHz;Communication System PAR: 9.04 dB; PMF: 2.83139
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

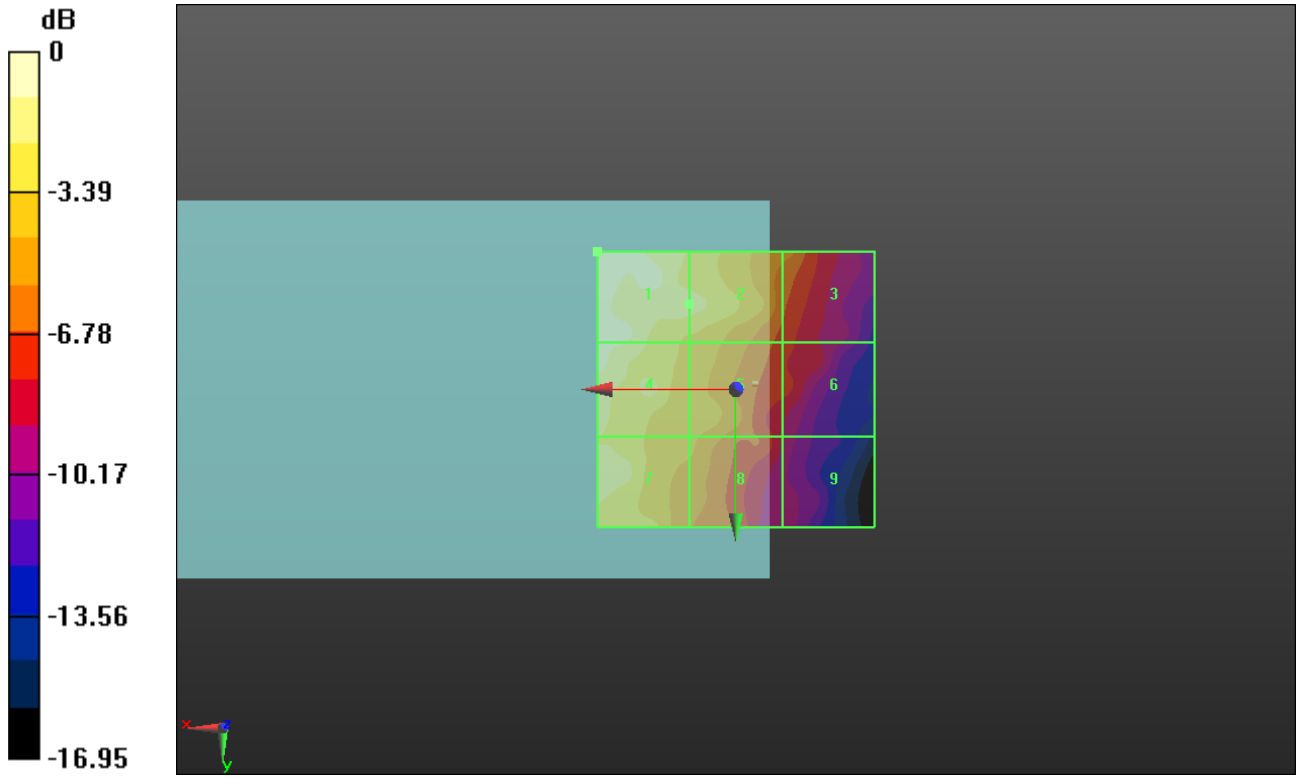
- Probe: H3DV6 - SN6220; ; Calibrated: 9/19/2011
- Sensor-Surface: (Fix Surface), z = 8.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

CDMA Device H-Field measurement with H3DV6 probe (H-field scan for ANSI C63.19-2007 compliance)/H Scan - H3DV6: 15 mm from Probe Center to the Device - Mid Channel/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.03200 A/m; Power Drift = 0.09 dB
PMR not calibrated. PMF = 2.770 is applied.
H-field emissions = 0.1603 A/m
Near-field category: M4 (AWF 0 dB)

PMF scaled H-field

Grid 1 **M4** **0.160 A/m**	Grid 2 **M4** **0.133 A/m**	Grid 3 **M4** **0.092 A/m**
Grid 4 **M4** **0.155 A/m**	Grid 5 **M4** **0.109 A/m**	Grid 6 **M4** **0.071 A/m**
Grid 7 **M4** **0.143 A/m**	Grid 8 **M4** **0.105 A/m**	Grid 9 **M4** **0.057 A/m**

Cursor:
Total = 0.1603 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.1639 A/m = -15.71 dB A/m

Date/Time: 8/2/2012 11:41:59 AM

Test Laboratory: Intertek

HAC RF PCS Band CDMA

DUT: Nokia RM-845; Type: Candybar; Serial: 30612

Communication System: Generic CDMA; Communication System Band: CDMA PCS Band; Frequency: 1880 MHz;Communication System PAR: 0 dB; PMF:
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

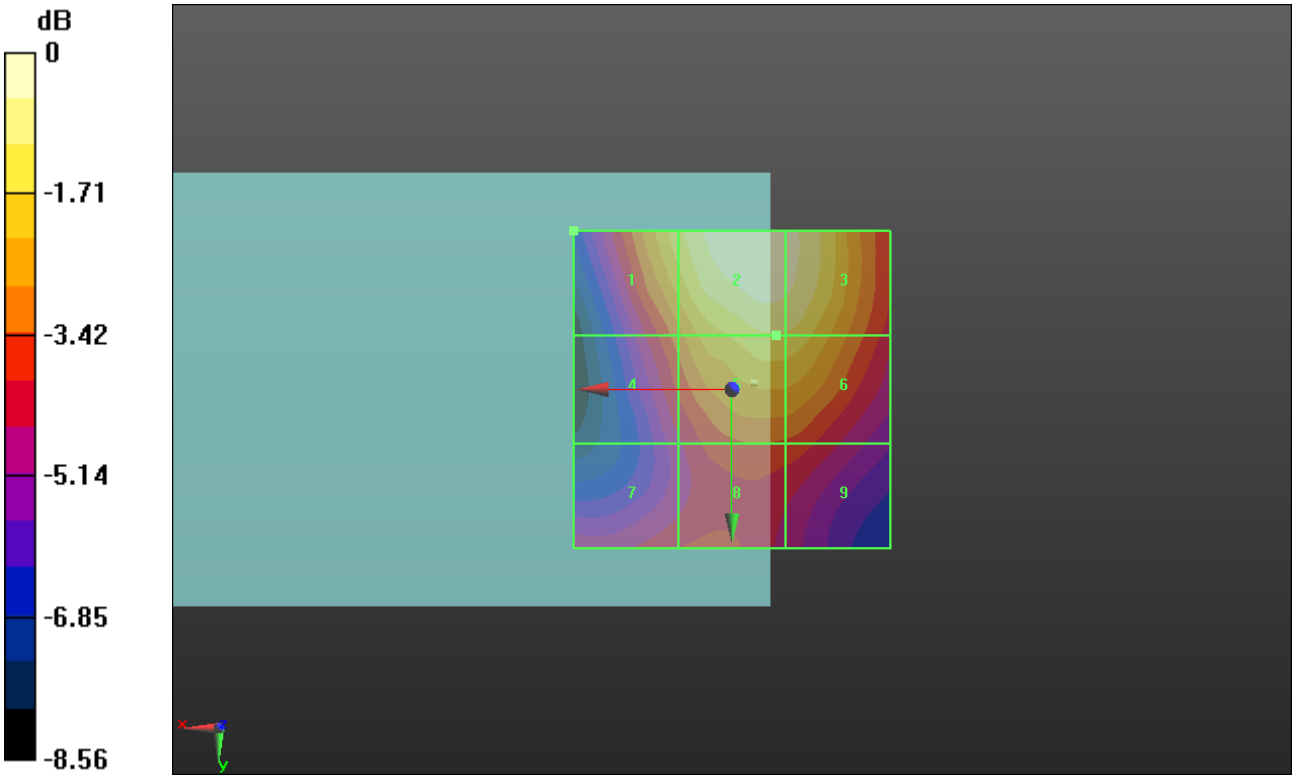
- Probe: ER3DV4R - SN2216; ConvF(1, 1, 1); Calibrated: 9/16/2011;
- Sensor-Surface: (Fix Surface), z = 8.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

CDMA Device E-Field measurement (E-field scan for ANSI C63.19-2007 & -2011 compliance)/E Scan - ER3D: 15 mm from Probe Center to the Device - Mid Channel/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 47.19 V/m; Power Drift = -0.05 dB
PMR not calibrated. PMF = 1.000 is applied.
E-field emissions = 50.66 V/m
Near-field category: M4 (AWF 0 dB)

PMF scaled E-field

Grid 1 **M4** **43.54 V/m**	Grid 2 **M4** **50.66 V/m**	Grid 3 **M4** **49.08 V/m**
Grid 4 **M4** **35.60 V/m**	Grid 5 **M4** **44.22 V/m**	Grid 6 **M4** **44.09 V/m**
Grid 7 **M4** **31.92 V/m**	Grid 8 **M4** **34.18 V/m**	Grid 9 **M4** **33.81 V/m**

Cursor:
Total = 23.58 V/m
E Category: M4
Location: 25, -25, 8.7 mm



0 dB = 50.66 V/m = 34.09 dB V/m

Date/Time: 8/1/2012 3:42:13 PM

Test Laboratory: Intertek

HAC RF PCS Band CDMA

DUT: Nokia RM-845; Type: Candybar; Serial: 30612

Communication System: Generic CDMA; Communication System Band: CDMA PCS Band; Frequency: 1880 MHz;Communication System PAR: 0 dB; PMF:
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 0 kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

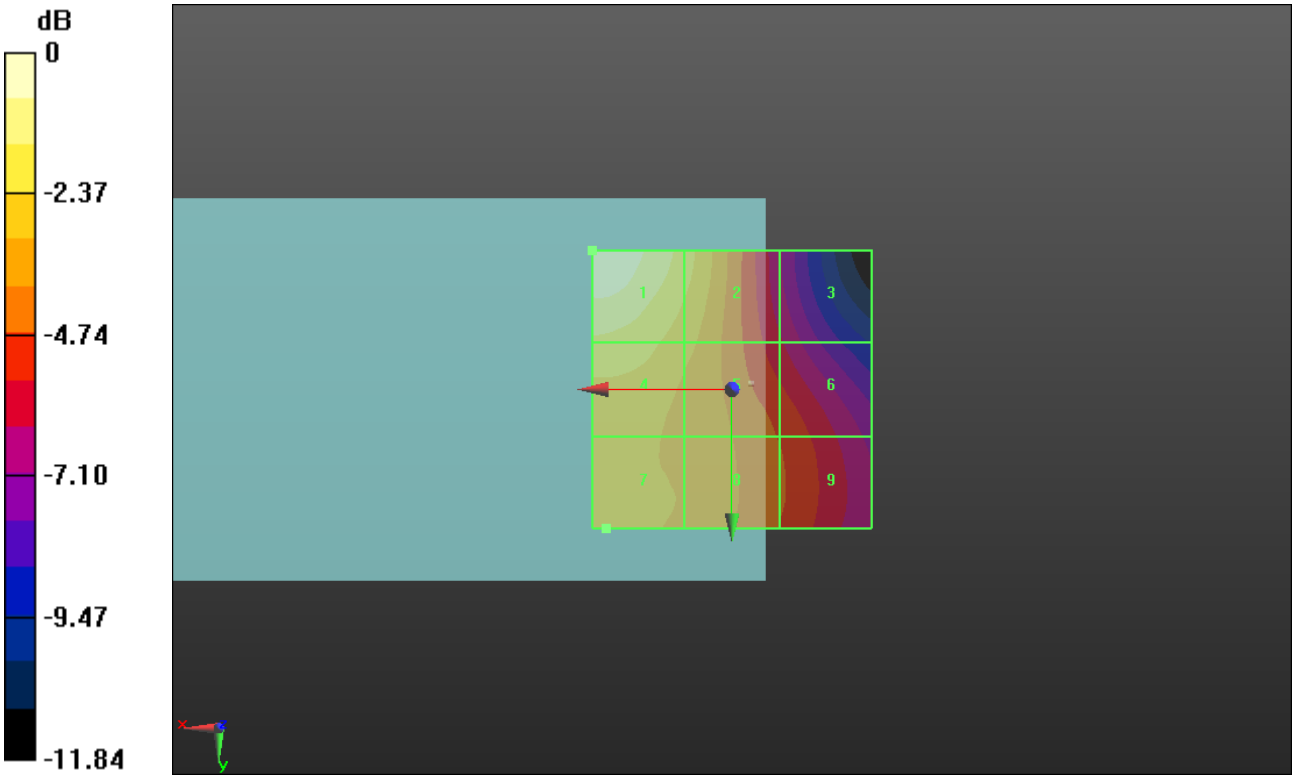
- Probe: H3DV6 - SN6220; ; Calibrated: 9/19/2011
- Sensor-Surface: (Fix Surface), z = 8.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

CDMA Device H-Field measurement with H3DV6 probe (H-field scan for ANSI C63.19-2007 compliance)/H Scan - H3DV6: 15 mm from Probe Center to the Device - Mid Channel/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.09600 A/m; Power Drift = 0.09 dB
PMR not calibrated. PMF = 1.000 is applied.
H-field emissions = 0.1434 A/m
Near-field category: M4 (AWF 0 dB)

PMF scaled H-field

Grid 1 **M4** **0.143 A/m**	Grid 2 **M4** **0.115 A/m**	Grid 3 **M4** **0.071 A/m**
Grid 4 **M4** **0.118 A/m**	Grid 5 **M4** **0.103 A/m**	Grid 6 **M4** **0.083 A/m**
Grid 7 **M4** **0.104 A/m**	Grid 8 **M4** **0.099 A/m**	Grid 9 **M4** **0.084 A/m**

Cursor:
Total = 0.1434 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.1434 A/m = -16.87 dB A/m

Date/Time: 7/31/2012 3:12:56 PM

Test Laboratory: Intertek

HAC RF Cell Band CDMA RC1 SO3

DUT: Nokia RM-845; Type: Candybar; Serial: 30612

Communication System: Generic CDMA RC1_SO3; Communication System Band: Cell Band; Frequency: 824.7 MHz;Communication System PAR: 9.04 dB; PMF: 2.83139
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

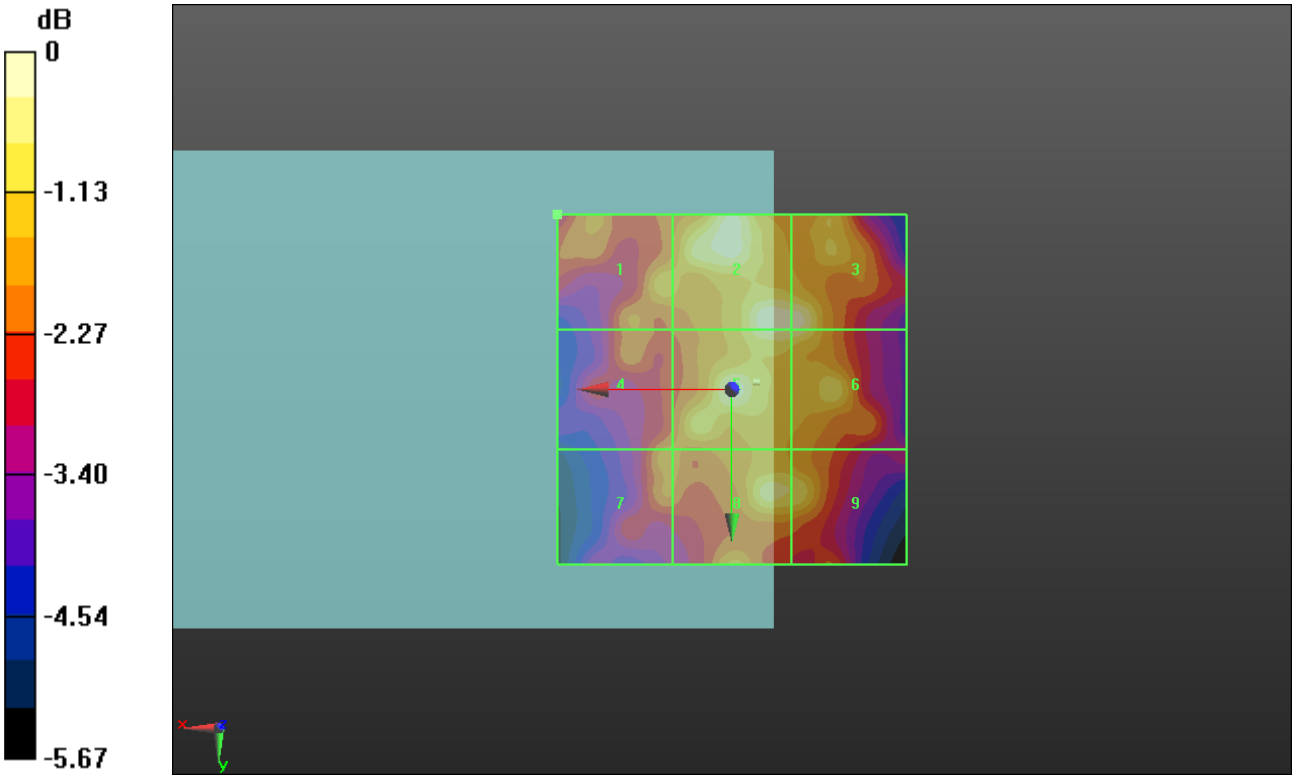
- Probe: ER3DV4R - SN2216; ConvF(1, 1, 1); Calibrated: 9/16/2011;
- Sensor-Surface: (Fix Surface), z = 8.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

CDMA Device E-Field measurement (E-field scan for ANSI C63.19-2007 & -2011 compliance)/E Scan - ER3D: 15 mm from Probe Center to the Device - Low Channel/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 25.76 V/m; Power Drift = 0.06 dB
PMR not calibrated. PMF = 2.820 is applied.
E-field emissions = 67.90 V/m
Near-field category: M4 (AWF 0 dB)

PMF scaled E-field

Grid 1 **M4** **59.90 V/m**	Grid 2 **M4** **67.90 V/m**	Grid 3 **M4** **66.64 V/m**
Grid 4 **M4** **55.68 V/m**	Grid 5 **M4** **67.21 V/m**	Grid 6 **M4** **65.28 V/m**
Grid 7 **M4** **56.79 V/m**	Grid 8 **M4** **63.92 V/m**	Grid 9 **M4** **62.46 V/m**

Cursor:
Total = 46.91 V/m
E Category: M4
Location: 25, -25, 8.7 mm



0 dB = 68.17 V/m = 36.67 dB V/m

Date/Time: 8/1/2012 11:40:24 AM

Test Laboratory: Intertek

HAC RF Cell Band CDMA RC1 SO3

DUT: Nokia RM-845; Type: Candybar; Serial: 30612

Communication System: Generic CDMA RC1_SO3; Communication System Band: Cell Band; Frequency: 824.7 MHz;Communication System PAR: 9.04 dB; PMF: 2.83139
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 0 kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

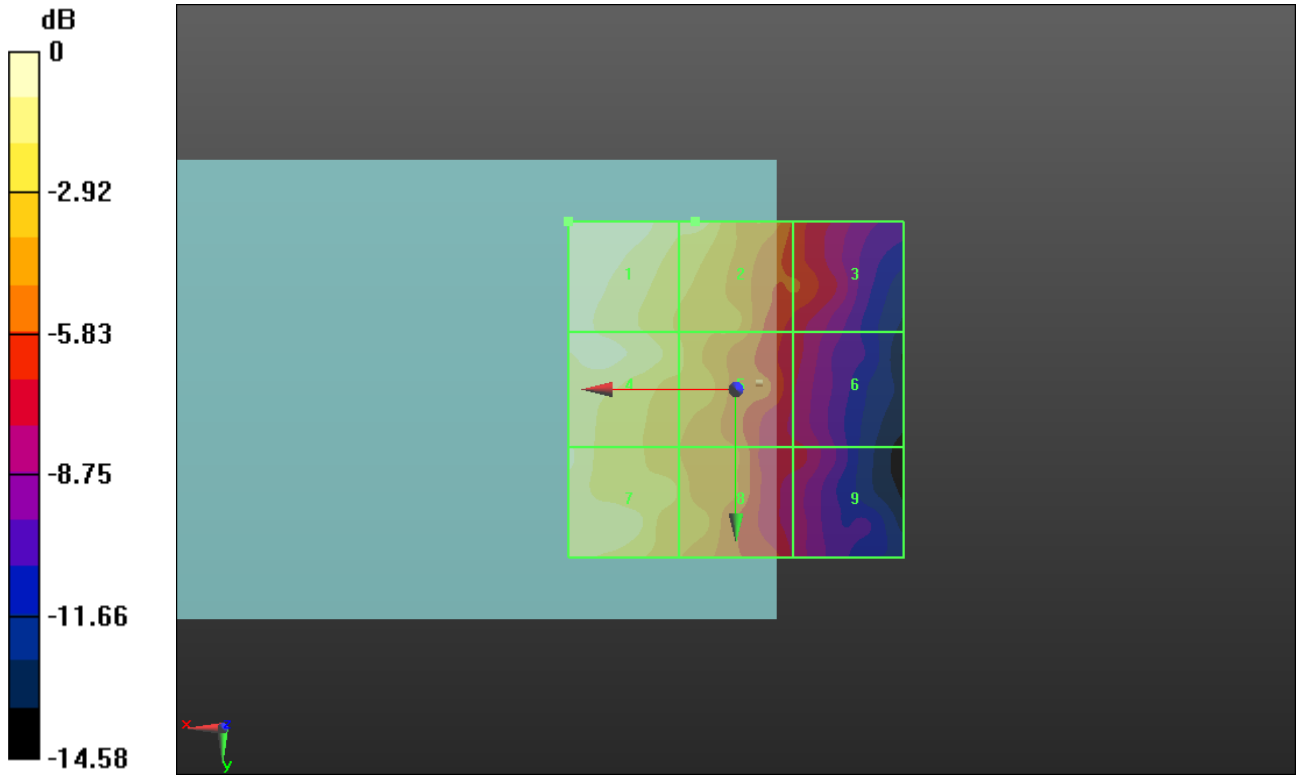
- Probe: H3DV6 - SN6220; ; Calibrated: 9/19/2011
- Sensor-Surface: (Fix Surface), z = 8.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

CDMA Device H-Field measurement with H3DV6 probe (H-field scan for ANSI C63.19-2007 compliance)/H Scan - H3DV6: 15 mm from Probe Center to the Device - Low Channel/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.02600 A/m; Power Drift = -0.13 dB
PMR not calibrated. PMF = 2.950 is applied.
H-field emissions = 0.1426 A/m
Near-field category: M4 (AWF 0 dB)

PMF scaled H-field

Grid 1 **M4** **0.143 A/m**	Grid 2 **M4** **0.117 A/m**	Grid 3 **M4** **0.071 A/m**
Grid 4 **M4** **0.137 A/m**	Grid 5 **M4** **0.102 A/m**	Grid 6 **M4** **0.060 A/m**
Grid 7 **M4** **0.128 A/m**	Grid 8 **M4** **0.097 A/m**	Grid 9 **M4** **0.059 A/m**

Cursor:
Total = 0.1426 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.1368 A/m = -17.28 dB A/m

SECTION 14: HAC RF EMISSIONS SYSTEM VALIDATION PLOTS

Date/Time: 7/31/2012 1:17:07 PM

Test Laboratory: Intertek

HAC RF Cell Band CDMA

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

Communication System: CW; Communication System Band: ITD835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

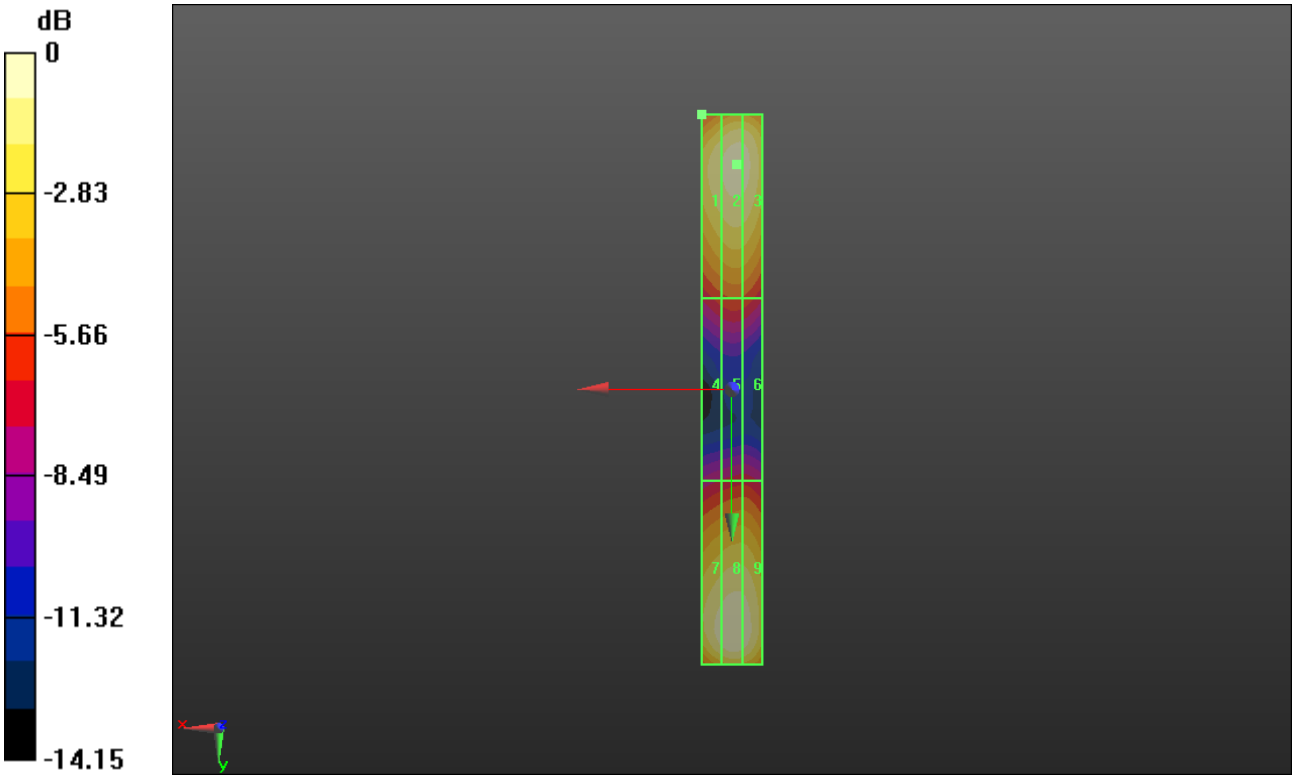
DASY Configuration:

- Probe: ER3DV4R - SN2216; ConvF(1, 1, 1); Calibrated: 9/16/2011;
- Sensor-Surface: (Fix Surface), z = 4.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole E-Field measurement (E-field scan for ANSI C63.19-2007 & -2011 compliance)/E Scan - measurement distance from the probe sensor center to CD835 = 10mm/Hearing Aid Compatibility Test at 10mm distance (41x361x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 115.5 V/m; Power Drift = 0.02 dB
PMR not calibrated. PMF = 1.000 is applied.
E-field emissions = 178.6 V/m
Near-field category: M4 (AWF 0 dB)

PMF scaled E-field

Grid 1 **M4** **160.8 V/m**	Grid 2 **M4** **170.2 V/m**	Grid 3 **M4** **168.7 V/m**
Grid 4 **M4** **89.65 V/m**	Grid 5 **M4** **93.74 V/m**	Grid 6 **M4** **92.23 V/m**
Grid 7 **M4** **170.2 V/m**	Grid 8 **M4** **178.6 V/m**	Grid 9 **M4** **174.0 V/m**



0 dB = 178.6 V/m = 45.04 dB V/m

Date/Time: 8/1/2012 9:47:41 AM

Test Laboratory: Intertek

HAC RF Cell Band CDMA

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

Communication System: CW; Communication System Band: CD835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

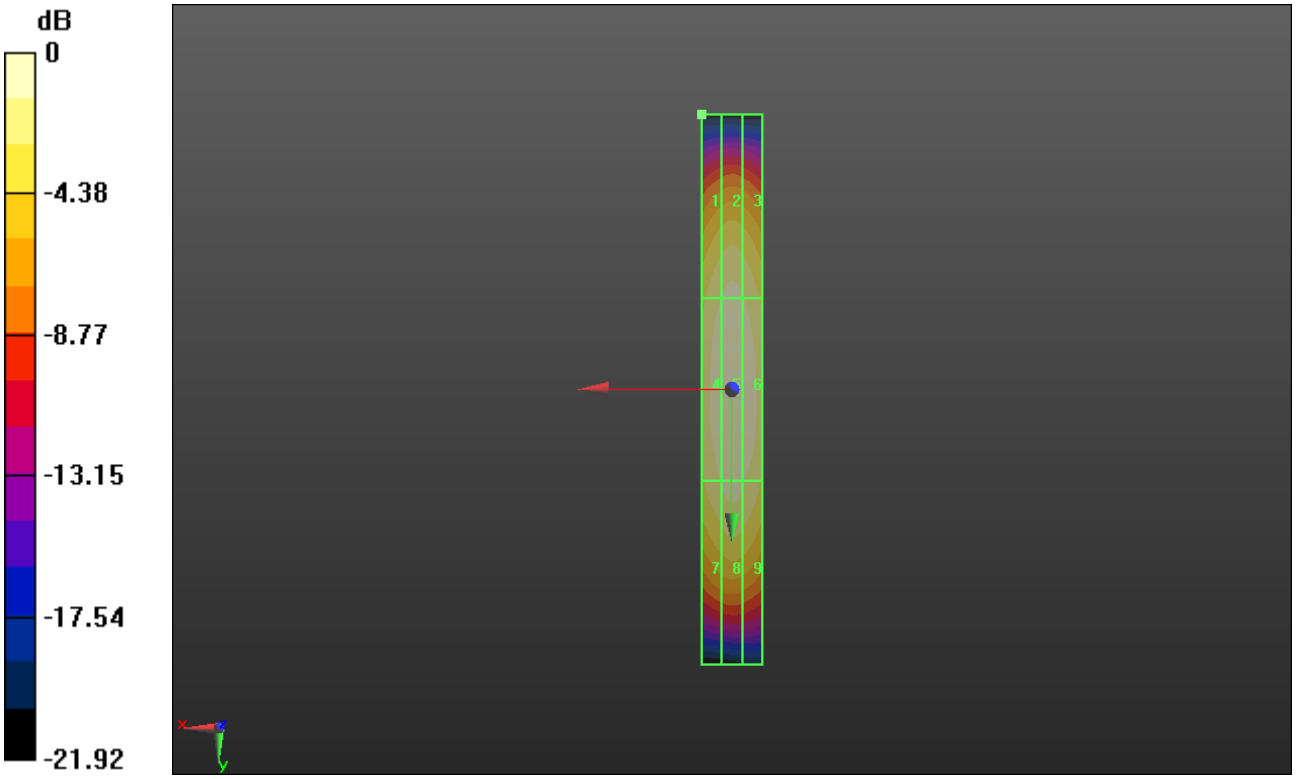
- Probe: H3DV6 - SN6220; ; Calibrated: 9/19/2011
- Sensor-Surface: (Fix Surface), z = 4.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole H-Field measurement with H3DV6 probe (H-field scan for ANSI C63.19-2007 compliance)/H Scan - measurement distance from the probe sensor center to CD835 Dipole = 10mm/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.5150 A/m; Power Drift = -0.01 dB
PMR not calibrated. PMF = 1.000 is applied.
H-field emissions = 0.4825 A/m
Near-field category: M4 (AWF 0 dB)

PMF scaled H-field

Grid 1 **M4** **0.408 A/m**	Grid 2 **M4** **0.431 A/m**	Grid 3 **M4** **0.411 A/m**
Grid 4 **M4** **0.457 A/m**	Grid 5 **M4** **0.482 A/m**	Grid 6 **M4** **0.464 A/m**
Grid 7 **M4** **0.413 A/m**	Grid 8 **M4** **0.437 A/m**	Grid 9 **M4** **0.414 A/m**

Cursor:
Total = 0.04190 A/m
H Category: M4
Location: 10, -90, 4.7 mm



0 dB = 0.4825 A/m = -6.33 dB A/m

Date/Time: 8/1/2012 2:50:40 PM

Test Laboratory: Intertek

HAC RF PCS Band CDMA

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial:

Communication System: CW; Communication System Band: CD1880 (1880.0 MHz); Frequency: 1880 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

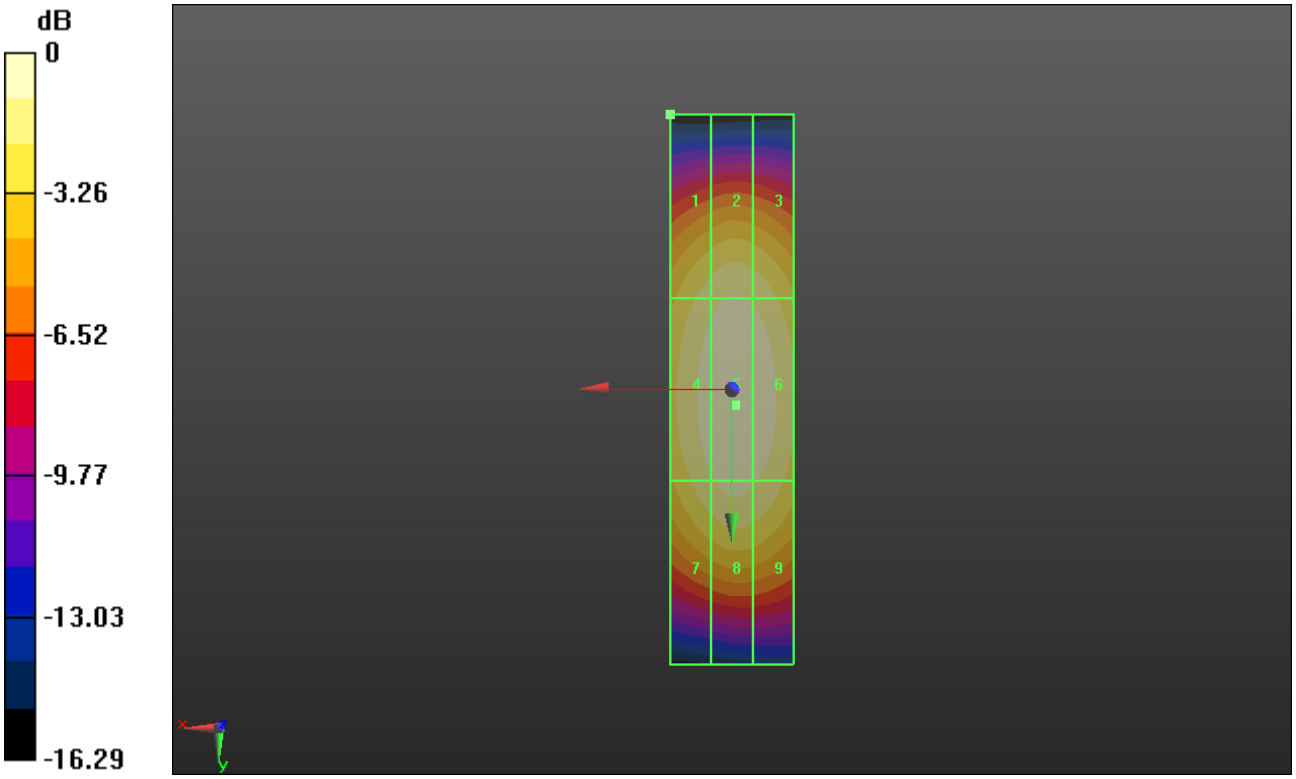
- Probe: H3DV6 - SN6220; ; Calibrated: 9/19/2011
- Sensor-Surface: (Fix Surface), z = 4.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole H-Field measurement with H3DV6 probe (H-field scan for ANSI C63.19-2007 compliance)/H Scan - measurement distance from the probe sensor center to CD1880 Dipole = 10mm/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.4900 A/m; Power Drift = 0.00 dB
PMR not calibrated. PMF = 1.000 is applied.
H-field emissions = 0.4617 A/m
Near-field category: M2 (AWF 0 dB)

PMF scaled H-field

Grid 1 **M2** **0.387 A/m**	Grid 2 **M2** **0.411 A/m**	Grid 3 **M2** **0.399 A/m**
Grid 4 **M2** **0.435 A/m**	Grid 5 **M2** **0.462 A/m**	Grid 6 **M2** **0.449 A/m**
Grid 7 **M2** **0.399 A/m**	Grid 8 **M2** **0.425 A/m**	Grid 9 **M2** **0.412 A/m**

Cursor:
Total = 0.07297 A/m
H Category: M4
Location: 10, -45, 4.7 mm



0 dB = 0.4617 A/m = -6.71 dB A/m

Date/Time: 8/2/2012 10:27:21 AM

Test Laboratory: Intertek

HAC RF PCS Band WCDMA

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial:

Communication System: CW; Communication System Band: CD1880 (1880.0 MHz); Frequency: 1880 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

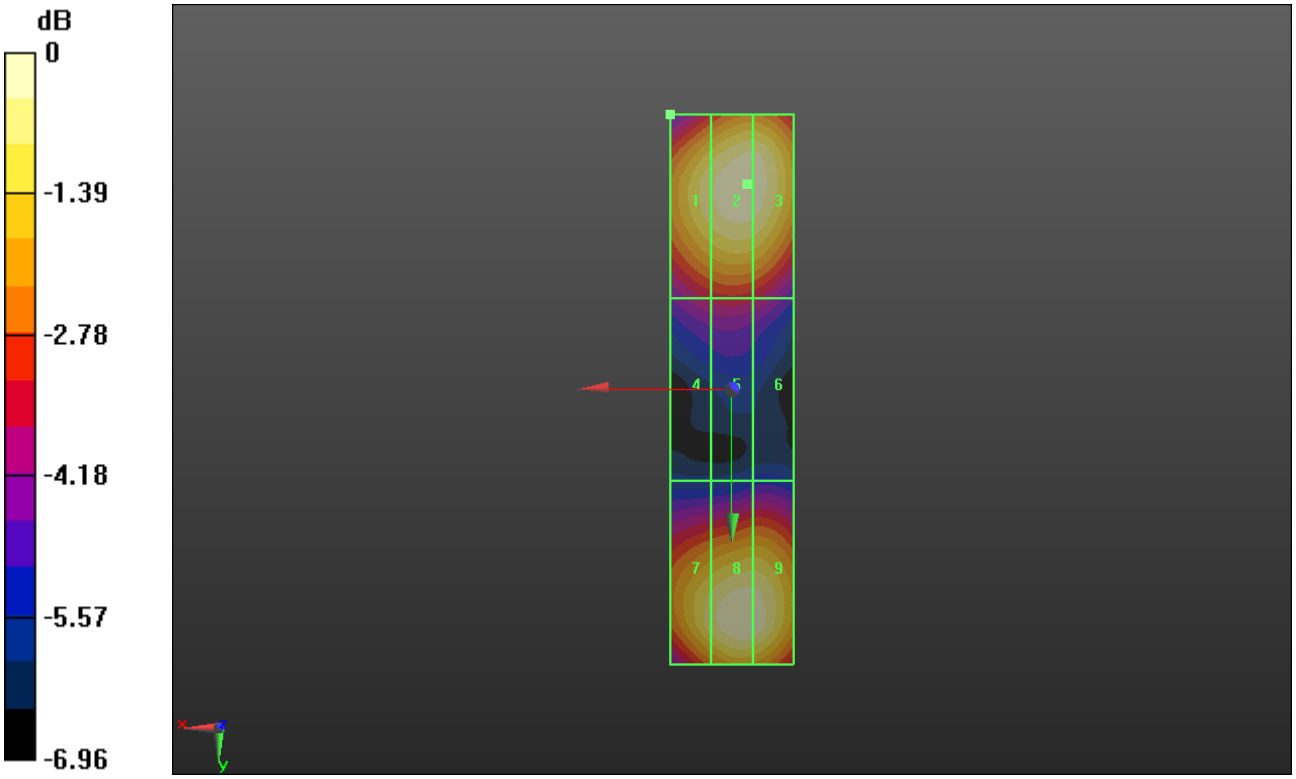
- Probe: ER3DV4R - SN2216; ConvF(1, 1, 1); Calibrated: 9/16/2011;
- Sensor-Surface: (Fix Surface), z = 4.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole E-Field measurement (E-field scan for ANSI C63.19-2007 & -2011 compliance)/E Scan - measurement distance from the probe sensor center to CD1880 = 10mm/Hearing Aid Compatibility Test at 10mm distance (41x181x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 147.3 V/m; Power Drift = 0.03 dB
PMR not calibrated. PMF = 1.000 is applied.
E-field emissions = 134.0 V/m
Near-field category: M2 (AWF 0 dB)

PMF scaled E-field

Grid 1 **M2** **126.1 V/m**	Grid 2 **M2** **133.2 V/m**	Grid 3 **M2** **132.8 V/m**
Grid 4 **M3** **89.17 V/m**	Grid 5 **M3** **91.35 V/m**	Grid 6 **M3** **88.97 V/m**
Grid 7 **M2** **124.2 V/m**	Grid 8 **M2** **134.0 V/m**	Grid 9 **M2** **132.7 V/m**

Cursor:
Total = 74.91 V/m
E Category: M3
Location: 10, -45, 4.7 mm



0 dB = 134.0 V/m = 42.54 dB V/m

Date/Time: 8/2/2012 9:12:23 AM

Test Laboratory: Intertek

HAC RF PCS Band WCDMA

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial:

Communication System: CW; Communication System Band: CD1880 (1880.0 MHz); Frequency: 1880 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

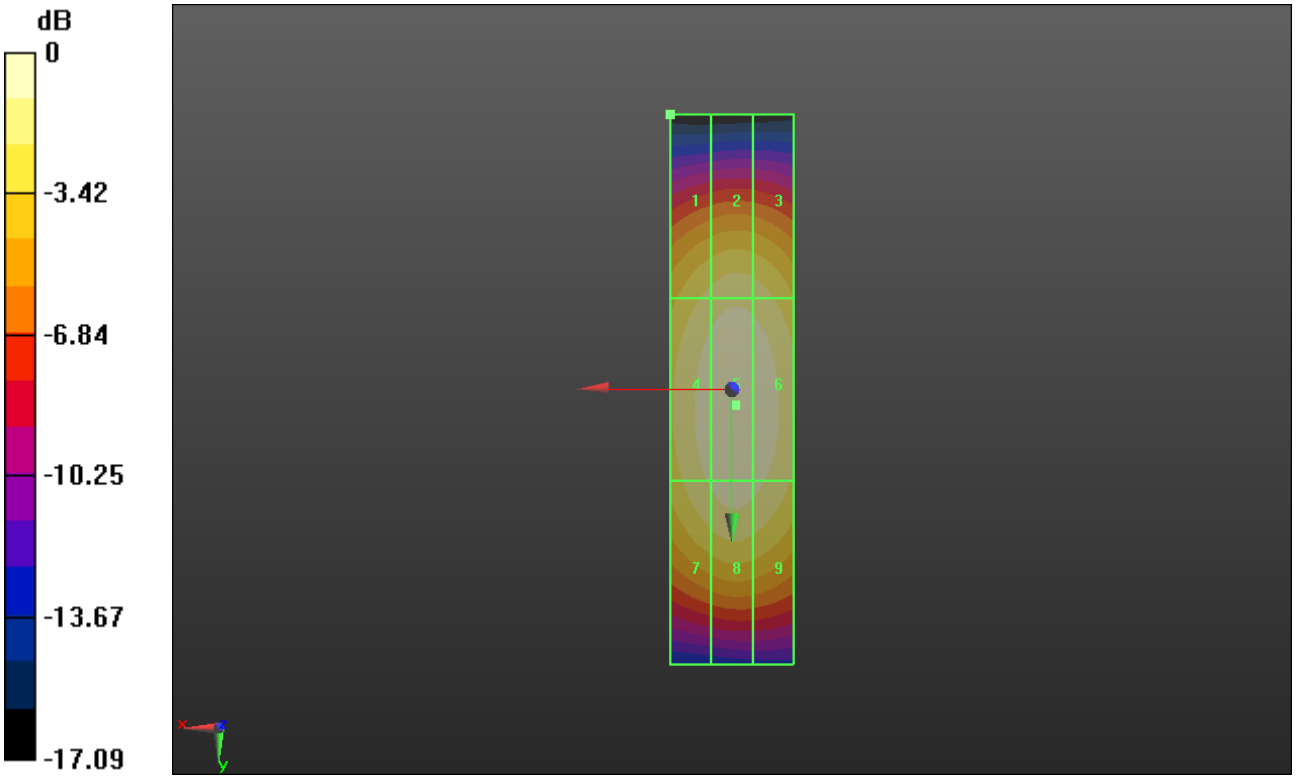
- Probe: H3DV6 - SN6220; ; Calibrated: 9/19/2011
- Sensor-Surface: (Fix Surface), z = 4.7
- Electronics: DAE4 Sn358; Calibrated: 9/15/2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1046
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole H-Field measurement with H3DV6 probe (H-field scan for ANSI C63.19-2007 compliance)/H Scan - measurement distance from the probe sensor center to CD1880 Dipole = 10mm/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.4740 A/m; Power Drift = 0.01 dB
PMR not calibrated. PMF = 1.000 is applied.
H-field emissions = 0.4491 A/m
Near-field category: M2 (AWF 0 dB)

PMF scaled H-field

Grid 1 **M2** **0.361 A/m**	Grid 2 **M2** **0.383 A/m**	Grid 3 **M2** **0.374 A/m**
Grid 4 **M2** **0.424 A/m**	Grid 5 **M2** **0.449 A/m**	Grid 6 **M2** **0.438 A/m**
Grid 7 **M2** **0.399 A/m**	Grid 8 **M2** **0.423 A/m**	Grid 9 **M2** **0.410 A/m**

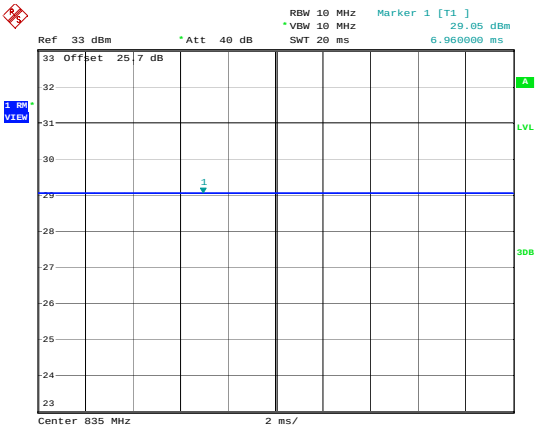
Cursor:
Total = 0.06537 A/m
H Category: M4
Location: 10, -45, 4.7 mm



0 dB = 0.4491 A/m = -6.95 dB A/m

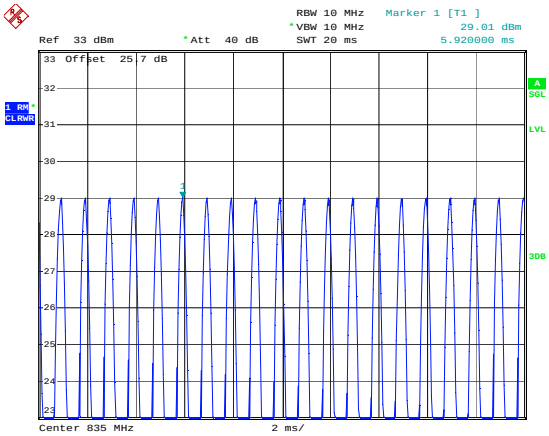
SECTION 15: PROBE MODULATION FACTOR - ZERO SPAN PLOTS

Figure 9: CW – 835MHz



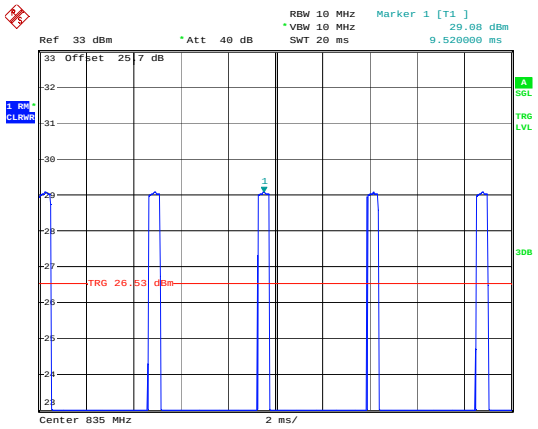
Date: 30.JUL.2012 13:16:18

Figure 10: AM – 835MHz



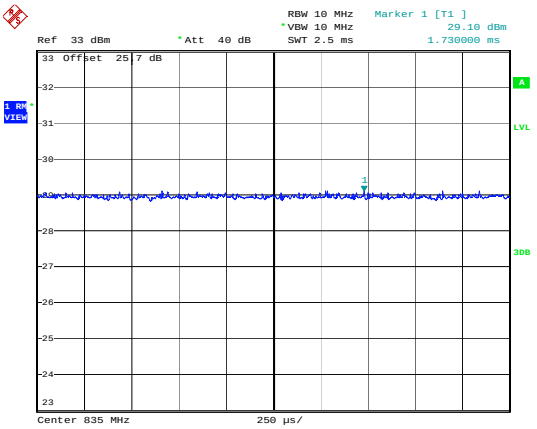
Date: 30.JUL.2012 13:18:20

Figure 11: GSM – 835MHz



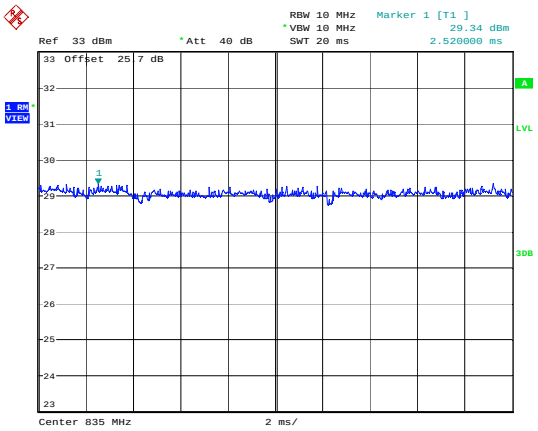
Date: 30.JUL.2012 14:34:57

Figure 12: WCDMA – 835MHz



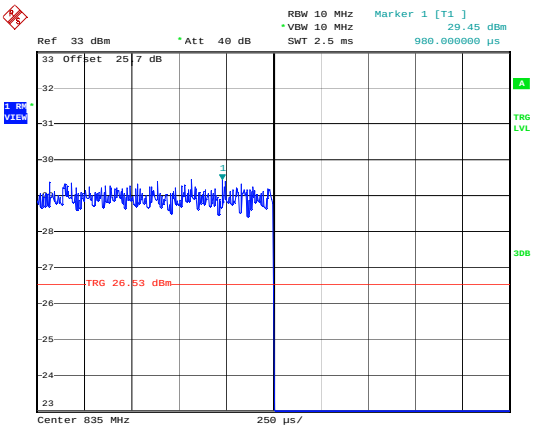
Date: 30.JUL.2012 14:28:12

Figure 13: CDMA Full Rate – 835MHz



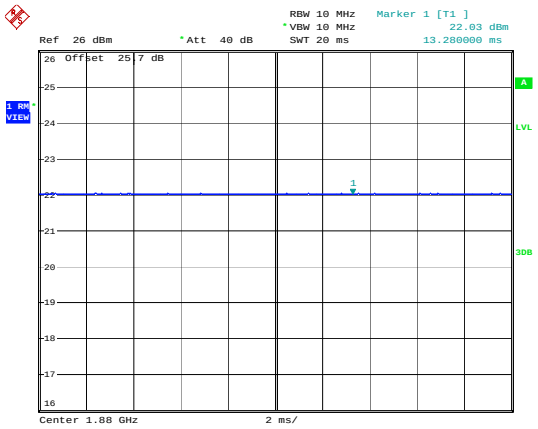
Date: 30.JUL.2012 13:26:56

Figure 14: CDMA 1/8th Rate – 835MHz



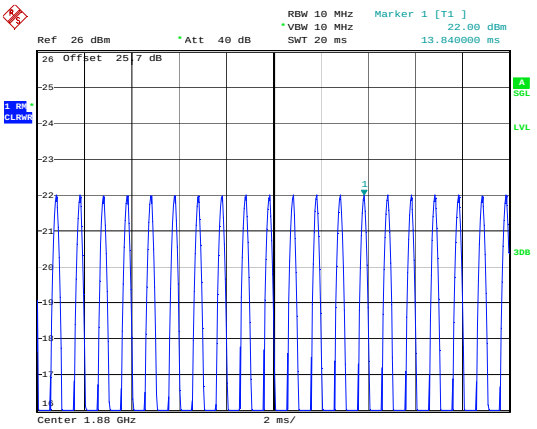
Date: 30.JUL.2012 14:09:31

Figure 15: CW – 1880MHz



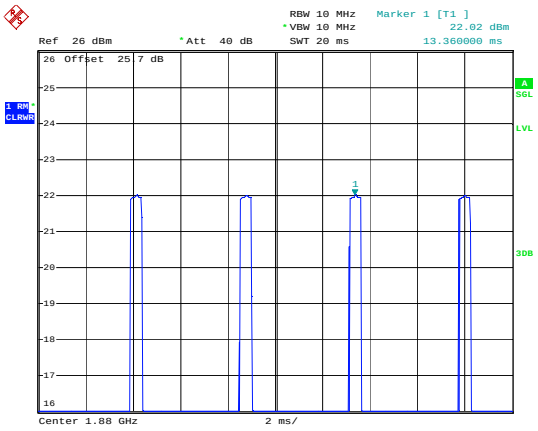
Date: 31.JUL.2012 09:28:23

Figure 16: AM – 1880MHz



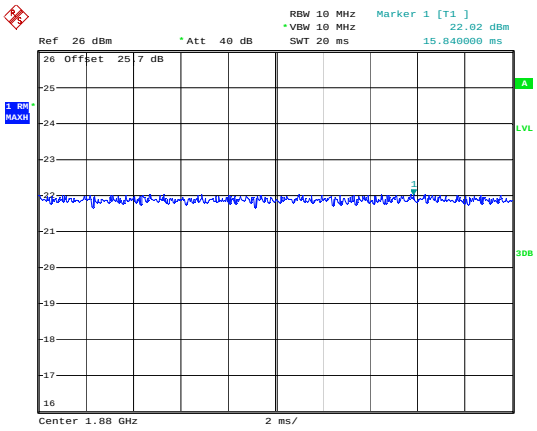
Date: 31.JUL.2012 09:30:34

Figure 17: GSM – 1880MHz



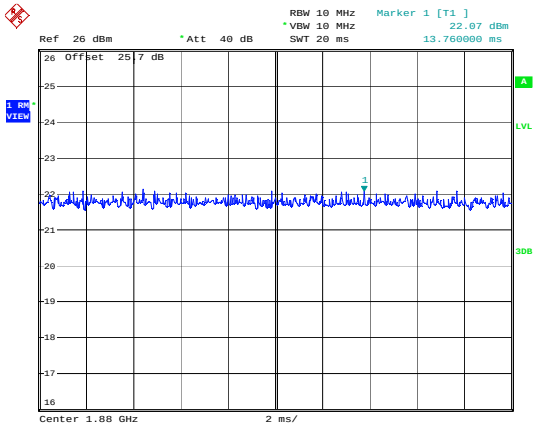
Date: 31.JUL.2012 09:43:05

Figure 18: WCDMA – 1880MHz



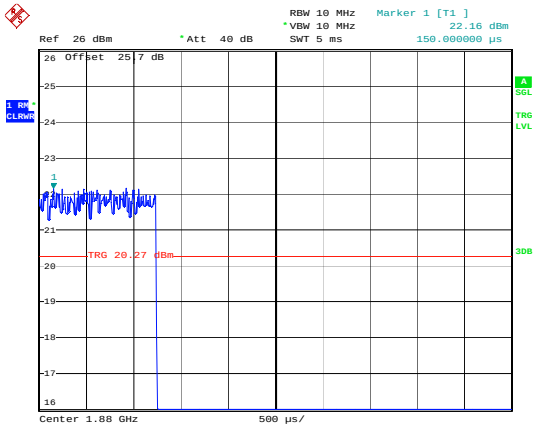
Date: 31.JUL.2012 09:37:17

Figure 19: CDMA Full Rate – 1880MHz



Date: 31.JUL.2012 09:40:18

Figure 20: CDMA 1/8th Rate – 1880MHz



Date: 31.JUL.2012 09:51:24

SECTION 16: CALIBRATION DOCUMENTS

Calibration documents are provided in a separate exhibit.