



**FCC CFR47 PART 20.19
ANSI C63.19-2007
HAC RF EMISSIONS TEST REPORT**

FOR
Cellular/PCS CDMA and GSM/WCDMA and LTE Phone with Bluetooth and WLAN

MODEL NAME: LG-VS920, VS920 and LGVS920

FCC ID: BEJVS920

REPORT NUMBER: 11U13867-21A2

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Prepared for
**LG ELECTRONICS INC.
1000 SYLVAN AVENUE
ENGLEWOOD CLIFFS, NEW JERSEY 07632**

Prepared by
**COMPLIANCE CERTIFICATION SERVICES (UL CCS)
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



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--	July 9, 2011	Initial Issue	--
A	July 14, 2011	Fixed some typos • Changed "GSM835" to "GSM850" • Changed "CDMA2000 850" to "CDMA Cell" • Changed "CDMA2000 1900" to "CDMA PCS"	Sunny Shih
A1	July 15, 2011	1. Added model name and updated EUT description. 2. Updated Voice over digital transport information in Section 6.	Sunny Shih
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1. ATTESTATION OF TEST RESULTS

Applicant name:	LG ELECTRONICS INC.
EUT description:	Cellular/PCS CDMA and GSM/WCDMA and LTE Phone with Bluetooth and WLAN
Model name:	LG-VS920, VS920 and LGVS920 IMEI: 990000-61-000122-6
Device category:	Portable
Exposure category:	General Population/Uncontrolled Exposure
Date of tested:	July 7 - 8, 2011

Maximum E/H-Filed Emissions

Max. E-Field emissions:	Part 22 - Cellular band: 173.4 V/m (M3)_GSM850 Part 24 - PCS band: 60.566 V/m (M3)_GSM1900
Max. H-Field emissions:	Part 22 - Cellular band: 0.235 A/m (M4)_GSM850 Part 24 - PCS band: 0.171 A/m (M3)_GSM1900

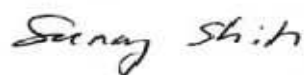
Hearing Aid Near-Field Category: M3 (Part 22) M3 (Part 24)

Applicable Standards	Test Results
ANSI C63.19-2007	Part 22 - Pass Part 24 - Pass

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

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released For UL CCS By:



Sunny Shih
Engineering Team Leader
Compliance Certification Services (UL CCS)

Tested By:



Devin Chang
EMC Engineer
Compliance Certification Services (UL CCS)

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.19-2007 Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids and FCC KDB 285076 D01 HAC Guidance v02r01

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

<u>Name of Equipment</u>	<u>Manufacturer</u>	<u>Type/Model</u>	<u>Serial Number</u>	<u>Cal. Due date</u>
Robot - Six Axes	Stäubli	TX90 XL	N/A	N/A
DASY5 Measurement Server	SPEAG	SEUMS001BA	1041	N/A
Data Acquisition Electronics	SPEAG	DAE4	1257	5/3/12
E-Field Probe	SPEAG	ER3DV6	2509	4/8/12
H-Field Probe	SPEAG	H3DV6	6324	4/11/12
Calibration Dipole	SPEAG	CD835V3	1175	5/3/12
Calibration Dipole	SPEAG	CD1880V3	1159	5/3/12
Power Meter	Giga-Tronics	8651A	8651404	5/13/12
Power Sensor	Giga-Tronics	80701A	1834588	5/13/12
Amplifier	Mini-Circuits	ZHL-42W	D072701-5	N/A
Wireless Communication Test Set	Agilent	8960	GB46160222	6/17/12
Signal Generator	HP	8665B	3744A01084	N/A

4.2. MEASUREMENT UNCERTAINTY

HAC Uncertainty Budget According to ANSI PC63.19

Error Description	Uncertainty value (±%)	Probe Dist.	Div.	(Ci) E	(Ci) H	Std. Unc.(±%)	
						E	H
Measurement System							
Probe Calibration	5.10	N	1	1	1	5.1	5.1
Axial Isotropy	4.70	R	1.732	1	1	2.7	2.7
Sensor Displacement	16.50	R	1.732	1	0.145	9.5	1.4
Boundary Effects	2.40	R	1.732	1	1	1.4	1.4
Linearity	4.70	R	1.732	1	1	2.7	2.7
Scaling to Peak Envelope Power	2.00	R	1.732	1	1	1.2	1.2
System Detection Limit	1.00	R	1.732	1	1	0.6	0.6
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.80	R	1.732	1	1	0.5	0.5
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Conditions	3.00	R	1.732	1	1	1.7	1.7
RF Reflections	12.00	R	1.732	1	1	6.9	6.9
Probe Positioner	1.20	R	1.732	1	0.67	0.7	0.5
Probe Positioning	4.70	R	1.732	1	0.67	2.7	1.8
Extrapolation and Interpolation	1.00	R	1.732	1	1	0.6	0.6
Test sample Related							
Test Positioning Vertical	4.70	R	1.732	1	0.67	2.7	1.8
Test Positioning Lateral	1.00	R	1.732	1	1	0.6	0.6
Device Holder and Phantom	2.40	R	1.732	1	1	1.4	1.4
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Phantom and Setup Related							
Phantom Thickness	2.40	R	1.732	1	0.67	1.4	0.9
Combined Std. Uncertainty						14.7	10.9
Expanded Std. Uncertainty on Power						29.4	21.8
Expanded Std. Uncertainty on Field						14.7	10.9
Notesfor table							
1. N - Nomal							
2. R - Rectangular							
3. Div. - Divisor used to obtain standard uncertainty							
4. Ci - is te sensitivity coefficient							

5. EQUIPMENT UNDER TEST

Cellular/PCS CDMA and GSM/WCDMA and LTE Phone with Bluetooth and WLAN Model name: LG-VS920, VS920 and LGVS920	
Normal operation:	Held to head
Accessory:	Standard cover and Wireless charger cover

6. LIST OF AIR INTERFACES/BANDS & OPERATING MODES

Air-Interface	Bands (MHz)	Type	C63.19/ Tested	Simultaneous Transmissions Note: Not to be tested	Concurrent single transmission	Reduced power 20.19 (c) (1)	Voice Over Digital Transport (Data)
GSM	850	VO	Yes	Yes: WiFi and Bluetooth	Yes: GPRS/EDGE, LTE, WiFi and Bluetooth	N/A	N/A
	1900		Yes				
	GPRS/EDGE	DT	N/A	N/A	Yes: * see note	N/A	Yes
CDMA	800	VO	Yes	Yes LTE, EV-DO, WiFi and Bluetooth	Yes: EV-DO, LTE, WiFi and Bluetooth	N/A	N/A
	1900		Yes				
	EV-DO	DT	N/A	N/A	Yes: * see note	Yes: **SVDO mode only	Yes
LTE	Band 13	DT	N/A	Yes EV-DO, WiFi and Bluetooth	Yes: * see note	Yes: **SVLTE mode only	Yes
UMTS	Band II R 99	VO	Yes	Yes WiFi or Bluetooth	Yes: HSPA, WiFi and Bluetooth	N/A	N/A
	HSPA	DT	N/A	N/A	Yes: * see note	N/A	Yes
WiFi	2450	DT	N/A	Yes CDMA,GSM,UMTE, LTE, EV-DO and Bluetooth	N/A	N/A	Yes
Bluetooth	2400	DT	N/A	Yes CDMA,GSM,UMTE, LTE, EV-DO and WiFi	N/A	N/A	N/A
VO Voice CMRS/PTSN Service Only V/D Voice CMRS/PSTN and Data Service DT Digital Transport				Note: * HAC Rating was not base on concurrent voice and data modes, Noncurrent mode was found to represent worst case rating. For M rating Note: ** SVDO: CDMA voice and EVDO Simultaneously transmission SVLTE: CDMA voice and LTE Simultaneously transmission			

7. SYSTEM SPECIFICATIONS

E-field and H-field measurements are performed using the DASY5 automated dosimetric assessment system. The DASY5 is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland.

The DASY5 HAC Extension consists of the following parts:

Test Arch Phantom

The specially designed Test Arch allows high precision positioning of both the device and any of the validation dipoles.

ER3DV6 Isotropic E-Field Probe

Construction:	One dipole parallel, two dipoles normal to probe axis Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether)
Calibration:	In air from 100 MHz to 3.0 GHz (absolute accuracy $\pm 6.0\%$, $k=2$)
Frequency:	100 MHz to > 6 GHz; Linearity: ± 0.2 dB (100 MHz 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; Linearity: ± 0.2 dB
Dimensions:	Overall length: 330 mm (Tip: 16 mm) Tip diameter: 8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.5 mm The closest part of the sensor element is 1.1 mm closer to the tip
Application:	General near-field measurements up to 6 GHz Field component measurements

H3DV6 3-Dimensional H-Field Probe

Construction:	Three concentric loop sensors with 3.8 mm loop diameters resistively loaded detector diodes for linear response Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether)
Frequency:	200 MHz to 3 GHz (absolute accuracy $\pm 6.0\%$, $k=2$); Output linearized
Directivity:	± 0.25 dB (spherical isotropy error)
Dynamic Range:	10 mA/m to 2 A/m at 1 GHz
E-Field Interference:	$< 10\%$ at 3 GHz (for plane wave)
Dimensions:	Overall length: 330 mm (Tip: 40 mm) Tip diameter: 6 mm (Body: 12 mm) Distance from probe tip to dipole centers: 3 mm The closest part of the sensor element is 1.9 mm closer to the tip
Application:	General magnetic near-field measurements up to 3 GHz Field component measurements Surface current measurements Measurements in air or liquids Low interaction with the measured field

8. SYSTEM VALIDATION

The test setup was validated when first configured and verified periodically thereafter to ensure proper function. The procedure provided in this section is a validation procedure using dipole antennas for which the field levels were computed by numeric modeling.

Procedure

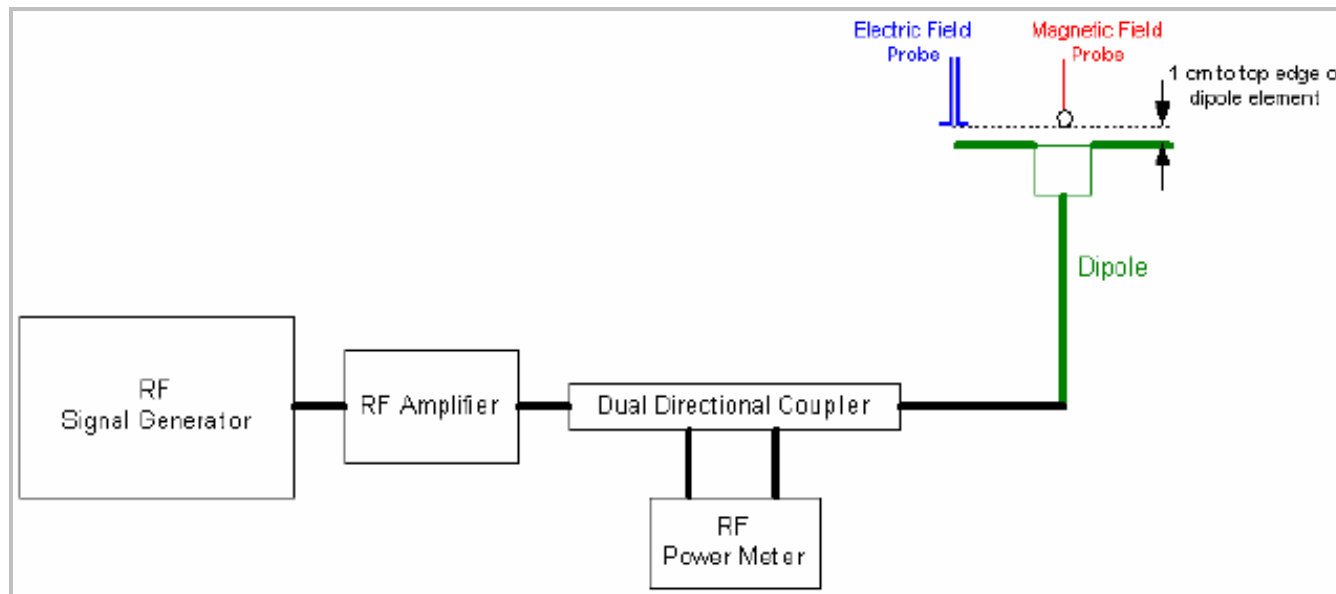
Place a dipole antenna meeting the requirements given in ANSI-PC63.19 2007 in the normally occupied by the WD.

The dipole antenna serves as a known source for an electrical and magnetic output. Position the E-field and H-field probes so that:

- The probes and their cables are parallel to the coaxial feed of the dipole antenna
- The probe cables and the coaxial feed of the dipole antenna approach the measurement area from opposite directions; and
- The center point of the probe element(s) are 10 mm from the closest surface of the dipole elements.

Scan the length of the dipole with both E-field and H-field probes and record the maximum values for each. Compare the readings to expected values.

Setup diagram



8.1. SYSTEM VALIDATION RESULTS

E-field

Calibration Dipole	f (MHz)	Input Power (mW)	Max. measured from		Average max. above arm (V/m)	E-field Target Values (V/m) (From SPEAG)	Deviation ¹⁾ (%)
			above high end (V/m)	above low end (V/m)			
CD835V3 SN 1175	835	100	166.2	167.5	166.85	171.0	-2.43
CD1880V3 SN 1159	1880	100	133.2	137.1	135.15	140.3	-3.67

H-field

Calibration Dipole	f (MHz)	Input Power (mW)	Measured H-field (A/m)	H-field Target Values (A/m) (From SPEAG)	Deviation ¹⁾ (%)
CD835V3 SN 1175	835	100	0.437	0.475	-8.00
CD1880V3 SN 1159	1880	100	0.436	0.464	-6.03

Notes:

- 1) Delta (Deviation) % = 100 * (Measured value minus Target value) divided by the Target value.
Deltas within $\pm 25\%$ are acceptable, of which 12% is deviation and 13% is measurement uncertainty.
- 2) The maximum E-field or H-field were evaluated and compared to the target values provided by SPEAG in the calibration certificate of specific dipoles.
- 3) Please refer to the attachment for detailed measurement data and plots.

9. PROBE MODULATION FACTOR (PMF)

Purpose

The HAC Standard requires measurement of the peak envelope E- and H-fields of the wireless device (WD). Para. 4.2.2.1, and C.3.1 of the standard describes the Probe Modulation Response Factor that shall be applied to convert the probe reading to Peak Envelope Field.

Definitions

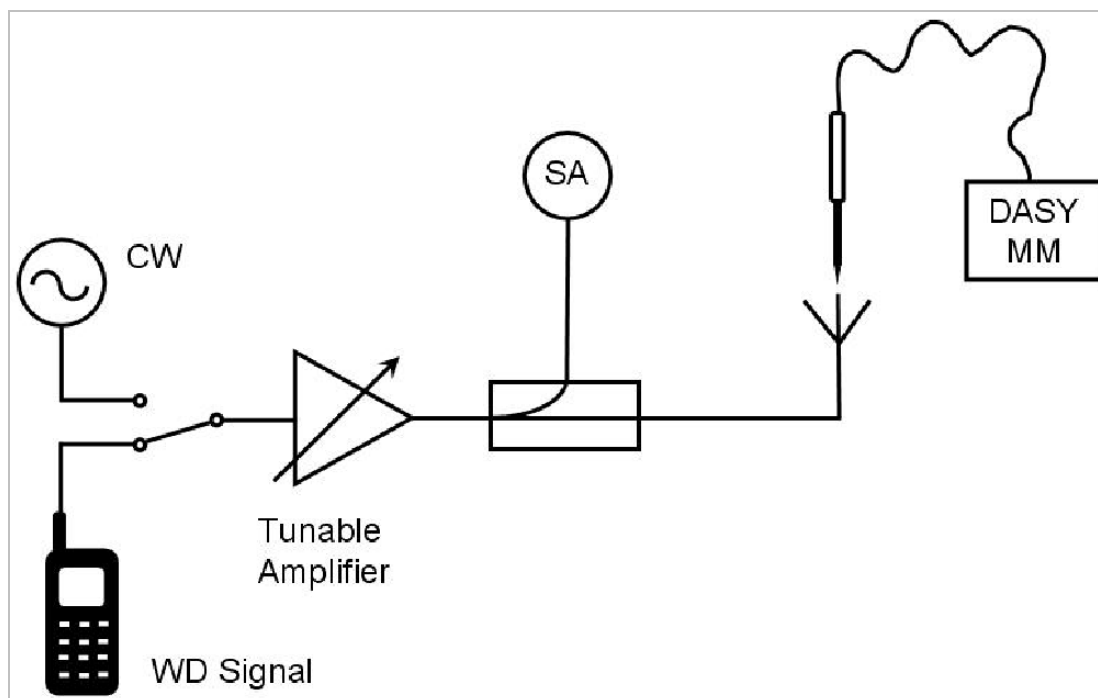
The Probe Modulation Factor (PMF) is defined as the ratio of the field readings for a CW and a modulated signal with the equivalent Field Envelope Peak as defined in the Standard (Chapter C.3.1).

Evaluation Procedure for Unknown PMF (DASY4 Application note, Section 28.8)

The proposed measurement setup corresponds to the procedure as required in the Standard, Chapter C.3.1.

1. Install a calibration dipole for the appropriate frequency band under the Test Arch Phantom and select the proper phantom section according to the probe type installed (E- or H-field). Move the probe to the field reference point. (Do not move the probe between the subsequent CW and modulated measurements.)
2. Install the field probe in the setup.
3. The modulated signal to the dipole must be monitored to record peak amplitude and compared to a CW signal with the same peak envelope level (e.g., with a directional coupler and a spectrum analyzer in zero span mode set to the operating frequency). To determine the peak envelope level of the modulated signal properly, the settings of a spectrum analyzer shall be as follows:
 - Resolution bandwidth $\geq$ emission bandwidth (4 MHz for UMTS bands, 300 kHz)
 - Video bandwidth $\geq$ 20 kHz
 - Span: zero
 - Center Frequency: nominal center frequency of channel
 - Detection: RMS detection with averaging turned on
 - Trigger: Video or IF trigger, adjusted to give a stable display of the transmission
 - Sweep rate: Sufficiently rapid to permit the transmit pulse to be resolved accurately. The sweep shall be long enough to show a complete transmission. The sweep time may be set to allow a full transmission cycle, displaying the on and off time.
4. Define a DASY4 document and set the procedure properties (frequency, modulation frequency and crest factor) according to the measured signal. Define a multimeter job for the field reading.
5. Define a second procedure for the evaluation of the CW signal (frequency set as above, modulation frequency = 0, crest factor = 1) and a multimeter job.

PMF Measurement Setup Diagram



The HAC measurement procedure is as follows:

- a) Modulated signals (WD and 80% AM) measurement:
 - 1) Connect the modulated signal using the appropriate frequency via the cable to the dipole.
 - 2) The signal to the dipole must be monitored to record peak amplitude with a directional coupler and a spectrum analyzer.
 - 3) Run the multimeter job in the procedure with the corresponding modulation setting in continuous mode.
 - 4) Read the envelope peak on the monitor in order to adjust the CW signal later to the same level.
- b) CW signal measurement:
 - 1) Change the signal to CW at the same center frequency, without touching or moving the dipole and probe in the setup.
 - 2) Adjust the CW signal amplitude to the same peak level on the spectrum analyzer (keep the same bandwidth and attenuation for CW and modulated signals).
 - 3) Run the multimeter job in the CW procedure in continuous mode.
 - 4) Read the multimeter total field display and note it together with modulation type and frequency.
 - 5) Calculate the Probe Modulation Factor as the ratio between the CW multimeter field reading and the reading for the applicable modulation. I.e., $PMF = \frac{E_{cw}}{E_{mod}}$ and similar for H.

9.1. PMF MEASUREMENT RESULTS

GSM

Probe	Frequency (MHz)	Type of signal	E-field V/m	PMF
E-Field Probe	835	GSM	54.4	2.79
		CW	152.0	
	1880	GSM	29.8	2.82
		CW	83.9	
Probe	Frequency (MHz)	Type of signal	H-field A/m	PMF
H-Field Probe	835	GSM	0.144	2.79
		CW	0.402	
	1880	GSM	0.132	2.84
		CW	0.375	

CDMA2000

Probe	Frequency (MHz)	Type of signal	E-field V/m	PMF
E-Field Probe	835	CDMA (RC3/SO55)	64.6	0.95
		CW	61.4	
	1880	CDMA (RC3/SO55)	44.7	0.95
		CW	42.6	
Probe	Frequency (MHz)	Type of signal	H-field A/m	PMF
H-Field Probe	835	CDMA (RC3/SO55)	0.260	0.96
		CW	0.249	
	1880	CDMA (RC3/SO55)	0.190	0.98
		CW	0.187	

WCDMA

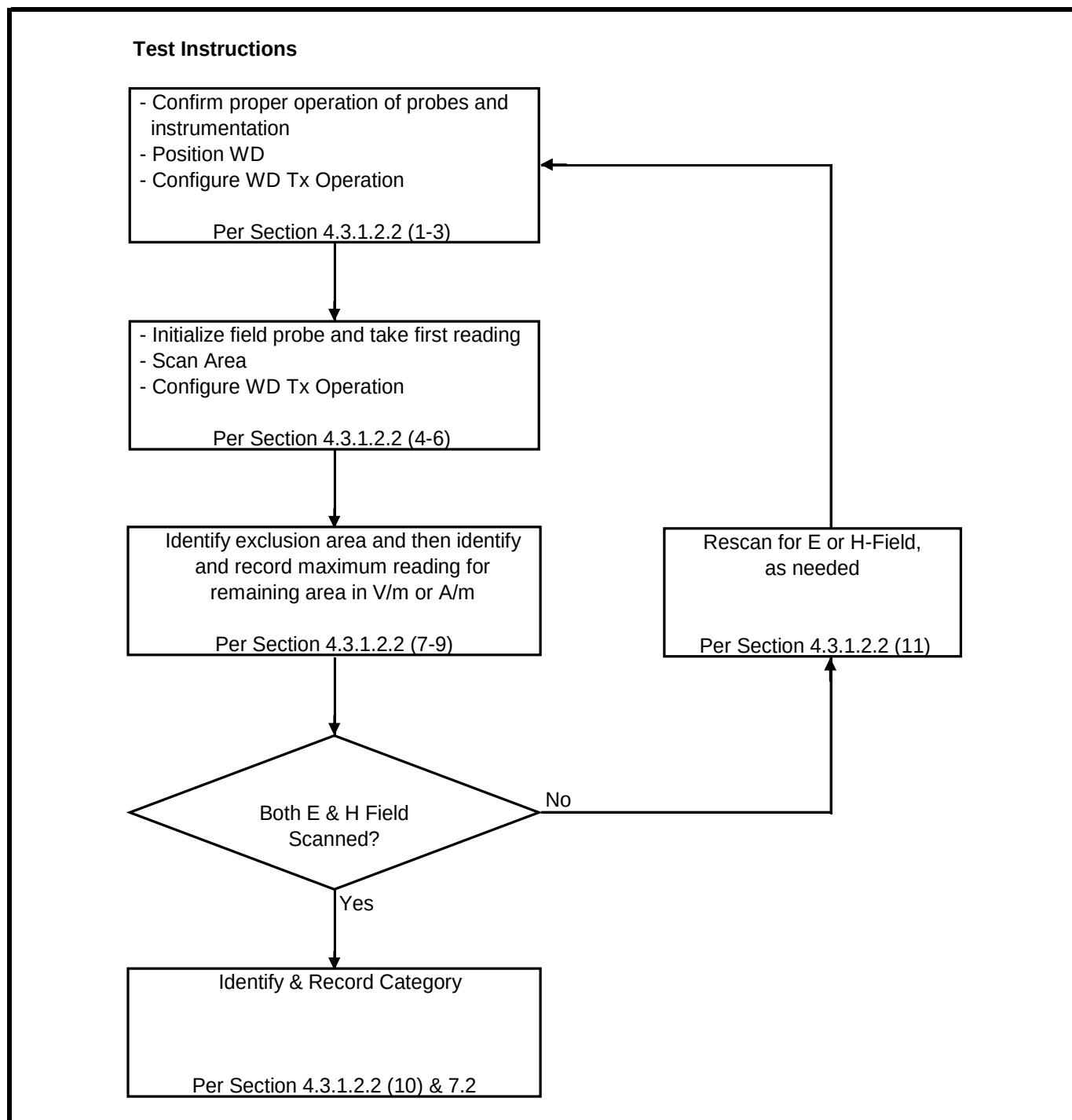
Probe	Frequency (MHz)	Type of signal	E-field V/m	PMF
E-Field Probe	1880	UMTS	36.90	0.96
		CW	35.30	
Probe	Frequency (MHz)	Type of signal	H-field A/m	PMF
H-Field Probe	1880	UMTS	0.128	0.95
		CW	0.122	

10. HAC RF EMISSIONS TEST PROCEDURE

The following are step-by-step test procedures.

1. Confirm proper operation of the field probe, probe measurement system and other instrumentation and the positioning system.
2. Position the WD in its intended test position.
3. Configure the WD normal operation for maximum rated RF output power, at the desired channel and other operating parameters, (e.g. test mode) as intended for the test.
4. The center sub-grid shall be centered on the center of the WD output (acoustic or T-coil output), as appropriate. Locate the field probe at the initial test position in the 5 x 5 cm grid, which is contained in the measurement plane, see illustrated in Figure 5.
5. Record the reading.
6. Scan the entire 5 x 5 cm region in equally spaced increments and record the reading at each measurement point. The distance between measurement points shall be sufficient to assure the identification of the peak reading.
7. Identify the five contiguous sub-grids around the center sub-grid with the lowest maximum strength readings. Thus the 6 areas to be used to determine the WD's peak emissions are identified and outlined for the final manual scan. Please note that a maximum of five blocks can be excluded for both E- and H-field measurements for the WD output being measured. State another way, the center sub-grid and 3 other must be common to both the E- and H-field measurements.
8. Identify the highest field reading within the non-excluded sub-grids identified in step 7.
9. Convert the highest field reading within identified in step 8 to peak V/m or A/m, as appropriate.
10. Repeat steps 1-10 for both the E- and H-field measurements.
11. Compare this reading to the categories in ANSI-PC63.19 and record the resulting category. The lowest category number listed in ANSI-PC63.19 obtained in step 10 for either E or H field determines the M category for the audio coupling mode assessment. Record the WD category rating.

Test flowchart Per ANSI-PC63.19 2007



11. RF EMISSIONS MEASUREMENT CRITERA

Telephone near-field Categories in linear units

		Telephone RF Parameters			
		< 960 MHz		> 960 MHz	
Category	AWF	E-Field Emissions (V/m)	H-Field Emissions (A/m)	E-Field Emissions (V/m)	H-Field Emissions (A/m)
M3	0	199.5 to 354.8	0.60 to 1.07	63.1 to 112.2	0.19 to 0.34
	-5	149.6 to 266.1	0.45 to 0.80	47.3 to 84.1	0.14 to 0.25
M4	0	< 199.5	< 0.60	< 63.1	< 0.19
	-5	< 149.6	< 0.45	< 47.3	< 0.14

12. SUMMARY OF TEST RESULTS

12.1. E-FIELD EMISSIONS

With Standard Cover

Operating Mode	Ch. No.	f (MHz)	PMF	Peak E-Field (V/m)	M-Rating
GSM 850	128	824.2	2.79	159.4	M3
	190	836.6		173.4	M3
	251	848.8		165.9	M3
PCS 1900	512	1850.2	2.82	60.566	M3
	661	1880.0		54.123	M3
	810	1909.8		50.642	M3
CDMA Cell 1xRTT (RC3, SO55)	1013	824.70	0.95	62.741	M4
	384	836.52		67.274	M4
	777	848.31		66.890	M4
CDMAPCS 1xRTT (RC3, SO55)	25	1851.25	0.95	42.941	M4
	600	1880.00		40.812	M4
	1175	1908.75		36.330	M4
UMTS band II R99 RMC 12.2kbps	9262	1852.4	0.96	35.699	M4
	9400	1880.0		35.178	M4
	9538	1907.6		32.528	M4

With Wireless Charger Cover

Operating Mode	Ch. No.	f (MHz)	PMF	Peak E-Field (V/m)	M-Rating
GSM 850	128	824.2	2.79	143.6	M4
	190	836.6		159.7	M3
	251	848.8		155.2	M3
PCS 1900	512	1850.2	2.82	60.503	M3
	661	1880.0		55.399	M3
	810	1909.8		52.491	M3
CDMA Cell 1xRTT (RC3, SO55)	1013	824.70	0.95	56.768	M4
	384	836.52		62.964	M4
	777	848.31		63.179	M4
CDMA PCS 1xRTT (RC3, SO55)	25	1851.25	0.95	42.513	M4
	600	1880.00		43.035	M4
	1175	1908.75		39.240	M4
UMTS band II R99 RMC 12.2kbps	9262	1852.4	0.96	33.643	M4
	9400	1880.0		33.249	M4
	9538	1907.6		32.093	M4

12.2. H-FIELD EMISSIONS

With Standard Cover

Operating Mode	Ch. No.	f (MHz)	PMF	Peak H-Field (A/m)	M-Rating
GSM 850	128	824.2	2.79	0.235	M4
	190	836.6		0.232	M4
	251	848.8		0.212	M4
PCS 1900	512	1850.2	2.84	0.171	M3
	661	1880.0		0.157	M3
	810	1909.8		0.160	M3
CDMA Cell 1xRTT (RC3, SO55)	1013	824.70	0.96	0.088	M4
	384	836.52		0.090	M4
	777	848.31		0.086	M4
CDMA PCS 1xRTT (RC3, SO55)	25	1851.25	0.98	0.120	M4
	600	1880.00		0.118	M4
	1175	1908.75		0.113	M4
UMTS band II R99 RMC 12.2kbps	9262	1852.4	0.95	0.095	M4
	9400	1880.0		0.095	M4
	9538	1907.6		0.094	M4

With Wireless Changer Cover

Operating Mode	Ch. No.	f (MHz)	PMF	Peak H-Field (A/m)	M-Rating
GSM 850	128	824.2	2.79	0.193	M4
	190	836.6		0.204	M4
	251	848.8		0.193	M4
PCS 1900	512	1850.2	2.84	0.162	M3
	661	1880.0		0.151	M3
	810	1909.8		0.143	M3
CDMA Cell 1xRTT (RC3, SO55)	1013	824.70	0.96	0.078	M4
	384	836.52		0.084	M4
	777	848.31		0.084	M4
CDMA PCS 1xRTT (RC3, SO55)	25	1851.25	0.98	0.120	M4
	600	1880.00		0.119	M4
	1175	1908.75		0.117	M4
UMTS band II R99 RMC 12.2kbps	9262	1852.4	0.95	0.093	M4
	9400	1880.0		0.095	M4
	9538	1907.6		0.093	M4

13. WORST-CAST TEST PLOTS

E-field worst-cast test plot for Part 22

Date: 7/7/2011

Test Laboratory: UL CCS SAR Lab C

1_GSM 850

Communication System: Generic GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Phantom section: RF Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2509; ConvF(1, 1, 1); Calibrated: 4/8/2011

- Sensor-Surface: (Fix Surface)

- Electronics: DAE4 Sn1257; Calibrated: 5/3/2011

- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BB

- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

E-Field, Standard Cover/M ch/Hearing Aid Compatibility Test (101x101x1): Measurement

grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 173.4 V/m

Probe Modulation Factor = 2.790

Device Reference Point: 0, 0, -6.3 mm

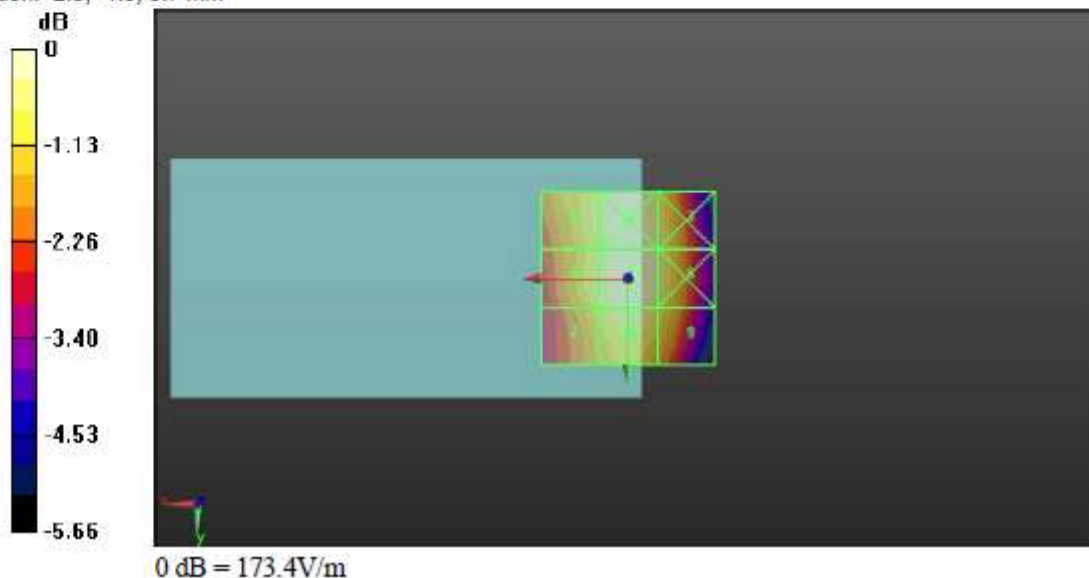
Reference Value = 83.054 V/m; Power Drift = 0.04 dB

Hearing Aid Near-Field Category: **M3 (AWF -5 dB)**

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
162.8 M3	173.1 M3	164.1 M3
Grid 4	Grid 5	Grid 6
162.4 M3	173.4 M3	164.5 M3
Grid 7	Grid 8	Grid 9
155.8 M3	167.7 M3	158.8 M3

Location: -2.5, -1.5, 8.7 mm



E-field worst-cast test plot for Part 24

Date: 7/7/2011

Test Laboratory: UL CCS SAR Lab C

2_GSM 1900

Communication System: Generic GSM; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042

Phantom section: RF Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2509; ConvF(1, 1, 1); Calibrated: 4/8/2011

- Sensor-Surface: (Fix Surface)

- Electronics: DAE4 Sn1257; Calibrated: 5/3/2011

- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BB

- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

E-Field, Standard Cover/L ch/Hearing Aid Compatibility Test (101x101x1): Measurement

grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 60.566 V/m

Probe Modulation Factor = 2.820

Device Reference Point: 0, 0, -6.3 mm

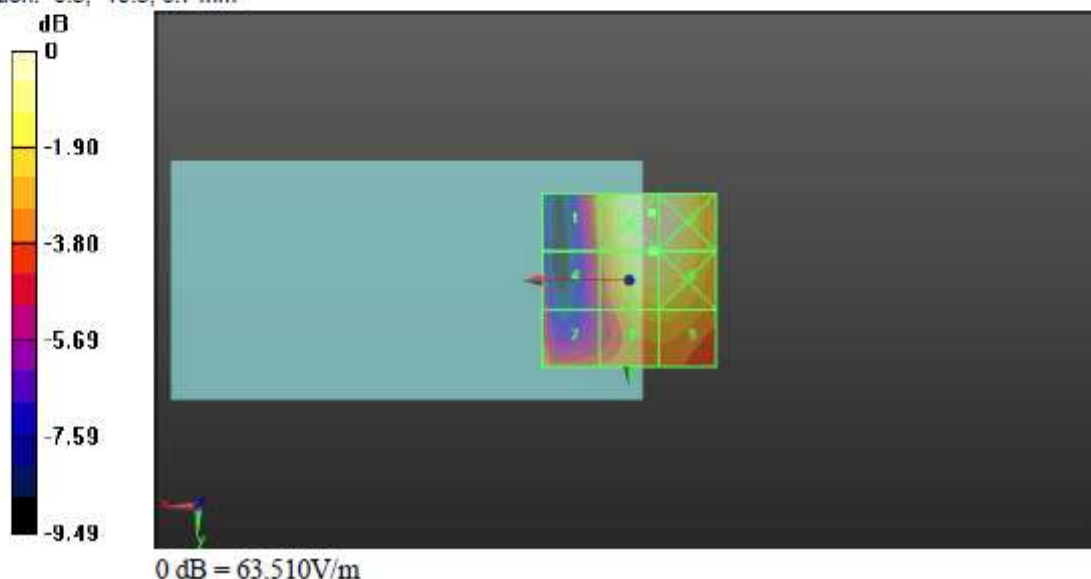
Reference Value = 24.581 V/m; Power Drift = -0.08 dB

Hearing Aid Near-Field Category: **M3 (AWF -5 dB)**

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
45.318 M4	63.514 M3	63.071 M3
Grid 4	Grid 5	Grid 6
49.926 M3	60.566 M3	60.369 M3
Grid 7	Grid 8	Grid 9
44.169 M4	50.199 M3	50.142 M3

Location: -6.5, -19.5, 8.7 mm



H-field worst-cast test plot for Part 22

Date: 7/7/2011

Test Laboratory: UL CCS SAR Lab C

1_GSM 850

Communication System: Generic GSM; Frequency: 824.2 MHz; Duty Cycle: 1:8.30042

Phantom section: RF Section

DASY4 Configuration:

- Probe: H3DV6 - SN6324; ; Calibrated: 4/11/2011

- Sensor-Surface: (Fix Surface)

- Electronics: DAE4 Sn1257; Calibrated: 5/3/2011

- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BB

- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

H-Field, Standard Cover/L ch/Hearing Aid Compatibility Test (101x101x1): Measurement

grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.235 A/m

Probe Modulation Factor = 2.790

Device Reference Point: 0, 0, -6.3 mm

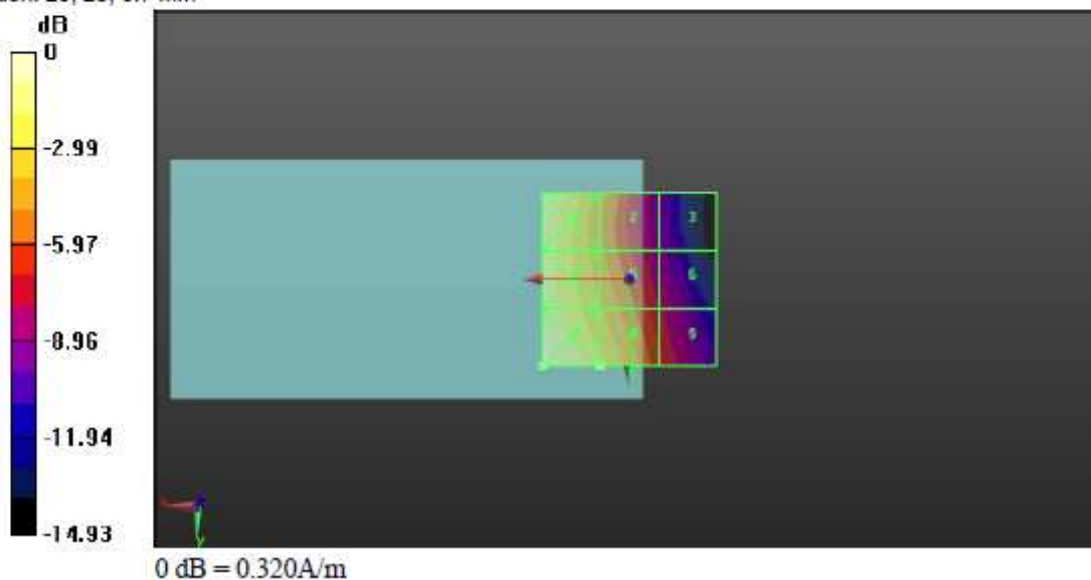
Reference Value = 0.060 A/m; Power Drift = -0.11 dB

Hearing Aid Near-Field Category: **M4 (AWF -5 dB)**

Peak H-field in A/m

Grid 1 0.296 M4	Grid 2 0.190 M4	Grid 3 0.108 M4
Grid 4 0.279 M4	Grid 5 0.206 M4	Grid 6 0.130 M4
Grid 7 0.317 M4	Grid 8 0.235 M4	Grid 9 0.149 M4

Location: 25, 25, 8.7 mm



H-field worst-cast test plot for Part 24

Date: 7/7/2011

Test Laboratory: UL CCS SAR Lab C

2_GSM 1900

Communication System: Generic GSM; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042

Phantom section: RF Section

DASY4 Configuration:

- Probe: H3DV6 - SN6324; ; Calibrated: 4/11/2011

- Sensor-Surface: (Fix Surface)

- Electronics: DAE4 Sn1257; Calibrated: 5/3/2011

- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BB

- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

H-Field, Standard Cover/L ch/Hearing Aid Compatibility Test (101x101x1): Measurement

grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.171 A/m

Probe Modulation Factor = 2.840

Device Reference Point: 0, 0, -6.3 mm

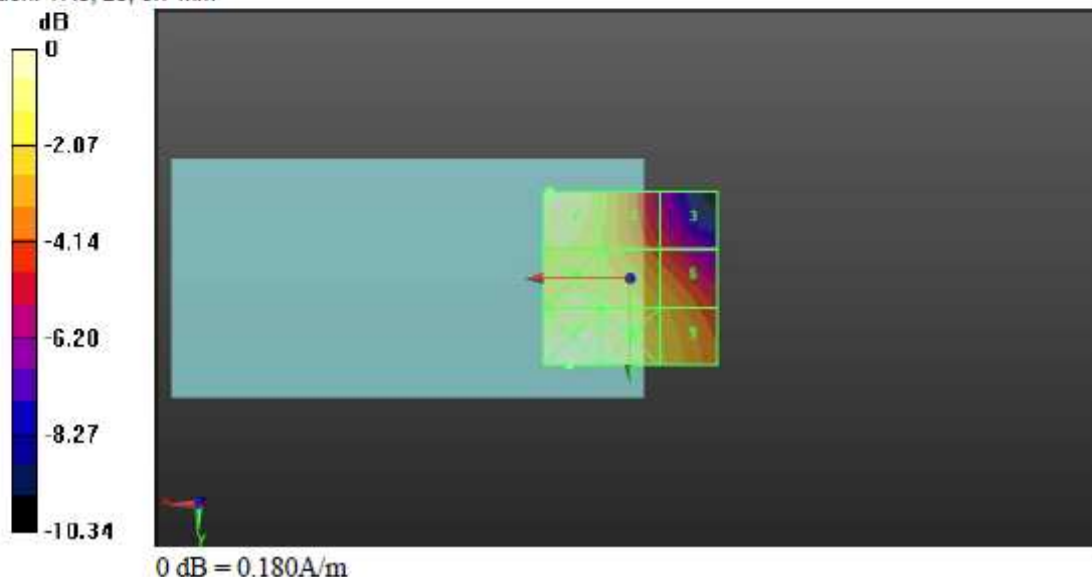
Reference Value = 0.052 A/m; Power Drift = -0.37 dB

Hearing Aid Near-Field Category: **M3 (AWF -5 dB)**

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.171 M3	0.148 M3	0.105 M4
Grid 4	Grid 5	Grid 6
0.158 M3	0.156 M3	0.135 M4
Grid 7	Grid 8	Grid 9
0.182 M3	0.175 M3	0.145 M3

Location: 17.5, 25, 8.7 mm



14. APPENDIX

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