FCC CFR47 PART 20.19
ANSI C63.19-2007

HAC RF EMISSIONS TEST REPORT

For

iPhone

MODEL: A1332
FCC ID: BCG-E2380A

REPORT NUMBER: 11U13769-1
ISSUE DATE: September 1, 2011

Prepared for

APPLE INC
1 INFINITE LOOP, MS-26A
CUPERTINO, CA 95014

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	August 8, 2011	Initial Issue	--
A	September 6, 2011	Add statement in section 5 of the RF report based on FCC reviewer's comments.	Sunny Shih

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COMPLIANCE CERTIFICATION SERVICES (UL CCS) FORM NO: CCSUP4031B
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1. ATTESTATION OF TEST RESULTS

Applicant name:	APPLE INC 1 INFINITE LOOP, MS-26A CUPERTINO, CA 95014
EUT description:	iPhone
Model number:	A1332 Serial number: 7Q114CM7A4S
Device category:	Portable
Exposure category:	General Population/Uncontrolled Exposure
Date of tested:	June 8 -9, 2011
Maximum E/H-Filed Emissions	
Max. E-Field emissions:	Part 22 - Cellular band: 196.3 V/m (M3) Part 24 - PCS band: 66.331 V/m (M3)
Max. H-Field emissions:	Part 22 - Cellular band: 0.392 A/m (M4) Part 24 - PCS band: 0.227 A/m (M3)
Hearing Aid Near-Field Category:	**M3 (Part 22), M3 (Part 24)**

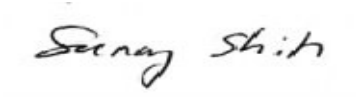
Applicable Standards	Test Results
ANSI C63.19-2007	Pass

This device supports held to the ear telephone calls while transmitting in air-interface modes not defined in C63.19-2007 which have not been tested for hearing aid compatibility

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.

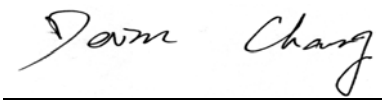
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this 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.

Name of Equipment	Manufacturer	Type/Model	Serial Number	Cal. Due date
Data Acquisition Electronics	SPEAG	DAE3	427	7/21/11
E-Field Probe	SPEAG	ER3DV6	2339	1/20/12
H-Field Probe	SPEAG	H3DV6	6157	1/25/12
Calibration Dipole	SPEAG	CD835V3	1014	1/20/12
Calibration Dipole	SPEAG	CD1880V3	1122	7/15/11
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
Radio Communication Tester	R & S	CMU 200	106291	11/27/10

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

iPhone with 802.11bgn and Bluetooth radio modules. Model: A1332, FCC ID: BCG-E2380A and BCG-E2380B. Both FCC ID: BCG-E2380A and BCG-E2380B are marked and sold as one model “Apple’s iPhone 4, Model A1332”. The difference between FCC ID: BCG-E2380A and BCG-E2380B is that each uses a different WiFi / Bluetooth sub-assembly module that are soldered to the main cellular printed board. The main cellular printed board is the same for both FCC ID: BCG-E2380A and BCG-E2380B. Apple has evaluated both BCG-E2380A and BCG-E2380B and determined that there is no difference in the HAC RF/T-Coil measurements between measuring BCG-E2380A or BCG-E2380B and therefore the HAC exhibits in the respective applications are the same for both FCC IDs. HAC RF Emissions test was done at BCG-E2380A.

Normal operation:	Held to head

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, WiFi and Bluetooth	N/A	N/A
	1900	VO	Yes	Yes: WiFi and Bluetooth	Yes: GPRS/EDGE, WiFi and Bluetooth	**Yes:** See sec. 6.1 note	N/A
	GPRS/EDGE	DT	N/A	N/A	Yes: * see note	N/A	Yes
UMTS	Band V R 99	VO	Yes	Yes WiFi or Bluetooth	Yes: HSPA, WiFi and Bluetooth	N/A	N/A
	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 GSM,UMTS and Bluetooth	N/A	N/A	Yes
Bluetooth	2400	DT	N/A	Yes GSM,UMTS, 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

6.1. OUTPUT POWER FOR VOICE MODES

GSM (GMSK)

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)	Avg burst Pwr (dBm) (with Power Reduction)
GSM850	128	824.2	32.4	n/a
	190	836.6	32.5	n/a
	251	848.8	32.5	n/a
GSM1900	512	1850.2	30.4	28.0
	661	1880	30.3	28.0
	810	1909.8	30.4	28.0

Note:

1. Power reduction is activated for GSM voice mode operation in the 1900 MHz band during HAC RF emission testing.

UMTS Release 99

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)	Avg burst Pwr (dBm) (with Power Reduction)
UMTS Band V (12.2 kbps RCM)	4132	826.4	23.7	n/a
	4183	836.6	23.4	n/a
	4233	846.6	23.6	n/a
UMTS Band II (12.2 kbps RCM)	9262	1852.4	22.9	n/a
	9400	1880.0	22.9	n/a
	9538	1907.6	22.8	n/a

Note:

1. No Power reduction for UMTS Release 99 mode

7. SYSTEM SPECIFICATIONS

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

The DASY 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 ±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 ± 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

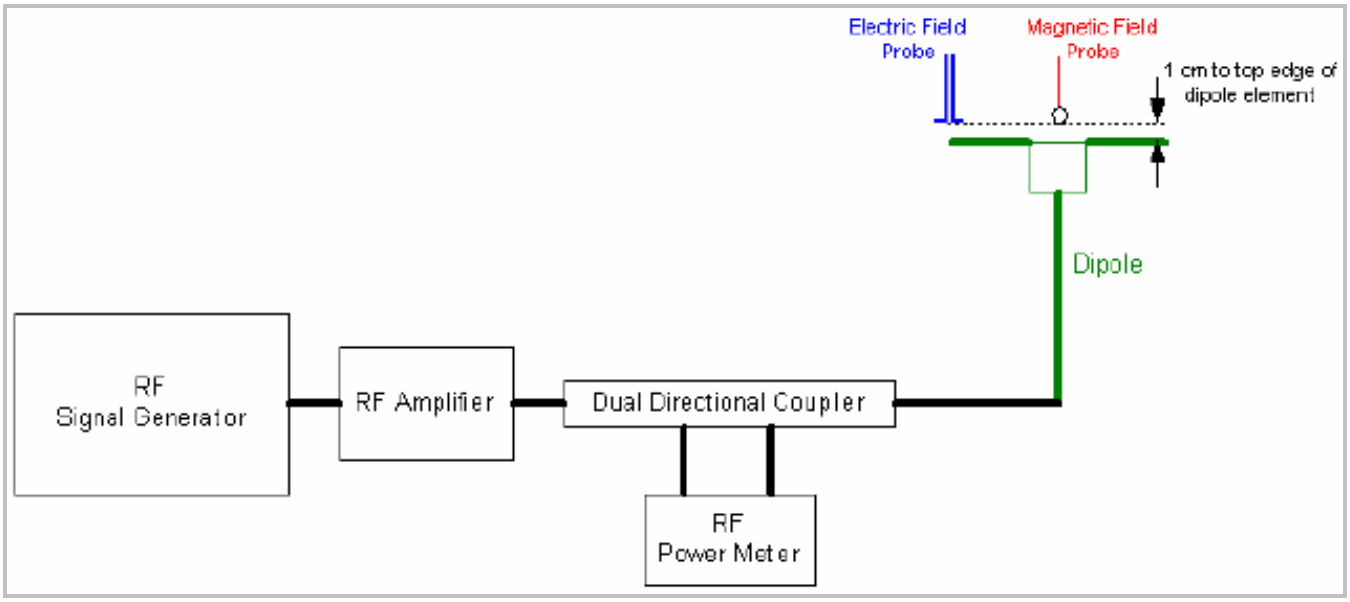
Place a dipole antenna meeting the requirements given in ANSI-PC63.19 2007 in the normally occupied by the WD.

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 above high end (V/m)	Max. measured from above low end (V/m)	Average max. above arm (V/m)	E-field Target Values (V/m) (From SPEAG)	Deviation[1)] (%)
CD835V3 SN 1014	835	100	158.7	163.4	161.05	172	-6.37
CD1880V3 SN 1122	1880	100	133.4	135.3	134.35	137.9	-2.57

H-field

Calibration Dipole	f (MHz)	Input Power (mW)	Measured H-field (A/m)	H-field Target Values (A/m) (From SPEAG)	Deviation1) (%)
CD835V3 SN 1014	835	100	0.475	0.461	3.04
CD1880V3 SN 1122	1880	100	0.475	0.47	1.06

Notes:

1) Delta (Deviation) % = 100 * (Measured value minus Target value) divided by the Target value. Deltas within ±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

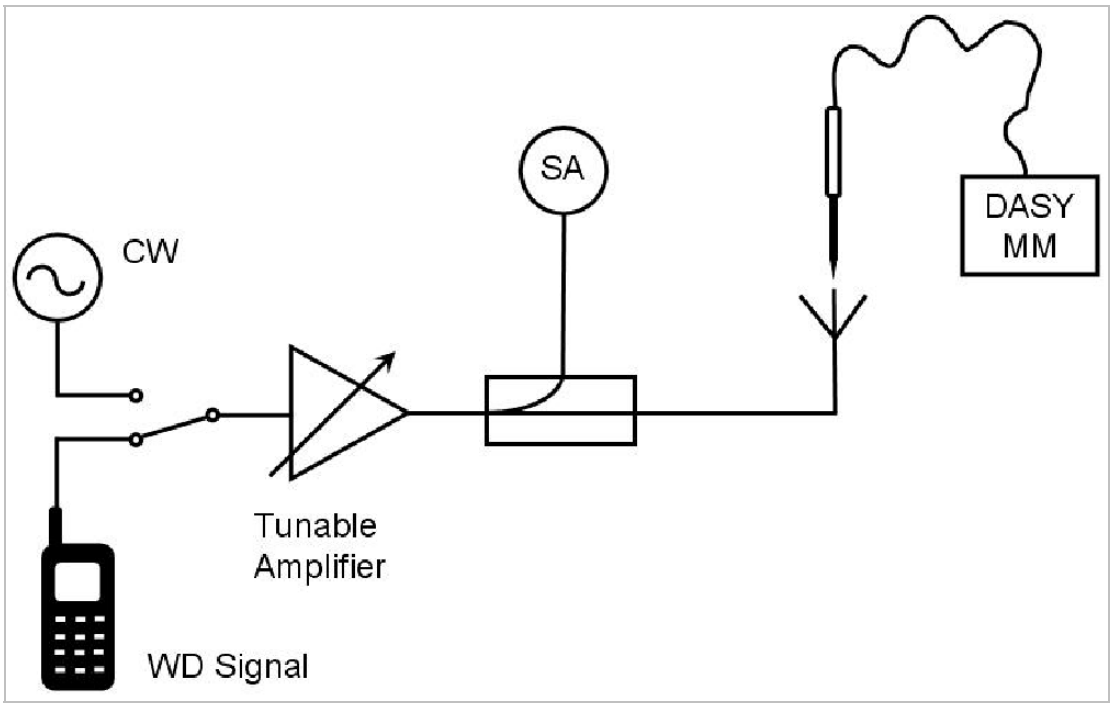
The Probe Modulation Factor (PMF) is defined as the ratio of the field readings for a CW and a modulated signal with the equivalent Field Envelope Peak as defined in the Standard (Chapter C.3.1).

Evaluation Procedure for Unknown PMF (DASY 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 >= emission bandwidth (4 MHz for UMTS bands, 300 kHz)
   - Video bandwidth >= 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 DASY 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., $PMF = \frac{E_{cw}}{E_{\mathrm{mod}}}$ and similar for H.

9.1. PMF RESULTS

Probe	Frequency (MHz)	Type of signal	E-field V/m	PMF
E-Field Probe	835	GSM	17.20	2.67
		CW	45.86	
	1880	GSM	10.04	2.60
		CW	26.15	
Probe	Frequency (MHz)	Type of signal	H-field A/m	PMF
H-Field Probe	835	GSM	0.050	2.70
		CW	0.135	
	1880	GSM	0.034	2.68
		CW	0.090	

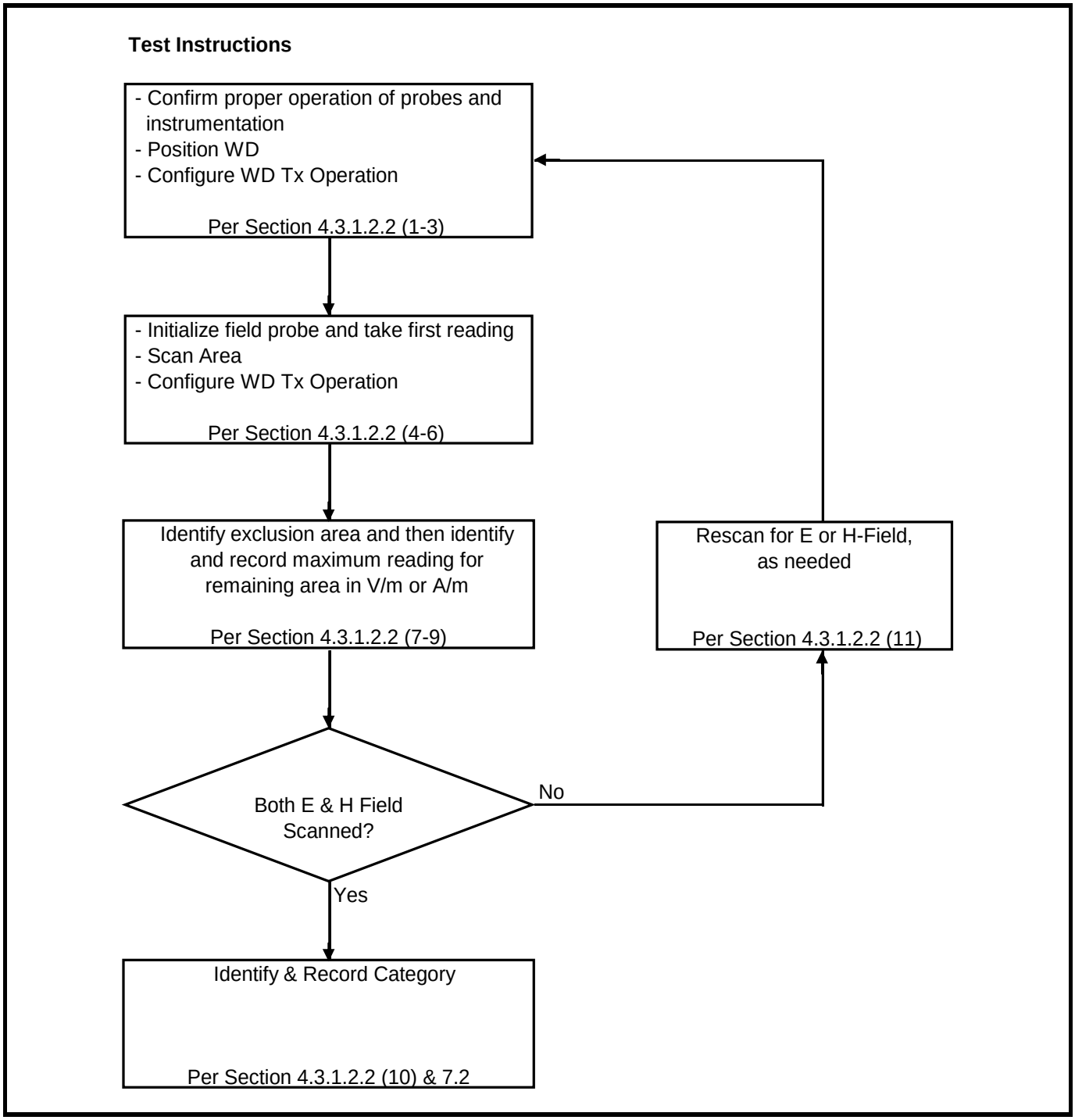
Probe	Frequency (MHz)	Type of signal	E-field V/m	PMF
E-Field Probe	835	UMTS	49.66	0.89
		CW	44.30	
	1880	UMTS	36.90	0.87
		CW	32.20	
Probe	Frequency (MHz)	Type of signal	H-field A/m	PMF
H-Field Probe	835	UMTS	0.144	0.90
		CW	0.129	
	1880	UMTS	0.128	0.88
		CW	0.112	

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

Note: The WiFi and Bluetooth off during HAC testing and run in a radiated environment.

12.1. E-FIELD EMISSIONS

Operating Mode	Ch. No.	f (MHz)	PMF	Peak E-Field (V/m)	M-Rating
GSM850	128	824.2	2.67	162.7	M3
	190	836.6		180.7	M3
	251	848.8		**196.3**	M3
GSM1900	512	1850.2	2.60	**66.331**	M3
	661	1880.0		63.173	M3
	810	1909.8		59.744	M3
UMTS band V	4132	826.4	0.89	56.596	M4
	4183	836.6		61.145	M4
	4233	846.6		63.435	M4
UMTS band II	9262	1852.4	0.87	39.551	M4
	9400	1880.0		35.668	M4
	9538	1907.6		36.109	M4

12.2. H-FIELD EMISSIONS

Operating Mode	Ch. No.	f (MHz)	PMF	Peak H-Field (A/m)	M-Rating
GSM850	128	824.2	2.70	0.325	M4
	190	836.6		0.370	M4
	251	848.8		**0.392**	M4
GSM1900	512	1850.2	2.68	**0.227**	M3
	661	1880.0		0.211	M3
	810	1909.8		0.212	M3
UMTS band V	4132	826.4	0.90	0.107	M4
	4183	836.6		0.119	M4
	4233	846.6		0.121	M4
UMTS band II	9262	1852.4	0.88	0.129	M4
	9400	1880.0		0.114	M4
	9538	1907.6		0.121	M4

13. WORST-CAST TEST PLOTS

E-field worst-cast test plot for Part 22

Date/Time: 6/9/2011 8:44:51 PM

Test Laboratory: UL CCS

HAC RF Emission

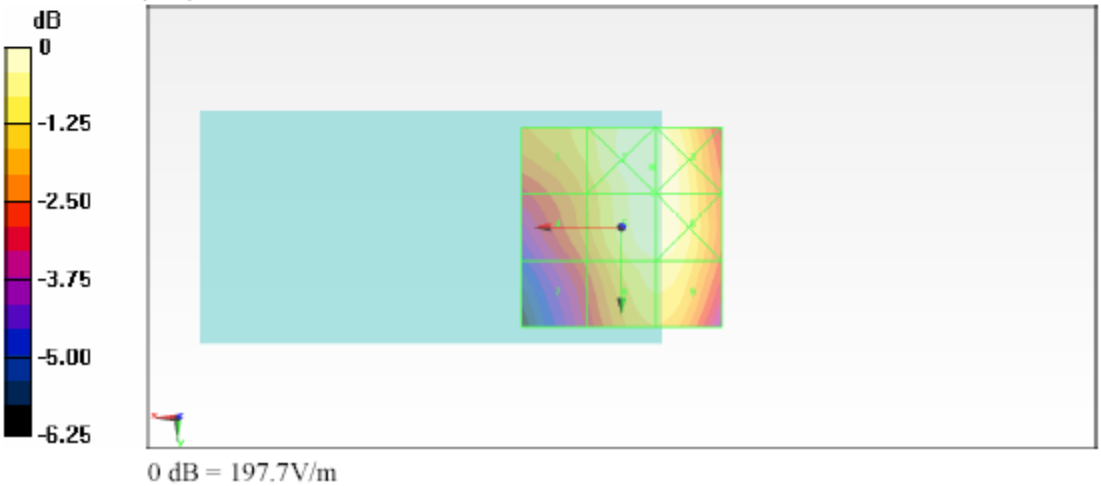
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.00018
Phantom section: TCoil Section
DASY4 Configuration:
- Probe: ER3DV6 - SN2339; ConvF(1, 1, 1); Calibrated: 1/20/2011
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BB
- Measurement SW: DASY52, Version 52.6 (1);SEMCAD X Version 14.4.2 (2595)

GSM850_E Scan/H ch/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 196.3 V/m
Probe Modulation Factor = 2.670
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 87.363 V/m; Power Drift = -0.0054 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 176.7 M3	Grid 2 197.7 M3	Grid 3 197.5 M3
Grid 4 165.6 M3	Grid 5 196.3 M3	Grid 6 196.3 M3
Grid 7 151.5 M3	Grid 8 187.4 M3	Grid 9 187.5 M3

Cursor:
Total = 197.7 V/m
E Category: M3
Location: -7.5, -15, 8.7 mm



0 dB = 197.7V/m

E-field worst-cast test plot for Part 24

Date/Time: 6/9/2011 8:13:01 PM

Test Laboratory: UL CCS

HAC RF Emission

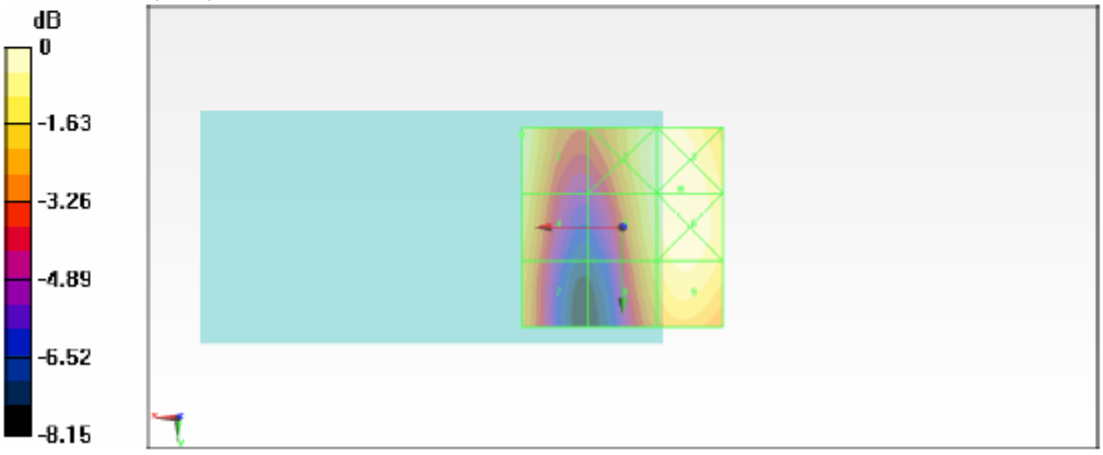
Communication System: GSM1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.00018
Phantom section: TCoil Section
DASY4 Configuration:
- Probe: ER3DV6 - SN2339; ConvF(1, 1, 1); Calibrated: 1/20/2011
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BB
- Measurement SW: DASY52, Version 52.6 (1);SEMCAD X Version 14.4.2 (2595)

GSM1900_E Scan/L ch/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 66.331 V/m
Probe Modulation Factor = 2.600
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 21.216 V/m; Power Drift = -0.03 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **66.331 M3**	Grid 2 **66.037 M3**	Grid 3 **68.481 M3**
Grid 4 **61.922 M3**	Grid 5 **64.812 M3**	Grid 6 **68.433 M3**
Grid 7 **56.181 M3**	Grid 8 **59.734 M3**	Grid 9 **65.539 M3**

Cursor:
Total = 68.480 V/m
E Category: M3
Location: -14.5, -9.5, 8.7 mm



0 dB = 68.480V/m

H-field worst-cast test plot for Part 22

Date/Time: 6/9/2011 7:49:42 PM

Test Laboratory: UL CCS

HAC RF Emission

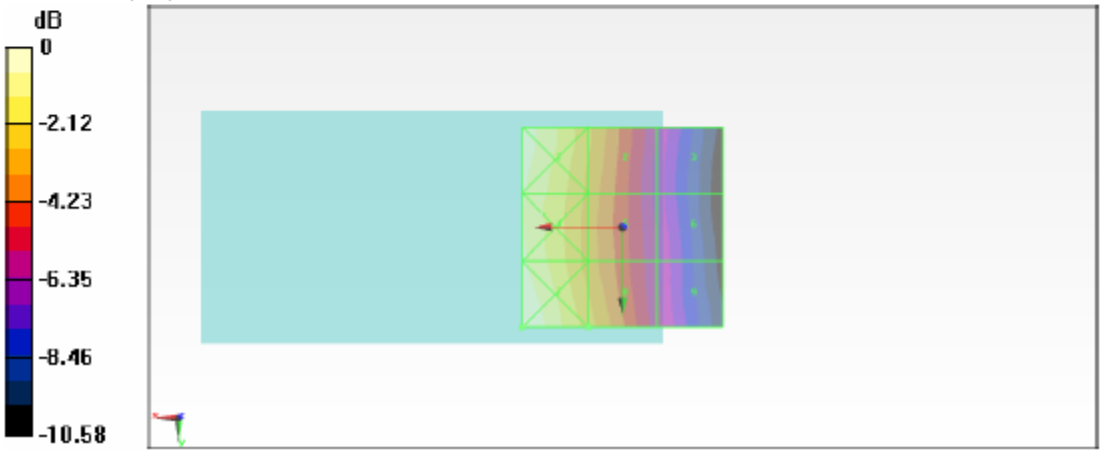
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.00018
Phantom section: TCoil Section
DASY4 Configuration:
- Probe: H3DV6 - SN6157; ; Calibrated: 1/25/2011
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BB
- Measurement SW: DASY52, Version 52.6 (1);SEMCAD X Version 14.4.2 (2595)

GSM850_H Scan/H ch/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.392 A/m
Probe Modulation Factor = 2.700
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.118 A/m; Power Drift = -0.01 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.506 M3**	Grid 2 **0.381 M4**	Grid 3 **0.250 M4**
Grid 4 **0.487 M3**	Grid 5 **0.368 M4**	Grid 6 **0.253 M4**
Grid 7 **0.523 M3**	Grid 8 **0.392 M4**	Grid 9 **0.262 M4**

Cursor:
Total = 0.523 A/m
H Category: M3
Location: 25, 25, 8.7 mm



0 dB = 0.520A/m

H-field worst-cast test plot for Part 24

Date/Time: 6/9/2011 7:22:13 PM

Test Laboratory: UL CCS

HAC RF Emission

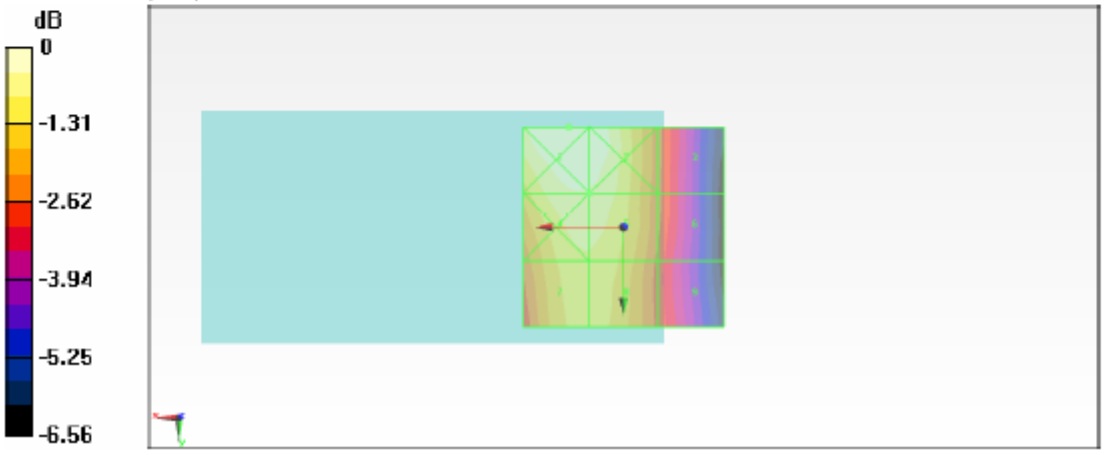
Communication System: GSM1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.00018
Phantom section: TCoil Section
DASY4 Configuration:
- Probe: H3DV6 - SN6157; ; Calibrated: 1/25/2011
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BB
- Measurement SW: DASY52, Version 52.6 (1);SEMCAD X Version 14.4.2 (2595)

GSM1900_H Scan/L ch/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.227 A/m
Probe Modulation Factor = 2.680
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.083 A/m; Power Drift = 0.02 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.244 M3**	Grid 2 **0.240 M3**	Grid 3 **0.182 M3**
Grid 4 **0.228 M3**	Grid 5 **0.227 M3**	Grid 6 **0.181 M3**
Grid 7 **0.215 M3**	Grid 8 **0.215 M3**	Grid 9 **0.176 M3**

Cursor:
Total = 0.244 A/m
H Category: M3
Location: 13.5, -25, 8.7 mm



0 dB = 0.240A/m

14. ATTACHMENTS

No.	Contents	No. of page (s)
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2-2	H-field emissions test plots	12
3	Certificate of E-Field Probe - ER3DV6 SN 2339	10
4	Certificate of H-Field Probe - H3DV6 SN 6157	10
5	Certificate of Dipole CD835V3 - SN 1014	6
6	Certificate of Dipole CD1880V3 - SN 1010	6

15. TEST SETUP PHOTO

TEST SETUP

END OF REPORT