

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 1 (33)
Author Data Daoud Attayi	Dates of Test Feb. 04, April 17-27, May 14, 2015	Report No RTS-6067-1505-04	FCC ID L6ARHR190LW	

Annex A: Measurement data and plots

A.1 MIF validation plots

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Date/Time: 12:00:00 AM

Test Laboratory: BlackBerry RTS

MIF_measurements_02_04_15

DUT: BlackBerry Smartphone; Type: Sample ; Serial: 2FFE768F

Communication System: UID 0, CW; Frequency: 835 MHz

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 0$ kg/m³

Phantom section: TCoil Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ER3DV6 - SN2286; ; Calibrated: 1/19/2015
- Sensor-Surface: 0mm (Fix Surface), $z = 2.5$
- Electronics: DAE4 Sn881; Calibrated: 1/13/2015
- Phantom: HAC RF Test Arch with AMCC; Type: SD HAC P01 BA
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/MIF Measurements/MIF_AM80%_1KHz_Measurement

Calibration Factors: 1.096, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-1.29 dB		0.00 dB	
PMF	3.80 dB	1.549	0.00 dB	
Detector Level	4.32 dBm		0.00 dB	
RFAIP	3.03 dBm		0.00 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements/MIF_AM10%_1KHz_Measurement

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
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MIF	-9.26 dB		0.00 dB
PMF	0.78 dB	1.094	0.00 dB
Detector Level	4.24 dBm		0.00 dB
RFAIP	-5.02 dBm		0.00 dB (MIF+CF+Detector Level)

Configuration/MIF Measurements/MIF_AM1%_1KHz_Measurement

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-19.22 dB		0.01 dB	
PMF	0.09 dB	1.010	0.00 dB	
Detector Level	4.21 dBm		0.00 dB	
RFAIP	-15.01 dBm		0.01 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements/MIF_GSM_Measurement

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	3.46 dB		0.00 dB	
PMF	9.90 dB	3.124	0.01 dB	
Detector Level	-2.52 dBm		0.00 dB	
RFAIP	0.94 dBm		0.01 dB	(MIF+CF+Detector Level)

Configuration/MIF

Measurements/MIF_WCDMA_Voice_AMR12_2kps_Mute_Measurement

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-25.78 dB		0.08 dB	MIF Low
PMF	0.06 dB	1.007	0.00 dB	
Detector Level	-1.56 dBm		0.00 dB	
RFAIP	-27.34 dBm		0.08 dB	(MIF+CF+Detector Level)

Configuration/MIF

Measurements/MIF_WCDMA_voice_AMR4_75kps_Mute_Measurement

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

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Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-25.41 dB		0.08 dB	MIF Low
PMF	0.07 dB	1.008	0.01 dB	
Detector Level	-1.49 dBm		0.07 dB	
RFAIP	-26.89 dBm		0.15 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements/MIF_WCDMA_RMC_Mute_Measurement

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-25.65 dB		0.04 dB	MIF Low
PMF	0.06 dB	1.007	0.00 dB	
Detector Level	-1.53 dBm		0.00 dB	
RFAIP	-27.18 dBm		0.05 dB	(MIF+CF+Detector Level)

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Date/Time: 12:00:00 AM

Test Laboratory: BlackBerry RTS

MIF_WiFi_measurements_02_04_15

DUT: BlackBerry Smartphone; Type: Sample ; Serial: 2FFE768F

Communication System: UID 0, 802.11 b (2450) (0); Frequency: 2437 MHz

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 0$ kg/m³

Phantom section: TCoil Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ER3DV6 - SN2286; ; Calibrated: 1/19/2015
- Sensor-Surface: 0mm (Fix Surface), $z = 2.5$
- Electronics: DAE4 Sn881; Calibrated: 1/13/2015
- Phantom: HAC RF Test Arch with AMCC; Type: SD HAC P01 BA
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/MIF Measurements

WiFi_VoIP/MIF_AM80%_1KHz_Measurement

Calibration Factors: 1.096, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-1.30 dB		0.00 dB	
PMF	3.81 dB	1.550	0.00 dB	
Detector Level	8.07 dBm		0.00 dB	
RFAIP	6.78 dBm		0.00 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements

WiFi_VoIP/MIF_AM10%_1KHz_Measurement

Calibration Factors: 1.096, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

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Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-9.30 dB		0.00 dB	
PMF	0.77 dB	1.093	0.00 dB	
Detector Level	8.09 dBm		0.00 dB	
RFAIP	-1.20 dBm		0.01 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements

WiFi_VoIP/MIF_AM1%_1KHz_Measurement

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-19.26 dB		0.01 dB	
PMF	0.09 dB	1.010	0.00 dB	
Detector Level	8.06 dBm		0.00 dB	
RFAIP	-11.20 dBm		0.01 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11b_Rate_1Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-13.06 dB		0.09 dB	
PMF	0.44 dB	1.052	0.04 dB	
Detector Level	5.11 dBm		0.02 dB	
RFAIP	-7.95 dBm		0.11 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11b_Rate_2Mbps

Calibration Factors: 1.096, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-12.28 dB		0.08 dB	
PMF	0.48 dB	1.056	0.03 dB	
Detector Level	5.22 dBm		0.01 dB	
RFAIP	-7.06 dBm		0.09 dB	(MIF+CF+Detector Level)

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Configuration/MIF Measurements WiFi_VoIP/MIF_802.11b_Rate_5.5Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-9.76 dB		0.06 dB	
PMF	0.67 dB	1.080	0.05 dB	
Detector Level	5.41 dBm		0.01 dB	
RFAIP	-4.35 dBm		0.07 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11b_Rate_11Mbps

Calibration Factors: 1.096, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-8.99 dB		0.11 dB	
PMF	0.80 dB	1.096	0.04 dB	
Detector Level	5.31 dBm		0.01 dB	
RFAIP	-3.68 dBm		0.12 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11g_Rate_6Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-10.07 dB		0.04 dB	
PMF	0.89 dB	1.108	0.01 dB	
Detector Level	5.83 dBm		0.01 dB	
RFAIP	-4.24 dBm		0.05 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11g_Rate_9Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-9.40 dB		0.08 dB	
PMF	1.05 dB	1.129	0.01 dB	
Detector Level	5.70 dBm		0.01 dB	
RFAIP	-3.70 dBm		0.09 dB	(MIF+CF+Detector Level)

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Configuration/MIF Measurements WiFi_VoIP/MIF_802.11g_Rate_18Mbps

Calibration Factors: 1.096, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-8.13 dB		0.14 dB	
PMF	1.08 dB	1.132	0.03 dB	
Detector Level	5.52 dBm		0.00 dB	
RFAIP	-2.61 dBm		0.14 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11g_Rate_54Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-8.62 dB		0.13 dB	
PMF	1.91 dB	1.246	0.05 dB	
Detector Level	2.40 dBm		0.01 dB	
RFAIP	-6.23 dBm		0.14 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11n_Rate_6.5Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-10.94 dB		0.06 dB	
PMF	0.95 dB	1.116	0.02 dB	
Detector Level	4.13 dBm		0.01 dB	
RFAIP	-6.81 dBm		0.06 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11n_Rate_39Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-7.94 dB		0.14 dB	
PMF	1.32 dB	1.164	0.01 dB	
Detector Level	2.02 dBm		0.01 dB	
RFAIP	-5.93 dBm		0.15 dB	(MIF+CF+Detector Level)

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Configuration/MIF Measurements WiFi_VoIP/MIF_802.11n_Rate_65Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-7.91 dB		0.13 dB	
PMF	1.63 dB	1.206	0.01 dB	
Detector Level	0.90 dBm		0.01 dB	
RFAIP	-7.01 dBm		0.14 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11a_Rate_6Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-10.19 dB		0.09 dB	
PMF	0.95 dB	1.116	0.05 dB	
Detector Level	2.92 dBm		0.10 dB	
RFAIP	-7.27 dBm		0.19 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11a_Rate_24Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-7.98 dB		0.15 dB	
PMF	1.47 dB	1.184	0.02 dB	
Detector Level	1.95 dBm		0.01 dB	
RFAIP	-6.03 dBm		0.16 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11a_Rate_54Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-8.92 dB		0.11 dB	
PMF	1.77 dB	1.227	0.02 dB	
Detector Level	-0.05 dBm		0.01 dB	
RFAIP	-8.97 dBm		0.12 dB	(MIF+CF+Detector Level)

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Configuration/MIF Measurements WiFi_VoIP/MIF_802.11ac_Rate_6Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-10.21 dB		0.05 dB	
PMF	0.83 dB	1.101	0.00 dB	
Detector Level	-0.89 dBm		0.02 dB	
RFAIP	-11.10 dBm		0.07 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11ac_Rate_9Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-9.59 dB		0.07 dB	
PMF	0.94 dB	1.114	0.01 dB	
Detector Level	-1.09 dBm		0.01 dB	
RFAIP	-10.68 dBm		0.08 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11ac_Rate_18Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

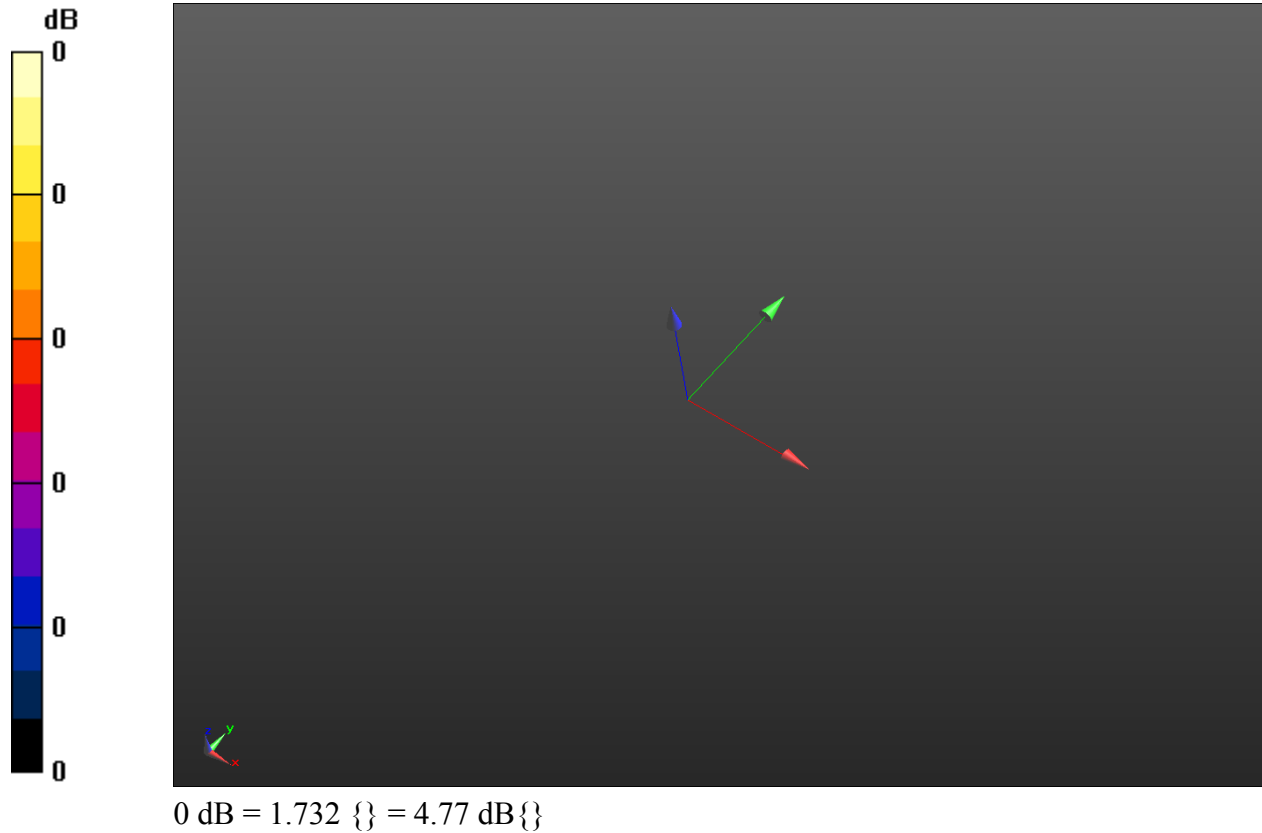
Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-8.23 dB		0.16 dB	
PMF	0.99 dB	1.121	0.08 dB	
Detector Level	-1.26 dBm		0.00 dB	
RFAIP	-9.50 dBm		0.17 dB	(MIF+CF+Detector Level)

Configuration/MIF Measurements WiFi_VoIP/MIF_802.11ac_Rate_54Mbps

Calibration Factors: 1.095, 1.095; MIF Scale: 0.00 dB; Coupling Factor (CF): 0.00 dB

Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-8.80 dB		0.16 dB	
PMF	1.94 dB	1.250	0.02 dB	
Detector Level	-2.07 dBm		0.01 dB	
RFAIP	-10.87 dBm		0.17 dB	(MIF+CF+Detector Level)

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A.2 Dipole validation

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Date/Time: 4/17/2015 9:42:07 AM

Test Laboratory: BlackBerry RTS

HAC RF_E-Field_validation_04_17_15

DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: 1011

Communication System: UID 0, CW For MIF; Frequency: 835 MHz

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 0$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ER3DV6 - SN2286; ConvF(1, 1, 1); Calibrated: 1/19/2015;
- Sensor-Surface: (Fix Surface), $z = 9.7$
- Electronics: DAE4 Sn881; Calibrated: 1/13/2015
- Phantom: HAC RF Test Arch with AMCC; Type: SD HAC P01 BA
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

CD835 Dipole E-Field measurement (E-field scan for ANSI C63.19-2011 compliance)/E Scan - measurement distance from the probe sensor center to CD835 = 15mm/Hearing Aid Compatibility Test at 15mm distance (41x361x1):

Interpolated grid: $dx=0.5000$ mm, $dy=0.5000$ mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 106.8 V/m; Power Drift = 0.14 dB

PMR not calibrated. PMF = 1.000 is applied.

E-field emissions = 111.1 V/m

Near-field category: M4 (AWF 0 dB)

PMF scaled E-field

Grid 1 M4 104.6 V/m	Grid 2 M4 107.8 V/m	Grid 3 M4 107.6 V/m
Grid 4 M4 64.34 V/m	Grid 5 M4 65.37 V/m	Grid 6 M4 64.21 V/m

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Grid 7 M4 108.6 V/m	Grid 8 M4 111.1 V/m	Grid 9 M4 109.5 V/m
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Cursor:

Total = 111.1 V/m

E Category: M4

Location: -0.5, 78.5, 9.7 mm

Date/Time: 4/17/2015 9:54:24 AM

Test Laboratory: BlackBerry RTS

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1008

Communication System: UID 0, CW For MIF; Frequency: 1880 MHz

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 0$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ER3DV6 - SN2286; ConvF(1, 1, 1); Calibrated: 1/19/2015;
- Sensor-Surface: (Fix Surface), z = 9.7
- Electronics: DAE4 Sn881; Calibrated: 1/13/2015
- Phantom: HAC RF Test Arch with AMCC; Type: SD HAC P01 BA
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

CD1880 Dipole E-Field measurement (E-field scan for ANSI C63.19-2011 compliance)/E Scan - measurement distance from the probe sensor center to CD1880 = 15mm/Hearing Aid Compatibility Test at 15mm distance (41x181x1):

Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 143.4 V/m; Power Drift = 0.04 dB

PMR not calibrated. PMF = 1.000 is applied.

E-field emissions = 84.15 V/m

Near-field category: **M3 (AWF 0 dB)**

PMF scaled E-field

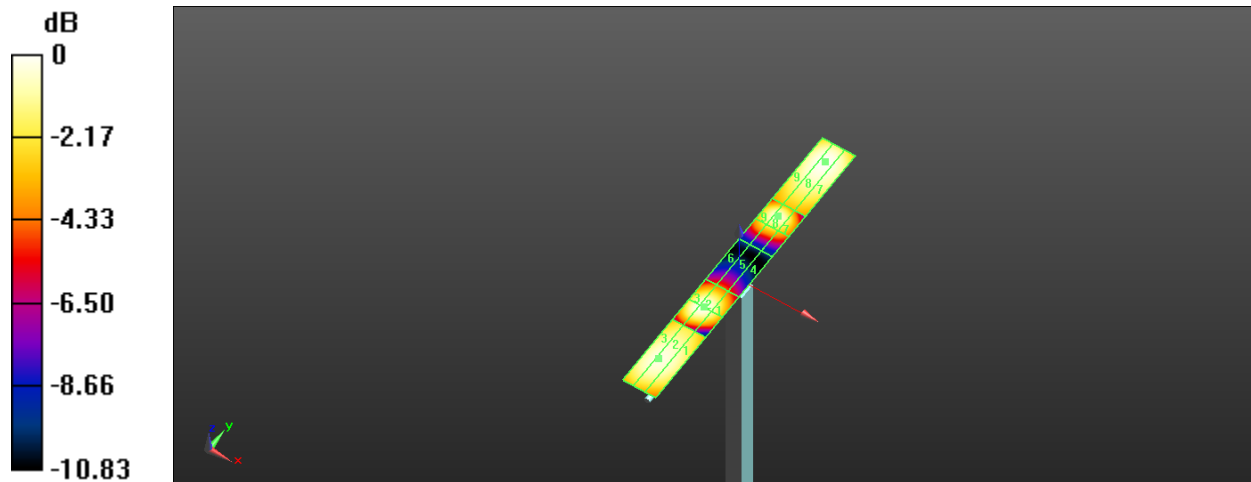
Grid 1 M3 81.53 V/m	Grid 2 M3 84.15 V/m	Grid 3 M3 83.91 V/m
Grid 4 M3 68.98 V/m	Grid 5 M3 69.84 V/m	Grid 6 M3 69.16 V/m
Grid 7 M3 79.79 V/m	Grid 8 M3 82.68 V/m	Grid 9 M3 82.31 V/m

Cursor:

Total = 84.15 V/m

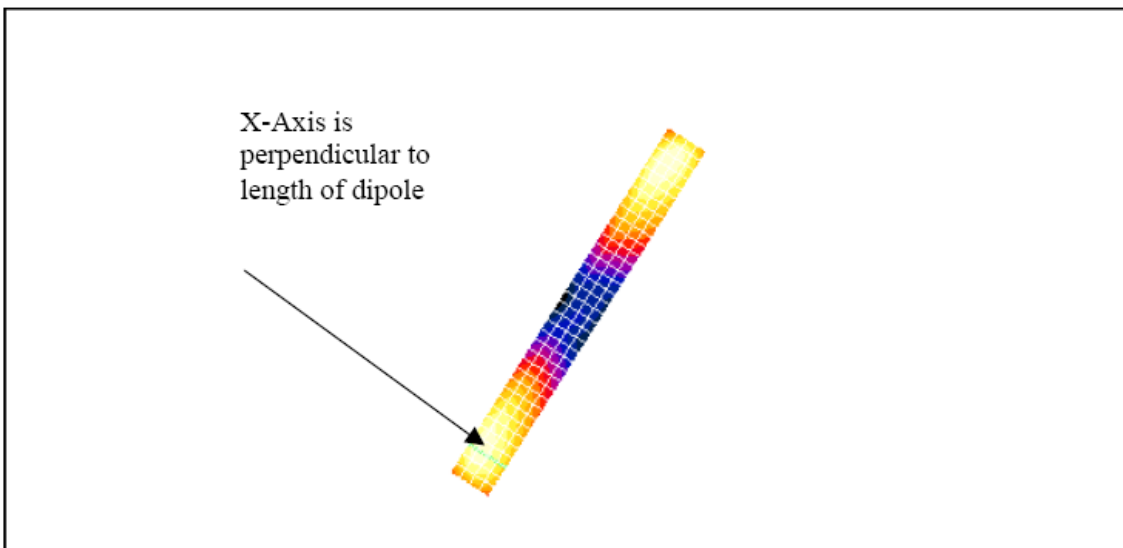
E Category: M3

Location: -1, -30, 9.7 mm



0 dB = 111.1 V/m = 40.91 dBV/m

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The green line in this figure shows the axis along which the points lie.

Comparison of 5mm and 2mm step sizes

An additional set of measurements was taken: dipole validations were performed using 5mm and 2mm step sizes. The delta between the two readings is insignificant for both field types ($< 0.4\%$ for E and 0% for H), demonstrating that 5mm is sufficient. The plots follow.

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Date/Time: 14/07/2005 11:35:24 AM

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Lab: RIM Testing Services (RTS)

Dipole Validation 1880 MHz_E-Field 07_14_05

DUT: HAC Dipole 1880 MHz; Type: CD1880V3

Communication System: CW; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³

Phantom section: H Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2285; ConvF(1, 1, 1); Calibrated: 10/12/2004
- Sensor-Surface: 0mm (Fix Surface) Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn472; Calibrated: 03/01/2005
- Phantom: HAC Test Arch; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

E Scan 10mm above CD 1880 MHz/Hearing Aid Compatibility Test (5x19x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of Total (measured) = 134.8 V/m

E Scan 10mm above CD 1880 MHz/Hearing Aid Compatibility Test (41x181x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of Total field (slot averaged) = 131.0 V/m

Hearing Aid Near-Field Category: M2 (AWF 0 dB)

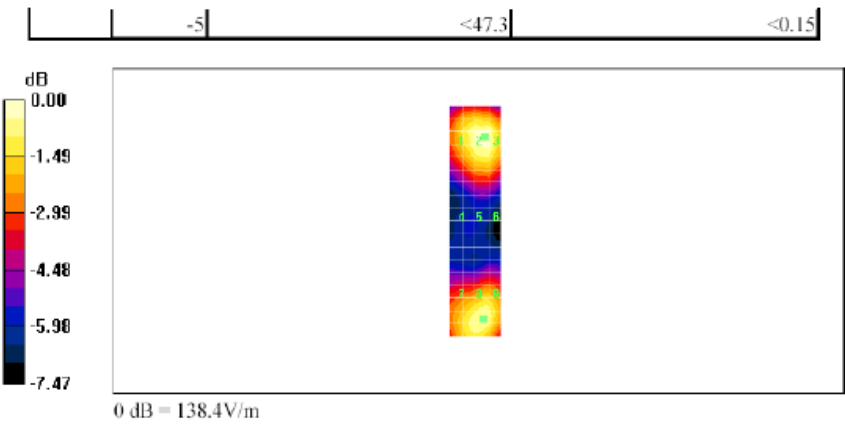
E in V/m (Time averaged) E in V/m (Slot averaged)

Grid 1	Grid 2	Grid 3	Grid 1	Grid 2	Grid 3
123.2	138.1	138.4	123.2	138.1	138.4
Grid 4	Grid 5	Grid 6	Grid 4	Grid 5	Grid 6
80.9	92.3	92.2	80.9	92.3	92.2
Grid 7	Grid 8	Grid 9	Grid 7	Grid 8	Grid 9
119.8	131.0	130.7	119.8	131.0	130.7

Category	AWF (dB)	Limits for E-Field Emissions (V/m)	Limits for H-Field Emissions (A/m)
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.15 - 0.25
M4	0	<63.1	<0.19

file://C:\Program%20Files\DASY4\Print_Templates\Dipole%20Validation%201880%20... 14/07/2005

Date/Time: 14/07/2005 11:35:24 AM
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Author Data Daoud Attayi	Dates of Test Feb. 04, April 17-27, May 14, 2015	Report No RTS-6067-1505-04	FCC ID L6ARHR190LW

Date/Time: 14/07/2005 11:44:51 AM

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Date/Time: 14/07/2005 11:44:51 AM

Lab: RIM Testing Services (RTS)

Dipole Validation 1880 MHz_2mm step_E-Field 07_14_05

DUT: HAC Dipole 1880 MHz; Type: CD1880V3

Communication System: CW; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³

Phantom section: H Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2285; ConvF(1, 1, 1); Calibrated: 10/12/2004
- Sensor-Surface: 0mm (Fix Surface) Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn472; Calibrated: 03/01/2005
- Phantom: HAC Test Arch; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

E Scan 10mm above CD 1880 MHz/Hearing Aid Compatibility Test (11x46x1):

Measurement grid: dx=2mm, dy=2mm

Maximum value of Total (measured) = 138.0 V/m

E Scan 10mm above CD 1880 MHz/Hearing Aid Compatibility Test (101x451x1):

Measurement grid: dx=2mm, dy=2mm

Maximum value of Total field (slot averaged) = 131.2 V/m

Hearing Aid Near-Field Category: M2 (AWF 0 dB)

E in V/m (Time averaged) E in V/m (Slot averaged)

Grid 1	Grid 2	Grid 3	Grid 1	Grid 2	Grid 3
123.1	138.6	138.6	123.1	138.6	138.6
Grid 4	Grid 5	Grid 6	Grid 4	Grid 5	Grid 6
81.4	92.1	91.6	81.4	92.1	91.6
Grid 7	Grid 8	Grid 9	Grid 7	Grid 8	Grid 9
121.3	131.2	131.0	121.3	131.2	131.0

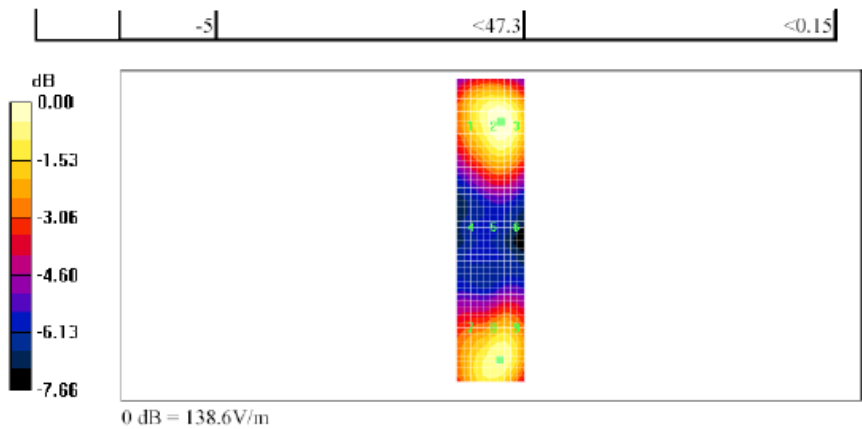
Category	AWF (dB)	Limits for E-Field Emissions (V/m)	Limits for H-Field Emissions (A/m)
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.15 - 0.25
M4	0	<63.1	<0.19

file://C:\Program%20Files\DASY4\Print_Templates\Dipole%20Validation%201880%20... 14/07/2005

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A.3 RF emission field plots

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Date/Time: 4/17/2015 10:17:22 AM

Test Laboratory: BlackBerry RTS

HAC RF_E-Field_GSM 850

DUT: BlackBerry Smartphone; Type: Sample ; Serial: 1160701958

Communication System: UID 0, GSM 850; Frequency: 824.2 MHz, Frequency: 836.8 MHz,
Frequency: 848.8 MHz

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 0$ kg/m³

Phantom section: RF Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: ER3DV6 - SN2286; ConvF(1, 1, 1); Calibrated: 1/19/2015;
- Sensor-Surface: (Fix Surface), $z = 8.7$
- Electronics: DAE4 Sn881; Calibrated: 1/13/2015
- Phantom: HAC RF Test Arch with AMCC; Type: SD HAC P01 BA
- DASYS 52.8.8(1222); SEMCAD X 14.6.10(7331)

Device E-Field GSM850 measurement with ER probe/E Scan - ER3D - 2011: 15 mm from Probe Center to the Device_Low_Chan/Hearing Aid Compatibility

Test (101x101x1): Interpolated grid: $dx=0.5000$ mm, $dy=0.5000$ mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 35.72 V/m; Power Drift = 0.04 dB

Applied MIF = 3.46 dB

RF audio interference level = 33.26 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 M4 33.7 dBV/m	Grid 2 M4 34.47 dBV/m	Grid 3 M4 34.17 dBV/m
Grid 4 M4	Grid 5 M4	Grid 6 M4

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32.25 dBV/m	33.26 dBV/m	33.1 dBV/m
Grid 7 M4	Grid 8 M4	Grid 9 M4
31.02 dBV/m	32.1 dBV/m	31.99 dBV/m

Cursor:

Total = 34.47 dBV/m

E Category: M4

Location: -3, -25, 8.7 mm

Device E-Field GSM850 measurement with ER probe/E Scan - ER3D - 2011: 15 mm from Probe Center to the Device_Mid_Chan/Hearing Aid Compatibility Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 42.01 V/m; Power Drift = -0.13 dB

Applied MIF = 3.46 dB

RF audio interference level = 34.79 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 M4	Grid 2 M4	Grid 3 M4
35.06 dBV/m	35.81 dBV/m	35.55 dBV/m
Grid 4 M4	Grid 5 M4	Grid 6 M4
33.81 dBV/m	34.79 dBV/m	34.7 dBV/m
Grid 7 M4	Grid 8 M4	Grid 9 M4
32.3 dBV/m	33.7 dBV/m	33.65 dBV/m

Cursor:

Total = 35.81 dBV/m

E Category: M4

Location: -4, -25, 8.7 mm

Device E-Field GSM850 measurement with ER probe/E Scan - ER3D - 2011: 15 mm from Probe Center to the Device_High_Chan/Hearing Aid Compatibility

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Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 38.03 V/m; Power Drift = -0.10 dB
Applied MIF = 3.46 dB
RF audio interference level = 33.85 dBV/m
Emission category: M4

MIF scaled E-field

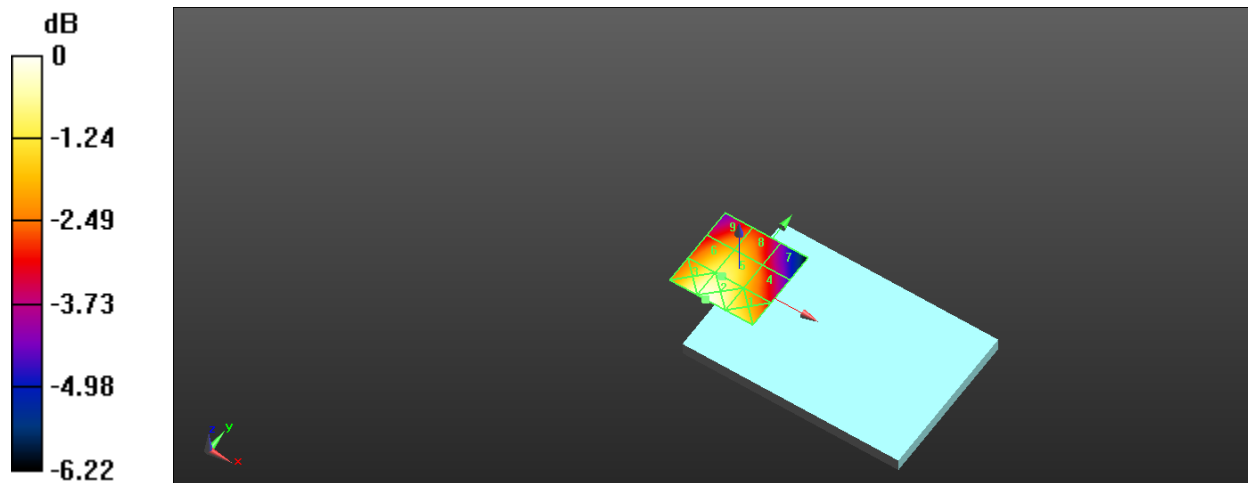
Grid 1 M4 34.04 dBV/m	Grid 2 M4 35.01 dBV/m	Grid 3 M4 34.71 dBV/m
Grid 4 M4 32.61 dBV/m	Grid 5 M4 33.85 dBV/m	Grid 6 M4 33.73 dBV/m
Grid 7 M4 31.09 dBV/m	Grid 8 M4 32.52 dBV/m	Grid 9 M4 32.39 dBV/m

Cursor:

Total = 35.01 dBV/m

E Category: M4

Location: -3.5, -25, 8.7 mm



0 dB = 52.76 V/m = 34.45 dBV/m

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Date/Time: 4/17/2015 10:38:02 AM

Test Laboratory: BlackBerry RTS

HAC RF_E-Field_GSM 1900

DUT: BlackBerry Smartphone; Type: Sample ; Serial: 1160701958

Communication System: UID 0, GSM 1900; Frequency: 1850.2 MHz, Frequency: 1880 MHz,
Frequency: 1909.8 MHz

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 0$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: ER3DV6 - SN2286; ConvF(1, 1, 1); Calibrated: 1/19/2015;
- Sensor-Surface: (Fix Surface), $z = 8.7$
- Electronics: DAE4 Sn881; Calibrated: 1/13/2015
- Phantom: HAC RF Test Arch with AMCC; Type: SD HAC P01 BA
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Device E-Field GSM 1900 measurement with ER probe/E Scan - ER3D - 2011:
15 mm from Probe Center to the Device_Low_Chan/Hearing Aid Compatibility
Test (101x101x1):** Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 6.534 V/m; Power Drift = 0.03 dB

Applied MIF = 3.46 dB

RF audio interference level = 25.55 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 M4 21.75 dBV/m	Grid 2 M4 25.55 dBV/m	Grid 3 M4 25.46 dBV/m
Grid 4 M4 22.62 dBV/m	Grid 5 M4 24.78 dBV/m	Grid 6 M4 24.77 dBV/m

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Grid 7 M4	Grid 8 M4	Grid 9 M4
27.84 dBV/m	29.98 dBV/m	29.9 dBV/m

Cursor:

Total = 29.98 dBV/m

E Category: M4

Location: -6, 25, 8.7 mm

**Device E-Field GSM 1900 measurement with ER probe/E Scan - ER3D - 2011:
15 mm from Probe Center to the Device_Mid_Chan/Hearing Aid Compatibility
Test (101x101x1):** Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 7.066 V/m; Power Drift = 0.58 dB

Applied MIF = 3.46 dB

RF audio interference level = 24.52 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 M4	Grid 2 M4	Grid 3 M4
19.42 dBV/m	22.84 dBV/m	22.62 dBV/m
Grid 4 M4	Grid 5 M4	Grid 6 M4
22.2 dBV/m	24.52 dBV/m	24.46 dBV/m
Grid 7 M4	Grid 8 M4	Grid 9 M4
26.42 dBV/m	28.81 dBV/m	28.66 dBV/m

Cursor:

Total = 28.81 dBV/m

E Category: M4

Location: -5.5, 25, 8.7 mm

**Device E-Field GSM 1900 measurement with ER probe/E Scan - ER3D - 2011:
15 mm from Probe Center to the Device_High_Chan/Hearing Aid Compatibility
Test (101x101x1):** Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

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Device Reference Point: 0, 0, -6.3 mm

Reference Value = 6.656 V/m; Power Drift = -0.04 dB

Applied MIF = 3.46 dB

RF audio interference level = 23.81 dBV/m

Emission category: M4

MIF scaled E-field

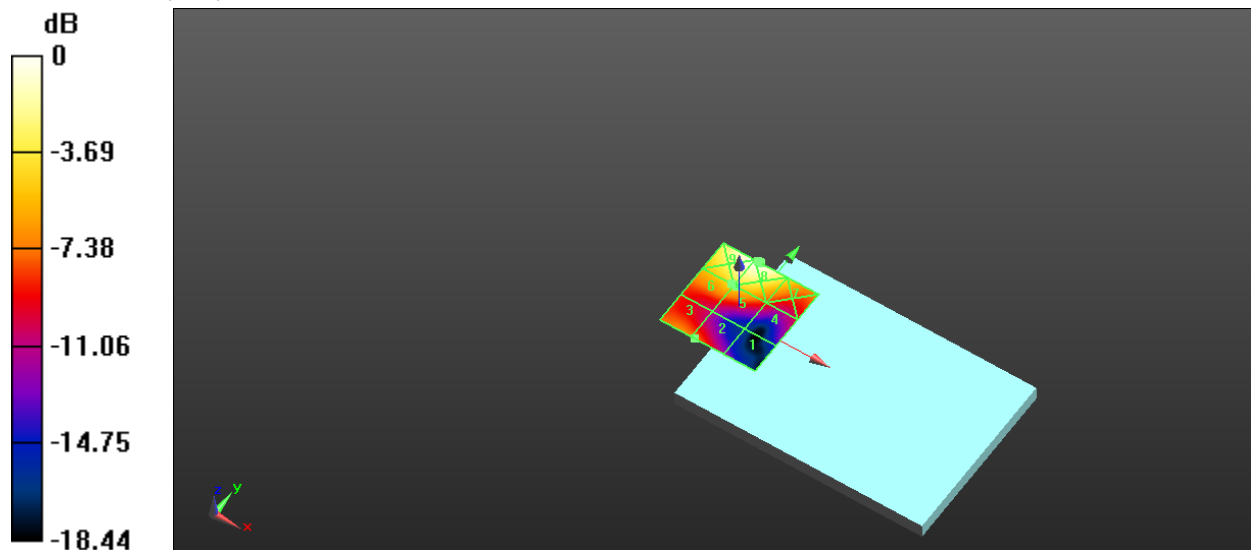
Grid 1 M4 17.32 dBV/m	Grid 2 M4 21.29 dBV/m	Grid 3 M4 21.62 dBV/m
Grid 4 M4 19.89 dBV/m	Grid 5 M4 23.77 dBV/m	Grid 6 M4 23.81 dBV/m
Grid 7 M4 24.6 dBV/m	Grid 8 M4 27.82 dBV/m	Grid 9 M4 27.78 dBV/m

Cursor:

Total = 27.82 dBV/m

E Category: M4

Location: -7, 25, 8.7 mm



0 dB = 31.49 V/m = 29.96 dBV/m

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Date/Time: 4/27/2015 3:21:44 PM

Test Laboratory: BlackBerry RTS

HAC RF_E-Field_Rev 2-02_GSM 850

DUT: BlackBerry Smartphone; Type: Sample ; Serial: 1160701958

Communication System: UID 0, GSM 850; Frequency: 824.2 MHz, Frequency: 836.8 MHz,
Frequency: 848.8 MHz

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 0$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: ER3DV6 - SN2286; ConvF(1, 1, 1); Calibrated: 1/19/2015;
- Sensor-Surface: (Fix Surface), $z = 8.7$
- Electronics: DAE4 Sn881; Calibrated: 1/13/2015
- Phantom: HAC RF Test Arch with AMCC; Type: SD HAC P01 BA
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Device E-Field GSM850 measurement with ER probe/E Scan - ER3D - 2011: 15 mm from Probe Center to the Device_Low_Chan/Hearing Aid Compatibility

Test (101x101x1): Interpolated grid: $dx=0.5000$ mm, $dy=0.5000$ mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 38.99 V/m; Power Drift = 0.05 dB

Applied MIF = 3.46 dB

RF audio interference level = 33.72 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 M4 34.16 dBV/m	Grid 2 M4 34.78 dBV/m	Grid 3 M4 34.2 dBV/m
Grid 4 M4 33.04 dBV/m	Grid 5 M4 33.72 dBV/m	Grid 6 M4 33.42 dBV/m

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Grid 7 M4 32.26 dBV/m	Grid 8 M4 32.98 dBV/m	Grid 9 M4 32.62 dBV/m
--	--	--

Cursor:

Total = 34.78 dBV/m

E Category: M4

Location: -0.5, -25, 8.7 mm

Device E-Field GSM850 measurement with ER probe/E Scan - ER3D - 2011: 15 mm from Probe Center to the Device_Mid_Chan/Hearing Aid Compatibility

Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 45.55 V/m; Power Drift = 0.01 dB

Applied MIF = 3.46 dB

RF audio interference level = 35.13 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 M4 35.47 dBV/m	Grid 2 M4 36.15 dBV/m	Grid 3 M4 35.78 dBV/m
Grid 4 M4 34.19 dBV/m	Grid 5 M4 35.13 dBV/m	Grid 6 M4 34.91 dBV/m
Grid 7 M4 32.82 dBV/m	Grid 8 M4 34.04 dBV/m	Grid 9 M4 33.89 dBV/m

Cursor:

Total = 36.15 dBV/m

E Category: M4

Location: -2, -25, 8.7 mm

Device E-Field GSM850 measurement with ER probe/E Scan - ER3D - 2011: 15 mm from Probe Center to the Device_High_Chan/Hearing Aid Compatibility

Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

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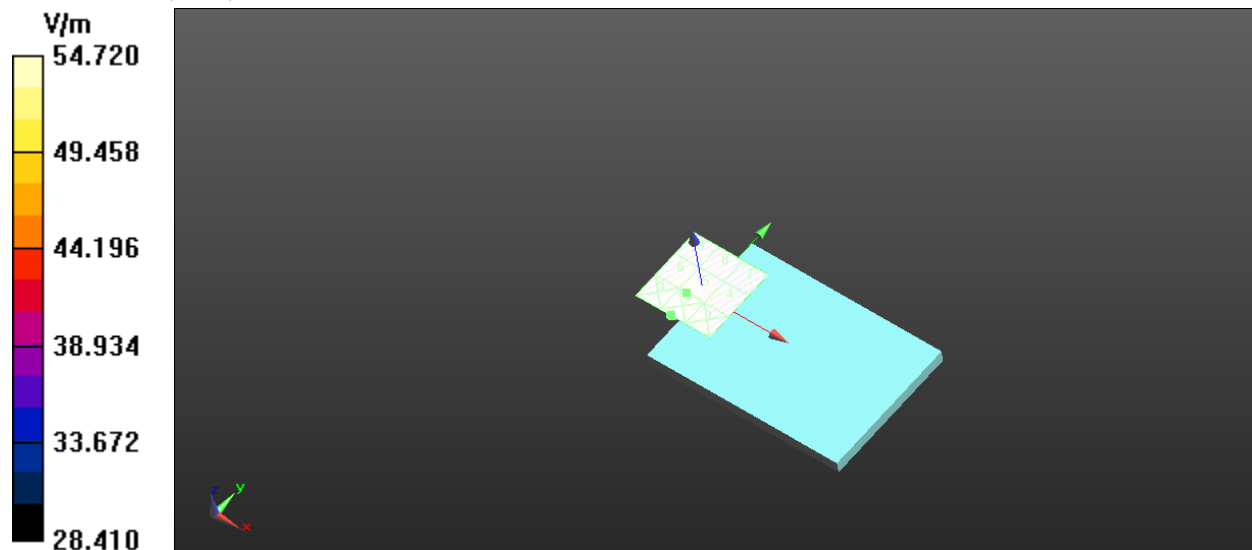
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 42.21 V/m; Power Drift = -0.01 dB
Applied MIF = 3.46 dB
RF audio interference level = 34.40 dBV/m
Emission category: M4

MIF scaled E-field

Grid 1 M4 34.66 dBV/m	Grid 2 M4 35.44 dBV/m	Grid 3 M4 35.02 dBV/m
Grid 4 M4 33.39 dBV/m	Grid 5 M4 34.4 dBV/m	Grid 6 M4 34.16 dBV/m
Grid 7 M4 32.04 dBV/m	Grid 8 M4 33.23 dBV/m	Grid 9 M4 33.08 dBV/m

Cursor:

Total = 35.44 dBV/m
E Category: M4
Location: -1, -25, 8.7 mm



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Date/Time: 4/27/2015 3:52:05 PM

Test Laboratory: BlackBerry RTS

HAC RF_E-Field_Rev 2-02_GSM 1900

DUT: BlackBerry Smartphone; Type: Sample ; Serial: 1160701958

Communication System: UID 0, GSM 1900; Frequency: 1850.2 MHz, Frequency: 1880 MHz,
Frequency: 1909.8 MHz

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 0$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: ER3DV6 - SN2286; ConvF(1, 1, 1); Calibrated: 1/19/2015;
- Sensor-Surface: (Fix Surface), $z = 8.7$
- Electronics: DAE4 Sn881; Calibrated: 1/13/2015
- Phantom: HAC RF Test Arch with AMCC; Type: SD HAC P01 BA
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Device E-Field GSM 1900 measurement with ER probe/E Scan - ER3D - 2011: 15 mm from Probe Center to the Device_Low_Chan/Hearing Aid Compatibility Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 8.591 V/m; Power Drift = 0.56 dB

Applied MIF = 3.46 dB

RF audio interference level = 26.76 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 M4 24.05 dBV/m	Grid 2 M4 26.76 dBV/m	Grid 3 M4 26.75 dBV/m
Grid 4 M4 24.32 dBV/m	Grid 5 M4 26.44 dBV/m	Grid 6 M4 26.43 dBV/m

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Grid 7 M4 29.66 dBV/m	Grid 8 M3 31.34 dBV/m	Grid 9 M3 31.06 dBV/m
--	--	--

Cursor:

Total = 31.34 dBV/m

E Category: M3

Location: -4, 25, 8.7 mm

**Device E-Field GSM 1900 measurement with ER probe/E Scan - ER3D - 2011:
15 mm from Probe Center to the Device_Mid_Chan/Hearing Aid Compatibility
Test (101x101x1):** Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 8.080 V/m; Power Drift = 0.35 dB

Applied MIF = 3.46 dB

RF audio interference level = 25.60 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 M4 21.34 dBV/m	Grid 2 M4 24.26 dBV/m	Grid 3 M4 24.3 dBV/m
Grid 4 M4 23.29 dBV/m	Grid 5 M4 25.6 dBV/m	Grid 6 M4 25.59 dBV/m
Grid 7 M4 28.04 dBV/m	Grid 8 M4 29.99 dBV/m	Grid 9 M4 29.8 dBV/m

Cursor:

Total = 29.99 dBV/m

E Category: M4

Location: -5, 25, 8.7 mm

**Device E-Field GSM 1900 measurement with ER probe/E Scan - ER3D - 2011:
15 mm from Probe Center to the Device_High_Chan/Hearing Aid Compatibility
Test (101x101x1):** Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

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Device Reference Point: 0, 0, -6.3 mm
Reference Value = 7.701 V/m; Power Drift = -0.02 dB
Applied MIF = 3.46 dB
RF audio interference level = 24.85 dBV/m
Emission category: M4

MIF scaled E-field

Grid 1 M4 19.31 dBV/m	Grid 2 M4 22.88 dBV/m	Grid 3 M4 22.97 dBV/m
Grid 4 M4 21.74 dBV/m	Grid 5 M4 24.85 dBV/m	Grid 6 M4 24.85 dBV/m
Grid 7 M4 26.7 dBV/m	Grid 8 M4 29.31 dBV/m	Grid 9 M4 29.16 dBV/m

Cursor:

Total = 29.31 dBV/m
E Category: M4
Location: -5.5, 25, 8.7 mm

