

		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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 2 (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	

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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		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 3 (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

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 4 (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

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)

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 5 (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	

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 6 (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

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)

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 7 (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

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)

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 8 (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

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)

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 9 (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

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)

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 10 (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

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

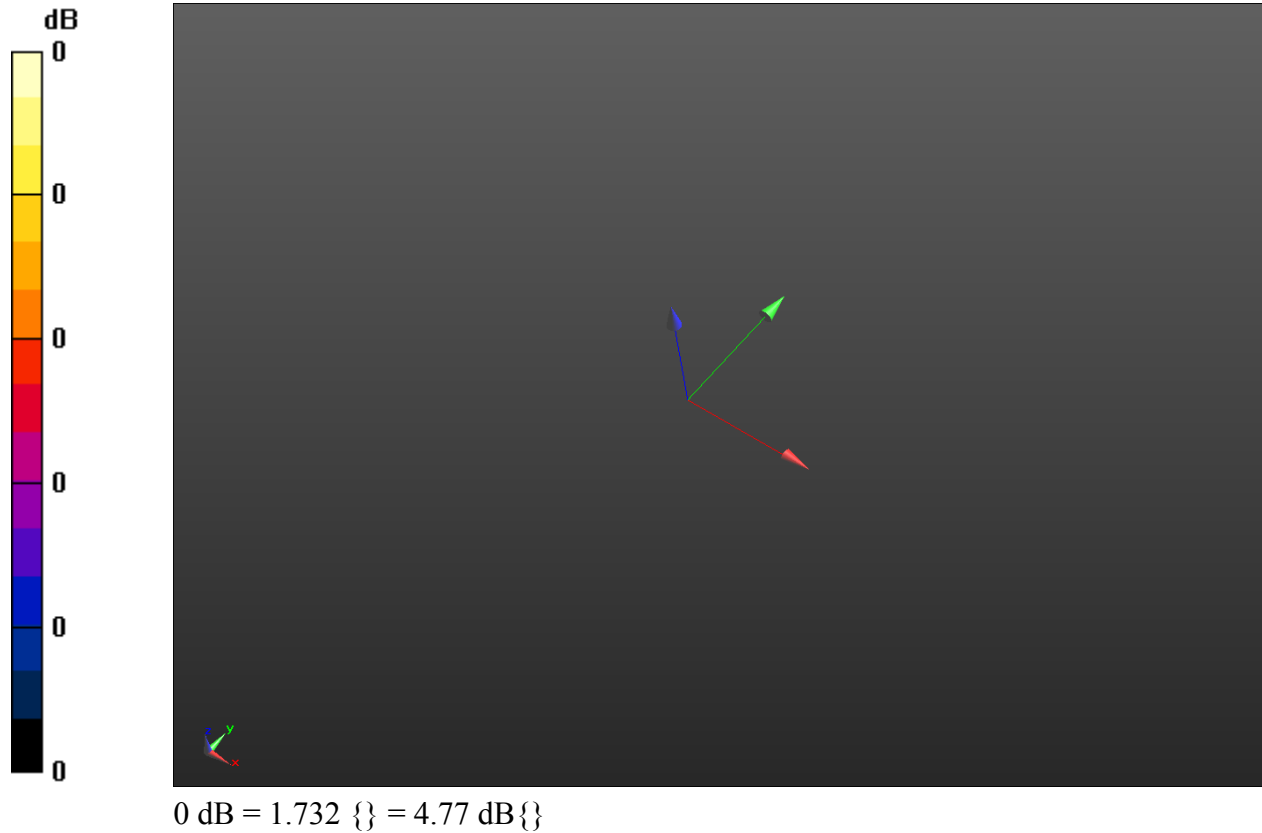
Quantity	Value [log]	[linear]	Fluctuation	Remark
MIF	-8.23 dB		0.16 dB	
PMF	0.99 dB	1.121	0.08 dB	
Detector Level	-1.26 dBm		0.00 dB	
RFAIP	-9.50 dBm		0.17 dB	(MIF+CF+Detector Level)

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)

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 11 (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



		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 12 (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	

A.2 Dipole validation

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 13 (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

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 14 (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

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

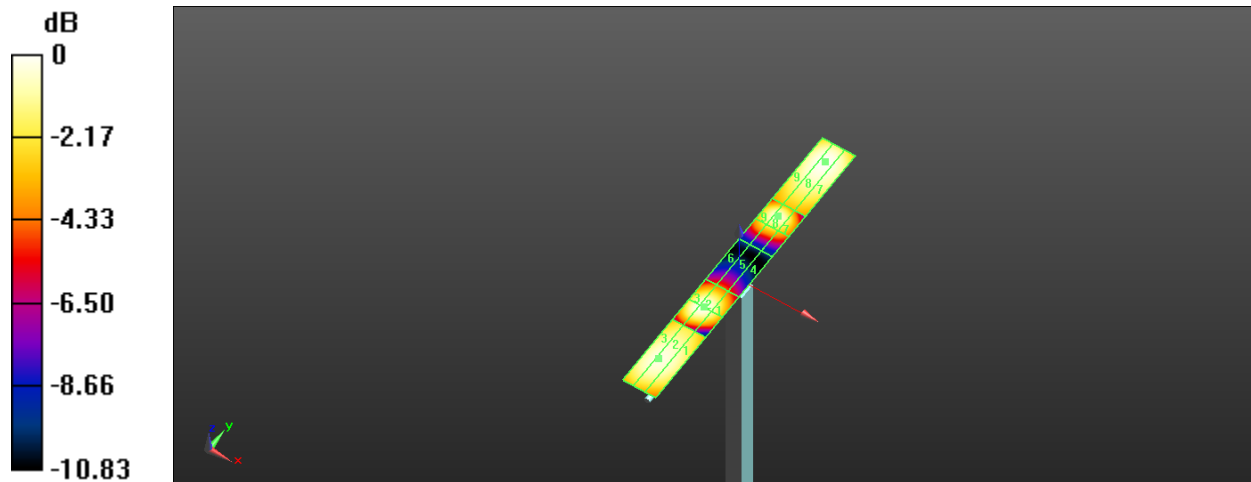
Grid 1 M3 81.53 V/m	Grid 2 M3 84.15 V/m	Grid 3 M3 83.91 V/m
Grid 4 M3 68.98 V/m	Grid 5 M3 69.84 V/m	Grid 6 M3 69.16 V/m
Grid 7 M3 79.79 V/m	Grid 8 M3 82.68 V/m	Grid 9 M3 82.31 V/m

Cursor:

Total = 84.15 V/m

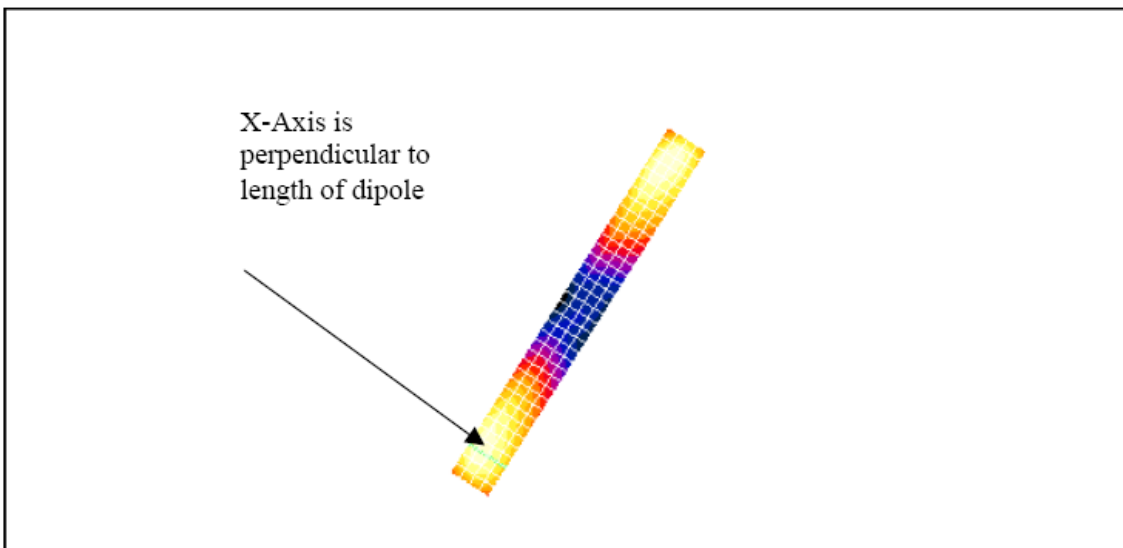
E Category: M3

Location: -1, -30, 9.7 mm



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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 16 (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	



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.

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 17 (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

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

Page 1 of 2

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

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

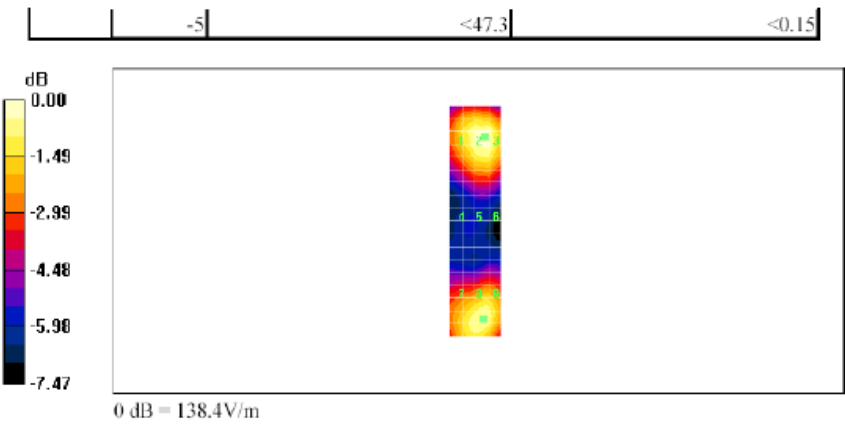
Category	AWF (dB)	Limits for E-Field Emissions (V/m)	Limits for H-Field Emissions (A/m)
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.15 - 0.25
M4	0	<63.1	<0.19

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 18 (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

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

Page 2 of 2



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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 19 (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

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

Page 1 of 2

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

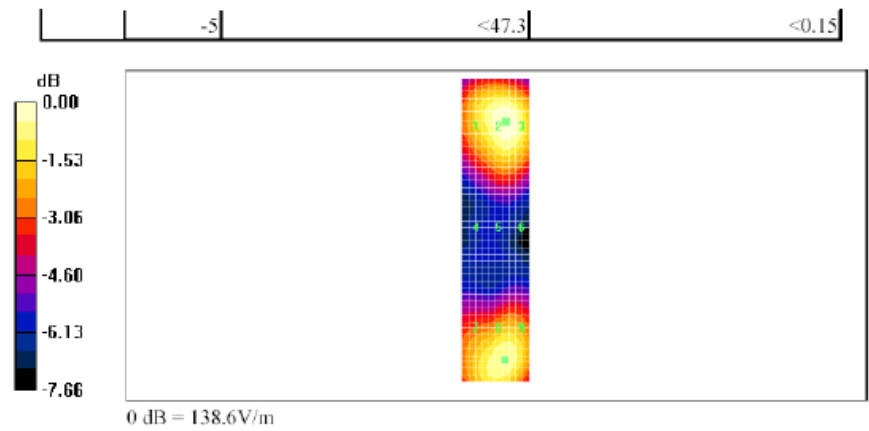
Hearing Aid Near-Field Category: M2 (AWF 0 dB)

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



		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 21 (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	

A.3 RF emission field plots

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 22 (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

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: 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 = 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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 23 (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

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 24 (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

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

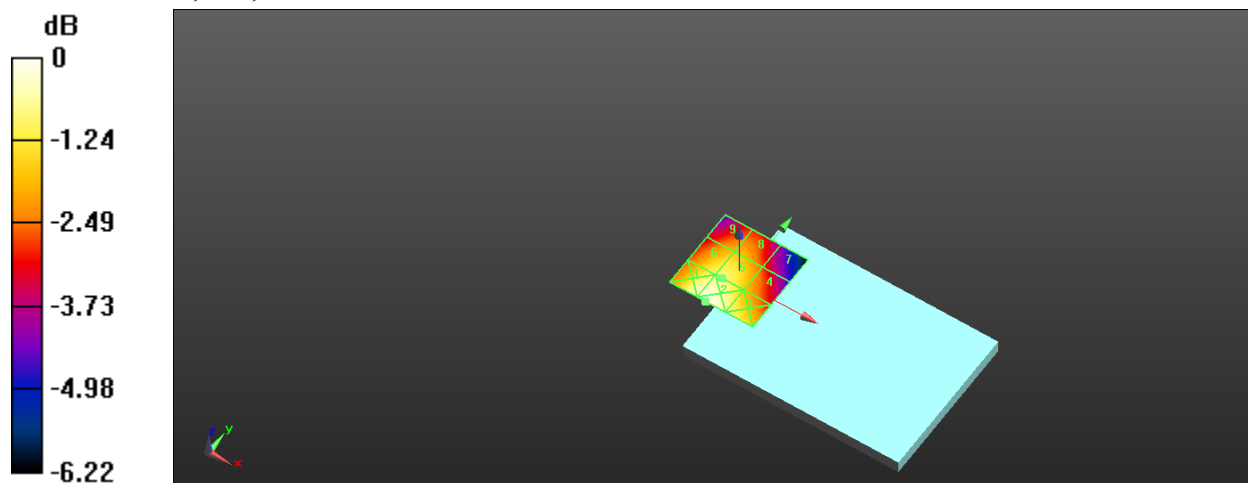
Grid 1 M4 34.04 dBV/m	Grid 2 M4 35.01 dBV/m	Grid 3 M4 34.71 dBV/m
Grid 4 M4 32.61 dBV/m	Grid 5 M4 33.85 dBV/m	Grid 6 M4 33.73 dBV/m
Grid 7 M4 31.09 dBV/m	Grid 8 M4 32.52 dBV/m	Grid 9 M4 32.39 dBV/m

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 25 (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

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

	Document		Page
	Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		26 (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

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 27 (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	

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

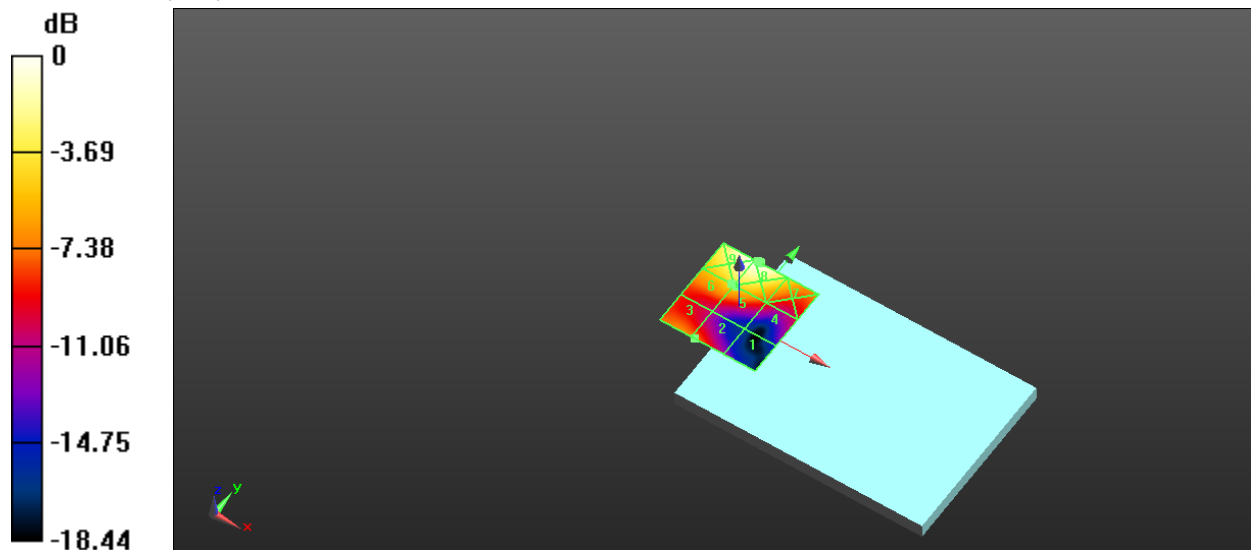
Grid 1 M4 17.32 dBV/m	Grid 2 M4 21.29 dBV/m	Grid 3 M4 21.62 dBV/m
Grid 4 M4 19.89 dBV/m	Grid 5 M4 23.77 dBV/m	Grid 6 M4 23.81 dBV/m
Grid 7 M4 24.6 dBV/m	Grid 8 M4 27.82 dBV/m	Grid 9 M4 27.78 dBV/m

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 28 (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

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 29 (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

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)		Page 30 (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	

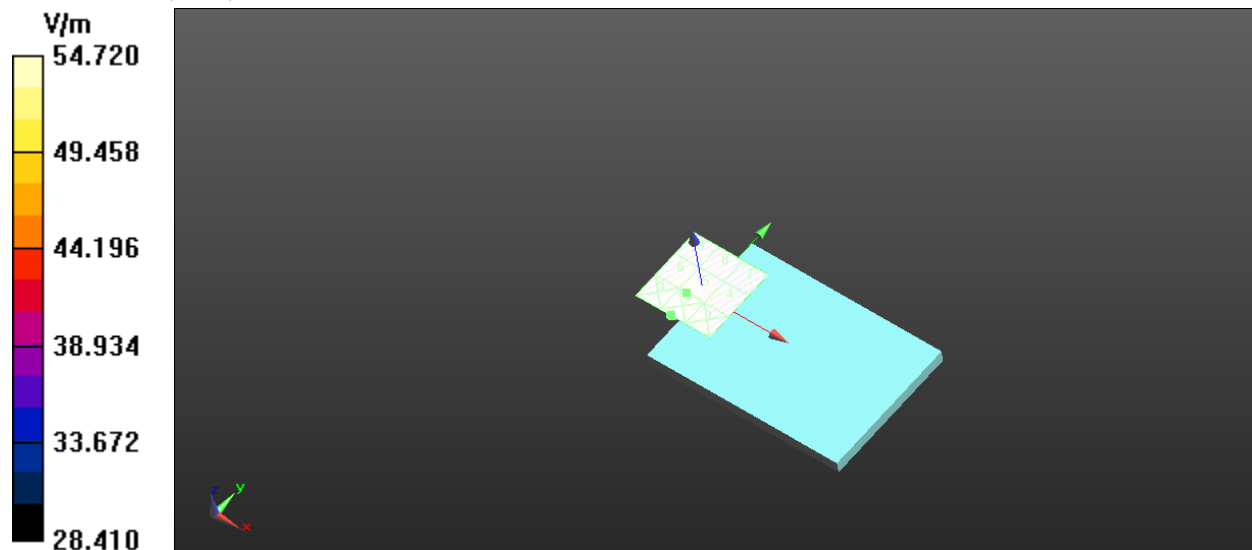
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 42.21 V/m; Power Drift = -0.01 dB
Applied MIF = 3.46 dB
RF audio interference level = 34.40 dBV/m
Emission category: M4

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



		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 31 (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

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 32 (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

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

		Document Annex A to Hearing Aid Compatibility RF Emissions Test Report for the BlackBerry® Smartphone RHR191LW (SQW100-4)	Page 33 (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

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

