Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

December 15, 2004

Attention: Timothy R. Johnson,
Examining Engineer
American Telecommunications Certification Body Inc.
6731 Whittier Ave
McLean, VA 22101 USA

Subject: Response to the ATCB Comments Reference Number 120704 for clarification on RIM BlackBerry Wireless Handheld FCC ID L6ARAR20CN.

The following addresses your inquiry Reference Number 120704**:**

1. We got the CDG2 Infrastructure reports and CDG2 DoC, so IC will be filed shortly

2. Bluetooth is on sheet 11 - lower half. U1103 is the Bluetooth IC. FL1104 is the Bluetooth Balun filter. The Bluetooth antenna is printed on the board.

3. Page 13 only has ground vias so it was skipped. It does not contain any useful information. Please check page 1, lower left hand corner for confirmation.

4. The device was powered on, and the charging mode was turned on. USB data TX is not possible in this configuration since there is no user application to TX data, it's only for charging purposes. USB data TX occurs when the USB cable is connected to a PC, in that configuration a special test tool running on the PC would TX data back and forth.

5. The limits on page 17 of the PC peripheral report have been revised. A copy of the revised report RIM-0110-0410-05 is included here.

6. The measurement was repeated, and the revised report RIM-0110-0411-02 is attached here.

7. The report has been updated with the correct time of investigation of 31.6 seconds (0.4*79), which has now been used in the calculations. Please see the revised report RIM-0110-0411-02_revised.pdf above.

8. 3.5 V is the lowest operating voltage of the device in the TX mode. 4.2 V is the maximum charged voltage of the battery, under load the battery voltage drops to 4.1 V instantaneously and then stabilizes to nominal voltage of 3.8 V. Any higher voltage will be regulated down to the nominal voltage of 3.8 V.

9. The -7.8 dB is the antenna gain taken from the calibration sheet. Since it's a negative number, it's been subtracted.

Research In Motion Limited
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10. The percentage deviation for the 835 MHz muscle tissues was higher than the recommended limit by 5.99 %, which gave more conservative SAR values. The liquid has been adjusted and the dielectric parameters were re-measured as shown in the table 1. The new muscle tissue parameters were used to recalculate the worst-case body worn SAR with 15 mm distance. The new SAR value was determined to be 0.79 W/kg as compared to the value of 0.84 W/kg with the higher dielectric parameters. Please refer to the appendix for the SAR plot.

f (MHz)	Tissue Type	Limits / Measured	Dielectric Parameters		Liquid Temp (°C)
			ε_r	σ [S/m]	
835	Muscle	Measured	52.5	0.97	21.7
		Recommended Limits	55.2	0.97	N/A

Table 1: Electrical parameters of tissue simulating liquid

11. We will modify our Safety Information Booklet to show the following statement:

"To maintain compliance with FCC and IC RF exposure guidelines when carrying the handheld on your body, use RIM-supplied or approved accessories or accessories that contain no metallic components and provide a separation distance to the body of at least 15 mm. Use of other accessories might violate FCC and IC RF exposure guidelines and might void any warranty applicable to the handheld. For data operation (when you do not use a body-worn accessory and are not holding the handheld at the ear), position the handheld at least 15 mm (0.60 inches) from the body..."

12. The conducted output power measurements were reported to be the same in both SAR and EMC reports and are also shown in the table below.

		EMC report	SAR report
Channel	**Frequency (MHz)**	**Maximum Output Power (dBm)**	**Maximum Output Power (dBm)**

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

1013	824.700	24.95	24.95
384	836.520	24.80	24.80
777	848.310	24.86	24.86
25	1851.200	23.76	23.76
600	1880.000	23.60	23.60
1175	1908.750	23.70	23.70

Table 2: Conducted output power

13. The photos below are for the 15 mm separation distance configuration:

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Figure 2: Photos with 15 mm separation distance

14. We have been using the DASY SAR measurement system since January 2002 and haven't found any problem with the system and thus we believe it is not necessary to perform daily dipole validation. In addition, we have previously submitted many applications with the FCC and ATCB with one dipole validation data per band. FCC and ATCB haven't asked us for daily validation before and issued us approval. Also, I have seen many SAR test reports from other manufacturers or test labs with dipole validation performed only once that were approved by the FCC or ATCB**. Please inform us if it is really mandatory and other applicants are submitting daily dipole validation, then we will have to perform daily validation for our future filings.**

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15. The worst case 835 MHz band body SAR is with 15 mm spacing. The photos with holster and headset are incorrect, since they are not the worst case. The handheld has been re-tested with or without the headset as shown in the tables below with 15 mm distance:

f (MHz)	Limits / Measured	SAR (W/kg) 1 g/ 10 g	Dielectric Parameters		Liquid Temp (°C)
			ε_r	σ [S/m]	
835	Measured	9.8 / 6.4	42.0	0.90	21.5
	Recommended Limits	9.6 / 6.2	43.3	0.91	N/A

Table 3: System accuracy verification

Mode	f (MHz)	Cond. Output Power (dBm)	Liquid Temp (°C)	Configuration	SAR, averaged over 1 g (W/kg)
Cellular CDMA	*836.52	24.8	22.4	No headset attached	0.78
	836.52	24.8	22.2	Headset attached	**0.81**

Table 4: Body worn with a distance of 15 mm between the backside of handheld and flat phantom with or without the headset

* Supplement C: Middle channel testing is sufficient only if SAR is at least 3dB below the limit see PN 02-1438

16. Please refer to the Appendix B: Calibration Certificate, for probe sensor location, distance, probe linearity, axial and special isotropy, boundary effect error and calibration uncertainty . We are using a standard dosimetric SPEAG probe and DASY 4 automated system. It is the same system and probe used to test our previous products that were approved by the ATCB and FCC.

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Please do not hesitate to contact the undersigned should you have any questions.

Yours truly,

Masud S. Attayi, P.Eng.
Senior Compliance Engineer
Research In Motion Limited
Tel: +1 519 888–7465 x2442
Fax: +1 519 888-6906
Email: mattayi@rim.com

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Appendix A: SAR plots and data

Title
SubTitle
December 13, 2004 04:43 PM

Frequency	e'	e''
800.000000 MHz	42.4991	19.5668
805.000000 MHz	42.4515	19.5424
810.000000 MHz	42.3820	19.5137
815.000000 MHz	42.2877	19.5084
820.000000 MHz	42.2467	19.4779
825.000000 MHz	42.1530	19.4466
830.000000 MHz	42.0953	19.4640
835.000000 MHz	42.0375	19.4394
840.000000 MHz	41.9666	19.4397
845.000000 MHz	41.9066	19.4372
850.000000 MHz	41.8448	19.4250
855.000000 MHz	41.7799	19.4347
860.000000 MHz	41.7323	19.4291
865.000000 MHz	41.6537	19.4020
870.000000 MHz	41.5993	19.4193
875.000000 MHz	41.5545	19.4135
880.000000 MHz	41.5104	19.4077
885.000000 MHz	41.4431	19.3887
890.000000 MHz	41.4411	19.4007
895.000000 MHz	41.4240	19.3772
900.000000 MHz	41.3650	19.3614
905.000000 MHz	41.3277	19.3493
910.000000 MHz	41.2857	19.3191
915.000000 MHz	41.2605	19.2939
920.000000 MHz	41.2337	19.2938
925.000000 MHz	41.1488	19.2922
930.000000 MHz	41.0772	19.2674
935.000000 MHz	41.0378	19.2812
940.000000 MHz	40.9680	19.2565
945.000000 MHz	40.9247	19.2527
950.000000 MHz	40.8577	19.2468

Title
SubTitle
December 13, 2004 05:11 PM

Frequency	e'	e''
800.000000 MHz	52.8782	21.1390
805.000000 MHz	52.8467	21.1186
810.000000 MHz	52.7827	21.1153
815.000000 MHz	52.7381	21.0998
820.000000 MHz	52.6591	21.0465
825.000000 MHz	52.6001	21.0311
830.000000 MHz	52.5405	21.0108
835.000000 MHz	52.4688	20.9841
840.000000 MHz	52.4502	20.9498
845.000000 MHz	52.3841	20.9328
850.000000 MHz	52.3191	20.9156
855.000000 MHz	52.2517	20.8889
860.000000 MHz	52.2170	20.8454
865.000000 MHz	52.1556	20.8441
870.000000 MHz	52.0924	20.8489
875.000000 MHz	52.0420	20.8279
880.000000 MHz	52.0043	20.7814
885.000000 MHz	51.9753	20.7846
890.000000 MHz	51.9379	20.7909
895.000000 MHz	51.9076	20.7580
900.000000 MHz	51.8792	20.7558
905.000000 MHz	51.8453	20.7504
910.000000 MHz	51.7913	20.7168
915.000000 MHz	51.7724	20.7060
920.000000 MHz	51.7078	20.7333
925.000000 MHz	51.6431	20.7046
930.000000 MHz	51.5933	20.6857
935.000000 MHz	51.5479	20.6756
940.000000 MHz	51.5294	20.6550
945.000000 MHz	51.4458	20.6201
950.000000 MHz	51.4019	20.6200

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Date/Time: 12/13/04 17:19:50

Test Laboratory: RIM

835 MHz dipole validation; Ambient Tem. 24.1 deg. cel.; Liquid Temp. 21.5 deg. cel

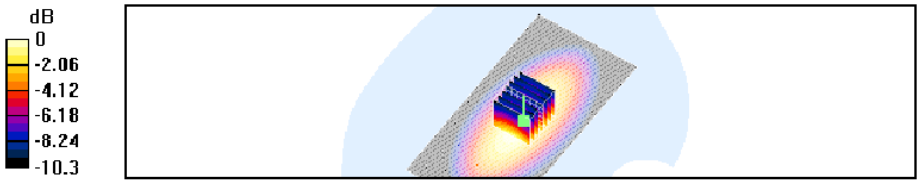
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:446

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 MHz Head Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 42; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1642; ConvF(6.57, 6.57, 6.57); Calibrated: 31/08/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn472; Calibrated: 27/08/2004
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Unnamed procedure/Area Scan (81x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 10.6 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 115.8 V/m; Power Drift = -0.0003 dB
Peak SAR (extrapolated) = 14 W/kg
SAR(1 g) = 9.78 mW/g; SAR(10 g) = 6.44 mW/g
Maximum value of SAR (measured) = 10.6 mW/g



0 dB = 10.6mW/g

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Date/Time: 10/28/04 07:52:28

Test Laboratory: RIM

Body-worn with 15 mm separation; CDMA cellular band; Low Chan; Ambient Temp. 24.5 deg. cel.; Liquid Temp. 22.2 deg. cel

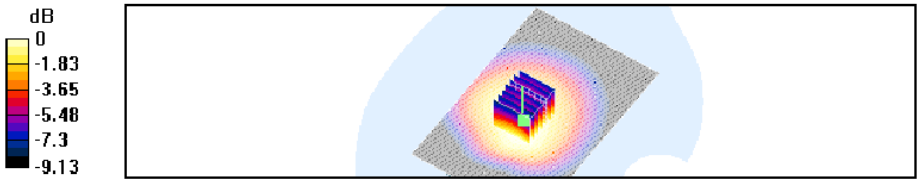
DUT: BlackBerry Wireless Handheld Model: RAR20CN; Type: Sample

Communication System: Cellular CDMA ; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: M 835 Medium parameters used: f = 836.52 MHz; σ = 0.97 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1642; ConvF(6.13, 6.13, 6.13); Calibrated: 31/08/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn472; Calibrated: 27/08/2004
- Phantom: SAM 2; Type: SAM 4.0; Serial: 1080
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Unnamed procedure/Area Scan (101x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.822 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.8 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.794 mW/g; SAR(10 g) = 0.588 mW/g
Maximum value of SAR (measured) = 0.838 mW/g



0 dB = 0.838mW/g

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Date/Time: 12/14/04 12:16:43

Test Laboratory: RIM

Body-worn with no headset and 15 mm separation; CDMA cellular band; Mid Chan; Ambient Temp. 23.8 deg. cel.; Liquid Temp. 22.2 deg. cel

DUT: BlackBerry Wireless Handheld Model: RAR20CN; Type: Sample

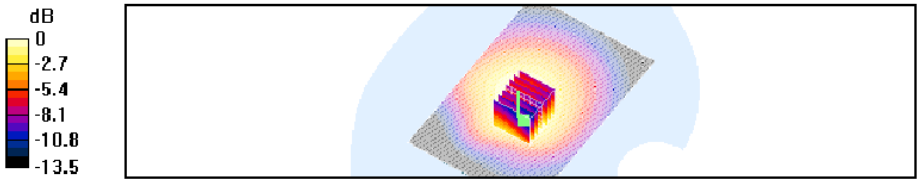
Communication System: Cellular CDMA ; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: M 835 Medium parameters used: f = 836.52 MHz; σ = 0.97 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1642; ConvF(6.13, 6.13, 6.13); Calibrated: 31/08/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn472; Calibrated: 27/08/2004
- Phantom: SAM 2; Type: SAM 4.0; Serial: 1080
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Unnamed procedure/Area Scan (101x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.818 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.8 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.783 mW/g; SAR(10 g) = 0.544 mW/g

Maximum value of SAR (measured) = 0.842 mW/g



0 dB = 0.842mW/g

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Date/Time: 12/14/04 11:37:02

Test Laboratory: RIM

Body-worn with headset and 15 mm separation; CDMA cellular band; Mid Chan; Ambient Temp. 24.3 deg. cel.; Liquid Temp. 22.4 deg. cel

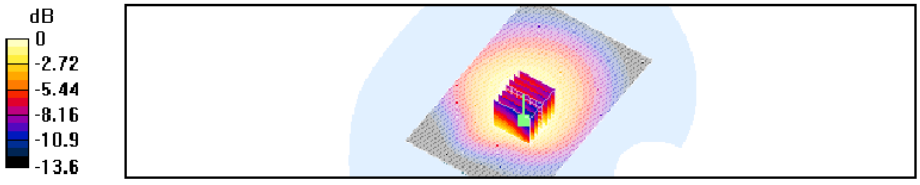
DUT: BlackBerry Wireless Handheld Model: RAR20CN; Type: Sample

Communication System: Cellular CDMA ; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: M 835 Medium parameters used: f = 836.52 MHz; σ = 0.97 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1642; ConvF(6.13, 6.13, 6.13); Calibrated: 31/08/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn472; Calibrated: 27/08/2004
- Phantom: SAM 2; Type: SAM 4.0; Serial: 1080
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Unnamed procedure/Area Scan (101x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.875 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.7 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.813 mW/g; SAR(10 g) = 0.552 mW/g
Maximum value of SAR (measured) = 0.872 mW/g



0 dB = 0.872mW/g

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Appendix B: Probe calibration certificate

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Applications
Support & Downloads
Products
• DASY4 Packages
• EASY4
• Probes
ET3DV6 - Isotropic Dos-Probe
ES3DV3 - Isotropic Dos-Probe
EX3DV4 - Isotropic Dos-Probe
ET1DV3 - D-Probe
EUV3 - Universal Vector E-Probe
H3DV6 - Isotropic H-Probe
HUV4 - Universal Vector H-Probe
T1V3 - Temp-Probe
DP1 - Dummy-Probe
• Data Acquisition System
• Software
• Phantoms
• Robots
• Validation Kits & Calibration Dipoles
• Hearing Aid Compatibility (HAC) Ext
• Tissue Simulating Liquids
SPEAG Home
Legal Notice

ER3DV6 ISOTROPIC E-FIELD PROBE FOR GENERAL NEAR-FIE MEASUREMENTS

Construction	One dipole parallel, two dipoles normal to probe ax Built-in shielding against static charges PEEK enclosure material (resistant to organic solve glycolether)
Calibration	In air from 100 MHz to 3.0 GHz (absolute accuracy
Frequency	100 MHz to > 6 GHz; Linearity: ± 0.2 dB (100 MH:
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
Application	General near-field measurements up to 6 GHz Field component measurements Fast automatic scanning in phantoms

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

Client RIM

CALIBRATION CERTIFICATE

Object(s) ET3DV6 - SN:1642

Calibration procedure(s) QA CAL-01.v2
Calibration procedure for dosimetric E-field probes

Calibration date: August31, 2004

Condition of the calibrated item In Tolerance (according to the specific calibration document)

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	GB41293874	5-May-04 (METAS, No 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No 251-00388)	May-05
Reference 20 dB Attenuator	SN: 5086 (20b)	3-May-04 (METAS, No 251-00389)	May-05
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug02)	In house check: Aug05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued:September1, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Probe ET3DV6

SN:1642

Manufactured:	November 7, 2001
Last calibrated:	August 28, 2003
Recalibrated:	August 31, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

DASY - Parameters of Probe: ET3DV6 SN:1642

Sensitivity in Free Space

NormX	**1.62** $\mu V/(V/m)^2$	DCP X	**96**	mV
NormY	**1.86** $\mu V/(V/m)^2$	DCP Y	**96**	mV
NormZ	**1.61** $\mu V/(V/m)^2$	DCP Z	**96**	mV

Diode Compression[A]

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Plese see Page 7.

Boundary Effect

Head **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	9.5	5.3
SAR_{be} [%]	With Correction Algorithm	0.1	0.2

Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	13.4	8.9
SAR_{be} [%]	With Correction Algorithm	0.1	0.1

Sensor Offset

Probe Tip to Sensor Center	**2.7** mm
Optical Surface Detection	**in tolerance**

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] numerical linearization parameter: uncertainty not required

Research In Motion Limited
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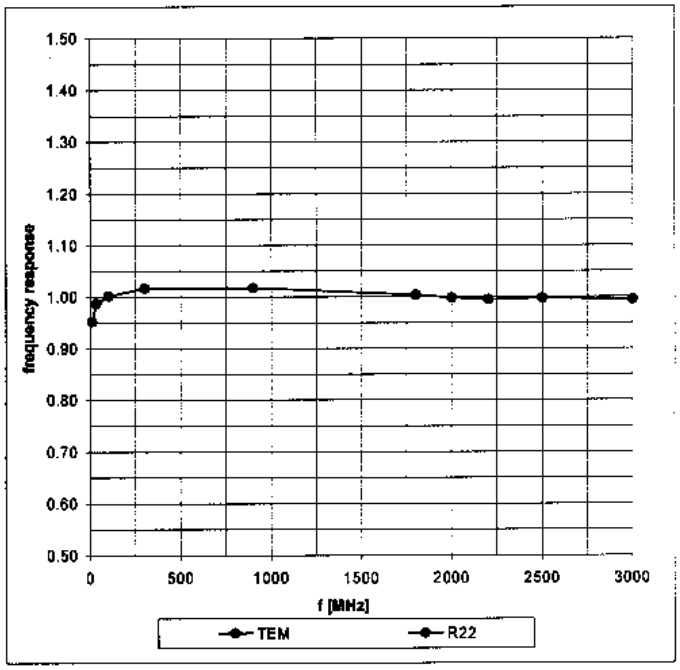
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)



Research In Motion Limited
295 Phillip Street
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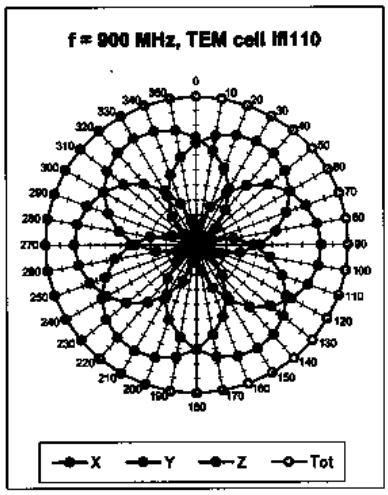
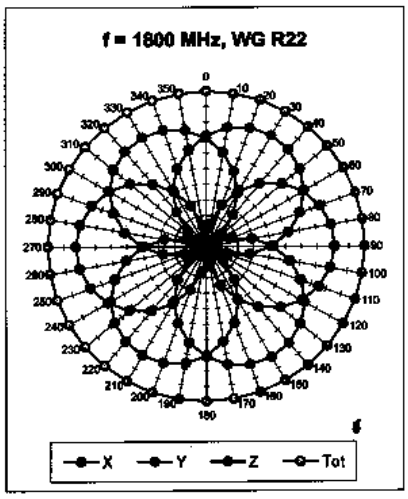
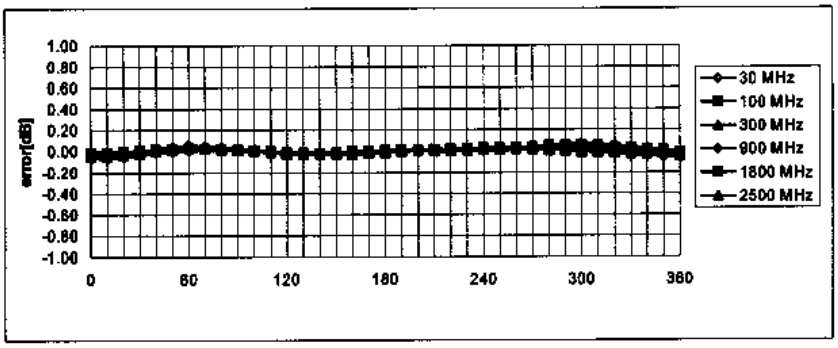
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Receiving Pattern (ϕ), θ = 0°





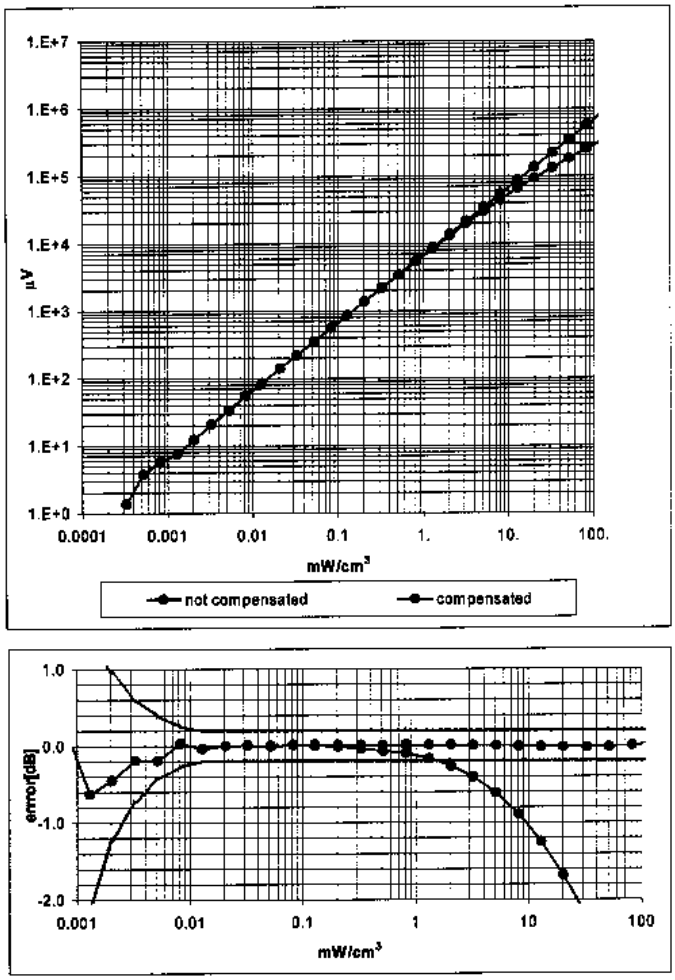


Axial Isotropy Error < ± 0.2 dB

Research In Motion Limited
295 Phillip Street
Waterloo, Ontario
Canada N2L 3W8
+1 519 888 7465, fax +1 519 888 6906
E-mail: info@rim.com

Dynamic Range f(SAR$_{head}$)

(Waveguide R22)



Probe Linearity Error < ± 0.2 dB

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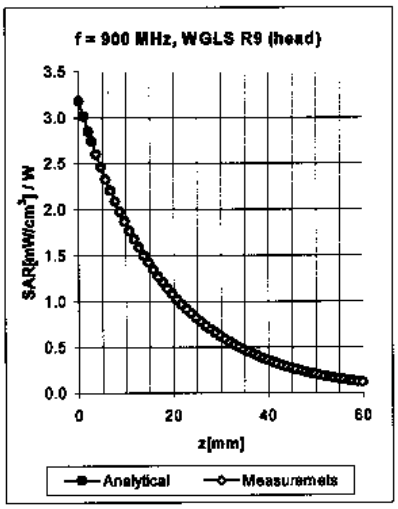
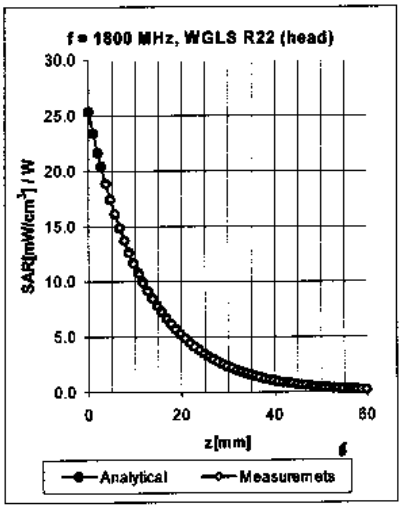
Conversion Factor Assessment





f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	800-1000	Head	41.5 ± 5%	0.97 ± 5%	0.56	1.97	6.57 ± 11.3% (k=2)
1800	1710-1910	Head	40.0 ± 5%	1.40 ± 5%	0.50	2.60	5.38 ± 11.7% (k=2)
900	800-1000	Body	55.0 ± 5%	1.05 ± 5%	0.54	2.08	6.13 ± 11.3% (k=2)
1800	1710-1910	Body	53.3 ± 5%	1.52 ± 5%	0.56	2.78	4.67 ± 11.7% (k=2)

[B] The total standard uncertainty is calculated as root-sum-square of standard uncertainty of the Conversion Factor at calibration frequency and the standard uncertainty for the indicated frequency band.

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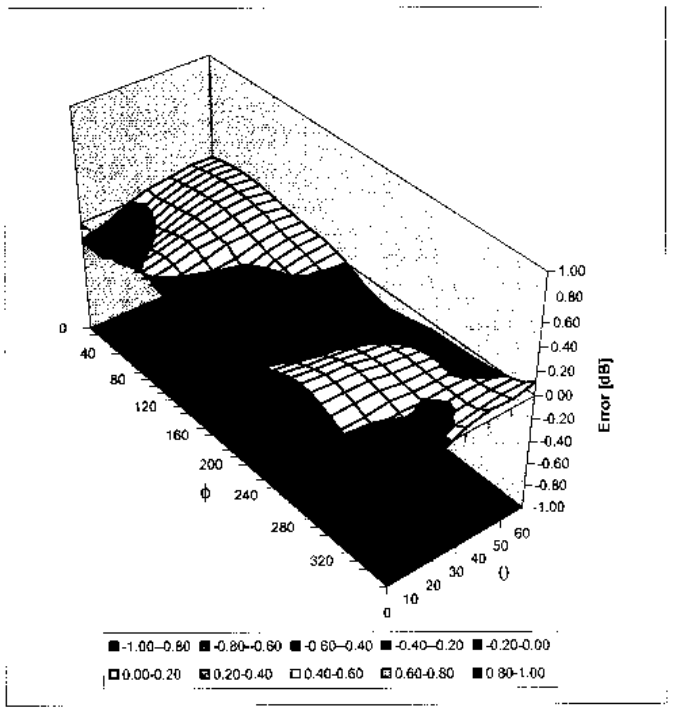
Deviation from Isotropy in HSL

Error (θ, φ), f = 900 MHz



Spherical Isotropy Error < ± 0.4 dB

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