



EMISSIONS TEST REPORT

Report Number: 3161566BOX-005

Project Number: 3161566

Testing performed on the

Carelink Monitor

Model: 2490C-LCM

To

CFR47 "Telecommunications"
FCC Part 15 Subpart C "Intentional Radiators" 15.209
IC RSS-210 Issue 7 June 2007

For

Medtronic

Test Performed by:
Intertek – ETL SEMKO
70 Codman Hill Road
Boxborough, MA 01719

Test Authorized by:
Medtronic
8200 Coral Sea Street NE
MVC 55
Mounds View, MN 55112

Prepared by:  Date: 09/29/2008
Kouma Sinn

Reviewed by:  Date: 09/29/08
Jeff Goulet

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1.0 Job Description

1.1 Client Information

This EUT has been tested at the request of:

Company: Medtronic
8200 Coral Sea Street NE
MVC 55
Mounds View, MN 55112

Contact: Andrew Palecek
Telephone: (763) 526-1686
Fax: (763) 526-5854
Email: N/A

1.2 Equipment Under Test

Equipment Type: Carelink Monitor
Model Number(s): 2490C-LCM
Serial number(s): IJX000075A, IJX000052A, IJX000037A, IJX000074A
Manufacturer: Plexus Services Corp.
EUT receive date: 06/09/2008
EUT received condition: Prototypes in Good Condition
Test start date: 07/29/2008
Test end date: 08/21/2008

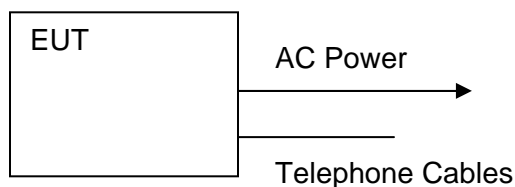
Serial Number(s): IJX000074A

EUT receive date: 09/04/08
EUT received condition: Prototype in good condition
Test start date: 09/10/08
Test end date: 09/24/08

1.3 Test Plan Reference: Tested according to the standards listed, ANSI C63.4:2003, and IC RSS-Gen Issue 2 June 2007.

1.4 Test Configuration

1.4.1 Block Diagram





1.4.2. Cables:

Cable	Shielding	Connector	Length (m)	Qty.
AC Power	None	Metal/360 Jack	1.9	1
Telephone Cables	None	Plastic RJ-11	2.0	2

1.4.3. Support Equipment:

Name: GlobTek AC/DC Power Supply
Model No.: GS-1569
Serial No.: N/L

1.5 Mode(s) of Operation:

The EUT was activated from nominal 120V/60Hz, 100V/60Hz, 100V/50Hz, 230V/50Hz AC power except during the permitted range of modulation bandwidth test, and was transmitting a typical burst repetitively throughout testing.

1.6 Floor Standing Equipment: Applicable: _____ Not Applicable: X



2.0 Test Summary

TEST STANDARD	RESULTS	
FCC Part 15 Subpart C 15.209 IC RSS-210		
SUB-TEST	TEST PARAMETER	COMMENT
Fundamental Field Strength and Spurious Emissions Below 30 MHz FCC 15.209 RSS-210 Section 2.7	The fundamental field strength and spurious emissions below 30 MHz must meet the 15.209 limits and the limits of RSS-210 Table 3.	Pass
Occupied Bandwidth FCC 15.215, RSS-Gen 4.6.1	The fundamental frequency must not fall into a restricted band.	Pass
Spurious Emissions Above 30 MHz FCC 15.209 RSS-210 Section 2.7	The spurious emissions must meet the 15.209 limits and the limits of RSS-210 Table 2.	Pass
AC Line-Conducted Emissions FCC §15.207, RSS-Gen Section 7.2.2	The AC line-conducted emissions must not exceed the FCC 15.207 and RSS-Gen Section 7.2.2 Table 2 limits.	Pass

Notes: The EUT transmits at 150 and 200 kHz, and contains an integral antenna.

REVISION SUMMARY – The following changes have been made to this Report:

<u>Date</u>	<u>Project No.</u>	<u>Project Handler</u>	<u>Page(s)</u>	<u>Item</u>	<u>Description of Change</u>
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3.0 Sample Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where

- FS = Field Strength in dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 52.0 dB μ V
 AF = 7.4 dB/m
 CF = 1.6 dB
 AG = 29.0 dB
 FS = 32 dB μ V/m

$$\text{Level in } \mu\text{V/m} = [10(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

The following is how net line-conducted readings were determined:

$$NF = RF + LF + CF + AF$$

Where NF = Net Reading in dB μ V

- RF = Reading from receiver in dB μ V
- LF = LISN Correction Factor in dB
- CF = Cable Correction Factor in dB
- AF = Attenuator Loss Factor in dB

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where UF = Net Reading in } \mu\text{V}$$

Example:

$$NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 \text{ dB}\mu\text{V}$$

$$UF = 10^{(49.1 \text{ dB}\mu\text{V} / 20)} = 254 \mu\text{V/m}$$

3.1 Measurement Uncertainty

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.

The expanded uncertainty ($k = 2$) for radiated emissions from 30 to 1000 MHz has been determined to be:

± 3.5 dB at 10m, ± 3.8 dB at 3m

The expanded uncertainty ($k = 2$) for mains conducted emissions from 150 kHz to 30 MHz has been determined to be:

± 2.6 dB

The expanded uncertainty ($k = 2$) for telecom port conducted emissions from 150 kHz to 30 MHz has been determined to be:

± 3.2 for ISN and voltage probe measurements

± 3.1 for current probe measurements

3.2 Site Description

Test Site(s): 1 and Littleton

Our OATS are 3m and 10m sheltered emissions measurement ranges located in a light commercial environment in Boxborough, Massachusetts. They meet the technical requirements of ANSI C63.4-2003 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a quonset hut with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal groundplane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with a 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity (12,000 lb. in Site 3) is provided for floor-standing equipment. A wooden table 80 cm high is used for table-top equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the groundplane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed, however the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical groundplane (2 meter X 2 meter area) is used for line-conducted measurements for table top equipment. The vertical groundplane is electrically connected to the reference groundplane.

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference groundplanes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.



Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.209, IC RSS-210

Test: Fundamental Field Strength and Spurious Emissions Below 30 MHz

Performance Criterion: The fundamental field strength and spurious emissions below 30 MHz must meet the 15.209 limits and the limits of RSS-210 Table 3.

Frequency (fundamental or spurious)	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Test Environment (06/25/2008):

Environmental Conditions During Testing:	Ambient (°C):	21	Humidity (%):	55	Pressure (hPa):	1012
Pretest Verification Performed	Yes		Equipment under Test:	2490C-LCM		
Test Engineer(s):	Nicholas Abbondante		EUT Serial Number:	IJX000077A		

Test Environment (09/10/2008-09/24/2008):

Environmental Conditions During Testing:	Ambient (°C):	See data tables	Humidity (%):	See data tables	Pressure (hPa):	See data tables
Pretest Verification Performed	Yes		Equipment under Test:	2490C-LCM		
Test Engineer(s):	Kouma Sinn, Vathana Ven, Nicholas Abbondante		EUT Serial Number:	IJX000074A		

Test Equipment Used (06/25/2008):

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	Spectrum Analyzer	Hewlett Packard	8591E	3346A02319	05/06/2009
3	10 Meter in floor cable for site 1	ITS	RG214B/U	S1 10M FLR	09/07/2008
4	Active Loop Antenna (10 khz to 30 mhz)	EMCO	6502/1	9902-3267	08/23/2008



Test Equipment Used (09/10/2008-09/24/2008):

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	ANTENNA	EMCO	3142	9711-1224	12/05/2008
2	10 Meter in floor cable for site 1	ITS	RG214B/U	S1 10M FLR	09/08/2009
3	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
4	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	01/25/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision



Test Details:

Special Radiated Emissions

Company: Mdtronic
 Model #: 2490C-LCM
 Serial #: IJX000077A
 Engineers: Nicholas Abbondante
 Project #: 3155100
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: HP 8591E (SA0003)
 PreAmp: PRE7 11-05-08.txt
 PreAmp Used? (Y or N): N
 Antenna & Cables: LF Bands: N, LF, HF, SHF
 Antenna: LOOP 145-019 E-Field 08-23-08.txt LOOP 145-019 H-Field 08-23-08.txt
 Cable(s): S1 10m Floor 9-7-08.txt NONE.
 Location: Site 1
 Barometer: BAR1
 Date(s): 06/25/08
 Voltage/Frequency: 120V/60Hz
 Frequency Range: 150 kHz - 30 MHz
 Temp/Humidity/Pressure: 21c 55% 1012mB
 Limit Distance (m): 3
 Test Distance (m): 3
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
Note: RF Head manipulated through 3 orthogonal axes; EMC Mode Telemetry B											
PK	V	0.151	63.6	12.3	0.0	0.0	0.0	75.9	104.0	-28.2	9/30 kHz
PK	V	0.202	61.9	12.1	0.0	0.0	0.0	74.0	101.5	-27.5	9/30 kHz
PK	V	0.300	41.3	12.0	0.0	0.0	0.0	53.3	98.1	-44.8	9/30 kHz
PK	V	0.403	38.8	12.1	0.0	0.0	0.0	50.9	95.5	-44.6	9/30 kHz
PK	V	0.450	38.6	12.0	0.0	0.0	0.0	50.7	94.5	-43.9	9/30 kHz
PK	V	0.600	35.1	11.9	0.1	0.0	0.0	47.1	72.0	-25.0	9/30 kHz
PK	V	0.605	36.2	11.9	0.1	0.0	0.0	48.2	72.0	-23.8	9/30 kHz
PK	V	0.750	31.6	11.8	0.1	0.0	0.0	43.5	70.1	-26.6	9/30 kHz
PK	V	0.807	35.3	11.8	0.1	0.0	0.0	47.2	69.5	-22.3	9/30 kHz
PK	V	0.900	42.7	11.9	0.1	0.0	0.0	54.7	68.5	-13.9	9/30 kHz
PK	V	1.010	31.4	11.6	0.1	0.0	0.0	43.1	67.5	-24.4	9/30 kHz
PK	V	1.050	45.5	11.6	0.1	0.0	0.0	57.1	67.2	-10.0	9/30 kHz
PK	V	1.200	53.9	11.6	0.1	0.0	0.0	65.6	66.0	-0.5	9/30 kHz*
PK	V	1.212	36.4	11.6	0.1	0.0	0.0	48.0	65.9	-17.9	9/30 kHz
PK	V	1.350	33.2	11.5	0.1	0.0	0.0	44.8	65.0	-20.2	9/30 kHz
PK	V	1.414	31.2	11.5	0.1	0.0	0.0	42.9	64.6	-21.7	9/30 kHz
PK	V	1.500	31.9	11.5	0.1	0.0	0.0	43.6	64.1	-20.5	9/30 kHz
PK	V	1.616	23.8	11.5	0.2	0.0	0.0	35.5	63.4	-28.0	9/30 kHz
PK	V	1.818	23.8	11.4	0.2	0.0	0.0	35.5	69.5	-34.0	9/30 kHz
PK	V	2.020	23.1	11.4	0.2	0.0	0.0	34.7	69.5	-34.8	9/30 kHz

FCC IC

Notes: The 30 meter limits have been extrapolated to a 3 meter limit distance.
 * - The 1.2 MHz emission was an ambient, but is included as it meets the limit.

Setup Photo 1



Setup Photo 2





Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.209, IC RSS-210

Test: Occupied Bandwidth

Performance Criterion: The fundamental frequency must not fall within a restricted band.

Test Environment:

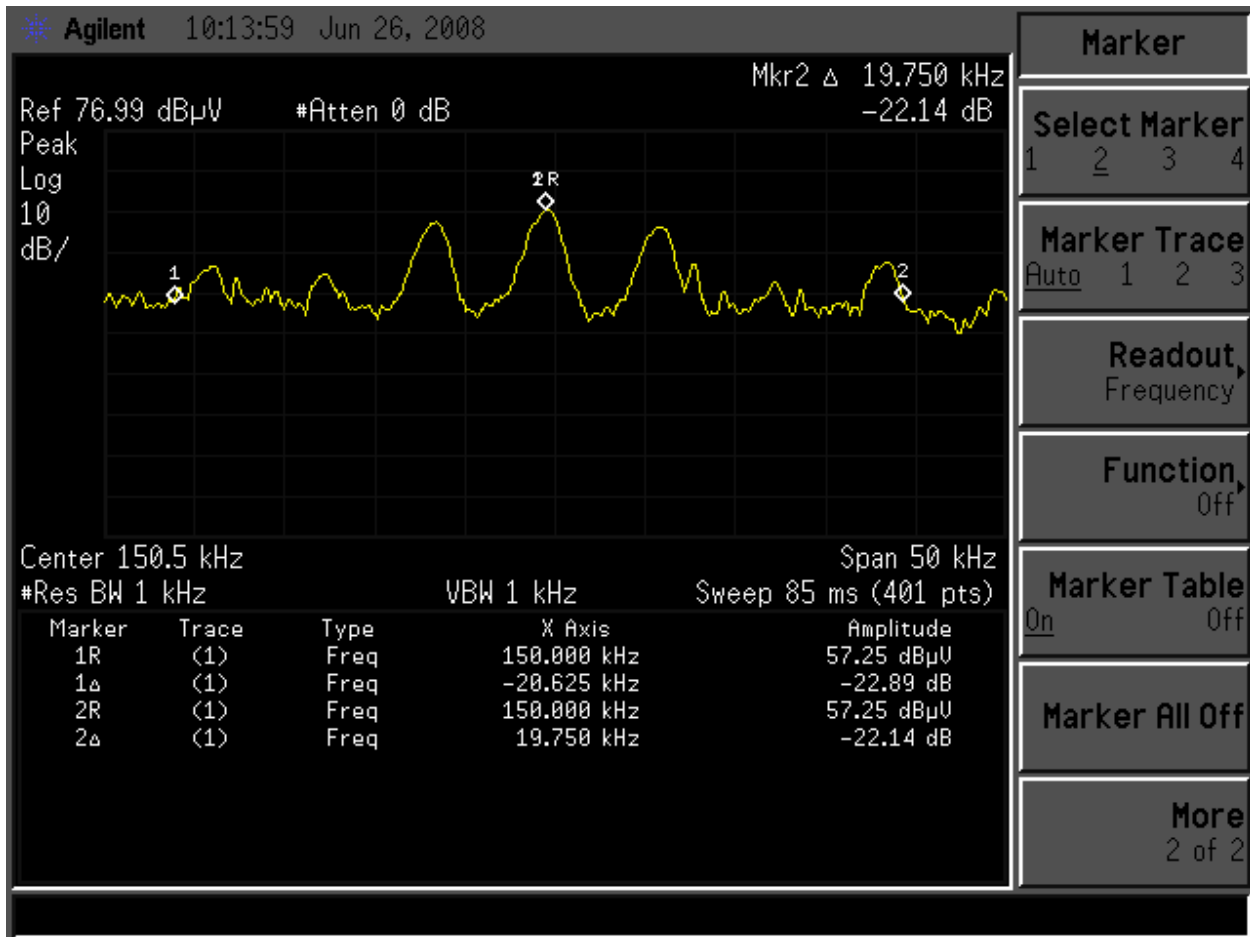
Environmental Conditions During Testing:	Ambient (°C):	N/A	Humidity (%):	N/A	Pressure (hPa):	N/A
Pretest Verification Performed	Yes		Equipment under Test:	2490C-LCM		
Test Engineer(s):	Nicholas Abbondante		EUT Serial Number:	IJX000077A		

Test Equipment Used:

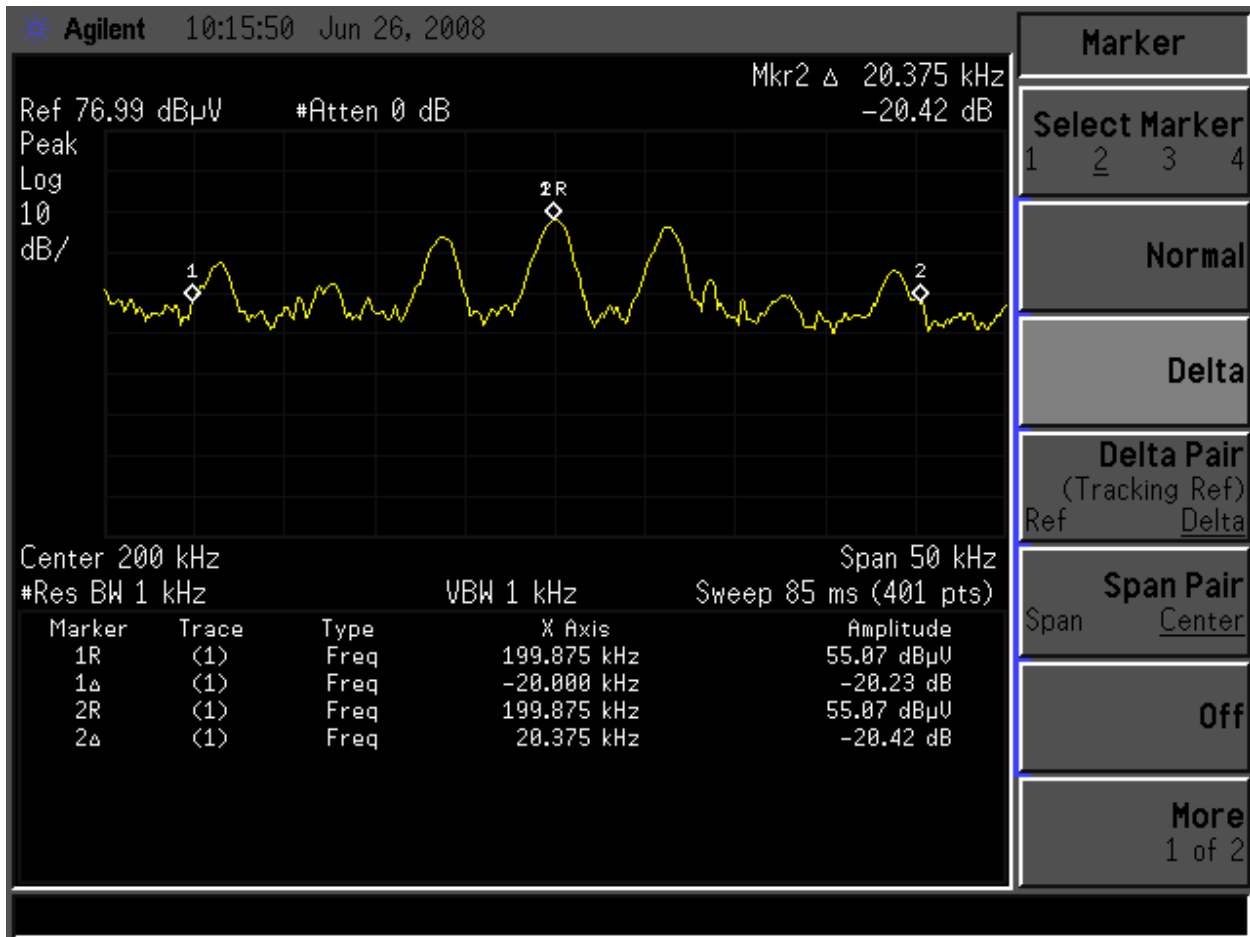
TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Spectrum Analyzer	Agilent	E7405A	US40240205	08/09/2008
2	Active Loop Antenna (10 khz to 30 mhz)	EMCO	6502/1	9902-3267	08/23/2008
3	10 Meter in floor cable for site 1	ITS	RG214B/U	S1 10M FLR	09/07/2008

Test Details:

Notes: The 20 dB bandwidth is 39.775 kHz at the 150 kHz carrier, and is 40.375 kHz at the 200 kHz carrier.



39.775 kHz 20 dB Bandwidth, 150 kHz Carrier



40.375 kHz 20 dB Bandwidth, 200 kHz Carrier



Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.209, IC RSS-210

Test: Radiated Emissions

Performance Criterion: The spurious emissions must meet the 15.209 limits and the limits of RSS-210 Table 2.

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Test Environment:

Environmental Conditions During Testing:	Ambient (°C):	21/21	Humidity (%):	58/61	Pressure (hPa):	1007/1007
Pretest Verification Performed	Yes		Equipment under Test:	2490C-LCM		
Test Engineer(s):	Nicholas Abbondante		EUT Serial Number:	IJX000077A		

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	Spectrum Analyzer	Hewlett Packard	8591E	3346A02319	05/06/2009
3	10 Meter in floor cable for site 1	ITS	RG214B/U	S1 10M FLR	09/07/2008
4	ANTENNA	EMCO	3142	9711-1224	12/05/2008

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision



Test Results:

Special Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000077A
 Engineers: Nicholas Abbondante
 Project #: 3155100
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: HP 8591E (SA0003)
 PreAmp: PRE7 11-05-08.txt
 PreAmp Used? (Y or N): Y
 Antenna & Cables: N
 Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-7-08.txt CBL017 9-18-08.txt
 Location: Site 1
 Date(s): 06/24/08 06/25/08
 Barometer: BAR1
 Temp/Humidity/Pressure: 21c 58% 1007mB
 21c 71% 1012mB
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 120V/60Hz
 Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
Note: RF Head manipulated through 3 orthogonal axes; EMC Mode Telemetry B											
QP	V	151.000	28.2	9.7	2.3	27.3	-10.5	23.3	43.5	-20.2	120/300 kHz
QP	V	161.400	28.6	10.3	2.3	27.3	-10.5	24.3	43.5	-19.2	120/300 kHz
QP	V	225.000	28.4	12.0	3.2	27.2	-10.5	26.9	46.0	-19.1	120/300 kHz
QP	V	241.913	22.8	12.6	3.7	27.2	-10.5	22.4	46.0	-23.6	120/300 kHz
QP	V	300.000	28.2	13.8	3.0	27.4	-10.5	28.2	46.0	-17.8	120/300 kHz
QP	V	375.000	25.5	16.4	3.6	27.6	-10.5	28.2	46.0	-17.8	120/300 kHz
QP	H	821.500	29.5	22.4	7.4	28.2	-10.5	41.4	46.0	-4.6	120/300 kHz

FCC IC
 RB RB



Standby Mode @ 100V/50Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Kouma Sinn
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 PreAmp Used? (Y or N): N
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1

Location: 1
 Date(s): 09/24/08
 Temp/Humidity/Pressure: 20C 55% 1022mbar

Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: See below Frequency Range: 30-1000MHz

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
N: Standby mode 100V/50Hz @ 10m 30-1000MHz. Telephone ports were populated.											
QP	V	156.000	1.5	10.2	2.3	0.0	-10.5	24.4	43.5	-19.1	120/300 kHz
QP	V	161.000	3.0	10.3	2.3	0.0	-10.5	26.0	43.5	-17.5	120/300 kHz
QP	V	164.000	2.5	10.2	2.3	0.0	-10.5	25.5	43.5	-18.0	120/300 kHz
QP	V	167.700	2.7	10.2	2.3	0.0	-10.5	25.6	43.5	-17.9	120/300 kHz
QP	V	172.140	3.5	10.4	2.3	0.0	-10.5	26.7	43.5	-16.8	120/300 kHz
QP	V	184.000	1.8	11.1	2.3	0.0	-10.5	25.7	43.5	-17.8	120/300 kHz
QP	V	189.240	1.5	11.2	2.4	0.0	-10.5	25.5	43.5	-18.0	120/300 kHz
QP	V	225.000	3.3	12.0	2.8	0.0	-10.5	28.6	46.0	-17.4	120/300 kHz
QP	H	823.475	3.7	22.4	6.7	0.0	-10.5	43.3	46.0	-2.7	120/300 kHz



Standby Mode @ 100V/60Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Kouma Sinn
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 PreAmp Used? (Y or N): N
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1
 Location: 1
 Date(s): 09/24/08
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: See below
 Frequency Range: 30-1000MHz
 Temp/Humidity/Pressure: 20C 55% 1022mbar
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
N: Standby mode 100V/60Hz @ 10m 30-1000MHz. Telephone ports were populated.											
QP	V	156.000	1.4	10.2	2.3	0.0	-10.5	24.3	43.5	-19.2	120/300 kHz
QP	V	161.000	2.7	10.3	2.3	0.0	-10.5	25.7	43.5	-17.8	120/300 kHz
QP	V	164.000	3.0	10.2	2.3	0.0	-10.5	26.0	43.5	-17.5	120/300 kHz
QP	V	167.700	3.3	10.2	2.3	0.0	-10.5	26.2	43.5	-17.3	120/300 kHz
QP	V	172.140	2.5	10.4	2.3	0.0	-10.5	25.7	43.5	-17.8	120/300 kHz
QP	V	184.000	1.0	11.1	2.3	0.0	-10.5	24.9	43.5	-18.6	120/300 kHz
QP	V	189.240	1.7	11.2	2.4	0.0	-10.5	25.7	43.5	-17.8	120/300 kHz
QP	V	225.000	3.2	12.0	2.8	0.0	-10.5	28.5	46.0	-17.5	120/300 kHz
QP	H	823.475	2.5	22.4	6.7	0.0	-10.5	42.1	46.0	-3.9	120/300 kHz



Standby Mode @ 230V/50Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Kouma Sinn
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 PreAmp Used? (Y or N): N
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1
 Location: 1
 Date(s): 09/24/08
 Temp/Humidity/Pressure: 20C 55% 1022mbar
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: See below
 Frequency Range: 30-1000MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
N: Standby mode 230V/50Hz @ 10m 30-1000MHz. Phone ports were populated											
QP	V	156.000	2.8	10.2	2.3	0.0	-10.5	25.7	43.5	-17.8	120/300 kHz
QP	V	161.000	2.7	10.3	2.3	0.0	-10.5	25.7	43.5	-17.8	120/300 kHz
QP	V	164.000	2.4	10.2	2.3	0.0	-10.5	25.4	43.5	-18.1	120/300 kHz
QP	V	167.700	2.0	10.2	2.3	0.0	-10.5	24.9	43.5	-18.6	120/300 kHz
QP	V	172.140	-0.5	10.4	2.3	0.0	-10.5	22.7	43.5	-20.8	120/300 kHz
QP	V	184.000	1.8	11.1	2.3	0.0	-10.5	25.7	43.5	-17.8	120/300 kHz
QP	V	189.240	1.6	11.2	2.4	0.0	-10.5	25.6	43.5	-17.9	120/300 kHz
QP	V	225.000	3.2	12.0	2.8	0.0	-10.5	28.5	46.0	-17.5	120/300 kHz
QP	H	823.475	3.7	22.4	6.7	0.0	-10.5	43.3	46.0	-2.7	120/300 kHz
QP	V	160.800	3.5	10.3	2.3	0.0	-10.5	26.5	43.5	-17.0	120/300 kHz
QP	V	30.000	0.0	13.2	0.8	0.0	-10.5	24.5	40.0	-15.5	120/300 kHz



Telemetry B Mode @ 100V/50Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Vathana Ven
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: HP 8591E (SA0003)/R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1
 Location: Site 1
 Date(s): 09/10/08
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 100 Vac/50 Hz
 Frequency Range: 30-1000 MHz
 Temp/Humidity/Pressure: 21 deg. C 56% 1017 mB
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
7: Telemetry B - Communicating with the probe on top of the implant. Telephone ports were populated.											
100V/50Hz @ 10m 30-1000MHz, PreAmp was not used											
QP	V	73.700	6.0	5.8	1.5	0.0	-10.5	23.8	40.0	-16.2	120/300 kHz
QP	V	74.200	4.6	5.9	1.5	0.0	-10.5	22.4	40.0	-17.6	120/300 kHz
QP	V	82.590	5.0	6.8	1.6	0.0	-10.5	23.9	40.0	-16.1	120/300 kHz
QP	V	130.660	6.0	7.5	2.0	0.0	-10.5	25.9	43.5	-17.6	120/300 kHz
QP	V	165.150	-2.0	10.2	2.3	0.0	-10.5	21.0	43.5	-22.5	120/300 kHz
QP	V	170.300	-2.0	10.2	2.3	0.0	-10.5	21.0	43.5	-22.5	120/300 kHz
QP	V	223.250	-3.0	11.9	2.8	0.0	-10.5	22.1	46.0	-23.9	120/300 kHz
QP	H	227.000	-4.0	11.3	2.8	0.0	-10.5	20.6	46.0	-25.4	120/300 kHz
QP	H	243.500	-4.0	12.1	3.1	0.0	-10.5	21.7	46.0	-24.3	120/300 kHz
QP	H	250.000	2.0	12.2	3.3	0.0	-10.5	27.9	46.0	-18.1	120/300 kHz
QP	H	260.000	-2.0	12.4	3.2	0.0	-10.5	24.1	46.0	-21.9	120/300 kHz
QP	H	300.000	1.0	13.0	3.0	0.0	-10.5	27.5	46.0	-18.5	120/300 kHz
QP	H	330.000	-1.0	14.4	3.2	0.0	-10.5	27.0	46.0	-19.0	120/300 kHz



Telemetry B Mode @ 100V/60Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Vathana Ven
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: HP 8591E (SA0003)/R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 Date(s): 09/10/08
 Location: Site 1
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1
 Temp/Humidity/Pressure: 21 deg. C 56% 1017 mB
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 100 Vac/60 Hz
 Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
7: Telemetry B - Communicating with the probe on top of the implant. Telephone ports were populated.											
100V/60Hz @ 10m 30-1000MHz, PreAmp was not used											
QP	V	73.700	5.9	5.8	1.5	0.0	-10.5	23.7	40.0	-16.3	120/300 kHz
QP	V	74.200	4.6	5.9	1.5	0.0	-10.5	22.4	40.0	-17.6	120/300 kHz
QP	V	82.590	5.0	6.8	1.6	0.0	-10.5	23.9	40.0	-16.1	120/300 kHz
QP	V	130.660	7.0	7.5	2.0	0.0	-10.5	26.9	43.5	-16.6	120/300 kHz
QP	V	165.150	-1.0	10.2	2.3	0.0	-10.5	22.0	43.5	-21.5	120/300 kHz
QP	V	170.300	-2.0	10.2	2.3	0.0	-10.5	21.0	43.5	-22.5	120/300 kHz
QP	V	223.250	-2.0	11.9	2.8	0.0	-10.5	23.1	46.0	-22.9	120/300 kHz
QP	H	227.000	-2.0	11.3	2.8	0.0	-10.5	22.6	46.0	-23.4	120/300 kHz
QP	H	243.500	-4.0	12.1	3.1	0.0	-10.5	21.7	46.0	-24.3	120/300 kHz
QP	H	250.000	3.0	12.2	3.3	0.0	-10.5	28.9	46.0	-17.1	120/300 kHz
QP	H	260.000	-1.0	12.4	3.2	0.0	-10.5	25.1	46.0	-20.9	120/300 kHz
QP	H	300.000	2.0	13.0	3.0	0.0	-10.5	28.5	46.0	-17.5	120/300 kHz
QP	H	330.000	-1.0	14.4	3.2	0.0	-10.5	27.0	46.0	-19.0	120/300 kHz



Telemetry B Mode @ 230V/50Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Vathana Ven
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: HP 8591E (SA0003)/R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 Date(s): 09/10/08
 Location: Site 1
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1
 Temp/Humidity/Pressure: 21 deg. C 56% 1017 mB
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 230 Vac/50 Hz
 Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
7: Telemetry B - Communicating with the probe on top of the implant. Telephone ports were populated.											
230V/50Hz @ 10m 30-1000MHz, PreAmp was not used above 223.25 MHz											
QP	V	73.366	33.9	5.8	1.5	27.7	-10.5	23.9	40.0	-16.1	120/300 kHz
QP	V	74.174	34.2	5.9	1.5	27.7	-10.5	24.3	40.0	-15.7	120/300 kHz
QP	V	82.675	26.7	6.8	1.6	27.7	-10.5	17.9	40.0	-22.1	120/300 kHz
QP	V	130.700	24.3	7.5	2.0	27.4	-10.5	16.8	43.5	-26.7	120/300 kHz
QP	V	165.175	28.9	10.2	2.3	27.3	-10.5	24.6	43.5	-18.9	120/300 kHz
QP	V	170.383	29.7	10.2	2.3	27.2	-10.5	25.5	43.5	-18.0	120/300 kHz
QP	V	223.250	21.9	11.9	2.8	27.2	-10.5	19.8	46.0	-26.2	120/300 kHz
QP	H	226.998	38.7	11.3	2.8	27.2	-10.5	36.1	46.0	-9.9	120/300 kHz
QP	H	243.488	2.0	12.1	3.1	0.0	-10.5	27.7	46.0	-18.3	120/300 kHz
QP	H	248.985	1.0	12.2	3.2	0.0	-10.5	26.9	46.0	-19.1	120/300 kHz
QP	H	260.385	-2.0	12.5	3.2	0.0	-10.5	24.1	46.0	-21.9	120/300 kHz
QP	H	300.000	-4.0	13.0	3.0	0.0	-10.5	22.5	46.0	-23.5	120/300 kHz
QP	H	330.385	-4.0	14.4	3.2	0.0	-10.5	24.0	46.0	-22.0	120/300 kHz



Telemetry C Mode @ 100V/50Hz Mode Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Kouma Sinn
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 Date(s): 09/15/08
 Location: 1
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1
 Temp/Humidity/Pressure: 21c 86% 991mbar
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 230V/50Hz
 Frequency Range: 30-1000MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/BW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
8: Telemetry C - Communicating with the probe on top of the implant. Telephone ports were populated.											
100V/50Hz @ 10m 30-1000MHz, No pre-amp. Fundamental Frequency not recorded.											
QP	V	73.366	1.7	5.8	1.5	0.0	-10.5	19.4	40.0	-20.6	120/300 kHz
QP	V	74.174	1.9	5.9	1.5	0.0	-10.5	19.7	40.0	-20.3	120/300 kHz
QP	V	82.675	-0.3	6.8	1.6	0.0	-10.5	18.6	40.0	-21.4	120/300 kHz
QP	V	85.184	-0.5	6.8	1.6	0.0	-10.5	18.4	40.0	-21.6	120/300 kHz
QP	V	130.700	-0.9	7.5	2.0	0.0	-10.5	19.0	43.5	-24.5	120/300 kHz
QP	V	224.994	2.0	12.0	2.8	0.0	-10.5	27.3	46.0	-18.7	120/300 kHz
QP	V	260.385	0.6	13.5	3.2	0.0	-10.5	27.7	46.0	-18.3	120/300 kHz
QP	V	300.000	0.3	13.8	3.0	0.0	-10.5	27.6	46.0	-18.4	120/300 kHz
QP	H	830.490	3.9	22.5	6.6	0.0	-10.5	43.5	46.0	-2.5	120/300 kHz



Telemetry C Mode @ 100/60Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Kouma Sinn
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 Date(s): 09/15/08
 Location: 1
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1
 Temp/Humidity/Pressure: 21c 86% 991mbar
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 230V/50Hz
 Frequency Range: 30-1000MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
8: Telemetry C - Communicating with the probe on top of the implant. Telephone ports were populated.											
100V/60Hz @ 10m 30-1000MHz, No pre-amp. Fundamental Frequency not recorded.											
QP	V	73.366	2.9	5.8	1.5	0.0	-10.5	20.6	40.0	-19.4	120/300 kHz
QP	V	74.174	3.3	5.9	1.5	0.0	-10.5	21.1	40.0	-18.9	120/300 kHz
QP	V	82.675	1.8	6.8	1.6	0.0	-10.5	20.7	40.0	-19.3	120/300 kHz
QP	V	85.184	-0.5	6.8	1.6	0.0	-10.5	18.4	40.0	-21.6	120/300 kHz
QP	V	130.700	-0.6	7.5	2.0	0.0	-10.5	19.3	43.5	-24.2	120/300 kHz
QP	V	224.994	2.0	12.0	2.8	0.0	-10.5	27.3	46.0	-18.7	120/300 kHz
QP	V	260.385	0.2	13.5	3.2	0.0	-10.5	27.3	46.0	-18.7	120/300 kHz
QP	V	300.000	0.4	13.8	3.0	0.0	-10.5	27.7	46.0	-18.3	120/300 kHz
QP	H	830.490	3.2	22.5	6.6	0.0	-10.5	42.8	46.0	-3.2	120/300 kHz



Telemetry C Mode @ 230V/50Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Kouma Sinn
 Project #: 3161566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE7 11-05-08.txt
 Date(s): 09/15/08
 Location: 1
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 230V/50Hz
 Frequency Range: 30-1000MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/BW

Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09..txt NONE.
 Barometer: BAR1
 Temp/Humidity/Pressure: 21c 86% 991mbar

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
8: Telemetry C - Communicating with the probe on top of the implant. Telephone ports were populated.											
230V/50Hz @ 10m 30-1000MHz. No pre-amp (internal pre-amp turned on). Fundamental Frequency not recorded.											
QP	V	73.366	1.5	5.8	1.5	0.0	-10.5	19.2	40.0	-20.8	120/300 kHz
QP	V	74.174	1.6	5.9	1.5	0.0	-10.5	19.4	40.0	-20.6	120/300 kHz
QP	V	82.675	0.9	6.8	1.6	0.0	-10.5	19.8	40.0	-20.2	120/300 kHz
QP	V	85.184	0.8	6.8	1.6	0.0	-10.5	19.7	40.0	-20.3	120/300 kHz
QP	V	130.700	-2.5	7.5	2.0	0.0	-10.5	17.4	43.5	-26.1	120/300 kHz
QP	V	224.994	0.7	12.0	2.8	0.0	-10.5	26.0	46.0	-20.0	120/300 kHz
QP	V	260.385	-0.7	13.5	3.2	0.0	-10.5	26.4	46.0	-19.6	120/300 kHz
QP	V	300.000	1.3	13.8	3.0	0.0	-10.5	28.6	46.0	-17.4	120/300 kHz
QP	H	830.490	3.6	22.5	6.6	0.0	-10.5	43.2	46.0	-2.8	120/300 kHz



Modem Mode @ 100V/50Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Vathana Ven
 Project #: 3151566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: NONE
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09.txt NONE.
 Location: Site 1
 Barometer: BAR1
 Date(s): 09/12/08
 Temp/Humidity/Pressure: 20c 61% 1021mB
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 100V/50Hz
 Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
Note: Modem Mode, 100V/50Hz											
QP	V	73.700	16.0	5.8	1.5	0.0	-10.5	33.8	40.0	-6.2	120/300 kHz
QP	V	75.000	17.1	5.9	1.5	0.0	-10.5	35.0	40.0	-5.0	120/300 kHz
QP	V	82.600	1.1	6.8	1.6	0.0	-10.5	20.0	40.0	-20.0	120/300 kHz
QP	V	125.900	8.3	7.6	1.9	0.0	-10.5	28.3	43.5	-15.2	120/300 kHz
QP	V	195.700	2.7	11.3	2.4	0.0	-10.5	26.8	43.5	-16.7	120/300 kHz
QP	V	224.800	0.0	12.0	2.8	0.0	-10.5	25.2	46.0	-20.8	120/300 kHz
QP	V	233.200	0.0	12.4	3.0	0.0	-10.5	25.8	46.0	-20.2	120/300 kHz
QP	V	240.000	0.0	12.5	3.1	0.0	-10.5	26.0	46.0	-20.0	120/300 kHz
QP	V	244.000	0.0	12.7	3.1	0.0	-10.5	26.3	46.0	-19.7	120/300 kHz
QP	V	250.000	0.5	13.0	3.3	0.0	-10.5	27.2	46.0	-18.8	120/300 kHz
QP	V	253.324	-2.0	13.1	3.2	0.0	-10.5	24.8	46.0	-21.2	120/300 kHz
QP	H	294.828	8.0	12.2	3.0	0.0	-10.5	33.7	46.0	-12.3	120/300 kHz
QP	H	335.832	4.0	14.6	3.2	0.0	-10.5	32.3	46.0	-13.7	120/300 kHz
QP	H	360.354	4.0	15.7	3.3	0.0	-10.5	33.5	46.0	-12.5	120/300 kHz
QP	H	393.318	10.0	16.9	3.5	0.0	-10.5	40.9	46.0	-5.1	120/300 kHz
QP	H	401.354	4.0	16.9	3.6	0.0	-10.5	34.9	46.0	-11.1	120/300 kHz
QP	H	557.000	9.0	19.5	4.1	0.0	-10.5	43.0	46.0	-3.0	120/300 kHz
QP	H	823.000	-2.0	22.4	6.8	0.0	-10.5	37.6	46.0	-8.4	120/300 kHz



Modem Mode @ 100V/60Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Nicholas Abbondante
 Project #: 3151566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: NONE.
 PreAmp Used? (Y or N): N
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/BW

Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09.txt NONE.
 Barometer: BAR1

Date(s): 09/11/08
 Location: Site 1
 Temp/Humidity/Pressure: 20c 56% 1022mB
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 100V/60Hz
 Frequency Range: 30-1000 MHz

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
Note: Modem Mode, 100V/60Hz											
QP	V	73.700	16.9	5.8	1.5	0.0	-10.5	34.7	40.0	-5.3	120/300 kHz
QP	V	75.000	16.7	5.9	1.5	0.0	-10.5	34.6	40.0	-5.4	120/300 kHz
QP	V	82.600	3.3	6.8	1.6	0.0	-10.5	22.2	40.0	-17.8	120/300 kHz
QP	V	136.000	0.4	7.5	2.1	0.0	-10.5	20.4	43.5	-23.1	120/300 kHz
QP	V	166.550	0.3	10.2	2.3	0.0	-10.5	23.2	43.5	-20.3	120/300 kHz
QP	V	223.250	0.0	11.9	2.8	0.0	-10.5	25.1	46.0	-20.9	120/300 kHz
QP	V	229.400	3.0	12.3	2.9	0.0	-10.5	28.6	46.0	-17.4	120/300 kHz
QP	V	237.600	0.6	12.4	3.0	0.0	-10.5	26.5	46.0	-19.5	120/300 kHz
QP	V	240.000	0.6	12.5	3.1	0.0	-10.5	26.6	46.0	-19.4	120/300 kHz
QP	V	245.800	3.7	12.8	3.2	0.0	-10.5	30.1	46.0	-15.9	120/300 kHz
QP	V	250.000	3.1	13.0	3.3	0.0	-10.5	29.8	46.0	-16.2	120/300 kHz
QP	V	253.324	0.9	13.1	3.2	0.0	-10.5	27.7	46.0	-18.3	120/300 kHz
QP	V	294.828	6.9	13.5	3.0	0.0	-10.5	33.9	46.0	-12.1	120/300 kHz
QP	V	335.832	5.3	15.2	3.2	0.0	-10.5	34.2	46.0	-11.8	120/300 kHz
QP	H	360.354	2.0	15.7	3.3	0.0	-10.5	31.5	46.0	-14.5	120/300 kHz
QP	H	393.318	7.2	16.9	3.5	0.0	-10.5	38.1	46.0	-7.9	120/300 kHz
QP	H	401.354	0.6	16.9	3.6	0.0	-10.5	31.5	46.0	-14.5	120/300 kHz
QP	H	557.000	8.4	19.5	4.1	0.0	-10.5	42.4	46.0	-3.6	120/300 kHz
QP	V	823.000	3.2	22.7	6.8	0.0	-10.5	43.1	46.0	-2.9	120/300 kHz



Modem Mode @ 230V/50Hz Radiated Emissions

Company: Medtronic
 Model #: 2490C-LCM
 Serial #: IJX000074A
 Engineers: Vathana Ven
 Project #: 3151566
 Standard: FCC Part 15 Subpart C 15.209/IC RSS-210
 Receiver: R&S ESCI (ROS002)
 PreAmp: NONE.
 PreAmp Used? (Y or N): N
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG3 V10m 12-05-08.txt LOG3 H10m 12-05-08.txt
 Cable(s): S1 10m Floor 9-08-09.txt NONE.
 Barometer: BAR1
 Location: Site 1
 Date(s): 09/12/08
 Temp/Humidity/Pressure: 20c 61% 1021mB
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: 230V/50Hz
 Frequency Range: 30-1000 MHz

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
Note: Modem Mode, 230V/50Hz											
QP	V	73.700	21.0	5.8	1.5	0.0	-10.5	38.8	40.0	-1.2	120/300 kHz
QP	V	75.000	19.3	5.9	1.5	0.0	-10.5	37.2	40.0	-2.8	120/300 kHz
QP	V	82.600	0.0	6.8	1.6	0.0	-10.5	18.9	40.0	-21.1	120/300 kHz
QP	V	125.900	8.0	7.6	1.9	0.0	-10.5	28.0	43.5	-15.5	120/300 kHz
QP	V	195.700	2.0	11.3	2.4	0.0	-10.5	26.1	43.5	-17.4	120/300 kHz
QP	V	224.800	0.0	12.0	2.8	0.0	-10.5	25.2	46.0	-20.8	120/300 kHz
QP	V	233.200	0.0	12.4	3.0	0.0	-10.5	25.8	46.0	-20.2	120/300 kHz
QP	V	240.000	-1.0	12.5	3.1	0.0	-10.5	25.0	46.0	-21.0	120/300 kHz
QP	V	244.000	3.0	12.7	3.1	0.0	-10.5	29.3	46.0	-16.7	120/300 kHz
QP	V	250.000	1.0	13.0	3.3	0.0	-10.5	27.7	46.0	-18.3	120/300 kHz
QP	V	253.324	-2.0	13.1	3.2	0.0	-10.5	24.8	46.0	-21.2	120/300 kHz
QP	H	294.908	8.5	12.2	3.0	0.0	-10.5	34.2	46.0	-11.8	120/300 kHz
QP	H	335.832	5.0	14.6	3.2	0.0	-10.5	33.3	46.0	-12.7	120/300 kHz
QP	H	360.442	6.0	15.7	3.3	0.0	-10.5	35.5	46.0	-10.5	120/300 kHz
QP	H	393.318	9.0	16.9	3.5	0.0	-10.5	39.9	46.0	-6.1	120/300 kHz
QP	H	401.354	3.5	16.9	3.6	0.0	-10.5	34.4	46.0	-11.6	120/300 kHz
QP	H	557.046	8.5	19.5	4.1	0.0	-10.5	42.5	46.0	-3.5	120/300 kHz
QP	H	823.000	-3.0	22.4	6.8	0.0	-10.5	36.6	46.0	-9.4	120/300 kHz

Radiated Emissions Setup Photo 1



Radiated Emissions Setup Photo 2



Radiated Emissions Setup Photo 3



Radiated Emissions Setup Photo 4





Test Results: Pass

Test Standard: FCC Part 15.207, IC RSS-Gen

Test: AC Line-Conducted Emissions

Performance Criterion: The AC line-conducted emissions must not exceed the FCC 15.207 and RSS-Gen Section 7.2.2 Table 2 limits.

Test Environment:

Environmental Conditions During Testing:	Ambient (°C):	21	Humidity (%):	57	Pressure (hPa):	1004
Pretest Verification Performed	Yes		Equipment under Test:	2490C-LCM		
Test Engineer(s):	Philip Zimmeran		EUT Serial Number:	IJX000052A		

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	Spectrum Analyzer	Hewlett Packard	8593A	3009A00659	05/08/2009
3	30 ft 50 ohm coax, BNC - BNC	ITT Pomona	RG 58 C/U	CBLBNC7	11/06/2008
4	LISN, 50uH, .01 - 50MHz, 24A	Solar Electronics	9252-50-R-24-BNC	941713	08/30/2008
5	Attenuator, 20dB	Mini Circuits	20dB, 50 ohm	DS20	12/28/2008

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision



Test Results:

Conducted Emissions

Company: Medtronic
 Model #: 2490C-LCM (150 kHz)
 Serial #: IJX000052A
 Engineer(s): Philip Zimmermann
 Project #: 3155100
 Standard: FCC Part 15.207/IC RSS-Gen 7.2.2
 Barometer: BAR1
 Temp/Humidity/Pressure: 21 C 57% 1004 mb
 Voltage/Frequency: 120V 60Hz
 Receiver: HP 8593A (HP3)
 Cable: CBLBNC7 11-06-08.txt
 LISN 1: LISN11 [1] 8-30-08.lsn
 LISN 2: NONE.
 LISN 3: NONE.
 LISN 4: LISN11 [2] 8-30-08.lsn
 Location: EMI 1
 Date: 07/30/08
 Attenuator: DS20 12-28-08.txt

Net is the sum of worst-case lsn, cable, & attenuator losses, and initial reading, factors are not shown

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor; Bandwidth denoted as RBW/VBW

Detector Type	Frequency MHz	Reading Line 1 dB(uV)	Reading Line 2 dB(uV)	Reading Line 3 dB(uV)	Reading Line 4 dB(uV)	Net dB(uV)	QP Limit dB(uV)	Margin dB	Bandwidth
QP	0.175	12.5			21.6	41.7	64.7	-23.0	9/30 kHz
QP	0.205	17.9			19.7	39.8	63.4	-23.6	9/30 kHz
QP	0.233	7.2			20.0	40.1	62.3	-22.2	9/30 kHz
QP	0.288	5.9			15.8	36.0	60.6	-24.6	9/30 kHz
QP	0.342	5.3			15.1	35.3	59.2	-23.8	9/30 kHz
QP	0.407	12.8			14.7	35.0	57.7	-22.7	9/30 kHz
QP	0.610	15.4			14.0	35.6	56.0	-20.4	9/30 kHz
QP	14.430	8.0			5.1	29.0	60.0	-31.0	9/30 kHz
QP	28.960	-0.7			-0.2	21.1	60.0	-38.9	9/30 kHz

Detector Type	Frequency MHz	Reading Line 1 dB(uV)	Reading Line 2 dB(uV)	Reading Line 3 dB(uV)	Reading Line 4 dB(uV)	Net dB(uV)	Average Limit dB(uV)	Margin dB	Bandwidth
AVG	0.175	4.5			14.1	34.2	54.7	-20.5	9/30 kHz
AVG	0.205	5.4			12.2	32.3	53.4	-21.1	9/30 kHz
AVG	0.233	2.0			13.1	33.2	52.3	-19.1	9/30 kHz
AVG	0.288	1.2			10.3	30.5	50.6	-20.1	9/30 kHz
AVG	0.342	0.6			9.2	29.4	49.2	-19.7	9/30 kHz
AVG	0.407	1.1			7.2	27.5	47.7	-20.2	9/30 kHz
AVG	0.610	2.0			6.0	26.1	46.0	-19.9	9/30 kHz
AVG	14.430	-5.8			-2.5	18.5	50.0	-31.5	9/30 kHz
AVG	28.960	-7.3			-7.4	14.1	50.0	-35.9	9/30 kHz

AC Line-Conducted Emissions Setup Photo 1



AC Line-Conducted Emissions Setup Photo 2

