

TEST RESULT SUMMARY

EN 300 330-2 V1.1.1: 2001
Subclauses 7.2, 7.3, 7.4

MANUFACTURER'S NAME	Medtronic, Incorporated
NAME OF EQUIPMENT	Home Monitor
MODEL NUMBER	2490D with RF Head magnet 2490D without RF Head magnet
TYPE OF EQUIPMENT	Product for communication with implantable medical devices.
MANUFACTURER'S ADDRESS	7000 Central Avenue NE Fridley MN 55432
TEST REPORT NUMBER	NC204549
TEST DATE	29 August 2002

According to testing performed at TÜV Product Service Inc, the above-mentioned unit is in compliance with the emission requirements defined in European Telecommunication Standard EN 300 330.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

TÜV Product Service Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the emission requirements of European Telecommunication Standard EN 300 330: "Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Short Range Devices (SRD); Technical Characteristics and Test Methods for Radio Equipment in the Frequency Range 9 kHz to 25 MHz and Inductive Loop Systems in the Frequency Range 9 kHz to 30 MHz."

Date: 09 September 2002

Location: Taylors Falls MN
USA



Tested By:
G. S. Jakubowski



T. K. Swanson
Test Technician

Not Transferable

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D I R E C T O R Y / SUB-CLAUSE PARAMETER TO BE MEASURED PAGE

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The complete list of measurements called for in EN 300 330 is given below.

Transmitter parameters - Ambient temperature22°C Relative humidity55%

7.2.1	Transmitter Carrier Output Levels	3
7.2.2	RF Carrier Current Class 3 Only	N/A
7.2.3	Radiated E-Field Class 4 Only	N/A
7.3.1	Permitted Frequency Range of Modulation bandwidth	4
7.4.2	Conducted Spurious Emissions (Operating) Class 3 Only	N/A
7.4.2	Conducted Spurious Emissions (Standby) Class 3 Only	N/A
7.4.3	Radiated Field Strength (Transmit < 30 MHz)	5
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Receiver parameters -

8.1.2	Receiver Spurious Radiation (Frequencies < 30 MHz)	N/A
8.1.2	Receiver Spurious Radiation (Frequencies > 30 MHz)	N/A

H-FIELD FIELD STRENGTH - SUB-CLAUSE 7.2.1 (Class 1)

Rated field strength (maximum) 5 dB μ A/m at 10 metres

Test conditions	Nominal System Operating Frequency: 175 kHz Maximum Transmitter Field Strength (dBμA/m)			
T _{nom} (..22...)°C		Final 10 Metre	10 Metre Limit	
V _{nom} (..6)VDC		5	36.57	
Maximum deviation from rated output under normal test conditions (dB)				
Measurement uncertainty (dBμA/m)	±1			
The noise floor measurement at 10 metres is −16.5dBuA/m.				

LIMIT SUB-CLAUSE 7.2.1.3

Frequency range - (MHz)	H-field field strength limit (Hf) - dB μ A/m at 10 m
$0,009 \leq f < 0,03$	72 or per note on loop coil antenna area
$0,03 \leq f < 0,07$ $0,119 \leq f < 0,135$	72 at 0,03 MHz descending 3 dB/oct or per note on loop coil antenna area
$0,05975 \leq f < 0,06025$ $0,07 \leq f < 0,119$	42
$0,135 \leq f < 1,0$ $1,0 \leq f < 4,642$ $4,642 \leq f < 30$	37,7 at 0,135 MHz descending 3 dB/oct 29 at 1,0 MHz descending 9 dB/oct 9
$6,765 \leq f \leq 6,795$ (ISM) $13,553 \leq f \leq 13,567$ (ISM) $26,957 \leq f \leq 27,283$ (ISM)	42

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED (for reference see test equipment listing)

1,2,3

Ambient temperature22.°C

Relative humidity55%

RF CARRIER CURRENT - SUB-CLAUSE 7.2.2 (Class 2)

N/A

RADIATED E-FIELD, FIELD STRENGTH (measured as H-field) - SUB-CLAUSE 7.2.3 (Class 4)

N/A

PERMITTED FREQUENCY RANGE OF MODULATION BANDWIDTH - SUB-CLAUSE 7.3.1

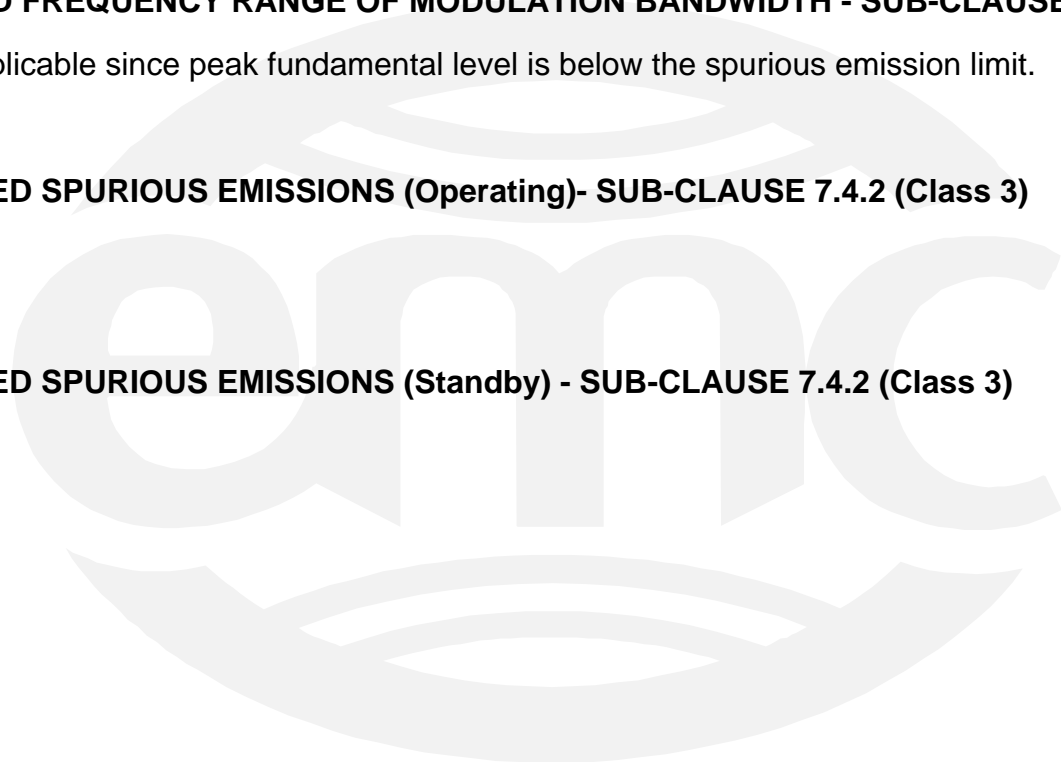
Test not applicable since peak fundamental level is below the spurious emission limit.

CONDUCTED SPURIOUS EMISSIONS (Operating)- SUB-CLAUSE 7.4.2 (Class 3)

N/A

CONDUCTED SPURIOUS EMISSIONS (Standby) - SUB-CLAUSE 7.4.2 (Class 3)

N/A



TRANSMITTER RADIATED SPURIOUS EMISSIONS (Transmit < 30 MHz) - SUB-CLAUSE 7.4.3

	dBuA/m	dBuA/m	dBuA/m	dBuA/m	spec limit	10 meters	
MHz	0.3 meter	1 meter	3 meters	10 meters	300 330		
transmit					dBuA/m	dBuV/m	
0.009					27	78.5	
0.175	73	54	29	5	14.11204	65.61204	fundamental - n/a
0.35	18	2			11.10174	62.60174	
0.525	42	25	-1	-20	9.340832	60.84083	
0.7	6	-11			8.091445	59.59144	
0.875	32	14	-9		7.122345	58.62234	
1.225	25	8	-12		5.661064	57.16106	
1.575	19	3			4.56962	56.06962	
1.925	16	-3	-22		3.698118	55.19812	
2.275	12	-6	-25		2.972611	54.47261	
1.75					4.112045	55.61204	
2.28					2.963077	54.46308	
3.16					1.545554	53.04555	
4.04					0.478611	51.97861	
6.32					-1.46475	50.03525	
8.08					-2.53169	48.96831	
3.623					0.951742	52.45174	
10					-3.45757	48.04243	
30					-3.5	48	

Quasi-Peak

Final measurements made at 1 or 3 Meters when compared to a 10 meter limit still indicate a passing result. Levels measured at 1 or 3 are extrapolated to 10 Meters using a conservative inverse linear relationship. Extrapolated 10 meter levels also indicate a passing result.

Transmitter operating with normal internal modulation.

LIMIT SUB-CLAUSE 7.4.3.2

State	Frequency 9 kHz ≤ f < 10 MHz	Frequency 10 MHz ≤ f < 30 MHz
Transmit	27 dBμA/m descending 3 dB/oct	-3,5 dBμA/m

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED (for reference see test equipment listing)

1,2,3

Ambient temperature22.°C

Relative humidity55%

TRANSMITTER RADIATED SPURIOUS EMISSIONS (standby < 30 MHz) - SUB-CLAUSE 7.4.3

No spurious emissions detected in standby mode below 30 MHz.

LIMIT SUB-CLAUSE 7.4.3.2

State	Frequency $9 \text{ kHz} \leq f < 10 \text{ MHz}$	Frequency $10 \text{ MHz} \leq f < 30 \text{ MHz}$
Standby	6 dB μ A/m descending 3 dB/oct	-24,5 dB μ A/m

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED (for reference see test equipment listing)

1,2,3

Ambient temperature22.°C Relative humidity55%

TRANSMITTER RADIATED SPURIOUS EMISSIONS (Transmit > 30 MHz) - SUB-CLAUSE 7.4.4

No spurious emissions detected in Transmit mode above 30 MHz.

LIMIT SUB-CLAUSE 7.4.4.2

State	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other Frequencies between 30 to 1000 MHz
Operating	4 nW	250 nW

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED (for reference see test equipment listing)

4,5,6,7,8

Ambient temperature22.°C Relative humidity55%

TRANSMITTER RADIATED SPURIOUS EMISSIONS (standby > 30 MHz) - SUB-CLAUSE 7.4.4

No spurious emissions detected in standby mode above 30 MHz.

LIMIT SUB-CLAUSE 7.4.4.2

State	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other Frequencies between 30 to 1000 MHz
Standby	2 nW	2 nW

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED (for reference see test equipment listing)

4,5,6,7,8

Ambient temperature22.°C

Relative humidity55%

RECEIVER SPURIOUS RADIATION (< 30 MHz) - SUB-CLAUSE 8.1

N/A

RECEIVER SPURIOUS RADIATION (>30 MHz) SUB-CLAUSE 8.1

N/A

TEST EQUIPMENT

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

Ref. No.	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Loop Antenna	HFH2-Z2	Polarad	879285/036
02	EMI Receiver	ESH-20	Rohde-Schwarz	837055/003
03	Coaxial cable		Polarad	
04	Spectrum Analyzer	8566B	HP	2430A00930
05	Analyzer Display	85662A	HP	2403A08134
06	Quasi-Peak Adapter	85650A	HP	2521A01006
07	Preamplifier	ZHL-1042J	Mini-Circuits	32296
08	Biconicalog Antenna	EM-6917B	Electro-Metrics	106

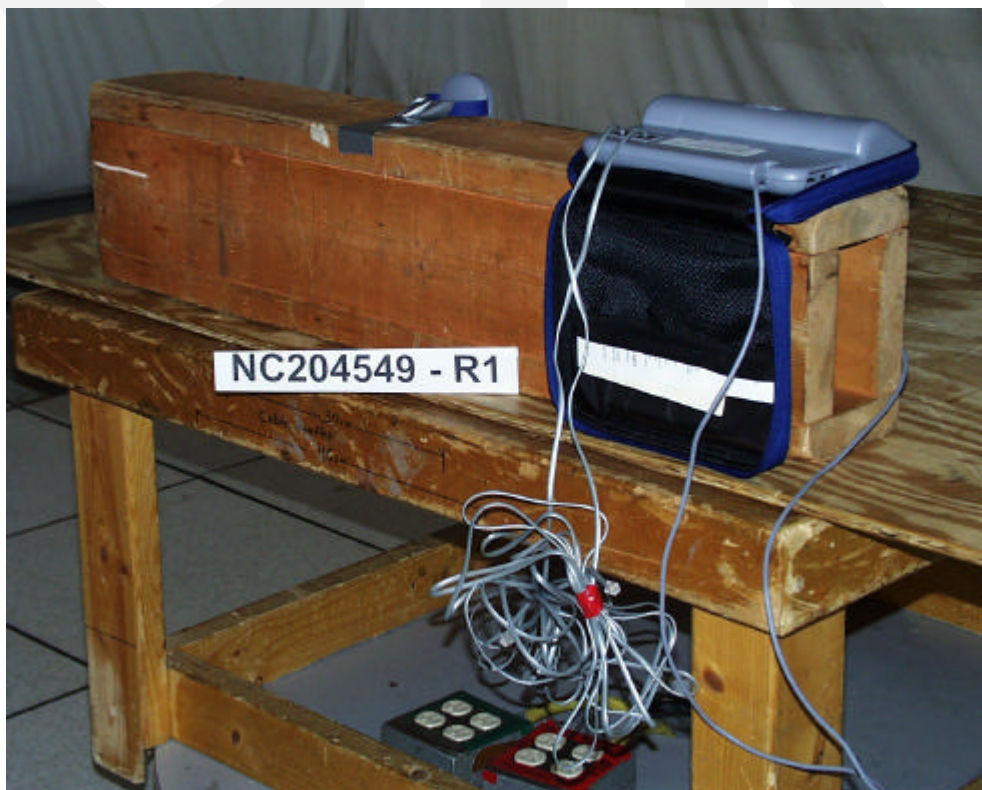
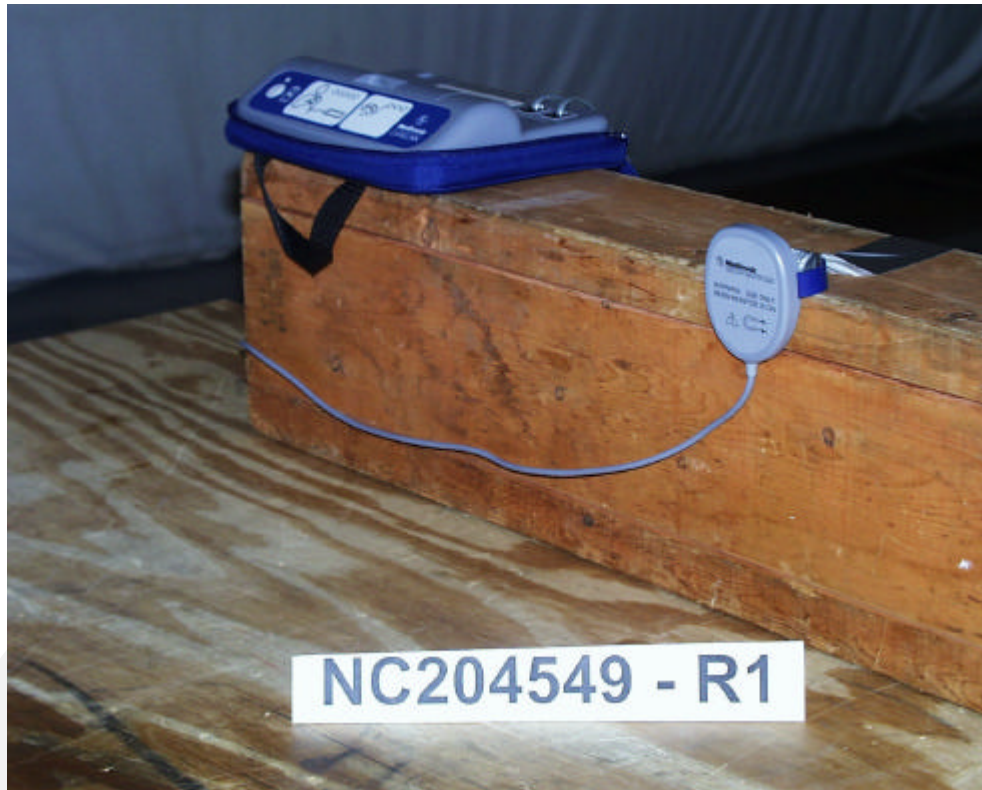
ADDITIONAL INFORMATION SUPPLEMENTARY TO THE TEST REPORT

Photographs other than of the test-setup are sent independently from report.

TEST SETUP PHOTOS



Test-setup photo(s):
Radiated Emission



Test-setup photo(s):

Radiated Emission



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