

TEST RESULT SUMMARY

EN 300 330 v1.2.2: 1999
Subclauses 7.2, 7.3, 7.4

MANUFACTURER'S NAME	Medtronic, Incorporated
NAME OF EQUIPMENT	Programming Head
MODEL NUMBER	9767
TYPE DESIGNATION	Programming Head 9767
TYPE OF EQUIPMENT	Transceiver used to communicate with Implantable Devices
MANUFACTURER'S ADDRESS	7000 Central Avenue NE Fridley MN 55432
TEST REPORT NUMBER	W0670
TEST DATE	22 November & 26 December 2000

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: 08 February 2001

Location: Taylors Falls MN
USA



Tested By:
G. S. Jakubowski



T. K. Swanson
Test Technician

Not Transferable

D I R E C T O R Y / S U B - C L A U S E P A R A M E T E R T O B E M E A S U R E D P A G E

A) Documentation	Page(s)
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Test Setup Photos	<u>A1 – A3</u>

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

Transmitter parameters - Ambient temperature23°C Relative humidity22%

7.2.1	Transmitter Carrier Output Levels		<u>3</u>
7.2.2	RF Carrier Current	Class 3 Only	<u>N/A</u>
7.2.3	Radiated E-Field	Class 4 Only	<u>N/A</u>
7.3.1	Permitted Frequency Range of Modulation bandwidth		<u>4</u>
7.4.2	Conducted Spurious Emissions (Operating)	Class 3 Only	<u>N/A</u>
7.4.2	Conducted Spurious Emissions (Standby)	Class 3 Only	<u>N/A</u>
7.4.3	Radiated Field Strength (Transmit < 30 MHz)		<u>5</u>
7.4.3	Radiated Field Strength (Standby < 30 MHz)		<u>6</u>
7.4.4	Radiated Field Strength (Transmit > 30 MHz)		<u>6</u>
7.4.4	Radiated Field Strength (Standby > 30 MHz)		<u>7</u>

Receiver parameters -

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

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

Rated field strength (maximum) 19.5 dB μ A/m at 10 metres - Antenna size < 0.004 m²

Test conditions	Nominal System Operating Frequency: 175 kHz Maximum Transmitter Field Strength (dB μ A/m)			
T _{nom} (..23...)°C		Final 10 Metre	10 Metre Limit	
V _{nom} (..12)VDC		19.5	36.57	
Maximum deviation from rated output under normal test conditions (dB)				
Measurement uncertainty (dB μ A/m)	±1			

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 ≤ f < 0,03	72 or per note on loop coil antenna area
0,03 ≤ f < 0,07 0,119 ≤ f < 0,135	72 at 0,03 MHz descending 3 dB/oct or per note on loop coil antenna area
0,05975 ≤ f < 0,06025 0,07 ≤ f < 0,119	42
0,135 ≤ f < 1,0 1,0 ≤ f < 4,642 4,642 ≤ f < 30	37,7 at 0,135 MHz descending 3 dB/oct 29 at 1,0 MHz descending 9 dB/oct 9
6,765 ≤ f ≤ 6,795 (ISM) 13,553 ≤ f ≤ 13,567 (ISM) 26,957 ≤ f ≤ 27,283 (ISM)	42

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

1,2,3

Ambient temperature23.°C Relative humidity22%

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

Applicants declared operating frequency band:

Lowest frequency 173.1 kHz Highest frequency . 176.9 kHz

The 9767 programming head receives regulated 12 VDC from an instrument called a programmer. The programmer is AC powered. Extreme voltages consisted of varying the programmer AC line voltage.

Test Conditions		Lowest frequency (F _l) (KHz)	Highest Frequency (F _h) (KHz)
Temperature	AC line voltage		
T _{nom} (22 °C)	198 VAC, 50 Hz	173.1	176.8
	220	173.1	176.9
	242	173.1	176.8
T _{low} (0 °C)	198 VAC, 50 Hz	173.2	176.8
	220	173.2	176.8
	242	173.1	176.8
T _{high} (55 °C)	198 VAC, 50 Hz	173.2	176.8
	220	173.2	176.8
	242	173.2	176.8

Where Fl Lowest frequency at the appropriate spurious emission level, Fh Highest frequency at the appropriate spurious emission level; Band edge limits Flm = Lowest Fl (measured) and Fhm = Highest Fh (measured)

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

1, 2, 3

Ambient temperature.....23°C Relative humidity.....22%

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

						Transmit
						spec limit
Freq.	0.3 M	1 Meter	3 Meter	10 M	10 M	dBuA/m
MHz	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dBuA/m	300 330
0.009						27
0.078		44	30	24	-27.5	17.60844292
0.088		61	43	28	-23.5	17.08383403
0.181		85	65	42	-9.5	13.94752158
0.224		74	54	38	-13.5	13.02054043
0.263		74	49	NF	-12.5	12.3224942
0.3	78	56	43	NF	-18.5	11.75004453
0.35	87	60	41	NF	-20.5	11.07964608
0.36		61	39	NF	-22.5	10.95713145
0.38	80	51	NF	NF	-20.5	10.72199411
0.4	78	55	NF	NF	-16.5	10.49892052
0.45	77	55	33	NF	-28.5	9.986684274
0.525	94	71	47	NF	-14.5	9.316285817
0.7	69	48	NF	NF	-23.5	8.065161802
0.78	68	47	NF	NF	-24.5	7.594542923
0.875	74	53	NF	NF	-18.5	7.094714623
1	66	44	NF	NF	-27.5	6.513989065
1.75	62	50	28	NF	-33.5	4.08023035
2.27		49	27	NF	-34.5	2.948781734
10						-3.5
30						-3.5

NF = Noise Floor

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 dBuA/m descending 3 dB/oct	-3,5 dBuA/m

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

1,2,3

Ambient temperature.....23°C Relative humidity.....22%

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 temperature.....23°C Relative humidity.....22%

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 temperature.....23°C Relative humidity.....22%

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 temperature.....23°C Relative humidity.....22%

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-3	Rohde-Schwarz	892473/004
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	H072294-11
08	Biconicalog Antenna	EM-6917B	Electro-Metrics	101

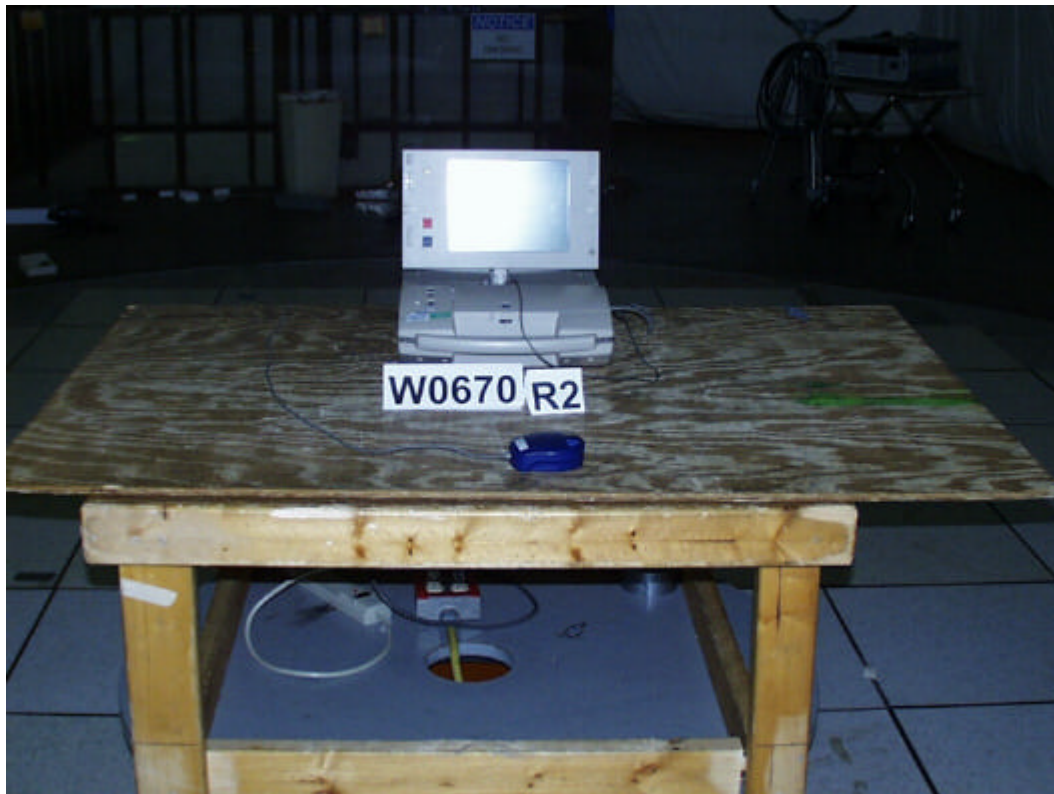
ADDITIONAL INFORMATION SUPPLEMENTARY TO THE TEST REPORT

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

