

EMISSIONS TEST REPORT

Report Number: 3114493BOX-004

Project Number: 3114493

Testing performed on the

Merlin Antenna

Model: 3638

To

**FCC Part 15 Subpart C 15.249
IC RSS-210 Issue 6 September 2005**

For

St. Jude Medical AB

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

Test Authorized by:
St. Jude Medical AB
175 84 Järfälla
Stockholm, Sweden

Prepared by: _____

Nicholas Abbondante

Date: _____

2/16/07

Reviewed by: _____

Jeff Goulet

Date: _____

2-19-07

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1.0 Job Description

1.1 Client Information

This EUT has been tested at the request of:

Company: St. Jude Medical AB
SE-175 84
Järfälla, Sweden
Contact: Hans Andersen
Telephone: +46 8 474 4567
Fax: +46 8 761 2905
Email: handersen@sjm.com

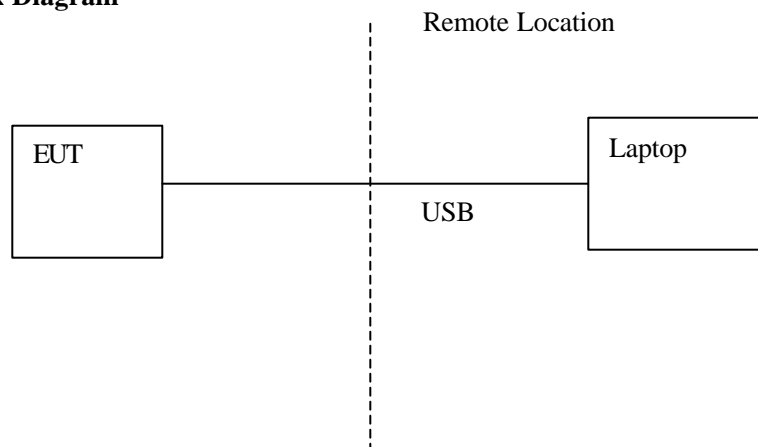
1.2 Equipment Under Test

Equipment Type: Merlin Antenna
Intended FCC ID: RIASJMRFANT
Model Number(s): 3638
Serial number(s): 85200001, 85200093, 900061
Manufacturer: St. Jude Medical
EUT receive date: 01/15/2007
EUT received condition: Prototype in Good Condition
Test start date: 01/18/2007
Test end date: 02/09/2007

1.3 Test Plan Reference: Tested according to the standards listed.

1.4 Test Configuration

1.4.1 Block Diagram



1.4.2. Cables:

Cable	Shielding	Connector	Length (m)	Qty.
USB	Braid	Metal/USB	2	1
USB	Braid	Metal/USB	2.9	1

1.4.3. Support Equipment:

Name: Laptop Computer
 Model No.: Dell Latitude
 Serial No.: WS2330

Name: LG Electronics Inc. Laptop
 Model No.: LGM6
 Serial No.: N/L

Name: LG Electronics Inc. AC Adapter
 Model No.: PA-1900-08
 Serial No.: N/L

1.5 Mode(s) of Operation:

The EUT was activated from a fresh battery and was transmitting a modulated carrier during testing. Channels 6, 13, and 20 were utilized for testing unless otherwise indicated.

Ch6 2406.00 MHz
 Ch13 2413.00 MHz
 Ch20 2420.00 MHz

2.0 Test Summary

TEST STANDARD	RESULTS	
FCC Part 15 Subpart C 15.249 IC RSS-210 Issue 6 September 2005		
SUB-TEST	TEST PARAMETER	COMMENT
RF Output Power FCC §15.249, RSS-210 Section A2.9	The fundamental field strength must not exceed 50 mV/meter at 3m test distance (94 dBµV/m at 3m).	Pass
Emission Bandwidth FCC §15.215, RSS-Gen Section 4.4	The fundamental frequency must stay within the assigned band.	Pass
Radiated Spurious Emissions FCC §15.205, 15.209, 15.249, RSS-210 Sections 2.7, A2.9	Harmonic emissions must not exceed 500uV/m (54 dBuV/m). Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation. Field strength limits are specified at a distance of 3 meters. Emissions falling into the restricted bands of 15.205 must meet the general limits of 15.209.	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

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

<u>Date</u>	<u>Project</u> <u>No.</u>	<u>Project</u> <u>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): 2

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 15.247, IC RSS-210 Issue 6 September 2005

Test: RF Output Power, FCC §15.249, RSS-210 Section A2.9

Performance Criterion: The fundamental field strength must not exceed 50 mV/meter at 3m test distance (94 dBμV/m at 3m).

Test Environment:

Environmental Conditions During Testing:	Humidity (%):	See Table	Pressure (hPa):	See Table	Ambient (°C):	See Table
Pretest Verification Performed	Yes		Equipment under Test:		3638	

Test Equipment Used:

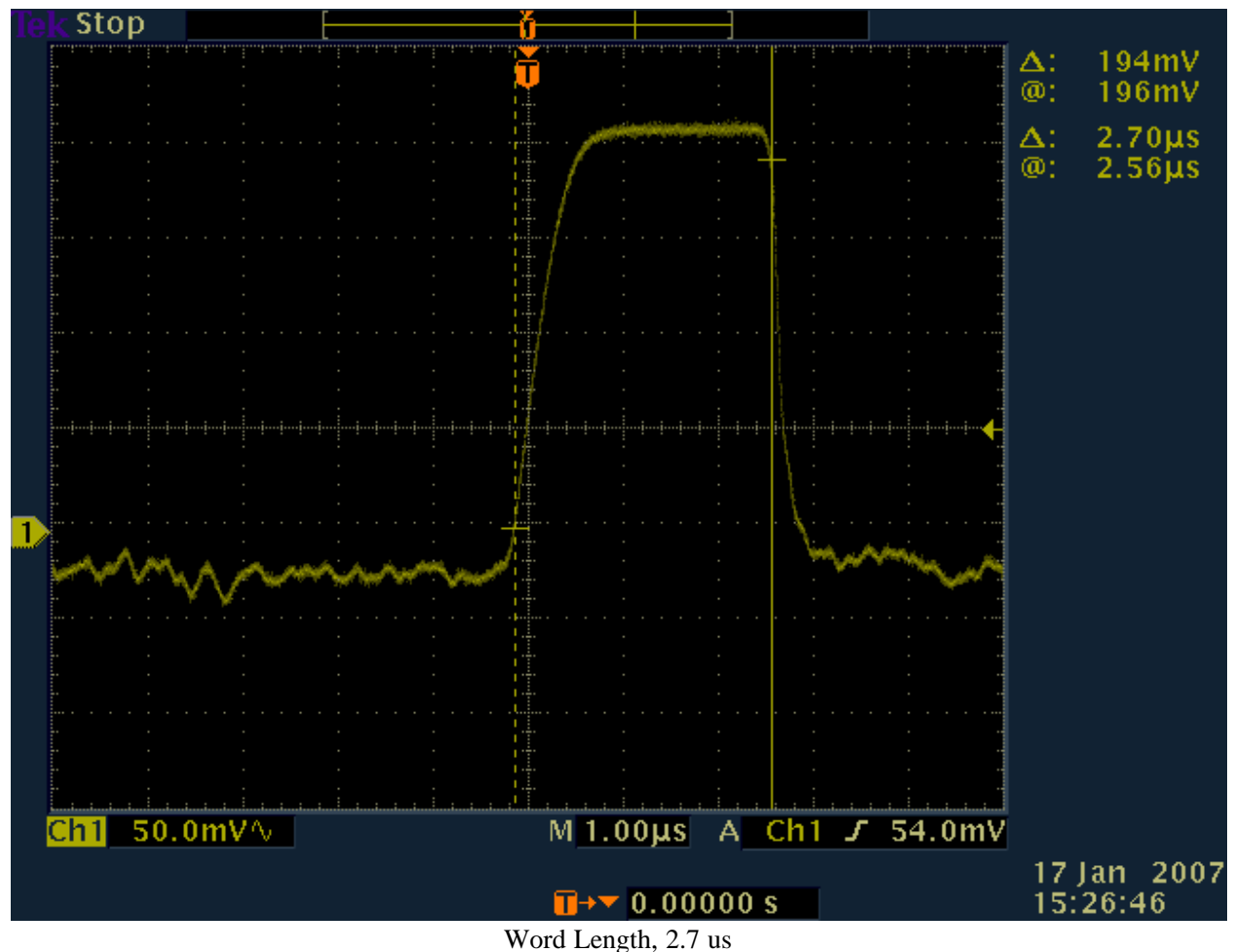
TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR2	08/02/2007
2	HORN ANTENNA	EMCO	3115	9610-4980	06/12/2007
3	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/04/2007
4	Oscilloscope, Digital Storage	Tektronix	TDS3052	B014809	03/03/2007
5	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	10/23/2007

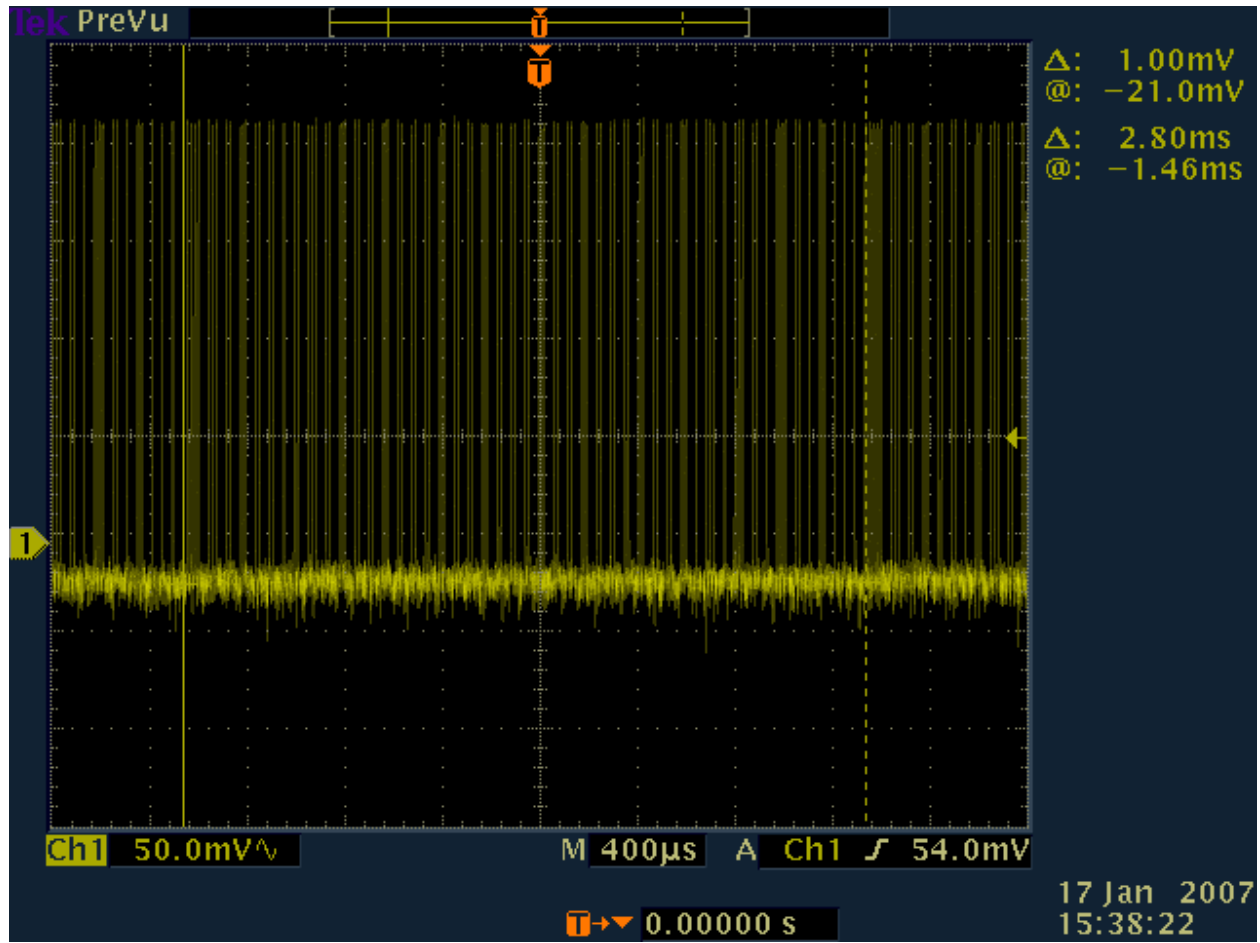
Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	9/20/06 Revision

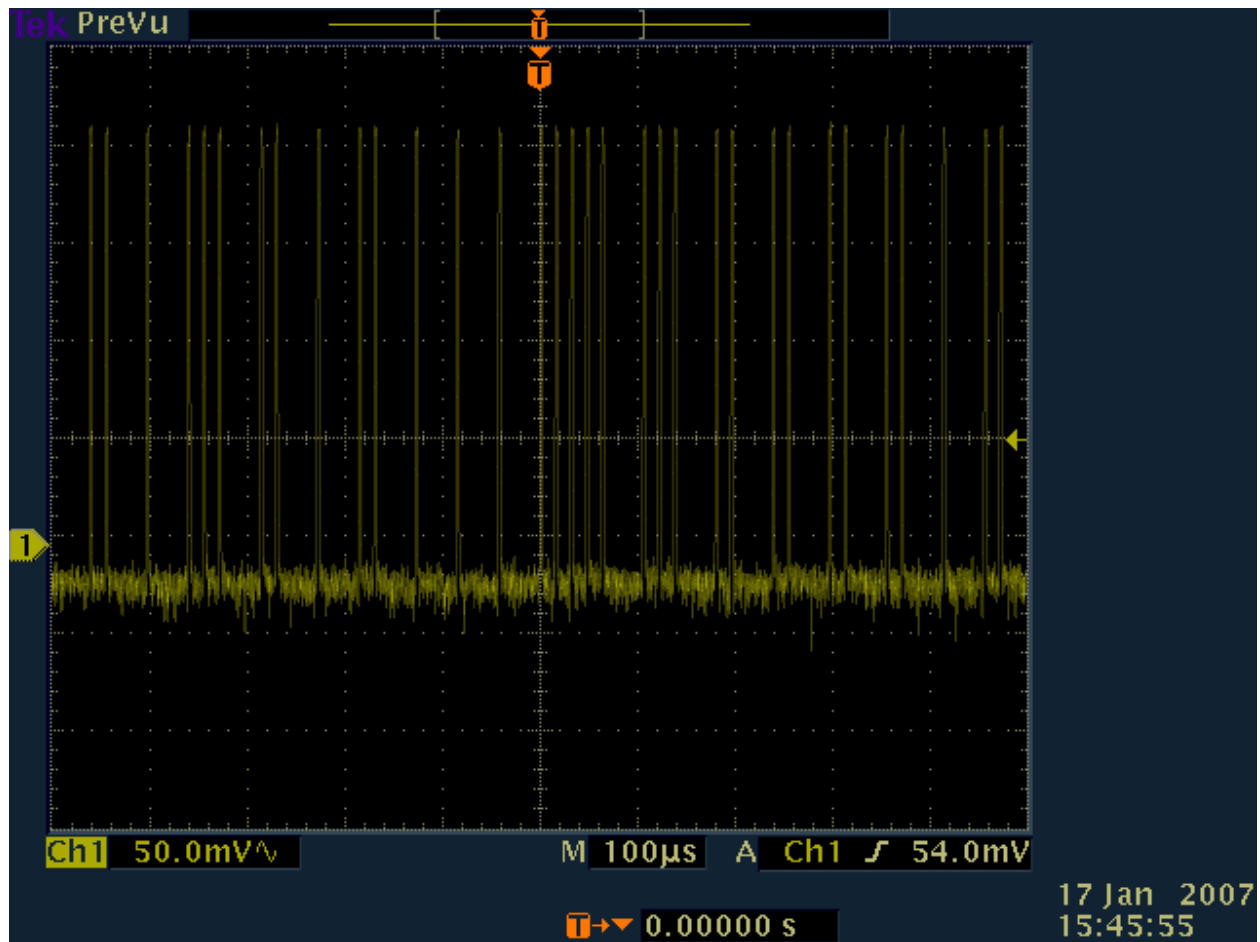
Test Details:

Special Radiated Emissions													
Company:	St. Jude Medical					Antenna & Cables:		HF	Bands: N, LF, HF, SHF				
Model #:	3638					LF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt			
Serial #:	85200001					N Antenna:		LOG2 1-25-07 V3.txt		LOG2 1-25-07 H3.txt			
Engineers:	Nicholas Abbondante			Location:	Site 2		HF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt		
Project #:	3114493			Date(s):	01/15/07	01/16/07	01/17/07	SHF Antenna:		EMC04 V 1m 12-13-2007.txt		EMC04 H 1m 12-13-2007.txt	
Standard:	FCC Part 15 Subpart C 15.249/IC RSS-210 A2.9					LF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt			
Receiver:	R&S FSEK-30 (ROS001)			Limit Distance (m):	3		N Cable(s):		S3 3M FLR 9-26-07.txt		NONE.		
PreAmp:	PRE8 11-14-07.txt			Test Distance (m):	3		HF Cable(s):		CBL030 12-04-2007.txt		NONE.		
Barometer:	BAR2	Temp/Humidity/Pressure:		20c	35%		1007mB		SHF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt
PreAmp Used? (Y or N):		N		Voltage/Frequency:		120V/60Hz		Frequency Range:		1-4 GHz			
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	FCC	IC
Note: Duty Cycle Adjusted Average Values (-19.97 dB)													
PK	H	2406.000	82.1	30.0	1.5	0.0	0.0	113.5	114.0	-0.5	1/10MHz		
AVG	H	2406.000	62.1	30.0	1.5	0.0	0.0	93.6	94.0	-0.4	1/10MHz		
PK	H	2413.000	81.5	30.0	1.5	0.0	0.0	112.9	114.0	-1.1	1/10MHz		
AVG	H	2413.000	61.5	30.0	1.5	0.0	0.0	93.0	94.0	-1.0	1/10MHz		
PK	H	2420.000	81.3	30.0	1.5	0.0	0.0	112.8	114.0	-1.2	1/10MHz		
AVG	H	2420.000	61.3	30.0	1.5	0.0	0.0	92.8	94.0	-1.2	1/10MHz		





Pulse Train, 96 words



Example of Burst Start

Notes: Pulse trains from the EUT consist of 96 words in a 2.8 ms burst. Each word is 2.7 us long. This yields a duty cycle of 9.26%, and a duty cycle correction factor of -20.67 dB.

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.249, IC RSS-210 Issue 6 September 2005

Test: Emission Bandwidth, FCC §15.215, RSS-Gen Section 4.4

Performance Criterion: The fundamental frequency must stay within the assigned band.

Test Environment:

Environmental Conditions During Testing:	Humidity (%):	N/A	Pressure (hPa):	N/A	Ambient (°C):	N/A
Pretest Verification Performed	Yes		Equipment under Test:		3638	

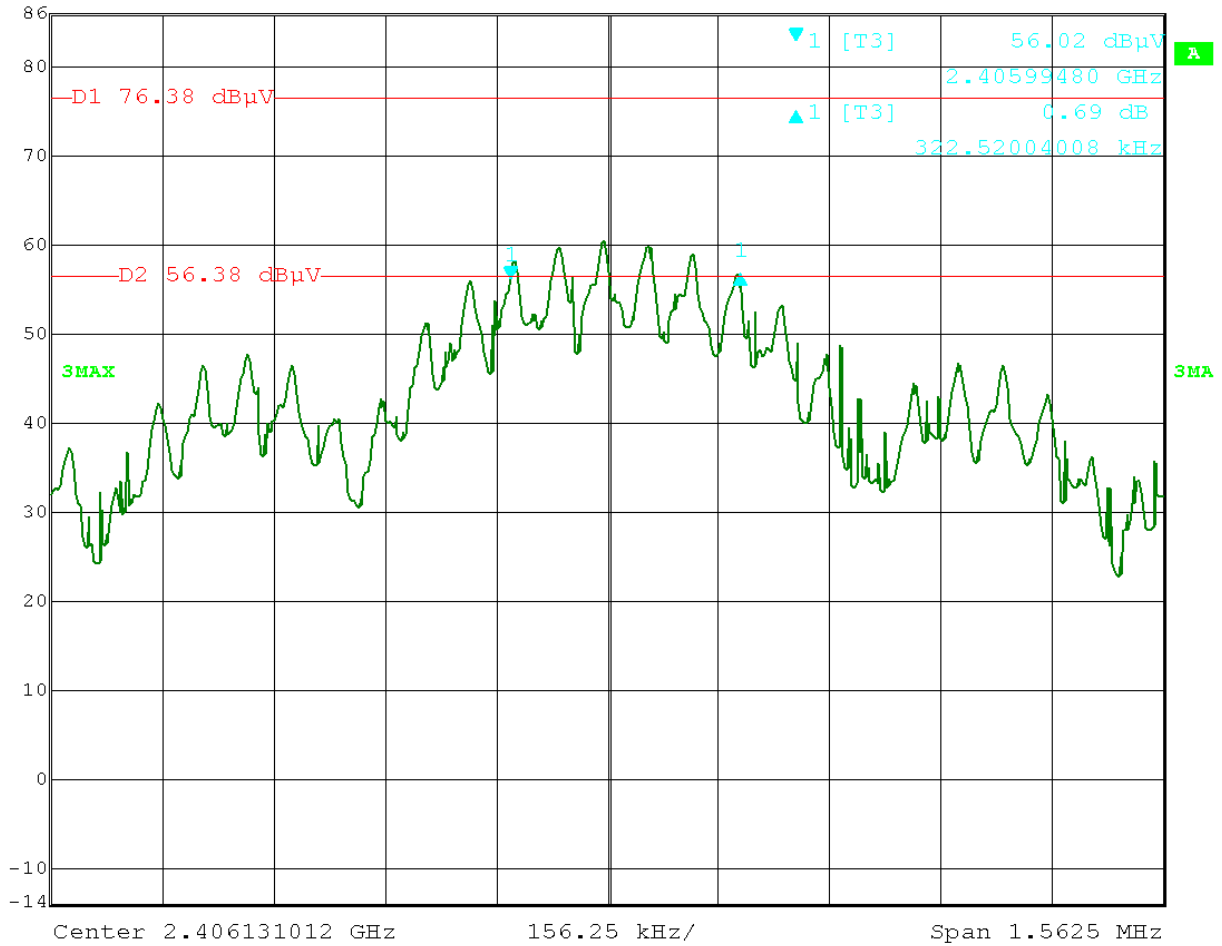
Test Equipment Used:

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	10/23/2007

Test Details:



Ref Lvl	Delta 1 [T3]	RBW	10 kHz	RF Att	0 dB
86 dBμV	0.69 dB	VBW	10 MHz		
	322.52004008 kHz	SWT	40 ms	Unit	dBμV

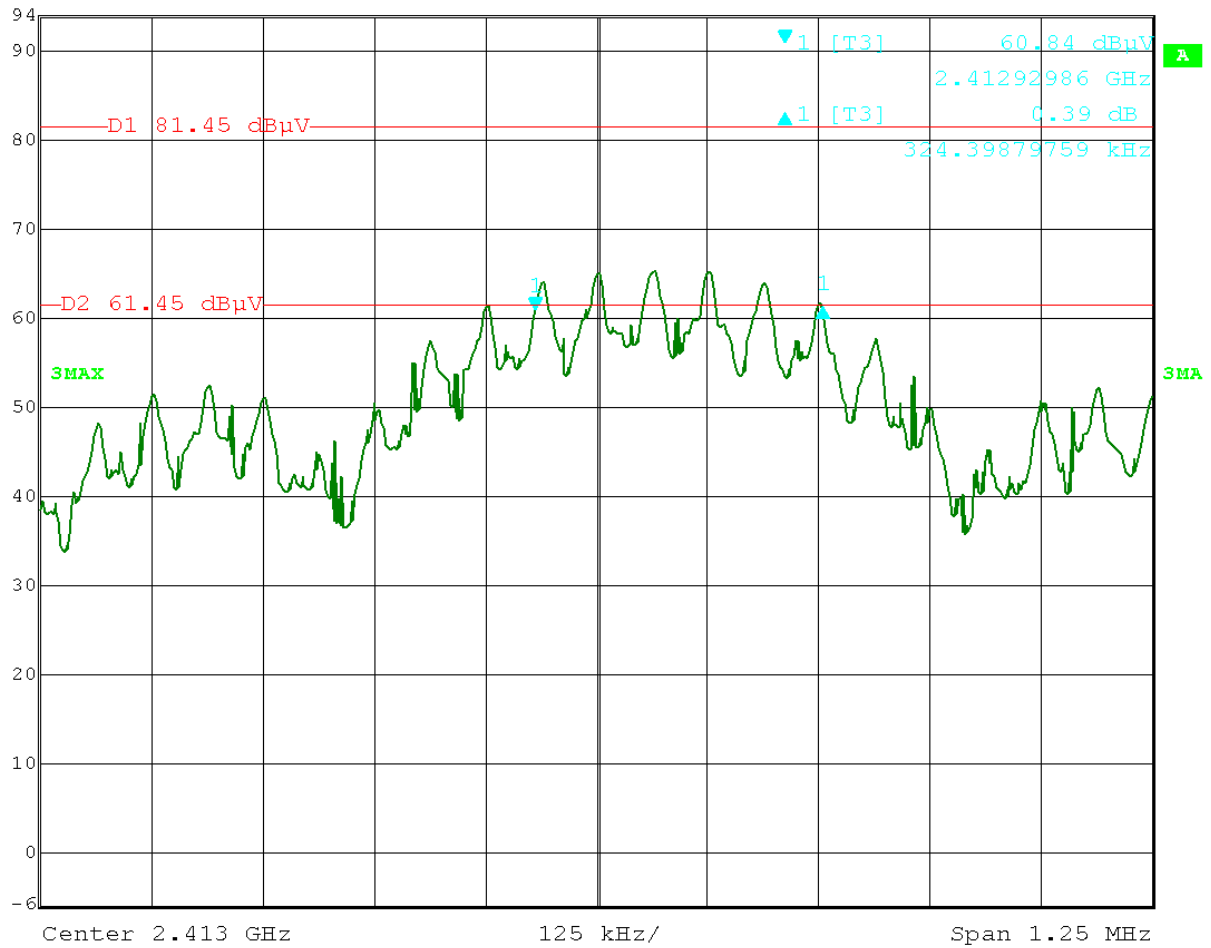


Date: 15.JAN.2007 12:37:55

Channel 6 20 dB Bandwidth, 322.5 kHz



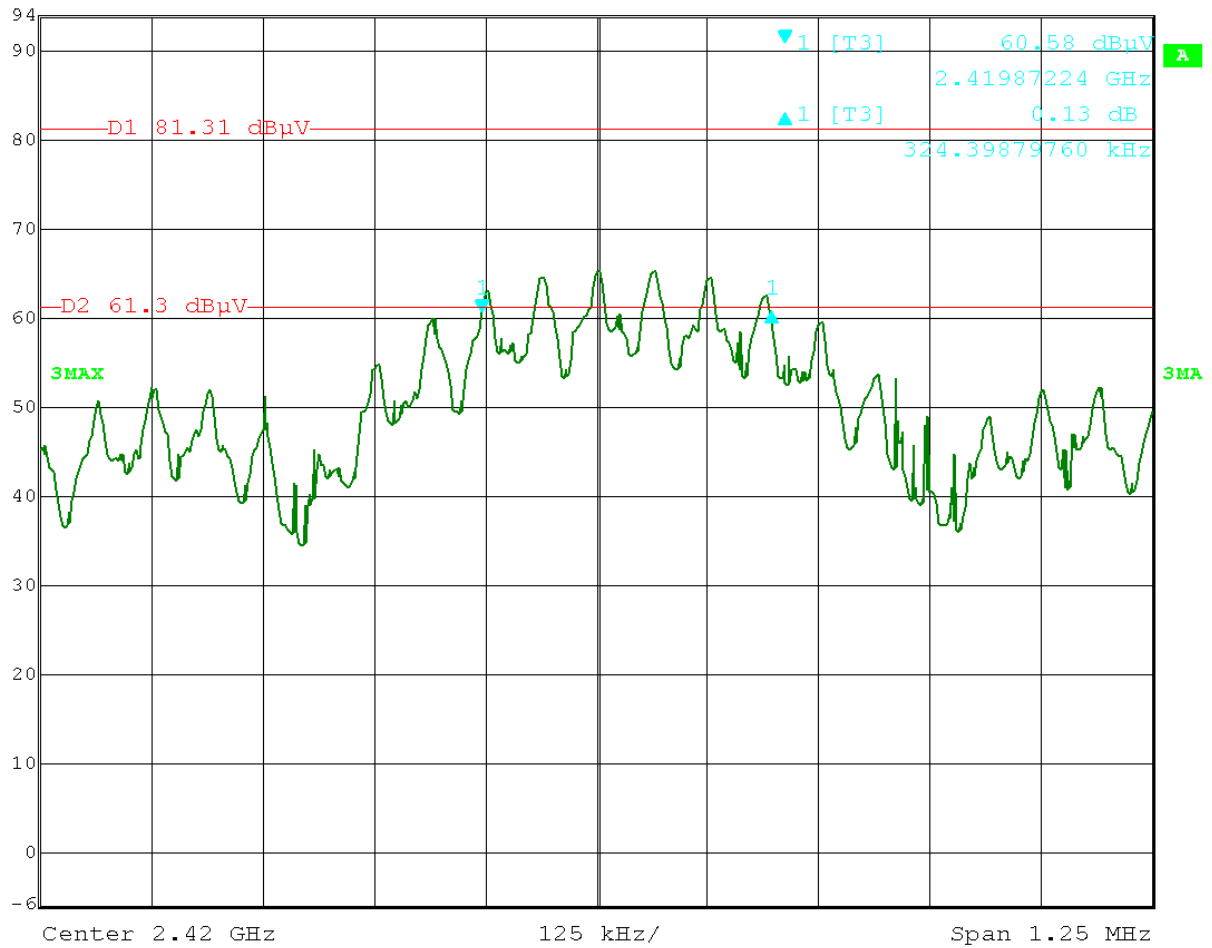
Delta 1 [T3] RBW 10 kHz RF Att 0 dB
 Ref Lvl 0.39 dB VBW 10 MHz
 94 dBμV 324.39879759 kHz SWT 32 ms Unit dBμV



Date: 15.JAN.2007 13:33:39
 Channel 13 20 dB Bandwidth, 324.4 kHz



Delta 1 [T3] RBW 10 kHz RF Att 0 dB
 Ref Lvl 0.13 dB VBW 10 MHz
 94 dBμV 324.39879760 kHz SWT 32 ms Unit dBμV



Date: 15.JAN.2007 13:40:33
 Channel 20 20 dB Bandwidth, 324.4 kHz

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.249, IC RSS-210 Issue 6 September 2005

Test: Radiated Spurious Emissions, FCC §15.205, 15.209, 15.249, RSS-210 Sections 2.7, A2.9

Performance Criterion: Harmonic emissions must not exceed 500uV/m (54 dBuV/m). Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation. Field strength limits are specified at a distance of 3 meters. Emissions falling into the restricted bands of 15.205 must meet the general limits of 15.209.

Test Environment:

Environmental Conditions During Testing:	Humidity (%):	See Tables	Pressure (hPa):	See Tables	Ambient (°C):	See Tables
Pretest Verification Performed	Yes		Equipment under Test:		3638	

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR2	08/02/2007
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	10/23/2007
3	PREAMPLIFIER 1-40 GHz	MITEQ	NSP4000-NF	507145	11/14/2007
4	3 Meter In floor cable for site 2	ITS	RG214B/U	S2 3M FLR	09/26/2007
5	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL029	12/04/2007
6	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/04/2007
7	ANTENNA	EMCO	3142	9711-1223	02/06/2008
8	HORN ANTENNA	EMCO	3115	9610-4980	06/12/2007
9	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	12/13/2007

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	9/20/06 Revision

Test Details:

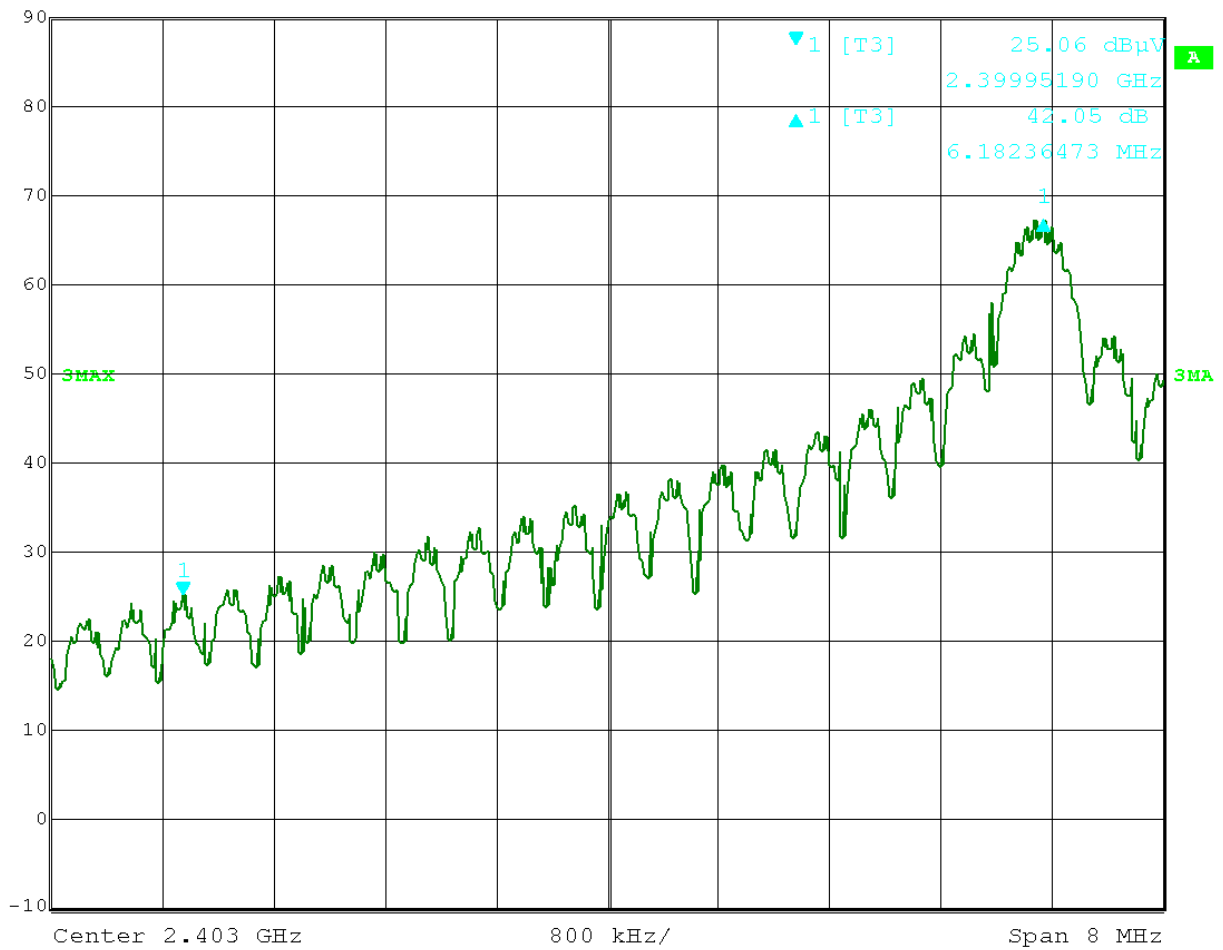
Notes: See RF Output Power for duty cycle calculations.

Radiated Emissions													
Company: St. Jude Medical							Antenna & Cables:		N		Bands: N, LF, HF, SHF		
Model #: 3638							LF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt		
Serial #: 85200001							N Antenna:		LOG2 2-06-08 V3.txt		LOG2 2-06-08 H3.txt		
Engineers: Nicholas Abbondante			Location: Site 2			HF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt			
Project #: 3114493			Date(s): 01/18/07			SHF Antenna:		EMC04 V 1m 12-13-2007.txt		EMC04 H 1m 12-13-2007.txt			
Standard: FCC Part 15 Subpart C 15.249/IC RSS-210 A2.9							LF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt		
Receiver: R&S FSEK-30 (ROS001)			Limit Distance (m): 3			N Cable(s):		S2 3M FLR 9-26-07.txt		NONE.			
PreAmp: PRE8 11-14-07.txt			Test Distance (m): 3			HF Cable(s):		CBL030 12-04-2007.txt		NONE.			
Barometer: BAR2		Temp/Humidity/Pressure: 19c 24%		1026mB		SHF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt			
PreAmp Used? (Y or N): N			Voltage/Frequency: 120V/60Hz			Frequency Range:			30-1000 MHz				
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS: NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW													
Detector Type	Ant. Pol.	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	FCC	IC
QP	V	37.570	10.5	12.6	0.9	0.0	0.0	24.0	40.0	-16.0	120/300 kHz	RB	RB
QP	V	49.570	11.3	8.5	1.0	0.0	0.0	20.8	42.8	-22.0	120/300 kHz		
QP	V	62.820	5.9	8.4	1.1	0.0	0.0	15.4	42.8	-27.4	120/300 kHz		
QP	V	74.680	14.5	7.5	1.2	0.0	0.0	23.2	42.8	-19.6	120/300 kHz		
QP	V	84.000	25.9	7.7	1.2	0.0	0.0	34.8	42.8	-8.0	120/300 kHz		
QP	V	108.800	10.7	7.9	1.4	0.0	0.0	20.0	43.5	-23.5	120/300 kHz	RB	RB
QP	V	114.500	17.3	7.5	1.5	0.0	0.0	26.3	43.5	-17.2	120/300 kHz	RB	RB
QP	V	120.000	28.7	7.0	1.4	0.0	0.0	37.1	43.5	-6.4	120/300 kHz	RB	RB
QP	V	122.800	17.5	6.9	1.5	0.0	0.0	25.9	43.5	-17.6	120/300 kHz		RB
QP	V	132.100	26.1	6.7	1.6	0.0	0.0	34.4	43.5	-9.1	120/300 kHz	RB	RB
QP	V	137.900	20.8	7.1	1.5	0.0	0.0	29.3	43.5	-14.2	120/300 kHz	RB	RB
QP	V	144.000	27.5	7.6	1.5	0.0	0.0	36.6	43.5	-6.9	120/300 kHz		
QP	V	168.000	15.9	8.7	1.8	0.0	0.0	26.3	43.5	-17.2	120/300 kHz	RB	
QP	V	173.500	10.2	8.8	1.8	0.0	0.0	20.8	43.5	-22.7	120/300 kHz		
QP	V	182.500	13.2	9.2	1.9	0.0	0.0	24.3	43.5	-19.2	120/300 kHz		
QP	V	204.000	13.2	10.7	2.0	0.0	0.0	25.9	43.5	-17.6	120/300 kHz		
QP	V	216.000	17.3	11.5	2.0	0.0	0.0	30.8	43.5	-12.7	120/300 kHz		
QP	V	228.000	13.1	12.1	2.2	0.0	0.0	27.4	46.0	-18.6	120/300 kHz		
QP	V	240.000	10.7	12.4	2.2	0.0	0.0	25.3	46.0	-20.7	120/300 kHz	RB	RB
QP	V	252.000	6.6	12.7	2.4	0.0	0.0	21.6	46.0	-24.4	120/300 kHz	RB	RB
QP	V	258.000	1.2	12.8	2.2	0.0	0.0	16.2	46.0	-29.8	120/300 kHz	RB	RB
QP	V	264.000	4.7	13.0	2.4	0.0	0.0	20.1	46.0	-25.9	120/300 kHz	RB	RB
QP	V	276.000	0.1	13.4	2.3	0.0	0.0	15.8	46.0	-30.2	120/300 kHz	RB	RB
QP	V	288.000	4.9	13.9	2.4	0.0	0.0	21.2	46.0	-24.8	120/300 kHz		
QP	V	300.000	3.2	14.4	2.4	0.0	0.0	20.0	46.0	-26.0	120/300 kHz		
QP	V	312.000	4.8	14.4	2.4	0.0	0.0	21.6	46.0	-24.4	120/300 kHz		
QP	V	324.000	2.2	14.4	2.5	0.0	0.0	19.1	46.0	-26.9	120/300 kHz	RB	RB
QP	V	336.000	6.7	14.7	2.6	0.0	0.0	24.0	46.0	-22.0	120/300 kHz		
QP	V	348.000	1.4	15.1	2.5	0.0	0.0	19.0	46.0	-27.0	120/300 kHz		
QP	V	360.000	2.5	15.2	2.7	0.0	0.0	20.4	46.0	-25.6	120/300 kHz		
QP	V	372.000	2.5	15.2	3.1	0.0	0.0	20.8	46.0	-25.2	120/300 kHz		
QP	V	384.000	6.6	15.4	2.8	0.0	0.0	24.8	46.0	-21.2	120/300 kHz		
QP	V	396.000	4.9	15.6	2.7	0.0	0.0	23.2	46.0	-22.8	120/300 kHz		
QP	V	408.000	1.6	15.9	2.8	0.0	0.0	20.3	46.0	-25.7	120/300 kHz	RB	RB
QP	V	420.000	0.7	16.2	2.9	0.0	0.0	19.8	46.0	-26.2	120/300 kHz		
QP	V	432.000	7.2	16.5	3.0	0.0	0.0	26.6	46.0	-19.4	120/300 kHz		
QP	V	444.000	0.3	16.7	2.9	0.0	0.0	19.9	46.0	-26.1	120/300 kHz		
QP	V	456.000	-1.1	17.2	3.2	0.0	0.0	19.3	46.0	-26.7	120/300 kHz		

Special Radiated Emissions																
Company:	St. Jude Medical						Antenna & Cables:		HF	Bands: N, LF, HF, SHF						
Model #:	3638						LF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt					
Serial #:	85200001						N Antenna:		LOG2 2-06-08 V3.txt		LOG2 2-06-08 H3.txt					
Engineers:	Nicholas Abbondante				Location:		Site 2		HF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt			
Project #:	3114493		Date(s): 01/15/07		01/16/07		01/17/07		SHF Antenna:		EMC04 V 1m 12-13-2007.txt		EMC04 H 1m 12-13-2007.txt			
Standard: FCC Part 15 Subpart C 15.249/IC RSS-210 A2.9																
Receiver:	R&S FSEK-30 (ROS001)				Limit Distance (m):		3		LF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt			
PreAmp:	PRE8 11-14-07.txt				Test Distance (m):		3		N Cable(s):		S3 3M FLR 9-26-07.txt		NONE.			
Barometer:	BAR2		Temp/Humidity/Pressure:		20c		35%		1007mB		SHF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt	
PreAmp Used? (Y or N):		N		Voltage/Frequency:		120V/60Hz		Frequency Range:		1-4 GHz						
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW																
Detector	Ant.	Pol.	Frequency	Reading	Antenna	Cable	Pre-amp	Distance	Net	Limit	Margin	Bandwidth				
Type	(V/H)		MHz	dB(uV)	Factor	Loss	Factor	dB	dB(uV/m)	dB(uV/m)	dB		FCC	IC		
Note: Ch6 values adjusted -42.05 dB using marker-delta method																
PK		H	2399.990	39.6	30.0	1.5	0.0	0.0	71.0	74.0	-3.0	100kHz/1MHz				
AVG sweep		H	2399.990	17.2	30.0	1.5	0.0	0.0	48.7	54.0	-5.3	100kHz/1MHz				
AVG10kHz		H	2399.990	5.1	30.0	1.5	0.0	0.0	36.5	54.0	-17.5	100kHz/1MHz				
Note: Ch20 Band Edge Compliance 1 MHz RBW																
PK		H	2483.510	25.6	30.2	1.5	0.0	0.0	57.3	74.0	-16.7	1/10 MHz	RB			
AVG sweep		H	2483.510	21.6	30.2	1.5	0.0	0.0	53.3	54.0	-0.7	1/10 MHz	RB			
AVG10kHz		H	2483.510	15.6	30.2	1.5	0.0	0.0	47.3	54.0	-6.7	1MHz/10kHz	RB			
Note: Spurious Emissions 1-4 GHz																
PK		V	3693.000	28.0	32.7	1.6	0.0	0.0	62.3	74.0	-11.7	1/10MHz	RB	RB		
AVG detect		V	3693.000	16.7	32.7	1.6	0.0	0.0	51.0	54.0	-3.0	1/10MHz	RB	RB		
AVG10kHz		V	3693.000	15.5	32.7	1.6	0.0	0.0	49.8	54.0	-4.2	1MHz/10kHz	RB	RB		



Delta 1 [T3] RBW 30 kHz RF Att 0 dB
 Ref Lvl 42.05 dB VBW 1 MHz
 90 dBμV 6.18236473 MHz SWT 22.5 ms Unit dBμV



Date: 15.JAN.2007 14:23:50

Channel 6 Band Edge Compliance, Marker Delta Measurement

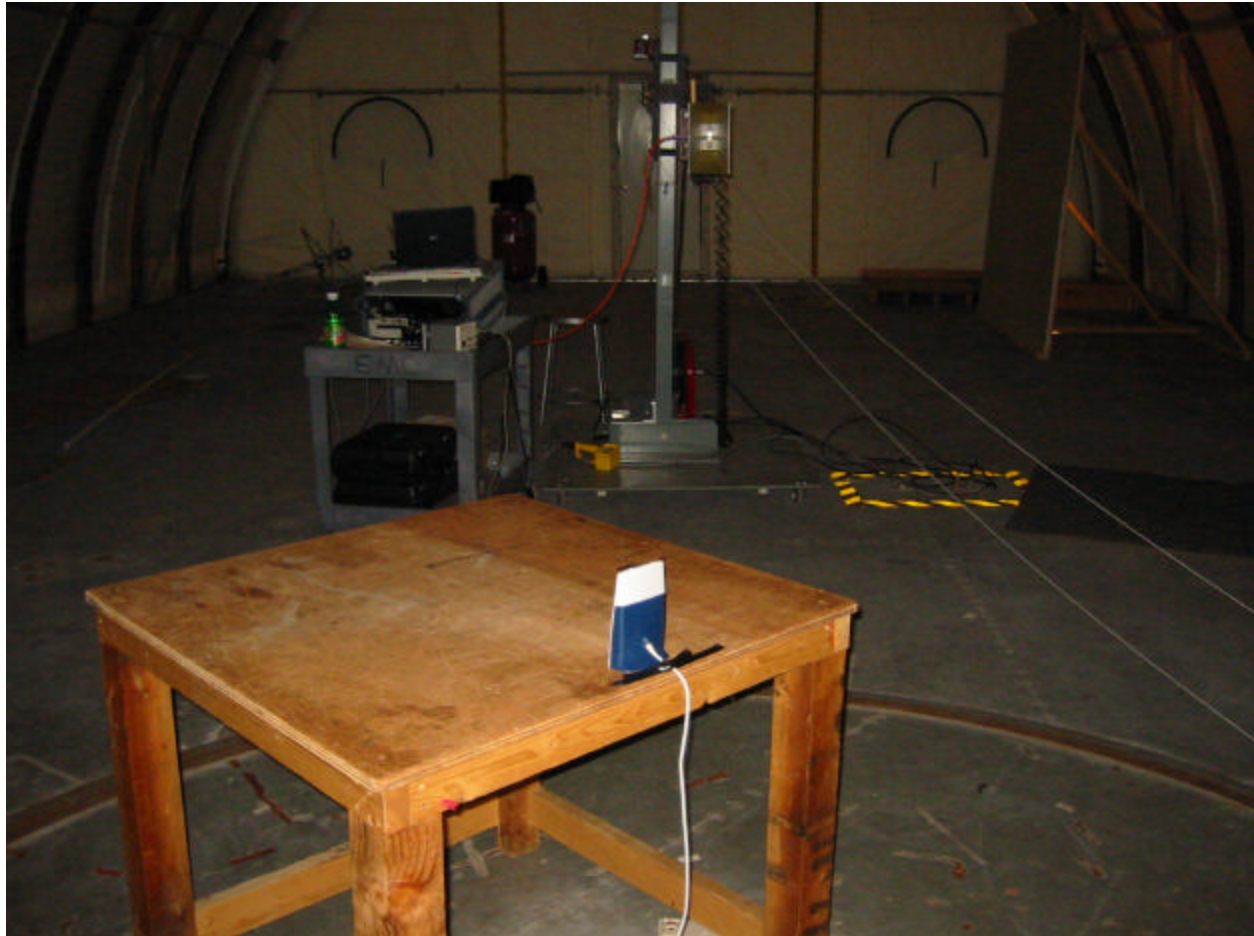
Special Radiated Emissions														
Company: St. Jude Medical							Antenna & Cables:		LF		Bands: N, LF, HF, SHF			
Model #: 3638							LF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt			
Serial #: 85200001							N Antenna:		LOG2 2-06-08 V3.txt		LOG2 2-06-08 H3.txt			
Engineers: Nicholas Abbondante				Location: Site 2			HF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt			
Project #: 3114493		Date(s): 01/15/07		01/16/07		01/17/07		SHF Antenna:		EMC04 V 1m 12-13-2007.txt		EMC04 H 1m 12-13-2007.txt		
Standard: FCC Part 15 Subpart C 15.249/IC RSS-210 A2.9							LF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt			
Receiver: R&S FSEK-30 (ROS001)				Limit Distance (m): 3			N Cable(s):		S3 3M FLR 9-26-07.txt		NONE.			
PreAmp: PRE8 11-14-07.txt				Test Distance (m): 3			HF Cable(s):		CBL030 12-04-2007.txt		NONE.			
Barometer: BAR2		Temp/Humidity/Pressure: 19c		31%		1001mB		SHF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt		
PreAmp Used? (Y or N): Y							Voltage/Frequency: 120V60Hz		Frequency Range: 4-18 GHz					
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/BW														
Detector	Ant.	Frequency	Reading	Antenna	Cable	Pre-amp	Distance	Net	Limit	Margin	Bandwidth			
Type	(V/H)	MHz	dB(uV)	Factor	Loss	Factor	dB	dB(uV/m)	dB(uV/m)	dB		FCC	IC	
Note: Noise Floor														
PK	V	8292.580	32.3	38.1	5.3	19.6	0.0	56.1	74.0	-17.9	1/10MHz	RB	RB	
VGdetect	V	8292.580	21.0	38.1	5.3	19.6	0.0	44.8	54.0	-9.2	1/10MHz	RB	RB	
AVG10kHz	V	8292.580	22.7	38.1	5.3	19.6	0.0	46.5	54.0	-7.5	1/10MHz	RB	RB	
PK	V	15980.000	34.2	40.7	8.5	22.3	0.0	61.0	74.0	-13.0	1/10MHz	RB	RB	
VGdetect	V	15980.000	22.9	40.7	8.5	22.3	0.0	49.8	54.0	-4.2	1/10MHz	RB	RB	
AVG10kHz	V	15980.000	24.2	40.7	8.5	22.3	0.0	51.1	54.0	-2.9	1/10MHz	RB	RB	
Note: Duty Cycle Adjusted Average Values (-19.97 dB)														
PK	H	4812.000	39.2	35.7	3.8	21.5	0.0	57.2	74.0	-16.8	1/10MHz	RB	RB	
AVG	H	4812.000	19.3	35.7	3.8	21.5	0.0	37.2	54.0	-16.8	1/10MHz	RB	RB	
PK	H	7218.000	34.8	38.4	4.8	20.4	0.0	57.7	74.0	-16.3	1/10MHz			
AVG	H	7218.000	14.9	38.4	4.8	20.4	0.0	37.7	54.0	-16.3	1/10MHz			
PK	H	9624.000	34.8	41.6	5.6	18.6	0.0	63.5	74.0	-10.5	1/10MHz			
AVG	H	9624.000	14.9	41.6	5.6	18.6	0.0	43.5	54.0	-10.5	1/10MHz			
PK	V	12028.000	28.0	40.7	6.6	18.2	0.0	57.1	74.0	-16.9	1/10MHz	RB	RB	
AVG	V	12028.000	8.1	40.7	6.6	18.2	0.0	37.2	54.0	-16.8	1/10MHz	RB	RB	
PK	H	4826.000	36.4	35.8	3.8	21.6	0.0	54.4	74.0	-19.6	1/10MHz	RB	RB	
AVG	H	4826.000	16.5	35.8	3.8	21.6	0.0	34.5	54.0	-19.5	1/10MHz	RB	RB	
PK	H	7239.000	34.8	38.4	4.8	20.3	0.0	57.7	74.0	-16.3	1/10MHz			
AVG	H	7239.000	14.9	38.4	4.8	20.3	0.0	37.8	54.0	-16.2	1/10MHz			
PK	H	9652.000	34.6	41.6	5.6	18.5	0.0	63.3	74.0	-10.7	1/10MHz			
AVG	H	9652.000	14.6	41.6	5.6	18.5	0.0	43.4	54.0	-10.6	1/10MHz			
PK	H	12065.000	33.5	40.8	6.6	18.2	0.0	62.7	74.0	-11.3	1/10MHz	RB	RB	
AVG	H	12065.000	13.5	40.8	6.6	18.2	0.0	42.7	54.0	-11.3	1/10MHz	RB	RB	
PK	H	4840.000	35.9	35.8	3.8	21.6	0.0	53.9	74.0	-20.1	1/10MHz	RB	RB	
AVG	H	4840.000	15.9	35.8	3.8	21.6	0.0	34.0	54.0	-20.0	1/10MHz	RB	RB	
PK	H	7260.000	33.7	38.5	4.8	20.3	0.0	56.7	74.0	-17.3	1/10MHz	RB	RB	
AVG	H	7260.000	13.7	38.5	4.8	20.3	0.0	36.7	54.0	-17.3	1/10MHz	RB	RB	
PK	H	9680.000	34.3	41.7	5.7	18.5	0.0	63.1	74.0	-10.9	1/10MHz			
AVG	H	9680.000	14.3	41.7	5.7	18.5	0.0	43.1	54.0	-10.9	1/10MHz			
PK	H	12100.000	33.5	40.9	6.7	18.2	0.0	62.8	74.0	-11.2	1/10MHz	RB	RB	
AVG	H	12100.000	13.5	40.9	6.7	18.2	0.0	42.8	54.0	-11.2	1/10MHz	RB	RB	
PK	H	14520.000	29.7	43.4	7.6	20.0	0.0	60.7	74.0	-13.3	1/10MHz			
AVG	H	14520.000	9.7	43.4	7.6	20.0	0.0	40.7	54.0	-13.3	1/10MHz			

Special Radiated Emissions															
Company:	St. Jude Medical						Antenna & Cables:		SHF		Bands: N, LF, HF, SHF				
Model #:	3638						LF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt				
Serial #:	85200001						N Antenna:		LOG2 2-06-08 V3.txt		LOG2 2-06-08 H3.txt				
Engineers:	Nicholas Abbondante				Location:		Site 2		HF Antenna:		HORN3 V3m 6-12-07.txt		HORN3 H3m 6-12-07.txt		
Project #:	3114493			Date(s):		01/18/07		SHF Antenna:		EMC04 V 1m 12-13-2007.txt		EMC04 H 1m 12-13-2007.txt			
Standard:	FCC Part 15 Subpart C 15.249/IC RSS-210 A2.9						LF Cable(s):		CBL029 12-04-2007.txt		CBL030 12-04-2007.txt				
Receiver:	R&S FSEK-30 (ROS001)				Limit Distance (m):		3		N Cable(s):		S2 3M FLR 9-26-07.txt		NONE.		
PreAmp:	PRE8 11-14-07.txt				Test Distance (m):		1		HF Cable(s):		CBL030 12-04-2007.txt		NONE.		
Barometer:	BAR2		Temp/Humidity/Pressure:		19c		24%		1026mB		SHF Cable(s):		CBL029 12-04-2007.txt		
PreAmp Used? (Y or N):		Y		Voltage/Frequency:		120V/60Hz		Frequency Range:		18-25 GHz					
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS: NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW															
Detector	Ant.	Pol.	Frequency	Reading	Antenna	Cable	Pre-amp	Distance	Net	Limit	Margin	Bandwidth			
Type	(V/H)		MHz	dB(uV)	Factor	Loss	Factor	Factor	dB(uV/m)	dB(uV/m)	dB		FCC	IC	
PK	V		19248.000	33.7	45.0	10.4	24.0	9.5	55.6	74.0	-18.4	1/10 MHz	RB	RB	
AVG	V		19248.000	22.0	45.0	10.4	24.0	9.5	43.9	54.0	-10.1	1/10 MHz	RB	RB	
PK	V		21654.000	35.2	45.3	9.9	21.4	9.5	59.4	74.0	-14.6	1/10 MHz			
AVG	V		21654.000	22.9	45.3	9.9	21.4	9.5	47.1	54.0	-6.9	1/10 MHz			
PK	V		24060.000	33.3	45.5	10.4	19.4	9.5	60.3	74.0	-13.7	1/10 MHz			
AVG	V		24060.000	21.5	45.5	10.4	19.4	9.5	48.5	54.0	-5.5	1/10 MHz			
PK	V		19304.000	33.2	45.1	10.3	23.9	9.5	55.1	74.0	-18.9	1/10 MHz	RB	RB	
AVG	V		19304.000	21.5	45.1	10.3	23.9	9.5	43.4	54.0	-10.6	1/10 MHz	RB	RB	
PK	V		21717.000	35.2	45.3	9.9	21.5	9.5	59.4	74.0	-14.6	1/10 MHz			
AVG	V		21717.000	23.3	45.3	9.9	21.5	9.5	47.5	54.0	-6.5	1/10 MHz			
PK	V		24130.000	33.3	45.6	10.4	19.6	9.5	60.2	74.0	-13.8	1/10 MHz			
AVG	V		24130.000	21.5	45.6	10.4	19.6	9.5	48.4	54.0	-5.6	1/10 MHz			
PK	V		19360.000	33.3	45.1	10.3	23.9	9.5	55.3	74.0	-18.7	1/10 MHz	RB	RB	
AVG	V		19360.000	21.5	45.1	10.3	23.9	9.5	43.5	54.0	-10.5	1/10 MHz	RB	RB	
PK	V		21780.000	35.8	45.2	9.9	21.5	9.5	59.9	74.0	-14.1	1/10 MHz			
AVG	V		21780.000	23.7	45.2	9.9	21.5	9.5	47.8	54.0	-6.2	1/10 MHz			
PK	V		24200.000	33.6	45.6	10.4	19.7	9.5	60.3	74.0	-13.7	1/10 MHz			
AVG	V		24200.000	22.0	45.6	10.4	19.7	9.5	48.8	54.0	-5.2	1/10 MHz			

Setup Photos







Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.249, IC RSS-210 Issue 6 September 2005

Test: AC Line-Conducted Emissions, FCC §15.207, RSS-Gen Section 7.2.2

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:	Humidity (%):	24-30	Pressure (hPa):	N/A	Ambient (°C):	23-24
Pretest Verification Performed	Yes		Equipment under Test:		3638	

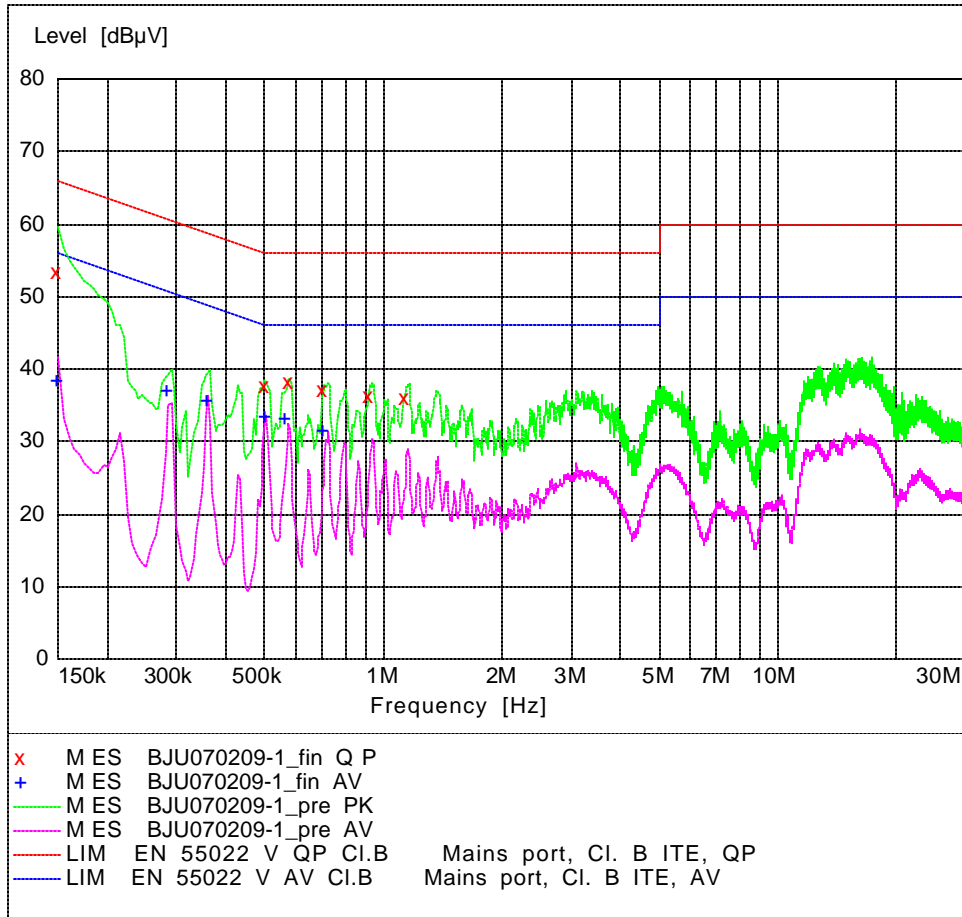
Test Equipment Used:

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	ID No.	Next Cal. Due
1	FCC Test Site	N/L	N/L	5164	N/A
2	Measurement Receiver	Rohde & Schwarz	ESHS30	4946	06/15/207
3	LISN	Rohde & Schwarz	ESH3-Z5	2727	07/07/2008
4	Transformer	Tufvassons	AFM-1500	30317	Verified
5	Cable, LISN-Measurement Receiver	N/L	N/L	8911	10/26/2007

Software Utilized:

Name	Manufacturer	Version
ES-K1	Rohde & Schwarz	V1.70

Test Details:



Overview sweeps performed with peak and average detectors

Data summary

Frequency /MHz	Quasi-Peak	
	Disturbance Level /dB(μV)	Permitted limit /dB(μV)
0,150	53,2	66
0,503	37,6	56
0,578	38,1	56
0,713	37,1	56
0,923	36,2	56
1,140	36,0	56

Frequency /MHz	Average	
	Disturbance Level /dB(μV)	Permitted limit /dB(μV)
0,150	38,2	56
0,285	37,1	51
0,360	35,6	49
0,503	33,4	46
0,570	33,0	46
0,713	31,4	46

Setup Photos



