

Medtronic MiniMed

ADDENDUM TO TEST REPORT 96784-9

Translator
Model: MMT-7018

Tested To The Following Standards:

FCC Part 15 Subpart C Section(s)
15.207 & 15.247

Report No.: 96784-9A

Date of issue: June 22, 2015



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Medtronic MiniMed
18000 Devonshire Street
Northridge, CA 91325-1219

Representative: Bob Vitti
Customer Reference Number: 4500102211

DATE OF EQUIPMENT RECEIPT:

DATE(S) OF TESTING:

REPORT PREPARED BY:

Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 96784

March 2, 2015

March 2 - 4, 2015

Revision History

Original: Testing of Translator, Model: MMT-7018 tested to FCC Part 15 Subpart C Section(s), 15.207 & 15.247.

Addendum A: To remove the mV/m field strength limit column in the table in section 15.247(b)(3) and replaced Band Edge plots with corrected bandwidth plots in section 15.247(d).

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Bothell, WA 98021-4413

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Bothell	US0081	SL2-IN-E-1145R	3082C-1	318736	A-0148

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C

Test Procedure	Description	Modifications*	Results
15.207	Conducted Emissions	NA	Pass
15.247(a)(2)	Bandwidth	NA	Pass
15.247(b)(3)	Maximum Output Power	NA	Pass
15.247(d)	Field Strength of Spurious Emissions and Band Edge	NA	Pass
15.247(e)	Power Spectral Density	NA	Pass

NA = Not Applicable

Modifications* During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

***Modifications listed above must be incorporated into all production units.**

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
This device contains two separate transmitters. One transmitter is at 916.5MHz, which is referred to as 900M and the other is a Bluetooth transmitter which is referred to as 2.4G and was investigated on the Low, Middle, and High channels.
The Spurious Emissions contains data for both the 900M and 2.4G.

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

Translator

Manuf: Medtronic MiniMed

Model: MMT-7018

Serial: TR0000222M

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

USB Charger

Manuf: PHIHONG

Model: PSA03F-050Q1

Serial: DE04000165A1

FCC PART 15 SUBPART C

15.207 AC Conducted Emissions

Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer:	Medtronic MiniMed	Date:	3/2/2015
Specification:	15.207 AC Mains - Average	Time:	18:36:51
Work Order #:	96784	Sequence#:	2
Test Type:	Conducted Emissions	Tested By:	Michael Atkinson
Equipment:	Translator		115V 60Hz
Manufacturer:	Medtronic MiniMed		
Model:	MMT-7018		
S/N:	TR0000222M		

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05435	Attenuator	PE7015-10	9/2/2014	9/2/2016
T2	ANP05305	Cable	ETSI-50T	2/20/2014	2/20/2016
T3	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
	AN01492	50uH LISN-Line	3816/2NM	7/21/2013	7/21/2015
T4	AN01492	50uH LISN-Neutral	3816/2NM	7/21/2013	7/21/2015
	AN02871	Spectrum Analyzer	E4440A	2/9/2015	2/9/2017
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	3/26/2014	3/26/2016

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Translator*	Medtronic MiniMed	MMT-7018	TR0000222M

Support Devices:

Function	Manufacturer	Model #	S/N
USB Charger	PHIHONG	PSA03F-050Q1	DE04000165A1

Test Conditions / Notes:

Temperature: 21°C
 Humidity: 29%
 Pressure: 102.1kPa
 Frequency: 150k-30MHz

Test Method: ANSI C63.10 (2009)

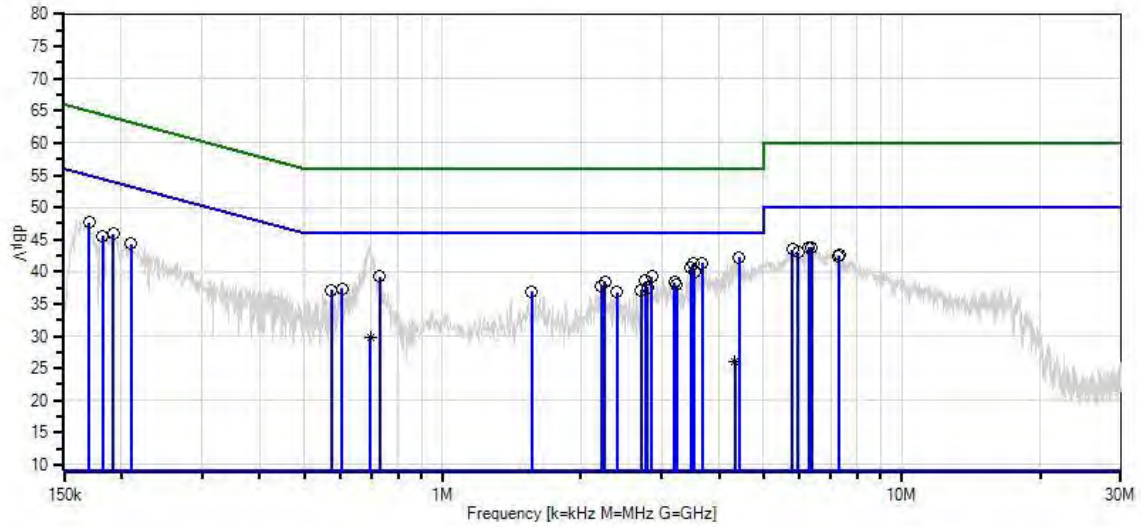
EUT: Unit is on 80cm foam table. The EUT is connected to USB Charger which is connected to 115V/60Hz through LISN. Unit is transmitting on mid channel.

Ext Attn: 0 dB

#	Freq MHz	Rdng dB μ V	Reading listed by margin.				Test Lead: Line				
			T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	4.428M	32.6	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	42.2	46.0	-3.8	Line
2	3.671M	31.8	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	41.4	46.0	-4.6	Line
3	3.510M	31.6	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	41.2	46.0	-4.8	Line
4	3.471M	31.1	+9.0 +0.1	+0.1	+0.0	+0.3	+0.0	40.6	46.0	-5.4	Line
5	3.539M	30.4	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	40.0	46.0	-6.0	Line
6	6.283M	34.2	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	43.8	50.0	-6.2	Line
7	6.373M	34.2	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	43.8	50.0	-6.2	Line
8	5.770M	33.9	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	43.5	50.0	-6.5	Line
9	730.309k	29.1	+9.4 +0.2	+0.1	+0.0	+0.4	+0.0	39.2	46.0	-6.8	Line
10	2.855M	29.5	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	39.2	46.0	-6.8	Line
11	5.941M	33.4	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	43.0	50.0	-7.0	Line
12	170.361k	36.2	+9.3 +0.4	+0.0	+0.0	+1.7	+0.0	47.6	54.9	-7.3	Line
13	2.770M	29.0	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	38.6	46.0	-7.4	Line
14	7.301M	33.0	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	42.6	50.0	-7.4	Line
15	2.259M	28.9	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	38.5	46.0	-7.5	Line
16	3.195M	28.7	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	38.4	46.0	-7.6	Line
17	7.274M	32.8	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	42.4	50.0	-7.6	Line
18	192.177k	34.9	+9.3 +0.3	+0.0	+0.0	+1.4	+0.0	45.9	53.9	-8.0	Line

19	3.233M	28.2	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	37.9	46.0	-8.1	Line
20	2.217M	28.1	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.7	46.0	-8.3	Line
21	2.791M	28.0	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.6	46.0	-8.4	Line
22	604.503k	27.4	+9.4 +0.2	+0.0	+0.0	+0.4	+0.0	37.4	46.0	-8.6	Line
23	573.960k	27.1	+9.4 +0.2	+0.0	+0.0	+0.5	+0.0	37.2	46.0	-8.8	Line
24	181.996k	34.3	+9.3 +0.3	+0.0	+0.0	+1.6	+0.0	45.5	54.4	-8.9	Line
25	210.357k	33.5	+9.3 +0.2	+0.0	+0.0	+1.3	+0.0	44.3	53.2	-8.9	Line
26	2.710M	27.5	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.1	46.0	-8.9	Line
27	1.566M	27.2	+9.2 +0.1	+0.1	+0.0	+0.3	+0.0	36.9	46.0	-9.1	Line
28	2.400M	27.2	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	36.8	46.0	-9.2	Line
29	698.312k Ave	19.9	+9.4 +0.2	+0.0	+0.0	+0.4	+0.0	29.9	46.0	-16.1	Line
^	698.312k	34.2	+9.4 +0.2	+0.0	+0.0	+0.4	+0.0	44.2	46.0	-1.8	Line
31	4.335M Ave	16.5	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	26.1	46.0	-19.9	Line
^	4.335M	32.8	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	42.4	46.0	-3.6	Line

CKC Laboratories, Inc. Date: 3/2/2015 Time: 18:36:51 Medtronic MiniMed WO#: 96784
 15.207 AC Mains - Average Test Lead: Line 115V 60Hz Sequence#: 2 Ext ATTN: 0 dB
 Translator Medtronic MiniMed MMT-7018



— Sweep Data
 ○ Peak Readings
 * Average Readings
 — Readings
 × QP Readings
 ▼ Ambient
 — 1 - 15.207 AC Mains - Average
 — 2 - 15.207 AC Mains - Quasi-peak

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Medtronic MiniMed**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **96784**
 Test Type: **Conducted Emissions**
 Equipment: **Translator**
 Manufacturer: **Medtronic MiniMed**
 Model: **MMT-7018**
 S/N: **TR0000222M**

Date: 3/2/2015
 Time: 18:45:24
 Sequence#: 3
 Tested By: Michael Atkinson
 115V 60Hz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05435	Attenuator	PE7015-10	9/2/2014	9/2/2016
T2	ANP05305	Cable	ETSI-50T	2/20/2014	2/20/2016
T3	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
	AN01492	50uH LISN-Line	3816/2NM	7/21/2013	7/21/2015
T4	AN01492	50uH LISN-Neutral	3816/2NM	7/21/2013	7/21/2015
	AN02871	Spectrum Analyzer	E4440A	2/9/2015	2/9/2017
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	3/26/2014	3/26/2016

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Translator*	Medtronic MiniMed	MMT-7018	TR0000222M

Support Devices:

Function	Manufacturer	Model #	S/N
USB Charger	PHIHONG	PSA03F-050Q1	DE04000165A1

Test Conditions / Notes:

Temperature: 21°C
 Humidity: 29%
 Pressure: 102.1kPa
 Frequency: 150k-30MHz

Test Method: ANSI C63.10 (2009)

EUT: Unit is on 80cm foam table. The EUT is connected to USB Charger which is connected to 115V/60Hz through LISN. Unit is transmitting on mid channel.

Ext Attn: 0 dB

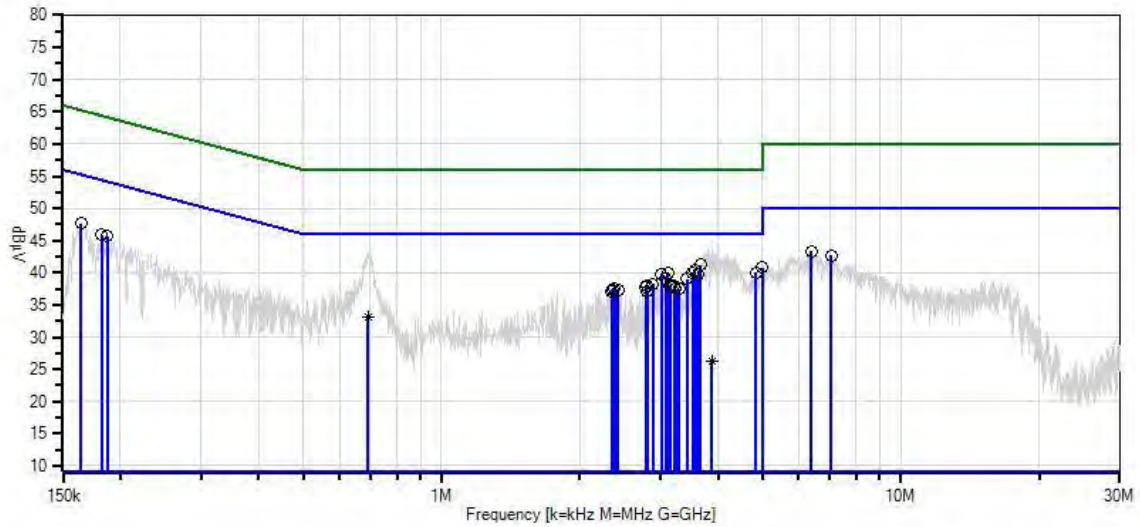
Measurement Data: Reading listed by margin. Test Lead: Neutral

#	Freq MHz	Rdng dBµV	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	3.658M	31.6	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	41.2	46.0	-4.8	Neutr
2	4.994M	31.2	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	40.8	46.0	-5.2	Neutr
3	3.565M	30.8	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	40.4	46.0	-5.6	Neutr
4	3.106M	30.3	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	40.0	46.0	-6.0	Neutr

5	3.518M	30.4	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	40.0	46.0	-6.0	Neutr
6	4.836M	30.3	+9.0 +0.1	+0.1	+0.1	+0.4	+0.0	40.0	46.0	-6.0	Neutr
7	3.016M	30.0	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	39.7	46.0	-6.3	Neutr
8	3.607M	30.1	+9.0 +0.1	+0.1	+0.0	+0.4	+0.0	39.7	46.0	-6.3	Neutr
9	6.382M	33.7	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	43.3	50.0	-6.7	Neutr
10	3.076M	29.3	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	39.0	46.0	-7.0	Neutr
11	3.425M	29.5	+9.0 +0.1	+0.1	+0.0	+0.3	+0.0	39.0	46.0	-7.0	Neutr
12	7.058M	33.1	+8.9 +0.1	+0.1	+0.1	+0.4	+0.0	42.7	50.0	-7.3	Neutr
13	164.544k	36.0	+9.3 +0.5	+0.0	+0.0	+1.8	+0.0	47.6	55.2	-7.6	Neutr
14	2.884M	28.6	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	38.3	46.0	-7.7	Neutr
15	2.791M	28.4	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	38.0	46.0	-8.0	Neutr
16	3.152M	28.3	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	38.0	46.0	-8.0	Neutr
17	3.216M	28.3	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	38.0	46.0	-8.0	Neutr
18	3.135M	28.2	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	37.9	46.0	-8.1	Neutr
19	2.782M	28.1	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.7	46.0	-8.3	Neutr
20	2.378M	28.0	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.6	46.0	-8.4	Neutr
21	187.088k	34.6	+9.3 +0.3	+0.0	+0.0	+1.5	+0.0	45.7	54.2	-8.5	Neutr
22	181.997k	34.7	+9.3 +0.3	+0.0	+0.0	+1.6	+0.0	45.9	54.4	-8.5	Neutr
23	3.293M	27.8	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	37.5	46.0	-8.5	Neutr
24	3.233M	27.8	+9.1 +0.1	+0.1	+0.0	+0.4	+0.0	37.5	46.0	-8.5	Neutr
25	2.357M	27.8	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.4	46.0	-8.6	Neutr
26	2.425M	27.8	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.4	46.0	-8.6	Neutr
27	2.349M	27.6	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.2	46.0	-8.8	Neutr
28	2.808M	27.5	+9.1 +0.1	+0.1	+0.0	+0.3	+0.0	37.1	46.0	-8.9	Neutr

29	691.041k	23.1	+9.4	+0.0	+0.0	+0.4	+0.0	33.1	46.0	-12.9	Neutr
	Ave		+0.2								
^	691.041k	33.1	+9.4	+0.0	+0.0	+0.4	+0.0	43.1	46.0	-2.9	Neutr
			+0.2								
31	3.884M	16.7	+9.0	+0.1	+0.0	+0.4	+0.0	26.3	46.0	-19.7	Neutr
	Ave		+0.1								
^	3.884M	34.1	+9.0	+0.1	+0.0	+0.4	+0.0	43.7	46.0	-2.3	Neutr
			+0.1								

CKC Laboratories, Inc. Date: 3/2/2015 Time: 18:45:24 Medtronic MiniMed WO#: 96784
 15.207 AC Mains - Average Test Lead: Neutral 115V 60Hz Sequence#: 3 Ext ATTN: 0 dB
 Translator Medtronic MiniMed MMT-7018



- Sweep Data
- Peak Readings
- * Average Readings
- Readings
- × QP Readings
- ▼ Ambient
- 1 - 15.207 AC Mains - Average
- 2 - 15.207 AC Mains - Quasi-peak

Test Setup Photo



15.247(a)(2) Occupied Bandwidth

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Medtronic MiniMed**

Specification: **15.247(a)(2) OBW**

Work Order #: **96784**

Date: 3/3/2015

Test Type: **Maximized Emissions**

Time: 10:21:05

Equipment: **Translator**

Sequence#: 2

Manufacturer: Medtronic MiniMed

Tested By: Michael Atkinson

Model: MMT-7018

S/N: TR0000222M

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03441	Power Amplifier	83017A	5/7/2014	5/7/2016
	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	9/16/2013	9/16/2015
	ANP05305	Cable	ETSI-50T	2/20/2014	2/20/2016
	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
	AN02871	Spectrum Analyzer	E4440A	2/9/2015	2/9/2017

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Translator*	Medtronic MiniMed	MMT-7018	TR0000222M

Support Devices:

Function	Manufacturer	Model #	S/N
USB Charger	PHIHONG	PSA03F-050Q1	DE04000165A1

Test Conditions / Notes:

Temperature: 21°C

Humidity: 29%

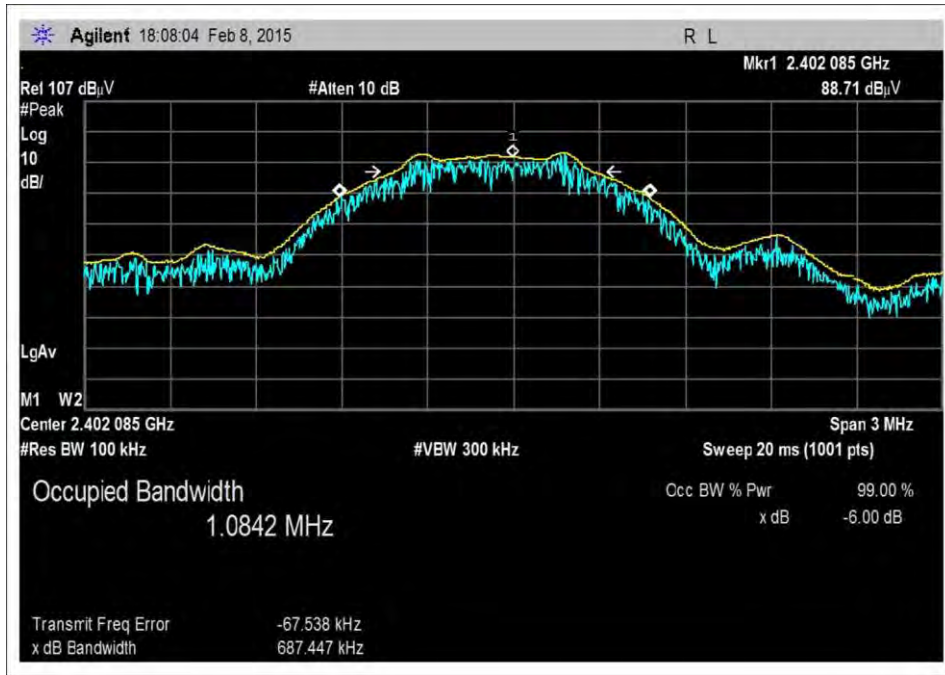
Pressure: 102.1kPa

Test Method: KDB 558074 D01 DTS Meas Guidance v03r02 and ANSI C63.10 (2009) (for 6dB OBW)

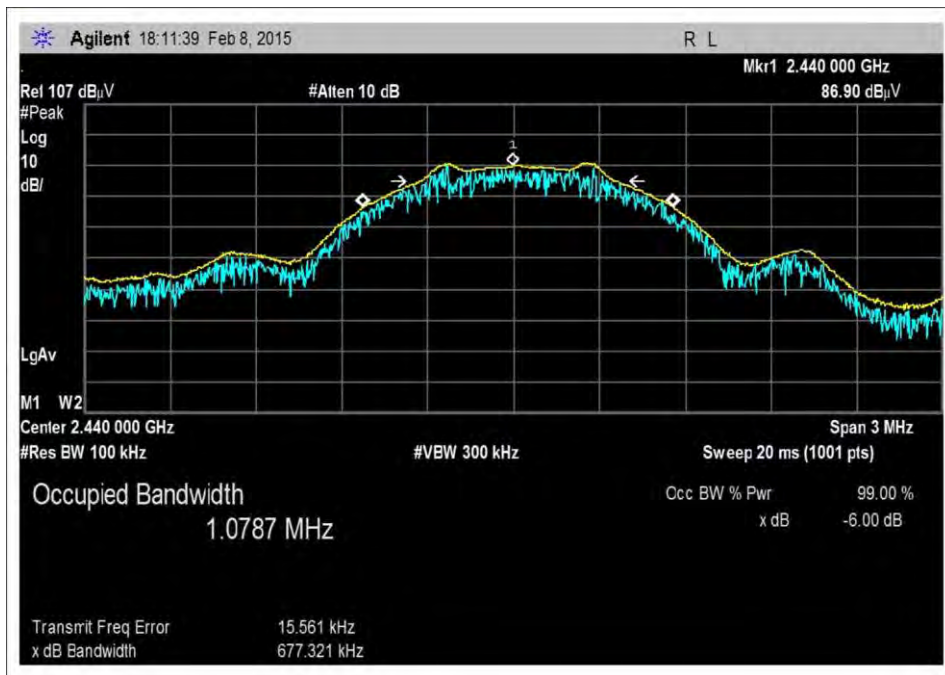
EUT: Unit is on 80cm foam table. The EUT is connected to USB Charger which is connected to 115V/60Hz. Low, Mid, and High channels is investigated. The X, Y, Z axis and Horizontal and Vertical antenna polarities investigated, only worst case reported.

Frequency	-6dB Occupied Bandwidth
2.402GHz	687.4kHz
2.440GHz	677.3kHz
2.480GHz	681.2kHz

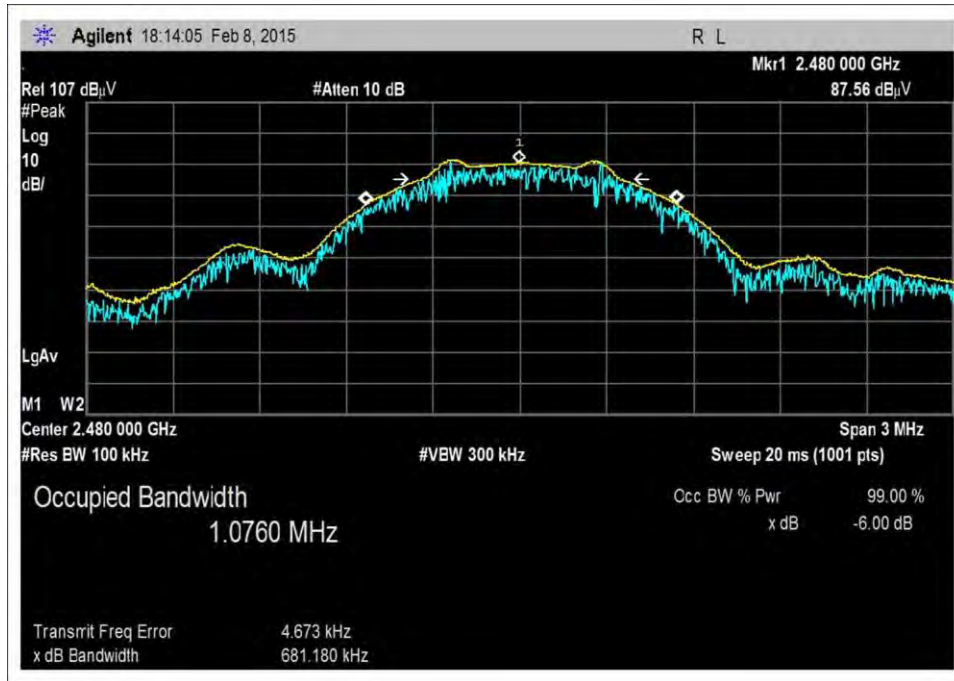
Test Data



Low Channel



Middle Channel



High Channel

Note: At the time of testing, the date stamp on the plots above was set on a default setting and should read 03/03/2015.

Test Setup Photo(s)



X-Axis



Y-Axis



Z-Axis

15.247(b)(3) Maximum Output Power

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Medtronic MiniMed**
 Specification: **15.247(b)(3) Max Power**
 Work Order #: **96784** Date: 3/3/2015
 Test Type: **Maximized Emissions** Time: 11:43:50
 Equipment: **Translator** Sequence#: 2
 Manufacturer: Medtronic MiniMed Tested By: Michael Atkinson
 Model: MMT-7018
 S/N: TR0000222M

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	9/16/2013	9/16/2015
T2	ANP05305	Cable	ETSI-50T	2/20/2014	2/20/2016
T3	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
T4	AN02871	Spectrum Analyzer	E4440A	2/9/2015	2/9/2017
T5	AN03303	Preamplifier	AMF-7D-00101800-30-10P	9/4/2014	9/4/2016
T6	ANP05748	Attenuator	PE7004-20	4/2/2014	4/2/2016

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Translator*	Medtronic MiniMed	MMT-7018	TR0000222M

Support Devices:

Function	Manufacturer	Model #	S/N
USB Charger	PHIHONG	PSA03F-050Q1	DE04000165A1

Test Conditions / Notes:

Temperature: 21°C
 Humidity: 29%
 Pressure: 102.1kPa

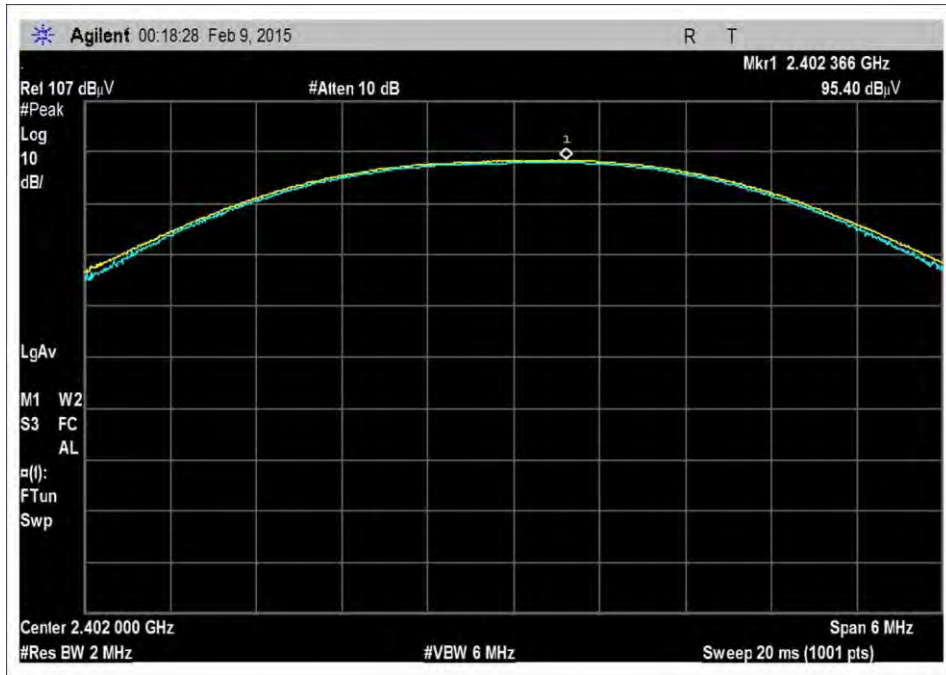
Test Method: KDB 558074 D01 DTS Meas Guidance v03r02 and ANSI C63.10 (2009)

EUT: Unit is on 80cm foam table. EUT is connected to USB Charger which is connected to 115V/60Hz. Low, Mid, and High channels is investigated. The X, Y, Z axis and Horizontal and Vertical antenna polarities investigated, only worst case reported.

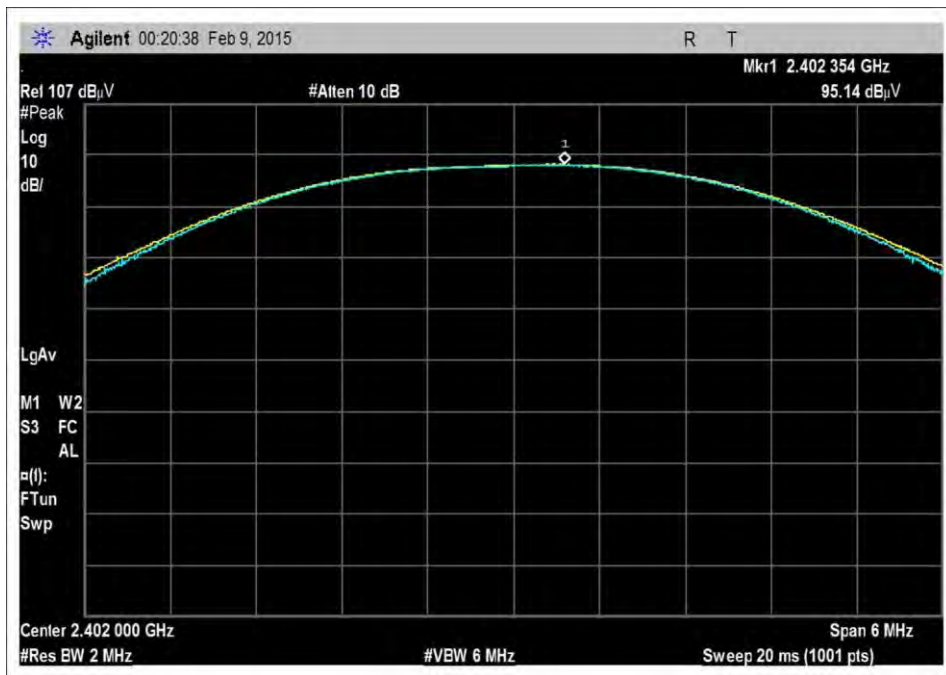
15.31(e) EUT was investigated 85 and 115% of nominal power voltage.

Frequency	Voltage	Uncorrected Analyzer Reading (dB μ V/m)	Correction Factors due to cables, amplifiers, and antenna	Corrected Analyzer Reading (dB μ V/m)	Fundamental Field Strength (mV/m)	Calculated Conducted Power (with 1.7dBi antenna gain) (watts)	Conducted Power Limit (watts)
2.402GHz	Nominal	95.4	-5.8	89.6	30.2	0.000185	1.0
2.402GHz	85% Nominal	95.1	-5.8	89.3	29.2	0.000173	1.0
2.402GHz	115% Nominal	95.2	-5.8	89.4	29.5	0.000177	1.0
2.440GHz	Nominal	96.5	-5.8	90.7	34.3	0.000238	1.0
2.440GHz	85% Nominal	96.5	-5.8	90.7	34.3	0.000238	1.0
2.440GHz	115% Nominal	96.4	-5.8	90.6	33.9	0.000233	1.0
2.480GHz	Nominal	97.4	-6.0	91.4	37.2	0.000280	1.0
2.480GHz	85% Nominal	97.4	-6.0	91.4	37.2	0.000280	1.0
2.480GHz	115% Nominal	97.4	-6.0	91.4	37.2	0.000280	1.0

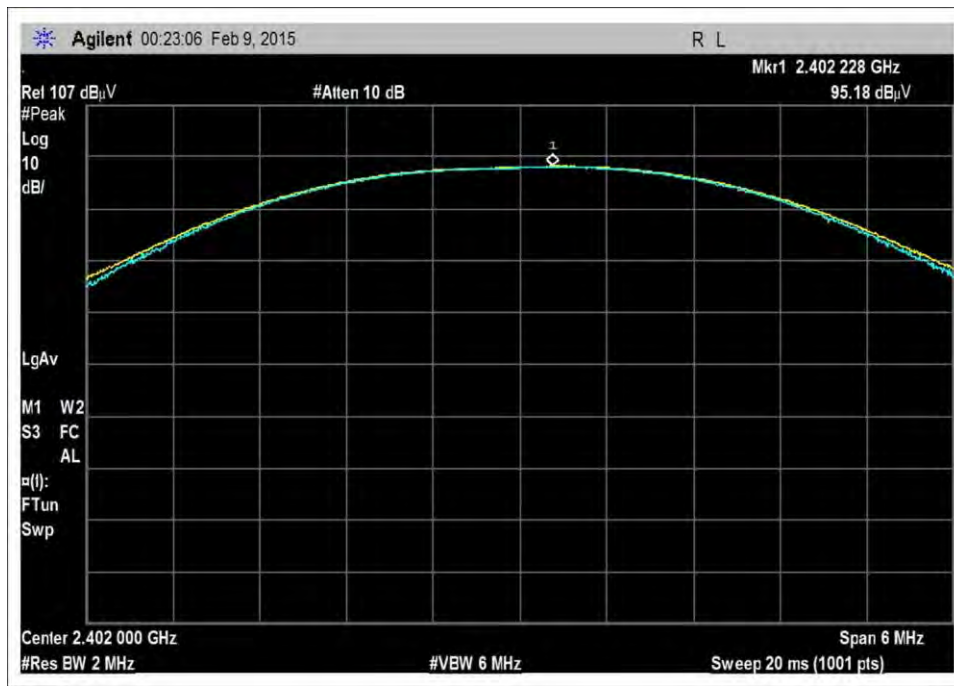
Test Data



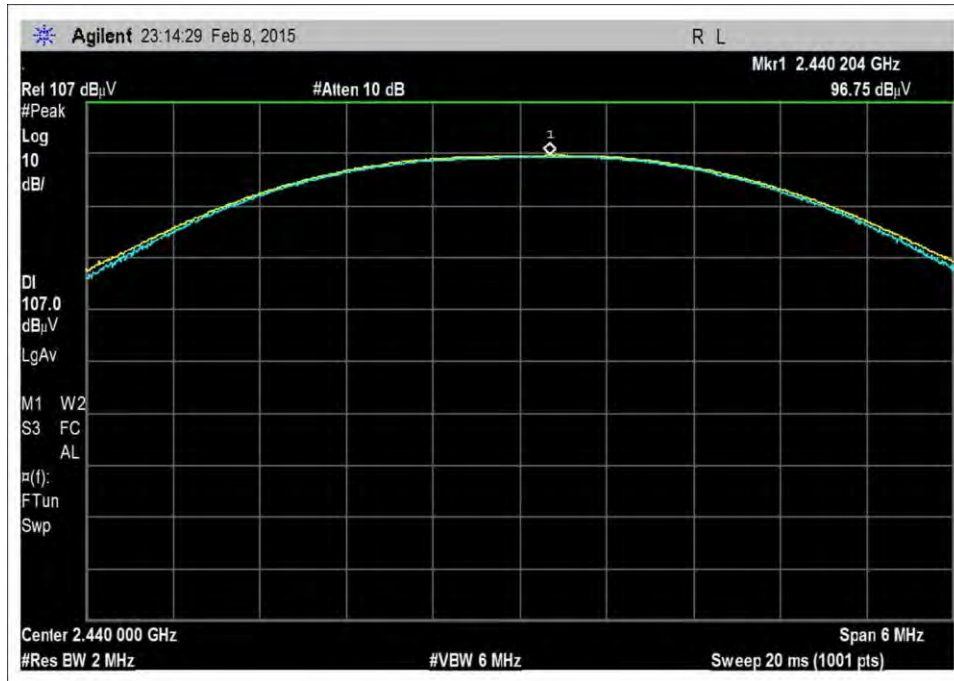
Low Channel, Nominal



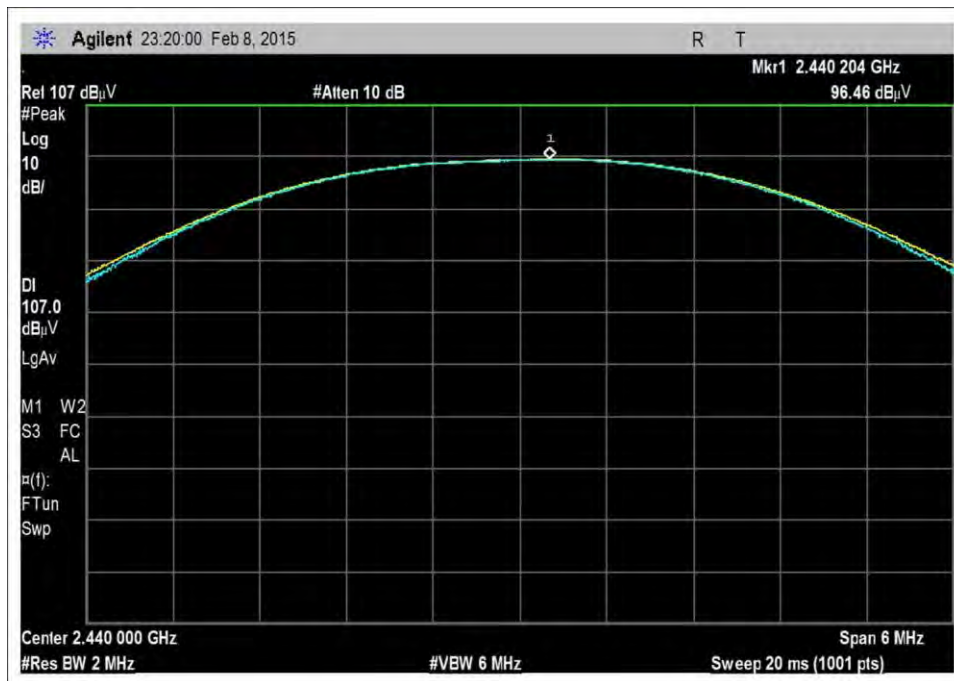
Low Channel, Nominal 85%



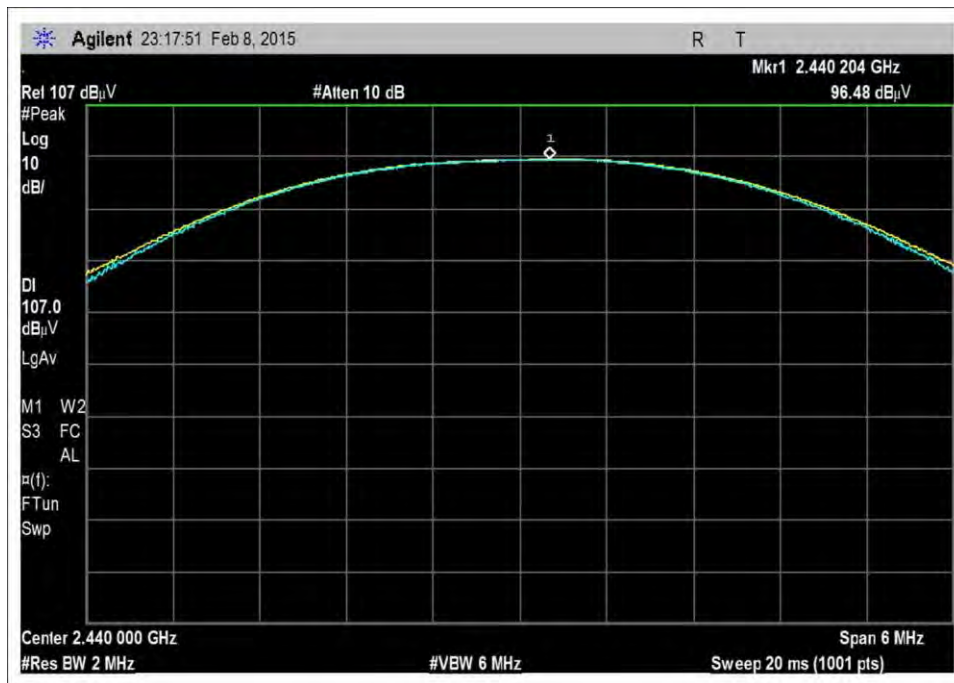
Low Channel, Nominal 115%



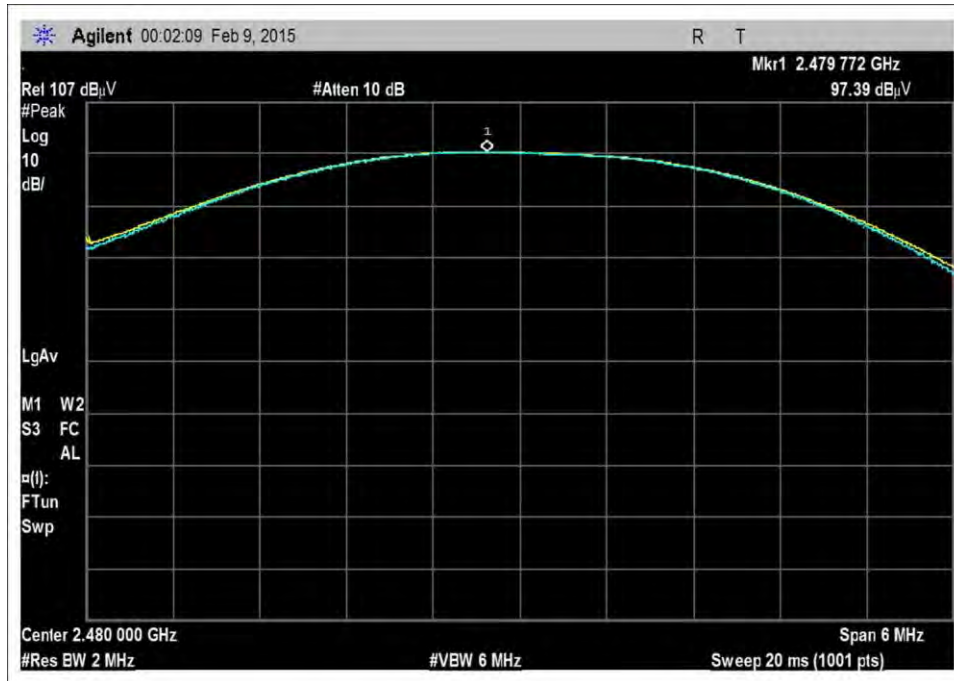
Middle Channel, Nominal



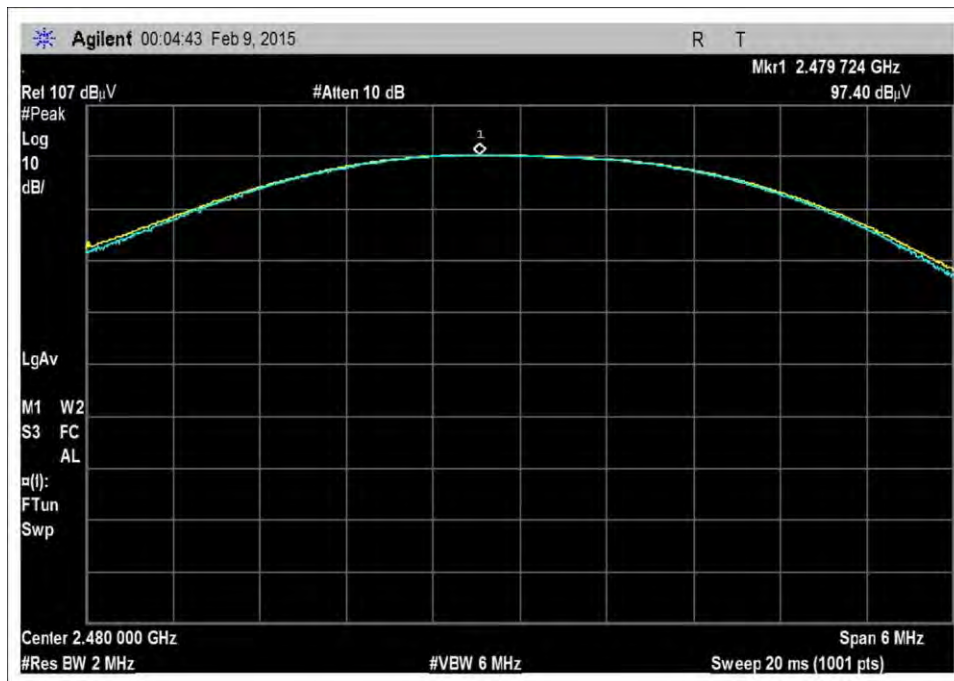
Middle Channel, Nominal 85%



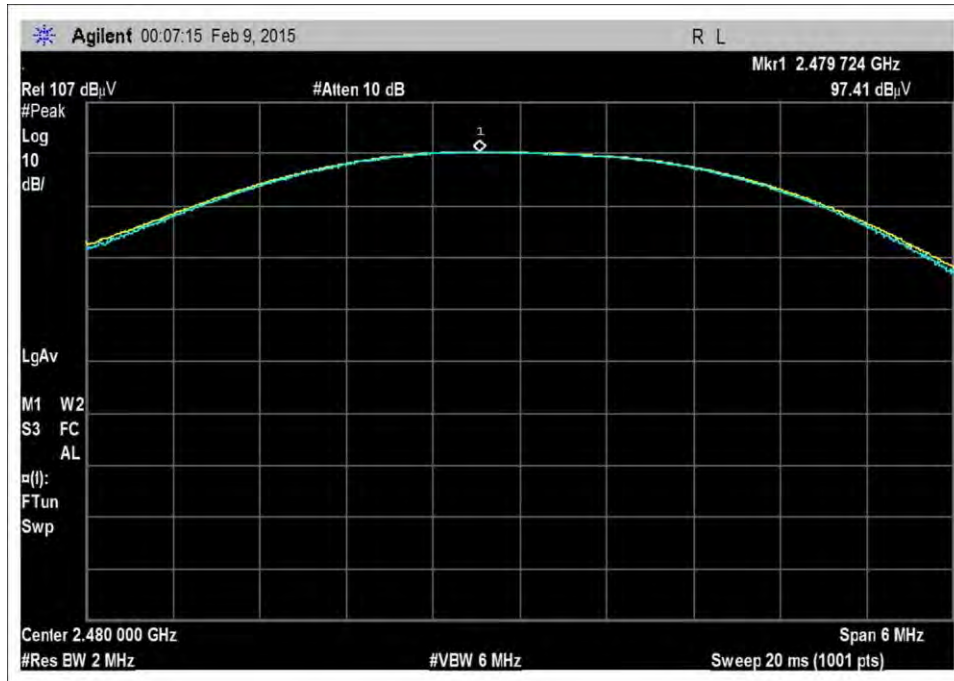
Middle Channel, Nominal 115%



High Channel, Nominal



High Channel, Nominal 85%



High Channel, Nominal 115%

Note: At the time of testing, the date stamp on the plots above was set on a default setting and should read 03/03/2015.

Test Setup Photo(s)



X-Axis



Y-Axis



Z-Axis

15.247(d) Field Strength of Spurious Emissions and Band Edge

Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Medtronic MiniMed**
 Specification: **15.247, 15.249, 15.209 - Carrier and Spurious Emissions**
 Work Order #: **96784** Date: 3/4/2015
 Test Type: **Maximized Emissions** Time: 10:56:35
 Equipment: **Translator** Sequence#: 1
 Manufacturer: Medtronic MiniMed Tested By: Michael Atkinson
 Model: MMT-7018
 S/N: TR0000222M

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02307	Preamp	8447D	3/14/2014	3/14/2016
T2	AN01996	Biconilog Antenna	CBL6111C	7/16/2014	7/16/2016
T3	ANP05360	Cable	RG214	12/1/2014	12/1/2016
T4	ANP05963	Cable	RG-214	2/21/2014	2/21/2016
T5	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
T6	AN02871	Spectrum Analyzer	E4440A	2/9/2015	2/9/2017
T7	AN03209	Preamp	83051A	3/5/2013	3/5/2015
T8	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	9/16/2013	9/16/2015
T9	ANP05305	Cable	ETSI-50T	2/20/2014	2/20/2016
T10	AN00052	Loop Antenna	6502	5/20/2014	5/20/2016
T11	AN03441	Power Amplifier	83017A	5/7/2014	5/7/2016
T12	AN03303	Preamp	AMF-7D-00101800-30-10P	9/4/2014	9/4/2016
T13	ANP05748	Attenuator	PE7004-20	4/2/2014	4/2/2016
T14	ANP06124	Attenuator	18N-6	5/13/2013	5/13/2015
T15	AN03116	High Pass Filter	11SH10-00313	2/6/2015	2/6/2017
T16	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	1/14/2015	1/14/2017
T17	AN02763-69	Waveguide	Multiple	5/21/2014	5/21/2016
T18	ANP06503	Cable	32026-29801-29801-36	5/1/2014	5/1/2016
T19	ANP06678	Cable	32026-29801-29801-144	9/18/2014	9/18/2016

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Translator*	Medtronic MiniMed	MMT-7018	TR0000222M

Support Devices:

Function	Manufacturer	Model #	S/N
USB Charger	PHIHONG	PSA03F-050Q1	DE04000165A1

Test Conditions / Notes:

Temperature: 21°C
 Humidity: 29%
 Pressure: 102.1kPa
 Frequency: 9kHz-26GHz

Test Method: ANSI C63.10 (2009)

The EUT is on an 80cm foam table. The EUT is connected to an USB Charger which is connected to 115V/60Hz. The EUT was investigated and data collected in multiple modes: transmitting 2 packets per second at 916.5MHz, transmitting continuously at 2.402GHz (Low), 2.440GHz (Mid), 2.480GHz (High).

Maximum radiated emission in the 100kHz transmitter band (2.40-2.4835GHz) is 90.6 dBuV/m

The X, Y, Z axis and Horizontal and Vertical antenna polarities investigated, only worst case reported.

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13	T14	T15	T16					
			T17	T18							
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	2399.600M Ave	56.7	+0.0	+0.0	+0.0	+0.0	+0.0	50.9	54.0	-3.1	Vert
			+1.4	+0.0	+0.0	+28.0	11		Low Band Edge		111
			+2.7	+0.0	-57.9	+20.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
2	2399.330M	56.7	+0.0	+0.0	+0.0	+0.0	+0.0	50.9	54.0	-3.1	Vert
			+1.4	+0.0	+0.0	+28.0	10		Low Band		111
			+2.7	+0.0	-57.9	+20.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
3	10081.560 M	29.4	+0.0	+0.0	+0.0	+0.0	+0.0	48.2	54.0	-5.8	Vert
			+3.0	+0.0	-27.9	+37.4					
			+6.3	+0.0	+0.0	+0.0	360		916.5MHz		107
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
4	96.270M	54.3	-27.8	+9.7	+0.6	+0.4	+0.0	37.5	43.5	-6.0	Vert
			+0.3	+0.0	+0.0	+0.0	227		916.5MHz		109
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
5	7332.184M	31.9	+0.0	+0.0	+0.0	+0.0	+0.0	47.9	54.0	-6.1	Vert
			+2.4	+0.0	-28.2	+37.0	137		916.5MHz		107
			+4.8	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							

6	8249.000M	31.0	+0.0	+0.0	+0.0	+0.0	+0.0	47.7	54.0	-6.3	Vert
			+2.5	+0.0	-28.0	+36.6	360		916.5MHz		107
			+5.6	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
7	9165.529M	30.1	+0.0	+0.0	+0.0	+0.0	+0.0	47.5	54.0	-6.5	Vert
			+2.8	+0.0	-27.7	+36.7	166		916.5MHz		107
			+5.6	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
8	95.254M	53.8	-27.8	+9.6	+0.6	+0.4	+0.0	36.9	43.5	-6.6	Vert
			+0.3	+0.0	+0.0	+0.0	360		916.5MHz		110
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
9	901.980M	38.4	-27.4	+23.7	+2.0	+1.5	+0.0	39.1	46.0	-6.9	Vert
			+0.9	+0.0	+0.0	+0.0	360		916.5MHz		100
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
10	3666.215M	43.1	+0.0	+0.0	+0.0	+0.0	+0.0	46.8	54.0	-7.2	Vert
			+1.6	+0.0	-30.9	+29.8	160		916.5MHz		107
			+3.2	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
11	12156.600 M	57.2	+0.0	+0.0	+0.0	+0.0	+0.0	46.5	54.0	-7.5	Vert
			+3.5	+0.0	+0.0	+38.3					
			+6.9	+0.0	-60.0	+0.0	360		2.4G Mid		111
			+0.0	+0.6	+0.0	+0.0					
			+0.0	+0.0							
12	9585.800M	57.4	+0.0	+0.0	+0.0	+0.0	+0.0	46.4	54.0	-7.6	Vert
			+2.9	+0.0	+0.0	+37.5	37		2.4G Low		111
			+6.3	+0.0	-59.0	+0.0					
			+0.0	+1.3	+0.0	+0.0					
			+0.0	+0.0							
13	2483.524M Ave	52.3	+0.0	+0.0	+0.0	+0.0	+0.0	46.3	54.0	-7.7	Vert
			+1.4	+0.0	+0.0	+27.9	360		High Band		111
			+2.7	+0.0	-58.0	+20.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	2483.524M	56.5	+0.0	+0.0	+0.0	+0.0	+0.0	50.5	54.0	-3.5	Vert
			+1.4	+0.0	+0.0	+27.9	32		High Band		111
			+2.7	+0.0	-58.0	+20.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
15	7278.700M	58.1	+0.0	+0.0	+0.0	+0.0	+0.0	45.6	54.0	-8.4	Vert
			+2.4	+0.0	+0.0	+36.8	360		2.4G Mid		111
			+4.8	+0.0	-57.2	+0.0					
			+0.0	+0.7	+0.0	+0.0					
			+0.0	+0.0							

16	7190.400M	58.3	+0.0	+0.0	+0.0	+0.0	+0.0	45.6	54.0	-8.4	Vert
			+2.4	+0.0	+0.0	+36.5	316		2.4G Low		111
			+4.8	+0.0	-57.2	+0.0					
			+0.0	+0.8	+0.0	+0.0					
			+0.0	+0.0							
17	12350.800 M	56.1	+0.0	+0.0	+0.0	+0.0	+0.0	45.2	54.0	-8.8	Vert
			+3.5	+0.0	+0.0	+38.3					111
			+7.1	+0.0	-60.4	+0.0	174		2.4G High		
			+0.0	+0.6	+0.0	+0.0					
			+0.0	+0.0							
18	24504.000 M	44.2	+0.0	+0.0	+0.0	+0.0	+0.0	44.8	54.0	-9.2	Vert
			+0.0	+0.0	+0.0	+0.0					107
			+0.0	+0.0	+0.0	+0.0			2.4G High		
			+0.0	+0.0	-12.9	+3.3					
			+2.4	+7.8							
19	24512.000 M	44.1	+0.0	+0.0	+0.0	+0.0	+0.0	44.7	54.0	-9.3	Vert
			+0.0	+0.0	+0.0	+0.0					107
			+0.0	+0.0	+0.0	+0.0			2.4G Low		
			+0.0	+0.0	-12.9	+3.3					
			+2.4	+7.8							
20	9785.000M	56.6	+0.0	+0.0	+0.0	+0.0	+0.0	44.7	54.0	-9.3	Vert
			+2.9	+0.0	+0.0	+37.4			2.4G Mid		111
			+6.3	+0.0	-59.8	+0.0					
			+0.0	+1.3	+0.0	+0.0					
			+0.0	+0.0							
21	12050.300 M	54.9	+0.0	+0.0	+0.0	+0.0	+0.0	44.4	54.0	-9.6	Vert
			+3.6	+0.0	+0.0	+38.3					111
			+6.8	+0.0	-59.8	+0.0	228		2.4G Low		
			+0.0	+0.6	+0.0	+0.0					
			+0.0	+0.0							
22	9836.000M	56.2	+0.0	+0.0	+0.0	+0.0	+0.0	44.0	54.0	-10.0	Vert
			+2.9	+0.0	+0.0	+37.4	357		2.4G High		111
			+6.3	+0.0	-60.0	+0.0					
			+0.0	+1.2	+0.0	+0.0					
			+0.0	+0.0							
23	7440.000M	55.7	+0.0	+0.0	+0.0	+0.0	+0.0	43.9	54.0	-10.1	Vert
			+2.5	+0.0	+0.0	+37.5			2.4G High		111
			+4.7	+0.0	-57.2	+0.0					
			+0.0	+0.7	+0.0	+0.0					
			+0.0	+0.0							
24	928.020M QP	34.5	-27.3	+23.8	+2.1	+1.5	+0.0	35.5	46.0	-10.5	Vert
			+0.9	+0.0	+0.0	+0.0			916.5MHz		109
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	928.020M	42.6	-27.3	+23.8	+2.1	+1.5	+0.0	43.6	46.0	-2.4	Vert
			+0.9	+0.0	+0.0	+0.0	91		916.5MHz		112
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							

26	6415.684M	31.4	+0.0	+0.0	+0.0	+0.0	+0.0	43.2	54.0	-10.8	Vert
			+2.4	+0.0	-28.9	+34.0			916.5MHz		107
			+4.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
27	4879.400M	62.8	+0.0	+0.0	+0.0	+0.0	+0.0	43.0	54.0	-11.0	Vert
			+2.7	+0.0	+0.0	+32.3			2.4G Mid		111
			+3.9	+0.0	-59.5	+0.0					
			+0.0	+0.8	+0.0	+0.0					
			+0.0	+0.0							
28	23576.000 M	45.1	+0.0	+0.0	+0.0	+0.0	+0.0	42.6	54.0	-11.4	Vert
			+0.0	+0.0	+0.0	+0.0					107
			+0.0	+0.0	+0.0	+0.0	360		2.4G Mid		
			+0.0	+0.0	-15.0	+2.6					
			+2.3	+7.6							
29	2976.300M	60.7	+0.0	+0.0	+0.0	+0.0	+0.0	42.5	54.0	-11.5	Vert
			+1.6	+0.0	+0.0	+29.5	71		Low (6pad)		111
			+3.0	+0.0	-58.1	+0.0					
			+5.8	+0.0	+0.0	+0.0					
			+0.0	+0.0							
30	2928.000M	61.0	+0.0	+0.0	+0.0	+0.0	+0.0	42.5	54.0	-11.5	Vert
			+1.6	+0.0	+0.0	+29.4	360		High (6pad)		111
			+2.9	+0.0	-58.2	+0.0					
			+5.8	+0.0	+0.0	+0.0					
			+0.0	+0.0							
31	4803.800M	62.6	+0.0	+0.0	+0.0	+0.0	+0.0	42.3	54.0	-11.7	Vert
			+2.5	+0.0	+0.0	+32.1	46		2.4G Low		111
			+3.8	+0.0	-59.5	+0.0					
			+0.0	+0.8	+0.0	+0.0					
			+0.0	+0.0							
32	2969.100M	60.4	+0.0	+0.0	+0.0	+0.0	+0.0	42.2	54.0	-11.8	Vert
			+1.6	+0.0	+0.0	+29.5	38		Mid (6pad)		111
			+3.0	+0.0	-58.1	+0.0					
			+5.8	+0.0	+0.0	+0.0					
			+0.0	+0.0							
33	21000.000 M	44.8	+0.0	+0.0	+0.0	+0.0	+0.0	41.9	54.0	-12.1	Vert
			+0.0	+0.0	+0.0	+0.0					107
			+0.0	+0.0	+0.0	+0.0			2.4G Low		
			+0.0	+0.0	-14.7	+2.4					
			+2.2	+7.2							
34	19216.000 M	43.0	+0.0	+0.0	+0.0	+0.0	+0.0	41.8	54.0	-12.2	Vert
			+0.0	+0.0	+0.0	+0.0					107
			+0.0	+0.0	+0.0	+0.0			2.4G High		
			+0.0	+0.0	-13.2	+3.1					
			+2.1	+6.8							
35	2090.600M	62.1	+0.0	+0.0	+0.0	+0.0	+0.0	41.8	54.0	-12.2	Vert
			+1.3	+0.0	+0.0	+28.3	309		2.4G High		111
			+2.5	+0.0	-58.2	+0.0					
			+5.8	+0.0	+0.0	+0.0					
			+0.0	+0.0							

36	4960.000M	61.4	+0.0	+0.0	+0.0	+0.0	+0.0	41.7	54.0	-12.3	Vert
			+2.6	+0.0	+0.0	+32.5	360		2.4G High		111
			+4.0	+0.0	-59.5	+0.0					
			+0.0	+0.7	+0.0	+0.0					
			+0.0	+0.0							
37	57.733M	47.5	-27.9	+7.1	+0.4	+0.3	+0.0	27.7	40.0	-12.3	Vert
			+0.3	+0.0	+0.0	+0.0	3		916.5MHz		108
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
38	19896.000 M	43.2	+0.0	+0.0	+0.0	+0.0	+0.0	41.6	54.0	-12.4	Vert
			+0.0	+0.0	+0.0	+0.0			2.4G Mid		107
			+0.0	+0.0	+0.0	+0.0	360				
			+0.0	+0.0	-13.3	+2.6					
			+2.1	+7.0							
39	1833.228M	41.0	+0.0	+0.0	+0.0	+0.0	+0.0	41.1	54.0	-12.9	Vert
			+1.2	+0.0	-30.6	+27.2	262		916.5MHz		108
			+2.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
40	92.750M	46.7	-27.8	+9.4	+0.6	+0.4	+0.0	29.6	43.5	-13.9	Vert
			+0.3	+0.0	+0.0	+0.0			2.4G Low		107
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
41	2069.600M	60.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.0	54.0	-14.0	Vert
			+1.3	+0.0	+0.0	+28.3			2.4G Low		111
			+2.5	+0.0	-58.1	+0.0					
			+5.8	+0.0	+0.0	+0.0					
			+0.0	+0.0							
42	1715.400M	62.7	+0.0	+0.0	+0.0	+0.0	+0.0	40.0	54.0	-14.0	Vert
			+1.2	+0.0	+0.0	+26.4	178		2.4G Mid		111
			+2.2	+0.0	-58.3	+0.0					
			+5.8	+0.0	+0.0	+0.0					
			+0.0	+0.0							
43	93.560M	46.3	-27.8	+9.5	+0.6	+0.4	+0.0	29.3	43.5	-14.2	Vert
			+0.3	+0.0	+0.0	+0.0	126		2.4G Low		107
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
44	65.743M	46.1	-27.9	+6.5	+0.4	+0.3	+0.0	25.7	40.0	-14.3	Vert
			+0.3	+0.0	+0.0	+0.0	334		2.4G Low		107
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
45	93.650M	46.1	-27.8	+9.5	+0.6	+0.4	+0.0	29.1	43.5	-14.4	Vert
			+0.3	+0.0	+0.0	+0.0	151		2.4G High		107
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							

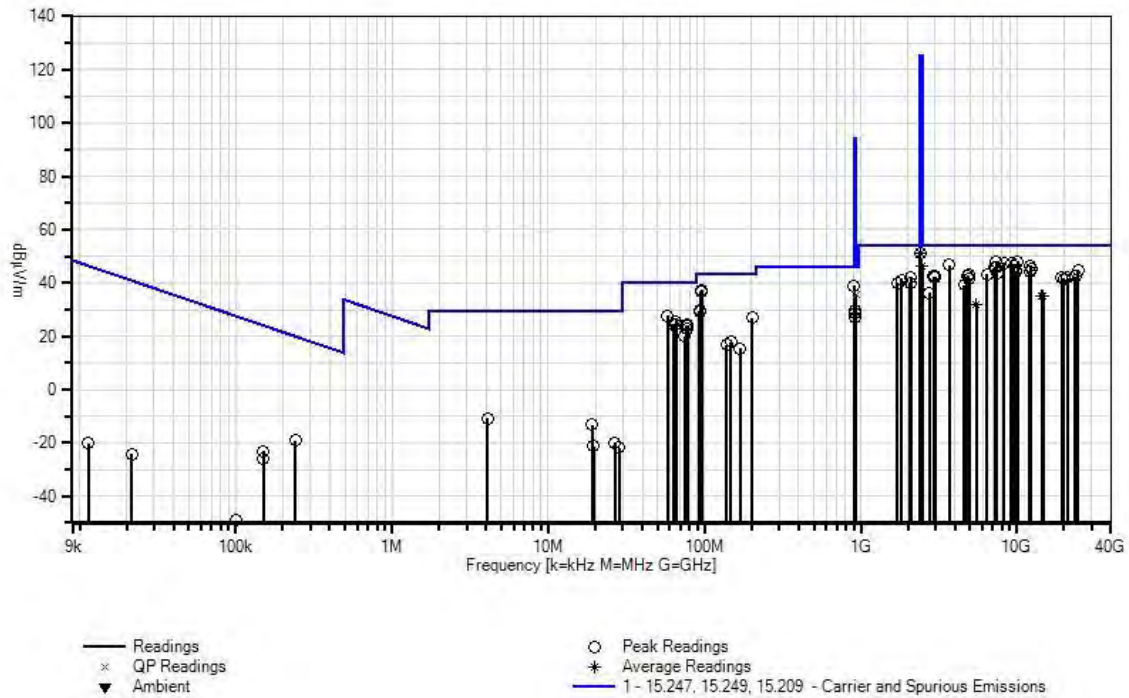
46	94.260M	46.0	-27.8 +0.3 +0.0 +0.0 +0.0	+9.5 +0.0 +0.0 +0.0	+0.6 +0.0 +0.0 +0.0	+0.4 +0.0 +0.0 +0.0	+0.0	29.0	43.5 2.4G Mid	-14.5	Vert 107
47	4582.331M	33.1	+0.0 +2.2 +3.6 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 -31.0 +0.0 +0.0	+0.0 +31.4 +0.0 +0.0	+0.0 360	39.3	54.0 916.5MHz	-14.7	Vert 107
48	63.320M	44.9	-27.9 +0.3 +0.0 +0.0 +0.0	+6.5 +0.0 +0.0 +0.0	+0.4 +0.0 +0.0 +0.0	+0.3 +0.0 +0.0 +0.0	+0.0	24.5	40.0 2.4G Mid	-15.5	Vert 107
49	64.770M	44.9	-27.9 +0.3 +0.0 +0.0 +0.0	+6.5 +0.0 +0.0 +0.0	+0.4 +0.0 +0.0 +0.0	+0.3 +0.0 +0.0 +0.0	+0.0 360	24.5	40.0 2.4G High	-15.5	Vert 107
50	77.120M	43.5	-27.8 +0.3 +0.0 +0.0 +0.0	+7.3 +0.0 +0.0 +0.0	+0.5 +0.0 +0.0 +0.0	+0.4 +0.0 +0.0 +0.0	+0.0 360	24.2	40.0 2.4G High	-15.8	Vert 107
51	77.940M	43.2	-27.9 +0.3 +0.0 +0.0 +0.0	+7.4 +0.0 +0.0 +0.0	+0.5 +0.0 +0.0 +0.0	+0.4 +0.0 +0.0 +0.0	+0.0	23.9	40.0 2.4G Low	-16.1	Vert 106
52	202.541M	42.9	-27.3 +0.4 +0.0 +0.0 +0.0	+9.5 +0.0 +0.0 +0.0	+0.8 +0.0 +0.0 +0.0	+0.6 +0.0 +0.0 +0.0	+0.0	26.9	43.5 916.5MHz	-16.6	Vert 132
53	77.120M	42.2	-27.8 +0.3 +0.0 +0.0 +0.0	+7.3 +0.0 +0.0 +0.0	+0.5 +0.0 +0.0 +0.0	+0.4 +0.0 +0.0 +0.0	+0.0 360	22.9	40.0 2.4G Mid	-17.1	Vert 107
54	2749.605M	33.4	+0.0 +1.5 +2.8 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 -30.2 +0.0 +0.0	+0.0 +28.8 +0.0 +0.0	+0.0	36.3	54.0 916.5MHz	-17.7	Vert 107
55	14608.400 M Ave	40.8	+0.0 +3.8 +8.3 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 -58.8 +0.0	+0.0 +40.3 +0.0 +0.0	+0.0	35.2	54.0 2.4G Mid	-18.8	Vert 111

^	14608.400 M	55.7	+0.0 +3.8 +8.3 +0.0 +0.0	+0.0 +0.0 +0.0 +0.8 +0.0	+0.0 +0.0 -58.8 +0.0 +0.0	+0.0 +40.3 +0.0 +0.0	+0.0	50.1	54.0 2.4G Mid	-3.9	Vert 111
57	14396.200 M Ave	40.0	+0.0 +4.2 +8.1 +0.0 +0.0	+0.0 +0.0 +0.0 +0.8 +0.0	+0.0 +0.0 -59.1 +0.0 +0.0	+0.0 +41.1 +0.0 +0.0	+0.0	35.1	54.0 2.4G Low	-18.9	Vert 111
^	14396.200 M	53.1	+0.0 +4.2 +8.1 +0.0 +0.0	+0.0 +0.0 +0.0 +0.8 +0.0	+0.0 +0.0 -59.1 +0.0 +0.0	+0.0 +41.1 +0.0 +0.0	+0.0	48.2	54.0 2.4G Low	-5.8	Vert 111
59	14631.600 M Ave	40.7	+0.0 +3.8 +8.3 +0.0 +0.0	+0.0 +0.0 +0.0 +0.8 +0.0	+0.0 +0.0 -58.8 +0.0 +0.0	+0.0 +40.2 +0.0 +0.0	+0.0	35.0	54.0 2.4G High	-19.0	Vert 111
^	14631.600 M	54.5	+0.0 +3.8 +8.3 +0.0 +0.0	+0.0 +0.0 +0.0 +0.8 +0.0	+0.0 +0.0 -58.8 +0.0 +0.0	+0.0 +40.2 +0.0 +0.0	+0.0	48.8	54.0 2.4G High	-5.2	Vert 111
61	74.650M	39.7	-27.8 +0.3 +0.0 +0.0 +0.0	+7.0 +0.0 +0.0 +0.0 +0.0	+0.4 +0.0 +0.0 +0.0 +0.0	+0.4 +0.0 +0.0 +0.0	+0.0	20.0	40.0 916.5MHz	-20.0	Vert 109
62	5499.378M Ave	22.6	+0.0 +2.6 +4.1 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 -30.1 +0.0 +0.0	+0.0 +32.9 +0.0 +0.0	+0.0	32.1	54.0 916.5MHz	-21.9	Vert 108
^	5499.378M	39.2	+0.0 +2.6 +4.1 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 -30.1 +0.0 +0.0	+0.0 +32.9 +0.0 +0.0	+0.0	48.7	54.0 916.5MHz	-5.3	Vert 107
64	146.660M	32.1	-27.5 +0.4 +0.0 +0.0 +0.0	+11.5 +0.0 +0.0 +0.0 +0.0	+0.7 +0.0 +0.0 +0.0 +0.0	+0.6 +0.0 +0.0 +0.0	+0.0	17.8	43.5 2.4G High	-25.7	Vert 107
65	138.290M	31.0	-27.6 +0.4 +0.0 +0.0 +0.0	+11.8 +0.0 +0.0 +0.0 +0.0	+0.7 +0.0 +0.0 +0.0 +0.0	+0.5 +0.0 +0.0 +0.0	+0.0	16.8	43.5 2.4G Mid	-26.7	Vert 107

66	168.180M	31.0	-27.5 +0.4 +0.0 +0.0 +0.0	+10.2 +0.0 +0.0 +0.0	+0.8 +0.0 +0.0 +0.0	+0.6 +0.0 +0.0 +0.0	+0.0 360	15.5	43.5 2.4G Low	-28.0	Vert 106
67	240.000k	51.3	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +9.5 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-19.2	20.0 2.4G High	-39.2	Vert 108
68	4.090M	19.6	+0.0 +0.0 +0.1 +0.0 +0.0	+0.0 +0.0 +9.5 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	-10.8	29.5 2.4G Low	-40.3	Vert 108
69	18.985M	18.6	+0.0 +0.1 +0.2 +0.0 +0.0	+0.0 +0.0 +7.8 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	-13.3	29.5 2.4G High	-42.8	Vert 108
70	150.000k	47.3	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +9.6 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0 360	-23.1	24.1 916.5MHz	-47.2	Vert 108
71	150.000k	46.9	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +9.6 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-23.5	24.1 2.4G Mid	-47.6	Vert 108
72	26.716M	15.0	+0.0 +0.2 +0.3 +0.0 +0.0	+0.0 +0.0 +4.7 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	-19.8	29.5 2.4G Low	-49.3	Vert 108
73	150.000k	44.3	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +9.6 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-26.1	24.1 2.4G Low	-50.2	Vert 108
74	19.552M	10.6	+0.0 +0.1 +0.2 +0.0 +0.0	+0.0 +0.0 +7.7 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0 360	-21.4	29.5 916.5MHz	-50.9	Vert 108
75	28.418M	13.2	+0.0 +0.2 +0.3 +0.0 +0.0	+0.0 +0.0 +4.6 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	-21.7	29.5 2.4G Mid	-51.2	Vert 108

76	916.499M	28.7	-27.3 +0.9 +0.0 +0.0 +0.0	+23.8 +0.0 +0.0 +0.0	+2.0 +0.0 +0.0 +0.0	+1.5 +0.0 +0.0 +0.0	+0.0 360	29.6	94.0 2.4G Low	-64.4	Vert 107
77	916.506M	27.9	-27.3 +0.9 +0.0 +0.0 +0.0	+23.8 +0.0 +0.0 +0.0	+2.0 +0.0 +0.0 +0.0	+1.5 +0.0 +0.0 +0.0	+0.0	28.8	94.0 2.4G Mid	-65.2	Vert 107
78	21.549k	42.9	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +12.8 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-24.3	40.9 2.4G High	-65.2	Vert 108
79	11.397k	45.1	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +14.7 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-20.2	46.5 2.4G Mid	-66.7	Vert 108
80	916.510M	26.3	-27.3 +0.9 +0.0 +0.0 +0.0	+23.8 +0.0 +0.0 +0.0	+2.0 +0.0 +0.0 +0.0	+1.5 +0.0 +0.0 +0.0	+0.0	27.2	94.0 2.4G High	-66.8	Vert 107
81	100.650k	21.4	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +9.6 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0 312	-49.0	27.5 916.5MHz	-76.5	Vert 108

CKC Laboratories, Inc. Date: 3/4/2015 Time: 10:56:35 Medtronic MiniMed WO#: 96784
 15.247, 15.249, 15.209 - Carrier and Spurious Emissions Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB
 Translator Medtronic MiniMed MMT-7018



Band Edge

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Medtronic MiniMed**
 Specification: **15.247(d) Spurs**
 Work Order #: **96784** Date: 3/3/2015
 Test Type: **Maximized Emissions** Time: 11:43:50
 Equipment: **Translator** Sequence#: 2
 Manufacturer: Medtronic MiniMed Tested By: Michael Atkinson
 Model: MMT-7018
 S/N: TR0000222M

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	9/16/2013	9/16/2015
T2	ANP05305	Cable	ETSI-50T	2/20/2014	2/20/2016
T3	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
T4	AN02871	Spectrum Analyzer	E4440A	2/9/2015	2/9/2017
T5	AN03303	Preamp	AMF-7D-00101800-30-10P	9/4/2014	9/4/2016
T6	ANP05748	Attenuator	PE7004-20	4/2/2014	4/2/2016

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Translator*	Medtronic MiniMed	MMT-7018	TR0000222M

Support Devices:

Function	Manufacturer	Model #	S/N
USB Charger	PHIHONG	PSA03F-050Q1	DE04000165A1

Test Conditions / Notes:

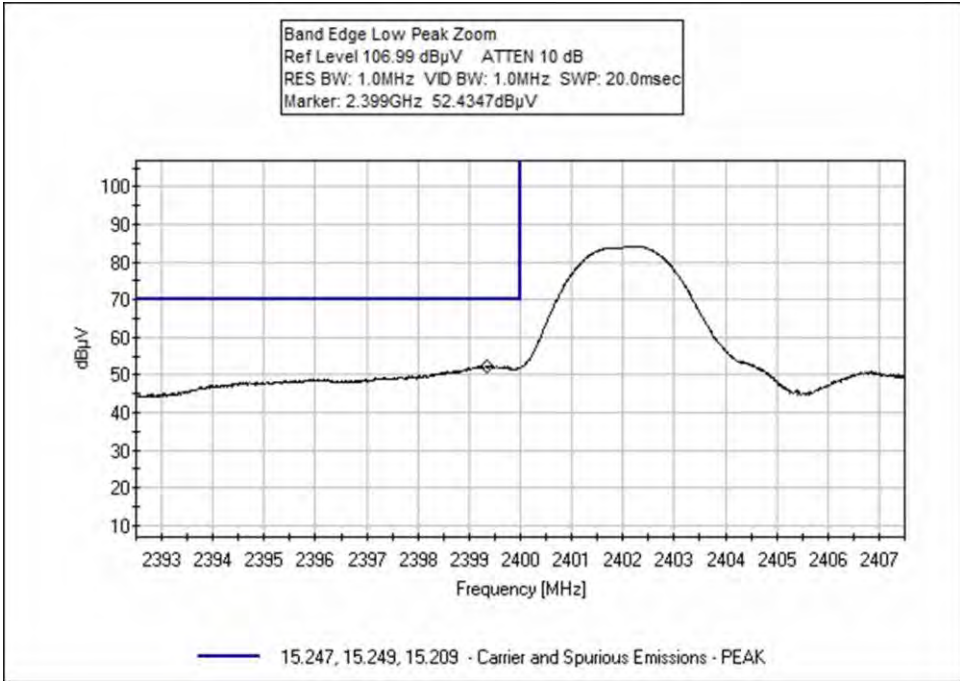
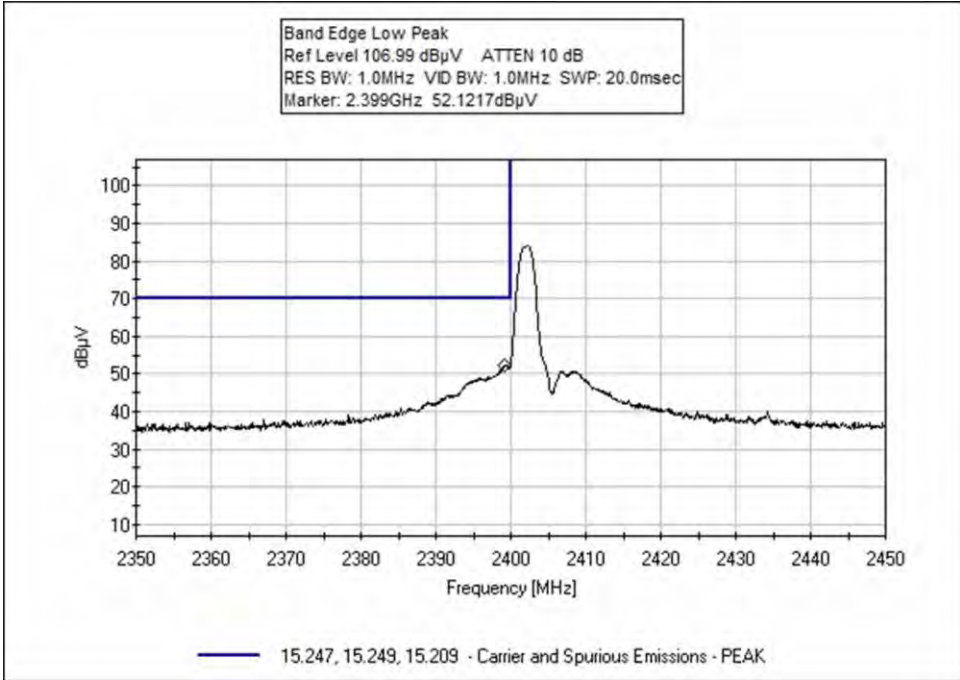
Temperature: 21°C
 Humidity: 29%
 Pressure: 102.1kPa

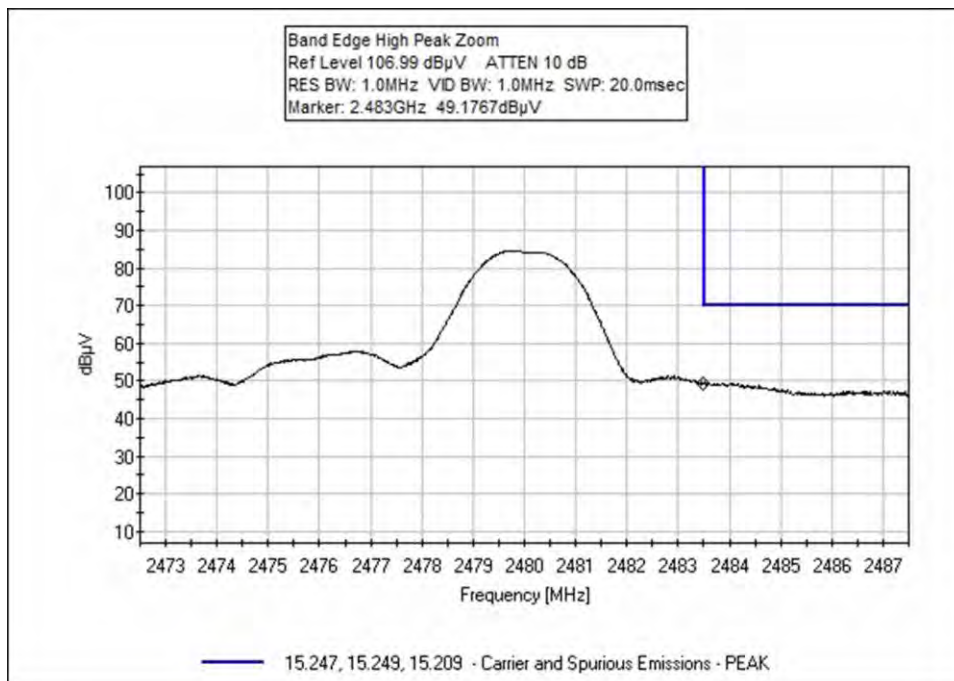
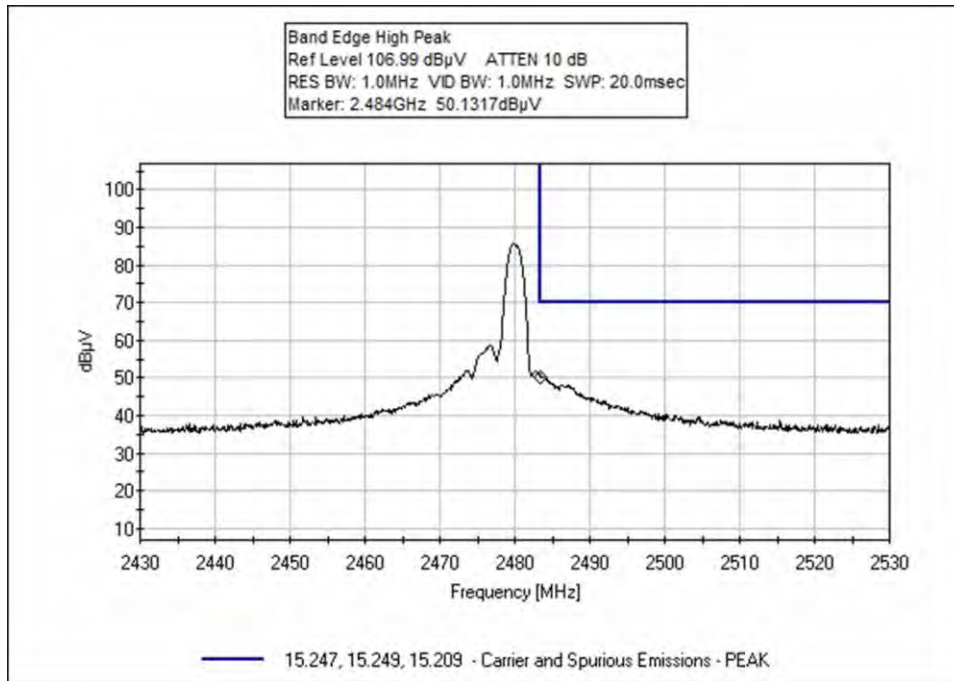
Test Method: KDB 558074 D01 DTS Meas Guidance v03r02 and ANSI C63.10 (2009)

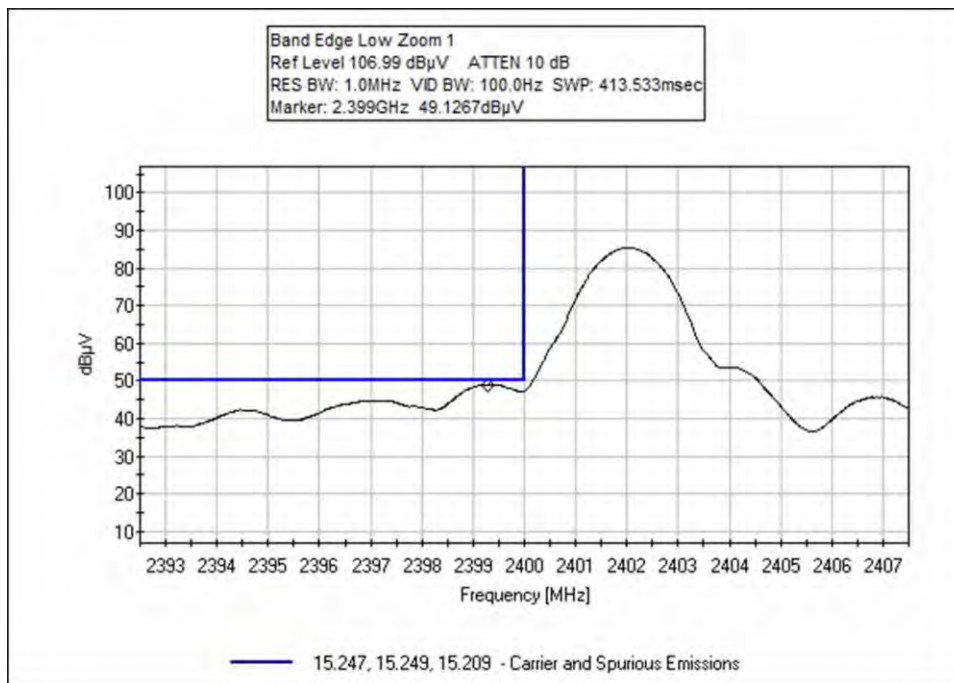
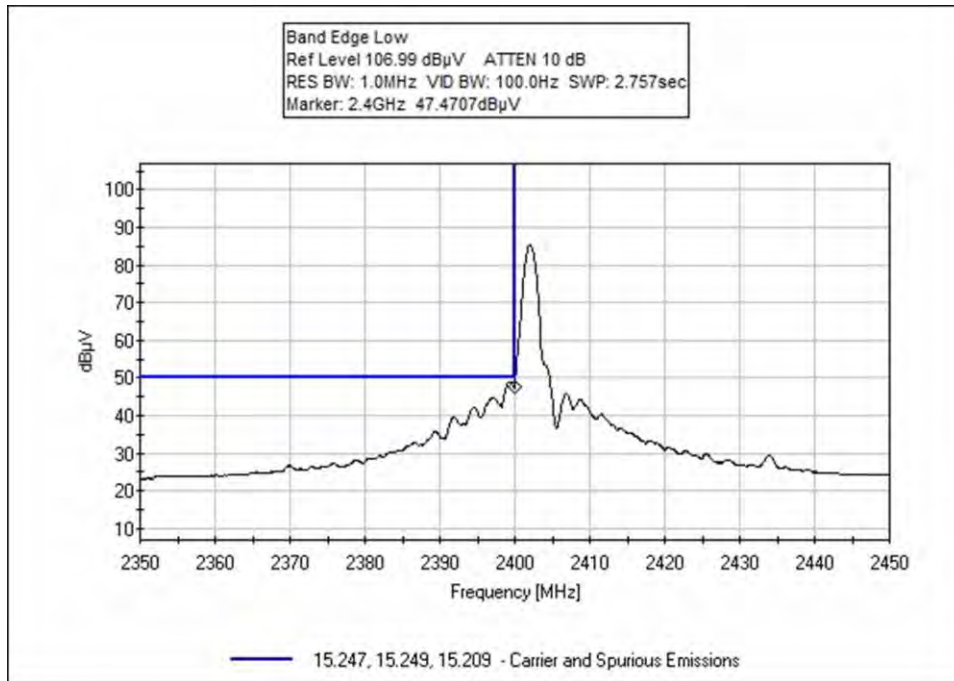
The EUT is on an 80cm foam table. The EUT is connected to an USB Charger which is connected to 115V/60Hz. Low, Mid, and High channels is investigated.

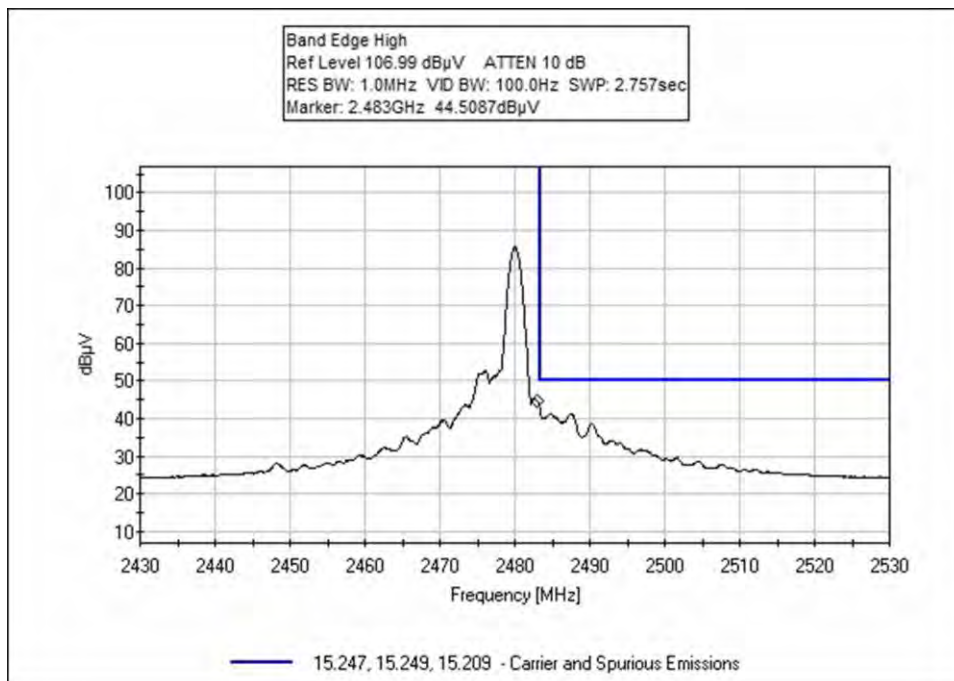
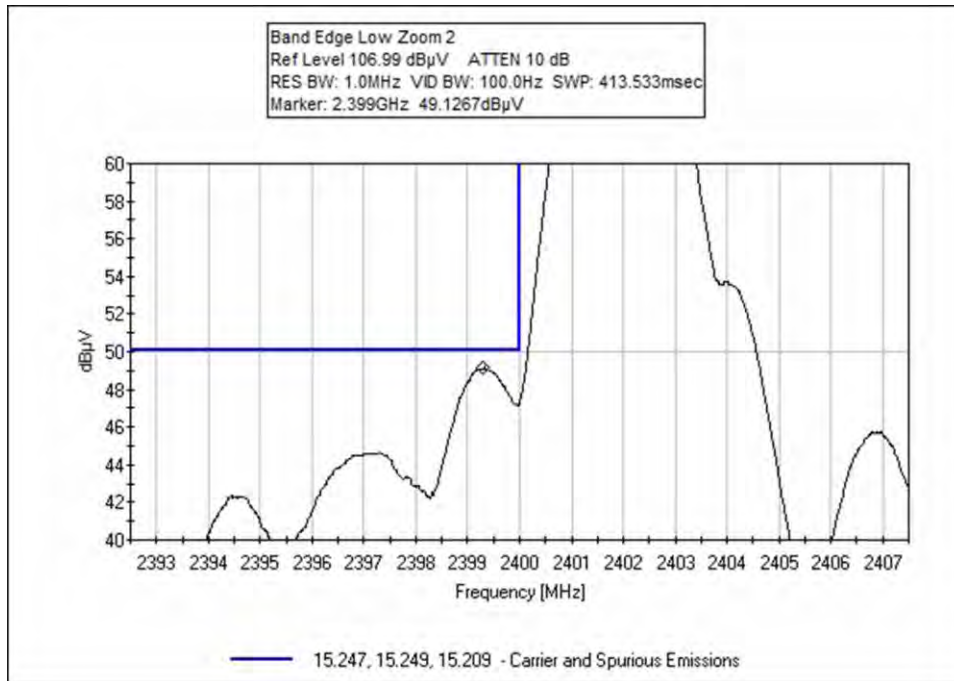
The X, Y, Z axis and Horizontal and Vertical antenna polarities investigated, only worst case reported.

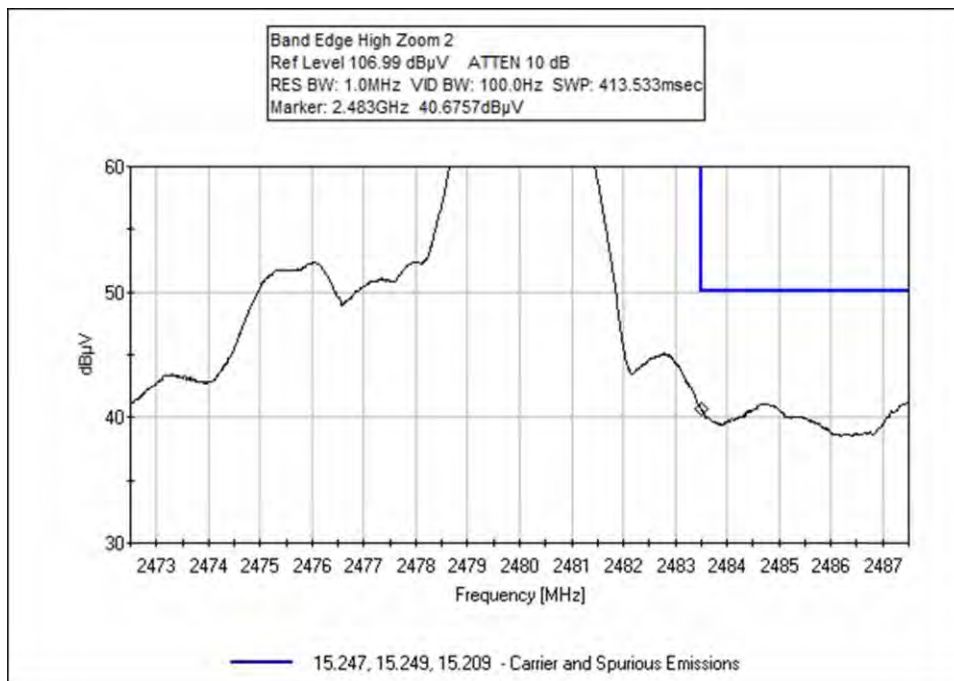
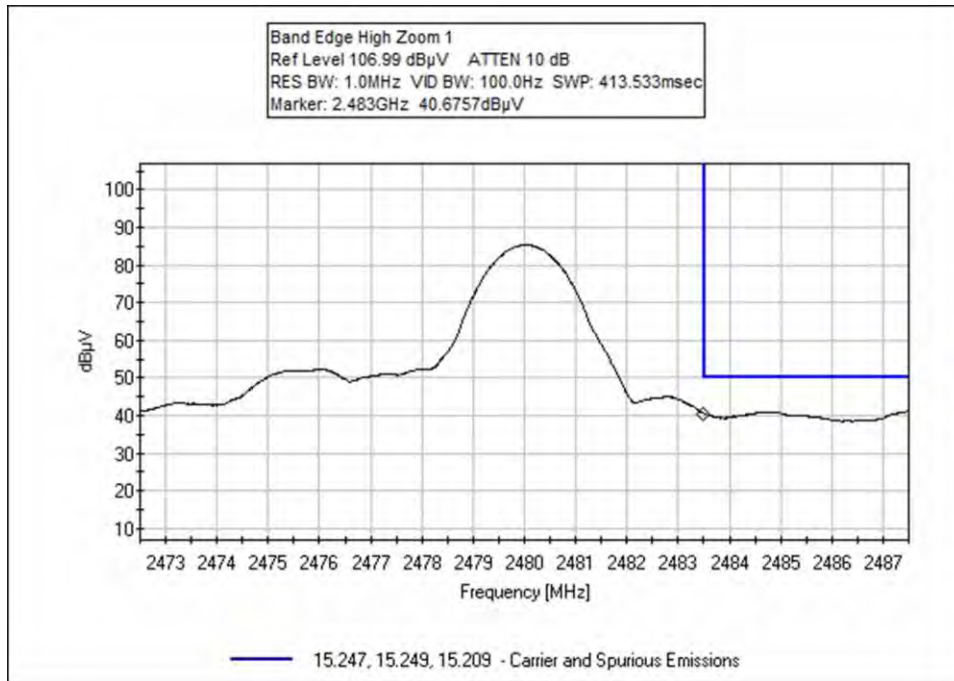
Test Data











Test Setup Photo(s)



X-Axis



Y-Axis



Z-Axis

15.247(e) Power Spectral Density

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Medtronic MiniMed**

Specification: **15.247(e) PSD**

Work Order #: **96784**

Date: 3/3/2015

Test Type: **Maximized Emissions**

Time: 11:43:50

Equipment: **Translator**

Sequence#: 2

Manufacturer: Medtronic MiniMed

Tested By: Michael Atkinson

Model: MMT-7018

S/N: TR0000222M

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	9/16/2013	9/16/2015
T2	ANP05305	Cable	ETSI-50T	2/20/2014	2/20/2016
T3	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
T4	AN02871	Spectrum Analyzer	E4440A	2/9/2015	2/9/2017
T5	AN03303	Preamp	AMF-7D-00101800-30-10P	9/4/2014	9/4/2016
T6	ANP05748	Attenuator	PE7004-20	4/2/2014	4/2/2016

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Translator*	Medtronic MiniMed	MMT-7018	TR0000222M

Support Devices:

Function	Manufacturer	Model #	S/N
USB Charger	PHIHONG	PSA03F-050Q1	DE04000165A1

Test Conditions / Notes:

Temperature: 21°C
 Humidity: 29%
 Pressure: 102.1kPa

Test Method: KDB 558074 D01 DTS Meas Guidance v03r02 and ANSI C63.10 (2009)

EUT: Unit is on 80cm foam table. The EUT is connected to USB Charger which is connected to 115V/60Hz. Low, Mid, and High channels is investigated. The X, Y, Z axis and Horizontal and Vertical antenna polarities investigated, only worst case reported.

Correction factors are NOT factored into the spectrum analyzer screen captures.

$$P = 10\log((Ed)^2 / (30 * G)*1000)$$

E = Field strength of the measurement converted to V/M

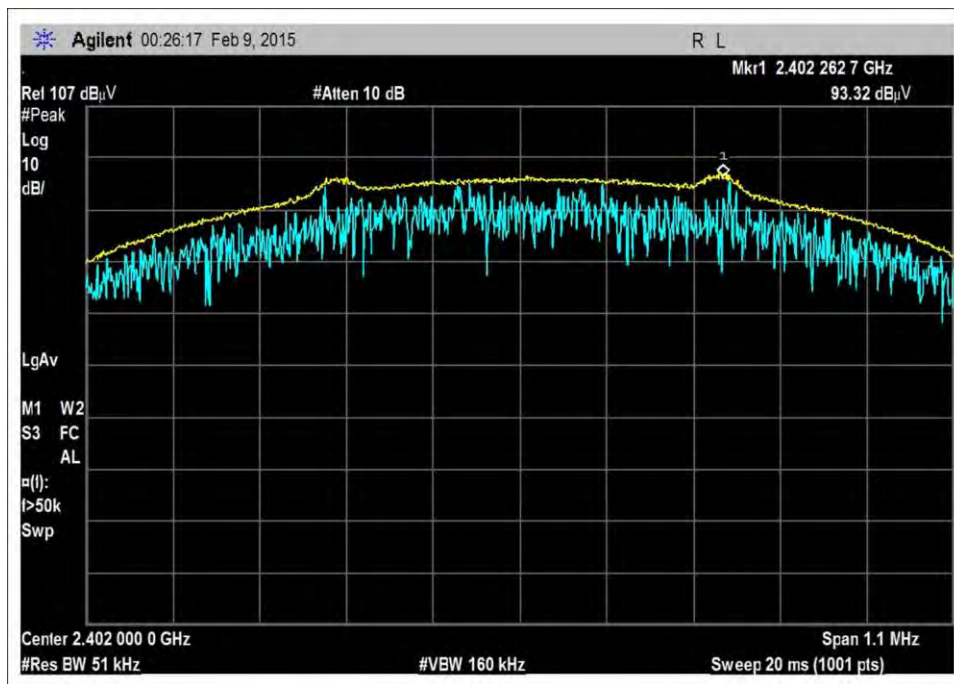
d = Measurement distance in meters

G = Numerical gain of the EUT's antenna relative to an isotropic radiator.

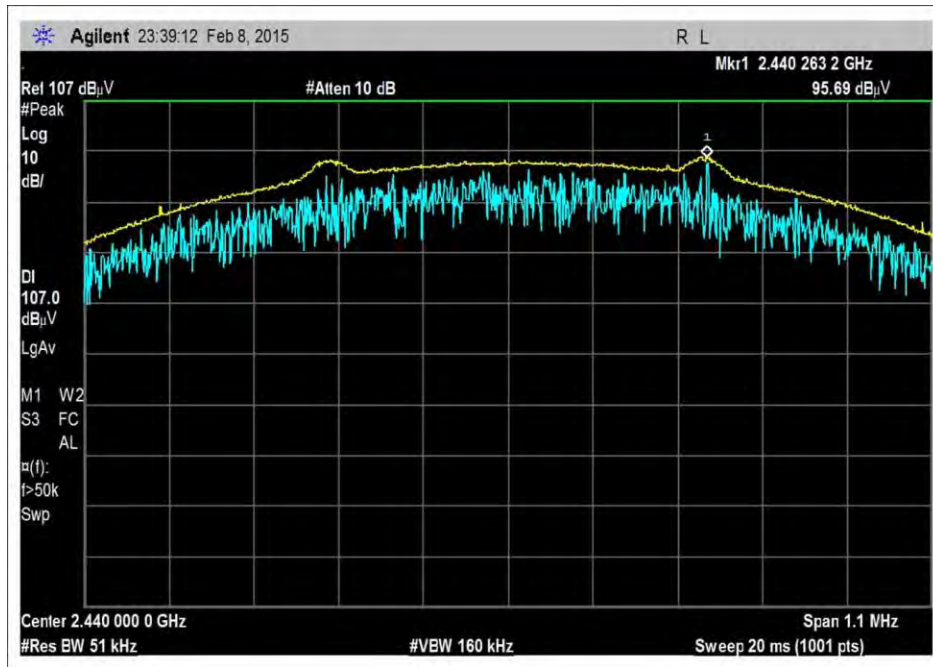
P = The power in dBm for which we are solving

Frequency (MHz)	Uncorrected Reading (dbμV/m)	Corrections due to cables, amplifiers, antennas (dB)	Corrected Reading (dbμV/m)	Antenna Gain (dBi)	Spectral Density (dBm)
2.402GHz	93.3	-5.8	87.5	1.7	-9.43
2.440GHz	95.7	-5.8	89.9	1.7	-7.03
2.480GHz	95.5	-6.0	89.5	1.7	-7.43

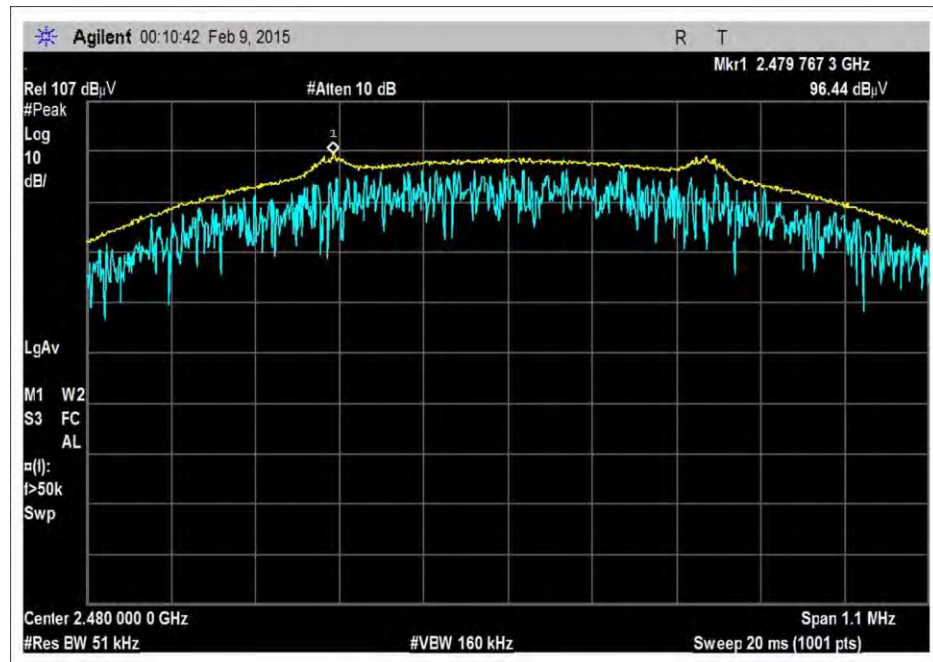
Test Data



Low Channel



Middle Channel



High Channel

Note: At the time of testing, the date stamp on the plots above was set on a default setting and should read 03/03/2015.

Test Setup Photo(s)



X-Axis



Y-Axis



Z-Axis

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBμV/m, the spectrum analyzer reading in dBμV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBμV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBμV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.