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Quote Number:	937689
Project Number:	08NK10239
File Number:	MC1323
Date:	12 Feb 09
FCC ID:	W26-BT200
IC ID:	8142A-BT200
Model:	BT200

Electromagnetic Compatibility Test Report

For

Apriva

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Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc.** **1285 Walt Whitman Rd.** **Melville, NY 11747**
Tests Performed For:	**Apriva** **6900 E. Camelback Rd** **Suite 700** **Scottsdale, AZ 85251**
Applicant Contact: Phone: E-mail:	**Rinaldo Spinella** **(781) 777-0004** **raspinella@apriva.com**
Test Report Date:	**12 Feb 2009**
Product Type:	**Blue Tooth Card Reader**
Product standards	**FCC Part 15, Subparts B & C; RSS-GEN; RSS-210**
Model Number:	**BT200**
Sample Serial Number:	**38-2000001**
EUT Category:	**Frequency Hopping Spread Spectrum Transmitter**
Testing Start Date:	**25 March 2008**
Date Testing Complete:	**02 June 2008**
Overall Results:	**Compliant**

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

Report Directory

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None	Original	-	-

1.0 G E N E R A L - Product Description

1.1 Equipment Description

Apriva®'s BT200 Bluetooth® Smart Card Reader enables data sensitive enterprises to have the highest level of security available for wireless communication. Our Smart Card Readers provide S/MIME users with strong identification and authentication using hard token certificate and private key policies. Additionally, Apriva's Smart Card Readers employ a proprietary embedded operating system with advanced power management capabilities.

Features
• AES 256 Encryption
• DoD PKI Hard Token Common Access Cards
• HSPD-12 PKI Hard Token Personal Identity Verification
• Rechargeable Internal Li++ Battery with Sophisticated Power Management
• Wide Range of Bluetooth Connectivity Options Including: Windows Mobile® PDAs Most RIM BlackBerry® Bluetooth Devices Desktop and Laptop PCs• Bluetooth Security Verified by NSA

The antenna used in this product is an internal PCB design and cannot be changed by the end user.

It was determined that the output power of the device was low enough such that SAR testing is not applicable.

The BT100, also reference in the User Guide, represents an earlier version of the BT200. Only the BT200 was tested as part of this test program.

1.2 Equipment Marking Plate

Note: The difference between Model: BT200-T and BT200 is that one model offers a 1-year warranty and the other offers a 3-year warranty.

Device Configuration During Test

1.3.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Bluetooth Transmitter	Apriva	BT200	None
SIM	PDA	AT&T	Blackberry	None
Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test)				

1.3.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	PC/Charger	I/O	N	N	None
2	PDA	I/O	N	N	None

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

1.3.3 EUT Internal Operating Frequencies:

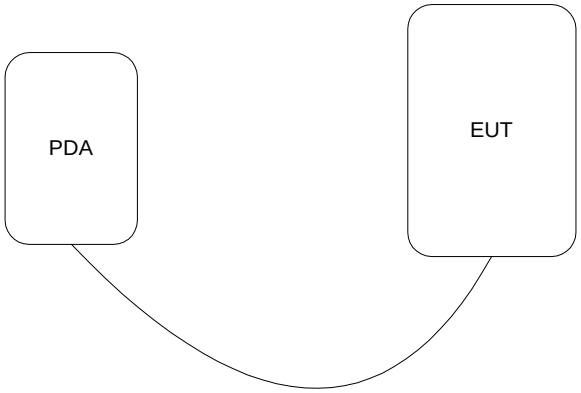
Frequency (MHz)	Description
2402	Low Channel
2441	Mid Channel
2480	High Channel
20	Crystal
13	Crystal
6	Crystal
3.6864	Crystal
0.032768	Crystal

1.3.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	Battery Operated	-	-	DC	-	None

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



1.5 EUT Configurations

Mode #	Description
1	EUT connected to Blackberry PDA via USB cable. EUT is orientated in worse case configuration.

Note: EUT was checked in all three orthogonal axes to determine worse case orientation. It is in this orientation that all testing was performed.

1.6 EUT Operation Modes

Mode #	Description
1	EUT operating under DH5 modulation. Fo = 2402GHz.
2	EUT operating under DH5 modulation. Fo = 2441GHz.
3	EUT operating under DH5 modulation. Fo = 2480GHz.
4	EUT operating in receive mode.
5	EUT operating under DH5 modulation with hopping enabled.
6	Inquiry Mode

Note: It was determined that DH5 represented the worse case modulation scheme. It is this modulation that all testing was performed.

2.0 Summary

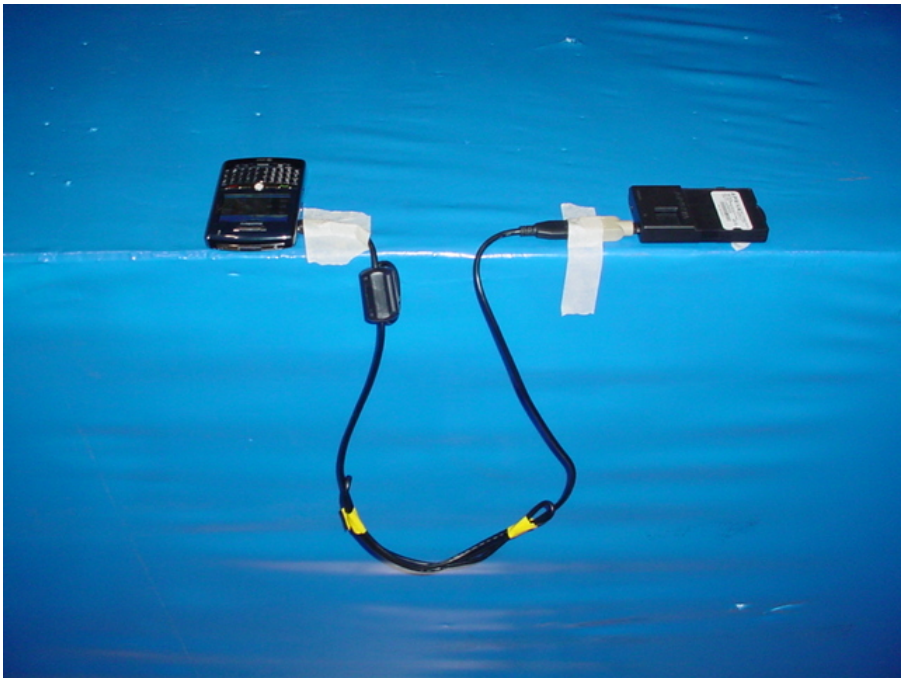
The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

For Radiated Emissions (30-1000MHz): Added ferrite, Mfg: Fair-Rite Part Number 0446167281, to USB cable. See photo for details.



2.3 Reference Standards

Standard Number	Standard Name	Standard Date
FCC Part 15, Subpart C, 15.231	Code of Federal Regulations, Part 15, Radio Frequency Devices	2007
FCC Part 15, Subpart B	Code of Federal Regulations, Part 15, Radio Frequency Devices	2007
RSS-GEN	General Requirements and Information for the Certification of Radiocommunication Equipment	2007
RSS-210	Low-Power License-Exempt Radiocommunication Devices (All frequency bands): Category I Equipment	2007

2.4 Results Summary

This product is considered Class B

Requirement – Test	Result (Compliant / Non-Compliant)*
Carrier Frequency Separation	Compliant
Number of Hopping Frequencies	Compliant
Occupied Bandwidth (20dB)	Compliant
Occupied Bandwidth (99%)	Compliant
Peak Power	Compliant
Time of Occupancy (Dwell Time)	Compliant
Band-edge Measurements	Compliant
Transmit Radiated Emissions	Compliant
Receiver Radiated Emissions	Compliant

Test Engineer:

Mike Antola (Ext.23053)
Senior Project Engineer
International EMC Services
Conformity Assessment Services-

Reviewer:

Bob DeLisi (Ext.22452)
Senior Staff Engineer
International EMC Services
Conformity Assessment Services

Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

---------- North America ----------

Code of Federal Regulations Title 47	Part 15, Subpart B, Radio Frequency Devices
Code of Federal Regulations Title 47	Part 15, Subpart C, Radio Frequency Devices
Industry Canada	RSS-GEN, RSS-210, ICES-003

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150

4.1 Test Conditions and Results – Occupied Bandwidth

Test Description	Measurements were made in the laboratory environment. The output of the EUT antenna was attached to the input of a spectrum analyzer by way of a coaxial connector and attenuator. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	CFR 47, Part 15, Subpart C; RSS-GEN; RSS-210

Table 1 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1,2,3,6
Supplementary information: None		

Table 2 Occupied Bandwidth Spectrum Analyzer Settings

Resolution Bandwidth (MHz)	Occupied Bandwidth Requirements	
	dBc	%
1% of the Span	-20	99
Supplementary information: None		

Table 3 Occupied Bandwidth Test Results

Mode	20dB Bandwidth	99% Bandwidth
Low Channel	2.66MHz	2.645MHz
Mid Channel	2.61MHz	2.605MHz
High Channel	2.51MHz	2.565MHz
Inquiry	3.24MHz	2.525MHz

Table 4 Occupied Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB40	34968
10dB Attenuator	MCL	BW-N20W5+	31618
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Measurement Software	UL	Version 9.3	44740

Figure 1 Test Setup for Occupied Bandwidth

Figure 2 Occupied Bandwidth Graph (Low Channel - 20dB Bandwidth)

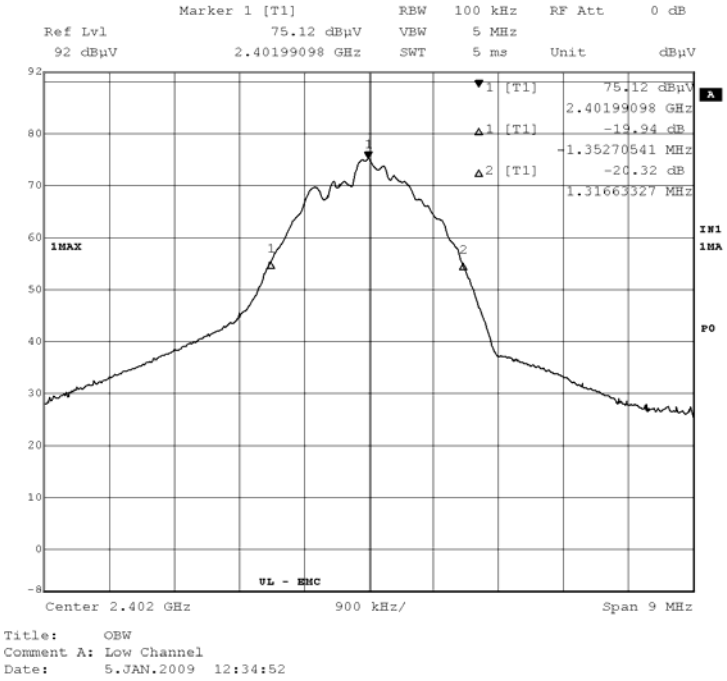


Figure 3 Occupied Bandwidth Graph (Mid Channel - 20dB Bandwidth)

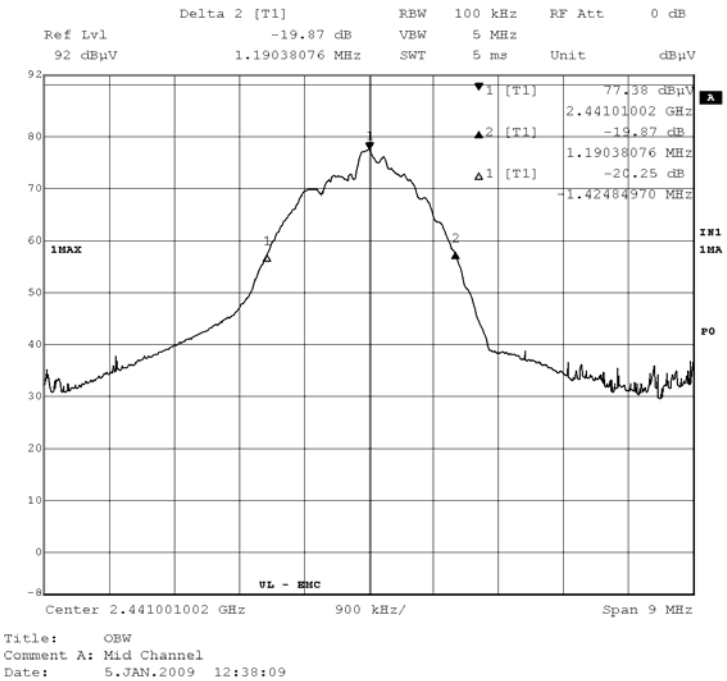


Figure 4 Occupied Bandwidth Graph (High Channel - 20dB Bandwidth)

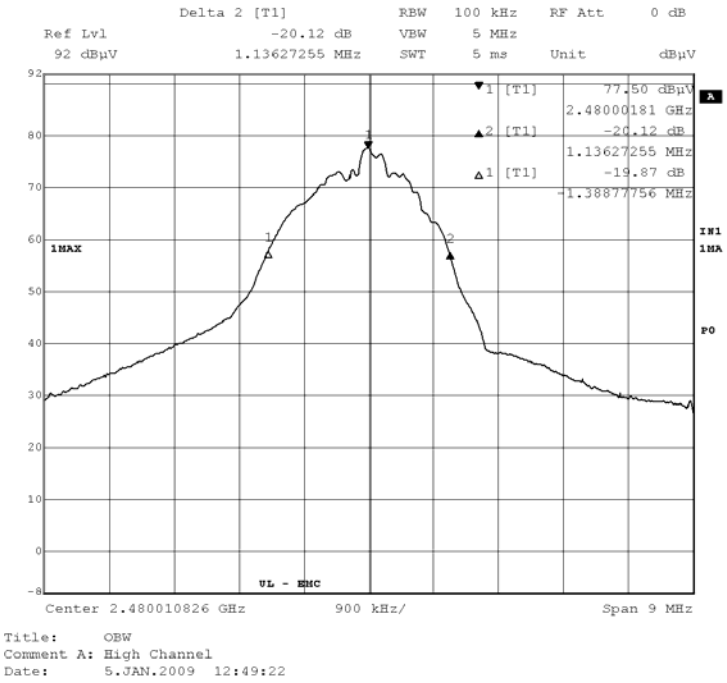


Figure 5 Occupied Bandwidth Graph (Inquiry - 20dB Bandwidth)

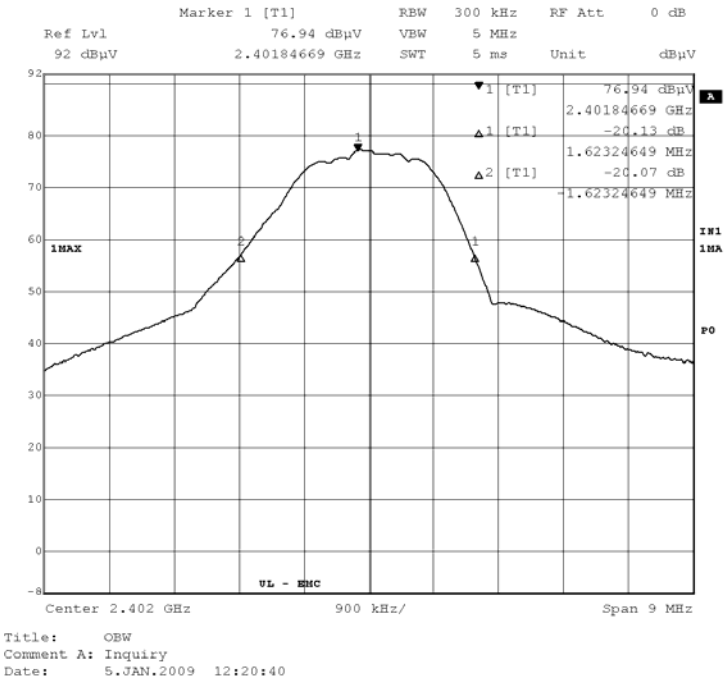


Figure 6 Occupied Bandwidth Graph (Low Channel – 99% Bandwidth)

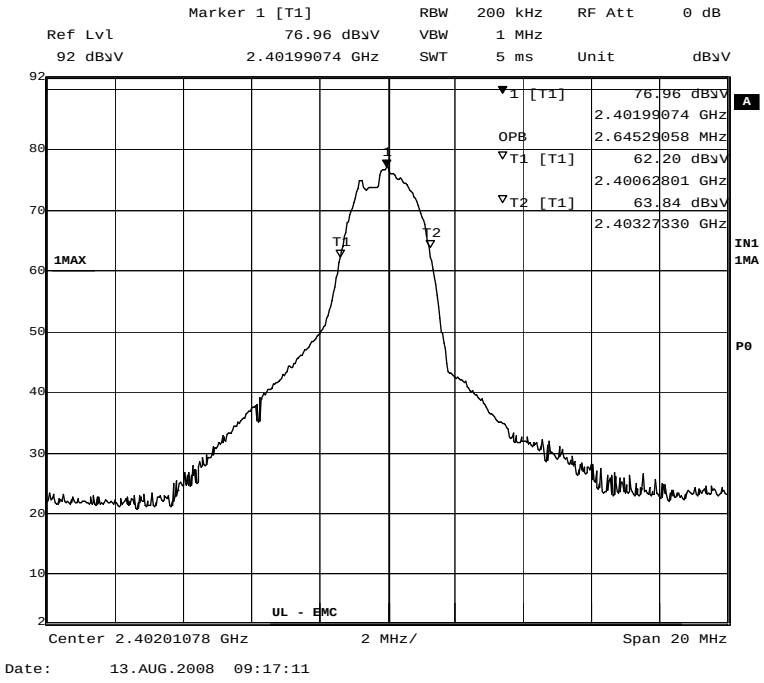


Figure 7 Occupied Bandwidth Graph (Mid Channel – 99% Bandwidth)

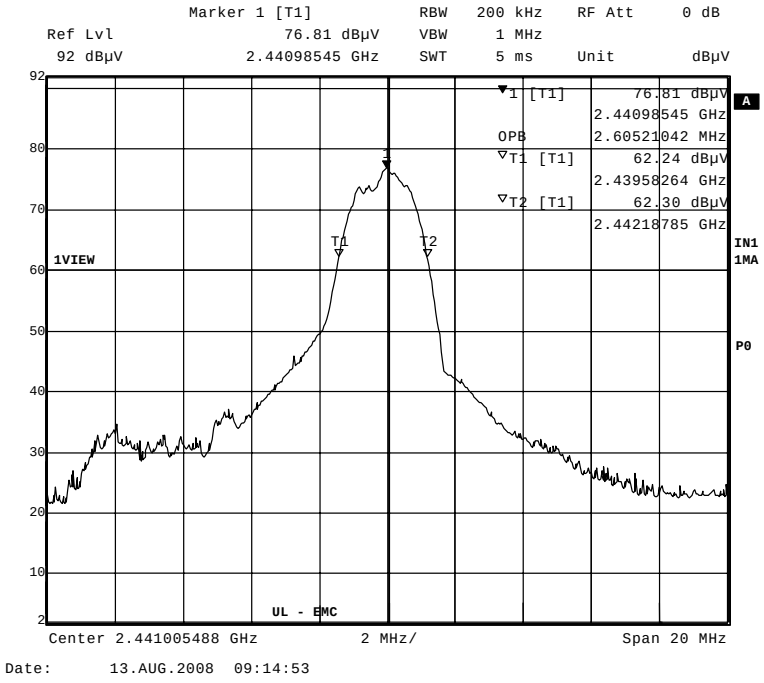


Figure 8 Occupied Bandwidth Graph (High Channel – 99% Bandwidth)

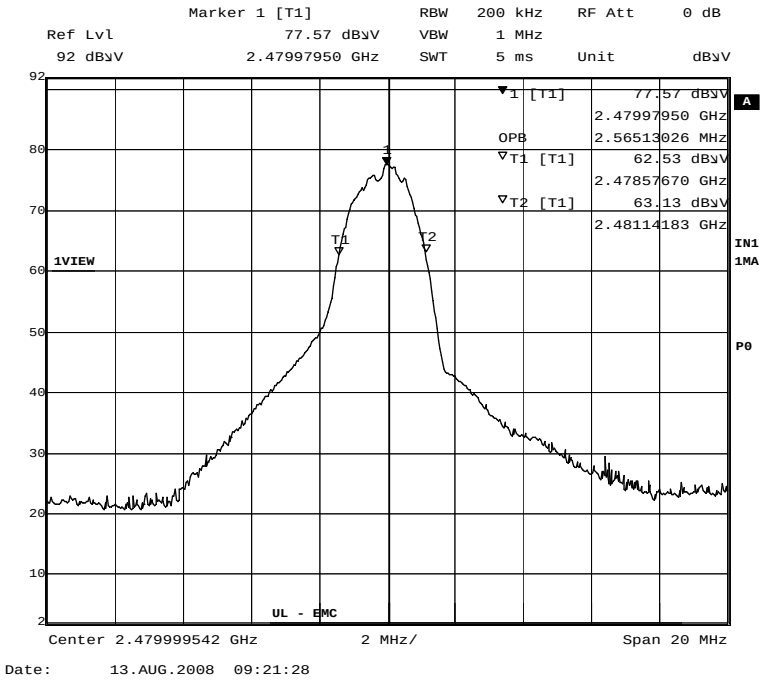
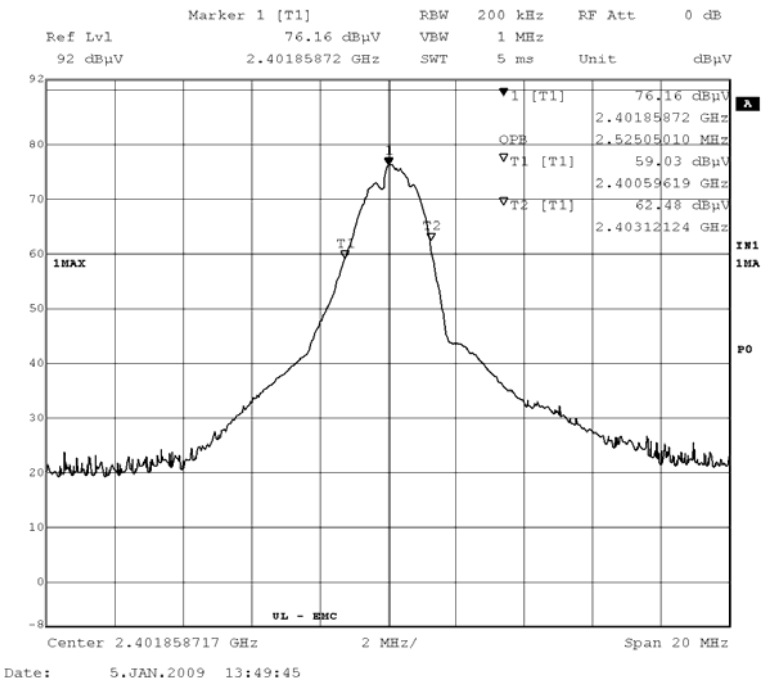


Figure 9 Occupied Bandwidth Graph (Inquiry – 99% Bandwidth)



4.2 Test Conditions and Results – Peak Power

Test Description	Measurements were made in the laboratory environment. The EUT was connected directly to the input of a spectrum analyzer by way of an attenuator. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	CFR 47, Part 15, Subpart C Section 15.247 (b)
Peak Power Limits	
1 watt (Hopping Modes)	
0.125 watt (Inquiry Mode)	

Table 5 Peak Power Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1,2,3,6
Supplementary information: None		

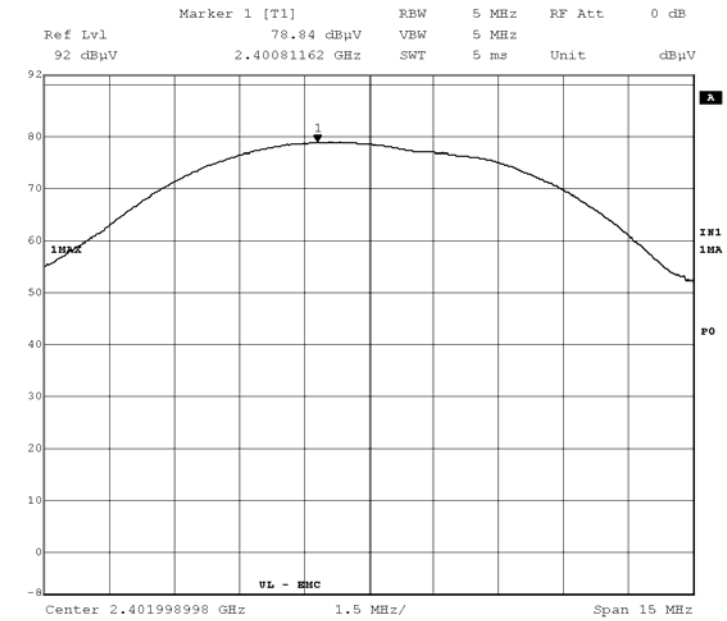
Table 6 Peak Power Spectrum Analyzer Settings

Resolution Bandwidth (MHz)	Video Bandwidth (MHz)	Span
> 20dB bandwidth	> RBW	Approx 5 times the 20dB bandwidth
Supplementary information: None		

Table 7 Peak Power Test Equipment

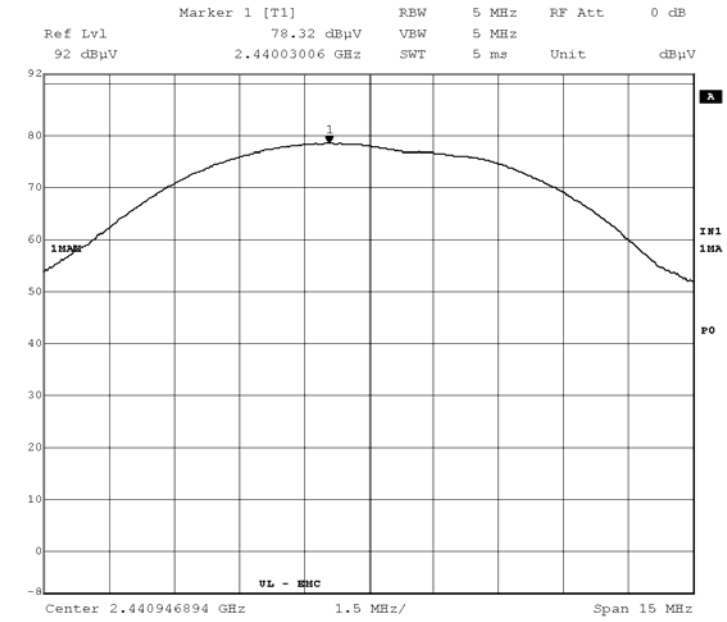
Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB40	34968
10dB Attenuator	MCL	BW-N20W5+	31618
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268

Figure 10 Peak Power Graph – Low Channel



Title: Peak Power
Comment A: Low Channel
Date: 5.JAN.2009 13:00:15

Figure 11 Peak Power Graph – Mid Channel



Title: Peak Power
Comment A: Mid Channel
Date: 5.JAN.2009 12:56:14

Figure 13 Peak Power Graph – High Channel

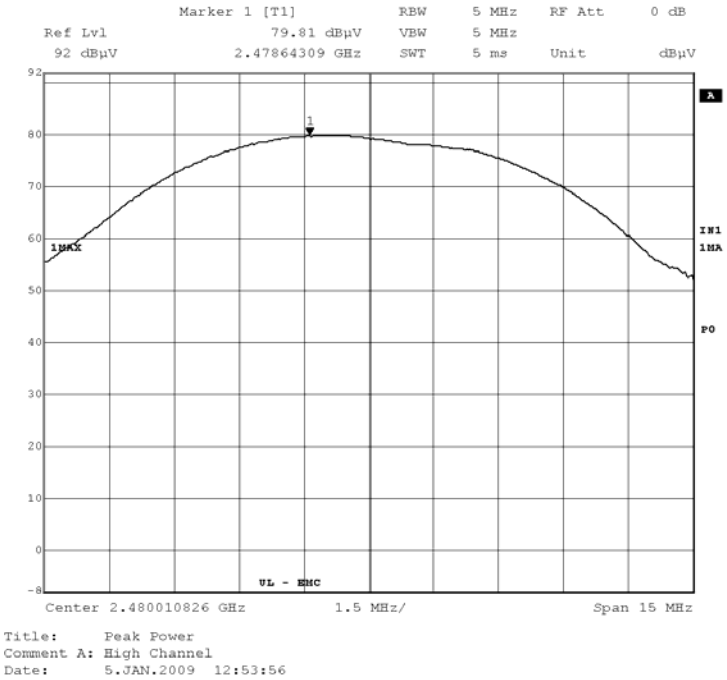


Figure 14 Peak Power Graph – Inquiry

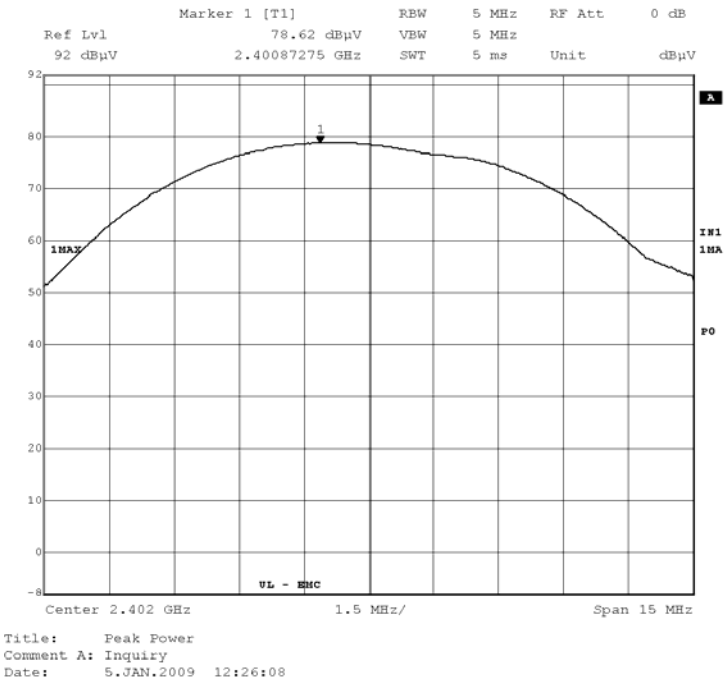


Table 15 Peak Power Calculations

Apriva
Freq Hopping Spectrum Xnsmitter
BT200 Card Reader
Job: 937689

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Attenuator Factor [dB]	Level [dB(uV)]	Level [mW]	Limit:1 [mW]	2	3	4	5
Low Channel										
2400	78.84 pk	2.6	10	91.44	0.02	1000	-	-	-	-
				Margin:		-999.98	-	-	-	-
Middle Channel										
2441	78.32 pk	2.6	10	90.92	0.02	1000	-	-	-	-
				Margin:		-999.98	-	-	-	-
High Channel										
2480	79.81 pk	2.6	10	92.41	0.03	1000	-	-	-	-
				Margin:		-999.97	-	-	-	-
Inquiry										
2400	78.62 pk	2.6	10	91.22	0.02	-	125	-	-	-
				Margin:		-	-124.98	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.247 (1 watt)
LIMIT 2: FCC Part 15 Subpart C 15.247 (0.125 watt)
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

4.3 Test Conditions and Results – Band-Edge Measurement

Test Description	Measurements were made in the laboratory environment. The output of the transmitter was attached directly to the input of a spectrum analyzer, with a 20dB attenuator in line. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	CFR 47, Section 15.247c
Band-Edge Criteria	
Frequency range shall lie within the band 2.390GHz to 2.4835GHz (f_L > 2.390GHz and f_H < 2.4835GHz)	

Table 8 Band-Edge Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1,3
Supplementary information: None		

Table 9 Band-Edge Spectrum Analyzer Settings

Resolution Bandwidth	Video Bandwidth	Detector	Sweep Time	Span	Trace Mode
1% of Span	>RBW	Peak	Auto	Wide enough to capture complete power envelope	Max Hold

Table 10 Band-Edge Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB 26	ME5B-081
20dB Attenuator	MCL	BW-N20W5+	31618
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268

Figure 16 Test Setup for Band-Edge

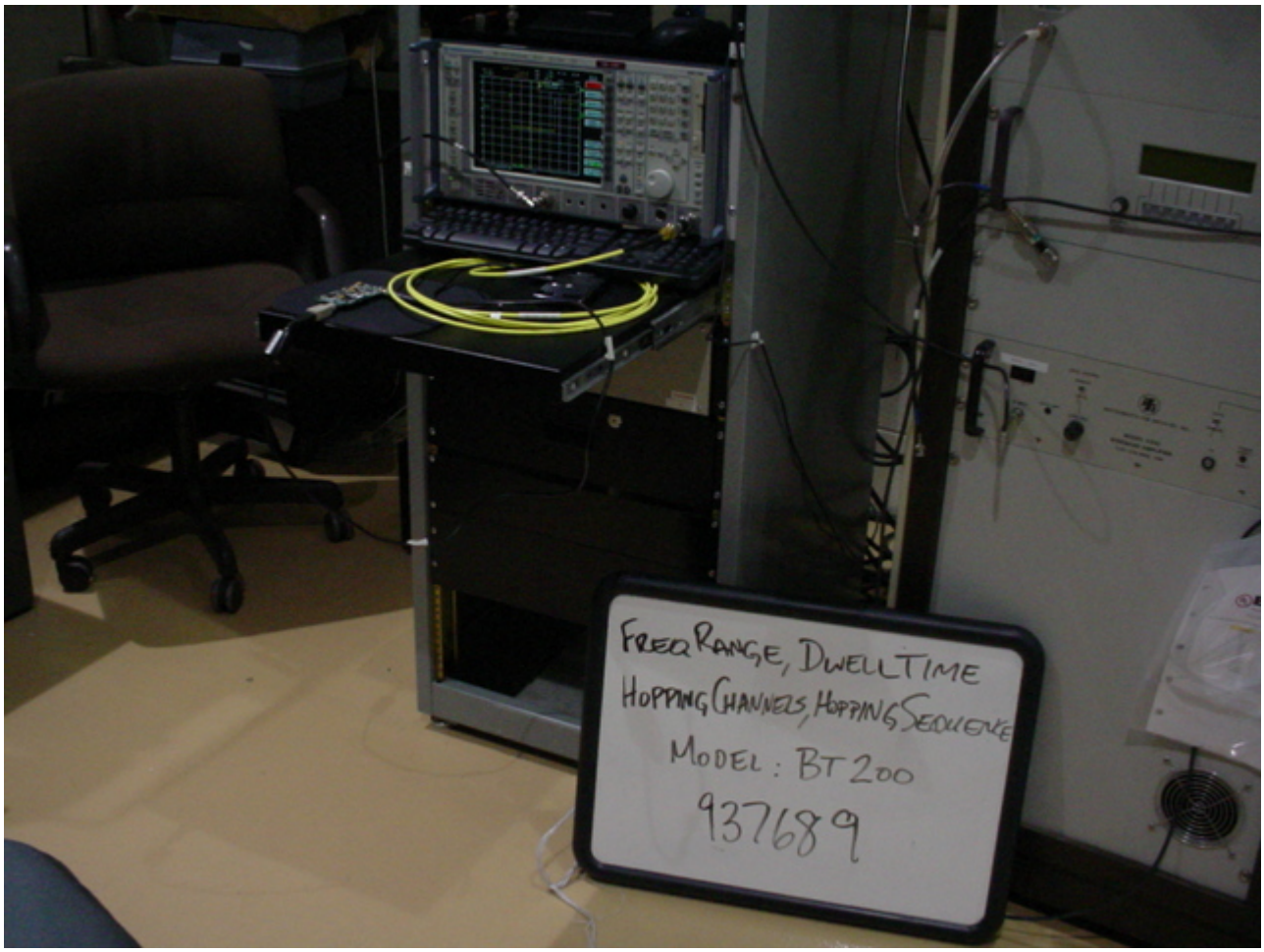
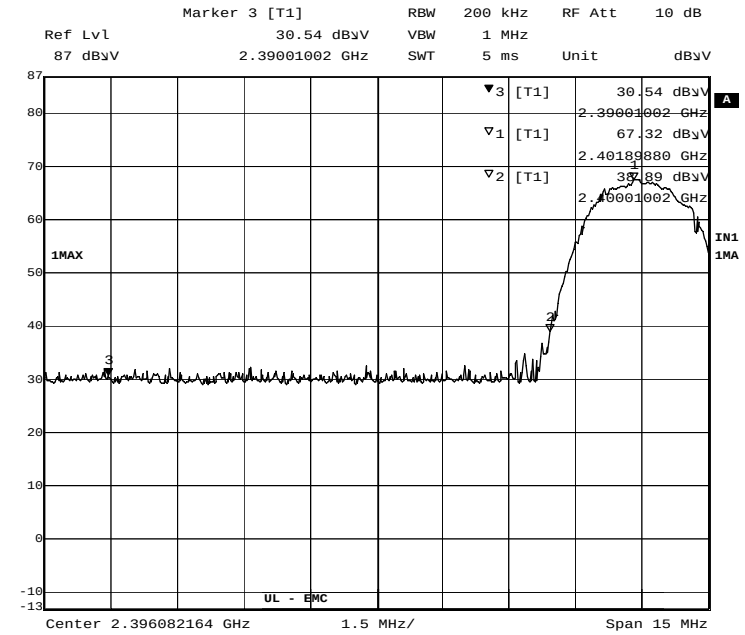
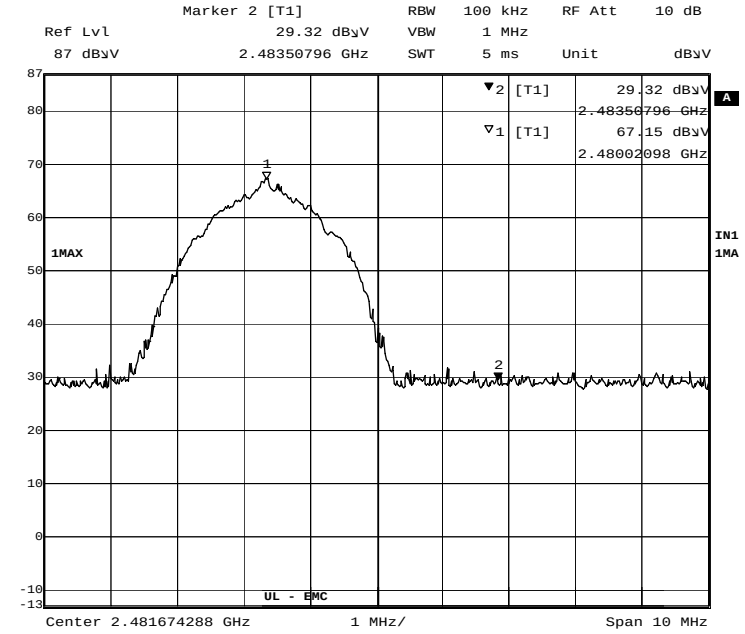


Figure 17 Plots for Band-Edge





4.4 Test Conditions and Results – Number of Hopping Channels

Test Description	Measurements were made in the laboratory environment. The output of the transmitter was attached directly to the input of a spectrum analyzer, with a 20dB attenuator in line. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	CFR 47, Part 15, Subpart C, Section 15.247a
Number of Channels Criteria	
>15	

Table 11 Number of Hopping Channels Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	5,6
Supplementary information: None		

Table 12 Number of Hopping Channels Spectrum Analyzer Settings

Resolution Bandwidth	Video Bandwidth	Number of Channels Measured
100kHz	1MHz	79 (Hopping Mode)
100kHz	300kHz	32 (Inquiry Mode)
Supplementary information: None		

Table 13 Number of Hopping Channels Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
20dB Attenuator	MCL	BW-N20W5+	31618
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268

Figure 18 Test Setup for Number of Hopping Channels

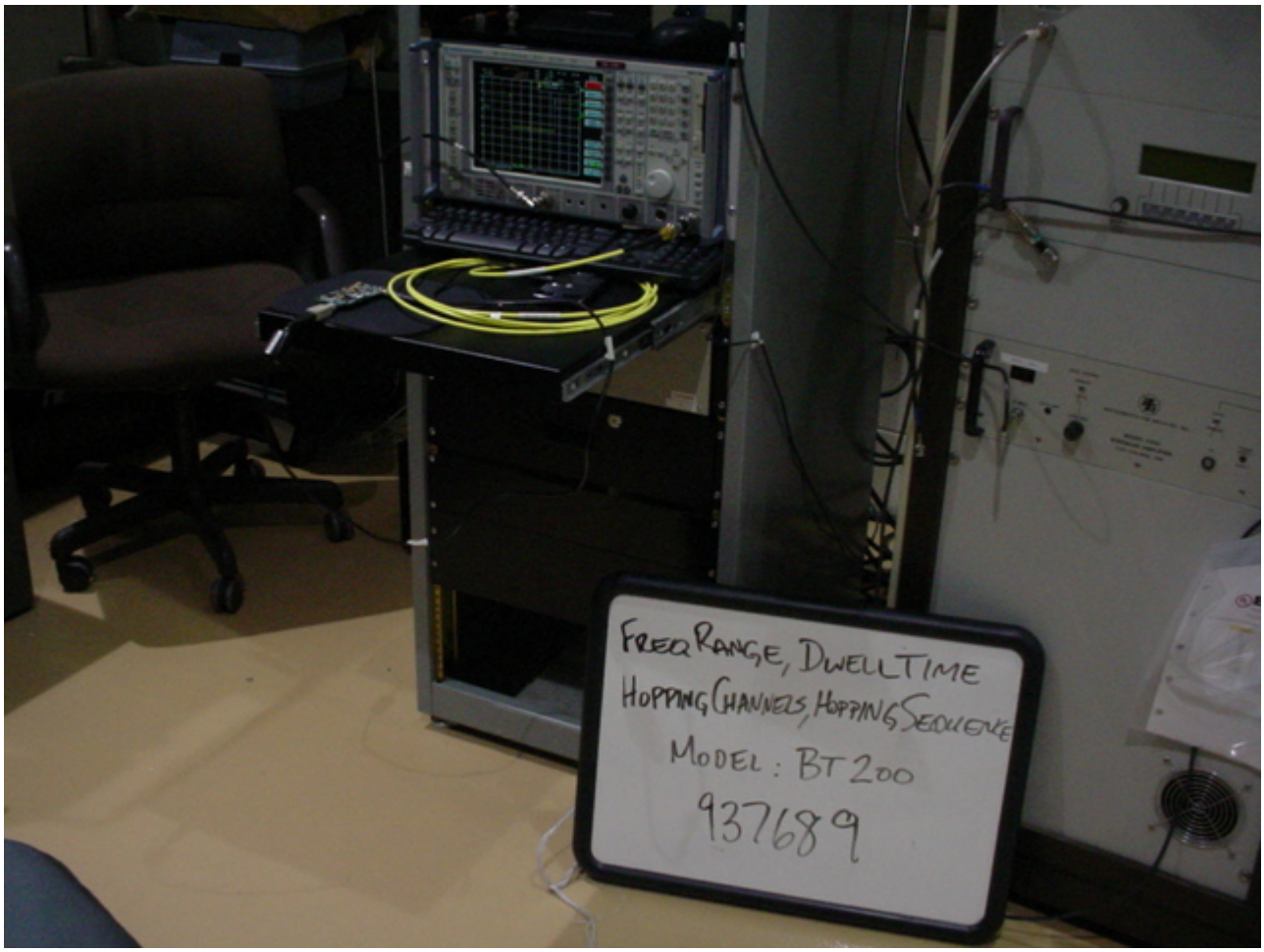


Figure 19 Number of Hopping Channels Graph

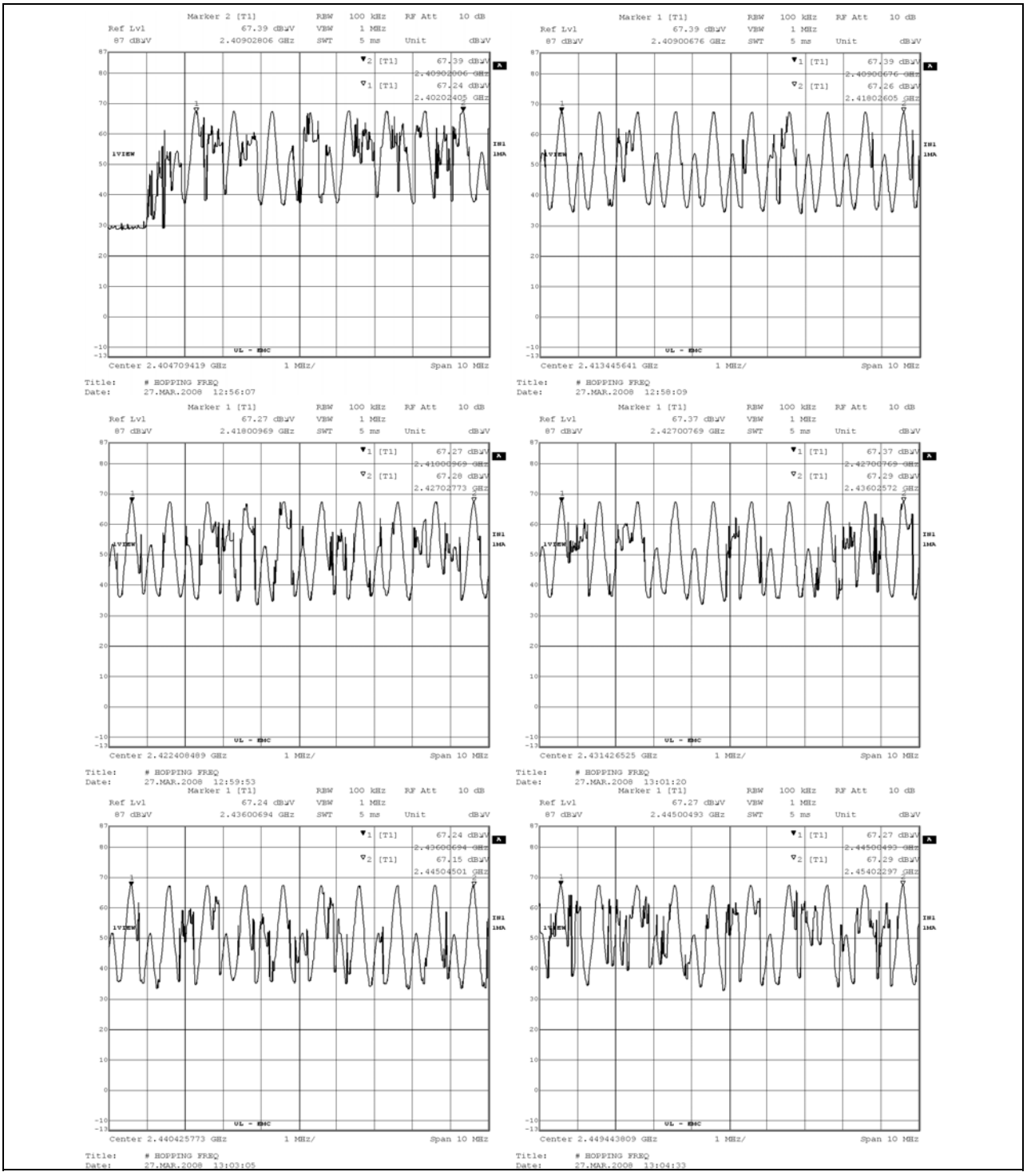


Figure 20 Number of Hopping Channels Graph

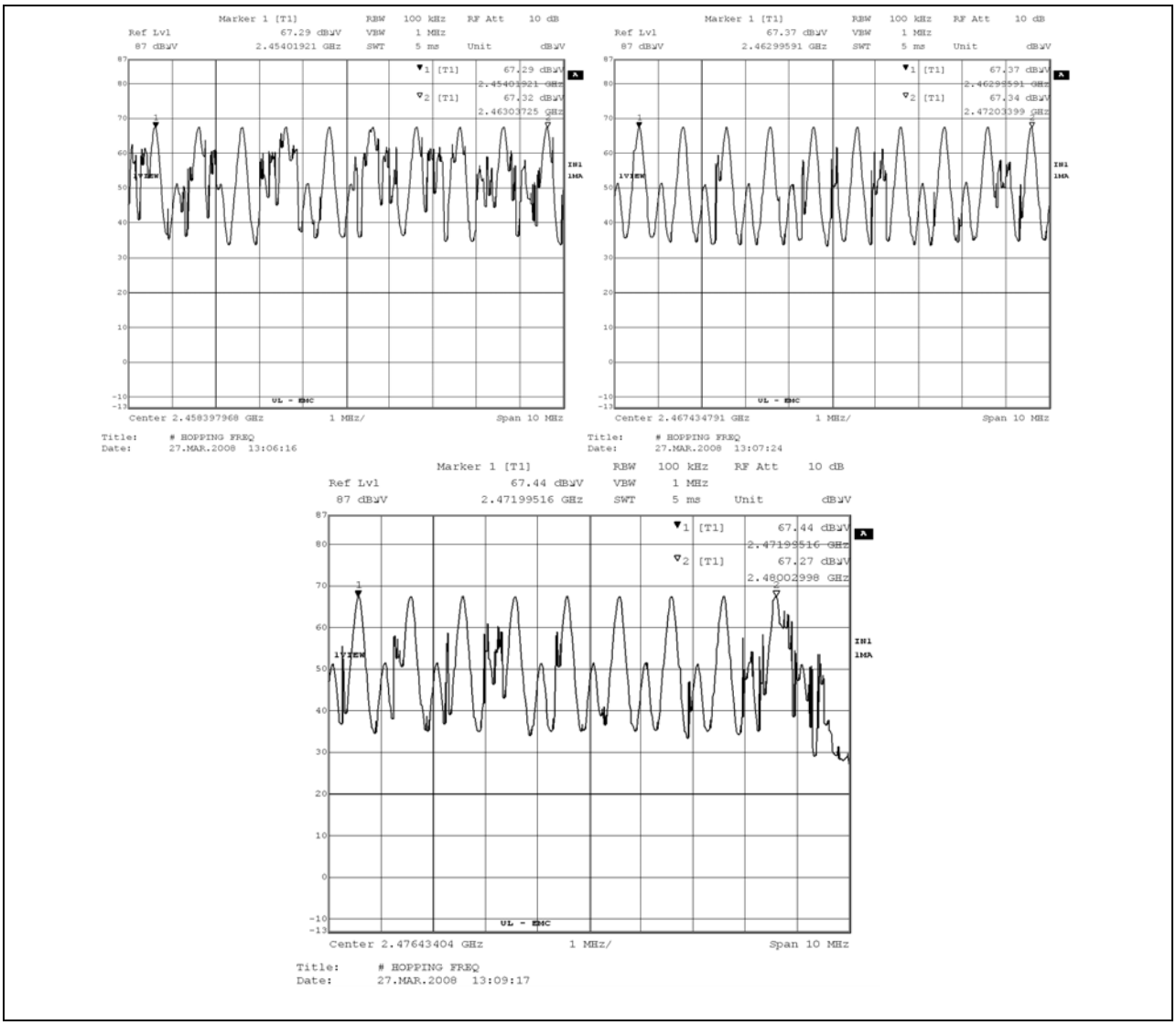
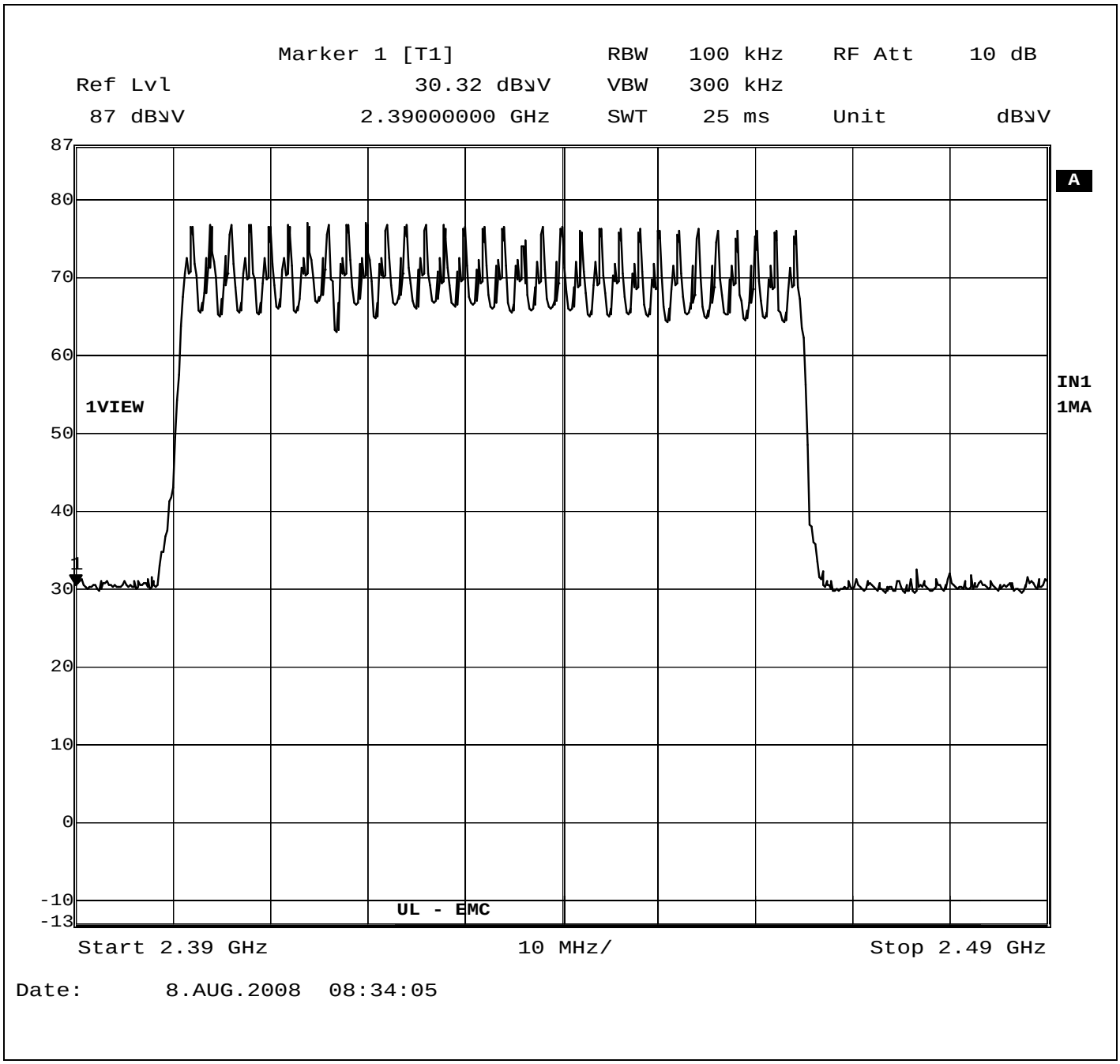


Figure 21 Number of Hopping Channels Graph – Inquiry Mode



4.5 Test Conditions and Results – Channel Separation

Test Description	Measurements were made in the laboratory environment. The output of the transmitter was attached directly to the input of a spectrum analyzer, with a 20dB attenuator in line. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	CFR 47, Part 15, Subpart C, Section 15.247a
Minimum Channel Separation Criteria	
>25kHz	

Table 14 Channel Separation Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	5,6
Supplementary information: None		

Table 15 Channel Separation Results

Mode of Operation	Channel Separation Measured
DH5 Modulation	1.002MHz
Inquiry Mode	2.04MHz
Supplementary information: None	

Table 16 Channel Separation Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
20dB Attenuator	MCL	BW-N20W5+	31618
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268

Figure 22 Test Setup for Channel Separation

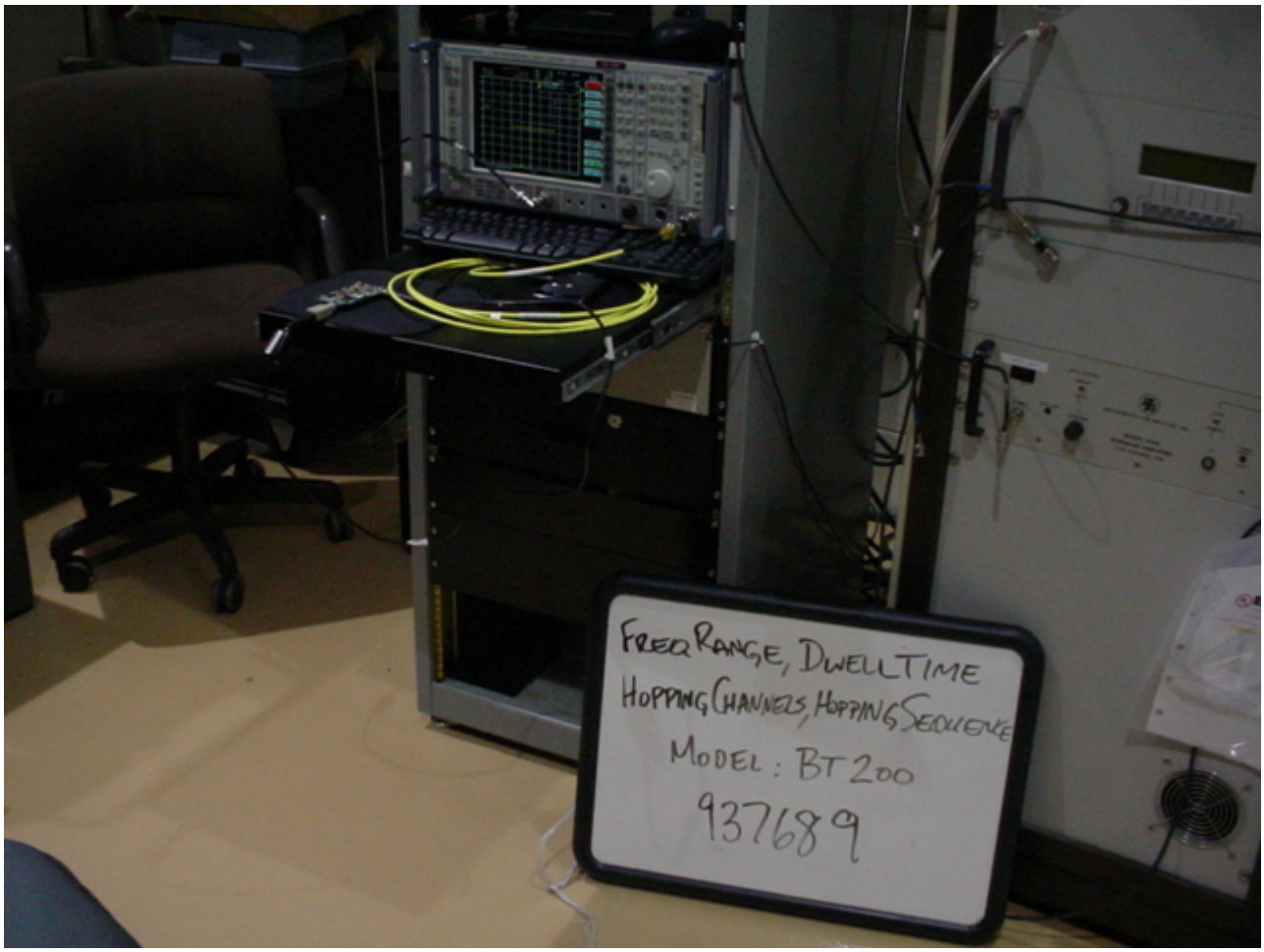
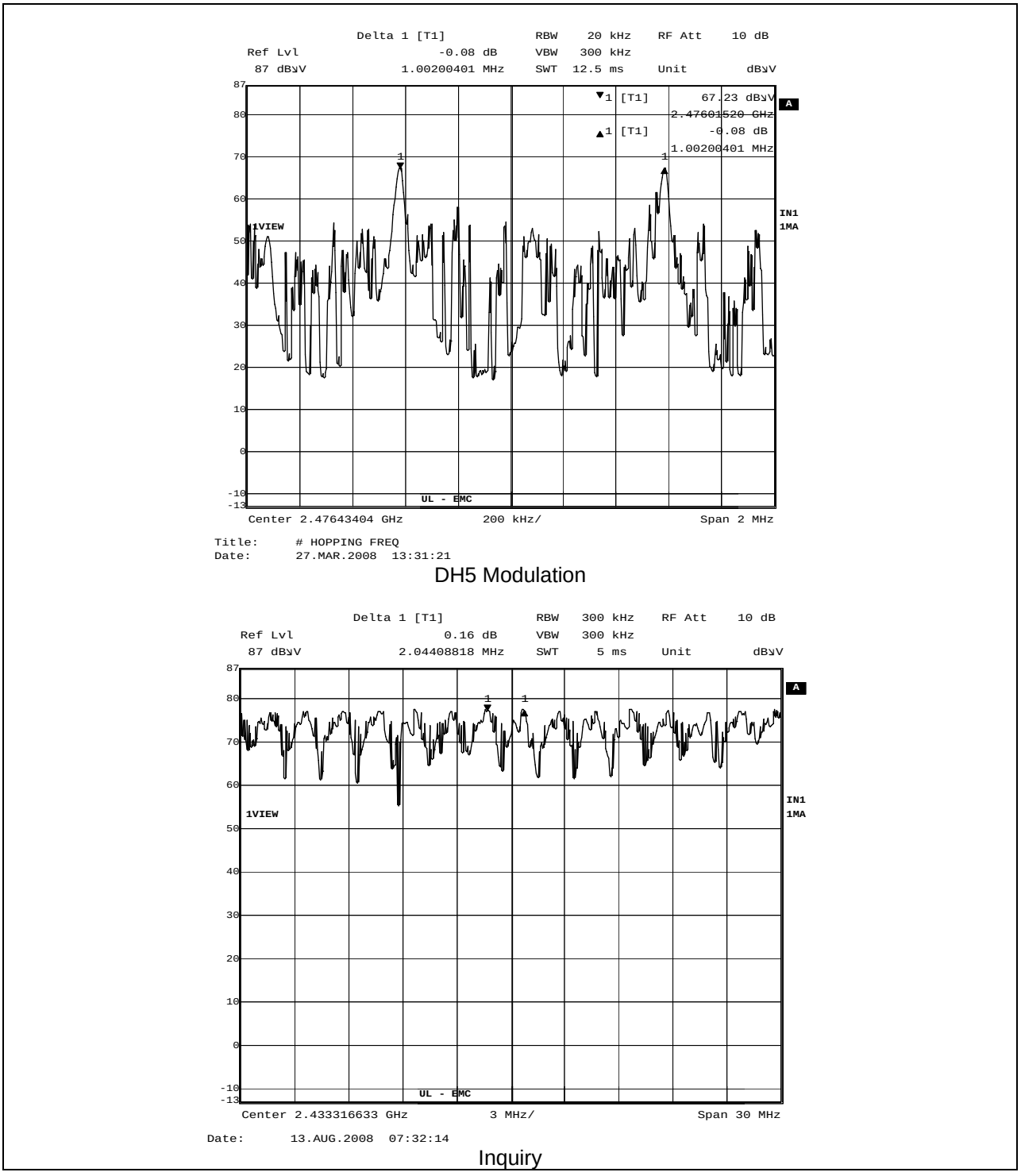


Figure 23 Channel Separation Graph



4.6 Test Conditions and Results – Dwell Time

Test Description	Measurements were made in the laboratory environment. The output of the transmitter was attached directly to the input of a spectrum analyzer, with a 20dB attenuator in line. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	CFR 47, Part 15, Subpart C, Section 15.247a
Dwell Time Criteria	
Shall not exceed 0.4s	

Table 17 Dwell Time Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	5,6
Supplementary information: None		

Table 18 Dwell Time Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
20dB Attenuator	MCL	BW-N20W5+	31618
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268

Figure 24 Test Setup for Dwell Time

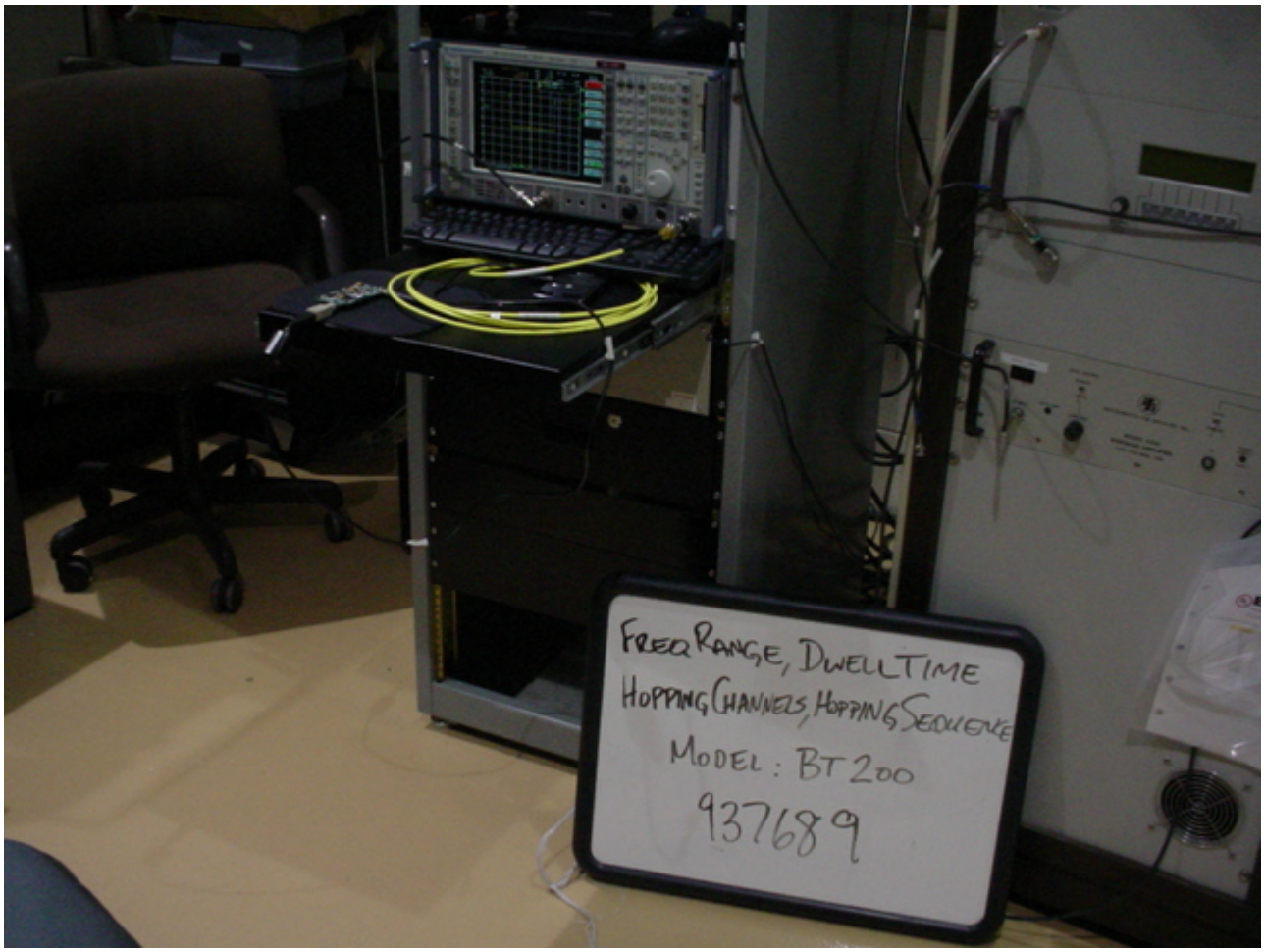


Figure 25 Inquiry Mode – Hop Counts

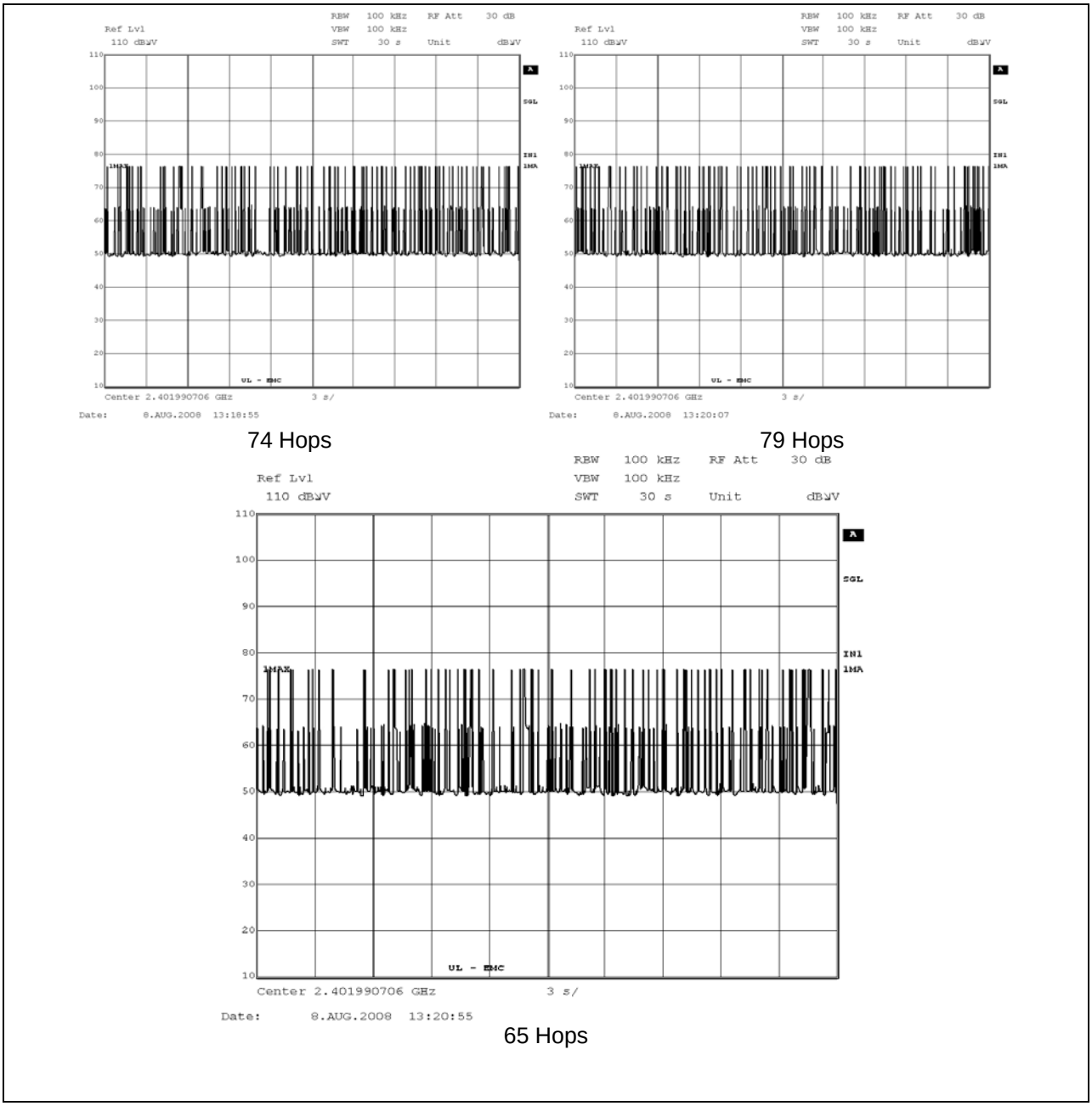
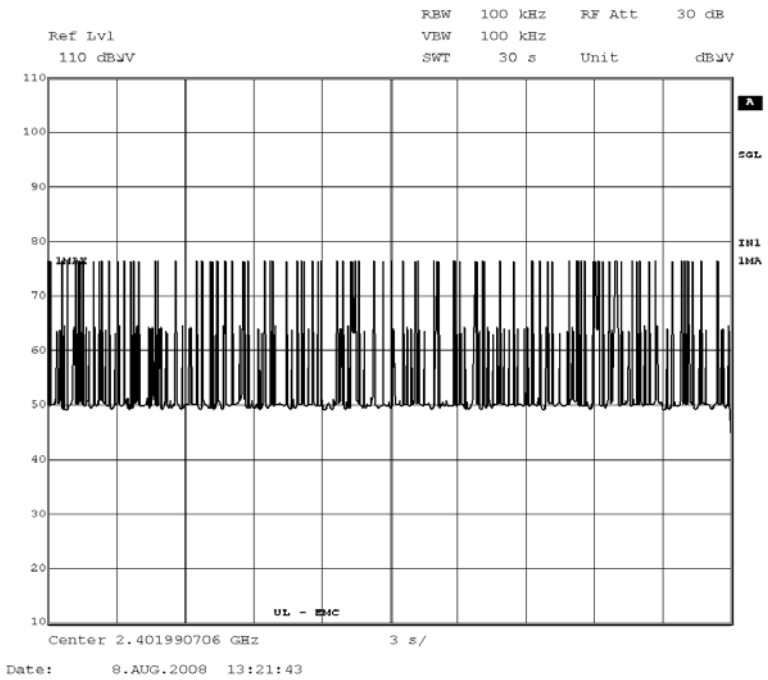
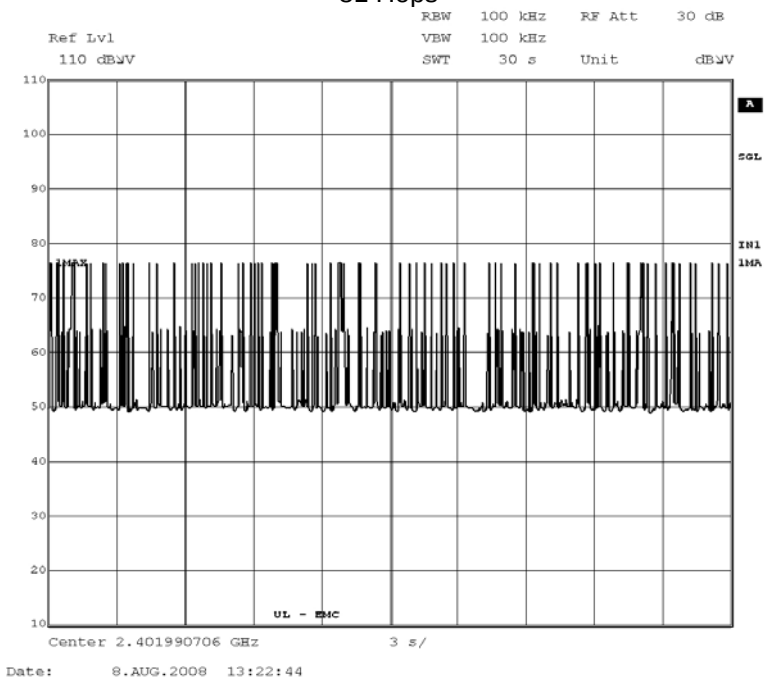


Figure 26 Inquiry Mode – Hop Counts



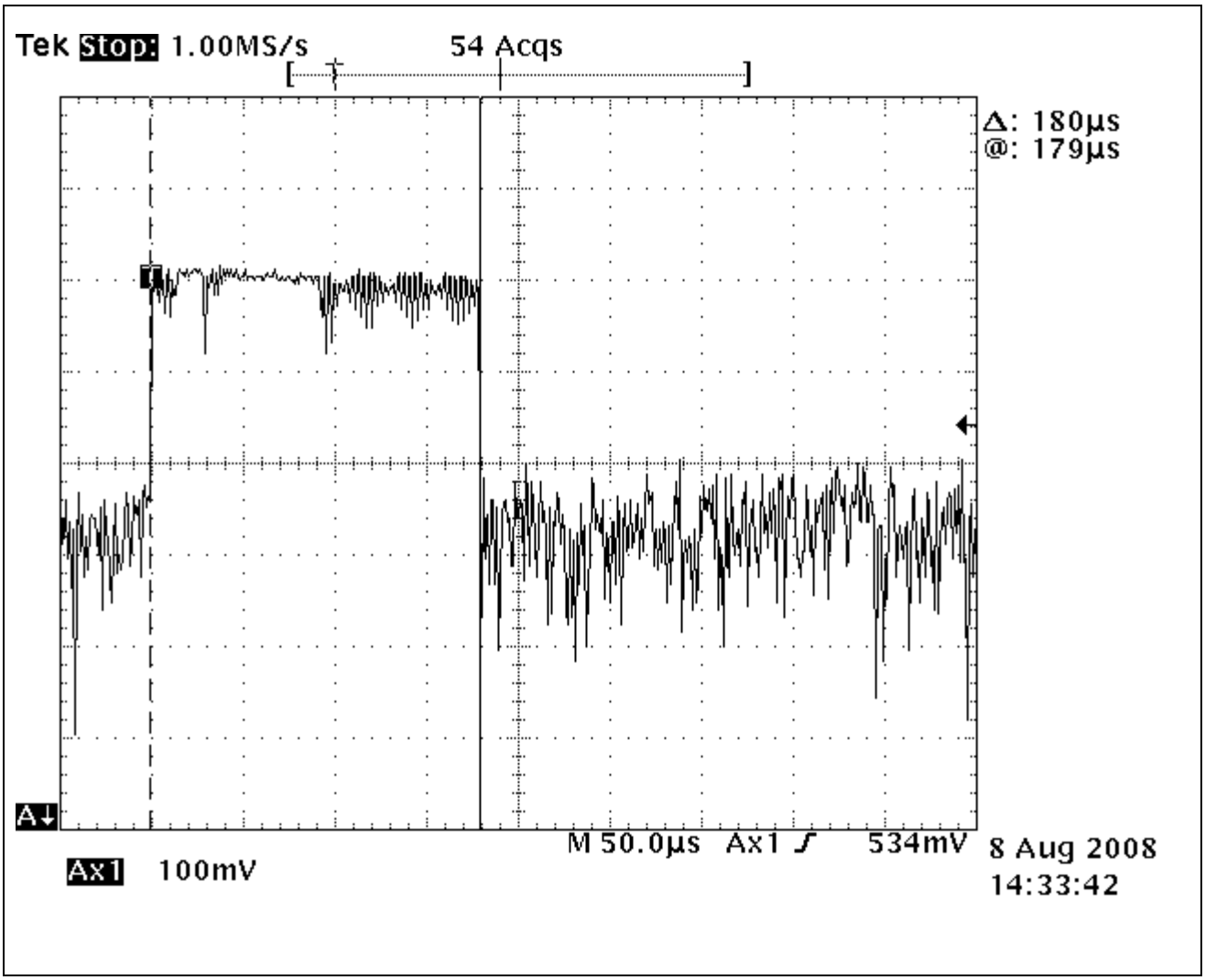
81 Hops



71 Hops

Average Hop Count per Second = [(71+81+65+79+74)/5] / 30 = 2.467

Figure 27 Inquiry Mode – Duty Cycle



Calculations

Number of Hopping Channels = 32 (from Section 4.4)

Period Time = (0.4)(Number of Channels) = (0.4)(32) = 12.8

Dwell Time = [Average Hop Count per Second]*[Period Time]*[Pulse Time]
= [2.467]*[12.8]*[0.00018]
= 5.68ms (Limit: < 400ms)

Figure 28 DH5 Modulation Mode – Hop Counts

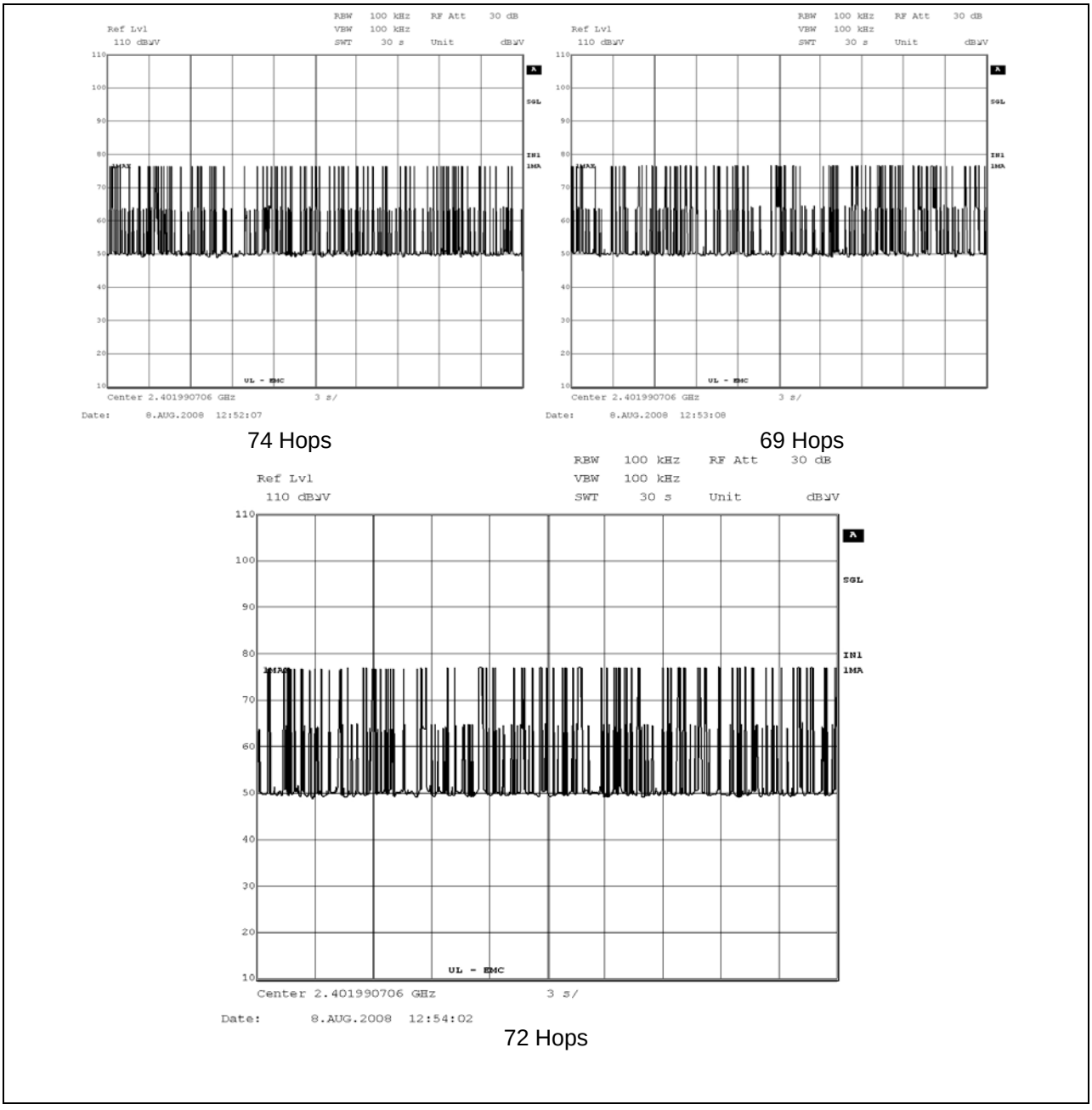
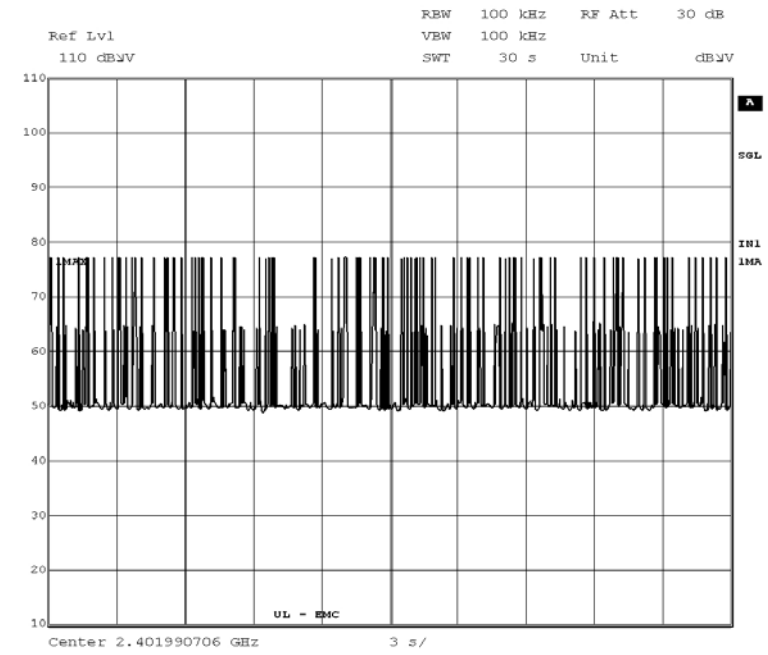
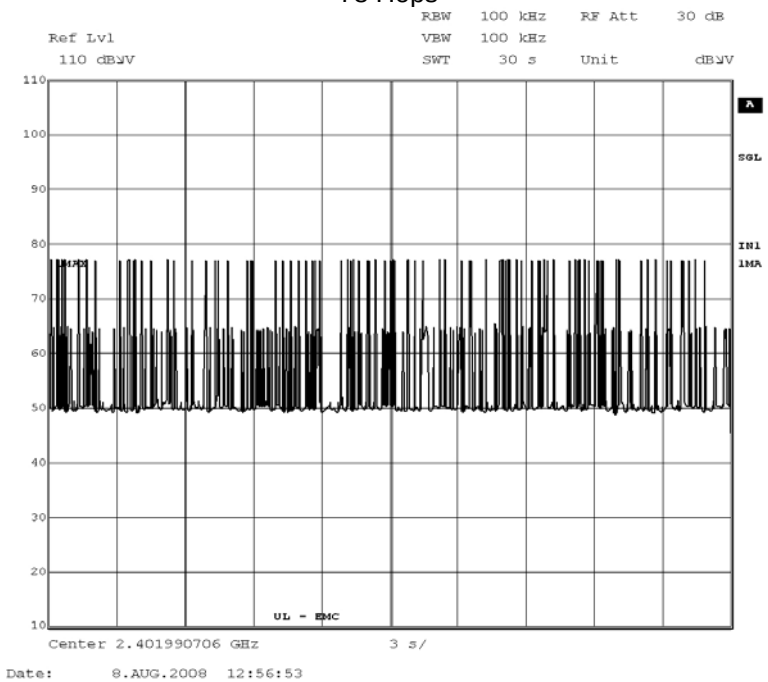


Figure 29 DH5 Modulation Mode – Hop Counts



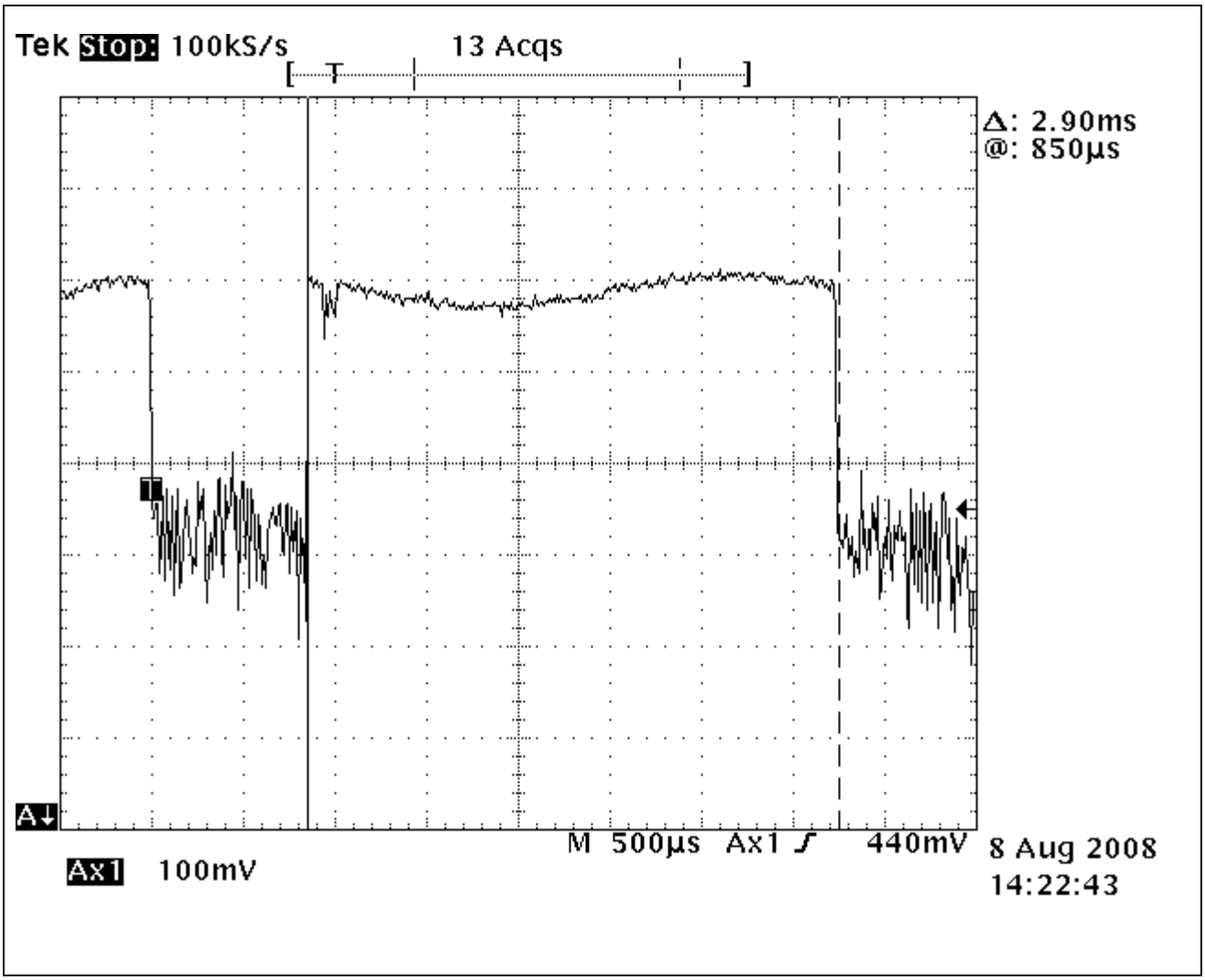
78 Hops



71 Hops

Average Hop Count per Second = [(71+78+72+74+69)/5] / 30 = 2.427

Figure 30 DH5 Modulation Mode – Duty Cycle



Calculations

Number of Hopping Channels = 79 (from Section 4.4)

Period Time = (0.4)(Number of Channels) = (0.4)(79) = 31.6

Dwell Time = [Average Hop Count per Second]*[Period Time]*[Pulse Time]
= [2.427]*[31.6]*[0.0029]
= 222ms (Limit: < 400ms)

4.7 Test Conditions and Results – Transmitter Spurious Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	CFR 47, Part 15, Subpart C, Section 15.247c	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	9kHz – 30MHz	(3 meter measurement distance)
	30MHz – 1GHz	(3 meter measurement distance)
	1 – 26.5GHz	(3 meter measurement distance)

Limits

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
0.009 – 0.490	128.5 – 93.8	-
0.490 – 1.705	73.8 – 63	-
1.705 – 30	69.5	-
30 – 88	40	-
88 – 216	43.5	-
216-960	46	-
960-1000	54	-
1000-26500	-	54

Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. It was determined that there were no products of the fundamental below 30MHz, so in the frequency range 9kHz to 30MHz, testing was only performed at one channel.

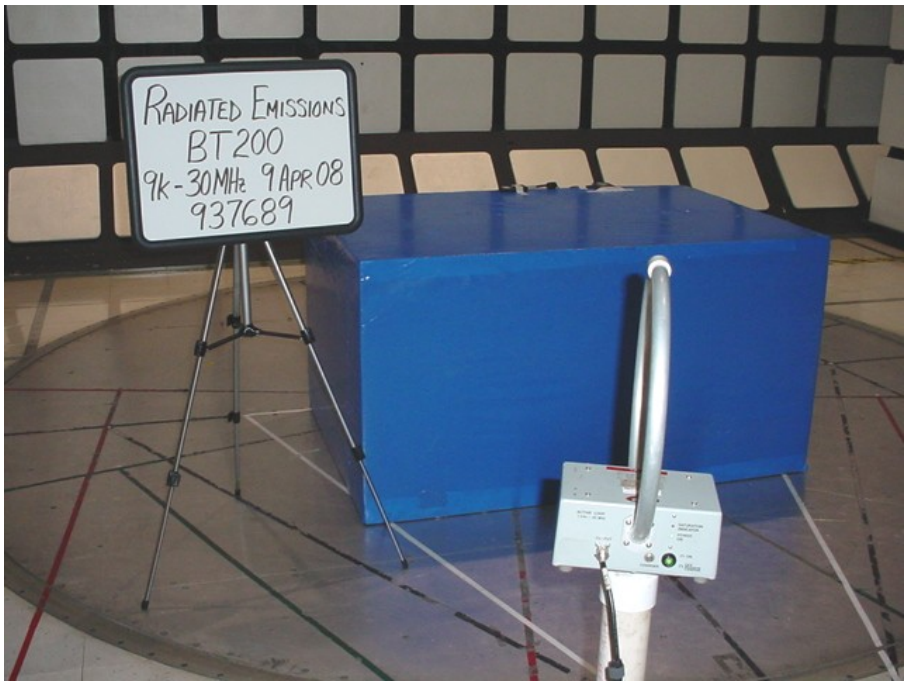
Table 19 Transmitter Spurious Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1,2,3
Supplementary information: None		

Table 20 Transmitter Spurious Emissions Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
60Hz-30MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Active Loop Antenna	EMCO	6507	ME5A-288
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
30-1000MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Bicon Antenna	Schaffner	VBA6106A	54
Log-P Antenna	Schaffner	UPA6109	44067
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Above 1GHz (Band Optimized System)			
Spectrum Analyzer	Agilent	E7405A	19695
Horn Antenna (2-4 GHz)	ETS	3161-02	48107
Horn Antenna (4-8 GHz)	ETS	3161-03	48106
Horn Antenna (8-12 GHz)	ETS	3160-07	8933
Horn Antenna (12-18 GHz)	ETS	3160-08	8932
Horn Antenna (18-26.5 GHz)	ETS	3160-09	8947
Horn Antenna (1-2GHz)	EMCO	3115	ME5A-766
Signal Path Controller	HP	11713A	50250
Gain Controller	HP	11713A	50251
RF Switch / Preamp Fixture	UL	BOMS1	50249
System Controller	UL	BOMS2	50252
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268

Figure 31 Test setup for Transmitter Spurious Emissions



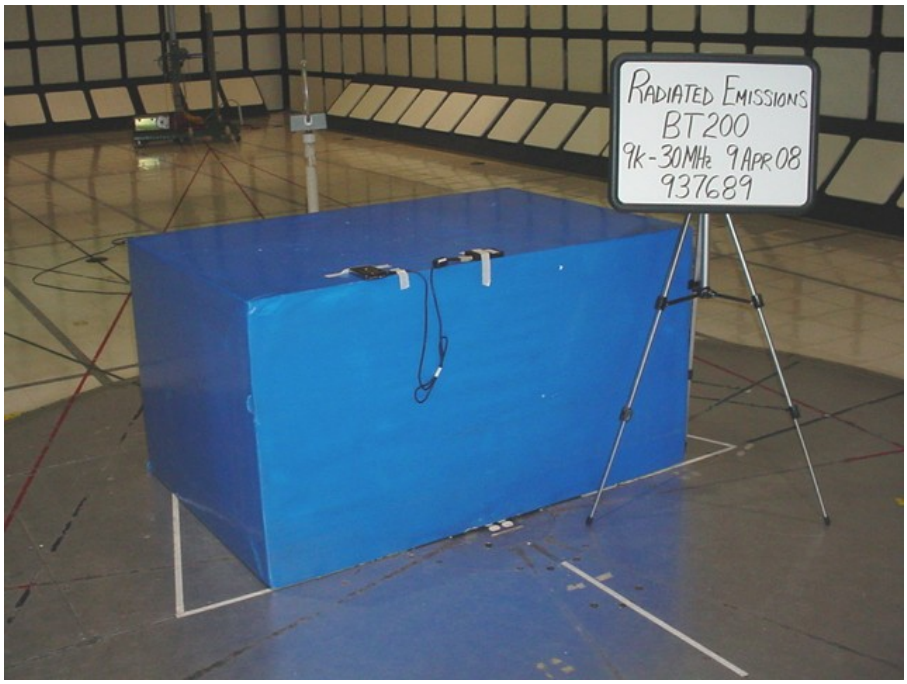
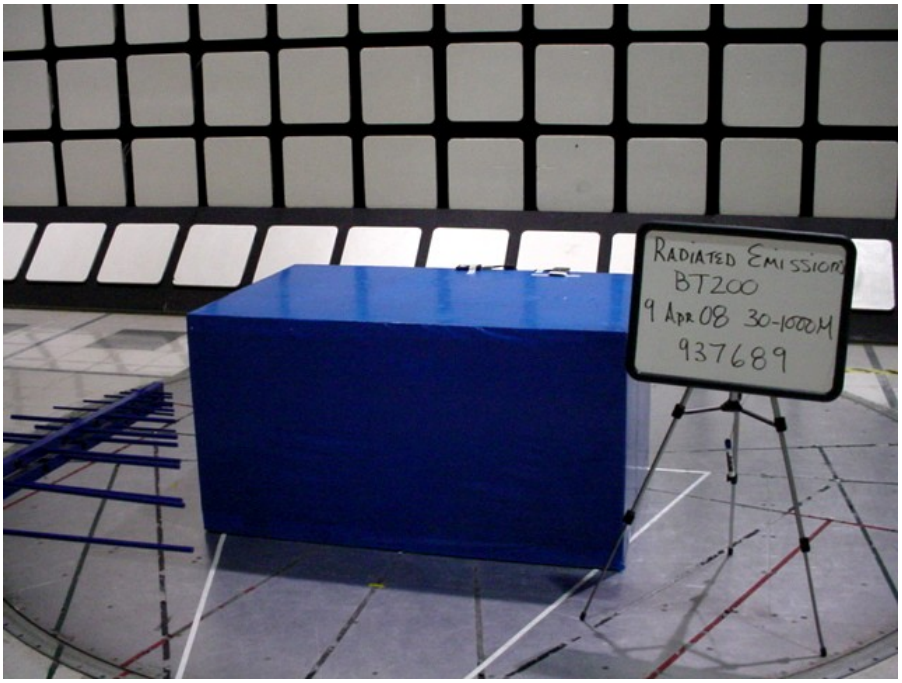


Figure 32 Test setup for Transmitter Spurious Emissions



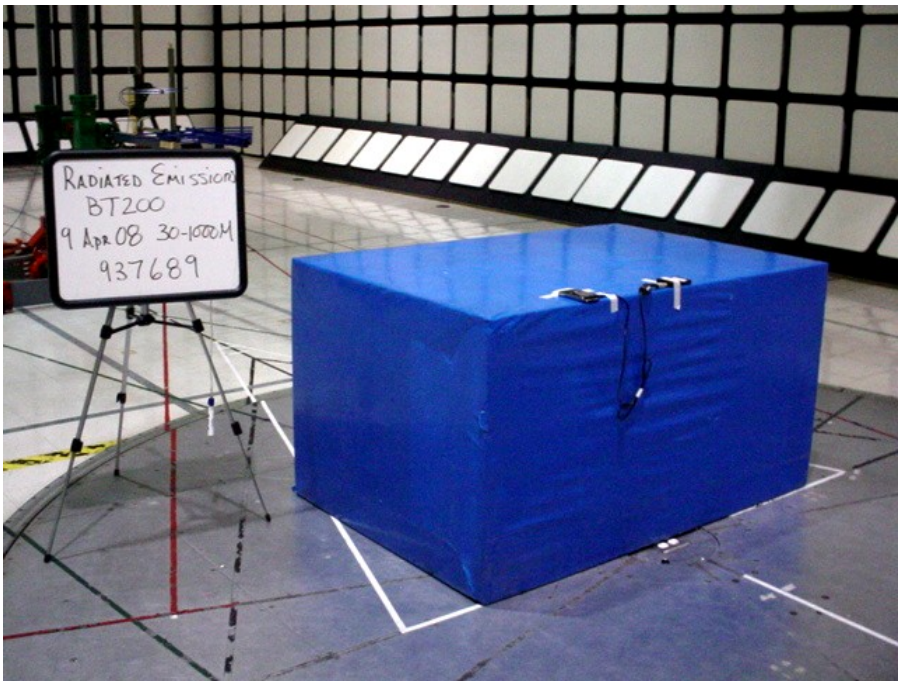
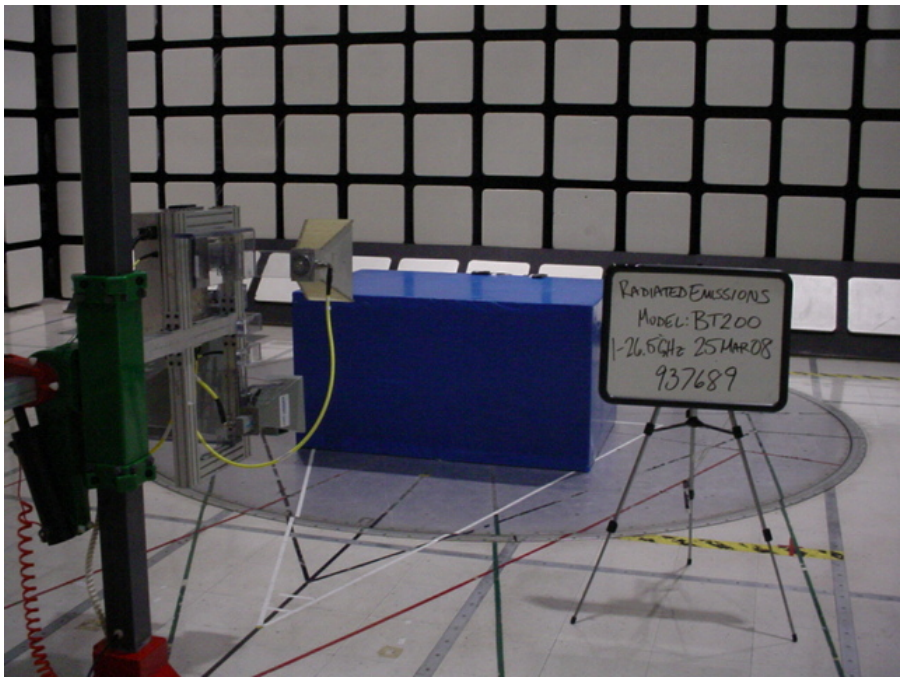


Figure 33 Test setup for Transmitter Spurious Emissions



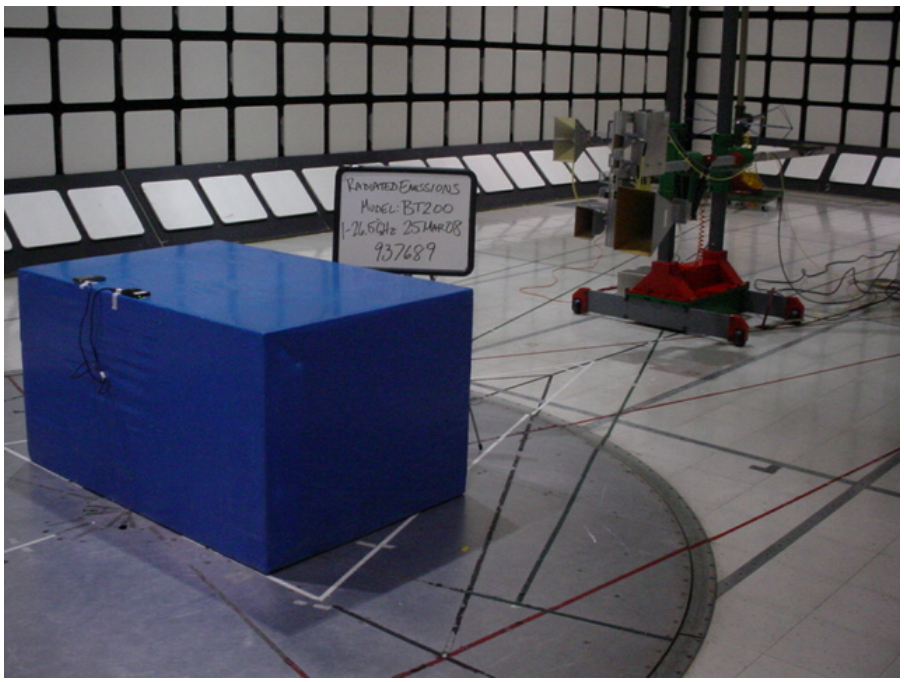


Figure 34 Transmitter Spurious Emissions Graph

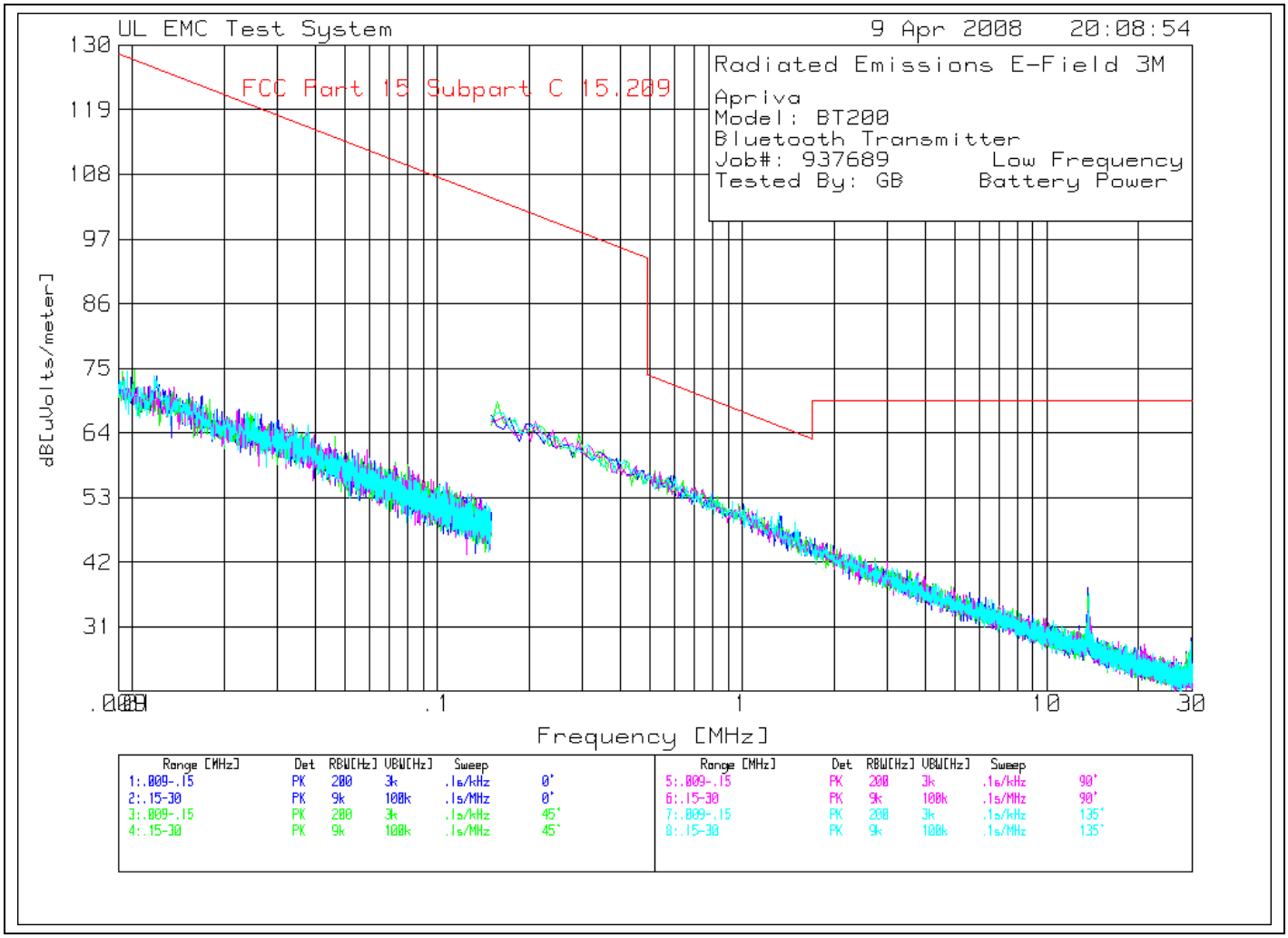


Table 21 Transmitter Spurious Emissions Data Points

Apriva
Model: BT200
Bluetooth Transmitter
Job#: 937689 Low Frequency
Tested By: GB Battery Power

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
0° .009 - .15MHz											
1	.0121	45.54 pk	.1	28	73.64	125.9	-	-	-	-	-
	Azimuth:282	Height:100 Horz		Margin [dB]		-52.26	-	-	-	-	-
0° .15 - 30MHz											
2	.15	51.32 pk	0	15.7	67.02	104.1	-	-	-	-	-
	Azimuth:354	Height:100 Horz		Margin [dB]		-37.08	-	-	-	-	-
3	13.64557	21.71 pk	.2	15.7	37.61	69.5	-	-	-	-	-
	Azimuth:358	Height:100 Horz		Margin [dB]		-31.89	-	-	-	-	-
45° .009 - .15MHz											
4	.01797	45.23 pk	0	24.5	69.73	122.5	-	-	-	-	-
	Azimuth:302	Height:120 Horz		Margin [dB]		-52.77	-	-	-	-	-
45° .15 - 30MHz											
5	.15746	53.5 pk	0	15.7	69.2	103.7	-	-	-	-	-
	Azimuth:338	Height:120 Horz		Margin [dB]		-34.5	-	-	-	-	-
6	1.16515	34.1 pk	.1	15.5	49.7	66.3	-	-	-	-	-
	Azimuth:93	Height:120 Horz		Margin [dB]		-16.6	-	-	-	-	-
90° .009 - .15MHz											
7	.02841	43.79 pk	0	21.8	65.59	118.5	-	-	-	-	-
	Azimuth:58	Height:139 Horz		Margin [dB]		-52.91	-	-	-	-	-
90° .15 - 30MHz											
8	.73969	38.76 pk	0	15.5	54.26	70.2	-	-	-	-	-
	Azimuth:175	Height:139 Horz		Margin [dB]		-15.94	-	-	-	-	-
135° .15 - 30MHz											
9	1.32191	34.87 pk	.1	15.5	50.47	65.2	-	-	-	-	-
	Azimuth:145	Height:160 Horz		Margin [dB]		-14.73	-	-	-	-	-
10	13.70529	20.79 pk	.2	15.7	36.69	69.5	-	-	-	-	-
	Azimuth:6	Height:160 Horz		Margin [dB]		-32.81	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

Figure 35 Transmitter Spurious Emissions Graph

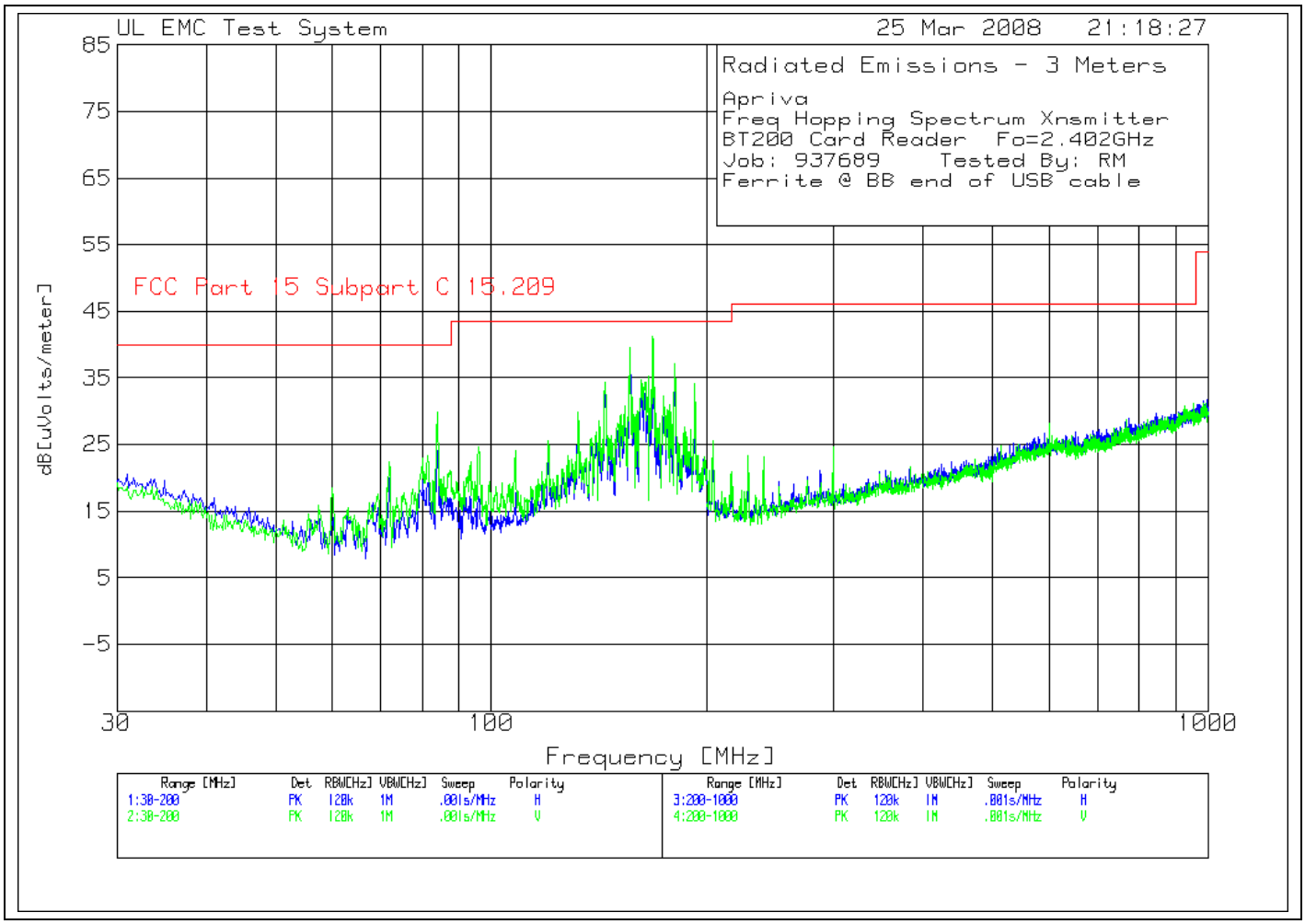


Table 22 Transmitter Spurious Emissions Data Points

Apriva
Freq Hopping Spectrum Xnsmitter
BT200 Card Reader Fo=2.402GHz
Job: 937689   Tested By: RM
Ferrite @ BB end of USB cable

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz											
1	156.2663	21.72 pk	.8	14.5	37.02	43.5	-	-	-	-	-
	Azimuth:17	Height:249 Horz		Margin [dB]		-6.48	-	-	-	-	-
2	168.008	23.57 pk	.8	14.8	39.17	43.5	-	-	-	-	-
	Azimuth:17	Height:249 Horz		Margin [dB]		-4.33	-	-	-	-	-
Vertical 30 - 200MHz											
3	83.9439	20.61 pk	.6	8.7	29.91	40	-	-	-	-	-
	Azimuth:285	Height:100 Vert		Margin [dB]		-10.09	-	-	-	-	-
4	156.0961	23.31 pk	.8	15.5	39.61	43.5	-	-	-	-	-
	Azimuth:321	Height:100 Vert		Margin [dB]		-3.89	-	-	-	-	-
5	167.8378	24.68 pk	.8	15.7	41.18	43.5	-	-	-	-	-
	Azimuth:321	Height:100 Vert		Margin [dB]		-2.32	-	-	-	-	-
6	180.0901	20.12 pk	.8	16.2	37.12	43.5	-	-	-	-	-
	Azimuth:358	Height:100 Vert		Margin [dB]		-6.38	-	-	-	-	-
Horizontal 200 - 1000MHz											
7	287.6438	6.15 pk	1.1	13.8	21.05	46	-	-	-	-	-
	Azimuth:347	Height:100 Horz		Margin [dB]		-24.95	-	-	-	-	-
Vertical 200 - 1000MHz											
8	228.014	11.5 pk	.9	11	23.4	46	-	-	-	-	-
	Azimuth:317	Height:100 Vert		Margin [dB]		-22.6	-	-	-	-	-
9	300.05	10.27 pk	1.2	13.2	24.67	46	-	-	-	-	-
	Azimuth:358	Height:100 Vert		Margin [dB]		-21.33	-	-	-	-	-
10	599.7999	6.97 pk	1.6	19.6	28.17	46	-	-	-	-	-
	Azimuth:187	Height:200 Vert		Margin [dB]		-17.83	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

Apriva
Freq Hopping Spectrum Xnsmitter
BT200 Card Reader Fo=2.402GHz
Job: 937689   Tested By: RM
Ferrite @ BB end of USB cable

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz										
167.9885	22.98 qp	.8	14.8	38.58	43.5	-	-	-	-	-
Azimuth: 10	Height:229 Horz		Margin [dB]:	-4.92		-	-	-	-	-
Vertical 30 - 200MHz										
167.9963	24.36 qp	.8	15.7	40.86	43.5	-	-	-	-	-
Azimuth: 280	Height:104 Vert		Margin [dB]:	-2.64		-	-	-	-	-
156.0003	22.6 qp	.8	15.5	38.9	43.5	-	-	-	-	-
Azimuth: 297	Height:104 Vert		Margin [dB]:	-4.6		-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

Figure 36 Transmitter Spurious Emissions Graph

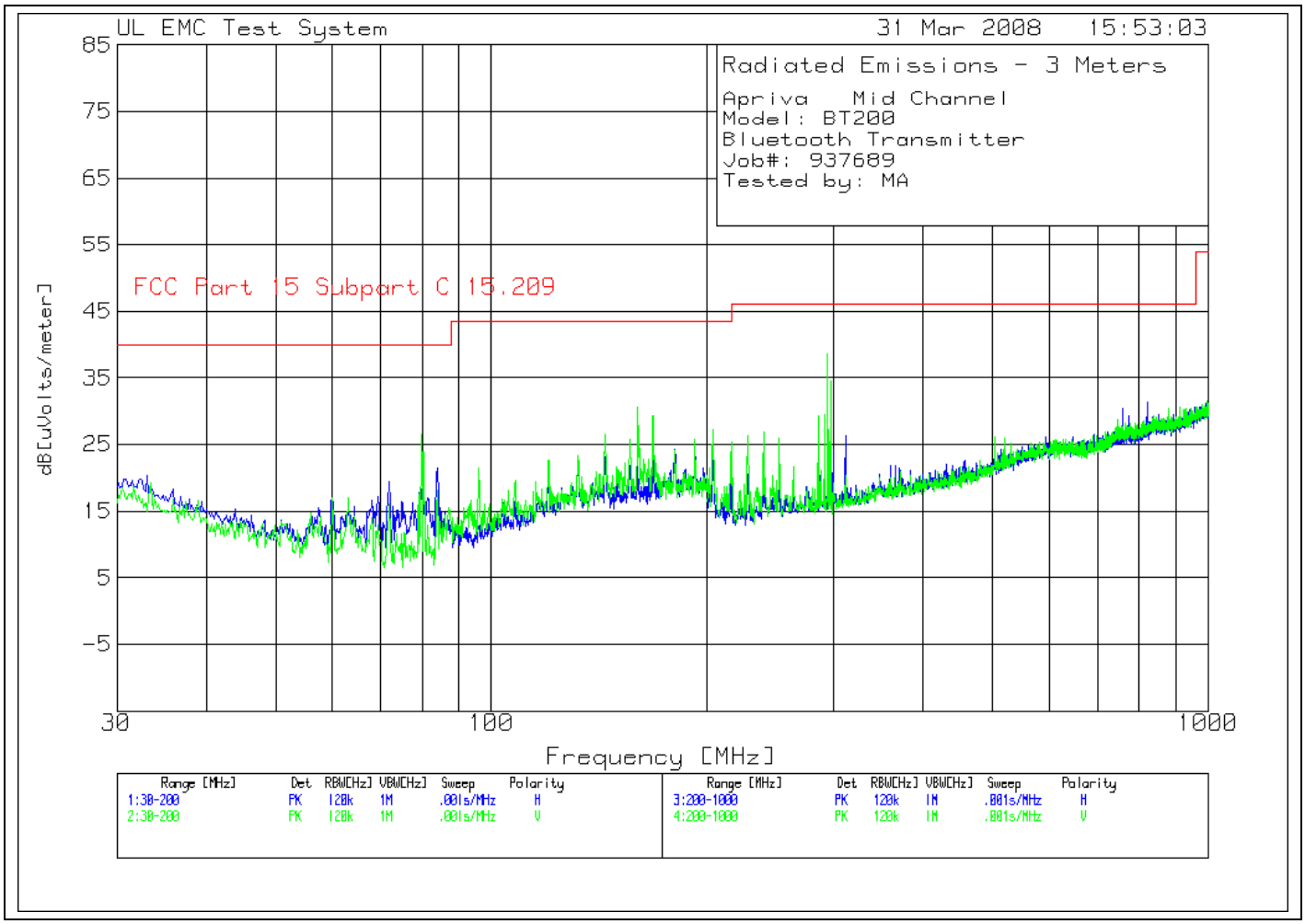


Table 23 Transmitter Spurious Emissions Data Points

```
 Apriva   Mid Channel
 Model: BT200
 Bluetooth Transmitter
 Job#: 937689
 Tested by: MA

      Test     Meter     Gain/Loss  Transducer  Level  Limit:1      2       3       4       5       6
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
=============================================================================================================
Horizontal 30 - 200MHz ------------------------------------------------------
6  83.9439      13 pk        .6        7.9       21.5    40          -       -       -       -       -
   Azimuth:343   Height:250 Horz     Margin [dB]          -18.5       -       -       -       -       -

Vertical 30 - 200MHz --------------------------------------------------------
1  79.8599      18.02 pk     .6        7.9       26.52   40          -       -       -       -       -
   Azimuth:93    Height:100 Vert     Margin [dB]          -13.48      -       -       -       -       -
2  160.01       14.27 pk     .8        15.6      30.67   43.5        -       -       -       -       -
   Azimuth:56    Height:100 Vert     Margin [dB]          -12.83      -       -       -       -       -
3  167.8378     12.87 pk     .8        15.6      29.27   43.5        -       -       -       -       -
   Azimuth:322   Height:100 Vert     Margin [dB]          -14.23      -       -       -       -       -
4  144.014      10.59 pk     .8        15.1      26.49   43.5        -       -       -       -       -
   Azimuth:358   Height:100 Vert     Margin [dB]          -17.01      -       -       -       -       -

Vertical 200 - 1000MHz ------------------------------------------------------
5  297.2486     20.03 pk     1.1       13.4      34.53   46          -       -       -       -       -
   Azimuth:358   Height:200 Vert     Margin [dB]          -11.47      -       -       -       -       -
7  285.6428     15.03 pk     1.1       13.2      29.33   46          -       -       -       -       -
   Azimuth:230   Height:200 Vert     Margin [dB]          -16.67      -       -       -       -       -
8  294.4472     24.13 pk     1.1       13.4      38.63   46          -       -       -       -       -
   Azimuth:17    Height:200 Vert     Margin [dB]          -7.37       -       -       -       -       -

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
```

Figure 37 Transmitter Spurious Emissions Graph

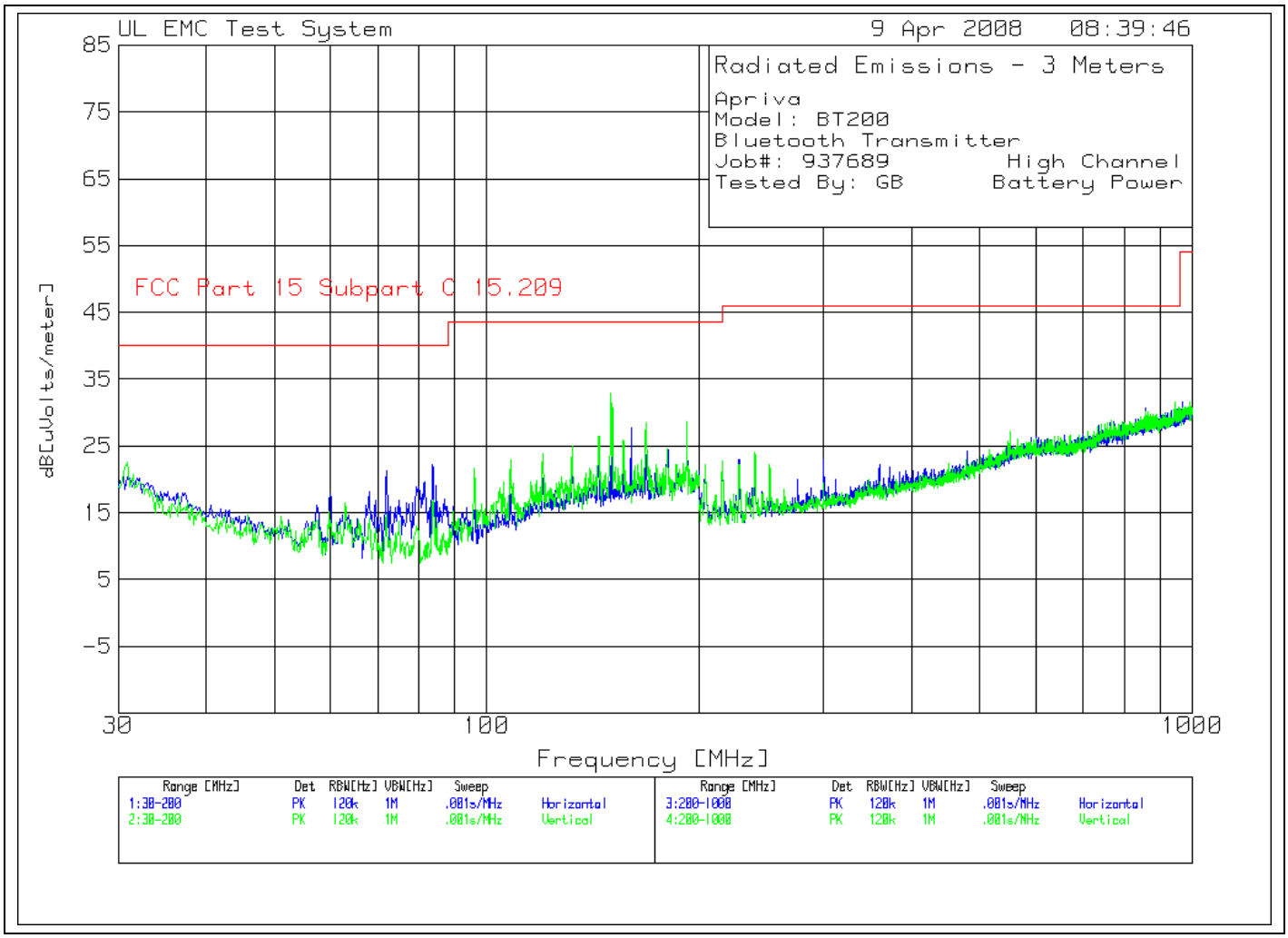


Table 24 Transmitter Spurious Emissions Data Points

Apriva
Model: BT200
Bluetooth Transmitter
Job#: 937689 High Channel
Tested By: GB Battery Power

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz											
1	72.032	14.99 pk	.6	5.6	21.19	40	-	-	-	-	-
	Azimuth:344	Height:250 Horz		Margin [dB]		-18.81	-	-	-	-	-
2	83.7738	13.73 pk	.6	7.8	22.13	40	-	-	-	-	-
	Azimuth:16	Height:400 Horz		Margin [dB]		-17.87	-	-	-	-	-
Vertical 30 - 200MHz											
3	144.014	10.55 pk	.8	15.1	26.45	43.5	-	-	-	-	-
	Azimuth:139	Height:100 Vert		Margin [dB]		-17.05	-	-	-	-	-
4	149.7998	16.59 pk	.7	15.6	32.89	43.5	-	-	-	-	-
	Azimuth:358	Height:100 Vert		Margin [dB]		-10.61	-	-	-	-	-
5	167.8378	12.15 pk	.8	15.6	28.55	43.5	-	-	-	-	-
	Azimuth:353	Height:100 Vert		Margin [dB]		-14.95	-	-	-	-	-
6	192.1722	11.6 pk	.9	16.2	28.7	43.5	-	-	-	-	-
	Azimuth:286	Height:100 Vert		Margin [dB]		-14.8	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection

Figure 38 Transmitter Spurious Emissions Graph

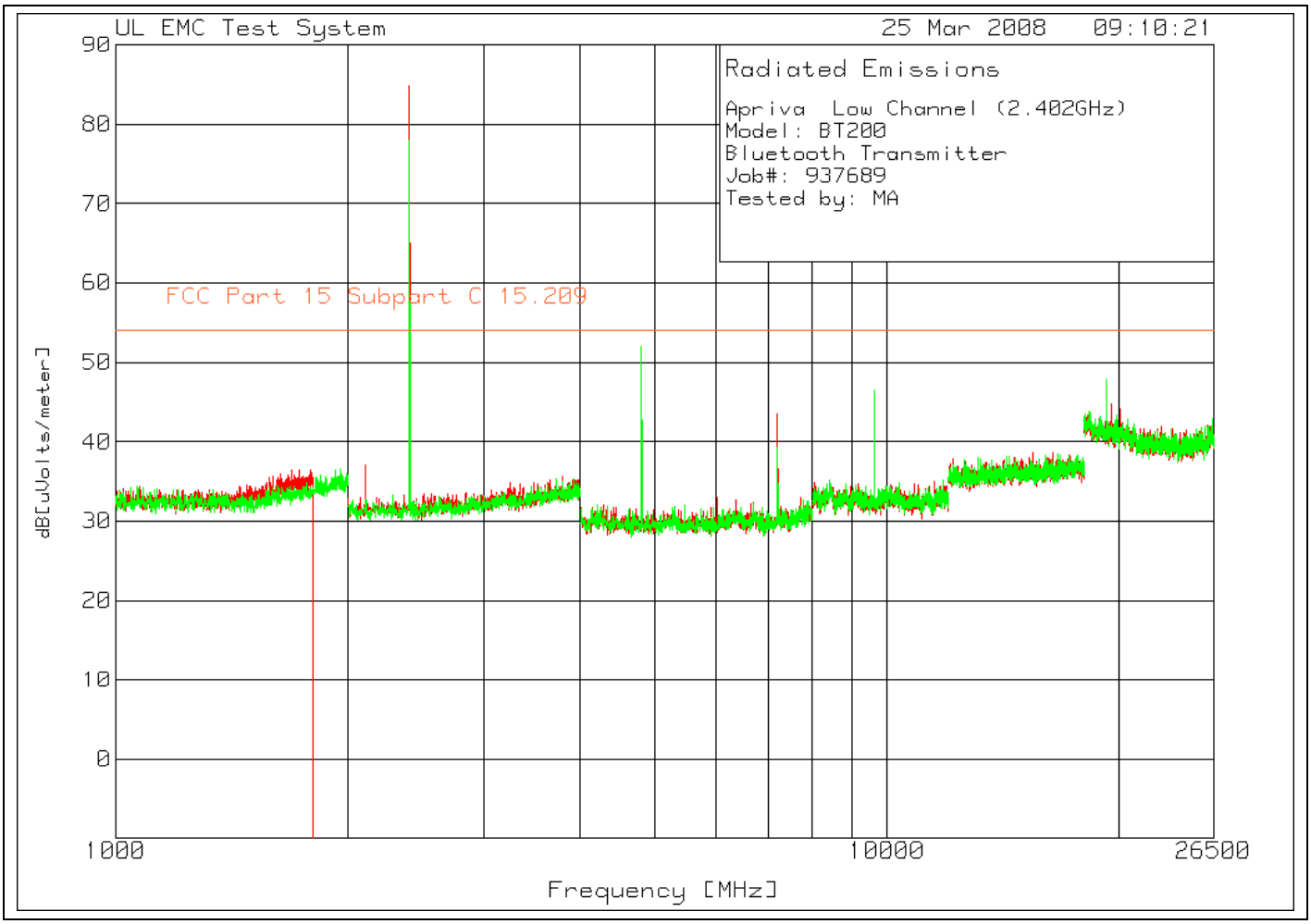


Table 25 Transmitter Spurious Emissions Data Points

Apriva Low Channel (2.402GHz)
Model: BT200
Bluetooth Transmitter
Job#: 937689
Tested by: MA

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
4 - 8GHz 4000 - 8000MHz											
2	4801.997	71.96 pk	-52.47	30	49.49	54	-	-	-	-	-
	Azimuth:103	Height:200 Horz		Margin [dB]		-4.51	-	-	-	-	-
3	7207.987	64.64 pk	-51.87	30.7	43.47	54	-	-	-	-	-
	Azimuth:154	Height:99 Horz		Margin [dB]		-10.53	-	-	-	-	-
8 - 12GHz 8000 - 12000MHz											
4	9610.649	59.79 pk	-50.57	33.4	42.62	54	-	-	-	-	-
	Azimuth:359	Height:200 Horz		Margin [dB]		-11.38	-	-	-	-	-
18-26.5GHz 18000 - 26500MHz											
5	19543.912	58.14 pk	-53.6	40.3	44.84	54	-	-	-	-	-
	Azimuth:353	Height:150 Horz		Margin [dB]		-9.16	-	-	-	-	-
4 - 8GHz 4000 - 8000MHz											
7	4801.997	74.43 pk	-52.47	30	51.96	54	-	-	-	-	-
	Azimuth:1	Height:99 Vert		Margin [dB]		-2.04	-	-	-	-	-
8	7207.987	60.38 pk	-51.87	30.7	39.21	54	-	-	-	-	-
	Azimuth:78	Height:150 Vert		Margin [dB]		-14.79	-	-	-	-	-
8 - 12GHz 8000 - 12000MHz											
9	9610.649	63.59 pk	-50.57	33.4	46.42	54	-	-	-	-	-
	Azimuth:26	Height:200 Vert		Margin [dB]		-7.58	-	-	-	-	-
18-26.5GHz 18000 - 26500MHz											
10	19213.074	61.53 pk	-53.89	40.2	47.84	54	-	-	-	-	-
	Azimuth:26	Height:200 Vert		Margin [dB]		-6.16	-	-	-	-	-

Apriva Low Channel (2.402GHz)
Model: BT200
Bluetooth Transmitter
Job#: 937689
Tested by: MA

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
4 - 8GHz 4000 - 8000MHz										
4804.0125	72.62 av	-52.46	30	50.16	54	-	-	-	-	-
Azimuth: 268	Height:109 Horz		Margin [dB]:	-3.84		-	-	-	-	-
7204.3	51.84 av	-51.8	30.7	30.74	54	-	-	-	-	-
Azimuth: 161	Height:165 Horz		Margin [dB]:	-23.26		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz										
9608.045	57.96 av	-50.57	33.4	40.79	54	-	-	-	-	-
Azimuth: 131	Height:151 Horz		Margin [dB]:	-13.21		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz										
19544	54.39 av	-53.6	40.3	41.09	54	-	-	-	-	-
Azimuth: 328	Height:234 Horz		Margin [dB]:	-12.91		-	-	-	-	-
4 - 8GHz 4000 - 8000MHz										
4804.01	51.04 av	-52.46	30	28.58	54	-	-	-	-	-
Azimuth: 338	Height:217 Vert		Margin [dB]:	-25.42		-	-	-	-	-
7204.45	50.94 av	-51.8	30.7	29.84	54	-	-	-	-	-
Azimuth: 218	Height:138 Vert		Margin [dB]:	-24.16		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz										
19216.08	60.26 av	-53.92	40.2	46.54	54	-	-	-	-	-
Azimuth: 295	Height:224 Vert		Margin [dB]:	-7.46		-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

Figure 39 Transmitter Spurious Emissions Graph

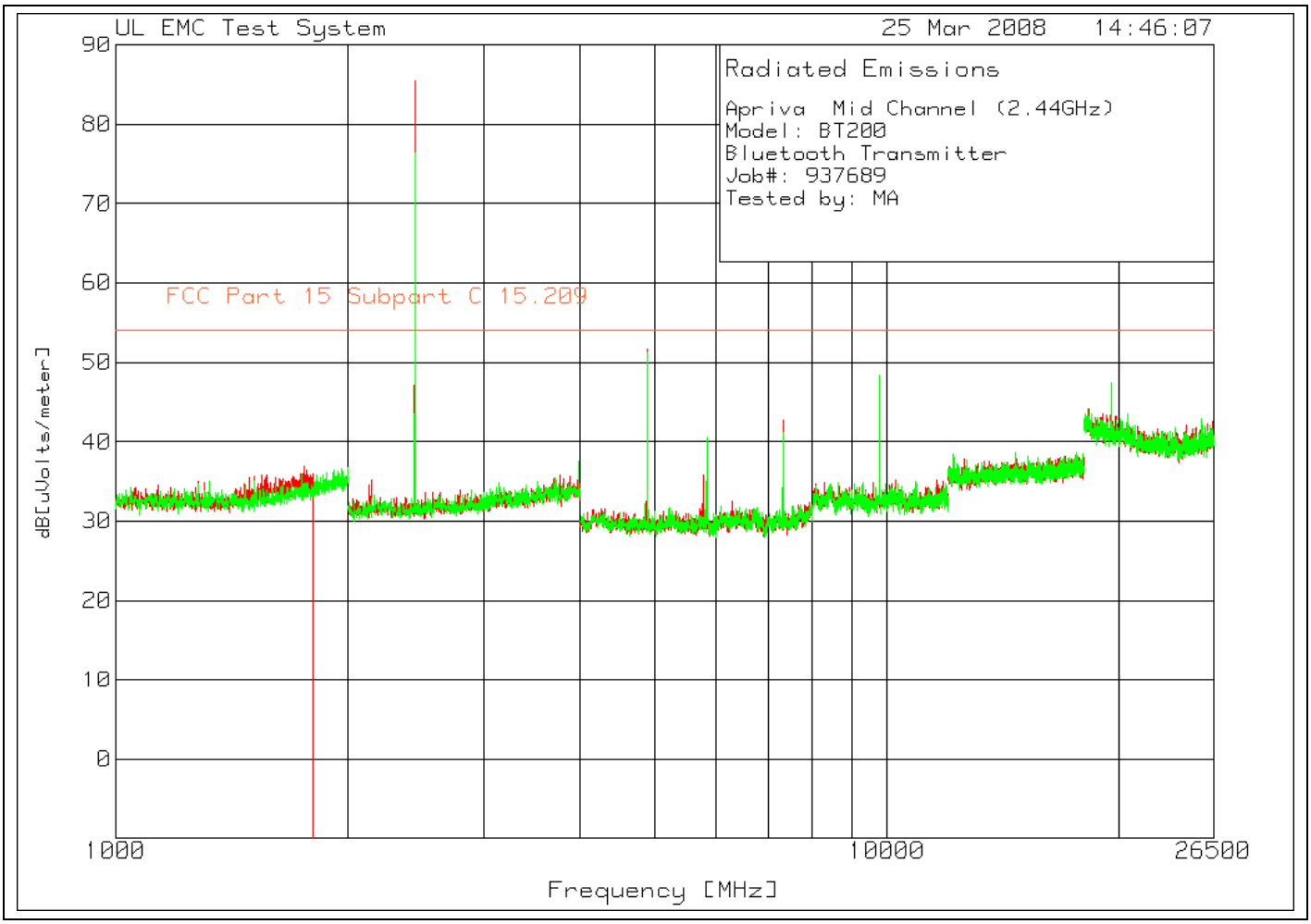


Table 26 Transmitter Spurious Emissions Data Points

Apriva Mid Channel (2.44GHz)
Model: BT200
Bluetooth Transmitter
Job#: 937689
Tested by: MA

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
4 - 8GHz 4000 - 8000MHz											
2	4881.864	76.8 pk	-52.46	30.1	54.44	54	-	-	-	-	-
	Azimuth:333	Height:99 Horz		Margin [dB]	.44		-	-	-	-	-
3	5797.005	61.36 pk	-52.16	30.4	39.6	54	-	-	-	-	-
	Azimuth:276	Height:149 Horz		Margin [dB]	-14.4		-	-	-	-	-
4	7324.459	66.15 pk	-51.8	30.7	45.05	54	-	-	-	-	-
	Azimuth:184	Height:149 Horz		Margin [dB]	-8.95		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz											
5	9763.727	61.34 pk	-49.91	33.5	44.93	54	-	-	-	-	-
	Azimuth:359	Height:200 Horz		Margin [dB]	-9.07		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz											
6	19526.946	58.55 pk	-53.91	40.3	44.94	54	-	-	-	-	-
	Azimuth:7	Height:149 Horz		Margin [dB]	-9.06		-	-	-	-	-
4 - 8GHz 4000 - 8000MHz											
8	4881.864	73.89 pk	-52.46	30.1	51.53	54	-	-	-	-	-
	Azimuth:282	Height:99 Vert		Margin [dB]	-2.47		-	-	-	-	-
9	5806.988	64.95 pk	-52.12	30.4	43.23	54	-	-	-	-	-
	Azimuth:358	Height:199 Vert		Margin [dB]	-10.77		-	-	-	-	-
10	7324.459	60.15 pk	-51.8	30.7	39.05	54	-	-	-	-	-
	Azimuth:233	Height:199 Vert		Margin [dB]	-14.95		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz											
11	9763.727	64.85 pk	-49.91	33.5	48.44	54	-	-	-	-	-
	Azimuth:1	Height:199 Vert		Margin [dB]	-5.56		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz											
12	19526.946	61.11 pk	-53.91	40.3	47.5	54	-	-	-	-	-
	Azimuth:237	Height:200 Vert		Margin [dB]	-6.5		-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

Apriva Mid Channel (2.44GHz)
Model: BT200
Bluetooth Transmitter
Job#: 937689
Tested by: MA

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
4 - 8GHz 4000 - 8000MHz										
4882.02	74.36 av	-52.46	30.1	56	54	-	-	-	-	-
Azimuth: 271	Height:106 Horz		Margin [dB]:	-2		-	-	-	-	-
5795.4	50.51 av	-52.18	30.4	28.73	54	-	-	-	-	-
Azimuth: 287	Height:201 Horz		Margin [dB]:	-25.27		-	-	-	-	-
7321.95	55.66 av	-51.81	30.7	34.55	54	-	-	-	-	-
Azimuth: 155	Height:126 Horz		Margin [dB]:	-19.45		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz										
9764.04	58.1 av	-49.91	33.5	41.69	54	-	-	-	-	-
Azimuth: 351	Height:123 Horz		Margin [dB]:	-12.31		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz										
19528.075	60 av	-53.85	40.3	46.45	54	-	-	-	-	-
Azimuth: 233	Height:166 Horz		Margin [dB]:	-7.55		-	-	-	-	-
4 - 8GHz 4000 - 8000MHz										
4882.0263	74.53 av	-52.46	30.1	52.17	54	-	-	-	-	-
Azimuth: 171	Height:250 Vert		Margin [dB]:	-1.83		-	-	-	-	-
5779.5	50.68 av	-52.3	30.4	28.78	54	-	-	-	-	-
Azimuth: 298	Height:130 Vert		Margin [dB]:	-25.22		-	-	-	-	-
7321.175	50.42 av	-51.82	30.7	29.3	54	-	-	-	-	-
Azimuth: 34	Height:247 Vert		Margin [dB]:	-24.7		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz										
9764.0225	64.64 av	-49.91	33.5	48.23	54	-	-	-	-	-
Azimuth: 222	Height:109 Vert		Margin [dB]:	-5.77		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz										
19528.045	58.19 av	-53.85	40.3	44.64	54	-	-	-	-	-
Azimuth: 235	Height:101 Vert		Margin [dB]:	-9.36		-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

Figure 40 Transmitter Spurious Emissions Graph

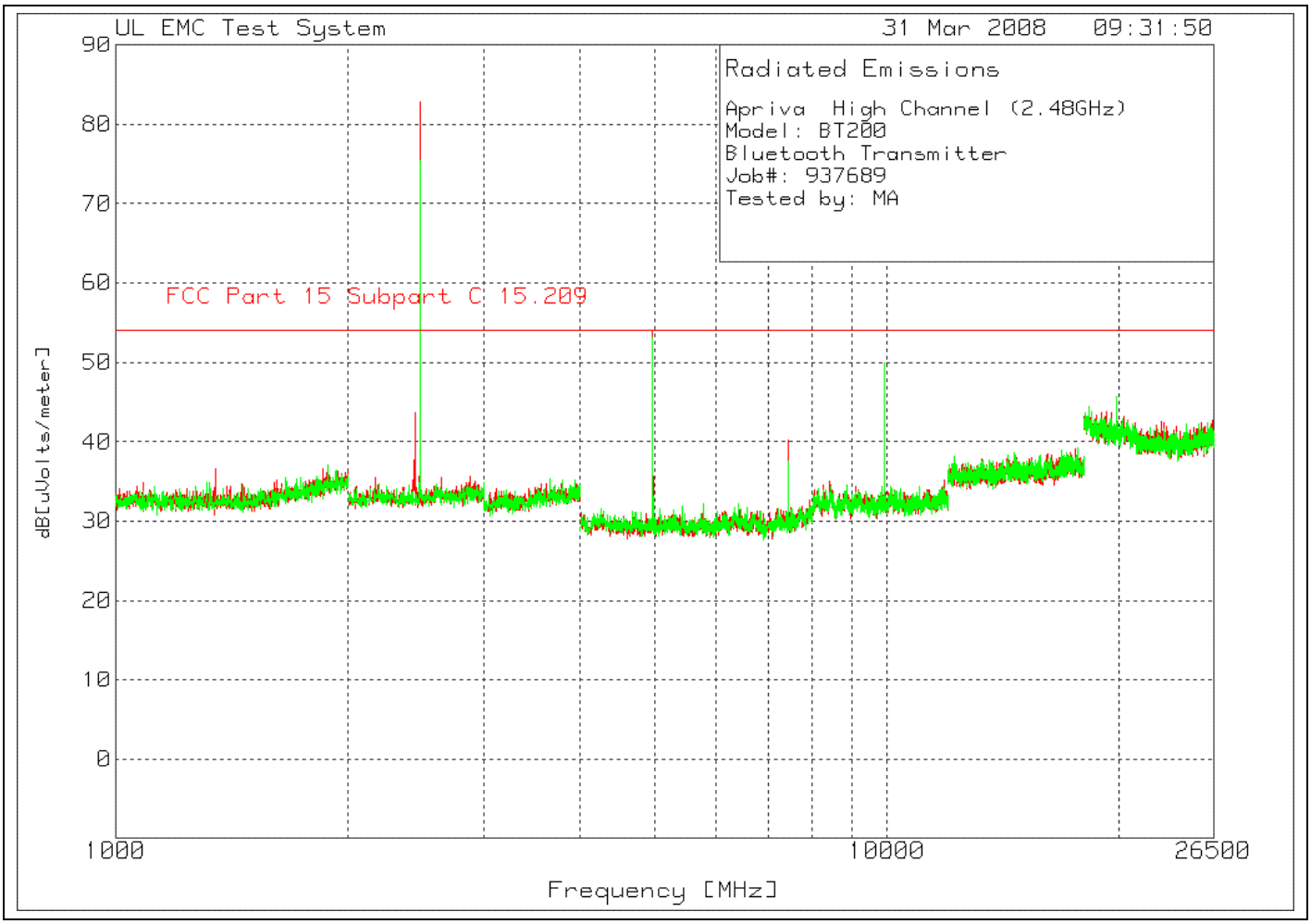


Table 27 Transmitter Spurious Emissions Data Points

Apriva High Channel (2.48GHz)
Model: BT200
Bluetooth Transmitter
Job#: 937689
Tested by: MA

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
4 - 8GHz 4000 - 8000MHz											
2	4958.403	76.81 pk	-52.35	30.2	54.66	54	-	-	-	-	-
	Azimuth:260	Height:99 Horz	Margin [dB]		.66		-	-	-	-	-
3	7440.932	61.07 pk	-51.56	30.7	40.21	54	-	-	-	-	-
	Azimuth:183	Height:99 Horz	Margin [dB]		-13.79		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz											
4	9920.133	63.25 pk	-50.17	33.5	46.58	54	-	-	-	-	-
	Azimuth:333	Height:199 Horz	Margin [dB]		-7.42		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz											
5	19840.818	57.15 pk	-54.44	40.3	43.01	54	-	-	-	-	-
	Azimuth:4	Height:99 Horz	Margin [dB]		-10.99		-	-	-	-	-
4 - 8GHz 4000 - 8000MHz											
7	4958.403	75.26 pk	-52.35	30.2	53.11	54	-	-	-	-	-
	Azimuth:282	Height:150 Vert	Margin [dB]		-.89		-	-	-	-	-
8	7440.932	58.45 pk	-51.56	30.7	37.59	54	-	-	-	-	-
	Azimuth:102	Height:199 Vert	Margin [dB]		-16.41		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz											
9	9920.133	66.67 pk	-50.17	33.5	50	54	-	-	-	-	-
	Azimuth:51	Height:200 Vert	Margin [dB]		-4		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz											
10	19840.818	59.88 pk	-54.44	40.3	45.74	54	-	-	-	-	-
	Azimuth:0	Height:150 Vert	Margin [dB]		-8.26		-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

Apriva High Channel (2.48GHz)
Model: BT200
Bluetooth Transmitter
Job#: 937689
Tested by: MA

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
4 - 8GHz 4000 - 8000MHz										
4960.0563	74.36 av	-52.46	30.1	56	54	-	-	-	-	-
Azimuth: 271	Height:106 Horz		Margin [dB]:	-2		-	-	-	-	-
7439.625	56.52 av	-51.57	30.7	35.65	54	-	-	-	-	-
Azimuth: 224	Height:116 Horz		Margin [dB]:	-18.35		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz										
9920.095	58.63 av	-50.17	33.5	41.96	54	-	-	-	-	-
Azimuth: 210	Height:154 Horz		Margin [dB]:	-12.04		-	-	-	-	-
4 - 8GHz 4000 - 8000MHz										
4960.0588	74.53 av	-52.46	30.1	52.17	54	-	-	-	-	-
Azimuth: 171	Height:250 Vert		Margin [dB]:	-1.83		-	-	-	-	-
5783.5	50.57 av	-52.27	30.4	28.7	54	-	-	-	-	-
Azimuth: 150	Height:112 Vert		Margin [dB]:	-25.3		-	-	-	-	-
7439.575	53.78 av	-51.57	30.7	32.91	54	-	-	-	-	-
Azimuth: 117	Height:248 Vert		Margin [dB]:	-21.09		-	-	-	-	-
8 - 12GHz 8000 - 12000MHz										
9920.1225	63.73 av	-50.17	33.5	47.06	54	-	-	-	-	-
Azimuth: 173	Height:223 Vert		Margin [dB]:	-6.94		-	-	-	-	-
18-26.5GHz 18000 - 26500MHz										
19840.235	58.11 av	-54.44	40.3	43.97	54	-	-	-	-	-
Azimuth: 163	Height:221 Vert		Margin [dB]:	-10.03		-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

4.8 Test Conditions and Results – Receiver Spurious Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	FCC Part 15, Subpart B	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	(3 meter measurement distance)
	1GHz – 12GHz	(3 meter measurement distance)

Limits - Class B

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
30 – 88	40	-
88 – 216	43.5	-
216-960	46	-
960-1000	54	-
1000-12000	-	54

Supplementary information: None

Table 28 Radiated Emissions EUT Configuration Settings

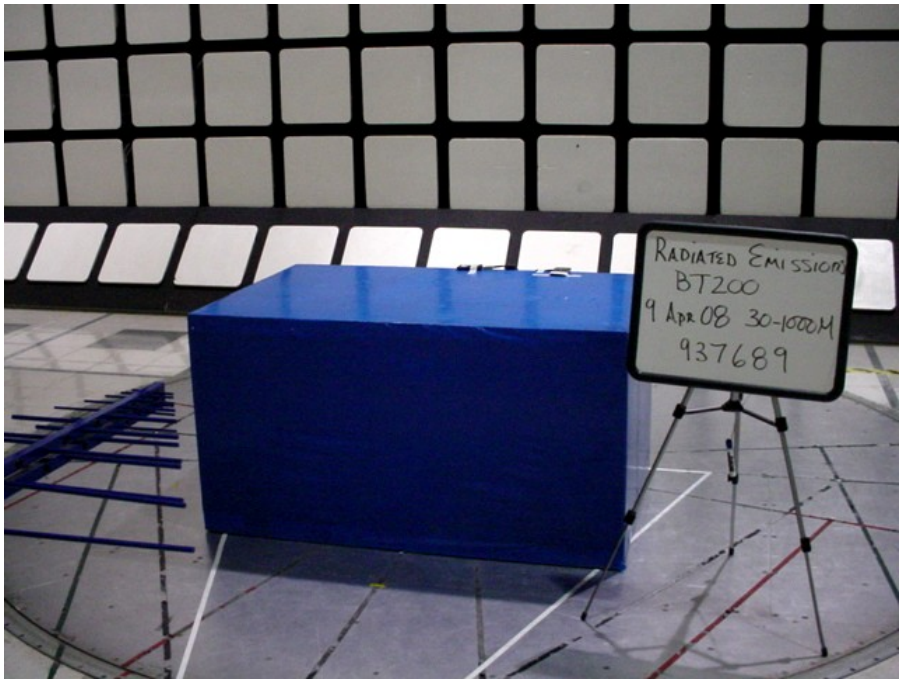
Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	4

Supplementary information: None

Table 29 Radiated Emissions Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
30-1000MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Bicon Antenna	Schaffner	VBA6106A	54
Log-P Antenna	Schaffner	UPA6109	44067
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268
Above 1GHz (Band Optimized System)			
Spectrum Analyzer	Agilent	E7405A	19695
Horn Antenna (2-4 GHz)	ETS	3161-02	48107
Horn Antenna (4-8 GHz)	ETS	3161-03	48106
Horn Antenna (8-12 GHz)	ETS	3160-07	8933
Horn Antenna (1-2GHz)	EMCO	3115	ME5A-766
Signal Path Controller	HP	11713A	50250
Gain Controller	HP	11713A	50251
RF Switch / Preamp Fixture	UL	BOMS1	50249
System Controller	UL	BOMS2	50252
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268

Figure 41 Test setup for Radiated Emissions



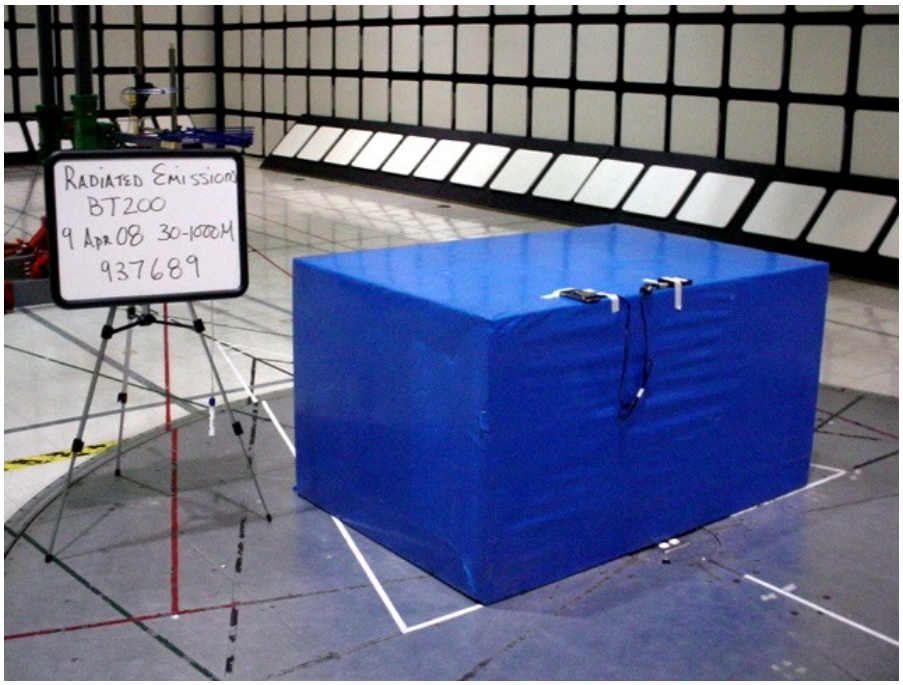
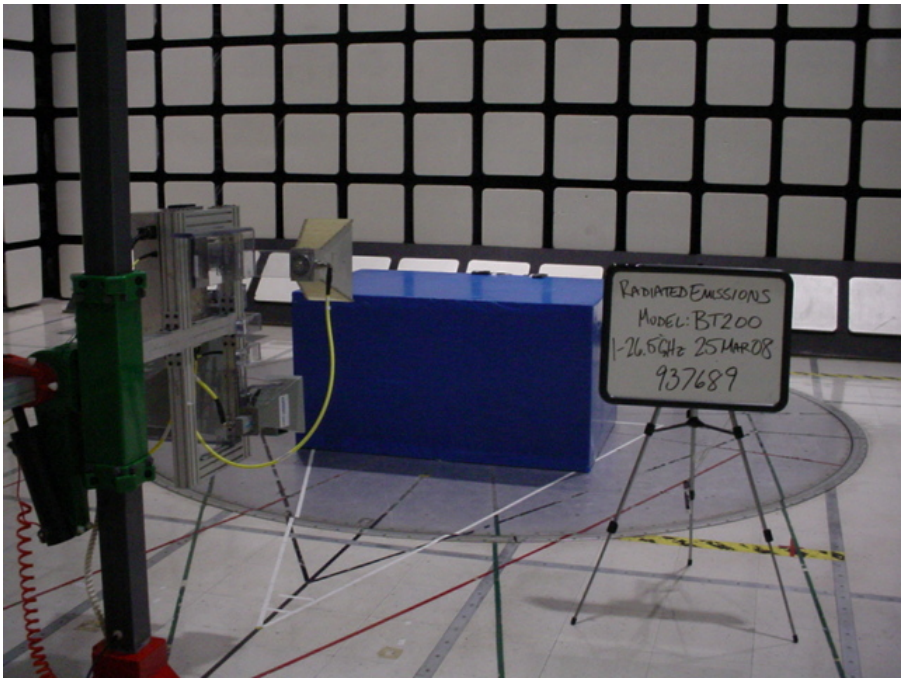


Figure 42 Test setup for Radiated Emissions



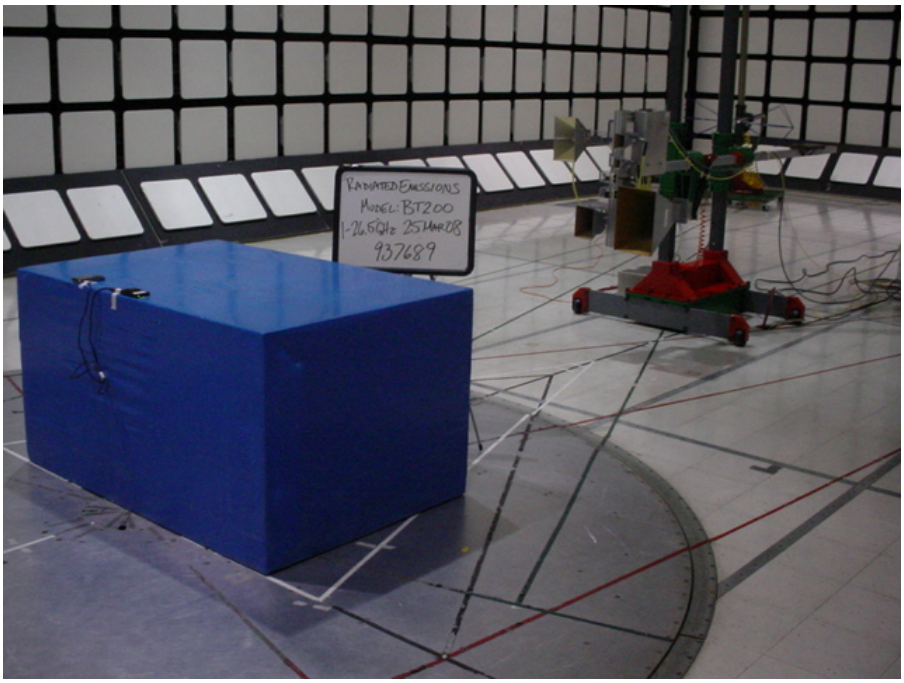


Figure 43 Radiated Emissions Graph

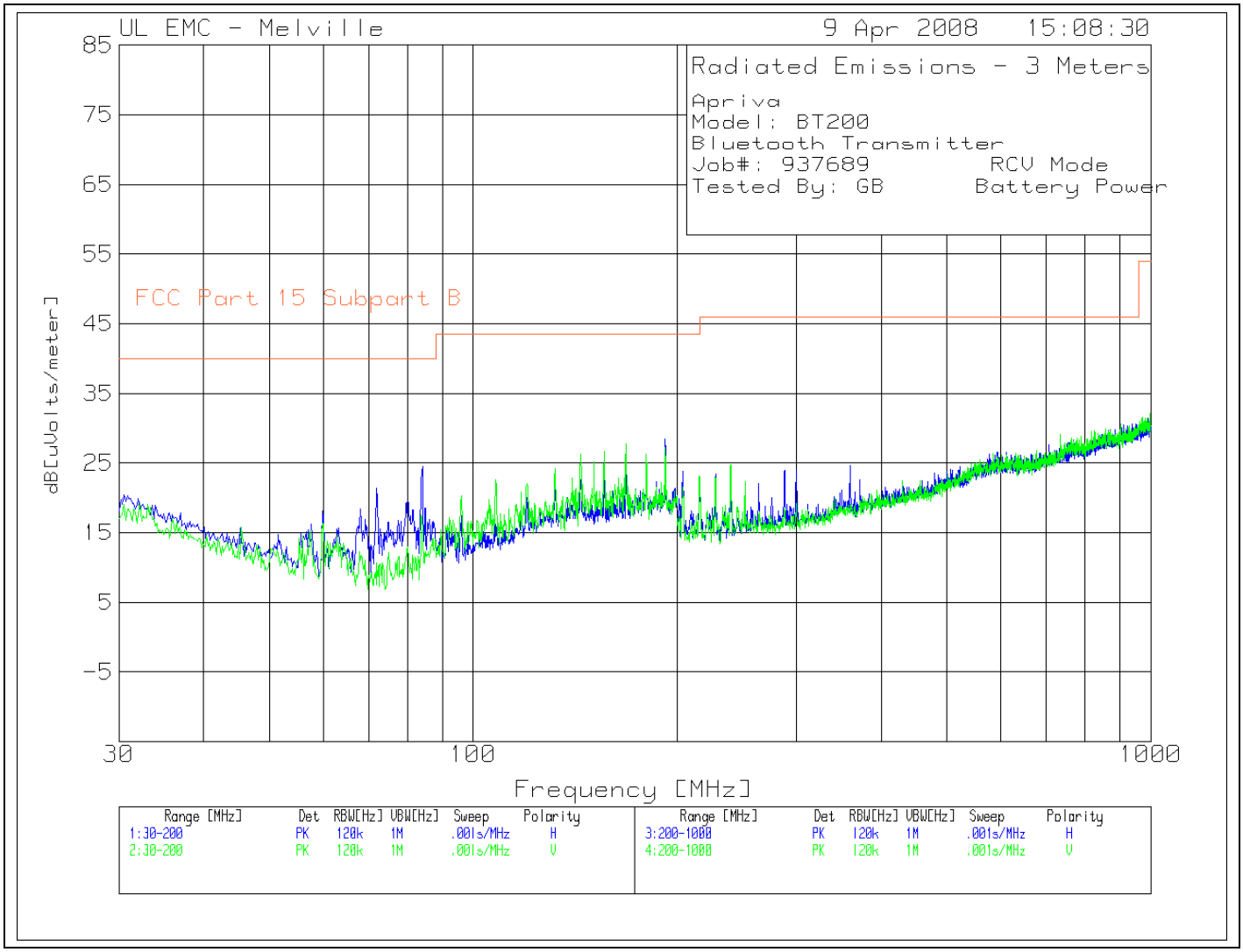


Table 30 Radiated Emissions Data Points

Apriva
Model: BT200
Bluetooth Transmitter
Job#: 937689 RCV Mode
Tested By: GB Battery Power

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz											
1	72.032	15.19 pk	.6	5.6	21.39	40	-	-	-	-	-
	Azimuth:17	Height:250 Horz		Margin [dB]		-18.61	-	-	-	-	-
2	84.1141	15.95 pk	.6	7.9	24.45	40	-	-	-	-	-
	Azimuth:245	Height:250 Horz		Margin [dB]		-15.55	-	-	-	-	-
4	192.002	11.96 pk	.9	15.6	28.46	43.5	-	-	-	-	-
	Azimuth:58	Height:100 Horz		Margin [dB]		-15.04	-	-	-	-	-
Vertical 30 - 200MHz											
3	167.8378	11.34 pk	.8	15.6	27.74	43.5	-	-	-	-	-
	Azimuth:352	Height:100 Vert		Margin [dB]		-15.76	-	-	-	-	-
Horizontal 200 - 1000MHz											
6	360.08	8.01 pk	1.2	15.4	24.61	46	-	-	-	-	-
	Azimuth:17	Height:100 Horz		Margin [dB]		-21.39	-	-	-	-	-
Vertical 200 - 1000MHz											
5	240.02	11.9 pk	1	11.9	24.8	46	-	-	-	-	-
	Azimuth:2	Height:100 Vert		Margin [dB]		-21.2	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart B
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

Figure 44 Radiated Emissions Graph

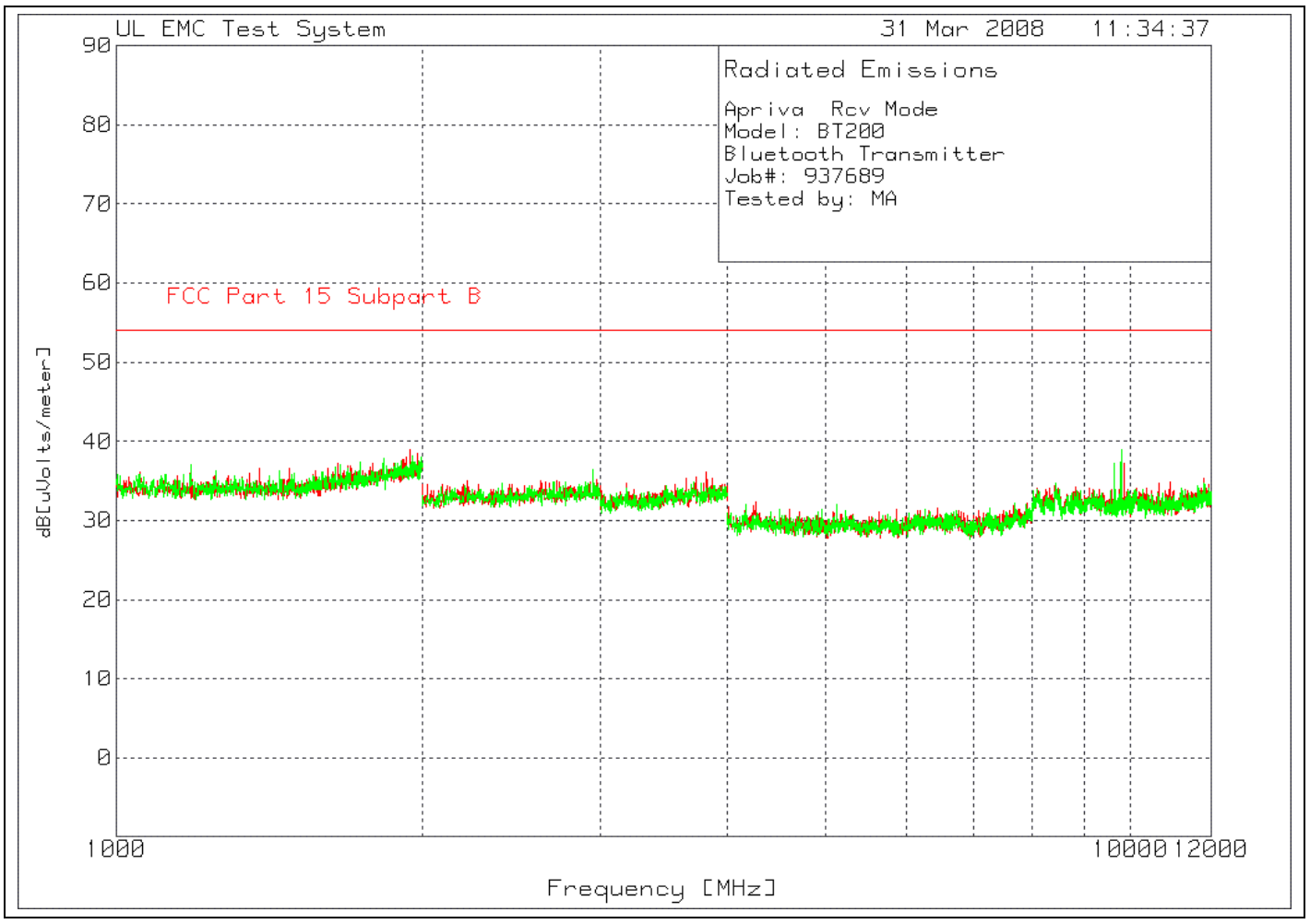


Table 31 Radiated Emissions Data Points

Apriva Rcv Mode
Model: BT200
Bluetooth Transmitter
Job#: 937689
Tested by: MA

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 1000 - 2000MHz											
6	1946.317	55.97 pk	-44.47	27.5	39	54	-	-	-	-	-
	Azimuth:358	Height:99 Horz		Margin [dB]		-15	-	-	-	-	-
Horizontal 8000 - 12000MHz											
1	9843.594	53.13 pk	-49.4	33.5	37.23	54	-	-	-	-	-
	Azimuth:157	Height:150 Horz		Margin [dB]		-16.77	-	-	-	-	-
2	8419.301	52.32 pk	-51.25	33.4	34.47	54	-	-	-	-	-
	Azimuth:358	Height:200 Horz		Margin [dB]		-19.53	-	-	-	-	-
Vertical 1000 - 2000MHz											
7	1960.05	55.16 pk	-44.55	27.6	38.21	54	-	-	-	-	-
	Azimuth:22	Height:150 Vert		Margin [dB]		-15.79	-	-	-	-	-
Vertical 8000 - 12000MHz											
3	9797.005	55.24 pk	-49.81	33.5	38.93	54	-	-	-	-	-
	Azimuth:151	Height:200 Vert		Margin [dB]		-15.07	-	-	-	-	-
4	9770.383	53.78 pk	-49.85	33.5	37.43	54	-	-	-	-	-
	Azimuth:27	Height:99 Vert		Margin [dB]		-16.57	-	-	-	-	-
5	9640.599	54.34 pk	-50.57	33.5	37.27	54	-	-	-	-	-
	Azimuth:327	Height:99 Vert		Margin [dB]		-16.73	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart B
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

5.0 IMMUNITY TEST RESULTS

Not Applicable

Appendix A

Accreditations and Authorizations

NVLAP Lab code: 100255-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. For a full scope listing see http://ts.nist.gov/ts/htdocs/210/214/scopes/1002550.htm

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91040).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-160.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6