



ADDENDUM TO COLEMAN TECHNOLOGIES TEST REPORT FC04-020

FOR THE

**AVL/GPS DATA LOGGING WITH WIRELESS COMMUNICATION,
1XR TT AGENT**

FCC PART 22 & PART 24

COMPLIANCE

DATE OF ISSUE: APRIL 20, 2004

PREPARED FOR:

Coleman Technologies
20 N. Orange Avenue, Suite 300
Orlando, FL

P.O. No.: JET 2677
W.O. No.: 81879

PREPARED BY:

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Mariposa, CA 95338

Date of test: March 4-5, 2004

Report No.: FC04-020A

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ADMINISTRATIVE INFORMATION

DATE OF TEST: March 4-5, 2004

DATE OF RECEIPT: March 4, 2004

PURPOSE OF TEST: To demonstrate the compliance of the AVL/GPS Data Logging with Wireless Communication, 1XRTT Agent with the requirements for FCC Part 22 & Part 24 devices.
Addendum A is to revise the operating power on page 6, add information regarding modulation and dc voltages, add a statement regarding conditions for compliance and revise the occupied bandwidth plots.

TEST METHOD: FCC Part 22 & Part 24

FREQUENCY RANGE TESTED: 9 kHz-20 GHz

MANUFACTURER: Coleman Technologies
20 N. Orange Avenue, Suite 300
Orlando, FL

REPRESENTATIVE: Peter Stern

TEST LOCATION: CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92621

SUMMARY OF RESULTS

As received, the Coleman Technologies AVL/GPS Data Logging w/ Wireless Communication, 1XRTT Agent was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 22 & Part 24

CONDITIONS FOR COMPLIANCE

Portions of testing contained in this test report represent a demonstration of continued compliance for this product. Emissions characteristics deemed unaffected by installation type are contained in a separate test report.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:



Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:



Matthew Pettersen, EMC Test Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

AVL/GPS Data Logging with Wireless Communication

Manuf: Coleman Technologies
Model: 1XRTT Agent
Serial: 20040304
FCC ID: QQZ (pending)

PERIPHERAL DEVICES

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

Laptop

Manuf: Compaq
Model: Evo N150
Serial: D171QK260V3
FCC ID: DoC

Power Supply

Manuf: CUI Inc.
Model: DV-1280
Serial: NA
FCC ID: NA

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

FCC 2.1033(c)(3) USER'S MANUAL

The necessary information is contained in a separate document.

FCC 2.1033 (c)(4) TYPE OF EMISSIONS

1M25F9W

FCC 2.1033 (c)(5) FREQUENCY RANGE

824.04MHz – 848.97MHz and 1851.25MHz – 1908.75MHz.

FCC 2.1033 (c)(6) OPERATING POWER

0.31 Watts Part 22, 0.28 Watts Part 24

FCC 2.1033 (c)(7) MAXIMUM POWER RATING

280mW

FCC 2.1033 (c)(8) DC VOLTAGES

6-26 Volts, 40 milliamps @ 12 volts

FCC 2.1033 (c)(9) TUNE-UP PROCEDURE

The necessary information is contained in a separate document.

FCC 2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION

The necessary information is contained in a separate document.

FCC 2.1033(c)(11) LABEL AND PLACEMENT

The necessary information is contained in a separate document.

FCC 2.1033(c)(12) SUBMITTAL PHOTOS

The necessary information is contained in a separate document.

FCC 2.1033 (c)(13) MODULATION INFORMATION

Phase

FCC 2.1033(c)(14)/2.1046/22.913/24.232 - RF POWER OUTPUT

Test Conditions : EUT is placed on the test bench. Discrete I/O port is connected to the support laptop. Power is obtained from a support DC power supply. RF port is connected to the spectrum analyzer for evaluation of the signal. EUT is in operational. 12VDC (110VAC, 60Hz), 23°C, 55% relative humidity.

Comparison of Conducted power.

Data taken for AnyData EMIII Dual, W/O 78691

Frequency	Av Power (Watt)	SA reading (dBuV)
824.04 MHz	0.34	135.1 (0.6472 W)
836.52MHz	0.48	136.1 (0.8148 W)
848.97MHz	0.25	134.6 (0.5768 W)

Frequency	Av Power (Watt)	SA reading (dBuV)
1851.25 MHz	0.42	136.4 (0.8730 W)
1880.00 MHz	0.55	137.3 (1.0741 W)
1908.75 MHz	0.40	136.5 (0.8934 W)

Data taken for Coleman Technologies, 1XRTT Agent, W/O 81879

	Frequency	Av Power meter	SA (peak power)
L	824.04 MHz	0.31watt	135dBuV (0.62W)
M	836.52 MHz	0.30 watt	135dBuV (0.62W)
H	848.97 MHz	0.24watt	134dBuV (0.48W)

	Frequency	Av Power meter	SA (peak power)
L	1851.25 MHz	0.28 watt	134.1dBuV (0.51W)
M	1880.00 MHz	0.28 watt	133 dBuV (0.396W)
H	1908.75 MHz	0.28 watt	134dBuV (0.48W)

The data taken for 1XRTT Agent shows that the power level does not exceed the RF power of EMII Dual. Hence using the test report of AnyData is acceptable.

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	2111	HP	8593EM	3624A00159	05/12/2003	05/12/2005
2.4 GHz HPF	1440	K & L	91H31-3000	1	02/20/2003	02/20/2005
Power Meter	2082	HP	435B	2445A11881	09/30/2002	09/30/2004
Power Sensor	2036	HP	8482A	1551A01004	05/29/2003	05/29/2004

TEST SETUP



FCC 24.232 & 22.913

TEST SETUP



FCC 24.232 & 22.913

FCC 2.1033(c)(14)/2.1047(a)/22.915(a) - MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE

The necessary information is contained in a separate document.

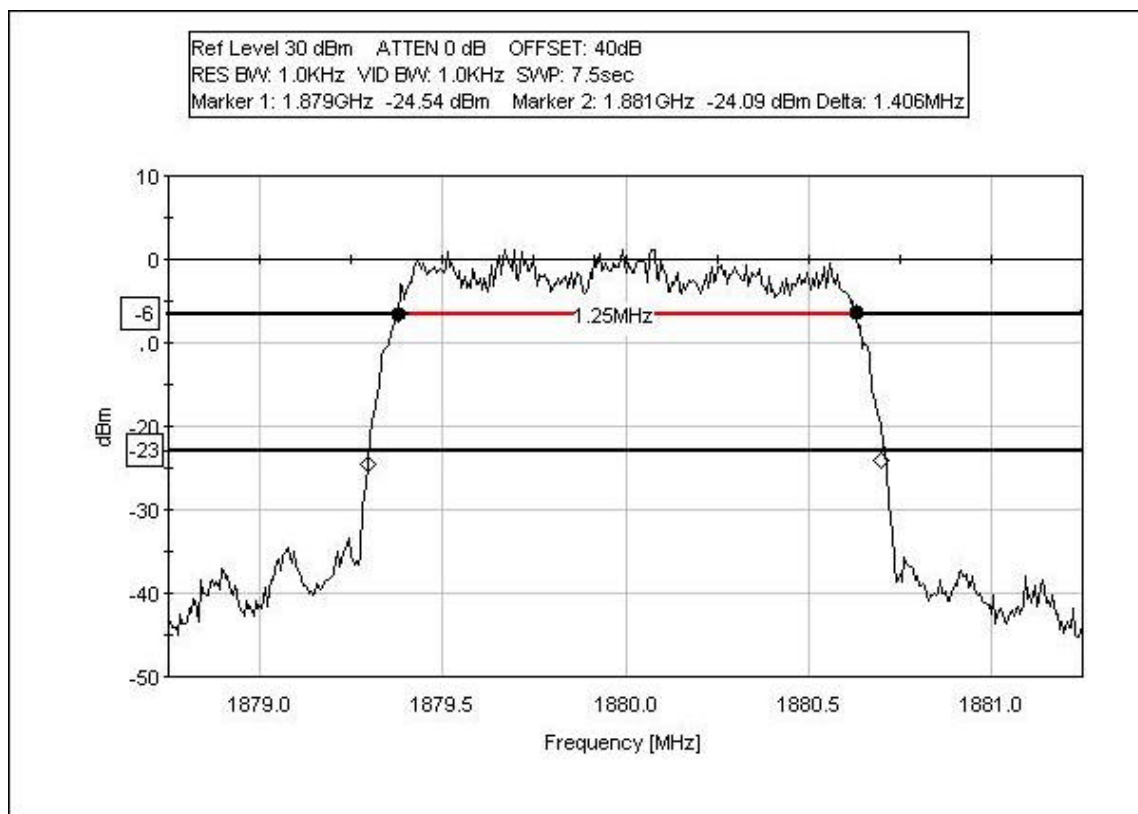
FCC 2.1033(c)(14)/2.1047(b)/22.915(a) MODULATION CHARACTERISTICS- Modulation Limiting Response

The necessary information is contained in a separate document.

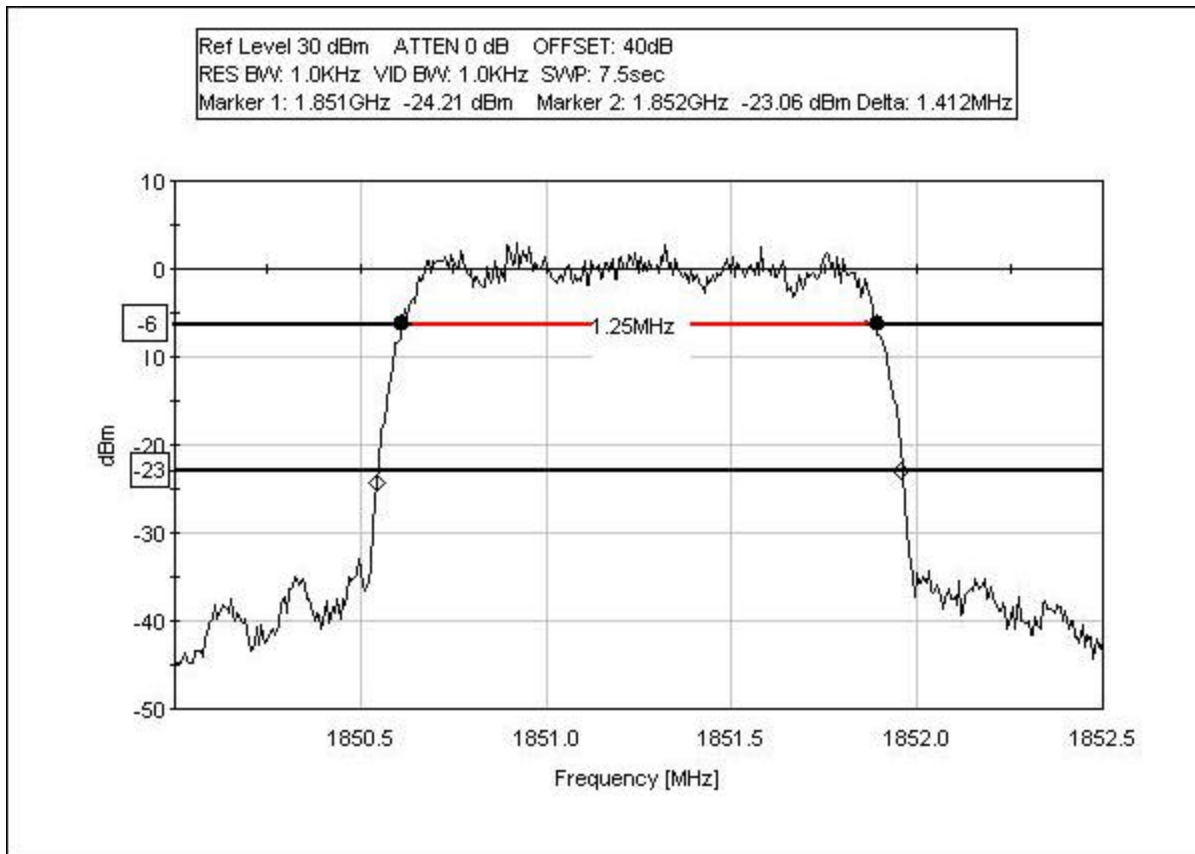
FCC 2.1033(c)(14)/2.1049(i)- OCCUPIED BANDWIDTH

Test Conditions: EUT is placed on the test bench. Discrete I/O port is connected to the support laptop. Power is obtained from a support DC power supply. RF port is connected to the spectrum analyzer for evaluation if the signal. EUT is in operational. 12VDC (110VAC, 60Hz), 23°Celsius, 55% relative humidity.

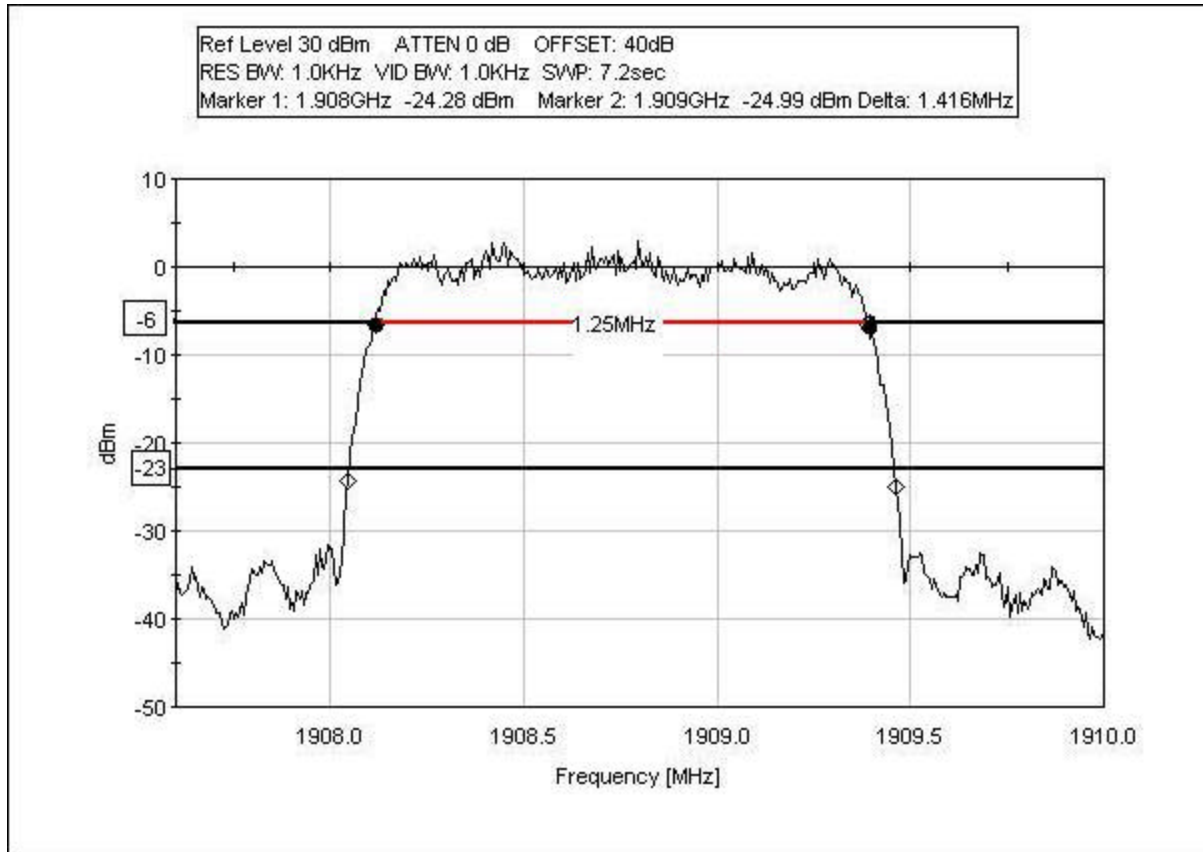
FCC 2.1049 Occupied Bandwidth 1880MHz



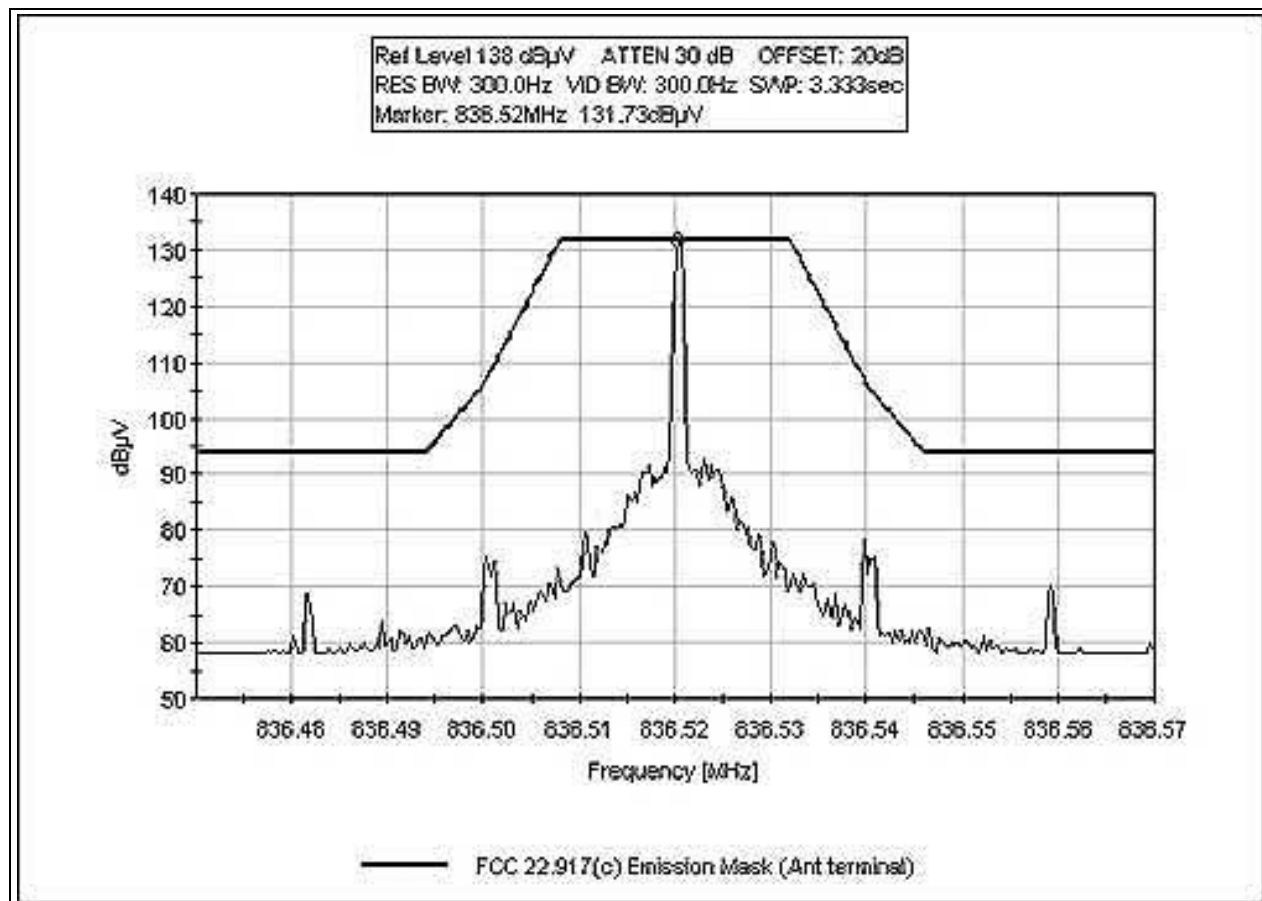
FCC 2.1049 Occupied Bandwidth 1851.25MHz



FCC 2.1049 Occupied Bandwidth 1908.75MHz



FCC 22.917(c) Emissions Mask Mid Channel



Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	2111	HP	8593EM	3624A00159	05/12/2003	05/12/2005
2.4 GHz HPF	1440	K & L	91H31-3000	1	02/20/2003	02/20/2005
Power Meter	2082	HP	435B	2445A11881	09/30/2002	09/30/2004
Power Sensor	2036	HP	8482A	1551A01004	05/29/2003	05/29/2004

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP



Front View

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP



Side View

FCC 2.1033(c)(14)/2.1051/2.1053/22.917(e) - OUT OF BAND EMISSIONS

The necessary information is contained in a separate document.

FCC 2.1033(c)(14)/2.1051/24.238 - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112
 Customer: **Coleman Technologies**
 Specification: **FCC 24.238 RF Spur**
 Work Order #: **81879** Date: 03/04/2004
 Test Type: **Conducted Emissions** Time: 14:26:49
 Equipment: **AVL/GPS Data Logging w/ Wireless Communication** Sequence#: 1
 Manufacturer: Coleman Technologies Tested By: Matthew Pettersen
 Model: 1XRTT Agent 12VDC
 S/N: 20040304

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
AVL/GPS Data Logging w/ Wireless Communication*	Coleman Technologies	1XRTT Agent	20040304

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Evo N150	D171QK260V3
Power Supply	CUI Inc.	DV-1280	none

Test Conditions / Notes:

EUT is placed on the test bench. Discrete I/O port is connected to the support laptop. Power is obtained from a support DC power supply. RF port is connected to the spectrum analyzer for evaluation of the signal. EUT is in operation. Tx Freq = 1851.25MHz. 9 kHz -150 kHz; RBW=200 Hz,VBW=200 Hz; 150 kHz-30 MHz; RBW=9 kHz,VBW=9 kHz; 30 MHz-1000 MHz; RBW=120 kHz,VBW=120 kHz, 1000 MHz-20000 MHz; RBW=1 MHz,VBW=1 MHz. 12VDC (110VAC, 60Hz), 23°C, 55% relative humidity. Frequency range tested: 9kHz – 20GHz.

Transducer Legend:

T1=HPF 2.4GHz High Pass 022004

Measurement Data: Reading listed by margin. Test Lead: Antenna Terminal

#	Freq MHz	Rdng dBμV	T1 dB	dB	dB	dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5552.750M	84.3	+2.4				+0.0	86.7	94.0	-7.3	Anten
2	3702.500M	76.9	+0.7				+0.0	77.6	94.0	-16.4	Anten
3	7404.000M	71.7	+5.1				+0.0	76.8	94.0	-17.2	Anten
4	9254.750M	70.9	+5.3				+0.0	76.2	94.0	-17.8	Anten
5	11106.250M	56.6	+4.7				+0.0	61.3	94.0	-32.7	Anten
6	14808.250M	44.1	+3.8				+0.0	47.9	94.0	-46.1	Anten
7	12959.750M	41.3	+5.0				+0.0	46.3	94.0	-47.7	Anten
8	5021.000M	36.4	+1.2				+0.0	37.6	94.0	-56.4	Anten

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Coleman Technologies**

Specification: **FCC 24.238 RF Spur**

Work Order #: **81879**

Date: 03/04/2004

Test Type: **Conducted Emissions**

Time: 14:19:57

Equipment: **AVL/GPS Data Logging w/ Wireless Communication**

Sequence#: 2

Manufacturer: Coleman Technologies

Tested By: Matthew Pettersen

Model: 1XRTT Agent

12VDC

S/N: 20040304

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
AVL/GPS Data Logging w/ Wireless Communication*	Coleman Technologies	1XRTT Agent	20040304

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Evo N150	D171QK260V3
Power Supply	CUI Inc.	DV-1280	none

Test Conditions / Notes:

EUT is placed on the test bench. Discrete I/O port is connected to the support laptop. Power is obtained from a support DC power supply. RF port is connected to the spectrum analyzer for evaluation of the signal. EUT is in operation. Tx Freq = 1880MHz. 9 kHz-150 kHz; RBW=200 Hz, VBW=200 Hz; 150 kHz-30 MHz; RBW=9 kHz, VBW=9 kHz; 30 MHz-1000 MHz; RBW=120 kHz, VBW=120 kHz, 1000 MHz-20000 MHz; RBW=1 MHz, VBW=1 MHz. 12VDC (110VAC, 60Hz), 23°C, 55% relative humidity. Frequency range tested: 9kHz – 20GHz.

Transducer Legend:

T1=HPF 2.4GHz High Pass 022004

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Terminal

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5639.080M	76.0	+2.0				+0.0	78.0	94.0	-16.0	Anten
2	9398.700M	65.7	+6.7				+0.0	72.4	94.0	-21.6	Anten
3	7518.950M	64.6	+5.5				+0.0	70.1	94.0	-23.9	Anten
4	3760.450M	67.7	+0.8				+0.0	68.5	94.0	-25.5	Anten
5	11278.330M	50.3	+4.4				+0.0	54.7	94.0	-39.3	Anten
6	13160.080M	37.8	+4.5				+0.0	42.3	94.0	-51.7	Anten
7	15040.200M	37.8	+4.3				+0.0	42.1	94.0	-51.9	Anten
8	5113.000M	35.3	+1.5				+0.0	36.8	94.0	-57.2	Anten

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112
 Customer: **Coleman Technologies**
 Specification: **FCC 24.238 RF Spur**
 Work Order #: **81879** Date: 03/04/2004
 Test Type: **Conducted Emissions** Time: 14:03:29
 Equipment: **AVL/GPS Data Logging w/ Wireless Communication** Sequence#: 3
 Manufacturer: Coleman Technologies Tested By: Matthew Pettersen
 Model: 1XRTT Agent 12VDC
 S/N: 20040304

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
AVL/GPS Data Logging w/ Wireless Communication*	Coleman Technologies	1XRTT Agent	20040304

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Evo N150	D171QK260V3
Power Supply	CUI Inc.	DV-1280	none

Test Conditions / Notes:

EUT is placed on the test bench. Discrete I/O port is connected to the support laptop. Power is obtained from a support DC power supply. RF port is connected to the spectrum analyzer for evaluation of the signal. EUT is in operation. Tx Freq = 1908.75MHz. 9 kHz -150 kHz; RBW=200 Hz, VBW=200 Hz; 150 kHz-30 MHz; RBW=9 kHz, VBW=9 kHz; 30 MHz-1000 MHz; RBW=120 kHz, VBW=120 kHz, 1000 MHz-20000 MHz; RBW=1 MHz, VBW=1 MHz. 12VDC (110VAC, 60Hz), 23°C, 55% relative humidity. Frequency range tested: 9kHz – 20GHz.

Transducer Legend:

T1=HPF 2.4GHz High Pass 022004

Measurement Data: Reading listed by margin. Test Lead: Antenna Terminal

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5725.250M	80.8	+1.6				+0.0	82.4	94.0	-11.6	Anten
2	3816.900M	80.4	+0.8				+0.0	81.2	94.0	-12.8	Anten
3	9542.200M	70.9	+7.4				+0.0	78.3	94.0	-15.7	Anten
4	7633.700M	64.7	+5.7				+0.0	70.4	94.0	-23.6	Anten
5	11452.450M	53.3	+4.0				+0.0	57.3	94.0	-36.7	Anten
6	13362.550M	45.1	+3.7				+0.0	48.8	94.0	-45.2	Anten
7	15269.500M	42.8	+3.6				+0.0	46.4	94.0	-47.6	Anten

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	2111	HP	8593EM	3624A00159	05/12/2003	05/12/2005
2.4 GHz HPF	1440	K & L	91H31-3000	1	02/20/2003	02/20/2005
Power Meter	2082	HP	435B	2445A11881	09/30/2002	09/30/2004
Power Sensor	2036	HP	8482A	1551A01004	05/29/2003	05/29/2004

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP



Front View

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP



Side View

FCC 2.1033(c)(14)/2.1055/22.355/24.235 - FREQUENCY STABILITY

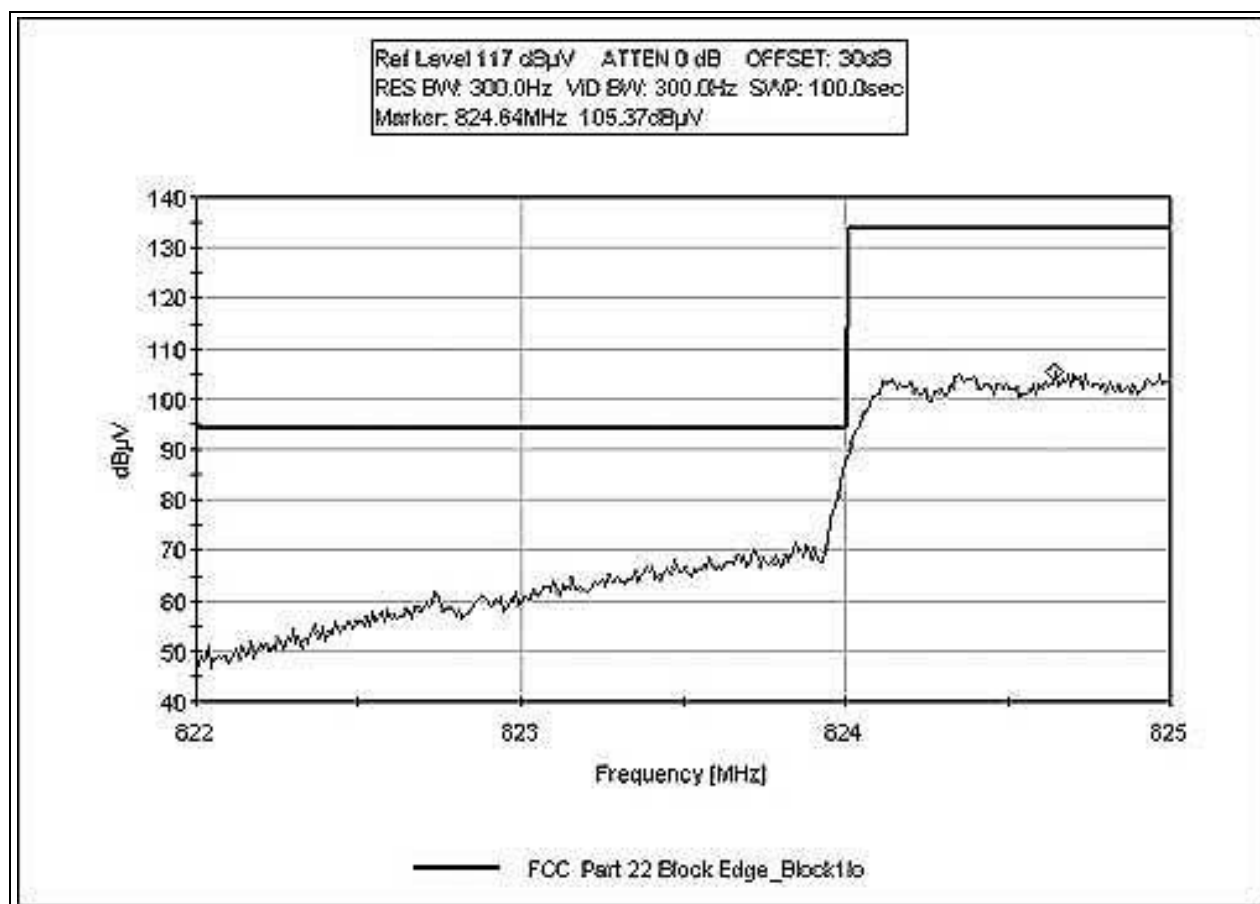
The necessary information is contained in a separate document.

FCC 24.236 - FIELD STRENGTH LIMITS

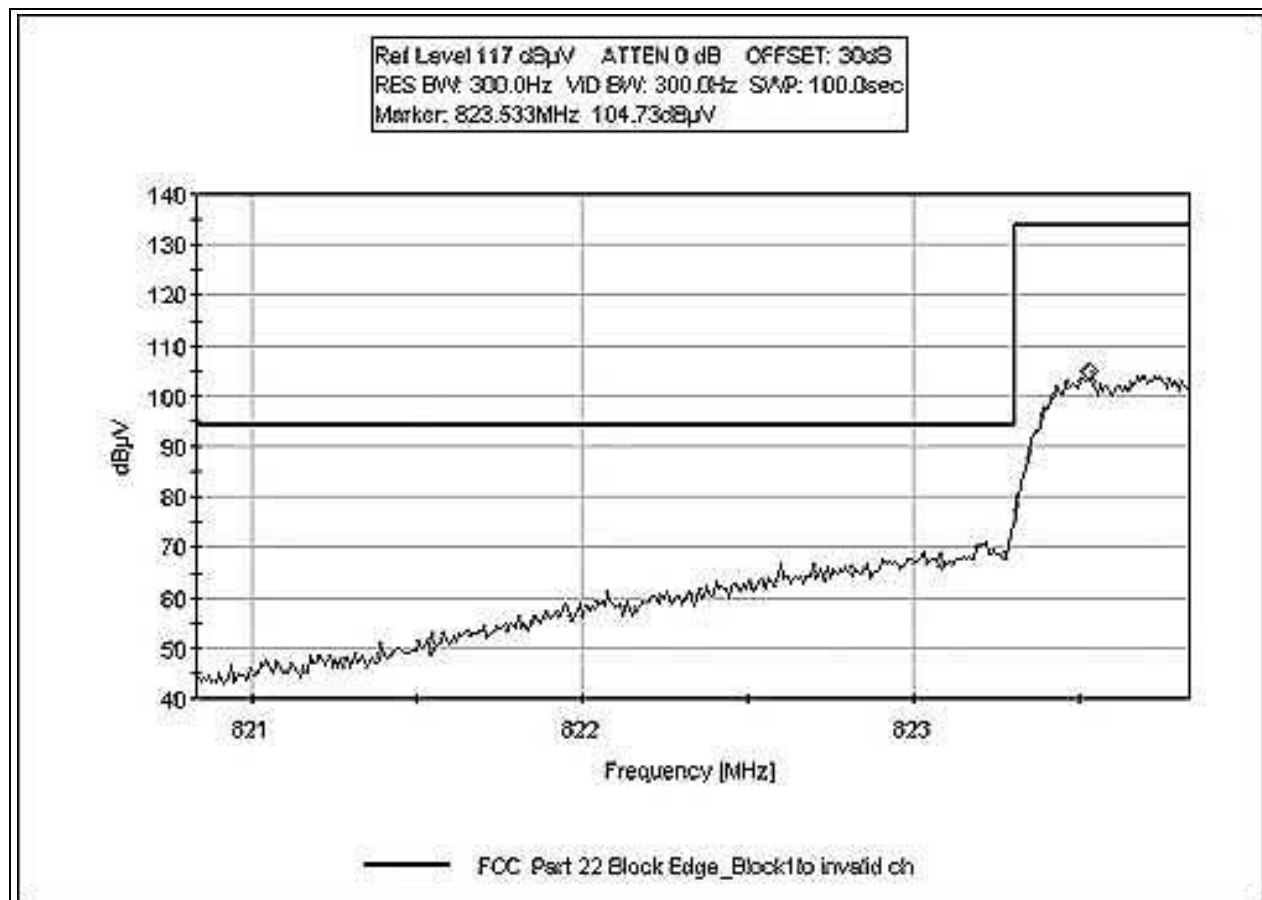
The necessary information is contained in a separate document.

FCC Part 22 Block Edge Block 1 Low

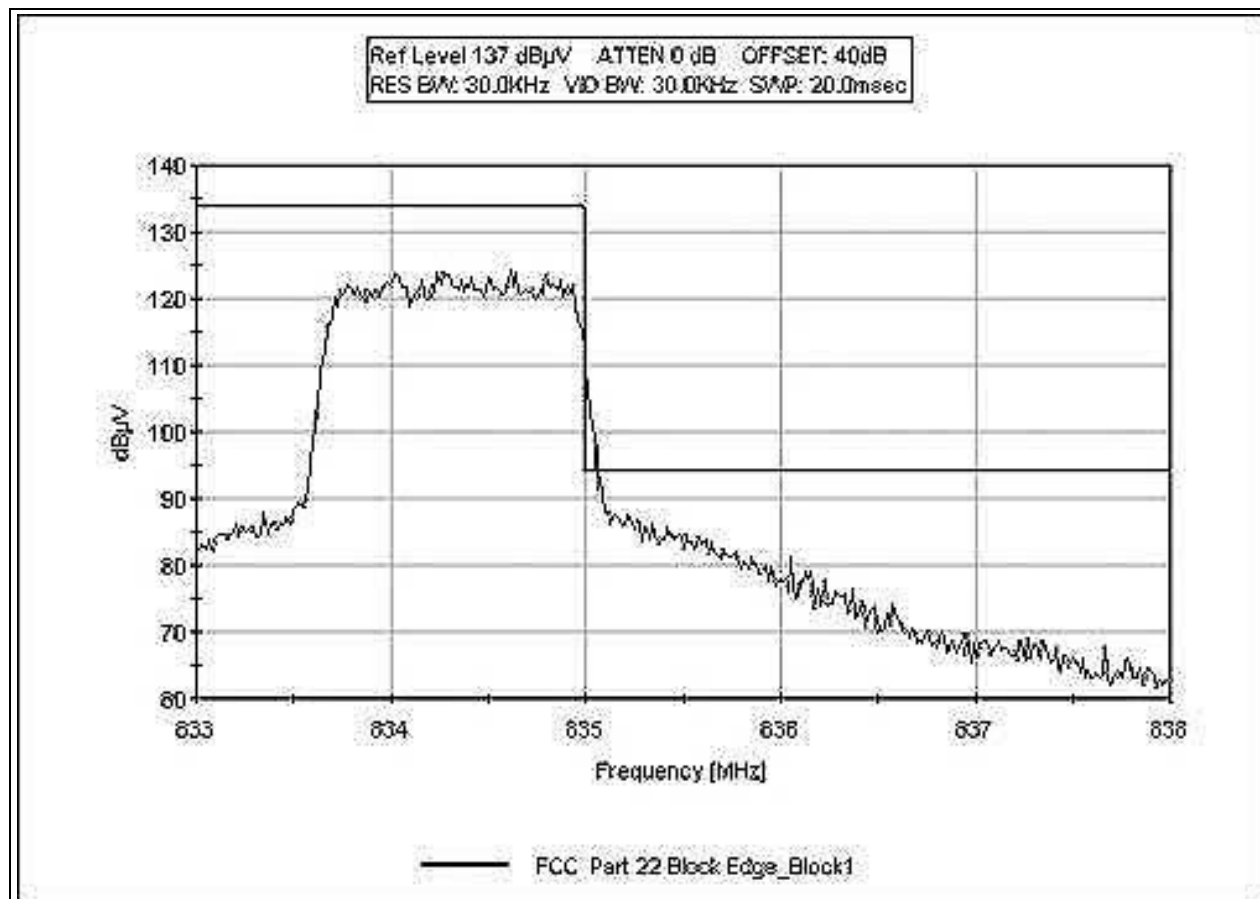
Test Conditions : EUT is placed on the test bench. Discrete I/O port is connected to the support laptop. Power is obtained from a support DC power supply. RF port is connected to the spectrum analyzer for evaluation of the signal. EUT is in operational. 12VDC (110VAC, 60Hz), 23°C, 55% relative humidity.



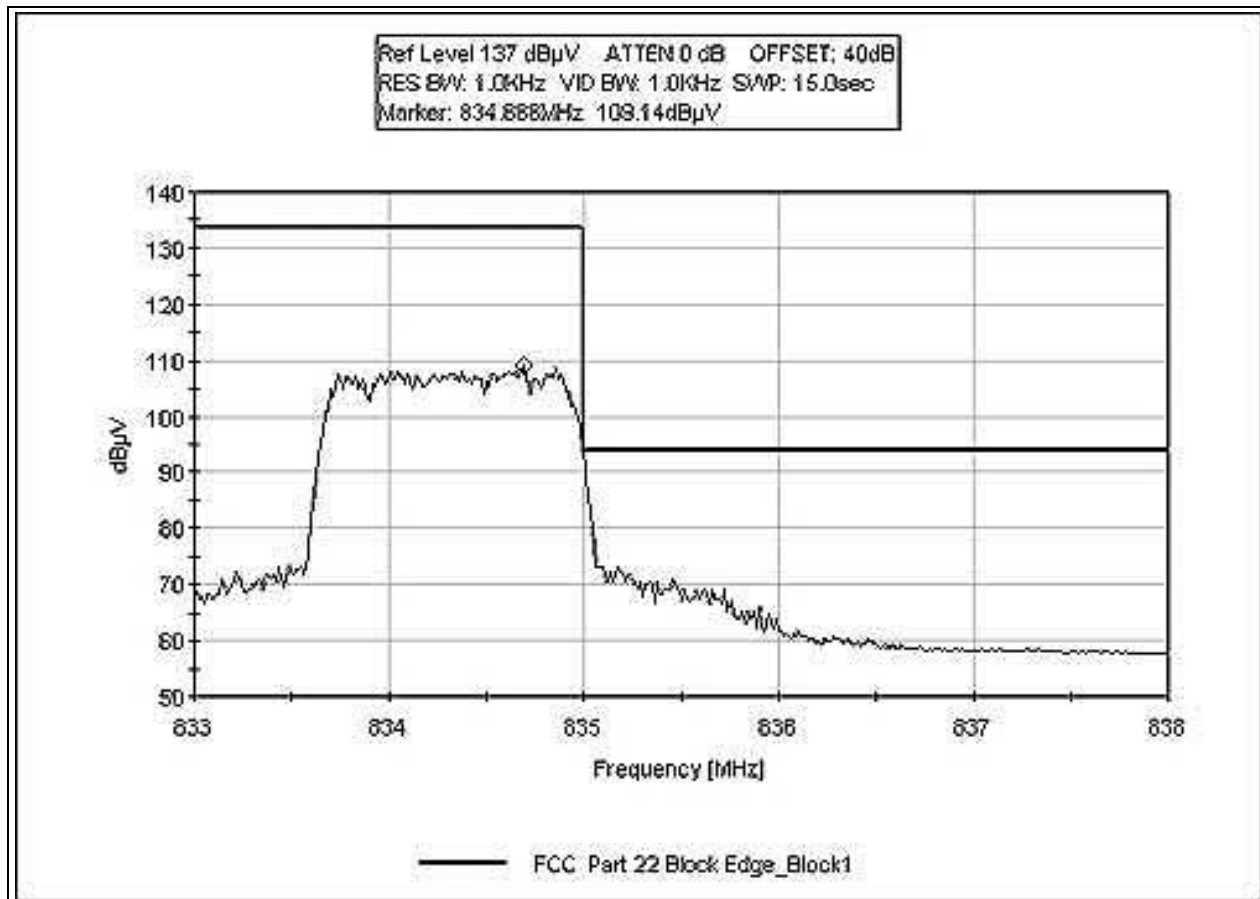
FCC Part 22 Block Edge Block 1 Low Invalid Channel



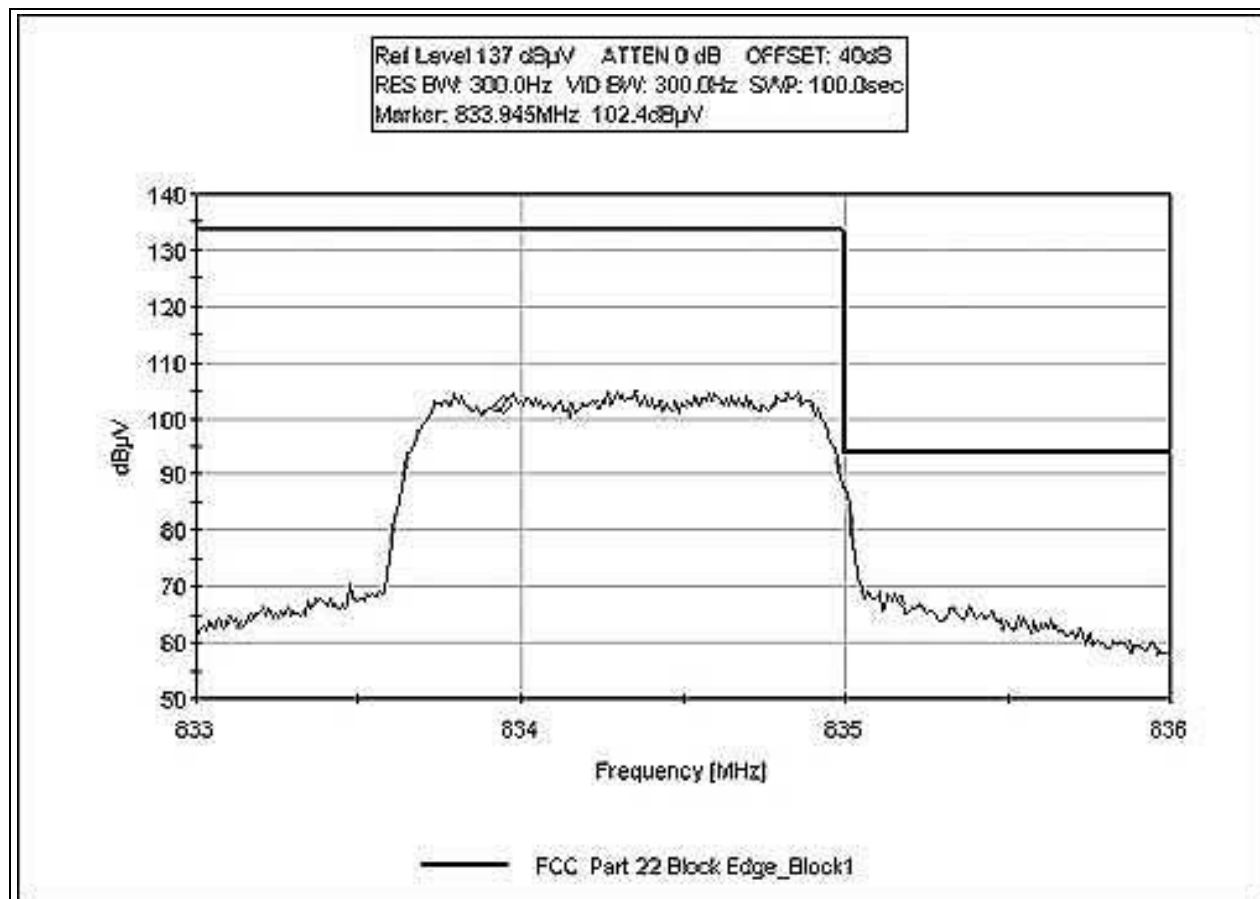
FCC Part 22 Block Edge Block 1 High



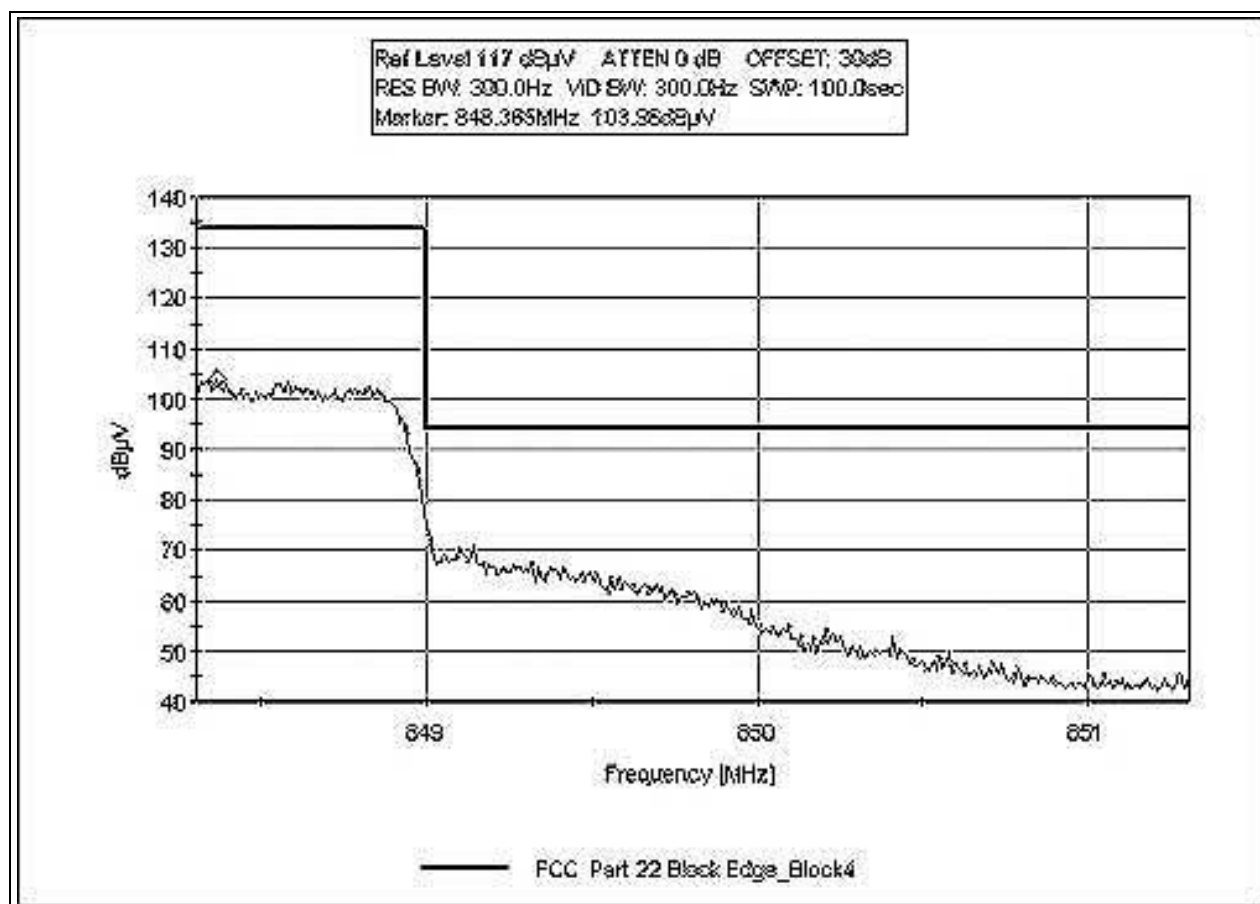
FCC Part 22 Block Edge Block 1 High 1kHz



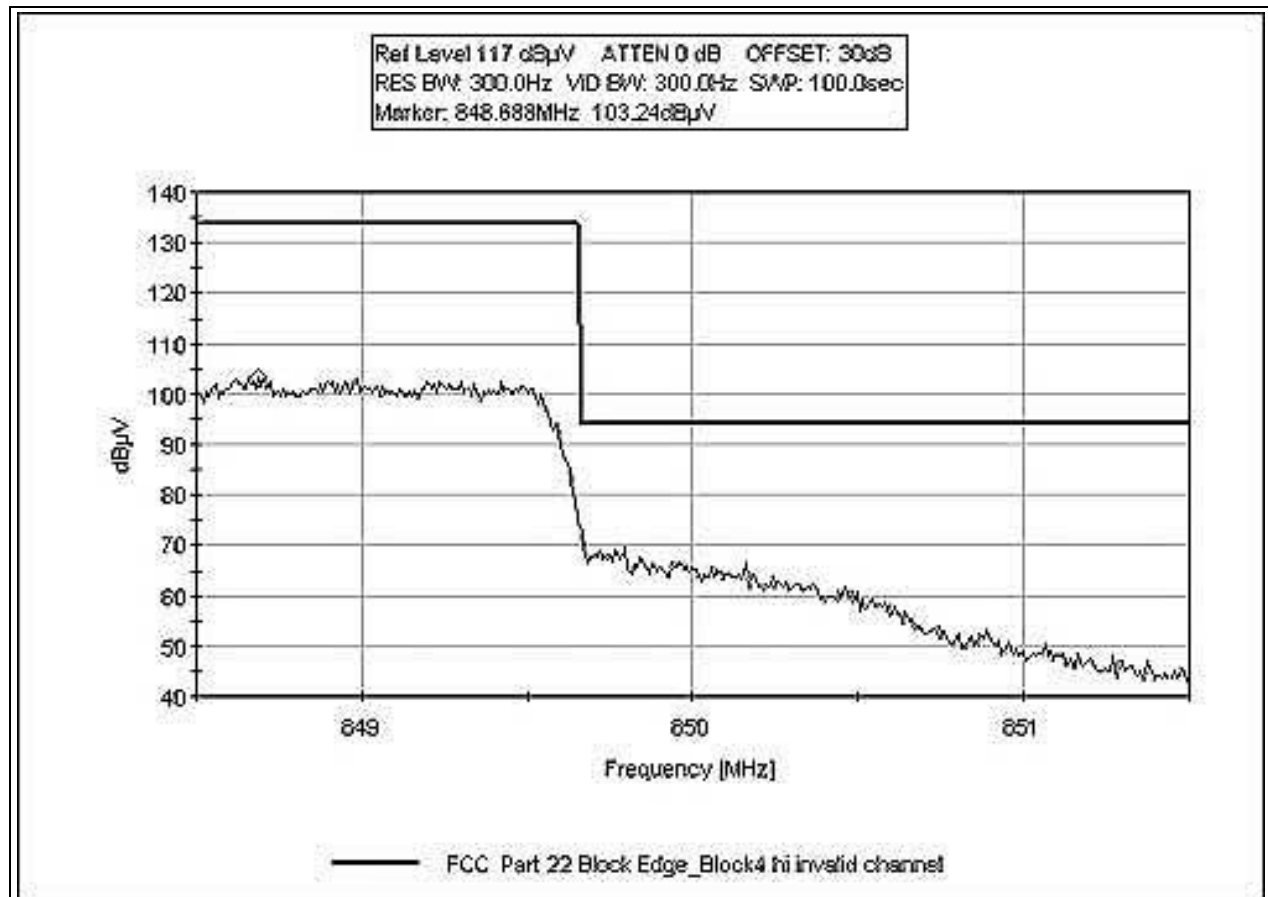
FCC Part 22 Block Edge Block 1 High 300Hz



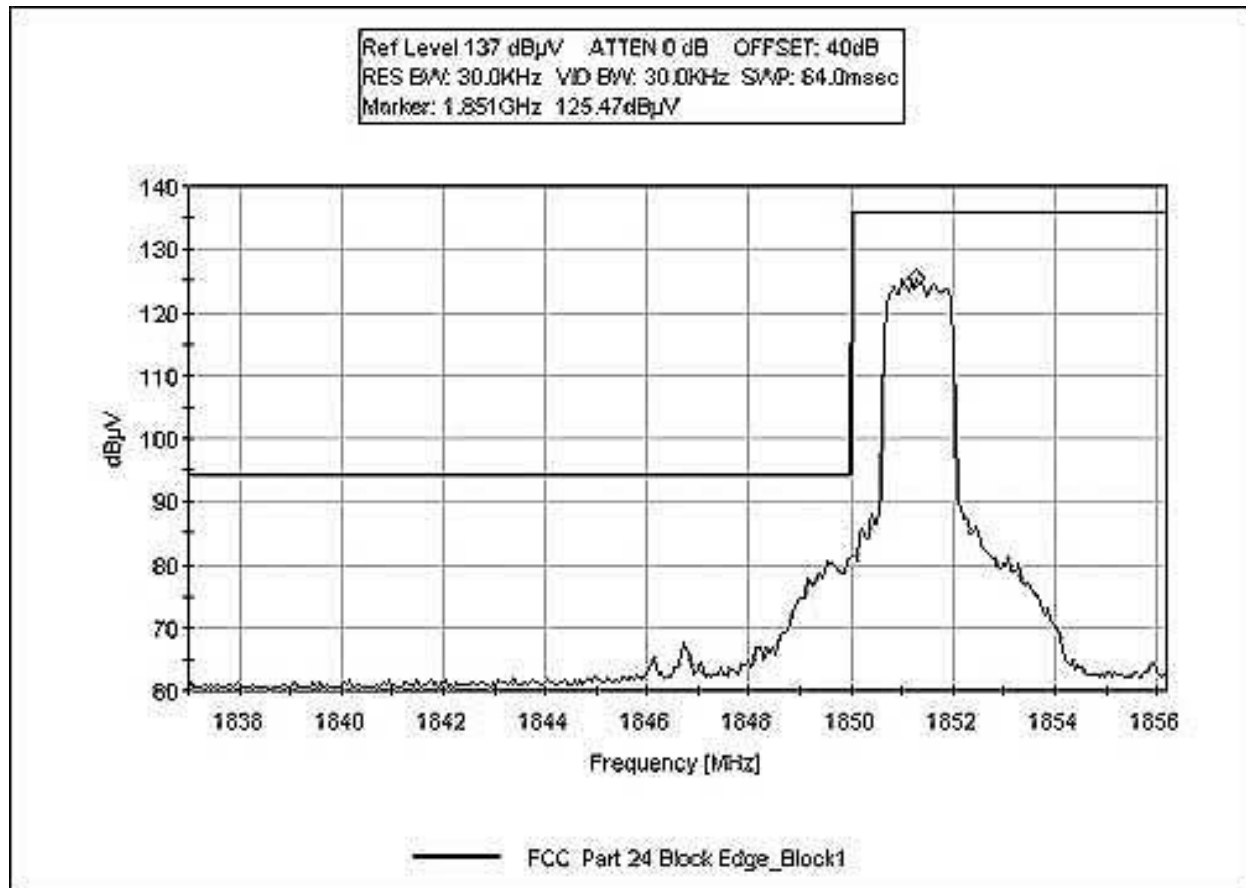
FCC Part 22 Block Edge Block 4 High



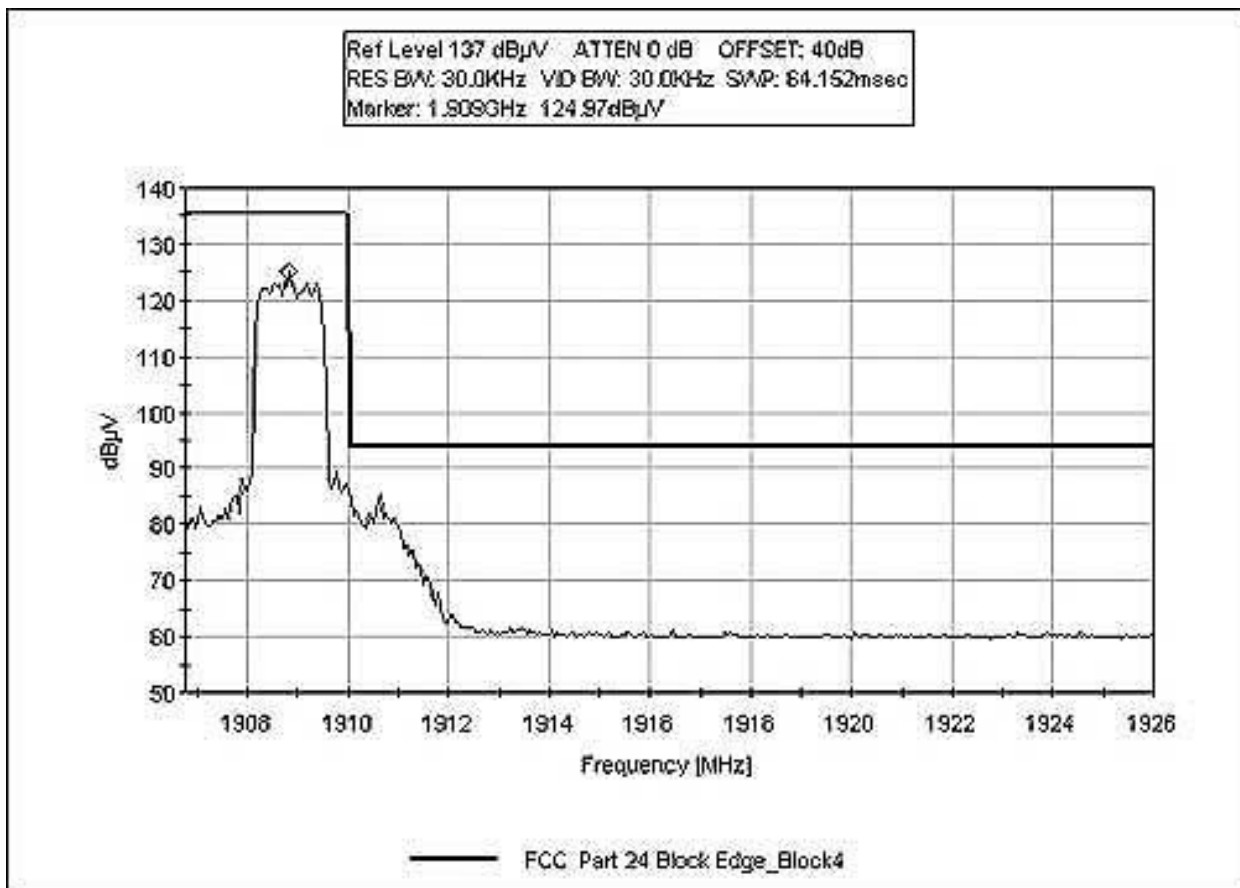
FCC Part 22 Block Edge Block 4 High Invalid Channel



FCC Part 24 Block Edge Block 1 Low 1851.25MHz



FCC Part 24 Block Edge Block 1 High 1908.75MHz



Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	2111	HP	8593EM	3624A00159	05/12/2003	05/12/2005
2.4 GHz HPF	1440	K & L	91H31-3000	1	02/20/2003	02/20/2005
Power Meter	2082	HP	435B	2445A11881	09/30/2002	09/30/2004
Power Sensor	2036	HP	8482A	1551A01004	05/29/2003	05/29/2004

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP



Front View

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP



Side View