Test Report

FCC Part 95, LPRS
and
FCC Part 90

Model: GT-Motion Beacon
FCC ID.: NBI-GTMB001

Report No.: 27894RUS1

Prepared for:

Spectrum Management-Electronic Tracking Systems
2545 Tarpley Rd.
Carrollton, TX, 75006 USA

TESTED BY: _____ **DATE:** 20 May 2009

Tom Tidwell, Telecom Direct

APPROVED BY: _____ **DATE:** 21 May 2009

David Light, Wireless Engineer

Number of Pages: 45

NVLAP LAB CODE: 100426-0

Report Summary
Nemko USA, Dallas Lab

Test range numbers: FCC: 298477
IC: 2040C-3

Applicant: Spectrum Tracking Systems, Inc.
Grantee code: NBI
FRN: 0005024047

Customer Representative: John Gergen

EUT Description	Manufacturer	Model	Revision	Serial Number
The EUT is a transmit device used by law enforcement to locate and track assets that have been stolen.	Spectrum Tracking Systems	GT-Motion Beacon	-	Device 1

Test Summary

Test/Requirement Description	Pass / Fail	Applicable Rule Parts
Maximimum RF Transmitting Power	Pass	2.1046, 95.135, 95.639(e), 90.259(a)(4)
Modulation Characteristics	Pass	2.1047, 95.631(g), 95.637, 90.207
Occupied Bandwidth	Pass	2.1049, 95.633(d)(2), 90.210(f), 90.217(b)
Spurious Emissions at Antenna Terminals	Pass	2.1051, 95.635(c)(1), 90.210(f), 90.217(b)
Field Strength of Spurious Emissions	Pass	2.1053, 95.635(c)(1), 90.210(f), 90.217(b)
Frequency Stability	Pass	2.1055, 95.629(b)(2), 90.210(f), 90.217(b)
Control Accessibility	Pass	95.645(a)
Power Capability	Pass	95.649
Permissible Communications	Pass	95.1009(c)
Antennas and ERP	Pass	95.1013(a)

Notes:

Test Result: The product as presented for testing complied with test requirements as shown above.

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Nemko USA, Inc., 802 N. Kealy, Lewisville, Texas 75057-3136 Tel: (972) 436-9600, Fax: (972) 436-2667

Revision History

Revision No.	Reason for Revision	Revision Date

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to describe results of the tests applied by Nemko USA to demonstrate compliance of the GT-Motion Beacon to FCC Part 90 and 95 Rules.

2.0 EUT DESCRIPTION

2.1 CONFIGURATION

Description of EUT

	Name	Model	Revision	Serial Number
EUT	TracPac	GT-Motion Beacon	A	Device 1
RF Exposure Classification	☐ Portable (<20 cm. separation from user) ☒ Mobile (>20 cm. separation from user) ☐ Fixed (Antenna mounted on an outdoor, permanent fixed structure)			
Channels/Frequency Range	216.0125 - 216.9975 MHz (Part 95) and 219.930 – 219.990 MHz (Part 90)			
Antenna type	☐ Integral ☒ External with reverse polarity SMA connector ☐ Integral and External			
Antenna gain	0 dBd, 2.14 dBi			
Type of Modulation	ASK			
Emission Designator	1K40A1D			
Power supply	☒ Battery ☐ External adapter ☐ Direct to AC mains			
Functional Description	The EUT is used for wireless data transmission.			

2.1.1 EUT POWER

Voltage Rating	3.3V ☒DC ☐AC
Current Rating	.1 Amps charging

2.2 INTERCONNECT CABLES

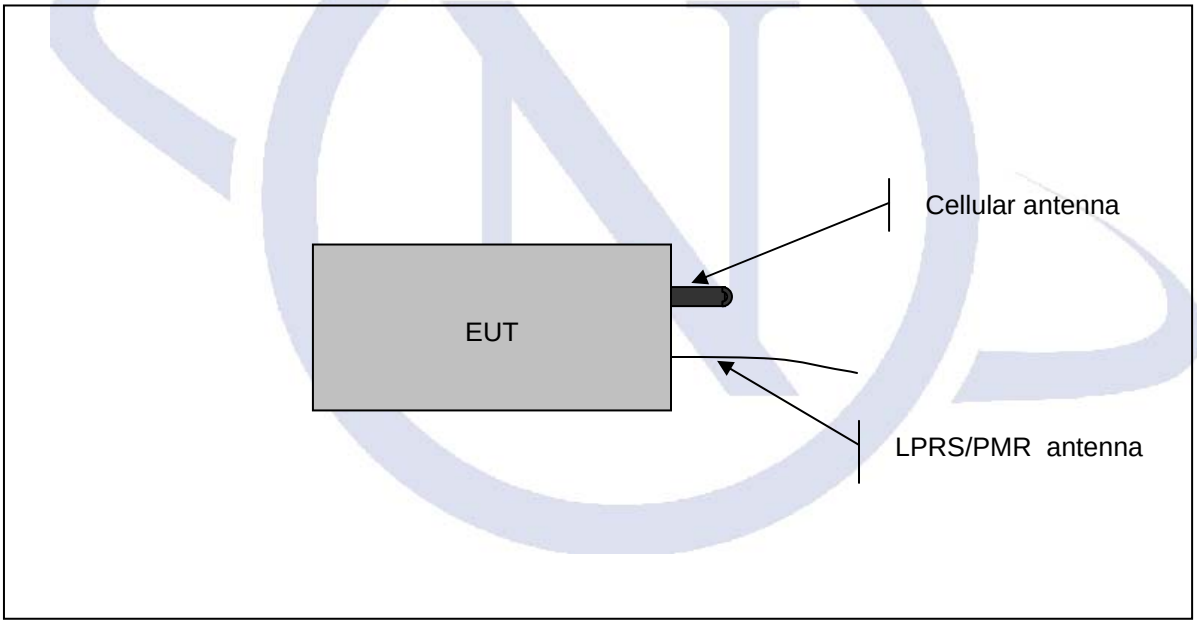
☒ NONE. The device is a stand-alone device with no interconnecting cables.

2.3 MODE OF OPERATION DURING TESTS

The EUT was tested while in a continuous transmit mode. The EUT was tuned to the lowest, middle, and highest channels. The EUT continuously transmitted pseudo-random data. While transmitting the EUT was setup to operate at the intended maximum power output available to the end user. For all test cases pre-scans were completed in all modes to determine worst case levels.

3.0 SUPPORT EQUIPMENT

3.1 CONFIGURATION



APPENDICES

APPENDIX A: MAXIMUM TRANSMIT RF POWER

A.1. Base Standard & Test Basis

Base Standard	FCC PART 95.135, 95.639(e)
Test Basis	FCC PART 2.1046
Test Method	ANSI/TIA 603-C

A.2. Specifications

90.217 Except as noted herein, transmitters used at stations licensed below 800 MHz on any frequency listed in subparts B and C of this part or licensed on a business category channel above 800 MHz **which have an output power not exceeding 120 milliwatts are exempt from the technical requirements set out in this subpart, but must instead comply with the following**:
(a) For equipment designed to operate with a 25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 40 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.
(b) For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.
(c) For equipment designed to operate with a 6.25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 12.5 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.
(d) Transmitters may be operated in the continuous carrier transmit mode.
(e) Transmitters used for wireless microphone operations and operating on frequencies allocated for Federal use must comply with the requirements of §90.265(b).

90.259(a)(4) In the 217–220 MHz band, the maximum transmitter output power is 2 watts. The maximum antenna height above average terrain (HAAT) is 152 m (500 feet).

95.639(e) – The maximum transmitter output power authorized for LPRS stations is 100 mW.

A.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
1.2 dB / .01 ppm

A.4. Deviations

Deviation Number	**Date**	**Description and Justification of Deviation**	**Deviation Reference**	
			Base Standard	**Test Procedure**
none				

A.5. Test Procedure

ANSI/TIA 603-C

A.6. Test Results

Compliant. The maximum rf output power is +14.23 dBm (0.0265 watts).

A.7. Operating Mode During Test

The EUT was tested in a beacon transmit mode.

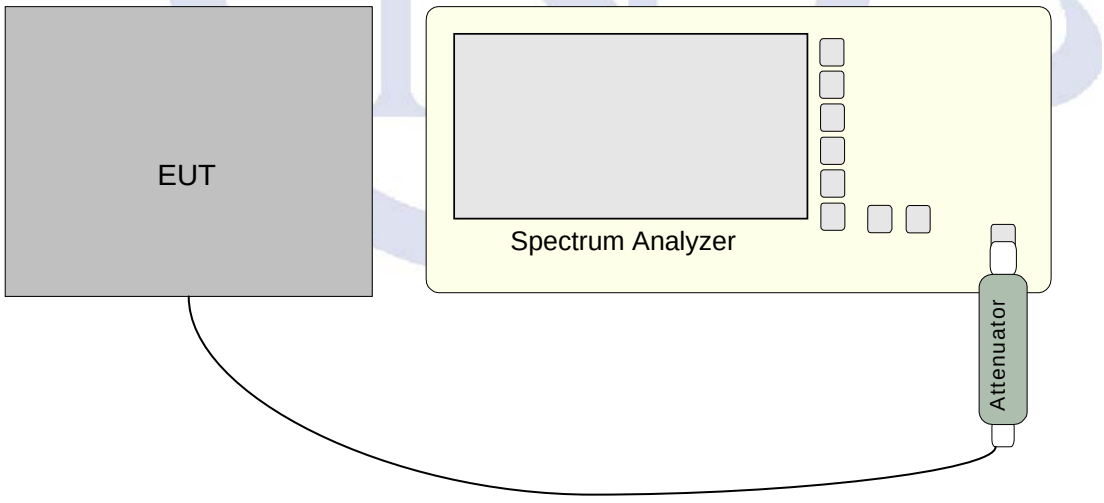
A.8. Sample Calculation

$P(mW) = 10^{(P(dBm)/10)}$

A.9. Test Data

Frequency (MHz)	Peak Conducted Power (dBm)	Limit (dBm)
216.462	+14.23	+20.0
219.960	+14.02	+20.8

A.10. Test Configuration



A.11. Tested By

Name: Tom Tidwell
Date: 16 April, 2009

Figure 1 Peak Conducted RF Power - LPRS

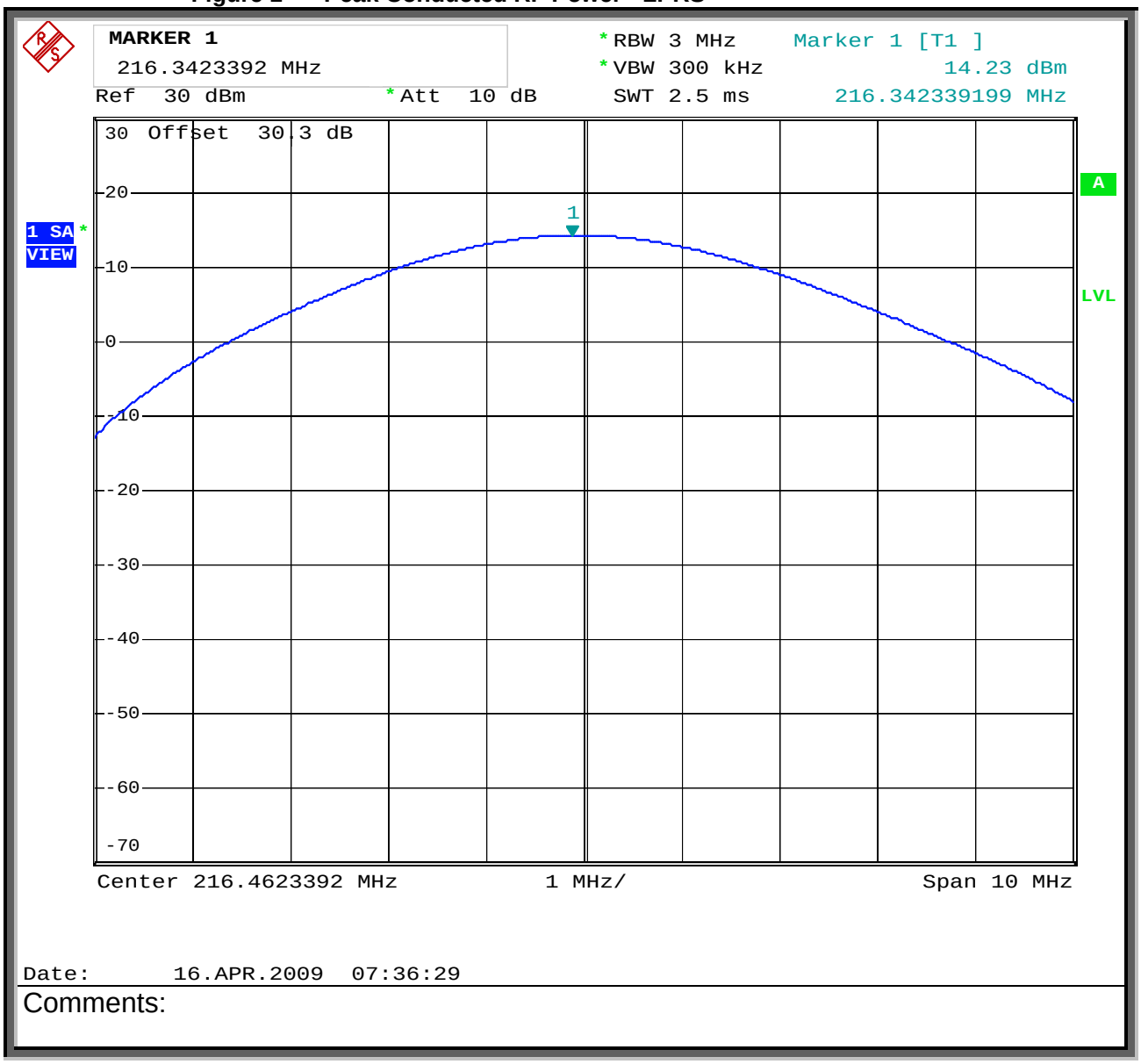
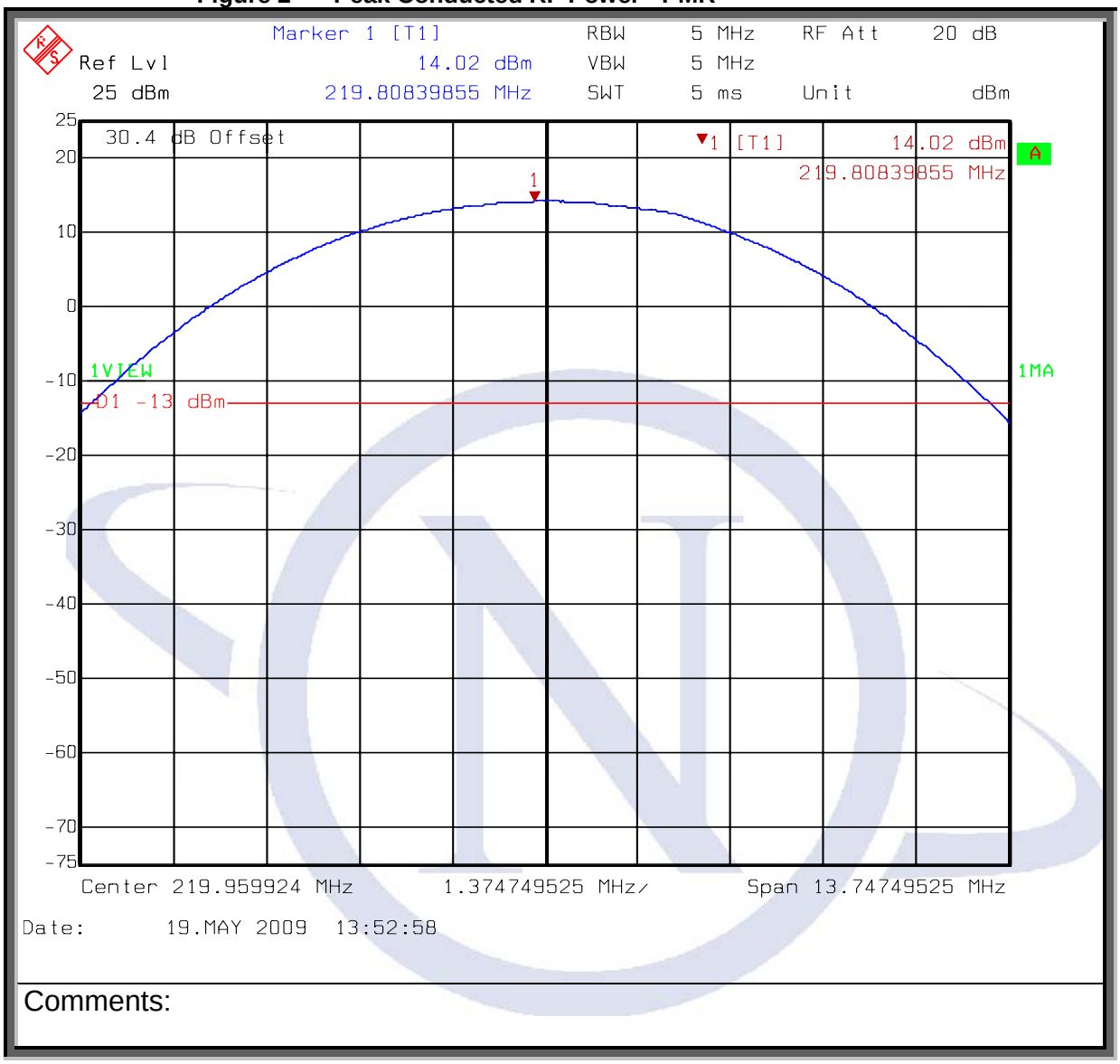


Figure 2 Peak Conducted RF Power - PMR



Comments:

APPENDIX B: MODULATION CHARACTERISTICS

B.1. Base Standard & Test Basis

Base Standard	FCC CFR 47, 95.631(g), 95.637
Test Basis	FCC CFR 47, 2.1047
Test Method	ANSI/TIA 603-C

B.2. Specifications

95.631(g) – An LPRS station may transmit any emission type appropriate for communications in this service. Two-way voice communications, however, are prohibited.

95.637(a) – A GMRS transmitter that transmits emission types F1D, G1D, or G3E must not exceed a peak frequency deviation of plus or minus 5 kHz.

B.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
0.00125 kHz

B.4. Deviations

Deviation Number	Date	Description and Justification of Deviation	Deviation Reference	
			Base Standard	Test Procedure
none				

B.5. Test Method

ANSI/TIA 603-C

B.6. Test Results

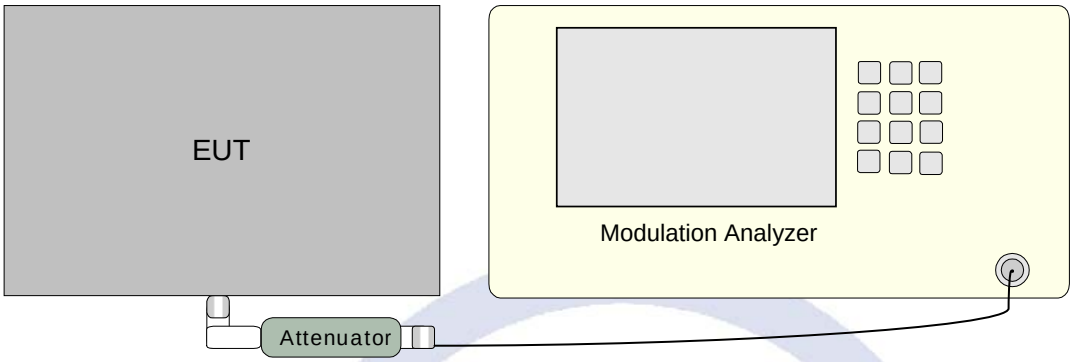
Compliant. The device evaluated used Amplitude Shift Keying modulation (A1D).

B.7. Sample Calculation

B.8. Test Data

None

B.9. Test Diagram



B.10. Tested By

Name: Tom Tidwell
Date: 22 April, 2009

APPENDIX C: OCCUPIED BANDWIDTH

C.1. Base Standard & Test Basis

Base Standard	FCC CFR 47, 95.633(d)(2)
Test Basis	FCC CFR 47, 2.1049
Test Method	ANSI/TIA 603-C

C.2. Specifications

90.210
(f) *Emission Mask F.* For transmitters operating in the 220–222 MHz frequency band, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:
(1) On any frequency from the center of the authorized bandwidth $f_o$to the edge of the authorized bandwidth f_e: Zero dB.
(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ($f_d$in kHz) of more than 2 kHz up to and including 3.75 kHz: 30 + 20(f_d-2) dB or 55 + 10 log (P), or 65 dB, whichever is the lesser attenuation.
(3) On any frequency beyond 3.75 kHz removed from the center of the authorized bandwidth fd:At least 55 + 10 log (P) dB.

90.217 Except as noted herein, transmitters used at stations licensed below 800 MHz on any frequency listed in subparts B and C of this part or licensed on a business category channel above 800 MHz **which have an output power not exceeding 120 milliwatts are exempt from the technical requirements set out in this subpart, but must instead comply with the following**:
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(b) For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.
(c) For equipment designed to operate with a 6.25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 12.5 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

95-633(d)(2) – The channel bandwidth for standard channels is 25 kHz.

95.635(c)(1) – Emissions for LPRS transmitters operating on standard band channels (25 kHz) shall be attenuated below the unmodulated carrier in accordance with the following:

(i) Emissions 12.5 kHz to 22.5 kHz away from the carrier center frequency: at least 30 dB; and

(ii) Emissions more than 22.5 kHz away from the channel center frequency: at least 43 + 10log(carrier power in watts) dB.

C.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
+/-1.2 dB

C.4. Deviations

Deviation Number	Date	Description and Justification of Deviation	Deviation Reference	
			Base Standard	Test Procedure
none				

C.5. Test Method

ANSI/TIA 603-C

C.6. Test Results

Compliant. The occupied bandwidth is 1.14 kHz. The emission also meets the emission mask requirements of 95.635(c)1(i), 90.217, and 90.210(f).

C.7. Deviations from Normal Operating Mode During Test

None.

C.8. Sample Calculation

None

C.9. Test Data

Figure 3 Occupied Bandwidth

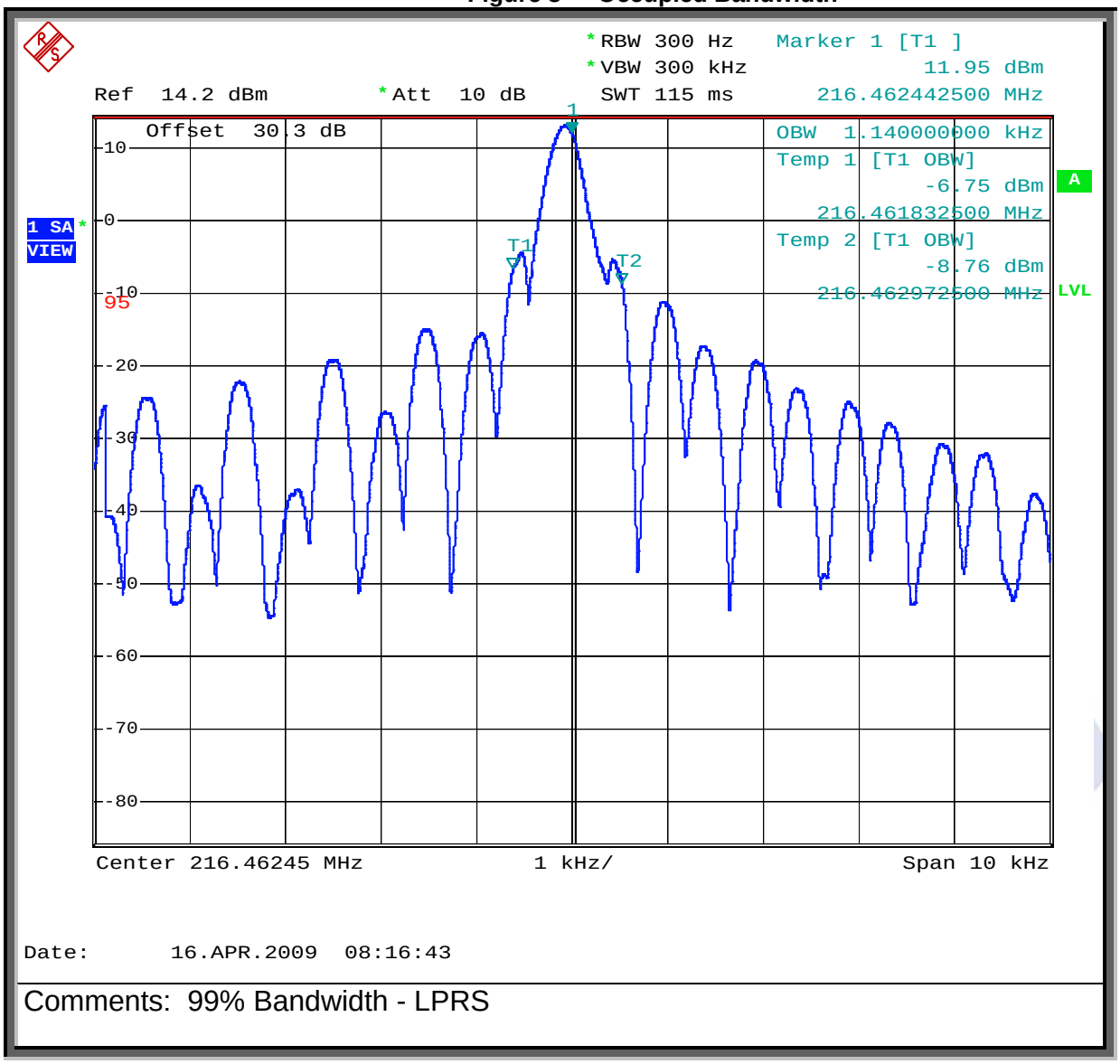


Figure 4 Occupied Bandwidth

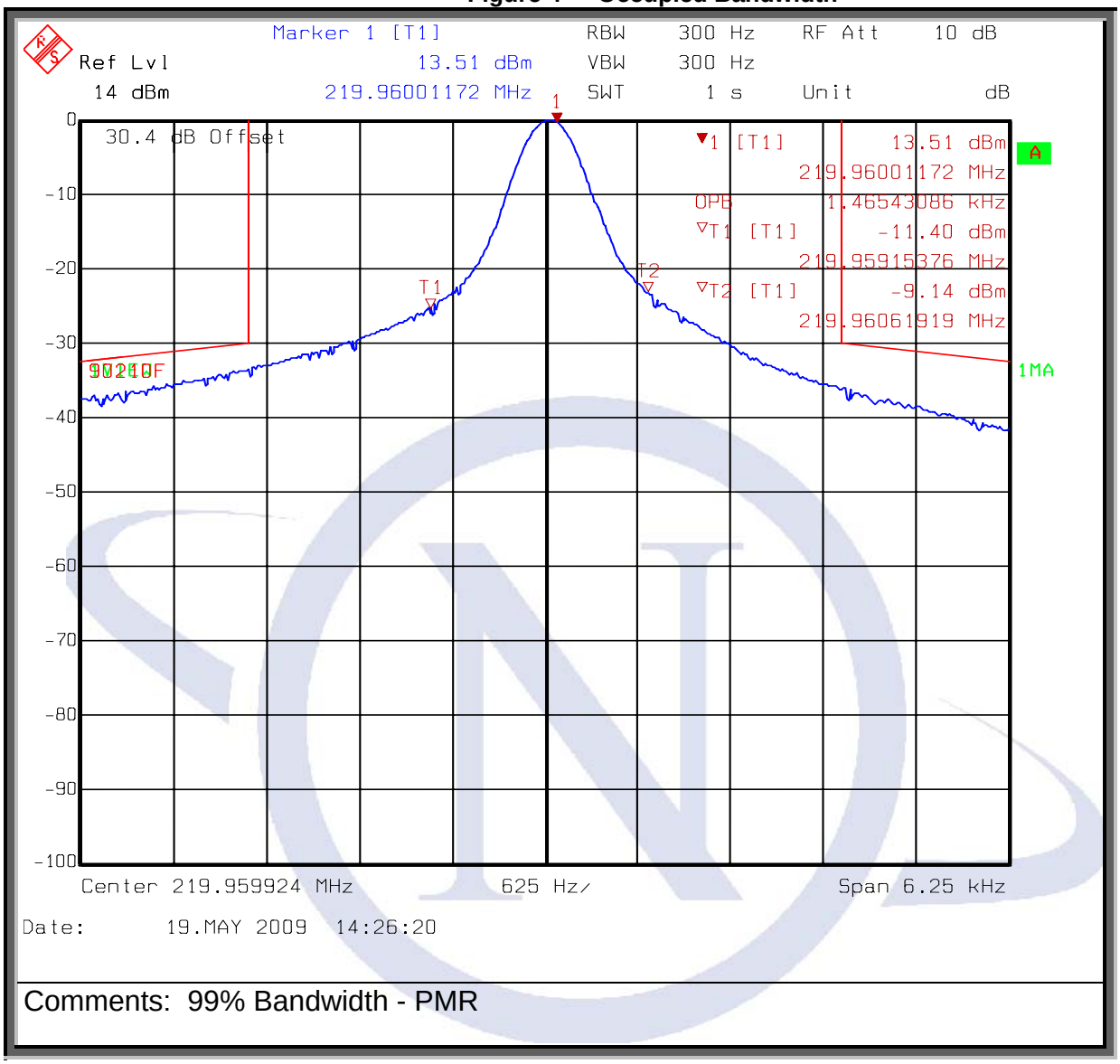


Figure 5 Occupied Bandwidth

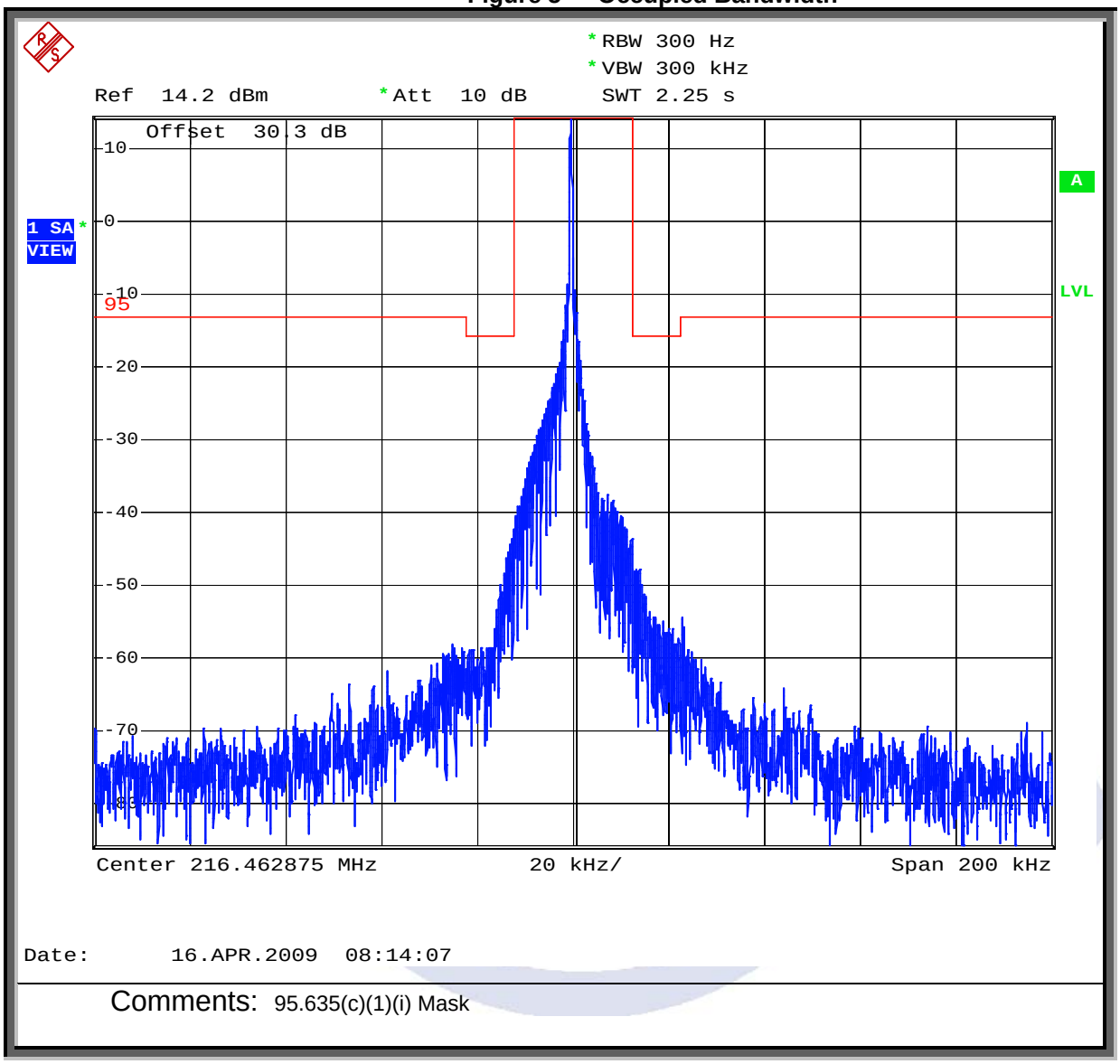


Figure 6 Occupied Bandwidth

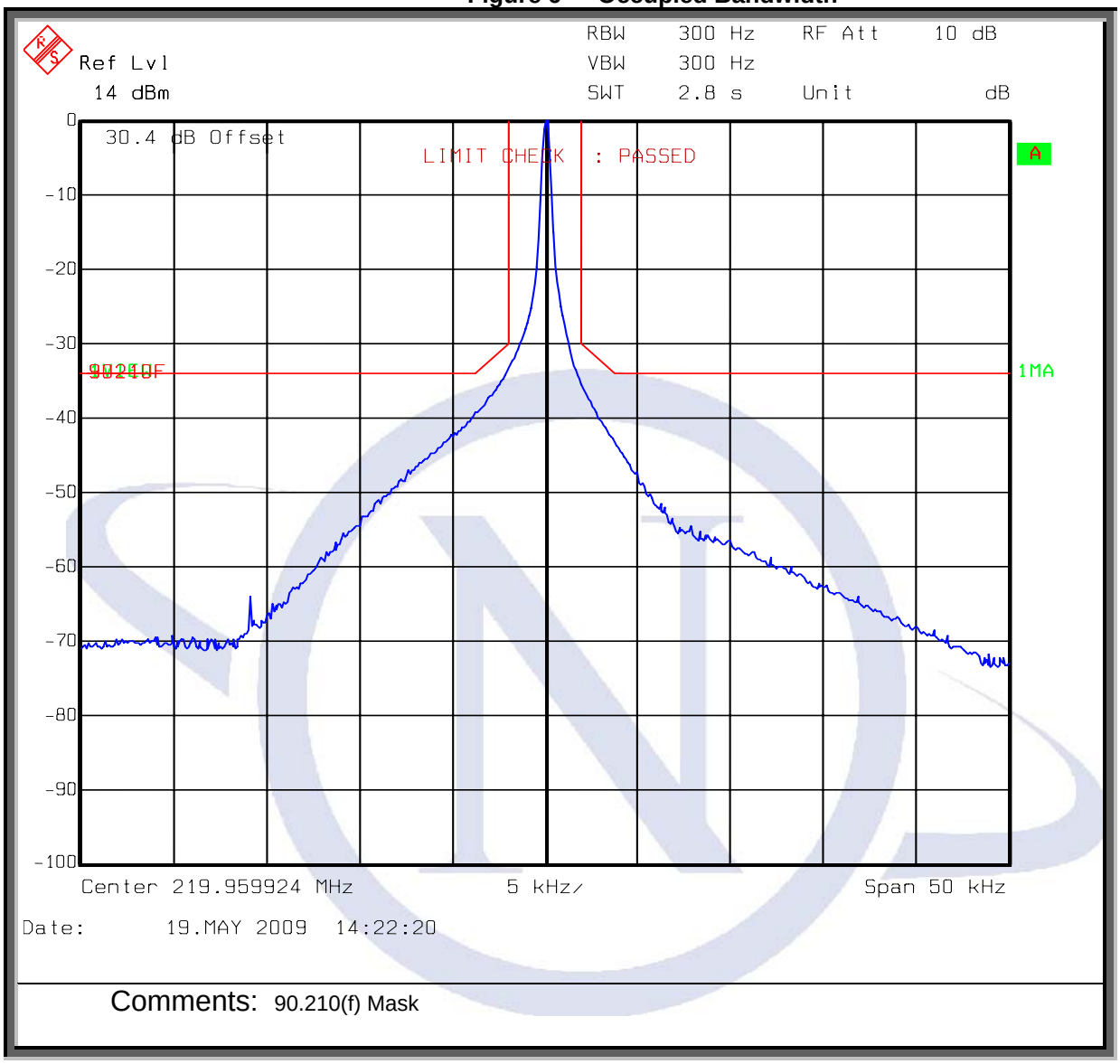
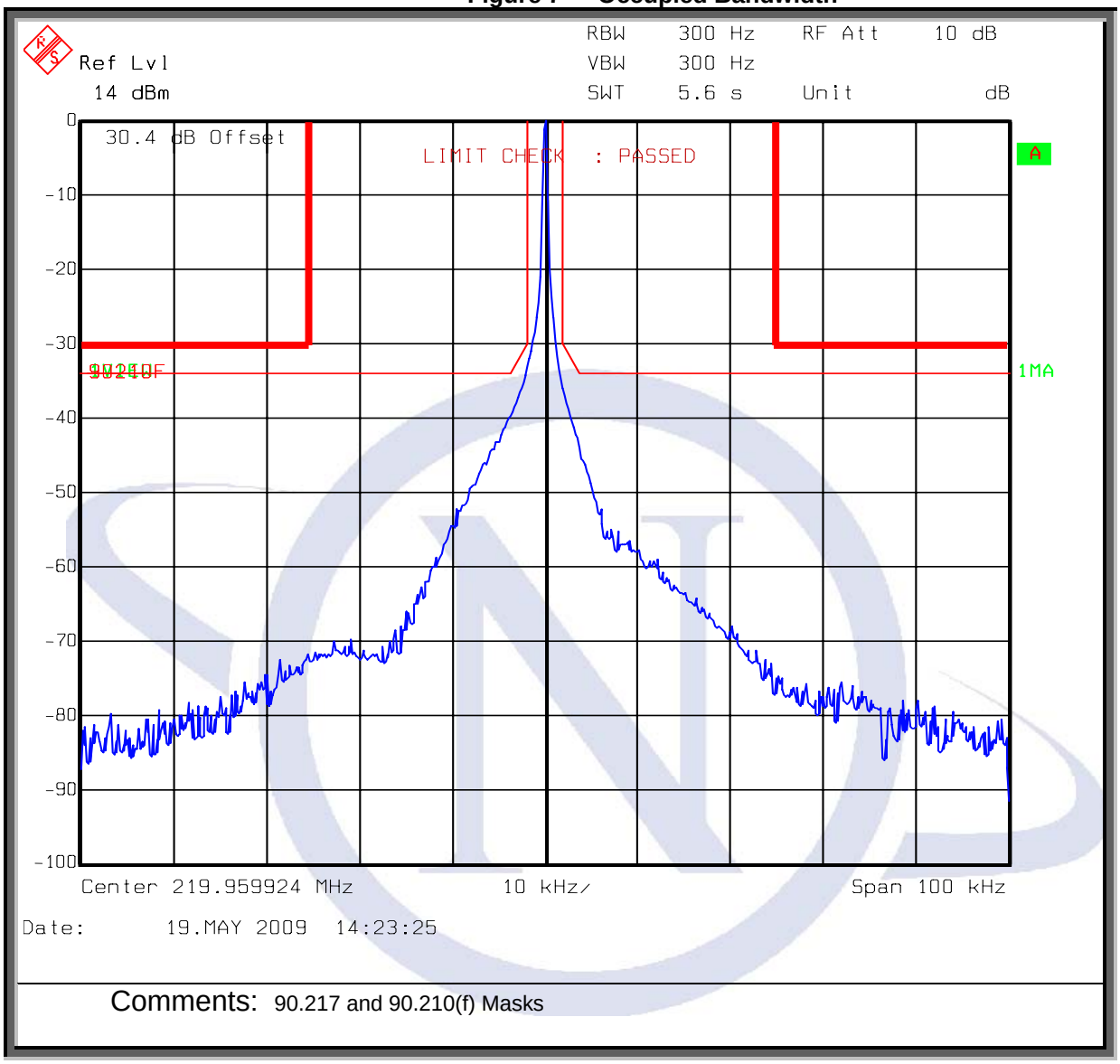
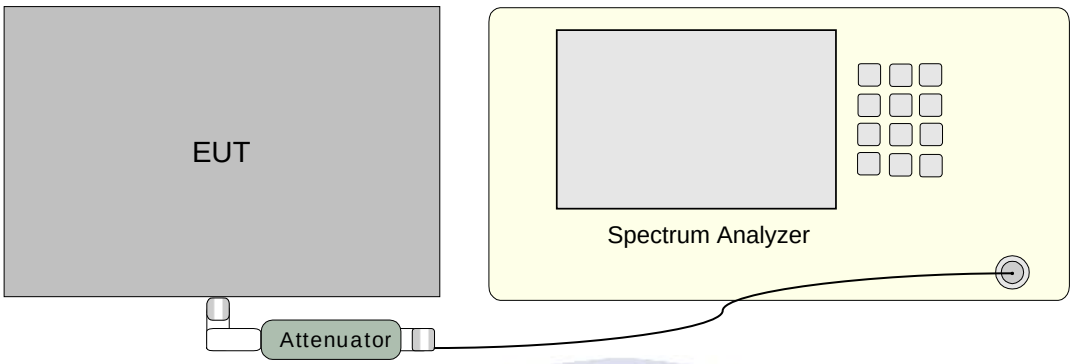


Figure 7 Occupied Bandwidth



C.10. Test Diagram



C.11. Tested By

Name: Tom Tidwell
Date: 16 April, 2009

APPENDIX D: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

D.1. Base Standard & Test Basis

Base Standard	FCC CFR 47, 95.635(c)(1)
Test Basis	FCC CFR 47, 2.1051
Test Method	ANSI/TIA 603-C

D.2. Specifications

90.210

(f) *Emission Mask F.* For transmitters operating in the 220–222 MHz frequency band, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth $f_o$to the edge of the authorized bandwidth f_e: Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ($f_d$in kHz) of more than 2 kHz up to and including 3.75 kHz: 30 + 20(f_d-2) dB or 55 + 10 log (P), or 65 dB, whichever is the lesser attenuation.

(3) On any frequency beyond 3.75 kHz removed from the center of the authorized bandwidth fd:At least 55 + 10 log (P) dB.

90.217 Except as noted herein, transmitters used at stations licensed below 800 MHz on any frequency listed in subparts B and C of this part or licensed on a business category channel above 800 MHz **which have an output power not exceeding 120 milliwatts are exempt from the technical requirements set out in this subpart, but must instead comply with the following**:

(a) For equipment designed to operate with a 25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 40 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

(b) For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

(c) For equipment designed to operate with a 6.25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 12.5 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

95.635(c)(1) – Emissions for LPRS transmitters operating on standard band channels (25 kHz) shall be attenuated below the unmodulated carrier in accordance with the following:

(i) Emisssions 12.5 kHz to 22.5 kHz away from the carrier center frequency: at least 30 dB; and

(ii) Emissions more than 22.5 kHz away from the channel center frequency: at least 43 + 10log(carrier power in watts) dB.

D.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
+/- 1.2 dB

D.4. Deviations

Deviation Number	Date	Description and Justification of Deviation	Deviation Reference	
			Base Standard	Test Procedure
none				

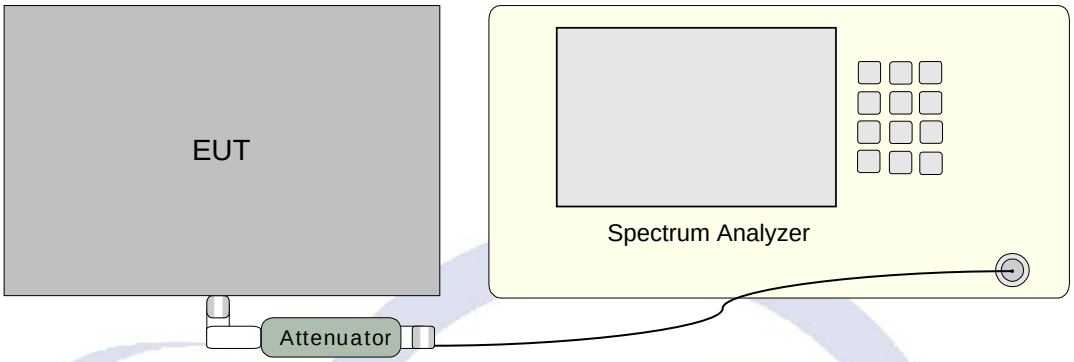
D.5. Test Results

Compliant. In LPRS mode the highest emission level is attenuated 38.33 dB relative to the carrier power. The minimum attenuation level according to the specification is 43 + 10 log (0.0265) dB or 27.2 dB for LPRS operation. In PMR mode the highest emission level is -30.1 dBm which is attenuated 44.1 dB relative to the carrier power. The minimum attenuation level according to 90.210(f) is 55 + 10 log (0.025) dB or -39 dB. The minimum attenuation level for 90.217 is 30 dBc.

D.6. Test Data

See following pages.

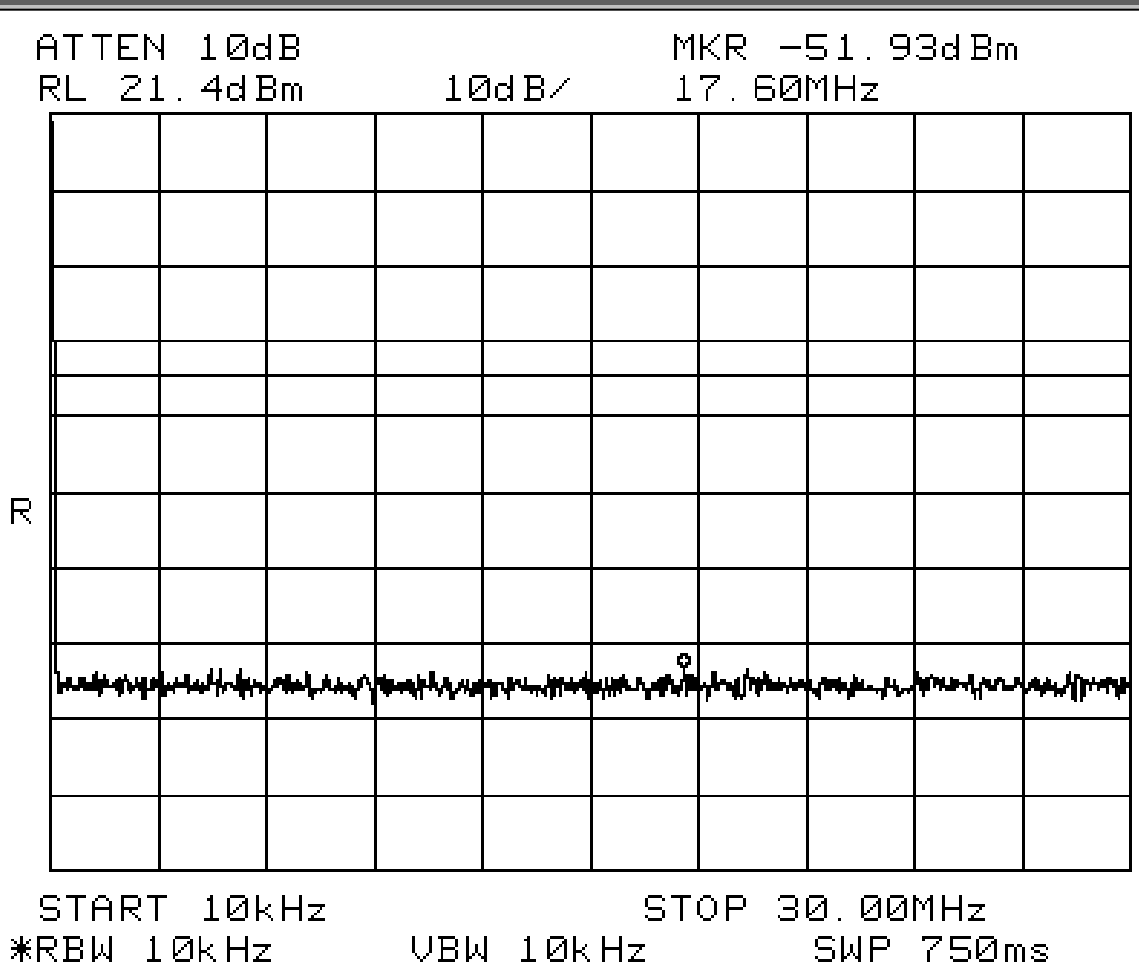
D.7. Test Configuration



D.8. Tested By

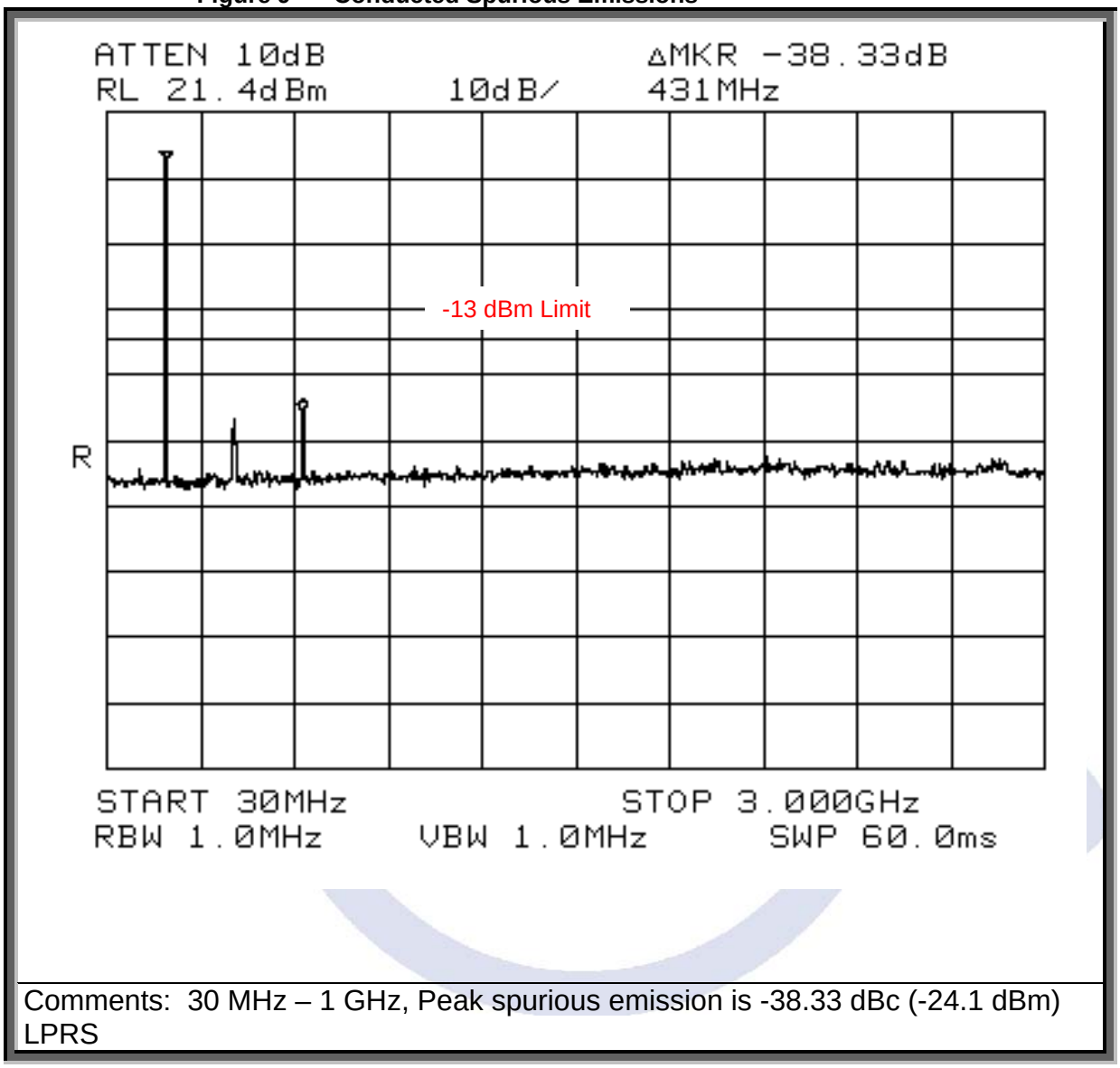
Name: Tom Tidwell
Date: 21 April, 2009

Figure 8 Conducted Spurious Emissions



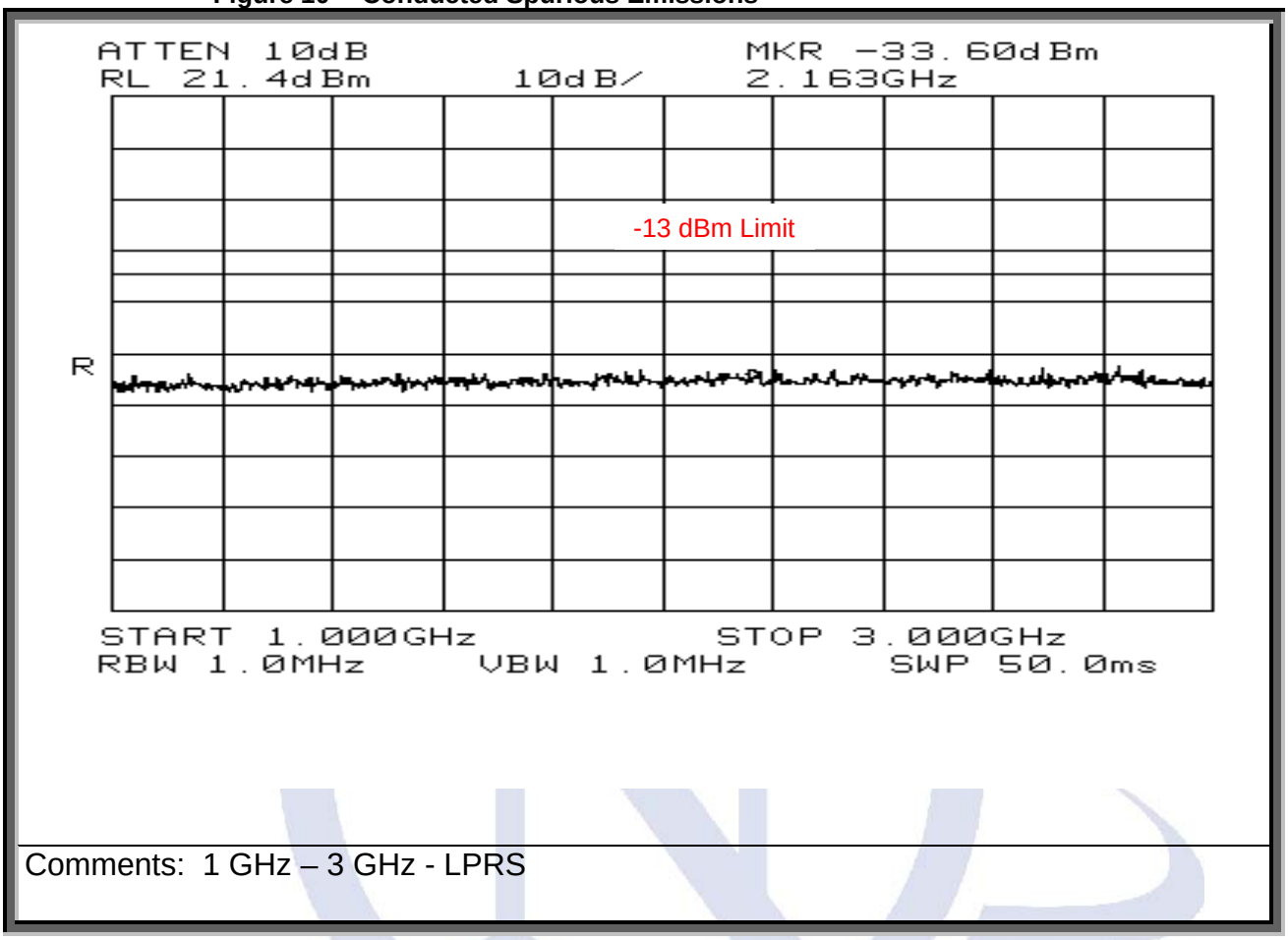
Comments: 10 kHz – 30 MHz - LPRS

Figure 9 Conducted Spurious Emissions



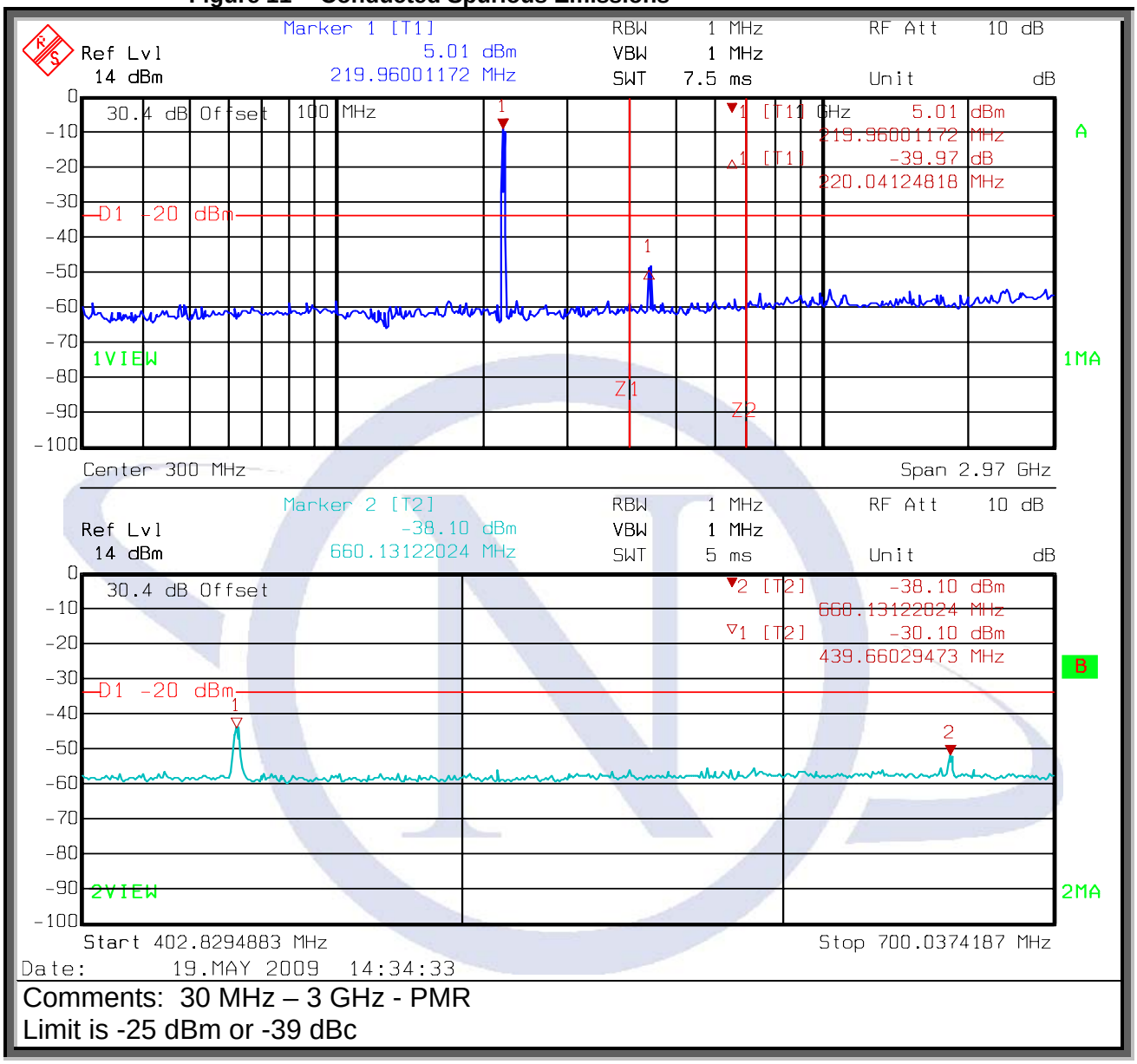
Comments: 30 MHz – 1 GHz, Peak spurious emission is -38.33 dBc (-24.1 dBm) LPRS

Figure 10 Conducted Spurious Emissions



Comments: 1 GHz – 3 GHz - LPRS

Figure 11 Conducted Spurious Emissions



Comments: 30 MHz – 3 GHz - PMR
Limit is -25 dBm or -39 dBc

APPENDIX E: FIELD STRENGTH OF SPURIOUS EMISSIONS

E.1. Base Standard & Test Basis

Base Standard	CFR 47, 95.635(c)(1)
Test Basis	CFR 47, 2.1053
Test Method	ANSI/TIA 603-C

E.2. Limits

90.210

(f) *Emission Mask F.* For transmitters operating in the 220–222 MHz frequency band, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

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(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ($f_d$in kHz) of more than 2 kHz up to and including 3.75 kHz: 30 + 20(f_d-2) dB or 55 + 10 log (P), or 65 dB, whichever is the lesser attenuation.

(3) On any frequency beyond 3.75 kHz removed from the center of the authorized bandwidth fd:At least 55 + 10 log (P) dB.

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(b) For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

(c) For equipment designed to operate with a 6.25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 12.5 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

95.635(c)(1) – Emissions for LPRS transmitters operating on standard band channels (25 kHz) shall be attenuated below the unmodulated carrier in accordance with the following:

(i) Emisssions 12.5 kHz to 22.5 kHz away from the carrier center frequency: at least 30 dB; and

(ii) Emissions more than 22.5 kHz away from the channel center frequency: at least 43 + 10log(carrier power in watts) dB.

E.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
+/- 3.6 dB

E.4. Test Results

Compliant. The worst-case spurious emission level is -33.2 dBm erp.

E.5. Deviations from Normal Operating Mode During Test

None.

E.6. Sample Calculation

NA.

E.7. Test Data

ERP Substitution Method

Page 1 of 1 Complete X

Job No.: 27894 Date: 21 April, 2009 Preliminary

Specification: Part 95 Temperature(°C): 23

Tested By: Tom Tidwell Relative Humidity(%) 37

E.U.T.: GT-Motion Beacon

Configuration: TX at full rf power. 50 ohm load on TX

Sample No: Device 1

Location: AC 1 Measurement

Detector Type: Peak Distance: 3 m

Additional equipment used:

Measurement Uncertainty: +/-3.6 dB

Frequency (MHz)	Meter Reading (dBm)	Substitution Level (dBm)			Substitution Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarity	Comments
1836.7	-88.4	-57.3			6.2	-51.1	-13.0	-38.0700	V	RBW/VBW 1 MHz
1836.7	-105.9	-72.4			6.2	-66.2	-13.0	-53.1700	H	RBW/VBW 1 MHz
1855.7	-70.5	-39.4			6.2	-33.2	-13.0	-20.1700	V	RBW/VBW 1 MHz
1855.7	-87.9	-54.4			6.2	-48.2	-13.0	-35.1700	H	RBW/VBW 1 MHz
1875.8	-94.6	-63.5			6.2	-57.3	-13.0	-44.2700	V	RBW/VBW 1 MHz
1875.8	-69.7	-36.2			6.2	-30.0	-13.0	-16.9700	H	RBW/VBW 1 MHz
1893.8	-95.8	-64.7			6.2	-58.5	-13.0	-45.4700	V	RBW/VBW 1 MHz
1893.8	-101.5	-68.0			6.2	-61.8	-13.0	-48.7700	H	RBW/VBW 1 MHz
2597.2	-99.8	-62.9			7.1	-55.8	-13.0	-42.7600	V	RBW/VBW 1 MHz
2597.2	-100.5	-66.9			7.1	-59.8	-13.0	-46.7600	H	RBW/VBW 1 MHz
432.93	-82.7	-70.9			0.0	-70.9	-13.0	-57.9000	V	RBW/VBW 100 kHz
432.93	-78.0	-66.2			0.0	-66.2	-13.0	-53.2000	H	RBW/VBW 100 kHz
649.39	-81.2	-69.4			0.0	-69.4	-13.0	-56.4000	V	RBW/VBW 100 kHz
649.39	-72.8	-61.0			0.0	-61.0	-13.0	-48.0000	H	RBW/VBW 100 kHz

Notes:

ERP Substitution Method

Page 1 of 1 — Complete X

Job No.: 27894 — Date: 19 May, 2009 — Preliminary

Specification: Part 90 — Temperature(°C): 24

Tested By: Tom Tidwell — Relative Humidity(%) 30

E.U.T.: GT-Motion Beacon

Configuration: TX at full rf power. 50 ohm load on TX

Sample No: Device 1

Location: AC 1 — Measurement Distance: 3 m

Detector Type: Peak

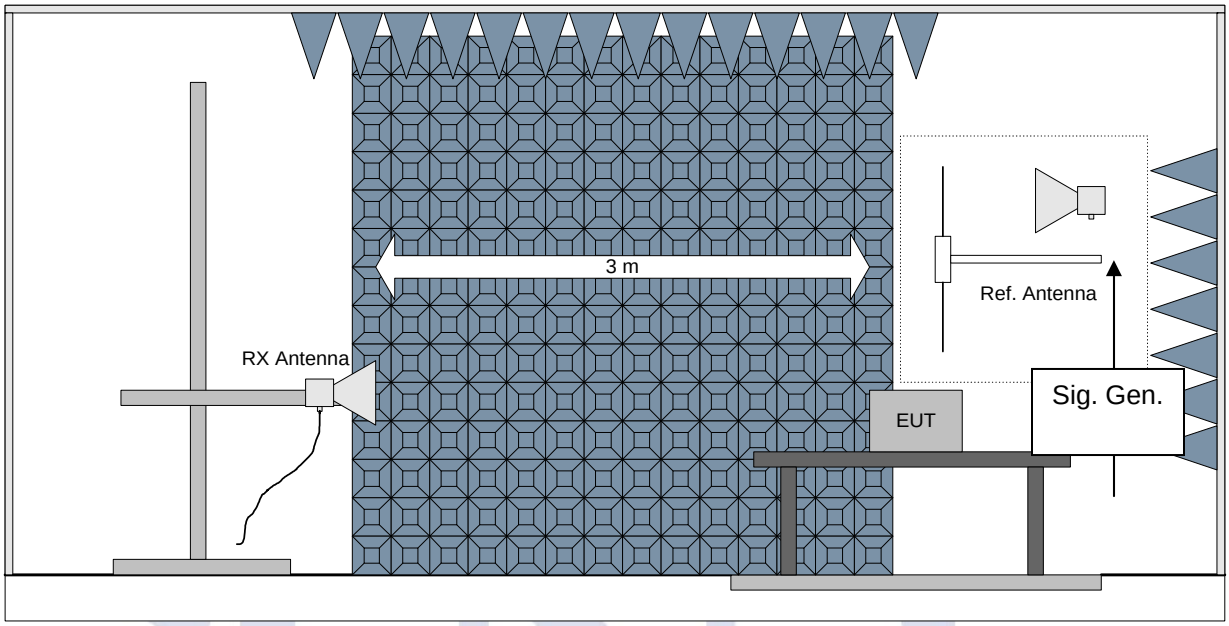
Additional equipment used:

Measurement Uncertainty: +/-3.6 dB

Frequency (MHz)	Meter Reading (dBm)	Substitution Level (dBm)			Substitution Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarity	Comments
1319.76	-87.0	-55.2			3.7	-51.5	-25.0	-26.5400	V	RBW/VBW 1 MHz
1319.76	-98.8	-67.1			3.7	-63.4	-25.0	-38.4400	H	RBW/VBW 1 MHz
1739.72	-76.4	-45.3			6.2	-39.1	-25.0	-14.0700	V	RBW/VBW 1 MHz
1739.72	-88.0	-54.5			6.2	-48.3	-25.0	-23.2700	H	RBW/VBW 1 MHz
439.92	-82.9	-71.1			0.0	-71.1	-25.0	-46.1000	V	RBW/VBW 100 kHz
439.92	-79.0	-66.6			0.0	-66.6	-25.0	-41.6000	H	RBW/VBW 100 kHz
659.88	-77.5	-69.4			0.0	-69.4	-25.0	-44.4000	V	RBW/VBW 100 kHz
659.88	-73.0	-61.6			0.0	-61.6	-25.0	-36.6000	H	RBW/VBW 100 kHz

Notes:

E.8. Test Diagram



Note: The EUT is set to transmit a signal at maximum rf output power into a coaxial load for this testing.

E.9. Tested By

Name: Tom Tidwell
Date: 21 April, 2009

APPENDIX F: FREQUENCY STABILITY

F.1. Base Standard & Test Basis

Base Standard	FCC CFR 47 Part 95.629(b)(2)
Test Basis	FCC CFR 47 Part 2.1055
Test Method	ANSI/TIA 603-C

Specifications

95.629(b)(2) – LPRS transmitters operating on standard band channels must be maintained within a frequency stability of 50 parts per million.

F.2. Test Results

Compliant. The maximum frequency drift is 0.2 ppm.

F.3. Observations

None

F.4. Deviations from Normal Operating Mode During Test

None.

F.5. Sample Calculation

F_{drift} (ppm) = F_m / F_{ref}

where,
F_{drift} = The maximum carrier drift in parts-per-million
F_m = The measured carrier drift in Hertz
F_{ref} = The reference frequency in MHz

F.6. Test Data

Frequency Stability

Page 1 of 1

Job No.: 27894 Date: 4/17/2009

Specification: CFR 47, Part 95.629(2)

Tested By: Tom Tidwell

E.U.T.: GT-MotionBeacon, Model CMT-0013

Configuration: Full RF power output

Sample Number: FCC Test Device 1

Standard Limit: 50 ppm

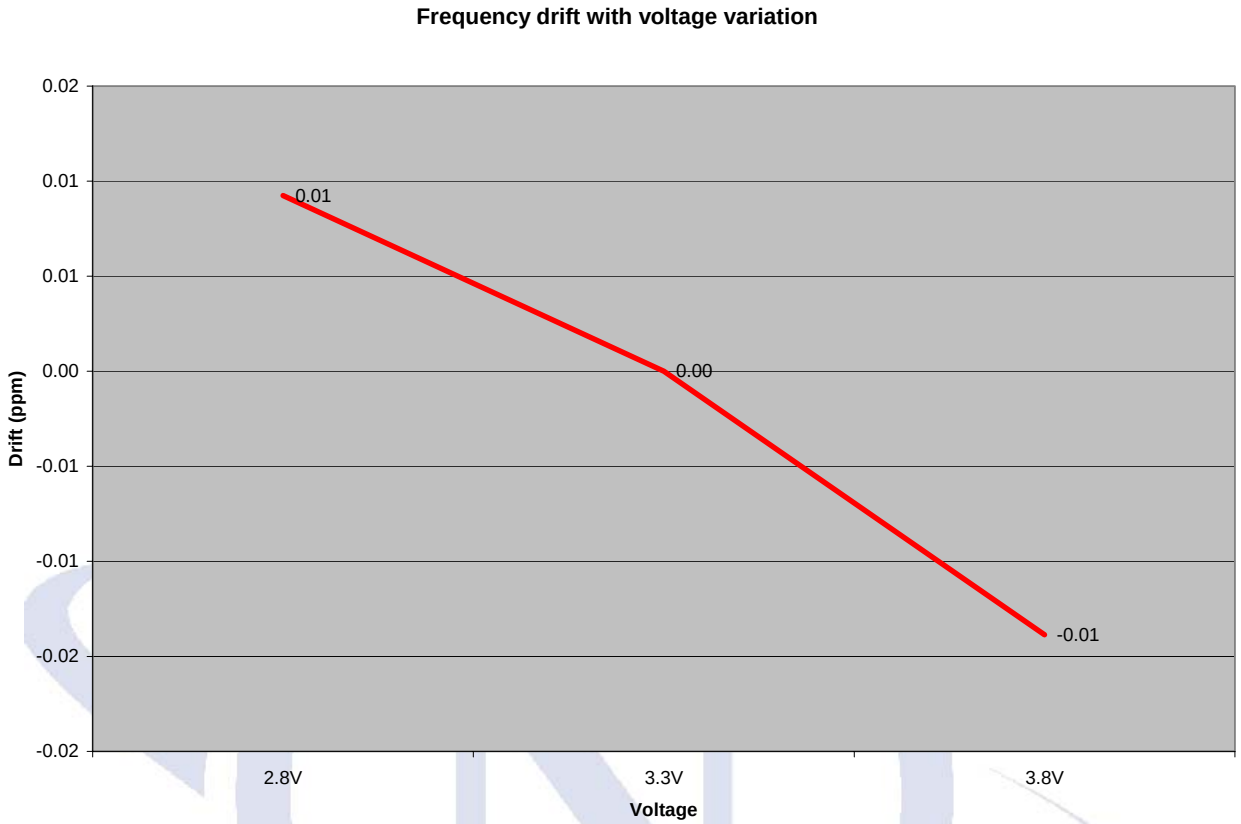
Measurement Uncertainty: $1x10^{-17}$ppm

Reference Frequency 216.462437 MHz

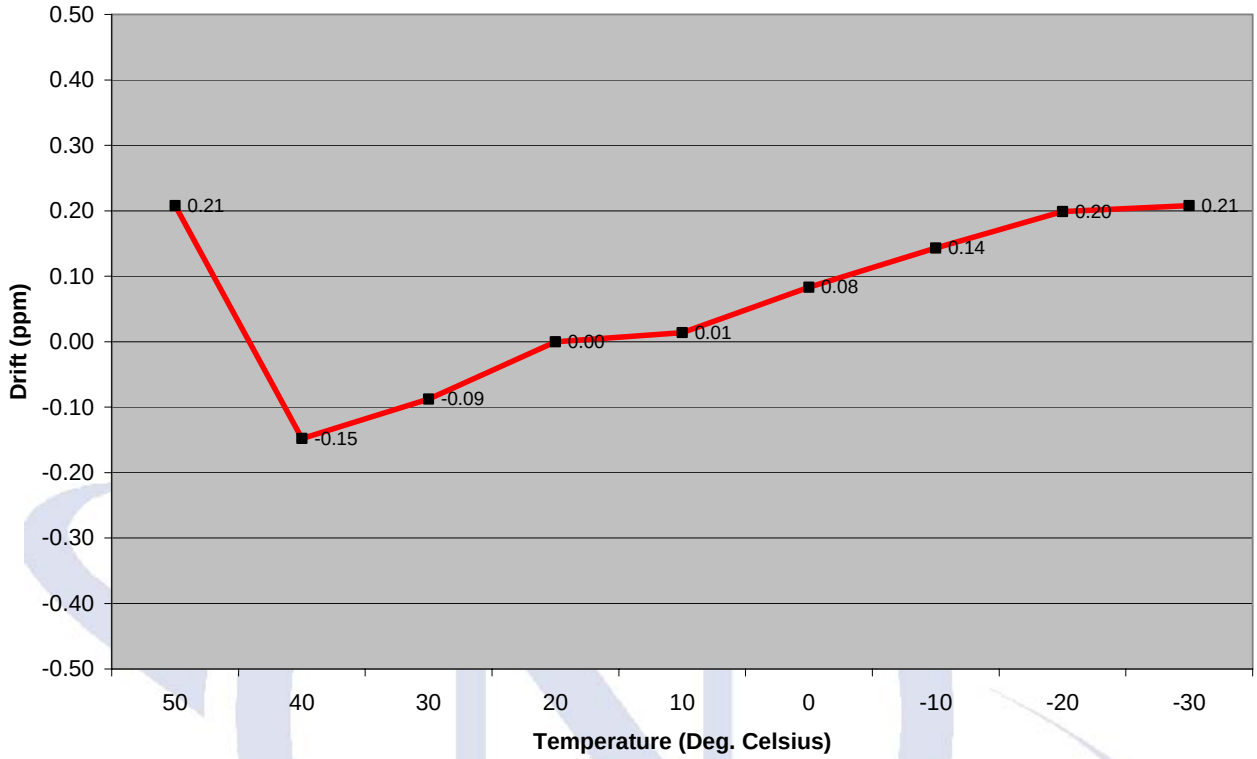
Temp (°C)	Measured Frequency (MHz)		Test Voltage	Frequency Error (Hz)	Limit (+/-Hz)	Drift (ppm)	Comment
20	216.462439		2.8V	2	10823.1	0.01	
20	216.462437		3.3V	0	10823.1	0.00	
20	216.462434		3.8V	-3	10823.1	-0.01	
50	216.462482			45	10823.1	0.21	
40	216.462405			-32	10823.1	-0.15	
30	216.462418			-19	10823.1	-0.09	
20	216.462437			0	10823.1	0.00	
10	216.462440			3	10823.1	0.01	
0	216.462455			18	10823.1	0.08	
-10	216.462468			31	10823.1	0.14	
-20	216.462480			43	10823.1	0.20	
-30	216.462482			45	10823.1	0.21	

Notes:

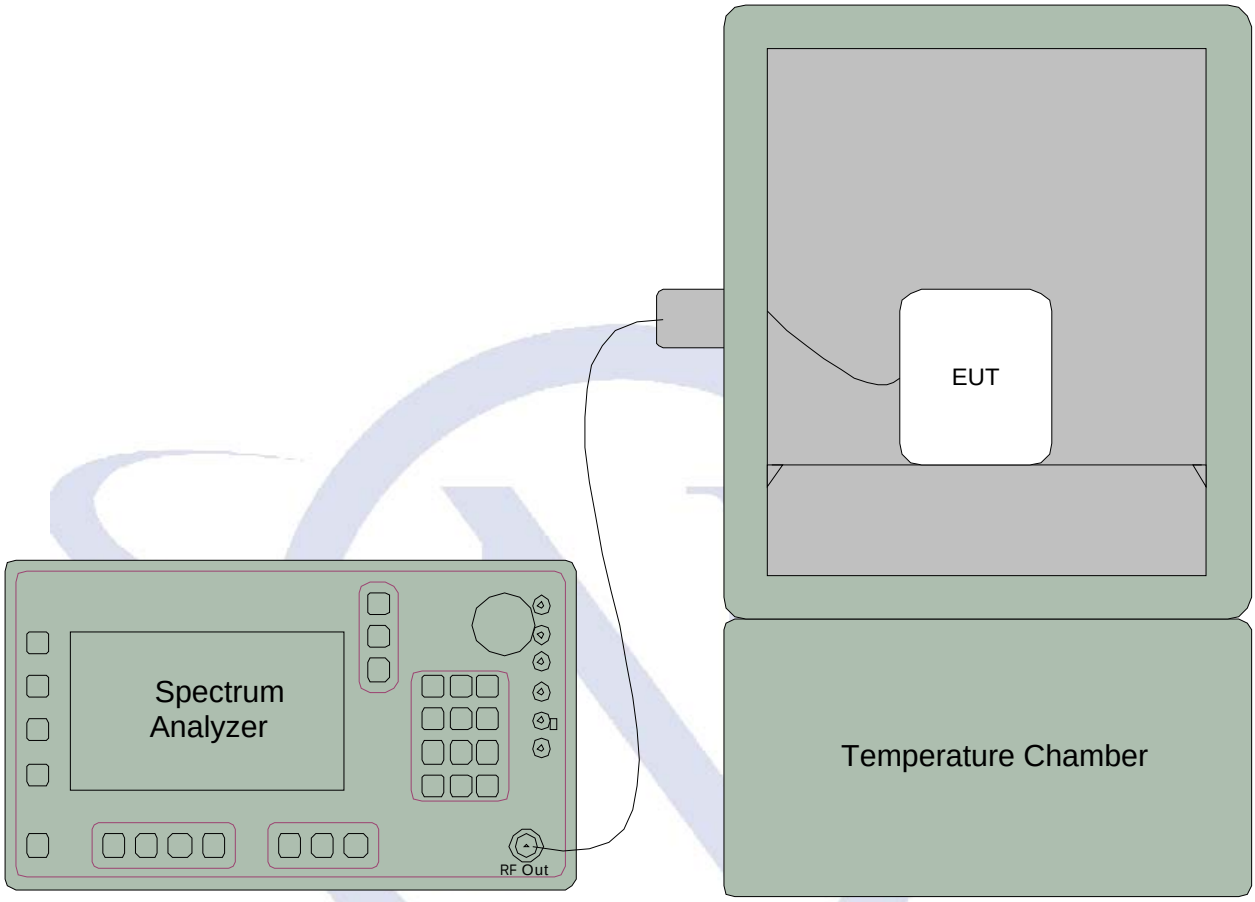
This testing was not repeated at 219.96 MHz because the frequency determining circuit (synthesizer) is the same for both bands.



Frequency drift over temperature



F.7. Test Diagram



F.8. Tested By

Name: Tom Tidwell
Date: 17 April, 2009

APPENDIX G: CONTROL ACCESSIBILITY

G.1. Base Standard & Test Basis

Base Standard	CFR 47, Part 95.645(a)
Basis	CFR 47, Part 95.645(a)
Test Method	Not Applicable

Specifications

95.645(a) – No control, switch or other type of adjustment which, when manipulated, can result in a violation of the rules shall be accessible

G.2. Test Results

Compliant. There are no user-accessible controls, switches, or adjustments that can result in a violation of the rules. The only user control is used to set the operating mode. The operating modes determine the sensor sensitivity and the beacon transmission timing, not rf power, modulation, or frequency.

G.3. Observations

No user-accessible controls except mode switch.

G.4. Deviations from Normal Operating Mode During Test

None.

G.5. Sample Calculation

None

G.6. Evaluated By

Name: Tom Tidwell
Date: 17 April, 2009

APPENDIX H: POWER OUTPUT CAPABILITY

H.1. Base Standard & Test Basis

Base Standard	CFR 47, Part CFR 47, Part 95.649
Basis	CFR 47, Part 95.649
Test Method	Not Applicable

Specifications

95.649 – No CB, R/C, LPRS, FRS, MICS, MURS, or WMTS unit shall incorporate provisions for increasing its transmitter power to any level in excess of the limits specified in 95.639.

H.2. Test Results

Compliant. There is no provision to increase (or decrease) rf output power.

H.3. Observations

No rf power adjustment control.

H.4. Deviations from Normal Operating Mode During Test

None.

H.5. Sample Calculation

None

H.6. Evaluated By

Name: Tom Tidwell
Date: 17 April, 2009

APPENDIX I: PERMISSIBLE COMMUNICATIONS

I.1. Base Standard & Test Basis

Base Standard	CFR 47, Part CFR 47, Part 95.1009(c)
Basis	CFR 47, Part 95.1009(c)
Test Method	Not Applicable

Specifications

95.1009 – LPRS stations may transmit voice, data, or tracking signals as permitted in this section. Two-way voice communications are prohibited.

95.1009(c) Law enforcement tracking signals (for homing or interrogation), including the tracking of persons or stolen goods under the authority or agreement with a law enforcement agency (federal, state, or local) having jurisdiction in the area where the transmitters are placed.

I.2. Test Results

Compliant. The transmitter sends a tracking signal in accordance with 95.1009(c).

I.3. Observations

None.

I.4. Deviations from Normal Operating Mode During Test

None.

I.5. Sample Calculation

None

I.6. Evaluated By

Name: Tom Tidwell
Date: 17 April, 2009

APPENDIX J: ANTENNAS AND ERP

J.1. Base Standard & Test Basis

Base Standard	CFR 47, Part CFR 47, Part 95.1013(a)
Basis	CFR 47, Part 95.1013(a)
Test Method	Not Applicable

Specifications

95.1013(a) – The maximum allowable ERP for a station in the LPRS other than an AMTS station is 100 mW.

J.2. Test Results

Compliant. The maximum erp is +14.23 dBm (26.5 mW).

J.3. Observations

Antenna gain: 2.14 dBi, 0 dBd

J.4. Deviations from Normal Operating Mode During Test

None.

J.5. Sample Calculation

ERP = RF Power at antenna port (dBm) + antenna gain (dBd) = ERP (dBm)

J.6. Evaluated By

Name: Tom Tidwell
Date: 17 April, 2009

APPENDIX K: TEST EQUIPMENT LIST

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	02/27/09	02/28/11
1659	Spectrum Analyzer	Rhode & Schwarz FSP	973353	05/28/08	05/29/10
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	01/19/09	01/20/11
1767	EMI Test Receiver 20Hz - 26.5 GHz - 150 - +30 dBm LCD	ROHDE & SCHWARZ ESIB26	837491/0002	09/20/07	09/20/09
1763	Bilog Antenna	Schaffner CBL 6111D	22926	11/04/08	11/04/09
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/09/08	09/10/10
1061	TUNABLE NOTCH FILTER	K&L 3TNF-200/400-N/N	81	CBU	N/A
283	Environmental Chamber with controller # 1189006	ENVIROTRONICS SH27 & 2030-22844	129010083	08/20/08	08/20/09
1684	Signal Generator	R&S SMIQ03	DE24568	01/31/09	02/01/10
1471	10 db Attenuator DC - 18 GHz	MCL Inc. BW-S10W2 10db-2WDC	NONE	CBU	CBU
1474	20dB Attenuator DC - 18 GHz	MCL Inc. BW-S20W2	NONE	CBU	CBU
1404	Dipole set	EMCO 3121C	9701-1256	06/21/08	06/20/09

END OF DOCUMENT

Nemko USA, Inc., 802 N. Kealy, Lewisville, Texas 75057-3136 Tel: (972) 436-9600, Fax: (972) 436-2667