



Test Report: 6W66744

Applicant: Verichip
309 Legget Drive
Kanata, ON
K2K 3A3

Apparatus: Hugs Tag (M/N: 600-000296-000)

FCC ID: ISEH2H

In Accordance With: FCC Part 15 Subpart C, 15.231
Periodic operation in the band 40.66-40.70MHz and
above 70 MHz.

Tested By: Nemko Canada Inc.
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Ottawa, Ontario
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Authorized By: 
Roman Kuleba, Wireless Specialist

Date: June 20, 2006

Total Number of Pages: 22

Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

Apparatus Assessed:	Hugs Tag (M/N: 600-000296-000)
Specification:	FCC Part 15 Subpart C, 15.231
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Jason Nixon, Telecom Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

Hugs Tag (M/N: 600-000296-000)

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
1	Hugs Tag (BBB simulation)	None
2	Hugs Tag (FCC tag ID 88)	None
3	Hugs Tag (Fastburst)	None

The first samples were received on: May 19, 2006

1.3 Theory of Operation

The EUT is used as part of an infant protection system. The EUT communicates with a Mother Tag which if it does not match would cause the EUT to alarm, or if the EUT is brought out a protected door the EUT would alarm. The EUT also has a number of built in alarms such as a proximity detector, a wrist strap and a low battery indication, if any of these are tampered with the EUT will also alarm.

1.4 Technical Specifications of the EUT

Manufacturer:	Verichip
Operating Frequency:	Tx: 433.92MHz Rx: 307.2kHz
Emission Designator:	P1D
Modulation:	On/Off Keying
Antenna Data:	Integral
Power Source:	3V CR2032 Battery

Section 2 : Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.231

Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 °C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
Spectrum Analyzer	Rohde & Schwarz	FSP	FA001920	March 17/07
Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 16/07
Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 16/07
Receiver	Rohde & Schwarz	ESHS 10	FA001918	Feb. 17/07
Active Loop Antenna	EMCO	6502	FA001686	July 13/06
Biconical (2) Antenna	EMCO	3109	FA000904	Aug. 26/06
Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Aug. 29/06
Horn Antenna #2	EMCO	3115	FA000825	Dec. 16/06
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	July 14/06
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	July 14/06
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	July 14/06

COU – Calibrate on Use

NCR – No Calibration Required

Section 3 : Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

3.4 Test Deleted

No Tests were deleted from this assessment.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart C : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N No : not applicable / not relevant.
- Y Yes : Mandatory i.e. the apparatus shall conform to these tests.
- N/T Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.207(a)	Powerline Conducted Emissions	N	
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.231(a)(1)	Manually operated transmitter	N	
15.231(a)(2)	Automatically activated transmitter	Y	PASS
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	Y	PASS
15.231(a)(4)	Radiators used in cases of emergency	Y	PASS
15.231(a)(5)	Set-up information for security systems	N	
15.231(b)	Radiated Emissions	N	
15.231(c)	20dB Bandwidth	Y	PASS
15.231(d)	Devices operating within the frequency band 40.66-40.70 MHz	N	
15.231(e)	Radiated emissions for Periodic radiators	Y	PASS

Notes:

Appendix A : Test Results

Clause 15.209(a) Radiated Emissions within Restricted Bands

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Conditions:

Sample Number:	3	Temperature:	10
Date:	May 23, 2006	Humidity:	62
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	OATS

Test Results:

See results for 15.231(e). All harmonics are below the limits of 15.209(a).

Additional Observations:

The Spectrum was searched from 30MHz to the 10th Harmonic.

These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.

The EUT was measured on three orthogonal axis. The EUT was tested with a fresh new battery..

All measurements were performed using a Peak Detector with 100kHz RBW below 1GHz and a 1MHz RBW above 1GHz at a distance of 3 meters.

Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.
- (4) Intentional radiators, which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.
- (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

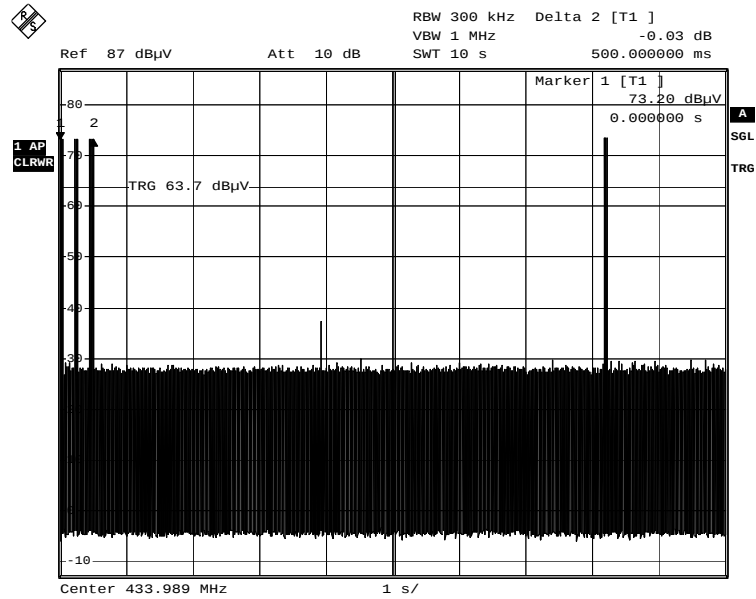
Test Conditions:

Sample Number:	1,2	Temperature:	21
Date:	May 23, 2006	Humidity:	32
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:

- 1) The EUT is not manually operated.
- 2) When in a safety of life alarm mode the EUT deactivates an alarm condition in 500msec, see attached plot.
- 3) When in the supervisory mode the EUT complies with the requirements of 15.231(e).
- 4) The EUT is used as a baby protection system in Hospitals. It would be permitted to continue to transmit an alarm condition for the entire interval of the alarm.
- 5) The EUT does not transmit an extended transmission during setup.

Alarm transmission duration



Alarm transmission - Off

Date: 23.MAY.2006 15:49:29

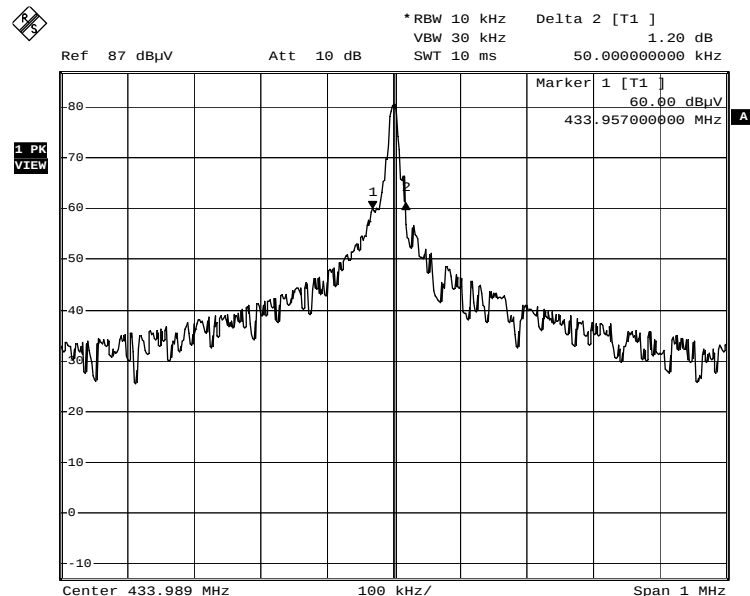
The above plot shows the duration of a safety of life alarm condition. The safety of life can occur at any time during the supervisory pulses, which would continue to transmit as stated in 15.231(e).

Clause 15.231(c) 20dB Bandwidth

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Conditions:

Sample Number:	3	Temperature:	21
Date:	May 23, 2006	Humidity:	32
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:**20dB Bandwidth:**

20dB Bandwidth

Date: 23.MAY.2006 15:30:56

Clause 15.231(e) Radiated emissions for Periodic radiators

Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500	50 to 150
174-260	1,500	150
260-470	1,500 to 5,000	150 to 500
Above 470	5,000	500

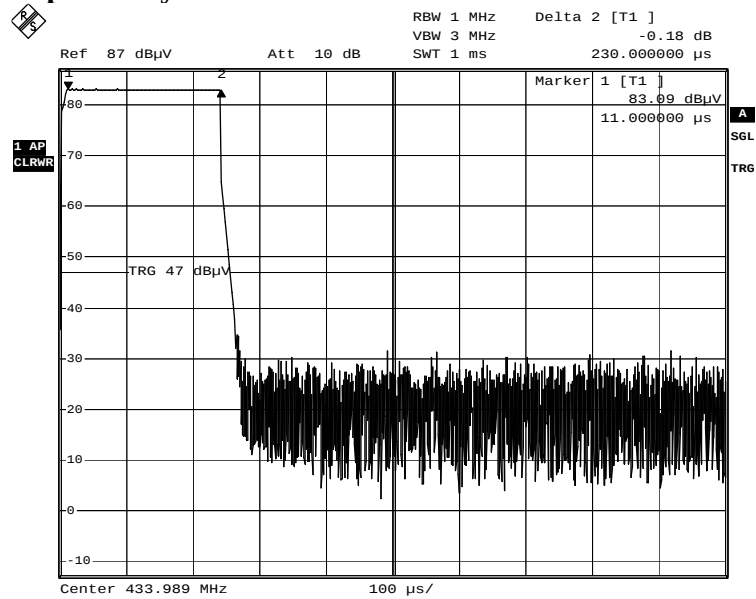
In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

Test Conditions:

Sample Number:	3	Temperature:	10
Date:	May 23, 2006	Humidity:	62
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	OATS

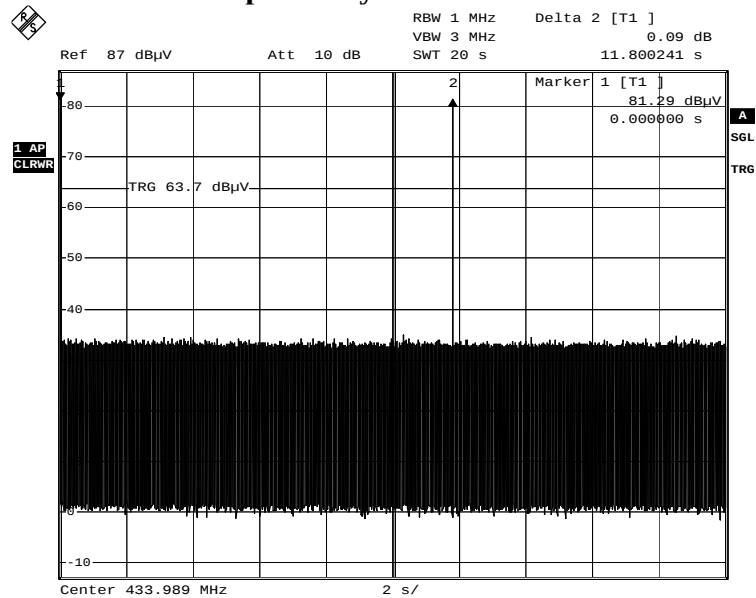
Test Results:

See Attached Table and Plots for Results

Supervisory burst On-Time:

Supervisory Transmissions - On-time

Date: 23.MAY.2006 15:37:21

Time between Supervisory bursts:

Supervisory Transmissions

Date: 23.MAY.2006 15:42:58

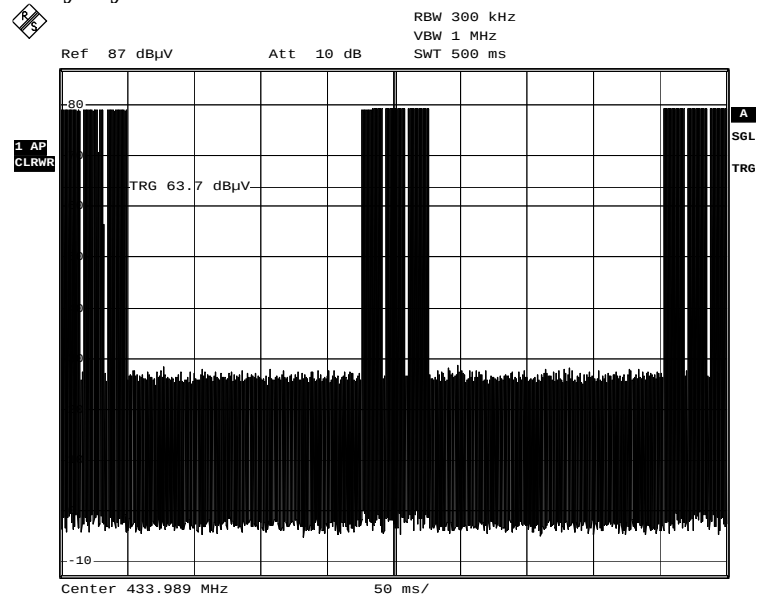
Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBμV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. (dB)	Cable Loss (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)
433.9800	LP1	V	39.6	16.1	N/A	-13.3	3.1	45.5	72.9	27.5
433.9800	LP1	H	39.0	16.8	N/A	-13.3	3.1	45.6	72.9	27.3
867.9800	LP1	V	25.3	22.1	N/A	-13.3	4.3	38.4	52.9	14.5
867.9800	LP1	H	20.9	23.1	N/A	-13.3	4.3	35.0	52.9	17.9
1302.0000	Horn2	V	68.0	25.4	48.0	-13.3	3.4	35.5	54.0	18.5
1302.0000	Horn2	H	68.0	25.3	48.0	-13.3	3.4	35.5	54.0	18.5
1731.0000	Horn2	V	66.9	27.5	47.8	-13.3	4.0	37.3	54.0	16.7
1731.0000	Horn2	H	64.8	27.6	47.8	-13.3	4.0	35.4	54.0	18.6
2169.9000	Horn2	V	69.3	28.3	57.7	-13.3	4.7	31.3	54.0	22.7
2169.9000	Horn2	H	69.2	28.3	57.7	-13.3	4.7	31.2	54.0	22.8
2603.9800	Horn2	V	69.6	29.8	58.9	-13.3	5.3	32.5	54.0	21.5
2603.9800	Horn2	H	71.4	29.8	58.9	-13.3	5.3	34.2	54.0	19.8
3032.8600	Horn2	V	71.0	30.9	59.2	-13.3	5.7	35.2	54.0	18.8
3032.8600	Horn2	H	67.5	30.9	59.2	-13.3	5.7	31.7	54.0	22.3
3466.8400	Horn2	V	73.5	31.1	58.5	-13.3	6.4	39.1	54.0	14.9
3466.8400	Horn2	H	69.6	31.0	58.5	-13.3	6.4	35.1	54.0	18.9
3900.8200	Horn2	V	69.6	32.6	57.4	-13.3	7.1	38.6	54.0	15.4
3900.8200	Horn2	H	75.6	32.4	57.4	-13.3	7.1	44.3	54.0	9.7
4339.8000	Horn2	V	61.2	32.2	54.2	-13.3	7.9	33.8	54.0	20.2
4339.8000	Horn2	H	65.2	32.1	54.2	-13.3	7.9	37.7	54.0	16.3
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole										

Additional Observations:

The Spectrum was searched from 30MHz to 4339.8MHz.

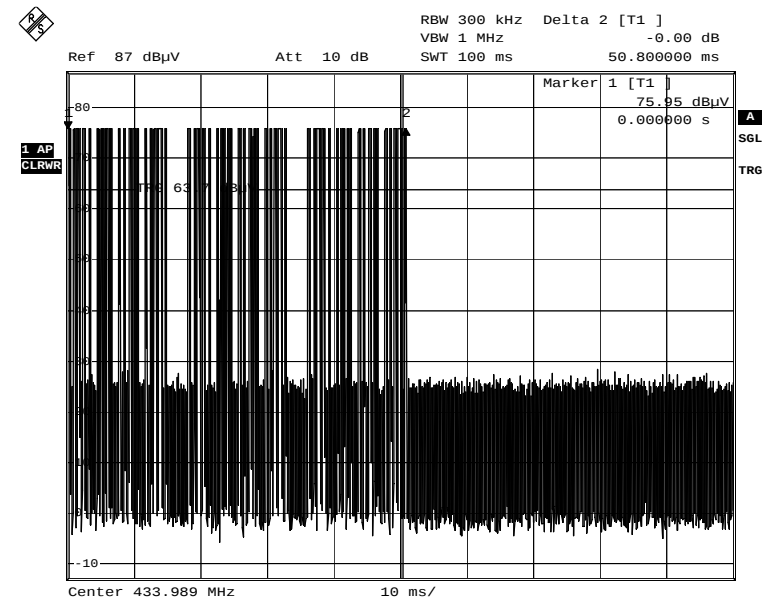
The EUT was measured on three orthogonal axis. The EUT was tested with a fresh new battery.

All measurements were performed using a Peak Detector with 100kHz RBW below 1GHz and a 1MHz RBW above 1GHz at a distance of 3 meters.

Duty Cycle:

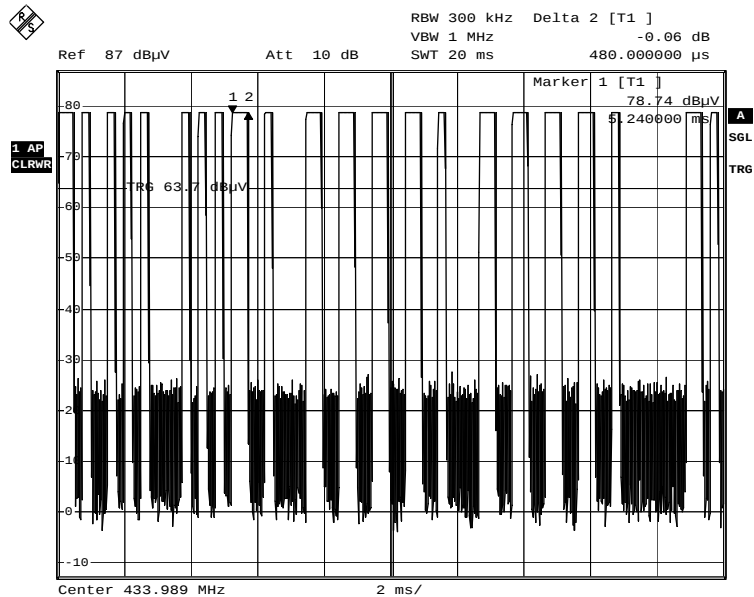
Alarm transmission

Date: 23.MAY.2006 15:47:06



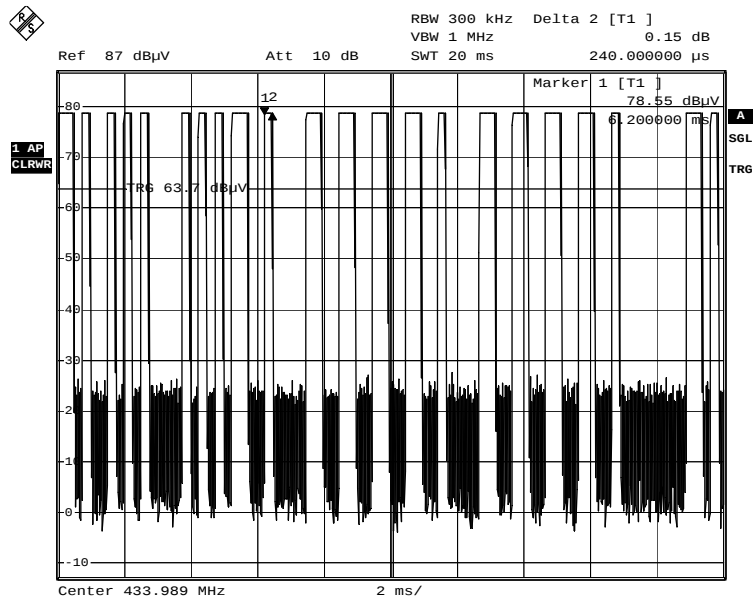
Alarm transmission - On-time in 100msec

Date: 23.MAY.2006 15:50:36



Alarm transmission - Long pulse

Date: 23.MAY.2006 15:58:17



Alarm transmission - Short pulse

Date: 23.MAY.2006 16:01:27

Above is the worst-case transmissions code for one's density.

Short pulses = 10

Long pulses = 10

Number of packets in 100msec = 3

On-time of each packet = $(10 \times 0.48) + (10 \times 0.24) = 7.2\text{msec}$

On-time in 100msec = $7.2 \times 3 = 21.6\text{msec}$

Duty Cycle correction = $20\log(21.6/100) = -13.3\text{dB}$

Appendix B : Setup Photographs

Spurious Emissions Setup:





Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions

