

TEST NUMBER - 201-05

TEST REPORT TO

**INDUSTRY CANADA RSS 210 SECTION 6.1
FEDERAL COMMUNICATIONS COMMISSION CFR47 PART15.231**

**Low Power License-Exempt Radio communication Devices
Intentional Radiators**

for

Napco Security Systems Inc
333 Bayview Avenue
Amityville, NY 11701
(631) 842 9400

of

Recessed Bolt Cup Transmitter

SAFEWATCH EZ SW-BOLT-TRANS

FCC ID:AD876520619
IC ID: 596A-76520619

on

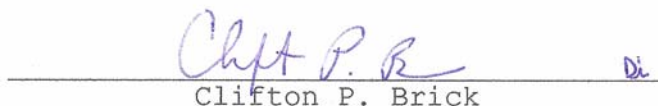
7/13/2005

Tested by



Andrew Mertinooke

Reviewed by



Clifton P. Brick

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TEST DESCRIPTION

1. TEST OBJECTIVE

To test the Recessed Bolt Cup Transmitter SAFEWATCH EZ SW-BOLT-TRANS to RSS 210 / Part 15 Subpart C Rules and write a report.

2. E.U.T. DESCRIPTION

GENERAL

The Recessed Bolt Cup Transmitter SAFEWATCH EZ SW-BOLT-TRANS is a wireless entry alarm system sensor for use with Napco's SW-EZ-WL Receivers. The alarm transmitter sends data on 2 separate channels

SERIAL NUMBERS:

Production Prototype.

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TEST RESULTS AND CONCLUSIONS

PRODUCT TESTED - Recessed Bolt Cup Transmitter

MODEL NUMBER - SAFEWATCH EZ SW-BOLT-TRANS

RADIATED TEST RESULTS

The test results show that the emissions radiated from this equipment are in compliance with IC Rules RSS 210 / FCC Rules Part 15 Subpart C.

OCCUPIED BANDWIDTH & OUTPUT POWER

The test results show that the occupied bandwidth and output power of this equipment are in compliance with IC Rules RSS 210 / FCC Rules Part 15 Subpart C .

CONDUCTED TEST RESULTS

Conducted Emission limits do not apply to this EUT as it is battery powered.

ANALYSIS AND CONCLUSIONS

Based upon the radiated measurements we find that this equipment is within the limits of the IC Rules RSS 210 / FCC Rules Part 15 Subpart C. All results are based on a test of one sample, and represent other production units, only in as much as a sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

NOTES (Special conditions unique to this test)

None

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TEST PROCEDURES

1. TEST EQUIPMENT

- A. HP 8546A (9 kHz - 6.5 GHz) EMI Receiver w/ RF Filter Section, S/N 3704A00323 / 3650A00360. Calibration Date 1-5-2005, calibrated annually.
- B. Com-Power Biconilog Antenna, Model AC220, S/N 25509.
Calibration Date 7-16-2004, calibrated annually.
- B. Electro-Metrics Double Ridged Guide Antenna, Model EM-6961, S/N 6337. Calibration Date: 7-30-2004, calibrated biannually.
- D. Tektronix 1Gs/Sec 500MHz Oscilloscope, Model TDS540, S/N BO10921.
Calibration Date: 1-18-2005. calibrated annually.

2. FREQUENCY RANGE TO BE SCANNED.

- A. Radiated Test from 30 MHz to 40 GHz (or the 10th harmonic of the highest frequency whichever is lower).
- B. Conducted Test from 150 kHz to 30 MHz.

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3. TEST PROCEDURES.

Radiated test procedure:

The EUT, associated cables and peripheral devices are placed on the supporting table and any support equipment is placed off the site. The EUT is turned on and any necessary operating or test software installed and allowed to warm up. The EUT is pre-scanned in our ferrite tile lined chamber where it is rotated 360 degrees and examined in both horizontal and vertical polarization, all emission frequencies are identified and recorded. The EUT is then moved to the OATS and the frequency band from 30 MHz to 40 GHz is scanned, all frequencies identified in the chamber are investigated, as well as harmonic frequencies of the EUT. When an emission is found the emission is maximized by varying the bundle position of the connecting cables, the antenna height, the antenna polarization (vertical and horizontal) and the table orientation (360 degrees). The maximum reading is recorded and the next signal is searched for.

Conducted test procedure:

The power line of the EUT is connected to the LISN (Line Impedance Stabilization Network). A measurement of the emissions are made from the power line for both phase and neutral on the analyzer in the frequency range from 150 kHz to 30 MHz. The maximum readings are recorded for each phase.

All measurements are made according to the procedures defined in: "ANSI C63.4-2003 Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz, American National Standard for (ISBN 1-55937-215-5).

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RSS 210 TEST LIMITS

1. RSS 210 Section 6.1, Table 1 Radiation Limits (Average):
FCC Part 15.231 Radiation Limits (Average):

Table 1:
Permissible Field Strength Limits
(Momentarily Operated Devices, section 6.1)

FUNDAMENTAL FREQUENCY (MHz), excluding restricted band frequencies of Table 2	FIELD STRENGTH OF FUNDAMENTAL microvolts/m at 3 metres, (watts, EIRP)	FIELD STRENGTH OF UNWANTED EMISSIONS ⁽¹⁾ microvolt/metre at 3 metres
40.66-40.70	See section 6.2.2(g) .	
70-130	1,250 (470 nW)	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750 (4.2 uW)	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500 (47 uW)	1250

Note 1 Use quasi-peak or averaging meter.

* Linear interpolation with frequency F in MHz:

For 130-174 MHz: FS (microvolts/m) = (56.82 x F) - 6136

For 260-470 MHz: FS (microvolts/m) = (41.67 x F) - 7083

nW = nanowatt (EIRP); uW = microwatt (EIRP);

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TEST FACILITY DESCRIPTION

Compliance Worldwide is located on 357 Main Street in Sandown, New Hampshire. The conducted and radiated test sites, located at C.W. are used for Federal Communications Commission (FCC) testing and Industry Canada Testing. A site description is on file with the FCC in Columbia, MD USA. Site information is also on file with Industry Canada, anyone wishing to review this Test Facility Description is referred to file number **IC 3023**. This is currently on file at Industry Canada, 1241 Clyde Avenue, Ottawa, ON K2C 1Y3.

The radiated site is a 3/10 meter indoor site with an enclosure for the product and a basement for the personnel, support equipment and test equipment.

The conducted site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical metal wall required by EN 55022.

Both sites are designed to test products or systems 1.5 meter x 1.0 meter, floor standing or table top.

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**TEST SET UP
AND
PERIPHERAL CONNECTION INFORMATION**



EUT

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PLEASE NOTE - EUT (equipment under test) is Recessed Bolt Cup Transmitter.

The cables directly connected to this equipment are listed below.

Connection Descriptions

1. No Cables were associated with this test.
(description)

(from device)

(to device)

CABLE LENGTH (S) SHIELDED or (U) UNSHIELDED

2. N/A
(description)

(from device)

(to device)

CABLE LENGTH (S) SHIELDED or (U) UNSHIELDED

3. N/A
(description)

(from device)

(to device)

CABLE LENGTH (S) SHIELDED or (U) UNSHIELDED

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GENERAL TECHNICAL REQUIREMENTS FCC and IC

- 15.231(a): This device is an alarm system transmitter and is
6.1.1(a): allowed under this part.
- 15.231(a)(1): This device is not manually operated, it operates
6.1.1 (a)(1): automatically in supervisory mode and when an alarm
condition is present.
- 15.231(a)(2): In supervisory mode, this EUT transmits 10, 100ms
6.1.1(a)(2): transmissions every 2 hours, of the 100ms only 13.75ms
of data is sent in 1 packet. These 10 transmissions are completely inside
2 seconds of time and are spread evenly over the units 2 channels. The
EUT then
ceases transmission for another 2 hours unless an
alarm condition is present.
- 15.231(a)(3): In supervisory mode, this EUT transmits 10, 100ms
6.1.1(a)(3): transmissions every 2 hours, of the 100ms only 13.75ms
of data is sent in 1 packet. These 10 transmissions are completely inside
2 seconds of time and are spread evenly over the units 2 channels.
- 15.231(a)(4): During an alarm condition, the EUT will transmit
6.1.1(a)(4): additional packets of data to alert the control
panel.
- 15.231(b): The EUT was found to Comply with the limits in this
6.1.1(b) section.

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DETERMINATION OF AVERAGE FACTOR

In supervisory mode, the EUT makes 100ms transmissions within which a 27.5ms long train of pulses is sent. The duty cycle of the pulse train is by design 50% or lower.

Total Duration of 1 cycle:	100ms
Total On-Time in 1 cycle:	$(.5)*27.5=13.75\text{ms}$
On-Time divided by cycle:	$13.75\text{ms}/100\text{ms} = 0.1375$
Average Factor:	$20*\log(0.1375) = -17.23\text{dB}$

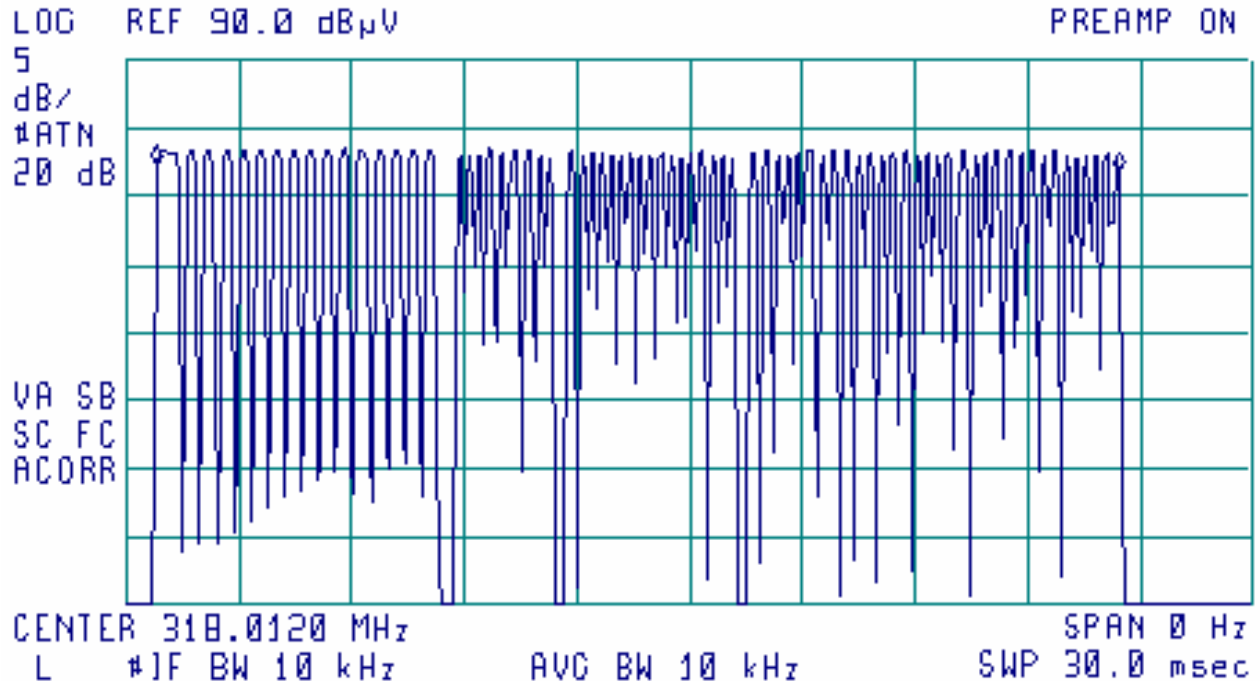
Data was taken from the manufacturer's declaration included in the filing submission as an operational description exhibit.

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DETERMINATION OF AVERAGE FACTOR

Plot showing total duration of pulse train.

10:43:06 MAY 13, 2005 SINGLE PULSE TRAIN
201-05 NAPCO SAFEWATCH EZ SW-BOLT-TRANS
ACTV DET: PEAK
MEAS DET: PEAK
MKR Δ 25.575 msec
-.46 dB



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RADIATED TEST RESULTS

Frequency Range: 30 - 3195 MHz.
Measurement Distance: 3.0 Meters.
Bandwidth: 120 kHz, Per ANSI C63.4-2003.*
Detector Functions: Peak
Video Filter: 300 kHz
Table Height: 0.8 meters
Antenna Height Variation: 1 - 4 Meters.

Horizontal and Vertical Polarization Measurements Taken Worst Case shown.

*Resolution Bandwidth is 1 MHz, and Video Bandwidth is 3 MHz above 1 GHz

PLEASE SEE NEXT PAGE FOR RADIATED TEST DATA

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Radiated List Channel 310 MHz

Frequency MHz	Peak Amp dB μ V /m	Polarization	Avg Amp dB μ V /m	Limit dB μ V /m	Avg Margin dB
620.12	54.81	H	37.58	55.30	-17.72
930.18	52.24	H	35.01	55.30	-20.29
1240.24	58.49	H	41.26	55.30	-14.04
1550.30	50.91	H	33.68	55.30	-21.62
1860.36	53.66	H	36.43	55.30	-18.87
2170.42	54.71	H	37.48	55.30	-17.82
2480.48	60.88	H	43.65	55.30	-11.65
2790.54	63.81	H	46.58	55.30	-8.72
3100.60	60.13	H	42.90	55.30	-12.40

Radiated List Channel 318 MHz

Frequency MHz	Peak Amp dB μ V /m	Polarization	Avg Amp dB μ V /m	Limit dB μ V /m	Avg Margin dB
636.00	57.00	H	39.77	55.80	-16.03
954.00	51.48	H	34.25	55.80	-21.55
1272.00	59.30	H	42.07	55.80	-13.73
1590.00	50.76	H	33.53	55.80	-22.27
1908.00	62.31	H	45.08	55.80	-10.72
2226.00	47.69	H	30.46	55.80	-25.34
2544.00	53.74	H	36.51	55.80	-19.29
2862.00	62.96	H	45.73	55.80	-10.07
3180.00	59.39	H	42.16	55.80	-13.64

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RADIATED OUTPUT POWER & OCCUPIED BANDWIDTH TEST RESULTS

Frequency Range: 319.5 MHz.

Measurement Distance: 3.0 Meters.

Bandwidth: As Noted, Per ANSI C63.4-2003.

Detector Functions: Peak, Quasi Peak, Average.

Video Filter: 300 kHz

Table Height: 0.8 meters

Antenna Height Variation: 1 - 4 Meters.

Horizontal and Vertical Polarization Measurements Taken, Worst Case Reported.

PLEASE SEE NEXT PAGE(S) OUTPUT FIELD STRENGTH TEST DATA

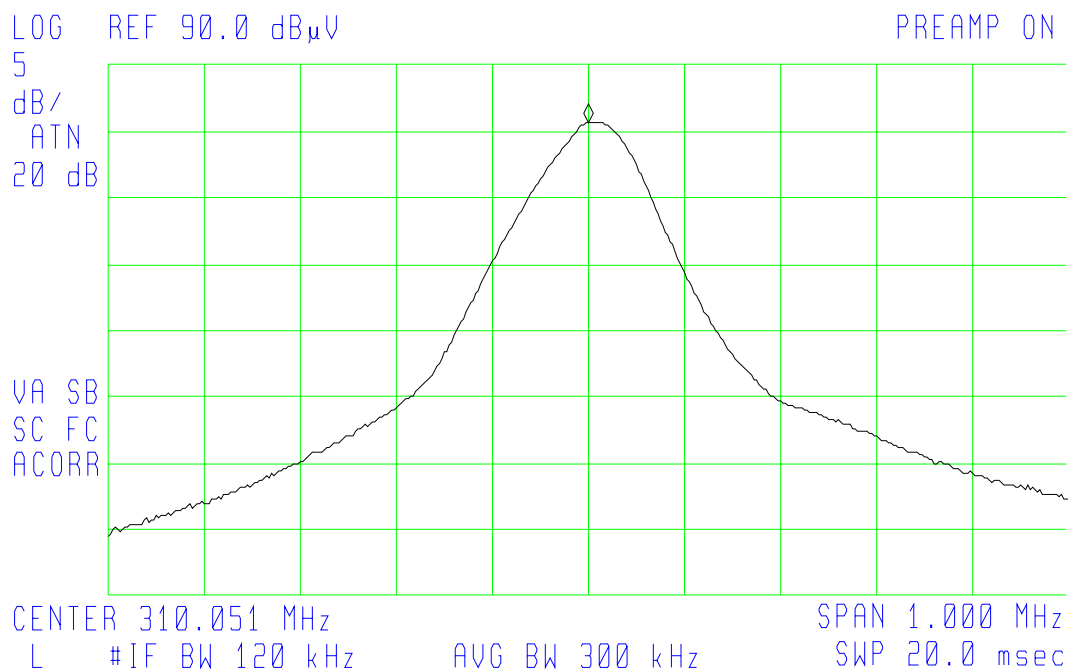
Occupied bandwidth was measured at the 99% power bandwidth points, and was found to MEET the limit of 775kHz or 0.25% of 310.0MHz.

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Channel A Output Power Plot

10:21:01 JUL 13, 2005 LOW CH FS
201-05 NAPCO BOLT TRANS

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 310.051 MHz
85.55 dB μ V



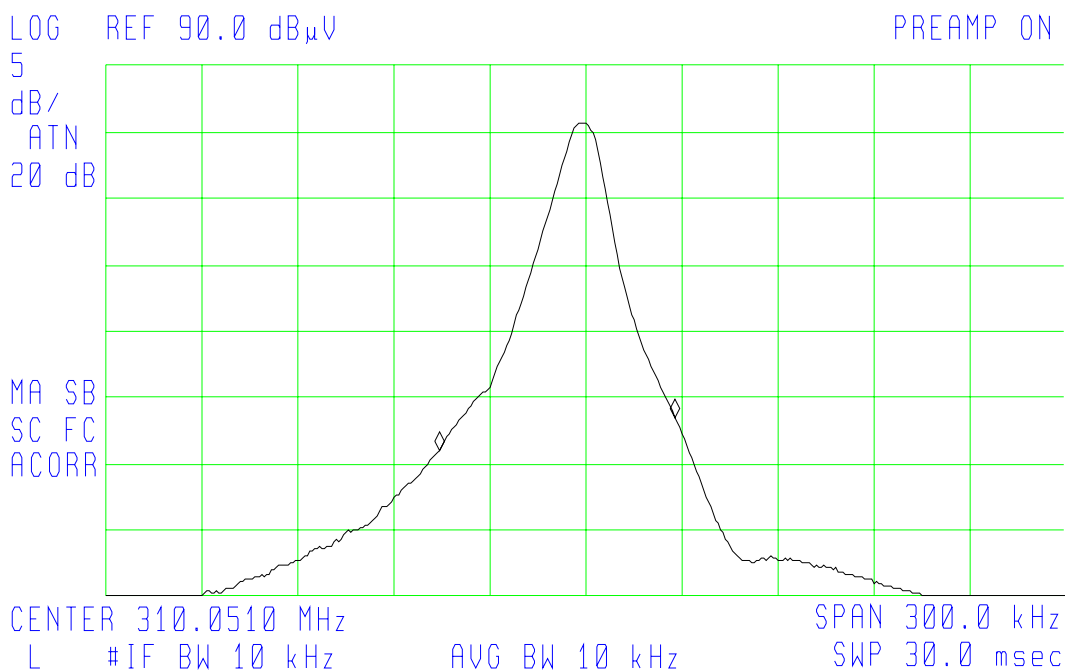
Freq (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)
310.00	H	85.55	66.32	75.3	-9.0

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Channel A Bandwidth Plot

10:26:21 JUL 13, 2005 LOW CH 99%PWR BW
201-05 NAPCO BOLT TRANS

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR Δ 73.5 kHz
2.44 dB



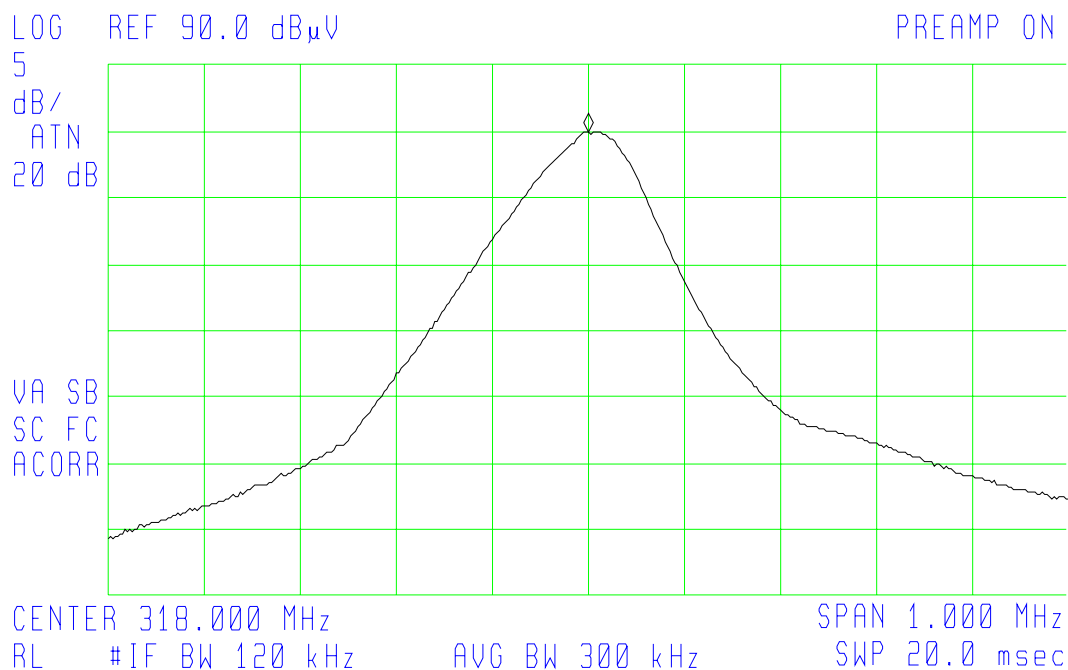
Freq (MHz)	99% power bandwidth (kHz)
310.00	73.5

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Channel B Output Power Plot

10:06:20 JUL 13, 2005 HIGH CHANNEL FS
201-05 NAPCO BOLT TRANS

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 318.000 MHz
84.85 dB μ V



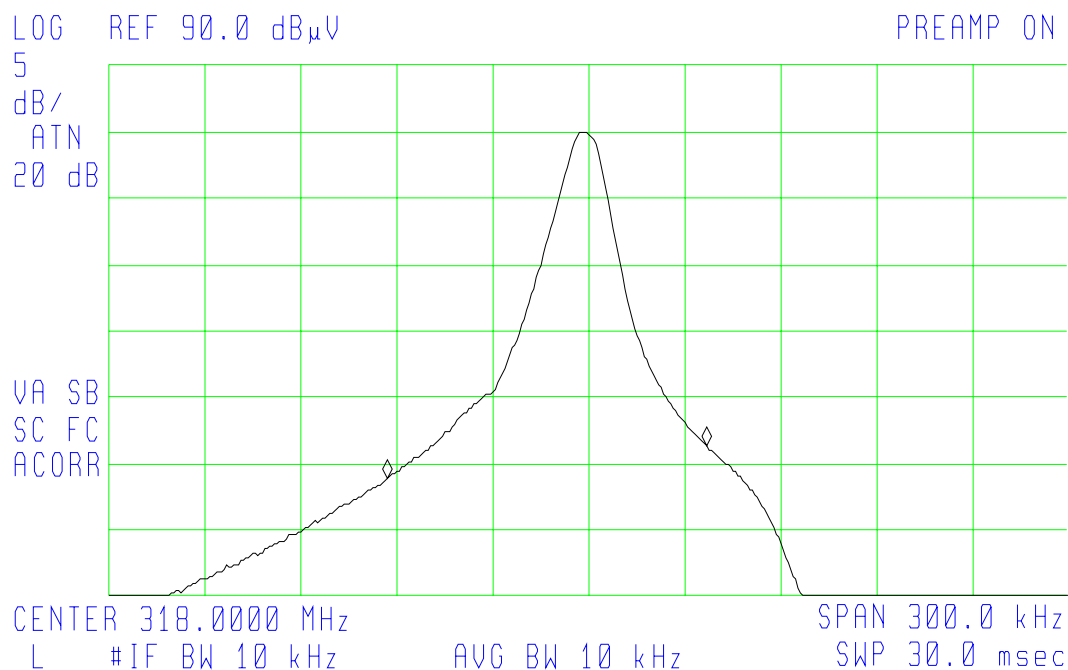
Freq (MHz)	Polarization (H/V)	Peak Amp (dB μ V /m)	Avg Amp (dB μ V /m)	Avg Limit (dB μ V /m)	Avg Margin (dB)
318.00	H	84.85	67.62	75.8	-8.2

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Channel B Bandwidth Plot

10:13:01 JUL 13, 2005 HIGH CH 99%PWR BW
201-05 NAPCO BOLT TRANS

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR Δ 99.8 kHz
2.54 dB



Freq (MHz)	99% power bandwidth (kHz)
318.00	99.8

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CONDUCTED TEST RESULTS

Frequency Range:	150 kHz to 30.0 MHz.
Bandwidth:	9 kHz per ANSI C63.4-2003.
Detector Functions:	Peak, Quasi-Peak, Average
Table Height:	0.8 meters
Video Bandwidth:	30 kHz.

Phase and Neutral Measurements Taken.

EUT IS BATTERY OPERATED ONLY, CONDUCTED LIMITS DO NOT APPLY.

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NOTES AND COMMENTS

(Special conditions unique to this test)

The EUT was examined in 3 orthogonal planes, the worst case plane is as shown in the setup photos.

A new Duracell Ultra, 123, Lithium, 3V battery was used during testing.