TEST NUMBER - 371-03

TEST REPORT TO

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

Low Power License-Exempt Radiocommunication Devices
Intentional Radiators

for

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

of

Heat Detector Transmitter

GEM-HEAT

FCC ID:AD8GEMHEAT
IC ID: 596A-GEMHEAT

on

12/19/03 and 1/8/04

Tested by

_____
Andrew Mertinooke

Reviewed by

_____
Clifton P Brick

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TEST DESCRIPTION

1. TEST OBJECTIVE

To test the Heat Detector Transmitter GEM-HEAT to RSS 210 / Part 15 Subpart C Rules and write a report.

2. E.U.T. DESCRIPTION

GENERAL

The Heat Detector Transmitter GEM-HEAT is a wireless alarm system heat sensor for use with Napco's Gemini and Napco Express Receivers.

SERIAL NUMBERS:

Production Prototype.

TEST RESULTS AND CONCLUSIONS

PRODUCT TESTED - Heat Detector Transmitter

MODEL NUMBER - GEM-HEAT

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 12-28-2002 & 1-16-2004, calibrated annually, was received and returned in tolerance 1-16-04.

B. Com-Power Biconilog Antenna, Model AC220, S/N 25509. Calibration Date 3-11-2003, calibrated annually.

B. Electro-Metrics Double Ridged Guide Antenna, Model EM-6961, S/N 6337. Calibration Date: 6-24-2003, calibrated annually.

D. Tektronix 1Gs/Sec 500MHz Oscilloscope, Model TDS540, S/N BO10921. Calibration Date: 11-21-2003. calibrated annually.

2. FREQUENCY RANGE TO BE SCANNED.

A. Radiated Test from 30 MHz to 40 GHz (or the 10^{th} harmonic of the highest frequency whichever is lower).

B. Conducted Test from 150 kHz to 30 MHz.

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 C63.4-1992 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).

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) (1)	FIELD STRENGTH OF UNWANTED EMISSIONS (1) microvolt/metre at 3 meti
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);

TEST FACILITY DESCRIPTION

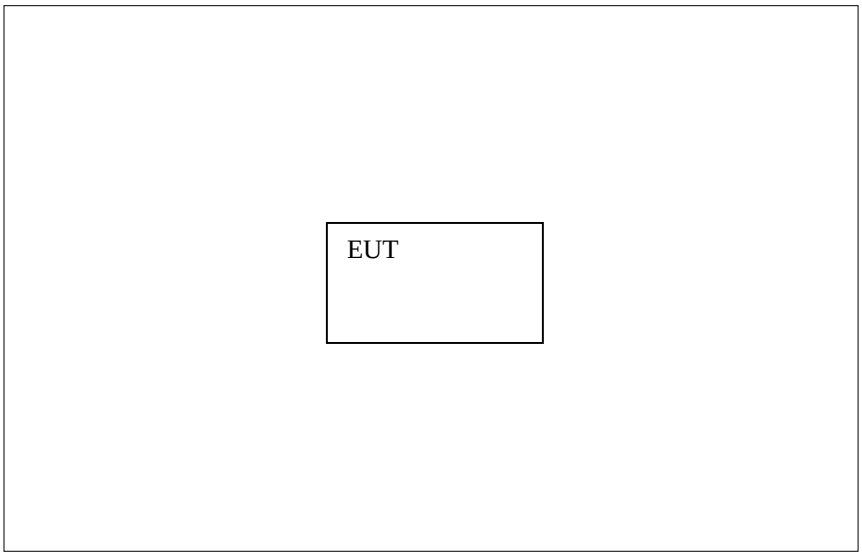
Compliance Worldwide is located on 357 Main Street in Sandown, New Hampshire. The conducted and radiated test sites, located at C.W. are used for Federal Communications Commission (FCC) testing and Industry Canada Testing. A site description is on file with the FCC in Columbia, MD USA. Site information 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.

TEST SET UP
AND
PERIPHERAL CONNECTION INFORMATION



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PLEASE NOTE - EUT (equipment under test) is Heat Detector 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 ____

GENERAL TECHNICAL REQUIREMENTS FCC and IC

15.231(a): 6.1.1(a):	This device is an alarm system transmitter and is allowed under this part.
15.231(a)(1): 6.1.1 (a)(1):	This device is not manually operated, it operates automatically in supervisory mode and when an alarm condition is present.
15.231(a)(2): 6.1.1(a)(2):	In supervisory mode, this EUT transmits 4, 100ms transmissions every hour, of the 100ms only 17ms of data is sent in 1 packet. These 4 transmissions are completely inside 1 second of time. The EUT then ceases transmission for another hour unless an alarm condition is present.
15.231(a)(3): 6.1.1(a)(3):	In supervisory mode, this EUT transmits 4, 100ms transmissions every hour, of the 100ms only 17mS of data is sent in 1 packet. These 4 transmissions are completely inside 1 second of time.
15.231(a)(4): 6.1.1(a)(4):	During an alarm condition, the EUT will transmit additional packets of data to alert the control panel.
15.231(b): 6.1.1(b)	The EUT was found to Comply with the limits in this section.

DETERMINATION OF AVERAGE FACTOR

In supervisory mode, the EUT makes 100ms transmissions within which a 17ms long train of pulses is sent. The pulses are in two pulse widths, 128µs and 256µs. The total pulses of the short duration is 40 and the total of the long pulses is 14. A Tektronix TDS540 Oscilloscope was used for the time measurements of the pulses.

Total Duration of 1 cycle:	100ms
Total On-Time in 1 cycle:	(40*128µs)+(14*256µs)=8.7ms
On-Time divided by cycle:	8.7ms/100ms = 0.087
Average Factor:	20*log(0.087) = -21.2dB

FCC and IC maximum allowed average factor is –20dB.

See the next pages for supporting data.

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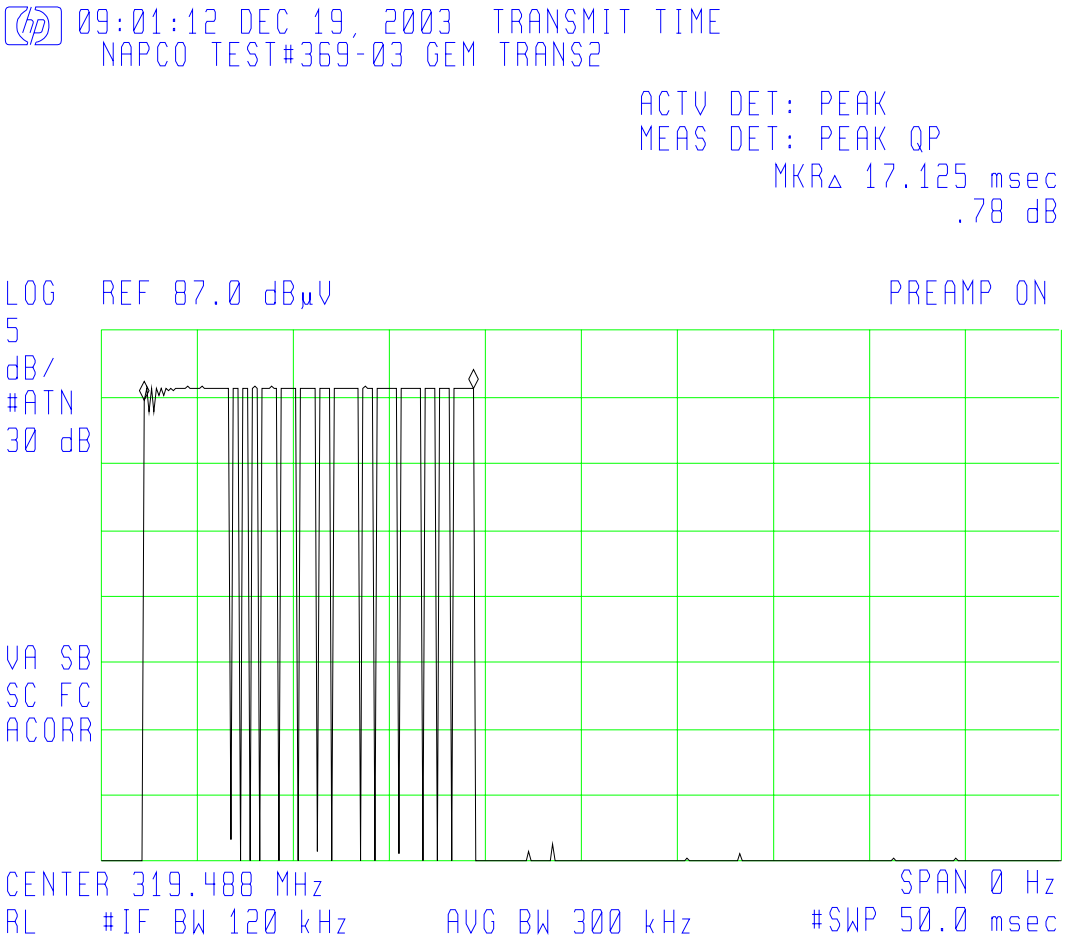
DETERMINATION OF AVERAGE FACTOR

Plot showing total duration of pulse train.



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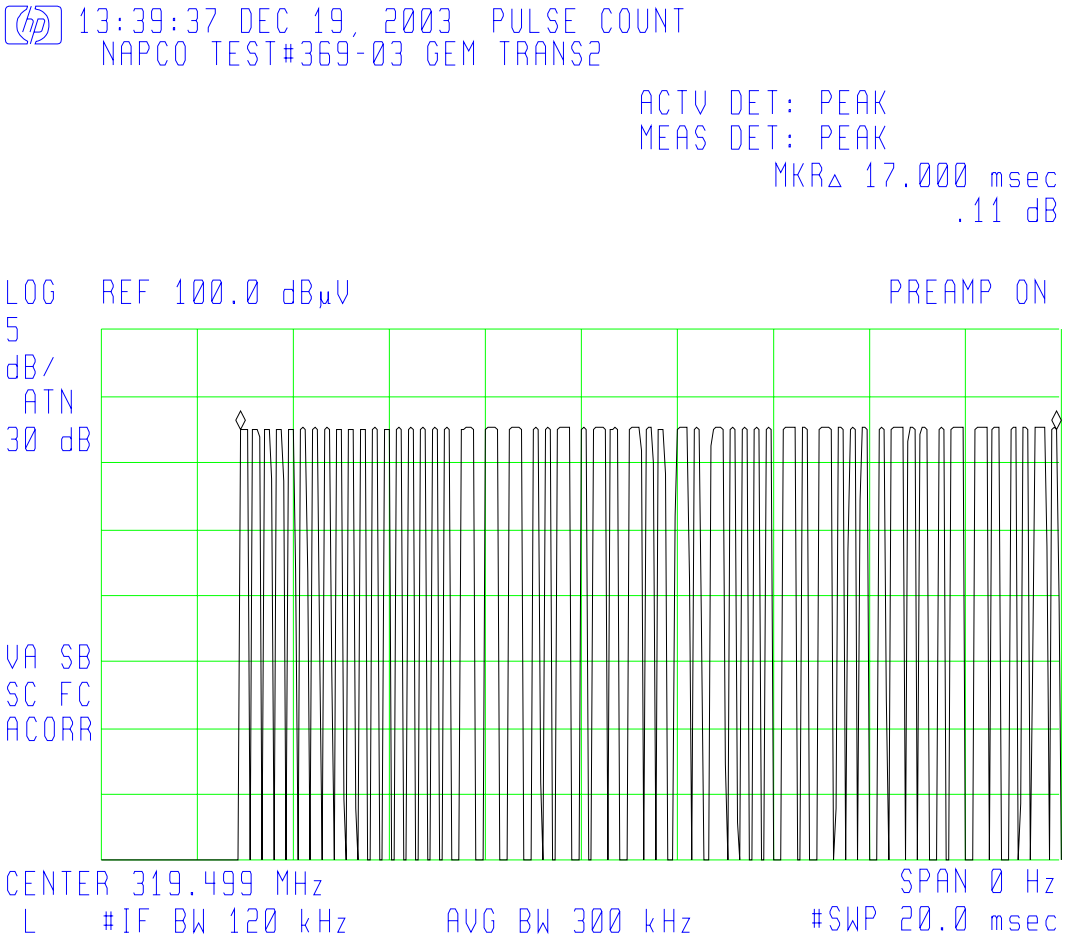
DETERMINATION OF AVERAGE FACTOR

Plot showing the individual pulses.



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RADIATED TEST RESULTS

Frequency Range:	30 - 3195 MHz.
Measurement Distance:	3.0 Meters.
Bandwidth:	120 kHz, Per ANSI C63.4-1992.*
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.

*Measurement Bandwidth is 1 MHz above 1 GHz

PLEASE SEE NEXT PAGE FOR RADIATED TEST DATA

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Radiated List

Frequency MHz	Peak Amp dBuV/m	Polarization	Avg Amp dBuV/m	Limit dBuV/m	QP Margin dB
426.0	56.2	V	36.2	55.9	-19.7
532.5	56.5	V	36.5	55.9	-19.4
639.0	62.9	V	42.9	55.9	-13.0
745.5	54.7	V	34.7	55.9	-21.2
852.0	48.4	V	28.4	55.9	-27.5
958.5	51.9	V	31.9	55.9	-24.0
1065.0	55.6	V	35.6	54.0	-18.4
1171.5	51.6	V	31.6	54.0	-22.4
1278.0	48.3	V	28.3	55.9	-27.6
1384.5	57.7	H	37.7	54.0	-16.3
1491.0	62.3	V	42.3	54.0	-11.7
1597.5	63.5	V	43.5	54.0	-10.5
1704.0	70.2	V	50.2	54.0	-3.8
1810.5	65.1	V	45.1	55.9	-10.8
1917.0	61.9	V	41.9	55.9	-14.0
2023.5	61.7	V	41.7	55.9	-14.2
2130.0	58.3	V	38.3	55.9	-17.6
2236.5	56.9	V	36.9	54.0	-17.1
2343.0	60.9	V	40.9	54.0	-13.1
2449.5	59.9	V	39.9	55.9	-16.0
2556.0	61.7	V	41.7	55.9	-14.2
2662.5	49.8	V	29.8	54.0	-24.2
2769.0	57.8	V	37.8	54.0	-16.2
2875.5	53.9	V	33.9	54.0	-20.1
2982.0	47.7	V	27.7	55.9	-28.2
3088.5	56.4	V	36.4	55.9	-19.5
3195.0	46.2	V	26.2	55.9	-29.7

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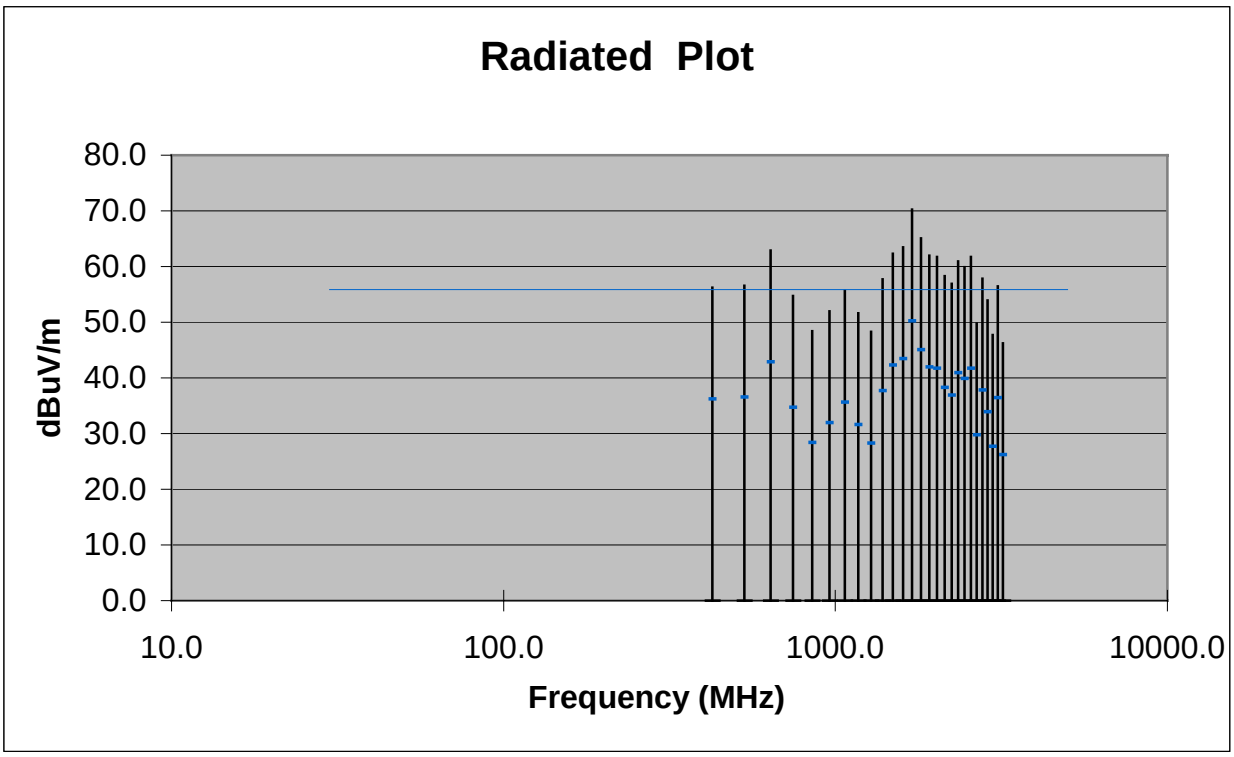
Radiated Plot



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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 C63.4-1992.
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 found to be 29.4kHz at 20 dB down from the peak of the modulated carrier using 10kHz bandwidth. This MEETS the limit of 798kHz or 0.25% of 319.5MHz.

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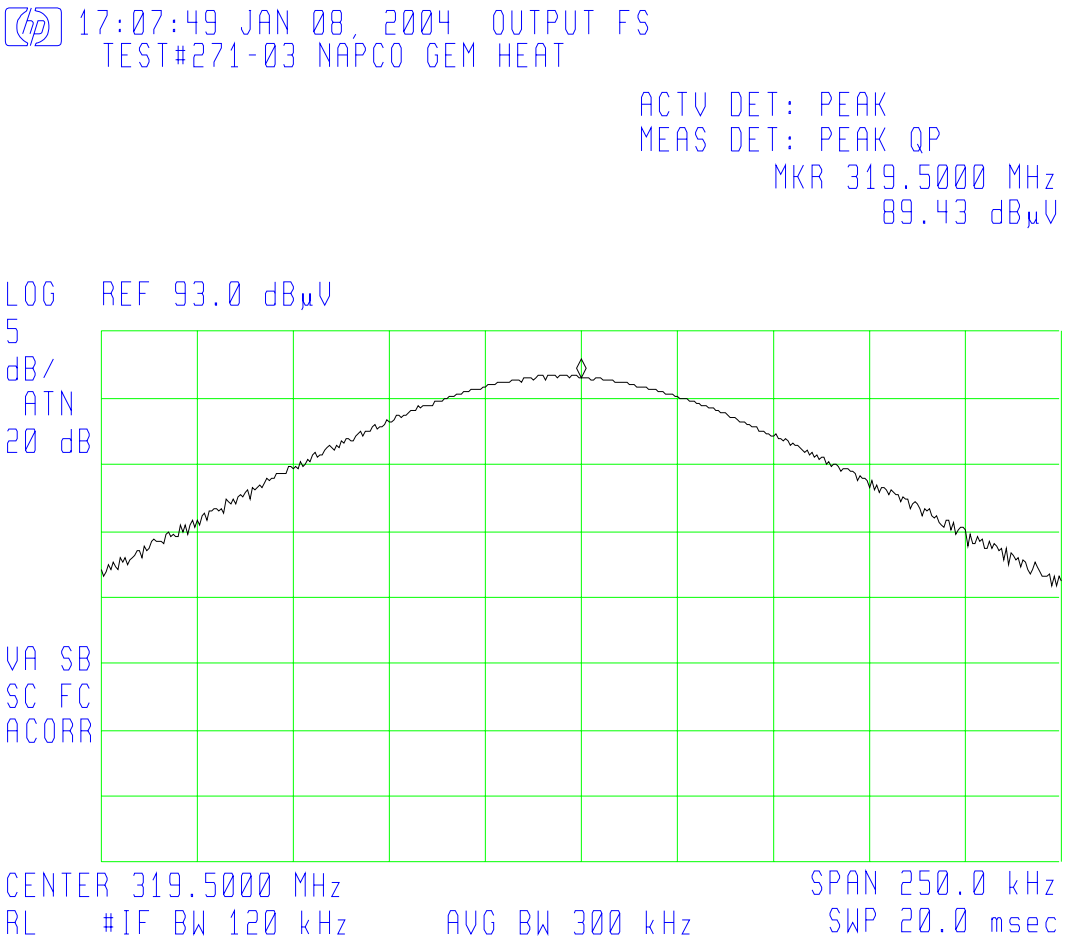
Channel A Output Power Plot



Freq (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)
319.50	H	89.4	69.4	75.9	-6.5

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CONDUCTED TEST RESULTS

Frequency Range:	150 kHz to 30.0 MHz.
Bandwidth:	9 kHz per ANSI C63.4-1992.
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.

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.