TEST NUMBER - 135-05

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

Key-Fob Remote Control Transmitter

GEM-KEYF

FCC ID: AD8765206230
IC ID: 596A-76520623

on

2/25/2005

Tested by

Andrew Mertinooke

Reviewed by

Clifton P. Brick

TEST NUMBER - 135-05

TABLE OF CONTENTS

TEST NUMBER - 135-05

TEST DESCRIPTION

1. TEST OBJECTIVE

To test the Key-Fob Remote Control Transmitter GEM-KEYF to RSS 210 / Part 15 Subpart C Rules and write a report.

2. E.U.T. DESCRIPTION

GENERAL

The Key-Fob Remote Control Transmitter GEM-KEYF is a remote control for alarm system control.

SERIAL NUMBERS:

Production Prototype.

TEST RESULTS AND CONCLUSIONS

PRODUCT TESTED - Key-Fob Remote Control Transmitter

MODEL NUMBER - GEM-KEYF

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)

The EUT was modified to transmit continuously for the radiated measurements. Normal operation was used for determining compliance with the duration limiting and average factor measurements.

TEST NUMBER - 135-05

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. HP 8593E (9 kHz - 26.5 GHz) Spectrum Analyzer, S/N 3829A03887. Calibration Date 1-17-2005, calibrated annually.

C. Com-Power Biconilog Antenna, Model AC220, S/N 25509. Calibration Date 7-16-2004, calibrated annually.

D. Electro-Metrics Double Ridged Guide Antenna, Model EM-6961, S/N 6337. Calibration Date: 7-30-2004, calibrated biannually.

E. 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 10^{th} 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).

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 1Ùse 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

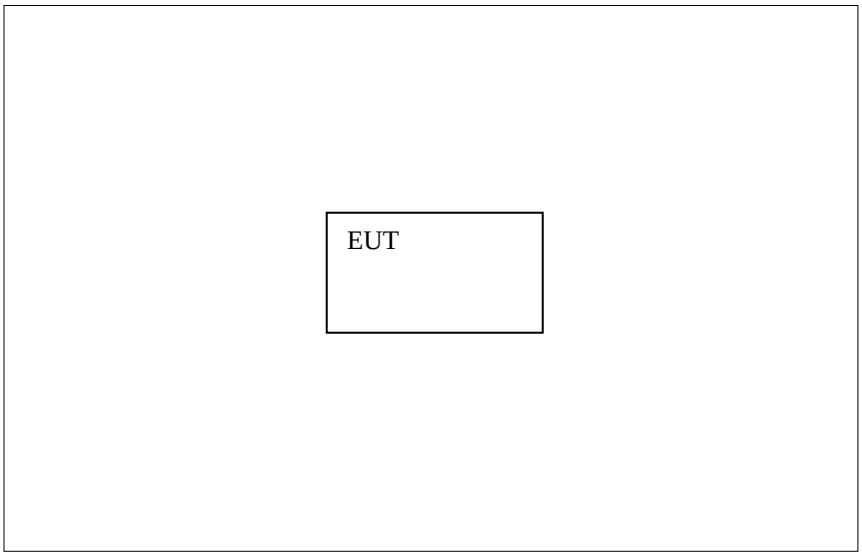
Compliance Worldwide is located on 357 Main Street in Sandown, New Hampshire. The conducted and radiated test sites, located at C.W. are used for Federal Communications Commission (FCC) testing and Industry Canada Testing. A site description is on file with the FCC in Columbia, MD USA. Site information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

TEST SET UP
AND
PERIPHERAL CONNECTION INFORMATION



TEST NUMBER - 135-05

PLEASE NOTE - EUT (equipment under test) is Key-Fob Remote Control 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 manually operates and shuts down within less than 5 seconds after the key is released. Actual function stops in 1 second after the key is pushed and does not repeat unless the key is pushed again.
15.231(a)(2): 6.1.1(a)(2):	The transmitter is not automatically operated. N/A.
15.231(a)(3): 6.1.1(a)(3):	The transmitter is not automatically operated. N/A.
15.231(a)(4): 6.1.1(a)(4):	The transmitter is not automatically operated. N/A.
15.231(b): 6.1.1(b)	The EUT was found to Comply with the limits in this section.

DETERMINATION OF AVERAGE FACTOR

When the key is pushed, 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 38 and the total of the long pulses is 14. A Tektronix TDS540 Oscilloscope was used for the time measurements of the pulses.

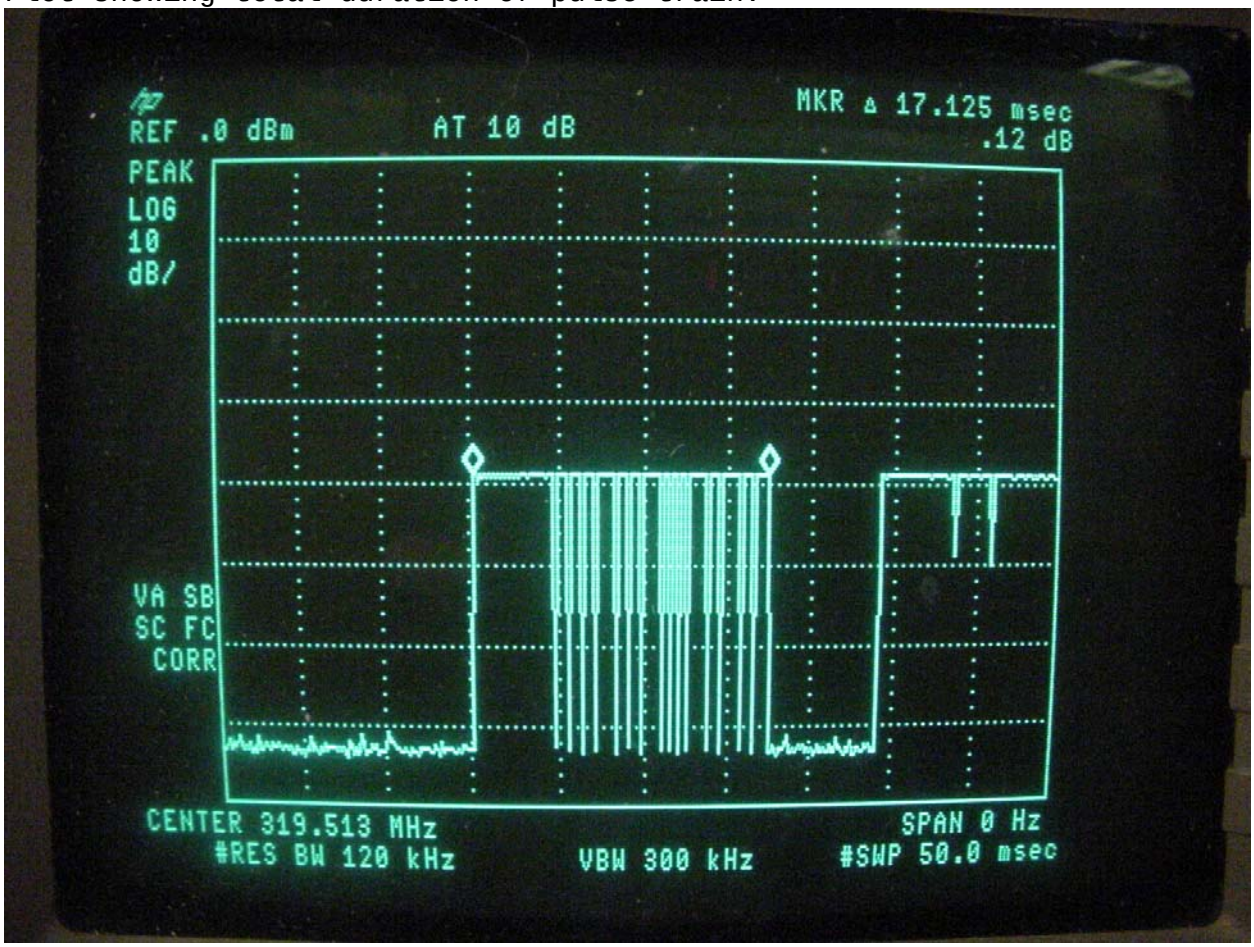
Total Duration of 1 cycle:	100ms
Total On-Time in 1 cycle:	(38*128µs)+(14*256µs)=8.5ms
On-Time divided by cycle:	8.5ms/100ms = 0.085
Average Factor:	20*log(0.085) = -21.4dB

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

See the next pages for supporting data.

DETERMINATION OF AVERAGE FACTOR

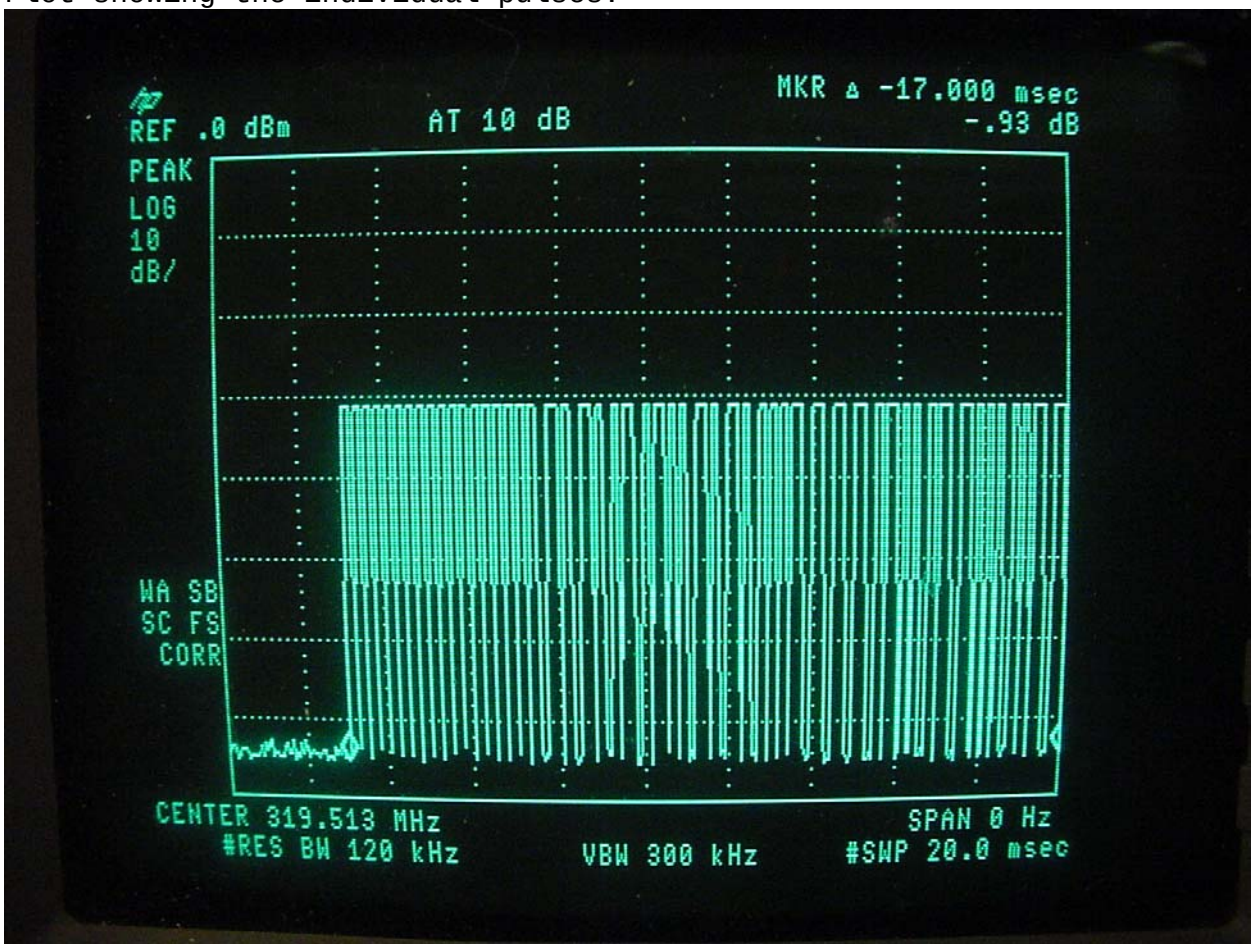
Plot showing total duration of pulse train.



The plot was captured using a continuous trigger with max hold, pressing view when the pulse was captured. Please disregard the partial pulse on the right of the display.

DETERMINATION OF AVERAGE FACTOR

Plot showing the individual pulses.



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TEST NUMBER - 135-05

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.

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

PLEASE SEE NEXT PAGE FOR RADIATED TEST DATA

TEST NUMBER - 135-05

Radiated Data

Frequency MHz	Peak Amp dBuV/m	Polarization	Avg Amp dBuV/m	Limit dBuV/m	Avg Margin dB
639.0	49.8	H	29.8	55.9	-26.1
958.5	57.4	H	37.4	55.9	-18.5
1278.0	60.4	H	40.4	55.9	-15.5
1597.5	60.3	H	40.3	54.0	-13.7
1917.0	48.9	H	28.9	55.9	-27.0
2236.5	51.0	H	31.0	54.0	-23.0
2556.0	46.7	H	26.7	55.9	-29.2
2875.5	47.9	H	27.9	54.0	-26.1

No other signals found within 20 dB of the limit up to 3.2GHz.

TEST NUMBER - 135-05

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.

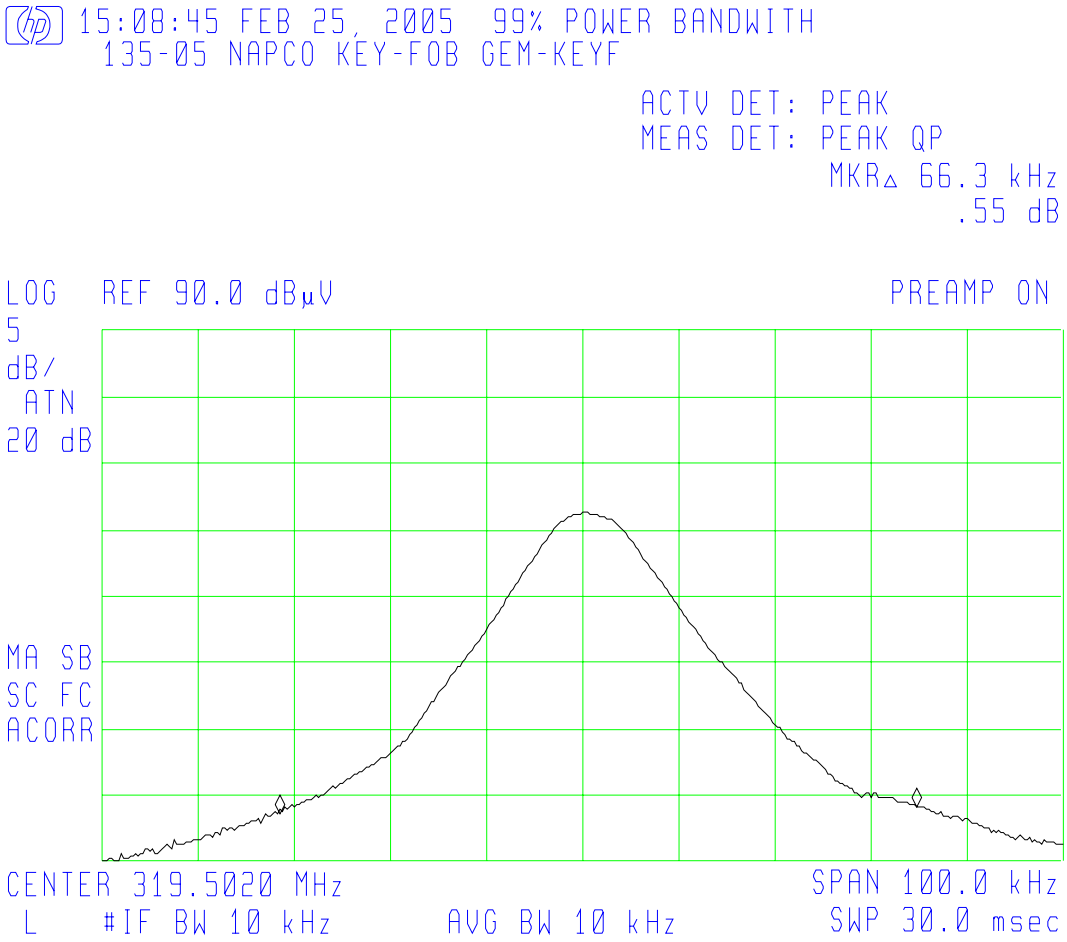
Horizontal and Vertical Polarization Measurements Taken, Worst Case Reported.

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

TEST NUMBER - 135-05

Channel A 99% Power Bandwidth Plot

Occupied bandwidth was found to be 66.3kHz using 10kHz bandwidth. This MEETS the limit of 798kHz or 0.25% of 319.5MHz.



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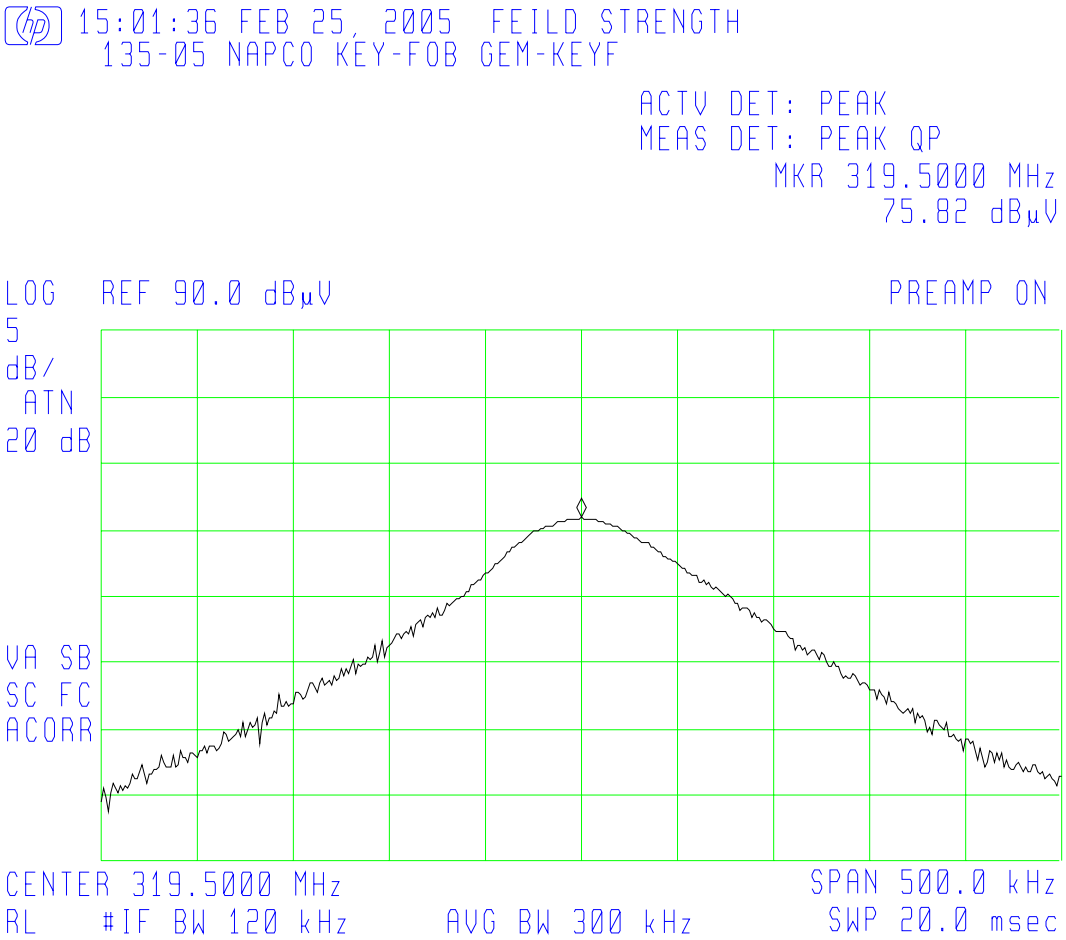
TEST NUMBER - 135-05

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	75.82	55.82	75.9	-20.08

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TEST NUMBER - 135-05

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 Energizer, CR2032, 3V battery was used during testing.

The EUT was modified to transmit continuously for the radiated measurements. Normal operation was used for determining compliance with the duration limiting and average factor measurements.