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FCC TEST REPORT

PART 15.231

| | |
|----------------------|--|
| APPLICANT | AUTOSTART |
| ADDRESS | 5764 PARE MONTREAL QUEBEC H4P 2M2 CANADA |
| FCC ID | NAHAS5501 |
| PRODUCT DESCRIPTION | SECURITY TRANSCEIVER |
| DATE SAMPLE RECEIVED | SEPTEMBER 5, 2006 |
| DATE TESTED | SEPTEMBER 6, 2006 |
| TESTED BY | NAM NGUYEN |
| APPROVED BY | MARIO DE ARANZETA |
| TIMCO REPORT NO. | 2285ZUT6TestReport.doc |
| TEST RESULTS | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL |
| TOTAL PAGES | 12 |

THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE
WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.

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GENERAL INFORMATION

EUT Specification

| | |
|---|---|
| The test results relate only to the items tested. | |
| FCC ID | NAHAS5501 |
| Product Description | SECURITY TRANSCEIVER |
| Operating Frequency | 433.92 MHz |
| EUT Power | Battery Operated |
| | <i>Secondary Power</i> N/A |
| Test Item | <input type="checkbox"/> Prototype <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Production |
| Type of Equipment | <input type="checkbox"/> Fixed <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable |

Test standards

FCC Part 15, Subpart C, & ANSI C63.4 - 2003

Modification to the DUT

No modification was made to the DUT during testing.

Test exercise (e.g software description, test signal, etc.)

The EUT was set in continuous transmit mode of operation.

Test Facility

All tests are carried out at Timco Engineering Inc., 849 NW State Road 45, Newberry, FL 32669.

Receiver

The receiver portion of this transceiver has been tested and meets all of the FCC requirements per FCC rules Part 15.109. A verification report was issued and a copy of this report is available upon request.

COMPLIANCE WITH PART 15.231(a)

Part 15.231(a):

- Continuous operation: Yes No
- Control signal only: Yes No
- Data transmission with a control signal Yes No N/A
Description of control signal: car alarm (notes: indicate whether such info is included in supporting exhibit such as operation description page xx)

Part 15.231(a)(1):

- Manually operated device: Yes No
- Does it meet the 5s deactivation requirement after the switch is being released: Yes No

Description: _____ (notes: a plot showing the pulse train does not necessarily constitute an objective evidence of compliance with the deactivation requirement. A plot should be accompanied by an explanation and/or statement of compliance, if not otherwise clearly stated in supporting documentation e.g. operation description page xx)

Part 15.231(a)(2):

- Automatically operated device: Yes No
- Does it meet the 5s deactivation requirement after being activated: Yes No N/A

Description: _____ (notes: a plot showing the pulse train does not necessarily constitute an objective evidence of compliance with the deactivation requirement. A plot should be accompanied by an explanation and/or statement of compliance, if not otherwise clearly stated in supporting documentation e.g. operation description page xx)

Part 15.231(a)(3):

- Periodic transmission at regular predetermined intervals: Yes No N/A

Description: _____

- Polling or supervision transmissions, including data, to check system integrity check requires a total transmission time not exceeding 2s per hour:
Yes No N/A

Part 15.231(a)(4):

Operation involving fire, security, or safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Does the transmitter meet the following condition? Yes No

EMC EQUIPMENT LIST

| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date |
|--|-----------------|---------------|--------------------------|----------------|----------|
| 3-Meter OATS | TEI | N/A | N/A | Listed 1/11/06 | 1/10/09 |
| 3/10-Meter OATS | TEI | N/A | N/A | Listed 3/27/04 | 3/26/07 |
| Analyzer Tan Tower Spectrum Analyzer | HP | 8566B Opt 462 | 3138A07786 3144A20661 | CAL 12/7/05 | 12/7/07 |
| Analyzer Tan Tower RF Preselector | HP | 85685A | 3221A01400 | CAL 12/7/05 | 12/7/07 |
| Analyzer Tan Tower Quasi-Peak Adapter | HP | 85650A | 3303A01690 | CAL 12/8/05 | 12/8/07 |
| Analyzer Tan Tower Preamplifier | HP | 8449B-H02 | 3008A00372 | CAL 12/8/05 | 12/8/07 |
| Analyzer Blue Tower Spectrum Analyzer | HP | 8568B | 2928A04729 2848A18049 | CAL 4/13/05 | 4/13/07 |
| Analyzer Blue Tower RF Preselector | HP | 85685A | 2926A00983 | CAL 9/5/05 | 9/5/07 |
| Analyzer Blue Tower Quasi-Peak Adapter | HP | 85650A | 2811A01279 | CAL 4/13/05 | 4/13/07 |
| Analyzer Silver Tower Spectrum Analyzer | HP | 8566B Opt 462 | 3552A22064 3638A08608 | CAL 12/8/04 | 12/8/06 |
| Analyzer Silver Tower RF Preselector | HP | 85685A | 2620A00294 | CAL 4/27/04 | 12/8/06 |
| Analyzer Silver Tower Quasi-Peak Adapter | HP | 85650A | 3303A01844 | CAL 12/8/04 | 12/8/06 |
| Analyzer Open-Frame Tower Preamplifier | HP | 8449B | 3008A01075 | CAL 8/8/05 | 8/8/07 |
| Antenna: Biconnical | Electro-Metrics | BIA-25 | 1171 | CAL 4/29/05 | 4/29/07 |
| Antenna: Biconnical | Eaton | 94455-1 | 1057 | CAL 12/12/05 | 12/12/07 |

TEST PROCEDURE

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2003 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz. The ambient temperature of the UUT was 98.3°F with a humidity of 40%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

$$\begin{array}{ll} \text{Freq (MHz) METER READING + ACF = FS} \\ 33 \quad 20 \text{ dBuV} + 10.36 \text{ dB} = 30.36 \text{ dBuV/m @ 3m} \end{array}$$

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings were converted to average readings based on the duration of "ON" time.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

RADIATION INTERFERENCE

RULES PART NO.: 15.231

REQUIREMENTS:

| Fundamental Frequency (MHz) | Field Strength of Fundamental (dB μ V) | Field Strength of Harmonics and Spurious Emissions (dB μ V/m @ 3m) |
|-----------------------------|--|--|
| 40.66 to 40.70 | 67.04 | 47.04 |
| 70 to 130 | 61.94 | 41.94 |
| 130 to 174 | 61.94 to 71.48 | 41.94 to 51.48 |
| 174 to 260 | 71.48 | 51.48 |
| 260 to 470 | 71.48 to 81.94 | 51.48 to 61.94 |
| 470 and above | 81.94 | 61.94 |

The limit for average field strength dbuv/m for the fundamental frequency = 80.82 dB μ V/m. No fundamental is allowed in the restricted bands.

The limit for average field strength dbuv/m for the harmonics and spurious frequencies = 60.82 dB μ V/m. Spurious in the restricted bands must be less than 54 dB μ V/m or 15.209.

TEST DATA:

| Emission Frequency MHz | * | Meter Reading dBuV | Ant. Pol. | Coax Loss dB | Correction Factor dB | Duty Cycle Factor dB | Field Strength dBuV/m | Margin dB |
|------------------------|----|--------------------|-----------|--------------|----------------------|----------------------|-----------------------|-----------|
| 433.90 | | 42.1 | V | 3.24 | 16.40 | 0.00 | 61.74 | 19.09 |
| 433.90 | | 59.3 | H | 3.24 | 16.76 | 0.00 | 79.30 | 1.53 |
| 867.80 | | 15.9 | H | 4.87 | 22.86 | 0.00 | 43.63 | 17.20 |
| 867.80 | | 23.6 | V | 4.87 | 22.48 | 0.00 | 50.95 | 9.88 |
| 1,301.64 | ** | 15.2 | V | 1.35 | 28.00 | 0.00 | 44.55 | 9.45 |
| 1,301.64 | ** | 15.5 | H | 1.35 | 28.00 | 0.00 | 44.85 | 9.15 |
| 1,735.50 | | 16.4 | V | 1.57 | 29.70 | 0.00 | 47.67 | 13.16 |
| 1,735.50 | | 16.5 | H | 1.57 | 29.70 | 0.00 | 47.77 | 13.06 |
| 2,169.40 | | 8.5 | V | 1.77 | 31.94 | 0.00 | 42.21 | 18.62 |
| 2,169.40 | | 9.3 | H | 1.77 | 31.94 | 0.00 | 43.01 | 17.82 |
| 2,603.30 | | 6.7 | H | 1.94 | 32.77 | 0.00 | 41.41 | 19.41 |
| 2,603.30 | | 7.7 | V | 1.94 | 32.77 | 0.00 | 42.41 | 18.41 |

** -DENOTES RESTRICTED BANDS.

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows:

- 1) for the band 130-174 MHz, uV/m at 3 meters = $56.81818(F) - 6136.3636$;
- 2) for the band 260-470 MHz, uV/m at 3 meters = $41.6667(F) - 7083.3333$.

Emissions attenuated more than 20 dB below the permissible value are not reported.

Sample Calculation of Limit @ 433.9 MHz:

$$41.6667 (433.9) - 7083.3333 = 10,995.85 \text{ uV/m}$$
$$20\log(10,995.85) = 80.82 \text{ dBuV/m limit @ 433.9 MHz}$$

CALCULATION OF DUTY CYCLE

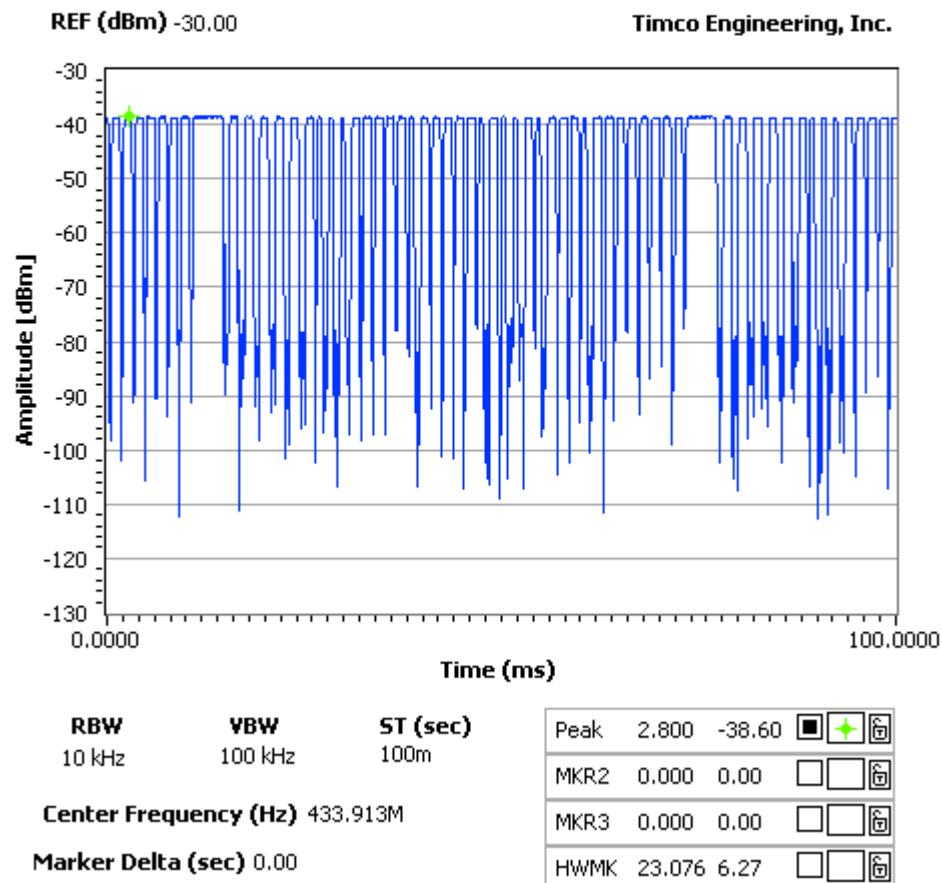
The period of the pulse train is determined by observing it on an oscilloscope or a spectrum analyzer with zero (0) frequency span. A plot is then made of the pulse train with a sweep time of 100 milliseconds. This sweep determines the duration of the pulse train, which in this case is millisecond. This sweep allows the determination of the number of and type of pulses, i.e. long & short. Plots are then made showing the duration of each type of pulse and its duration. From the 100 millisecond Plot, the number of a given type of pulse is then multiplied by the duration of that type pulse. This allows the calculation of the amount of time the UUT is on within 100 ms. If the pulse train is longer than 100 ms then this number is multiplied by 100 to determine the percentage ON TIME. If the pulse train is less than 100 ms the total on time is divided by the length of the pulse train and then multiplied by 100 to determine the percentage ON TIME.

NOT APPLICABLE - DEVICE HAS 100% DUTY CYCLE.

DUTY CYCLE PLOT

NOTES:

AUTOSTART - FCC ID: NAHAS5501
 DUTY CYCLE PLOT - ON TIME 100 %



OCCUPIED BANDWIDTH

Rules Part No.: 15.231(C)

Requirements: The bandwidth of the emission shall be no wider than .25% of the center frequency for devices operating between 70 and 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Method Of Measurement: A small sample of the transmitter output was fed into the spectrum analyzer and the following plot was generated. The vertical scale is set to 10 dB per division.

Test Data: The following plot represents the emissions taken for the device.

OCCUPIED BANDWIDTH PLOT

NOTES:

2285aut6 occupied bandwidth

