# UTC Fire & Security Americas Corporation, Inc.

## TRAC-Lid BT

**FCC 15.247:2012**

**Report #: SUPR0095**

Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

# CERTIFICATE OF TEST

**Last Date of Test: August 31, 2012**
**UTC Fire & Security Americas Corporation, Inc.**
**Model: TRAC-Lid BT**

## Emissions

| Test Description | Specification | Test Method | Pass/Fail |
|---|---|---|---|
| Channel Spacing | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Dwell Time | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Duty Cycle | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Number of Hopping Frequencies | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Occupied Bandwidth | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Output Power | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Band Edge Compliance | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Spurious Conducted Emissions | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Spurious Radiated Emissions | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |

## Deviations From Test Standards

None

**Approved By:**

*Tim O'Shea, Operations Manager*

**NVLAP Lab Code: 200676-0**

***Test Facility***

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
41 Tesla Ave.
Irvine, CA 92618

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834B-1).

***This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.***

***Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.***

NORTHWEST EMC
REV 2012.08.02

# REVISION HISTORY

| Revision Number | Description | Date | Page Number |
|---|---|---|---|
| 00 | None | | |

## Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

## United States

**FCC -** Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

**A2LA -** Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

**NVLAP -** Each laboratory is accredited by NVLAP to ISO 17025. The scope includes radio, ITE, and medical standards from around the world. See: http://www.nwemc.com/accreditations/

## Canada

**IC -** Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

## European Union

**European Commission –** Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

## Australia/New Zealand

**ACMA -** Recognized by ACMA as a CAB for the acceptance of test data.

## Korea

**KCC / RRA -** Recognized by KCC's RRA as a CAB for the acceptance of test data.

## Japan

**VCCI -** Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

## Taiwan

**BSMI –** Recognized by BSMI as a CAB for the acceptance of test data.

**NCC -** Recognized by NCC as a CAB for the acceptance of test data.

## Singapore

**IDA –** Recognized by IDA as a CAB for the acceptance of test data.

## Hong Kong

**OFTA –** Recognized by OFTA as a CAB for the acceptance of test data.

## Vietnam

**MIC –** Recognized by MIC as a CAB for the acceptance of test data.

## Russia

**GOST –** Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards**.**

# MEASUREMENT UNCERTAINTY

## Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

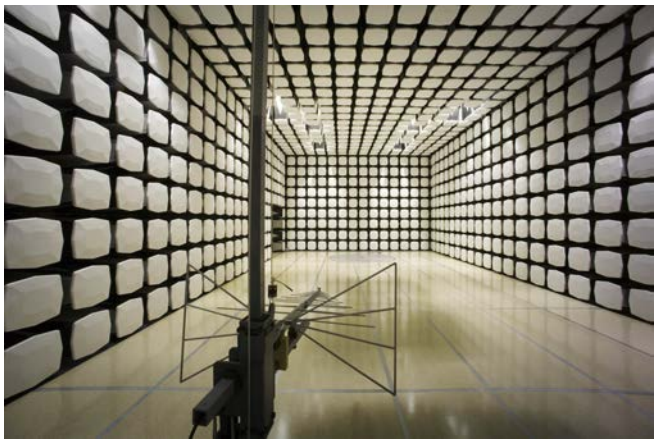
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

| Test | + MU | - MU |
|---|---|---|
| Frequency Accuracy (Hz) | 0.12 | -0.01 |
| Amplitude Accuracy (dB) | 0.49 | -0.49 |
| Conducted Power (dB) | 0.41 | -0.41 |
| Radiated Power via Substitution (dB) | 0.69 | -0.68 |
| Temperature (degrees C) | 0.81 | -0.81 |
| Humidity (% RH) | 2.89 | -2.89 |
| Field Strength (dB) | 4.00 | -4.00 |
| AC Powerline Conducted Emissions (dB) | 2.70 | -2.70 |

# Locations

Revision 8/3/12

| **Oregon**<br>Labs EV01-EV12<br>22975 NW Evergreen Pkwy, #400<br>Hillsboro, OR 97124<br>(503) 844-4066 | **California**<br>Labs OC01-OC13<br>41 Tesla<br>Irvine, CA 92618<br>(949) 861-8918 | **New York**<br>Labs WA01-WA04<br>4939 Jordan Rd.<br>Elbridge, NY 13060<br>(315) 685-0796 | **Minnesota**<br>Labs MN01-MN08<br>9349 W Broadway Ave.<br>Brooklyn Park, MN 55445<br>(763) 425-2281 | **Washington**<br>Labs SU01-SU07<br>14128 339th Ave. SE<br>Sultan, WA 98294<br>(360) 793-8675 |
|---|---|---|---|---|
| **VCCI** | | | | |
| A-0108 | A-0029 | | A-0109 | A-0110 |
| **Industry Canada** | | | | |
| 2834D-1, 2834D-2 | 2834B-1, 2834B-2, 2834B-3 | | 2834E-1 | 2834C-1 |



# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

| | |
|---|---|
| **Company Name:** | UTC Fire & Security Americas Corporation, Inc. |
| **Address:** | 4001 Fairview Industrial Drive SE |
| **City, State, Zip:** | Salem, OR 97302-0167 |
| **Test Requested By:** | Adam Purdue |
| **Model:** | TRAC-Lid BT |
| **First Date of Test:** | August 31, 2012 |
| **Last Date of Test:** | August 31, 2012 |
| **Receipt Date of Samples:** | August 31, 2012 |
| **Equipment Design Stage:** | Production |
| **Equipment Condition:** | No Damage |

## Information Provided by the Party Requesting the Test

| **Functional Description of the EUT (Equipment Under Test):** |
|---|
| Bluetooth radio module with 1 antenna. |

| **Clocks and Oscillators of the EUT:** |
|---|
| None Provided |

| **Testing Objective:** |
|---|
| To demonstrate compliance to FCC 15.247 requirements. |

# CONFIGURATIONS

## Configuration SUPR0095- 1

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| TRAC-Lid Bluetooth | UTC Fire & Security Americas Corporation, Inc. | Tx Low Channel Unit | None |
| TRAC-Lid Bluetooth | UTC Fire & Security Americas Corporation, Inc. | Tx Mid Channel Unit | None |
| TRAC-Lid Bluetooth | UTC Fire & Security Americas Corporation, Inc. | Tx High Channel Unit | None |

## Configuration SUPR0095- 2

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| TRAC-Lid Bluetooth Board | Amped RF Wireless Technology | PCB60031 | None |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Host Laptop | Dell Corporation | Latitude D620 | NR139 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| USB Cable | Yes | 1.0m | No | TRAC-Lid Bluetooth Board | Host Laptop |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

# MODIFICATIONS

WTD 12.5.23

## Equipment Modifications

| Item | Date | Test | Modification | Note | Disposition of EUT |
|---|---|---|---|---|---|
| 1 | 8/31/2012 | Band Edge Compliance | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 2 | 8/31/2012 | Output Power | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 3 | 8/31/2012 | Occupied Bandwidth | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 4 | 8/31/2012 | Spurious Radiated Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 5 | 8/31/2012 | Spurious Conducted Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 6 | 8/31/2012 | Channel Spacing | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 7 | 8/31/2012 | Number of Hopping Frequencies | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 8 | 8/31/2012 | Duty Cycle | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 9 | 8/31/2012 | Dwell Time | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed. |

# Channel Spacing

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |
| 18 GHz DC Block, SMA | Pasternack | PE8210 | AME | 10/6/2011 | 13 |
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |

**TEST DESCRIPTION**

The channel carrier frequencies in the 2400-2483.5MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

# Channel Spacing

| | | | | | |
|---|---|---|---|---|---|
| EUT: | TRAC-Lid BT | | | Work Order: | SUPR0095 |
| Serial Number: | None | | | Date: | 08/31/12 |
| Customer: | UTC Fire & Security Americas Corporation, Inc. | | | Temperature: | 24.84°C |
| Attendees: | None | | | Humidity: | 53% |
| Project: | None | | | Barometric Pres.: | 1014 |
| Tested by: | Jaemi Suh | Power: | Battery | Job Site: | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

DH5 Type Packets with Payload Size of 1021. Section 2.2 TX Test.

**DEVIATIONS FROM TEST STANDARD**

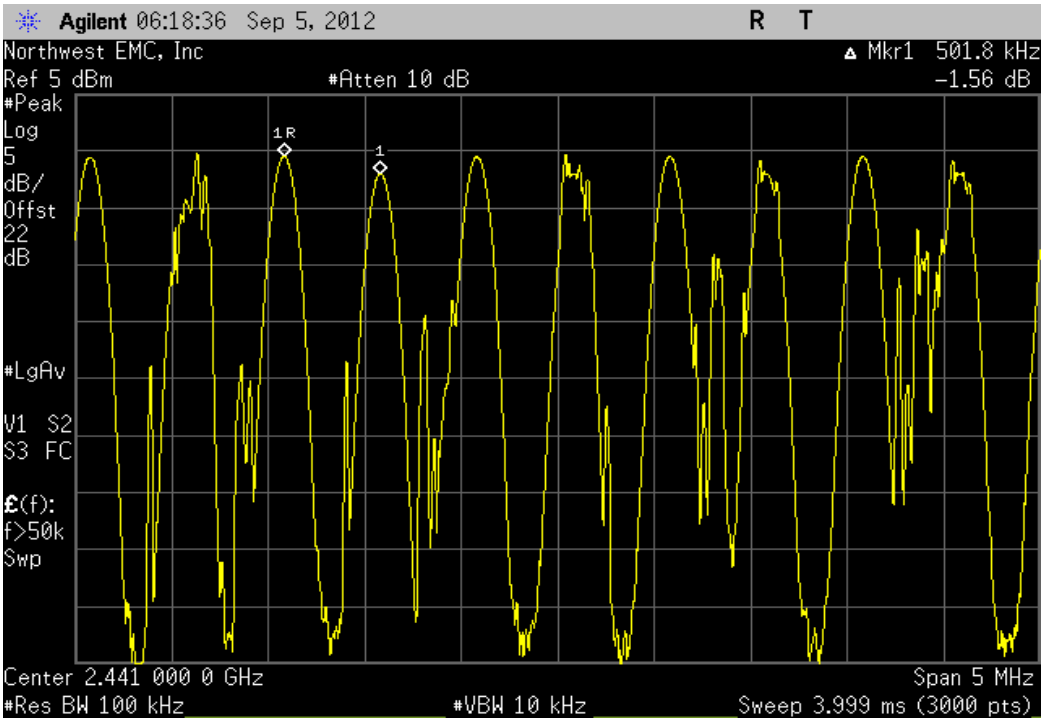
None

| Configuration # | 2 | Signature |
|---|---|---|

| | | Value | Limit | Result |
|---|---|---|---|---|
| GFSK, DH5 | | | | |
| | Mid Channel, 2441 MHz | 0.5 MHz | | N/A |

# Channel Spacing

| GFSK, DH5, Mid Channel, 2441 MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | Value | Limit | Result |
| | | | | | 0.5 MHz | | N/A |



# Dwell Time

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |
| 18 GHz DC Block, SMA | Pasternack | PE8210 | AME | 10/6/2011 | 13 |
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

The dwell time limit is based on the Number of Hopping Channels * 400 mS. For Bluetooth this would be 79 Channels * 400mS = 31.6 Sec.

On Time During 31.6 Sec = Pulse Width * Average Number of Pulses * Scale Factor

Average Number of Pulses is based on 4 samples.

Scale Factor = 31.6 Sec / Screen Capture Sweep Time = 31.6 Sec / 6.32 Sec = 5

# Dwell Time

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | TRAC-Lid BT | | | **Work Order:** | SUPR0095 |
| **Serial Number:** | None | | | **Date:** | 08/31/12 |
| **Customer:** | UTC Fire & Security Americas Corporation, Inc. | | | **Temperature:** | 24.84°C |
| **Attendees:** | None | | | **Humidity:** | 53% |
| **Project:** | None | | | **Barometric Pres.:** | 1014 |
| **Tested by:** | Jaemi Suh | **Power:** | Battery | **Job Site:** | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

DH5 Type Packets with Payload Size of 1021. Section 2.2 TX Test.

**DEVIATIONS FROM TEST STANDARD**

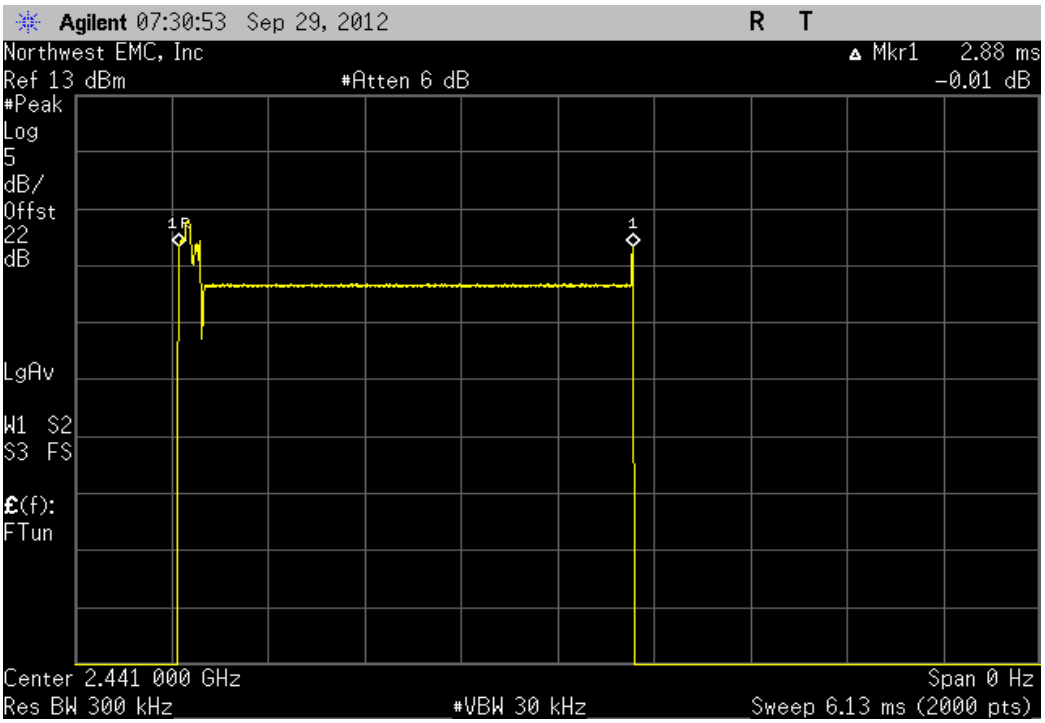
None

| Configuration # | 2 | Signature |
|---|---|---|

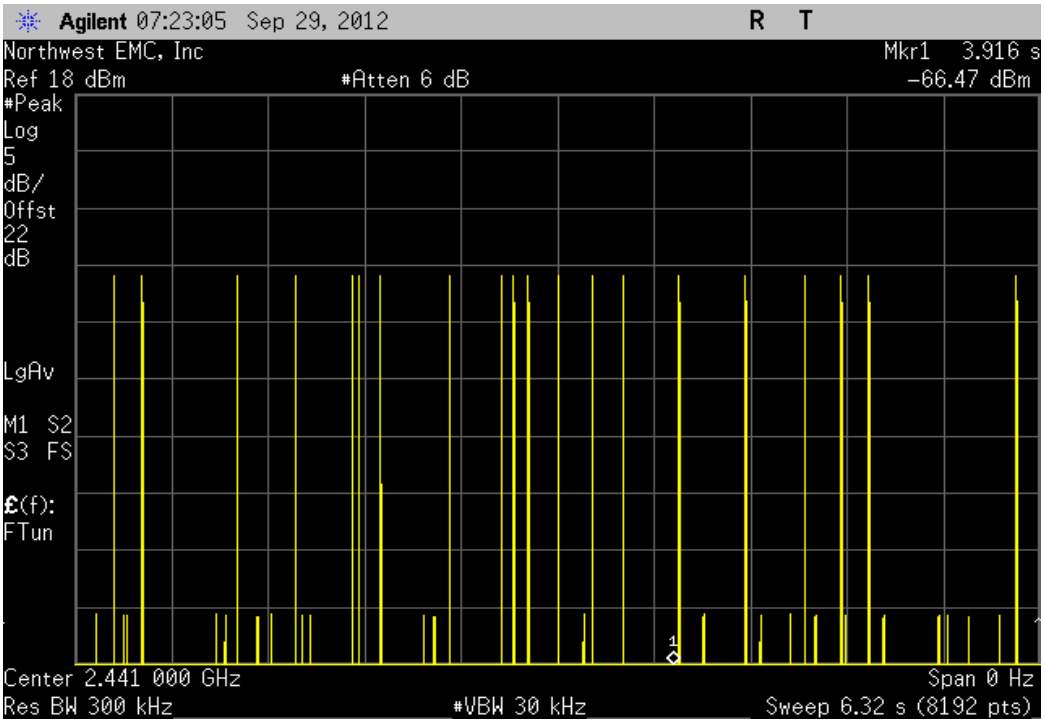
| | Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
|---|---|---|---|---|---|---|---|
| GFSK, DH5 | | | | | | | |
| Mid Channel, 2441 MHz | 2.88 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | 20 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | 17 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | 16 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | 2.88 | N/A | 19 | 5 | 273.6 | 400 | Pass |

# Dwell Time

| GFSK, DH5, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| 2.88 | N/A | N/A | N/A | N/A | N/A | N/A |

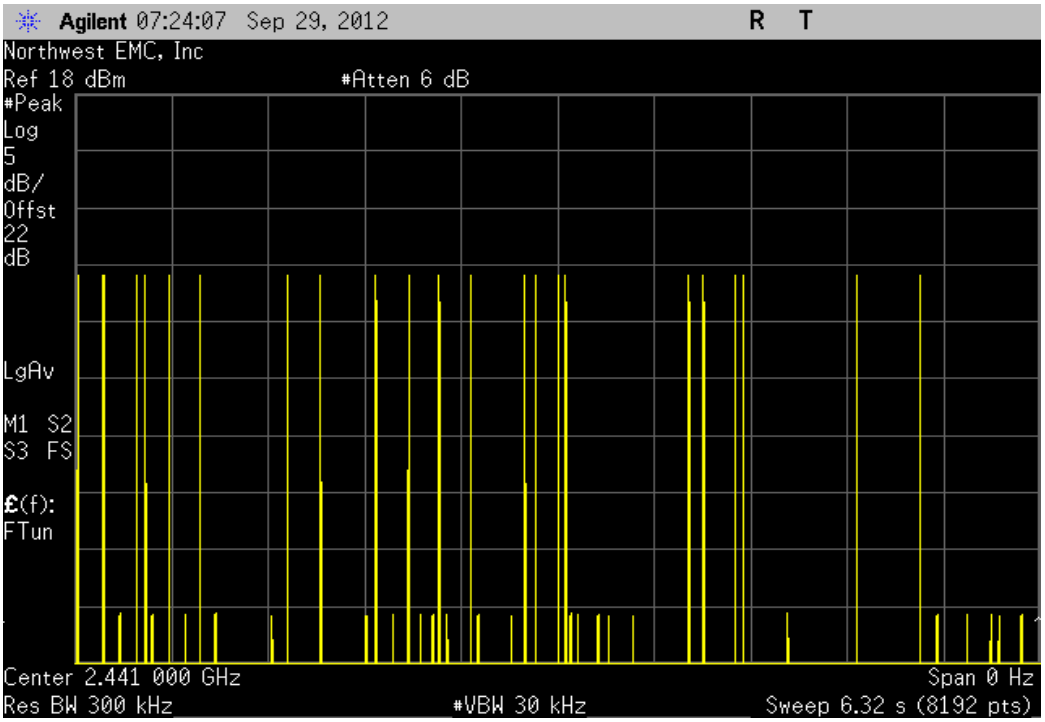



| GFSK, DH5, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| N/A | 20 | N/A | N/A | N/A | N/A | N/A |

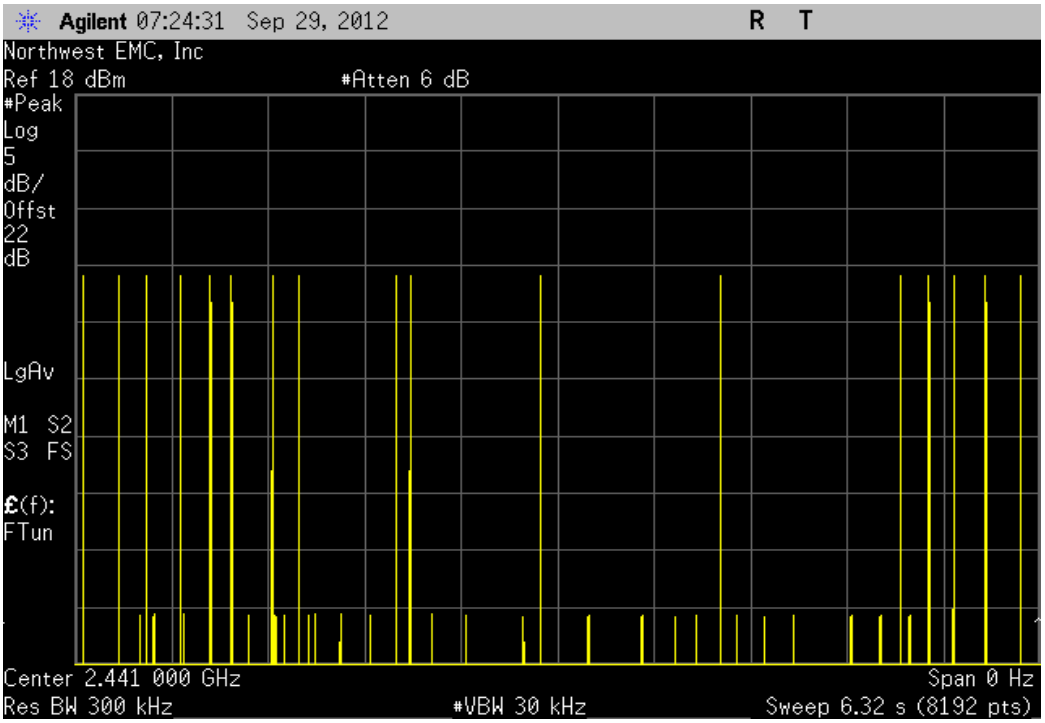


# Dwell Time

| GFSK, DH5, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |

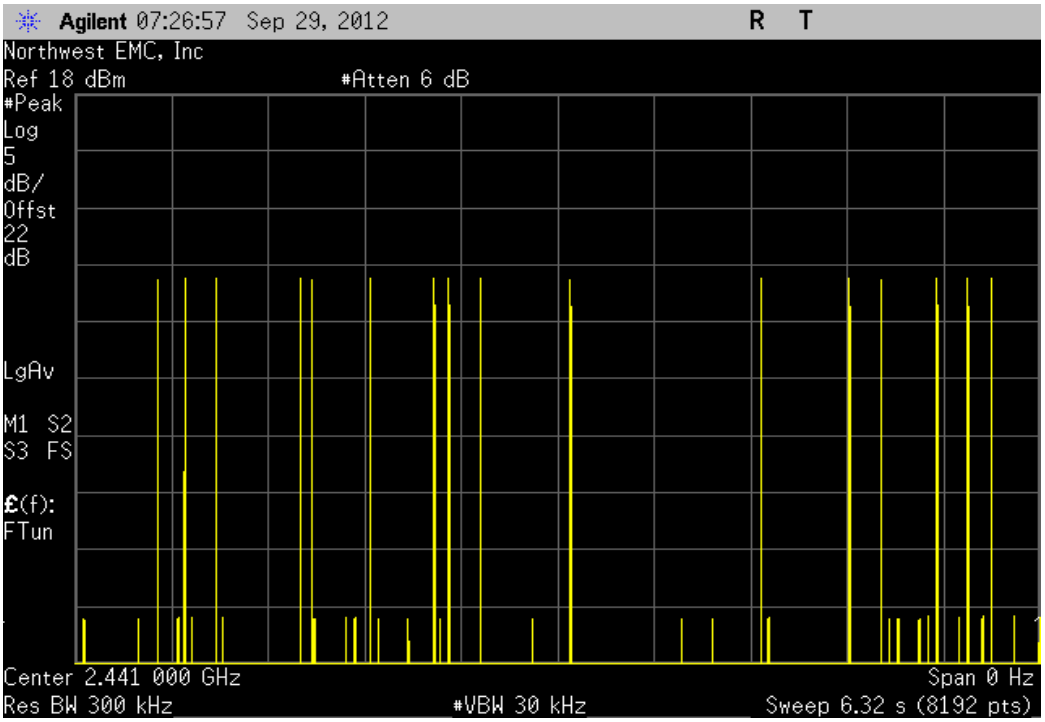



| GFSK, DH5, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| N/A | 17 | N/A | N/A | N/A | N/A | N/A |



# Dwell Time

| GFSK, DH5, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| N/A | 16 | N/A | N/A | N/A | N/A | N/A |




| GFSK, DH5, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| 2.696 | N/A | 19 | 5 | 23.0025 | 400 | Pass |

**Calculation Only**

**No Screen Capture Required**

# Duty Cycle

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |
| 18 GHz DC Block, SMA | Pasternack | PE8210 | AME | 10/6/2011 | 13 |
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report to only measure during the burst duration.

# Duty Cycle

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | TRAC-Lid BT | | | **Work Order:** | SUPR0095 |
| **Serial Number:** | None | | | **Date:** | 08/31/12 |
| **Customer:** | UTC Fire & Security Americas Corporation, Inc. | | | **Temperature:** | 24.84°C |
| **Attendees:** | None | | | **Humidity:** | 53% |
| **Project:** | None | | | **Barometric Pres.:** | 1014 |
| **Tested by:** | Jaemi Suh | **Power:** | Battery | **Job Site:** | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

DH5 Type Packets with Payload Size of 1021. Section 2.2 TX Test.

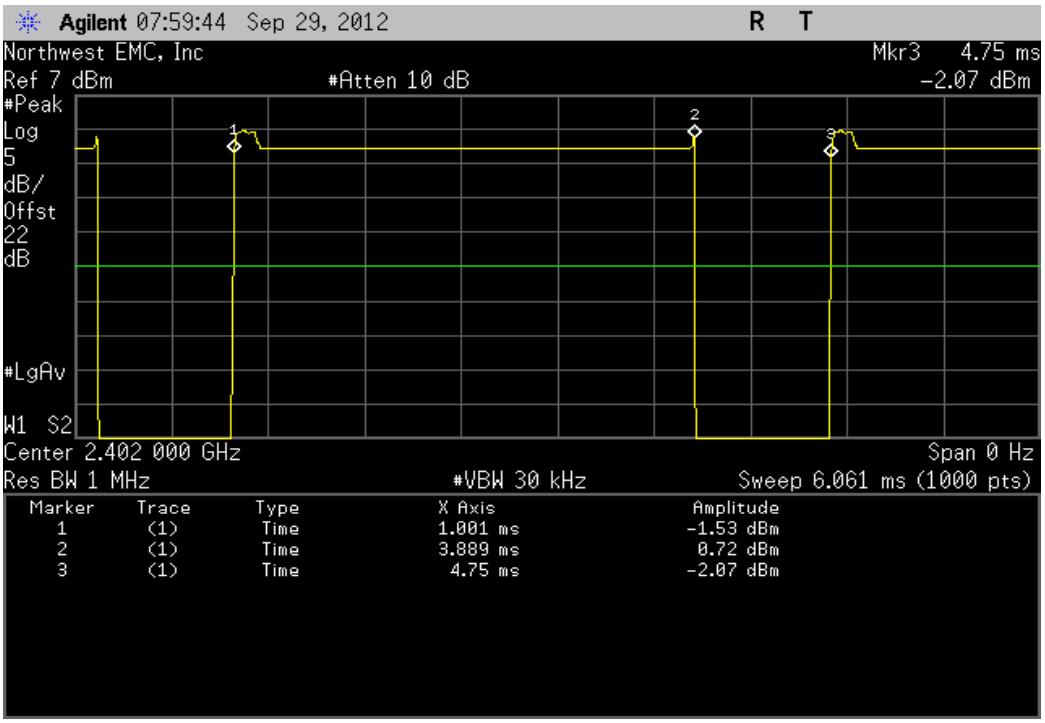
**DEVIATIONS FROM TEST STANDARD**

| Configuration # | 2 | Signature |
|---|---|---|

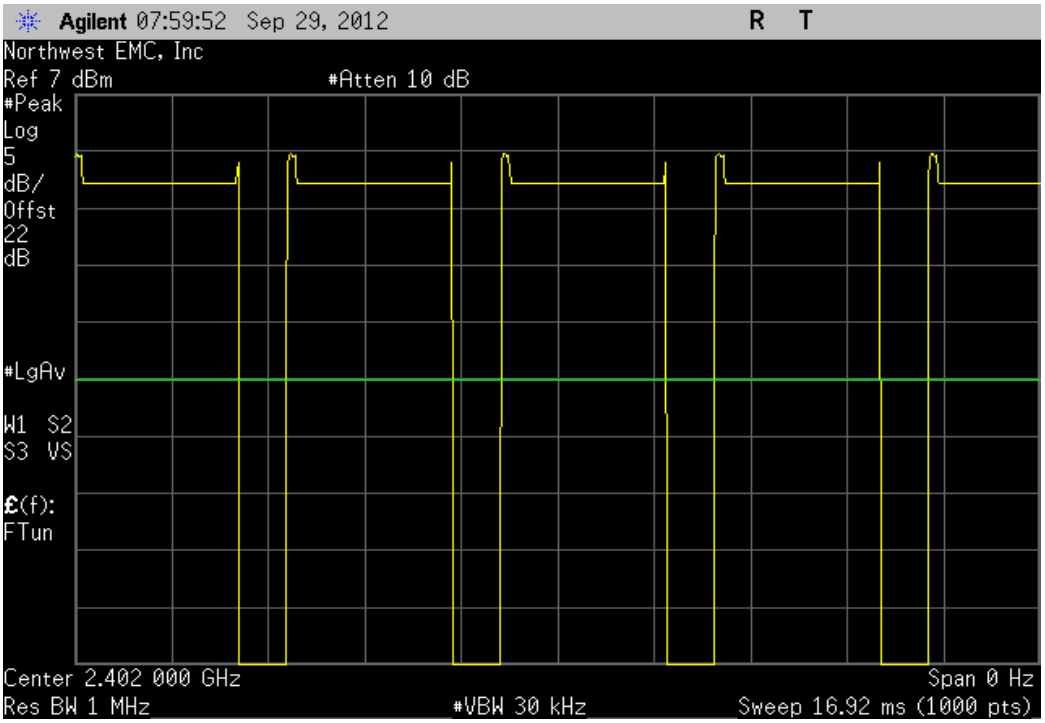
| Channel | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| Low | 2.888 mS | 3.749 mS | 1 | 77 | N/A | N/A |
| Low | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid | 2.888 mS | 3.749 mS | 1 | 77 | N/A | N/A |
| Mid | N/A | N/A | 5 | N/A | N/A | N/A |
| High | 2.894 mS | 3.749 mS | 1 | 77.2 | N/A | N/A |
| High | N/A | N/A | 5 | N/A | N/A | N/A |

# Duty Cycle

| Low | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | 2.888 mS | 3.749 mS | 1 | 77 | N/A | N/A |

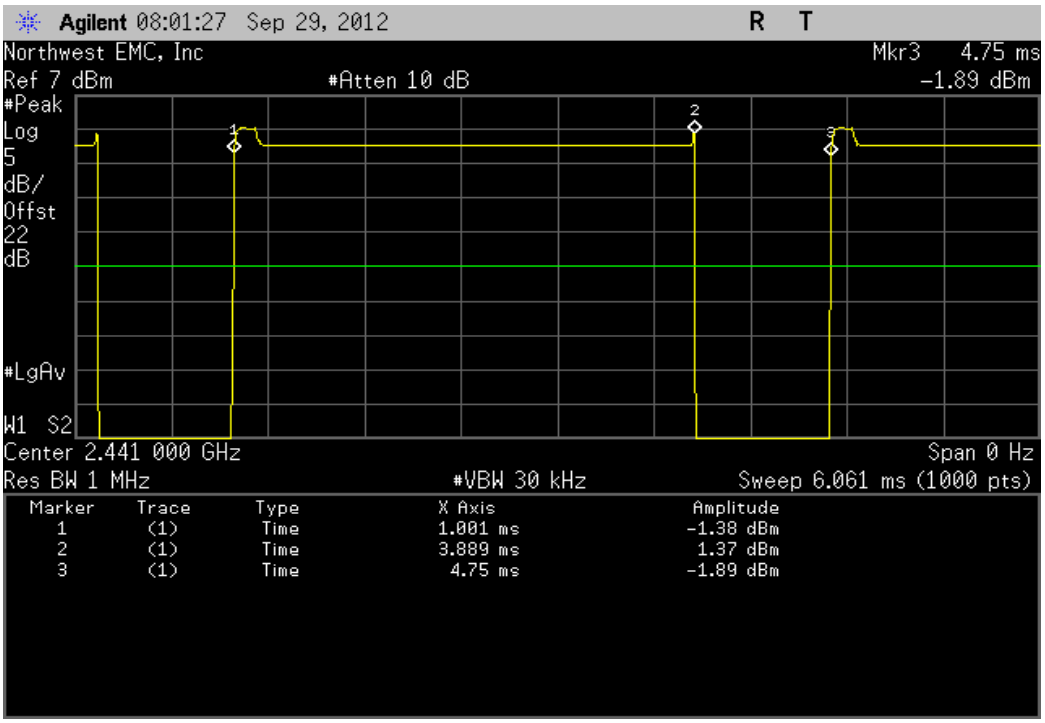



| Low | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | N/A | N/A | 5 | N/A | N/A | N/A |

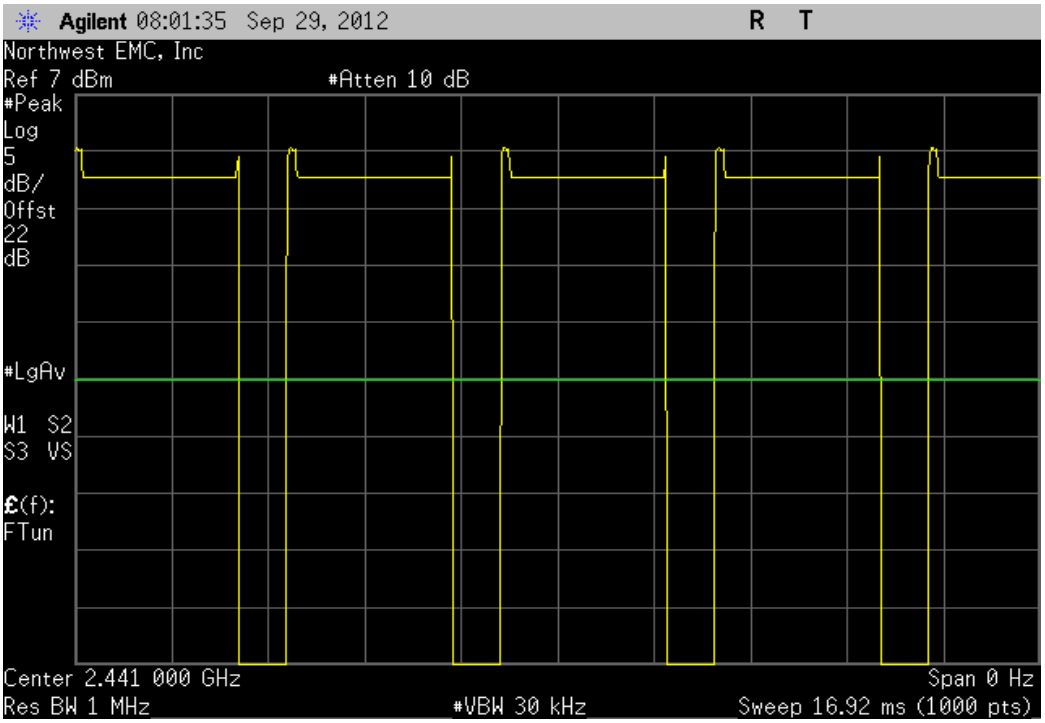


# Duty Cycle

| Mid | | | | | |
|---|---|---|---|---|---|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| 2.888 mS | 3.749 mS | 1 | 77 | N/A | N/A |

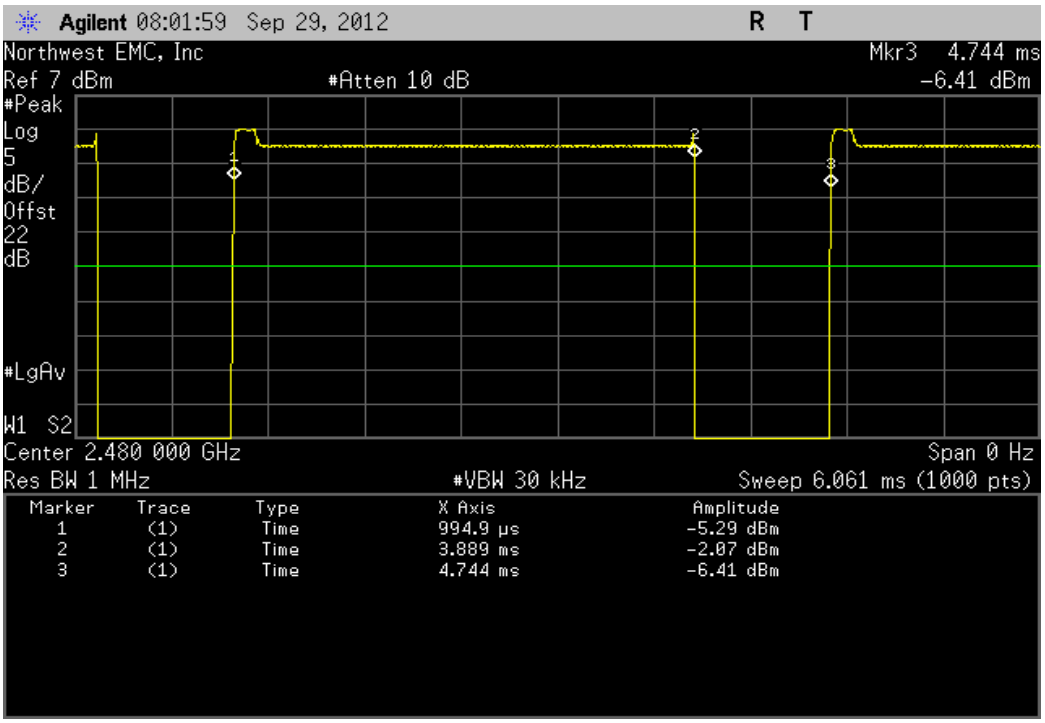



| Mid | | | | | |
|---|---|---|---|---|---|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| N/A | N/A | 5 | N/A | N/A | N/A |

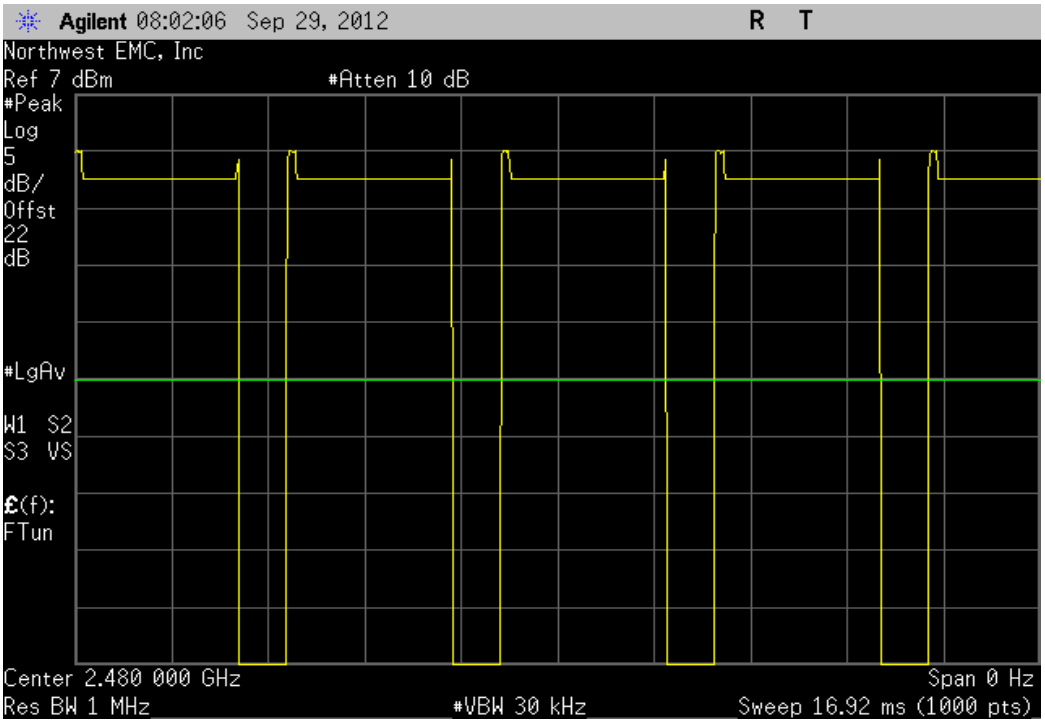


# Duty Cycle

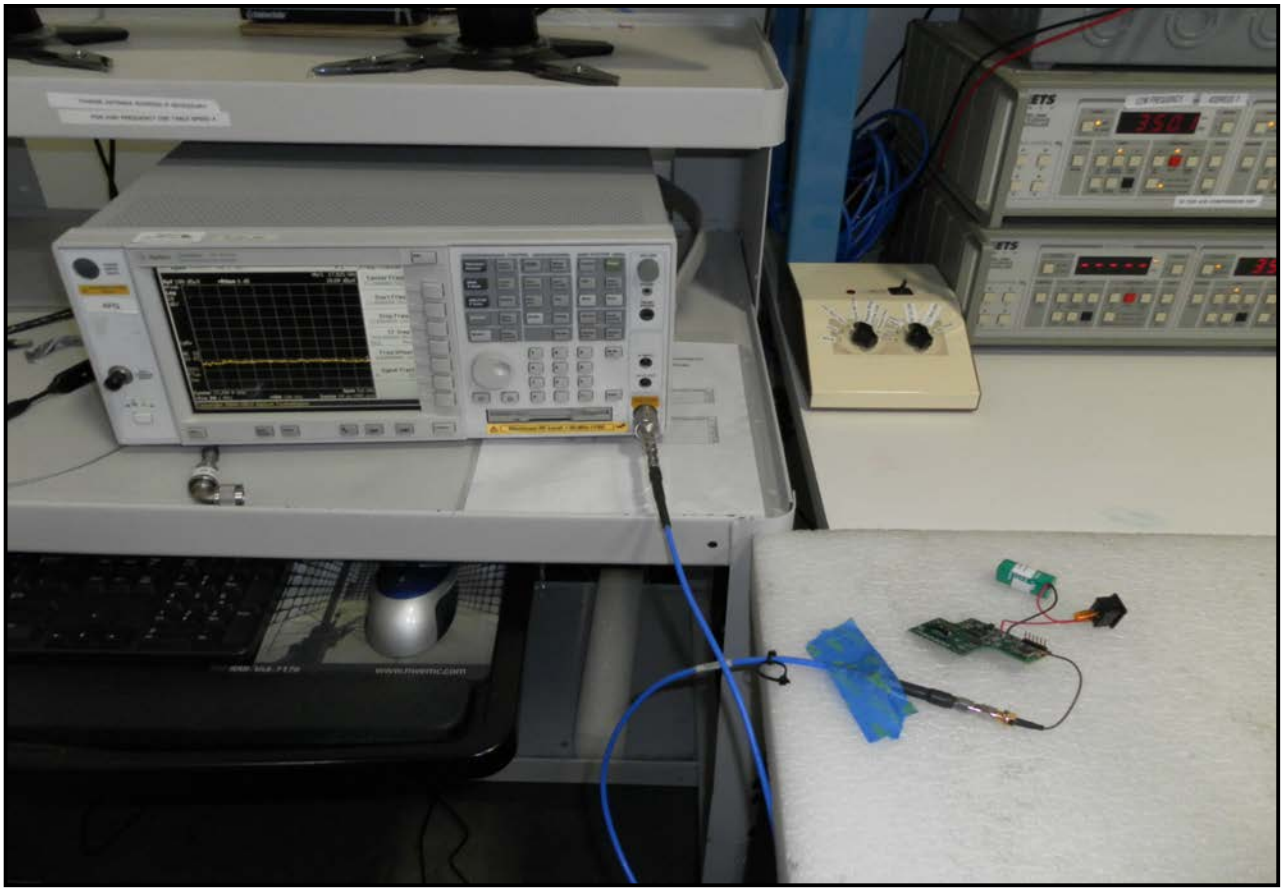
| High | | | | | |
|---|---|---|---|---|---|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| 2.894 mS | 3.749 mS | 1 | 77.2 | N/A | N/A |

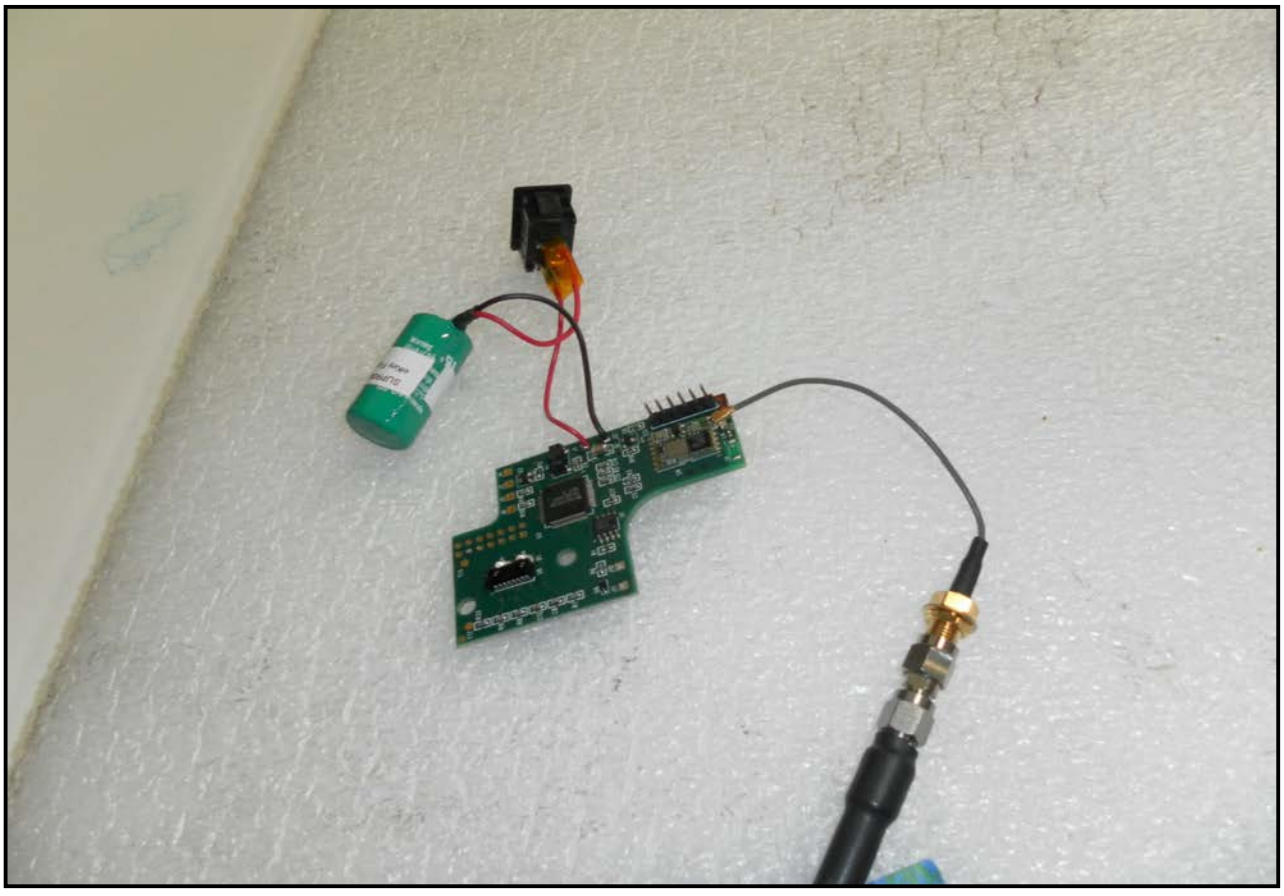



| High | | | | | |
|---|---|---|---|---|---|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle





# Number of Hopping Frequencies

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |
| 18 GHz DC Block, SMA | Pasternack | PE8210 | AME | 10/6/2011 | 13 |
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |

**TEST DESCRIPTION**

The number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

# Number of Hopping Frequencies

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | TRAC-Lid BT | | | **Work Order:** | SUPR0095 |
| **Serial Number:** | None | | | **Date:** | 08/31/12 |
| **Customer:** | UTC Fire & Security Americas Corporation, Inc. | | | **Temperature:** | 24.84°C |
| **Attendees:** | None | | | **Humidity:** | 53% |
| **Project:** | None | | | **Barometric Pres.:** | 1014 |
| **Tested by:** | Jaemi Suh | **Power:** | Battery | **Job Site:** | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

DH5 Type Packets with Payload Size of 1021. Section 2.2 TX Test.

**DEVIATIONS FROM TEST STANDARD**

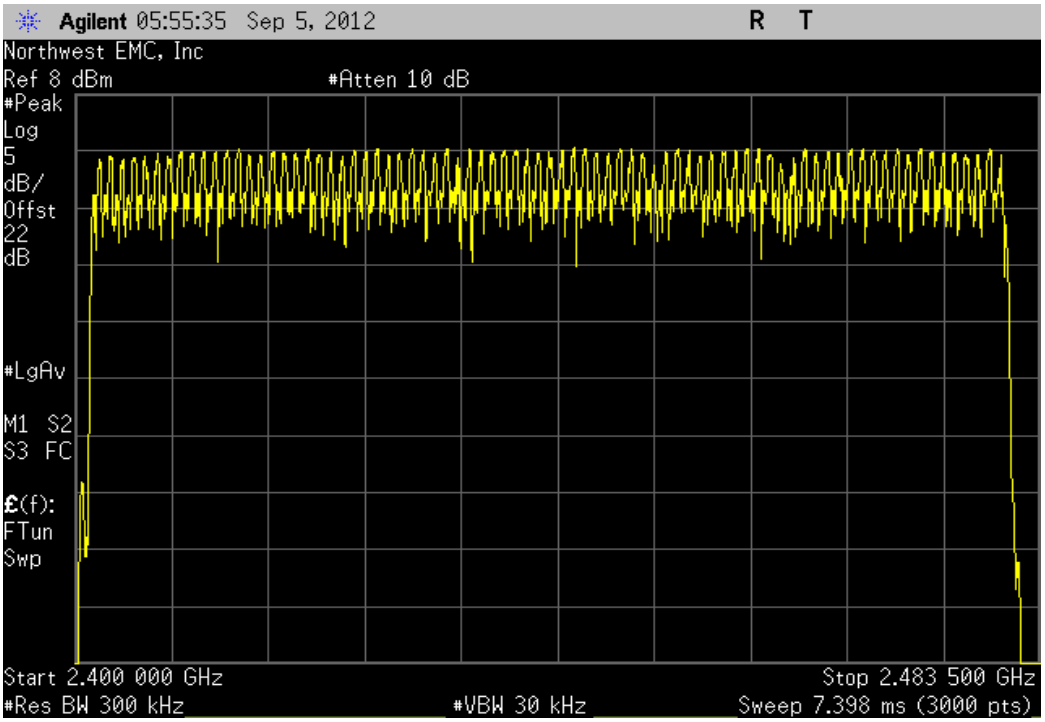
None

| Configuration # | 2 | Signature |
|---|---|---|

| | Number of Channels | Limit | Result |
|---|---|---|---|
| GFSK, DH5 | | | |
| Mid Channel, 2441 MHz | 79 | ≥15 | N/A |

# Number of Hopping Frequencies

| GFSK, DH5, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Number of Channels | Limit | Result |
| | | | | 79 | ≥15 | N/A |



# Occupied Bandwidth

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| 18 GHz DC Block, SMA | Pasternack | PE8210 | AME | 10/6/2011 | 13 |
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

The 20dB occupied bandwidth was measured. The 26 dB (99.9%) emission bandwidth (EBW) was also measured at the same time.

The EUT was set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

# Occupied Bandwidth

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | TRAC-Lid BT | | | **Work Order:** | SUPR0095 |
| **Serial Number:** | None | | | **Date:** | 08/31/12 |
| **Customer:** | Supra, A Division of UTCFS | | | **Temperature:** | 24.84°C |
| **Attendees:** | None | | | **Humidity:** | 53% |
| **Project:** | None | | | **Barometric Pres.:** | 1014 |
| **Tested by:** | Jaemi Suh | **Power:** | Battery | **Job Site:** | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

DH5 Type Packets with Payload Size of 1021. Section 2.2 TX Test.

**DEVIATIONS FROM TEST STANDARD**

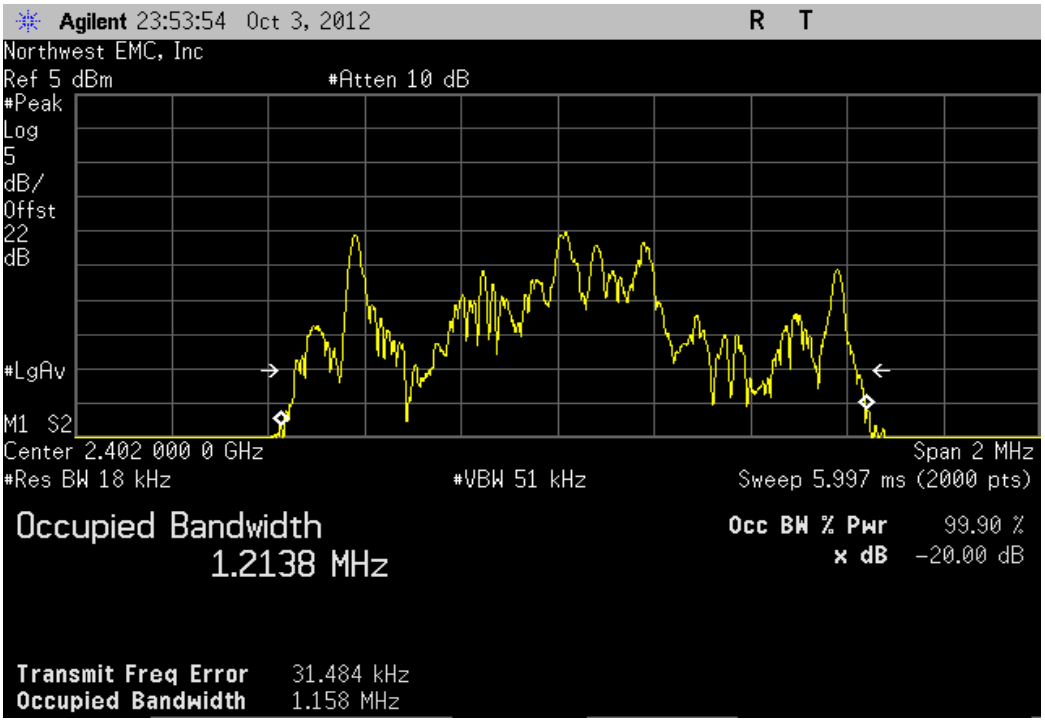
None

| Configuration # | 2 | Signature |
|---|---|---|

| | | Value | Limit | Result |
|---|---|---|---|---|
| DH5, GFSK | | | | |
| | Low Channel | 1.158 MHz | < 1.5 MHz | Pass |
| | Mid Channel | 1.154 MHz | < 1.5 MHz | Pass |
| | High Channel | 1.148 MHz | < 1.5 MHz | Pass |

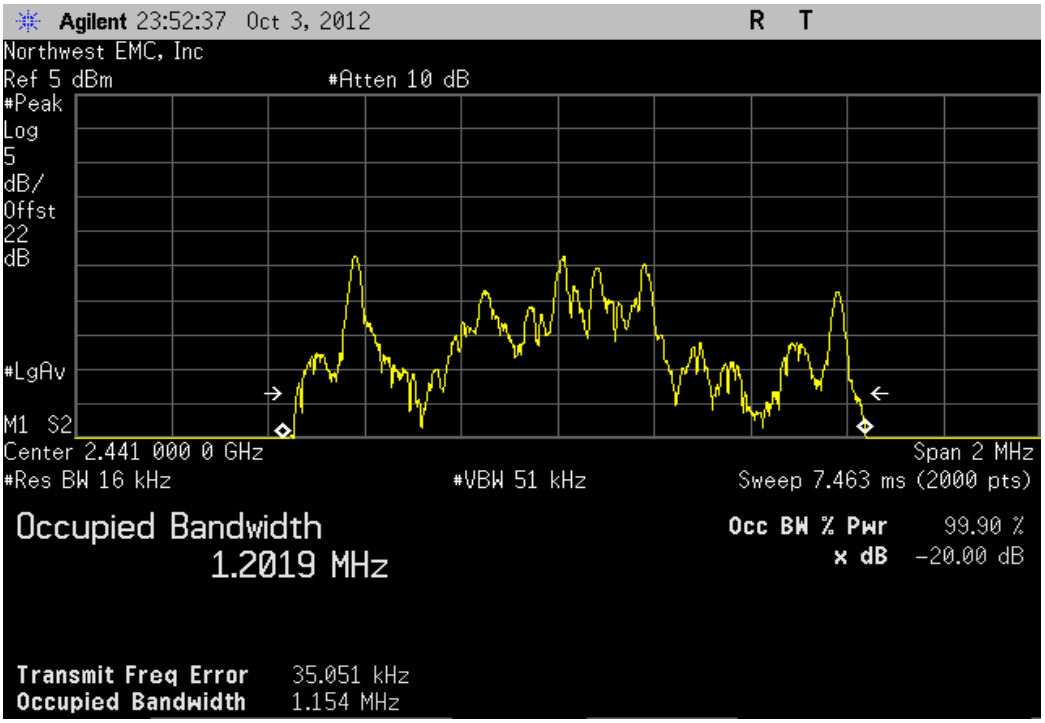
Low Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.158 MHz | < 1.5 MHz | Pass |

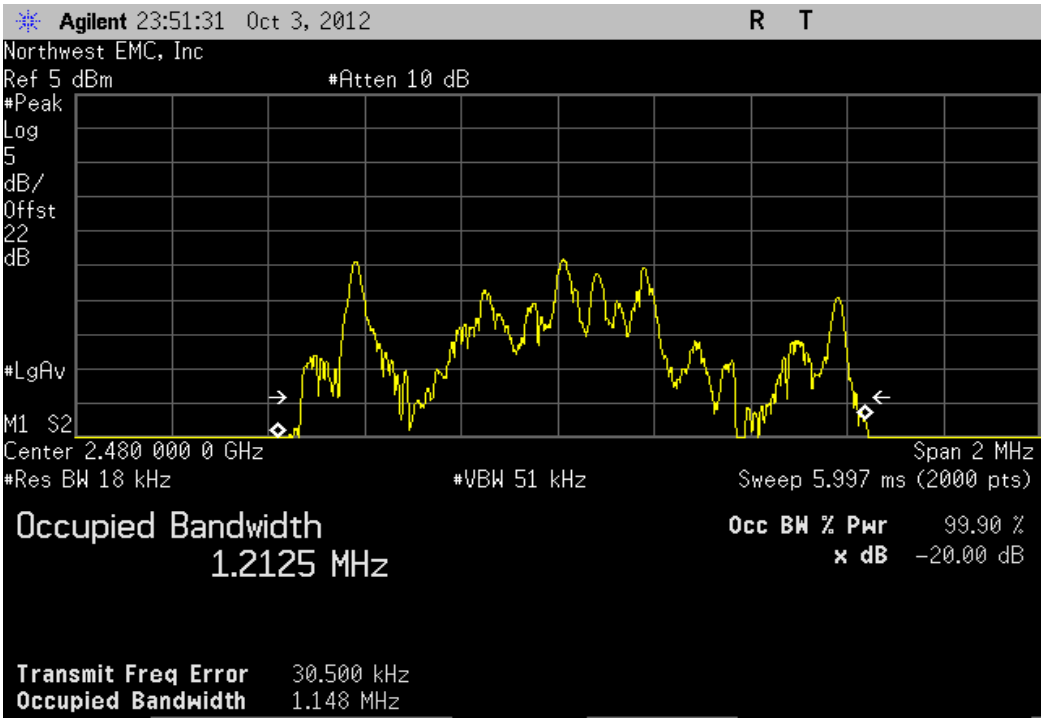



Mid Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.154 MHz | < 1.5 MHz | Pass |



| High Channel | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit | Result |
| | | | | 1.148 MHz | < 1.5 MHz | Pass |



# Output Power

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |
| 40 GHz DC block | Fairview Microwave | SD3379 | AMI | 10/12/2011 | 12 |
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |

**TEST DESCRIPTION**

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

**De Facto EIRP Limit:** Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +27dBm.

# Output Power

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | TRAC-Lid BT | | | **Work Order:** | SUPR0095 |
| **Serial Number:** | None | | | **Date:** | 08/31/12 |
| **Customer:** | UTC Fire & Security Americas Corporation, Inc. | | | **Temperature:** | 24.84°C |
| **Attendees:** | None | | | **Humidity:** | 53% |
| **Project:** | None | | | **Barometric Pres.:** | 1014 |
| **Tested by:** | Jaemi Suh | **Power:** | Battery | **Job Site:** | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

Basic Data Rate 1 Mbps.

**DEVIATIONS FROM TEST STANDARD**

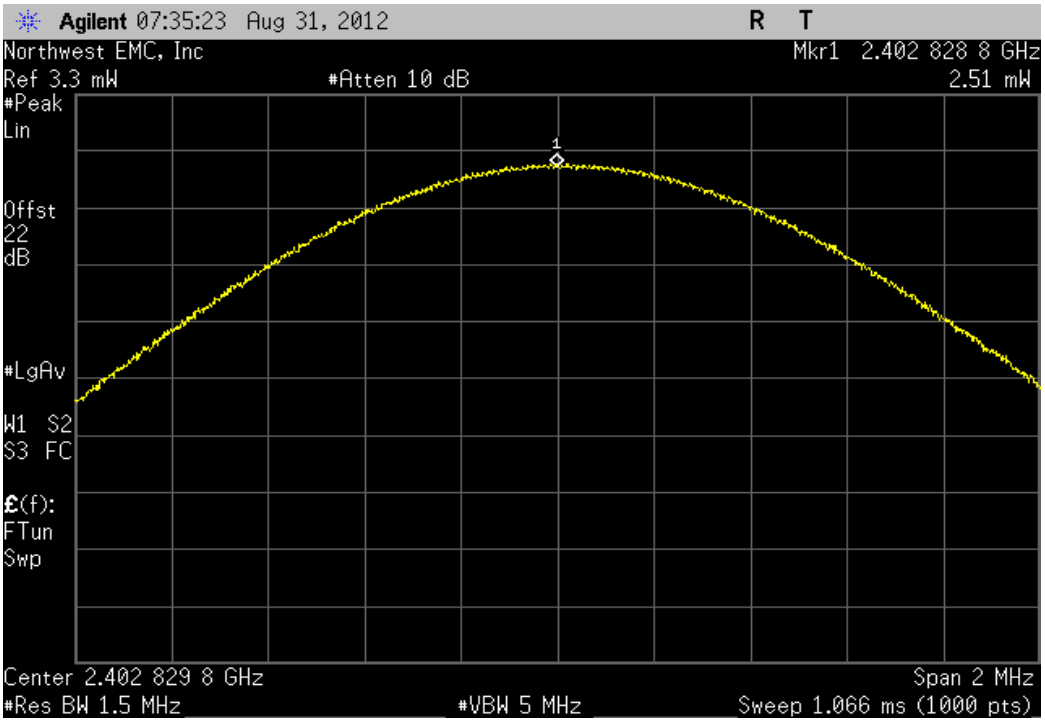
None

| Configuration # | 2 | Signature |
|---|---|---|

| | Value | Limit | Result |
|---|---|---|---|
| DH5, GFSK | | | |
| Low Channel | 2.513 mW | < 125 mW | Pass |
| Mid Channel | 2.919 mW | < 125 mW | Pass |
| High Channel | 2.854 mW | < 125 mW | Pass |

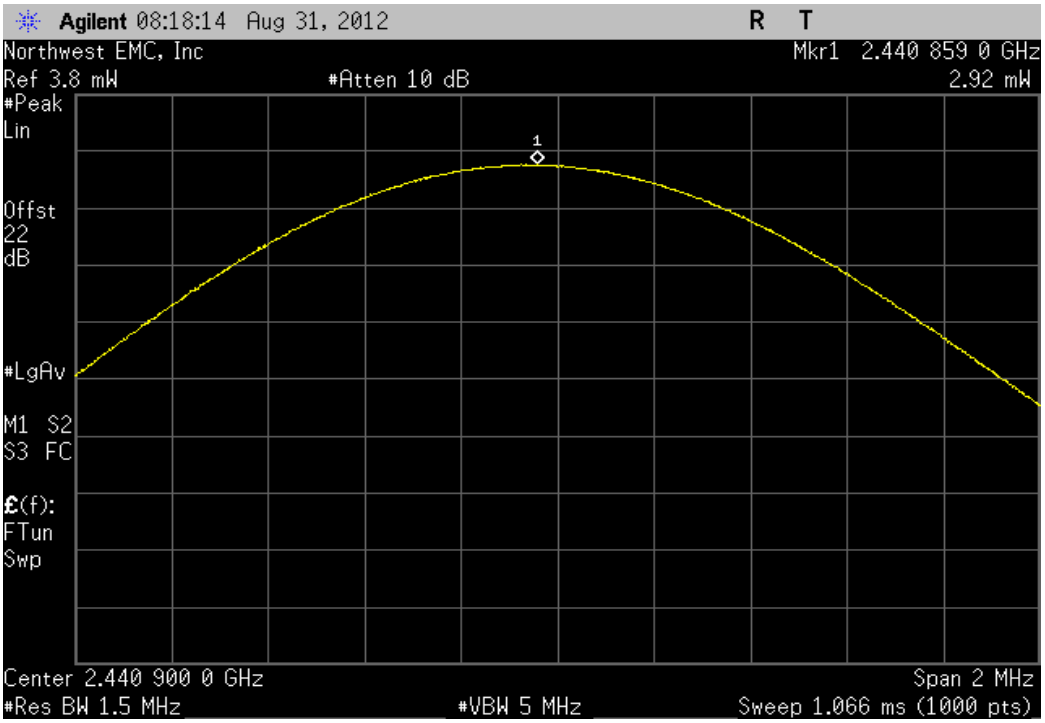
DH5, GFSK, Low Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.513 mW | < 125 mW | Pass |



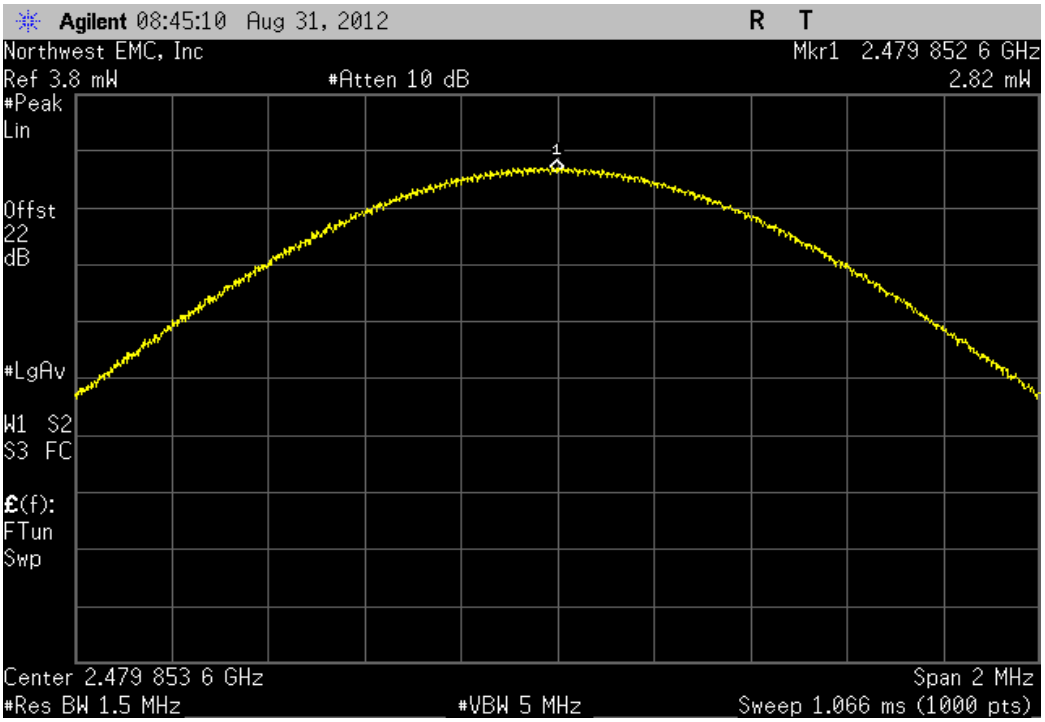

DH5, GFSK, Mid Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.919 mW | < 125 mW | Pass |



# Output Power

| DH5, GFSK, High Channel | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit | Result |
| | | | | 2.854 mW | < 125 mW | Pass |



# Band Edge Compliance - Hopping Mode

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |
| 18 GHz DC Block, SMA | Pasternack | PE8210 | AME | 10/6/2011 | 13 |
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudo-random hopping sequence. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

# Band Edge Compliance - Hopping Mode

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | TRAC-Lid BT | | | **Work Order:** | SUPR0095 |
| **Serial Number:** | None | | | **Date:** | 08/31/12 |
| **Customer:** | UTC Fire & Security Americas Corporation, Inc. | | | **Temperature:** | 24.84°C |
| **Attendees:** | None | | | **Humidity:** | 53% |
| **Project:** | None | | | **Barometric Pres.:** | 1014 |
| **Tested by:** | Jaemi Suh | **Power:** | Battery | **Job Site:** | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

DH5 Type Packets with Payload Size of 1021. Section 2.2 TX Test.

**DEVIATIONS FROM TEST STANDARD**

None

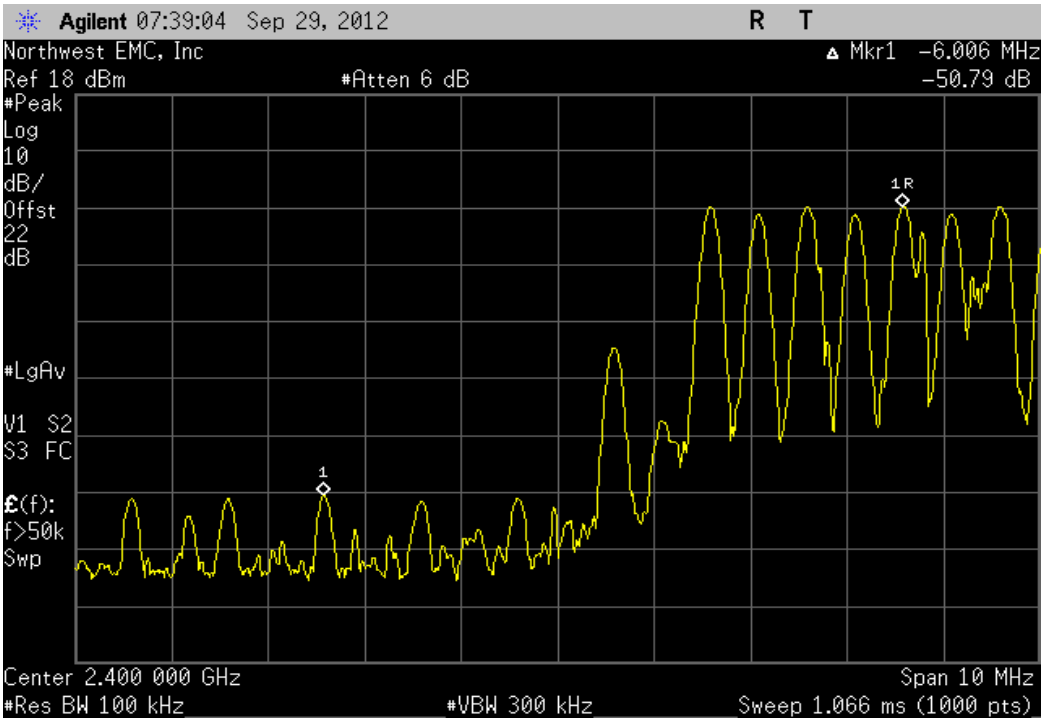
| Configuration # | 2 | Signature |
|---|---|---|

| | | Value | Limit | Result |
|---|---|---|---|---|
| GFSK, DH5 | | | | |
| | Low Channel, 2402 MHz | -50.79 dBc | -20 dBc | Pass |
| | High Channel, 2480 MHz | -53.02 dBc | -20 dBc | Pass |

# Band Edge Compliance - Hopping Mode

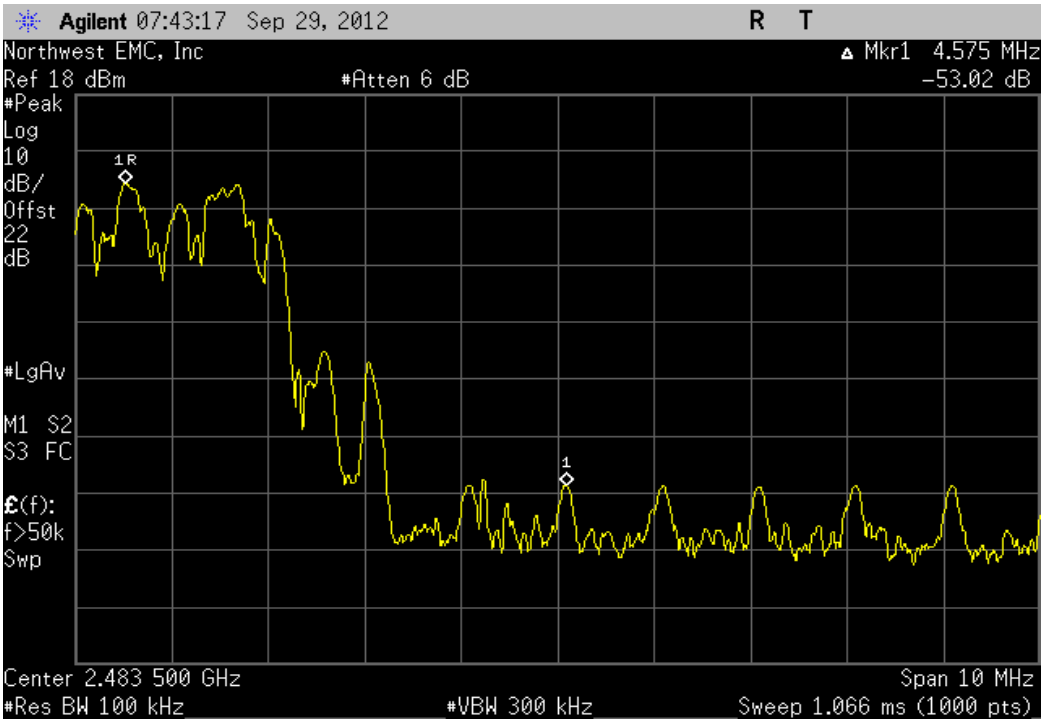
GFSK, DH5, Low Channel, 2402 MHz

| Value | Limit | Result |
|---|---|---|
| -50.79 dBc | -20 dBc | Pass |




GFSK, DH5, High Channel, 2480 MHz

| Value | Limit | Result |
|---|---|---|
| -53.02 dBc | -20 dBc | Pass |



# Band Edge Compliance

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |
| 18 GHz DC Block, SMA | Pasternack | PE8210 | AME | 10/6/2011 | 13 |
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |

**TEST DESCRIPTION**

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet in a no hop mode. The channels closest to the band edges were selected.

The spectrum was scanned below the lower band edge and above the higher band edge.

# Band Edge Compliance

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | TRAC-Lid BT | | | **Work Order:** | SUPR0095 |
| **Serial Number:** | None | | | **Date:** | 08/31/12 |
| **Customer:** | UTC Fire & Security Americas Corporation, Inc. | | | **Temperature:** | 24.84°C |
| **Attendees:** | None | | | **Humidity:** | 53% |
| **Project:** | None | | | **Barometric Pres.:** | 1014 |
| **Tested by:** | Jaemi Suh | **Power:** | Battery | **Job Site:** | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

Basic Data Rate 1 Mbps.

**DEVIATIONS FROM TEST STANDARD**

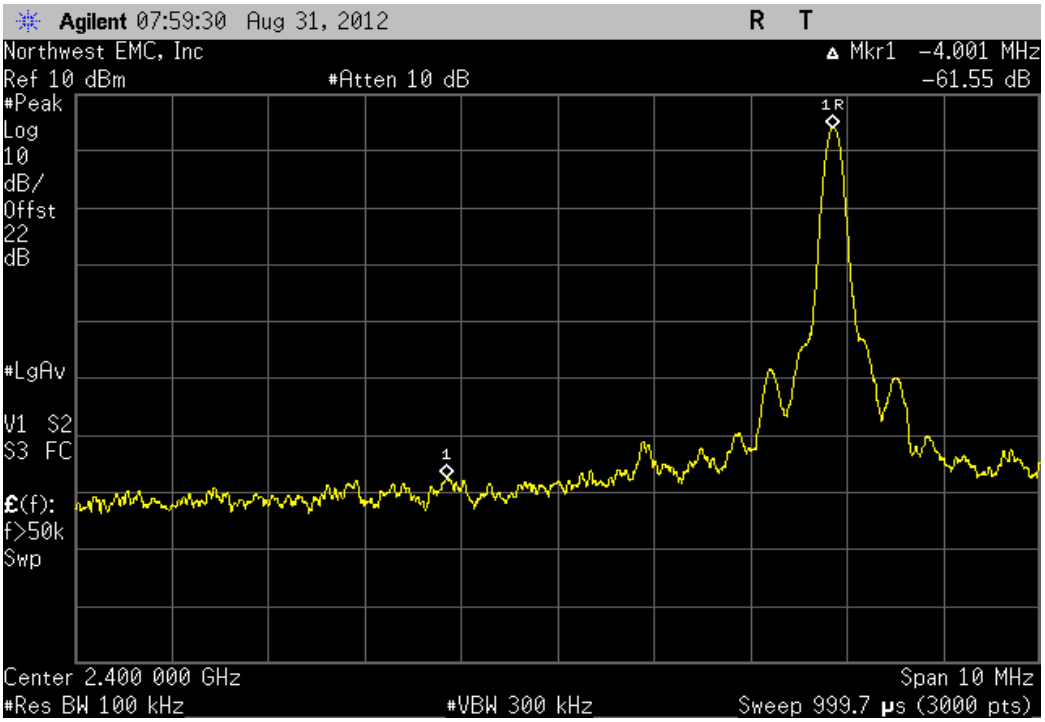
None

| Configuration # | 2 | Signature |
|---|---|---|

| | | Value | Limit | Result |
|---|---|---|---|---|
| DH5, GFSK | | | | |
| | Low Channel | -61.55 dBc | ≤ -20 dBc | Pass |
| | High Channel | -60.48 dBc | ≤ -20 dBc | Pass |

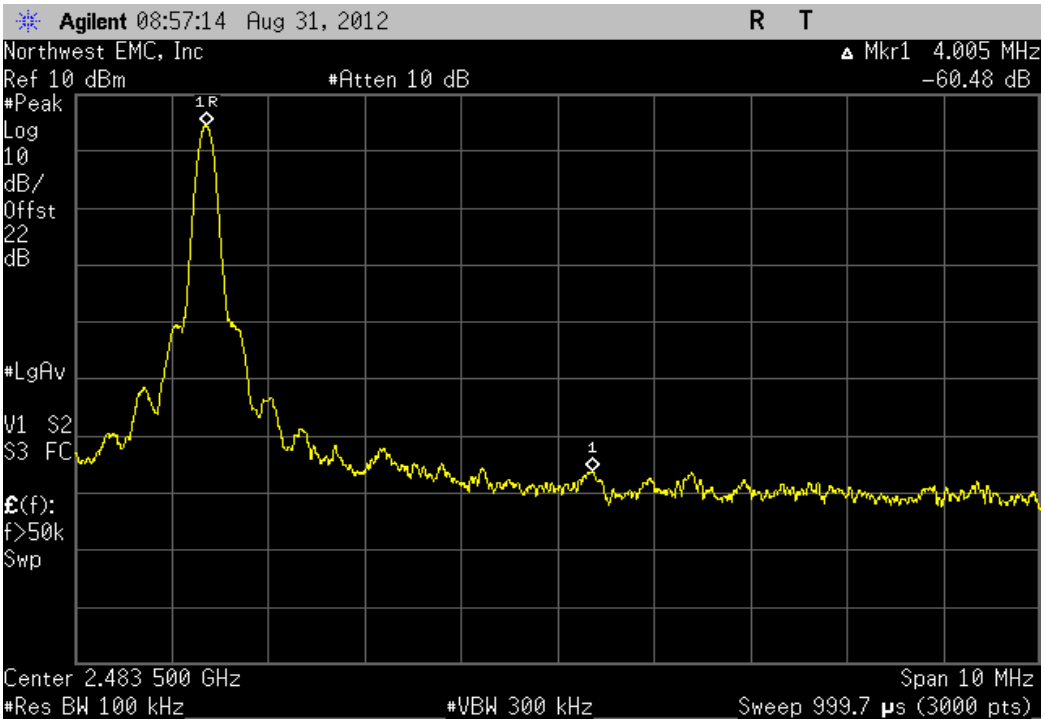
Basic Rate 1 Mbps, Low Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -61.55 dBc | ≤ -20 dBc | Pass |




Basic Rate 1 Mbps,, High Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -60.48 dBc | ≤ -20 dBc | Pass |



# Spurious Conducted Emissions

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| 18 GHz DC Block, SMA | Pasternack | PE8210 | AME | 10/6/2011 | 13 |
| Attenuator SMA - 20dB, 40 GHz | Fairview Microwave | SA4014-20 | AQI | 10/12/2011 | 12 |
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 |

**TEST DESCRIPTION**

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

# Spurious Conducted Emissions

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | TRAC-Lid BT | | | **Work Order:** | SUPR0095 |
| **Serial Number:** | None | | | **Date:** | 08/31/12 |
| **Customer:** | UTC Fire & Security Americas Corporation, Inc. | | | **Temperature:** | 24.84°C |
| **Attendees:** | None | | | **Humidity:** | 53% |
| **Project:** | None | | | **Barometric Pres.:** | 1014 |
| **Tested by:** | Jaemi Suh | **Power:** | Battery | **Job Site:** | OC10 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |
| | |

**COMMENTS**

Basic Data Rate 1 Mbps.

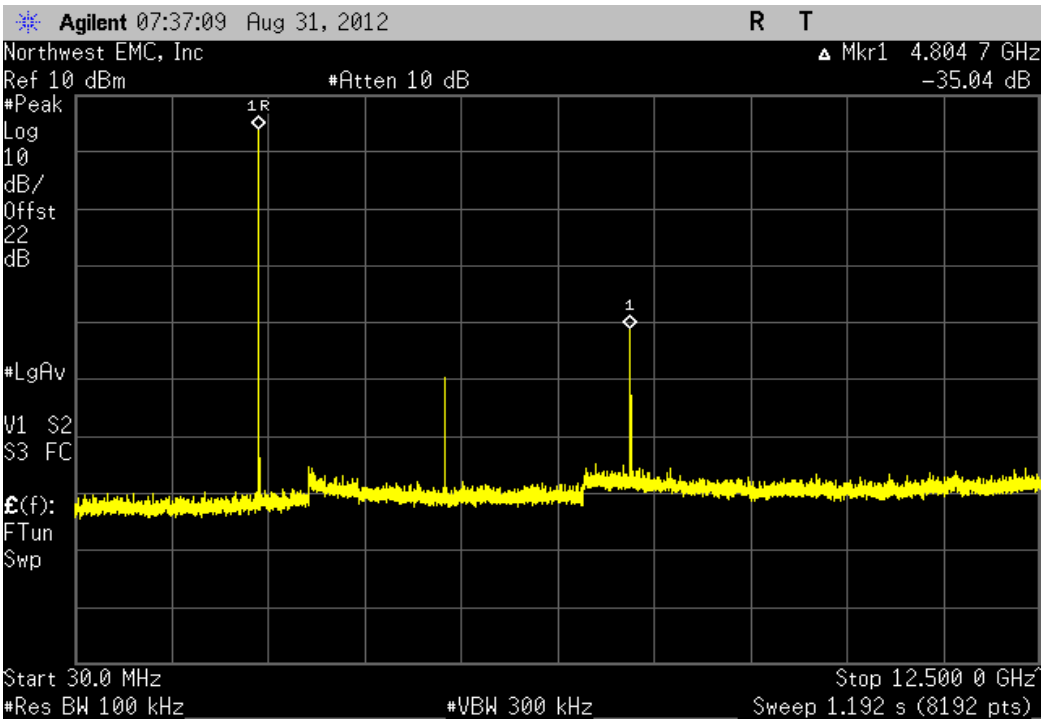
**DEVIATIONS FROM TEST STANDARD**

None

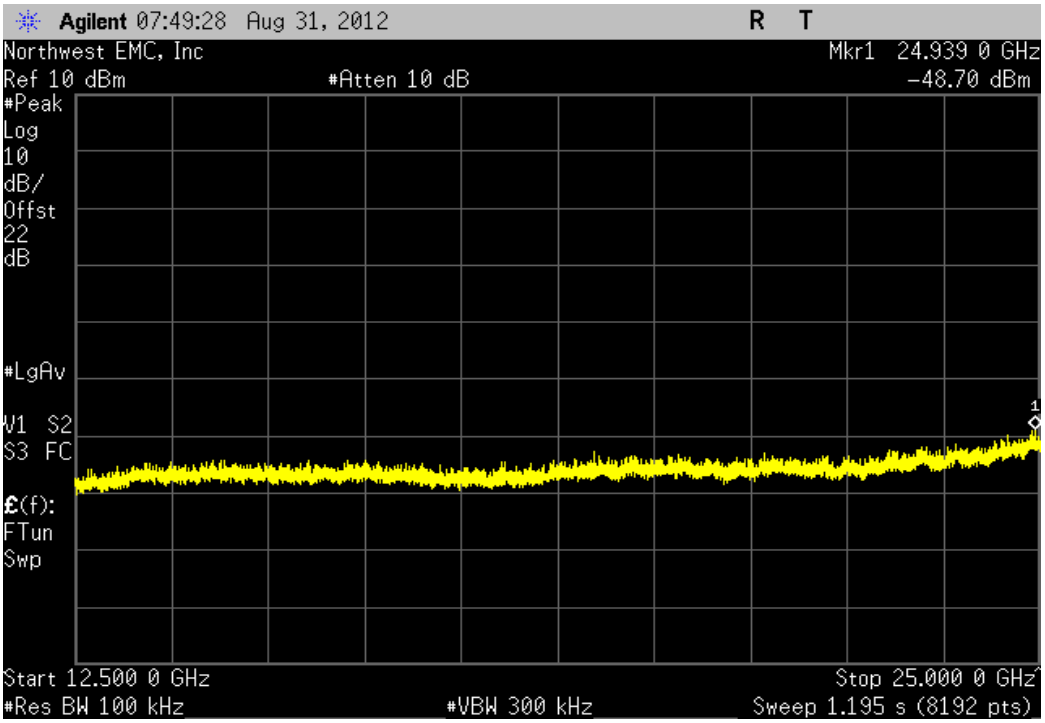
| Configuration # | 2 | Signature |
|---|---|---|

| | | Frequency Range | Value | Limit | Result |
|---|---|---|---|---|---|
| DH5, GFSK | | | | | |
| | Low Channel | 30 MHz - 12.5 GHz | -35.04 dBc | ≤ -20 dBc | Pass |
| | Low Channel | 12.5 GHz - 25 GHz | -52.76 dBc | ≤ -20 dBc | Pass |
| | Mid Channel | 30 MHz - 12.5 GHz | -37.88 dBc | ≤ -20 dBc | Pass |
| | Mid Channel | 12.5 GHz - 25 GHz | -53.77 dBc | ≤ -20 dBc | Pass |
| | High Channel | 30 MHz - 12.5 GHz | -41.24 dBc | ≤ -20 dBc | Pass |
| | High Channel | 12.5 GHz - 25 GHz | -53.86 dBc | ≤ -20 dBc | Pass |

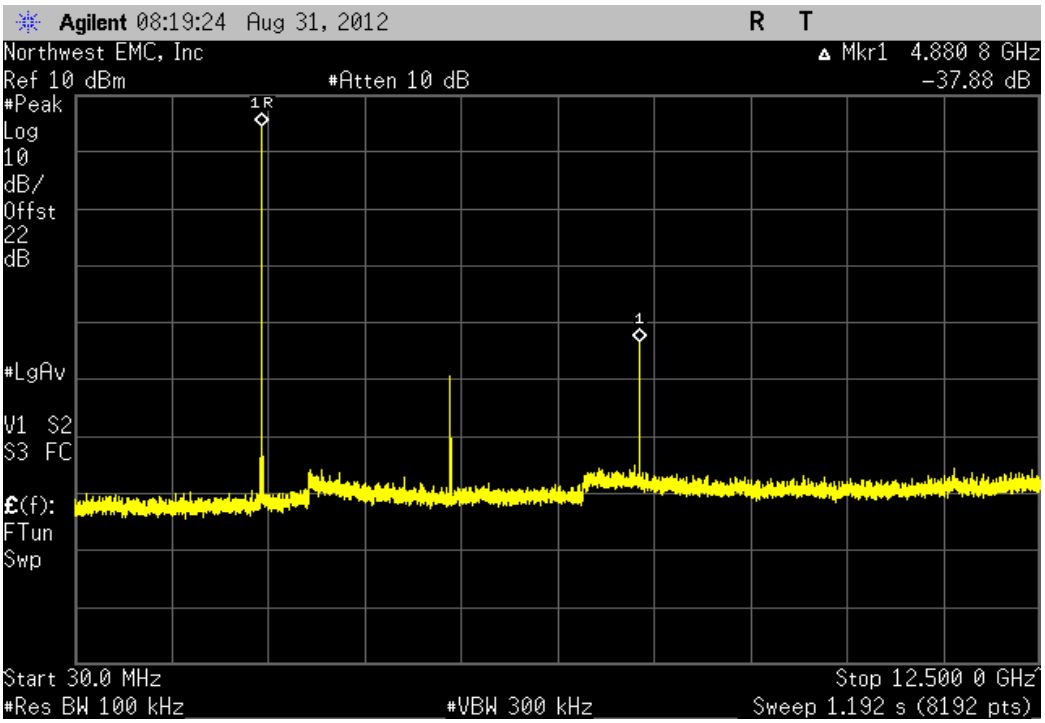
| DH5, GFSK, Low Channel | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -35.04 dBc | ≤ -20 dBc | Pass |



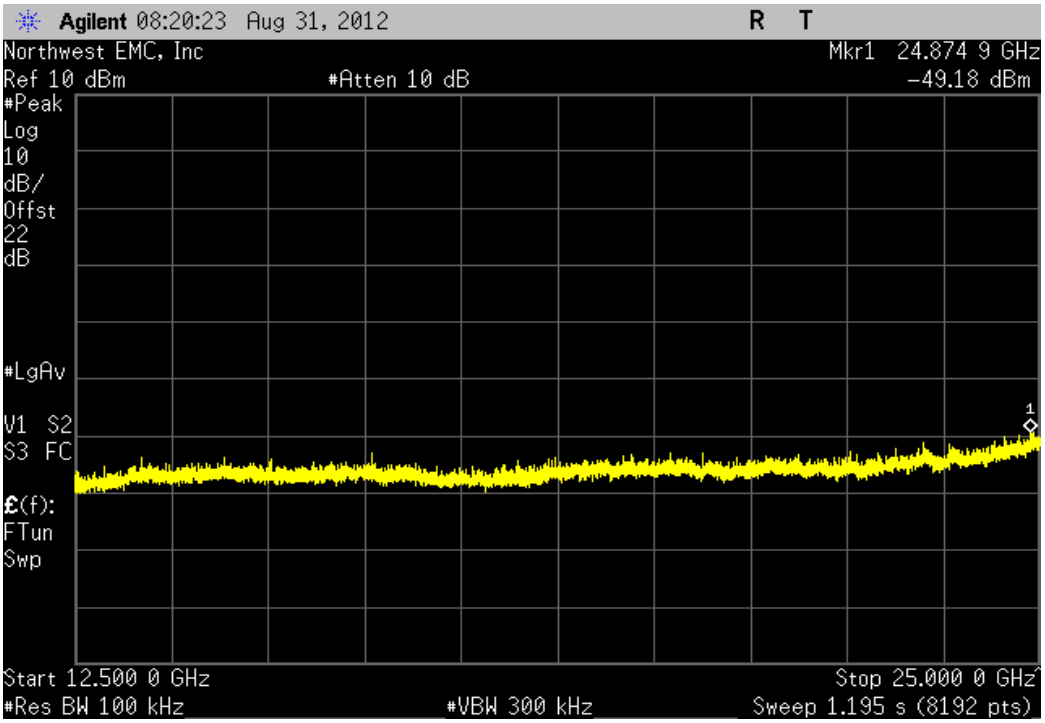

| DH5, GFSK, Low Channel | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -52.76 dBc | ≤ -20 dBc | Pass |



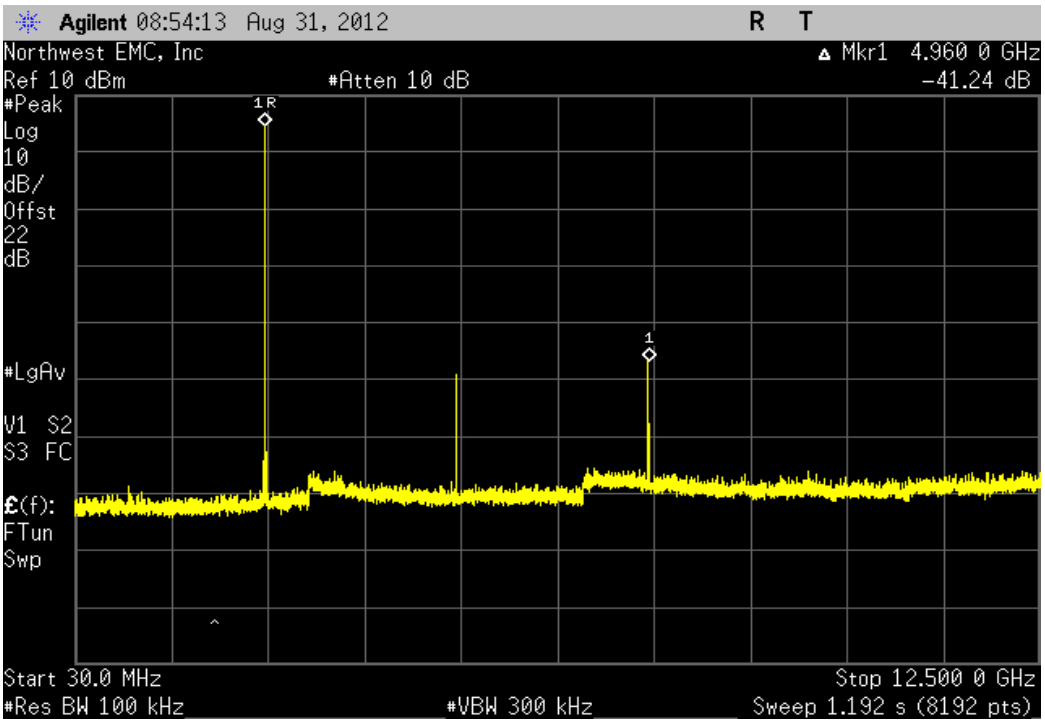
| DH5, GFSK, Mid Channel | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -37.88 dBc | ≤ -20 dBc | Pass |



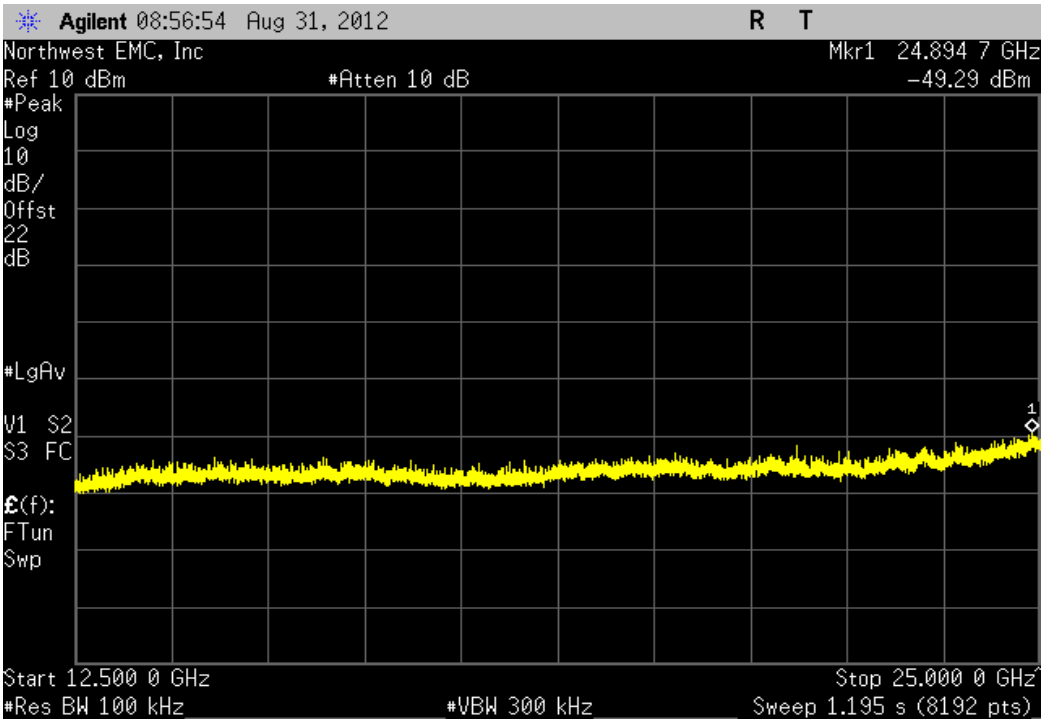

| DH5, GFSK, Mid Channel | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -53.77 dBc | ≤ -20 dBc | Pass |



| DH5, GFSK, High Channel | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -41.24 dBc | ≤ -20 dBc | Pass |




| DH5, GFSK, High Channel | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -53.86 dBc | ≤ -20 dBc | Pass |



# SPURIOUS RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

**MODES OF OPERATION**

Basic Data Rate 1's Modulated. Transmitting at Low (2402 MHz), Mid (2440 MHz) and High (2480 MHz) Channel.

**POWER SETTINGS INVESTIGATED**

Battery

**CONFIGURATIONS INVESTIGATED**

SUPR0095 - 1

**FREQUENCY RANGE INVESTIGATED**

| | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 26 GHz |

**SAMPLE CALCULATIONS**

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Pre-Amplifier | Miteq | AMF-6F-18002650-25-10P | AOI | 4/27/2012 | 12 mo |
| Antenna, Horn | EMCO | 3160-09 | AHN | NCR | 0 mo |
| OC floating Cable | N/A | 18-26GHz RE Cables | OCK | 4/27/2012 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AOF | 11/21/2011 | 12 mo |
| Antenna, Horn | ETS | 3160-08 | AHT | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AOE | 11/21/2011 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AHR | NCR | 0 mo |
| OC 10 Cables | N/A | 12-18GHz RE Cables | OCO | 10/13/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/7/2012 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 10/13/2011 | 12 mo |
| Antenna, Bilog | Teseq | CBL 6141A | AYE | 4/26/2012 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/7/2012 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/7/2012 | 12 mo |
| Spectrum Analyzer | Agilent | E4440A | AFG | 5/16/2012 | 12 mo |

**MEASUREMENT BANDWIDTHS**

| Frequency Range (MHz) | Peak Data (kHz) | Quasi-Peak Data (kHz) | Average Data (kHz) |
|---|---|---|---|
| 0.01 - 0.15 | 1.0 | 0.2 | 0.2 |
| 0.15 - 30.0 | 10.0 | 9.0 | 9.0 |
| 30.0 - 1000 | 100.0 | 120.0 | 120.0 |
| Above 1000 | 1000.0 | N/A | 1000.0 |

**TEST DESCRIPTION**

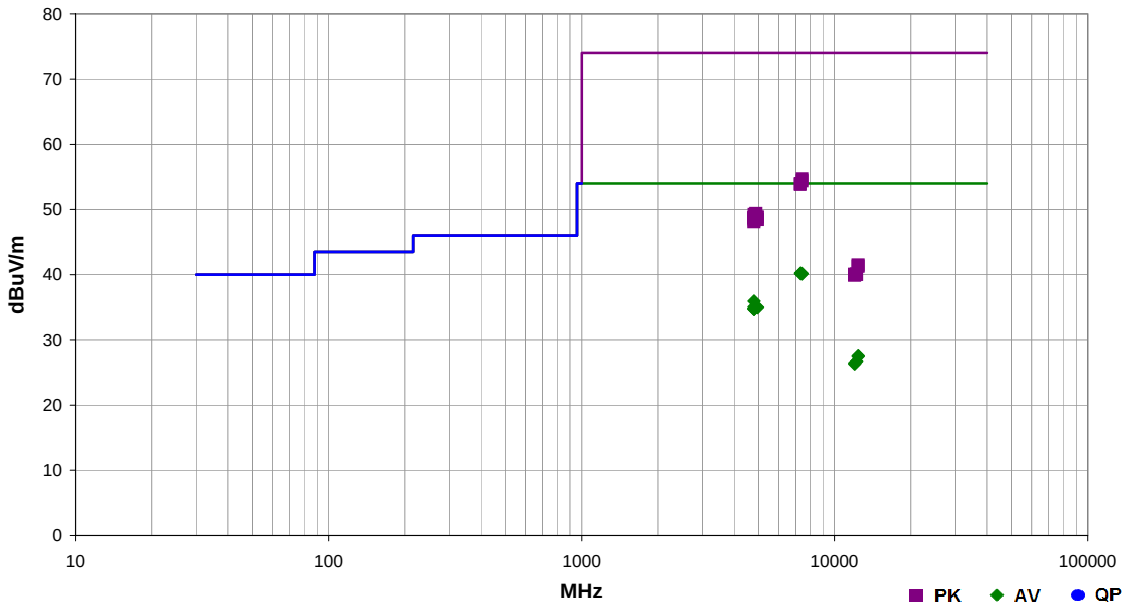
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

# SPURIOUS RADIATED EMISSIONS

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | SUPR0095 | **Date:** | 08/31/12 | | |
| **Project:** | None | **Temperature:** | 28.15 °C | | |
| **Job Site:** | OC10 | **Humidity:** | 48.15% RH | | |
| **Serial Number:** | None | **Barometric Pres.:** | 1019 mbar | **Tested by:** | Jaemi Suh |
| **EUT:** | TRAC-Lid BT | | | | |
| **Configuration:** | 1 | | | | |
| **Customer:** | UTC Fire & Security Americas Corporation, Inc. | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | Battery | | | | |
| **Operating Mode:** | Basic Data Rate 1's Modulated. Transmitting at Low (2402 MHz), Mid (2440 MHz) and High (2480 MHz) Channel. | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | 3 Different Units, each unit transmitting at one frequency and data rate. | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.247:2012 | ANSI C63.10:2009 |

| **Run #** | 2 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (dBuV/m) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7321.900 | 24.3 | 15.9 | 1.0 | 66.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 40.2 | 54.0 | -13.8 | X-Axis, Mid Channel 2440 MHz |
| 7441.353 | 24.1 | 16.1 | 1.0 | 95.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 40.2 | 54.0 | -13.8 | X-Axis, High Channel 2480 MHz |
| 7322.000 | 24.2 | 15.9 | 1.0 | 124.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 40.1 | 54.0 | -13.9 | X-Axis, Mid Channel 2440 MHz |
| 7441.433 | 24.0 | 16.1 | 1.0 | 228.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 40.1 | 54.0 | -13.9 | X-Axis, High Channel 2480 MHz |
| 4803.740 | 24.8 | 11.2 | 1.0 | 113.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 36.0 | 54.0 | -18.0 | X-Axis, Low Channel 2402 MHz |
| 4803.807 | 23.9 | 11.2 | 1.0 | 48.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 35.1 | 54.0 | -18.9 | Y-Axis, Low Channel 2402 MHz |
| 4960.053 | 23.4 | 11.6 | 1.0 | 212.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 35.0 | 54.0 | -19.0 | X-Axis, High Channel 2480 MHz |
| 4878.053 | 23.6 | 11.4 | 1.0 | 301.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 35.0 | 54.0 | -19.0 | X-Axis, Mid Channel 2440 MHz |
| 4959.840 | 23.3 | 11.6 | 1.6 | 20.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 34.9 | 54.0 | -19.1 | X-Axis, High Channel 2480 MHz |
| 4804.000 | 23.6 | 11.2 | 1.0 | 332.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 34.8 | 54.0 | -19.2 | Y-Axis, Low Channel 2402 MHz |
| 4803.627 | 23.6 | 11.2 | 1.0 | 331.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 34.8 | 54.0 | -19.2 | X-Axis, Low Channel 2402 MHz |
| 4803.920 | 23.5 | 11.2 | 1.0 | 209.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 34.7 | 54.0 | -19.3 | Z-Axis, Low Channel 2402 MHz |
| 4803.820 | 23.5 | 11.2 | 1.0 | 41.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 34.7 | 54.0 | -19.3 | Z-Axis, Low Channel 2402 MHz |
| 7441.260 | 38.6 | 16.1 | 1.0 | 95.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 54.7 | 74.0 | -19.3 | X-Axis, High Channel 2480 MHz |
| 7441.807 | 38.3 | 16.1 | 1.0 | 228.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 54.4 | 74.0 | -19.6 | X-Axis, High Channel 2480 MHz |
| 7321.887 | 38.0 | 15.9 | 1.0 | 124.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 53.9 | 74.0 | -20.1 | X-Axis, Mid Channel 2440 MHz |
| 7320.113 | 37.9 | 15.9 | 1.0 | 66.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 53.8 | 74.0 | -20.2 | X-Axis, Mid Channel 2440 MHz |
| 4878.920 | 38.0 | 11.4 | 1.0 | 301.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 49.4 | 74.0 | -24.6 | X-Axis, Mid Channel 2440 MHz |
| 4806.000 | 38.0 | 11.2 | 1.0 | 331.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 49.2 | 74.0 | -24.8 | X-Axis, Low Channel 2402 MHz |
| 4880.813 | 37.5 | 11.4 | 1.0 | 357.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.9 | 74.0 | -25.1 | X-Axis, Mid Channel 2440 MHz |
| 4959.747 | 37.2 | 11.6 | 1.6 | 20.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 48.8 | 74.0 | -25.2 | X-Axis, High Channel 2480 MHz |
| 4804.440 | 37.6 | 11.2 | 1.0 | 113.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 48.8 | 74.0 | -25.2 | X-Axis, Low Channel 2402 MHz |
| 4803.847 | 37.5 | 11.2 | 1.0 | 209.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.7 | 74.0 | -25.3 | Z-Axis, Low Channel 2402 MHz |
| 4802.413 | 37.5 | 11.2 | 1.0 | 48.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 48.7 | 74.0 | -25.3 | Y-Axis, Low Channel 2402 MHz |
| 4960.140 | 36.8 | 11.6 | 1.0 | 212.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.4 | 74.0 | -25.6 | X-Axis, High Channel 2480 MHz |
| 4805.000 | 37.2 | 11.2 | 1.0 | 332.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.4 | 74.0 | -25.6 | Y-Axis, Low Channel 2402 MHz |
| 4803.327 | 36.9 | 11.2 | 1.0 | 41.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 48.1 | 74.0 | -25.9 | Z-Axis, Low Channel 2402 MHz |

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (dBuV/m) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12399.930 | 33.8 | -6.2 | 1.3 | 2.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 27.6 | 54.0 | -26.4 | X-Axis, High Channel 2480 MHz |
| 12399.950 | 33.7 | -6.2 | 1.0 | 272.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 27.5 | 54.0 | -26.5 | X-Axis, High Channel 2480 MHz |
| 12201.890 | 34.1 | -7.4 | 1.0 | 225.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 26.7 | 54.0 | -27.3 | X-Axis, Mid Channel 2440 MHz |
| 12201.980 | 34.0 | -7.4 | 2.3 | 113.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 26.6 | 54.0 | -27.4 | X-Axis, Mid Channel 2440 MHz |
| 12010.050 | 34.9 | -8.5 | 1.0 | 200.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 26.4 | 54.0 | -27.6 | X-Axis, Low Channel 2402 MHz |
| 12011.890 | 34.7 | -8.5 | 1.0 | 354.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 26.2 | 54.0 | -27.8 | X-Axis, Low Channel 2402 MHz |
| 12397.800 | 47.7 | -6.2 | 1.3 | 2.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 41.5 | 74.0 | -32.5 | X-Axis, High Channel 2480 MHz |
| 12397.890 | 47.5 | -6.2 | 1.0 | 272.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 41.3 | 74.0 | -32.7 | X-Axis, High Channel 2480 MHz |
| 12201.720 | 47.4 | -7.4 | 1.0 | 225.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 40.0 | 74.0 | -34.0 | X-Axis, Mid Channel 2440 MHz |
| 12011.680 | 48.5 | -8.5 | 1.0 | 354.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 40.0 | 74.0 | -34.0 | X-Axis, Low Channel 2402 MHz |
| 12200.620 | 47.4 | -7.4 | 2.3 | 113.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 40.0 | 74.0 | -34.0 | X-Axis, Mid Channel 2440 MHz |
| 12008.410 | 48.4 | -8.5 | 1.0 | 200.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 39.9 | 74.0 | -34.1 | X-Axis, Low Channel 2402 MHz |