# Audio Precision

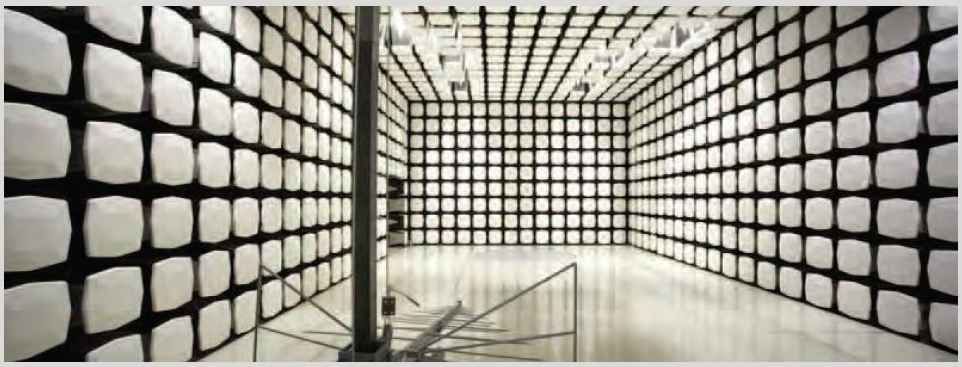
**APx 525D2**

**FCC 15.207:2017**

**FCC 15.247:2017**

**Bluetooth Radio**

**Report # AUDI0246.2**



NVLAP Lab Code: 200630-0

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# CERTIFICATE OF TEST

**Last Date of Test: July 13, 2017**
**Audio Precision**
**Model: APx 525D2**

## Radio Equipment Testing

### Standards

| Specification | Method |
|---|---|
| FCC 15.207:2017 | ANSI C63.10:2013, KDB 558074 |
| FCC 15.247:2017 | |

### Results

| Method Clause | Test Description | Applied | Results | Comments |
|---|---|---|---|---|
| 6.2 | Powerline Conducted Emissions | Yes | Pass | |
| 6.5, 6.6 | Spurious Radiated Emissions | Yes | Pass | |
| 7.5 | Duty Cycle | Yes | Pass | |
| 7.8.2 | Carrier Frequency Separation | Yes | Pass | |
| 7.8.3 | Number of Hopping Frequencies | Yes | Pass | |
| 7.8.4 | Dwell Time | Yes | Pass | |
| 7.8.5 | Output Power | Yes | Pass | |
| 7.8.6 | Band Edge Compliance | Yes | Pass | |
| 7.8.6 | Band Edge Compliance - Hopping Mode | Yes | Pass | |
| 7.8.7 | Occupied Bandwidth | Yes | Pass | |
| 7.8.8 | Spurious Conducted Emissions | Yes | Pass | |

### Deviations From Test Standards

None

### Approved By:

*Kyle Holgate, Operations Manager*

***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. 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. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.***

# REVISION HISTORY

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

# ACCREDITATIONS AND AUTHORIZATIONS

2017.6.12

## 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 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

**NVLAP** - Each laboratory is accredited by NVLAP to ISO 17025

## Canada

**ISED** - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

## European Union

**European Commission** – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

## Australia/New Zealand

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

## Korea

**MSIP / 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.

## Israel

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

## Hong Kong

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

## Vietnam

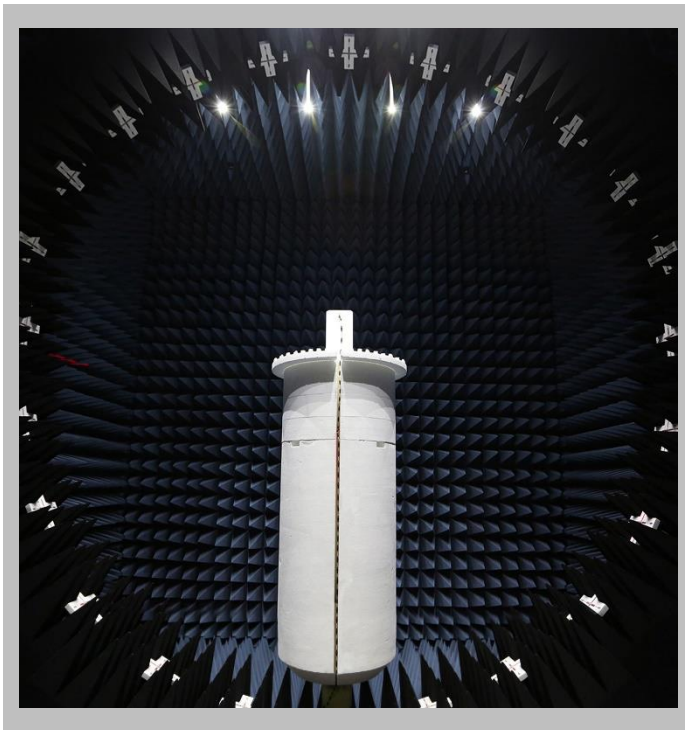
**MIC** – Recognized by MIC as a CAB for the acceptance of test data.

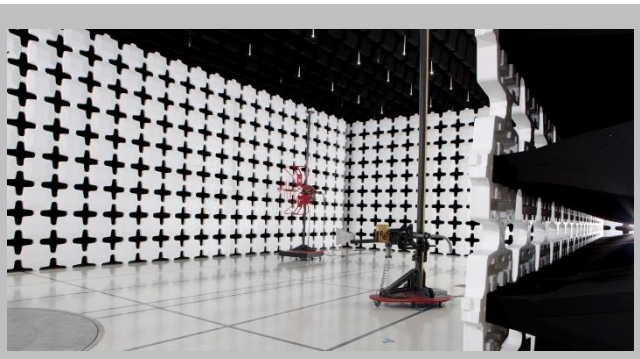
## SCOPE

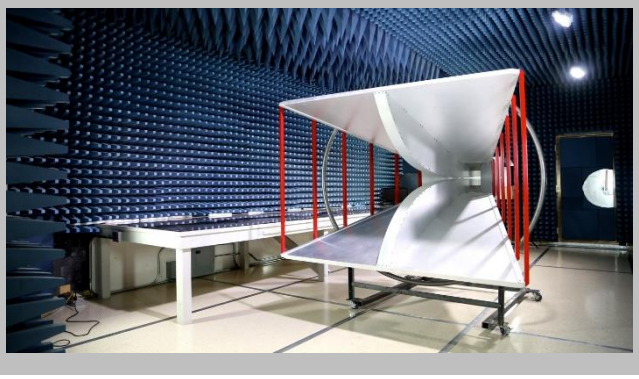
For details on the Scopes of our Accreditations, please visit:
http://portlandcustomer.element.com/ts/scope/scope.htm
http://gsi.nist.gov/global/docs/cabs/designations.html

# FACILITIES

| California | Minnesota | New York | Oregon | Texas | Washington |
|---|---|---|---|---|---|
| Labs OC01-13<br>41 Tesla<br>Irvine, CA 92618<br>(949) 861-8918 | Labs MN01-08, MN10<br>9349 W Broadway Ave.<br>Brooklyn Park, MN 55445<br>(612)-638-5136 | Labs NY01-04<br>4939 Jordan Rd.<br>Elbridge, NY 13060<br>(315) 554-8214 | Labs EV01-12<br>22975 NW Evergreen Pkwy<br>Hillsboro, OR 97124<br>(503) 844-4066 | Labs TX01-09<br>3801 E Plano Pkwy<br>Plano, TX 75074<br>(469) 304-5255 | Labs NC01-05<br>19201 120th Ave NE<br>Bothell, WA 98011<br>(425)984-6600 |
| **NVLAP** | | | | | |
| NVLAP Lab Code: 200676-0 | NVLAP Lab Code: 200881-0 | NVLAP Lab Code: 200761-0 | NVLAP Lab Code: 200630-0 | NVLAP Lab Code:201049-0 | NVLAP Lab Code: 200629-0 |
| **Innovation, Science and Economic Development Canada** | | | | | |
| 2834B-1, 2834B-3 | 2834E-1, 2834E-3 | N/A | 2834D-1, 2834D-2 | 2834G-1 | 2834F-1 |
| **BSMI** | | | | | |
| SL2-IN-E-1154R | SL2-IN-E-1152R | N/A | SL2-IN-E-1017 | SL2-IN-E-1158R | SL2-IN-E-1153R |
| **VCCI** | | | | | |
| A-0029 | A-0109 | N/A | A-0108 | A-0201 | A-0110 |
| **Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA** | | | | | |
| US0158 | US0175 | N/A | US0017 | US0191 | US0157 |







# MEASUREMENT UNCERTAINTY

TMU.2015.07.10

## 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.

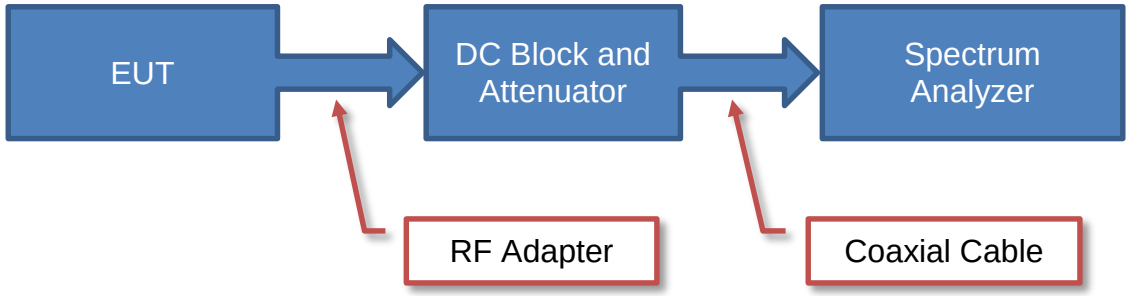
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. 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 16-4-2 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.

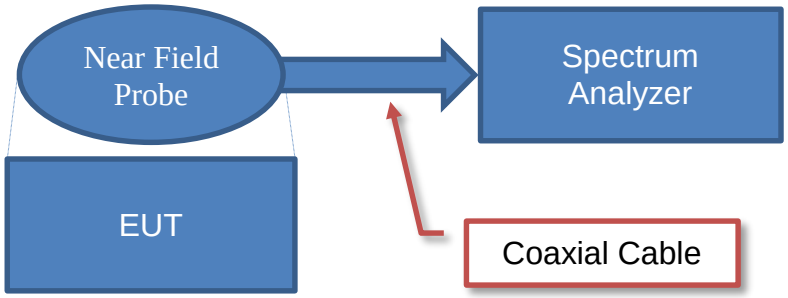
| Test | + MU | - MU |
|---|---|---|
| Frequency Accuracy (Hz) | 0.0007% | -0.0007% |
| Amplitude Accuracy (dB) | 1.2 dB | -1.2 dB |
| Conducted Power (dB) | 0.3 dB | -0.3 dB |
| Radiated Power via Substitution (dB) | 0.7 dB | -0.7 dB |
| Temperature (degrees C) | 0.7°C | -0.7°C |
| Humidity (% RH) | 2.5% RH | -2.5% RH |
| Voltage (AC) | 1.0% | -1.0% |
| Voltage (DC) | 0.7% | -0.7% |
| Field Strength (dB) | 5.2 dB | -5.2 dB |
| AC Powerline Conducted Emissions (dB) | 2.4 dB | -2.4 dB |

# Test Setup Block Diagrams

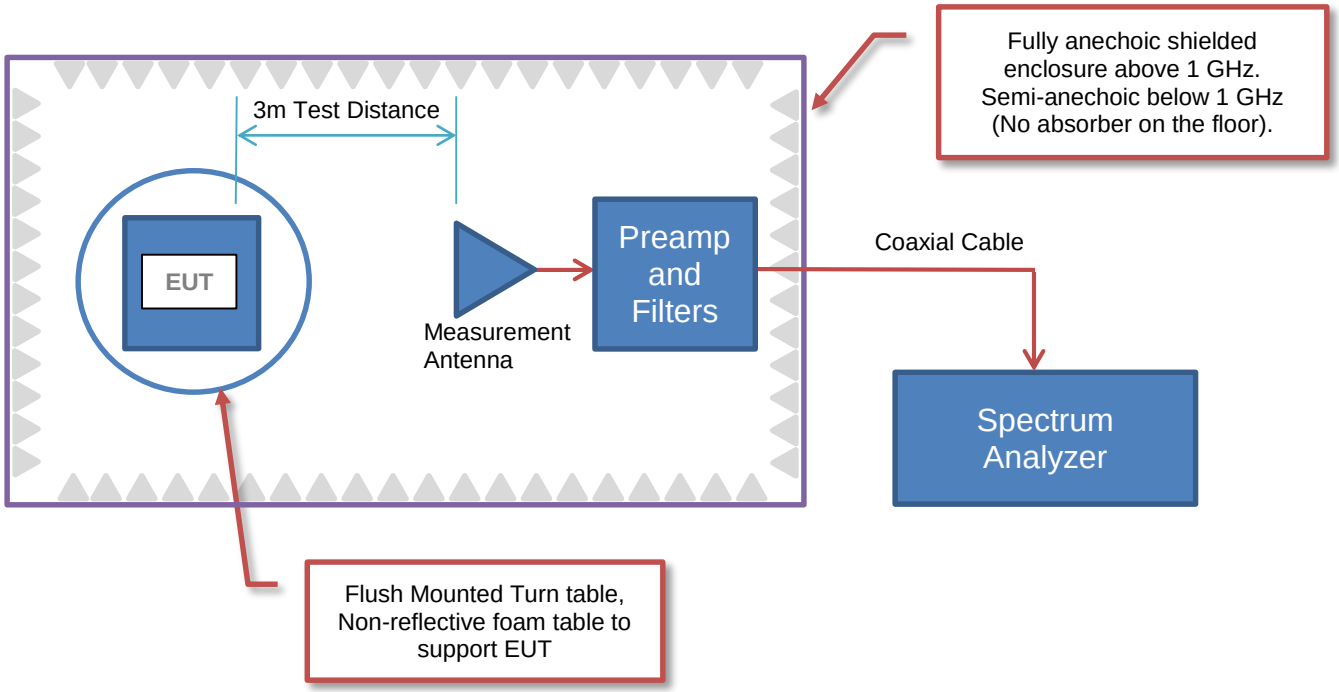
## Antenna Port Conducted Measurements




## Near Field Test Fixture Measurements




## Spurious Radiated Emissions



# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

| | |
|---|---|
| **Company Name:** | Audio Precision |
| **Address:** | 5750 SW Arctic Drive |
| **City, State, Zip:** | Beaverton, OR 97005 |
| **Test Requested By:** | Bill Bunnell |
| **Model:** | APx 525D2 |
| **First Date of Test:** | July 5, 2017 |
| **Last Date of Test:** | July 13, 2017 |
| **Receipt Date of Samples:** | June 27, 2017 |
| **Equipment Design Stage:** | Production |
| **Equipment Condition:** | No Damage |
| **Purchase Authorization:** | Verified |

## Information Provided by the Party Requesting the Test

**Functional Description of the EUT:**

The APx Platform consists of a common chassis, rear panel, front panel bezel, upper and lower covers, internal vertical and horizontal metal partitions, backplane assembly and power supply that can be configured by the installation of individual modules into the 8 available front panel locations. By choosing the combination of modules the APx can accommodate 2 to 16 Audio Input channels and 2 to 8 Audio Generator channels, 2 channels of digital audio I/O and Bluetooth I/O for connection to the EUT. The internal modules and the power supply of the APx are filtered, decoupled, separated, partitioned and shielded to prevent interference between the modules. The specific model numbers of the APx series are based on the number of Output and Input channels. The APx modules are not functional on a standalone basis or in equipment other than the APx. In order to be functional the modules must be installed in the APx chassis using APx control Software.

| Model Numbers | Audio Output Channels | Audio Input Channels |
|---|---|---|
| APx 525 | 2 | 2 |
| APx 526 | 2 | 4 |
| APx 582 | 2 | 8 |
| APx585 | 8 | 8 |
| APx586 | 8 | 16 |
| APx 555 | 2 (High Performance) | 2 (High Performance) |

The Azul 2 Bluetooth module consists of a single 3 x 8 inch multilayer Pcb with 2 isolated layers of 360 degree RF shielding. The first layer of RF shielding covers the RX/TX active circuitry, the output filter, and the I/O ports. The second layer of RF shielding covers the first layer of shielding and the complete PCB assembly. Connections to and from the Antenna ports are made with double shielded coaxial cable with SMA bulkhead and cable terminations.

**Testing Objective:**

To demonstrate compliance of the Bluetooth radio to FCC 15.247 requirements.

# CONFIGURATIONS

## Configuration AUDI0246- 1

| Software/Firmware Running during test | |
|---|---|
| **Description** | **Version** |
| APx500 | 4.5.0.289.118768 Beta |
| BlueTest3 | 2.6.6 |
| BlueSuit | 2.6.6 |

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Audio analyzer containing a Bluetooth BR/EDR radio module | Audio Precision | APx 525D2 | APX2-28804 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| SPI to Ethernet Adapter #1 | CSR | M1616V2 | None |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| USB to SPI Converter | CSR | 1324 USB-SPI Converter | 373641 |
| USB Mouse | Dell | MS1110L | None |
| AC Adapter | Dell | DA45NM140 | None |
| Remote Laptop | Dell | Inspiron 15 | 20911042190 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | AC Mains | Audio Analyzer |
| Cat5e flat cable | No | 2.1m | No | SPI to Ethernet Adapter #1 | USB to SPI Converter |
| USB | Yes | 2.0m | No | USB to SPI Converter | Remote Laptop |
| USB (Mouse) | Yes | 1.8m | No | USB Mouse | Remote Laptop |
| USB | Yes | 1.8m | Yes | Audio Analyzer | Remote Laptop |
| DC Power | No | 1.8m | Yes | Remote Laptop | AC Adapter |
| AC Power | No | 1.8m | No | AC Mains | AC Adapter |

# CONFIGURATIONS

## Configuration AUDI0246- 2

| Software/Firmware Running during test | |
|---|---|
| **Description** | **Version** |
| APx500 | 4.5.0.289.118768 Beta |
| BlueTest3 | 2.6.6 |
| BlueSuit | 2.6.6 |

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Audio analyzer containing a Bluetooth BR/EDR radio module | Audio Precision | APx 525D2 | APX2-28804 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| SPI to Ethernet Adapter #1 | CSR | M1616V2 | None |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| USB to SPI Converter | CSR | 1324 USB-SPI Converter | 373641 |
| USB Mouse | Dell | MS1110L | None |
| AC Adapter | Dell | DA45NM140 | None |
| Remote Laptop | Dell | Inspiron 15 | 20911042190 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | AC Mains | Audio Analyzer |
| Cat5e flat cable | No | 2.1m | No | SPI to Ethernet Adapter #1 | USB to SPI Converter |
| USB | Yes | 2.0m | No | USB to SPI Converter | Remote Laptop |
| USB (Mouse) | Yes | 1.8m | No | USB Mouse | Remote Laptop |
| USB | Yes | 1.8m | Yes | Audio Analyzer | Remote Laptop |
| DC Power | No | 1.8m | Yes | Remote Laptop | AC Adapter |
| AC Power | No | 1.8m | No | AC Mains | AC Adapter |
| XLR x6 | Yes | 1.0m | Yes | Audio Analyzer | Unterminated |
| DB9 | Yes | 1.8m | No | Audio Analyzer | Unterminated |
| DB9 | Yes | 1.8m | No | Audio Analyzer | Unterminated |

# CONFIGURATIONS

## Configuration AUDI0246- 5

| Software/Firmware Running during test | |
|---|---|
| **Description** | **Version** |
| APx500 | 4.5.0.289.118768 Beta |
| BlueTest3 | 2.6.6 |
| BlueSuit | 2.6.6 |

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Audio analyzer containing a Bluetooth BR/EDR radio module | Audio Precision | APx 525D2 | APX2-28804 |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| SPI to Ethernet Adapter #1 | CSR | M1616V2 | None |
| USB to SPI Converter | CSR | 1324 USB-SPI Converter | 373641 |
| USB Mouse | Dell | MS1110L | None |
| AC Adapter | Dell | DA45NM140 | None |
| Remote Laptop | Dell | Inspiron 15 | 20911042190 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | AC Mains | Audio Analyzer |
| Cat5e flat cable | No | 2.1m | No | SPI to Ethernet Adapter #1 | USB to SPI Converter |
| USB (Mouse) | Yes | 1.8m | No | USB Mouse | Remote Laptop |
| USB | Yes | 1.8m | Yes | Audio Analyzer | Remote Laptop |
| DC Power | No | 1.8m | Yes | Remote Laptop | AC Adapter |
| AC Power | No | 1.8m | No | AC Mains | AC Adapter |
| XLR x6 | Yes | 1.0m | Yes | Audio Analyzer | Unterminated |
| DB9 | Yes | 1.8m | No | Audio Analyzer | Unterminated |
| DB9 | Yes | 1.8m | No | Audio Analyzer | Unterminated |

# CONFIGURATIONS

## Configuration AUDI0246- 6

| Software/Firmware Running during test | |
|---|---|
| **Description** | **Version** |
| APx500 | 4.5.0.289.118768 Beta |
| BlueTest3 | 2.6.6 |
| BlueSuit | 2.6.6 |

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Audio analyzer containing a Bluetooth BR/EDR radio module | Audio Precision | APx 525D2 | APX2-28804 |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| USB Mouse | Dell | MS1110L | None |
| AC Adapter | Dell | DA45NM140 | None |
| Remote Laptop | Dell | Inspiron 15 | 21398130830 |
| Wireless Adapter | Taotronics | TT-BA09 | OGTKDVWH |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | AC Mains | Audio Analyzer |
| USB (Mouse) | Yes | 1.8m | No | USB Mouse | Remote Laptop |
| USB | Yes | 1.8m | Yes | Audio Analyzer | Remote Laptop |
| DC Power | No | 1.8m | Yes | Remote Laptop | AC Adapter |
| AC Power | No | 1.8m | No | AC Mains | AC Adapter |
| XLR x6 | Yes | 1.0m | Yes | Audio Analyzer | Unterminated |
| DB9 | Yes | 1.8m | No | Audio Analyzer | Unterminated |
| DB9 | Yes | 1.8m | No | Audio Analyzer | Unterminated |
| USB (for power) | Yes | 1.8m | No | Laptop | Wireless Adapter |
| Audio RCA Pair | No | 2.0m | No | Wireless Adapter | Audio Analyzer |

# CONFIGURATIONS

## Configuration AUDI0246- 7

| Software/Firmware Running during test | |
|---|---|
| **Description** | **Version** |
| APx500 | 4.5.0.289.118768 Beta |
| BlueTest3 | 2.6.6 |
| BlueSuit | 2.6.6 |

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Audio analyzer containing a Bluetooth BR/EDR radio module | Audio Precision | APx 525D2 | APX2-28804 |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| USB to SPI Converter | CSR | 1324 USB-SPI Converter | 373641 |
| USB Mouse | Dell | MS1110L | None |
| AC Adapter | Dell | DA45NM140 | None |
| Remote Laptop | Dell | Inspiron 15 | 21398130830 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | AC Mains | Audio Analyzer |
| Cat5e flat cable | No | 2.1m | No | SPI to Ethernet Adapter #1 | USB to SPI Converter |
| USB | Yes | 2.0m | No | USB to SPI Converter | Remote Laptop |
| USB (Mouse) | Yes | 1.8m | No | USB Mouse | Remote Laptop |
| USB | Yes | 1.8m | Yes | Audio Analyzer | Remote Laptop |
| DC Power | No | 1.8m | Yes | Remote Laptop | AC Adapter |
| AC Power | No | 1.8m | No | AC Mains | AC Adapter |
| XLR x6 | Yes | 1.0m | Yes | Audio Analyzer | Unterminated |
| DB9 | Yes | 1.8m | No | Audio Analyzer | Unterminated |
| DB9 | Yes | 1.8m | No | Audio Analyzer | Unterminated |

# MODIFICATIONS

## Equipment Modifications

| Item | Date | Test | Modification | Note | Disposition of EUT |
|---|---|---|---|---|---|
| 1 | 7/5/2017 | Spurious Conducted Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 2 | 7/5/2017 | Spurious Radiated Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 3 | 7/5/2017 | Duty Cycle | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 4 | 7/5/2017 | Carrier Frequency Separation | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 5 | 7/5/2017 | Number of Hopping Frequencies | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 6 | 7/5/2017 | Dwell Time | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 7 | 7/5/2017 | Output Power | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 8 | 7/5/2017 | Band Edge Compliance | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 9 | 7/5/2017 | Band Edge Compliance - Hopping Mode | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 10 | 7/5/2017 | Occupied Bandwidth | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 11 | 7/13/2017 | Powerline Conducted Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed. |

# POWERLINE CONDUCTED EMISSIONS

WTD.2017.03.21

## TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

## TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|---|---|---|---|---|---|
| LISN | Solar Electronics | 9252-50-R-24-BNC | LIP | 10/4/2016 | 10/4/2018 |
| Cable - Conducted Cable Assembly | Northwest EMC | EVG, HHD, RKA | EVGA | 4/13/2017 | 4/13/2018 |
| Receiver | Rohde & Schwarz | ESCI | ARH | 3/27/2017 | 3/27/2018 |

## MEASUREMENT UNCERTAINTY

| Description | | |
|---|---|---|
| Expanded k=2 | 2.4 dB | -2.4 dB |

## CONFIGURATIONS INVESTIGATED

AUDI0246-7

## MODES INVESTIGATED

Mid Channel 2440MHz, DH5 (GFSK).

# POWERLINE CONDUCTED EMISSIONS

| | | | |
|---|---|---|---|
| EUT: | APx 525D2 | Work Order: | AUDI0246 |
| Serial Number: | APX2-28804 | Date: | 07/13/2017 |
| Customer: | Audio Precision | Temperature: | 24°C |
| Attendees: | None | Relative Humidity: | 43.6% |
| Customer Project: | None | Bar. Pressure: | 1022 mb |
| Tested By: | Duane Niesen and Rod Peloquin | Job Site: | EV07 |
| Power: | 110VAC/60Hz | Configuration: | AUDI0246-7 |

## TEST SPECIFICATIONS

| Specification: | Method: |
|---|---|
| FCC 15.207:2017 | ANSI C63.10:2013 |

## TEST PARAMETERS

| | | | | | |
|---|---|---|---|---|---|
| Run #: | 11 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |

## COMMENTS

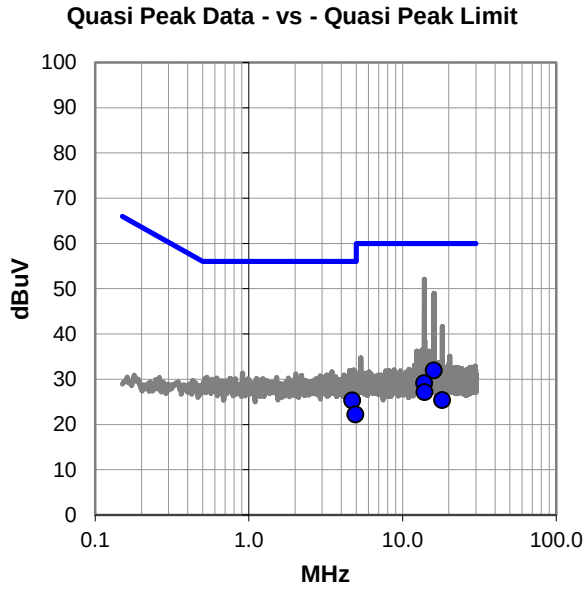
BR and EDR Power settings [(Ext),(Int)]= [255,63]

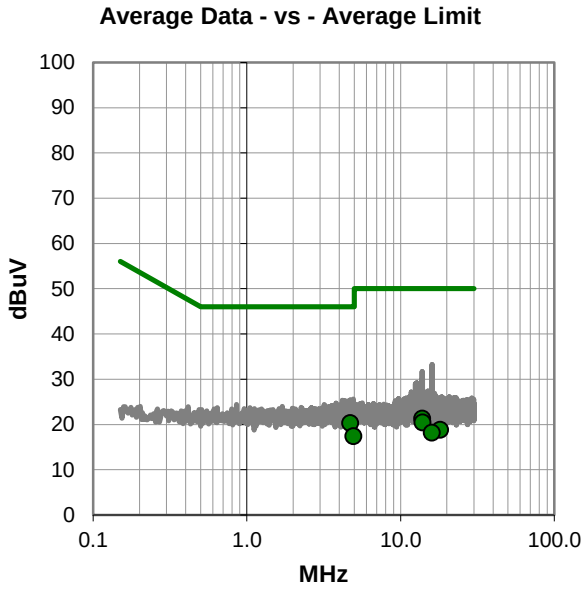
## EUT OPERATING MODES

Mid Channel 2440MHz, DH5 (GFSK).

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

WTD.2017.03.21

## RESULTS - Run #11

Quasi Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|---|---|---|---|---|---|
| 16.002 | 11.5 | 20.4 | 31.9 | 60.0 | -28.1 |
| 4.713 | 5.5 | 19.8 | 25.3 | 56.0 | -30.7 |
| 13.836 | 8.9 | 20.2 | 29.1 | 60.0 | -30.9 |
| 13.908 | 6.9 | 20.2 | 27.1 | 60.0 | -32.9 |
| 4.938 | 2.4 | 19.8 | 22.2 | 56.0 | -33.8 |
| 18.131 | 5.0 | 20.4 | 25.4 | 60.0 | -34.6 |

Average Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|---|---|---|---|---|---|
| 4.713 | 0.5 | 19.8 | 20.3 | 46.0 | -25.7 |
| 4.938 | -2.4 | 19.8 | 17.4 | 46.0 | -28.6 |
| 13.836 | 1.1 | 20.2 | 21.3 | 50.0 | -28.7 |
| 13.908 | 0.2 | 20.2 | 20.4 | 50.0 | -29.6 |
| 18.131 | -1.6 | 20.4 | 18.8 | 50.0 | -31.2 |
| 16.002 | -2.2 | 20.4 | 18.2 | 50.0 | -31.8 |

## CONCLUSION

Pass

Tested By

# POWERLINE CONDUCTED EMISSIONS

| | | | |
|---|---|---|---|
| EUT: | APx 525D2 | Work Order: | AUDI0246 |
| Serial Number: | APX2-28804 | Date: | 07/13/2017 |
| Customer: | Audio Precision | Temperature: | 24°C |
| Attendees: | None | Relative Humidity: | 43.6% |
| Customer Project: | None | Bar. Pressure: | 1022 mb |
| Tested By: | Duane Niesen and Rod Peloquin | Job Site: | EV07 |
| Power: | 110VAC/60Hz | Configuration: | AUDI0246-6 |

## TEST SPECIFICATIONS

| Specification: | Method: |
|---|---|
| FCC 15.207:2017 | ANSI C63.10:2013 |

## TEST PARAMETERS

| | | | | | |
|---|---|---|---|---|---|
| Run #: | 12 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |

## COMMENTS

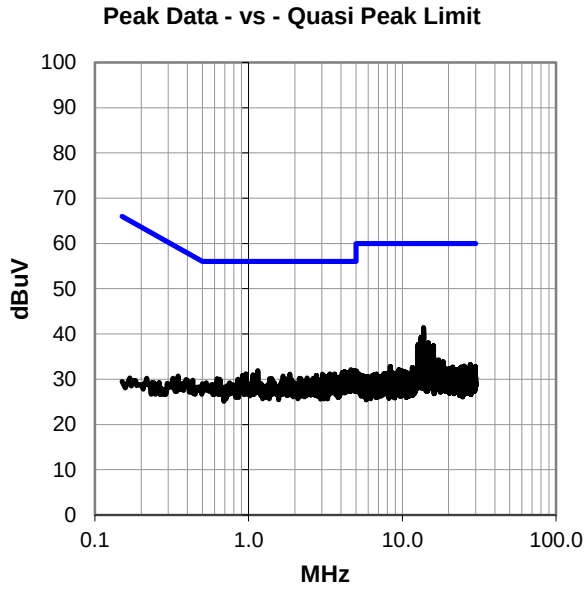
BR and EDR Power settings [(Ext),(Int)]= [255,63]

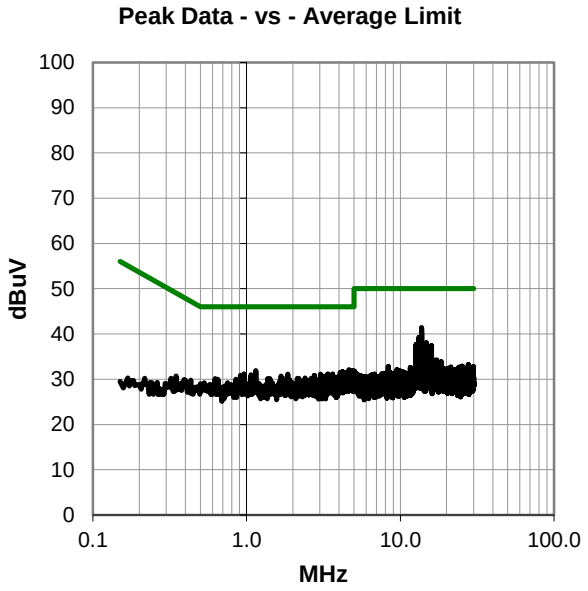
## EUT OPERATING MODES

Mid Channel 2440MHz, DH5 (GFSK).

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

WTD.2017.03.21

## RESULTS - Run #12

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|---|---|---|---|---|---|
| 13.779 | 21.2 | 20.2 | 41.4 | 60.0 | -18.6 |
| 13.238 | 19.0 | 20.2 | 39.2 | 60.0 | -20.8 |
| 14.771 | 17.6 | 20.4 | 38.0 | 60.0 | -22.0 |
| 12.652 | 17.5 | 20.2 | 37.7 | 60.0 | -22.3 |
| 15.976 | 17.0 | 20.4 | 37.4 | 60.0 | -22.6 |
| 12.588 | 16.9 | 20.2 | 37.1 | 60.0 | -22.9 |
| 14.402 | 16.7 | 20.2 | 36.9 | 60.0 | -23.1 |
| 4.642 | 12.3 | 19.8 | 32.1 | 56.0 | -23.9 |
| 1.150 | 12.4 | 19.5 | 31.9 | 56.0 | -24.1 |
| 4.903 | 12.1 | 19.8 | 31.9 | 56.0 | -24.1 |
| 13.148 | 15.7 | 20.2 | 35.9 | 60.0 | -24.1 |
| 4.209 | 11.9 | 19.8 | 31.7 | 56.0 | -24.3 |
| 4.071 | 11.7 | 19.8 | 31.5 | 56.0 | -24.5 |
| 4.396 | 11.7 | 19.8 | 31.5 | 56.0 | -24.5 |
| 12.671 | 15.3 | 20.2 | 35.5 | 60.0 | -24.5 |
| 4.571 | 11.6 | 19.8 | 31.4 | 56.0 | -24.6 |
| 4.149 | 11.5 | 19.8 | 31.3 | 56.0 | -24.7 |
| 13.066 | 15.0 | 20.2 | 35.2 | 60.0 | -24.8 |
| 0.963 | 11.7 | 19.5 | 31.2 | 56.0 | -24.8 |
| 4.541 | 11.4 | 19.8 | 31.2 | 56.0 | -24.8 |
| 1.851 | 11.5 | 19.6 | 31.1 | 56.0 | -24.9 |
| 3.026 | 11.3 | 19.8 | 31.1 | 56.0 | -24.9 |
| 3.377 | 11.3 | 19.8 | 31.1 | 56.0 | -24.9 |
| 3.627 | 11.3 | 19.8 | 31.1 | 56.0 | -24.9 |
| 4.802 | 11.3 | 19.8 | 31.1 | 56.0 | -24.9 |
| 13.286 | 14.9 | 20.2 | 35.1 | 60.0 | -24.9 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|---|---|---|---|---|---|
| 13.779 | 21.2 | 20.2 | 41.4 | 50.0 | -8.6 |
| 13.238 | 19.0 | 20.2 | 39.2 | 50.0 | -10.8 |
| 14.771 | 17.6 | 20.4 | 38.0 | 50.0 | -12.0 |
| 12.652 | 17.5 | 20.2 | 37.7 | 50.0 | -12.3 |
| 15.976 | 17.0 | 20.4 | 37.4 | 50.0 | -12.6 |
| 12.588 | 16.9 | 20.2 | 37.1 | 50.0 | -12.9 |
| 14.402 | 16.7 | 20.2 | 36.9 | 50.0 | -13.1 |
| 4.642 | 12.3 | 19.8 | 32.1 | 46.0 | -13.9 |
| 1.150 | 12.4 | 19.5 | 31.9 | 46.0 | -14.1 |
| 4.903 | 12.1 | 19.8 | 31.9 | 46.0 | -14.1 |
| 13.148 | 15.7 | 20.2 | 35.9 | 50.0 | -14.1 |
| 4.209 | 11.9 | 19.8 | 31.7 | 46.0 | -14.3 |
| 4.071 | 11.7 | 19.8 | 31.5 | 46.0 | -14.5 |
| 4.396 | 11.7 | 19.8 | 31.5 | 46.0 | -14.5 |
| 12.671 | 15.3 | 20.2 | 35.5 | 50.0 | -14.5 |
| 4.571 | 11.6 | 19.8 | 31.4 | 46.0 | -14.6 |
| 4.149 | 11.5 | 19.8 | 31.3 | 46.0 | -14.7 |
| 13.066 | 15.0 | 20.2 | 35.2 | 50.0 | -14.8 |
| 0.963 | 11.7 | 19.5 | 31.2 | 46.0 | -14.8 |
| 4.541 | 11.4 | 19.8 | 31.2 | 46.0 | -14.8 |
| 1.851 | 11.5 | 19.6 | 31.1 | 46.0 | -14.9 |
| 3.026 | 11.3 | 19.8 | 31.1 | 46.0 | -14.9 |
| 3.377 | 11.3 | 19.8 | 31.1 | 46.0 | -14.9 |
| 3.627 | 11.3 | 19.8 | 31.1 | 46.0 | -14.9 |
| 4.802 | 11.3 | 19.8 | 31.1 | 46.0 | -14.9 |
| 13.286 | 14.9 | 20.2 | 35.1 | 50.0 | -14.9 |

## CONCLUSION

Pass

Tested By

# SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2017.01.26

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**

Bluetooth continuous Tx

**POWER SETTINGS INVESTIGATED**

110VAC/60Hz

**CONFIGURATIONS INVESTIGATED**

AUDI0246 - 2

AUDI0246 - 5

**FREQUENCY RANGE INVESTIGATED**

| | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 26.5 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 |
|---|---|---|---|---|---|
| Cable | ESM Cable Corp. | KMKM-72 | EVY | 10/17/2016 | 12 mo |
| Amplifier - Pre-Amplifier | Miteq | AMF-6F-18002650-25-10P | AVU | 10/17/2016 | 12 mo |
| Antenna - Standard Gain | ETS Lindgren | 3160-09 | AIV | NCR | 0 mo |
| Amplifier - Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AVD | 2/6/2017 | 12 mo |
| Antenna - Standard Gain | ETS Lindgren | 3160-08 | AHV | NCR | 0 mo |
| Cable | None | Standard Gain Horns Cable | EVF | 2/6/2017 | 12 mo |
| Amplifier - Pre-Amplifier | L-3 Narda-MITEQ | AMF-6F-08001200-30-10P | PAO | 2/7/2017 | 12 mo |
| Antenna - Standard Gain | ETS Lindgren | 3160-07 | AHU | NCR | 0 mo |
| Filter - High Pass | Micro-Tronics | HPM50111 | HFO | 2/6/2017 | 12 mo |
| Attenuator | Coaxicom | 3910-20 | AXZ | 4/19/2017 | 12 mo |
| Cable | N/A | Double Ridge Horn Cables | EVB | 2/6/2017 | 12 mo |
| Amplifier - Pre-Amplifier | Miteq | AMF-3D-00100800-32-13P | PAG | 2/6/2017 | 12 mo |
| Antenna - Double Ridge | ETS Lindgren | 3115 | AIZ | 2/3/2016 | 24 mo |
| Cable | N/A | Bilog Cables | EVA | 2/6/2017 | 12 mo |
| Amplifier - Pre-Amplifier | Miteq | AM-1616-1000 | AOL | 2/6/2017 | 12 mo |
| Antenna - Biconilog | Teseq | CBL 6141B | AXR | 6/30/2016 | 24 mo |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFN | 4/13/2017 | 12 mo |

# SPURIOUS RADIATED EMISSIONS

**TEST DESCRIPTION**

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

During the testing the EUT was operating with a 77.9% Duty cycle. The test software provided would not allow continuous operation. Per ANSI C63.10 methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 1.1dB: DCCF (dB) = 10*log(duty cycle). In addition, a Frequency Hopping Spread Spectrum (FHSS) duty cycle correction factor (DCCF) was applied against the average measurements based on the hopping dwell time in a 100 ms period as allowed by FCC 15.35: DCCF (dB) = 20*log(duty cycle)

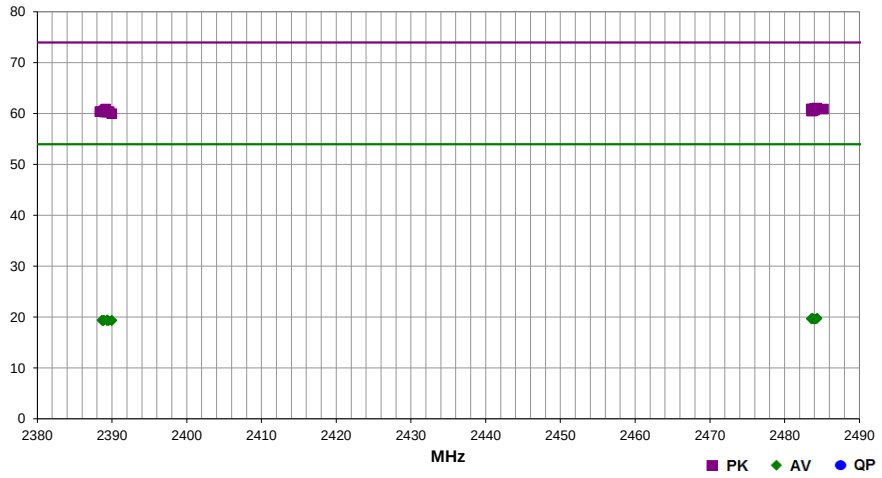
# SPURIOUS RADIATED EMISSIONS

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | AUDI0246 | **Date:** | 07/05/17 | | |
| **Project:** | None | **Temperature:** | 23.6 °C | | |
| **Job Site:** | EV01 | **Humidity:** | 46.3% RH | | |
| **Serial Number:** | APX2-28804 | **Barometric Pres.:** | 1016 mbar | **Tested by:** | Jeff Alcoke and Rod Peloquin |
| **EUT:** | APx 525D2 | | | | |
| **Configuration:** | 2 | | | | |
| **Customer:** | Audio Precision | | | | |
| **Attendees:** | Bill Bunnell | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Bluetooth continuous Tx | | | | |
| **Deviations:** | I/O ports populated per customer direction | | | | |
| **Comments:** | BR and EDR Power settings [(Ext),(Int)]= [255,63]. See comments below for Channel, Frequency, Modulation, Antenna Port and Antenna Orientation. | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.247:2017 | ANSI C63.10:2013 |

| **Run #** | 22 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1 to 4(m) | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Duty Cycle Correction Factor (dB) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Carrier Duty Cycle (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2484.293 | 40.8 | 0.3 | 1.0 | 344.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 61.1 | 74.0 | -12.9 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2484.007 | 40.7 | 0.3 | 2.7 | 187.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 61.0 | 74.0 | -13.0 | High Ch. 2480 MHz, 3DH5 (8DPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2484.080 | 40.6 | 0.3 | 2.0 | 357.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.9 | 74.0 | -13.1 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2485.203 | 40.6 | 0.3 | 1.2 | 357.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.9 | 74.0 | -13.1 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 2483.590 | 40.6 | 0.3 | 1.0 | 114.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 60.9 | 74.0 | -13.1 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 2483.560 | 40.6 | 0.3 | 2.7 | 206.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 60.9 | 74.0 | -13.1 | High Ch. 2480 MHz, 2DH5 (pi/4DQPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2389.133 | 41.0 | -0.1 | 1.0 | 116.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.9 | 74.0 | -13.1 | Low Ch. 2402 MHz, 3DH5 (8DPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2484.003 | 40.4 | 0.3 | 2.7 | 206.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 60.7 | 74.0 | -13.3 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2388.893 | 40.7 | -0.1 | 1.0 | 50.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 60.6 | 74.0 | -13.4 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 2483.750 | 40.3 | 0.3 | 1.0 | 266.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 60.6 | 74.0 | -13.4 | High Ch. 2480 MHz, 3DH5 (8DPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2483.593 | 40.2 | 0.3 | 1.0 | 13.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 60.5 | 74.0 | -13.5 | High Ch. 2480 MHz, 2DH5 (pi/4DQPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2388.367 | 40.5 | -0.1 | 1.0 | 100.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.4 | 74.0 | -13.6 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 2388.507 | 40.5 | -0.1 | 1.0 | 249.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.4 | 74.0 | -13.6 | Low Ch. 2402 MHz, 3DH5 (8DPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2389.633 | 40.5 | -0.1 | 1.0 | 116.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.4 | 74.0 | -13.6 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2389.413 | 40.5 | -0.1 | 1.0 | 116.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.4 | 74.0 | -13.6 | Low Ch. 2402 MHz, 2DH5 (pi/4DQPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2389.427 | 40.4 | -0.1 | 1.0 | 31.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.3 | 74.0 | -13.7 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2389.013 | 40.4 | -0.1 | 1.0 | 150.0 | 0.0 | 20.0 | Horz | PK | 0.0 | 60.3 | 74.0 | -13.7 | Low Ch. 2402 MHz, 2DH5 (pi/4DQPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2389.970 | 40.1 | -0.1 | 1.6 | 55.0 | 0.0 | 20.0 | Vert | PK | 0.0 | 60.0 | 74.0 | -14.0 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2483.713 | 29.1 | 0.3 | 1.0 | 344.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.8 | 54.0 | -34.2 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2484.367 | 29.1 | 0.3 | 1.0 | 266.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.8 | 54.0 | -34.2 | High Ch. 2480 MHz, 3DH5 (8DPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2483.617 | 29.0 | 0.3 | 2.0 | 357.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.7 | 54.0 | -34.3 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2484.320 | 29.0 | 0.3 | 1.0 | 114.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.7 | 54.0 | -34.3 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 2483.830 | 29.0 | 0.3 | 1.0 | 13.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.7 | 54.0 | -34.3 | High Ch. 2480 MHz, 2DH5 (pi/4DQPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2483.567 | 29.0 | 0.3 | 2.7 | 187.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.7 | 54.0 | -34.3 | High Ch. 2480 MHz, 3DH5 (8DPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2483.693 | 29.0 | 0.3 | 2.7 | 206.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.7 | 54.0 | -34.3 | High Ch. 2480 MHz, 2DH5 (pi/4DQPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2483.933 | 28.9 | 0.3 | 1.2 | 357.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.6 | 54.0 | -34.4 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 2484.120 | 28.9 | 0.3 | 2.7 | 206.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.6 | 54.0 | -34.4 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2389.357 | 29.2 | -0.1 | 1.0 | 249.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.5 | 54.0 | -34.5 | Low Ch. 2402 MHz, 3DH5 (8DPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2388.940 | 29.1 | -0.1 | 1.0 | 31.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.4 | 54.0 | -34.6 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2389.967 | 29.1 | -0.1 | 1.0 | 116.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.4 | 54.0 | -34.6 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2388.657 | 29.1 | -0.1 | 1.0 | 116.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.4 | 54.0 | -34.6 | Low Ch. 2402 MHz, 2DH5 (pi/4DQPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 2388.847 | 29.0 | -0.1 | 1.6 | 55.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.3 | 54.0 | -34.7 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2389.573 | 29.0 | -0.1 | 1.0 | 100.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.3 | 54.0 | -34.7 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 2389.970 | 29.0 | -0.1 | 1.0 | 50.0 | -30.7 | 20.0 | Vert | AV | 1.1 | 19.3 | 54.0 | -34.7 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 2388.710 | 29.0 | -0.1 | 1.0 | 150.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.3 | 54.0 | -34.7 | Low Ch. 2402 MHz, 2DH5 (pi/4DQPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 2389.327 | 29.0 | -0.1 | 1.0 | 116.0 | -30.7 | 20.0 | Horz | AV | 1.1 | 19.3 | 54.0 | -34.7 | Low Ch. 2402 MHz, 3DH5 (8DPSK), EUT Horizontal, Sink Ant, Antenna Horz. |

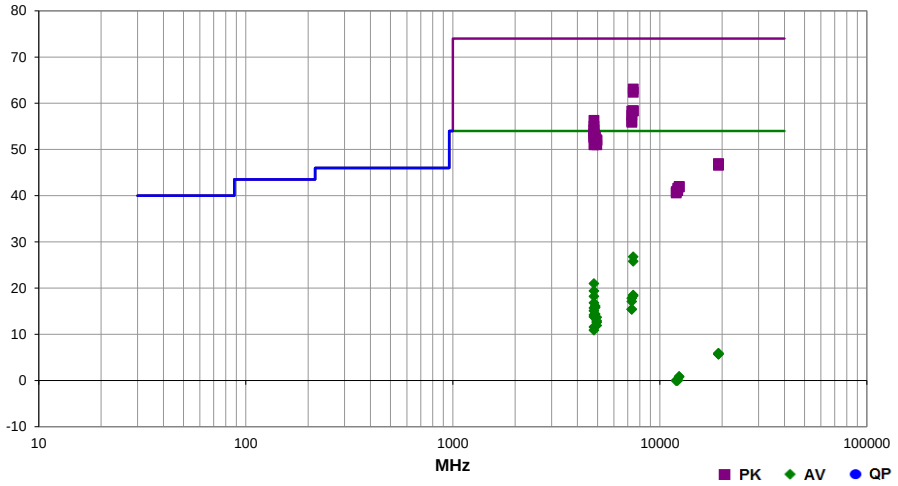
# SPURIOUS RADIATED EMISSIONS

EmiRS 2017.01.25 PSA-ESCI 2017.01.26

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | AUDI0246 | **Date:** | 07/05/17 | | |
| **Project:** | None | **Temperature:** | 23.3 °C | | |
| **Job Site:** | EV01 | **Humidity:** | 40.9% RH | | |
| **Serial Number:** | APX2-28804 | **Barometric Pres.:** | 1021 mbar | **Tested by:** | Jeff Alcoke and Rod Peloquin |
| **EUT:** | APx 525D2 | | | | |
| **Configuration:** | 2 and 5 | | | | |
| **Customer:** | Audio Precision | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Bluetooth continuous Tx | | | | |
| **Deviations:** | I/O ports populated per customer direction | | | | |
| **Comments:** | BR and EDR Power settings [(Ext),(Int)]= [255,63]. See comments below for Channel, Frequency, Modulation, Antenna Port and Antenna Orientation. | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 15.247:2017 | ANSI C63.10:2013 |

| Run # | 27 | Test Distance (m) | 3 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | FHSS Duty Cycle (dB) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Carrier Duty Cycle (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7440.325 | 43.7 | 19.4 | 1.9 | 360.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 63.1 | 74.0 | -10.9 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 7440.533 | 43.0 | 19.4 | 1.0 | 67.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 62.4 | 74.0 | -11.6 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 7439.608 | 39.0 | 19.4 | 2.9 | 45.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 58.4 | 74.0 | -15.6 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 7439.475 | 38.9 | 19.4 | 1.0 | 307.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 58.3 | 74.0 | -15.7 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 7320.783 | 39.5 | 18.8 | 2.1 | 59.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 58.3 | 74.0 | -15.7 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 7320.267 | 38.6 | 18.8 | 3.8 | 11.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 57.4 | 74.0 | -16.6 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4803.675 | 45.7 | 10.6 | 2.0 | 25.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 56.3 | 74.0 | -17.7 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 7317.842 | 37.3 | 18.8 | 1.5 | 60.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 56.1 | 74.0 | -17.9 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 7320.320 | 37.1 | 18.8 | 1.0 | 282.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 55.9 | 74.0 | -18.1 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4804.100 | 44.5 | 10.6 | 2.1 | 25.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 55.1 | 74.0 | -18.9 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4803.875 | 43.6 | 10.6 | 2.1 | 14.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 54.2 | 74.0 | -19.8 | Low Ch. 2402 MHz, 2DH5 (pi/4-DQPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4804.167 | 43.6 | 10.6 | 1.0 | 328.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 54.2 | 74.0 | -19.8 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 4804.358 | 42.8 | 10.6 | 1.0 | 25.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 53.4 | 74.0 | -20.6 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 4804.180 | 42.7 | 10.6 | 2.1 | 28.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 53.3 | 74.0 | -20.7 | Low Ch. 2402 MHz, 2DH5 (8DPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4804.383 | 42.5 | 10.6 | 2.5 | 53.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 53.1 | 74.0 | -20.9 | Low Ch. 2402 MHz, 2DH5 (pi/4-DQPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4879.905 | 42.1 | 10.8 | 2.1 | 360.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 52.9 | 74.0 | -21.1 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4804.492 | 42.2 | 10.6 | 2.5 | 53.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 52.8 | 74.0 | -21.2 | Low Ch. 2402 MHz, 2DH5 (8DPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4880.292 | 41.8 | 10.8 | 2.1 | 0.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 52.6 | 74.0 | -21.4 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4803.700 | 41.9 | 10.6 | 2.0 | 27.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 52.5 | 74.0 | -21.5 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 4880.008 | 41.4 | 10.8 | 1.9 | 332.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 52.2 | 74.0 | -21.8 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 4960.075 | 41.1 | 11.0 | 2.3 | 34.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 52.1 | 74.0 | -21.9 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4960.258 | 41.0 | 11.0 | 1.8 | 359.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 52.0 | 74.0 | -22.0 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4960.000 | 40.9 | 11.0 | 1.0 | 328.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 51.9 | 74.0 | -22.1 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 4879.675 | 40.9 | 10.8 | 1.0 | 21.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 51.7 | 74.0 | -22.3 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 4804.425 | 40.4 | 10.6 | 2.3 | 319.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 51.0 | 74.0 | -23.0 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4960.167 | 40.0 | 11.0 | 1.0 | 0.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 51.0 | 74.0 | -23.0 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 19217.350 | 45.9 | 1.0 | 1.8 | 328.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 46.9 | 74.0 | -27.1 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 19214.760 | 45.9 | 1.0 | 1.8 | 147.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 46.9 | 74.0 | -27.1 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 19214.250 | 45.7 | 1.0 | 1.8 | 0.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 46.7 | 74.0 | -27.3 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 19214.600 | 45.6 | 1.0 | 1.8 | 61.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 46.6 | 74.0 | -27.4 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 7439.767 | 37.0 | 19.4 | 1.9 | 360.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 26.8 | 54.0 | -27.2 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 7439.758 | 36.0 | 19.4 | 1.0 | 67.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 25.8 | 54.0 | -28.2 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 12398.760 | 38.1 | 3.9 | 1.2 | 64.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 42.0 | 74.0 | -32.0 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 12398.750 | 38.0 | 3.9 | 1.0 | 43.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 41.9 | 74.0 | -32.1 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 12199.410 | 38.3 | 3.3 | 1.1 | 284.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 41.6 | 74.0 | -32.4 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 12199.130 | 37.8 | 3.3 | 1.0 | 218.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 41.1 | 74.0 | -32.9 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 12007.680 | 37.7 | 3.2 | 1.0 | 170.0 | 0.0 | 0.0 | Horz | PK | 0.0 | 40.9 | 74.0 | -33.1 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 12009.710 | 37.4 | 3.2 | 1.0 | 232.0 | 0.0 | 0.0 | Vert | PK | 0.0 | 40.6 | 74.0 | -33.4 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 4804.000 | 40.0 | 10.6 | 2.0 | 25.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 21.0 | 54.0 | -33.0 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4804.000 | 38.4 | 10.6 | 2.1 | 25.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 19.4 | 54.0 | -34.6 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 7439.675 | 28.7 | 19.4 | 1.0 | 307.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 18.5 | 54.0 | -35.5 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 7439.725 | 28.5 | 19.4 | 2.9 | 45.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 18.3 | 54.0 | -35.7 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4803.983 | 37.2 | 10.6 | 1.0 | 328.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 18.2 | 54.0 | -35.8 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 7319.733 | 28.6 | 18.8 | 2.1 | 59.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 17.8 | 54.0 | -36.2 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 7319.825 | 27.9 | 18.8 | 3.8 | 11.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 17.1 | 54.0 | -36.9 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4803.992 | 35.8 | 10.6 | 1.0 | 25.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 16.8 | 54.0 | -37.2 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 4880.020 | 34.9 | 10.8 | 2.1 | 360.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 16.1 | 54.0 | -37.9 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4879.908 | 34.6 | 10.8 | 2.1 | 0.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 15.8 | 54.0 | -38.2 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | FHSS Duty Cycle (dB) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Carrier Duty Cycle (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4804.067 | 34.7 | 10.6 | 2.1 | 14.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 15.7 | 54.0 | -38.3 | Low Ch. 2402 MHz, 2DH5 (pi/4-DQPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 7319.835 | 26.2 | 18.8 | 1.0 | 282.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 15.4 | 54.0 | -38.6 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 7320.067 | 26.2 | 18.8 | 1.5 | 60.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 15.4 | 54.0 | -38.6 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 4803.995 | 34.1 | 10.6 | 2.1 | 28.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 15.1 | 54.0 | -38.9 | Low Ch. 2402 MHz, 2DH5 (8DPSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4879.900 | 33.2 | 10.8 | 1.9 | 332.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 14.4 | 54.0 | -39.6 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 4804.125 | 33.2 | 10.6 | 2.5 | 53.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 14.2 | 54.0 | -39.8 | Low Ch. 2402 MHz, 2DH5 (pi/4-DQPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4804.008 | 32.8 | 10.6 | 2.5 | 53.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 13.8 | 54.0 | -40.2 | Low Ch. 2402 MHz, 2DH5 (8DPSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4960.033 | 32.3 | 11.0 | 2.3 | 34.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 13.7 | 54.0 | -40.3 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 4880.025 | 32.4 | 10.8 | 1.0 | 21.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 13.6 | 54.0 | -40.4 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 4959.992 | 31.5 | 11.0 | 1.0 | 328.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 12.9 | 54.0 | -41.1 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 4959.992 | 31.2 | 11.0 | 1.8 | 359.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 12.6 | 54.0 | -41.4 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4959.917 | 30.5 | 11.0 | 1.0 | 0.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 11.9 | 54.0 | -42.1 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 4804.042 | 30.6 | 10.6 | 2.3 | 319.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 11.6 | 54.0 | -42.4 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 4803.933 | 29.9 | 10.6 | 2.0 | 27.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 10.9 | 54.0 | -43.1 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 19215.330 | 34.5 | 1.0 | 1.8 | 61.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 5.9 | 54.0 | -48.1 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 19214.740 | 34.5 | 1.0 | 1.8 | 328.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 5.9 | 54.0 | -48.1 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Vert. |
| 19214.120 | 34.3 | 1.0 | 1.8 | 0.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 5.7 | 54.0 | -48.3 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 19215.830 | 34.3 | 1.0 | 1.8 | 147.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 5.7 | 54.0 | -48.3 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Sink Ant, Antenna Horz. |
| 12399.110 | 26.6 | 3.9 | 1.2 | 64.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 0.9 | 54.0 | -53.1 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 12399.380 | 26.5 | 3.9 | 1.0 | 43.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 0.8 | 54.0 | -53.2 | High Ch. 2480 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 12199.090 | 26.4 | 3.3 | 1.1 | 284.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 0.1 | 54.0 | -53.9 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 12009.510 | 26.4 | 3.2 | 1.0 | 170.0 | -30.7 | 0.0 | Horz | AV | 1.1 | 0.0 | 54.0 | -54.0 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Horz. |
| 12009.610 | 26.4 | 3.2 | 1.0 | 232.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 0.0 | 54.0 | -54.0 | Low Ch. 2402 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |
| 12198.220 | 26.3 | 3.3 | 1.0 | 218.0 | -30.7 | 0.0 | Vert | AV | 1.1 | 0.0 | 54.0 | -54.0 | Mid Ch. 2440 MHz, DH5 (GFSK), EUT Horizontal, Source Ant, Antenna Vert. |

# DUTY CYCLE

XMit 2017.02.08

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. | Cal. Due |
|---|---|---|---|---|---|
| Generator - Signal | Keysight | N5182B | TFU | 10/27/2015 | 10/27/2018 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 6/5/2017 | 6/5/2018 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 5/30/2017 | 5/30/2018 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVH | 5/30/2017 | 5/30/2018 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFP | 8/10/2016 | 8/10/2017 |

**TEST DESCRIPTION**

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

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.

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 may have been used during some of the other tests in this report to only take the measurement during the burst duration.

# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| | | | |
|---|---|---|---|
| **EUT:** | **APx 525D2** | **Work Order:** | **AUDI0246** |
| **Serial Number:** | **APX2-28804** | **Date:** | **07/05/17** |
| **Customer:** | **Audio Precision** | **Temperature:** | **23.2 °C** |
| **Attendees:** | **None** | **Humidity:** | **44.9% RH** |
| **Project:** | **None** | **Barometric Pres.:** | **1017 mbar** |
| **Tested by:** | **Jeff Alcoke and Rod Peloquin** | **Power:** **110VAC/60Hz** | **Job Site:** **EV06** |

| **TEST SPECIFICATIONS** | **Test Method** |
|---|---|
| **FCC 15.247:2017** | ANSI C63.10:2013 |

**COMMENTS**

**BR and EDR Power settings [(Ext),(Int)]= [255,63]. Measurments were taken on the Source only. Source was shown to have highest output power.**

**DEVIATIONS FROM TEST STANDARD**

**None**

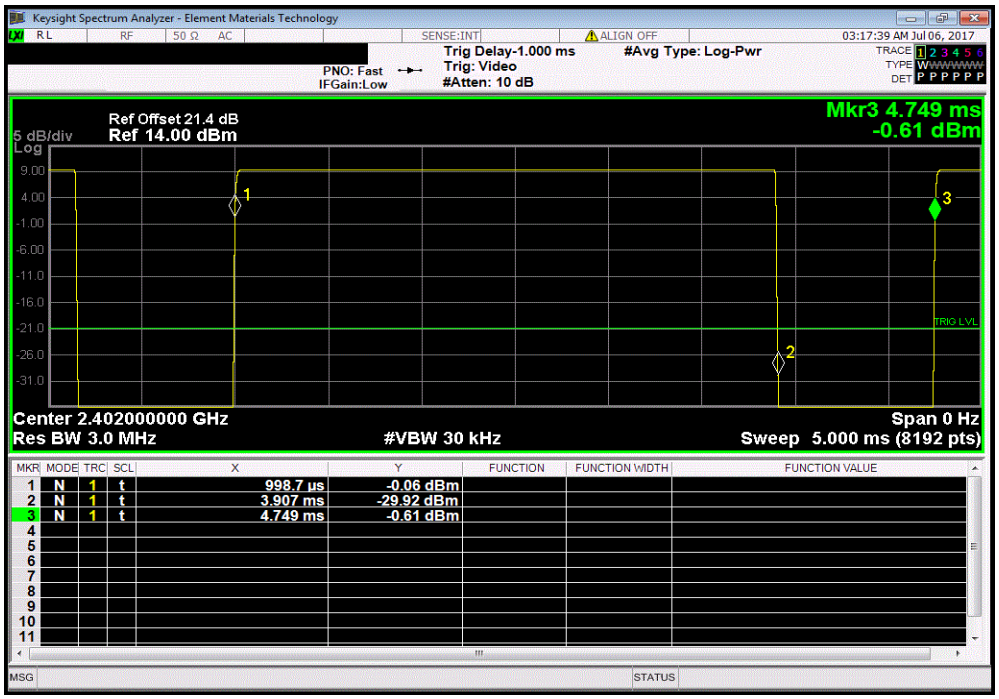
| **Configuration #** | **1** | *Signature* |
|---|---|---|

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|---|---|---|---|---|---|---|
| Source | | | | | | |
| DH5, GFSK | | | | | | |
| Low Channel, 2402 MHz | 2.909 ms | 3.75 ms | 1 | 77.6 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2440 MHz | 2.908 ms | 3.75 ms | 1 | 77.5 | N/A | N/A |
| Mid Channel, 2440 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 2.908 ms | 3.75 ms | 1 | 77.6 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| 2DH5, pi/4-DQPSK | | | | | | |
| Low Channel, 2402 MHz | 2.919 ms | 3.75 ms | 1 | 77.8 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2440 MHz | 2.919 ms | 3.75 ms | 1 | 77.8 | N/A | N/A |
| Mid Channel, 2440 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 2.918 ms | 3.75 ms | 1 | 77.8 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| 3DH5, 8-DPSK | | | | | | |
| Low Channel, 2402 MHz | 2.92 ms | 3.75 ms | 1 | 77.9 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2440 MHz | 2.92 ms | 3.75 ms | 1 | 77.9 | N/A | N/A |
| Mid Channel, 2440 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 2.92 ms | 3.75 ms | 1 | 77.9 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |

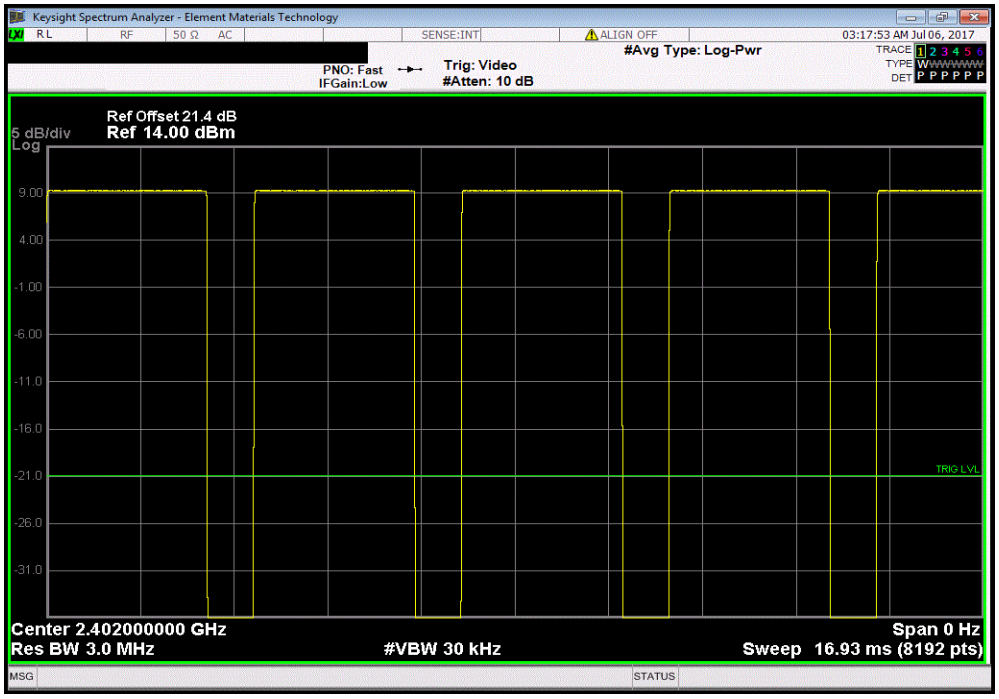
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, DH5, GFSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.909 ms | 3.75 ms | 1 | 77.6 | N/A | N/A |



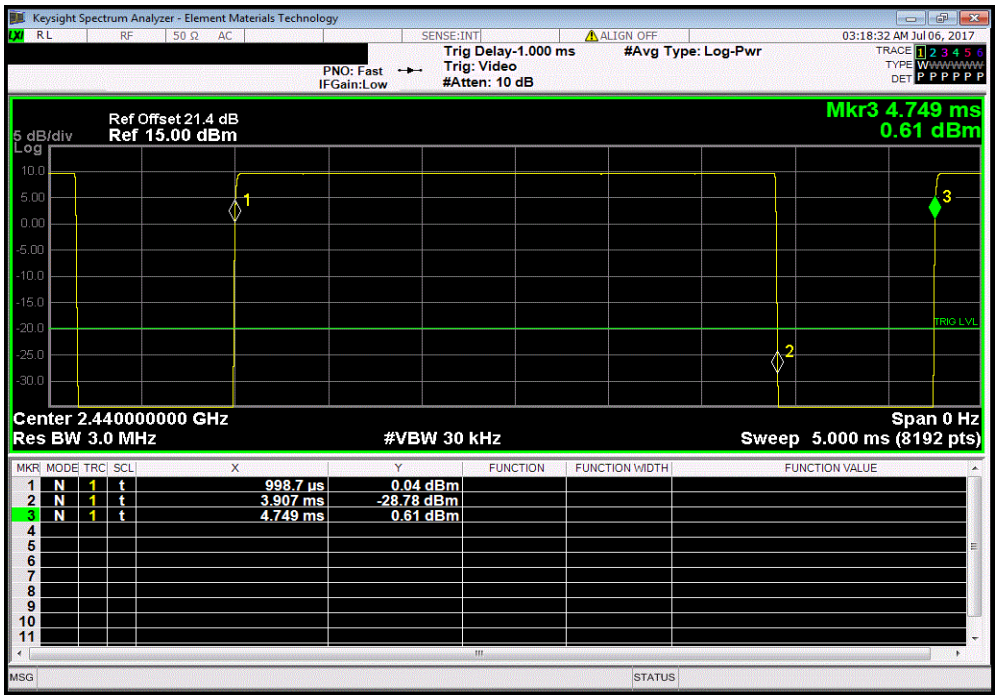

| Source, DH5, GFSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



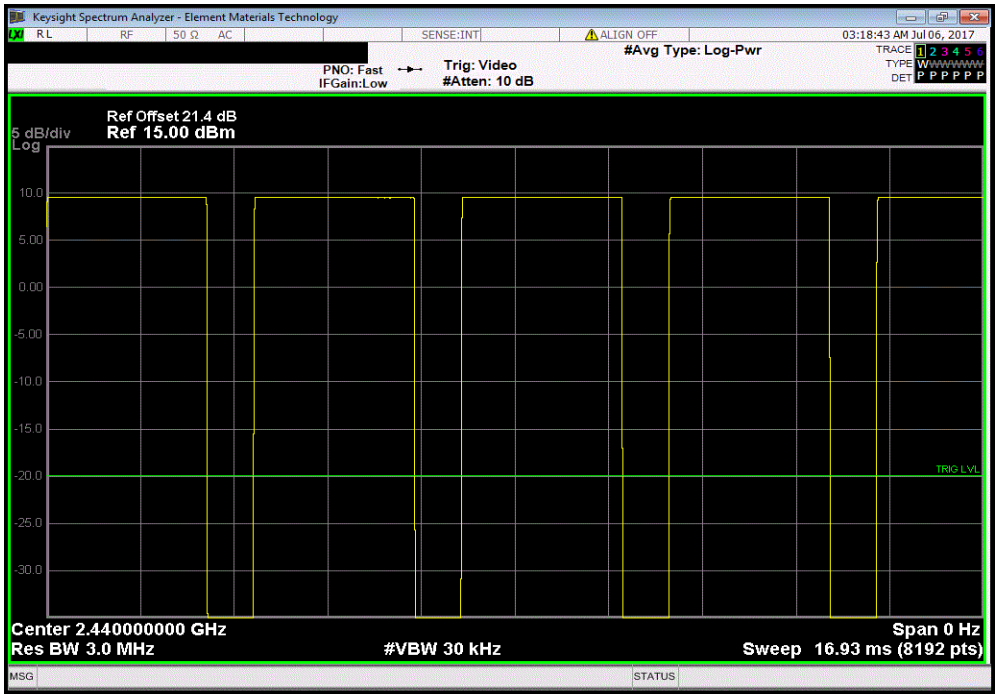
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, DH5, GFSK, Mid Channel, 2440 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.908 ms | 3.75 ms | 1 | 77.5 | N/A | N/A |



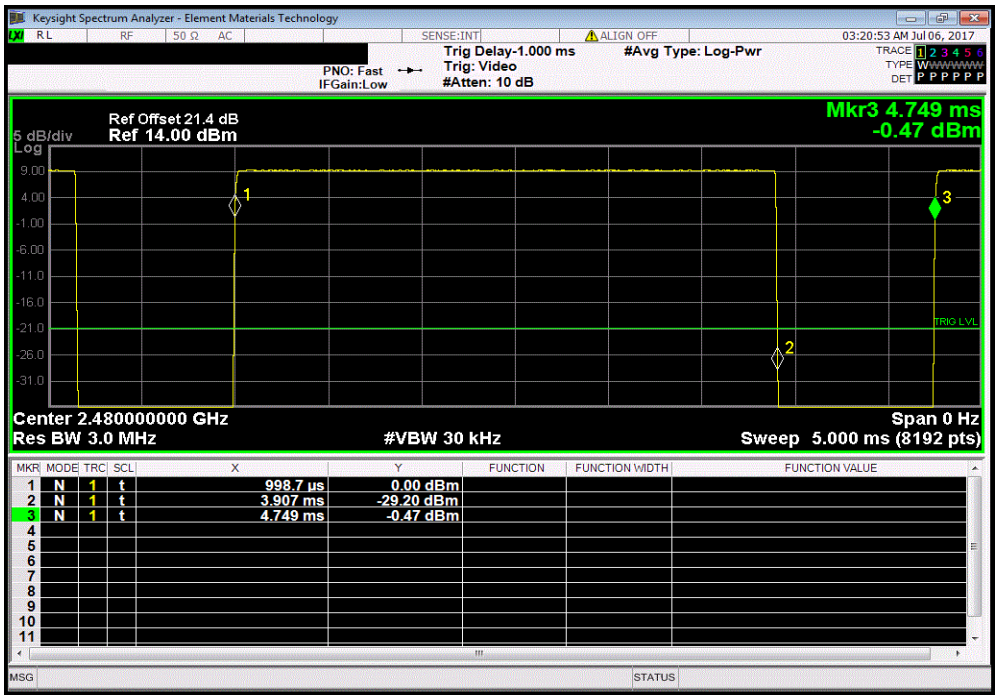

| Source, DH5, GFSK, Mid Channel, 2440 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



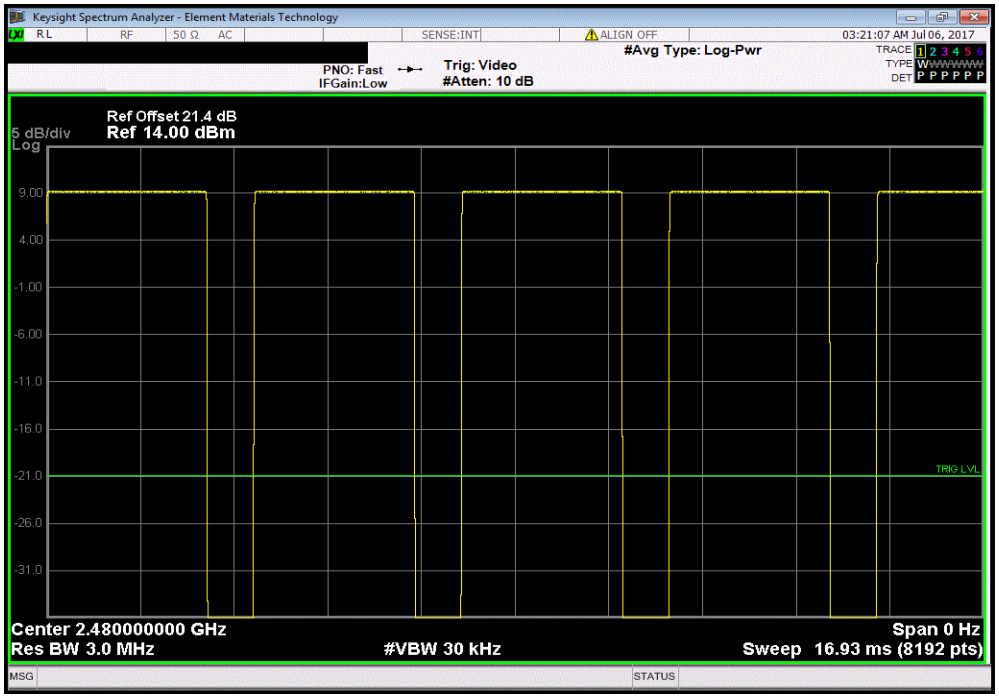
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, DH5, GFSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.908 ms | 3.75 ms | 1 | 77.6 | N/A | N/A |



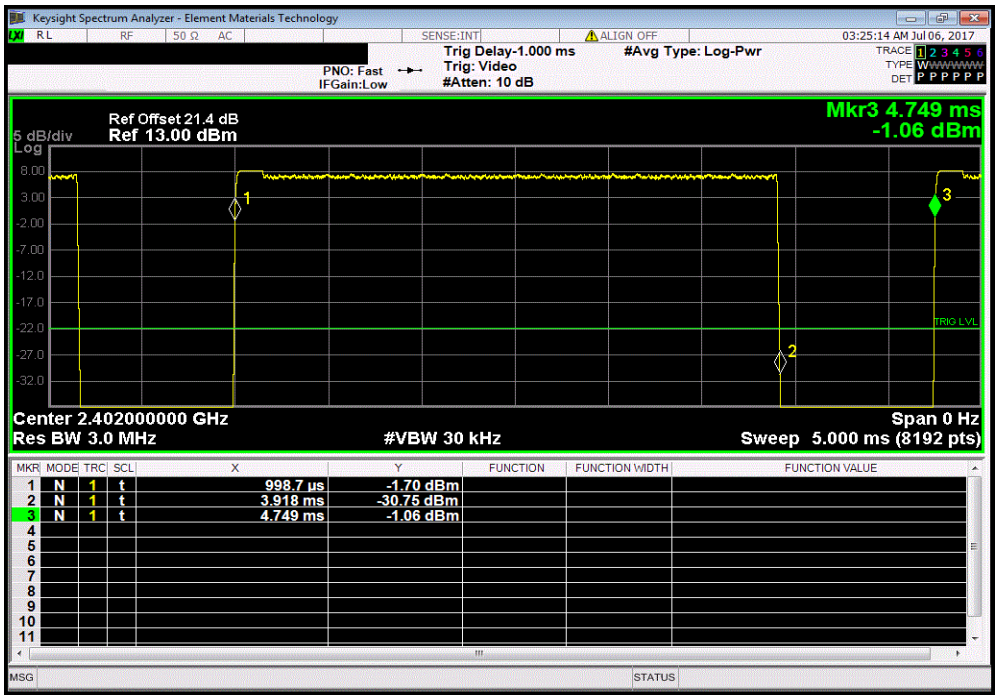

| Source, DH5, GFSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



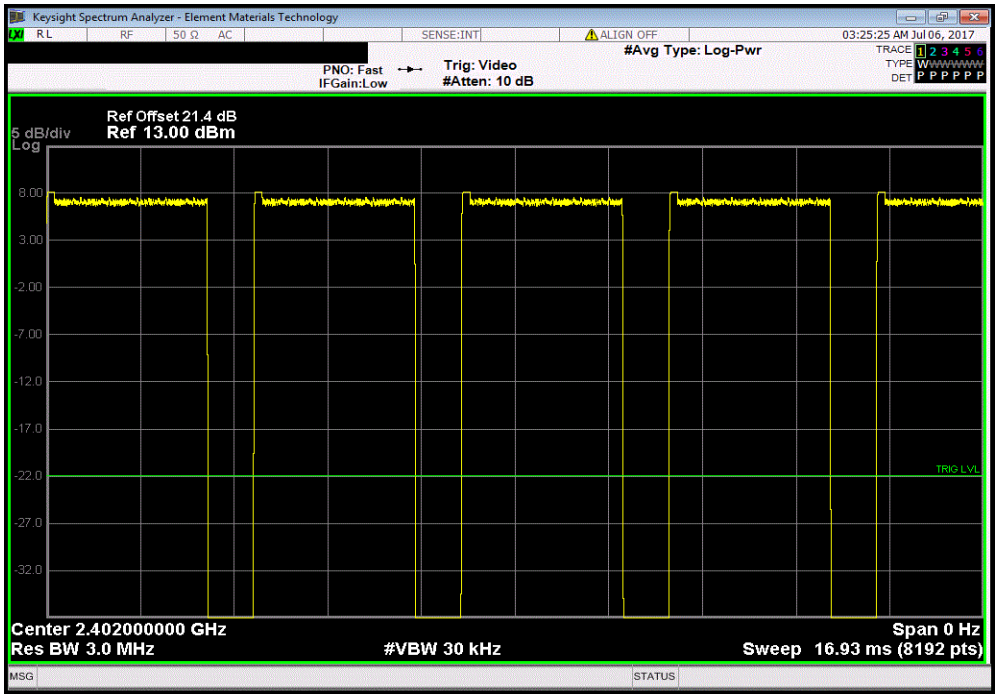
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, 2DH5, pi/4-DQPSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.919 ms | 3.75 ms | 1 | 77.8 | N/A | N/A |



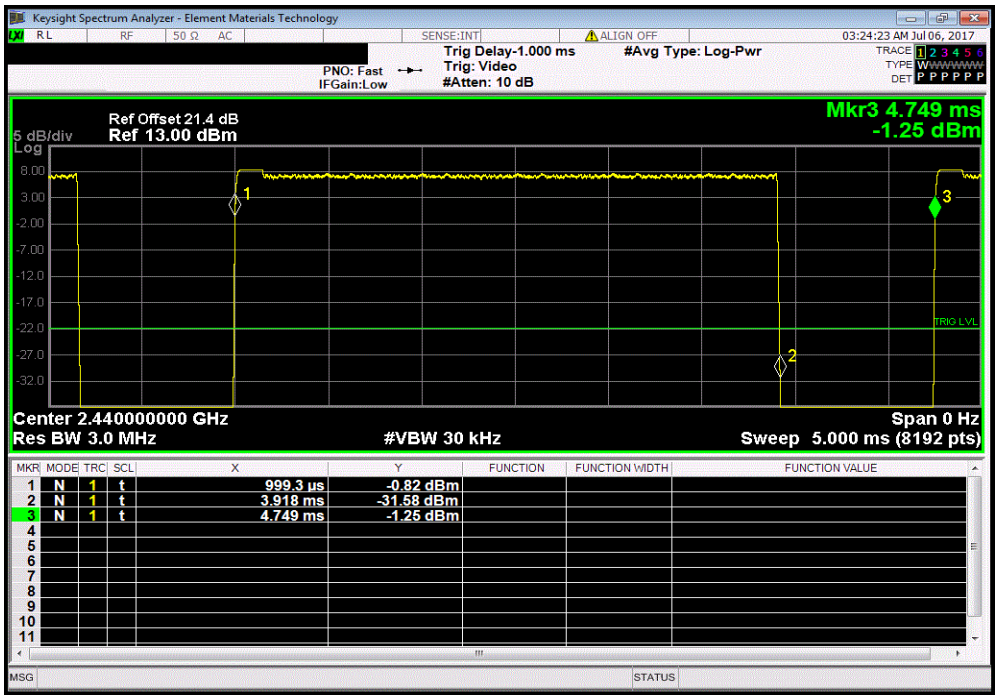

| Source, 2DH5, pi/4-DQPSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



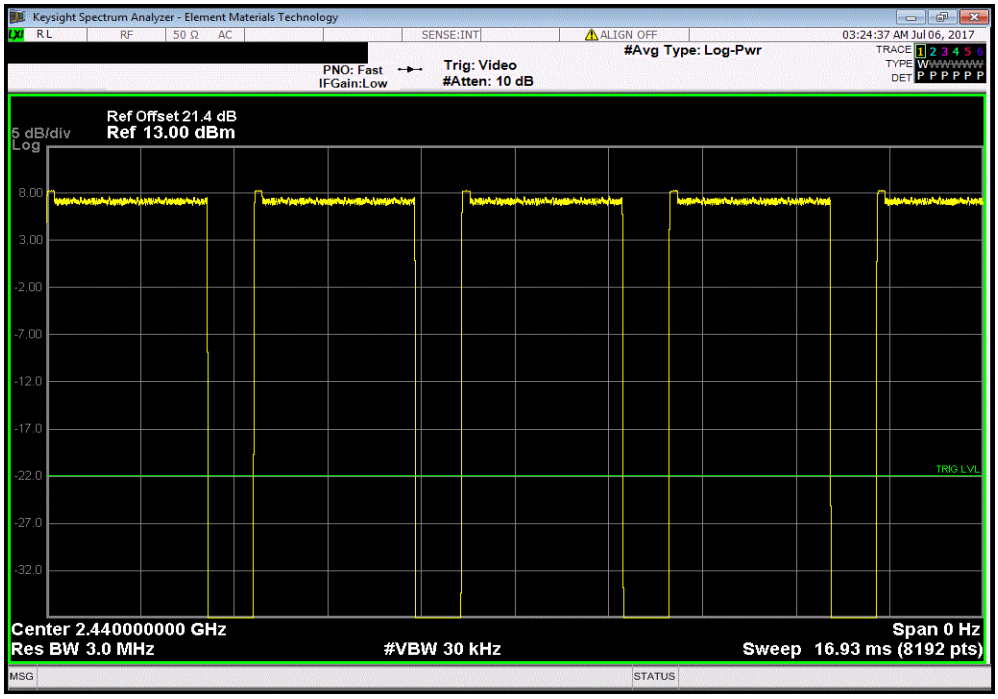
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.919 ms | 3.75 ms | 1 | 77.8 | N/A | N/A |



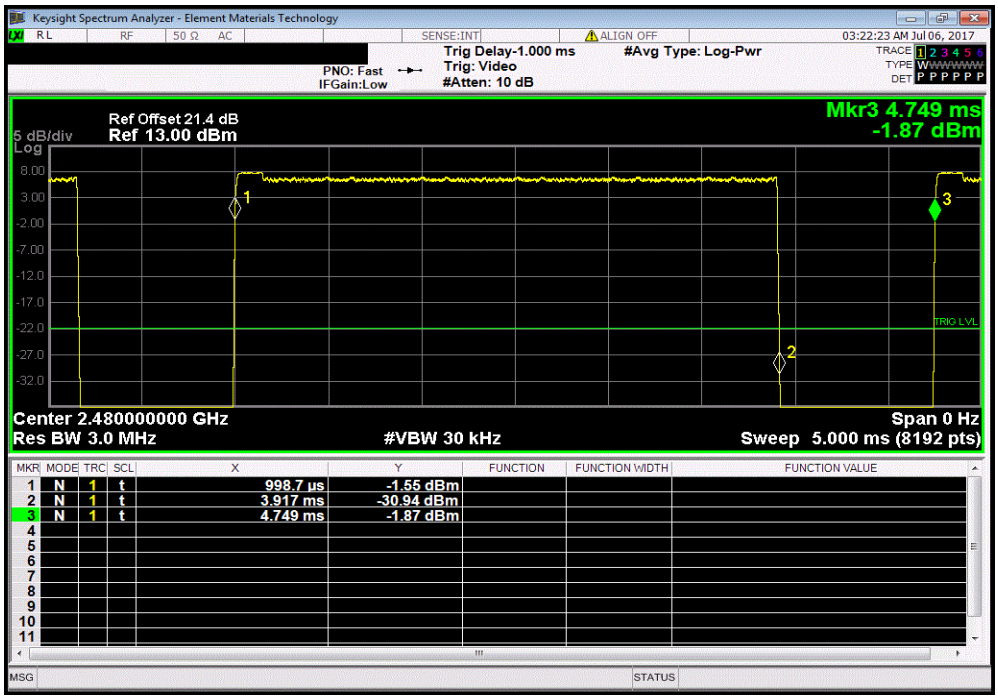

| Source, 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



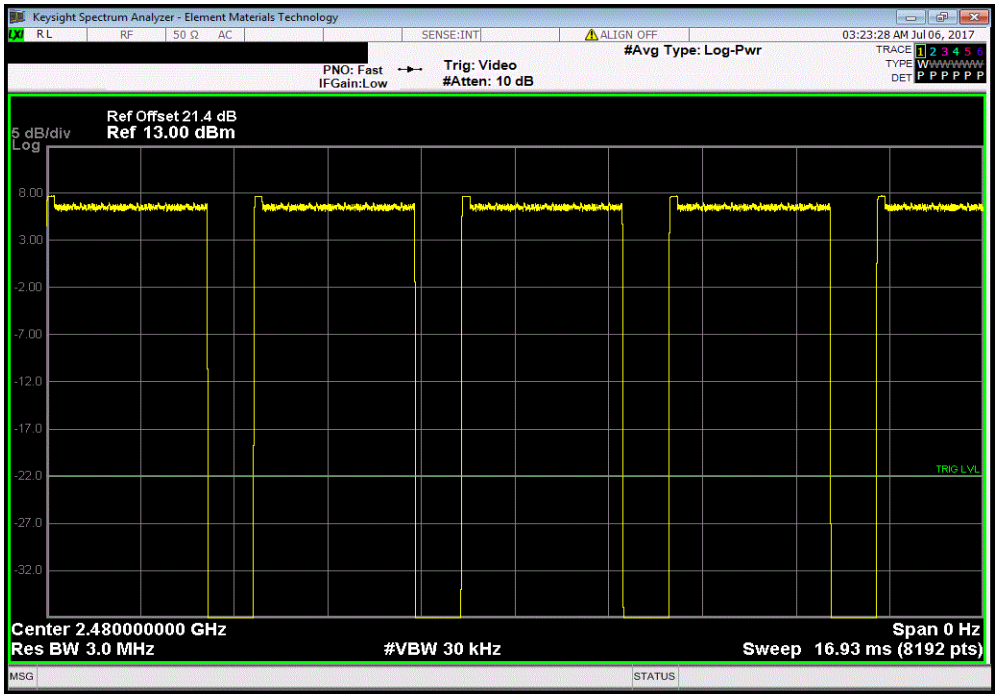
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, 2DH5, pi/4-DQPSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.918 ms | 3.75 ms | 1 | 77.8 | N/A | N/A |



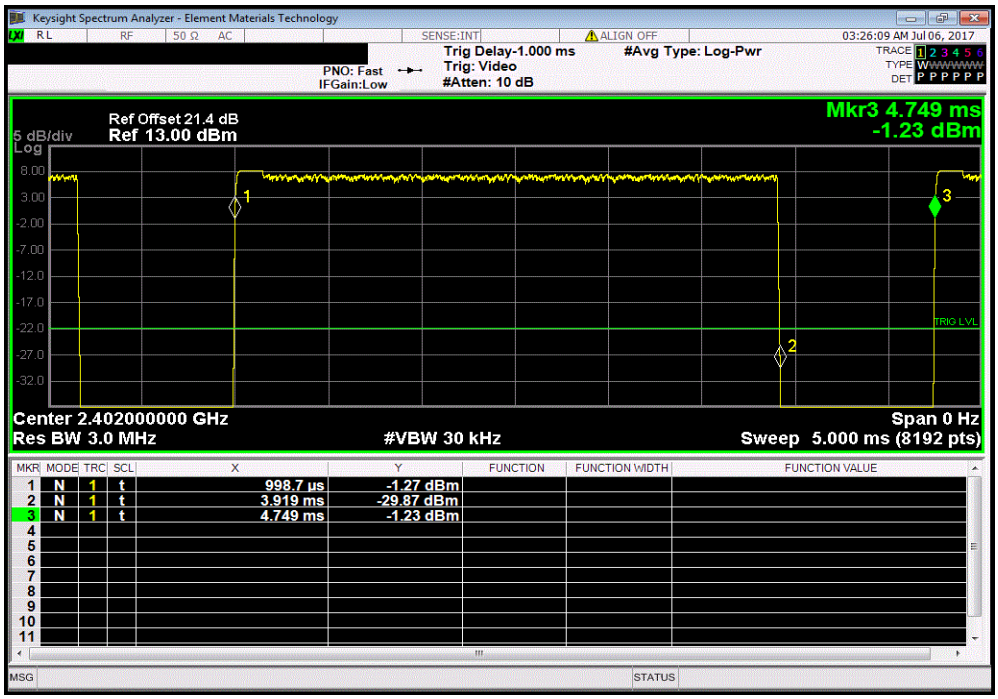

| Source, 2DH5, pi/4-DQPSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



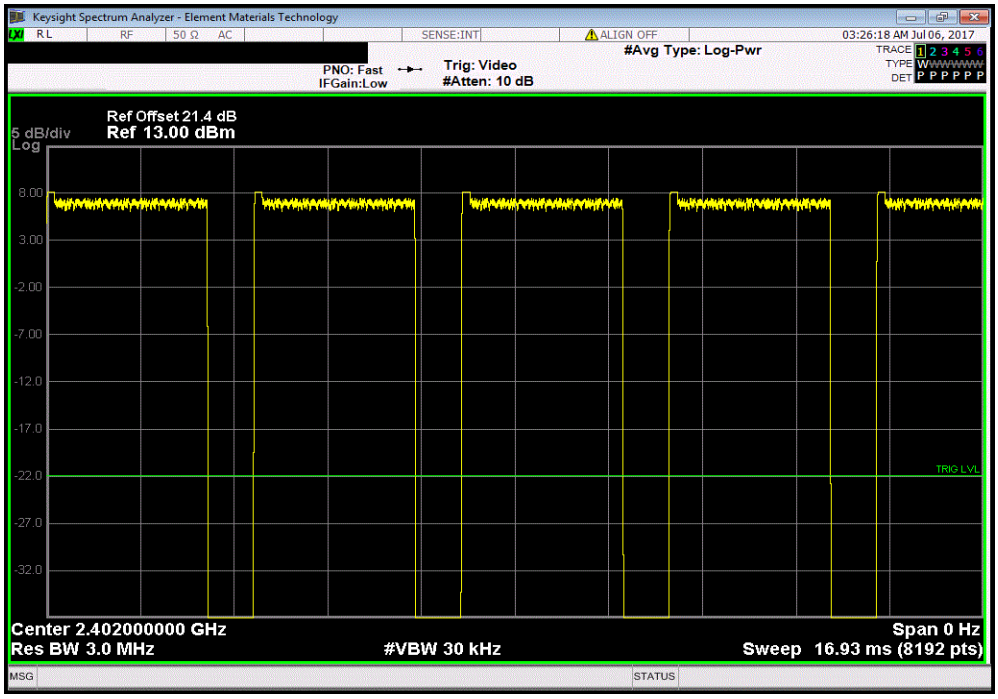
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, 3DH5, 8-DPSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.92 ms | 3.75 ms | 1 | 77.9 | N/A | N/A |



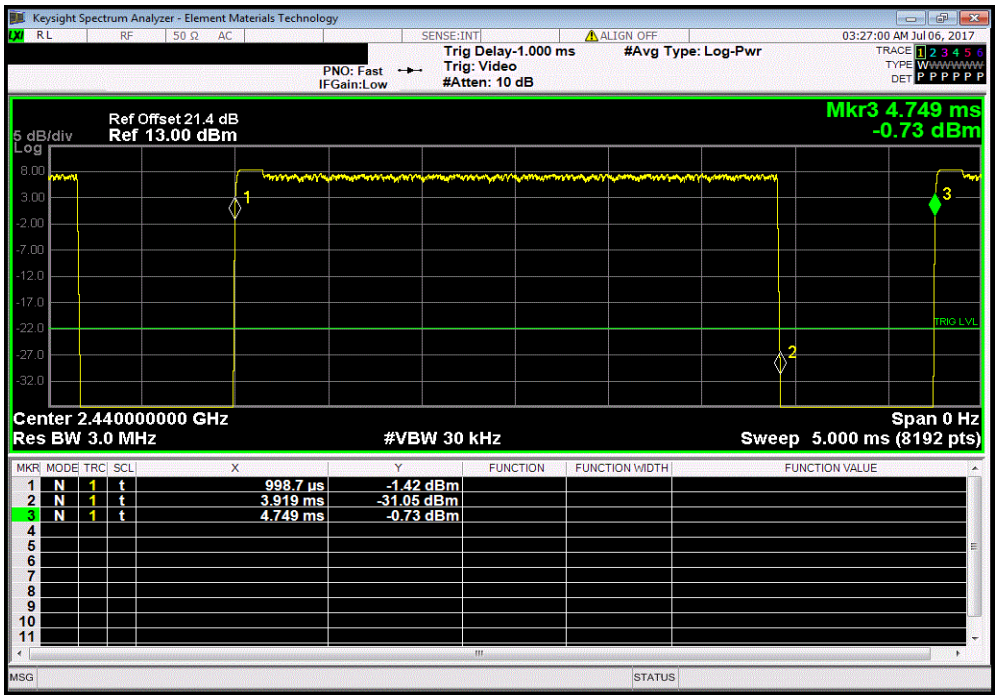

| Source, 3DH5, 8-DPSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



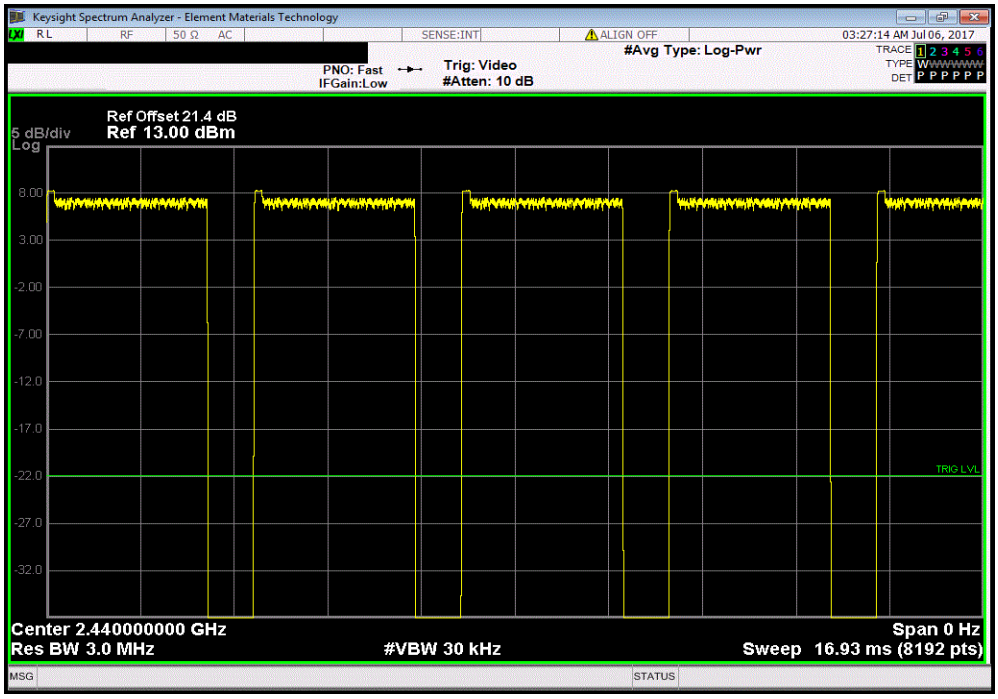
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, 3DH5, 8-DPSK, Mid Channel, 2440 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.92 ms | 3.75 ms | 1 | 77.9 | N/A | N/A |



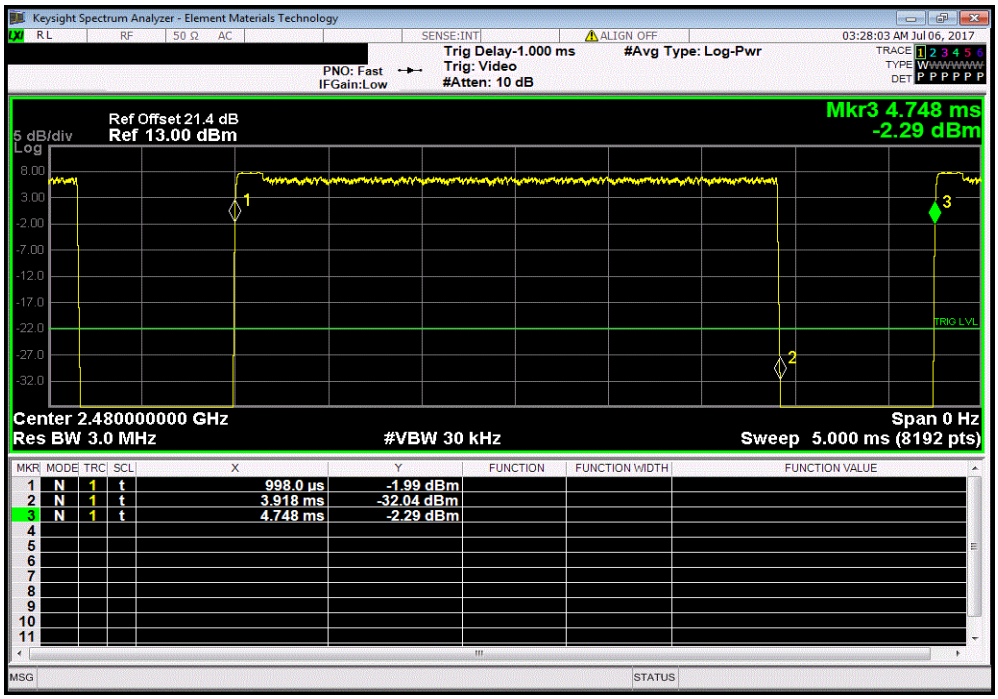

| Source, 3DH5, 8-DPSK, Mid Channel, 2440 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



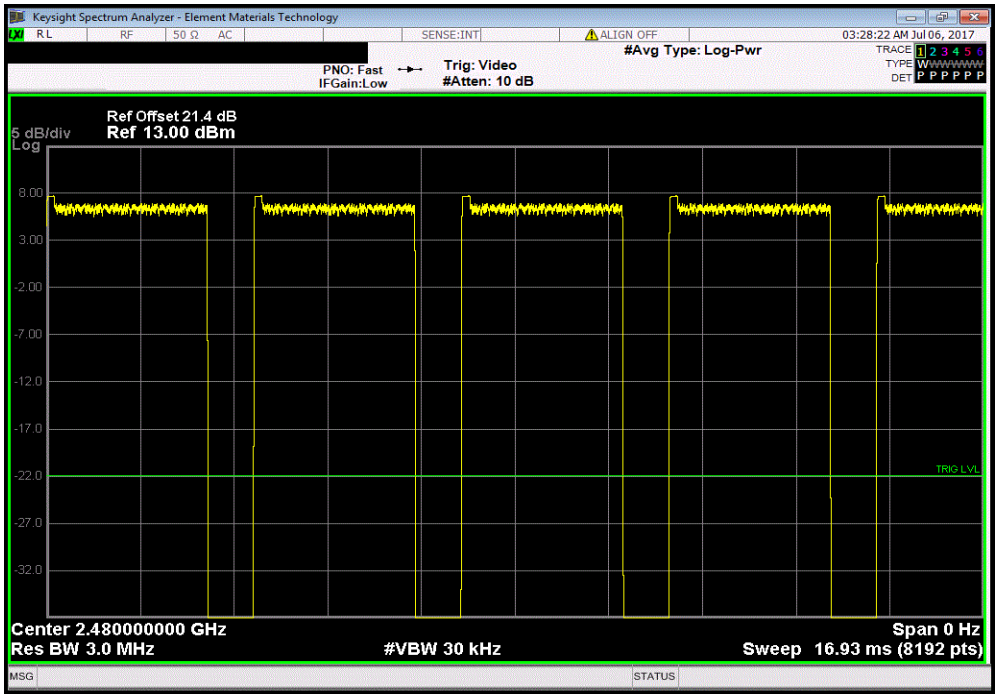
# DUTY CYCLE

TbtTx 2017.04.18 XMit 2017.02.08

| Source, 3DH5, 8-DPSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 2.92 ms | 3.75 ms | 1 | 77.9 | N/A | N/A |




| Source, 3DH5, 8-DPSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



# CARRIER FREQUENCY SEPARATION

XMit 2017.02.08

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. | Cal. Due |
|---|---|---|---|---|---|
| Generator - Signal | Keysight | N5182B | TFU | 10/27/2015 | 10/27/2018 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 6/5/2017 | 6/5/2018 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 5/30/2017 | 5/30/2018 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVH | 5/30/2017 | 5/30/2018 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFP | 8/10/2016 | 8/10/2017 |

**TEST DESCRIPTION**

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. 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.

# CARRIER FREQUENCY SEPARATION

TbtTx 2017.04.18 XMit 2017.02.08

| | | | |
|---|---|---|---|
| **EUT:** | **APx 525D2** | **Work Order:** | **AUDI0246** |
| **Serial Number:** | **APX2-28804** | **Date:** | **07/05/17** |
| **Customer:** | **Audio Precision** | **Temperature:** | **23.3 °C** |
| **Attendees:** | **None** | **Humidity:** | **45.2% RH** |
| **Project:** | **None** | **Barometric Pres.:** | **1017 mbar** |
| **Tested by:** | **Jeff Alcoke and Rod Peloquin** | **Power:** **110VAC/60Hz** | **Job Site:** **EV06** |

| **TEST SPECIFICATIONS** | **Test Method** |
|---|---|
| **FCC 15.247:2017** | ANSI C63.10:2013 |

**COMMENTS**

**BR and EDR Power settings [(Ext),(Int)]= [255,63]. Measurments were taken on the Source only. Source was shown to have highest output power.**

**DEVIATIONS FROM TEST STANDARD**

**None**

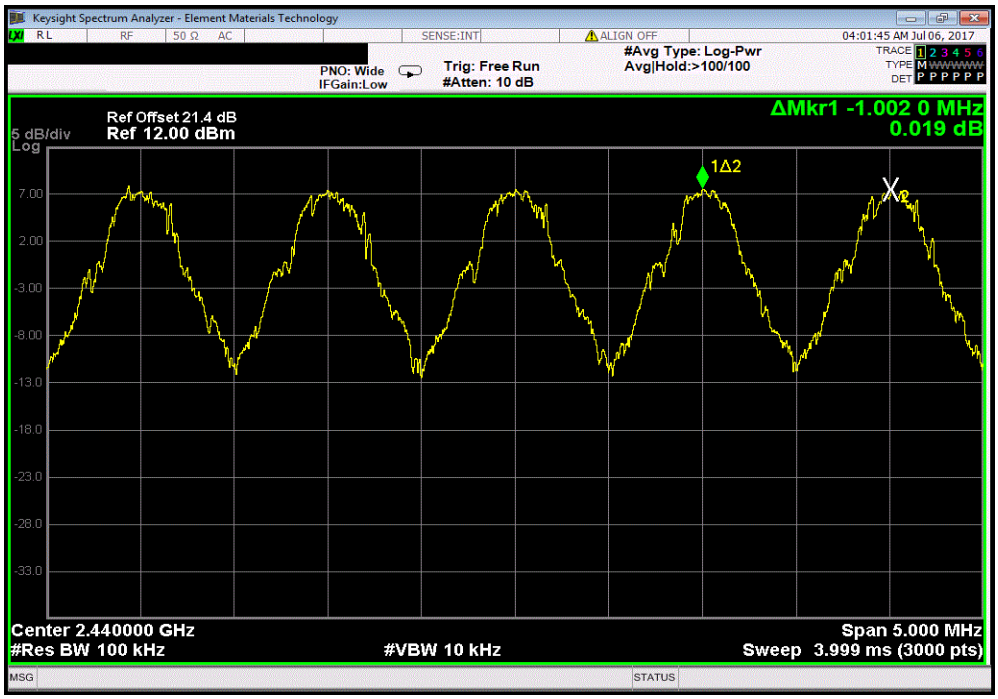
| **Configuration #** | **1** | *Signature* |
|---|---|---|

| | **Value** | **Limit (≥)** | **Results** |
|---|---|---|---|
| Source | | | |
| Hopping | | | |
| DH5, GFSK | | | |
| Mid Channel | 1.0 MHz | 1 MHz | Pass |

# CARRIER FREQUENCY SEPARATION

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit (≥) | Results |
| | | | | 1.0 MHz | 1 MHz | Pass |



# NUMBER OF HOPPING FREQUENCIES

XMit 2017.02.08

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. | Cal. Due |
|---|---|---|---|---|---|
| Generator - Signal | Keysight | N5182B | TFU | 10/27/2015 | 10/27/2018 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 6/5/2017 | 6/5/2018 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 5/30/2017 | 5/30/2018 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVH | 5/30/2017 | 5/30/2018 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFP | 8/10/2016 | 8/10/2017 |

**TEST DESCRIPTION**

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

# NUMBER OF HOPPING FREQUENCIES

TbtTx 2017.04.18 XMit 2017.02.08

| | | | |
|---|---|---|---|
| EUT: | APx 525D2 | Work Order: | AUDI0246 |
| Serial Number: | APX2-28804 | Date: | 07/05/17 |
| Customer: | Audio Precision | Temperature: | 23.4 °C |
| Attendees: | None | Humidity: | 45.3% RH |
| Project: | None | Barometric Pres.: | 1017 mbar |
| Tested by: | Jeff Alcoke and Rod Peloquin | Power: 110VAC/60Hz | Job Site: EV06 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2017 | ANSI C63.10:2013 |

**COMMENTS**

BR and EDR Power settings [(Ext),(Int)]= [255,63]. Measurments were taken on the Source only. Source was shown to have highest output power.

**DEVIATIONS FROM TEST STANDARD**

None

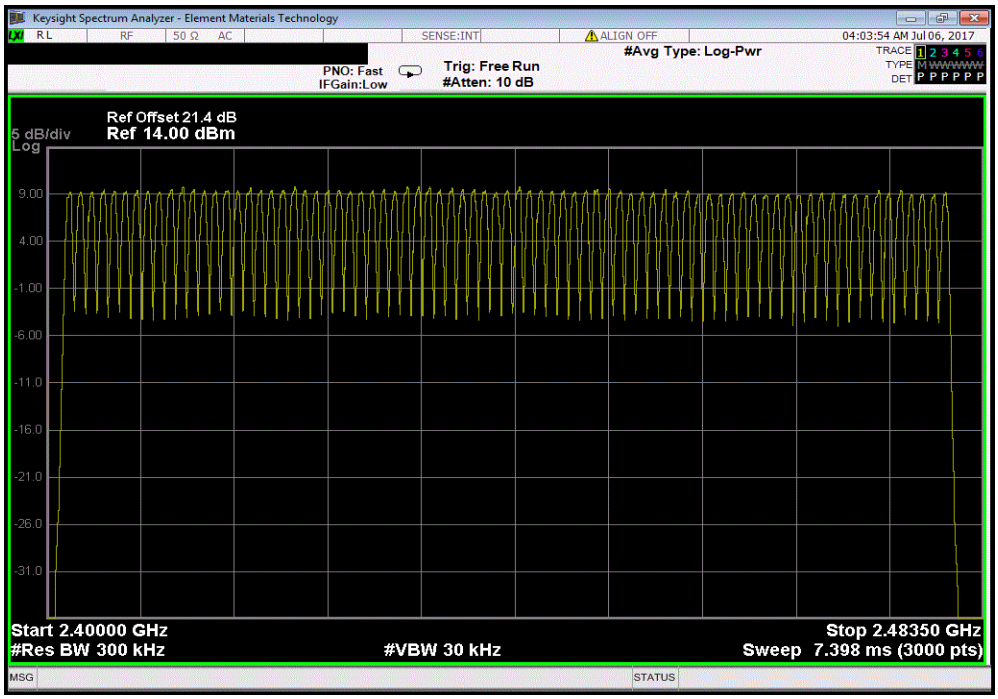
| Configuration # | 1 | Signature |
|---|---|---|

| | Number of Channels | Limit (≥) | Results |
|---|---|---|---|
| Source | | | |
| Hopping | | | |
| DH5, GFSK | | | |
| Mid Channel | 79 | 15 | Pass |

# NUMBER OF HOPPING FREQUENCIES

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Number of Channels | Limit (≥) | Results |
| | | | | 79 | 15 | Pass |



# DWELL TIME

XMit 2017.02.08

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. | Cal. Due |
|---|---|---|---|---|---|
| Generator - Signal | Keysight | N5182B | TFU | 10/27/2015 | 10/27/2018 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 6/5/2017 | 6/5/2018 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 5/30/2017 | 5/30/2018 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVH | 5/30/2017 | 5/30/2018 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFP | 8/10/2016 | 8/10/2017 |

**TEST DESCRIPTION**

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

TbtTx 2017.04.18 XMit 2017.02.08

| | | | | | |
|---|---|---|---|---|---|
| EUT: | APx 525D2 | | | Work Order: | AUDI0246 |
| Serial Number: | APX2-28804 | | | Date: | 07/05/17 |
| Customer: | Audio Precision | | | Temperature: | 23.3 °C |
| Attendees: | None | | | Humidity: | 45.3% RH |
| Project: | None | | | Barometric Pres.: | 1017 mbar |
| Tested by: | Jeff Alcoke and Rod Peloquin | Power: | 110VAC/60Hz | Job Site: | EV06 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2017 | ANSI C63.10:2013 |

**COMMENTS**

BR and EDR Power settings [(Ext),(Int)]= [255,63]. Measurments were taken on the Source only. Source was shown to have highest output power.

**DEVIATIONS FROM TEST STANDARD**

None

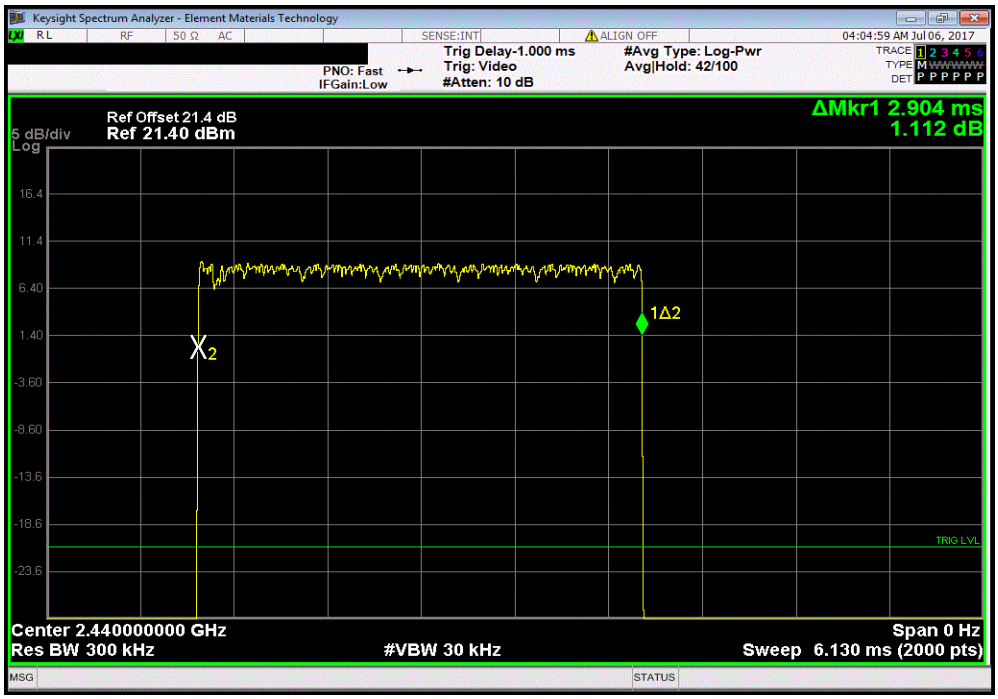
| Configuration # | 1 | Signature |
|---|---|---|

| | Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
|---|---|---|---|---|---|---|---|
| Source | | | | | | | |
| Hopping | | | | | | | |
| DH5, GFSK | | | | | | | |
| Mid Channel | 2.904 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | 2.904 | N/A | 22 | 5 | 319.44 | 400 | Pass |
| 2DH5, pi/4-DQPSK | | | | | | | |
| Mid Channel | 2.913 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | 2.913 | N/A | 22 | 5 | 320.43 | 400 | Pass |
| 3DH5, 8-DPSK | | | | | | | |
| Mid Channel | 2.913 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 22 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | 2.913 | N/A | 22 | 5 | 320.43 | 400 | Pass |

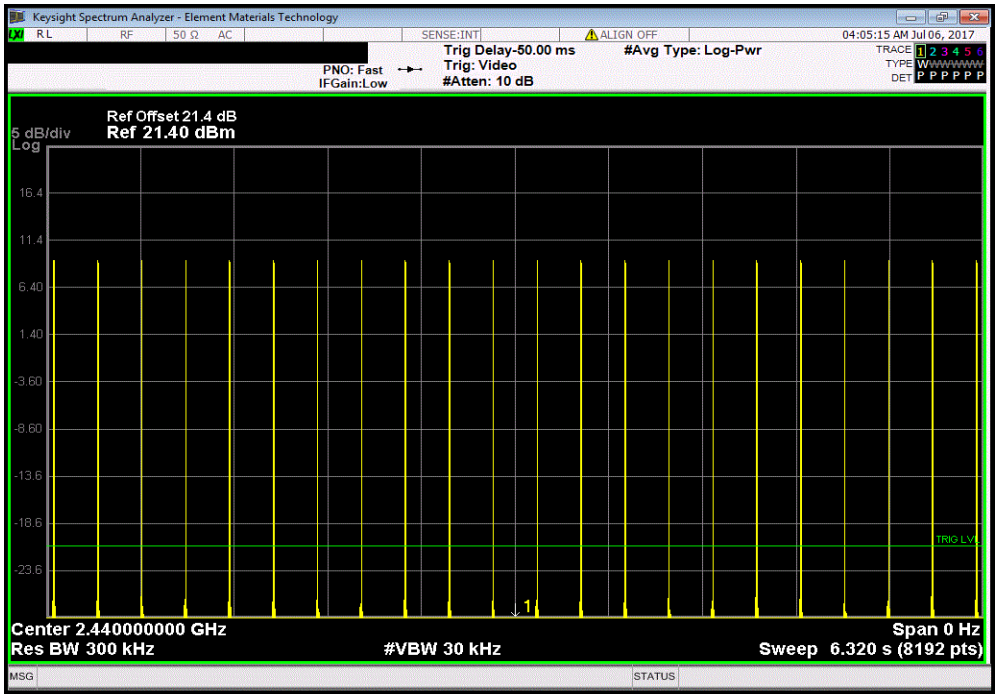
# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.904 | N/A | N/A | N/A | N/A | N/A | N/A |



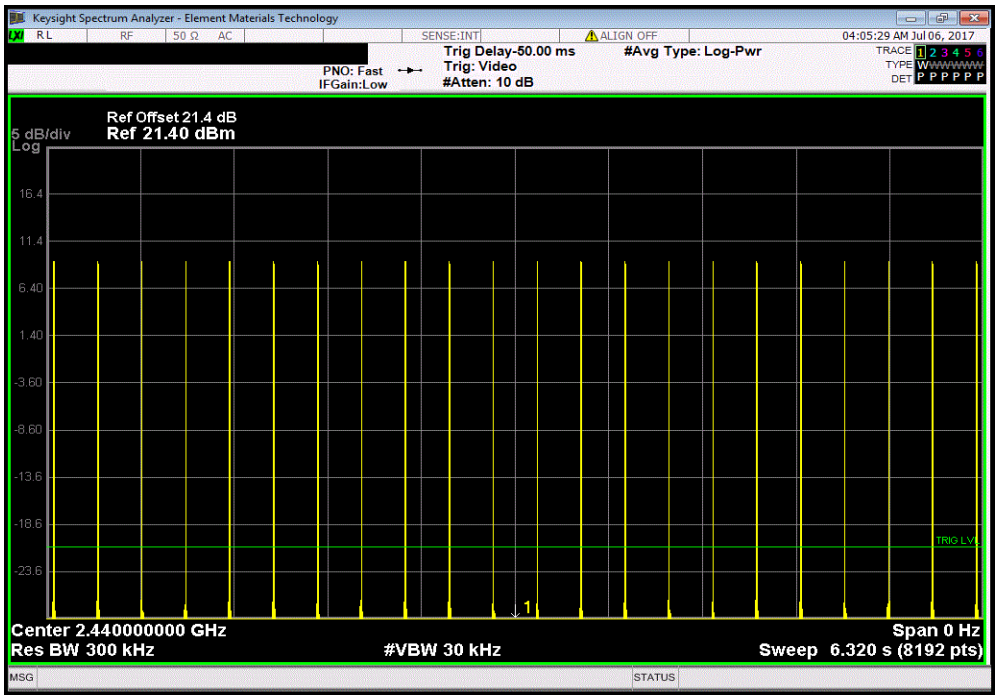

| Source, Hopping, DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



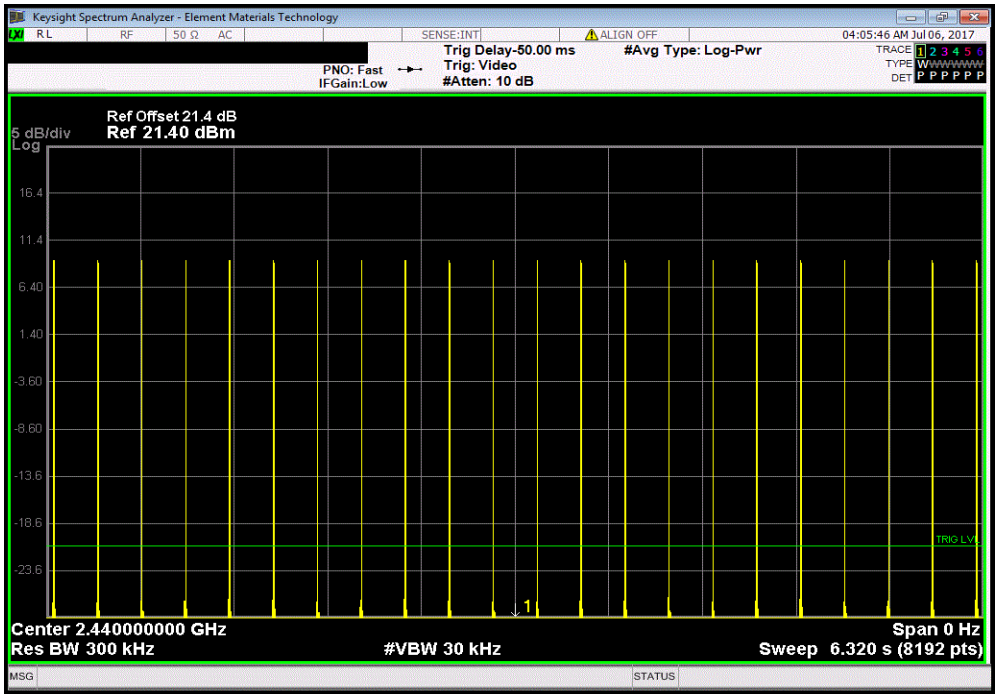
# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



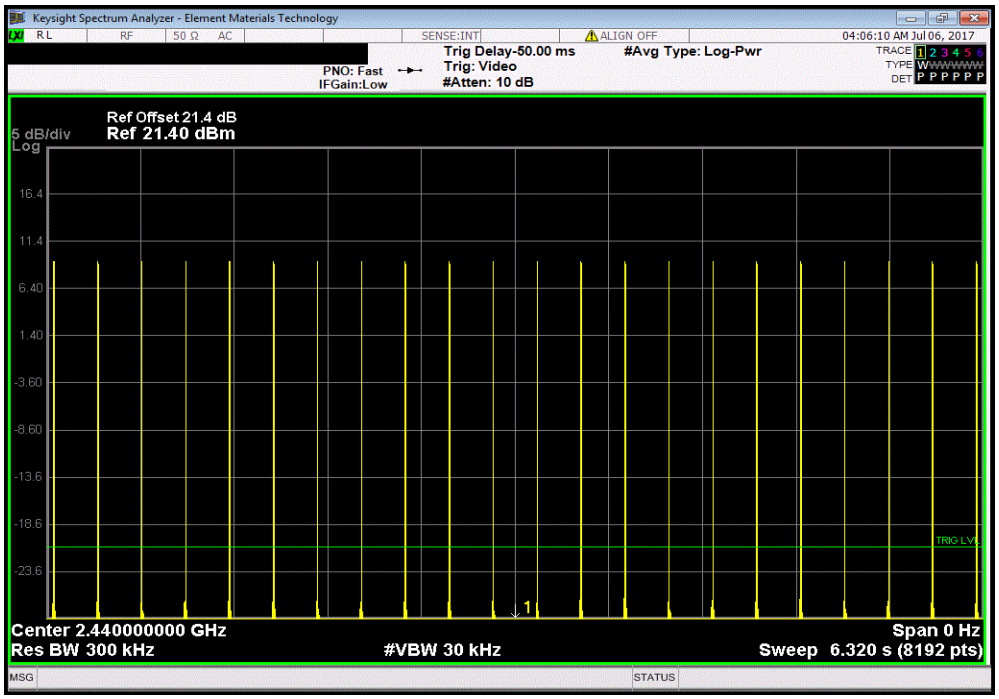

| Source, Hopping, DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |




| Source, Hopping, DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.904 | N/A | 22 | 5 | 319.44 | 400 | Pass |

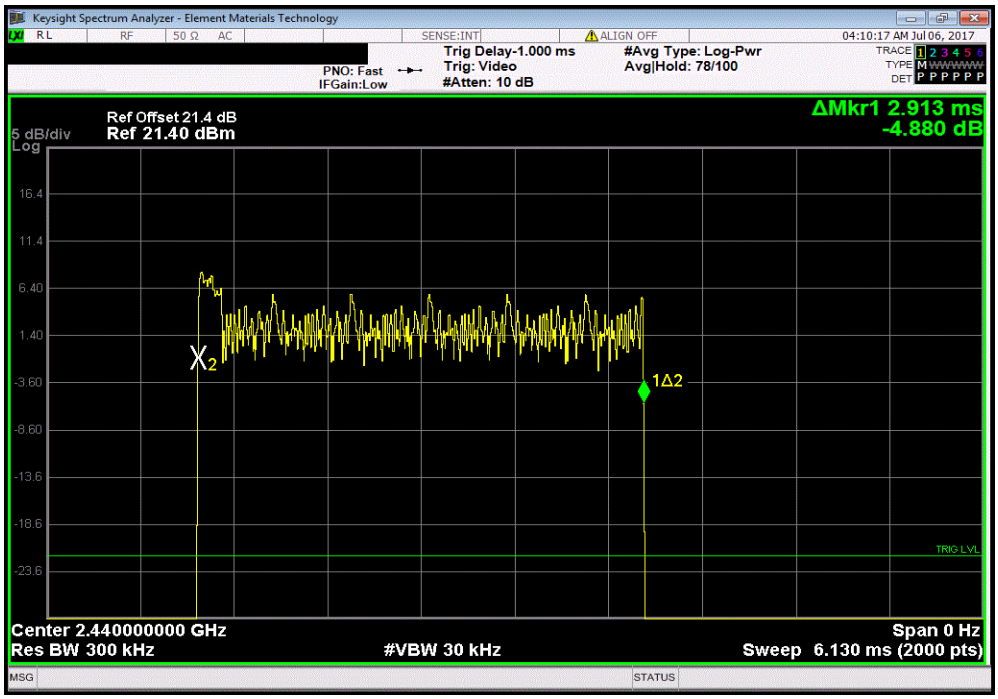
**Calculation Only**

**No Screen Capture Required**

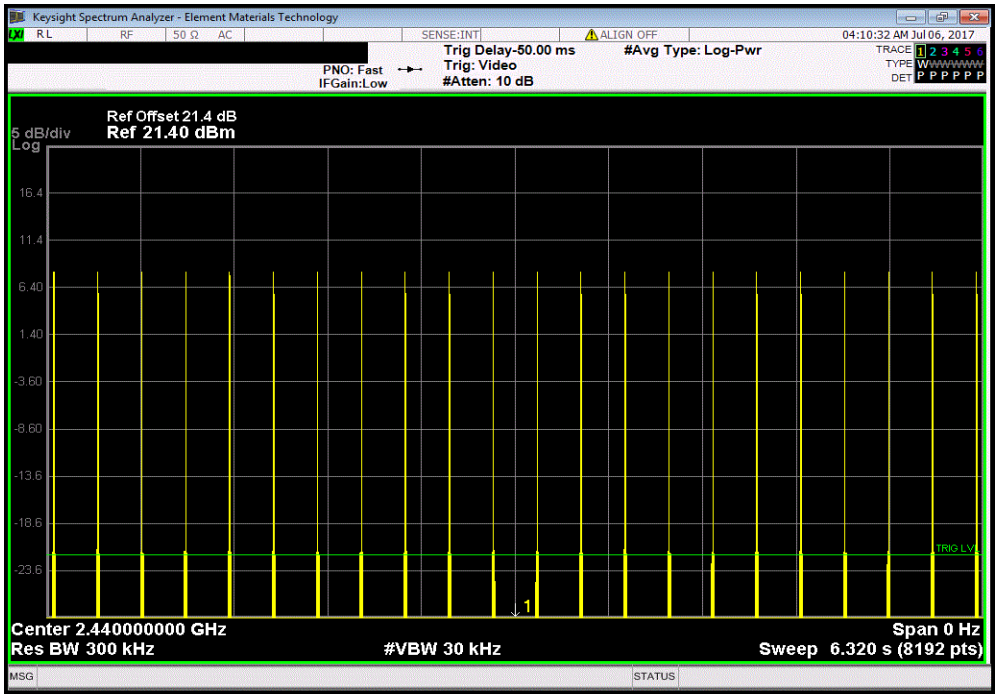
# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, 2DH5, pi/4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.913 | N/A | N/A | N/A | N/A | N/A | N/A |



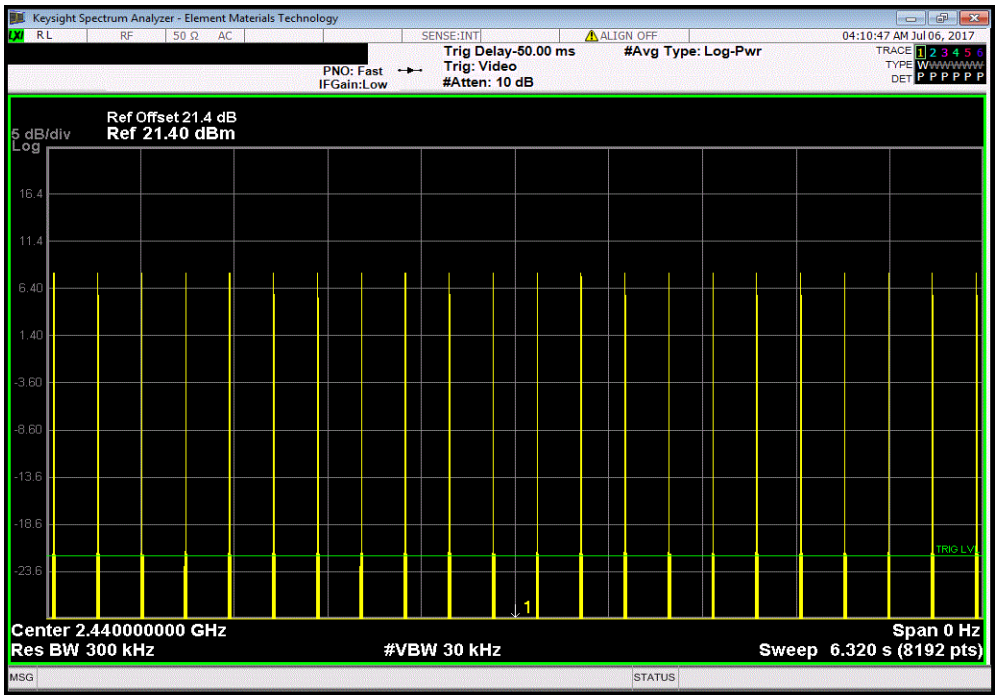

| Source, Hopping, 2DH5, pi/4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



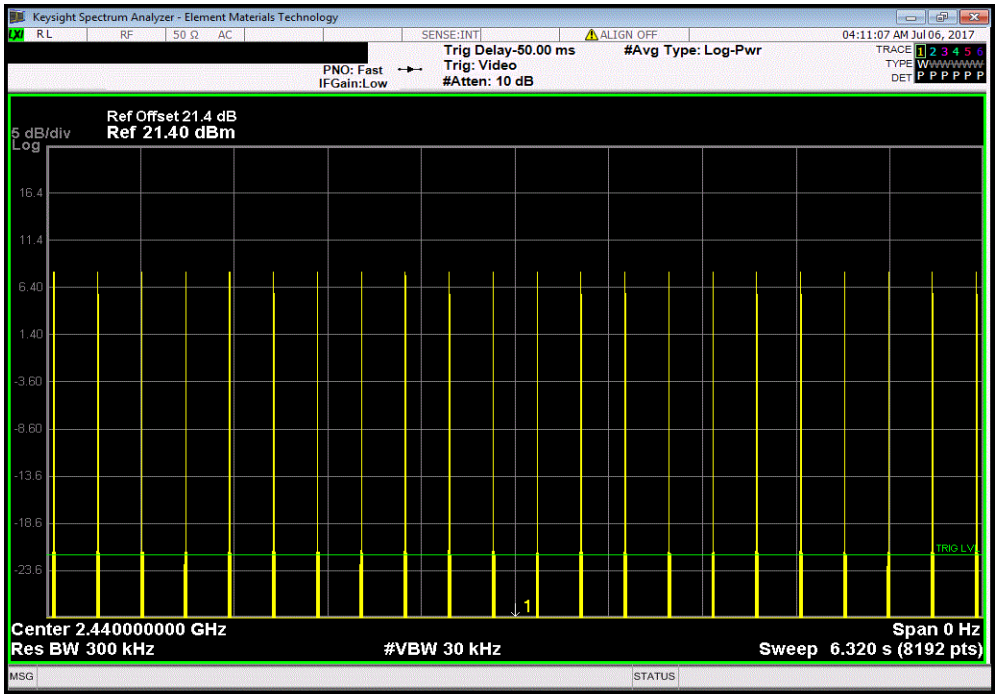
# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, 2DH5, pi/4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



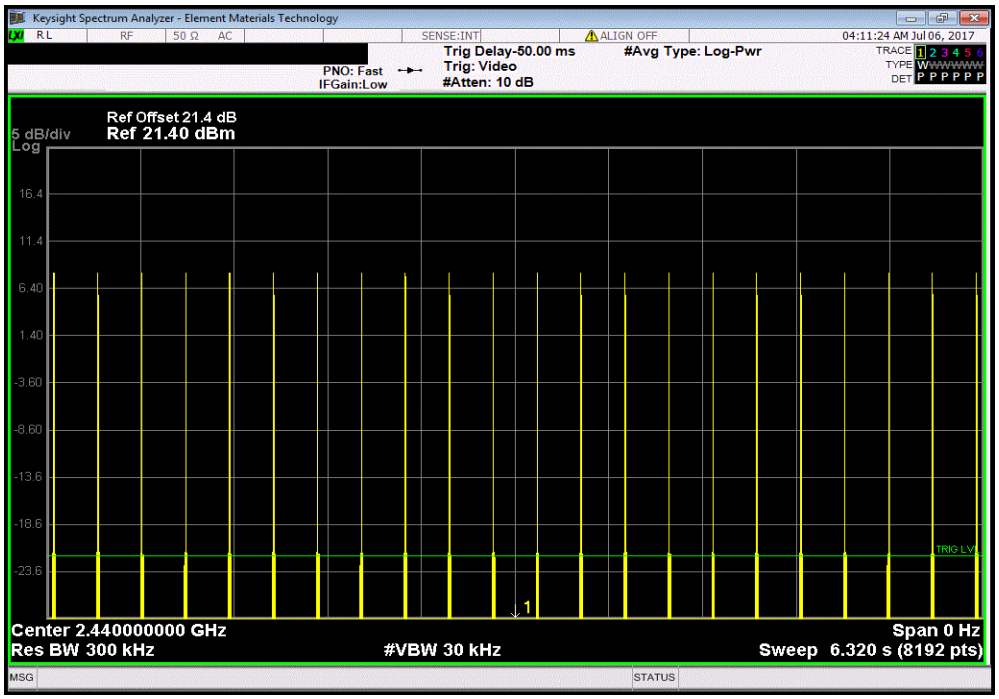

| Source, Hopping, 2DH5, pi/4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, 2DH5, pi/4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |




| Source, Hopping, 2DH5, pi/4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.913 | N/A | 22 | 5 | 320.43 | 400 | Pass |

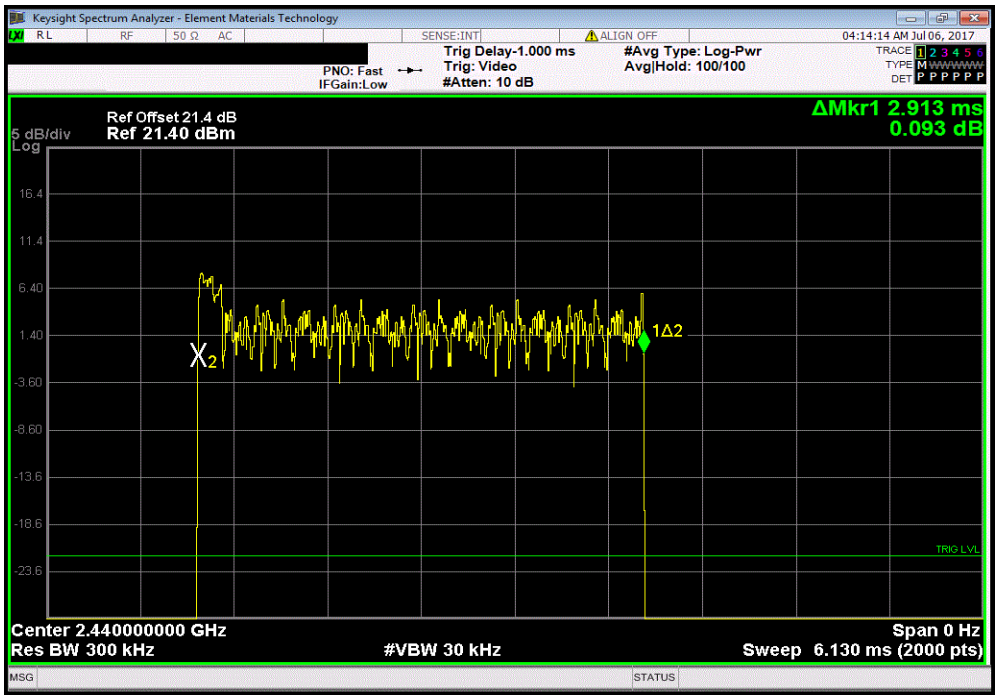
**Calculation Only**

**No Screen Capture Required**

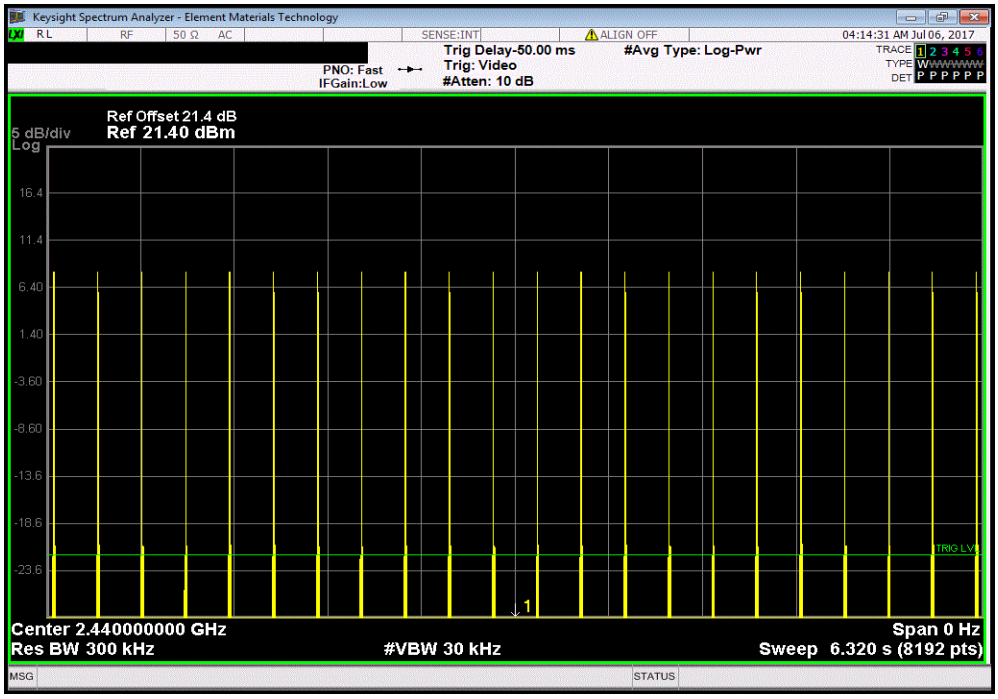
# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.913 | N/A | N/A | N/A | N/A | N/A | N/A |



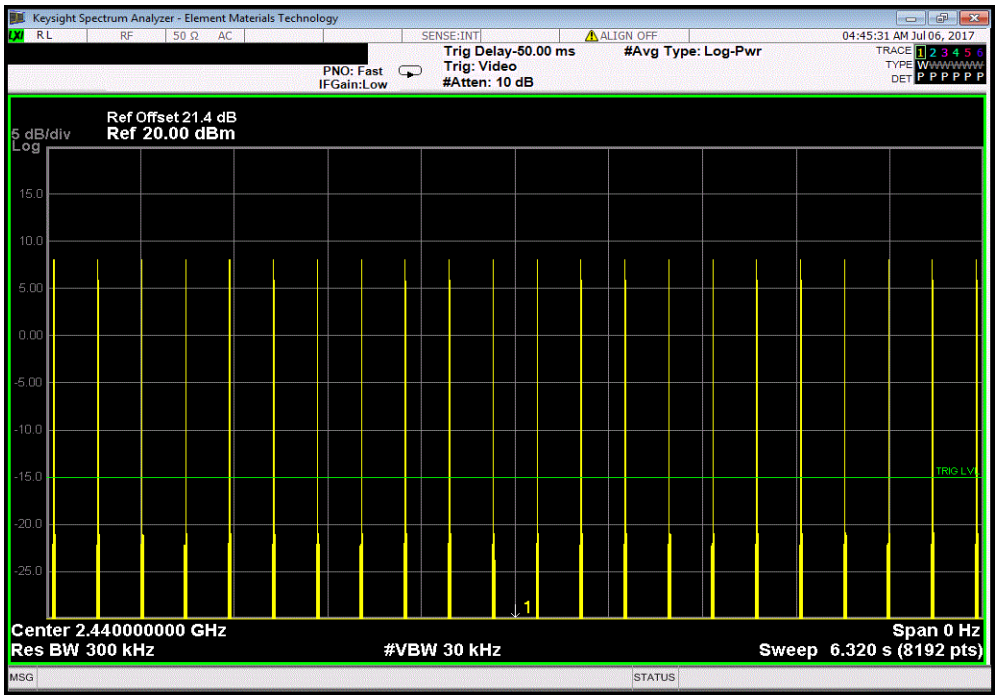

| Source, Hopping, 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



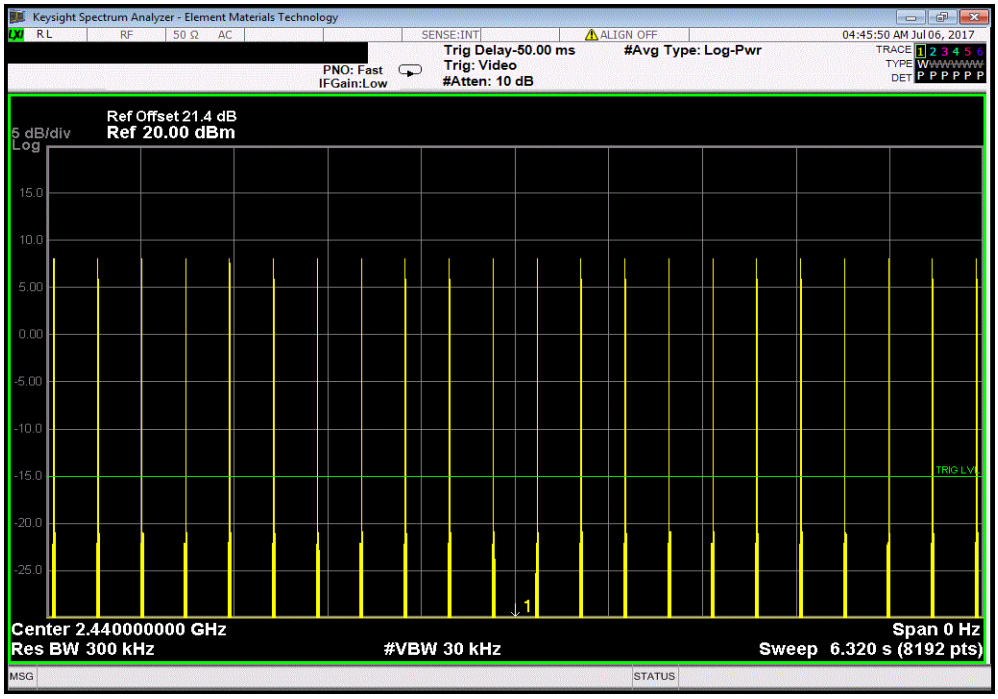
# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



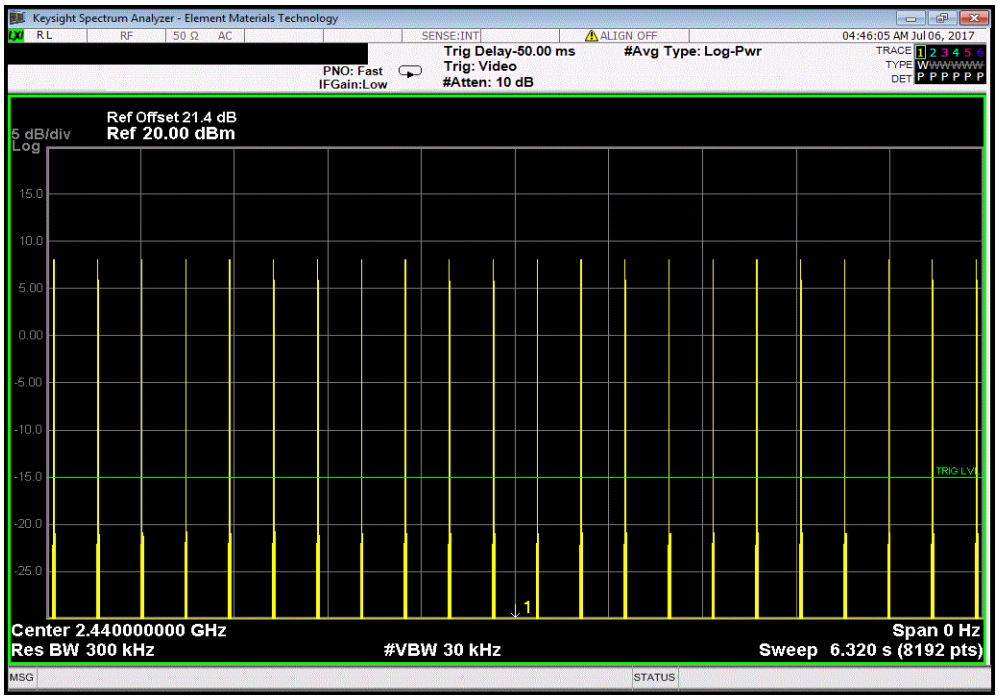

| Source, Hopping, 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



# DWELL TIME

TbtTx 2017.04.18 XMit 2017.02.08

| Source, Hopping, 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |




| Source, Hopping, 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (ms) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.913 | N/A | 22 | 5 | 320.43 | 400 | Pass |

Azul 2

**Calculation Only**

**No Screen Capture Required**