41039 Boyce Road
Fremont, CA. 94538
510-578-3500 Phone

EMC Test Report

Application for FCC Grant of Equipment Authorization
Canada Certification

Innovation, Science and Economic Development Canada
RSS-Gen Issue 5 / RSS-247 Issue 2
FCC Part 15 Subpart C

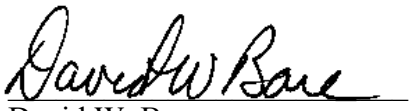
Model: DC PRO-X2 Headset

IC CERTIFICATION #:	9409A-DCXBT2
FCC ID:	Y3J-DCXBT2
APPLICANT:	David Clark Co., Inc. 360 Franklin St. Worcester, MA 1615
TEST SITE(S):	NTS Labs LLC 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5, 2845B-7
PROJECT NUMBER:	PR168558
REPORT DATE:	April 11, 2023
FINAL TEST DATES:	March 16, 17, 20, 21 and 22, 2023
TOTAL NUMBER OF PAGES:	103

ACCREDITED
Testing Cert #0214.26

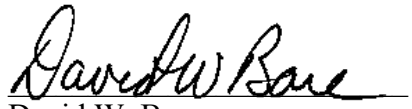
VALIDATING SIGNATORIES

PROGRAM MGR



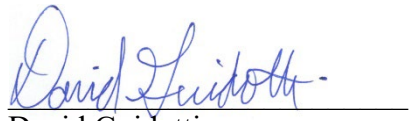
David W. Bare
Chief Engineer

TECHNICAL REVIEWER:



David W. Bare
Chief Engineer

FINAL REPORT PREPARER:



David Guidotti
Senior Technical Writer

QUALITY ASSURANCE DELEGATE

Gary Izard
Senior Technical Writer

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	April 11, 2023	First release	

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SCOPE

An electromagnetic emissions test has been performed on the David Clark Co., Inc. model DC PRO-X2 Headset, pursuant to the following rules:

RSS-GEN Issue 5 " General Requirements for Compliance of Radio Apparatus"
RSS 247 Issue 2 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in NTS Labs LLC test procedures:

ANSI C63.10-2013

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

NTS Labs LLC is accredited by the A2LA, certificate number 0214.26, to perform the test(s) listed in this report, except where noted otherwise.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of David Clark Co., Inc. model DC PRO-X2 Headset complied with the requirements of the following regulations:

RSS-GEN Issue 5 " General Requirements for Compliance of Radio Apparatus"
RSS 247 Issue 2 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of David Clark Co., Inc. model DC PRO-X2 Headset and therefore apply only to the tested sample. The sample was selected and prepared by Nick Cannata of David Clark Co., Inc.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS SUMMARY

FREQUENCY HOPPING SPREAD SPECTRUM (2400 – 2483.5 MHz, 75 Hopping Channels)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247 (a) (1)	RSS 247 5.1 (1)	20dB Bandwidth	Maximum 1.347 MHz	Channel spacing > 2/3rds 20dB BW (minimum 25 kHz)	Complies
		Channel Separation	1 MHz		Complies
15.247 (a) (1) (iii)	RSS 247 5.1 (4)	Channel Dwell Time (*average time of occupancy)*	< 0.4s per 31.6s	<0.4 second within a period of 0.4 x number of channels	Complies
15.247 (a) (1) (iii) & (b) (1)	RSS 247 5.1 (4) & 5.4 (2)	Number of Channels	79	75 or more	Complies
15.247 (a) (1)	RSS 247 5.1 (1)	Channel Utilization	All channels are used equally - refer to the operational description for full explanation	All channels shall, on average, be used equally	Complies
15.247 (b) (3)	RSS 247 5.4 (2)	Output Power (multipoint systems)	-0.5 dBm (0.00089 W) calculated	0.125 Watts (EIRP <= 0.5 Watts))	Complies
15.247(d)	RSS 247 5.5	Spurious Emissions – 30MHz – 25GHz	All spurious emissions < -20dBc	< -20dBc	Complies
15.247(d) / 15.209	RSS 247 5.5	Radiated Spurious Emissions 30MHz – 25GHz	Basic (GFSK) 32.1 dBµV/m @ 120.01 MHz(-11.4 dB)	Refer to the limits section (p21) for restricted bands, all others < -20dBc	Complies
			EDR (8DPSK) 29.8 dBµV/m @ 168.96 MHz(-13.7 dB)		
15.247 (a) (1)	RSS 247 5.1(2)	Receiver bandwidth	Refer to operational description	Shall match the channel bandwidth	Complies

Note 1 Power calculated from EIRP using antenna gain of 2.2 dBi
Note 2 Pass/Fail criteria defined by standards listed above.

FREQUENCY HOPPING SPREAD SPECTRUM (2400 – 2483.5 MHz, Less Than 75 Hopping Channels)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247 (a) (1)	RSS 247 5.1 (1)	20dB Bandwidth	Maximum 1.347 MHz	Channel spacing > 2/3rds 20dB BW (minimum 25 kHz)	Complies
		Channel Separation	1 MHz		Complies
15.247 (a) (1) (iii)	RSS 247 5.1 (4) & 5.4 (2)	Number of Channels	20	15 or more	Complies
15.247 (a) (1) (iii) & (b) (1)	RSS 247 5.1 (4)	Channel Dwell Time (*average time of occupancy)*	< 0.4s per 8s	<0.4 second within a period of 0.4 x number of channels	Complies
15.247 (a) (1)	RSS 247 5.1 (1)	Channel Utilization	All channels are used equally - refer to the operational description for full explanation The system uses the Bluetooth algorithm and, therefore, meets all requirements for channel utilization.	All channels shall, on average, be used equally	Complies
15.247 (b) (3)	RSS 247 5.4 (2)	Output Power	-0.5 dBm (0.00089 W) calculated	0.125 Watts (EIRP <= 0.5 Watts))	Complies
15.247(d)	RSS 247 5.5	Spurious Emissions – 30MHz – 25GHz	All spurious emissions < -20dBc	< -20dBc	Complies
15.247(d) / 15.209	RSS 247 5.5	Radiated Spurious Emissions 30MHz – 25GHz	Basic (GFSK) 49.3 dBµV/m @ 11999.9 MHz (-4.7 dB)	Refer to the limits section (p21) for restricted bands, all others < -20dBc	Complies
			EDR (π/4-DQPSK) 51.3 dBµV/m @ 4500.0 MHz (-2.7 dB)		
			EDR (8DPSK) 49.1 dBµV/m @ 12000.35 MHz (-4.9 dB)		
15.247 (a) (1)	RSS 247 5.1(2)	Receiver bandwidth	Refer to operational description	Shall match the channel bandwidth	Complies

Note 1 Power calculated from EIRP using antenna gain of 2.2 dBi
Note 2 Pass/Fail criteria defined by standards listed above.

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Integral antenna	Unique or integral antenna required	Complies
15.207	RSS-Gen Table 4	AC Conducted Emissions	Testing was not performed as the EUT is battery powered.		
15.247 (i)	RSS 102	RF Exposure Requirements	Refer to SAR report	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSS-Gen 6.8	User Manual	No detachable antenna	Statement for products with detachable antenna	N/A
-	RSS-Gen 8.4	User Manual		Statement for all products	Complies
-	RSP-100 RSS-Gen 6.7	Occupied Bandwidth	Basic:870 kHz EDR: 1.206 MHz	Information only	N/A

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
Radiated emission (field strength)	dBµV/m	25 to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The David Clark Co., Inc. model DC PRO-X2 Headset is a Bluetooth enabled aviation communications headset with active noise cancelling. Since the EUT could be placed in any position during operation, the EUT was treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3.0 VDC supplied from replaceable batteries.

The sample was received on March 16, 2023 and tested on March 16, 17, 20, 21 and 22, 2023. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
David Clark Co., Inc.	DC PRO-X2	Headset	None	Y3J-DCXBT2

ANTENNA SYSTEM

The antenna system consists of an integral antenna.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 12.5 cm long by 3.2 cm wide by 3.5 cm deep.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at NTS Labs LLC.

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Lenovo	80TJ	ideapad 110-15ACL	PF0TKHZE	-

No remote support equipment was used during testing.

EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

EUT

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Audio Jacks (x2)	Unterminated	Audio	Shielded	0.6
Headphone	Headphones	Audio	Shielded	1.4
Temporary Programming	ideapad	Special	Unshielded	1.2

Additional on Support Equipment

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
ideapad DC power	AC Adapter	Two wire	Unshielded	1.4

EUT OPERATION

During emissions testing the EUT was commanded to transmit a continuous modulated signal at the desired frequency at maximum power with the specified modulation using a debug port connected to the ideapad.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 6.2 of RSS-GEN, NTS Labs LLC has been recognized as an accredited test laboratory by the Commission and Innovation, Science and Economic Development Canada. A description of the facilities employed for testing is maintained by NTS Labs LLC.

Site	Company / Registration Numbers		Location
	FCC	Canada	
Chamber 7	US1031	2845B (Wireless Test Lab #US0027)	41039 Boyce Road Fremont, CA 94538-2435

ANSI C63.4 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Results from testing performed in this chamber have been correlated with results from an open area test site. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.10. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

Software is used to view and convert receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers. The software used for radiated and conducted emissions measurements is NTS Labs LLC EMI Test Software (rev 2.10)

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.10 specifies that the test height above ground for table mounted devices shall be 80 centimeters for testing below 1 GHz and 1.5m for testing above 1 GHz. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor as specified in ANSI C63.4. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.10, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

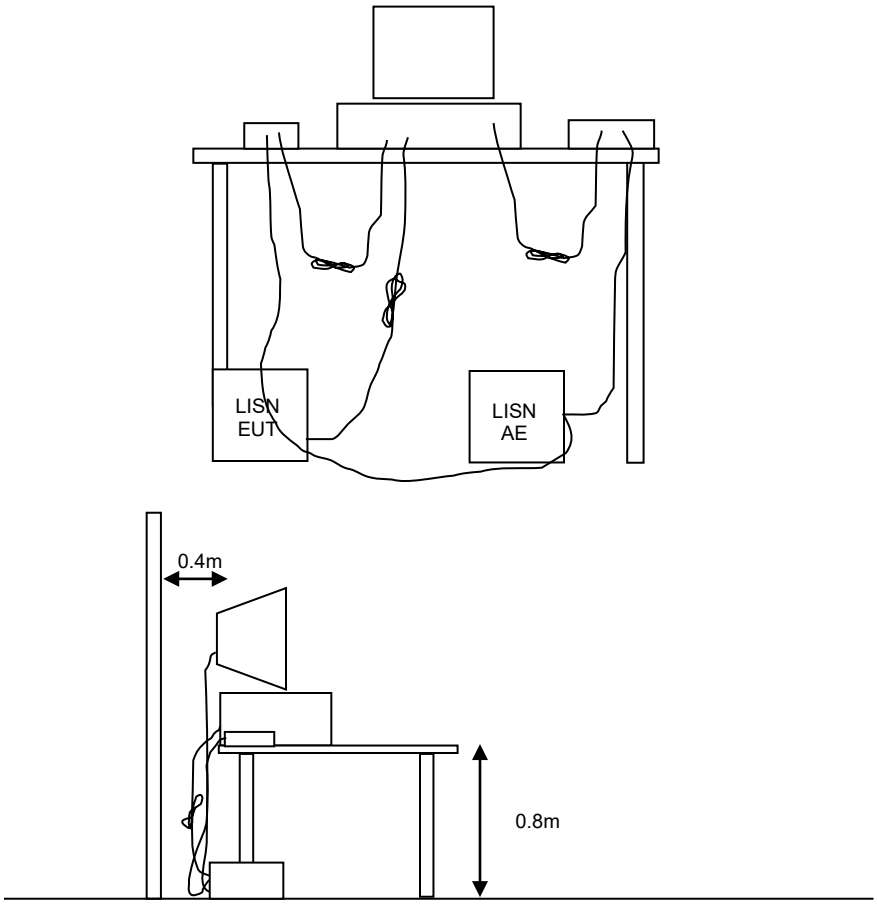


Figure 1 Typical Conducted Emissions Test Configuration

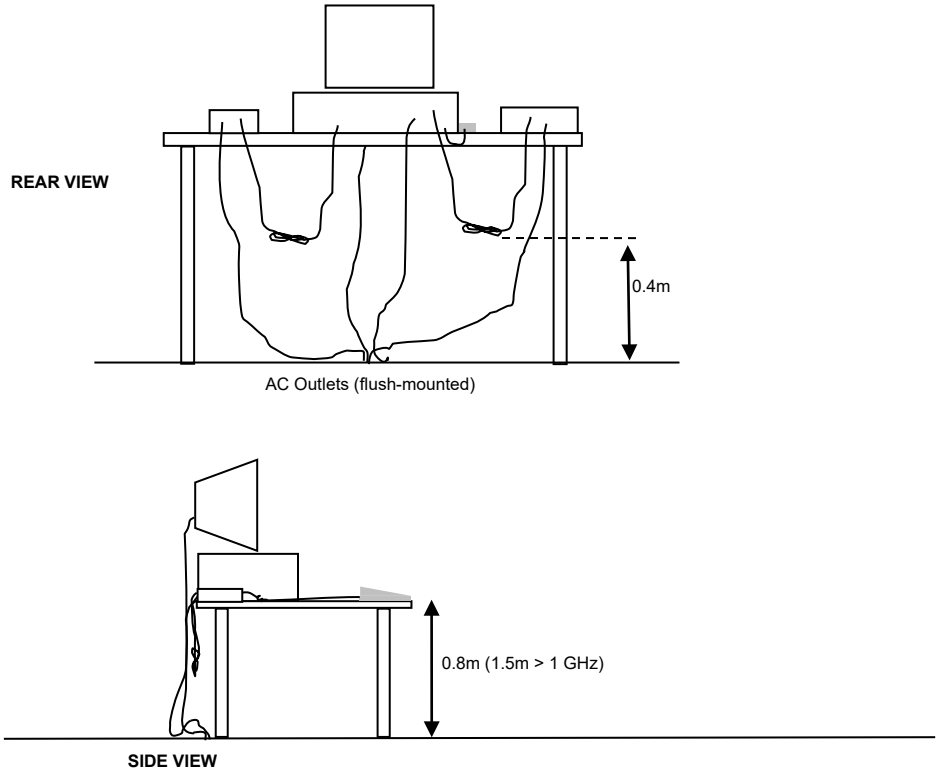
RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

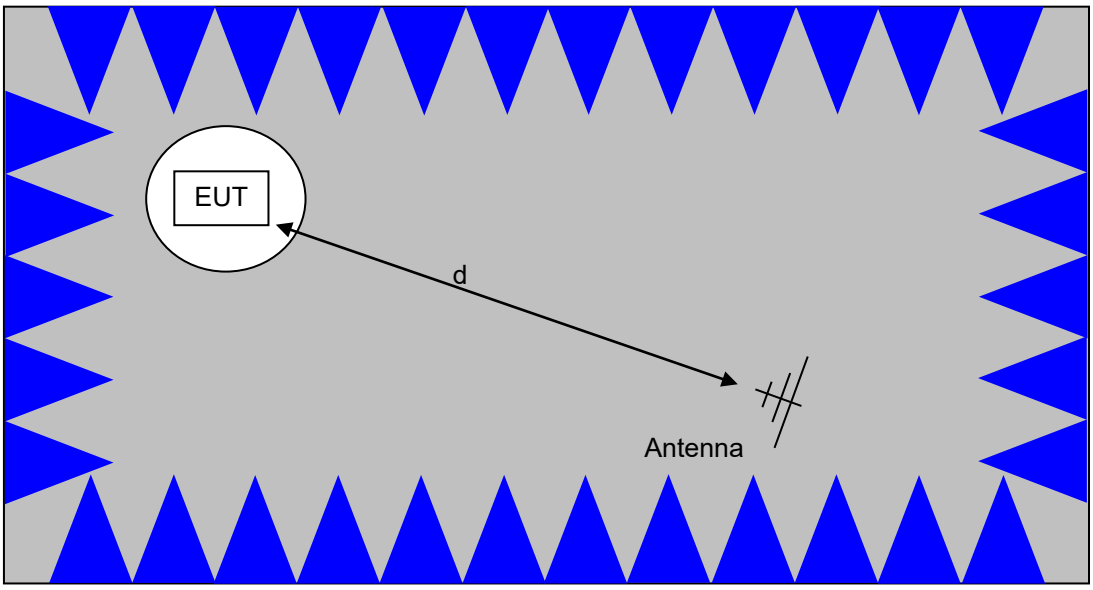
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

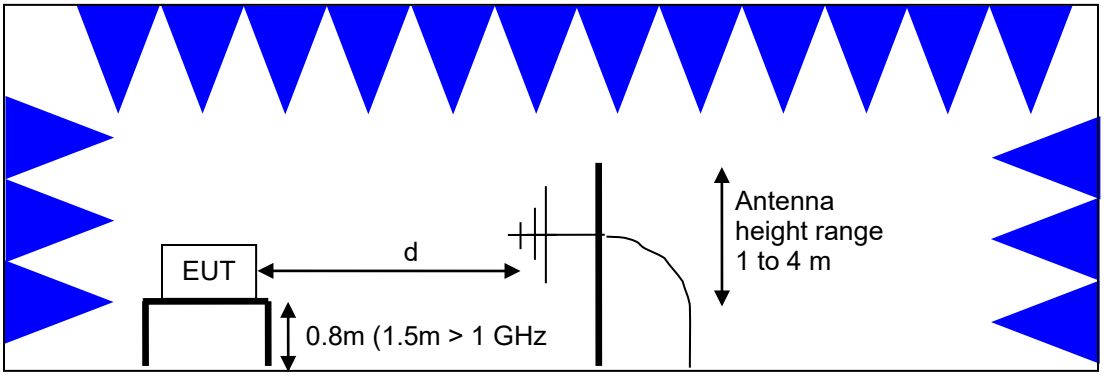


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

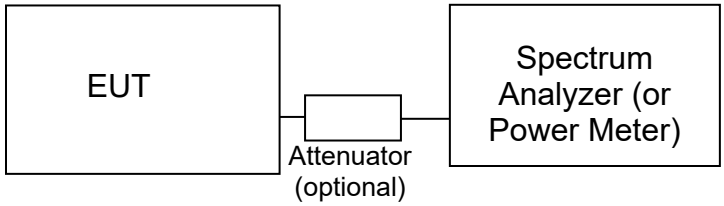
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, Plan and Side Views

CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.



Test Configuration for Antenna Port Measurements

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and NTS Labs LLC's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

BANDWIDTH MEASUREMENTS

The 6dB, 20dB, 26dB and/or 99% signal bandwidth are measured using the bandwidths recommended by ANSI C63.10 and RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[1].

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

OUTPUT POWER LIMITS – FHSS SYSTEMS

The table below shows the limits for output power based on the number of channels available for the hopping system.

Operating Frequency (MHz)	Number of Channels	Output Power
902 – 928	≥ 50	1 Watt (30 dBm)
902 – 928	25 to 49	0.25 Watts (24 dBm)
2400 – 2483.5	≥ 75	1 Watt (30 dBm)
2400 – 2483.5	< 75	0.125 Watts (21 dBm)
5725 – 5850	75	1 Watt (30 dBm)

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

[1] The restricted bands are detailed in FCC 15.205 and RSS-Gen Table 7

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS GEN. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:
R_r = Receiver Reading in dBuV
S = Specification Limit in dBuV
M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Measurements of radiated field strength are compared directly to the specification limit (decibel form). The receiver and/or control software corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:
F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:
R_r = Receiver Reading in dBuV/m
F_d = Distance Factor in dB
R_c = Corrected Reading in dBuV/m
L_s = Specification Limit in dBuV/m
M = Margin in dB Relative to Spec

For electric field measurements below 30MHz the extrapolation factor is determined by the methods described in ANSI C63.10 section 6.4.4.

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of d (meters) from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{d} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.dB.

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, 1,000 - 18,000 MHz, 17, 20-Mar-23					
NTS Labs LLC	N/A	NTS EMI Software (rev 2.10)	WC022452	N/A	
Agilent Technologies	E4446A	PSA Spectrum Analyzer	WC055670	10/24/2022	10/31/2023
Micro-Tronics	BRM50702-02	Band Reject Filter, 2400-2500 MHz	WC064481	11/15/2022	11/15/2023
EMCO	3115	Antenna, Horn, 1-18 GHz	WC064725	8/17/2021	8/17/2023
Semflex Microwave Solutions	Cable Assembly	HPT 305, Coax, 3.5m blue	WC064855	3/21/2022	3/21/2023
SM Electronics	SA18B-10	Attenuator	WC072176	N/A	
MITEQ	AFS44	Preamplifier, 1-18 GHz	WC080962	7/18/2022	7/18/2023
Radiated Emissions, 30 - 1,000 MHz, 22-Mar-23					
NTS Labs LLC	N/A	NTS EMI Software (rev 2.10)	WC022452	N/A	
Micro-Tronics	BRM50702-02	Band Reject Filter, 2400-2500 MHz	WC064481	11/15/2022	11/15/2023
Sunol Sciences	JB3	Biconilog, 30-3000 MHz	WC064536	1/29/2021	3/23/2023
Hewlett Packard	8447F	9kHz-1300MHz pre-amp	WC064718	12/28/2022	12/28/2023
Rohde & Schwarz	ESI	EMI Test Receiver, 20Hz-40GHz	WC068000	7/21/2022	7/21/2023
Radiated Emissions, 0.03-30MHz, 22-Mar-23					
NTS Labs LLC	N/A	NTS EMI Software (rev 2.10)	WC022452	N/A	
Rhode & Schwarz	HFH2-Z2	Loop Antenna	WC062457	2/17/2022	2/17/2024
Rohde & Schwarz	ESI	EMI Test Receiver, 20Hz-40GHz	WC068000	7/21/2022	7/21/2023

Appendix B Test Data

TL168558-RANA Pages 27 – 102

Client:	David Clark Co., Inc.	PR Number:	PR168558
Product	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
System Configuration:	-	Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Emissions Standard(s):	FCC 15.247/RSS-247	Class:	-
Immunity Standard(s):	-	Environment:	Radio

EMC Test Data

For The

David Clark Co., Inc.

Product

DC PRO-X2 Headset

Date of Last Test: 3/20/2023

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

RSS-247 and FCC 15.247 (FHSS) Measurements

Power, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 3/16, 3/20, 3/21/2023
Test Engineer: David Bare
Test Location: Fremont EMC Lab #

Config. Used: 1
Config Change: None
EUT Voltage: 3V

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the ground plane or routed in overhead in the GR-1089 test configuration.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.
Unless stated otherwise the EUT was operating such that it constantly hopped on either the low, center or high channels.

Ambient Conditions:

Temperature: 18-21 °C
Rel. Humidity: 30-45 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
3	Spurious Emissions	15.247(b)	-	Performed Radiated
4	Output Power	15.247(b)	Pass	-0.5 dBm (0.00089 W) calculated
5	20dB Bandwidth	15.247(a)	Pass	Maximum 1.347 MHz
5	99% Bandwidth	-	-	Maximum 1.206 MHz
5	Channel Occupancy	15.247(a)	Pass	< 0.4s per 31.6s (79 channels), < 0.4s per 8s (20 channels)
5	Channel Spacing	15.247(a)	Pass	1 MHz
5	Number of Channels	15.247(a)	Pass	20 -79

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Sample Notes

Sample S/N: None
Driver and Version: Bluetest3 V3.3.15

Run #3: Radiated Spurious Emissions, 30 - 1000 MHz.
These tests were performed using the radiated method as the device has no antenna port.

Run #4: Output Power
Date of Test: 3/20, 3/21/2023
Test Engineer: David Bare
Test Location: Fremont Chmaber #7
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt.
For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

Maximum antenna gain: 2.2 dBi

Channel	Frequency (MHz)	Field Strength at 3m (dBuV/m)	Antenna Pol. (H/V)	Res BW (MHz)	Signal Bandwidth	Bandwidth Correction	EIRP (dBm)	EIRP (Watts)
Basic (GFSK)								
Low	2402	96.0	V	2	0.870	0	0.8	0.0012023
Mid	2441	94.9	V	2	0.868	0	-0.3	0.0009333
High	2480	93.4	V	2	0.868	0	-1.8	0.0006607
EDR (π/4-DQPSK)								
Low	2402	96.9	V	2	1.196	0	1.7	0.0014791
Mid	2441	95.8	V	2	1.206	0	0.6	0.0011482
High	2480	95.0	V	2	1.190	0	-0.2	0.000955
EDR (8DPSK)								
Low	2402	96.7	V	2	1.196	0	1.5	0.0014125
Mid	2441	96.5	V	2	1.203	0	1.3	0.001349
High	2480	94.4	V	2	1.185	0	-0.8	0.0008318

Note 1:	Output power calculated from field strength at 3m based on free space path loss formula $E = \sqrt{(30PG)} / d$, where E is the field strength (V/m), PG is the effective isotropic radiated power (W) and d is the distance (3m). Additional correction to the calculated power is made to account for the difference between the measurement bandwidth and signal bandwidth.

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Run #5: Bandwidth, Channel Occupancy, Spacing and Number of Channels

Date of Test: 3/16, 3/21/2023
Test Engineer: David Bare
Test Location: Fremont Chamber #7

Basic: 1-DH5

Channel	Frequency (MHz)	Resolution Bandwidth	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	30 kHz	961	870
Mid	2441	30 kHz	957	868
High	2480	30 kHz	959	868

EDR: 2-DH5

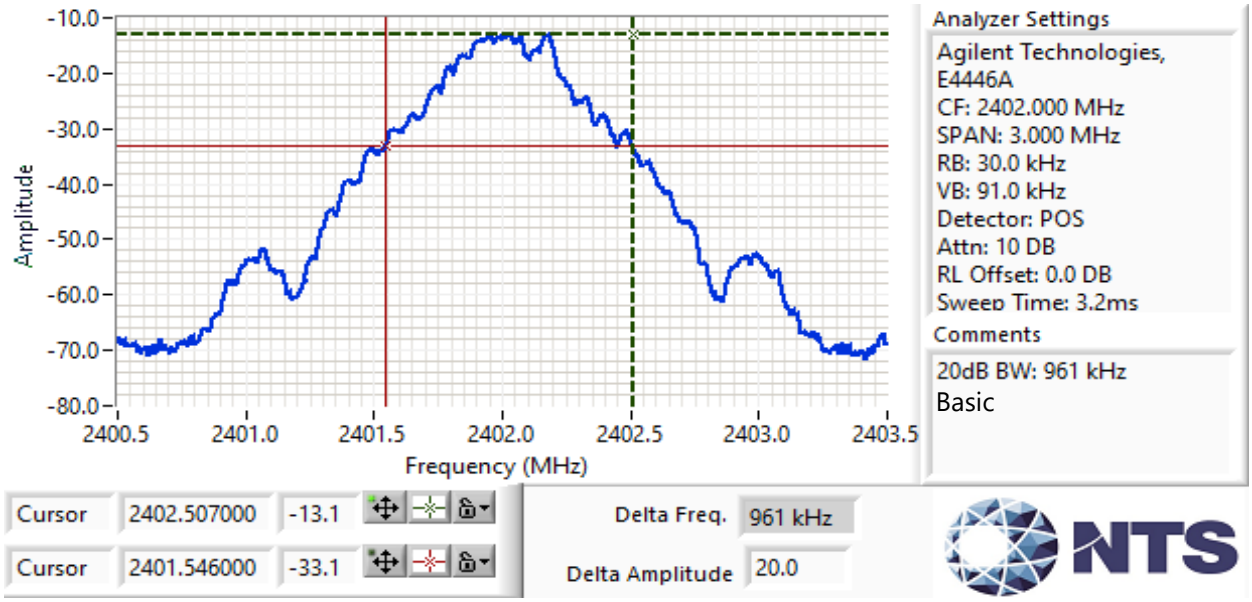
Channel	Frequency (MHz)	Resolution Bandwidth	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	30 kHz	1347	1196
Mid	2441	30 kHz	1333	1206
High	2480	30 kHz	1330	1190

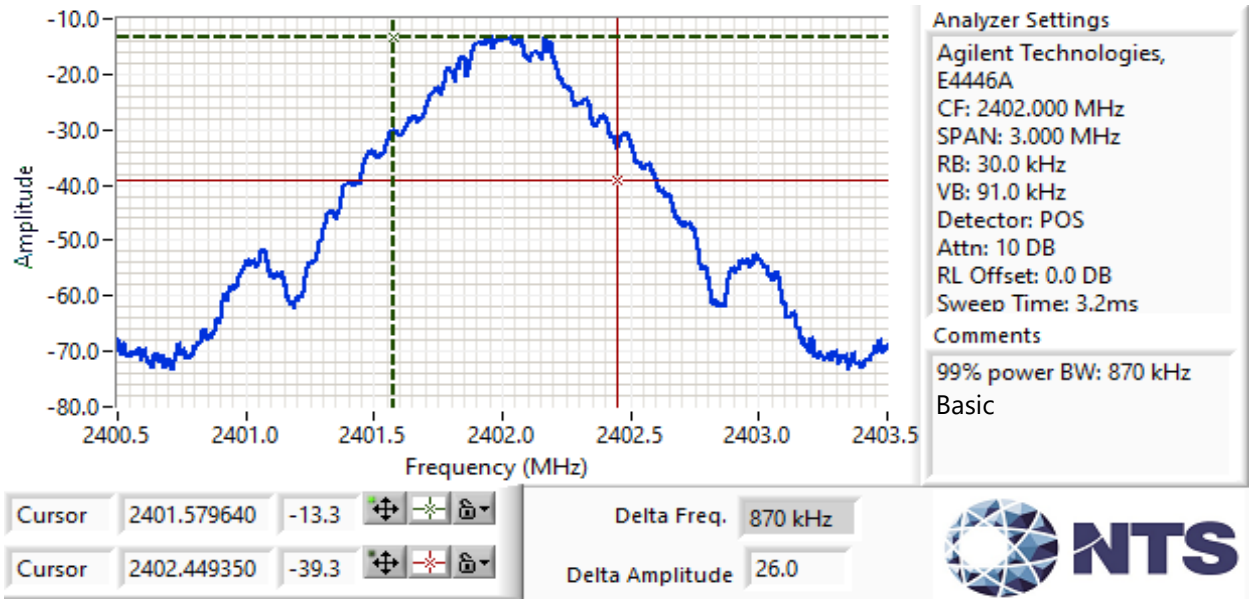
EDR: 3-DH5

Channel	Frequency (MHz)	Resolution Bandwidth	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	30 kHz	1335	1196
Mid	2441	30 kHz	1310	1203
High	2480	30 kHz	1308	1185

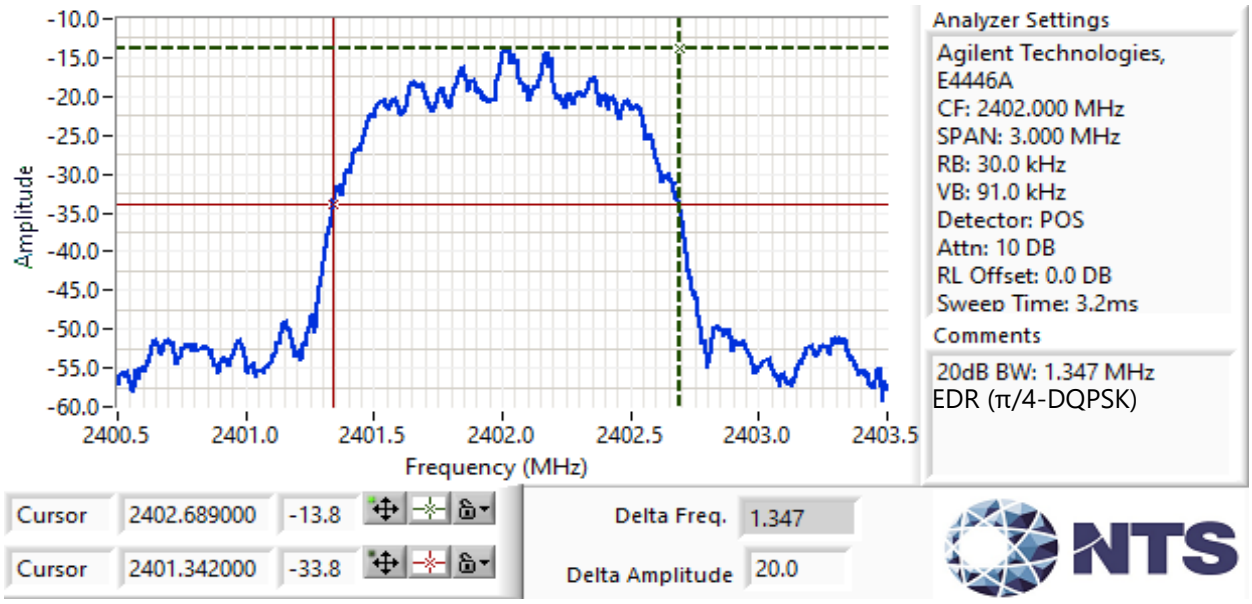
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

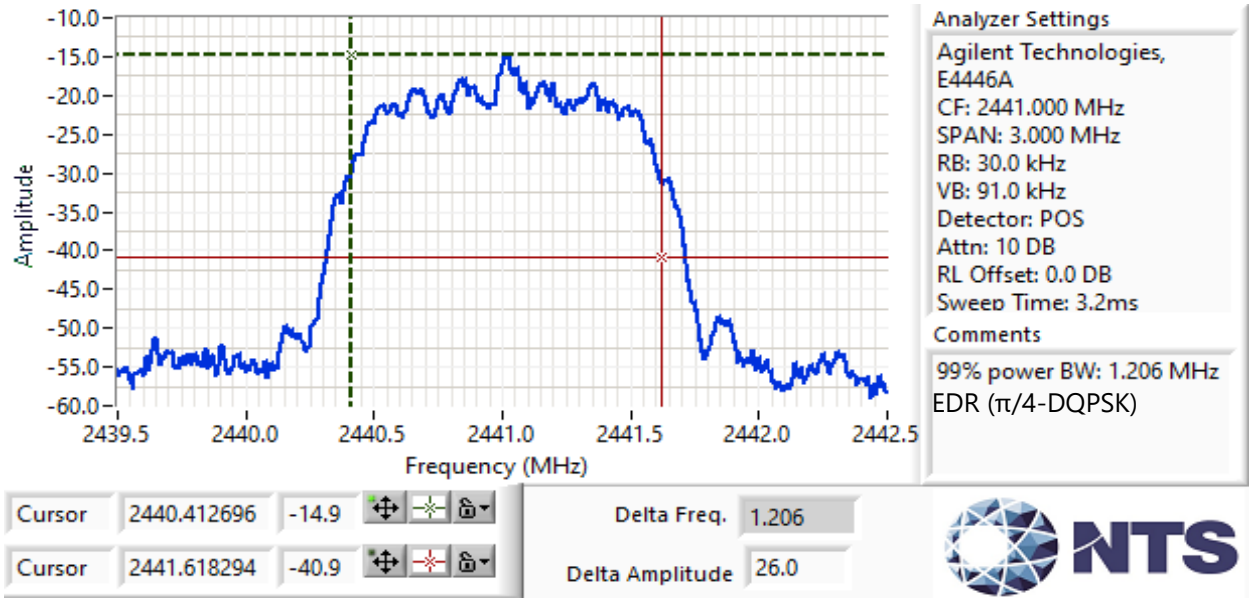
Maximum BW plots for each mode



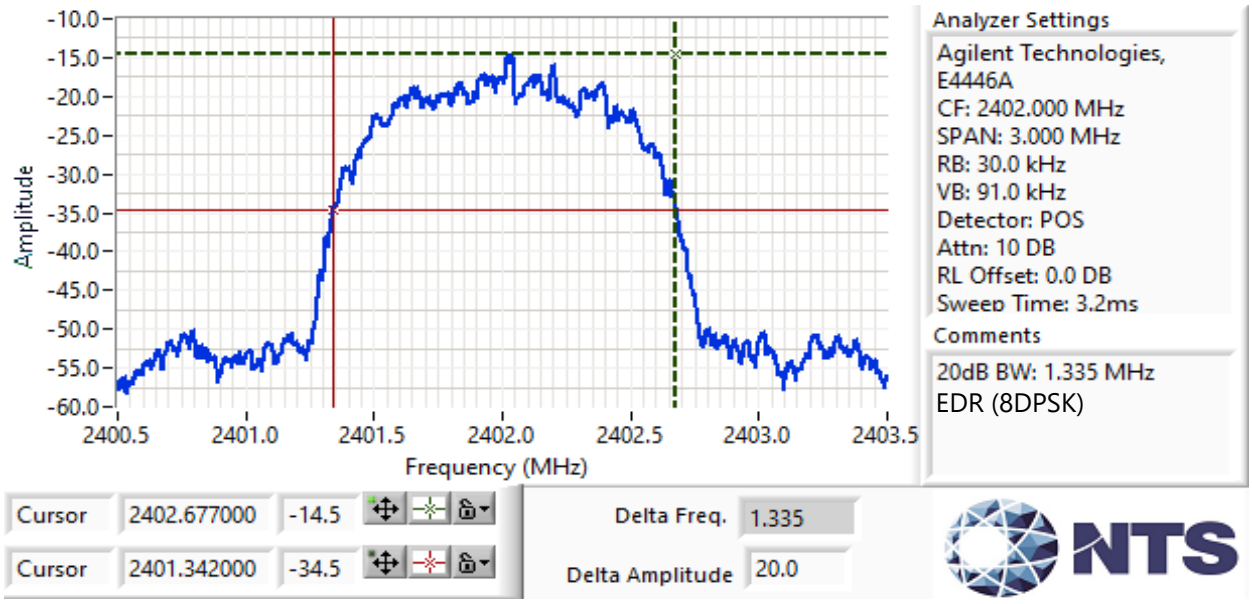


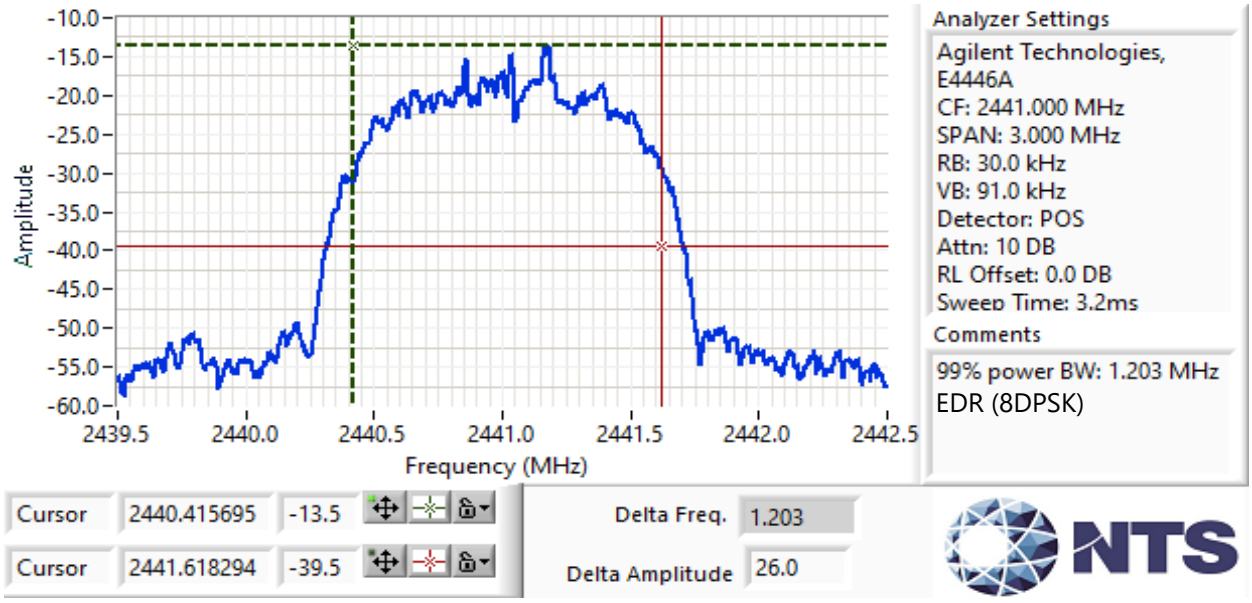
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A



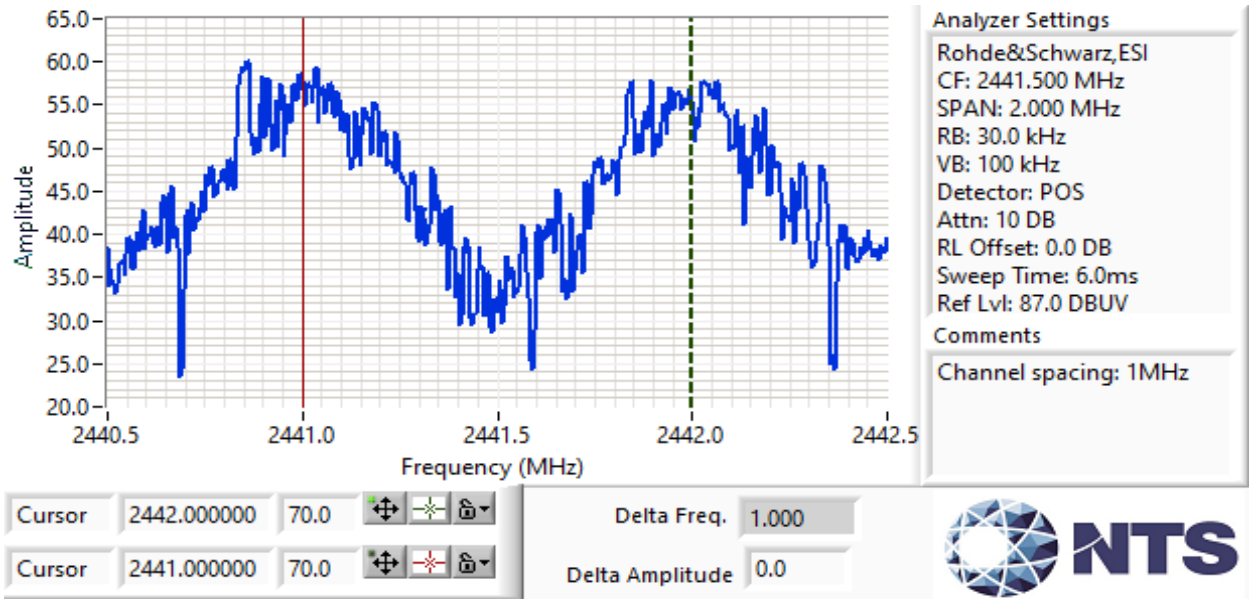


Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





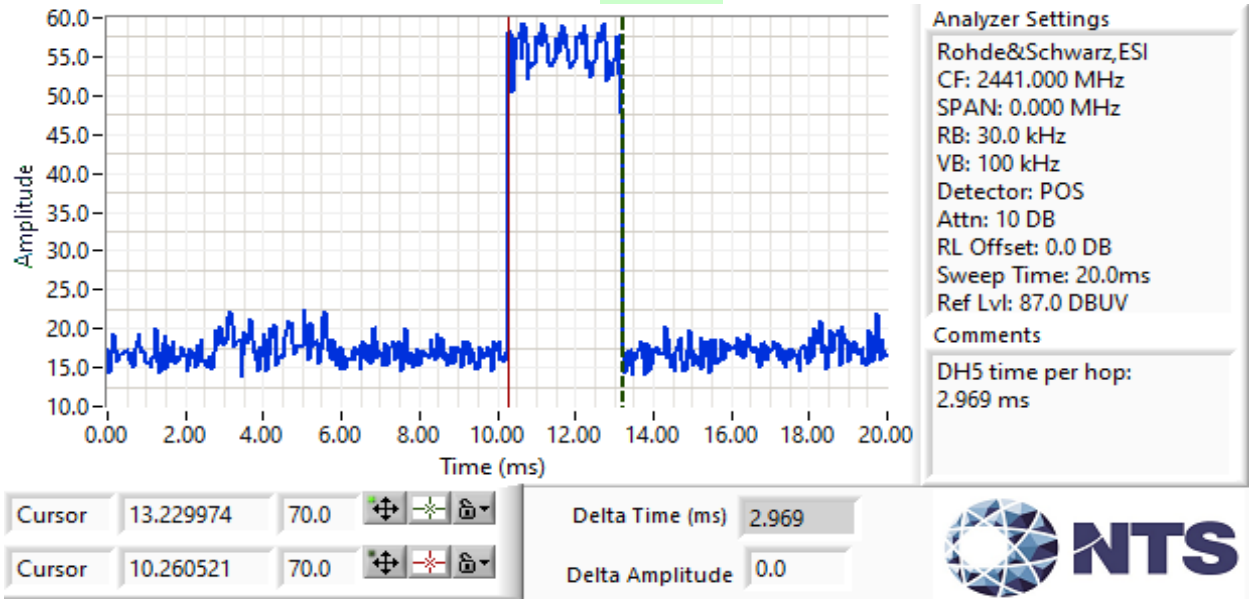
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A



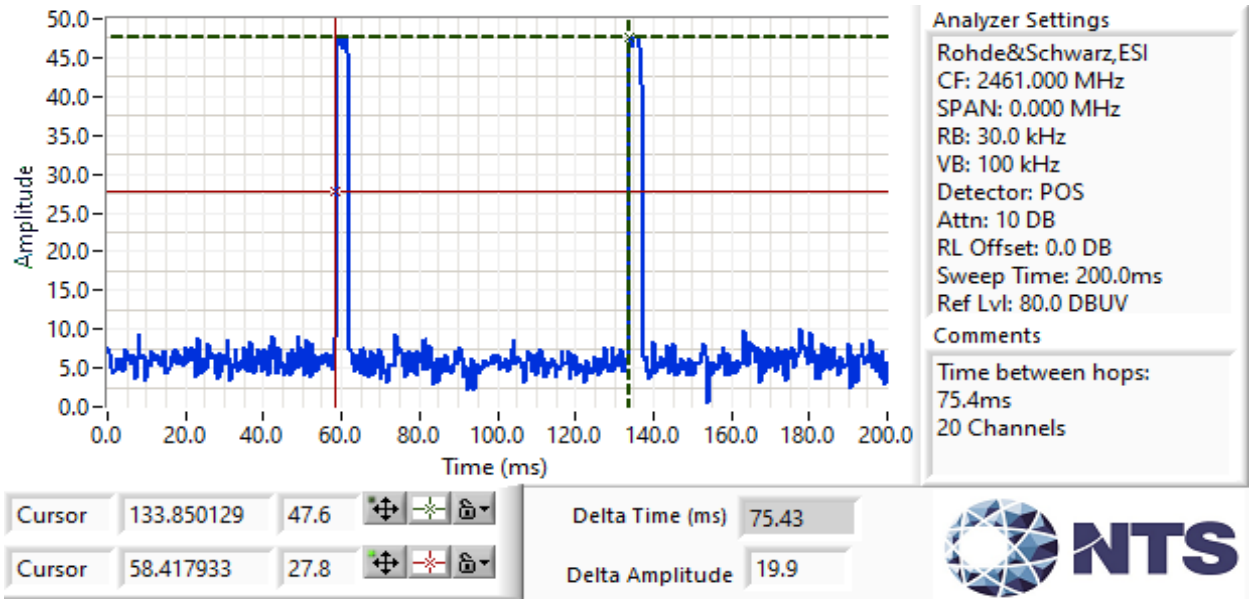
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

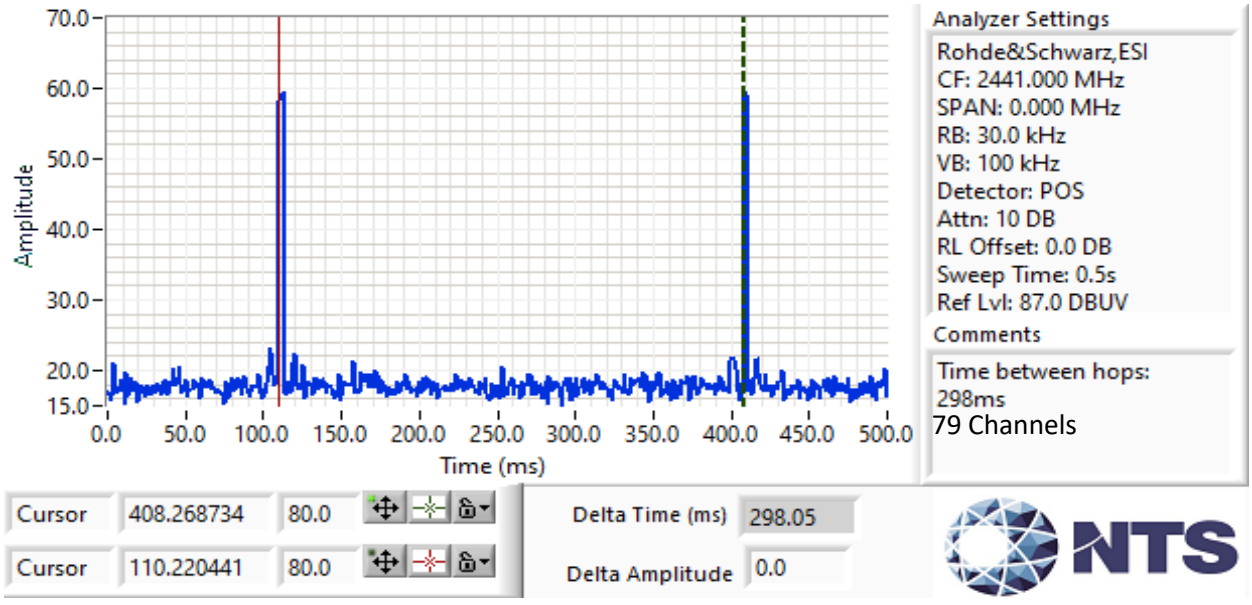
Frequency hopping systems in the **2400-2483.5 MHz** band shall use at least 15 channels.
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. (Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.)
The device complies with the Bluetooth protocol and employs a minimum of 20 of the available 79 hopping channels when employing adaptive frequency hopping and all 79 channels when not. Channels are selected in a pseudo random manner to ensure, on average, all channels are used equally.
The hopping rate is 1600 hops per second although any new channel may be used for a single hop slot, 3 hop slots or 5 hop slots. The dwell time per channel is, therefore either 0.625ms (single slot), 1.875ms (three slot) or 3.125ms (five slot). The average time of occupancy will not exceed 0.4s in any time interval of 0.4s multiplied by the number of channels being used.
The channel dwell time is calculated from the transmit time on a channel multiplied by the number of times a channel could be used in a period of 0.4 times the number of channels, N (i.e. 0.4N divided by the time between successive hops, rounded up to the closest integer), unless the time between successive hops exceeds 0.4N, in which case the channel dwell time is the transmit time on a channel.

Maximum 20dB bandwidth:	1347	kHz		
Channel spacing:	1000	kHz	**Pass**	
Transmission time per hop:	2.969	ms	5 hop slots (worst case = DH5 packets)	
The time between successive hops on a channel:	298	ms	maximum # of channels	
The time between successive hops on a channel:	75.4	ms	minimum # of channels	
Number of channels (N):	79		**Pass**	Maximum # of channels
Channel dwell time in 31.6 seconds:	317.683	ms	**Pass**	
Number of channels (N):	20		**Pass**	Minimum # of channels
Channel dwell time in 8.0 seconds:	317.683	ms	**Pass**	



Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-

Radiated Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 3/22/2023
Test Engineer: Jude Semana
Test Location: Fremont Chamber #7
Config. Used: 1
Config Change: None
EUT Voltage: 3V

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Remote support equipment was located on the floor.
The test distance and extrapolation factor (if used) are detailed under each run description.
Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 20-21 °C
Rel. Humidity: 35-40 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	.03 - 30 MHz	FCC 15.209	Pass	6.30 dBµV/m @ 21.082 MHz (-23.2 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

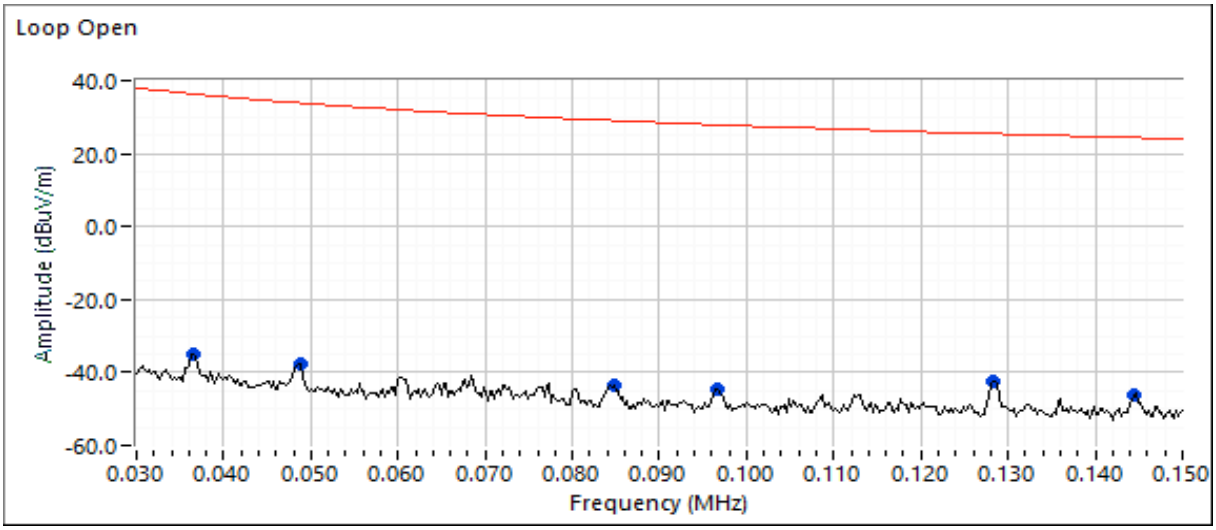
Sample Notes

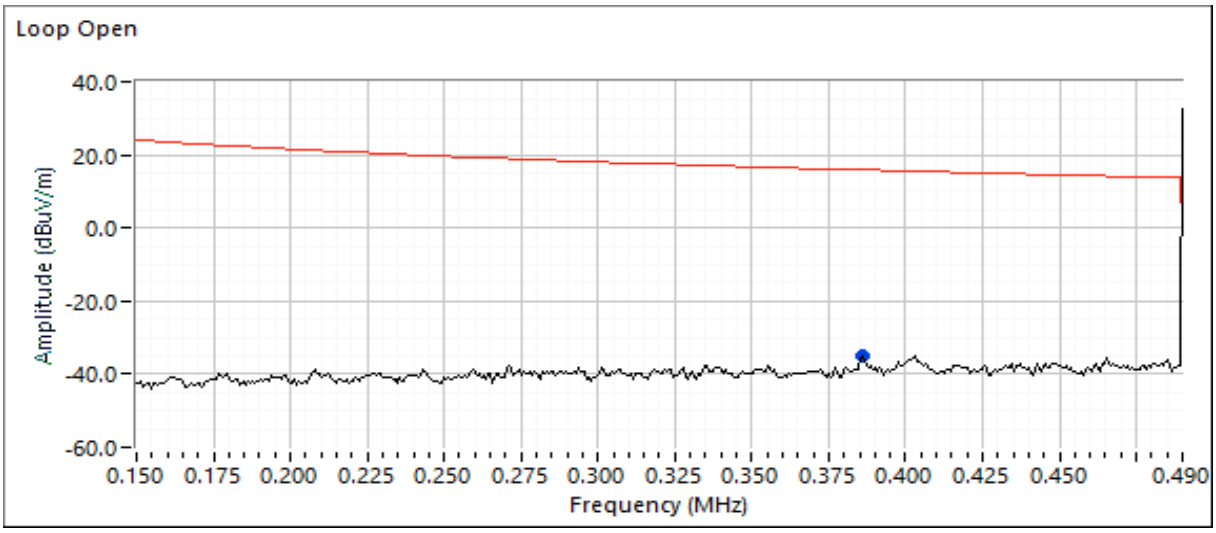
Sample S/N: None
Driver and Version: Bluetest3 V3.3.15

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-

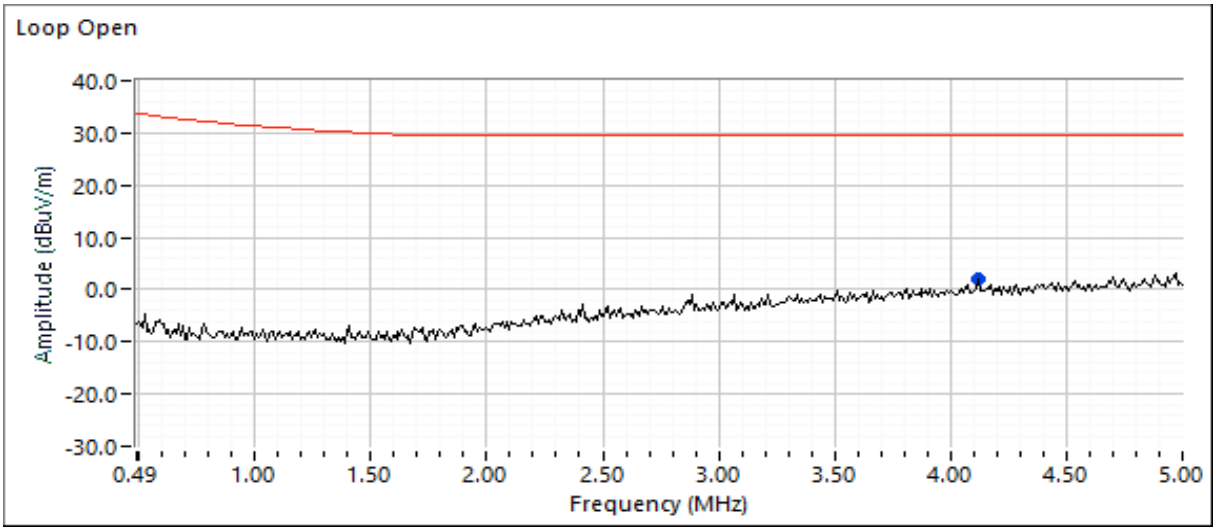
Run #1: Radiated Emissions, .03 - 30 MHz, FCC 15.209

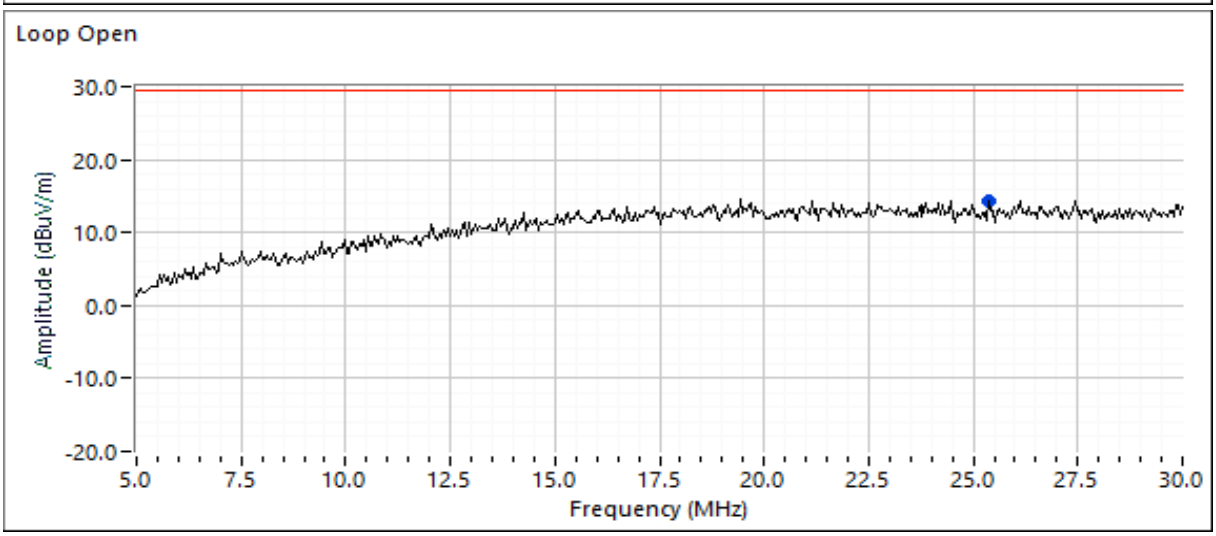
Test performed at 3m. Used ANSI C63.10 extrapolation factor to correct readings to limit distance.





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-



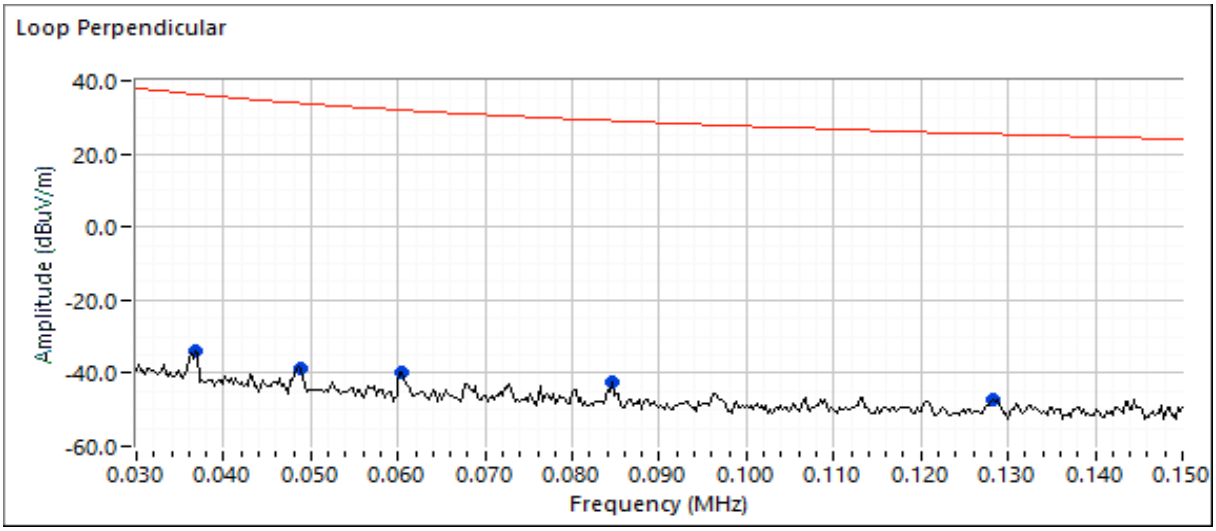


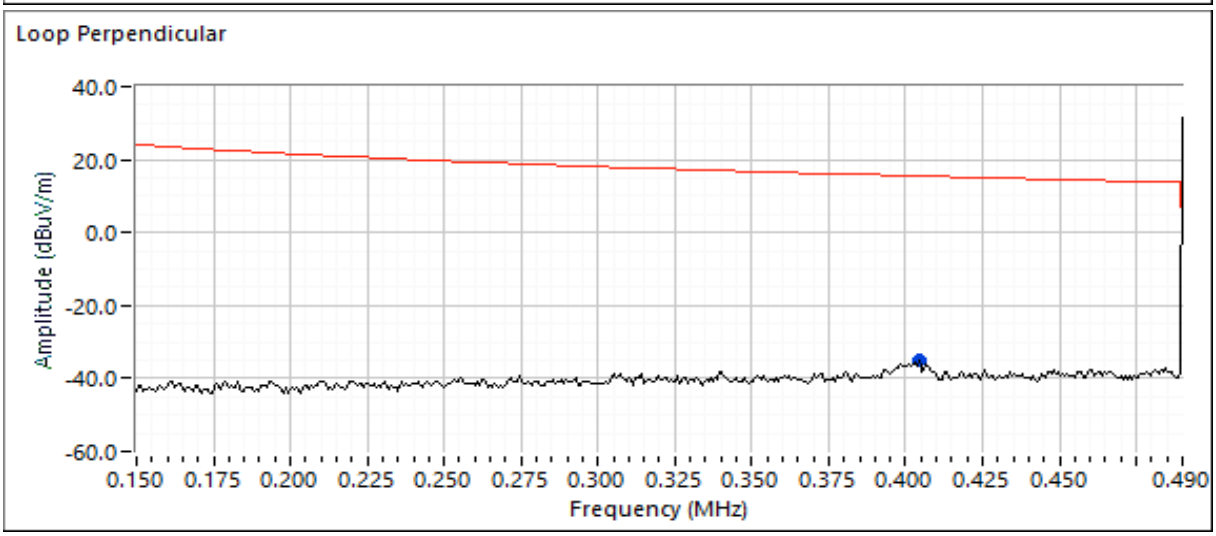
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-

Preliminary readings (Loop Open)

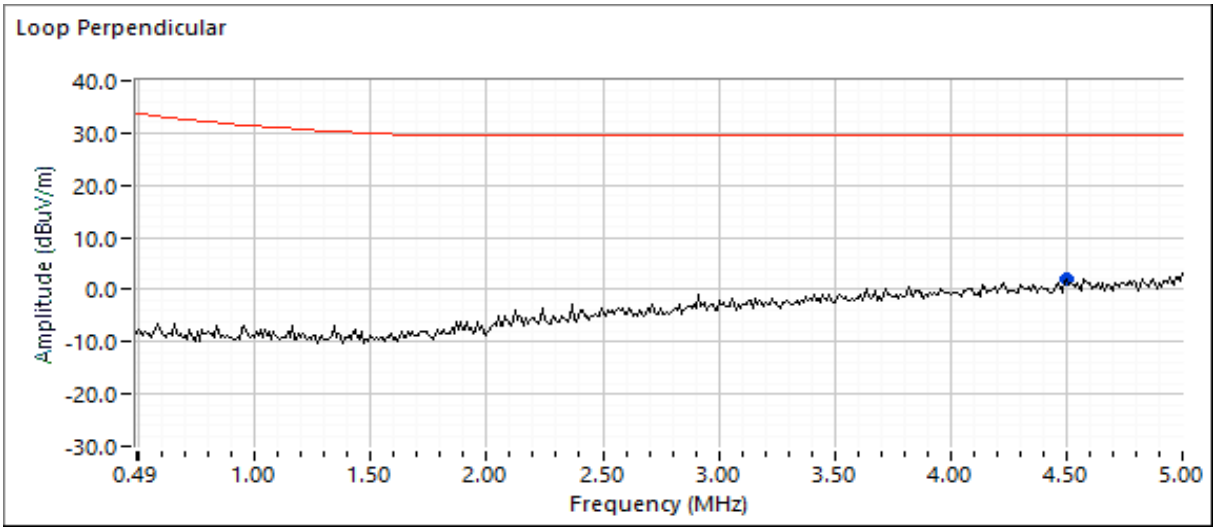
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
0.037	*-34.8*	*Open*	*36.3*	*-71.1*	*Peak*	*268*	*1.0*	
0.049	*-37.5*	*Open*	*33.8*	*-71.3*	*Peak*	*87*	*1.0*	
0.085	*-43.6*	*Open*	*29.0*	*-72.6*	*Peak*	*76*	*1.0*	
0.097	*-44.6*	*Open*	*27.9*	*-72.5*	*Peak*	*71*	*1.0*	
0.128	*-42.2*	*Open*	*25.4*	*-67.6*	*Peak*	*185*	*1.0*	
0.145	*-46.0*	*Open*	*24.4*	*-70.4*	*Peak*	*279*	*1.0*	
0.386	*-35.1*	*Open*	*15.9*	*-51.0*	*Peak*	*353*	*1.0*	
4.123	*2.2*	*Open*	*29.5*	*-27.3*	*Peak*	*210*	*1.0*	
25.391	*14.3*	*Open*	*29.5*	*-15.2*	*Peak*	*102*	*1.0*	

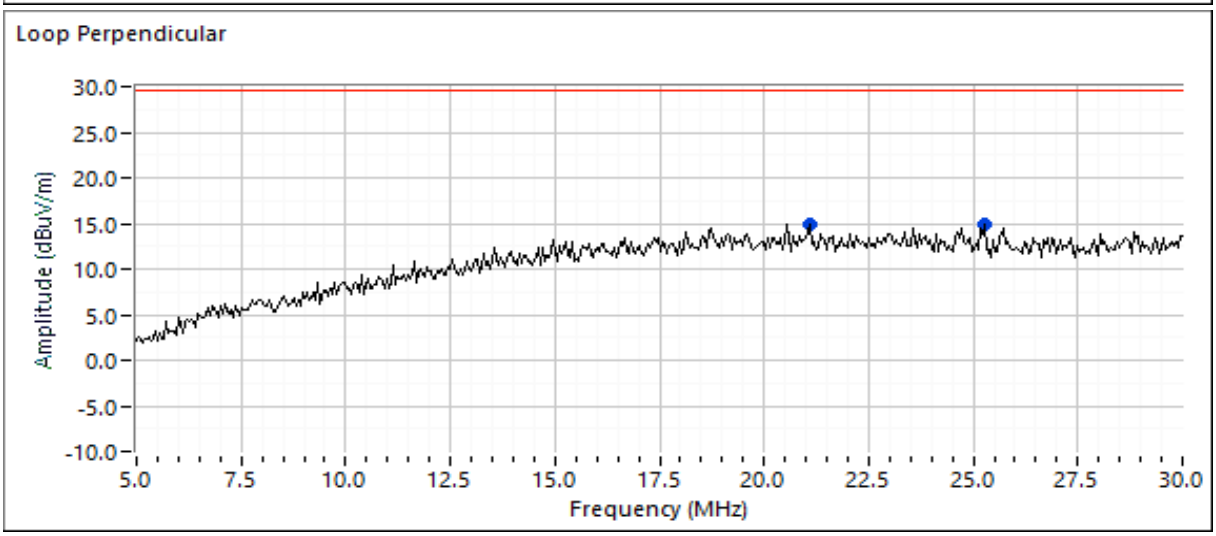
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-



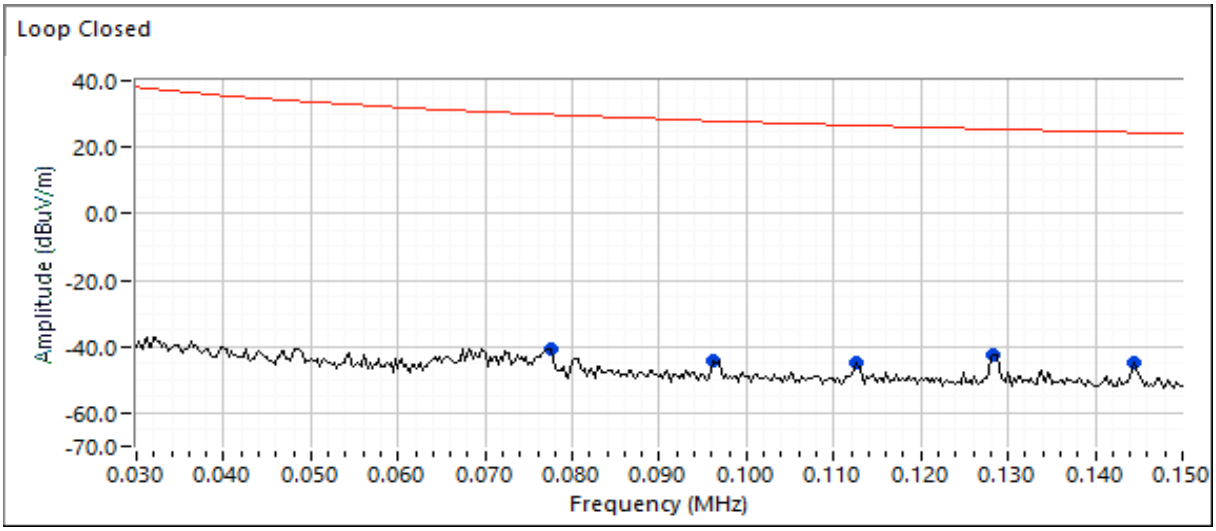


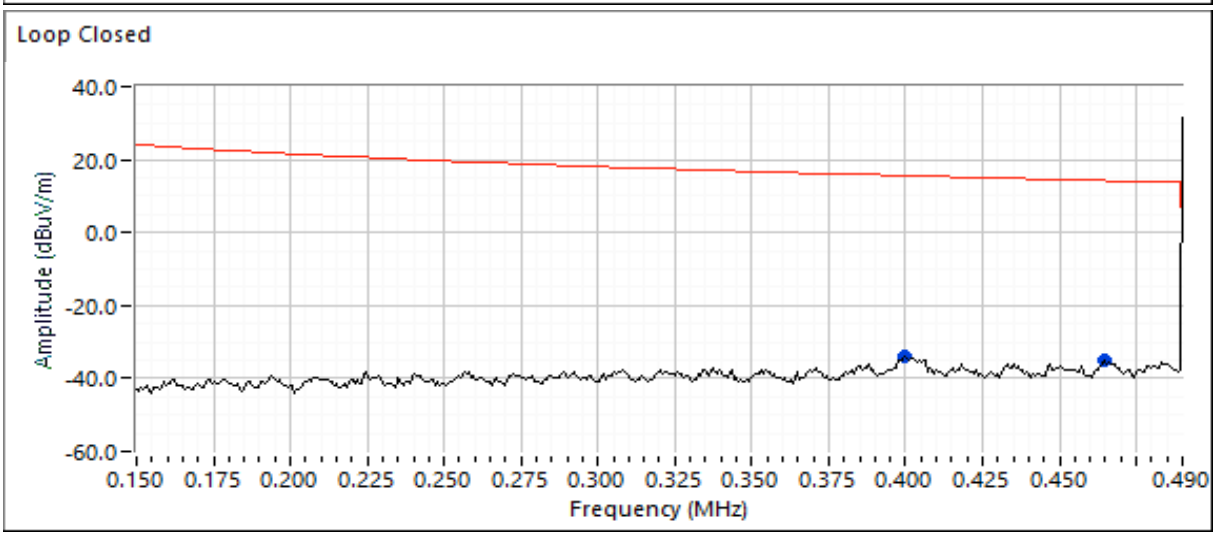
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-

Preliminary readings (Loop Perpendicular)

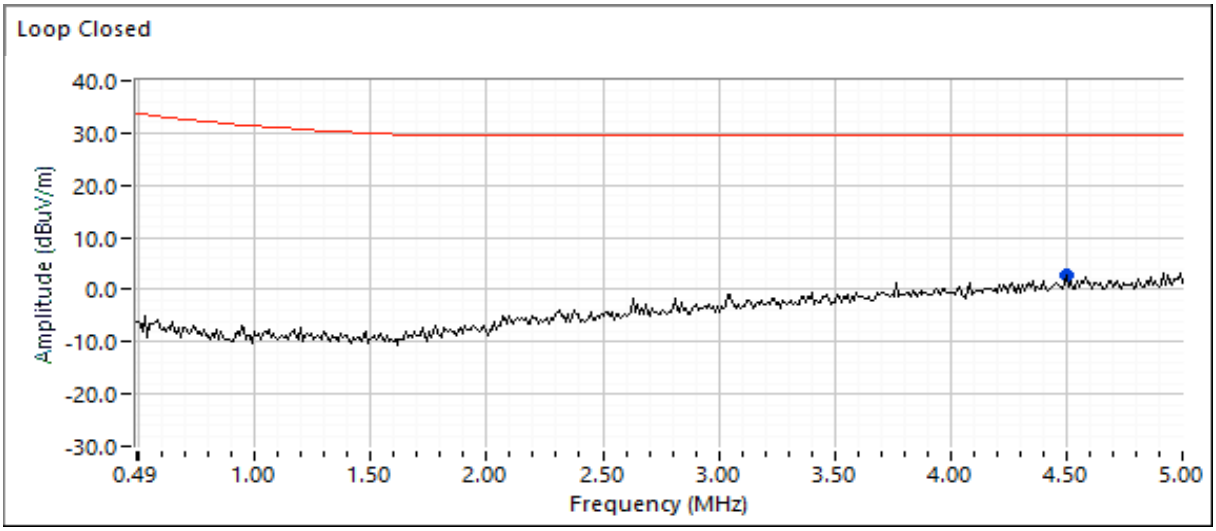
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
0.037	*-34.0*	*Perpend*	*36.3*	*-70.3*	*Peak*	*17*	*1.0*	
0.049	*-38.6*	*Perpend*	*33.8*	*-72.4*	*Peak*	*172*	*1.0*	
0.061	*-39.7*	*Perpend*	*32.0*	*-71.7*	*Peak*	*105*	*1.0*	
0.085	*-42.6*	*Perpend*	*29.0*	*-71.6*	*Peak*	*105*	*1.0*	
0.128	*-47.2*	*Perpend*	*25.4*	*-72.6*	*Peak*	*32*	*1.0*	
0.404	*-35.0*	*Perpend*	*15.5*	*-50.5*	*Peak*	*249*	*1.0*	
4.503	*2.0*	*Perpend*	*29.5*	*-27.5*	*Peak*	*95*	*1.0*	
21.082	*15.0*	*Perpend*	*29.5*	*-14.5*	*Peak*	*323*	*1.0*	
25.291	*14.9*	*Perpend*	*29.5*	*-14.6*	*Peak*	*216*	*1.0*	

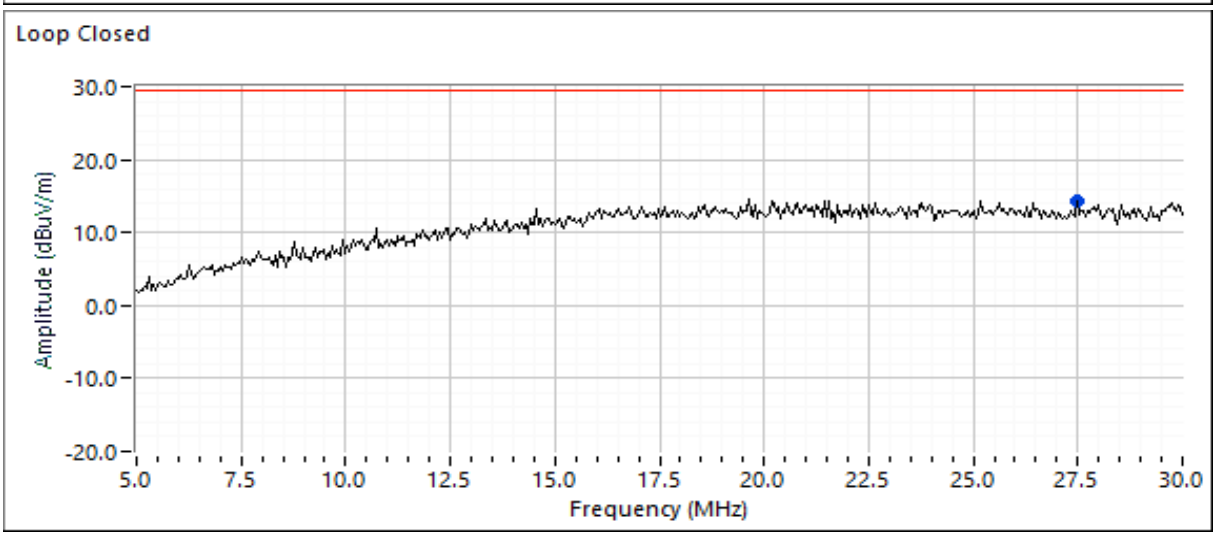
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	-

Preliminary readings (Loop Closed)

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
0.078	*-40.6*	*Closed*	*29.8*	*-70.4*	*Peak*	*355*	*1.0*	
0.096	*-44.5*	*Closed*	*27.9*	*-72.4*	*Peak*	*86*	*1.0*	
0.113	*-44.8*	*Closed*	*26.6*	*-71.4*	*Peak*	*174*	*1.0*	
0.128	*-42.3*	*Closed*	*25.4*	*-67.7*	*Peak*	*215*	*1.0*	
0.145	*-45.1*	*Closed*	*24.4*	*-69.5*	*Peak*	*148*	*1.0*	
0.399	*-34.2*	*Closed*	*15.6*	*-49.8*	*Peak*	*278*	*1.0*	
0.465	*-34.9*	*Closed*	*14.3*	*-49.2*	*Peak*	*245*	*1.0*	
4.503	*2.7*	*Closed*	*29.5*	*-26.8*	*Peak*	*285*	*1.0*	
27.495	*14.2*	*Closed*	*29.5*	*-15.3*	*Peak*	*200*	*1.0*	

Maximized readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
21.082	6.3	Perpend	29.5	-23.2	QP	320	1.0	Noise floor
25.291	6.0	Perpend	29.5	-23.5	QP	215	1.0	Noise floor

Note 1:	The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, with a peak limit 20dB above the average limit.

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

RSS-247 and FCC 15.247 Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 20-21 °C
Rel. Humidity: 35-40 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Power Setting		Test Performed	Limit	Result / Margin
1a	Basic (GFSK)	0 - 2402MHz	8		Radiated Emissions, 30 - 1000 MHz	FCC Part 15.209 / 15.247(c)	32.1 dBµV/m @ 120.01 MHz(-11.4 dB)
1b	EDR (8DPSK)	79 - 2480MHz	8		Radiated Emissions, 30 - 1000 MHz	FCC Part 15.209 / 15.247(c)	29.8 dBµV/m @ 168.96 MHz(-13.7 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: None
Driver and Version: Bluetest3 V3.3.15

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with ANSI C63.10
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear voltage average, auto sweep time, max hold.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)		
Basic DH5	1 Mbps	0.78	Yes	2.894	1.1	2.1	346	1 kHz	GFSK
EDR 2-DH5	2 Mbps	0.77	Yes	2.92	1.1	2.2	342	1 kHz	π/4-DQPSK
EDR 3-DH5	3 Mbps	0.77	Yes	2.894	1.2	2.3	346	1 kHz	8DPSK

Note: Symbol rate for all three modulations is 1 Msps

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 3:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces
Note 4:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by Linear voltage correction factor
Note 5:	Emission has constatnt duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces, measurement corrected by Pwr correction factor
Note 6:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear voltage average, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 7:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, RMS detector, sweep time auto, max hold. Max hold for 50*(1/DC) traces

* Pwr Cor Factor calculated using 10 X log(1/duty cycle)
** Lin Volt Cor Factor is calculated using 20 x log(1/duty cycle)

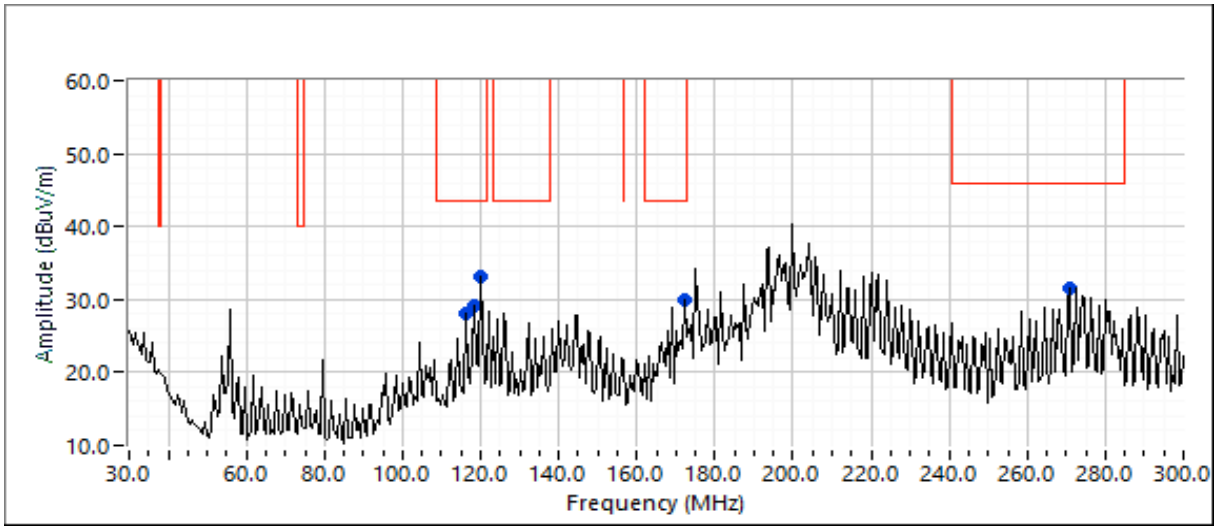
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

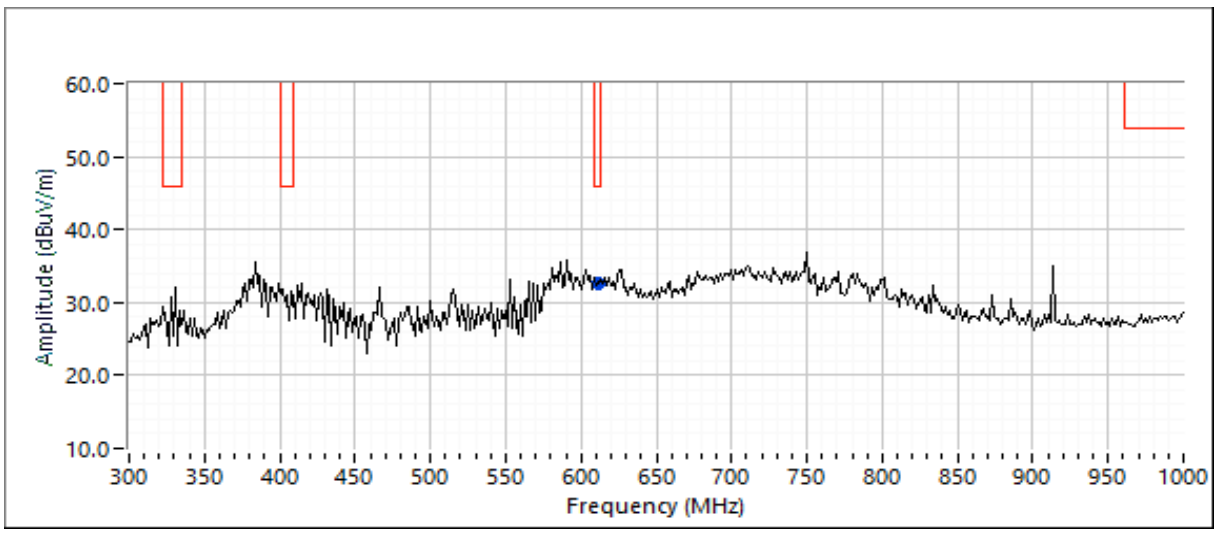
Run #1: Radiated Spurious Emissions, 30 - 1000 MHz.

Date of Test: 3/22/2023 Config. Used: 1
Test Engineer: R. Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 3V

Run #1a: Low Channel

Channel: 0 Mode: Basic (GFSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

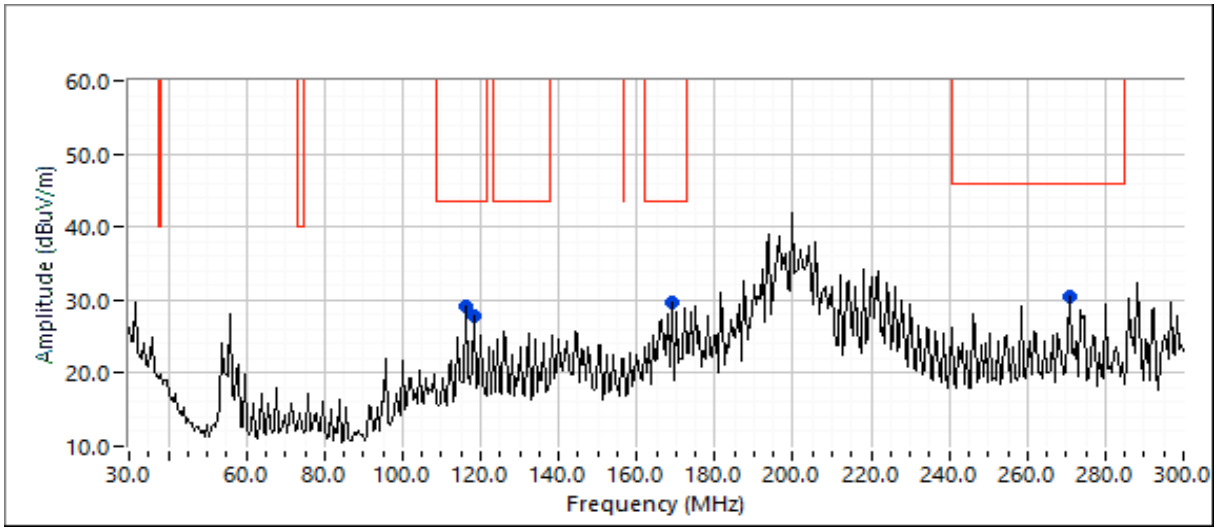
Spurious Emissions

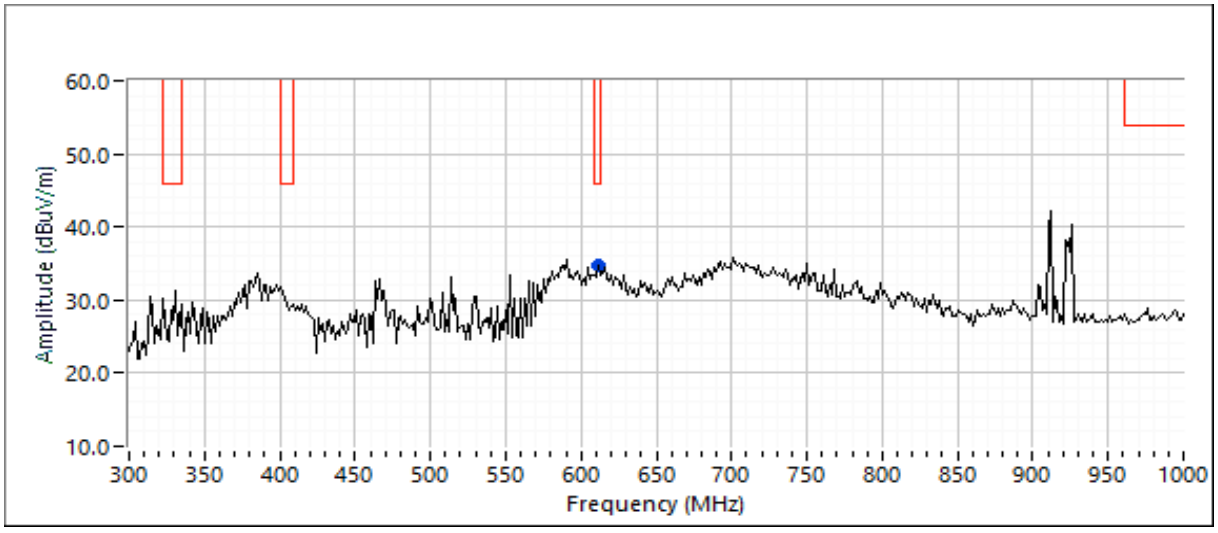
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
120.005	**32.1**	H	43.5	**-11.4**	QP	149	1.6	QP (1.00s)
172.010	30.3	V	43.5	-13.2	QP	115	1.0	QP (1.00s)
118.011	28.2	H	43.5	-15.3	QP	135	1.8	QP (1.00s)
611.768	30.1	H	46.0	-15.9	QP	321	1.0	QP (1.00s)
272.012	29.6	H	46.0	-16.4	QP	295	1.0	QP (1.00s)
116.003	26.8	H	43.5	-16.7	QP	136	1.8	QP (1.00s)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Run #1b: High Channel

Channel: 79 Mode: EDR (8DPSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
168.964	**29.8**	H	43.5	**-13.7**	QP	329	1.5	QP (1.00s)
270.337	31.1	H	46.0	-14.9	QP	285	1.0	QP (1.00s)
611.347	29.1	H	46.0	-16.9	QP	138	1.8	QP (1.00s)
115.996	26.5	V	43.5	-17.0	QP	90	1.0	QP (1.00s)
118.004	25.5	V	43.5	-18.0	QP	67	1.0	QP (1.00s)

Note:	No emissions were observed related to the radio below 1 GHz, so testing of additional modes and frequencies were not necessary.

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

RSS-247 and FCC 15.247 Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 20-21 °C
Rel. Humidity: 35-40 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel		Power Setting	Test Performed	Limit	Result / Margin
1	Basic (GFSK)	0 - 2402MHz		8	Band Edge (2400 MHz)	FCC Part 15.209 / 15.247(c)	-54.6 dB (-20dBc)
	Basic (GFSK)	0 - 2402MHz		8	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	35.0 dBµV/m @ 2355.7 MHz(-19.0 dB)
	Basic (GFSK)	79 - 2480MHz		8	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	34.5 dBµV/m @ 2483.6 MHz(-19.5 dB)
2	EDR (π/4-DQPSK)	0 - 2402MHz		8	Band Edge (2400 MHz)	FCC Part 15.209 / 15.247(c)	-52.6 dB (-20dBc)
	EDR (π/4-DQPSK)	0 - 2402MHz		8	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	33.9 dBµV/m @ 2388.3 MHz(-20.1 dB)
	EDR (π/4-DQPSK)	79 - 2480MHz		8	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	34.3 dBµV/m @ 2486.0 MHz(-19.7 dB)
3	EDR (8DPSK)	0 - 2402MHz		8	Band Edge (2400 MHz)	FCC Part 15.209 / 15.247(c)	-51.8 dB (-20dBc)
	EDR (8DPSK)	0 - 2402MHz		8	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	34.0 dBµV/m @ 2389.5 MHz(-20.0 dB)
	EDR (8DPSK)	79 - 2480MHz		8	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	34.4 dBµV/m @ 2484.2 MHz(-19.6 dB)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: None

Driver and Version: Bluetest3 V3.3.15

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with ANSI C63.10
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has a duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear voltage average, auto sweep time, max hold.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)		
Basic DH5	1 Mbps	0.78	Yes	2.894	1.1	2.1	346	1 kHz	GFSK
EDR 2-DH5	2 Mbps	0.77	Yes	2.92	1.1	2.2	342	1 kHz	π/4-DQPSK
EDR 3-DH5	3 Mbps	0.77	Yes	2.894	1.2	2.3	346	1 kHz	8DPSK

Note: Symbol rate for all three modulations is 1 Msps

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 3:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces
Note 4:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by Linear voltage correction factor
Note 5:	Emission has constatnt duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces, measurement corrected by Pwr correction factor
Note 6:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear voltage average, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 7:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, RMS detector, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 8:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

* Pwr Cor Factor calculated using 10 X log(1/duty cycle)
** Lin Volt Cor Factor is calculated using 20 x log(1/duty cycle)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Run #1: Radiated Bandedge Measurements

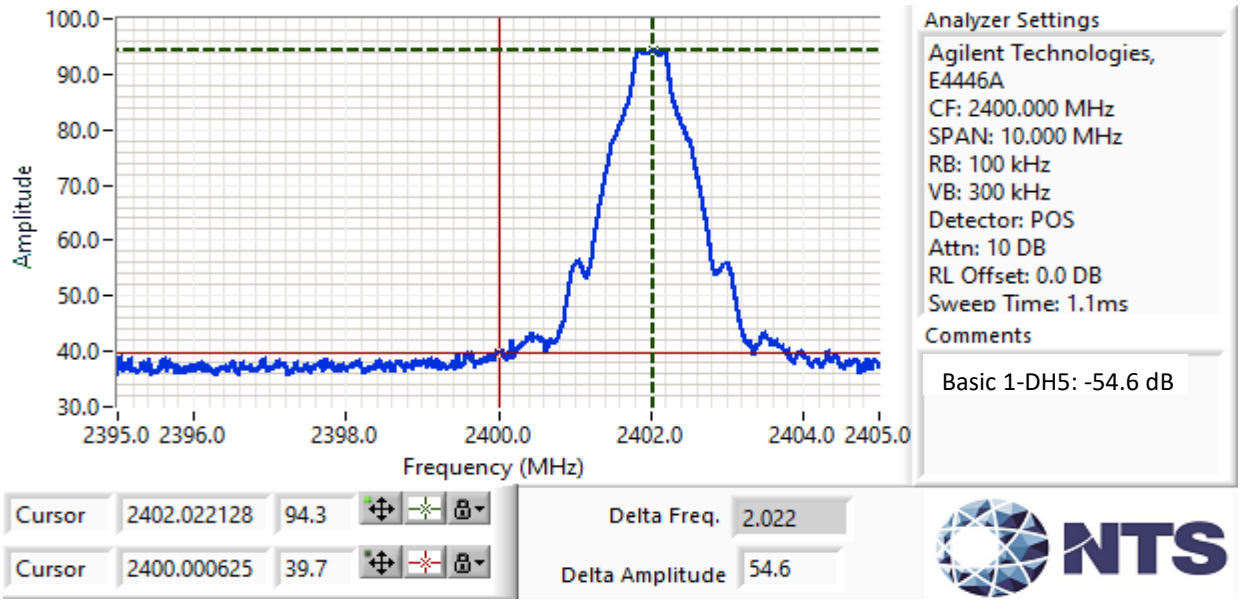
Date of Test: 3/21/2023 Config. Used: 1
Test Engineer: Jude Semana Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 3V

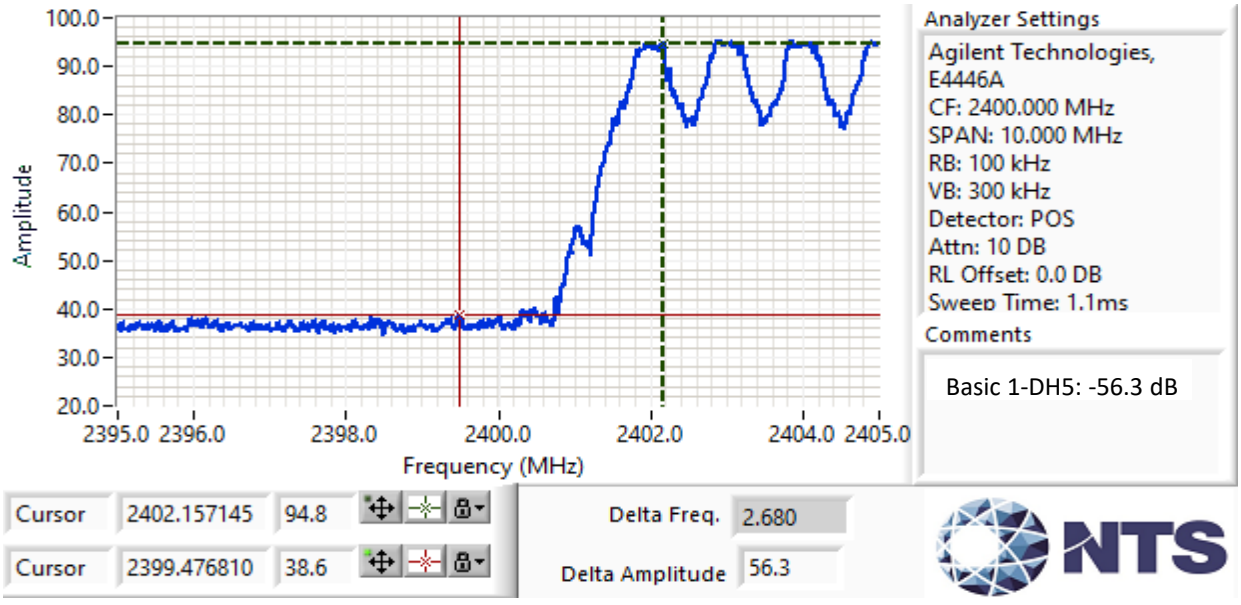
Channel: 0 Mode: Basic (GFSK) Pwr Setting: 8

Band Edge Signal Field Strength - Direct measurement of field strength

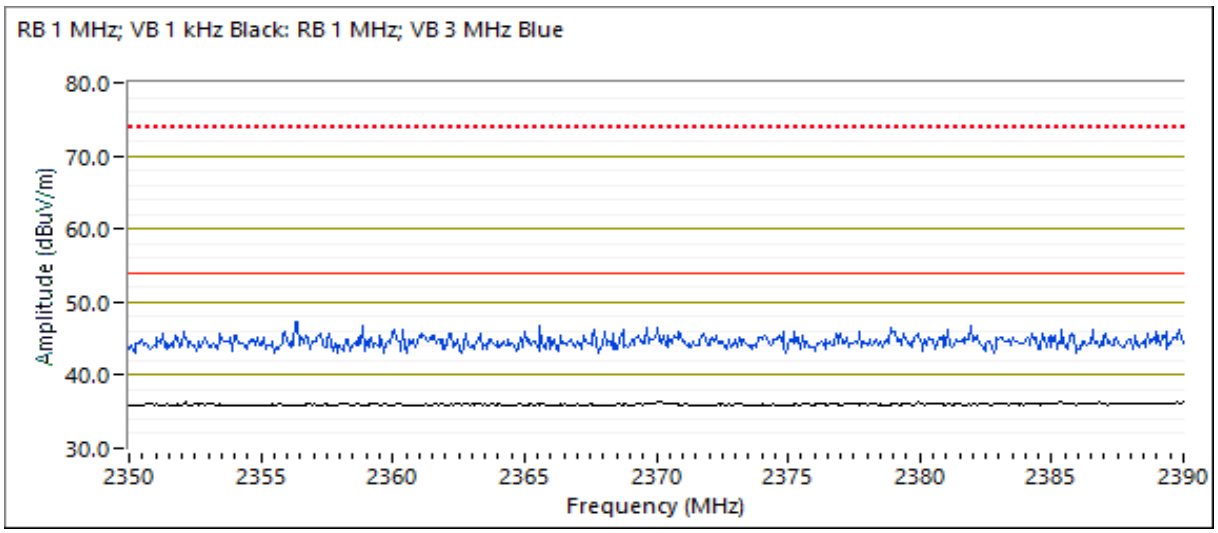
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2369.930	33.7	V	54.0	-20.3	AVG	90	1.0	RB 1 MHz; VB: 1 kHz - Note 6
2356.530	44.8	V	74.0	-29.2	PK	90	1.0	RB 1 MHz; VB: 3 MHz
2355.730	35.0	V	54.0	-19.0	AVG	90	1.0	RB 1 MHz; VB: 1 kHz - Note 6, Hop
2354.670	44.8	V	74.0	-29.2	PK	90	1.0	RB 1 MHz; VB: 3 MHz, Hopping

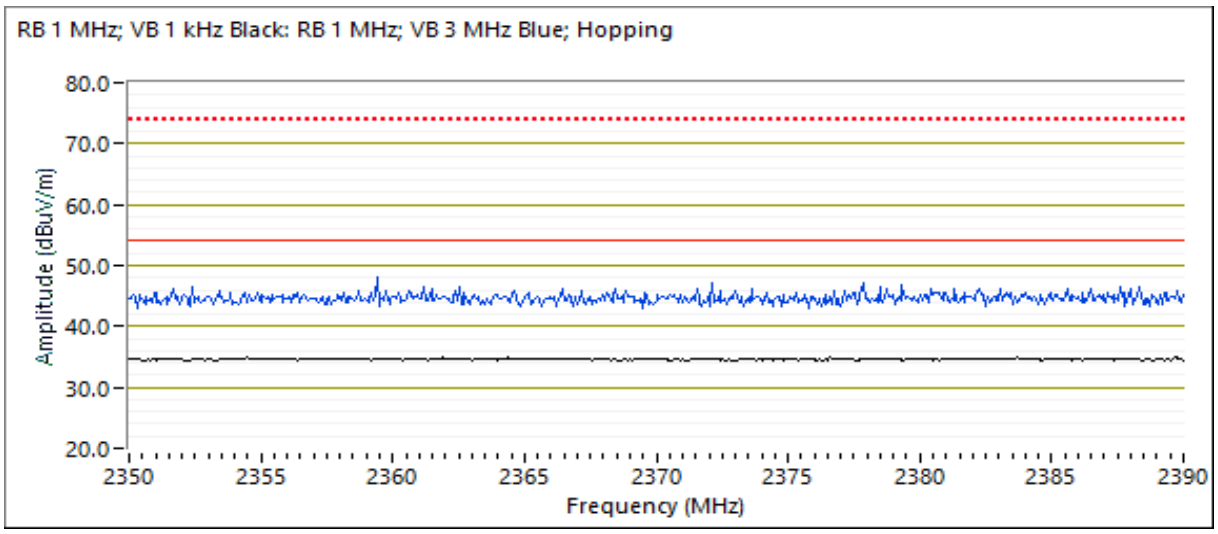
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A



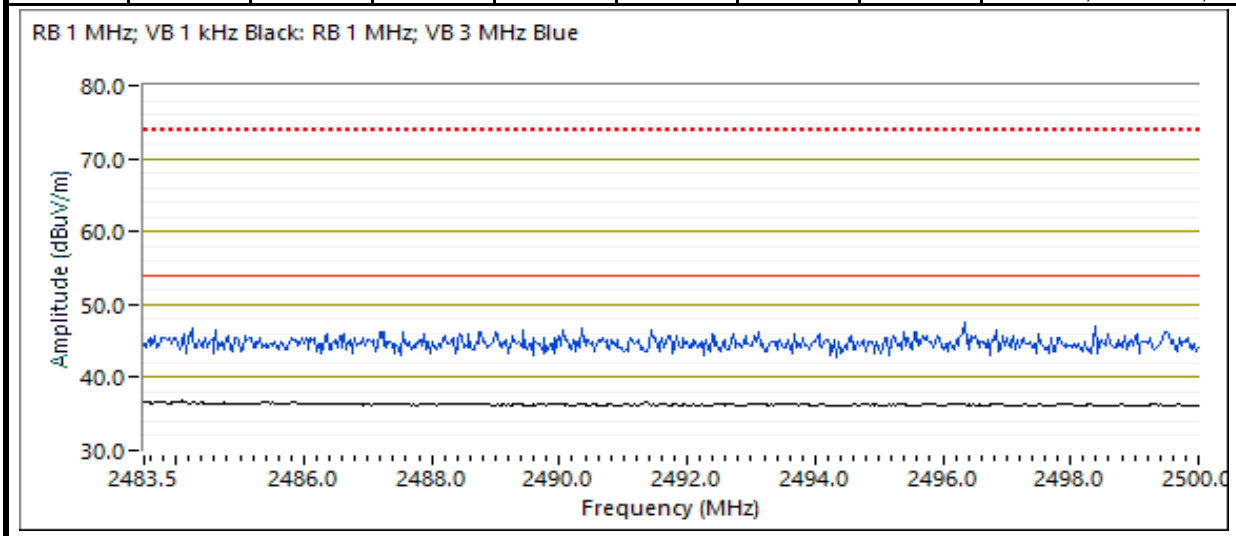


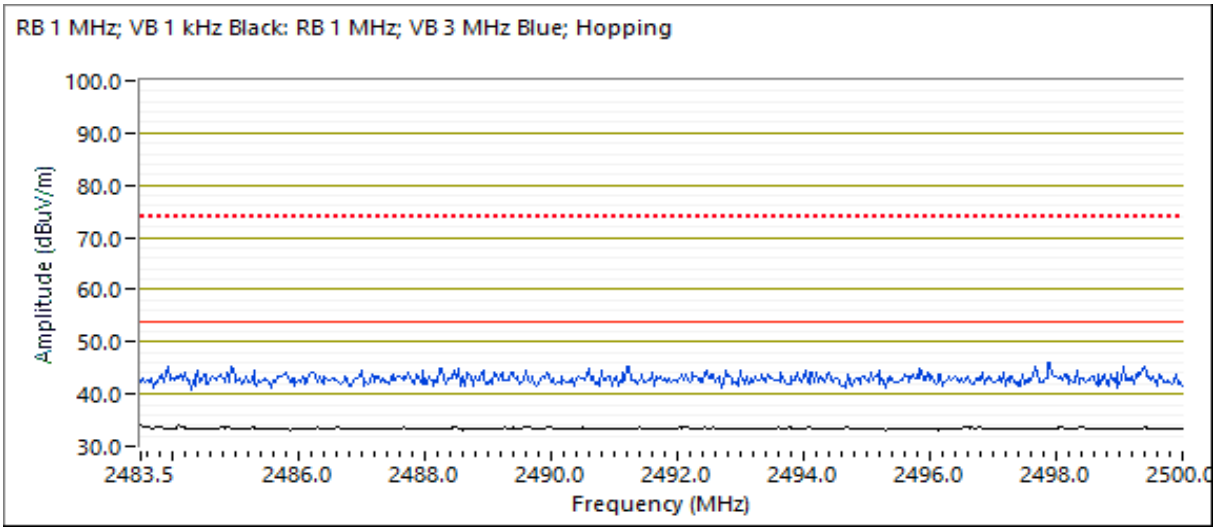
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Channel: 79 Mode: Basic (GFSK) Pwr Setting: 8

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.610	34.5	V	54.0	-19.5	AVG	90	1.0	RB 1 MHz; VB: 1 kHz; Note 6
2492.630	45.4	V	74.0	-28.6	PK	90	1.0	RB 1 MHz; VB: 3 MHz
2493.040	33.8	V	54.0	-20.2	AVG	90	1.0	RB 1 MHz; VB: 1 kHz; Note 6; Hop
2492.910	45.1	V	74.0	-28.9	PK	90	1.0	RB 1 MHz; VB: 3 MHz; Hopping





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Run #2: Radiated Bandedge Measurements

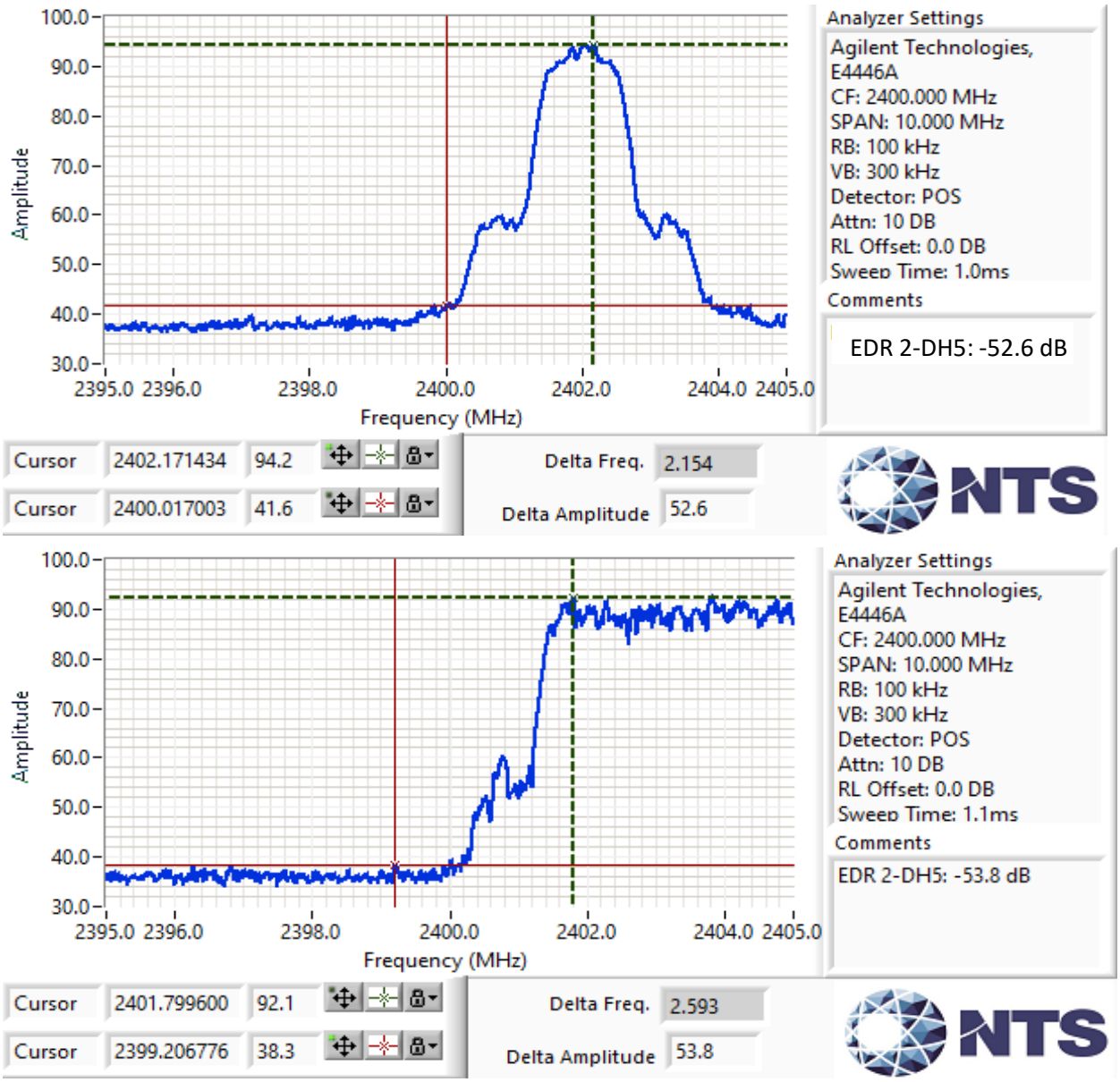
Date of Test: 3/21/2023 Config. Used: 1
Test Engineer: Jude Semana Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 3V

Channel: 0 Mode: EDR (π/4-DQPSK) Pwr Setting: 8

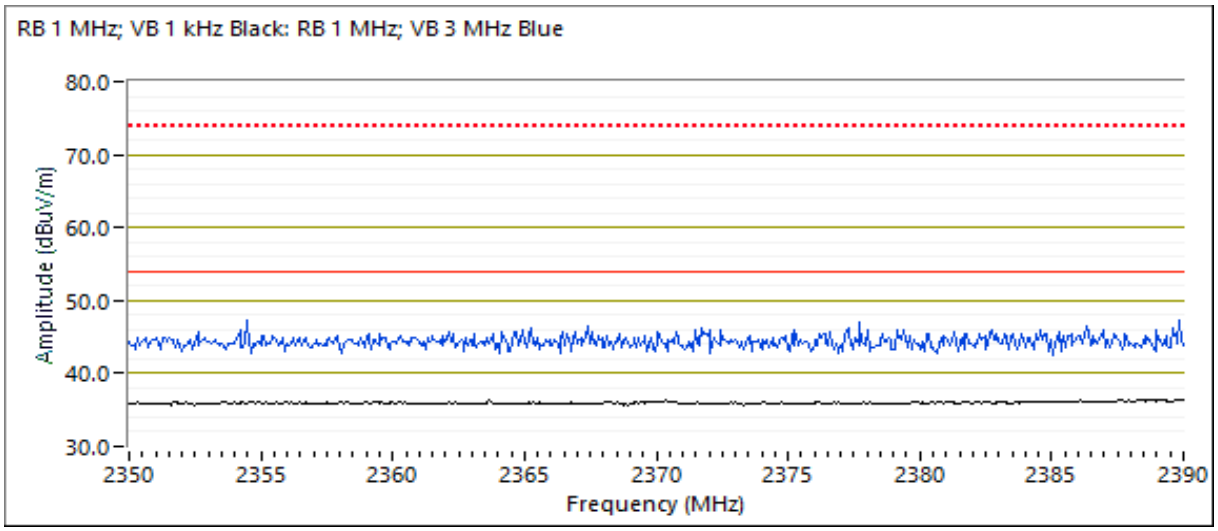
Band Edge Signal Field Strength - Direct measurement of field strength

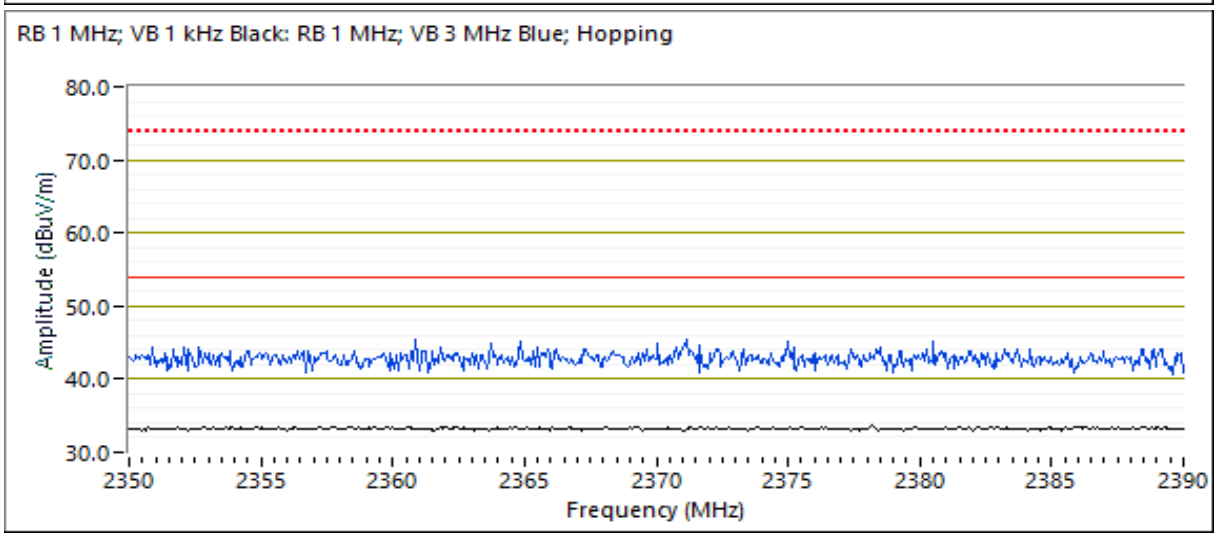
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2388.330	33.9	V	54.0	-20.1	AVG	90	1.0	RB 1 MHz; VB: 1 kHz - Note 6
2355.930	45.7	V	74.0	-28.3	PK	90	1.0	RB 1 MHz; VB: 3 MHz
2381.930	33.7	V	54.0	-20.3	AVG	90	1.0	RB 1 MHz; VB: 1 kHz - Note 6; Hop
2383.330	46.0	V	74.0	-28.0	PK	90	1.0	RB 1 MHz; VB: 3 MHz; Hopping

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A



Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A



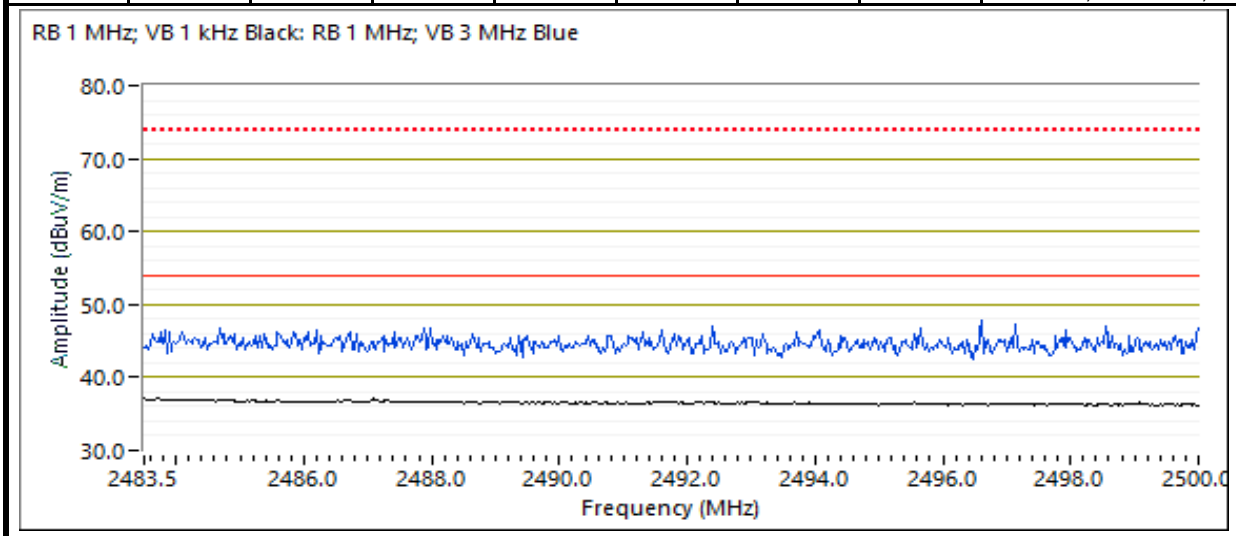


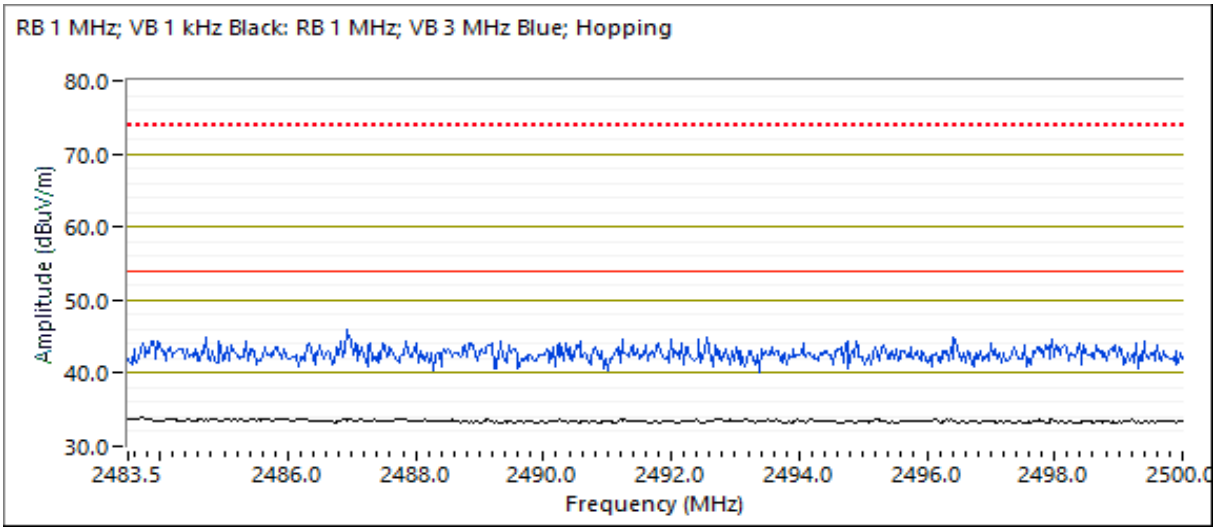
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Channel: 79 Mode: EDR (π/4-DQPSK) Pwr Setting: 8

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2486.000	34.3	V	54.0	-19.7	AVG	90	1.0	RB 1 MHz; VB: 1 kHz; Note 6
2497.520	45.9	V	74.0	-28.1	PK	90	1.0	RB 1 MHz; VB: 3 MHz
2496.400	34.2	V	54.0	-19.8	AVG	90	1.0	RB 1 MHz; VB: 1 kHz; Note 6; Hop
2497.880	45.5	V	74.0	-28.5	PK	90	1.0	RB 1 MHz; VB: 3 MHz; Hopping





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Run #3: Radiated Bandedge Measurements

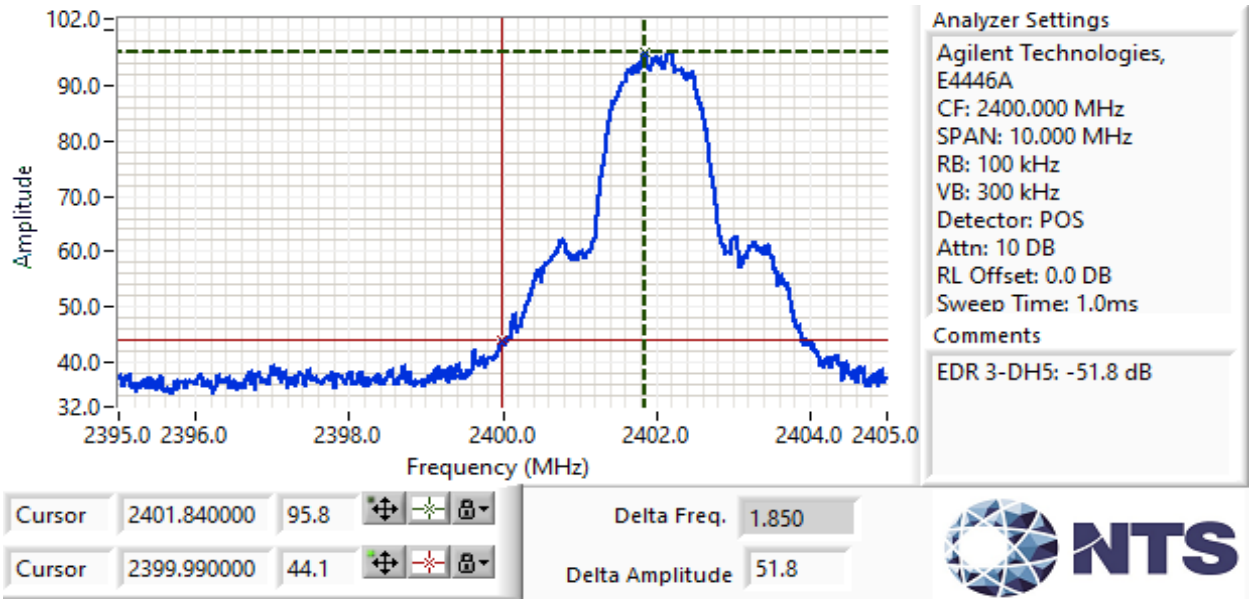
Date of Test: 3/21/2023 Config. Used: 1
Test Engineer: Jude Semana Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 3V

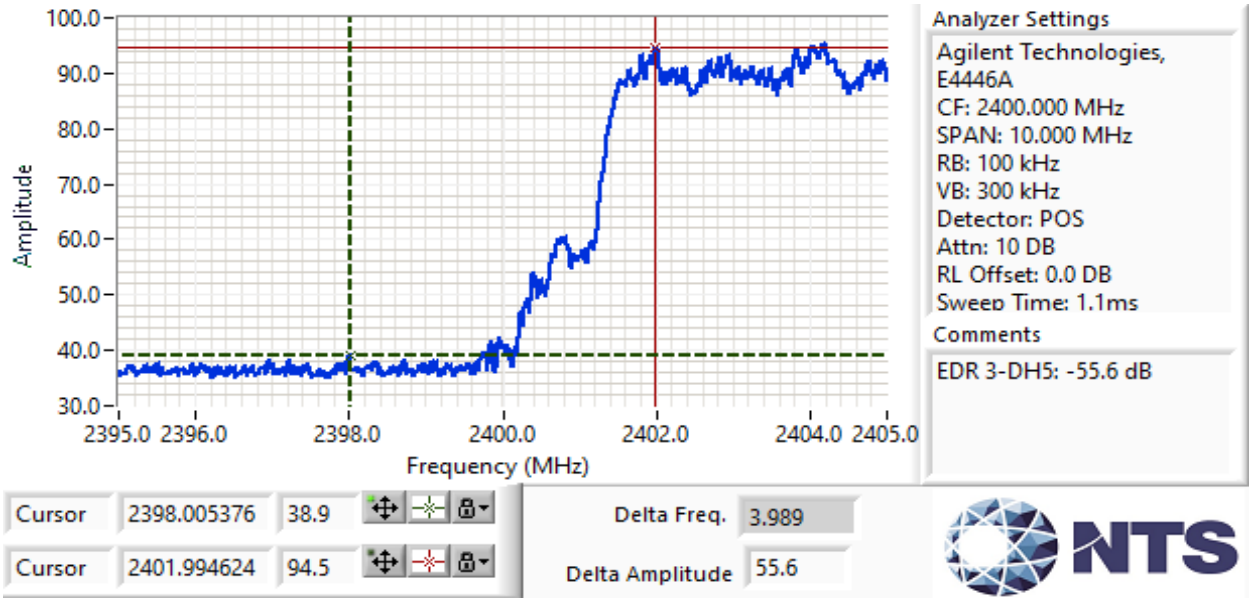
Channel: 0 Mode: EDR (8DPSK) Pwr Setting: 8

Band Edge Signal Field Strength - Direct measurement of field strength

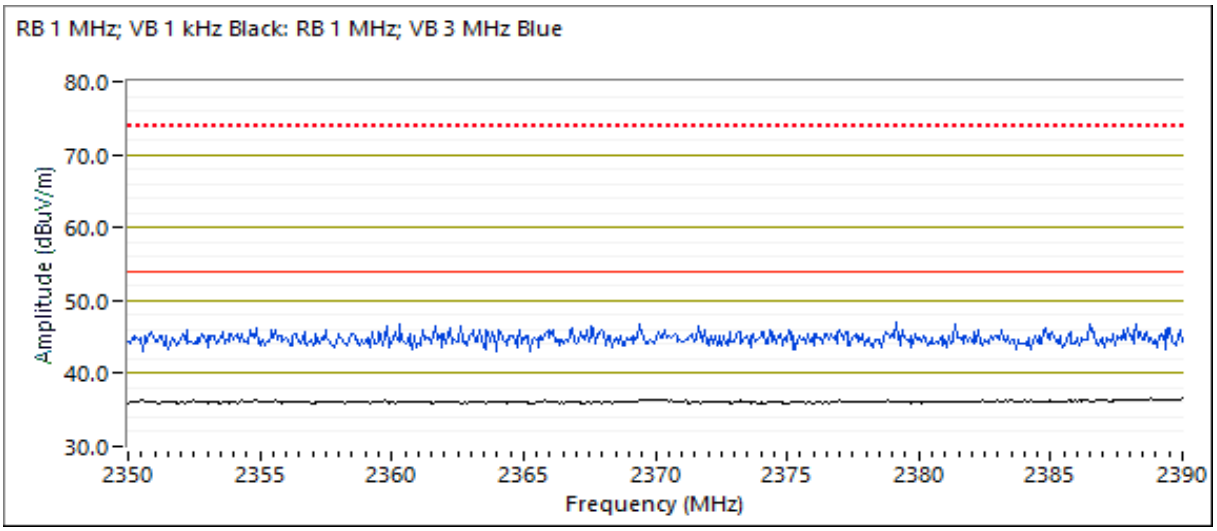
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.530	34.0	V	54.0	-20.0	AVG	90	1.0	RB 1 MHz; VB: 1 kHz; Note 6
2360.200	45.3	V	74.0	-28.7	PK	90	1.0	RB 1 MHz; VB: 3 MHz
2370.330	33.5	V	54.0	-20.5	AVG	90	1.0	RB 1 MHz; VB: 1 kHz - Note 6; Hop
2386.870	46.2	V	74.0	-27.8	PK	90	1.0	RB 1 MHz; VB: 3 MHz; Hopping

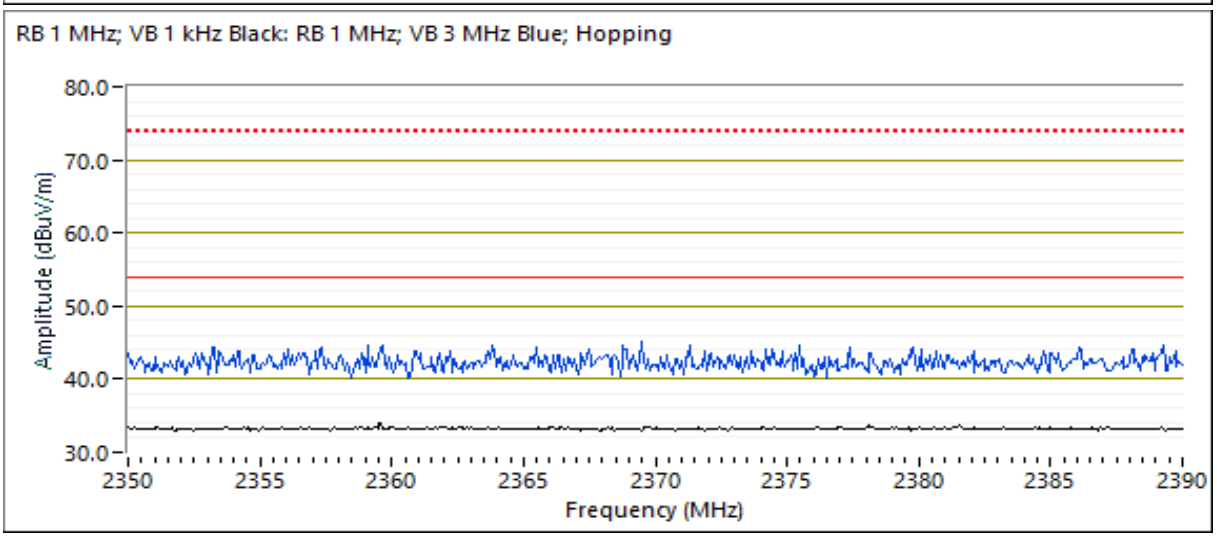
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A



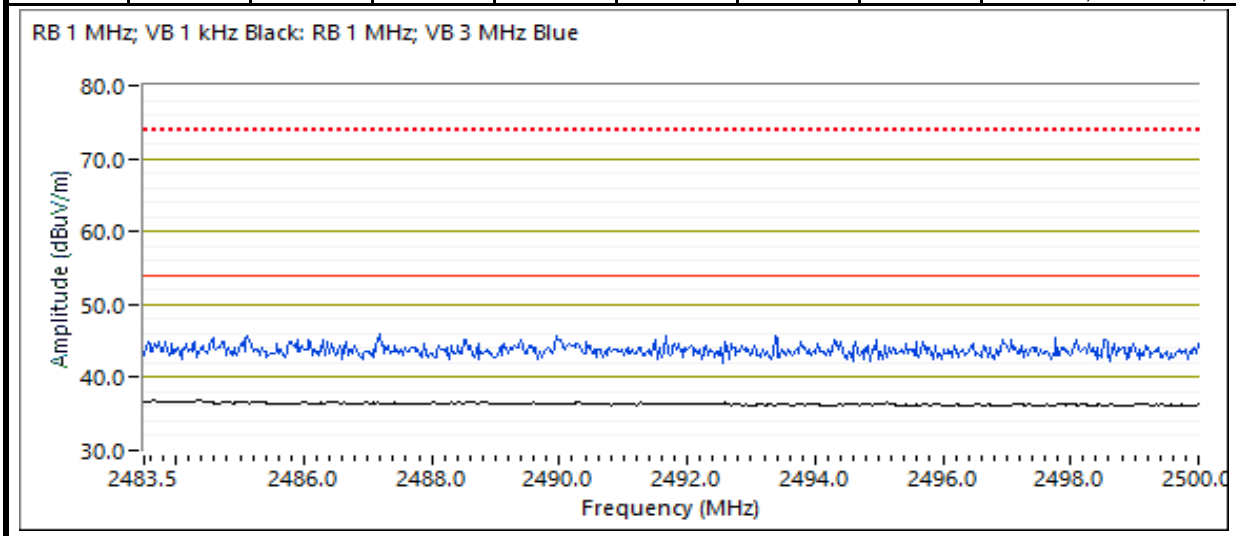


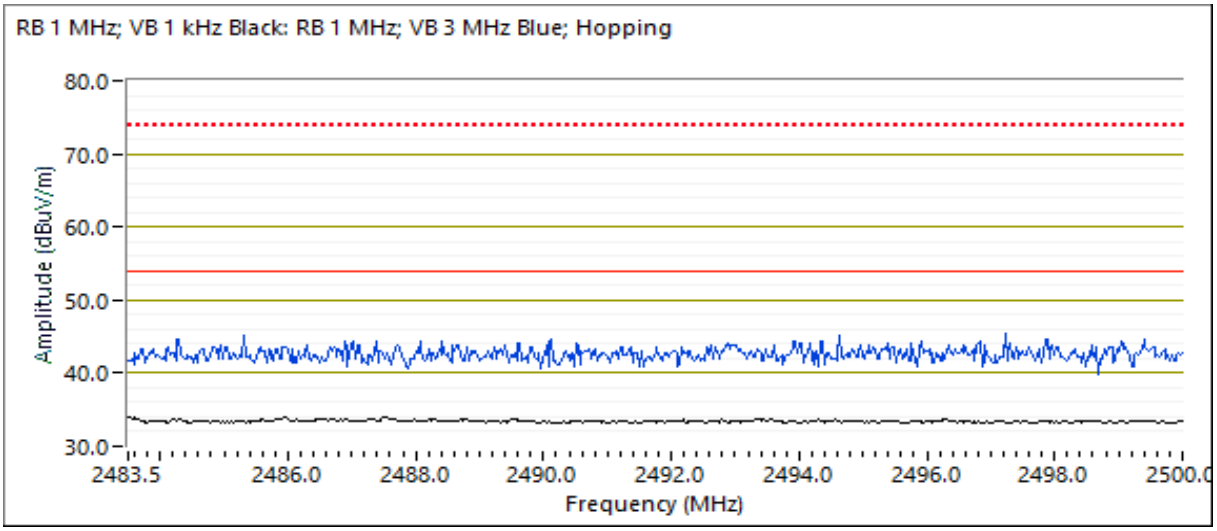
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Channel: 79 Mode: EDR (8DPSK) Pwr Setting: 8

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.220	34.4	V	54.0	-19.6	AVG	90	1.0	RB 1 MHz; VB: 1 kHz; Note 6
2499.310	45.4	V	74.0	-28.6	PK	90	1.0	RB 1 MHz; VB: 3 MHz
2484.630	34.0	V	54.0	-20.0	AVG	90	1.0	RB 1 MHz; VB: 1 kHz; Note 6; Hop
2485.670	45.9	V	74.0	-28.1	PK	90	1.0	RB 1 MHz; VB: 3 MHz; Hopping





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

RSS-247 and FCC 15.247 Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 18-21 °C

Rel. Humidity: 30-45 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel		Power Setting	Test Performed	Limit	Result / Margin
1	Basic (GFSK)	0 2402MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	49.3 dBµV/m @ 11999.9 MHz (-4.7 dB)
	Basic (GFSK)	39 2441MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	47.1 dBµV/m @ 12000.0 MHz (-6.9 dB)
	Basic (GFSK)	79 2480MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	48.1 dBµV/m @ 12000.0 MHz (-5.9 dB)
2	EDR (π/4-DQPSK)	0 2402MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	45.0 dBµV/m @ 7500.0 MHz (-9.0 dB)
	EDR (π/4-DQPSK)	39 2441MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	45.0 dBµV/m @ 7500.0 MHz (-9.0 dB)
	EDR (π/4-DQPSK)	79 2480MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	51.3 dBµV/m @ 4500.0 MHz (-2.7 dB)
3	EDR (8DPSK)	0 2402MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	44.8 dBµV/m @ 12000.37 MHz (-9.2 dB)
	EDR (8DPSK)	39 2441MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	45.3 dBµV/m @ 12000.21 MHz (-8.7 dB)
	EDR (8DPSK)	79 2480MHz		8	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	49.1 dBµV/m @ 12000.35 MHz (-4.9 dB)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: None

Driver and Version: Bluetest3 V3.3.15

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with ANSI C63.10
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear voltage average, auto sweep time, max hold.
2.4GHz band reject filter used

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)		
Basic DH5	1 Mbps	0.78	Yes	2.894	1.1	2.1	346	1 kHz	GFSK
EDR 2-DH5	2 Mbps	0.77	Yes	2.92	1.1	2.2	342	1 kHz	π/4-DQPSK
EDR 3-DH5	3 Mbps	0.77	Yes	2.894	1.2	2.3	346	1 kHz	8DPSK

Note: Symbol rate for all three modulations is 1 Msps

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 3:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces
Note 4:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by Linear voltage correction factor
Note 5:	Emission has constatnt duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces, measurement corrected by Pwr correction factor
Note 6:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear voltage average, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 7:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, RMS detector, sweep time auto, max hold. Max hold for 50*(1/DC) traces

* Pwr Cor Factor calculated using 10 X log(1/duty cycle)
** Lin Volt Cor Factor is calculated using 20 x log(1/duty cycle)

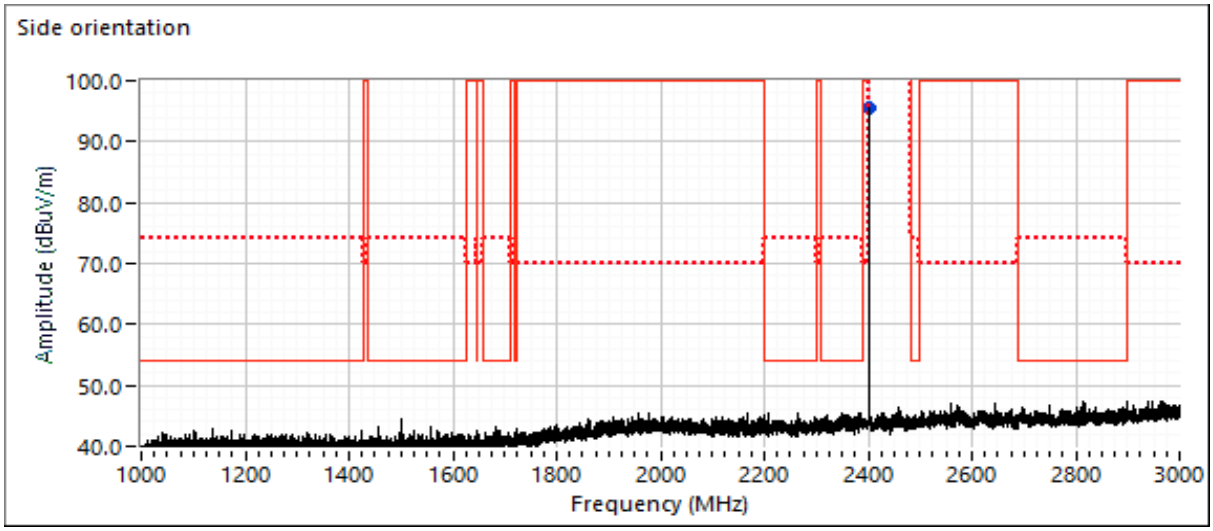
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

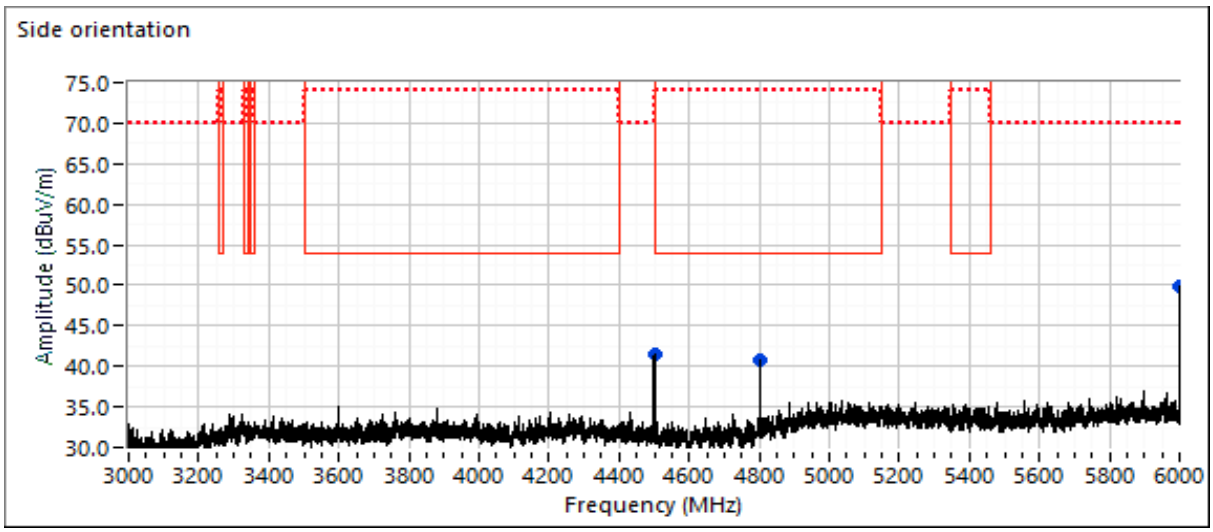
Run #1: Radiated Spurious Emissions, 1,000 - 25,000 MHz

Date of Test: 3/17/2023 Config. Used: 1
Test Engineer: Deniz Demirci Config Change: None
Test Location: FT Ch #7 EUT Voltage: 3V

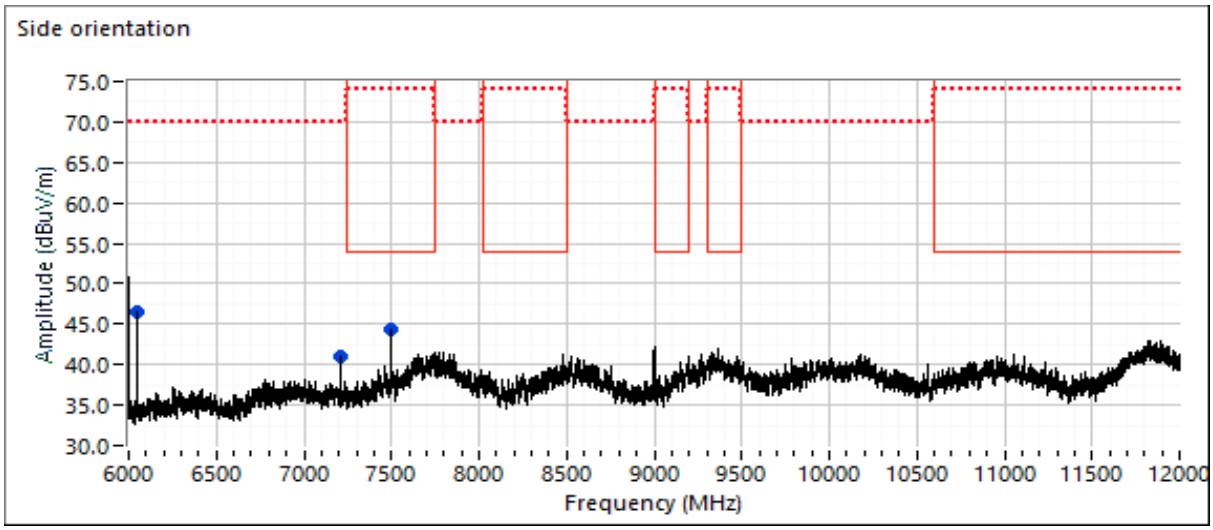
Run #1a: Low Channel Tested in 3 orthogonal orientations to determine worst case

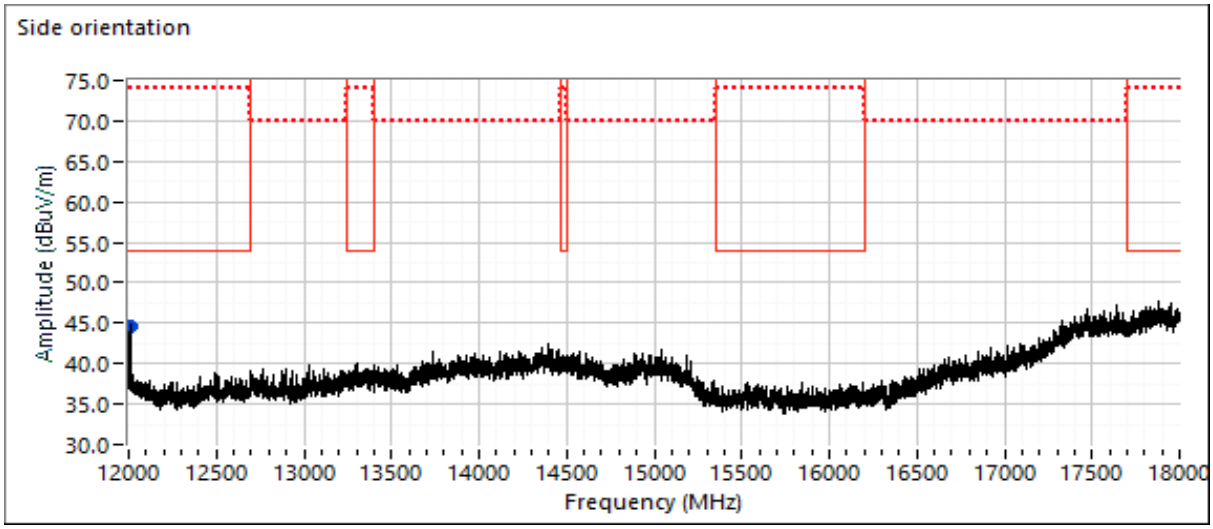
Channel: 0 Mode: Basic (GFSK) Pwr Setting: 8



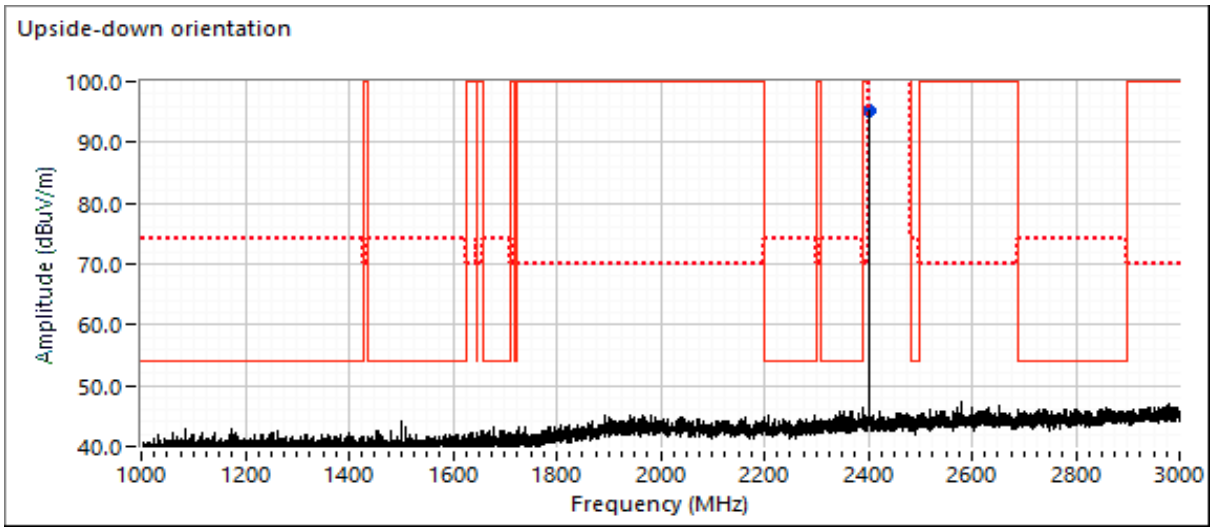


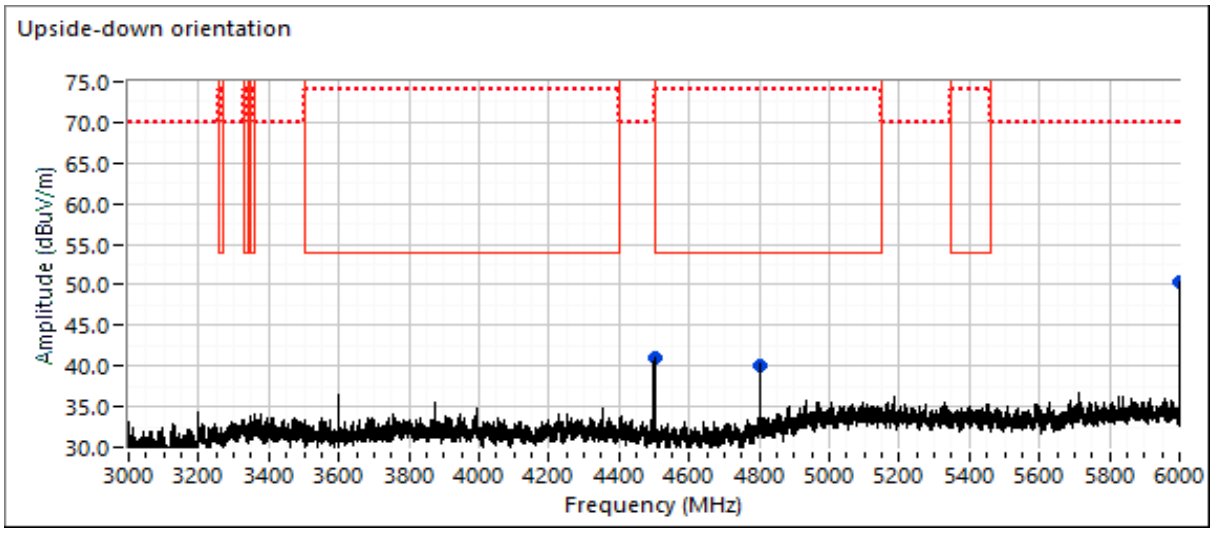
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A



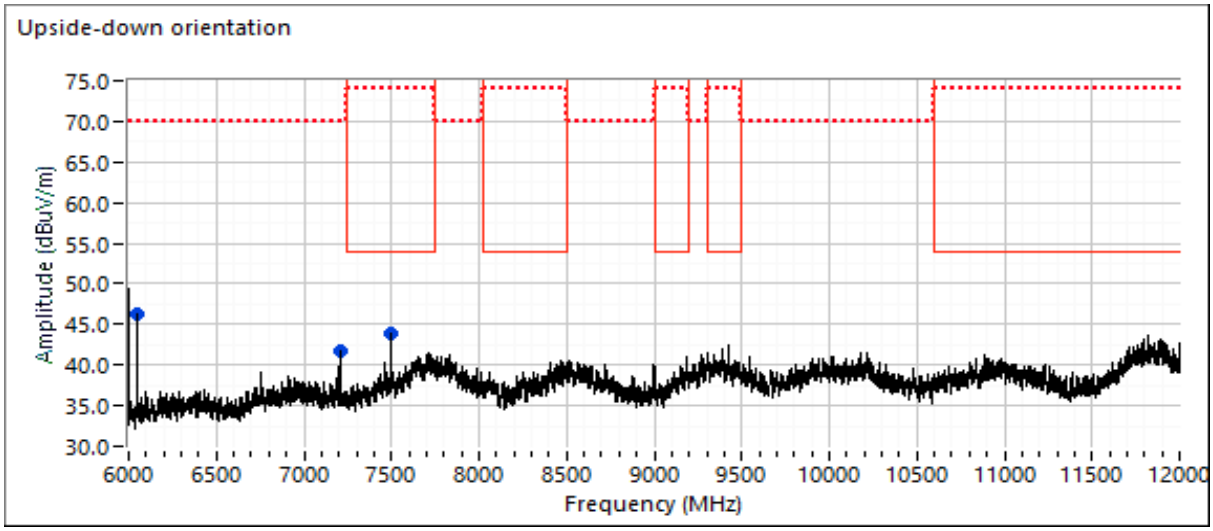


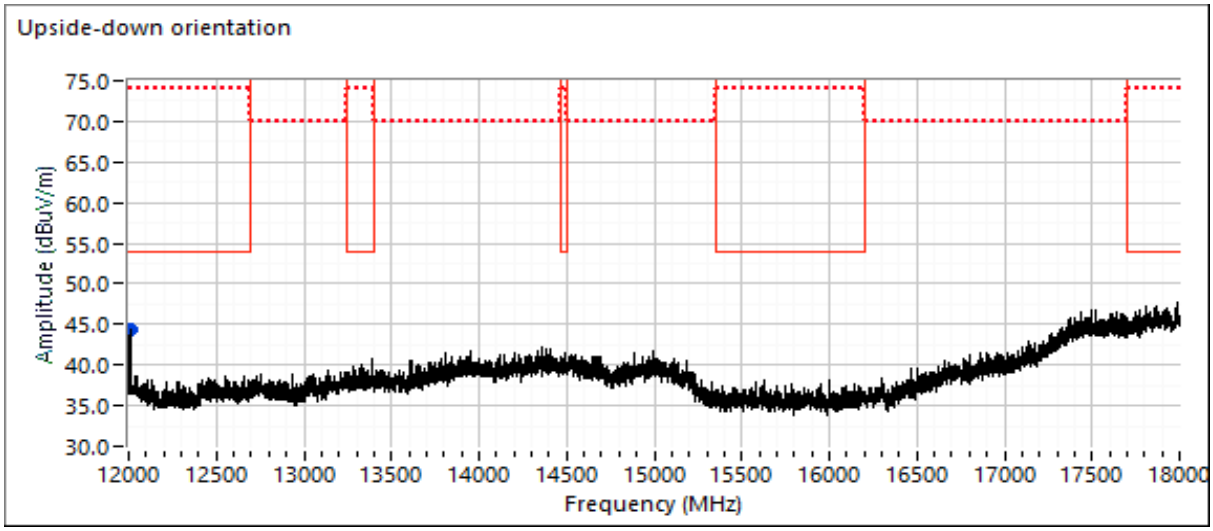
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





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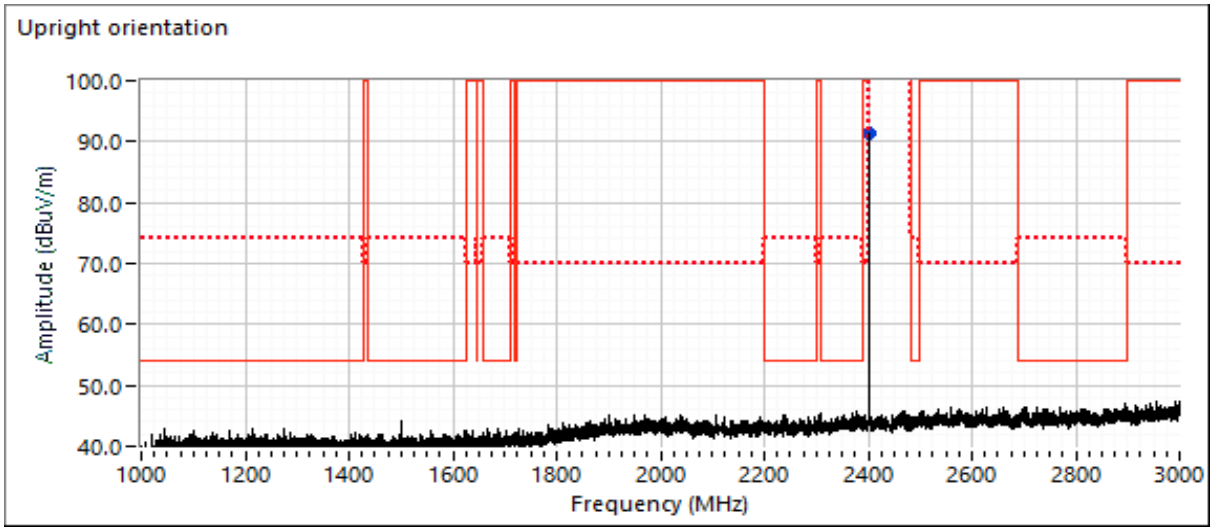
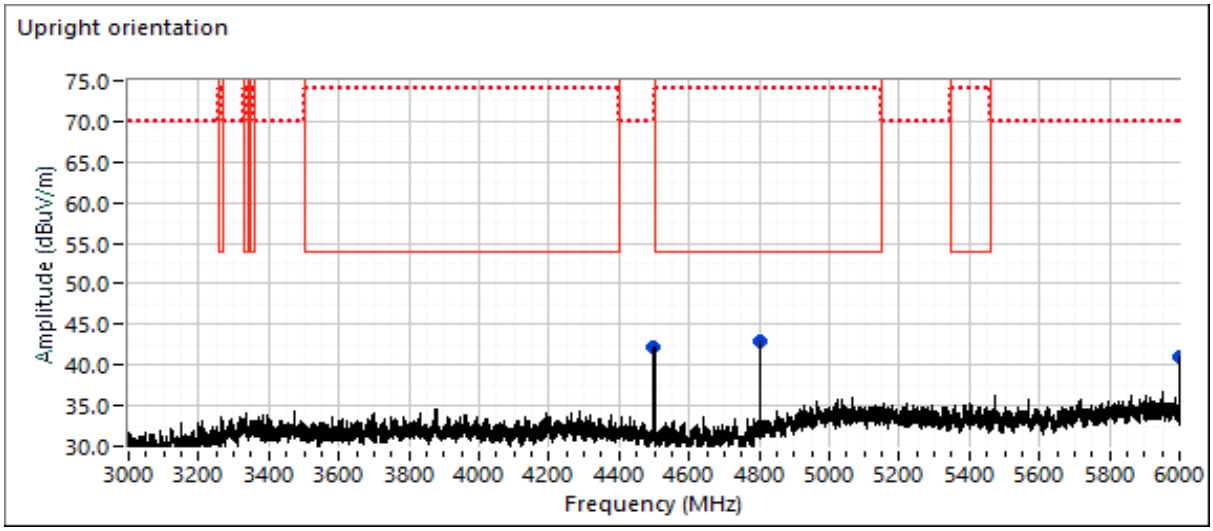
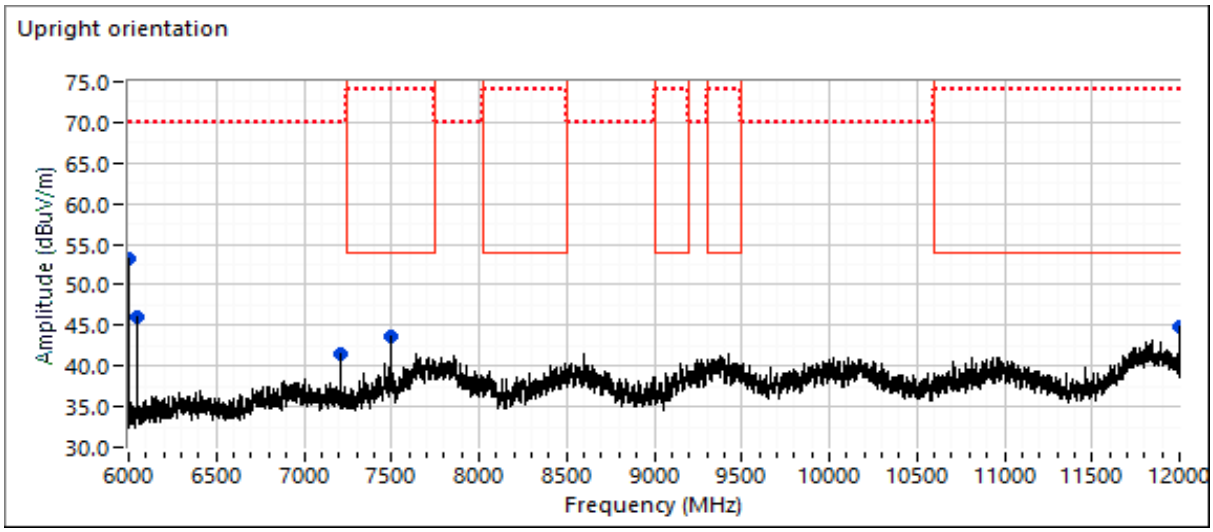
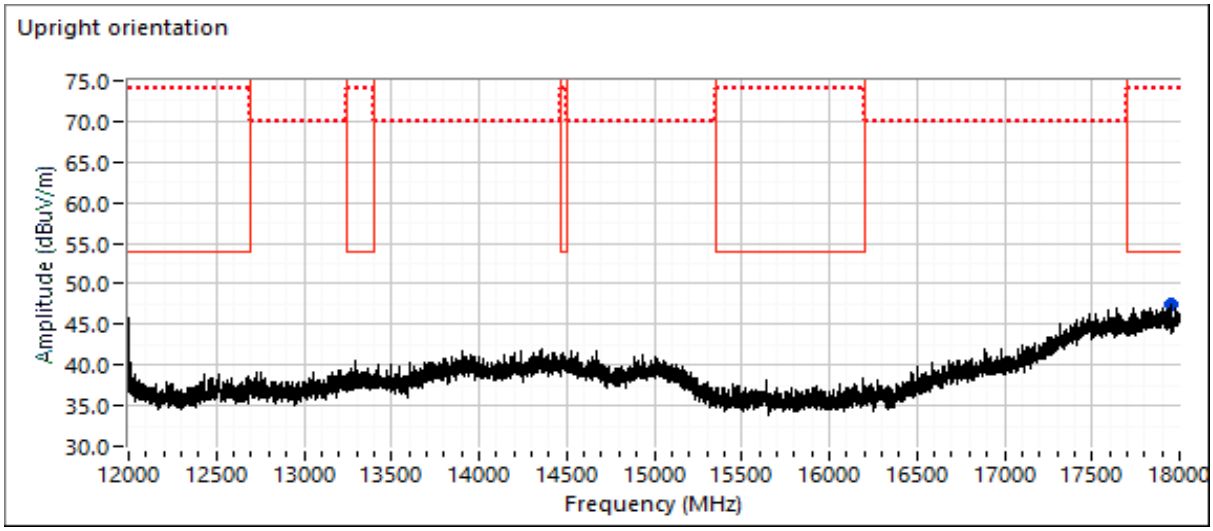
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Side Orientation

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2402.140	**96.0**	V	-	-	PK	105	1.5	RB 2 MHz; VB: 8 MHz
2401.320	95.4	V	-	-	PK	105	1.5	RB 100 kHz; VB: 300 kHz
4500.000	42.0	V	54.0	-12.0	AVG	207	1.0	RB 1 MHz; VB: 10 Hz - unmodulated
4500.030	46.4	V	74.0	-27.6	PK	207	1.0	RB 1 MHz; VB: 3 MHz
4804.440	42.3	V	54.0	-11.7	AVG	159	1.2	RB 1 MHz; VB: 1 kHz - Note 6
4804.810	48.0	V	74.0	-26.0	PK	159	1.2	RB 1 MHz; VB: 3 MHz
6000.000	49.8	V	75.4	-25.6	PK	148	2.5	RB 100 kHz; VB: 300 kHz
6045.380	45.7	V	75.4	-29.7	PK	241	1.6	RB 100 kHz; VB: 300 kHz
7206.520	43.2	V	75.4	-32.2	PK	213	1.6	RB 100 kHz; VB: 300 kHz
7500.060	43.1	V	54.0	-10.9	AVG	149	1.4	RB 1 MHz; VB: 10 Hz - unmodulated
7500.040	48.4	V	74.0	-25.6	PK	149	1.4	RB 1 MHz; VB: 3 MHz
12009.540	40.5	V	54.0	-13.5	AVG	118	1.4	RB 1 MHz; VB: 1 kHz - Note 6
12009.090	50.7	V	74.0	-23.3	PK	118	1.4	RB 1 MHz; VB: 3 MHz

For non restricted bands

Fundamental emission level @ 3m in 100kHz RBW:	95.4	dBµV/m	
Limit for emissions outside of restricted bands:	75.4	dBµV/m	Limit is -20dBc (Peak power measurement)

Upside-down orientation

2401.950	95.7	H	-	-	PK	151	1.5	RB 2 MHz; VB: 8 MHz
2401.930	94.7	H	-	-	PK	151	1.5	RB 100 kHz; VB: 300 kHz
4500.000	42.3	V	54.0	-11.7	AVG	171	1.4	RB 1 MHz; VB: 10 Hz - unmodulated
4500.170	45.6	V	74.0	-28.4	PK	171	1.4	RB 1 MHz; VB: 3 MHz
4804.120	38.7	V	54.0	-15.3	AVG	190	2.1	RB 1 MHz; VB: 1 kHz - Note 6
4803.830	44.0	V	74.0	-30.0	PK	190	2.1	RB 1 MHz; VB: 3 MHz
6000.000	51.2	V	74.7	-23.5	PK	173	2.5	RB 100 kHz; VB: 300 kHz
6045.630	46.3	V	74.7	-28.4	PK	243	1.4	RB 100 kHz; VB: 300 kHz
7205.550	41.4	V	74.7	-33.3	PK	246	1.7	RB 100 kHz; VB: 300 kHz
7500.060	43.1	V	54.0	-10.9	AVG	148	1.4	RB 1 MHz; VB: 10 Hz - unmodulated
7500.040	48.5	V	74.0	-25.5	PK	148	1.4	RB 1 MHz; VB: 3 MHz
12010.340	42.3	H	54.0	-11.7	AVG	112	1.6	RB 1 MHz; VB: 1 kHz - Note 6
12010.690	52.0	H	74.0	-22.0	PK	112	1.6	RB 1 MHz; VB: 3 MHz

For non restricted bands

Fundamental emission level @ 3m in 100kHz RBW:	94.7	dBµV/m	
Limit for emissions outside of restricted bands:	74.7	dBµV/m	Limit is -20dBc (Peak power measurement)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Upright orientation

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2402.190	92.7	H	-	-	PK	67	2.5	RB 2 MHz; VB: 8 MHz
2400.650	91.6	H	-	-	PK	67	2.5	RB 100 kHz; VB: 300 kHz
4500.000	42.3	V	54.0	-11.7	AVG	207	1.0	RB 1 MHz; VB: 10 Hz - unmodulated
4500.020	46.0	V	74.0	-28.0	PK	207	1.0	RB 1 MHz; VB: 3 MHz
4804.030	43.7	H	54.0	-10.3	AVG	202	1.2	RB 1 MHz; VB: 1 kHz - Note 6
4803.650	47.7	H	74.0	-26.3	PK	202	1.2	RB 1 MHz; VB: 3 MHz
6000.000	56.0	V	71.6	-15.6	PK	222	1.5	RB 100 kHz; VB: 300 kHz
6046.180	46.0	V	71.6	-25.6	PK	244	1.5	RB 100 kHz; VB: 300 kHz
7206.540	40.4	H	71.6	-31.2	PK	284	1.3	RB 100 kHz; VB: 300 kHz
7500.060	43.1	V	54.0	-10.9	AVG	147	1.3	RB 1 MHz; VB: 10 Hz - unmodulated
7499.940	48.6	V	74.0	-25.4	PK	147	1.3	RB 1 MHz; VB: 3 MHz
11999.940	49.3	V	54.0	-4.7	PK	132	1.0	RB 1 MHz; VB: 3 MHz
17946.530	47.4	V	54.0	-6.6	PK	154	1.5	Noise floor reading
			0.0	0.0				

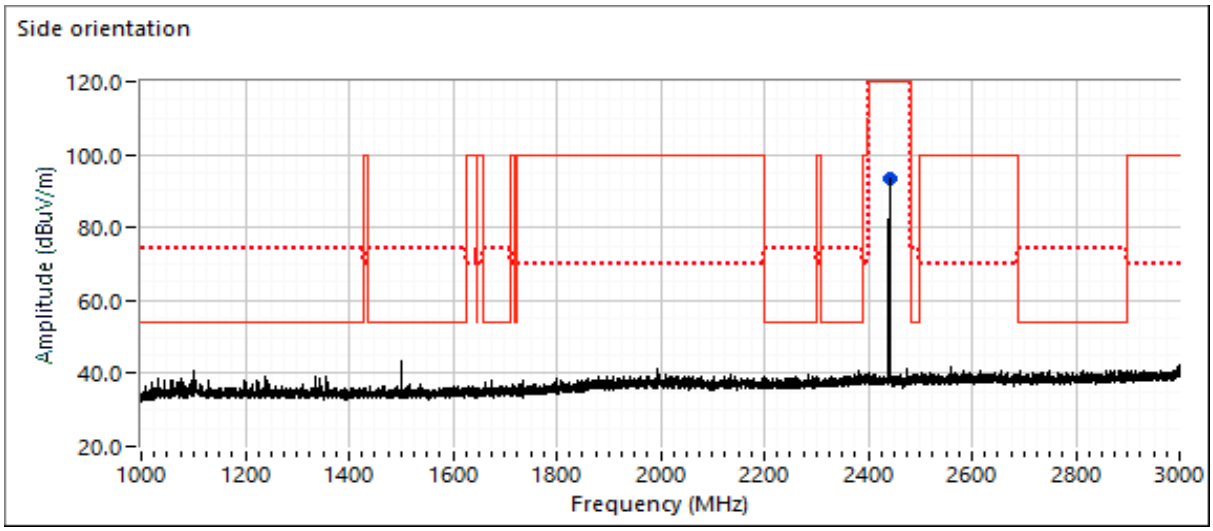
For non restricted bands

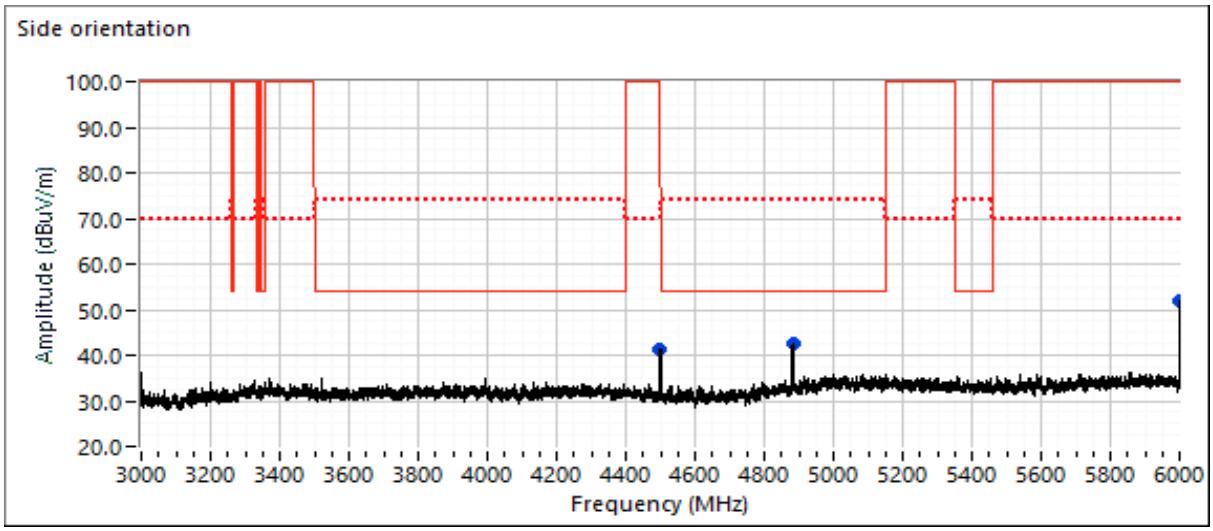
Fundamental emission level @ 3m in 100kHz RBW:	91.6	dBµV/m	
Limit for emissions outside of restricted bands:	71.6	dBµV/m	Limit is -20dBc (Peak power measurement)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

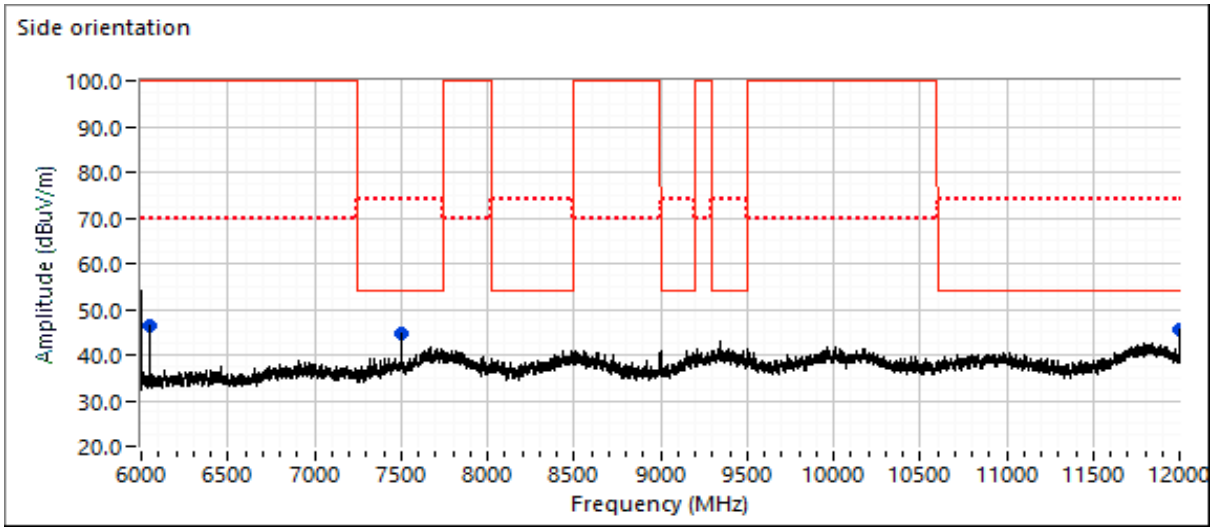
Date of Test: 3/20/2023 Config. Used: 1
Test Engineer: David Bare Config Change: None
Test Location: Fremont Chamber #7 EUT Voltage: 3V

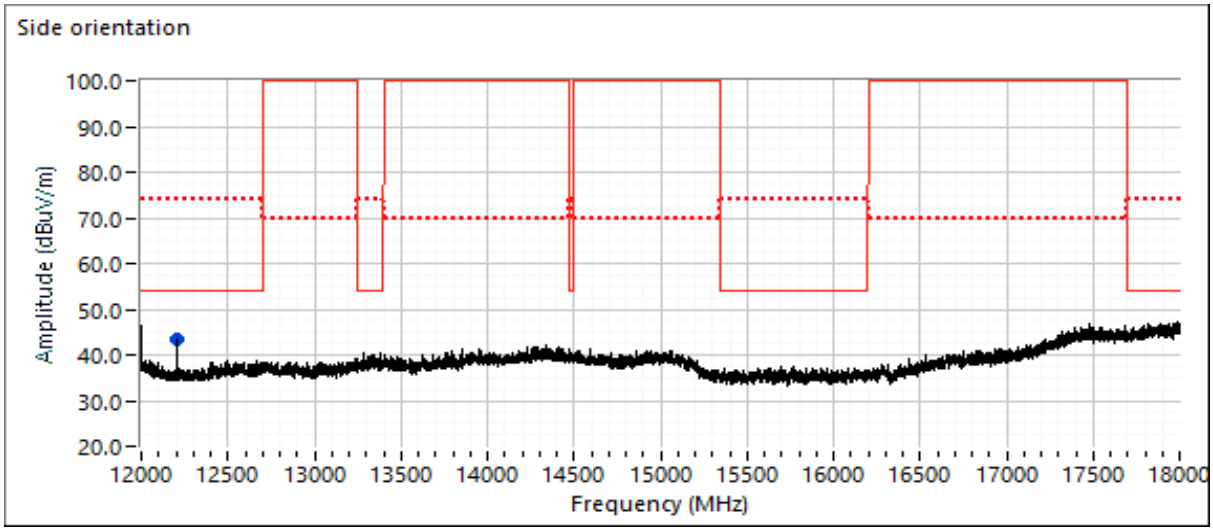
Run #1b: Center Channel Based on testing on the low channel, side orientation was selected as worst case
Channel: 39 Mode: Basic (GFSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

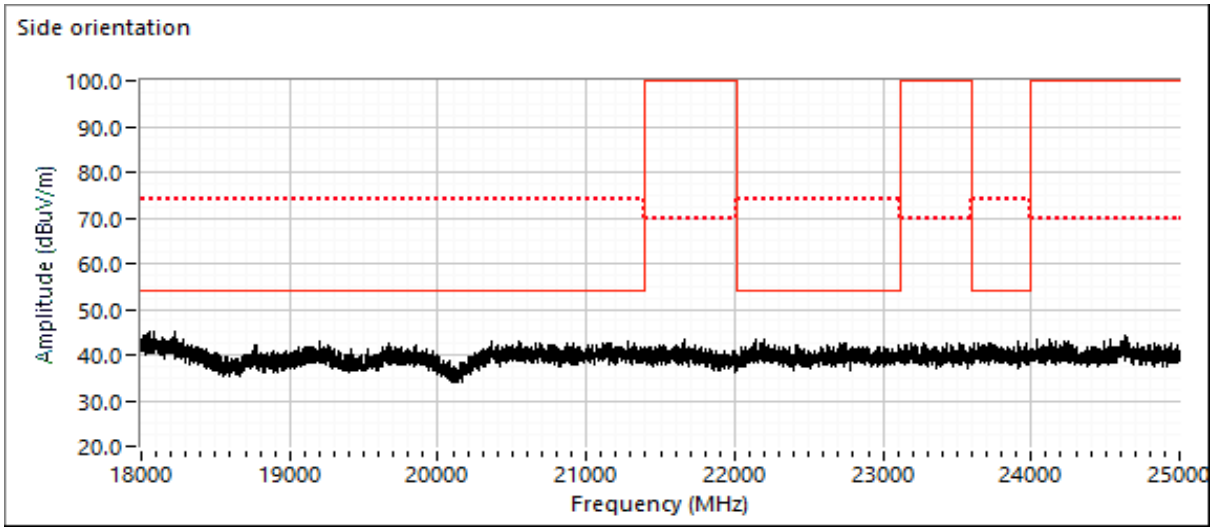




Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2441.490	94.9	V	-	-	PK	97	1.4	RB 2 MHz; VB: 8 MHz
2440.860	94.4	V	-	-	PK	97	1.4	RB 100 kHz; VB: 300 kHz
4500.000	38.9	V	54.0	-15.1	AVG	219	1.2	RB 1 MHz; VB: 10 Hz - unmodulated
4500.000	42.6	V	70.0	-27.4	PK	219	1.2	RB 1 MHz; VB: 3 MHz
4882.000	42.4	V	54.0	-11.6	AVG	146	1.0	RB 1 MHz; VB: 1 kHz; Note 6
4882.000	46.9	V	74.0	-27.1	PK	146	1.0	RB 1 MHz; VB: 3 MHz
6000.000	53.5	V	74.4	-20.9	PK	210	2.5	RB 100 kHz; VB: 300 kHz
6047.420	46.2	V	74.4	-28.2	PK	282	1.0	RB 100 kHz; VB: 300 kHz
7500.000	42.7	V	54.0	-11.3	AVG	181	1.7	RB 1 MHz; VB: 10 Hz - unmodulated
7500.000	48.4	V	74.0	-25.6	PK	181	1.7	RB 1 MHz; VB: 3 MHz
12000.000	47.1	V	54.0	-6.9	AVG	231	1.6	RB 1 MHz; VB: 10 Hz - unmodulated
12000.000	53.5	V	74.0	-20.5	PK	231	1.6	RB 1 MHz; VB: 3 MHz
12205.000	39.1	V	54.0	-14.9	AVG	277	1.0	RB 1 MHz; VB: 1 kHz; Note 6
12205.000	49.9	V	74.0	-24.1	PK	277	1.0	RB 1 MHz; VB: 3 MHz

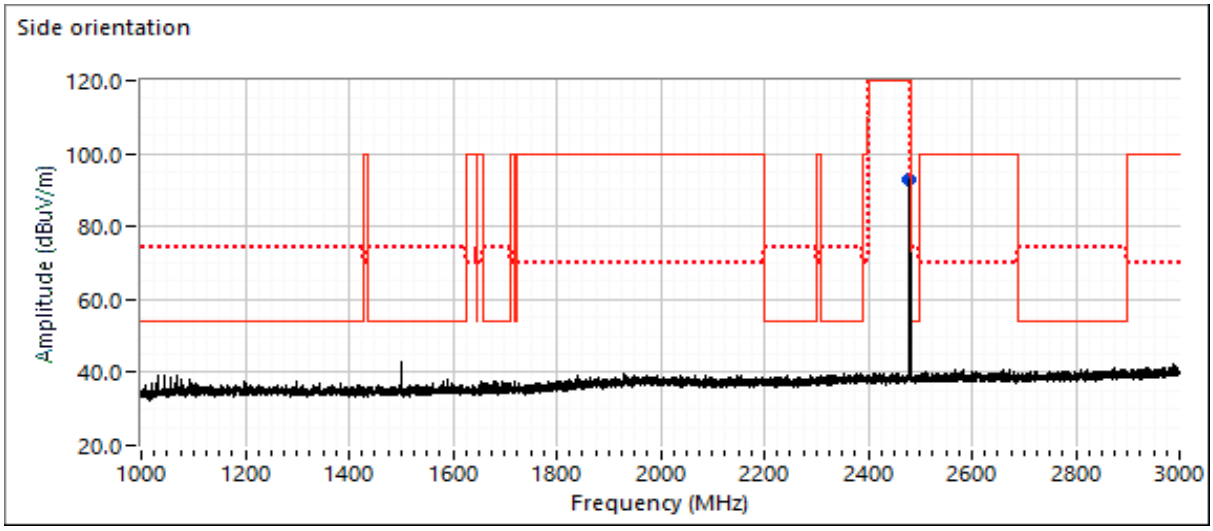
Note:	Scan made between 18 - 25 GHz with the measurement antenna moved around the EUT and its antenna 30cm from the device indicated there were no significant emissions in this frequency range. See below.

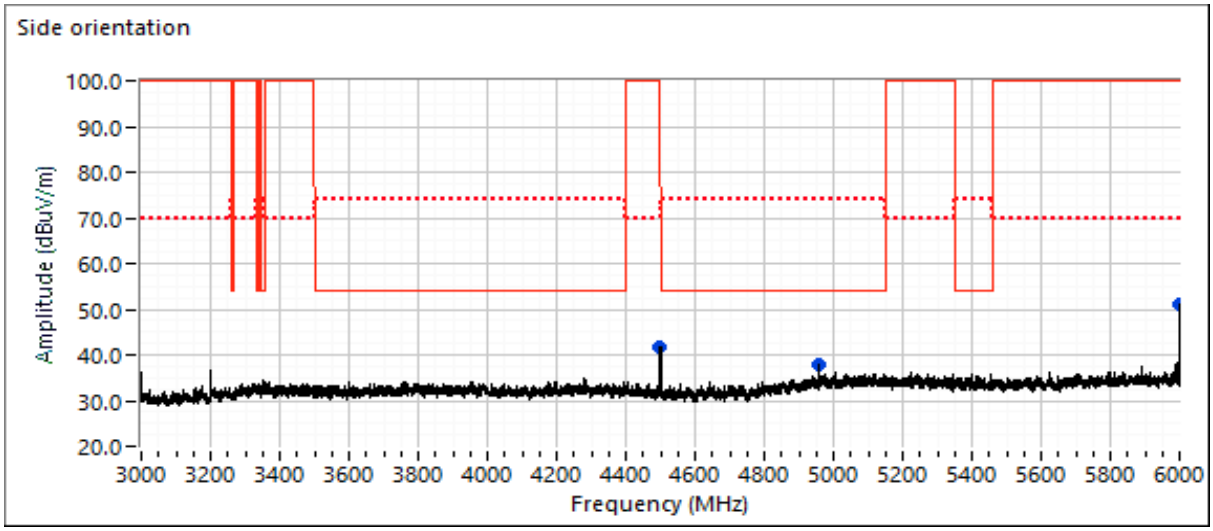


Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

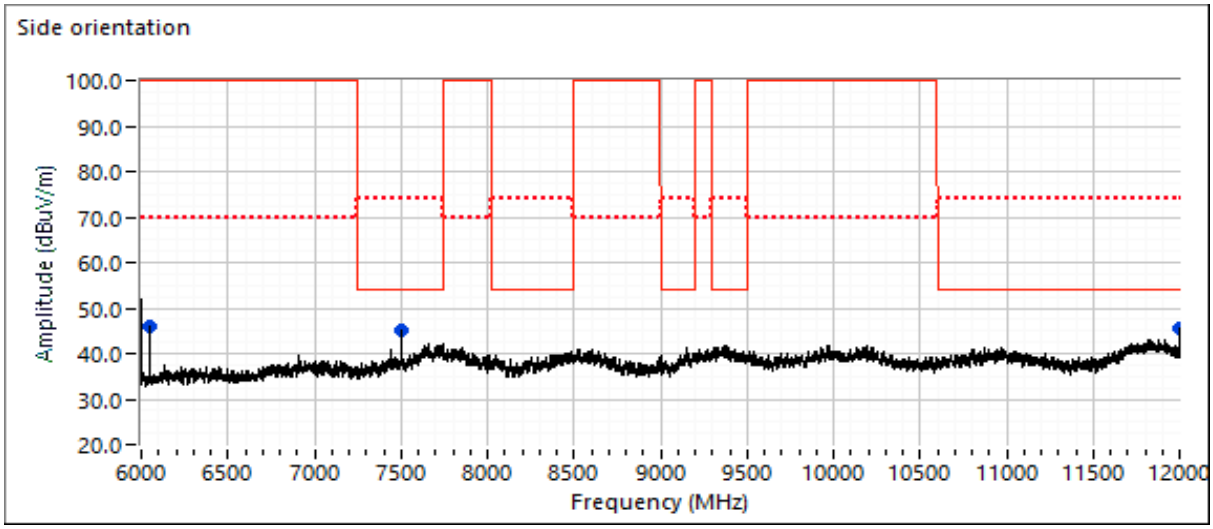
Run #1c: High Channel

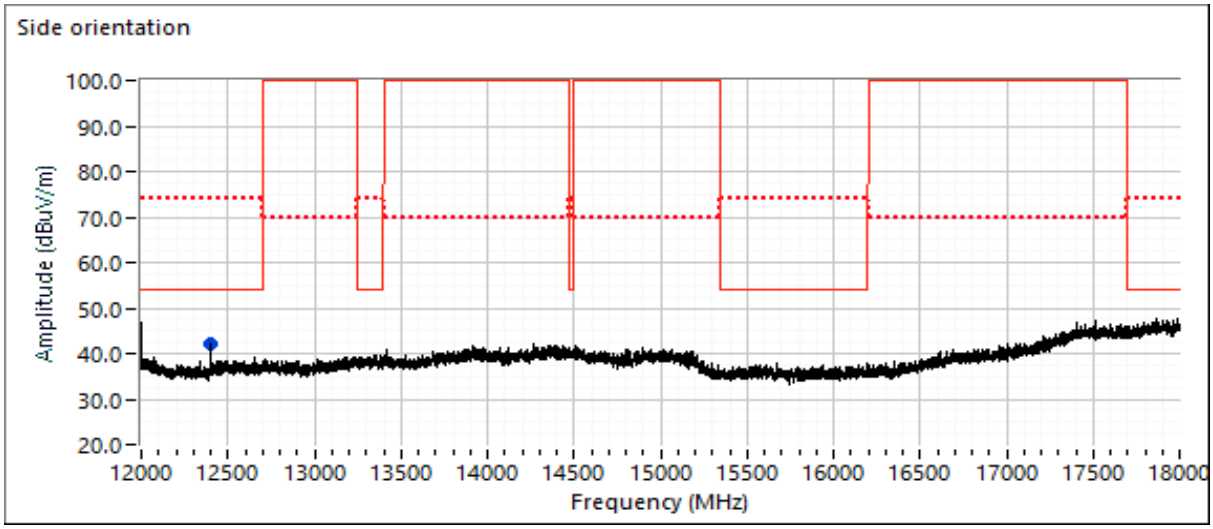
Channel: 79 Mode: Basic (GFSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2480.000	93.4	V	-	-	PK	97	1.9	RB 2 MHz; VB: 8 MHz
2480.000	92.7	V	-	-	PK	97	1.9	RB 100 kHz; VB: 300 kHz
4500.000	42.3	V	54.0	-11.7	AVG	202	1.5	RB 1 MHz; VB: 10 Hz - unmodulated
4500.040	46.1	V	74.0	-27.9	PK	202	1.5	RB 1 MHz; VB: 3 MHz
4960.030	38.1	H	54.0	-15.9	AVG	228	1.0	RB 1 MHz; VB: 1 kHz; Note 6
4960.380	44.3	H	74.0	-29.7	PK	228	1.0	RB 1 MHz; VB: 3 MHz
6000.000	52.2	V	72.7	-20.5	PK	45	2.5	RB 100 kHz; VB: 300 kHz
6047.260	47.2	V	72.7	-25.5	PK	247	1.0	RB 100 kHz; VB: 300 kHz
7500.000	45.4	V	54.0	-8.6	AVG	146	1.4	RB 1 MHz; VB: 10 Hz - unmodulated
7500.000	50.1	V	74.0	-23.9	PK	146	1.4	RB 1 MHz; VB: 3 MHz
12000.000	48.1	V	54.0	-5.9	AVG	231	1.6	RB 1 MHz; VB: 10 Hz - unmodulated
12000.000	52.9	V	74.0	-21.1	PK	231	1.6	RB 1 MHz; VB: 3 MHz
12400.620	39.3	V	54.0	-14.7	AVG	327	1.8	RB 1 MHz; VB: 1 kHz; Note 6
12399.490	48.6	V	74.0	-25.4	PK	327	1.8	RB 1 MHz; VB: 3 MHz

For non restricted bands

Fundamental emission level @ 3m in 100kHz RBW:	92.7	dBµV/m	
Limit for emissions outside of restricted bands:	72.7	dBµV/m	Limit is -20dBc (Peak power measurement)

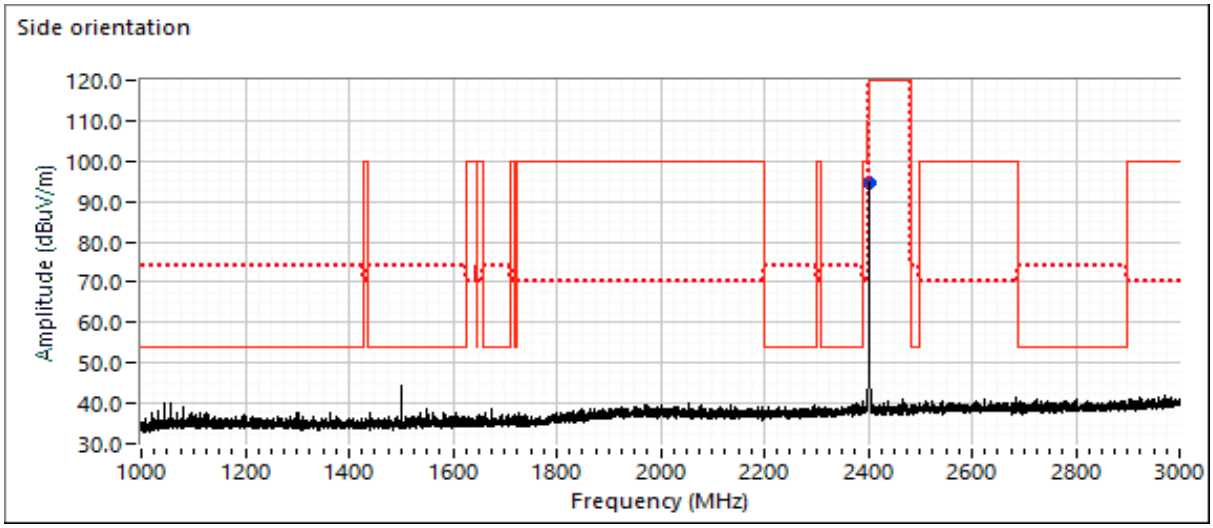
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

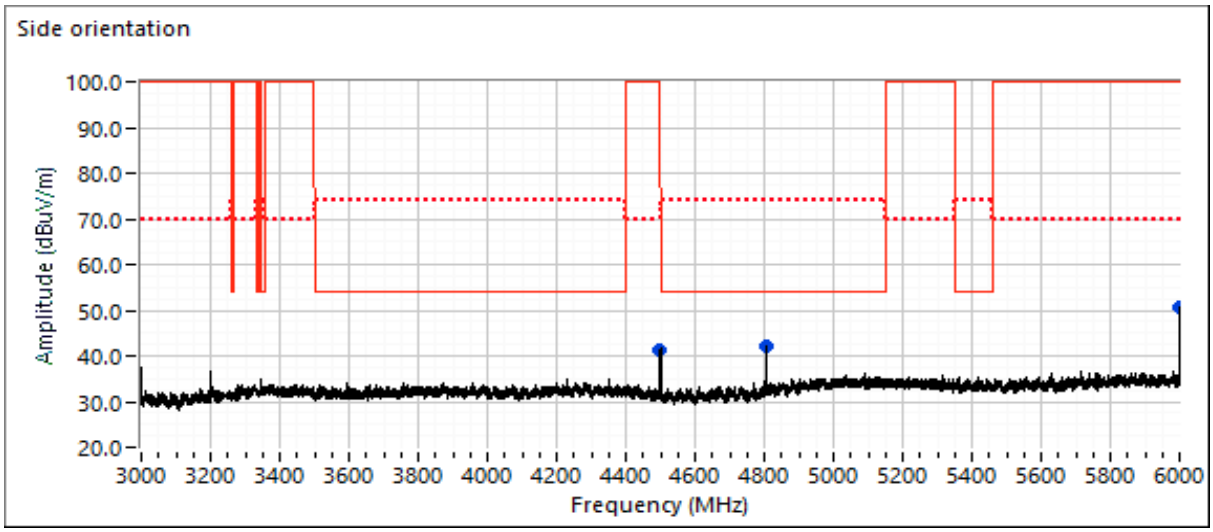
Run #2: Radiated Spurious Emissions, 1,000 - 25000 MHz

Date of Test: 3/20/2023 Config. Used: 1
Test Engineer: Jude Semana Config Change: None
Test Location: Fremont Chamber #7 EUT Voltage: 3V

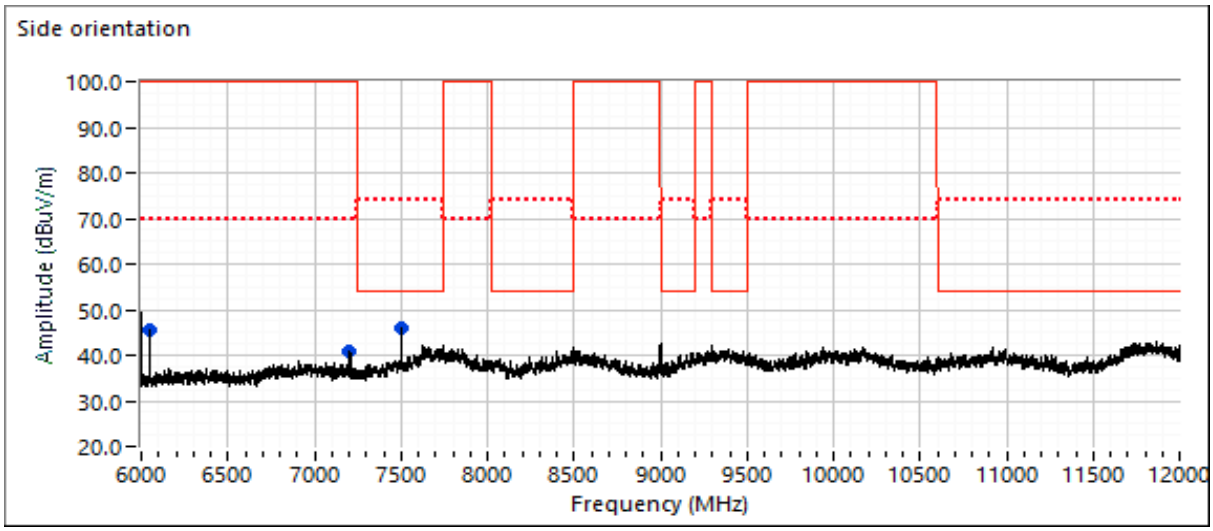
Run #1a: Low Channel Based on testing on the low channel, side orientation was selected as worst case

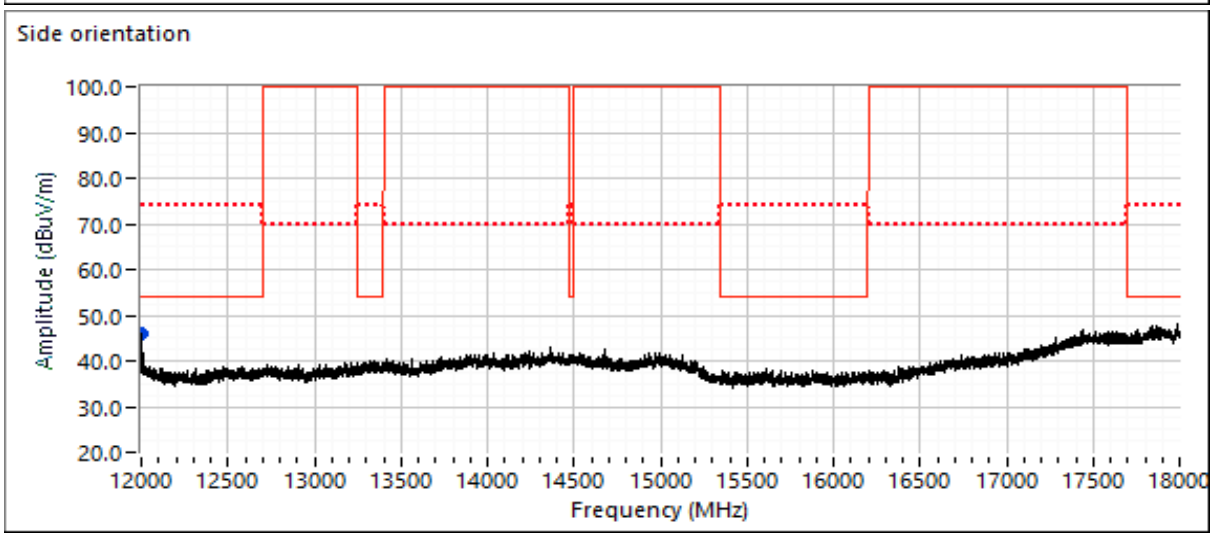
Channel: 0 Mode: EDR (π/4-DQPSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2401.970	96.9	V	-	-	PK	83	1.2	Peak-RB 2 MHz; VB: 8 MHz
2400.670	94.1	V	-	-	PK	83	1.2	Peak-RB 100 kHz; VB: 300 kHz
4500.000	42.2	V	54.0	-11.8	AVG	201	1.0	RB 1 MHz; VB: 10 Hz - unmodulated
4500.000	45.9	V	74.0	-28.1	PK	201	1.0	RB 1 MHz; VB: 3 MHz
4803.620	46.6	V	74.0	-27.4	PK	237	1.6	RB 1 MHz; VB: 3 MHz
4804.000	36.8	V	54.0	-17.2	AVG	237	1.6	RB 1 MHz; VB: 1 kHz; Note 6
6000.000	55.4	V	74.1	-18.7	PK	217	1.5	RB 100 kHz; VB: 300 kHz
6047.170	44.9	V	74.1	-29.2	PK	251	1.0	RB 100 kHz; VB: 300 kHz
7500.000	45.0	V	54.0	-9.0	AVG	143	1.6	RB 1 MHz; VB: 10 Hz - unmodulated
7500.000	49.9	V	74.0	-24.1	PK	143	1.6	RB 1 MHz; VB: 3 MHz
7206.520	36.3	V	74.1	-37.8	PK	203	1.0	RB 100 kHz; VB: 300 kHz
12000.200	35.5	V	54.0	-18.5	AVG	256	1.6	RB 1 MHz; VB: 10 Hz - unmodulated
12000.150	46.9	V	74.0	-27.1	PK	256	1.6	RB 1 MHz; VB: 3 MHz

For non restricted bands

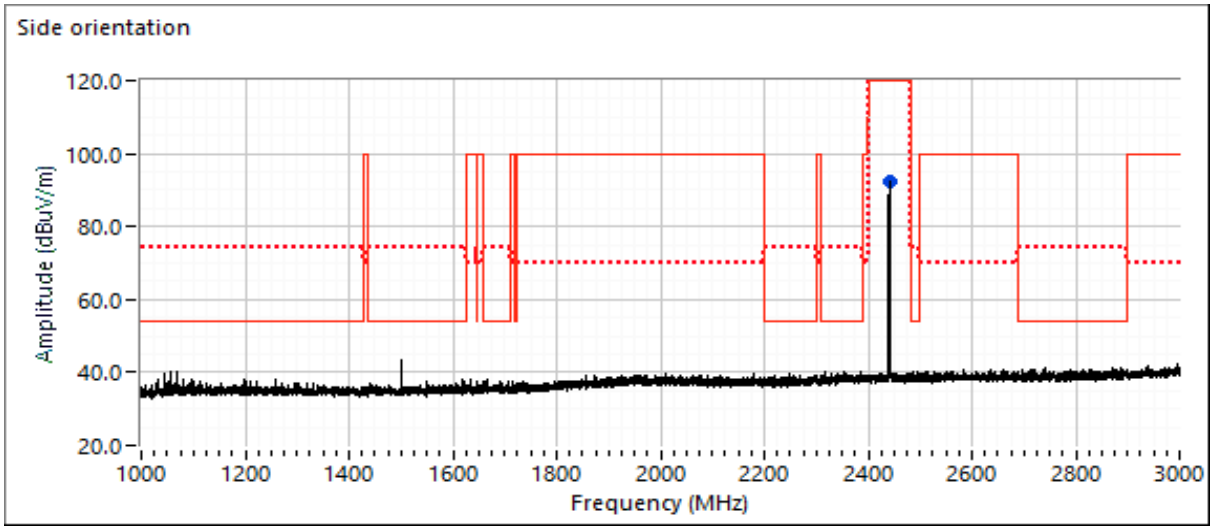
Fundamental emission level @ 3m in 100kHz RBW:	94.1	dBµV/m
Limit for emissions outside of restricted bands:	74.1	dBµV/m

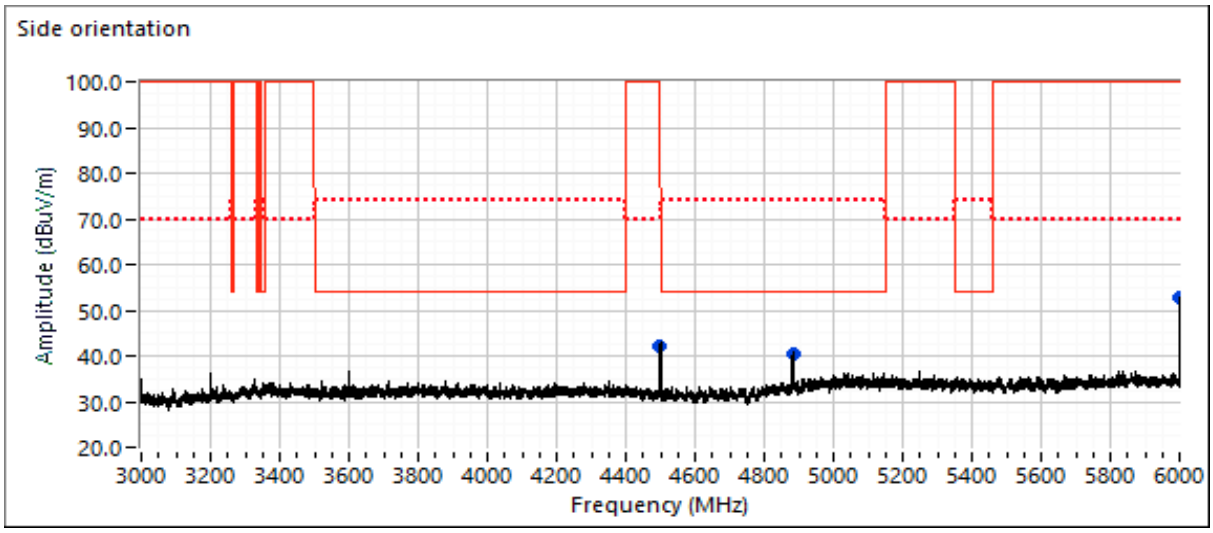
Limit is -20dBc (Peak power measurement)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

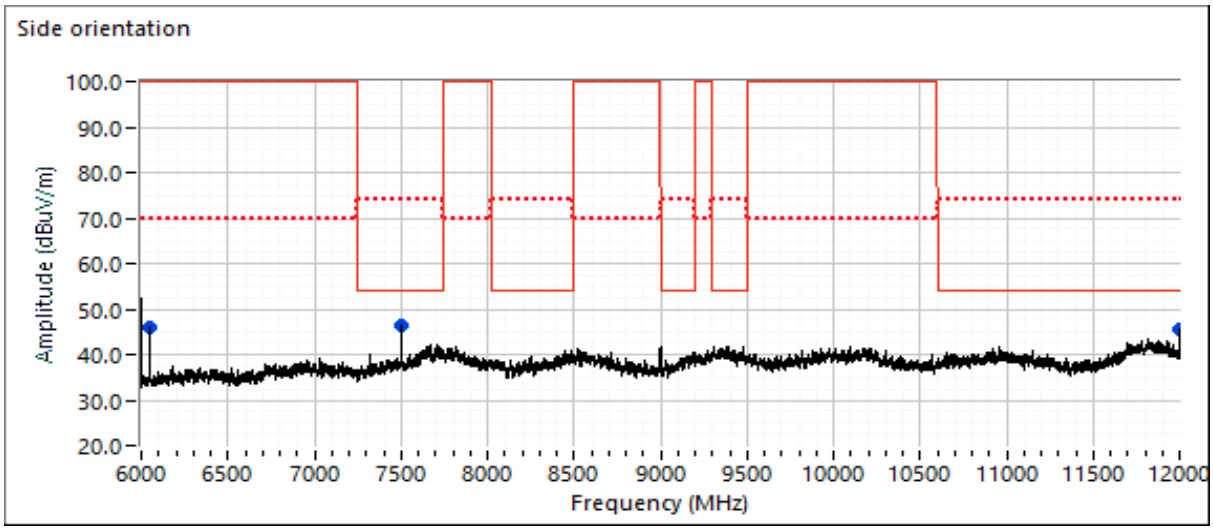
Run #1b: Center Channel

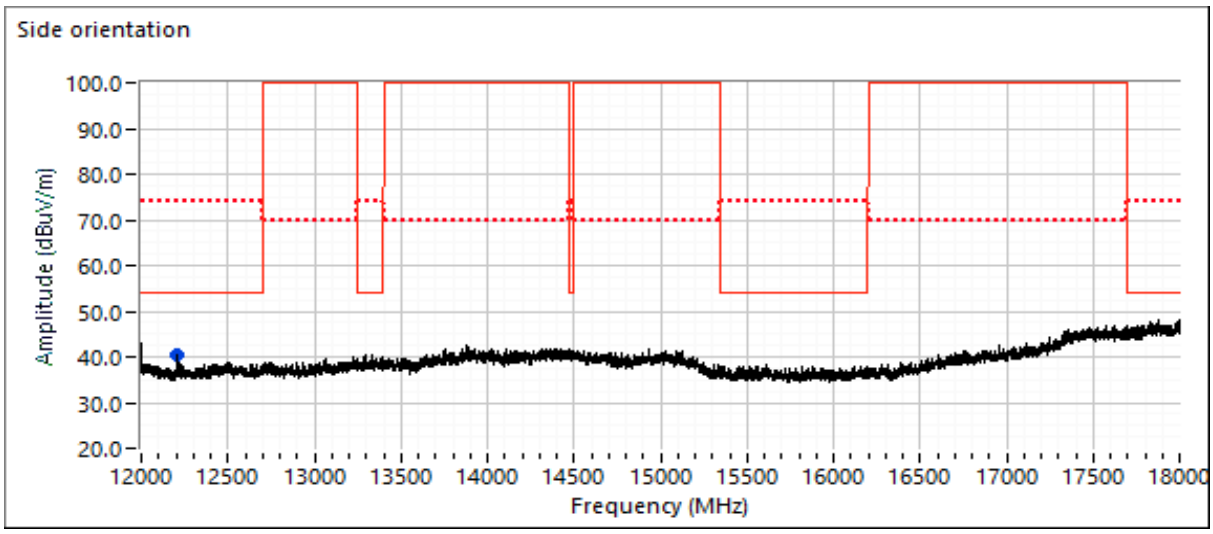
Channel: 39 Mode: EDR (π/4-DQPSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2440.820	95.8	V	-	-	PK	90	2.0	RB 2 MHz; VB: 8 MHz
2441.390	93.5	V	-	-	PK	90	2.0	RB 100 kHz; VB: 300 kHz
4500.030	42.3	V	54.0	-11.7	AVG	201	1.0	RB 1 MHz; VB: 10 Hz - unmodulated
4500.060	46.2	V	74.0	-27.8	PK	201	1.0	RB 1 MHz; VB: 3 MHz
4882.090	39.4	V	54.0	-14.6	Avg	149	1.6	RB 1 MHz; VB: 1 kHz; Note 6
4881.690	46.9	V	74.0	-27.1	PK	149	1.6	RB 1 MHz; VB: 3 MHz
6000.000	47.9	V	73.5	-25.6	PK	149	1.0	RB 100 kHz; VB: 300 kHz
6046.880	46.0	V	73.5	-27.5	PK	282	1.0	RB 100 kHz; VB: 300 kHz
7500.000	45.0	V	54.0	-9.0	AVG	141	1.4	RB 1 MHz; VB: 10 Hz - unmodulated
7500.000	50.0	V	74.0	-24.0	PK	141	1.4	RB 1 MHz; VB: 3 MHz
12000.060	40.2	V	54.0	-13.8	AVG	230	2.2	RB 1 MHz; VB: 10 Hz - unmodulated
12000.050	47.9	V	74.0	-26.1	PK	230	2.2	RB 1 MHz; VB: 3 MHz
12204.380	38.3	V	54.0	-15.7	AVG	279	1.0	RB 1 MHz; VB: 1 kHz; Note 6
12204.220	48.9	V	74.0	-25.1	PK	279	1.0	RB 1 MHz; VB: 3 MHz

For non restricted bands

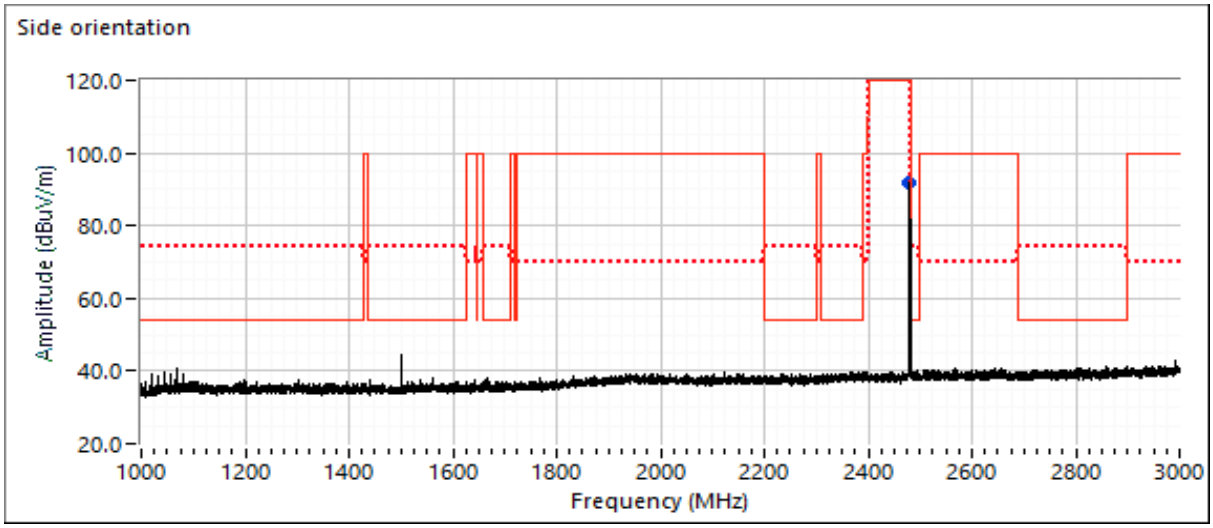
Fundamental emission level @ 3m in 100kHz RBW:	93.5	dBµV/m
Limit for emissions outside of restricted bands:	73.5	dBµV/m

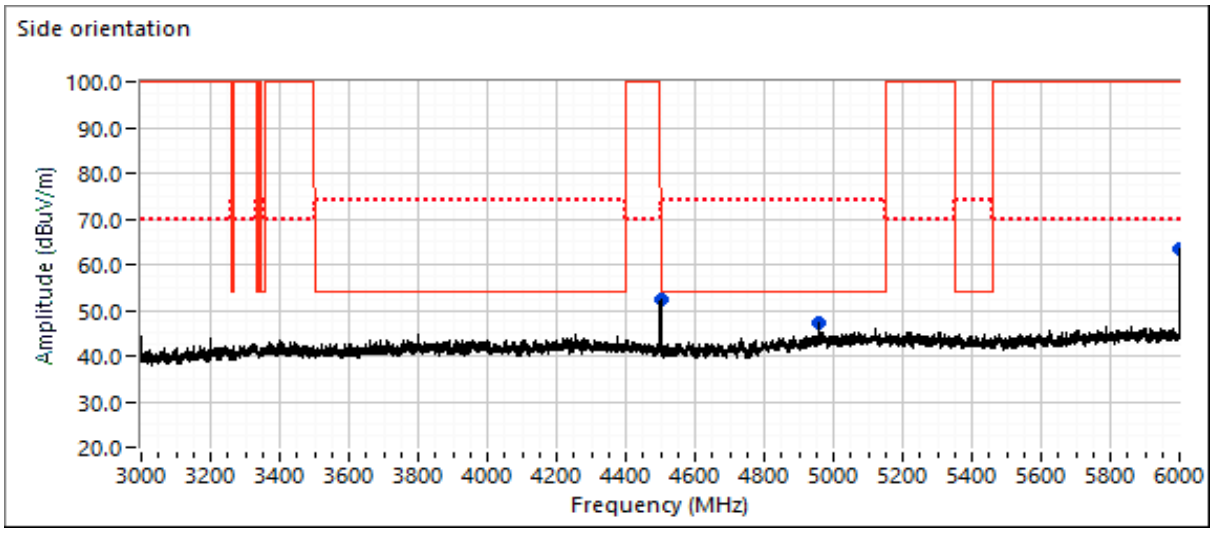
Limit is -20dBc (Peak power measurement)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

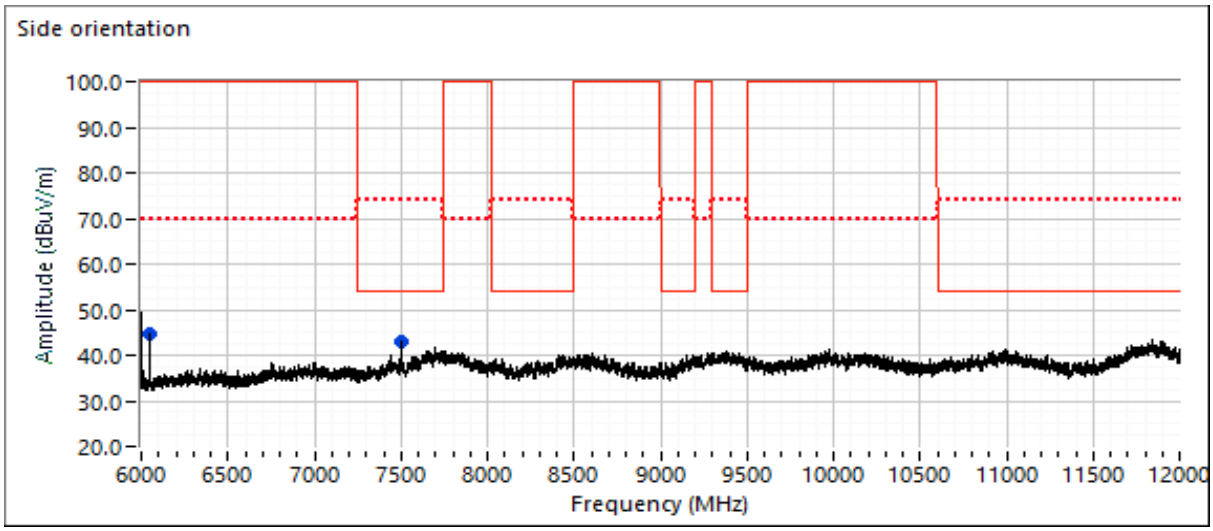
Run #1c: High Channel

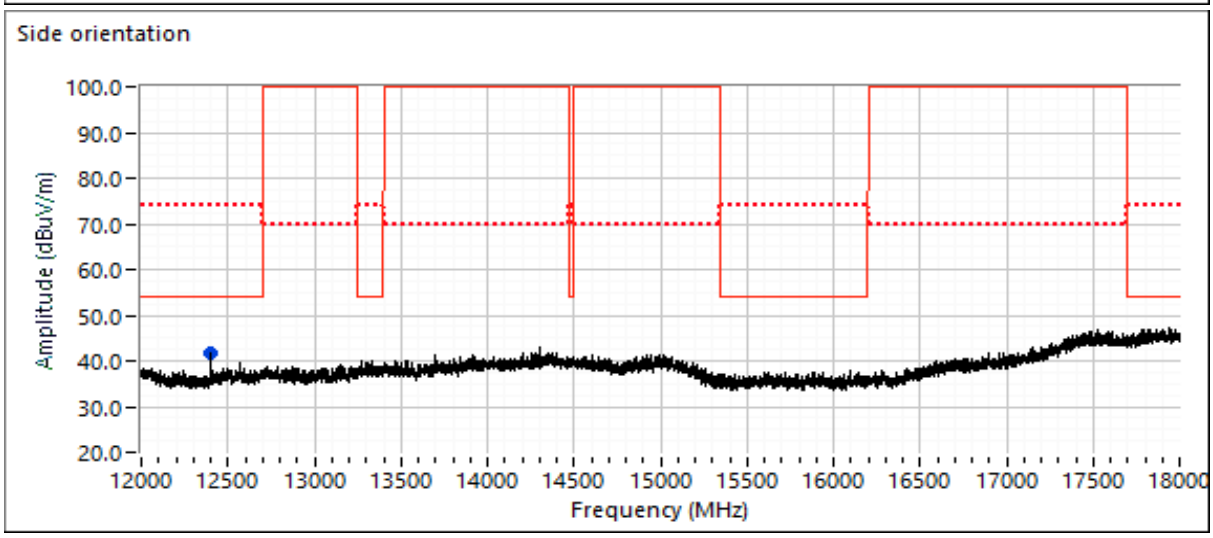
Channel: 79 Mode: EDR (π/4-DQPSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2479.180	95.0	V	-	-	PK	74	1.9	RB 2 MHz; VB: 8 MHz
2478.730	91.7	V	-	-	PK	74	1.9	RB 100 kHz; VB: 300 kHz
4500.000	51.3	V	54.0	-2.7	AVG	199	1.2	RB 1 MHz; VB: 10 Hz - unmodulated
4500.000	55.7	V	71.7	-14.3	PK	199	1.2	RB 1 MHz; VB: 3 MHz
4960.290	53.9	V	74.0	-20.1	PK	154	1.6	RB 1 MHz; VB: 3 MHz
4960.000	43.8	V	54.0	-10.2	AVG	159	1.6	RB 1 MHz; VB: 1 kHz; Note 6
6000.000	62.4	V	71.7	-7.6	PK	148	1.6	RB 100 kHz; VB: 300 kHz
6046.590	46.1	V	71.7	-23.9	PK	282	1.0	RB 100 kHz; VB: 300 kHz
7500.030	41.8	V	54.0	-12.2	AVG	177	1.4	RB 1 MHz; VB: 10 Hz - unmodulated
7500.000	48.8	V	74.0	-25.2	PK	177	1.4	RB 1 MHz; VB: 3 MHz
12400.070	49.6	V	74.0	-24.4	PK	149	1.3	RB 1 MHz; VB: 3 MHz
12400.050	39.4	V	54.0	-14.6	AVG	149	1.3	RB 1 MHz; VB: 1 kHz; Note 6

For non restricted bands

Fundamental emission level @ 3m in 100kHz RBW:	91.7	dBµV/m	
Limit for emissions outside of restricted bands:	71.7	dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	61.7	dBµV/m	Limit is -30dBc (UNII power measurement)

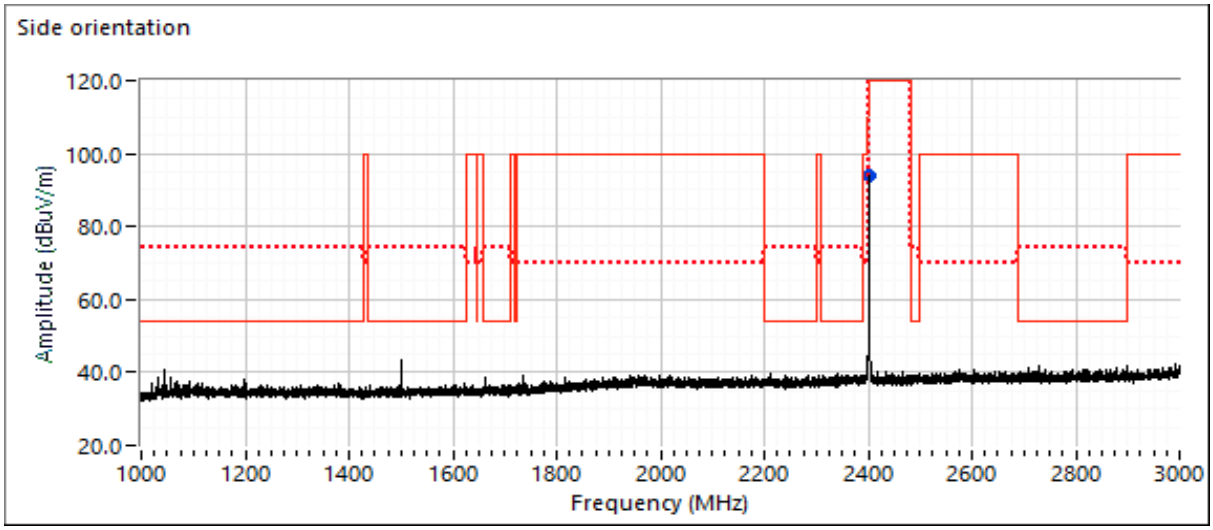
Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

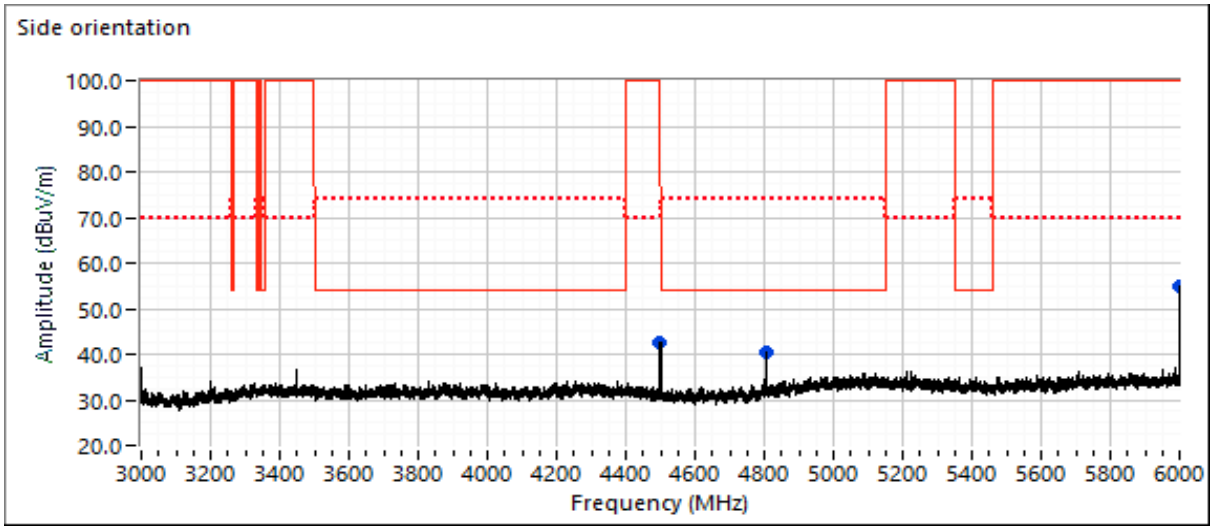
Run #3: Radiated Spurious Emissions, 1,000 - 25000 MHz

Date of Test: 3/21/2023 Config. Used: 1
Test Engineer: David Bare Config Change: None
Test Location: Fremont Chamber #7 EUT Voltage: 3V

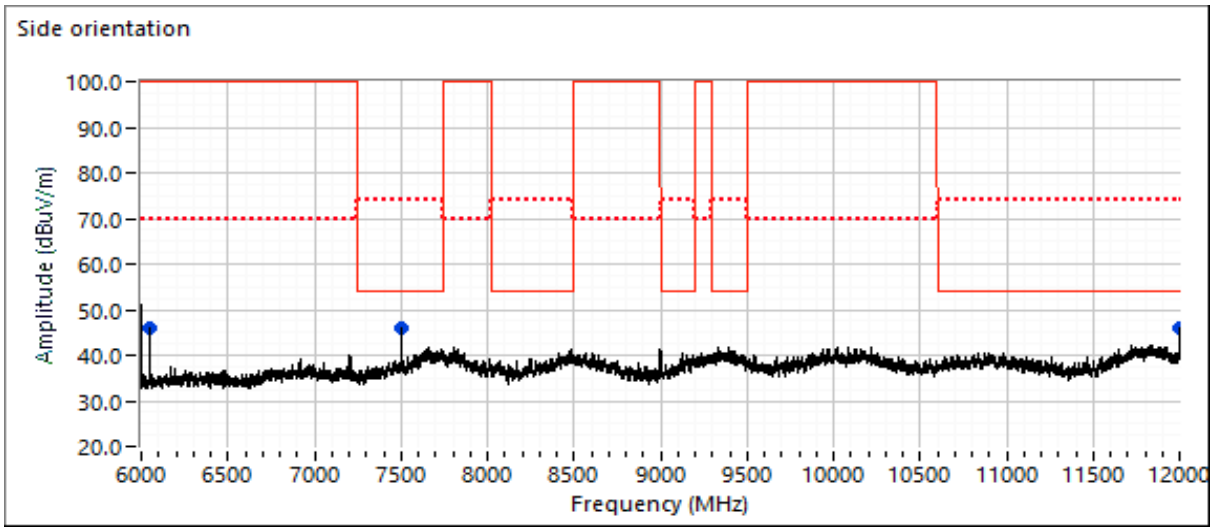
Run #1a: Low Channel Based on testing on the low channel, side orientation was selected as worst case

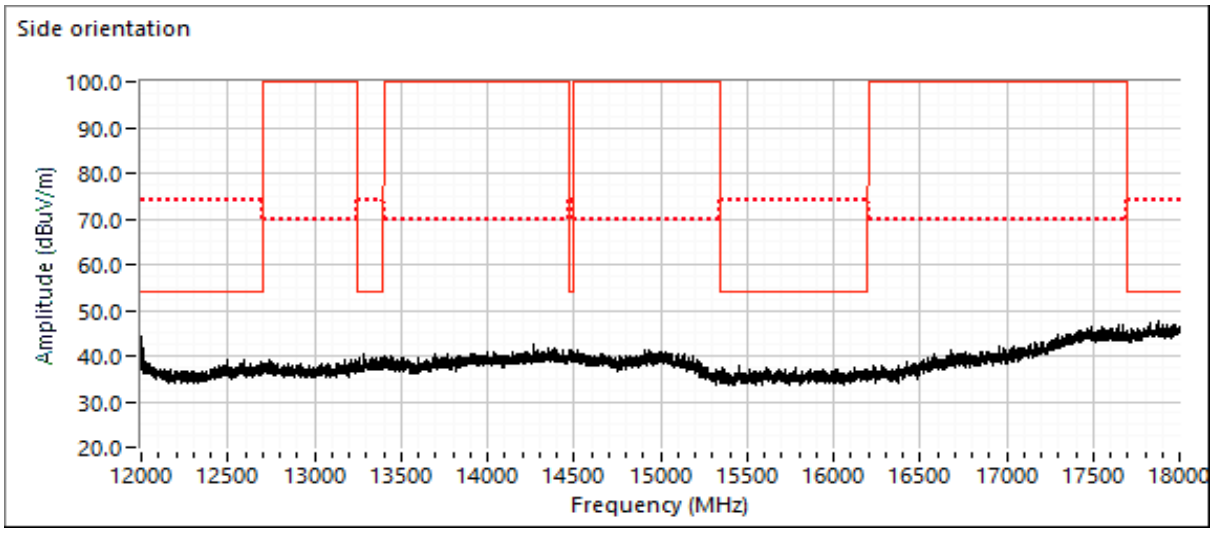
Channel: 0 Mode: EDR (8DPSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





EMC Test Data

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2402.780	96.7	V	-	-	PK	69	1.0	RB 2 MHz; VB: 8 MHz
2402.500	94.7	V	-	-	PK	69	1.0	RB 100 kHz; VB: 300 kHz
4500.000	42.1	V	54.0	-11.9	AVG	202	1.0	RB 1 MHz; VB: 10 Hz - unmodulated
4500.000	46.1	V	74.0	-27.9	PK	202	1.0	RB 1 MHz; VB: 3 MHz
4803.310	41.2	V	54.0	-12.8	AVG	153	1.3	RB 1 MHz; VB: 1 kHz; Note 6
4803.500	46.3	V	74.0	-27.7	PK	153	1.3	RB 1 MHz; VB: 3 MHz
6000.000	56.7	V	74.7	-18.0	PK	212	1.6	RB 100 kHz; VB: 300 kHz
6047.730	46.6	V	74.7	-28.1	PK	282	1.0	RB 100 kHz; VB: 300 kHz
7500.000	44.4	V	54.0	-9.6	AVG	145	1.8	RB 1 MHz; VB: 10 Hz - unmodulated
7500.000	50.0	V	74.0	-24.0	PK	145	1.8	RB 1 MHz; VB: 3 MHz
12000.370	44.8	V	54.0	-9.2	AVG	223	1.7	RB 1 MHz; VB: 10 Hz - unmodulated
12000.730	52.9	V	74.0	-21.1	PK	223	1.7	RB 1 MHz; VB: 3 MHz

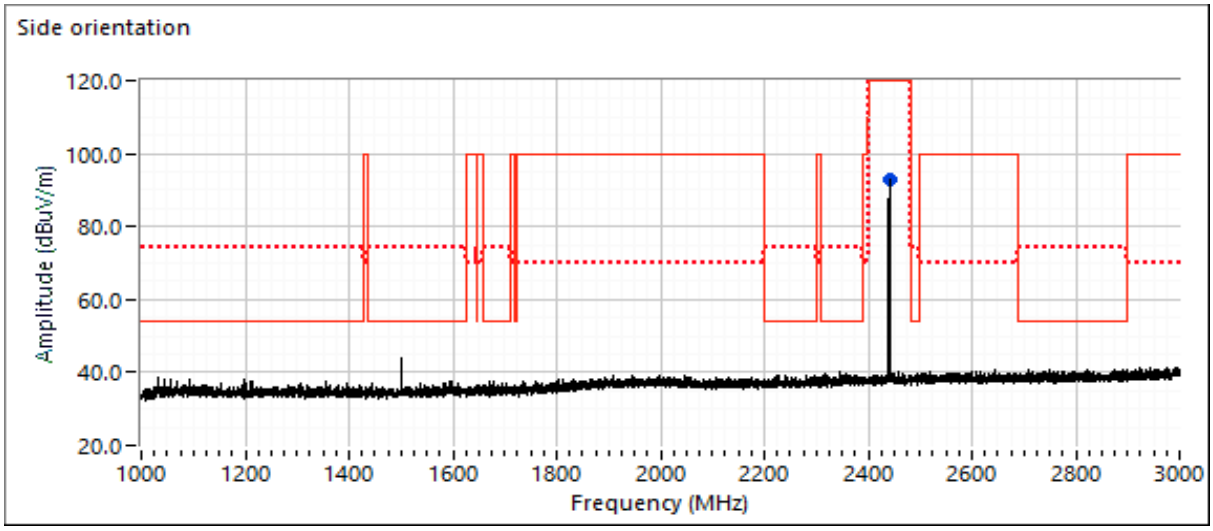
For non restricted bands

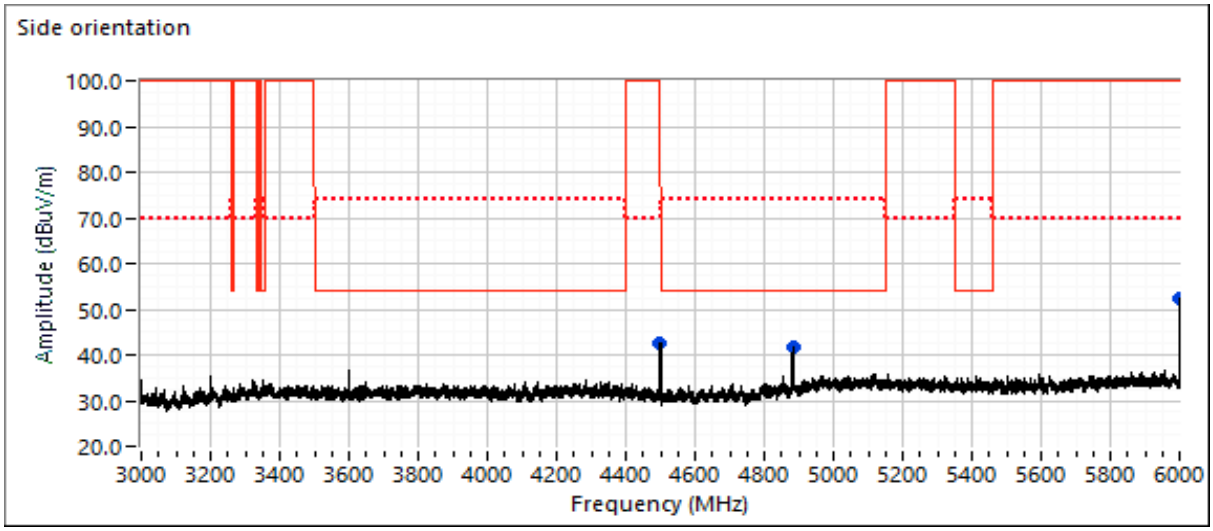
Fundamental emission level @ 3m in 100kHz RBW:	94.7	dBµV/m	
Limit for emissions outside of restricted bands:	74.7	dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	64.7	dBµV/m	Limit is -30dBc (UNII power measurement)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

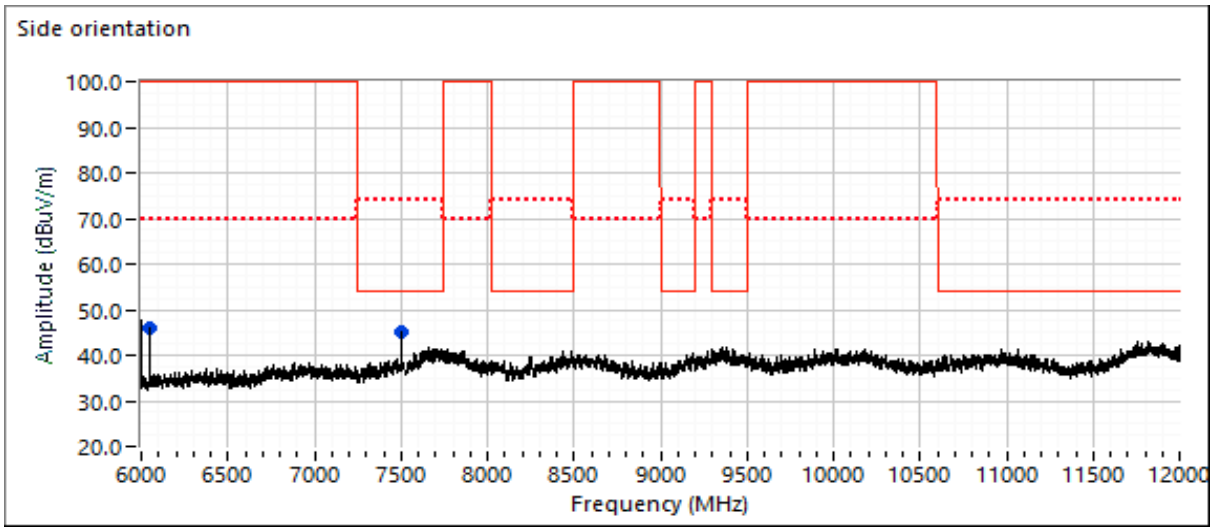
Run #1b: Center Channel

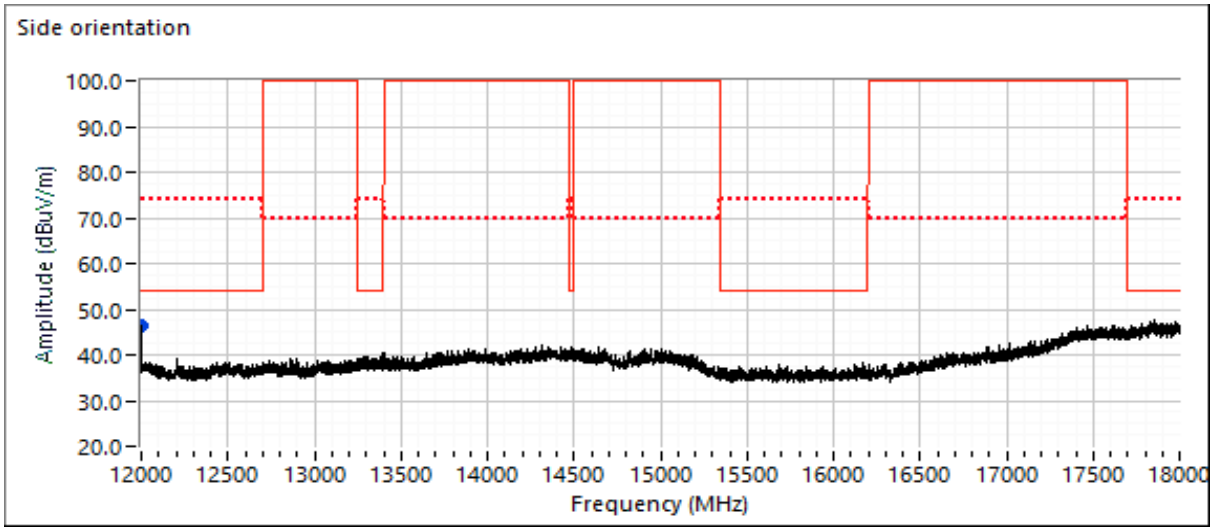
Channel: 39 Mode: EDR (8DPSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2441.150	96.5	V	-	-	PK	87	1.9	RB 2 MHz; VB: 8 MHz
2440.930	93.8	V	-	-	PK	87	1.9	RB 100 kHz; VB: 300 kHz
4500.040	42.9	V	54.0	-11.1	AVG	202	1.3	RB 1 MHz; VB: 10 Hz - unmodulated
4499.810	46.6	V	70.0	-23.4	PK	202	1.3	RB 1 MHz; VB: 3 MHz
4881.930	39.1	V	54.0	-14.9	AVG	136	1.6	RB 1 MHz; VB: 1 kHz; Note 6
4882.040	46.8	V	74.0	-27.2	PK	136	1.6	RB 1 MHz; VB: 3 MHz
5999.990	52.2	V	70.0	-17.8	PK	149	1.6	RB 100 kHz; VB: 300 kHz
6046.870	46.6	V	70.0	-23.4	PK	244	1.0	RB 100 kHz; VB: 300 kHz
7500.040	44.9	V	54.0	-9.1	AVG	146	1.6	RB 1 MHz; VB: 10 Hz - unmodulated
7499.940	49.8	V	74.0	-24.2	PK	146	1.6	RB 1 MHz; VB: 3 MHz
12000.210	45.3	V	54.0	-8.7	??	258	1.0	RB 1 MHz; VB: 10 Hz - unmodulated
11998.810	48.2	V	74.0	-25.8	PK	258	1.0	RB 1 MHz; VB: 3 MHz

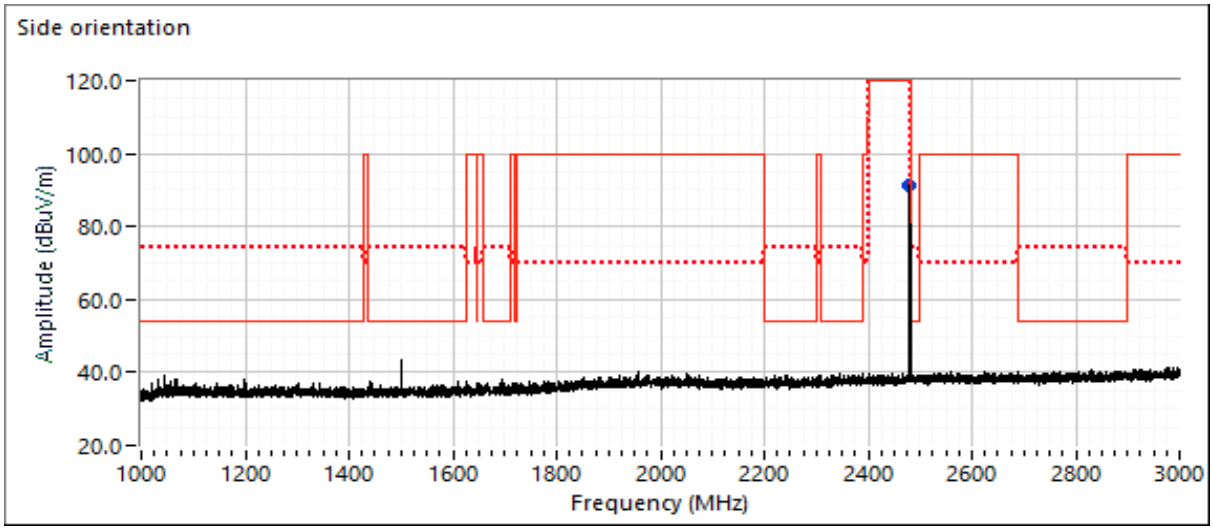
For non restricted bands

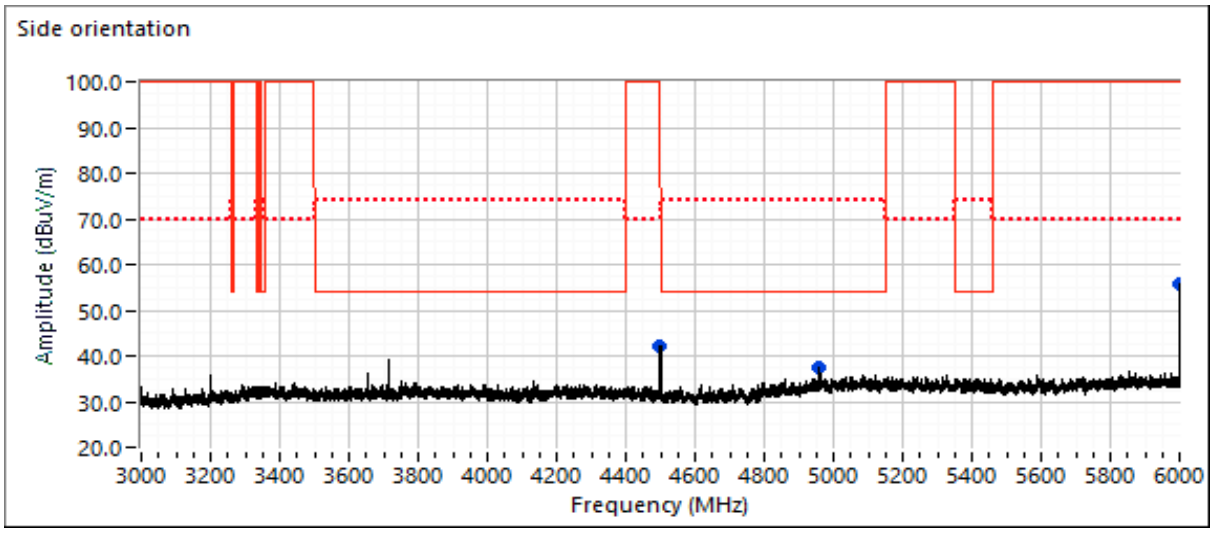
Fundamental emission level @ 3m in 100kHz RBW:	93.8	dBµV/m	
Limit for emissions outside of restricted bands:	73.8	dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	63.8	dBµV/m	Limit is -30dBc (UNII power measurement)

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

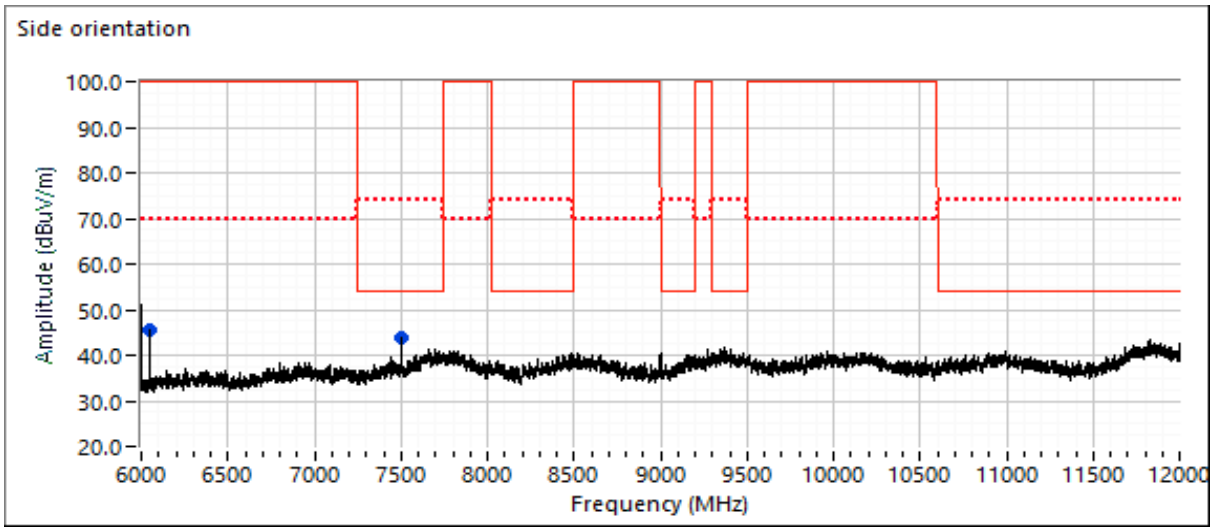
Run #1c: High Channel

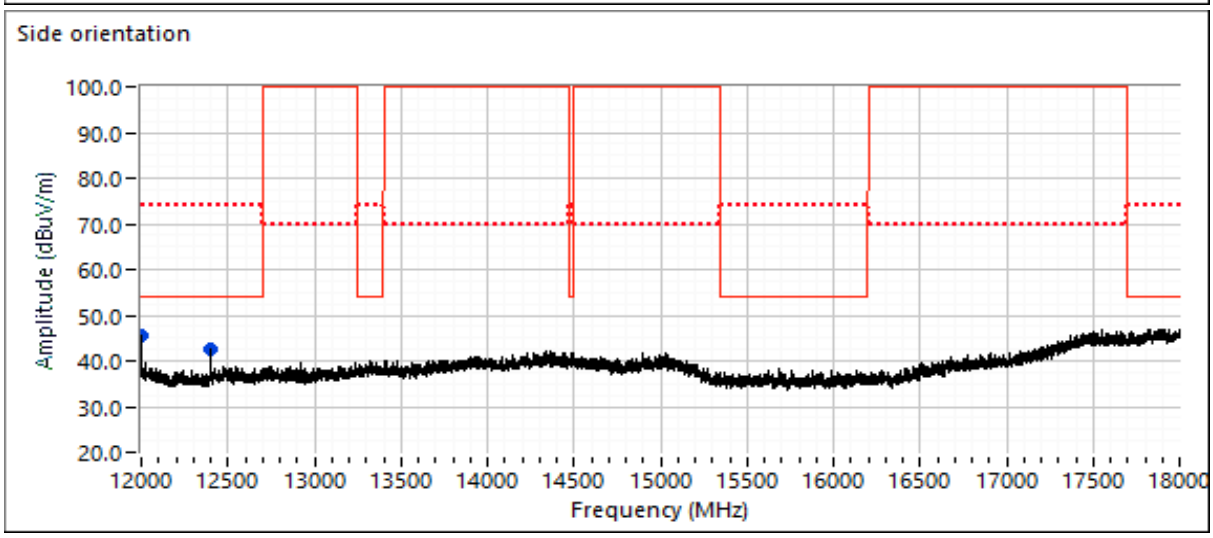
Channel: 79 Mode: EDR (8DPSK) Pwr Setting: 8





Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A





EMC Test Data

Client:	David Clark Co., Inc.	PR Number:	PR168558
Model:	DC PRO-X2 Headset	T-Log Number:	TL168558-RANA
		Project Manager:	Christine Krebill
Contact:	Nick Cannata	Project Engineer:	David Bare
Standard:	FCC 15.247/RSS-247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2480.770	94.4	V	-	-	PK	62	1.6	RB 2 MHz; VB: 8 MHz
2479.840	91.2	V	-	-	PK	62	1.6	RB 100 kHz; VB: 300 kHz
4500.040	42.7	V	54.0	-11.3	AVG	199	1.5	RB 1 MHz; VB: 10 Hz - Unmodulated
4499.950	46.3	V	70.0	-23.7	PK	199	1.5	RB 1 MHz; VB: 3 MHz
4960.200	35.7	V	54.0	-18.3	AVG	149	1.6	RB 1 MHz; VB: 1 kHz; Note 6
4959.350	44.9	V	74.0	-29.1	PK	149	1.6	RB 1 MHz; VB: 3 MHz
6000.000	51.2	V	70.0	-18.8	PK	162	1.6	RB 100 kHz; VB: 300 kHz
6046.900	47.3	V	70.0	-22.7	PK	209	1.1	RB 100 kHz; VB: 300 kHz
7500.050	43.2	V	54.0	-10.8	AVG	180	1.5	RB 1 MHz; VB: 10 Hz - unmodulated
7500.150	49.2	V	74.0	-24.8	PK	180	1.5	RB 1 MHz; VB: 3 MHz
12000.350	49.1	V	54.0	-4.9	AVG	244	1.5	RB 1 MHz; VB: 10 Hz - unmodulated
11999.260	53.6	V	74.0	-20.4	PK	244	1.5	RB 1 MHz; VB: 3 MHz
12400.010	39.1	V	54.0	-14.9	AVG	154	1.6	RB 1 MHz; VB: 1 kHz; Note 6
12399.880	49.8	V	74.0	-24.2	PK	154	1.6	RB 1 MHz; VB: 3 MHz

For non restricted bands

Fundamental emission level @ 3m in 100kHz RBW:	91.2	dBµV/m	
Limit for emissions outside of restricted bands:	71.2	dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	61.2	dBµV/m	Limit is -30dBc (UNII power measurement)

End of Report

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