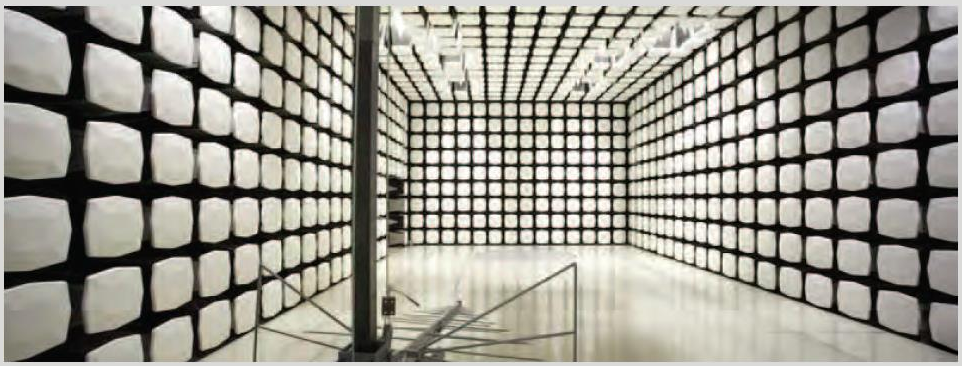
LightSpeed Aviation

Delta Zulu

FCC 15.247:2022
RSS-247 Issue 2:2017

Bluetooth (FHSS) Radio

Report: LISA0060, Issue Date: June 30, 2022



CERT #3310.02
#3310.04

CERTIFICATE OF TEST

Last Date of Test: May 19, 2022
LightSpeed Aviation
EUT: Delta Zulu

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2022	ANSI C63.10:2013 FCC KDB 558074 v05r02:2019
RSS-247 Issue 2:2017	
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Band Edge Compliance	Pass	15.247(d)	RSS-247 5.5	7.8.6	
Band Edge Compliance - Hopping Mode	Pass	15.247(d)	RSS-247 5.5	7.8.6	
Carrier Frequency Separation	Pass	15.247(a)(1)	RSS-247 5.1(b)	7.8.2	
Duty Cycle	Pass	15.247	RSS-Gen 3.2	7.5	
Dwell Time	Pass	15.247(a)(1)(iii)	RSS-247 5.1(d)	7.8.4	
Emissions Bandwidth (20 dB)	Pass	15.247(a)(1)	RSS-247 5.1(a)	7.8.7	
Equivalent Isotropic Radiated Power	Pass	15.247(b)(1)	RSS-247 5.4(b)	7.8.5	
Number of Hopping Frequencies	Pass	15.247(a)(1)(iii)	RSS-247 5.1(d)	7.8.3	
Occupied Bandwidth (99%)	Pass	N/A	RSS-Gen 6.7	6.9.3	
Output Power	Pass	15.247(b)(1)	RSS-247 5.4(b)	7.8.5	
Powerline Conducted Emissions	N/A	15.207	RSS-Gen 8.8	6.2	Not required for a device powered from a vehicle.
Spurious Conducted Emissions	Pass	15.247(d)	RSS-247 5.5	7.8.8	
Spurious Radiated Emissions	Pass	15.247(d)	RSS-247 5.5	6.5, 6.6	

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

CERTIFICATE OF TEST

Deviations From Test Standards

None

Approved By:

Johnny Candelas, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

element
2021.09.01

United States

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

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

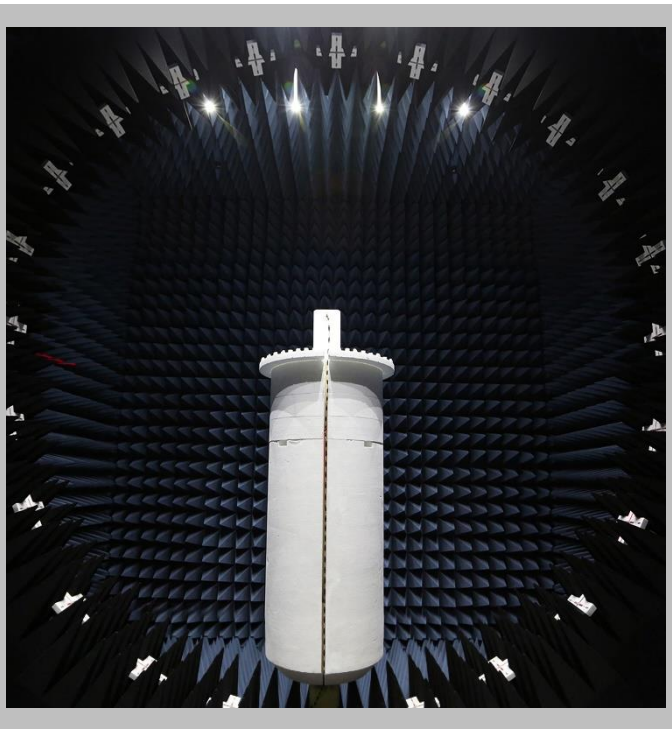
SCOPE

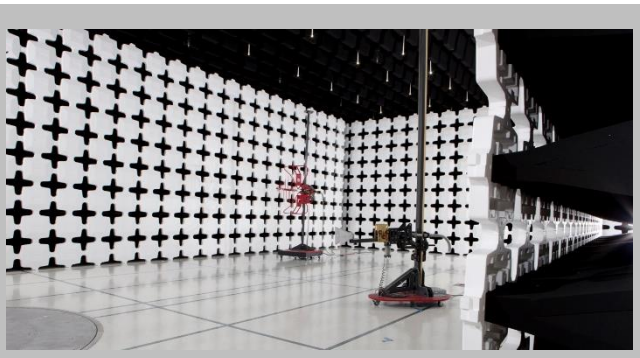
For details on the Scopes of our Accreditations, please visit:

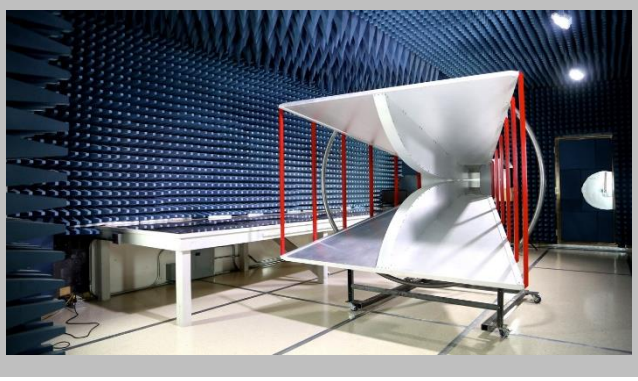
California Minnesota Oregon Texas Washington

FACILITIES

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
A2LA				
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

Measurement Uncertainty

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

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

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

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	3.2 dB	-3.2 dB

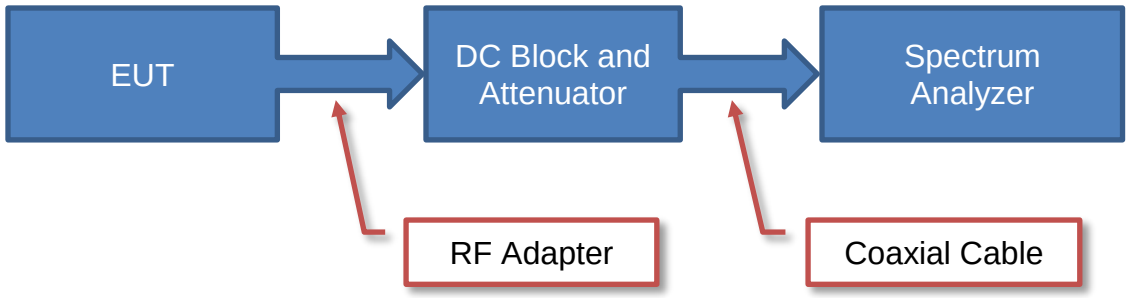
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

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

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

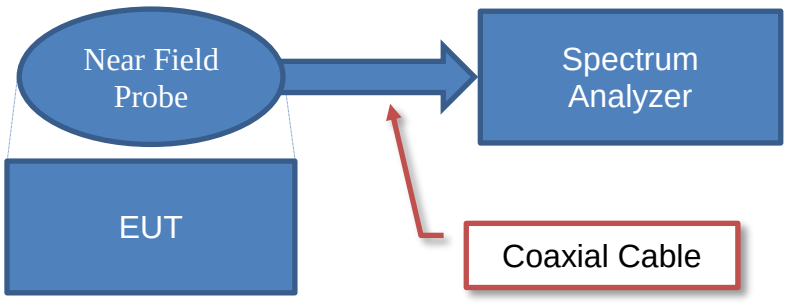
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

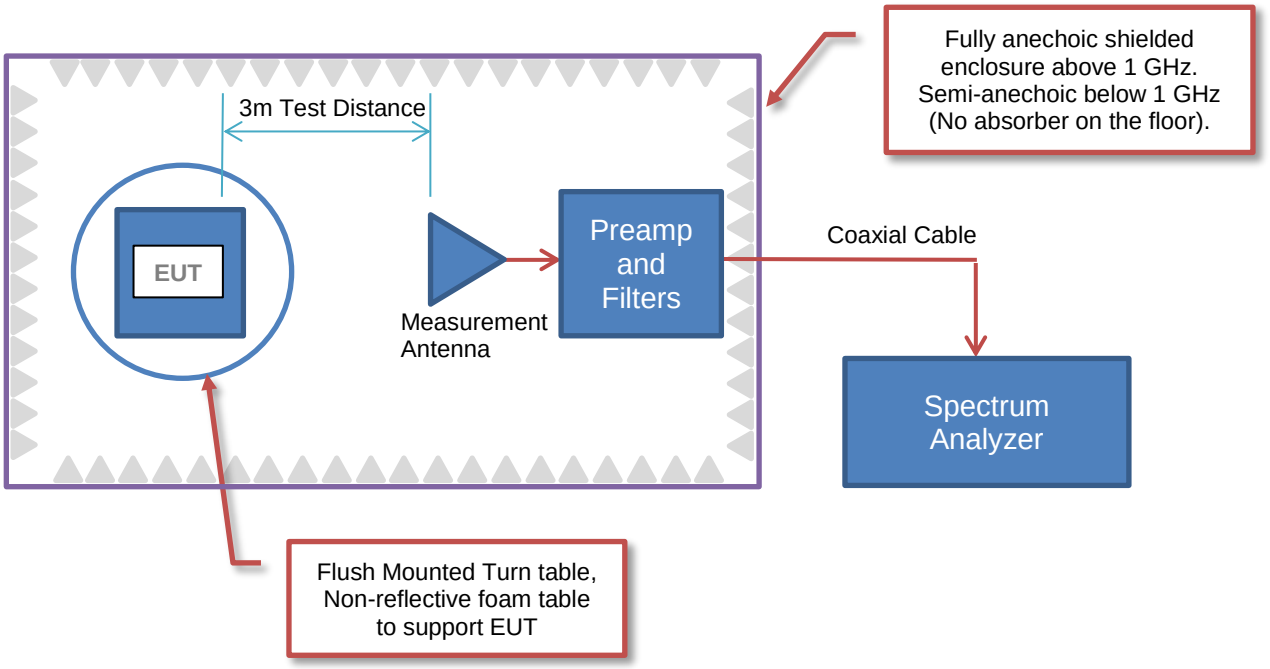


Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)		Factor: Antenna Factor		Factor: Cable Factor		Factor: Amplifier Gain		Distance Adjustment Factor		External Attenuation		Field Strength
42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0	=	**33.5**

Conducted Emissions:

Measured Level (Amplitude)		Factor: Transducer Factor		Factor: Cable Factor		External Attenuation		Adjusted Level
26.7	+	0.3	+	0.1	+	20.0	=	**47.1**

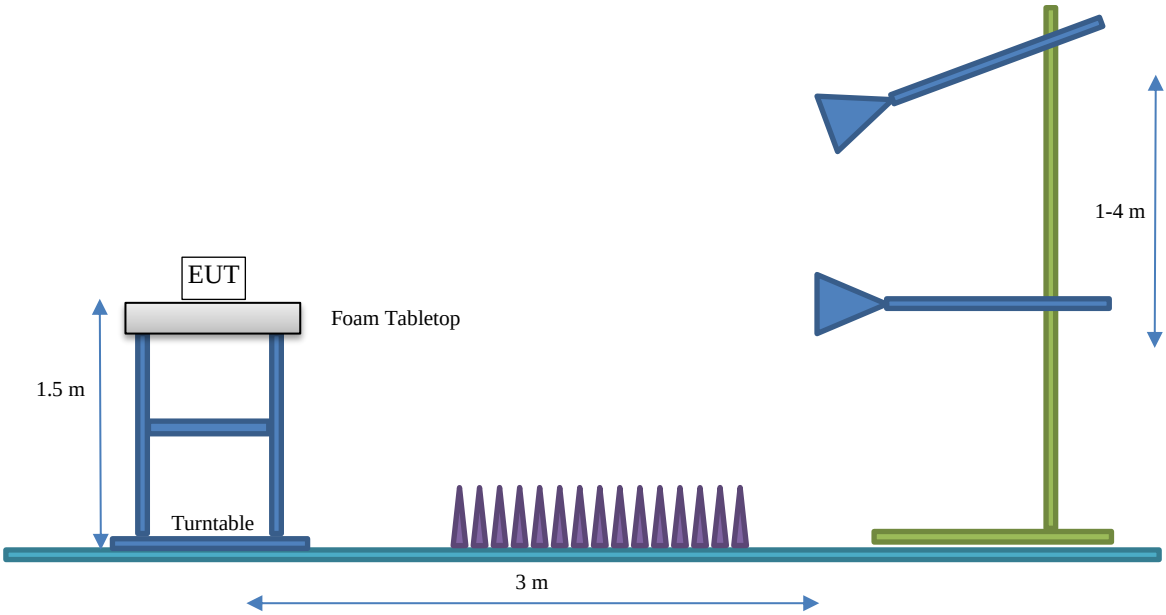
Radiated Power (ERP/EIRP):

Measured Level into Substitution Antenna (Amplitude dBm)		Substitution Antenna Factor (dBi)		EIRP to ERP (if applicable)		Measured power (dBm ERP/EIRP)
10.0	+	6.0	-	2.15	=	**13.9/16.0**

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	LightSpeed Aviation
Address:	6135 Jean Road
City, State, Zip:	Lake Oswego, OR 97035
Test Requested By:	Louis Hindman
EUT:	Delta Zulu
First Date of Test:	May 13, 2022
Last Date of Test:	May 19, 2022
Receipt Date of Samples:	May 13, 2022
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Delta Zulu is an aviation headset that provided automatic noise cancellation and wired connection to aircraft communication systems. In addition, a Bluetooth connection is provided for auxiliary audio and telephony. This is the only radio in the product. The headset is 8" tall and connected to a 6" control box via a 52" cable, which in turn connects to aircraft com via a 24" cable. The maximum length of the product with all cables extended is about 96".

Highest frequency generated or used in the device:
Assumes > 108 MHz and < 3.6 GHz

Testing Objective:
To demonstrate compliance of the Bluetooth radio to FCC 15.247/RSS-247 requirements.

POWER SETTINGS AND ANTENNAS

The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
PCB inverted F-type (PIFA)	Manufacturer	2400-2500	4.0

The EUT was tested using the power settings provided by the manufacturer:

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Type	Channel	Position	Frequency (MHz)	Power Setting
GFSK DH5	FHSS	0	Low Channel	2402	15
		39	Mid Channel	2440	
		78	High Channel	2480	
DQPSK 2DH5	FHSS	0	Low Channel	2402	
		39	Mid Channel	2440	
		78	High Channel	2480	
8DPSK 3DH5	FHSS	0	Low Channel	2402	
		39	Mid Channel	2440	
		78	High Channel	2480	

CONFIGURATIONS

Configuration LISA0060- 1

Software/Firmware Running During Test	
Description	**Version**
AVBootUI	1.16

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio	LightSpeed Aviation	Delta Zulu	808000413DZ

Peripherals in Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Headset	LightSpeed Aviation	Noise Cancelling Headphones with Microphone	None
Audio Jack	LightSpeed Aviation	Large Phono Jack	None
Mic Jack	LightSpeed Aviation	Medium Phono Jack	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Computer	Dell	Laptop Computer	None
Brick	Dell	Laptop Power Supply	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphone Cable	No	1.2m	No	Headset	Radio
Microphone Cable	No	1.2m	No	Headset	Radio
USB Cable	No	1.2m	No	Computer	Radio
DC Cable	No	1.8m	No	Computer	Brick
AC Cord	No	1.8m	No	AC Power	Brick
Audio Cable	No	0.4m	No	Audio Jack	Radio
Mic Cable	No	0.4m	No	Mic Jack	Radio

CONFIGURATIONS

Configuration LISA0060- 2

Software/Firmware Running During Test	
Description	**Version**
AVBootUI	1.16

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio	LightSpeed Aviation	Delta Zulu	808000414

Peripherals in Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Headset	LightSpeed Aviation	Noise Cancelling Headphones with Microphone	None
Audio Jack	LightSpeed Aviation	Large Phono Jack	None
Mic Jack	LightSpeed Aviation	Medium Phono Jack	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Computer	Dell	Laptop Computer	None
Brick	Dell	Laptop Power Supply	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphone Cable	No	1.2m	No	Headset	Radio
Microphone Cable	No	1.2m	No	Headset	Radio
USB Cable	No	1.2m	No	Computer	Radio
DC Cable	No	1.8m	No	Computer	Brick
AC Cord	No	1.8m	No	AC Power	Brick
Audio Cable	No	0.4m	No	Audio Jack	Radio
Mic Cable	No	0.4m	No	Mic Jack	Radio

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2022-05-13	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2022-05-19	Carrier Frequency Separation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2022-05-19	Number of Hopping Frequencies	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2022-05-19	Dwell Time	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2022-05-19	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2022-05-19	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2022-05-19	Band Edge Compliance – Hopping Mode	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2022-05-19	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2022-05-19	Emissions Bandwidth (20dB)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
10	2022-05-19	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
11	2022-05-19	Occupied Bandwidth (99%)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

BAND EDGE COMPLIANCE

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Cable	Element	None	OC5	2022-02-14	2023-02-14
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

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

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

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

BAND EDGE COMPLIANCE

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	Delta Zulu			Work Order:	LISA0060
Serial Number:	808000414			Date:	19-May-22
Customer:	LightSpeed Aviation			Temperature:	23.2 °C
Attendees:	None			Humidity:	48.1% RH
Project:	None			Barometric Pres.:	1014 mbar
Tested by:	Nolan De Ramos, Luis Flores	Power:	5VDC USB charging	Job Site:	OC13

TEST SPECIFICATIONS	Test Method
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

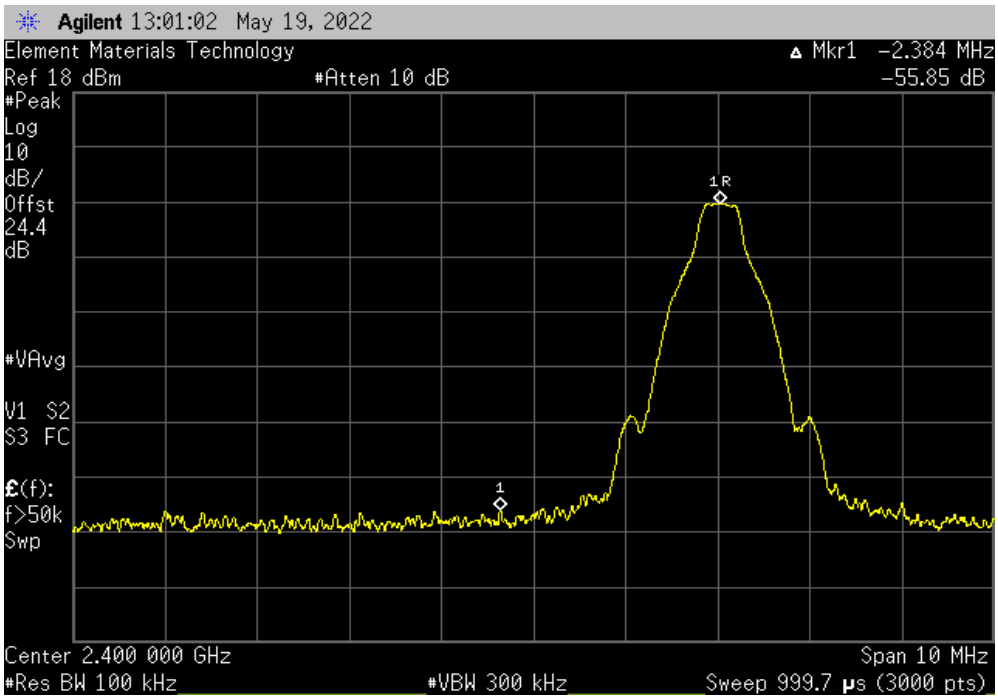
None

Configuration #	2	Signature

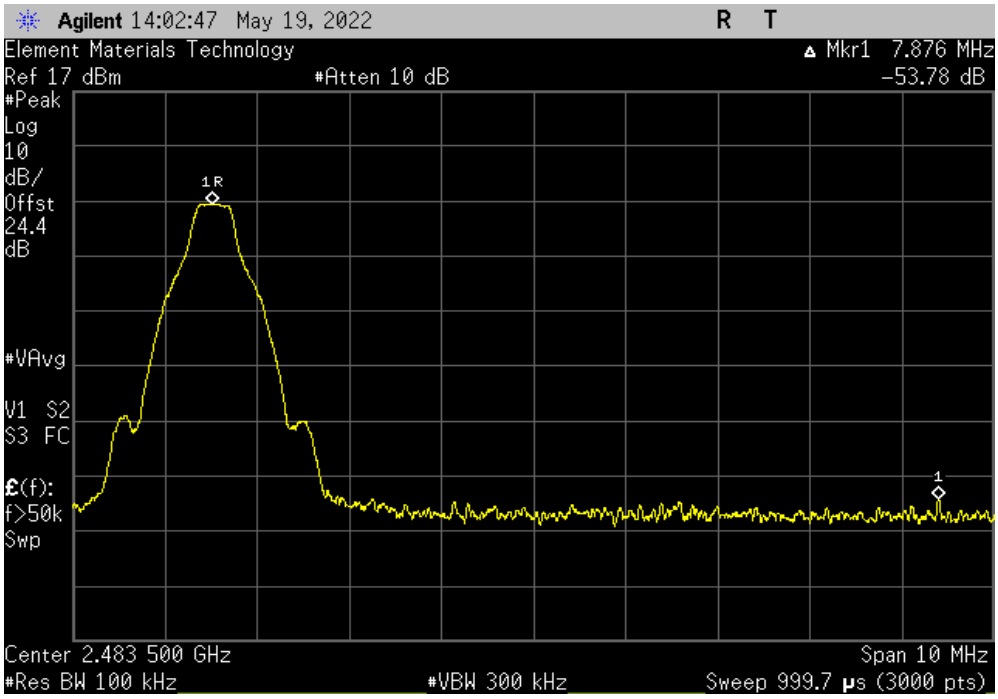
		Value (dBc)	Limit ≤ (dBc)	Result
DH5, GFSK				
	Low Channel, 2402 MHz	-55.85	-20	Pass
	High Channel, 2480 MHz	-53.78	-20	Pass
2DH5, pi/4-DQPSK				
	Low Channel, 2402 MHz	-49.43	-20	Pass
	High Channel, 2480 MHz	-52.06	-20	Pass
3DH5, 8-DPSK				
	Low Channel, 2402 MHz	-48.88	-20	Pass
	High Channel, 2480 MHz	-51.46	-20	Pass

BAND EDGE COMPLIANCE

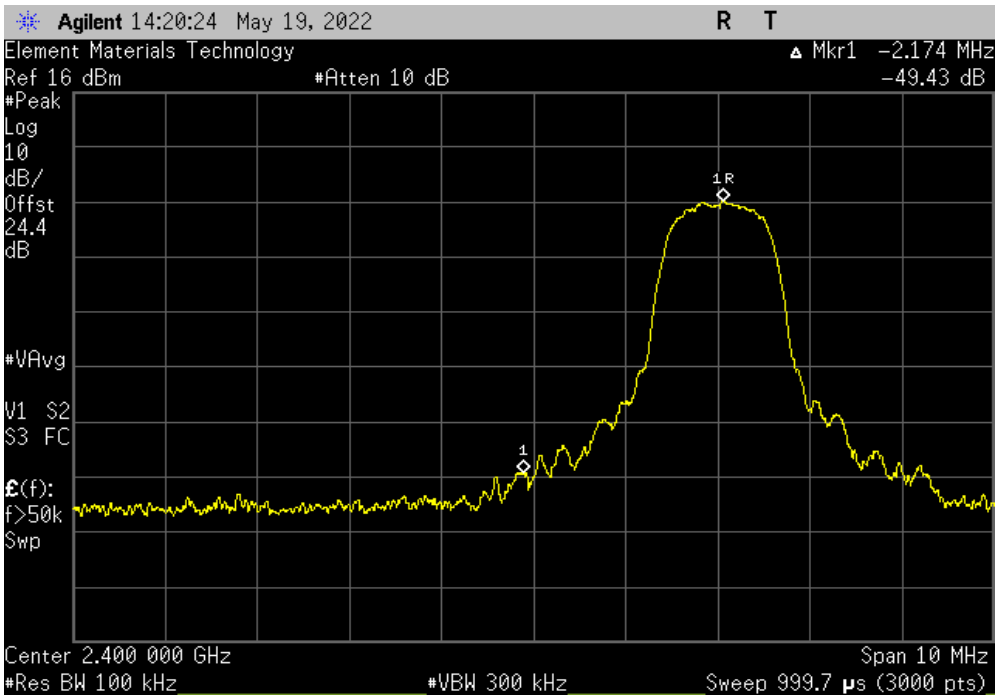
DH5, GFSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-55.85	-20	Pass



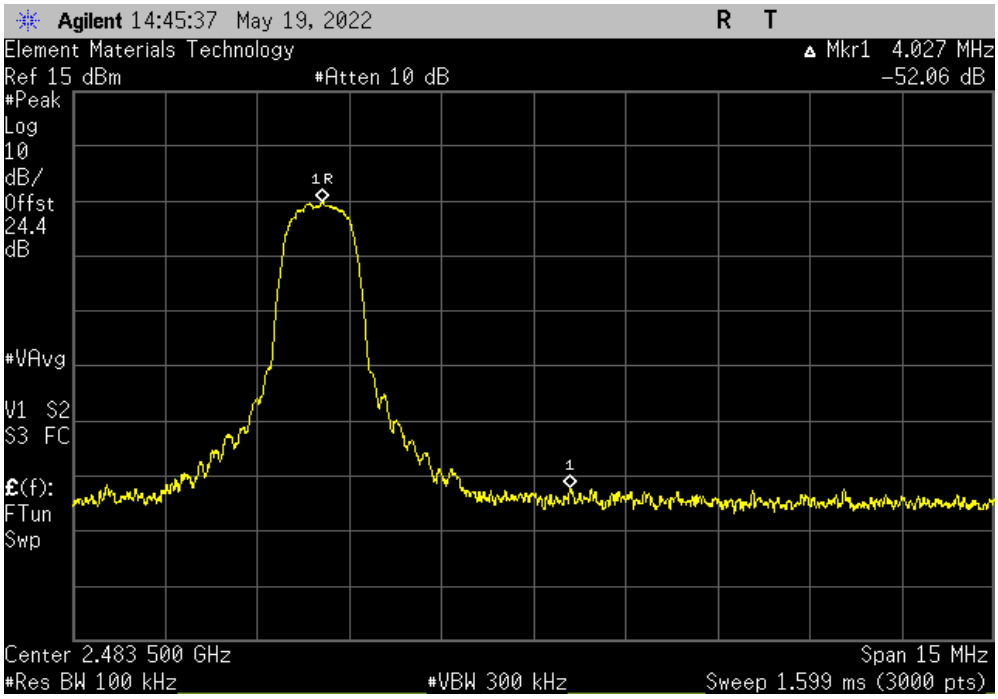
DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-53.78	-20	Pass



2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.43	-20	Pass

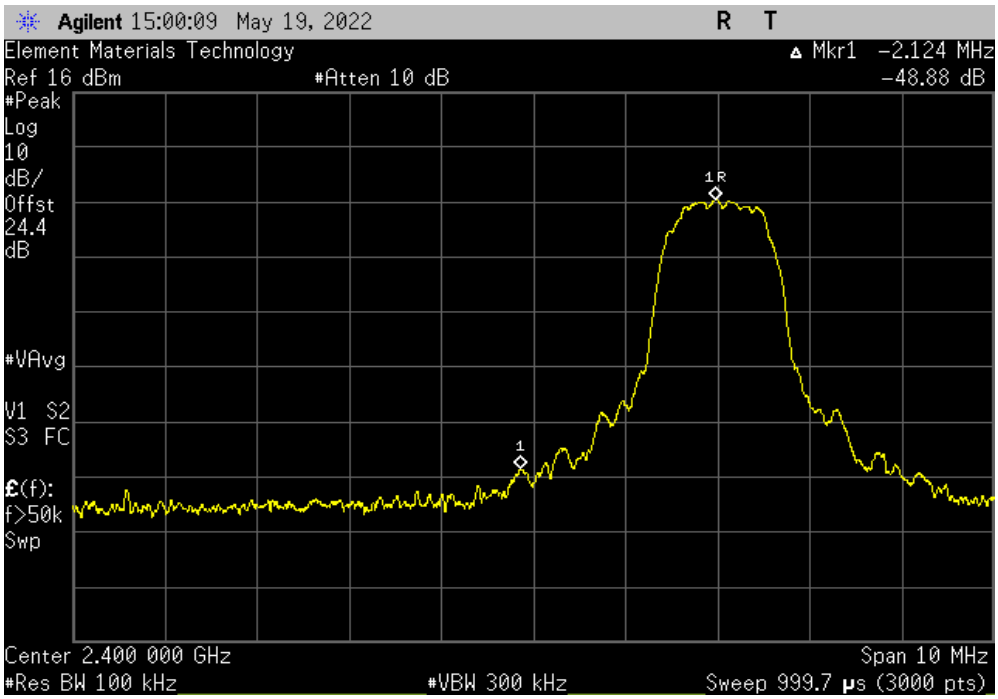


2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-52.06	-20	Pass

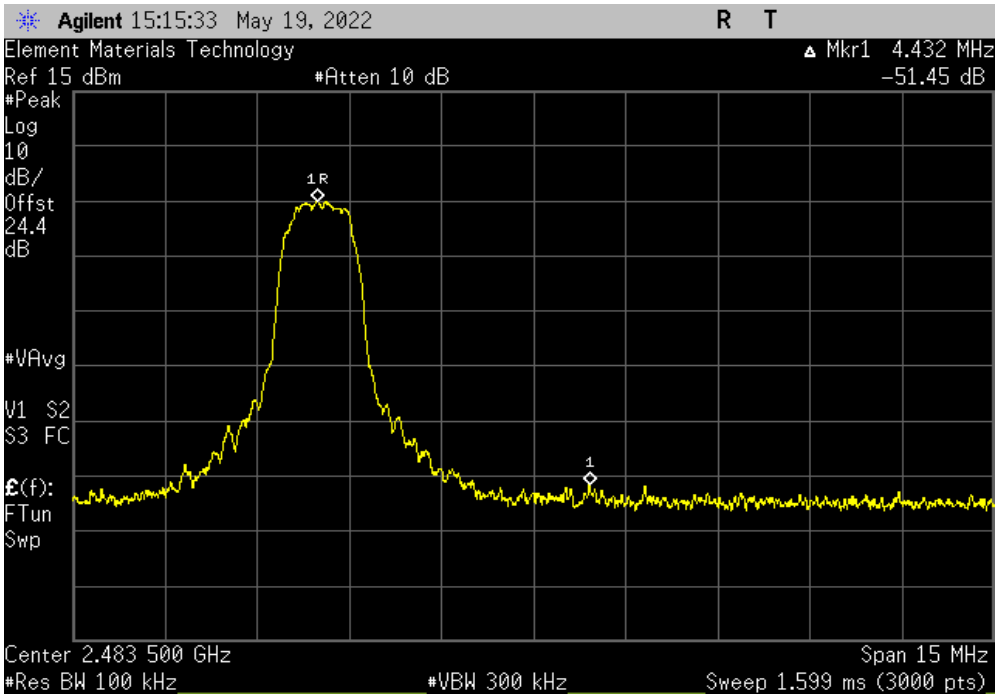


BAND EDGE COMPLIANCE

3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-48.88	-20	Pass



3DH5, 8-DPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-51.46	-20	Pass



BAND EDGE COMPLIANCE - HOPPING MODE

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Cable	Element	None	OC5	2022-02-14	2023-02-14
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

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

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudo-random hopping sequence. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

BAND EDGE COMPLIANCE - HOPPING MODE

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

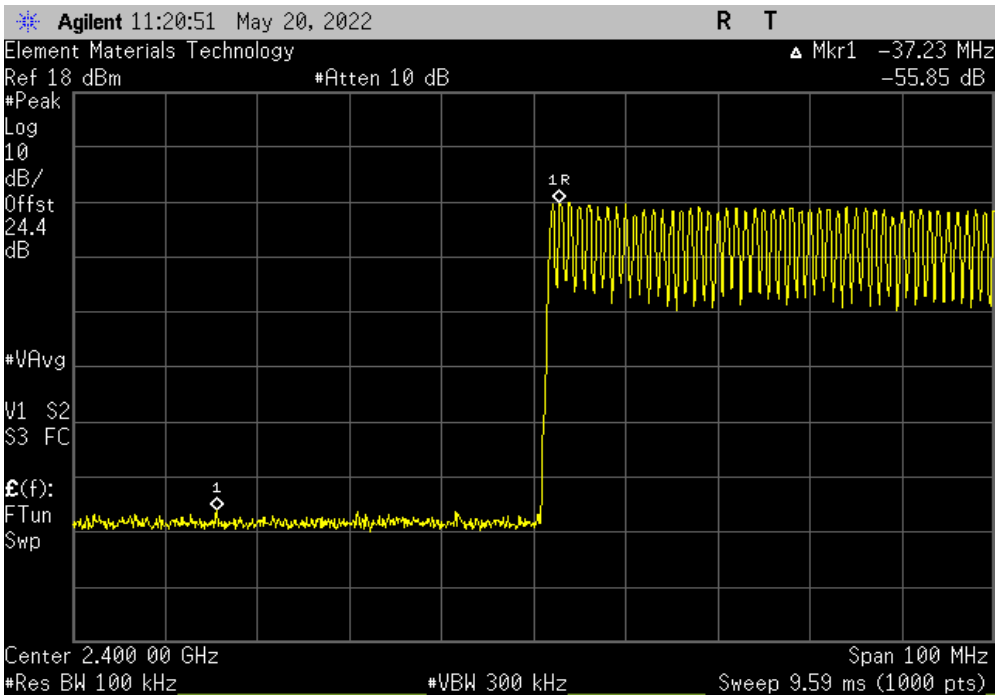
None

Configuration #	**2**	*Signature*

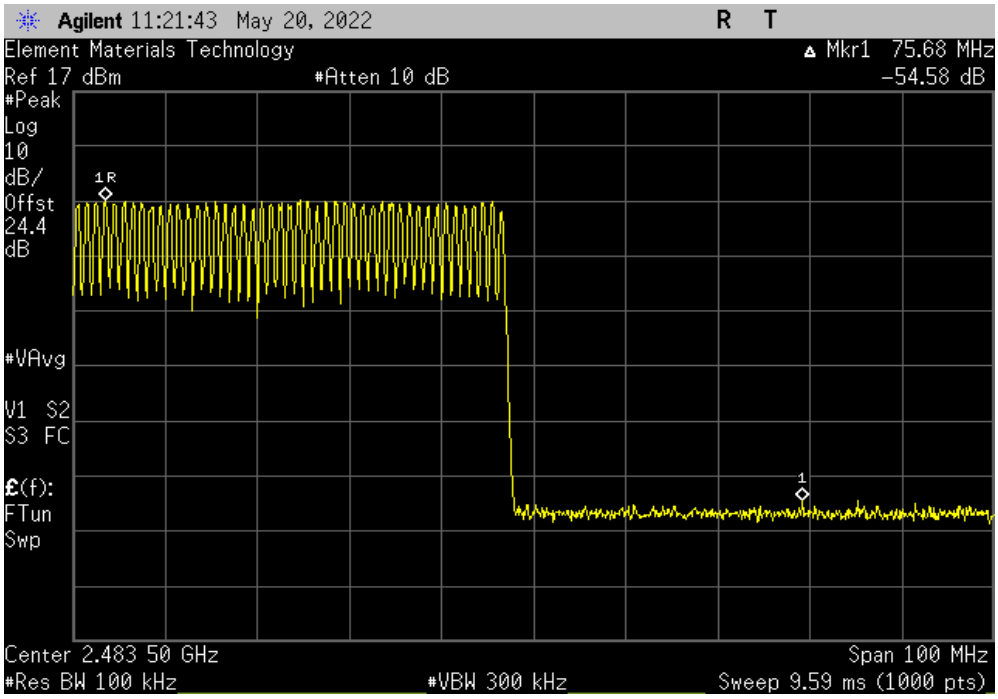
	Value (dBc)	**Limit ≤ (dBc)**	**Result**
Hopping Mode (All Channels)			
DH5, GFSK			
Low Channel, 2402 MHz	-55.85	-20	Pass
High Channel, 2480 MHz	-54.58	-20	Pass
2DH5, pi/4-DQPSK			
Low Channel, 2402 MHz	-50.22	-20	Pass
High Channel, 2480 MHz	-53.72	-20	Pass
3DH5, 8-DPSK			
Low Channel, 2402 MHz	-49.17	-20	Pass
High Channel, 2480 MHz	-54.63	-20	Pass

BAND EDGE COMPLIANCE - HOPPING MODE

Hopping Mode (All Channels), DH5, GFSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-55.85	-20	Pass

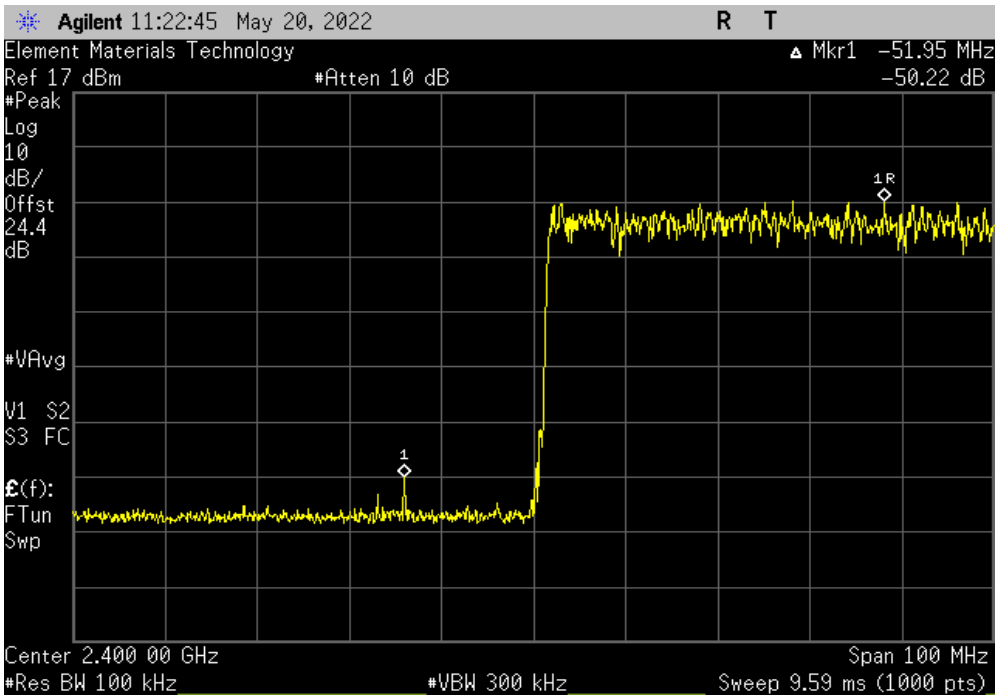


Hopping Mode (All Channels), DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-54.58	-20	Pass

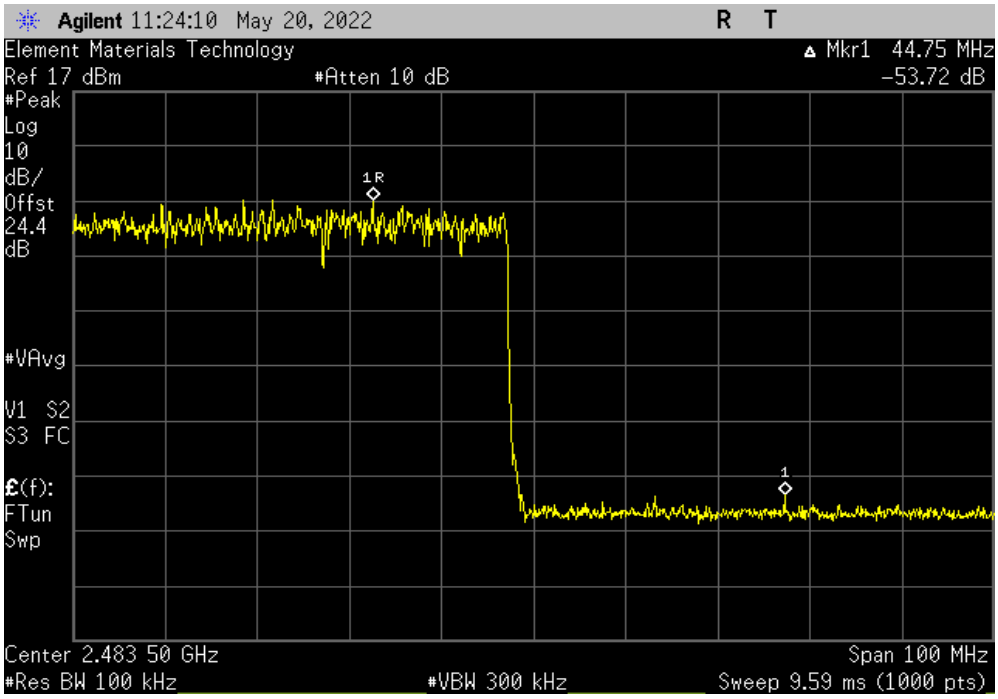


BAND EDGE COMPLIANCE - HOPPING MODE

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-50.22	-20	Pass

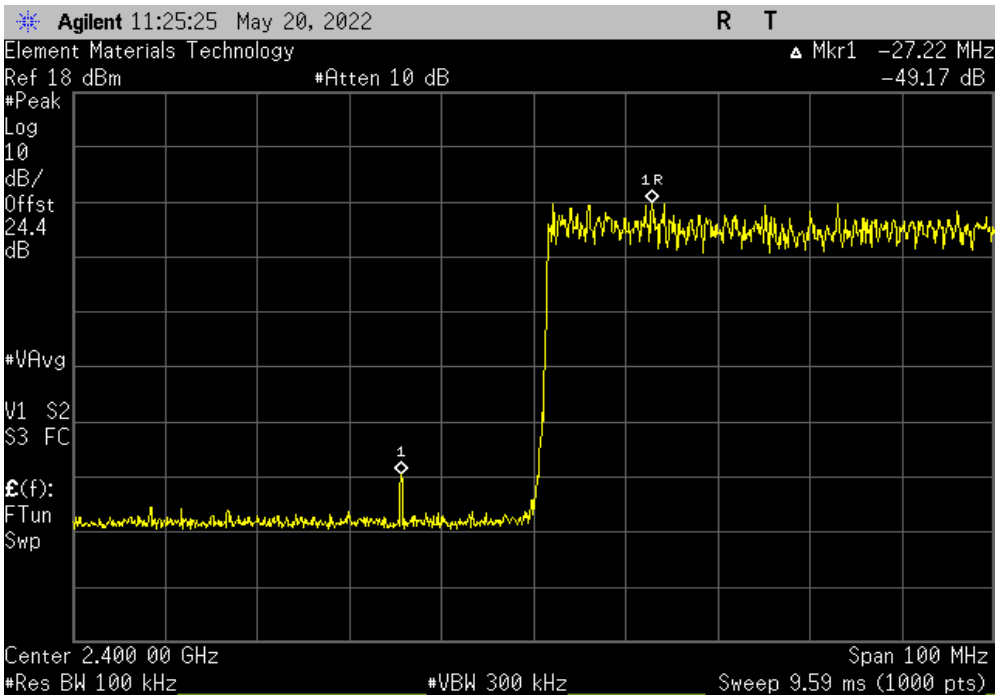


Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-53.72	-20	Pass

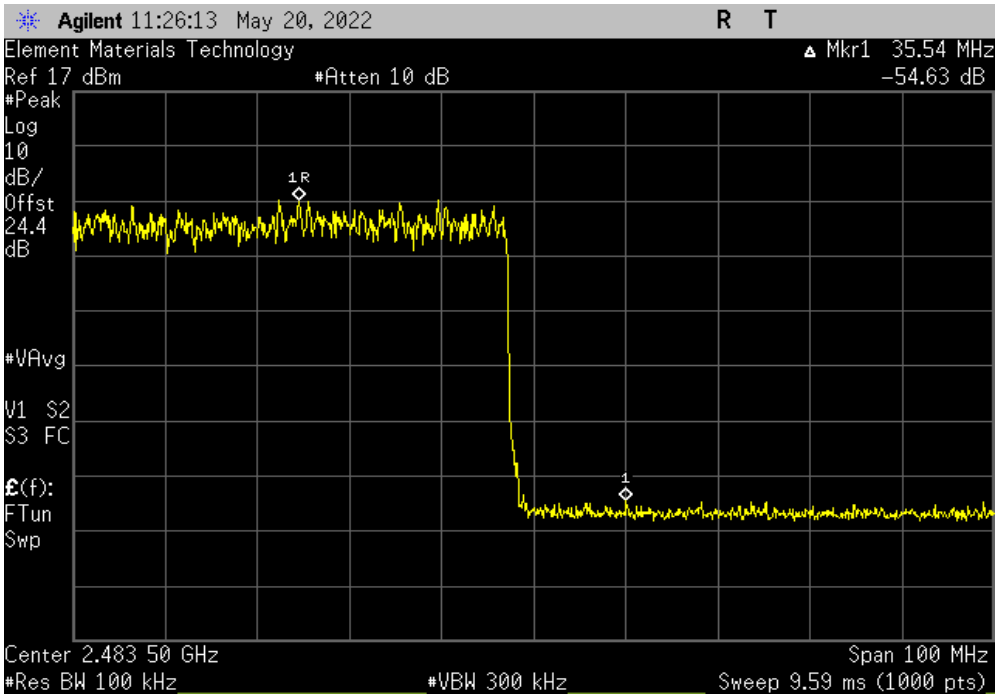


BAND EDGE COMPLIANCE - HOPPING MODE

Hopping Mode (All Channels), 3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.17	-20	Pass



Hopping Mode (All Channels), 3DH5, 8-DPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-54.63	-20	Pass



CARRIER FREQUENCY SEPARATION

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Element	None	OC5	2022-02-14	2023-02-14
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

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

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

CARRIER FREQUENCY SEPARATION

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

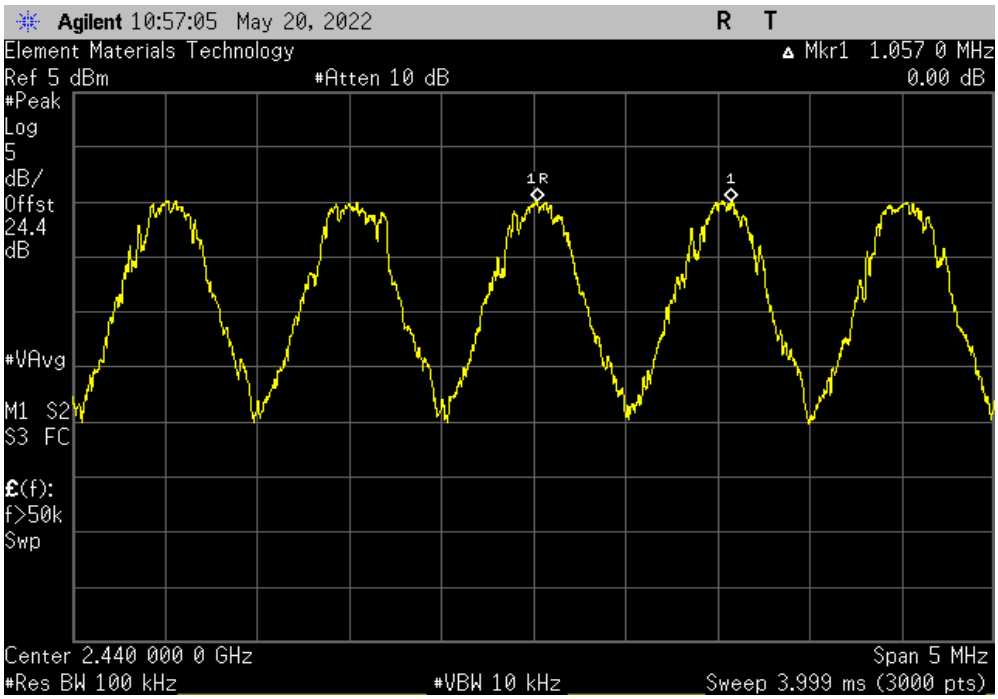
None

Configuration #	**2**	*Signature*

	Value	**Limit (≥)**	**Results**
Hopping Mode (All Channels)			
DH5, GFSK			
Mid Channel, 2440 MHz	1.1 MHz	1 MHz	Pass

CARRIER FREQUENCY SEPARATION

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2440 MHz						
				Value	Limit (≥)	Results
				1.1 MHz	1 MHz	Pass



DUTY CYCLE

XMit 2022.02.07.0

TEST DESCRIPTION

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

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

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

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The test software provided for operation in a fixed, single channel mode allows the EUT to operate continuously at 100% Duty Cycle.

DWELL TIME

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Cable	Element	None	OC5	2022-02-14	2023-02-14
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

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

The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The hopping function of the EUT was enabled.

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

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

Average Number of Pulses is based on 4 samples.

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

DWELL TIME

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

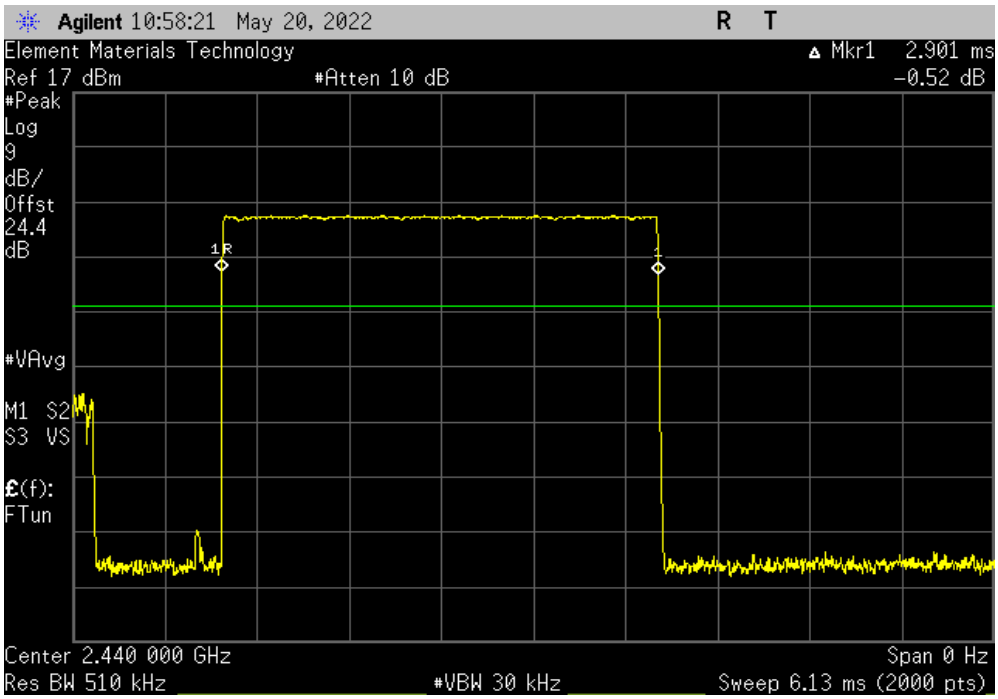
None

Configuration #	**2**	*Signature*

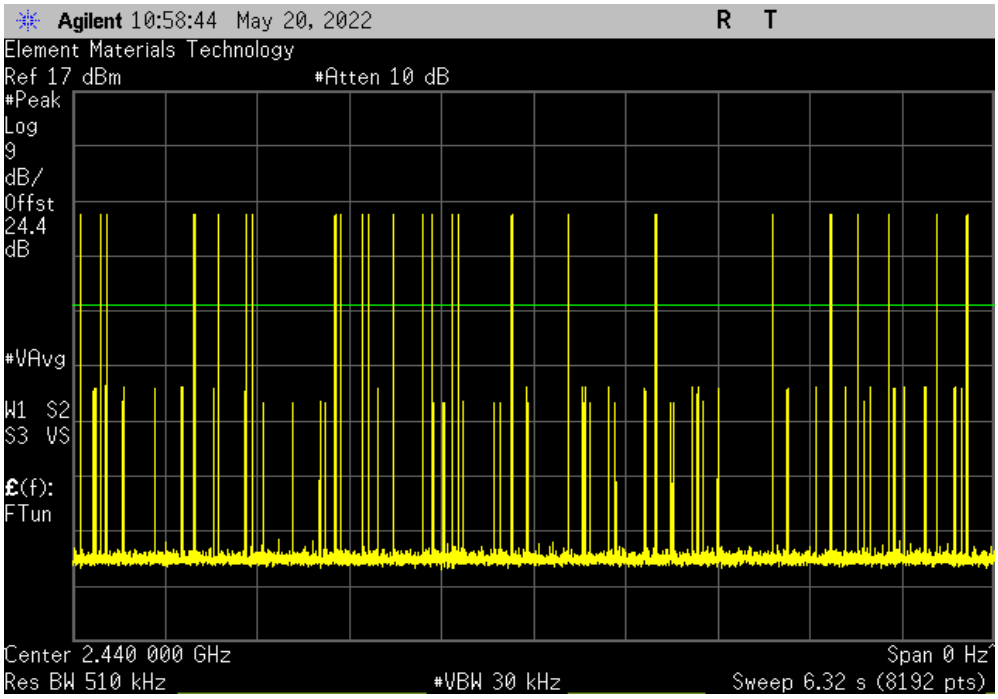
	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
Hopping Mode (All Channels)							
DH5, GFSK							
Mid Channel, 2440 MHz	2.901	N/A	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	25	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	24	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	28	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	29	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	2.901	N/A	26.5	5	384.383	400	Pass
2DH5, pi/4-DQPSK							
Mid Channel, 2440 MHz	2.898	N/A	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	20	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	17	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	20	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	17	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	2.898	N/A	18.5	5	268.065	400	Pass
3DH5, 8-DPSK							
Mid Channel, 2440 MHz	2.900	N/A	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	20	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	20	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	20	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	N/A	29	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2440 MHz	2.900	N/A	22.25	5	322.625	400	Pass

DWELL TIME

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.901	N/A	N/A	N/A	N/A	N/A	N/A

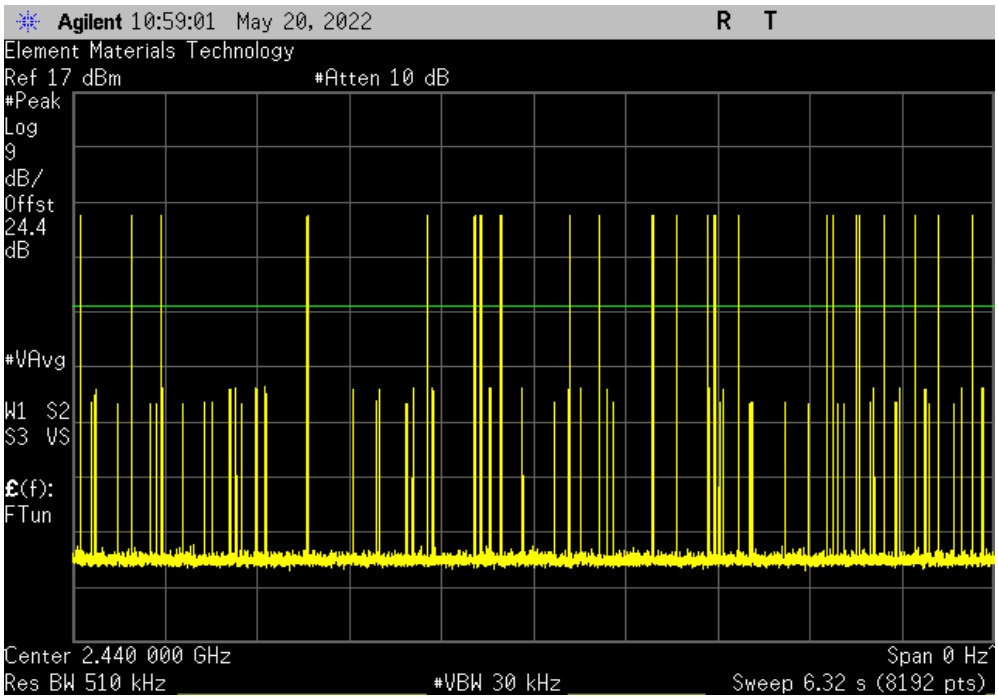


Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	25	N/A	N/A	N/A	N/A	N/A

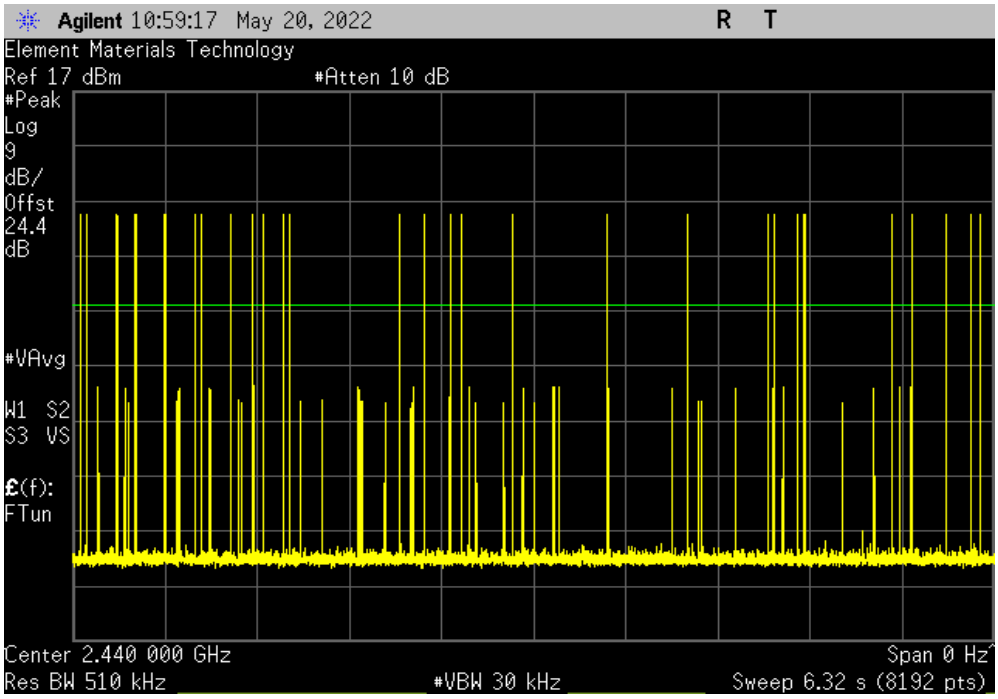


DWELL TIME

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	24	N/A	N/A	N/A	N/A	N/A

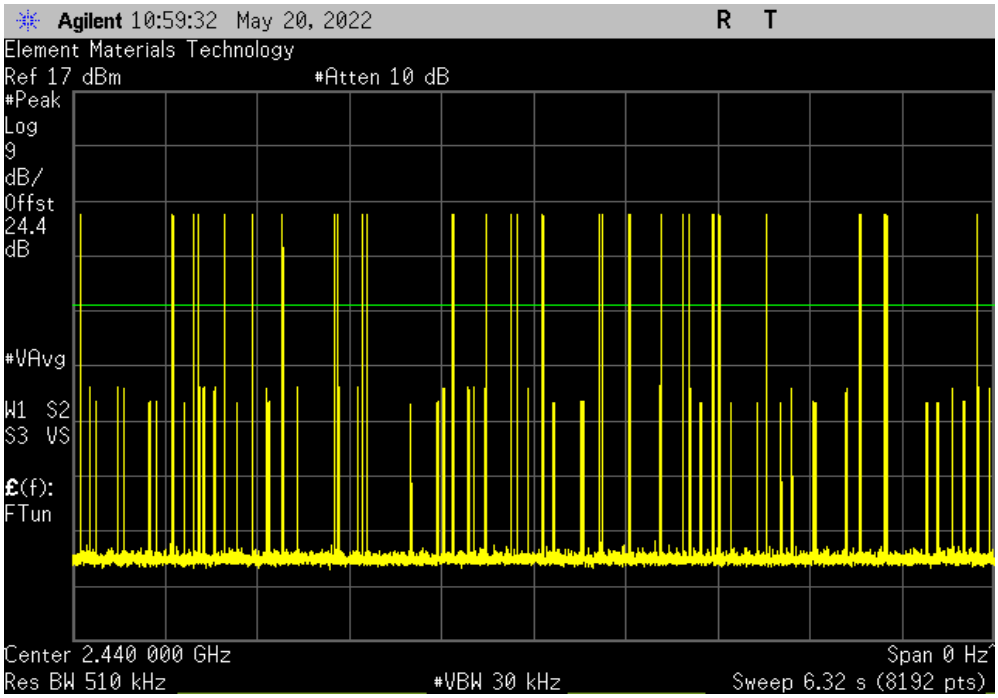


Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	28	N/A	N/A	N/A	N/A	N/A



DWELL TIME

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	29	N/A	N/A	N/A	N/A	N/A



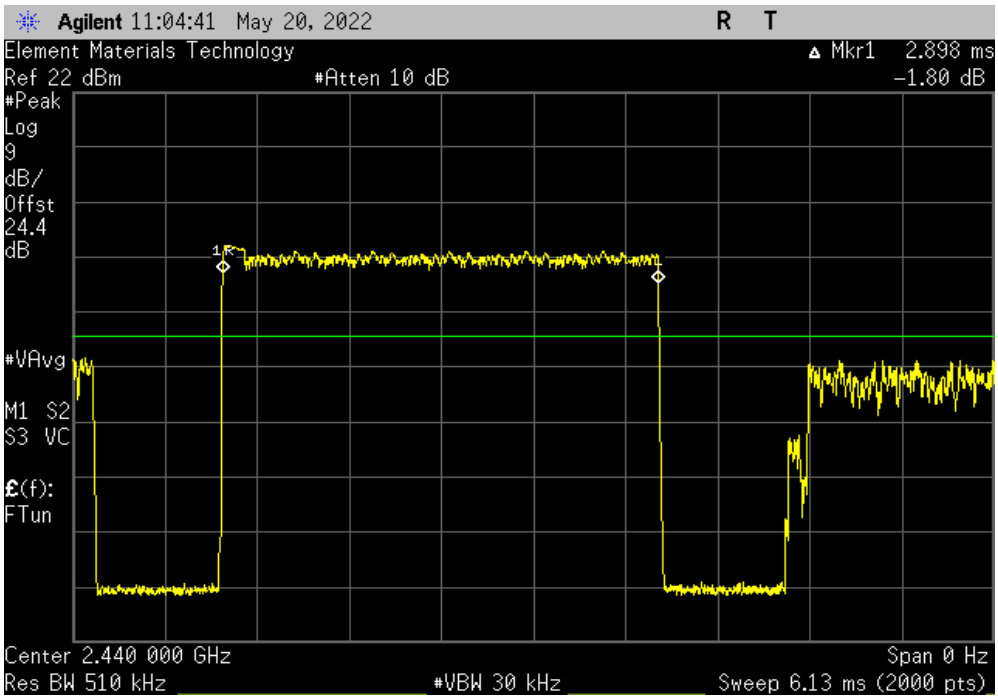
Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.901	N/A	26.5	5	384.3825	400	Pass

Calculation Only

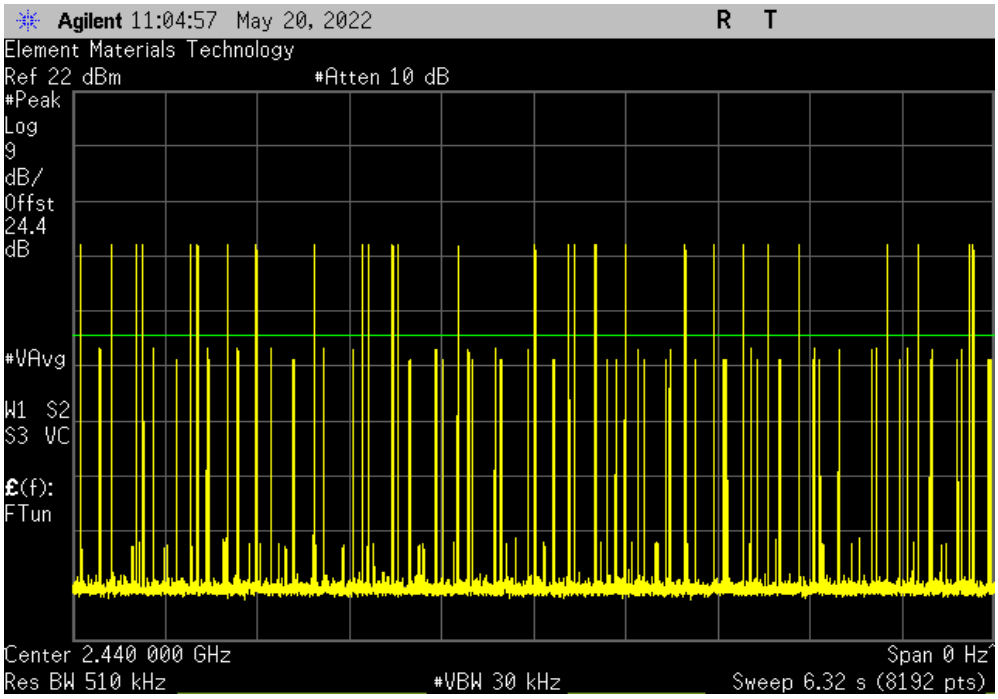
No Screen Capture Required

DWELL TIME

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.898	N/A	N/A	N/A	N/A	N/A	N/A



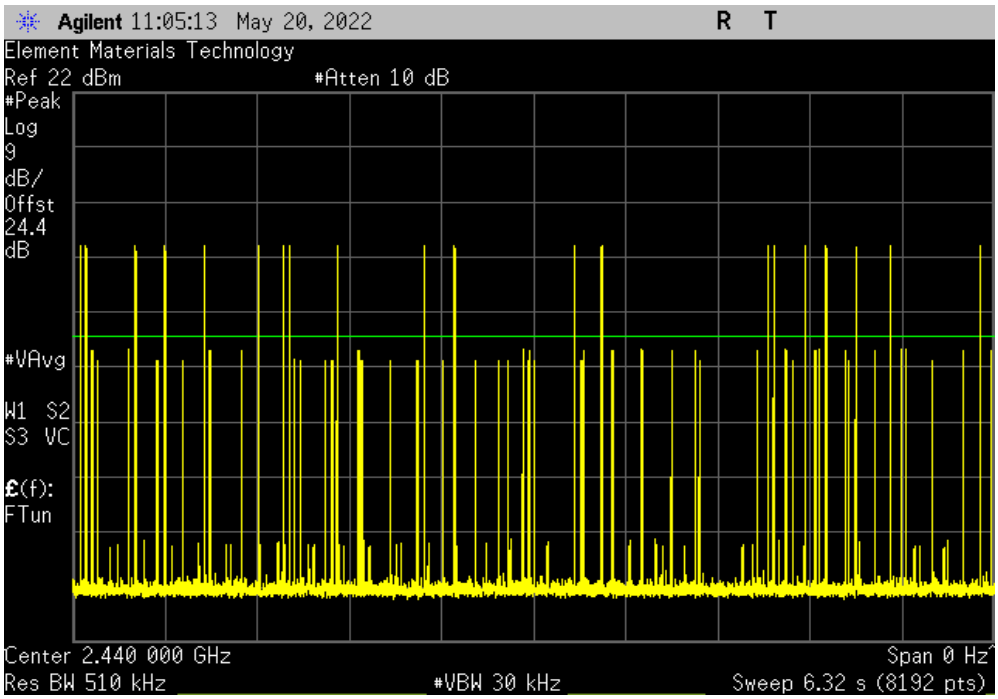
Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A



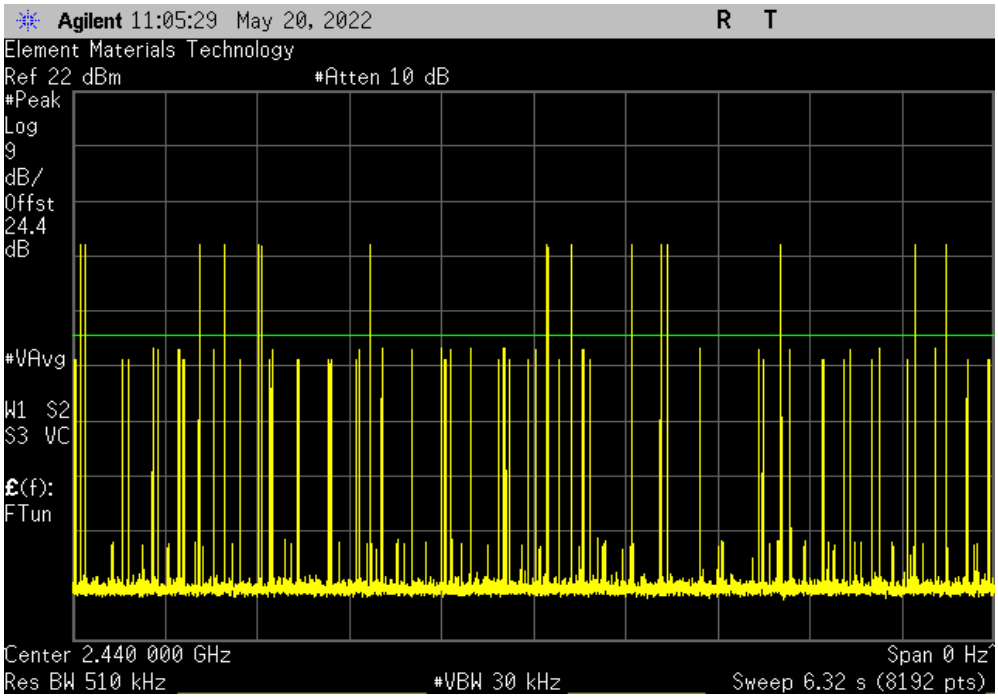
DWELL TIME

TbtTx 2022.05.02.0 XMit 2022.02.07.0

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	17	N/A	N/A	N/A	N/A	N/A

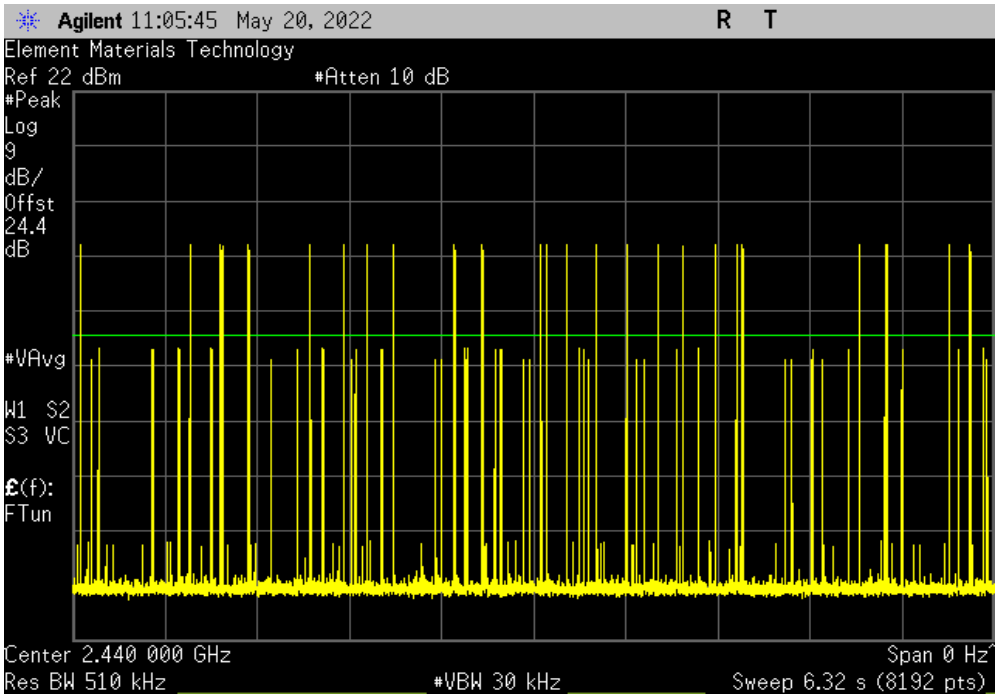


Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A



DWELL TIME

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	17	N/A	N/A	N/A	N/A	N/A



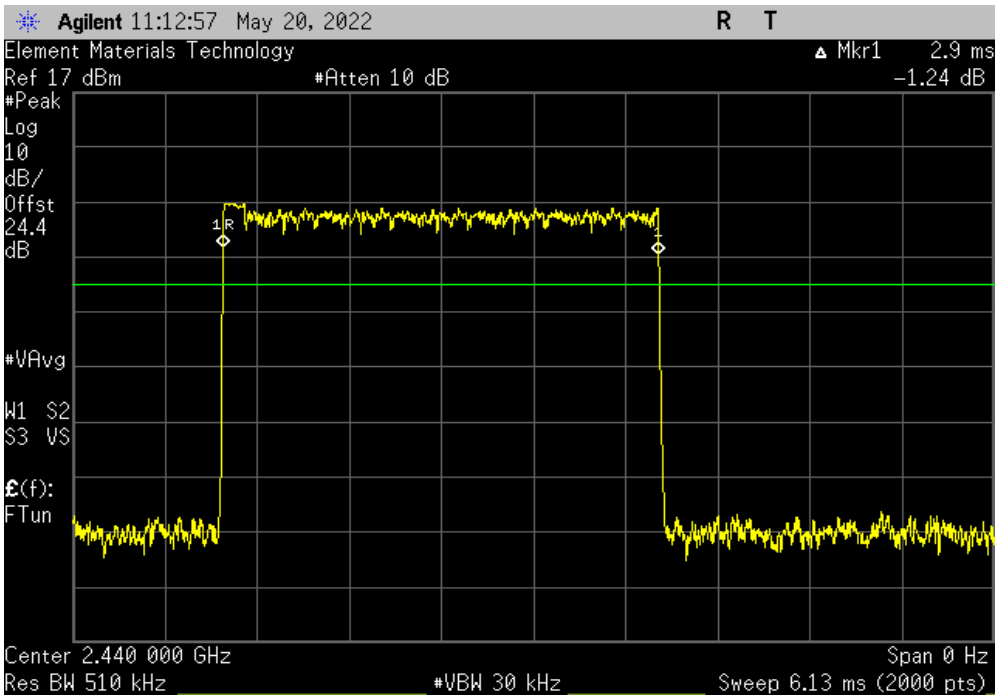
Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.898	N/A	18.5	5	268.065	400	Pass

Calculation Only

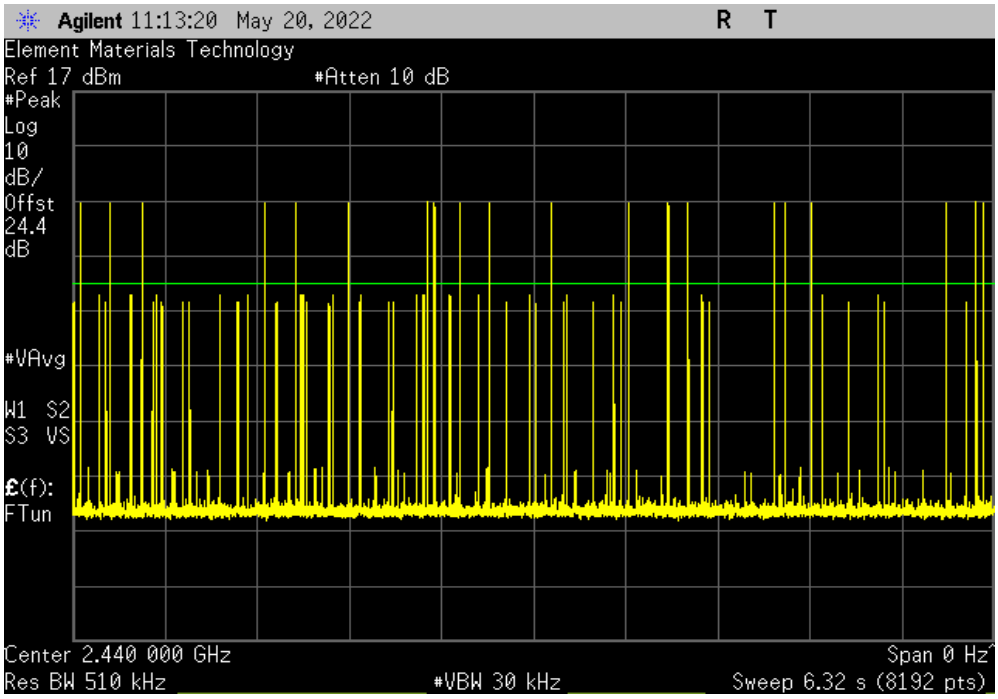
No Screen Capture Required

DWELL TIME

Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.900	N/A	N/A	N/A	N/A	N/A	N/A



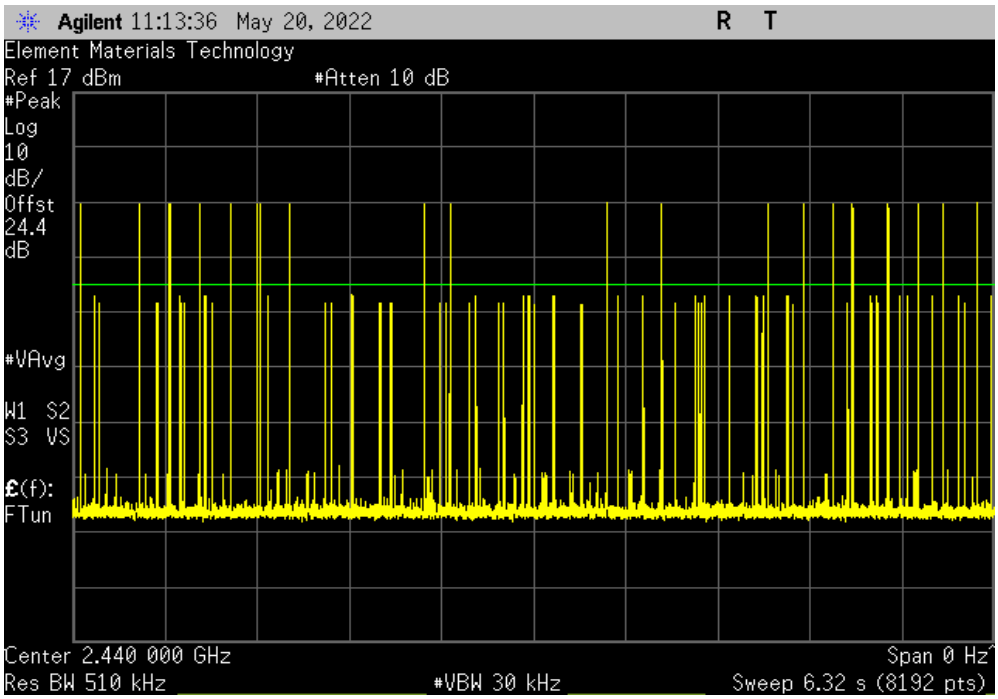
Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A



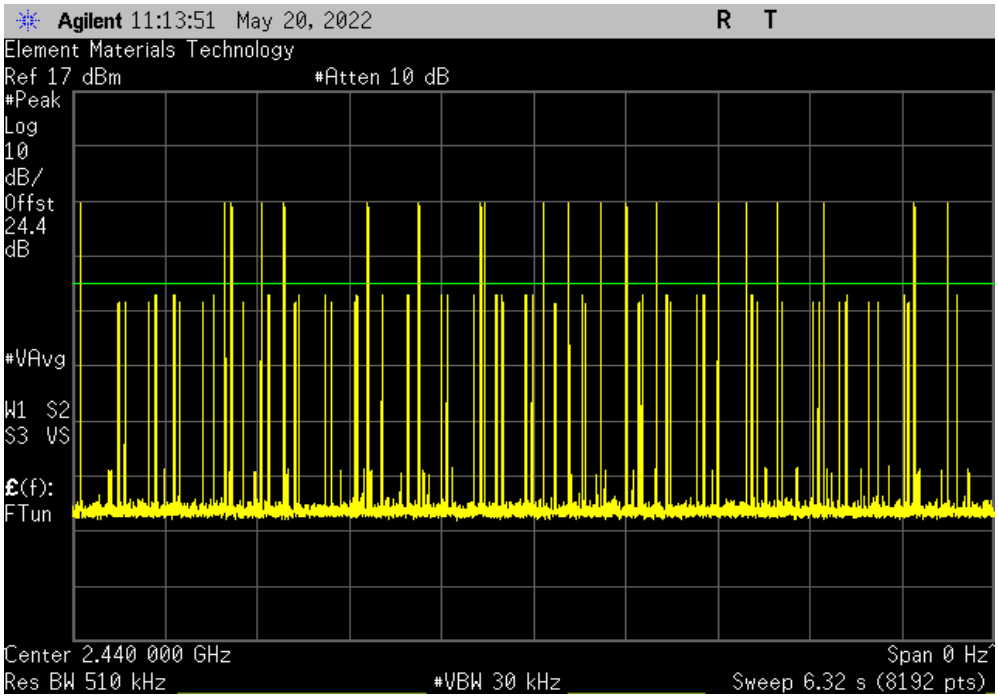
DWELL TIME

TbtTx 2022.05.02.0 XMit 2022.02.07.0

Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A

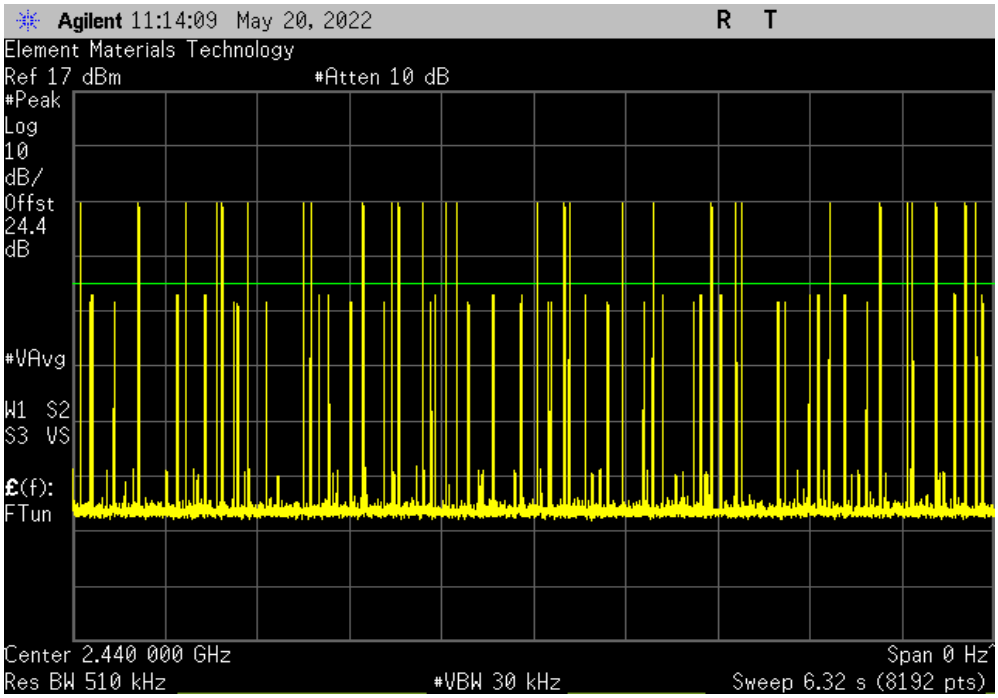


Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A



DWELL TIME

Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	29	N/A	N/A	N/A	N/A	N/A



Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.900	N/A	22.25	5	322.625	400	Pass

Calculation Only

No Screen Capture Required

EMISSIONS BANDWIDTH

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Cable	Element	None	OC5	2022-02-14	2023-02-14
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

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

The 20 dB emissions bandwidth was measured with the EUT set to low, medium and high transmit frequencies in the band. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

EMISSIONS BANDWIDTH

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

None

Configuration #	**2**	*Signature*

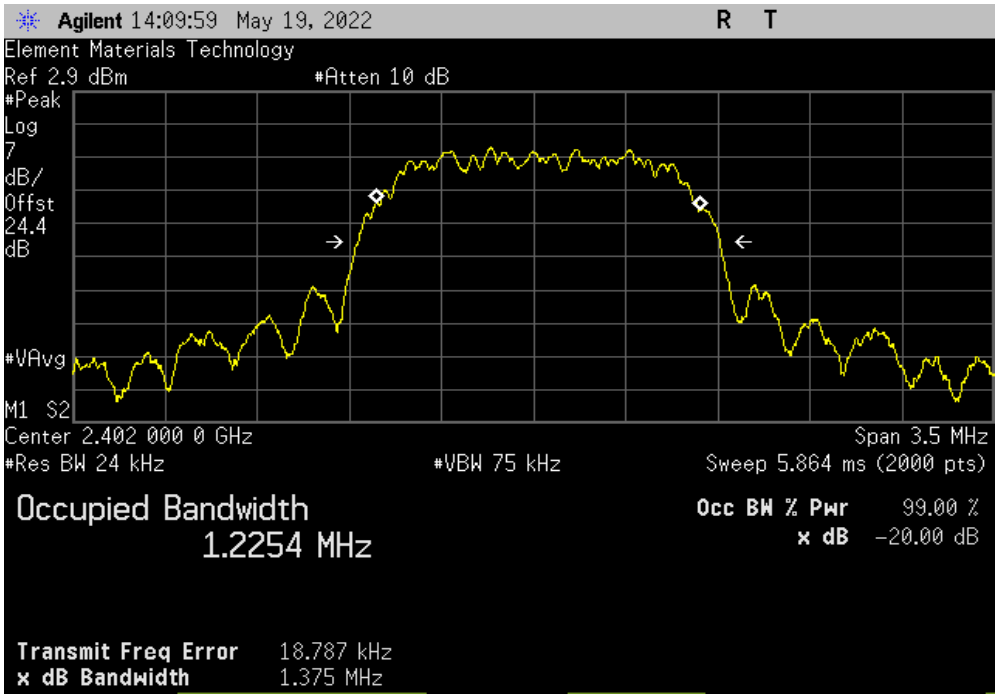
		Value	**Limit (<)**	**Result**
DH5, GFSK				
	Low Channel, 2402 MHz	886.784 kHz	1.5 MHz	Pass
	Mid Channel, 2440 MHz	885.849 kHz	1.5 MHz	Pass
	High Channel, 2480 MHz	885.518 kHz	1.5 MHz	Pass
2DH5, pi/4-DQPSK				
	Low Channel, 2402 MHz	1.375 MHz	1.5 MHz	Pass
	Mid Channel, 2440 MHz	1.374 MHz	1.5 MHz	Pass
	High Channel, 2480 MHz	1.375 MHz	1.5 MHz	Pass
3DH5, 8-DPSK				
	Low Channel, 2402 MHz	1.358 MHz	1.5 MHz	Pass
	Mid Channel, 2440 MHz	1.356 MHz	1.5 MHz	Pass
	High Channel, 2480 MHz	1.426 MHz	1.5 MHz	Pass

DH5, GFSK, Low Channel, 2402 MHz						
				Value	Limit (<)	Result
				886.784 kHz	1.5 MHz	Pass

DH5, GFSK, Mid Channel, 2440 MHz						
				Value	Limit (<)	Result
				885.849 kHz	1.5 MHz	Pass

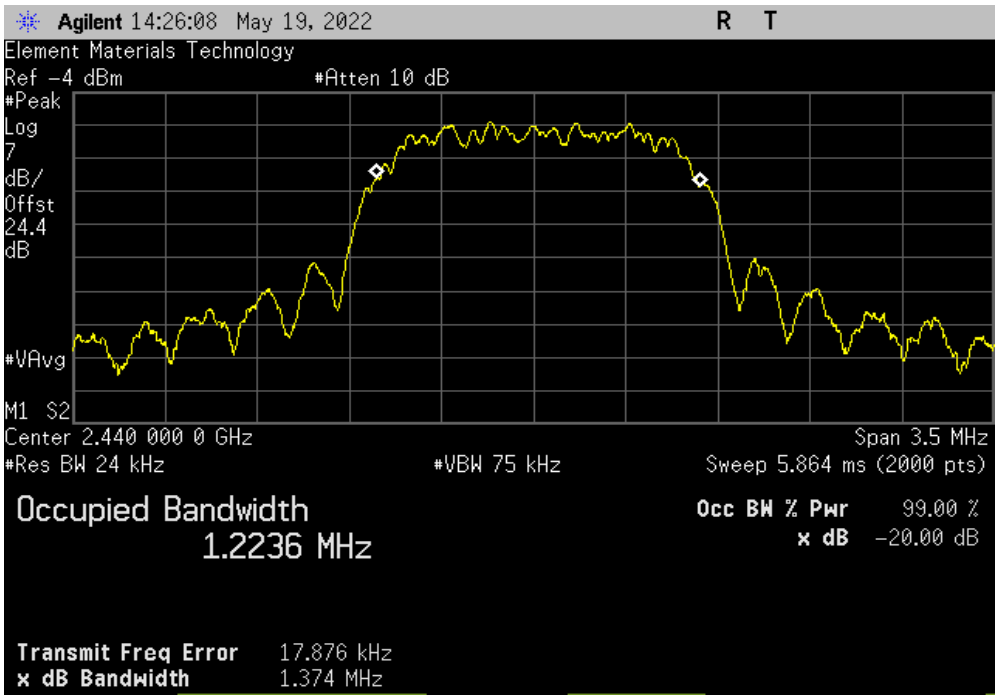
DH5, GFSK, High Channel, 2480 MHz						
				Value	Limit (<)	Result
				885.518 kHz	1.5 MHz	Pass

2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value	Limit (<)	Result
				1.375 MHz	1.5 MHz	Pass

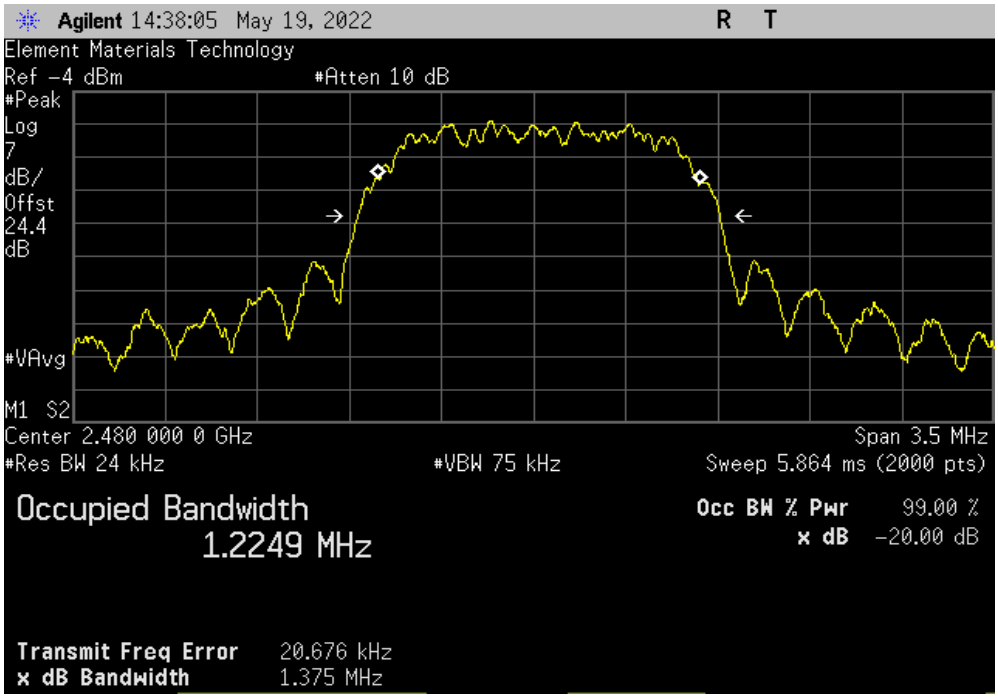


EMISSIONS BANDWIDTH

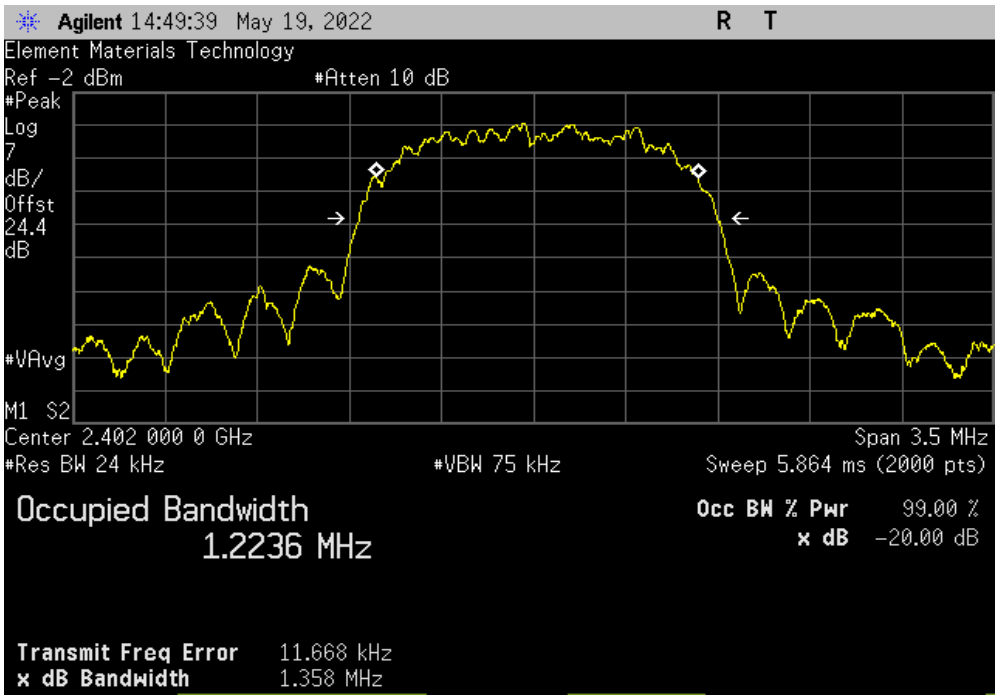
2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
				Value	Limit (<)	Result
				1.374 MHz	1.5 MHz	Pass



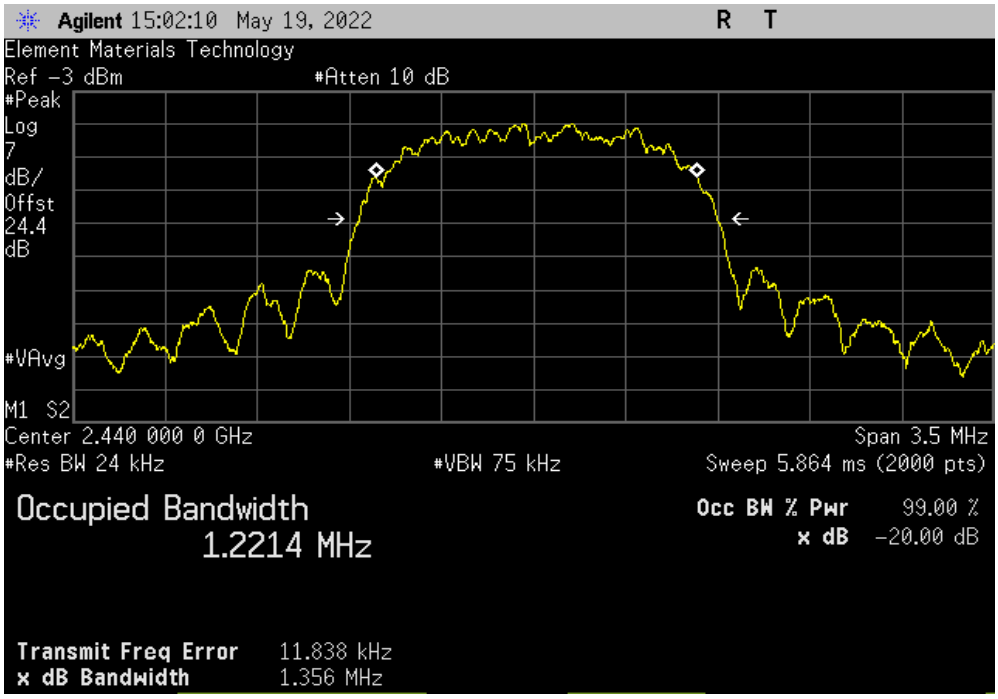
2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value	Limit (<)	Result
				1.375 MHz	1.5 MHz	Pass



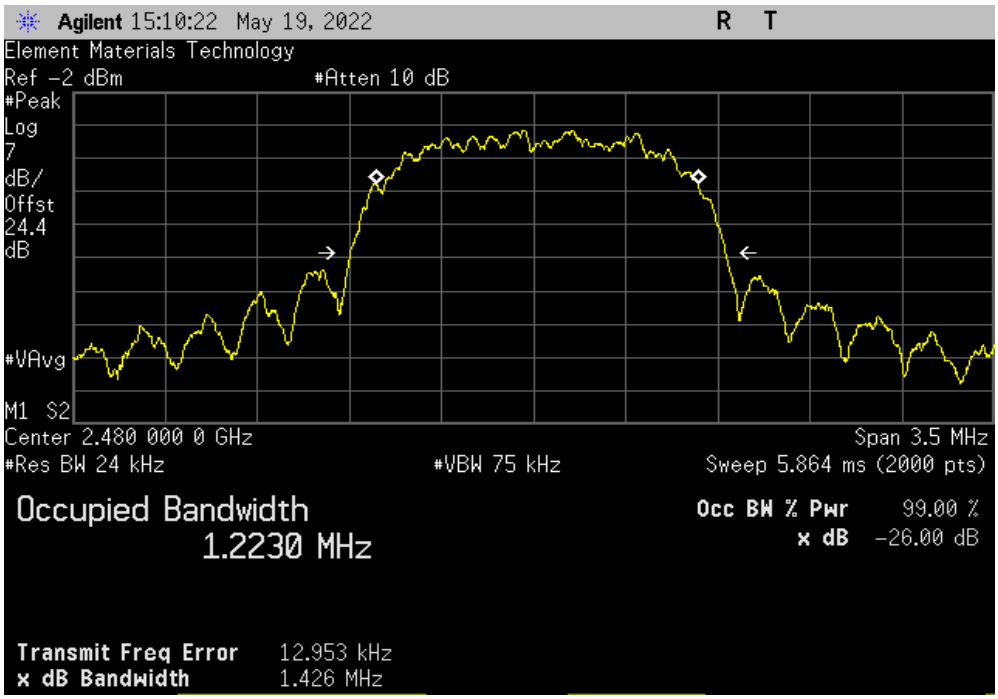
3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value	Limit (<)	Result
				1.358 MHz	1.5 MHz	Pass



3DH5, 8-DPSK, Mid Channel, 2440 MHz						
				Value	Limit (<)	Result
				1.356 MHz	1.5 MHz	Pass



3DH5, 8-DPSK, High Channel, 2480 MHz						
				Value	Limit (<)	Result
				1.426 MHz	1.5 MHz	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Cable	Element	None	OC5	2022-02-14	2023-02-14
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

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

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

The method found in ANSI C63.10:2013 Section 7.8.5 was used for a FHSS radio.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi)

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

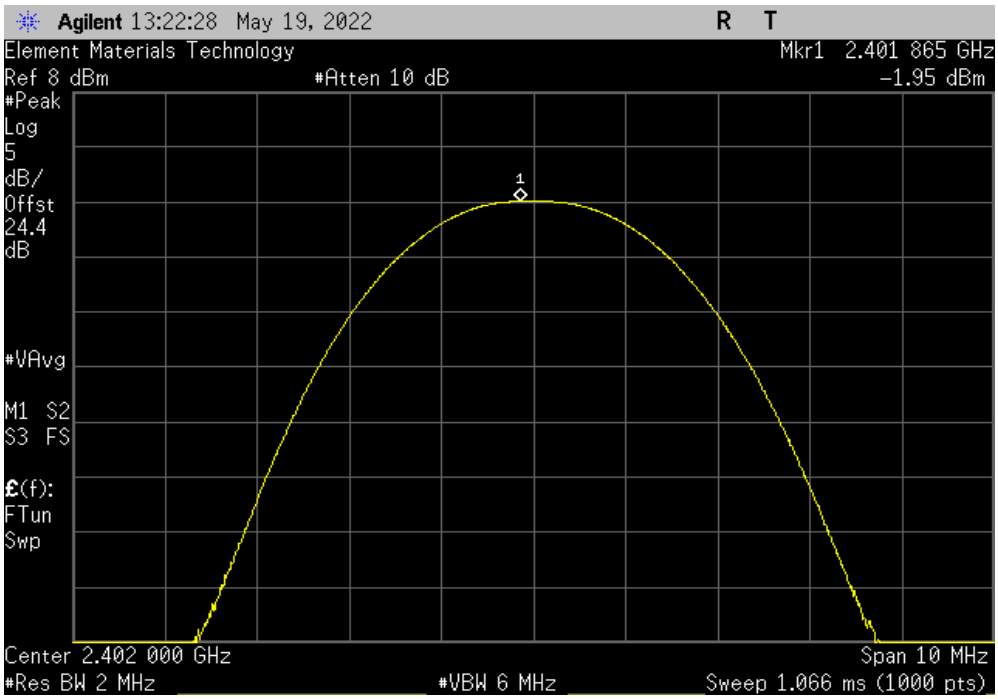
None

Configuration #	**2**	*Signature*

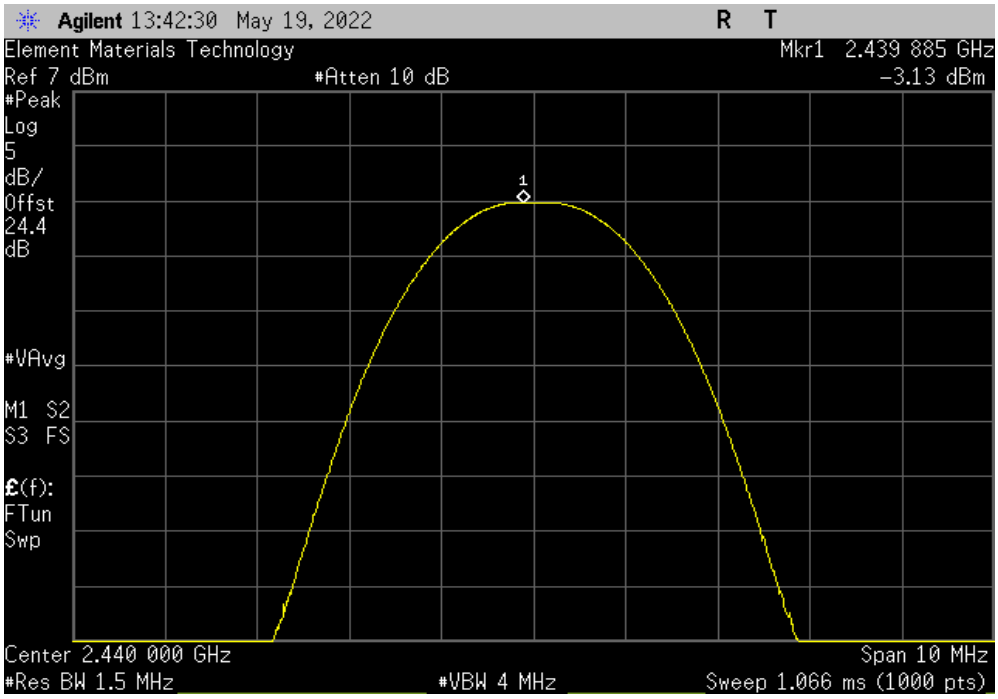
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
DH5, GFSK						
	Low Channel, 2402 MHz	-1.954	4	2.046	27	Pass
	Mid Channel, 2440 MHz	-3.132	4	0.868	27	Pass
	High Channel, 2480 MHz	-3.234	4	0.766	27	Pass
2DH5, pi/4-DQPSK						
	Low Channel, 2402 MHz	0.196	4	4.196	27	Pass
	Mid Channel, 2440 MHz	-0.892	4	3.108	27	Pass
	High Channel, 2480 MHz	-0.971	4	3.029	27	Pass
3DH5, 8-DPSK						
	Low Channel, 2402 MHz	0.841	4	4.841	27	Pass
	Mid Channel, 2440 MHz	-0.252	4	3.748	27	Pass
	High Channel, 2480 MHz	-0.357	4	3.643	27	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

DH5, GFSK, Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-1.954	4	2.046	27	Pass



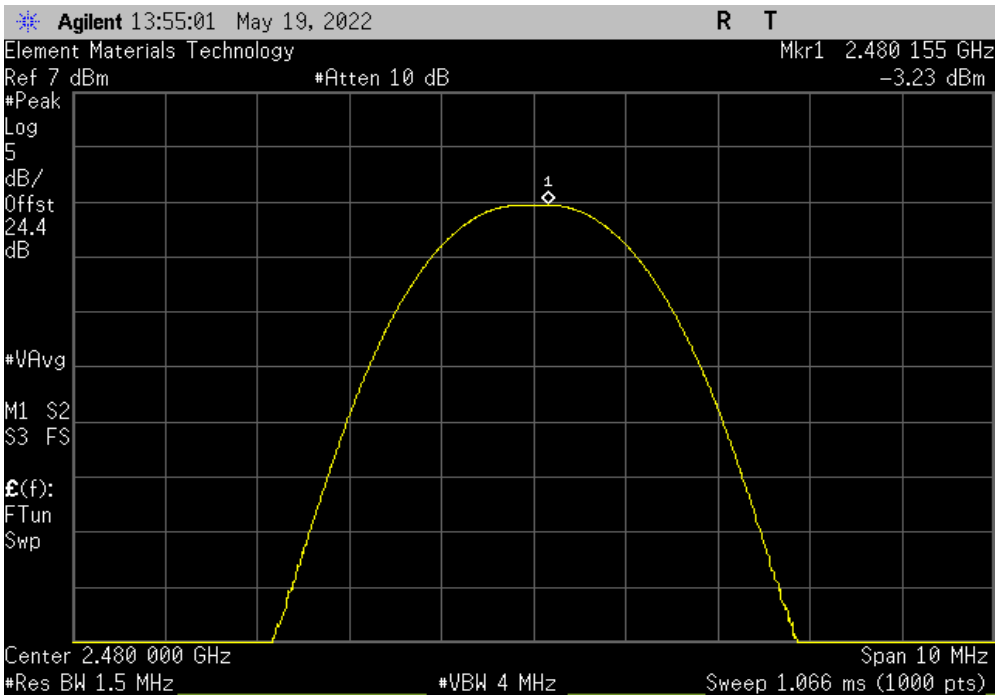
DH5, GFSK, Mid Channel, 2440 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-3.132	4	0.868	27	Pass



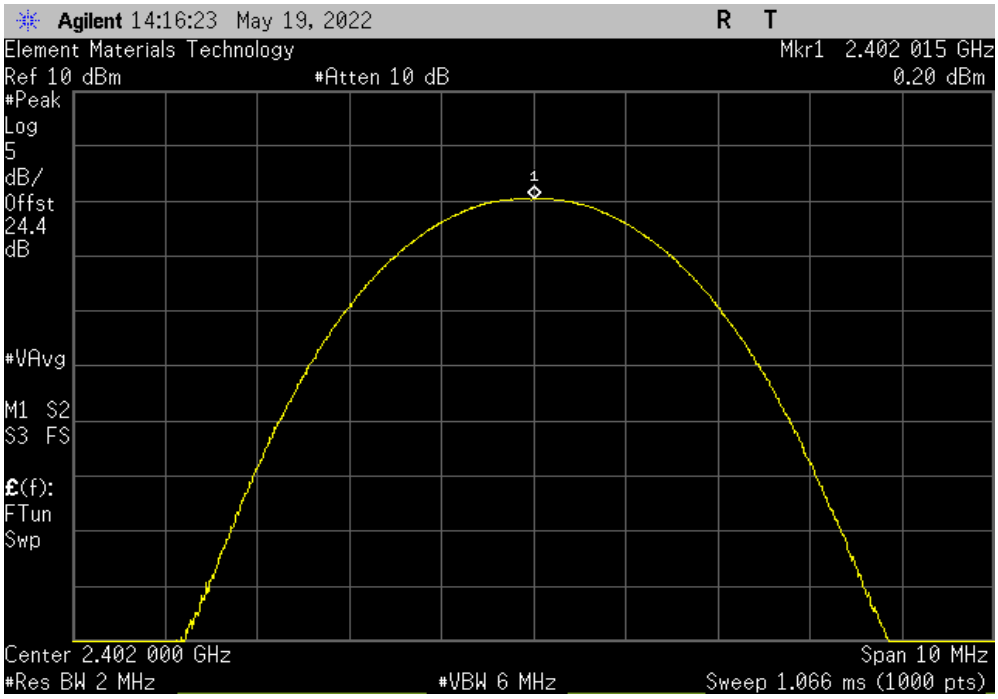
EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

TbtTx 2022.05.02.0 XMit 2022.02.07.0

DH5, GFSK, High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-3.234	4	0.766	27	Pass

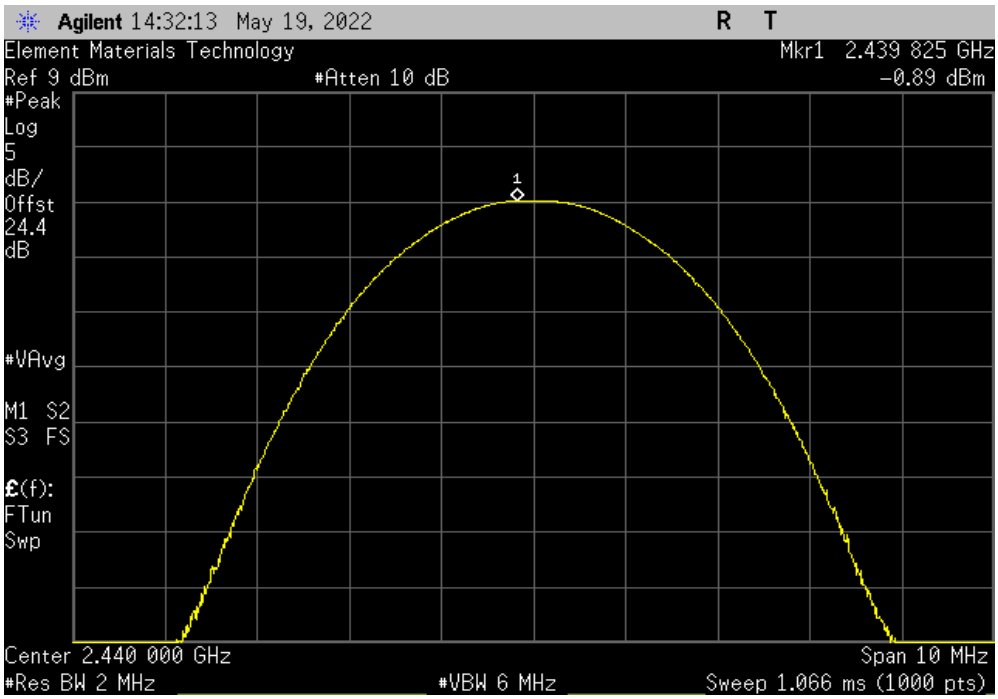


2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		0.196	4	4.196	27	Pass

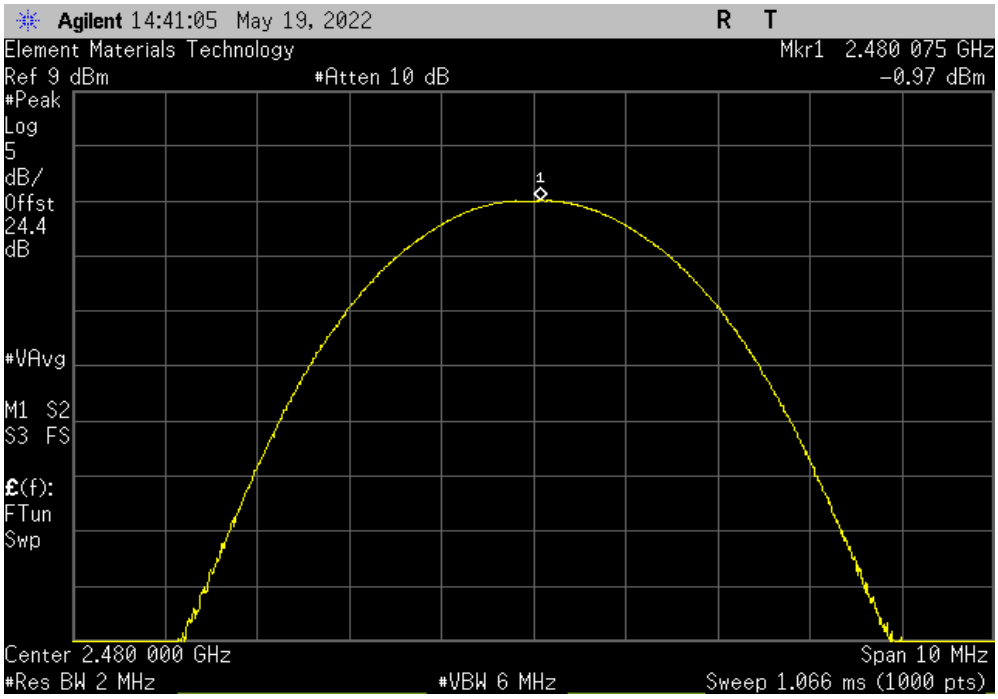


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-0.892	4	3.108	27	Pass

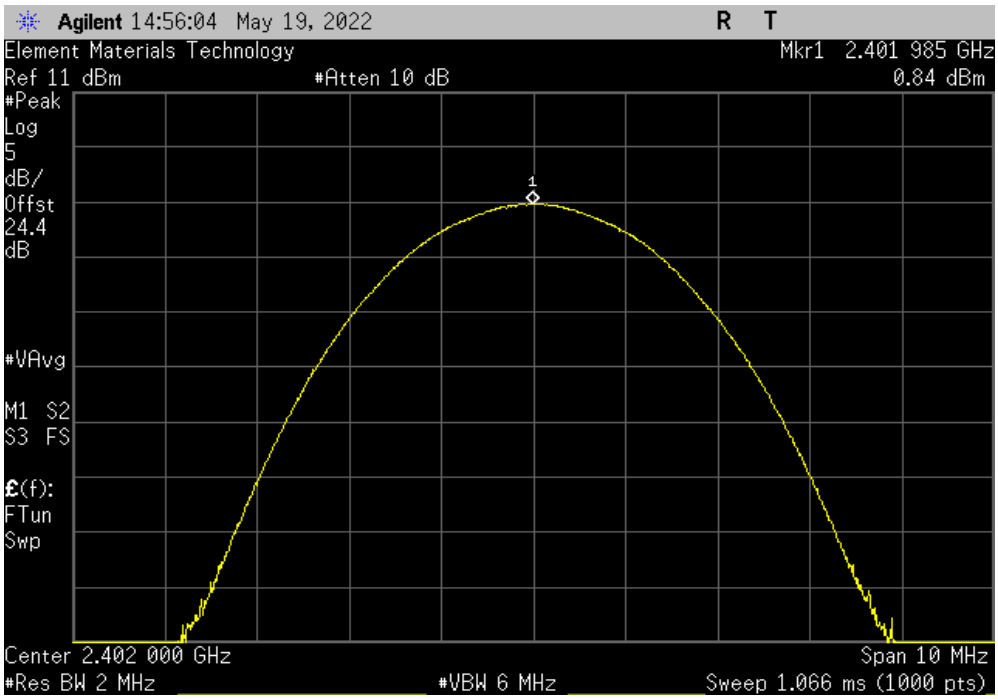


2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-0.971	4	3.029	27	Pass

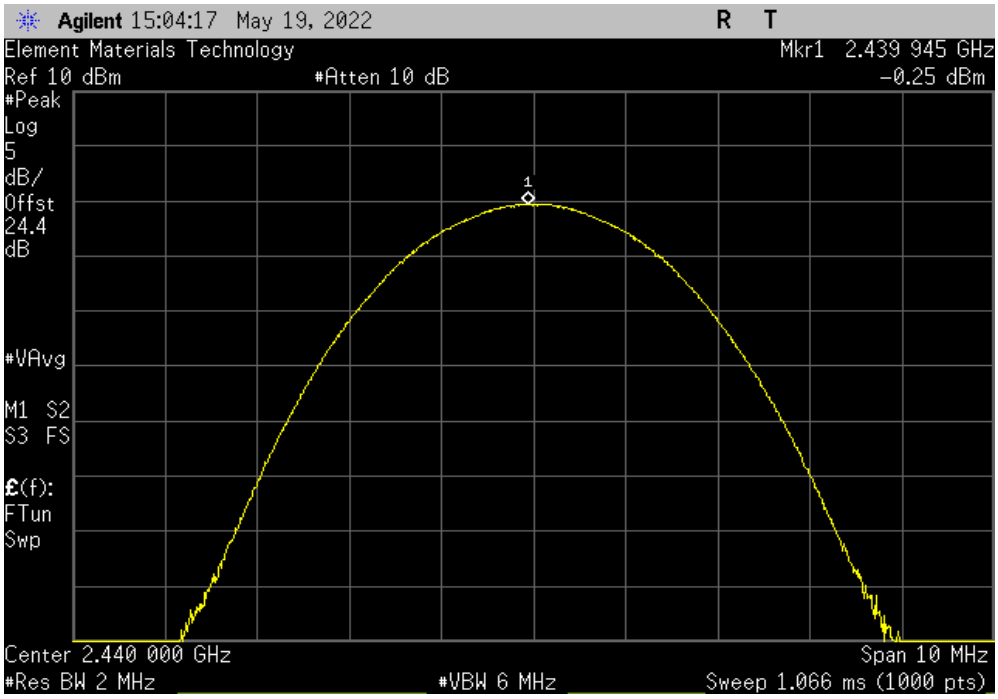


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

3DH5, 8-DPSK, Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		0.841	4	4.841	27	Pass

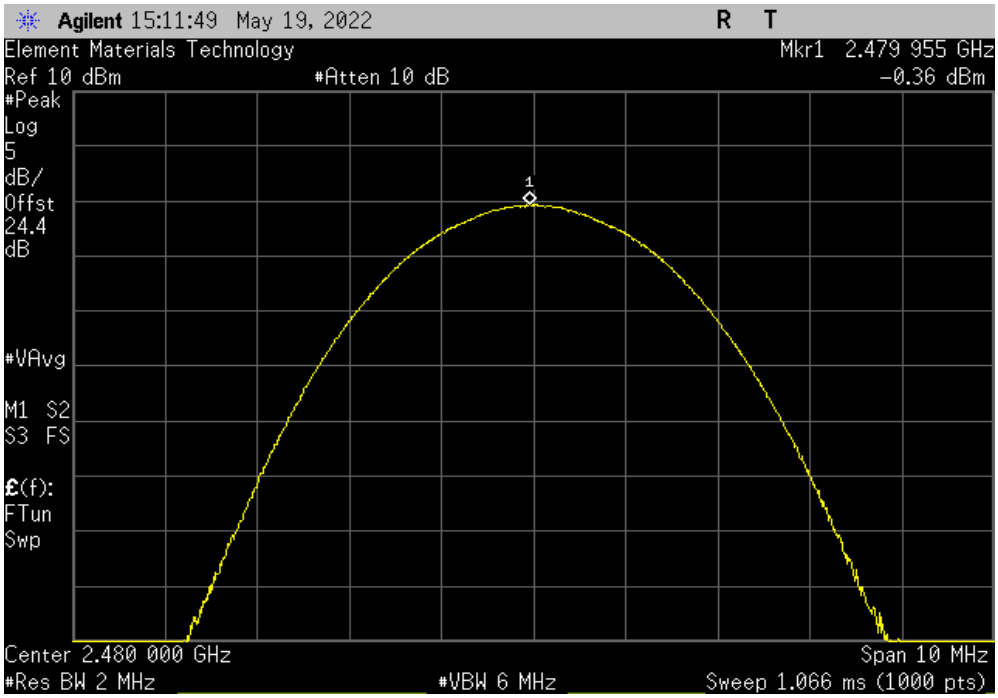


3DH5, 8-DPSK, Mid Channel, 2440 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-0.252	4	3.748	27	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

3DH5, 8-DPSK, High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-0.357	4	3.643	27	Pass



NUMBER OF HOPPING FREQUENCIES

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Cable	Element	None	OC5	2022-02-14	2023-02-14
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

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

The number of hopping frequencies was measured across the authorized band. The hopping function of the EUT was enabled.

NUMBER OF HOPPING FREQUENCIES

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

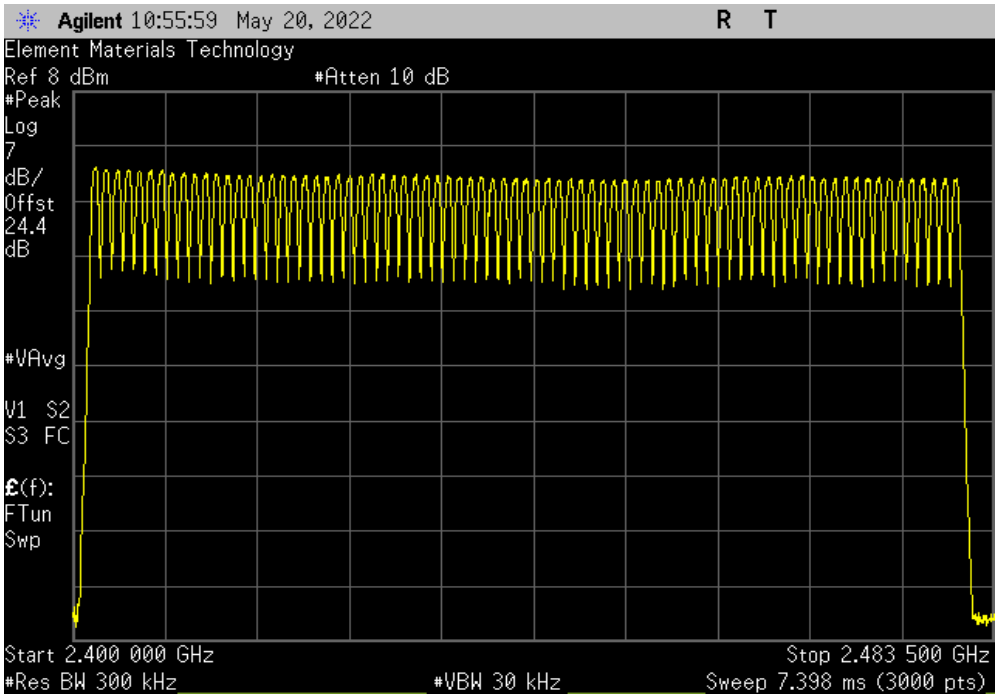
None

Configuration #	**2**	*Signature*

	Number of Channels	**Limit (≥)**	**Results**
Hopping Mode (All Channels)			
DH5, GFSK			
Mid Channel, 2440 MHz	79	15	Pass

NUMBER OF HOPPING FREQUENCIES

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2440 MHz						
				Number of Channels	Limit (≥)	Results
				79	15	Pass



OCCUPIED BANDWIDTH (99%)

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Cable	Element	None	OC5	2022-02-14	2023-02-14
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth as defined in RSS-Gen.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

OCCUPIED BANDWIDTH (99%)

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

None

Configuration #	**2**	*Signature*

		Value	**Limit**	**Result**
DH5, GFSK				
	Low Channel, 2402 MHz	862.875 kHz	n/a	n/a
	Mid Channel, 2440 MHz	862.393 kHz	n/a	n/a
	High Channel, 2480 MHz	860.986 kHz	n/a	n/a
2DH5, pi/4-DQPSK				
	Low Channel, 2402 MHz	1.225 kHz	n/a	n/a
	Mid Channel, 2440 MHz	1.224 MHz	n/a	n/a
	High Channel, 2480 MHz	1.225 MHz	n/a	n/a
3DH5, 8-DPSK				
	Low Channel, 2402 MHz	1.224 MHz	n/a	n/a
	Mid Channel, 2440 MHz	1.221 MHz	n/a	n/a
	High Channel, 2480 MHz	1.223 MHz	n/a	n/a

OCCUPIED BANDWIDTH (99%)

DH5, GFSK, Low Channel, 2402 MHz

				Value	Limit	Result
				862.875 kHz	n/a	n/a

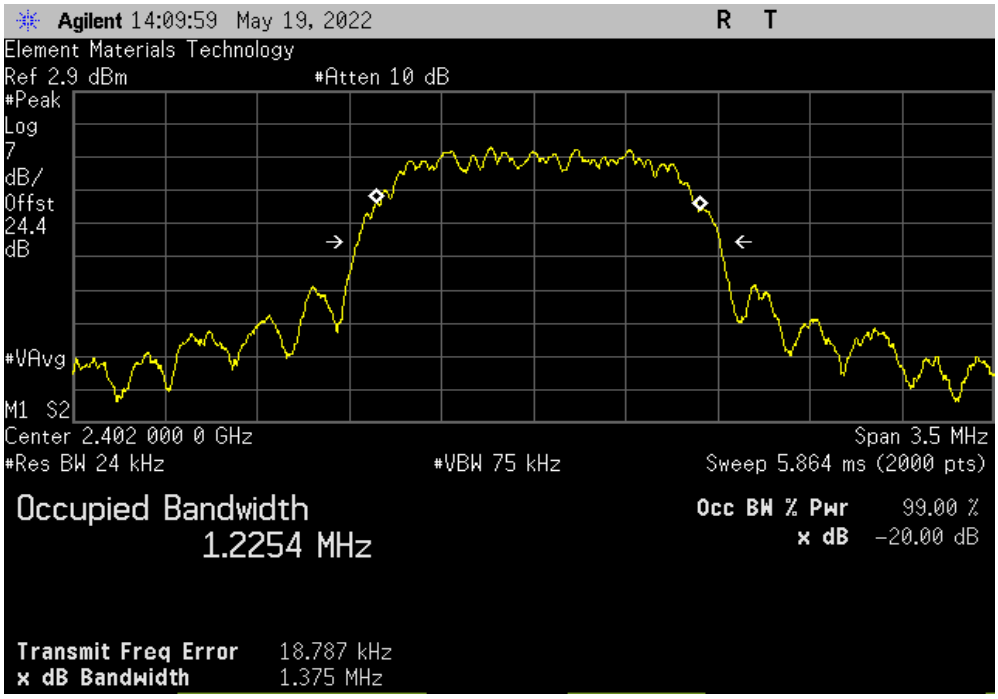
DH5, GFSK, Mid Channel, 2440 MHz

				Value	Limit	Result
				862.393 kHz	n/a	n/a

OCCUPIED BANDWIDTH (99%)

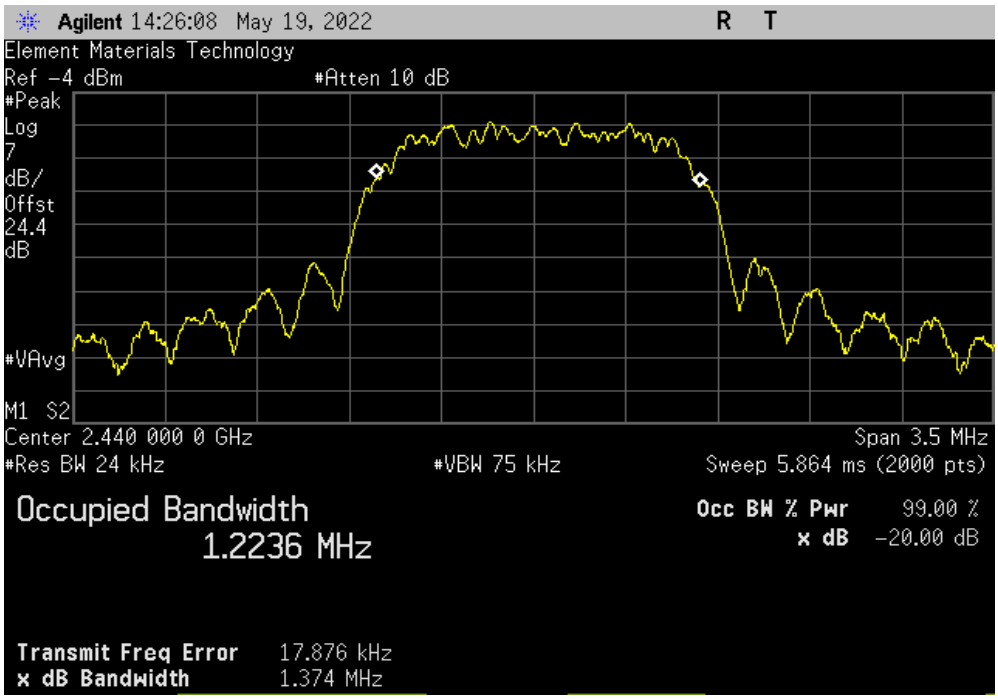
DH5, GFSK, High Channel, 2480 MHz						
				Value	Limit	Result
				860.986 kHz	n/a	n/a

2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value	Limit	Result
				1.225 kHz	n/a	n/a

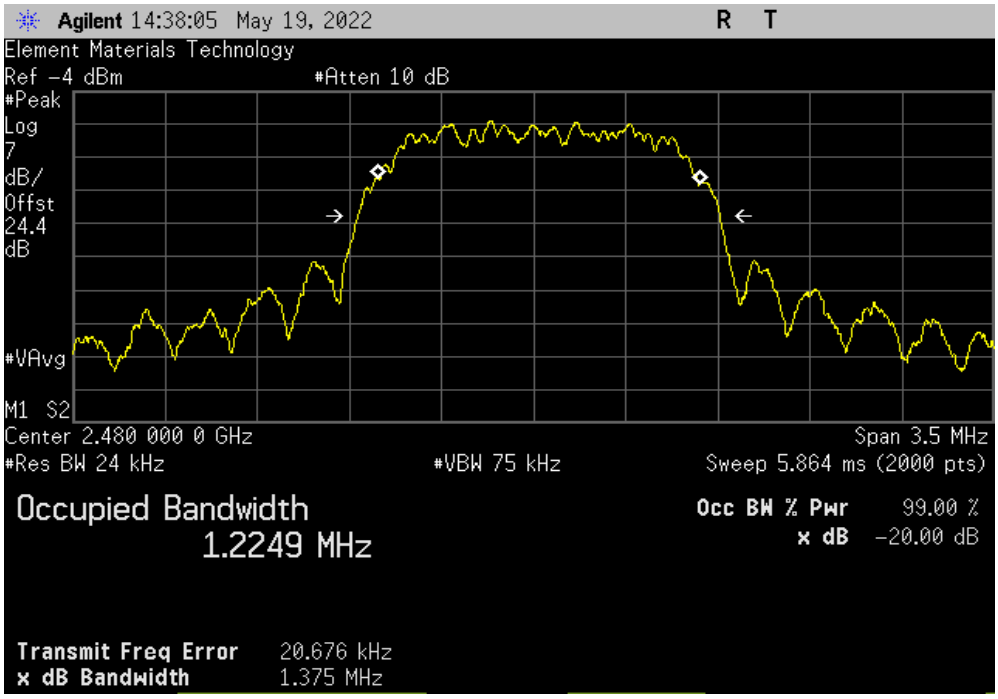


OCCUPIED BANDWIDTH (99%)

2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
				Value	Limit	Result
				1.224 MHz	n/a	n/a

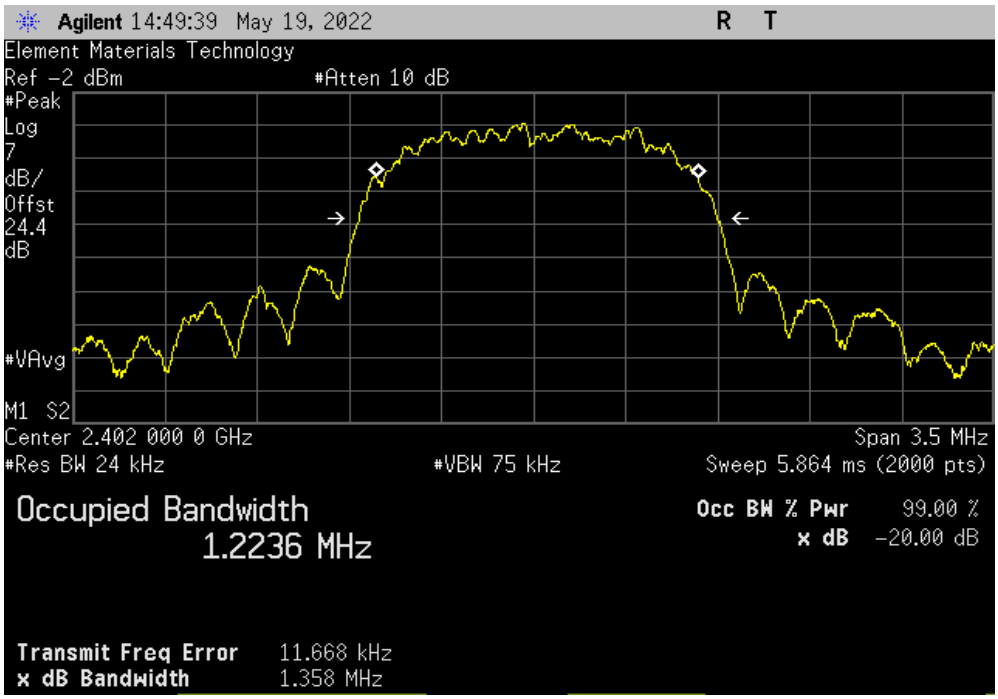


2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value	Limit	Result
				1.225 MHz	n/a	n/a

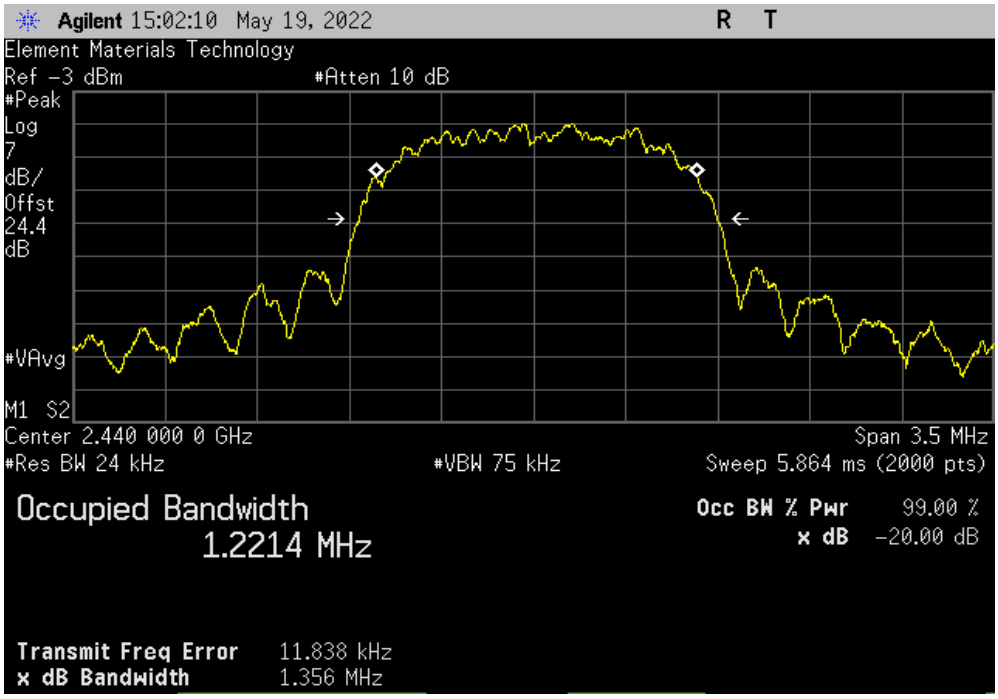


OCCUPIED BANDWIDTH (99%)

3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value	Limit	Result
				1.224 MHz	n/a	n/a

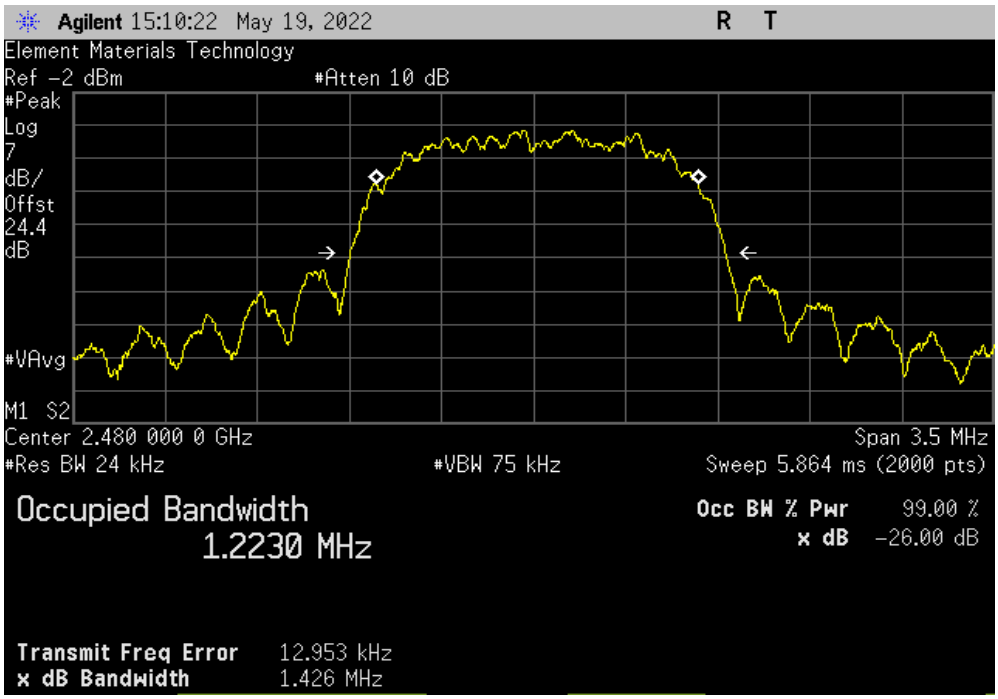


3DH5, 8-DPSK, Mid Channel, 2440 MHz						
				Value	Limit	Result
				1.221 MHz	n/a	n/a



OCCUPIED BANDWIDTH (99%)

3DH5, 8-DPSK, High Channel, 2480 MHz						
				Value	Limit	Result
				1.223 MHz	n/a	n/a



OUTPUT POWER

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Element	None	OC5	2022-02-14	2023-02-14
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14

TEST DESCRIPTION

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

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

The method found in ANSI C63.10:2013 Section 7.8.5 was used for a FHSS radio.

OUTPUT POWER

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

DEVIATIONS FROM TEST STANDARD

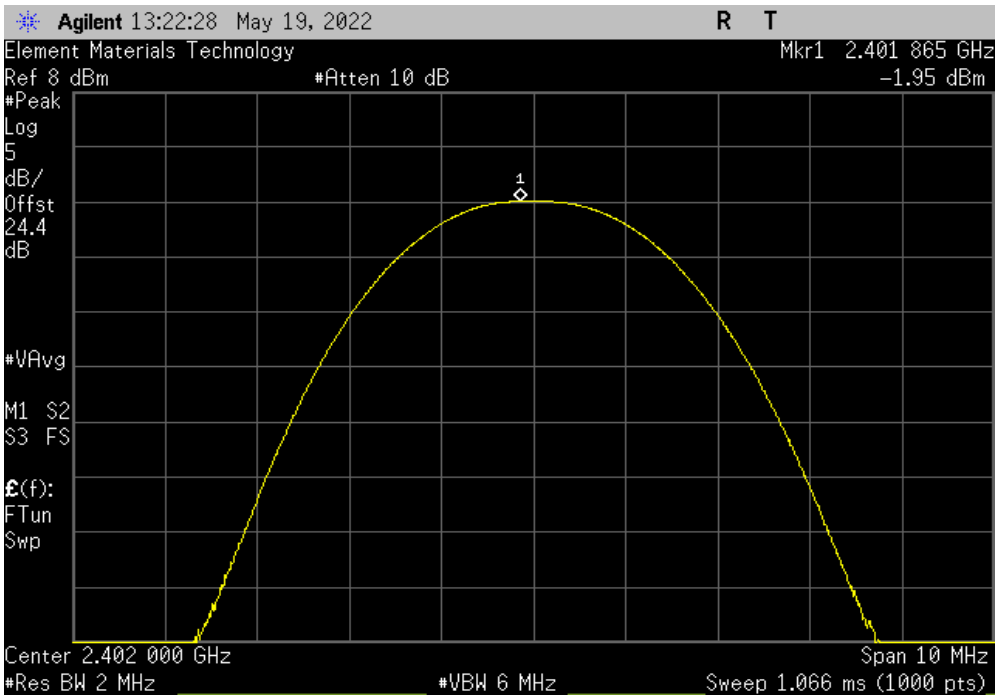
None

Configuration #	**2**	*Signature*

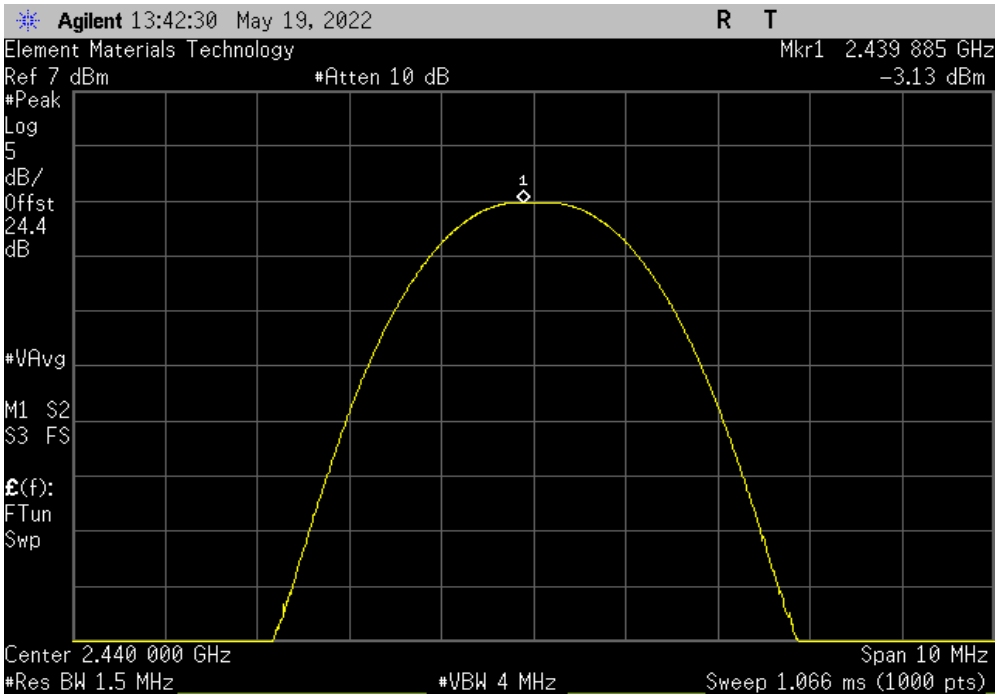
		Out Pwr (dBm)	**Limit (dBm)**	**Result**
DH5, GFSK				
	Low Channel, 2402 MHz	-1.954	21	Pass
	Mid Channel, 2440 MHz	-3.132	21	Pass
	High Channel, 2480 MHz	-3.234	21	Pass
2DH5, pi/4-DQPSK				
	Low Channel, 2402 MHz	0.196	21	Pass
	Mid Channel, 2440 MHz	-0.892	21	Pass
	High Channel, 2480 MHz	-0.971	21	Pass
3DH5, 8-DPSK				
	Low Channel, 2402 MHz	0.841	21	Pass
	Mid Channel, 2440 MHz	-0.252	21	Pass
	High Channel, 2480 MHz	-0.357	21	Pass

OUTPUT POWER

DH5, GFSK, Low Channel, 2402 MHz							
					Out Pwr (dBm)	Limit (dBm)	Result
					-1.954	21	Pass

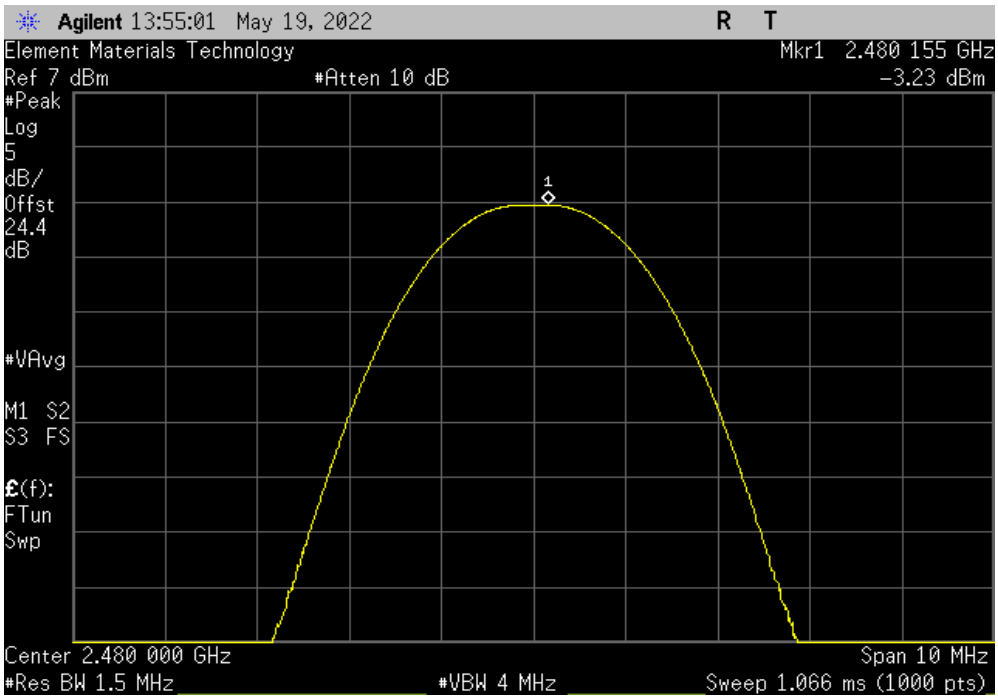


DH5, GFSK, Mid Channel, 2440 MHz							
					Out Pwr (dBm)	Limit (dBm)	Result
					-3.132	21	Pass

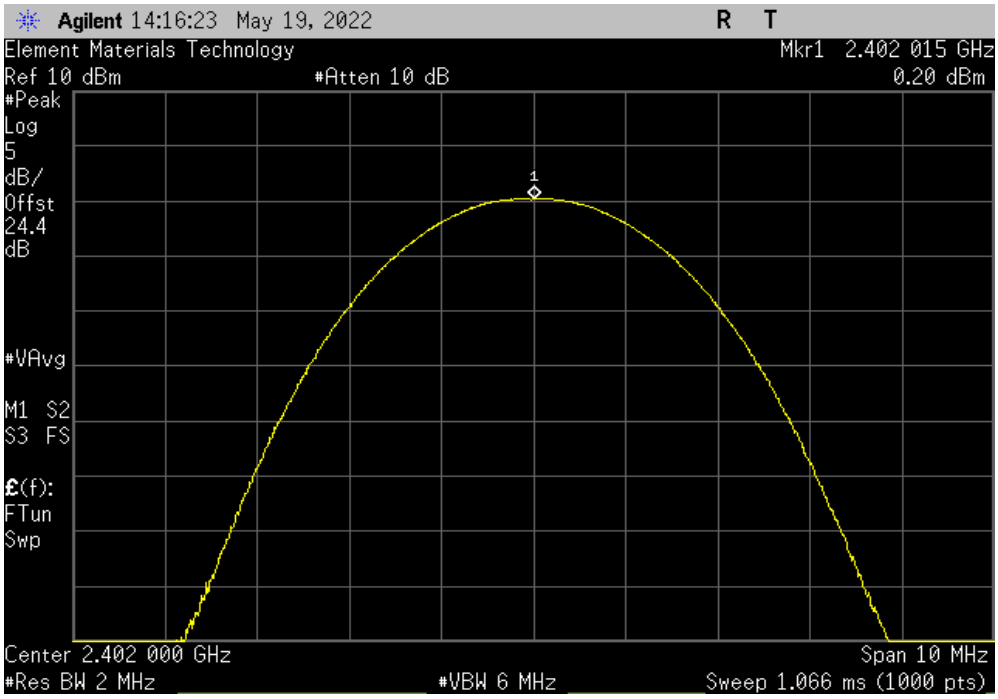


OUTPUT POWER

DH5, GFSK, High Channel, 2480 MHz							
					Out Pwr (dBm)	Limit (dBm)	Result
					-3.234	21	Pass

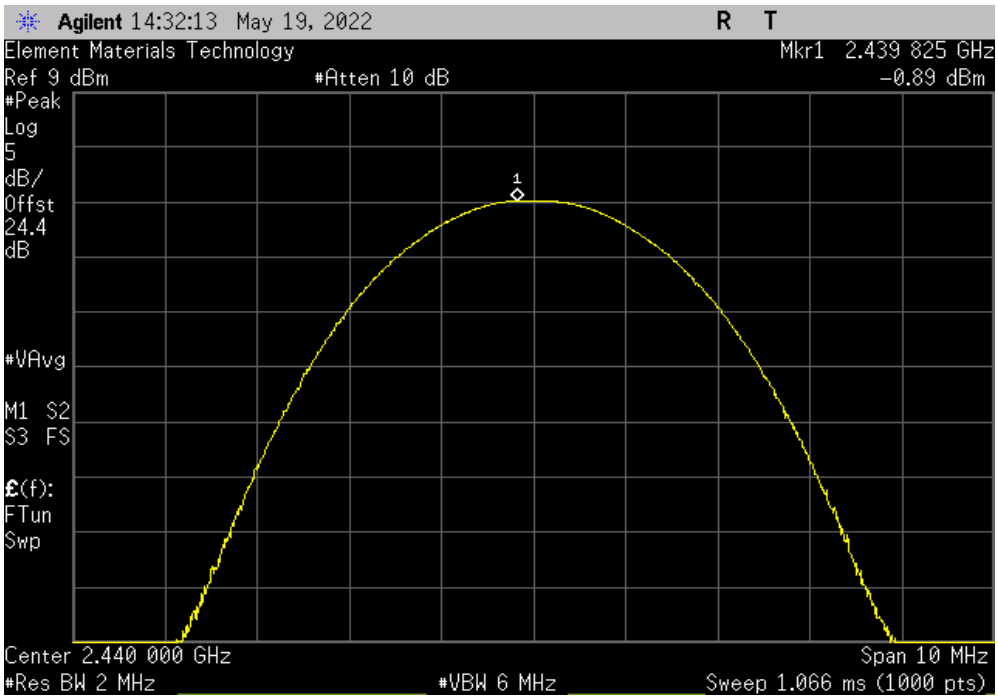


2DH5, pi/4-DQPSK, Low Channel, 2402 MHz							
					Out Pwr (dBm)	Limit (dBm)	Result
					0.196	21	Pass

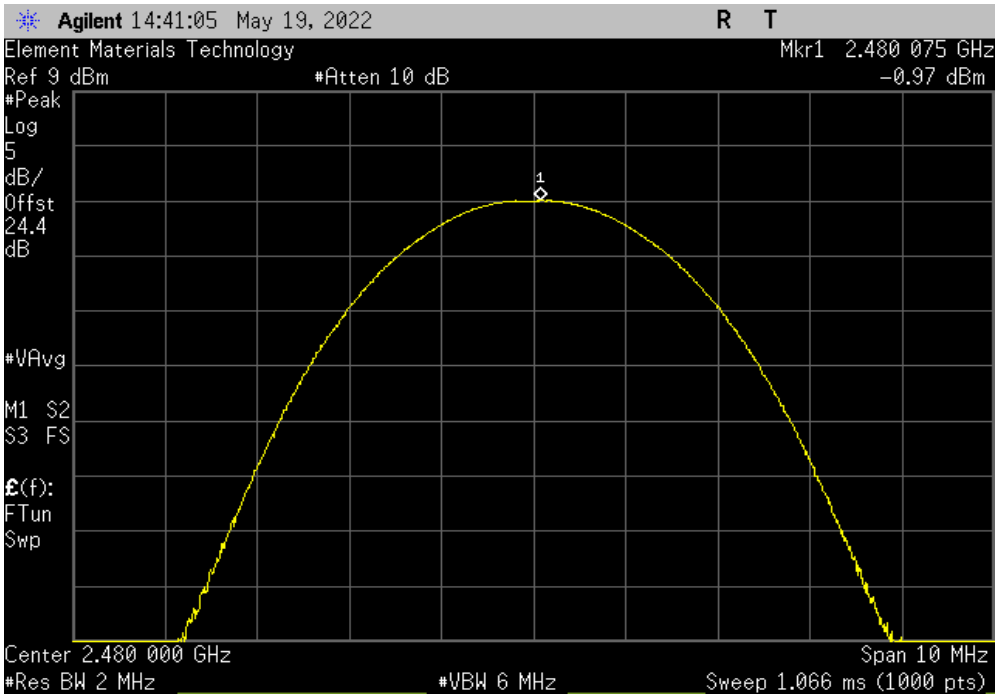


OUTPUT POWER

2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.892	21	Pass

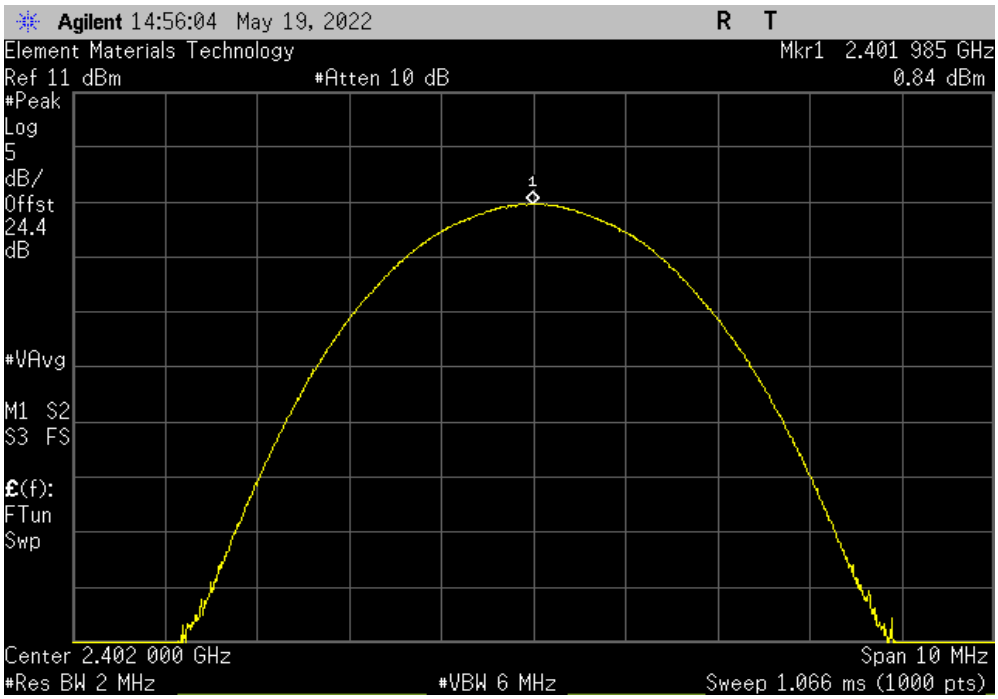


2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.971	21	Pass

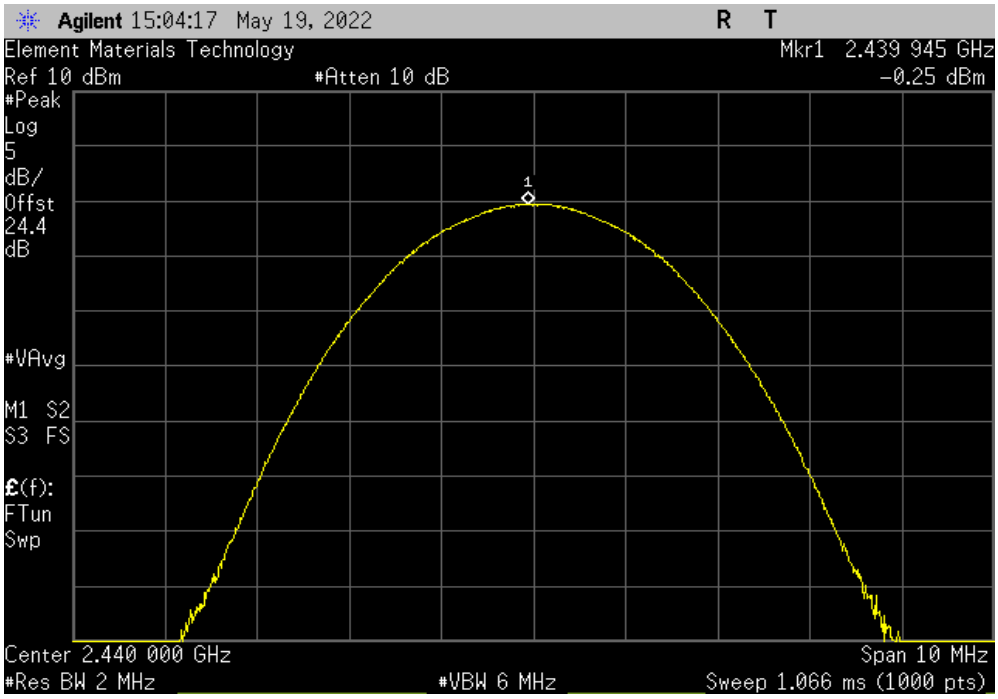


OUTPUT POWER

3DH5, 8-DPSK, Low Channel, 2402 MHz							
					Out Pwr (dBm)	Limit (dBm)	Result
					0.841	21	Pass

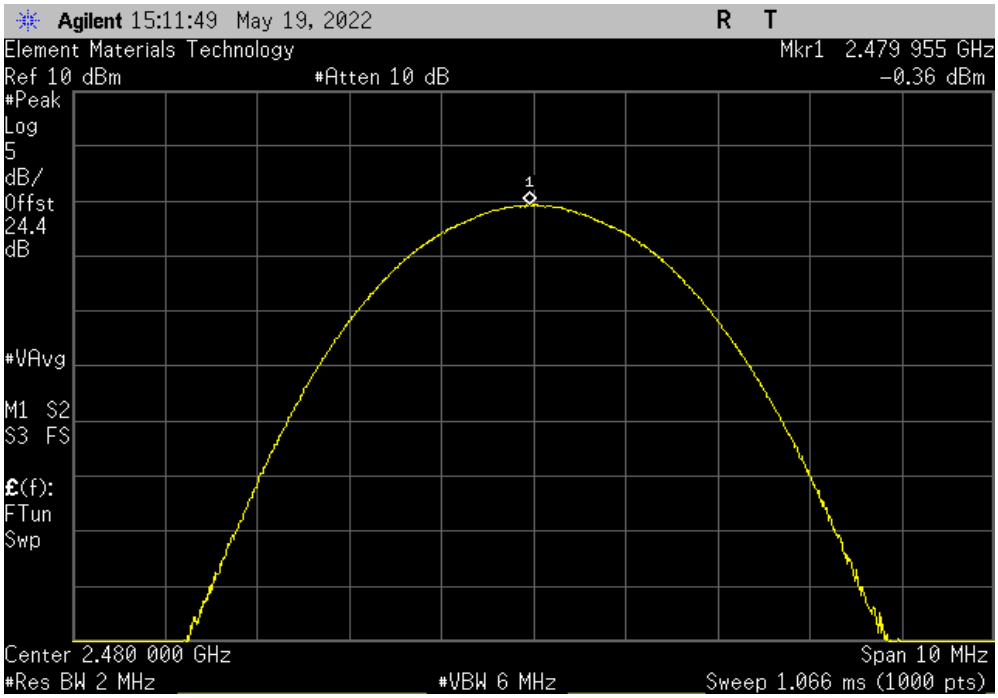


3DH5, 8-DPSK, Mid Channel, 2440 MHz							
					Out Pwr (dBm)	Limit (dBm)	Result
					-0.252	21	Pass



OUTPUT POWER

3DH5, 8-DPSK, High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.357	21	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Aeroflex	INMET 8535	AMO	2022-02-18	2023-02-18
Attenuator	Fairview Microwave	SA18H-20	UAY	2022-03-30	2023-03-30
Cable	Element	None	OC5	2022-02-14	2023-02-14
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2021-10-14	2022-10-14

TEST DESCRIPTION

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

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. For each transmit frequency, the fundamental was measured with a 100 kHz resolution bandwidth and the highest value was recorded. The rest of the spectrum was then measured with a 100 kHz resolution bandwidth and the highest value was found. The difference between the value found on the fundamental and the rest of the spectrum was compared against the limit to determine compliance.

SPURIOUS CONDUCTED EMISSIONS

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**Delta Zulu**			**Work Order:**	**LISA0060**
Serial Number:	**808000414**			**Date:**	**19-May-22**
Customer:	**LightSpeed Aviation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**48.1% RH**
Project:	**None**			**Barometric Pres.:**	**1014 mbar**
Tested by:	**Nolan De Ramos, Luis Flores**	**Power:**	**5VDC USB charging**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference Level Offset = Test Cable + 20 dB Attenuator + DC Block + 2 dB (EUT Pigtail)

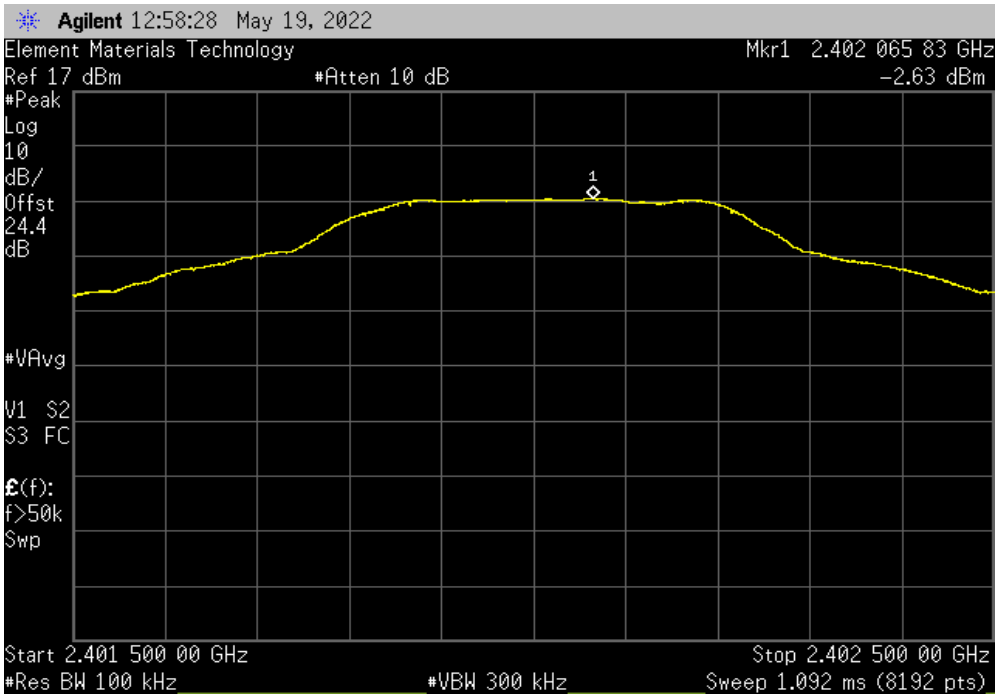
DEVIATIONS FROM TEST STANDARD

None

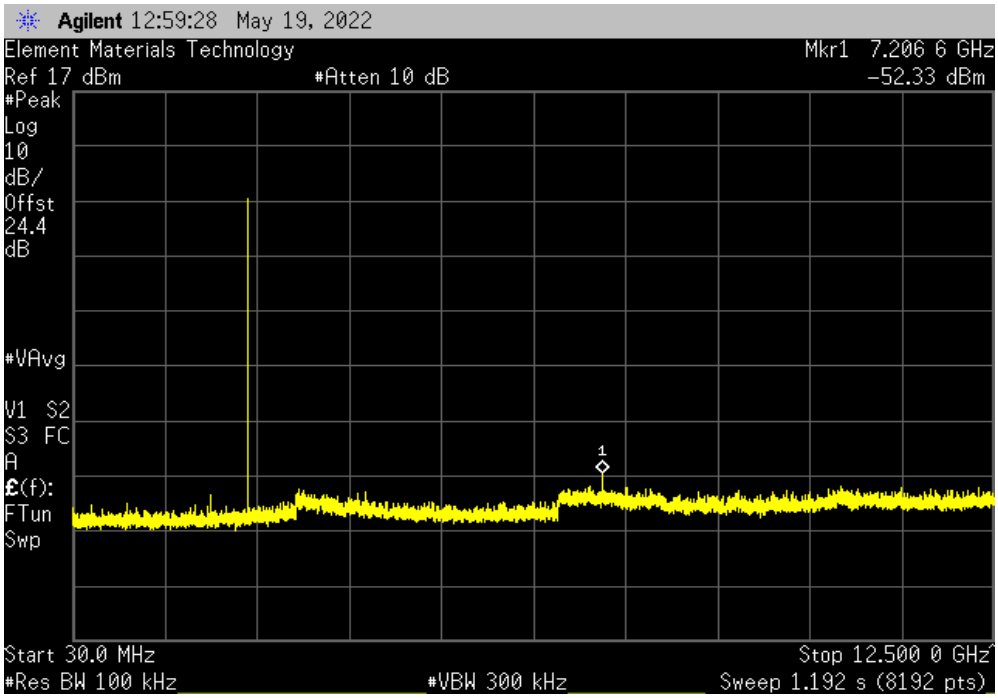
Configuration #	**2**	*Signature*

		Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
DH5, GFSK						
	Low Channel, 2402 MHz	Fundamental	2402.07	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	7206.6	-49.7	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24980.2	-48.58	-20	Pass
	Mid Channel, 2440 MHz	Fundamental	2440.06	N/A	N/A	N/A
	Mid Channel, 2440 MHz	30 MHz - 12.5 GHz	1867.5	-39.92	-20	Pass
	Mid Channel, 2440 MHz	12.5 GHz - 25 GHz	23977.5	-47.12	-20	Pass
	High Channel, 2480 MHz	Fundamental	2480.06	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	1893.4	-48.91	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	24055.4	-46.53	-20	Pass
2DH5, pi/4-DQPSK						
	Low Channel, 2402 MHz	Fundamental	2402.04	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	7205.1	-49.3	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24615.4	-46.78	-20	Pass
	Mid Channel, 2440 MHz	Fundamental	2440.05	N/A	N/A	N/A
	Mid Channel, 2440 MHz	30 MHz - 12.5 GHz	6663.1	-48.55	-20	Pass
	Mid Channel, 2440 MHz	12.5 GHz - 25 GHz	24566.6	-45.15	-20	Pass
	High Channel, 2480 MHz	Fundamental	2480.05	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	7355.8	-48.77	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	24559	-45.87	-20	Pass
3DH5, 8-DPSK						
	Low Channel, 2402 MHz	Fundamental	2402.11	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	7205.1	-49.74	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24980.2	-46.09	-20	Pass
	Mid Channel, 2440 MHz	Fundamental	2440.11	N/A	N/A	N/A
	Mid Channel, 2440 MHz	30 MHz - 12.5 GHz	10412.8	-48.73	-20	Pass
	Mid Channel, 2440 MHz	12.5 GHz - 25 GHz	24360.6	-45.57	-20	Pass
	High Channel, 2480 MHz	Fundamental	2480.11	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	3102.2	-48.99	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	24983.2	-44.64	-20	Pass

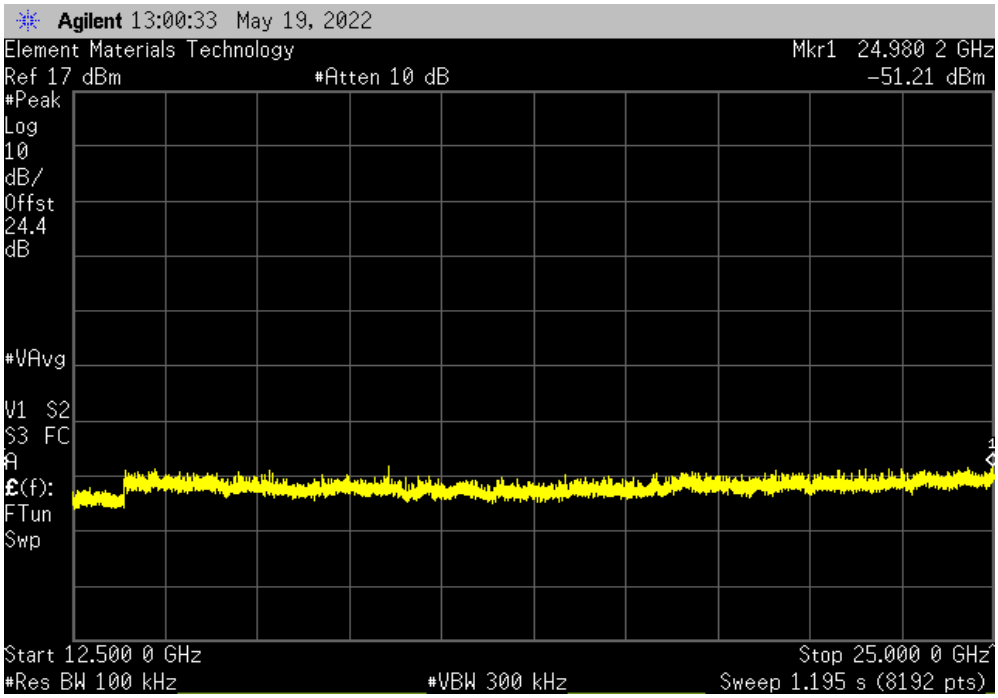
DH5, GFSK, Low Channel, 2402 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2402.07	N/A	N/A	N/A



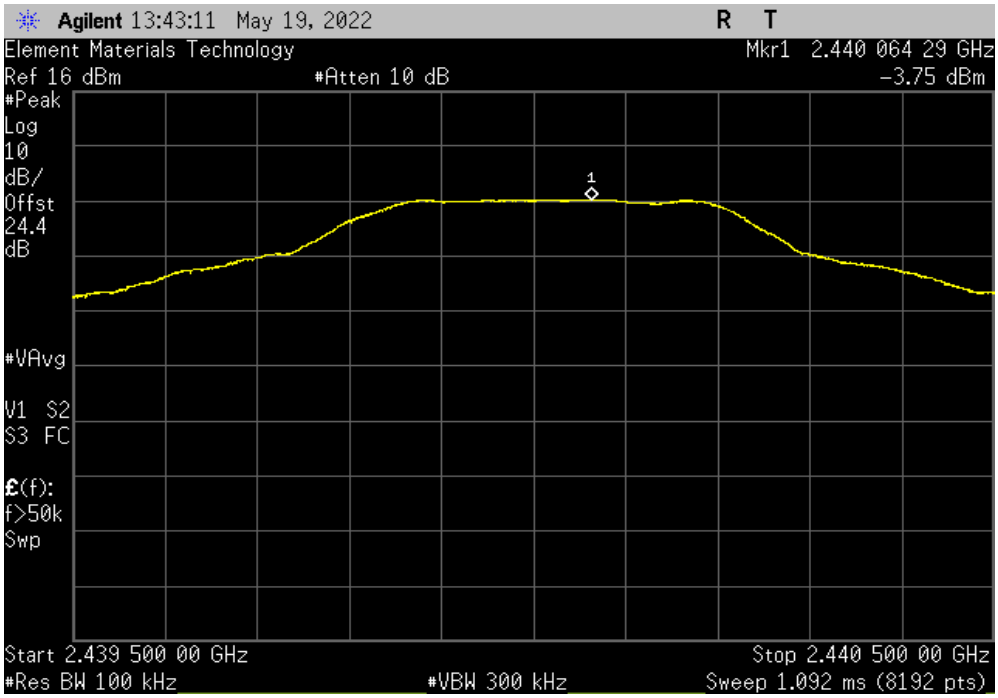
DH5, GFSK, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	7206.6	-49.7	-20	Pass



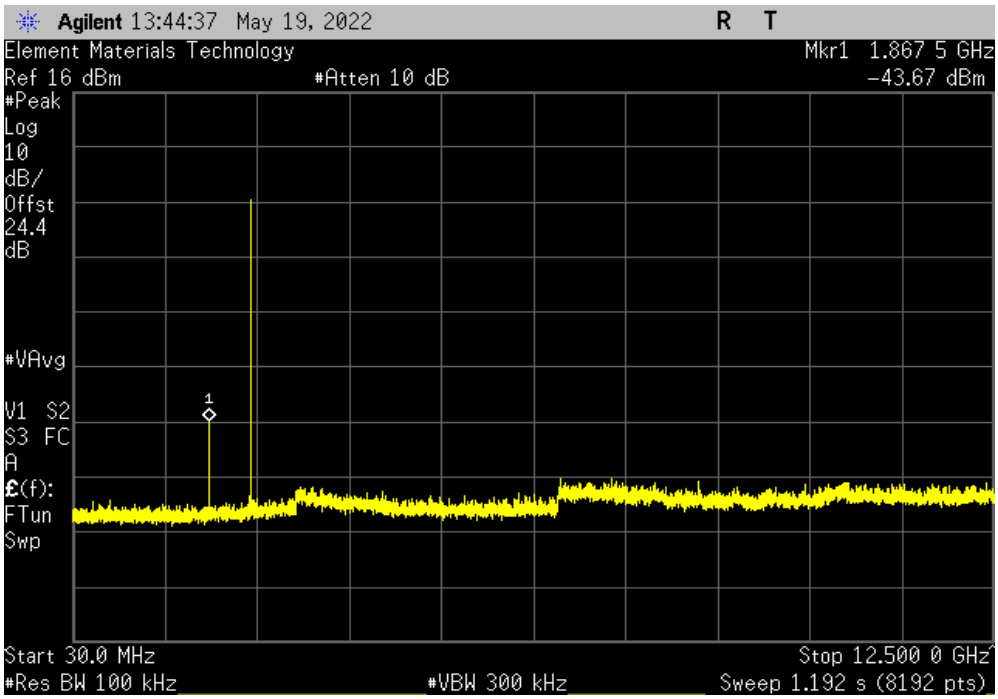
DH5, GFSK, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24980.2	-48.58	-20	Pass



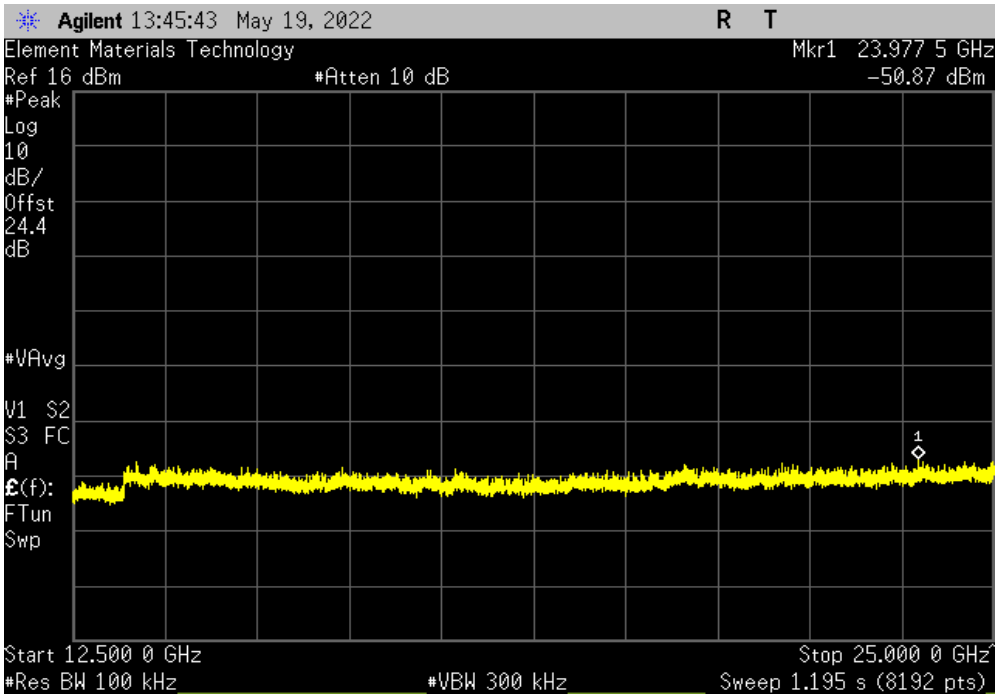
DH5, GFSK, Mid Channel, 2440 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental		2440.06	N/A	N/A	N/A



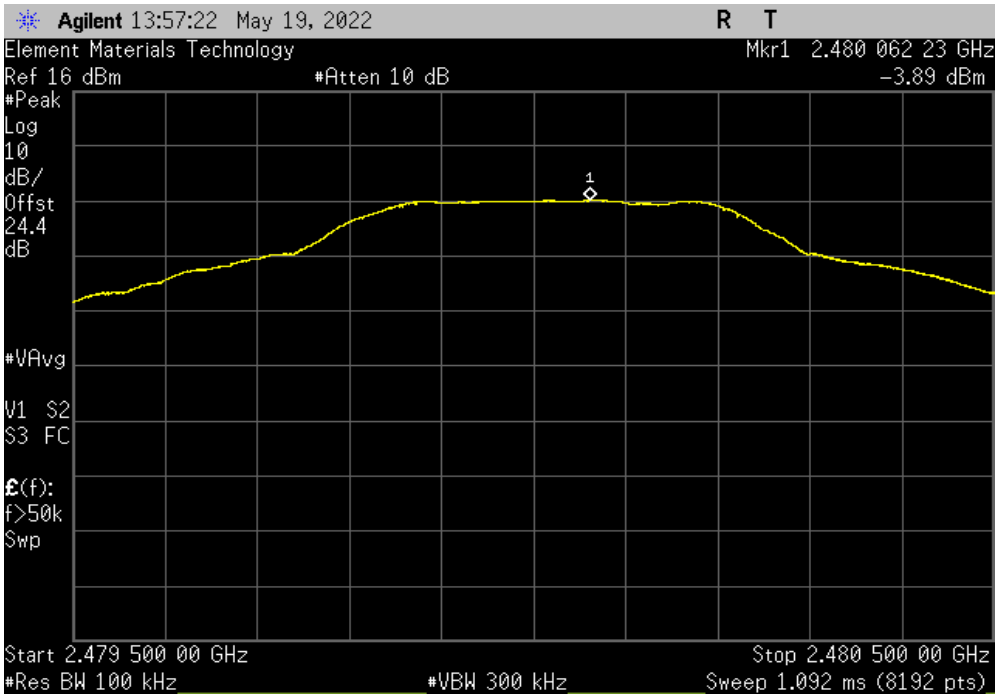
DH5, GFSK, Mid Channel, 2440 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	1867.5	-39.92	-20	Pass



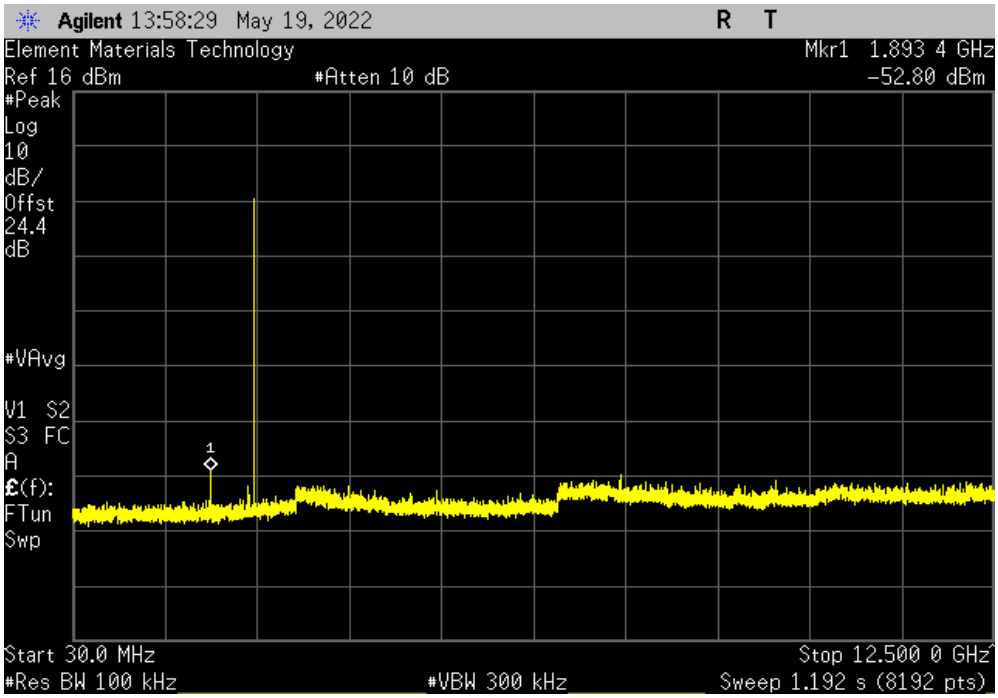
DH5, GFSK, Mid Channel, 2440 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	23977.5	-47.12	-20	Pass



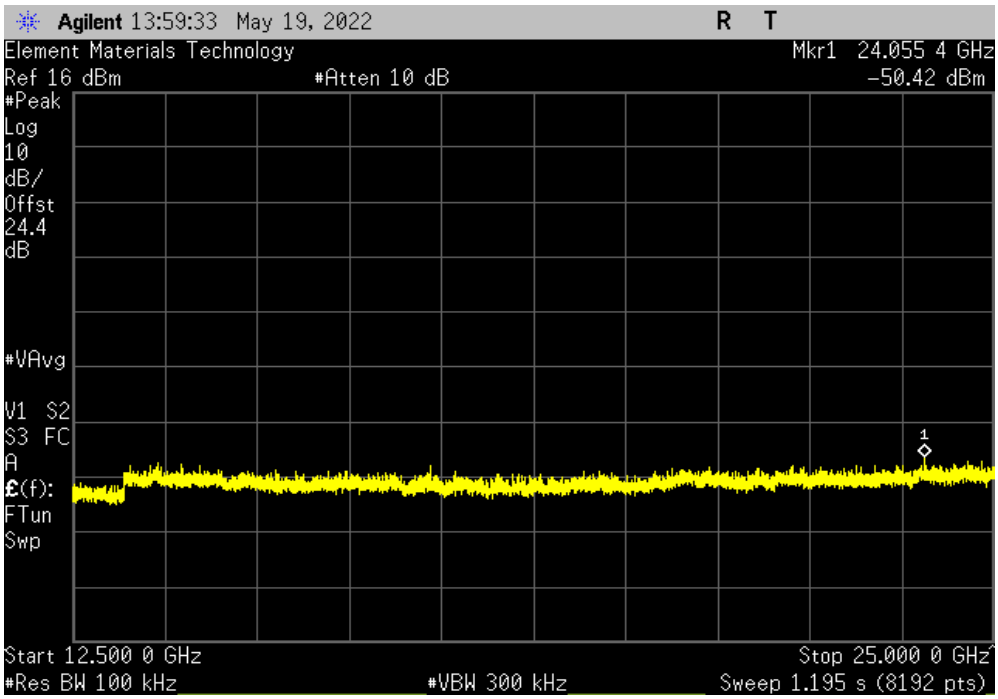
DH5, GFSK, High Channel, 2480 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental		2480.06	N/A	N/A	N/A



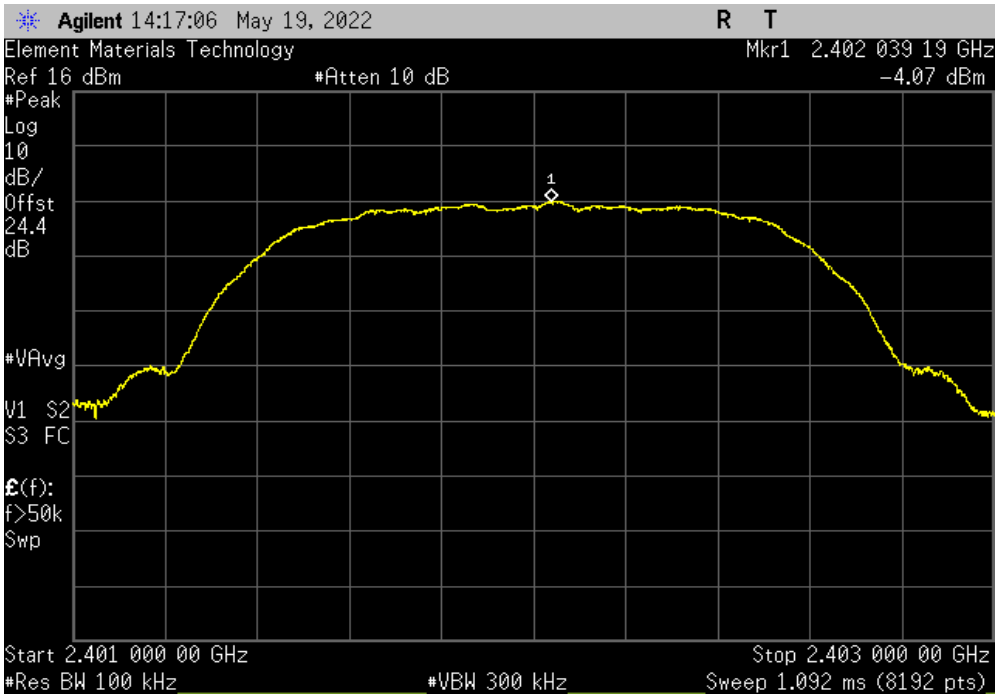
DH5, GFSK, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	1893.4	-48.91	-20	Pass



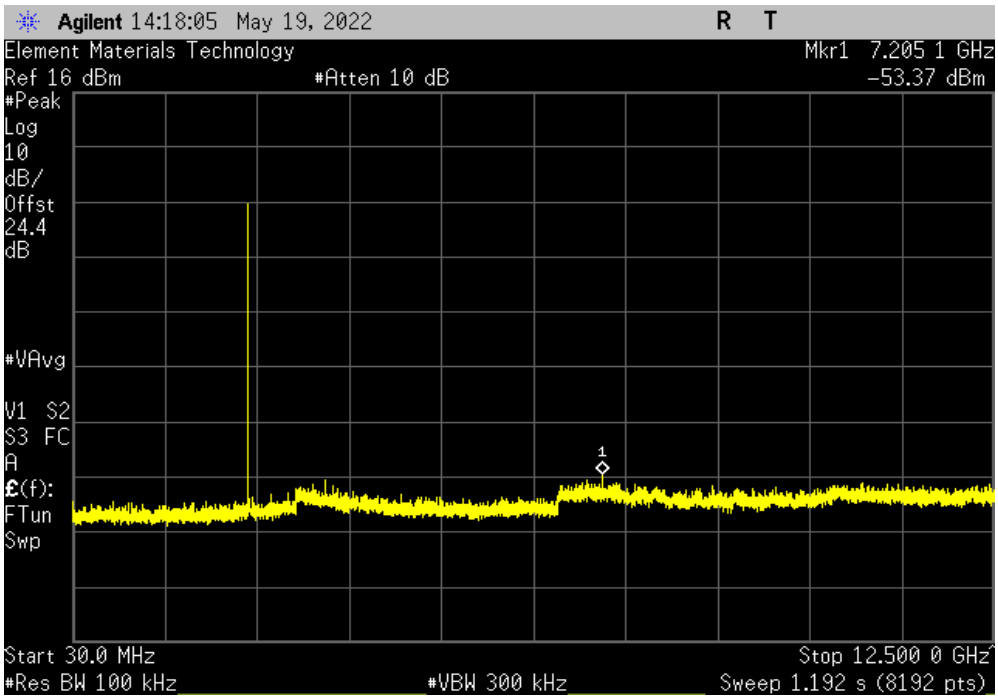
DH5, GFSK, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24055.4	-46.53	-20	Pass



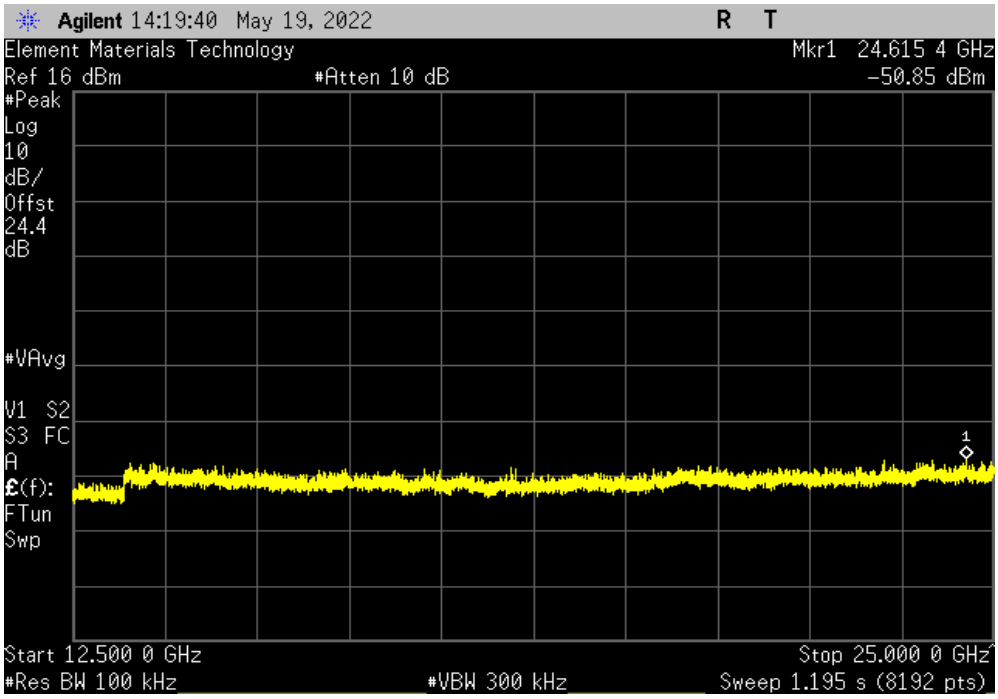
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2402.04	N/A	N/A	N/A



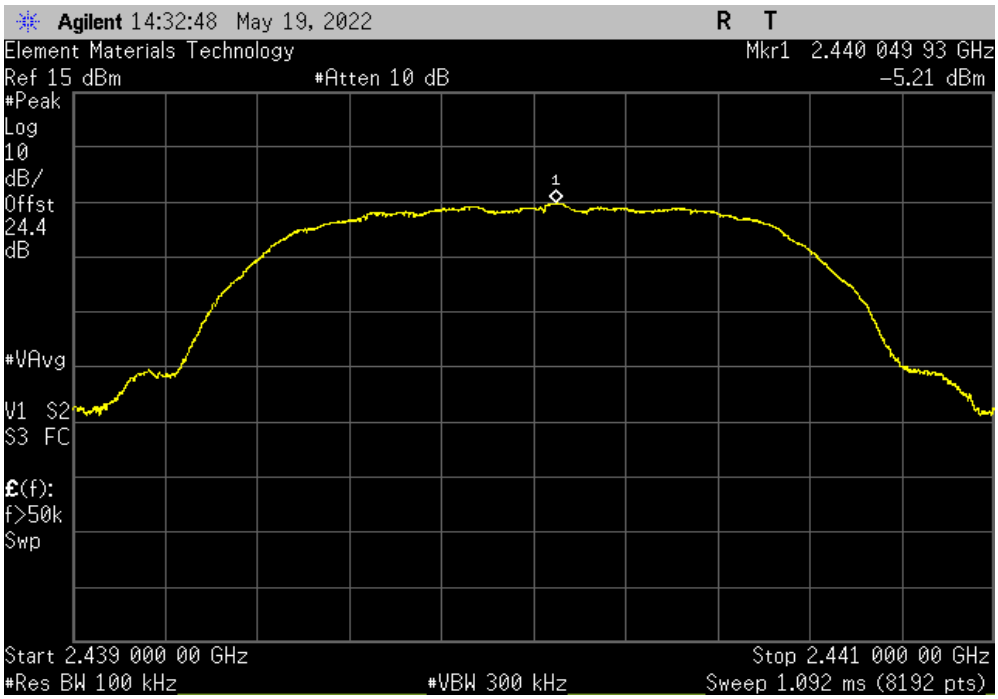
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	7205.1	-49.3	-20	Pass



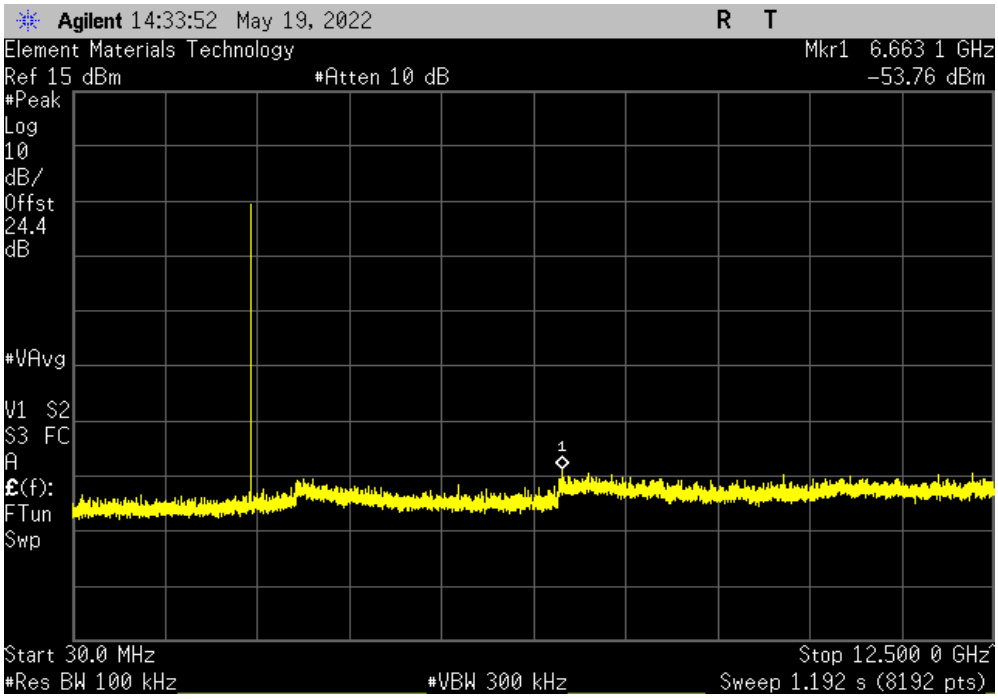
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24615.4	-46.78	-20	Pass



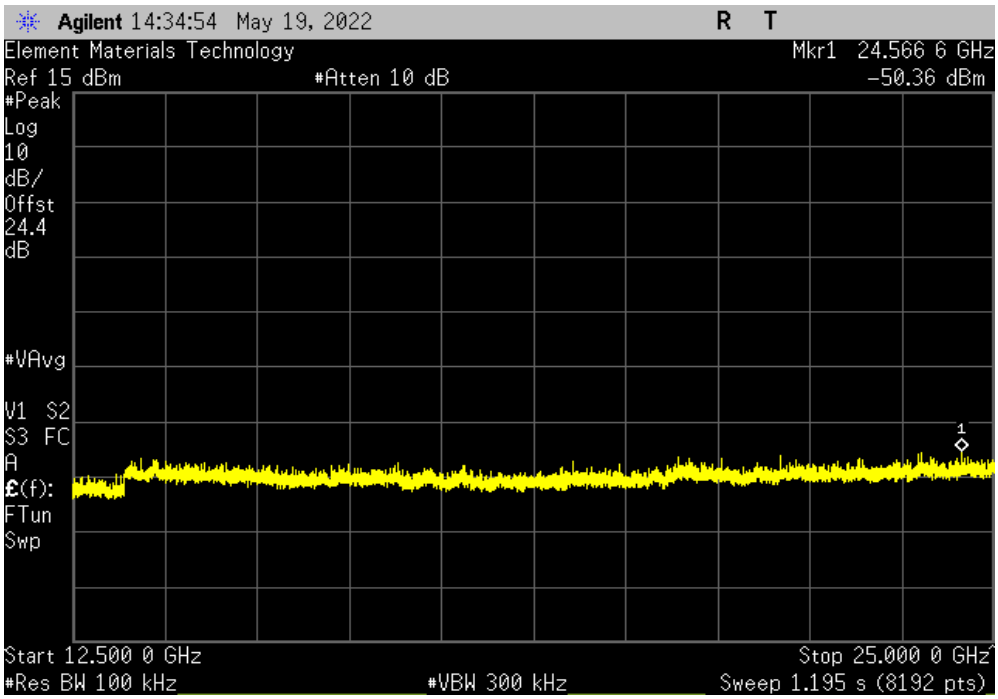
2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		2440.05	N/A	N/A	N/A



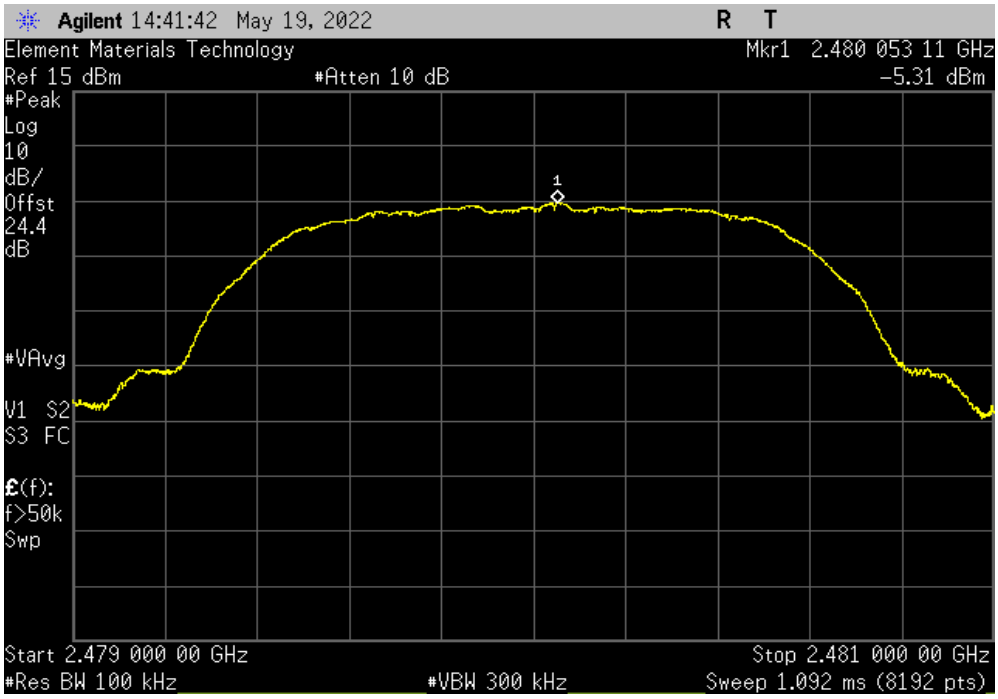
2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	6663.1	-48.55	-20	Pass



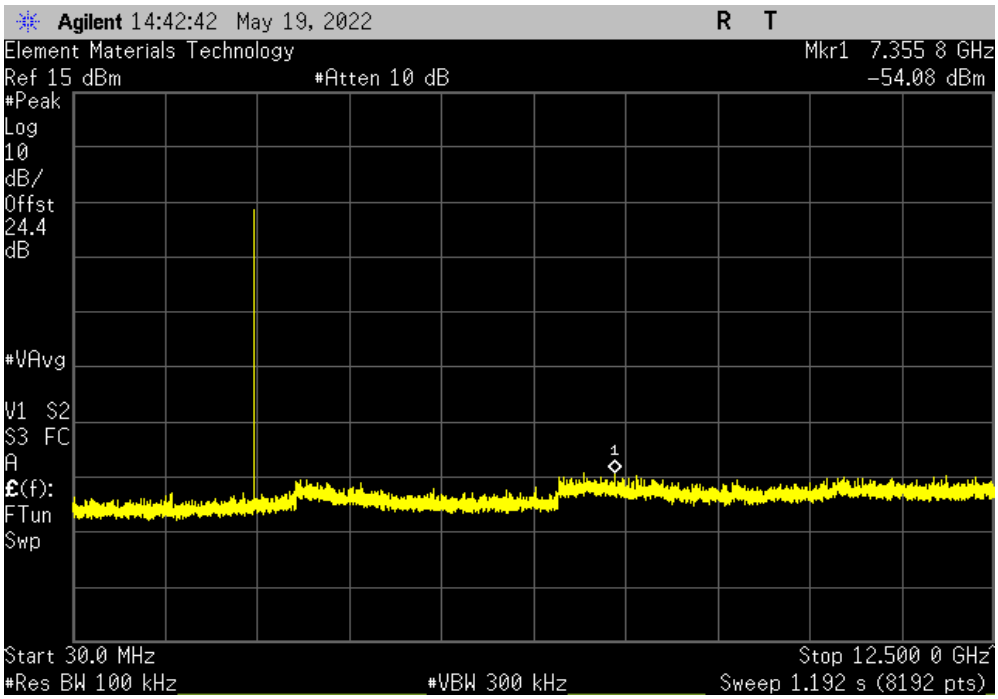
2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24566.6	-45.15	-20	Pass



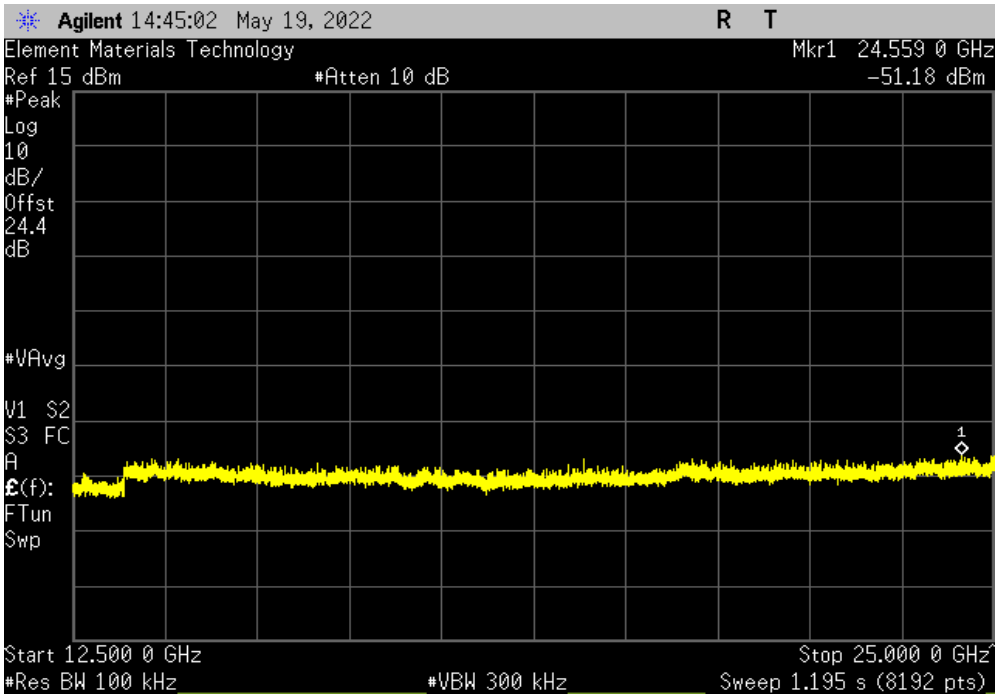
2DH5, pi/4-DQPSK, High Channel, 2480 MHz					
Frequency Range		**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental	2480.05	N/A	N/A	N/A



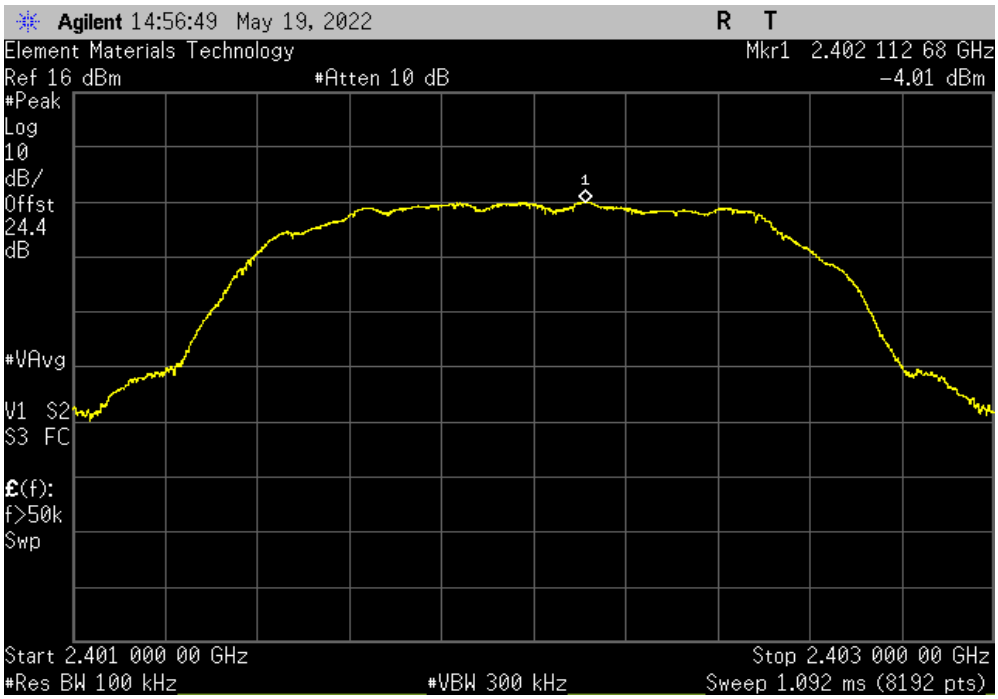
2DH5, pi/4-DQPSK, High Channel, 2480 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	7355.8	-48.77	-20	Pass



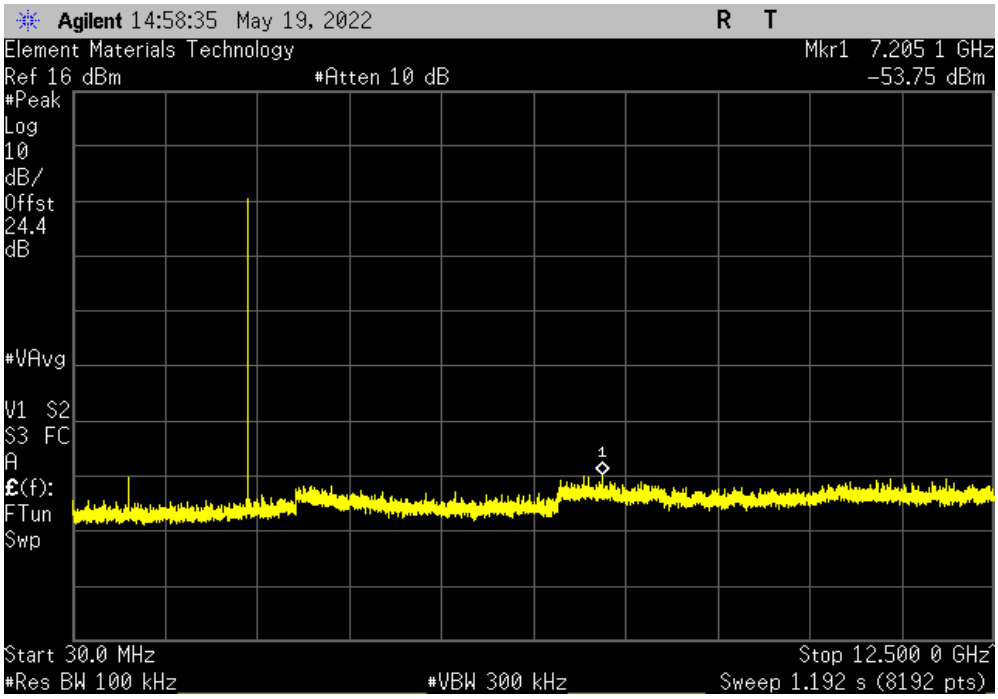
2DH5, pi/4-DQPSK, High Channel, 2480 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24559	-45.87	-20	Pass



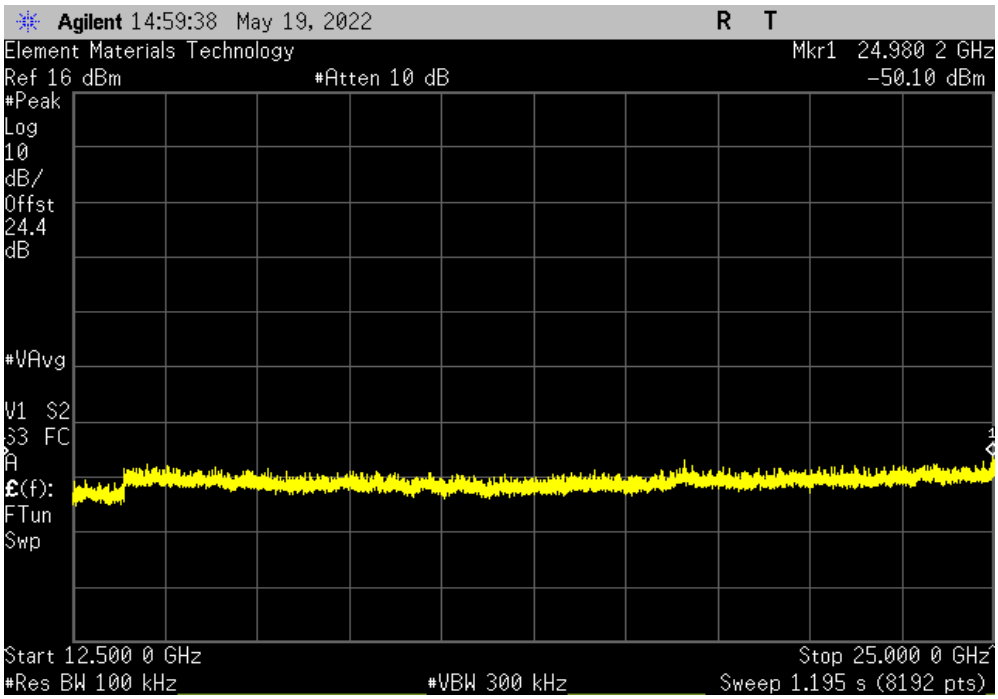
3DH5, 8-DPSK, Low Channel, 2402 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		2402.11	N/A	N/A	N/A



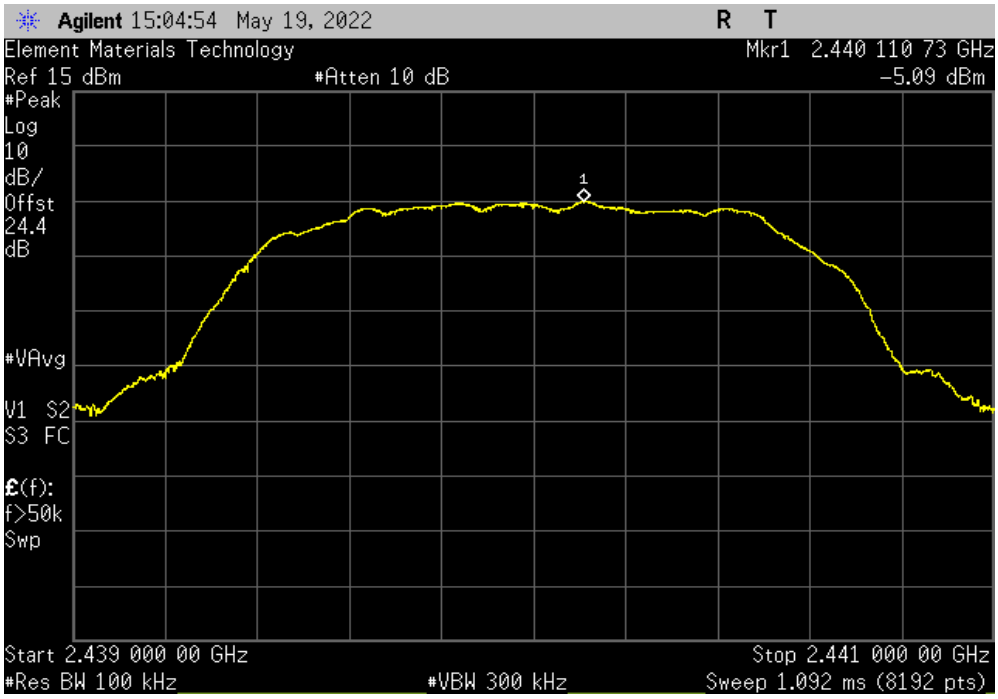
3DH5, 8-DPSK, Low Channel, 2402 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	7205.1	-49.74	-20	Pass



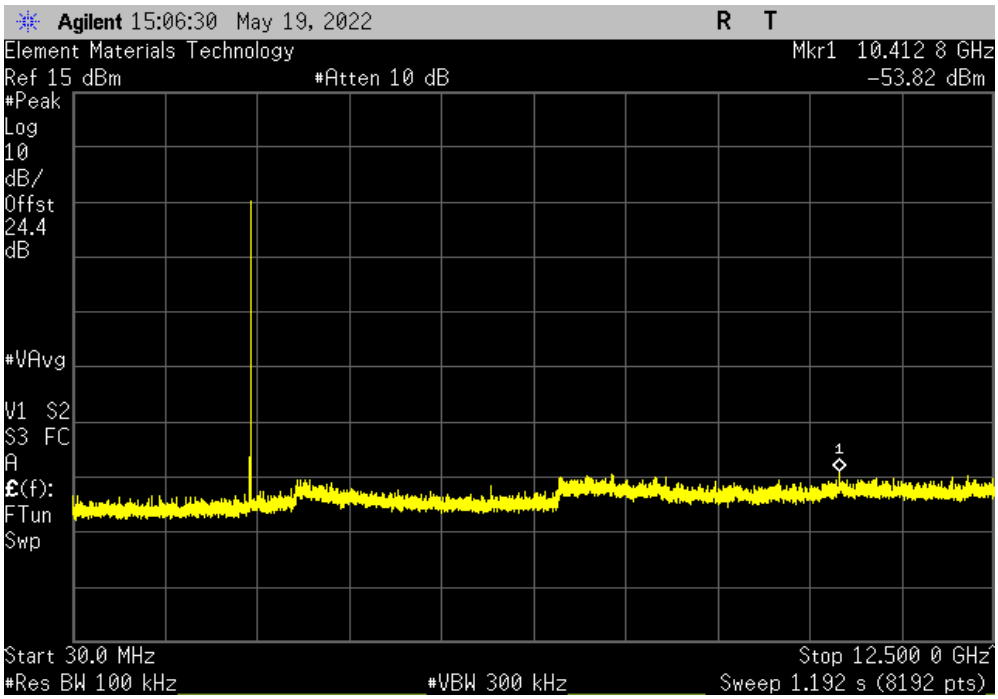
3DH5, 8-DPSK, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24980.2	-46.09	-20	Pass



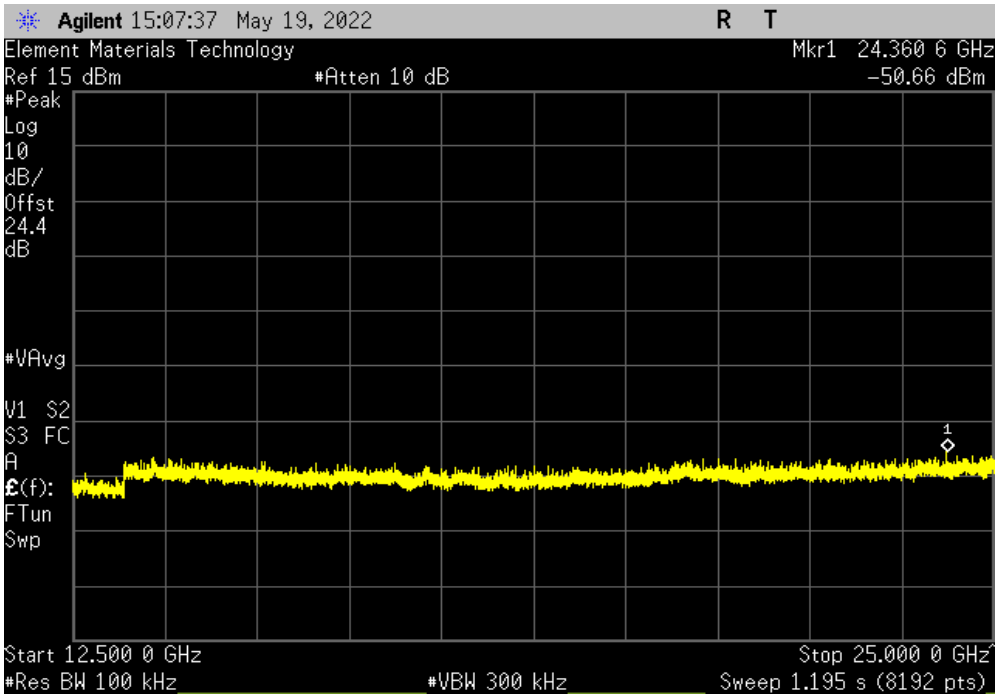
3DH5, 8-DPSK, Mid Channel, 2440 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2440.11	N/A	N/A	N/A



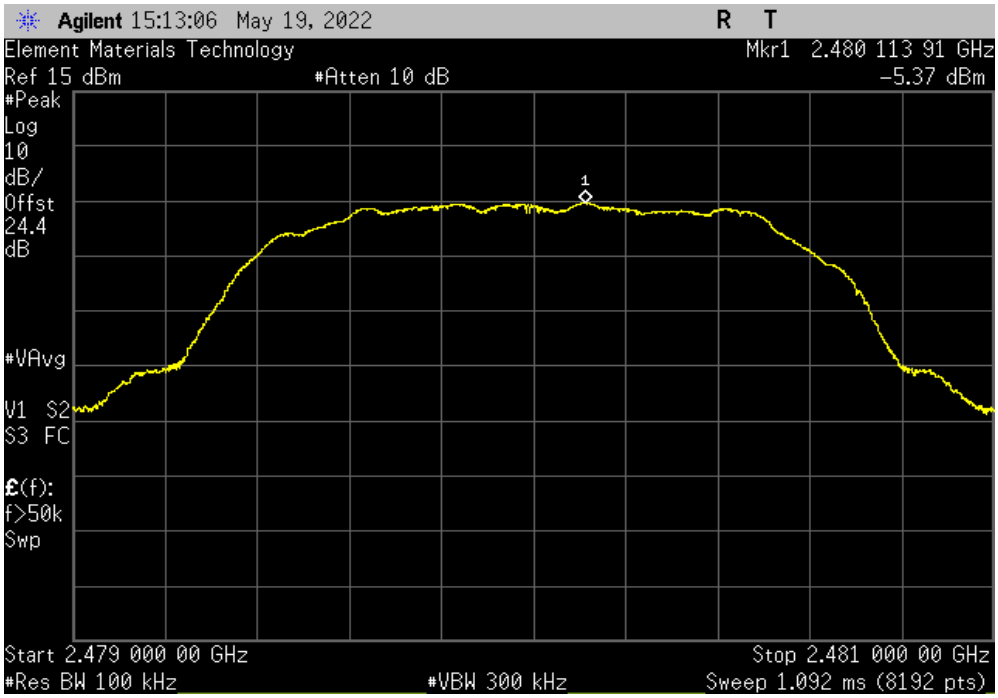
3DH5, 8-DPSK, Mid Channel, 2440 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	10412.8	-48.73	-20	Pass



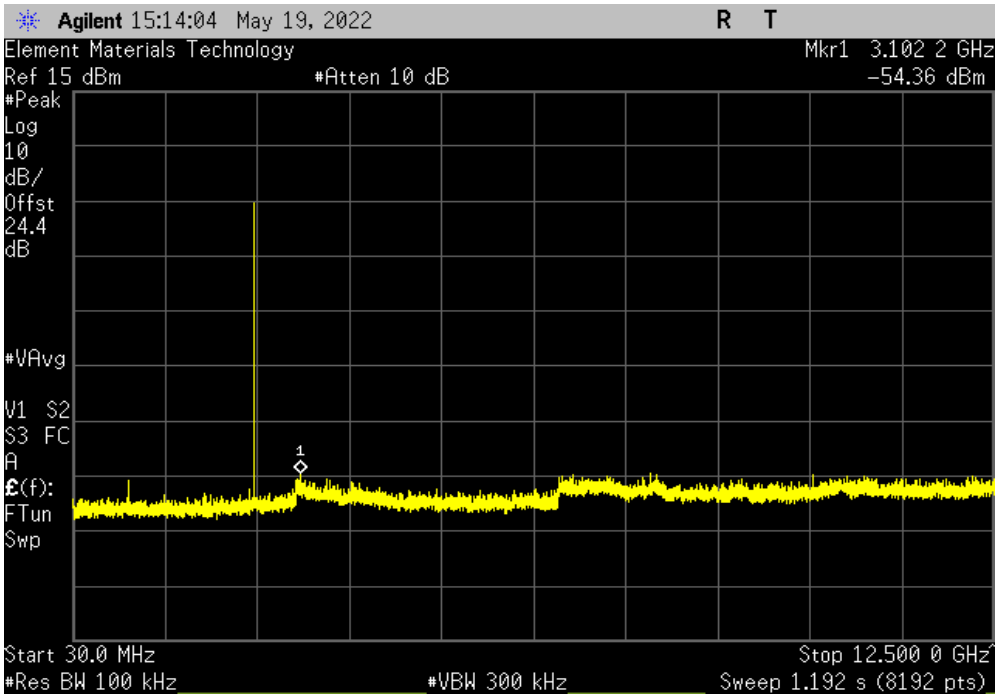
3DH5, 8-DPSK, Mid Channel, 2440 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24360.6	-45.57	-20	Pass



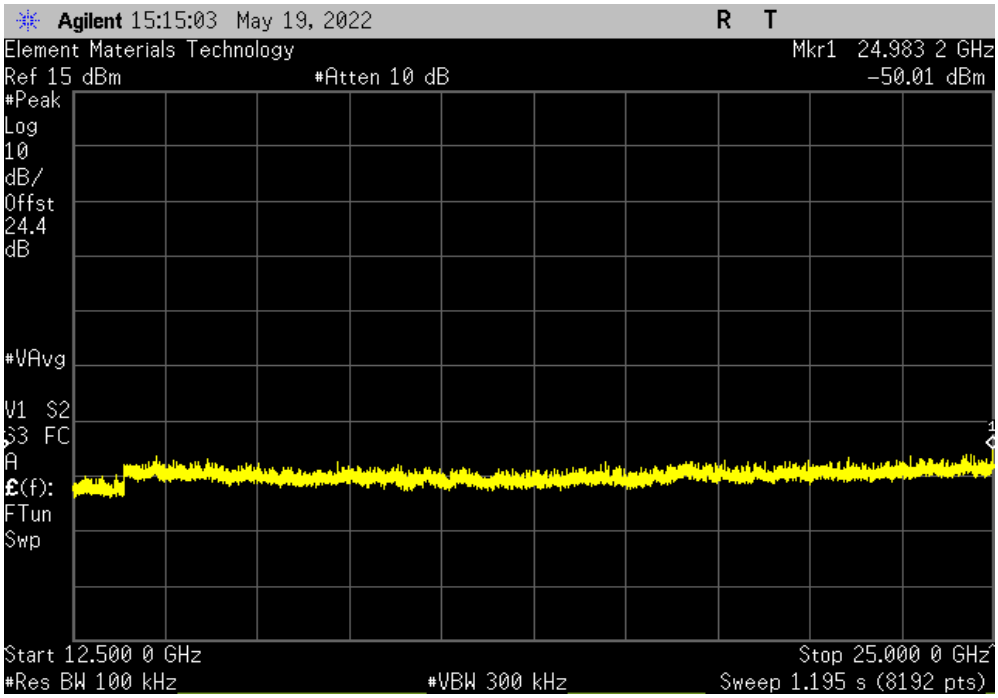
3DH5, 8-DPSK, High Channel, 2480 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2480.11	N/A	N/A	N/A



3DH5, 8-DPSK, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	3102.2	-48.99	-20	Pass



3DH5, 8-DPSK, High Channel, 2480 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24983.2	-44.64	-20	Pass



SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies (in no-hop, single channel mode) and the modes as showed in the data sheets.

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

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

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

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

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

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

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of 10*log(1/dc).

RMS measurements taken for a FHSS radio also may have a duty cycle correction subtracted using the formula 10*log(DC), where DC is the worst-case dwell time of the radio while in a hopping mode in a 100 ms period.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Biconilog	EMCO	3142B	AXJ	2021-03-03	2023-03-03
Antenna - Double Ridge	EMCO	3115	AHC	2020-07-01	2022-07-01
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2021-11-17	2022-11-17
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2022-05-03	2023-05-03
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2021-11-17	2022-11-17
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2021-11-17	2022-11-17
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	2021-07-16	2022-07-16
Cable	N/A	Bilog Cables	EVA	2021-11-17	2022-11-17
Cable	N/A	Double Ridge Horn Cables	EVB	2022-05-03	2023-05-03
Cable	None	Standard Gain Horn Cables	EVF	2021-11-17	2022-11-17
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	EVY	2021-07-16	2022-07-16
Spectrum Analyzer	Agilent	N9010A	AFI	2021-12-09	2022-12-09
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2021-11-17	2022-11-17
Attenuator	Coaxicom	3910-20	AXZ	2022-02-10	2023-02-10

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26500 MHz

POWER INVESTIGATED

5VDC USB charging

CONFIGURATIONS INVESTIGATED

LISA0060-1

MODES INVESTIGATED

Continuous TX, BT, Low Ch = 2402 Mhz, High Ch = 2480 MHz

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

EUT:	Delta Zulu	Work Order:	LISA0060
Serial Number:	808000413DZ	Date:	2022-05-13
Customer:	LightSpeed Aviation	Temperature:	22.1°C
Attendees:	Louis Hindman	Relative Humidity:	35.5%
Customer Project:	None	Bar. Pressure (PMSL):	1027 mb
Tested By:	Kam Robertson & Cole Ghizzone	Job Site:	EV01
Power:	5VDC USB charging	Configuration:	LISA0060-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	48	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

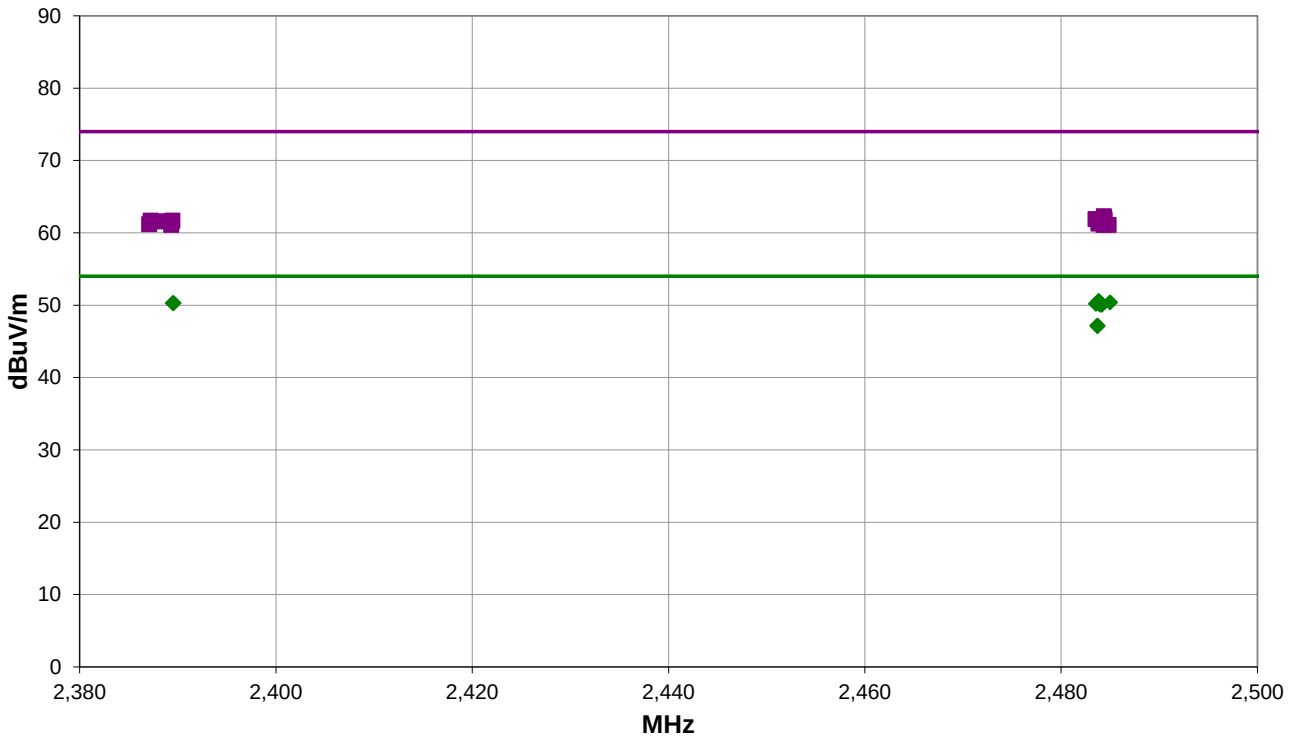
See comments below for channel, orientation and data rate

EUT OPERATING MODES

Continuous TX, BT, Low Ch = 2402 Mhz, High Ch = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 48 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

RESULTS - Run #48

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.827	31.6	-1.0	1.5	360.0	3.0	20.0	Horz	AV	0.0	50.6	54.0	-3.4	High Ch, Horz, DH5
2484.983	31.4	-1.0	3.57	291.0	3.0	20.0	Vert	AV	0.0	50.4	54.0	-3.6	High Ch, Horz, DH5
2389.490	31.4	-1.1	1.5	5.0	3.0	20.0	Vert	AV	0.0	50.3	54.0	-3.7	Low Ch, Horz, DH5
2389.570	31.4	-1.1	3.86	292.0	3.0	20.0	Horz	AV	0.0	50.3	54.0	-3.7	Low Ch, Horz, DH5
2483.687	31.3	-1.0	1.5	165.0	3.0	20.0	Horz	AV	0.0	50.3	54.0	-3.7	High Ch, OnSide, DH5
2483.543	31.2	-1.0	1.5	328.0	3.0	20.0	Vert	AV	0.0	50.2	54.0	-3.8	High Ch, Vert, DH5
2483.977	31.1	-1.0	1.94	179.0	3.0	20.0	Vert	AV	0.0	50.1	54.0	-3.9	High Ch, Horz, 2DH5
2483.980	31.1	-1.0	1.5	340.0	3.0	20.0	Vert	AV	0.0	50.1	54.0	-3.9	High Ch, OnSide, 3DH5
2484.127	31.1	-1.0	2.23	0.0	3.0	20.0	Horz	AV	0.0	50.1	54.0	-3.9	High Ch, OnSide, 3DH5
2484.163	31.1	-1.0	1.5	269.0	3.0	20.0	Horz	AV	0.0	50.1	54.0	-3.9	High Ch, Horz, 2DH5
2483.697	28.2	-1.0	1.5	0.0	3.0	20.0	Vert	AV	0.0	47.2	54.0	-6.8	High Ch, OnSide, DH5
2483.707	28.1	-1.0	1.5	29.0	3.0	20.0	Horz	AV	0.0	47.1	54.0	-6.9	High Ch, Vert, DH5
2484.350	43.3	-1.0	1.5	269.0	3.0	20.0	Horz	PK	0.0	62.3	74.0	-11.7	High Ch, Horz, 2DH5
2484.397	43.2	-1.0	1.5	165.0	3.0	20.0	Horz	PK	0.0	62.2	74.0	-11.8	High Ch, OnSide, DH5
2483.510	42.9	-1.0	1.5	287.0	3.0	20.0	Vert	PK	0.0	61.9	74.0	-12.1	High Ch, OnSide, DH5
2484.113	42.8	-1.0	1.5	360.0	3.0	20.0	Horz	PK	0.0	61.8	74.0	-12.2	High Ch, Horz, DH5
2484.423	42.8	-1.0	1.5	360.0	3.0	20.0	Vert	PK	0.0	61.8	74.0	-12.2	High Ch, Vert, 2DH5
2387.225	42.8	-1.1	1.5	91.0	3.0	20.0	Vert	PK	0.0	61.7	74.0	-12.3	Low Ch, Horz, 3DH5
2389.433	42.8	-1.1	1.5	5.0	3.0	20.0	Vert	PK	0.0	61.7	74.0	-12.3	Low Ch, Horz, DH5
2388.480	42.7	-1.1	3.86	292.0	3.0	20.0	Horz	PK	0.0	61.6	74.0	-12.4	Low Ch, Horz, DH5
2484.193	42.6	-1.0	1.5	0.0	3.0	20.0	Vert	PK	0.0	61.6	74.0	-12.4	High Ch, OnSide, DH5
2484.043	42.5	-1.0	1.5	340.0	3.0	20.0	Vert	PK	0.0	61.5	74.0	-12.5	High Ch, OnSide, 3DH5
2484.123	42.4	-1.0	3.57	291.0	3.0	20.0	Vert	PK	0.0	61.4	74.0	-12.6	High Ch, Horz, DH5
2483.793	42.3	-1.0	2.38	108.0	3.0	20.0	Vert	PK	0.0	61.3	74.0	-12.7	High Ch, Horz, 3DH5
2387.083	42.3	-1.1	1.5	21.0	3.0	20.0	Vert	PK	0.0	61.2	74.0	-12.8	Low Ch, OnSide, 3DH5
2389.325	42.2	-1.1	1.5	32.0	3.0	20.0	Horz	PK	0.0	61.1	74.0	-12.9	High Ch, Horz, 2DH5
2484.323	42.1	-1.0	1.5	355.0	3.0	20.0	Horz	PK	0.0	61.1	74.0	-12.9	High Ch, OnSide, 2DH5
2484.847	42.1	-1.0	1.5	29.0	3.0	20.0	Horz	PK	0.0	61.1	74.0	-12.9	High Ch, Vert, DH5

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

EUT:	Delta Zulu	Work Order:	LISA0060
Serial Number:	808000413DZ	Date:	2022-05-13
Customer:	LightSpeed Aviation	Temperature:	22.1°C
Attendees:	Louis Hindman	Relative Humidity:	35.5%
Customer Project:	None	Bar. Pressure (PMSL):	1027 mb
Tested By:	Kam Robertson & Cole Ghizzone	Job Site:	EV01
Power:	5VDC USB charging	Configuration:	LISA0060-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	49	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

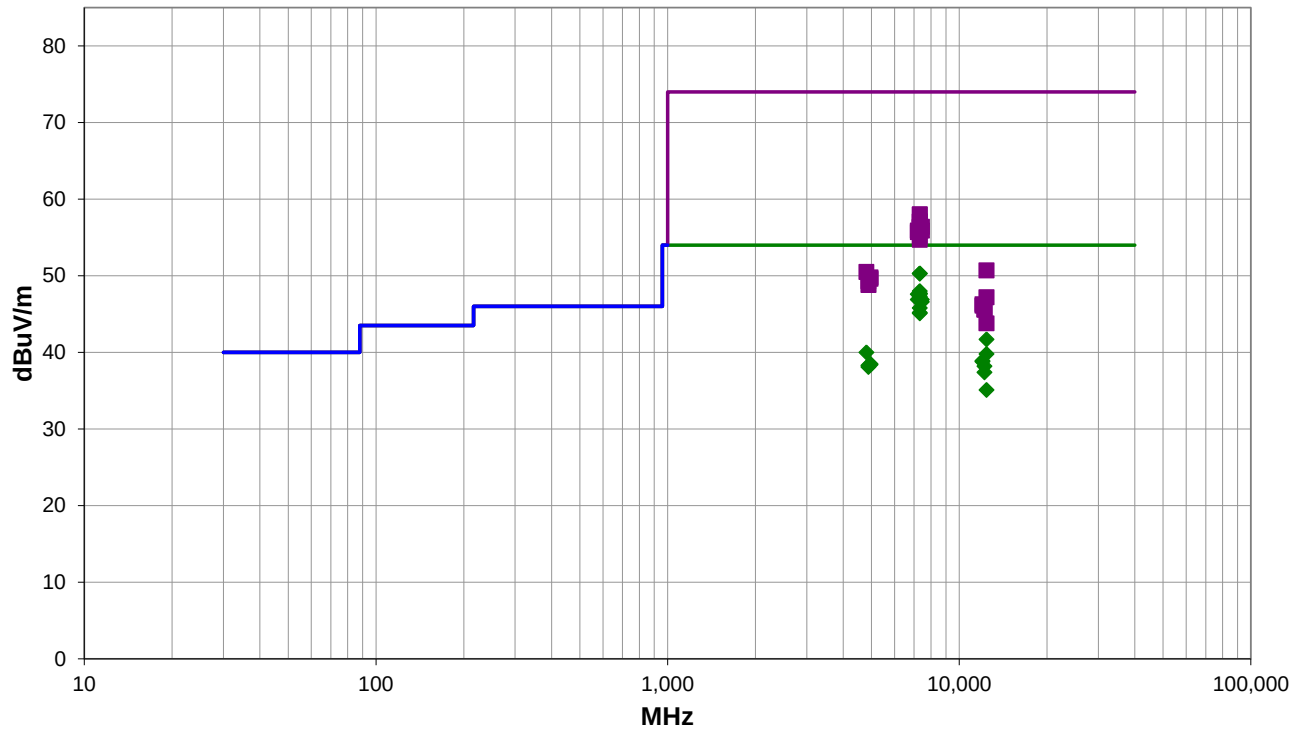
See comments below for channel, orientation and data rate

EUT OPERATING MODES

Continuous TX, BT, Low Ch = 2402 Mhz, Mid Ch = 2440 MHz, High Ch = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 49 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

RESULTS - Run #49

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7320.017	35.7	14.6	2.11	116.0	3.0	0.0	Vert	AV	0.0	50.3	54.0	-3.7	Mid Ch, Horz, DH5
7320.017	35.7	14.6	2.11	116.0	3.0	0.0	Vert	AV	0.0	50.3	54.0	-3.7	Mid Ch, Horz, DH5
7319.997	33.4	14.6	2.02	343.0	3.0	0.0	Vert	AV	0.0	48.0	54.0	-6.0	Mid Ch, Horz, 2DH5
7319.950	33.1	14.6	2.16	0.0	3.0	0.0	Horz	AV	0.0	47.7	54.0	-6.3	Mid Ch, Horz, DH5
7319.950	33.1	14.6	2.16	0.0	3.0	0.0	Horz	AV	0.0	47.7	54.0	-6.3	Mid Ch, Horz, DH5
7320.053	33.0	14.6	1.66	124.0	3.0	0.0	Vert	AV	0.0	47.6	54.0	-6.4	Mid Ch, Horz, DH5
7206.100	33.4	14.2	2.23	102.0	3.0	0.0	Vert	AV	0.0	47.6	54.0	-6.4	Low Ch, Horz, DH5
7320.033	32.7	14.6	3.29	111.0	3.0	0.0	Horz	AV	0.0	47.3	54.0	-6.7	Mid Ch, Vert, DH5
7440.058	31.8	15.1	2.09	269.0	3.0	0.0	Horz	AV	0.0	46.9	54.0	-7.1	High Ch, Horz, DH5
7320.033	32.3	14.6	1.5	112.0	3.0	0.0	Horz	AV	0.0	46.9	54.0	-7.1	Mid Ch, OnSide, DH5
7206.142	32.7	14.2	1.95	0.0	3.0	0.0	Horz	AV	0.0	46.9	54.0	-7.1	Low Ch, Horz, DH5
7439.942	31.5	15.1	1.5	326.0	3.0	0.0	Vert	AV	0.0	46.6	54.0	-7.4	High Ch, Horz, DH5
7320.107	31.2	14.6	1.5	129.0	3.0	0.0	Vert	AV	0.0	45.8	54.0	-8.2	Mid Ch, Horz, 3DH5
7320.158	30.6	14.6	1.5	340.0	3.0	0.0	Vert	AV	0.0	45.2	54.0	-8.8	Mid Ch, Vert, DH5
7319.992	30.5	14.6	1.5	95.0	3.0	0.0	Vert	AV	0.0	45.1	54.0	-8.9	Mid Ch, OnSide, DH5
12400.740	31.9	9.8	1.61	200.0	3.0	0.0	Vert	AV	0.0	41.7	54.0	-12.3	High Ch, Horz, DH5
4804.117	31.4	8.6	3.29	11.0	3.0	0.0	Horz	AV	0.0	40.0	54.0	-14.0	Low Ch, Horz, DH5
12399.430	39.3	0.5	1.6	210.0	3.0	0.0	Vert	AV	0.0	39.8	54.0	-14.2	High Ch, Horz, DH5
12009.450	39.1	-0.2	2.2	317.0	3.0	0.0	Vert	AV	0.0	38.9	54.0	-15.1	Low Ch, Horz, DH5
12009.480	39.0	-0.2	1.61	258.0	3.0	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Low Ch, Horz, DH5
4960.225	29.7	8.8	1.5	183.0	3.0	0.0	Vert	AV	0.0	38.5	54.0	-15.5	High Ch, Horz, DH5
4962.008	29.6	8.8	1.5	163.0	3.0	0.0	Horz	AV	0.0	38.4	54.0	-15.6	High Ch, Horz, DH5
4879.950	29.7	8.6	1.5	347.0	3.0	0.0	Vert	AV	0.0	38.3	54.0	-15.7	Mid Ch, Horz, DH5
12199.590	38.1	0.1	1.5	198.0	3.0	0.0	Vert	AV	0.0	38.2	54.0	-15.8	Mid Ch, Horz, DH5
4880.158	29.5	8.6	1.5	119.0	3.0	0.0	Horz	AV	0.0	38.1	54.0	-15.9	Mid Ch, Horz, DH5
7320.283	43.4	14.6	2.11	116.0	3.0	0.0	Vert	PK	0.0	58.0	74.0	-16.0	Mid Ch, Horz, DH5
7320.283	43.4	14.6	2.11	116.0	3.0	0.0	Vert	PK	0.0	58.0	74.0	-16.0	Mid Ch, Horz, DH5
12199.530	37.3	0.1	1.5	159.0	3.0	0.0	Horz	AV	0.0	37.4	54.0	-16.6	Mid Ch, Horz, DH5
7320.587	42.5	14.6	1.66	124.0	3.0	0.0	Vert	PK	0.0	57.1	74.0	-16.9	Mid Ch, Horz, DH5
7319.197	42.5	14.6	2.02	343.0	3.0	0.0	Vert	PK	0.0	57.1	74.0	-16.9	Mid Ch, Horz, 2DH5
7440.417	41.3	15.1	2.09	269.0	3.0	0.0	Horz	PK	0.0	56.4	74.0	-17.6	High Ch, Horz, DH5
7319.592	41.8	14.6	2.16	0.0	3.0	0.0	Horz	PK	0.0	56.4	74.0	-17.6	Mid Ch, Horz, DH5
7319.592	41.8	14.6	2.16	0.0	3.0	0.0	Horz	PK	0.0	56.4	74.0	-17.6	Mid Ch, Horz, DH5
7319.492	41.7	14.6	3.29	111.0	3.0	0.0	Horz	PK	0.0	56.3	74.0	-17.7	Mid Ch, Vert, DH5
7440.350	40.8	15.1	1.5	326.0	3.0	0.0	Vert	PK	0.0	55.9	74.0	-18.1	High Ch, Horz, DH5
7320.358	41.3	14.6	1.5	112.0	3.0	0.0	Horz	PK	0.0	55.9	74.0	-18.1	Mid Ch, OnSide, DH5
7319.747	41.3	14.6	1.5	129.0	3.0	0.0	Vert	PK	0.0	55.9	74.0	-18.1	Mid Ch, Horz, 3DH5
7206.442	41.7	14.2	2.23	102.0	3.0	0.0	Vert	PK	0.0	55.9	74.0	-18.1	Low Ch, Horz, DH5
7206.783	41.5	14.2	1.95	0.0	3.0	0.0	Horz	PK	0.0	55.7	74.0	-18.3	Low Ch, Horz, DH5
12399.520	34.6	0.5	1.5	246.0	3.0	0.0	Horz	AV	0.0	35.1	54.0	-18.9	High Ch, Horz, DH5

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7320.667	40.5	14.6	1.5	95.0	3.0	0.0	Vert	PK	0.0	55.1	74.0	-18.9	Mid Ch, OnSide, DH5
7320.508	40.1	14.6	1.5	340.0	3.0	0.0	Vert	PK	0.0	54.7	74.0	-19.3	Mid Ch, Vert, DH5
12400.720	40.9	9.8	1.61	200.0	3.0	0.0	Vert	PK	0.0	50.7	74.0	-23.3	High Ch, Horz, DH5
4803.158	41.9	8.6	3.29	11.0	3.0	0.0	Horz	PK	0.0	50.5	74.0	-23.5	Low Ch, Horz, DH5
4959.833	41.0	8.8	1.5	183.0	3.0	0.0	Vert	PK	0.0	49.8	74.0	-24.2	High Ch, Horz, DH5
4959.350	40.8	8.8	1.5	163.0	3.0	0.0	Horz	PK	0.0	49.6	74.0	-24.4	High Ch, Horz, DH5
4878.508	40.7	8.6	1.5	119.0	3.0	0.0	Horz	PK	0.0	49.3	74.0	-24.7	Mid Ch, Horz, DH5
4880.217	40.2	8.6	1.5	347.0	3.0	0.0	Vert	PK	0.0	48.8	74.0	-25.2	Mid Ch, Horz, DH5
12399.400	46.7	0.5	1.6	210.0	3.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	High Ch, Horz, DH5
12009.390	46.5	-0.2	2.2	317.0	3.0	0.0	Vert	PK	0.0	46.3	74.0	-27.7	Low Ch, Horz, DH5
12009.330	46.3	-0.2	1.61	258.0	3.0	0.0	Horz	PK	0.0	46.1	74.0	-27.9	Low Ch, Horz, DH5
12200.610	45.5	0.1	1.5	198.0	3.0	0.0	Vert	PK	0.0	45.6	74.0	-28.4	Mid Ch, Horz, DH5
12199.340	45.5	0.1	1.5	159.0	3.0	0.0	Horz	PK	0.0	45.6	74.0	-28.4	Mid Ch, Horz, DH5
12399.130	43.3	0.5	1.5	246.0	3.0	0.0	Horz	PK	0.0	43.8	74.0	-30.2	High Ch, Horz, DH5

CONCLUSION

Pass

Tested By

End of Test Report