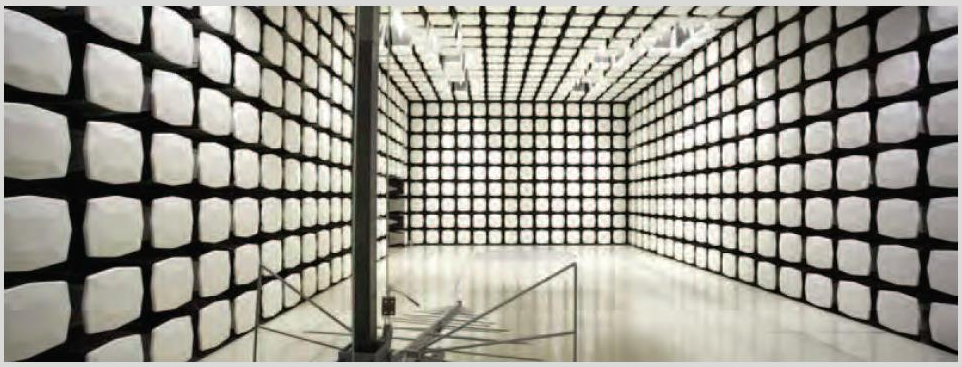
NAL Research Corporation

SHOUT sp Handheld Iridium Smartphone

FCC 15.247:2021

Bluetooth (FHSS) Radio

Report: PCTE0003.3 Rev. 1, Issue Date: March 11, 2022



NVLAP LAB CODE: 200630-0

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CERTIFICATE OF TEST

Last Date of Test: August 30, 2021
NAL Research Corporation
EUT: SHOUT sp Handheld Iridium Smartphone

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2021	ANSI C63.10:2013, KDB 558074

Results

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

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. 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
01	Updated block diagrams	2022-03-11	7
	Antenna gain in the power settings has been updated to 3 dBi	2022-03-11	14
	Antenna gain has been updated to 3 dBi and final values have been adjusted to account for the change in antenna gain.	2022-03-11	53
	Antenna info has been added to config 10	2022-03-11	10-13
	AC powerline conducted emissions data has been replaced with new data.	2022-03-11	16-20
	HCI testing has been added to the configurations.	2022-03-11	10-13
	Added both accreditations bodies to the report to reflect Elements transitions to A2LA	2022-03-11	1

ACCREDITATIONS AND AUTHORIZATIONS

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.

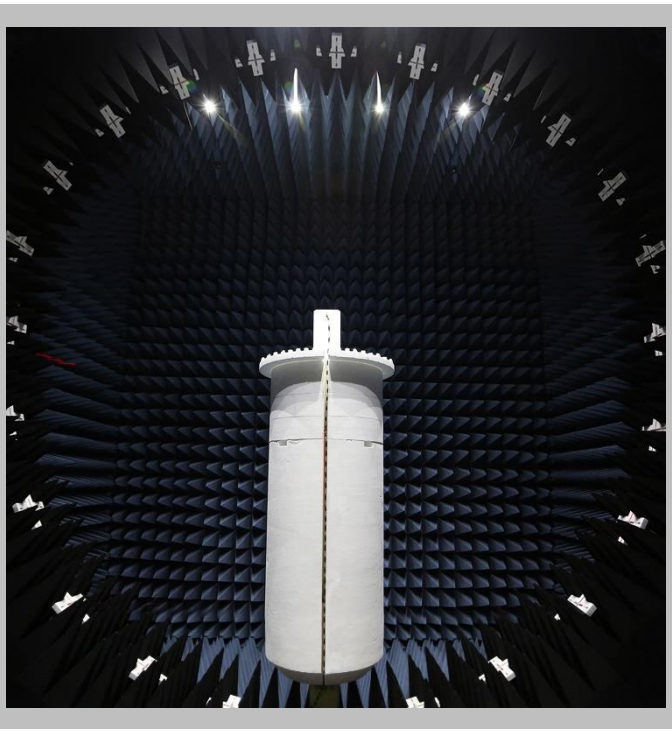
SCOPE

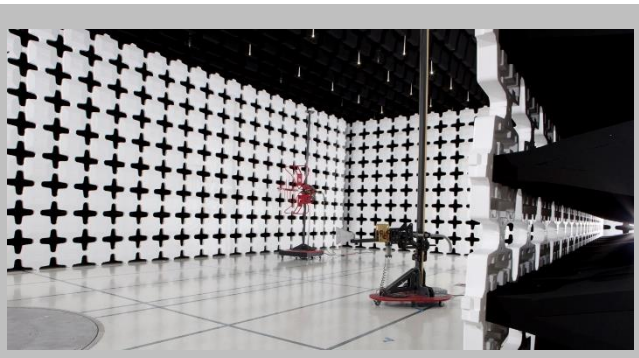
For details on the Scopes of our Accreditations, please visit:

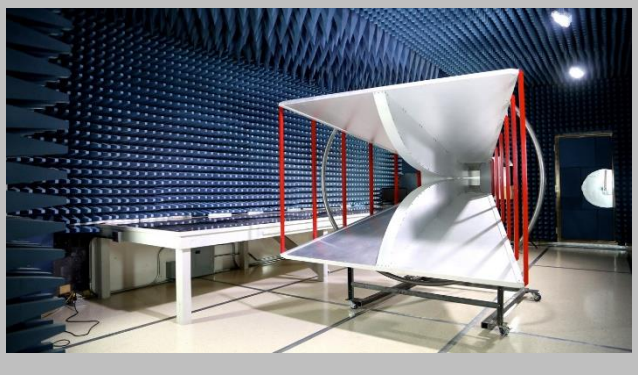
California Minnesota Oregon Texas Washington

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)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	3.2 dB	-3.2 dB

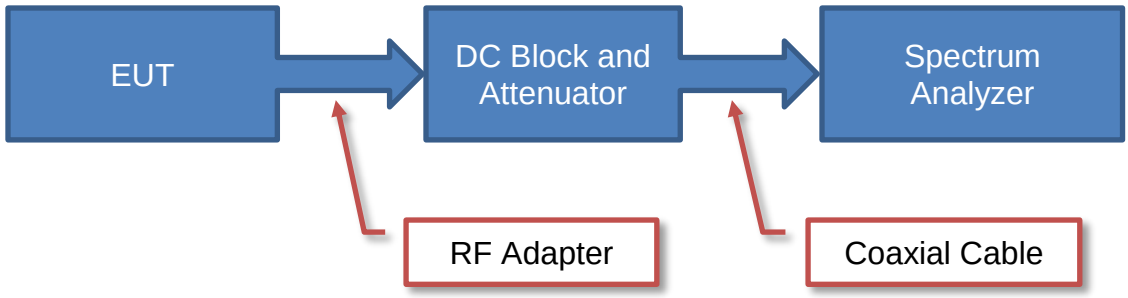
TEST SETUP BLOCK DIAGRAMS

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.

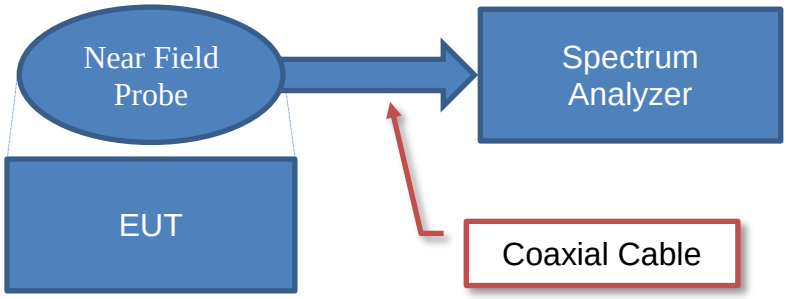
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

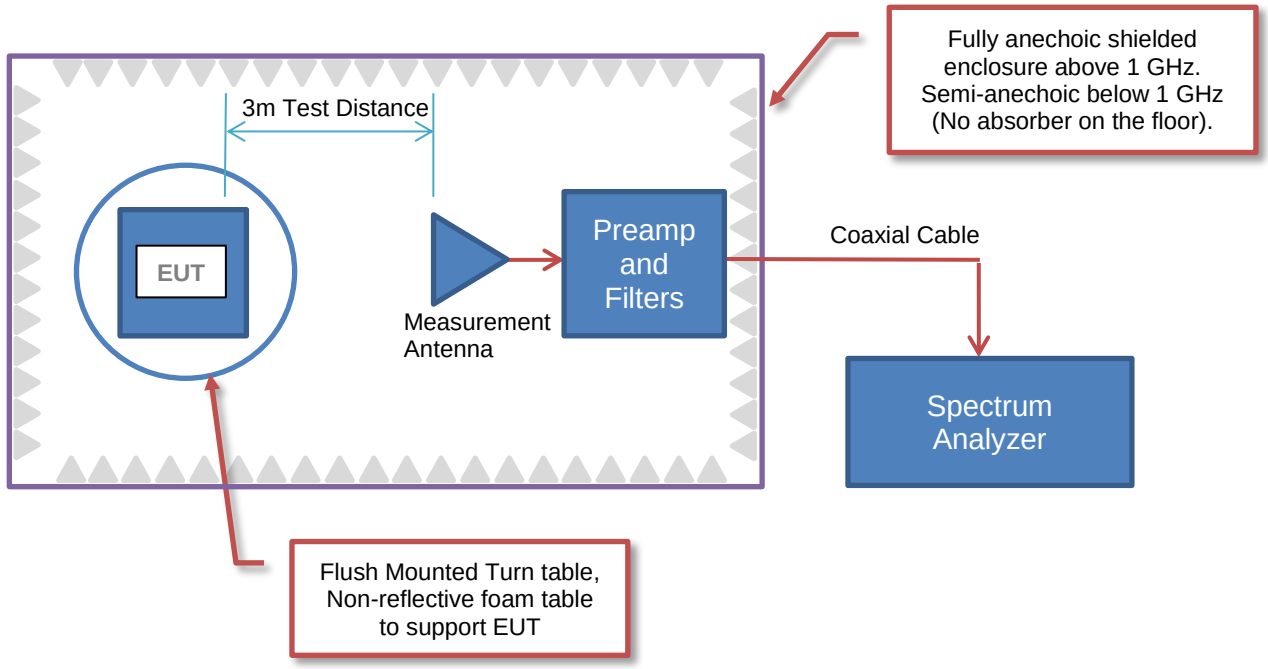


Sample Calculation (logarithmic units)

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**

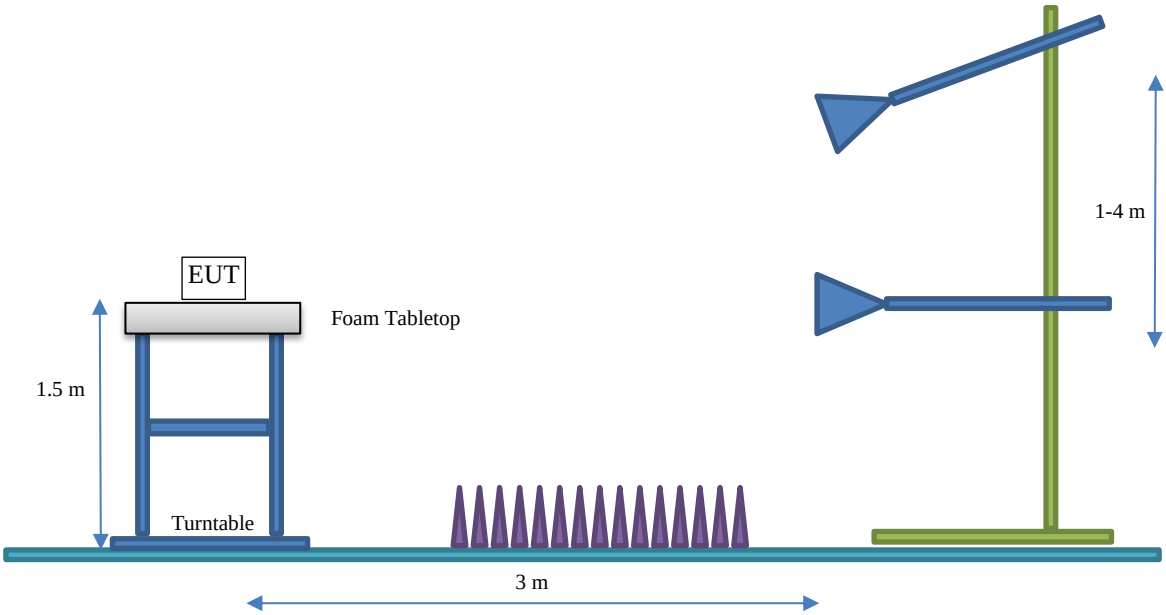
Conducted Emissions:

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

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:	NAL Research Corporation
Address:	11100 Endeavor Ct. Suite 300
City, State, Zip:	Manassas, VA 20109
Test Requested By:	Andy Schiltz
EUT:	SHOUT sp Handheld Iridium Smartphone
First Date of Test:	May 24, 2021
Last Date of Test:	August 30, 2021
Receipt Date of Samples:	May 24, 2021
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Handheld Iridium Smartphone with 1.6 GHz radio and 802.11/Bluetooth radio.

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

CONFIGURATIONS

Configuration PCTE0003- 1

Software/Firmware Running during test	
Description	**Version**
HCI Tester	3.0.0.37

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	3000425060205200
Antenna	HARRIS-NEXGEN	8960263-1	18942

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Client Laptop	Lenovo	81VS	R90YGNE6
USB extension	ANKER	A7516	ACDPUD0A02200670
Earbuds	Betron	MK23	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable (Power)	Yes	3.0 m	No	Phone	USB extension
USB Cable x2	Yes	1.1 m	No	Phone	Unterminated
USB Cable (com)	Yes	1.1 m	No	Phone	USB extension
Headphones	No	1.2 m	No	Earbuds	SHOUT sp Handheld Iridium Smartphone

CONFIGURATIONS

Configuration PCTE0003- 3

Software/Firmware Running during test	
Description	**Version**
HCI Tester	3.0.0.37

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	FCC 1

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Inspiron	20976051206
AC/DC Adapter	Dell	LA45NM140	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable (Power)	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
AC Power	No	1.0 m	No	AC/DC Adapter	AC Power
DC Power	No	1.8 m	No	AC/DC Adapter	Laptop
USB Cable x2	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
USB Cable	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	Unterminated

CONFIGURATIONS

Configuration PCTE0003- 10

Software/Firmware Running during test	
Description	**Version**
HCI Tester	3.0.0.37

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	FCC 2
Antenna	HARRIS-NEXGEN	8960263-1	18942

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude E5450	5z9B063
Earbuds	Betron	MK23	None
AC Adaptor	SONY	AC-UUD12	1910AQ2032484

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable x3	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
USB Cable	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	AC Adaptor
Headphones	No	1.2 m	No	Earbuds	SHOUT sp Handheld Iridium Smartphone

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2020-05-24	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.
2	2021-05-24	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.
3	2021-05-24	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.
4	2021-05-24	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.
5	2021-05-24	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.
6	2021-05-24	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.
7	2021-05-24	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	2021-05-24	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2021-05-24	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.
10	2021-08-24	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.
11	2021-08-30	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
12	2022-03-04	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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)
On-ground MID Chip	Manufacturer	2400 – 2485	3.0

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

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Type	Channel		Frequency (MHz)	Power Setting
DH5, 2DH5, 3DH5	FHSS	0	Low Channel	2402	Max
		39	Mid Channel	2441	Max
		79	High channel	2480	Max

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

TEST DESCRIPTION

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT	EVGA	2022-01-04	2023-01-04
LISN	Solar Electronics	9252-50-R-24-BNC	LIP	2021-09-10	2022-09-10
Receiver	Gauss Instruments	TDEMI 30M	ARN	2021-04-06	2022-04-06

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.2 dB	-3.2 dB

CONFIGURATIONS INVESTIGATED

PCTE0003-10

MODES INVESTIGATED

Continuous Tx - Bluetooth, Mid ch = 2441 MHz, DH5

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 1	Date:	2022-03-04
Customer:	PCTEST Engineering Laboratory, LLC	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	41.7%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	PCTE0003-10

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2022	ANSI C63.10:2013

TEST PARAMETERS

Run #:	23	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

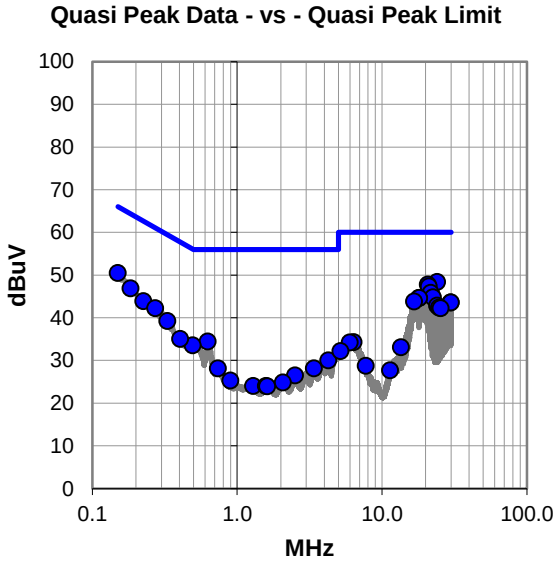
None

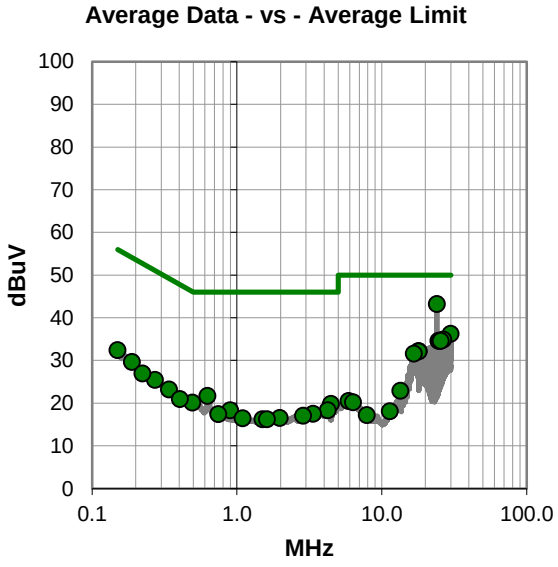
EUT OPERATING MODES

Continuous Tx - Bluetooth, Mid ch = 2441 MHz, DH5

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

RESULTS - Run #23

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
24.000	27.5	20.9	48.4	60.0	-11.6
20.725	27.0	20.8	47.8	60.0	-12.2
21.072	26.5	20.8	47.3	60.0	-12.7
21.763	25.0	20.8	45.8	60.0	-14.2
22.454	24.0	20.8	44.8	60.0	-15.2
17.978	24.0	20.6	44.6	60.0	-15.4
18.054	24.0	20.6	44.6	60.0	-15.4
0.150	30.4	20.1	50.5	66.0	-15.5
16.632	23.2	20.6	43.8	60.0	-16.2
29.839	22.5	21.1	43.6	60.0	-16.4
29.954	22.5	21.1	43.6	60.0	-16.4
24.067	21.9	20.9	42.8	60.0	-17.2
0.184	26.9	20.0	46.9	64.3	-17.4
24.758	21.5	20.9	42.4	60.0	-17.6
25.449	21.3	20.9	42.2	60.0	-17.8
0.225	23.9	20.0	43.9	62.6	-18.7
0.272	22.3	19.9	42.2	61.1	-18.9
0.330	19.4	19.8	39.2	59.5	-20.3
0.626	14.6	19.8	34.4	56.0	-21.6
0.493	13.7	19.8	33.5	56.1	-22.6
0.405	15.2	19.8	35.0	57.8	-22.8
6.387	14.1	20.2	34.3	60.0	-25.7
6.005	14.0	20.2	34.2	60.0	-25.8
4.267	10.0	20.0	30.0	56.0	-26.0
13.542	12.7	20.4	33.1	60.0	-26.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
24.000	22.3	20.9	43.2	50.0	-6.8
29.966	15.1	21.1	36.2	50.0	-13.8
26.601	13.9	21.0	34.9	50.0	-15.1
24.632	13.7	20.9	34.6	50.0	-15.4
25.323	13.7	20.9	34.6	50.0	-15.4
25.553	13.7	20.9	34.6	50.0	-15.4
17.981	11.6	20.6	32.2	50.0	-17.8
18.005	11.5	20.6	32.1	50.0	-17.9
16.635	11.0	20.6	31.6	50.0	-18.4
0.150	12.3	20.1	32.4	56.0	-23.6
0.628	1.9	19.8	21.7	46.0	-24.3
0.188	9.6	20.0	29.6	54.1	-24.5
0.272	5.5	19.9	25.4	51.1	-25.7
0.223	6.9	20.0	26.9	52.7	-25.8
0.493	0.3	19.8	20.1	46.1	-26.0
0.339	3.4	19.8	23.2	49.2	-26.0
4.462	-0.2	20.0	19.8	46.0	-26.2
0.405	1.1	19.8	20.9	47.8	-26.9
13.492	2.5	20.4	22.9	50.0	-27.1
0.901	-1.6	19.9	18.3	46.0	-27.7
4.250	-1.7	20.0	18.3	46.0	-27.7
3.363	-2.5	20.0	17.5	46.0	-28.5
0.744	-2.5	19.9	17.4	46.0	-28.6
2.871	-3.0	20.0	17.0	46.0	-29.0
1.973	-3.5	20.0	16.5	46.0	-29.5

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 1	Date:	2022-03-04
Customer:	PCTEST Engineering Laboratory, LLC	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	41.7%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	PCTE0003-10

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2022	ANSI C63.10:2013

TEST PARAMETERS

Run #:	24	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

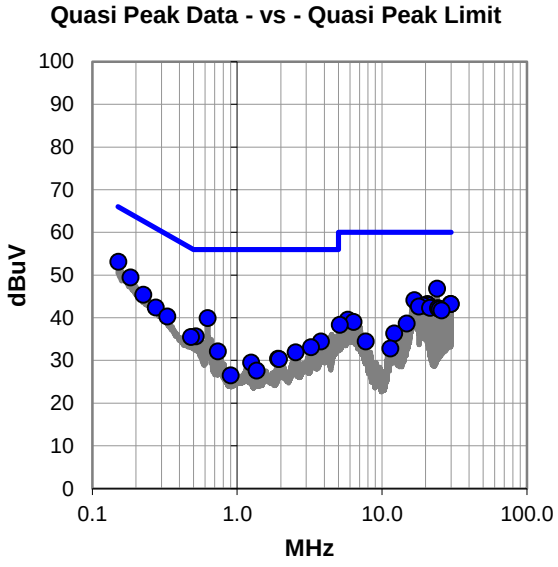
None

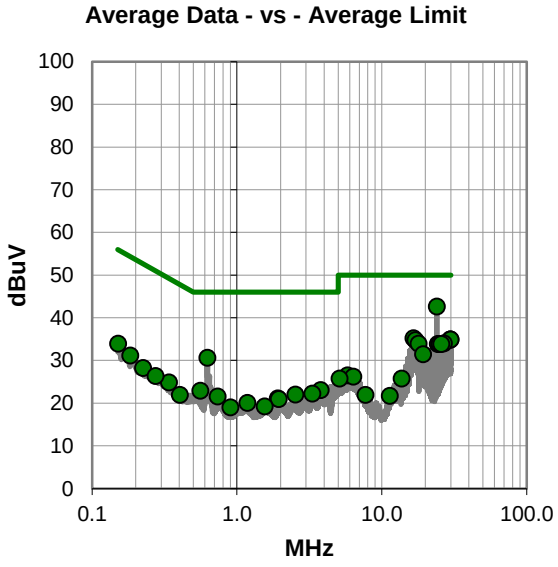
EUT OPERATING MODES

Continuous Tx - Bluetooth, Mid ch = 2441 MHz, DH5

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

RESULTS - Run #24

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.152	33.0	20.1	53.1	65.9	-12.8
24.000	25.9	20.9	46.8	60.0	-13.2
0.184	29.4	20.0	49.4	64.3	-14.9
16.717	23.5	20.6	44.1	60.0	-15.9
0.628	20.1	19.8	39.9	56.0	-16.1
20.622	22.4	20.8	43.2	60.0	-16.8
29.839	22.1	21.1	43.2	60.0	-16.8
29.954	22.1	21.1	43.2	60.0	-16.8
20.725	22.2	20.8	43.0	60.0	-17.0
19.331	22.2	20.6	42.8	60.0	-17.2
0.225	25.4	20.0	45.4	62.6	-17.2
18.003	22.0	20.6	42.6	60.0	-17.4
21.533	21.5	20.8	42.3	60.0	-17.7
24.412	21.3	20.9	42.2	60.0	-17.8
25.103	21.1	20.9	42.0	60.0	-18.0
25.796	20.8	20.9	41.7	60.0	-18.3
0.275	22.5	19.9	42.4	61.0	-18.6
0.330	20.5	19.8	40.3	59.5	-19.2
0.518	15.8	19.8	35.6	56.0	-20.4
5.818	19.3	20.2	39.5	60.0	-20.5
0.481	15.7	19.8	35.5	56.3	-20.8
6.368	18.8	20.2	39.0	60.0	-21.0
14.804	18.1	20.5	38.6	60.0	-21.4
3.791	14.4	20.0	34.4	56.0	-21.6
5.118	18.1	20.2	38.3	60.0	-21.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
24.000	21.7	20.9	42.6	50.0	-7.4
16.612	14.6	20.6	35.2	50.0	-14.8
29.735	13.8	21.1	34.9	50.0	-15.1
29.850	13.8	21.1	34.9	50.0	-15.1
29.943	13.8	21.1	34.9	50.0	-15.1
17.083	14.1	20.6	34.7	50.0	-15.3
0.628	10.8	19.8	30.6	46.0	-15.4
26.832	13.0	21.0	34.0	50.0	-16.0
18.003	13.3	20.6	33.9	50.0	-16.1
24.401	12.9	20.9	33.8	50.0	-16.2
25.092	12.9	20.9	33.8	50.0	-16.2
25.207	12.9	20.9	33.8	50.0	-16.2
25.784	12.9	20.9	33.8	50.0	-16.2
19.331	10.8	20.6	31.4	50.0	-18.6
0.152	13.8	20.1	33.9	55.9	-22.0
3.791	3.0	20.0	23.0	46.0	-23.0
0.559	3.1	19.8	22.9	46.0	-23.1
0.184	11.1	20.0	31.1	54.3	-23.2
5.818	6.3	20.2	26.5	50.0	-23.5
3.315	2.2	20.0	22.2	46.0	-23.8
6.368	6.0	20.2	26.2	50.0	-23.8
2.541	2.0	20.0	22.0	46.0	-24.0
5.118	5.5	20.2	25.7	50.0	-24.3
13.719	5.3	20.4	25.7	50.0	-24.3
0.225	8.2	20.0	28.2	52.6	-24.4

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.05.19.0
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

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.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

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 20*log(dc), based on the requirements for pulsed operation from ANSI C63.10 section 7.5.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFI	2020-12-08	2021-12-08
Antenna - Biconilog	Teseq	CBL 6141B	AXR	2020-10-13	2022-10-13
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	2020-11-17	2021-11-17
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2020-11-17	2021-11-17
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2020-11-18	2021-11-18
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2020-11-18	2021-11-18
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	2021-07-16	2022-07-16
Cable	N/A	Bilog Cables	EVA	2020-11-17	2021-11-17
Cable	N/A	Double Ridge Horn Cables	EVB	2020-11-17	2021-11-17
Cable	None	Standard Gain Horns Cable	EVF	2020-11-18	2021-11-18
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	EVY	2021-07-16	2022-07-16
Attenuator	Coaxicom	3910-20	AXZ	2021-02-15	2022-02-15
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	2021-02-15	2022-02-15
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2020-11-17	2021-11-17

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.05.19.0
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26.5 GHz

POWER INVESTIGATED

5.0 VDC via USB

CONFIGURATIONS INVESTIGATED

PCTE0003-1

MODES INVESTIGATED

Continuous Tx, BT, Low Ch = 2402 MHz, Mid Ch = 2441 MHz, High Ch = 2480 MHz
DH5, 2DH5, 3DH5

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.05.19.0
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	See Configurations	Date:	2021-08-24
Customer:	NAL Research Corporation	Temperature:	21.9°C
Attendees:	None	Relative Humidity:	42.5%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	5.0 VDC via USB	Configuration:	PCTE0003-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	15	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

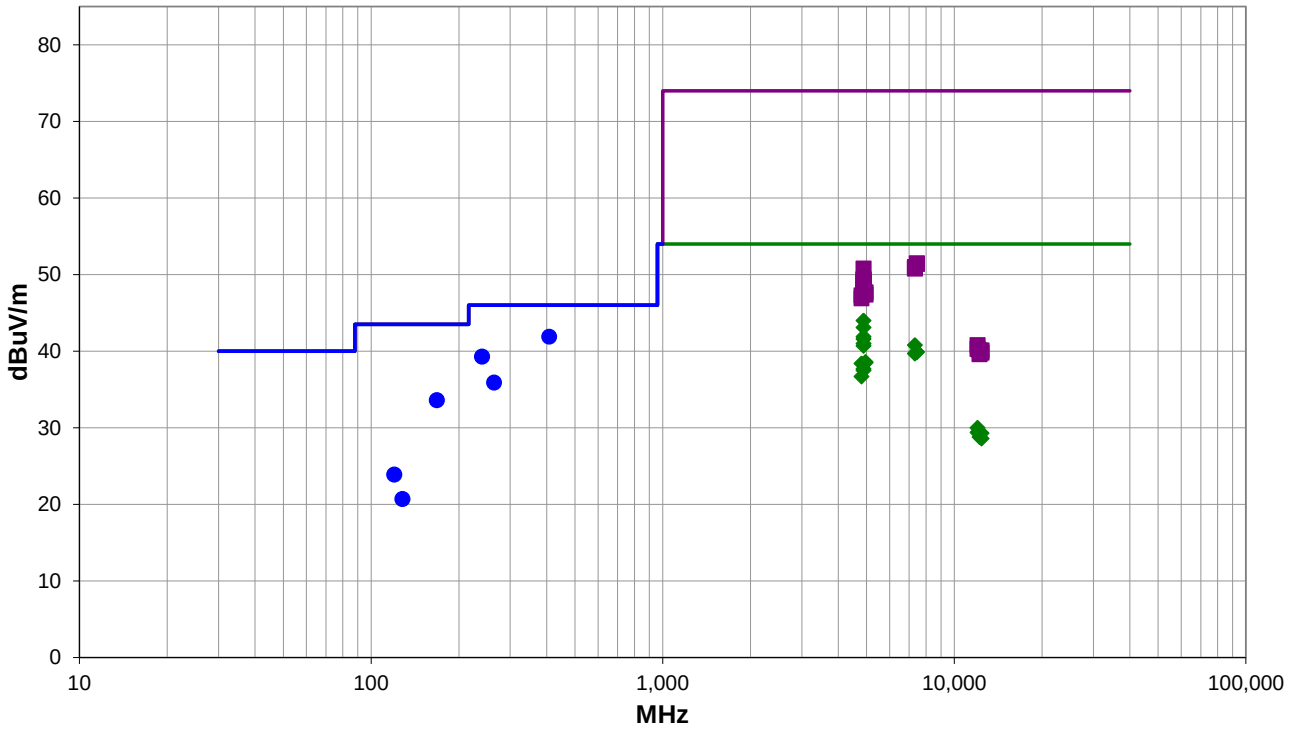
Please reference data comments below for channel, data rate, and EUT orientation.

EUT OPERATING MODES

Continuous Tx, BT, Low Ch = 2402 MHz, Mid Ch = 2441 MHz, High Ch = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 15 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.05.19.0
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #15

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
408.010	39.4	2.5	1.0	318.0	3.0	0.0	Horz	QP	0.0	41.9	46.0	-4.1	High Ch, DH5, EUT Horz
240.010	42.7	-3.4	1.0	326.0	3.0	0.0	Horz	QP	0.0	39.3	46.0	-6.7	High Ch, DH5, EUT Horz
168.010	38.3	-4.7	2.2	324.0	3.0	0.0	Horz	QP	0.0	33.6	43.5	-9.9	High Ch, DH5, EUT Horz
4881.975	38.0	6.0	2.06	205.0	3.0	0.0	Horz	AV	0.0	44.0	54.0	-10.0	Mid Ch, DH5, EUT Vert
264.010	38.1	-2.2	1.0	269.0	3.0	0.0	Horz	QP	0.0	35.9	46.0	-10.1	High Ch, DH5, EUT Horz
4881.975	37.1	6.0	1.61	193.0	3.0	0.0	Horz	AV	0.0	43.1	54.0	-10.9	Mid Ch, DH5, EUT Horz
4882.017	35.9	6.0	1.58	165.0	3.0	0.0	Vert	AV	0.0	41.9	54.0	-12.1	Mid Ch, DH5, EUT Vert
4881.950	35.6	6.0	1.5	210.0	3.0	0.0	Vert	AV	0.0	41.6	54.0	-12.4	Mid Ch, DH5, EUT Horz
4881.992	35.0	6.0	1.11	242.0	3.0	0.0	Horz	AV	0.0	41.0	54.0	-13.0	Mid Ch, DH5, EUT on Side
7323.183	29.1	11.7	1.77	155.0	3.0	0.0	Horz	AV	0.0	40.8	54.0	-13.2	Mid Ch, DH5, EUT Vert
4882.033	34.7	6.0	1.52	183.0	3.0	0.0	Vert	AV	0.0	40.7	54.0	-13.3	Mid Ch, DH5, EUT on Side
7440.308	27.7	12.2	3.31	50.0	3.0	0.0	Horz	AV	0.0	39.9	54.0	-14.1	High Ch, DH5, EUT Vert
7439.233	27.7	12.2	1.5	265.0	3.0	0.0	Vert	AV	0.0	39.9	54.0	-14.1	High Ch, DH5, EUT Vert
7321.742	28.0	11.7	1.5	38.0	3.0	0.0	Vert	AV	0.0	39.7	54.0	-14.3	Mid Ch, DH5, EUT Vert
4959.917	32.7	5.9	1.5	22.0	3.0	0.0	Vert	AV	0.0	38.6	54.0	-15.4	High Ch, DH5, EUT Vert
4960.058	32.6	5.9	1.5	36.0	3.0	0.0	Horz	AV	0.0	38.5	54.0	-15.5	High Ch, DH5, EUT Vert
4804.017	33.3	5.1	2.05	262.0	3.0	0.0	Horz	AV	0.0	38.4	54.0	-15.6	Low Ch, DH5, EUT Vert
4881.883	31.7	6.0	2.24	253.0	3.0	0.0	Horz	AV	0.0	37.7	54.0	-16.3	Mid Ch, 3DH5, EUT Vert
4882.042	31.5	6.0	2.24	253.0	3.0	0.0	Horz	AV	0.0	37.5	54.0	-16.5	Mid Ch, 3DH5, EUT Vert
4803.992	31.6	5.1	1.09	146.0	3.0	0.0	Vert	AV	0.0	36.7	54.0	-17.3	Low Ch, DH5, EUT Vert
120.008	28.0	-4.1	1.0	38.0	3.0	0.0	Vert	QP	0.0	23.9	43.5	-19.6	High Ch, DH5, EUT Horz
7438.558	39.3	12.2	1.5	265.0	3.0	0.0	Vert	PK	0.0	51.5	74.0	-22.5	High Ch, DH5, EUT Vert
7442.183	39.2	12.2	3.31	50.0	3.0	0.0	Horz	PK	0.0	51.4	74.0	-22.6	High Ch, DH5, EUT Vert
128.012	24.3	-3.6	2.12	116.0	3.0	0.0	Horz	QP	0.0	20.7	43.5	-22.8	High Ch, DH5, EUT Horz
7322.592	39.3	11.7	1.5	38.0	3.0	0.0	Vert	PK	0.0	51.0	74.0	-23.0	Mid Ch, DH5, EUT Vert
4882.342	44.8	6.0	2.06	205.0	3.0	0.0	Horz	PK	0.0	50.8	74.0	-23.2	Mid Ch, DH5, EUT Vert
7323.533	39.1	11.7	1.77	155.0	3.0	0.0	Horz	PK	0.0	50.8	74.0	-23.2	Mid Ch, DH5, EUT Vert
12010.490	28.9	1.1	1.09	178.0	3.0	0.0	Horz	AV	0.0	30.0	54.0	-24.0	Low Ch. DH5, EUT Vert
4881.700	43.4	6.0	1.61	193.0	3.0	0.0	Horz	PK	0.0	49.4	74.0	-24.6	Mid Ch, DH5, EUT Horz
4882.642	43.4	6.0	1.5	210.0	3.0	0.0	Vert	PK	0.0	49.4	74.0	-24.6	Mid Ch, DH5, EUT Horz
12009.060	28.3	1.1	1.04	181.0	3.0	0.0	Vert	AV	0.0	29.4	54.0	-24.6	Low Ch. DH5, EUT Vert
12397.980	27.8	1.5	1.0	333.0	3.0	0.0	Vert	AV	0.0	29.3	54.0	-24.7	High Ch, DH5, EUT Vert
12206.030	28.3	0.9	1.0	195.0	3.0	0.0	Horz	AV	0.0	29.2	54.0	-24.8	Mid Ch, DH5, EUT Vert
4881.967	43.0	6.0	1.58	165.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	Mid Ch, DH5, EUT Vert
4881.267	42.9	6.0	1.11	242.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	Mid Ch, DH5, EUT on Side
12204.720	27.9	0.9	1.03	54.0	3.0	0.0	Vert	AV	0.0	28.8	54.0	-25.2	Mid Ch, DH5, EUT Vert
4882.167	42.8	6.0	1.52	183.0	3.0	0.0	Vert	PK	0.0	48.8	74.0	-25.2	Mid Ch, DH5, EUT on Side
12398.730	27.1	1.5	2.43	60.0	3.0	0.0	Horz	AV	0.0	28.6	54.0	-25.4	High Ch, DH5, EUT Vert
4882.200	42.1	6.0	2.24	253.0	3.0	0.0	Horz	PK	0.0	48.1	74.0	-25.9	Mid Ch, 3DH5, EUT Vert
4960.075	41.8	5.9	1.5	22.0	3.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	High Ch, DH5, EUT Vert
4881.925	41.6	6.0	2.24	253.0	3.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	Mid Ch, 2DH5, EUT Vert

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.05.19.0
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

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
4960.483	41.5	5.9	1.5	36.0	3.0	0.0	Horz	PK	0.0	47.4	74.0	-26.6	High Ch, DH5, EUT Vert
4804.783	42.1	5.2	2.05	262.0	3.0	0.0	Horz	PK	0.0	47.3	74.0	-26.7	Low Ch, DH5, EUT Vert
4802.075	41.8	5.1	1.09	146.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Low Ch, DH5, EUT Vert
12009.960	39.7	1.1	1.09	178.0	3.0	0.0	Horz	PK	0.0	40.8	74.0	-33.2	Low Ch. DH5, EUT Vert
12011.250	39.2	1.1	1.04	181.0	3.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	Low Ch. DH5, EUT Vert
12207.080	39.2	0.9	1.0	195.0	3.0	0.0	Horz	PK	0.0	40.1	74.0	-33.9	Mid Ch, DH5, EUT Vert
12398.990	38.6	1.5	1.0	333.0	3.0	0.0	Vert	PK	0.0	40.1	74.0	-33.9	High Ch, DH5, EUT Vert
12398.480	38.3	1.5	2.43	60.0	3.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	High Ch, DH5, EUT Vert
12205.420	38.7	0.9	1.03	54.0	3.0	0.0	Vert	PK	0.0	39.6	74.0	-34.4	Mid Ch, DH5, EUT Vert

CONCLUSION
Pass

Tested By

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.05.19.0
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	See Configurations	Date:	2021-08-24
Customer:	NAL Research Corporation	Temperature:	22.6°C
Attendees:	None	Relative Humidity:	42.8%
Customer Project:	None	Bar. Pressure:	1017 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	5.0 VDC via USB	Configuration:	PCTE0003-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	21	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

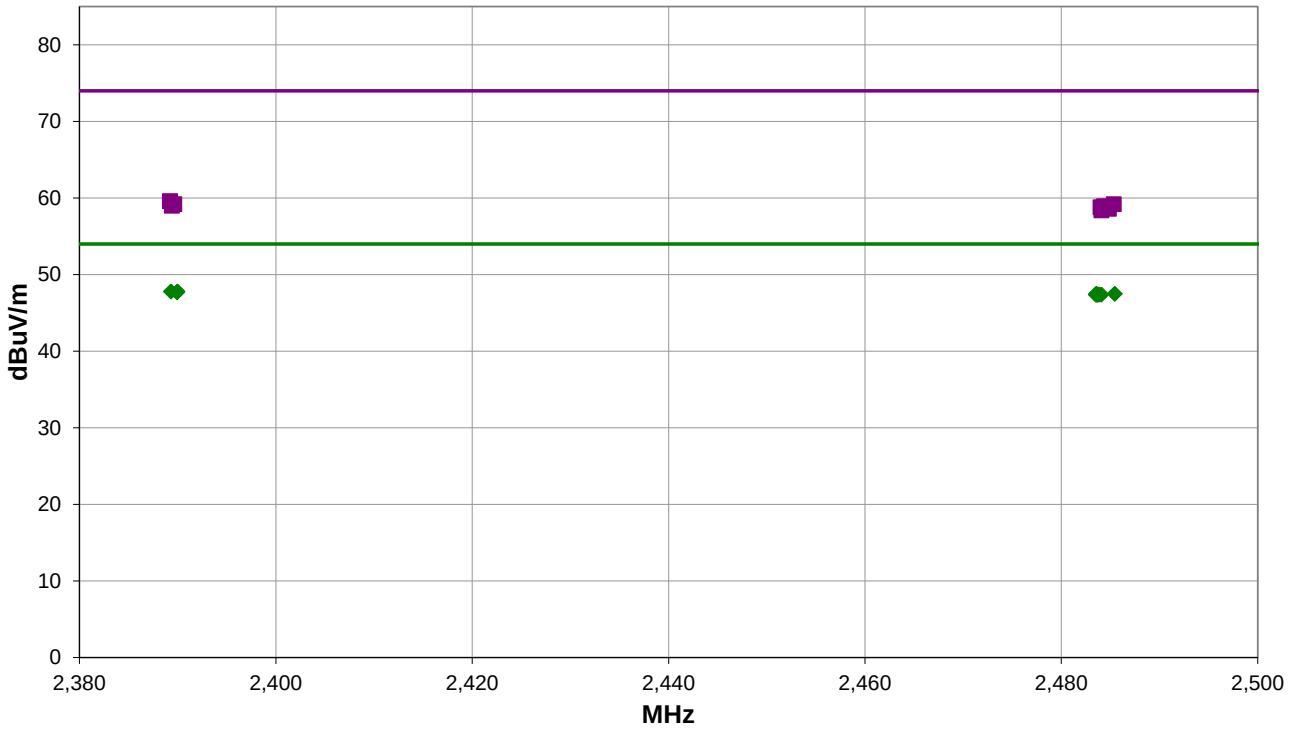
Please reference data comments below for channel, data rate, and EUT orientation.

EUT OPERATING MODES

Continuous Tx, BT, Low Ch = 2402 MHz, Mid Ch = 2441 MHz, High Ch = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 21 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.05.19.0
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #21

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
2389.313	31.3	-3.5	1.5	15.0	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	Low Ch, DH5, EUT Horz
2389.977	31.3	-3.5	1.5	15.0	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	Low Ch, 2DH5, EUT Horz
2389.930	31.2	-3.5	1.5	15.0	3.0	20.0	Vert	AV	0.0	47.7	54.0	-6.3	Low Ch, 3DH5, EUT Horz
2485.440	31.0	-3.5	1.5	357.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	High Ch, DH5, EUT Vert
2483.567	31.1	-3.6	1.5	48.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	High Ch, DH5, EUT Horz
2483.703	31.0	-3.6	1.5	173.0	3.0	20.0	Vert	AV	0.0	47.4	54.0	-6.6	High Ch, DH5, EUT Vert
2483.510	31.0	-3.6	1.5	38.0	3.0	20.0	Horz	AV	0.0	47.4	54.0	-6.6	High Ch, DH5, EUT on Side
2483.643	31.0	-3.6	1.5	152.0	3.0	20.0	Vert	AV	0.0	47.4	54.0	-6.6	High Ch, DH5, EUT on Side
2483.573	31.0	-3.6	1.5	15.0	3.0	20.0	Vert	AV	0.0	47.4	54.0	-6.6	High Ch, DH5, EUT Horz
2483.827	31.0	-3.6	1.5	15.0	3.0	20.0	Vert	AV	0.0	47.4	54.0	-6.6	High Ch, 2DH5, EUT Horz
2484.073	31.0	-3.6	1.5	15.0	3.0	20.0	Vert	AV	0.0	47.4	54.0	-6.6	High Ch, 3DH5, EUT Horz
2389.217	43.1	-3.5	1.5	15.0	3.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	Low Ch, DH5, EUT Horz
2485.343	42.7	-3.5	1.5	15.0	3.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch, 3DH5, EUT Horz
2389.647	42.7	-3.5	1.5	15.0	3.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	Low Ch, 3DH5, EUT Horz
2389.403	42.5	-3.5	1.5	15.0	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	Low Ch, 2DH5, EUT Horz
2484.307	42.5	-3.6	1.5	357.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	High Ch, DH5, EUT Vert
2484.433	42.5	-3.6	1.5	15.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	High Ch, 2DH5, EUT Horz
2484.370	42.4	-3.6	1.5	38.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	High Ch, DH5, EUT on Side
2484.313	42.4	-3.6	1.5	48.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	High Ch, DH5, EUT Horz
2484.000	42.4	-3.6	1.5	15.0	3.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	High Ch, DH5, EUT Horz
2484.843	42.2	-3.6	1.5	152.0	3.0	20.0	Vert	PK	0.0	58.6	74.0	-15.4	High Ch, DH5, EUT on Side
2484.083	42.0	-3.6	1.5	173.0	3.0	20.0	Vert	PK	0.0	58.4	74.0	-15.6	High Ch, DH5, EUT Vert

CONCLUSION

Pass

Tested By

DUTY CYCLE

TEST DESCRIPTION

The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

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

The EUT operates at 100% Duty Cycle.

CARRIER FREQUENCY SEPARATION

XMit 2020.12.30.0

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	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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

CARRIER FREQUENCY SEPARATION

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 1	Date:	24-May-21
Customer:	NAL Research Corporation	Temperature:	22.6 °C
Attendees:	None	Humidity:	43.6% RH
Project:	None	Barometric Pres.:	1021 mbar
Tested by:	Jeff Alcoke	Power: 5.0 VDC via USB	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

From this report the 20dB occupied bandwidth is 0.8864 MHz. The carrier frequency seperation shall be 2/3 * the 20 dB occupied bandwidth = 2/3 * 0.8864 MHz = 0.591 MHz.

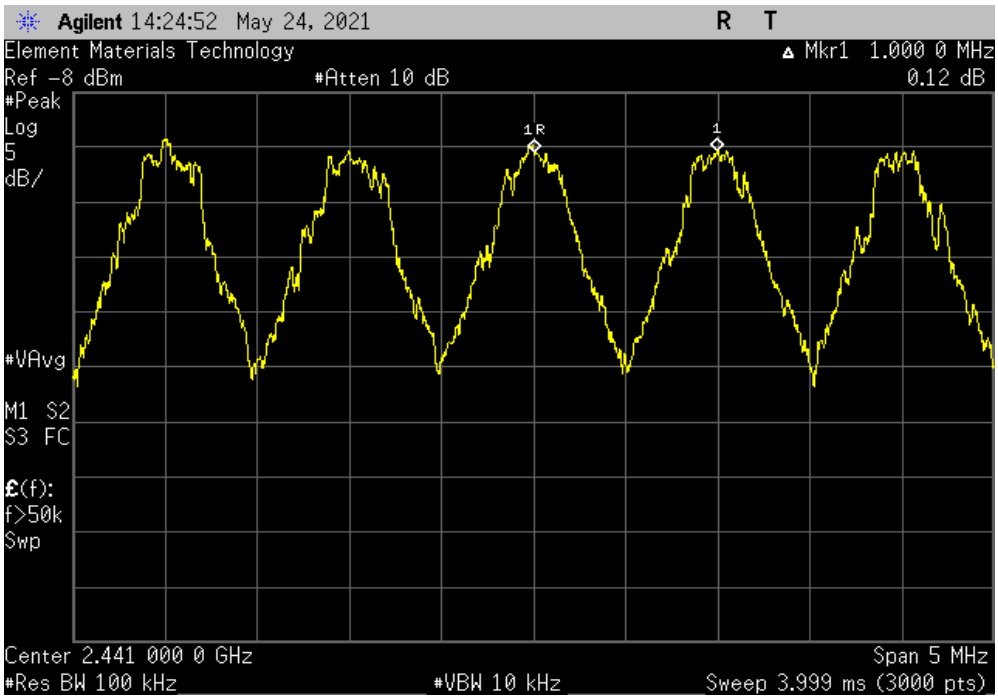
DEVIATIONS FROM TEST STANDARD

None

Configuration #	3	Signature

	Value	Limit (≥)	Results
Hopping Mode (All Channels)			
DH5, GFSK			
Mid Channel, 2441 MHz	1.0 MHz	.591 MHz	Pass

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz						
				Value	Limit (≥)	Results
				1.0 MHz	.591 MHz	Pass



NUMBER OF HOPPING FREQUENCIES

XMit 2020.12.30.0

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
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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

NUMBER OF HOPPING FREQUENCIES

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**	**Work Order:**	**PCTE0003**
Serial Number:	**FCC 1**	**Date:**	**24-May-21**
Customer:	**NAL Research Corporation**	**Temperature:**	**22.6 °C**
Attendees:	**None**	**Humidity:**	**43.6% RH**
Project:	**None**	**Barometric Pres.:**	**1021 mbar**
Tested by:	**Jeff Alcoke**	**Power:** **5.0 VDC via USB**	**Job Site:** **EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

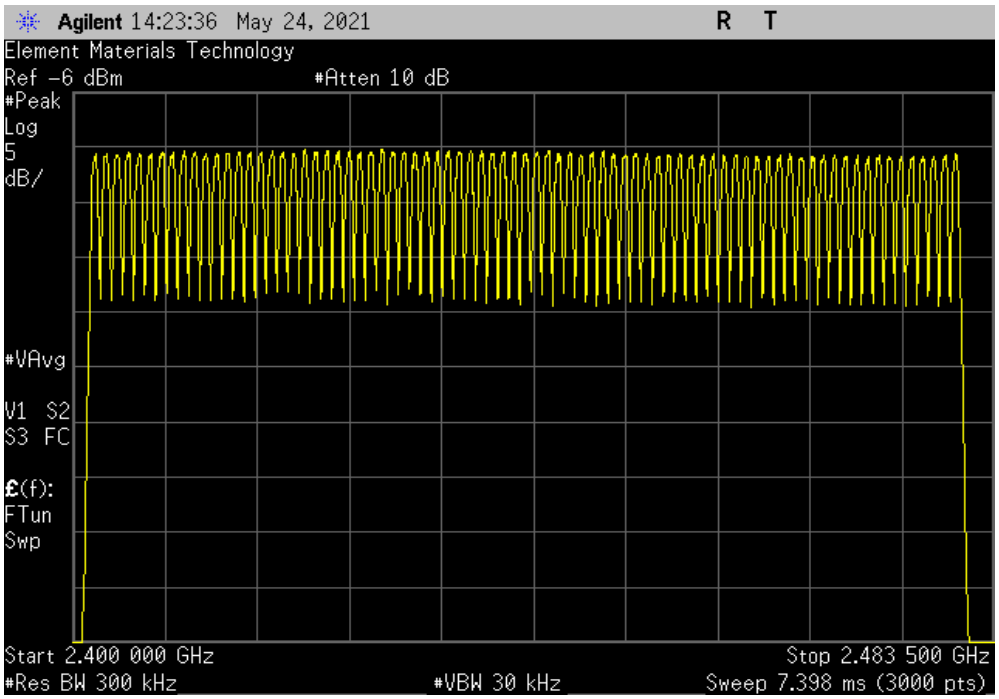
None

Configuration #	**3**	*Signature*

	Number of Channels	**Limit (≥)**	**Results**
Hopping Mode (All Channels)			
DH5, GFSK			
Mid Channel, 2441 MHz	79	15	Pass

NUMBER OF HOPPING FREQUENCIES

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz						
				Number of Channels	**Limit (≥)**	**Results**
				79	15	Pass



DWELL TIME

XMit 2020.12.30.0

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
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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 2021.03.19.1 XMit 2020.12.30.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 1	Date:	24-May-21
Customer:	NAL Research Corporation	Temperature:	22.6 °C
Attendees:	None	Humidity:	43.6% RH
Project:	None	Barometric Pres.:	1021 mbar
Tested by:	Jeff Alcoke	Power: 5.0 VDC via USB	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

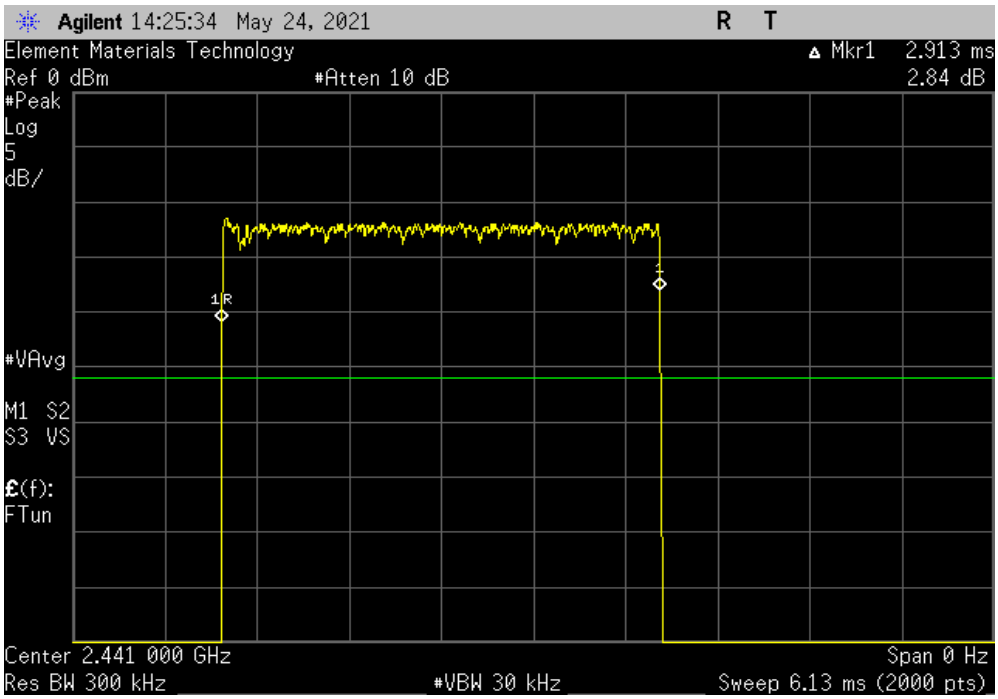
None

Configuration #	3	Signature

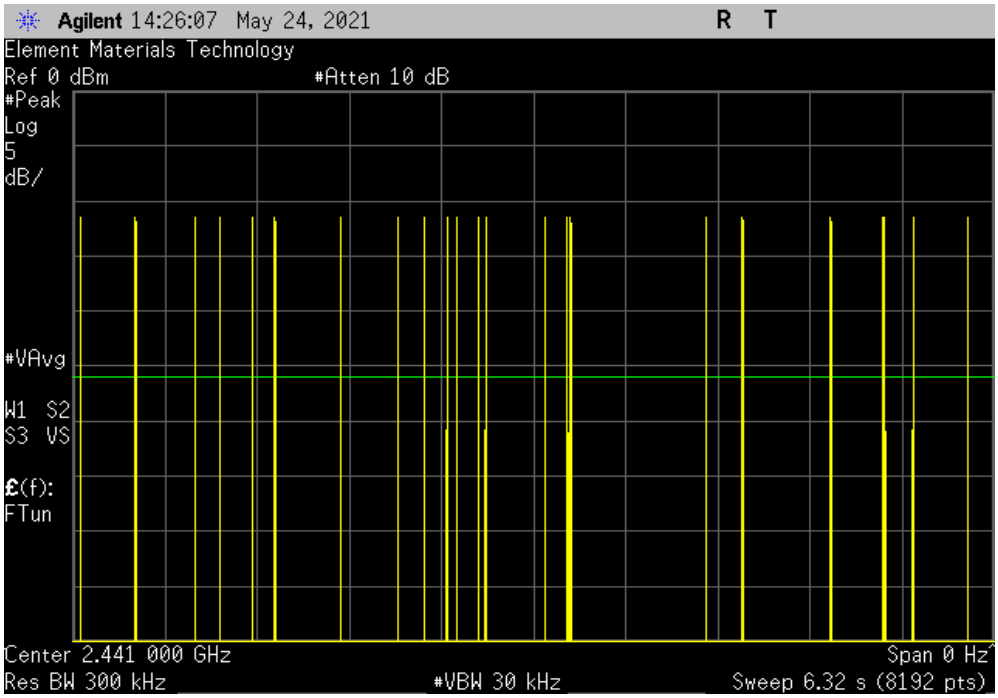
	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
Hopping Mode (All Channels)							
DH5, GFSK							
Mid Channel, 2441 MHz	2.913	N/A	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	23	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	24	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	19	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	14	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	2.913	N/A	20	5	291.3	≤ 400	Pass
2DH5, pi/4-DQPSK							
Mid Channel, 2441 MHz	2.91	N/A	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	30	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	19	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	24	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	20	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	2.91	N/A	23.25	5	338.29	≤ 400	Pass
3DH5, 8-DPSK							
Mid Channel, 2441 MHz	2.914	N/A	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	23	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	21	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	N/A	20	N/A	N/A	N/A	N/A	N/A
Mid Channel, 2441 MHz	2.914	N/A	21.5	5	313.26	≤ 400	Pass

DWELL TIME

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.913	N/A	N/A	N/A	N/A	N/A	N/A

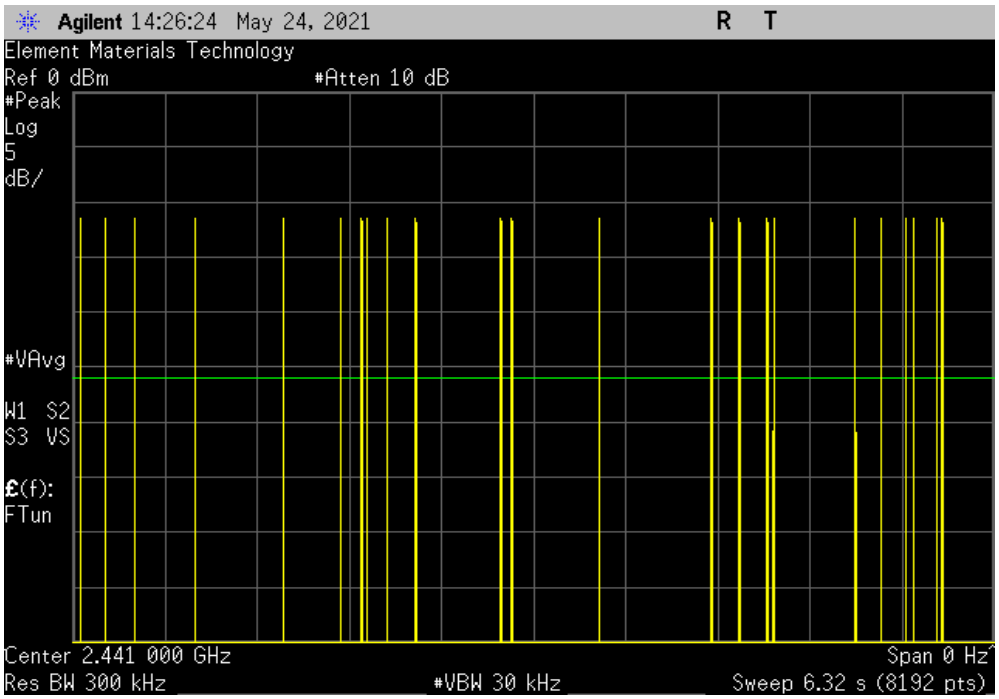


Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	23	N/A	N/A	N/A	N/A	N/A

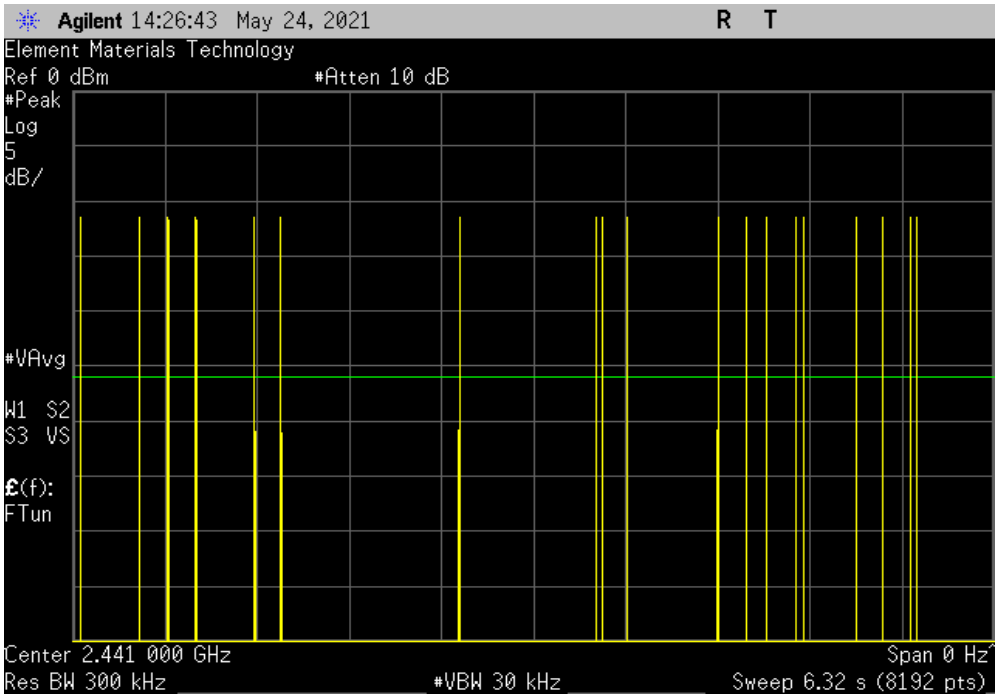


DWELL TIME

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	24	N/A	N/A	N/A	N/A	N/A

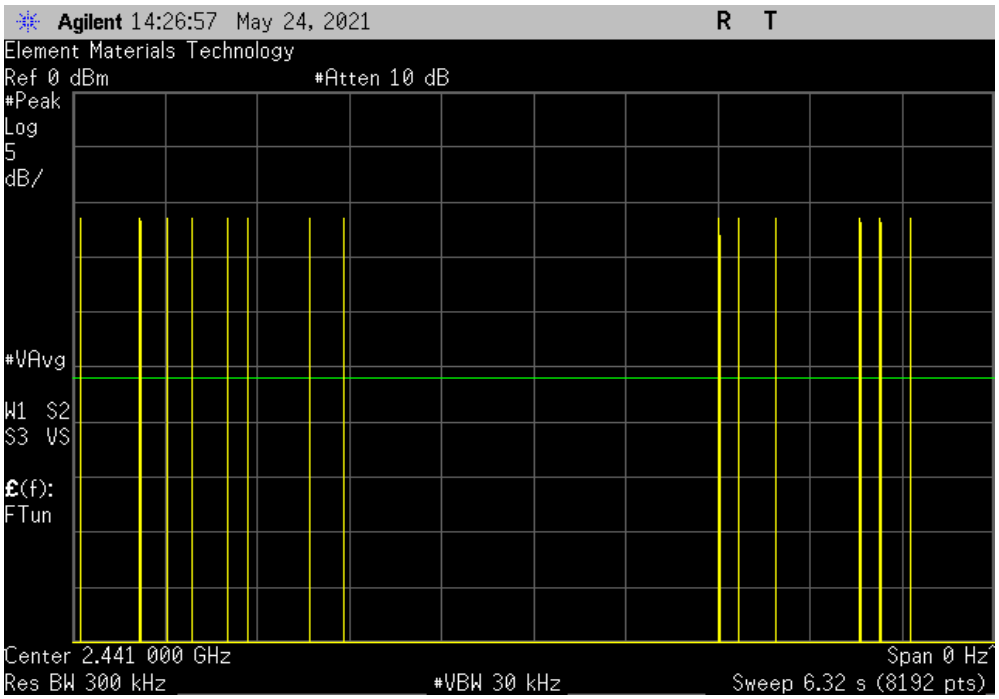


Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	19	N/A	N/A	N/A	N/A	N/A



DWELL TIME

Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	14	N/A	N/A	N/A	N/A	N/A



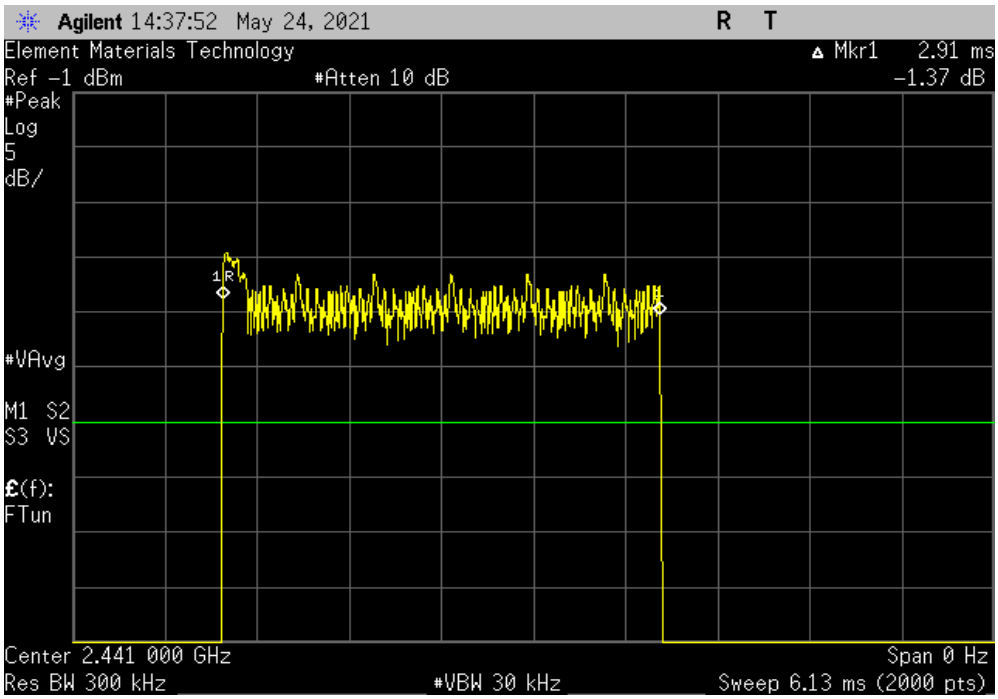
Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.913	N/A	20	5	291.3	≤ 400	Pass

Calculation Only

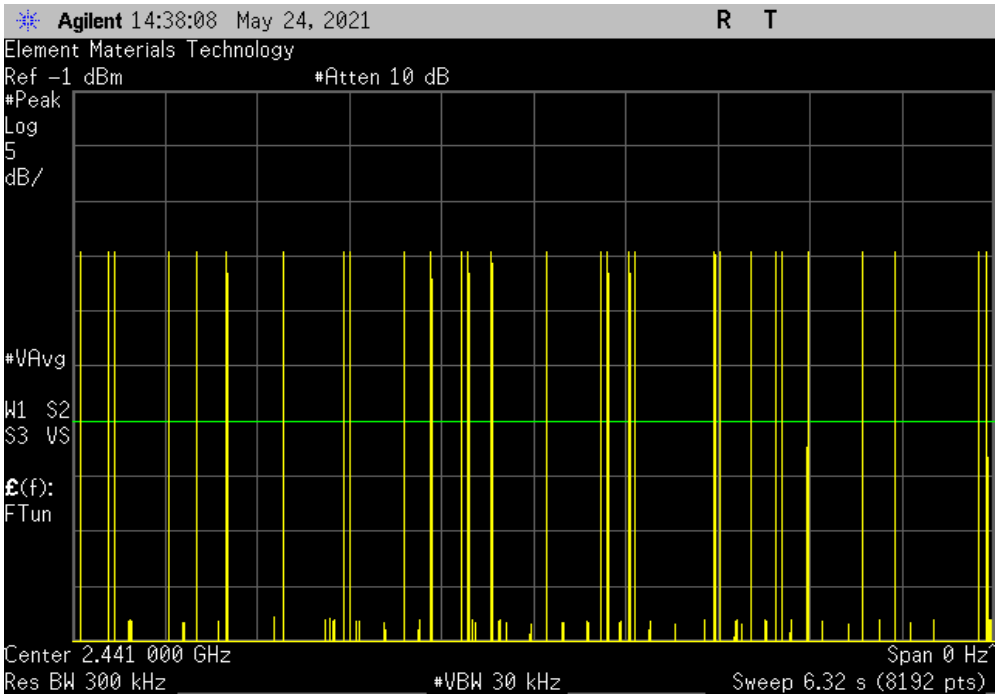
No Screen Capture Required

DWELL TIME

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.91	N/A	N/A	N/A	N/A	N/A	N/A



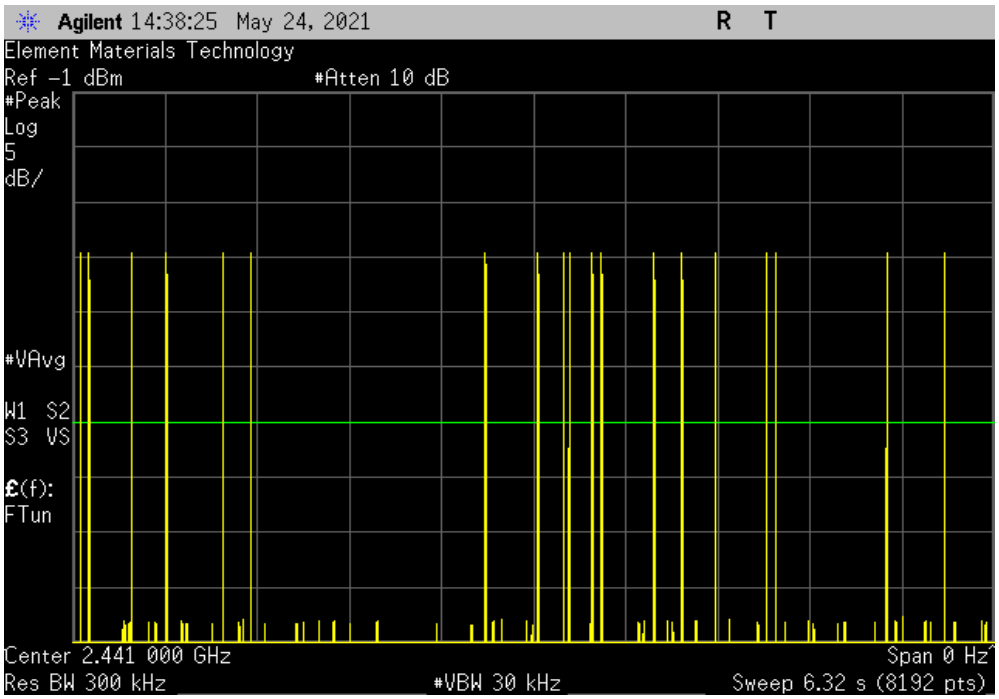
Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	30	N/A	N/A	N/A	N/A	N/A



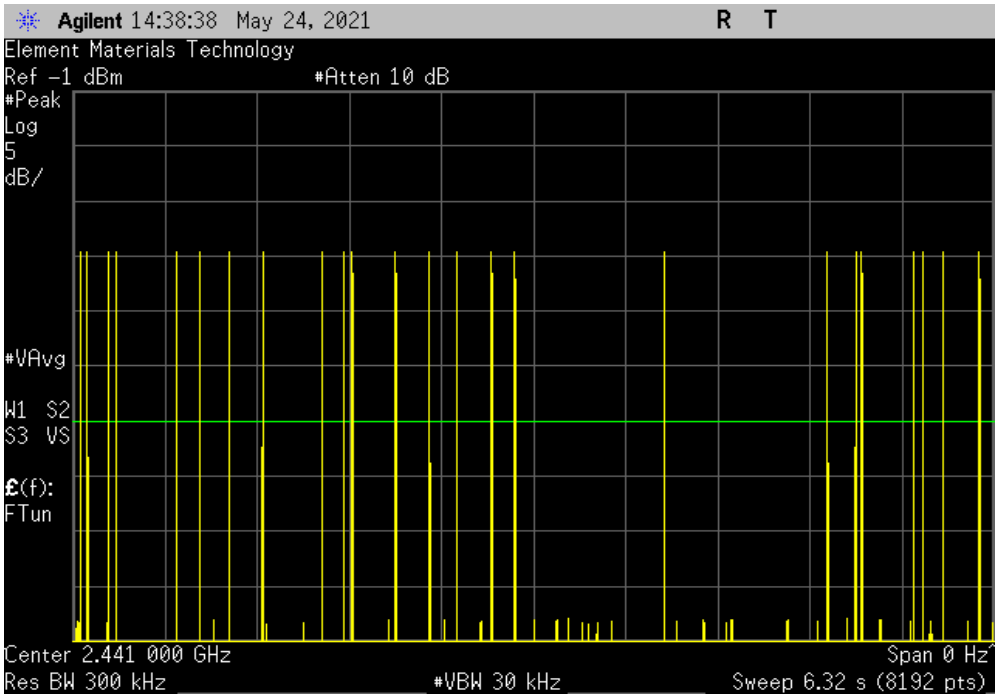
DWELL TIME

TbtTx 2021.03.19.1 XMit 2020.12.30.0

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	19	N/A	N/A	N/A	N/A	N/A



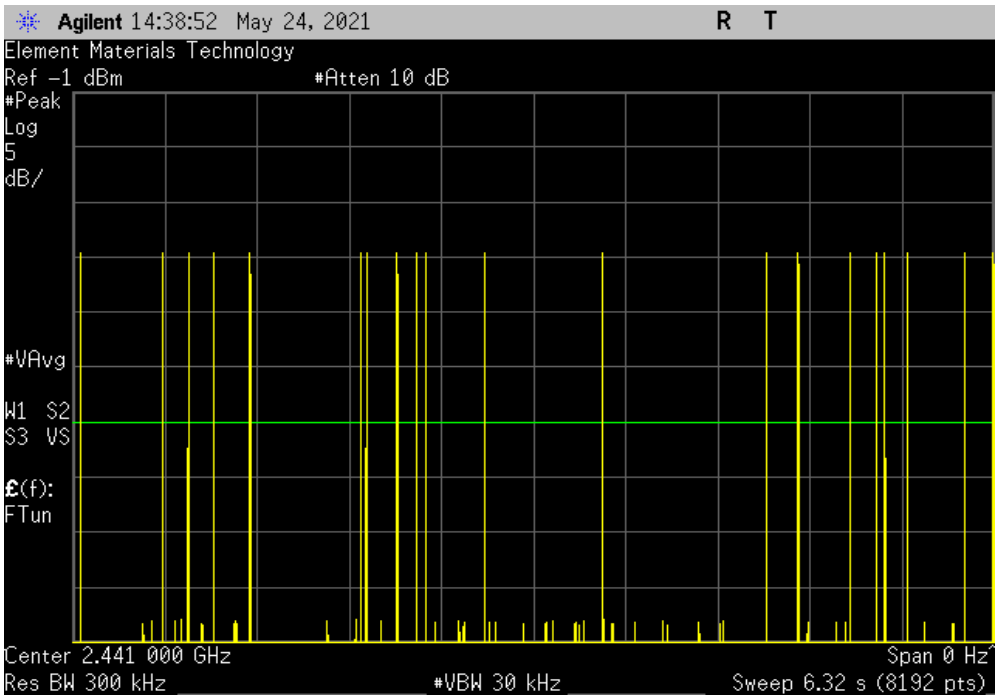
Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	24	N/A	N/A	N/A	N/A	N/A



DWELL TIME

TbtTx 2021.03.19.1 XMit 2020.12.30.0

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A



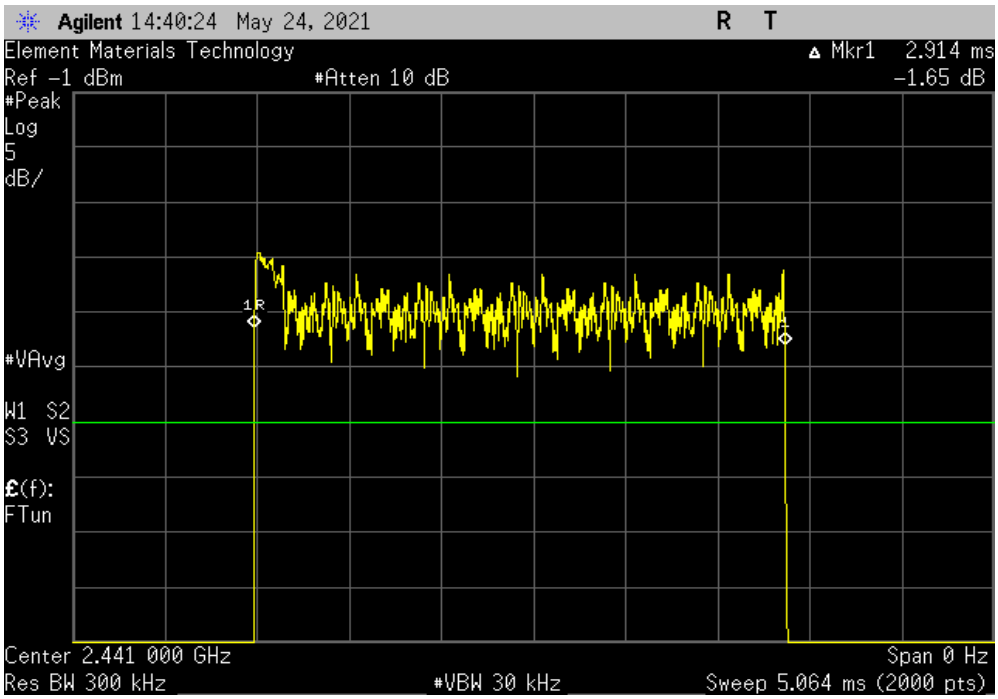
Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.91	N/A	23.25	5	338.29	≤ 400	Pass

Calculation Only

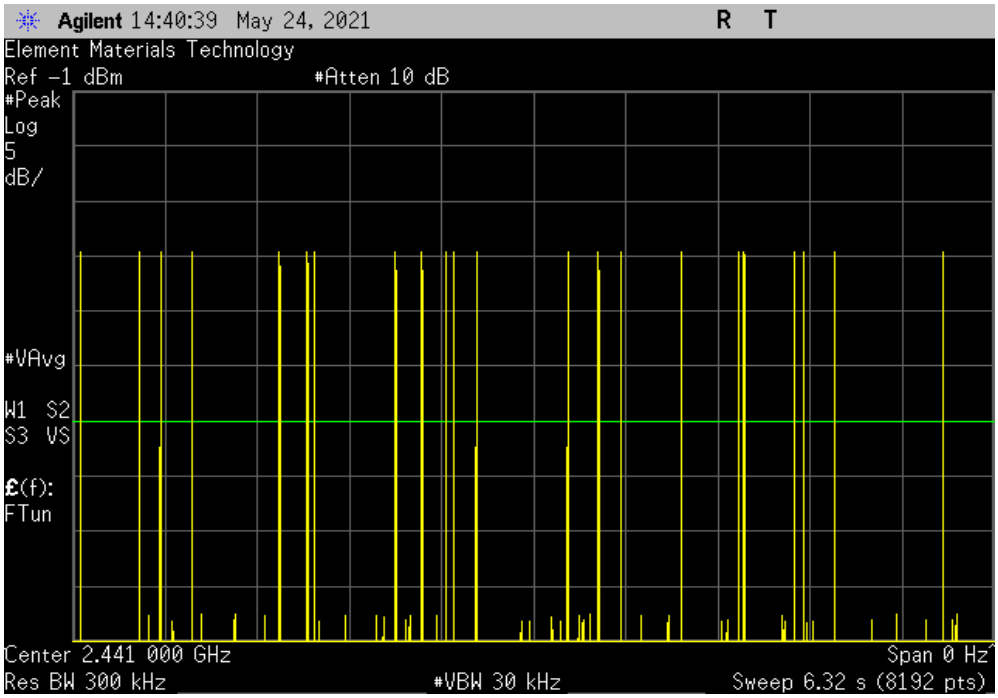
No Screen Capture Required

DWELL TIME

Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.914	N/A	N/A	N/A	N/A	N/A	N/A

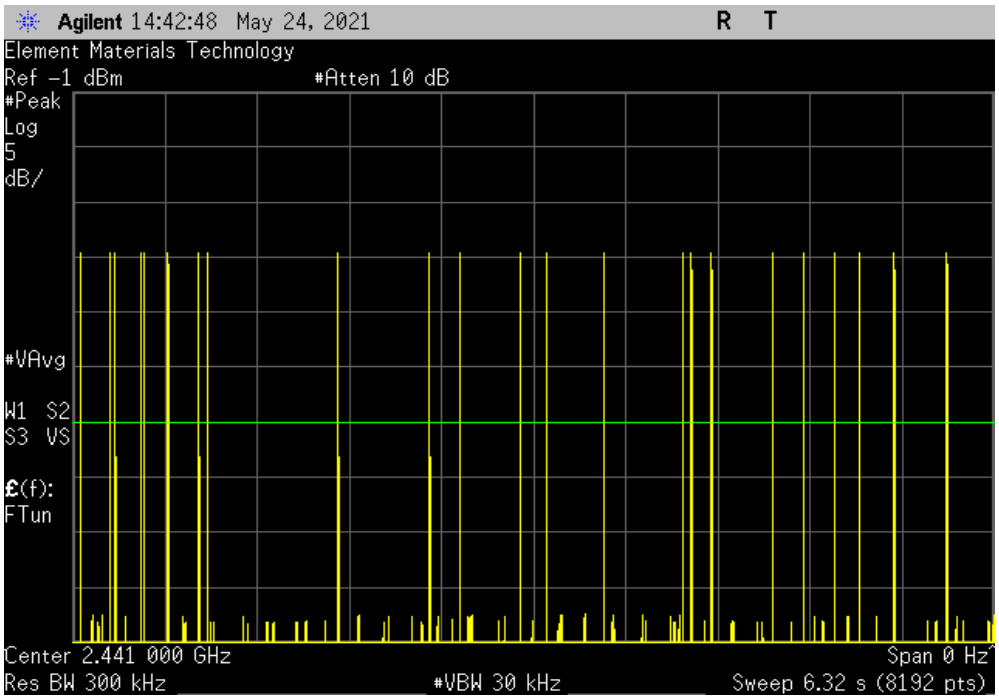


Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	22	N/A	N/A	N/A	N/A	N/A

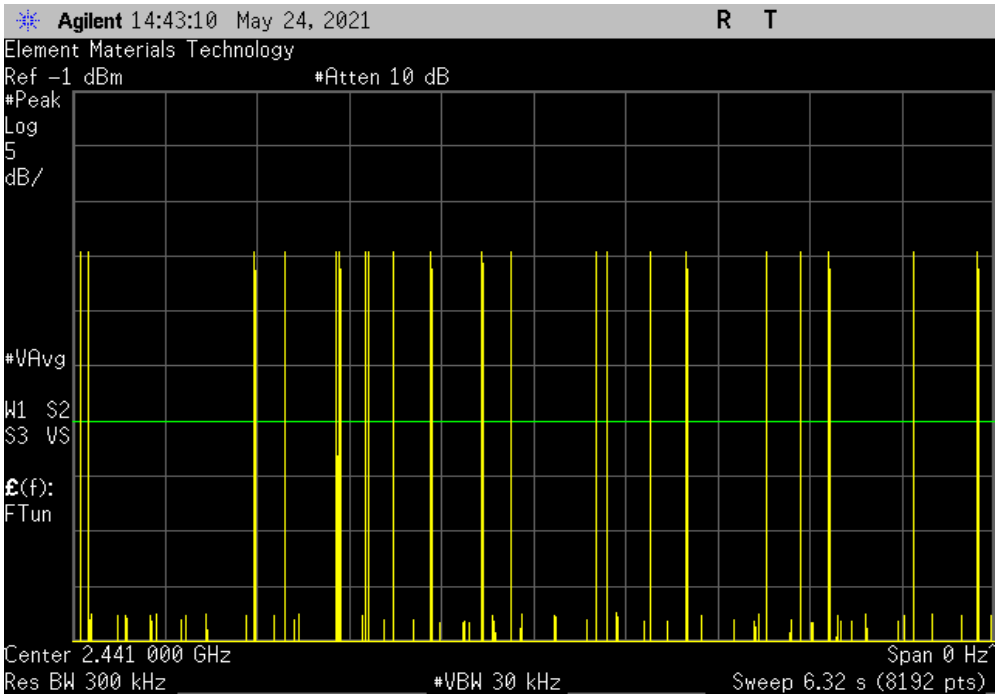


DWELL TIME

Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	23	N/A	N/A	N/A	N/A	N/A



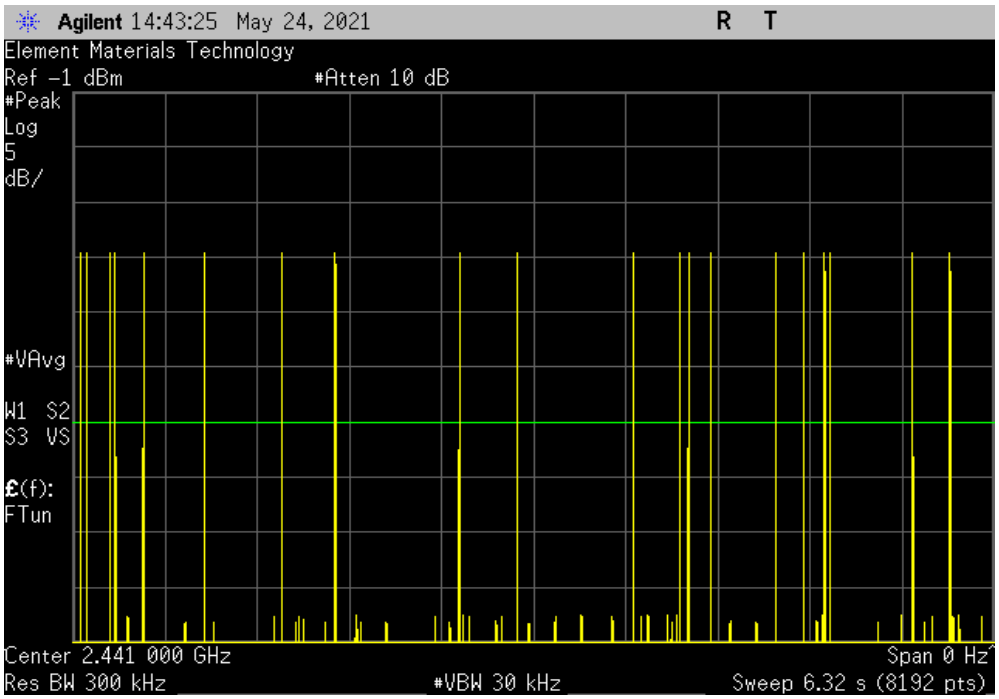
Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	21	N/A	N/A	N/A	N/A	N/A



DWELL TIME

TbtTx 2021.03.19.1 XMit 2020.12.30.0

Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A



Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.914	N/A	21.5	5	313.26	≤ 400	Pass

Calculation Only

No Screen Capture Required

OUTPUT POWER

XMit 2020.12.30.0

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
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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 2021.03.19.1 XMit 2020.12.30.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 1	Date:	24-May-21
Customer:	NAL Research Corporation	Temperature:	22.8 °C
Attendees:	None	Humidity:	44.1% RH
Project:	None	Barometric Pres.:	1021 mbar
Tested by:	Jeff Alcoke	Power: 5.0 VDC via USB	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC block, 20 dB attenuator, measurement cable, and manufacturers SMA patch cable.

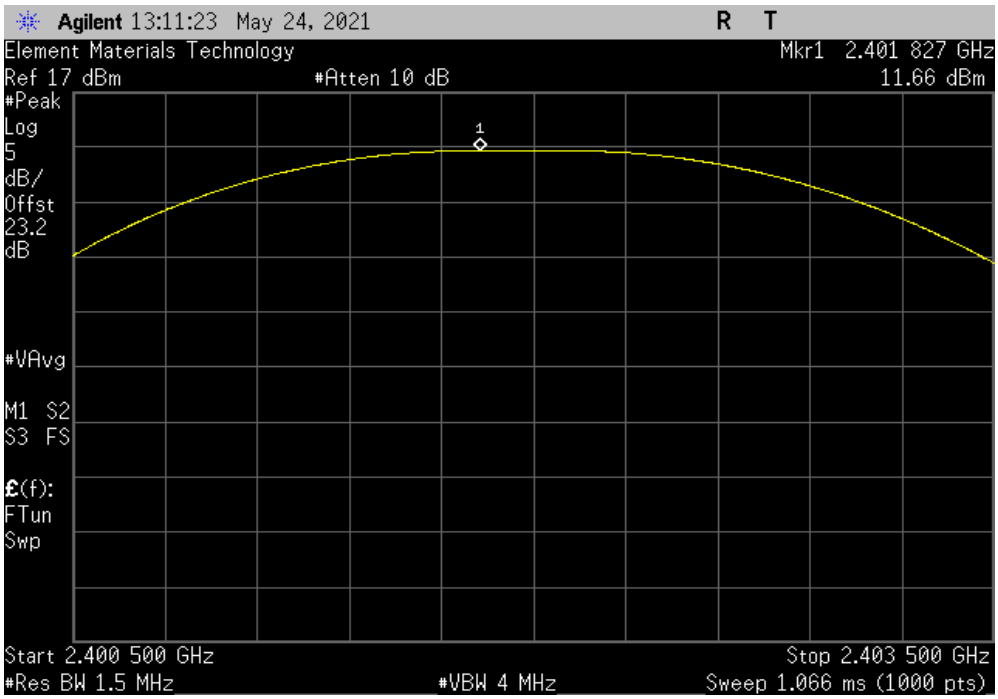
DEVIATIONS FROM TEST STANDARD

None

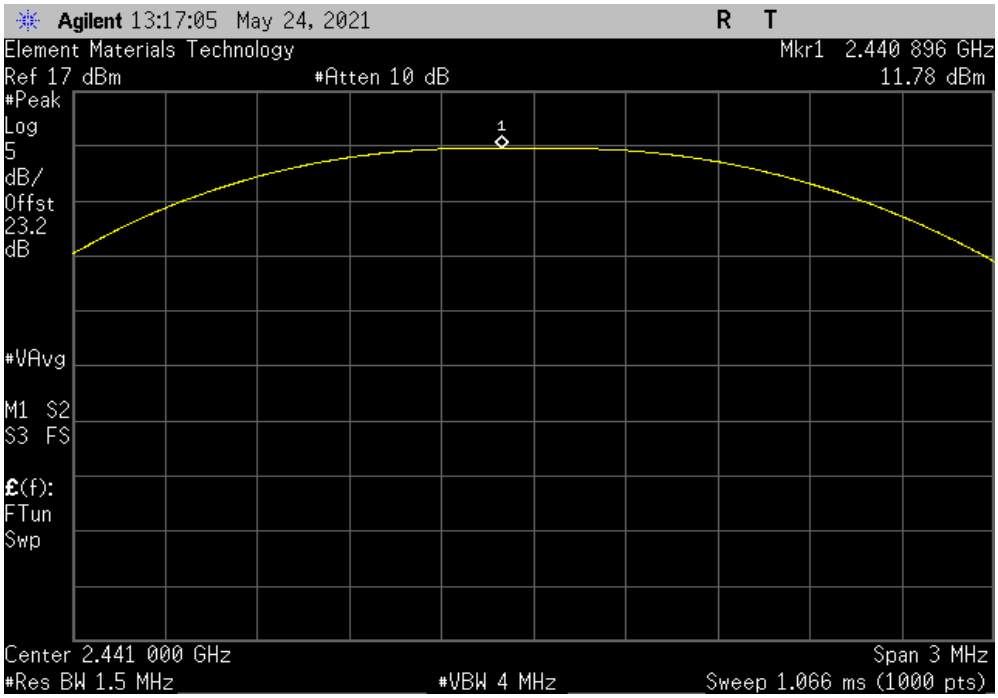
Configuration #	3	Signature

		Out Pwr (dBm)	Limit (dBm)	Result
DH5, GFSK				
	Low Channel, 2402 MHz	11.665	21	Pass
	Mid Channel, 2441 MHz	11.783	21	Pass
	High Channel, 2480 MHz	11.47	21	Pass
2DH5, pi/4-DQPSK				
	Low Channel, 2402 MHz	9.266	21	Pass
	Mid Channel, 2441 MHz	9.891	21	Pass
	High Channel, 2480 MHz	9.982	21	Pass
3DH5, 8-DPSK				
	Low Channel, 2402 MHz	9.933	21	Pass
	Mid Channel, 2441 MHz	10.442	21	Pass
	High Channel, 2480 MHz	10.409	21	Pass

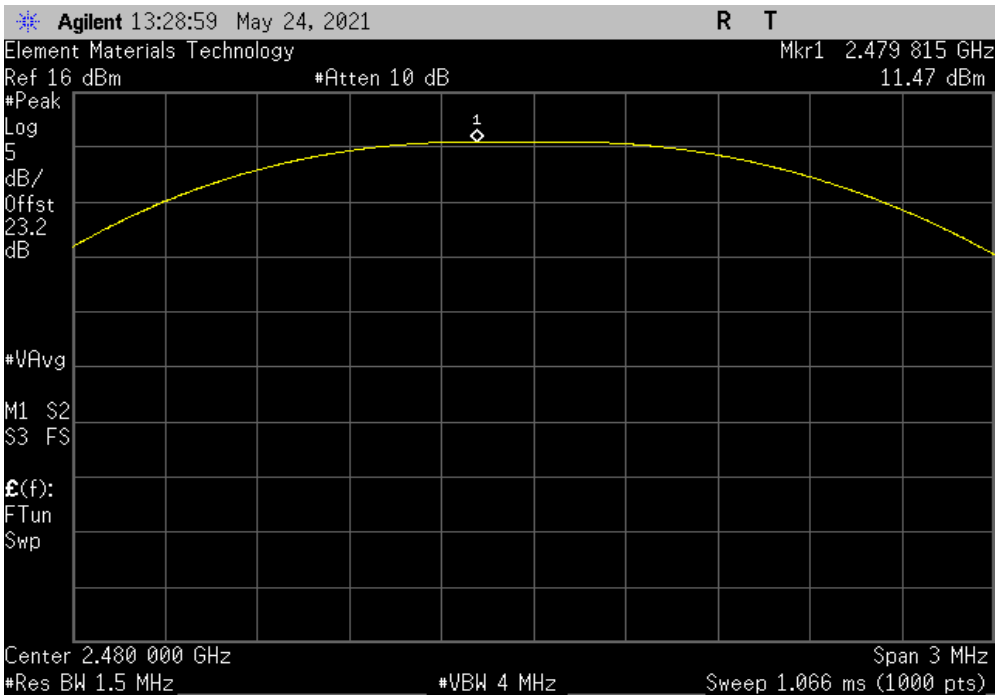
DH5, GFSK, Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				11.665	21	Pass



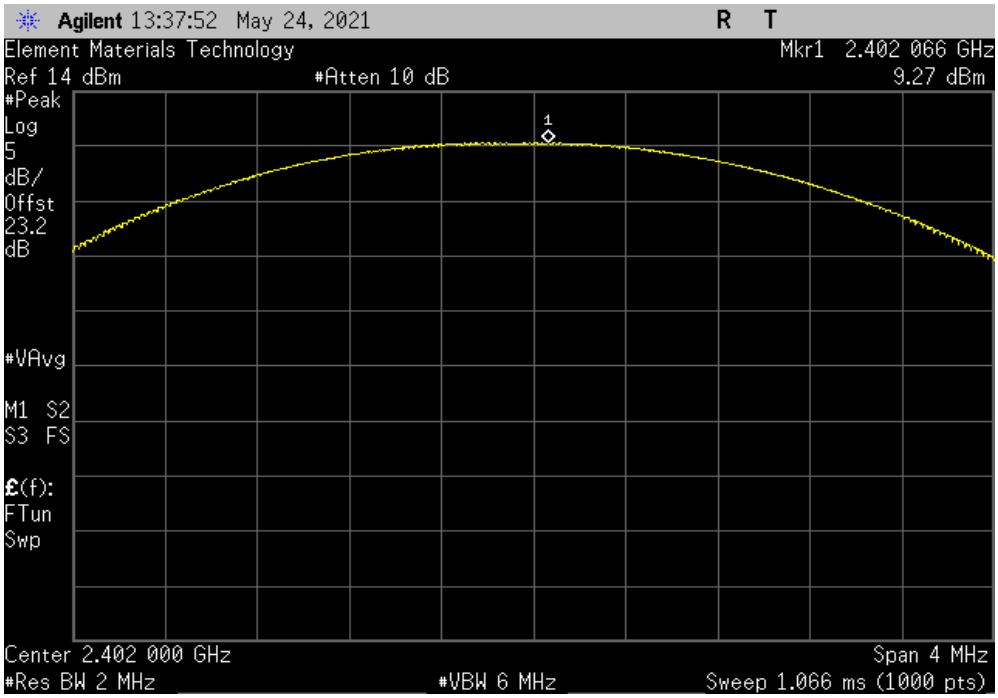
DH5, GFSK, Mid Channel, 2441 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				11.783	21	Pass



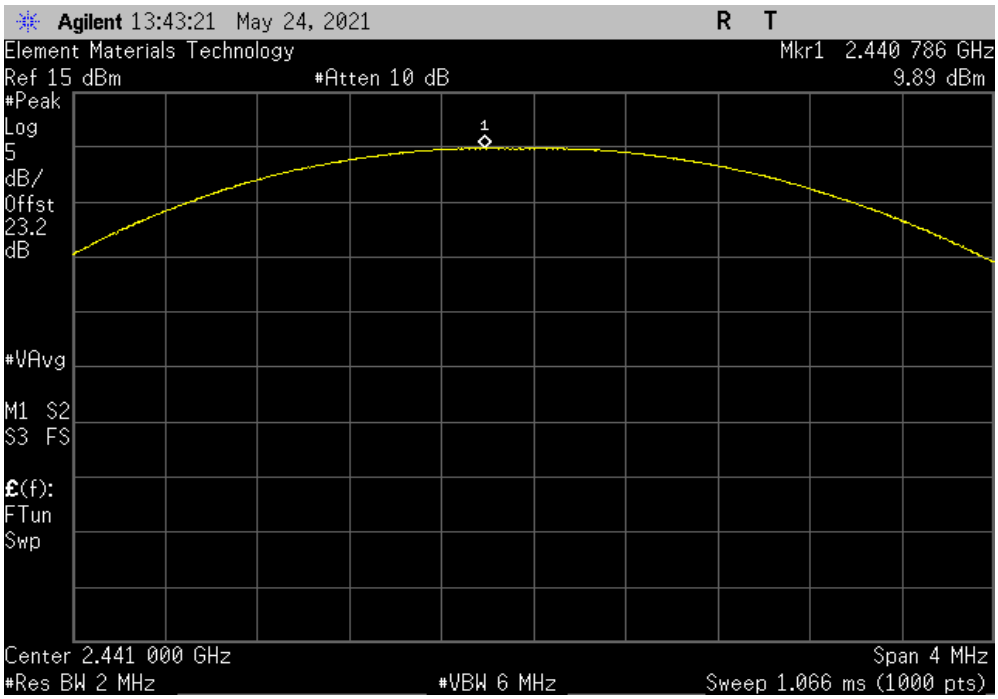
DH5, GFSK, High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				11.47	21	Pass



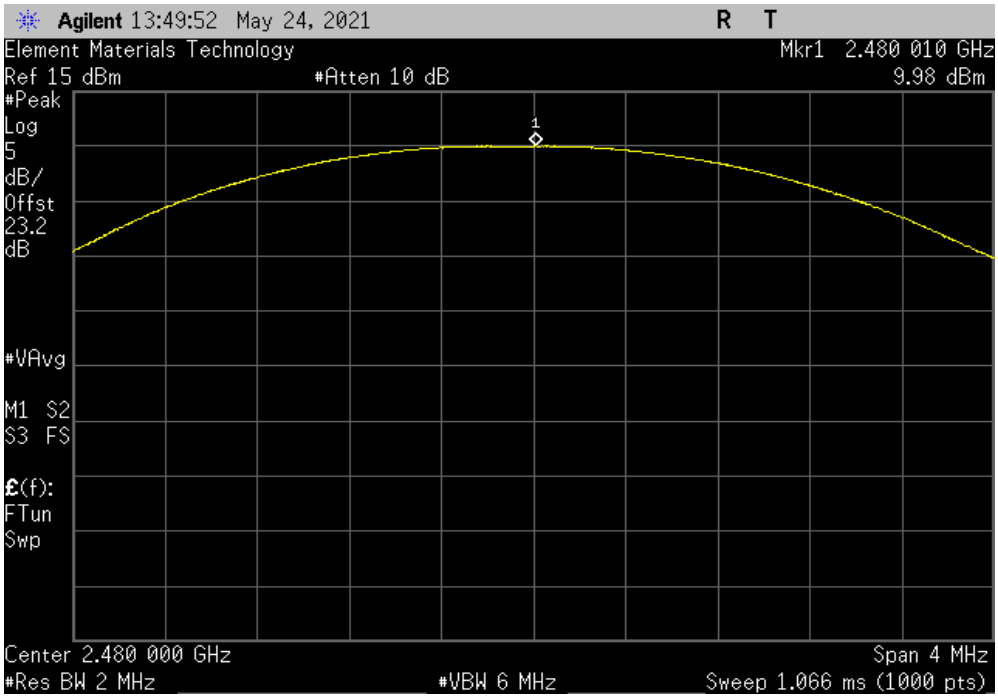
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				9.266	21	Pass



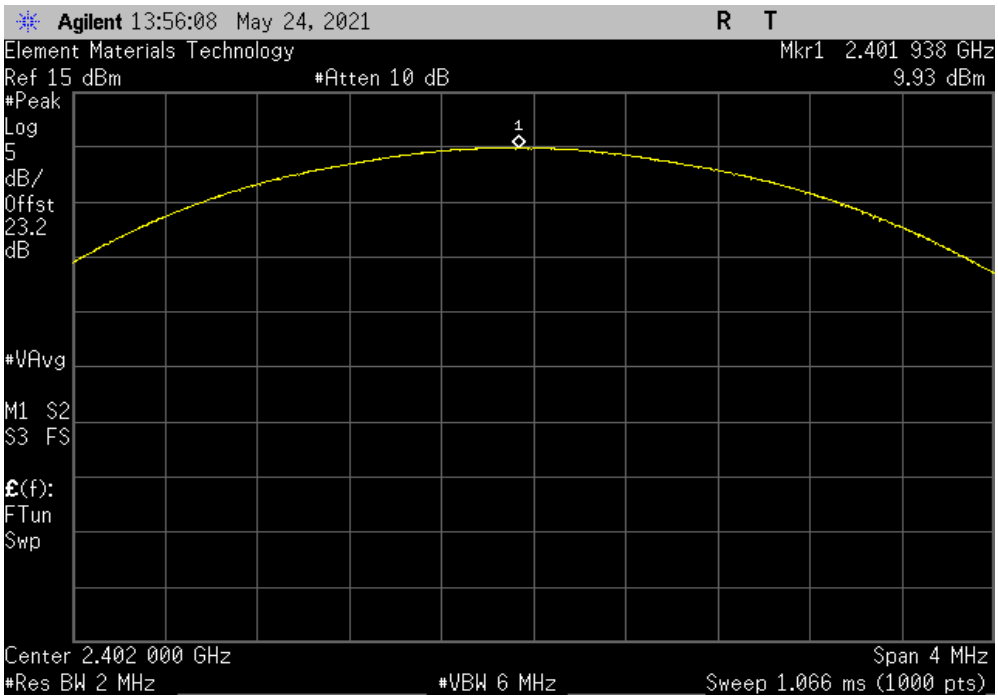
2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				9.891	21	Pass



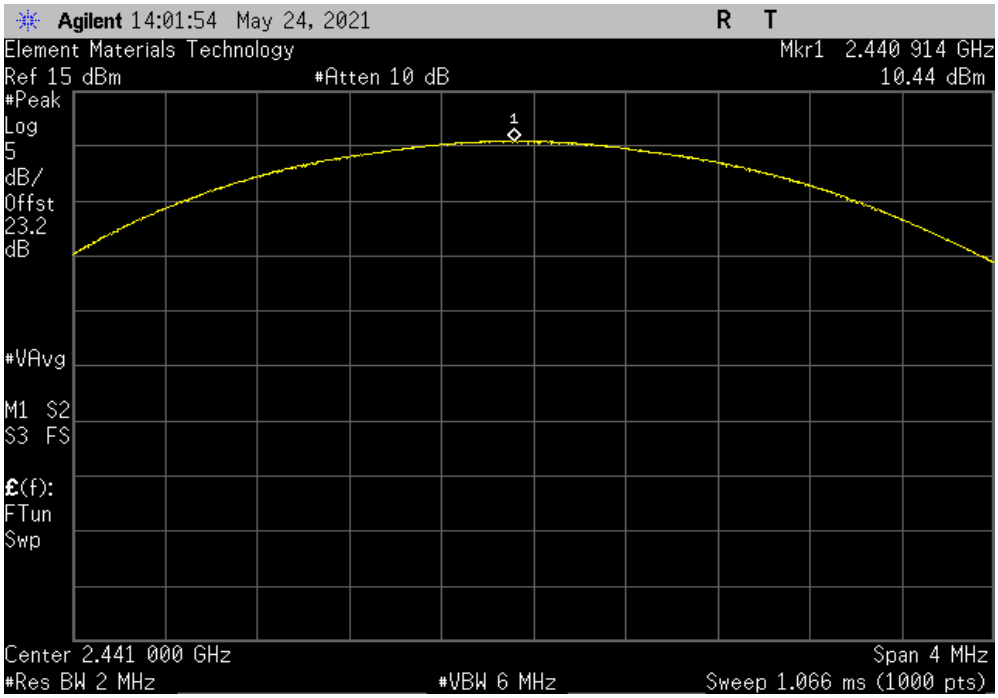
2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				9.982	21	Pass



3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				9.933	21	Pass



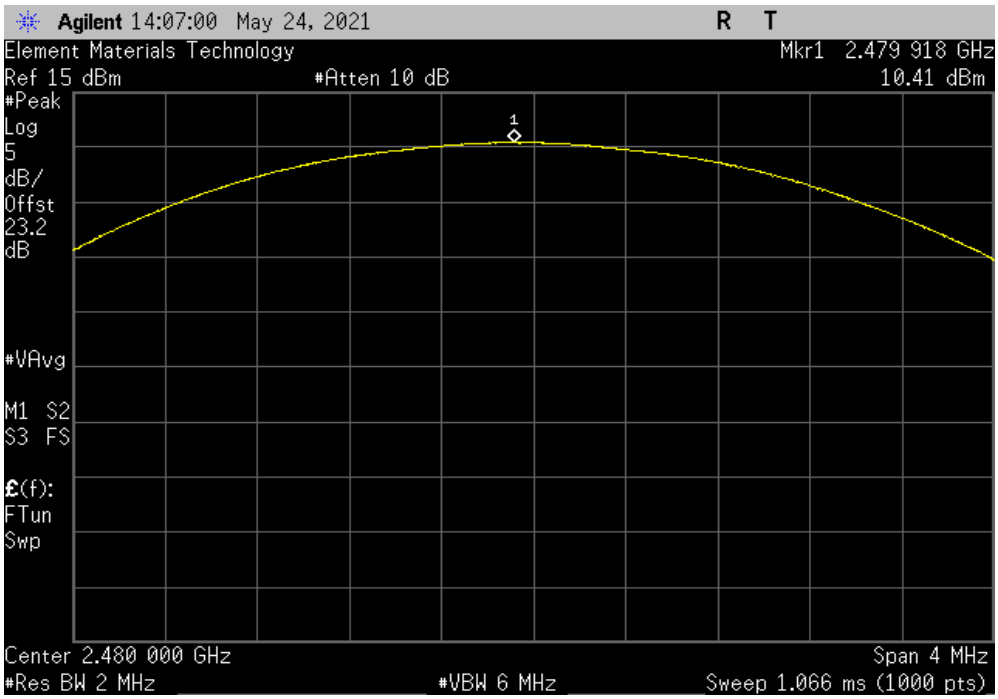
3DH5, 8-DPSK, Mid Channel, 2441 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				10.442	21	Pass



OUTPUT POWER

TbtTx 2021.03.19.1 XMit 2020.12.30.0

3DH5, 8-DPSK, High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				10.409	21	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2020.12.30.0

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
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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 2021.03.19.1 XMit 2020.12.30.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**	**Work Order:**	**PCTE0003**
Serial Number:	**FCC 1**	**Date:**	**24-May-21**
Customer:	**NAL Research Corporation**	**Temperature:**	**22.6 °C**
Attendees:	**None**	**Humidity:**	**44% RH**
Project:	**None**	**Barometric Pres.:**	**1021 mbar**
Tested by:	**Jeff Alcoke**	**Power:** **5.0 VDC via USB**	**Job Site:** **EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC block, 20 dB attenautor, measurement cable, and manufacturers SMA patch cable.

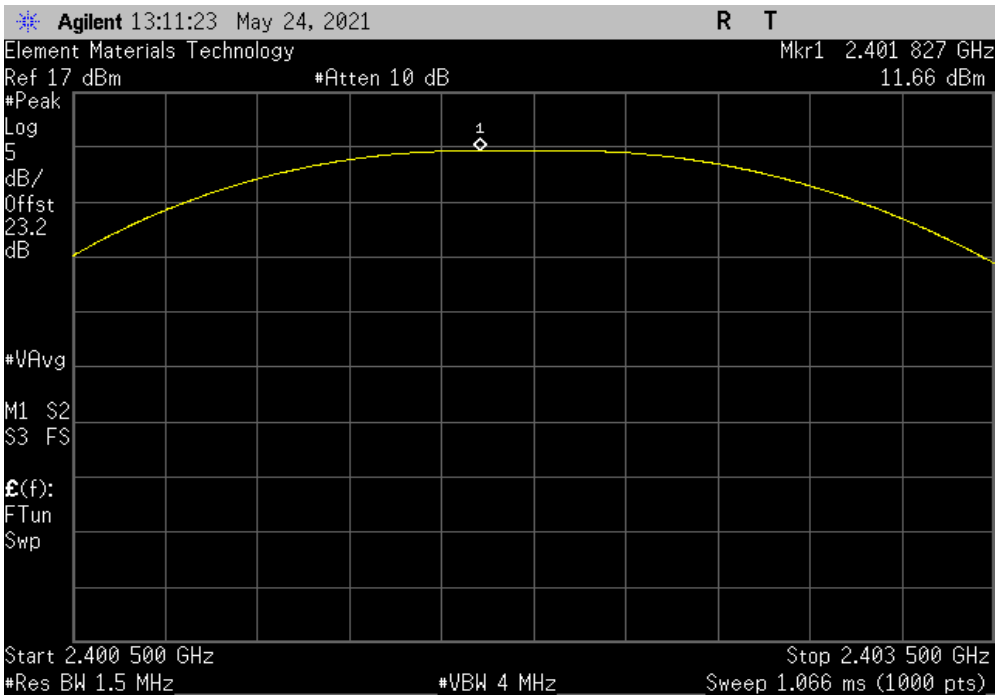
DEVIATIONS FROM TEST STANDARD

None

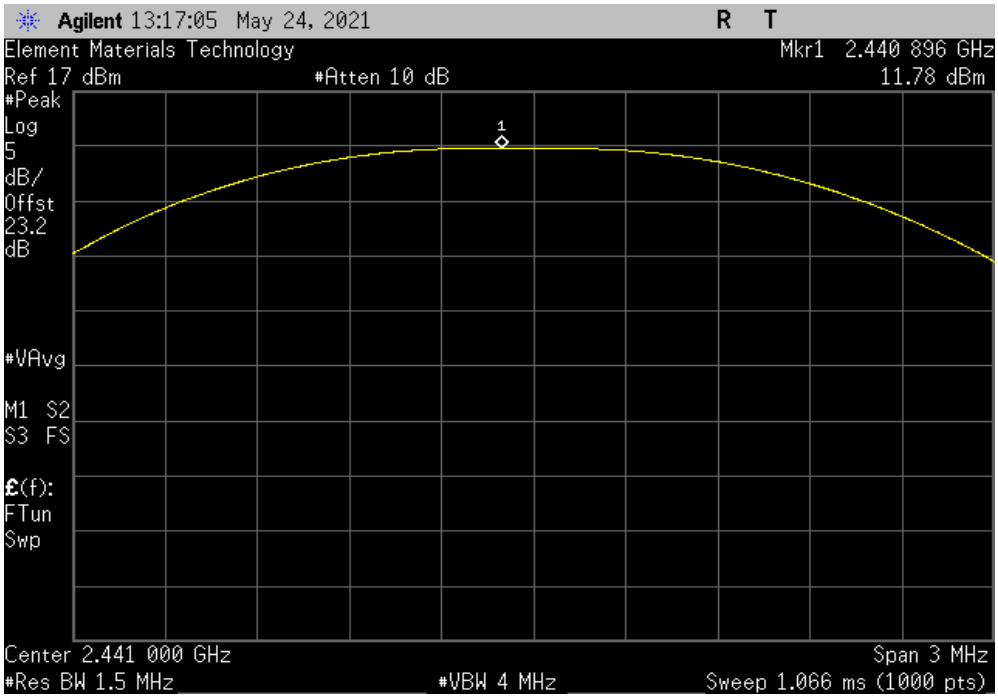
Configuration #	**3**	*Signature*

		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
DH5, GFSK						
	Low Channel, 2402 MHz	11.665	3	14.7	27	Pass
	Mid Channel, 2441 MHz	11.783	3	14.8	27	Pass
	High Channel, 2480 MHz	11.47	3	14.5	27	Pass
2DH5, pi/4-DQPSK						
	Low Channel, 2402 MHz	9.266	3	12.3	27	Pass
	Mid Channel, 2441 MHz	9.891	3	12.9	27	Pass
	High Channel, 2480 MHz	9.982	3	13.0	27	Pass
3DH5, 8-DPSK						
	Low Channel, 2402 MHz	9.933	3	12.9	27	Pass
	Mid Channel, 2441 MHz	10.442	3	13.4	27	Pass
	High Channel, 2480 MHz	10.409	3	13.4	27	Pass

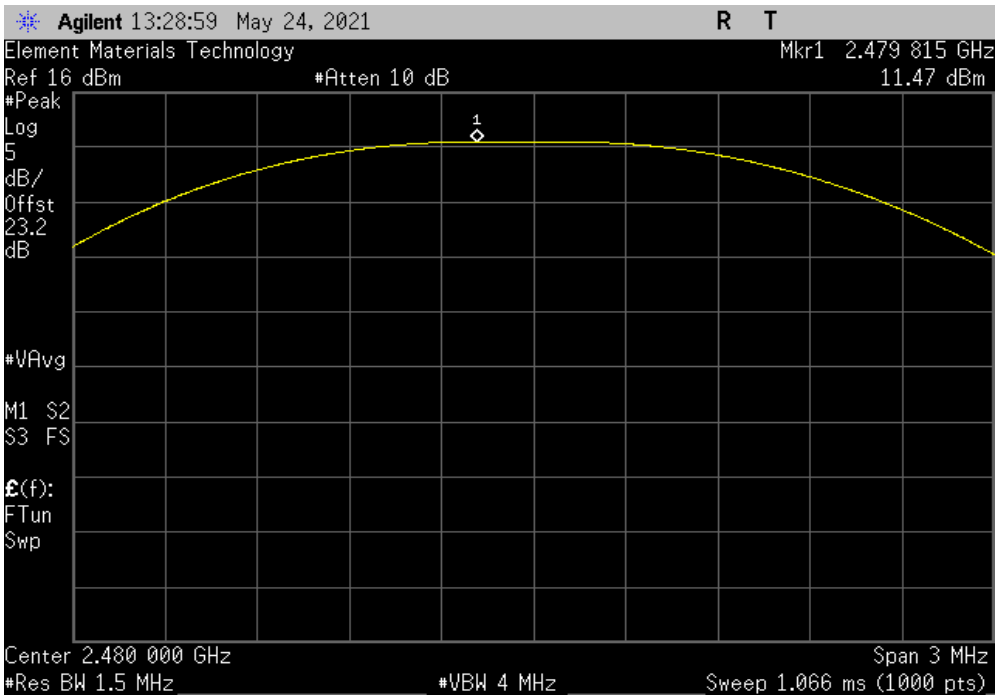
DH5, GFSK, Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		11.665	3	14.7	27	Pass



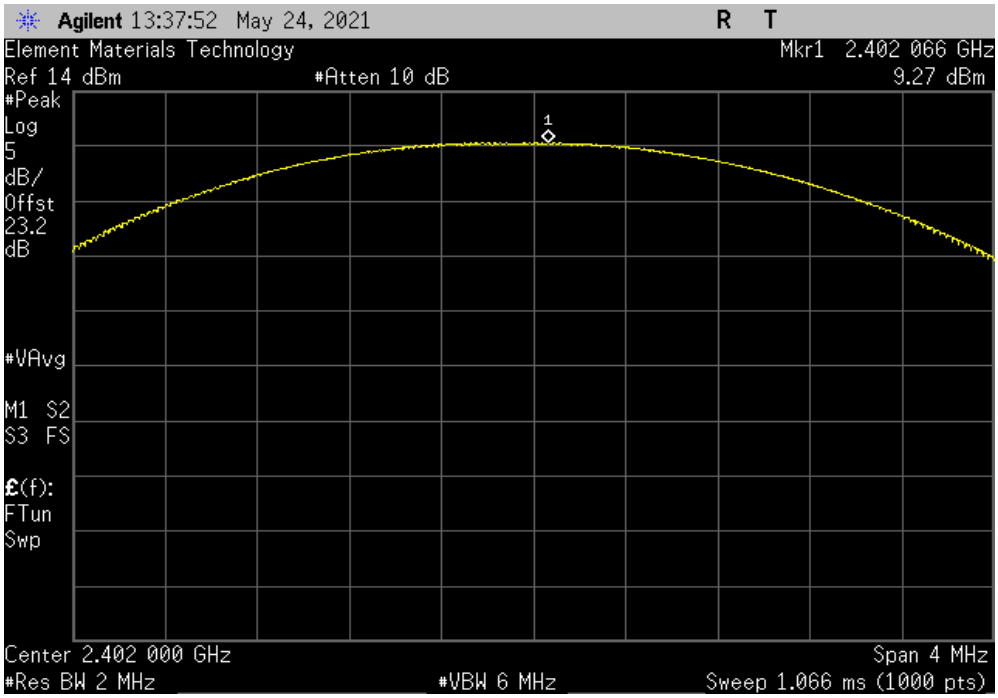
DH5, GFSK, Mid Channel, 2441 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		11.783	3	14.8	27	Pass



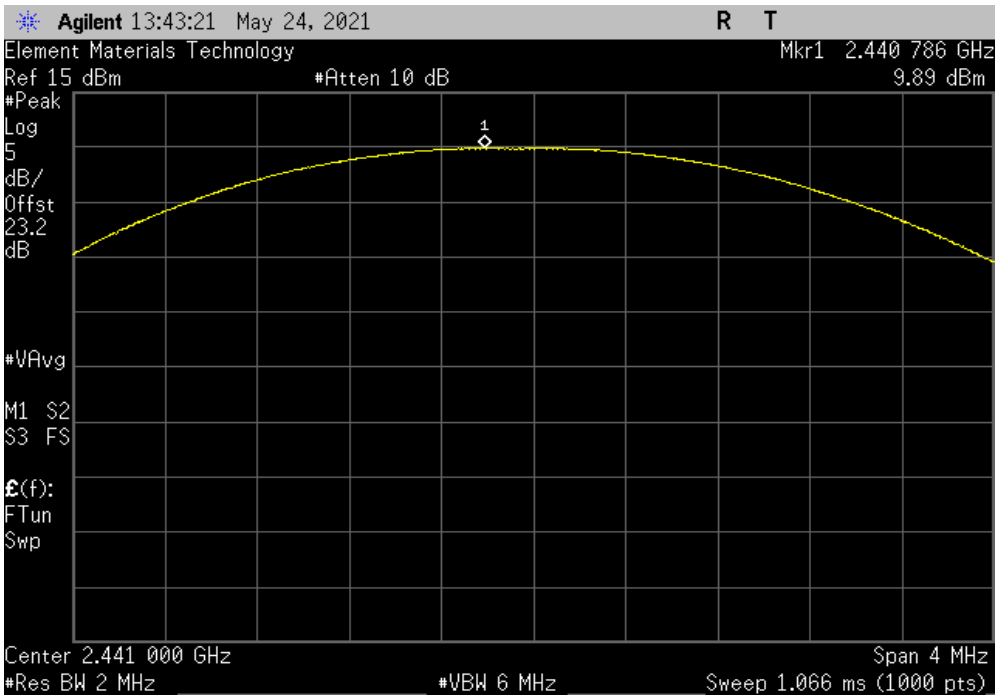
DH5, GFSK, High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		11.47	3	14.5	27	Pass



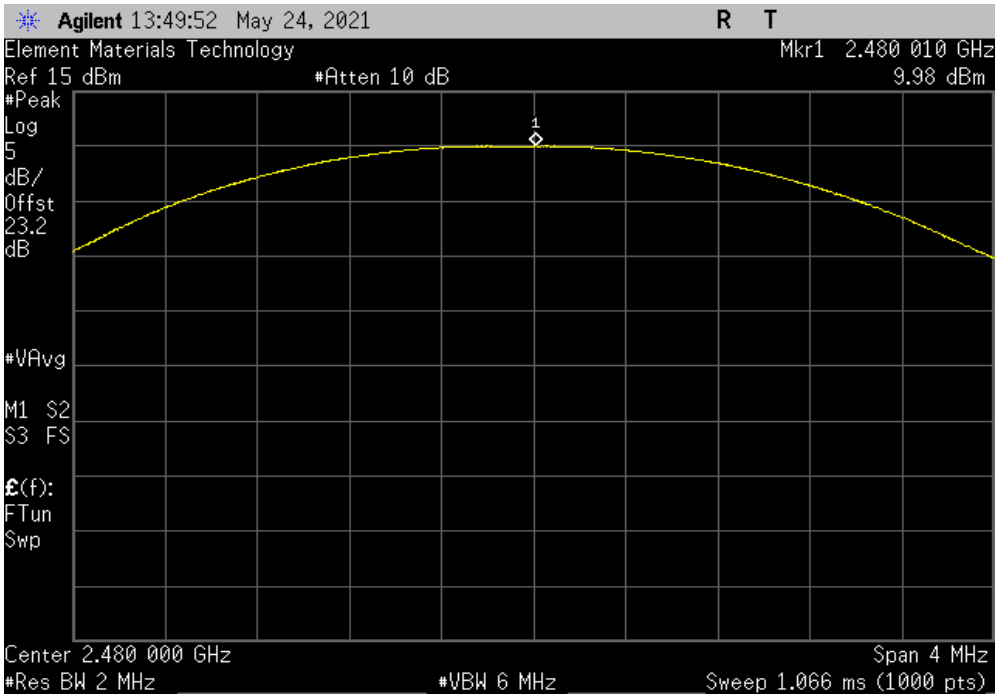
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		9.266	3	12.3	27	Pass



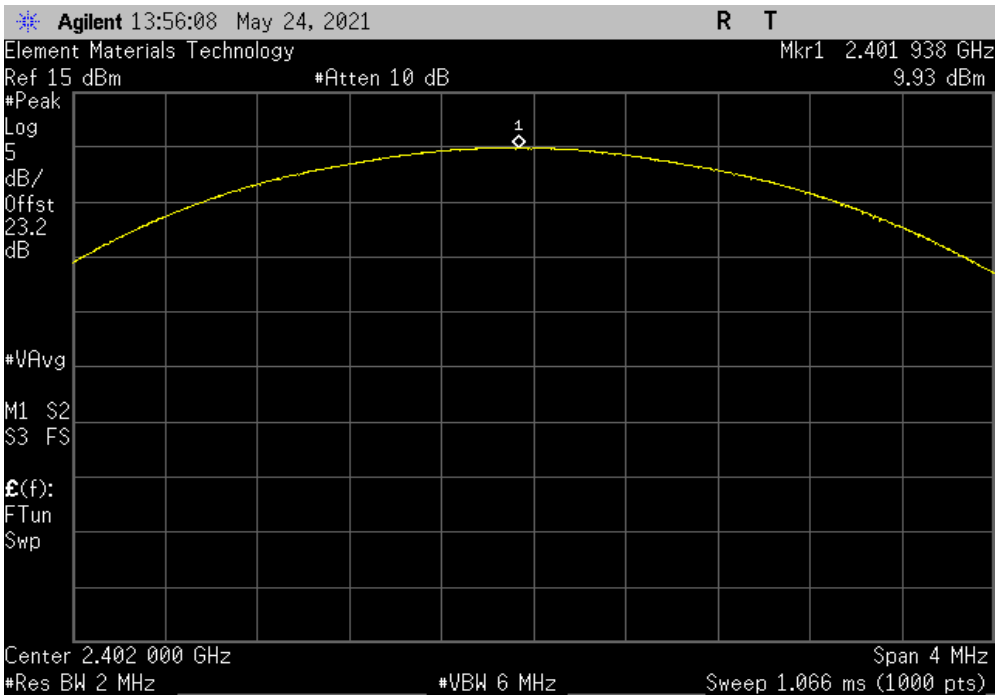
2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		9.891	3	12.9	27	Pass



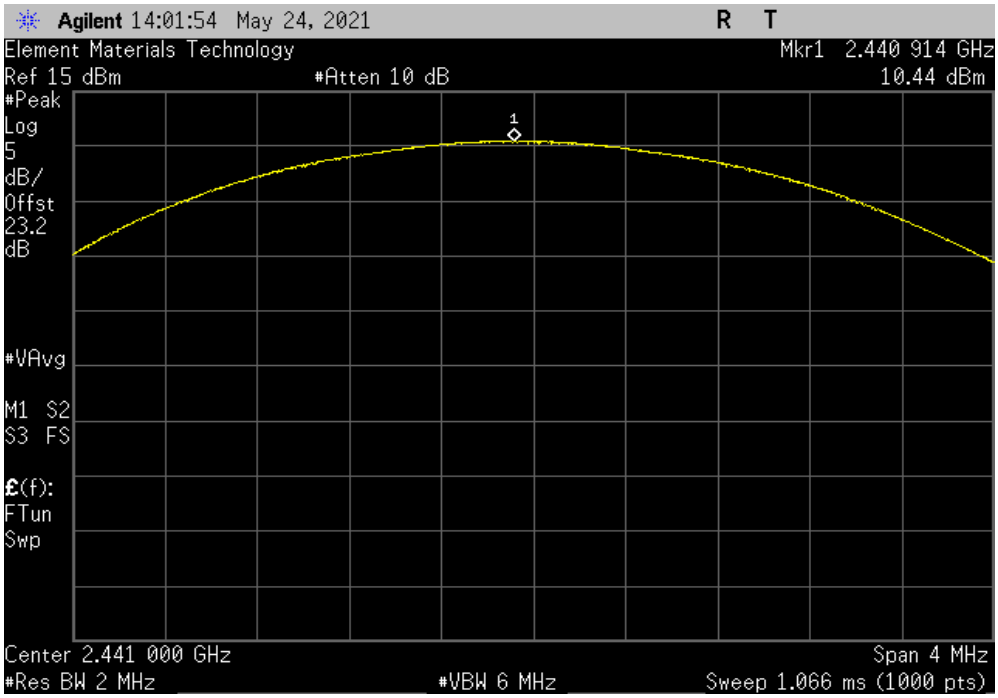
2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		9.982	3	13.0	27	Pass



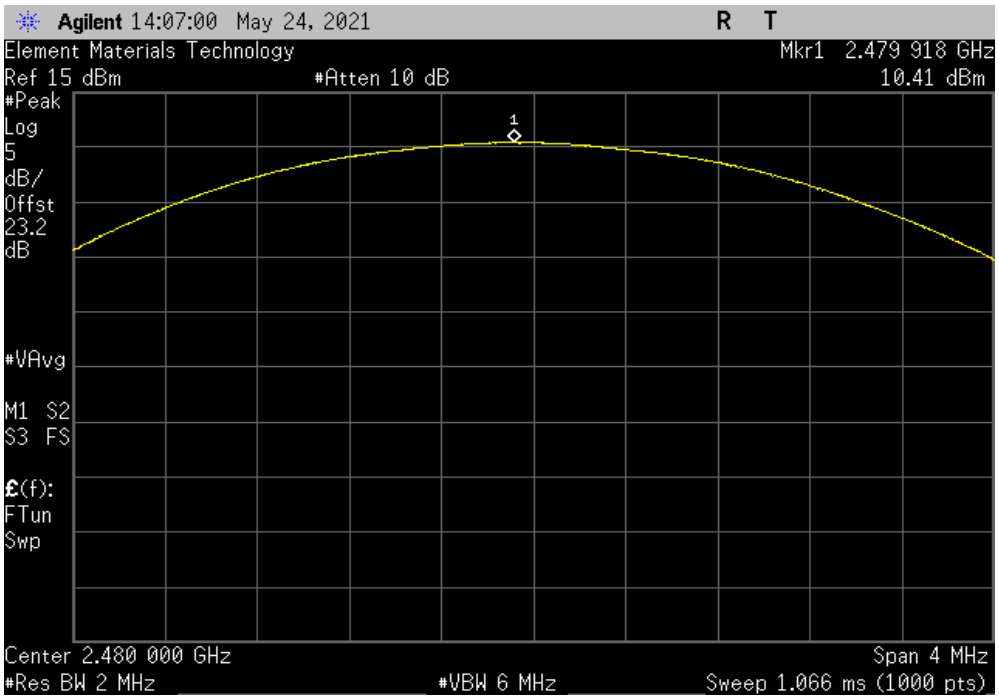
3DH5, 8-DPSK, Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		9.933	3	12.9	27	Pass



3DH5, 8-DPSK, Mid Channel, 2441 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		10.442	3	13.4	27	Pass



3DH5, 8-DPSK, High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		10.409	3	13.4	27	Pass



3 3.0

BAND EDGE COMPLIANCE

XMit 2020.12.30.0

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
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The 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 2021.03.19.1 XMit 2020.12.30.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**	**Work Order:**	**PCTE0003**
Serial Number:	**FCC 1**	**Date:**	**24-May-21**
Customer:	**NAL Research Corporation**	**Temperature:**	**22.6 °C**
Attendees:	**None**	**Humidity:**	**43.6% RH**
Project:	**None**	**Barometric Pres.:**	**1019 mbar**
Tested by:	**Jeff Alcoke** **Power:** **5.0 VDC via USB**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

None

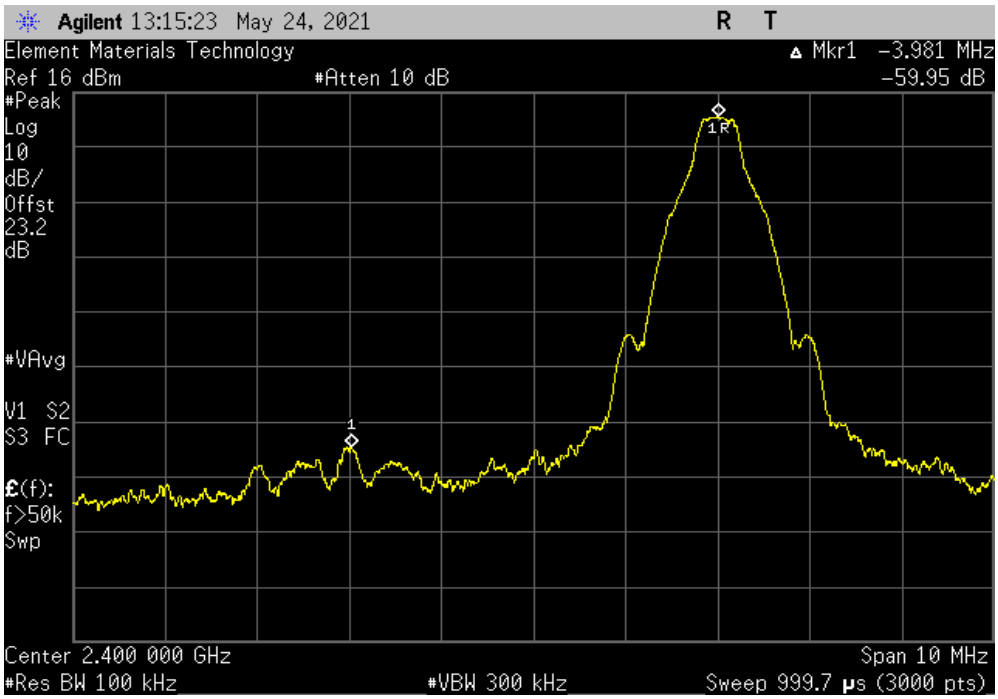
DEVIATIONS FROM TEST STANDARD

None

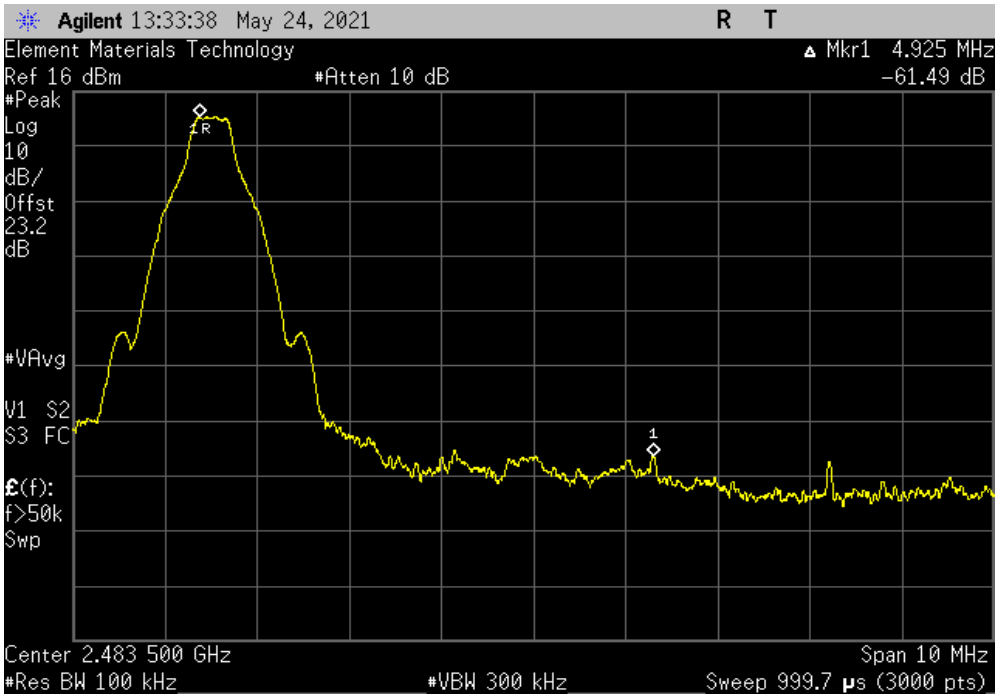
Configuration #	**3**	*Signature*

	Value (dBc)	**Limit ≤ (dBc)**	**Result**
DH5, GFSK			
Low Channel, 2402 MHz	-59.95	-20	Pass
High Channel, 2480 MHz	-61.49	-20	Pass
2DH5, pi/4-DQPSK			
Low Channel, 2402 MHz	-52.41	-20	Pass
High Channel, 2480 MHz	-51.85	-20	Pass
3DH5, 8-DPSK			
Low Channel, 2402 MHz	-51.94	-20	Pass
High Channel, 2480 MHz	-51.46	-20	Pass

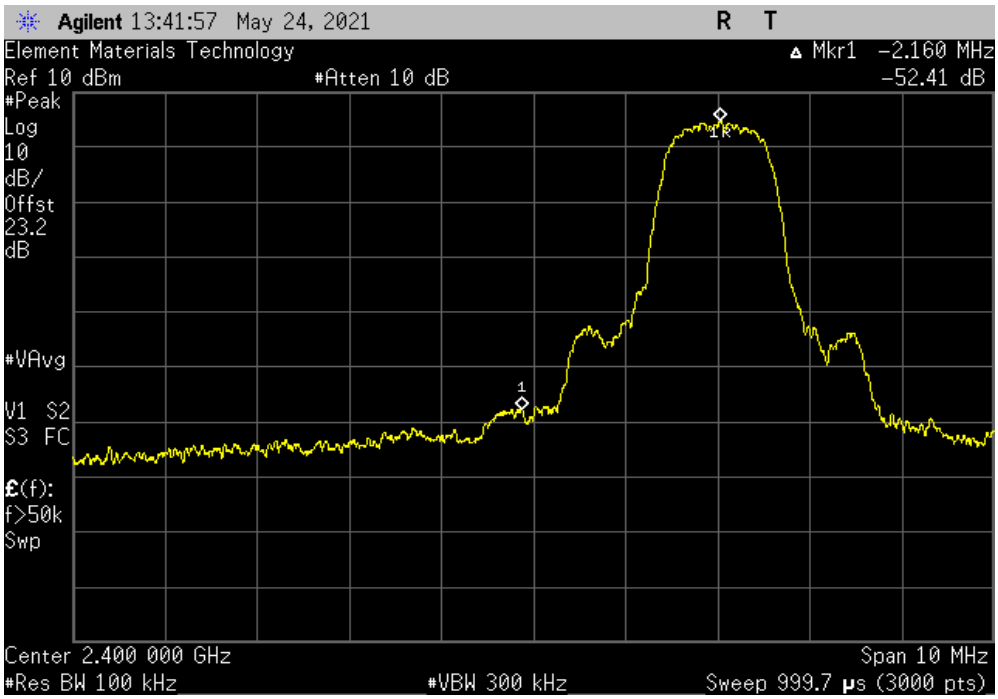
DH5, GFSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.95	-20	Pass



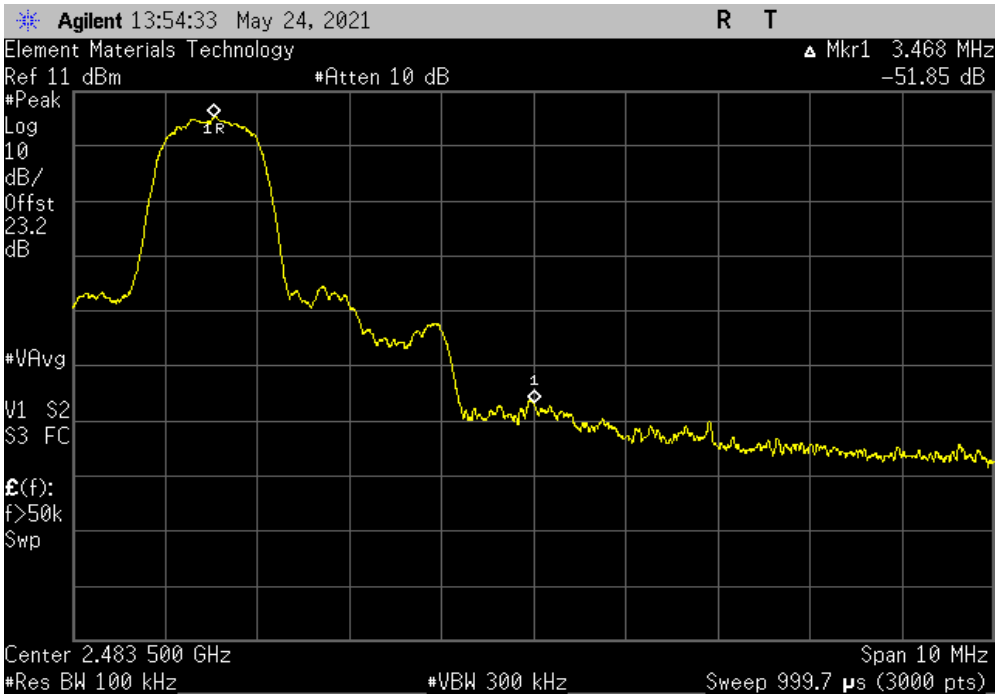
DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-61.49	-20	Pass



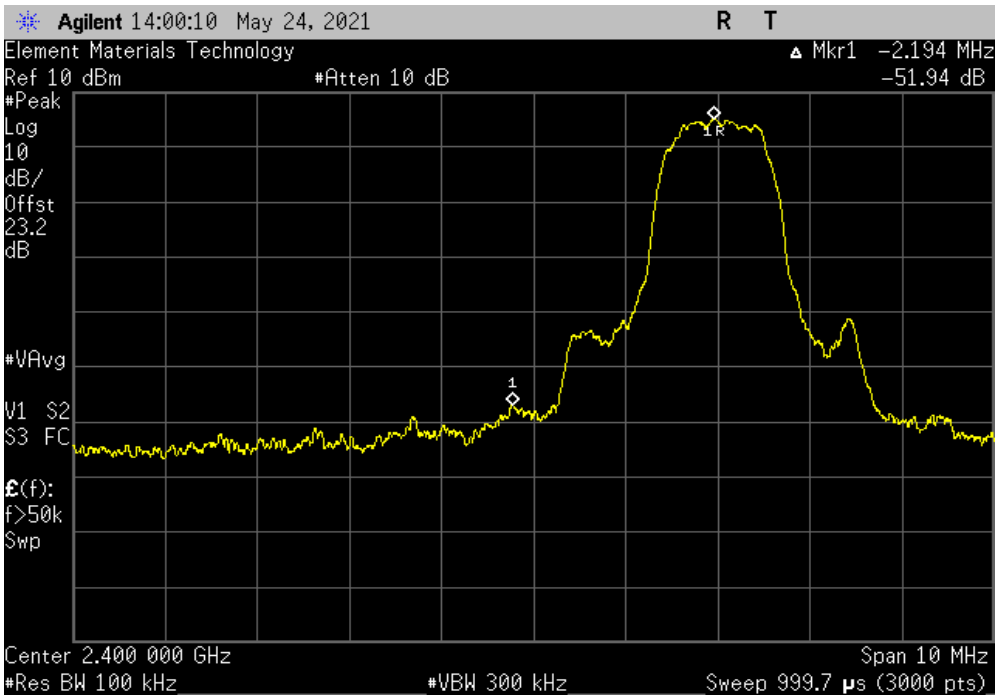
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-52.41	-20	Pass



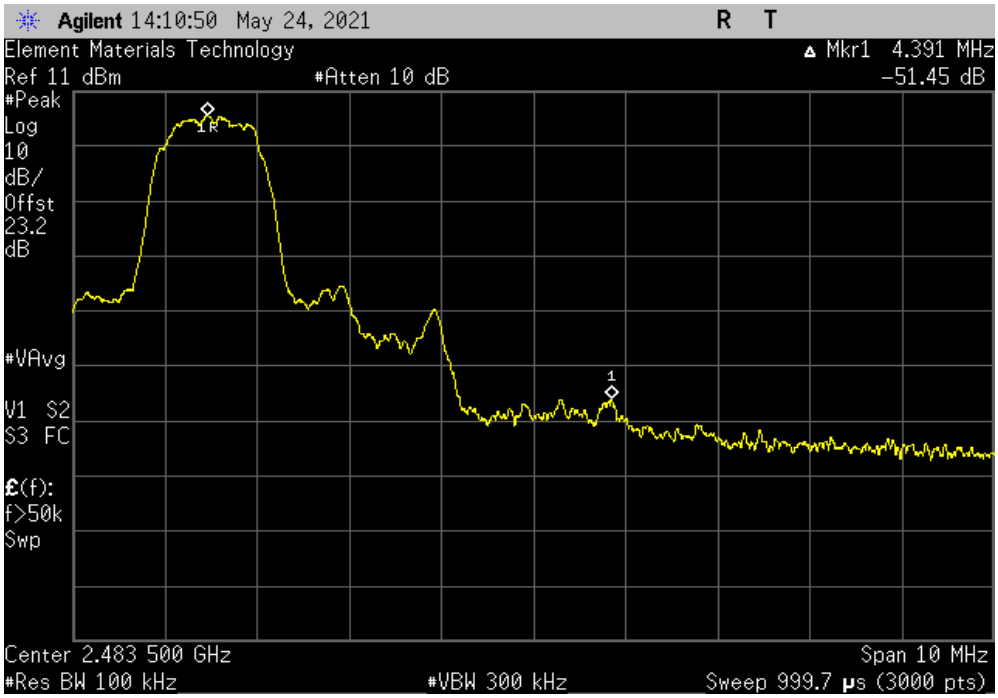
2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-51.85	-20	Pass



3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-51.94	-20	Pass



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



BAND EDGE COMPLIANCE - HOPPING MODE

XMit 2020.12.30.0

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	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudo-random hopping sequence. The 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 2021.03.19.1 XMit 2020.12.30.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**	**Work Order:**	**PCTE0003**
Serial Number:	**FCC 1**	**Date:**	**24-May-21**
Customer:	**NAL Research Corporation**	**Temperature:**	**22.6 °C**
Attendees:	**None**	**Humidity:**	**43.7% RH**
Project:	**None**	**Barometric Pres.:**	**1022 mbar**
Tested by:	**Jeff Alcoke**	**Power:** **5.0 VDC via USB**	**Job Site:** **EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

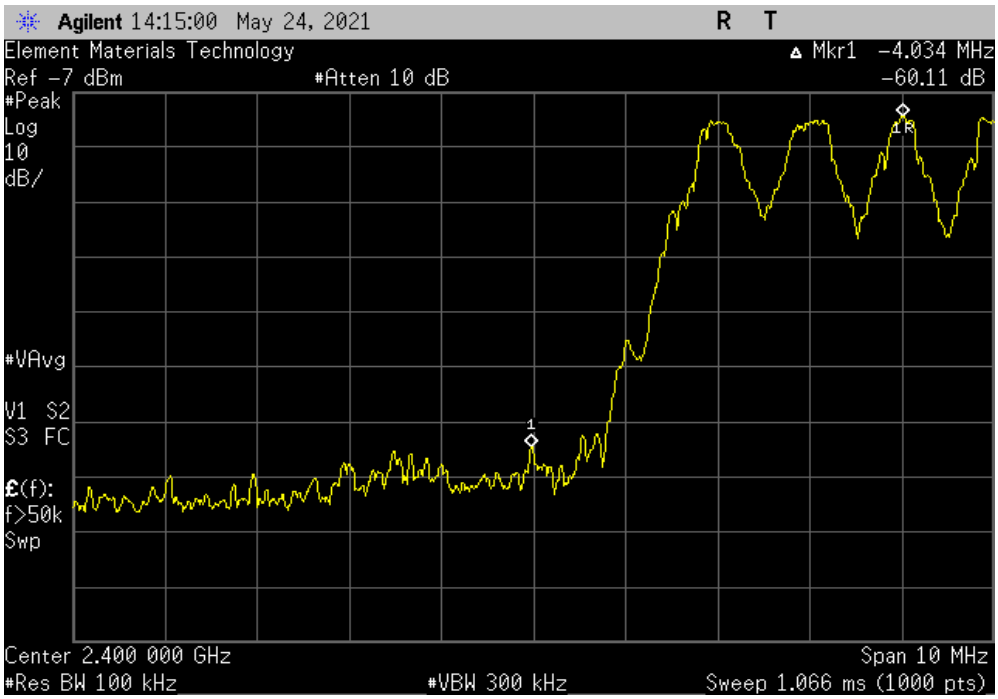
None

Configuration #	**3**	*Signature*

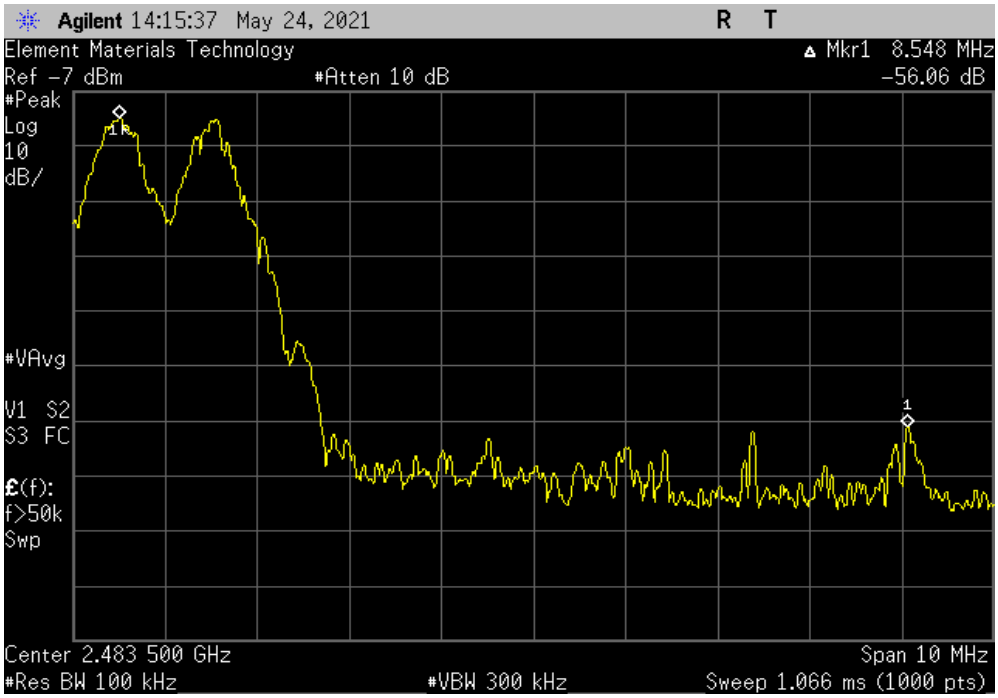
	Value (dBc)	Limit ≤ (dBc)	Result
Hopping Mode (All Channels)			
DH5, GFSK			
Low Channel, 2402 MHz	-60.11	-20	Pass
High Channel, 2480 MHz	-56.06	-20	Pass
2DH5, pi/4-DQPSK			
Low Channel, 2402 MHz	-56.25	-20	Pass
High Channel, 2480 MHz	-55.53	-20	Pass
3DH5, 8-DPSK			
Low Channel, 2402 MHz	-57.92	-20	Pass
High Channel, 2480 MHz	-53.25	-20	Pass

BAND EDGE COMPLIANCE - HOPPING MODE

Hopping Mode (All Channels), DH5, GFSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-60.11	-20	Pass



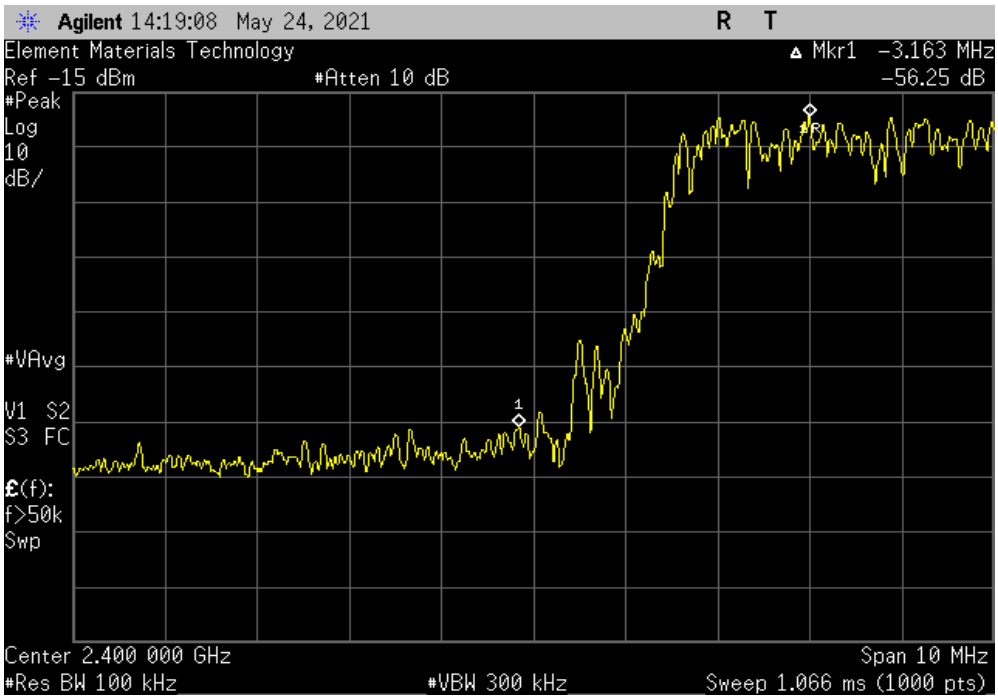
Hopping Mode (All Channels), DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-56.06	-20	Pass



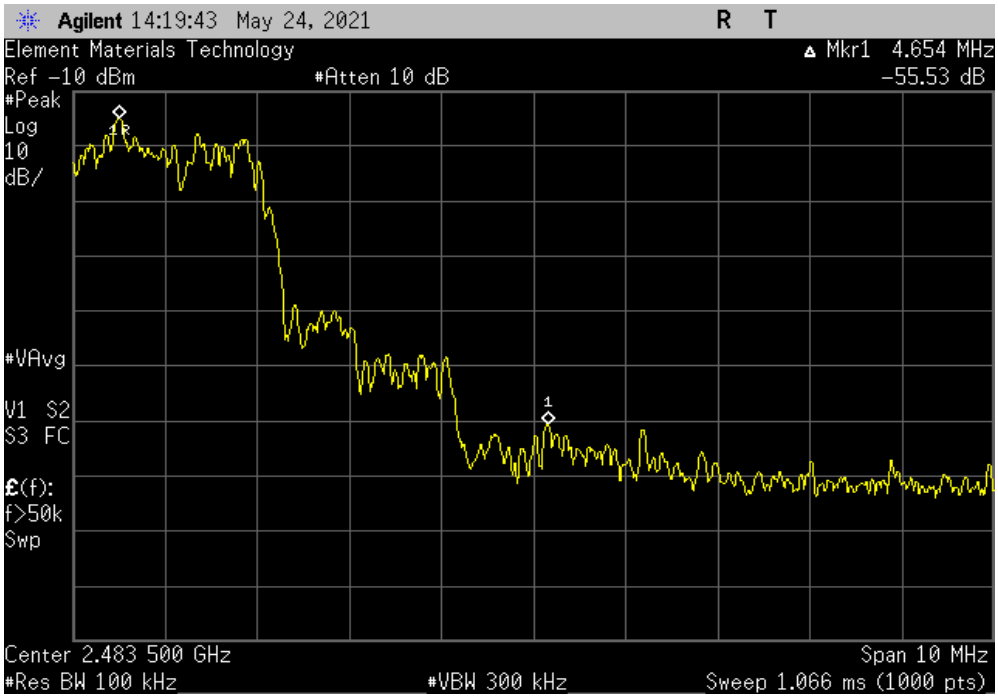
BAND EDGE COMPLIANCE - HOPPING MODE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-56.25	-20	Pass



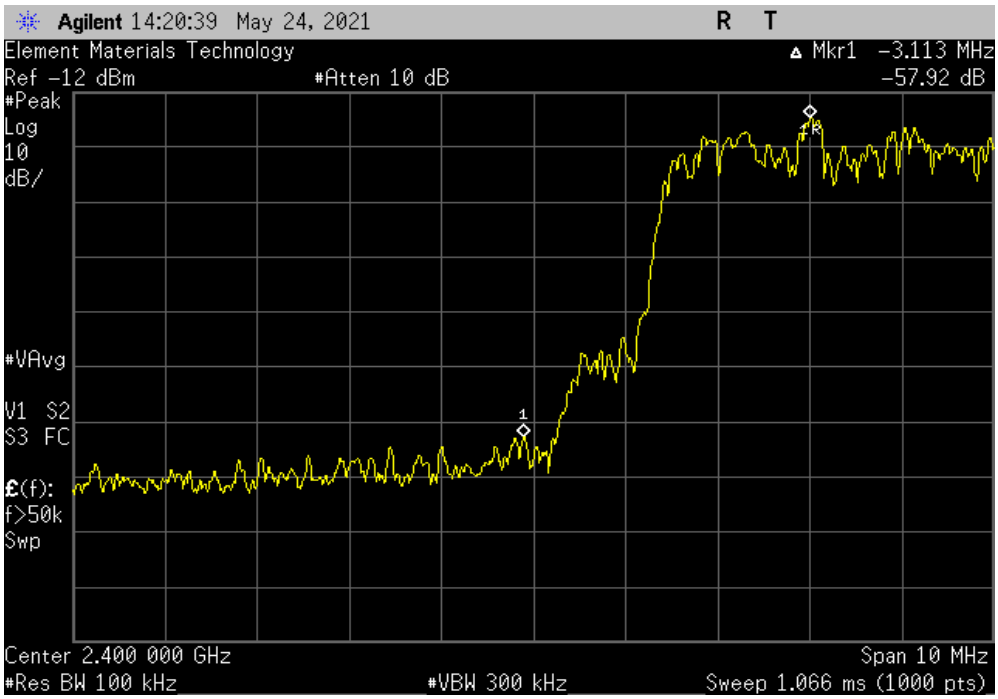
Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-55.53	-20	Pass



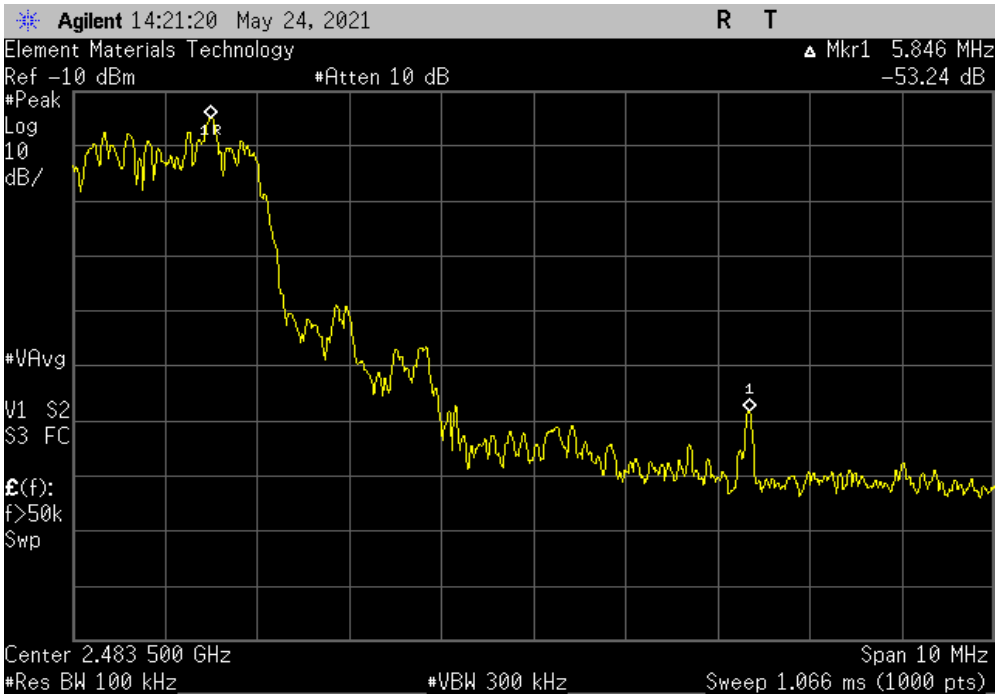
BAND EDGE COMPLIANCE - HOPPING MODE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

Hopping Mode (All Channels), 3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-57.92	-20	Pass



Hopping Mode (All Channels), 3DH5, 8-DPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-53.25	-20	Pass



OCCUPIED BANDWIDTH

XMit 2020.12.30.0

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
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

The 20 dB occupied 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.

OCCUPIED BANDWIDTH

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**	**Work Order:**	**PCTE0003**
Serial Number:	**FCC 1**	**Date:**	**24-May-21**
Customer:	**NAL Research Corporation**	**Temperature:**	**22.5 °C**
Attendees:	**None**	**Humidity:**	**44.2% RH**
Project:	**None**	**Barometric Pres.:**	**1021 mbar**
Tested by:	**Jeff Alcoke**	**Power:** **5.0 VDC via USB**	**Job Site:** **EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

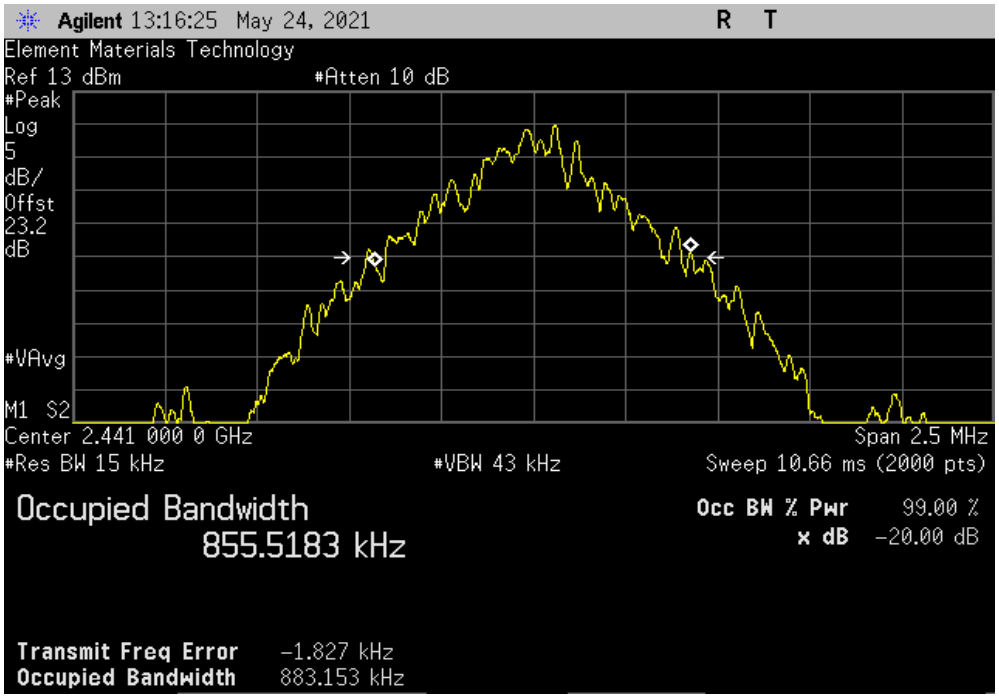
None

Configuration #	**3**	*Signature*

		Value	Limit (<)	Result
DH5, GFSK				
	Low Channel, 2402 MHz	884.527 kHz	1.5 MHz	Pass
	Mid Channel, 2441 MHz	883.153 kHz	1.5 MHz	Pass
	High Channel, 2480 MHz	886.375 kHz	1.5 MHz	Pass
2DH5, pi/4-DQPSK				
	Low Channel, 2402 MHz	1.36 MHz	1.5 MHz	Pass
	Mid Channel, 2441 MHz	1.363 MHz	1.5 MHz	Pass
	High Channel, 2480 MHz	1.375 MHz	1.5 MHz	Pass
3DH5, 8-DPSK				
	Low Channel, 2402 MHz	1.348 MHz	1.5 MHz	Pass
	Mid Channel, 2441 MHz	1.349 MHz	1.5 MHz	Pass
	High Channel, 2480 MHz	1.352 MHz	1.5 MHz	Pass

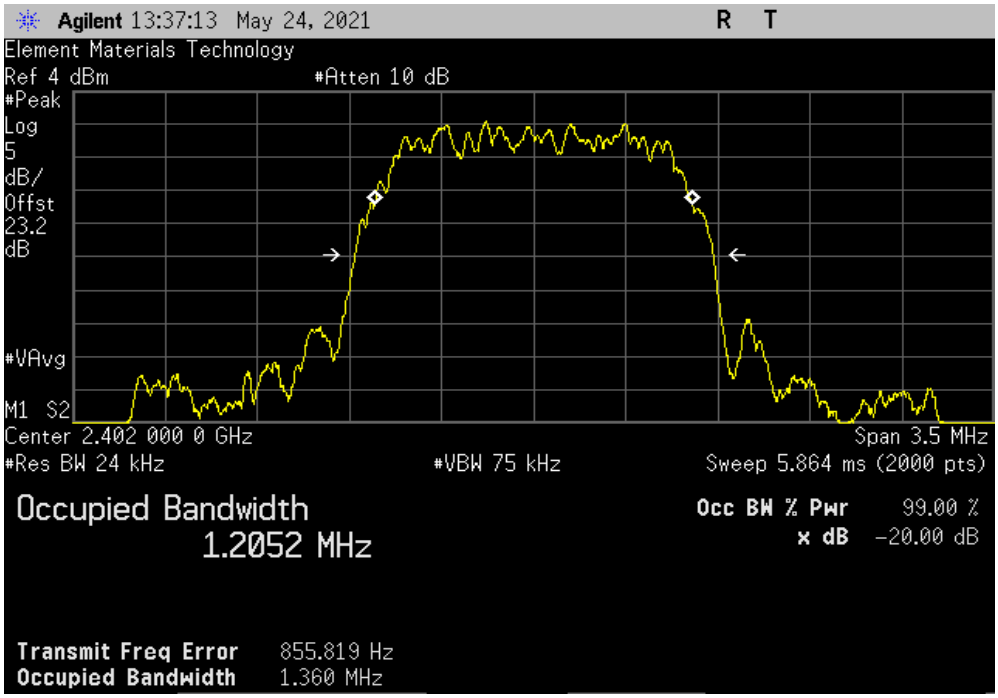
DH5, GFSK, Low Channel, 2402 MHz						
				Value	Limit (<)	Result
				884.527 kHz	1.5 MHz	Pass

DH5, GFSK, Mid Channel, 2441 MHz						
				Value	Limit (<)	Result
				883.153 kHz	1.5 MHz	Pass

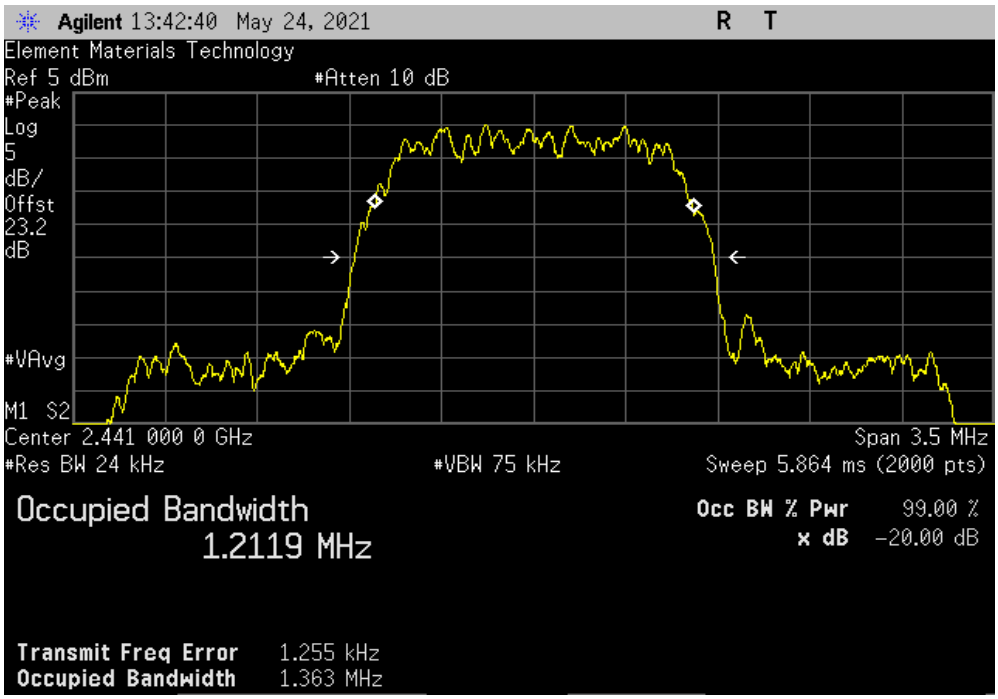


DH5, GFSK, High Channel, 2480 MHz						
				Value	Limit (<)	Result
				886.375 kHz	1.5 MHz	Pass

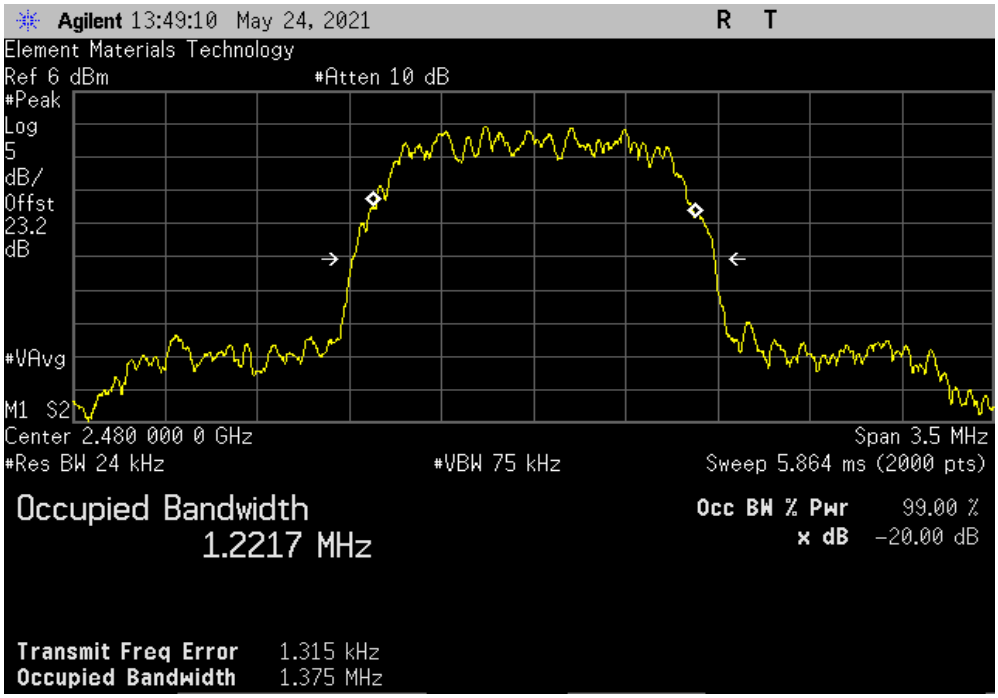
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value	Limit (<)	Result
				1.36 MHz	1.5 MHz	Pass



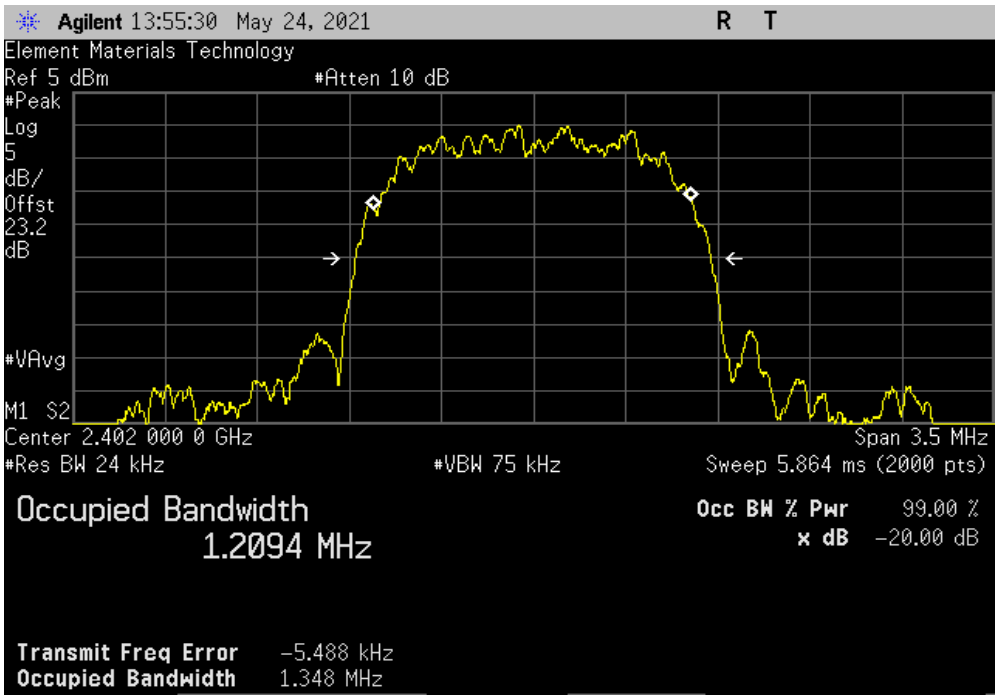
2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
				Value	Limit (<)	Result
				1.363 MHz	1.5 MHz	Pass



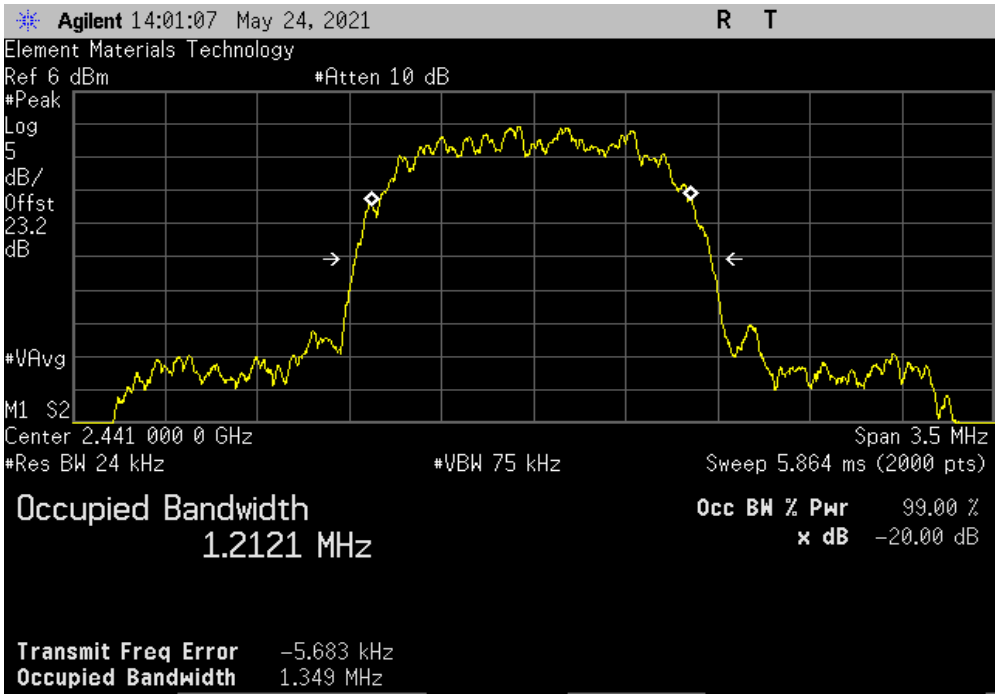
2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value	Limit (<)	Result
				1.375 MHz	1.5 MHz	Pass



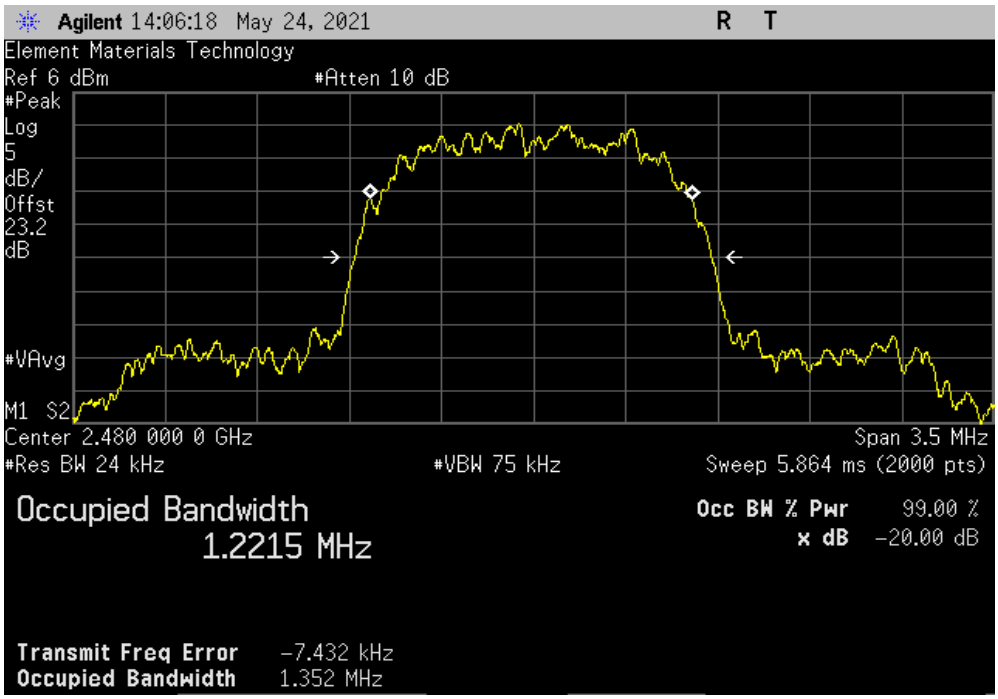
3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value	Limit (<)	Result
				1.348 MHz	1.5 MHz	Pass



3DH5, 8-DPSK, Mid Channel, 2441 MHz						
				Value	Limit (<)	Result
				1.349 MHz	1.5 MHz	Pass



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



SPURIOUS CONDUCTED EMISSIONS

XMit 2020.12.30.0

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
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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

element

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 1	Date:	24-May-21
Customer:	NAL Research Corporation	Temperature:	22.8 °C
Attendees:	None	Humidity:	44.1% RH
Project:	None	Barometric Pres.:	1021 mbar
Tested by:	Jeff Alcoke	Power: 5.0 VDC via USB	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC block, 20 dB attenuator, measurement cable, and manufacturers SMA patch cable.

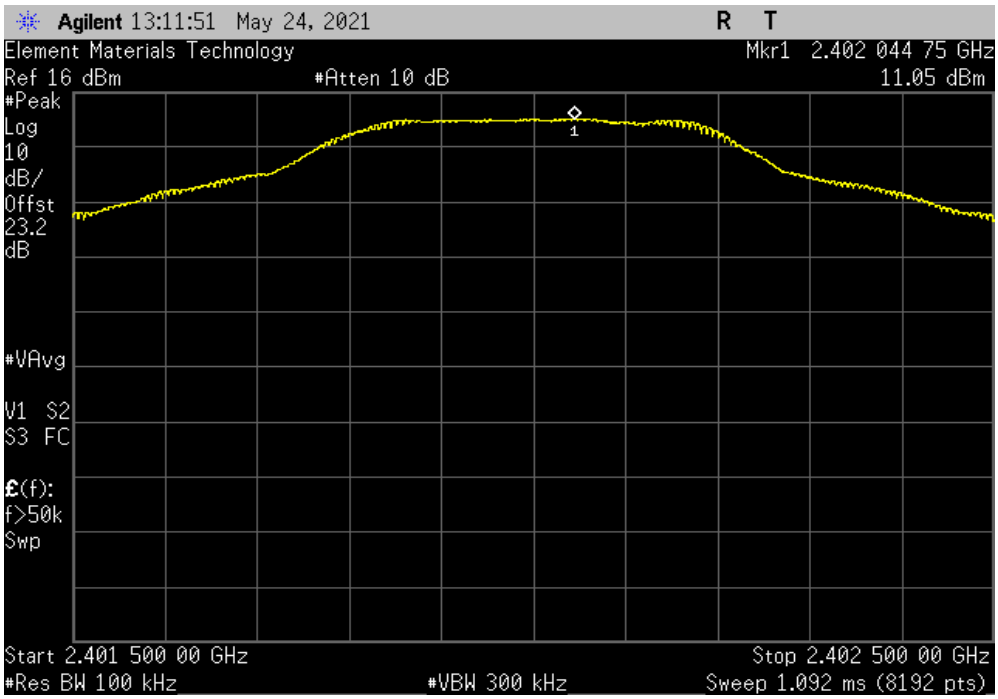
DEVIATIONS FROM TEST STANDARD

None

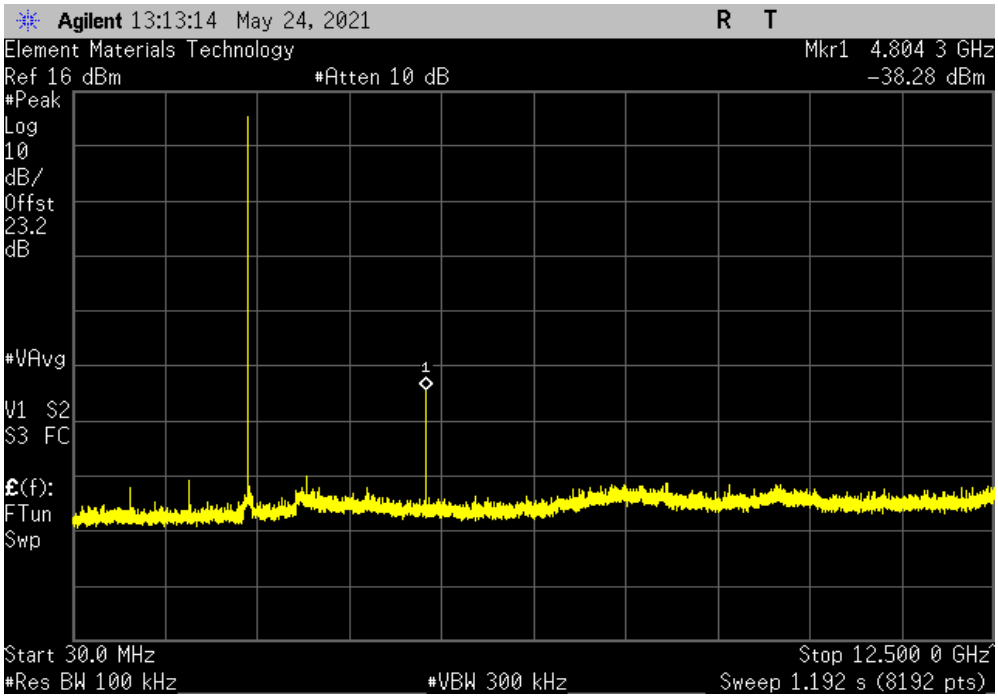
Configuration #	3	Signature

		Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
DH5, GFSK						
	Low Channel, 2402 MHz	Fundamental	2402.04	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	4804.3	-49.33	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24789.4	-62.75	-20	Pass
	Mid Channel, 2441 MHz	Fundamental	2441.05	N/A	N/A	N/A
	Mid Channel, 2441 MHz	30 MHz - 12.5 GHz	4881.9	-47.27	-20	Pass
	Mid Channel, 2441 MHz	12.5 GHz - 25 GHz	24339.2	-63.05	-20	Pass
	High Channel, 2480 MHz	Fundamental	2480.05	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	4961.1	-46.9	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	24502.5	-62.45	-20	Pass
2DH5, pi/4-DQPSK						
	Low Channel, 2402 MHz	Fundamental	2402.03	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	4804.3	-55.01	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	23469.4	-56.09	-20	Pass
	Mid Channel, 2441 MHz	Fundamental	2441.03	N/A	N/A	N/A
	Mid Channel, 2441 MHz	30 MHz - 12.5 GHz	4881.9	-52.51	-20	Pass
	Mid Channel, 2441 MHz	12.5 GHz - 25 GHz	24824.5	-56.5	-20	Pass
	High Channel, 2480 MHz	Fundamental	2480.03	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	4959.5	-50.4	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	24890.1	-56.3	-20	Pass
3DH5, 8-DPSK						
	Low Channel, 2402 MHz	Fundamental	2402.09	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	4804.3	-55.1	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24845.9	-56.29	-20	Pass
	Mid Channel, 2441 MHz	Fundamental	2441.1	N/A	N/A	N/A
	Mid Channel, 2441 MHz	30 MHz - 12.5 GHz	4881.9	-52.34	-20	Pass
	Mid Channel, 2441 MHz	12.5 GHz - 25 GHz	24879.4	-56.2	-20	Pass
	High Channel, 2480 MHz	Fundamental	2480.09	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	4959.5	-49.54	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	23486.1	-57.54	-20	Pass

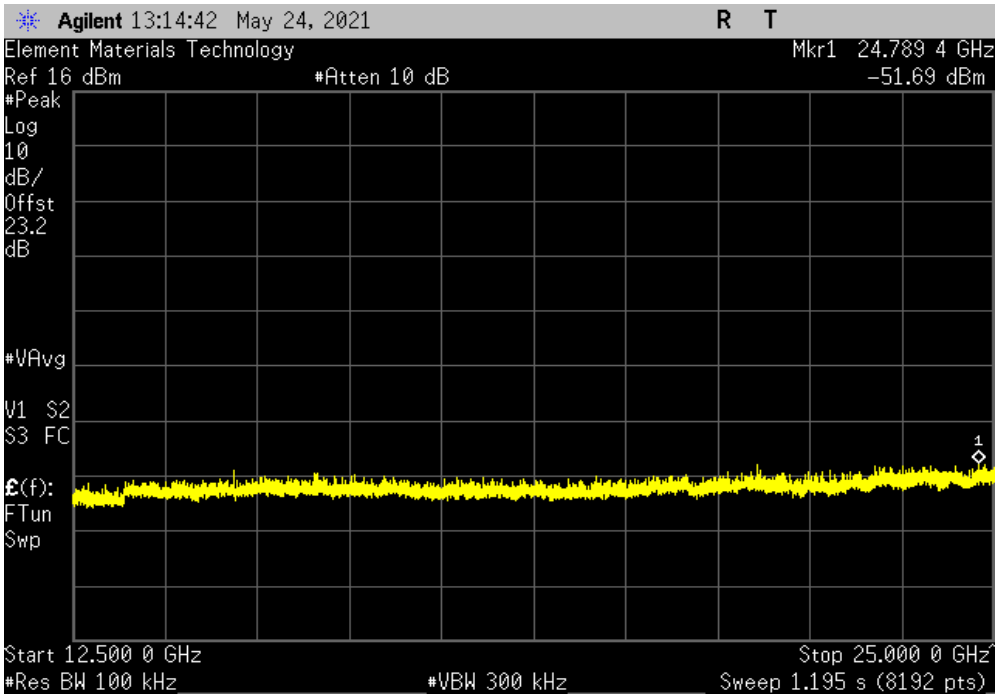
DH5, GFSK, Low Channel, 2402 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		2402.04	N/A	N/A	N/A



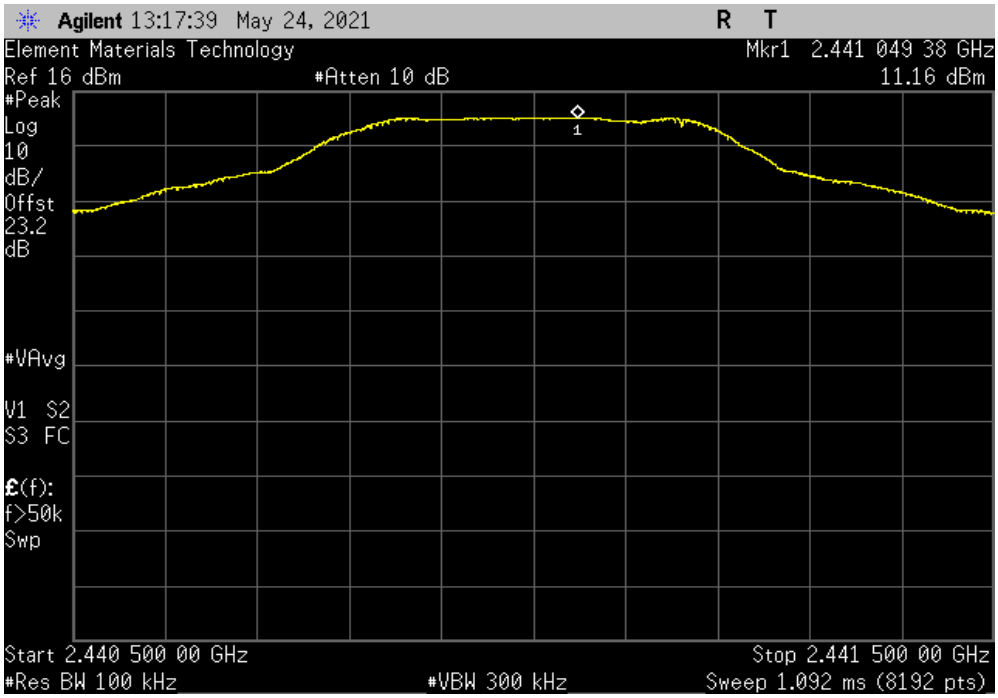
DH5, GFSK, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4804.3	-49.33	-20	Pass



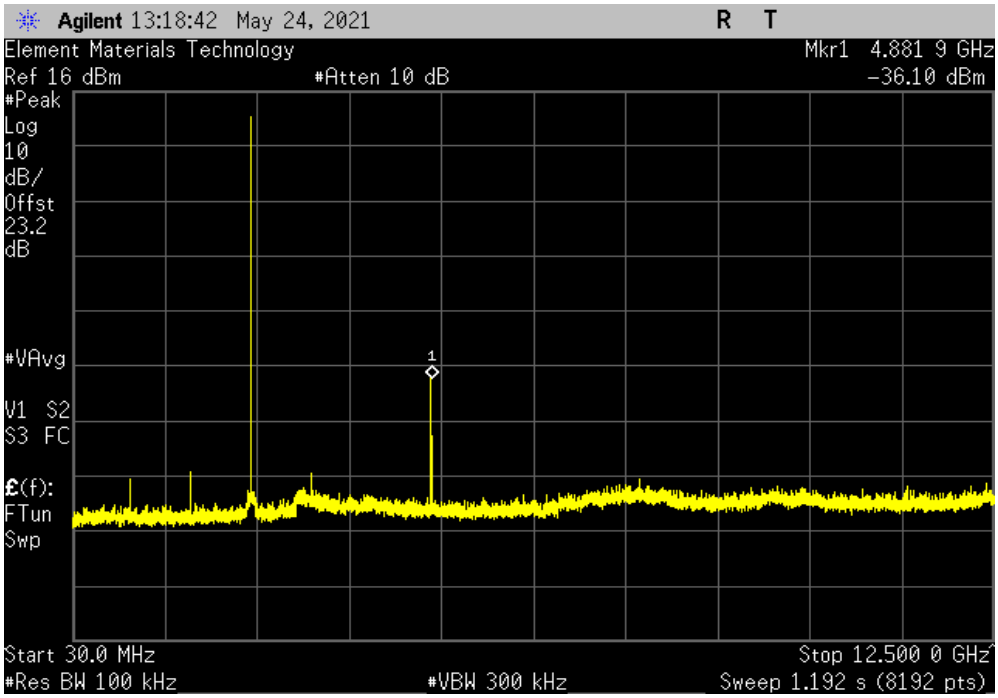
DH5, GFSK, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24789.4	-62.75	-20	Pass



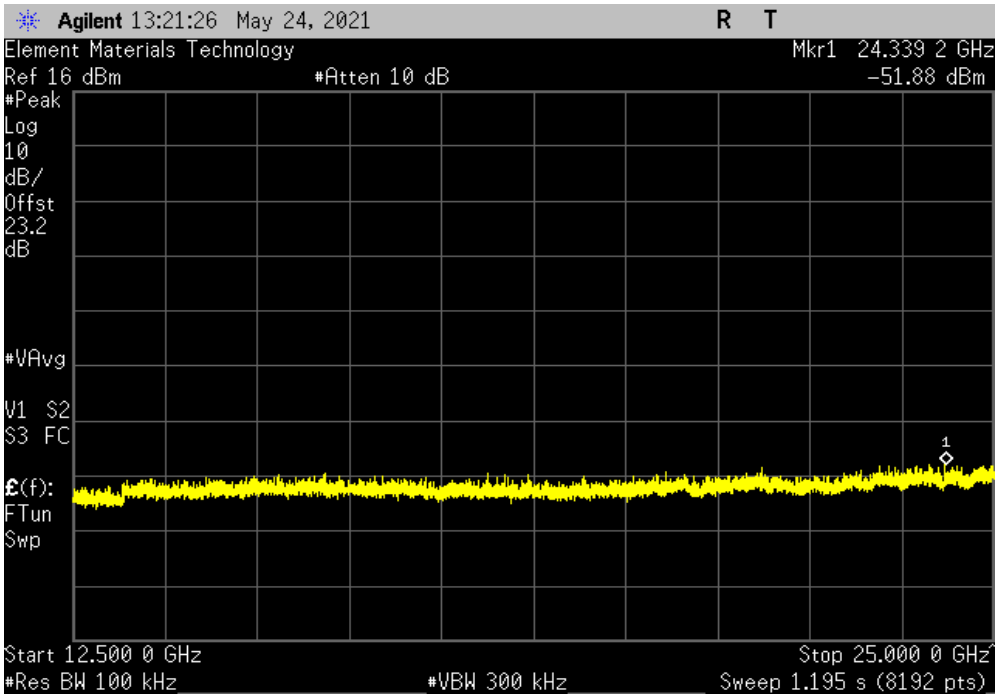
DH5, GFSK, Mid Channel, 2441 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2441.05	N/A	N/A	N/A



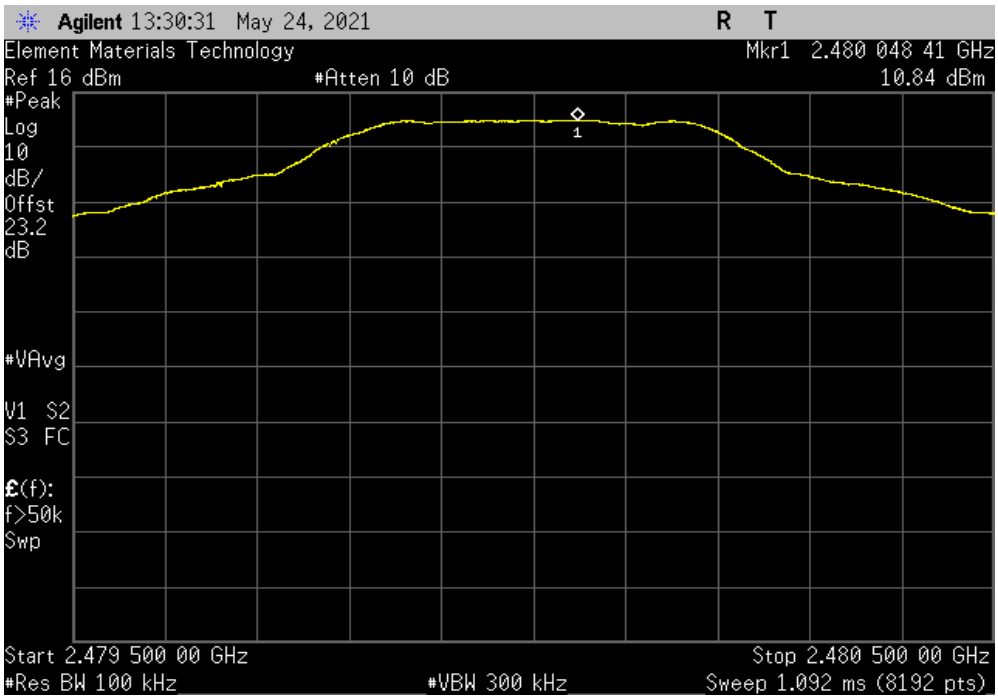
DH5, GFSK, Mid Channel, 2441 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	4881.9	-47.27	-20	Pass



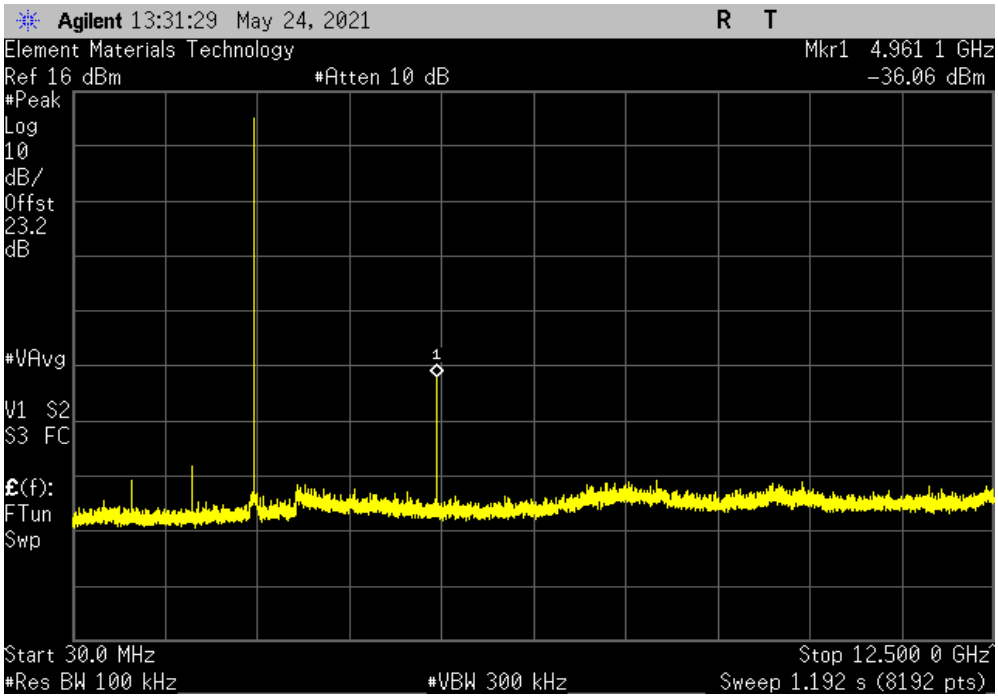
DH5, GFSK, Mid Channel, 2441 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24339.2	-63.05	-20	Pass



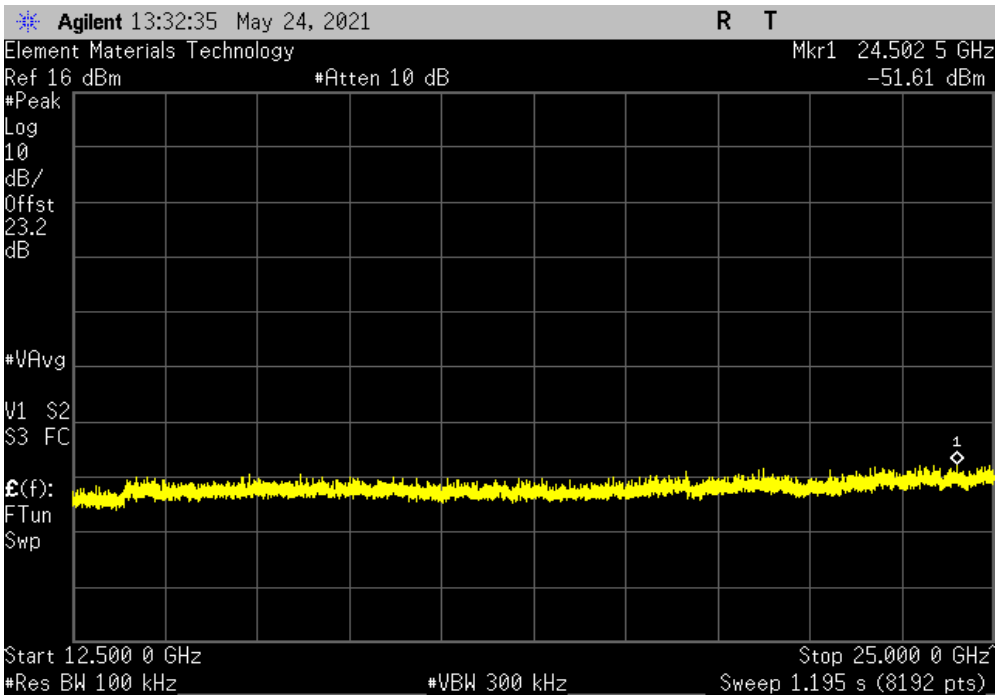
DH5, GFSK, High Channel, 2480 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		2480.05	N/A	N/A	N/A



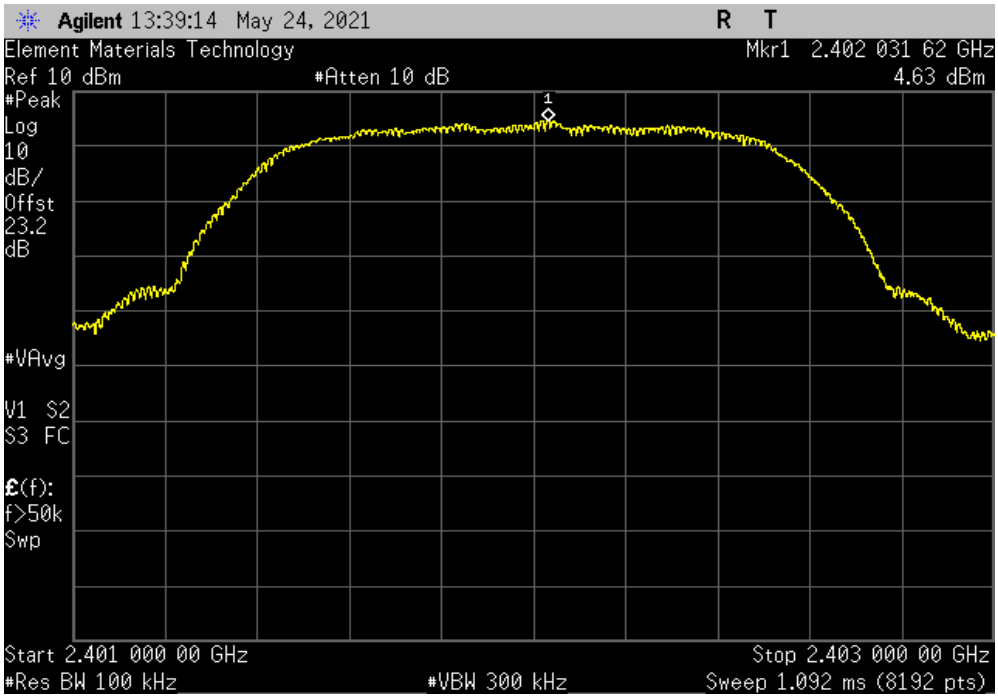
DH5, GFSK, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4961.1	-46.9	-20	Pass



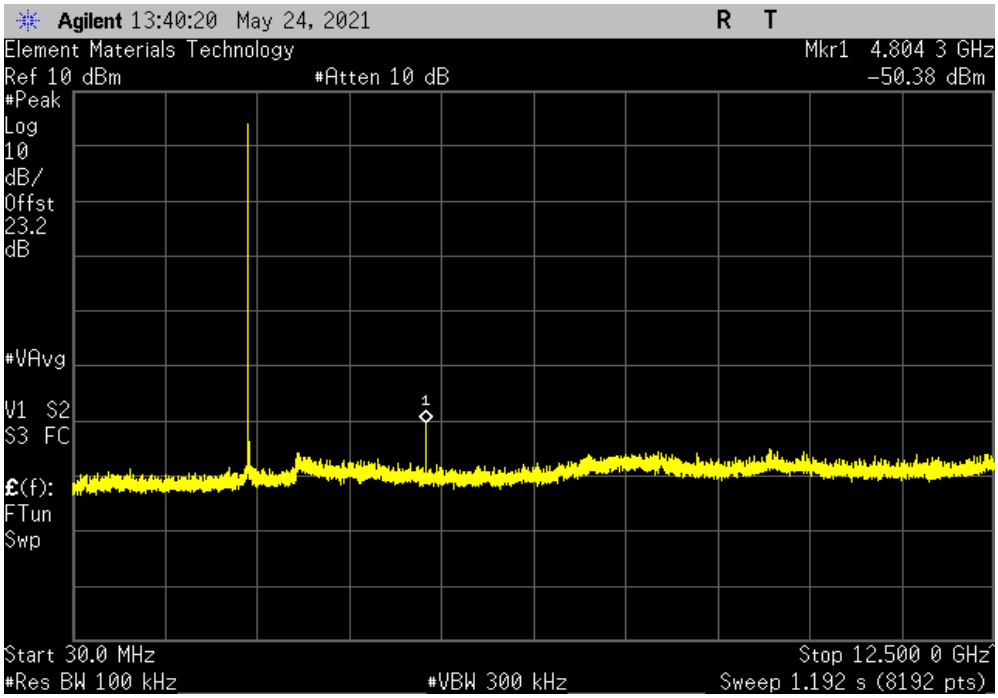
DH5, GFSK, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24502.5	-62.45	-20	Pass



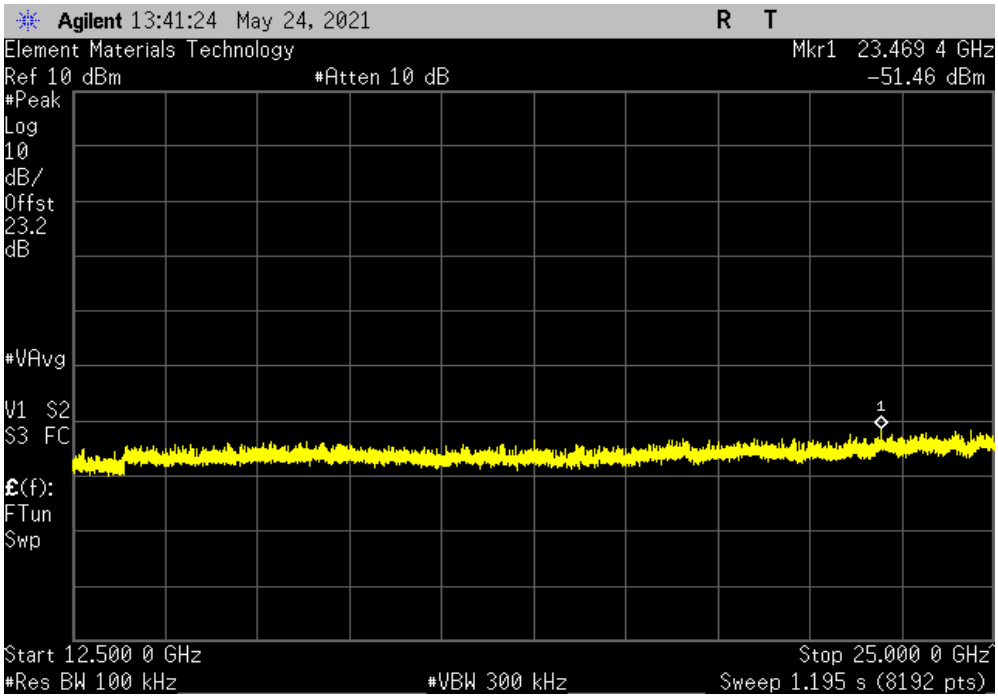
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2402.03	N/A	N/A	N/A



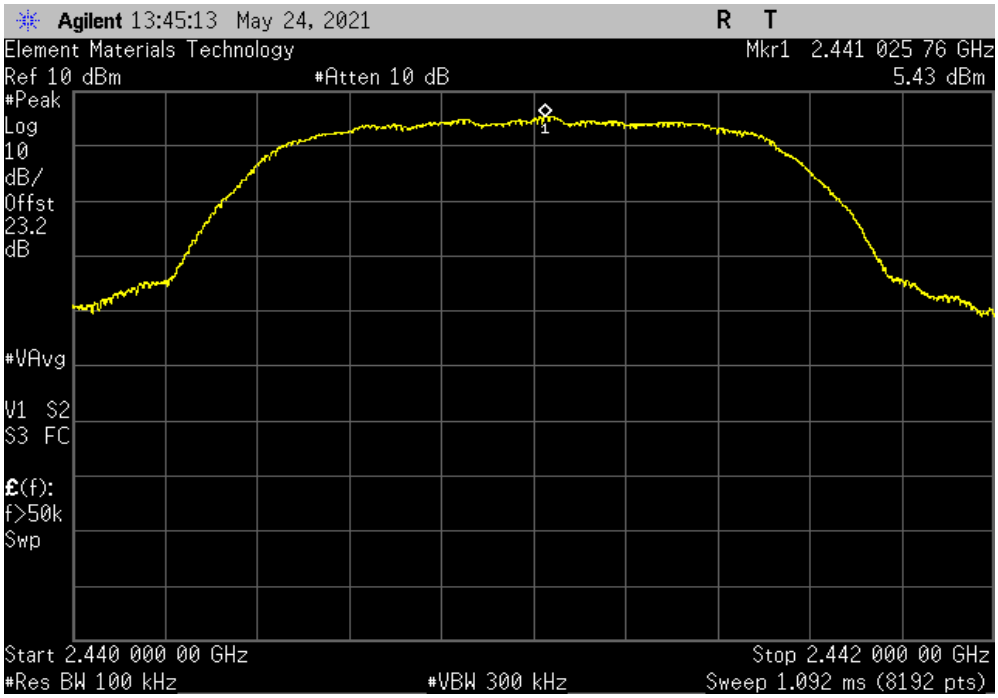
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	4804.3	-55.01	-20	Pass



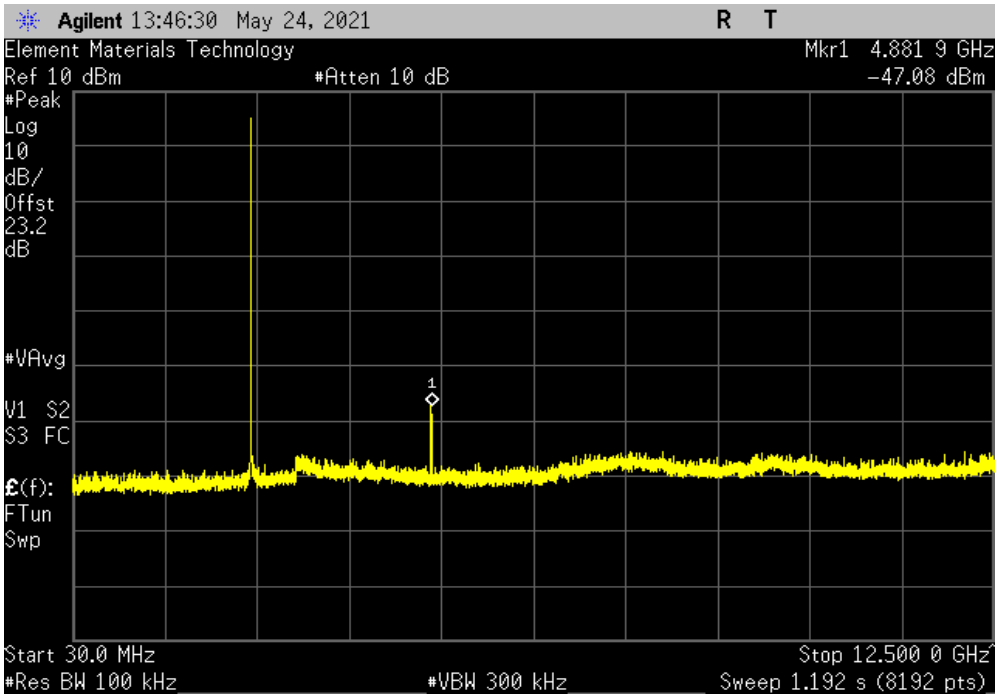
2DH5, pi/4-DQPSK, Low Channel, 2402 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	23469.4	-56.09	-20	Pass



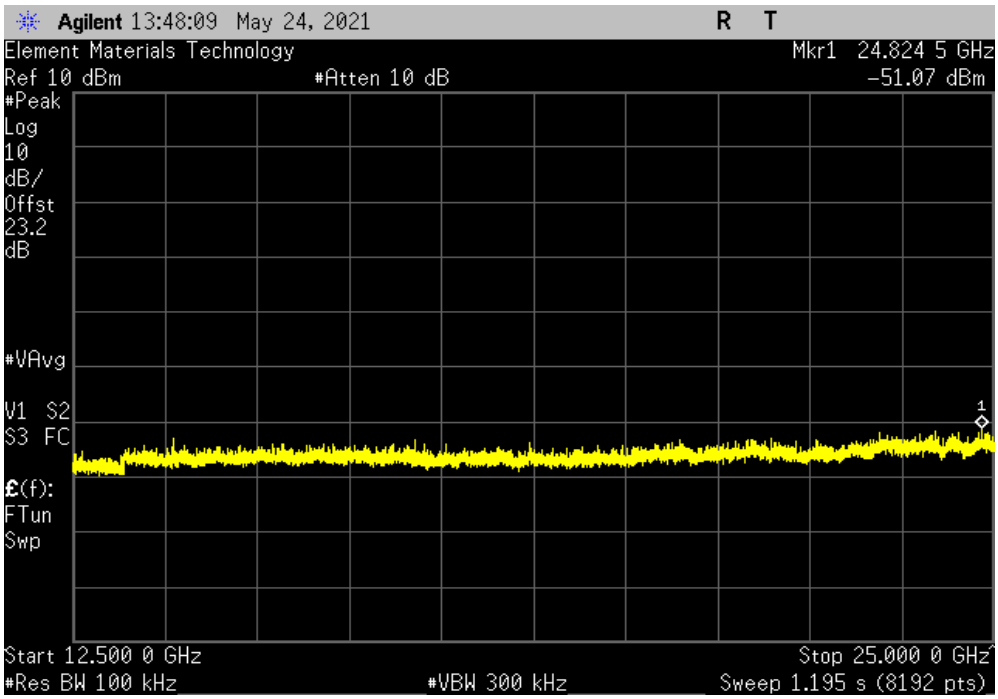
2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		2441.03	N/A	N/A	N/A



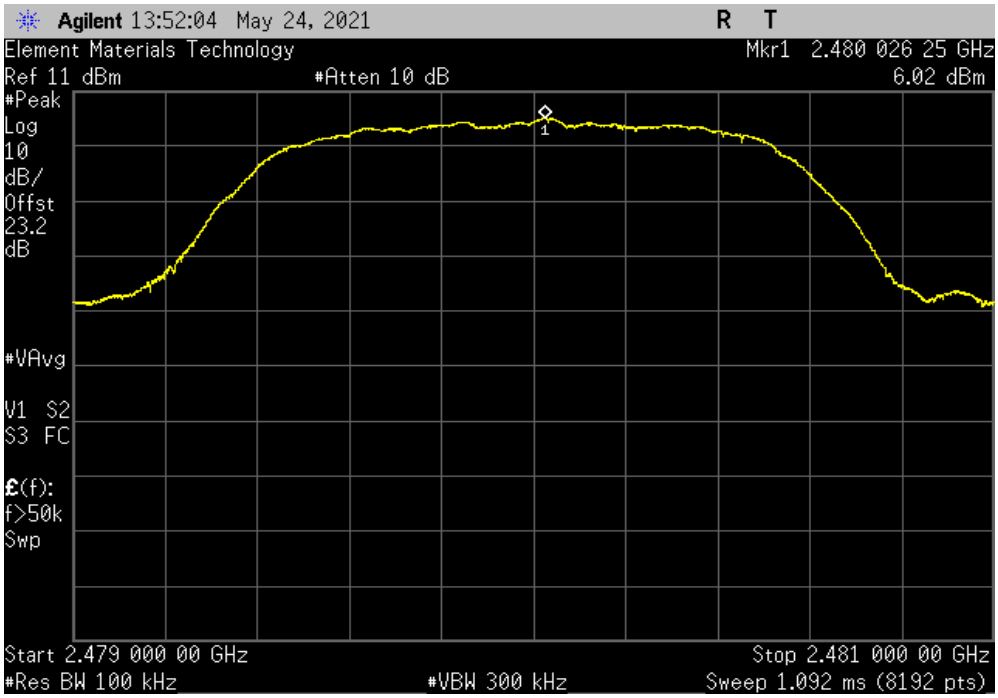
2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4881.9	-52.51	-20	Pass



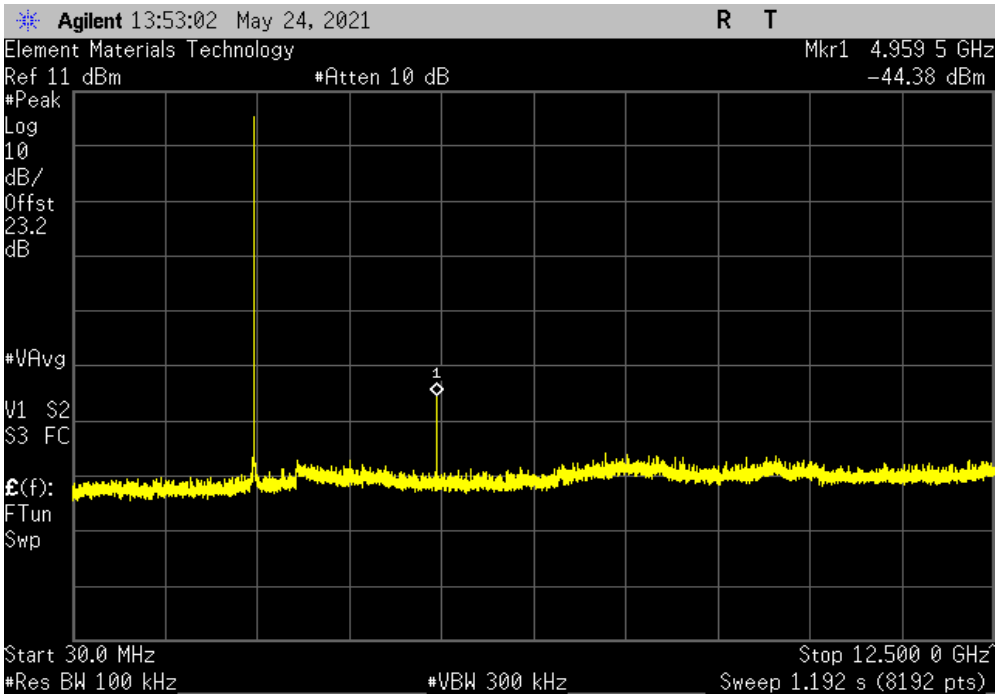
2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24824.5	-56.5	-20	Pass



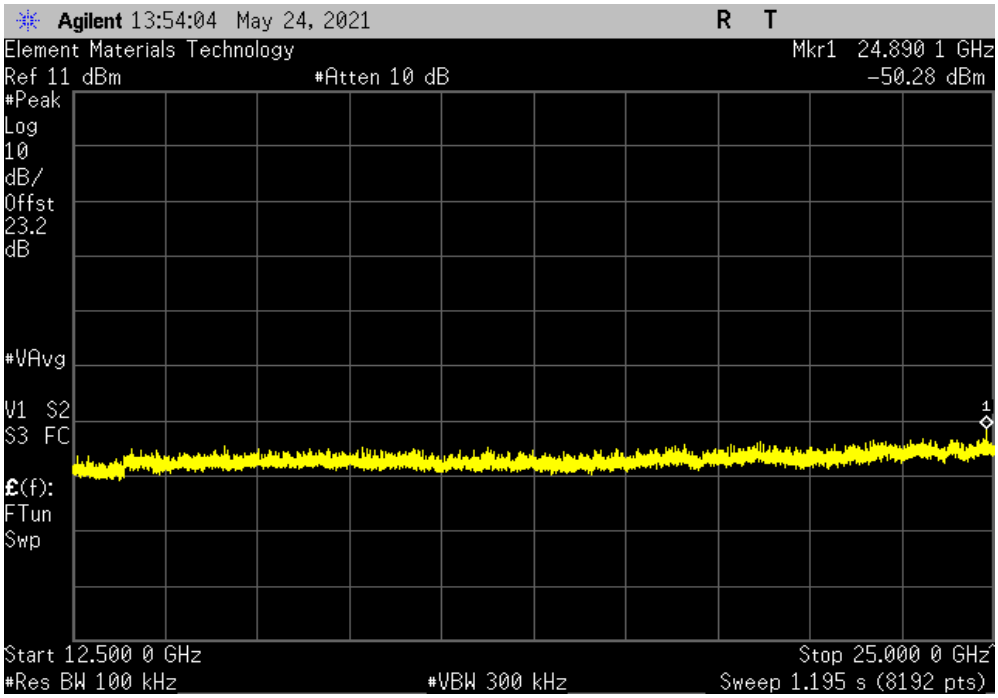
2DH5, pi/4-DQPSK, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2480.03	N/A	N/A	N/A



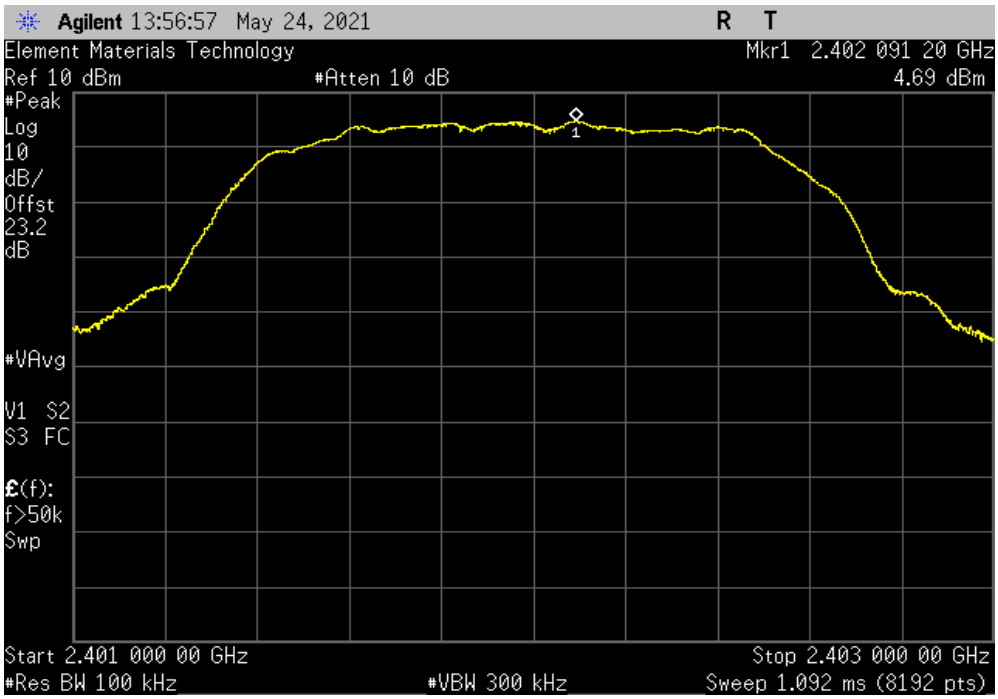
2DH5, pi/4-DQPSK, High Channel, 2480 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	4959.5	-50.4	-20	Pass



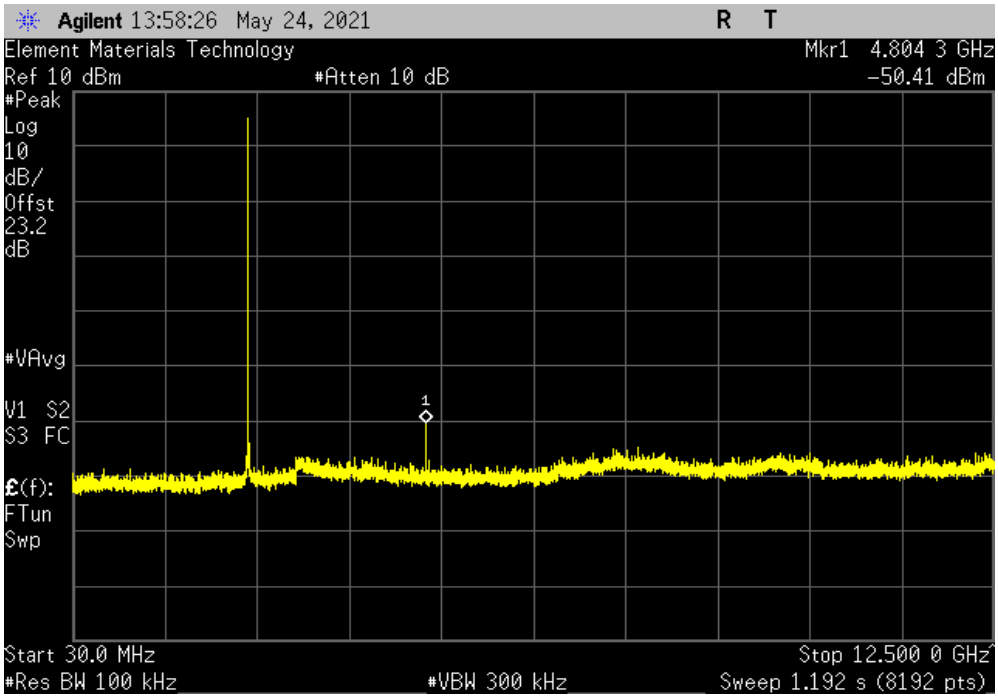
2DH5, pi/4-DQPSK, High Channel, 2480 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24890.1	-56.3	-20	Pass



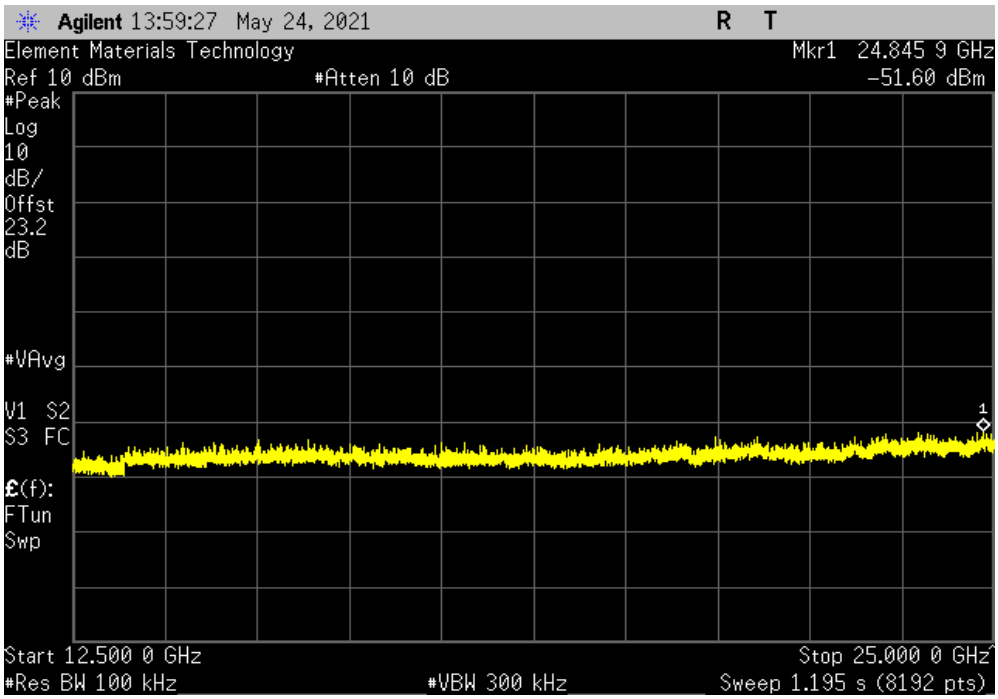
3DH5, 8-DPSK, Low Channel, 2402 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		2402.09	N/A	N/A	N/A



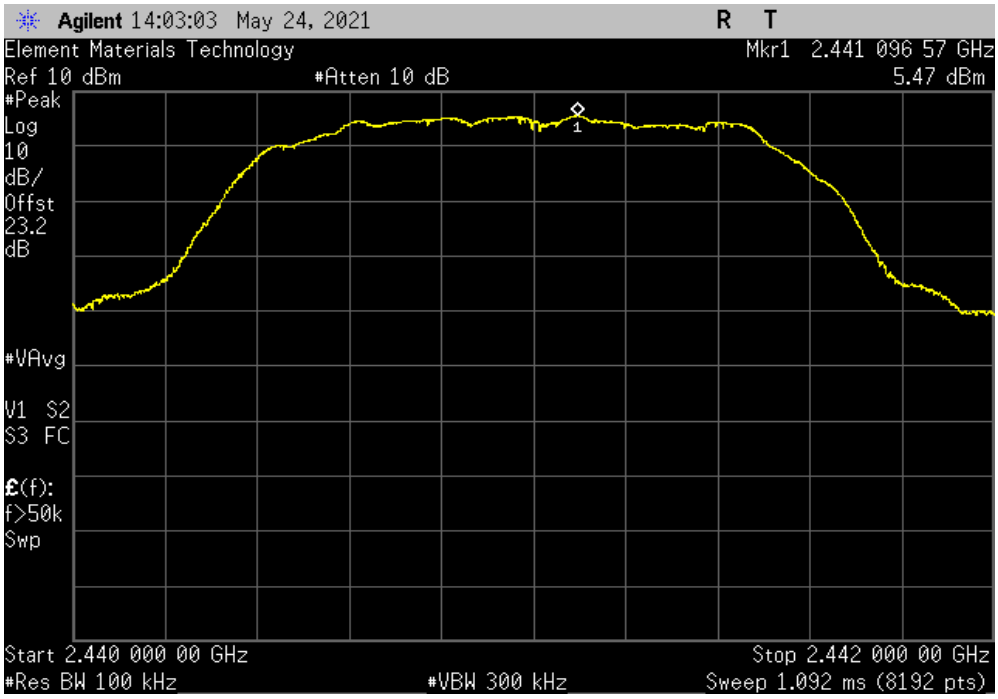
3DH5, 8-DPSK, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4804.3	-55.1	-20	Pass



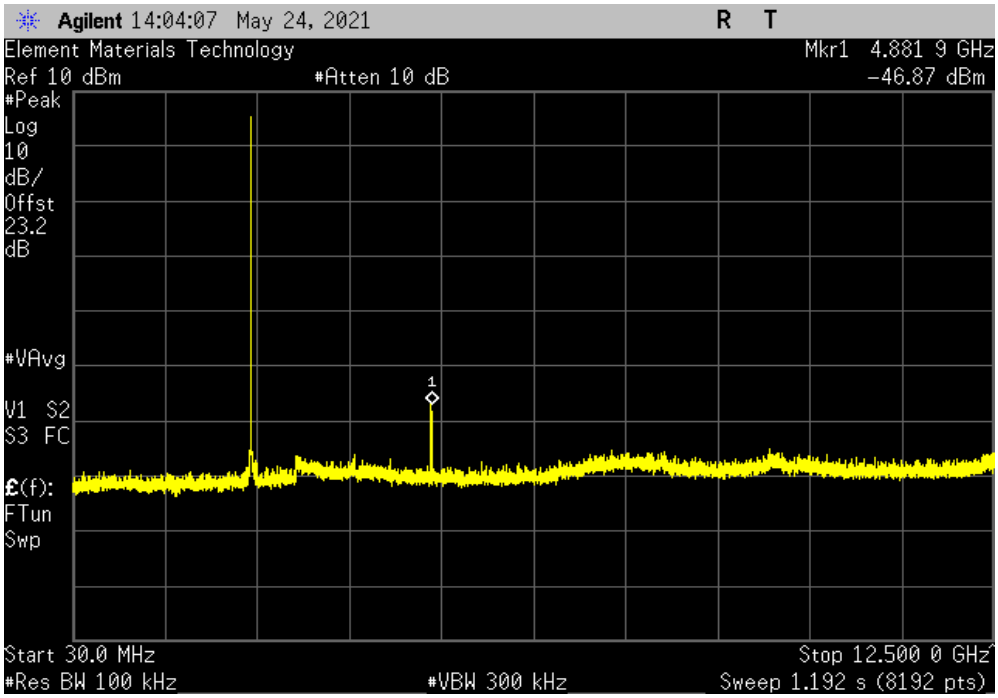
3DH5, 8-DPSK, Low Channel, 2402 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24845.9	-56.29	-20	Pass



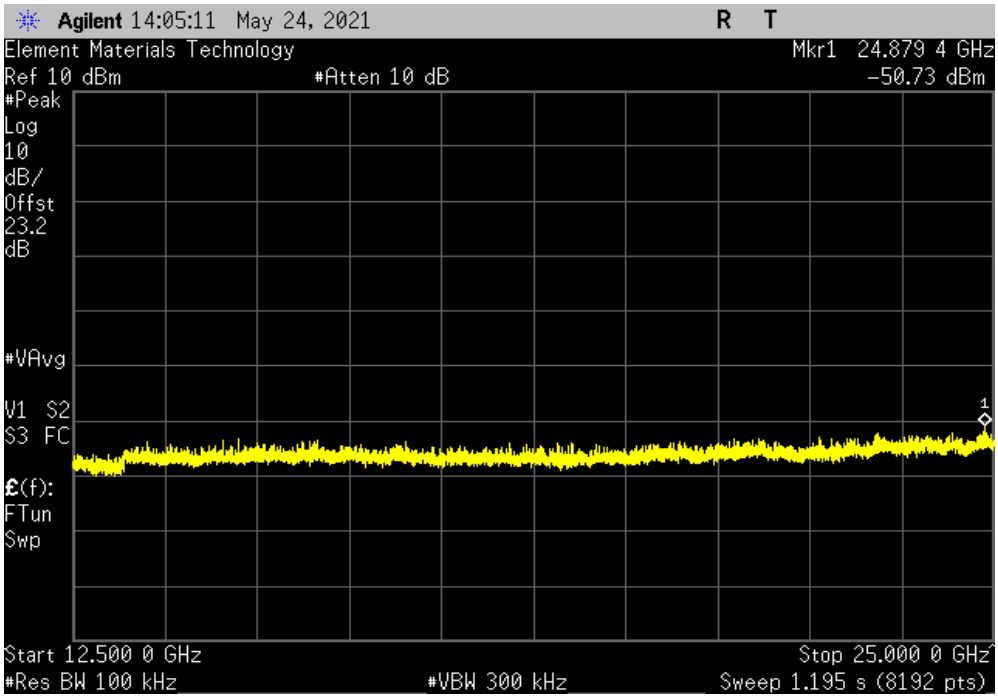
3DH5, 8-DPSK, Mid Channel, 2441 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
Fundamental	2441.1	N/A	N/A	N/A



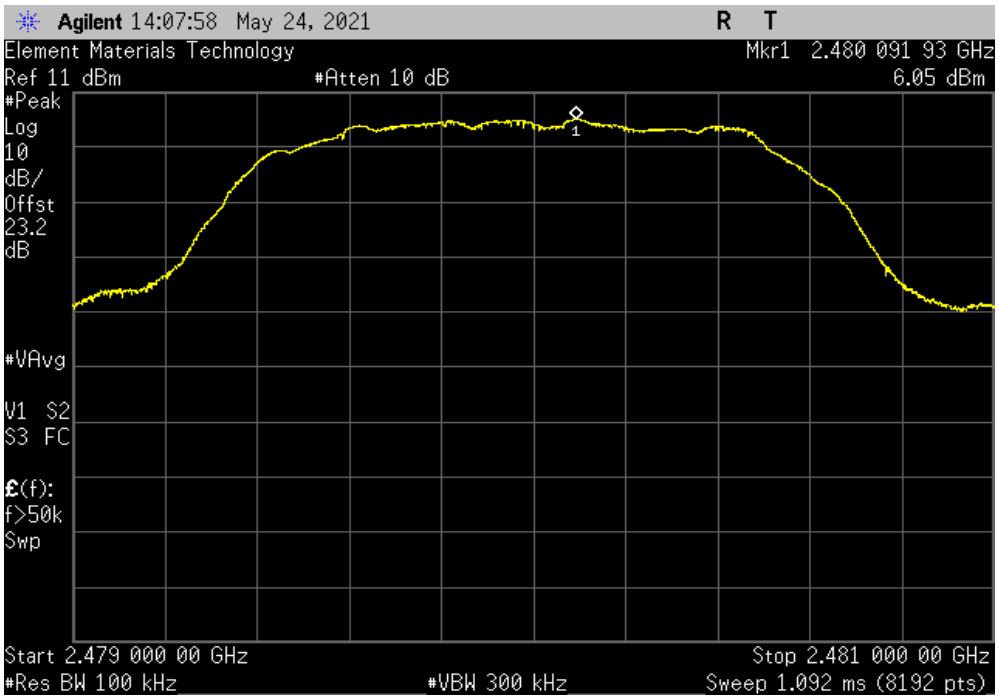
3DH5, 8-DPSK, Mid Channel, 2441 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	4881.9	-52.34	-20	Pass



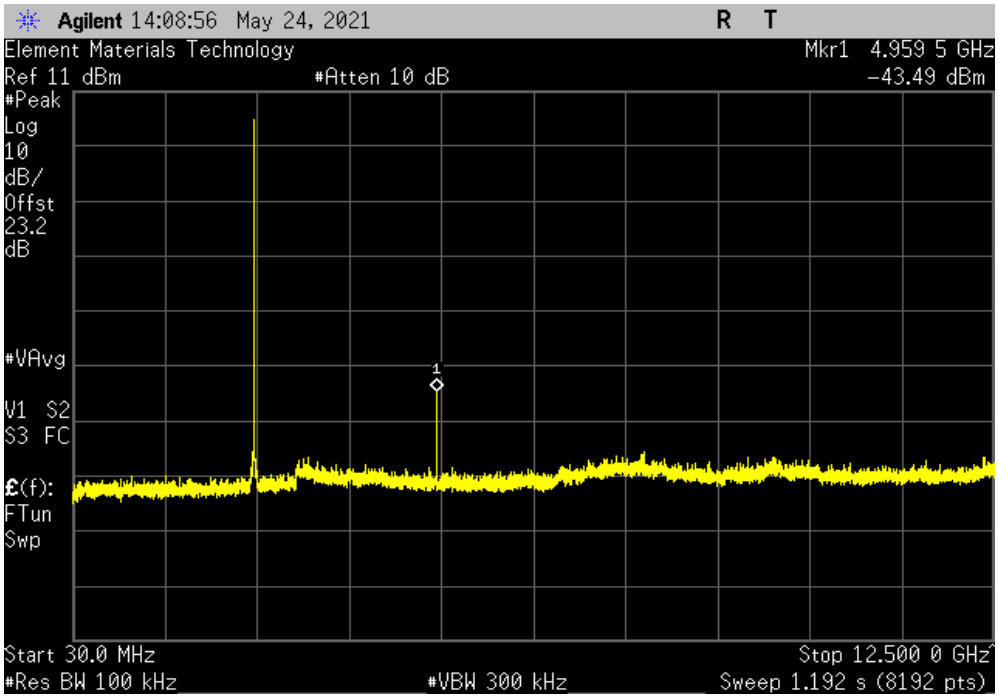
3DH5, 8-DPSK, Mid Channel, 2441 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24879.4	-56.2	-20	Pass



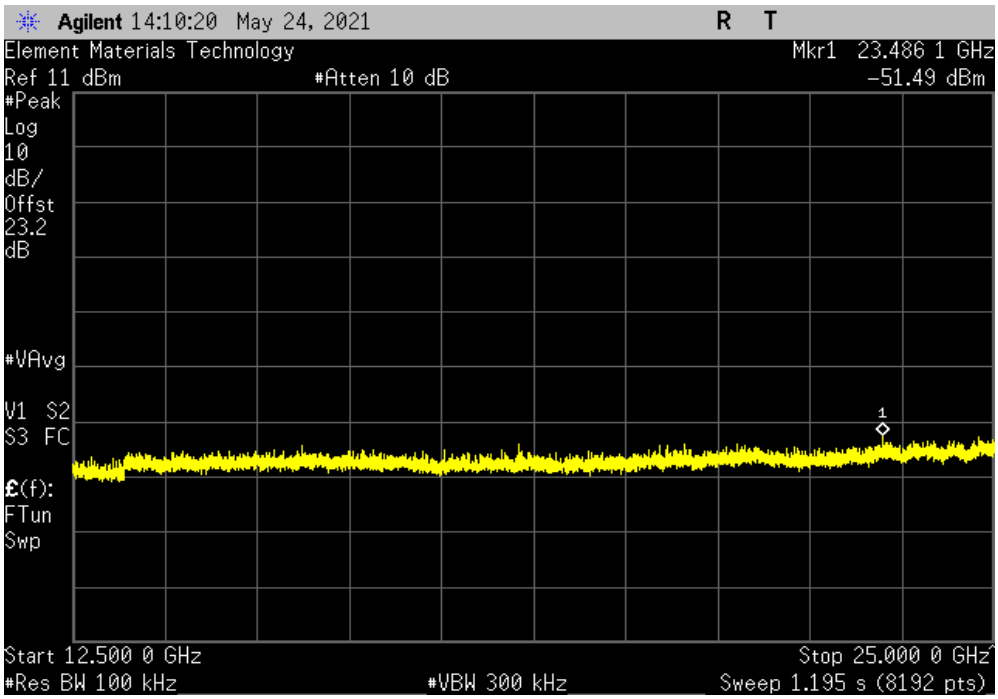
3DH5, 8-DPSK, High Channel, 2480 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		2480.09	N/A	N/A	N/A



3DH5, 8-DPSK, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4959.5	-49.54	-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	23486.1	-57.54	-20	Pass



End of Test Report