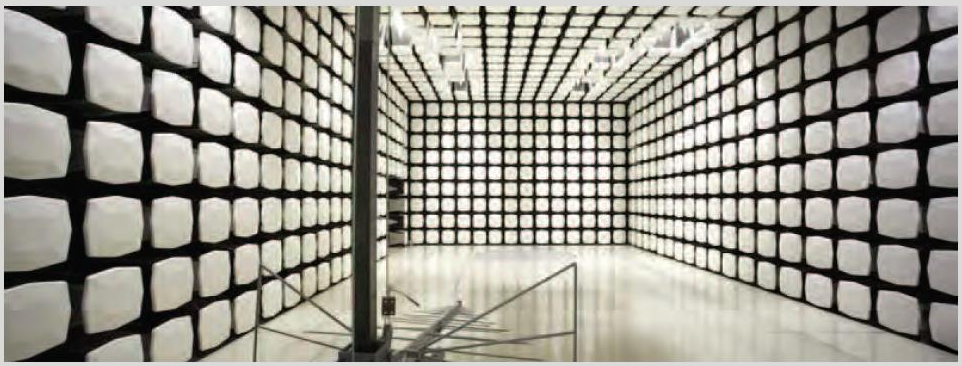
Supra, a division of Carrier Fire and Security Americas Corporation

Invoy

FCC 15.247:2023;
RSS-247 Issue 3:2023; RSS-Gen Issue 5:2018+A1:2019+A1L2021

Bluetooth Low Energy (DTS) Radio

Report: CAFI0010.1 Rev. 1, Issue Date: May 1, 2024



ACCREDITED
CERT #3310.02

TABLE OF CONTENTS

Section	Page Number

CERTIFICATE OF TEST

Last Date of Test: August 31, 2023
Supra, a division of Carrier Fire and Security Americas Corporat
EUT: Invoy

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 3:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

Note: RSS-247 Issue 3 has been updated superseding prior issues. The changes between the specifications do not affect the results of the prior testing.

Guidance

FCC KDB 558074 v05r02:2019
Notice 2021 - CEB0001

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Powerline Conducted Emissions	N/A	15.207	RSS-Gen 8.8	6.2	Not required for a battery powered EUT.
Occupied Bandwidth (99%)	Pass	KDB 558074 -2.1	RSS-Gen 6.7	6.9.3	
Duty Cycle	N/A	KDB 558074 -6.0	RSS-Gen 3.2	11.6	
DTS Bandwidth (6 dB)	Pass	15.247(a)(2), KDB 558074 -8.2	RSS-247 5.2(a)	11.8.2	
Output Power	Pass	15.247(b)(3), KDB 558074 -8.3.1	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.1.1	
Equivalent Isotropic Radiated Power	Pass	15.247(b)(3), KDB 558074 -8.3.1	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.1.1	
Power Spectral Density	Pass	15.247(e), KDB 558074 -8.4	RSS-247 5.2(b)	11.10.2	
Band Edge Compliance	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
Spurious Conducted Emissions	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
Spurious Radiated	Pass	15.247(d),	RSS-247 5.5,	11.12.1,	

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

CERTIFICATE OF TEST

Emissions		KDB 558074 - 8.6, 8.7	RSS-Gen 6.13, 8.10	11.13.2, 6.5, 6.6	

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Customer Support Engineer

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	Report revised to reflect RSS-247 Issue 3	2024-05-01	1,3
01	Added Appendix to include Gap Analysis	2024-05-01	62,63

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

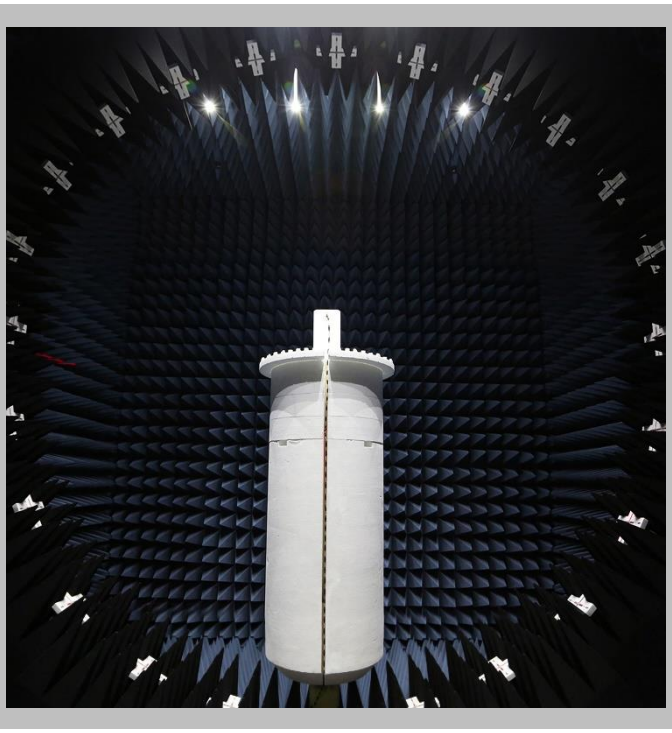
For details on the Scopes of our Accreditations, please visit:

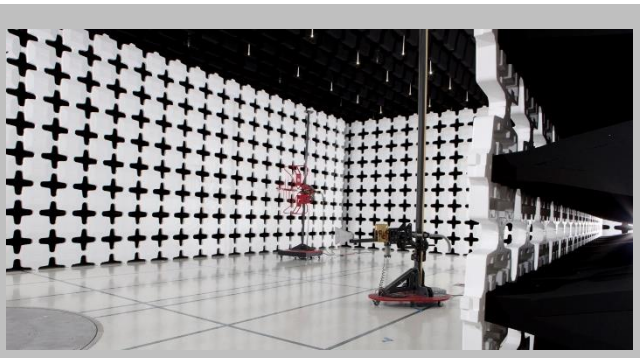
California Minnesota Oregon Texas Washington

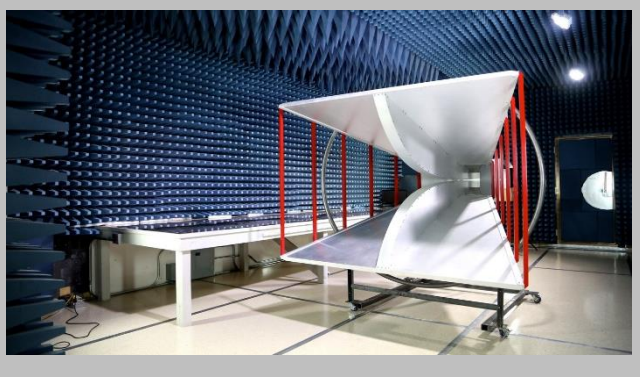
FACILITIES

element
2020.12.15

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
RP.2023.05.08.0

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 Location: Oregon

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

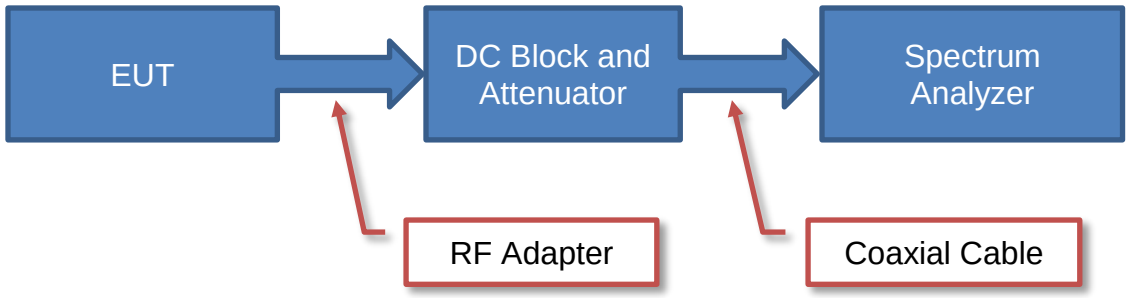
TEST SETUP BLOCK DIAGRAMS

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.

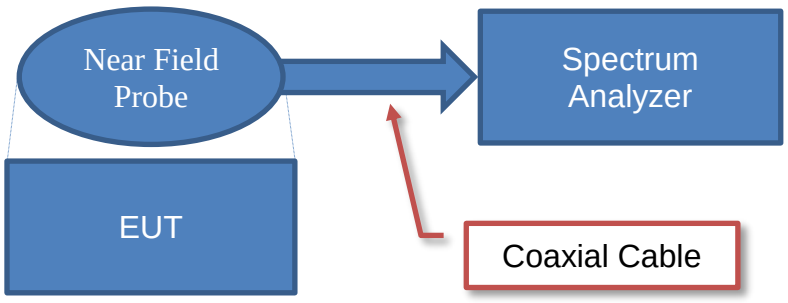
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

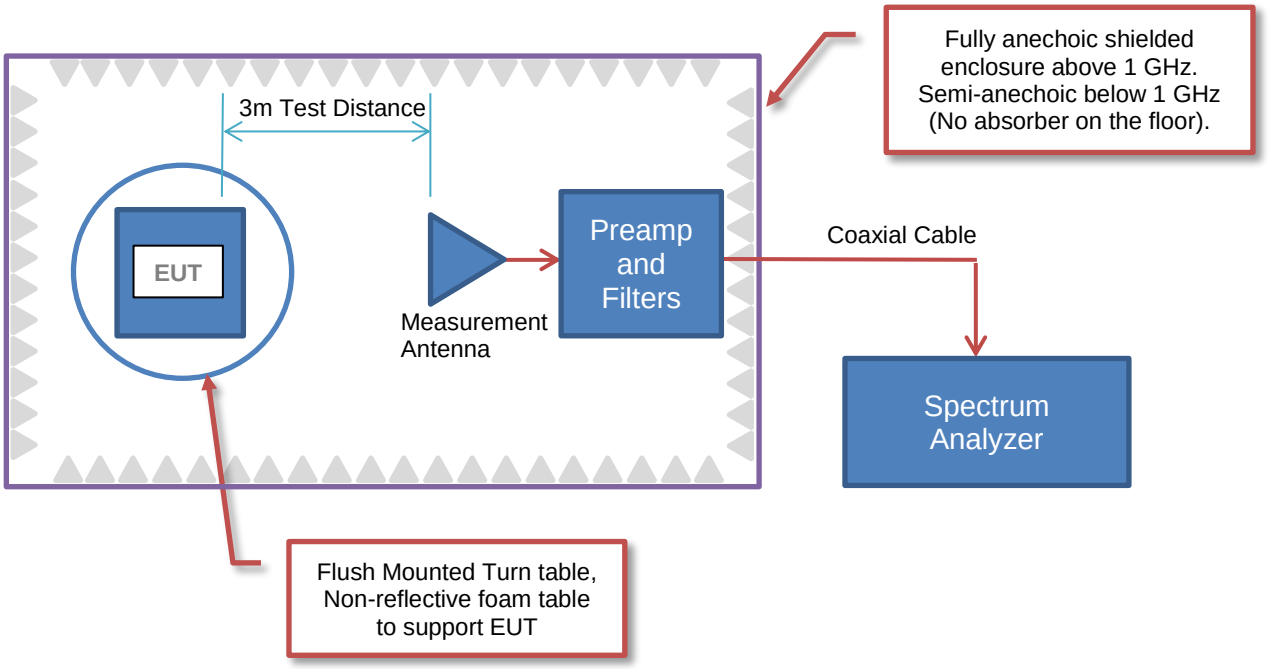


Sample Calculation (logarithmic units)

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**

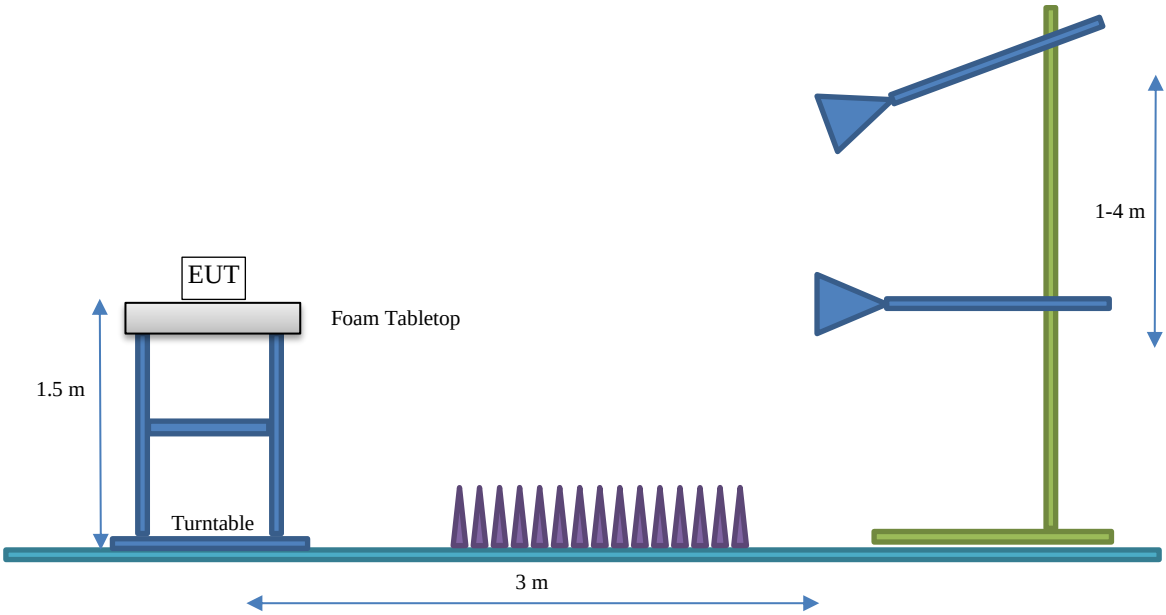
Radiated Power (ERP/EIRP) – Substitution Method:

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

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

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



PRODUCT DESCRIPTION

Client and Equipment under Test (EUT) Information

Company Name:	Supra, a division of Carrier Fire and Security Americas Corporation
Address:	4001 Fairview Industrial Dr. SE
City, State, Zip:	Salem, OR 97302
Test Requested By:	Ali Elmi
EUT:	Invoy
First Date of Test:	August 31, 2023
Last Date of Test:	August 31, 2023
Receipt Date of Samples:	August 31, 2023
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Electronic keybox that can be opened using Bluetooth or infrared signals.

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

POWER SETTINGS AND ANTENNAS

The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Modified Monopole	KYOCERA AVX Components Corp.	2400 – 2483.5	-4.3

The EUT was tested using the power settings provided by the manufacturer which were based upon:

☒ Test software settings Test software/firmware installed on EUT: 7.2
☐ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types / Data Rates	Type	Channel	Frequency (MHz)	Power Setting (dBm)
BLE GFSK, 125 kbps, 500 kbps, 1 Mbps, 2 Mbps	DTS	0 or 37	2402	5
		20 or 18	2440	
		39	2480	

CONFIGURATIONS

Configuration CAFI0010-1

Software/Firmware Running During Test	
Description	**Version**
Firmware	7.2
BT Excel Program	1.0.0.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Lock Box with Bluetooth LE	Supra, a division of Carrier Fire and Security Americas Corporation	Invoy	99011015

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
11.6in Detachable Laptop	Venturer	WT9I11P44GD51	Y8LD8Z0042W8

Configuration CAFI0010-2

Software/Firmware Running During Test	
Description	**Version**
Firmware	7.2
BT Excel Program	1.0.0.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Direct Connect Sample	Supra, a division of Carrier Fire and Security Americas Corporation	Invoy	99011023

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
11.6in Detachable Laptop	Venturer	WT9I11P44GD51	Y8LD8Z0042W8

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2023-08-31	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.
2	2023-08-31	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2023-08-31	Power Spectral Density	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	2023-08-31	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.
5	2023-08-31	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.
6	2023-08-31	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2023-08-31	Occupied Bandwidth (99%)	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	2023-08-31	DTS Bandwidth (6 Db)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

OCCUPIED BANDWIDTH (99%)

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

TEST DESCRIPTION

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

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

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

Per ANSI C63.10:2013, 6.9.3, the spectrum analyzer was configured as follows:

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

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

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2023-04-18	2024-04-18
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

OCCUPIED BANDWIDTH (99%)

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011023	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	50.9%
Customer Project:	None	Bar. Pressure (PMSL):	1010 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	Battery	Configuration:	CAFI0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A1L2021	ANSI C63.10:2013

COMMENTS

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

DEVIATIONS FROM TEST STANDARD

None

TESTED BY

Jeff Alcoke

TEST RESULTS

	Value	Limit	Result
BLE/GFSK 125 kbps			
Low Channel, 2402 MHz	1.101 MHz	N/A	N/A
Mid Channel, 2440 MHz	1.103 MHz	N/A	N/A
High Channel, 2480 MHz	1.097 MHz	N/A	N/A
BLE/GFSK 500 kbps			
Low Channel, 2402 MHz	1.089 MHz	N/A	N/A
Mid Channel, 2440 MHz	1.085 MHz	N/A	N/A
High Channel, 2480 MHz	1.085 MHz	N/A	N/A
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	1.095 MHz	N/A	N/A
Mid Channel, 2440 MHz	1.09 MHz	N/A	N/A
High Channel, 2480 MHz	1.088 MHz	N/A	N/A
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	2.078 MHz	N/A	N/A
Mid Channel, 2440 MHz	2.054 MHz	N/A	N/A
High Channel, 2480 MHz	2.085 MHz	N/A	N/A

OCCUPIED BANDWIDTH (99%)

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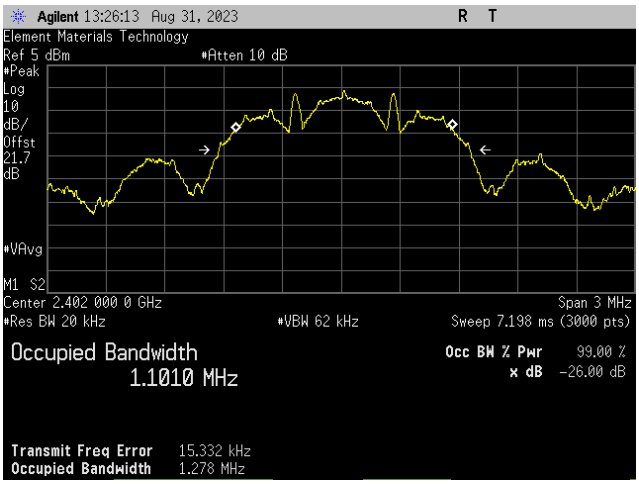
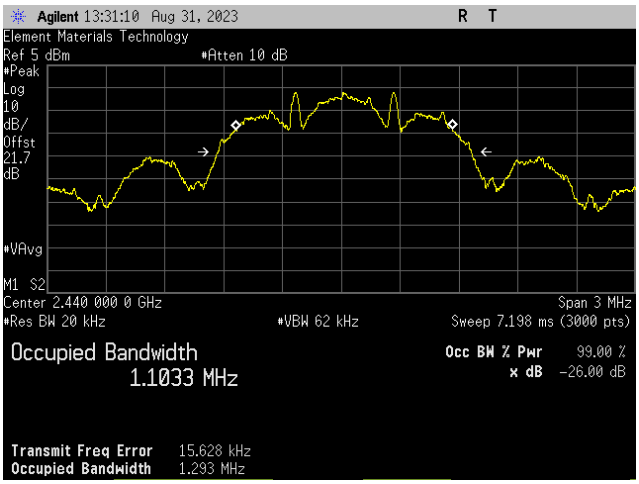
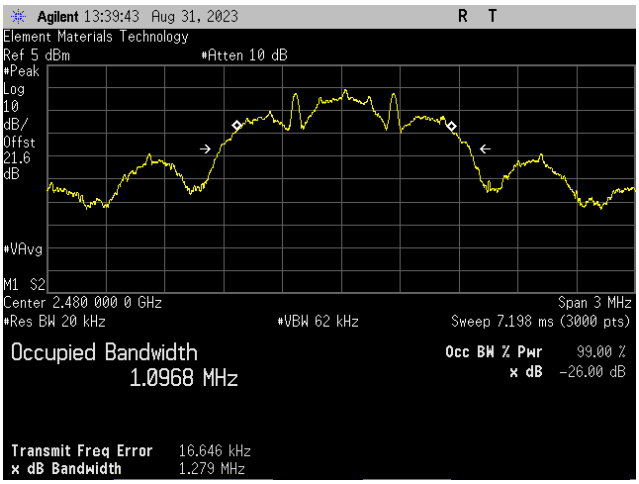
TbtTx 2023.08.15.0
WTD.2023.08.03.0



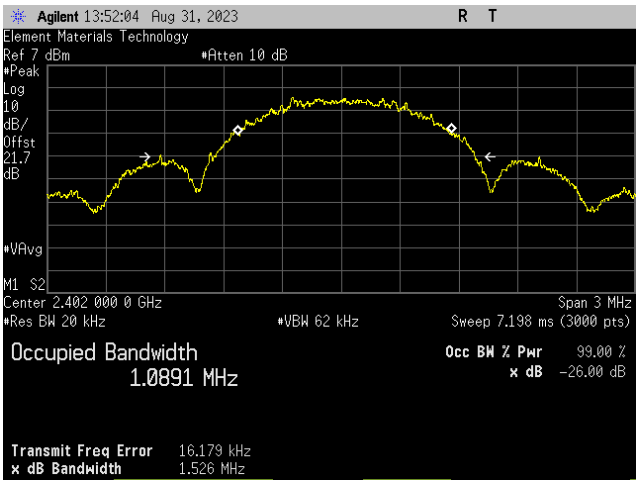
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



BLE/GFSK 125 kbps
Mid Channel, 2440 MHz



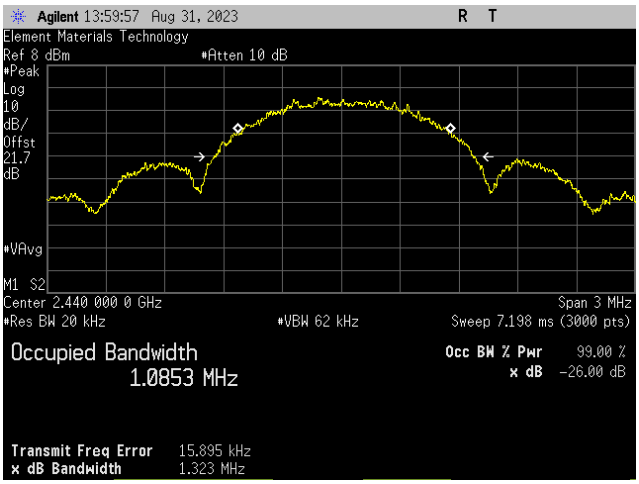
BLE/GFSK 125 kbps
High Channel, 2480 MHz



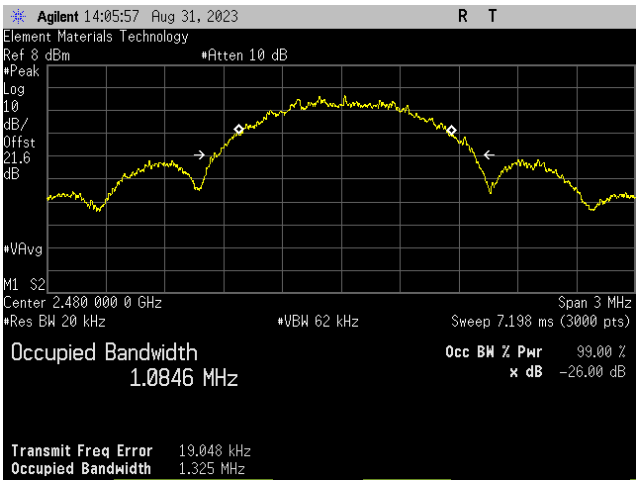
BLE/GFSK 500 kbps
Low Channel, 2402 MHz

OCCUPIED BANDWIDTH (99%)

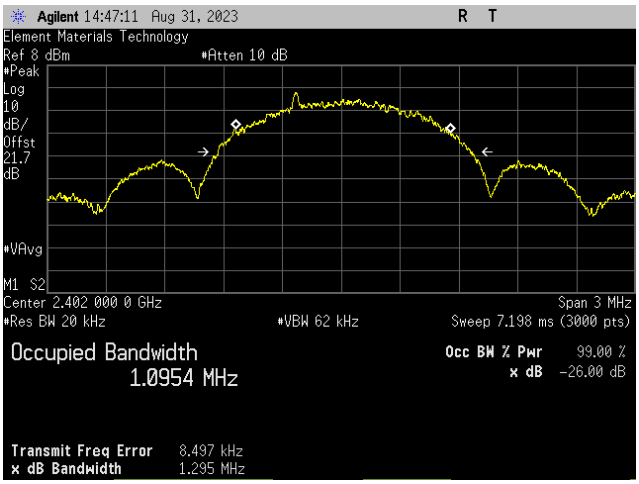
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



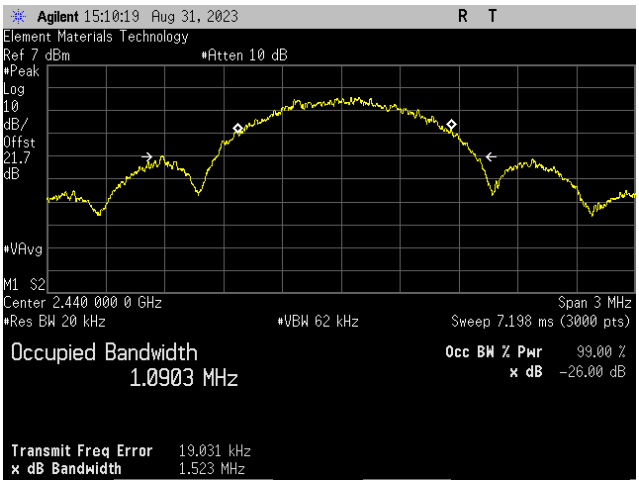
BLE/GFSK 500 kbps
Mid Channel, 2440 MHz



BLE/GFSK 500 kbps
High Channel, 2480 MHz



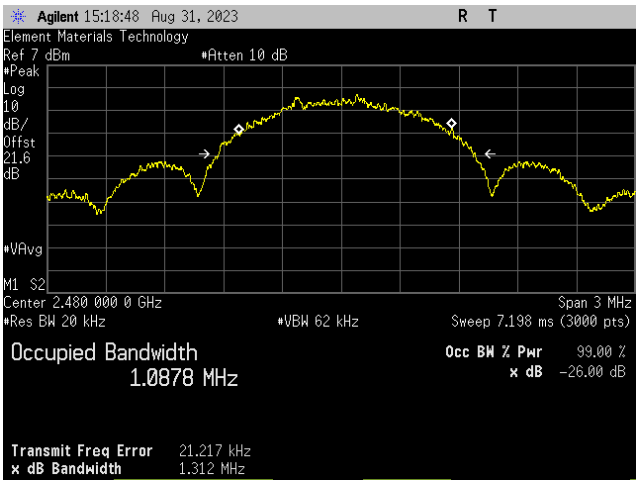
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



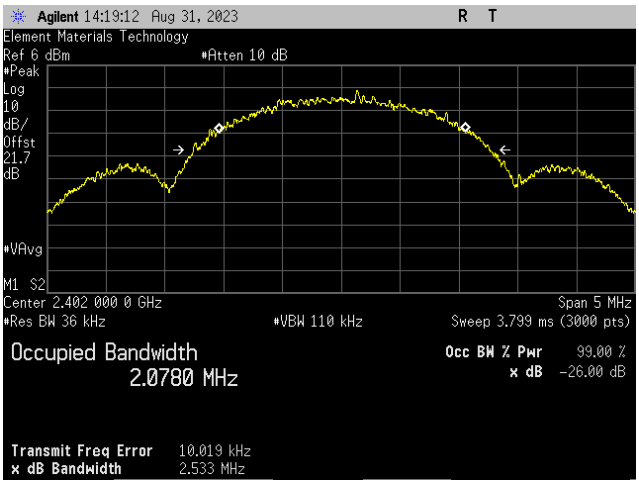
BLE/GFSK 1 Mbps
Mid Channel, 2440 MHz

OCCUPIED BANDWIDTH (99%)

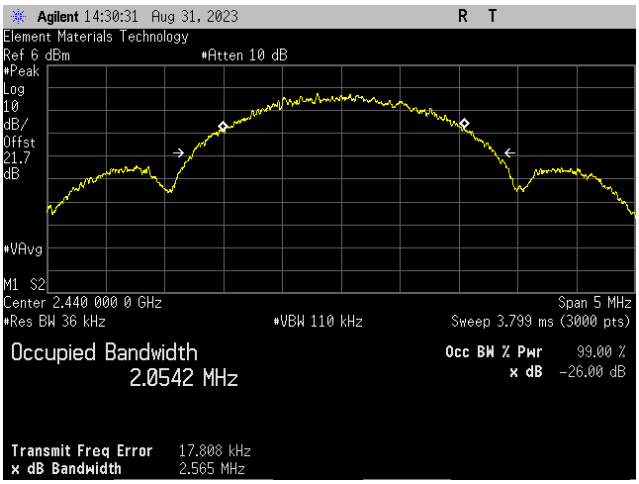
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



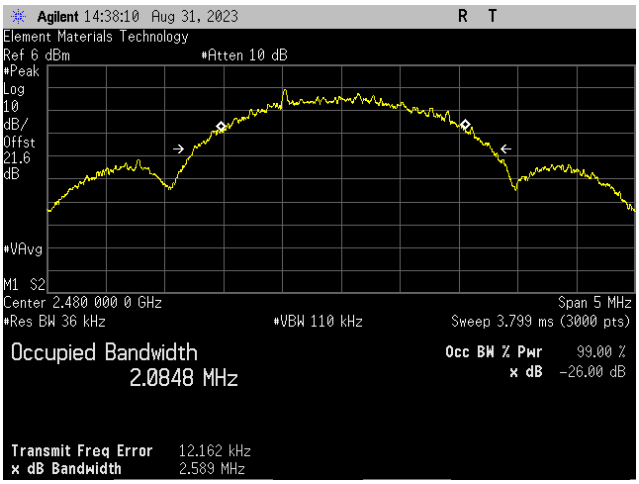
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2440 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

DUTY CYCLE

element
WTD.2023.04.25.0
EmiR5 2022.07.06.0
PSA-ESCI 2023.04.25.0

TEST DESCRIPTION

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

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

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

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

DTS BANDWIDTH (6 dB)

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

TEST DESCRIPTION

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

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

The EUT was set to the channels and modes listed in the datasheet.

The 6dB DTS bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2023-04-18	2024-04-18
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

DTS BANDWIDTH (6 dB)

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011023	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	50.8%
Customer Project:	None	Bar. Pressure (PMSL):	1010 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	Battery	Configuration:	CAFI0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013

COMMENTS

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

DEVIATIONS FROM TEST STANDARD

None

TESTED BY

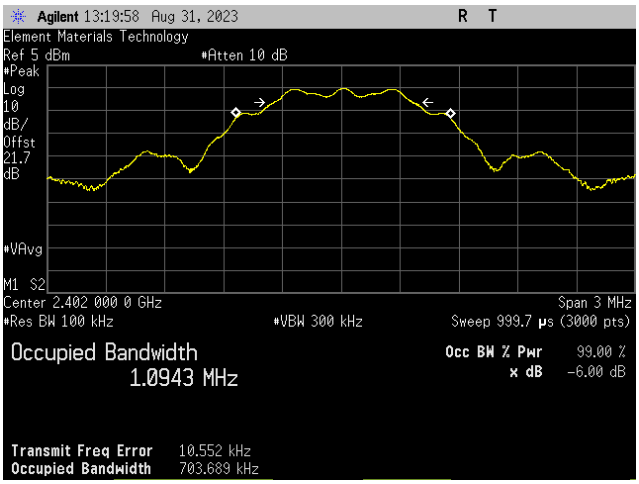
Jeff Alcoke

TEST RESULTS

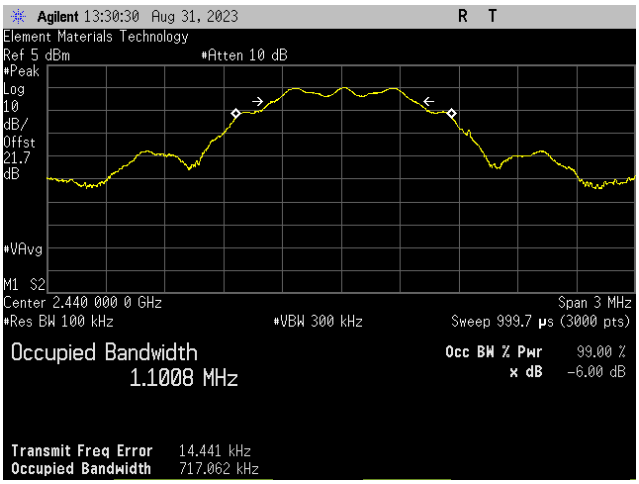
	Value	Limit (≥)	Result
BLE/GFSK 125 kbps			
Low Channel, 2402 MHz	703.689 kHz	500 kHz	Pass
Mid Channel, 2440 MHz	717.062 kHz	500 kHz	Pass
High Channel, 2480 MHz	692.856 kHz	500 kHz	Pass
BLE/GFSK 500 kbps			
Low Channel, 2402 MHz	668.321 kHz	500 kHz	Pass
Mid Channel, 2440 MHz	718.43 kHz	500 kHz	Pass
High Channel, 2480 MHz	678.641 kHz	500 kHz	Pass
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	722.823 kHz	500 kHz	Pass
Mid Channel, 2440 MHz	690.178 kHz	500 kHz	Pass
High Channel, 2480 MHz	689.423 kHz	500 kHz	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	1.404 MHz	500 kHz	Pass
Mid Channel, 2440 MHz	1.442 MHz	500 kHz	Pass
High Channel, 2480 MHz	1.354 MHz	500 kHz	Pass

DTS BANDWIDTH (6 dB)

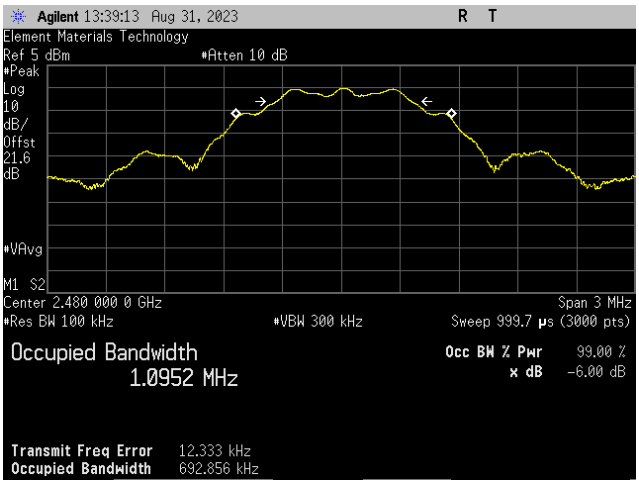
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



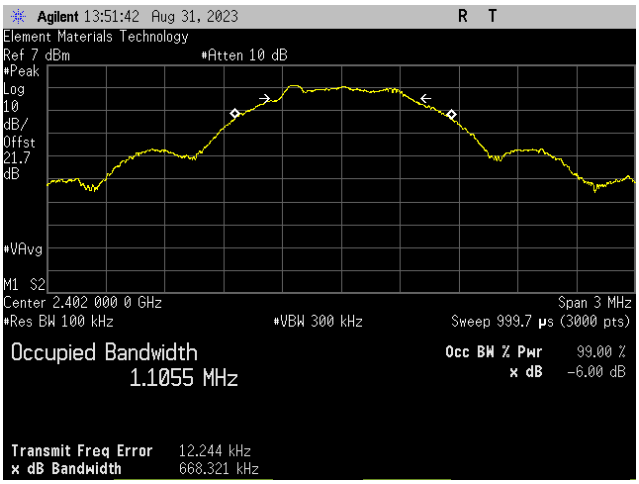
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



BLE/GFSK 125 kbps
Mid Channel, 2440 MHz



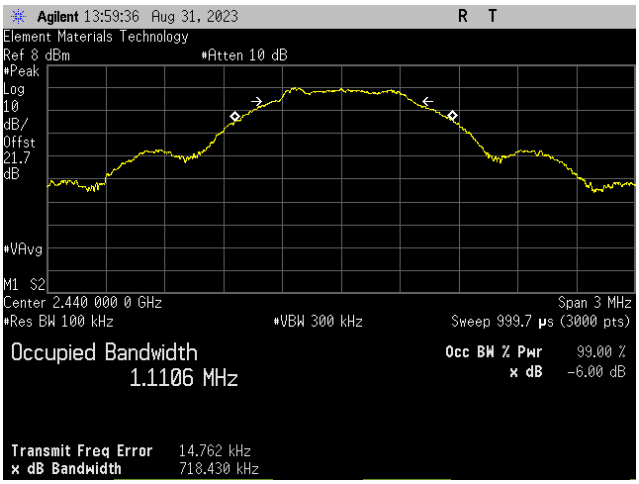
BLE/GFSK 125 kbps
High Channel, 2480 MHz



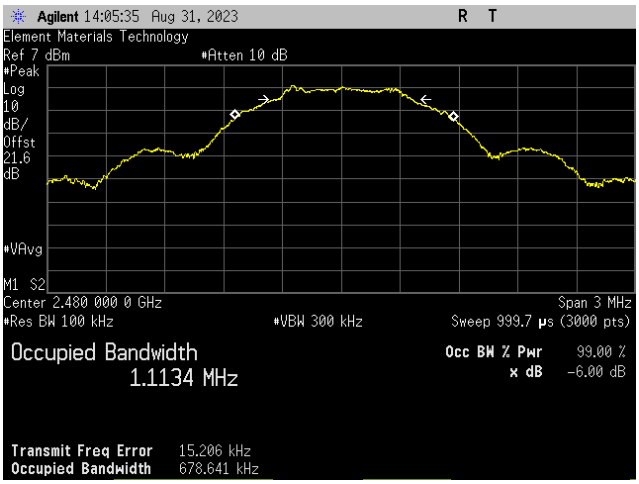
BLE/GFSK 500 kbps
Low Channel, 2402 MHz

DTS BANDWIDTH (6 dB)

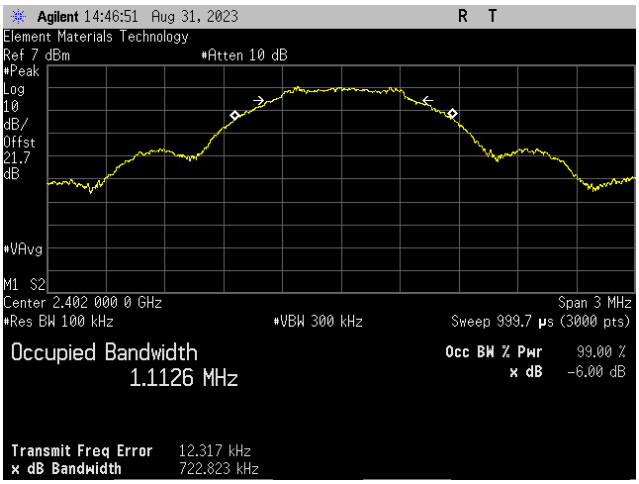
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



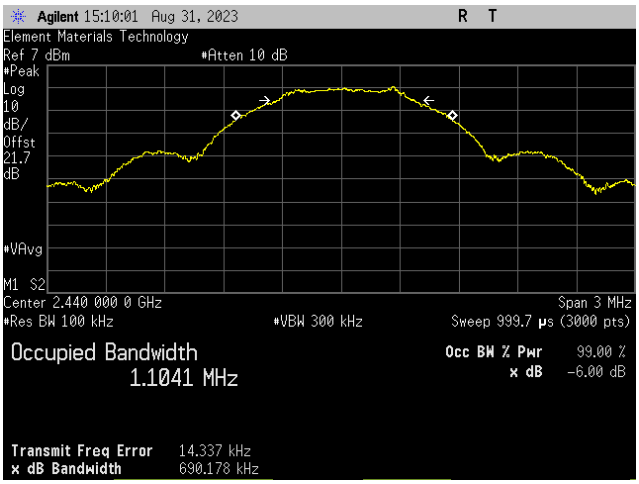
BLE/GFSK 500 kbps
Mid Channel, 2440 MHz



BLE/GFSK 500 kbps
High Channel, 2480 MHz



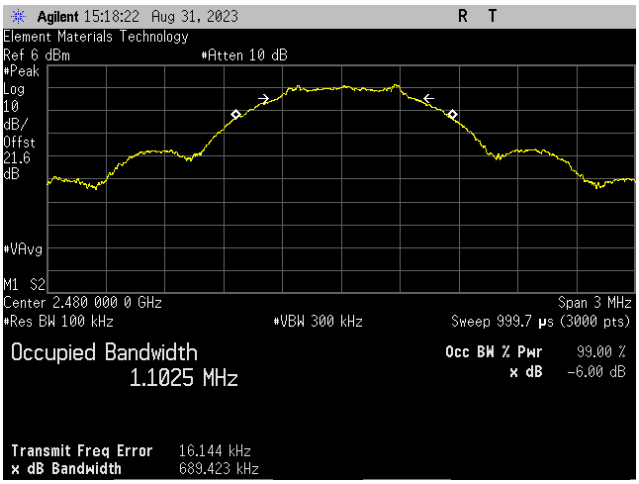
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



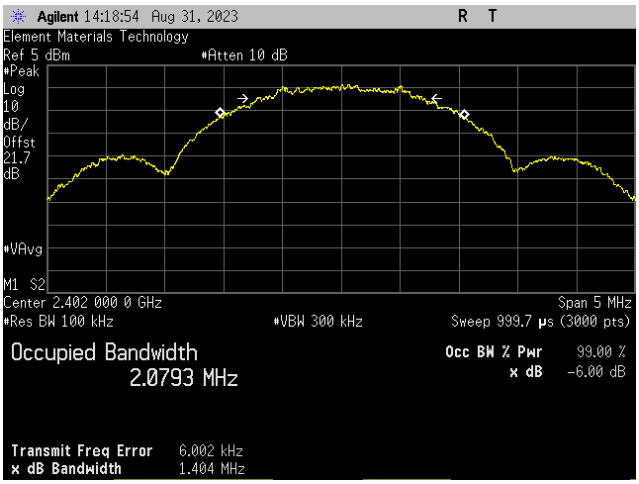
BLE/GFSK 1 Mbps
Mid Channel, 2440 MHz

DTS BANDWIDTH (6 dB)

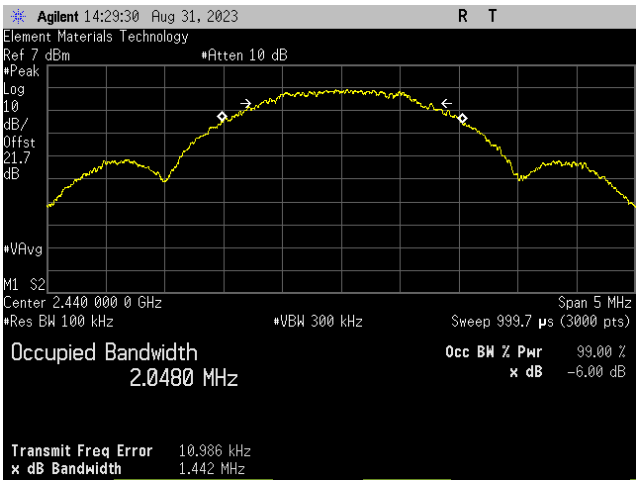
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



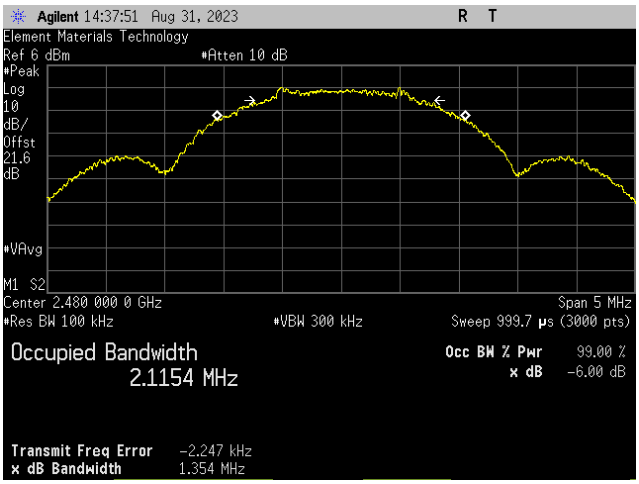
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2440 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

OUTPUT POWER

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

TEST DESCRIPTION

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

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

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2023-04-18	2024-04-18
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

OUTPUT POWER

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011023	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	50.8%
Customer Project:	None	Bar. Pressure (PMSL):	1010 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	Battery	Configuration:	CAFI0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013

COMMENTS

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

DEVIATIONS FROM TEST STANDARD

None

TESTED BY

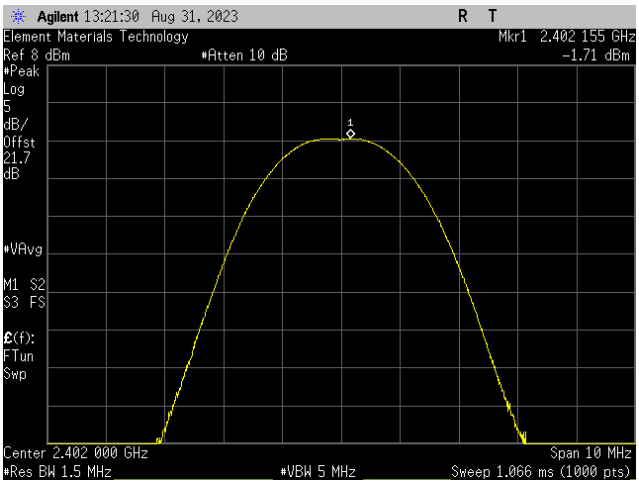
Jeff Alcoke

TEST RESULTS

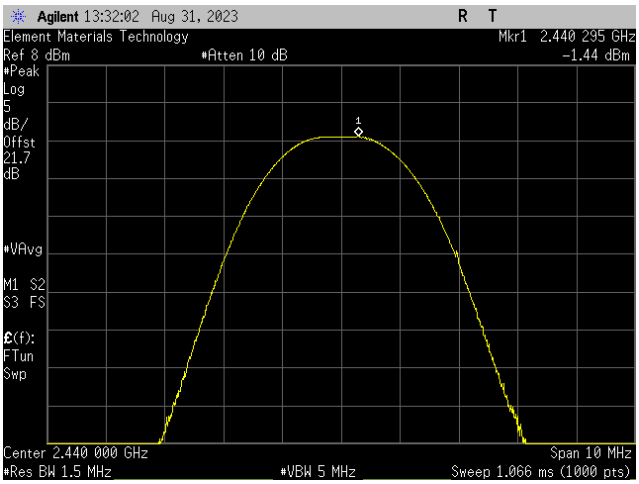
	Out Pwr (dBm)	Limit (dBm)	Result
BLE/GFSK 125 kbps			
Low Channel, 2402 MHz	-1.714	30	Pass
Mid Channel, 2440 MHz	-1.438	30	Pass
High Channel, 2480 MHz	-1.747	30	Pass
BLE/GFSK 500 kbps			
Low Channel, 2402 MHz	-1.77	30	Pass
Mid Channel, 2440 MHz	-1.388	30	Pass
High Channel, 2480 MHz	-1.757	30	Pass
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-1.658	30	Pass
Mid Channel, 2440 MHz	-2.068	30	Pass
High Channel, 2480 MHz	-2.345	30	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	-1.674	30	Pass
Mid Channel, 2440 MHz	-1.435	30	Pass
High Channel, 2480 MHz	-1.614	30	Pass

OUTPUT POWER

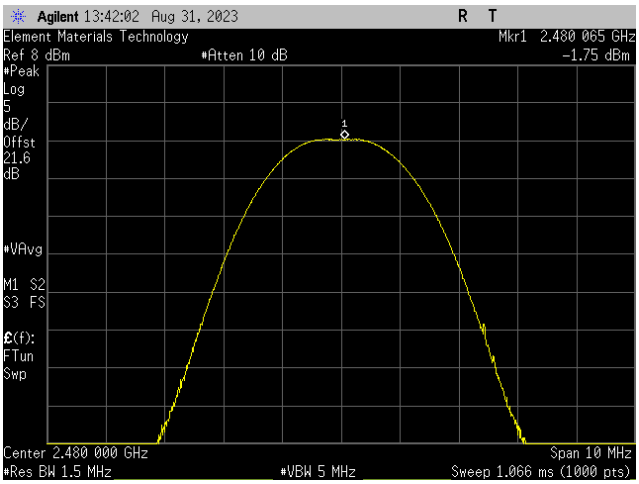
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



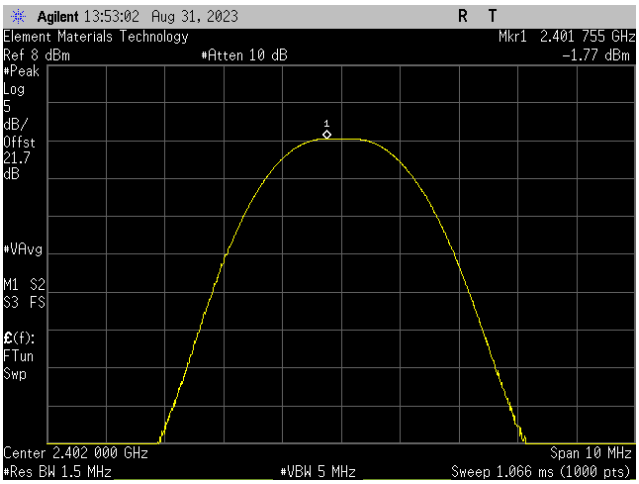
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



BLE/GFSK 125 kbps
Mid Channel, 2440 MHz



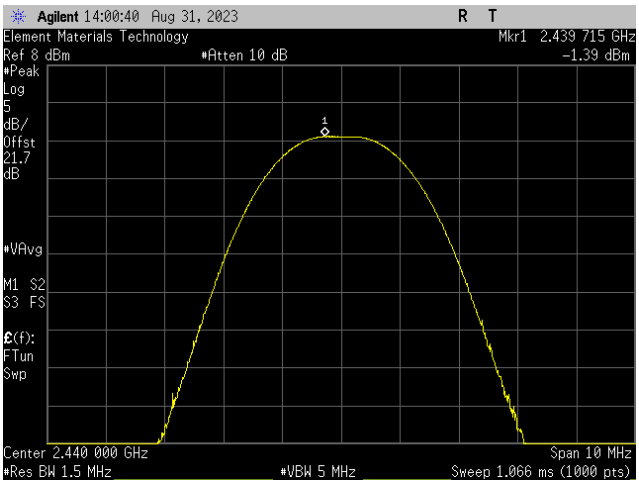
BLE/GFSK 125 kbps
High Channel, 2480 MHz



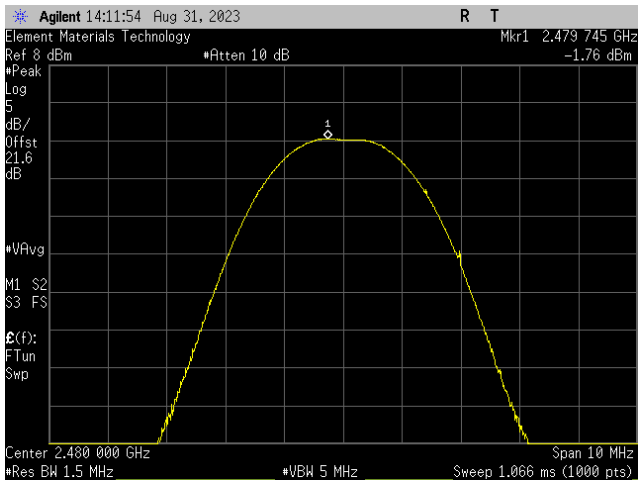
BLE/GFSK 500 kbps
Low Channel, 2402 MHz

OUTPUT POWER

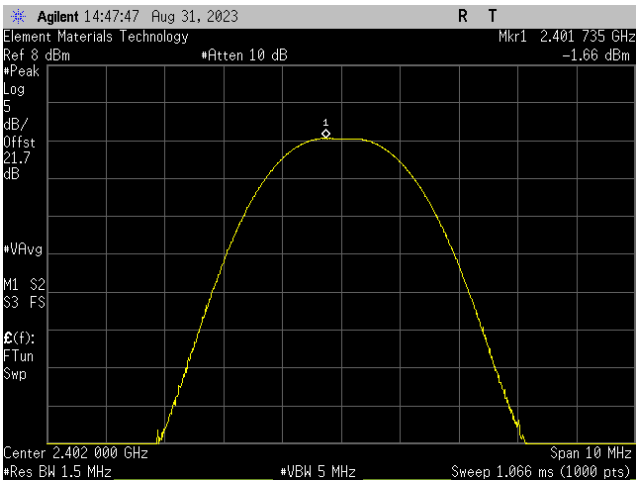
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



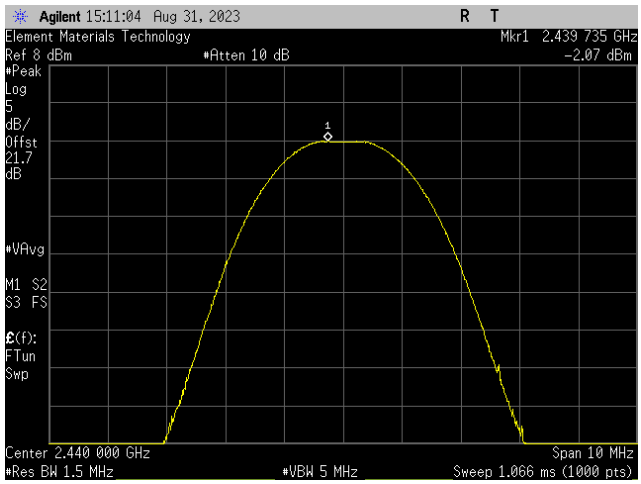
BLE/GFSK 500 kbps
Mid Channel, 2440 MHz



BLE/GFSK 500 kbps
High Channel, 2480 MHz



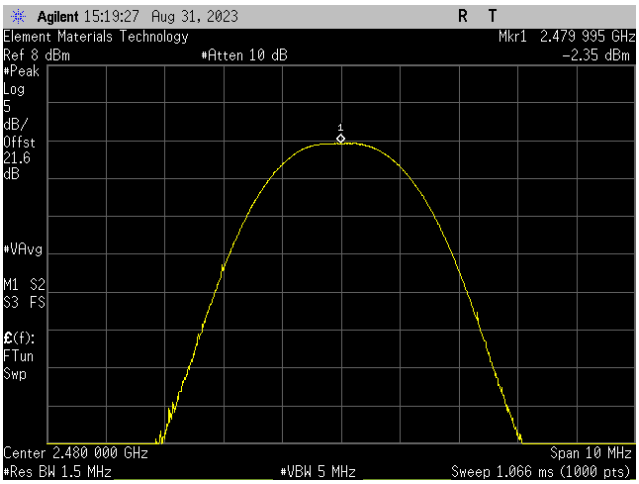
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



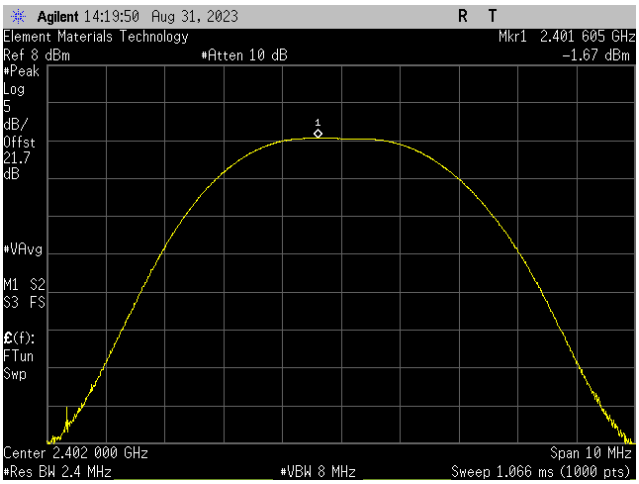
BLE/GFSK 1 Mbps
Mid Channel, 2440 MHz

OUTPUT POWER

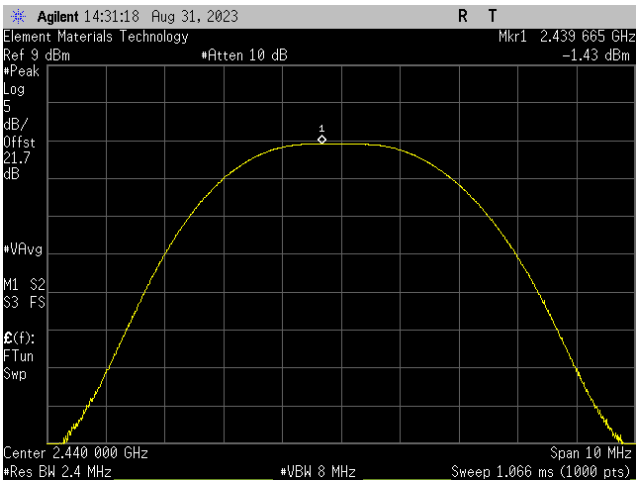
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



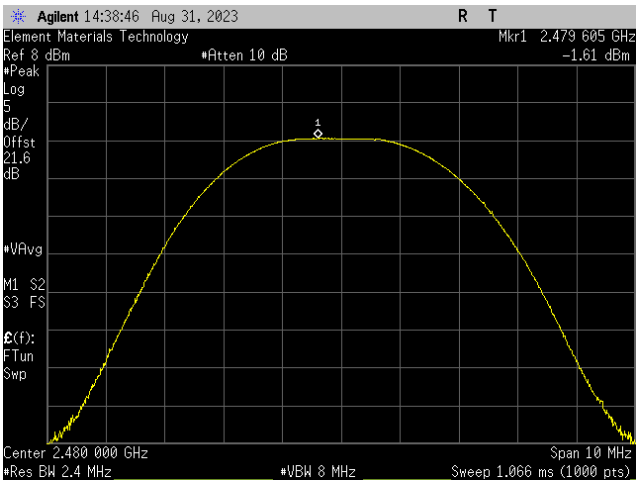
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2440 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

TEST DESCRIPTION

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

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

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2023-04-18	2024-04-18
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011023	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	50.9%
Customer Project:	None	Bar. Pressure (PMSL):	1010 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	Battery	Configuration:	CAFI0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013

COMMENTS

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

DEVIATIONS FROM TEST STANDARD

None

TESTED BY

Jeff Alcoke

TEST RESULTS

	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
BLE/GFSK 125 kbps					
Low Channel, 2402 MHz	-1.714	-4.3	-6.014	36	Pass
Mid Channel, 2440 MHz	-1.438	-4.3	-5.738	36	Pass
High Channel, 2480 MHz	-1.747	-4.3	-6.047	36	Pass
BLE/GFSK 500 kbps					
Low Channel, 2402 MHz	-1.77	-4.3	-6.07	36	Pass
Mid Channel, 2440 MHz	-1.388	-4.3	-5.688	36	Pass
High Channel, 2480 MHz	-1.757	-4.3	-6.057	36	Pass
BLE/GFSK 1 Mbps					
Low Channel, 2402 MHz	-1.658	-4.3	-5.958	36	Pass
Mid Channel, 2440 MHz	-2.068	-4.3	-6.368	36	Pass
High Channel, 2480 MHz	-2.345	-4.3	-6.645	36	Pass
BLE/GFSK 2 Mbps					
Low Channel, 2402 MHz	-1.674	-4.3	-5.974	36	Pass
Mid Channel, 2440 MHz	-1.435	-4.3	-5.735	36	Pass
High Channel, 2480 MHz	-1.614	-4.3	-5.914	36	Pass

POWER SPECTRAL DENSITY

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

TEST DESCRIPTION

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

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

The maximum power spectral density measurements were measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2023-04-18	2024-04-18
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

POWER SPECTRAL DENSITY

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011023	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	50.9%
Customer Project:	None	Bar. Pressure (PMSL):	1010 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	Battery	Configuration:	CAFI0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013

COMMENTS

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

DEVIATIONS FROM TEST STANDARD

None

TESTED BY

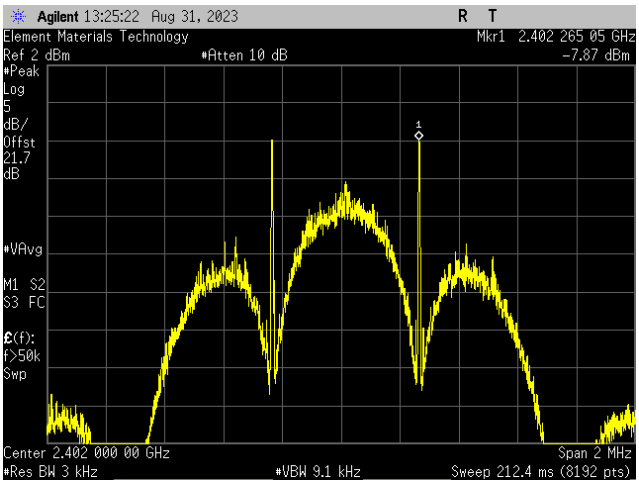
Jeff Alcoke

TEST RESULTS

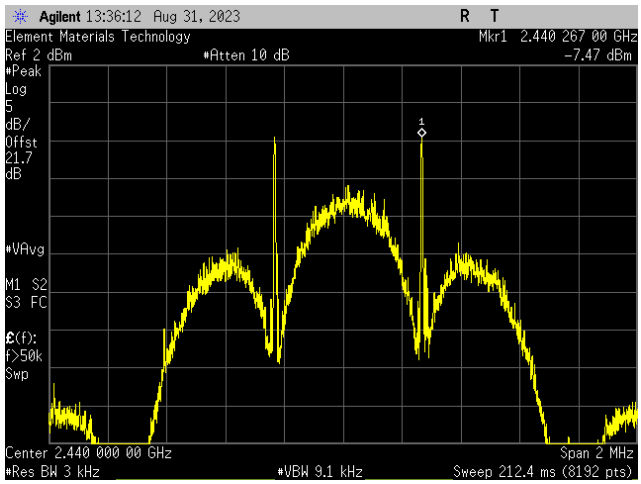
	Value dBm/3kHz	Limit ≤ (dBm/3kHz)	Results
BLE/GFSK 125 kbps			
Low Channel, 2402 MHz	-7.872	8	Pass
Mid Channel, 2440 MHz	-7.468	8	Pass
High Channel, 2480 MHz	-7.826	8	Pass
BLE/GFSK 500 kbps			
Low Channel, 2402 MHz	-11.483	8	Pass
Mid Channel, 2440 MHz	-9.777	8	Pass
High Channel, 2480 MHz	-11.331	8	Pass
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-11.55	8	Pass
Mid Channel, 2440 MHz	-11.724	8	Pass
High Channel, 2480 MHz	-12.77	8	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	-15.024	8	Pass
Mid Channel, 2440 MHz	-15.414	8	Pass
High Channel, 2480 MHz	-15.228	8	Pass

POWER SPECTRAL DENSITY

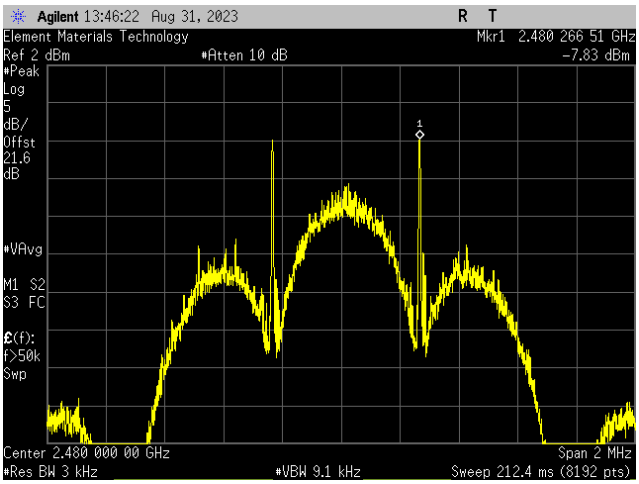
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



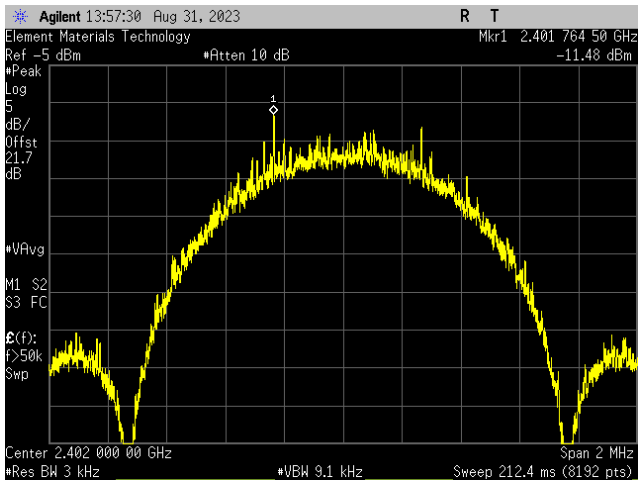
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



BLE/GFSK 125 kbps
Mid Channel, 2440 MHz



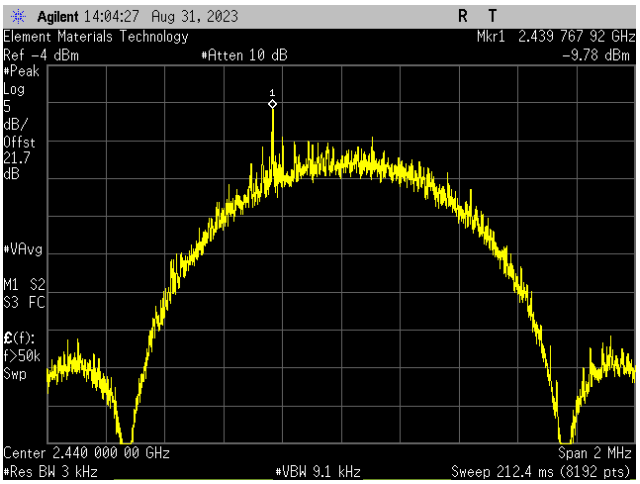
BLE/GFSK 125 kbps
High Channel, 2480 MHz



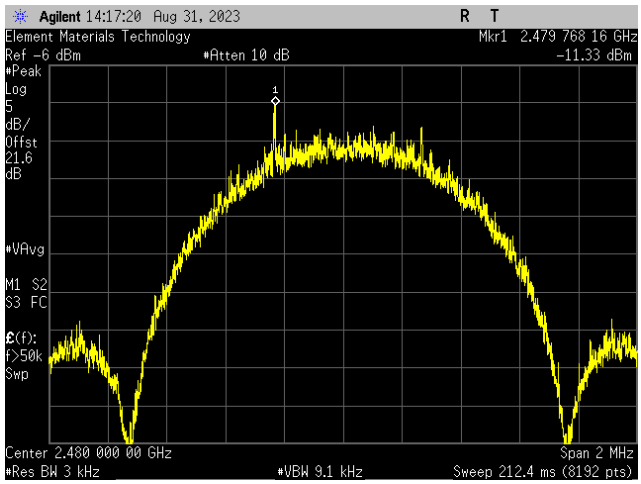
BLE/GFSK 500 kbps
Low Channel, 2402 MHz

POWER SPECTRAL DENSITY

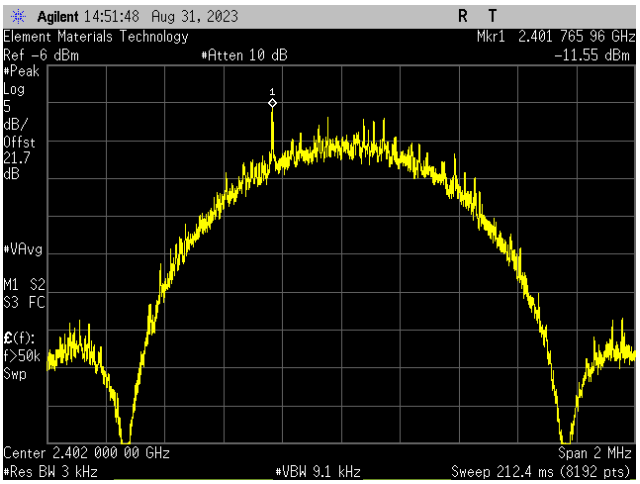
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



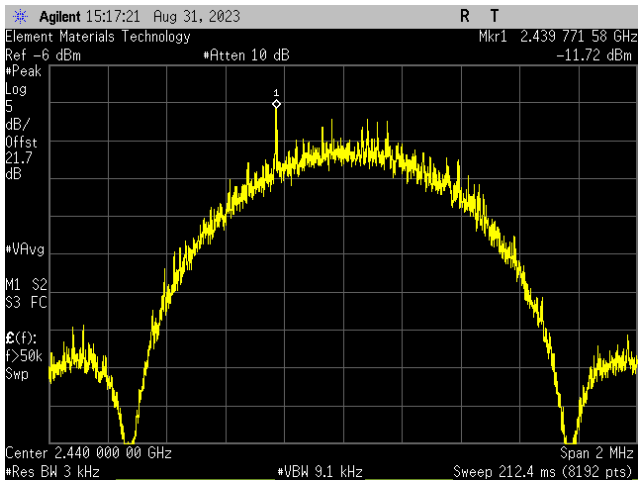
BLE/GFSK 500 kbps
Mid Channel, 2440 MHz



BLE/GFSK 500 kbps
High Channel, 2480 MHz



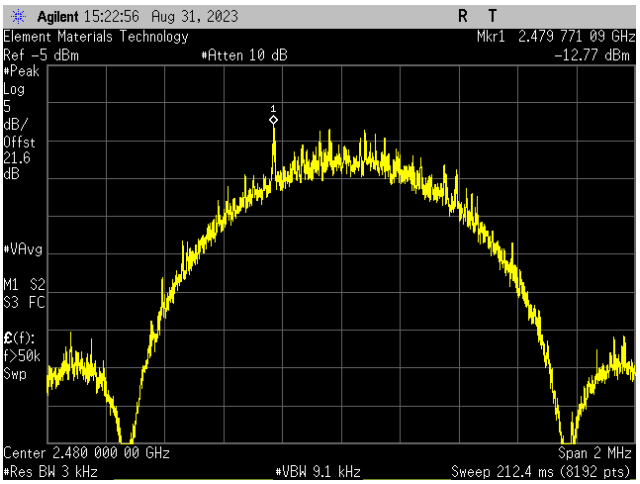
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



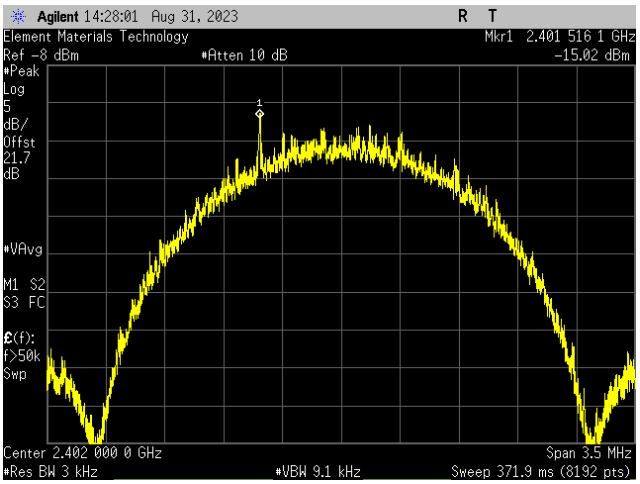
BLE/GFSK 1 Mbps
Mid Channel, 2440 MHz

POWER SPECTRAL DENSITY

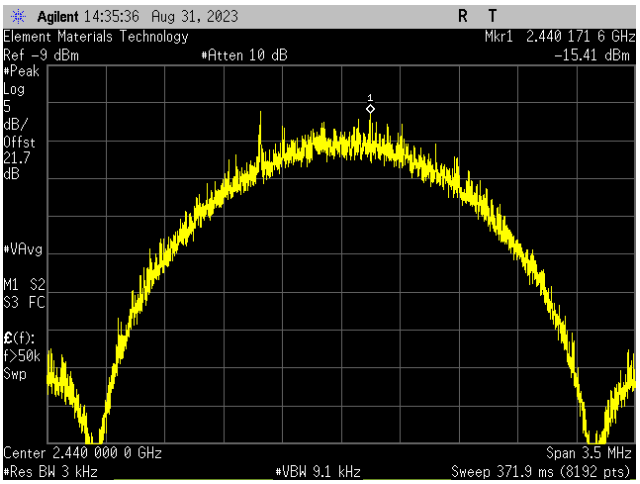
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



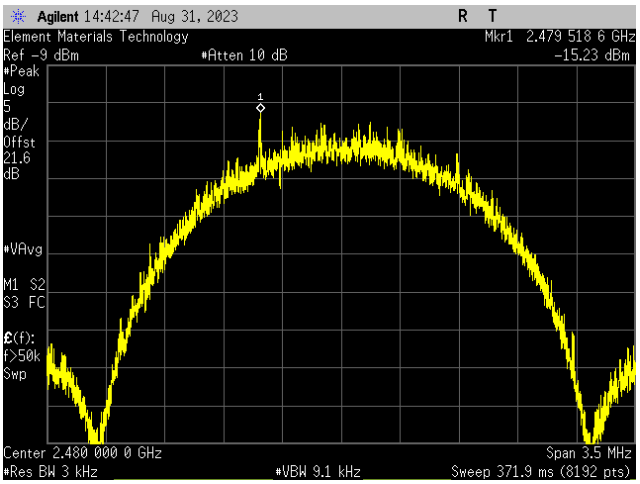
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2440 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

BAND EDGE COMPLIANCE

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

TEST DESCRIPTION

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

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

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. 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. The analyzer screen captures for this test show an example of the emission mask for the test mode also used during the radiated spurious emissions at the restricted band edges test.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2023-04-18	2024-04-18
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

BAND EDGE COMPLIANCE

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011023	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	50.9%
Customer Project:	None	Bar. Pressure (PMSL):	1010 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	Battery	Configuration:	CAFI0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013

COMMENTS

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

DEVIATIONS FROM TEST STANDARD

None

TESTED BY

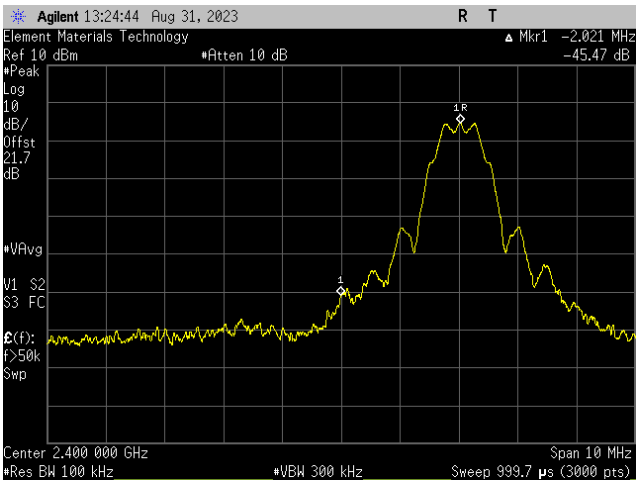
Jeff Alcoke

TEST RESULTS

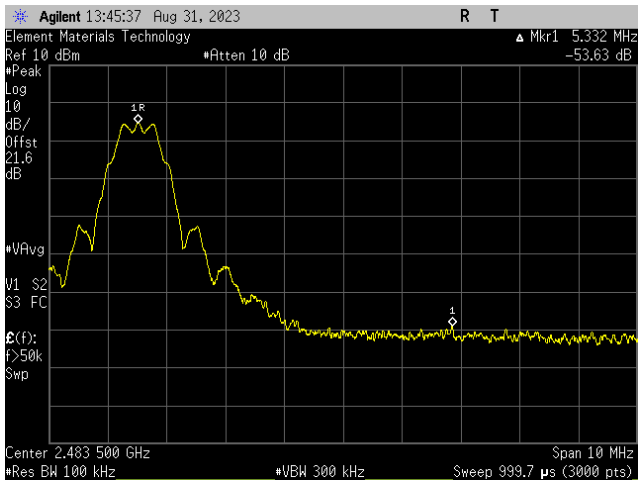
	Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 125 kbps			
Low Channel, 2402 MHz	-45.47	-20	Pass
High Channel, 2480 MHz	-53.63	-20	Pass
BLE/GFSK 500 kbps			
Low Channel, 2402 MHz	-48.26	-20	Pass
High Channel, 2480 MHz	-55.4	-20	Pass
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-47.85	-20	Pass
High Channel, 2480 MHz	-56.29	-20	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	-32.46	-20	Pass
High Channel, 2480 MHz	-53.15	-20	Pass

BAND EDGE COMPLIANCE

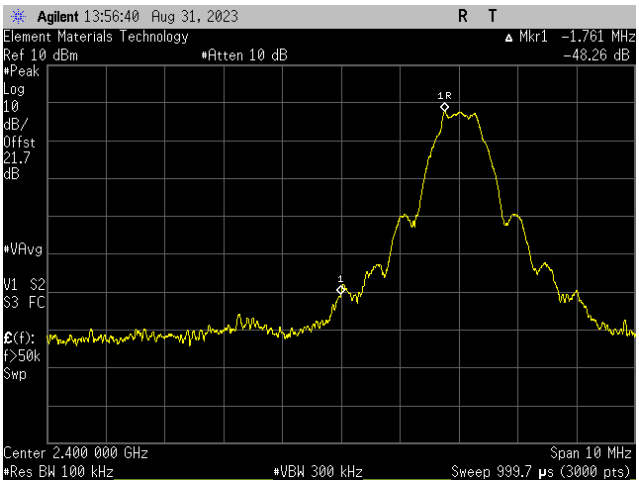
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



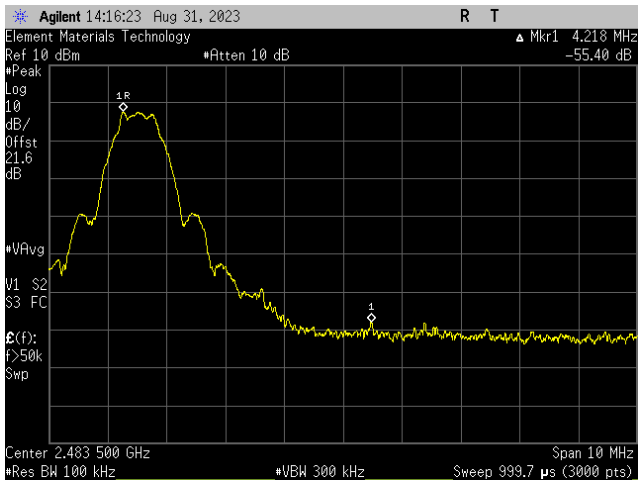
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



BLE/GFSK 125 kbps
High Channel, 2480 MHz



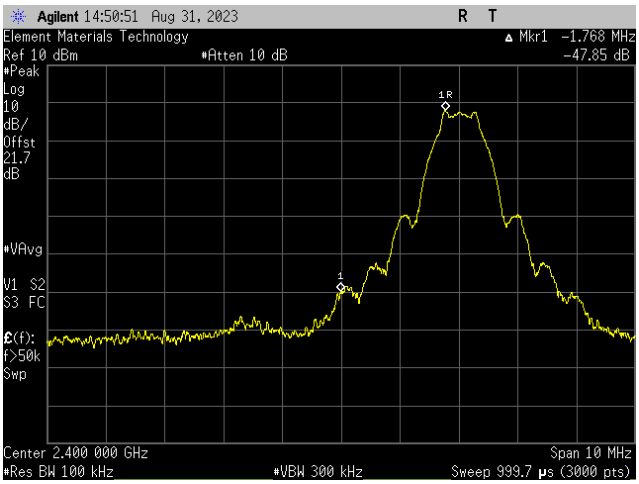
BLE/GFSK 500 kbps
Low Channel, 2402 MHz



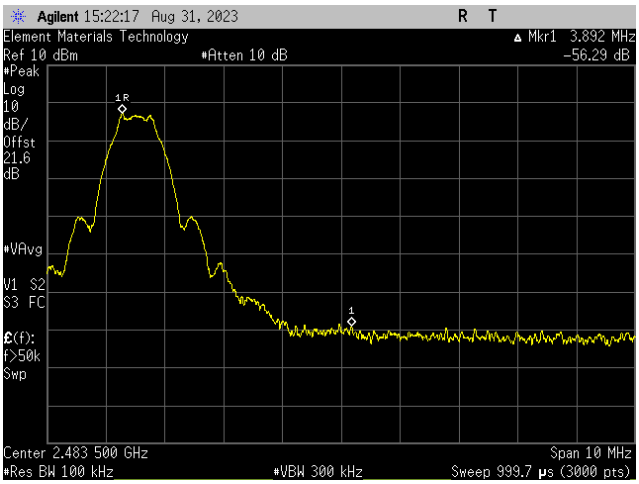
BLE/GFSK 500 kbps
High Channel, 2480 MHz

BAND EDGE COMPLIANCE

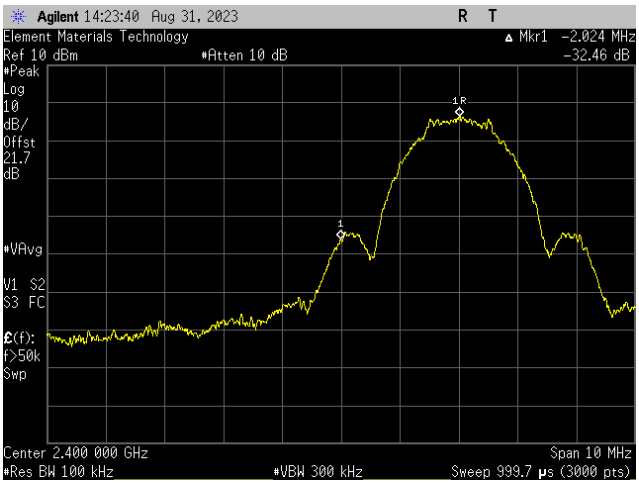
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



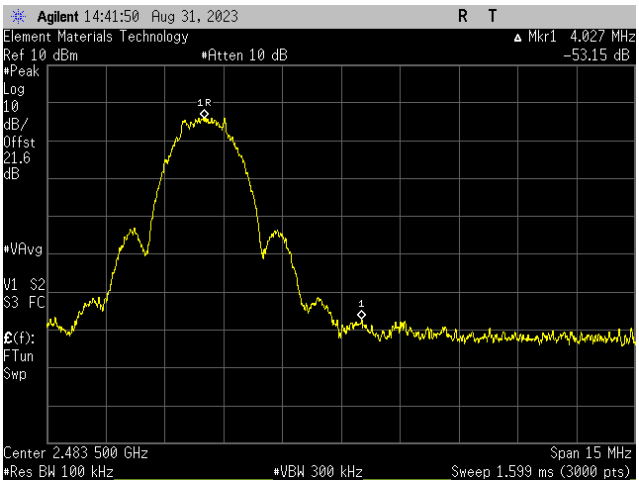
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

TEST DESCRIPTION

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

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

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. 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.

The reference level offset for the fundamental screen capture was based on a measured value of the loss between the spectrum analyzer and the EUT which was verified at the time of test. The remaining screen capture(s) use an internal transducer factor on the analyzer to correct the displayed trace based on the cable loss over frequency. The reference level offset for the additional screen capture(s) is then based on the expected attenuator value and any other losses.

Fundamental Offset = Ref Lvl Offset showing measured composite factor of all losses

Remaining Screen capture(s) Offset = “Internal” cable loss factor not shown on screen capture + Ref Lvl Offset showing expected attenuator value and any other losses

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2023-04-18	2024-04-18
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011023	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	50.9%
Customer Project:	None	Bar. Pressure (PMSL):	1010 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	Battery	Configuration:	CAFI0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013

COMMENTS

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

DEVIATIONS FROM TEST STANDARD

None

TESTED BY

Jeff Alcoke

TEST RESULTS

	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 125 kbps					
Low Channel, 2402 MHz	Fundamental	2402.01	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4804.3	-43.11	-20	Pass
	12.5 GHz - 25 GHz	24827.6	-46.19	-20	Pass
Mid Channel, 2440 MHz	Fundamental	2440.02	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4878.9	-41.67	-20	Pass
	12.5 GHz - 25 GHz	24481.1	-46.44	-20	Pass
High Channel, 2480 MHz	Fundamental	2480.02	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4959.5	-41	-20	Pass
	12.5 GHz - 25 GHz	24841.3	-45.47	-20	Pass
BLE/GFSK 500 kbps					
Low Channel, 2402 MHz	Fundamental	2401.77	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4804.3	-43.8	-20	Pass
	12.5 GHz - 25 GHz	23478.5	-48.66	-20	Pass
Mid Channel, 2440 MHz	Fundamental	2439.76	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4880.4	-43	-20	Pass
	12.5 GHz - 25 GHz	23799	-50.27	-20	Pass
High Channel, 2480 MHz	Fundamental	2479.76	N/A	N/A	N/A

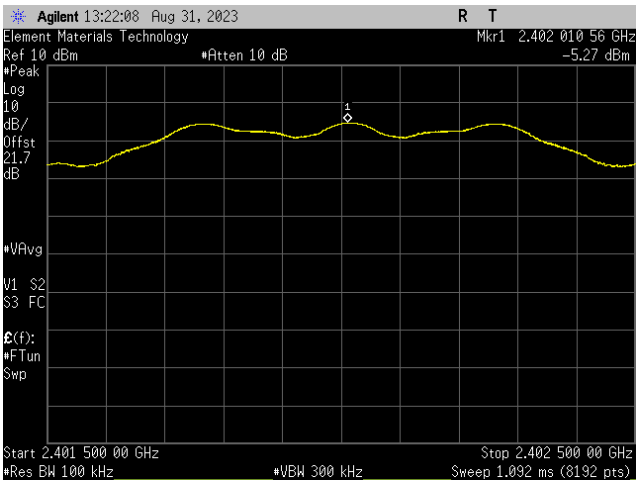
SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.08.15.0
WTD.2023.08.03.0

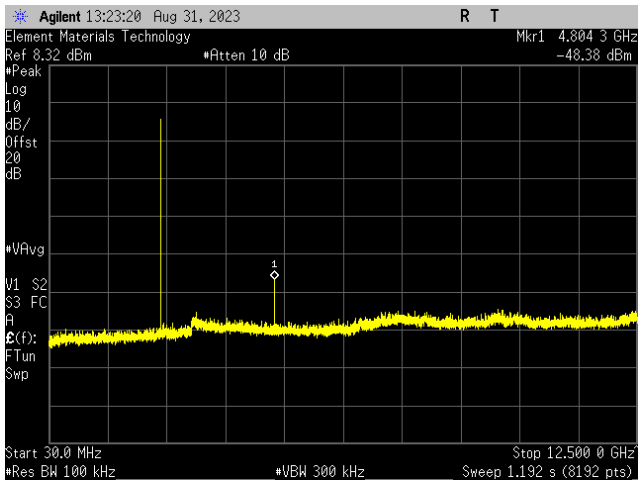
	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	30 MHz - 12.5 GHz	4959.5	-41.09	-20	Pass
	12.5 GHz - 25 GHz	24069.1	-49.05	-20	Pass
BLE/GFSK 1 Mbps					
Low Channel, 2402 MHz	Fundamental	2401.76	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4804.3	-44.55	-20	Pass
	12.5 GHz - 25 GHz	23577.7	-49.29	-20	Pass
Mid Channel, 2440 MHz	Fundamental	2439.78	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4880.7	-43.95	-20	Pass
	12.5 GHz - 25 GHz	24029.4	-49.34	-20	Pass
High Channel, 2480 MHz	Fundamental	2480.27	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4961.1	-42	-20	Pass
	12.5 GHz - 25 GHz	24824.5	-48.84	-20	Pass
BLE/GFSK 2 Mbps					
Low Channel, 2402 MHz	Fundamental	2402.01	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4802.7	-45.37	-20	Pass
	12.5 GHz - 25 GHz	24981.7	-48.06	-20	Pass
Mid Channel, 2440 MHz	Fundamental	2440.51	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4880.4	-42.62	-20	Pass
	12.5 GHz - 25 GHz	24823	-47.86	-20	Pass
High Channel, 2480 MHz	Fundamental	2480.13	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4961.1	-40.26	-20	Pass
	12.5 GHz - 25 GHz	23998.9	-47.46	-20	Pass

SPURIOUS CONDUCTED EMISSIONS

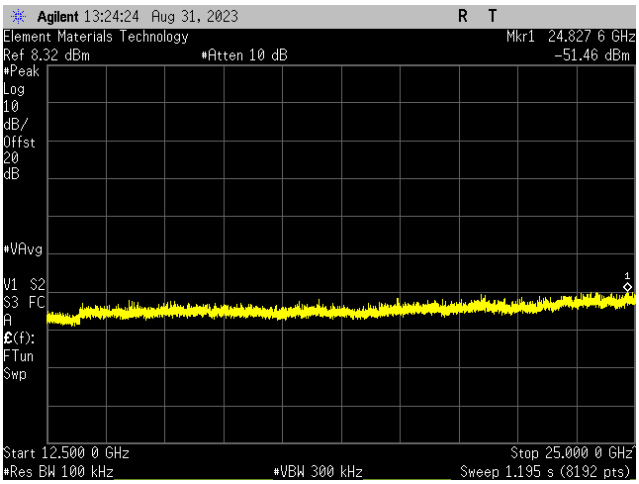
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



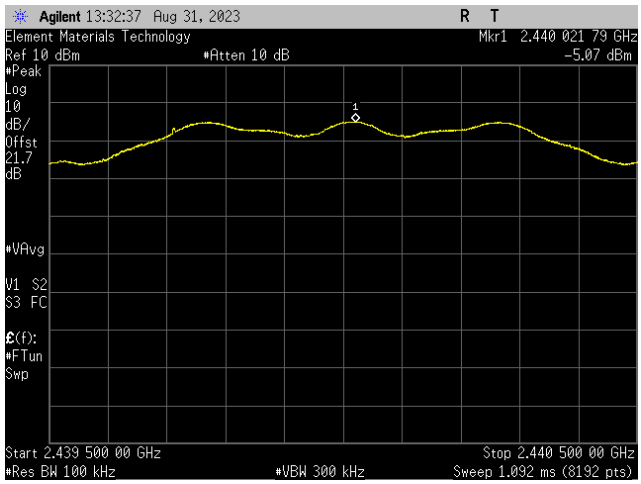
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



BLE/GFSK 125 kbps
Low Channel, 2402 MHz



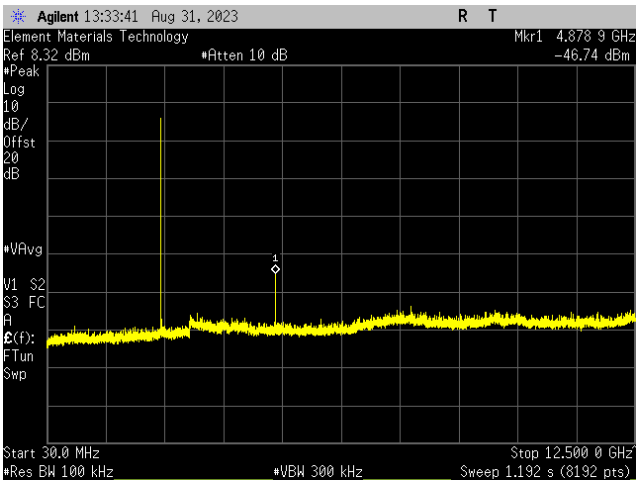
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



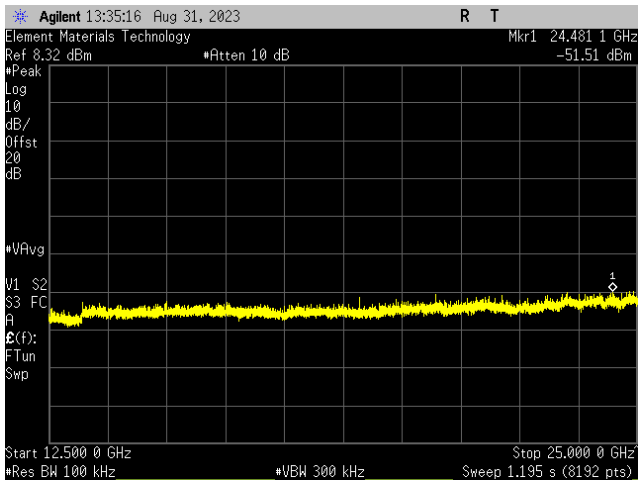
BLE/GFSK 125 kbps
Mid Channel, 2440 MHz

SPURIOUS CONDUCTED EMISSIONS

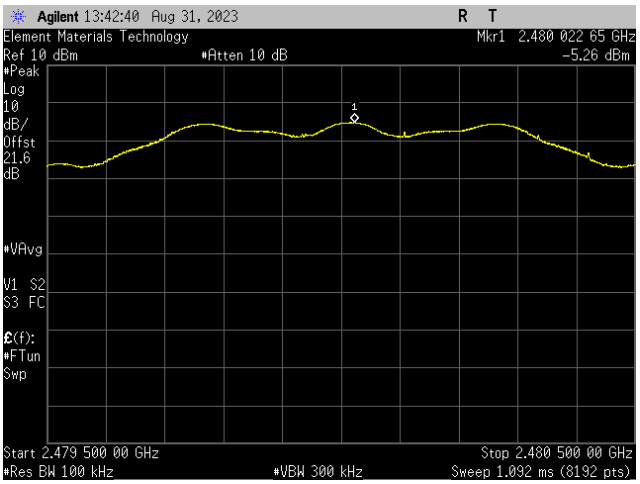
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



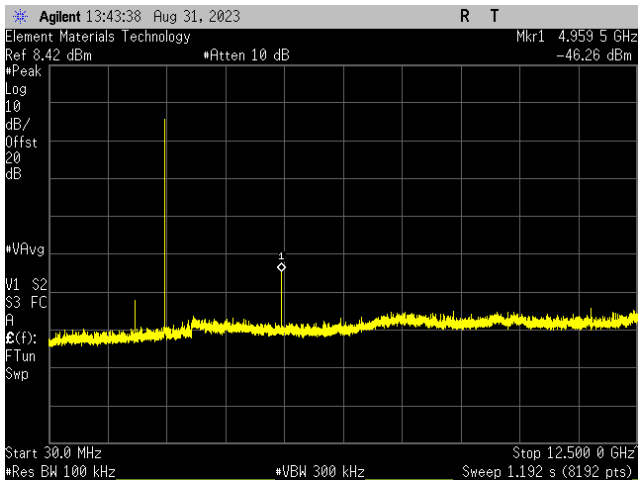
BLE/GFSK 125 kbps
Mid Channel, 2440 MHz



BLE/GFSK 125 kbps
Mid Channel, 2440 MHz



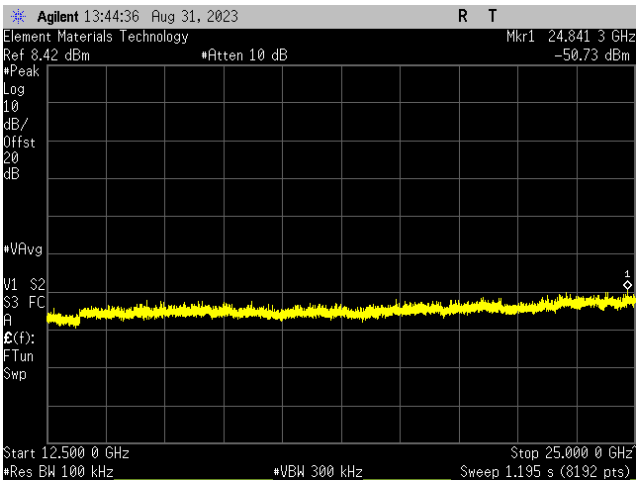
BLE/GFSK 125 kbps
High Channel, 2480 MHz



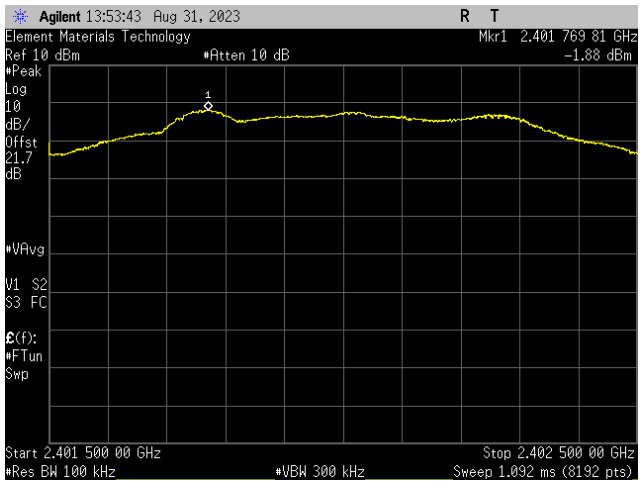
BLE/GFSK 125 kbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS

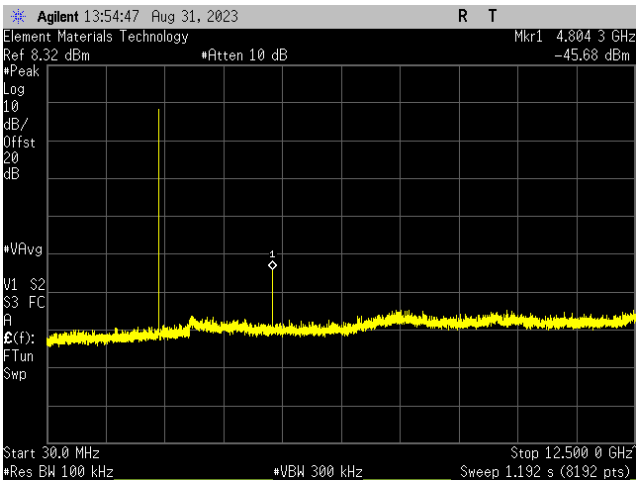
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



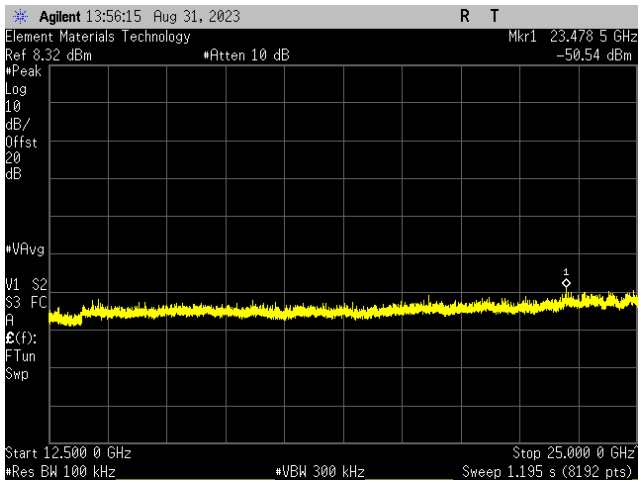
BLE/GFSK 125 kbps
High Channel, 2480 MHz



BLE/GFSK 500 kbps
Low Channel, 2402 MHz



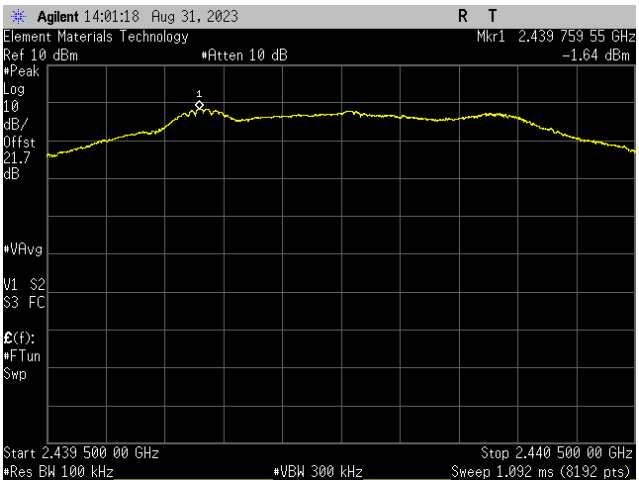
BLE/GFSK 500 kbps
Low Channel, 2402 MHz



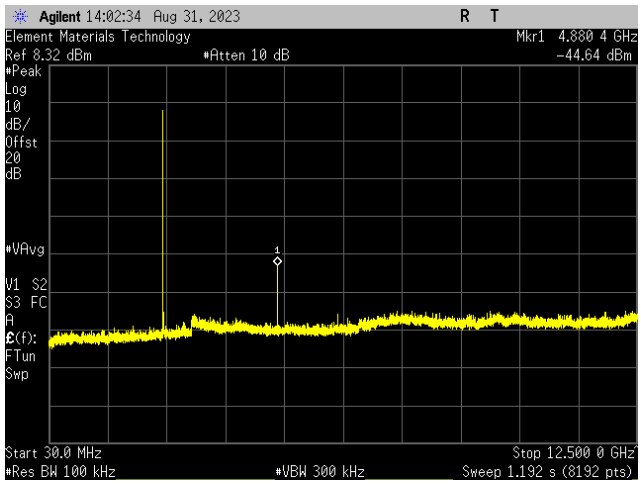
BLE/GFSK 500 kbps
Low Channel, 2402 MHz

SPURIOUS CONDUCTED EMISSIONS

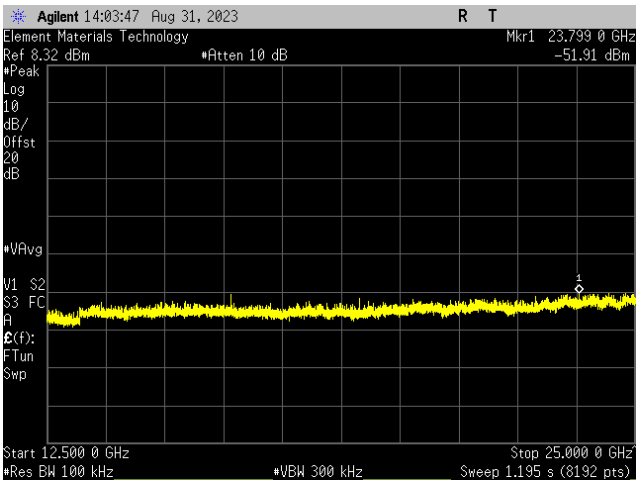
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



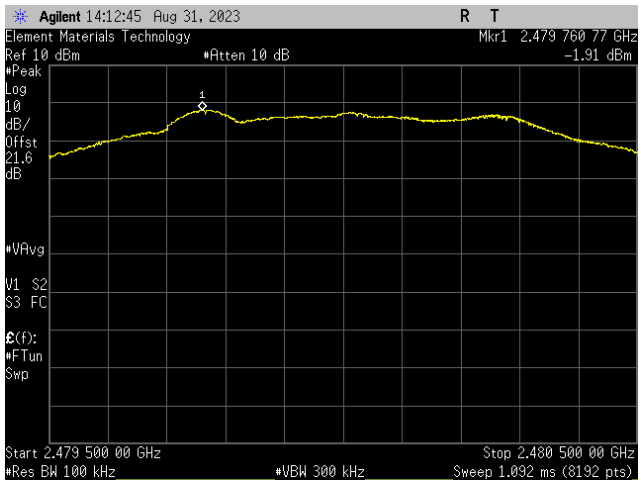
BLE/GFSK 500 kbps
Mid Channel, 2440 MHz



BLE/GFSK 500 kbps
Mid Channel, 2440 MHz



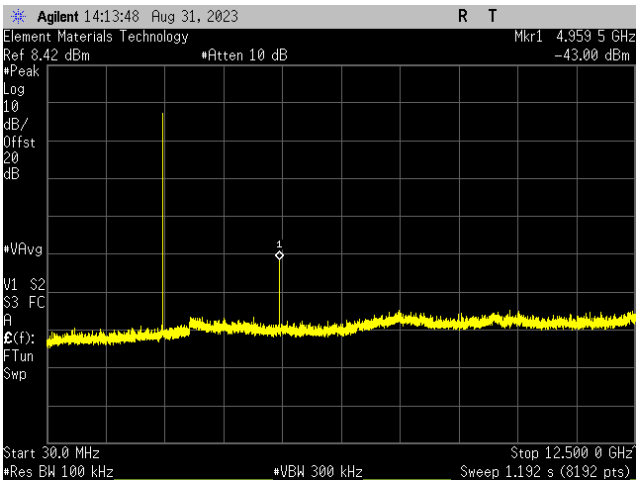
BLE/GFSK 500 kbps
Mid Channel, 2440 MHz



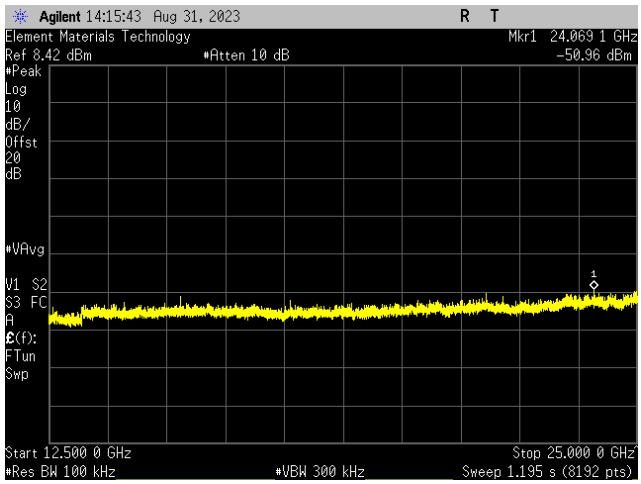
BLE/GFSK 500 kbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS

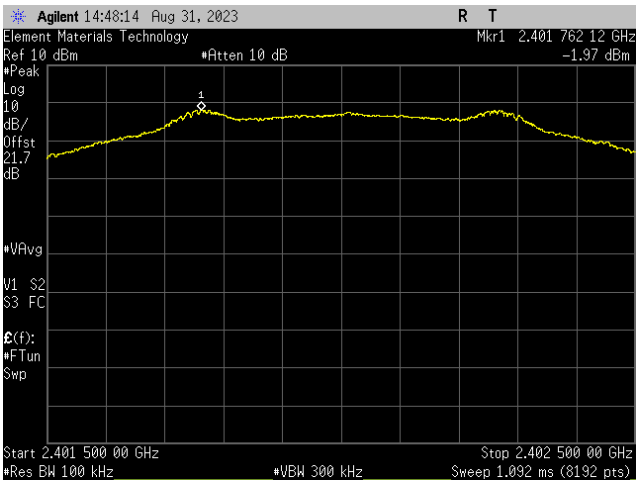
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



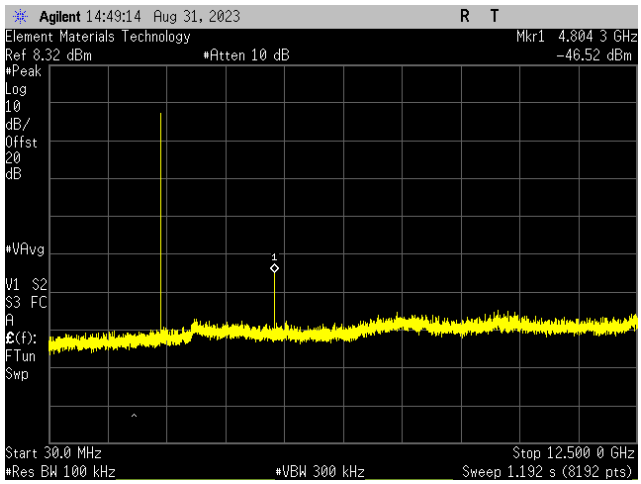
BLE/GFSK 500 kbps
High Channel, 2480 MHz



BLE/GFSK 500 kbps
High Channel, 2480 MHz



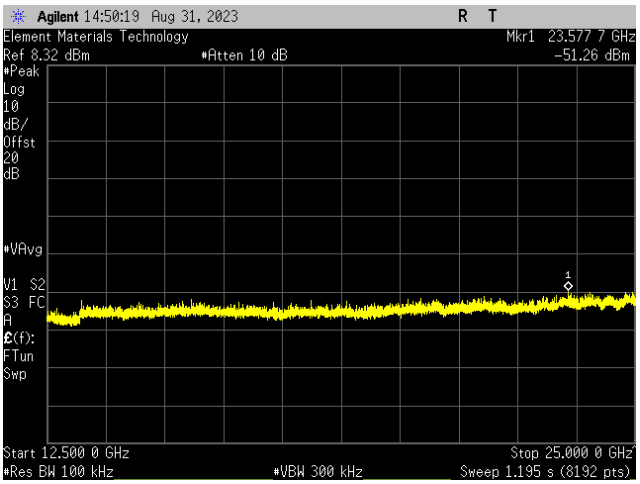
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



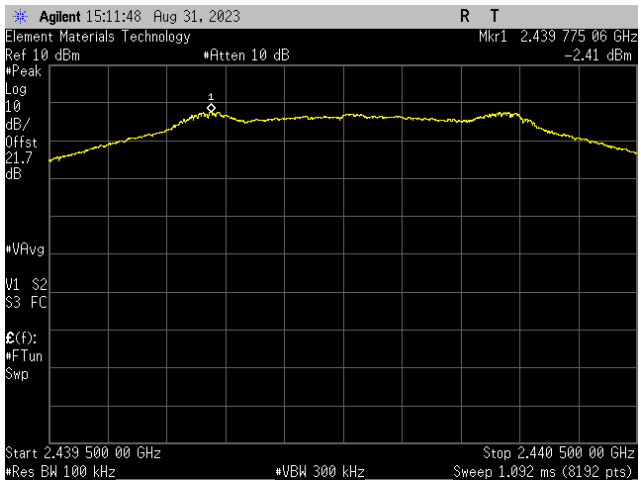
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz

SPURIOUS CONDUCTED EMISSIONS

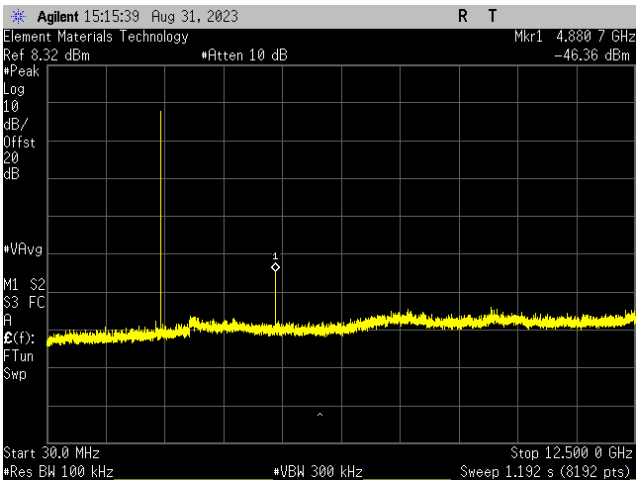
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



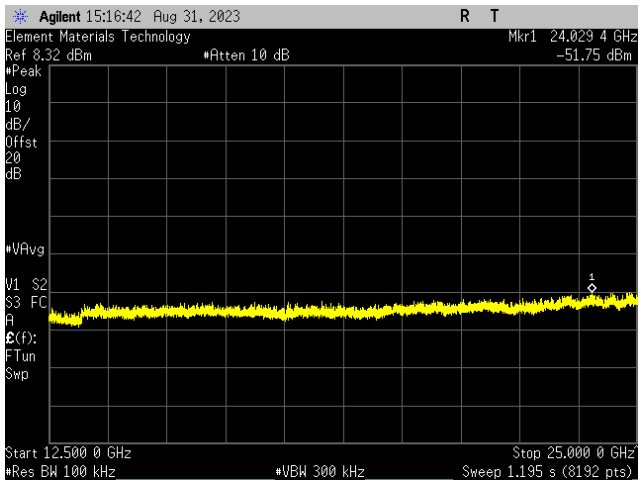
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Mid Channel, 2440 MHz



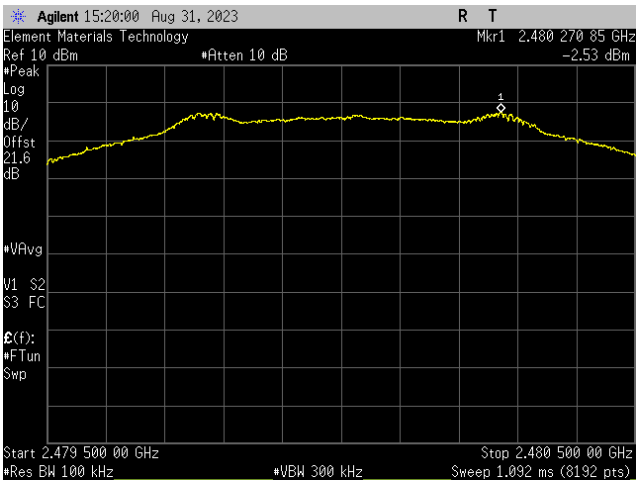
BLE/GFSK 1 Mbps
Mid Channel, 2440 MHz



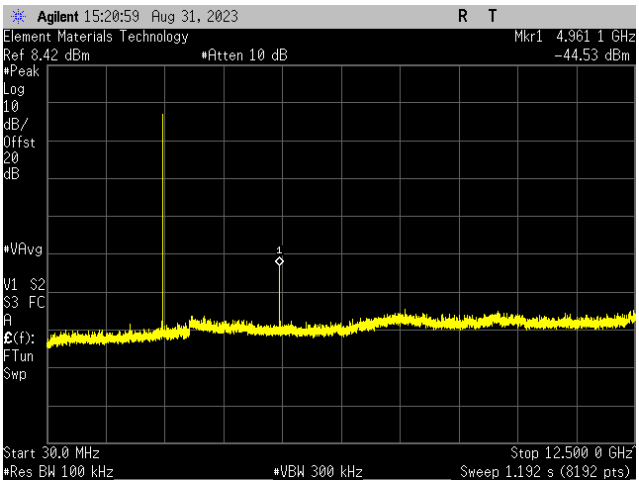
BLE/GFSK 1 Mbps
Mid Channel, 2440 MHz

SPURIOUS CONDUCTED EMISSIONS

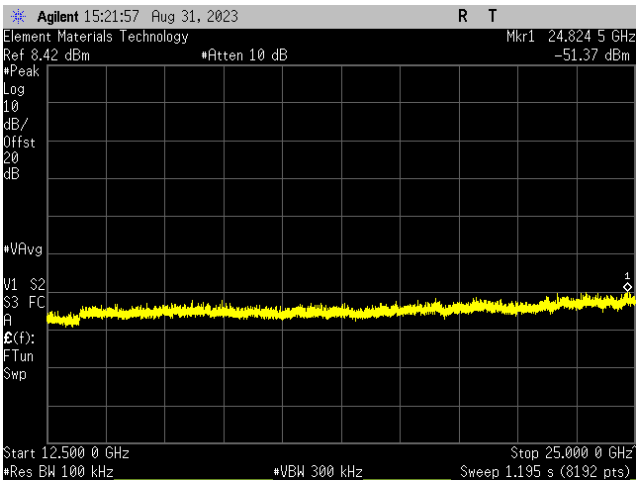
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



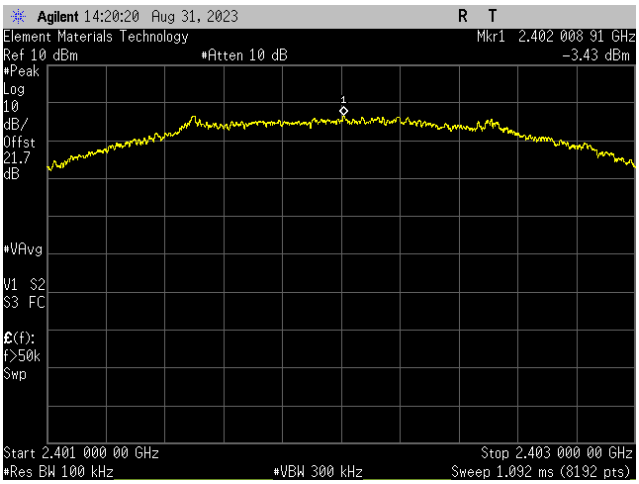
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz



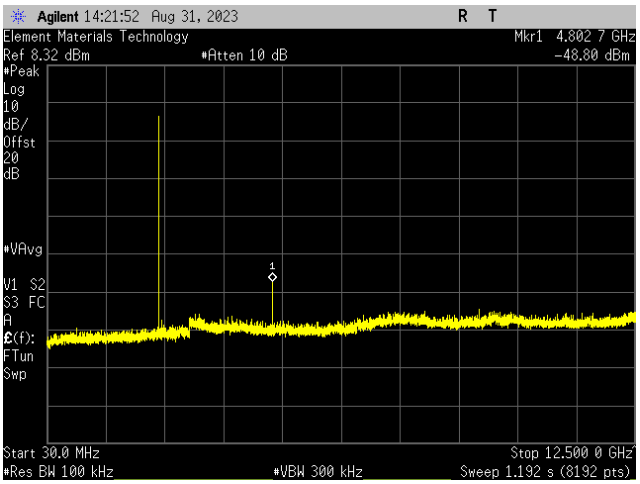
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



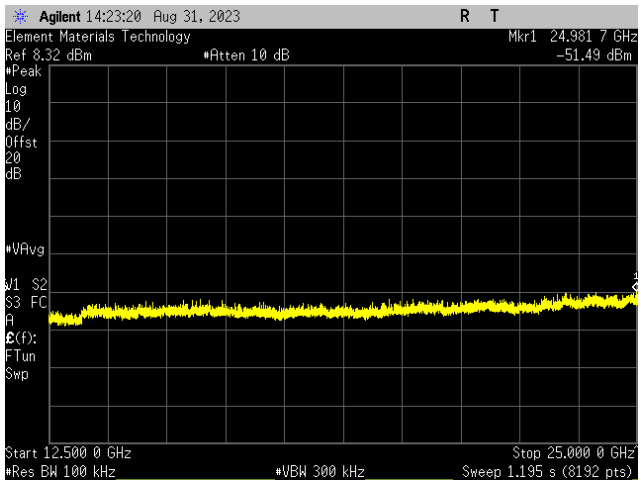
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

SPURIOUS CONDUCTED EMISSIONS

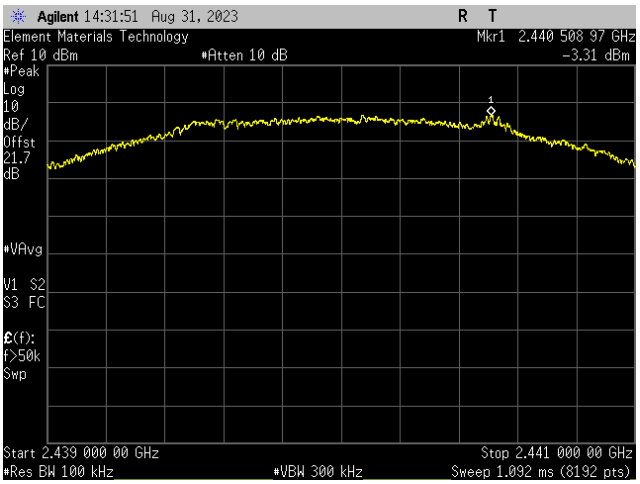
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



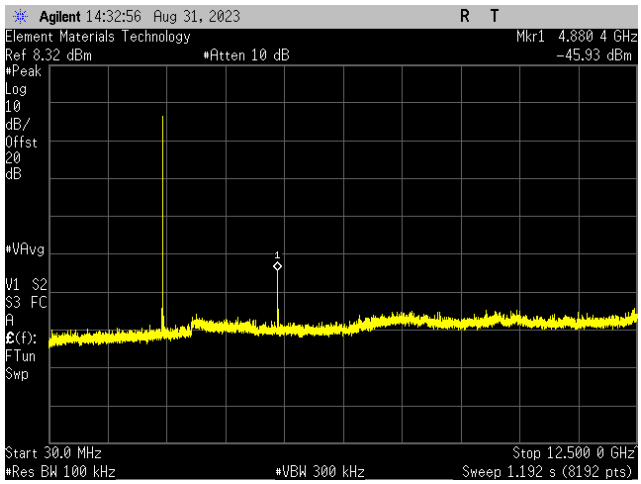
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



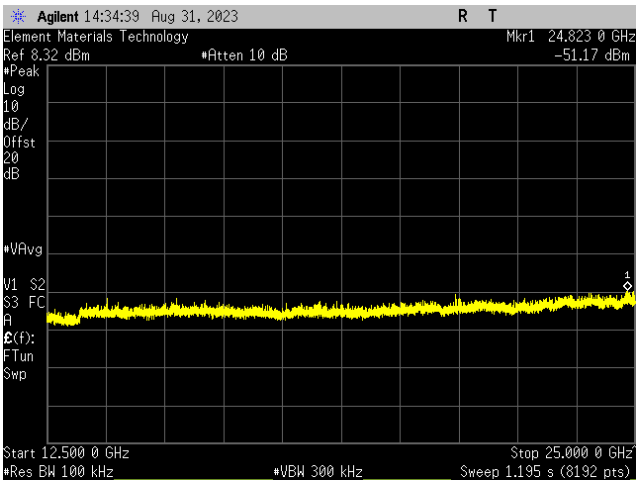
BLE/GFSK 2 Mbps
Mid Channel, 2440 MHz



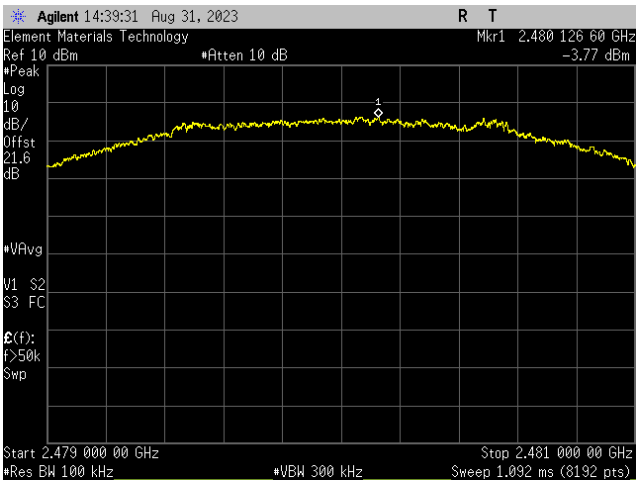
BLE/GFSK 2 Mbps
Mid Channel, 2440 MHz

SPURIOUS CONDUCTED EMISSIONS

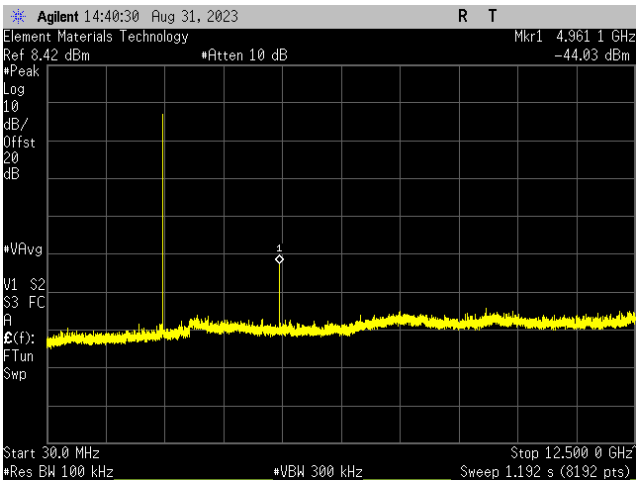
element
TbtTx 2023.08.15.0
WTD.2023.08.03.0



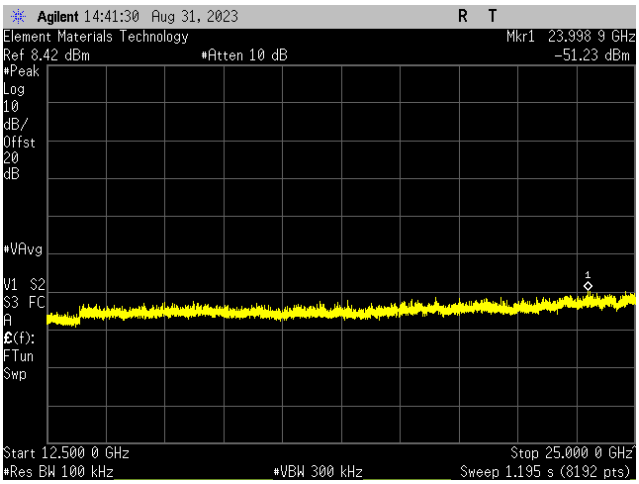
BLE/GFSK 2 Mbps
Mid Channel, 2440 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.04.25.0
EmiR5 2022.07.06.0
PSA-ESCI 2023.04.25.0

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 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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2022-09-08	2023-09-08
Antenna - Biconilog	Teseq	CBL 6141B	AXR	2022-11-01	2024-11-01
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2022-03-02	2024-03-02
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	2022-11-03	2023-11-03
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2023-03-26	2024-03-26
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2022-11-03	2023-11-03
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2022-11-03	2023-11-03
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	2023-07-10	2024-07-10
Cable	N/A	Bilog Cables	EVA	2022-11-03	2023-11-03
Cable	N/A	Double Ridge Horn Cables	EVB	2023-03-26	2024-03-26
Cable	None	Standard Gain Horn Cables	EVF	2022-11-03	2023-11-03
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	EVY	2023-07-10	2024-07-10
Attenuator	Coaxicom	3910-10	AWX	2023-02-10	2024-02-10
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	2023-02-10	2024-02-10
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2022-11-03	2023-11-03

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.04.25.0
EmiR5 2022.07.06.0
PSA-ESCI 2023.04.25.0

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26500 MHz

POWER INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

CAFI0010-1

MODES INVESTIGATED

Continuous TX, BLE, Low Ch. = 2402 MHz, Mid Ch. = 2440 MHz, High Ch. = 2480 MHz

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.04.25.0
EmiR5 2022.07.06.0
PSA-ESCI 2023.04.25.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011015	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	48.6%
Customer Project:	None	Bar. Pressure (PMSL):	1011 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	Battery	Configuration:	CAFI0010-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	24	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

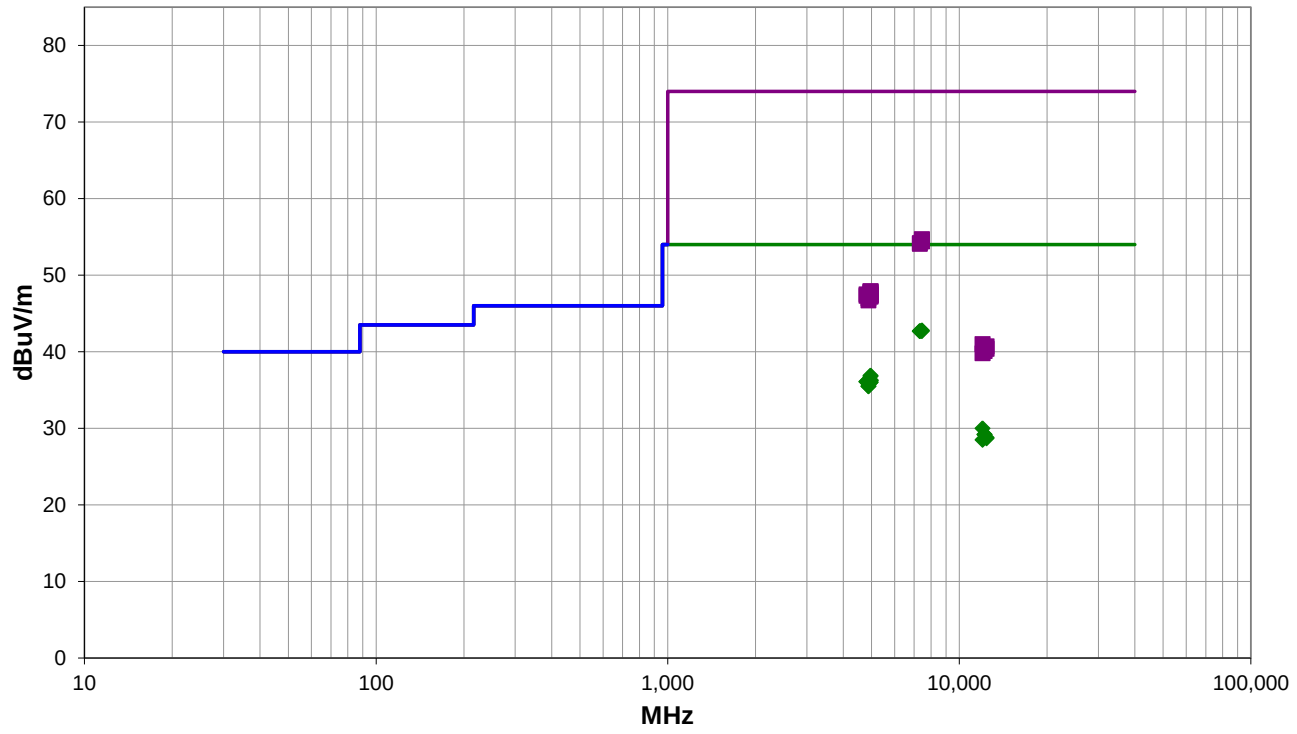
Please reference data comments below for EUT orientation and data rate.

EUT OPERATING MODES

Continuous TX, BLE, Low Ch. = 2402 MHz, Mid Ch. = 2440 MHz, High Ch. = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 24 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.04.25.0
EmiR5 2022.07.06.0
PSA-ESCI 2023.04.25.0

RESULTS - Run #24

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
7439.408	27.2	15.6	3.0	272.0	3.0	0.0	Horz	AV	0.0	42.8	54.0	-11.2	High Ch, 1 Mbps, EUT on Side
7437.950	27.1	15.6	2.2	181.0	3.0	0.0	Vert	AV	0.0	42.7	54.0	-11.3	High Ch, 1 Mbps, EUT on Side
7319.227	27.3	15.4	1.5	289.0	3.0	0.0	Horz	AV	0.0	42.7	54.0	-11.3	Mid Ch, 1 Mbps, EUT Horz
7318.093	27.3	15.4	1.5	75.0	3.0	0.0	Vert	AV	0.0	42.7	54.0	-11.3	Mid Ch, 1 Mbps, EUT Horz
4959.792	29.2	7.7	1.5	279.0	3.0	0.0	Horz	AV	0.0	36.9	54.0	-17.1	High Ch, 1 Mbps, EUT on Side
4960.042	29.1	7.7	3.76	0.0	3.0	0.0	Horz	AV	0.0	36.8	54.0	-17.2	High Ch, 500 kbps, EUT on Side
4959.117	28.6	7.7	1.5	110.0	3.0	0.0	Horz	AV	0.0	36.3	54.0	-17.7	High Ch, 2 Mbps, EUT on Side
4960.183	28.6	7.7	1.5	147.0	3.0	0.0	Horz	AV	0.0	36.3	54.0	-17.7	High Ch, 125 kbps, EUT on Side
4957.733	28.5	7.7	1.5	151.0	3.0	0.0	Vert	AV	0.0	36.2	54.0	-17.8	High Ch, 1 Mbps, EUT on Side
4959.925	28.5	7.7	3.84	250.0	3.0	0.0	Vert	AV	0.0	36.2	54.0	-17.8	High Ch, 125 kbps, EUT on Side
4803.150	28.4	7.7	2.8	240.0	3.0	0.0	Horz	AV	0.0	36.1	54.0	-17.9	Low Ch, 1 Mbps, EUT Horz
4802.113	28.4	7.7	1.5	316.0	3.0	0.0	Vert	AV	0.0	36.1	54.0	-17.9	Low Ch, 1 Mbps, EUT Horz
4959.150	28.3	7.7	3.62	15.0	3.0	0.0	Vert	AV	0.0	36.0	54.0	-18.0	High Ch, 2 Mbps, EUT on Side
4959.825	28.3	7.7	1.5	61.0	3.0	0.0	Vert	AV	0.0	36.0	54.0	-18.0	High Ch, 500 kbps, EUT on Side
4878.800	27.8	7.7	1.5	93.0	3.0	0.0	Horz	AV	0.0	35.5	54.0	-18.5	Mid Ch, 1 Mbps, EUT Horz
4879.180	27.8	7.7	1.5	65.0	3.0	0.0	Vert	AV	0.0	35.5	54.0	-18.5	Mid Ch, 1 Mbps, EUT Horz
7438.625	39.1	15.6	3.0	272.0	3.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	High Ch, 1 Mbps, EUT on Side
7439.133	38.8	15.6	2.2	181.0	3.0	0.0	Vert	PK	0.0	54.4	74.0	-19.6	High Ch, 1 Mbps, EUT on Side
7319.260	38.8	15.4	1.5	75.0	3.0	0.0	Vert	PK	0.0	54.2	74.0	-19.8	Mid Ch, 1 Mbps, EUT Horz
7321.387	38.7	15.4	1.5	289.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	Mid Ch, 1 Mbps, EUT Horz
12008.870	30.5	-0.5	2.4	307.0	3.0	0.0	Vert	AV	0.0	30.0	54.0	-24.0	Low Ch, 1 Mbps, EUT Horz
12198.940	29.5	-0.3	1.5	100.0	3.0	0.0	Horz	AV	0.0	29.2	54.0	-24.8	Mid Ch, 1 Mbps, EUT Horz
12198.950	29.5	-0.3	1.5	102.0	3.0	0.0	Vert	AV	0.0	29.2	54.0	-24.8	Mid Ch, 1 Mbps, EUT Horz
12399.170	28.7	0.1	1.5	47.0	3.0	0.0	Horz	AV	0.0	28.8	54.0	-25.2	High Ch, 1 Mbps, EUT on Side
12398.890	28.6	0.1	2.4	45.0	3.0	0.0	Vert	AV	0.0	28.7	54.0	-25.3	High Ch, 1 Mbps, EUT on Side
12009.680	29.0	-0.5	1.5	236.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	Low Ch, 1 Mbps, EUT Horz
4961.858	40.2	7.7	1.5	279.0	3.0	0.0	Horz	PK	0.0	47.9	74.0	-26.1	High Ch, 1 Mbps, EUT on Side
4958.092	40.2	7.7	1.5	110.0	3.0	0.0	Horz	PK	0.0	47.9	74.0	-26.1	High Ch, 2 Mbps, EUT on Side
4961.692	40.0	7.7	1.5	151.0	3.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	High Ch, 1 Mbps, EUT on Side
4803.353	39.8	7.7	2.8	240.0	3.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	Low Ch, 1 Mbps, EUT Horz
4959.342	39.8	7.7	3.76	0.0	3.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	High Ch, 500 kbps, EUT on Side
4959.942	39.7	7.7	3.62	15.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	High Ch, 2 Mbps, EUT on Side
4961.925	39.7	7.7	1.5	61.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	High Ch, 500 kbps, EUT on Side
4805.707	39.6	7.7	1.5	316.0	3.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	Low Ch, 1 Mbps, EUT Horz
4961.842	39.6	7.7	3.84	250.0	3.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	High Ch, 125 kbps, EUT on Side
4961.850	39.5	7.7	1.5	147.0	3.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	High Ch, 125 kbps, EUT on Side
4878.120	39.3	7.7	1.5	93.0	3.0	0.0	Horz	PK	0.0	47.0	74.0	-27.0	Mid Ch, 1 Mbps, EUT Horz
4878.353	39.0	7.7	1.5	65.0	3.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	Mid Ch, 1 Mbps, EUT Horz
12009.020	41.5	-0.5	2.4	307.0	3.0	0.0	Vert	PK	0.0	41.0	74.0	-33.0	Low Ch, 1 Mbps, EUT Horz
12399.120	40.6	0.1	2.4	45.0	3.0	0.0	Vert	PK	0.0	40.7	74.0	-33.3	High Ch, 1 Mbps, EUT on Side

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.04.25.0
EmiR5 2022.07.06.0
PSA-ESCI 2023.04.25.0

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
12397.810	40.3	0.1	1.5	47.0	3.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	High Ch, 1 Mbps, EUT on Side
12199.640	40.7	-0.3	1.5	102.0	3.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	Mid Ch, 1 Mbps, EUT Horz
12199.030	40.4	-0.3	1.5	100.0	3.0	0.0	Horz	PK	0.0	40.1	74.0	-33.9	Mid Ch, 1 Mbps, EUT Horz
12011.480	40.3	-0.5	1.5	236.0	3.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	Low Ch, 1 Mbps, EUT Horz

CONCLUSION

Pass

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SPURIOUS RADIATED EMISSIONS

element
WTD.2023.04.25.0
EmiR5 2022.07.06.0
PSA-ESCI 2023.04.25.0

EUT:	Invoy	Work Order:	CAFI0010
Serial Number:	99011015	Date:	2023-08-31
Customer:	Supra, a division of Carrier Fire and Security Americas Corporation	Temperature:	22.2°C
Attendees:	Ali Elmi	Relative Humidity:	48.6%
Customer Project:	None	Bar. Pressure (PMSL):	1011 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	Battery	Configuration:	CAFI0010-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	26	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

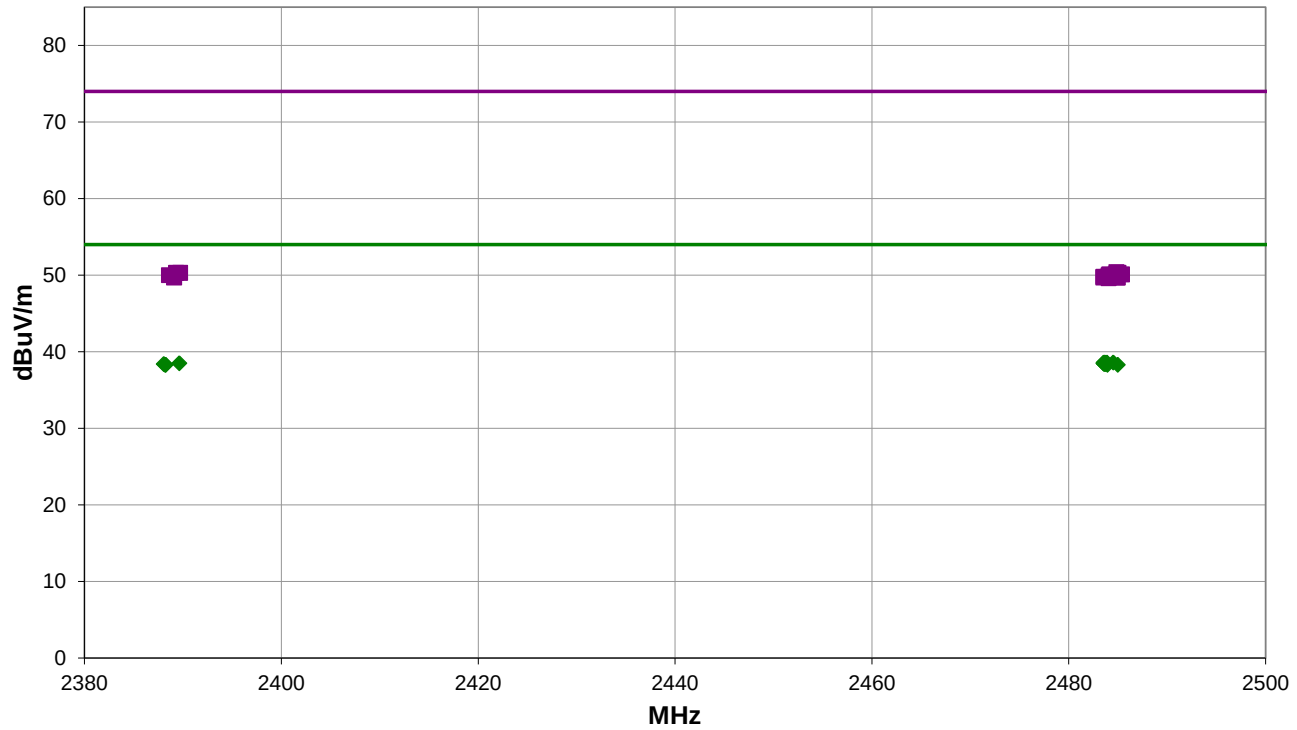
Please reference data comments below for EUT orientation and data rate.

EUT OPERATING MODES

Continuous TX, BLE, Low Ch. = 2402 MHz, Mid Ch. = 2440 MHz, High Ch. = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 26 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.04.25.0
EmiR5 2022.07.06.0
PSA-ESCI 2023.04.25.0

RESULTS - Run #26

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
2484.520	30.9	-2.3	1.5	0.0	3.0	10.0	Vert	AV	0.0	38.6	54.0	-15.4	High Ch, 1 Mbps, EUT on Side
2483.683	30.9	-2.3	1.13	225.0	3.0	10.0	Vert	AV	0.0	38.6	54.0	-15.4	High Ch, 1 Mbps, EUT Horz
2483.550	30.9	-2.3	1.5	101.0	3.0	10.0	Vert	AV	0.0	38.6	54.0	-15.4	High Ch, 1 Mbps, EUT Face Up
2483.870	30.9	-2.3	1.5	188.0	3.0	10.0	Horz	AV	0.0	38.6	54.0	-15.4	High Ch, 2 Mbps, EUT Horz
2483.530	30.8	-2.3	1.03	97.0	3.0	10.0	Horz	AV	0.0	38.5	54.0	-15.5	High Ch, 1 Mbps, EUT on Side
2483.600	30.8	-2.3	1.5	221.0	3.0	10.0	Horz	AV	0.0	38.5	54.0	-15.5	High Ch, 1 Mbps, EUT Horz
2483.637	30.8	-2.3	2.9	183.0	3.0	10.0	Horz	AV	0.0	38.5	54.0	-15.5	High Ch, 1 Mbps, EUT Face Up
2389.630	31.1	-2.6	1.78	40.0	3.0	10.0	Horz	AV	0.0	38.5	54.0	-15.5	Low Ch, 1 Mbps, EUT Horz
2483.540	30.8	-2.3	1.5	312.0	3.0	10.0	Vert	AV	0.0	38.5	54.0	-15.5	High Ch, 2 Mbps, EUT Horz
2388.050	31.0	-2.6	1.5	273.0	3.0	10.0	Vert	AV	0.0	38.4	54.0	-15.6	Low Ch, 1 Mbps, EUT Horz
2483.733	30.7	-2.3	1.5	97.0	3.0	10.0	Horz	AV	0.0	38.4	54.0	-15.6	High Ch, 500 kbps, EUT Horiz
2483.600	30.7	-2.3	1.5	217.0	3.0	10.0	Horz	AV	0.0	38.4	54.0	-15.6	High Ch, 125 kbps, EUT Horiz
2388.190	30.9	-2.6	1.5	151.0	3.0	10.0	Horz	AV	0.0	38.3	54.0	-15.7	Low Ch, 2 Mbps, EUT Horz
2388.250	30.9	-2.6	1.5	301.0	3.0	10.0	Vert	AV	0.0	38.3	54.0	-15.7	Low Ch, 2 Mbps, EUT Horz
2483.930	30.6	-2.3	1.5	195.0	3.0	10.0	Vert	AV	0.0	38.3	54.0	-15.7	High Ch, 500 kbps, EUT Horiz
2484.977	30.6	-2.3	1.5	282.0	3.0	10.0	Vert	AV	0.0	38.3	54.0	-15.7	High Ch, 125 kbps, EUT Horiz
2484.847	42.7	-2.3	2.9	183.0	3.0	10.0	Horz	PK	0.0	50.4	74.0	-23.6	High Ch, 1 Mbps, EUT Face Up
2485.057	42.6	-2.3	1.03	97.0	3.0	10.0	Horz	PK	0.0	50.3	74.0	-23.7	High Ch, 1 Mbps, EUT on Side
2389.713	42.9	-2.6	1.5	273.0	3.0	10.0	Vert	PK	0.0	50.3	74.0	-23.7	Low Ch, 1 Mbps, EUT Horz
2389.303	42.9	-2.6	1.5	301.0	3.0	10.0	Vert	PK	0.0	50.3	74.0	-23.7	Low Ch, 2 Mbps, EUT Horz
2484.113	42.4	-2.3	1.5	0.0	3.0	10.0	Vert	PK	0.0	50.1	74.0	-23.9	High Ch, 1 Mbps, EUT on Side
2485.413	42.4	-2.3	1.5	186.0	3.0	10.0	Horz	PK	0.0	50.1	74.0	-23.9	High Ch, 2 Mbps, EUT Horz
2484.780	42.4	-2.3	1.5	32.0	3.0	10.0	Vert	PK	0.0	50.1	74.0	-23.9	High Ch, 2 Mbps, EUT Horz
2484.057	42.3	-2.3	1.5	101.0	3.0	10.0	Vert	PK	0.0	50.0	74.0	-24.0	High Ch, 1 Mbps, EUT Face Up
2388.580	42.6	-2.6	1.5	151.0	3.0	10.0	Horz	PK	0.0	50.0	74.0	-24.0	Low Ch, 2 Mbps, EUT Horz
2484.430	42.1	-2.3	1.5	221.0	3.0	10.0	Horz	PK	0.0	49.8	74.0	-24.2	High Ch, 1 Mbps, EUT Horz
2483.913	42.1	-2.3	1.13	225.0	3.0	10.0	Vert	PK	0.0	49.8	74.0	-24.2	High Ch, 1 Mbps, EUT Horz
2483.520	42.1	-2.3	1.5	188.0	3.0	10.0	Horz	PK	0.0	49.8	74.0	-24.2	High Ch, 2 Mbps, EUT Horz
2484.323	42.1	-2.3	1.5	195.0	3.0	10.0	Vert	PK	0.0	49.8	74.0	-24.2	High Ch, 500 kbps, EUT Horiz
2389.103	42.3	-2.6	1.78	40.0	3.0	10.0	Horz	PK	0.0	49.7	74.0	-24.3	Low Ch, 1 Mbps, EUT Horz
2483.527	42.0	-2.3	1.5	97.0	3.0	10.0	Horz	PK	0.0	49.7	74.0	-24.3	High Ch, 500 kbps, EUT Horiz
2484.977	42.0	-2.3	1.5	217.0	3.0	10.0	Horz	PK	0.0	49.7	74.0	-24.3	High Ch, 125 kbps, EUT Horiz
2484.917	42.0	-2.3	1.5	282.0	3.0	10.0	Vert	PK	0.0	49.7	74.0	-24.3	High Ch, 125 kbps, EUT Horiz
2484.050	41.9	-2.3	1.5	312.0	3.0	10.0	Vert	PK	0.0	49.6	74.0	-24.4	High Ch, 2 Mbps, EUT Horz

CONCLUSION

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APPENDIX

GAP ANALYSIS

Gap analysis comparing RSS-247 Issue 2:2017 to RSS-247 Issue 3:2023

RSS-247 Issue 2 has been superseded by RSS-247 Issue 3.

The standard has had technical changes requiring evaluation of the compliance information of relevant products. The following changes have been made to this report

- The manufacturer's attestation to the status of the product is included in this report.
- A Gap Analysis (GA) has been performed of the current issue of the standard and was compared to the standard and method used during testing of the device documented in this report. The GA is located in the appendix of this report.

The data was verified that it continues to comply with the requirements of RSS-247 Issue 3:2023.

Conclusion:
No retesting of the device described in this report is required due to the changes made to the standard.

The following changes were made in RSS-247 Issue 3:2023

1. Modified section 6.2 to clarify that different measurement methods can apply depending on the operating frequency range of the device.
2. Added section 6.2.5 to introduce the requirements for devices operating from 5850 5895 MHz and channels that span across 5850 MHz.
3. Added section 6.2.5.1 to provide general information and definitions.
4. Added section 6.2.5.2 to identify the power limits associated with devices operating in the 5850-5895 MHz band.
5. Added section 6.2.5.3 to identify the unwanted emission limits associated with devices operating in the 5850-5895 MHz band.
6. Made editorial changes and clarifications, as appropriate.

End of Test Report