

# Test Report # 319351 A

**Equipment Under Test:** CC2564MODN

**Test Date(s):** November 7<sup>th</sup>, 2020 to February 18<sup>th</sup>, 2021


**Prepared for:**  
Polaris Incorporated  
Attn: Bob Puckette  
1600 SE 18<sup>th</sup> Avenue  
Battle Ground, WA 98604

**Report Issued by:** Zach Wilson, EMC Engineer

Signature: 

Date: 3/15/2021

**Report Reviewed by:** Adam Alger, Quality Manager

Signature: 

Date: 2/18/2021

**Report Constructed by:** Zach Wilson, EMC Engineer

Signature: 

Date: 2/1/2021

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Company: Polaris Incorporated	Page 1 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

## CONTENTS

Contents.....	2
Laird Connectivity Test Services in Review .....	3
1 Test Report Summary .....	4
2 Client Information.....	6
2.1 Equipment Under Test (EUT) Information .....	6
2.2 Product Description .....	6
2.3 Modifications Incorporated for Compliance.....	6
2.4 Deviations and Exclusions from Test Specifications .....	6
2.5 Programming Information .....	6
2.6 Radio Information .....	6
2.7 Power Setting.....	7
3 References .....	8
4 Uncertainty Summary .....	9
5 Test Data .....	10
5.1 Antenna Port Conducted Emissions.....	10
5.2 Radiated Emissions .....	30
6 Revision History .....	38

**Laird Connectivity Test Services in Review**

The Laird Connectivity, Inc. laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:



**A2LA – American Association for Laboratory Accreditation**

*Accreditation based on ISO/IEC 17025:2017 with Electrical (EMC) Scope*

*A2LA Certificate Number: 1255.01*

*Scope of accreditation includes all test methods listed herein unless otherwise noted*



**Federal Communications Commission (FCC) – USA**

*Accredited Test Firm Registration Number: 953492*

*Recognition of two 3 meter Semi-Anechoic Chambers*



**Government  
of Canada**

**Innovation, Science and Economic Development Canada**

*Accredited U.S. Identification Number: US0218*

*Recognition of two 3 meter Semi-Anechoic Chambers*

Company: Polaris Incorporated	Page 3 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

## 1 TEST REPORT SUMMARY

During **November 7<sup>th</sup>, 2020 to February 18<sup>th</sup>, 2021** the Equipment Under Test (EUT), **CC2564MODN**, as provided by **Polaris Incorporated** was tested to the following requirements:

### Federal Communications Commission 15.247 – DTS Innovation, Science and Economic Development Canada RSS-247 - DTS

Requirement	Description	Specification	Method	Result
FCC: 15.247 (a)(2) ISED: RSS-247 5.2 (1)	Digital Modulation System 6 dB bandwidth	500 kHz	ANSI C63.10	Complaint
FCC: 2.1049 ISED: RSS-GEN 6.7	Occupied Bandwidth	Reported	ANSI C63.10	Reported
FCC: 15.247 (b)(3) ISED: RSS-247 5.4 (d)	Maximum Conducted Output Power	30 dBm	ANSI C63.10	Complaint
FCC: 15.247 (e) ISED: RSS-247 5.2 (b)	Digital Modulation System Power Spectral Density	8 dBm / 3 kHz	ANSI C63.10	Complaint
FCC: 15.247 (d) ISED: RSS-247 5.5	RF Spurious Emissions at the Transmitter Antenna Terminal	20 dBc	ANSI C63.10	Complaint
FCC: 15.247 (d) ISED: RSS-GEN 8.10	Spurious Radiated Emissions in Restricted Bands	FCC 15.209 RSS-GEN 8.9	ANSI C63.10	Complaint

### Federal Communications Commission 15.247 – FHSS Innovation, Science and Economic Development Canada RSS-247 - FHSS

Requirement	Description	Specification	Method	Result
FCC: 2.1049 ISED: RSS-GEN 6.6	Occupied Bandwidth	Reported	ANSI C63.10	Reported
FCC: 15.247 (b)(1) ISED: RSS-247 5.4 (b)	Maximum Conducted Output Power	30 dBm	ANSI C63.10	Complaint
FCC: 15.247 (d) ISED: RSS-247 5.5	RF Spurious Emissions at the Transmitter Antenna Terminal	20 dBc	ANSI C63.10	Complaint
FCC: 15.247 (d) ISED: RSS-GEN 8.10	Spurious Radiated Emissions in Restricted Bands	FCC 15.209 RSS-GEN 8.9	ANSI C63.10	Complaint

**Note:** This report is to show compliance for a Class 2 Permissive Change to lower the output power of the CC2564 BLE/BT module.

**Notice:**

The results relate only to the item tested as configured and described in this report. Any additional configurations, modes of operation, or modifications made to the equipment under test after the specified test date(s) are at the decision of the client and may not apply to the data seen in this test report.

The decision rule for Pass / Fail assessment to the specification or standard listed in this test report has been agreed upon by the client and laboratory to be as follows:

Measurement Type	Rule
Emissions – Amplitude	1 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

## 2 CLIENT INFORMATION

<b>Company Name</b>	Polaris Incorporated
<b>Contact Person</b>	Bob Puckette
<b>Address</b>	1600 SE 18 <sup>th</sup> Avenue Battle Ground, WA 98604

### 2.1 Equipment Under Test (EUT) Information

*The following information has been supplied by the client*

<b>Product Name</b>	CC2564MODN
<b>Model Number</b>	259-0005-01
<b>Serial Number</b>	Engineering Sample
<b>FCC ID</b>	2AOW7-MOD01
<b>ISED ID</b>	5966A-MOD01

### 2.2 Product Description

CC2564MODN BT/BLE module. The EUT was powered by 5VDC USB to PC.

### 2.3 Modifications Incorporated for Compliance

None noted at time of test

### 2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

### 2.5 Programming Information

Both radios were programmed using the CC2564\_Direct software, version 1.0.0.0.

### 2.6 Radio Information

BLE Channels: 2402MHz (0), 2440MHz (19), 2480MHz (39)

BLE Data Rate: BR/EDR3

BT Classic: 2402MHz (0), 2440MHz (39), 2480MHz (79), Hopping (0-79)

BT Classic Data Rate: GFSK 1Mbps

Company: Polaris Incorporated	Page 6 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

## 2.7 Power Setting

Power Setting 13 used for both BLE and Bluetooth Classic.

Company: Polaris Incorporated	Page 7 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

### 3 REFERENCES

Publication	Edition	Date
eCFR	-	2021
ANSI C63.10	-	2013
RSS-247	2	2017
RSS-GEN	5	2019



## 4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of k = 2.

References	Version / Date
CISPR 16-4-1	Ed. 2 (2009-02)
CISPR 16-4-2	Ed. 2 (2011-06)
CISPR 32	Ed. 1 (2012-01)
ANSI C63.23	2012
A2LA P103	February 4, 2016
A2LA P103c	August 10, 2015
ETSI TR 100-028	V1.3.1 (2001-03)

Measurement Type	Configuration	Uncertainty ±
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

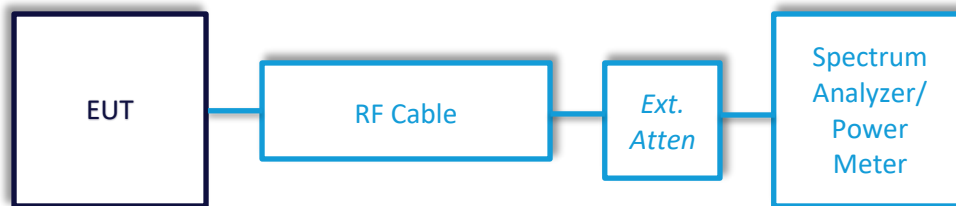
Parameter	ETSI U.C. ±	U.C. ±
Radio Frequency, from F0	1x10 <sup>-7</sup>	0.55x10 <sup>-7</sup>
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

## 5 TEST DATA

### 5.1 Antenna Port Conducted Emissions

<b>Description of Measurement</b>	<p>The direct measurement of emissions at the antenna port of the EUT is achieved by use of a RF connection to a spectrum analyzer or power meter.</p> <p>The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.</p>
<b>Example Calculations</b>	<p>Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm)</p> <p>Margin (dB) = Limit (dBm) – Corrected Reading (dBm)</p>

#### Block Diagram



### 5.1.1 Output Power – BLE (DTS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Shane Dock
<b>Temperature</b>	21.0°C	<b>R.H. %</b>	45.80%
<b>Test Date</b>	11/6/2020	<b>Location</b>	Conducted RF
<b>Requirement</b>	FCC 15.247 §b.3 RSS-247	<b>Method</b>	ANSI C63.10 §11.9.1.1

**Limits: 30 dBm, 1 Watt**

#### Test Parameters

<b>Frequency</b>	2400-2483.5 MHz	<b>Setup</b>	Conducted
<b>RBW</b>	3 MHz	<b>VBW</b>	50 MHz
<b>Detector(s)</b>	Max hold with peak detector.	<b>Span</b>	10 MHz

#### Instrumentation



Date : 4-Feb-2021 \_\_\_\_\_ Test : Conducted 247 \_\_\_\_\_ Job : C-3381 \_\_\_\_\_  
 PE : Zach Wilson \_\_\_\_\_ Customer : Polaris \_\_\_\_\_ Quote : 319351 \_\_\_\_\_

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	7/14/2020	7/14/2021	Active Calibration
2	AA 960143	Cable	Gore	EKD01D01048.0	5546519	2/3/2020	2/3/2022	Active Verification

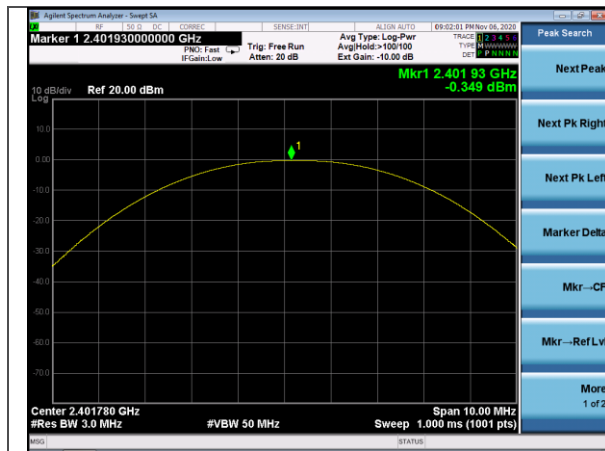
#### EUT Parameters

<b>Input Power</b>	5VDC via USB	<b>Mode</b>	BLE Transmit
<b>Frequency</b>	2402 MHz, 2440 MHz, 2480 MHz	<b>Channel</b>	0, 19, 39
<b>Power Setting</b>	Power setting 13 used		

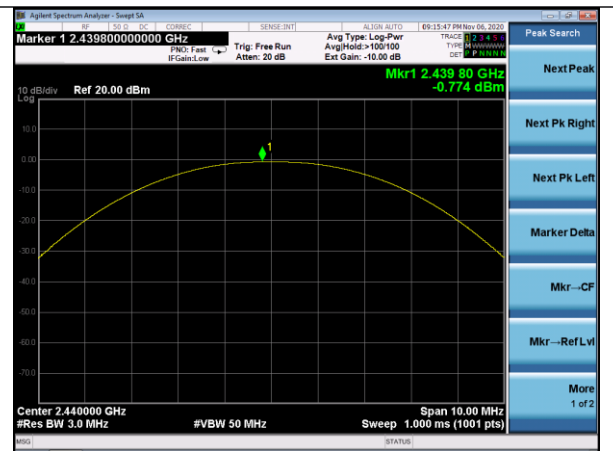
Data Table

Channel	Conducted Output Power (dBm)	Output Power Limit (dBm)	Margin (dB)
Low	-0.3	30.0	30.3
Mid	-0.8	30.0	30.8
High	-1.3	30.0	31.3

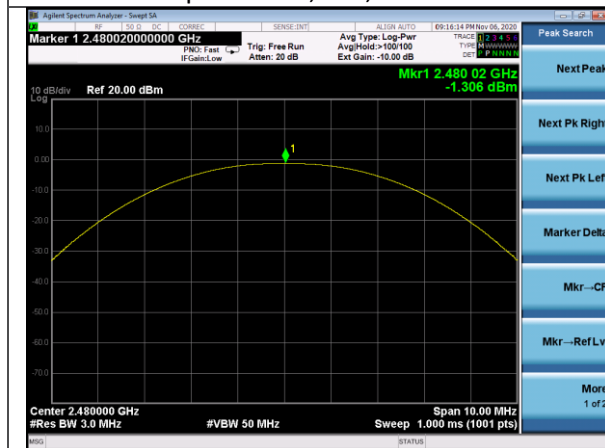
Plots



Output Power, BLE, Channel 0



Output Power, BLE, Channel 19



Output Power, BLE, Channel 39

### 5.1.2 Output Power – BT Classic (FHSS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Shane Dock
<b>Temperature</b>	21.0°C	<b>R.H. %</b>	45.8%
<b>Test Date</b>	11/6/2020	<b>Location</b>	Conducted RF
<b>Requirement</b>	FCC 15.247 §b.1 RSS-247	<b>Method</b>	ANSI C63.10 §7.8.5

**Limits: 30 dBm, 1 Watt**

#### Test Parameters

<b>Frequency</b>	2400-2483.5 MHz	<b>Setup</b>	Conducted
<b>RBW</b>	3 MHz	<b>VBW</b>	50 MHz
<b>Detector(s)</b>	Max hold with peak detector.	<b>Span</b>	5 MHz

#### Instrumentation



Date: 4-Feb-2021 Test: Conducted 247 Job: C-3381  
 PE: Zach Wilson Customer: Polaris Quote: 319351

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	7/14/2020	7/14/2021	Active Calibration
2	AA 960143	Cable	Gore	EKD01D01048.0	5546519	2/3/2020	2/3/2022	Active Verification

#### EUT Parameters

<b>Input Power</b>	5VDC via USB	<b>Mode</b>	BT Classic Single Channel Transmit
<b>Frequency</b>	2402 MHz, 2440 MHz, 2480 MHz	<b>Channel</b>	0, 39, 79
<b>Power Setting</b>	Power setting 13 used		

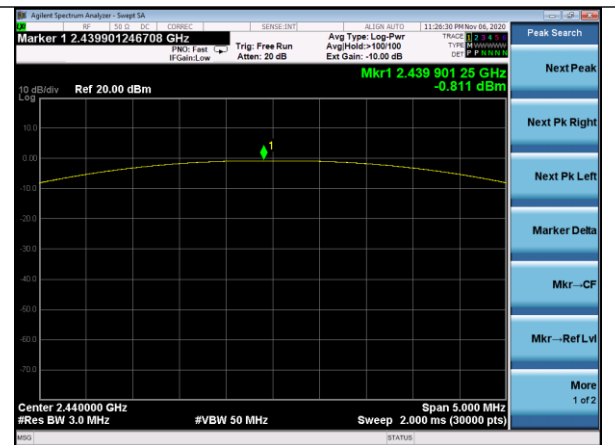
Data Table

Channel	Conducted Output Power (dBm)	Output Power Limit (dBm)	Margin (dB)
Low	-0.4	30.0	30.4
Mid	-0.8	30.0	30.8
High	-1.3	30.0	31.3

Plots



Output Power, BT Classic, Channel 0



Output Power, BT Classic, Channel 39



Output Power, BT Classic, Channel 79

### 5.1.3 DTS & 99% Occupied Bandwidth – BLE (DTS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Shane Dock
<b>Temperature</b>	21.0°C, 22.2°C	<b>R.H. %</b>	45.8%, 23.9%
<b>Test Date</b>	11/6/2020, 2/4/2021	<b>Location</b>	Conducted RF
<b>Requirement</b>	FCC 15.247 §a.2 FCC 2.1049, RSS-GEN, RSS-247	<b>Method</b>	ANSI C63.10 §11.8.2 ANSI C63.10 §6.9.3

**DTS BW Limits: OBW greater than 500kHz**

**99% BW Limits: Reported Only**

#### Test Parameters

<b>Frequency</b>	2400-2483.5 MHz	<b>Setup</b>	Conducted
<b>RBW</b>	DTS BW: 100 kHz 99% BW: 10 kHz	<b>VBW</b>	DTS BW: 300 kHz 99% BW: 30 kHz
<b>Detector(s)</b>	Max hold with peak detector.	<b>Span</b>	3 MHz

#### Instrumentation



Date : 4-Feb-2021 Test : Conducted 247 Job : C-3381  
PE : Zach Wilson Customer : Polaris Quote : 319351

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	7/14/2020	7/14/2021	Active Calibration
2	AA 960143	Cable	Gore	EKD01D01048.0	5546519	2/3/2020	2/3/2022	Active Verification



Date : 4-Feb-2021 Test : Conducted 247 Job : C-3381  
PE : Zach Wilson Customer : Polaris Quote : 319351

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	7/13/2020	7/13/2021	Active Calibration
2	AA 960144	Cable	Gore	EKD01D010720	5800373	2/3/2020	2/3/2022	Active Verification

#### EUT Parameters

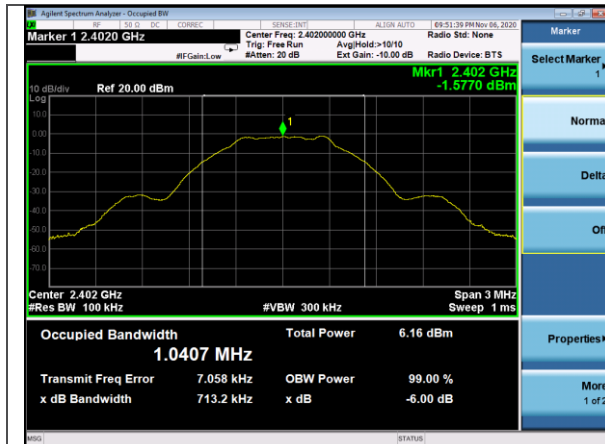
<b>Input Power</b>	5VDC via USB	<b>Mode</b>	BLE Transmit
<b>Frequency</b>	2402 MHz, 2440 MHz, 2480 MHz	<b>Channel</b>	0, 19, 39
<b>Power Setting</b>	Power setting 13 used		

Data Table

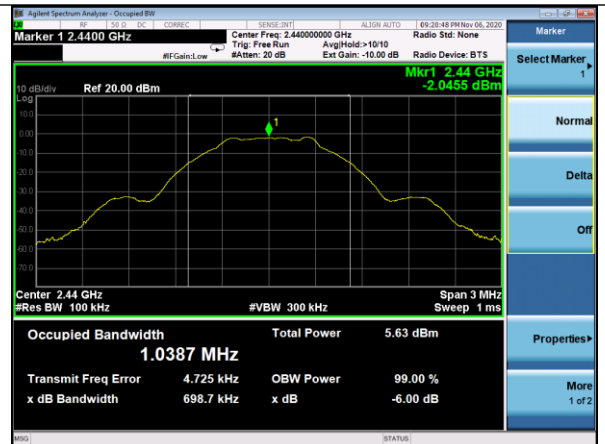
Channel	99% BW (kHz)	6 dB BW (kHz)
Low	1036.6	713.2
Mid	1039.6	698.7
High	1036.2	704.6



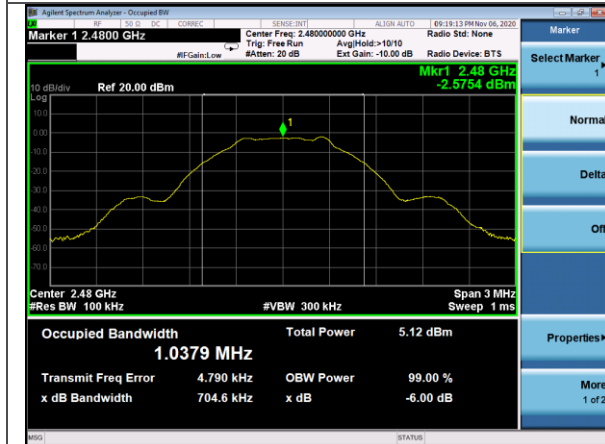
Plots



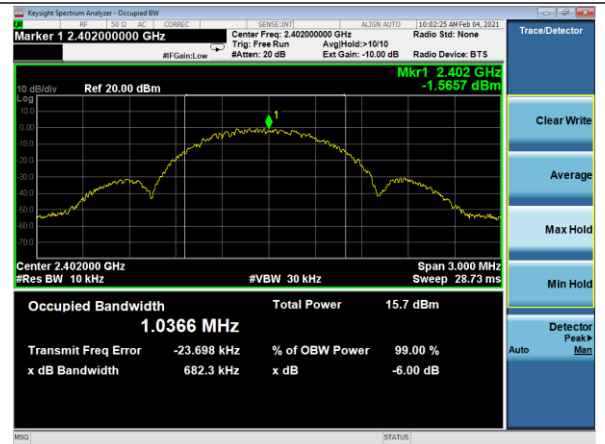
DTS BW, BLE, Channel 0



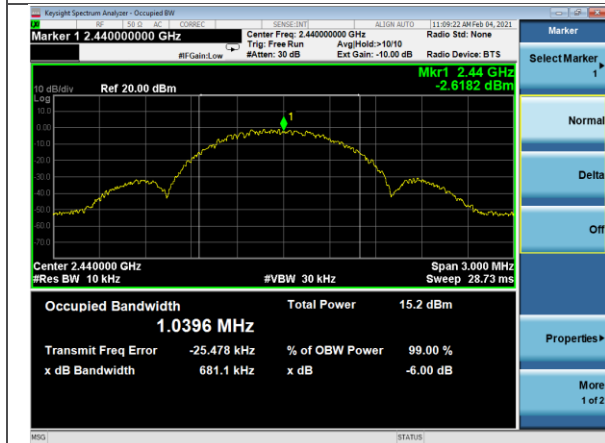
DTS BW, BLE, Channel 19



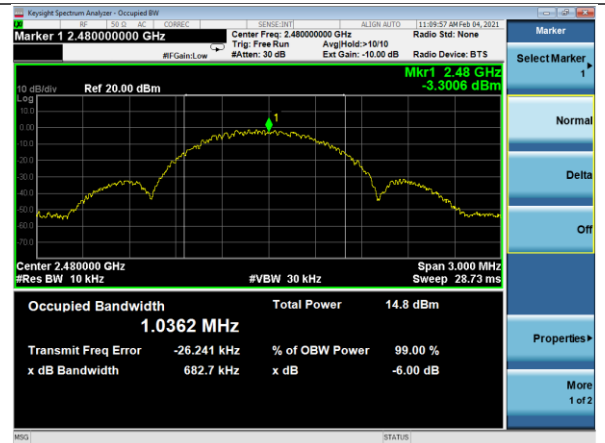
DTS BW, BLE, Channel 39



99% BW, BLE, Channel 0



99% BW, BLE, Channel 19



99% BW, BLE, Channel 39

Company: Polaris Incorporated	Page 17 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

### 5.1.4 20 dB and 99% Occupied Bandwidth – Bluetooth Classic (FHSS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Shane Dock
<b>Temperature</b>	22.2°C	<b>R.H. %</b>	23.9%
<b>Test Date</b>	2/4/2021	<b>Location</b>	Conducted RF
<b>Requirement</b>	FCC 2.1049, RSS-GEN	<b>Method</b>	ANSI C63.10 §6.9.3

### 99% BW Limits: Reported Only

#### Test Parameters

<b>Frequency</b>	2400-2483.5 MHz	<b>Setup</b>	Conducted
<b>RBW</b>	99% BW: 10 kHz 20dB BW: 30 kHz	<b>VBW</b>	99% BW: 30 kHz 20dB BW: 91 kHz
<b>Detector(s)</b>	Max hold with peak detector.	<b>Span</b>	3 MHz

#### Instrumentation



Date: 4-Feb-2021      Test: Conducted 247      Job: C-3381  
 PE: Zach Wilson      Customer: Polaris      Quote: 319351

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	7/13/2020	7/13/2021	Active Calibration
2	AA 960144	Cable	Gore	EKD01D010720	5800373	2/3/2020	2/3/2022	Active Verification

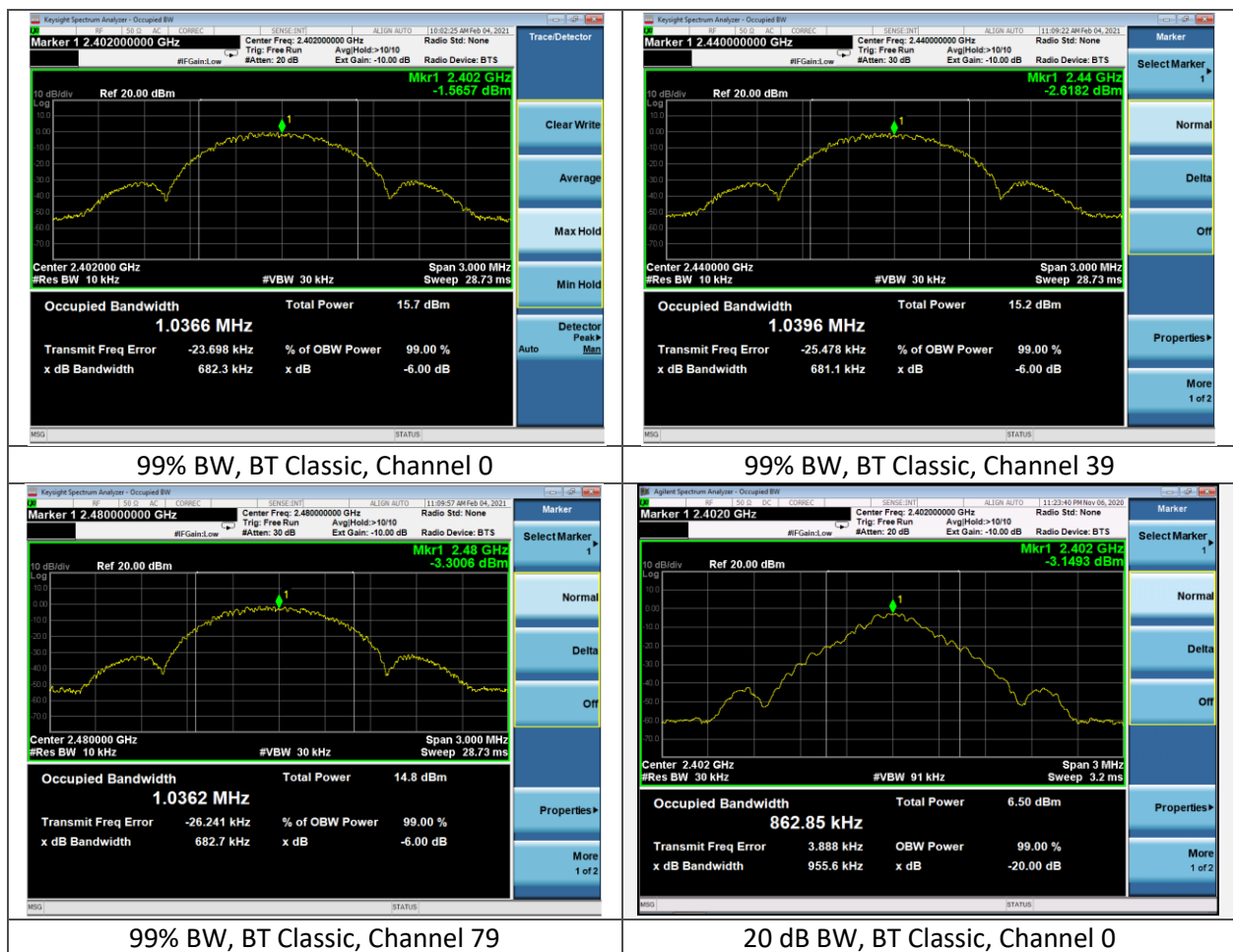
#### EUT Parameters

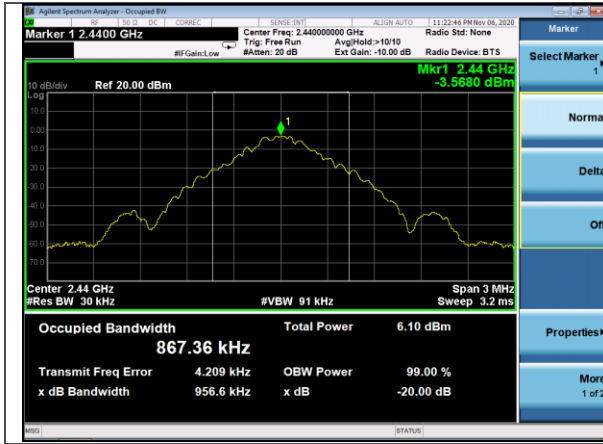
<b>Input Power</b>	5VDC via USB	<b>Mode</b>	BT Classic Single Channel Transmit
<b>Frequency</b>	2402 MHz, 2440 MHz, 2480 MHz	<b>Channel</b>	0, 39, 79
<b>Power Setting</b>	Power setting 13 used		

### Data Table

Channel	99% BW (kHz)	20 dB BW (kHz)
0	1036.6	955.6
39	1039.6	956.6
79	1036.2	959.5

### Plots





20 dB BW, BT Classic, Channel 39



20 dB BW, BT Classic, Channel 79

Company: Polaris Incorporated	Page 20 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

### 5.1.5 Power Spectral Density – BLE (DTS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Shane Dock
<b>Temperature</b>	21.0°C	<b>R.H. %</b>	45.8%
<b>Test Date</b>	11/6/2020	<b>Location</b>	Conducted RF
<b>Requirement</b>	FCC 15.247.e RSS-247	<b>Method</b>	ANSI C63.10 §11.10.2

Limit: 8dBm/3kHz

#### Test Parameters

<b>Frequency</b>	2400-2483.5 MHz	<b>Setup</b>	Conducted
<b>RBW</b>	30kHz	<b>VBW</b>	91kHz
<b>Detector(s)</b>	Max hold with peak detector.	<b>Span</b>	1.05MHz

#### Instrumentation



Date : 4-Feb-2021      Test : Conducted 247      Job : C-3381  
 PE : Zach Wilson      Customer : Polaris      Quote : 319351

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	7/14/2020	7/14/2021	Active Calibration
2	AA 960143	Cable	Gore	EKD01D01048.0	5546519	2/3/2020	2/3/2022	Active Verification

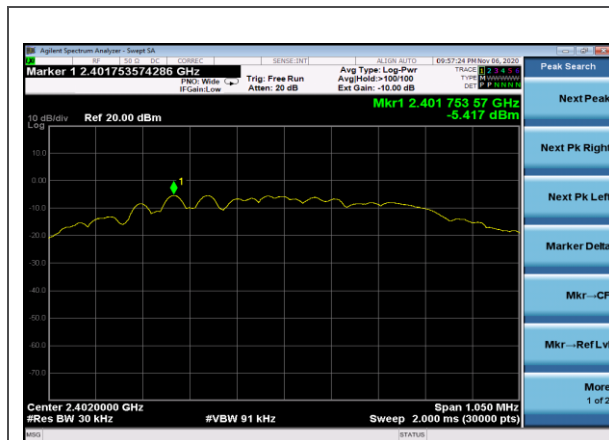
#### EUT Parameters

<b>Input Power</b>	5VDC via USB	<b>Mode</b>	BLE Transmit
<b>Frequency</b>	2402 MHz, 2440 MHz, 2480 MHz	<b>Channel</b>	0, 19, 39
<b>Power Setting</b>	Power setting 13 used		

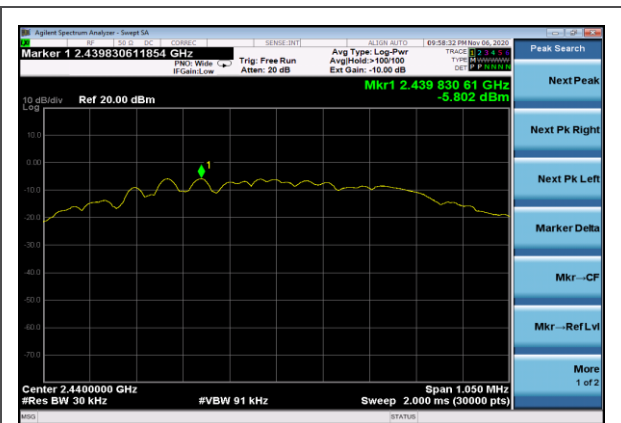
Data Table

Channel	Conducted PSD (dBm/30kHz)	PSD Limit (dBm/3kHz)	Margin (dB)
0	-5.4	8.0	13.4
19	-5.8	8.0	13.8
39	-6.4	8.0	14.4

Plots



PSD, BLE, Channel 0



PSD, BLE, Channel 19



PSD, BLE, Channel 39

### 5.1.6 Conducted Spurious Emissions – BLE (DTS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Shane Dock
<b>Temperature</b>	22.2°C	<b>R.H. %</b>	23.90%
<b>Test Date</b>	2/4/2021, 2/18/2021	<b>Location</b>	Conducted RF
<b>Requirement</b>	FCC 15.247 (d) RSS-247	<b>Method</b>	ANSI C63.10 §11.11

**Limit: 20dBc = -11.2dBm**

#### Test Parameters

<b>Frequency</b>	30MHz-25GHz	<b>Setup</b>	Conducted
<b>RBW</b>	100kHz	<b>VBW</b>	300kHz
<b>Detector(s)</b>	Max hold with peak detector.	<b>Sweep</b>	Auto
<b>Notes</b>	No emissions within 20 dB of limit.		

#### Instrumentation



Date : 4-Feb-2021

Test : Conducted 247

Job : C-3381

PE : Zach Wilson

Customer : Polaris

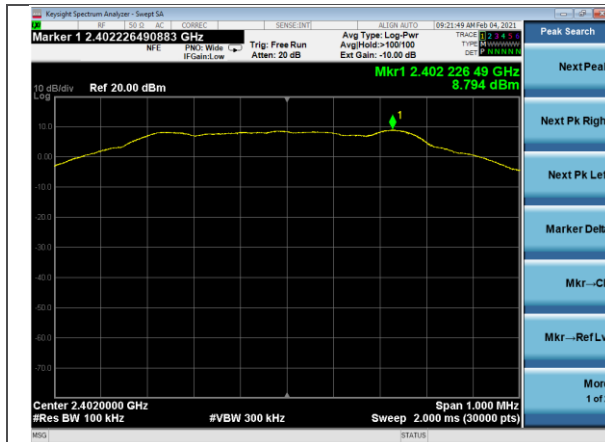
Quote : 319351

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	7/14/2020	7/14/2021	Active Calibration
2	AA 960143	Cable	Gore	EKD01D01048.0	5546519	2/3/2020	2/3/2022	Active Verification

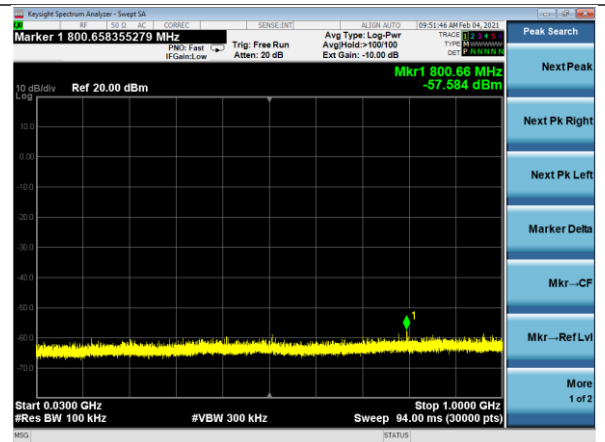
#### EUT Parameters

<b>Input Power</b>	5VDC via USB	<b>Mode</b>	BLE Transmit
<b>Frequency</b>	2402 MHz, 2480 MHz	<b>Channel</b>	0, 39
<b>Power Setting</b>	Power setting 13 used		

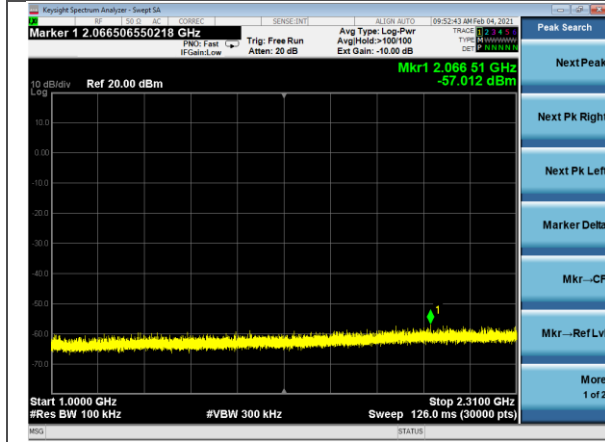
Plots



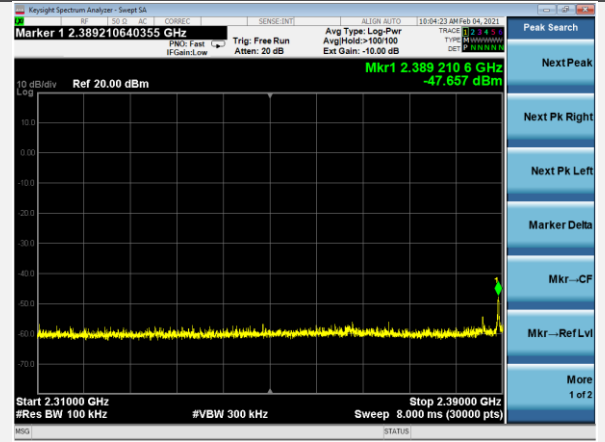
Reference Level, BLE, 8.8dBm



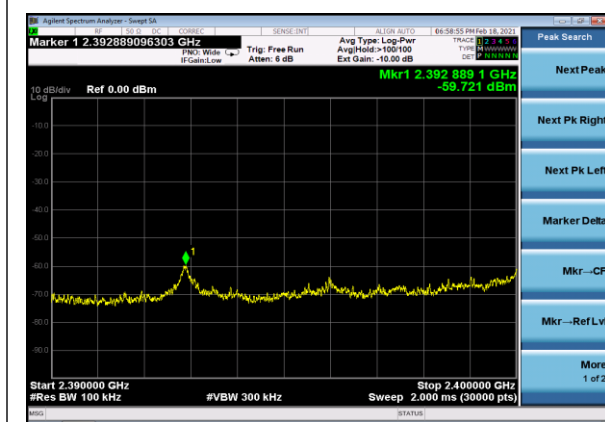
Conducted Spurious, 30-100 MHz, Channel 0



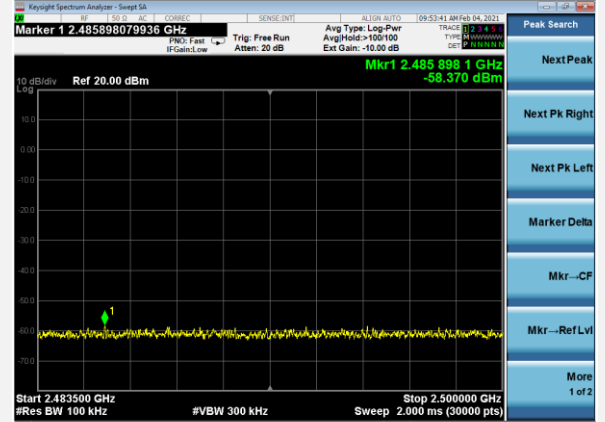
Conducted Spurious, 1-2.31 GHz, Channel 0



Conducted Spurious, 2.31-2.39 GHz, Channel 0

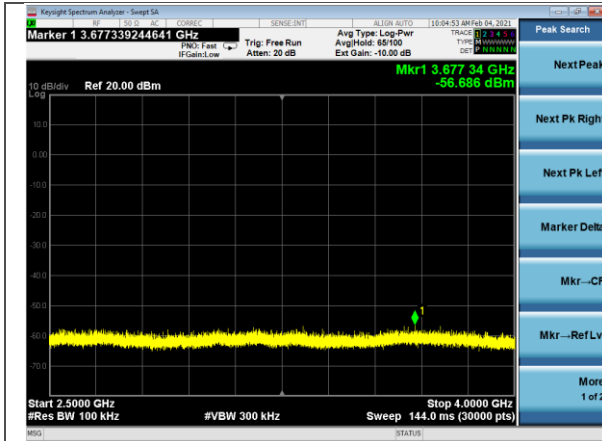


Conducted Spurious, 2.39-2.4 GHz, Channel 0

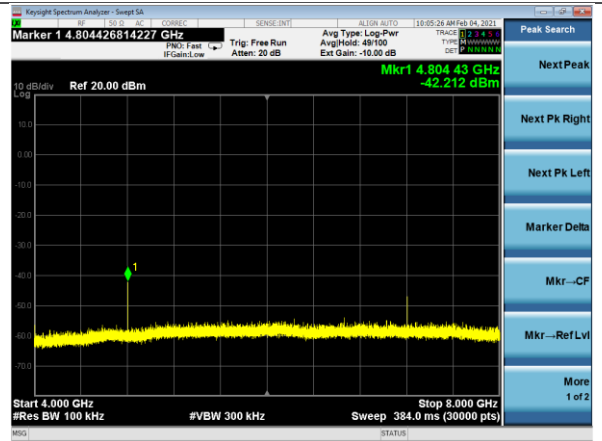


Conducted Spurious, 2.4835-2.5 GHz, Channel 39

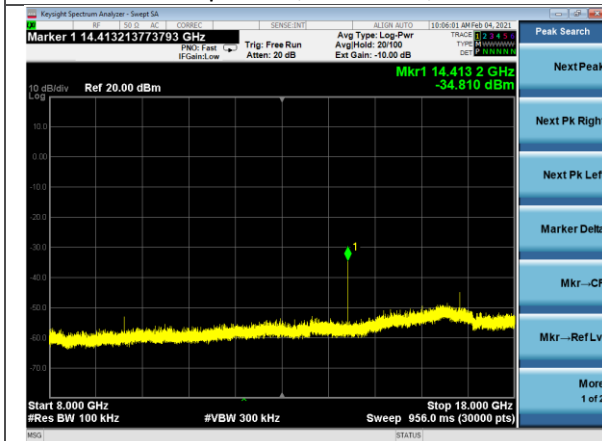




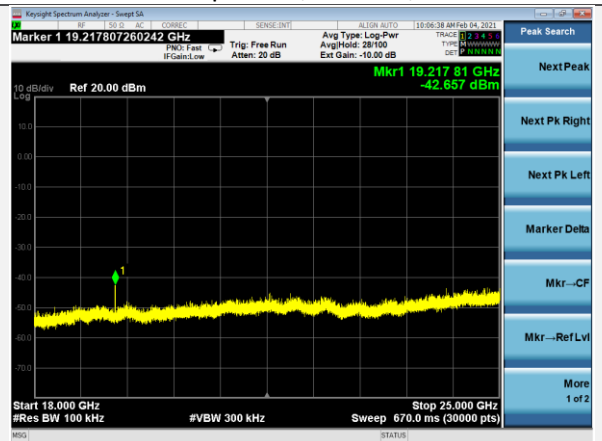
Conducted Spurious, 2.5-4 GHz, Channel 39



Conducted Spurious, 4-8 GHz, Channel 0



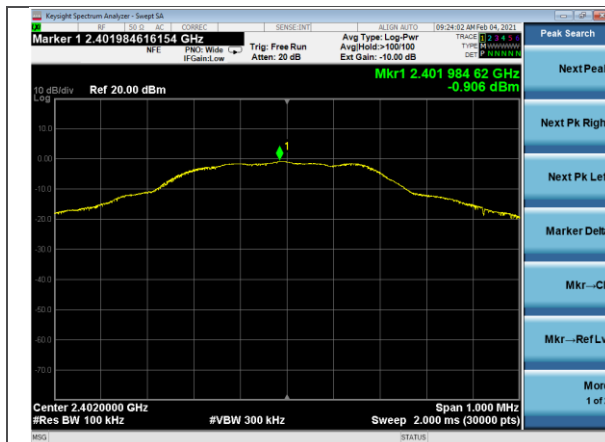
Conducted Spurious, 8-18 GHz, Channel 0



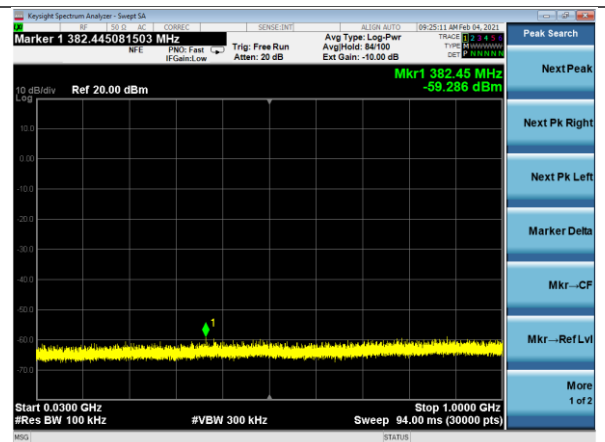
Conducted Spurious, 18-25 GHz, Channel 0



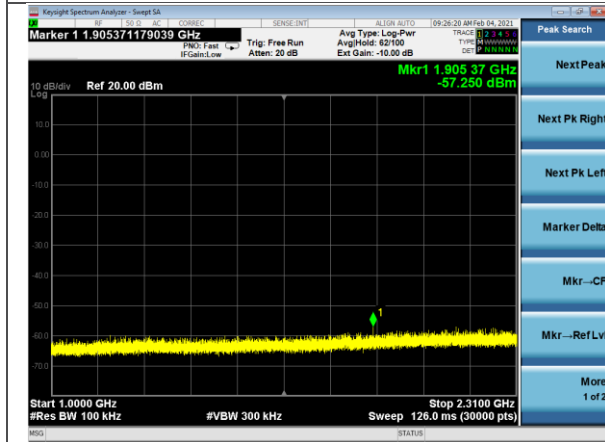
Plots



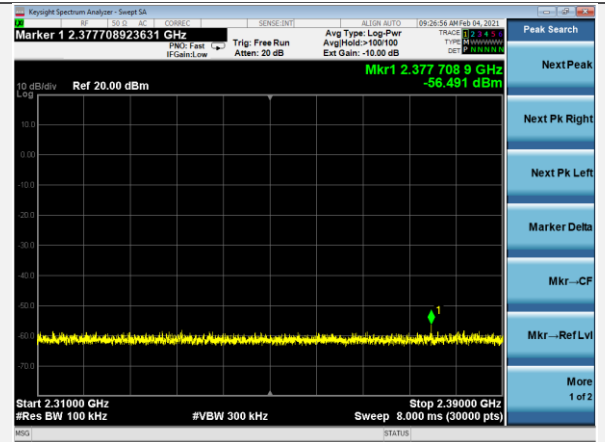
Reference Level, BT Classic, -0.9dBm



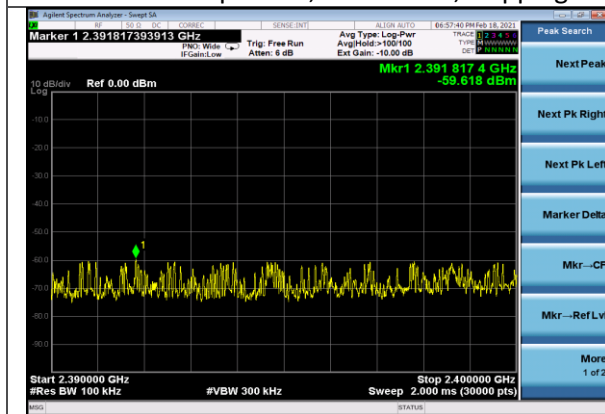
Conducted Spurious, 30-1000 MHz, Hopping



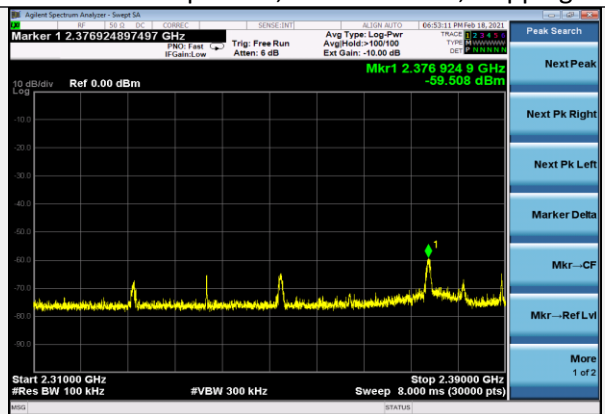
Conducted Spurious, 1-2.31 GHz, Hopping



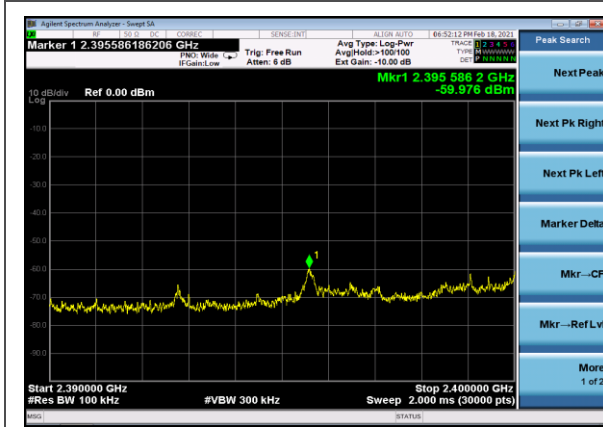
Conducted Spurious, 2.31-2.39 GHz, Hopping



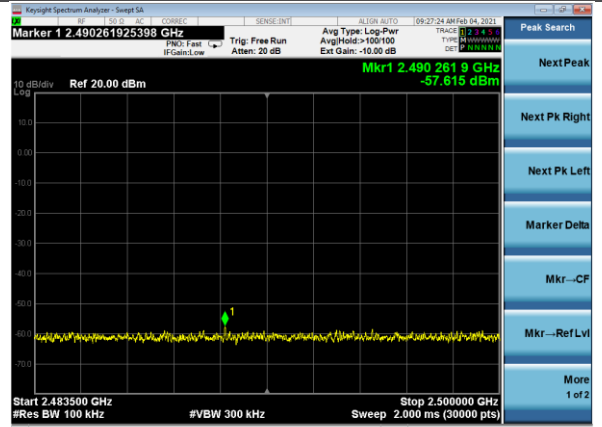
Conducted Spurious, 2.39-2.4 GHz, Hopping



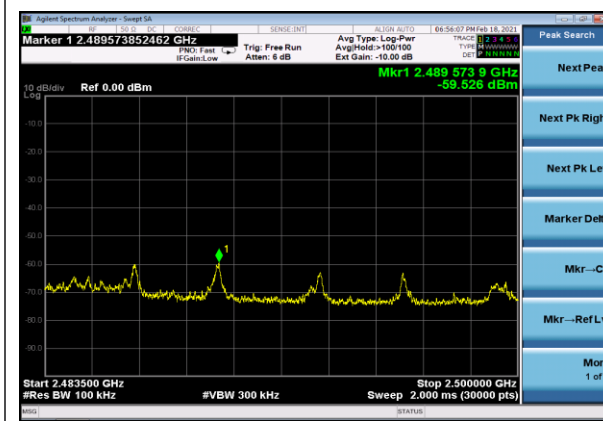
Conducted Spurious, 2.31-2.39 GHz  
Low Single Channel



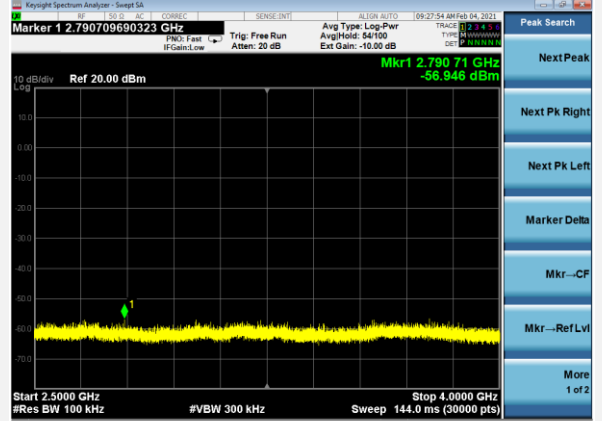
Conducted Spurious, 2.39-2.4 GHz  
Low Single Channel



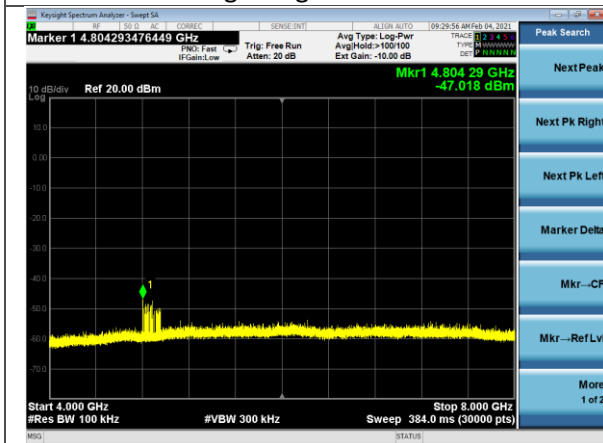
Conducted Spurious, 2.4835-2.5 GHz, Hopping



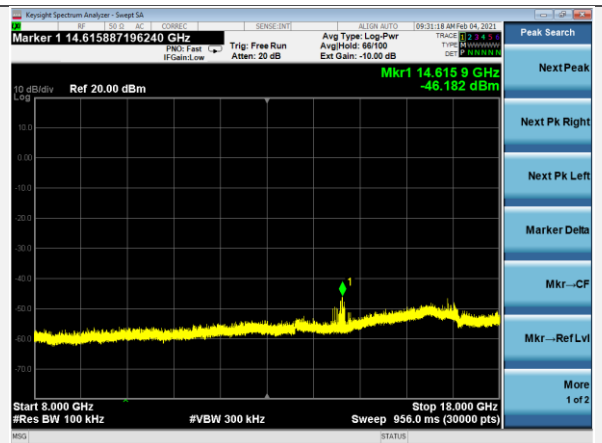
Conducted Spurious, 2.4835-2.5 GHz  
High Single Channel



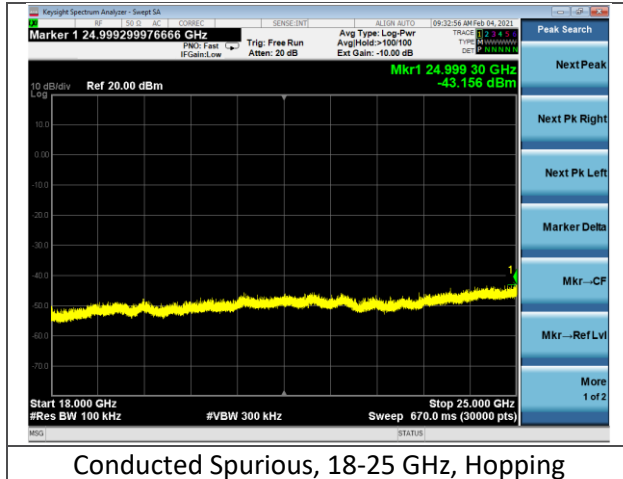
Conducted Spurious, 2.5-4 GHz, Hopping



Conducted Spurious, 4-8 GHz, Hopping



Conducted Spurious, 8-18 GHz, Hopping



Conducted Spurious, 18-25 GHz, Hopping

Company: Polaris Incorporated	Page 29 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

## 5.2 Radiated Emissions

<p><b>Description of Measurement</b></p>	<p>The frequency spectrum is investigated for intentional and / or unintentional signals emanating from the EUT by use of a standardized test site and measurement antenna.</p> <p>The antenna, cable, pre-amp, and other necessary measurement system correction factors are loaded onto the EMI receiver / spectrum analyzer when the measurements are performed allowing the data to be gathered and reported as corrected values.</p> <p>The maximum emissions from the EUT are determined by turn-table azimuth rotation (360°) and scanning of the measurement antenna. Maximized levels are noted at degree values of azimuth, measurement antenna height, and measurement antenna polarity.</p>
<p><b>Example Calculations</b></p>	<p>Measurement (dBμV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBμV/m)</p> <p>Margin (dB) = Limit (dBμV/m) - Corrected Reading (dBμV/m)</p> <p>Example at 4000 MHz:            Reading = 40 dBμV + 3.4 dB + 0.9 dB + 6.5 dB/m = 50.8 dBμV/m            Average Limit = 20 log (500) = 54 dBμV/m            Margin = 54 dBμV/m - 50.8 dBμV/m = 3.2 dB</p>

### Block Diagram



### 5.2.1 Radiated Emissions – Bluetooth Classic (FHSS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Zach Wilson
<b>Temperature</b>	24°C, 23°C	<b>R.H. %</b>	41%, 42%
<b>Test Date</b>	11/5/2020, 11/6/2020	<b>Location</b>	Chamber 3
<b>Requirement</b>	FCC 15.209, FCC 15.247, RSS-247	<b>Method</b>	ANSI C63.10

#### Limits:

Frequency Range (MHz)	Average Limit (dBµV/m)	Peak Limit (dBµV/m)
1-25GHz	54	74

#### Test Parameters

<b>Frequency</b>	1-18 GHz	<b>Distance</b>	3m
<b>Detector(s)</b>	Max hold with peak detector for plots. Reduced VBW of 10Hz used for average measurements.	<b>Table height</b>	150cm
<b>RBW</b>	1 MHz	<b>VBW</b>	Peak: 3 MHz Average: 10Hz
<b>Notes</b>	Device capable of 100% Duty Cycle.		

#### EUT Parameters

<b>Input Power</b>	5VDC (USB)	<b>Mode</b>	BT Classic Single Channel and Hopping
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#### Instrumentation



Date : 4-Feb-2021 Test : RE Job : C-3381  
 PE : Zach Wilson Customer : Polaris Quote : 319351

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	7/14/2020	7/14/2021	Active Calibration
2	AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	9/21/2020	9/21/2021	Active Calibration
3	LSC-300	Cable	Chamber 3 Emist -	-	-	8/9/2020	8/9/2021	Active Verification
4	EE 960096	Antenna - Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	40201429	10/29/2020	10/29/2021	Active Calibration
5	AA 960176	Cable	A.H. Systems, Inc	SAC-26G-6	395	2/3/2021	2/3/2022	Active Verification
6	AA 960153	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-04	7/16/2020	7/16/2021	Active Calibration

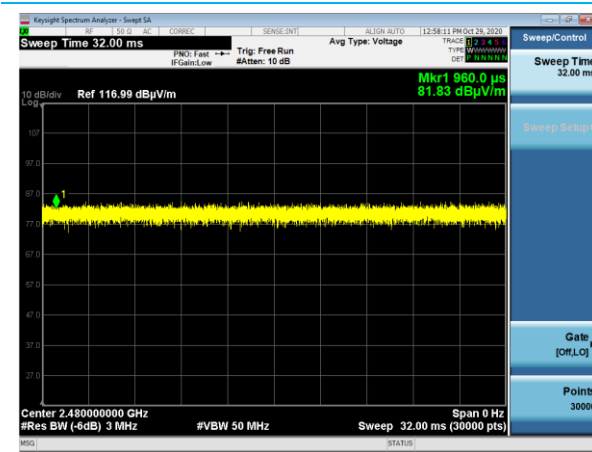
## Data Tables

Frequency (MHz)	Antenna Polarity	EUT Orientation	Height (cm)	Azimuth (degree)	Average Reading (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Measurement Frequency (MHz)	Peak Reading (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Radio/ Channel
2484.9	Horizontal	Flat	119	285	38.8	54.0	15.2	2487.3	52.3	74.0	21.7	39
2382.9	Horizontal	Flat	150	296	34.6	54.0	19.4	2340.0	46.8	74.0	27.2	0
2375.2	Horizontal	Flat	150	290	41.1	54.0	12.9	2372.5	53.2	74.0	20.8	Hopping
2488.3	Vertical	Flat	150	0	41.9	54.0	12.1	2484.3	54.4	74.0	19.6	Hopping

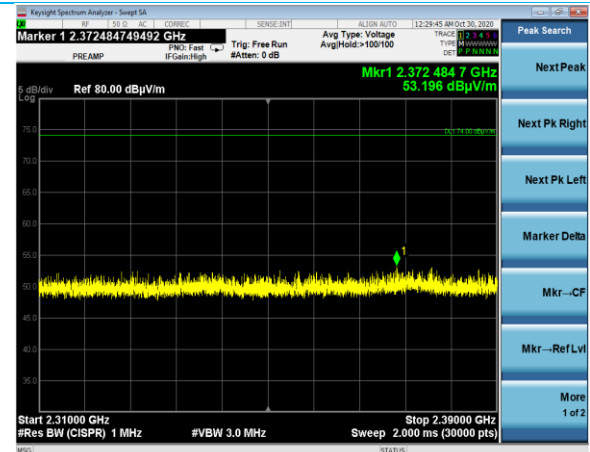
Frequency (MHz)	Antenna Polarity	EUT Orientation	Height (cm)	Azimuth (degree)	Average Reading (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Reading (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Channel
4802.0	Vertical	Vertical	308	209	34.1	54.0	19.9	41.7	74.0	32.3	39
4878.0	Vertical	Vertical	104	310	34.1	54.0	19.9	41.9	74.0	32.1	39
4956.0	Vertical	Vertical	189	208	37.4	54.0	16.6	43.8	74.0	30.2	79
4956.0	Horizontal	Vertical	141	47	35.8	54.0	18.2	42.8	74.0	31.2	79
4956.0	Horizontal	Side	109	187	36.6	54.0	17.4	43.8	74.0	30.2	79
4956.0	Vertical	Side	100	26	36.2	54.0	17.8	43.1	74.0	30.9	79
4956.0	Vertical	Flat	334	290	35.0	54.0	19.0	42.5	74.0	31.5	79
4956.0	Horizontal	Flat	135	270	35.4	54.0	18.6	43.0	74.0	31.0	79



Plots



Bluetooth Classic, GFSK Modulation  
Duty Cycle = 100%



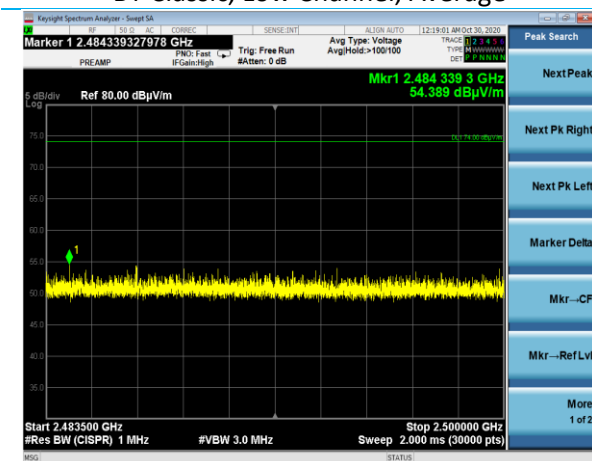
2310-2390 MHz  
BT Classic, Hopping, Peak



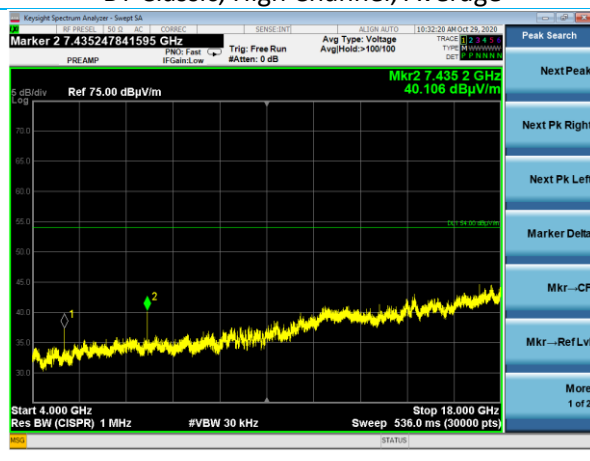
2310-2390 MHz  
BT Classic, Low Channel, Average



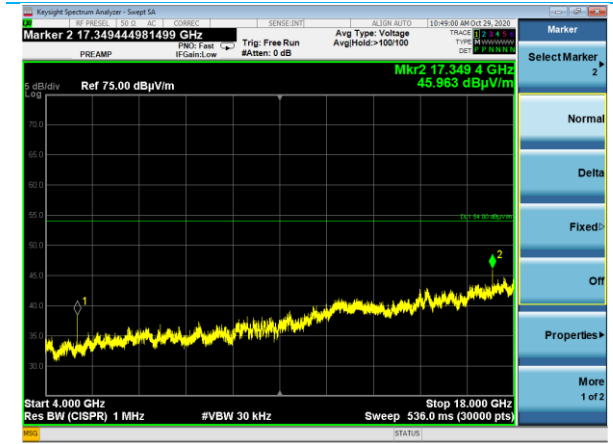
2483.5-2500 MHz  
BT Classic, High Channel, Average



2483.5-2500 MHz  
BT Classic, Hopping, Peak



4-18 GHz, Vertical Antenna  
BT Classic, Channel 79



4-18 GHz, Horizontal Antenna  
BT Classic, Channel 79

Company: Polaris Incorporated	Page 34 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

## 5.2.2 Radiated Emissions – BLE (DTS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Zach Wilson
<b>Temperature</b>	24°C, 23°C	<b>R.H. %</b>	41%, 42%
<b>Test Date</b>	11/5/2020, 11/6/2020	<b>Location</b>	Chamber 3
<b>Requirement</b>	FCC 15.209, FCC 15.247, RSS-247	<b>Method</b>	ANSI C63.10

### Limits:

Frequency Range (MHz)	Average Limit (dBµV/m)	Peak Limit (dBµV/m)
1-25GHz	54	74

### Test Parameters

<b>Frequency</b>	1-18 GHz	<b>Distance</b>	3m
<b>Detector(s)</b>	Max hold with peak detector for plots. Reduced VBW of 10Hz used for average measurements.	<b>Table height</b>	150cm
<b>RBW</b>	1 MHz	<b>VBW</b>	Peak: 3 MHz Average: 10Hz

### EUT Parameters

<b>Input Power</b>	5VDC (USB)	<b>Mode</b>	BLE Single Channel, 0, 19, 39
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### Instrumentation



Date : 4-Feb-2021

Test : RE

Job : C-3381

PE : Zach Wilson

Customer : Polaris

Quote : 319351

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	7/14/2020	7/14/2021	Active Calibration
2	AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	9/21/2020	9/21/2021	Active Calibration
3	LSC-300	Cable	Chamber 3 Emiss -		-	8/9/2020	8/9/2021	Active Verification
4	EE 960096	Antenna - Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	40201429	10/29/2020	10/29/2021	Active Calibration
5	AA 960176	Cable	A.H. Systems, Inc	SAC-26G-6	395	2/3/2021	2/3/2022	Active Verification
6	AA 960153	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-04	7/16/2020	7/16/2021	Active Calibration

Company: Polaris Incorporated	Page 35 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

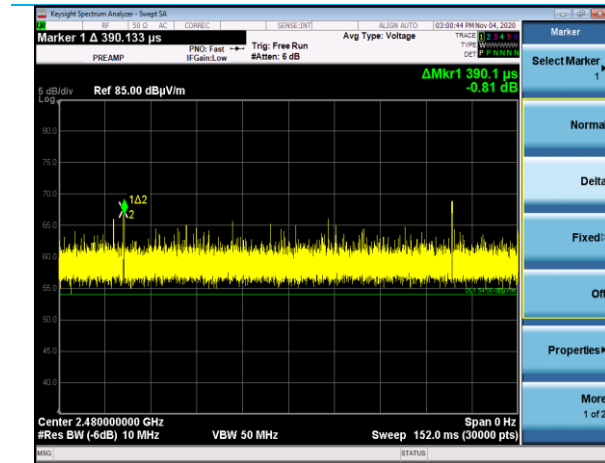
## Data Tables

Average Measurement Frequency (MHz)	Antenna Polarity	EUT Orientation	Height (cm)	Azimuth (degree)	Average Reading (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Measurement Frequency (MHz)	Peak Reading (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Channel
2484.9	Horizontal	Flat	119	285	38.8	54.0	15.2	2487.3	52.3	74.0	21.7	79
2382.9	Horizontal	Flat	150	296	34.6	54.0	19.4	2340.0	46.8	74.0	27.2	0

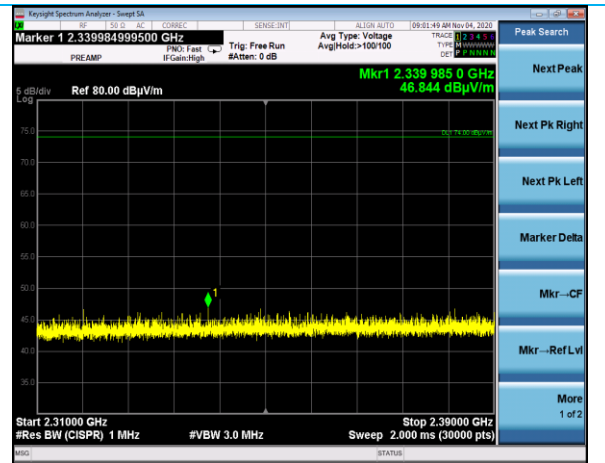
Channel	Frequency (MHz)	Antenna Polarity	EUT Orientation	Height (cm)	Azimuth (degree)	Average Reading (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Reading (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
0	4804.0	Vertical	Flat	100	148	32.3	54.0	21.7	42.2	74.0	31.8
19	4880.0	Vertical	Flat	108	147	33.6	54.0	20.4	42.7	74.0	31.3
39	4960.0	Horizontal	Vertical	335	224	31.0	54.0	23.0	41.1	74.0	32.9
39	4960.0	Vertical	Vertical	165	162	32.7	54.0	21.3	41.9	74.0	32.1
39	4960.0	Vertical	Side	155	197	30.2	54.0	23.8	40.6	74.0	33.4
39	4960.0	Horizontal	Side	130	170	33.3	54.0	20.7	42.7	74.0	31.3
39	4960.0	Horizontal	Flat	105	107	31.1	54.0	22.9	41.6	74.0	32.4
39	4960.0	Vertical	Flat	142	145	33.5	54.0	20.5	42.6	74.0	31.4

Channel	Frequency (MHz)	Antenna Polarity	EUT Orientation	Height (cm)	Azimuth (degree)	Average Reading (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Reading (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
0	7206.0	Horizontal	Vertical	100	42	33.2	54.0	20.8	43.6	74.0	30.4
19	7320.0	Horizontal	Vertical	100	38	35.7	54.0	18.3	46.0	74.0	28.0
39	7440.0	Vertical	Vertical	150	0	31.3	54.0	22.7	41.5	74.0	32.5
39	7440.0	Horizontal	Vertical	100	25	34.1	54.0	19.9	44.8	74.0	29.2
39	7440.0	Horizontal	Side	243	180	32.1	54.0	21.9	44.2	74.0	29.8
39	7440.0	Vertical	Side	342	100	32.7	54.0	21.3	43.9	74.0	30.1
39	7440.0	Vertical	Flat	100	244	32.3	54.0	21.7	43.2	74.0	30.8
39	7440.0	Horizontal	Flat	100	274	31.9	54.0	22.1	43.2	74.0	30.8

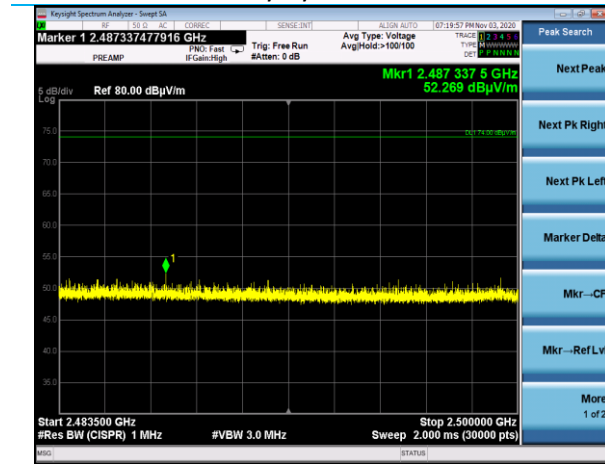
Plots



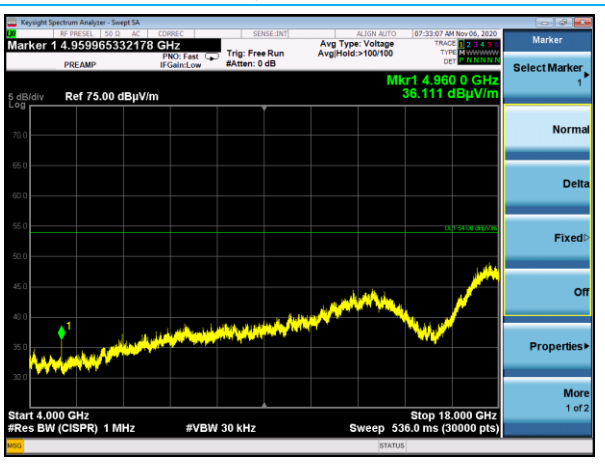
BLE On Time  
Duty Cycle = 99%



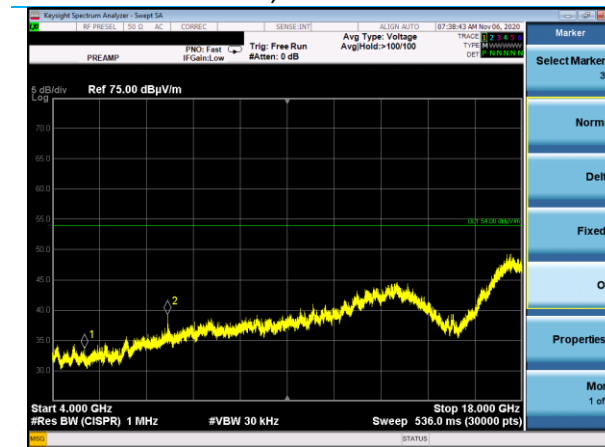
2310-2390 MHz  
BLE, Channel 0



2483.5-2500 MHz  
BLE, Channel 39



4-18 GHz, Vertical Antenna  
BLE, Channel 39, Reduced VBW



4-18 GHz, Horizontal Antenna  
BLE, Channel 39, Reduced VBW

Company: Polaris Incorporated	Page 37 of 38	Name: CC2564MODN
Report: TR319351 A		Model: 259-0005-01
Job: C-3381		Serial: Engineering Sample

## 6 REVISION HISTORY

Version	Date	Notes	Person
v0	2/17/2021	Initial Draft	Zach Wilson
v1	2/18/2021	Revised per internal review, added band edge data	Zach Wilson

**END OF REPORT**