

Test Report # 319197 A

Equipment Under Test: 982057

Test Date(s): November 25th, 2019– April 7th, 2020

Prepared for: Pass & Seymour, Inc. d/b/a Legrand
Attn: Joshua Haines
50 Boyd Avenue
Syracuse, NY 13209

Report Issued by: Zach Wilson, EMC Engineer

Signature: 

Date: 5/12/2020

Report Reviewed by: Adam Alger, Quality Manager

Signature: 

Date: 4/9/2020

Report Constructed by: Zach Wilson, EMC Engineer

Signature: 

Date: 4/7/2020

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Report: TR 319197 A		Model: 982057
Job: C-3272		Serial: Engineering Sample

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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



Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

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1 TEST REPORT SUMMARY

During **November 25th, 2019 – April 7th, 2020** the Equipment Under Test (EUT), **982057**, as provided by **Pass & Seymour, Inc. d/b/a Legrand** was tested to the following requirements of the **Federal Communication Commission and Innovation, Science and Economic Development Canada**:

Requirement	Description	Specification	Method	Result
FCC: 15.247 (a)(2) IC: RSS-247 5.2 (a)	Digital Modulation System 6 dB bandwidth	500 kHz	ANSI C63.10	Compliant
FCC: 2.1049 IC: RSS-GEN 6.7	Occupied Bandwidth	Reported	ANSI C63.10	Reported
FCC: 15.247 (b)(3) IC: RSS-247 5.4 (d)	Maximum Conducted Output Power	30 dBm	ANSI C63.10	Compliant
FCC: 15.247 (e) IC: RSS-247 5.2 (b)	Digital Modulation System Power Spectral Density	8 dBm / 3 kHz	ANSI C63.10	Compliant
FCC: 15.247 (d) IC: RSS-247 5.5	RF Spurious Emissions at the Transmitter Antenna Terminal	20 dBc	ANSI C63.10	Compliant
FCC: 15.247 (d) IC: RSS-GEN 8.10	Spurious Radiated Emissions in Restricted Bands	FCC 15.209 RSS-GEN 8.9	ANSI C63.10	Compliant
FCC: 2.1055 (d) IC: RSS-GEN 6.11	Frequency Stability	Reported	ANSI C63.10	Reported
FCC: 2.1049 IC: RSS-GEN 6.7	Occupied Bandwidth 99%	Reported	ANSI C63.10	Reported

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

Company Name	Legrand
Contact Person	Joshua Haines
Address	50 Boyd Avenue Syracuse, NY 13209

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	982057
Model Number	982057
Serial Number	Engineering Sample
FCC ID	2AU5D982057
IC ID	25764-982057

2.2 Product Description

Zigbee module using a custom PCB F-type antenna. The antenna gain is 1.7 dBi. Low channel 11 set at 2405 MHz, Mid channel 18 at 2440 MHz, and High channel 25 at 2475 MHz.

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 Radio Programming

Channel increments by POR implemented by customer.

3 REFERENCES

Publication	Edition	Date
RSS-247	2	2017
RSS-GEN	5	2019
CFR Title 47	-	2019
ANSI C63.10	-	2013

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 \pm
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

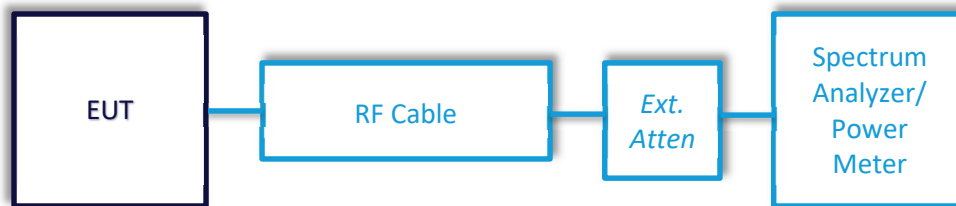
Parameter	ETSI U.C. \pm	U.C. \pm
Radio Frequency, from F0	1×10^{-7}	0.55×10^{-7}
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

5 TEST DATA

5.1 Antenna Port Conducted Emissions

Description of Measurement	<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>
Example Calculations	<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 DTS Bandwidth

Operator	Zach Wilson	QA	Anthony Smith
Temperature	28.4°C	R.H. %	32.5
Test Date	12/3/2019	Location	Radio Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10 Section 11.8 Option 2

Limits: DTS BW greater than 500 kHz

Test Parameters

Frequency	2405 MHz, 2440 MHz, 2475 MHz	Setup	Conducted
RBW	100 kHz	VBW	300 kHz
Detector(s)	Peak	Trace	Max Hold

Instrumentation



Date : 25-Nov-2019 Test : Conducted Radio Job : C-3272
 PE : Zach Wilson Customer : Legrand Quote : 319197

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/24/2019	4/24/2020	Active Calibration
2	AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	12/9/2018	12/9/2019	Active Verification

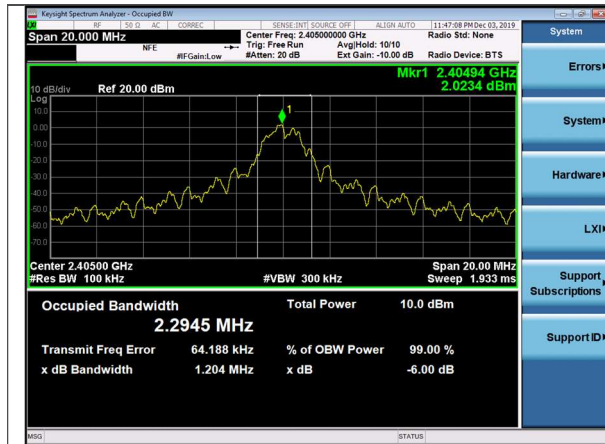
EUT Parameters

Input Power	5 VDC	Mode	Zigbee TX
Frequency	2405, 2440, 2475 MHz	Channel	11, 18, 25

Data Table

Frequency (MHz)	DTS BW (kHz)	Limit (kHz)	Margin (kHz)
2405.0	1204.0	500.0	704.0
2440.0	1304.0	500.0	804.0
2475.0	1447.0	500.0	947.0

Plots



5.1.2 99% Bandwidth

Operator	Zach Wilson	QA	Anthony Smith
Temperature	28.4°C	R.H. %	32.5
Test Date	12/3/2019, 4/7/2020	Location	Radio Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10 Section 6.9.3

Limits: Reported

Test Parameters

Frequency	2405 MHz, 2440 MHz, 2475 MHz	Setup	Conducted
RBW	20 kHz	VBW	62 kHz
Detector(s)	Peak	Trace	Max Hold

Instrumentation



Date : 25-Nov-2019 Test : Conducted Radio Job : C-3272
 PE : Zach Wilson Customer : Legrand Quote : 319197

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/24/2019	4/24/2020	Active Calibration
2	AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	12/9/2018	12/9/2020	Active Verification

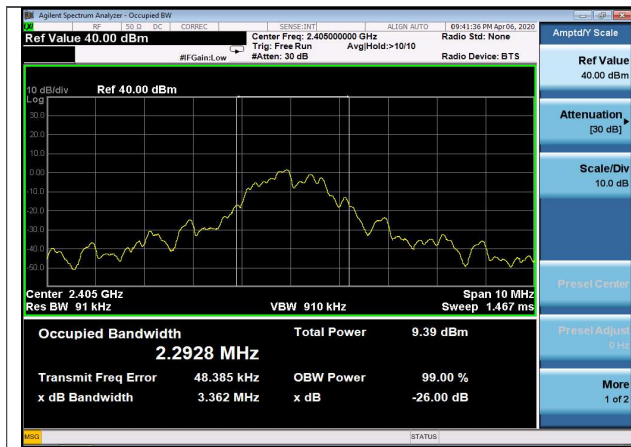
EUT Parameters

Input Power	5 VDC	Mode	Zigbee TX
Frequency	2405, 2440, 2475 MHz	Channel	11, 18, 25

Data Table

Frequency (MHz)	99% OBW (kHz)
2405	2292.8
2440	2347.1
2475	2365.1

Plots



Low Channel 99% BW



Mid Channel 99% BW



High Channel 99% BW

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5.1.3 Maximum Peak Conducted Output Power

Operator	Zach Wilson	QA	Anthony Smith
Temperature	28.4°C	R.H. %	32.5
Test Date	12/3/2019	Location	Radio Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10 Section 11.9.1.1

Limits: 1 Watt / 30 dBm

Test Parameters

Frequency	2405 MHz, 2440 MHz, 2475 MHz	Setup	Conducted
RBW	8/10 MHz	VBW	50 MHz
Detector(s)	Peak	Trace	Max Hold

Instrumentation



Date : 25-Nov-2019 Test : Conducted Radio Job : C-3272
 PE : Zach Wilson Customer : Legrand Quote : 319197

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/24/2019	4/24/2020	Active Calibration
2	AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	12/9/2018	12/9/2019	Active Verification

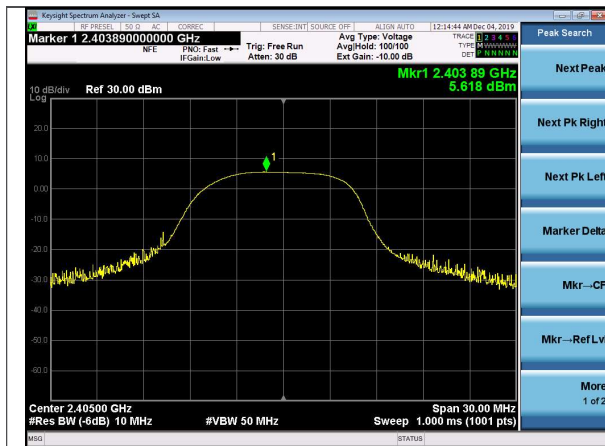
EUT Parameters

Input Power	5 VDC	Mode	Zigbee TX
Frequency	2405, 2440, 2475 MHz	Channel	11, 18, 25

Data Table

Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
2405	5.6	30.0	24.4
2440	5.7	30.0	24.3
2475	5.7	30.0	24.3

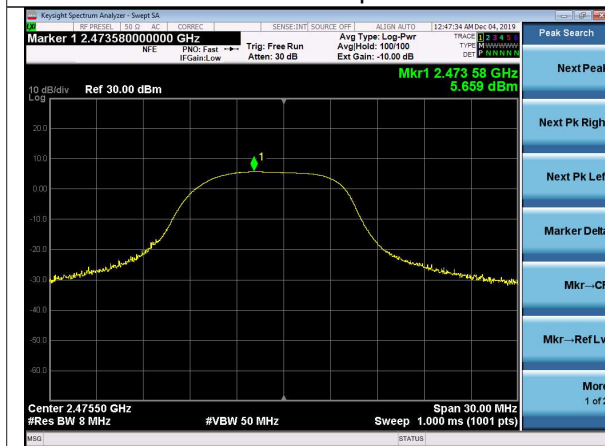
Plots



Low Channel Output Power



Mid Channel Output Power



High Channel Output Power

5.1.4 Duty Cycle

Operator	Zach Wilson	QA	Anthony Smith
Temperature	28.4°C	R.H. %	32.5
Test Date	12/3/2019	Location	Radio Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10 Section 11.6

Limits: Reported

Test Parameters

Frequency	2405 MHz, 2440 MHz, 2475 MHz	Setup	Conducted
RBW	8 MHz	VBW	50 MHz
Detector(s)	Peak	Trace	Clear Write

Instrumentation



Date : 25-Nov-2019 Test : Conducted Radio Job : C-3272
 PE : Zach Wilson Customer : Legrand Quote : 319197

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/24/2019	4/24/2020	Active Calibration
2	AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	12/9/2018	12/9/2019	Active Verification

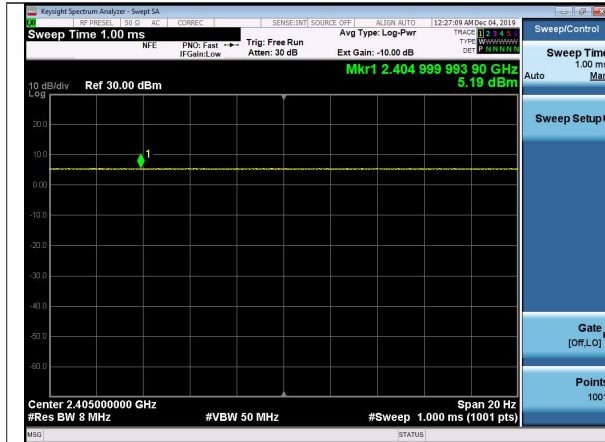
EUT Parameters

Input Power	5 VDC	Mode	Zigbee TX
Frequency	2405, 2440, 2475 MHz	Channel	11, 18, 25

Data Table

Frequency (MHz)	Duty Cycle %
2405	100
2440	100
2475	100

Plots



Low Channel Duty Cycle



Mid Channel Duty Cycle



High Channel Duty Cycle

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5.1.5 Peak Power Spectral Density

Operator	Zach Wilson	QA	Anthony Smith
Temperature	28.4°C	R.H. %	32.5
Test Date	12/3/2019	Location	Radio Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10 Section 11.10.2

Limits: 8 dBm / 3 kHz

Test Parameters

Frequency	2405 MHz, 2440 MHz, 2475 MHz	Setup	Conducted
RBW	3 kHz	VBW	10 kHz
Detector(s)	Peak	Trace	Max Hold

Instrumentation



Date: 25-Nov-2019 Test: Conducted Radio Job: C-3272
 PE: Zach Wilson Customer: Legrand Quote: 319197

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/24/2019	4/24/2020	Active Calibration
2	AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	12/9/2018	12/9/2019	Active Verification

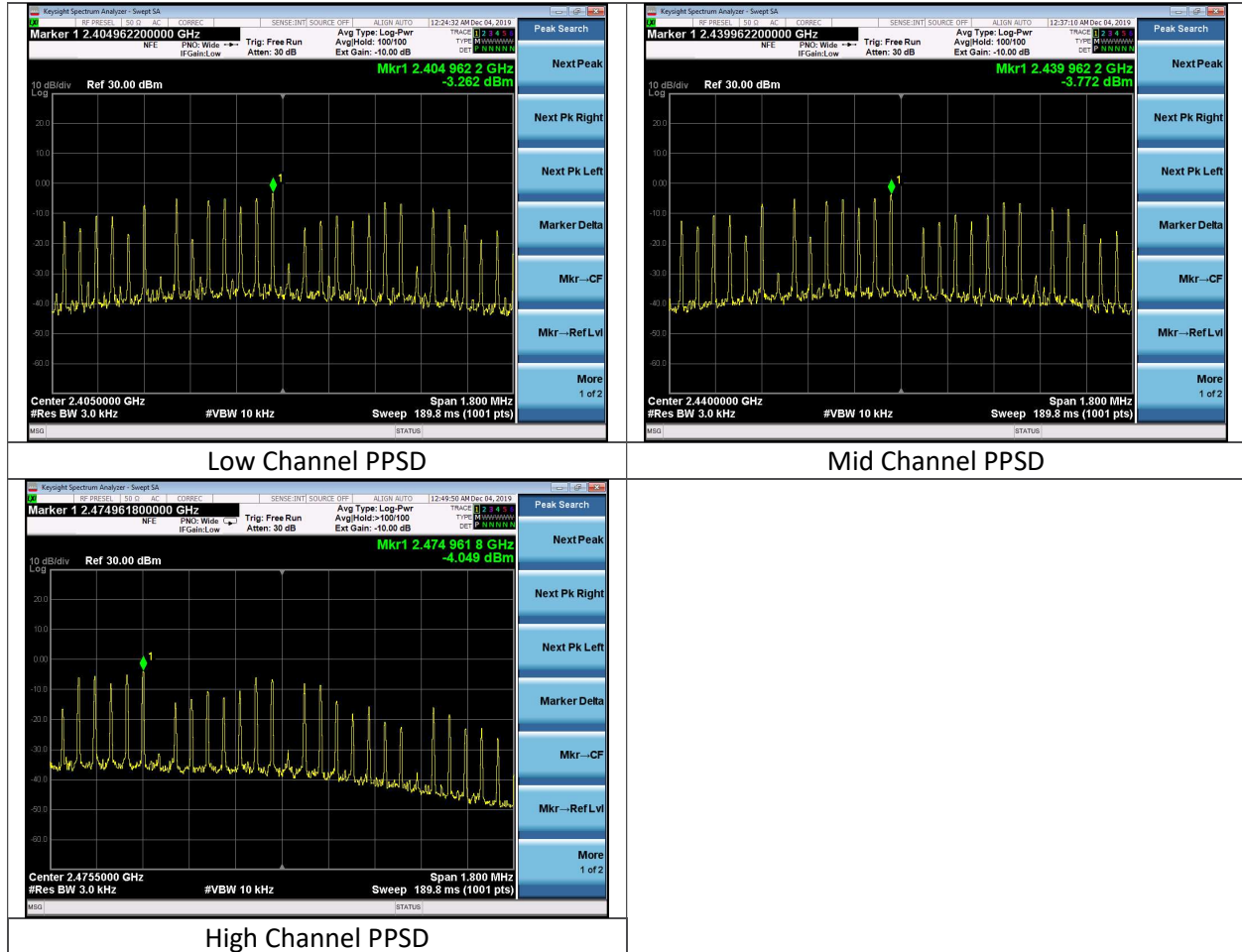
EUT Parameters

Input Power	5 VDC	Mode	Zigbee TX
Frequency	2405, 2440, 2475 MHz	Channel	11, 18, 25

Data Table

Frequency (MHz)	Peak PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
2405	-3.3	8.0	11.3
2440	-3.8	8.0	11.8
2475	-4.0	8.0	12.0

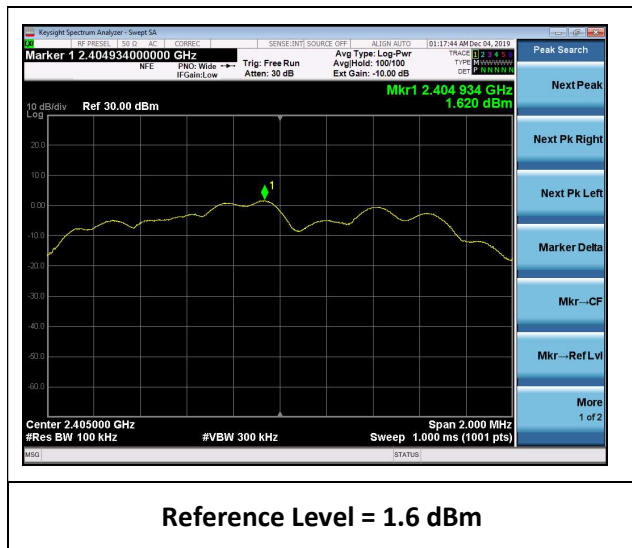
Plots



5.1.6 Conducted Spurious Emissions

Operator	Zach Wilson	QA	Anthony Smith
Temperature	28.4°C	R.H. %	32.5
Test Date	12/3/2019, 4/7/2020	Location	Radio Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10 Section 11.11

Limits: 20 dBc = -18.4 dBm



Test Parameters

Frequency	2405 MHz, 2440 MHz, 2475 MHz	Setup	Conducted
RBW	100 kHz	VBW	300 kHz
Detector(s)	Peak	Trace	Max Hold

Instrumentation



Date : 25-Nov-2019 Test : Conducted Radio Job : C-3272
 PE : Zach Wilson Customer : Legrand Quote : 319197

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/24/2019	4/24/2020	Active Calibration
2	AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	12/9/2018	12/9/2020	Active Verification

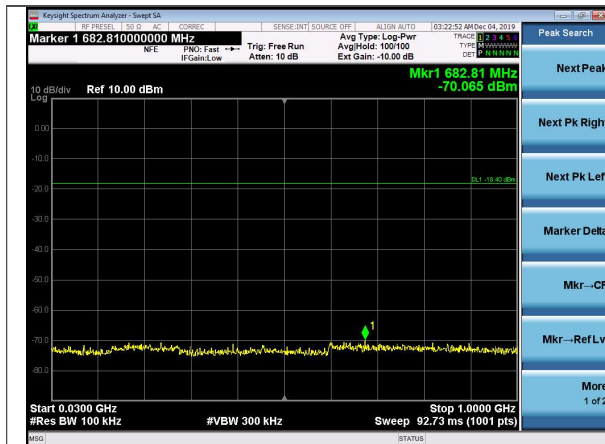
EUT Parameters

Input Power	5 VDC	Mode	Zigbee TX
Frequency	2405, 2440, 2475 MHz	Channel	11, 18, 25

Data Table

Frequency (MHz)	Channel	Peak Reading (dBm)	Limit (dBm)	Margin (dBm)
2398.9	11	-42.7	-18.4	24.3
2488.1	11	-70.3	-18.4	51.9
4809.1	11	-52.8	-18.4	34.4
4879.05	18	-55.1	-18.4	36.7
2365.98	25	-68.0	-18.4	49.6
2484.127	25	-48.8	-18.4	30.4
9898.08	25	-55.2	-18.4	36.8

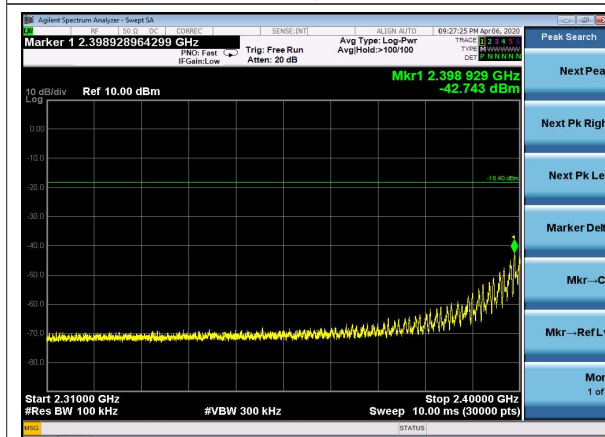
Plots



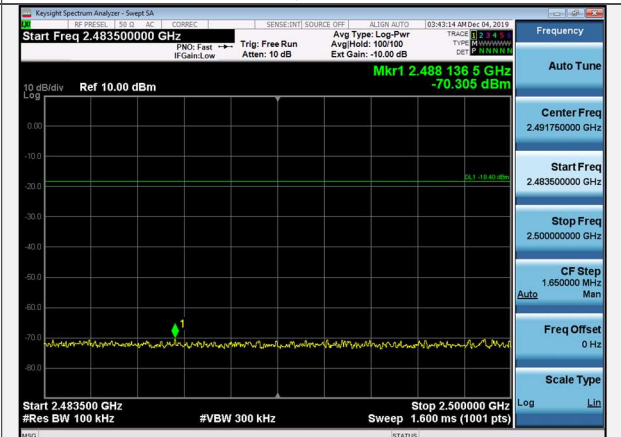
30-1000 MHz, Low Channel



1-2.31 GHz, Low Channel



2.31-2.4 GHz, Low Channel

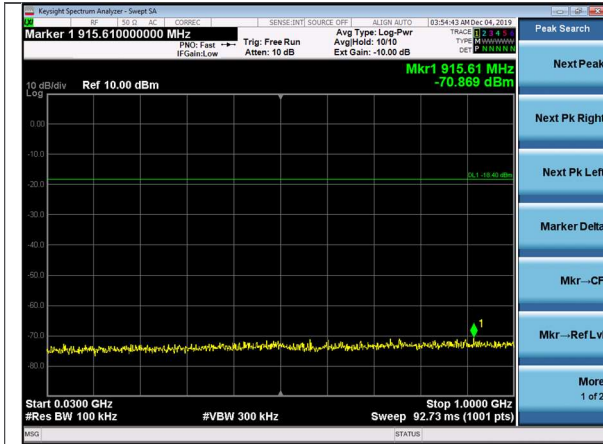


2.4835-2.5 GHz, Low Channel

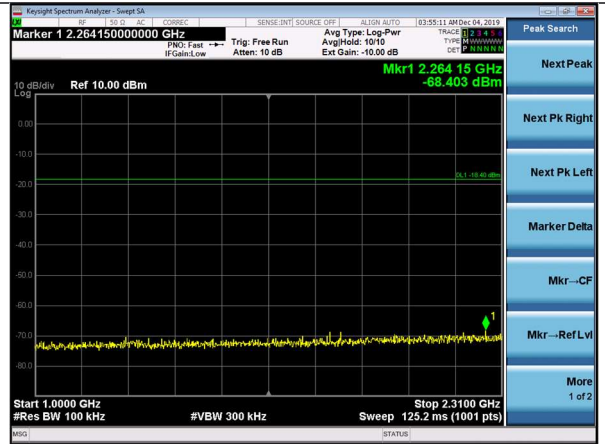


2.5-25 GHz, Low Channel

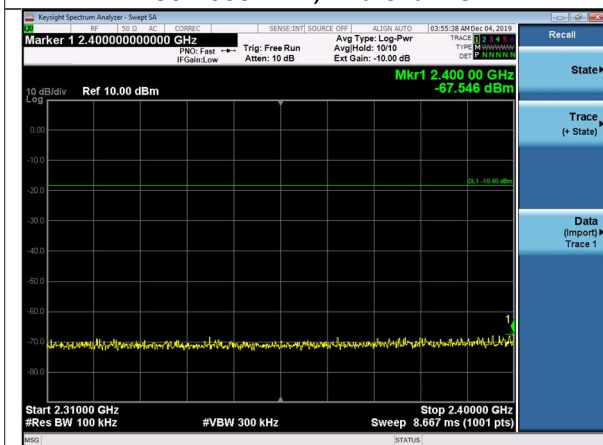
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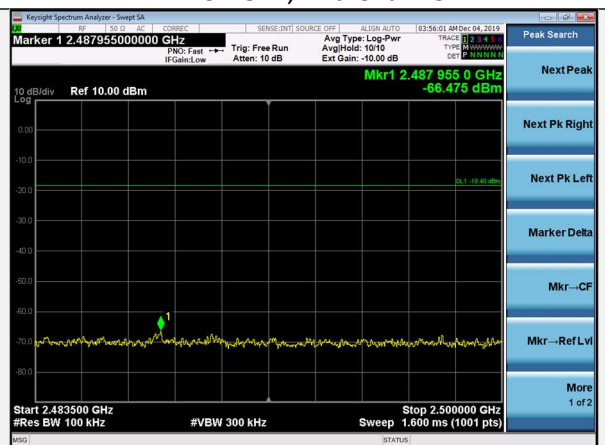
30-1000 MHz, Mid Channel



1-2.31 GHz, Mid Channel



2.31-2.4 GHz, Mid Channel



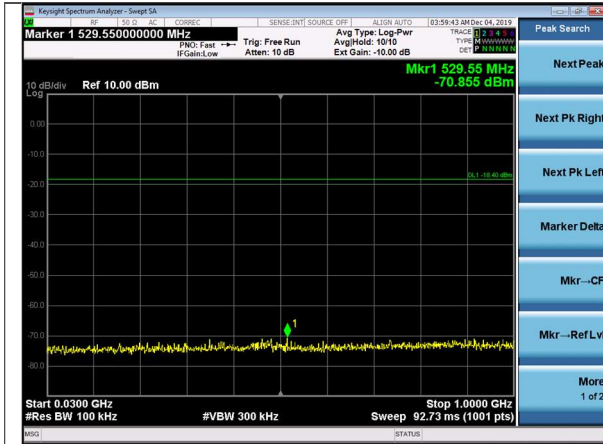
2.4835-2.5 GHz, Mid Channel



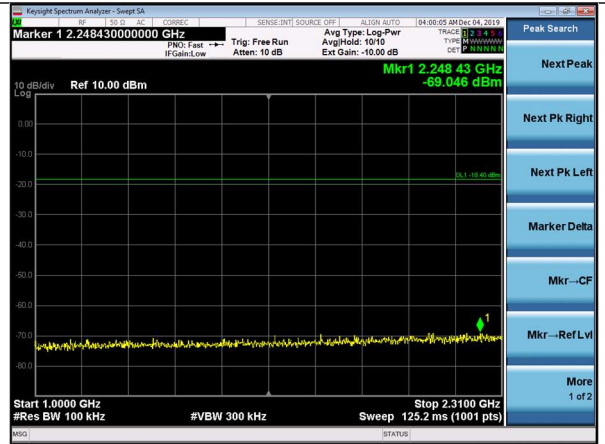
2.5-25 GHz, Mid Channel

Company: Pass & Seymour, Inc. d/b/a
Legrand
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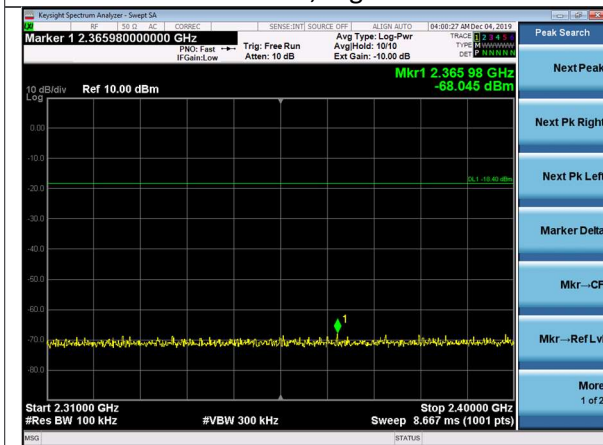
Name: 982057
Model: 982057
Serial: Engineering Sample



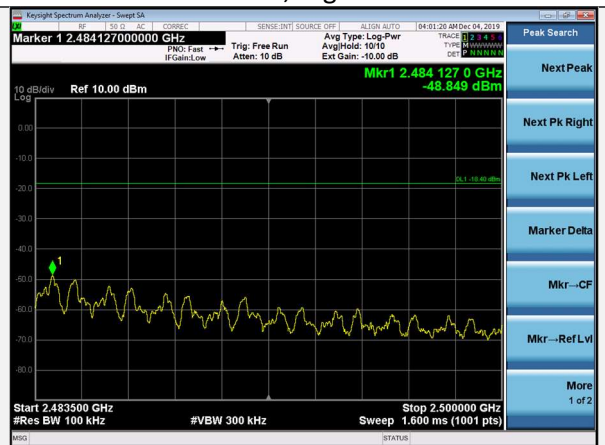
30-1000 MHz, High Channel



1-2.31 GHz, High Channel



2.31-2.4 GHz, High Channel



2.4835-2.5 GHz, High Channel



2.5-25 GHz, High Channel

Company: Pass & Seymour, Inc. d/b/a
Legrand
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Name: 982057
Model: 982057
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5.1.7 Frequency Stability

Operator	Zach Wilson	QA	Anthony Smith
Temperature	28.4°C	R.H. %	32.5
Test Date	12/3/2019	Location	Radio Bench
Requirement	FCC 2.1049, RSS-GEN	Method	ANSI C63.10 Section 6.8

Limits: Reported

Test Parameters

Frequency	2405 MHz, 2440 MHz, 2475 MHz	Setup	Conducted
RBW	8 MHz	VBW	50 MHz
Detector(s)	Peak	Trace	Max Hold
Temperature Range	-20° to 50°C	Voltage Range	4.3 VDC to 5.8 VDC

Instrumentation



Date : 25-Nov-2019

Test : Conducted Radio

Job : C-3272

PE : Zach Wilson

Customer : Legrand

Quote : 319197

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	CC 000210C	Chamber - Environmental	Thermotron	S-8C	28133	10/26/2018	10/26/2020	Active Verification
2	AA 960172	Cable	A.H. Systems, Inc	SAC-26G-1	387	12/9/2018	12/9/2020	Active Verification
3	RE 19001	Analyzer - EMI Receiver	Keysight	N9038A	MY50010111	9/23/2019	9/23/2020	Active Calibration

EUT Parameters

Input Power	4.3, 5.0, 5.8 VDC	Mode	Zigbee TX
Frequency	2405, 2440, 2475 MHz	Channel	11, 18, 25

Data Table

Channel	Voltage (VDC)	Temperature (°C)	Frequency (Hz)	Deviation (Hz)
11	5.0	20.0	2,404,961,324.3	0.0
11	5.0	50.0	2,404,961,182.1	142.2
11	5.0	-20.0	2,404,961,219.6	104.7
18	5.0	20.0	2,439,961,746.6	0.0
18	5.0	50.0	2,439,961,883.7	137.1
18	5.0	-20.0	2,439,961,641.8	104.8
25	5.0	20.0	2,474,962,048.3	0.0
25	5.0	50.0	2,474,961,989.3	59.0
25	5.0	-20.0	2,474,962,003.1	45.2

Channel	Voltage (VDC)	Temperature (°C)	Frequency (Hz)	Deviation (Hz)
11	5.0	20.0	2,404,961,324.3	0.0
11	5.8	20.0	2,404,961,232.0	92.3
11	4.3	20.0	2,404,961,390.4	66.1
18	5.0	20.0	2,439,961,746.6	0.0
18	5.8	20.0	2,439,961,582.3	164.3
18	4.3	20.0	2,439,961,618.1	128.5
25	5.0	20.0	2,474,962,048.3	0.0
25	5.8	20.0	2,474,961,914.6	133.7
25	4.3	20.0	2,474,961,968.7	79.6

Plots



Low Channel, Nominal Temp, Nominal Voltage



Mid Channel, Nominal Temp, Nominal Voltage



High Channel, Nominal Temp, Nominal Voltage

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5.2 Radiated Emissions

<p>Description of Measurement</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>Example Calculations</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

Operator	Anthony Smith	QA	Zach Wilson
Temperature	24.3°C, 26.5°C, 24.7°C	R.H. %	26.8%, 33%, 33%
Test Date	11/25/2019, 11/26/2019, 11/27/2019	Location	Chamber 3
Requirement	FCC 15.209, RSS-GEN	Method	ANSI C63.10 Sections 6.5 & 6.6

Limits: FCC 15.209

Frequency (MHz)	Quasi Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Peak Limit (dBµV/m)
30-88	40	-	-
88-216	43.5	-	-
216-960	46	-	-
960-1000	54	-	-
1000-25000	-	54	74

Test Parameters

Frequency	30 MHz – 25 GHz	Distance	3m
Detector(s)	Max peak hold with peak detector for plots and final peak measurements. Quasi peak detector used for measurements under 1 GHz. 10 Hz used for average measurements as unit can transmit modulated with a 100% duty cycle.	Table height	150cm
RBW	Below 1 GHz: 120 kHz Above 1 GHz: 1 MHz	VBW	Below 1 GHz: 1.2 MHz Above 1 GHz (plots): 30 kHz Above 1 GHz (peak): 3 MHz Above 1 GHz (avg.): 10 Hz
EUT Orientations	Flat, Side, Vertical. Only showing worst case plots and data.		

EUT Parameters

Input Power	5 VDC	Mode	Zigbee Transmit
EUT Chan.	2405 MHz (Low), 2440 MHz (Mid), 2475 MHz (High)	Plots	Only showing mid channel outside of band edges.

Instrumentation



Date : 25-Nov-2019

Test : Radiated Emissions - TX

Job : C-3272

PE : Zach Wilson

Customer : Legrand

Quote : 319197

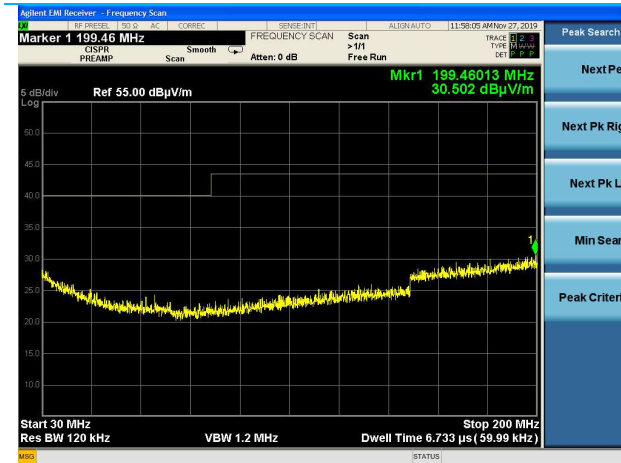
No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	10/7/2019	10/7/2020	Active Calibration
2	EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/24/2019	4/24/2020	Active Calibration
3	EE 960160	Antenna - Low Noise Amplifier	Mini-Circuits	ZVA-213%-S-	977711030	10/7/2019	10/7/2020	Active Calibration
4	AA 960171	Cable	A.H. Systems, Inc	SAC-26G-6	386	12/9/2019	12/9/2020	Active Verification
5	AA 960174	Antenna - Small Horn	ETS Lindgren	3116C-PA	00206880	11/7/2019	11/7/2020	Active Calibration
6	AA 960195	Antenna - Log Periodic	A.H. Systems, Inc	SAS-512-2	557	1/30/2018	1/30/2020	Active Calibration
7	AA 960128	Antenna - Biconical	ETS Lindgren	3110B	00062899	10/9/2019	10/9/2020	Active Calibration
8	AA 960153	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-04	4/22/2019	4/22/2020	Active Calibration

Table

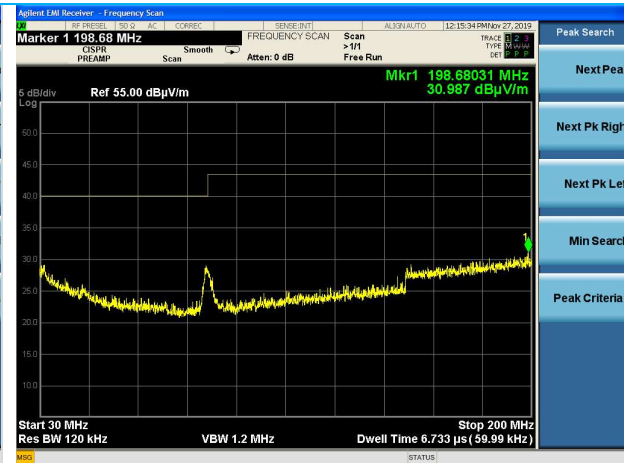
Frequency (MHz)	Antenna Polarity	EUT Orientation	Height (cm)	Azimuth (degree)	Quasi-Peak Reading (dBµV/m)	Quasi-Peak Limit (dBµV/m)	Quasi-Peak Margin (dB)
960.6	V	Vertical	100	0	28.4	54.0	25.7
384.0	H	Side	100	250	27.0	46.0	19.0
87.9	V	Flat	110	227	23.7	40.0	16.3
31.2	V	Vertical	207	0	27.9	40.0	12.1
31.3	V	Side	207	0	27.6	40.0	12.4

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Average Reading (dBµV/m)	Peak Reading (dBµV/m)	Average Limit (dBµV/m)	Peak Limit (dBµV/m)	Average Margin (dB)	Peak Margin (dB)	Channel	EUT Orientation
2484.1	H	135	80	46.3	53.5	54.0	74.0	7.7	20.5	25	Flat
2390.0	H	115	79	40.3	53.3	54.0	74.0	13.7	20.7	11	Flat
2231.0	V	150	0	50.6	38.1	54.0	74.0	3.4	35.9	18	Flat
4879.1	H	100	42	52.8	58.4	54.0	74.0	1.2	15.6	18	Flat
4879.1	V	202	119	46.9	53.1	54.0	74.0	7.1	20.9	18	Flat
4881.0	V	220	274	46.7	55.0	54.0	74.0	7.3	19.0	18	Vertical
4879.0	H	236	32	52.3	57.9	54.0	74.0	1.7	16.1	18	Vertical
4879.0	V	150	150	51.7	57.4	54.0	74.0	2.3	16.6	18	Side
22620.0	V	150	0	41.4	53.2	54.0	74.0	12.6	20.8	18	Side

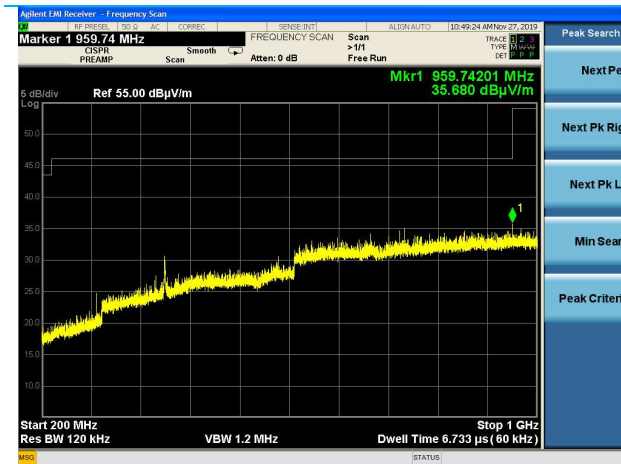
Plots



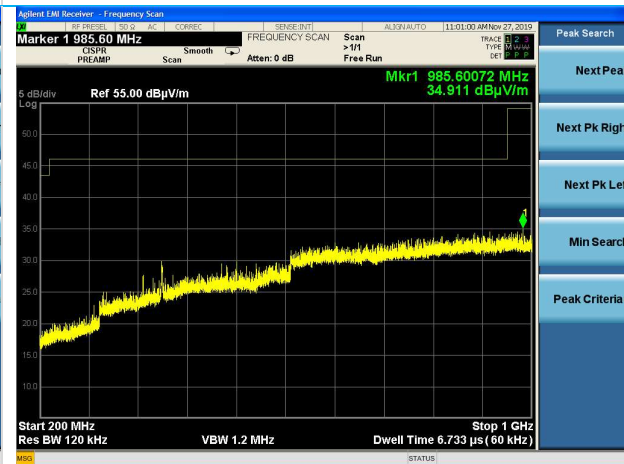
30-200 MHz, Horizontal Antenna, Flat EUT,
Channel 18



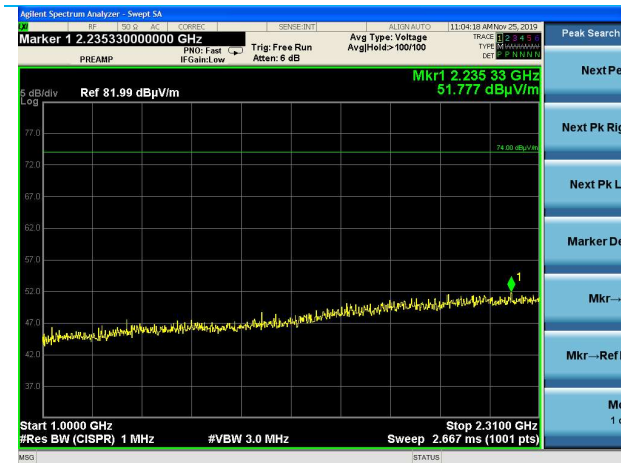
30-200 MHz, Vertical Antenna, Flat EUT,
Channel 18



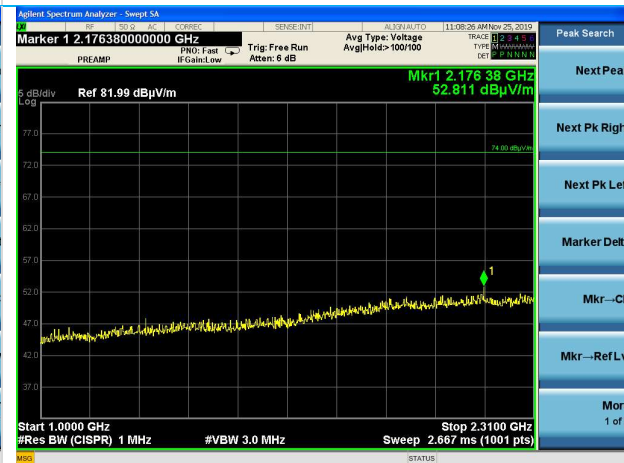
200-1000 MHz, Horizontal Antenna, Flat EUT,
Channel 18



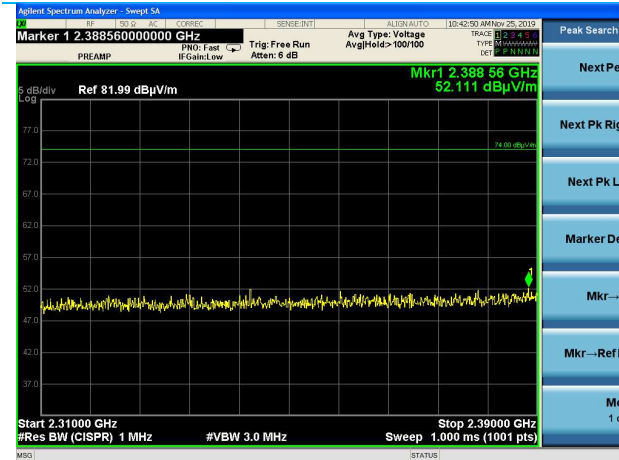
200-1000 MHz, Vertical Antenna, Flat EUT,
Channel 18



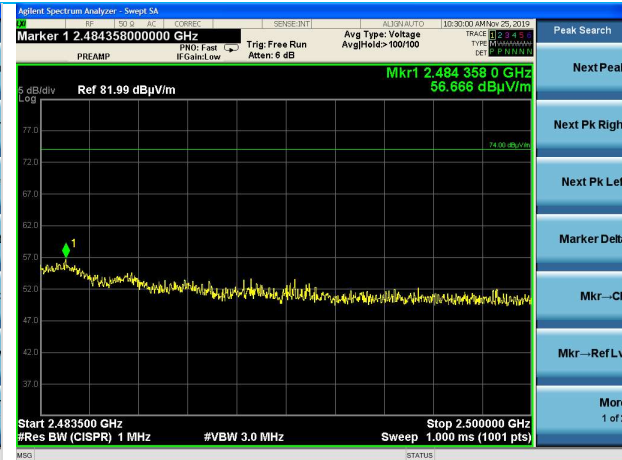
1-2.31 GHz, Horizontal Antenna, Flat EUT
Channel 18



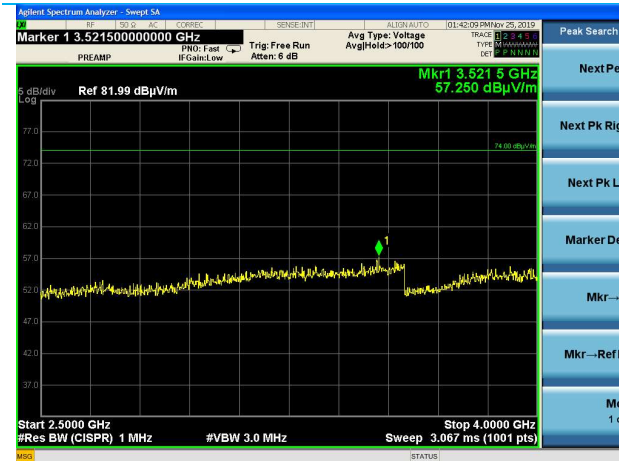
1-2.31 GHz, Vertical Antenna, Flat EUT
Channel 18



2310-2390 MHz, Horizontal Antenna, Flat EUT
Channel 11



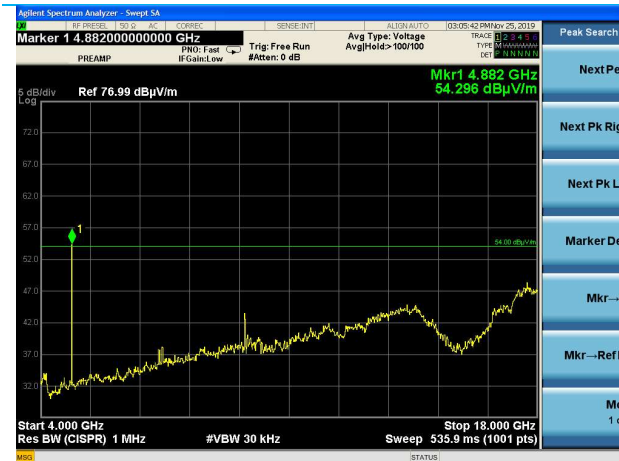
2483.5-2500 MHz, Horizontal Antenna, Flat EUT
Channel 25



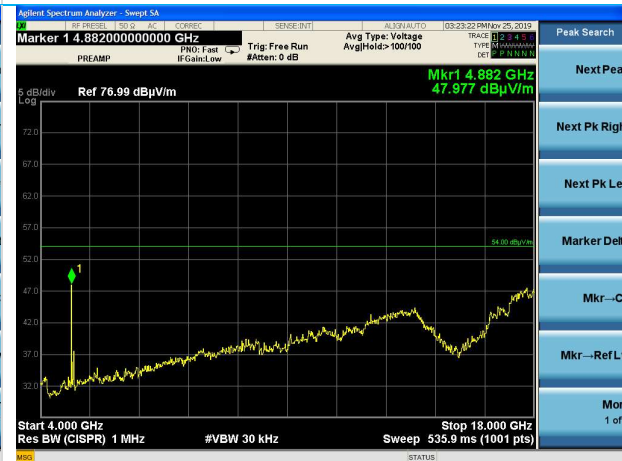
2.5-4 GHz, Horizontal Antenna, Flat EUT
Channel 18



2.5-4 GHz, Vertical Antenna, Flat EUT
Channel 18



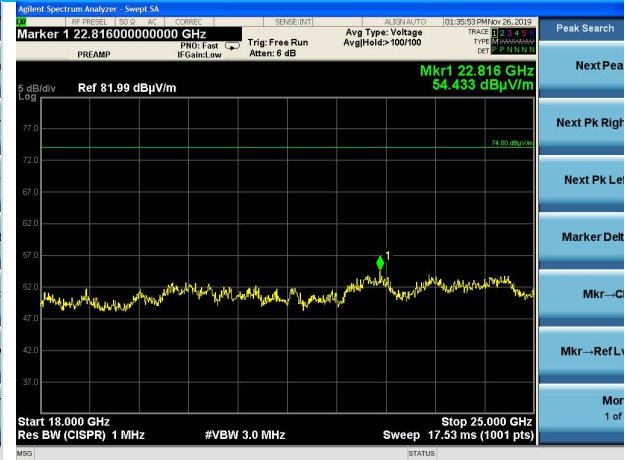
4-18 GHz, Horizontal Antenna, Flat EUT
Channel 18, Average worst case VBW



4-18 GHz, Vertical Antenna, Flat EUT
Channel 18, Average worst case VBW



18-25 GHz, Horizontal Antenna, Flat EUT
Channel 18



18-25 GHz, Vertical Antenna, Flat EUT
Channel 18

6 REVISION HISTORY

Version	Date	Notes	Person
v0.1	12/19/2019	Initial Draft	Zach Wilson
v1.0	1/2/2020	Revised per internal review	Zach Wilson
v2.0	4/7/20220	Revised per internal review	Zach Wilson
v3.0	4/7/2020	Revised per internal review	Zach Wilson

END OF REPORT