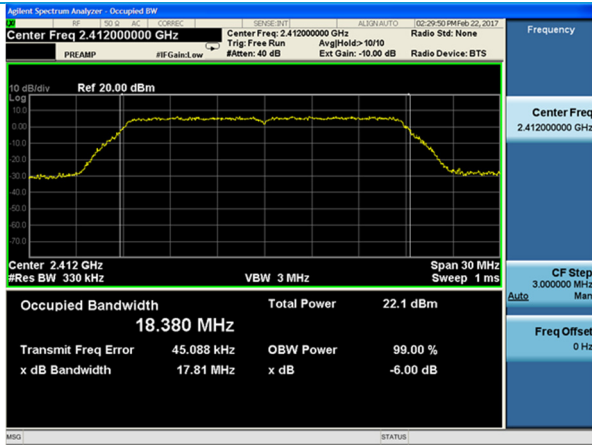
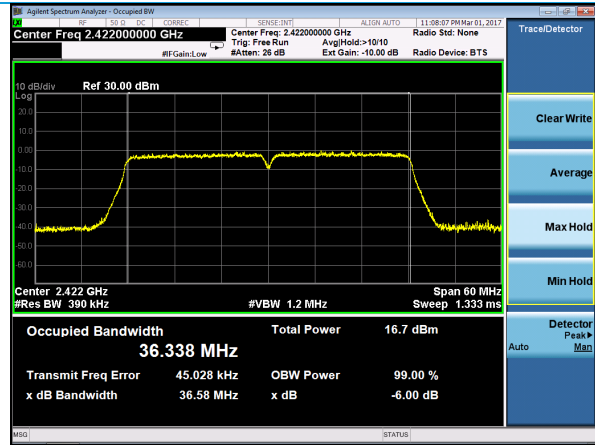


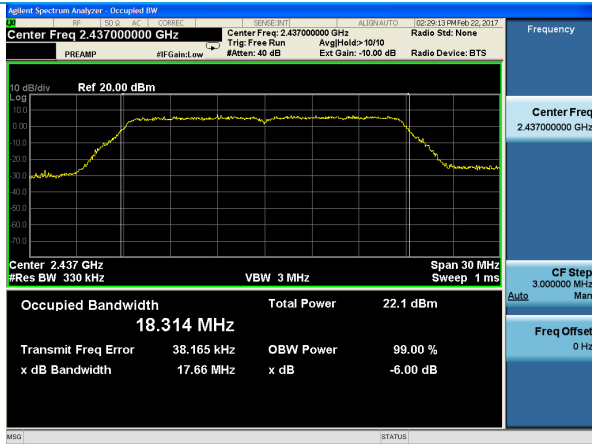
### Plots – WLAN 99% BW



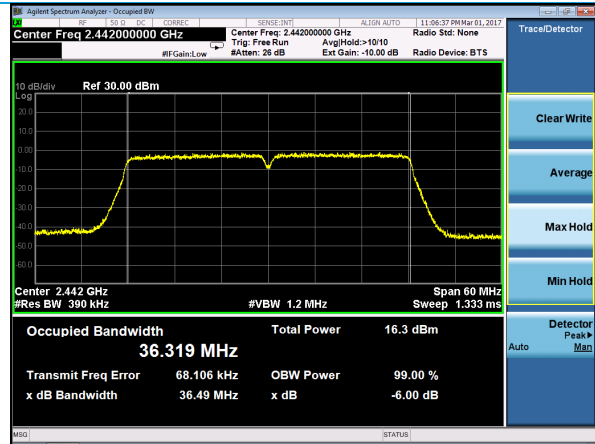
802.11n – Low Channel



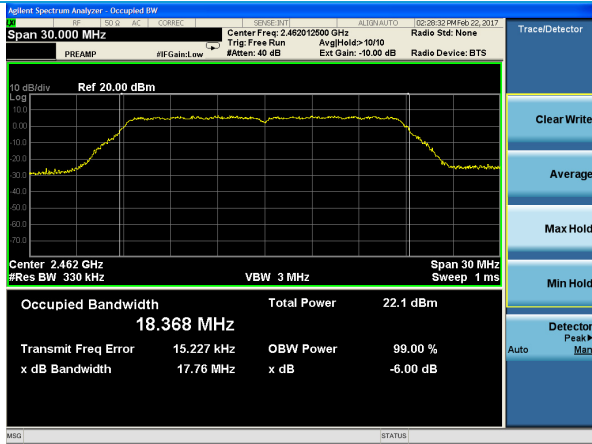
802.11n – HT40 – Low Channel



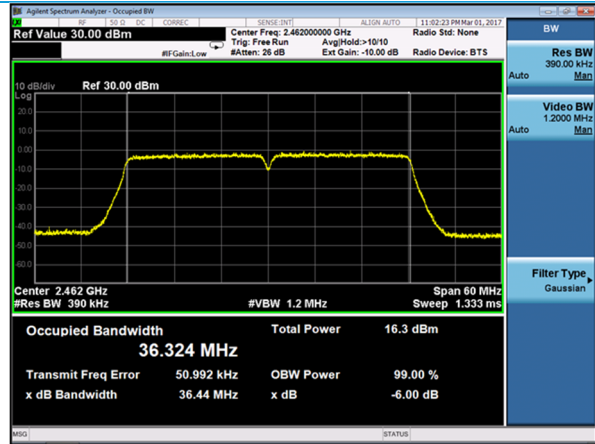
802.11n – Mid Channel



802.11n – HT40 – Mid Channel



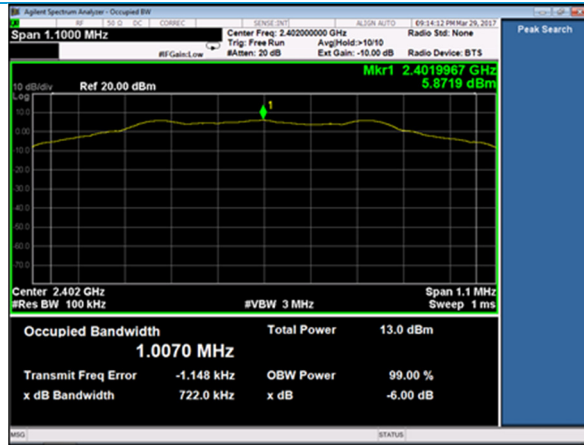
802.11n – High Channel



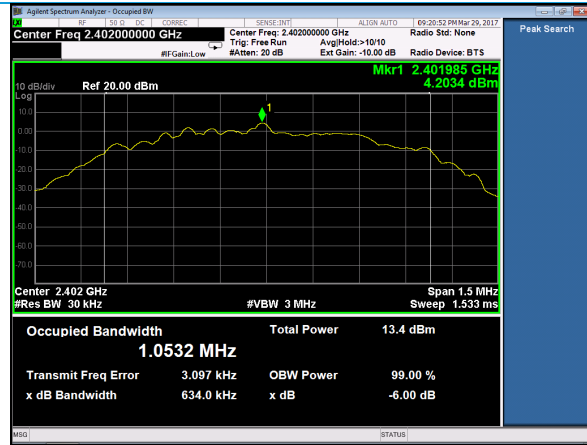
802.11n – HT40 – High Channel

Company: Laird Technologies, Inc.	Page 18 of 73	Name: Sterling – LWB5
Report: TR 315356 A (DTS)		Model: Sterling – LWB5
Job: C-2602		Serial: WLAN – 00008, 00035 BLE – 00009, 00015, 00019, 00032

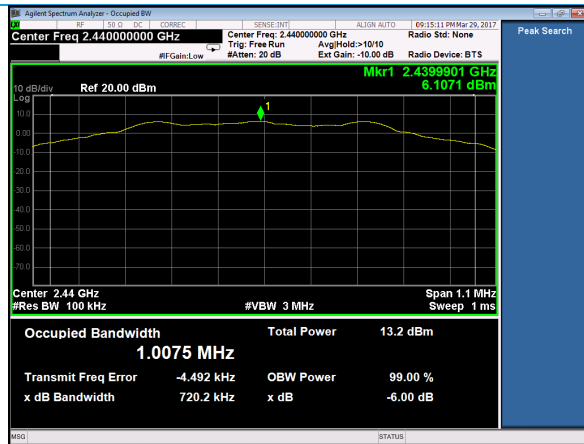
Plots – BLE 6 dB and 99% BW



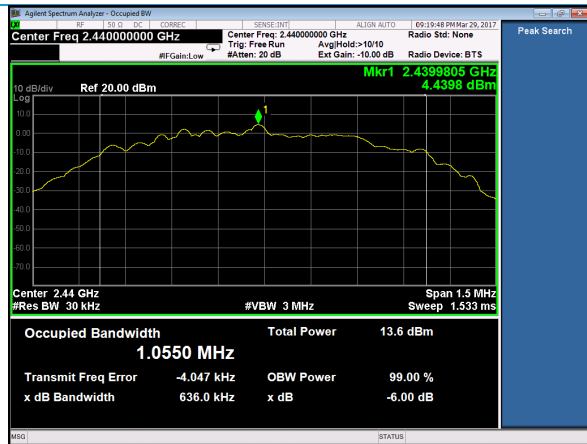
6dB BW – Low Channel



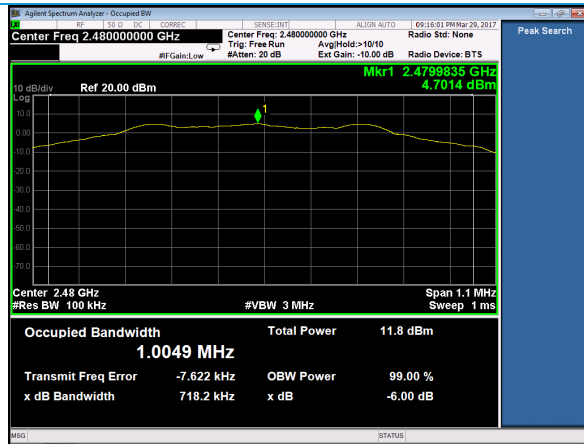
99% BW – Low Channel



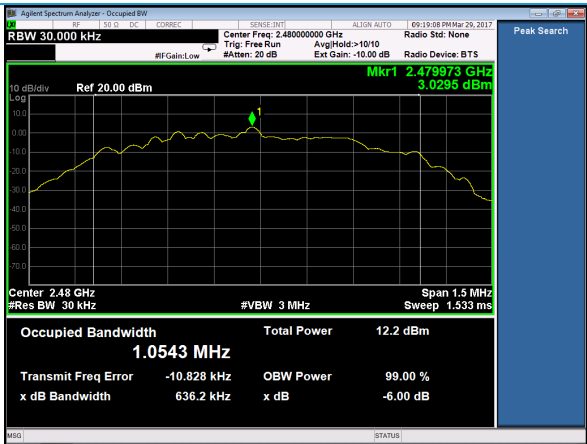
6dB BW – Mid Channel



99% BW – Mid Channel



6dB BW – High Channel



99% BW – High Channel

Company: Laird Technologies, Inc.	Page 19 of 73	Name: Sterling – LWB5
Report: TR 315356 A (DTS)		Model: Sterling – LWB5
Job: C-2602		Serial: WLAN – 00008, 00035 BLE – 00009, 00015, 00019, 00032

### 5.1.3 Antenna Port Conducted Emissions – Conducted Power Output

<b>Operator</b>	Kimberly Bay / Shane Dock
<b>QA</b>	Shane Dock / Kimberly Bay
<b>Test Date</b>	March 1, 2017 / March 29, 2017
<b>Location</b>	Conducted RF Test Bench
<b>Temp. / R.H.</b>	21-22°C / 34-35% RH
<b>Requirement</b>	FCC 15.247 (b)(3) / RSS-247 Section 5.4 (d)
<b>Method</b>	WLAN - ANSI C63.10 2013 Section 11.9.1.2 Integrated band power method BLE – ANSI C63.10 2013 Section 11.9.1.1

#### Limits:

#### Maximum Conducted Output Power

30 dBm

#### Test Parameters

<b>Settings</b>	<u>802.11b HT-20, 1 Mbps:</u> 2412, 2437, 2462 MHz
<b>Settings</b>	<u>802.11g HT-20, 6 Mbps:</u> 2412, 2437, 2462 MHz
<b>Settings</b>	<u>802.11n HT-20, MCS0:</u> 2412, 2437, 2462 MHz
<b>Settings</b>	<u>802.11n HT-40, MCS0:</u> 2422, 2442, 2462 MHz
<b>Settings</b>	<u>BLE:</u> 2402, 2440, 2480 MHz

#### Instrumentation



Date : 6-Feb-2017

Type Test : DTS Conducted RF Measurements

Job # : C-2602

Prepared By: Kim/Shane

Customer : Laird Technologies, Inc.

Quote #: 316356

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Spectrum Analyzer	Agilent	N9010A	MY53400296	12/22/2016	12/22/2017	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D01048.0	5546519	6/26/2015	6/25/2017	Active Calibration
3	AA 960172	Cable - low loss 1m	A.H. Systems, Inc	SAC-26G-1	387	5/16/2016	5/16/2017	Active Verification
4	EE 960085	EMI Receiver	Agilent	N9038A	MY51210148	5/12/2016	5/12/2017	Active Calibration

Company: Laird Technologies, Inc.	Page 20 of 73	Name: Sterling – LWB5
Report: TR 315356 A (DTS)		Model: Sterling – LWB5
Job: C-2602		Serial: WLAN – 00008, 00035 BLE – 00009, 00015, 00019, 00032

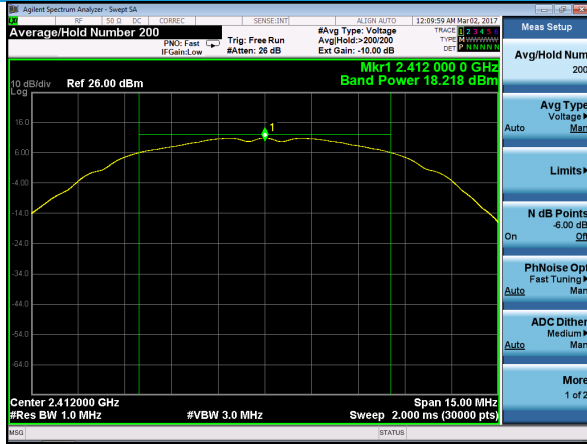
**Table – WLAN Power Out**

Channel	Limit (dBm)	802.11b (dBm)	Margin 802.11b (dB)	802.11g (dBm)	Margin 802.11g (dB)	802.11n (dBm)	Margin 802.11n (dB)	802.11n - HT40 (dBm)	Margin 802.11n - HT40 (dB)
Low	30	18.2	11.8	21.5	8.5	19.8	10.2	17.3	12.7
Mid	30	19.0	11.0	21.2	8.8	19.8	10.2	17.0	13.0
High	30	16.7	13.3	18.9	11.1	18.8	11.2	16.9	13.1

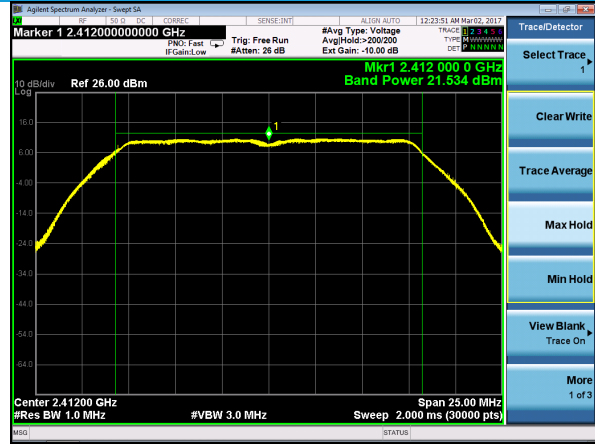
**Table – BLE Power Out**

Channel	Limit (dBm)	BLE Reading (dBm)	Margin (dB)
Low	30	6.7	23.3
Mid	30	6.9	23.1
High	30	5.5	24.5

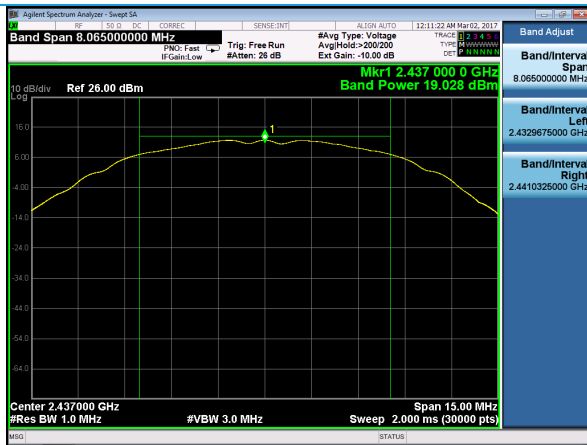
### Plots – WLAN Power Out



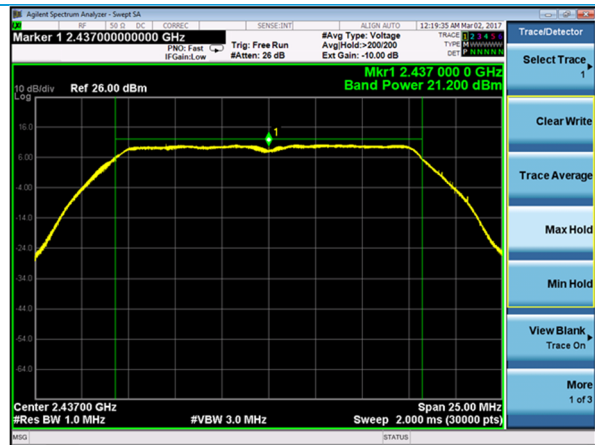
1 Mbps – Low Channel



6 Mbps – Low Channel



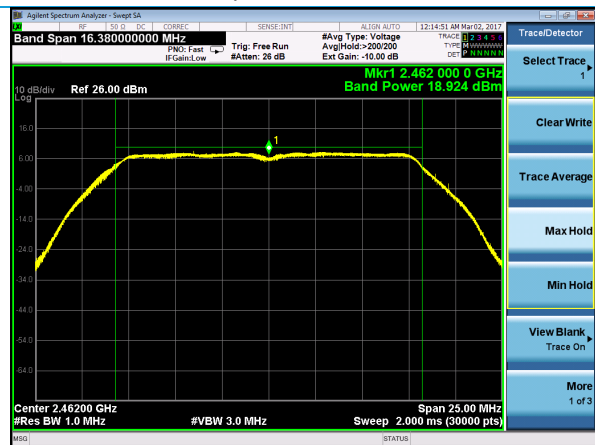
1 Mbps – Mid Channel



6 Mbps – Mid Channel

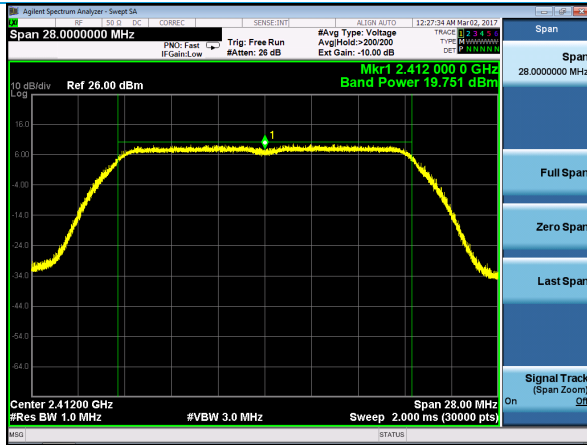


1 Mbps – High Channel

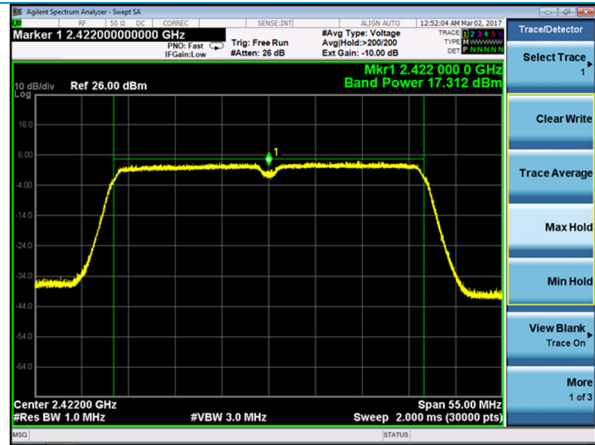


6 Mbps – High Channel

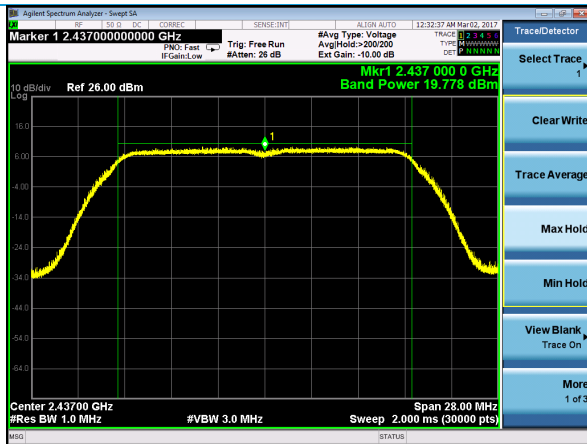
Plots – WLAN Power Out, continued



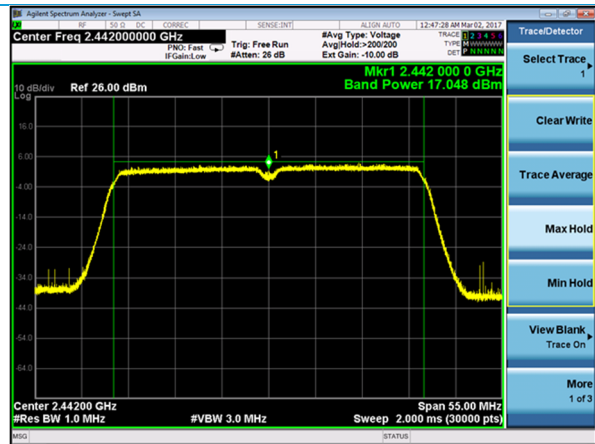
MCS0 – Low Channel



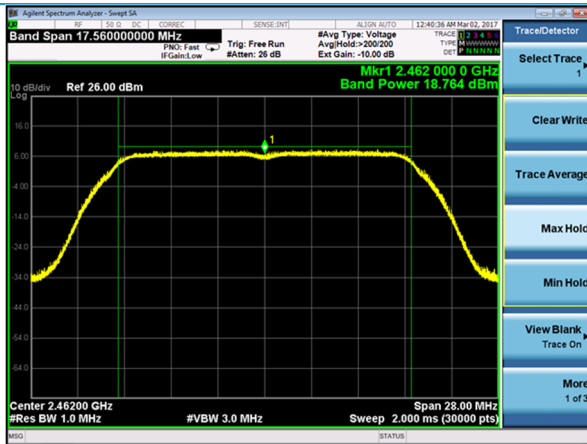
MCS0 – HT40 – Low Channel



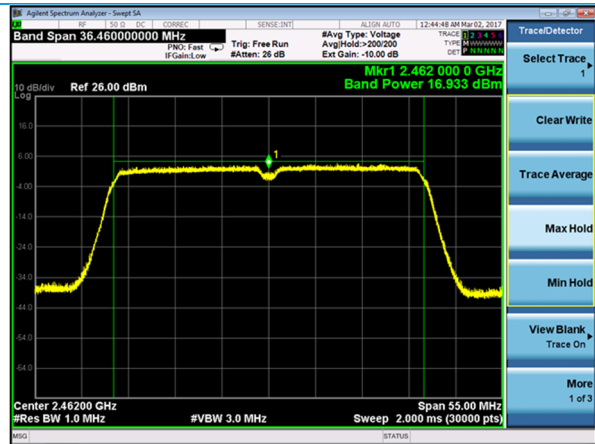
MCS0 – Mid Channel



MCS0 – HT40 – Mid Channel

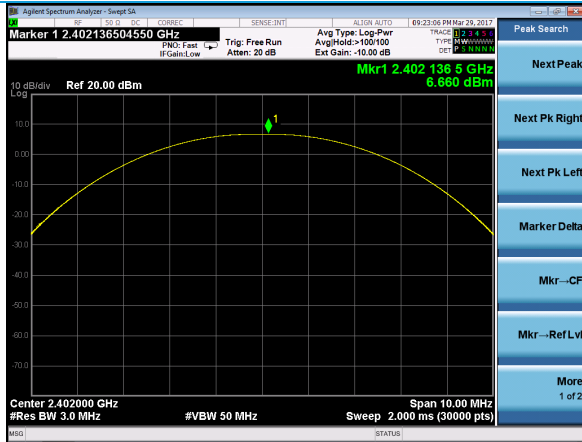


MCS0 – High Channel

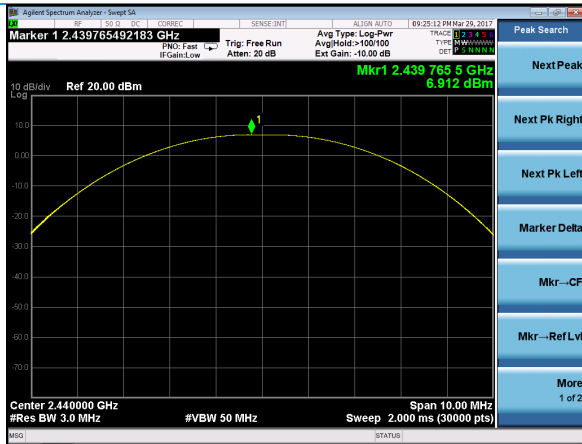


MCS0 – HT40 – High Channel

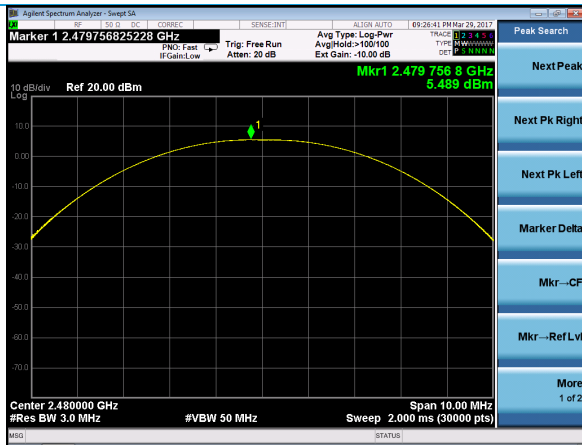
## Plots – BLE Power Out



Low Channel



Mid Channel



High Channel

Company: Laird Technologies, Inc.

Report: TR 315356 A (DTS)

Job: C-2602

Name: Sterling – LWB5

Model: Sterling – LWB5

Serial: WLAN – 00008, 00035

BLE – 00009, 00015, 00019, 00032

### 5.1.4 Antenna Port Conducted Emissions – Power Spectral Density (PSD)

<b>Operator</b>	Kimberly Bay / Shane Dock
<b>QA</b>	Shane Dock / Kimberly Bay
<b>Test Date</b>	March 1, 2017 / March 29, 2017
<b>Location</b>	Conducted RF Test Bench
<b>Temp. / R.H.</b>	21-22°C / 34-35% RH
<b>Requirement</b>	FCC 15.247 (e) / RSS-247 Section 5.2 (b)
<b>Method</b>	ANSI C63.10 2013 Section 11.10.2

**Limits:**

<b>Power Spectral Density</b>
8 dBm / 3 kHz

**Test Parameters**

<b>Settings</b>	WLAN – RBW = 30 kHz; BLE – RBW = 100 kHz
<b>EUT</b>	<u>802.11b HT-20, 1 Mbps:</u> 2412, 2437, 2462 MHz
<b>EUT</b>	<u>802.11g HT-20, 6 Mbps:</u> 2412, 2437, 2462 MHz
<b>EUT</b>	<u>802.11n HT-20, MCS0:</u> 2412, 2437, 2462 MHz
<b>EUT</b>	<u>802.11n HT-40, MCS0:</u> 2422, 2442, 2462 MHz
<b>EUT</b>	<u>BLE:</u> 2402, 2440, 2480 MHz

**Instrumentation**



Date : 6-Feb-2017      Type Test : DTS Conducted RF Measurements      Job # : C-2602  
 Prepared By: Kim/Shane      Customer : Laird Technologies, Inc.      Quote # : 316356

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Spectrum Analyzer	Agilent	N9010A	MY53400296	12/22/2016	12/22/2017	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D1048.0	5546519	6/26/2015	6/25/2017	Active Calibration
3	AA 960172	Cable - low loss 1m	A.H. Systems, Inc	SAC-26G-1	387	5/16/2016	5/16/2017	Active Verification
4	EE 960085	EMI Receiver	Agilent	N9038A	MY51210148	5/12/2016	5/12/2017	Active Calibration

Company: <u>Laird Technologies, Inc.</u>	Page 25 of 73	Name: <u>Sterling – LWB5</u>
Report: <u>TR 315356 A (DTS)</u>		Model: <u>Sterling – LWB5</u>
Job: <u>C-2602</u>		Serial: <u>WLAN – 00008, 00035</u> BLE – <u>00009, 00015, 00019, 00032</u>



**Table – WLAN PSD in 3 kHz**

Channel	Limit (dBm/3 kHz)	802.11b (dBm)	802.11b Margin (dB)	802.11g (dBm)	802.11g Margin (dB)	802.11n (dBm)	802.11n Margin (dB)	802.11n - HT40 (dBm)	802.11n HT-40 Margin (dB)
Low	8	4.2	3.8	-2.2	10.2	-4.1	12.1	-9.9	17.9
Mid	8	5.9	2.1	-2.7	10.7	-4.2	12.2	-10.0	18
High	8	4.4	3.6	-4.9	12.9	-5.6	13.6	-10.0	18

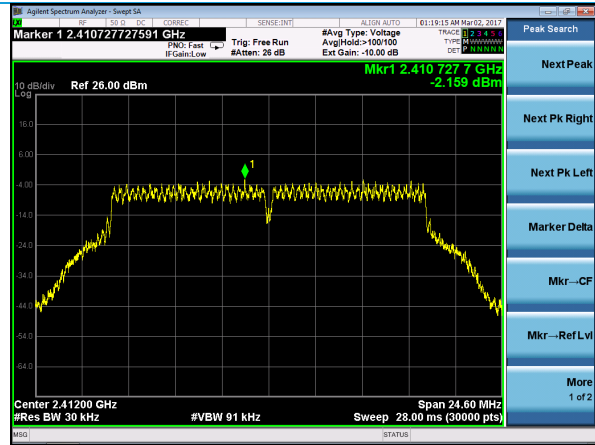
**Table – BLE PSD**

Channel	Limit (dBm/3 kHz)	BLE Reading (dBm)	Margin (dB)
Low	8	5.9	2.1
Mid	8	6.1	1.9
High	8	4.7	3.3

Plots – WLAN PSD



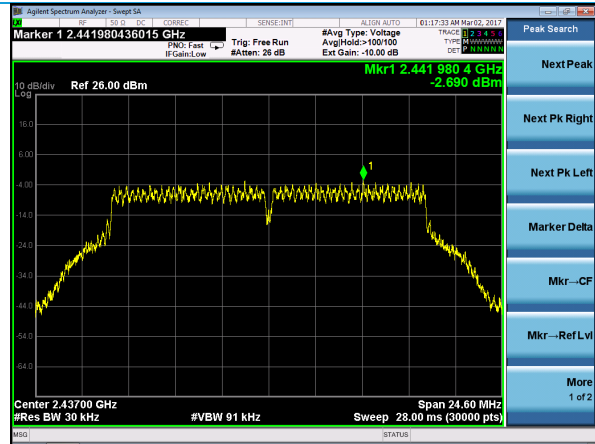
1 Mbps – Low Channel



6 Mbps – Low Channel



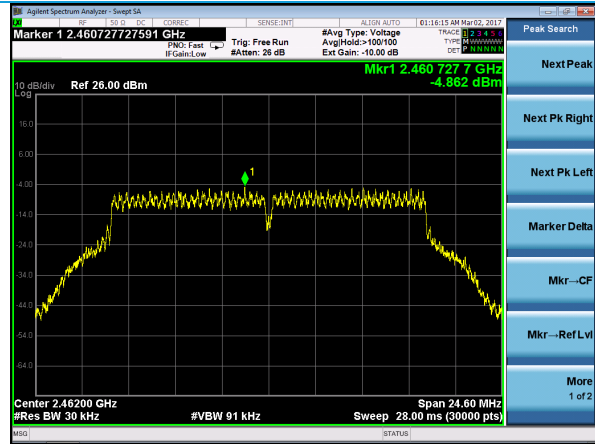
1 Mbps – Mid Channel



6 Mbps – Mid Channel



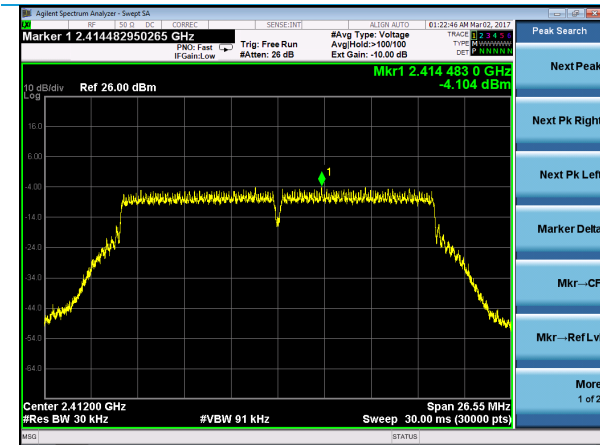
1 Mbps – High Channel



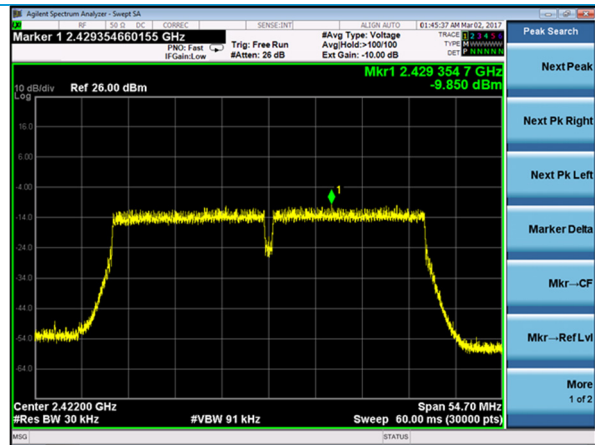
6 Mbps – High Channel

Company: Laird Technologies, Inc.	Page 27 of 73	Name: Sterling – LWB5
Report: TR 315356 A (DTS)		Model: Sterling – LWB5
Job: C-2602		Serial: WLAN – 00008, 00035 BLE – 00009, 00015, 00019, 00032

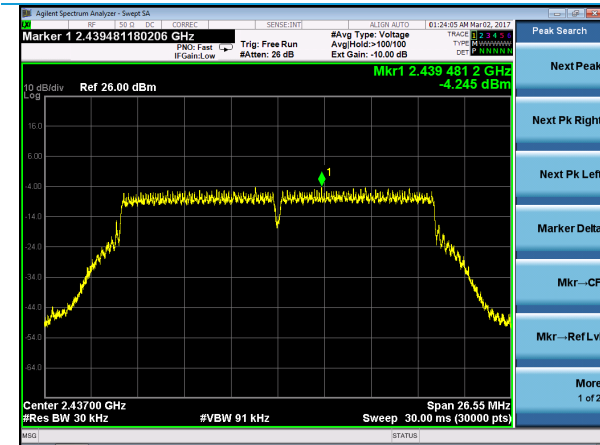
### Plots – WLAN PSD



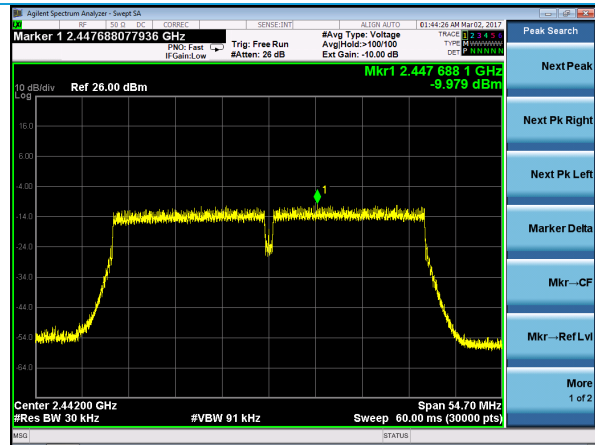
MCS0 – Low Channel



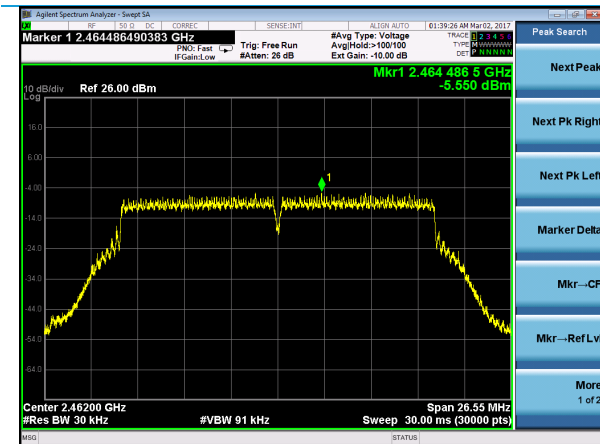
MCS0 – HT40 – Low Channel



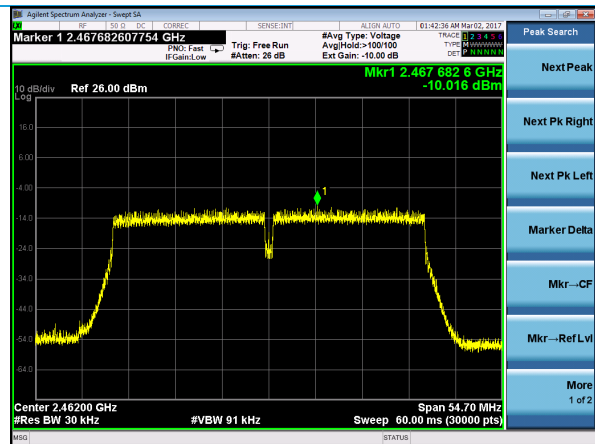
MCS0 – Mid Channel



MCS0 – HT40 – Mid Channel



MCS0 – High Channel



MCS0 – HT40 – High Channel

Company: Laird Technologies, Inc.

Report: TR 315356 A (DTS)

Job: C-2602

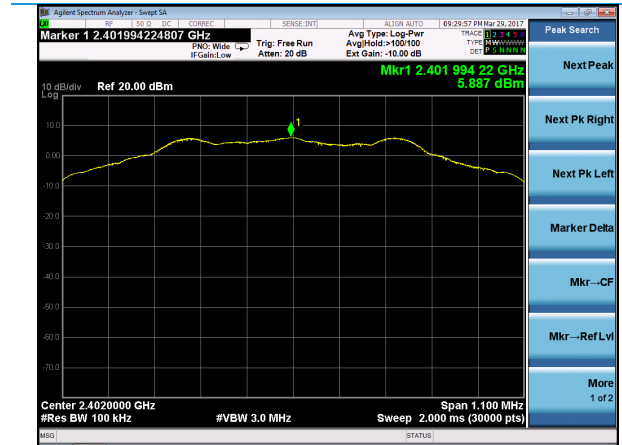
Name: Sterling – LWB5

Model: Sterling – LWB5

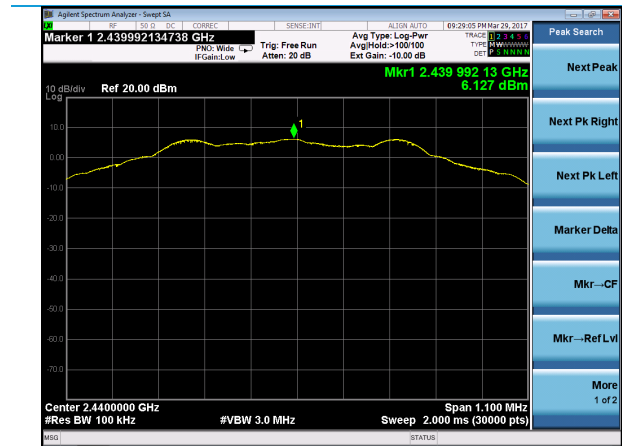
Serial: WLAN – 00008, 00035

BLE – 00009, 00015, 00019, 00032

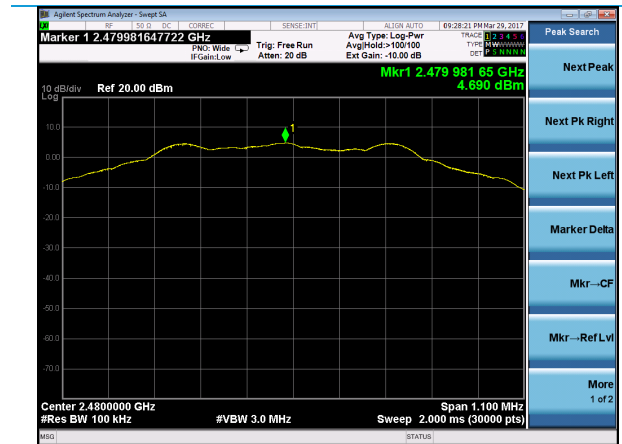
## Plots – BLE PSD



Low Channel



Mid Channel



High Channel

Company: Laird Technologies, Inc.	Page 29 of 73	Name: Sterling – LWB5
Report: TR 315356 A (DTS)		Model: Sterling – LWB5
Job: C-2602		Serial: WLAN – 00008, 00035 BLE – 00009, 00015, 00019, 00032

### 5.1.5 Antenna Port Conducted Emissions – 100 kHz Band Edge

<b>Operator</b>	Kimberly Bay
<b>QA</b>	Shane Dock
<b>Test Date</b>	March 2, 2017 / May 6, 2017
<b>Location</b>	Conducted RF Test Bench
<b>Temp. / R.H.</b>	21-22°C / 34-37% RH
<b>Requirement</b>	FCC 15.247 (d) / RSS-247 Section 5.5
<b>Method</b>	ANSI C63.10 Section 6.10.4

#### Limits:

<b>100 kHz Band Edge</b>
-20 dBc

#### Test Parameters

<b>Settings</b>	<u>802.11b HT-20, 1 Mbps:</u> 2412, 2462 MHz
<b>Settings</b>	<u>802.11g HT-20, 6 Mbps:</u> 2412, 2462 MHz
<b>Settings</b>	<u>802.11n HT-20, MCS0:</u> 2412, 2462 MHz
<b>Settings</b>	<u>802.11n HT-40, MCS0:</u> 2422, 2462 MHz
<b>Settings</b>	<u>BLE:</u> 2402, 2480 MHz

#### Instrumentation



Date: 6-Feb-2017      Type Test: DTS Conducted RF Measurements      Job #: C-2602  
 Prepared By: Kim/Shane      Customer: Laird Technologies, Inc.      Quote #: 316356

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Spectrum Analyzer	Agilent	N9010A	MY53400296	12/22/2016	12/22/2017	Active Calibration
2	AA 360143	Phaseflex	Gore	EKD01D01048.0	5546519	6/26/2015	6/25/2017	Active Calibration
3	AA 360172	Cable - low loss 1m	A.H. Systems, Inc	SAC-26G-1	387	5/16/2016	5/16/2017	Active Verification
4	EE 960085	EMI Receiver	Agilent	N9038A	MY51210148	5/12/2016	5/12/2017	Active Calibration

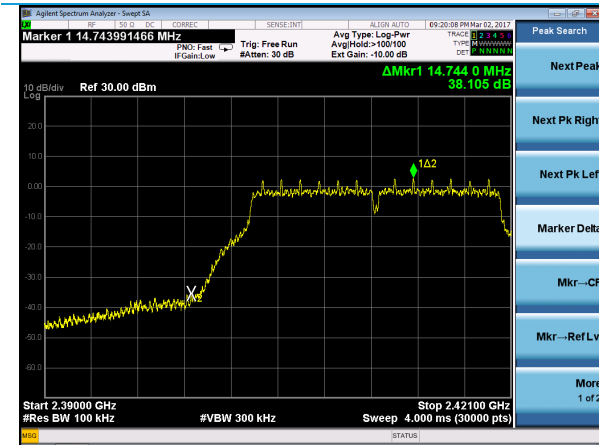
## Plots – WLAN 100 kHz Band Edge



1 Mbps – Low Channel



1 Mbps – High Channel



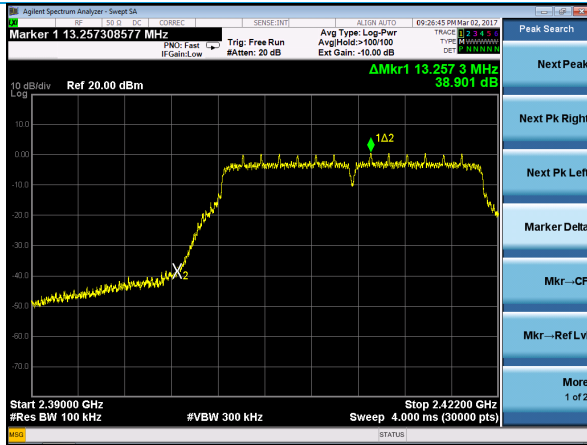
6 Mbps – Low Channel



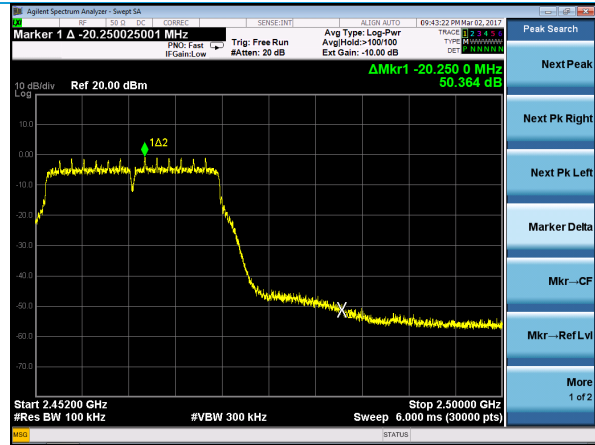
6 Mbps – High Channel

Company: Laird Technologies, Inc.	Page 31 of 73	Name: Sterling – LWB5
Report: TR 315356 A (DTS)		Model: Sterling – LWB5
Job: C-2602		Serial: WLAN – 00008, 00035 BLE – 00009, 00015, 00019, 00032

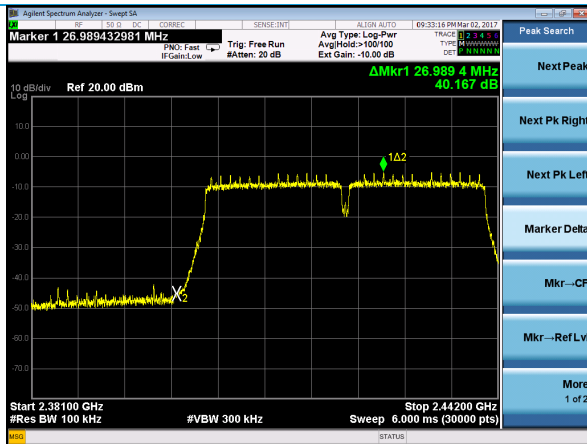
## Plots – WLAN 100 kHz Band Edge, continued



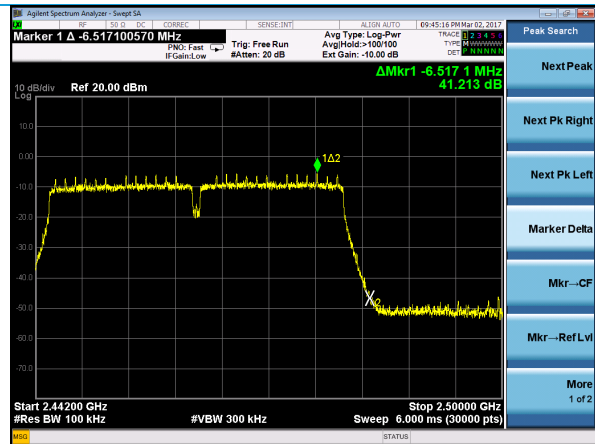
MCS0 – Low Channel



MCS0 – High Channel



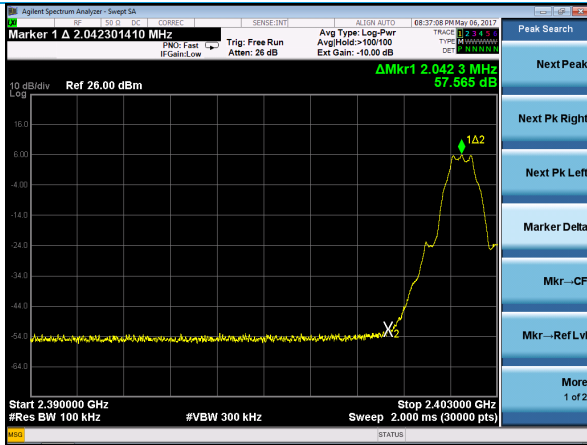
MCS0 – HT40 – Low Channel



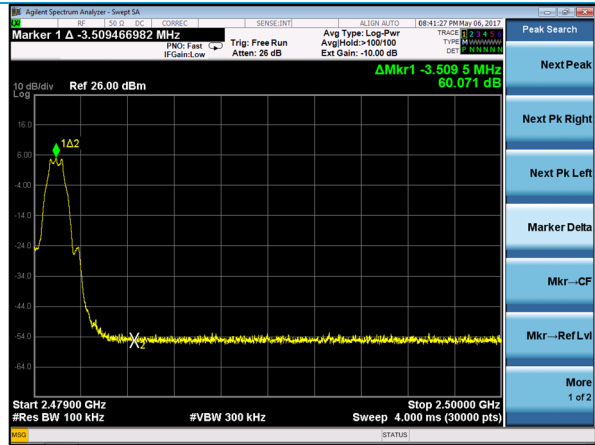
MCS0 – HT40 – High Channel

Company: Laird Technologies, Inc.	Page 32 of 73	Name: Sterling – LWB5
Report: TR 315356 A (DTS)		Model: Sterling – LWB5
Job: C-2602		Serial: WLAN – 00008, 00035 BLE – 00009, 00015, 00019, 00032

## Plots – BLE 100 kHz Band Edge



Low Channel



High Channel

Company: Laird Technologies, Inc.	Page 33 of 73	Name: Sterling – LWB5
Report: TR 315356 A (DTS)		Model: Sterling – LWB5
Job: C-2602		Serial: WLAN – 00008, 00035 BLE – 00009, 00015, 00019, 00032



### 5.1.6 Antenna Port Conducted Emissions – Restricted-Band Band-Edges

<b>Operator</b>	Kimberly Bay
<b>QA</b>	John Johnston / Shane Dock
<b>Test Date</b>	February 8, 2017 & April 28, 2017
<b>Location</b>	Conducted RF Test Bench
<b>Temp. / R.H.</b>	21°C / 31% RH
<b>Requirement</b>	FCC 15.247 (d) / RSS-GEN Section 8.10
<b>Method</b>	ANSI C63.10 2013 Peak Measurements: Section 11.12.2.4 Average Measurements: 802.11b: Section 11.12.2.5.1; All other: Section 11.12.2.5.2

#### Limits:

Frequency (MHz)	Average Limit (dBm)	Peak Limit (dBm)
2310-2390	-41.23	-21.23
2483.5-2500	-41.23	-21.23

#### Test Parameters

<b>Settings</b>	<u>802.11b HT-20, 1 Mbps:</u> 2412, 2462 MHz
<b>Settings</b>	<u>802.11g HT-20, 6 Mbps:</u> 2412, 2462 MHz
<b>Settings</b>	<u>802.11n HT-20, MCS0:</u> 2412, 2462 MHz
<b>Settings</b>	<u>802.11n HT-40, MCS0:</u> 2422, 2462 MHz

#### Instrumentation



Date: 6-Feb-2017      Type Test: DTS Conducted RF Measurements      Job #: C-2602  
Prepared By: Kim/Shane      Customer: Laird Technologies, Inc.      Quote #: 316356

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Spectrum Analyzer	Agilent	N9010A	MY53400296	12/22/2016	12/22/2017	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D1048.0	5546519	6/26/2015	6/25/2017	Active Calibration
3	AA 960172	Cable - low loss 1m	A.H. Systems, Inc	SAC-26G-1	387	5/16/2016	5/16/2017	Active Verification
4	EE 960085	EMI Receiver	Agilent	N9038A	MY51210148	5/12/2016	5/12/2017	Active Calibration

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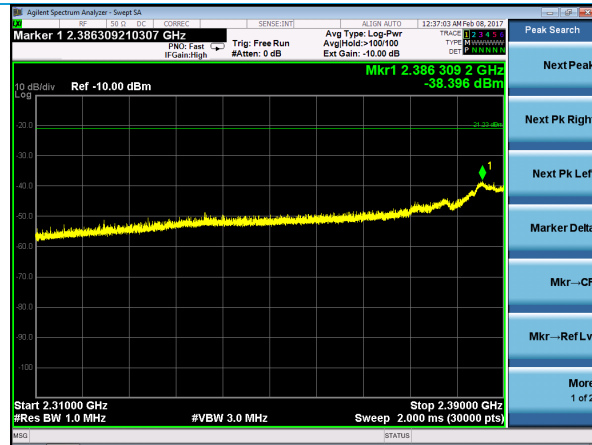
**Table – Lower Band-Edge Measurements (2310-2390 MHz)**

Mode	Peak Frequency (MHz)	Peak Reading (dBm)	Avg. Frequency (MHz)	Avg. Reading (dBm)	Correction Factor	Antenna Gain (dBi)	Peak Limit (dBm)	Average Limit (dBm)	Peak Margin (dB)	Average Margin (dB)
802.11b	2386	-38.40	2390	-46.86	0.00	2.5	-21.23	-41.23	14.67	3.13
802.11g	290	-34.41	2390	-47.44	0.18	2.5	-21.23	-41.23	10.50	3.53
802.11n	2388	-36.35	2390	-49.78	0.19	2.5	-21.23	-41.23	12.43	5.86
802.11n (HT-40)	2384	-31.32	2388	-49.16	0.315	2.5	-21.23	-41.23	7.28	5.12

**Table – Upper Band-Edge Measurements (2483.5-2500 MHz)**

Mode	Data Rate	Peak Frequency (MHz)	Peak Reading (dBm)	Avg. Frequency (MHz)	Avg. Reading (dBm)	Correction Factor	Antenna Gain (dBi)	Peak Limit (dBm)	Average Limit (dBm)	Peak Margin (dB)	Average Margin (dB)
802.11b	1 Mbps	2484	-42.72	2484	-49.50	0.00	2.5	-21.23	-41.23	18.99	5.77
802.11g	6 Mbps	2484	-31.23	2484	-47.75	0.18	2.5	-21.23	-41.23	7.32	3.84
802.11n	MCS0	2484	-35.04	2484	-50.30	0.19	2.5	-21.23	-41.23	11.12	6.38
802.11n (HT-40)	MCS0 (HT-40)	2484	-30.69	2484	-45.60	0.315	2.5	-21.23	-41.23	6.65	1.56

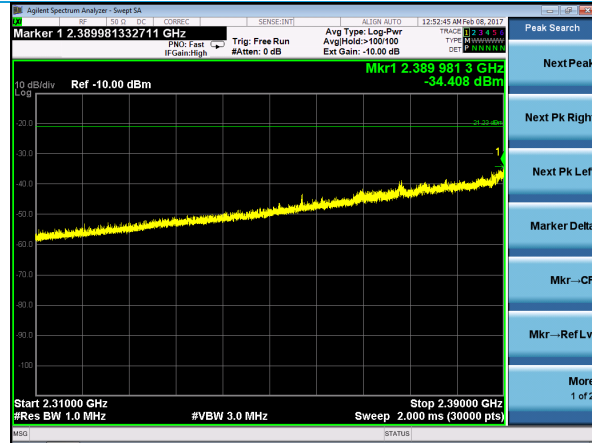
## Plots – Lower Band Edge



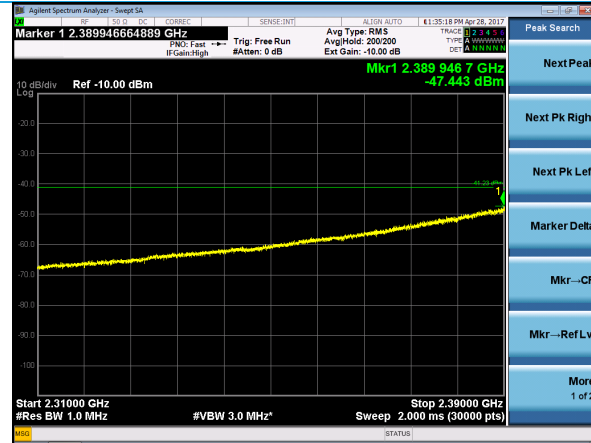
802.11b – 1 Mbps – Peak



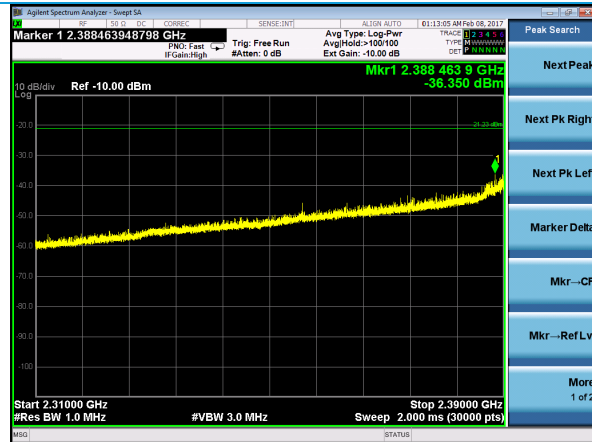
802.11b – 1 Mbps – Average



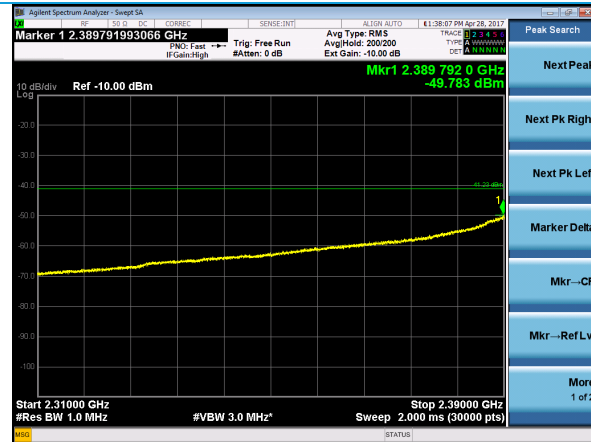
802.11g – 6 Mbps – Peak



802.11g – 6 Mbps – Average

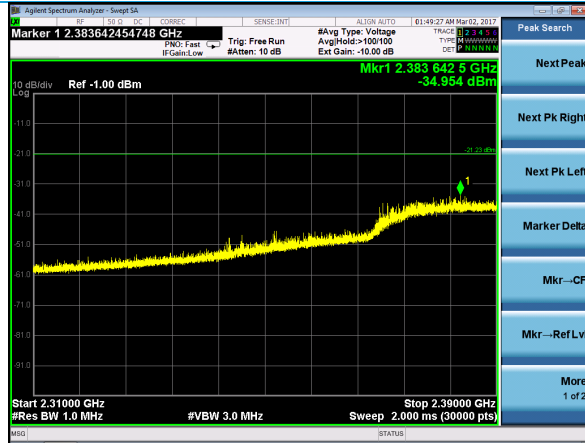


802.11n – MCS0 – Peak



802.11n MCS0 - Average

### Plots – Lower Band Edge, continued



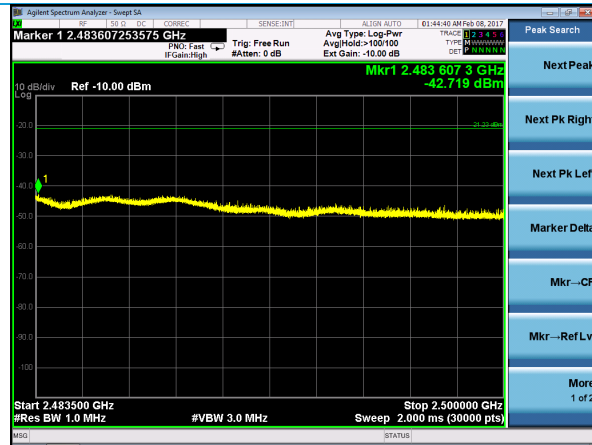
802.11n HT-40 – MCS0 – Peak



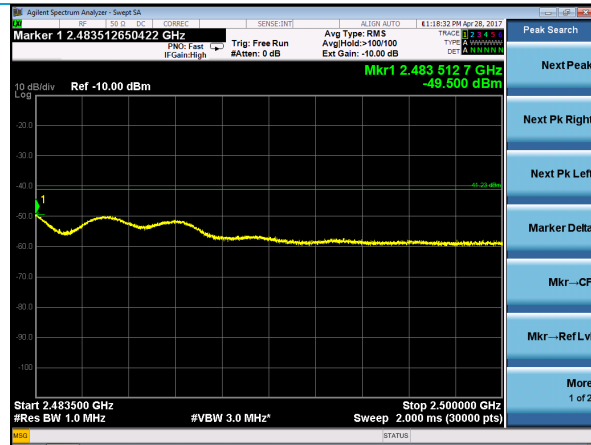
802.11n HT-40 – MCS0 - Average

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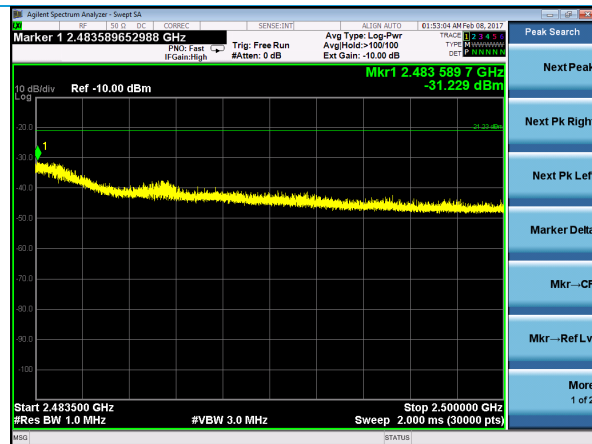
## Plots – Upper Band Edge



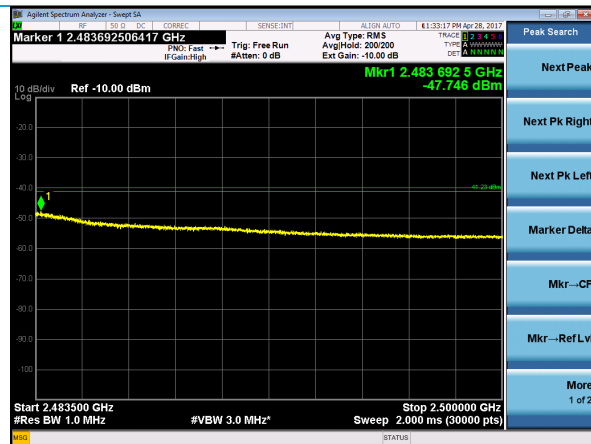
802.11b – 1 Mbps – Peak



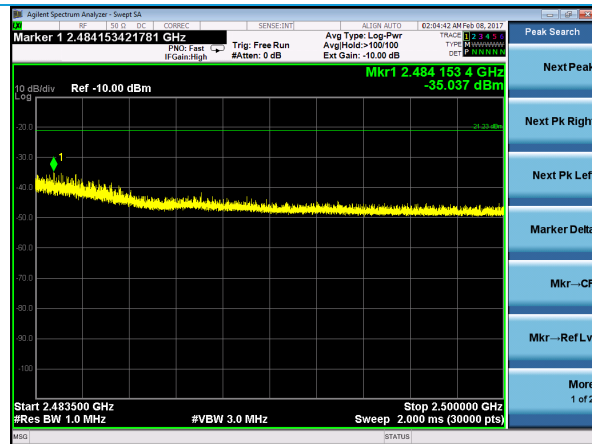
802.11b – 1 Mbps – Average



802.11g – 6 Mbps – Peak



802.11g – 6 Mbps – Average



802.11n – MCS0 – Peak



802.11n MCS0 - Average

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