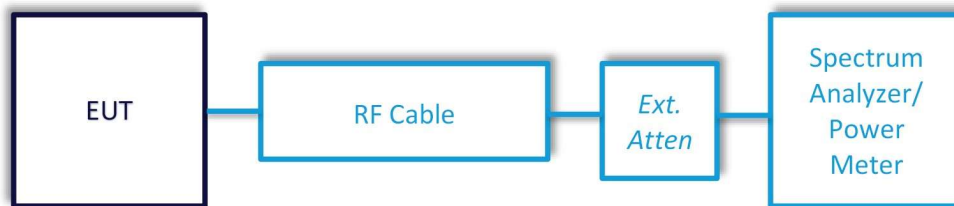


## 5 TEST DATA

### 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 Antenna Port Conducted Emissions – RF Output Power

<b>Operator</b>	Anthony Smith	<b>QA</b>	Adam Alger
<b>Temperature</b>	20.7°C	<b>R.H. %</b>	29.4%
<b>Test Date</b>	3/9/2023	<b>Location</b>	Conducted RF Bench
<b>Requirement</b>	FCC 15.247 RSS-247	<b>Method</b>	ANSI C63.10

Limits: <30dBm

#### 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>	Peak	<b>Settings</b>	Trace Max Hold

#### Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960173	Cable	A.H. Systems, Inc.	SAC-26G-1	388	6/13/2023	6/12/2024	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/11/2023	4/11/2024	Active Calibration

#### EUT Parameters

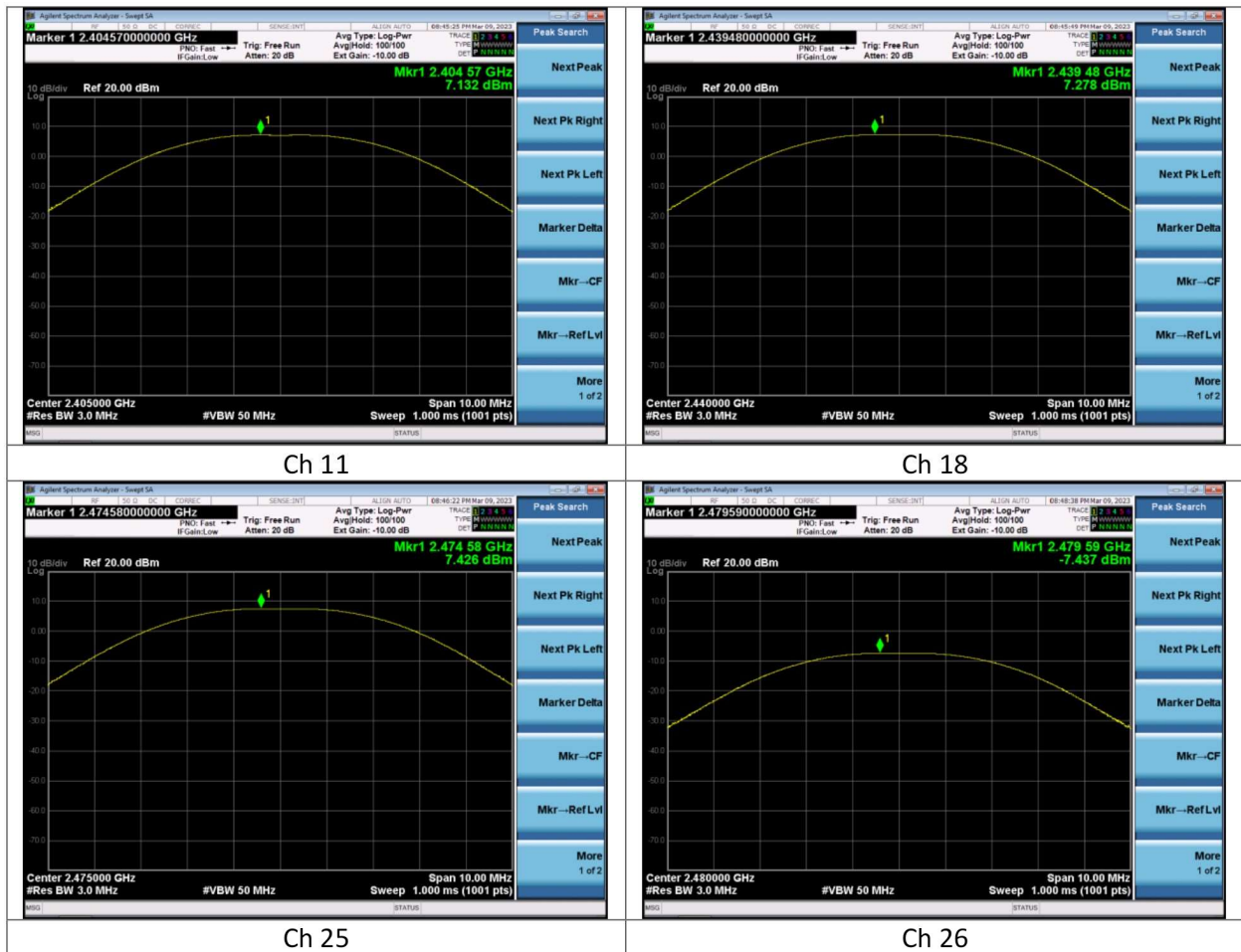
<b>Input Power</b>	12VDC	<b>Mode</b>	802.15.4 250kbit
<b>Frequency</b>	2405, 2440, 2475, 2480 MHz	<b>Channel</b>	11, 18, 25, 26
<b>Notes</b>	Power Index: 7 for channels 11, 18, and 25; -8 for channel 26		

Data

Table

Channel	Mode	Peak Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Transmit Power Setting
11	Zigbee	7.1	30.0	22.9	7
18	Zigbee	7.3	30.0	22.7	7
25	Zigbee	7.4	30.0	22.6	7
26	Zigbee	-7.4	30.0	37.4	-8

Plots



### 5.1.2 Antenna Port Conducted Emissions – Emissions in Restricted Frequency Bands

<b>Operator</b>	Anthony Smith	<b>QA</b>	Adam Alger
<b>Temperature</b>	22.8	<b>R.H. %</b>	21.20%
<b>Test Date</b>	3/20/2023	<b>Location</b>	Bench
<b>Requirement</b>	FCC 15.247	<b>Method</b>	ANSI C63.10 § 11.12.2 Cabinet Radiation method

#### Limits:

Frequency (MHz)	Quasi Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Peak Limit (dBµV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-25000	-	54.0	74.0

#### Test Parameters

<b>Frequency</b>	1-25 GHz	<b>Setup</b>	Conducted
<b>RBW</b>	1 MHz	<b>VBW</b>	3 MHz
<b>Detector(s)</b>	Peak, Average	<b>Settings</b>	Peak – Max Hold Average – Trace Average

#### Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	6/13/2023	6/12/2024	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/11/2023	4/11/2024	Active Calibration

#### EUT Parameters

<b>Input Power</b>	12VDC	<b>Mode</b>	802.15.4 250kbit
<b>Frequency</b>	2405, 2440, 2475, 2480 MHz	<b>Channel</b>	11, 18, 25, 26
<b>Notes</b>	Power Index: 7 for channels 11, 18, and 25; -8 for channel 26 100% Duty Cycle		

**Data  
Table  
Peak**

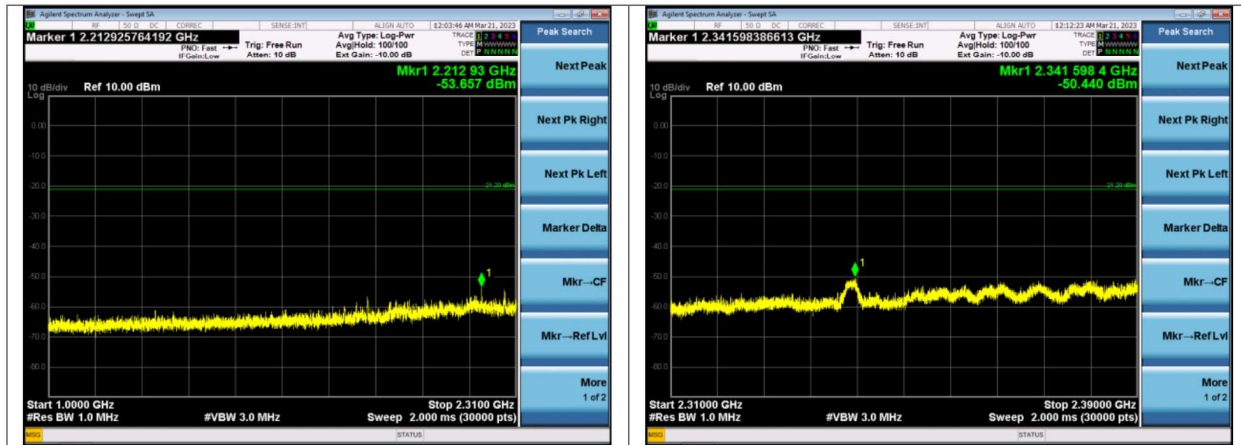
Mode/Channel	Freq (MHz)	Meas. (dBm)	Ant. Gain (dBi)	Corrected Meas. (dBm)	Limit (dBm)	Margin (dB)
11	2341.6	-50.4	3.1	-47.3	-21.2	26.1
25	2483.6	-43.9	3.1	-40.8	-21.2	19.6
26	2483.7	-42.2	3.1	-39.1	-21.2	17.9
25	7423.9	-46.7	3.1	-43.6	-21.2	22.4
18	7318.9	-47.3	3.1	-44.2	-21.2	23.0
11	4809.3	-46.3	3.1	-43.2	-21.2	22.0

**Average**

Mode/Channel	Freq (MHz)	Meas. (dBm)	Ant. Gain (dBi)	Corrected Meas. (dBm)	Limit (dBm)	Margin (dB)
11	2341.1	-57.2	3.1	-54.1	-41.2	12.9
25	2483.6	-54.3	3.1	-51.2	-41.2	10.0
26	2483.5	-48.3	3.1	-45.2	-41.2	4.0
25	7426.8	-52.1	3.1	-49.0	-41.2	7.8
18	7318.7	-53.2	3.1	-50.1	-41.2	8.9
11	4809.3	-51.6	3.1	-48.5	-41.2	7.3

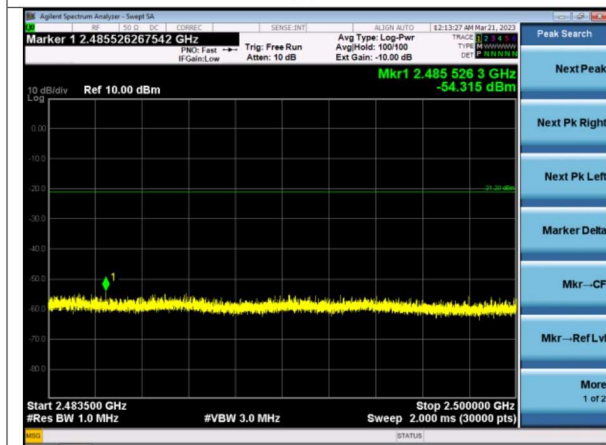
Plots

Peak – Worst Case 1-25 GHz, no change in 30-1000 MHz

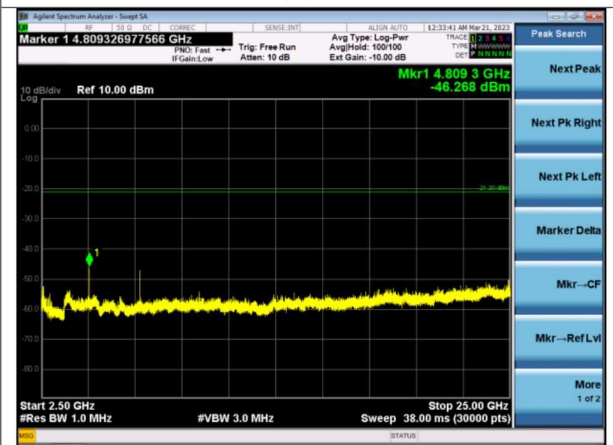


1-2.31 GHz  
Ch 11

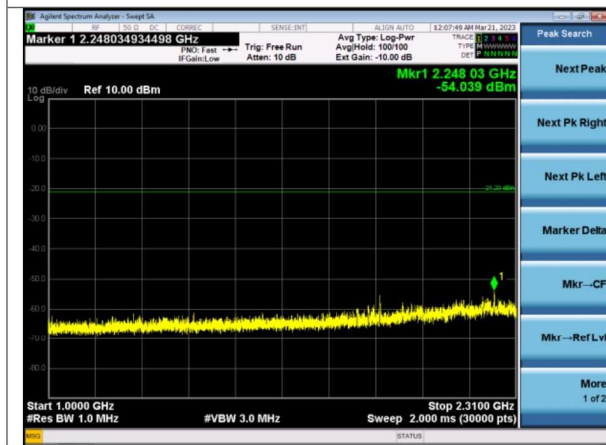
2.31-2.39 GHz  
Ch 11



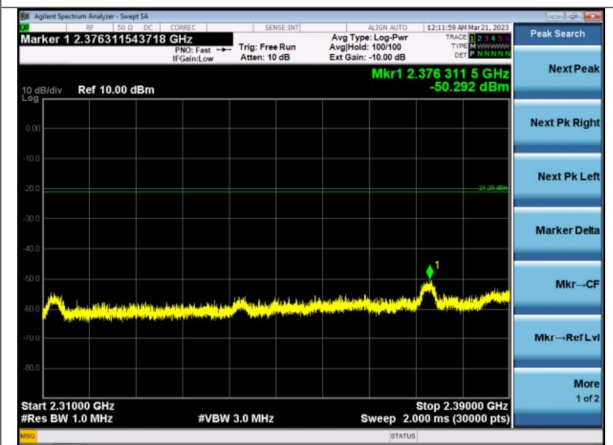
2.4835-2.5 GHz  
Ch 11



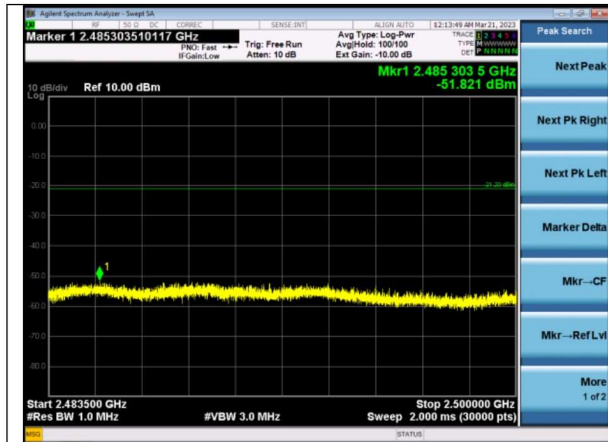
2.5-25 GHz  
Ch 11



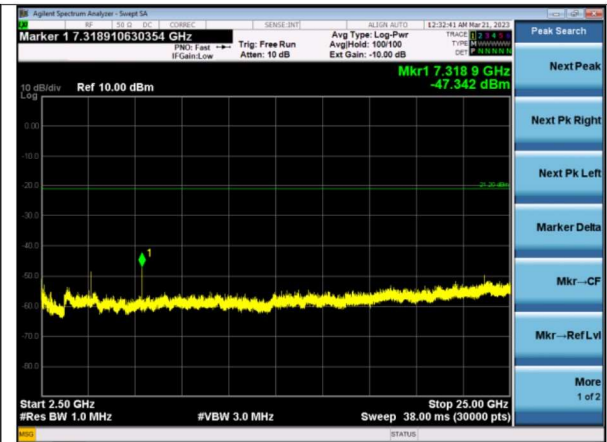
1-2.31 GHz  
Ch 18



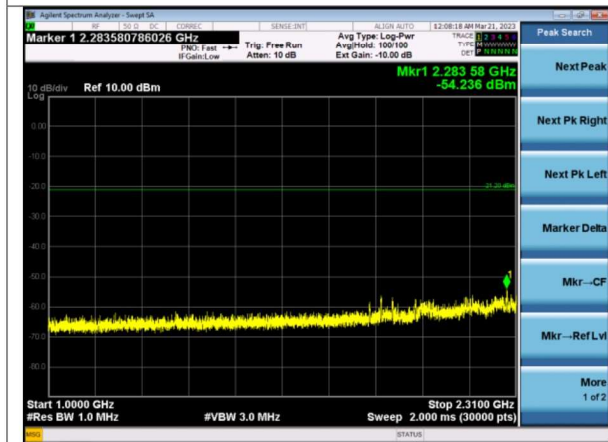
2.31-2.39 GHz  
Ch 18



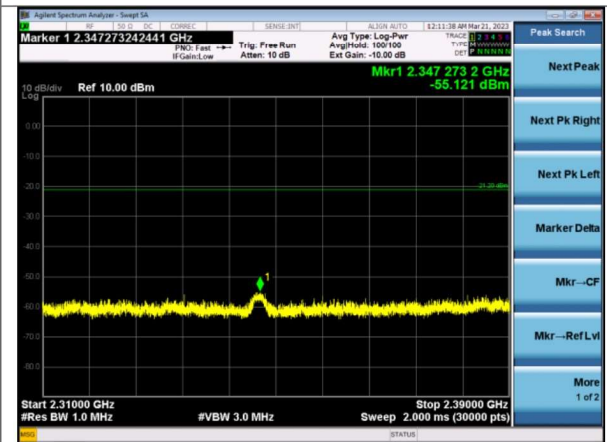
2.4835-2.5 GHz  
Ch 18



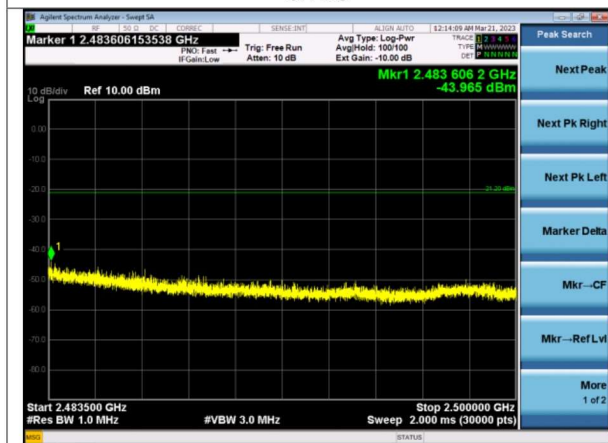
2.5-25 GHz  
Ch 18



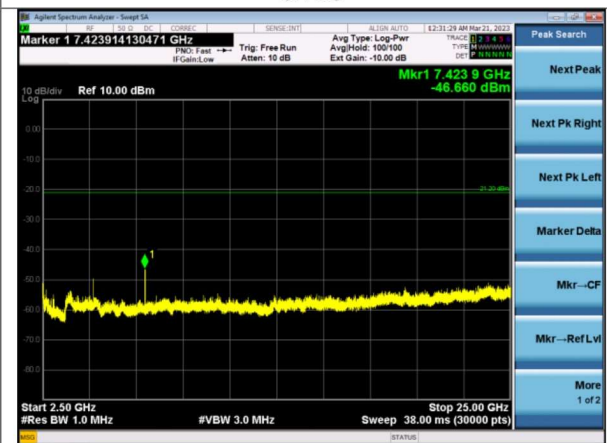
1-2.31 GHz  
Ch 25



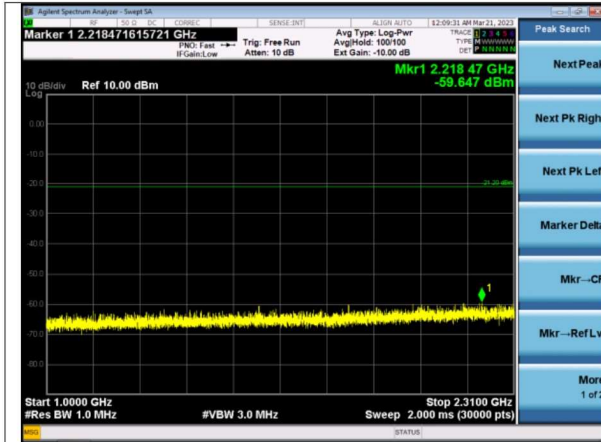
2.31-2.39 GHz  
Ch 25



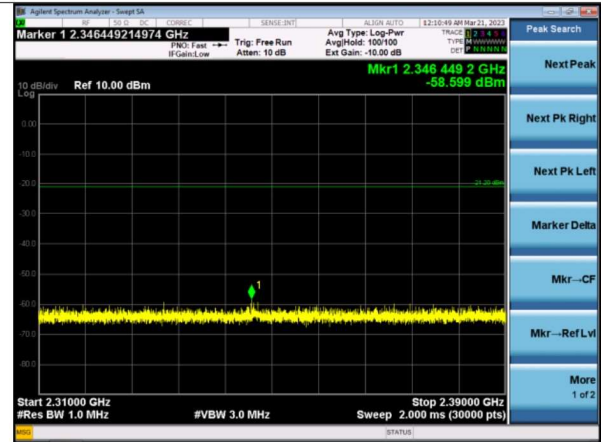
2.4835-2.5 GHz  
Ch 25



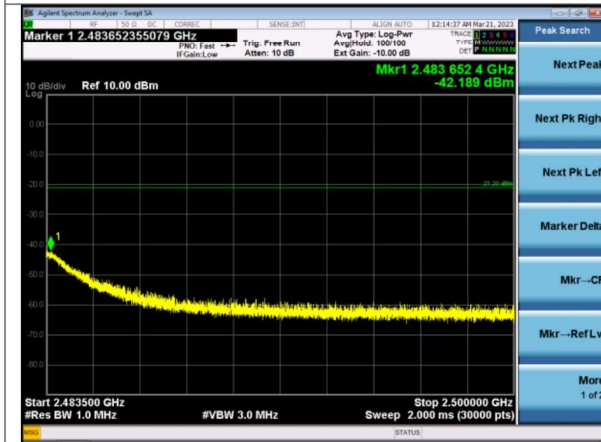
2.5-25 GHz  
Ch 25



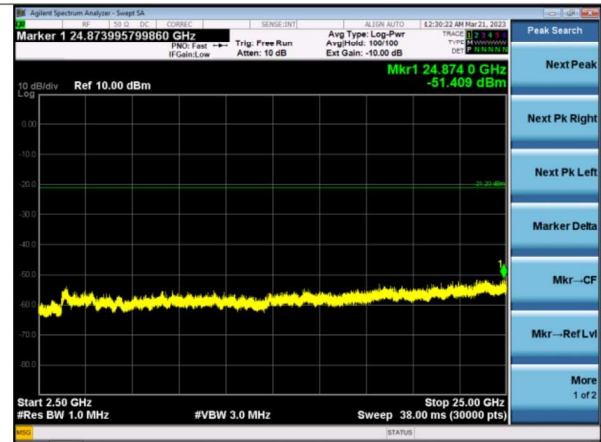
1-2.31 GHz  
Ch 26



2.31-2.39 GHz  
Ch 26



2.4835-2.5 GHz  
Ch 26



2.5-25 GHz  
Ch 26

Company: Laird Connectivity

Report: TR3664B BL654

Quote: NBO-12-2022-005678

Name: BL654

Model: BL654

Serial: Engineering Sample