8. Transmitted Power Density

8.1 *Test Specification*

FCC, Part 15, Subpart C, Section 247(e)

8.2 *Test Procedure*

(Temperature (20°C)/ Humidity (62%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable Special attention was taken to prevent Spectrum Analyzer RF input overload.

The spectrum analyzer was set to 3 kHz RBW.

8.3 *Test Limit*

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.4 *Test Results*

Protocol Type	Operation Frequency (MHz)	PSD Reading (dBm)	Limit (dBm)	Margin (dB)
BLE	2402.0	-12.9	8.0	-20.9
	2440.0	-12.6	8.0	-20.6
	2480.0	-12.3	8.0	-20.3
Wi-fi/g(6Mbit/s)	2412.0	-11.78	8.0	-19.78
	2437.0	-13.3	8.0	-21.3
	2462.0	-11.5	8.0	-19.5
Wi-fi/g(54Mbit/s)	2412.0	-12.5	8.0	-20.5
	2437.0	-15.2	8.0	-23.2
	2462.0	-13.5	8.0	-21.5
Wi-fi/n(6.5Mbit/s)	2412.0	-9.9	8.0	-17.9
	2437.0	-11.6	8.0	-19.6
	2462.0	-11.1	8.0	-19.1
Wi-fi/n(65Mbit/s)	2412.0	-13.9	8.0	-21.9
	2437.0	-16.4	8.0	-24.4
	2462.0	-14.8	8.0	-22.8

Figure 62 Test Results

JUDGEMENT: Passed by 17.9dB

For additional information see *Figure 63* to *Figure 77*.

Transmitted Power Density

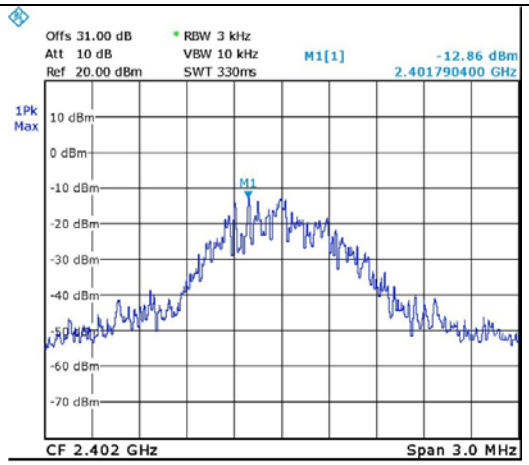

Figure 63. 2402.0 MHz, BLE

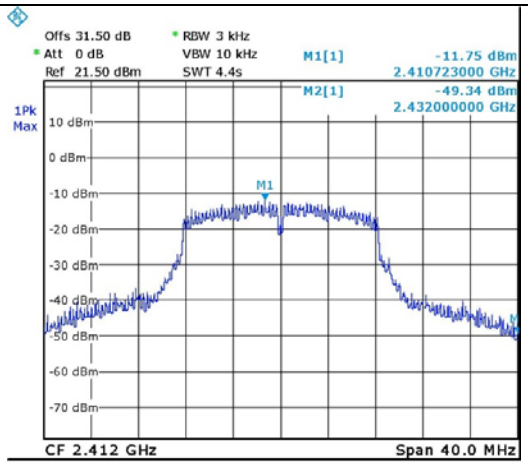

Figure 64. 2412.0 MHz, Wi-fi/g(6Mbit/s)

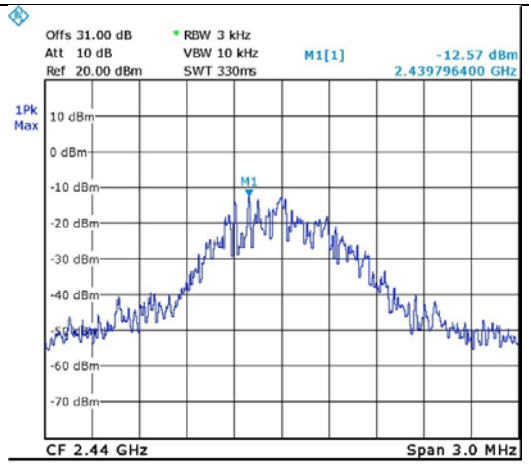

Figure 65. 2440.0 MHz, BLE

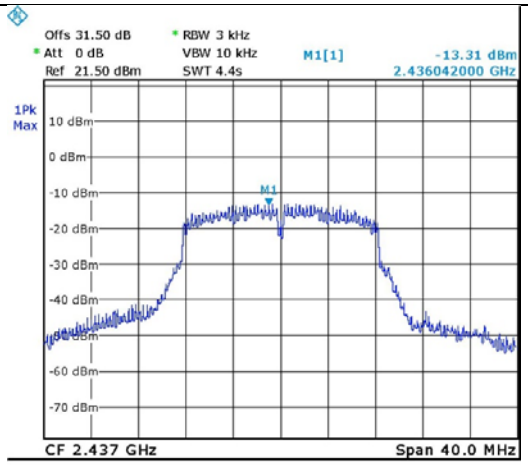

Figure 66. 2437.0 MHz, Wi-fi/g(6Mbit/s)

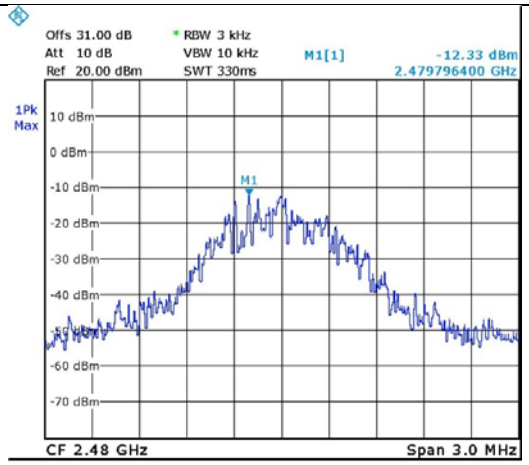

Figure 67. 2480.0 MHz, BLE

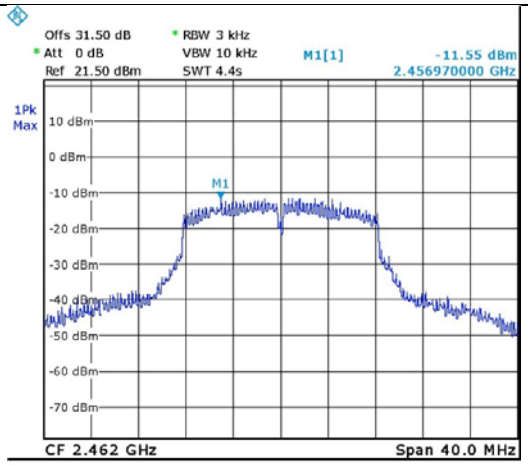

Figure 68. 2462.0 MHz, Wi-fi/g(6Mbit/s)

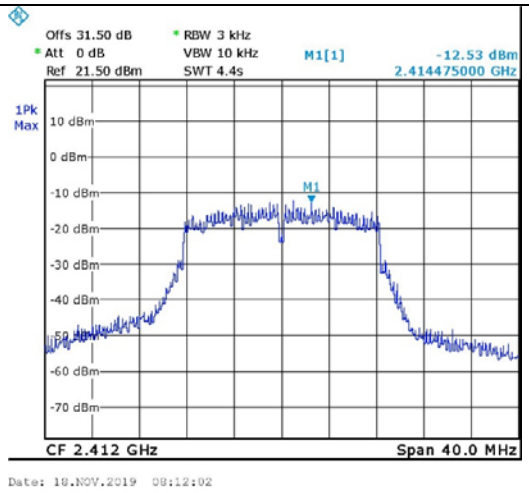

Figure 69. 2412.0 MHz, Wi-fi/g(54Mbit/s)

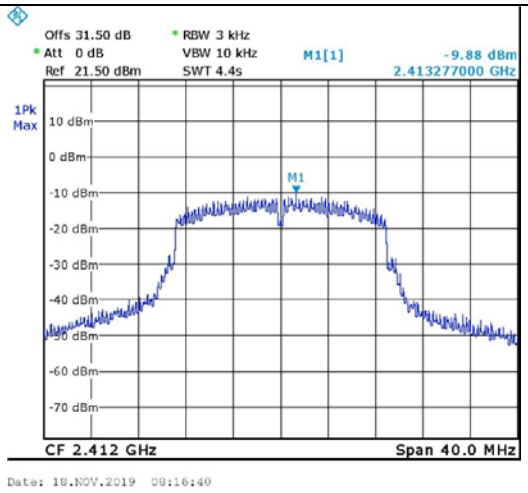

Figure 70. 2412.0 MHz, Wi-fi/n(6.5Mbit/s)

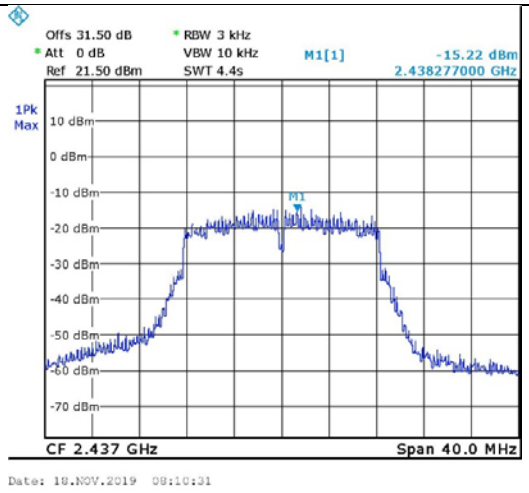

Figure 71. 2437.0 MHz, Wi-fi/g(54Mbit/s)

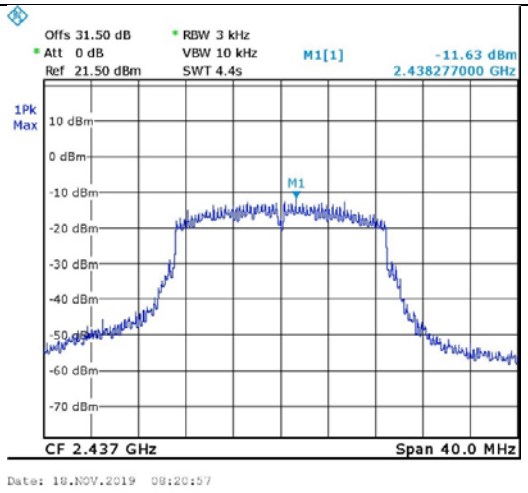

Figure 72. 2437.0 MHz, Wi-fi/n(6.5Mbit/s)

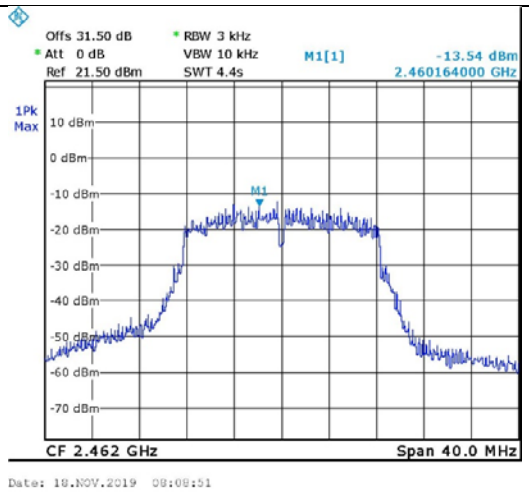

Figure 73. 2462.0 MHz, Wi-fi/g(54Mbit/s)

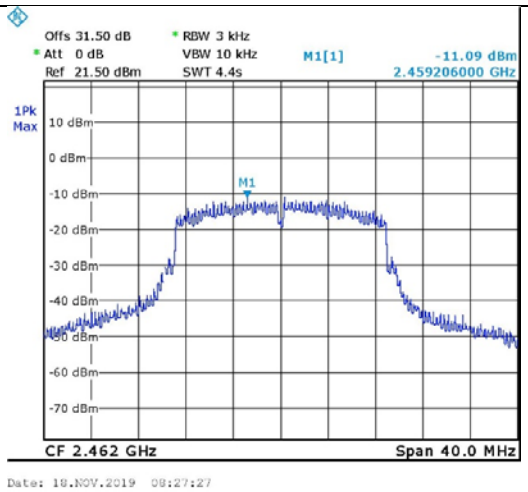

Figure 74. 2462.0 MHz, Wi-fi/n(6.5Mbit/s)

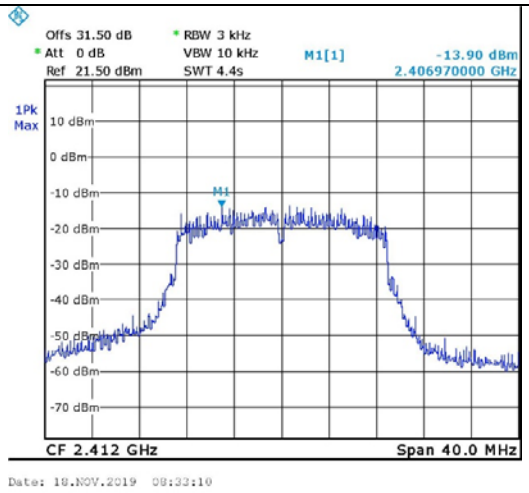

Figure 75. 2412.0 MHz, Wi-fi/n(65Mbit/s)

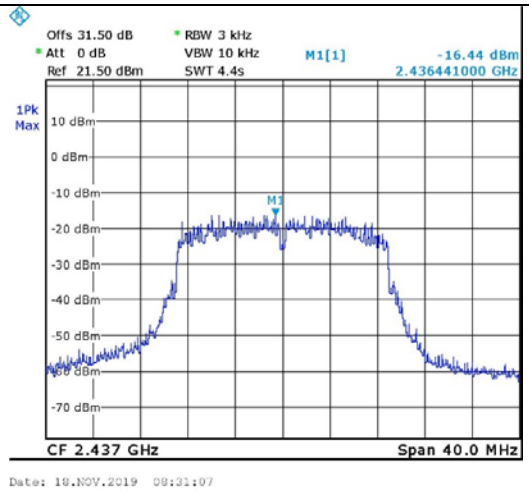

Figure 76. 2437.0 MHz, Wi-fi/n(65Mbit/s)

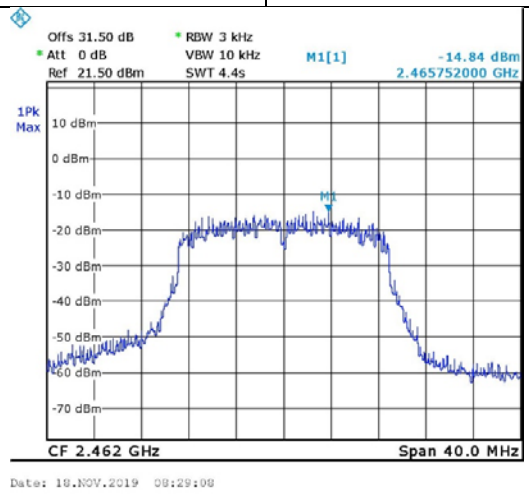

Figure 77. 2462.0 MHz, Wi-fi/n(65Mbit/s)

8.5 *Test Equipment Used; Transmitted Power Density*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	March 24, 2019	March 31, 2020
30dB Attenuator	MCL	BW-S30W5	533	December 24, 2018	December 31, 2019
RF Cable	Huber Suner	Sucofelex	27502/4PEA	December 24, 2018	December 31, 2019
RF Cable	EIM	705A009301 EIM	-	December 24, 2018	December 31, 2019

Figure 78 Test Equipment Used

9. Occupied Bandwidth

9.1 *Test Specification*

FCC, Part 2, Sub part J, Section 2.1049

9.2 *Test Procedure*

(Temperature (20°C)/ Humidity (62%RH))
The E.U.T. operation mode and test set-up are as described in Section 2 of this report.
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable Special attention was taken to prevent Spectrum Analyzer RF input overload.

The RBW set to the range of 1% to 5% of the OBW.

The span was set to ~ 3 times the OBW.
99% occupied bandwidth function was set on.

9.3 *Test Limit*

N/A

9.4 *Test Results*

Protocol Type	Operation Frequency (MHz)	Reading (MHz)
BLE	2402.0	1.05
	2440.0	1.05
	2480.0	1.05
Wi-fi/g(6Mbit/s)	2412.0	18.9
	2437.0	18.8
	2462.0	19.0
Wi-fi/g(54Mbit/s)	2412.0	18.2
	2437.0	18.2
	2462.0	17.9
Wi-fi/n(6.5Mbit/s)	2412.0	20.3
	2437.0	20.1
	2462.0	20.3
Wi-fi/n(65Mbit/s)	2412.0	18.8
	2437.0	18.9
	2462.0	18.8

Figure 79. Bandwidth Test Results

JUDGEMENT: N/A

See additional information in *Figure 80* to *Figure 94.*

Occupied Bandwidth

E.U.T Description Portable, Pocket- Sized Smart Pen Scanner
Model Number Orcam **Read**
Part Number: 19350053

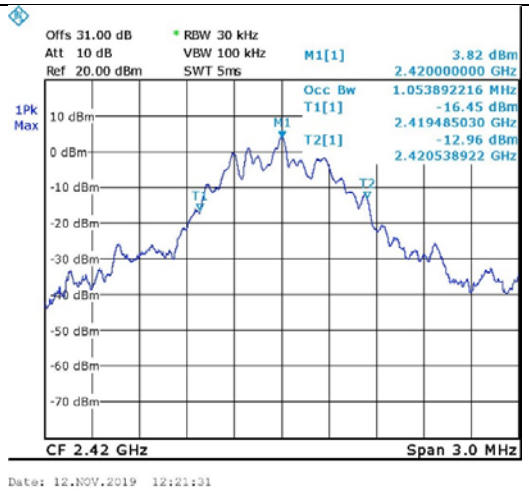

Figure 80. 2402.0 MHz, BLE

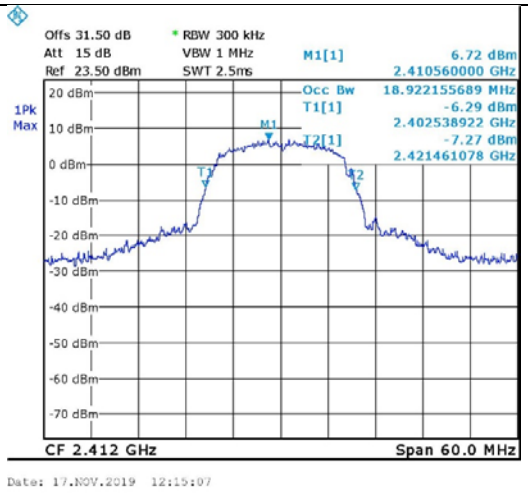

Figure 81. 2412.0 MHz, Wi-fi/g(6Mbit/s)

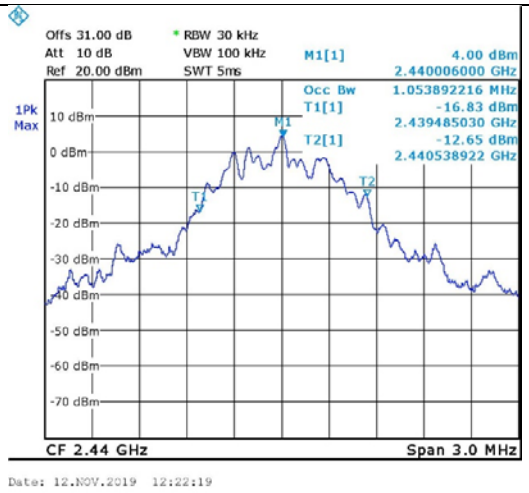

Figure 82. 2440.0 MHz, BLE

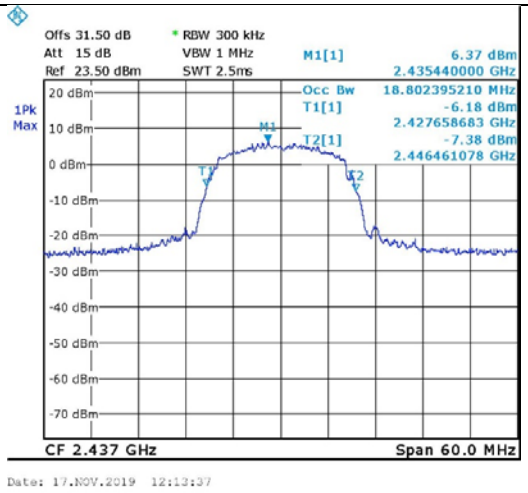

Figure 83. 2437.0 MHz, Wi-fi/g(6Mbit/s)

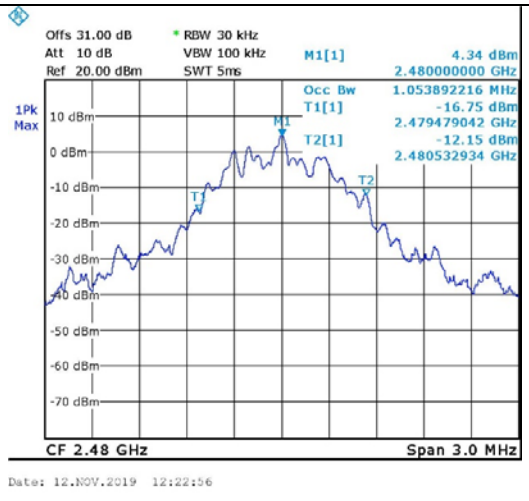

Figure 84. 2480.0 MHz, BLE

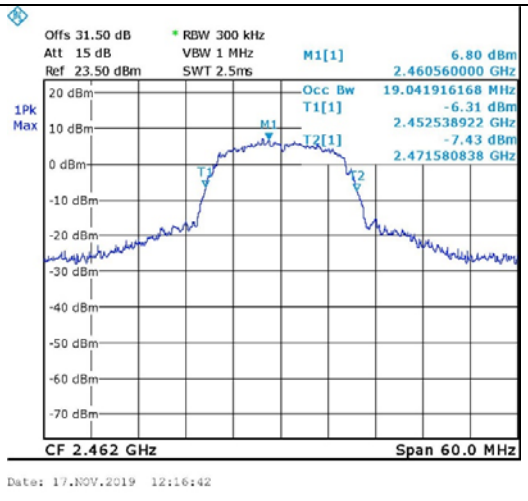

Figure 85. 2462.0 MHz, Wi-fi/g(6Mbit/s)

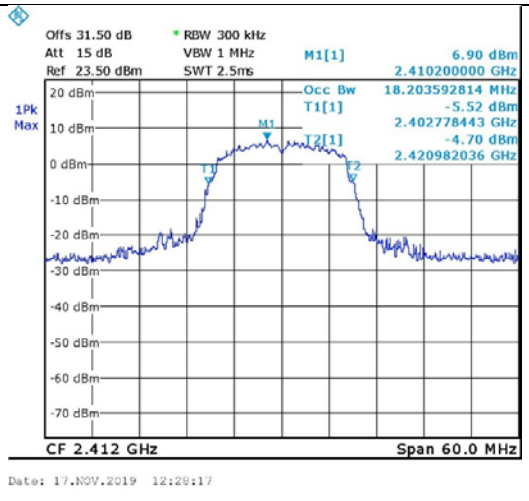

Figure 86. 2412.0 MHz, Wi-fi/g(54Mbit/s)

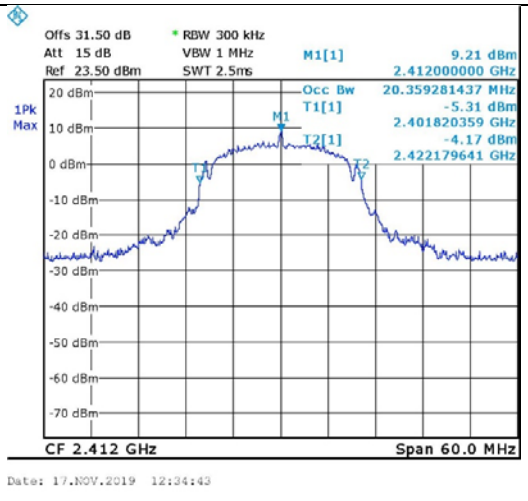

Figure 87. 2412.0 MHz, Wi-fi/n(6.5Mbit/s)

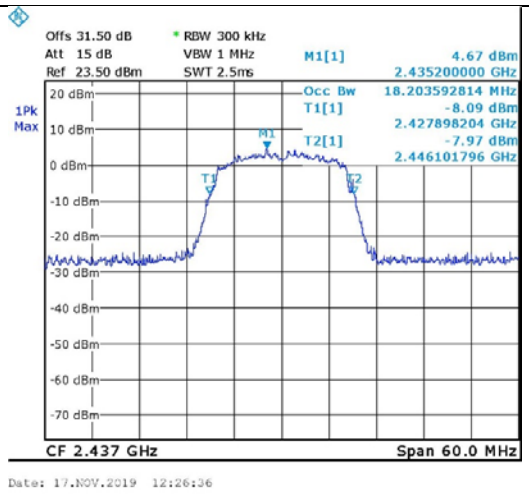

Figure 88. 2437.0 MHz, Wi-fi/g(54Mbit/s)

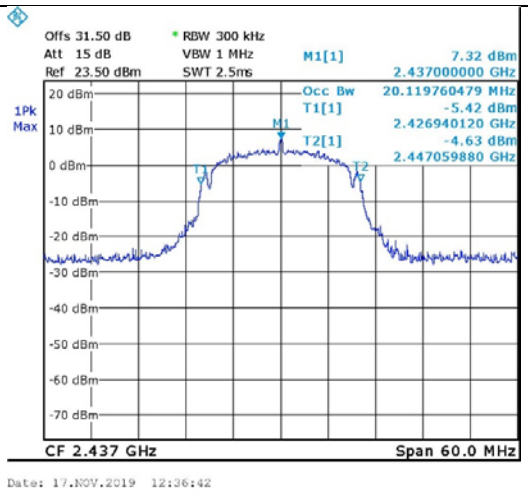

Figure 89. 2437.0 MHz, Wi-fi/n(6.5Mbit/s)

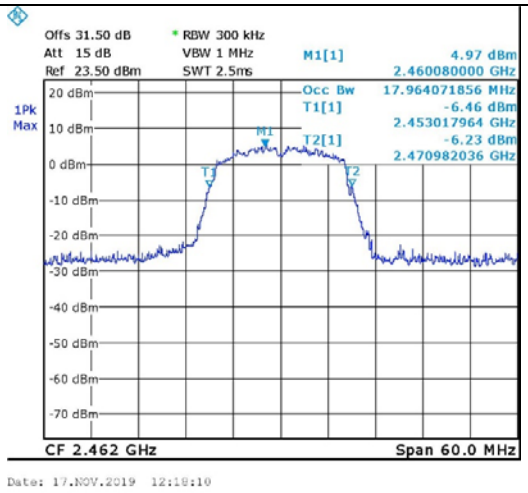

Figure 90. 2462.0 MHz, Wi-fi/g(54Mbit/s)

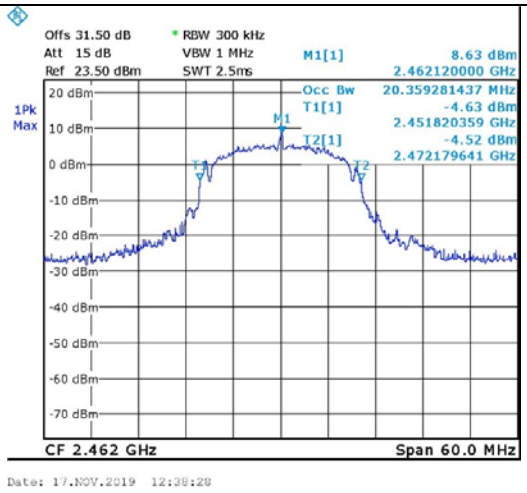

Figure 91. 2462.0 MHz, Wi-fi/n(6.5Mbit/s)

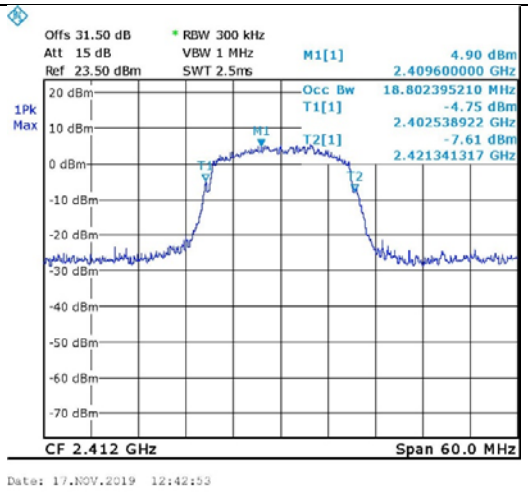

Figure 92. 2412.0 MHz, Wi-fi/n(65Mbit/s)

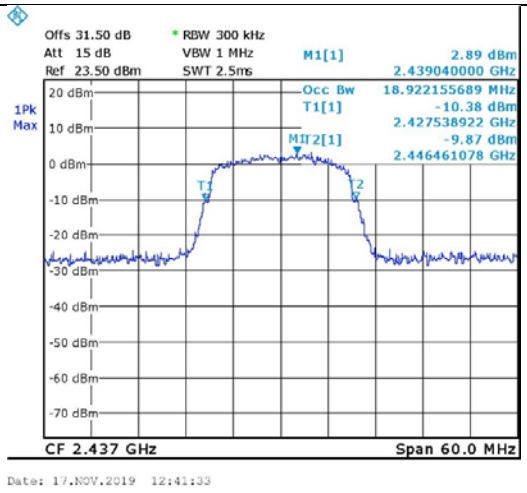

Figure 93. 2437.0 MHz, Wi-fi/n(65Mbit/s)

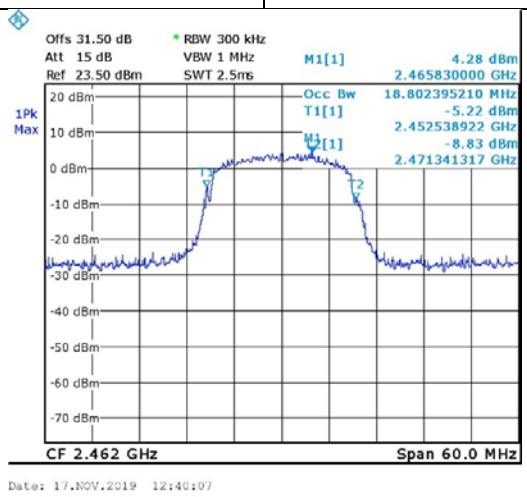

Figure 94. 2462.0 MHz, Wi-fi/n(65Mbit/s)

9.5 *Test Equipment Used; Occupied Bandwidth*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	March 24, 2019	March 31, 2020
30dB Attenuator	MCL	BW-S30W5	533	December 24, 2018	December 31, 2019
RF Cable	Huber Suner	Sucofelex	27502/4PEA	December 24, 2018	December 31, 2019
RF Cable	EIM	705A009301 EIM	-	December 24, 2018	December 31, 2019

Figure 95 Test Equipment Used

10. Emissions in Non-Restricted Frequency Bands

10.1 *Test Specification*

FCC, Part 15, Subpart C, Section 247(d)

10.2 *Test Procedure*

(Temperature (20°C)/ Humidity (62%RH))
The E.U.T. operation mode and test set-up are as described in Section 2 of this report.
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (max total loss=34.0 dB).
Special attention was taken to prevent Spectrum Analyzer RF input overload.
RBW was set to 100kHz, detector set to max peak and trace to "max hold".

10.3 *Test Limit*

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

10.4 *Test Results*

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 247(d) specification.

For additional information see *Figure 96* to *Figure 110.*

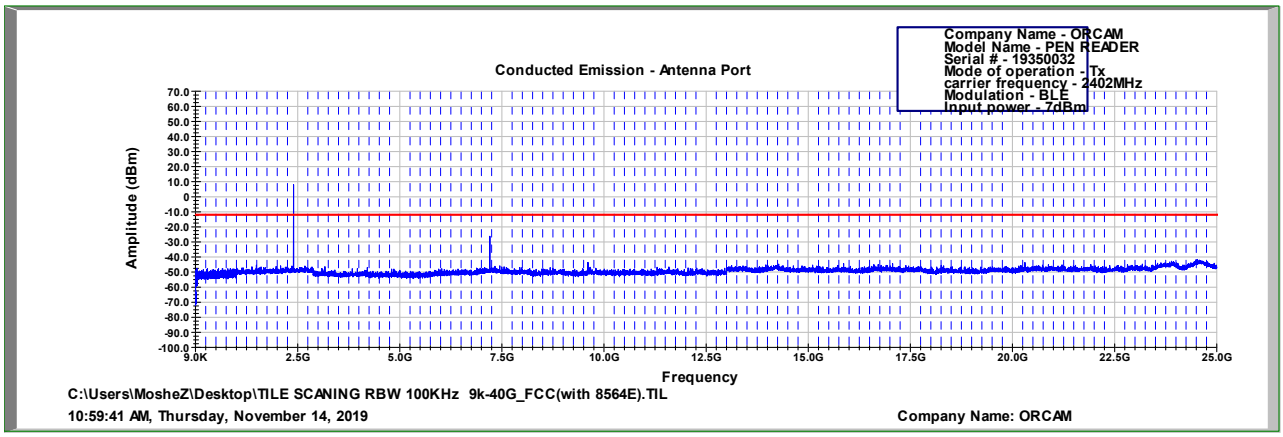

Figure 96 2402.0 MHz, BLE

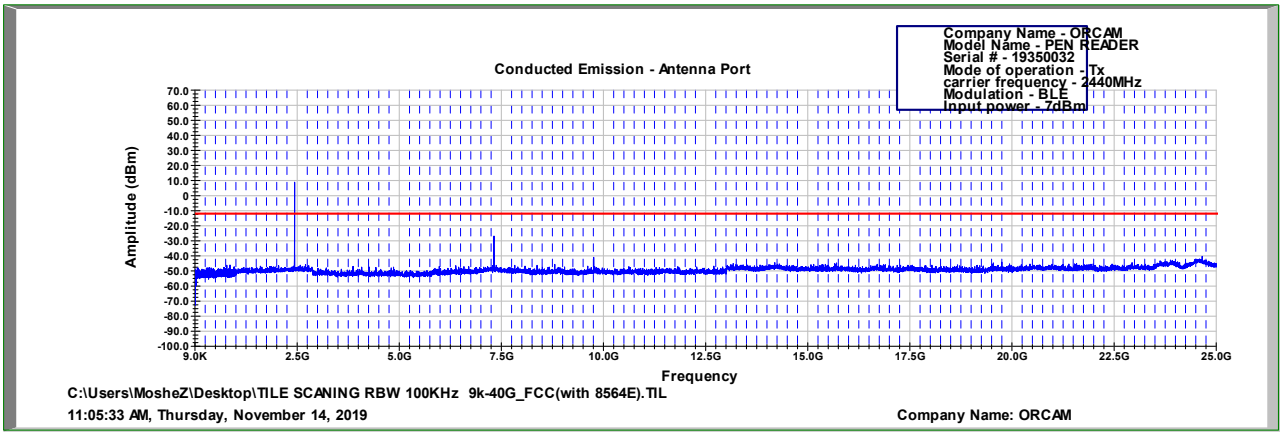

Figure 97 2440.0 MHz, BLE

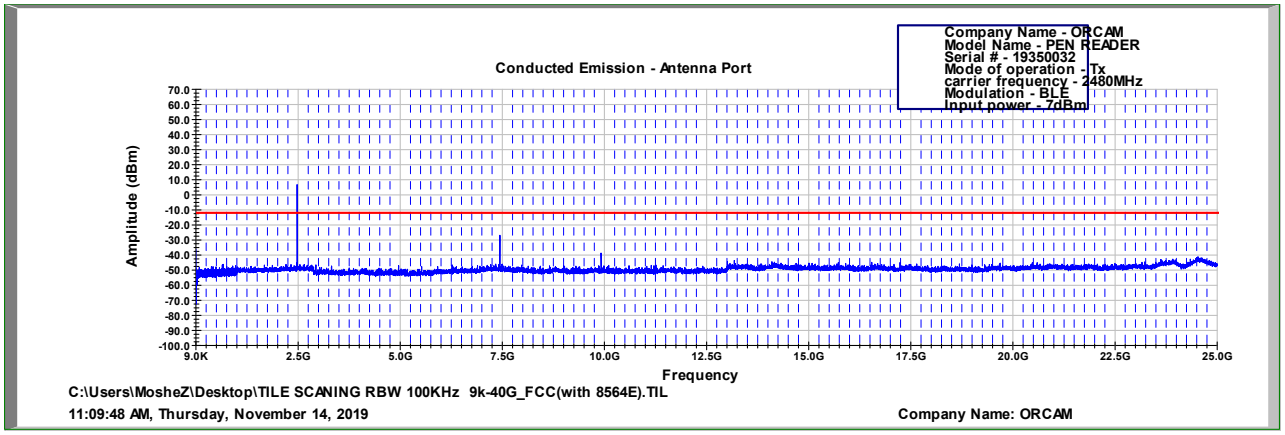

Figure 98 2480.0 MHz, BLE

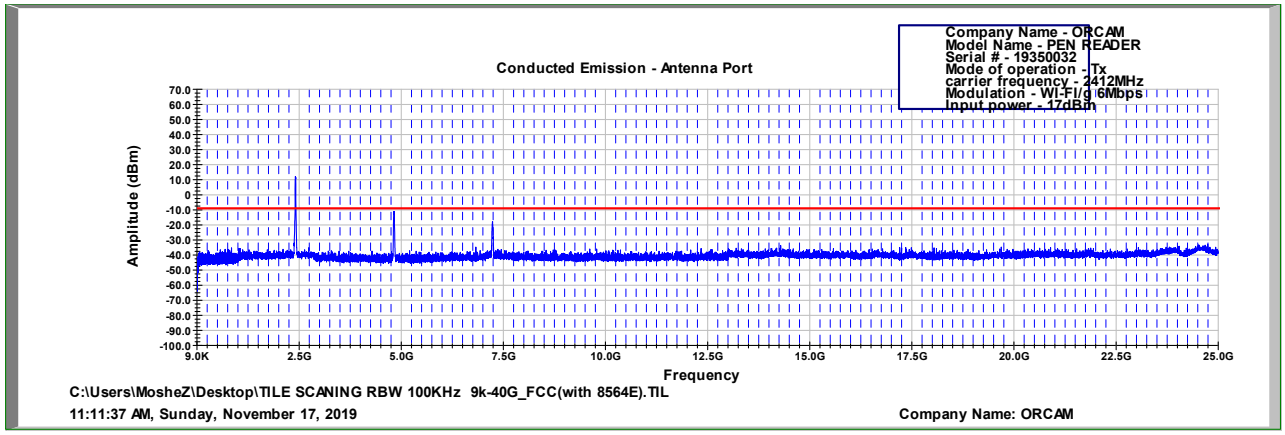

Figure 99 2412.0 MHz, WI-FI/g(6Mbit/s)

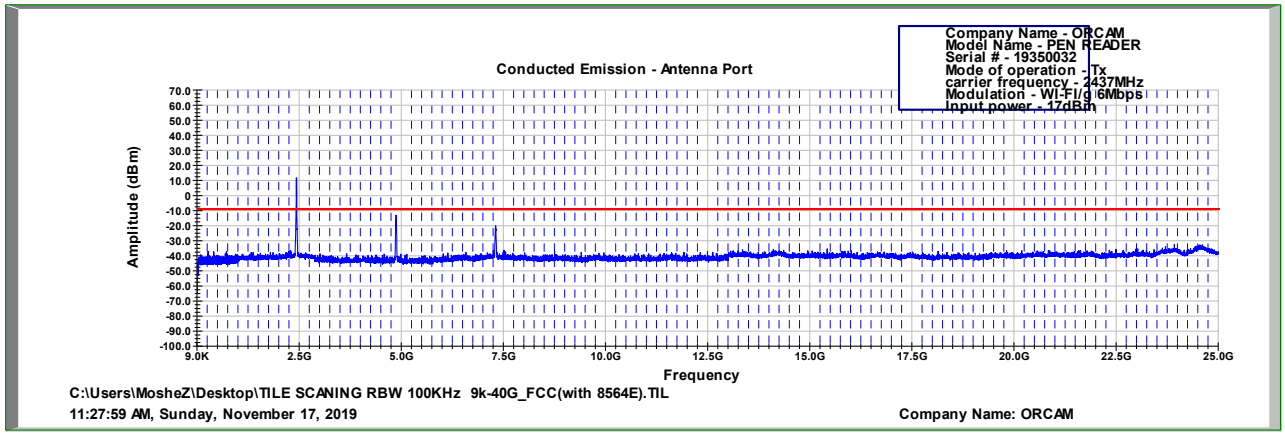

Figure 100 2437.0 MHz, WI-FI/g(6Mbit/s)

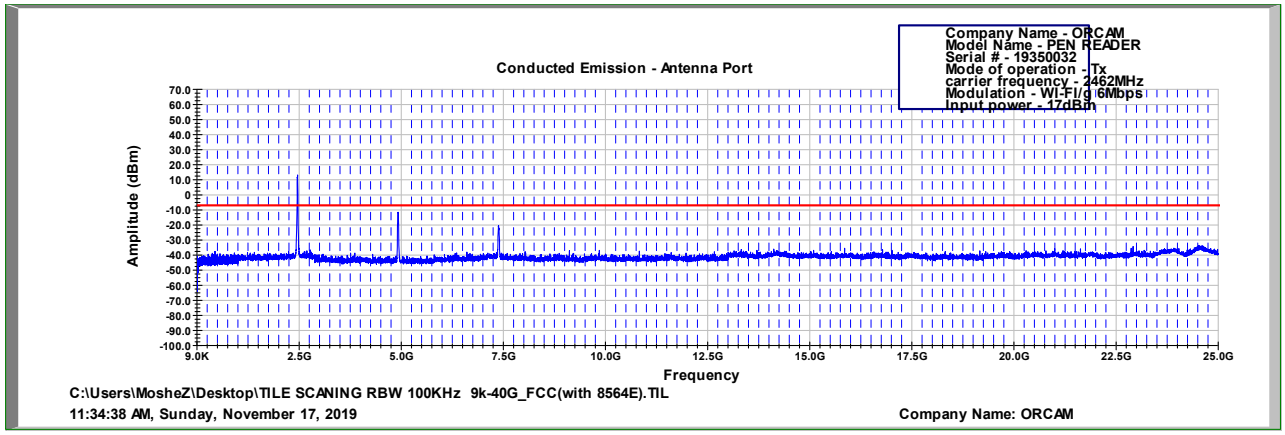

Figure 101 2462.0 MHz, WI-FI/g(6Mbit/s)

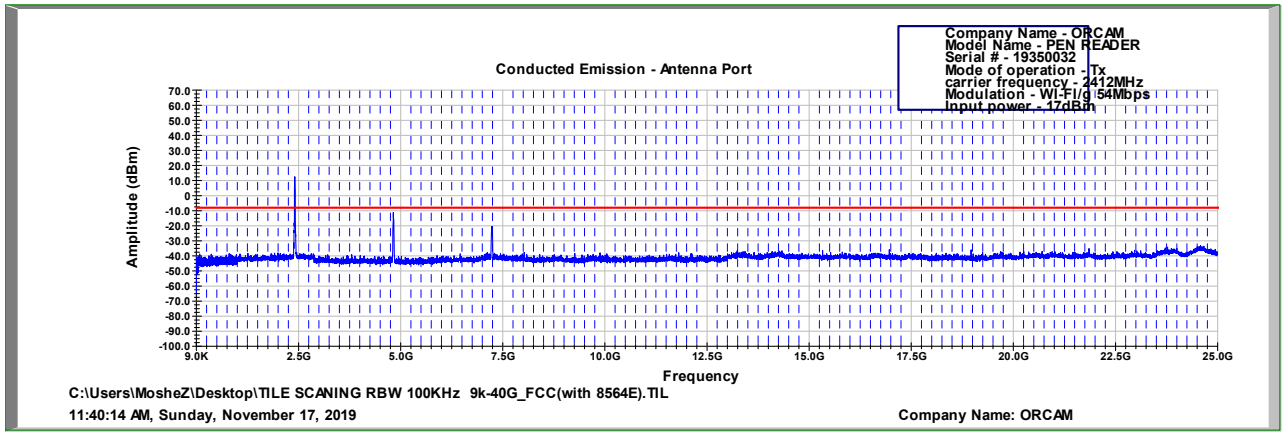

Figure 102 2412.0 MHz, WI-FI/g(54Mbit/s)

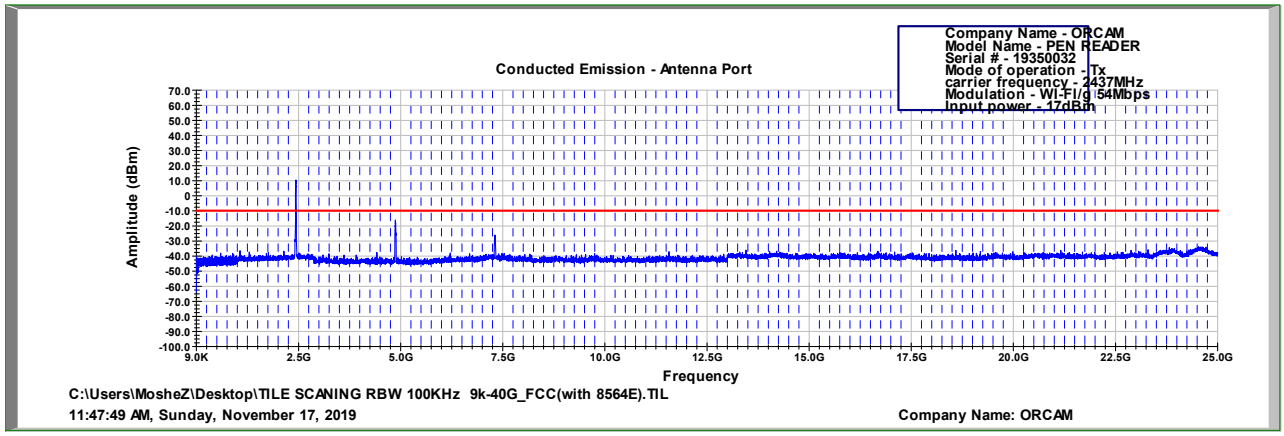

Figure 103 2437.0 MHz, WI-FI/g(54Mbit/s)

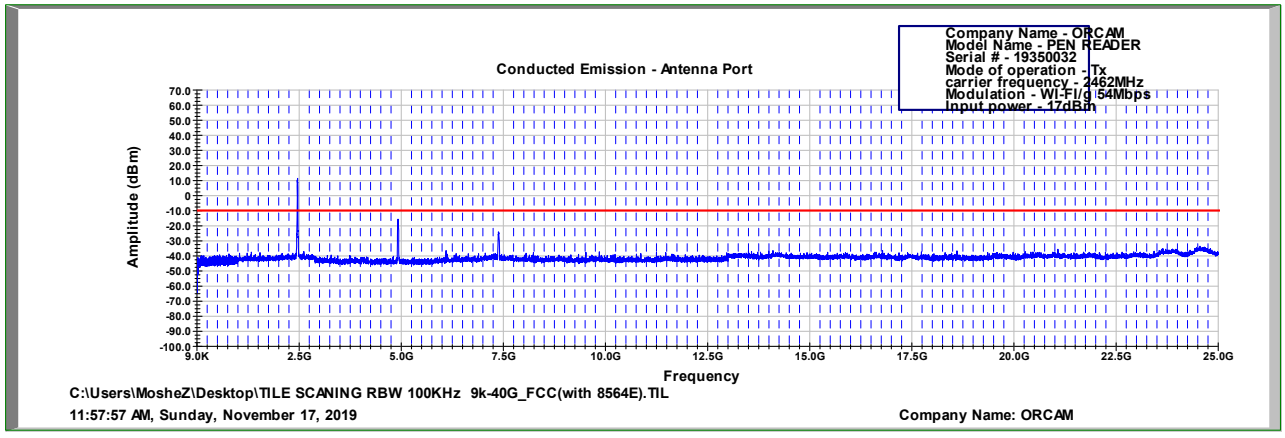

Figure 104 2462.0 MHz, WI-FI/g(54Mbit/s)

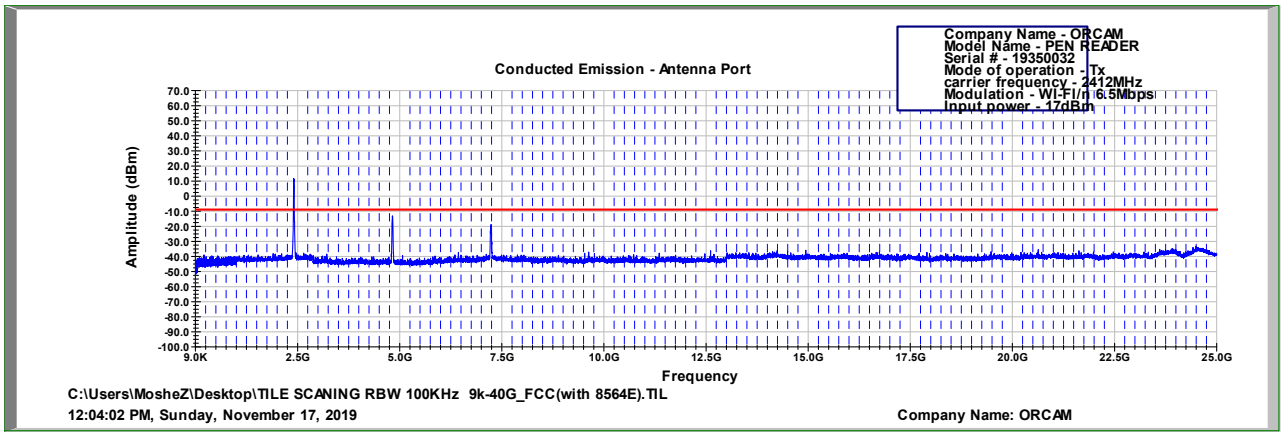

Figure 105 2412.0 MHz, WI-FI/n(6.5Mbit/s)

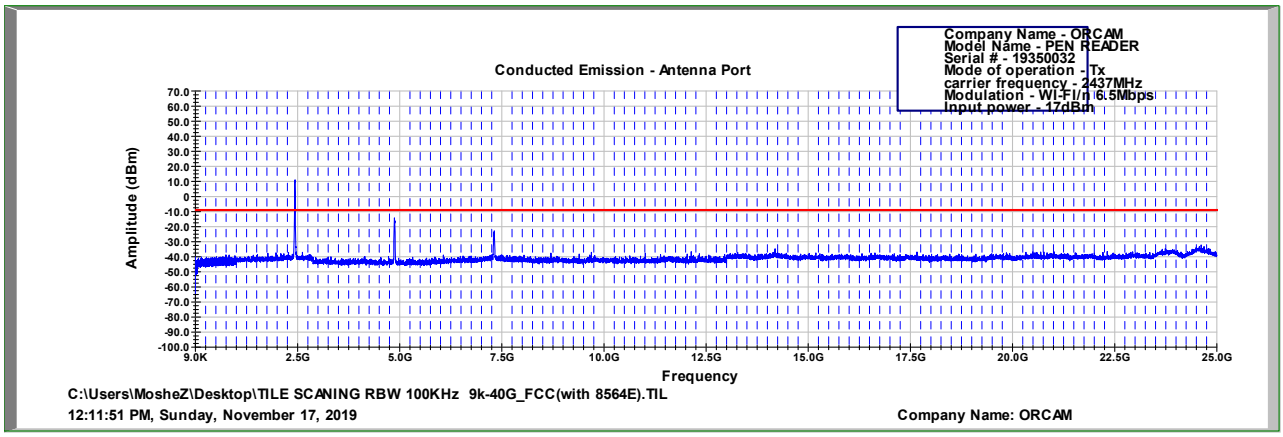

Figure 106 2437.0 MHz, WI-FI/n(6.5Mbit/s)

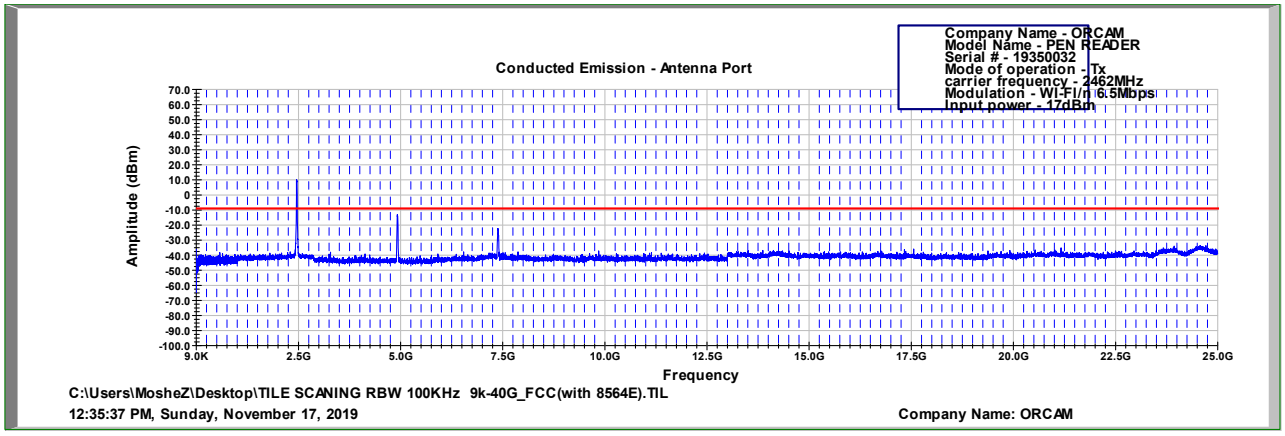

Figure 107 2462.0 MHz, WI-FI/n(6.5Mbit/s)

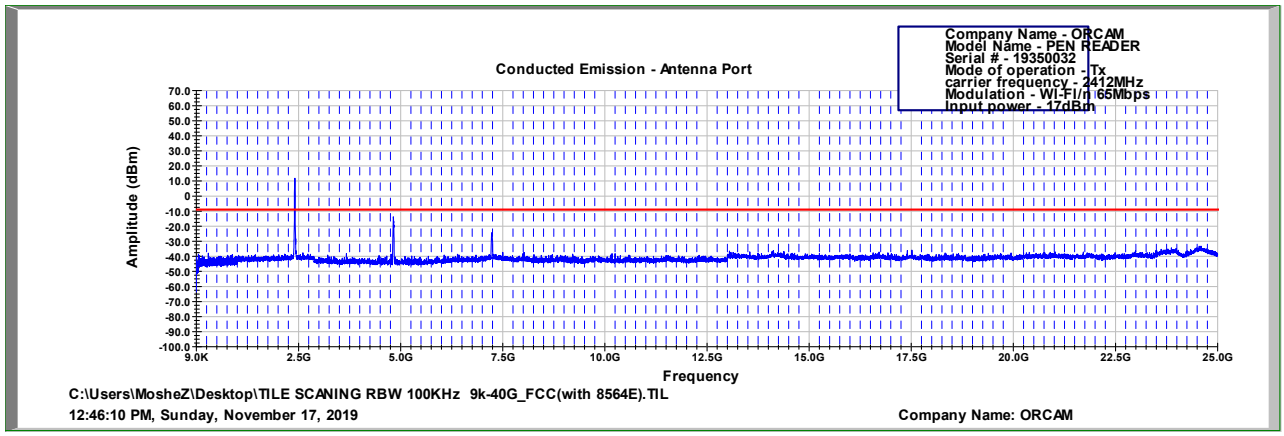

Figure 108 2412.0 MHz, WI-FI/n(65Mbit/s)

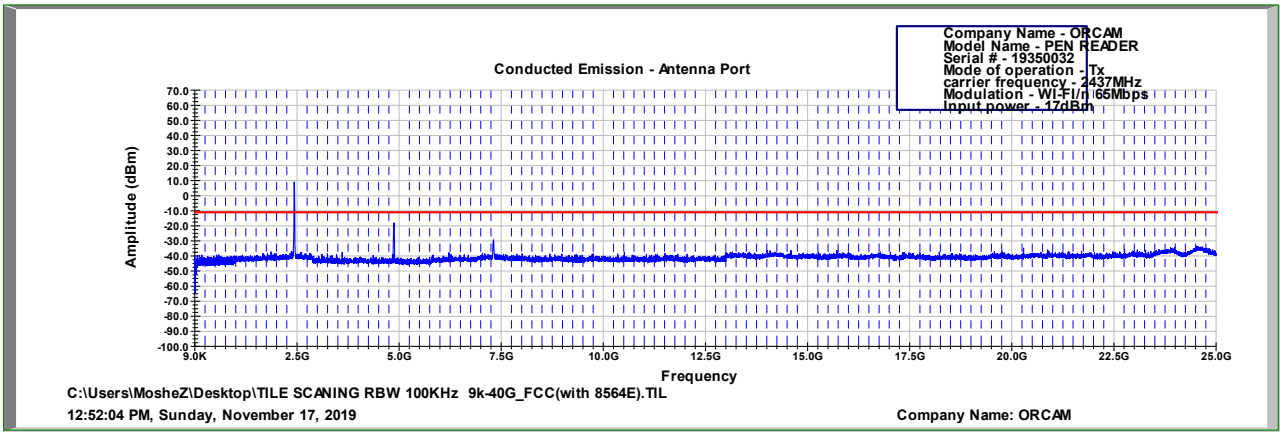

Figure 109 2437.0 MHz, WI-FI/n(65Mbit/s)

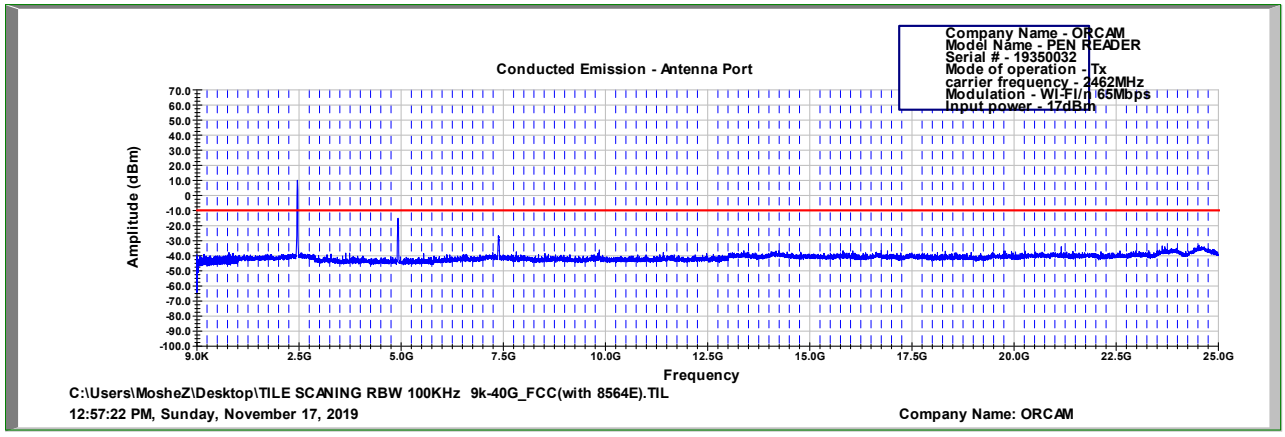

Figure 110 2462.0 MHz, WI-FI/n(65Mbit/s)

Note: All exceed peaks in plots are the fundamental transmission frequency.

10.5 *Test Instrumentation Used, Emissions in Non Restricted Frequency Bands*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	March 24, 2019	March 31, 2020
30dB Attenuator	MCL	BW-S30W5	533	December 24, 2018	December 31, 2019
RF Cable	Huber Suner	Sucofelex	27502/4PEA	December 24, 2018	December 31, 2019

Figure 111 Test Equipment Used

11. Emissions in Restricted Frequency Bands

11.1 *Test Specification*

FCC Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)

11.2 *Test Procedure*

(Temperature (21°C)/ Humidity (40%RH))
The E.U.T. operation mode and test set-up are as described in Section 2 of this report.

For measurements between 0.009-30MHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 0.009MHz-30MHz was scanned.

For measurements between 30-1000MHz:
A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. The frequency range 30MHz -1000MHz was scanned and the list of the highest emissions was verified and updated accordingly.

For measurements between 1GHz-25GHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 1.5 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 1GHz -25GHz was scanned.

Tests done for all “worst case”, each protocol type. The highest radiation describes in the tables below

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

11.3 *Test Limit*

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement distance (meters)	Field Strength* (dBµV/m)	Field Strength* (dBµV/m)@3m
0.009-0.490	2400/F(kHz)	300	48.5-13.8	128.5-73.8
0.490-1.705	24000/F(kHz)	30	33.8-23.0	73.8-63.0
1.705-30.0	30	30	29.5	69.5
30-88	100	3	40.0	40.0
88-216	150	3	43.5	43.5
216-960	200	3	46.0	46.0
Above 960	500	3	54.0	54.0

*The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

Figure 112 Table of Limits

11.4 *Test Results for BLE*

JUDGEMENT: Passed by 0.9 dB

For the operation frequency of 2402 MHz, the margin between the emission level and the specification limit is in the worst case -0.9 dB at the frequency of 7206.0 MHz, vertical polarization.

For the operation frequency of 2440 MHz, the margin between the emission level and the specification limit is in the worst case -2.1dB at the frequency of 7320.0 MHz, vertical polarization.

For the operation frequency of 2480 MHz, the margin between the emission level and the specification limit is in the worst case -3.7dB at the frequency of 7440.0 MHz, horizontal polarization.

The EUT met the requirements of the F.C.C. Part 15, Subpart C Sections 15.209, 15.205, 15.247(d) specifications.

The details of the highest emissions are given in *Figure 113.*

11.5 *Test Results for WiFi*

JUDGEMENT: Passed by 0.2 dB

For the operation frequency of 2412 MHz, the margin between the emission level and the specification limit is in the worst case -3.3 dB at the frequency of 4824.0 MHz, horizontal polarization.

For the operation frequency of 2437 MHz, the margin between the emission level and the specification limit is in the worst case -4.0dB at the frequency of 4874.0 MHz, horizontal polarization.

For the operation frequency of 2462 MHz, the margin between the emission level and the specification limit is in the worst case -0.2dB at the frequency of 2483.5 MHz, horizontal polarization.

The EUT met the requirements of the F.C.C. Part 15, Subpart C Sections 15.209, 15.205, 15.247(d) specifications.

The details of the highest emissions are given in *Figure 114* to *Figure 117.*

Radiated Emission

E.U.T Description	Portable, Pocket- Sized Smart Pen Scanner
Type	Orcam Read
Serial Number:	19350053

Specifications: FCC, Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)

Antenna Polarization: Horizontal/Vertical
Frequency Range: 9kHz to 25.0 GHz
Protocol Type: BLE
Detector: Peak, Average

Operation Frequency	Freq.	Pol	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
2402.0	2390.0	V	54.1	74.0	-19.9	46.3	54.0	-7.7
	2390.0	H	54.2	74.0	-19.8	46.3	54.0	-7.7
	7206.0	V	55.4	74.0	-18.6	47.8	54.0	-6.2
	7206.0	H	57.1	74.0	-16.9	48.5	54.0	-5.5
2440.0	4880.0	V	47.2	74.0	-26.8	-	54.0	-
	4880.0	H	47.8	74.0	-26.2	-	54.0	-
	7320.0	V	54.7	74.0	-19.3	45.7	54.0	-8.3
	7320.0	H	56.2	74.0	-17.8	47.8	54.0	-6.2
2480.0	7440.0	V	53.1	74.0	-20.9	-	54.0	-
	7440.0	H	55.0	74.0	-19.0	47.5	54.0	-6.5
	2483.5	V	63.7	74.0	-10.3	52.1	54.0	-1.9
	2483.5	H	66.3	74.0	-7.7	53.2	54.0	-0.8

Figure 113. Radiated Emission Results

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Peak Amp" includes correction factor.

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission

E.U.T Description Portable, Pocket- Sized Smart Pen Scanner
Type Orcam Read
Serial Number: 19350053

Specifications: FCC, Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)

Antenna Polarization: Horizontal/Vertical Frequency Range: 9kHz to 25.0 GHz
Protocol Type: WI-FI/g(6Mbps) Detector: Peak, Average

Operation Frequency	Freq.	Pol	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
2412.0	2390.0	V	60.4	74.0	-13.6	44.2	54.0	-9.8
	2390.0	H	61.1	74.0	-12.9	45.6	54.0	-8.4
	4824.0	V	60.9	74.0	-13.1	47.8	54.0	-6.2
	4824.0	H	63.4	74.0	-10.6	49.2	54.0	-4.8
2437.0	4874.0	V	61.5	74.0	-12.5	48.9	54.0	-5.1
	4874.0	H	63.0	74.0	-11	49.7	54.0	-4.3
	7311.0	V	50.4	74.0	-23.6	-	54.0	-
	7311.0	H	50.7	74.0	-23.3	-	54.0	-
2462.0	4924.0	V	60.2	74.0	-13.8	48.1	54.0	-5.9
	4924.0	H	64.6	74.0	-9.4	51.2	54.0	-2.8
	2483.5	V	65.0	74.0	-9.0	47.6	54.0	-6.4
	2483.5	H	73.7	74.0	-0.3	53.5	54.0	-0.5

Figure 114. Radiated Emission Results

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Peak Amp" includes correction factor.

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission

E.U.T Description Portable, Pocket- Sized Smart Pen Scanner
Type Orcam Read
Serial Number: 19350053

Specifications: FCC, Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)

Antenna Polarization: Horizontal/Vertical Frequency Range: 9kHz to 25.0 GHz
Protocol Type: WI-FI/g(54Mbps) Detector: Peak, Average

Operation Frequency	Freq.	Pol	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
2412.0	2390.0	V	51.0	74.0	-23.0	41.2	54.0	-12.8
	2390.0	H	51.3	74.0	-22.7	42.0	54.0	-12.0
	4824.0	V	57.3	74.0	-16.7	49.9	54.0	-4.1
	4824.0	H	58.6	74.0	-15.4	50.7	54.0	-3.3
2437.0	4874.0	V	61.8	74.0	-12.2	49.2	54.0	-4.8
	4874.0	H	62.6	74.0	-11.4	50.0	54.0	-4.0
	7311.0	V	50.0	74.0	-24.0	-	54.0	-
	7311.0	H	50.2	74.0	-23.8	-	54.0	-
2462.0	4924.0	V	60.8	74.0	-13.2	49.7	54.0	-4.3
	4924.0	H	63.5	74.0	-10.5	50.6	54.0	-3.4
	2483.5	V	66.4	74.0	-7.6	46.4	54.0	-7.6
	2483.5	H	73.8	74.0	-0.2	52.5	54.0	-1.5

Figure 115. Radiated Emission Results

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Peak Amp" includes correction factor.

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission

E.U.T Description Portable, Pocket- Sized Smart Pen Scanner
Type Orcam Read
Serial Number: 19350053

Specifications: FCC, Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)

Antenna Polarization: Horizontal/Vertical Frequency Range: 9kHz to 25.0 GHz
Protocol Type: WI-FI/n(6.5Mbps) Detector: Peak, Average

Operation Frequency	Freq.	Pol	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
2412.0	2390.0	V	53.0	74.0	-21.0	41.0	54.0	-13.0
	2390.0	H	54.3	74.0	-19.7	41.2	54.0	-12.8
	4824.0	V	60.1	74.0	-13.9	46.4	54.0	-7.6
	4824.0	H	62.3	74.0	-11.7	47.2	54.0	-6.8
2437.0	4874.0	V	60.8	74.0	-13.2	47.0	54.0	-7.0
	4874.0	H	64.1	74.0	-9.9	48.3	54.0	-5.7
	7311.0	V	50.5	74.0	-23.5	-	54.0	-
	7311.0	H	50.4	74.0	-23.6	-	54.0	-
2462.0	4924.0	V	59.9	74.0	-14.1	46.8	54.0	-7.2
	4924.0	H	65.1	74.0	-8.9	49.2	54.0	-4.8
	2483.5	V	65.7	74.0	-8.3	48.1	54.0	-5.9
	2483.5	H	73.7	74.0	-0.3	53.8	54.0	-0.2

Figure 116. Radiated Emission Results

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Peak Amp" includes correction factor.

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission

E.U.T Description Portable, Pocket- Sized Smart Pen Scanner
Type Orcam Read
Serial Number: 19350053

Specifications: FCC, Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)

Antenna Polarization: Horizontal/Vertical Frequency Range: 9kHz to 25.0 GHz
Protocol Type: WI-FI/n(65Mbps) Detector: Peak, Average

Operation Frequency	Freq.	Pol	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
2412.0	2390.0	V	52.9	74.0	-21.1	40.7	54.0	-13.3
	2390.0	H	53.1	74.0	-20.9	40.7	54.0	-13.3
	4824.0	V	60.8	74.0	-13.2	46.5	54.0	-7.5
	4824.0	H	62.0	74.0	-12.0	47.0	54.0	-7.0
2437.0	4874.0	V	60.0	74.0	-14.0	47.1	54.0	-6.9
	4874.0	H	63.6	74.0	-10.4	49.1	54.0	-4.9
	7311.0	V	50.1	74.0	-23.9	-	54.0	-
	7311.0	H	50.7	74.0	-23.3	-	54.0	-
2462.0	4924.0	V	61.2	74.0	-12.8	49.2	54.0	-4.8
	4924.0	H	65.4	74.0	-8.6	50.0	54.0	-4.0
	2483.5	V	65.7	74.0	-8.3	47.3	54.0	-6.7
	2483.5	H	70.9	74.0	-3.1	52.1	54.0	-1.9

Figure 117. Radiated Emission Results

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Peak Amp" includes correction factor.

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

11.6 *Test Instrumentation Used; Emissions in Restricted Frequency Bands*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 27, 2019	February 28, 2020
EMI Receiver	HP	8542E	3906A00276	February 28, 2019	February 28, 2020
RF Filter Section	HP	85420E	3705A00248	February 28, 2019	February 28, 2020
Spectrum Analyzer	HP	8593EM	3536A00120 ADI	February 26, 2019	February 280, 2020
Active Loop Antenna	EMCO	6502	9506-2950	February 5, 2019	February 28, 2020
Biconical Antenna	EMCO	3110B	9912-3337	May 21, 2019	May 31, 2021
Log Periodic Antenna	EMCO	3146	9505-4081	May 31, 2018	May 31, 2020
Horn Antenna	ETS	3115	29845	May 31, 2018	May 31, 2021
Horn Antenna	ARA	SWH-28	1007	December 31, 2017	December 31, 2020
MicroWave System Amplifier	HP	83006A	3104A00589	December 24, 2018	December 31, 2019
Low Noise Amplifier 1GHz-18GHz	Miteq	AFSX4-02001800-50-8P	-	December 24, 2018	December 31, 2019
RF Cable Chamber	Commscope ORS	0623 WBC-400	G020132	December 24, 2018	December 31, 2019
RF Cable Oats	EIM	RG214-11N(X2)		May 26, 2019	May 31, 2020
Filter Band Pass 4-20 GHz	Meuro	MFL040120H50	902252	December 24, 2018	December 24, 2019
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR
Antenna Mast	ETS	2070-2	9608-1497	NCR	NCR
Turntable	ETS	2087	-	NCR	NCR
Mast & Table Controller	ETS/EMCO	2090	9608-1456	NCR	NCR

Figure 118 Test Equipment Used

12. Antenna Gain/Information

The antenna gain is -0.87dBi, PCB printed type

13. R.F Exposure/Safety

Typical use of the E.U.T. is as a wearable device.

The typical distance between the E.U.T. and the user is 0.4 cm.

SAR Testing Exclusion Based on Section 4.3.1 and Appendix A of KDB 447498 D01 V06 Requirements

For FCC

Section 4.3.1 and Appendix A of KDB447498 D01 V06 was used as the guidance as follows:

Conducted power output = 15.6dBm

duty cycle factor = 10log(0.1)=-10dB (See customer declaration on following page)

EIRP = 15.6 - 10= 5.6dBm = 3.63mW

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *· [√f(GHz)]

=3.63/4 * 1.55=1.41 this value is less than 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR.

The SAR measurement is not necessary.

ORCAM

Date:12.15.19

DECLARATION

I hereby declare that E.U.T – (Equipment Under Test)

OrCam Read

Maximum duty cycle is 10% while using WIFI for firmware update.
Current ratio of transmitted to received packets is 2.5%

Thank you,

Signature: _____
Printed Name: Dmitry Babukh
Title: Hardware engineer

14. APPENDIX A - CORRECTION FACTORS

14.1 *Correction factors for RF OATS Cable 35m ITL #1911*

Frequency (MHz)	loss (dB)
30.0	1.3
50.0	1.7
100.0	2.6
200.0	3.7
300.0	4.7
400.0	5.5
500.0	6.3
600.0	7.0
700.0	7.6
800.0	8.4
900.0	9.0
1000.0	9.6

14.2 *Correction factor for RF CABLE for Semi Anechoic Chamber ITL # 1840*

FREQ (MHz)	LOSS (dB)
1000.0	1.5
2000.0	2.1
3000.0	2.7
4000.0	3.1
5000.0	3.5
6000.0	4.1
7000.0	4.6
8000.0	4.9
9000.0	5.7
10000.0	5.7
11000.0	6.1
12000.0	6.1
13000.0	6.2
14000.0	6.7
15000.0	7.4
16000.0	7.5
17000.0	7.9
18000.0	8.1
19000.0	8.8
20000.0	9.1

14.3 *Correction factors for Active Loop Antenna ITL # 1075:*

f(MHz)	AF(dB/m)
0.01	18.4
0.02	14.3
0.03	13.3
0.05	11.7
0.1	11.4
0.2	11.2
0.3	11.2
0.5	11.2
0.7	11.2
1	11.4
2	11.5
3	11.5
4	11.4
5	11.3
6	11.1
7	11.1
8	11.1
9	11
10	11
20	10
30	8

14.4 *Correction factors for biconical antenna ITL # 1356*

Frequency [MHz]	AF [dB/m]
30	13.00
35	10.89
40	10.59
45	10.63
50	10.12
60	9.26
70	7.74
80	6.63
90	8.23
100	11.12
120	13.16
140	13.07
160	14.80
180	16.95
200	17.17

14.5 *Correction factors for log periodic antenna ITL # 1349*

Frequency [MHz]	AF [dB/m]
200	11.58
250	12.04
300	14.76
400	15.55
500	17.85
600	18.66
700	20.87
800	21.15
900	22.32
1000	24.22

14.6 *Correction factors for Double –Ridged Waveguide Horn ANTENNA ITL # 1352*

FREQUENCY (GHz)	AFE (dB/m)	FREQUENCY (GHz)	AFE (dB/m)
0.75	25	9.5	38
1.0	23.5	10.0	38.5
1.5	26.0	10.5	38.5
2.0	29.0	11.0	38.5
2.5	27.5	11.5	38.5
3.0	30.0	12.0	38.0
3.5	31.5	12.5	38.5
4.0	32.5	13.0	40.0
4.5	32.5	13.5	41.0
5.0	33.0	14.0	40.0
5.5	35.0	14.5	39.0
6.0	36.5	15.0	38.0
6.5	36.5	15.5	37.5
7.0	37.5	16.0	37.5
7.5	37.5	16.5	39.0
8.0	37.5	17.0	40.0
8.5	38.0	17.5	42.0
9.0	37.5	18.0	42.5

14.7 *Correction factors for Horn Antenna ITL #:1353*

CALIBRATION DATA

3 m distance

Frequency, MHz	Measured antenna factor, dB/m [1]
18000	32.4
18500	32.0
19000	32.3
19500	32.4
20000	32.3
20500	32.8
21000	32.8
21500	32.7
22000	33.1
22500	33.0
23000	33.1
23500	33.8
24000	33.5
24500	33.5
25000	33.8
25500	33.9
26000	34.2
26500	34.7

[1] The antenna factor shall be added to receiver reading in dBµV to obtain field strength in dBµV/m.