RHEIN TECH LABORATORIES, INC.

Engineering Solutions & Electromagnetic Compatibility Services

Class 2 Permissive Change

Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501

Model: XL-200P (International)

FCC ID: OWDTR-0145-E
IC: 3636B-0145

August 21, 2019

Standards Referenced for this Report	
Part 2: 2018	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 15B: 2018	Radio Frequency Devices
Part 22: 2018	Public Mobile Services
Part 74: 2018	Experimental Radio, Auxiliary, Special Broadcast And Other Program Distributional Services
Part 80: 2018	Stations In The Maritime Services
Part 90: 2018	Private Land Portable Radio Services
ANSI C63.26-2017	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
RSS-119 Issue 12	Land Mobile and Fixed Radio Transmitters and Receivers 27.41 to 960.0 MHz
ICES-003 Issue 6	Information Technology Equipment (Including Digital Apparatus) — Limits and Methods of Measurement

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These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANAB.
Refer to certificate and scope of accreditation AT-1445.

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1 General Information

The following Class 2 Permissive Change Report is prepared on behalf of **Harris Corporation** in accordance with the FCC and ISED rules and regulations. The Equipment Under Test (EUT) was the **XL-200P (International).**

All measurements contained in this application were conducted in accordance with the applicable sections of FCC Rules and Regulations CFR 47 Parts 2, 15, 22, 74, 80 and 90, and ISED RSS-119. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.1 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report submitted to, and approved by, the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

1.2 Related Submittal(s)/Grant(s)

This is a Class 2 Permissive Change Report based on a change to a SKU reduction.

The original FCC and ISED certifications were granted March 3 and March 7, 2016 respectively. Two additional models were approved November 20, 2017. Two emission designators were added to the FCC and ISED certifications on January 23, 2019 and January 8, 2019 respectively.

The Harris model numbers currently included in this ISED family certification are:

XL-PFM2M	XL-PFM2Y	XL-PFM2B	XL-PFM2G	XL-PFM2P
XL-PPM2M	XL-PPM2Y	XL-PPM2B	XL-PPM2G	XL-PPM2P

2 Tested System Details

The test sample was received on June 3, 2019. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

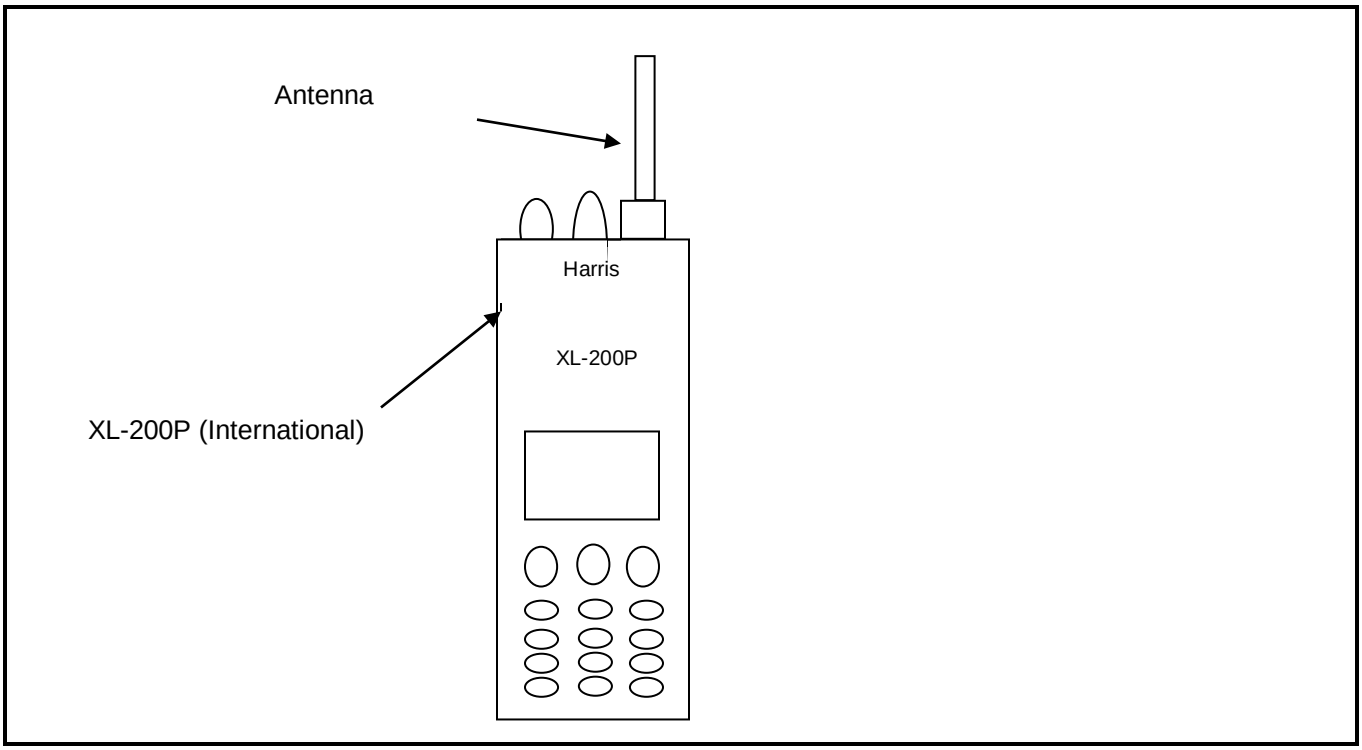
Table 2-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	RTL Bar Code
Radio	Harris Corporation	XL-200P	A40302201644RW	OWDTR-0145-E	23254
Radio	Harris Corporation	XL-200P	A40302201045RW	OWDTR-0145-E	23253
Antenna Full Spectrum LMR	Harris Corporation	14035-4000-01	N/A	N/A	23108

Table 2-2: Auxiliary Equipment

Part	Manufacturer	Model	Part Number	FCC ID	RTL Bar Code
Li-Ion Rechargeable Battery	Harris Corporation	14035-4010 rev	009833	N/A	23103
Li-Ion Rechargeable Battery	Harris Corporation	14035-4010-05 rev	001897	N/A	23104

Figure 2-1: Configuration of Tested System



2.1 EUT Exercise Description

The EUT was supplied with the ability to change LMR, LTE, Bluetooth, and Wi-Fi frequencies for testing radiated emissions and collocation of various frequencies. The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that information was being transmitted. There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested.

The EUT was configured for testing in a manner simulating a typical end-user configuration. All circuitry, clocks, and oscillators were powered, and all functions were active. Applicable I/O ports to be cabled or loaded included Ethernet and data programming cables. For testing purposes, the EUT was programmed using a generic programming board.

2.2 Test Result Summary

Table 2-3: Test Result Summary – FCC Part 15 Subpart C

Test	FCC Reference	Result
Collocation Radiated Emissions	FCC 15.209	Pass

3 FCC Part 2.1053(a): Field Strength of Spurious Radiation; Part 90.543: Out of Band Emissions Limit; RSS-Gen 6.13: Transmitter Unwanted Emissions

3.1 Test Procedure

ANSI 63.26, section 5.5.

The device uses digital modulation modulated to its maximum extent using a pseudo-random data sequence.

The spurious emissions levels were measured, and the device under test was replaced by a substitution antenna connected to a signal generator. This signal generator level was then corrected by subtracting the cable loss from the substitution antenna to the signal generator, and the gain of the antenna (dBi) was added to achieve the EIRP level, then converted from the corrected signal generator level (dBm) to dBc, and compared to the limit.

For emissions in the 1559-1610 band, Part 90.543(f) states: "For operations in the 763–775 MHz and 793–805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation."

3.2 Test Data

Table 3-1: Field Strength of Spurious Radiation – 136.000 MHz

Conducted Power 37.8 dBm; 6 W; Limit=50+10LogP=57.8 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
272.000	51.8	-27.9	0.2	-0.5	66.4	-8.6
408.000	55.4	-25.5	0.2	-0.4	63.8	-6.0
544.000	38.0	-42.0	0.2	-0.7	80.7	-22.9
680.000	36.9	-42.8	0.2	-0.9	81.7	-23.9
816.000	30.0	-41.8	0.2	-1.5	81.3	-23.5
952.000	20.6	-54.1	0.2	-0.9	93.0	-35.2
1088.000	15.1	-61.5	0.2	2.6	96.9	-39.1
1224.000	14.1	-61.5	0.2	4.2	95.3	-37.5
1360.000	10.3	-64.6	0.3	4.7	97.9	-40.1

Table 3-2: Field Strength of Spurious Radiation – 138.000 MHz

Conducted Power 37.9 dBm; 6.2 W; Limit=50+10LogP=57.9 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
276.000	57.9	-23.7	0.2	-0.5	62.3	-4.4
414.000	55.0	-24.7	0.2	-0.4	63.2	-5.3
552.000	35.5	-43.5	0.2	-0.7	82.4	-24.5
690.000	34.5	-44.5	0.2	-0.9	83.5	-25.6
828.000	22.6	-52.0	0.2	-1.4	91.5	-33.6
966.000	23.3	-50.4	0.2	-0.9	89.4	-31.5
1104.000	36.5	-39.0	0.2	3.0	74.1	-16.2
1242.000	16.9	-58.5	0.2	4.3	92.3	-34.4
1380.000	6.5	-67.6	0.3	4.8	101.0	-43.1

Table 3-3: Field Strength of Spurious Radiation – 141.000 MHz

Conducted Power 38.2 dBm; 6.6 W; Limit=50+10LogP=58.2 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
282.000	50.3	-31.3	0.2	-0.6	70.3	-12.1
423.000	50.5	-28.8	0.2	-0.4	67.6	-9.4
564.000	37.2	-43.1	0.2	-0.8	82.3	-24.1
705.000	43.2	-35.7	0.2	-1.0	75.1	-16.9
846.000	33.0	-45.6	0.2	-1.4	85.4	-27.2
987.000	20.7	-53.3	0.2	-0.7	92.5	-34.3
1128.000	19.9	-55.9	0.2	3.3	91.1	-32.9
1269.000	12.5	-62.9	0.3	4.5	96.9	-38.7
1410.000	8.3	-67.2	0.3	4.9	100.8	-42.6

Table 3-4: Field Strength of Spurious Radiation – 144.000 MHz

Conducted Power 38.3 d8Bm; 6 W; Limit=50+10LogP=58.3 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
288.000	53.2	-28.7	0.2	-0.6	67.8	-9.5
432.000	45.6	-34.0	0.2	-0.4	73.0	-14.7
576.000	23.2	-53.8	0.2	-0.8	93.2	-34.9
720.000	35.7	-41.3	0.2	-1.0	80.9	-22.6
864.000	18.5	-55.2	0.2	-1.4	95.1	-36.8
1008.000	21.6	-53.9	0.2	0.2	92.2	-33.9
1152.000	7.4	-68.1	0.2	3.6	103.0	-44.7
1296.000	14.9	-60.0	0.3	4.6	94.0	-35.7
1440.000	4.5	-69.2	0.3	5.1	102.7	-44.4

Table 3-5: Field Strength of Spurious Radiation – 148.000 MHz

Conducted Power 38.3 d8Bm; 6 W; Limit=50+10LogP=58.3 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
296.000	45.3	-35.5	0.2	-0.7	74.7	-16.4
444.000	52.8	-29.7	0.2	-0.4	68.7	-10.4
592.000	36.6	-43.7	0.2	-0.8	83.0	-24.7
740.000	34.2	-45.6	0.2	-1.2	85.3	-27.0
888.000	17.8	-56.1	0.2	-1.3	95.9	-37.6
1036.000	17.7	-56.7	0.2	1.1	94.2	-35.9
1184.000	22.1	-54.0	0.2	3.9	88.6	-30.3
1332.000	4.4	-71.0	0.3	4.7	104.8	-46.5
1480.000	7.5	-67.2	0.3	5.3	100.4	-42.1

Table 3-6: Field Strength of Spurious Radiation – 150.000 MHz

Conducted Power 38.3 d8Bm; 6 W; Limit=50+10LogP=58.3 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
300.000	46.6	-33.3	0.2	-0.7	72.6	-14.3
450.000	43.8	-36.1	0.2	-0.4	75.0	-16.7
600.000	9.0	-68.5	0.2	-0.8	107.8	-49.5
750.000	17.8	-59.2	0.2	-1.2	99.0	-40.7
900.000	3.7	-72.4	0.2	-1.2	112.2	-53.9
1050.000	2.5	-73.6	0.2	1.5	110.7	-52.4
1200.000	-2.0	-77.9	0.2	4.1	112.3	-54.0
1350.000	-5.7	-80.8	0.3	4.7	114.6	-56.3
1500.000	-10.0	-83.6	0.3	5.5	116.6	-58.3

Table 3-7: Field Strength of Spurious Radiation – 156.800 MHz

Conducted Power 38.2 dBm; 6.6 W; Limit=50+10LogP=58.2 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
313.600	51.0	-31.2	0.2	-0.6	70.3	-12.1
470.400	49.4	-32.4	0.2	-0.5	71.4	-13.2
627.200	31.5	-44.4	0.2	-0.8	83.6	-25.4
784.000	37.4	-42.0	0.2	-1.4	81.9	-23.7
940.800	14.0	-60.8	0.2	-1.0	100.2	-42.0
1097.600	16.7	-59.5	0.2	2.9	95.1	-36.9
1254.400	7.0	-68.5	0.2	4.4	102.6	-44.4
1411.200	14.7	-59.9	0.3	4.9	93.5	-35.3
1568.000	-3.0	-77.2	0.3	6.4	109.3	-51.1

Table 3-8: Field Strength of Spurious Radiation – 162.000 MHz

Conducted Power 38.1 dBm; 6.5 W; Limit=50+10LogP=58.1 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
324.000	58.1	-24.6	0.2	-0.6	63.5	-5.4
486.000	52.3	-29.6	0.2	-0.6	68.5	-10.4
648.000	24.5	-51.7	0.2	-0.8	90.9	-32.8
810.000	35.0	-40.4	0.2	-1.5	80.2	-22.1
972.000	8.0	-65.3	0.2	-0.9	104.5	-46.4
1134.000	17.7	-58.1	0.2	3.4	93.1	-35.0
1296.000	1.2	-73.6	0.3	4.6	107.4	-49.3
1458.000	17.1	-56.7	0.3	5.2	89.8	-31.7
1620.000	1.0	-73.5	0.3	6.9	105.0	-46.9

Table 3-9: Field Strength of Spurious Radiation – 174.000 MHz

Conducted Power 38.3 dBm; 6.8 W; Limit=50+10LogP=58.3dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
348.000	47.9	-35.0	0.2	-0.5	74.0	-15.7
522.000	47.4	-33.0	0.2	-0.6	72.2	-13.9
696.000	46.0	-33.0	0.2	-0.9	72.4	-14.1
870.000	21.9	-52.4	0.2	-1.4	92.3	-34.0
1044.000	9.2	-66.8	0.2	1.3	104.1	-45.8
1218.000	11.6	-63.9	0.2	4.2	98.3	-40.0
1392.000	-8.7	-82.6	0.3	4.8	116.4	-58.1
1566.000	3.3	-70.9	0.3	6.3	103.1	-44.8
1740.000	13.0	-62.2	0.3	7.4	93.4	-35.1

Table 3-10: Field Strength of Spurious Radiation – 406.1000 MHz

Conducted Power 37.4 dBm; 5.5 W; Limit=50+10LogP=57.4 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
812.2000	46.5	-31.7	0.2	-1.5	70.8	-13.4
1218.3000	37.9	-36.9	0.2	6.9	67.6	-10.2
1624.4000	10.7	-63.8	0.3	8.8	92.6	-35.2
2030.5000	14.6	-59.6	0.3	8.8	88.5	-31.1
2436.6000	11.8	-62.2	0.3	0.0	99.9	-42.5
2842.7000	4.2	-70.5	0.3	10.0	98.2	-40.8
3248.8000	2.9	-71.8	0.3	9.2	100.3	-42.9
3654.9000	10.6	-62.9	0.3	9.5	91.2	-33.8
4061.0000	-7.3	-78.2	0.4	10.0	106.0	-48.6

Table 3-11: Field Strength of Spurious Radiation – 418.0125 MHz

Conducted Power 37.3 dBm; 5.4 W; Limit=50+10LogP=57.3 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
836.0250	39.8	-38.3	0.2	-1.4	77.3	-20.0
1254.0375	30.6	-44.9	0.2	7.1	75.4	-18.1
1672.0500	-3.2	-78.3	0.3	8.6	107.3	-50.0
2090.0625	15.1	-60.0	0.3	8.5	89.1	-31.8
2508.0750	-13.6	-87.6	0.3	9.5	115.7	-58.4
2926.0875	-7.7	-81.5	0.3	0.0	119.2	-61.9
3344.1000	-4.6	-78.3	0.3	9.4	106.5	-49.2
3762.1125	2.4	-72.1	0.3	9.2	100.5	-43.2
4180.1250	-7.0	-78.0	0.4	10.5	105.2	-47.9

Table 3-12: Field Strength of Spurious Radiation – 429.9875 MHz

Conducted Power 37.3 dBm; 5.4 W; Limit=50+10LogP=57.3 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
859.9750	43.9	-33.7	0.2	-1.4	72.6	-15.3
1289.9625	29.6	-45.3	0.3	7.2	75.6	-18.3
1719.9500	4.5	-69.9	0.3	8.6	98.8	-41.5
2149.9375	25.7	-49.0	0.3	8.7	77.8	-20.5
2579.9250	9.0	-65.0	0.3	9.6	93.0	-35.7
3009.9125	-1.8	-76.6	0.3	0.0	114.2	-56.9
3439.9000	3.8	-69.8	0.3	9.7	97.8	-40.5
3869.8875	6.4	-67.9	0.3	9.1	96.4	-39.1
4299.8750	10.9	-60.2	0.4	10.9	87.0	-29.7

Table 3-13: Field Strength of Spurious Radiation – 450.0125 MHz

Conducted Power 37.4 dBm; 5.5 W; Limit=50+10LogP=57.4 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
900.0250	40.6	-35.5	0.2	-1.2	74.4	-17.0
1350.0375	36.0	-39.1	0.3	7.7	69.0	-11.6
1800.0500	20.5	-53.8	0.3	8.8	82.7	-25.3
2250.0625	27.9	-47.1	0.3	9.2	75.6	-18.2
2700.0750	14.1	-59.8	0.3	0.0	97.5	-40.1
3150.0875	20.7	-54.0	0.3	9.2	82.5	-25.1
3600.1000	6.5	-67.1	0.3	9.7	95.1	-37.7
4050.1125	4.9	-66.0	0.4	9.9	93.9	-36.5
4500.1250	0.7	-70.6	0.4	11.0	97.4	-40.0

Table 3-14: Field Strength of Spurious Radiation – 459.9750 MHz

Conducted Power 37.3 dBm; 5.4 W; Limit=50+10LogP=57.3 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
919.9500	52.0	-22.2	0.2	-1.2	60.9	-3.6
1379.9250	33.9	-40.2	0.3	7.9	69.8	-12.5
1839.9000	6.3	-68.0	0.3	8.6	96.9	-39.6
2299.8750	18.4	-55.7	0.3	9.5	83.8	-26.5
2759.8500	0.1	-73.8	0.3	0.0	111.4	-54.1
3219.8250	3.0	-71.7	0.3	9.2	100.1	-42.8
3679.8000	9.0	-65.5	0.3	9.4	93.7	-36.4
4139.7750	11.2	-59.8	0.4	10.4	87.1	-29.8
4599.7500	0.4	-71.3	0.4	11.0	97.9	-40.6

Table 3-15: Field Strength of Spurious Radiation – 469.9875 MHz

Conducted Power 37.4 dBm; 5.5 W; Limit=50+10LogP=57.4 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
939.9750	43.6	-31.2	0.2	-1.0	69.8	-12.4
1409.9625	39.1	-35.5	0.3	8.2	65.0	-7.6
1879.9500	6.5	-67.8	0.3	8.5	97.0	-39.6
2349.9375	15.8	-58.3	0.3	9.5	86.5	-29.1
2819.9250	-1.7	-75.6	0.3	10.0	103.3	-45.9
3289.9125	0.2	-74.5	0.3	9.2	102.9	-45.5
3759.9000	7.2	-66.3	0.3	9.2	94.9	-37.5
4229.8875	7.0	-64.4	0.4	10.7	91.4	-34.0
4699.8750	1.4	-70.4	0.4	11.1	97.0	-39.6

Table 3-16: Field Strength of Spurious Radiation – 768.0125 MHz

Conducted Power 34.3 dBm; 2.7 W; Limit=50+10LogP=54.3 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1536.0250	24.9	-50.0	0.3	5.9	78.6	-24.3
2304.0375	35.0	-39.1	0.3	7.7	66.0	-11.7
3072.0500	12.8	-61.0	0.3	7.6	88.0	-33.7
3840.0625	25.9	-48.6	0.3	7.3	75.9	-21.6
4608.0750	8.4	-63.3	0.4	9.0	89.0	-34.7
5376.0875	11.9	-59.9	0.4	8.6	86.0	-31.7
6144.1000	10.0	-60.6	0.4	8.9	86.4	-32.1
6912.1125	1.9	-68.0	0.5	9.0	93.7	-39.4
7680.1250	1.6	-67.2	0.5	9.3	92.7	-38.4

Table 3-17: Field Strength of Spurious Radiation – 771.0125 MHz

Conducted Power 34.4 dBm; 2.8 W; Limit=50+10LogP=54.4 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1542.0250	26.0	-48.9	0.3	6.0	77.5	-23.1
2313.0375	31.8	-42.3	0.3	7.7	69.3	-14.9
3084.0500	11.1	-62.7	0.3	7.6	89.8	-35.4
3855.0625	20.7	-52.8	0.3	7.3	80.2	-25.8
4626.0750	9.8	-61.6	0.4	9.0	87.4	-33.0
5397.0875	11.4	-60.4	0.4	8.6	86.6	-32.2
6168.1000	3.6	-67.0	0.4	8.9	92.9	-38.5
6939.1125	8.3	-61.8	0.5	9.1	87.6	-33.2
7710.1250	-3.6	-72.4	0.5	9.4	97.9	-43.5

Table 3-18: Field Strength of Spurious Radiation – 775.9875 MHz

Conducted Power 34.4 dBm; 2.8 W; Limit=50+10LogP=54.4 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1551.9750	14.4	-59.7	0.3	6.2	88.2	-33.8
2327.9625	33.0	-42.0	0.3	7.7	69.0	-14.6
3103.9500	1.3	-73.4	0.3	7.5	100.6	-46.2
3879.9375	18.9	-54.5	0.3	7.3	82.0	-27.6
4655.9250	0.1	-71.3	0.4	9.0	97.1	-42.7
5431.9125	-11.6	-83.4	0.4	8.6	109.6	-55.2
6207.9000	-5.7	-76.3	0.4	8.9	102.2	-47.8
6983.8875	-19.0	-88.8	0.5	9.2	114.5	-60.1
7759.8750	-11.0	-80.4	0.5	9.4	105.9	-51.5

Table 3-19: Field Strength of Spurious Radiation – 798.0125 MHz

Conducted Power 34.4 dBm; 2.8W; Limit=50+10LogP=54.4 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1596.0250	22.3	-52.6	0.3	6.7	80.6	-26.2
2394.0375	28.5	-46.5	0.3	7.6	73.6	-19.2
3192.0500	6.6	-67.1	0.3	7.4	94.4	-40.0
3990.0625	2.3	-71.1	0.4	7.5	98.3	-43.9
4788.0750	10.0	-61.8	0.4	9.0	87.6	-33.2
5586.0875	1.6	-69.6	0.4	8.9	95.5	-41.1
6384.1000	-4.0	-74.4	0.4	9.2	100.1	-45.7
7182.1125	-1.8	-71.4	0.5	9.1	97.2	-42.8
7980.1250	-14.8	-83.4	0.5	9.3	109.0	-54.6

Table 3-20: Field Strength of Spurious Radiation – 801.0125 MHz

Conducted Power 34.4 dBm; 2.8 W; Limit=50+10LogP=54.4 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1602.0250	24.6	-50.4	0.3	6.8	78.3	-23.9
2403.0375	42.4	-31.7	0.3	7.6	58.8	-4.4
3204.0500	9.4	-64.3	0.3	7.4	91.7	-37.3
4005.0625	-1.3	-72.5	0.4	7.6	99.7	-45.3
4806.0750	12.0	-59.9	0.4	9.0	85.7	-31.3
5607.0875	-0.5	-71.7	0.4	8.9	97.5	-43.1
6408.1000	-4.6	-75.0	0.4	9.2	100.6	-46.2
7209.1125	-14.0	-83.8	0.5	9.0	109.6	-55.2
8010.1250	-13.7	-81.9	0.5	9.3	107.5	-53.1

Table 3-21: Field Strength of Spurious Radiation – 805.9875 MHz

Conducted Power 34.4 dBm; 2.8 W; Limit=50+10LogP=54.4 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1611.9750	25.7	-49.3	0.3	6.8	77.1	-22.7
2417.9625	42.2	-31.9	0.3	7.6	58.9	-4.5
3223.9500	7.5	-67.2	0.3	7.4	94.5	-40.1
4029.9375	12.2	-59.0	0.4	7.7	86.1	-31.7
4835.9250	12.6	-59.0	0.4	8.9	84.8	-30.4
5641.9125	7.7	-63.4	0.4	9.0	89.3	-34.9
6447.9000	-6.6	-76.9	0.4	9.2	102.6	-48.2
7253.8875	-0.9	-70.4	0.5	8.9	96.4	-42.0
8059.8750	-18.0	-84.1	0.5	9.3	109.7	-55.3

Table 3-22: Field Strength of Spurious Radiation – 806.0250 MHz

Conducted Power 34.9 dBm; 3.1 W; Limit=50+10LogP=54.9 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1612.0500	25.1	-49.4	0.3	6.8	77.7	-22.8
2418.0750	23.6	-50.5	0.3	7.6	78.0	-23.1
3224.1000	8.6	-65.1	0.3	7.4	93.0	-38.1
4030.1250	-3.8	-74.7	0.4	7.7	102.3	-47.4
4836.1500	13.0	-58.9	0.4	8.9	85.2	-30.3
5642.1750	-3.0	-74.1	0.4	9.0	100.5	-45.6
6448.2000	4.2	-66.1	0.4	9.2	92.3	-37.4
7254.2250	-12.4	-82.2	0.5	8.9	108.6	-53.7
8060.2500	-13.3	-79.4	0.5	9.3	105.5	-50.6

Table 3-23: Field Strength of Spurious Radiation – 809.0000 MHz

Conducted Power 35 dBm; 3.2 W; Limit=50+10LogP=55 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1618.0000	12.6	-61.9	0.3	6.9	90.3	-35.3
2427.0000	4.5	-70.5	0.3	7.6	98.1	-43.1
3236.0000	-1.5	-75.2	0.3	7.4	103.2	-48.2
4045.0000	-4.3	-75.2	0.4	7.8	102.8	-47.8
4854.0000	5.4	-66.5	0.4	8.9	92.9	-37.9
5663.0000	-8.9	-80.0	0.4	9.0	106.4	-51.4
6472.0000	-5.6	-75.9	0.4	9.2	102.1	-47.1
7281.0000	-9.1	-78.6	0.5	8.8	105.3	-50.3
8090.0000	-7.5	-72.4	0.5	9.4	98.5	-43.5

Table 3-24: Field Strength of Spurious Radiation – 815.9875 MHz

Conducted Power 35bdBm; 3.2 W; Limit=50+10LogP=55 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1631.9750	25.5	-49.6	0.3	7.0	77.9	-22.9
2447.9625	38.4	-36.6	0.3	7.7	64.2	-9.2
3263.9500	10.0	-63.7	0.3	7.3	91.7	-36.7
4079.9375	10.6	-60.7	0.4	7.9	88.1	-33.1
4895.9250	12.4	-59.3	0.4	8.9	85.8	-30.8
5711.9125	17.5	-54.0	0.4	9.1	80.3	-25.3
6527.9000	-4.7	-75.0	0.4	9.2	101.2	-46.2
7343.8875	-0.8	-70.3	0.5	8.8	97.0	-42.0
8159.8750	-7.8	-69.8	0.5	9.4	95.8	-40.8

Table 3-25: Field Strength of Spurious Radiation – 851.0250 MHz

Conducted Power 34.9 dBm; 3.1 W; Limit=50+10LogP=54.9 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1702.0500	20.9	-53.5	0.3	7.4	81.2	-26.3
2553.0750	21.1	-52.9	0.3	7.6	80.5	-25.6
3404.1000	14.2	-60.4	0.3	7.6	88.1	-33.2
4255.1250	1.3	-70.1	0.4	8.6	96.8	-41.9
5106.1500	-0.3	-72.0	0.4	8.6	98.6	-43.7
5957.1750	1.7	-69.5	0.4	9.0	95.8	-40.9
6808.2000	-3.9	-73.9	0.5	8.8	100.4	-45.5
7659.2250	-8.1	-76.9	0.5	9.3	103.0	-48.1
8510.2500	-7.0	-68.1	0.5	9.3	94.2	-39.3

Table 3-26: Field Strength of Spurious Radiation – 856.0250 MHz

Conducted Power 35 dBm; 3.2 W; Limit=50+10LogP=55 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1712.0500	21.6	-52.8	0.3	7.4	80.6	-25.6
2568.0750	37.2	-37.7	0.3	7.6	65.4	-10.4
3424.1000	10.3	-63.3	0.3	7.6	91.1	-36.1
4280.1250	5.9	-65.2	0.4	8.6	92.0	-37.0
5136.1500	4.0	-67.6	0.4	8.6	94.4	-39.4
5992.1750	6.2	-65.0	0.4	9.0	91.4	-36.4
6848.2000	-1.6	-71.8	0.5	8.9	98.4	-43.4
7704.2250	-2.1	-70.9	0.5	9.4	97.0	-42.0
8560.2500	-7.3	-68.5	0.5	9.3	94.8	-39.8

Table 3-27: Field Strength of Spurious Radiation – 860.9875 MHz

Conducted Power 35 dBm; 3.2 W; Limit=50+10LogP=55 dBc

Frequency (MHz)	Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Normalized Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1721.9750	18.4	-56.0	0.3	7.4	83.8	-28.8
2582.9625	17.9	-57.0	0.3	7.6	84.8	-29.8
3443.9500	13.6	-61.0	0.3	7.7	88.7	-33.7
4304.9375	8.8	-62.6	0.4	8.7	89.3	-34.3
5165.9250	16.3	-55.8	0.4	8.6	82.6	-27.6
6026.9125	9.8	-61.0	0.4	9.0	87.4	-32.4
6887.9000	3.3	-66.6	0.5	8.9	93.1	-38.1
7748.8875	-3.2	-72.6	0.5	9.4	98.7	-43.7
8609.8750	-7.4	-68.8	0.5	9.3	95.0	-40.0

Table 3-28: Part 90.543(f): Out of Band Emissions Limit

Fundamental Frequency (MHz)	Second Harmonic Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBW)	Limit (dBW)	Margin (dB)
798.0125	1596.025	22.3	-52.6	0.3	6.7	-76.2	-70	-6.2
801.0125	1602.025	24.6	-50.4	0.3	6.8	-73.9	-70	-3.9

Table 3-29: FCC Unintentional Digital/RX Emissions

Frequency (MHz)	Analyzer Level (dBuV)	Site Correction Factor (dB/m)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
49.317	40.6	-17.6	23.0	40.0	-17.0
58.280	55.1	-21.5	33.6	40.0	-6.4
63.388	42.7	-21.7	21.0	40.0	-19.0
77.346	44.3	-20.6	23.7	40.0	-16.3
86.560	42.1	-18.4	23.7	40.0	-16.3
91.288	45.6	-17.4	28.2	43.5	-15.3
105.711	41.0	-14.7	26.3	43.5	-17.2
133.837	39.1	-14.7	24.4	43.5	-19.1
147.000	38.2	-15.4	22.8	43.5	-20.7
231.731	32.7	-14.6	18.1	46.0	-27.9
351.763	32.3	-9.2	23.1	46.0	-22.9
502.404	32.0	-5.1	26.9	46.0	-19.1
654.327	33.1	-2.2	30.9	46.0	-15.1
775.003	31.5	-0.1	31.4	46.0	-14.6

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±4.6 dB

Table 3-30: Collocation Frequencies Tested

LMR (MHz)	Bluetooth (MHz)	Wi-Fi (MHz)	LTE Cellular (MHz)
138, 156.8, 174	2402	2412	2500
418.0125, 450.0125, 469.9875	2440	2437	2535
768.0125, 775.9875, 805.9875	2480	2462	2570
806.025, 815.9875, 860.9875			

Note: Radiated emissions were investigated with the modules collocated and transmitting simultaneously with the LMR, Bluetooth, Wi-Fi, and LTE transceivers. No non-compliant emissions were found; per FCC guidance, no data is being reported.

Table 3-31: Test Equipment Used For Testing Field Strength of Spurious Radiation and Unintentional Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	OATS1	N/A
901729	Insulated Wire Inc.	KPS-1503-3150-KPR	SMK RF Cables 20’	NA	8/21/19
901593	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	8/21/19
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	N/A
900791	Chase	CBL6111B	Bilog Antenna (30 MHz – 2000 MHz)	N/A	10/4/20
900321	EMCO	3161-03	Horn Antenna (4.0 - 8.2 GHz)	9508-1020	5/17/21
900323	EMCO	3160-07	Horn Antenna (8.2 - 12.4 GHz)	9605-1054	5/17/21
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	5/17/21
901582	Rohde & Schwarz	1167.0000.02	Signal Generator	101903	4/24/21
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/21
901129	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	8/10/19
901131	Par Electronics	118-174 (25W)	VHF Notch Filter	N/A	8/10/19
901135	Par Electronics	400-512 (25W)	UHF Notch Filter	N/A	8/10/19
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridged Guide Antenna (1 - 18 GHz)	2310	4/7/22

Test Personnel:

Daniel Baltzell		June 11, 2019
Test Engineer	Signature	Date of Tests

4 Conclusion

The data in this measurement report shows that the harmonic emissions levels and intermodulation frequencies for collocation testing were passing for the Harris Corporation XL-200P (International),
FCC ID: OWDTR-0145-E, IC: 3636B-0145.