



Engineering Solutions & Electromagnetic Compatibility Services

Class II Permissive Change

**Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501**

**Model: XL-185P 7/8/900 MHz
Multiband Portable Radio**

IC: 3636B-0143

August 3, 2017

Standards Referenced for this Report	
RSS-119 Issue 12	Land Mobile and Fixed Radio Transmitters and Receivers 27.41 to 960.0 MHz

Report Prepared By: Daniel Baltzell

Document Number: 2017084

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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.*

Frequency Range (MHz)	Rated Conducted Output Power (W)	Frequency Tolerance (ppm)	Transmit Mode	Emission Designator
901 – 902 940 – 941 941 – 944	0.5 – 3.0	0.5	Analog FM (WB)	16K0F3E
901 – 902 940 – 941 941 – 944	0.5 – 3.0	0.5	2-level FSK 9600 Data/ Digital Voice (WB)	16K0F1D/E
896 – 901 901 – 902 935 – 940 940 – 941 941 – 944	0.5 – 3.0	0.5	Analog FM (NB)	11K0F3E
896 – 901 901 – 902 935 – 940 940 – 941 941 – 944	0.5 – 3.0	0.5	2-level FSK 9600 Data/ Digital Voice (NB)	11K7F1D/E
896 – 901 901 – 902 935 – 940 940 – 941 941 – 944	0.5 – 3.0	0.5	2-level FSK 4800 Data/ Digital Voice (XNB)	7K10F1D/E
896 – 901 901 – 902 935 – 940 940 – 941 941 – 944	0.5 – 3.0	0.5	C4FM Data/Voice	8K40F1D/E
896 – 901 901 – 902 935 – 940 940 – 941 941 – 944	0.5 – 3.0	0.5	H-CPM (TDMA) Data/Voice	8K10DXW

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1 Test Result Summary

Test	IC Reference	Result
Field Strength of Spurious Radiation	RSS-119 5.5, 5.8	Complies
RF Power Output	RSS-119 5.4	Complies

2 General Information

The following Class II Permissive Change Report is prepared on behalf of **Harris Corporation** in accordance with Innovation, Science and Economic Development rules and regulations. The Equipment Under Test (EUT) was the **XL-185P 7/8/900 MHz Radio; IC: 3636B-0143**, with antenna model # SPEN14918.

All measurements contained in this application were conducted in accordance with the applicable sections of ISED RSS-119. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

2.1 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, Innovation, Science and Economic Development to perform AC line conducted and radiated emissions testing.

2.2 Related Submittal(s)/Grant(s)

This is a Class II Permissive Change for Innovation, Science and Economic Development to add a new antenna for the 900 MHz band.

2.3 Tested System Details

The test sample was received on July 24, 2017. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

The EUT includes a System model and a Scan model, the difference being that the System model has a DTMF keypad. The System model is considered to be representative of the radio family and to have the worst case emissions, and was therefore used for testing.

The device was programmed for multiple modes of operation and modulation types.

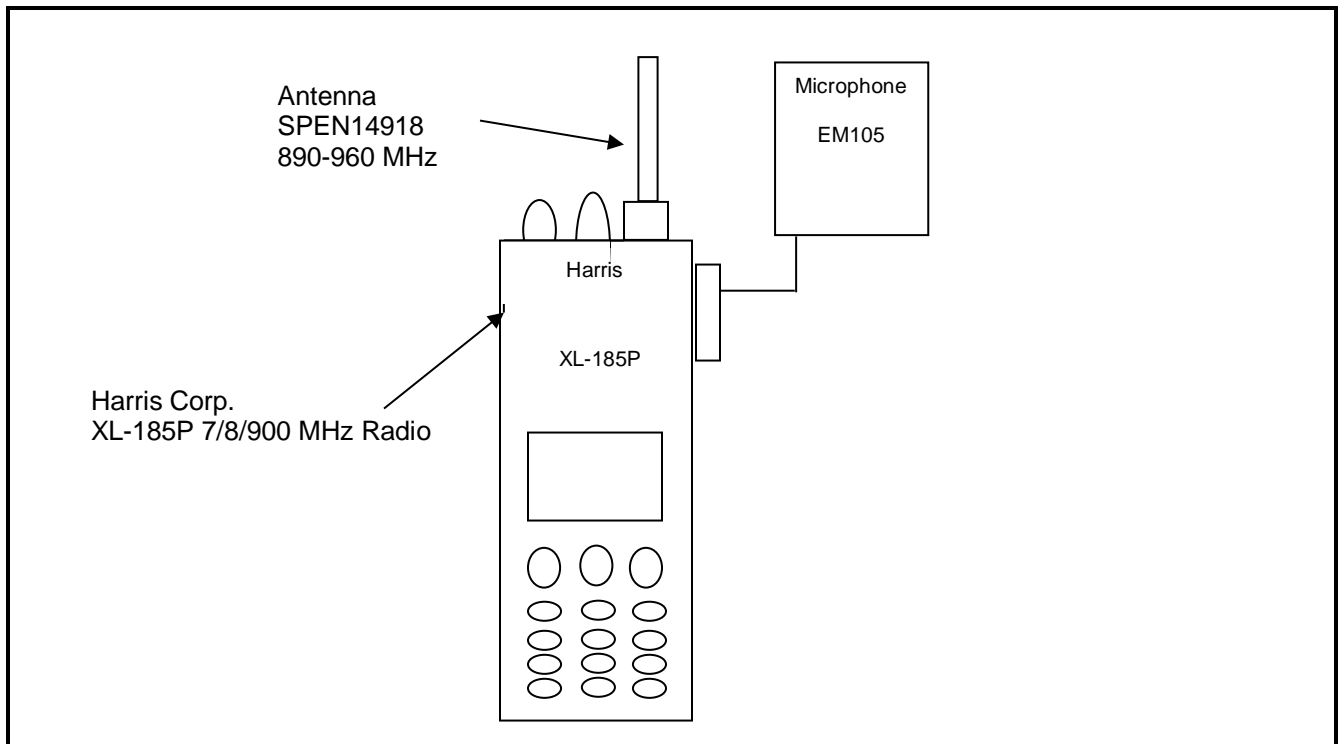
Table 2-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	SN/PN	IC ID	RTL Bar Code
Radio	Harris Corporation	XL-185P	E00002	3636B-0143	22557
Antenna (890-960 MHz)	PulseLarsen	SPEN14918	E75-0286-001	N/A	22558

Table 2-2: Auxiliary Equipment

Part	Manufacturer	Model	PN	IC ID	RTL Bar Code
Microphone	Harris Corporation	EM105	N/A	N/A	21563
7.2 V/3300 mAh Li-Ion Rechargeable Battery	Harris Corporation	BAT-L-CASE-R- HR003	Engineering Sample #37	N/A	21552
7.4 V/3300 mAh Li-Ion Rechargeable Battery	Harris Corporation	BAT-L-CASE-R- HR003	Engineering Sample #42	N/A	N/A
7.4 V/3300 mAh Li-Ion Rechargeable Battery	Harris Corporation	BAT-L-CASE-R- HR003	Engineering Sample #39	N/A	N/A

Figure 2-1: Configuration of Tested System



3 IC RSS-119 4.1: Transmitter Output Power

3.1 Test Procedure

ANSI/TIA-603-D 2010, section 2.2.1

The EUT was connected to a coaxial attenuator having a 50 Ω load impedance.

Manufacturer's rated power: 3 W

3.2 Test Data

Table 3-1: RF Conducted Output Power – Measured

MHz	dBm	W
896.0	35.0	3.1
898.5	34.9	3.1
901.0	34.8	3.0
935.0	35.2	3.3
937.5	35.0	3.1
940.0	35.0	3.2

Notes: Data presented is for analog mode. All other modes were investigated and found to have equivalent power within measurement tolerances.

Table 3-2: Test Equipment Used For Testing RF Power Output - Conducted

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18
900948	Weinschel Corporation	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	9/1/18

Test Personnel:

Daniel Baltzell EMC Test Engineer	 Signature	August 1, 2017 Date of Test
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4 IC RSS-119 5.8.9.2 Out-of-band Emission Limit

4.1 Test Procedure

ANSI/TIA-603-D 2010, section 2.2.12

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.

4.2 Test Data

Table 4-1: Field Strength of Spurious Radiation – 896.000 MHz

Conducted Power 35.0 dBm; 3.1 W; Limit=50+10LogP=55.0 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1792.000	30.5	-41.3	0.4	7.6	69.1	-14.2
2688.000	11.1	-64.9	0.6	9.6	90.9	-35.9
3584.000	8.3	-66.0	0.8	9.4	92.3	-37.3
4480.000	8.8	-62.5	0.9	12.5	85.9	-30.9
5376.000	6.0	-65.4	1.0	11.7	89.7	-34.7
6272.000	25.6	-45.0	1.2	13.6	67.6	-12.6
7168.000	3.0	-66.6	1.3	13.9	89.0	-34.1
8064.000	-0.1	-66.0	1.5	13.6	88.8	-33.8
8960.000	-1.5	-66.1	1.6	12.8	89.8	-34.9

Table 4-2: Field Strength of Spurious Radiation – 898.500 MHz

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

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1797.000	29.7	-42.5	0.4	7.6	70.2	-15.3
2695.500	13.5	-62.5	0.6	9.6	88.4	-33.5
3594.000	13.2	-61.0	0.8	9.4	87.2	-32.3
4492.500	3.3	-68.0	0.9	12.5	91.3	-36.4
5391.000	1.6	-69.8	1.0	11.6	94.1	-39.2
6289.500	25.7	-44.9	1.2	13.7	67.3	-12.4
7188.000	-1.1	-70.7	1.3	13.6	93.3	-38.4
8086.500	-0.3	-65.3	1.5	13.6	88.0	-33.1
8985.000	-3.3	-65.6	1.6	12.9	89.2	-34.3

Table 4-3: Field Strength of Spurious Radiation – 901.000 MHz

Conducted Power 34.8 dBm; 3.0 W; Limit=50+10LogP=54.8 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1802.000	27.0	-44.9	0.4	7.6	72.6	-17.7
2703.000	13.3	-64.5	0.6	9.7	90.3	-35.4
3604.000	12.1	-62.1	0.8	9.4	88.3	-33.5
4505.000	1.2	-70.1	0.9	12.5	93.3	-38.5
5406.000	0.4	-71.0	1.0	11.6	95.3	-40.5
6307.000	24.4	-46.1	1.2	13.8	68.3	-13.5
7208.000	0.1	-69.5	1.3	13.4	92.3	-37.4
8109.000	-2.0	-66.1	1.5	13.7	88.7	-33.9
9010.000	-2.0	-66.6	1.6	12.9	90.1	-35.3

Table 4-4: Field Strength of Spurious Radiation – 935.000 MHz

Conducted Power 35.2 dBm; 3.3 W; Limit=50+10LogP=55.9 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1870.000	28.8	-43.1	0.5	7.1	71.6	-16.4
2805.000	16.3	-59.5	0.6	10.1	85.2	-30.0
3740.000	15.7	-58.2	0.8	8.4	85.8	-30.6
4675.000	13.5	-57.9	0.9	12.8	81.2	-26.0
5610.000	16.0	-55.2	1.1	12.3	79.2	-24.0
6545.000	19.5	-51.1	1.2	15.3	72.2	-17.0
7480.000	5.8	-63.4	1.4	12.6	87.3	-32.1
8415.000	5.3	-59.4	1.5	14.0	82.1	-26.9
9350.000	-4.6	-67.9	1.6	14.1	90.6	-35.4

Table 4-5: Field Strength of Spurious Radiation – 937.500 MHz

Conducted Power 35.0 dBm; 3.1 W; Limit=50+10LogP=55.5 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1875.000	30.1	-41.6	0.5	7.1	69.8	-15.0
2812.500	17.4	-58.4	0.6	10.1	83.8	-28.9
3750.000	17.0	-56.9	0.8	8.3	84.2	-29.3
4687.500	15.9	-55.6	0.9	12.9	78.6	-23.7
5625.000	18.8	-52.4	1.1	12.4	76.0	-21.1
6562.500	21.0	-49.3	1.2	15.2	70.2	-15.3
7500.000	6.5	-62.7	1.4	12.8	86.2	-31.3
8437.500	3.7	-61.0	1.5	14.1	83.3	-28.4
9375.000	-5.6	-68.9	1.7	14.2	91.2	-36.4

Table 4-6: Field Strength of Spurious Radiation – 940.000 MHz

Conducted Power 35.0 dBm; 3.2 W; Limit=50+10LogP=55.0 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1880.000	30.6	-41.1	0.5	7.1	69.3	-14.5
2820.000	18.0	-57.8	0.6	10.1	83.2	-28.4
3760.000	16.1	-57.8	0.8	8.3	85.1	-30.3
4700.000	14.8	-56.7	0.9	12.9	79.6	-24.8
5640.000	18.6	-52.6	1.1	12.5	76.0	-21.2
6580.000	23.3	-47.3	1.2	15.2	68.2	-13.3
7520.000	5.8	-63.4	1.4	12.9	86.7	-31.9
8460.000	4.8	-59.9	1.5	14.2	82.1	-27.3
9400.000	-4.5	-67.9	1.7	14.2	90.2	-35.3

Table 4-7: Test Equipment Used For Testing Field Strength of Spurious Radiation

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
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	8/3/17
901594	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36"	NA	8/1/17
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	6/11/18
900321	EMCO	3161-03	Horn Antenna (4.0 - 8.2 GHz)	9508-1020	4/9/18
900323	EMCO	3160-07	Horn Antenna (8.2 - 12.4 GHz)	9605-1054	4/9/18
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	4/9/18
901582	Rohde & Schwarz	1167.0000.02	Signal Generator	101903	3/20/18
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18

Test Personnel:

Daniel Baltzell
 Test Engineer



Signature

July 31, 2017
 Date of Tests

5 Conclusion

The data in this measurement report shows that the **Harris Corporation XL-185P Portable Land Mobile Radio, IC: 3636B-0143**, with antenna model # SPEN14918 complies with all the applicable requirements of ISED RSS-119.