RHEIN TECH LABORATORIES, INC.

Engineering Solutions & Electromagnetic Compatibility Services

FCC Certification Report

Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501

Model: XL-200M
Multiband Mobile Radio, VL/V/U/7/8/9

FCC ID: OWDTR-0161-E

September 27, 2018

Standards Referenced for this Report	
Part 2: 2018	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 24: 2018	Personal Communications Services
ANSI C63.26-2017	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

Report Prepared By: Daniel Baltzell

Document Number: 2019062PCB

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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.

FCC Equipment Class: PCB

FCC Rule Part	Frequency Range (MHz)	Rated Conducted Output Power (W)	Frequency Tolerance (ppm)	Emission Designator	Transmit Mode
24D	901 – 902	7.0	0.1	16K0F3E	Analog FM (Wideband)
24D	940 – 941	7.0	0.1	16K0F3E	
24D	901 – 902	7.0	0.1	16K0F1D/E	2-level FSK 9600 Data/Digital Voice (Wideband)
24D	940 – 941	7.0	0.1	16K0F1D/E	
24D	901 – 902	7.0	0.1	11K0F3E	Analog FM (Narrowband)
24D	940 – 941	7.0	0.1	11K0F3E	
24D	901 – 902	7.0	0.1	11K7F1D/E	2-level FSK 9600 Data/Digital Voice (Narrowband)
24D	940 – 941	7.0	0.1	11K7F1D/E	
24D	901 – 902	7.0	0.1	7K10F1D/E	2-level FSK 4800 Data/Digital Voice (XNarrowband)
24D	940 – 941	7.0	0.1	7K10F1D/E	
24D	901 – 902	7.0	0.1	8K40F1D/E	C4FM Data/Voice
24D	940 – 941	7.0	0.1	8K40F1D/E	
24D	901 – 902	7.0	0.1	8K10DXW	H-CPM (TDMA) Data/Voice
24D	940 – 941	7.0	0.1	8K10DXW	

** power is maximum ERP*

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1 Test Result Summary

Test	FCC Reference	Result
RF Power Output	2.1046(a), 24.132(b)	Complies
Spurious Emissions at Antenna Terminals	2.1051	Complies
Field Strength of Spurious Radiation	2.1053(a)	Complies
Occupied Bandwidth/Emission Masks	2.1049(c)(1), 24.131, 24.133(a)(1),(2)	Complies
Frequency Stability vs. Temperature and Voltage	2.1055, 24.135	Complies

2 General Information

The following Certification Report is prepared on behalf of Harris Corporation in accordance with the Federal Communications Commission and ISED rules and regulations. The Equipment Under Test (EUT) was the XL-200M Multi-Band Mobile, VL/V/U/7/8/9, Model # XZ-MPM1M, FCC ID: OWDTR-0161-E, IC: 3636B-0161.

All measurements contained in this application were conducted in accordance with the applicable sections of FCC Rules and Regulations CFR 47 Parts 2 and 24. 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, the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

2.2 Related Submittal(s)/Grant(s)

This is an original certification application for Harris Corporation Model XL-200M Multi-Band Mobile, Model # XZ-MPM1M, FCC ID: OWDTR-0161-E, IC: 3636B-0161.

2.3 Grant Notes

RF power switchable from 2 W to rated power 7 W ERP.

2.4 Tested System Details

The test sample was received on August 24, 2018. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

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

Table 2-1: Equipment Under Test (EUT)

Part	Manufacturer	Model/HVIN	PN/SN	FCC ID	RTL Bar Code
Vehicular Communication Hub (VCH)	Harris Corporation	XL-200M	14050-1100-11/EVM2 No.25	OWDTR-0161-E	22754
Control Head	Harris Corporation	XL-CH Mobile Control Head/ N/A	14050-1150-01/005	OWDTR-0161-E	22755

Table 2-2: Auxiliary Equipment

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
USB Mobile Mic	N/A	USB Mobile Mic	14050-6010-01/V22e	N/A	22756
Remote Speaker	N/A	Remote Speaker	14050-6100-01	N/A	N/A
Analog Deskmic	N/A	Analog Deskmic	MC-014121-003	N/A	N/A
CH Mounting Kit	N/A	CH Mounting Kit	14050-6210-01	N/A	N/A
VCH Mounting Kit	N/A	VCH Mounting Kit	14050-6200-01	N/A	N/A
Ethernet Cable, overmold, 45cm	N/A	N/A	14050-6300-01	N/A	N/A
Ethernet Cable, overmold, 9m	N/A	N/A	14050-6300-02	N/A	N/A
DC power cables (CH)	N/A	N/A	CA-012616-001	N/A	N/A
DC power cables (VCH)	N/A	N/A	CA-012365-001	N/A	N/A

2.5 Configuration of Tested System

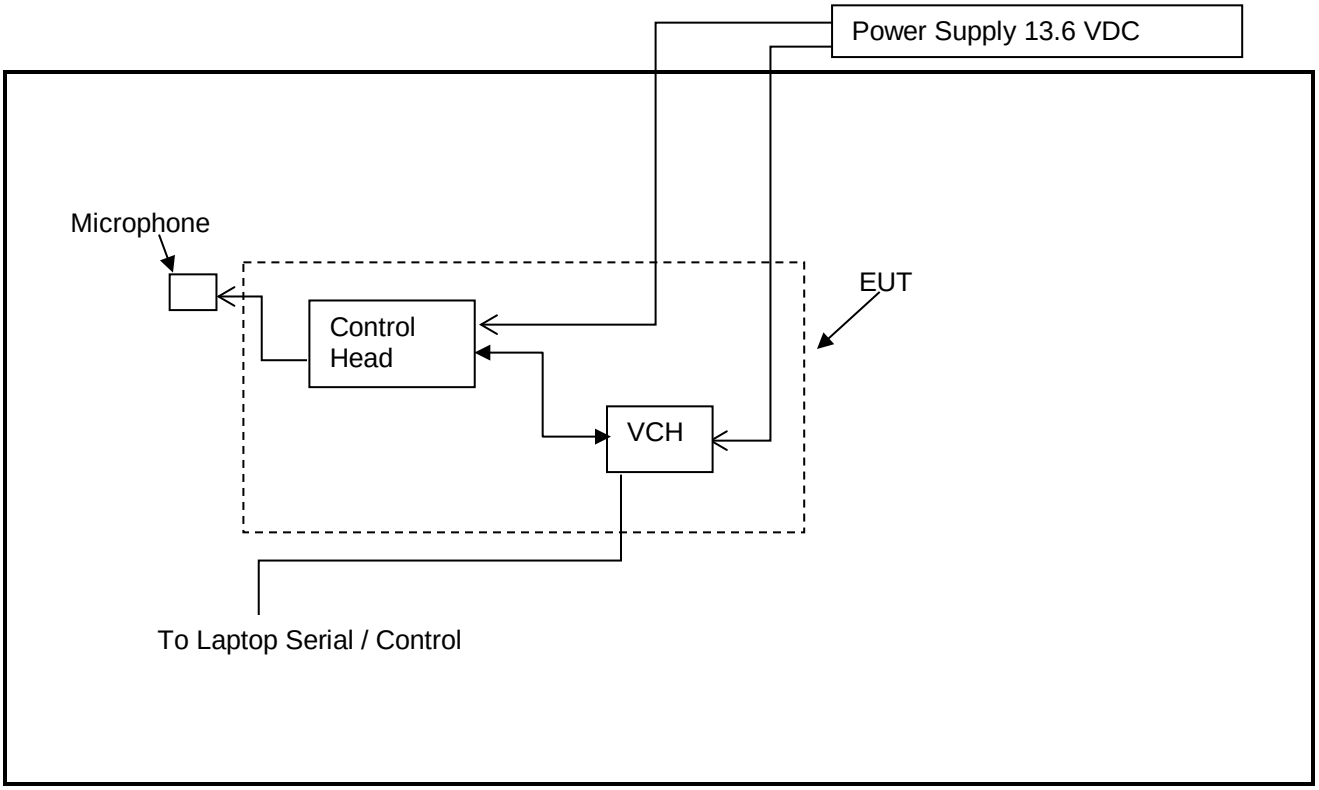


Figure 2-1: Configuration of Tested System

3 FCC Part 2.1033(C)(8): Voltages and Currents through the Final Amplifying Stage

13.6 VDC / 8.6 A

4 FCC Part 2.1046(a): RF power output: Conducted; Part 24.132(b): Power and antenna height limits;

4.1 Test Procedure

ANSI C63.26, section 5.2

The EUT was connected to a coaxial attenuator having a 50 Ω load impedance. Manufacturer's rated power: 7 W.

4.2 Test Data

Table 4-1: RF Conducted Output Power – Measured

Frequency (MHz)	High Power (dBm)	High Power (W)	Low Power (dBm)	Low Power (W)
901.9750	38.5	7.0	33.2	2.1
940.9750	38.5	7.0	33.2	2.1

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

Table 4-2: 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	4/26/21
901724	API Weinschel, Inc.	48-40-34	40 dB 100W Attenuator	CJ8921	8/7/19

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 dB

Results: Pass

Test Personnel:

Daniel Baltzell		September 26, 2018
EMC Test Engineer	Signature	Date of Test

5 FCC Part 2.1051: Spurious Emissions at Antenna Terminals

5.1 Test Procedure

ANSI C63.26, Section 5.7

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer.

Device with digital modulation: Modulated to its maximum extent using a pseudo-random data sequence.

5.2 Test Data

Frequency range of measurement per Part 2.1057: 9 kHz to 10 x Fc

Limits: (43+10LOG P(W)) for wideband and 50 + 10 LOG P(W)) for narrowband

The following channels (in MHz) were investigated:

901.9750
940.9750

Both high and low power settings were checked; high power was found to be worst case and is presented. All modes were investigated and no emissions were found within 20 dB below the limit, therefore no data is presented.

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 dB

Results: Pass

Table 5-1: Test Equipment Used For Testing Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/21
901724	API Weinschel, Inc.	48-40-34	40 dB 100W Attenuator	CJ8921	8/7/19
901132	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	8/10/19

Test Personnel:

Daniel Baltzell		September 27, 2018
EMC Test Engineer	Signature	Date of Test

6 FCC Part 2.1053(a): Field Strength of Spurious Emissions

6.1 Test Procedure

ANSI C63.26 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.

6.2 Test Data

Table 6-1: Field Strength of Spurious Radiation – 901.9750 MHz
Conducted Power 45.8 dBm; 38.0 W; Limit=50+10 Log P=65.8 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)
1803.9500	2.1	-69.8	0.4	8.8	107.2	-41.4
2705.9250	15.6	-62.2	0.6	0.0	108.6	-42.8
3607.9000	8.1	-66.1	0.8	9.7	103.0	-37.2
4509.8750	-2.6	-74.2	0.9	11.0	109.9	-44.1
5411.8500	-0.7	-72.6	1.0	10.6	108.8	-43.0
6313.8250	-5.7	-76.6	1.2	11.4	112.2	-46.4
7215.8000	-1.3	-71.1	1.3	11.2	107.0	-41.2
8117.7750	-4.2	-67.9	1.5	11.4	103.8	-38.0
9019.7500	-7.5	-69.9	1.6	11.1	106.1	-40.3

Table 6-2: Field Strength of Spurious Radiation – 940.9750 MHz
Conducted Power 45.7 dBm; 37.2 W; Limit=50+10 Log P=65.7 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)
1881.9500	2.8	-68.7	0.5	8.5	106.4	-40.7
2822.9250	7.5	-70.0	0.6	10.0	106.3	-40.6
3763.9000	21.7	-52.2	0.8	9.2	89.5	-23.8
4704.8750	11.6	-59.9	0.9	11.1	95.4	-29.7
5645.8500	5.0	-66.6	1.1	11.0	102.4	-36.7
6586.8250	-5.2	-75.7	1.2	11.8	110.8	-45.1
7527.8000	2.0	-67.2	1.4	11.1	103.2	-37.5
8468.7750	-11.2	-72.2	1.5	11.5	107.9	-42.2
9409.7500	-8.2	-71.6	1.7	11.5	107.4	-41.7

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

Results: Pass

Table 6-3: 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
901729	Insulated Wire Inc.	KPS-1503-3150-KPR	SMK RF Cables 20’	NA	8/21/19
901128	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	8/10/19
901727	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	8/20/19
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	4/9/19
900323	EMCO	3160-07	Horn Antenna (8.2 - 12.4 GHz)	9605-1054	4/9/19
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	4/9/19
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/21
901582	Rohde & Schwarz	1167.0000.02	Signal Generator	101903	4/24/21

Test Personnel:

Daniel Baltzell		September 13-17, 2018
Test Engineer	Signature	Dates of Tests

7 FCC Part 2.1049(c)(1): Occupied Bandwidth; Part 24.131, Part 24.133(a)(1),(2): Authorized Bandwidth;

Occupied Bandwidth - Compliance with the Emission Masks

7.1 Test Procedure

ANSI C63.26-2015, section 5.4

Device with digital modulation: Modulated to its maximum extent using a pseudo-random data sequence.

Part 24.131 Authorized Bandwidth

The authorized bandwidth of narrowband PCS channels will be 10 kHz for 12.5 kHz channels and 45 kHz for 50 kHz channels. For aggregated adjacent channels, a maximum authorized bandwidth of 5 kHz less than the total aggregated channel width is permitted.

Part 24.133 Emission Limits

(1) For transmitters authorized a bandwidth greater than 10 kHz:

(i) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of up to and including 40 kHz: at least 116 Log10 ((fd + 10)/6.1) decibels or 50 plus 10 Log10 (P) decibels or 70 decibels, whichever is the lesser attenuation;

(ii) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 40 kHz: at least 43 + 10 Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation.

(2) For transmitters authorized a bandwidth of 10 kHz:

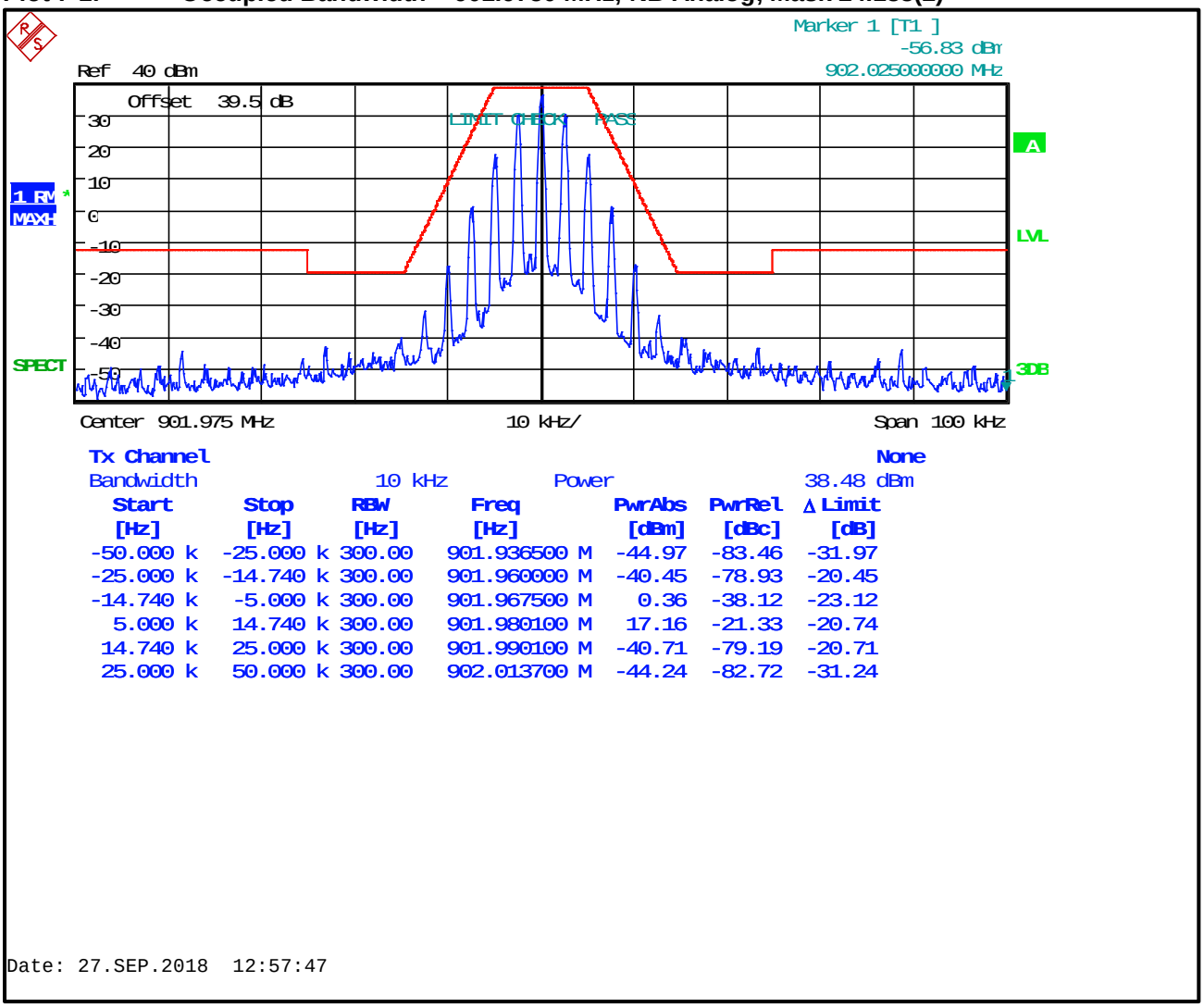
(i) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of up to and including 20 kHz: at least 116 × Log10 ((fd + 5)/3.05) decibels or 50 + 10 × Log10 (P) decibels or 70 decibels, whichever is the lesser attenuation;

(ii) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 20 kHz: at least 43 + 10 Log 10 (P) decibels or 80 decibels, whichever is the lesser attenuation.

(d) The following minimum spectrum analyzer resolution bandwidth settings will be used: 300 Hz when showing compliance with paragraphs (a)(1)(i) and (a)(2)(i) of this section; and 30 kHz when showing compliance with paragraphs (a)(1)(ii) and (a)(2)(ii) of this section.

7.2 Test Data

Plot 7-1: Occupied Bandwidth – 901.9750 MHz; NB Analog; Mask 24.133(2)



Tx Channel				None		
Bandwidth		10 kHz	Power		38.48 dBm	
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	Δ Limit [dB]
-50.000 k	-25.000 k	300.00	901.936500 M	-44.97	-83.46	-31.97
-25.000 k	-14.740 k	300.00	901.960000 M	-40.45	-78.93	-20.45
-14.740 k	-5.000 k	300.00	901.967500 M	0.36	-38.12	-23.12
5.000 k	14.740 k	300.00	901.980100 M	17.16	-21.33	-20.74
14.740 k	25.000 k	300.00	901.990100 M	-40.71	-79.19	-20.71
25.000 k	50.000 k	300.00	902.013700 M	-44.24	-82.72	-31.24

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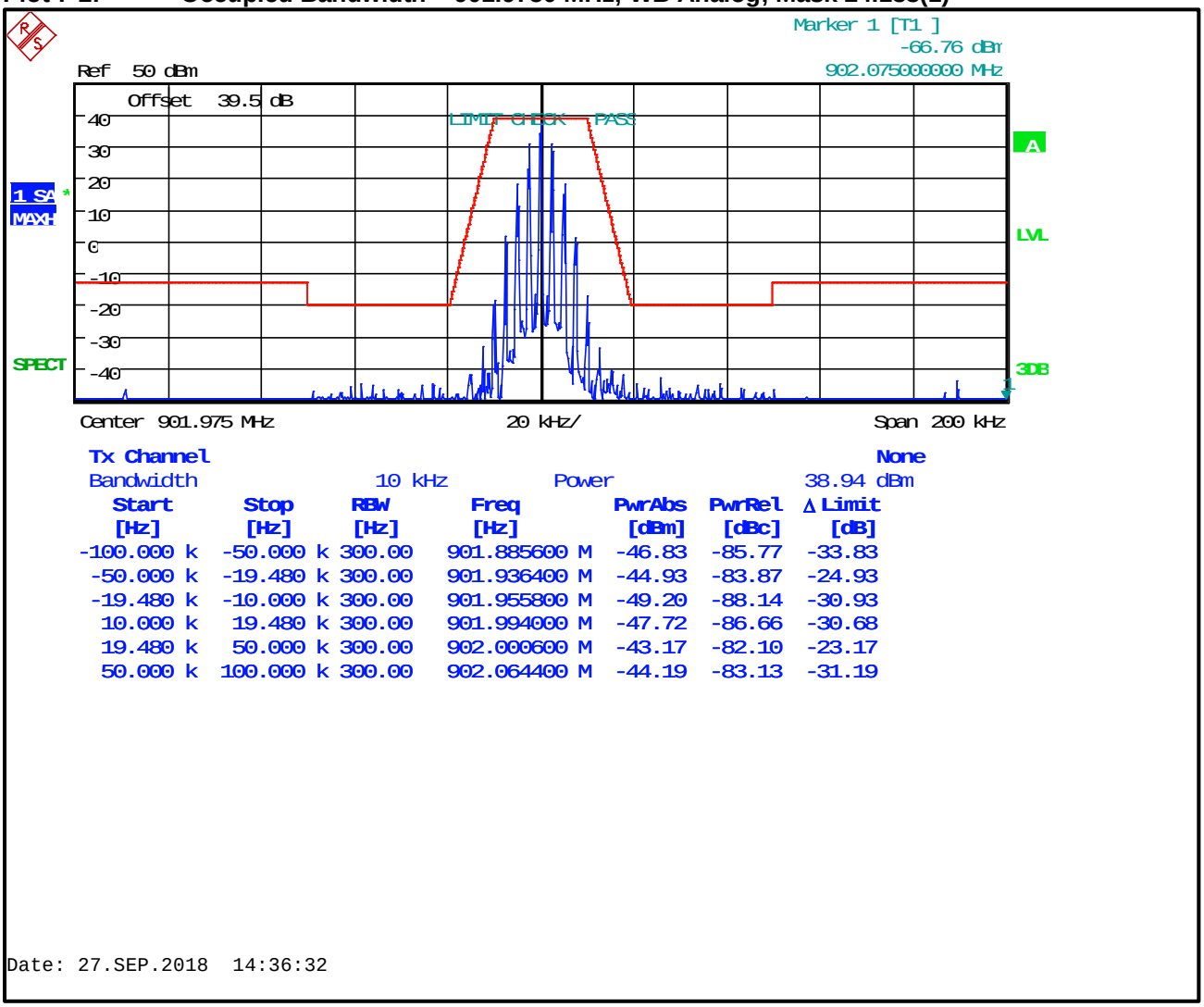
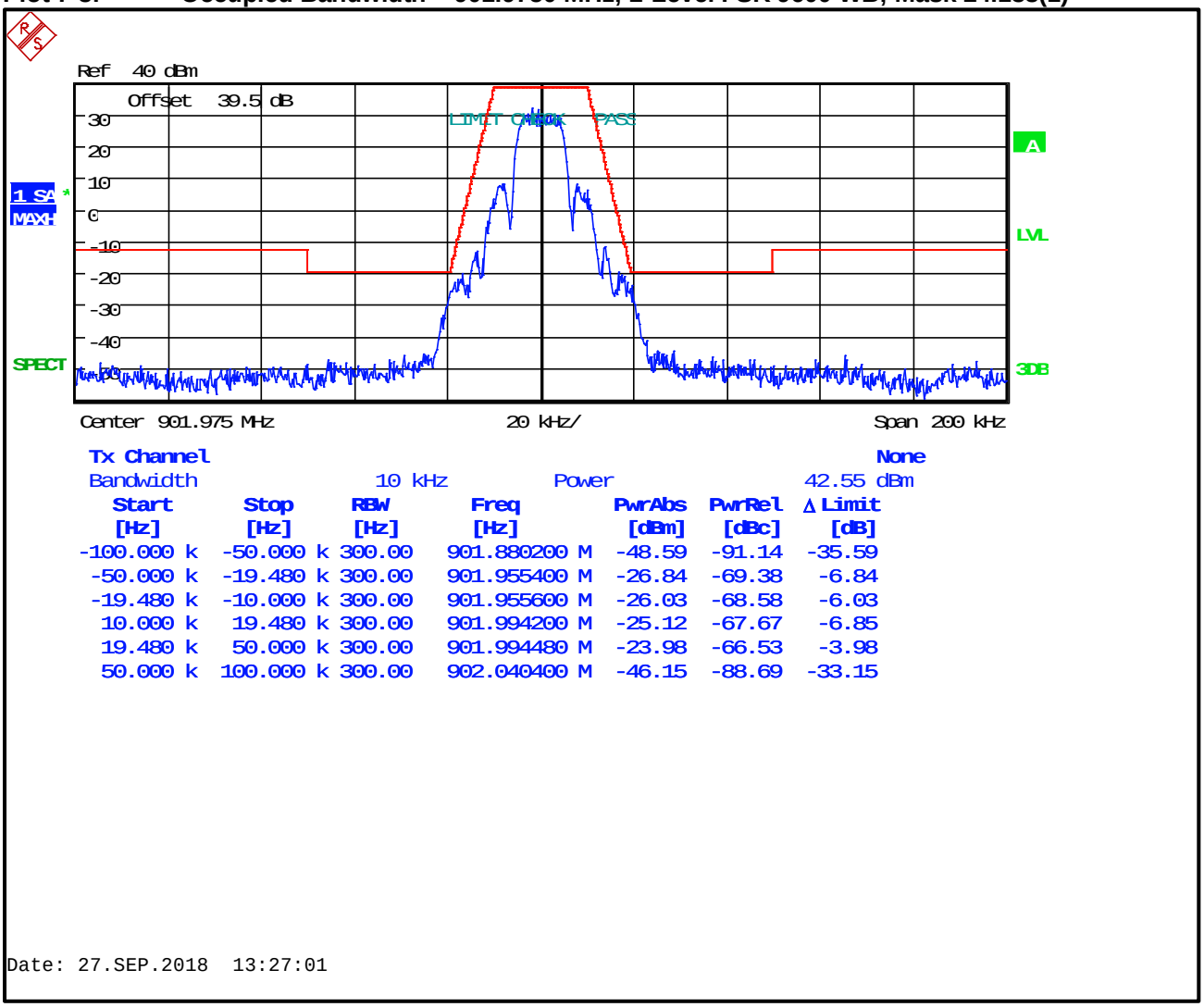
Plot 7-2: Occupied Bandwidth – 901.9750 MHz; WB Analog; Mask 24.133(1)



Plot 7-3: Occupied Bandwidth – 901.9750 MHz; 2-Level FSK 9600 WB; Mask 24.133(1)



Tx Channel						None
Bandwidth		10 kHz	Power			42.55 dBm
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	Δ Limit [dB]
-100.000 k	-50.000 k	300.00	901.880200 M	-48.59	-91.14	-35.59
-50.000 k	-19.480 k	300.00	901.955400 M	-26.84	-69.38	-6.84
-19.480 k	-10.000 k	300.00	901.955600 M	-26.03	-68.58	-6.03
10.000 k	19.480 k	300.00	901.994200 M	-25.12	-67.67	-6.85
19.480 k	50.000 k	300.00	901.994480 M	-23.98	-66.53	-3.98
50.000 k	100.000 k	300.00	902.040400 M	-46.15	-88.69	-33.15

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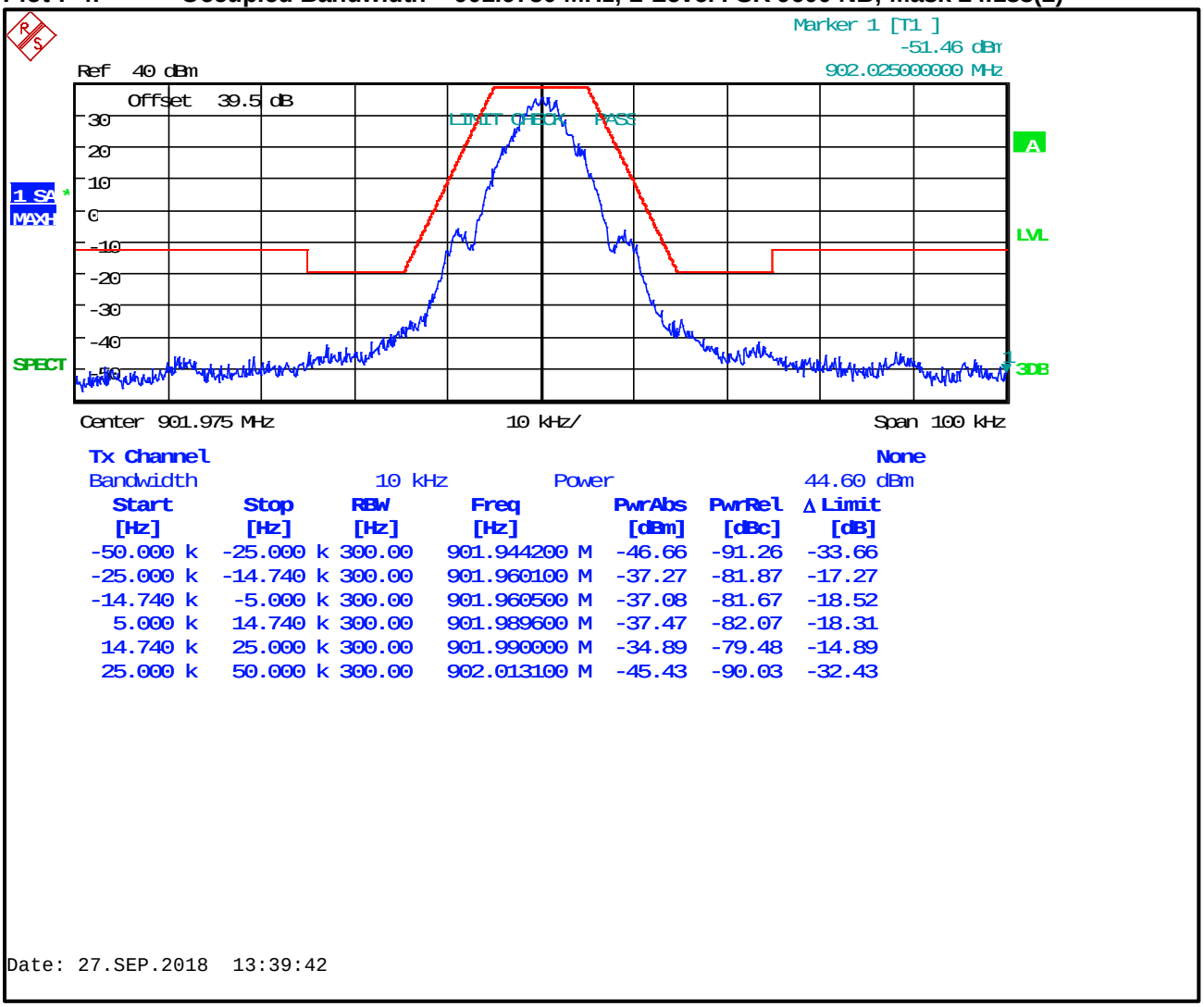
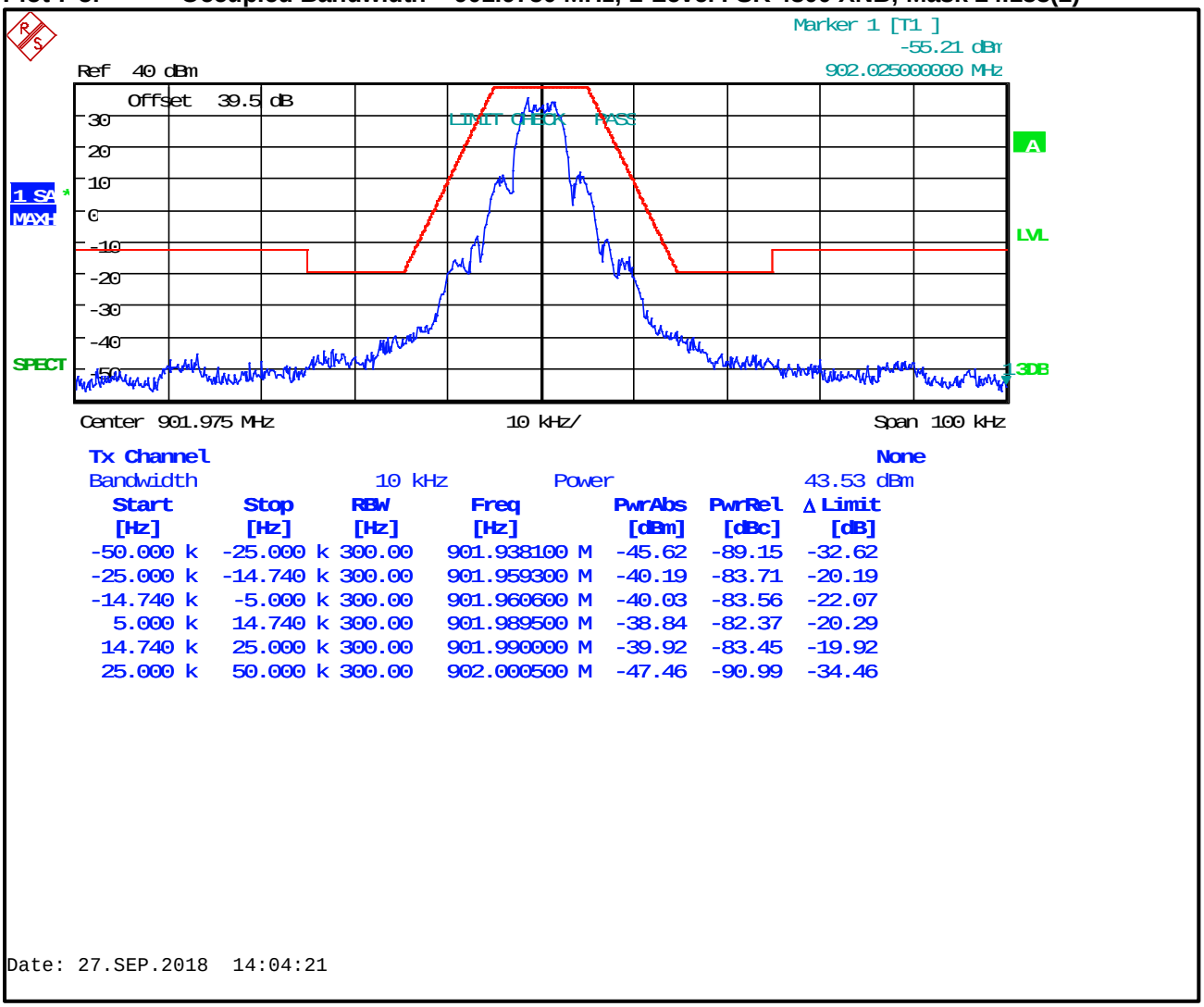
Plot 7-4: Occupied Bandwidth – 901.9750 MHz; 2-Level FSK 9600 NB; Mask 24.133(2)



Plot 7-5: Occupied Bandwidth – 901.9750 MHz; 2-Level FSK 4800 XNB; Mask 24.133(2)



Tx Channel **None**

Bandwidth 10 kHz Power 43.53 dBm

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	Δ Limit [dB]
-50.000 k	-25.000 k	300.00	901.938100 M	-45.62	-89.15	-32.62
-25.000 k	-14.740 k	300.00	901.959300 M	-40.19	-83.71	-20.19
-14.740 k	-5.000 k	300.00	901.960600 M	-40.03	-83.56	-22.07
5.000 k	14.740 k	300.00	901.989500 M	-38.84	-82.37	-20.29
14.740 k	25.000 k	300.00	901.990000 M	-39.92	-83.45	-19.92
25.000 k	50.000 k	300.00	902.000500 M	-47.46	-90.99	-34.46

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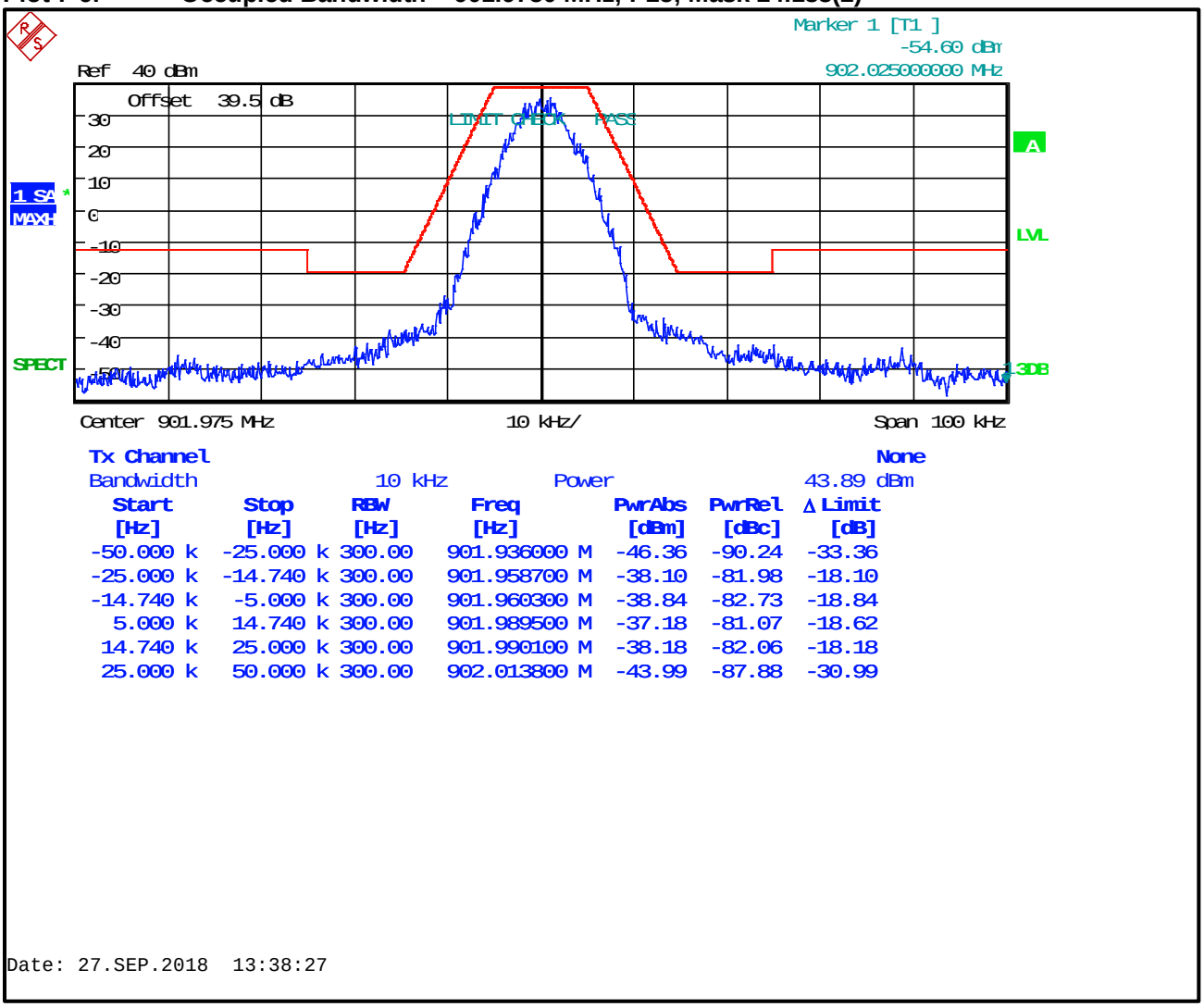
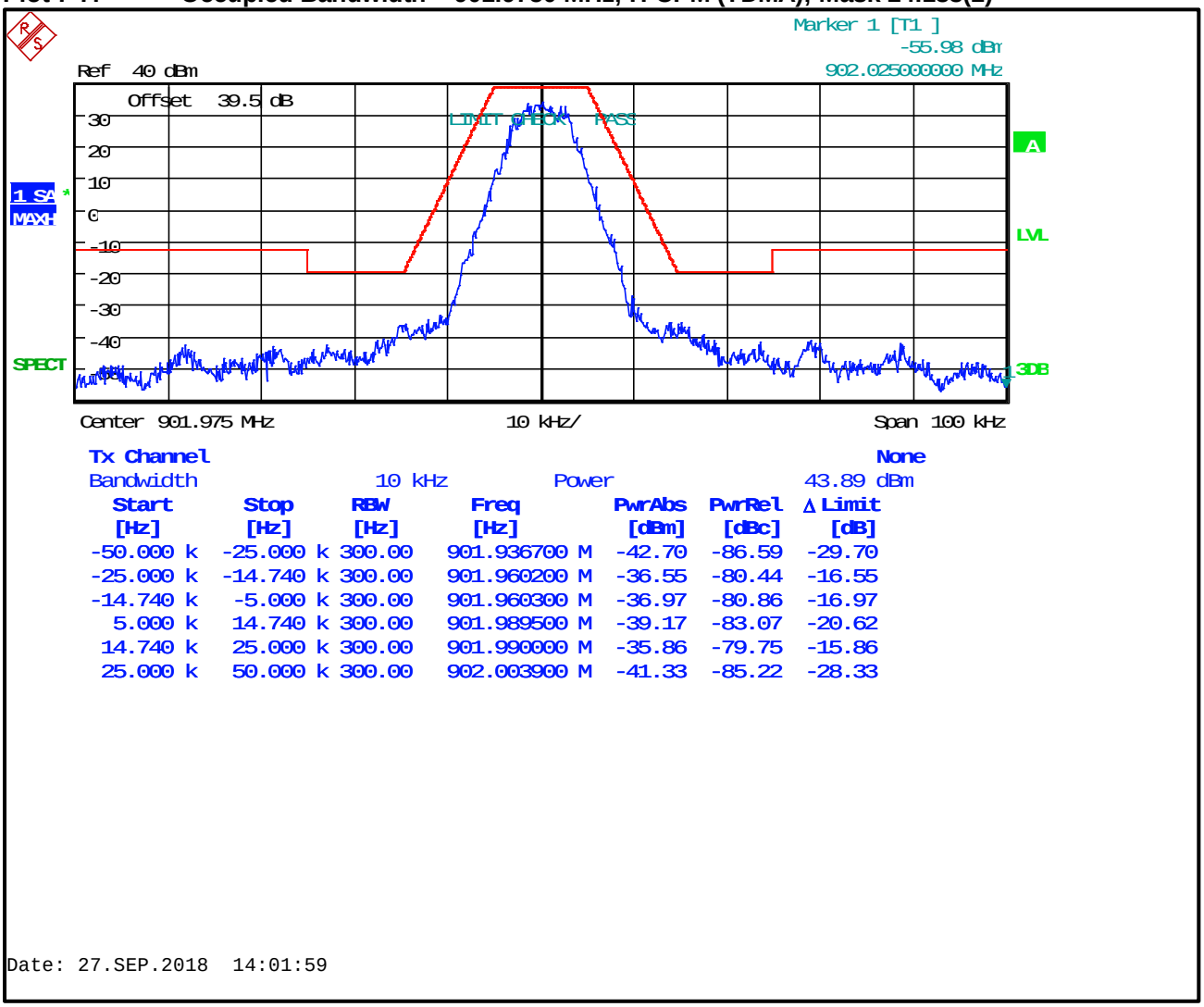
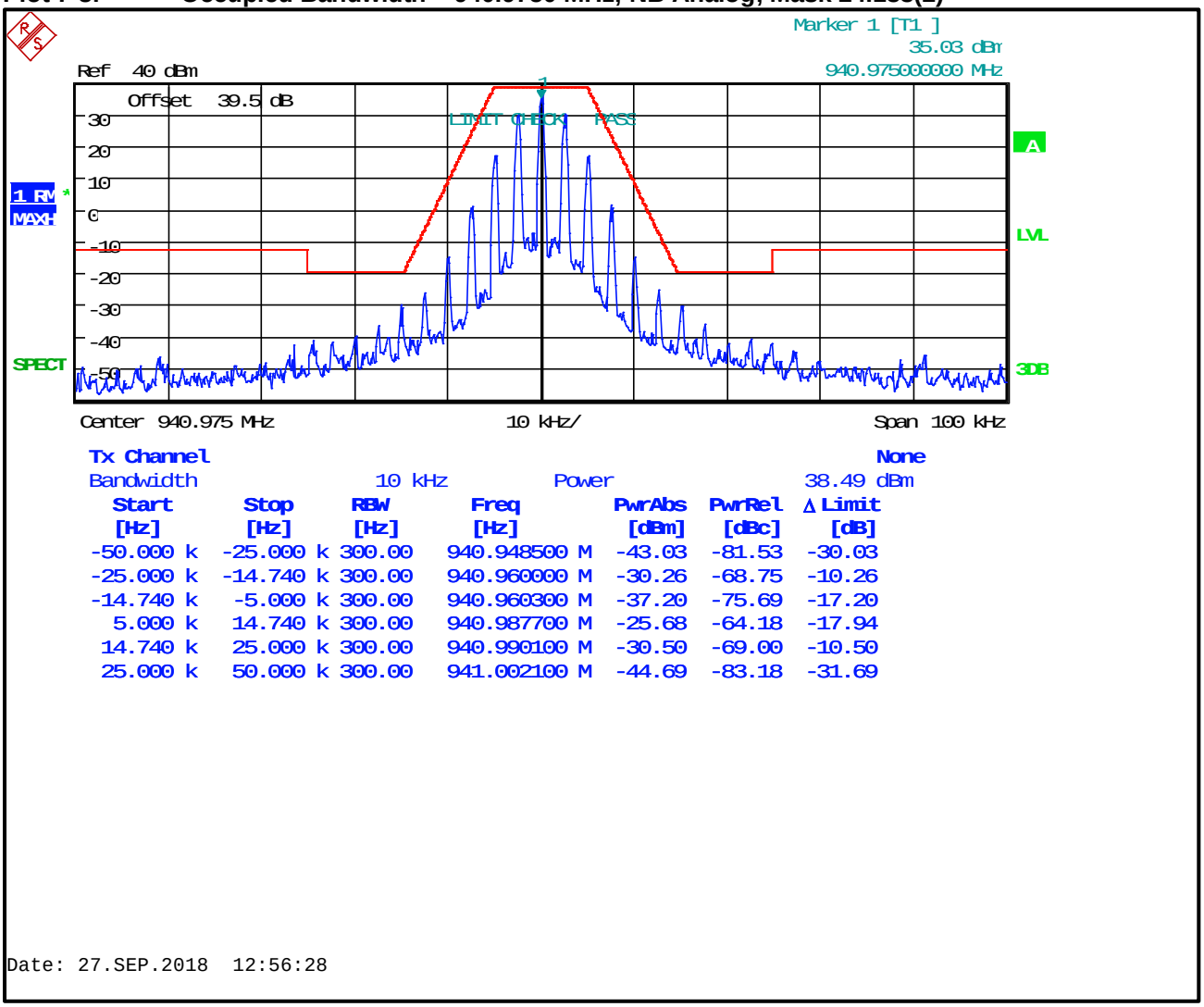
Plot 7-6: Occupied Bandwidth – 901.9750 MHz; P25; Mask 24.133(2)



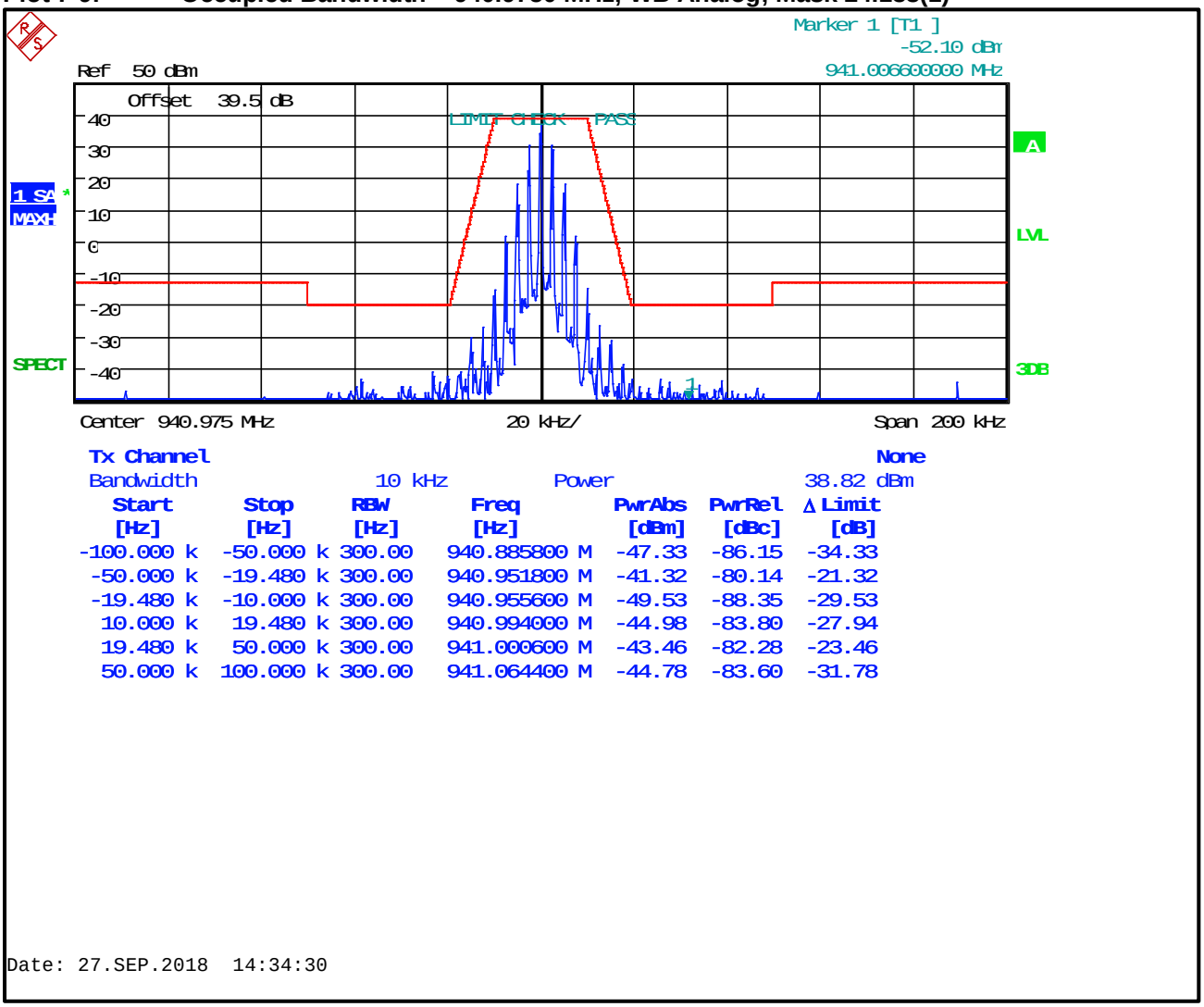
Plot 7-7: Occupied Bandwidth – 901.9750 MHz; H-CPM (TDMA); Mask 24.133(2)



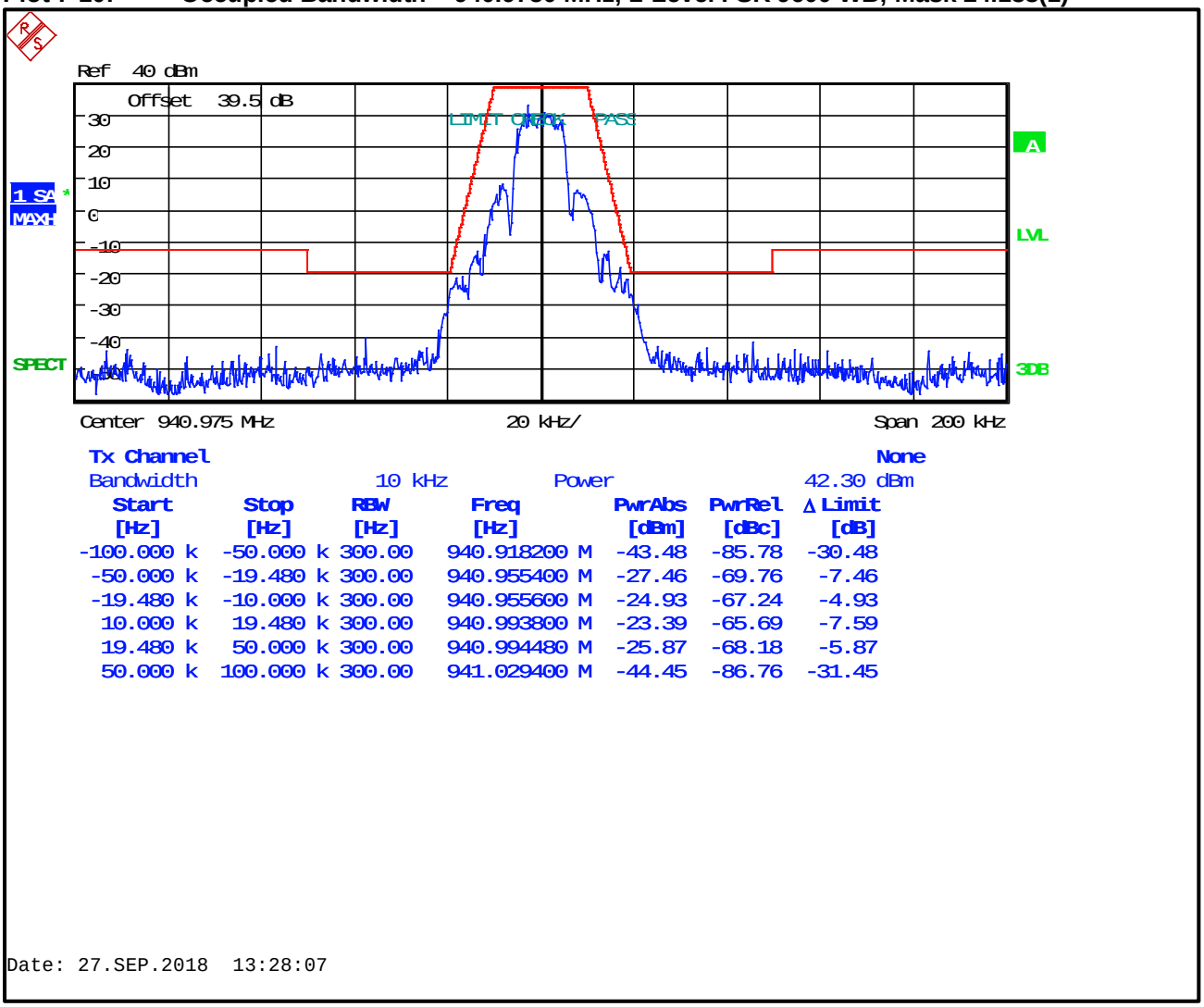
Plot 7-8: Occupied Bandwidth – 940.9750 MHz; NB Analog; Mask 24.133(2)



Plot 7-9: Occupied Bandwidth – 940.9750 MHz; WB Analog; Mask 24.133(1)



Plot 7-10: Occupied Bandwidth – 940.9750 MHz; 2-Level FSK 9600 WB; Mask 24.133(1)



Tx Channel						None
Bandwidth		10 kHz	Power			42.30 dBm
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	Δ Limit [dB]
-100.000 k	-50.000 k	300.00	940.918200 M	-43.48	-85.78	-30.48
-50.000 k	-19.480 k	300.00	940.955400 M	-27.46	-69.76	-7.46
-19.480 k	-10.000 k	300.00	940.955600 M	-24.93	-67.24	-4.93
10.000 k	19.480 k	300.00	940.993800 M	-23.39	-65.69	-7.59
19.480 k	50.000 k	300.00	940.994480 M	-25.87	-68.18	-5.87
50.000 k	100.000 k	300.00	941.029400 M	-44.45	-86.76	-31.45

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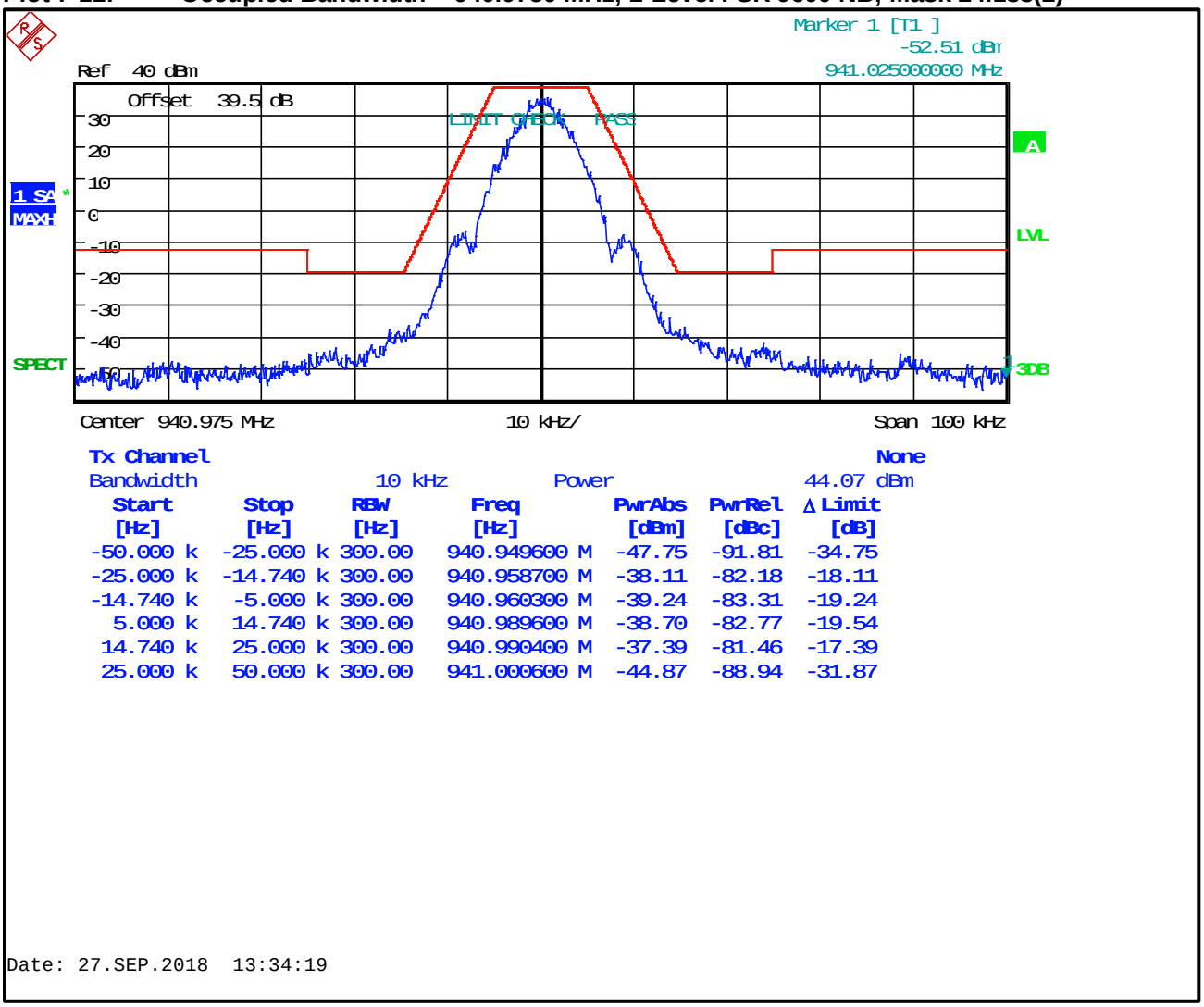
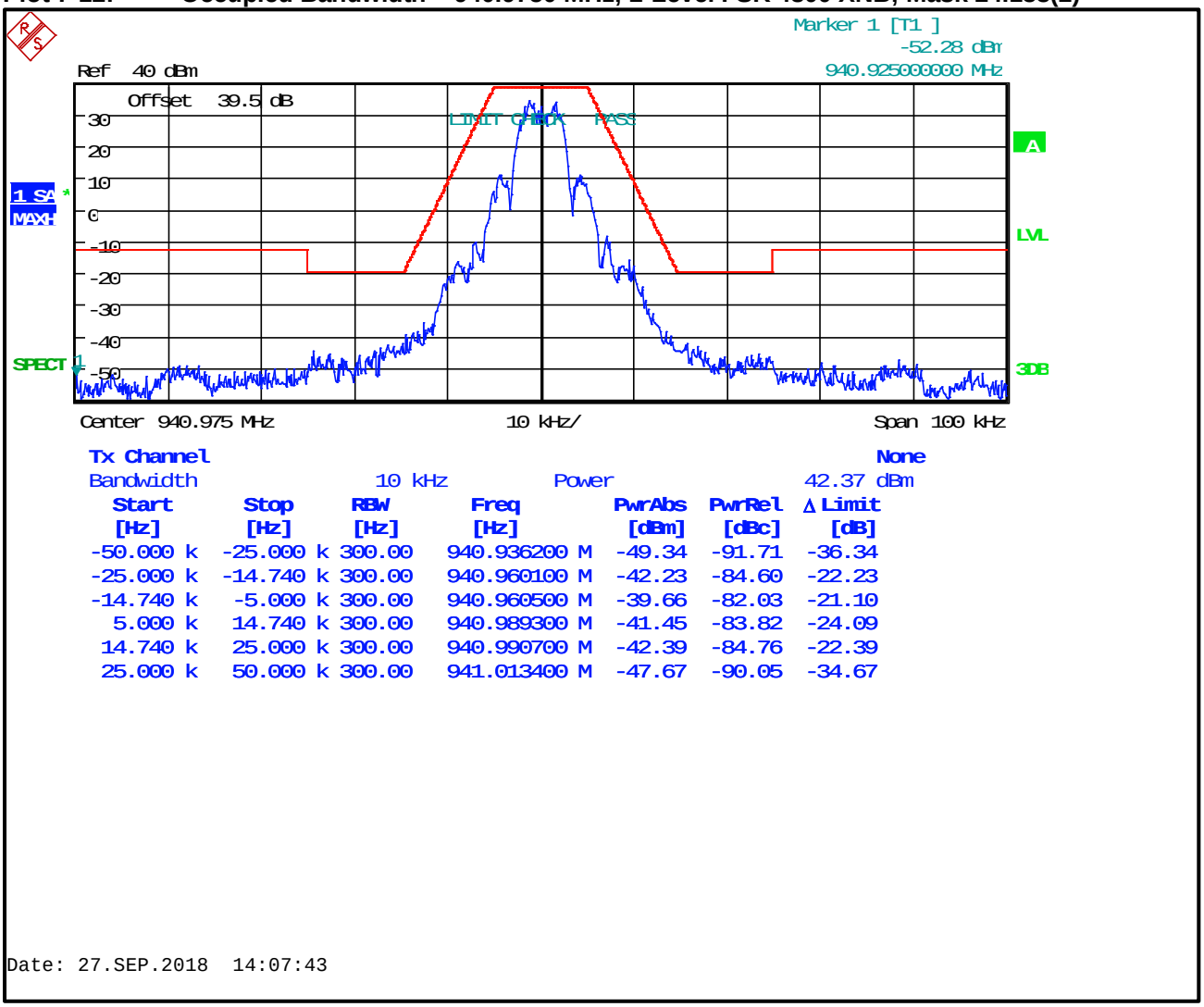
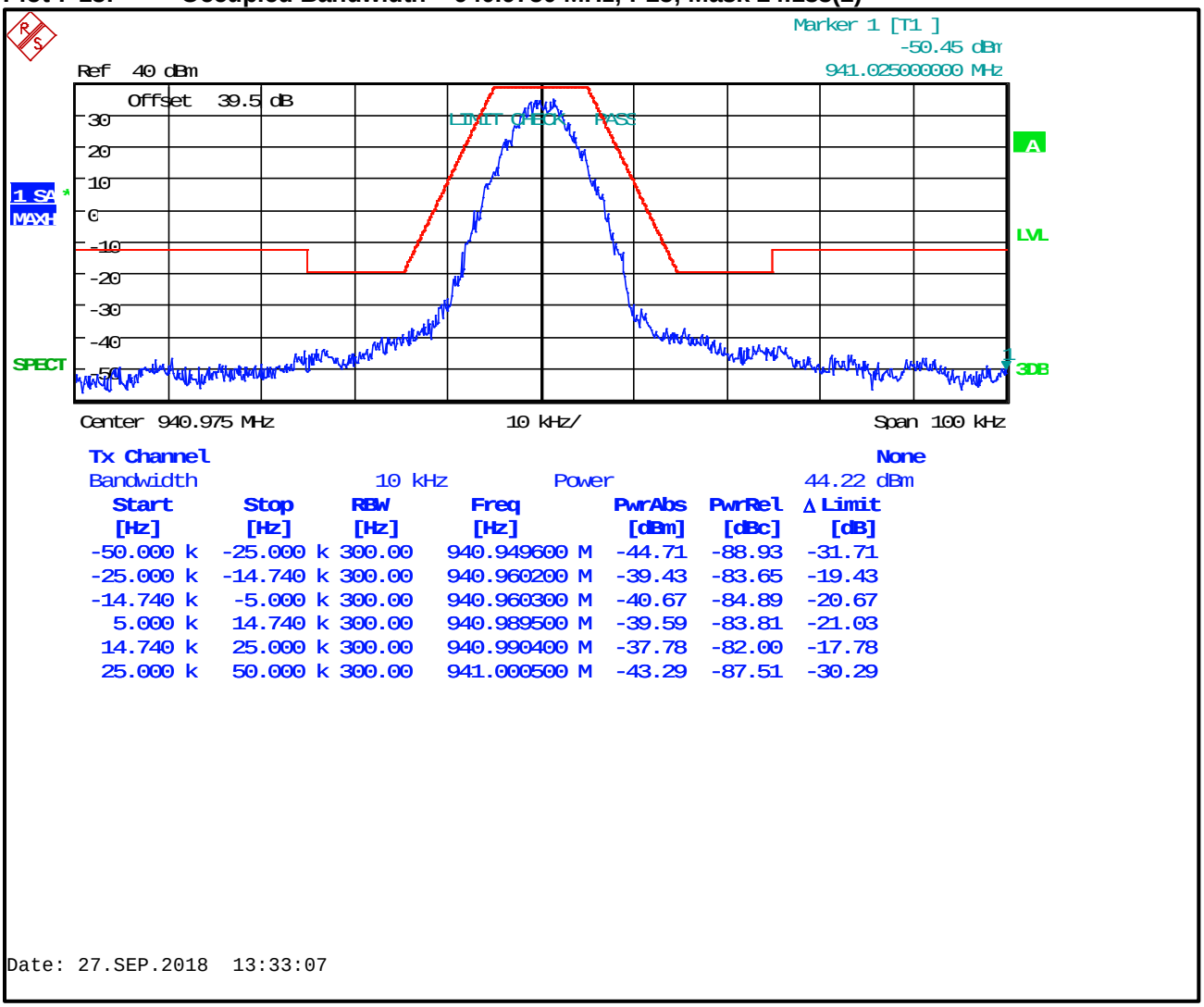
Plot 7-11: Occupied Bandwidth – 940.9750 MHz; 2-Level FSK 9600 NB; Mask 24.133(2)



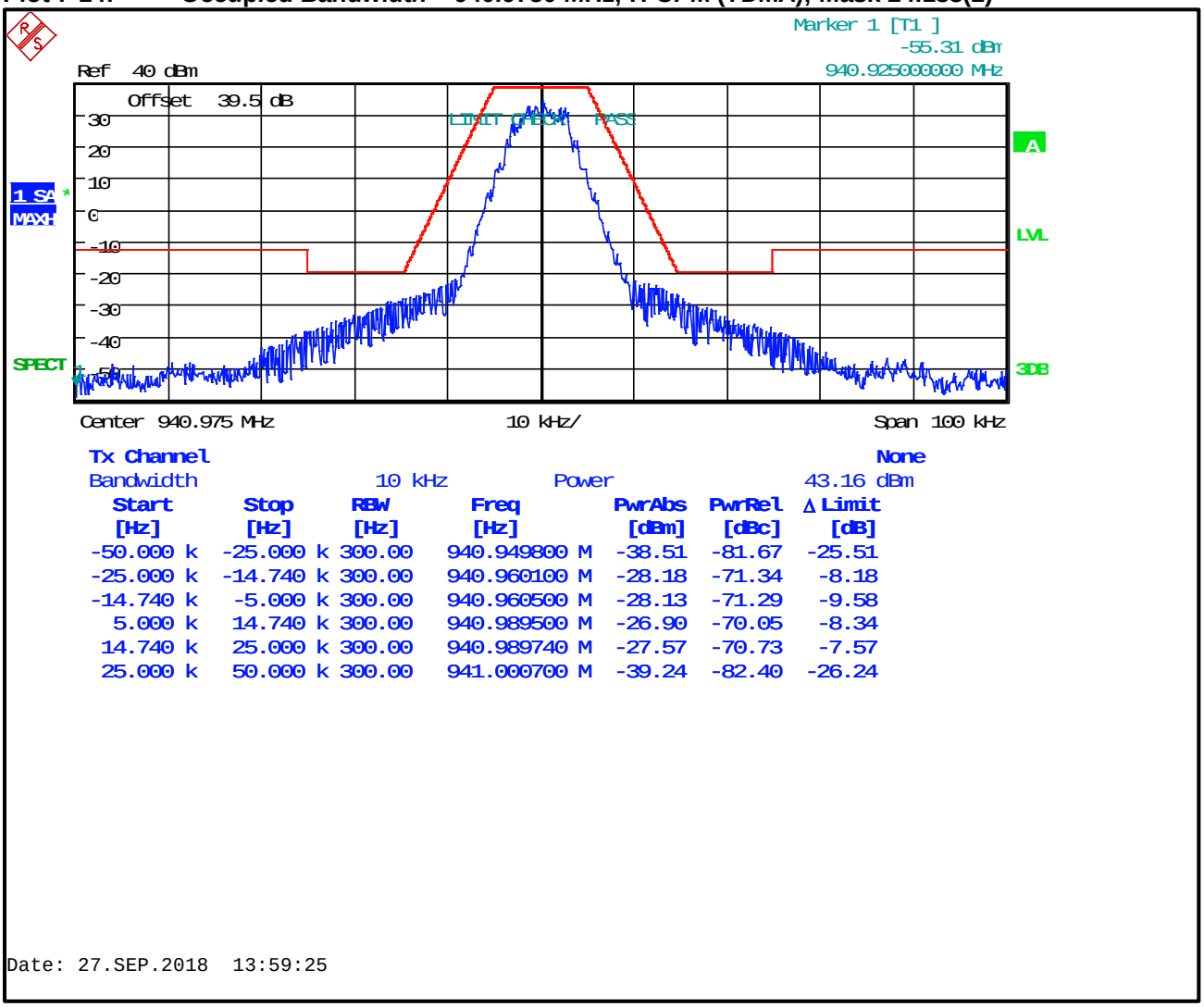
Plot 7-12: Occupied Bandwidth – 940.9750 MHz; 2-Level FSK 4800 XNB; Mask 24.133(2)



Plot 7-13: Occupied Bandwidth – 940.9750 MHz; P25; Mask 24.133(2)



Plot 7-14: Occupied Bandwidth – 940.9750 MHz; H-CPM (TDMA); Mask 24.133(2)



Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 Hz

Results: Pass

Table 7-1: Test Equipment Used For Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/21
901724	Weinschel Corp.	48-20-34 DC-18GHz	Attenuator, 100W 20dB	CJ8921	8/7/19
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	1/31/20

Test Personnel:

Daniel Baltzell		September 27, 2018
EMC Test Engineer	Signature	Date of Test

8 FCC Part 2.1055: Frequency Stability; Part 24.135: Frequency Stability

8.1 Test Procedure

ANSI C63.26, section 5.6

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

The EUT was evaluated over the temperature range -30°C to +60°C. The AFC was not locked to the base station.

Note: Though the frequency tested below is not within the Part 24 frequency allocations, it is representative of the frequency stability for the entire 900 MHz band.

The temperature was initially set to -30°C and a 1-hour period was observed for stabilization of the EUT. The frequency stability was measured within one minute after application of primary power to the transmitter. The temperature was raised at intervals of 10 degrees centigrade through the range. A ½-hour period was observed to stabilize the EUT at each measurement step and the frequency stability was measured within one minute after application of primary power to the transmitter. Additionally, the power supply voltage of the EUT was varied +/-15% nominal input voltage.

Part 24.135: Frequency Stability

(a) The frequency stability of the transmitter shall be maintained within ±0.0001 percent (±1 ppm) of the center frequency over a temperature variation of -30° Celsius to +60° Celsius at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20° Celsius.
(b) For battery operated equipment, the equipment tests shall be performed using a new battery without any further requirement to vary supply voltage.
(c) It is acceptable for a transmitter to meet this frequency stability requirement over a narrower temperature range provided the transmitter ceases to function before it exceeds these frequency stability limits.

8.2 Test Data

Table 8-1: Temperature Frequency Stability – 937.5 MHz

Temperature (°C)	Measured Frequency (Hz)	ppm
-30	937.500031	0.03
-20	937.500000	0.00
-10	937.500016	0.02
0	937.500027	0.03
10	937.499949	-0.05
20 (reference)	937.500000	0.00
30	937.500031	0.03
40	937.500051	0.05
50	937.500125	0.13
55	937.500086	0.09
60	937.500063	0.07

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 Hz

Results: Pass

Table 8-2: Test Equipment Used For Testing Temperature Frequency Stability

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901350	Meterman	33XR	Multimeter	040402802	4/26/19
901672	Rohde & Schwarz	FSEM30	Spectrum Analyzer	FSEM30	4/17/19
901724	API Weinschel, Inc.	48-40-34	40 dB 100W Attenuator	CJ8921	8/7/19
901124	Alinco	DM-33MVT 32A	Power Supply	1638	Not Required

Test Personnel:

Daniel Baltzell — Signature — September 3, 2018

EMC Test Engineer — Date of Test

8.2.1 Frequency Stability/Voltage Variation

Table 8-3: Frequency Stability/Voltage Variation – 937.5 MHz

Voltage (VDC)	Measured Frequency (Hz)	ppm
11.56	937.500031	0.03
13.6(reference)	937.500000	0.00
15.64	937.500000	0.00

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 Hz

Results: Pass

Table 8-4: Test Equipment Used For Testing Frequency Stability/Voltage Variation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901350	Meterman	33XR	Multimeter	040402802	4/26/19
901672	Rohde & Schwarz	FSEM30	Spectrum Analyzer	FSEM30	4/17/19
901724	API Weinschel, Inc.	48-40-34	40 dB 100W Attenuator	CJ8921	8/7/19
901124	Alinco	DM-33MVT 32A	Power Supply	1638	Not Required

Test Personnel:

Daniel Baltzell — Signature — September 3, 2018

EMC Test Engineer — Date of Test

9 FCC Part 2.202: Necessary Bandwidth and Emission Bandwidth

Voice – 12.5 kHz channel separation
Calculation:
Max modulation (M) in kHz: 3.0
Max deviation (D) in kHz: 2.5
Constant factor (K): 1 (assumed)
Bn = 2xM+2xDK = 11.0 kHz
Emission designator: 11K0F3E

Voice – 25 kHz channel separation
Calculation:
Max modulation (M) in kHz: 3.0
Max deviation (D) in kHz: 5
Constant factor (K): 1 (assumed)
Bn = 2M+2DK = 16.0 kHz
Emission designator: 16K0F3E

P25 – 9600 bps
Calculation:
Data rate in bps (R) = 9600
Peak deviation of carrier (D) = 1800
Bn = [$9600/\log_2(4)$ + 2 (1800) (1) = 8.400 kHz
Emission designator: 8K40F1D, 8K40F1E

P25 Phase 2 Data/Voice (H-CPM TDMA)
Calculation:
Data rate in bps (R) =12000
Peak deviation of carrier (D) = 1050
Bn = [$12000/\log_2(4)$ + 2 (1050) (1) = 8.1 kHz
Emission designator: 8K10DXW

2-level FSK 9600 Data/Digital Voice (NB)
Calculation:
Data rate in bps (R) = 9600
Peak deviation of carrier (D) = 3450
Bn = [9600/log2(4) + 2 (3450) (1) = 11.700 kHz
Emission designator: 11K7F1D, 11K7F1E

2-level FSK 9600 Data/Digital Voice (WB)
Calculation:
Data rate in bps (R) = 9600
Peak deviation of carrier (D) = 5600
Bn = [9600/log2(4) + 2 (5600) (1) = 16.000 kHz
Emission designator: 16K0F1D, 16K0F1E

2-level FSK 4800 Data/Digital Voice (XNB)
Calculation:
Data rate in bps (R) = 4800
Peak deviation of carrier (D) = 1800
Bn = [4800/log2(4) + 2 (2350) (1) = 7.100 kHz
Emission designator: 7K10F1D, 7K10F1E

10 Conclusion

The data in this measurement report shows that the Harris Corporation XL-200M Multi-Band Mobile, VL/V/U/7/8/9, FCC ID: OWDTR-0161-E, IC: 3636B-0161, complies with the applicable requirements of Parts 2 and 24 of the FCC Rules.