China

FCC/IC - TEST REPORT

Report Number	:	**68.950.18.0360.01**	Date of Issue:	November 29, 2018

Model	:	50126-R
Product Type	:	Wireless Remote Control
Brand name	:	Woods
Applicant	:	Southwire Company, LLC
Address	:	One Southwire Drive, Carrollton, Georgia 30119, USA
Production Facility	:	Everflourish Electrical Co., Ltd
Address	:	77 Wuxiang East Road,Yin County, Ningbo, 315111, China

Test Result	:	■ **Positive** ☐ **Negative**
Total pages including Appendices	:	21

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China

2 Details about the Test Laboratory

Details about the Test Laboratory
Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China
FCC Registration Number:	514049
IC Registration Number:	10320A-1
Telephone:	86 755 8828 6998
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3 Description of the Equipment Under Test

Product:	Wireless Remote Control
Model no.:	50126-R
FCC ID:	2AENI-50126R
IC:	20144-50126R
Brand Name:	Woods
Options and accessories:	NIL
Rating:	DC 3.0V by CR2032 Batteries
RF Transmission Frequency:	433.92MHz
Modulation:	OOK
Antenna gain:	1 dBi
Antenna Type:	PCB
Description of the EUT:	The Equipment Under Test (EUT) is a Remote Control operated at 433.92MHz

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2018 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
RSS-Gen Issue 5 April 2018	General Requirements for the Certification of Radio Apparatus
RSS-210 Issue 9 Issue 9, August 2016	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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5 Summary of Test Results

Technical Requirements				
FCC Part 15 Subpart C				
Test Condition		Pages	Test Site	Test Result
§15.207/ RSS-Gen 8.8	Conducted emission AC power port	---	---	N/A
§15.231(b)/ RSS-210 A1.2	Radiated Emission of Carrier Frequency	11	Site 1	Pass
§15.231 (b)/ RSS-210 A1.4(d)	Radiated Emission, 30MHz to 4.5GHz	13	Site 1	Pass
§15.231(c)/ RSS-210 A1.3	Bandwidth Measurement	16	Site 1	Pass
§15.205/ RSS-Gen 6.13	Average Factor	17	Site 1	Pass
§15.231(a)/ RSS-210 A1.1(a)	Transmitter Time	19	Site 1	Pass
§15.203/ RSS-Gen 6.8	Antenna requirement	--	Site1	Pass

Note 1: N/A=Not Applicable.

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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AENI-50126R, IC: 20144-50126R complies with Section15.203, 15.205, 15.231 of the FCC Part 15, Subpart C Rules and complies with RSS-210, RSS-Gen.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: August 25, 2018

Testing Start Date: August 27, 2018

Testing End Date: November 25, 2018

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Tested by:	Reviewed by:	Prepared by:
Louise Liu	John Zhi	Moon Xiong
EMC Test engineer	EMC Project Manager	EMC Project Engineer

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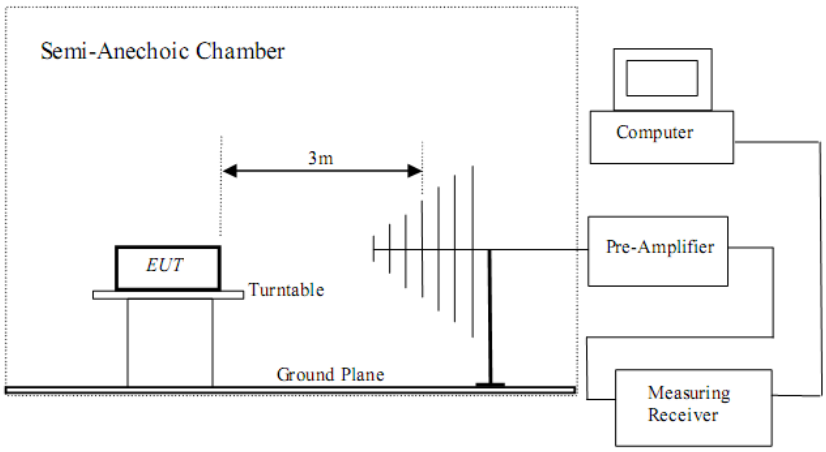
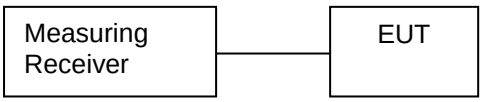
7 Test Setups

7.1 Radiated test setups



7.2 Conducted RF test setups



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8 Test Methodology

8.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules.

8.2 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyser to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

FS = R + System Factor
System Factor = AF + CF + FA – PA

Where FS = Net Field Strength in dBuV/m at 3 meters.
R = Reading of Spectrum Analyzer / Test Receiver in dBµV.
AF = Antenna Factor in dB.
CF = Cable Attenuation Factor in dB.
FA = Filter Attenuation Factor in dB.
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

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9 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
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10 Technical Requirement

10.1 Radiated Emission of Fundamental Frequency

Test Requirement:	FCC part 15 section 15.231(b)/ RSS-210 A1.2
Mode of Operation:	Transmitting mode.
Detector Function	Quasi-peak (Below 1000 MHz) Average and Peak (Above 1000 MHz)
Measurement BW	120 kHz (Below 1000 MHz) 1 MHz (Above 1000 MHz)

Results: PASS

Emissions Frequency **MHz**	E-Field polarity	PK Value Field Strength at 3m **dBuV/m**	Average Factor **dB**	AV Net Field Strength at 3m **dBuV/m**	AV Limit **dBuV/m**	PK Limit **dBuV/m**
433.951111	H	86.75	-9.68	77.07	80.83	100.83
433.951111	V	87.43	-9.68	77.75	80.83	100.83

Remark:

-Refer to section 10.4 for average factor calculation.

Limits for Fundamental Frequency: [Section 15.231(b) and RSS-210 Table A1]:

Fundamental Frequency	Field Strength of Fundamental	Field Strength of Fundamental
[MHz]	[μV/m]	[dBμV/m]
433.92	10996.67	80.83

Compliance with the limits in the above table may be based on the use of measurement instrumentation with a average detector.

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10.2 Spurious Radiated Emission

Test Requirement:	FCC part 15 section 15.231(b)/RSS-210 A1.4(d)
Mode of Operation:	Transmitting mode.
Detector Function	Quasi-peak (Below 1000 MHz) Average and Peak (Above 1000 MHz)
Measurement BW	120 kHz (Below 1000 MHz) 1 MHz (Above 1000 MHz)

Results: PASS

Emissions Frequency **MHz**	E-Field polarity	PK value Field Strength at 3m **dBuV/m**	Average Factor **dB**	AV Net Field Strength at 3m **dBuV/m**	Limit **dBuV/m**	PK Limit **dBuV/m**
867.864444	**V**	**41.10**	**-9.68**	**31.42**	**60.83**	**80.83**
1301.687500	**V**	**59.53**	**-9.68**	**49.85**	**54**	**74**
1735.562500	**V**	**56.10**	**-9.68**	**46.42**	**54**	**74**
2169.625000	**V**	**59.89**	**-9.68**	**50.21**	**60.83**	**80.83**
2603.500000	**V**	**53.35**	**-9.68**	**43.67**	**60.83**	**80.83**
3037.375000	**V**	**55.35**	**-9.68**	**45.67**	**60.83**	**80.83**
867.864444	**H**	**39.21**	**-9.68**	**29.53**	**60.83**	**80.83**
1301.687500	**H**	**58.37**	**-9.68**	**48.69**	**54**	**74**
1735.562500	**H**	**55.11**	**-9.68**	**45.43**	**54**	**74**
2169.625000	**H**	**56.76**	**-9.68**	**47.08**	**60.83**	**80.83**
2603.500000	**H**	**53.68**	**-9.68**	**44.00**	**60.83**	**80.83**
3037.375000	**H**	**50.45**	**-9.68**	**40.77**	**60.83**	**80.83**

Note: No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.

Remark:
- Refer to section 10.4 for average factor calculation.

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Limits for Radiated Emission [Section 15.231(b) and RS 210 Table A1]:

Fundamental Frequency [MHz]	Field Strength of Spurious Emission [μV/m]	Field Strength of Spurious Emission [dBμV/m]
433.92	1099.67	60.83

Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table .

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10.3 Bandwidth Measurement

Test Requirement:	FCC part 15 section 15.231 (c)/RSS-210 A1.3
Mode of Operation:	Transmitting mode.
Detector Function:	Peak

Results: PASS

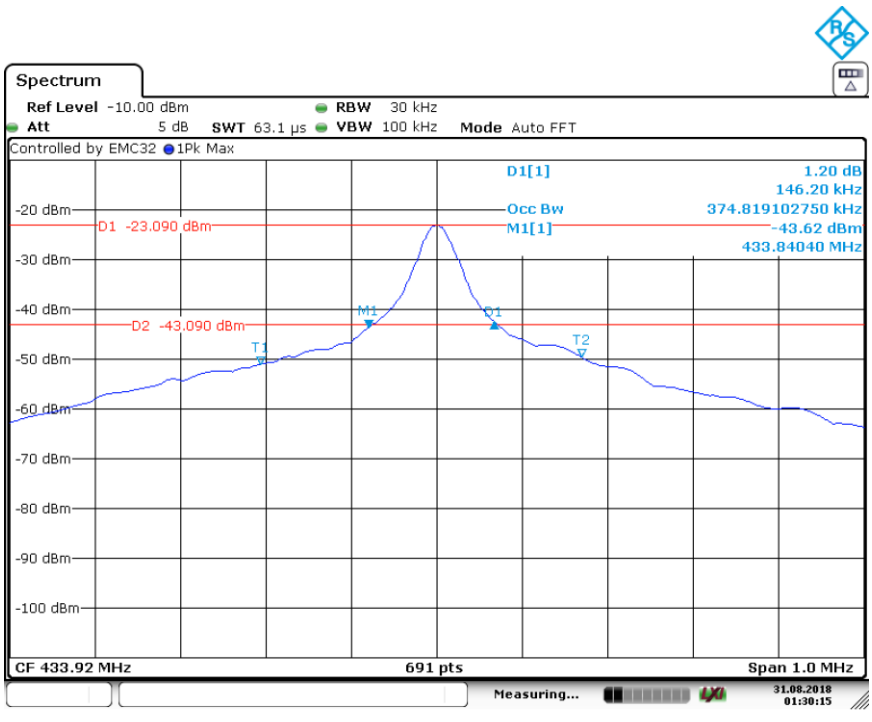
Refer to the data graph, bandwidth of the emission is 146.20Khz, and is 0.071% of the centre frequency. Therefore, the EUT meets the requirement of section 15.231(c).

Limit for Bandwidth [Section 15.231 (c) and RSS-210 A.1.3]

The bandwidth of the emission shall be no wider than 0.25% if the centre frequency for devices

operating above 70MHz and below 900MHz.

Test Result: Result data graph is shown in the following for reference.



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10.4 Average Factor

Average factor in dB = 20 log (duty cycle)

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long The specification for output field strengths in accordance with the FCC rules specify measurements with an average detector.

The duty cycle is the total signal on time per one transmission.

The duration of one cycle = 33.6522ms

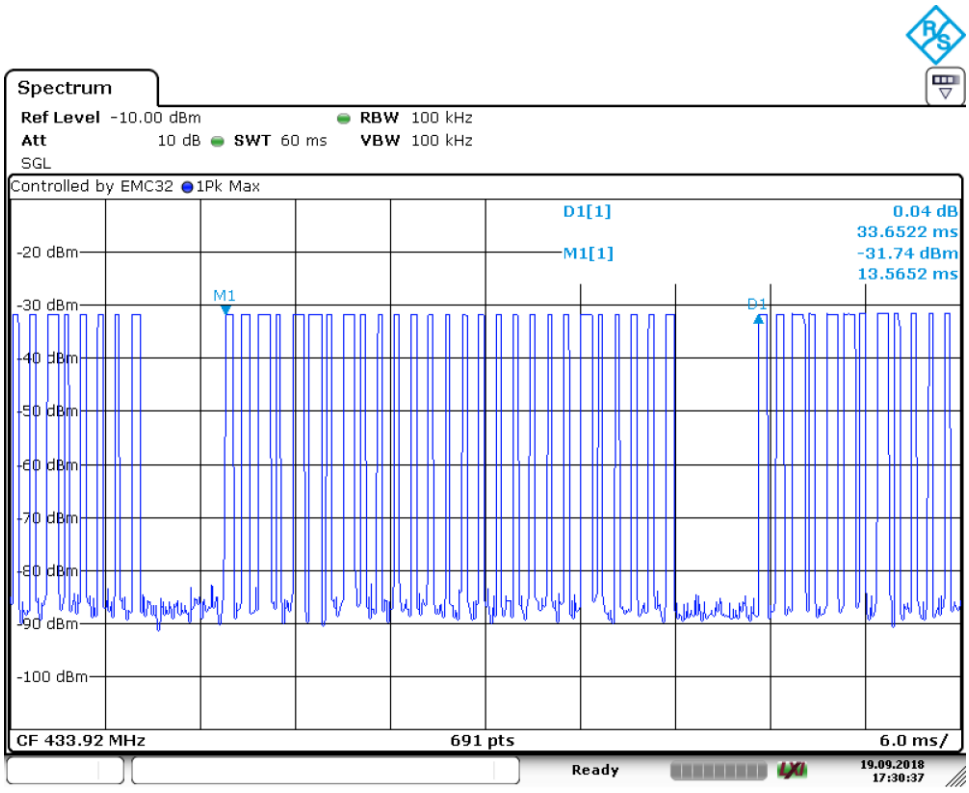
Effective period of the cycle = (0.3043ms x 19 +0.5217 x 3+0.7391 x 5)

= 11.0423ms

Duty cycle = 11.0423/33.6522x 100%=32.81%

Therefore, the averaging factor is 20 log (0.3281)
= -9.68dB

Remark:
- Refer to the following graph for the detail.



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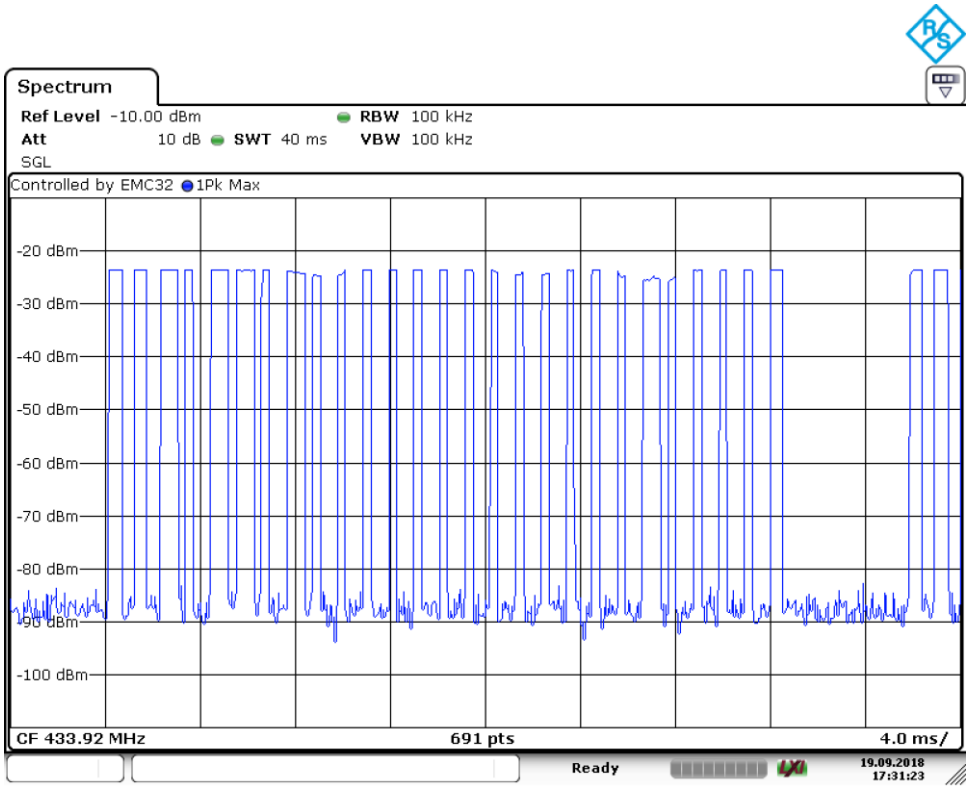

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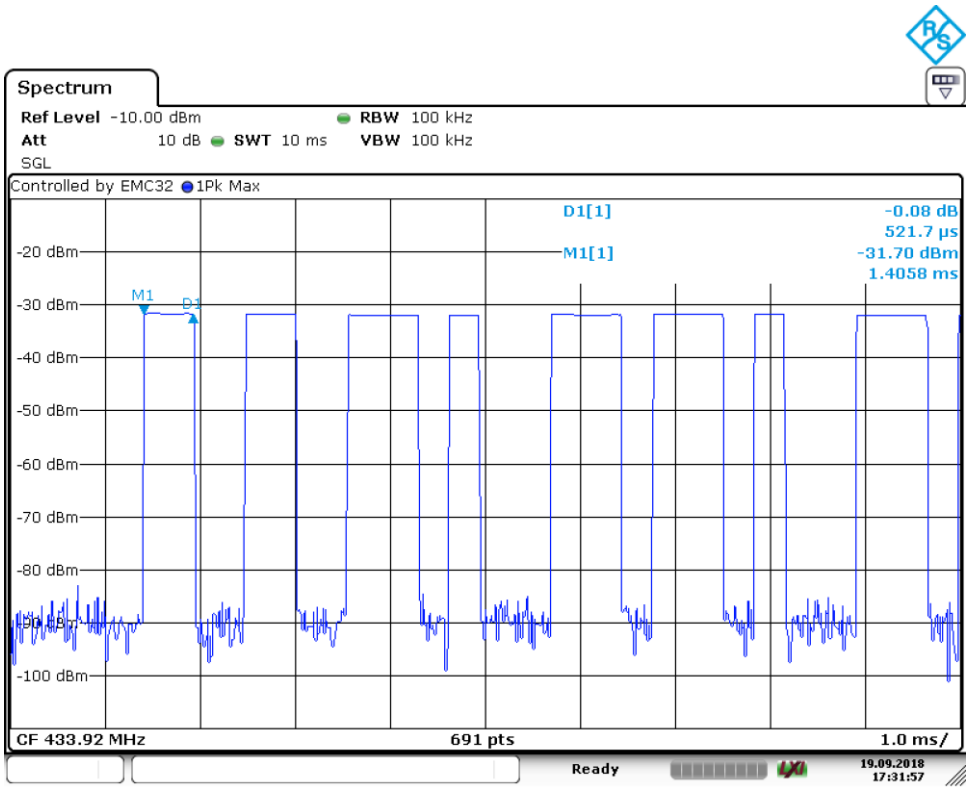

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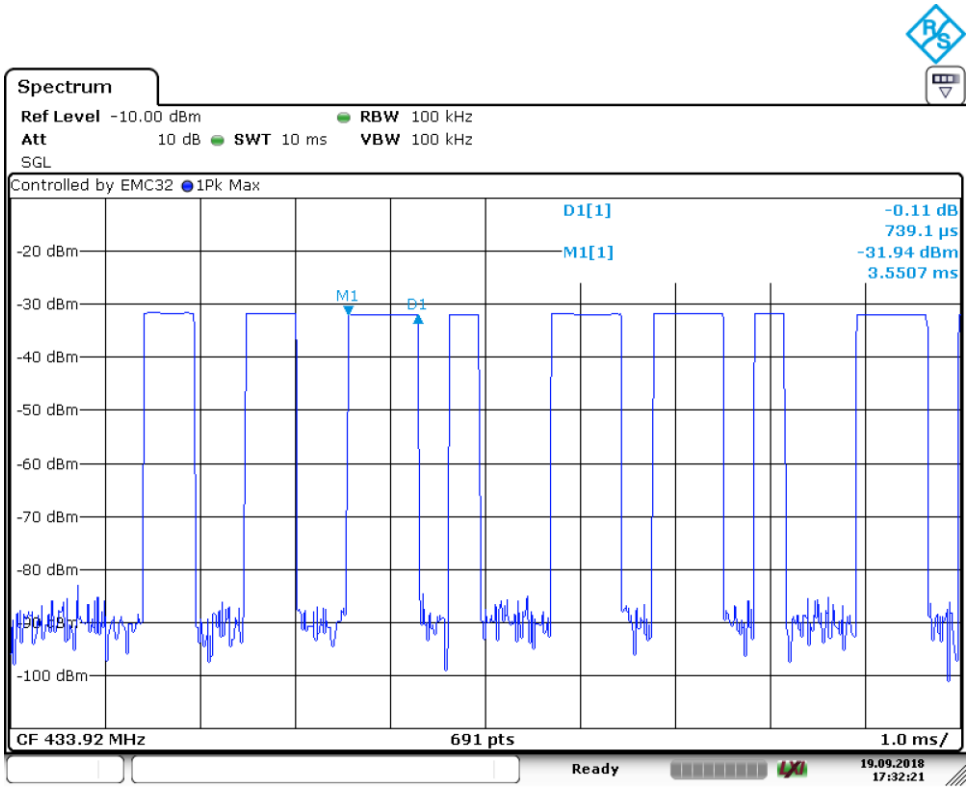

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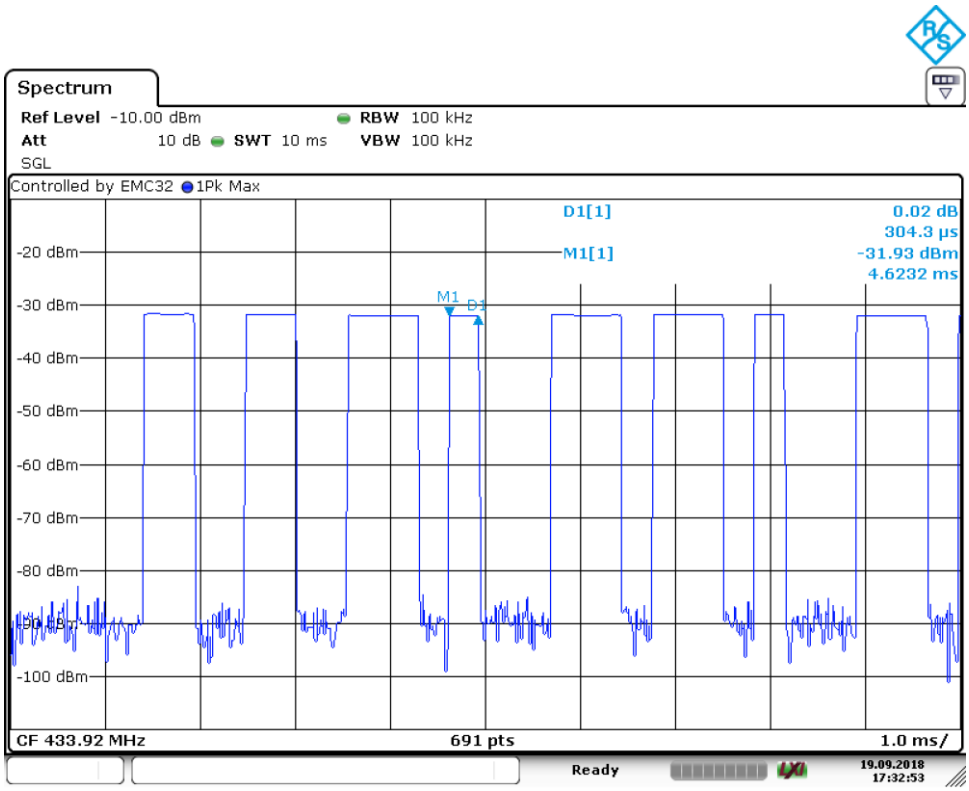

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10.5 Transmitter Time

Test Requirement:	FCC part 15 section 15.231 (a)/RSS-210 A1.1(a)
Mode of Operation:	Transmitting mode.
Detector Function:	Peak

Results: PASS

According to FCC Part 15.231 (a), the transmitter shall be complied the following requirements:

(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

Limit for Transmitter Time [Section 15.231 (a)(1) and RSS-210 A1.1]

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Test Result: The Transmitter Time is 391.3ms

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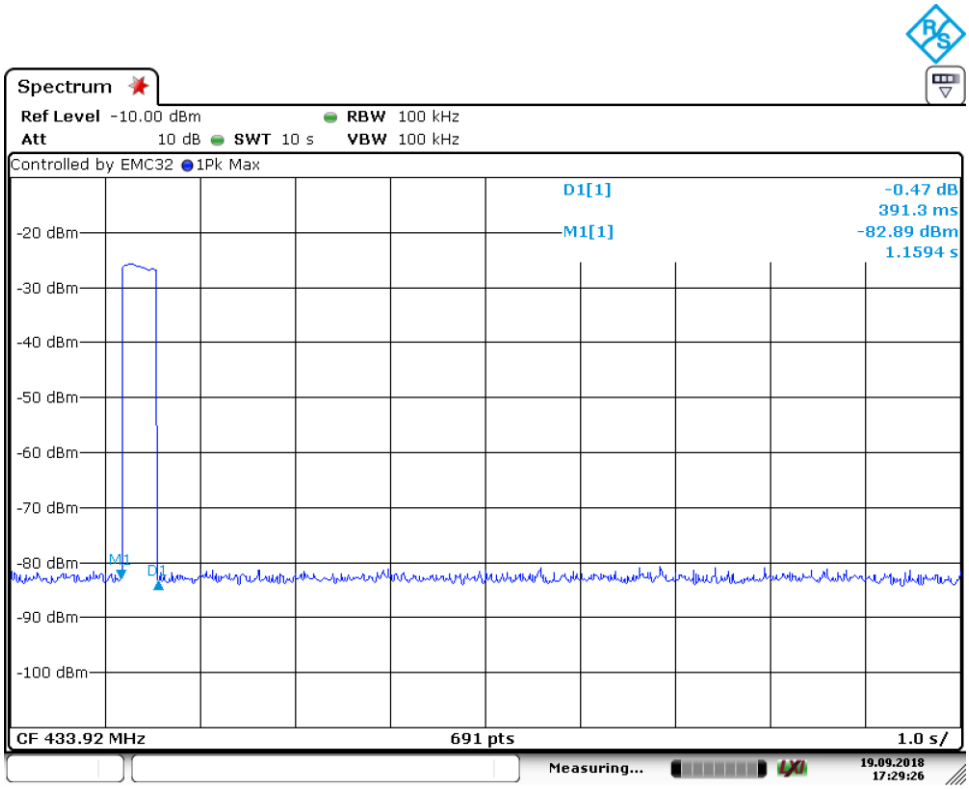

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11 Test Equipment List

List of Test Instruments

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2019-7-6
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2019-6-28
Horn Antenna	Rohde & Schwarz	HF907	102294	2019-6-28
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2019-7-6
Signal Generator	Rohde & Schwarz	SMY01	839369/005	2019-7-6
Attenuator	Agilent	8491A	MY39264334	2019-7-6
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

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12 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items	Extended Uncertainty
Radiated spurious emission	Horizontal: U=4.91dB (30MHz~1GHz) Vertical: U=4.89dB (30MHz~1GHz) Horizontal: U=4.80dB (1GHz~18GHz) Vertical: U=4.79dB (1GHz~18GHz)

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