FCC- TEST REPORT

Report Number	:	**68.950.18.0339.01**	Date of Issue:	October 26 2018

Model	:	**59747-R**
Brand Name		**Woods**
Product Type	:	Outdoor Remote Control
Applicant	:	Southwire Co.
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	:	**n Positive o Negative**
Total pages including Appendices	:	16

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1 Table of Contents

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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
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3 Description of the Equipment Under Test

Product:	Outdoor Remote Control
Model no.:	59747-R
FCC ID:	2AENI-59747R
Brand Name	Woods
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 10-1-2017 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to ANSI C63.10 (2013).

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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		**Conducted emission AC power port**	**--**	**--**	**Not Applicable**
§15.205, §15.209, 15.35 (c)§15.231(b)		**Radiated Emission, 30MHz to 4.5GHz**	**10**	**Site 1**	**Pass**
§15.231(c)		**Bandwidth Measurement**	**13**	**Site 1**	**Pass**
§15.231(a)(1)		**Deactivation Time**	**14**	**Site 1**	**Pass**
§15.203		**Antenna requirement**	**--**	**See Note 2**	**Pass**

Note 1: N/A=Not Applicable.
Note 2: The EUT uses a PCB antenna, which gain is -1dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AENI-59747R complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

n - Performed

o - **Not** Performed

The Equipment Under Test

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

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

Sample Received Date: August 23, 2018

Testing Start Date: August 23, 2018

Testing End Date: September 20, 2018

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Tested by:	Reviewed by:	Prepared by:
Louise Liu	Laurent	Vincent Zheng
EMC Test engineer	EMC Project Manager	EMC Project Engineer

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7 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
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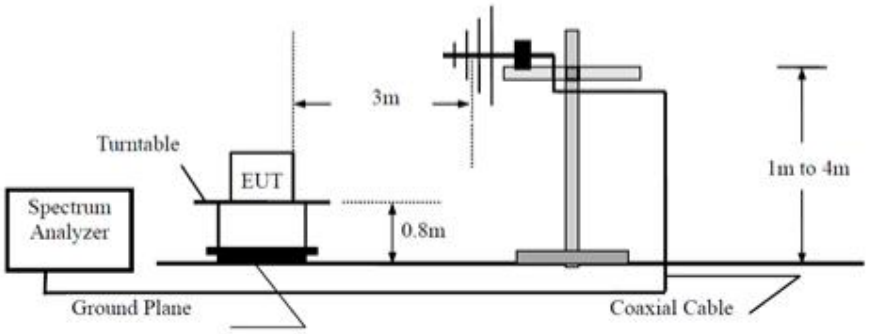
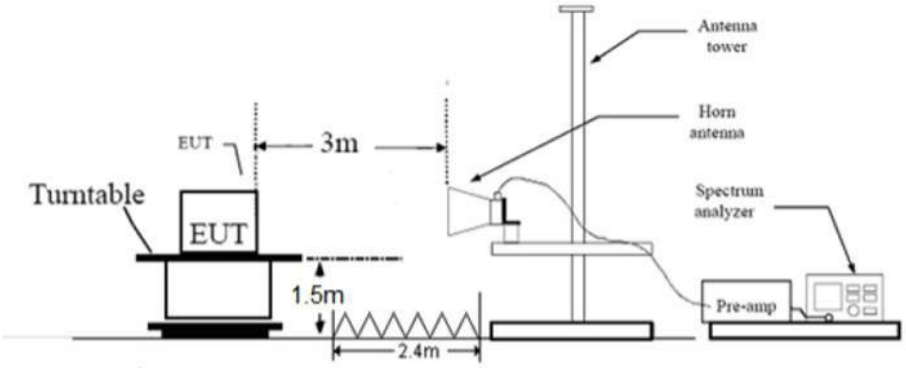
8 Test Setups

8.1 Radiated test setups

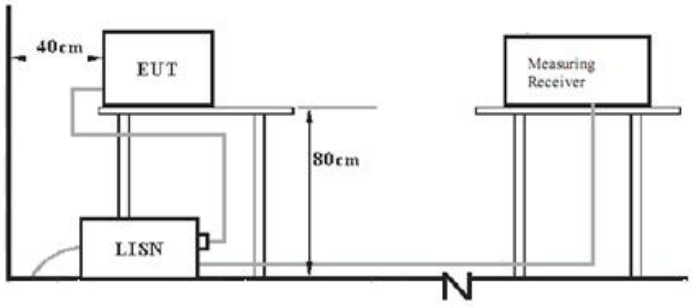
Below 1GHz



Above 1GHz



8.2 AC Power Line Conducted Emission test setups



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9 Test Methodology

9.1 Radiated Emission

Test Method

1: The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3: The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4: For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5: Use the following spectrum analyzer settings According to C63.10:
For Above 1GHz
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW≥RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.
For Below 1GHz
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Limit

According to §15.231 (b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (Microvolts /meter)	Field Strength of spurious emissions ((Microvolts /meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,370 *	125 to 375 *
174-260	3,750	375
260-470 √	3,750 to 12, 500*	375 to 1,250*
Above 470	12,500	1,250

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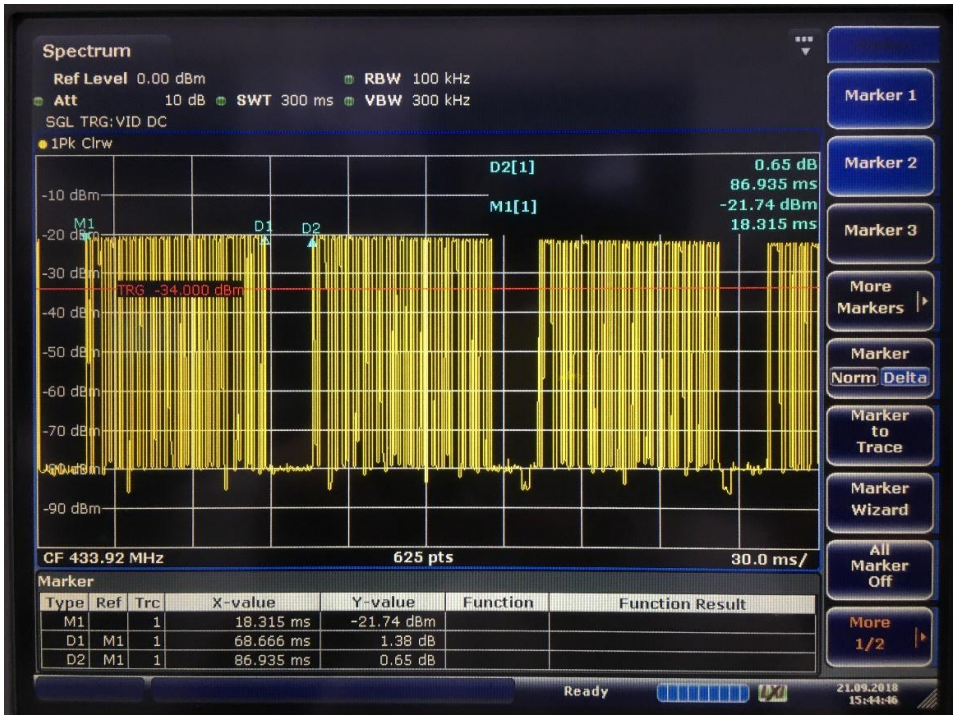
Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Radiated Emissions								
Value	Emissions Frequency **MHz**	E-Field Polarity	Field at 3m **dBµV/m**	Average Factor **dB**	Net Field at 3m **dBµV/m**	Limit **dBµV/m**	Margin	Emission Type
Below 1GHz								
PK	433.920	H	76.85	0.00	76.85	100.83	23.98	Fundamental
AV	433.920	H	76.85	-1.99	74.86	80.83	5.97	Fundamental
PK	433.920	V	77.24	0.00	77.24	100.83	23.59	Fundamental
AV	433.920	V	77.24	-1.99	75.25	80.83	5.58	Fundamental
PK	867.220	H	36.62	0.00	36.49	80.83	44.34	Spurious
AV	868.160	H	36.49	-1.99	34.50	60.83	26.33	Spurious
Above 1GHz								
PK	3470.25	H	65.29	0.00	65.29	74	8.71	Spurious
AV	3470.57	H	44.17	-1.99	42.18	54	11.82	Spurious
PK	3470.61	V	66.19	0.00	66.19	74	7.81	Spurious
AV	3470.92	V	46.83	-23.52	23.31	54	30.69	Spurious

Remark:
1: AV Emission Level= PK Emission Level+20log(dutycycle)
2: Data of measurement within this frequency range shown "/" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.
3: "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

Duty Cycle =[(4.85*2)+(0.72*20)+(0.35*20)](ms)/80 (ms) =79.52%
Duty Cycle Factor =20log (Duty Cycle) =-1.99



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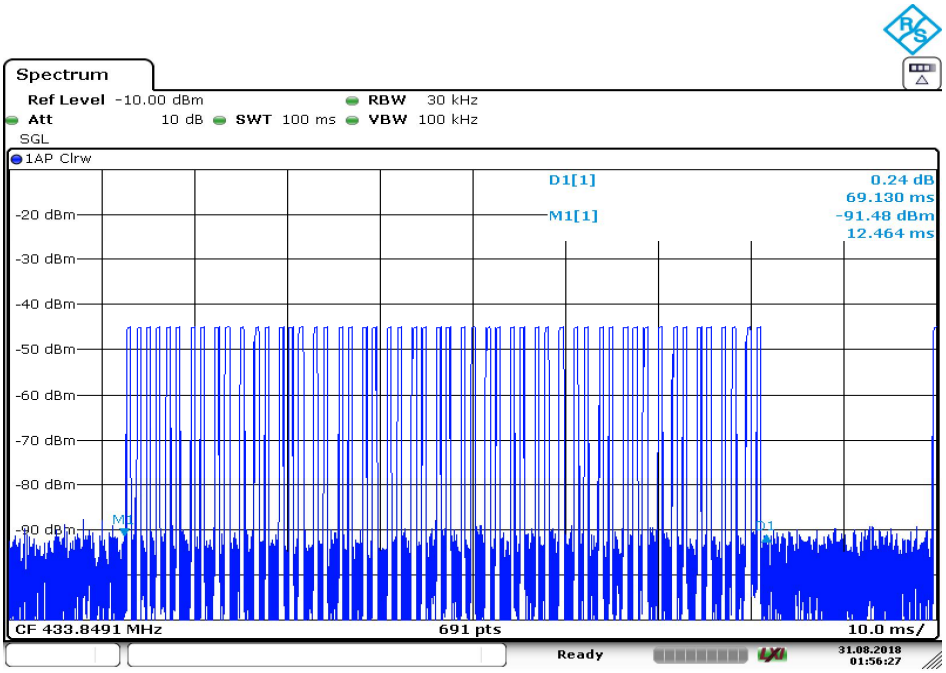

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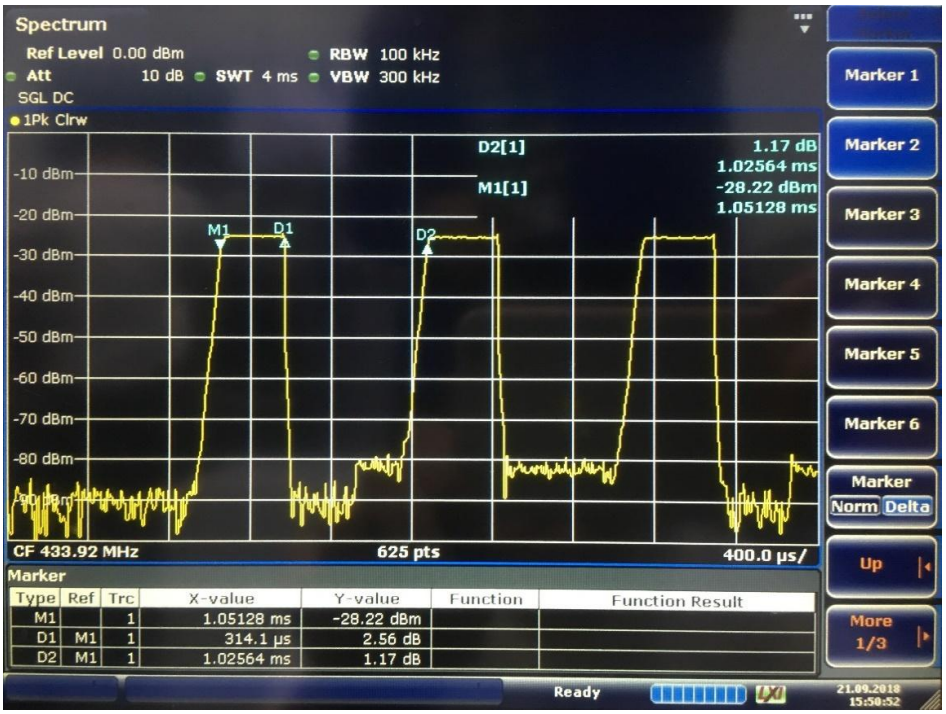

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9.2 Bandwidth Measurement

Test Method

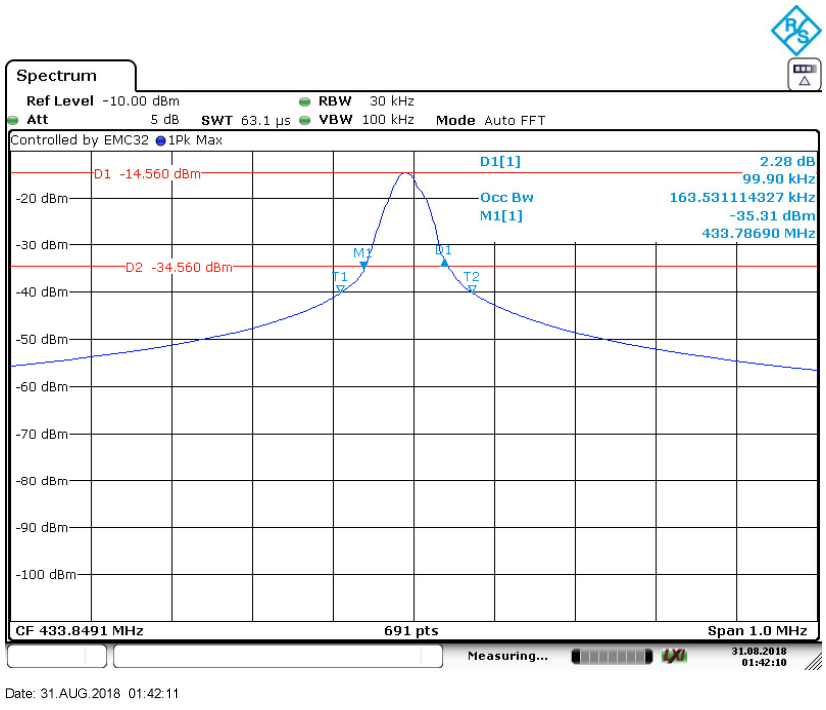
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20dB down from the modulated carrier.
The limit for the EUT = 0.25% * 433.91 MHz = 1084 kHz

Test Result

Channel	20dB Bandwidth (KHz)	99% bandwidth (KHz)	Limit (KHz)
1	99.90	163.53	1084



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9.3 Transmitter Time

Test Method

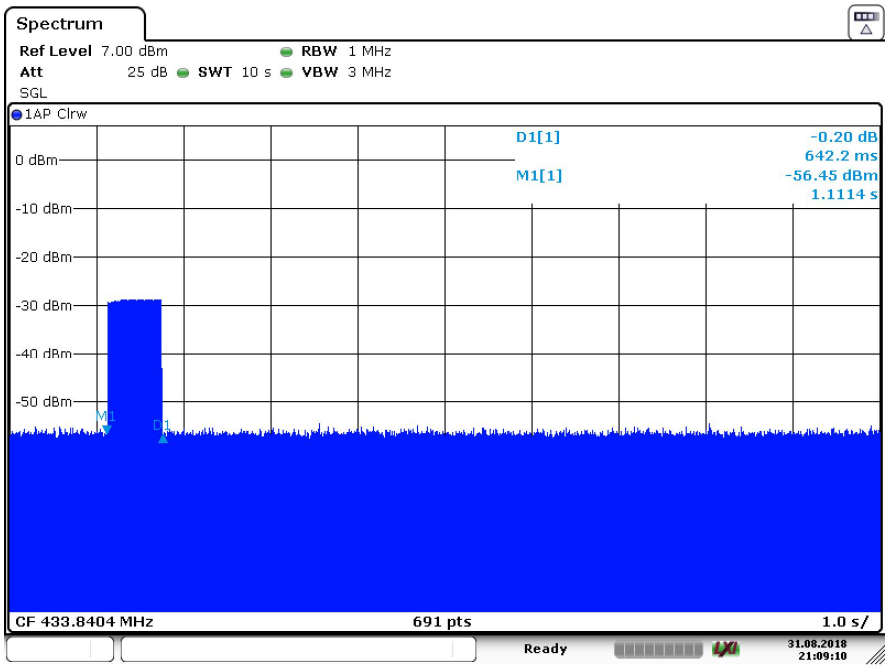
1. Place the EUT in the chamber and set it in transmitting mode.
2. Set center frequency of spectrum analyzer=operating frequency.
3. Set the spectrum analyzer as RBW=120 KHz, VBW=1MHz, Span=0Hz.
4. 4. Repeat above procedures until all frequency measured was complete.

Limit

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.

Test Result

Channel	Frequency	Deactivation Time	Result
1	433.92MHz	642.2ms	Pass



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10 Test Equipment List

List of Test Instruments

Radiated Spurious Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101031	2019-7-6
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	708	2019-7-13
Horn Antenna	Rohde & Schwarz	HF907	102295	2019-7-13
Wideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	12827	2019-7-12
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2019-7-6
Pre-amplifier	Rohde & Schwarz	SCU 40A	100432	2019-7-6
Fully Anechoic Chamber	TDK	8X4X4	--	2020-7-7

TS8997 Test System

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	2019-7-6
Vector Signal Generator	Rohde & Schwarz	SMBV100A	262825	2019-7-6
Communication Synthetical Test Instrument	Rohde & Schwarz	CMW 270	101251	2019-5-31
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2019-7-6
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	2019-7-6
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2019-7-6
Power Splitter	Weinschel	1580	SC319	2019-7-5
10dB Attenuator	Weinschel	4M-10	43152	2019-7-6
10dB Attenuator	R&S	DNF	DNF-001	2019-7-6
10dB Attenuator	R&S	DNF	DNF-002	2019-7-6
10dB Attenuator	R&S	DNF	DNF-003	2019-7-6
10dB Attenuator	R&S	DNF	DNF-004	2019-7-6
Test software	Rohde & Schwarz	EMC32	Version 10.38.00	N/A
Test software	Tonscend	System for BT/WIFI	Version 2.6	N/A

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11 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	
Test Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.91dB; Vertical: 4.89dB;
Uncertainty for Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.80dB; Vertical: 4.87dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.59dB; Vertical: 4.58dB;
Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz	Horizontal: 5.05dB; Vertical: 5.04dB;

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