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Report No.: 1609100326RFC-1

FCC TEST REPORT

Product	:	Smart Thermometer
Trade mark	:	WEBER
Model/Type reference	:	WEBER IGRILL 3
Report Number	:	1609100326RFC-1
Date of Issue	:	September 28, 2016
FCCID	:	2AHSR-WEBER
Test Standards	:	47 CFR Part 15 Subpart C (2015)
Test result	:	PASS

Prepared for: Weber-Stephen Products LLC 1415 S. Roselle Road, Palatine, IL 60067, USA

Prepared by:

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Date:



Version

Version No.	Date	Description	
V1.0	September 28, 2016	Original	





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1 General Information

1.1 Client Information

Applicant:	Weber-Stephen Products LLC
Address of Applicant:	1415 S. Roselle Road, Palatine, IL 60067, USA
Manufacturer:	
Address of Manufacturer:	

1.2 General Description of EUT

Product Name:	Smart Thermometer			
Mode No.(EUT):	WEBER IGRILL 3	WEBER IGRILL 3		
Add Mode No.:	N/A			
Trade Mark:	WEBER	WEBER		
EUT Supports Radios	Bluetooth V4.0 BLE			
application:	2.4GHz Wireless			
Power Supply:	AC adapter	N/A		
	Vehicle adapter	N/A		
	Battery	DC 4.5V (AA x 3)		
USB Micro-B Plug cable:	N/A			
USB Changing cable:	N/A			
AUX cable:	N/A			
AC Adapter (1) line:	N/A			

1.3 Product Specification subjective to this standard

Frequency Range:	2402MHz ~ 2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Sample Type:	Portable production
Test Power Grade:	Fixed
Test Software of EUT:	N/A
Antenna Type:	PCB
Antenna Gain:	3.3dBi
Test voltage:	DC 4.5V
Sample Received Date:	September 2, 2016
Sample tested Date:	September 2, 2016 to September 8, 2016



Operation Frequency each of channel

Bluetooth 4.0 BLE

The sample supplied operated on 40 channels, nominally at 2402 -2480 MHz for transceiver. The channel is separated by 2 MHz channel spacing. The tests were carried out on 2402MHz, 2440MHz and 2480MHz of the frequency of the alignment range. 1, 19 and 39

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency		
The Lowest channel(CH0)	2402MHz		
The Middle channel(CH19)	2440MHz		
The Highest channel(CH39)	2480MHz		

1.4 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	9976 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

1.5 Description of Support Units

The EUT has been tested independently.

1.6 Test Location

All tests were performed at:

Compliance Certification Services (Shenzhen) Inc.

No.10-1 Mingkeda Logistics Park, No.18 Huanguan South RD. Guan lan Town, Baoan Distr, Shenzhen, Guangdong, China.

Compliance Certification Services (Shenzhen) Inc. has been accepted by the FCC, the FCC Registration Number is 441872.

Tested by: Darry Wu

1.7 Deviation from Standards

None.

1.8 Deviation from Standards

None.



1.9 Abnormalities from Standard Conditions

None.

1.10 Other Information Requested by the Customer

None.

1.11 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty	
1	Radio Frequency	±6.3 x 10 ⁻⁸	
2	RF power, conducted	±0.52 dB	
2	Spurious emissions, radiated (Below 1GHz)	±5.3 dB	
3	Spurious emissions, radiated (Above 1GHz)	±5.1 dB	
	Conduction emission (9KHz~150KHz)	±3.8 dB	
4	Conduction emission (150KHz~30MHz)	±3.4 dB	
5	Temperature	±0.64 °C	
6	Humidity	±2.8 %	
7	Supply voltages	±0.49 %	



2 Test Summary

Test Item	Test Requirement	Test method	Result	
Antonno Doguizomont	47 CFR Part 15 Subpart C		PASS	
Antenna Requirement	Section 15.203	ANSI 063.10-2013		
Conducted Emission	47 CFR Part 15 Subpart C	ANSI 062 10 2012	N1/A	
Conducted Emission	Section 15.207	ANSI C63.10-2013	IN/A	
Field Strength of the 47 CFR Part 15 Subpart C		ANEL CC2 10 2012	PASS	
Fundamental Signal	Section 15.249 (a)			
Spurious Emissions	47 CFR Part 15 Subpart C	ANSI 062 10 2012	DASS	
Spurious Emissions	Section 15.249 (a)/15.209	(a)/15.209		
Restricted bands around	47 CFR Part 15 Subpart C			
(Radiated Emission)	Section 15.249(a)/15.205	ANSI C63.10-2013	PASS	
20dB Occupied 47 CFR Part 15 Subpart C			D 400	
Bandwidth Section 15.215 (c)		ANSI C63.10-2013	PASS	

Remark:

N/A: Not application, this EUT is powered by batteries.



Test results and Measurement Data 3

3.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 3.3dBi.



3.2 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209

Test Method: ANSI C63.10

Test Site: Measurement Distance: 3m (Semi-Anechoic Chamber)

	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
Paggiver Setup	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
Receiver Setup.	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
		Peak	1MHz	3MHz	Peak
	Above 1GHZ	Peak	1MHz	10Hz	Average

Test Setup:



Figure 3. Above 1GHz

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Test Procedure:	Below 1GHz test proce The EUT was placed on meter semi-anechoic ca position of the highest ra The EUT was set 3 me mounted on the top of a The antenna height is determine the maximum polarizations of the anter For each suspected em antenna was tuned to he 30MHz, the antenna was from 0 degrees to 360 de The test-receiver system Maximum Hold Mode. If the emission level of t then testing could be s Otherwise the emissions using peak, quasi-peak sheet. Above 1GHz test proce Different between above Anechoic Chamber and distance is 1 meter and t Test the EUT in the lowe The radiation measurem	edure a the ambe adiation varia varia m varia m varia issio eights s tun egree n was the E stopp s that or a edure e is th chai table est chi ients	as below: top of a rotating er. The table was on. away from the i able-height anten ed from one me alue of the field are set to make the on, the EUT was s from 1 meter to be to find the max s set to Peak Det CUT in peak mod ed and the peak t did not have 10 average method are set site, char nge form table 0 is 1.5 meter hannel ,middle ch are performed in	table 0. as rotate nterferen na towen eter to f d streng be meas arrange o 4 mete meter) a kimum re ect Fund le was 1 k values 0dB marg as spec nge from 0.8 mete	8 m ed 3 our gth. uren ed to ers (f nd t eadir ction 0dB s of gin v ified Ser r to ne H axis	eters above the 60 degrees to receiving anter meters above Both horizonta nent. o its worst cas or the test freq he rota table ta ng. and Specified lower than the the EUT wou vould be re-tes and then rep mi- Anechoic C 1.5 meter(Ab ighest channel positioning for	e ground at a 3 determine the ana, which was the ground to al and vertical e and then the uency of below able was turned Bandwidth with e limit specified, Id be reported. ted one by one orted in a data Chamber to fully ove 18GHz the Transmitting		
	mode, and found the X axis positioning which it is worse case.								
Limit:	Frequency	es un F (m	Field strength	Limit (dBuV/	ea v t m)	Remark	Measurement distance (m)		
(Spurious Emissions)	0.009MHz-0.490MHz		2400/F(kHz)	-		-	300		
	0.490MHz-1.705MHz	2	24000/F(kHz)	-		-	30		
	1.705MHz-30MHz		30	-		-	30		
	30MHz-88MHz		100	40.0		Quasi-peak	3		
	88MHz-216MHz		150	43.5		Quasi-peak	3		
	216MHz-960MHz		200	46.0		Quasi-peak	3		
	960MHz-1GHz		500	54.0		Quasi-peak	3		
	Above 1GHz		500	54.0		Average	3		
Limit:	Note: 15.35(b), Unless of is 20dB above the equipment under radiated by the de	otherv e ma test. evice.	wise specified, th aximum permitted This peak limit	ne limit o d averag applies	on pe ge ei to	eak radio frequ mission limit a the total peak	ency emissions oplicable to the emission level		
(Field strenath of the	Frequency		Limit (dBµV/m	@3m)		Remark	_		
fundamental signal)	2400MHz-2483.5MHz	z –	94.0		A	verage Value Peak Value			

fundamental signal) Exploratory Test Mode:

Transmitting	mode

Final Test Mode: Instruments Used:

Test Results:

Pretest the EUT at Transmitting mode, Only the worst case is recorded in the report. Refer to section 5.11 for details Pass

Measurement Data Field Strength of the Fundamental Signal

Peak value:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Result (Pass/Fail)	Antenna Polaxis
2402	94.3	114.00	-19.7	Pass	Н
2440	95.2	114.00	-18.8	Pass	Н
2480	96.0	114.00	-18.0	Pass	Н

Average value:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Result (Pass/Fail)	Antenna Polaxis
2402	75.6	94	-18.4	Pass	Н
2440	76.2	94	-17.8	Pass	Н
2480	76.9	94	-17.1	Pass	Н



Spurious Emissions

30MHz~1GHz





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Test m	Test mode: Trar		smitting	Test channel:	Lowest	Rem	ark:	Peak
ANT	Freque (MHz	ncy <u>z</u>)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Н	1741.250		49.66	-6.39	43.27	74	-30.73	peak
Н	2398.2	250	45.93	-2.91	43.02	74	-30.98	peak
Н	3293.7	'50	44.62	-1.39	43.23	74	-30.77	peak
Н	4804.000		41.34	3.02	44.36	74	-29.64	peak
Н	5512.0	000	40.79	4.88	45.67	74	-28.33	peak
H*	7206.0	000	40.21	9.29	49.50	74	-24.50	peak

Above 1GHz

Test m	node:	Trar	smitting	Test channel:	Middle	Rema	rk: F	Peak
ANT	Freque (MHz	ncy z)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Н	1740.2	250	50.16	-6.40	43.76	74.00	-30.24	peak
н	3173.7	750	43.78	-1.07	42.71	74.00	-31.29	peak
Н	4607.2	250	41.13	3.70	44.83	74.00	-29.17	peak
Н	4880.0	000	41.80	4.35	46.15	74.00	-27.85	peak
Н	5993.7	750	40.50	6.08	46.58	74.00	-27.42	peak
H*	7320.0	000	40.49	8.01	48.50	74.00	-25.50	peak

Test m	ode:	Trar	smitting	Test channel:	Highest	Rema	rk: F	Peak
ANT	Freque (MHz	ncy ː)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Н	1728.5	500	49.66	-6.42	43.24	74.00	-30.76	peak
н	2398.2	250	45.93	-2.82	43.11	74.00	-30.89	peak
Н	3173.7	750	44.62	-1.07	43.55	74.00	-30.45	peak
Н	4960.0	000	41.34	3.62	44.96	74.00	-29.04	peak
Н	5512.0	000	40.79	5.88	46.67	74.00	-27.33	peak
H*	7440.0	000	40.21	7.04	47.25	74.00	-26.75	peak

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Result =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor – Antenna Factor – Cable Factor

2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Average Value

Peak Value

3.3 Restricted bands around fundamental frequency

Above 1GHz

Test Requirement:	47 CFR Part 15C Section 15	5.209 and 15.205					
Test Method:	ANSI C63.10						
Test Site:	Measurement Distance: 3m	(Semi-Anechoic Chamber)				
Limit(band edge):	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.						
	Frequency	Limit (dBµV/m @3m)	Remark				
	30MHz-88MHz	40.0	Quasi-peak Value				
	88MHz-216MHz	43.5	Quasi-peak Value				
	216MHz-960MHz	46.0	Quasi-peak Value				
	960MHz-1GHz	54.0	Quasi-peak Value				

Test Setup:

Test Procedure:



Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz

Below 1GHz test procedure as below: a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

54.0

74.0

- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height 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.
- d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).

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	 Test the EUT in the lowest channel, the Highest channel
	i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
	j. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting mode
Final Test Mode:	Transmitting mode
	Only the worst case is recorded in the report.
Instruments Used:	Refer to section 3 for details
Test Results:	Pass

Test plot as follows:

Test m	node:	Trar	smitting	Test channel:	Lowest	Rema	rk: I	Peak
ANT	Freque (MHz	ncy <u>z</u>)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Н	2379.4	100	50.68	-2.92	47.76	74.00	-26.24	peak
Н	2379.4	100	37.04	-2.92	34.12	54.00	-19.88	AVG

Test m	node:	Trar	smitting	Test channel:	Highest	Rema	rk:	Peak
ANT	Freque (MHz	ncy <u>z</u>)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Н	2507.2	200	51.52	-2.25	49.27	74.00	-24.73	peak
Н	2507.2	200	37.23	-2.25	34.98	54.00	-19.02	AVG

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Result = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor- Antenna Factor-Cable Factor



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3.4 20dB Bandwidth

Test R	equirement:
--------	-------------

47 CFR Part 15C Section 15.215

ANSI C63.10

Test Method:

Test Setup:



Ground Reference Plane

N/A
Transmitter mode
GFSK
Refer to section 3 for details
Pass

Measurement Data

Test Channel	20dB bandwidth (MHz)	Results			
Lowest	1.465	Pass			
Middle	1.365	Pass			
Highest	1.341	Pass			



Test plot as	follows:	I				
Test channel	:	Lowest				
	Keysight Spectrum Analyz Center Freq 2.4	zer - Occupied BW 50 Ω AC CORREC 020000000 GHz	#IFGain:Low	SENSE:INT Center Freq: 2.4020 Trig: Free Run #Atten: 20 dB	ALIGN AUTO/NO RF 00000 GHz Avg Hold:>10/10	05:56:44 PM Sep 02, 2016 Radio Std: None Radio Device: BTS
	10 dB/div Ref Log	91.99 dBµV		#VBW 300 Total Power	кHz 90.9 dBµV	Span 3 MHz Sweep 1 ms
	Transmit Free x dB Bandwid	1.271 1 g Error 80 ith 1.	1 MHz .228 kHz 465 MHz	% of OBW Por x dB	wer 99.00 % -20.00 dB	
Test channel	:	Middle				
	Keysight Spectrum Analyz	zer - Occupied BW 50 Ω AC CORREC 400000000 GHz	#IFGain:Low	SENSE:INT Center Freq: 2.44000 Trig: Free Run #Atten: 20 dB	ALIGN AUTO/NO RF 200000 GHz Avg Hold:>10/10	05:57:34 PM Sep 02, 2016 Radio Std: None Radio Device: BTS
	10 dB/div Ref Log 25.0 35.0 45.0 55.0 55.0 55.0 55.0 55.0 55.0 5	91.99 dBµV	3 MHz .220 kHz 365 MHz	#VBW 300 Total Power % of OBW Power x dB	kHz 91.5 dBµV wer 99.00 % -20.00 dB	Span 3 MHz Sweep 1 ms
	MSG				STATUS	

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Keysight Spectrum Analyzer -	Occupied BW 0 Ω AC CORREC	S	ENSE:INT	ALIGN A	UTO/NO RF		05:58:1	
Center Freq 2.480	000000 GHz		Center Freq: Trig: Free Ru	2.480000000 (n	GHz AvalHold:>	10/10	Radio Std: N	lone
	#1	FGain:Low	#Atten: 20 dE	3	0,		Radio Devic	e: BTS
10 dB/div Ref 91	.99 dBµV							
-25.0								
-35.0								
-45.0	~~~~~							
-55.0								~
-b6.0 mar mar								
-75.0								
-95.0								
-105								
Center 2.48 GHz #Res BW 100 kHz			#VBV	/ 300 kHz			s Sv	pan 3 MHz veep 1 ms
Occupied Bar			Total Po	Nor	02.7 dB	υV		
Occupied Bar		N 41 I	Total TO	Wei	52.7 UD	μν		
	1.1713	MHZ						
Transmit Freq E	Error 16.0	66 kHz	% of OB	V Power	99.00	%		
x dB Bandwidth	1.34	41 MHz	x dB		-20.00	dB		



APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

See test photographs attached in Appendix 1 for the actual connections

APPENDIX 2 PHOTOGRAPHS OF EUT

Refer to Appendix 2 for EUT external and internal photographs. *** End of Report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.

