

FCC - TEST REPORTReport Number : **60.792.18.013.01R01** Date of Issue : August 27, 2018Model : **HG04641A-US-TX, HG04641B-US-TX**Product Type : **TEMPERATURE STATION LCD**Applicant : Lidl US Trading, LLCAddress : 3500 S. Clark Street, Arlington, Virginia, United StatesProduction Facility : PUTIAN DIOR INDUSTRIAL CO., LTD.Address : Linan Industrial Area, Xianyou County, Putian, Fujian, ChinaTest Result : **Positive** **Negative**Total pages
including
Appendices : 19

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2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	TEMPERATURE STATION LCD
Model no.:	HG04641A-US-TX
FCC ID:	2AJ9O-HG4641TX
Rating:	3 VDC (2 x AA battery)
Frequency:	433.92MHz
Antenna gain:	0 dBi
Number of operated channel:	1
Modulation:	FSK



3 Summary of Test Standards

Test Standards

FCC Part 15 Subpart C 10-1-17 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Unintentional Radiators



4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Hong Kong Ltd.
 3/F, West Wing, Lakeside 2,
 10 Science Park West Avenue,
 Science Park, Shatin, Hong Kong

Site 2

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
 Building 12&13 Zhiheng Wisdomland Business Park,
 Nantou Checkpoint Road 2,
 Shenzhen 518052, P.R.China
 FCC Registration Number: 514049

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 & 15.231(e) Radiated Emission	Site 2
FCC Title 47 Part 15.207 Conduct Emission	NIL
FCC Title 47 Part 15.231(c) 20dB Bandwidth	Site 2
FCC Title 47 Part 15.247(e) Transmission Time	Site 2

4.1 Test Equipment Site List

Radiated emission Test – Site 2

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

20dB Bandwidth, Transmission Time – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2019-7-6

4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.54dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.83dB; Vertical: 4.91dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.89dB; Vertical: 4.88dB;
Uncertainty for Conducted RF test	2.04dB

5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.205, 15.209 & 15.231(e) Radiated Emission	10-13	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.207 Conduct Emission (1)	NIL	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FCC Title 47 Part 15.231(c) 20dB Bandwidth	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(e) Transmission Time	15	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remark:

- 1) These requirements do not apply for equipment which employ battery power for operation and which do not operate from the AC power lines.

6 General Remarks

Remarks

Client informs that the HG04641B-US-TX have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with TEMPERATURE STATION LCD, HG04641A-US-TX. The difference lies only on different color of the different models. (Client's conformation letter shown at appendix C)

EMC Tests were performed on model: HG04641A-US-TX

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.

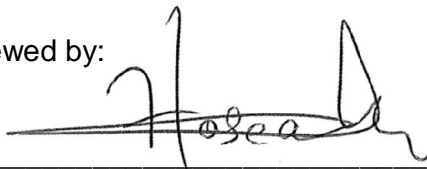
Sample Received Date: August 1, 2018

Testing Start Date: August 7, 2018

Testing End Date: August 15, 2018

- TÜV SÜD HONG KONG LTD. -

Reviewed by:



Hosea CHAN
EMC Project Engineer

Prepared by:



Eric LI
EMC Senior Project Engineer



7 Emission Test Results

7.1 Spurious Radiated Emission

EUT: HG04641A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.205, 15.209 & 15.231(e) Antenna: Horizontal
 Comment: 3 VDC
 Remark: 9kHz to 5GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
59.9622	16.65	40	-23.35	Peak
182.1822	12.25	43.5	-31.25	Peak
433.9258	64.42	92.87	-28.45	Peak
867.8516	41.37	72.87	-31.50	Peak
1301.7774	52.54	74	-21.46	Peak
1735.7032	47.10	74	-26.90	Peak
2169.6290	57.41	74	-16.59	Peak
2603.5548	56.39	74	-17.61	Peak
3037.4806	52.69	74	-21.31	Peak
3471.4064	52.54	74	-21.46	Peak

Duty cycle factor=-10.78
 Average value = Peak value + Duty cycle factor

Frequency MHz	PK Result @3m dB μ V/m	Duty Cycle Factor dB	AV Result @3m dB μ V/m	Limit dB μ V/m	Margin dB
59.9622	16.65	/	/	40	-23.35
182.1822	12.25	/	/	43.5	-31.25
433.9258	64.42	-10.78	53.64	72.87	-19.23
867.8516	41.37	-10.78	30.59	52.87	-22.28
1301.7774	52.54	-10.78	41.76	54	-12.24
1735.7032	47.10	-10.78	36.32	54	-17.68
2169.6290	57.41	-10.78	46.63	54	-7.37
2603.5548	56.39	-10.78	45.61	54	-8.39
3037.4806	52.69	-10.78	41.91	54	-12.09
3471.4064	42.51	-10.78	31.73	54	-22.27

Spurious Radiated Emission

EUT: HG04641A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.205, 15.209 & 15.231(e) Antenna: Vertical
 Comment: 3 VDC
 Remark: 9kHz to 5GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
63.3033	17.97	40	-22.03	Peak
113.9050	10.09	43.5	-33.41	Peak
433.9258	73.67	92.87	-19.20	Peak
867.8516	54.87	72.87	-18.00	Peak
1301.7774	44.23	74	-29.77	Peak
1735.7032	44.69	74	-29.31	Peak
2169.629	56.40	74	-17.60	Peak
2603.5548	51.67	74	-22.33	Peak
3037.4806	56.77	74	-17.23	Peak

Duty cycle factor=-10.78
 Average value = Peak value + Duty cycle factor

Frequency MHz	PK Result @3m dB μ V/m	Duty Cycle Factor dB	AV Result @3m dB μ V/m	Limit dB μ V/m	Margin dB
63.3033	17.97	/	/	40	-22.03
113.9050	10.09	/	/	43.5	-33.41
433.9258	73.67	-10.78	62.89	72.87	-9.98
867.8516	54.87	-10.78	44.09	52.87	-8.78
1301.7774	44.23	-10.78	33.45	54	-20.55
1735.7032	44.69	-10.78	33.91	54	-20.09
2169.629	56.40	-10.78	45.62	54	-8.38
2603.5548	51.67	-10.78	40.89	54	-13.11
3037.4806	56.77	-10.78	45.99	54	-8.01

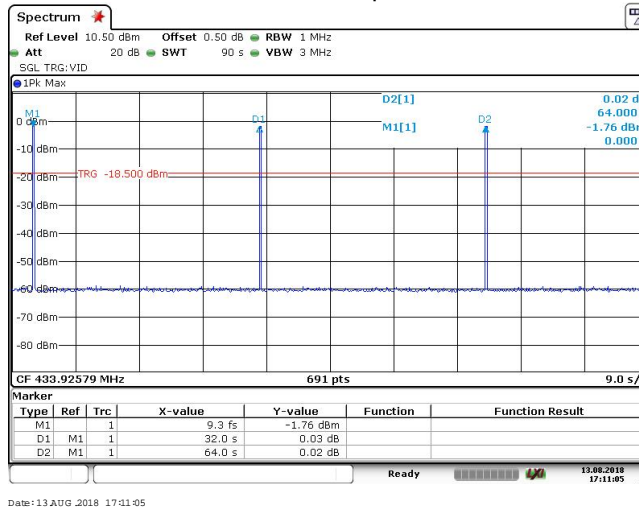
Spurious Radiated Emission

EUT: HG04641A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.205, 15.209 & 15.231(e) Antenna: Vertical
 Comment: 3 VDC
 Remark: 9kHz to 5GHz

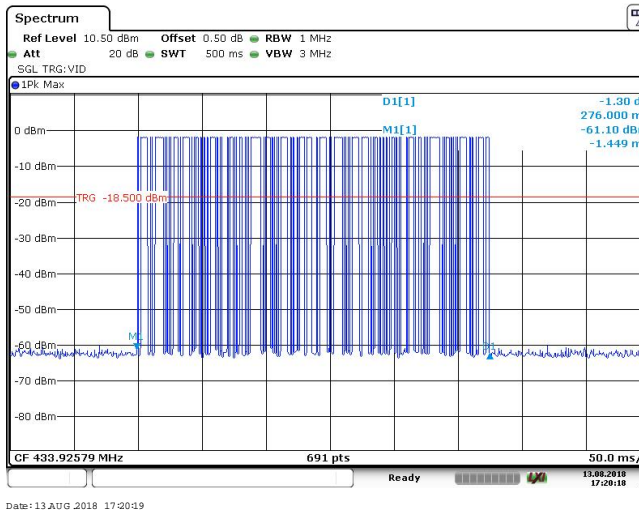
Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Duct Cycle Factor Calculation

a. Transmission period



b. Duration = 276ms

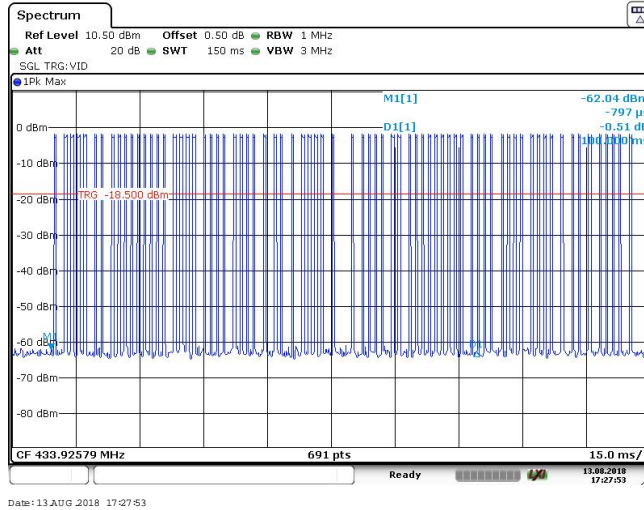


Spurious Radiated Emission

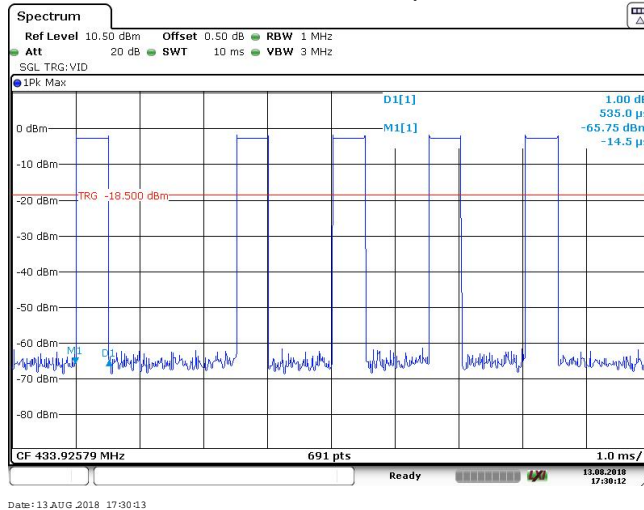
EUT: HG04641A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.205, 15.209 & 15.231(e) Antenna: Vertical
 Comment: 3 VDC
 Remark: 9kHz to 5GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

c. Pulse number in 100ms



d. Pulse width=535 μs

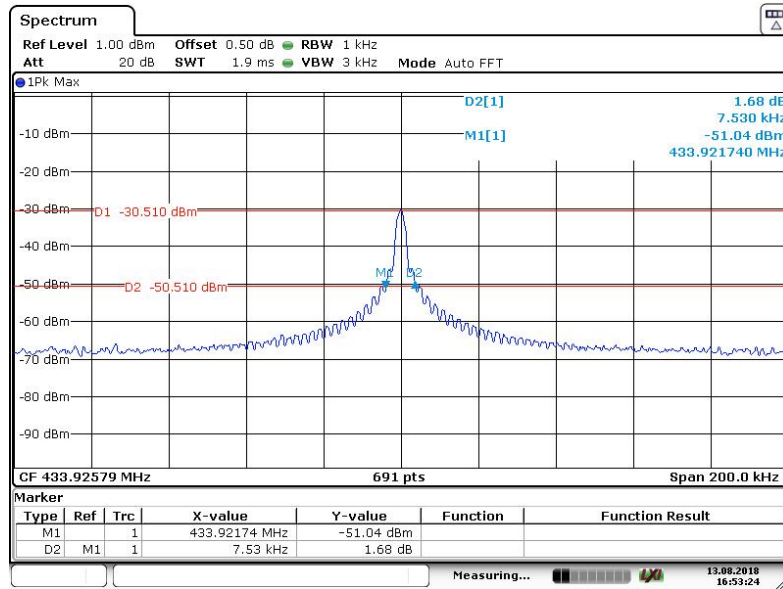


Calculation:
 Max. allowed $T_p=100\text{ms}$
 Number of pulses in 100ms=54
 Pulse width=535 μs
 Ton= Pulse width* Number of pulses in 100ms=28.89ms
 Duty cycle factor= $20*\log(\text{Ton}/T_p)=-10.78$

7.2 20dB Bandwidth

EUT: HG04641A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.231(c) 20dB Bandwidth
 Comment: 3 VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 13 AUG 2018 16:53:25

Bandwidth	Measured Value	Limit
20dB bandwidth	7.530 kHz	> 1084.8 kHz
Limit=0.25%*Center Frequency=0.25%*433.92MHz=1084.8kHz		

7.3 Transmission Time

EUT: HG04641A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.231(e)
 Comment: 3 VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency	Duration of each transmission	Limit	Silent period	Limit
433.92MHz	960ms	< 1s	32s	28.8s

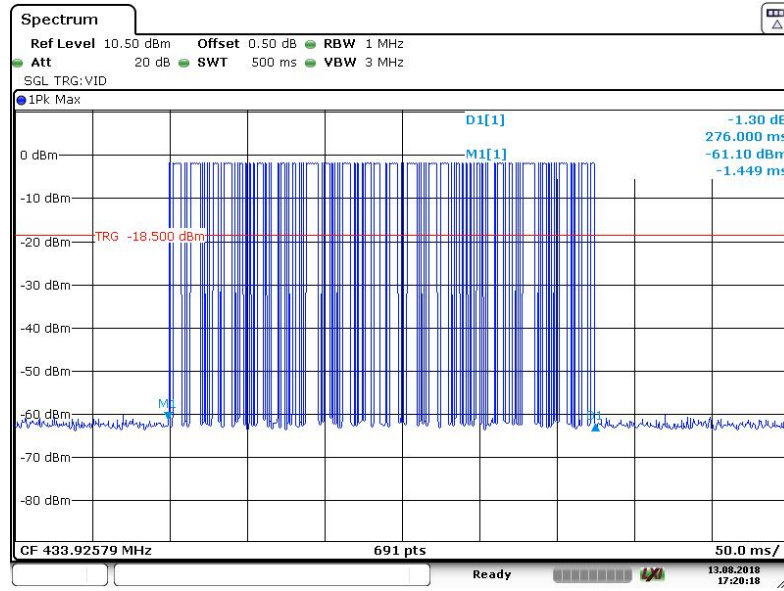
Note: Silent period limit is 30 times the duration of the transmission but in no case less than 10 seconds

Transmission Time

EUT: HG04641A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.231(e)
 Comment: 3 VDC

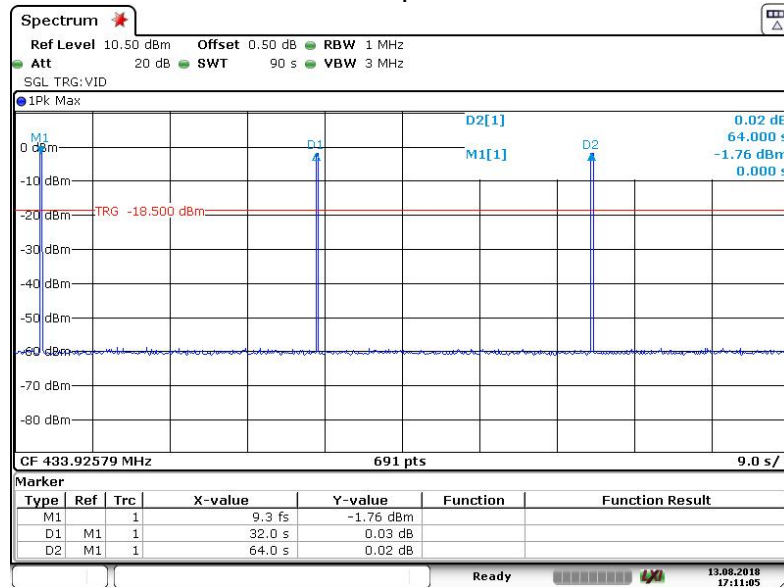
Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Duration of each transmission



Date: 13 AUG 2018 17:20:19

Silent period



Date: 13 AUG 2018 17:11:05

8 Appendix A - General Product Information

To: TÜV SÜD HKG Ltd.

Attention: Edmond Fung
From: Mr. Maxwell Hand
Fax No:

Date: September 6, 2018
Total Page (Cover Included): 1

Declaration Letter

Subject:

We:

Officially notify TÜV SÜD HKG Ltd. that the <<Additional Model>> have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with <<PRODUCT>>, <<Main Test Model>>. The difference lies only on the different on the non-metallic outlook case color of the different models.

<<Additional Model >>: HG04641B-US-TX , HG04641B-US-RX

<<Main Test Model >>: HG04641A-US-TX , HG04641A-US-RX

<<Product>>: TEMPERATURE STATION LCD

Applicant: Lidl US, LCC

9/6/18
(Date)


(Applicant's authorized signature and company Chop)
Mr. Maxwell Hand
Senior Quality Assurance Manager

9 Appendix C - General Product Information

Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v06 section 4.3.1, For frequencies between 100 MHz to 6GHz and test separation distances ≤ 50 mm, the Numeric threshold is determined as:

Step a)

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]
· $[\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR

>> The fundamental frequency of the EUT is 433.92MHz, the test separation distance is $\leq 5\text{mm}$ &
 $\leq 20\text{mm}$

(Manufacturer specified the separation distance is:20mm)

Step a.1)

>> Numeric threshold, mW / **5 mm** * $\sqrt{0.43392\text{GHz}} \leq 3.0$
Numeric threshold \leq **22.771mW**

Step a.2)

>> Numeric threshold, mW / **20 mm** * $\sqrt{0.43392\text{GHz}} \leq 3.0$
Numeric threshold \leq **91.084mW**

>> The power of EUT measured is: -1.69dBm = 0.68mW
Which is smaller than the Numeric threshold.
Therefore, the device is exempt from stand-alone SAR test requirements.

Appendix C - Conducted power

EUT: HG04641A-US-TX
Op Condition: Operated, TX Mode
Comment: 3 VDC
Remark: NA

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

