China

FCC - TEST REPORT

Report Number	:	**60.792.19.006.01R01**	Date of Issue	:	October 15, 2019
Model	:	**HG05686A-US-TX, HG05686B-US-TX**			
Product Type	:	**Temperature station LCD USA, 2 assorted**			
Applicant	:	Lidl US, LLC			
Address	:	3500 South Clark Street, Arlington, VA 22202, USA			
Production Facility	:	AOK Electronic Limited			
Address	:	Tianxin Ind. District, Dahou, Xiegang, Dongguan, Guangdong China			
Test Result	:	■**Positive** ☐**Negative**			
Total pages including Appendices	:	21			

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TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch issued reports.

China

1 Table of Contents

2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	Temperature station LCD USA, 2 assorted
Model no.:	HG05686A-US-TX, HG05686B-US-TX
FCC ID:	2AJ9O-HG5686TX
Rating:	3 VDC (2 x 1.5V AAA battery)
Frequency:	433.92MHz
Antenna gain:	0 dBi
Number of operated channel:	1
Modulation:	OOK(2ASK)

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
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3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-18 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 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	Site1
FCC Title 47 Part 15.207 Conduct Emission	NIL
FCC Title 47 Part 15.231(c) 20dB Bandwidth	Site 1
FCC Title 47 Part 15.247(e) Transmission Time	Site 1

4.1 Test Equipment Site List

Radiated emission Test – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2020-6-28
Signal Analyzer	Rohde & Schwarz	FSV40	101031	2020-6-28
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100398	2020-7-7
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2020-7-5
Horn Antenna	Rohde & Schwarz	HF907	102294	2020-6-22
Wideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	12827	2020-7-5
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2020-6-28
Pre-amplifier	Rohde & Schwarz	SCU 40A	100432	2020-6-28
Attenuator	Agilent	8491A	MY39264334	2020-6-28
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

Conducted Emission Test – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2020-6-28
LISN	Rohde & Schwarz	ENV4200	100249	2020-6-28
LISN	Rohde & Schwarz	ENV432	101318	2020-7-19
LISN	Rohde & Schwarz	ENV216	100326	2020-6-28
ISN	Rohde & Schwarz	ENY81	100177	2020-6-28
ISN	Rohde & Schwarz	ENY81-CA6	101664	2020-6-28
High Voltage Probe	Rohde & Schwarz	TK9420(VT9420)	9420-584	2020-6-24
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2020-7-2
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2020-6-28
Test software	Rohde & Schwarz	EMC32	Version9.15.00	N/A

20dB Bandwidth, Transmission Time – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2020-6-28

4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	**Extended Uncertainty**
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.46dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.91dB; Vertical: 4.89dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.80dB; Vertical: 4.79dB;
Uncertainty for Conducted Emission 150kHz-30MHz	3.21dB
Uncertainty for Conducted RF test	2.13dB
Uncertainty for Frequency RF test	0.6×10-7

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	12-15	☒	☐	☐
FCC Title 47 Part 15.207 Conduct Emission (1)	NIL	☐	☐	☒
FCC Title 47 Part 15.231(c) 20dB Bandwidth	16	☒	☐	☐
FCC Title 47 Part 15.247(e) Transmission Time	17-18	☒	☐	☐

Remark:
1) Conducted Emission testing is not applicable for battery operated device.

6 General Remarks

Remarks

Client informs that the **HG05686B-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 USA, 2 assorted**, **HG05686A-US-TX**. The difference lies only in the outlook/color of the different models. (Client's conformation letter shown at appendix A)

All tests were performed on model **HG05686A-US-TX.**

This submittal(s) (test report) is intended for **FCC ID: 2AJ9O-HG5686TX**, complies with Section 15.205, 15.207, 15.209, 15.231 of the FCC Part 15, Subpart C rules.

The TX frequency is 433.92MHz.

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: September 4, 2019

Testing Start Date: September 7, 2019

Testing End Date: September 19, 2019

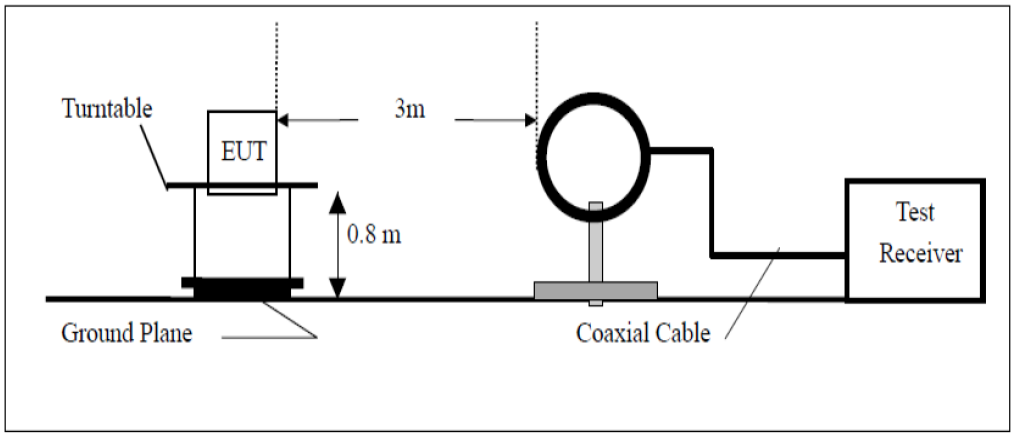
Reviewed by: Prepared by:

Hosea CHAN
EMC Project Engineer

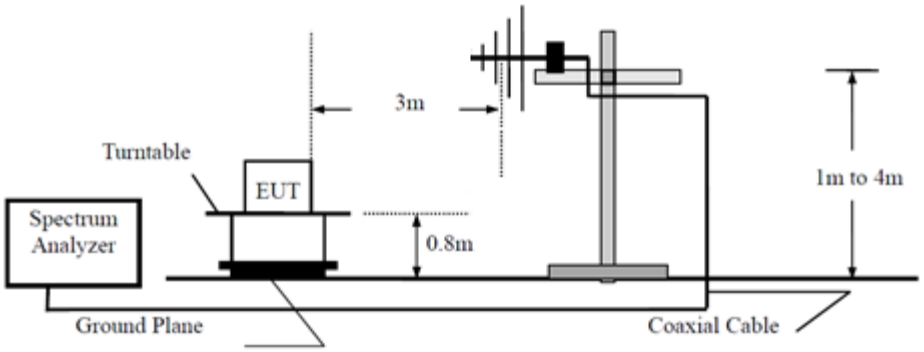
Eric LI
EMC Senior Project Engineer

7 Test Setups

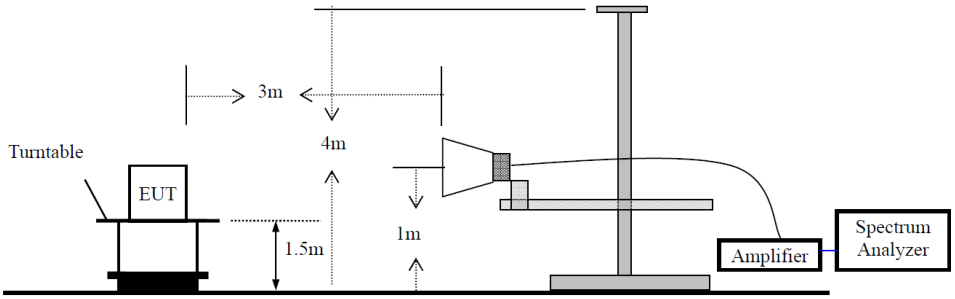
7.1 Radiated test setups 9kHz-30MHz



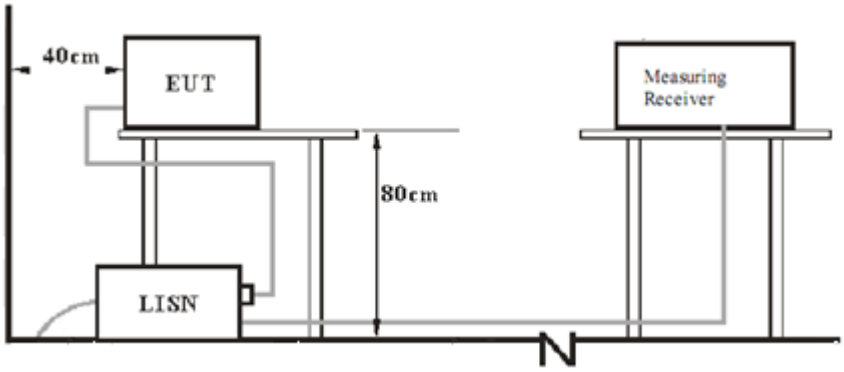
7.2 Radiated test setups Below 1GHz



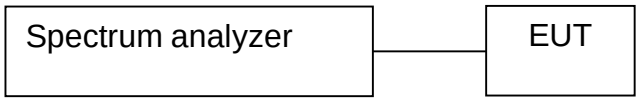
7.3 Radiated test setups Above 1GHz



7.4 AC Power Line Conducted Emission test setups



7.5 Conducted RF test setups



China

8 Emission Test Results

8.1 Spurious Radiated Emission

EUT: HG05686A-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
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector PK/QP/AV	Corr. (dB)
433.92	55.46	92.87	-37.41	Peak	-23.3
867.84	34.62	72.87	-38.25	Peak	-16.0
1301.76	39.34	74.00	-34.66	Peak	-11.7
1735.68	38.70	74.00	-35.3	Peak	-9.7
2169.60	51.20	74.00	-22.8	Peak	-7.3
2603.52	54.91	74.00	-19.09	Peak	-4.2
3037.44	53.23	74.00	-20.77	Peak	-3.6
3471.36	48.21	74.00	-25.79	Peak	-0.5
3905.28	43.64	74.00	-30.36	Peak	-1.8
4339.20	42.27	74.00	-31.73	Peak	0.2

Frequency MHz	PK Result @3m dBµV/m	Duty Cycle Factor dB	AV Result @3m dBµV/m	Limit dBµV/m	Margin dB
433.92	55.46	-11.85	43.61	72.87	-29.26
867.84	34.62	-11.85	22.77	52.87	-30.10
1301.76	39.34	-11.85	27.49	54.00	-26.51
1735.68	38.70	-11.85	26.85	54.00	-27.15
2169.60	51.20	-11.85	39.35	54.00	-14.65
2603.52	54.91	-11.85	43.06	54.00	-10.94
3037.44	53.23	-11.85	41.38	54.00	-12.62
3471.36	48.21	-11.85	36.36	54.00	-17.64
3905.28	43.64	-11.85	31.79	54.00	-22.21
4339.20	42.27	-11.85	30.42	54.00	-23.58

Average value = Peak value + Duty cycle factor

China

Spurious Radiated Emission

EUT:	HG05686A-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
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector PK/QP/AV	Corr. (dB)
433.92	72.90	92.87	-19.97	Peak	-23.2
867.84	44.29	72.87	-28.58	Peak	-15.9
2169.60	44.41	74.00	-29.59	Peak	-7.3
2603.52	47.57	74.00	-26.43	Peak	-4.9
3037.44	50.09	74.00	-23.91	Peak	-3.8
3471.36	45.51	74.00	-28.49	Peak	-0.5
3905.28	38.67	74.00	-35.33	Peak	-1.8

Frequency MHz	PK Result @3m dBµV/m	Duty Cycle Factor dB	AV Result @3m dBµV/m	Limit dBµV/m	Margin dB
433.92	72.90	-11.85	61.05	72.87	-11.82
867.84	44.29	-11.85	32.44	52.87	-20.43
2169.60	44.41	-11.85	32.56	54.00	-21.44
2603.52	47.57	-11.85	35.72	54.00	-18.28
3037.44	50.09	-11.85	38.24	54.00	-15.76
3471.36	45.51	-11.85	33.66	54.00	-20.34
3905.28	38.67	-11.85	26.82	54.00	-27.18

Average value = Peak value + Duty cycle factor

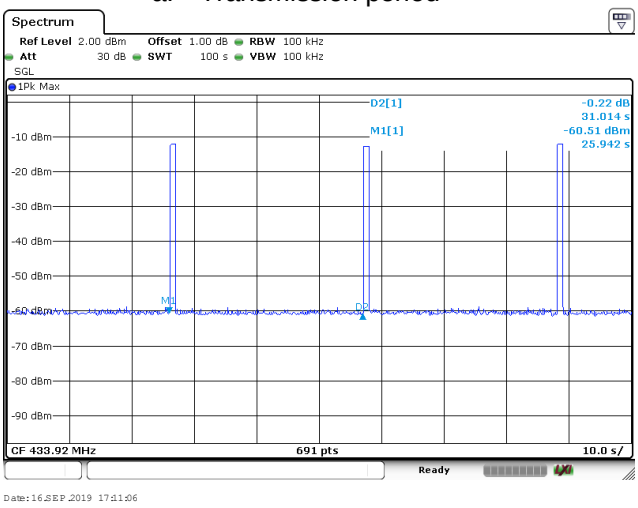
Spurious Radiated Emission

EUT:	HG05686A-US-TX
Op Condition:	Operated, TX Mode (433.92MHz)
Test Specification:	FCC15.205, 15.209 & 15.231(e)
Comment:	3 VDC
Remark:	Duct Cycle Factor Calculation

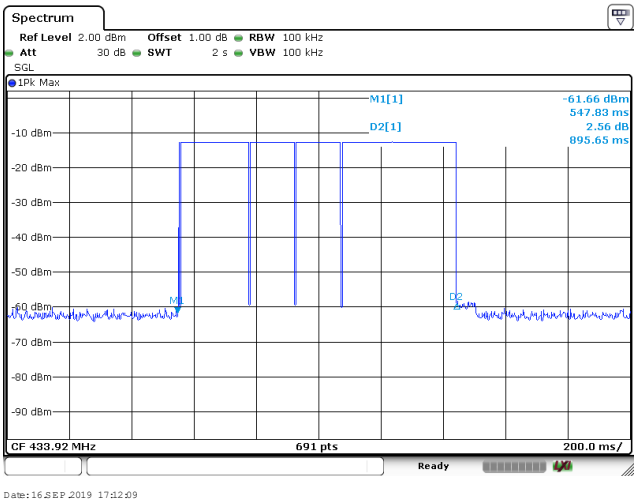
Test Result
☒ Passed
☐ Not Passed

Duct Cycle Factor Calculation

a. Transmission period



b. Duration of each transmission

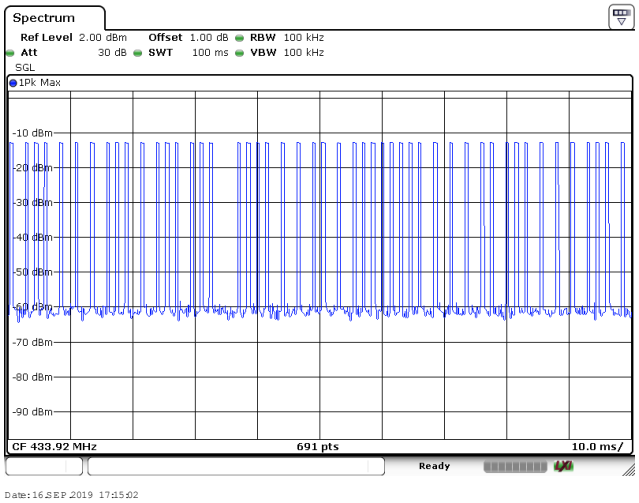


Spurious Radiated Emission

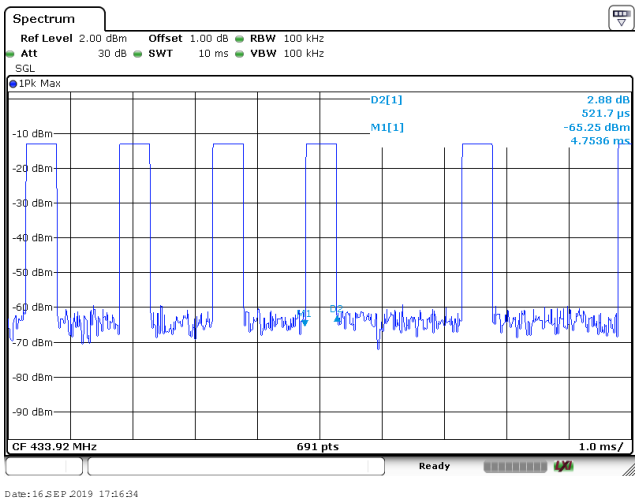
EUT:	HG05686A-US-TX
Op Condition:	Operated, TX Mode (433.92MHz)
Test Specification:	FCC15.205, 15.209 & 15.231(e)
Comment:	3 VDC
Remark:	Duct Cycle Factor Calculation

Test Result
☒ Passed
☐ Not Passed

c. Pulse number in 100ms



d. Pulse width



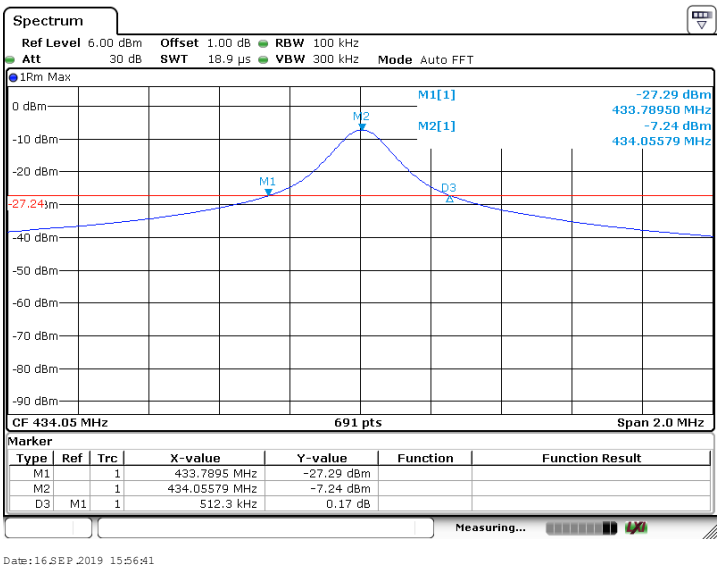
Calculation:

Tp=100ms (Max. allowed Tp for calculation)
Number of pulse in Tp=49,
Pulse width=0.5217ms
Ton= Pulse width* Number of pulses in Tp
=25.5633 ms
Duty cycle factor= 20*log(Ton/Tp)=-11.85dB

8.2 20dB Bandwidth

EUT: HG05686A-US-TX
Op Condition: Operated, TX Mode (433.92MHz)
Test Specification: FCC15.231(c) 20dB Bandwidth
Comment: 3 VDC

Test Result
☒ Passed
☐ Not Passed



Bandwidth	Measured Value	Limit
20dB bandwidth	512.3 kHz	<= 1084.8 kHz
Limit=0.25%*Center Frequency=0.25%*433.92MHz=1084.8kHz		

8.3 Transmission Time

EUT: HG05686A-US-TX
Op Condition: Operated, TX Mode (433.92MHz)
Test Specification: FCC15.231(e)
Comment: 3 VDC

Test Result
☒ Passed
☐ Not Passed

Frequency	Duration of each transmission	Limit	Silent period	Limit
433.92MHz	895.65ms	< 1s	30.12s	≥ 26.8695s

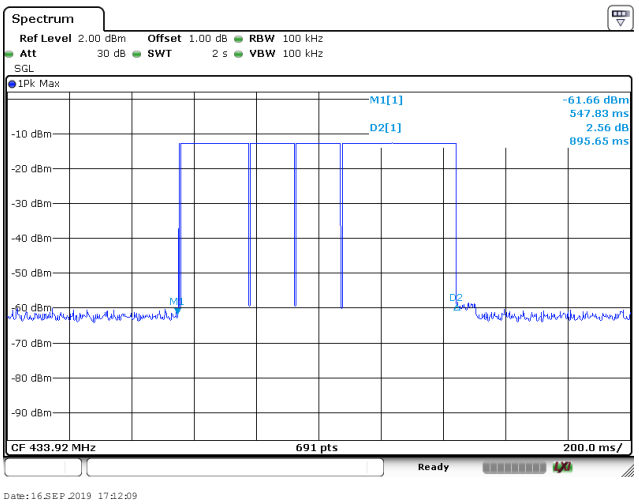
1. Silent period=Transmission period - Duration of each transmission
=31.014-0.89565s=30.11835s≈30.12s
2. Silent period should be at least 30 times the duration of the transmission but in no case less than 10 seconds

Transmission Time

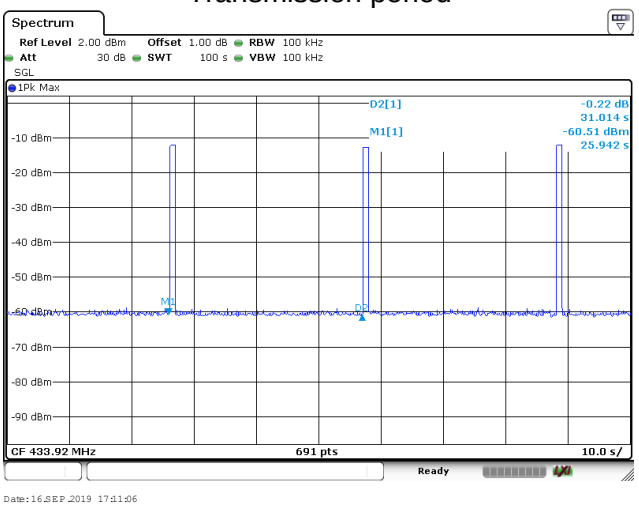
EUT:	HG05686A-US-TX
Op Condition:	Operated, TX Mode (433.92MHz)
Test Specification:	FCC15.231(e)
Comment:	3 VDC

Test Result
☒ Passed
☐ Not Passed

Duration of each transmission



Transmission period



9 Appendix A - 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)] · [√f(GHz)] ≤ 3.0 for 1-g SAR

>> The fundamental frequency of the EUT is 433.92MHz, the test separation distance is ≤ 5mm & ≤ 20mm.
(Manufacturer specified the separation distance is: 20mm)

Step a.1)
>> Numeric threshold, mW / **5 mm** * √0.43392GHz ≤ 3.0
Numeric threshold ≤ **22.771mW**

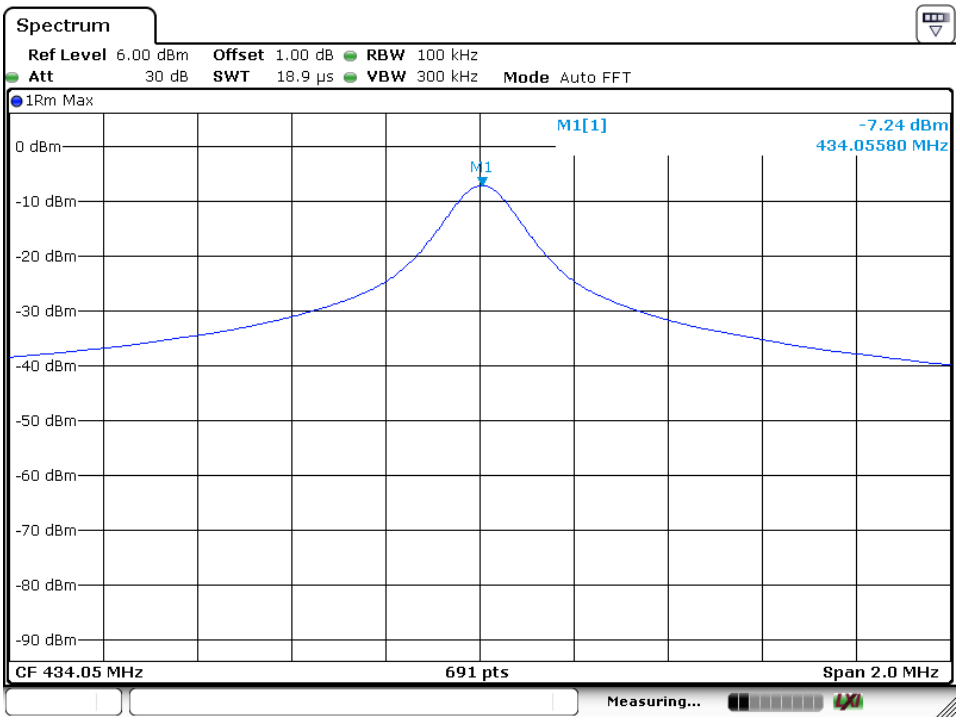
Step a.2)
>> Numeric threshold, mW / **20 mm** * √0.43392GHz ≤ 3.0
Numeric threshold ≤ **91.084mW**

>> The power of EUT measured is: -7.24dBm = 0.189mW
Which is smaller than the Numeric threshold.
Therefore, the device is exempt from stand-alone SAR test requirements.

Appendix A - Conducted power

EUT:	HG05686A-US-TX
Op Condition:	Operated, TX Mode
Comment:	3 VDC
Remark:	NA

Test Result
☒ Passed
☐ Not Passed



China

Appendix A Declaration letter of model difference

Declaration letter of model difference

Lidl US LLC.

To: TÜV SÜD Hong Kong Limited

Attention: Edmond Fung
From:
Fax No:
Project No.:

Date: October 11, 2019
Total Page (Cover Included): 1

Subject: **Declaration letter**

We: **Company Name:** Lidl US LLC.
Address: 3500 S. Clark Street, Arlington, Virginia, United States

Officially notify TÜV SÜV Hong Kong Limited that the <<Model A>> have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with <<PRODUCT>>, <<Model B>>. The difference lies only in the outlook/color of the different models.

<<Model A>>: HG05686A-US-TX, HG05686A-US-RX

<<Model B>>: HG05686B-US-TX, HG05686B-US-RX

<<Product>>: Temperature station LCD USA, 2 assorted

Applicant: Lidl US LLC.

10/11/2019
(Date)

(Applicant's authorized signature and company Chop)

10/11/2019
(Date)

(Applicant's authorized signature and company Chop)

Page 1 of 1