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.*

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# 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) |
|---|---|---|---|
| -- | -- | -- | -- |

# 3 Summary of Test Standards

| Test Standards |
| --- |
| FCC Part 15 Subpart C 10-1-18 Edition<br>Federal Communications Commission, PART 15 — Radio Frequency Devices,<br>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;<br>Vertical: 4.89dB; |
| Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz | Horizontal: 4.80dB;<br>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

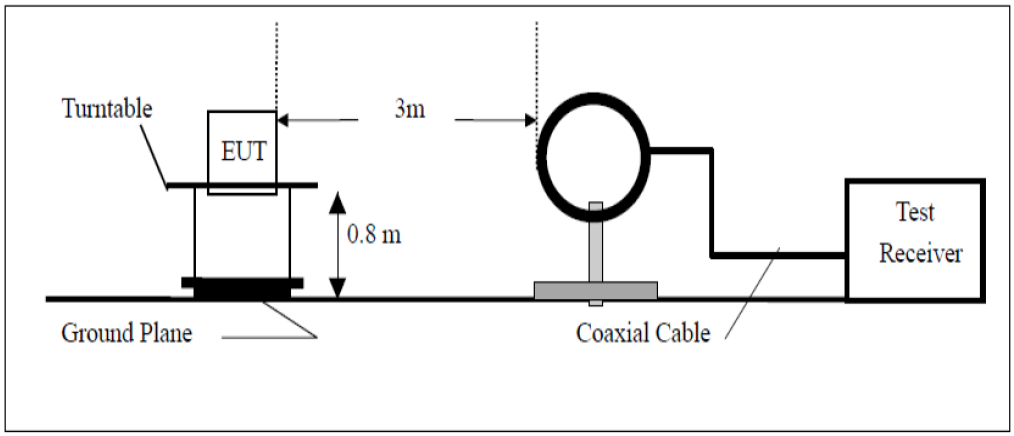
Reviewed by: Prepared by:

Hosea CHAN
EMC Project Engineer

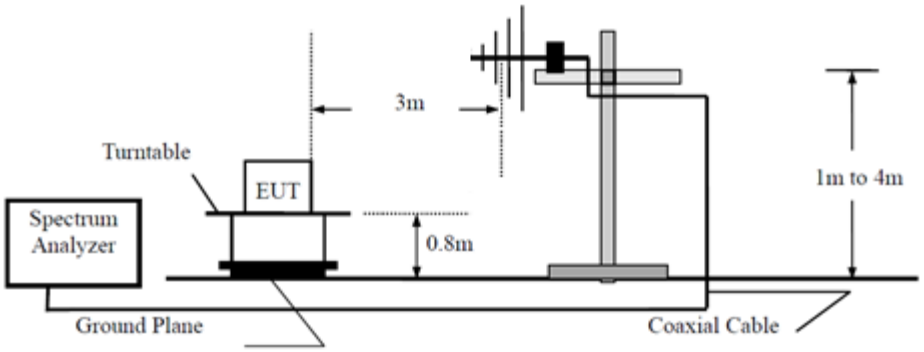
Eric LI
EMC Senior Project Engineer

# 7 Test Setups

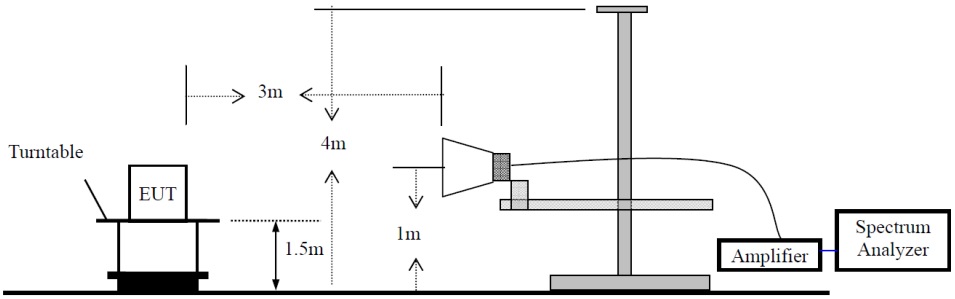
## 7.1 Radiated test setups 9kHz-30MHz



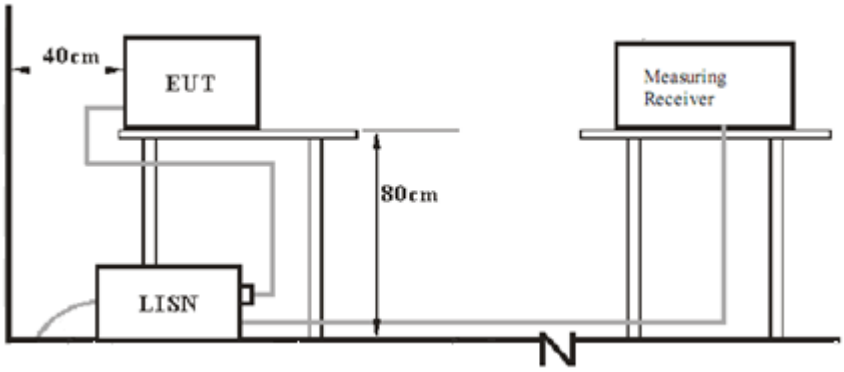

## 7.2 Radiated test setups Below 1GHz



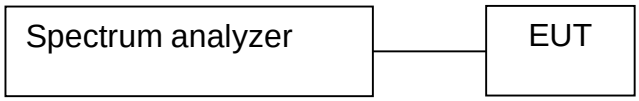

## 7.3 Radiated test setups Above 1GHz



## 7.4 AC Power Line Conducted Emission test setups




## 7.5 Conducted RF test setups



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# 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

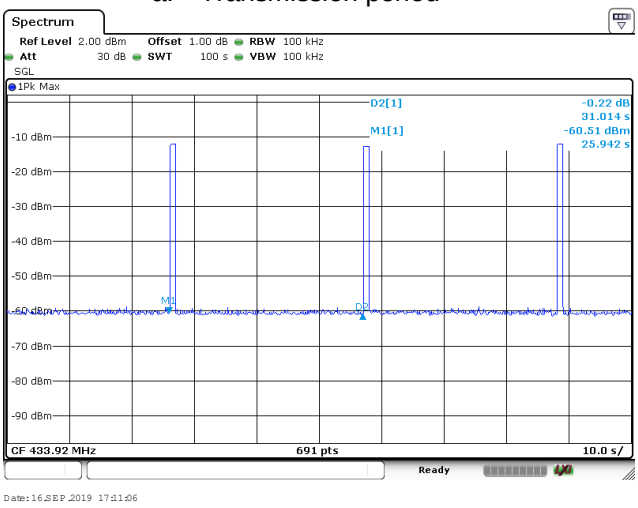
## Spurious Radiated Emission

| | |
|---|---|
| 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 |

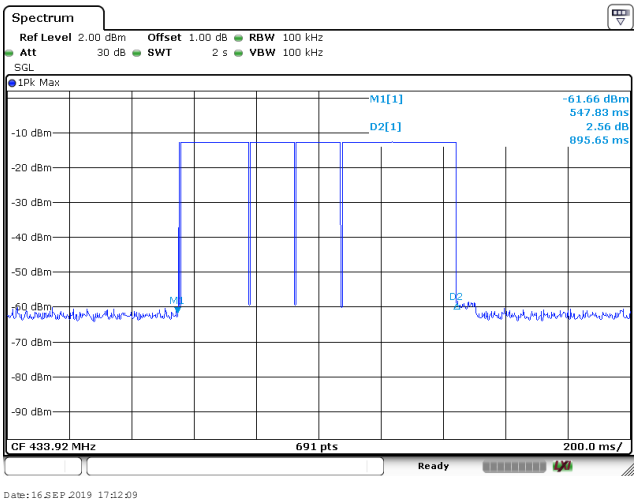
Test Result
☒ Passed
☐ Not Passed

### Duct Cycle Factor Calculation

a. Transmission period




b. Duration of each transmission

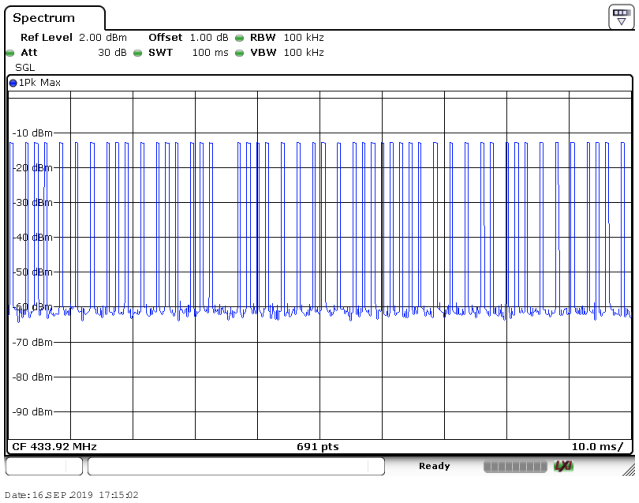


## Spurious Radiated Emission

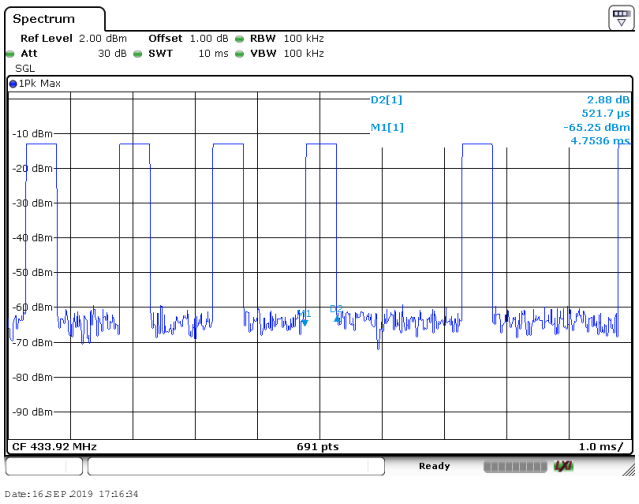
| | |
|---|---|
| EUT: | HG05686A-US-TX |
| Op Condition: | Operated, TX Mode (433.92MHz) |
| Test Specification: | FCC15.205, 15.209 & 15.231(e) |
| Comment: | 3 VDC |
| Remark: | Duct Cycle Factor Calculation |

Test Result
☒ Passed
☐ Not Passed

c. Pulse number in 100ms




d. Pulse width



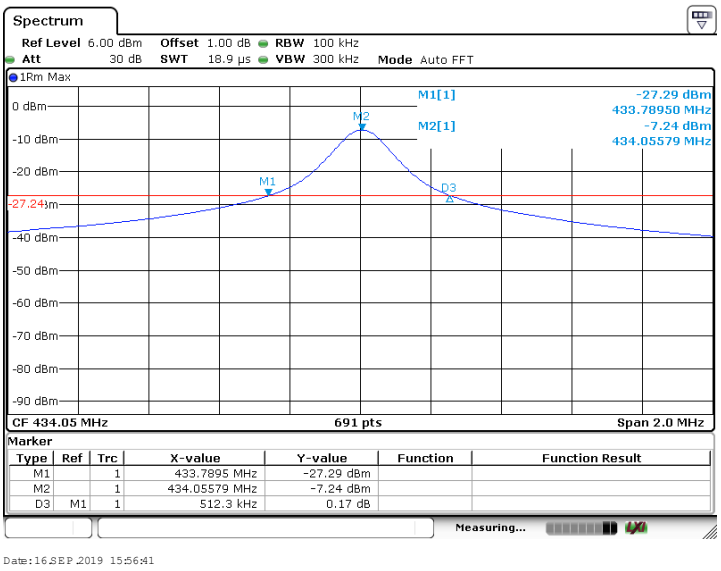

**Calculation:**

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 |

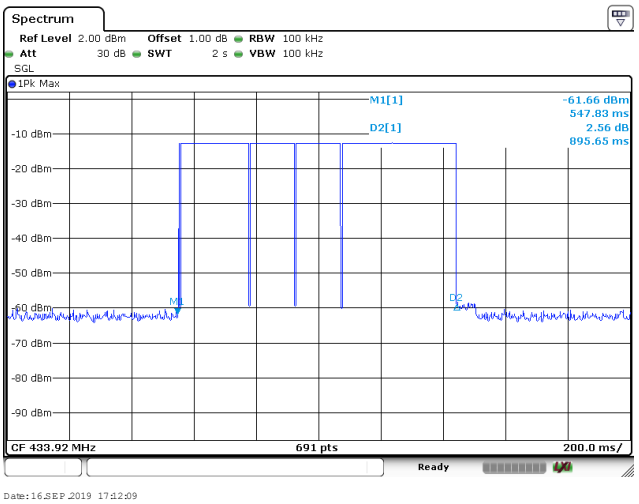
1. Silent period=Transmission period - Duration of each transmission
=31.014-0.89565s=30.11835s≈30.12s
2. Silent period should be at least 30 times the duration of the transmission but in no case less than 10 seconds

## Transmission Time

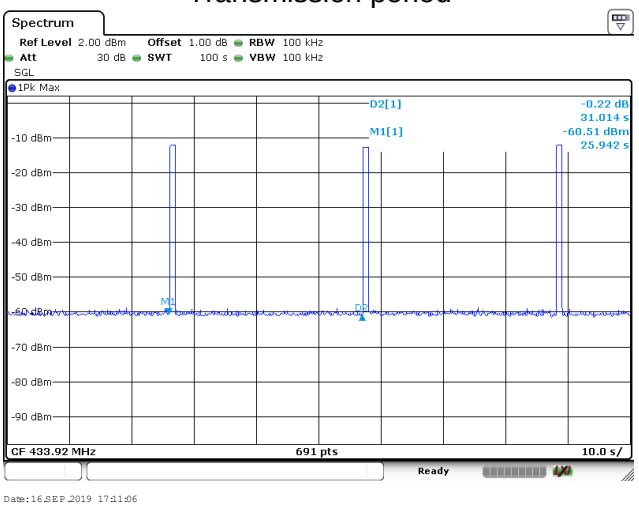
| | |
|---|---|
| EUT: | HG05686A-US-TX |
| Op Condition: | Operated, TX Mode (433.92MHz) |
| Test Specification: | FCC15.231(e) |
| Comment: | 3 VDC |

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**

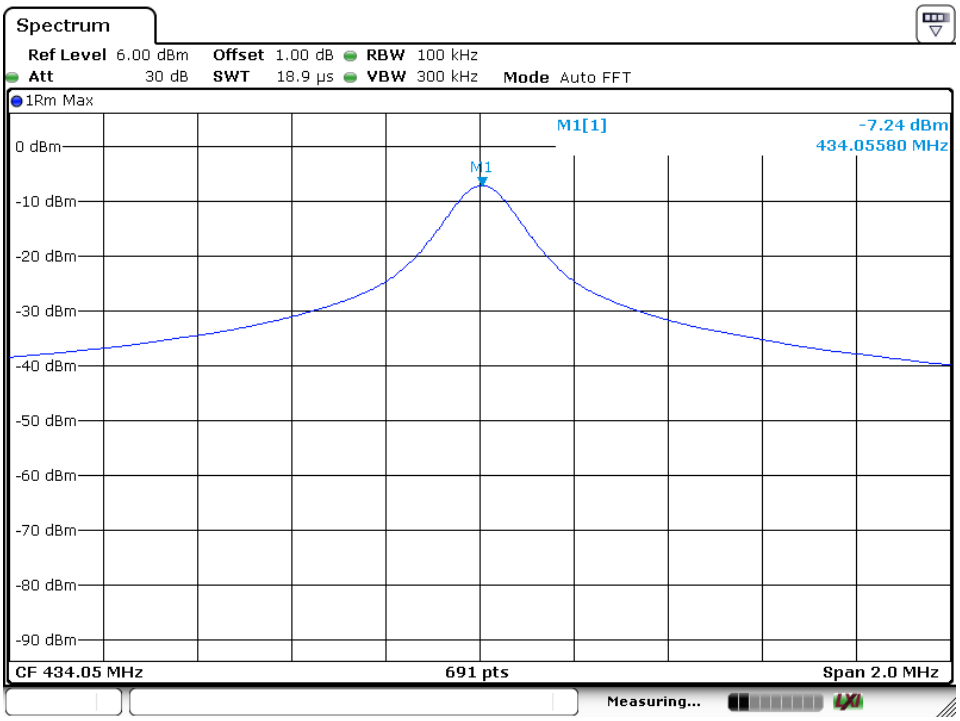
Step a.2)
>> Numeric threshold, mW / **20 mm** * √0.43392GHz ≤ 3.0
Numeric threshold ≤ **91.084mW**

>> 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



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## 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)

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