

FCC - TEST REPORT

Report Number : **60.792.19.009.01R01** Date of Issue : February 5, 2020

Model : **HG06061A-US-TX, HG06061B-US-TX**

Product Type : **Wireless weather station**

Applicant : Lidl US, LLC

Address : 3500 S. 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

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.

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.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval

1 Table of Contents

| | |
|---|----|
| 1 Table of Contents | 2 |
| 2 Description of Equipment Under Test..... | 3 |
| 3 Summary of Test Standards..... | 4 |
| 4 Details about the Test Laboratory | 5 |
| 4.1 Test Equipment Site List | 6 |
| 4.2 Measurement System Uncertainty | 7 |
| 5 Summary of Test Results | 8 |
| 6 General Remarks | 9 |
| 7 Test Setups | 10 |
| 7.1 Radiated test setups 9kHz-30MHz..... | 10 |
| 7.2 Radiated test setups Below 1GHz | 10 |
| 7.3 Radiated test setups Above 1GHz..... | 10 |
| 7.4 AC Power Line Conducted Emission test setups..... | 11 |
| 7.5 Conducted RF test setups..... | 11 |
| 8 Emission Test Results | 12 |
| 8.1 Spurious Radiated Emission | 12 |
| 8.2 20dB Bandwidth | 16 |
| 8.3 Transmission Time..... | 17 |
| 9 Appendix A - General Product Information..... | 19 |

2 Description of Equipment Under Test

Description of the Equipment Under Test

Product: Wireless weather station

Model no.: HG06061A-US-TX, HG06061B-US-TX

FCC ID: 2AJ9O-HG06061TX

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 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 | <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 | 16 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| FCC Title 47 Part 15.247(e) Transmission Time | 17-18 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Remark:

- 1) Conducted Emission testing is not applicable for battery operating device.

6 General Remarks

Remarks

Client informs that the **HG06061B-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, HG06061A-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 **HG06061A-US-TX**.

This submittal(s) (test report) is intended for **FCC ID: 2AJ90-HG06061TX**, 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.

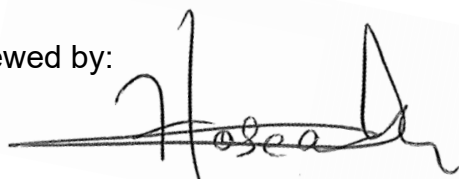
□ - **Does not** fulfill the general approval requirements.

Sample Received Date: December 12, 2019

Testing Start Date: December 16, 2019

Testing End Date: January 3, 2020

Reviewed by:



Hosea CHAN
EMC Project Engineer

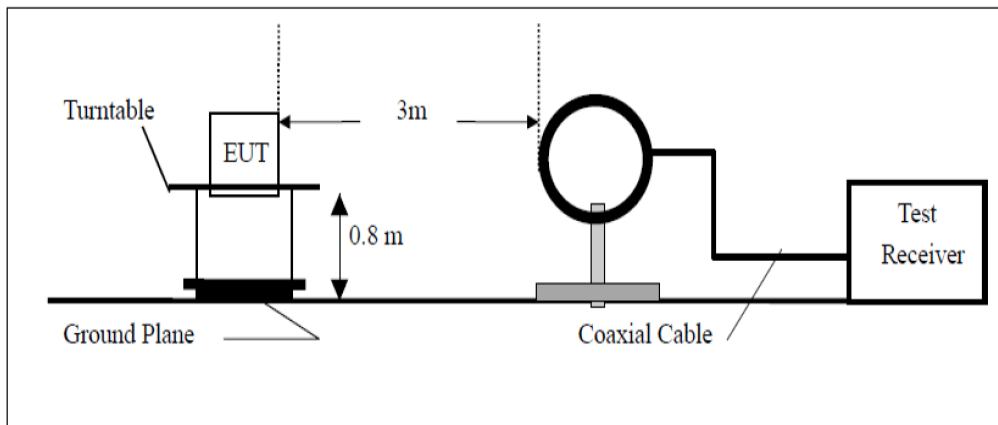
Prepared by:



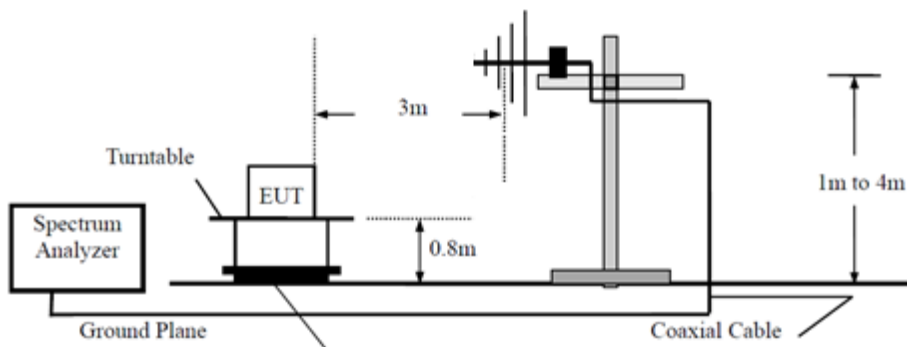
Eric LI
EMC Senior Project Engineer

7 Test Setups

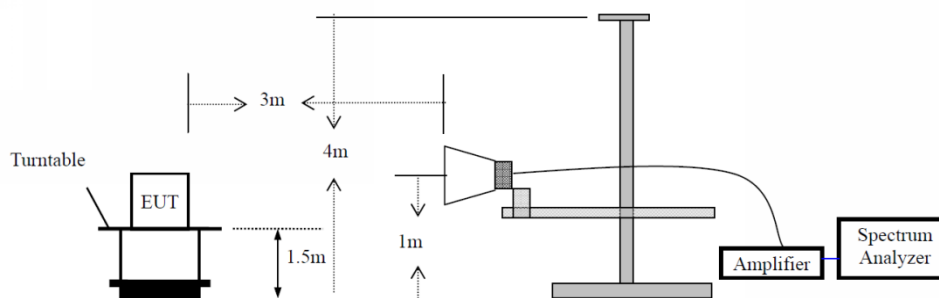
7.1 Radiated test setups 9kHz-30MHz



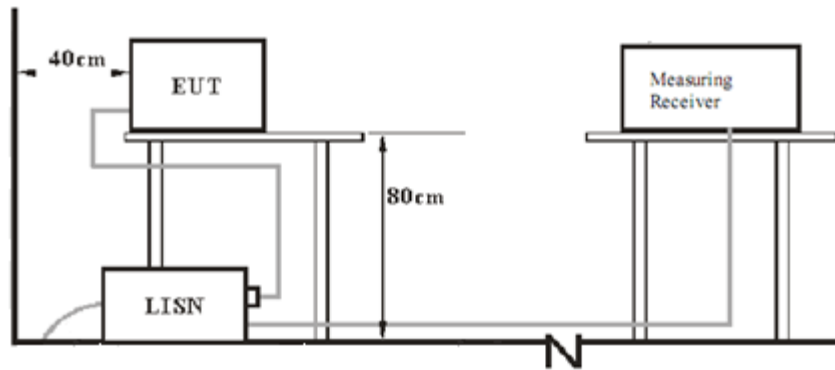
7.2 Radiated test setups Below 1GHz



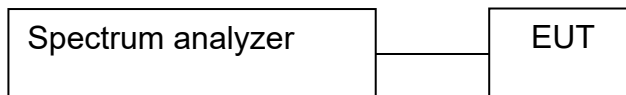
7.3 Radiated test setups Above 1GHz



7.4 AC Power Line Conducted Emission test setups



7.5 Conducted RF test setups



8 Emission Test Results

8.1 Spurious Radiated Emission

EUT: HG06061A-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 PK/QP/AV | Corr. (dB) |
|------------------|------------------------|-----------------------|--------------|----------------------|---------------|
| 433.92 | 73.19 | 92.87 | -19.68 | Peak | -23.3 |
| 867.84 | 45.85 | 72.87 | -27.02 | Peak | -16.0 |
| 1301.76 | 36.83 | 74.00 | -37.17 | Peak | -11.7 |
| 1735.68 | 37.72 | 74.00 | -36.28 | Peak | -9.7 |
| 2169.60 | 50.34 | 74.00 | -23.66 | Peak | -7.3 |
| 2603.52 | 44.76 | 74.00 | -29.24 | Peak | -4.2 |
| 3037.44 | 46.54 | 74.00 | -27.46 | Peak | -3.6 |
| 3471.36 | 44.88 | 74.00 | -29.12 | Peak | -0.5 |
| 3905.28 | 45.12 | 74.00 | -28.88 | Peak | -1.8 |
| 4339.20 | 47.88 | 74.00 | -26.12 | Peak | 0.2 |

| 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 |
|------------------|-------------------------------|-------------------------|-------------------------------|-----------------------|--------------|
| 433.92 | 73.19 | -11.87 | 61.32 | 72.87 | -11.55 |
| 867.84 | 45.85 | -11.87 | 33.98 | 52.87 | -18.89 |
| 1301.76 | 36.83 | -11.87 | 24.96 | 54.00 | -29.04 |
| 1735.68 | 37.72 | -11.87 | 25.85 | 54.00 | -28.15 |
| 2169.60 | 50.34 | -11.87 | 38.47 | 54.00 | -15.53 |
| 2603.52 | 44.76 | -11.87 | 32.89 | 54.00 | -21.11 |
| 3037.44 | 46.54 | -11.87 | 34.67 | 54.00 | -19.33 |
| 3471.36 | 44.88 | -11.87 | 33.01 | 54.00 | -20.99 |
| 3905.28 | 45.12 | -11.87 | 33.25 | 54.00 | -20.75 |
| 4339.20 | 47.88 | -11.87 | 36.01 | 54.00 | -17.99 |

Average value = Peak value + Duty cycle factor

Spurious Radiated Emission

EUT: HG06061A-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 PK/QP/AV | Corr. (dB) |
|------------------|------------------------|-----------------------|--------------|----------------------|---------------|
| 433.92 | 81.60 | 92.87 | -11.27 | Peak | -23.2 |
| 867.84 | 59.27 | 72.87 | -13.60 | Peak | -15.9 |
| 1301.76 | 42.39 | 74.00 | -31.61 | Peak | -11.7 |
| 1735.68 | 36.46 | 74.00 | -37.54 | Peak | -9.7 |
| 2169.60 | 55.24 | 74.00 | -18.76 | Peak | -7.3 |
| 2603.52 | 43.62 | 74.00 | -30.38 | Peak | -4.9 |
| 3037.44 | 44.76 | 74.00 | -29.24 | Peak | -3.8 |
| 3471.36 | 44.51 | 74.00 | -29.49 | Peak | -0.5 |
| 3905.28 | 45.17 | 74.00 | -28.83 | Peak | -1.8 |
| 4339.20 | 46.57 | 74.00 | -27.43 | Peak | 0.2 |

| 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 |
|------------------|-------------------------------|-------------------------|-------------------------------|-----------------------|--------------|
| 433.92 | 81.60 | -11.87 | 69.73 | 72.87 | -3.14 |
| 867.84 | 59.27 | -11.87 | 47.40 | 52.87 | -5.47 |
| 1301.76 | 42.39 | -11.87 | 30.52 | 54.00 | -23.48 |
| 1735.68 | 36.46 | -11.87 | 24.59 | 54.00 | -29.41 |
| 2169.60 | 55.24 | -11.87 | 43.37 | 54.00 | -10.63 |
| 2603.52 | 43.62 | -11.87 | 31.75 | 54.00 | -22.25 |
| 3037.44 | 44.76 | -11.87 | 32.89 | 54.00 | -21.11 |
| 3471.36 | 44.51 | -11.87 | 32.64 | 54.00 | -21.36 |
| 3905.28 | 45.17 | -11.87 | 33.30 | 54.00 | -20.70 |
| 4339.20 | 46.57 | -11.87 | 34.70 | 54.00 | -19.30 |

Average value = Peak value + Duty cycle factor

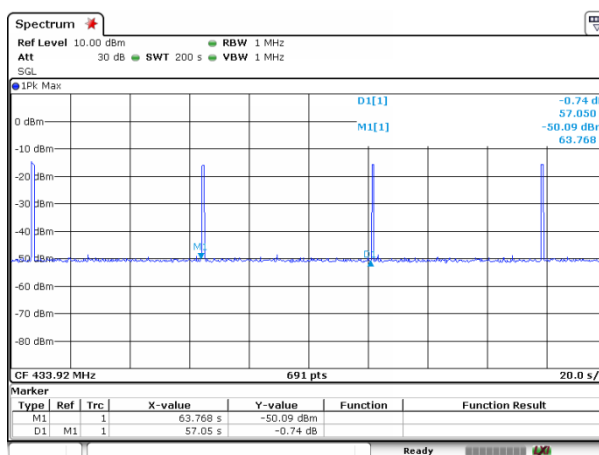
Spurious Radiated Emission

EUT: HG06061A-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

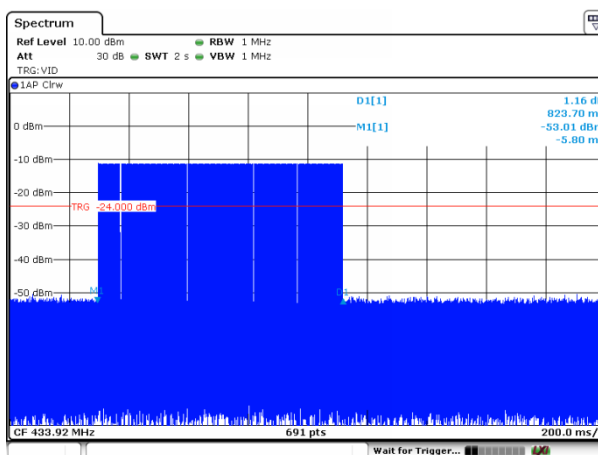
| | |
|-------------------------------------|------------|
| Test Result | |
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |

Duct Cycle Factor Calculation

a. Transmission period



b. Duration of each transmission

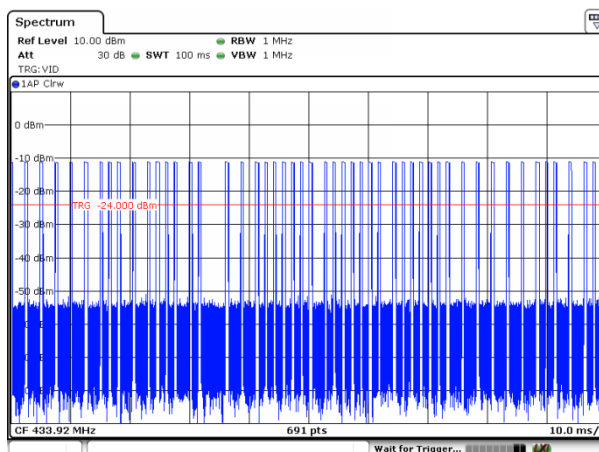


Spurious Radiated Emission

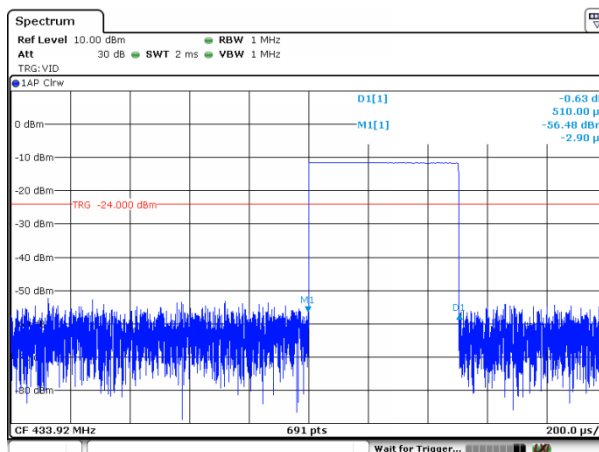
EUT: HG06061A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.205, 15.209 & 15.231(e)
 Comment: 3 VDC
 Remark: Duct Cycle Factor Calculation

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

c. Pulse number in 100ms



d. Pulse width



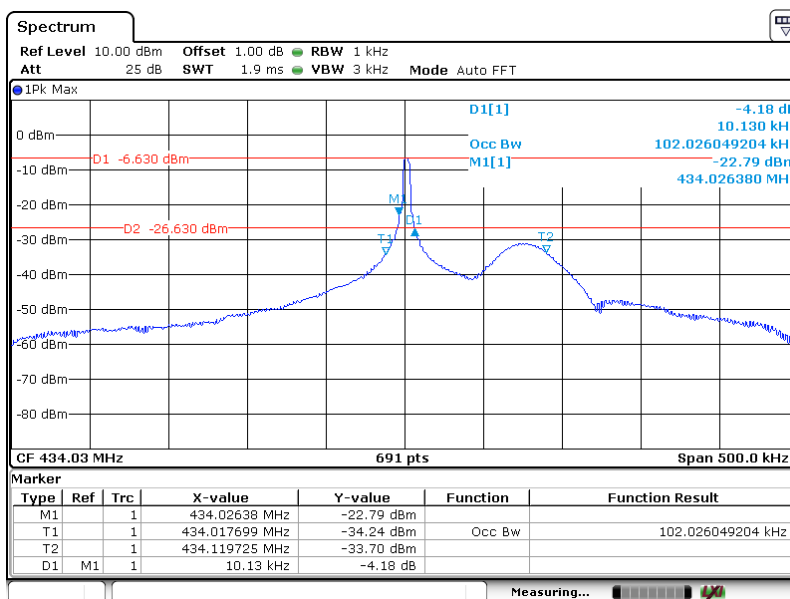
Calculation:

$T_p=100\text{ms}$ (Max. allowed T_p for calculation)
 Number of pulses in $T_p=50$,
 Pulse width= 0.510ms
 $T_{on} = \text{Pulse width} * \text{Number of pulses in } T_p$
 $=25.50 \text{ ms}$
 Duty cycle factor= $20 * \log(T_{on}/T_p)=-11.87\text{dB}$

8.2 20dB Bandwidth

EUT: HG06061A-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 |



| Bandwidth | Measured Value | Limit |
|--|----------------|---------------|
| 20dB bandwidth | 10.13 kHz | <= 1084.8 kHz |
| Limit=0.25%*Center Frequency=0.25%*433.92MHz=1084.8kHz | | |



8.3 Transmission Time

EUT: HG06061A-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 | 823.70ms | < 1s | 56.23s | ≥ 24.711s |

1.Silent period=Transmission period - Duration of each transmission
 =57.05-0.8237s=56.2263s≈56.23s

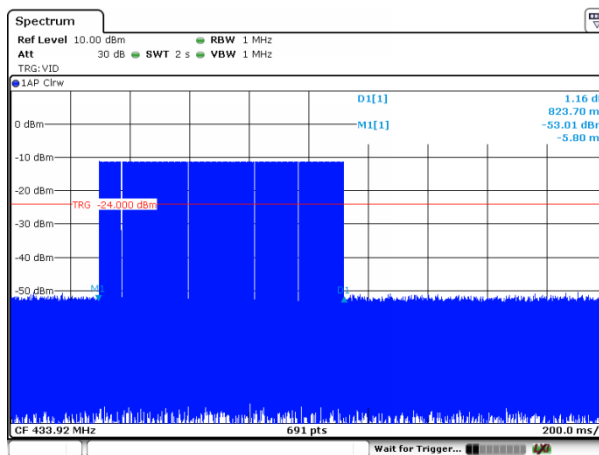
2.Silent period should be at least 30 times the duration of the transmission but in no case less than 10 seconds.

Transmission Time

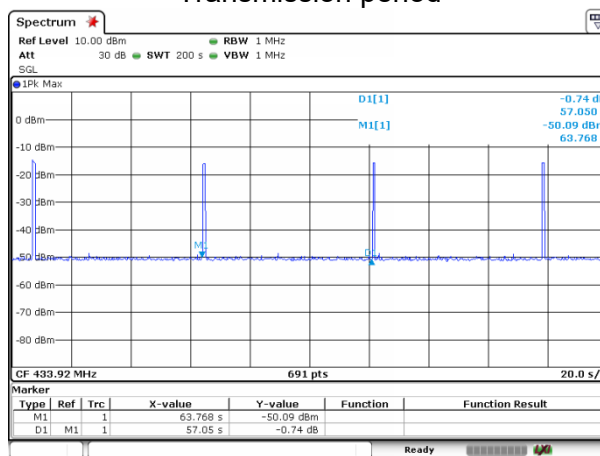
EUT: HG06061A-US-TX
 Op Condition: Operated, TX Mode (433.92MHz)
 Test Specification: FCC15.231(e)
 Comment: 3 VDC

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

Duration of each transmission



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)

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ 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, $\text{mW} / 5 \text{ mm} * \sqrt{0.43392\text{GHz}} \leq 3.0$
Numeric threshold $\leq 22.771\text{mW}$

Step a.2)

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

>> The power of EUT measured is: $-2.23\text{dBm} = 0.598\text{mW}$

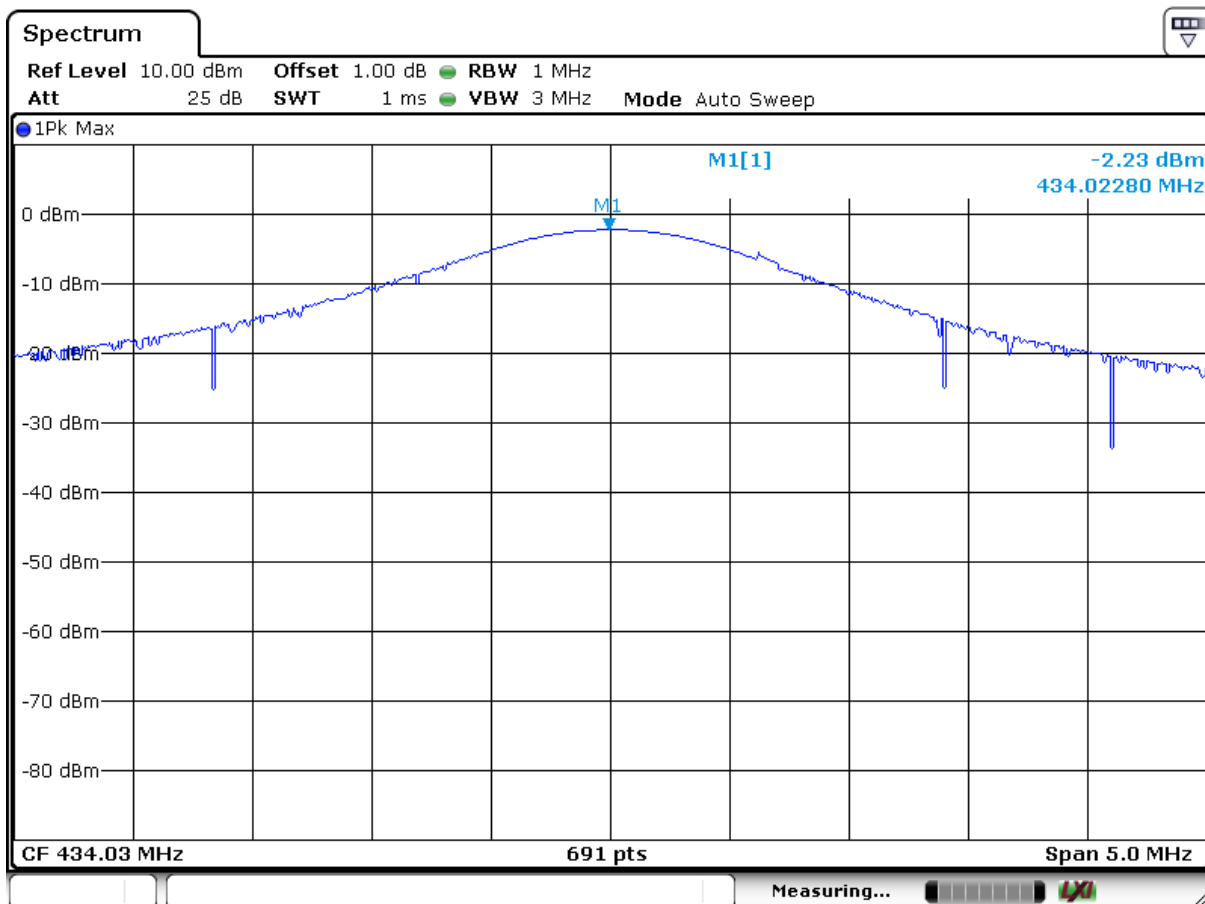
Which is smaller than the Numeric threshold.

Therefore, the device is exempt from stand-alone SAR test requirements.

Appendix A - Conducted power

EUT: HG06061A-US-TX
Op Condition: Operated, TX Mode
Comment: 3 VDC
Remark: NA

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



Date: 24 DEC 2019 21:09:36

Appendix A Declaration letter of model difference

Declaration letter of model difference

To: TÜV SÜD HKG Ltd.

Attention:

From:

Date: February 12, 2020

Fax No:

Total Page (Cover Included): 1

Declaration Letter

Subject:

We:

Officially notify TÜV SÜD HKG Ltd. that the << HG06061B-US >> have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with << Wireless weather station >>, << HG06061A-US >>.

The difference lies only in outlook/ color & receiver frequency of the different models.

<<Additional Model >>: HG06061B-US

<<Main Test Model >>: HG06061A-US

<<Product>>: Wireless weather station

Applicant: LIDL US LLC

12-Feb, 2020

(Date)



(Applicant's authorized signature and company Chop)