

**FCC - TEST REPORT**

Report Number : **60.792.19.005.01R01** Date of Issue : July 9, 2019

Model : **HG05124A-US-TX, HG05124B-US-TX**

Product Type : **WIRELESS WEATHER STATION**

Applicant : Lidl US, LLC

Address : 3500 S Clark Street, ARLINGTON VA 22202

Production Facility : PUTIAN DIOR INDUSTRIAL CO., LTD.

Address : Linan Industrial Area, Xianyou County, Putian, Fujian, China

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 21

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## 2 Description of Equipment Under Test

### Description of the Equipment Under Test

Product:	WIRELESS WEATHER STATION
Model no.:	HG05124A-US-TX, HG05124B-US-TX
FCC ID:	2AJ9O-HG05124TX
Rating:	3 VDC (2 x AA battery)
Frequency:	433.92MHz
Antenna gain:	0 dBi
Number of operated channel:	1
Modulation:	OOK(2ASK)

### 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
<b>FCC Part 15 Subpart C</b>	
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	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 1

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	4.46dB
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 RF test	2.13dB
Uncertainty for Frequency RF test	$0.6 \times 10^{-7}$

## 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	10-15	<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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remark:

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



## 6 General Remarks

### Remarks

Client informs that the **HG05124B-US-TX** have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction with **WIRELESS WEATHER STATION, HG05124A-US-TX**. The difference lies only on the different color of the different models. (Client's conformation letter shown at appendix A)

All tests were performed on model **HG05124A-US-TX**.

This submittal(s) (test report) is intended for **FCC ID: 2AJ90-HG05124TX**, 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.

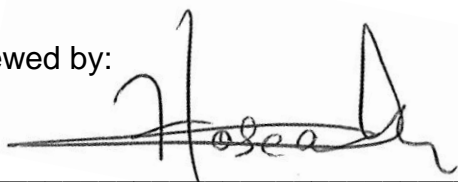
□ - **Does not** fulfill the general approval requirements.

Sample Received Date: May 29, 2019

Testing Start Date: June 6, 2019

Testing End Date: June 19, 2019

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: HG05124A-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 dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Corr. (dB)
433.92	61.76	92.87	-31.11	Peak	-23.3
867.84	39.34	72.87	-33.53	Peak	-16.0
1301.76	37.88	74.00	-36.12	Peak	-11.7
2169.60	50.12	74.00	-23.88	Peak	-7.3
2603.52	56.45	74.00	-17.55	Peak	-4.2
3037.44	55.08	74.00	-18.92	Peak	-3.6
3471.36	57.44	74.00	-16.56	Peak	-0.5
3905.28	51.86	74.00	-22.14	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	61.76	-13.35	48.41	72.87	-24.46
867.84	39.34	-13.35	25.99	52.87	-26.88
1301.76	37.88	-13.35	24.53	54.00	-29.47
2169.60	50.12	-13.35	36.77	54.00	-17.23
2603.52	56.45	-13.35	43.10	54.00	-10.90
3037.44	55.08	-13.35	41.73	54.00	-12.27
3471.36	57.44	-13.35	44.09	54.00	-9.91
3905.28	51.86	-13.35	38.51	54.00	-15.49

Average value = Peak value + Duty cycle factor

## Spurious Radiated Emission

EUT: HG05124A-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 dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Corr. (dB)
433.92	80.01	92.87	-12.86	Peak	-23.2
867.84	47.36	72.87	-25.51	Peak	-15.9
2169.60	47.28	74.00	-26.72	Peak	-7.3
2603.52	55.70	74.00	-18.30	Peak	-4.9
3037.44	58.60	74.00	-15.40	Peak	-3.8
3471.36	59.14	74.00	-14.86	Peak	-0.5
3905.28	52.51	74.00	-21.49	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	80.01	-13.35	66.66	72.87	-6.21
867.84	47.36	-13.35	34.01	52.87	-18.86
2169.60	47.28	-13.35	33.93	54.00	-20.07
2603.52	55.70	-13.35	42.35	54.00	-11.65
3037.44	58.60	-13.35	45.25	54.00	-8.75
3471.36	59.14	-13.35	45.79	54.00	-8.21
3905.28	52.51	-13.35	39.16	54.00	-14.84

Average value = Peak value + Duty cycle factor

## Spurious Radiated Emission

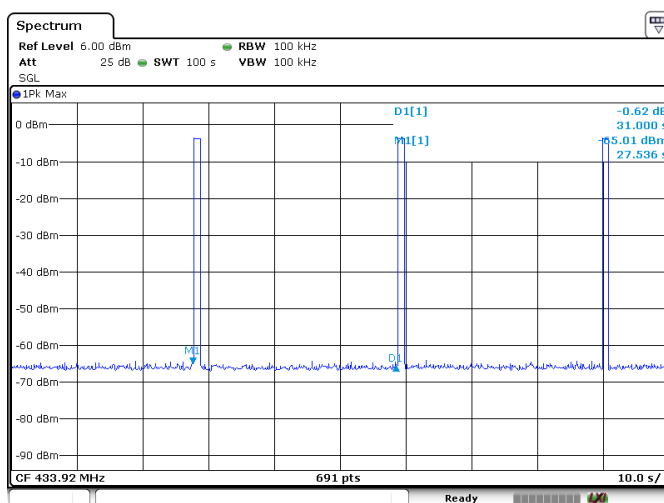
EUT: HG05124A-US-TX  
 Op Condition: Operated, TX Mode (433.92MHz)  
 Test Specification: FCC15.205, 15.209 & 15.231(e)  
 Comment: 3 VDC  
 Remark: Duct Cycle Factor Calculation

### Test Result

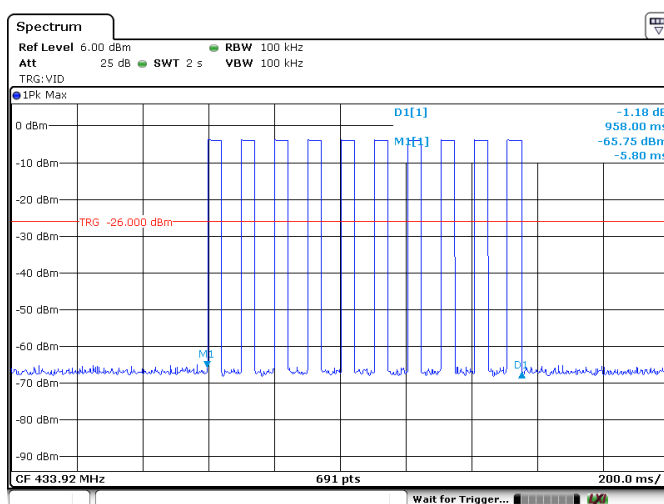
☒ Passed  
☐ Not Passed

## Duct Cycle Factor Calculation

### a. Transmission period



### b. Duration of each transmission



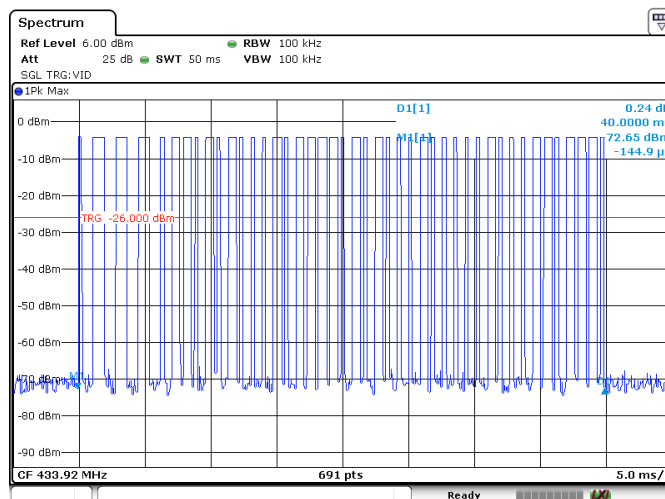
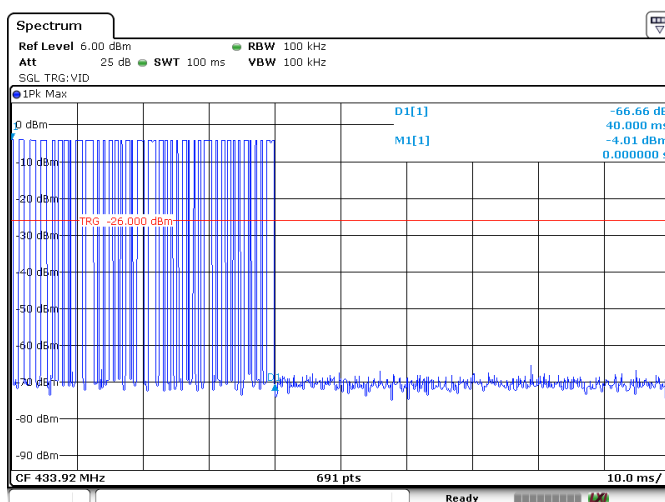
**Spurious Radiated Emission**

EUT: HG05124A-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



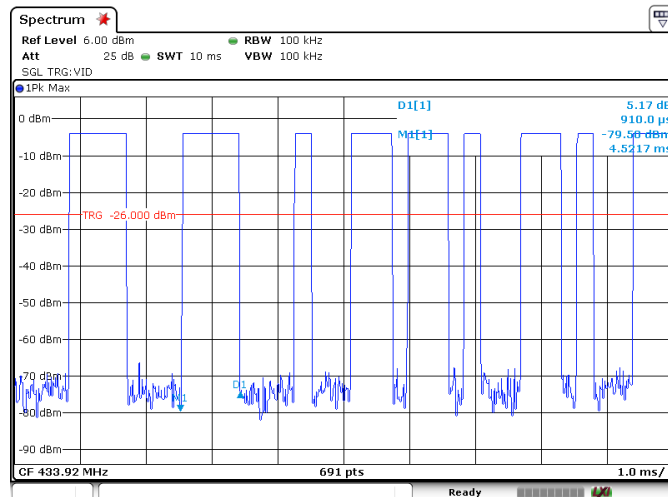
## Spurious Radiated Emission

EUT: HG05124A-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

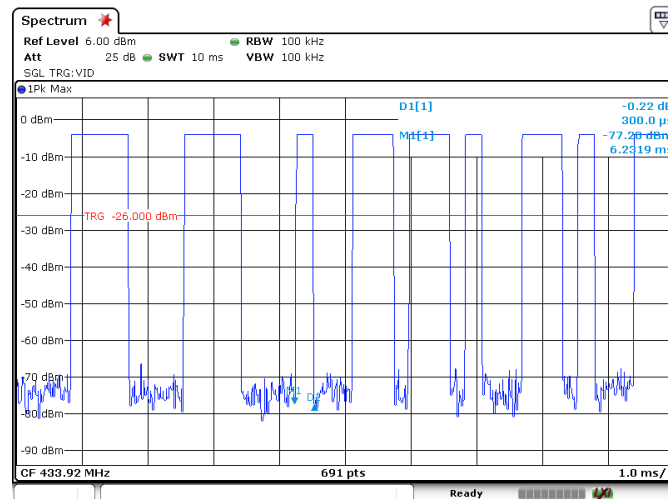
### Test Result

☒ Passed  
☐ Not Passed

#### d. Pulse 1 width



#### Pulse 2 width



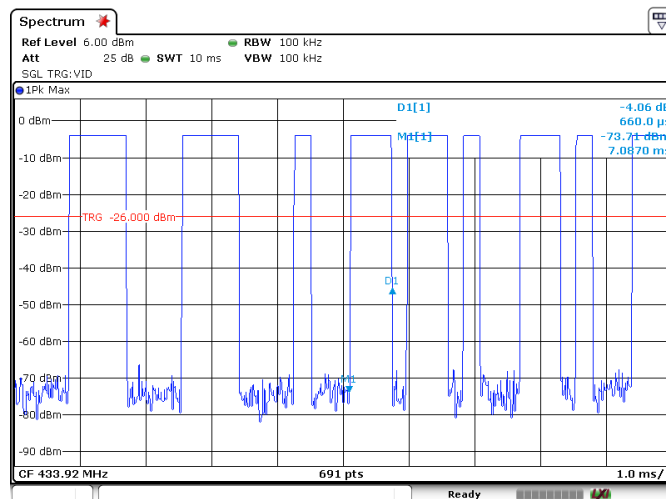
## Spurious Radiated Emission

EUT: HG05124A-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

Pulse 3 width



Calculation:

Max. allowed  $T_p=100\text{ms}$

Number of pulse 1 in  $T_p=3$ , Pulse1 width= $0.910\text{ms}$

Number of pulse 2 in  $T_p=23$ , Pulse1 width= $0.300\text{ms}$

Number of pulse 3 in  $T_p=18$ , Pulse1 width= $0.660\text{ms}$

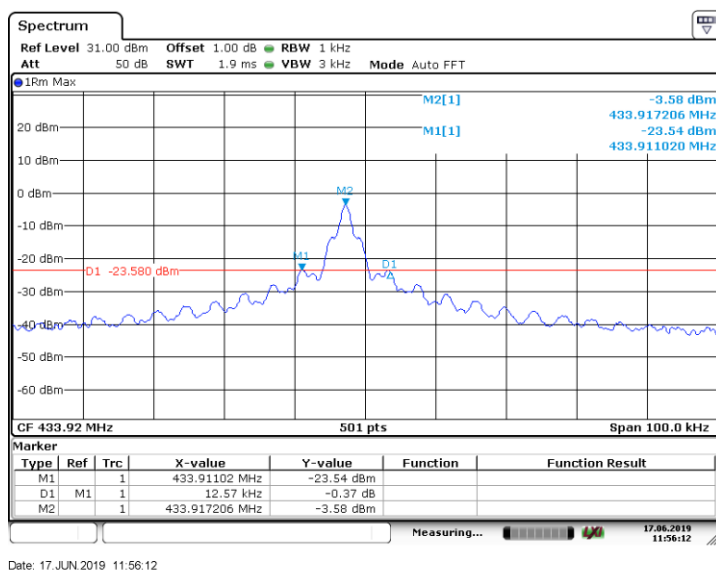
$T_{on} = \text{Pulse1 width} \times \text{Number of pulses in 1 period} + \text{Pulse2 width} \times \text{Number of pulses in 1 period} + \text{Pulse3 width} \times \text{Number of pulses in 1 period}$   
 $= 21.51 \text{ ms}$

Duty cycle factor =  $20 \times \log(T_{on}/T_p) = -13.35\text{dB}$

## 7.2 20dB Bandwidth

EUT: HG05124A-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	12.57 kHz	<= 1084.8 kHz
Limit=0.25%*Center Frequency=0.25%*433.92MHz=1084.8kHz		



### 7.3 Transmission Time

EUT: HG05124A-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	958ms	< 1s	29.93s	>28.74s

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

## Transmission Time

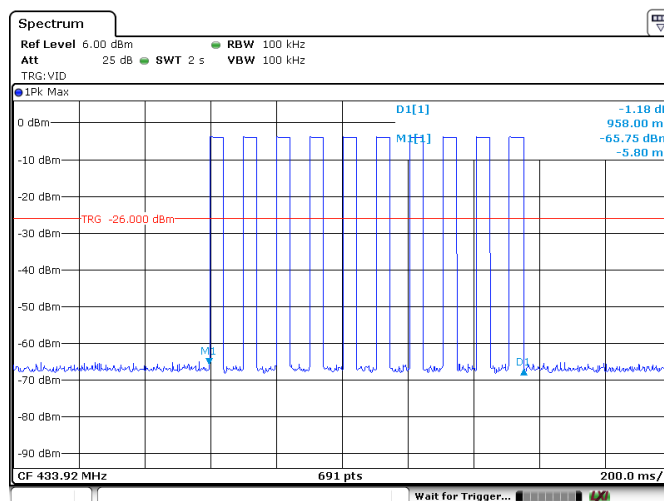
EUT: HG05124A-US-TX  
Op Condition: Operated, TX Mode (433.92MHz)  
Test Specification: FCC15.231(e)  
Comment: 3 VDC

Test Result

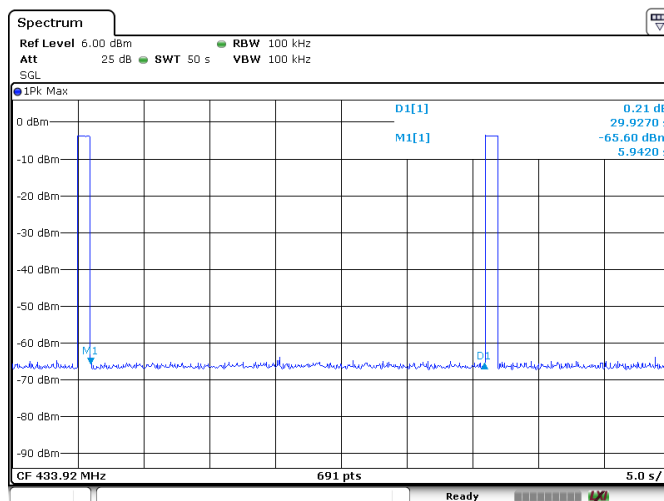
☒ Passed

☐ Not Passed

### Duration of each transmission



### Silent period



## 8 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  $\leq 50$  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,  $\text{mW} / 5 \text{ mm} \cdot \sqrt{0.43392\text{GHz}} \leq 3.0$

Numeric threshold  $\leq 22.771\text{mW}$

Step a.2)

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

Numeric threshold  $\leq 91.084\text{mW}$

>> The power of EUT measured is:  $-2.49\text{dBm} = 0.564\text{mW}$

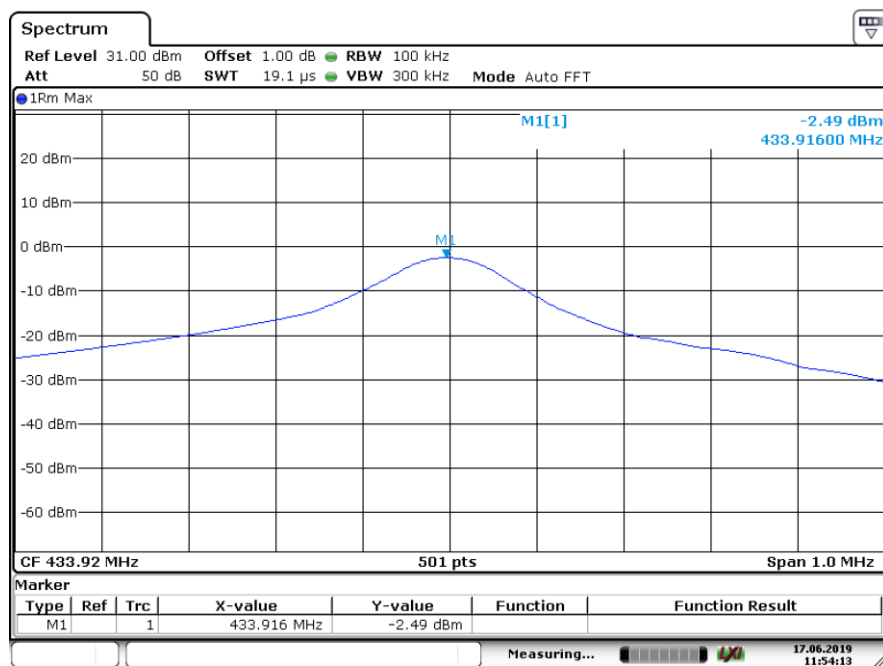
Which is smaller than the Numeric threshold.

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

**Appendix A - Conducted power**

EUT: HG05124A-US-TX  
Op Condition: Operated, TX Mode  
Comment: 3 VDC  
Remark: NA

Test Result  
☒ Passed  
☐ Not Passed



Date: 17.JUN.2019 11:54:14

## Appendix A Declaration letter of model difference

### Declaration letter of model difference

To: TÜV SÜD HKG Ltd.

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Attention:

From:

Date: 18-Jul, 2019

Fax No:

Total Page (Cover Included): 1

#### Declaration Letter

Subject:

We:

Officially notify TÜV SÜD HKG Ltd. that the HG05124B-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, HG05124A-US. The difference lies only in color and model of the different models.

<<Additional Model >>: HG05124B-US

<<Main Test Model >>: HG05124A-US

<<Product>>: Wireless weather station

Applicant: Lidl US, LLC

18-Jul, 2019  
(Date)



(Applicant's authorized signature and company Chop)