China

FCC - TEST REPORT

Report Number	:	60.790.19.006.01R01	Date of Issue	:	May 15, 2019
Model	:	25417, 25415			
Product Type	:	**Lawn & Garden Wireless Moisture Sensor**			
Applicant	:	Yuan Mei Corp.			
Address	:	No. 21, Lane 409, Sec. 1, Lu Ho Rd., Lu Kang, Chang Hua, Taiwan, R.O.C.			
Production Facility	:	/			
Address	:	/			
Test Result	:	■Positive ☐Negative			
Total pages including Appendices	:	19			

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China

1 Table of Contents

2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	Lawn & Garden Wireless Moisture Sensor
Model no.:	25417, 25415
FCC ID:	2ASWP-254S1
Rating:	3V DC (2 x1.5V AA battery)
Frequency:	915MHz
Antenna gain:	0 dBi
Number of operated channel:	1
Modulation:	FSK

Auxiliary Equipment and Software Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	S/N
/	/	/	/

Auxiliary Software Used during Test:

DESCRIPTION	SOFTWARE NAME	VERSION	REMARK
/	/	/	/

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 — Intentional Radiators

All the tests were performed using the procedures from ANSI C63.4(2014) and ANSI C63.10 (2013).

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
ISED test site number: 10320A-1

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 & 15.249 Radiated Emission	Site1
FCC Title 47 Part 15.207 Conduct Emission	NIL
FCC Title 47 Part 15.215 20dB Bandwidth	Site 1
FCC Title 47 Part 15.203 Antenna Requirements	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

20dB and 99% Bandwidth – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2020-6-28
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	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 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 & 15.249 Radiated Emission	12-13	☒	☐	☐
FCC Title 47 Part 15.207 Conduct Emission (1)	14	☐	☐	☒
FCC Title 47 Part 15.215 20dB Bandwidth	15	☒	☐	☐
FCC Title 47 Part 15.203 Antenna Requirement	16	☒	☐	☐

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

6 General Remarks

Remarks

Client informs that the **25415** have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction with **25417**, The difference lies only on the model number (Client's conformation letter shown at appendix A)

EMC tests were performed on model: **25417**.

This submittal(s) (test report) is intended for **FCC ID: 2ASWP-254S1**, complies with Section 15.205, 15.207, 15.209, 15.249 of the FCC Part 15, Subpart C rules.

The TX frequency is 915MHz.

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: January 31, 2019

Testing Start Date: March 4, 2019

Testing End Date: April 3, 2019

Reviewed by:

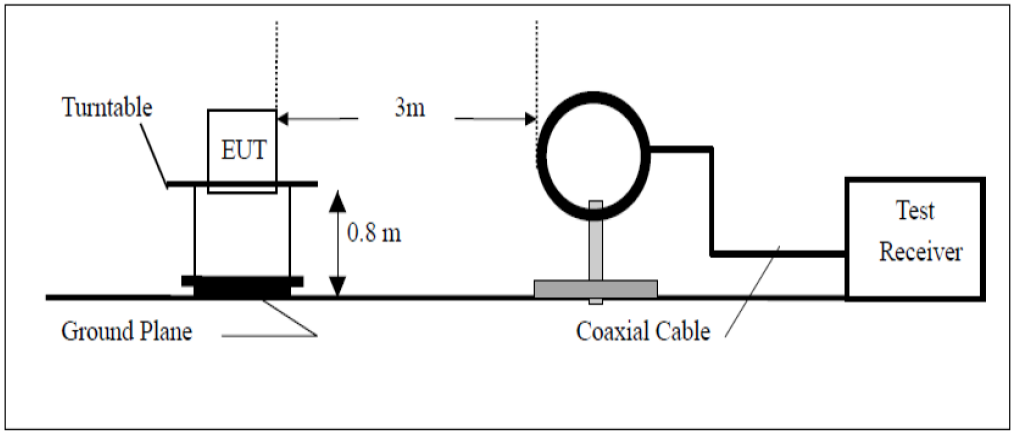
Hosea CHAN
EMC Project Engineer

Prepared by:

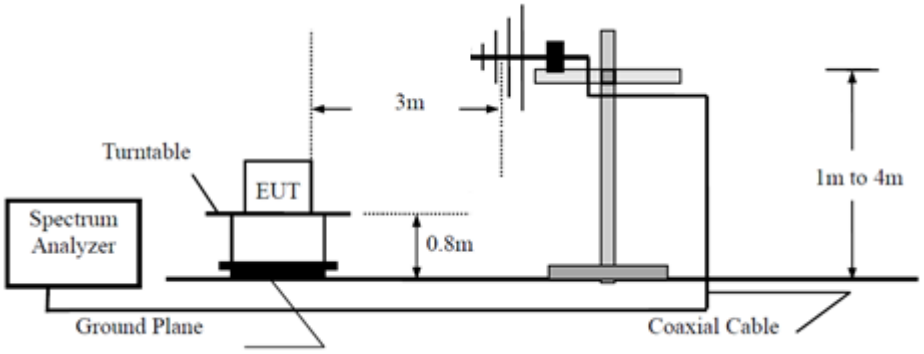
Eric LI
EMC Senior Project Engineer

7 Test Setups

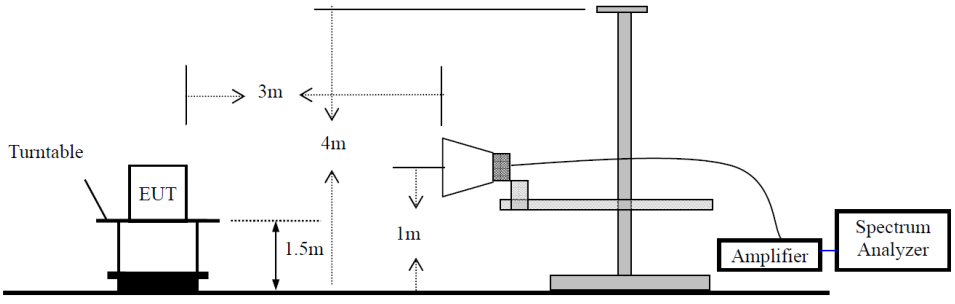
7.1 Radiated test setups 9kHz-30MHz



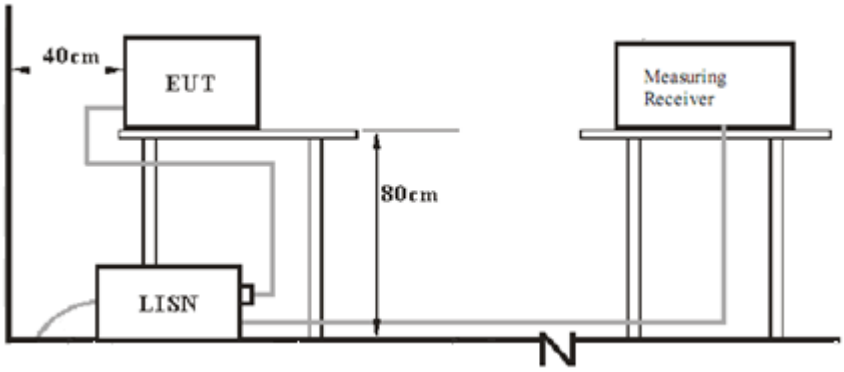
7.2 Radiated test setups Below 1GHz



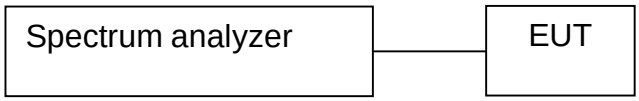
7.3 Radiated test setups Above 1GHz



7.4 AC Power Line Conducted Emission test setups



7.5 Conducted RF test setups



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8 Emission Test Results

8.1 Spurious Radiated Emission

EUT: 25417
Op Condition: Operated, TX Mode (915MHz)
Test Specification: FCC15.205, 15.209 & 15.249(a) Antenna: Horizontal
Comment: 3 VDC
Remark: 9kHz to 10GHz

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector PK/QP/AV	Corr. (dB)
58.45	17.44	40.00	-22.56	Peak	-26.9
436.65	19.31	46.00	-26.69	Peak	-23.3
915.00	92.40	114.00	-21.60	Peak	-15.5
915.00	76.88	94.00	-17.12	Average	-15.5
1830.00	49.18	74.00	-24.82	Peak	-9.8
1830.00	34.82	54.00	-19.18	Average	-9.8
5490.00	50.63	74.00	-23.37	Peak	4.2
5490.00	33.59	54.00	-20.41	Average	4.2
7320.00	39.79	74.00	-34.21	Peak	5.2
7320.00	30.18	54.00	-23.82	Average	5.2

Spurious Radiated Emission

EUT: 25417
Op Condition: Operated, TX Mode (915MHz)
Test Specification: FCC15.205, 15.209 & 15.249(a) Antenna: Vertical
Comment: 3 VDC
Remark: 9kHz to 10GHz

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector PK/QP/AV	Corr. (dB)
45.84	18.10	40.00	-21.90	Peak	-25.2
58.13	19.06	40.00	-20.94	Peak	-26.9
915.00	96.70	114.00	-17.30	Peak	-15.5
915.00	81.21	94.00	-12.79	Average	-15.5
1830.00	51.49	74.00	-22.51	Peak	-9.8
1830.00	36.22	54.00	-17.78	Average	-9.8
5490.00	46.75	74.00	-27.25	Peak	4.2
5490.00	31.78	54.00	-22.22	Average	4.2
6405.00	47.26	74.00	-26.74	Peak	3.9
6405.00	33.24	54.00	-20.76	Average	3.9

8.2 Conducted Emission at AC Power line

EUT:	25417
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.207
Comment:	3V DC
Remark:	

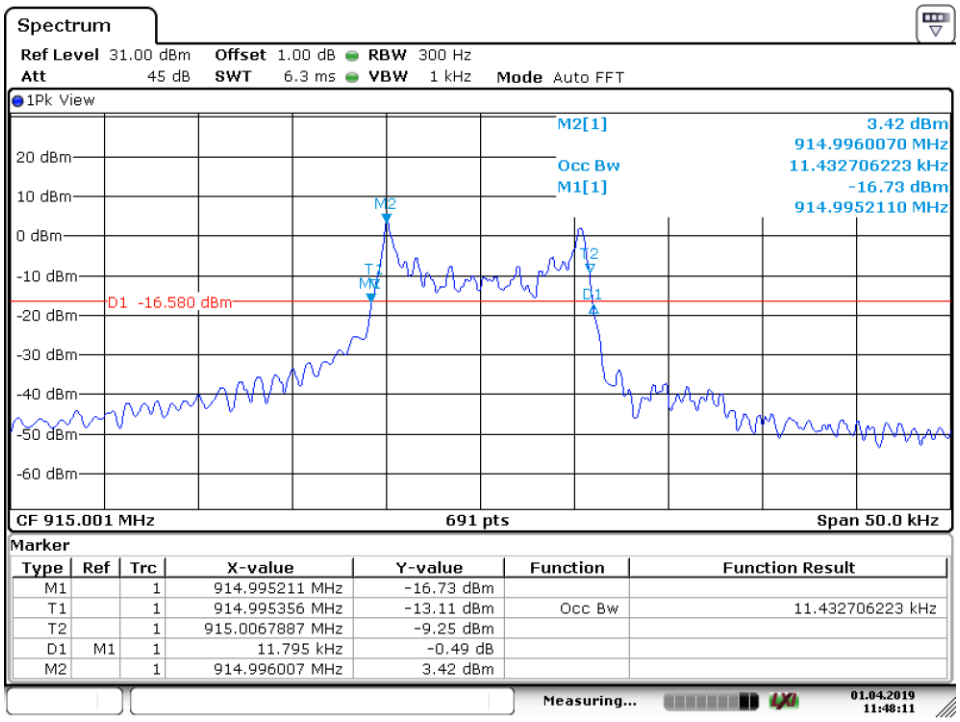
Test Result
☐ Passed
☐ Not Passed

Conducted Emission testing is not applicable for this EUT as it is a battery operating device.

8.3 20dB and 99% Bandwidth

EUT: 25417
Op Condition: Operated, TX Mode (915MHz)
Test Specification: FCC15.15 20dB Bandwidth
Comment: 3 VDC

Test Result
☒ Passed
☐ Not Passed



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Bandwidth	Measured Value
20dB bandwidth	11.8 kHz
99% OWB	11.4 kHz

8.4 Antenna Requirements

EUT:	25417
Op Condition:	Operated, TX Mode (915MHz)
Test Specification:	FCC15.203
Comment:	3 VDC

Test Result
☒ Passed
☐ Not Passed

Limit

For intentional device, according to FCC Title 47 Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Connector Construction

The antenna used in this product is chip antenna, which is embedded permanently on PCB and no consideration of replacement.

9 Appendix A - General Product Information

Radiofrequency radiation exposure evaluation

This exposure evaluation is intended for **FCC ID: 2ASWP-254S1.**

According to FCC CFR 47 part1 1.1310, As specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

MPE calculation method:
Pd = (P*G) / (4*Pi* R^2), where
Pd = power density in mW/cm^2
P = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
R= calculation distance in cm

>> The limit of Power density 915MHz is 915/1500=0.61mW/cm^2

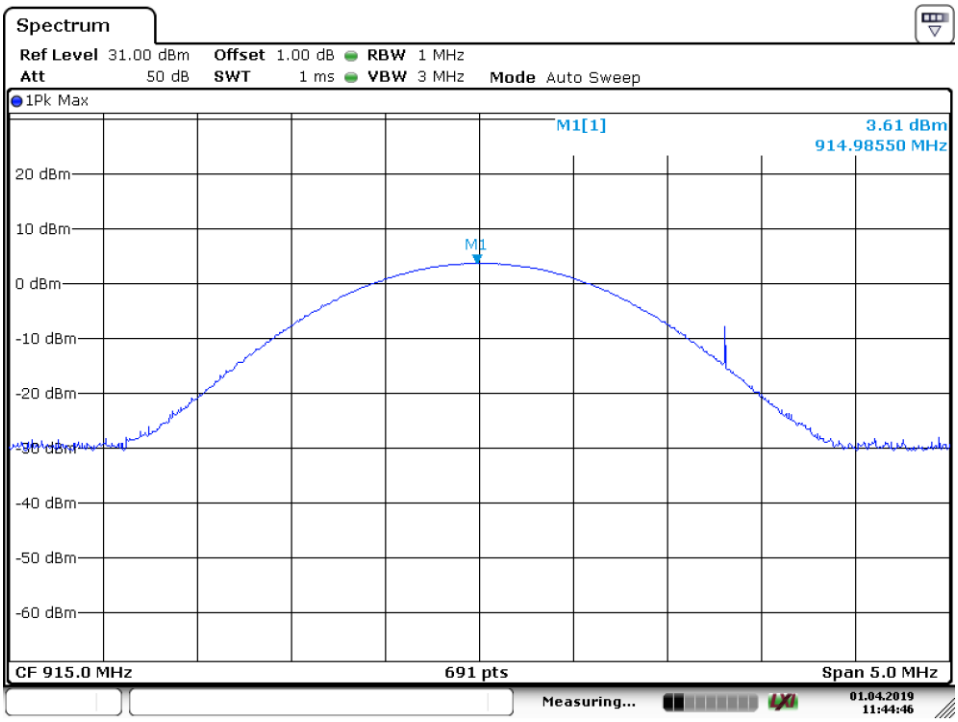
>> The antenna gain is 0dBi (=1 in linear scale).
Manufacturer specified the separation distance is: 20cm
The power of EUT measured (915MHz) is: 3.61dBm = 2.296mW

>> The Pd calculated of 915MHz is 0.00046mW/cm^2
Which is smaller than the threshold of the limit.
Therefore, the device is exempt from stand-alone SAR test requirements.

General Product Information

EUT:	25417
Op Condition:	Operated, TX Mode
Comment:	3 VDC
Remark:	Conducted power

Test Result
☒ Passed
☐ Not Passed



Date: 1.APR.2019 11:44:46

China

General Product Information

Declaration Letter of Model Difference

源美股份有限公司 YUAN MEI CORP.
Tel : 886-4-7775096 Fax : 886-4-7783107
website : www.yuanmei.tw e-mail : support@yuanmei.tw
No. 21, Lane 409, Sec. 1, Lu Ho Rd., Lu Kang, Chang Hua, 505 Taiwan R.O.C.

To: TÜV SÜD Hong Kong Limited

Attention: **Mr. Edmond Fung**
From: **Yuan Mei Corp.** Date: September 7, 2019
Fax No: Total Page (Cover Included): 1

Declaration Letter

Subject:

We:

Officially notify TÜV SÜD Hong Kong Limited 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 model 25415 appearance & model number.

<<Additional Model >>: 25415

<<Main Test Model >>: 25417

<<Product>>: Lawn & Garden Moisture Sensor

Applicant: Yuan Mei Corp.

Sep. 7th, 2019
(Date)

(Applicant's authorized signature and company Chop)
Name: Lita Lin
Job title: VP of Sales & Marketing

China

General Product Information

Declaration Letter of Model Difference

源美股份有限公司 YUAN MEI CORP.
Tel : 886-4-7775096 Fax : 886-4-7783107
website : www.yuanmei.tw e-mail : support@yuanmei.tw
No. 21, Lane 409, Sec. 1, Lu Ho Rd., Lu Kang, Chang Hua, 505 Taiwan R.O.C.

	Sample	Model	Different	remark
1.		25417 (main test model)	Main test unit.	
2.		25415	1. only different on appearance	