

FCC CERTIFICATION TEST REPORT

FOR

Applicant		Lang Beverages SA		
Address of Applicant	:	Baarerstrasse 125, 6300 Zug, Switzerland		
Manufacturer	•	Dongguan Yulia Electronic Technology Co.,Ltd		
Address of Manufacturer		Building#2, Huantuo block, Jinlong Industrial Park, Sanzhong, Qingxi, Dongguan, Guangdong, China 523651		
Equipment under Test	• •	TheWell 2		
Model No.	••	021		
FCC ID	:	A3UV-C021REV1		
Test Standard(s)	:	CC Rules and Regulations Part 15 Subpart C, ANSI C63.10:2020		
Report No.	••	DDT-RE24061822-1E03		
Issue Date	:	2024/12/05		
Issue By	•	Guangdong Dongdian Testing Service Co., Ltd. Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808		



Table of Contents

	Test report declares	3
1.	Summary of Test Results	5
2.	General Test Information	
2.1.	Description of EUT	6
2.2.	Accessories of EUT	
2.3.	Assistant equipment used for test	6
2.4.	Block diagram of EUT configuration for test	6
2.5.	Deviations of test Stand	
2.6.	Test environment conditions	7
2.7.	Test laboratory	7
2.8.	Measurement uncertainty	7
3. 🔗 🛞	Equipment Used During Test	8 ®
4.	20 dB Bandwidth & 99% Bandwidth	
4.1.	Block diagram of test setup	9
4.2.	Limits	9
4.3.	Test procedure	9
4.4.	Test result	. 10
4.5.	Original test data	. 10
5.	Frequency Tolerance	.11
5.1.	Limit	. 11
5.2.	Block diagram of test setup	. 11
5.3.	Test procedure	. 11
5.4.	Test result	. 12
6.	Radiated Emission	.13
6.1.	Block diagram of test setup	.13
6.2.	Limit	
6.3.	Test procedure	. 15
6.4.	Test result	. 16
7.	Power Line Conducted Emission	. 21
7.1.	Block diagram of test setup	.21
7.2.	Power line conducted emission limits	. 21
7.3.	Test procedure	. 21
7.4.	Test result	
8.	Antenna Requirements	. 25
9.	Test Setup Photograph	.26
10.	Photos of the EUT	. 27

Test Report Declare

Applicant	:	Lang Beverages SA
Address of Applicant	:	Baarerstrasse 125, 6300 Zug, Switzerland
Equipment under Test	:	TheWell 2
Model No.	:	C021
Manufacturer		Dongguan Yulia Electronic Technology Co.,Ltd
Address of Manufacturer		Building#2, Huantuo block, Jinlong Industrial Park, Sanzhong, Qingxi, Dongguan, Guangdong, China 523651

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C

Test procedure used:

ANSI C63.10:2020

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No.:	DDT-RE24061822-1E03	r oli		
Date of Receipt:	2024/06/20	Date of Test:	2024/07/21-2024/12/05	

Prepared By:

IACRU HUANA

Jacky Huang/Engineer



Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Report No.: DDT-RE24061822-1E03

Revision History

Rev.	Revisions		Issue Date	Revised By
	Initial issue		2024/12/05	œ
	DP!	pP	pp	



1. Summary of Test Results		
Description of Test Item	Standard	Results
20 dB Bandwidth	FCC Part 15: 15.215 ANSI C63.10:2020	Pass
Frequency Tolerance	FCC Part 15:15.225 ANSI C63.10:2020	Pass
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.225 ANSI C63.10:2020	Pass ®
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.10:2020	Pass
Antenna Requirement	FCC Part 15: 15.203 ANSI C63.10:2020	Pass

2. General Test Information

2.1. Description of EUT

EUT Name	: TheWell 2
Model Number	: C021
EUT function description	: Please reference user manual of this device
Power Supply	: AC 120V, 60Hz
Radio Specification	· NFC
Modulation	: ASK
Operation Frequency	: 13.56 MHz
Antenna Type	: PCB antenna

Note 1: EUT is the abbreviation of equipment under test.

Note 2: This EUT support Bluetooth LE, 2.4 GHz WLAN, NFC, this report only for NFC.

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Serial No.	Other
N/A	N/A	N/A	N/A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number or Type	EMC Compliance	Other
N/A	N/A	N/A	N/A	N/A

2.4. Block diagram of EUT configuration for test



2.5. Deviations of test Stand

No deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

/	Normal Conditions	Extreme Conditions
Temperature range:	21-25 ℃	[®] 10 ℃ and +35 ℃
Humidity range:	40-75%	10-90%
Pressure range:	86-106 kPa	86-106 kPa
Power supply	NV: AC 120V/60Hz	AC 102V/60Hz, AC 138V/60Hz (from 85% to 115% of the rated supply voltage)
(8)	B	(8) (8)

Note: The Extreme temperature range and extreme voltages are declared by the manufacturer.

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808.

Tel.: +86-0769-38826678, http://www.dgddt.com, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

Test Item	Uncertainty	
Uncertainty for Radiation Emission test	3.78 dB (150 kHz - 30 MHz)	
(9 kHz - 30 MHz)	3.37 dB (9 kHz - 150 kHz)	
Uncertainty for Radiation Emission test	4.70 dB (Antenna Polarize: V)	
(30 MHz - 1 GHz)	4.84 dB (Antenna Polarize: H)	
Uncertainty for Radiation Emission test	4.10 dB (1-6 GHz)	
(1 GHz to 18 GHz)	4.40 dB (6 GHz - 18 GHz)	
Bandwidth	1.1%	
Uncertainty for radio frequency (RBW < 20 kHz)	3×10-8	
Conducted disturbance at mains terminals	3.34 dB (150 kHz-30 MHz)	
Note: This uncertainty represents an expanded uncertai confidence level using a coverage factor of k=2.	inty expressed at approximately the 95%	

.8. Measurement uncertainty

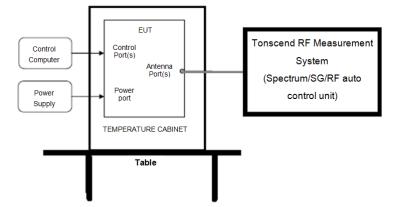
3. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
⊠Radiation 3#cham	ber				
RF Cable	N/A	W13.02 AP1-X2	DDT-ZC04023	2025/03/31	1 Year
High Pass filter	Xi'an Xingbo	XBLBQ-GTA67	DDT-ZC02179	2025/04/22	1 Year
EMI TEST RECEIVER	R&S	ESU26	DDT-ZC01909	2025/03/31	1 Year
RF cable	Yuhu Technology	JCTB810-NJ-NJ-9M	DDT-ZC02538	2025/03/31	1 Year
Active Loop Antenna	Schwarzbeck	FMZB1519	DDT-ZC00524	2025/09/11	2 Year
High pass filter	Micro-Tronics	HPM50102	DDT-ZC00561	2025/04/22	1 Year
PSA Series Spectrum Analyzer	Agilent	E4447A	DDT-ZC00517	2025/03/31	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	DDT-ZC02050	2025/07/11	1 Year
Micro-Tronics filters	REBES	BRM50702	DDT-ZC03242		D
High pass filter	Micro-Tronics	HPM50108	DDT-ZC00560	2025/04/22	1 Year
Hochgewinn-Horn antenna	SCHWARZBECK	BBHA 9120 D	DDT-ZC02129	2025/09/18	2 Year
RF cable	Zhongke Junchuang	JCT26S-NJ-NJ-1.5 M	DDT-ZC02762	2025/03/31	1 Year
Micro-Tronics filters	REBES	BRM50716	DDT-ZC03240	/	
RF Cable	N/A	W24.02 HL-562	DDT-ZC04022	2025/03/31	1 Year
Pre-amplifier	COM-POWER	PAM-840A	DDT-ZC01693	2025/03/31	1 Year
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2025/04/26	1 Year
RF cable	Yuhu Technology	ZT26S-SMAJ-SMAJ -1M	DDT-ZC02037	2025/03/31	1 Year
⊠Power Line Condu	ucted Emissions	Test 3#			
Two Line V-Network	R&S	ENV216	DDT-ZC00586	2025/07/08	1 Year
Pulse Limiter	R&S	KH43101	DDT-ZC00747	2025/04/22	1 Year
Two Line V-Network	R&S	ENV216	DDT-ZC01247	/	/
Condected Radiated Software	Audix	E3	DDT-ZC00562	/	
EMI Test Receiver	R&S	ESCI	DDT-ZC01972	2025/03/31	1 Year
Copper shaft signal cable	H&S	RG214-5	DDT-ZC01817	2025/03/31	1 Year

Report No.: DDT-RE24061822-1E03

4. 20 dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Set the spectrum analyzer as follows:

RBW: VBW:

Detector Mode:

Sweep time:

Trace mode

Max hold

30 kHz

100 kHz

Peak

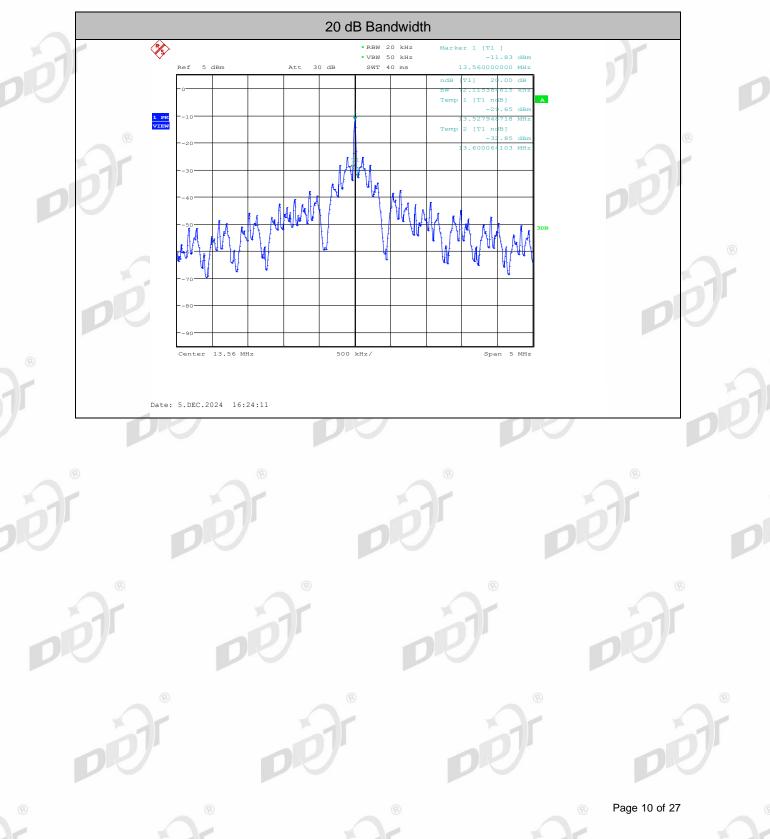
auto

(3) Allow the trace to stabilize, measure the 20 dB bandwidth of signal.

4.4. Test result

Mode	Frequency (MHz)	20 dB bandwidth Result (kHz)	Conclusion
ASK	13.56	72.115	Pass

4.5. Original test data



5. Frequency Tolerance

5.1. Limit

As contained in § 15.225 the frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply Voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.2. Block diagram of test setup

Spectrum Analyzer

Attenuator

EUT and Assistant System

5.3. Test procedure

(1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 10 kHz.

Video BW: 10 kHz.

Span: 1 MHz.

Detector: Peak.

Trace Mode: Max Hold.

(2) When the trace is complete, find the peak value of the power envelope and record the frequency.

5.4. Test result

			1			
N4. 1.	Conc	lition		Limit		
Mode	Temperature (℃)	Voltage (V)	Measured (MHz)	Tolerance (kHz)	Tolerance (ppm)	ppm
	NT	NV	13.560	0	0	±100
	10	10 NV		0		±100
Carrier	30	NV	13.560	0	0	±100
Tx Mode	35	NV	13.560	0	0	±100
	NT	AC 102V	13.560	0	0	±100
	NT AC 138V		13.560	0	0	±100
(B)		B		B		

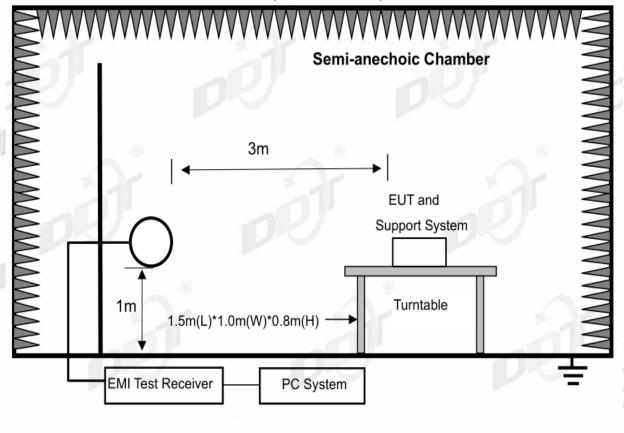
Note: NT: 20 °C, NV: AC 120V/60Hz

Page 12 of 27

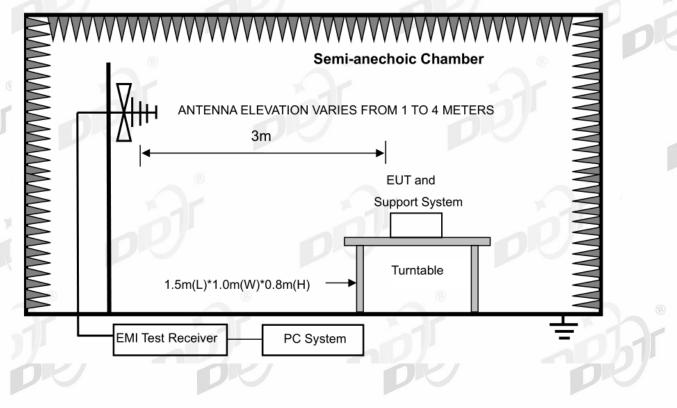
6. Radiated Emission

6.1. Block diagram of test setup

In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



6.2. Limit

Operation within the band 13.110-14.010 MHz as contained in §15.225:

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed

15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter

at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at

30 meters.

(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

FREQUENCY	DISTANCE	FIELD STRENG	GTHS LIMIT	
(MHz)	Meters	(μV/m)	dB(µV)/m	
0.009 ~ 0.490	300	2400/F(KHz)	67.6-20log(F)	
0.490 ~ 1.705	30	24000/F(KHz)	87.6-20log(F)	
1.705 ~ 13.110	30	30	29.54	
13.110 ~ 13.410	30	106 📀	40.51	
13.410~ 13.553	30	334	50.47	
13.553~13.567	30	15848	84.00	
13.567~13.710	30	334	50.47	
13.710~14.010	30	106	40.51	
14.010~30	30 🛞	30	_@ 29.54	
30 ~ 88	3	100	40.0	
88 ~ 216	3	150	43.5	
216 ~ 960	3	200	46.0	
960 ~ 1000	3	500	54.0	

Note:

(1)The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer then that specified, and the limit at closer measurement distance can be extrapolated by below formula:

Limit_{3m}(dBuV/m)= Limit_{300m}(dBuV/m) + 40Log(300m/3m) = Limit_{300m}(dBuV/m) + 80

Limit_{3m}(dBuV/m)= Limit_{30m}(dBuV/m) + 40Log(30m/3m) = Limit_{30m}(dBuV/m) + 40

FREQUENCY (MHz)	DISTANCE Meters	FIELD STRENGTHS LIMIT dB(µV)/m
0.009 ~ 0.490	3	147.6-20log(F)
0.490 ~ 1.705	3	127.6-20log(F)
1.705 ~ 13.110	3 8	69.54 [®]
13.110 ~ 13.410	3	80.51
13.410 ~ 13.553	3	90.47
13.553 ~13.567	3	124.00
13.567 ~13.710	3	90.47
13.710 ~14.010	3	80.51
14.010~30	3	69.54
30 ~88	3	40.00
88 ~216	3	43.50
216 ~960	3	46.00
960 ~ 1000	3	54.00

6.3. Test procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.

(2) Test antenna was located 3m from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used	Test antenna distance
9 kHz - 30 MHz	Active Loop antenna	3 m
30 MHz - 1 GHz	Trilog Broadband Antenna	3 m

According ANSI C63.10:2020 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also is positioned with its plane horizontal at the specified distance from the EUT. The lowest height of the loop is 1 m above the ground. For measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 1 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions. Spectrum frequency from 9 kHz to 1 GHz (tenth harmonic of fundamental frequency) was investigated.

(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2020 on Radiated Emission test.

(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz, for emissions from 9 kHz - 90 kHz, 110 kHz - 490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW.

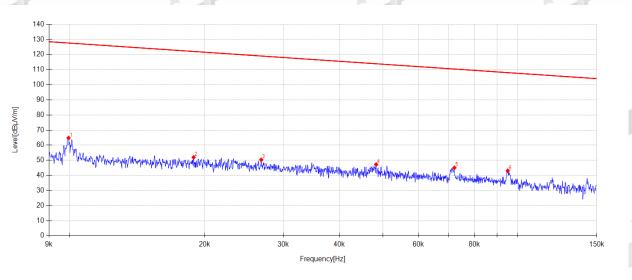
Frequency band	RBW
9 kHz - 150 kHz	200 Hz
⊚150 kHz - 30 MHz 🛞	9 kHz
30 MHz - 1 GHz	120 kHz

6.4. Test result

Pass. (See below detailed test result)

TR-4-E-009 Radiated Emission Test Result

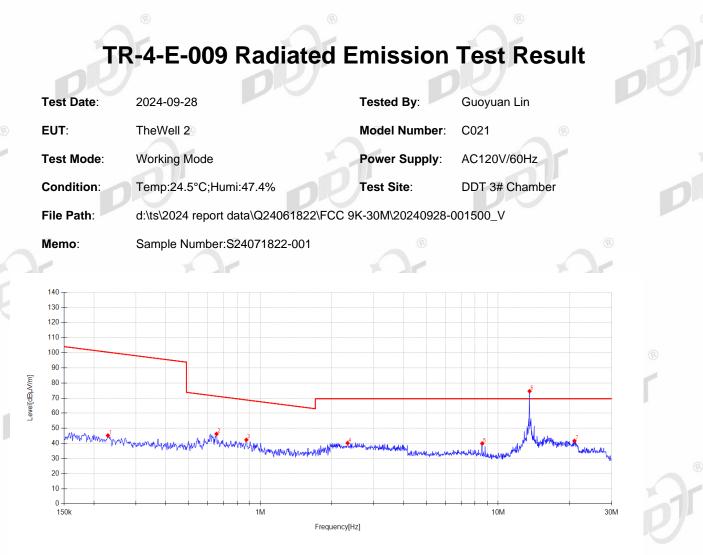
Test Date:	2024-09-28	Tested By:	Guoyuan Lin				
EUT:	TheWell 2	Model Number:	C021 ®				
Test Mode:	Working Mode	Power Supply:	AC120V/60Hz				
Condition:	Temp:24.5°C;Humi:47.4%	Test Site:	DDT 3# Chamber				
File Path:	d:\ts\2024 report data\Q24061822\FCC 9K-30M\20240928-001652_V						
Memo:	Sample Number:S24071822-001						



Data L	list					0			6	
NO.	Freq. [MHz]	Reading [dBµV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Polarity
1	0.010	71.45	20.50	3.21	-30.39	64.77	127.64	62.87	PK	Х
2	0.019	58.70	20.50	3.22	-30.46	51.96	122.06	70.10	PK	Х
3	0.027	57.18	20.43	3.23	-30.51	50.33	119.05	68.72	PK	Х
4	0.048	54.21	20.40	3.25	-30.66	47.20	113.92	66.72	PK	Х
5	0.072	52.22	20.40	3.23	-30.81	45.04	110.43	65.39	PK	Х
6	0.095	50.41	20.38	3.23	-30.97	43.05	108.05	65.00	PK	Х

Note:

- 1. Level = Reading + Cable Loss + Antenna Factor + AMP
- 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
- 3. Test setup: 9kHz-150kHz RBW: 300Hz, VBW: 1 kHz, Sweep time: auto.
 - 150kHz-30MHz RBW: 10kHz, VBW: 30kHz, Sweep time: auto.
- 4. Have been tested X, Y, Z directions, only recorded the worst case (X direction) on this report.



Data L	ist									
NO.	Freq. [MHz]	Reading [dBµV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Polarity
1	0.229	52.84	20.15	3.24	-31.00	45.23	100.40	55.17	PK	х
2	0.656	53.64	20.33	3.26	-31.00	46.23	71.27	25.04	PK	х
3	0.875	49.70	20.37	3.27	-31.00	42.34	68.77	26.43	PK	х
4	2.330	47.50	20.40	3.33	-31.00	40.23	69.54	29.31	PK	х
5	8.574	46.84	20.52	3.57	-31.00	39.93	69.54	29.61	PK	х
6	13.560	81.63	20.30	3.65	-31.02	74.56	124.00	52.44	PK	х
7	20.928	49.11	19.91	3.70	-31.05	41.67	69.54	27.87	PK	х

Note:

- 1. Level = Reading + Cable Loss + Antenna Factor + AMP
- 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
- 3. Test setup: 9kHz-150kHz RBW: 300Hz, VBW: 1 kHz, Sweep time: auto.
 - 150kHz-30MHz RBW: 10kHz, VBW: 30kHz, Sweep time: auto.
- 4. Have been tested X, Y, Z directions, only recorded the worst case (X direction) on this report.

TR-4-E-009 Radiated Emission Test Result

Test Date:	2024-09-28	Tested By:	Guoyuan Lin	
EUT:	TheWell 2	Model Number:	C021	
Test Mode:	Working Mode	Power Supply:	AC120V/60Hz	
Condition:	Temp:24.5°C;Humi:47.4%	Test Site:	DDT 3# Chamber	
File Path:	d:\ts\2024 report data\Q24061822\FCC	9K-30M\20240928-0)11721_H	
Memo:	Sample Number:S24071822-001	Ar	- Ar	
60 T				
50				
40				
[U] 30				
Level C	WARA I.	a dil n		

0 ↓ 30M			100M	Fre	quency[Hz]		+ +		1G
	1			y			-		
Data L NO.	ist Freq. [MHz]	Reading [dBµV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Polarity
1	32.588	36.84	10.57	3.78	20.09	40.00	19.91	QP	Horizontal
2	97.433	43.63	10.80	4.20	27.53	43.50	15.97	QP	Horizontal
3	112.652	40.47	11.44	4.29	25.09	43.50	18.41	QP	Horizontal
4	144.087	38.73	9.23	4.46	21.28	43.50	22.22	QP	Horizontal
5	218.069	37.98	10.88	4.84	22.46	46.00	23.54	QP	Horizontal
6	304.042	31.92	13.70	5.24	19.46	46.00	26.54	QP	Horizontal

Note:

20 -

10 -

- 1. Result Level = Reading + Cable loss + Antenna Factor + AMP
- 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
- 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Те	st Date:	2024-09-28	Tested By:	Guoyuan Lin
EU	JT:	TheWell 2	Model Number:	C021
Те	st Mode:	Working Mode	Power Supply:	AC120V/60Hz
Co	ondition:	Temp:24.5°C;Humi:47.4%	Test Site:	DDT 3# Chamber
File	e Path:	d:\ts\2024 report data\Q240618	322\FCC 9K-30M\20240928-(011815_V
Me	emo:	Sample Number:S24071822-0	01	3
6	0			
50	0			
4(0			
Level[dBµV/m]	0		A.T.	E
ت 2(with hum har with h	MANNAM MANA	
10	0 - M M		ALALI	

Data L	Data List									
NO.	Freq. [MHz]	Reading [dBµV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Polarity	
1	59.977	39.58	12.79	3.96	25.23	40.00	14.77	QP	Vertical	
2	88.014	41.76	8.91	4.14	23.71	43.50	19.79	QP	Vertical	
3	111.552	41.06	11.79	4.28	26.02	43.50	17.48	QP	Vertical	
4	256.771	41.77	11.69	5.02	27.17	46.00	18.83	QP	Vertical	
5	385.084	31.09	15.31	5.56	20.52	46.00	25.48	QP	Vertical	
6	867.328	38.36	21.19	7.12	35.95	46.00	10.05	QP	Vertical	

Frequency[Hz]

Note:

10 -

0 30M

- 1. Result Level = Reading + Cable loss + Antenna Factor + AMP
- 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

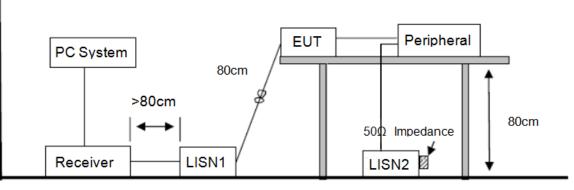
100M

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

Report No.: DDT-RE24061822-1E03

7. Power Line Conducted Emission

7.1. Block diagram of test setup



7.2. Power line conducted emission limits

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)			
150 kHz ~ 500 kHz	<u> </u>	<u> </u>			
500 kHz ~ 5 MHz	56	46			
5 MHz ~ 30 MHz	60	50			

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

7.3. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.20

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

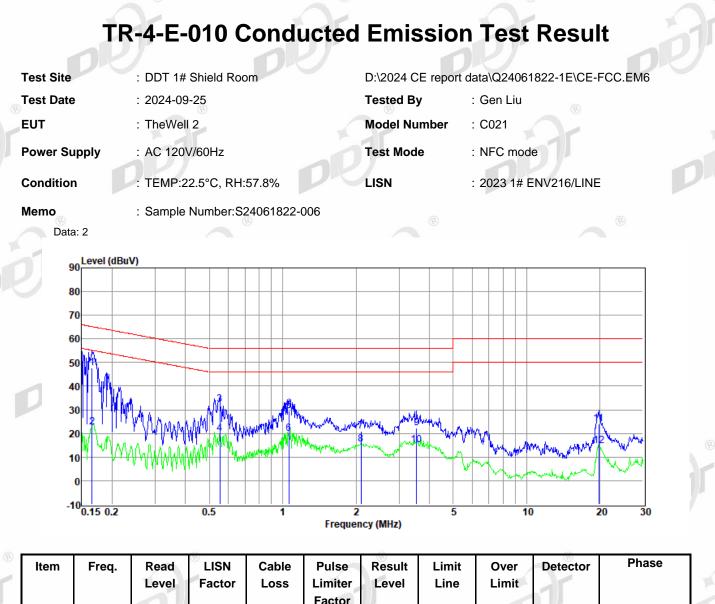
The bandwidth of test receiver is set at 9 kHz.

7.4. Test result

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits. Note2: "-----" means Peak detection; "-----" means Average detection

Report No.: DDT-RE24061822-1E03



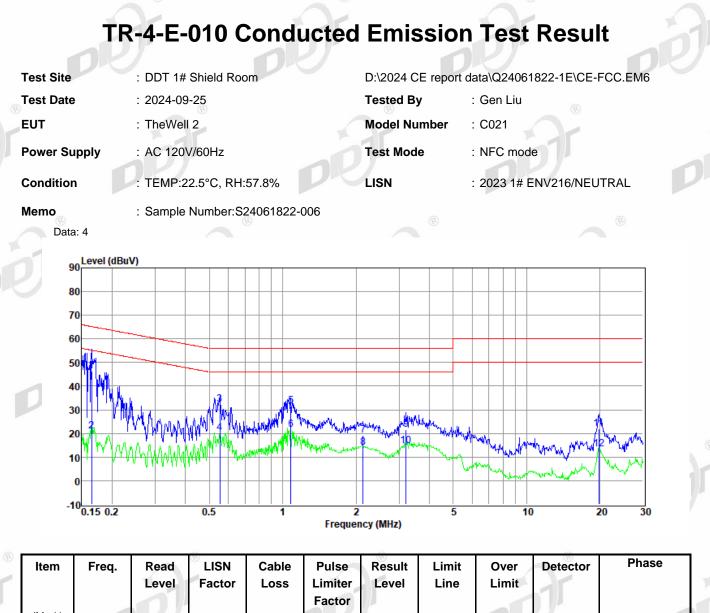
		Level	Factor	Loss	Limiter Factor	Level	Line	Limit	1	
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)		
1	0.17	27.44	9.76	0.92	9.68	47.80	65.16	-17.36	QP	LINE
2	0.17	2.39	9.76	0.92	9.68	22.75	55.16	-32.41	Average	LINE
3	0.55	12.04	9.80	0.84	9.71	32.39	[®] 56.00	-23.61	QP	[®] LINE
4	0.55	-0.29	9.80	0.84	9.71	20.06	46.00	-25.94	Average	LINE
5	1.06	9.59	9.65	0.67	9.73	29.64	56.00	-26.36	QP	LINE
6	1.06	-0.25	9.65	0.67	9.73	19.80	46.00	-26.20	Average	LINE
7	2.10	0.62	9.83	0.63	9.76	20.84	56.00	-35.16	QP	LINE
8	2.10	-4.95	9.83	0.63	9.76	15.27	46.00	-30.73	Average	LINE
9	3.55	2.31	9.64	0.57	9.78	22.30	56.00	-33.70	QP	LINE
10	3.55	-4.94	9.64	0.57	9.78	15.05	46.00	-30.95	Average	LINE
11	19.74	3.85	9.91	0.30	9.92	23.98	60.00	-36.02	QP	LINE
12	19.74	-5.29	9.91	0.30	9.92	14.84	50.00	-35.16	Average	LINE

Note:

1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.

- 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Test setup: RBW: 200 Hz (9 kHz-150 kHz), 9 kHz (150 kHz-30 MHz).
- 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

Report No.: DDT-RE24061822-1E03



		Level	Factor	Loss	Limiter	Level	Line	Limit	Ar .	
					Factor					
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)		
1	0.17	26.00	9.88	0.92	9.68	46.48	65.21	-18.73	QP	NEUTRAL
2	0.17	0.41	9.88	0.92	9.68	20.89	55.21	-34.32	Average	NEUTRAL
3	0.55	12.02	9.81	0.84	9.71	32.38	[®] 56.00	-23.62	QP	[®] NEUTRAL
4	0.55	-0.24	9.81	0.84	9.71	20.12	46.00	-25.88	Average	NEUTRAL
5	1.08	11.56	9.74	0.67	9.73	31.70	56.00	-24.30	QP	NEUTRAL
6	1.08	1.38	9.74	0.67	9.73	21.52	46.00	-24.48	Average	NEUTRAL
7	2.13	-0.92	9.79	0.63	9.76	19.26	56.00	-36.74	QP	NEUTRAL
8	2.13	-6.23	9.79	0.63	9.76	13.95	46.00	-32.05	Average	NEUTRAL
9	3.21	1.66	9.72	0.58	9.78	21.74	56.00	-34.26	QP	NEUTRAL
10	3.21	-5.25	9.72	0.58	9.78	14.83	46.00	-31.17	Average	NEUTRAL
11	19.74	2.00	9.88	0.30	9.92	22.10	60.00	-37.90	QP	NEUTRAL
12	19.74	-6.57	9.88	0.30	9.92	13.53	50.00	-36.47	Average	NEUTRAL

Note:

1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.

- 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Test setup: RBW: 200 Hz (9 kHz-150 kHz), 9 kHz (150 kHz-30 MHz).
- 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: aut

Report No.: DDT-RE24061822-1E03

10. Photos of the EUT

Please refer to DDT-Q24061822-2E appendix I

