

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: Certification Ordinance Article 2-1-19
Report No.: RJBEMI-WTW-P21070045A-3
Product: Electronic Display Device
Brand: Rakuten kobo
Model No.: N778
Received Date: 2024/1/19
Test Date: 2024/2/6
Issued Date: 2024/3/6
Applicant: NETRONIX, INC.
Address: No. 945, Boai St., Jubei City, Hsin-Chu, 30265, Taiwan
Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory
Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan

Approved by: _____

May Chen / Manager

, Date: _____

2024/3/6

This test report consists of 19 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The test results in the report only apply to the tested sample. The test results in this report are traceable to the national or international standards.

Prepared by : Phoenix Huang / Specialist



This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

Table of Contents

Release Control Record	3
1 Certificate	4
2 Summary of Test Results	5
2.1 Measurement Uncertainty	5
2.2 Supplementary Information	5
3 General Information	6
3.1 General Description	6
3.2 Antenna Description of EUT	7
3.3 Channel List	8
3.4 Power Setting	9
3.5 Test Mode Applicability and Tested Channel Detail	10
4 Test Instruments	11
4.1 Spurious Emissions	11
4.2 Spurious Emissions of Receiver	11
5 Limits of Test Items	12
5.1 Spurious Emissions	12
5.2 Spurious Emissions of Receiver	12
6 Test Arrangements	13
6.1 Spurious Emissions	13
6.2 Spurious Emissions of Receiver	13
7 Test Results of Test Item	14
7.1 Spurious Emissions	14
7.2 Spurious Emissions of Receiver	16
8 Pictures of Test Arrangements	18
9 Information of the Testing Laboratories	19



Release Control Record

Issue No.	Description	Date Issued
RJBEMI-WTW-P21070045A-3	Original release.	2024/3/6

1 Certificate

Product: Electronic Display Device
Brand: Rakuten kobo
Test Model: N778
Sample Status: Engineering sample
Applicant: NETRONIX, INC.
Test Date: 2024/2/6
Standard: Certification Ordinance Article 2-1-19
Measurement procedure: MIC notice 88 Appendix 43

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Summary of Test Results

Certification Ordinance Article 2-1-19		
Clause	Test Item	Result
OR: Article 7. Annex 3.26	Spurious Emissions	Pass
OR: Article 49-20	Antenna Specifications	Pass
OR: Article 24.2	Spurious Emissions of Receiver	Pass
OR: Article 49-20	Housing Requirements	Pass (Refer to Note 1)

Notes:

1. The relative information refer section 3.1 of this report.
2. OR: Ordinance Regulating Radio Equipment
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
4. This report is prepared for supplementary report.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETSI TR 100 028-1 and ETSI TR 100 028-2:

Parameter	Uncertainty (±)
Occupied Bandwidth	1050.00 Hz
Spurious Emissions	2.5 dB
Output Power Density	1.2 dB
Frequency Tolerance	960 Hz

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description

Product	Electronic Display Device
Brand	Rakuten kobo
Test Model	N778
Test Software Version	Realtek Bluetooth MP Kit
Status of EUT	Engineering sample
Power Supply Rating	3.7 Vdc from battery or 5 Vdc from USB interface
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 1 Mbps
Operating Frequency	2.402 GHz ~ 2.80 GHz
Number of Channel	40
Cable Supplied	USB Cable x1 (Shielded, 1.0m)
Housing Requirements	The housing consists of two parts and the plastic enclosure was assembled with glue and covered by rubbers, separating the two parts was only possible by means of brute force.

Note:

1. This is a supplementary report of Report No.: RJBEMI-WTW-P21070045-3. The differences between them are as below information:

◆ Add 2nd source LDO (Low-dropout Linear regulator).

2. According to above conditions, therefore only the TX/RX Spurious Emissions (below 1 GHz) test items need to be performed. And all data were verified to meet the requirements.

3. Simultaneously transmission condition.

Condition	Technology	
1	WLAN 2.4GHz	Bluetooth
2	WLAN 5GHz	Bluetooth

4. The eMMC provided to the EUT, please refer to the following table:

No.	Model	Remark
1	EMMC32G-TX29-GA8A	1 st source eMMC
2	MKEMF032GZ1E-C	2 nd source eMMC

Note: From the above eMMCs, the worst case was found in **No. 1**. Therefore only the test data of the mode was recorded in this report.

5. The EUT could be supplied with a rechargeable battery as the following table:

Brand Name	Model No.	Spec.
Guangdong Pow-Tech New Power	PT158098	3.7 Vdc, 1200 mAh, 4.44 Wh

6. For input voltage of EUT, the worse case was found at the voltage 5 Vdc condition. Therefore only the test data of the mode was recorded in this report individually.

7. The LDO provided to the EUT, please refer to the following table:

Original		
No.	Brand	Model
1	STCOMPONENT	ST6205B33FG
Newly		
2	TOPCHIP	TC50B33BDN

8. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Brand	Model No.	Antenna Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
INPAQ	ACM3-3216-P1-CC-S	0.6	2.4~2.4835	Chip Antenna	None
		2	5.15~5.85		

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

2. Antenna Pattern:

Please refer to the attached file (Antenna pattern).

3.3 Channel List

40 channels are provided for BT-LE:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.4 Power Setting

Channel	BT-LE 1M
19	23

3.5 Test Mode Applicability and Tested Channel Detail

Test Conditions	Voltage (Vdc)
V_{normal}	5
$V_{max. (+10\%)}$	5.5
$V_{min. (-10\%)}$	4.5

Pre-Scan:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
Worst Case:	Test condition is presented in the report as above according to original test report.

Following channel(s) was (were) selected for the final test as listed below:

Test Item	Mode	Tested Channel	Modulation	Data Rate Parameter
Spurious Emissions	BT-LE 1M	19	GFSK	1Mb/s
Spurious Emissions of Receiver	BT-LE 1M	19	-	-

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Spurious Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until	Calibration Authority	Calibration Method
DC Power Supply GOOD WILL INSTRUMENT CO. LTD	GPC-3030D	E847076	Note 2	Note 2	BV CPS E&E	(d)
MXA Signal Analyzer Keysight	N9020B	MY60112409	2023/2/18	2024/2/17	ETC	(c)
Software	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A	N/A	N/A
True RMS Clamp Meter FLUKE	325	31130711WS	2023/6/8	2024/6/7	ETC	(c)

Notes:

- Calibration method:
 - Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18 paragraph (1).
 - Calibration conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) Japan Calibration Service System.
 - Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
 - Calibration conducted by using other equipment that listed above from a) to c).
- The power supply no evaluation calibrated, which used the RMS clamp meter to verify before each testing.
- The test was performed in Oven room 2.
- Tested Date: 2024/2/6

4.2 Spurious Emissions of Receiver

Refer to section 4.1 to get information of the instruments.

5 Limits of Test Items

5.1 Spurious Emissions

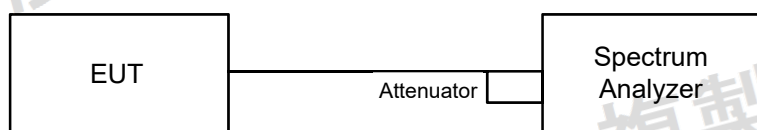
Frequencies	Limit
Operating frequency 2400 to 2483.5 MHz	
30.0 MHz to 1000.0 MHz	$\leq 0.25 \text{ uW}/100 \text{ kHz}$
1000.0 MHz to 2387 MHz	$\leq 2.5 \text{ uW}/\text{MHz}$
2387.0 MHz to 2400.0 MHz	$\leq 25 \text{ uW}/\text{MHz}$
2483.5 MHz to 2496.5 MHz	$\leq 25 \text{ uW}/\text{MHz}$
2496.5 MHz to 12500.0 MHz	$\leq 2.5 \text{ uW}/\text{MHz}$

5.2 Spurious Emissions of Receiver

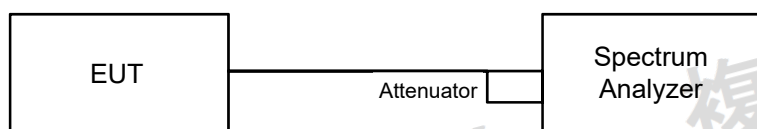
Frequencies	Limit
Below 1 GHz	$\leq 4 \text{ nW}$
Above 1 GHz	$\leq 20 \text{ nW}$

6 Test Arrangements

6.1 Spurious Emissions



6.2 Spurious Emissions of Receiver



7 Test Results of Test Item

7.1 Spurious Emissions

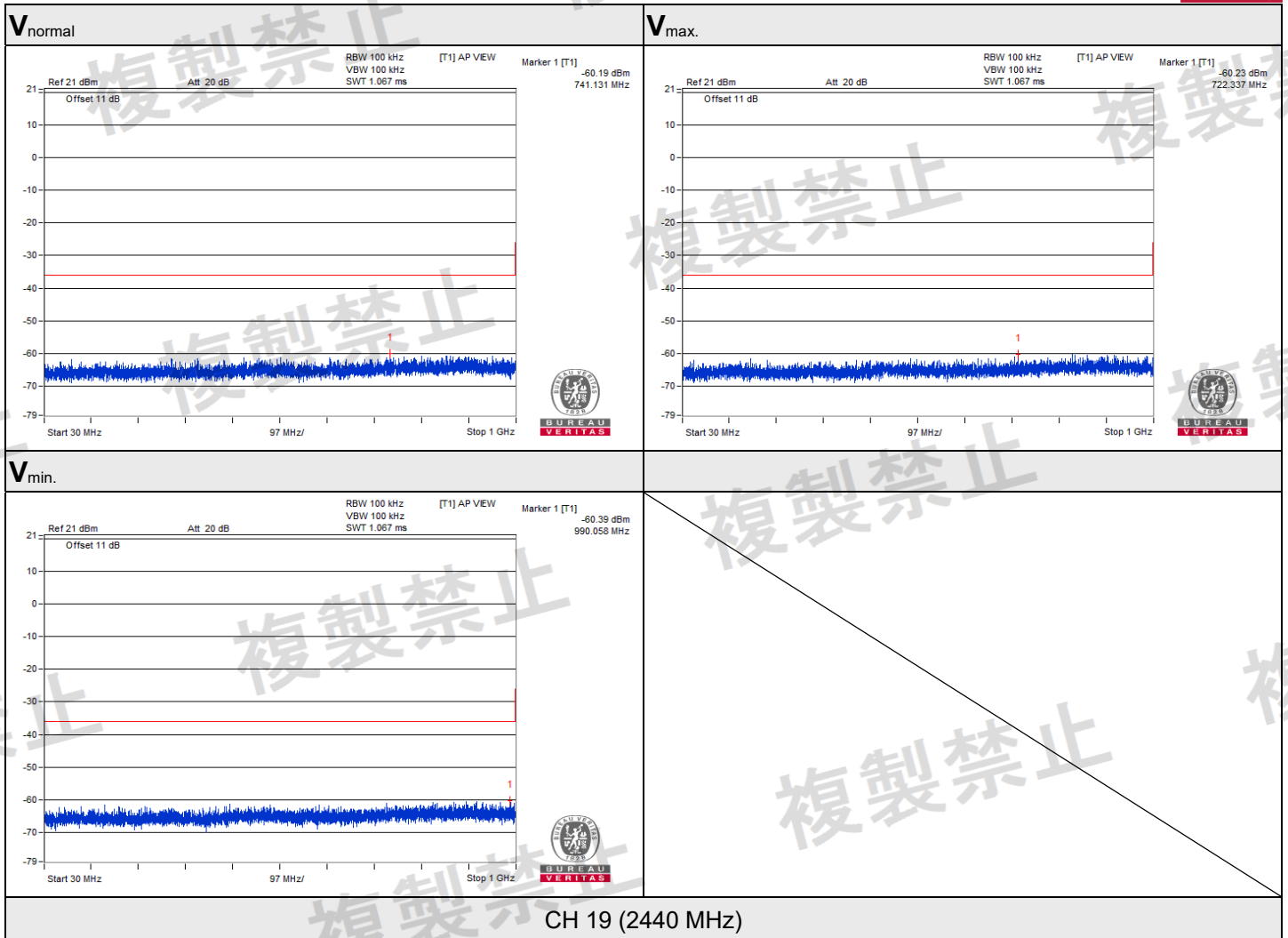
Environmental Conditions:	23°C, 67% RH	Tested By:	Katina Lu
---------------------------	--------------	------------	-----------

TEST CHANNEL		CH 19 (2440 MHz)			
TEST CONDITION	FREQUENCY RANGE(MHz)	FREQUENCY (MHz)	MEASUREMENT VALUE	LIMIT	RESULT
V _{normal}	30.0 to 1000.0	741.131	0.000957 uW/100kHz	0.25 uW/100kHz	PASS
V _{max.}	30.0 to 1000.0	722.337	0.000948 uW/100kHz	0.25 uW/100kHz	PASS
V _{min.}	30.0 to 1000.0	990.058	0.000914 uW/100kHz	0.25 uW/100kHz	PASS

NOTE: 1. The spectrum plots are attached on the following pages.



BUREAU
VERITAS



7.2 Spurious Emissions of Receiver

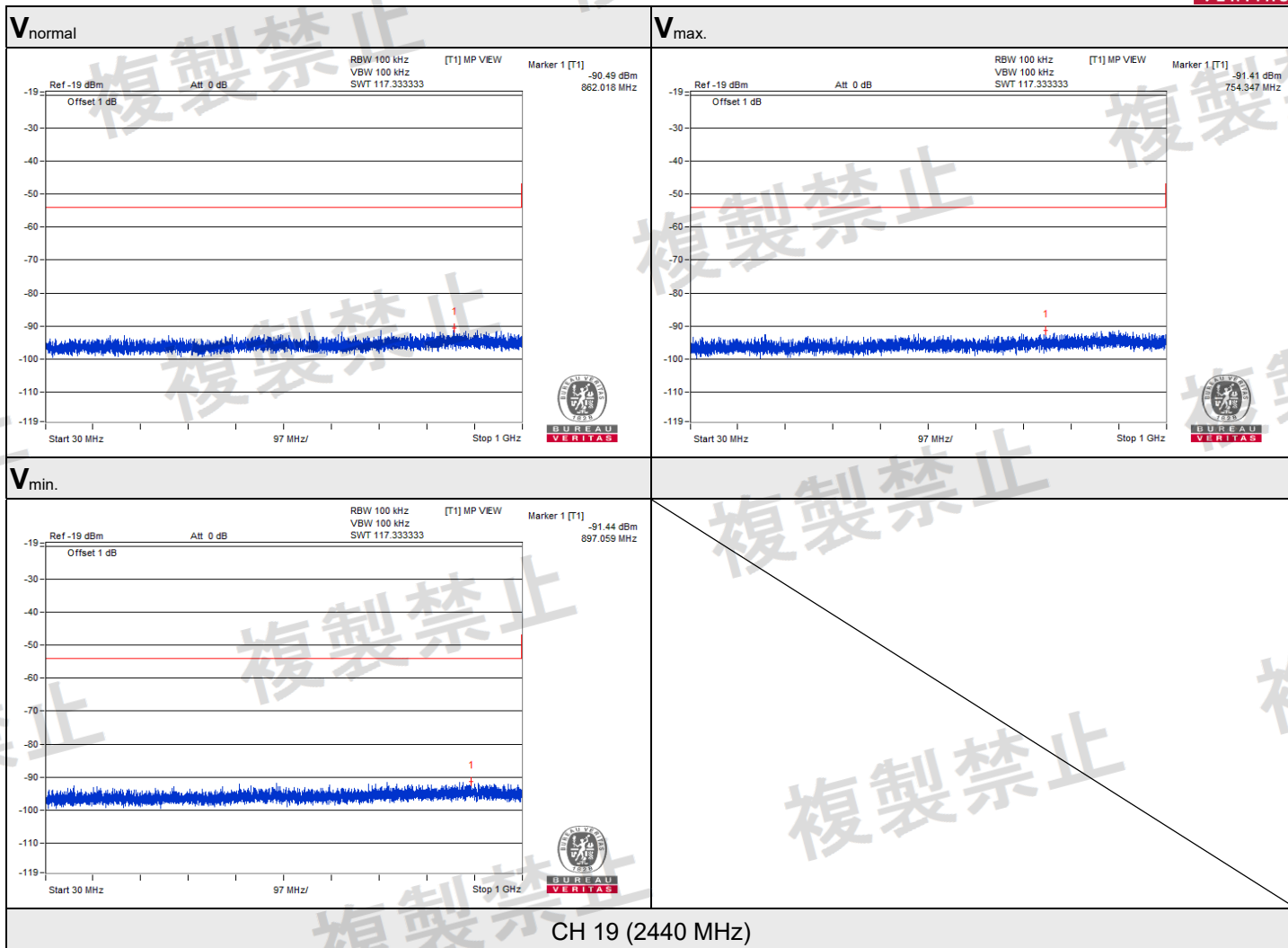
Environmental Conditions:	23°C, 67% RH	Tested By:	Katina Lu
---------------------------	--------------	------------	-----------

TEST CHANNEL		CH 19 (2440 MHz)			
TEST CONDITION	FREQUENCY RANGE(MHz)	FREQUENCY (MHz)	MEASUREMENT VALUE(nW)	LIMIT (nW)	RESULT
V _{normal}	30.0 to 1000.0	862.018	0.000893	4	PASS
V _{max.}	30.0 to 1000.0	754.347	0.000723	4	PASS
V _{min.}	30.0 to 1000.0	897.059	0.000718	4	PASS

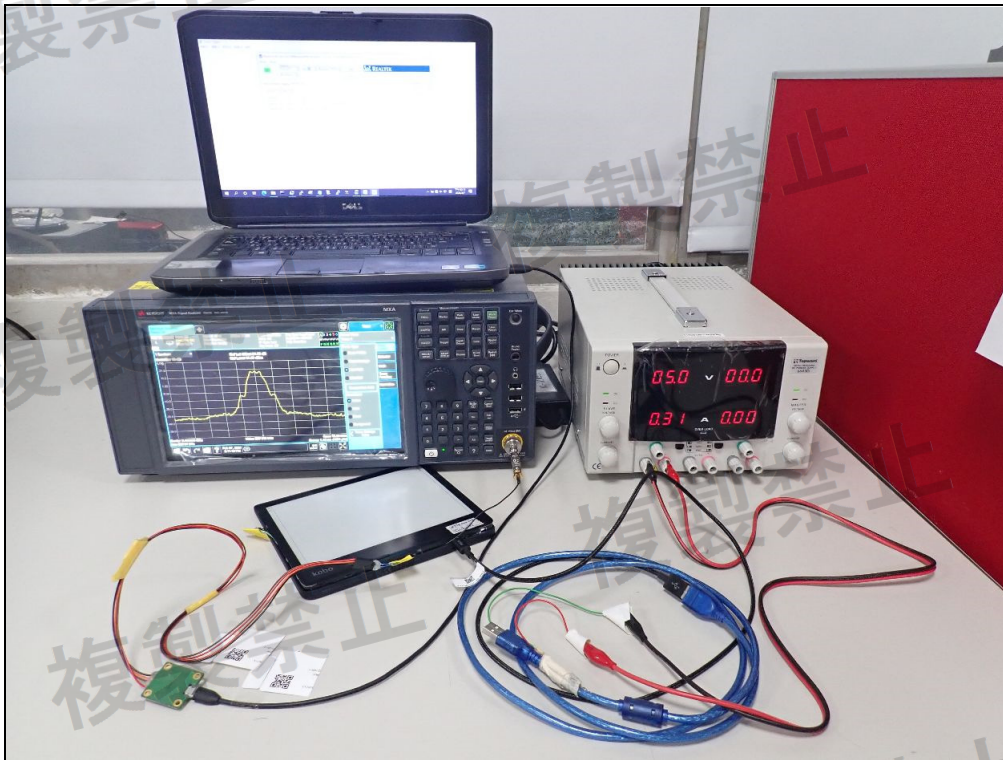
NOTE: 1. The spectrum plots are attached on the following pages.



BUREAU
VERITAS



8 Pictures of Test Arrangements



9 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@bureauveritas.com

Web Site: <http://ee.bureauveritas.com.tw>

The address and road map of all our labs can be found in our web site also.

--- END ---