

Page: 1 of 40

# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**





**Applicant:** CiaoDa Cloud Technology Co., Ltd.

17F.-1, No. 104, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei

City, Taiwan

Manufacturer: CiaoDa Cloud Technology Co., Ltd.

17F.-1, No. 104, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei

City. Taiwan

**Product Name: UHF RFID Reader Module** 

**Brand Name:** CiaoDa

SRF-M810 Model No.:

**Model Difference:** N/A

**Report Number:** TERF2204000410E2

FCC ID: 2A3LY-SRFM810

Date of EUT Received: Apr. 22, 2022

Date of Test: Jun. 09, 2022~Jul. 13, 2022

**Issue Date:** Sep. 12, 2022

Approved By\_HLW HSi

## We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.249.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

নি স্পূৰ্ব প্ৰতিষ্ঠান বিষয়ে বিজেপ্ত বিষয়ে বিজেপ্ত বিষয়ে বিষয় বিষ of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Page: 2 of 40

Revision History							
Report Number	Revision	Description	Issue Date	Revised By	Remark		
TERF2204000410E2	00	Original.	Jul. 25, 2022	Celery Wei			
TERF2204000410E2	01	Updated antenna information	Sep. 12, 2022	Celery Wei	*		

### Note:

1 . The remark "\*" indicates modification of the report upon requests from certification body.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 3 of 40

# **Contents**

1	GENERAL INFORMATION	4
2	SYSTEM TEST CONFIGURATION	6
3	SUMMARY OF TEST RESULTS	. 10
4	DESCRIPTION OF TEST MODES	.11
5	THE WORST TEST MODES AND CHANNEL DETAILS	.12
6	MEASUREMENT UNCERTAINTY	. 13
7	MEASUREMENT EQUIPMENT USED	. 14
8	CONDUCTED EMISSION TEST	. 15
9	RADIATED EMISSION TEST	. 19
10	EMISSION BANDWIDTH	. 35
Q	ANTENNA DECLUDEMENT	40

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

除非另有說明,比報告結果僅對測試之樣品負責,同時此樣品程体留則大。本務告未經本公司書面許可,不可部份複製。
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Taiwan Ltd. <sub>|</sub> No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Page: 4 of 40

## **GENERAL INFORMATION**

#### 1.1 **Product Description**

Product Name:	UHF RFID Reader Module
Brand Name:	CiaoDa
Model No.:	SRF-M810
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	TE-2204000176P
Power Supply:	5Vdc
Test Software (Name/Version)	Stand-Alone RFID Reader Calibrator Software /V1.0.0.0

### 1.2 **RF Specification**

Radio Technology:	UHF RFID Reader Module
Frequency Range:	902 – 928MHz
Channel number:	99 channels
Modulation type:	PR-ASK
Transmit Power:	92.70dBuV/m

## 1.3 Antenna Designation

Antenna	Freq.	Peak Antenna
Type	(MHz)	Gain (dBi)
Patch	902~928	5.24

**Note:** Antenna information is provided by the applicant.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號 t (886-2) 2299-3279 f (886-2) 2298-0488 www.sgs.com.tw



Page: 5 of 40

### 1.4 **Test Methodology of Applied Standards**

FCC Part 15, Subpart C §15.249 ANSI C63.10:2013

### 1.5 **Test Facility**

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
		SAC 1		
		SAC 3		
		Conduction 1		
	No.134, Wu Kung Road, New Taipei	Conducted 1		
	Industrial Park, Wuku District, New	Conducted 2	TW0027	
	Taipei City, Taiwan.	Conducted 3		TW3702
		Conducted 4	_	
		Conducted 5		
SGS Taiwan Ltd.		Conducted 6		
Central RF Lab.	No 2 Kaii 4at Ed. Cuich an Dietriet	Conduction C	]	
(TAF code 3702)		SAC C	_	
(1A1 Code 3702)		SAC D		
		SAC G		
		Conducted A		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conducted B	TW0028	
	ladyuan Gity, Taiwan 333	Conducted C	]	
		Conducted D		
		Conducted E		
		Conducted F	]	
		Conducted G		

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

### 1.6 **Special Accessories**

There are no special accessories used while test was conducted.

### 1.7 **Equipment Modifications**

There was no modification incorporated into the EUT.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 6 of 40

## SYSTEM TEST CONFIGURATION

### 2.1 **EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

#### 2.2 **EUT Exercise**

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

#### 2.3 **Test Procedure**

#### 2.3.1 **Conducted Emissions**

The EUT is a placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

#### 2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

#### 2.3.3 Radiated Emissions

The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max, emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> Attention is drawn to the limitation of liability, indemnielectronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the company and the company is unlocated after the company of the company. The company is unlocated to the full set of the company of the company. of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Page: 7 of 40

### 2.4 **Measurement Results Explanation Example**

### 2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m\*6m\*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

### 2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

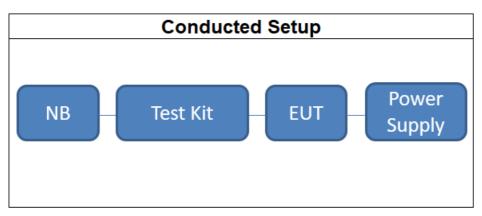
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

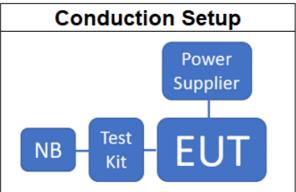
নি স্পূৰ্ব প্ৰতিষ্ঠান বিষয়ে বিজেপ্ত বিষয়ে বিজেপ্ত বিষয়ে বিষয় বিষ of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

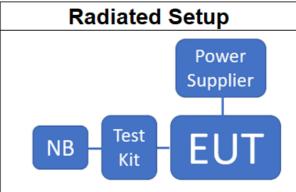


Page: 8 of 40

### 2.5 **Test Configuration**







### 2.6 Control Unit(s)

AC Power-Line Conducted Emission Test Site: Conduction C							
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CA							
Power Cable	One Ping	OP-120C33V- PBAM04D1	N/A	N.C.R	N.C.R		
UART Cable	One Ping	OP-120C33V- PBAM04D1	N/A	N.C.R	N.C.R		
UART Cable	CiaoDa	0W061501040400	N/A	N.C.R	N.C.R		
Notebook	Lenovo	L480	P0002332	N/A	N/A		

Conducted Emission Test Site: Conducted E							
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DU							
Power Cable	One Ping	OP-120C33V-PBAM04D1	N/A	N.C.R	N.C.R		
UART Cable	One Ping	OP-120C33V-PBAM04D1	N/A	N.C.R	N.C.R		
UART Cable	CiaoDa	0W061501040400	N/A	N.C.R	N.C.R		
Notebook	Lenovo	T430	P0000244	N.C.R	N.C.R		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 9 of 40

Radiated Emission Test Site: SAC C							
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.							
Notebook	Lenovo	P0002332	N/A	N/A			
Power Cable	One Ping	N/A	N.C.R	N.C.R			
UART Cable	One Ping	OP-120C33V-PBAM04D1	N/A	N.C.R	N.C.R		
UART Cable	CiaoDa	0W061501040400	N/A	N.C.R	N.C.R		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

除非另有說明,比報告結果僅對測試之樣品負責,同時此報品性保留別大。本報告未經本公司書面評可,不可能份複聚。
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

\*\*CCS\*\* Taiwan 14\*\*\* No 134 Witking Road New Taipel Industrial Park Wilking Dark Wilking



Page: 10 of 40

# 3 SUMMARY OF TEST RESULTS

FCC Rules	FCC Rules Description Of Test			
§15.207(a) AC Power Line Conducted Emission		Compliant		
§15.249(a)(e) §15.249(a), 15.209	Radiated Emission	Compliant		
§15.215(c)	Emission Bandwidth	Compliant		
§15.203	Antenna Requirement	Compliant		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 11 of 40

# 4 DESCRIPTION OF TEST MODES

## 4.1 Operating Frequencies

ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY
1	902.75 MHz	27	909.25 MHz	53	915.75 MHz	79	922.25 MHz
2	903 MHz	28	909.5 MHz	54	916 MHz	80	922.5 MHz
3	903.25 MHz	29	909.75 MHz	55	916.25 MHz	81	922.75 MHz
4	903.5 MHz	30	910 MHz	56	916.5 MHz	82	923 MHz
5	903.75 MHz	31	910.25 MHz	57	916.75 MHz	83	923.25 MHz
6	904 MHz	32	910.5 MHz	58	917 MHz	84	923.5 MHz
7	904.25 MHz	33	910.75 MHz	59	917.25 MHz	85	923.75 MHz
8	904.5 MHz	34	911 MHz	60	917.5 MHz	86	924 MHz
9	904.75 MHz	35	911.25 MHz	71	917.75 MHz	87	924.25 MHz
10	905 MHz	36	911.5 MHz	72	918 MHz	88	924.5 MHz
11	905.25 MHz	37	911.75 MHz	73	918.25 MHz	89	924.75 MHz
12	905.5 MHz	38	912 MHz	74	918.5 MHz	90	925 MHz
13	905.75 MHz	39	912.25 MHz	75	918.75 MHz	91	925.25 MHz
14	906 MHz	40	912.5 MHz	76	919 MHz	92	925.5 MHz
15	906.25 MHz	41	912.75 MHz	77	919.25 MHz	93	925.75 MHz
16	906.5 MHz	42	913 MHz	78	919.5 MHz	94	926 MHz
17	906.75 MHz	43	913.25 MHz	79	919.75 MHz	95	926.25 MHz
18	907 MHz	44	913.5 MHz	70	920 MHz	96	926.5 MHz
19	907.25 MHz	45	913.75 MHz	71	920.25 MHz	97	926.75 MHz
20	907.5 MHz	46	914 MHz	72	920.5 MHz	98	927 MHz
21	907.75 MHz	47	914.25 MHz	73	920.75 MHz	99	927.25 MHz
22	908 MHz	48	914.5 MHz	74	921 MHz		
23	908.25 MHz	49	914.75 MHz	75	921.25 MHz		
24	908.5 MHz	50	915 MHz	76	921.5 MHz		
25	908.75 MHz	51	915.25 MHz	77	921.75 MHz		
26	909 MHz	52	915.5 MHz	78	922 MHz		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 12 of 40

### THE WORST TEST MODES AND CHANNEL DETAILS

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

### RADIATED EMISSION TEST

NADIATED ENGOGON TEOT.							
RADIATED EMISSION TEST (BELOW 1 GHz)							
MODE AVAILABLE TESTED MODULATION FREQUENCY					ANTENNA PORT		
RFID	902.75~927.25	915	PR-ASK	N/A	MAIN		
	RADIATED	<b>EMISSION TES</b>	T (ABOVE 1 GHz	z)			
MODE AVAILABLE TESTED MODULATION RATE (Mbps)							
RFID	902.75~927.25	902.75, 915, 927.25	PR-ASK	N/A	MAIN		

Note: The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

### ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST								
MODE	AVAILABLE FREQUENCY	TESTED FREQUENCY	MODULATION	DATA RATE (Mbps)	ANTENNA PORT			
RFID	902.75~927.25	902.75, 915, 927.25	PR-ASK	N/A	MAIN			

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prospected to the fullest extent of the law of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號 t (886-2) 2299-3279 f (886-2) 2298-0488 www.sgs.com.tw



Page: 13 of 40

## **MEASUREMENT UNCERTAINTY**

Test Items	Uı	ncertaint	: <b>y</b>
AC Power Line Conducted Emission	+/-	2.34	dB
Emission Bandwidth	+/-	1.53	Hz
Undesignable radiated emission measurement	+/-	1.68	dB
Temperature	+/-	0.4	°C
Humidity	+/-	3.5	%
DC / AC Power Source	+/-	1	%

Radiated Spurious Emission Measurement Uncertainty							
	+/-	2.57	dB	9kHz~30MHz			
Polarization: Vertical	+/-	4.85	dB	30MHz - 1000MHz			
Polarization, vertical	+/-	4.45	dB	1GHz - 18GHz			
	+/-	4.24	dB	18GHz - 40GHz			
	+/-	2.57	dB	9kHz~30MHz			
Polarization: Horizontal	+/-	4.37	dB	30MHz - 1000MHz			
Folarization: Horizontal	+/-	4.45	dB	1GHz - 18GHz			
	+/-	4.24	dB	18GHz - 40GHz			

### Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 14 of 40

## **MEASUREMENT EQUIPMENT USED**

### 7.1 **Emission from AC power line**

·								
AC Power-Line Conducted Emission Test Site: Conduction C								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.			
LISN	SCHWARZBECK Mess- Elektronik	NSLK8127	973	04/13/2022	04/12/2023			
EMI Test Receiver	R&S	ESCI	101342	04/25/2022	04/24/2023			
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2022	03/26/2023			
Coaxial Cable	EMC Instruments Corp	EMC5D-BM-BM-3000	1401004	03/27/2022	03/26/2023			
DC Power Supply	Agilent	E3640A	MY53130054	09/30/2021	09/29/2022			
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2022	03/26/2023			
Test Software	audix	e3	E3 20923 SGS Ver.9 ( C )	N.C.R	N.C.R			

#### 7.2 **Conducted Measurement**

Conducted Emission Test Site: Conducted E								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.			
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	07/07/2022	07/06/2023			
DC Power Supply	Gwinstek	SPS-3610	GEV856769	08/04/2021	08/03/2022			
Test Software	SGS Taiwan	EMI Tool Function Alpha	Ver.1.0	N.C.R	N.C.R			
Temperature Chamber	TERCHY	MHK-120LK	1020582	06/21/2022	06/20/2023			
Attenuator	Marvelous	MVE2213-10	RF06	11/18/2021	11/17/2022			
DC Block	PASTERNACK	PE8210	RF158	11/18/2021	11/17/2022			

#### 7.3 **Radiated Measurement**

Radiated Emission Test Site: SAC C								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.			
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-300	10/19/2021	10/18/2022			
Horn Antenna	SCHWARZBECK	BBHA9120D	1187	01/06/2022	01/05/2023			
Loop Antenna	ETS.LINDGREN	6502	148045	09/29/2021	09/28/2022			
EMI Test Receiver	R&S	ESU 40	100363	04/28/2022	04/27/2023			
Pre-Amplifier	EMC Instruments	EMC330	980096	11/18/2021	11/17/2022			
Pre-Amplifier	EMC Instruments	EMC0011830	980199	11/18/2021	11/17/2022			
DC Power Supply	Agilent	E3640A	MY53140006	05/16/2022	05/15/2023			
Attenuator	Marvelous	WATT-218FS-10	RF20	11/18/2021	11/17/2022			
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	11/18/2021	11/17/2022			
Coaxial Cable	Huber Suhner	RG 214/U	W22.03	11/18/2021	11/17/2022			
Test Software	audix	e3	20923 sgs Ver.9	N.C.R	N.C.R			

### NOTE: N.C.R refers to Not Calibrated Required.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 15 of 40

## **CONDUCTED EMISSION TEST**

### **Applicable Standard:** 8.1

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range		mits BuV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

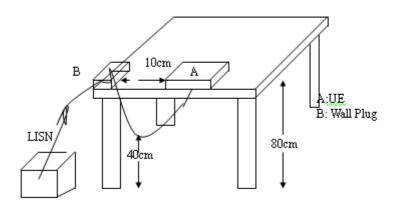
### Note

- 1. The lower limit shall apply at the transition frequencies
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

#### 8.2 **EUT Setup:**

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

### 8.3 **Test Setup**



#### 8.4 **Measurement Procedure:**

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for This document is issued by the Company subject to Its General Conditions or Service printed overliear, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



Page: 16 of 40

### 8.5 Measurement Result:

Note: Refer to next page for measurement data and plots.

Note2: The \* reveals the worst-case results that closet to the limit.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

n Ltd. No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279 f (886-2) 2298-0488



Page: 17 of 40

## AC POWER LINE CONDUCTED EMISSION TEST DATA

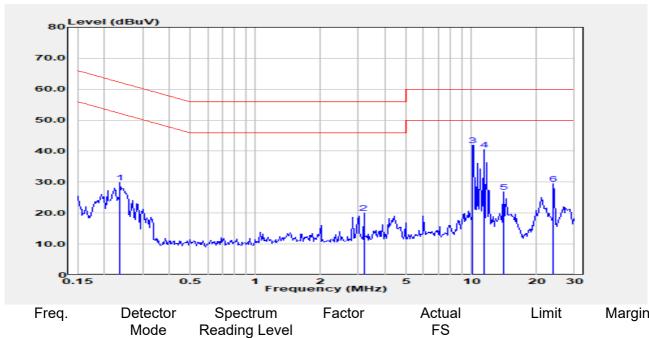
Report Number :TERF2204000410E2 :Conduction C Test Site

Test Mode :900M **Test Date** :2022-06-09

Power :120V/60Hz Temp./Humi. :24.2/65

Probe :L1 Engineer :Andy Wang

Note:



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dΒμV	dB	dΒμV	dΒμV	dB
0.237	Peak	19.59	10.28	29.86	62.22	-32.35
3.173	Peak	9.14	10.85	19.99	56.00	-36.01
10.179	Peak	31.26	10.67	41.92	60.00	-18.08
11.438	Peak	29.82	10.70	40.53	60.00	-19.47
14.138	Peak	16.08	10.76	26.84	60.00	-33.16
24.015	Peak	18.50	10.98	29.48	60.00	-30.52

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

\*\*SCST STANSACK\*\*\* THIS SCL. TRANSACK\*\*\* THIS SCL. TRANSACK\*\*\* THIS SCL. TRANSACK\*\*\* THIS SCL. TRANSACK\*\*\* THIS SCL. TRANSACK\*\*\*

\*\*THIS SCL. TRANSACK\*\*\*

\*\*THIS SCL. TRANSACK\*\*\*

\*\*THIS SCL. TRANSACK\*\*

\*



Page: 18 of 40

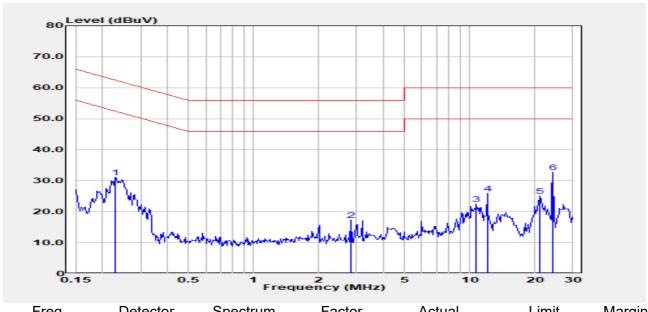
Report Number :TERF2204000410E2 **Test Site** :Conduction C

Test Mode :900M **Test Date** :2022-06-09

Power :120V/60Hz Temp./Humi. :24.2/65

Probe :N Engineer :Andy Wang

Note:



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dΒμV	dB	dΒμV	dΒμV	dB
0.229	Peak	20.81	10.27	31.08	62.48	-31.40
2.824	Peak	6.31	10.89	17.20	56.00	-38.80
10.733	Peak	11.82	10.63	22.46	60.00	-37.54
12.060	Peak	15.18	10.67	25.86	60.00	-34.14
21.147	Peak	14.25	10.88	25.13	60.00	-34.87
24.271	Peak	21.75	10.97	32.73	60.00	-27.27

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 19 of 40

### RADIATED EMISSION TEST

### 9.1 **Applicable Standard**

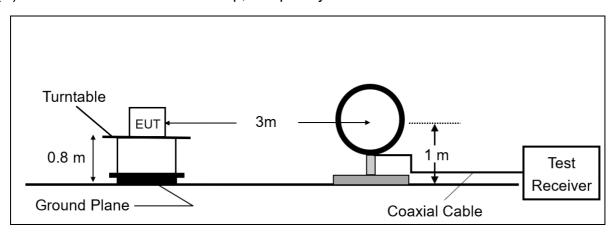
- 1. Only spurious emissions are permitted in any of the frequency bands listed in §15.205.
- 2. The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.
- 3. Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in §15.209, whichever is less stringent.

#### 9.2 **Measurement Procedure**

- The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compli-
- 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measured were complete.

### 9.3 **Test Setup**

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

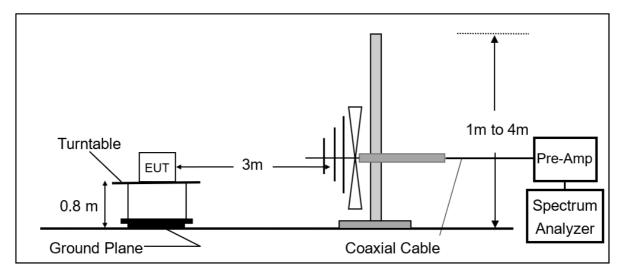
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> Attention is drawn to the limitation of liability, indemni-This document is issued by the Company subject to Its General Conditions or Service printed overliear, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號 t (886-2) 2299-3279 f (886-2) 2298-0488 www.sgs.com.tw

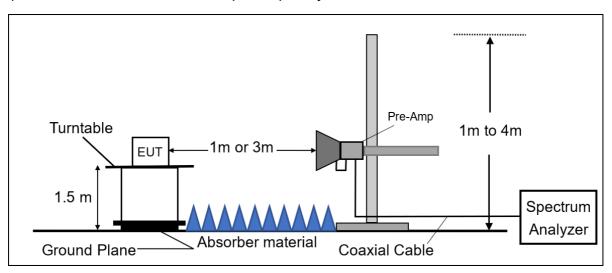


Page: 20 of 40

## (B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



## (C) Radiated Emission Test Set-Up, Frequency Above 1GHz.



#### 9.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	<u> </u>	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB) Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre Amplifier Gain(dB)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> Attention is drawn to the limitation of liability, indemni-This document is issued by the Company subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號 t (886-2) 2299-3279

台灣檢驗科技股份有限公司

f (886-2) 2298-0488



Page: 21 of 40

## 9.5 Measurement Result

Field Strength of the Fundamental Signal

Report Number :TERF2204000410E2 Test Site :SAC C

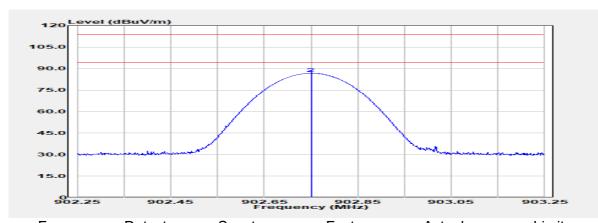
Operation Mode :RFID Test Date :2022-07-12

Test Frequency :902.75 MHz Temp./Humi. :21.8/62

Test Mode : Main Antenna Pol. : Vertical

EUT Pol :H Plane Engineer :Andy Wang

Ant :1037D10A021213 Note :



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
 MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
902.750	Average	84.33	0.83	85.16	94.00	-8.84
902.750	Peak	85.92	0.83	86.75	114.00	-27.25

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 22 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

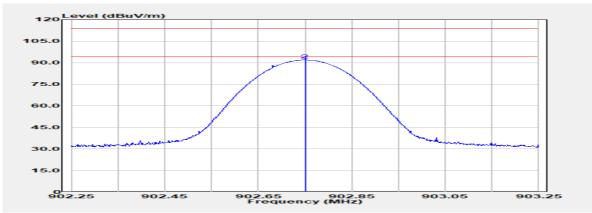
Operation Mode :RFID Test Date :2022-07-12

Test Frequency: 902.75 MHz Temp./Humi. :21.8/62

Test Mode :Main Antenna Pol. :Horizontal

**EUT Pol** :H Plane Engineer :Andy Wang

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
902.750	Average	89.97	0.83	90.80	94.00	-3.20
902.750	Peak	91.10	0.83	91.93	114.00	-22.07

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 23 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

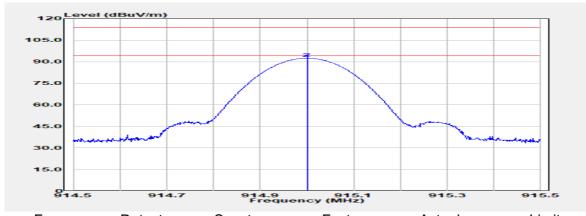
Operation Mode :RFID Test Date :2022-07-12

Test Frequency :915 MHz Temp./Humi. :23.5/61

Test Mode Antenna Pol. :Vertical :Main

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
915.000	Average	90.87	0.69	91.56	94.00	-2.44
915.000	Peak	91.75	0.69	92.44	114.00	-21.56

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 24 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

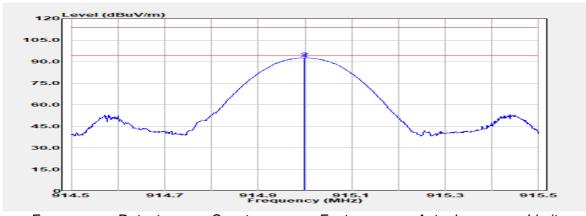
Operation Mode :RFID Test Date :2022-07-12

Test Frequency :915 MHz Temp./Humi. :23.5/61

Test Mode :Main Antenna Pol. :Horizontal

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
914.998	Average	91.25	0.69	91.94	94.00	-2.06
914.998	Peak	92.01	0.69	92.70	114.00	-21.30

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



:Main

:H Plane

:1037D10A021213

Test Mode

**EUT Pol** 

Ant

Report No.: TERF2204000410E2

Page: 25 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

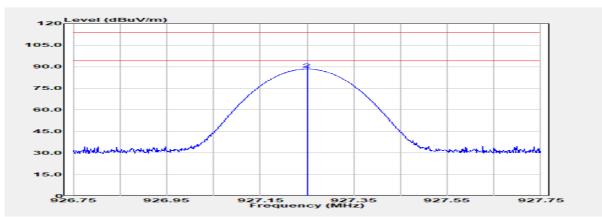
Operation Mode :RFID Test Date :2022-07-12

Test Frequency: 927.25 MHz Temp./Humi. :21.8/62

Antenna Pol. :Vertical

:Andy Wang Engineer

Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
927.250	Average	86.22	0.88	87.10	94.00	-6.90
927.250	Peak	87.49	0.88	88.37	114.00	-25.63

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 26 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

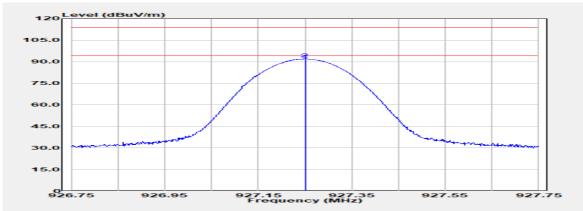
Operation Mode :RFID Test Date :2022-07-12

Test Frequency: 927.25 MHz Temp./Humi. :21.8/62

Test Mode :Main Antenna Pol. :Horizontal

**EUT Pol** :H Plane Engineer :Andy Wang

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
927.250	Average	90.31	0.88	91.19	94.00	-2.81
927.250	Peak	91.04	0.88	91.91	114.00	-22.09

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 27 of 40

### 9.5.1 Restricted bands around fundamental frequency

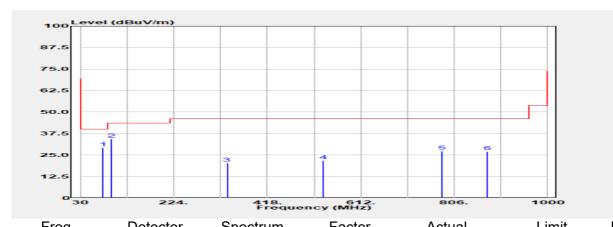
Report Number :TERF2204000410E2 Test Site :SAC C

Operation Mode :RFID :2022-07-08 Test Date

Test Frequency: 915 MHz Temp./Humi. :24.1/58 Test Mode :TX Antenna Pol. :Vertical

**EUT Pol** :H Plane :Andy Wang Engineer

:1037D10A021213 Ant Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
76.635	Peak	47.82	-18.51	29.31	40.00	-10.69
95.288	Peak	54.01	-19.77	34.24	43.50	-9.26
334.680	Peak	32.23	-11.91	20.32	46.00	-25.68
535.208	Peak	27.61	-5.92	21.69	46.00	-24.31
780.817	Peak	28.07	-0.66	27.40	46.00	-18.60
874.087	Peak	26.02	1.02	27.04	46.00	-18.96

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 28 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

Operation Mode :RFID Test Date :2022-07-08

Test Frequency :915 MHz Temp./Humi. :24.1/58

Test Mode :TX Antenna Pol. :Horizontal

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
95.288	Peak	51.50	-19.77	31.73	43.50	-11.77
163.686	Peak	46.74	-14.28	32.46	43.50	-11.04
334.680	Peak	46.35	-11.91	34.44	46.00	-11.56
452.821	Peak	36.76	-7.95	28.81	46.00	-17.19
538.317	Peak	35.77	-5.90	29.87	46.00	-16.13
746.619	Peak	32.75	-1.19	31.57	46.00	-14.43

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Test Mode

Report No.: TERF2204000410E2

Page: 29 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

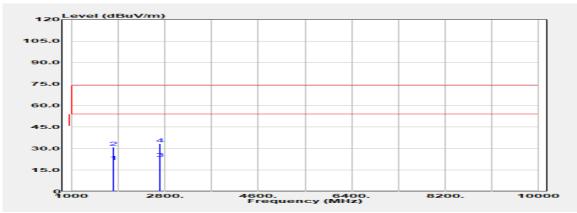
Operation Mode :RFID Test Date :2022-07-12

Test Frequency: 902.75 MHz Temp./Humi. :21.8/62

> :Tx Antenna Pol. :Vertical

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
1805.500	Average	21.07	0.03	21.10	54.00	-32.90
1805.500	Peak	31.04	0.03	31.08	74.00	-42.92
2705.250	Average	19.73	3.41	23.14	54.00	-30.86
2705.250	Peak	29.87	3.41	33.28	74.00	-40.72

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 30 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

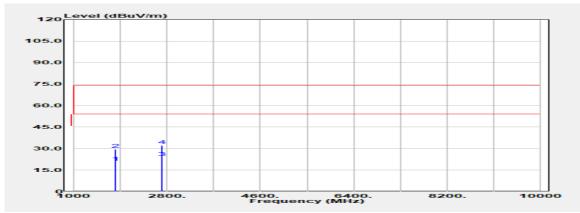
Operation Mode :RFID Test Date :2022-07-12

Test Frequency: 902.75 MHz Temp./Humi. :21.8/62

:Tx Test Mode Antenna Pol. :Horizontal

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
1805.500	Average	20.52	0.03	20.55	54.00	-33.45
1805.500	Peak	29.34	0.03	29.37	74.00	-44.63
2705.250	Average	20.36	3.41	23.77	54.00	-30.23
2705.250	Peak	28.75	3.41	32.16	74.00	-41.84

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 31 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

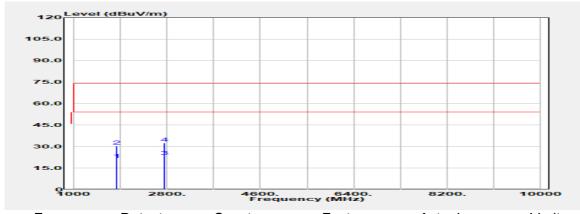
Operation Mode :RFID Test Date :2022-07-12

Test Frequency :915 MHz Temp./Humi. :21.8/62

:Tx Antenna Pol. :Vertical Test Mode

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
1830.000	Average	20.84	0.10	20.94	54.00	-33.06
1830.000	Peak	30.17	0.10	30.27	74.00	-43.73
2745.000	Average	20.07	3.23	23.30	54.00	-30.70
2745.000	Peak	29.30	3.23	32.53	74.00	-41.47

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 32 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

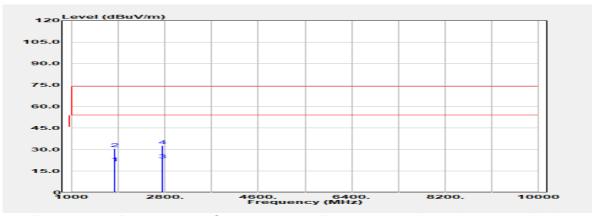
Operation Mode :RFID Test Date :2022-07-12

Test Frequency :915 MHz Temp./Humi. :21.8/62

:Tx Test Mode Antenna Pol. :Horizontal

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
1830.000	Average	20.77	0.10	20.87	54.00	-33.13
1830.000	Peak	30.71	0.10	30.81	74.00	-43.19
2745.000	Average	19.69	3.23	22.92	54.00	-31.08
2745.000	Peak	29.55	3.23	32.78	74.00	-41.22

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 33 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

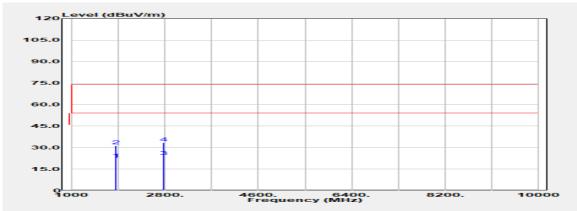
Operation Mode :RFID Test Date :2022-07-12

Test Frequency: 927.25 MHz Temp./Humi. :21.8/62

:Tx Test Mode Antenna Pol. :Vertical

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
						_
1854.500	Average	21.76	0.20	21.96	54.00	-32.04
1854.500	Peak	30.96	0.20	31.17	74.00	-42.83
2781.750	Average	19.99	3.67	23.66	54.00	-30.34
2781.750	Peak	29.74	3.67	33.40	74.00	-40.60

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 34 of 40

Report Number :TERF2204000410E2 Test Site :SAC C

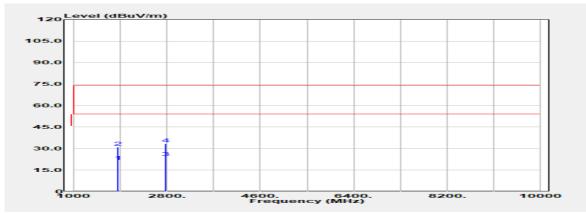
Operation Mode :RFID Test Date :2022-07-12

Test Frequency: 927.25 MHz Temp./Humi. :21.8/62

:Tx Test Mode Antenna Pol. :Horizontal

**EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
1854.500	Average	20.71	0.20	20.91	54.00	-33.09
1854.500	Peak	30.85	0.20	31.05	74.00	-42.95
2781.750	Average	20.13	3.67	23.80	54.00	-30.20
2781.750	Peak	29.68	3.67	33.35	74.00	-40.65

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Page: 35 of 40

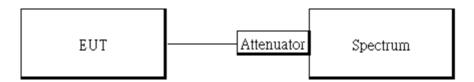
### 10 EMISSION BANDWIDTH

### 10.1 **Applicable Standard**

§2.1049 (h) & 15.215(c)

Intentional radiators operating under the alternative provisions to the general emis-(c) sion 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. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

### 10.1 **Test Setup**



#### 10.2 **Measurement Procedure**

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as

RBW=1% of the approximate emission bandwidth,

VBW = 3 times RBW.

Span= 2 to 5 times of the OBW.

Sweep=auto

Detector = Peak, and Max hold

Turn on the -20 dB Bandwidth function, max reading.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> Attention is drawn to the limitation of liability, indemnielectronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the company and the company is unlocated after the company of the company. The company is unlocated to the full set of the company of the company. of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Page: 36 of 40

#### 10.3 **Measurement Results:**

### Main

Frequency (MHz)	20dB BW (MHz)
902.75	0.2532
915	0.2526
927.25	0.2527

### Aux

Frequency (MHz)	20dB
	BW
	(MHz)
902.75	0.253
915	0.2528
927.25	0.2532

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

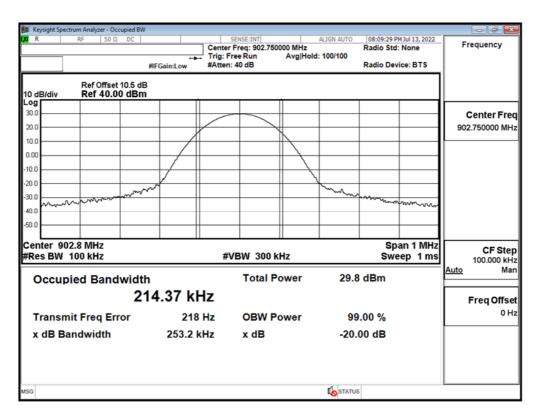
除非另有說明,比報告結果僅對測試之樣品負責,同時此樣品程体留則大。本務告未經本公司書面許可,不可部份複製。
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



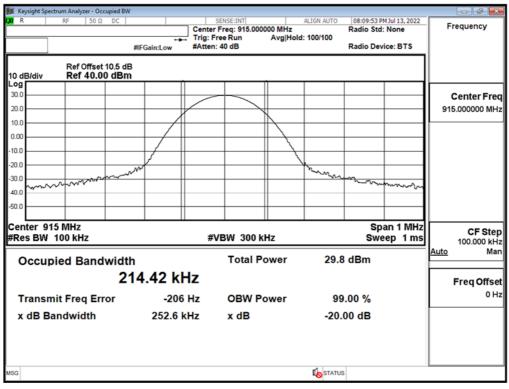
Page: 37 of 40

### Main

## **CH Low**



## **CH Mid**



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

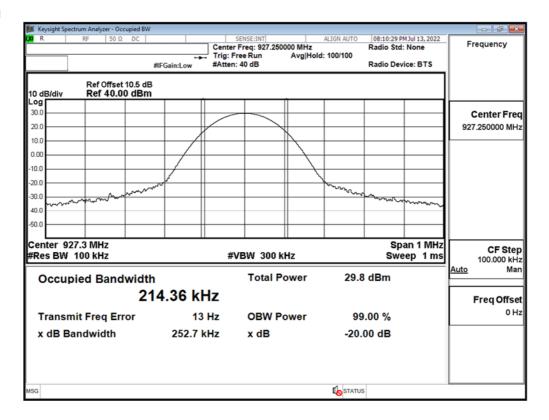
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

\*\*SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM ASSAME



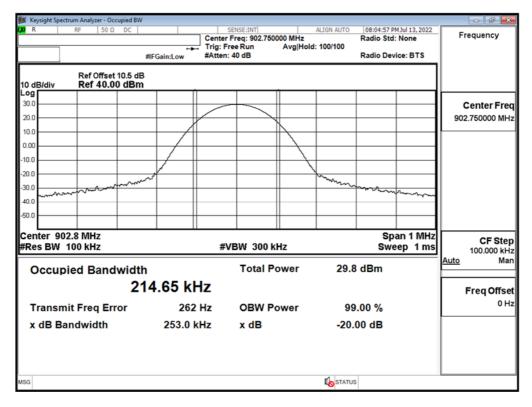
Page: 38 of 40

# **CH High**



## **Aux**

### **CH Low**



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

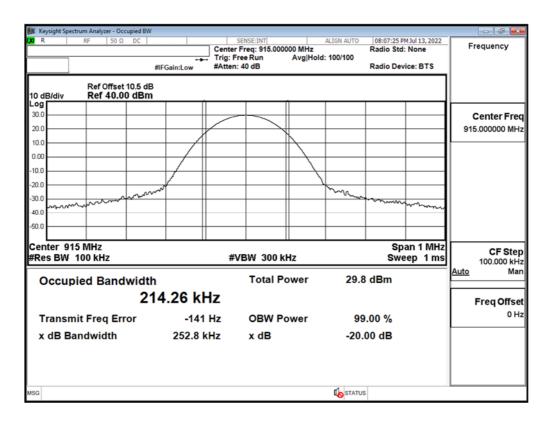
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

\*\*SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM ASSAME

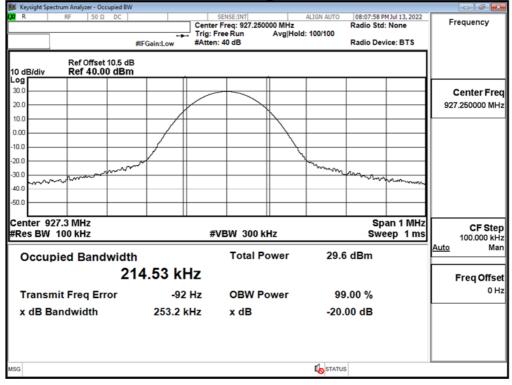


Page: 39 of 40

### **CH Mid**



# **CH High**



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

\*\*SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM AND ASSAME TO A STATE OF THE SCENTIAL PROBLEM ASSAME

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-2) 2298-0488



Page: 40 of 40

## **ANTENNA REQUIREMENT**

## 8.1 Standard Applicable:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 8.2 Antenna Connected Construction:

The antenna complies with this requirement and no consideration of replacement. Please see EUT photo for details.

~ End of Report ~

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a> at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://w electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com.tw/Terms-and-Conditions">http://www.sgs.com.tw/Terms-and-Conditions</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the company and the company is unlocated after the company of the company. The company is unlocated to the full set of the company of the company. of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.