



Report No.: FG1N2210F

# FCC RADIO TEST REPORT

FCC ID : PU5-TP00132B

Equipment : Notebook Computer

Brand Name : Lenovo Model Name : TP00132B

Applicant : Wistron Corporation

21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih

Dist, New Taipei City 221, Taiwan

Manufacturer : Lenovo PC HK Limited.

23/F, Lincoln House, Taikoo Place, 979 King's

Road, Quarry Bay, Hong Kong, China

Standard : FCC 47 CFR Part 2, 90(R)

Equipment: Fibocom FM350-GL tested inside of Lenovo Notebook Computer.

The product was received on Jan. 28, 2022 and testing was performed from Feb. 25, 2022 and completed on Mar. 24, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

Approved by: Louis Wu

Lunis Win

Sporton International Inc. Wensan Laboratory

 TEL: 0800-800005
 Page Number: 1 of 17

 FAX: 886-3-327-0855
 Issued Date: Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version: 02

### **Table of Contents**

His	story o	of this test report	3
Su	mmar	y of Test Result	4
1	Gene	eral Description	5
	1.1	Product Feature of Equipment Under Test	5
	1.2	Product Specification of Equipment Under Test	6
	1.3	Modification of EUT	6
	1.4	Testing Site	6
	1.5	Applied Standards	7
2	Test	Configuration of Equipment Under Test	8
	2.1	Test Mode	8
	2.2	Connection Diagram of Test System	8
	2.3	Support Unit used in test configuration and system	9
	2.4	Frequency List of Low/Middle/High Channels	9
3	Cond	ducted Test Items	10
	3.1	Measuring Instruments	10
	3.2	Conducted Output Power Measurement and ERP	11
4	Radi	ated Test Items	12
	4.1	Measuring Instruments	12
	4.2	Radiated Spurious Emission	14
5	List	of Measuring Equipment	15
6	Unce	ertainty of Evaluation	17
Аp	pendi	x A. Test Results of Conducted Test	
Аp	pendi	x B. Test Results of Radiated Test	
Дp	pendi	x C. Test Setup Photographs	

TEL: 0800-800005 FAX: 886-3-327-0855 E-mail: Alex@sporton.com.tw

Report Template No.: BU5-FGLTE90R Version 2.4

Page Number Issued Date : 2 of 17 : Apr. 13, 2022

Report Version

: 02

Report No.: FG1N2210F

# History of this test report

Report No.: FG1N2210F

Report No.	Version	Description	Issued Date
FG1N2210F	01	Initial issue of report	Apr. 01, 2022
FG1N2210F	02	Revise Product Feature	Apr. 13, 2022

 TEL: 0800-800005
 Page Number
 : 3 of 17

 FAX: 886-3-327-0855
 Issued Date
 : Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version
 : 02

### **Summary of Test Result**

Report No.: FG1N2210F

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2.2	§2.1046	Conducted Output Power	Reporting only	-
3.2	§90.542 (a)(7)	Effective Radiated Power	Pass	-
-	-	Peak-to-Average Ratio	-	See Note
-	§2.1049	Occupied Bandwidth	-	See Note
-	§2.1053 §90.543 (e)(2)	Conducted Band Edge Measurement	-	See Note
-	§2.1051 §90.210 (n)	Emission Mask	-	See Note
-	§2.1053 §90.543 (e)(3)	Conducted Spurious Emission	-	See Note
-	§2.1055 §90.539 (e)	Frequency Stability Temperature & Voltage	-	See Note
4.2	§2.1053 §90.543 (e)(3) §90.543 (f)	Radiated Spurious Emission	Pass	Under limit 7.93 dB at 1577.000 MHz

#### Note:

- The certified module (model: FM350-GL) which supports normal mode and TX switching mode being
  integrated into a notebook computer. Spot check on both modes were performed and no degradation
  occur. Thus the module test results were leveraged in this report and additionally reporting the spot
  check results in this report.
- In normal mode, Conducted power was verified to be consistent with the original modular approval, so
  the output power level in the original modular grant is referenced in this report for determining ERP of
  this host product, and verified the TX switching mode of Radiated Spurious Emission and Conducted
  power.

#### **Declaration of Conformity:**

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
   It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
- The measurement uncertainty please refer to this report "Uncertainty of Evaluation".

#### Comments and Explanations:

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sheng Kuo Report Producer: Clio Lo

TEL: 0800-800005 Page Number : 4 of 17
FAX: 886-3-327-0855 Issued Date : Apr. 13, 2022

E-mail : Alex@sporton.com.tw Report Version : 02



# 1 General Description

### 1.1 Product Feature of Equipment Under Test

Product Feature						
Equipment	Notebook Computer					
Brand Name	Lenovo					
Model Name	TP00132B					
FCC ID	PU5-TP00132B					
Sample 1	EUT with AVX/ Ethertronics Antenna					
Sample 2	EUT with LUXSHARE-ICT Antenna					
EUT supports Radios application	WCDMA/HSPA/LTE/5G NR/GNSS					
EUT Stage	Production Unit					

Report No.: FG1N2210F

#### Remark:

- 1. The above EUT's information was declared by manufacturer.
- 2. Equipment: Fibocom FM350-GL tested inside of Lenovo Notebook Computer.

	Normal mode	TX switching mode
	TX/RX	TX/RX
	WCDMA: 2/4/5	WCDMA: 5
Ant_0 (Main)	LTE: 2/4/5/7/12/13/14/17/25/26/30/38/66/71	LTE: 5/12/13/14/17/26/41/48/71
	NR: 2/5/7/25/30/38/66/71	NR : 5/41/71/77/78
	  LTE : 41/48	WCDMA : 2/4
Ant_2 (MIMO2)	NR : 41/77/78	LTE: 2/4/7/25/30/38/66
	NR . 41/17/10	NR: 2/7/25/30/38/66

WWAN Antenna Information							
	Manufacturer	AVX/ Ethertronics	Peak gain (dBi)	1.12			
Main Antenna	Part number	SA31F29287AA	Туре	PIFA			
Main Antenna	Manufacturer	LUXSHARE-ICT	Peak gain (dBi)	-0.70			
	Part number	SA31F29290AA	Туре	PIFA			

**Remark:** The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

TEL: 0800-800005 Page Number : 5 of 17
FAX: 886-3-327-0855 Issued Date : Apr. 13, 2022

E-mail : Alex@sporton.com.tw Report Version : 02
Report Template No.: BU5-FGLTE90R Version 2.4

### 1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard					
Tx Frequency	790.5 MHz ~ 795.5 MHz				
Rx Frequency	760.5 MHz ~ 765.5 MHz				
Bandwidth	5MHz / 10MHz				
Maximum Output Power to Antenna	23.72 dBm				
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM				

Report No.: FG1N2210F

### 1.3 Modification of EUT

No modifications are made to the EUT during all test items.

### 1.4 Testing Site

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory				
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333				
Test Site No.	Sporton Site No.				
rest site No.	TH03-HY (TAF Code: 1190)				
Test Engineer	Nina Cheng				
Temperature (°C)	22~25				
Relative Humidity (%)	52~54				
Remark	The Conducted test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory.				

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010
Test Site No.	Sporton Site No.
Test Site No.	03CH12-HY
Test Engineer	Jack Cheng, Lance Chiang and Chuan Chu
Temperature (°C)	21.6~26.2
Relative Humidity (%)	56~68

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW3786

TEL: 0800-800005 Page Number : 6 of 17
FAX: 886-3-327-0855 Issued Date : Apr. 13, 2022

E-mail : Alex@sporton.com.tw Report Version : 02
Report Template No.: BU5-FGLTE90R Version 2.4

### 1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

Report No.: FG1N2210F

- ANSI C63.26-2015
- FCC 47 CFR Part 2, Part 90(R)
- ANSI / TIA-603-E
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- FCC KDB 414788 D01 Radiated Test Site v01r01

#### Remark:

- 1. All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.

 TEL: 0800-800005
 Page Number : 7 of 17

 FAX: 886-3-327-0855
 Issued Date : Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version : 02



# 2 Test Configuration of Equipment Under Test

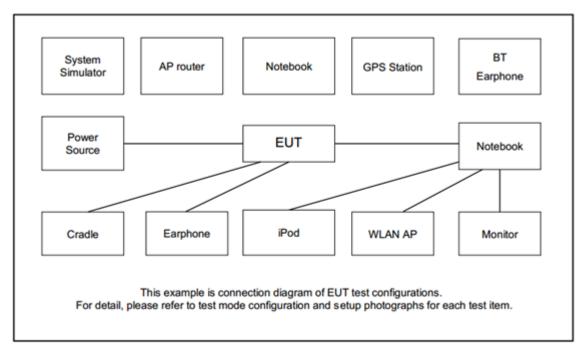
### 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Report No.: FG1N2210F

Conducted	Dand		Ва	ndwic	lth (Mł	Hz)		Modulation				RB#			Test Channel		
Test Cases	Band	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	Н
Max. Output Power	14	,	-	٧	v	-	-	v	v	v		V	٧	V	V	V	v
E.R.P	14	,	-	v	v	-	-	v	v	v				Max.	Powe	r	
Radiated																	
Spurious	14	-	-	V	V	-	-	V				V			V	V	V
Emission																	
	1. Th	ne mar	k " <b>v</b> " ı	neans	that th	is con	figurati	on is cho	sen for te	sting							
	2. Tł	2. The mark "-" means that this bandwidth is not supported.															
	3. Th	The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test															
	ur	under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions															
Remark	ar	are reported.															
	4. Fo	or mod	ulation	of 256	SQAM,	the m	aximuı	n power	of 256QA	M is lowe	r than oth	er mo	odulat	ion			
								•			tion, we c				ver		
	,				,.		-	•	how in th	Ū	,				-		
	,				,					•	C3A) and	Sam	ple 1.				

## 2.2 Connection Diagram of Test System



 TEL: 0800-800005
 Page Number: 8 of 17

 FAX: 886-3-327-0855
 Issued Date: Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version: 02

# 2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
2.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A

Report No.: FG1N2210F

# 2.4 Frequency List of Low/Middle/High Channels

LTE Band 14 Channel and Frequency List									
BW [MHz] Channel/Frequency(MHz) Lowest Middle Highest									
10	Channel	-	23330	-					
10	Frequency	-	793	-					
E	Channel	23305	23330	23355					
5	Frequency	790.5	793	795.5					

 TEL: 0800-800005
 Page Number
 : 9 of 17

 FAX: 886-3-327-0855
 Issued Date
 : Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version
 : 02

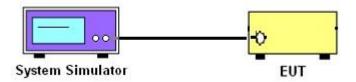
### 3 Conducted Test Items

### 3.1 Measuring Instruments

See list of measuring instruments of this test report.

### 3.1.1 Test Setup

### 3.1.2 Conducted Output Power



Report No.: FG1N2210F

#### 3.1.3 Test Result of Conducted Test

Please refer to Appendix A.

 TEL: 0800-800005
 Page Number
 : 10 of 17

 FAX: 886-3-327-0855
 Issued Date
 : Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version
 : 02

### 3.2 Conducted Output Power Measurement and ERP

# 3.2.1 Description of the Conducted Output Power Measurement and ERP Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

Report No.: FG1N2210F

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 14.

According to KDB 412172 D01 Power Approach,

 $EIRP = P_T + G_T - L_C$ , ERP = EIRP - 2.15, where

 $P_T$  = transmitter output power in dBm

 $G_T$  = gain of the transmitting antenna in dBi

L<sub>C</sub> = signal attenuation in the connecting cable between the transmitter and antenna in dB

#### 3.2.2 Test Procedures

- 1. The transmitter output port was connected to base station.
- 2. Set EUT at maximum power through base station.
- 3. Select lowest, middle, and highest channels for each band and different modulation.
- 4. Measure and record the power level from the system simulator.

 TEL: 0800-800005
 Page Number
 : 11 of 17

 FAX: 886-3-327-0855
 Issued Date
 : Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version
 : 02



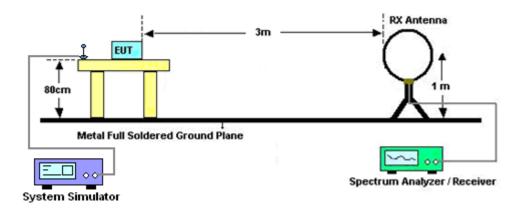
### 4 Radiated Test Items

### 4.1 Measuring Instruments

See list of measuring instruments of this test report.

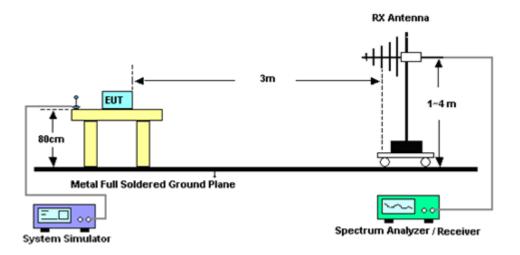
#### 4.1.1 Test Setup

#### For radiated test below 30MHz



Report No.: FG1N2210F

#### For radiated test from 30MHz to 1GHz

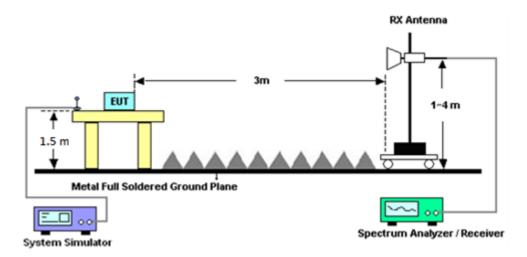


 TEL: 0800-800005
 Page Number
 : 12 of 17

 FAX: 886-3-327-0855
 Issued Date
 : Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version
 : 02

#### For radiated test above 1GHz



#### 4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

#### Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

TEL: 0800-800005 FAX: 886-3-327-0855 E-mail: Alex@sporton.com.tw

Report Template No.: BU5-FGLTE90R Version 2.4

Page Number : 13 of 17 Issued Date : Apr. 13, 2022

Report No.: FG1N2210F

Report Version : 02

### 4.2 Radiated Spurious Emission

### 4.2.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

Report No.: FG1N2210F

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

#### 4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

- The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- 2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- 4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- 5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
- 6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- 7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- 8. Taking the record of output power at antenna port.
- 9. Repeat step 7 to step 8 for another polarization.
- 10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 11. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

TEL: 0800-800005 Page Number : 14 of 17
FAX: 886-3-327-0855 Issued Date : Apr. 13, 2022

E-mail : Alex@sporton.com.tw Report Version : 02

# 5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 07, 2021	Mar. 05, 2022~ Mar. 23, 2022	Sep. 06, 2022	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01 N-06	37059 & 01	30MHz~1GHz	Oct. 09, 2021	Mar. 05, 2022~ Mar. 23, 2022	Oct. 08, 2022	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 09, 2021	Mar. 05, 2022~ Mar. 23, 2022	Oct. 08, 2022	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Dec. 03, 2021	Mar. 05, 2022~ Mar. 23, 2022	Dec. 02, 2022	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1212	1GHz~18GHz	May 18, 2021	Mar. 05, 2022~ Mar. 23, 2022	May 17, 2022	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 24, 2021	Mar. 05, 2022~ Mar. 22, 2022	Mar. 23, 2022	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 23, 2022	Mar. 23, 2022~ Mar. 23, 2022	Mar. 22, 2023	Radiation (03CH12-HY)
Preamplifier	Aglient	8449B	3008A02375	1GHz~26.5GHz	May 25, 2021	Mar. 05, 2022~ Mar. 23, 2022	May 24, 2022	Radiation (03CH12-HY)
Preamplifier	E-INSTRUME NT TECH LTD.	ERA-100M-18 G-56-01-A70	EC1900270	1GHz-18GHz	Dec. 27, 2021	Mar. 05, 2022~ Mar. 23, 2022	Dec. 26, 2022	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 15, 2021	Mar. 05, 2022~ Mar. 23, 2022	Oct. 14, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 10, 2021	Mar. 05, 2022~ Mar. 23, 2022	Dec. 09, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 21, 2022	Mar. 05, 2022~ Mar. 23, 2022	Feb. 20, 2023	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 21, 2022	Mar. 05, 2022~ Mar. 07, 2022	Feb. 20, 2023	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803953/2	30MHz~40GHz	Mar. 08, 2022	Mar. 08, 2022~ Mar. 23, 2022	Mar. 07, 2023	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN2	1.2GHz Low Pass Filter	Mar. 17, 2021	Mar. 05, 2022~ Mar. 15, 2022	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN2	1.2GHz Low Pass Filter	Mar. 16, 2022	Mar. 16, 2022~ Mar. 23, 2022	Mar. 15, 2023	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-108 0-1200-15000 -60SS	SN1	1.2GHz High Pass Filter	Mar. 17, 2021	Mar. 05, 2022~ Mar. 15, 2022	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-108 0-1200-15000 -60SS	SN1	1.2GHz High Pass Filter	Mar. 16, 2022	Mar. 16, 2022~ Mar. 23, 2022	Mar. 15, 2023	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60ST	SN2	3GHz High Pass Filter	Jul. 12, 2021	Mar. 05, 2022~ Mar. 23, 2022	Jul. 11, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000 -40ST	SN2	6.75GHz High Pass Filter	Mar. 17, 2021	Mar. 05, 2022~ Mar. 15, 2022	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000 -40ST	SN2	6.75GHz High Pass Filter	Mar. 16, 2022	Mar. 16, 2022~ Mar. 23, 2022	Mar. 15, 2023	Radiation (03CH12-HY)

Report No. : FG1N2210F

TEL: 0800-800005 Page Number : 15 of 17
FAX: 886-3-327-0855 Issued Date : Apr. 13, 2022

E-mail : Alex@sporton.com.tw Report Version : 02
Report Template No.: BU5-FGLTE90R Version 2.4



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303B	TP140349	N/A	Sep. 30, 2021	Mar. 05, 2022~ Mar. 23, 2022	Sep. 29, 2022	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Mar. 05, 2022~ Mar. 23, 2022	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Mar. 05, 2022~ Mar. 23, 2022	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Mar. 05, 2022~ Mar. 23, 2022	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Mar. 05, 2022~ Mar. 23, 2022	N/A	Radiation (03CH12-HY)
Radio Communication Analyzer	Anritsu	MT8821C	6201664755	2/3/4G/LTE FDD/TDD with44)/LTE-3C C DLCA/2CC ULCA, CatM1/NB1/NB2	Jul. 21, 2021	Feb. 25, 2022~ Mar. 24, 2022	Jul. 20, 2022	Conducted (TH03-HY)

Report No. : FG1N2210F

 TEL: 0800-800005
 Page Number
 : 16 of 17

 FAX: 886-3-327-0855
 Issued Date
 : Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version
 : 02



# 6 Uncertainty of Evaluation

#### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of	3.10 dB
Confidence of 95% (U = 2Uc(y))	3.10 dB

Report No.: FG1N2210F

#### **Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)**

Measuring Uncertainty for a Level of	0.00 ID
1	3.39 dB
Confidence of 95% (U = 2Uc(y))	

 TEL: 0800-800005
 Page Number
 : 17 of 17

 FAX: 886-3-327-0855
 Issued Date
 : Apr. 13, 2022

 E-mail: Alex@sporton.com.tw
 Report Version
 : 02

# **Appendix A. Test Results of Conducted Test**

# Conducted Output Power(Average power & ERP)

	LTE Band 14 Maximum Average Power [dBm] (GT - LC = 1.12 dB)											
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)				
10	1	0			23.59							
10	1	25			23.65							
10	1	49			23.72							
10	25	0	QPSK		22.67		22.69	0.1858				
10	25	12		-	22.51	-						
10	25	25			22.53							
10	50	0			22.57							
10	1	0	16-QAM		22.90		21.93	0.1560				
10	1	0	64-QAM		21.75		20.72	0.1180				
Limit ERP < 3W				Result			Pass					

Report No. : FG1N2210F

	LTE Band 14 Maximum Average Power [dBm] (GT - LC = 1.12 dB)											
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)				
5	1	0	QPSK	23.61	23.54	23.48	22.66	0.1845				
5	1	0	16-QAM	22.87	22.47	22.71	21.97	0.1574				
5	1	0	64-QAM	21.54	21.61	21.32	20.84	0.1213				
Limit	ERP < 3W				Result	Pass						

# **Appendix B. Test Results of Radiated Test**

### LTE Band 14 (Ant M)

Report No.: FG1N2210F

LTE Band 14 / 5MHz / QPSK											
Channel	Frequency ( MHz )	ERP (dBm)	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)		
	1577	-52.83	-42.15	-10.68	-64.27	-58.83	0.80	8.95	Н		
	2365	-46.11	-13	-33.11	-60.82	-52.79	0.99	9.83	Н		
	3153	-53.90	-13	-40.90	-71.29	-62.06	1.10	11.41	Н		
									Н		
									Н		
Lowest									Н		
Lowest	1577	-50.17	-42.15	-8.02	-61.54	-56.17	0.80	8.95	V		
	2365	-45.12	-13	-32.12	-60.00	-51.80	0.99	9.83	V		
	3153	-53.66	-13	-40.66	-71.29	-61.82	1.10	11.41	V		
									V		
									V		
									V		
	1582	-51.99	-42.15	-9.84	-63.46	-58.04	0.80	9.00	Н		
	2373	-45.06	-13	-32.06	-59.75	-51.78	0.99	9.87	Н		
	3163	-52.96	-13	-39.96	-70.40	-61.13	1.10	11.43	Н		
									Н		
									Н		
Middle									Н		
ivildale	1582	-51.12	-42.15	-8.97	-62.50	-57.17	0.80	9.00	V		
	2373	-44.10	-13	-31.10	-58.93	-50.82	0.99	9.87	V		
	3163	-53.15	-13	-40.15	-70.84	-61.32	1.10	11.43	V		
									V		
									V		
									V		

TEL: 0800-800005 Page Number : B1 of B3

FAX: 886-3-327-0855 E-mail: Alex@sporton.com.tw



	4507	50.00	40.45	40.00	00.74	50.04	0.00	0.00	
	1587	-52.23	-42.15	-10.08	-63.71	-58.34	0.80	9.06	Н
	2380	-43.66	-13	-30.66	-58.35	-50.41	1.00	9.90	Н
	3173	-53.08	-13	-40.08	-70.57	-61.27	1.10	11.45	Н
									Н
									Н
Lliaboot									Н
Highest	1587	-50.62	-42.15	-8.47	-61.99	-56.73	0.80	9.06	V
	2380	-44.30	-13	-31.30	-59.11	-51.05	1.00	9.90	V
	3173	-52.75	-13	-39.75	-70.49	-60.94	1.10	11.45	V
									V
									V
									V

Report No.: FG1N2210F

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

TEL: 0800-800005 Page Number : B2 of B3

FAX: 886-3-327-0855 E-mail: Alex@sporton.com.tw

			Ľ	TE Band 14	/ 10MHz / QF	PSK			
Channel	Frequency ( MHz )	ERP (dBm)	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
	1577	-50.39	-42.15	-8.24	-61.83	-56.39	0.80	8.95	Н
	2366	-45.64	-13	-32.64	-60.35	-52.33	0.99	9.83	Н
	3154	-53.49	-13	-40.49	-70.88	-61.65	1.10	11.41	Н
									Н
									Н
Middle									Н
Middle	1577	-50.08	-42.15	-7.93	-61.45	-56.08	0.80	8.95	V
	2366	-45.27	-13	-32.27	-60.15	-51.96	0.99	9.83	V
	3154	-53.37	-13	-40.37	-71.01	-61.53	1.10	11.41	V
									V
									V
									V

Report No.: FG1N2210F

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

TEL: 0800-800005 Page Number : B3 of B3

FAX: 886-3-327-0855 E-mail: Alex@sporton.com.tw