

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT **CLASS II PC REPORT**

	OF		
Product Name:	802.11abgn 2X2 MIMO + BT/BLE RADIO MODULE		
Brand Name:	N/A		
Marketing Name:	N/A		
Model No.:	DWM-W095A		
Model Difference:	N/A		
FCC ID	EW4DWMW095A		
Report No.:	E2/2016/30076		
Issue Date:	Apr. 13, 2016		
FCC Rule Part:	§15.407		
Prepared for:	Mitsumi Electric Co Ltd 2-11-2, Tsurumaki, Tama-shi, Tokyo, 206-8567, Japan.		
Prepared by:	SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333		
	<b>Note:</b> This report shall not be reproduced except in full, without the written approval of SGS Taiwan Ltd. This document may be altered or revised by SGS		

Testing Laboratory

0513

41.1.1

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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. personnel only, and shall be noted in the

revision section of the document.



# VERIFICATION OF COMPLIANCE

Applicant:	Mitsumi Electric Co Ltd 2-11-2, Tsurumaki, Tama-shi, Tokyo, 206-8567, Japan.
Product Name:	802.11abgn 2X2 MIMO + BT/BLE RADIO MODULE
Brand Name:	N/A
Marketing Name:	N/A
Model No.:	DWM-W095A
Model Difference:	N/A
FCC ID	EW4DWMW095A
File Number:	E2/2016/30076
Date of test:	Mar. 23, 2016 ~ Apr. 11, 2015
Date of EUT Received:	Mar. 23, 2016

# We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory 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 tested as described in this report is in compliance with conducted and radiated emission limits.

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

Test By:	Kenny	Date:	Apr. 13, 2016
-	Henry / Engineer		
Prepared By:	Allon Isai	Date:	Apr. 13, 2016
- Approved By:	Allen Tsai / Engineer Tim Ch ang	Date:	Apr. 13, 2016
	Jim Chang / Asst. Manager		

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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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.



# **Revision History**

Report Number	Revision	Description	Issue Date
E2/2016/30076	Rev.00	Initial creation of document	Apr. 13, 2016

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

# **Table of Contents**

1	GEN	ERAL INFORMATION	6
	1.1	Product Description	6
	1.2	Product Feature of Equipment Under Test	7
	1.3	Test Methodology of Applied Standards	8
	1.4	Test Facility	8
	1.5	Special Accessories	
	1.6	Equipment Modifications	8
2	SYS	TEM TEST CONFIGURATION	9
	2.1	EUT Configuration	9
	2.2	EUT Exercise	
	2.3	Test Procedure	9
	2.4	Measurement Results Explanation Example	9
	2.5	Configuration of Tested System	10
3	SUM	MARY OF TEST RESULT	11
4	DES	CRIPTION OF TEST MODES	
	4.1	Operated in U-NII Bands	
	4.2	The Worst Test Modes and Channel Details	12
5	MEA	SUREMENT UNCERTAINTY	14
6	DUT	Y CYCLE TEST SIGNAL	15
6 7	MAX	IMUM CONDUCTED OUTPUT POWER MEASUREMENT	19
-	<b>MAX</b> 7.1	IMUM CONDUCTED OUTPUT POWER MEASUREMENT	<b>19</b> 19
-	<b>MAX</b> 7.1 7.2	IMUM CONDUCTED OUTPUT POWER MEASUREMENT Standard Applicable Measurement Procedure	<b>19</b> 19 20
-	MAX 7.1 7.2 7.3	IMUM CONDUCTED OUTPUT POWER MEASUREMENT Standard Applicable Measurement Procedure Measurement Equipment Used	<b>19</b> 19 20 20
-	MAX 7.1 7.2 7.3 7.4	IMUM CONDUCTED OUTPUT POWER MEASUREMENT Standard Applicable Measurement Procedure Measurement Equipment Used Test Set-up	<b>19</b> 20 20 20
-	MAX 7.1 7.2 7.3	IMUM CONDUCTED OUTPUT POWER MEASUREMENT Standard Applicable Measurement Procedure Measurement Equipment Used	<b>19</b> 20 20 20
-	MAX 7.1 7.2 7.3 7.4 7.5 PEA	IMUM CONDUCTED OUTPUT POWER MEASUREMENT   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Measurement Result   K POWER SPECTRAL DENSITY	19 20 20 20 21 21
7	MAX 7.1 7.2 7.3 7.4 7.5 PEAI 8.1	IMUM CONDUCTED OUTPUT POWER MEASUREMENT   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Measurement Result   K POWER SPECTRAL DENSITY   Standard Applicable	19 20 20 21 21 21 22
7	MAX 7.1 7.2 7.3 7.4 7.5 PEAI 8.1 8.2	IMUM CONDUCTED OUTPUT POWER MEASUREMENT   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Measurement Result   K POWER SPECTRAL DENSITY   Standard Applicable   Measurement Procedure	19 20 20 20 21 21 22 22 23
7	MAX 7.1 7.2 7.3 7.4 7.5 <b>PEAI</b> 8.1 8.2 8.3	IMUM CONDUCTED OUTPUT POWER MEASUREMENT   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Measurement Result   K POWER SPECTRAL DENSITY   Standard Applicable   Measurement Procedure   Measurement Procedure   Measurement Result	19 20 20 20 20 21 22 23 23 23
7	MAX 7.1 7.2 7.3 7.4 7.5 PEAI 8.1 8.2 8.3 8.4	IMUM CONDUCTED OUTPUT POWER MEASUREMENT   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Measurement Result   K POWER SPECTRAL DENSITY   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Test Set-up   Standard Applicable   Measurement Equipment Used   Test Set-up	19 20 20 21 21 22 22 23 23 23 24
8	MAX 7.1 7.2 7.3 7.4 7.5 PEAI 8.1 8.2 8.3 8.4 8.5	IMUM CONDUCTED OUTPUT POWER MEASUREMENT.   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Measurement Result   K POWER SPECTRAL DENSITY   Standard Applicable   Measurement Equipment Used   Test Set-up   Measurement Result   K POWER SPECTRAL DENSITY   Standard Applicable   Measurement Procedure   Measurement Result   Measurement Result   Measurement Result	19 20 20 20 21 21 22 22 23 23 23 24 24
7	MAX 7.1 7.2 7.3 7.4 7.5 PEAI 8.1 8.2 8.3 8.4 8.5	IMUM CONDUCTED OUTPUT POWER MEASUREMENT   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Measurement Result   K POWER SPECTRAL DENSITY   Standard Applicable   Measurement Procedure   Measurement Equipment Used   Test Set-up   Test Set-up   Standard Applicable   Measurement Equipment Used   Test Set-up	19 20 20 20 21 22 23 23 23 24 24 24 24 24

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



	9.2	Measurement Equipment Used	35
	9.3	Test SET-UP	36
	9.4	Measurement Procedure	37
	9.5	Field Strength Calculation	37
	9.6	Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz	38
	9.7	Measurement Result	38
	9.8	Radiated Spurious Emission Measurement Result (2TX MODE)	39
	9.9	Radiated Spurious Emission Measurement Result (MIMO MODE)	59
10	ANTE	ENNA REQUIREMENT	82
	10.1	Standard Applicable	82
	10.2	Antenna Connected Construction	82

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



#### **GENERAL INFORMATION** 1

# **1.1 Product Description**

#### General:

Product Name:	802.11abgn 2X2 MIMO + BT/BLE RADIO MODULE
Brand Name:	N/A
Marketing Name:	N/A
Model No.:	DWM-W095A
Model Difference:	N/A
Hardware Version:	N/A
Software Version:	N/A
Power Supply:	3.3Vdc from Power Supply
Class II Permissive change:	For the requirement that certain National Information Infrastructure (U-NII) devices must comply with revised Section 15.407 rules in order to be certified.

#### WLAN 5GHz:

Wi-Fi	Frequency Range	Channels Rated Power (Avg.)		Modulation Technology
11a	5725-5850	5	15.51 dBm	OFDM
11n_20M	HT20 5725-5850	5	2TX(MCS0) :15.26 dBm MIMO (MCS8) :15.02 dBm	OFDM
11n_40M	HT40 5725-5850	2	2TX(MCS0) :15.38 dBm MIMO (MCS8) :15.06 dBm	OFDM

Antenna Designation:	PIFA Antenna *2 5GHz: 4.0 dBi (5725-5850MHz)
Modulation type	64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz(MCS0): 6.5 – 72.2 Mbps 802.11 n_20MHz(MCS8): 6.5 – 144.4Mbps 802.11 n_40MHz(MCS0): 13.5 - 150.0 Mbps 802.11 n_40MHz(MCS8): 13.5 – 300Mbps

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



# **1.2 Product Feature of Equipment Under Test**

The equipment under Test (Hereafter Called: EUT) is supporting Wi-Fi 802.11a/b/g/n features, and below is details of information.

Product Feature		
Product Name:	802.11abgn 2X2 MIMO + BT/BLE RADIO MODULE	
Brand Name:	N/A	
Marketing Name:	N/A	
Model No.:	DWM-W095A	
Model Difference:	N/A	
FCC ID	EW4DWMW095A	
Wi-Fi Specification	802.11a/b/g/n	

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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



# **1.3 Test Methodology of Applied Standards**

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules

FCC KDB 662911 D01 Multiple Transmitter Output

FCC KDB 926956 D01 U-NII Transition Plan

ANSI C63.10:2013

Note:

- 1. All test items have been performed and record as per the above standards.
- The composite system is compliance with FCC Subpart B is authorized under 2. the certification procedure.

#### 1.4 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333. (TAF code 0513)

FCC Registration Numbers are: 628985

#### 1.5 Special Accessories

There are no special accessories used while test was conducted.

#### **1.6 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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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 is unverted to the private to the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



# 2 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 as turn 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 §15.107. The two LISNs provide 50 ohm/ 50uH 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 Radiated Emissions

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plan. 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 hand-held 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.

#### 2.4 Measurement Results Explanation Example 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. **Note:** 

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example.

= RF cable loss (dB)+ attenuation factor(dB) + 10 log(NANT) (dB) =15.3(dB)

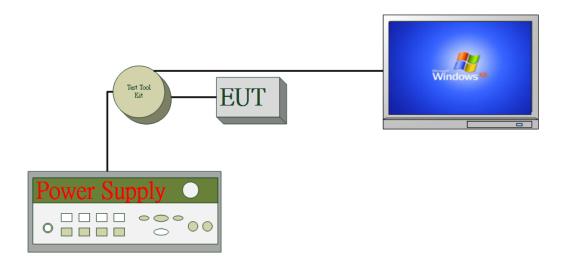
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

除非方方机则 "此報告題未僅對測紙之樣而具質") 同時起帳而僅低留別之"本和電子標本公司書面許可" 不可能按視。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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.



# 2.5 Configuration of Tested System

### Fig. 2-1 Radiated & Conducted (Antenna Port) Configuration Emission



#### Table 2-1 Equipment Used in Tested System

lte m	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	DC Power Sup- ply	Agilent	E3640A	MY53140006	N/A	Unshielded

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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



#### SUMMARY OF TEST RESULT 3

FCC Rules	Description Of Test	Result
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(b)	Undesirable Radiated Emissions	Compliant
§15.203 §15.407(a)	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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 ap-pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGCS Taiwan Ltd. No.134 Wu/KunRboad.NewTaibeiIndustrialPark.Wu/kunDistrict NewTaibeiCity. Taiwan24803/新 th. the T& BIG M the test of the test the test of the law.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



#### DESCRIPTION OF TEST MODES 4

# 4.1 Operated in U-NII Bands

Operated band in 5725 MHz ~5850 MHz:

5 channels are provided for 802.11a, 802.11n HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

2 channels are provided for 802.11n HT40

Ī	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
	151	5755 MHz	159	5795 MHz

# 4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting mode is programmed.

- 3. Investigation has been done on all the possible configurations for searching the worst case.
- 4. The given UE is supporting 2TX MODE and MIMO MODE, both test configurations are chosen to carry out the relevantly mandatory test items.

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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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



#### **RADIATED EMISSION TEST:**

	RADIATED EMISSION TEST (BELOW 1 GHz)								
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT			
802.11a	5745~5825	149 to 165	149, 165	OFDM	6	2TX			
802.11n_HT20	5755~5795	149 to 165	149, 165	OFDM	MCS0 / MCS8	2TX / MIMO			
802.11n_HT40	5755~5795	151 to 159	151, 159	OFDM	MCS0 / MCS8	2TX / MIMO			
	RADI	ATED EMISS	ION TEST (AI	BOVE 1 GHz)					
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT			
802.11a	5745~5825	149 to 165	149,165	OFDM	6	2TX			
802.11n_HT20	5755~5795	149 to 165	149,165	OFDM	MCS0 / MCS8	2TX / MIMO			
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0 / MCS8	2TX / MIMO			

#### Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n WLAN Transmitter for channel Low and High, the worst case E2 position was reported.

#### ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST								
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT		
802.11a				OFDM	6	2TX		
802.11n_HT20	5745~5825	149 to 165	149,157,165	OFDM	MCS0 / MCS8	2TX / MIMO		
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0 / MCS8	2TX / MIMO		

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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.



#### MEASUREMENT UNCERTAINTY 5

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
26dB & 6dB Emission Bandwidth	+/- 123.36 Hz
The Maximum Output Power Measurement	+/- 0.96 dB
Peak Power Spectral Density Measurement	+/- 1.67 dB
Frequency Stability	+/- 123.36 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%

Radiated Spurious Emission:

	30MHz - 180MHz: +/- 3.37dB
Measurement uncertainty	180MHz -417MHz: +/- 3.19dB
(Polarization : Vertical)	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : Horizontal)	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



#### **DUTY CYCLE TEST SIGNAL** 6

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

#### Formula:

Duty Cycle = Ton / (Ton+Toff)

#### **Measurement Procedure:**

- 1. Set span = Zero
- 2. RBW = 8MHz
- 3. VBW = 8MHz,
- 4. Detector = Peak

Duty Cycle:

Mode	Duty Cycle (%)	Duty Factor (dB) =10*log ( 1/Duty Cycle )
802.11a	99.40	0.03
802.11n_20 MIMO	99.80	0.01
802.11n_20 2TX	99.30	0.03
802.11n_40 MIMO	97.80	0.10
802.11n_40 2TX	98.70	0.06

802.11a Duty Cycle Factor:  $10 * \log(1/0.994) = 0.03$ 802.11n 20 MIMO Duty Cycle Factor: 10 \* log(1/0.998) = 0.01 802.11n 20 2TX Duty Cycle Factor: 10 \* log(1/0.993) = 0.03 802.11n 40 MIMO Duty Cycle Factor: 10 \* log(1/0.978) = 0.1 802.11n 40 2TX Duty Cycle Factor: 10 \* log(1/0.987) = 0.06

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 <u>www.sgs.com/terms and conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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



# **DUTY CYCLE TEST SIGNAL Measurement Result**

#### 802.11a

	ctrum Analyzer - Swept SA					
Center Fr	req 5.745000000		Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr	TRACE 1 2 3	Frequency
		PNO: Fast IFGain:Low	#Atten: 30 dB		DET P N N	
	Ref Offset 15.3 dB				ΔMkr3 3.143 r -0.31 (	
10 dB/div Log	Ref 30.00 dBm		3∆4		-0.51	
20.0 atvijedno 10.0	and the second second second	sanailataan santa marata	election and the set of the	and the second second second	Alexandre Alexandre Server	5.745000000 0
0.00						5.745000000
-10.0						Start F
-20.0					<b>├                                    </b>	5.745000000
-30.0			· ·			
-40.0						Stop F
-60.0						5.745000000
Center 5.	745000000 GHz				Span 0	Hz CF St
Res BW 8		#VBW	8.0 MHz	Sweep	9.467 ms (1001 p	ots) 8.000000 N
MKR MODE TR	C SCL X	3.124 ms (A)		NCTION FUNCTION WIDTH	FUNCTION VALUE	Auto M
2 F	t (Δ) t t (Δ)	3.124 ms (Δ) 1.846 ms 3.143 ms (Δ)	-0.31 dB 16.93 dBm -0.31 dB			Freq Off
4 F 1	t	1.846 ms	16.93 dBm			. 0
6 7						
9						
10						
< MSG				STAT	JS	•
	TV		H	STAT	JS	·
HT20 2			17	STAT	5	
💓 Keysight Spe 🚺 RL	ctrum Analyzer - Swept SA IU 50 Ω DC		IF SENSE: SNT	ALIGN AUTO	01/31/31 00 40:07	NI6 Frequency
💓 Keysight Spe 🚺 RL	ctrum Analyzer - Swept SA	PNO: Fast	Trig: Free Run		04:35:35 PN Apr 07, 3 TRACE 12 5	Frequency
💓 Keysight Spe 🚺 RL	ctrum Analyzer - Swept SA RF   50 Ω DC   7eq 5.745000000			ALIGN AUTO Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE TYPE DET	Auto T
Keysight Spe Center Fr 10 dB/div	ctrum Analyzer - Swept SA IU 50 Ω DC	PNO: Fast	Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr	04:35:35 PN Apr 07, 3 TRACE 12 5	Auto Tu
Keysight Spe WRL Center Fr	ctrum Analyzer - Swept SA RF   50 Ω DC   req 5.7450000000 Ref Offset 16.3 dB	PNO: Fast	Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE 112 3 TYPE WWW DET P NNI DET P NNI	Auto Tu
IN Keynight Spe DI RL Center Fr 10 dB/div Log	chum Analyzer - Swept SA RF 59 0 DC req 5.7450000000 Ref Offset 16.3 dB Ref 30.00 dBm	PNO: Fast	Trig: Free Run	Ation Auto Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE 112 3 TYPE WWW DET P NNI DET P NNI	Auto Tu dB Arr. Center F
10 dB/dlv	chum Analyzer - Swept SA RF 59 0 DC req 5.7450000000 Ref Offset 16.3 dB Ref 30.00 dBm	PNO: Fast	Trig: Free Run	Ation Auto Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE 112 3 TYPE WWW DET P NNI DET P NNI	Auto Tu
	chum Analyzer - Swept SA RF 59 0 DC req 5.7450000000 Ref Offset 16.3 dB Ref 30.00 dBm	PNO: Fast	Trig: Free Run	Ation Auto Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE 112 3 TYPE WWW DET PINN DET PINN	Auto Tu B Center F 5.745000000 0 Start F
10 dB/dlv	chum Analyzer - Swept SA RF 59 0 DC req 5.7450000000 Ref Offset 16.3 dB Ref 30.00 dBm	PNO: Fast	Trig: Free Run	Ation Auto Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE 112 3 TYPE WWW DET PINN DET PINN	Auto Tu B Center F 5.745000000 0 Start F
	chum Analyzer - Swept SA RF 59 0 DC req 5.7450000000 Ref Offset 16.3 dB Ref 30.00 dBm	PNO: Fast	Trig: Free Run	Ation Auto Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE 112 3 TYPE WWW DET PINN DET PINN	Auto Tu Auto Tu Center F 5.745000000 ( Start Fi 5.745000000 (
III.   Keynight Spectrum     00   RL     Center Fi     200   RL     10   dB/div     200   reference     100   RL     200   reference     100   RL     200   reference     -100   RL     -200   RL     -600   RL	chum Analyzer - Swept SA RF 59 0 DC req 5.7450000000 Ref Offset 16.3 dB Ref 30.00 dBm	PNO: Fast	Trig: Free Run	Ation Auto Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE 112 3 TYPE WWW DET PINN DET PINN	Auto Tu Auto Tu Center F 5.745000000 0 Start F 5.745000000 0
10 dE/div Center Fi 200 a 200	chum Analyzer - Swept SA RF 59 0 DC req 5.7450000000 Ref Offset 16.3 dB Ref 30.00 dBm	PNO: Fast	Trig: Free Run	Ation Auto Avg Type: Log-Pwr	04:35:35 PM Apr 07, 2 TRACE 112 3 TYPE WWW DET PINN DET PINN	Auto Tu dB Arr. Center F
III.   Keynight Spectrum     Of   R.L     Center Fi     20.0   address     10.0   address     20.0   address     10.0   address     10.0   address     10.0   address     -10.0   address     -20.0   address     -60.0   address     -60.0   address     Center 5.7   address	ctrum Analyser - Swept SA IV 50 0 C req 5.745000000 Ref Offset 15.3 dB Ref 30.00 dBm ded at a to be the second secon	PNO: Fast	Trig: Free Run #Atten: 30 dB	Aug Type: Log-Pwr	04:35:35 PM Apr 07, 2 TYPE 12:35 PM Apr 07, 2 TYPE 02:00 PM Apr 07, 2	Auto Tu Center F 5.745000000 ( Start F 5.745000000 ( Stop F 5.745000000 ( Stop F 5.745000000 (
III.   Keynight Spectrum     Off   R.L     Center Fr     200   address     10   dB/div     200   address     100   dB/div     200   address     300   address     -200   address     -	ctrum Analyser - Swept SA IV 50 0 C req 5.745000000 Ref Offset 16.3 dB Ref 30.00 dBm dual of the second secon	PNO: Fast	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	C4:35:35 PH Apro7, 2 TRACE 12:3 Type CMKr3 2.920 r -0.44 ( -0.44 ( -0.	Auto Tu     Auto Tu     Center F     5.745000000     Start F     5.745000000     Start F     5.745000000     Hz     CF S     8.000000
10 dE/div Center Fr 10 dE/div Log 20.0 -10.0 -20	ctrum Analyser - Swept SA IV S0 0 CC req 5.745000000 Ref 0ffset 16.3 dB Ref 30.00 dBm 4 2 4 4 4 4 4 4 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4	PNO: Fast	Trig: Free Run #Atten: 30 dB	Aug Type: Log-Pwr	C4:35:35 PH Apro7, 2 TRACE 12:3 Type CMKr3 2.920 r -0.44 ( -0.44 ( -0.	Auto Tu     Auto Tu     Center F     5.745000000     Start F     5.745000000     Start F     5.745000000     Hz     CF S     8.000000
10 dE/div Center Fr 10 dE/div Log 20.0 -10.0 -20	ctrum Analyser - Swept SA IV S0 0 CC req 5.745000000 Ref 0ffset 16.3 dB Ref 30.00 dBm 4 2 4 4 4 4 4 4 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4	PNO: Fast IFGain:Low 	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	C4:35:35 PH Apro7, 2 TRACE 12:3 Type CMKr3 2.920 r -0.44 ( -0.44 ( -0.	Hardwine   Center F     5.745000000   Start F
Image: second	ctrum Analyser - Swept SA IV 50 0 C req 5.745000000 Ref Offset 16.3 dB Ref 30.00 dBm dual of the second secon	PNO: Fast	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	C4:35:35 PH Apro7, 2 TRACE 12:3 Type CMKr3 2.920 r -0.44 ( -0.44 ( -0.	Hz Auto Ti Center F 5.745000000 Start F 5.745000000 Stop F 5.745000000 Stop F 5.745000000 Stop S 8.0000000 Freq Off
Image: second	ctrum Analyser - Swept SA IV S0 0 CC req 5.745000000 Ref 0ffset 16.3 dB Ref 30.00 dBm 4 2 4 4 4 4 4 4 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4	PNO: Fast IFGain:Low 	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	C4:35:35 PH Apro7, 2 TRACE 12:3 Type CMKr3 2.920 r -0.44 ( -0.44 ( -0.	Hardweine   Center F     5.745000000 f   Start F     5.74500000 f   Start F     5.74500000 f   Start F     5.74500000 f   Start F     5.74
Image: second	ctrum Analyser - Swept SA IV S0 0 CC req 5.745000000 Ref 0ffset 16.3 dB Ref 30.00 dBm 4 2 4 4 4 4 4 4 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4	PNO: Fast IFGain:Low 	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	C4:35:35 PH Apro7, 2 TRACE 12:3 Type CMKr3 2.920 r -0.44 ( -0.44 ( -0.	Hardwine   Center F     5.745000000   Start F
Image: second	ctrum Analyser - Swept SA IV S0 0 CC req 5.745000000 Ref 0ffset 16.3 dB Ref 30.00 dBm 4 2 4 4 4 4 4 4 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4	PNO: Fast IFGain:Low 	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	C4:35:35 PH Apro7, 2 TRACE 12:3 Type CMKr3 2.920 r -0.44 ( -0.44 ( -0.	Center F     5.745000000     Start F     5.745000000     Start F     5.745000000     Start F     5.745000000     Hz     CF S     8.000000

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



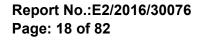
### 802.11n HT20 MIMO

	ectrum Analyzer								
Center F		50 00 DC				vg Type: Log-Pw	r TRAC	H Apr 07, 2016	Frequency
10 dB/div	Ref Offse Ref 30.0	t 16.3 dB	PNO: Fast H IFGain:Low	#Atten: 30			ΔMkr3 1		Auto Tune
20.0 10.0	karana daga daga gaga	Ximun	en la composit		344 Martinestrat 122	had from the population of the second	monestere	and the distance of the second	Center Fred 5.745000000 GHz
-10.0 -20.0 -30.0									Start Free 5.745000000 GH
-40.0 -50.0 -60.0									Stop Fre 5.745000000 GH
Center 5. Res BW 8	MHZ	X		V 8.0 MHz	FUNCTION		4.467 ms (	pan 0 Hz 1001 pts)	CF Step 8.000000 MH Auto Ma
1 Δ2 2 F 3 Δ4 4 F 5 6	t (Δ) t t (Δ) t		.465 ms (Δ 745.9 μs .483 ms (Δ 745.9 μs	16.21 dB	m IB				Freq Offse 0 H
7 8 9 10 11				18					
MSG						STA	TUS		

#### 802.11 nHT 40 2TX

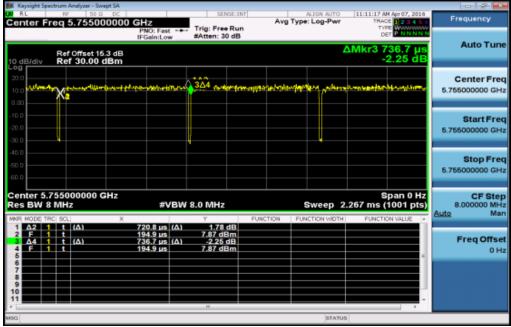
Keysight Spectrum Analyzer - Swept SA			
Center Freg 5.755000000	GHz SENSE:INT	ALIGN AUTO 04:39:50 PM Apr 07, 20 Avg Type: Log-Pwr TRACE	Frequency
	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	TYPE WWWW DET PNNN	Auto Tuno
Ref Offset 15.3 dB 10 dB/div Ref 30.00 dBm		ΔMkr3 1.426 n 0.19 d	IS I
20.0	addeter propositions 304	naja Alabara dista para papatan maadara dan dar	5.75500000 GHz
-10.0			Start Freq 5.755000000 GHz
-40.0 -60.0			Stop Freq 5.755000000 GHz
Center 5.755000000 GHz Res BW 8 MHz	#VBW 8.0 MHz	Span 0 1 Sweep   4.333 ms (1001 p	tz CF Step 8.000000 MHz Auto Man
MRR   MODE   TRC   SCL   X     1   Δ2   1   t   (Δ)     2   F   1   t     3   Δ4   1   t   (Δ)     4   F   1   t   (Δ)     5	Υ   FUNCT     1.408 ms   (Δ)   -0.59 dB     628.3 μs   8.81 dBm     1.426 ms   (Δ)   0.19 dB     628.3 μs   8.81 dBm	ION FUNCTION WIDTH FUNCTION VALUE	Freq Offset
6 7 8 9 10 11			
MSG		STATUS	

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.





#### 802.11 nHT 40 MIMO



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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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.



#### MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 7

# 7.1 Standard Applicable

OPERZTION Band		EUT CATEGORY	LIMIT
U-NII-1		Access Point (Mater device )	1 Watt(30dBm)
		Fixed point-to-point Acess Ponit	1 Watt(30dBm)
		Mobile and portable clinet device	250mW(23.98dBm)
U-NII-2A			250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C			250mW(23.98dBm) or 11dBm+10 log B
U-NII-3			1 Watt(30dBm)

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the direction-al gain of the antenna exceeds 6 dBi.

The antenna gain is granter than 6 dBi in MIMO mode the limit reduce as below:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

	Effective Legacy Gain (dBi)	Limit
U-NII-3	4+3.01=7.01dBi	30dBm – (7.01– 6 dBi) = 28.99dBm

Therefore the limit needs to reduce for the U-NII-3 band.

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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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



#### 7.2 Measurement Procedure

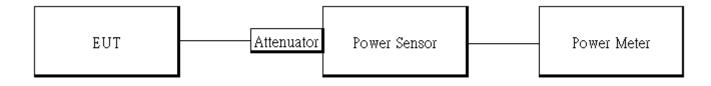
- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- 4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
- 5. Record the max. reading and add 10 log(1/duty cycle).
- 6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

### 7.3 Measurement Equipment Used

Refer to section 8.3 for details.

	Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL SERIAL		LAST	CAL DUE.			
TYPE		NUMBER	NUMBER	CAL.				
Power Meter	Anritsu	ML2495A	1005007	12/09/2015	12/08/2016			
Power Sensor	Anritsu	MA2411B	917032	12/09/2015	12/08/2016			
Spectrum Analyzer	Agilent	N9010A	MY50420195	12/21/2015	12/20/2016			
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017			
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017			
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017			

# 7.4 Test Set-up



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。

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.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sqs.com/terms and conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms e-document.htm</u>. 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 is unlawful and offenders may be prosecuted to the fullest extent of the law.



#### 7.5 Measurement Result

#### 802.11a\_2TX

СН	Frequency	AVERAGE P	OWER (dBm)	TOTAL	TOTAL	REQUIRED	RESULT
СП	(MHz) CHAIN 0 CH	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT	
149	5745	12.74	12.24	15.51	35.543	28.99	PASS
157	5785	12.72	12.01	15.39	34.592	28.99	PASS
165	5825	12.65	12.01	15.35	34.293	28.99	PASS

#### 802.11n\_HT20\_MIMO

011	Frequency	AVERAGE P	OWER (dBm)	TOTAL		REQUIRED	
СН	(MHz)	CHAIN 0	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT
149	5745	12.43	11.55	15.02	31.787	28.99	PASS
157	5785	12.38	11.53	14.99	31.521	28.99	PASS
165	5825	12.32	11.58	14.98	31.449	28.99	PASS

#### 802.11n 20 2TX

CH	CH Frequency AVERAGE POWER (dBm)		TOTAL POWER	TOTAL POWER	REQUIRED LIMIT	RESULT	
СП	(MHz)	CHAIN 0	CHAIN 1	(dBm)	(mW)	(dBm)	RESOLI
149	5745	12.67	11.78	15.26	33.559	28.99	PASS
157	5785	12.46	11.71	15.11	32.445	28.99	PASS
165	5825	12.54	11.81	15.20	33.118	28.99	PASS

#### 802.11n\_HT40\_MIMO

СН	Frequency			VERAGE POWER (dBm) TOTAL TOTAL TOTAL		REQUIRED LIMIT	RESULT
	(MHz)	CHAIN 0	CHAIN 1	(dBm)	(mW)	(dBm)	REGOLI
151	5755	12.49	11.56	15.06	32.064	28.99	PASS
159	5795	12.43	11.56	15.03	31.820	28.99	PASS

#### 802.11n 40 2TX

СН	Frequency	AVERAGE P	OWER (d Bm)	TOTAL POWER	TOTAL POWER	REQUIRED LIMIT	RESULT
011	(MHz)	CHAIN 0	CHAIN 1	(dBm)	(mW)	(dBm)	REGOLI
151	5755	12.16	11.31	14.77	29.964	28.99	PASS
1 59	5795	12.79	11.91	15.38	34.535	28.99	PASS

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



#### PEAK POWER SPECTRAL DENSITY 8

#### 8.1 Standard Applicable

OPERZTION Band		EUT CATEGORY	LIMIT		
U-NII-1		Access Point (Mater device)	17dBm/ MHz		
	Fixed point-to-point Acess Ponit				
		Mobile and portable clinet device	11dBm/ MHz		
U-NII-2A			11dBm/ MHz		
U-NII-2C			11dBm/ MHz		
U-NII-3			30dBm/ 500kHz		

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The antenna gain is granter than 6 dBi in MIMO mode the limit reduce as below:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

	Effective Legacy Gain (dBi)	Limit
U-NII-3	4+3.01=7.01dBi	30dBm – (7.01– 6 dBi) = 28.99dBm

Therefore the limit needs to reduce for the U-NII-3 band.

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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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



#### 8.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.

### 4. For U-NII1, U-NII-2A, U-NII-2C Band:

Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

#### For U-NII-3 Band:

Set RBW=500 kHz, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

- 5. User the cursor on spectrum to peak search the highest level of trace
- 6. Record the max. reading and add 10 log(1/duty cycle).
- 7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

**Note:** For the test of PSD at MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome

Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	Agilent	N9010A	MY5042019 5	12/21/2015	12/20/2016
Coaxial Cable	HUBER+SUHNE R	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017

#### 8.3 Measurement Equipment Used

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for electronic 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

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.



#### 8.4 Test Set-up



#### 8.5 Measurement Result

	POWER DENSITY 802.11a 2TX MODE							
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)					
5745	7.12	28.99	-21.87					
5785	6.13	28.99	-22.86					
5825	5.75	28.99	-23.24					
PO	WER DENSITY 802.11n HT20	MIMO MOD	E					
Frequency	PPSD	Limit	Margin					
(MHz)	(dBm)	(dBm)	(dB)					
5745	6.52	28.99	-22.47					
5785	6.44	28.99	-22.55					
5825	6.04	28.99	-22.95					
PC	OWER DENSITY 802.11n HT20	2TX MOD						
Frequency	PPSD	Limit	Margin					
(MHz)	(dBm)	(dBm)	(dB)					
5745	6.95	28.99	-22.04					
5785	6.88	28.99	-22.11					
5825	6.73	28.99	-22.26					
PO	POWER DENSITY 802.11n HT40 MIMO MODE							
			Manain					

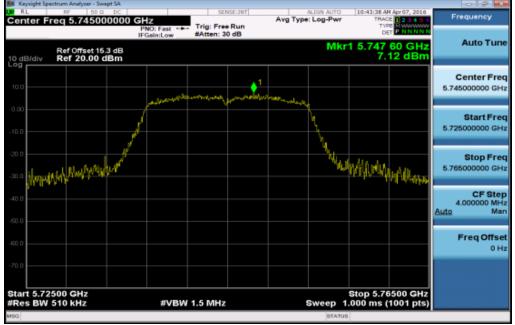
POWER DENSITY 802.11n HT40 MIMO MODE							
Frequency	PPSD	Limit	Margin				
(MHz)	(dBm)	(dBm)	(dB)				
5755	3.82	28.99	-25.17				
5795	2.99	28.99	-26.00				

POWER DENSITY 802.11n HT40 2TX MODE					
Frequency	PPSD	Limit	Margin		
(MHz)	(dBm)	(dBm)	(dB)		
5755	4.43	28.99	-24.56		
5795	3.94	28.99	-25.05		

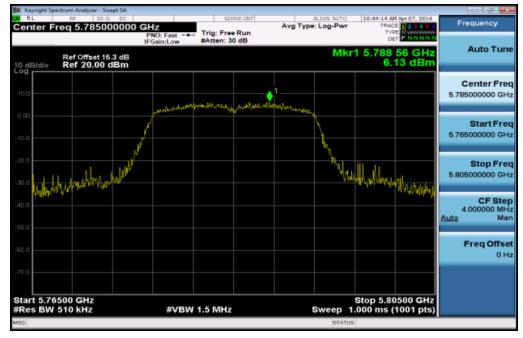
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



# 802.11a (2TX MODE) 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5785 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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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



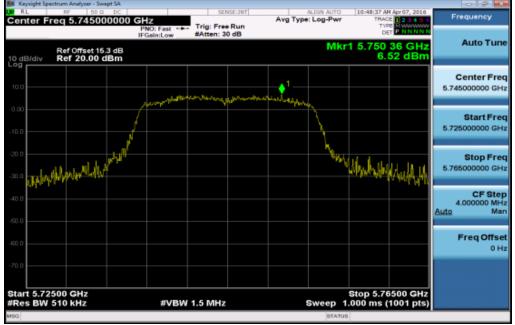
# Peak Power Spectral Density Data Plot (CH High 5825 MHz)



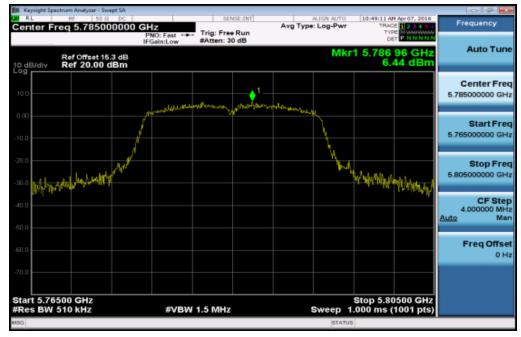
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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.



# 802.11n HT20(MIMO MODE), 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5785 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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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



# Peak Power Spectral Density Data Plot (CH High 5825 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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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.



# 802.11n HT20(2TX MODE), 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



# Peak Power Spectral Density Data Plot (CH Mid 5785 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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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



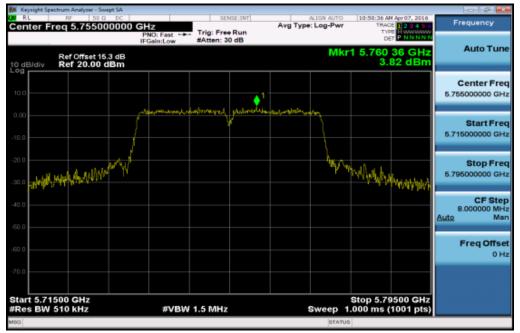
# Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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.



# 802.11n HT40(MIMO MODE), 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



# Peak Power Spectral Density Data Plot (CH High 5795 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。

除非方方就可 近報告題未僅對測測之後赤貝貝 河時近後赤貨術留別大 6 本報告本題本公司書面計 7 小可命位視泉。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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 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



# 802.11n HT40(2TX MODE), 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



# Peak Power Spectral Density Data Plot (CH High 5795 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。

除非方方就可 近報告題未僅對測測之後赤貝貝 河時近後赤貨術留別大 6 本報告本題本公司書面計 7 小可命位視泉。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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 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



# 9 UNDESIRABLE RADIATED EMISSION MEASUREMENT

# 9.1 Standard Applicable

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- 1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
- For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
- 3. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
- 4. For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

APPLICABLE TO	LIMIT		
FCC KDB 789033 D02 General UNII Test Procedures New Rules	FIELD STRENGTH AT 3m		
	PK: 74 (dBµV/m)	AV 54 (dBµV/m)	
APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m	
15.407(b)(1)			
15.407(b)(2)	PK: -27 (dBm/MHz)	PK: 68.3 (dBµV/m)	
15.407(b)(3)			
15.407(b)(4)	PK: -27 (dBm/MHz) PK: -17 (dBm/MHz)	PK: 68.3 (dBμV/m) PK: 78.2 (dBμV/m)	

EIRP =  $((E^*d)^2) / 30$ , where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

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 <u>www.sgs.com/terms and conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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 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.



Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

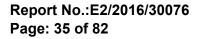
Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)	
0.009-0.490	2400/F(KHz)	300	
0.490-1.705	24000/F(KHz)	30	
1.705-30	30	30	
30-88	100	3	
88-216	150	3	
216-960	200	3	
Above 960	500	3	

#### Note:

1. The lower limit shall apply at the transition frequencies.

2. Emission level  $(dB\mu V/m) = 20 \log Emission level (dB\mu V/m)$ 

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law





# 9.2 Measurement Equipment Used

SGS 966 Chamber No.C							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
EMI Test Receiver	R&S	ESCI7	100760	05/04/2015	05/03/2016		
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017		
Loop Antenna	ETS.LINDGREN	6502	148045	09/07/2015	09/06/2016		
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/14/2015	12/13/2016		
Horn antenna	ETS.LINDGREN	3117	123995	05/05/2015	05/04/2016		
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2016	01/01/2017		
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/02/2016	01/01/2017		
Turn Table	HD	DT420	N/A	N.C.R	N.C.R		
Antenna Tower	ChamPro	AM-BS-4500-B	060776-ABS	N.C.R	N.C.R		
Controller	ChamPro	EM1000	60776	N.C.R	N.C.R		
Low Loss Cable	Huber Suhner	966_RX	9	01/02/2016	01/01/2017		
3m Site NSA	SGS	966 chamber	N/A	07/02/2015	07/01/2016		
Low Loss Cable	Huber Suhner	966 TX	1	01/02/2016	01/01/2017		

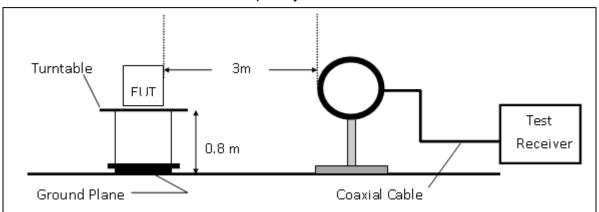
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.

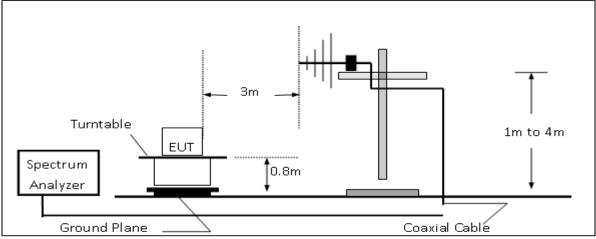


## 9.3 Test SET-UP

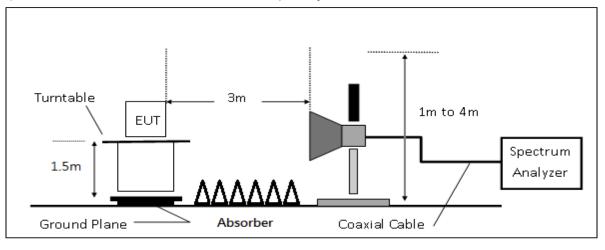
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



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

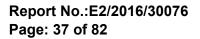


(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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。

除非另有就明,此報告結果僅對測試之樣品負責,问時此樣品僅保留则天。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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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 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





### 9.4 Measurement Procedure

- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules . 1.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 3. 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 4. the highest emissions.
- Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector 5. (PK) and Quasi-peak (QP) at frequency below 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at fre-6. quency above 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 7. 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- Maximum procedure was performed on the six highest emissions to ensure EUT com-8. pliance.
- 9. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 10. Repeat above procedures until all frequency measured were complete.

## 9.5 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:

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/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,同時此樣品僅係留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,此報告結果僅對測試之樣品負責,同時此樣品僅保留則天。本報告未經本公司書面許可,不可都份複製。 This document is issued by the Company subject to its General Conditions of Service printed overlead, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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



### Note :

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

# 9.6 Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

## 9.7 Measurement Result

Refer to attach tabular data sheets.

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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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

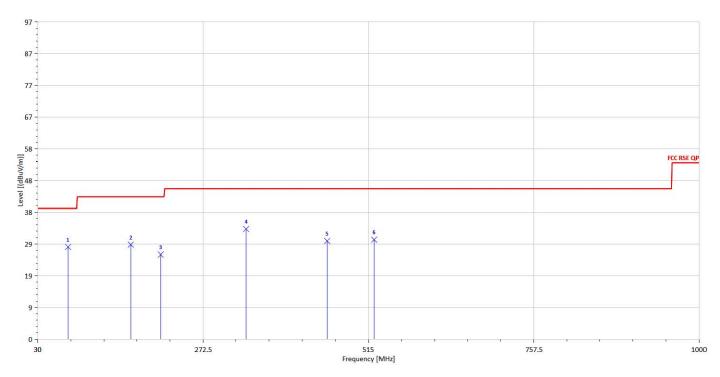
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



# 9.8 Radiated Spurious Emission Measurement Result (2TX MODE) Below 1GHz Worst-Case Data (2TX MODE):

#### 802.11a, 5725~5850 MHz

802.11a	Test Date :	2016/4/7
5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Tx CH Low	Test Engineer :	Ashton
E2	Measurement Antenna Pol.:	Vertical
	5745 MHz Tx CH Low	5745 MHz Temp. / Humi. : Tx CH Low Test Engineer :



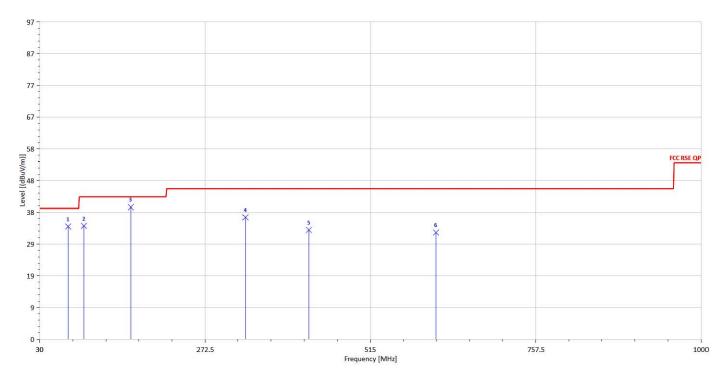
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
74.62	S	QP	49.56	-21.43	28.13	40	-11.87
166.77	S	Peak	46.83	-17.95	28.88	43.5	-14.62
210.42	S	Peak	42.98	-17.10	25.88	43.5	-17.62
335.55	S	Peak	45.58	-11.88	33.70	46	-12.30
454.86	S	Peak	38.45	-8.46	29.99	46	-16.01
523.73	S	Peak	37.83	-7.41	30.41	46	-15.59

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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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

SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號

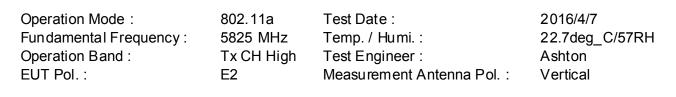


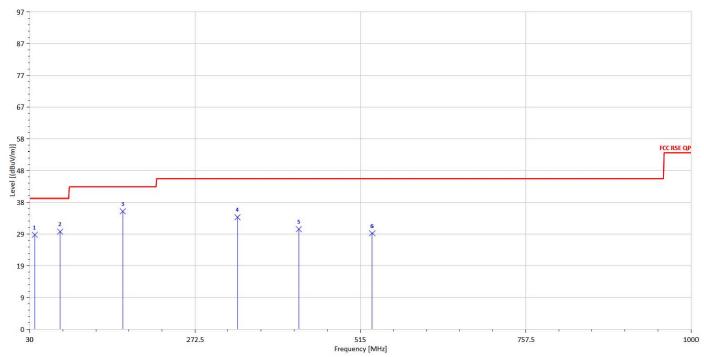
Operation Mode :	802.11a	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol.:	E2	Measurement Antenna Pol.:	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	S	Peak	56.13	-21.65	34.48	40	-5.52
94.99	S	Peak	53.28	-18.61	34.67	43.5	-8.83
163.86	S	Peak	57.97	-17.61	40.36	43.5	-3.14
331.67	S	Peak	49.23	-11.94	37.29	46	-8.71
424.79	S	Peak	42.49	-9.10	33.40	46	-12.60
611.03	S	Peak	39.41	-6.80	32.61	46	-13.39



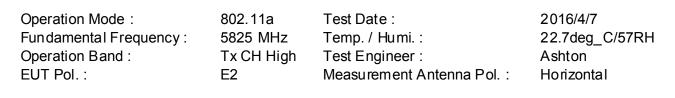


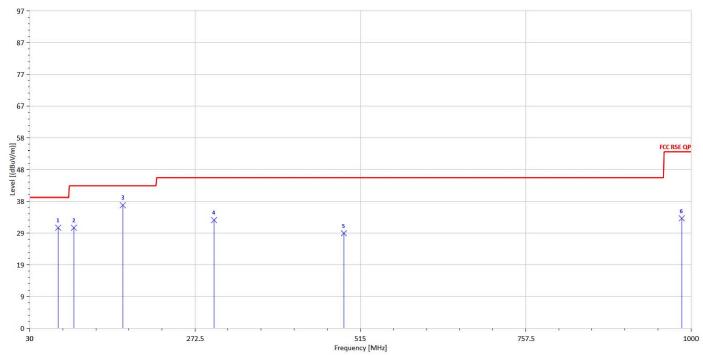


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
37.76	S	QP	40.32	-11.49	28.83	40	-11.17
74.62	S	QP	51.23	-21.43	29.80	40	-10.20
166.77	S	Peak	54.02	-17.95	36.07	43.5	-7.43
334.58	S	Peak	46.09	-11.85	34.25	46	-11.75
424.79	S	Peak	39.65	-9.10	30.55	46	-15.45
532.46	S	Peak	36.38	-7.09	29.29	46	-16.71

GS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號







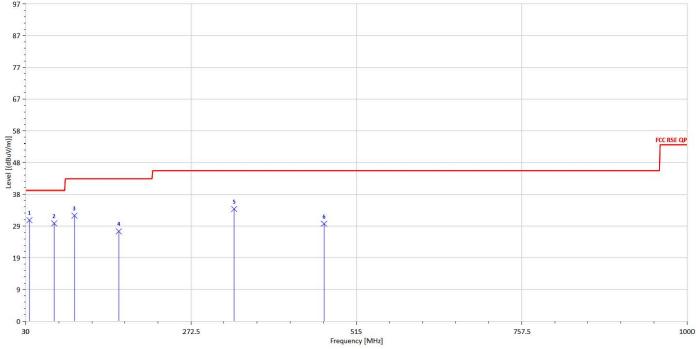
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	S	Peak	52.35	-21.65	30.70	40	-9.30
94.99	S	Peak	49.29	-18.61	30.68	43.5	-12.82
166.77	S	Peak	55.61	-17.95	37.66	43.5	-5.84
300.63	S	Peak	46.17	-13.12	33.06	46	-12.94
490.75	S	Peak	36.67	-7.68	28.98	46	-17.02
986.42	S	Peak	34.27	-0.65	33.61	54	-20.39

S Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



#### 802.11n HT40, 5725~5850 MHz

Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Vertical

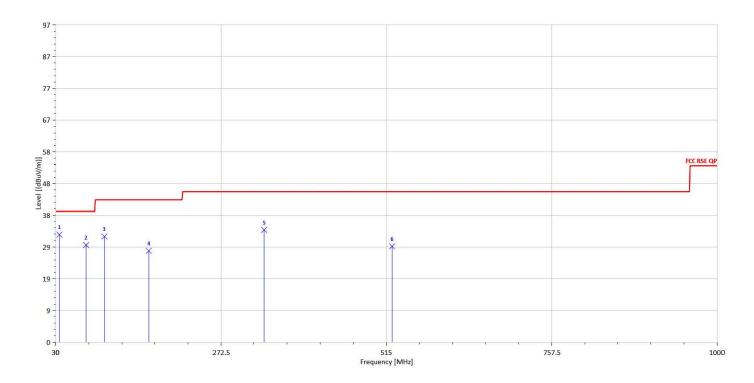


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
35.82	S	QP	41.23	-10.35	30.88	40	-9.12
71.71	S	QP	51.51	-21.65	29.86	40	-10.14
101.78	S	Peak	49.78	-17.52	32.26	43.5	-11.24
166.77	S	Peak	45.36	-17.95	27.41	43.5	-16.09
335.55	S	Peak	46.21	-11.88	34.33	46	-11.67
467.47	S	Peak	37.49	-7.73	29.76	46	-16.24

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



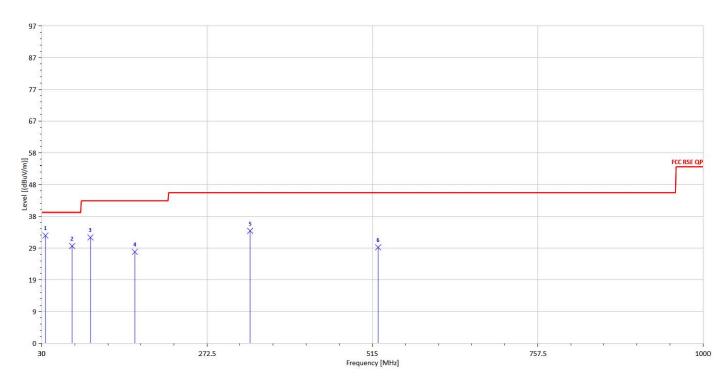
Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	S	Peak	51.08	-21.65	29.43	40	-10.57
94.99	S	Peak	49.62	-18.61	31.01	43.5	-12.49
166.77	S	Peak	55.83	-17.95	37.88	43.5	-5.62
300.63	S	Peak	47.08	-13.12	33.96	46	-12.04
436.43	S	Peak	40.65	-9.20	31.45	46	-14.55
539.25	S	Peak	35.93	-7.38	28.55	46	-17.45



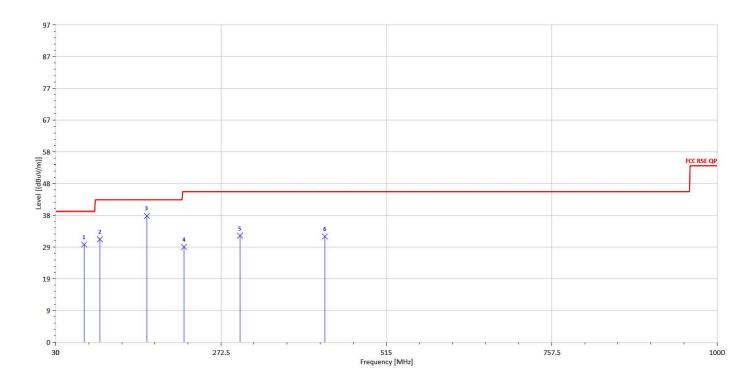
Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
35.82	S	QP	43.25	-10.35	32.90	40	-7.10
74.62	S	QP	51.11	-21.43	29.68	40	-10.32
101.78	S	Peak	49.85	-17.52	32.33	43.5	-11.17
166.77	S	Peak	45.84	-17.95	27.89	43.5	-15.61
335.55	S	Peak	46.24	-11.88	34.36	46	-11.64
523.73	S	Peak	36.68	-7.41	29.27	46	-16.73



Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Horizontal



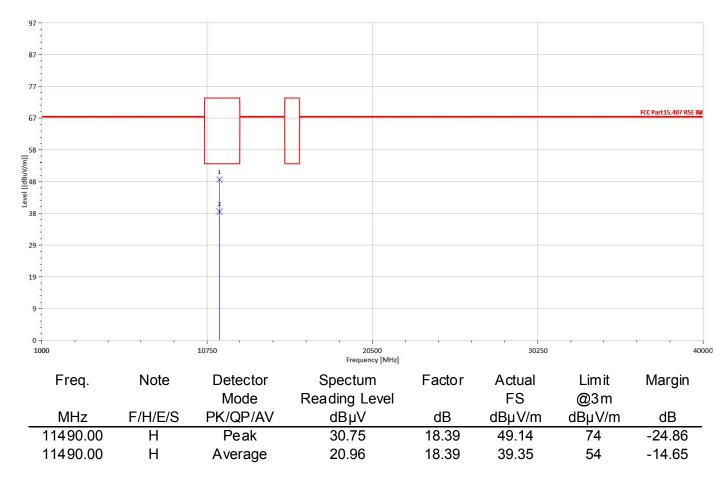
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	S	Peak	51.47	-21.65	29.83	40	-10.17
94.99	S	Peak	50.05	-18.61	31.43	43.5	-12.07
163.86	S	Peak	56.25	-17.61	38.64	43.5	-4.86
218.18	S	Peak	46.21	-17.15	29.06	46	-16.94
300.63	S	Peak	45.70	-13.12	32.59	46	-13.41
424.79	S	Peak	41.41	-9.10	32.32	46	-13.68



### Above 1GHz Worst-Case Data (2TX MODE):

#### Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz

Operation Mode :	802.11a	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Vertical



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.

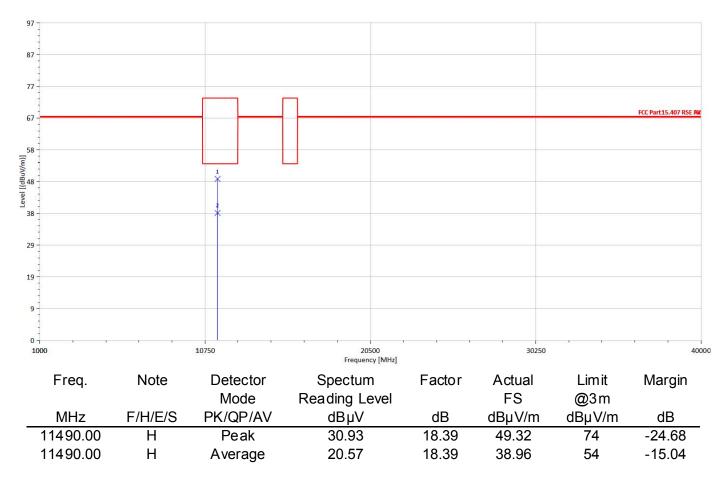
除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

除非方方就可 近報告題未僅對測測之後赤貝貝 河時近後赤貨術留別大 6 本報告本題本公司書面計 7 小可命位視泉。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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 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

S Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號

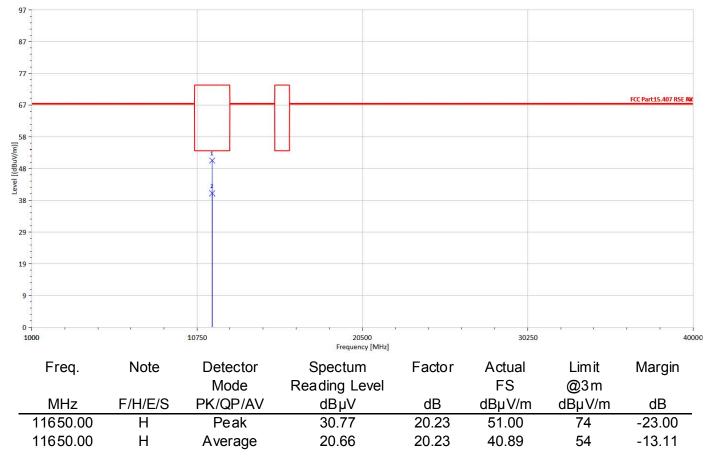


Operation Mode :	802.11a	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol.:	E2	Measurement Antenna Pol.:	Horizontal





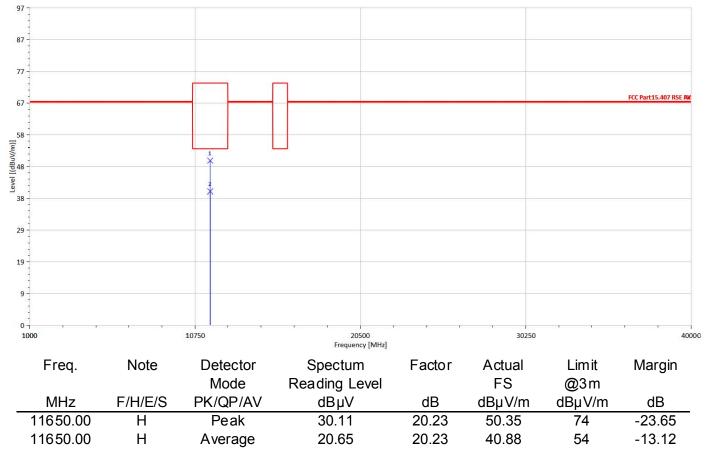
Operation Mode :	802.11a	Test Date :	2016/4/7
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



S Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



Operation Mode:	802.11a	Test Date :	2016/4/7
Fundamental Frequency:	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band:	Tx CH High	Test Engineer :	Ashton
EUT Pol.:	E2	Measurement Antenna Pol. :	Horizontal



pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law S Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



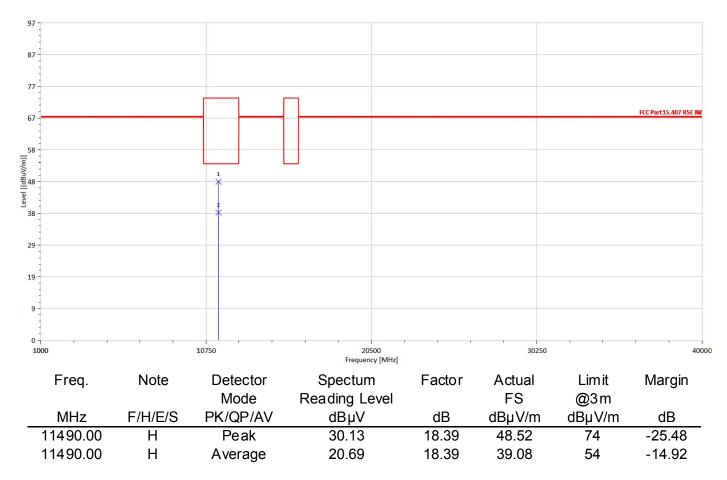
#### Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

Funda	tion Mode : mental Frequenc tion Band : ol. :	802.11 cy : 5745 M Tx CH E2	/Hz Temp Low Test F	Date : . / Humi. : Engineer : urement Antenr	na Pol. :	2016/4/7 22.7deg_C/s Ashton Vertical	57RH
97							
87 -							
67							FCC Part 15.407 RSE AM
58							
[[dw//mgp]]							
)] -   -   -   -   -   -   -   -   -   - 		2 *					
29 -							
19							
9-							
0					· · · ·		
1000		10750		500 cy [MHz]	30250		40000
Fred	a. Note	Detector Mode	Spectun Reading Le		Actual FS	Limit @3m	Margin
MH:	z F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11490		Peak	31.63	18.39	50.02	74	-23.98
11490	.00 H	Average	20.89	18.39	39.28	54	-14.72

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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



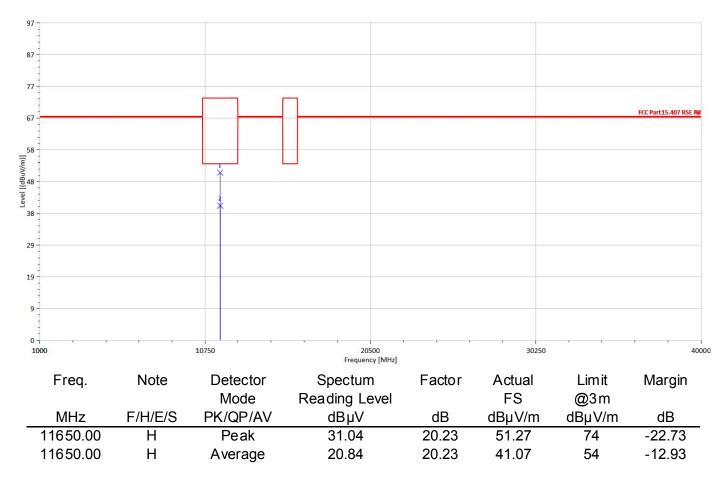
Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Horizontal



pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law S Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號

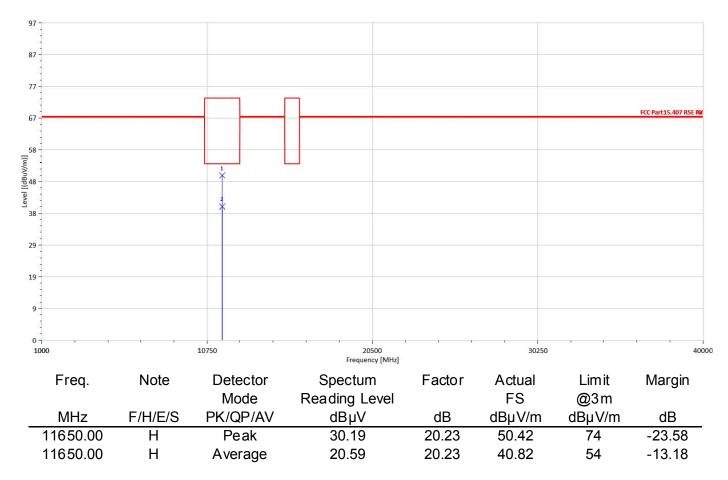


Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol.:	E2	Measurement Antenna Pol.:	Vertical





Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Horizontal



pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law S Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



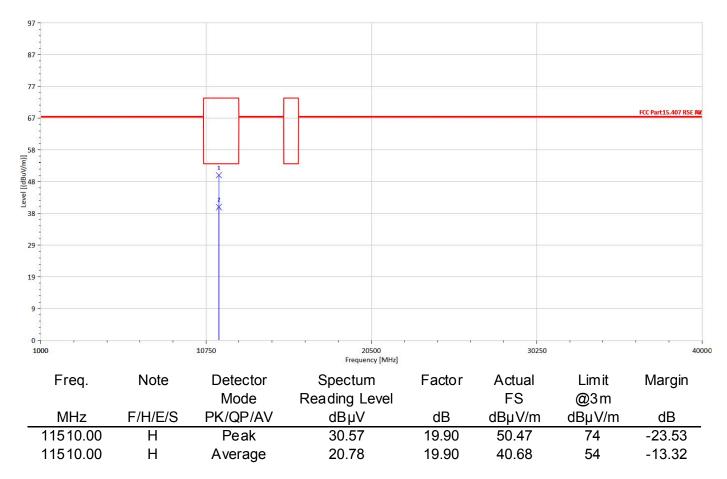
#### Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation N Fundament Operation E EUT Pol. :	al Frequenc	802.11 cy : 5755 M Tx CH E2	//Hz Temp Low Test	Date : b. / Humi. : Engineer : urement Antenr		2016/4/7 22.7deg_C/s Ashton Vertical	57RH
97							
87							
77							FCC Part 15.407 RSE PM
67							
Level [[dBuV/m]]		×					
20140 -   -   -   -   -   -   -   -   -   - 		2					
29 -							
19							
9							
0,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				, <u>, , , , , , , , , , , , , , , , , , </u>			
1000		10750		)500 ncy [MHz]	30250		40000
Freq.	Note	Detector Mode	Spectur Reading L		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11510.00	Н	Peak	30.61	19.90	50.51	74	-23.49
11510.00	Н	Average	20.67	19.90	40.57	54	-13.43

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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

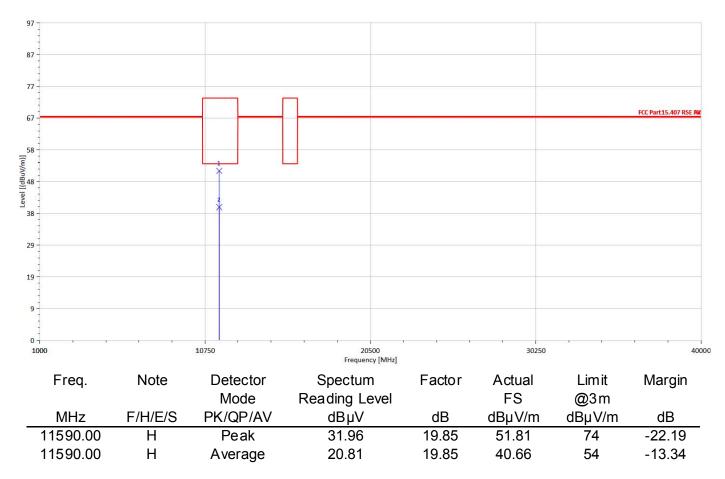


Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Horizontal



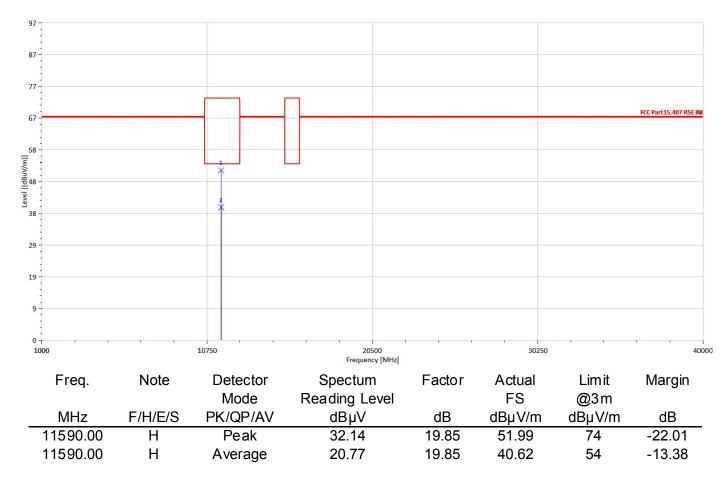


Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol.:	E2	Measurement Antenna Pol.:	Vertical





Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol.:	Horizontal

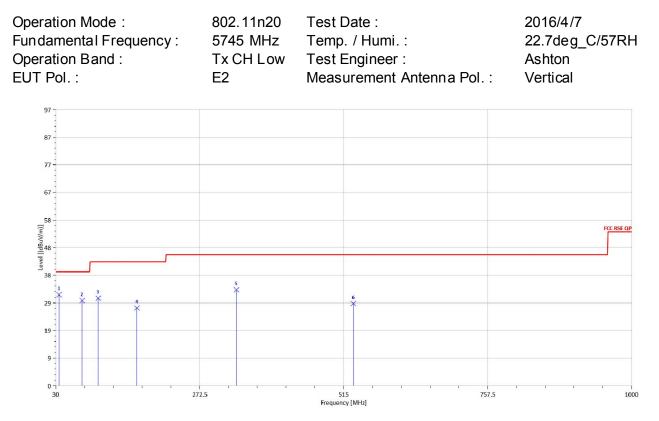


S Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



#### 9.9 **Radiated Spurious Emission Measurement Result (MIMO MODE)** Below 1GHz Worst-Case Data (MIMO MODE):

### 802.11n HT20, 5725~5850 MHz

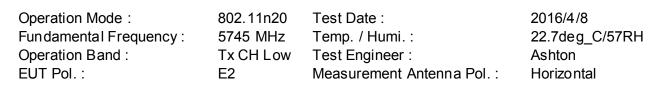


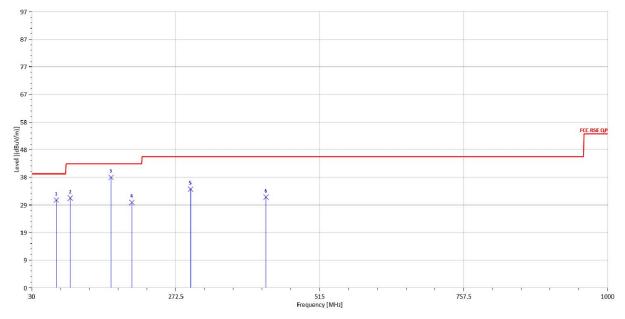
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
35.82	S	QP	42.32	-10.35	31.97	40	-8.03
74.62	S	QP	51.35	-21.43	29.92	40	-10.08
101.78	S	Peak	48.26	-17.52	30.74	43.5	-12.76
166.77	S	Peak	45.24	-17.95	27.30	43.5	-16.20
334.58	S	Peak	45.55	-11.85	33.70	46	-12.30
531.49	S	Peak	36.07	-7.22	28.85	46	-17.15

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 <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 atteration, 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

SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號

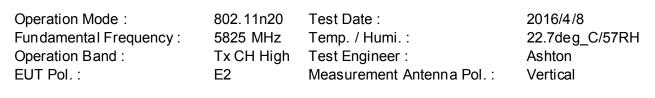


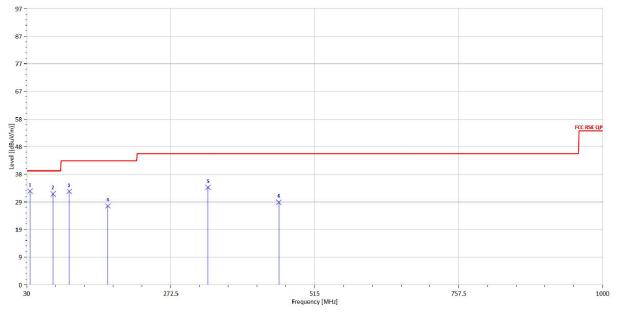




Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	S	Peak	52.45	-21.65	30.80	40	-9.20
94.99	S	Peak	50.09	-18.61	31.48	43.5	-12.02
163.86	S	Peak	56.35	-17.61	38.74	43.5	-4.76
198.78	S	Peak	47.52	-17.58	29.94	43.5	-13.56
297.72	S	Peak	47.76	-13.15	34.61	46	-11.39
424.79	S	Peak	40.93	-9.10	31.83	46	-14.17

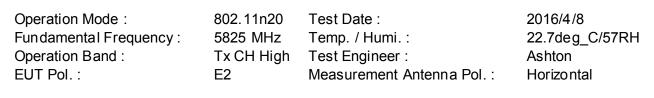


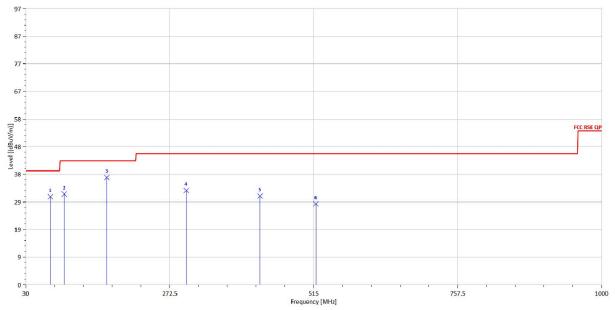




Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
35.82	S	QP	43.21	-10.35	32.86	40	-7.14
74.62	S	QP	53.32	-21.43	31.89	40	-8.11
101.78	S	Peak	50.27	-17.52	32.75	43.5	-10.75
166.77	S	Peak	45.60	-17.95	27.65	43.5	-15.85
335.55	S	Peak	46.05	-11.88	34.17	46	-11.83
454.86	S	Peak	37.40	-8.46	28.93	46	-17.07



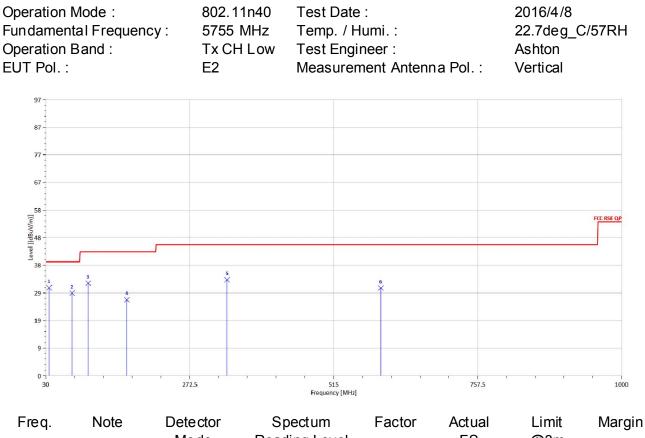




Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	S	Peak	52.55	-21.65	30.90	40	-9.10
94.99	S	Peak	50.45	-18.61	31.84	43.5	-11.66
166.77	S	Peak	55.61	-17.95	37.66	43.5	-5.84
300.63	S	Peak	46.20	-13.12	33.08	46	-12.92
424.79	S	Peak	40.24	-9.10	31.15	46	-14.85
518.88	S	Peak	35.81	-7.40	28.41	46	-17.59



#### 802.11n HT40, 5725~5850 MHz

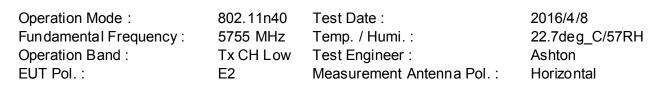


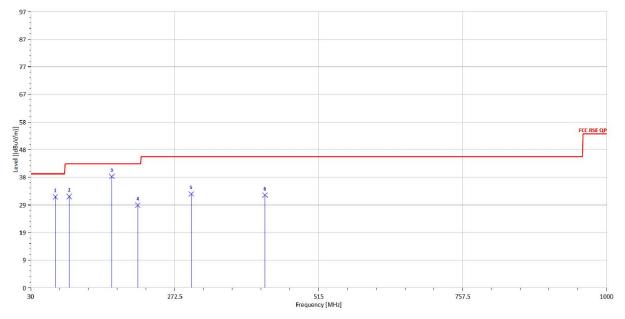
· · • • •								
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
35.82	S	QP	41.23	-10.35	30.88	40	-9.12	
74.62	S	QP	50.45	-21.43	29.02	40	-10.98	
101.78	S	Peak	50.00	-17.52	32.48	43.5	-11.02	
166.77	S	Peak	44.62	-17.95	26.67	43.5	-16.83	
335.55	S	Peak	45.58	-11.88	33.70	46	-12.30	
594.54	S	Peak	36.58	-5.76	30.82	46	-15.18	

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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

SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號

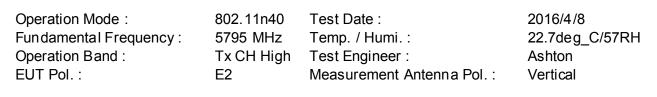


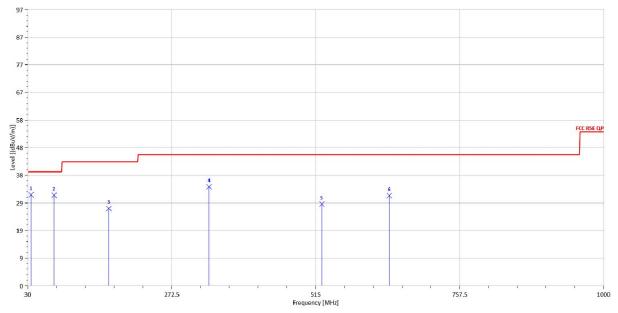




Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	S	Peak	53.56	-21.65	31.91	40	-8.09
94.99	S	Peak	50.64	-18.61	32.03	43.5	-11.47
166.77	S	Peak	57.04	-17.95	39.10	43.5	-4.40
210.42	S	Peak	46.08	-17.10	28.98	43.5	-14.52
300.63	S	Peak	46.04	-13.12	32.93	46	-13.07
424.79	S	Peak	41.61	-9.10	32.52	46	-13.48

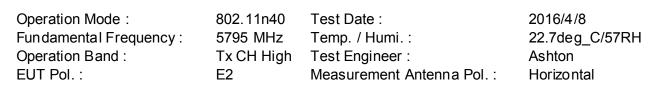


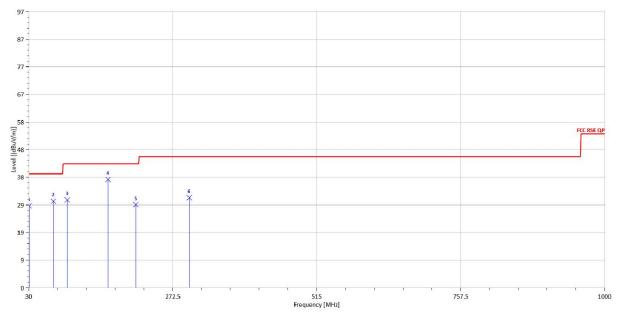




Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
35.82	S	QP	42.28	-10.35	31.93	40	-8.07
74.62	S	QP	53.21	-21.43	31.78	40	-8.22
166.77	S	Peak	45.07	-17.95	27.12	43.5	-16.38
335.55	S	Peak	46.61	-11.88	34.73	46	-11.27
525.67	S	Peak	36.15	-7.47	28.68	46	-17.32
639.16	S	Peak	36.90	-5.26	31.64	46	-14.36







Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
30.97	S	Peak	36.47	-7.70	28.76	40	-11.24
71.71	S	Peak	52.03	-21.65	30.38	40	-9.62
94.99	S	Peak	49.45	-18.61	30.84	43.5	-12.66
163.86	S	Peak	55.60	-17.61	37.99	43.5	-5.51
210.42	S	Peak	46.28	-17.10	29.18	43.5	-14.32
300.63	S	Peak	44.72	-13.12	31.60	46	-14.40



#### Above 1GHz Worst-Case Data (MIMO MODE):

#### Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

Operation N Fundament Operation E EUT Pol. :	al Frequenc	802.11 y : 5745 M Tx CH E2	1Hz Temp. Low Test E	ate : / Humi. : ngineer : irement Antenr	na Pol. :	2016/4/7 22.7deg_C/ł Ashton Vertical	57RH
97							
87 -							
77							
67 -						FCC Part15.	407 RSE AM
58							
دوبوا [(مالاسلام)] 28 8 30 40 40 40 40 40 40 40 40 40 40 40 40 40		1					
38		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
29 -							
19							
9							
0	ii			. i i i			
1000		10750	2050 Frequency	[MHz]	30250		40000
Freq.	Note	Detector Mode	Spectum Reading Le		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Н	Peak	30.89	18.39	49.28	74	-24.72
11490.00	Н	Average	20.90	18.39	39.29	54	-14.71

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



Operation N Fundament Operation E EUT Pol. :	al Frequenc	802.11 y : 5745 M Tx CH I E2	IHz Temp. / Low Test Eng	Humi. :		2016/4/7 22.7deg_C/& Ashton Horizontal	57RH
87 -							
67-						FCC Part15.	407 RSE RX
58 [(ш//\ngda 48 38 29		1 7 7 7					
9-							
1000	ŤŤŤ	10750	20500 Frequency [MH	[z]	30250		40000
Freq.	Note	Detector Mode	Spectum Reading Leve	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00 11490.00	H H	Peak Average	30.08 20.65	18.39 18.39	48.47 39.04	74 54	-25.53 -14.96



Operation N Fundament Operation E EUT Pol. :	al Frequenc	802.11 y : 5825 M Tx CH E2	1Hz Temp High Test	Date : b. / Humi. : Engineer : urement Anteni	na Pol. :	2016/4/7 22.7deg_C/& Ashton Vertical	57RH
97 -							
87							
77							
						FCC Part 15.	407 RSE RM
67 -							
58 [[ɯ/\/\ŋq48 [həəə]		×					
38		*					
29							
19							
9							
0	ī ī	10750		500 icy [MHz]	30250		40000
Freq.	Note	Detector	Spectur		Actual	Limit	Margin
N 41 1_		Mode	Reading L		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00 11650.00	H H	Peak Average	30.83 20.94	20.23 20.23	51.07 41.17	74 54	-22.93 -12.83
1000.00		Average	20.34	20.23	<b>H</b> 1.17	54	-12.00



Operation N Fundament Operation E EUT Pol. :	al Frequenc	802.11r y : 5825 M Tx CH I E2	Hz Temp High Test E	Date : . / Humi. : Engineer : urement Anteni		2016/4/7 22.7deg_C/§ Ashton Horizontal	57RH
97 87 77							
67 58 [(w//\ngg]48 ] Java1 38 29		1 *				FCC Part15.	407 RSE RM
19 9 0 1000	, , ,	10750	205 Frequenc	ry [MHz]	30250		40000
Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectum Reading Le dBµV		Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
11650.00 11650.00	H H	Peak Average	30.23 20.59	20.23 20.23	50.47 40.82	74 54	-23.53 -13.18



#### Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation M Fundamenta Operation B EUT Pol. :	al Frequenc	802.11 cy : 5755 M Tx CH E2	/Hz Temp Low Test	Date : b. / Humi. : Engineer : urement Antenr		2016/4/7 22.7deg_C/5 Ashton Vertical	57RH
97 -							
87							
77							
67 -						FCC Part15.	407 RSE RM
58 - [(ш //г							
58 [[w/\/10]] 48 38		*					
29 -							
19							
9 -							
0	, ı	10750		500 Ccy [MHz]	30250		40000
Freq.	Note	Detector	Spectur		Actual	Limit	Margin
MHz		Mode	Reading L		FS dDu\//m	@3m	٩D
11510.00	F/H/E/S H	PK/QP/AV Peak	dBµV 30.39	dB 19.90	dBµV/m 50.29	dBµV/m 74	dB -23.71
11510.00	H	Average	20.72	19.90	40.62	74 54	-23.71
11010.00		Average	20.12	10.00	70.02	07	10.00

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 is anyted to the fullest extent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

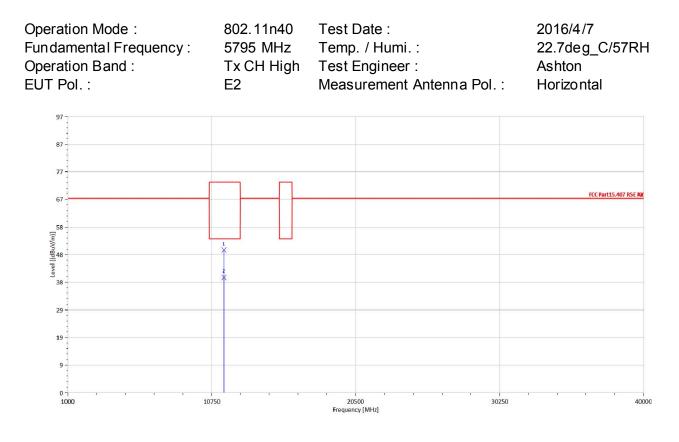


Operation N Fundament Operation E EUT Pol. :	al Frequenc	802.11 y : 5755 M Tx CH I E2	IHz Temp. / Low Test Eng	Humi.:	na Pol. :	2016/4/7 22.7deg_C/ Ashton Horizontal	57RH
97 -							
87 -							
77							
67						FCC Part 15.	407 RSE AM
58 - [(ɯ//\ŋg48 -		1					
38-		*					
29							
19							
9							
0							
1000		10750	20500 Frequency [M	Hz]	30250		40000
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode PK/QP/AV	Reading Leve	el dB	FS dBuV/m	@3m dBu\//m	dB
11510.00	<u>г/п/Е/З</u> Н	PR/QP/AV	dBµV 32.03	<u>ив</u> 19.90	dBµV/m 51.93	dBµV/m 74	-22.07
11510.00	H	Average	20.69	19.90 19.90	40.59	74 54	-13.41



Operation N Fundament Operation E EUT Pol. :	al Frequenc	802.11ı y : 5795 M Tx CH I E2	1Hz Temp High Test	Date : p. / Humi. : Engineer : surement Anten	na Pol. :	2016/4/7 22.7deg_C/s Ashton Vertical	57RH
97							
87							
77							
67 -						FCC Part15	407 RSE RM
58 [(ɯ/ʌาɡ尹]] Jəəə		×					
38 -		*					
29							
19							
9							
0		10750		0500 ency [MHz]	30250	- i i i	40000
Freq.	Note	Detector	Spectur			Limit	Margin
MHz	F/H/E/S	Mode PK/QP/AV	Reading L dBµV		FS dBµV/m	@3m dBµV/m	dB
11590.00	H	Peak	31.04		50.89	74	-23.11
11590.00	Н	Average	20.78	19.85	40.63	54	-13.37





Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11590.00	Н	Peak	30.27	19.85	50.12	74	-23.88
11590.00	Н	Average	20.64	19.85	40.49	54	-13.51

SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



# Band edge falling to restricted band (2TX MODE)

#### 802.11a 5725~5850 MHz

Operation M Fundamenta Operation B EUT Pol. :	al Frequenc	802.11a y : 5745 M BE CH E2	Hz Temp. / H Low Test Eng	łumi. :	na Pol. :	2016/4/7 22.7deg_C Ashton Vertical	/57RH
Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
5713.90	S	Peak	<u> </u>	11.97	63.07	<u>68.3</u>	-5.23
5724.80	S	Peak	54.73	12.01	66.74	78.2	-11.46
5725.00	Е	Peak	52.38	12.01	64.39	78.2	-13.81
Operation M Fundamenta Operation B EUT Pol. :	al Frequenc	802.11a y : 5745 M BE CH E2	Hz Temp. / H Low Test Eng	łumi. :	na Pol. :	2016/4/7 22.7deg_C Ashton Horizontal	/57RH
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
	_	Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	d BµV	dB	dBµV/m	dBµV/m	dB
5714.10 5723.70	S S	Peak Peak	55.82 62.34	11.97 12.01	67.79 74.35	68.3 78.2	-0.51 -3.85
5725.00	E	Peak	60.37	12.01	74.35	78.2	-5.82
Operation N Fundamenta Operation B EUT Pol. :	al Frequency	802.11a y : 5825 Mi BE CH I E2	Hz Temp. / H High Test Eng	Humi. :	ina Pol. :	2016/4/7 22.7deg_C Ashton Vertical	C/57RH
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	E	Peak	55.13	12.15	67.27	78.2	-10.93
5860.20	S	Peak	51.89	12.33	64.22	68.3	-4.08
Operation M		802.11a				2016/4/7	
Fundamenta			•			22.7deg_C	:/57RH
Operation B EUT Pol. :	and :	BE CH I E2	• •	ineer : ment Anten	na Poli ·	Ashton Horizontal	
Freq.	Note	Detector	Spectum Reading Level	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB
5850.00	E	Peak	57.55	12.15	69.70	78.2	-8.50
5850.50	S	Peak	57.78	12.16	69.94	78.2	-8.26
5860.50	S	Peak	54.09	12.34	66.42	68.3	-1.88



#### 802.11n\_HT20, 5725~5850 MHz

Operation Mo Fundamental Operation Ba EUT Pol. :	Frequency	/: 5745 M	BE CH Low Test Engineer :		lumi. : neer :	na Pol. :	2016/4/7 22.7deg_C Ashton Vertical	/57RH
Freq.	Note	Detector	Sp	pectum	Factor	Actual	Limit	Margin
		Mode	Read	ling Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	c	lΒμV	dB	dBµV/m	dBµV/m	dB
5714.10	S	Peak	5	50.25	11.97	62.22	68.3	-6.08
5724.60	S	Peak	5	56.63	12.01	68.64	78.2	-9.56
5725.00	Е	Peak	5	54.89	12.01	66.90	78.2	-11.30
Operation Mo Fundamental		802.11r /: 5745 M		Test Date Temp. / H			2016/4/7 22.7deg_C	/57RH
Operation Ba		BE CH		Test Engi			Ashton	
EUT Pol. :		E2		-	nent Anten	na Pol	Horizontal	
				Measurer			TIONZONIU	
Freq.	Note	Detector	Sp	bectum	Factor	Actual	Limit	Margin
		Mode	Read	ling Level		FS	@3m	Ū
MHz	F/H/E/S	PK/QP/AV	c	IΒμV	dB	dBµV/m	dBµV/m	dB
5714.90	S	Peak	5	55.44	11.97	67.42	68.3	-0.88
5724.90	S	Peak	6	60.37	12.01	72.38	78.2	-5.82
	-			/0.0/				



Operation M Fundamenta Operation B EUT Pol. :	al Frequency	802.11n /: 5825 MI BE CH I E2	Hz Temp. / High Test Eng	ina Pol. :	2016/4/7 22.7deg_0 Ashton Vertical	C/57RH	
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	E	Peak	53.89	12.15	66.04	78.2	-12.16
5850.30	S	Peak	55.08	12.15	67.23	78.2	-10.97
5860.70	S	Peak	51.09	12.34	63.44	68.3	-4.86
Operation M	lode :	802.11n	20 Test Dat	te :		2016/4/7	
Fundamenta	al Frequency	/: 5825 MI	Hz Temp. /	Humi. :		22.7deg_0	C/57RH
Operation B	and :	BE CH I	High Test Eng	gineer :		Ashton	
EUT Pol. :		E2	Measure	ement Anten	ina Pol. :	Horizontal	
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	E	Peak	57.60	12.15	<u>69.75</u>	78.2	-8.45
5850.80	S	Peak	57.60	12.16	69.76	78.2	-8.44
5862.00	S	Peak	53.49	12.10	65.85	68.3	-2.45
0002.00	0	r can	00.40	12.07	00.00	00.0	-2.70



#### 802.11n\_HT40, 5725~5850 MHz

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Operation M Fundamenta Operation B EUT Pol. :	al Frequency	y: 5755 M	BE CH Low Test Engineer :		ina Pol. :	2016/4/7 22.7deg_0 Ashton Vertical	757RH
5713.20   S   Peak   50.61   11.97   62.58   68.3   -5.72     5722.00   S   Peak   53.09   12.01   65.10   78.2   -11.60     5725.00   E   Peak   53.09   12.01   65.10   78.2   -13.10     Operation Mode :   802.11n40   Test Date :   2016/4/7   2.7deg_C/57RH     Operation Band :   BE CH Low   Test Engineer :   Ashton   Ashton     EUT Pol. :   E2   Measurement Antenna Pol. :   Horizontal   Horizontal     MHz   F/H/E/S   PK(QP/AV   dBµV   dBµV/m   dBµV/m   dBµV/m     5714.80   S   Peak   55.78   11.97   67.76   68.3   -0.54     5721.40   S   Peak   60.87   12.00   72.87   78.2   -5.33     5725.00   E   Peak   60.46   12.01   72.47   78.2   -5.73     Operation Mode :   802.11n40   Test Engineer :   Ashton   2016/4/7   Fund	·		Mode	Reading Level		FS	@3m	·
5722.00   S   Peak   54.60   12.00   66.60   78.2   -11.60     5725.00   E   Peak   53.09   12.01   65.10   78.2   -13.10     Operation Mode :   802.11n40   Test Date :   2016/4/7     Fundamental Frequency :   5755 MHz   Temp. / Humi. :   22.7deg_C/57RH     Operation Band :   BE CH Low   Test Engineer :   Ashton     EUT Pol. :   E2   Measurement Antenna Pol. :   Horizontal     Freq.   Note   Detector   Spectum   Factor   Actual   Limit   Margin     65714.80   S   Peak   65.78   11.97   67.76   68.3   -0.54     5725.00   E   Peak   60.46   12.01   72.47   78.2   -5.33     5725.00   E   Peak   60.46   12.01   72.47   78.2   -5.73     Operation Mode :   802.11n40   Test Date :   2016/4/7   2016/4/7     Fundamental Frequency :   5795 MHz   Temp. / Humi. :				•		•		
5725.00   E   Peak   53.09   12.01   65.10   78.2   -13.10     Operation Mode :   802.11n40   Test Date :   2016/4/7     Uperation Band :   BE CH Low   Test Engineer :   Ashton     EUT Pol. :   E2   Test Engineer :   Ashton     MHz   F/H/E/S   PK/QP/AV   BE V   BB V     MHz   F/H/E/S   PK/QP/AV   BB V   dB dBµV/m   dBµV/m     5714.80   S   Peak   55.78   11.97   67.76   68.3   -0.54     5725.00   E   Peak   60.87   12.01   72.47   78.2   -5.33     Operation Mode :   802.11n40   Test Date :   2016/4/7   Fundamental Frequency :   5795 MHz   Temp. / Humi. :   22.7deg_C/57RH     Operation Band :   BE CH High   Test Date :   2016/4/7   78.2   -5.33     Goperation Band :   BE CH High   Test Engineer :   Ashton   22.7deg_C/57RH     Operation Band :   BE CH High   Test Engineer :   Ashton	5713.20		Peak					
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	5722.00		Peak	54.60	12.00	66.60	78.2	-11.60
Fundamental Frequency :5755 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH LowTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualLimitMHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdB5714.80SPeak55.7811.9767.7668.3-0.545721.40SPeak60.8712.0072.8778.2-5.335725.00EPeak60.4612.0172.4778.2-5.73Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :VerticalFreq.NoteDetectorSpectumFactorActualMdzF/H/E/SPK/QP/AVdBµVdBdBµV/mdBs80.00EPeak45.6312.1557.7878.2MHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdB5860.00SPeak45.6312.1658.7278.2-19.485860.00SPeak45.6312.1658.7278.2-19.485860.01SPeak45.6312.1658.7278.2-19.48 <t< td=""><td>5725.00</td><td>E</td><td>Peak</td><td>53.09</td><td>12.01</td><td>65.10</td><td>78.2</td><td>-13.10</td></t<>	5725.00	E	Peak	53.09	12.01	65.10	78.2	-13.10
Operation Band : EUT Pol. :BE CH Low E2Test Engineer : Measurement Antenna Pol. :Ashton HorizontalFreq.NoteDetector Mode Reading LevelFactor Reading LevelActual FSLimit Margin @3mMHzF/H/E/SPK/QP/AVBµVdBdBµV/mdB5714.80SPeak55.7811.9767.7668.3-0.545721.40SPeak60.8712.0072.8778.2-5.335725.00EPeak60.4612.0172.4778.2-5.73Operation Mode : Band :802.11n40Test Date : E22016/4/72016/4/7Fundamental Frequency : S795 MHz5795 MHzTemp. / Humi. : Test Engineer :2016/4/7Operation Band : EUT Pol. :BE CH High BE CH HighTest Engineer : Test Engineer :AshtonFreq.NoteDetector Mode 	•							
EUT Pol.:E2Measurement Antenna Pol.:HorizontalFreq.NoteDetector ModeSpectum Reading LevelFactorActual FSLimit @3mMargin @3mMHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdBdBµV/mdB5714.80SPeak55.7811.9767.7668.3-0.545721.40SPeak60.8712.0072.8778.2-5.335725.00EPeak60.4612.0172.4778.2-5.73Operation Mode : Fundamental Frequency :802.11n40Test Date : Test Engineer : Measurement Antenna Pol. :2016/4/7Operation Band : EUT Pol. :BE CH High Mode ModeTest Engineer : Reading LevelAshtonFreq.NoteDetector Mode Reading LevelSpectum FS@3mMHzF/H/E/SPK/QP/AVdBµVdBdBµV/mMHzF/H/E/SPK/QP/AVdBµVdBdBµV/m5850.00EPeak45.6312.1557.7878.2-20.425850.00EPeak45.6612.1658.7278.2-19.485800.50SPeak44.8012.3457.1368.3-11.17Operation Mode : Stab0.50802.11n40Test Date : Test Date :2016/4/72016/4/7Fundamental Frequency : S795 MHz5795 MHzTemp. / Humi. : Temp. / Humi. :22.7deg_C/57RHOperation Band : EUT Pol. :B			•	-				757RH
Freq.NoteDetector ModeSpectum Reading LevelFactorActual FSLimit @3mMargin @3mMHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdBdBµV/mdB5714.80SPeak55.7811.9767.7668.3-0.545721.40SPeak60.8712.0072.8778.2-5.335725.00EPeak60.4612.0172.4778.2-5.73Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :VerticalFreq.NoteDetectorSpectumFactorActualLimitMHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdB5850.00EPeak45.6312.1557.7878.2-20.425850.70SPeak46.5612.1658.7278.2-19.485860.50SPeak44.8012.3457.1368.3-11.17Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH High	•	sand :		•				
Mode   Reading Level   FS   @3m     MHz   F/H/E/S   PK/QP/AV   dBµV   dB   dBµV/m   dBµV/m   dB     5714.80   S   Peak   55.78   11.97   67.76   68.3   -0.54     5721.40   S   Peak   60.87   12.00   72.87   78.2   -5.33     5725.00   E   Peak   60.46   12.01   72.47   78.2   -5.73     Operation Mode :   802.11n40   Test Date :   2016/4/7     Fundamental Frequency :   5795 MHz   Temp. / Humi. :   22.7deg_C/57RH     Operation Band :   BE CH High   Test Engineer :   Ashton     EUT Pol. :   E2   Measurement Antenna Pol. :   Vertical     Freq.   Note   Detector   Spectum   Factor   Actual   Limit   Margin     5850.00   E   Peak   45.63   12.15   57.78   78.2   -20.42     5860.50   S   Peak   46.56   12.16   58.72   78.2 </td <td>EUT POL:</td> <td></td> <td>E2</td> <td>Measurer</td> <td>nent Anten</td> <td>ina Pol. :</td> <td>Horizontai</td> <td></td>	EUT POL:		E2	Measurer	nent Anten	ina Pol. :	Horizontai	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
5714.80   S   Peak   55.78   11.97   67.76   68.3   -0.54     5721.40   S   Peak   60.87   12.00   72.87   78.2   -5.33     5725.00   E   Peak   60.46   12.01   72.47   78.2   -5.73     Operation Mode :   802.11n40   Test Date :   2016/4/7     Fundamental Frequency :   5795 MHz   Temp. / Humi. :   22.7deg_C/57RH     Operation Band :   BE CH High   Test Engineer :   Ashton     EUT Pol. :   E2   Measurement Antenna Pol. :   Vertical     Freq.   Note   Detector   Spectum   Factor   Actual   Limit   Margin     MHz   F/H/E/S   PK/QP/AV   dBµV   dB   dBµV/m   dB     5850.00   E   Peak   45.63   12.15   57.78   78.2   -20.42     5850.70   S   Peak   46.56   12.16   58.72   78.2   -19.48     5860.50   S   Peak   44.80			Mode	Reading Level		FS	@3m	-
5721.40 S Peak 60.87 12.00 72.87 78.2 -5.33   5725.00 E Peak 60.46 12.01 72.47 78.2 -5.73   Operation Mode : 802.11n40 Test Date : 2016/4/7   Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH   Operation Band : BE CH High Test Engineer : Ashton   EUT Pol. : E2 Measurement Antenna Pol. : Vertical   Freq. Note Detector Spectum Factor Actual Limit Margin   Mode Reading Level FS @3m @3m  -20.42   5850.00 E Peak 45.63 12.15 57.78 78.2 -20.42   5850.70 S Peak 46.56 12.16 58.72 78.2 -19.48   5860.50 S Peak 44.80 12.34 57.13 68.3 -11.17   Operation Mode : 802.11n40 Test Date : 2016/4/7 22.7deg_C/57RH   Operation Band : BE CH High <	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00   E   Peak   60.46   12.01   72.47   78.2   -5.73     Operation Mode :   802.11n40   Test Date :   2016/4/7     Fundamental Frequency :   5795 MHz   Temp. / Humi. :   22.7deg_C/57RH     Operation Band :   BE CH High   Test Engineer :   Ashton     EUT Pol. :   E2   Measurement Antenna Pol. :   Vertical     Freq.   Note   Detector   Spectum   Factor   Actual   Limit   Margin     Mdz   F/H/E/S   PK/QP/AV   dBµV   dB   dBµV/m   dB   dBµV/m   dB     5850.00   E   Peak   45.63   12.15   57.78   78.2   -20.42     5850.70   S   Peak   46.56   12.16   58.72   78.2   -19.48     5860.50   S   Peak   44.80   12.34   57.13   68.3   -11.17     Operation Mode :   802.11n40   Test Date :   2016/4/7   22.7deg_C/57RH     Poperation Band :   BE CH High   Te	5714.80	S	Peak	55.78	11.97	67.76	68.3	-0.54
Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :VerticalFreq.NoteDetectorSpectumFactorActualModeReading LevelFS@3mMHzF/H/E/SPK/QP/AVdBµVdBdBµV/m5850.00EPeak45.6312.1557.7878.25850.70SPeak46.5612.1658.7278.2-19.485860.50SPeak44.8012.3457.1368.3-11.17Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualLimitMarginMeasurement Antenna Pol. :Horizontal	5721.40	S	Peak	60.87	12.00	72.87	78.2	-5.33
Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :VerticalFreq.NoteDetectorSpectumFactorActualLimitMarginModeReading LevelFS@3mMBµV/mdBBµV/mdBBµV/mdB5850.00EPeak45.6312.1557.7878.2-20.425850.70SPeak46.5612.1658.7278.2-19.485860.50SPeak44.8012.3457.1368.3-11.17Operation Mode :802.11n40Test Date :2016/4/722.7deg_C/57RHFundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualModeReading LevelF3@3m	5725.00	E	Peak	60.46	12.01	72.47	78.2	-5.73
Operation Band :BE CH High EUT Pol. :Test Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :VerticalFreq.NoteDetectorSpectum Reading LevelFactor FSActual (@3m)Limit (Margin)MHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdB5850.00EPeak45.6312.1557.7878.2-20.425850.70SPeak46.5612.1658.7278.2-19.485860.50SPeak44.8012.3457.1368.3-11.17Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualLimitMarginModeReading LevelFS@3m								
EUT Pol. :E2Measurement Antenna Pol. :VerticalFreq.NoteDetectorSpectumFactorActualLimitMarginModeReading LevelFS@3mMHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdB5850.00EPeak45.6312.1557.7878.2-20.425850.70SPeak46.5612.1658.7278.2-19.485860.50SPeak44.8012.3457.1368.3-11.17Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualLimitModeReading LevelF3<				•				:/57RH
Freq.NoteDetector ModeSpectum Reading LevelFactorActual FSLimit @3mMargin @3mMHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdBµV/mdB5850.00EPeak45.6312.1557.7878.2-20.425850.70SPeak46.5612.1658.7278.2-19.485860.50SPeak44.8012.3457.1368.3-11.17Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualLimitMargin @3mModeReading LevelFS@3m		and :		• •		na Dal i		
ModeReading LevelFS@3mMHzF/H/E/SPK/QP/AVdBµVdBdBµV/mdBµV/mdB5850.00EPeak45.6312.1557.7878.2-20.425850.70SPeak46.5612.1658.7278.2-19.485860.50SPeak44.8012.3457.1368.3-11.17Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measure ment Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualLimitModeReading LevelFS@3m								
MHz   F/H/E/S   PK/QP/AV   dBµV   dB   dBµV/m   dBµV/m   dB     5850.00   E   Peak   45.63   12.15   57.78   78.2   -20.42     5850.70   S   Peak   46.56   12.16   58.72   78.2   -19.48     5860.50   S   Peak   44.80   12.34   57.13   68.3   -11.17     Operation Mode :   802.11n40   Test Date :   2016/4/7     Fundamental Frequency :   5795 MHz   Temp. / Humi. :   22.7deg_C/57RH     Operation Band :   BE CH High   Test Engineer :   Ash ton     EUT Pol. :   E2   Measurement Antenna Pol. :   Horizontal     Freq.   Note   Detector   Spectum   Factor   Actual   Limit   Margin     Mode   Reading Level   FS   @3m   4dagan   4dagan   4dagan	Freq.	Note			Factor			Margin
5850.00   E   Peak   45.63   12.15   57.78   78.2   -20.42     5850.70   S   Peak   46.56   12.16   58.72   78.2   -19.48     5860.50   S   Peak   44.80   12.34   57.13   68.3   -11.17     Operation Mode :   802.11n40   Test Date :   2016/4/7     Fundamental Frequency :   5795 MHz   Temp. / Humi. :   22.7deg_C/57RH     Operation Band :   BE CH High   Test Engineer :   Ashton     EUT Pol. :   E2   Measurement Antenna Pol. :   Horizontal     Freq.   Note   Detector   Spectum   Factor   Actual   Limit   Margin     Mode   Reading Level   FS   @3m   3m   3m   3m				•			-	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						-	-	
5860.50SPeak44.8012.3457.1368.3-11.17Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualLimitModeReading LevelFS@3m								
Operation Mode :802.11n40Test Date :2016/4/7Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualModeReading LevelFS@3m								
Fundamental Frequency :5795 MHzTemp. / Humi. :22.7deg_C/57RHOperation Band :BE CH HighTest Engineer :AshtonEUT Pol. :E2Measurement Antenna Pol. :HorizontalFreq.NoteDetectorSpectumFactorActualModeReading LevelFS@3m	5860.50	S	Peak	44.80	12.34	57.13	68.3	-11.17
Operation Band : BE CH High Test Engineer : Ashton   EUT Pol. : E2 Measurement Antenna Pol. : Horizontal   Freq. Note Detector Spectum Factor Actual Limit Margin   Mode Reading Level FS @3m	Operation N	lode :	802.11r	n40 Test Date	e:		2016/4/7	
EUT Pol.:E2Measurement Antenna Pol.:HorizontalFreq.NoteDetectorSpectumFactorActualLimitMarginModeReading LevelFS@3m	Fundamenta	al Frequency	/: 5795 M	Hz Temp. / H	łumi. :		22.7deg_0	C/57RH
Freq. Note Detector Spectum Factor Actual Limit Margin Mode Reading Level FS @3m	Operation B	and :	BE CH	High Test Engi	neer :		Ashton	
Mode Reading Level FS @3m	EUT Pol. :		E2	Measurer	ment Anter	na Pol. :	Horizontal	
Mode Reading Level FS @3m	Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
			Mode	Reading Level		FS	@3m	-
<u>MHz F/H/E/S PK/QP/AV dBµV dB dBµV/m dBµ</u> V/m dB	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00 E Peak 50.79 12.15 62.94 78.2 -15.26	5850.00	E	Peak	50.79	12.15	62.94	78.2	-15.26
5850.50 S Peak 51.73 12.16 63.89 78.2 -14.31	5850.50		Peak	51.73	12.16	63.89	78.2	-14.31
5860.20 S Peak 49.70 12.33 62.03 68.3 -6.27	5860.20	S	Peak	49.70	12.33	62.03	68.3	-6.27

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。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 ap-pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGCS Taiwan Ltd. No.134 Wu/KunRboad.NewTaibeiIndustrialPark.Wu/kunDistrict NewTaibeiCity. Taiwan24803/新 th. the T& BIG M the test of the test the test of the law.

台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com



### Band edge falling to restricted band (MIMO MODE)

#### 802.11n\_HT20, 5725~5850 MHz

Operation Mode: Fundamental Frequency: Operation Band: EUT Pol.:		y : 5745 M	802.11n20Test Date5745 MHzTemp.BE CH LowTest EndE2Measu		lumi. :	na Pol. :	2016/4/7 22.7deg_C Ashton Vertical	//57RH
Freq.	Note	Detector	Spe	ctum	Factor	Actual	Limit	Margin
		Mode	Readin	g Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dB	βμV	dB	dBµV/m	dBµV/m	dB
5712.30	S	Peak	50	. 13	11.97	62.10	68.3	-6.20
5725.00	Е	Peak	53	.09	12.01	65.10	78.2	-13.10
Operation Mode : 802.11n20				Test Date			2016/4/7	
Fundamental Frequency:		•	5745 MHz Temp. / Humi. :			22.7deg_C/57RH		
Operation Band :			BE CH Low Test Engineer :			Ashton		
EUT Pol.: E2				Measuren	nent Anten	na Pol. :	Horizontal	
Freq.	Note	Detector Mode	•	ctum g Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV		βμV	dB	dBµV/m	dBµV/m	dB
5714.70	S	Peak	53	.86	11.97	65.84	68.3	-2.46
5725.00	Е	Peak	58	.80	12.01	70.81	78.2	-7.39



Operation Mode : Fundamental Frequency : Operation Band : EUT Pol. :		/: 5825 M	BE CH High Test Engi		na Pol. :	2016/4/7 22.7deg_C/57RH Ashton Vertical	
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	52.41	12.15	64.56	78.2	-13.64
5850.80	S	Peak	52.50	12.16	64.66	78.2	-13.54
5860.60	S	Peak	50.22	12.34	62.55	68.3	-5.75
Operation Mode :		802.11r	802.11n20 Test Date :		2016/4/7		
Fundamental Frequency :		/: 5825 M	5825 MHz Temp. / Humi. :		22.7deg_C/57RH		
Operation Band :		BE CH	High Test En	Ashton			
EUT Pol. :		E2	Measure	ement Anten	na Pol. :	Horizontal	
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	56.07	12.15	68.22	78.2	-9.98
5860.20	S	Peak	53.13	12.33	65.46	68.3	-2.84



#### 802.11n\_HT40, 5725~5850 MHz

Operation M Fundamenta Operation B EUT Pol. :	al Frequency	802.11 y : 5755 N BE CH E2	IHz Temp. / H Low Test Engi	lumi. :	ina Pol. :	2016/4/7 22.7deg_C Ashton Vertical	757RH
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5714.40	S	Peak	51.37	11.97	63.34	68.3	-4.96
5723.60	S	Peak	55.07	12.01	67.08	78.2	-11.12
5725.00	Е	Peak	53.32	12.01	65.33	78.2	-12.87
Operation M		802.11				2016/4/7	
	al Frequency					22.7deg_C/57RH	
Operation B	and :	BE CH	•			Ashton	
EUT Pol. :		E2	Measuren	nent Anten	ina Pol. :	Horizontal	
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
N 41 1-		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	d BµV	dB	dBµV/m 67.78	dBµV/m	dB
5714.40	S	Peak	55.81	11.97		68.3	-0.52
5723.50	S	Peak	61.16	12.01	73.17	78.2	-5.03
5725.00	E	Peak	59.25	12.01	71.26	78.2 2016/4/7	-6.94
Operation N			802.11n40 Test Date :				
	al Frequency					22.7deg_0	C/57RH
Operation B	and :	BE CH	• •			Ashton	
EUT Pol. :		E2	Measurer	ment Anter	na Pol. :	Vertical	
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	E	Peak	45.54	12.15	57.69	78.2	-20.51
5851.90	S	Peak	47.43	12.18	59.61	78.2	-18.59
5863.50	S	Peak	44.87	12.36	57.23	68.3	-11.07
Operation M	lode :	802.11	n40 Test Date	e:		2016/4/7	
Fundamenta	al Frequency	/: 5795 M	Hz Temp. / H	łumi. :		22.7deg_0	C/57RH
Operation B		BE CH				Ashton	
EUT Pol. :		E2	• •	nent Anter	na Pol. :	Horizontal	
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
•		Mode	Reading Level		FS	@3m	Ŭ
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	49.35	12.15	61.50	78.2	-16.70
5851.60	S	Peak	50.73	12.18	62.90	78.2	-15.30
5864.40	S	Peak	48.36	12.35	60.71	68.3	-7.59

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 <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. 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 ap-pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGCS Taiwan Ltd. No.134 Wu/KunRboad.NewTaibeiIndustrialPark.Wu/kunDistrict NewTaibeiCity. Taiwan24803/新 th. the T& BIG M the test of the test the test of the law.

台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com	
	((000 L) LL00 0L10	1 (000 2) 2200 0 100		



# **10 ANTENNA REQUIREMENT**

# 10.1 Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

# 10.2 Antenna Connected Construction

A PIFA antenna design is used.

The antenna is designed with unique type connector and has no consideration of replacement. Please see EUT photo and antenna spec. for details.

The antenna gain is less than 6dBi. Therefore, it is not necessary to reduce maximum output power limit.

~ 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 <u>www.sgs.com/terms and conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. 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.

SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號