

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

	OF
Product Name:	USB module
Brand Name:	REALTEK
Model No.:	RTL8812BU
Model Difference:	N/A
FCC ID:	TX2-RTL8812BU
Report No.:	ER/2017/70015
Issue Date:	Jul. 21, 2017
FCC Rule Part:	§15.247, Cat: DTS
Prepared for:	REALTEK SEMICONDUCTOR CORP. NO. 2, INNOVATION ROAD II, SCIENCE PARK, HSINCHU 300, TAIWAN SGS Taiwan Ltd.
Prepared by:	Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803
BIC MRA Deting Laboratory 0513	Note: 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 Taiwan Ltd. personnel only, and shall be noted in the revision section of the document.

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></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 advised any the protective at the transaction from exercising all their rights and obligations under the transaction documents is unavity and offenders may be protected to the fulle at vertent of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



VERIFICATION OF COMPLIANCE

Applicant for:	REALTEK SEMICONDUCTOR CORP. NO. 2, INNOVATION ROAD II, SCIENCE PARK, HSINCHU 300, TAIWAN
Product Name:	USB module
Brand Name:	REALTEK
Model No.:	RTL8812BU
Model Difference:	N/A
FCC ID:	TX2-RTL8812BU
Report Number:	ER/2017/70015
Date of Test:	Jul. 03, 2017 ~ Jul. 17, 2017
Date of EUT Received:	Jul. 03, 2017

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:	Ton Lis	Date:	Jul. 21, 2017
Prepared By:	Tin Lin/Engineer Vroletta Tang	Date:	Jul. 21, 2017
- Approved By: _	Violetta Tang / Clerk Jim Chang Jim Chang / Asst. Manager	Date:	Jul. 21, 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.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained to so days only. 除非另有說明,此報告結果僅對測试之樣品負責,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.



Revision History

Report Number	Revision	Description	Issue Date
ER/2017/70015	Rev.00	Initial creation of document	Jul. 21, 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.

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,此報告結果僅對測试之樣品負責,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.

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



Contents

1	GENERAL INFORMATION	5
2	SYSTEM TEST CONFIGURATION	8
3	SUMMARY OF TEST RESULTS	10
4	DESCRIPTION OF TEST MODES	11
5	MEASUREMENT UNCERTAINTY	14
6	CONDUCTED EMISSION TEST	15
7	DUTY CYCLE OF TEST SIGNAL	19
8	PEAK OUTPUT POWER MEASUREMENT	22
9	6dB BANDWIDTH MEASUREMENT	26
10	CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT	43
11	RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT	61
12	PEAK POWER SPECTRAL DENSITY	112
13	ANTENNA REQUIREMENT	127
14	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	128



GENERAL INFORMATION 1

1.1 Product description

General:

Product Name:	USB module
Brand Name:	REALTEK
FCC Model No.:	RTL8812BU
Model Difference:	N/A
Software Version:	V0.6
Hardware Version:	0V8
Power Supply:	5V from USB Port

WLAN 2.4GHz:

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology
11b/g	2412-2462	11 b: 25.18dBm g: 27.45dBm (MIMO)		DSSS, OFDM
11n	HT20 2412-2462	11	27.69dBm (MIMO)	OFDM
11n	HT40 2422-2452	7	29.34dBm (MIMO)	OFDM
Antenna	Designation:	Printed Antenna, Main Antenna Gain: -1.5dBi, Part No.: RTK-ANT-0002, Supplier: REALTEK Aux Antenna Gain: -0.1dBi, Part No.: RTK-ANT-0002, Supplier: REALTEK		
Modulati	on type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM		
802.11 b: up to 11 Mbps; 802.11 g: up to 54 Mbps 802.11 n_20MHz: up to 144Mbps 802.11 n_40MHz: up to 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.

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,此報告結果僅對測试之樣品負責,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.



Host Information:

MB/NB/add-in card model name	OS	USB Host
Acer-Aspire VN7 719G-55MB(NB)	WIN8.1	Intel USB3.0
ASUS-(P7H55-M/USB3)	WIN7	NEC USB3.0
ASUS-(M5A87) (PC)	WIN7	Asmedia USB3.0
ASUS(NB)-(U36J)	WIN7	Fresco USB3.0
ASUS-(P8Z77-V LX)	WIN7	Intel USB3.0
DELL Vostro 270S (PC)	WIN7	Intel USB3.0
GIGABYTE-(GA-880GMA-UD2H)	WIN7	NEC USB3.0
GIGABYTE-(GA-F2A85X-UP4)	WIN7	AMD USB3.0
GIGABYTE-(GA-H61M-USB3(B3))	WIN7	ETRON USB3.0
HP 14-R017TU(NB)	WIN8	Intel USB3.0
Lenovo T430(NB)	WIN7	Intel USB3.0
MSI-(H67MA-E35(B3))	WIN7	NEC USB3.0
TOSHIBA(NB)-(R830)	WIN7	Renesas USB3.0
TOSHIBA(NB)-(R930)	WIN7	Intel USB3.0
UTB222	WIN7	Renesas USB3.0
UTB242	WIN7	TI USB3.0
UTB245	WIN7	Fresco USB3.0
VLI-805 add-in card	WIN7	VLI USB3.0



1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 DTS Meas. Guidance

FCC KDB 662911 D01 Multiple Transmitter Output

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 (TAF code 0513)

FCC Registration Numbers are: 509634

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 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.

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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



SYSTEM TEST CONFIGURATION 2

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 §15.207. 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 plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through one orthogonal axe 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 with cable loss 1.8dB, and 10dB attenuator (SISO) and cable loss 4.8dB, and 10dB attenuator (MIMO). Offset:

SISO mode offset = RF cable loss (dB)+ attenuation factor(dB) = 11.8(dB) MIMO mode offset = RF cable loss (dB)+ attenuation factor(dB)+ 10 log(NANT) dB =14.8(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

Ref 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元。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 www.sgs.com/terms_e-document.htm. Attention is frawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. No.134,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.



2.5 Configuration of Tested System

Fig. 2-1 Radiated & AC Power Line & Conducted (Antenna Port) Emission



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

ltem	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.	Notebook	Lenovo	L420	LR-7HXZA	Shielded	Un-shielded

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.

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 unlawful and offenders may be prosecuted 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.



SUMMARY OF TEST RESULTS 3

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	Peak Output Power	Compliant
§15.247(a)(2)	6dB Emission Bandwidth	Compliant
§15.247(d)	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	Radiated Band Edge and Spurious Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.203 §15.247(b)	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.

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,此報告結果僅對測试之樣品負責,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.

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 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b, 802.11g and 802.11n_HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	8	2447 MHz
2	2417 MHz	9	2452 MHz
3	2422 MHz	10	2457 MHz
4	2427 MHz	11	2462 MHz
5	2432 MHz		
6	2437 MHz		
7	2442 MHz		

7 channels are provided for 802.11n HT40

CHANNEL FREQUENCY		CHANNEL	FREQUENCY			
3	2422 MHz	8	2447 MHz			
4	2427 MHz	9	2452 MHz			
5	2432 MHz					
6	2437 MHz					
7	2442 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.

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 unlawful and offenders may be prosecuted 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.



4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST: RADIATED EMISSION TEST (BELOW 1 GHz) DATA **AVAILABLE** TESTED ANTENNA MODE MODULATION RATE CHANNEL CHANNEL PORT (Mbps) 1, 6, 11 MIMO 802.11g 1 to 11 OFDM 6 **RADIATED EMISSION TEST (ABOVE 1 GHz)** DATA **AVAILABLE** TESTED ANTENNA MODULATION MODE RATE CHANNEL CHANNEL PORT (Mbps) 802.11b 1 to 11 1, 6, 11 DSSS 1 AUX 802.11g 1 to 11 1, 6, 11 OFDM 6 MIMO 802.11n (HT20) 1 to 11 1, 6, 11 OFDM MCS 8 MIMO 802.11n (HT40) 3 to 9 3, 6, 9 OFDM MCS 8 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 802.11b/g/n WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

Pre-scanned was done on Main antenna and Aux antenna. The Aux antenna results higher emission at 2.4GHz. Therefore, the completed set of radiated measurement was done on Aux antenna to be presented on this test report.

ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST								
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT			
802.11b	802.11b1 to 111,802.11g1 to 111,		DSSS	1	AUX			
802.11g			OFDM	6	MIMO			
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 8	MIMO			
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 8	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

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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



Directional gain (MIMO)

The Tx transmission to construct MIMO operation is cyclic delay diversity, and the following deduction to obtain the array gain of MIMO operation is based on the approach given by KDB 662911 D01.

Array gain = 3.01dBi (peak spectral density, conducted spurious emission)

Gain that is combined with different magnitude of two antennas:

- If antenna gains are not equal, the user may use either of the following methods to calculate (ii) directional gain, provided that each transmit antenna is driven by only one spatial stream:
 - Directional gain may be calculated by using the formulas applicable to equal gain antennas . with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

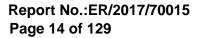
Each antenna is driven by no more than one spatial stream; N_{SS} = the number of independent spatial streams of data;

 N_{ANT} = the total number of antennas

 $g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not; G_k is the gain in dBi of the kth antenna.

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

で解す另有説明, 止報告結果僅對測試之様品頁, 同時此様品僅保留90 代。本報告未經本公司書面許可, 不可能份複製。 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





MEASUREMENT UNCERTAINTY 5

Test Items	Uncertainty		
AC Power Line Conducted Emission	+/- 2.586 dB		
Peak Output Power	+/- 0.84 dB		
6dB Bandwidth	+/- 51.33 Hz		
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB		
Peak Power Density	+/- 1.3 dB		
Temperature	+/- 0.65 °C		
Humidity	+/- 4.6 %		
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%		

Radiated Spurious Emission:

	9kHz-30MHz: +/-2.87dB		
	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		

	9kHz-30MHz: +/-2.87dB
	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.

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,此根告結果僅對测试之樣品負責,同時此樣品僅保留的无。本報告未舉本公司書面許可,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 libility, 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 form exercising all their rights and obligations under the transaction documents. This document is advised to the produced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or ap-peragrace of this document is underwift and other produced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or ap-peragrace of this document is underwift and the prosecuted 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.



CONDUCTED EMISSION TEST 6

6.1 Standard Applicable

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

Frequency range	Limits dB(uV)				
MHz	Quasi-peak	Average			
0.15 to 0.50	66 to 56	56 to 46			
0.50 to 5	56	46			
5 to 30	60 50				
Note					
1. The lower limit shall apply at the transition frequencies					
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50					
MHz.					

6.2 Measurement Equipment Used

Conducted Emission Test Site									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.					
EMI Test Receiver R&S		ESCI7	100760	05/11/2017	05/10/2018				
LISN	LISN SCHWARZBECK		8127-649	05/22/2017	05/21/2018				
LISN	MESS TEC	FCC-LISN-50/250 -25-2-01	4034	03/19/2017	03/18/2018				
Coaxial Cables N/A		WK CE Cable	N/A	11/26/2016	11/25/2017				

6.3 EUT Setup

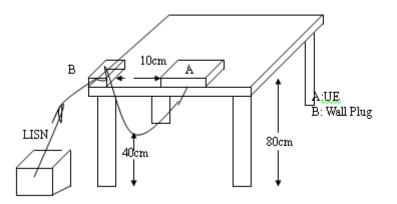
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

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.

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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.



6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure

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

6.6 Measurement Result

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

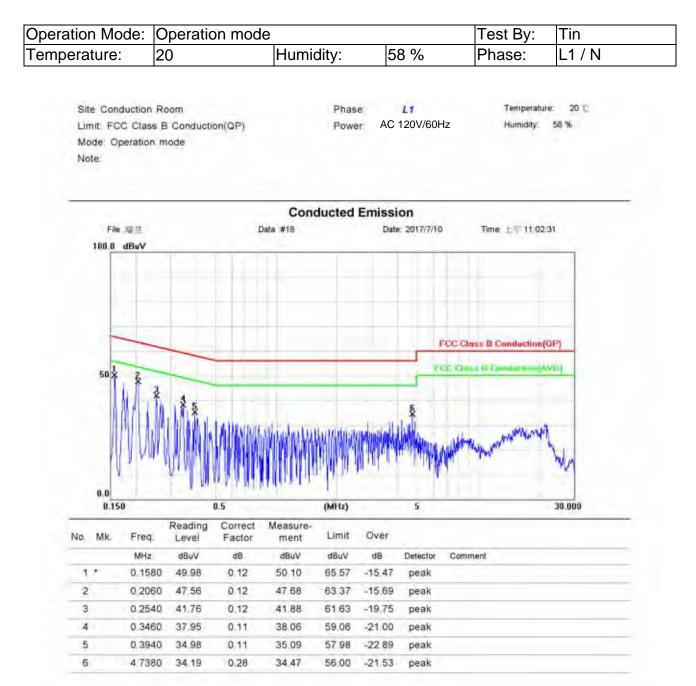
Note2: The * reveals the worst-case results that closet to the limit.

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

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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



AC POWER LINE CONDUCTED EMISSION TEST DATA



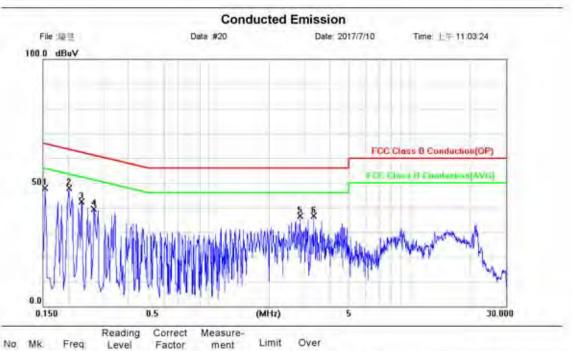
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.

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



Site Conduction Room Phase: N Temperature: 20 0 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 58 % Mode: Operation mode Note:



VO. MIK.	Fred	Level	Factor	ment	Linn	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1540	47.87	0.07	47.94	65.78	-17.84	peak	
2 .	0.2020	47.70	0.07	47.77	63.53	-15.76	peak	
3	0.2340	42.29	0.07	42.36	62.31	-19.95	peak	
4	0.2700	39.33	0.07	39.40	61.12	-21.72	peak	
5	2.8500	36.57	0 15	36.72	56.00	-19.28	peak	
6	3.3140	36.41	0.17	36.58	56.00	-19.42	peak	

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.

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



DUTY CYCLE OF TEST SIGNAL 7

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:

	Duty Cycle (%)	Duty Factor (dB)
802.11b	99.63	0.02
802.11g	96.24	0.17
802.11n_20	92.84	0.32
802.11n_40	86.51	0.63

b = 99.63%, g = 96.24%,n_ht_20 = 92.84%n_ht_40 = 86.51%

Duty Cycle Factor: $10 * \log(1/0.9963) = 0.02$ Duty Cycle Factor: $10 * \log(1/0.9624) = 0.17$ Duty Cycle Factor: $10 * \log(1/0.9284) = 0.32$ Duty Cycle Factor: $10 * \log(1/0.8651) = 0.63$

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

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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



802.11 g

7.1 DUTY CYCLE TEST SIGNAL Measurement Result 802.11 b

02:41:24.04 34.04, 2817 Avg Type: Log-Pwr Frequency Center Freq 2.412000000 GHz Trig: Free Run #Atten: 30 dB DET PNO: Fast Auto Tune ΔMkr3 8.250 ms -0.25 dB Ref Offset 11.8 dB Ref 30.00 dBm 0 dE Center Fred 2.412000000 GHz Start Fred 3Δ4 2 412000000 GH χ. Stop Freq 2.412000000 GH Center 2.412000000 GHz Res BW 8 MHz Span 0 Hz Sweep 10.00 ms (1001 pts) CF Step 8.000000 MHz #VBW 8.0 MHz Mar Auto 8.220 ms (Δ) 670.0 μs 8.250 ms (Δ) 670.0 μs -1.26 dB -29.04 dBm -0.25 dB -29.04 dBm ł (4) Freq Offset 4 0 H Ē 67 10 U347122443404.2017 Frequency Center Freq 2.412000000 GHz Avg Type: Log-Pwr Trig: Free Run #Atten: 30 dB PNO: Fast DET AMkr3 1.413 ms -0.15 dB Auto Tune Ref Offset 14.8 dB Ref 30.00 dBm O dE



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.

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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



802.11 n_20 MHz

12000000 GH2 PN0: Fast FSGin: Low FSGin: Low FSGin FSGin: Low FSGin: Low FSGin: Low FSGi	Frequency Auto Tune						
Ref Offset 14.8 dB ΔMkr3 713.0 μs dEl/div Ref 30.00 dBm							
an malatan an ana ana ana ana ana ana ana ana	Center Freq 2.412000000 GHz						
(a 304	Start Freq 2.412000000 GHz						
	Stop Freq 2.412000000 GHz						
000 GHz Span 0 Hz #VBW 8.0 MHz Sweep 1.000 ms (1001 pts)	CF Step 8.000000 MHz Auto Man						
a) 662.0 μs (Δ) 0.14 dB 131.0 μs -26.93 dBm) 713.0 μs (Δ) -1.63 dB 131.0 μs -26.93 dBm	Freq Offset 0 Hz						

802.11 n 40 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.

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 unlawful and offenders may be prosecuted 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.

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



PEAK OUTPUT POWER MEASUREMENT 8

8.1 Standard Applicable

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

Main Antenna Gain: Aux1 Antenna Gain:	-1.50 -0.10	dBi dBi
Number Antenna:	2	pcs
Limit: The antenna gain is grater than 6dBi in MIMO mode the limit reduce as below Directional gain = gain of antenna element + 10 log (# of TX antenna element	<i>':</i>	dBm

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.

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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.

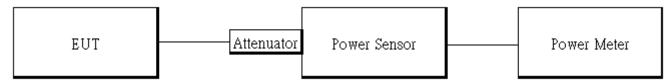


8.2 Measurement Equipment Used

SGS Conducted Room								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
TYPE		NUMBER	NUMBER	CAL.				
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017			
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017			
EXA Spectrum Analyzer	Agilent		MY53120760	03/21/2017	03/20/2018			
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018			
Coaxial Cable	HUBER+SUH NER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018			
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018			
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018			
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017			
Temperature Chamber	TERCHY	MHG-120LF	911009	05/19/2017	05/18/2018			

8.3 Test Set-up

Power Meter:



8.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.

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,不可部分複製。 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



8.5 Measurement Result

802.	802.11b Aux1							
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit		RESULT		
1	2412	1	24.92	1 Watt	30.00	dBm	PASS	
6	2437	1	25.18	1 Watt	30.00	dBm	PASS	
11	2462	1	24.94	1 Watt	30.00	dBm	PASS	
802.11b Aux1								
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Limit		RESULT		
1	2412	1	22.76	1 Watt	30.00	dBm	PASS	
6	2437	1	23.06	1 Watt	30.00	dBm	PASS	
11	2462	1	22.81	1 Watt	30.00	dBm	PASS	

802.	11g_MI	MO								
сн	Freq. (MHz)	Data Rate	Peak Output Power (dBm)		Power Output Power		Total Peak Output Power (dBm)	Total Peak Output Power (mW)	Limit	RESULT
			CH 0	CH 1	(abili)	(11144)				
1	2412	6	24.26	24.61	27.45	555.75	1 Watt = 30.00 dBm	PASS		
6	2437	6	24.25	24.53	27.40	549.86	1 Watt = 30.00 dBm	PASS		
11	2462	6	23.78	24.41	27.12	514.84	1 Watt = 30.00 dBm	PASS		
802.	11g_MI	MO								
сн	Freq. (MHz)	Data Rate	Po	Dutput wer Bm)	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit	RESULT		
			CH 0	CH 1	(abili)	(1117)				
1	2412	6	16.94	17.45	20.38	105.02	1 Watt = 30.00 dBm	PASS		
6	2437	6	16.75	17.36	20.24	101.77	1 Watt = 30.00 dBm	PASS		
11	2462	6	16.39	17.14	19.96	95.31	1 Watt = 30.00 dBm	PASS		

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.	802.11n_HT20M MIMO								
сн	Freq. (MHz)	Data Rate	Pov (dE	Output wer 3m)	Total Peak Output Power (dBm)	Total Peak Output Power (mW)	Limit	RESULT	
			CH 0	CH 1	(abili)	(11144)			
1	2412	MCS8	24.03	24.18	27.12	514.75	1 Watt = 30.00 dBm	PASS	
6	2437	MCS8	24.64	24.72	27.69	587.55	1 Watt = 30.00 dBm	PASS	
11	2462	MCS8	23.56	23.96	26.77	475.87	1 Watt = 30.00 dBm	PASS	
802.	11n_H	F20M M	IMO						
сн	Freq. (MHz)	Data Rate	Po	Dutput wer Bm)	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit	RESULT	
			CH 0	CH 1	(42)	()			
1	2412	MCS8	14.76	15.09	18.26	62.21	1 Watt = 30.00 dBm	PASS	
6	2437	MCS8	17.32	17.91	20.96	115.75	1 Watt = 30.00 dBm	PASS	
11	2462	MCS8	14.58	15.36	18.32	63.06	1 Watt = 30.00 dBm	PASS	

802.	802.11n_HT40M MIMO								
сн	Freq. (MHz)	Data Rate	Po	Output wer 3m) CH 1	Total Peak Output Power (dBm)	Total Peak Output Power (mW)	Limit	RESULT	
3	2422	MCS8	23.54	23.94	26.75	473.69	1 Watt = 30.00 dBm	PASS	
6	2437	MCS8	24.29	27.71	29.34	858.74	1 Watt = 30.00 dBm	PASS	
9	2452	MCS8	22.75	23.23	26.01	398.74	1 Watt = 30.00 dBm	PASS	
802.	11n_H1	Г40М М	IMO				-		
СН	Freq. (MHz)	Data Rate	Po	Dutput wer Bm)	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit	RESULT	
			CH 0	CH 1	(()			
3	2422	MCS8	13.71	14.34	17.68	50.66	1 Watt = 30.00 dBm	PASS	
6	2437	MCS8	16.73	17.36	20.70	101.55	1 Watt = 30.00 dBm	PASS	
9	2452	MCS8	13.19	13.96	17.23	45.73	1 Watt = 30.00 dBm	PASS	

* Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.

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,此報告結果僅對測试之樣品負責,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. SGS Taiwan Ltd.

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.



9 6DB BANDWIDTH MEASUREMENT

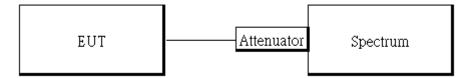
9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Measurement Equipment Used

SGS Conducted Room							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017		
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017		
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	03/21/2017	03/20/2018		
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018		
Coaxial Cable	HUBER+SUH NER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018		
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018		
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017		
Temperature Chamber	TERCHY	MHG-120LF	911009	05/19/2017	05/18/2018		

9.3 Test Set-up



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.

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.



9.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. For 6dB Bandwidth:

Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=peak, Sweep=auto.

- 5. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. For 99% Bandwidth:

Set the spectrum analyzer as RBW=1%, VBW = 3*RBW, Span = 30M/50MHz, Detector=Sample, Sweep=auto.

- 7. Turn on the 99% bandwidth function, max reading.
- 8. Repeat above procedures until all frequency of interest measured was complete.

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

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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



9.5 Measurement Result

6dB Bandwidth

802.11b Aux1							
Freq.	6dB BW	Limit	Result				
(MHz)	(kHz)	(kHz)	Result				
2412	10063	> 500	PASS				
2437	10068	> 500	PASS				

> 500

10057

PASS

802.11g Main

Freq.	6dB BW	Limit	Result
(MHz)	(kHz)	(kHz)	Result
2412	16360	> 500	PASS
2437	16370	> 500	PASS
2462	16330	> 500	PASS

2462

802.11_n_HT20 Main 6dB BW Freq. Limit Result (MHz) (kHz) (kHz) 2412 17580 > 500 PASS PASS 2437 17560 > 500

> 500

802.11g Aux1						
Freq.	6dB BW	Limit				
(MHz)	(kHz)	(kHz)				
2/12	16360	<u> </u>				

PASS

2412	16360	> 500	PASS
2437	16370	> 500	PASS
2462	16370	> 500	PASS

Result

802.11 n HT20 Aux1

Freq.	6dB BW	Limit	Result				
(MHz)	(kHz)	(kHz)	Result				
2412	17600	> 500	PASS				
2437	17590	> 500	PASS				
2462	17580	> 500	PASS				

802.11 n HT40 Main

17590

2462

Freq.	6dB BW	Limit	Result
(MHz)	(kHz)	(kHz)	Result
2422	36380	> 500	PASS
2437	36520	> 500	PASS
2452	36350	> 500	PASS

802.11_n_HT40 Aux1

Freq.	6dB BW	Limit	Result	
(MHz)	(kHz)	(kHz)	Result	
2422	36330	> 500	PASS	
2437	36420	> 500	PASS	
2452	36390	> 500	PASS	

*Refer to next page for plots

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.

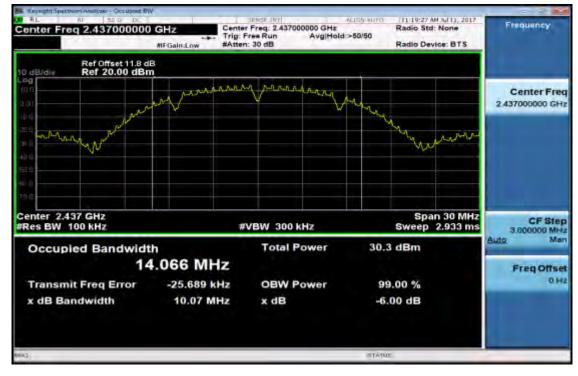
Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, 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.



802.11b (Aux) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

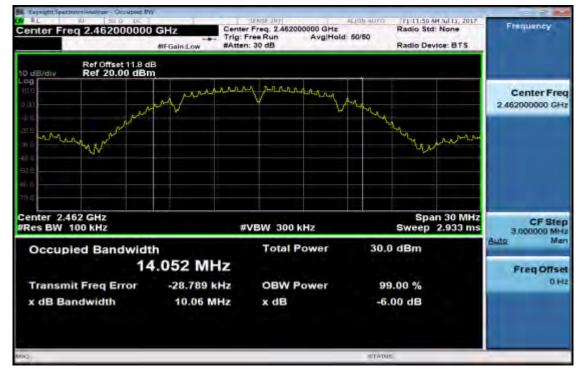


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.



6dB Band Width Test Data CH-High



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

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

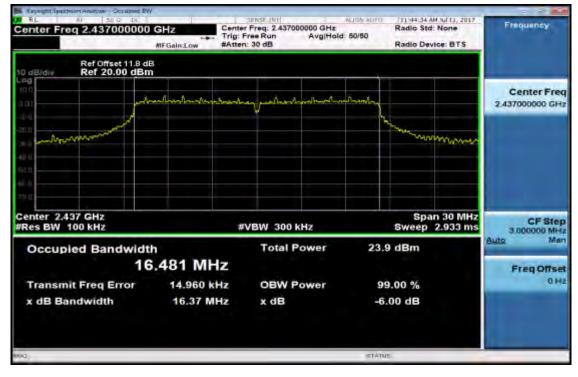
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



802.11g (Main) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

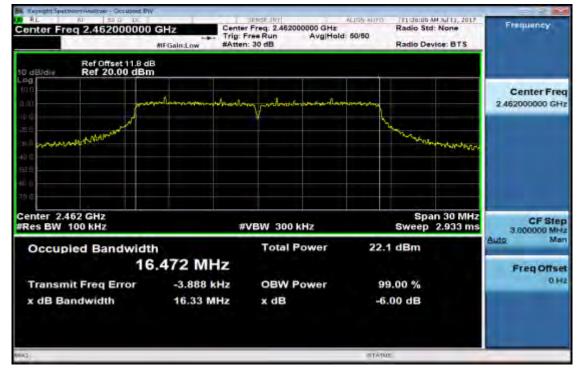


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.



6dB Band Width Test Data CH-High



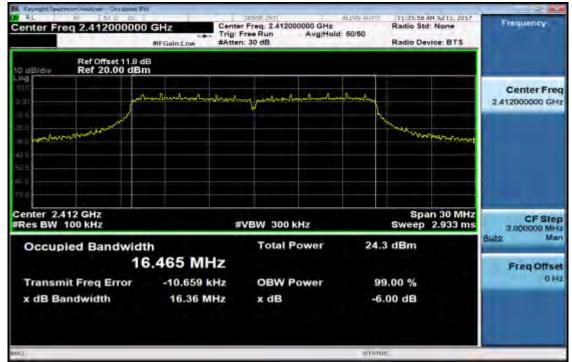
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

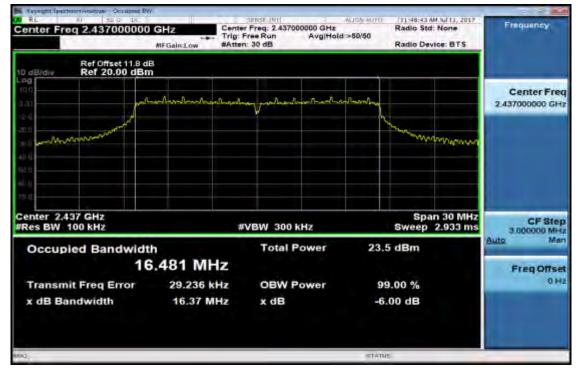
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



802.11g (Aux) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

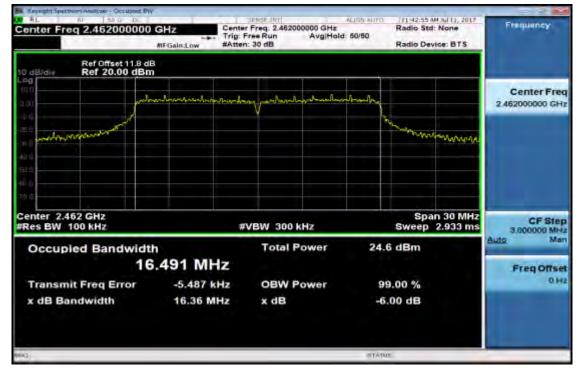


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.



6dB Band Width Test Data CH-High



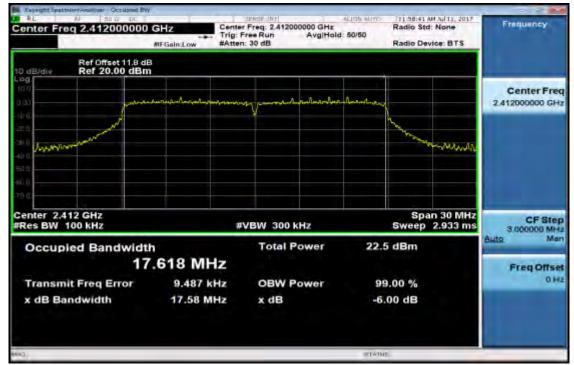
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

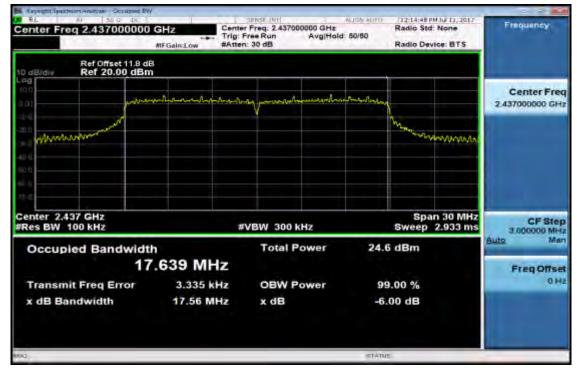
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



802.11n_20M (Main) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

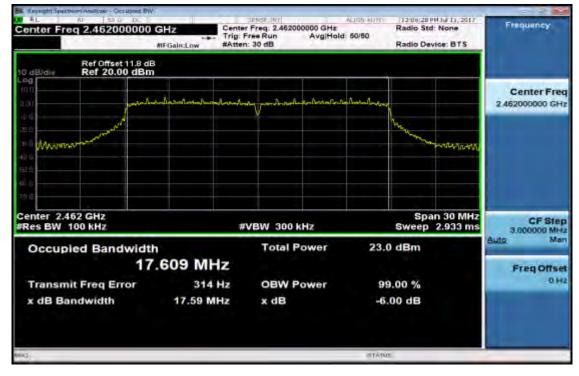


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.



6dB Band Width Test Data CH-High



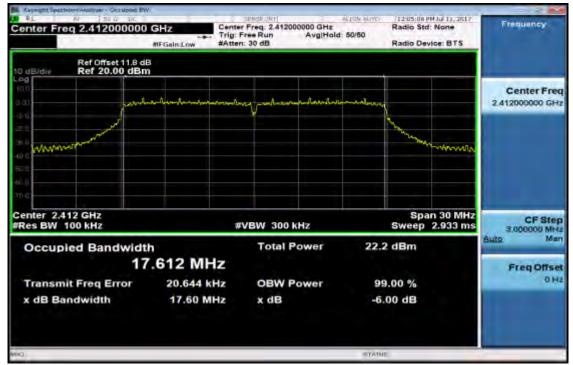
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

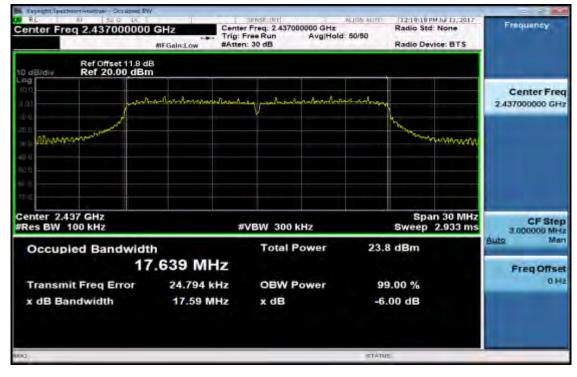
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



802.11n_20M (Aux) 6dB Band Width Test Data CH-Low



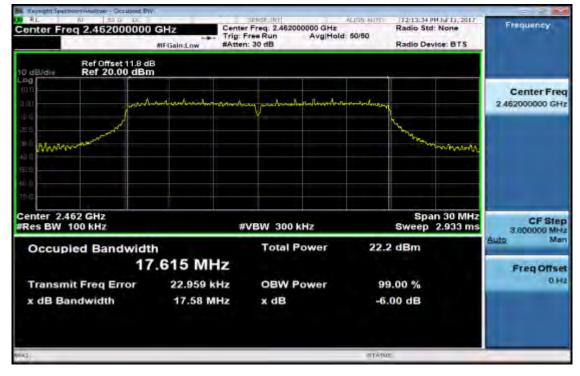
6dB Band Width Test Data CH-Mid



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



6dB Band Width Test Data CH-High



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

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

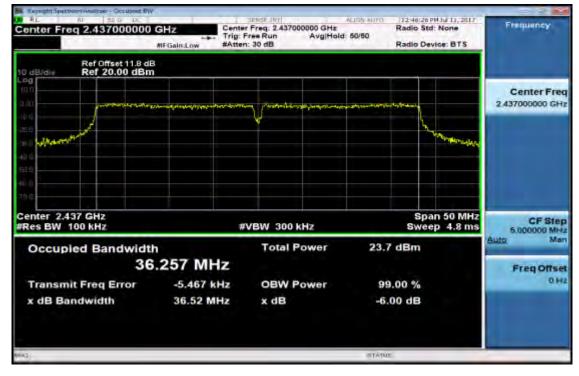
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



802.11n 40M (Main) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

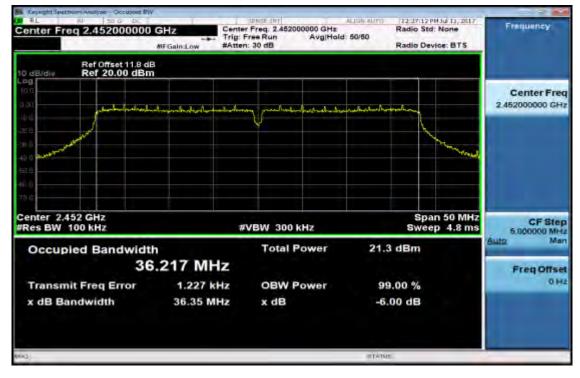


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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.



6dB Band Width Test Data CH-High



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

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

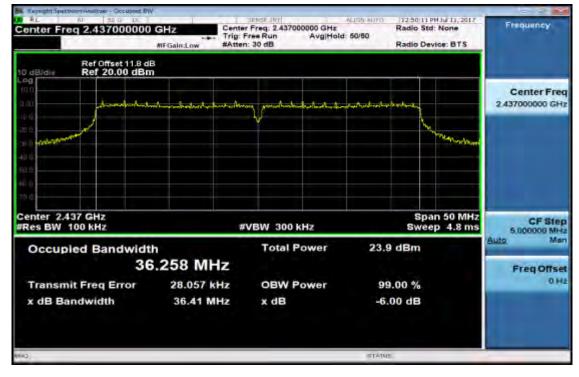
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



802.11n_40M (Aux) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

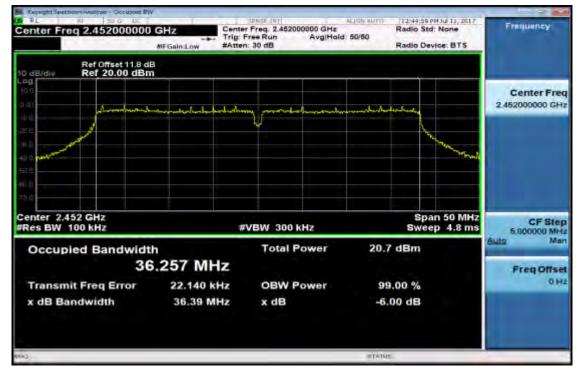


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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.



6dB Band Width Test Data CH-High



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

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance 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



10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB.

SGS Conducted Room									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017				
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017				
EXA Spectrum	Agilent	N9030A	MY53120760	03/21/2017	03/20/2018				
Analyzer	Aglient	NSOSOA	101 33 1207 00	03/21/2017	00/20/2010				
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018				
Coaxial Cable	HUBER+SUH NER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018				
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018				
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018				
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017				
Temperature Chamber	TERCHY	MHG-120LF	911009	05/19/2017	05/18/2018				

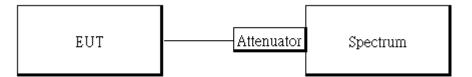
10.2 Measurement Equipment Used

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

Chino Soliton and Soliton and Soliton and Soliton and Soliton and Soliton Soliton and Soliton Soliton and Solito tronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is frawn 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



10.3 Test SET-UP



10.4 Measurement Procedure

Conducted Band Edge:

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
- 5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
- 6. Mark the highest reading of the emission as the reference level measurement.
- 7. Set DL as the limit = reading on marker 1 20dBm
- 8. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 kHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
- 9. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Conducted Spurious Emission:

- 1. To connect Antenna Port of EUT to Spectrum
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set RBW = 100 kHz & VBW= 300 kHz, Detector =Peak, Sweep = Auto.
- 4. Allow trace to fully stabilize.
- 5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- 6. Repeat above procedures until all default test channel measured were complete.

10.5 Measurement Result

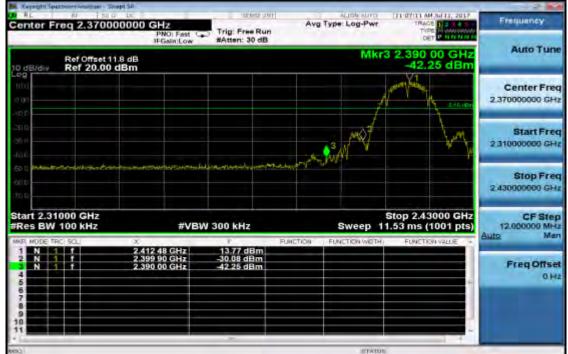
- 1. Refer to next page spectrum analyzer data chart and tabular data sheets.
- 2. For restricted Band Edge Limit, please refer to section 12.5 of this report for measurement result.

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.

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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



802.11b **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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



802.11b **Spurious Emission Test Data CH-Low**

RL AN Sach De 3 enter Freq 1.515000000	GH+	THE REALS	Avg Type: Log-Pwr	(31-07:38 AM Jul 13, 2017 TRACE TRACE	Frequency
enter Freg 1.5 15000000	PNO: Fast G	Trig: Free Run #Atten: 30 dB	and the set	DET P NIN MIN N	
Ref Offset 11.8 dB			Mk	r1 2.411 9 GHz 13.29 dBm	Auto Tur
				1 571 rei	Center Fr 1.515000000 G
00 00 00					Start Fr 30,000000 M
	الكاليون بيحرينيون متومرية	n general der sich der eine Alle Bertanne	أسامناني بسعمينية ومعاوما وماردان ويواغد	and the second sec	Stop Fr 3.000000000 G
tart 30 MHz Res BW 100 kHz	#VBV	V 300 kHz	Sweep 2	Stop 3.000 GHz 33.9 ms (1001 pts)	CF St 297.000000 M Auto M
	11 9 GHz	r FL 13.29 dBm	NETION FUNCTION WETH:	FUNCTION VALUE	Sulls N
2 3 4 5 6 7 8 9 9					Freq Offs 0
		-	STATUS		·

RL III 14.7500	00000 GHz	Trig: Free Run	Avg Type: Log-Pwr	11:10:52 AM Jul 11, 2017 TRACE 2 4 4	Frequency
Ref Offset 11.	PND: Fast Calification	#Atten: 30 dB	Mkr	1 26,006 5 GHz -39,20 dBm	Auto Tun
devide Ref 20.00 d	Bm			-39.20 (BM	Center Fre 14.750000000 GF
					Start Fre 3.000000000 GH
	وسترابا المجيرة فيريع والدواج من والتعاول	and a state of the	an an Istan an Istan an Istan an Istan		Stop Fr 26 50000000 G
tart 3.00 GHz Res BW 100 kHz R MODE TRC SQL	x		Sweep	Stop 26.50 GHz 2.246 s (1001 pts) FUNCTION VALUE	CF Sto 2 350000000 G Auto M
N T T 3	26,006 5 GHz	-39.20 dBm			Freq Offs 01
· · · · · · · · · · · · · · · · · · ·				-	

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.

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,此報告結果僅對測试之樣品負責,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.

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



Spurious Emission Test Data CH-Mid

Frequency	11:22:19 AM Jul 13, 2017	ALIGN AUTO	WT	SENSE		a bc		
Traduency	TYPE NUMBER	Type: Log-Pwr		Trig: Free R	PNO: Fast	00000 G	q 1.5150	er Free
Auto Tune	1 2.438 7 GHz 12.72 dBm	Mkr			and the second second	1.8 dB	tef Offset 1 Ref 20.00	
Center Freq 1.515000000 GHz	1 -/ 20149						20.00	
Start Freq 30,000000 MHz								
Stop Freq 3,000000000 GHz			n i e fan de stander i de stander		**********			
CF Step 297.000000 MHz Auto Man	Stop 3.000 GHz 3.9 ms (1001 pts)	Sweep 28	FUNCTI	300 kHz	#VBW	x	0 kHz	30 MH BW 10
Freq Offset 0 Hz				12.72 dBn	3 7 GHz	2.43	1	N_1
	_							
		STATUS						_

Rependent Spectretern-Analyzer - Skrept SA								
enter Freg 14.75000000	PNO: Fast G	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	TRACE 1 2 14 1 TRACE 1 2 14 1 TYPE DOWNLOW	Frequency			
Ref Offset 11.8 dB	Ref Offset 11.8 dB Mkr1 26.500 0 GHz							
				-7520-541	Center Fre 14.750000000 GH			
50 0 90 0				1	Start Fre 3.000000000 GH			
40,0 50 D	حيد عسر صبحا التور والجروج	- ware all and the stand and	and an also and a second s		Stop Fre 26 50000000 GH			
Start 3.00 GHz Res BW 100 kHz	#VBV	V 300 kHz		Stop 26.50 GHz 2.246 s (1001 pts)	CF Ste 2.36000000 GH Auto Ma			
MR MODE TRC SQL X. 1 N 1 7 25. 2 3 4 5 6 6 7 7 8 9 9 10	500 0 GHz	-38.73 dBm	UNCTION , FUNCTION WRITH	FUNCTION VALUE	Freq Offs 01			
a)		~	STAT	5				

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.

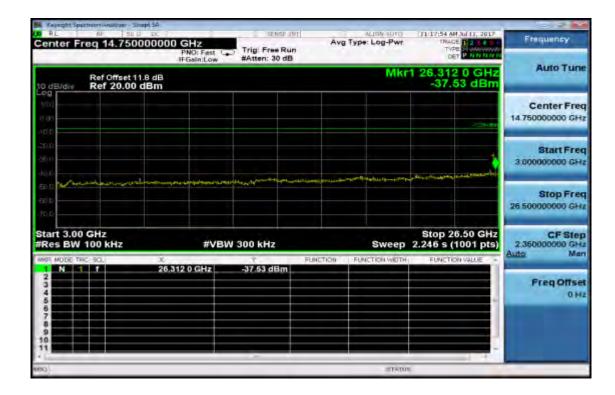
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測试之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, 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.

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



Spurious Emission Test Data CH-High

Keyeight Spectralmi-Analyzer - Skrept SA	_	-		the second second second	10. 10 M
Center Freq 1.51500000	PNO: East (-)	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	11:17:34 AM 3ul 13, 2017 TRACE 1, 2 3 4 9 0 TYPE NUMBER OF PARTICIPAL	Frequency
Ref Offset 11.8 dB	1 CONTLOR		Mk	r1 2,462 4 GHz 12,63 dBm	Auto Tune
- 00 1001 				-103×64	Center Fred 1.515000000 GH
26 0 90 0					Start Free 30,000000 MHz
50 0		and a construction of the state	ang an ang ang ang ang ang ang ang ang a	l Trainworked lynnessamperddar	Stop Free 3.000000000 GH
Start 30 MHz #Res BW 100 kHz	#VBW 3		Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	CF Step 297.000000 MHz Auto Mar
	2.462 4 GHz	12.63 dBm			Freq Offset 0 Hz
7 8 9 10 11					
(20)			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.

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 unlawful and offenders may be prosecuted 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.

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



802.11g **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High

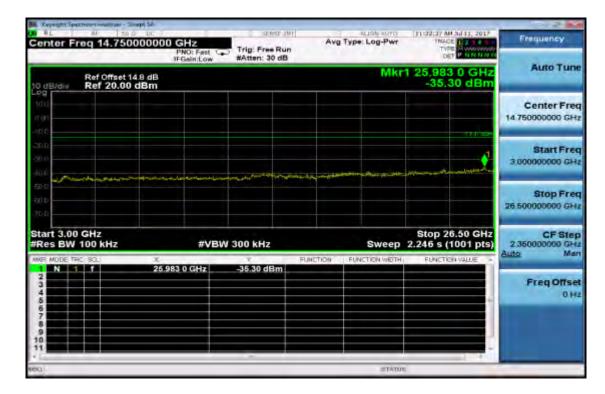


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



802.11g **Spurious Emission Test Data CH-Low**

enter Freq 1.515000000	GHz PNO: Fast C	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	31:32:10 AM Jul 13, 2017 TRADE 1 2 3 4 TRADE 1 2 3 4 DET 12 Range familie	Frequency
Ref Offset 14.8 dB			M	kr1 2,420 9 GHz 6.03 dBm	Auto Tun
01 (0)				1	Center Fre 1.515000000 GH
					Start Fr 30,000000 Mi
	normalio han han an Mala	en Benning a pagen an en			Stop Fr 3,00000000 Gi
tart 30 MHz Res BW 100 kHz	#VBV	V 300 kHz	Sweep	Stop 3.000 GHz 283.9 ms (1001 pts)	CF Str 297.000000 M Auto M
R MODE TRC SCL X	420 9 GHz	7 FL 6.03 dBm	AUCTION FUNCTION WET	FUNCTION VALUE	
3 4 5 6 7 7 8 9 9 0 1					Freq Offs 0
3			STAT	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.

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance 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



Spurious Emission Test Data CH-Mid

Keynight Spectroler - S/rept SA				
enter Freq 1.515000000	PNO: Fast C Trig: Free Run	Avg Type: Log-Pwr	31147:22 AM Jul 33, 2017 TRACE 1 2 4 4 5 TVPE Produced of OFT P N N N M	Frequency
Ref Offset 14.8 dB 0 dB/div Ref 20.00 dBm	IFGain:Low #Atten: 30 dB	MK	r1 2.441 6 GHz 5.62 dBm	Auto Tune
			1	Center Free 1.515000000 GH
				Start Free 39,00000 MHz
0 0 0 0		مربع المربع المربعة ال المربعة المربعة		Stop Free 3,000000000 GH
tart 30 MHz Res BW 100 kHz	#VBW 300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	
KR MODE TRC SCL X	441 6 GHz 5.52 dBm	FUNCTION FUNCTION WETH	FUNCTION VALUE .	Auto Mar
234				Freq Offse 0 H
		STATUS	11	

RL R/ Successful Strapt		SPASE JUT	NLIGH AUTO	314748 AM Jul 13, 2017	
enter Freq 14.75000	PNO: Fast G IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	TYPE NUMBER	Frequency
Ref Offset 14.8			Mkr	1 26,100 5 GHz -36,29 dBm	Auto Tun
99 01 01					Center Fre
10					
				and and a second second	Start Fre 3.000000000 GP
					Stop Fre 26 50000000 Gi
art 3.00 GHz Res BW 100 kHz	#VB	W 300 kHz	Sweep	Stop 26.50 GHz 2.246 s (1001 pts)	CF Ste 2.35000000 G
R MODE TRC: SQ.	x 26.100 5 GHz	-36.29 dBm	NCTION FUNCTION WIDTH	FUNCTION VALUE .	Auto M
				-	Freq Offs 01
		-			
			TATU		

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.

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,此報告結果僅對測试之樣品負責,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.

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



Spurious Emission Test Data CH-High

RL AF Successful Analyzer - Strept SA		and and	ALIGN BUTO	(11:41:15 AM 3ul 11, 2017	
nter Freq 1.51500000	PN0: Fast G	0.00000000	Avg Type: Log-Pwr		Frequency
Ref Offset 14.8 dB			Mi	r1 2.462 4 GHz 6.01 dBm	Auto Tune
				<u>*</u>	Center Freq 1.515000000 GHz
					Start Freq 30,000000 MHz
	*****	an a taning an pana dan baran an a	ie in Sundinania and Sundan Sundan Sundan State	ed MachdYrlandanoaniagusaileir	Stop Freq 3.00000000 GHz
rt 30 MHz es BW 100 kHz	#VBW	/ 300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	CF Step 297,000000 MHz
MODE TRC SOL X	2.462 4 GHz	7 FL 6.01 dBm	NCTION FUNCTION/WETH	FUNCTION VALUE	Auto Man
				-	Freq Offset 0 Hz
			STATUS	-	

Report Spectrolers Analyzer - Shapt Si RE AF Shi G D		SURGE OVER	4LIG4 4UT0	11:41:37 AM 30/11, 2017				
enter Freq 14.750000			Avg Type: Log-Pwr		Frequency Auto Tun			
O dE/div Ref 20.00 dBr	Ref Offset 14.8 dB Mkr1 25,936 0 GHz dB/div Ref 20.00 dBm -35,97 dBm							
101 101					Center Fre 14.75000000 GF			
00				-11.71.624				
90 m			والمراجع والمستنا المتعالية المراجع والمعالي والمراجع	mining	Start Fre 3.000000000 GH			
					Stop Fre 26 50000000 GH			
tart 3.00 GHz Res BW 100 kHz	#VBV	V 300 kHz	Sweep	Stop 26.50 GHz 2.246 s (1001 pts)	CF Ste 2.35000000 GP			
NR MODE TRC SO.	x 25.936 0 GHz	-35.97 dBm	NETION FUNCTION WOTH	FUNCTION VALUE	Auto M			
					Freq Offs 01			
6 7 8								
				-				
CR			STATU					

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.

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,此報告結果僅對測试之樣品負責,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.

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



802.11n HT20 **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High

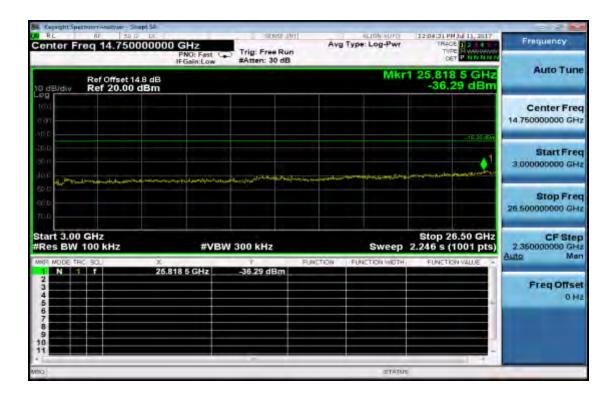


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

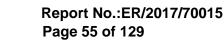


802.11n HT20 **Spurious Emission Test Data CH-Low**

RI BI IN INC.					100 M
enter Freq 1.515000		Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	12-0413 PM 34 13, 2017 TRACE 1 2 3 4 3 TYPE PROVIDENT	Frequency
Ref Offset 14.8 Ref 20.00 dB	dB		Mk	4.75 dBm	Auto Tune
eg (01) (01)				1	Center Free 1.515000000 GH
				AS JEAN	Start Free 30,000000 MH
1000 50 C uni	⁴ ميديا بر معلموريا يو مويد رو در ا رتو مع		المناهمة الحية الفرجوم (تاريخ من يومي الماريخ من المريخ الماريخ من الماريخ من الماريخ من المريخ من الماريخ من	° Age−i de rti n Muthati generati i − M	Stop Free 3,000000000 GH
Start 30 MHz Res BW 100 kHz	#VBW	300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	
1 N 1 f 2 3 4 4 5 6 7 8 9	2.417 9 GHz	4.75 dBm	CTOR TORCTORY OF	FORCE ANY VALUE	Freq Offse 0 Hi
				1.4	
53			STATUS	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.





Spurious Emission Test Data CH-Mid

Reyardst Spectrum Analyzer - Swept SP					212
enter Freq 1.515000000	PNO: Fast G	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	12:17:53 PM 34 11, 2617 TRACE 1, 2, 3, 4, 5 TYPE, N. WARDAN	Frequency
Ref Offset 14.8 dB	HOMILOW	WILLING OF US	Mk	1 2.432 7 GHz 5.76 dBm	Auto Tuni
00					Center Fre 1.515000000 GH
					Start Free 30,000000 MH
o o navelu dobane serve (anter e O o	enandenna statsanstelle	a data dan general da ang da	مەنپاھەيدىن ۋە يېنى مەن ئىن مىسىدا دارىي مەن		Stop Free 3.000000000 GH
tart 30 MHz Res BW 100 kHz	#VBW	V 300 kHz	Sweep 28	Stop 3.000 GHz 3.9 ms (1001 pts)	CF Ster 297.000000 MH
RR MODE TRC SQ. X	432 7 GHz	Y FU 5.76 dBm	NCTION FUNCTION WETH	FUNCTION VALUE ×	Auto Mar
2 3 4 5				_	Freq Offse 0 H
6 7 8 9 9					

Center Freq 14.75000000	PND: East () T	ig: Free Run Atten: 30 dB	Avg Type: Log-Pwr	12:10:22 PM Jul 11, 2017 TRACE 12:23 4 20 TYPE Newwww. CET P. N. N. N. N.	Frequency
Ref Offset 14.8 dB	IT CADIT. LOW		Mkr	26.077 0 GHz -35.25 dBm	Auto Tun
101 101					Center Fre 14.75000000 GH
0.0				14.74 (\$1)	Start Fre
101 deman market	No. B. at 1985 a 1944	1 Property in the local rest of the		- A Martine Contraction of the second	3.00000000 GH
ED 0 ED 0 70 0					Stop Fre 26 50000000 GR
Start 3.00 GHz Res BW 100 kHz	#VBW 30	0 kHz	Sweep	Stop 26.50 GHz 2.246 s (1001 pts)	CF Ste 2.35000000 GH
	.077 0 GHz -3	5.25 dBm	TION FUNCTION WIDTH:	FUNCTION VALUE	Auto Mo
2 3 4 5				+	Freq Offs
6 7 8 9 9					

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.

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,此報告結果僅對測试之樣品負責,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.

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



Spurious Emission Test Data CH-High

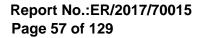
RL R/ Sno DC		SPIRE SHIEL	ALION AUTO	12-12:38 PM 34 11, 3617	20.0
enter Freq 1.515000000	GHz PNO: Fast	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr		Frequency
Ref Offset 14.8 dB			Mk	r1 2.468 4 GHz 4.73 dBm	Auto Tuni
101 101				?	Center Free 1.515000000 GH
				15.20 den	Start Free 30,000000 MH
	anderse and an	an a	a a geografia a tha an tha a tha	t kanalan ti kanangalati di	Stop Fre 3.000000000 GH
art 30 MHz Res BW 100 kHz	#VBW	300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	CF Step 297.000000 MH
	468 4 GHz	Y FU 4.73 dBm	RETION : FUNCTION WRITH:	FUNCTION VALUE	Auto Ma Freq Offse
3 4 5 6 7 7 8 9 9					OH
			STATUS		

RE AN SACE DC		Conservation and	and some of the second		20 2 M
enter Freg 14.75000000	O GHZ PND: Fast G	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	THECE 12.56 PM Jul 13, 3617 THECE 12.54 4 TYPE M WHAT	Frequency
Ref Offset 14.8 dB Ref 20.00 dBm			Mkr	1 25.912 5 GHz -35.08 dBm	Auto Tun
00) (01)					Center Fre 14.750000000 GH
00				(14.20 dbm	Start Fre
		And a Another Man server	and the second	مەرمىيە بىرى بىر دارىيە بىر	3.000000000 GH
	1.0400-1110-01/0404104				Stop Fre 26 50000000 GH
tart 3.00 GHz Res BW 100 kHz	#VBV	V 300 kHz	Sweep	Stop 26.50 GHz 2.246 s (1001 pts)	CF Ste 2.35000000 GH Auto Ma
	912 5 GHz	-35.08 dBm	INCTION FUNCTION WIGTH	FUNCTION VALUE *	Sug no
2 3 4 5 5				+	Freq Offse
6 7 8 9					
		-			
a)			≡TATUS		_

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.

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,此報告結果僅對測试之樣品負責,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.

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





802.11n HT40 **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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

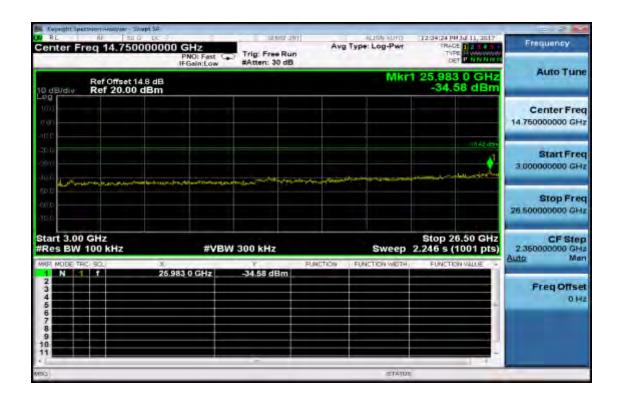
Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, 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.

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



802.11n_HT40 **Spurious Emission Test Data CH-Low**

Center Freq 1.515000000	GHz GHz	Avg Type: Log-Pwr	12-34:06 PM 34 13, 2617	Frequency
	PNO: Fast C Trig: Free Run IFGain:Low #Atten: 30 dB	Control of the	DET P N TO N TO N	
Ref Offset 14.8 dB 0 dB/div Ref 20.00 dBm		MK	r1 2.414 9 GHz 1.58 dBm	Auto Tune
1001 1001			1	Center Free 1.515000000 GH
40 0 30 0 50 1			(10.42 d5)	Start Free 30.000000 MH
50 D 3 4 mm - 2 4 1 4 m - 2 mm - 2 4 mm - 2 4	ي موجعه المراجع المراجع المراجع مواريع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع	an a		Stop Fre 3.000000000 GH
Start 30 MHz #Res BW 100 kHz	#VBW 300 kHz		Stop 3.000 GHz 83.9 ms (1001 pts)	CF Ste 297.000000 MH Auto Ma
MR MODE TRC SCL X	414 9 GHz 1,58 dBm	ETTON FUNCTION WETH	FUNCTION VALUE	Freq Offse 0 H
9				



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.



Spurious Emission Test Data CH-Mid

Keynight Spectraler Analyzer - Skrept SA					
Center Freq 1.51500000	PND: Fast	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	12:49:16 PM3d 11, 3617 THEOR 1 2:3:4 3 TYPE N OET P NIN NUMBER	Frequency
Ref Offset 14.8 dE			MK	r1 2.423 8 GHz 2.25 dBm	Auto Tun
1001 0 an				2	Center Fre 1.515000000 GH
400 200 300					Start Fre 30,000000 MH
50 0 					Stop Fre 3.000000000 GH
Start 30 MHz #Res BW 100 kHz	#VBW	300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	CF Ste 297.000000 MH Auto Ma
1 N 1 f 2 3 4 5 6 7	2.423 8 GHz	2.25 dBm		+	Freq Offse 0 H
			STATU		

Ref Offset 14.8 dB MRT 22,889 0 GH2 10 dB/dw -35.50 dBm	r Freg 14.750000000	El7 Frequency
100 Cente 101 Cente 102 Cente 103 Cente 104 Cente 105 Cente 105 Cente 105 Cente 105 <th></th> <th>HZ Auto Tun</th>		HZ Auto Tun
Start Star Start Start <ths< td=""><td></td><td>Center Fre 14,750000000 GH</td></ths<>		Center Fre 14,750000000 GH
500 500 500 500 500 500 500 500		1 Start Fre
Res BW 100 kHz #VBW 300 kHz Sweep 2.246 s (1001 pts) 2.3500000		Stop Fre 26 50000000 GR
NR MODE TRC SOL X. Y FUNCTION VEDTH, FUNCTION VALUE . Auto	3W 100 kHz	2.35000000 GP Auto M
1 N 1 f 25,889 0 GHz -35,50 dBm 2 3 3 5	1 1 25.8	Freq Offse

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.

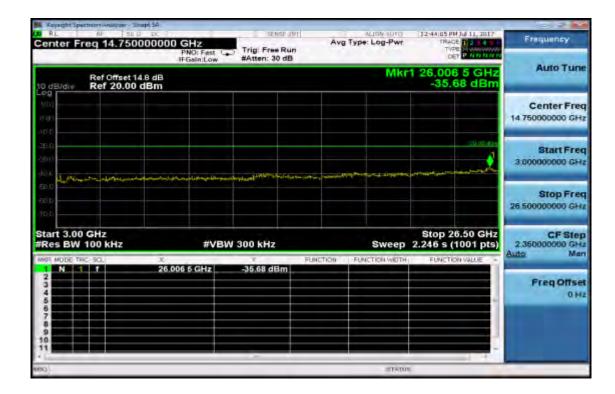
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測试之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, 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.

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



Spurious Emission Test Data CH-High

Keynight Spectralini Analyzer - Skrept SA					
Center Freq 1.5150000		Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	12-43/46 PM Jul 13, 2617 TRACE 1 2 3 4 4 1 TYPE MUSEUM DET P NN MUT	Frequency
Ref Offset 14.8 dl			MK	r1 2.438 7 GHz -0.95 dBm	Auto Tun
1000 0 001				<u>e</u> '	Center Fre 1.515000000 GH
40 0 30 D 30 H				and and a second se	Start Fre 30.000000 MH
50 0 5. A.M. S. A.M. S. A.M. A.M. A.M. A.M. A.	n an	ay Humana ani an Aling Aline ng Paning	ويه والب ماريكي المانية الماريكي والماريكي والمانية والمانية ومن المانية ومن المانية ومن المانية ومن المانية و المانية المانية ا		Stop Fre 3,000000000 GH
Start 30 MHz Res BW 100 kHz	#VBW	300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	CF Ste 297.000000 MH Auto Ma
1 N 1 f 2 3 4 5 6 7 8	2.438 7 GHz	-0.95 dBm		+	Freq Offse 0 H
9 10 11 11 10		-	STATU	-	



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.

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance 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



11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

11.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 limit as below.

And according to §15.33(a) (1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

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 ($dB\mu V/m$)

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.

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.



11.2 Measurement Equipment Used:

SGS SAC-III							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
EMI Test Receiver	R&S	ESCI7	100760	05/11/2017	05/10/2018		
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/25/2017	04/24/2018		
Loop Antenna	ETS-Lindgren	6502	148045	09/20/2016	09/19/2017		
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/19/2016	12/18/2017		
Horn Antenna	Schwarzbeck	BBHA9120D	1441	08/01/2016	07/31/2017		
Pre-Amplifier	Agilent	8447D	2944A07676	01/05/2017	01/04/2018		
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/05/2017	01/04/2018		
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	01/05/2017	01/04/2018		
3m Site NSA	SGS	966 chamber	N/A	07/01/2017	06/30/2018		
Low Loss Cable	Huber Suhner	966 TX	1	01/05/2017	01/04/2018		
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2016	12/11/2017		
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/05/2017	01/04/2018		

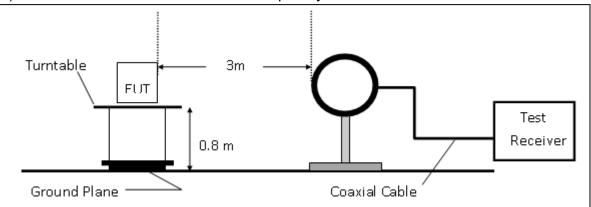
NOTE: N.C.R refers to Not Calibrated Required.

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

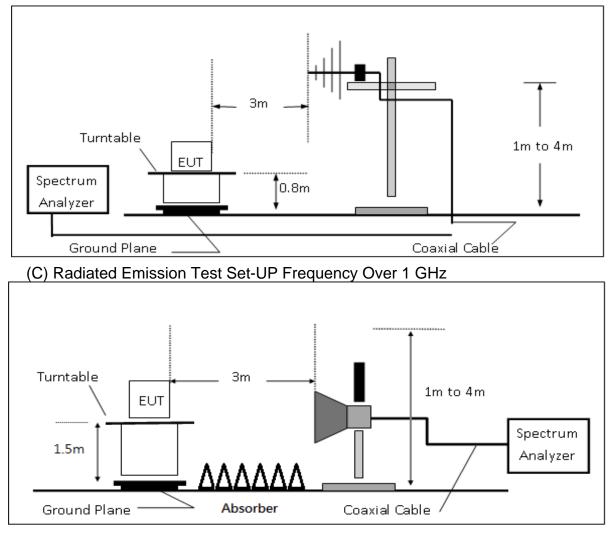


11.3 Test SET-UP





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



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.



11.4 Measurement Procedure

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 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.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. When 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.
- 6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- 8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
- 12. Repeat above procedures until all default test channel measured were complete.

Chino Soliton and Soliton and Soliton and Soliton and Soliton and Soliton Soliton and Soliton Soliton and Solito tronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is frawn 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.

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



11.5 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:

FS = RA + AF + CL - AG

Where	5	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB μ V/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note :

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

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

11.6 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.

11.7 Measurement Result

Note: Refer to next page spectrum analyzer data chart and 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.

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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

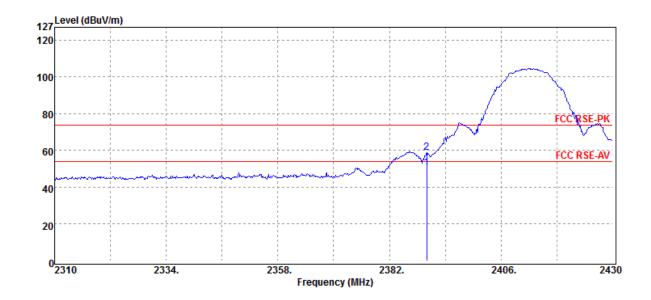


Radiated Band Edge Measurement Result (802.11b)

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11b :2412 MHz :Bandedge CH LOW :H Plane

Test Date :2017-07-06 Temp./Humi. :21 deg_C / 62 RH Engineer :Mike :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Average	52.23	-1.74	50.49	54.00	-3.51
2390.00	E	Peak	60.46	-1.74	58.72	74.00	-15.28

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.

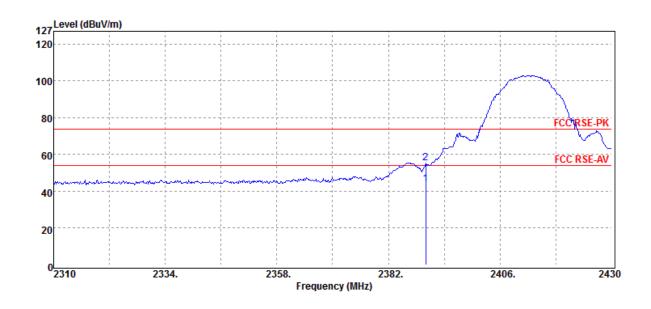


Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11b :2412 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer :Mike Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Average	45.59	-1.74	43.85	54.00	-10.15
2390.00	Е	Peak	57.07	-1.74	55.33	74.00	-18.67

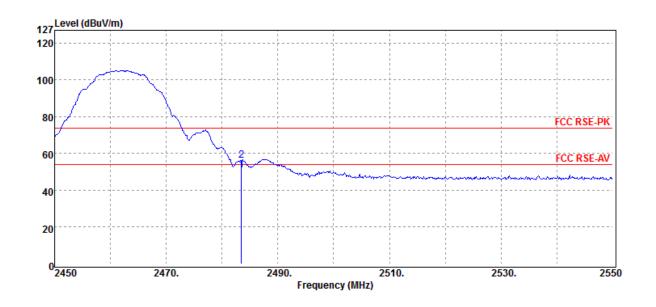
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Report No.: ER/2017/70015 Page 68 of 129



Operation Band :802.11b Fundamental Frequency :2462 MHz **Operation Mode** :Bandedge CH HIGH EUT Pol. :H Plane

Test Date :2017-07-06 Temp./Humi. :21 deg_C / 62 RH Engineer :Mike :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	52.62	-1.62	51.00	54.00	-3.00
2483.50	Е	Peak	57.86	-1.62	56.24	74.00	-17.76

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.

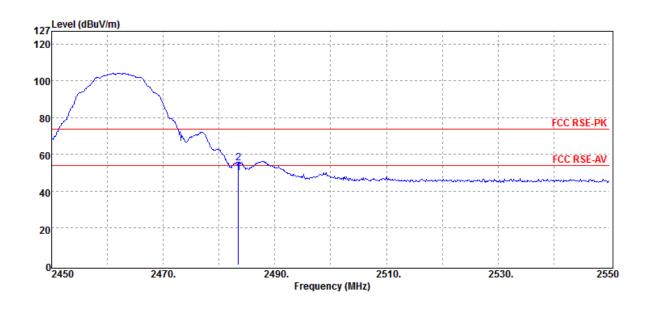
Report No.: ER/2017/70015 Page 69 of 129



Operation Band :802.11b Fundamental Frequency :2462 MHz **Operation Mode** :Bandedge CH HIGH EUT Pol. :H Plane

Test Date Temp./Humi. Engineer :Mike Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	51.72	-1.62	50.10	54.00	-3.90
2483.50	Е	Peak	57.15	-1.62	55.53	74.00	-18.47

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



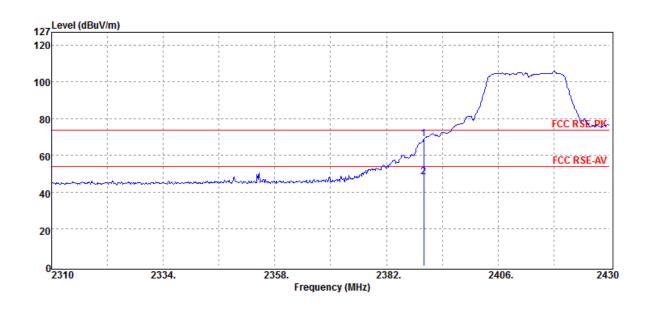
Radiated Band Edge Measurement Result (802.11g)

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11g :2412 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer :Mike Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Peak	70.67	-1.74	68.93	74.00	-5.07
2390.00	Е	Peak	49.96	-1.74	48.22	74.00	-25.78

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.



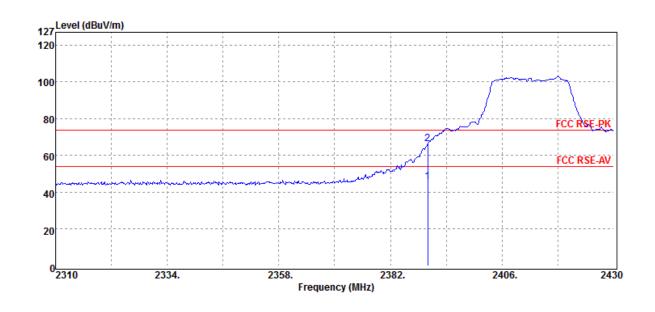
Report No.: ER/2017/70015 Page 71 of 129

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11g :2412 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer :Mike Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Average	47.32	-1.74	45.58	54.00	-8.42
2390.00	Е	Peak	68.08	-1.74	66.34	74.00	-7.66

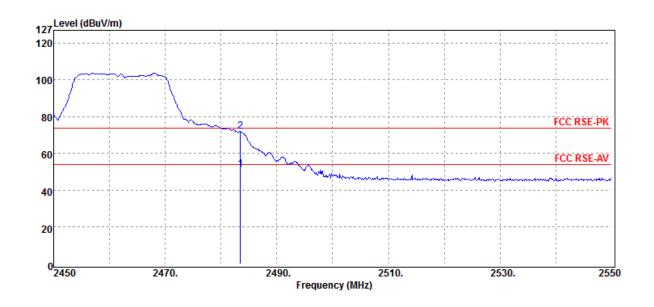
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Report No.: ER/2017/70015 Page 72 of 129



Operation Band :802.11g Fundamental Frequency :2462 MHz **Operation Mode** :Bandedge CH HIGH EUT Pol. :H Plane

Test Date :2017-07-06 Temp./Humi. :21 deg_C / 62 RH Engineer :Mike :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	53.04	-1.62	51.42	54.00	-2.58
2483.50	Е	Peak	73.51	-1.62	71.89	74.00	-2.11

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.

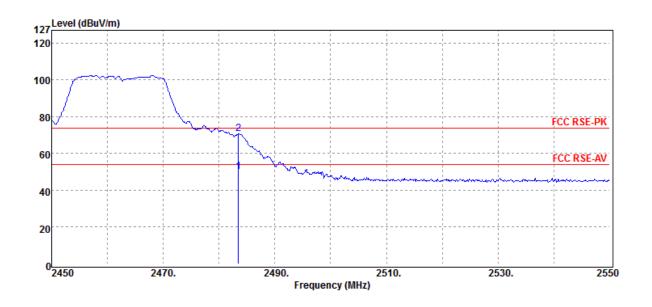
Report No.:ER/2017/70015 Page 73 of 129



Operation Band :802.11g Fundamental Frequency :2462 MHz **Operation Mode** :Bandedge CH HIGH EUT Pol. :H Plane

Test Date Temp./Humi. Engineer :Mike Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	51.52	-1.62	49.90	54.00	-4.10
2483.50	Е	Peak	72.25	-1.62	70.63	74.00	-3.37

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.



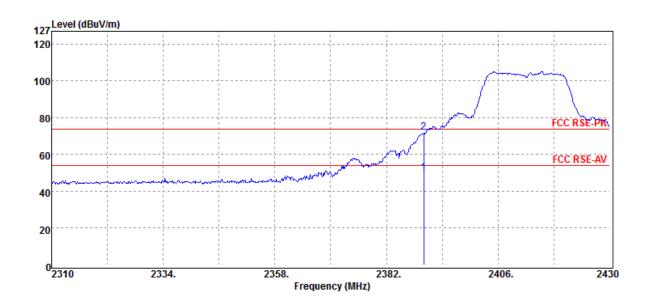
Radiated Band Edge Measurement Result (802.11_HT20)

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11n20 :2412 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Average	52.03	-1.74	50.29	54.00	-3.71
2390.00	Е	Peak	73.69	-1.74	71.95	74.00	-2.05

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.



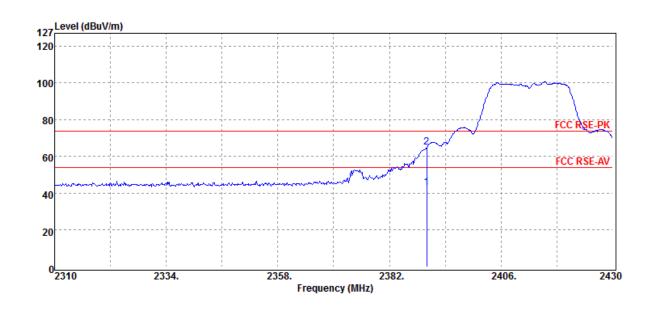
Report No.:ER/2017/70015 Page 75 of 129

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20 :2412 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer :Mike Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Average	44.60	-1.74	42.86	54.00	-11.14
2390.00	Е	Peak	66.98	-1.74	65.24	74.00	-8.76

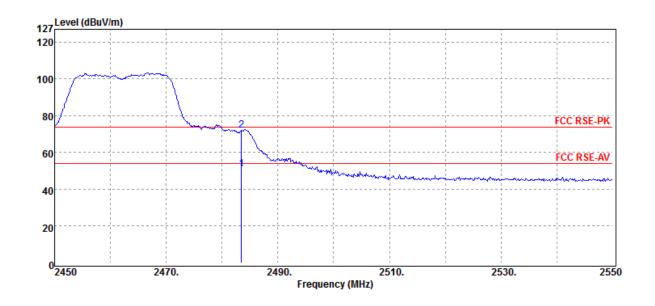
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Report No.:ER/2017/70015 Page 76 of 129



Operation Band :802.11n20 Fundamental Frequency :2462 MHz **Operation Mode** :Bandedge CH HIGH EUT Pol. :H Plane

Test Date :2017-07-06 Temp./Humi. :21 deg_C / 62 RH Engineer :Mike :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	52.48	-1.62	50.86	54.00	-3.14
2483.50	E	Peak	73.73	-1.62	72.11	74.00	-1.89

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.

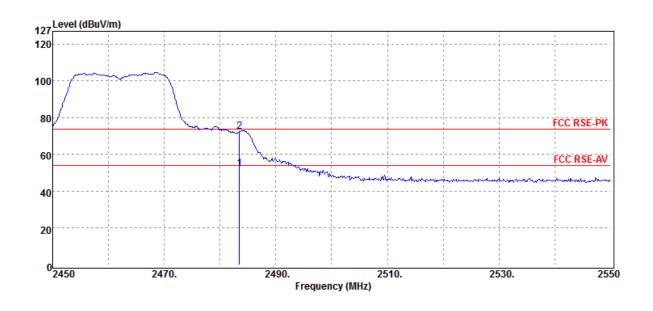
Report No.:ER/2017/70015 Page 77 of 129



Operation Band :802.11n20 Fundamental Frequency :2462 MHz **Operation Mode** :Bandedge CH HIGH EUT Pol. :H Plane

Test Date Temp./Humi. Engineer :Mike Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	54.10	-1.62	52.48	54.00	-1.52
2483.50	Е	Peak	74.12	-1.62	72.50	74.00	-1.50

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.



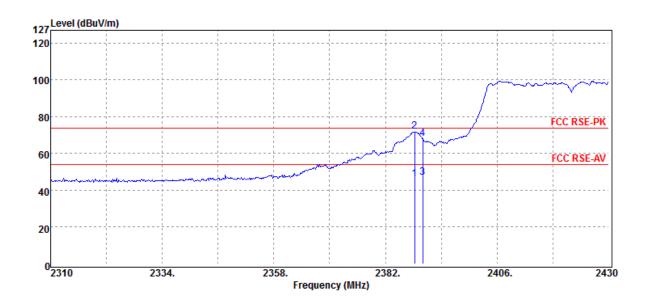
Radiated Band Edge Measurement Result (802.11_HT40)

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11n40 :2422 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2388.24	S	Average	47.68	-1.73	45.95	54.00	-8.05
2388.24	S	Peak	74.00	-1.73	72.27	74.00	-1.73
2390.00	Е	Average	48.63	-1.74	46.89	54.00	-7.11
2390.00	Е	Peak	69.67	-1.74	67.93	74.00	-6.07

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

Report No.:ER/2017/70015 Page 79 of 129

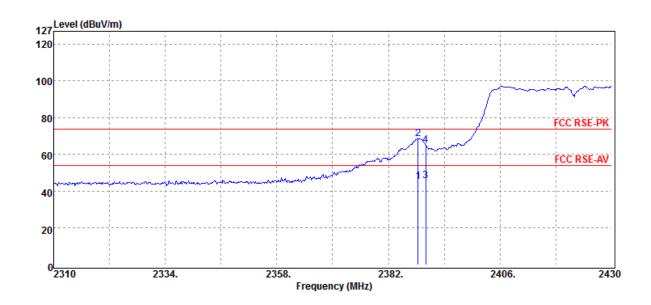


Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40 :2422 MHz :Bandedge CH LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :Mike :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2388.36	S	Average	47.08	-1.73	45.35	54.00	-8.65
2388.36	S	Peak	70.27	-1.73	68.54	74.00	-5.46
2390.00	Е	Average	47.32	-1.74	45.58	54.00	-8.42
2390.00	Е	Peak	66.80	-1.74	65.06	74.00	-8.94

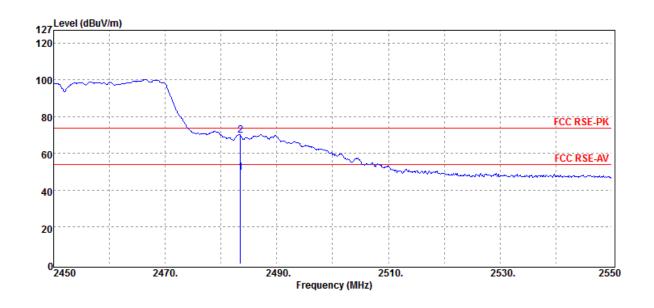
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Report No.:ER/2017/70015 Page 80 of 129



Operation Band :802.11n40 Fundamental Frequency :2422 MHz **Operation Mode** :Bandedge CH HIGH EUT Pol. :H Plane

Test Date :2017-07-06 Temp./Humi. :21 deg_C / 62 RH Engineer :Mike :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	51.49	-1.62	49.87	54.00	-4.13
2483.50	Е	Peak	71.54	-1.62	69.92	74.00	-4.08

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.

Report No.:ER/2017/70015 Page 81 of 129

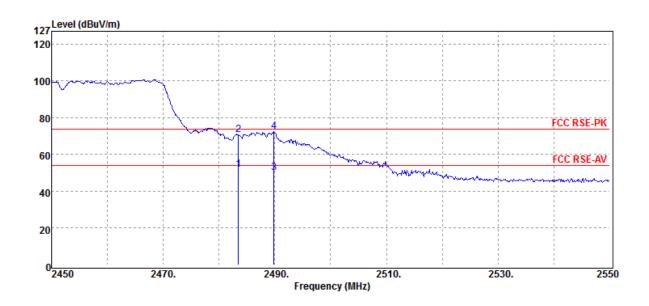


Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40 :2422 MHz :Bandedge CH HIGH :H Plane

Test Date Temp./Humi. Engineer :Mike Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :HORIZONTAL



l Limit Margin
@3m
m dBµV/m dB
54.00 -2.03
74.00 -3.40
54.00 -4.05
74.00 -1.50
r

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



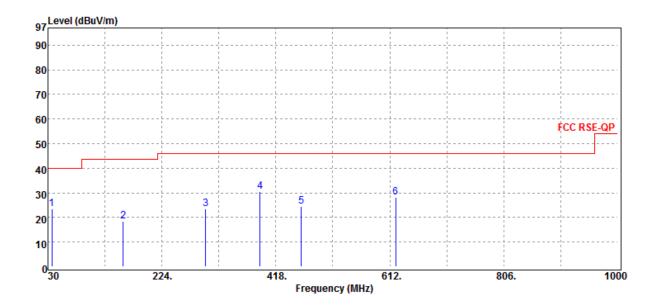
Below 1GHz Worst-Case Data:

Radiated Spurious Emission Measurement Result (802.11 g)

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11g :2412 MHz :Tx CH LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2017-07-07 :23 deg_C / 61 RH :Mike :VERTICAL



	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
			Mode	Reading Level		FS	@3m	
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	36.79	S	Peak	32.93	-9.47	23.46	40.00	-16.54
	158.04	S	Peak	27.18	-8.85	18.33	43.50	-25.17
	298.69	S	Peak	31.35	-7.72	23.63	46.00	-22.37
	390.84	S	Peak	36.60	-6.21	30.39	46.00	-15.61
	461.65	S	Peak	29.47	-4.98	24.49	46.00	-21.51
	621.70	S	Peak	30.78	-2.52	28.26	46.00	-17.74

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.

Contention is stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are relative 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.

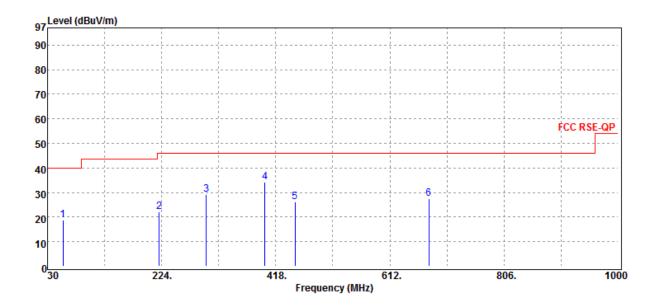
GS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



Operation Band :802.11g Fundamental Frequency :2412 MHz **Operation Mode** :Tx CH LOW EUT Pol. :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2017-07-07 :23 deg_C / 61 RH :Mike :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
56.19	S	Peak	27.46	-8.71	18.75	40.00	-21.25
220.12	S	Peak	32.90	-10.79	22.11	46.00	-23.89
299.66	S	Peak	36.78	-7.71	29.07	46.00	-16.93
399.57	S	Peak	40.37	-6.01	34.36	46.00	-11.64
450.98	S	Peak	31.30	-5.03	26.27	46.00	-19.73
677.96	S	Peak	29.30	-1.84	27.46	46.00	-18.54

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.

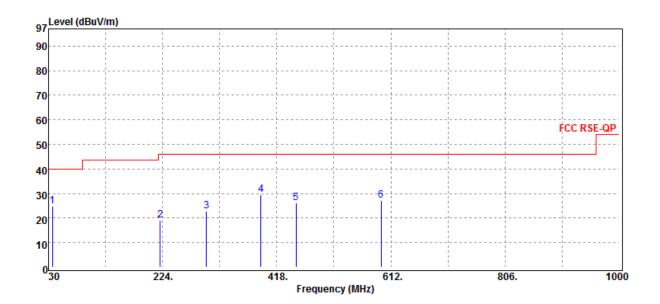
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, 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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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



Operation Band :802.11g Fundamental Frequency :2437 MHz **Operation Mode** :Tx CH MID EUT Pol. :H Plane

:2017-07-07 Test Date Temp./Humi. :23 deg_C / 61 RH Engineer :Mike :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
36.79	S	Peak	34.15	-9.47	24.68	40.00	-15.32
220.12	S	Peak	29.79	-10.79	19.00	46.00	-27.00
298.69	S	Peak	30.56	-7.72	22.84	46.00	-23.16
390.84	S	Peak	35.63	-6.21	29.42	46.00	-16.58
450.98	S	Peak	31.35	-5.03	26.32	46.00	-19.68
595.51	S	Peak	30.00	-2.70	27.30	46.00	-18.70

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.

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

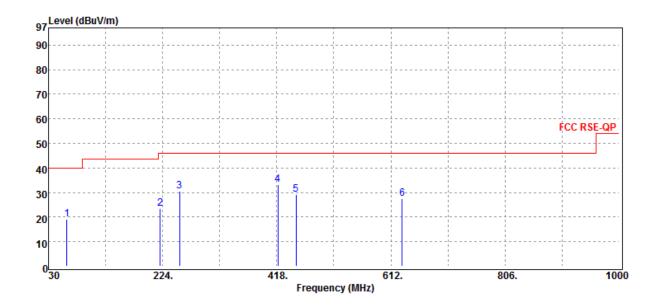
GS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



Operation Band :802.11g **Fundamental Frequency** :2437 MHz **Operation Mode** :Tx CH MID EUT Pol. :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2017-07-07 :23 deg_C / 61 RH :Mike :HORIZONTAL



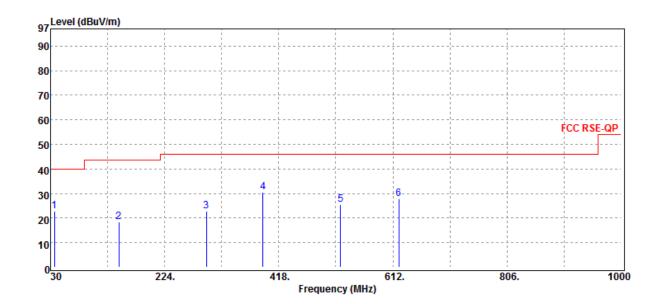
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
61.04	S	Peak	28.13	-9.13	19.00	40.00	-21.00
220.12	S	Peak	34.37	-10.79	23.58	46.00	-22.42
253.10	S	Peak	39.78	-9.35	30.43	46.00	-15.57
419.94	S	Peak	39.00	-5.68	33.32	46.00	-12.68
450.98	S	Peak	34.23	-5.03	29.20	46.00	-16.80
631.40	S	Peak	29.97	-2.59	27.38	46.00	-18.62

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.



Operation Band :802.11g Fundamental Frequency :2462 MHz **Operation Mode** :Tx CH HIGH EUT Pol. :H Plane

:2017-07-07 Test Date Temp./Humi. :23 deg_C / 61 RH Engineer :Mike :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
36.79	S	Peak	32.27	-9.47	22.80	40.00	-17.20
146.40	S	Peak	27.74	-9.18	18.56	43.50	-24.94
294.81	S	Peak	30.75	-7.78	22.97	46.00	-23.03
390.84	S	Peak	36.61	-6.21	30.40	46.00	-15.60
522.76	S	Peak	29.99	-4.34	25.65	46.00	-20.35
621.70	S	Peak	30.52	-2.52	28.00	46.00	-18.00

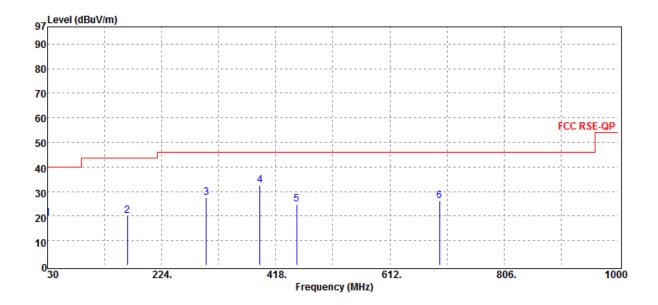
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Operation Band :802.11g Fundamental Frequency :2462 MHz **Operation Mode** :Tx CH HIGH EUT Pol. :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2017-07-07 :23 deg_C / 61 RH :Mike :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
30.00	S	Peak	28.88	-9.77	19.11	40.00	-20.89
165.80	S	Peak	28.90	-8.91	19.99	43.50	-23.51
299.66	S	Peak	35.29	-7.71	27.58	46.00	-18.42
390.84	S	Peak	38.83	-6.21	32.62	46.00	-13.38
453.89	S	Peak	29.82	-5.04	24.78	46.00	-21.22
696.39	S	Peak	27.73	-1.58	26.15	46.00	-19.85

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.



Above 1GHz Data:

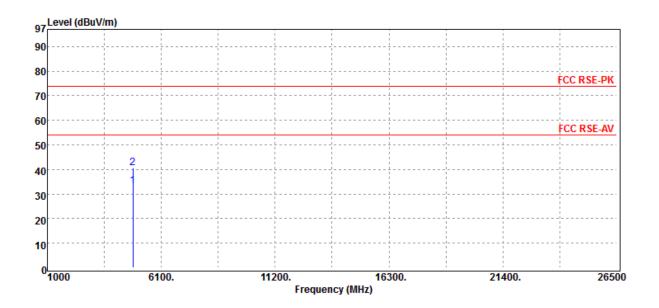
Radiated Spurious Emission Measurement Result (802.11 b)

Operation Band
Fundamental Frequency
Operation Mode
EUT Pol.

:802.11b :2412 MHz :Tx CH LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	_
4824.00	Н	Average	28.26	4.93	33.19	54.00	-20.81	
4824.00	Н	Peak	35.53	4.93	40.46	74.00	-33.54	

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.



4824.00

Н

Н

Operation Ba Fundamental Operation Mc EUT Pol.	Frequency	:802.11b :2412 MHz :Tx CH LOV :H Plane	V	Test Date Temp./Hu Engineer Measurer	ımi.	:21 de :Mike	07-06 g_C / 62 RH ZONTAL
97	(dBuV/m)						
90							
80						FCC RSE-	PK
70							
60						FCC RSE-	AV
50							
40	2						
30							
20							
10							
0 <mark></mark>	6	100.	11200. Frequency (I	16300. MHz)	21400.	1	26500
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

26.90

35.37

Average

Peak

4.93

4.93

31.83

40.30

54.00

74.00

-22.17



Н

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11b :2437 MHz :Tx CH MID :H Plane)	Test Date Temp./Hu Engineer Measurer		:Mike	9_C / 62 RH
97	(dBuV/m)						
90 		-			· · · · · · · · · · · · · · · · · · ·		
80						FCC RSE-P	K
70	 			 	I I 		
60				1 1 1 1		FCC RSE-A	v
50							
40	2						
30							
20						 	
10						 	
0 <mark></mark>	6	100.	11200. Frequency (I	16300. ЛНz)	21400.	26	500
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	н	Average	24.01	5.13	29.14	54.00	-24.86

Peak

35.78

5.13

40.91

74.00



Н

Operation Ba Fundamental Operation Mc EUT Pol.	Frequency	:802.11b :2437 MHz :Tx CH MID :H Plane		Test Date Temp./Hu Engineer Measuren		:Mike	07-06 g_C / 62 RH ZONTAL
97 Level	(dBuV/m)						
90 							
<mark>80</mark>						FCC RSE-P	K
70				 			<u></u>
<mark>60</mark>						FCC RSE-A	v
50				 			
40	2			1 1 1 1 1			
30		-					
20							
10							
0 <mark></mark> 1000	6	100.	11200. Frequency (I	16300. MHz)	21400.	26	5500
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	н	Average	24.11	5.13	29.24	54.00	-24.76

Peak

35.43

5.13

40.56

74.00



4924.00

Н

Н

Operation E Fundament Operation M EUT Pol.	al Frequency	:802.11b :2462 MHz :Tx CH HIG :H Plane	Н	Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:21 de :Mike	:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL		
97	el (dBuV/m)								
90									
80						FCC RSE	<u>-PK</u>		
70									
60						FCC RSE	-AV		
50	2						·		
40		· - L							
30									
20									
10						·	·		
0	0 6	100.	11200.	16300.	21400		26500		
100			Frequency (I		21100		20000		
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe		
		Mode	Reading Level		FS	@3m	Margin		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB		

24.33

35.96

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

Average

Peak

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,此報告結果僅對測试之樣品負責,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.

5.25

5.25

29.58

41.21

54.00

74.00

-24.42

-32.79



4924.00

Н

Н

Frequency	:802.11b :2462 MHz :Tx CH HIG :H Plane	Н	Temp./Hu Engineer	ımi.	:21 de :Mike	07-06 g_C / 62 RH ZONTAL
			INICASUICI	neni Antenna Ft	л.	
dBuV/m)						
,						
			1			
			·		FCC RSE-	PK
			·			
·			·		FCC RSE-	AV
2			·			
			 		1	
·						
6	100.	11200.	16300.	21400.	2	6500
		Frequency (N	IHz)			
Note	Detector	Spectrum	Factor	Actual	Limit	Safe
	Mode	Reading Level		FS	@3m	Margin
F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	o Note	Frequency :2462 MHz :Tx CH HIG :H Plane dBuV/m) 2 1 6100. 6100.	Frequency :2462 MHz de :Tx CH HIGH :H Plane	Frequency :2462 MHz Temp./Hu de :Tx CH HIGH Engineer :H Plane Measurer dBuV/m)	Frequency :2462 MHz Temp./Humi. de :Tx CH HIGH Engineer :H Plane Measurement Antenna Pc dBuV/m)	Frequency :2462 MHz Temp./Humi. :21 de de :Tx CH HIGH Engineer :Mike iH Plane Measurement Antenna Pol. :HORI dBuV/m)

Average

Peak

5.25

5.25

24.47

34.86

29.72

40.11

-24.28

-33.89

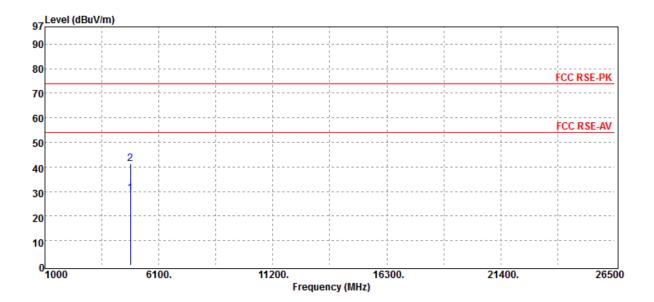
54.00

74.00



Radiated Spurious Emission Measurement Result (802.11 g)

Operation Band	:802.11g	Test Date	:2017-07-06
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Mike
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.00	Н	Average	24.17	4.93	29.10	54.00	-24.90
4824.00	Н	Peak	36.34	4.93	41.27	74.00	-32.73

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.



4824.00

Н

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11g :2412 MHz :Tx CH LOW :H Plane		Test Date Temp./Hu Engineer Measurer		:21 de :Mike	:2017-07-06 :21 deg_C / 62 RH :Mike :HORIZONTAL	
97	dBuV/m)							
90					· · · · · · · · · · · · · · · · · · ·			
80				1 1 1 1 1	·			
70					·	FCC RSE	- <u></u>	
60			L J			FCC RSE	AV	
50					· · · · · · · · · · · · · · · · · · ·	FUC R3E		
40	2							
30								
20								
10					·			
0	6	100.	11200.	16300.	21400		26500	
1000	Ū	100.	Frequency (I		21400		20300	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4824.00	Н	Average	24.24	4.93	29.17	54.00	-24.83	

Peak

35.16

4.93

40.09

74.00



Н

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11g :2437 MHz :Tx CH MID :H Plane		Test Date Temp./Hu Engineer Measurer		:21 deg :Mike	:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL				
97	(dBuV/m)										
90 					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·					
80					· · · · · · · · · · · · · · · · · · ·	FCC RSE-F					
70											
60			JJJJJJ			FCC RSE-	AV				
50											
40	2										
30											
20											
10						 					
0 <mark>.</mark> 1000	00										
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe				
		Mode	Reading Level		FS	@3m	Margin				
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB				
4874.00	н	Average	24.21	5.13	29.34	54.00	-24.66				

Peak

35.60

5.13

40.73

74.00



Н

Operation Ba Fundamental Operation Mc EUT Pol.	amental Frequency :2437 MHz Temp./Humi. ation Mode :Tx CH MID Engineer		ni. :21 (:Mik		07-06 g_C / 62 RH ZONTAL		
ozLevel	(dBuV/m)						
90 90							
80						FCC DCF F	
70						FCC RSE-F	<u>···</u>
60						FCC RSE-4	
50					· · · · · · · · · · · · · · · · · · ·	FUC KSE-4	<u> </u>
40	2						
30							
20		-					
10							
0 <mark></mark>	6	100.	11200.	16300.	21400.	2	6500
1000	v	100.	Frequency (I		21400.	2	0000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	Н	Average	24.33	5.13	29.46	54.00	-24.54

Peak

33.72

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></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 form exercising all their rights and obligations under the transaction documents is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WukungRoad,NewTaipeilndustialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

5.13

38.85

74.00

-35.15



4924.00

Н

Н

Operation Band Fundamental Frequency Operation Mode		:802.11g :2462 MHz :Tx CH HIGH		Test Date Temp./Hu Engineer	umi.	:21 de :Mike	-		
EUT Pol.		:H Plane		Measure	ment Antenna Po	ol. :VERT	ICAL		
97 Level (dBuV/m)								
90									
80									
70				 		FCC RSE-	PK		
60	 			I I I I		FCC RSE-	AV		
50	2			· · · · · · · · · · · · · · · · · · ·		·			
40									
30						·			
20						 			
10						, , , , , , , , , , , , , , , , , , ,			
0 <mark>1000</mark>	6	100.	11200. Frequency (N	16300. /Hz)	21400.	2	6500		
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe		
-		Mode	Reading Level		FS	@3m	Margin		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB		

Average

Peak

5.25

5.25

24.44

35.29

29.69

40.54

54.00

74.00

-24.31



4924.00

4924.00

Н

Н

Operation Band Fundamental Frequency Operation Mode EUT Pol.	ental Frequency :2462 MHz Temp./Humi. n Mode :Tx CH HIGH Engineer		:Mike	07-06 J_C / 62 RH CONTAL		
97 Level (dBuV/m)		: :	:		÷	_
90						- ·
80					FCC RSE-P	
70	- L					
60					FCC RSE-A	
50					FUC ROE-A	
40 2						
30						
20						
10	· · · · · · · · · · · · · · · · · · ·				 	
			10000			
01000	5100.	11200. Frequency (N	16300. IHz)	21400.	26	500
Freq. Note	Detector	Spectrum	Factor	Actual	Limit	Safe
	Mode	Reading Level		FS	@3m	Margin
MHz F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

24.57

35.55

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.

Average

Peak

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,此報告結果僅對測试之樣品負責,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.

5.25

5.25

29.82

40.80

54.00

74.00

-24.18

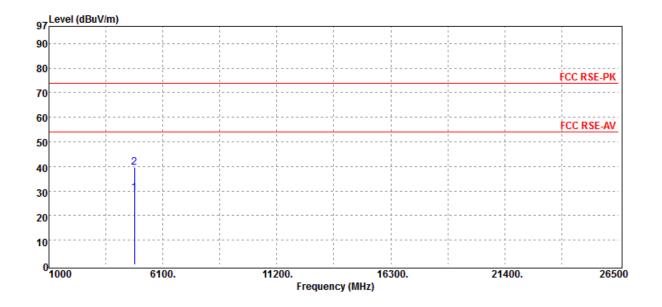


Radiated Spurious Emission Measurement Result (802.11_HT20)

Operation Band	:802.11n20	Ťest
Fundamental Frequency	:2412 MHz	Tem
Operation Mode	:Tx CH LOW	Engi
EUT Pol.	:H Plane	Mea

t Date :2017-07-06 np./Humi. ineer :Mike :VERTICAL Measurement Antenna Pol.

:21 deg_C / 62 RH



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4824.00	Н	Average	24.19	4.93	29.12	54.00	-24.88	
4824.00	Н	Peak	34.72	4.93	39.65	74.00	-34.35	

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.



4824.00

Н

Н

peration Band undamental Frequency peration Mode		:802.11n20 :2412 MHz :Tx CH LOW		Test Date Temp./Hu Engineer	ımi.	:21 deo :Mike		
JT Pol.		:H Plane		Measurement Antenna Po			ZONTAL	
97	dBuV/m)							
97 <u> </u>								
80						FCC RSE-P	K	
70	· J				i		·	
60	· · · · · · · · · · · · · · · · · · ·					FCC RSE-A	N	
50		- L						
40	2							
30								
20								
10								
0 <mark></mark> 1000	6	100.	11200. Frequency (I	16300. MHz)	21400.	20	5500	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	

24.28

35.32

Average

Peak

4.93

4.93

29.21

40.25

54.00

74.00

-24.79



Н

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11n20 :2437 MHz :Tx CH MID :H Plane	:2437 MHz :Tx CH MID		e imi. ment Antenna F	:21 de :Mike	:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL	
97	(dBuV/m)							
90								
80						FCC RSE-	DK	
70								
60				1 1 1 1 1		FCC RSE-	AV	
50						 		
40	2							
30								
20								
10								
0 1000 6100. 11200. 16300. 21400. 26500 Frequency (MHz)								
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4874.00	Н	Average	24.20	5.13	29.33	54.00	-24.67	

Peak

34.52

5.13

39.65

74.00

-34.35



Н

Fundamental	Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11n20 :2437 MHz :Tx CH MID :H Plane		, ımi. ment Antenna I	:21 de :Mike	:2017-07-06 :21 deg_C / 62 RH :Mike :HORIZONTAL	
97	(dBuV/m)							
90								
80						FCC RSE	DK	
70					 			
60					 	FCC RSE	-AV	
50								
40	2					 		
30					 	 		
20						 		
10						 		
0 1000	6	100.	11200. Frequency (I	11200. 16300. Frequency (MHz)			26500	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4874.00	Н	Average	24.25	5.13	29.38	54.00	-24.62	

Peak

34.55

5.13

39.68

74.00

-34.32



4924.00

Н

Н

peration Bai undamental peration Mo	Frequency	:802.11n20 :2462 MHz :Tx CH HIG	iΗ	Test Date Temp./Humi. Engineer		:21 de :Mike	:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL	
UT Pol.		:H Plane		Measure	ment Antenna F	ol. IVERI	ICAL	
97 Level ((dBuV/m)							
90								
80			· · · · · · · · · · · · · · · · · · ·	 				
						FCC RSE-	PK	
70				·				
60						FCC RSE-	AV	
50								
40	2	·						
30								
20	1			 				
10				·				
0	: 1	5 100.	11200.	16300.	21400.	2	6500	
			Frequency	(MHz)				
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	

24.44

36.08

Average

Peak

5.25

5.25

29.69

41.33

54.00

74.00

-24.31

-32.67



4924.00

4924.00

Н

Н

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11n20 :2462 MHz :Tx CH HIG :H Plane		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:Mike	07-06 J_C / 62 RH CONTAL
97	(dBuV/m)						_
90							
80						FCC RSE-P	ĸ
70							
60						FCC RSE-A	v
50							
40	2			 			
30							
20							- ·
10							
0		100.	11200.	16300.	21400.	26	500
1000	0	100.	Frequency (N		21400.	20	000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	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.

Average

Peak

24.61

34.87

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,此報告結果僅對測试之樣品負責,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.

5.25

5.25

29.86

40.12

54.00

74.00

-24.14

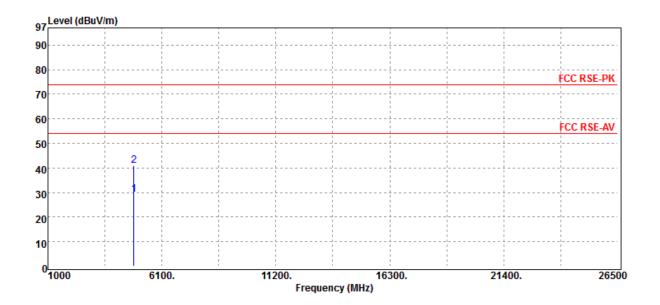


Radiated Spurious Emission Measurement Result (802.11_HT40)

Operation Band	:802.11n40
Fundamental Frequency	:2422 MHz
Operation Mode	:Tx CH LOW
EUT Pol.	:H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4844.00	н	Average	24.23	4.97	29.20	54.00	-24.80
4844.00	Н	Peak	35.88	4.97	40.85	74.00	-33.15

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.



Н

Operation Ba Fundamental Operation Mc EUT Pol.	Frequency	:802.11n40 :2422 MHz :Tx CH LOV :H Plane	V	Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:21 de :Mike	:2017-07-06 :21 deg_C / 62 RH :Mike :HORIZONTAL	
97 Level	(dBuV/m)							
90								
80						FCC RSE-		
70						FUU ROE-	<u></u>	
60						FCC RSE-	AV	
50						FUC RSE-	<u>HV</u>	
40	2	-						
30		-						
20								
10								
0 <mark></mark>	6	100	11200	46200	21400		6500	
⁰ 1000 6100. 11200. 16300. 21400. 26500 Frequency (MHz)								
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4844.00	Н	Average	24.33	4.97	29.30	54.00	-24.70	

Peak

34.17

4.97

39.14

74.00

-34.86



Operation Ba Fundamental Operation Mc EUT Pol.	Frequency	:802.11n40 :2437 MHz :Tx CH MID :H Plane		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:21 deg :Mike	:2017-07-06 :21 deg_C / 62 RH :Mike :VERTICAL	
97	(dBuV/m)						_	
90								
80						FCC RSE-PI		
70								
60					· · · · · · · · · · · · · · · · · · ·	FCC DCC A	-	
50				 	· · · · · · · · · · · · · · · · · · ·	FCC RSE-A		
40	2							
30								
20					· · · · · · · · · · · · · · · · · · ·	, , , ,		
				1		 		
10								
0 <mark>1000 6100.</mark>		100.	11200. Frequency (I	16300. MHz)			26500	
			i requeitey (i					
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4874.00	н	Average	24.26	5.13	29.39	54.00	-24.61	
4874.00	Н	Peak	35.27	5.13	40.40	74.00	-33.60	



4874.00

Н

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11n40 :2437 MHz :Tx CH MID :H Plane)	Test Date Temp./Hu Engineer Measurer		:Mike	07-06 g_C / 62 RH ZONTAL
97	(dBuV/m)						
90							
80						FCC RSE-I	X
70				 			
60		-				FCC RSE-	AV
50							
40	2						
30							
20						 	
10						 	
0 <mark></mark>	6	100.	11200. Frequency (I	16300. ЛНz)	21400.	2	6500
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.00	н	Average	24.37	5.13	29.50	54.00	-24.50

Peak

35.40

5.13

40.53

74.00

-33.47



4904.00

4904.00

Н

Н

Operation Band Fundamental Fre Operation Mode EUT Pol.	equency	:802.11n40 :2452 MHz :Tx CH HIG :H Plane	Н	Test Date Temp./H Enginee Measure	umi.	:Mike	g_C / 62 RH
97	//m)						_
90		· · · · · · · · · · · · · · · · · · ·					
80	·					FCC RSE-P	
70		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				<u>n</u>
60							
50				 		FCC RSE-A	<u>v</u>
	2						
40				1 1 1			
30							. = .
20		· · · · · · · · · · · · · · · · · · ·		 			
10							
0 <mark>.</mark> 1000	61	100.	11200. Frequency (I	16300. ЛНz)	21400.	26	5500
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz F	/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

Average

Peak

5.24

5.24

24.46

35.82

29.70

41.06

54.00

74.00

-24.30

-32.94



4904.00

4904.00

Н

Н

Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11n40 :2452 MHz :Tx CH HIG :H Plane	iΗ	Test Date Temp./Hu Engineer Measurei	umi.	:Mike	07-06 g_C / 62 RH ZONTAL
97	(dBuV/m)			÷			
90							
80						FCC RSE-	PK
70							
60	·					FCC RSE-	AV
50	·	- L		 			
40	2						
30						·	
20	·					 	
10						 	
0 <mark></mark>	6	100.	11200. Frequency (N	16300. ЛНz)	21400.	2	6500
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

24.57

35.59

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.

Average

Peak

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,此報告結果僅對測试之樣品負責,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.

5.24

5.24

29.81

40.83

54.00

74.00

-24.19

-33.17



12 PEAK POWER SPECTRAL DENSITY

12.1 Standard Applicable

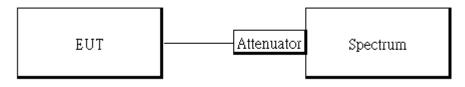
The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

-1.50	dBi
-0.10	dBi
2	pcs
8	dBm
MIMO mode a	the limit reduce as below:
nent + 10 log (‡	# of TX antenna elements)
3.01d <i>B</i> i	
	-0.10 2 8 MIMO mode 1

12.2 Measurement Equipment Used

SGS Conducted Room						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017	
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017	
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	03/21/2017	03/20/2018	
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018	
Coaxial Cable	HUBER+SUHN ER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018	
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018	
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018	
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017	
Temperature Chamber	TERCHY	MHG-120LF	911009	05/19/2017	05/18/2018	

12.3 Test Set-up



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.

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.



12.4 Measurement Procedure

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 3 kHz & VBW = 10 kHz.
- 5. For defining Restricted Band Edge Limit: Set the RBW = 100kHz & VBW = 300 kHz.
- 6. Detector = peak.
- 7. Sweep time = auto couple.
- 8. Trace mode = max hold.
- 9. Allow trace to fully stabilize.
- 10. Use the peak marker function to determine the maximum amplitude level.
- 11. 802.11g/n MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application

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.

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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



12.5 Measurement Result

POWER DENSITY 802.11b				POV	VER DEI	NSITY 8	02.11g
Freq. (MHz)	PSD (dBm)	Limit (dBm)	Result	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Result
2412	-1.41	8.00	PASS	2412	-6.48	8.00	PASS
2437	-0.23	8.00	PASS	2437	-6.03	8.00	PASS
2462	-0.55	8.00	PASS	2462	-6.05	8.00	PASS
POWE	r densi	TY 802.	11n HT20	POWE	r densi	TY 802.	11n HT40
Freq. (MHz)	PSD (dBm)	Limit (dBm)	Result	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Result
2412	-7.72	8.00	PASS	2422	-11.8	8.00	PASS
2437	-5.71	8.00	PASS	2437	-8.22	8.00	PASS
2462	-7.94	8.00	PASS	2452	-10.9	8.00	PASS

*Refer to next page for plots

Band	ledge L	imit 802.11b MODE	Banc	ledge L	imit 802.11g MODE
Freq.	PSD	Bandedge Limit	Freq.	PSD	Bandedge Limit
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)
2412	13.84	-6.16	2412	8.99	-11.01
2462	13.47	-6.53	2462	8.55	-11.45
Bande	dge Lir	nit 802.11 n20 MODE	Bande	dge Lir	nit 802.11 n40 MODE
Bande Freq.	e dge Lir PSD	nit 802.11 n20 MODE Bandedge Limit	Bande Freq.	e dge Li r PSD	nit 802.11 n40 MODE Bandedge Limit
				•	
Freq.	PSD	Bandedge Limit	Freq.	PSD	Bandedge Limit



802.11b **Power Spectral Density Test Plot (CH-Low)**

SC



Power Spectral Density Test Plot (CH-Mid)



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

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.



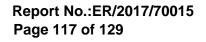
Power Spectral Density Test Plot (CH-High)



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

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance 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

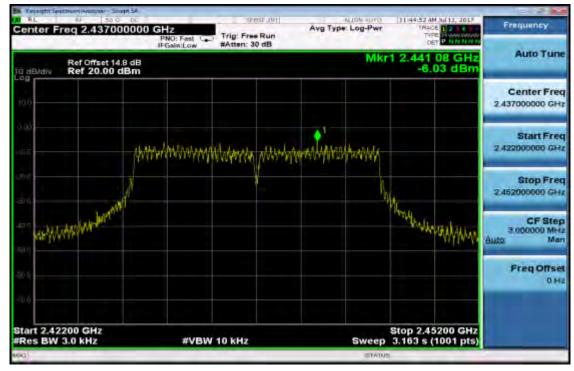




802.11g **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)



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

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.



Power Spectral Density Test Plot (CH-High)



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

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

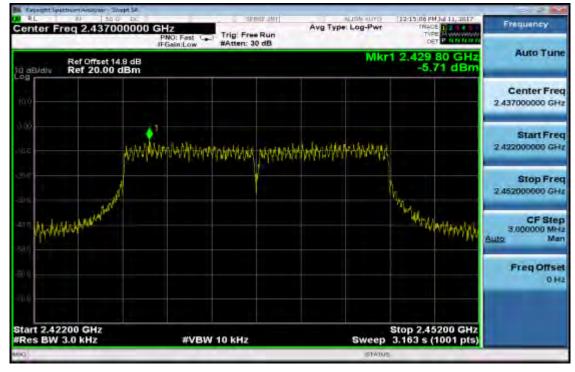
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



802.11n_HT20 (MIMO) **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)



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

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.



Power Spectral Density Test Plot (CH-High)



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

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance 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



802.11n_HT40 (MIMO) **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)

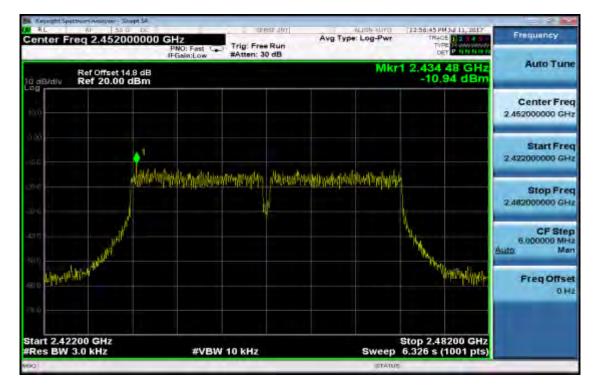


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.



Power Spectral Density Test Plot (CH-High)



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

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. 除非另有说明,此根告结果僅對測試之樣品負責,同時此樣品僅保留的天。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-reparatore of this document is unaveruent is unaveruent to any be prosecuted to the fulle at vertex of the law. pearance 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



802.11b PSD for Band edge Limit (CH-Low)



802.11b PSD for Bandedge Limit(CH-High)



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

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.

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



802.11g PSD for Bandedge Limit(CH-Low)



802.11g PSD for Bandedge Limit(CH-High)



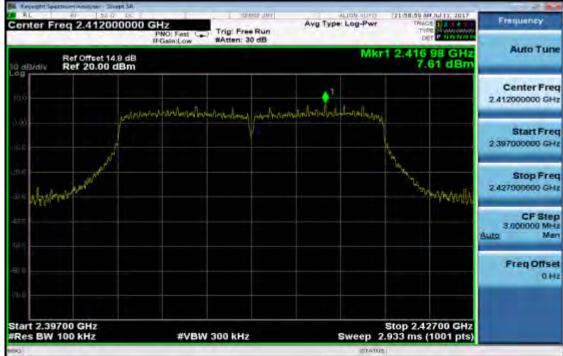
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.

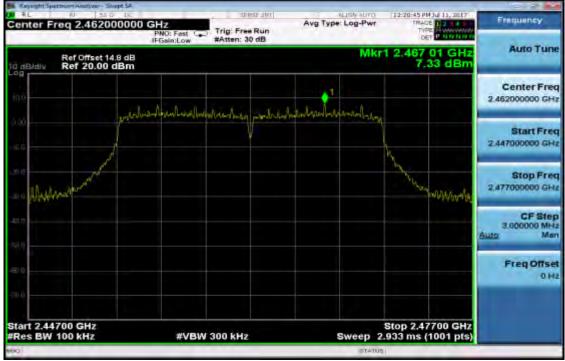
GS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



802.11n_HT20 PSD for Bandedge Limit(CH-Low)



802.11n_HT20 PSD for Bandedge Limit(CH-High)



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

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.

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_HT40 PSD for Bandedge Limit(CH-Low)



802.11n_HT40 PSD for Bandedge Limit(CH-High)



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

Unless otherwise stated the results shown in this test report feiter only to the sample(s) tested and such sample(s) are relatined to so 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.

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



13 ANTENNA REQUIREMENT

13.1 Standard Applicable

For intentional device, 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.

If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level.9 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

13.2 Antenna Connected Construction

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector and 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.

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.

Re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元。本報告未經本公司書面許可,不可能份複製。 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.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 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



14 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

14.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range	Electric Field	Magnetic Field	Power Density	Averaging Time			
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm ²)	(minute)			
	Limits for General Population/Uncontrolled Exposure						
0.3-1.34	614	1.63	*(100)	30			
1.34-30	824/f	2.19/f	*(180/f ²)	30			
30-300	27.5	0.073	0.2	30			
300-1500	/	/	F/1500	30			
1500-15000	/	/	1.0	30			

F = frequency in MHz

* = Plane-wave equipment power density

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.

でいたいでは、 除非另有就明,此報告結果僅對測試之樣品負責,同時此樣品僅保留知天。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</u> e-document.htm. 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



802.11b Aux1							
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)		Limit		RESULT
1	2412	1	24.92	1 Watt	30.00	dBm	PASS
6	2437	1	25.18	1 Watt	30.00	dBm	PASS
11	2462	1	24.94	1 Watt	30.00	dBm	PASS
802.11b Aux1							
СН	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Limit		RESULT	
			(abiii)				
1	2412	1	22.76	1 Watt	30.00	dBm	PASS
1 6	2412 2437	1	. ,	1 Watt 1 Watt	30.00 30.00	dBm dBm	

14.2 Maximum Permissible Exposure (MPE) Evaluation (Worst Case)

MPE Prediction (802.11b)

Prediction of MPE limit at a given distance Equation from page 18 of OET Bulletin 65, Edition 97-01 $S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Max. output power including tune-up tolerancel:	23.06	(dBm)			
Max. output power including tune-up tolerancel:	202.30192	(mW)			
Duty cycle:	99.63	(%)			
Maximum Pav :	201.5534	(mW)			
Peak Antenna gain (Maximum):	-0.1	(dBi)			
Peak Antenna gain (linear):	0.9772372	(numeric)			
Prediction distance:	20	(cm)			
Prediction frequency:	2437	(MHz)			
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)			
Power density at predication frequency at 20 (cm)	0.039	(mW/cm2)			
Measurement Result					
The predicted power density level at 20 cm is 0.039 mW/cm2.					
This is below the uncontrolled exposure limit of 1 mW/cm2 at 2437MHz.					

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.

Unless otherwise stated the results shown in this test report reter 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.