

FCC ID: QVZ-QM03YB3

Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 1 of 61

# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

OF

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

Product Name:	GSM 850/1900 Terminal Device
Brand Name:	Foxlink
Model Name:	QM03YB3
Model difference:	N/A
FCC ID:	QVZ-QM03YB3
Report No.:	EH/2010/90003
Issue Date:	Sep. 28, 2010
FCC Rule Part:	§15.247, Cat: DSS
Prepared for:	CHENG UEI PRECISION INDUSTRY CO., LTD
	No.49,Sec.4,jhongyang Rd., Tucheng City,taipei County 23675,Taiwan
Prepared by:	SGS Taiwan Ltd.
	<b>Electronics &amp; Communication Laboratory</b>
	No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.



*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.

No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號 t (886-2) 2299-3279 f (886-2) 2298-0488 www.tw.sgs.com



FCC ID: QVZ-QM03YB3

Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 2 of 61

## **VERIFICATION OF COMPLIANCE**

Applicant:	CHENG UEI PRECISION INDUSTRY CO., LTD		
	No.49,Sec.4,jhongyang Rd., Tucheng City,taipei County 23675,Taiwan		
Product Name:	GSM 850/1900 Terminal Device		
Brand Name:	Foxlink		
Model Name:	QM03YB3		
Model difference:	N/A		
FCC ID:	QVZ-QM03YB3		
File Number:	EH/2010/90003		
Date of test:	Sep. 06, 2010~ Sep, 24, 2010		
Date of EUT Received:	Sep. 06, 2010		

## We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

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

Test By:	Bondi Jin	Date:	Sep. 28, 2010
	Bondi Liu / Engineer		
Prepared By:	Gigi yeh	Date:	Sep. 28, 2010
	Gigi Yeh / Clerk		
Approved By:	ALNO HSIEH	Date:	Sep. 28, 2010
	Arno Hsieh / Asst. Supervisor		

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。



## Version

Version No.	Date	Description
00	Sep. 28, 2010	Initial creation of 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.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indem-nification 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 altera-tion, forgery or falsification of the content or appearance of this document ta unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 4 of 61

## **Table of Contents**

1.	GEN	ERAL INFORMATION	6
	1.1.	Product Description	6
	1.2.	Related Submittal(s) / Grant (s)	7
	1.3.	Test Methodology	7
	1.4.	Test Facility	7
	1.5.	Special Accessories	7
	1.6.	Equipment Modifications	7
2.	SYST	FEM TEST CONFIGURATION	8
	2.1.	EUT Configuration	8
	2.2.	EUT Exercise	8
	2.3.	Test Procedure	8
	2.4.	Configuration of Tested System	9
3.	SUM	IMARY OF TEST RESULTS	
4.	DES	CRIPTION OF TEST MODES	
5.	CON	DUCTED EMISSION TEST	
	5.1.	Standard Applicable	
	5.2.	EUT Setup	
	5.3.	Measurement Procedure	
	5.4.	Measurement Equipment Used:	
	5.5.	Measurement Result	
6.	PEA	K OUTPUT POWER MEASUREMENT	
	6.1.	Standard Applicable	
	6.2.	Measurement Equipment Used	
	6.3.	Test Set-up:	
	6.4.	Measurement Procedure:	
	6.5.	Measurement Result	
7.	20dB	BAND WIDTH	
	7.1.	Standard Applicable	
	7.2.	Measurement Equipment Used	
	7.3.	Test Set-up	
	7.4.	Measurement Procedure:	
	7.5.	Measurement Result:	
8.	100K	<b>KHz BANDWIDTH OF BAND EDGES MEASUREMENT</b>	
	8.1.	Standard Applicable	

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 tor 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責, 同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indem-infication 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 unavful and offenders may be prosecuted to the fullest extent of the law. tion, 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. 4 4 **6** 4 11 15

SGS Taiwan Ltd.	NO. 134, WU KUNG ROAD, WUKU	u industrial zone, Taipel County, Taiwan/台口	除五股⊥耒邑五⊥路 1 <b>34</b> 號
台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com
			Member of SGS Group



## FCC ID: QVZ-QM03YB3

Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 5 of 61

	8.2.	Measurement Equipment Used	27
	8.3.	Test SET-UP:	28
	8.4.	Measurement Procedure	29
	8.5.	Field Strength Calculation	29
	8.6.	Measurement Result	29
9.	SPUR	LIOUS RADIATED EMISSION TEST	34
	9.1.	Standard Applicable	34
	9.2.	Measurement Equipment Used:	34
	9.3.	Test SET-UP:	34
	9.4.	Measurement Procedure:	34
	9.5.	Field Strength Calculation	35
	9.6.	Measurement Result:	35
10.	FREQ	QUENCY SEPARATION	48
	10.1.	Standard Applicable	48
	10.2.	Measurement Equipment Used:	48
	10.3.	Test Set-up:	48
	10.4.	Measurement Procedure:	48
	10.5.	Measurement Result:	48
11.		Measurement Result:	
11.			50
11.	NUM	BER OF HOPPING FREQUENCY	<b>50</b> 50
11.	<b>NUM</b> 11.1.	BER OF HOPPING FREQUENCY	<b>50</b> 50
11.	NUM 11.1. 11.2.	BER OF HOPPING FREQUENCY Standard Applicable Measurement Equipment Used:	<b>50</b> 50 50
11.	NUM 11.1. 11.2. 11.3.	BER OF HOPPING FREQUENCY Standard Applicable Measurement Equipment Used: Test Set-up:	<b>50</b> 50 50 50
	NUM 11.1. 11.2. 11.3. 11.4. 11.5.	BER OF HOPPING FREQUENCY Standard Applicable Measurement Equipment Used: Test Set-up: Measurement Procedure:	<b>50</b> 50 50 50 50
	NUM 11.1. 11.2. 11.3. 11.4. 11.5.	BER OF HOPPING FREQUENCY	50 50 50 50 50 50 50
	NUM 11.1. 11.2. 11.3. 11.4. 11.5. TIME	BER OF HOPPING FREQUENCY	50 50 50 50 50 50 50 53
	NUM 11.1. 11.2. 11.3. 11.4. 11.5. TIME 12.1.	BER OF HOPPING FREQUENCY         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Procedure:         Measurement Result: <b>C OF OCCUPANCY (DWELL TIME)</b> Standard Applicable	50 50 50 50 50 53 53
	NUM 11.1. 11.2. 11.3. 11.4. 11.5. TIME 12.1. 12.2.	BER OF HOPPING FREQUENCY         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Procedure:         Measurement Result:         C OF OCCUPANCY (DWELL TIME)         Standard Applicable         Measurement Equipment Used:	50 50 50 50 50 50 53 53 53
	NUM 11.1. 11.2. 11.3. 11.4. 11.5. TIME 12.1. 12.2. 12.3.	BER OF HOPPING FREQUENCY         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Procedure:         Measurement Result: <b>C OF OCCUPANCY (DWELL TIME)</b> Standard Applicable         Measurement Equipment Used:         Test Set-up:	50 50 50 50 50 53 53 53 53
12.	NUM 11.1. 11.2. 11.3. 11.4. 11.5. TIME 12.1. 12.2. 12.3. 12.4. 12.5.	BER OF HOPPING FREQUENCY         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Procedure:         Measurement Result: <b>C OF OCCUPANCY (DWELL TIME)</b> Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Procedure:         Measurement Result: <b>C OF OCCUPANCY (DWELL TIME)</b> Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Procedure:	50 50 50 50 50 53 53 53 53 53
12.	NUM 11.1. 11.2. 11.3. 11.4. 11.5. TIME 12.1. 12.2. 12.3. 12.4. 12.5.	BER OF HOPPING FREQUENCY         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Procedure:         Measurement Result:         C OF OCCUPANCY (DWELL TIME)         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Result	50 50 50 50 50 53 53 53 53 54 54 61
12.	NUM 11.1. 11.2. 11.3. 11.4. 11.5. TIME 12.1. 12.2. 12.3. 12.4. 12.5. ANTE	BER OF HOPPING FREQUENCY         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Procedure:         Measurement Result:         C OF OCCUPANCY (DWELL TIME)         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Result         C OF OCCUPANCY (DWELL TIME)         Standard Applicable         Measurement Equipment Used:         Test Set-up:         Measurement Result         Measurement Result         Measurement Result         Measurement Result         ENNA REQUIREMENT	50 50 50 50 50 53 53 53 53 53 54 61

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 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, indem-nification 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 altera-tion, forgery or falsification of the content or appearance of this document ta unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號



## **1. GENERAL INFORMATION**

## **1.1. Product Description**

### General:

Product Name:	GSM 850/1900 Terminal Device
Brand Name:	Foxlink
Model Name:	QM03YB3
Model difference:	N/A
Simple Hands-Free:	Model No.: MY-109#BM13, Supplier: Meeyon
LCM:	Model No.: TM020GDZ32, Supplier: TIANMA

#### GSM:

Cellular Phone Standards	GSM / GPRS 850, Class 12		824.2 MHz- 848.8 MHz	33 dBm
Frequency Range:	GSM / GPRS 1900, Class 12		1850.2MHz – 1909.8MHz	30 dBm
IMEI	0125120099999	70		
Hardware Version	QM03S1-0B			
Software Version	QM03YB3.YB3.00.M01.01.01			
	3.7Vdc Li-Ion battery or 5Vdc from AC/DC adapter			
Power Supply	Battery: Model: BL-91, Supplier: B&K.			
	Adapter :       1. Model No.: IT-UL-D, Supplier: Power Solutions         2. Model: SPSH035429 DSC-3PFB-05 FUS         050070,Supplier: DVE			itions

#### **Bluetooth:**

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V2.1 + EDR (GFSK + $\pi/4$ DQPSK + 8DPSK)
Channel number:	79 channels
Transmit Power:	6.91 dBm (Peak)
Modulation type:	Frequency Hopping Spread Spectrum
Antenna Designation:	Print Antenna / antenna gain: -2.17dBi

The EUT is compliance with Bluetooth 2.1 with EDR This report applies for Bluetooth.

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 <a href="https://www.sgs.com/terms\_and\_conditions.htm">www.sgs.com/terms\_and\_conditions.htm</a> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sgs.com/terms\_e-document.htm">www.sgs.com/terms\_e-document.htm</a>. Attention is drawn to the limitation of liability, indem-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 unawful and offenders may he prosecuted to the law. tion, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



### **1.2.** Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: <u>**OVZ-OM03YB3**</u> filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

#### **1.3.** Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with FCC Public Notice DA 00-705

#### 1.4. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-4

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

#### **1.5.** Special Accessories

Not available for this EUT intended for grant.

#### **1.6.** Equipment Modifications

Not available for this EUT intended for grant.

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權品負責,同時比樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This decumpant is instructed by the Company subject to its General Conditions of Sension crited overloaf, available on project to its General Conditions of Sension and Sension for a subject of available on project to its General Conditions of Sension Sension and Sension Sens



## 2. SYSTEM TEST CONFIGURATION

#### 2.1. EUT Configuration

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

#### 2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

#### 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. According to the requirements in Section 7 and 13 of ANSI C63.4: 2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

#### **2.3.2 Radiated Emissions**

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna. according to the requirements in Section 8 and 13 and Subclause 8.3.1.2 of ANSI C63.4: 2003 and DA 00-705.

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。



and conditions.htm and.

## 2.4. Configuration of Tested System

### Fig. 2-1 AC Power line and Radiated Emission Configuration



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

Item	Equipment	Mfr/Brand	Model	Series No.	Data Cable	Power Cord
1	Bluetooth Test Set	Anritsu	MT8852B	N/A	N/A	Un-shielding

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.



and conditions.htm and.

## 3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207	Conducted Emission	Compliant
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(a)	20dB Bandwidth	No Limit
§15.247(d)	100 KHz Bandwidth Of Fre-	Compliant
	quency Band Edges	
§15.247(d)	Spurious Emission	Compliant
§15.247(a)(1)	Frequency Separation	Compliant
§15.247(a)(1)(iii)	Number of hopping frequency	Compliant
§15.247(a)(1)(iii)	Time of Occupancy	Compliant
§15.247(e)	Peak Power Density	Compliant
§15.203,	Antenna Requirement	Compliant
§15.247(b)(4)(i)		

## 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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

Channel low  $(2402MHz) \sim mid (2441MHz)$  and high (2480MHz) with highest data rate are chosen for full testing with BDR and to contrast with X, Y, Z axis, X axis which has Worst Case.

All tests were carried out for worst adapter model name: IT-UL-D

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;同時比樣品僅保留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</u> for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms</u>. Attention is drawn to the lim



## 5. CONDUCTED EMISSION TEST

## 5.1. Standard Applicable

According to §15.207. frequency 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.

## 5.2. EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4: 2003.
- 2. The EUT was plug-in the AC/DC Power adapter. The host system was placed on the center of the back edge on the test table. The peripherals was placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The spacing between the peripherals was 10 centimeters.
- 4. External I/O cables were draped along the edge of the test table and bundle when necessary.
- 5. The host system was connected with 120Vac/60Hz power source.

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

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="www.sgs.com/terms\_and\_conditions.htm">www.sgs.com/terms\_and\_conditions.htm</a> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="www.sgs.com/terms\_e-document.htm">www.sgs.com/terms\_e-document.htm</a>. Attention is drawn to the limitation of liability, indem of liability, indem only 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.
SGS Taiwan Ltd.
No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號



## 5.4. Measurement Equipment Used:

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
EMI Test Receiver	R&S	ESCS30	828985/004	09/16/2010	09/15/2011		
LISN	Rolf-Heine	NNB-2/16Z	99012	02/02/2010	02/01/2011		
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	02/02/2010	02/01/2011		
Coaxial Cables	N/A	WK CE Cable	N/A	10/30/2009	10/29/2010		

#### 5.5. Measurement Result

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

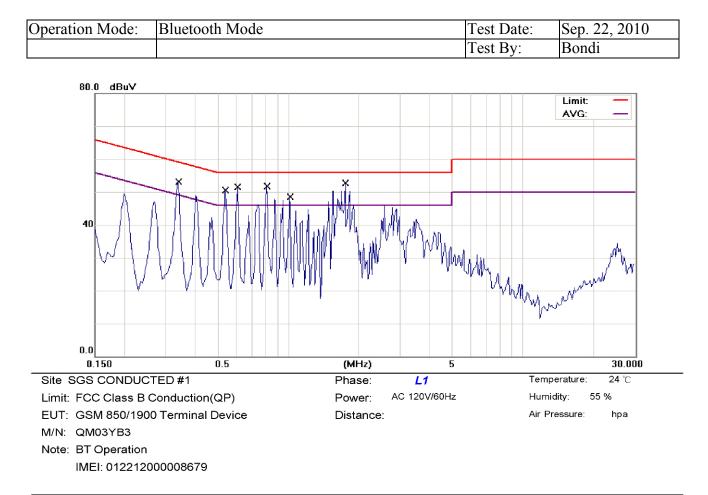
Note: Refer to next page for measurement data and plots.

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.



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 13 of 61

## AC POWER LINE CONDUCTED EMISSION TEST DATA



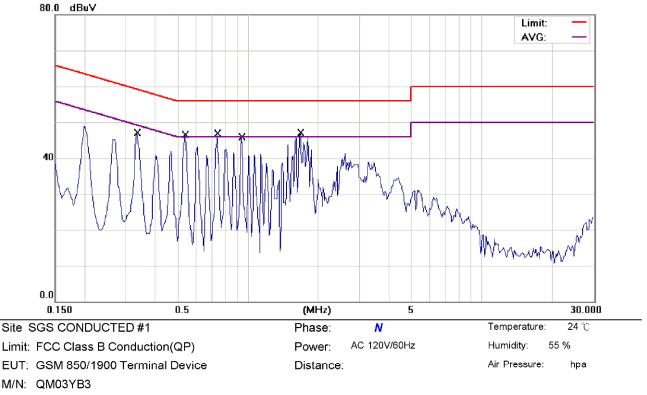
No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3398	45.67	0.12	45.79	59.21	-13.42	QP	
2		0.3398	35.45	0.12	35.57	49.21	-13.64	AVG	
3		0.5427	46.13	0.12	46.25	56.00	-9.75	QP	
4		0.5427	34.38	0.12	34.50	46.00	-11.50	AVG	
5		0.6083	45.95	0.12	46.07	56.00	-9.93	QP	
6		0.6083	32.78	0.12	32.90	46.00	-13.10	AVG	
7	*	0.8142	46.47	0.12	46.59	56.00	-9.41	QP	
8		0.8142	32.54	0.12	32.66	46.00	-13.34	AVG	
9		1.0158	43.98	0.12	44.10	56.00	-11.90	QP	
10		1.0158	28.74	0.12	28.86	46.00	-17.14	AVG	
11		1.7626	26.19	0.15	26.34	46.00	-19.66	AVG	
12		1.7628	45.15	0.15	45.30	56.00	-10.70	QP	

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



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 14 of 61



Note: BT Operation

#### IMEI: 012212000008679

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3364	46.13	0.12	46.25	59.29	-13.04	QP	
2		0.3364	37.72	0.12	37.84	49.29	-11.45	AVG	
3	*	0.5384	46.22	0.12	46.34	56.00	-9.66	QP	
4		0.5384	35.54	0.12	35.66	46.00	-10.34	AVG	
5		0.7376	45.96	0.13	46.09	56.00	-9.91	QP	
6		0.7376	33.42	0.13	33.55	46.00	-12.45	AVG	
7		0.9378	44.28	0.13	44.41	56.00	-11.59	QP	
8		0.9378	30.81	0.13	30.94	46.00	-15.06	AVG	
9		1.6763	44.56	0.15	44.71	56.00	-11.29	QP	
10		1.6763	28.74	0.15	28.89	46.00	-17.11	AVG	

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.sqs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms\_edocument.htm</u>. Attention is drawn to the limitation of liability, indem-nification 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 altera-tion. for fastification of the context of appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. and conditions.htm and. tion, 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. PEAK OUTPUT POWER MEASUREMENT

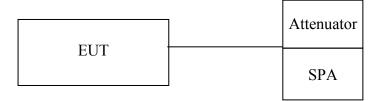
### 6.1. Standard Applicable

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1Watt. For all other frequency hopping systems in the 2400 - 2483.5MHz band: 0.125 Watts.

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
Power Sensor	Anritsu	MA2411B	917032	01/21/2010	01/20/2012		
Power Meter	Anritsu	ML2495A	1005007	02/17/2010	02/16/2012		
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012		
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/25/2010	01/24/2011		
DC Block	Agilent	BLK-18	155452	07/05/2010	07/04/2011		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2010	01/04/2011		
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2010	07/04/2011		
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2010	07/04/2011		
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2010	07/04/2011		
Splitter	Agilent	11636B	N/A	07/05/2010	07/04/2011		

#### 6.2. Measurement Equipment Used

### 6.3. 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.

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。



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 16 of 61

### 6.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Max peak function, >20dB bandwidth, >=RBW)
- 3. Record the max. reading.
- 4. Repeat above procedures until all frequency measured were complete.

#### 6.5. Measurement Result

#### **BDR mode:**

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (mW)
2402.00	6.91	0.00	6.91	0.00491	125
2441.00	6.69	0.00	6.69	0.00467	125
2480.00	6.68	0.00	6.68	0.00466	125

\*Note: offset 6dB

### **EDR mode:**

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (mW)
2402.00	5.16	0.00	5.16	0.00328	125
2441.00	4.81	0.00	4.81	0.00303	125
2480.00	4.83	0.00	4.83	0.00304	125

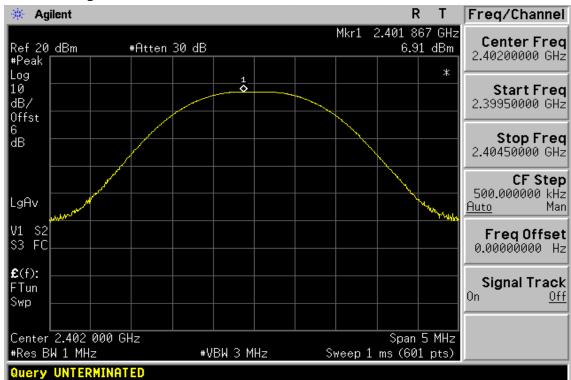
\*Note: offset 6dB

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 of the state of the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責, 同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indem-nification 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 right or and oblight to report the transport of the transport of the transport of the company. Apulation of the responsibility is to its Client and this document does not expended the theta parties document. The document application of the transport of the company. Apulation of the response of the company. Apulation of the response of the transport of the company. Apulation of the company. Apulation of the transport of the company. Apulation of the company. Apulation of the company. Apulation of the transport of the company. Apulation of the compa 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

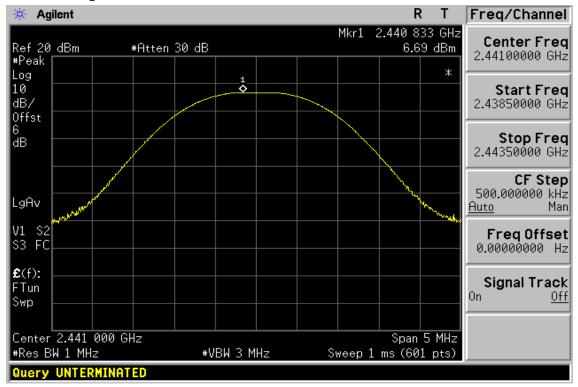


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 17 of 61



## Peak Power Output Data Plot (CH Low) (BDR mode)

## Peak Power Output Data Plot (CH Mid) (BDR mode)



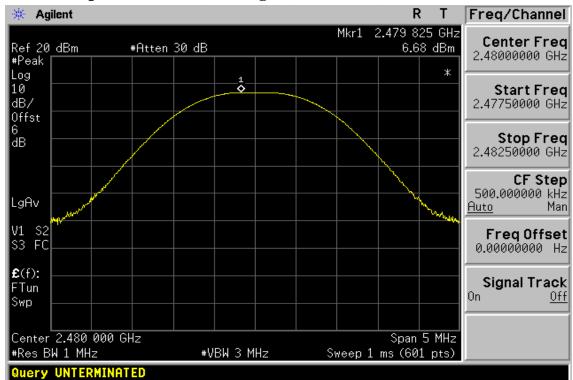
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indem-

SGS Taiwan Ltd.	No.134, Wu Kung Road, Wuku Ind	dustrial Zone, Taipei County, Taiwan/台北	縣五股上業區五上路 134 號
台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com
			Member of SGS Group



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 18 of 61



## Peak Power Output Data Plot (CH High) (BDR mode)

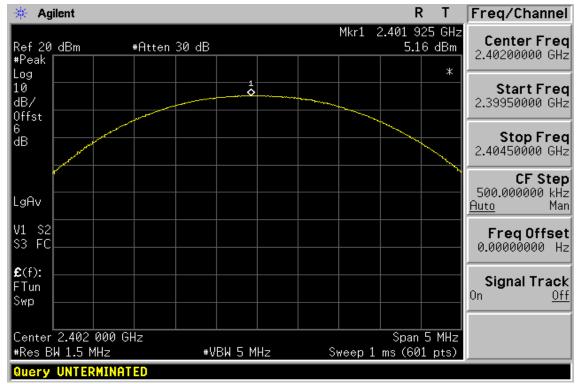
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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

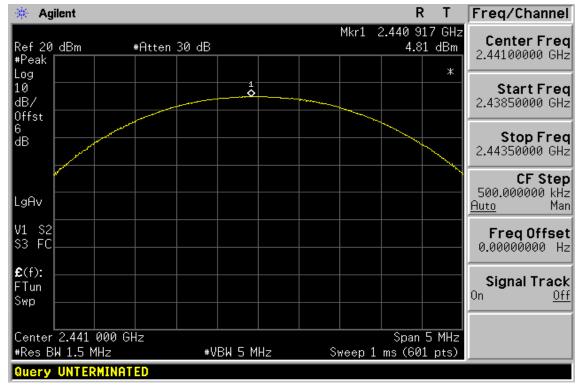


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 19 of 61

## Peak Power Output Data Plot (CH Low) (EDR mode)



## Peak Power Output Data Plot (CH Mid) (EDR mode)

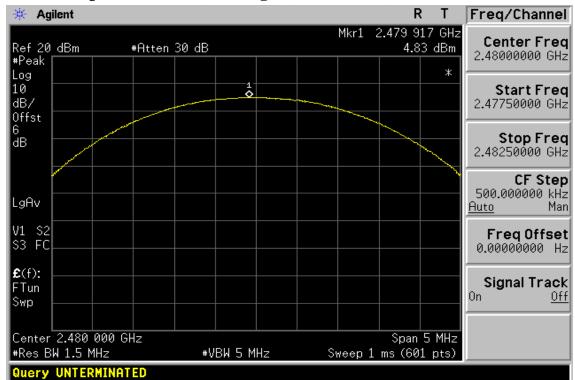


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留如天。本報告未經本公司書面許可,不可節份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sqs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions of Service printed overleaf, available on request or accessible at <u>www.sqs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 20 of 61



### Peak Power Output Data Plot (CH High) (EDR mode)

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



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 21 of 61

## 7. 20dB BAND WIDTH

## 7.1. Standard Applicable

For frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB band-width.

## 7.2. Measurement Equipment Used

Refer to section 6.2 for details.

### 7.3. Test Set-up

Refer to section 6.3 for details.

### 7.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW=1 % of Bandwidth., Span= 3MHz, Sweep=auto
- 4. Mark the peak frequency and -20dB (upper and lower) frequency.
- 5. Repeat above procedures until all frequency measured were complete.



#### 7.5. Measurement Result:

20dB Bandwidth : BDR mode

СН	Bandwidth
	(kHz)
Lower	928.120
Mid	926.555
Higher	926.258

20dB Bandwidth : EDR mode

СН	Bandwidth	2/3 Bandwidth
	(MHz)	(MHz)
Lower	1.296	0.864
Mid	1.257	0.838
Higher	1.261	0.841

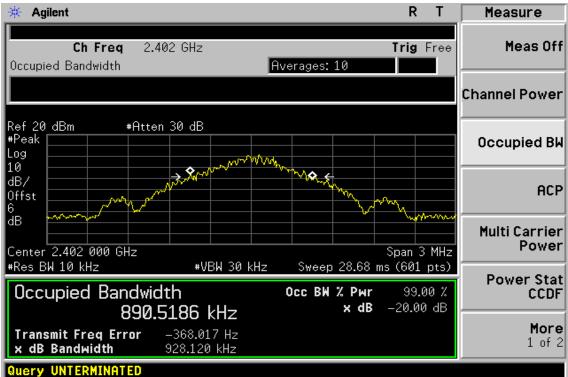
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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 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, indem-nification 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 altera-tion, forgery or falsification of the content or appearance of this document ta unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 23 of 61

## **20dB Band Width Test Data CH-Low (BDR mode)**



### **20dB Band Width Test Data CH-Mid (BDR mode)**



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 documents is subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms</u> e-document.htm. Attention is drawn to the lim



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 24 of 61

## 20dB Band Width Test Data CH-High (BDR mode)



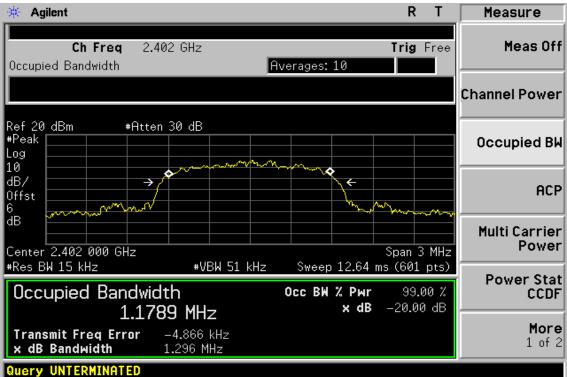
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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

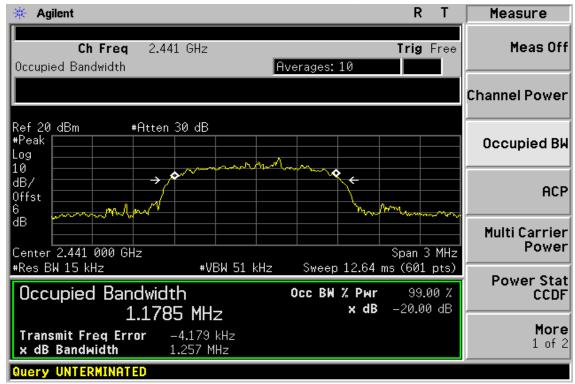


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 25 of 61

## 20dB Band Width Test Data CH-Low (EDR mode)



### 20dB Band Width Test Data CH-Mid (EDR mode)



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。



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 26 of 61

## 20dB Band Width Test Data CH-High (EDR mode)



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



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 27 of 61

## 8. 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

#### 8.1. Standard Applicable

According to §15.247(d), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, 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 in15.209(a).

#### 8.2. Measurement Equipment Used

#### 8.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

#### 8.2.2. Radiated emission:

966 Chamber							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2011		
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2009	11/18/2010		
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	03/09/2009	03/08/2011		
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2009	11/28/2010		
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011		
Radio Communication Analyzer	R & S	CMU200	102189	10/31/2008	10/30/2010		
DC Block	Agilent	BLK-18	155452	07/05/2010	07/04/2011		
Turn Table	HD	DT420	N/A	N.C.R	N.C.R		
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R		
Controller	HD	HD100	N/A	N.C.R	N.C.R		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2010	01/04/2011		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2011		
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010		

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。



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 28 of 61

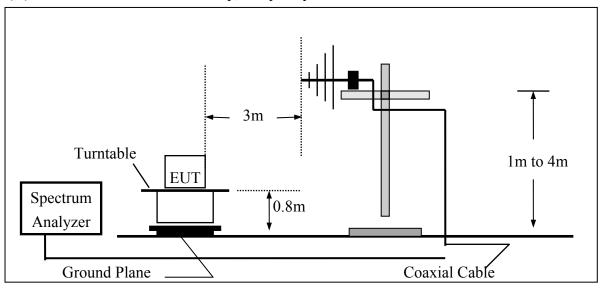
### 8.3. Test SET-UP:

## 8.3.1. Conducted Emission at antenna port:

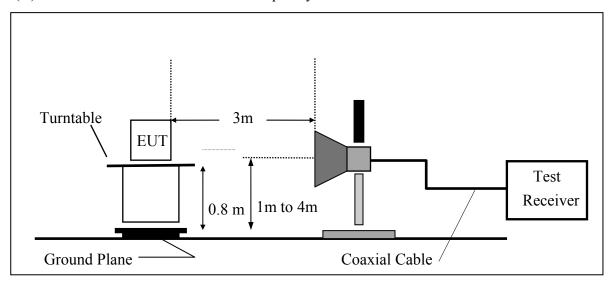
Refer to section 6.3 for details.

#### 8.3.2. Radiated emission:

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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



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

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

			Member of SGS Group
台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com
SGS Taiwall Llu.	NO. 134, WU KUNY KUdu, WU	ku inuusinai zone, Taipei County, Taiwan7⊟40§	除五版上未直五上哈 134 號



### 8.4. Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
- 5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
- 6. Repeat above procedures until all frequency measured were complete.
- 7. Radiated Emission refer to section 9.

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

#### 8.6. Measurement Result

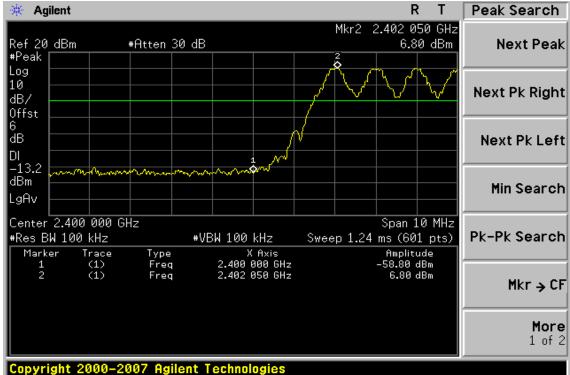
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

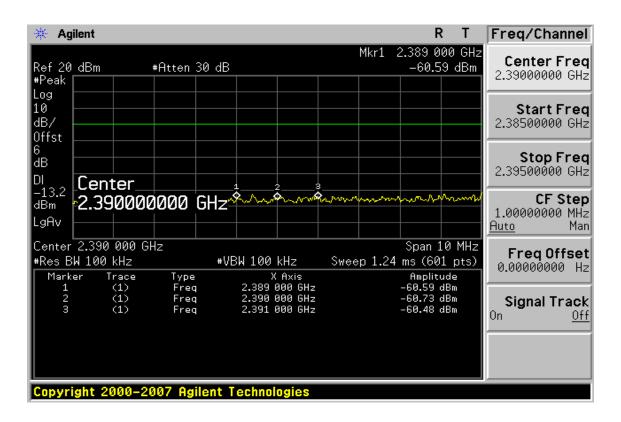
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 30 of 61







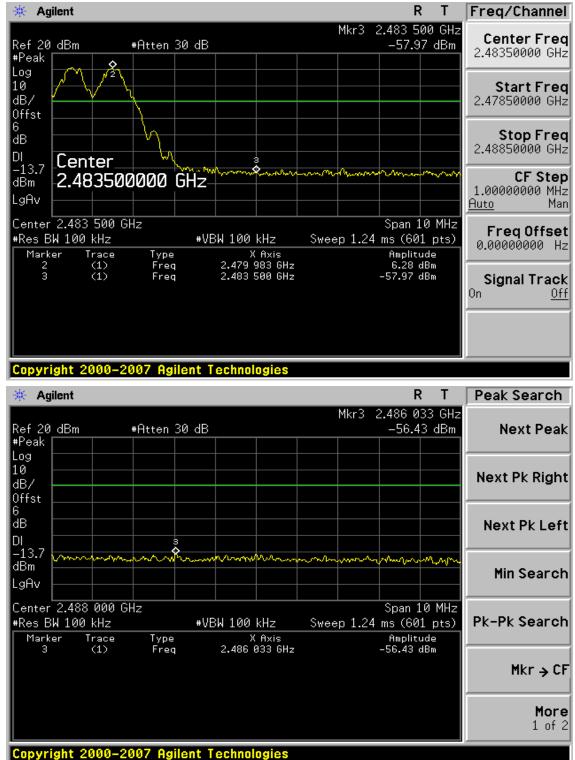
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 31 of 61

## **Conducted Emission: 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. 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。



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 32 of 61

#### Radiated Emission: (BDR mode)

Operation Mode	TX CH Low	Test Date	Sep. 20, 2010
Fundamental Frequency	2402 MHz	Test By	Bondi
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant/CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2390.00	43.88		-1.62	42.26		74.00	54.00	-11.74	Peak
Operation Fundamen Temperatu Humidity	tal Frequei					Test Test Pol	By	Sep. 20, 20 Bondi Hor.	)10
	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant/CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2390.00	44.96		-1.62	43.34		74.00	54.00	-10.66	Peak

Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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。



FCC ID: QVZ-QM03YB3

Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 33 of 61

### Radiated Emission: (BDR mode)

Fundamental Frequency Temperature	25 °C	Test Date Test By Pol	Sep. 20, 2010 Bondi Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq. (MHz)	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/n	0	Remark
2483.50	45.74		-1.22	44.52		74.00	54.00	-9.48	Peak
Operation	Mode	TX C	H High			Test	Date	Sep. 20, 20	010
Fundamen	tal Freque	ncy 2480	MHz			Test	By	Bondi	
Temperatu	re	25 °C				Pol		Hor.	
Humidity		65 %							
	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant/CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2483.50	54.22	40.34	-1.22	53.00	39.12	74.00	54.00	-14.88	AV

Remark :

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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。



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 34 of 61

## 9. SPURIOUS RADIATED EMISSION TEST

### 9.1. Standard Applicable

According to \$15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in \$15.209(a). 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.

### 9.2. Measurement Equipment Used:

**9.2.1. Conducted Emission at antenna port:** Refer to section 6.2 for details.

## 9.2.2. Radiated emission:

Refer to section 8.2 for details.

### 9.3. Test SET-UP:

**9.3.1. Conducted Emission at antenna port:** Refer to section 6.3 for details.

## 9.3.2. Radiated emission:

Refer to section 8.3 for details.

### 9.4. Measurement Procedure:

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 4. 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.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. Repeat above procedures until all frequency measured were complete.



### 9.5. Field Strength Calculation

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

### $\mathbf{FS} = \mathbf{RA} + \mathbf{AF} + \mathbf{CL} - \mathbf{AG}$

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

#### 9.6. Measurement Result:

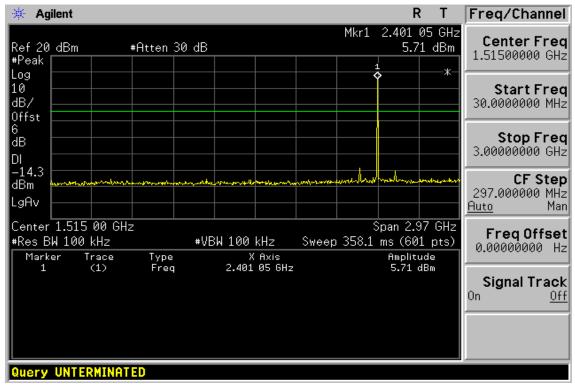
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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. 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。

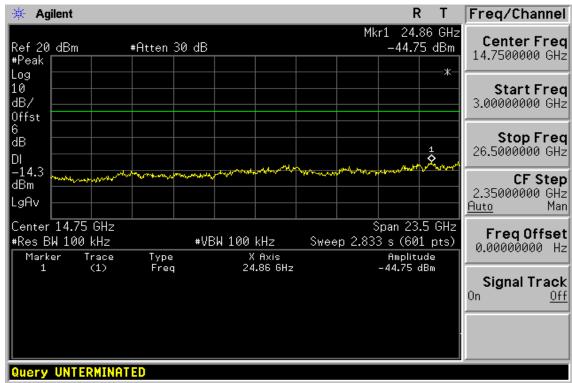


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 36 of 61

## Conducted Spurious Emission Measurement Result (Worst: BDR mode) Ch Low 30MHz – 3GHz



## Ch Low 3GHz - 26.5GHz



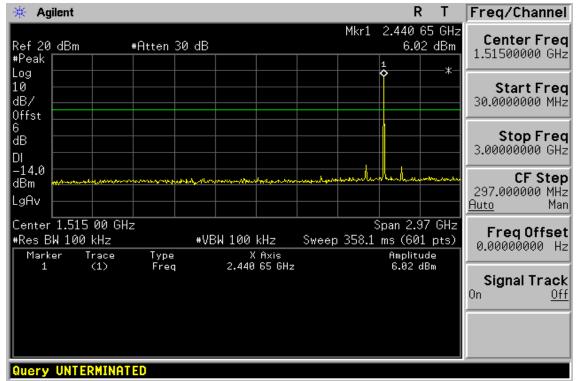
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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

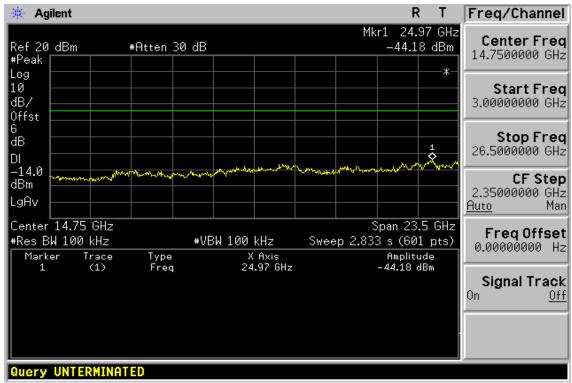


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 37 of 61

# Ch Mid 30MHz – 3GHz





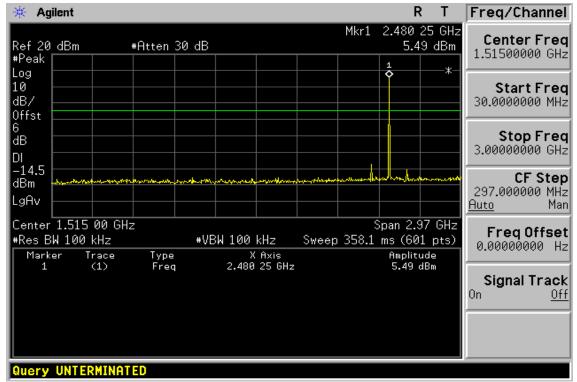


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此聚告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf,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

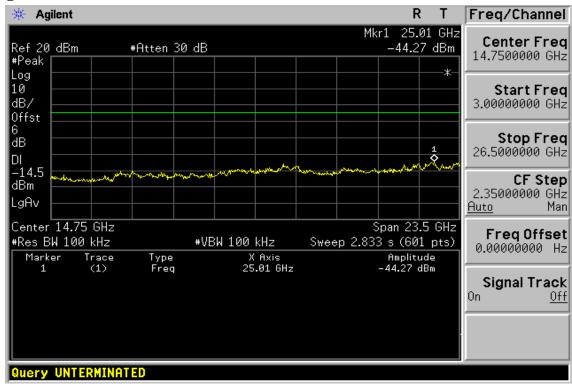


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 38 of 61

# Ch High 30MHz – 3GHz







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,此聚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 of Electronic Documents at <u>www.sgs.com/terms\_ed-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.



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 39 of 61

## **Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode	TX CH Low	Test Date	Sep. 20, 2010
Fundamental Frequency	2402MHz	Test By	Bondi
Temperature	25 °C	Pol	Ver./Hor.
Humidity	65 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
_	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	58.13	V	Peak	53.43	-26.35	27.08	40.00	-12.92
	104.69	V	Peak	56.83	-29.76	27.07	43.50	-16.43
	143.49	V	Peak	45.45	-27.19	18.26	43.50	-25.24
	318.09	V	Peak	42.95	-27.92	15.03	46.00	-30.97
	453.89	V	Peak	42.41	-24.86	17.55	46.00	-28.45
	644.98	V	Peak	43.25	-21.94	21.31	46.00	-24.69
	36.79	Н	Peak	50.97	-25.66	25.31	40.00	-14.69
	85.29	Н	Peak	50.41	-30.61	19.80	40.00	-20.20
	167.74	Н	Peak	45.72	-27.78	17.94	43.50	-25.56
	446.13	Н	Peak	42.84	-25.00	17.84	46.00	-28.16
	638.19	Н	Peak	43.70	-22.04	21.66	46.00	-24.34
	749.74	Н	Peak	43.53	-20.52	23.01	46.00	-22.99

## Remark :

- 1 Measuring frequencies from 30 MHz to the 1GHz °
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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 of the state of the results shown in this test report feirer 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, 同時比樣品僅保留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, indem-nification 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 right or and exhibiting upder the transaction from exercising all the reprodued avacent is full without price particue approved for the Company. Any undertiged particular to the transaction from exercising all their right or and exhibiting upder the 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.



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 40 of 61

## **Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode	TX CH Mid	Test Date	Sep. 20, 2010
Fundamental Frequency	2441MHz	Test By	Bondi
Temperature	25 °C	Pol	Ver./Hor.
Humidity	65 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
_	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	58.13	V	Peak	54.26	-26.35	27.91	40.00	-12.09
	104.69	V	Peak	53.39	-29.76	23.63	43.50	-19.87
	158.04	V	Peak	45.55	-27.01	18.54	43.50	-24.96
	402.48	V	Peak	43.17	-25.97	17.20	46.00	-28.80
	640.13	V	Peak	43.14	-22.01	21.13	46.00	-24.87
	890.39	V	Peak	42.57	-18.81	23.76	46.00	-22.24
	43.58	Н	Peak	50.21	-25.44	24.77	40.00	-15.23
	158.04	Н	Peak	45.74	-27.01	18.73	43.50	-24.77
	381.14	Н	Peak	42.17	-26.49	15.68	46.00	-30.32
	601.33	Н	Peak	43.65	-22.66	20.99	46.00	-25.01
	832.19	Н	Peak	43.32	-19.65	23.67	46.00	-22.33
	926.28	Н	Peak	43.12	-18.38	24.74	46.00	-21.26

## Remark :

- 1 Measuring frequencies from 30 MHz to the 1GHz °
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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 of the state of the results shown in this test report feirer 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, 同時比樣品僅保留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, indem-nification 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 right or and exhibiting upder the transaction from exercising all the reprodued avacent is full without price particue approved for the Company. Any undertiged particular to the transaction from exercising all their right or and exhibiting upder the 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.



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 41 of 61

## **Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode	TX CH High	Test Date	Sep. 20, 2010
Fundamental Frequency	2480MHz	Test By	Bondi
Temperature	25 °C	Pol	Ver./Hor.
Humidity	65 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
_	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	58.13	V	Peak	53.24	-26.35	26.89	40.00	-13.11
	104.69	V	Peak	52.51	-29.76	22.75	43.50	-20.75
	150.28	V	Peak	44.73	-26.99	17.74	43.50	-25.76
	383.08	V	Peak	42.90	-26.31	16.59	46.00	-29.41
	652.74	V	Peak	43.56	-21.76	21.80	46.00	-24.20
	829.28	V	Peak	43.13	-19.66	23.47	46.00	-22.53
	43.58	Н	Peak	49.52	-25.44	24.08	40.00	-15.92
	150.28	Н	Peak	45.40	-26.99	18.41	43.50	-25.09
	274.44	Н	Peak	45.18	-29.14	16.04	46.00	-29.96
	441.28	Н	Peak	43.11	-25.10	18.01	46.00	-27.99
	618.79	Н	Peak	43.01	-22.37	20.64	46.00	-25.36
	882.63	Н	Peak	42.86	-19.01	23.85	46.00	-22.15

## Remark :

- 1 Measuring frequencies from 30 MHz to the 1GHz °
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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 of the state of the results shown in this test report feirer 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, 同時比樣品僅保留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, indem-nification 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 right or and exhibiting upder the transaction from exercising all the reprodued avacent is full without price particue approved for the Company. Any undertiged particular to the transaction from exercising all their right or and exhibiting upder the 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.



Operation Mode	TX CH Low	Test Date	Sep. 20, 2010
Fundamental Frequency	2402 MHz	Test By	Bondi
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
4804.0						74.00	54.00		
5173.0	42.20		-5.19	37.01		74.00	54.00	-16.99	Peak
7206.0						74.00	54.00		
9608.0						74.00	54.00		
12010.0						74.00	54.00		
14412.0						74.00	54.00		
16814.0						74.00	54.00		
19216.0						74.00	54.00		
21618.0						74.00	54.00		
24020.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Operation Mode	TX CH Low	Test Date	Sep. 20, 2010
Fundamental Frequency	2402 MHz	Test By	Bondi
Temperature	25 °C	Pol	Hor.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
4804.0						74.00	54.00		
5283.5	42.66		-4.83	37.83		74.00	54.00	-16.17	Peak
7206.0						74.00	54.00		
9608.0						74.00	54.00		
12010.0						74.00	54.00		
14412.0						74.00	54.00		
16814.0						74.00	54.00		
19216.0						74.00	54.00		
21618.0						74.00	54.00		
24020.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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.



Operation Mode	TX CH Mid	Test Date	Sep. 20, 2010
Fundamental Frequency	2441 MHz	Test By	Bondi
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
4882.0						74.00	54.00		
5283.5	42.15		-4.83	37.32		74.00	54.00	-16.68	Peak
7323.0						74.00	54.00		
9764.0						74.00	54.00		
12205.0						74.00	54.00		
14646.0						74.00	54.00		
17087.0						74.00	54.00		
19528.0						74.00	54.00		
21969.0						74.00	54.00		
24410.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Operation Mode	TX CH Mid	Test Date	Sep. 20, 2010
Fundamental Frequency	2441 MHz	Test By	Bondi
Temperature	25 °C	Pol	Hor.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
4882.0						74.00	54.00		
5270.5	42.88		-4.89	37.99		74.00	54.00	-16.01	Peak
7323.0						74.00	54.00		
9764.0						74.00	54.00		
12205.0						74.00	54.00		
14646.0						74.00	54.00		
17087.0						74.00	54.00		
19528.0						74.00	54.00		
21969.0						74.00	54.00		
24410.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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.



Operation Mode	TX CH High	Test Date	Sep. 20, 2010
Fundamental Frequency	2480 MHz	Test By	Bondi
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
4960.0						74.00	54.00		
5270.5	43.22		-4.89	38.33		74.00	54.00	-15.67	Peak
7440.0						74.00	54.00		
9920.0						74.00	54.00		
12400.0						74.00	54.00		
14880.0						74.00	54.00		
17360.0						74.00	54.00		
19840.0						74.00	54.00		
22320.0						74.00	54.00		
24800.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Operation Mode	TX CH High	Test Date	Sep. 20, 2010
Fundamental Frequency	2480 MHz	Test By	Bondi
Temperature	25 °C	Pol	Hor.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
4960.0						74.00	54.00		
5251.0	42.83		-4.95	37.88		74.00	54.00	-16.12	Peak
7440.0						74.00	54.00		
9920.0						74.00	54.00		
12400.0						74.00	54.00		
14880.0						74.00	54.00		
17360.0						74.00	54.00		
19840.0						74.00	54.00		
22320.0						74.00	54.00		
24800.0						74.00	54.00		
14880.0 17360.0 19840.0 22320.0						74.00 74.00 74.00 74.00	54.00 54.00 54.00 54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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.sqs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions of Service printed overleaf, available on request or accessible at <u>www.sqs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indeminfication 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.



# **10. FREQUENCY SEPARATION**

# **10.1. Standard Applicable**

According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the 20dB bandwidth of the hopping channel, whichever is greater.

# 10.2. Measurement Equipment Used:

Refer to section 6.2 for details.

# 10.3. Test Set-up:

Refer to section 6.3 for details.

# **10.4. Measurement Procedure:**

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = middle of hopping channel.
- 4. Set the spectrum analyzer as RBW,VBW=100KHz/100KHz, Adjust Span to 3.0 MHz, Sweep = auto.
- 5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

# **10.5. Measurement Result:**

Channel separation (MHz)	Limit	Result	
1	>=25KHz or 2/3 20dB bandwidth	PASS	

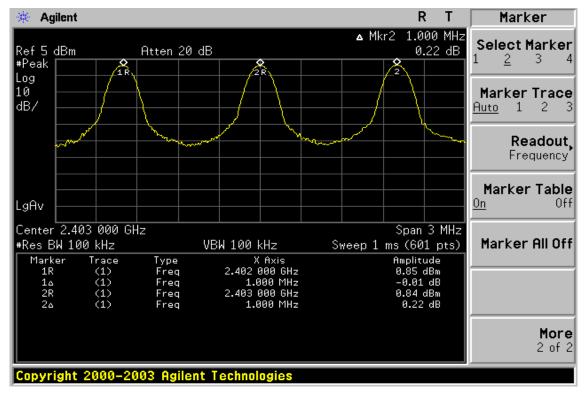
Note: Refer to next page for plots.

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。



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 49 of 61

# **Frequency Separation 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.

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



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 50 of 61

# **11. NUMBER OF HOPPING FREQUENCY**

# **11.1. Standard Applicable**

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

# **11.2. Measurement Equipment Used:**

Refer to section 6.2 for details.

# 11.3. Test Set-up:

Refer to section 6.3 for details.

# **11.4. Measurement Procedure:**

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set spectrum analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.
- 4. Set the spectrum analyzer as RBW, VBW=430KHz/1.3MHz,
- 5. Max hold, view and count how many channel in the band.

### **11.5. Measurement Result:**

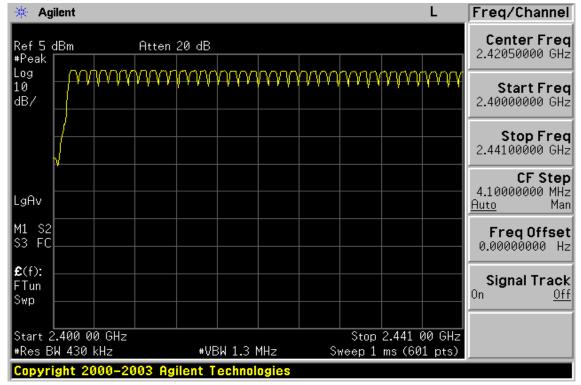
Note: Refer to next page for plots.



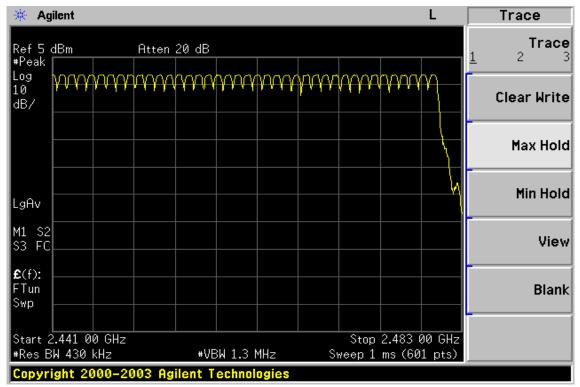
Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 51 of 61

# **Channel Number**

2.4 GHz – 2.441GHz



# 2.441 GHz – 2.4835GHz

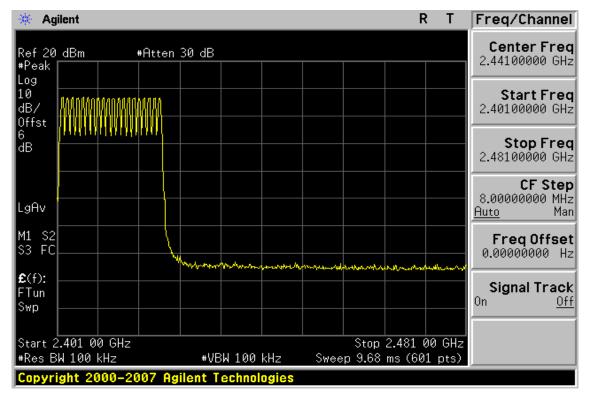


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 52 of 61

# **AFH Mode**



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 of the state of the results shown in this test report feiter only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indem-nification 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 right one ad oblighting under the transaction from exercising documents. This document are partied and users in full without price matter approximation approximation of the transaction from exercising all their right or and exhibiting under the 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.



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 53 of 61

# **12. TIME OF OCCUPANCY (DWELL TIME)**

# 12.1. Standard Applicable

According to \$15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channel employed.

# 12.2. Measurement Equipment Used:

Refer to section 6.2 for details.

# 12.3. Test Set-up:

Refer to section 6.3 for details.

# **12.4. Measurement Procedure:**

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=1MHz/1MHz, Span = 0Hz, Adjust Sweep = 2ms-5ms.
- 5. Repeat above procedures until all frequency measured were 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. 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。



FCC ID: QVZ-QM03YB3

Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 54 of 61

#### 12.5. Measurement Result

A period time = $0.4 \text{ (ms)} * 79 = 31.6 \text{ (s)}$					
CH Low	DH1 time slot $=$	0.327  (ms) * (1600/2/79) * 31.6 = 104.64  (ms)			
	DH3 time slot $=$	1.540  (ms) * (1600/4/79) * 31.6 = 246.40  (ms)			
	DH5 time slot $=$	2.892  (ms) * (1600/6/79) * 31.6 = 308.48  (ms)			
CH Mid	DH1 time slot $=$	0.327  (ms) * (1600/2/79) * 31.6 = 104.64  (ms)			
	DH3 time slot $=$	1.540  (ms) * (1600/4/79) * 31.6 = 246.40  (ms)			
	DH5 time slot =	2.892  (ms) * (1600/6/79) * 31.6 = 308.48  (ms)			
CH High	DH1 time slot $=$	0.327  (ms) * (1600/2/79) * 31.6 = 104.64  (ms)			
	DH3 time slot $=$	1.540  (ms) * (1600/4/79) * 31.6 = 246.40  (ms)			
	DH5 time slot $=$	2.892  (ms) * (1600/6/79) * 31.6 = 308.48  (ms)			

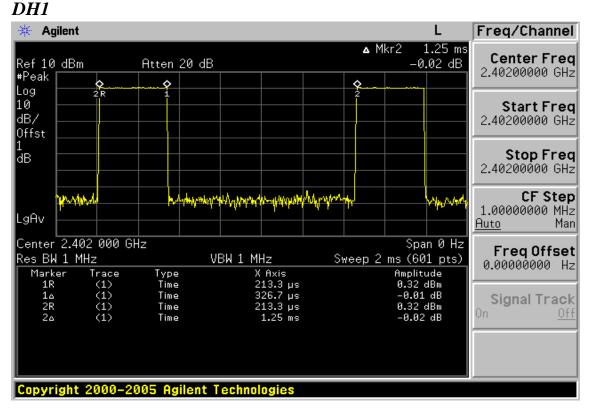
Note: Refer to next page for plots.

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.

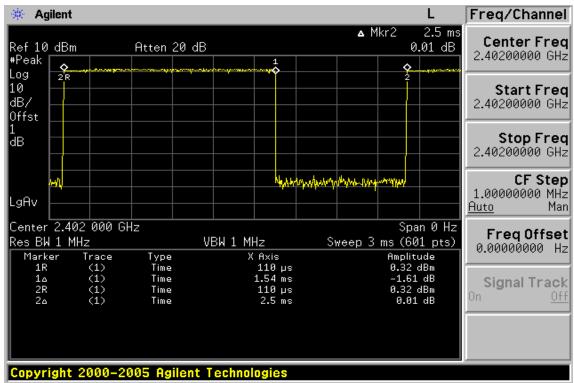


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 55 of 61

# CH-Low



#### DH3



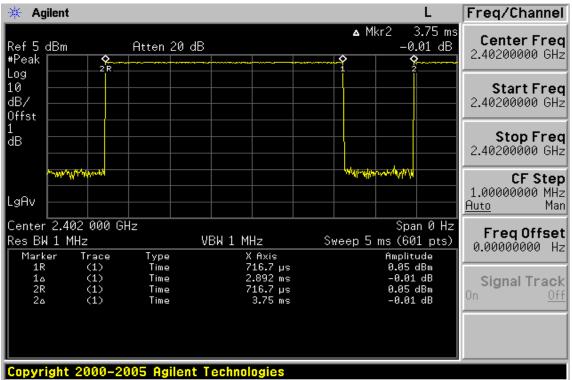
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 56 of 61

DH5



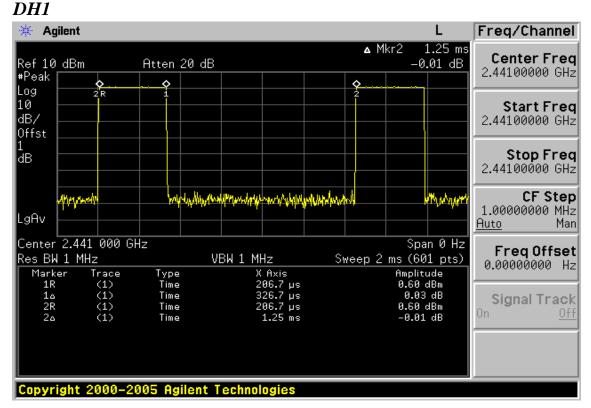
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Contention of the state of the results shown in this test report refer only to the sample(s) tested and such sample(s) are related to 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責, 同時比樣品僅保留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.sqs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indem-nification 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 right oned exhibiting upder the transaction from exercising downward expect in full without prior wither approxy. Approxy provide a server in full without prior withing approxy that particular to the formation approxy of the Company. Approxy approxy the provide a vector is full without prior withing approxy. Approxy approxy the provide a vector is full without prior withing approxy approxy the prior downward expecting and a vector is fully without prior without approxy. Approxy approxy the prior without prior without approxy approxy the prior downward approxy approxy approxy. Approxy app 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.

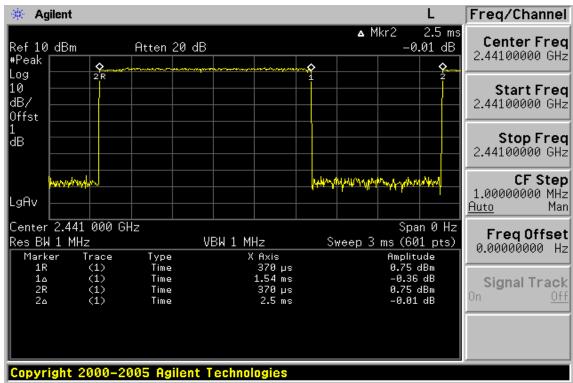


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 57 of 61

# CH-Mid



#### DH3



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

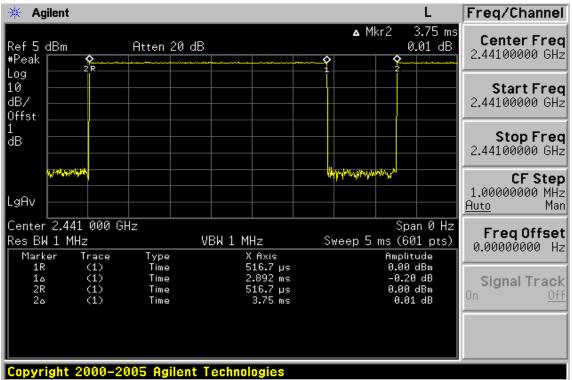
É

			Marshan of 000 Oracia
計灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com
SGS Taiwan Ltd.	No.134, Wu Kung Road, Wuku Indus	trial Zone, Taipei County, Taiwan/台;	比縣五股上業區五上路 134 號



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 58 of 61

DH5



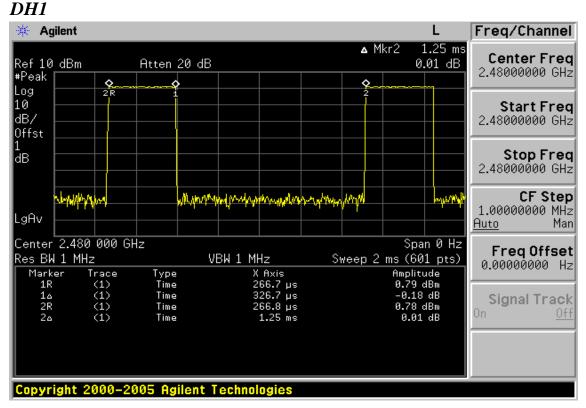
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Contention of the state of the results shown in this test report refer only to the sample(s) tested and such sample(s) are related to 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責, 同時比樣品僅保留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.sqs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indem-nification 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 right oned exhibiting upder the transaction from exercising downward expect in full without prior wither approxy. Approxy provide a server in full without prior withing approxy that particular to the formation approxy of the Company. Approxy approxy the provide a vector is full without prior withing approxy. Approxy approxy the provide a vector is full without prior withing approxy approxy the prior downward expecting and a vector is fully without prior without approxy. Approxy approxy the prior without prior without approxy approxy the prior downward approxy approxy approxy. Approxy app 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.

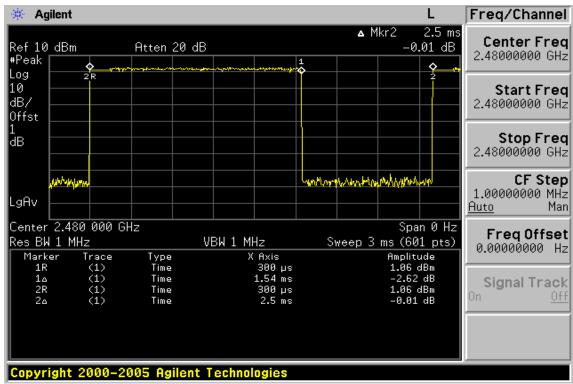


Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 59 of 61

# CH-High



### DH3



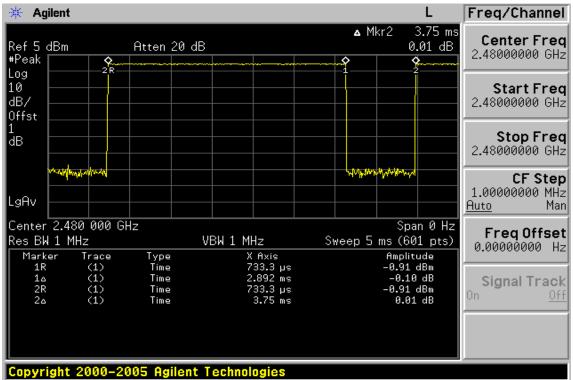
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 60 of 61

DH5



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 of the state of the results shown in this test report refer only to the sample(s) tested and such sample(s) are related to 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責, 同時比樣品僅保留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.sqs.com/terms\_and\_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms\_e-document.htm</u>. Attention is drawn to the limitation of liability, indem-nification 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 right oned exhibiting upder the transaction from exercising downward expect in full without prior wither approxy. Approxy provide a server in full without prior withing approxy that particular to the formation approxy of the Company. Approxy approxy the provide a vector is full without prior withing approxy. Approxy approxy the provide a vector is full without prior withing approxy approxy the prior downward expecting and a vector is fully without prior without approxy. Approxy approxy the prior without prior without approxy approxy the prior downward approxy approxy approxy. Approxy app 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.



Report No.: EH/2010/90003 Issue Date: Sep. 28, 2010 Page: 61 of 61

# **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.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

# 13.2. Antenna Connected Construction

The directional gains of antenna used for transmitting is -2.17dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

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。