

HCT CO., LTD.

Product Compliance Division

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FCC Certification

Applicant Name: Franklin Technology Inc. Address: 1505 Digital Tower Aston, 505-15 Gasan-dong, Gumcheon-gu, Seoul, Korea Date of Issue: April 14, 2011 Location: HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea Test Report No.: HCTR1104FR12 HCT FRN: 0005866421

IC Recognition No.: IC 5944A-3

FCC ID : XHG-M600A

APPLICANT : Franklin Technology Inc.

Model(s): EUT Type: Tx Frequency:	M600A 3G 4G Module 824.70 — 848.31 MHz (CDMA) 1 851.25 — 1 908.75 MHz (PCS CDMA)
Rx Frequency:	869.70 — 893.31 MHz (CDMA) 1 931.25 — 1 988.75 MHz (PCS CDMA)
Max. Conducted Power:	0.269 W CDMA (24.30 dBm) / 0.255 W PCS CDMA (24.06 dBm)/ 0.254 W CDMA EVDO (24.04 dBm) / 0.248 W PCS EVDO (23.95 dBm)
Emission Designator(s):	1M28F9W (CDMA) / 1M29F9W (PCS CDMA) 1M28F9W (CDMA EVDO), 1M30F9W (PCS CDMA EVDO)
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§22, §24, §2

The measurements shown in this report were made in accordance with the procedures specified in §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. **HCT CO., LTD.** Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by : Hyo Sun Kwak Test engineer of RF Team

Chang book Choi Approved by

Approved by : Chang Seok Choi Manager of RF Team

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Test Report No. HCTR1104FR12	Date of Issue: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A
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<u>Version</u>

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1104FR12	April 14, 2011	First Approval Report

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	Franklin Technology Inc.
Address:	1505 Digital Tower Aston, 505-15 Gasan-dong, Gumcheon-gu, Seoul, Korea
Contact Person:	Name: Joong II Hwang Phone #: TEL :+82-70-8228-3457 / FAX : +82-2-862-8923
FCC ID:	XHG-M600A
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§22, §24, §2
EUT Type:	3G 4G Module
Model(s):	M600A
Tx Frequency:	824.70 — 848.31 MHz (CDMA) 1 851.25 — 1 908.75 MHz (PCS CDMA)
Rx Frequency:	869.70 — 893.31 MHz (CDMA) 1 931.25 — 1 988.75 MHz (PCS CDMA)
Max. Conducted Power:	0.269 W CDMA (24.30 dBm) / 0.255 W PCS CDMA (24.06 dBm)/ 0.254 W CDMA EVDO (24.04 dBm) / 0.248 W PCS EVDO (23.95 dBm)
Emission Designator(s):	1M28F9W (CDMA) / 1M29F9W (PCS CDMA) 1M28F9W (CDMA EVDO), 1M30F9W (PCS CDMA EVDO)
Date(s) of Tests:	April 07, 2011 ~ April 14, 2011

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2.1. EUT DESCRIPTION

The M600A 3G 4G Module consists of Cellular CDMA, PCS CDMA, EVDO Rev.0, A.

2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.3. TEST FACILITY

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri , Majang-Myeon, Icheon-si, 467-811, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated September 03, 2010 (Registration Number: 90661)

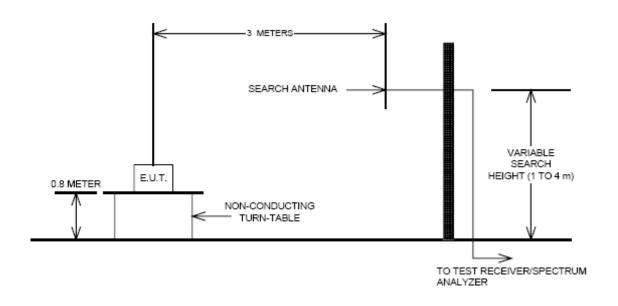
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3. DESCRIPTION OF TESTS

3.1 EFFECTIVE RADIATED POWER/EQUIVALENT ISOTROPIC RADIATED POWER

Test Set-up



Test Procedure

Radiated emission measurements were performed at an SAC(Semi-Anechoic Chamber)

The equipment under test is placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. A styrofoam turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

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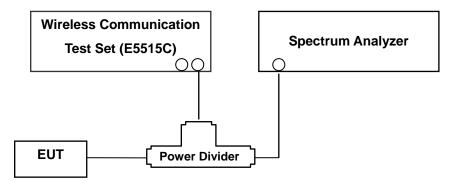
3.2 PEAK- TO- AVERAGE RATIO

A peak to average ratio measurement is performed at the conducted port of the EUT. For CDMA and WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. Plots of the EUT's Peak- to- Average Ratio are shown herein.

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Test set-up



(Configuration of conducted Emission measurement) Test Procedure

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

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3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.

The EUT was setup to maximum output power at its lowest channel. The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with the – 13 dBm limit, in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block. The 1 MHz RBW was used to scan from 30 MHz to 10 GHz. (PCS CDMA Mode: 30 MHz to 20 GHz). A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

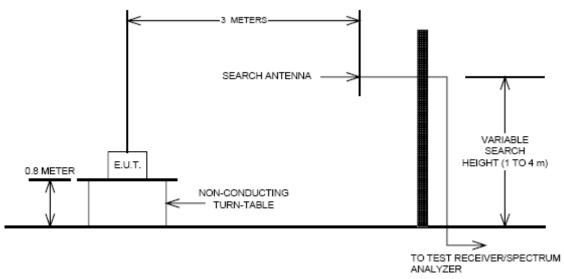
- Band Edge Requirement : In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

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3.5 RADIATED SPURIOUS AND HARMONIC EMISSIONS

Test Set-up



The measurement facilities used for this test have been documented in previous filings with the commission pursuant to section § 2.948. The SAC(Semi-Anechoic Chamber) meets requirements in ANSI C63.4 –2003. A mast capable of lifting the receiving antenna from a height of one to four meters is used together with a rotatable styrofoam platform mounted at three from the antenna mast.

- 1) The unit mounted on a styrofoam turntable 1.5 m × 1.0 m × 0.80 m is 0.8 meter above test site ground level.
- 2) During the emission test, the turntable is rotated and the EUT is manipulated to find the configuration resulting in maximum emission under normal condition of installation and operation.
- 3) The antenna height and polarization are also varied from 1 to 4 meters until the maximum signal is found.
- 4) The spectrum shall be scanned up to the 10th harmonic of the fundamental frequency.

Test Procedure

The equipment under test is placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. A styrofoam turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

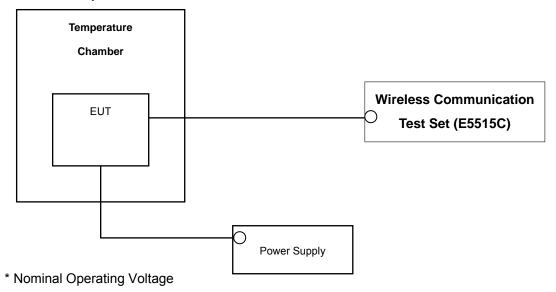
The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

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3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



Test Procedure

The frequency stability of the transmitter is measured by:

a.) Temperature: The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification — the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within \pm 0.000 25 %(\pm 2.5 ppm) of the center frequency.

Time Period and Procedure:

The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).

1. The equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

2. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one halfhour is provided to allow stabilization of the equipment at each temperature level. **NOTE: The EUT is tested down to the battery endpoint.**

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4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Interval	Calibration Due
R&S	ESI40/ Spectrum Analyzer	831564/003	Annual	10/29/2011
Agilent	E4416A/ Power Meter	GB41291412	Annual	01/04/2012
Agilent	E9327A/ Power Sensor	MY4442009	Annual	07/23/2011
Agilent	8960 (E5515C)/ Base Station	GB44400269	Annual	02/10/2012
MITEQ	AMF-6D-001180-35-20P/AMP	990893	Annual	05/20/2011
Wainwright	WHK1.2/15G-10EF/H.P.F	2	Annual	06/25/2011
Wainwright	WHK3.3/18G-10EF/H.P.F	1	Annual	06/25/2011
Agilent	775D/ Dual Directional Coupler	12922	Annual	12/29/2011
Agilent	11636B/ Power Divider	11377	Annual	12/29/2011
Digital	EP-3010/ Power Supply	3110117	Annual	01/04/2012
Schwarzbeck	UHAP/ Dipole Antenna	949	Biennial	03/18/2012
Schwarzbeck	UHAP/ Dipole Antenna	950	Biennial	03/18/2012
Korea Engineering	KR-1005L / Chamber	KRAB07063-2CH	Annual	12/28/2011
Schwarzbeck	BBHA 9120D/ Horn Antenna	296	Biennial	09/23/2011
Schwarzbeck	BBHA 9120D/ Horn Antenna	147	Biennial	04/13/2012
Agilent	E4440A/Spectrum Analyzer	US45303008	Annual	06/09/2011

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5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049, 22.917(a), 24.238(a)	Occupied Bandwidth	N/A		PASS
2.1051, 22.917(a), 24.238(a)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< 43 + 10log ₁₀ (P[Watts]) at Band Edge and for all out-of-band emissions	CONDUCTED	PASS
2.1046	Conducted Output Power	N/A		PASS
24.232(d),	Peak- to- Average Ratio	< 13 dB		PASS
2.1055, 22.355, 24.235	Frequency stability / variation of ambient temperature	< 2.5 ppm		PASS
22.913(a)(2)	Effective Radiated Power	< 7 Watts max. ERP		PASS
24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP(PCS)	RADIATED	PASS
2.1053, 22.917(a), 24.238(a)	Radiated Spurious and Harmonic Emissions	< 43 + 10log ₁₀ (P[Watts]) for all out-of band emissions		PASS

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6. SAMPLE CALCULATION

A. ERP Sample Calculation

Mode	Ch./ Freq.		Measured	Substitude Ant. Gain		C.L	Pol.	Ef	RP
Mode	channel	Freq.(MHz)	Level(dBm)	LEVEL(dBm)	Ant. Gain	U.L	FOI.	w	dBm
CDMA	384	836.52	-10.96	24.81	2.50	1.19	Н	0.41	26.12

ERP = SubstitudeLEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a wooden tripod is 0.8 meter above test site ground level.

2) During the test, the turn table is rotated and the antenna height is also varied from 1 to 4 meters until the maximum signal is found.

3) Record the field strength meter's level.

4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item (3).

6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power (**ERP**).

B. Emission Designator CDMA Emission Designator

Emission Designator = 1M27F9W

CDMA BW = 1.27 MHz (Measured at the 99% power bandwidth)

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

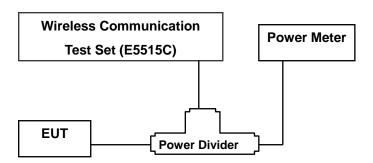
FCC CERTIFICATION REPORT		
EUT Type: 3G 4G Module	FCC ID: XHG-M600A	
	EUT Type:	



7. TEST DATA

7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with The EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



		SO2	SO2	SO55	SO55	TDSO	1xEvD Rev.O	1xEvD	1xEvDO	1xEvDO
Date		302	302	3055	3055	SO32		Rev.O	Rev.1	Rev.1
Band	Channel	RC1/1	RC3/3	RC1/1	RC3/3	RC3/3				
		(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(FTAP)	(RTAP)	(FETAP)	(RETAP)
	1013	24.03	23.90	24.06	24.13	24.16	23.89	23.74	23.95	24.04
CDMA	384	23.72	23.94	23.87	24.19	24.09	23.67	23.98	23.80	23.81
	777	23.58	23.84	23.98	24.30	24.05	23.71	23.91	23.67	23.84
	25	23.57	23.59	23.73	23.79	23.66	23.57	23.76	23.52	23.54
PCS	600	23.55	23.72	23.78	23.80	23.71	23.70	23.70	23.64	23.62
	1175	24.06	23.77	23.64	23.56	23.56	23.95	23.71	23.57	23.72

(Maximum Conducted Output Powers)

Note : Detecting mode is average.

7.2 PEAK-TO-AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown Page 26.

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7.2 OCCUPIED BANDWIDTH

Band	Channel	Frequency(MHz)	Data (MHz)
	1013	824.70	1.2774
CDMA	384	836.52	1.2787
	777	848.31	1.2799
CDMA EVDO	777	848.31	1.2784
	25	1851.25	1.2818
PCS	600	1880.00	1.2905
	1175	1908.75	1.2826
PCS EVDO	600	1880.00	1.2996

- Plots of the EUT's Occupied Bandwidth are shown Page 22 ~ 25.

7.3 CONDUCTED SPURIOUS EMISSIONS

Band	Channel	Frequency of Maximum Harmonic (GHz)	Maximum Data (dBm)
	1013	6.8000	-40.26
CDMA	384	7.4375	-40.33
	777	1.6970	-38.00
	25	3.7020	-36.23
PCS	600	3.7620	-30.48
	1175	3.8210	-20.52

- Plots of the EUT's Conducted Spurious Emissions are shown Page 34 ~ 40.

7.3.1 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 26 ~ 34.

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7.4 RADIATED SPURIOUS EMISSIONS 7.4.1 RADIATED SPURIOUS EMISSIONS(CDMA MODE)

MODULATION SIGNAL:	CDMA EVDO
DISTANCE:	<u>3 meters</u>
LIMIT:	- 13 dBm

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain	<u>Substitute</u> Level [dBm]	C.L	Pol.	ERP (dBm)
	1,649.40	-44.82	9.66	-53.43	2.63	Н	-46.40
1013	2,474.10	-39.25	10.79	-44.37	3.55	Н	-37.13
3,2	3,298.80	-43.04	11.76	-47.74	4.79	V	-40.77
	1,673.04	-42.98	9.77	-52.00	2.67	Н	-44.90
384	2,509.56	-35.83	10.82	-41.40	3.61	V	-34.19
	3,346.08	-41.73	11.87	-47.05	4.94	Н	-40.12
	1,696.62	-41.97	9.94	-51.05	2.61	V	-43.72
777	2,544.93	-25.93	10.83	-31.02	3.57	V	-23.76
	3,393.24	-35.67	11.96	-41.62	4.08	V	-33.74

NOTES: <u>1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method</u> <u>according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:</u>

2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5th Harmonic for <u>all channel.</u>

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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7.4.2 RADIATED SPURIOUS EMISSIONS(PCS CDMA MODE)

MODULATION SIGNAL:

PCS CDMA EVDO

3 meters

DISTANCE:LIMIT:

- 13 dBm

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain	<u>Substitute</u> Level [dBm]	C.L	Pol.	ERP (dBm)
	3,702.50	-27.84	12.36	-31.49	4.87	Н	-24.00
25	5,553.75	-	-	_	Ι	_	_
	7,405.00	-52.30	10.96	-40.93	6.55	Н	-36.52
	3,760.00	-27.79	12.40	-30.92	4.88	Н	-23.40
600	5,640.00	Ι	Ι	_	I	_	_
	7,520.00	_	_	-	_	-	_
	3,817.50	-24.33	12.45	-27.74	5.02	Н	-20.31
1175	5,726.25	_	-	-	-	-	_
	7,635.00	_	_	_	_	_	_

NOTES: 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5th Harmonic for <u>all channel.</u>

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

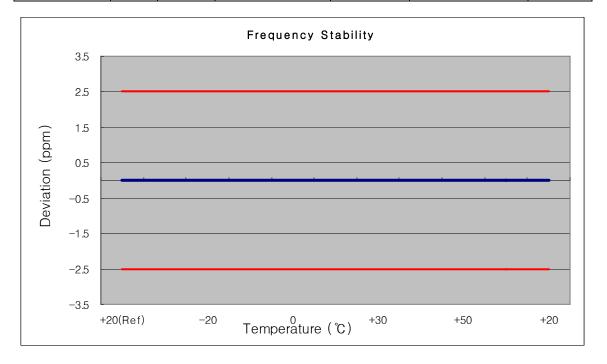
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7.5 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE 7.5.1 FREQUENCY STABILITY (CDMA)

OPERATING FREQUENCY:	836,520,000 Hz
CHANNEL:	384
REFERENCE VOLTAGE:	5.0 VDC
DEVIATION LIM IT:	± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	836 519 995	0	0.000 000	0.000
100%		-30	836 520 009	8.55	0.000 001	0.010
100%		-20	836 520 001	1.00	0.000 000	0.001
100%		-10	836 520 010	9.71	0.000 001	0.012
100%	5.00	0	836 519 998	-2.39	0.000 000	-0.003
100%		+10	836 520 010	10.20	0.000 001	0.012
100%		+30	836 520 001	0.62	0.000 000	0.001
100%		+40	836 520 007	7.12	0.000 001	0.009
100%		+50	836 519 998	-1.70	0.000 000	-0.002
115%	5.75	+20	836 520 003	3.37	0.000 000	0.004
Batt. Endpoint	4.25	+20	836 520 000	0.12	0.000 000	0.000



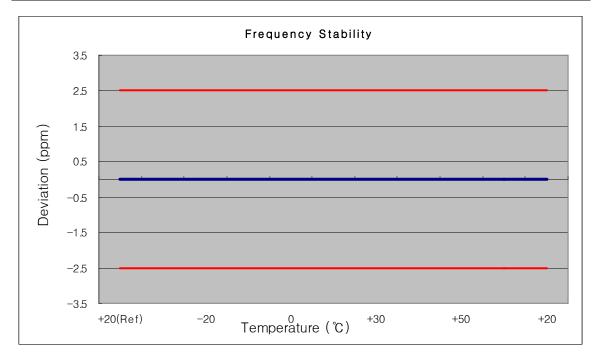
FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		



7.5.2 FREQUENCY STABILITY (PCS CDMA)

OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	600
REFERENCE VOLTAGE:	5.0 VDC
DEVIATION LIM IT:	± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	1879 999 981	0	0.000 000	0.000
100%		-30	1880 000 017	17.22	0.000 001	0.009
100%		-20	1880 000 015	14.68	0.000 001	0.008
100%		-10	1880 000 012	11.86	0.000 001	0.006
100%	5.00	0	1880 000 006	6.24	0.000 000	0.003
100%		+10	1880 000 014	14.33	0.000 001	0.008
100%		+30	1880 000 006	5.78	0.000 000	0.003
100%		+40	1880 000 010	10.20	0.000 001	0.005
100%		+50	1880 000 013	13.47	0.000 001	0.007
115%	5.75	+20	1880 000 013	12.78	0.000 001	0.007
Batt. Endpoint	4.25	+20	1880 000 007	6.61	0.000 000	0.004



FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A
	April 14, 2011		AT IG-INIOUOA

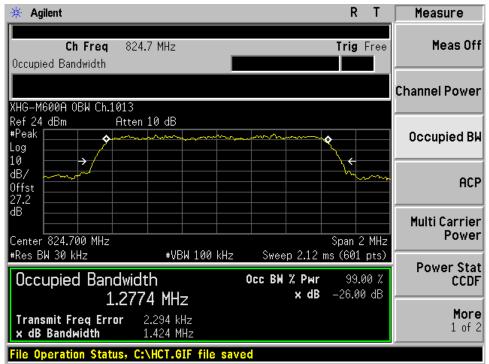


8. TEST PLOTS

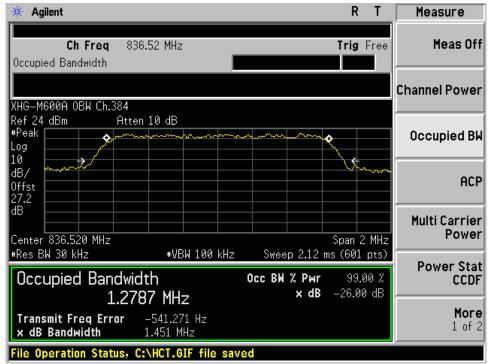
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	
Perce 0.1 of 40				



CDMA MODE (1013 CH.) Occupied Bandwidth



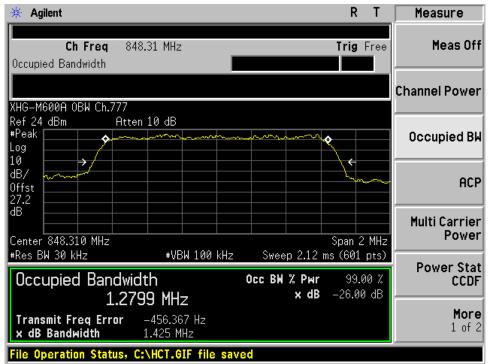
CDMA MODE (384 CH.) Occupied Bandwidth



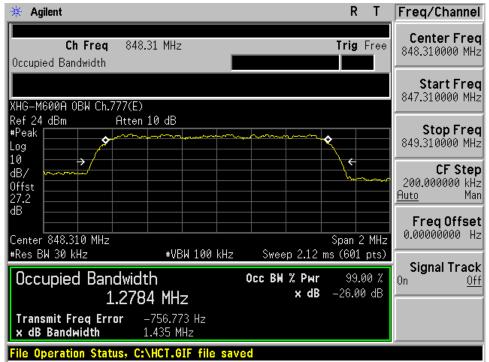
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	



CDMA MODE (777 CH.) Occupied Bandwidth



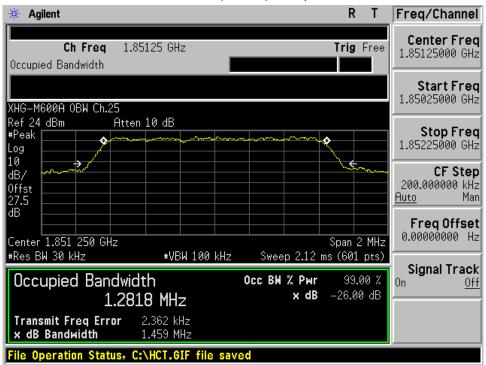
CDMA EVDO MODE (777 CH.) Occupied Bandwidth



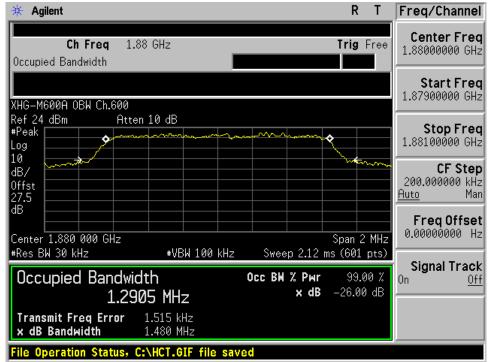
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	



■ PCS CDMA MODE (25 CH.) Occupied Bandwidth



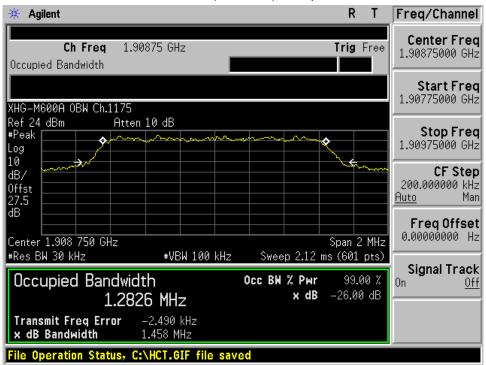
PCS CDMA MODE (600 CH.) Occupied Bandwidth



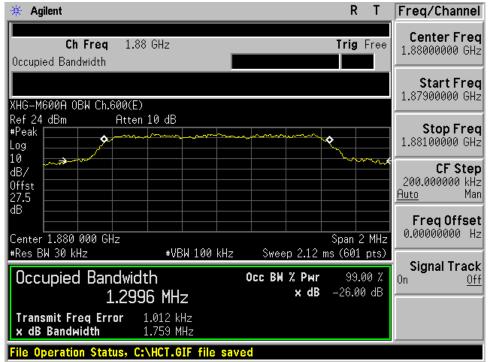
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	



PCS CDMA MODE (1175 CH.) Occupied Bandwidth

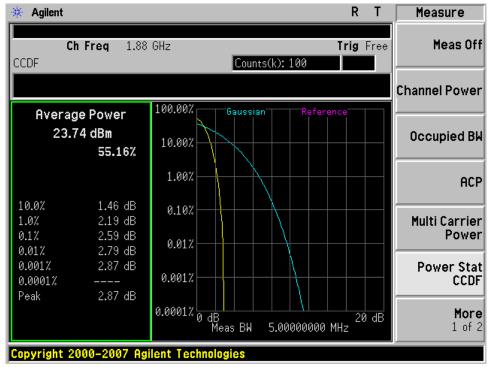


PCS CDMA EVDO MODE (600 CH.) Occupied Bandwidth



FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	





PCS CDMA MODE (600 CH.) Peak-to-Average Ratio



■ CDMA MODE (1013 CH.) Band Edge

FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	



■ CDMA MODE (777 CH.) Band Edge 🔆 Agilent R Т Measure XHG-M600A Band Edge Ch.777 Mkr1 849.000 MHz Ref 24 dBm #Samp -15.151 dBm Atten 10 dB Meas Off Log 10 dB/ Channel Power 0ffst 27.2 dB Occupied BW DI -13.0 dBm ACP ⊭LgAv 100 Av. W1 S2 S3 FS AA Multi Carrier Wm My A Power **£**(f): f>50k Power Stat CCDF Swp More Center 849.000 MHz Span 2 MHz 1 of 2 #Res BW 13 kHz ₩VBW 13 kHz Sweep 45.16 ms (601 pts) File Operation Status, C:\HCT.GIF file saved

CDMA EVDO MODE (1013 CH.) Band Edge

🔆 Agilent			RT	Freq/Channel
XHG-M600A Band Edg Ref 24 dBm	e Ch.1013(E) Atten 10 dB	Mk	r1 824.000 MHz -19.351 dBm	Center Freq 824.000000 MHz
#Samp Log 10				
dB/ Offst		put the answer of the state	Marthan Martin and and and and and and and and and an	Start Freq 823.000000 MHz
27.2 dB DI				Stop Freq 825.000000 MHz
-13.0 dBm	÷			CF Step 200.000000 kHz
#LgAv 100 W1 S2	and an and a state of the state			<u>Auto</u> Man
S3 FS AA				Freq Offset 0.00000000 Hz
£(f): f>50k Swp				Signal Track On <u>Off</u>
Center 824.000 MHz #Res BW 13 kHz	#VBW 13 kH	Hz Sweep <u>45.</u>	Span 2 MHz L6 ms (601 pts)	
File Operation Statu	s, C:\HCT.GIF file	saved		

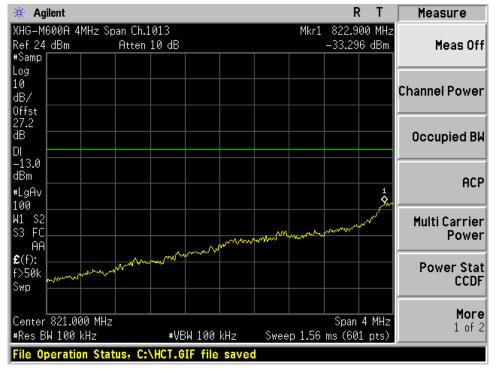
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	



R Т Freq/Channel 🔆 Agilent Mkr1 849.000 MHz XHG-M600A Band Edge Ch.777(E) **Center Freq** Ref 24 dBm -15.183 dBm Atten 10 dB 849.000000 MHz #Samp Log 10 Start Freq dB/ 848.000000 MHz 0ffst 27.2 dB Stop Freq 850.000000 MHz DI –13.0 dBm CF Step 200.000000 kHz #LgAv Auto Man 100 W1 S2 S3 FS AA Ŵ M FreqOffset 0.00000000 Hz Mr. N . Mar **£**(f): Signal Track f>50k 0n Off Swp Center 849.000 MHz Span 2 MHz #Res BW 13 kHz #VBW 13 kHz Sweep 45.16 ms (601 pts) File Operation Status, C:\HCT.GIF file saved

■ CDMA EVDO MODE (777 CH.) Band Edge

■ CDMA MODE (1013 CH.) 4 MHz Span



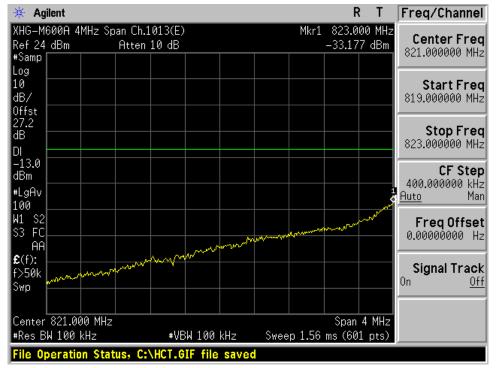
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	



n Ch.777 Atten 10 dB	Channel	eas Off Power pied BW
	Channel	Power
	0ccuj	oied BW
		ACP
Munnamen .	Multi	Carrier Power
	Pow	er Stat CCDF
*VBW 100	Span 4 MHz z Sweep 1.56 ms (601 pts)	More 1 of 2
	*VBW 100 kH	Span 4 MHz

CDMA MODE (777 CH.) 4 MHz Span

CDMA EVDO MODE (1013 CH.) 4 MHz Span



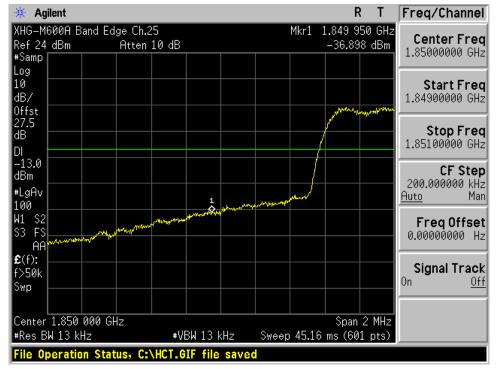
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A	



🕴 Agilent				R	Т	Freq/Channel
	z Span Ch.777(E)		Mkr1			Center Fred
Ref 24 dBm	Atten 10 dB			-36.503	3 dBm	852.000000 MHz
tSamp .og						
.0						Start Fred
1B/						850.000000 MHz
)ffst 27.2						
18				+		Stop Free
						854.000000 MHz
-13.0						CF Step
1Bm						400.000000 kH;
LgAv I						<u>Auto</u> Mar
.00 \$ 11 S2 ~~~~~						
	m					Freq Offset 0.00000000 Hz
AA	Carry and a star way and a star a sta	64				
S(f):	′	Murray Brown	×			Signal Track
>50k			werner			On Of
òwp				Careford and	and the second sec	<u>_</u>
Center 852.000			C 1 EC	Span		
Res BW 100 kHz	*VE Status, C:\HCT.G	3W 100 kHz	Sweep 1.56	ms (601	pts)	J

CDMA EVDO MODE (777 CH.) 4 MHz Span

■ PCS CDMA MODE (25 CH.) Band Edge



FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		





■ PCS CDMA MODE (1175 CH.) Band Edge





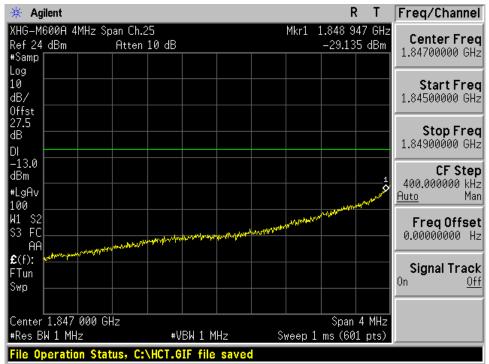
FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		





■ PCS CDMA EVDO MODE (1175 CH.) Band Edge

■ PCS CDMA MODE (25 CH.) 4 MHz Span



FCC CERTIFICATION REPORT			www.hct.co.kr		
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		



🔆 Agilent					R	Т	Freq/Channel
XHG-M600A 4MH				Mkr1	1.911 00		Center Freq
Ref 24 dBm	Atten	10 dB			-23.34	4 dBm	1.91300000 GHz
#Samp Log							
10							Start Freq
dB/							1.91100000 GHz
Offst							
27.5							Stop Fred
							1.91500000 GHz
-13.0 1							CF Step
dBm 🕵 🔜							400.000000 kHz
#LgAv	_						<u>Auto</u> Mar
100	and the second states and	theman					E
\$3 FC		With weth when when a start wat	munun				Freq Offset 0.00000000 Hz
AA				Martin Martin	WWWWWWWWWWW	MARKAN .	
£ (f):						- 10 W	Signal Track
FTun							On Off
Swp							<u></u>
Center 1.913 00	00 GHz			~ _		4 MHz	
#Res BW 1 MHz		#VBW 1		Sweep 1	ms (60)	i pts)	
File Operation	Status, C:	HCT.GIF fi	e saved				

■ PCS CDMA MODE (1175 CH.) 4 MHz Span



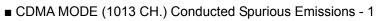


FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		



🔆 Agilent				R	Т	Freq/Channel
XHG-M600A 4MHz Ref 24 dBm #Samp	Span Ch.1175(E) Atten 10 dB		Mkr1 1	1.911 00 -22.453		Center Freq 1.91300000 GHz
Log 10 dB/						Start Fred 1.91100000 GHz
0ffst 27.5 1B DI						Stop Fred 1.91500000 GHz
-13.0 ± dBm #LgAv 100						CF Step 400.000000 kHz <u>Auto</u> Mar
41 S2 S3 FC AA	and be dependent of the second of the formation of the second of the sec	enderster og sen som stander og sen som	manifullinger	and you wanted	manhabarra	Freq Offset 0.00000000 Hz
€(f): =Tun Swp						Signal Track On <u>Off</u>
Center 1.913 000 #Res BW 1 MHz		3W 1 MHz	Sweep 1		4 MHz . pts)	
	#VI (tatus, C:\HCT.G			ms (601	. pts)	

PCS CDMA EVDO MODE (1175 CH.) 4 MHz Span



🔆 Agilent			RT	Measure
XHG–M600A Cond Spur			.648 GHz	
Ref 24 dBm A	tten 10 dB	-43	3.25 dBm	Meas Off
#Peak Log				
10				
dB/				Channel Power
Offst				
27.2 dB				O a sum is al DU
ab DI				Occupied BW
-13.0				
dBm				000
#LgAv				ACP
V1 S2				Multi Carrier
S3 FC	warden had marked and and and	and the second state of th	and the second second	Power
AA £(f):				
FTun				Power Stat
Swp				CCDF
Center 1.265 GHz		Snan -	2.47 GHz	More
#Res BW 1 MHz	₩VBW 1 MHz	Sweep 4.12 ms (1 of 2
	, C:\HCT.GIF file save			

FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		



🔆 Agilent				R	: Т	Measure
(HG-M600A Cond Sp	our Ch.1013		М	kr1 6.800	0 GHz	
Ref 24_dBm	Atten 10 df	3		-40.2	6 dBm	Meas Off
*Peak						
.og						
10 187						Channel Power
Offst						
27.2						
яв — —						Occupied BW
)						•
-13.0						
dBm						ACP
+LgAv						
		1				
J1 S2 S3 FC whythe may make			and work from the stand of	And when the state	mandal	Multi Carrier
S3 FC Antonio A	Marand and the high and	and the second second				Power
ɛ (f):						
Tun						Power Stat
Swp						CCDF
				<u> </u>		More
Center 6.250 0 GHz			Sum = 10	Span 7		1 of 2
ŧRes BW 1 MHz		ŧVBW 1 MHz	Sweep 12.	52 ms (60	i pts)	

■ CDMA MODE (1013 CH.) Conducted Spurious Emissions - 2

■ CDMA MODE (384 CH.) Conducted Spurious Emissions - 1

🔆 Agilent					R	Т	Measure
XHG-M600A Cond S				Mkr1 1			
Ref 24 dBm #Peak	Atten 10 dB			-41	.50	dBm	Meas Off
Log							
10							Channel Power
dB/ Offst							
27.2							
dB							Occupied BW
-13.0 dBm							
#LgAv					+		ACP
			1				
V1 S2			\$\vec{1}{2}\$				Multi Carrier
S3 FC	Manna Marina	and the state of the	and the works	and the state of the second	different of the state	Annhoy Annia	Power
£(f):							
FTun							Power Stat CCDF
Ѕwp					+		
							More
Center 1.265 GHz			S	Span 2			1 of 2
#Res BW 1 MHz		BW 1 MHz		4.12 ms (6	Tשכ	pts)	
File Operation Sta	itus, C:\HCT.G	IF file save	•				

FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		



(HG-M600A Cond Sp Ref 24 dBm +Peak	ur Ch.38 Atten :	34							
	Atten 🔅					Mkr1	7.437	5 GHz	
4Paal		10 dB					-40.3	3 dBm	Meas Off
.og LØ									
18/									Channel Power
)ffst									
27.2									
яв — — — — — — — — — — — — — — — — — — —									Occupied Bk
ו 🗖 🚽 וו									
-13.0									
dBm									ACP
+LgAv									
					1				
11 S2 53 FC				whent	www.	Mar Walter	Montrophie	-	Multi Carrier
AA	and the second second	an a	and the second	uyaCett				an al conside	Power
ɛ (f):									
Tun									Power Stat
Swp									CCDF
Center 6.250 0 GHz							Span 7.		More
Res BW 1 MHz		# U	BW 1 M	U-7	Swaan	12.52			1 of 2
ile Operation Stat						12.J2	1113 (00.	r pts)	

■ CDMA MODE (384 CH.) Conducted Spurious Emissions - 2

CDMA MODE (777 CH.) Conducted Spurious Emissions - 1

r Ch.777				
Atten 10 dB		Mkr1 1.6% –38.00		Meas Off
				Channel Power
				Occupied Bl
				ACI
	1			
an gana ha an	warden warden and the parts	abararan and a state		Multi Carrier Power
				Power Sta CCDF
		Spop 2.4	7 645	More
#VBW 1 MH	z Sweep			1 of 3
			Span 2.4 #VBW 1 MHz Sweep 4.12 ms (601	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		



🔆 Agilent				R	Т	Measure
XHG-M600A Cond Spi	ur Ch.777		Mkr1	7.687		
	Atten 10 dB			-40.44	dBm	Meas Off
#Peak						
Log 10						
dB/						Channel Power
Offst						
27.2						
dB						Occupied BW
DI						
-13.0						
dBm						ACP
#LgAv						
V1 S2			1			
VI 52 S3 FC		with these	the mailtageneration	e - Horney Han son fres	W.W.W.	Multi Carrier
AA	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	over an already				Power
£(f):						
FTun						Power Stat
Swp						CCDF
Center 6.250 0 GHz				Span 7.5	5 GHz	More
#Res BW 1 MHz	#VBW :	1 MHz Swee	∍p 12.52			1 of 2
File Operation State					(000)	P

■ CDMA MODE (777 CH.) Conducted Spurious Emissions - 2

PCS CDMA MODE (25 CH.) Conducted Spurious Emissions - 1

Hereak -30.23 dbin 2.01500000 Gk Log 10 -30.0000000 Mk 10 -30.0000000 Mk 30.0000000 Mk Offst 27.5 -30.25 dbin Start Free 0B -13.0 -30.0000000 Mk -30.0000000 Mk -13.0 -13.0 -13.0 -14.00000000 Mk W1 S2 S3 FC -4A -40.00000000 Mk FTun -50.25 dbin -50.25 dbin -50.25 dbin Start Free -30.0000000 Mk -50.25 dbin -50.25 dbin 0.00000000 Gk -50.25 dbin -50.25 dbin -50.25 dbin 0.00000000 Kk -50.25 dbin -50.25 dbin -50.25 dbin 0.00000000 k -50.25 dbin -50.25 dbin -50.25 dbin 0.00000000 k -50.25 dbin -50.25 dbin -50.25 dbin 0.	🔆 Agilent				RT	Freq/Channel
Log Start Fre 10 30.0000000 MI Offst 30.0000000 MI 27.5 30.0000000 MI DI 1.3.0 -13.0 CF Ste 397.000000 MI MBm 1 *LgAv 1 V1 S2 STC S3 FC MI AA MI £(f): Start Free Swp Signal Trac Center 2.015 GHz Span 3.97 GHz	Ref 24 dBm					Center Freq
dB/ 0ffst 27.5 dB 30.0000000 MI DI -13.0 dBm Stop Fre 4.0000000 GI +LgAv 1 V1 S2 S3 FC AA 1 E(f): FTun Swp Signal Trac On Center 2.015 GHz Span 3.97 GHz	Log					
27.5 dB DI -13.0 dBm #LgAv V1 \$2 \$3 FC AA £(f): FTun \$wp Center 2.015 GHz Stop Fre 4.0000000 GH Stop Fre 4.0000000 GH Stop Fre 4.0000000 GH Stop Fre 4.0000000 GH Stop Fre 397.000000 H Stop Fre Stop Fre	dB/					Start Freq 30.000000 MHz
-13.0 dBm #LgAv V1 S2 S3 FC AA £(f): FTun Swp Center 2.015 GHz CF Ste 397.000000 Mt <u>1</u> CF Ste 397.000000 Mt <u>1</u> Signal Trac On <u>0</u>	27.5 dB					Stop Freq 4.00000000 GHz
V1 \$2 \$3 FC AA £(f): FTun \$wp Center 2.015 GHz Center 2.015 GHz	dBm				1	CF Step 397.000000 MHz Auto Man
£(f): Signal Trac FTun Swp Swp Some Signal Trac Center 2.015 GHz Span 3.97 GHz	S3 FC	number of the second	ngeligen ngengalgen vill all del	and the second states of the s	eren werden der	FreqOffset 0.00000000 Hz
	£ (f): FTun					Signal Track On <u>Off</u>
<pre>#Res BW 1 MHz #VBW 1 MHz Sweep 6.64 ms (601 pts)</pre>	Center 2.015 GHz			Span	3.97 GH <u>z</u>	
	#Res BW 1 MHz	#VBW 1	MHz Sw	eep 6.64 ms	(601 pts)	

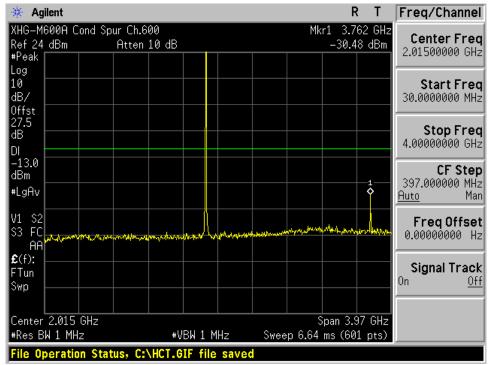
FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		



		,		
🔆 Agilent			RT	Freq/Channel
XHG-M600A Cond S Ref 24 dBm #Peak Log	pur Ch.25 Atten 10 dB		Mkr1 14.427 GH 38.22 dBr	Contor From
10 dB/ 0ffst				Start Freq 4.00000000 GHz
27.5 dB DI				Stop Freq 20.0000000 GHz
-13.0 dBm #LgAv		1		CF Step 1.60000000 GHz <u>Auto</u> Mar
V1 S2 S3 FC	where the property of the prop	Werter March	mananakalanana apitanaka	Freq Offset 0.00000000 Hz
€(f): =Tun Swp				Signal Track On <u>Of</u>
Center 12.000 GHz #Res BW 1 MHz		MHz _Swe	Span 16 GH eep 40 ms (601 pts	
#Res BW 1 MHz	#VBW 1 atus, C:\HCT.GIF file		Span 16 GH eep 40 ms (601 pts	

■ PCS CDMA MODE (25 CH.) Conducted Spurious Emissions - 2

■ PCS CDMA MODE (600 CH.) Conducted Spurious Emissions - 1



FCC CERTIFICATION REPORT					
Test Report No. HCTR1104FR12	Test Dates: April 14, 2011	EUT Type: 3G 4G Module	FCC ID: XHG-M600A		



		Conducted Spundus Emis	
🔆 Agilent		RT	Freq/Channel
#Peak	Ch.600 :en 10 dB	Mkr1 19.333 GHz 37.99 dBm	Center Freq 12.0000000 GHz
Log 10 dB/ 0ffst			Start Freq 4.00000000 GHz
27.5 dB DI			Stop Freq 20.0000000 GHz
-13.0 dBm #LgAv		1	CF Step 1.6000000 GHz <u>Auto</u> Man
AA	President of the state of the s	un hanna h	Freq Offset 0.00000000 Hz
£(f): FTun Swp			Signal Track On <u>Off</u>
Center 12.000 GHz #Res BW 1 MHz	#VBW 1 MHz	Span 16 GHz Sweep 40 ms (601 pts)	
File Operation Status,			

■ PCS CDMA MODE (600 CH.) Conducted Spurious Emissions - 2

■ PCS CDMA MODE (1175 CH.) Conducted Spurious Emissions - 1

🔆 Agilent				R	T Freq/Channel
XHG-M600A Cond S Ref 24 dBm	pur Ch.1175 Atten 10 dB		Mk	r1 3.821 (-20.52 dl	
#Peak Log					
10 dB/					Start Freq 30.0000000 MHz
0ffst 27.5 dB DI					Stop Freq 4.00000000 GHz
-13.0 dBm #LgAv					CF Step 397.000000 MHz Auto Man
V1 S2	Hundred May and Market Mark	d bygeddaearaan a	wanta and an and an	where and a section of the section o	Freq Offset
£(f): FTun Swp					Signal Track
Center 2.015 GHz) Span 3.97 G	:11=
#Res BW 1 MHz	#VBW :	1 MHz	Sweep 6.64		
File Operation Sta	tus, C:\HCT.GIF (file saved			

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🔆 Agilent				х т	Freq/Channel
#Peak	pur Ch.1175 Atten 10 dB			253 GHz 36 dBm	Center Freq 12.0000000 GHz
Log 10 dB/ Offst					Start Freq 4.00000000 GHz
27.5 dB DI					Stop Freq 20.0000000 GHz
-13.0 dBm #LgAv		1			CF Step 1.6000000 GHz <u>Auto</u> Man
V1 S2 S3 FC AA	when which produces and the	workness the many	and month land	Apolandertonea	FreqOffset 0.00000000 Hz
£(f): FTun Swp					Signal Track On <u>Off</u>
Center 12.000 GHz #Res BW 1 MHz	#VBW 1	MHz S	Span Sweep 40 ms (60	16 GHz 11 pts)	
File Operation Sta	atus, C:\HCT.GIF fil	e saved			

■ PCS CDMA MODE (1175 CH.) Conducted Spurious Emissions - 2

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