

HCT CO., LTD.

Product Compliance Division

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FCC Certification

Applicant Name:

PANTECH CO., LTD.

Address:

Pantech Bldg, I-2, DMC, Sangam-dong Mapo-gu, Seoul, 121-792, Korea

Date of Issue: October 29, 2010 Location: HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheonsi, Kyunggi-Do, Korea(Lab) Test Report No.: HCTR1010FR16-1 HCT FRN: 0005866421

IC Recognition No.: IC 5944A-2

FCC ID:

JYCRAY

APPLICANT: PANTECH CO., LTD.

Model(s): EUT Type:	UML290 USB Modem
Tx Frequency:	824.20 - 848.80 MHz (GSM850) 826.40 - 846.60 MHz (WCDMA850) 1 850.20 - 1 909.80 MHz (GSM1900) 1 852.4 – 1 907.6 MHz (WCDMA1900)
Rx Frequency:	869.20 - 893.80 MHz (GSM850) 871.40 - 891.60 (WCDMA850) 1 930.20 - 1 989.80 MHz (GSM1900) 1 932.4 – 1 987.6 MHz (WCDMA1900)
Max. RF Output Power:	0.804 W ERP GSM850 (29.05 dBm) / 0.553 W EIRP GSM1900 (27.43 dBm) 0.329 W ERP EDGE850 (25.17 dBm) / 0.548 W EIRP EDGE1900 (27.39 dBm) 0.203 W ERP WCDMA850(23.07 dBm) / 0.198 W EIRP WCDMA1900(22.97 dBm)
Emission Designator(s):	242KGXW (GSM850) 244KGXW (GSM1900) 247 KG7W (GSM850 EDGE) 242KG7W (GSM1900 EDGE) 4M16F9W (WCDMA850) 4M15F9W (WCDMA1900)
FCC Classification: FCC Rule Part(s):	PCS Licensed Transmitter (PCB) §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 prépared by : Hyo Sun Kwak Test engineer of RF Team

Approved by

: Sang Jun Lee Manager of RF Team

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

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<u>Version</u>

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1010FR16	October 25, 2010	First Approval Report
HCTR1010FR16-1	October 29, 2010	Change page 5 (Model name)

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	PANTECH CO., LTD.
Address: FCC ID:	Pantech Bldg, I-2, DMC, Sangam-dong Mapo-gu, Seoul, 121-792, Korea JYCRAY
Application Type: FCC Classification: FCC Rule Part(s):	Certification PCS Licensed Transmitter (PCB) §22, §24, §2
EUT Type:	USB Modem
Model(s): Tx Frequency:	UML290 824.20 - 848.80 MHz (GSM850) 826.40 - 846.60 MHz (WCDMA850) 1 850.20 - 1 909.80 MHz (GSM1900) 1 852.4 – 1 907.6 MHz (WCDMA1900)
Rx Frequency:	869.20 - 893.80 MHz (GSM850) 871.40 - 891.60 (WCDMA850) 1 930.20 - 1 989.80 MHz (GSM1900) 1 932.4 – 1 987.6 MHz (WCDMA1900)
Max. RF Output Power:	0.804 W ERP GSM850 (29.05 dBm) / 0.553 W EIRP GSM1900 (27.43 dBm) 0.329 W ERP EDGE850 (25.17 dBm) / 0.548 W EIRP EDGE1900 (27.39 dBm) 0.203 W ERP WCDMA850(23.07 dBm) / 0.198 W EIRP WCDMA1900(22.97 dBm)
Emission Designator(s):	242KGXW (GSM850) 244KGXW (GSM1900) 247 KG7W (GSM850 EDGE) 242KG7W (GSM1900 EDGE) 4M16F9W (WCDMA850) 4M15F9W (WCDMA1900)
Antenna Specification	Manufacturer: KARAM Solution. Antenna type: Internal Antenna Peak Gain: -8.0 dBi (GSM)
Date(s) of Tests:	Peak Gain: -1.5 dBi (WCDMA) October 01, 2010 ~ October 08, 2010

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2. INTRODUCTION

2.1. EUT DESCRIPTION

The LG Electronics, Inc. UML290 USB Modem consists of GSM850, GSM1900, GPRS Class12, GPRS mode Class B(GPRS and GSM, but not simultaneously), EDGE, WCDMA850, WCDMA1900, HSDPA and HSUPA.

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 June 10, 2009 (Registration Number: 90661)

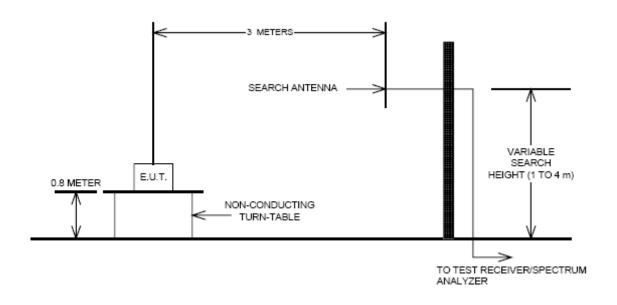
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3. DESCRIPTION OF TESTS

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

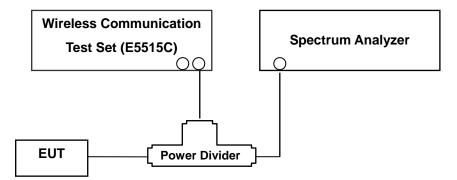
spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. Plots of the EUT's Peak- to- Average Ratio are shown herein.

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3.3 OCCUPIED BANDWIDTH.

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 10 MHz to 10 GHz. (GSM1900 Mode: 10 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.

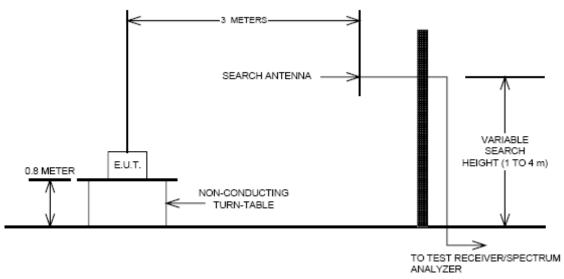
- Band Edge Requirement : In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

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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.

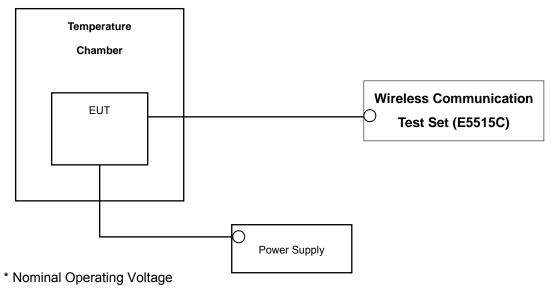
The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and 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	10/30/2010
Agilent	E4416A/ Power Meter	GB41291412	Annual	01/14/2011
Agilent	E9327A/ Power Sensor	MY4442009	Annual	07/23/2011
Agilent	8960 (E5515C)/ Base Station	GB44400269	Annual	02/10/2011
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	12/24/2010
Agilent	11636B/ Power Divider	11377	Annual	12/24/2010
Digital	EP-3010/ Power Supply	3110117	Annual	01/08/2011
Schwarzbeck	UHAP/ Dipole Antenna	585	Biennial	02/13/2011
Schwarzbeck	UHAP/ Dipole Antenna	558	Biennial	02/13/2011
Korea Engineering	KR-1005L / Chamber	KRAB07063-2CH	Annual	12/28/2010
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 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions		PASS
2.1046	Conducted Output Power	-	CONDUCTED	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	RADIATED	PASS
2.1053, 22.917(a), 24.238(a)	Radiated Spurious and Harmonic Emissions	< 43 + 10log10 (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.	ERP	
Mode	channel	Freq.(MHz)	Level(dBm)	LEVEL(dBm)	Ant. Gain	U.L	FUI.	w	dBm
GSM850	128	824.20	-11.56	34.28	-8.32	1.17	Н	0.30	24.79

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

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

- G = Phase Modulation
- X = Cases not otherwise covered
- W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

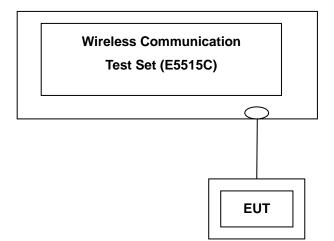
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7. TEST DATA

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.



Test Result

		GPRS Data				
Band	Channel	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	
GSM	128	32.7	29.5	26.4	25.0	
850	190	32.7	29.7	26.3	25.0	
000	251	32.8	29.8	26.3	25.0	
CSM	512	29.4	26.5	25.5	24.5	
GSM 1900	661	29.4	26.3	25.5	24.4	
1300	810	29.75	26.3	25.9	24.3	

(GSM Conducted Maximum Output Powers)

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			EDGE Data					
Band	Channel	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)			
GSM	128	26.0	22.1	21.0	20.2			
850	190	25.9	22.2	20.9	20.2			
000	251	25.8	21.9	21.0	20.1			
GSM	512	26.9	22.6	21.0	20.3			
1900	661	26.8	22.6	21.0	20.3			
1900	810	27.0	22.6	21.0	20.2			

(GSM EDGE Conducted Output Powers)

3GPP		3GPP 34.121	Cellu	lar Band [
Release	Mode		UL 4132	UL 4183	UL 4233	MPR
Version		Subtest	(826.4)	(836.6)	(846.6)	
			DL 4357	DL 4408	DL 4458	
99	WCDMA	12.2 kbps	23.03	23.08	23.02	
99	VVCDIVIA	RMC	23.03	23.08	23.02	-
5		Subtest 1	21.98	21.98	21.41	0
5	HSDPA	Subtest 2	22.12	22.27	21.56	0
5	HSDFA	Subtest 3	21.94	21.03	21.46	- 0.5
5		Subtest 4	21.61	22.04	21.53	- 0.5
6		Subtest 1	22.69	22.71	22.83	0
6		Subtest 2	20.56	20.33	20.67	-2
6	HSUPA	Subtest 3	22.05	21.90	21.74	-1
6		Subtest 4	20.95	20.46	20.54	-2
6		Subtest 5	22.87	23.10	22.25	0

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3GPP		3GPP 34.121	PC	S Band [dB	im]	
Release	Mode	Subtest	UL 9262 (1852.4)	UL 9400 (1880.0)	UL 9538 (1907.6)	MPR
Version			DL 9662	DL 9800	DL 9938	
99	WCDMA	12.2 kbps RMC	23.24	23.10	23.24	-
5		Subtest 1	22.23	22.37	22.44	0
5	HSDPA	Subtest 2	22.44	22.39	22.50	0
5	HODFA	Subtest 3	22.48	22.46	22.54	- 0.5
5		Subtest 4	22.46	21.48	22.52	- 0.5
6		Subtest 1	23.04	23.10	23.05	0
6		Subtest 2	21.07	20.93	21.00	-2
6	HSUPA	Subtest 3	21.88	21.70	22.04	-1
6		Subtest 4	21.20	20.92	21.03	-2
6		Subtest 5	22.85	23.08	22.51	0

(WCDMA 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 35, 38.

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7.3 OCCUPIED BANDWIDTH

Band	Channel	Frequency(MHz)	Data (GSM: kHz / WCDMA : MHz)
	128	824.20	239.1813
GSM850	190	836.60	240.3753
	251	848.80	242.1710
GSM850 EDGE	251	848.80	247.4792
	512	1850.20	243.5955
GSM1900	661	1880.00	242.3550
	810	1909.80	240.0014
GSM1900 EDGE	512	1850.20	242.2747
	4132	826.40	4.1241
WCDMA850	4183	836.60	4.1018
	4233	846.60	4.1614
	9262	1852.40	4.1392
WCDMA1900	9400	1880.00	4.1530
	9538	1907.60	4.1347

- Plots of the EUT's Occupied Bandwidth are shown Page 31 ~ 34, 35 ~ 38.

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7.4 CONDUCTED SPURIOUS EMISSIONS

Band	Channel	Frequency of Maximum Harmonic (GHz)	Maximum Data (dBm)
	128	8.1750	-30.29
GSM850	190	7.0125	-30.40
	251	7.0625	-30.84
	512	1.9620	-23.05
GSM1900	661	1.9950	-23.84
	810	1.7970	-23.08
	4132	6.9750	-39.91
WCDMA850	4183	4.9500	-21.06
	4233	7.0625	-39.56
	9262	1.9090	-33.76
WCDMA1900	9400	3.7620	-36.69
	9538	1.8500	-29.65

- Plots of the EUT's Conducted Spurious Emissions are shown Page 51 ~ 62.

7.4.1 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 39 ~ 50.

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7.5 EFFECTIVE RADIATED POWER OUTPUT (GSM / WCDMA)

(GSM850 Mode)

Ch./ F	Freq.	Measured	Substitude	Ant. Gain		Pol.	ER	P
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBd)	(EUT - Antenna of EUT - Detecting Antenna)	v	dBm	
128	824.20	-7.33	40.43	-10.24	1.17	Х – Н – Н	0.80	29.02
190	836.60	-8.03	40.60	-10.36	1.19	Х – Н – Н	0.80	29.05
251	848.80	-8.95	40.53	-10.48	1.20	Х – Н – Н	0.77	28.85
EDGE 128	824.20	-11.18	36.58	-10.24	1.17	X – H – H	0.33	25.17

(WCDMA850 Mode)

Ch./	Freq.	Measured	Substitude Ant. Gain			Pol.	E	RP	
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBd)	C.L	C.L	(EUT - Antenna of EUT - Detecting Antenna)	w	dBm
4132	826.40	-14.03	33.88	-10.26	1.17	X – H – H	0.18	22.45	
4183	836.60	-14.01	34.62	-10.36	1.19	Х – Н – Н	0.20	23.07	
4233	846.60	-15.27	34.06	-10.46	1.20	Х – Н – Н	0.17	22.40	

Note: This unit was tested with a notebook computer.

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. This unit was tested with its standard battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is x plane in GSM850 and WCDMA850 mode. Also worst case of detecting Antenna is Horizontal polarization in GSM850 and WCDMA850 mode.

The EDGE mode testing were performed using 1Tx because 1Tx is highest power in EDGE mode.

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7.6 EQUIVALENT ISOTROPIC RADIATED POWER (GSM / WCDMA)

(GSM1900 Mode)

Ch./	Ch./ Freq. Measured Substitude Ant. Gain		Ant Cain		Pol.	EII	RP	
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBi)	C.L	(EUT - Antenna of EUT - Detecting Antenna)	w	dBm
512	1,850.20	-13.60	17.65	10.40	1.91	Y – H – H	0.41	26.14
661	1,880.00	-12.49	18.95	10.43	1.95	Y – H – H	0.55	27.43
810	1,909.80	-13.40	18.09	10.47	1.97	Y – H – H	0.46	26.59
EDGE 661	1,880.00	-12.53	18.91	10.43	1.95	Y – H – H	0.55	27.39

(WCDMA1900 Mode)

Ch./	Freq.	Measured Substit	Substitudo	Substitude Ant. Gain		Pol.	Ell	RP
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBi)	C.L	(EUT - Antenna of EUT - Detecting Antenna)	W	dBm
9262	1,852.40	-17.60	13.66	10.40	1.91	Y – H – H	0.16	22.15
9400	1,880.00	-16.95	14.49	10.43	1.95	Y – H – H	0.20	22.97
9538	1,907.60	-18.27	13.24	10.47	1.97	Y – H – H	0.15	21.74

Note: This unit was tested with a notebook computer.

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. This unit was tested with its standard battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is y plane in GSM1900 and WCDMA1900 mode. Also worst case of detecting Antenna is in horizontal polarization in GSM1900 and WCDMA1900 mode.

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	,		



The EDGE mode testing were performed using 1Tx because 1Tx is highest power in EDGE mode.

7.7 RADIATED SPURIOUS EMISSIONS

7.7.1 RADIATED SPURIOUS EMISSIONS (GSM850)

MEASURED OUTPUT POWER:	<u>29.05 dBm = 0.804W</u>
MODULATION SIGNAL:	GSM850

DISTANCE: <u>3 meters</u>

LIMIT: - (43 + 10 log10 (W)) = - 42.05 dBc

Ch.	Freq.(MHz)	Measured Level	Ant. Gain (dBd)	<u>Substitute</u> Level [dBm]	C.L	Pol.	ERP (dBm)	dBc
	1,648.40	-30.17	8.57	-42.18	1.73	V	-35.34	-64.39
128 (824.2)	2,472.60	-22.89	11.10	-32.98	2.28	V	-24.16	-53.21
	3,296.80	-39.22	11.65	-48.73	2.57	V	-39.65	-68.70
	1,673.20	-31.39	8.57	-43.49	1.79	V	-36.71	-65.76
190 (836.6)	2,509.80	-26.22	11.15	-36.36	2.33	V	-27.54	-56.59
	3,346.40	-38.23	11.77	-48.04	2.66	Н	-38.93	-67.98
	1,697.60	-31.33	8.57	-43.10	1.83	Н	-36.36	-65.41
251 (848.8)	2,546.40	-29.58	11.15	-39.80	2.34	V	-30.99	-60.04
	3,395.20	-40.15	11.77	-49.64	2.85	V	-40.72	-69.77

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

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7.7.2 RADIATED SPURIOUS EMISSIONS (GSM1900)

- MEASURED OUTPUT POWER: 27.43 dBm = 0.553 W
- MODULATION SIGNAL:
 GSM1900
- DISTANCE:
- LIMIT: (43 + 10 log10 (W)) = -40.43 dBc

Ch.	Freq.(MHz)	Measured Level	Ant. Gain (dBi)	<u>Substitute</u> Level [dBm]	C.L	Pol.	EIRP (dBm)	dBc
	3,700.40	-42.09	12.25	-48.15	2.73	V	-38.63	-66.06
512 (1850.2)	5,550.60	_	_	_	_	-	_	_
	7,400.80	-51.58	11.40	-42.74	3.88	Н	-35.22	-62.65
	3,760.00	-44.84	12.25	-50.59	2.73	V	-41.07	-68.50
661 (1880.0)	5,640.00	_	_	-	-	-	-	_
	7,520.00	-48.29	11.36	-39.22	3.88	Н	-31.74	-59.17
	3,819.60	-47.54	12.37	-53.30	2.73	Н	-43.66	-71.09
810 (1909.8)	5,729.40	_	_	_	_	-	_	_
	7,639.20	-49.26	11.32	-39.95	3.88	Н	-32.51	-59.94

3 meters

NOTES: <u>1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method</u>

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>

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7.7.3 RADIATED SPURIOUS EMISSIONS (WCDMA850)

MEASURED OUTPUT POWER: 23.07 dBm = 0.203 W

MODULATION SIGNAL:

DISTANCE:

3 meters

WCDMA850

LIMIT: - (43 + 10 log10 (W)) = - 36.07 dBc

Ch.	Freq.(MHz)	Measured Level	Ant. Gain (dBd)	<u>Substitute</u> Level [dBm]	C.L	Pol.	ERP (dBm)	dBc
	1,652.80	-48.85	8.57	-60.89	1.73	Н	-54.05	-77.12
4,132 (826.4)	2,479.20	-51.77	11.10	-61.87	2.28	Н	-53.05	-76.12
, , ,	3,305.60	_	_	-	-	_	_	_
	1,673.20	-48.55	8.57	-60.65	1.79	Н	-53.87	-76.94
4,183 (836.6)	2,509.80	-54.29	11.15	-64.43	2.33	Н	-55.61	-78.68
	3,346.40	_	_	-	-	_	_	_
	1,693.20	-46.26	8.57	-58.08	1.83	Н	-51.34	-74.41
4,233 (846.6)	2,539.80	-52.26	11.15	-62.46	2.34	Н	-53.65	-76.72
	3,386.40	_	_	_	_	_	_	_

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 all channel.

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7.7.4 RADIATED SPURIOUS EMISSIONS (WCDMA1900)

MEASURED OUTPUT POWER: <u>22.97 dBm = 0.198 W</u>

MODULATION SIGNAL: WCDMA1900

DISTANCE:

3 meters

LIMIT: - (43 + 10 log10 (W)) = - 35.97 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBi)	<u>Substitute</u> Level [dBm]	C.L	Pol.	EIRP (dBm)	dBc
	3,704.80	-47.30	12.46	-53.54	2.73	V	-43.81	-66.78
9262	5,557.20	_	_	-	-	-	-	_
	7,409.60	_	_	-	_	-	-	_
	3,760.00	-47.60	12.47	-53.57	2.73	Н	-43.83	-66.80
9400	5,640.00	_	_	_	_	-	_	_
	7,520.00	_	_	-	_	-	-	_
	3,815.20	-47.37	12.46	-53.24	2.73	Н	-43.51	-66.48
9538	5,722.80	_	_	_	_	_	_	_
	7,630.40	_	_	_	_	_	_	_

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 all channel.

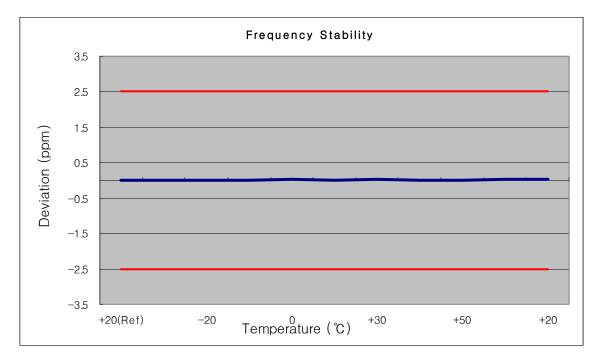
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7.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE 7.8.1 FREQUENCY STABILITY (GSM850)

OPERATING FREQUENCY:	836,600,000 Hz
CHANNEL:	190
REFERENCE VOLTAGE:	3.7 VDC
DEVIATION LIM IT:	± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	222
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	836 599 973	0	0.000 000	0.000
100%		-30	836 600 012	11.77	0.000 001	0.014
100%		-20	836 600 007	7.24	0.000 001	0.009
100%	3.700	-10	836 600 009	8.65	0.000 001	0.010
100%		0	836 600 013	13.26	0.000 002	0.016
100%		+10	836 600 009	9.37	0.000 001	0.011
100%		+30	836 600 012	12.24	0.000 001	0.015
100%		+40	836 600 010	9.54	0.000 001	0.011
100%		+50	836 600 010	9.52	0.000 001	0.011
115%	4.255	+20	836 600 013	13.37	0.000 002	0.016
Batt. Endpoint	3.400	+20	836 600 012	12.27	0.000 001	0.015



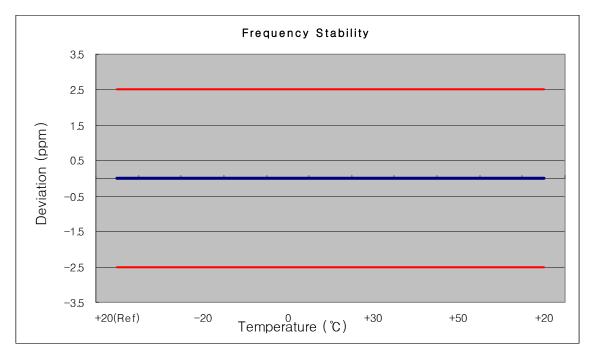
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7.8.2 FREQUENCY STABILITY (GSM1900)

OPERATING FREQUENCY:	1880,000,000 Hz
CHANNEL:	661
REFERENCE VOLTAGE:	3.7 VDC
DEVIATION LIM IT:	± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	1879 999 983	0	0.000 000	0.000
100%		-30	1880 000 008	8.19	0.000 000	0.004
100%		-20	1879 999 997	-3.26	0.000 000	-0.002
100%	3.700	-10	1879 999 996	-4.19	0.000 000	-0.002
100%		0	1879 999 986	-13.77	-0.000 001	-0.007
100%		+10	1879 999 985	-14.51	-0.000 001	-0.008
100%		+30	1879 999 976	-23.84	-0.000 001	-0.013
100%		+40	1879 999 987	-12.76	-0.000 001	-0.007
100%		+50	1879 999 985	-14.71	-0.000 001	-0.008
115%	4.255	+20	1879 999 981	-18.67	-0.000 001	-0.010
Batt. Endpoint	3.400	+20	1879 999 984	-15.51	-0.000 001	-0.008



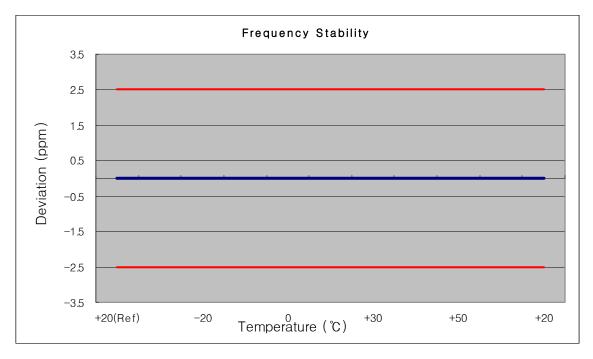
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7.8.3 FREQUENCY STABILITY (WCDMA850)

OPERATING FREQUENCY:	836,600,000 Hz
CHANNEL:	4183
REFERENCE VOLTAGE:	3.7 VDC
DEVIATION LIM IT:	± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	836 600 001	0	0.000 000	0.000
100%		-30	836 600 003	2.84	0.000 000	0.003
100%		-20	836 600 001	0.51	0.000 000	0.001
100%		-10	836 600 002	2.46	0.000 000	0.003
100%	3.700	0	836 599 998	-1.76	0.000 000	-0.002
100%		+10	836 600 001	1.00	0.000 000	0.001
100%		+30	836 600 002	1.86	0.000 000	0.002
100%		+40	836 599 998	-1.98	0.000 000	-0.002
100%		+50	836 600 001	0.61	0.000 000	0.001
115%	4.255	+20	836 600 001	1.32	0.000 000	0.002
Batt. Endpoint	3.400	+20	836 600 009	8.70	0.000 001	0.010



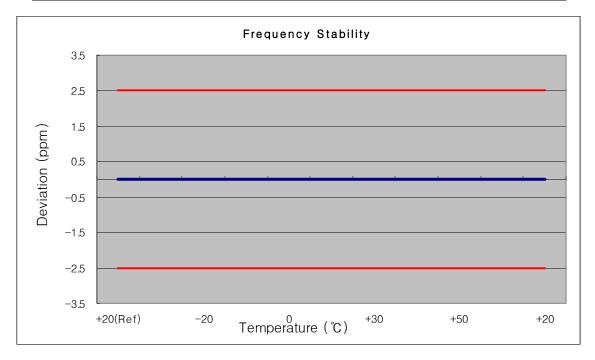
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7.8.4 FREQUENCY STABILITY (WCDMA1900)

OPERATING FREQUENCY:	1,880,000,000 Hz
CHANNEL:	9400
REFERENCE VOLTAGE:	3.7 VDC
DEVIATION LIM IT:	<u>± 0.000 25 % or 2.5 ppm</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	1879 999 995	0	0.000 000	0.000
100%		-30	1880 000 008	8.09	0.000 000	0.004
100%		-20	1879 999 999	-0.54	0.000 000	0.000
100%		-10	1880 000 005	5.33	0.000 000	0.003
100%	3.700	0	1880 000 000	0.29	0.000 000	0.000
100%		+10	1880 000 006	6.28	0.000 000	0.003
100%		+30	1879 999 998	-2.01	0.000 000	-0.001
100%		+40	1880 000 002	1.67	0.000 000	0.001
100%		+50	1880 000 006	6.06	0.000 000	0.003
115%	4.255	+20	1880 000 004	3.57	0.000 000	0.002
Batt. Endpoint	3.400	+20	1880 000 006	6.42	0.000 000	0.003



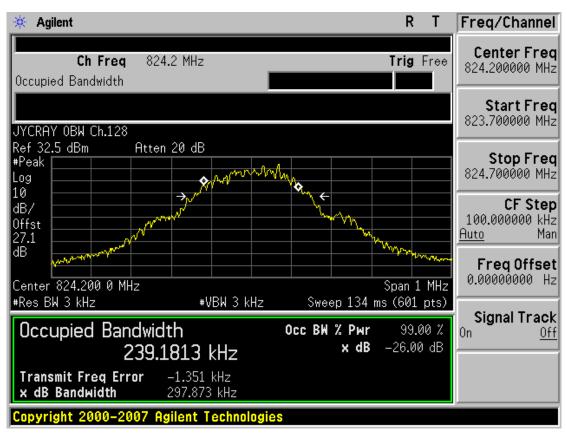
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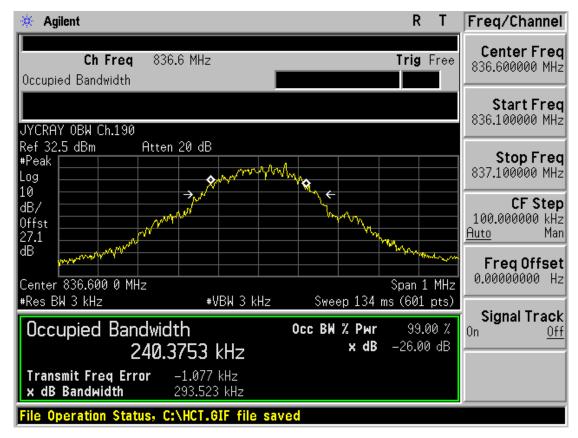
FCC CERTIFICATION REPORT				
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY	
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■ GSM850 MODE (128 CH.) Occupied Bandwidth



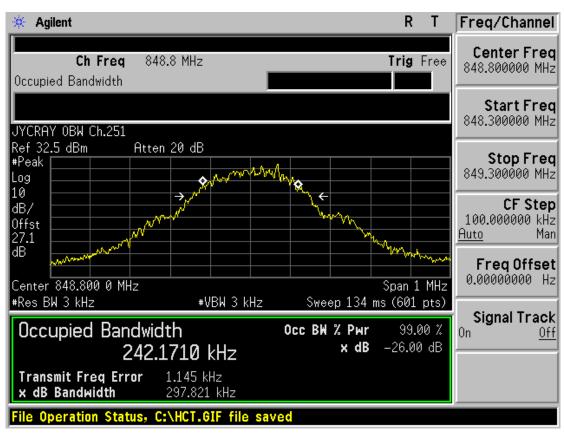
GSM850 MODE (190 CH.) Occupied Bandwidth



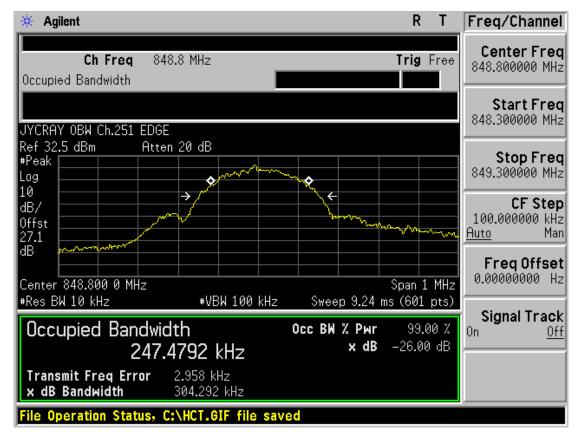
FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
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■ GSM850 MODE (251 CH.) Occupied Bandwidth



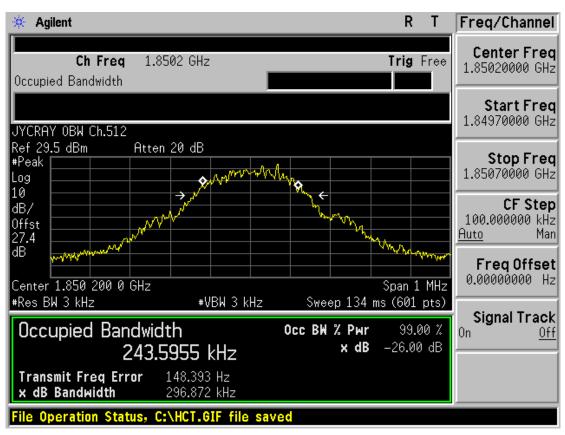
■ GSM850 EDGE (251 CH.) Occupied Bandwidth



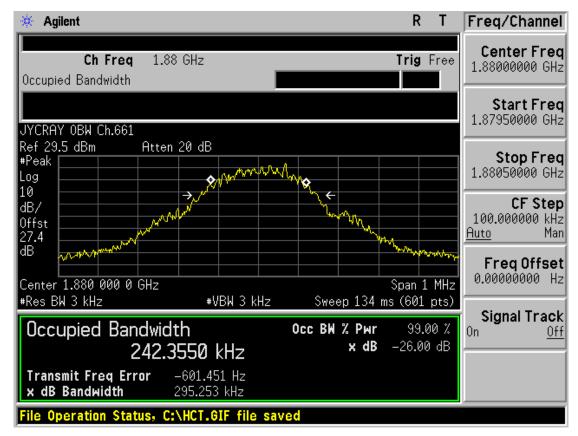
FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
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■ GSM1900 MODE (512 CH.) Occupied Bandwidth



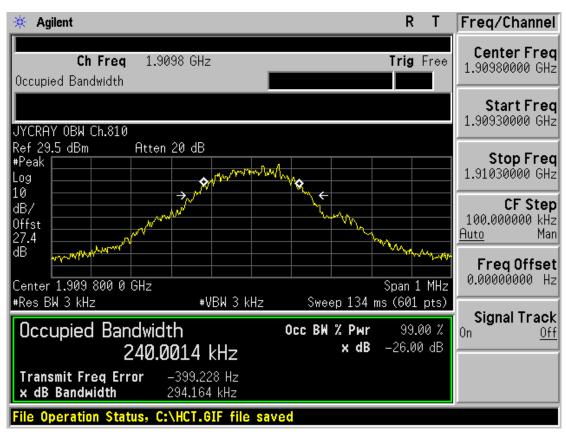
GSM1900 MODE (661 CH.) Occupied Bandwidth



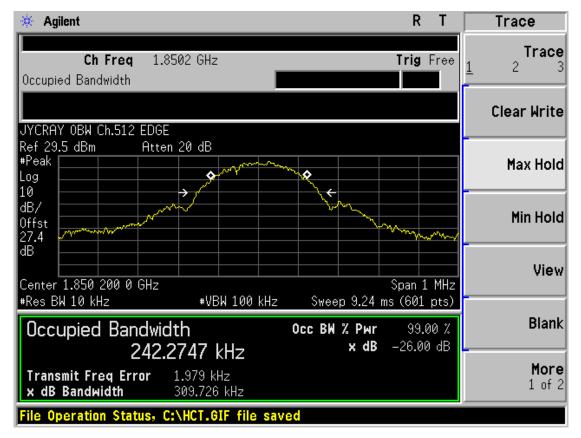
FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
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■ GSM1900 MODE (810 CH.) Occupied Bandwidth



■ GSM1900 EDGE (512 CH.) Occupied Bandwidth



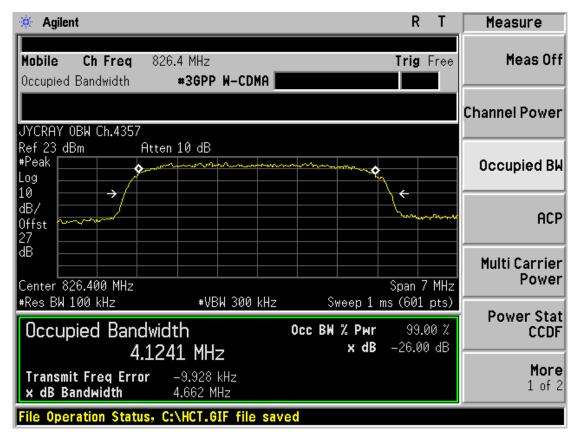
FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY



🔆 Agilent		R	T	Freq/Channel
	20 dB		17 kHz 00 dB	Center Freq 1.88000000 GHz
#Avg	1R		*	
10 dB/				Start Freq 1.87750000 GHz
0ffst 27.4 dB				Stop Freq 1.88250000 GHz
#LgAv				CF Step 500.000000 kHz <u>Auto</u> Man
V1 M2 S3 FC AA			An an all and	FreqOffset 0.00000000 Hz
£(f): FTun Swp				Signal Track ^{On <u>Off</u>}
Center 1.880 000 GHz #Res BW 1 MHz	#VBW 1 MHz	Span Sweep 1 ms (60	5 MHz 1 pts)	
File Operation Status, C:	\HCT.GIF file saved			

■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio

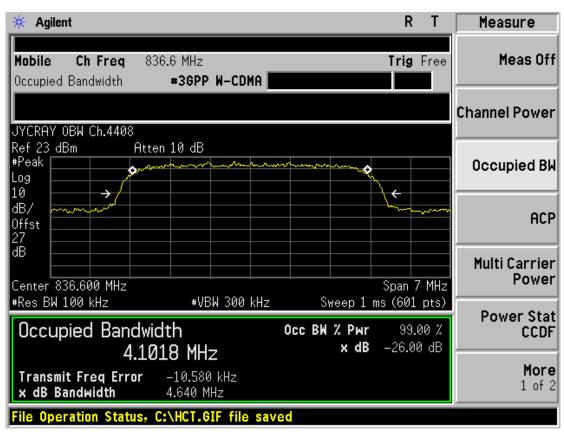
■ WCDMA850 MODE (4132 CH.) Occupied Bandwidth



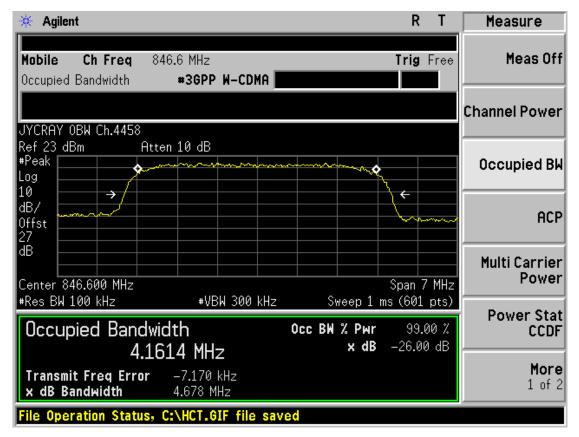
FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
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■ WCDMA850 MODE (4183 CH.) Occupied Bandwidth



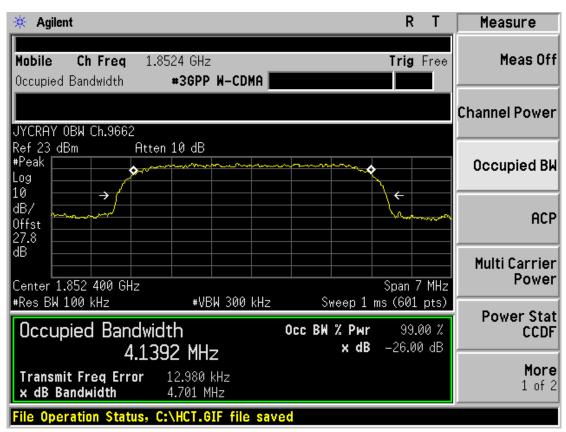
■ WCDMA850MODE (4233 CH.) Occupied Bandwidth



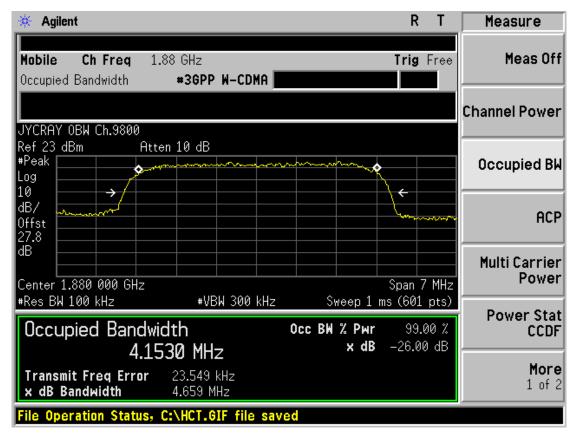
FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
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■ WCDMA1900 MODE (9262 CH.) Occupied Bandwidth



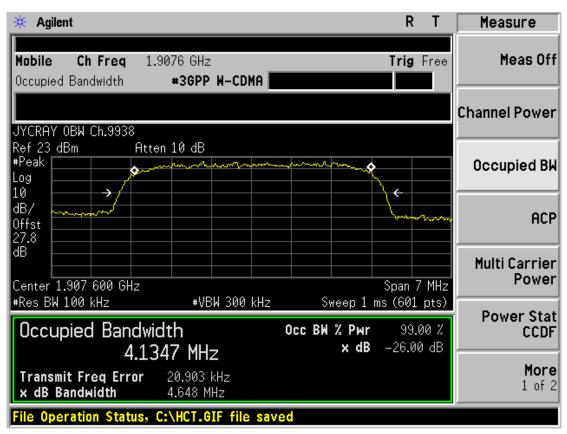
■ WCDMA1900 MODE (9400 CH.) Occupied Bandwidth



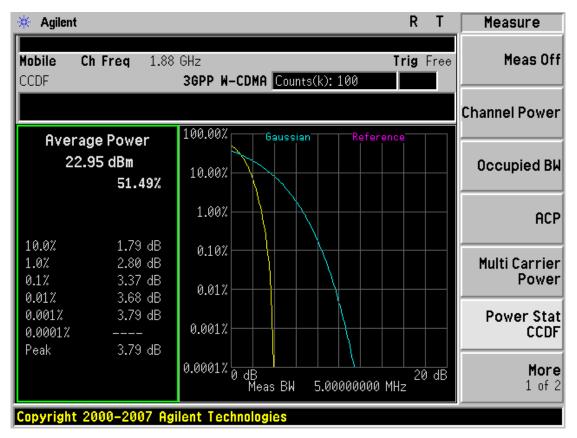
FCC CERTIFICATION REPORT					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY		



■ WCDMA1900 MODE (9538 CH.) Occupied Bandwidth



■ WCDMA1900 MODE (9400 CH.) Peak-to-Average Ratio



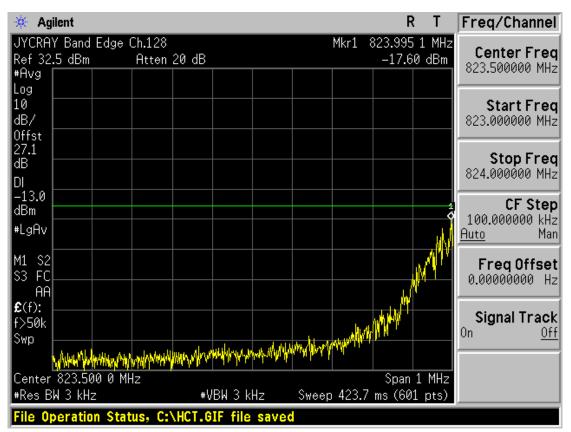
FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
	October 29, 2010		JICKAI



Agilent R Т Freg/Channel ¥. JYCRAY Band Edge Ch.128 Center Frea Ref 32.5 dBm Atten 20 dB 824.000000 MHz #Avg Log 10 Start Fred dB/ 823.500000 MHz Offst 27.1 Stop Freq dB 824.500000 MHz DI -13.0 **CF** Step dBm 100.000000 kHz #LgAv Auto Man M1 S2 Freq Offset S3 FC 0.00000000 Hz AΑ £(f): MMM Signal Track f>50k 0n Off Swp whether and a start Center 824.000 0 MHz Span 1 MHz Sweep 423.7 ms (601 pts) #Res BW 3 kHz ₩VBW 3 kHz **Operation Status, C:\HCT.GIF file saved**

■ GSM850 MODE (128 CH.) Block Edge 1

■ GSM850 MODE (128 CH.) Block Edge 2

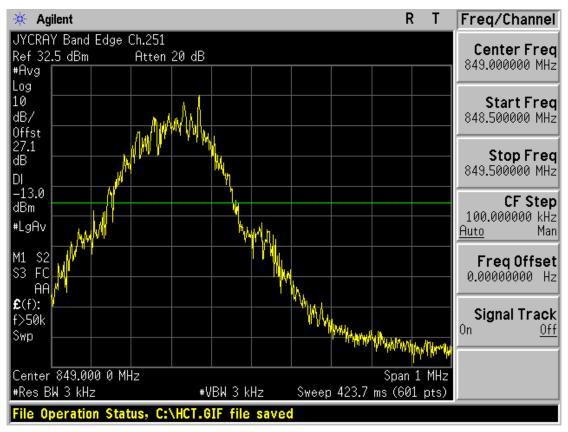


 FCC CERTIFICATION REPORT
 www.hct.co.kr

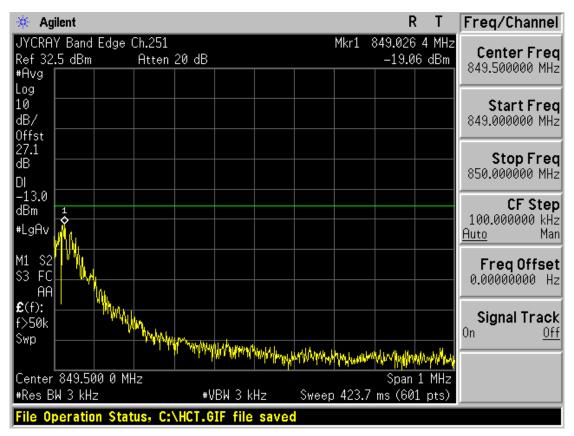
 Test Report No. HCTR1010FR16-1
 Date of Issue: October 29, 2010
 EUT Type: USB Modem
 FCC ID: JYCRAY



■ GSM850 MODE (251 CH.) Block Edge 1

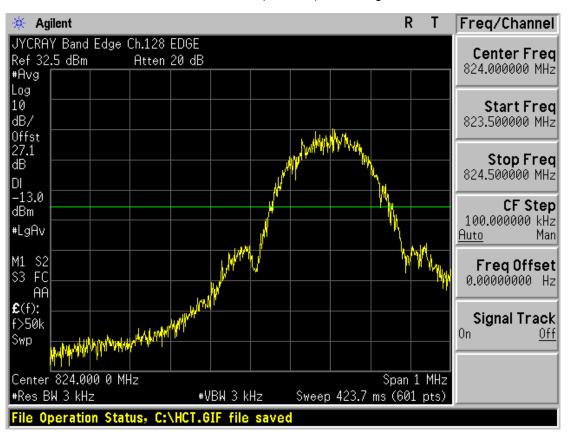


■ GSM850 MODE (251 CH.) Block Edge 2



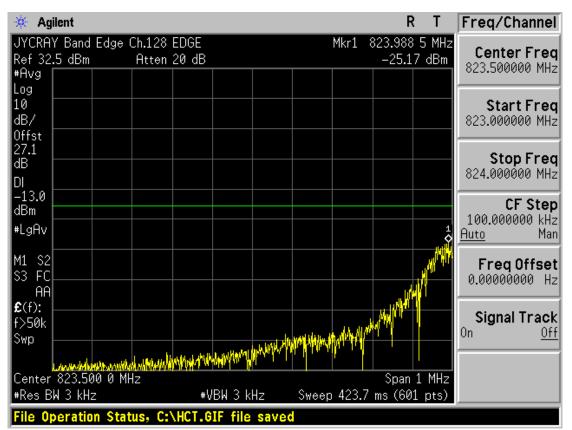
FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
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■ EDGE MODE (128 CH.) Block Edge 1

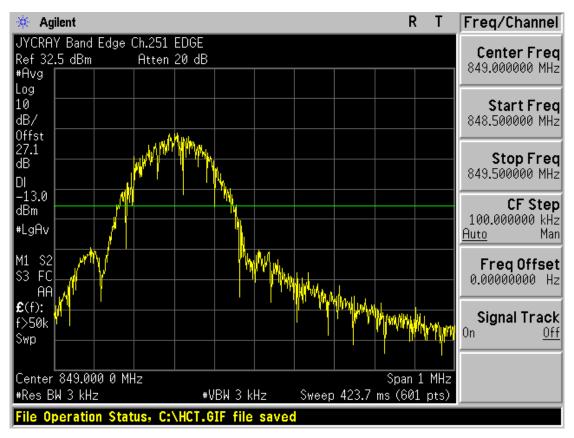
■ EDGE MODE (128 CH.) Block Edge 2



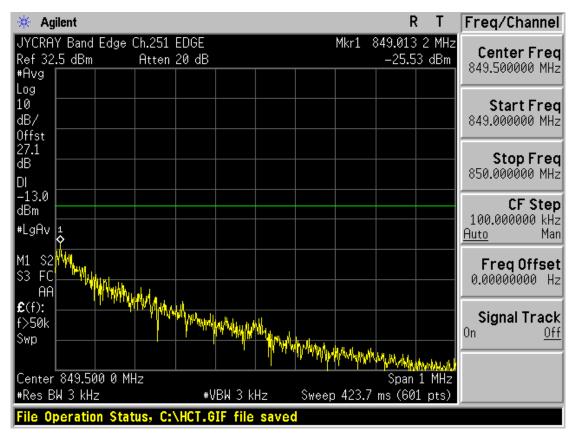
FCC CERTIFICATION REPORT					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY		



■ EDGE MODE (251 CH.) Block Edge 1



■ EDGE MODE (251 CH.) Block Edge 2



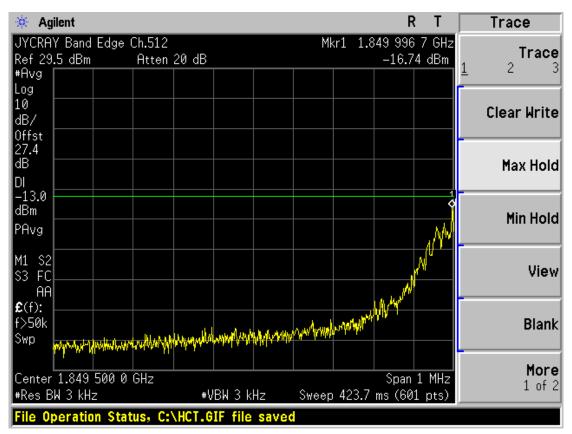
FCC CERTIFICATION REPORT					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY		
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R Agilent Т Trace 兼. JYCRAY Band Edge Ch.512 Trace Ref 29.5 dBm Atten 20 dB 2 1 #Avg Log 10 **Clear Write** dB/ Offst 27.4 dB Max Hold DI -13.0 dBm Min Hold PAvg M1 S2 S3 FC View AΑ £(f): esternet polynoperty f>50k Blank Swp TYPY Ш More Center 1.850 000 0 GHz Span 1 MHz 1 of 2 #Res BW 3 kHz ₩VBW 3 kHz Sweep 423.7 ms (601 pts) Copyright 2000–2007 Agilent Technologies

■ GSM1900 MODE (512 CH.) Block Edge 1

■ GSM1900 MODE (512 CH.) Block Edge 2



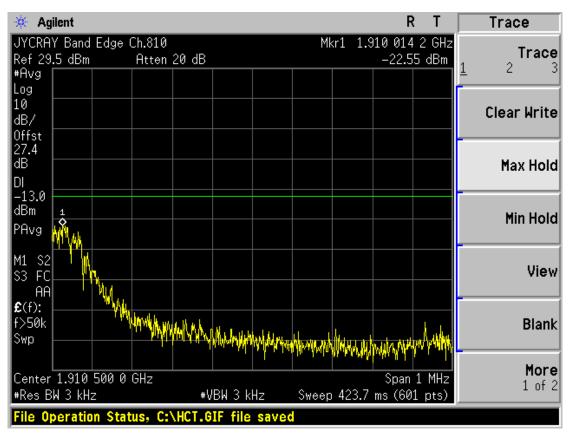
FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
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R Agilent Т Trace 瘚 JYCRAY Band Edge Ch.810 Trace Ref 29.5 dBm Atten 20 dB 2 1 #Avg Log 10 **Clear Write** dB/ Offst 27.4 dB Max Hold DI -13.0 dBm Min Hold PAvg M1 S2 View S3 FC AA Why **£**(f): Al way the transformed and f>50k Blank Swp More Center 1.910 000 0 GHz Span 1 MHz 1 of 2 #Res BW 3 kHz ₩VBW 3 kHz Sweep 423.7 ms (601 pts) File Operation Status, C:\HCT.GIF file saved

■ GSM1900 MODE (810 CH.) Block Edge 1

■ GSM1900 MODE (810 CH.) Block Edge 2



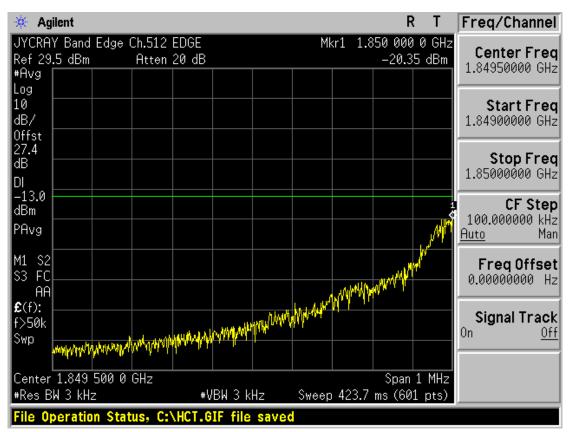
FCC CERTIFICATION REPORT					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY		



R Freg/Channel Agilent Т -<u>44</u>-JYCRAY Band Edge Ch.512 EDGE Center Frea Ref 29.5 dBm Atten 20 dB 1.85000000 GHz #Avg Log 10 Start Fred dB/ 1.84950000 GHz Offst 27.4 Stop Freq dB 1.85050000 GHz DI -13.0 **CF** Step dBm 100.000000 kHz PAvg M Auto Man M1 S2 Freq Offset S3 FC 0.00000000 Hz MMM Mary WY AΑ **£**(f): **r**M MI. Signal Track f>50k 0n Off Swp Center 1.850 000 0 GHz Span 1 MHz #Res BW 3 kHz ₩VBW 3 kHz Sweep 423.7 ms (601 pts) Copyright 2000–2007 Agilent Technologies

■ EDGE MODE (512 CH.) Block Edge 1

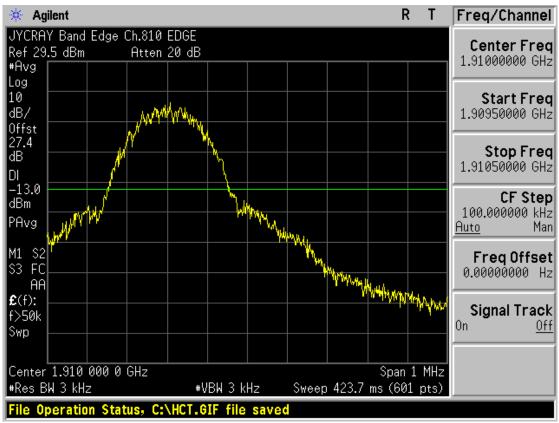
■ EDGE MODE (512 CH.) Block Edge 2



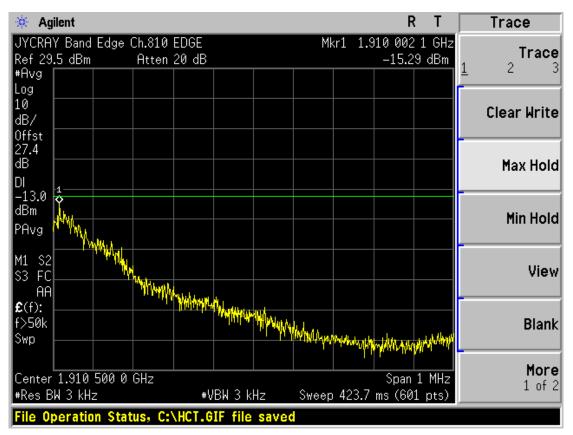
FCC CERTIFICATION REPORT					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY		
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EDGE MODE (810 CH.) Block Edge 1	



■ EDGE MODE (810 CH.) Block Edge 2



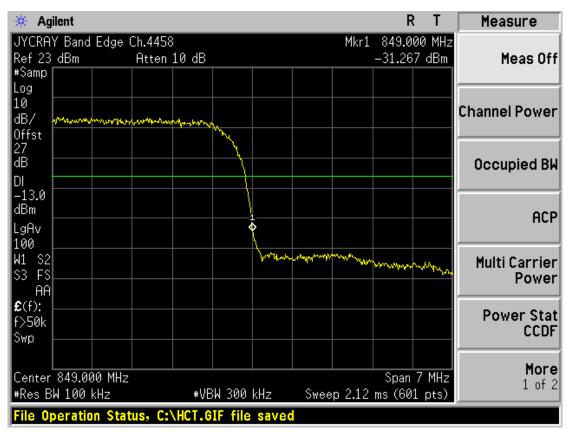
FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY
		Dage 46 of 62	



🔆 Agilent				R	Т	Measure
JYCRAY Band Edge			Mkr1	824.000		
Ref 23 dBm	Atten 10 dB			-30.737	dBm	Meas Off
#Samp Log						
10						
dB/			wp. A. market war war	manna	man mark	Channel Power
Offst 🛛 👘						
27		/				
dB		(Occupied BW
DI -13.0		<i> </i>				
dBm						
LgAv		1 \$				ACP
100		/				
W1 S2	where the work	Swell Market				Multi Carrier
S3 FS						Power
HH						
£(f): f>50k						Power Stat
Swp						CCDF
Center 824.000 MHz				Span 7	M⊔⇒	More
#Res BW 100 kHz		300 kHz	Sweep 2.12			1 of 2
				1113 (001	pts/	
File Operation Sta	tus, C:\HCI.G	IF THE Saved				

■ WCDMA850 MODE (4132 CH.) Block Edge

■ WCDMA850MODE (4233 CH.) Block Edge



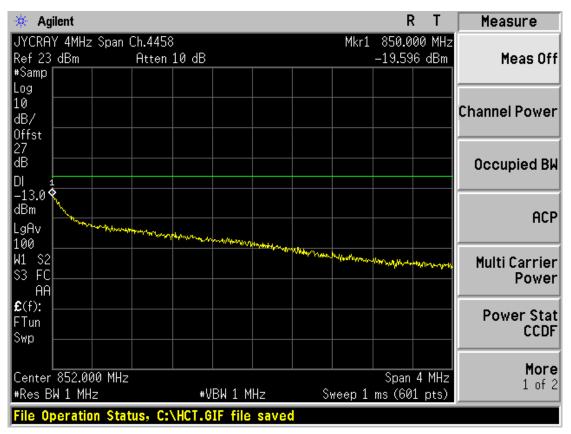
FCC CERTIFICATION REPORT					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY		



🔆 Agilent				R	Т	Measure
JYCRAY 4MHz Span (Mkr1	823.000		
Ref 23 dBm	Atten 10 dB			-19.632	dBm	Meas Off
#Samp Log						
10						
dB/						Channel Power
Offst 🛛 👘						
27						
dB						Occupied BW
DI -13.0					1	
dBm					se la constance de la constance	
LgAv					July -	ACP
100			and a more thank and a start of the			
W1 S2	and marker wards	www.www.wayawy				Multi Carrier
S3 FCpulumhanthanth	Arrado a seconda a s					Power
AA						
£ (f):						Power Stat
FTun Swp						CCDF
Swh						
						More
Center 821.000 MHz	1		<u> </u>	Span 4		1 of 2
#Res BW 1 MHz		BW 1 MHz	Sweep 1	ms (601	pts)	
File Operation Stat	us, C:\HCT.G	IF file saved				

■ WCDMA850 MODE (4132 CH.) – 4 MHz Span

■ WCDMA850MODE (4233 CH.) – 4 MHz Span



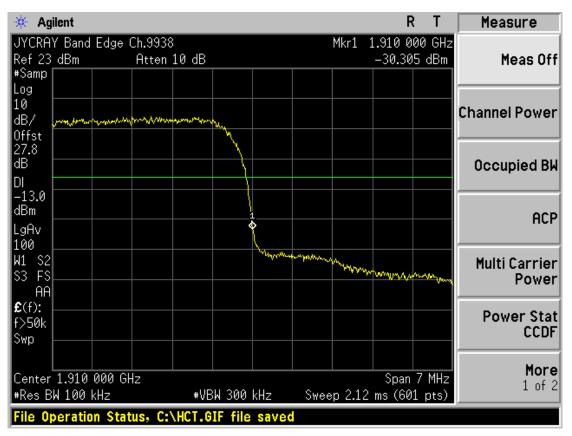
	FCC CERTIFICATION REPORT						
Test Report No. HCTR1010FR16-1	Date of Issue: October 29, 2010	EUT Type: USB Modem	FCC ID: JYCRAY				
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🔆 Agilent			RT	Measure
JYCRAY Band Edge (Ref 23 dBm	Ch.9662 Atten 10 dB	Mkr1	1.850 000 GHz -29.850 dBm	Meas Off
#Samp			-23.030 dDii	neas on
Log 10 dB/ Offst		and the second second second second	you wanter	Channel Power
27.8 dB				Occupied BW
-13.0 dBm LgAv				ACP
100 W1 S2 S3 FS AA	honoridani me vinterian possibile			Multi Carrier Power
£ (f): f>50k Swp				Power Stat CCDF
Center 1.850 000 GH #Res BW 100 kHz	 z #VBW 300	kHz Sweep 2.1	Span 7 MHz 2 ms (601 pts)	More 1 of 2
File Operation State	us, C:\HCT.GIF file	saved		

■ WCDMA1900 MODE (9262 CH.) Block Edge

■ WCDMA1900 MODE (9538 CH.) Block Edge



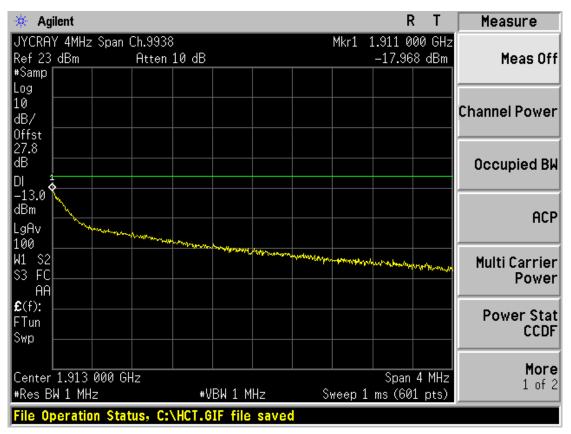
	FCC CERTIFICATION REPORT						
Test Report No.	Date of Issue:	EUT Type:	FCC ID:				
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY				



🔆 Agilent			RT	Measure
	Ch.9662 Atten 10 dB	Mk	r1 1.849 000 GHz —19.489 dBm	Meas Off
#Samp Log 10 dB/				Channel Power
0ffst 27.8 dB DI				Occupied BW
-13.0 dBm LgAv 100		e-Warnerson	and the second	ACP
AA	an and the second se			Multi Carrier Power
£(f): FTun Swp				Power Stat CCDF
Center 1.847 000 GH: #Res BW 1 MHz	z #VBW 1	MHz Swee	Span 4 MHz ep 1 ms (601 pts)	More 1 of 2
File Operation Statu	us, C:\HCT.GIF file	e saved		

■ WCDMA1900 MODE (9262 CH.) – 4 MHz Span

■ WCDMA1900 MODE (9538 CH.) – 4 MHz Span



	FCC CERTIFICATION REPORT						
Test Report No.	Date of Issue:	EUT Type:	FCC ID:				
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY				



🔆 Agilent				F	х т	Freq/Channel
JYCRAY Cond Spur C				Mkr1 1.6		Center Freq
Ref 32.5 dBm #Peak	Atten 20 dB		1	-32.2	7 dBm	1.26500000 GHz
10 dB/						Start Freq 30.0000000 MHz
Offst 🛛						
27.1 dB DI						Stop Freq 2.50000000 GHz
-13.0						
dBm						CF Step 247.000000 MHz
#LgAv						<u>Auto</u> Man
CO I C Martin Winning	an a	an a	And the property	un and the state of the state o	have have	Freq Offset 0.00000000 Hz
AA ACO:						
£(f): FTun Swp						Signal Track On <u>Off</u>
Center 1.265 GHz				Span 2.4	47 GHz	
#Res BW 1 MHz	#V	BW 1 MHz	Sweep -	4.12 ms (60	1 pts)	
File Operation Stat	us, C:\HCT.G	IF file saved				

■ GSM850 MODE (128 CH.) Conducted Spurious Emissions1

■ GSM850 MODE (128 CH.) Conducted Spurious Emissions2

🔆 Ag	ilent								R	T	Freq/Channel
		Spur C						Mkr1		0 GHz	Center Freq
Ref 32. #Peak	.5 dBm		Atten	20 dB					-30.2	9 dBm	6.25000000 GHz
+reak Log											
10											Start Freq
dB/											2.50000000 GHz
Offst											
27.1 dB											Stop Freq
DI											10.0000000 GHz
-13.0											CF Step
dBm											750.000000 MHz
#LgAv											<u>Auto</u> Man
V1 S2											
\$3 FC	mann	which where the	munul	no traille br	mound have	Norral Porto	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www.hateway	where the strength with	hunderson	Freq Offset 0.00000000 Hz
ÂA											0.00000000 HZ
£ (f):											
FTun											Signal Track On Off
Swp											
Center									Span 7		
#Res B	W 1 MH	Z		#V	BW 1 M	Hz	Sweep	12.52	ms (60	1 pts)	
File 0p	peratio	in Stat	us, C:Y	HCT.G	IF file	saved					

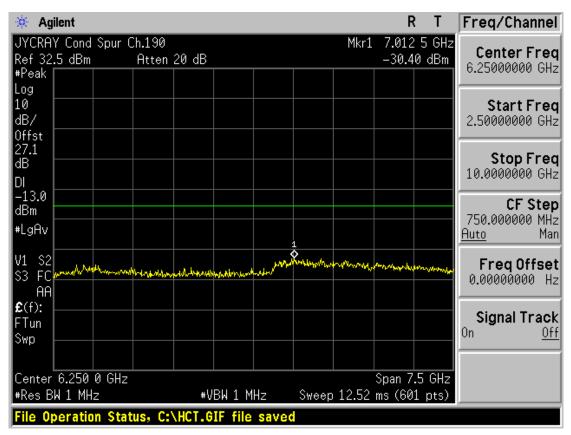
	FCC CERTIFICATION REPORT						
Test Report No.	Date of Issue:	EUT Type:	FCC ID:				
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY				
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🔆 Agilent				RT	Freq/Channel
JYCRAY Cond Spu			Mkr	1 1.673 GHz	Center Freq
Ref 32.5 dBm	Atten 20 d	B		-34.08 dBm	1.26500000 GHz
#Peak					1.20300000 0112
Log					A 1 F
10					Start Freq
dB/					30.0000000 MHz
Offst 27.1					
dB					Stop Freq
					2.50000000 GHz
DI -13.0					
dBm					CF Step
					247.000000 MHz
#LgAv					<u>Auto</u> Man
V1 S2			1		
	manshamore	www.marka.achimanana.ach	\$	al and a subscription of the	Freq Offset
AA	an the share the second second	0.77404797754,75,7777567780786.a.a)r	19 - Harrison - All 19 - All 1		0.00000000 Hz
£ (f):					
FTun					Signal Track
					On Off
Swp					
Center 1.265 GHz			S	pan 2.47 GHz	
#Res BW 1 MHz		#VBW 1 MHz	Sweep 4.12	ms (601 pts)	
File Operation St	tatue. C+\HCT	.GIF file save			
The operation of	acasi er mer	TVIT THE SAVE	N.		

■ GSM850 MODE (190 CH.) Conducted Spurious Emissions1

■ GSM850 MODE (190 CH.) Conducted Spurious Emissions2



	FCC CERTIFICATION REPORT						
Test Report No.	Date of Issue:	EUT Type:	FCC ID:				
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY				



🔆 Agilent							RT	Freq/Channel
JYCRAY Cond Spur					٢		656 MHz	Center Freq
Ref 32.5 dBm	Atten 2	0 dB				-33.	76 dBm	1.26500000 GHz
#Peak								1.20300000 0/12
Log 10								Stort From
dB/								Start Freq 30.0000000 MHz
Offst	+		+					30.0000000 MH2
27.1								
dB								Stop Freq
DI								2.50000000 GHz
-13.0								CE Stan
dBm 🛛 👘								CF Step 247.000000 MHz
#LgAv								Auto Man
								<u>11000</u> 1101
V1 S2								Freq Offset
S3 FC Martin Martin	manulan	- marganet and	honoritar	monthe	norshahadanada	war when the	na n	0.00000000 Hz
AA								
£ (f):								Signal Track
FTun								On Off
Swp								<u> </u>
Center 1.265 GHz					S	pan 2	.47 GHz	
#Res BW 1 MHz		#VBW 1	MHz	Sweep			01 pts)	
File Operation Sta	tue Call							· · · · · · · · · · · · · · · · · · ·
rife operation sta	cuby GrA		s saveu					

■ GSM850 MODE (251 CH.) Conducted Spurious Emissions1

■ GSM850 MODE (251 CH.) Conducted Spurious Emissions2

* Agilent				R	T Freq/Chan	nel
JYCRAY Cond Spur C	h.251		Mkr1	7.062 5	GHz Contor Fr	
Ref 32.5 dBm	Atten 20 dB			-30.84	dBm 6.25000000 (
#Peak					0.23000000	202
Log						
10					Start Fr	
dB/					2.50000000 (GHz
Offst						
27.1 dB					Stop Fr	ea
					10.0000000	
-13.0 dBm					CF St	ep
					750.000000	
#LgAv					Auto	Man
			1 \$			
V1 S2 S3 EC MANNAMANAN	water and a	1. 1. 1. March 19 March 19 March	and the second and the second of	how the stand when	Freq Offs	
	an berefan weder an een al de	AWAR-ANARA I STATE			0.00000000	Hz
AA						_
£ (f):					Signal Tra	uck
FTun					On	Off
Swp						<u></u>
Center 6.250 0 GHz		<u> </u>	<u> </u>	Span 7.5	GHz	
#Res BW 1 MHz	#\/	BW 1 MHz	Sweep 12.52			
				1110 (OOI)		
File Operation Stat	us, c:\HCI.G	IF file save	•			

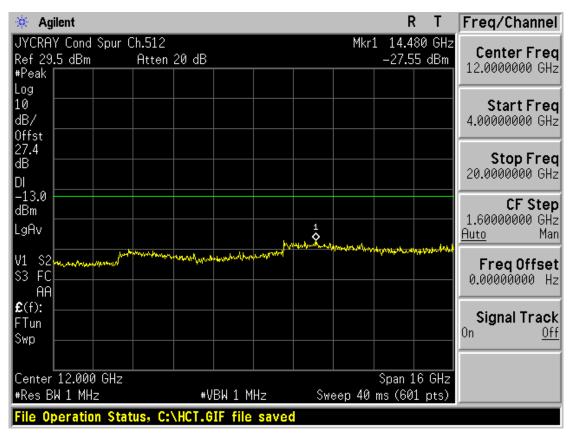
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
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🔆 Agilent			R	Т	Freq/Channel
JYCRAY Cond Spur Ch			Mkr1 1.96		Center Freq
	Atten 20 dB		-23.05	5 dBm	2.01500000 GHz
#Peak Log					
10					Start Freq
dB/					30.0000000 MHz
Offst 🛛					
27.4					Stop Freq
dB					4.00000000 GHz
-13.0 dBm		4			CF Step
LgAv		1 ^			_397.000000 MHz
19110					<u>Auto</u> Man
V1 S2		Lan and the most	where the advant of the state o	mound	Freq Offset
\$3 FC	4hunterinus	ANNOVATION AND A ST			0.00000000 Hz
AA					
£ (f):					Signal Track
FTun					Signal Track On Off
Swp					
Center 2.015 GHz			Span 3.9	7 GHz	
#Res BW 1 MHz	#VBW 1	MHz Swee	p 6.64 ms (601	pts)	
Copyright 2000-200	07 Agilent Tech	nologies			

■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions1

■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions2



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🔆 Agilent				RT	Freq/Channel
JYCRAY Cond Spur C			Mkr1 1.9		Center Freq
Ref 29.5 dBm #Peak	Atten 20 dB		-23.	34 dBm	2.01500000 GHz
Log					
10					Start Freq
dB/					30.0000000 MHz
Offst					
27.4 dB					Stop Freq
DI					4.00000000 GHz
-13.0					
dBm		11			CF Step 397.000000 MHz
LgAv		\$			Auto Man
			ward and and and and and and and		
V1 S2 S3 FC	mounderstand		have a state of the second sold of the	white the states	Freq Offset
AA					0.00000000 Hz
£ (f):					
FTun					Signal Track
Swp					0n <u>0ff</u>
Center 2.015 GHz			Span 3.	97 GHz	
#Res BW 1 MHz	#VBW	1 MHz – Sw	eep 6.64 ms (60		
File Operation Stat	us, C:\HCT.GIF (file saved			

■ GSM1900 MODE (661 CH) Conducted Spurious Emissions1

■ GSM1900 MODE (661 CH.) Conducted Spurious Emissions2

🔆 Agilent				RT	Freq/Channel
JYCRAY Cond Spur (3.440 GHz	Center Freq
Ref 29.5 dBm #Peak	Atten 20 dB		-2,	7.55 dBm	12.0000000 GHz
Log					
10 dB/					Start Freq 4.00000000 GHz
Offst 27.4					
dB DI					Stop Freq 20.0000000 GHz
-13.0 dBm					CF Step
LgAv			4		1.60000000 GHz <u>Auto</u> Man
AT A MARKAGA AND AND AND AND AND AND AND AND AND AN	Wind International Actions	Walaque - Andrew Mary M	and the state of t	water of the stand	Freq Offset
S3 FC					0.00000000 Hz
£ (f):					Cignal Trook
FTun					Signal Track On Off
Swp					
Center 12.000 GHz			Spa	n 16 GHz	
#Res BW 1 MHz	#VBW	1 MHz S	weep 40 ms (
File Operation Stat	tus, C:\HCT.GIF	file saved			

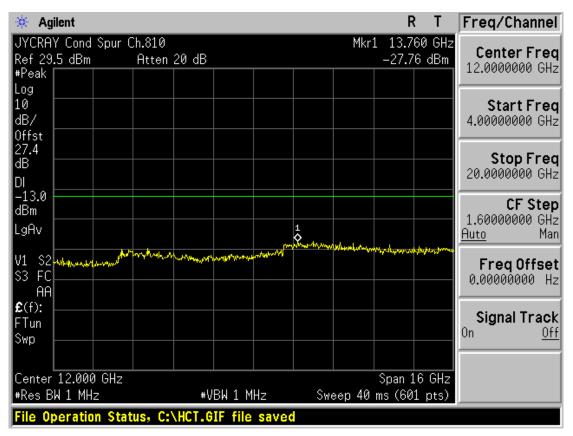
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
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🔆 Agilent				RT	Freq/Channel
JYCRAY Cond Spur			Mkr:	1 1.797 GHz	Center Freq
Ref 29.5 dBm #Peak	Atten 20 dB			-23.08 dBm	2.01500000 GHz
Log					
10 dB/					Start Freq 30.0000000 MHz
Offst					
27.4 dB DI					Stop Freq 4.00000000 GHz
-13.0					CF Step
dBm LgAv		1			397.000000 MHz Auto Man
V1 S2			and an installing	Mathan Mathana Marine Street and Street	
S3 FC Andrew Aller	the production of the production of	and Address Marine Address	All Colored and a		FreqOffset 0.00000000 Hz
£ (f):					
FTun					Signal Track On Off
Swp					
				2 07 04-	
Center 2.015 GHz #Res BW 1 MHz	#VB	W 1 MHz	op Sweep 6.64 m	an 3.97 GHz 15 (601 nts)	
	atus, C:\HCT.GI			13 (001 p(3)	J
pine operation sta					

■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions1

■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions2



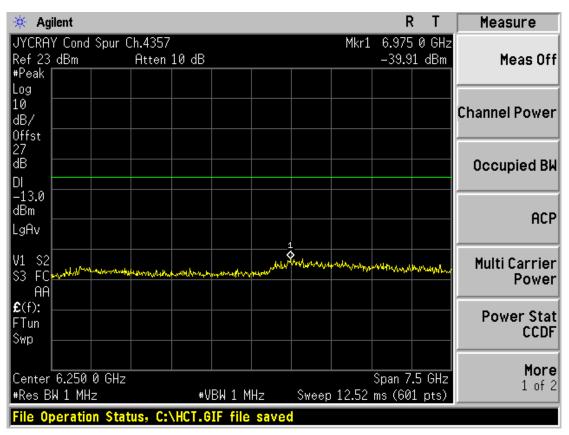
FCC CERTIFICATION REPORT			www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY	



🔆 Agilent				RT	Measure
JYCRAY Cond Spur (Ref 23 dBm #Peak	Ch.4357 Atten 10 dB		Mkr1 -43	351 MHz .41 dBm	Meas Off
Log 10 dB/					Channel Power
0ffst 27 dB DI					Occupied BW
-13.0 dBm LgAv					ACP
V1 S2 S3 FC	Welmenter and Contenenter against	warsterfoger, gegenerater botyper	Hannyan Inger	www.enstalliteerit	Multi Carrier Power
£(f): FTun Swp					Power Stat CCDF
Center 1.265 GHz #Res BW 1 MHz	#VBW 1	MHz Sweer	Span 2 5 4.12 ms (6	2.47 GHz 601 pts)	More 1 of 2
File Operation Stat	tus, C:\HCT.GIF fil	e saved			

■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions1

■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions2



FCC CERTIFICATION REPORT				
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY	



🔆 Agilent				R	Т	Measure
JYCRAY Cond Spur (Ref 23 dBm #Peak	Ch.4408 Atten 10 dB		Mkı	1 1.67 -41.41		Meas Off
Log 10 dB/ Offst						Channel Power
27 dB						Occupied BW
-13.0 dBm LgAv						ACP
V1 S2 S3 FC	martur water a		1 Marine Marine and Andrewson	un attantion	mhalung	Multi Carrier Power
£(f): FTun Swp						Power Stat CCDF
Center 1.265 GHz #Res BW 1 MHz	#\	/BW 1 MHz	Sweep 4.12	pan 2.4 ms (601		More 1 of 2
File Operation Stat	us, C:\HCT.C	IF file save	d			

■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions1

■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions2

🔆 Agilent				R	Т	Measure
JYCRAY Cond Spur Ch.4408			Mkr1 4	4.950 0		
	10 dB			21.06	dBm	Meas Off
#Peak Log						
10						
dB/						Channel Power
Öffst						
27						
dB						Occupied BW
-13.0 dBm						
						ACP
LgAv						
V1 S2						Multi Comion
S3 FC	no hornerstervent	mative	and the start of t	Multimetter	thopse	Multi Carrier Power
AA						FOWER
£ (f):						Derver Chat
FTun FTun						Power Stat CCDF
Swp						CUDF
Center 6.250 0 GHz			Sr	an 7.5	GHz	More
#Res BW 1 MHz	#VBW 1 M	Hz Sweep 1				1 of 2
File Operation Status, C:						

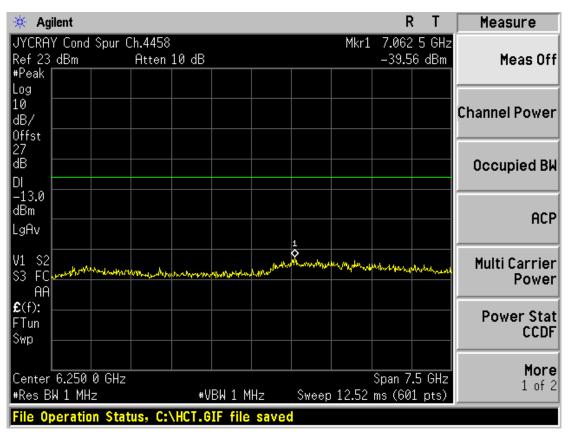
	FCC CERTIFICATION REPORT							
Test Report No.	Date of Issue:	EUT Type:	FCC ID:					
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY					



🔆 Agilent						F	х т	Measure
JYCRAY Cond Spur					Mkr		93 GHz	
Ref 23 dBm #Peak	Atten	10 dB				-40.8)7 dBm	Meas Off
Log								
10 dB/								Channel Power
Offst								
27 dB								Occupied BW
DI -13.0								
dBm								ACP
LgAv								
V1 S2 S3 FC <mark>Anna Anna Anna Anna Anna Anna Anna Ann</mark>	H. J. M. Jawa	w www.	whenter	ndata and	 prochasseminer	والمعادية	ndukan meninda	Multi Carrier Power
£ (f):								
FTun Swp								Power Stat CCDF
Center 1.265 GHz							47 GHz	More 1 of 2
#Res BW 1 MHz			BW 1 M		p 4.12 i	ms (60	I pts)	
File Operation Sta	tus, C:\	HCT.G	IF file	save				

■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions1

■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions2



	FCC CERTIFICATION REPORT							
Test Report No.	Date of Issue:	EUT Type:	FCC ID:					
HCTR1010FR16-1	October 29, 2010	USB Modem	JYCRAY					
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Measure	R T	R								ilent	🔆 Ag
Meas Off	09 GHz 6 dBm							Ch.9662 Atten	d Spur (JYCRA Ref 23 #Peak
Channel Power											Log 10 dB/ Offst
Occupied BW											27.8 dB DI
ACP						1 \$					-13.0 dBm LgAv
Multi Carrier Power	an Auguran	runn	han an a	non dhanh nd nh	an a		and an	Muther	uhmonen	destherent?	V1 S2 S3 FC AA
Power Stat CCDF											€(f): FTun Swp
More 1 of 2	97 GHz 1 pts)		Sp 5.64 m	Swe	llen len len len len len len len len len	BW 1 1	#\			2.015 W 1 MH	
				ed	e save	IF file	HCT.G	us, C:	on Stat	peratio	File 0

■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions1

■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions2

🔆 Agilent				R	Т	Measure	
JYCRAY Cond Spu			Mkr1	13.893			
Ref 23 dBm	Atten 10 df	3		-36.36	dBm	Meas Off	
#Peak							
Log 10							
dB/						Channel Power	
Öffst							
27.8							
dB						Occupied BW	
DI							
-13.0							
dBm						ACP	
LgAv			1 And the second				
V1 S2	American		metaline manufacture and	markenan	Mar + MU		
\$3 FC	C	(All Marine Andrew Contraction				Multi Carrier	
						Power	
£(f):						_	
FTun						Power Stat	
Swp						CCDF	
Center 12.000 GH	7			Span 16	GHz	More	
#Res BW 1 MHz		ŧVBW 1 MHz	Sweep 40			1 of 2	
					19409		
File Operation S	Catus, Cathol.	our the save	W I I I I I I I I I I I I I I I I I I I				

	FCC CERTIFICATION REPORT						
Test Report No.	Date of Issue:	EUT Type:	FCC ID:				
HCTR1010FR16-1							



Measure	₹ T	R								ilent	🔆 Ag
Meas Off	62 GHz 9 dBm		Mk				10 JR	h.9800 Atten	Spur C		JYCRA Ref 23
neas on		-30.0						niten			#Peak
Channel Power											Log 10 dB/ Offst
Occupied Bk											27.8 dB DI
ACF	1										-13.0 dBm LgAv
Multi Carrier Power		ndrindan	mandunanten	spillite and		hein ton fr	konnerson	mm	y ny we we have	· ·	V1 S2 S3 FC AA
Power Stat CCDF											€(f): FTun Swp
More 1 of 2	97 GHz 1 pts)		S ep 6.64	:	1 Mł	/BW 1	#\			2.015 W 1 MH	
				aved	ile	F f	HCT.6	us, C:'	on Stat	peratio	File O

■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions1

■ WCDMA1900 MODE (9400 CH.) Condcted Spurious Emissions2

🔆 Agilent				RΤ	Measure
JYCRAY Cond Spur (3.733 GHz	
Ref 23 dBm	Atten 10 dB			6.97 dBm	Meas Off
#Peak Log					
10					
dB/					Channel Power
Offst					
27.8					
dB					Occupied BW
-13.0 dBm					
					ACP
LgAv		1			
V1 S2 🛛 🗸	adden all in a	Martin and Martin and Martin	moundlyman	Maddagater	Multi Carrier
\$3 FC	white my Mercul Mercer market	All a state of the			Power
AA					I Ower
£ (f):					Power Stat
FTun					CCDF
Swp					CCDI
					М
Center 12.000 GHz			Spa	an 16 GHz	More 1 of 2
#Res BW 1 MHz	#VBW	1 MHz Sv	veep 40 ms		1 07 2
File Operation Stat	us, C:\HCT.GIF	file saved			

	FCC CERTIFICATION REPORT							
Test Report No.	Date of Issue:	EUT Type:	FCC ID:					
HCTR1010FR16-1								



🔆 Agilent				R	Т	Measure
JYCRAY Cond Spur (Mkr	1 1.850		
Ref 23 dBm	Atten 10 dB			-29.65	dBm	Meas Off
#Peak Log						
10						
dB/						Channel Power
Öffst						
27.8						
dB						Occupied BW
-13.0 dBm						
						ACP
LgAv						
V1 S2						Multi Carrier
	manter Maple along hours	ways when an an and a second	And the stand and the second	and the second	service and	Power
AA						i onei
£ (f):						Power Stat
FTun						CCDF
Swp						CCDI
						М
Center 2.015 GHz			S	pan 3.97	GHz	More 1 of 2
#Res BW 1 MHz	#\	BW 1 MHz	Sweep 6.64 i			1 UF 2
File Operation Stat	us. C:\HCT.G	IF file saver				

■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions1

■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions2

🔆 Agilent		R	T Measure
JYCRAY Cond Spur Ch.		Mkr1 13.707	
Ref 23 dBm At #Peak	ten 10 dB	-36.10	dBm MeasOff
Log			
10 dB/			Channel Power
Offst 27.8			
dB DI			Occupied BW
-13.0 dBm			ACP
LgAv		1 ¢	
V1 S2 S3 FC	What we want have a start and a start a	¢ «Marthanting and the stand and stand the sta	Multi Carrier Power
€(f): FTun Swp			Power Stat CCDF
			More
Center 12.000 GHz #Res BW 1 MHz	#VBW 1 MHz	Span 16 Sweep 40 ms (601	GHZ 1 of 2
File Operation Status	C:\HCT.GIF file saved		

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