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Test Report

Report Number	**ESTR0503-003**			
Applicant	**Company Name**	**CYBERBANK Corp.**		
	Address	**3,4,5F., Mirae Bldg., 545-7 Dogok-dong, Kangnam-gu, Korea 135-857**		
	Telephone	**82-2-526-8762**		
Product	**Product Name**	**CDMA 800MHz PDA Phone**		
	Model No.	**CP-X315**	**Manufacturer**	**CYBERBANK Corp.**
	Serial No.	**HKR34DL003487**	**Country of origin**	**Korea**
	Date of Issue	**2005-03-10**	**Date of Test**	**2005-02-19 ~2005-03-07**
Testing Lab.	**ESTECH. Co., Ltd**			
Standard	**FCC PART 22 Subpart H, FCC PART 15**			
Tested by	**S.R. Kim/ Engineer** (Signature)			
Approved by	**Jay Kim/ Engineering Manager** (Signature)			

*** Note**
- This test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test result based on a single evaluation of one sample of the above mentioned

TABLE OF CONTENTS

1. INSTROCTION

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and tested in accordance with the measurement procedures as indicated in this report ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab., assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name: ESTECH Co. Ltd.

Head Office: Rm. 1015, World Venture Center II, 426-5, Gansan-dong, Geumcheon-gu, Seoul, 153-803, Korea **(Safety & SAR & Telecom. Test Lab)**

EMC Test Lab.: 58-1, Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1, Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

2. Description of EUT

2.1 Summary of Equipment Under Test

♦ **FCC ID :** PGVCP-X315

♦ **Freq. Range :** Tx : 824.70 ~ 848.31 MHz
Rx : 869.70 ~ 893.31 MHz

♦ **Power Rating :** 3.7VDC(3.2 ~ 4.2VDC)

♦ **Voltage and Current applied through the final Amplifier:**
Voltage: 3.678V, Current: 0.462A
Watt: 1.699W

♦ **EUT Type :** CDMA 800MHz PDA Phone

♦ **Modulation(s) :**
CDMA – F9W

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3. DESCRIPTION OF TEST

3.1 RF Power Output

- The EUT was placed on a wooden turn table 3 meters from the receive antenna. The receive antenna height and turn table rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1MHz, 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. This spurious level is recorded. For reading 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

3.5 Occupied Bandwidth

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% of the Emission bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

3.6 Spurious and Harmonic Emission at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to 10GHz.

Set the RES BW to 1% of the emission bandwidth to show compliance with the -13dBm, limit, in the 1MHz bands immediately outside and adjacent to the top and bottom edges of the frequency block.

For the Out-of-Band measurements a 1MHz RBW was used to scan from 10MHz to 10xfo of the fundamental carrier for all frequency block. A display line was placed at -13dBm to show compliance for spurious, and harmonics.

Mobile emission in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmit antenna connector.

3.7 Radiation Spurious and Harmonic Emissions

Radiation and harmonic emission are measured outdoors at our 3 meters test range. The equipment under test is placed on a wooden turntable 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer(or receiver). A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

3. DESCRIPTION OF TEST(CONTINUE)

3.8 Frequency stability (Temperature Variation)

The frequency stability of the transmitter is measured by:

a) **Temperature**: The temperature is varied from -30℃ to +60℃ using an environmental chamber.

b) **Primary Supply Voltage**: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

※ 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 ±2.5ppm of the center frequency.

Time Period and Procedure

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (22℃ to 25℃ to provide a reference.)
2. The equipment is subjected to an overnight "soak" at -30℃ without any power applied.
3. After the overnight "soak" at -30℃ (usually 14 – 16hours), 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 and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements are made at 10℃ interval up to room temperature. At least a period of one and one half hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency measurements are at 10 intervals starting -30℃ up to +50℃ allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after re-applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

3.9 FCC Part 15 Test (Conducted/Radiated Emission For Digital Device)

Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

3. DESCRIPTION OF TEST(CONTINUE)

Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 to 30 MHz was measured in accordance to FCC Part 15 (2002) & ANSI C 63.4 (2001) The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

4. TEST DATA

4.1 PART 15 TEST RESULT

Measurement of radiated disturbance

MEASUREMENT INSTRUMENTS

EQUIPMENT	MANUFACTURE	MODEL NO.
TEST Receive	Rohde & Schwarz	ESPI7
Spectrum Analyzer	ADVANTEST	R3261C
LogBicon Antenna	SCHWARZBECK	VULB 9160
Turn Table	EMCO	2087
Antenna Mast	EMCO	2070-01
ANT Mast Controller	EMCO	2090
Turn Table Controller	EMCO	2090

Frequency (MHz)	Reading (dBuV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
248.95	20.00	H	1.4	11.91	2.4	34.35	46.0	-11.65
270.31	21.00	H	1.3	12.48	2.5	35.98	46.0	-10.02
294.90	19.90	H	1.3	13.10	2.6	35.63	46.0	-10.37
298.59	22.50	H	1.4	13.18	2.6	38.32	46.0	-7.68
344.05	19.50	H	1.0	14.18	2.8	36.52	46.0	-9.48
398.11	23.10	H	1.0	15.28	3.1	41.50	46.0	-4.5
497.66	16.30	H	1.0	17.04	3.5	36.88	46.0	-9.12
Remark	H: Horizontal, V: Vertical Test Mode: PC Sync Mode (Worse Case)							

4. TEST DATA(CONTINUED)

Frequency (MHz)	Reading (dBuV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
39.32	21.20	V	1.0	12.44	0.9	34.59	40.0	-5.41
349.02	22.50	H	1.0	11.91	2.4	36.85	46.0	-9.15
394.90	20.60	H	1.0	13.10	2.6	36.33	46.0	-9.67
298.59	24.80	H	1.0	13.18	2.6	40.62	46.0	-5.38
344.04	17.80	H	1.0	14.18	2.8	34.82	46.0	-11.18
398.12	21.40	H	1.0	15.28	3.1	39.80	46.0	-6.20
497.67	16.60	V	1.0	17.04	3.5	37.18	46.0	-8.82
504.21	17.00	V	1.0	17.21	3.6	37.67	46.0	-8.33
Remark	H: Horizontal, V: Vertical Test Mode: Only PDA Mode (Worse Case)							

4. TEST DATA(CONTINUED)

Measurement of conducted disturbance

MEASUREMENT INSTRUMENTS

EQUIPMENT	MANUFACTURE	MODEL NO.
LSIN	Rohde & Schwarz	ESH3-Z5
LSIN	SCHWARZBECK	NNLA8120A
TEST Receive	Rohde & Schwarz	ESPI7
Pulse Limiter	Rohde & Schwarz	ESH3Z2

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-Peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Reading (dBuV)	Result (dBuV)	Limit (dBuV)	Reading (dBuV)	Result (dBuV)	Limit (dBuV)
0.15	0.07	0.0	H	50.48	50.55	65.89	-	-	55.89
0.18	0.07	0.0	N	52.53	52.62	64.67	-	-	54.67
0.25	0.07	0.1	H	40.43	40.56	61.86	28.99	29.12	51.86
0.34	0.07	0.1	N	36.24	36.43	59.11	-	-	49.11
0.42	0.07	0.2	H	35.66	35.89	57.49	-	-	47.49
0.49	0.07	0.2	H	34.29	34.56	56.15	-	-	46.15
0.52	0.07	0.2	N	33.70	33.97	56.00	-	-	46.00
0.79	0.09	0.2	N	34.50	34.79	56.00	27.04	27.33	46.00
0.98	0.09	0.2	H	32.78	33.07	56.00	-	-	46.00
1.05	0.09	0.2	N	32.95	33.25	56.00	25.24	25.54	46.00
2.35	0.12	0.3	H	34.35	34.77	56.00	-	-	46.00
2.52	0.13	0.3	H	36.08	36.51	56.00	24.76	25.19	46.00
8.58	0.32	0.5	H	28.09	28.92	60.00	-	-	50.00
9.35	0.34	0.6	N	34.51	35.41	60.00	-	-	50.00
18.67	0.68	0.8	N	31.24	32.72	60.00	22.91	24.39	50.00
20.92	0.72	0.8	H	34.03	35.57	60.00	-	-	50.00
21.60	0.74	0.8	N	38.23	39.80	60.00	34.13	35.70	50.00
Remark	H: Hot Line, N: Neutral Line Test Mode: PC Sync Mode (Worse Case)								

4. TEST DATA(CONTINUED)

Frequenc y (MHz)	Correction Factor		Line (H/N)	Quasi-Peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Reading (dBuV)	Result (dBuV)	Limit (dBuV)	Reading (dBuV)	Result (dBuV)	Limit (dBuV)
0.15	0.07	0.0	H	33.47	33.54	66.00	-	0.07	56.00
0.19	0.07	0.0	N	50.49	50.59	64.08	39.45	39.55	54.08
0.23	0.07	0.1	H	44.90	45.02	62.49	37.00	-	52.49
0.27	0.07	0.1	N	26.00	26.15	61.21	-	-	51.21
0.36	0.07	0.1	N	26.58	26.78	58.80	18.56	18.76	48.80
0.43	0.07	0.2	H	24.51	24.75	57.25	18.05	18.29	47.25
0.96	0.09	0.2	N	29.34	29.63	56.00	22.84	23.13	46.00
1.00	0.09	0.2	H	27.06	27.35	56.00	17.97	18.26	46.00
1.16	0.09	0.2	N	29.54	29.85	56.00	-	-	46.00
1.43	0.10	0.2	N	28.34	28.68	56.00	21.96	22.30	46.00
2.35	0.12	0.3	H	28.64	29.06	56.00	-	0.42	46.00
2.51	0.13	0.3	N	29.70	30.13	56.00	-	-	46.00
5.62	0.22	0.3	H	14.22	14.78	60.00	-	0.56	50.00
7.92	0.30	0.5	N	17.39	18.16	60.00	-	-	50.00
13.50	0.54	0.7	N	18.37	19.65	60.00	-	-	50.00
29.95	0.70	0.9	N	24.04	25.64	60.00	-	-	50.00
Remark	H: Hot Line, N: Neutral Line Test Mode: Only PDA Mode (Worse Case)								

4. TEST DATA(CONTINUED)

4.2 EFFECTIVE RADIATED POWER OUTPUT (E.R.P.)

MEASUREMENT INSTRUMENTS

EQUIPMENT	MANUFACTURE	MODEL NO.
Receiver	Rohde & Schwarz	ESPI7
Signal Generator	HP	E4432B
Power Meter	HP	EPM-442A
Pre Amplifier	SONOMA INSTRUMENT	310 N
Log-bicon Antenna	SCHWARZBECK	VULB 9160
Dipole Antenna	SCHWARZBECK	UHAP

***TEST RESULT**

- Company Name: LG Electronics Inc.
- EUT Description: Single Band, Single Mode CDMA Mobile Phone

CDMA

	Ch. No.	Freq. (MHz)	Peak Power Meter(dBm)	Peak Power ERP(dBm)
Low Ch.	1013	824.70	24.66	21.68
Mid Ch.	363	835.89	24.68	23.26
High Ch.	777	848.31	24.64	22.29

4. TEST DATA(CONTINUED)

FREQ. (MHz)	Receiver Reading (dBuV)	Correction Factor (dB)		Peak Value (dBm)		Limit (dBm)	POL (H/V)
		Antenna gain (dBd)	CL (dB)	SG Reading	Result		
824.70	97.01	-9.98	1.05	32.71	21.68	38.5	V
835.89	100.01	-10.00	1.07	34.33	23.26	38.5	V
848.31	98.21	-10.02	1.07	33.38	22.29	38.5	V

4. TEST DATA(CONTINUED)

4.3 OCCUPIED BANDWIDTH

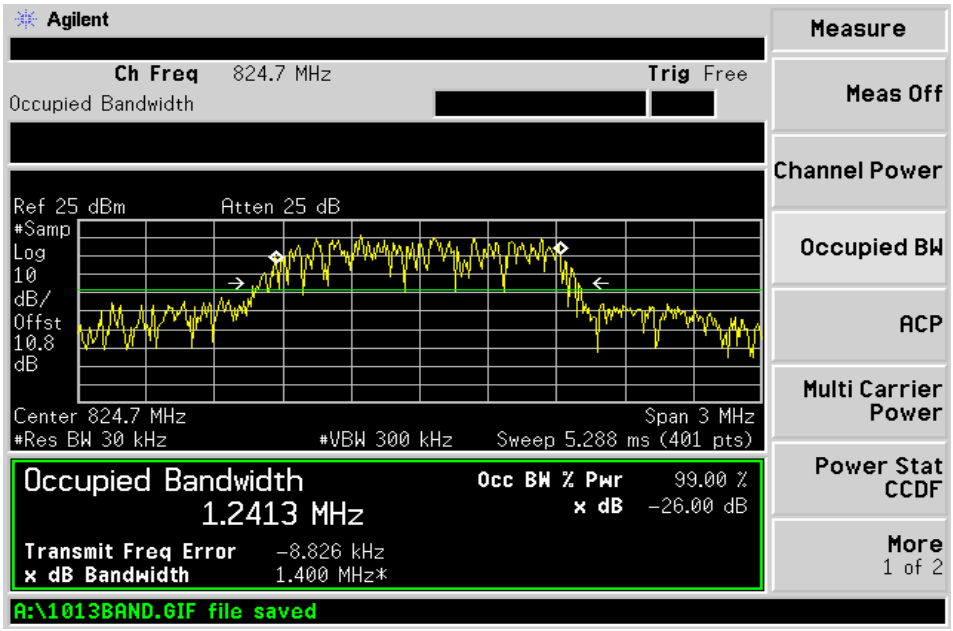
* MEASUREMENT INSTRUMENTS

EQUIPMENT	MANUFACTURE	MODEL NO.
Spectrum Analyzer	HP, Agilent	8563E, E4402B
Attenuator	JFW	50FH-010-5

Test Result:

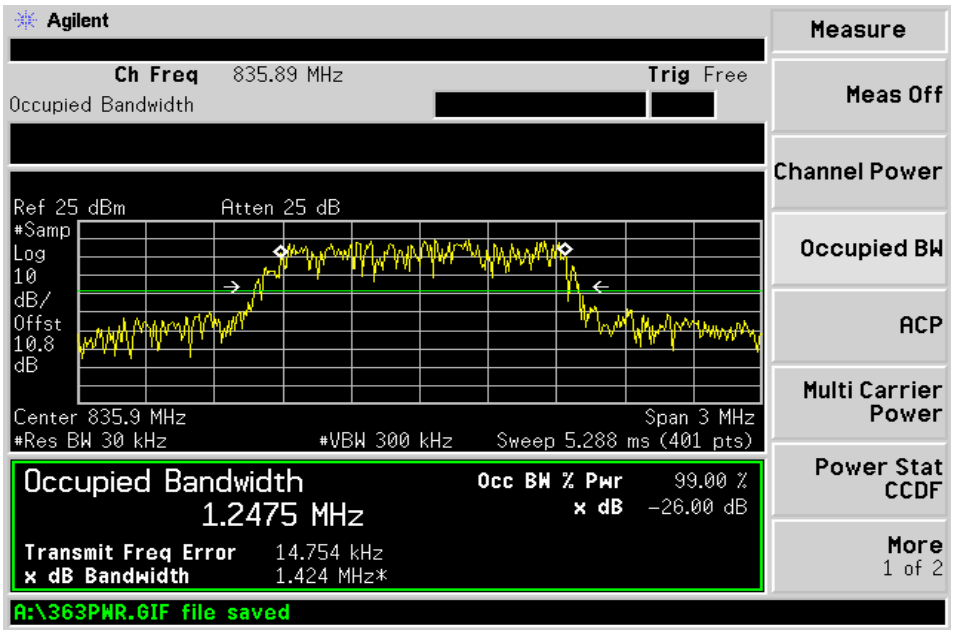
Channel	Frequency(MHz)	26dB BW(MHz)
1013	824.70	1.400
363	835.89	1.424
777	848.31	1.408

26dB BANDWIDTH (CH 1017)

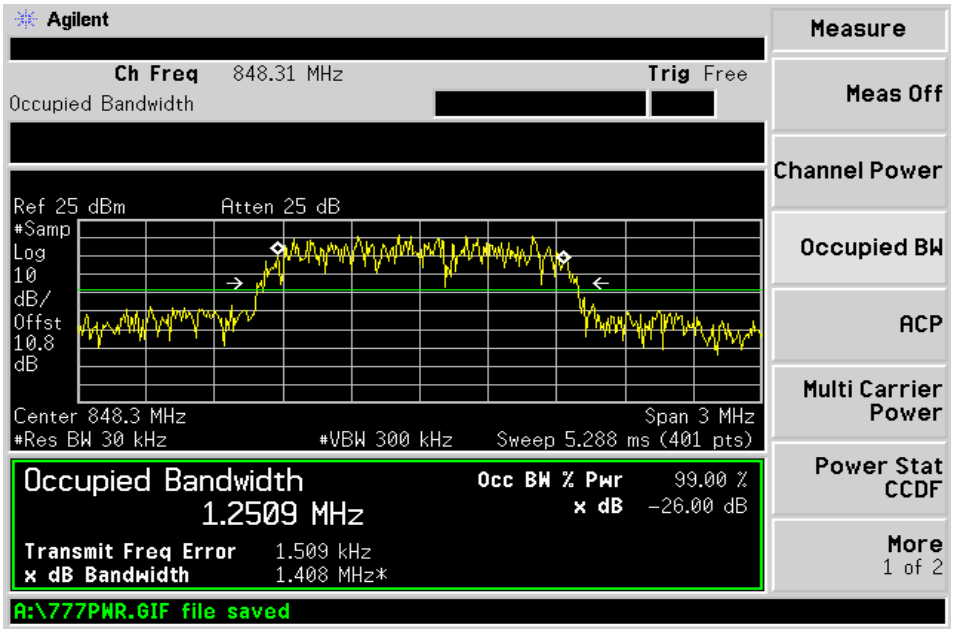


4. TEST DATA(CONTINUE)

26dB BANDWIDTH (CH 383)



26dB BANDWIDTH (CH 772)



4. TEST DATA(CONTINUE)

4.4 FIELD STRENGTH OF SPURIOUS RADIATION

a) MEASUREMENT INSTRUMENTS

EQUIPMENT	MANUFACTURE	MODEL NO.
Receiver	Rohde & Schwarz	ESPI7
Pre Amplifier	SONOMA INSTRUMENT	310 N
Horn Antenna	EMCO	3115
Horn Antenna	SCHWARZBECK	BBHA 9120 D
Signal Generator	HP	E4432B

b) MEASUREMENT PROCEDURE

- The EUT was placed on a wooden turn table 3 meters from the receive antenna. The receive antenna height and turn table rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1MHz, 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 (or receiver). This spurious level is recorded.

4. TEST DATA(CONTINUED)

- CDMA (CH 1013)

FREQ. (MHz)	Receiver Reading (dBuV)	Correction Factor (dB)		Peak Value (dBm)		Limit (dBm)	POL (H/V)
		Antenna gain(dBd)	CL (dB)	SG Reading	Result		
1649.40	21.20	5.85	4.60	-45.08	-43.83	-13.0	V
2474.10	21.40	9.55	6.63	-43.49	-40.57	-13.0	V

- CDMA (CH 363)

FREQ. (MHz)	Receiver Reading (dBuV)	Correction Factor (dB)		Peak Value (dBm)		Limit (dBm)	POL (H/V)
		Antenna gain(dBd)	CL (dB)	SG Reading	Result		
1671.78	21.40	5.95	4.60	-45.51	-44.16	-13.0	V
2507.67	21.60	9.65	6.63	-43.35	-40.33	-13.0	V

4. TEST DATA(CONTINUED)

- CDMA (CH 777)

FREQ. (MHz)	Receiver Reading (dBuV)	Correction Factor (dB)		Peak Value (dBm)		Limit (dBm)	POL (H/V)
		Antenna gain(dBd)	CL (dB)	SG Reading	Result		
1696.62	21.30	6.05	4.60	-49.52	-48.07	-13.0	V
2544.93	21.70	9.75	6.63	-46.54	-43.42	-13.0	V

4. TEST DATA(CONTINUED)

4.5 SPURIOUS EMISSION AT ANTENNA TERMINAL

a) MEASUREMENT INSTRUMENTS

EQUIPMENT	MANUFACTURE	MODEL NO.
Spectrum Analyzer	HP, Agilent	8563E, E4402B
Attenuator	JFW	50FH-010-5

b) MEASUREMENT PROCEDURE

- The EUT's RF output connector (made solely for the purpose of the test) is connected to the spectrum analyzer, and set as close as possible to the bottom of the block edge and one set as close as possible to the top of the block edge. Set the RES BW to 1% of the emission bandwidth to show compliance with the -13dBm limit, in the 1MHz bands immediately outside and adjacent to the top and bottom edges of the frequency block.
For the Out-of –Band measurements a 1MHz RES BW was used to scan from 15MHz to 10 x fo the fundamental carrier for all frequency block. A display line was placed at -13dBm to show compliance for spurious, and harmonics.

22.917(f): Mobile emission in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitter operated must be attenuated to a level not to exceed -80dBm at the transmit antenna connector.

*TEST RESULT

- EUT Description: Single Band, Single Mode CDMA Mobile Phone

CDMA(Spurious Emission: Block Edge)

Freq. (MHz)	Channel	Measurement Value(dBm)	Limit(dBm)	Margin(dB)
824.70	1013	-15.59	-13	2.59
848.31	777	-14.52	-13	1.52

4. TEST DATA(CONTINUED)

CDMA (Spurious Emission: Out of Band)

Freq. (MHz)	Channel	Measurement Value(dBm)	Limit(dBm)	Margin(dB)
824.70	1013	-30.83	-13	17.83
835.89	363	-31.83	-13	18.83
848.31	777	-28.50	-13	15.50

4. TEST DATA(CONTINUED)

4.6 FREQUENCY STABILITY (CDMA)

OPERATING FREQUENCY: 835,890,000 Hz

CHANNEL: 363

REFERENCE VOLTAGE: 3.7 VDC

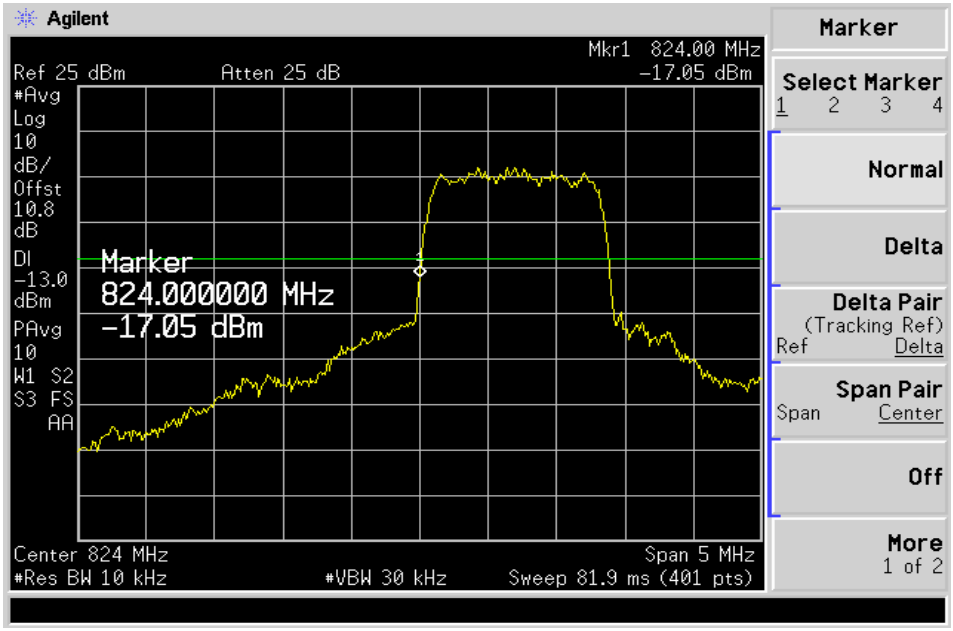
DEVIATION LIMIT: ±0.00025 % or 2.5ppm

VOLTAGE (%)	POWER (VDC)	TEMP. (℃)	FREQ. (Hz)	Deviation (%)
100 %	3.70	+20℃ (Ref)	835,889,994	0.000000
100 %		-30	835,889,935	0.000007
100 %		-20	835,889,938	0.000007
100 %		-10	835,889,952	0.000005
100 %		0	835,889,920	0.000009
100 %		+10	835,889,942	0.000006
100 %		+20	835,889,994	0.000000
100 %		+25	835,889,930	0.000008
100 %		+30	835,889,947	0.000006
100 %		+40	835,889,960	0.000004
100 %		+50	835,889,899	0.000011
100 %		+60	835,889,902	0.000011
85 %	3.15	+20	835,889,981	0.000002
115 %	4.26	+20	835,889,978	0.000002
BATT. ENDPOINT	3.10	+20	835,889,954	0.000005

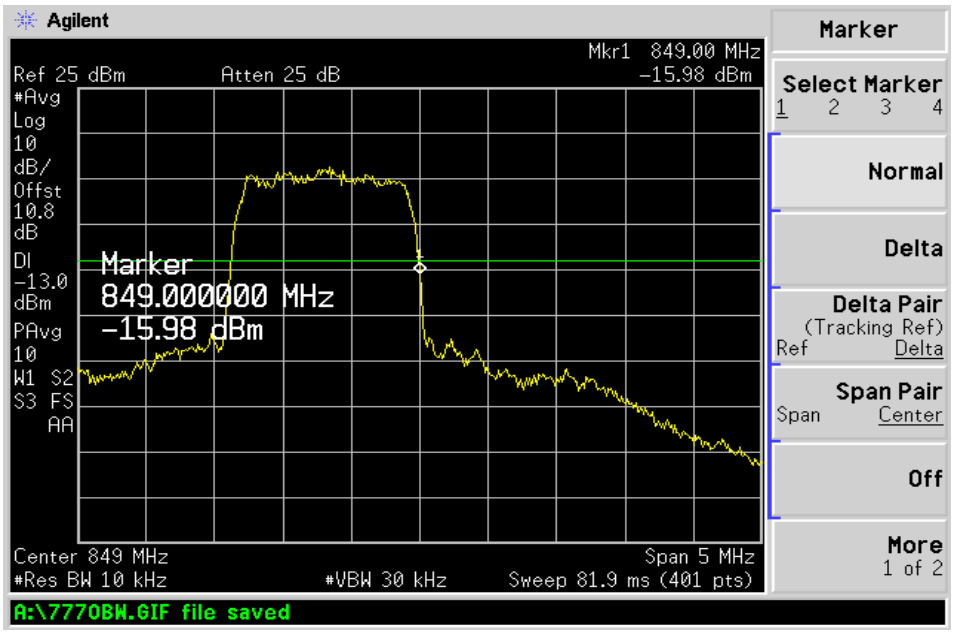
5. TEST PLOTS

5.1.1 PLOTS OF EMISSION (CDMA): BAND EDGE

- Ch 1013



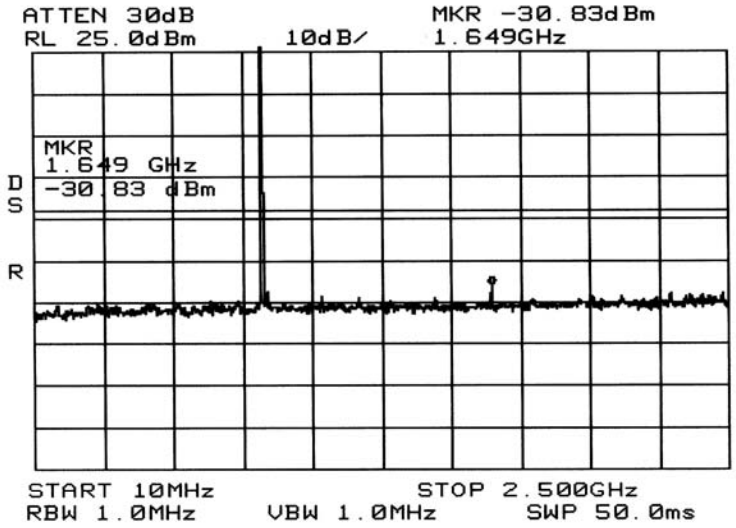
- Ch 777

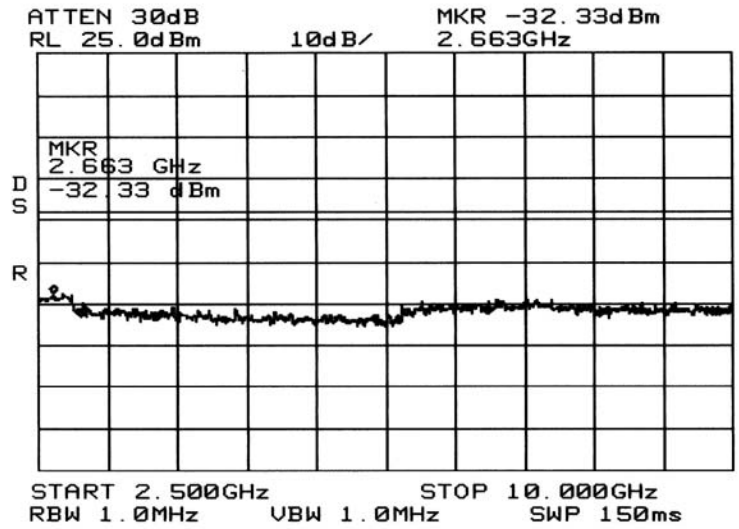


5. TEST PLOTS (CONTINUED)

5.1.2 PLOTS OF EMISSION (CDMA): OUT OF BAND

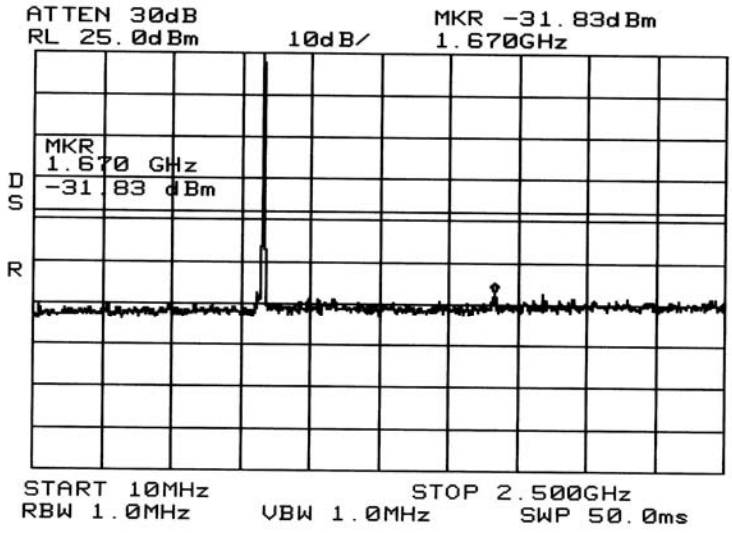
- Ch 1013

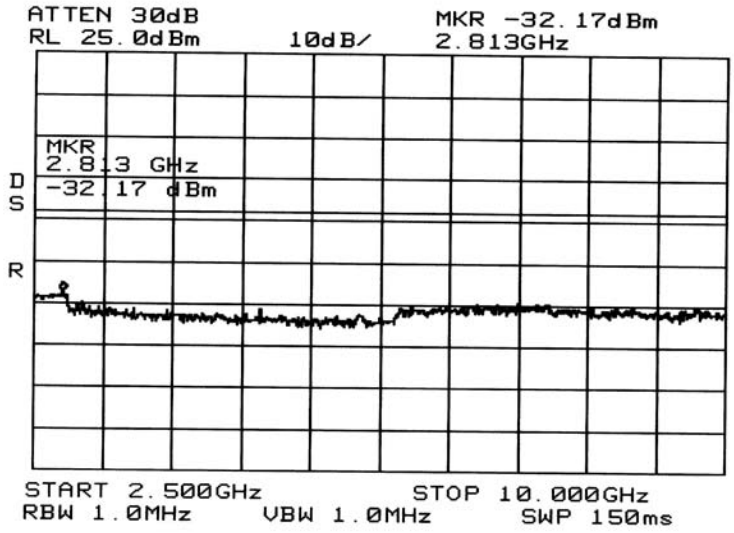




5. TEST PLOTS (CONTINUED)

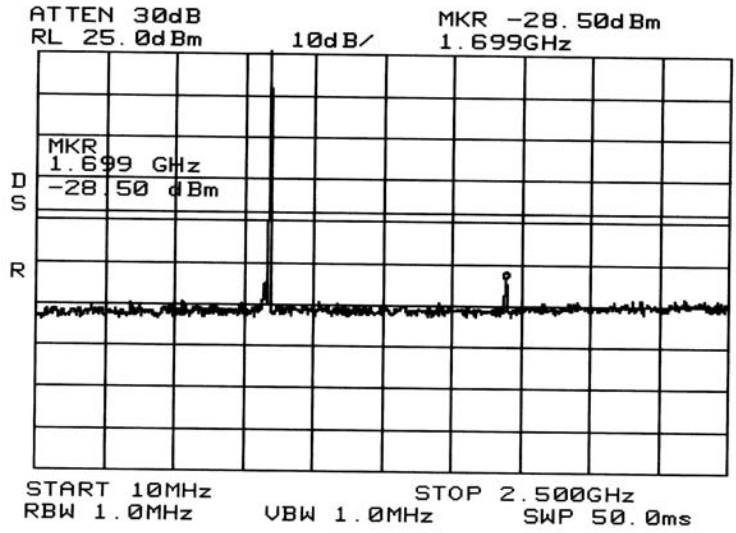
- Ch 363

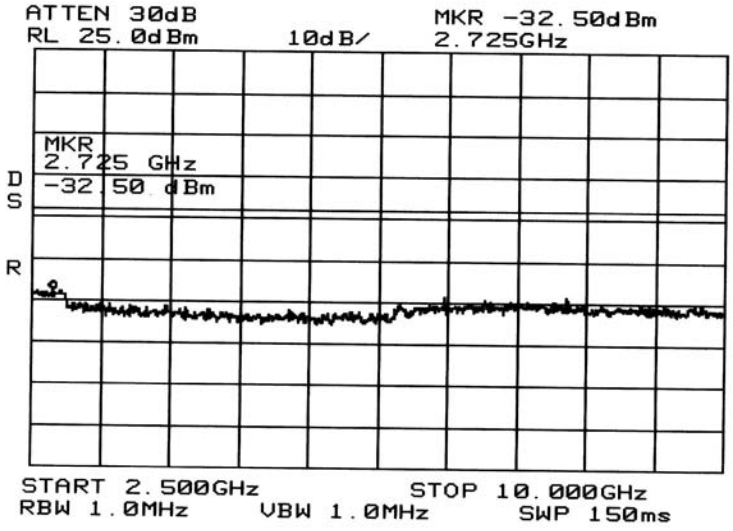




5. TEST PLOTS (CONTINUED)

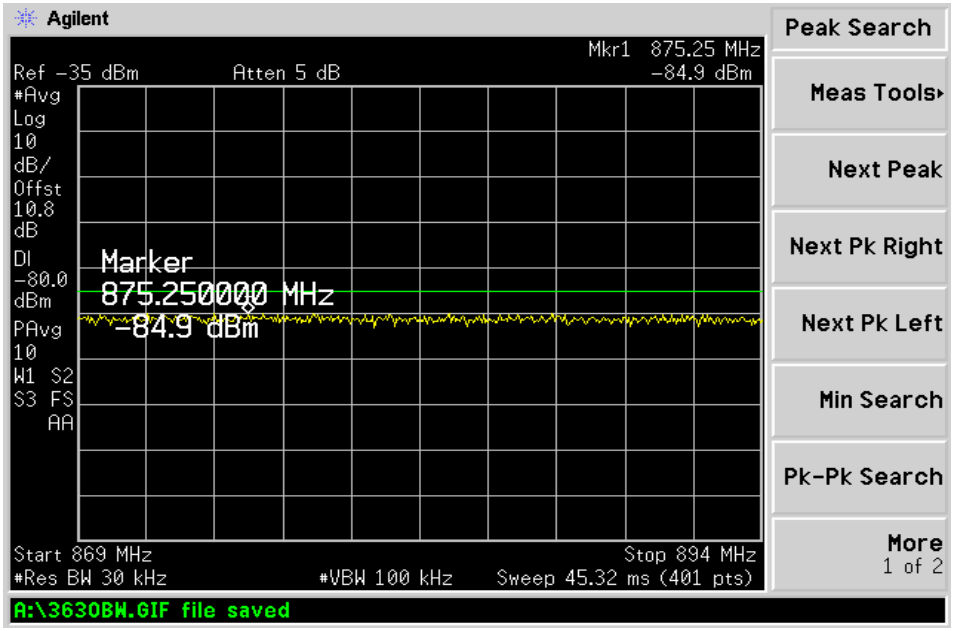
- Ch 777





5. TEST PLOTS (CONTINUED)

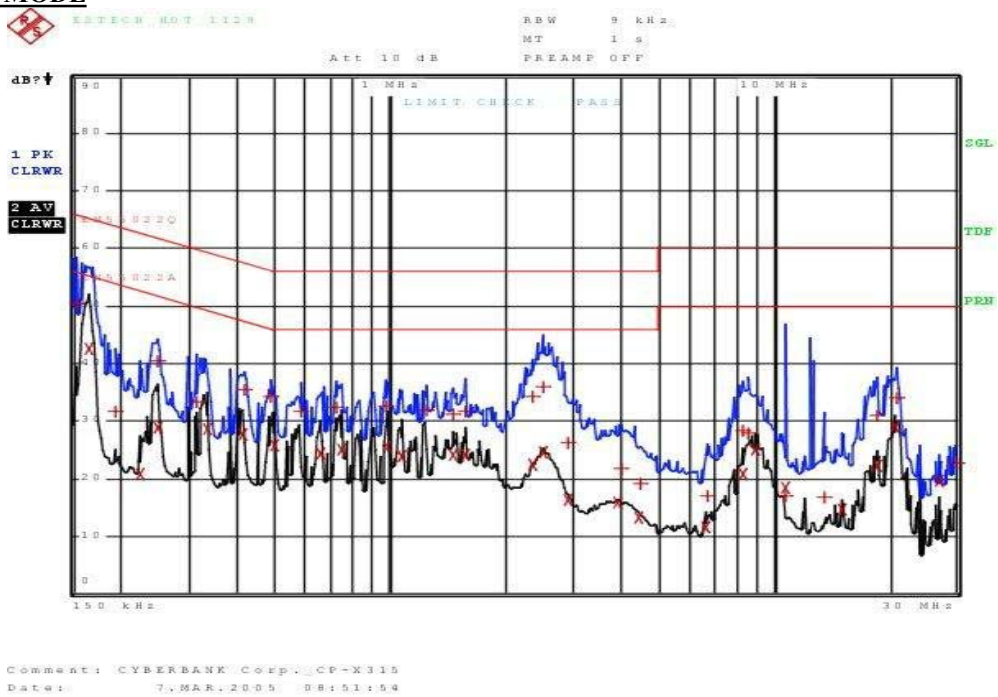
5.2 MOBILE EMISSION IN BASE FREQUENCY RANGE

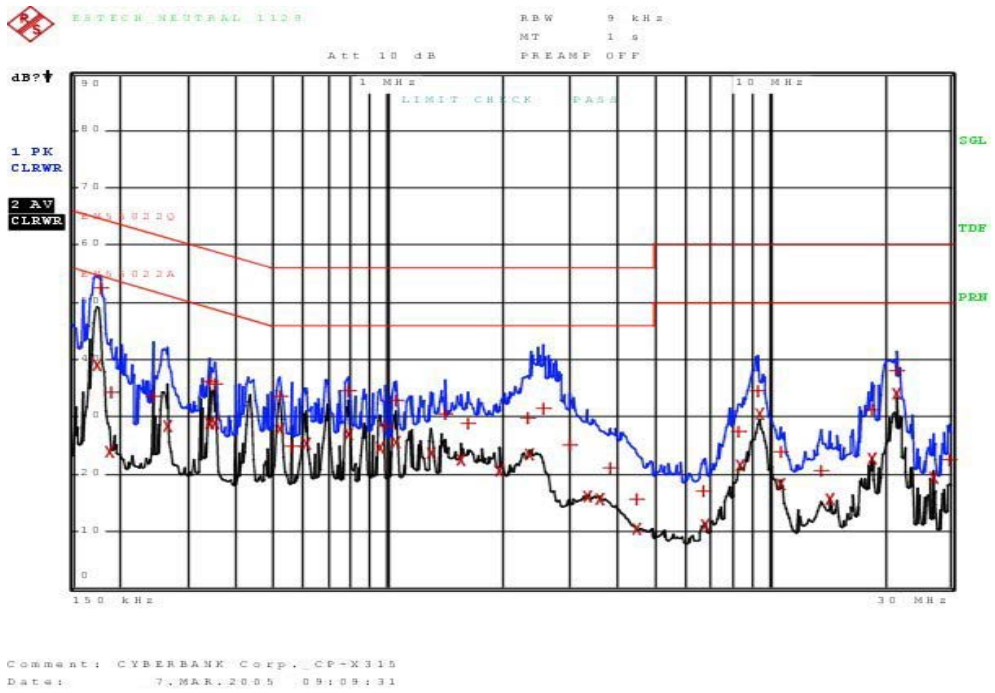


5. TEST PLOTS (CONTINUED)

5.3 PART 15 CONDEUCTED EMISSION DATA

PC SYNC MODE





5. TEST PLOTS (CONTINUED)

ONLY PDA MODE