

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR PCS LICENSED TRANSMITTER

Test Report No. : E06DR-0113
AGR No. : A069A-113R
Applicant : Bluebird Soft Inc.
Address : 558-5, Sinsa-dong, Gangnam-gu, Seoul Korea
Manufacturer : Bluebird Soft Inc.
Address : 558-5, Sinsa-dong, Gangnam-gu, Seoul Korea
Type of Equipment : Industrial PDA
FCC ID. : SS4BIP13X0
Model Name : BIP-1300
Serial number : None
Total page of Report : 69 pages (including this page)
Date of Incoming : September 19, 2006
Date of issuing : December 28, 2006


SUMMARY

The equipment complies with the regulation; **FCC Part 22 Subpart H and Part 24 Subpart E.**


This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Prepared by: _____


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1. VERIFICATION OF COMPLIANCE

APPLICANT : Bluebird Soft Inc.
 ADDRESS : 558-5, Sinsa-dong, Gangnam-gu, Seoul Korea
 CONTACT PERSON : Young Tai, Ji
 TELEPHONE NO : +82-2-548-0740
 FCC ID : SS4BIP13X0
 MODEL NO/NAME : BIP-1300
 SERIAL NUMBER : N/A
 DATE : December 28, 2006

EQUIPMENT CLASS		PCB-PCS Licensed Transmitter
EQUIPMENT DESCRIPTION		Industrial PDA
MEASUREMENT PROCEDURES		ANSI C63.4: 2003, EIA/TAI 603B
TYPE OF EQUIPMENT TESTED		PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED		CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)		Part 22 Subpart H and Part 24 Subpart E
TRANSMITTING FREQUENCY	CDMA IS-2000	Cellular: 824.82~848.19 MHz, PCS: 1850~1910 MHz
	CDMA 1x EVDO	Cellular: 824.82~848.19 MHz, PCS: 1850~1910 MHz
MAX. OUTPUT POWER	CDMA IS-2000	ERP: 178.24 mW (22.51 dBm) EIRP: 260.62 mW (24.16 dBm)
	CDMA 1x EVDO	ERP: 192.31 mW (22.84 dBm) EIRP: 398.11 mW (26.00 dBm)
EMISSION DESIGNATOR	CDMA IS-2000	Cellular and PCS: 1M44F9W
	CDMA 1x EVDO	Cellular and PCS: 1M44F9W
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE		No
FINAL TEST WAS CONDUCTED ON		3 METER(S) OPEN AREA TEST SITE

- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
2.1046, 22.913, 24.232	RF Power Output at Antenna Terminals	Met the Limit / PASS
2.1049, 22.917(b), 24.238	Occupied Bandwidth	Met the Limit / PASS
2.1051, 22.917(a), 24.238(a)	Spurious Emissions at Antenna Terminals	Met the Limit / PASS
2.1051, 22.917, 24.229	Spurious Emissions at Antenna Terminals at Block Edges ± 1 MHz	Met the Limit / PASS
2.1053, 22.917(a), 24.238(a)	Field strength of Spurious Radiation	Met the Limit / PASS
2.1047	Modulation Characteristics	Met the requirement / PASS
2.1055(a)(1), 22.355, 24.235	Frequency Stability over Temperature variation	Met the requirement / PASS
2.1055(d), 22.355, 24.235	Frequency stability over Primary voltage variation	Met the requirement / PASS
2.1093	RF Exposure	Met the Limit / PASS
15.207 and 15.107	Conducted Limits	Met the Limit / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 2.1.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The Electromagnetic compatibility measurement facilities are located on at 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyeonggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Federal Communications Commission on August 31, 2005 (Registration Number: 92819 and 340658), accredited by KOLAS (Korea Laboratory Accreditation Scheme, No: 85) and approved by TUV, DNV and MIC (Ministry of Information and Communications in Korea) according to the requirement of ISO17025.

3. GENERAL INFORMATION

3.1 Product Description

The Bluebird Soft Inc., Model BIP-1300 (referred to as the EUT in this report) is an Industrial PDA which has a function of battery charging and data uploading/downloading by USB cable. This report is for WLAN function. And the report for the Bluetooth mode and Peripheral Device for Class B Computing Device will be issued by other report. The product specification described herein was obtained from product data sheet or user’s manual.

DEVICE TYPE		Industrial PDA
EMISSION DESIGNATOR		1M23F9W
TRANSMITTING FREQUENCY	CDMA IS-2000	Cellular: 824.82~848.19 MHz, PCS: 1850~1910 MHz
	CDMA 1x EVDO	Cellular: 824.82~848.19 MHz, PCS: 1850~1910 MHz
RECEIVING FREQUENCY	CDMA IS-2000	Cellular: 869.82~893.19 MHz, PCS: 1930~1990 MHz
	CDMA 1x EVDO	Cellular: 869.82~893.19 MHz, PCS: 1930~1990 MHz
Channel Bandwidth		1.23 MHz
ANTENNA	Type	Inverted L Antenna
	Gain	1.60 dBi
	Impedance	50 Ohm
MS PROTOCOL REVISION NUMBER		?
DATA TRANSFER RATE	CDMA IS-2000	Forward: 153 Kbps, Reverse: 153 Kbps
	CDMA 1x EVDO	Forward: 2.4 Mbps, Reverse: 153 Kbps
MODULATION METHOD		CDMA IS-2000: QPSK, CDMA 1x EVDO: QPSK
LIST OF EACH OSC. ORCRY. FREQ.(FREQ.>=1MHz)		26 MHz, 14.7456 MHz, 12 MHz and 6 MHz
NUMBER OF LAYER		Main Board: 8 Layers, Key: 4 Layers
POWER REQUIREMENT		DC 9V, 3.0A from AC/DC Adapter or DC 8.4V Battery Adapter Model Name: JPW128KA0900N01, MFR: Ault Korea Co., Ltd. Rechargeable Lithium Polymer Battery
EXTERNAL CONNECTOR		Molex 24 Pin

3.2 Alternative type(s)/model(s); also covered by this test report.

No other model differences have been mentioned.

4. EUT MODIFICATIONS

-. None

5. SYSTEM TEST CONFIGURATION**5.1 Justification**

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Bluebird Soft Inc.	Bip1300 EVDO	N/A
Key Board	Bluebird Soft Inc.	Bip1300_Key_Rev 0.4	N/A
LCD	N/A	PD0511012	N/A
Main Board for Cradle	N/A	CRA-1300	N/A
SUB Board for Cradle	N/A	N/A	N/A
Camera Module	N/A	N/A	N/A
CDMA Module	C-Motech	CDE-650G	N/A
CDMA Module Board	N/A	N/A	N/A
Barcode Reader	Intermac Technplogies Corp.	EV10	N/A
Smart Card Interface Module	SCSpro Co., Ltd.	SCS-IFM1V0	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	FCC ID	Description	Connected to
BIP-1300	Bluebird Soft Inc.	SS4BIP13X0	Industrial PDA (EUT)	PC
JPW128KA0900N01	Ault Korea	N/A	AC/DC Adapter	EUT
PP10L	Dell	DoC	PC	-
N/A	ARTec	DoC	Mouse	PC
UP-DP10	Sony	DoC	Printer	PC
3453C	U.S.Robotics	CJE-0263	Modem	PC

5.4 Mode of operation during the test

The EUT was linked with Wireless Communication Test Set and then each mode, CDMA IS-2000 and 1xEVDO was configured for maximum signal gain and bandwidth. The EUT was operated in a manner representative of the typical usage of the equipment. During all testing, system components were manipulated within the confines of typical usage to maximize each emission. To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

5.5 Modulation Characteristics

The EUT uses CDMA modulation, so the voice is digitized and coded into a bit stream, so the test dose not performed and met the requirement.

5.6 Output Power Verification and Justification for Final Measurement

Pre-scan was performed on RF conducted port to determine the worst-case operating mode:

Band	Channel	Frequency (MHz)	Output Power (dBm)						
			SO2	SO2	SO55	SO55	SO32	1xEVDO	1xEVDO
			RC1/1	RC3/3	RC1/1	RC3/3	RC3/3	FTAP	RTAP
Cellular	1013	824.70	23.88	23.89	23.87	23.81	23.87	23.99	23.89
	363	835.89	24.01	23.98	24.04	24.00	24.01	24.00	24.16
	777	848.31	24.27	24.22	24.25	24.29	24.22	24.16	24.17
PCS	25	1851.25	24.06	23.99	24.12	24.10	23.98	24.62	24.57
	600	1880.00	24.41	24.24	24.21	24.36	24.40	24.79	24.82
	1175	1908.75	24.17	24.10	24.13	24.13	24.15	24.82	24.70

Based on the above results from different modulations, the worst modes at each channels were selected for the measurement of fundamental ERP/EIRP measurement, radiated spurious emissions test, band-edge and bandwidth tests.

6. RF POWER OUTPUT at ANTENNA TERMINAL

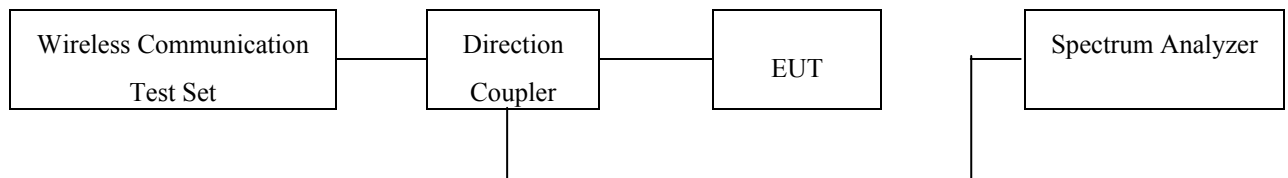
6.1 Operating environment

Temperature : 20°C

Relative humidity : 50 %

6.2 Test set-up

The RF output port of the EUT was connected to the Directional Coupler and the wanted signal for was supplied by the Wireless Communication Test Set using directional coupler. Also the output of the directional coupler was connected to the input of the spectrum analyzer. The test was performed at three frequencies (low, middle, and high channels) for each mode.



6.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 22, 2006
■ -	E5515C	Agilent	Wireless Communication Test Set	GB44051419	August 30, 2006
■ -	778D	HP	Directional Coupler	N/A	June 23, 2006

All test equipment used is calibrated on a regular basis.

6.4 Test data

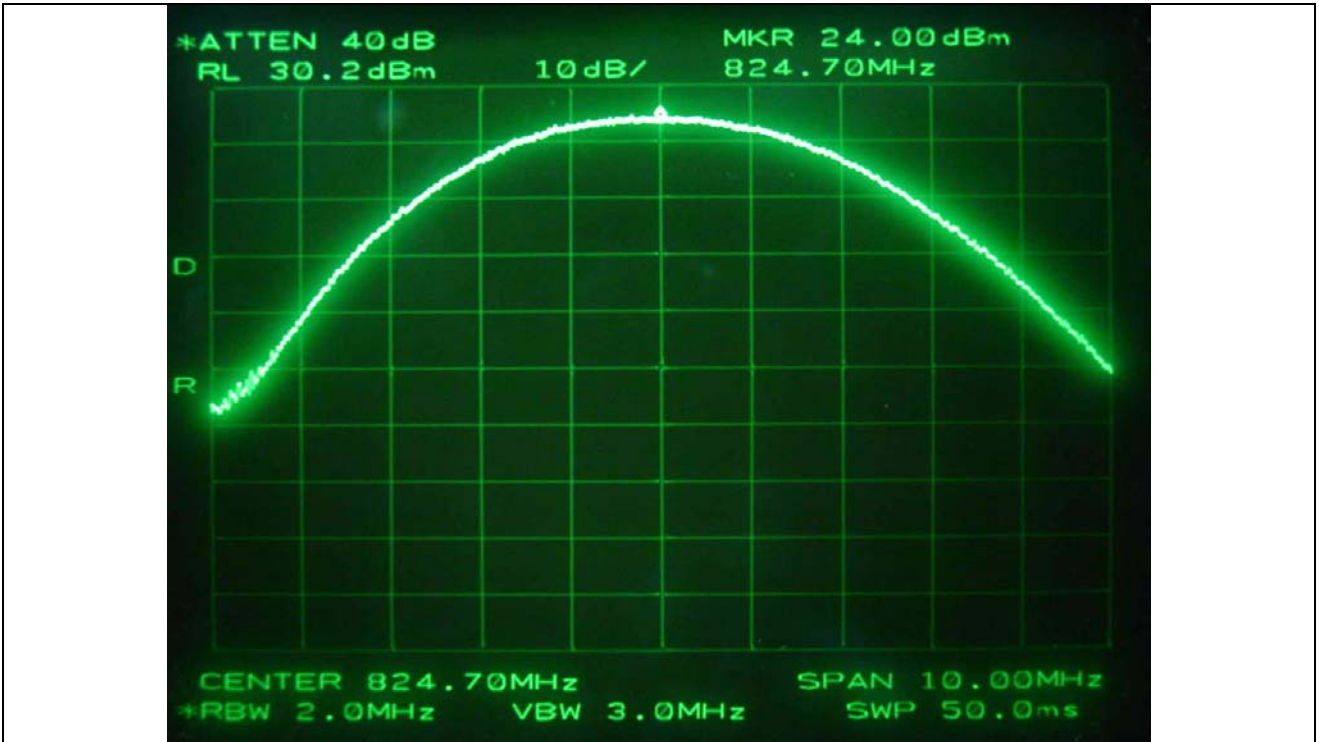
- Test Date : December 5, 2006
- Test Result : Pass

Modulation	Bands	Channel	Frequency (MHz)	Measured Output Power		Limit (W)
				dBm	W	
CDMA IS-2000	Cellular	Low	824.70	24.00	0.2512	7
		Middle	835.89	24.34	0.2716	
		High	848.31	24.50	0.2818	
	PCS	Low	1851.25	24.34	0.2716	2
		Middle	1880.00	24.84	0.3048	
		High	1908.75	24.17	0.2612	
CDMA 1xEvDO	Cellular	Low	824.70	24.20	0.2630	7
		Middle	835.89	24.53	0.2838	
		High	848.31	24.70	0.2951	
	PCS	Low	1851.25	25.13	0.3258	2
		Middle	1880.00	25.63	0.3656	
		High	1908.75	25.80	0.3802	

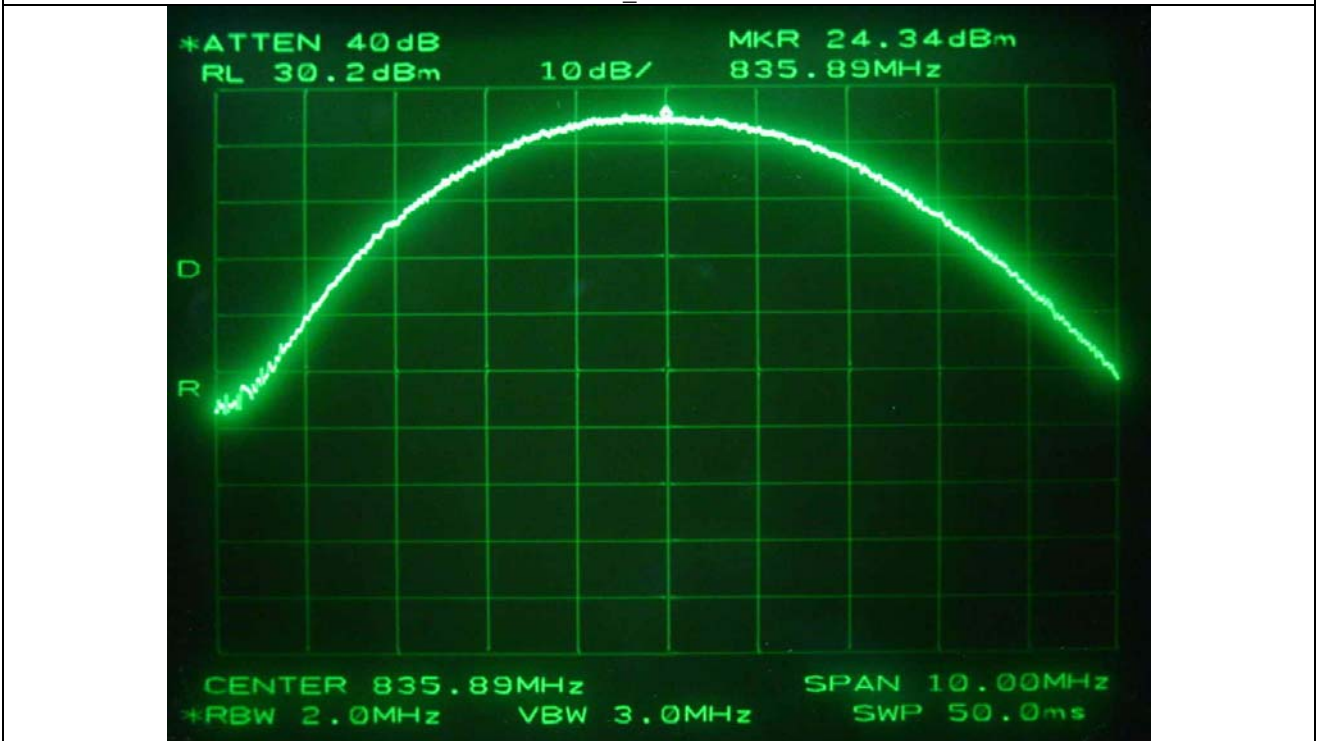


Tested by: Ki-Hong, Nam / Test Engineer

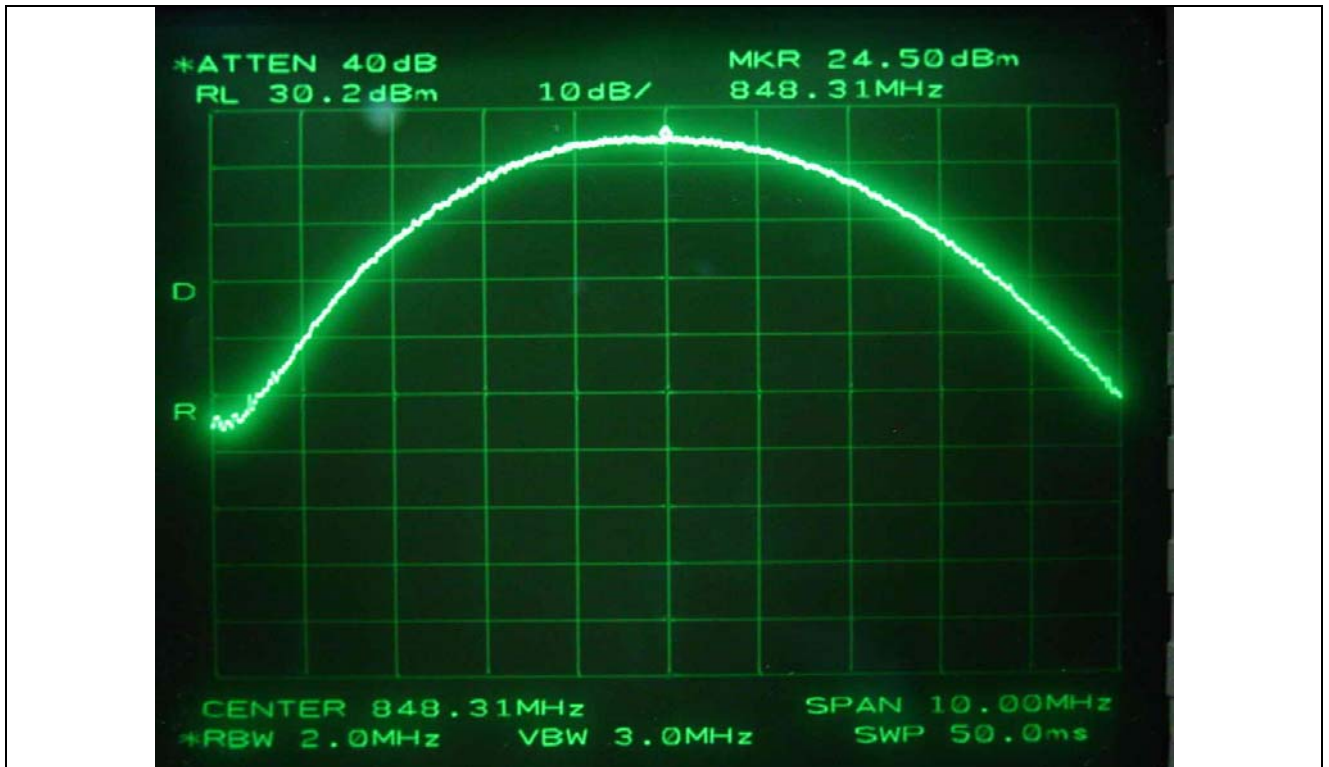
6.5 Data Photo for CDMA IS-2000



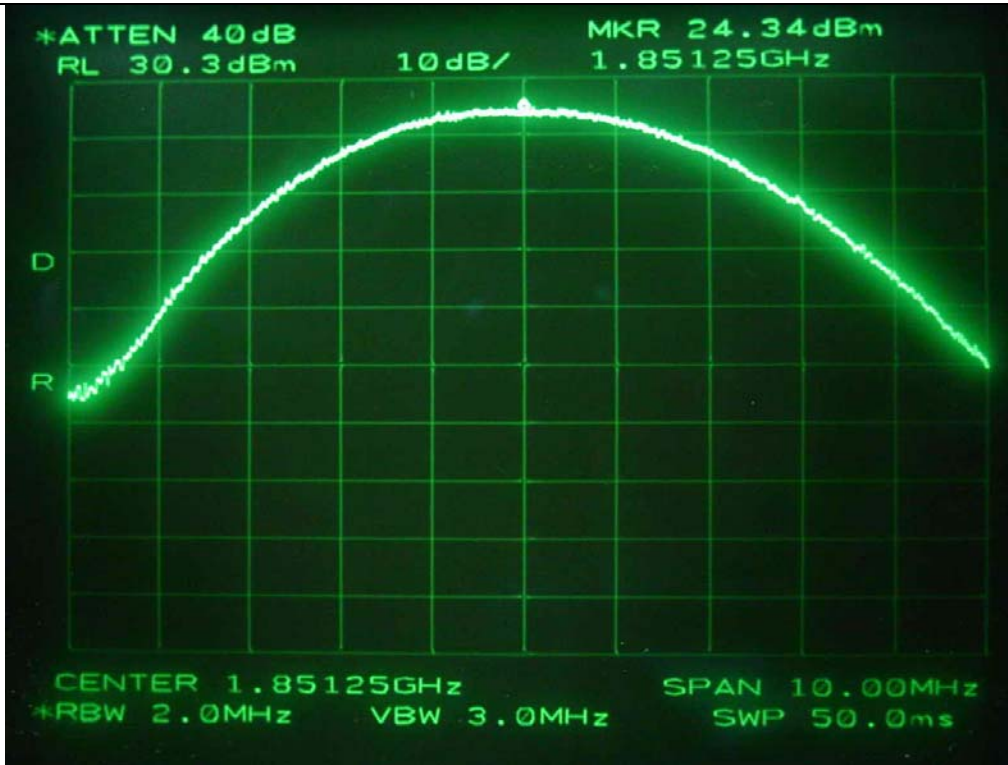
Cellular _ Low Channel



Cellular _ Middle Channel



Cellular _ High Channel



PCS _ Low Channel

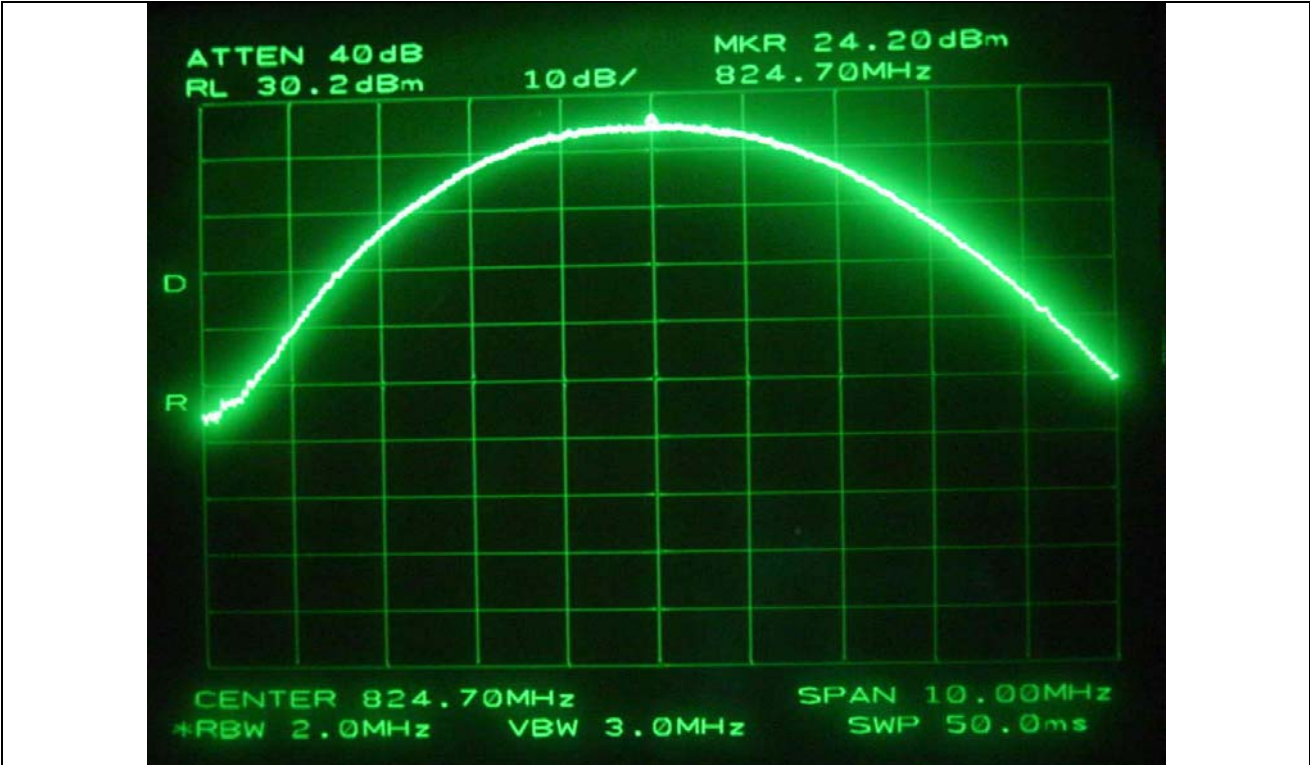


PCS _ Middle Channel

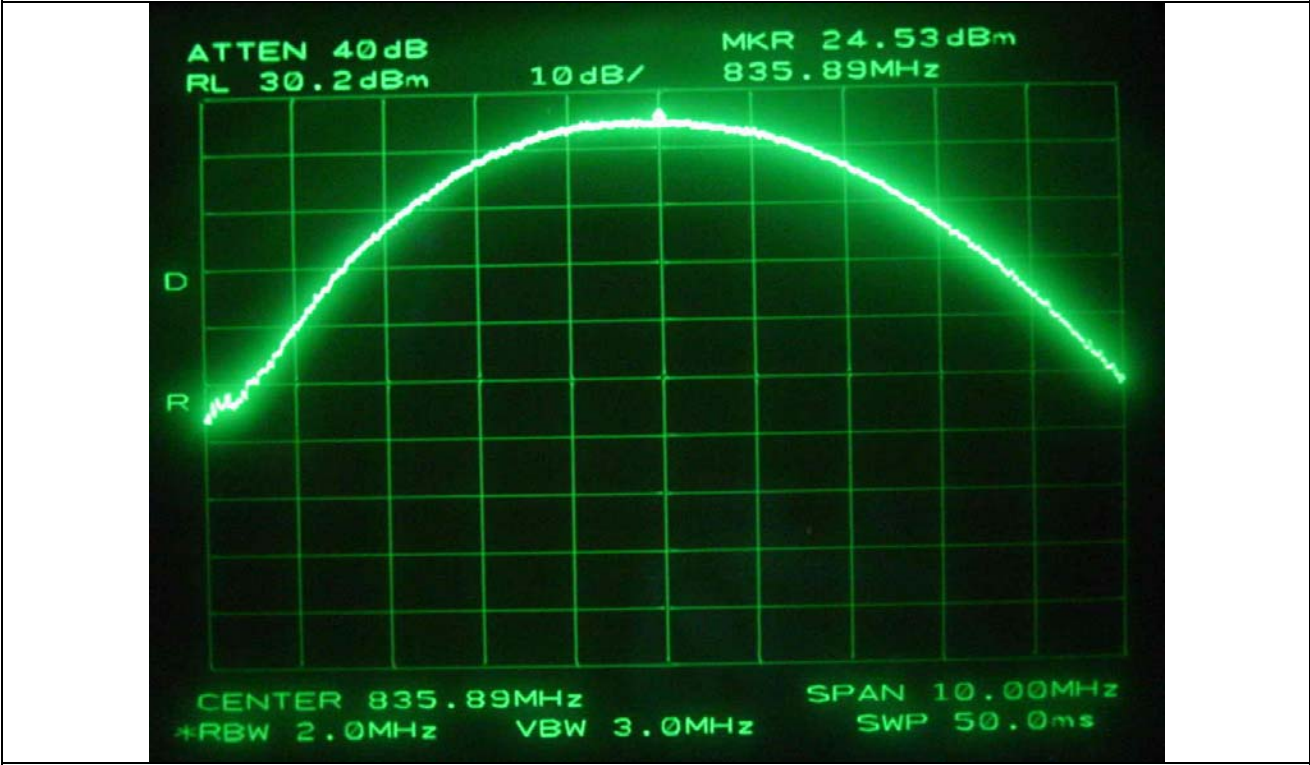


PCS _ High Channel

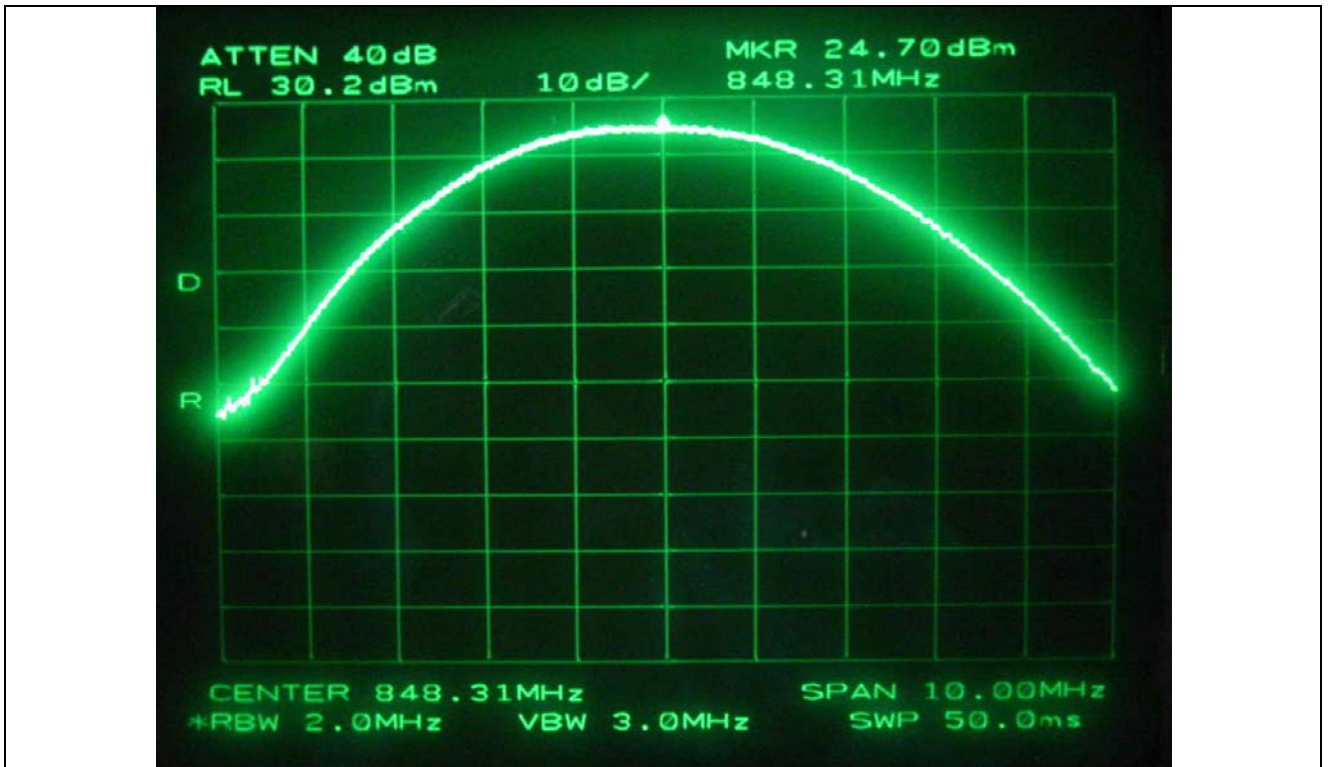
6.6 Data Photo for CDMA 1X EvDO



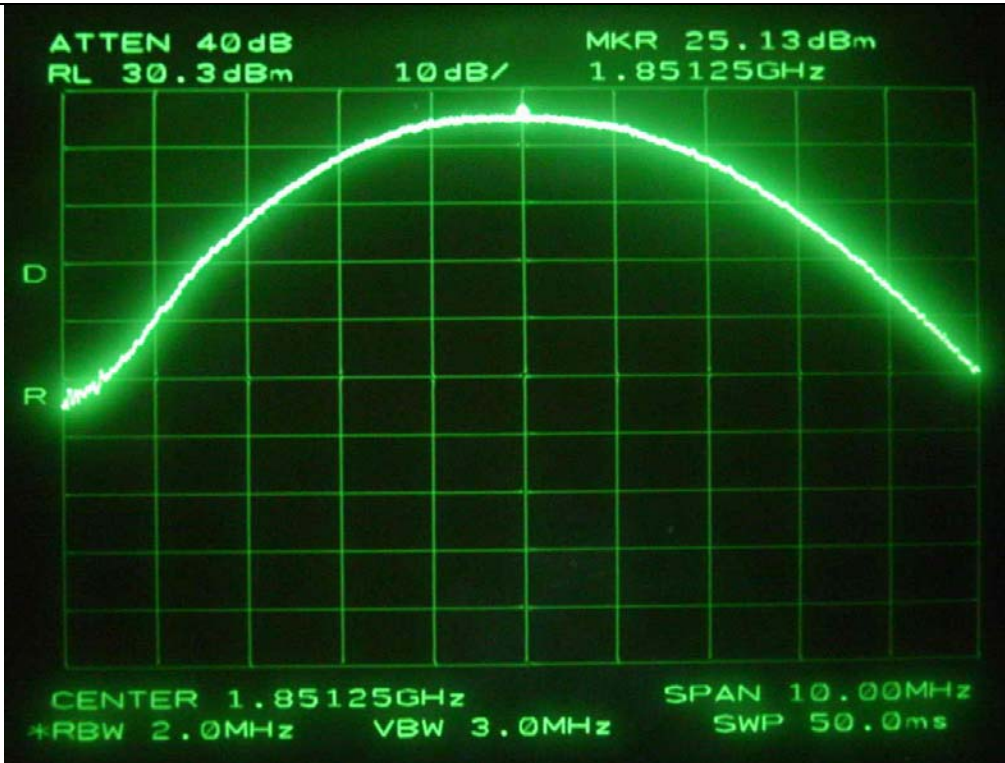
Cellular _ Low Channel



Cellular _ Middle Channel



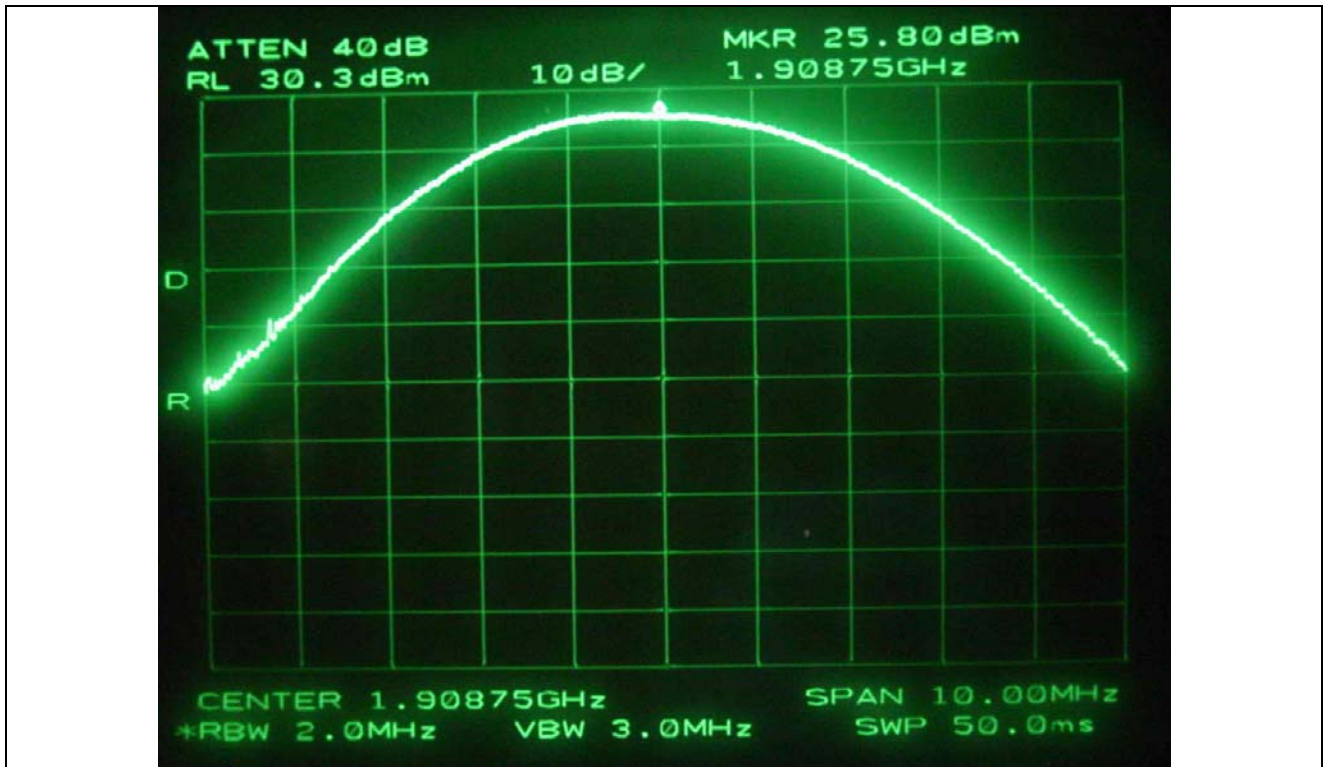
Cellular _ High Channel



PCS _ Low Channel



PCS _ Middle Channel



PCS _ High Channel

7. OCCUPIED BANDWIDTH TEST

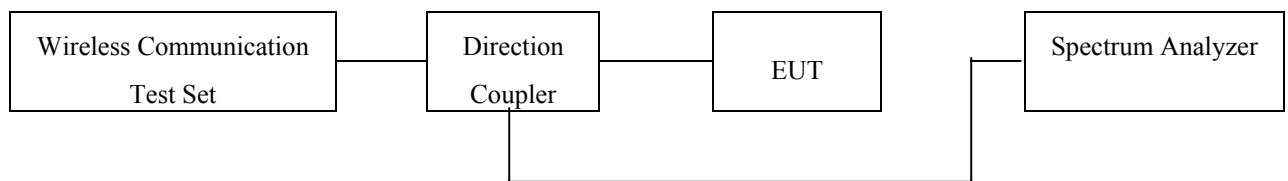
7.1 Operating environment

Temperature : 20°C

Relative humidity : 50 %

7.2 Test set-up

The RF output port of the EUT was connected to the Directional Coupler and the wanted signal for was supplied by the Wireless Communication Test Set using directional coupler. Also the output of the directional coupler was conneted to the input of the spectrum analyzer. The test was performed at three frequencies (low, middle, and high channels) for each mode.



7.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 22, 2006
■ -	E5515C	Agilent	Wireless Communication Test Set	GB44051419	August 30, 2006
■ -	778D	HP	Directional Coupler	N/A	June 23, 2006

All test equipment used is calibrated on a regular basis.

7.4 Test data

- . Test Date : December 5, 2006
 -. Test Result : Pass

Modulation	Bands	Channel	Frequency (MHz)	Measured Occupied Bandwidth (MHz)	
				99 %	26 dB
CDMA IS-2000	Cellular	Low	824.70	1.275	1.440
		Middle	835.89	1.275	1.430
		High	848.31	1.275	1.440
	PCS	Low	1851.25	1.280	1.430
		Middle	1880.00	1.280	1.440
		High	1908.75	1.280	1.435
CDMA 1XEvDO	Cellular	Low	824.70	1.275	1.435
		Middle	835.89	1.275	1.435
		High	848.31	1.275	1.430
	PCS	Low	1851.25	1.280	1.440
		Middle	1880.00	1.275	1.440
		High	1908.75	1.280	1.440

Remark. According to above result, the carrier frequency shall be within the frequency block edges.

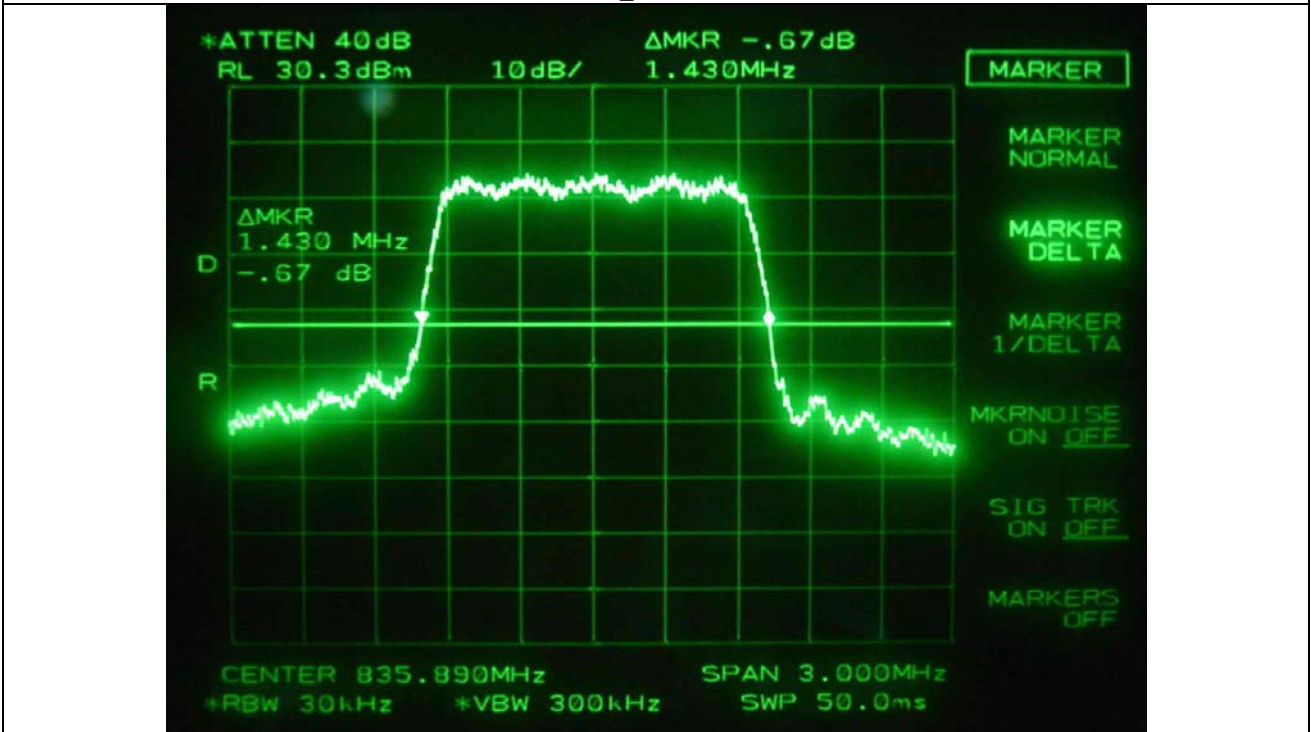


Tested by: Ki-Hong, Nam / Test Engineer

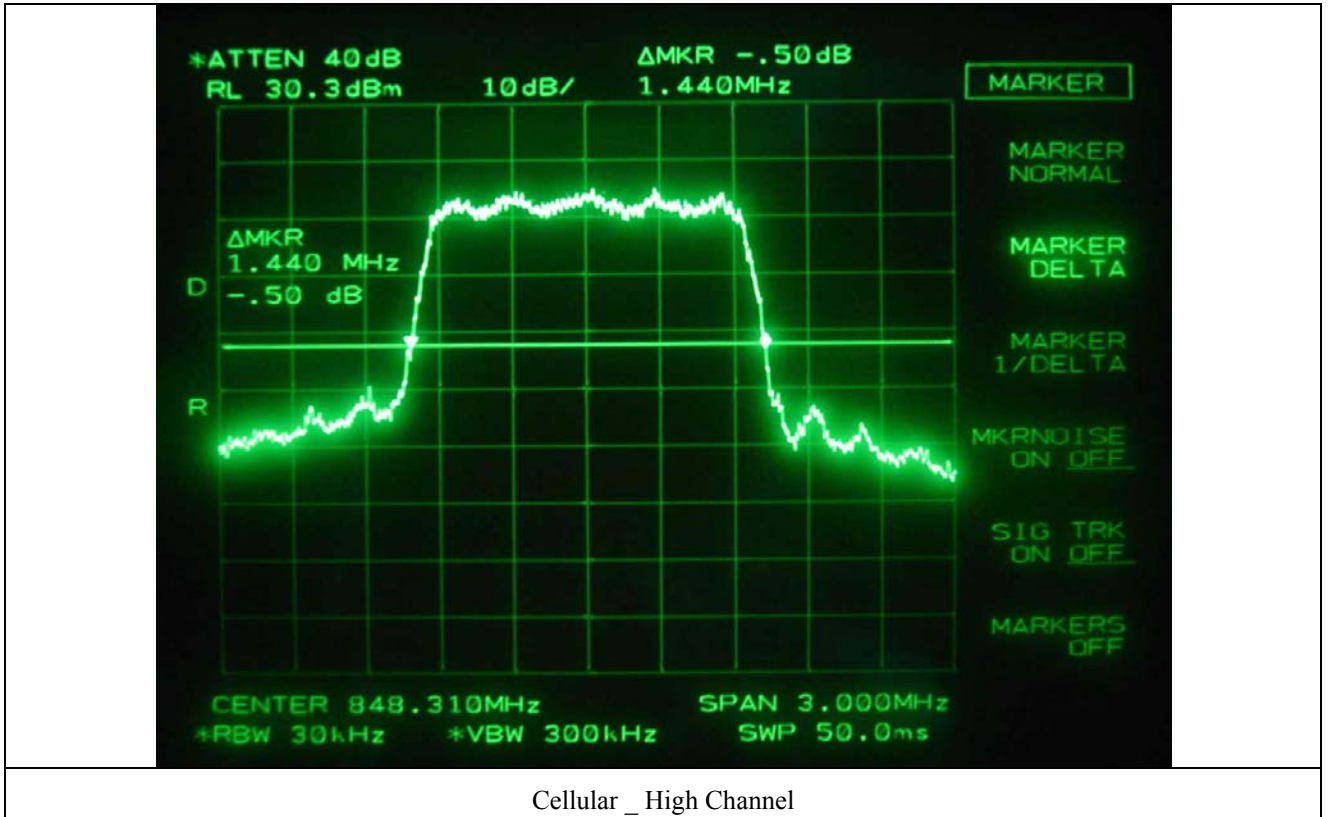
7.5 Data Photo for CDMA IS-2000



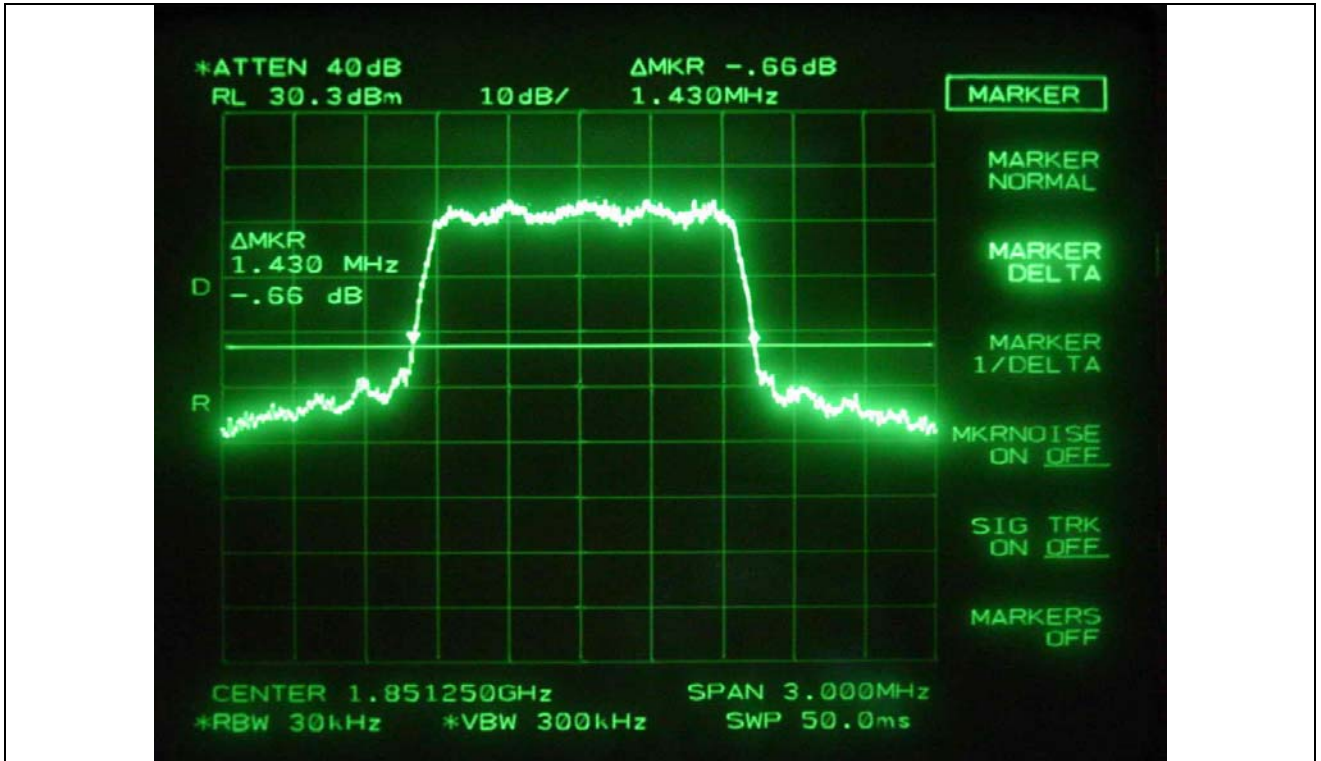
Cellular _ Low Channel



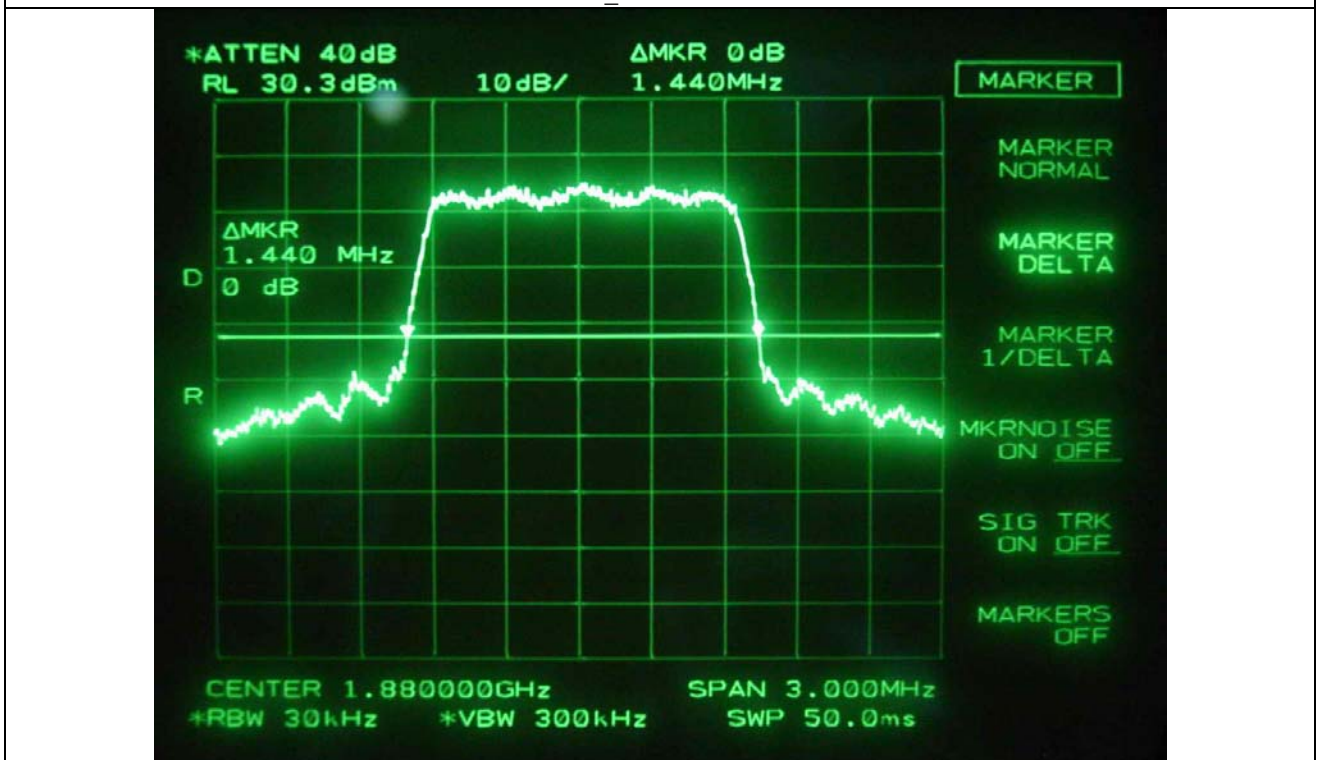
Cellular _ Middle Channel



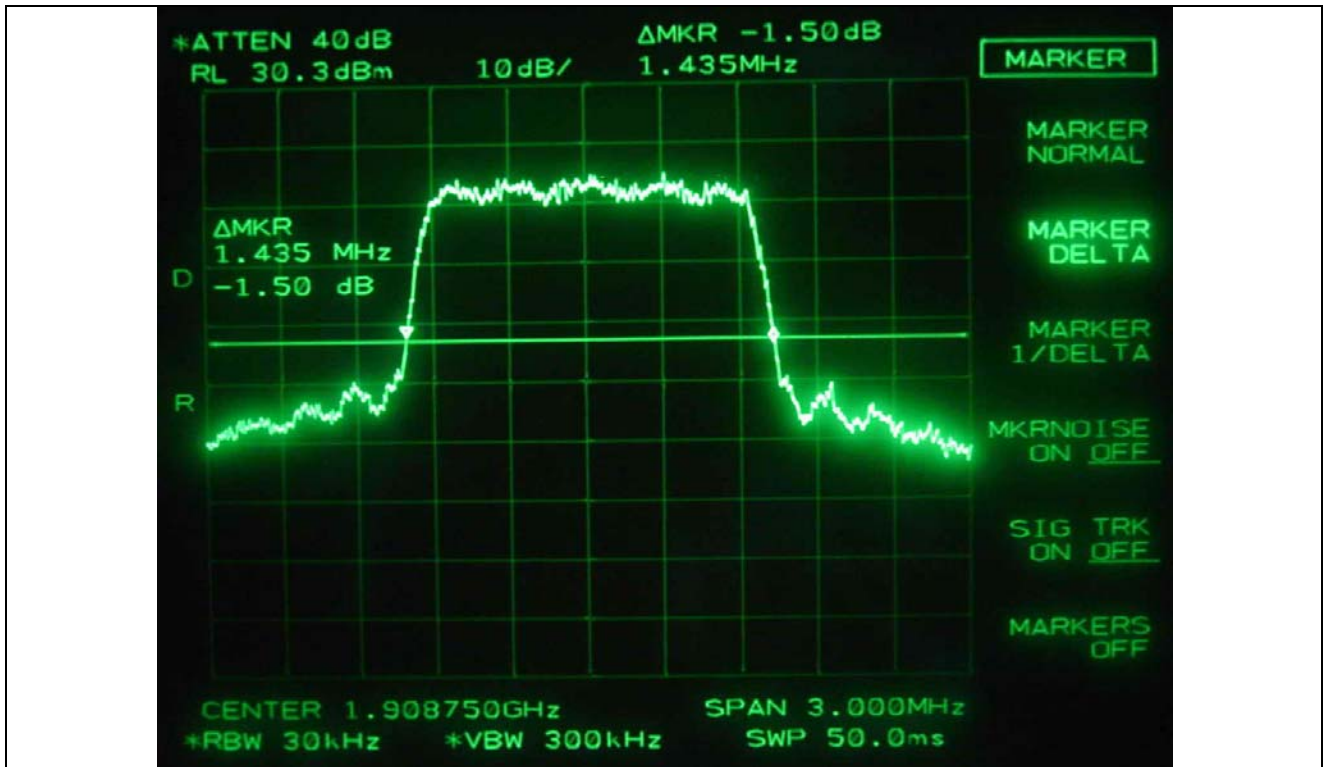
Cellular _ High Channel



PCS_Low Channel

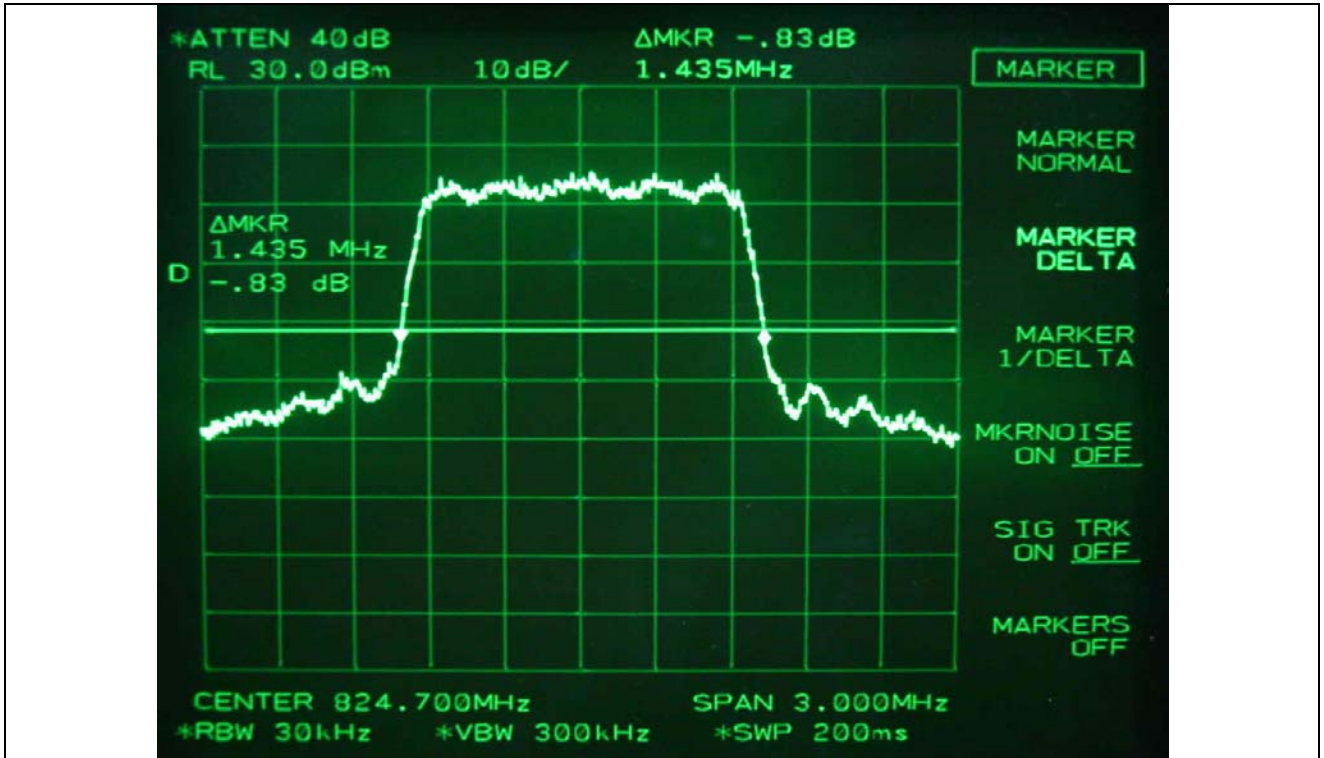


PCS_Middle Channel

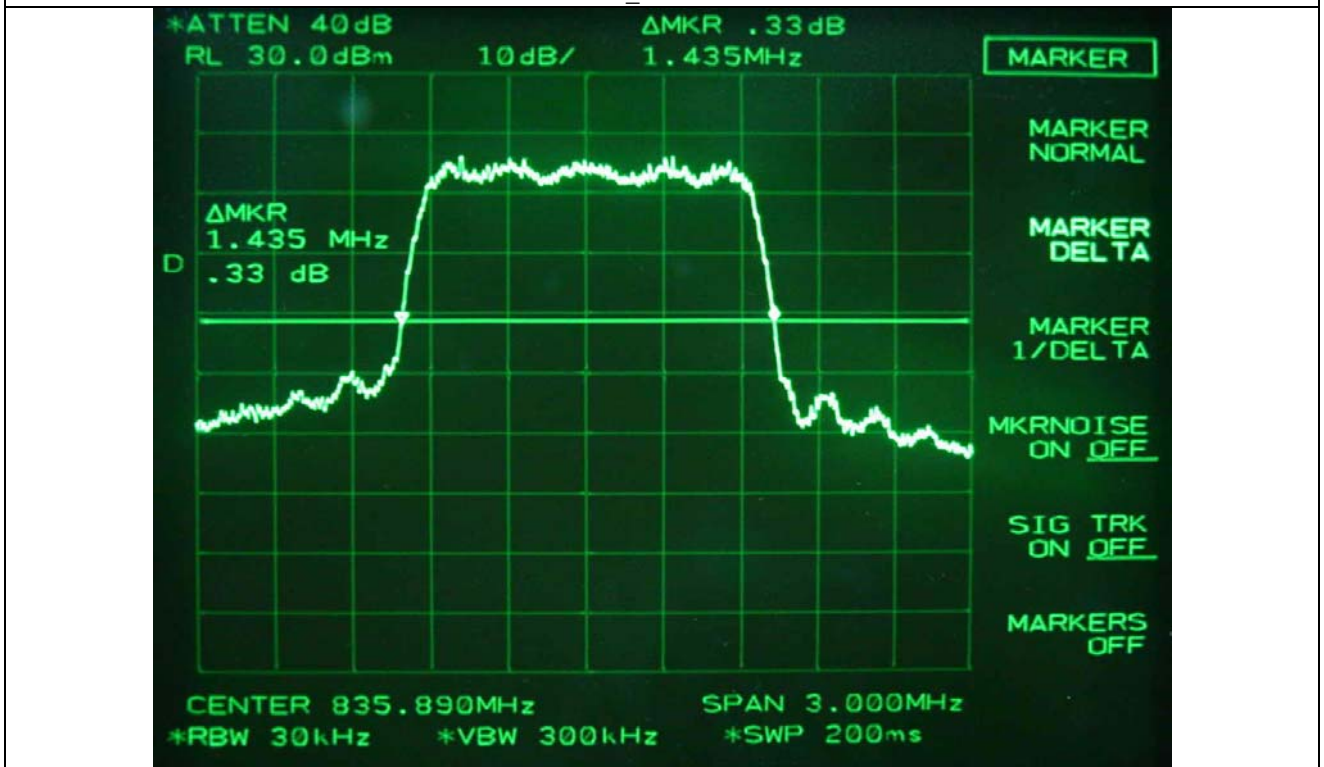


PCS _ High Channel

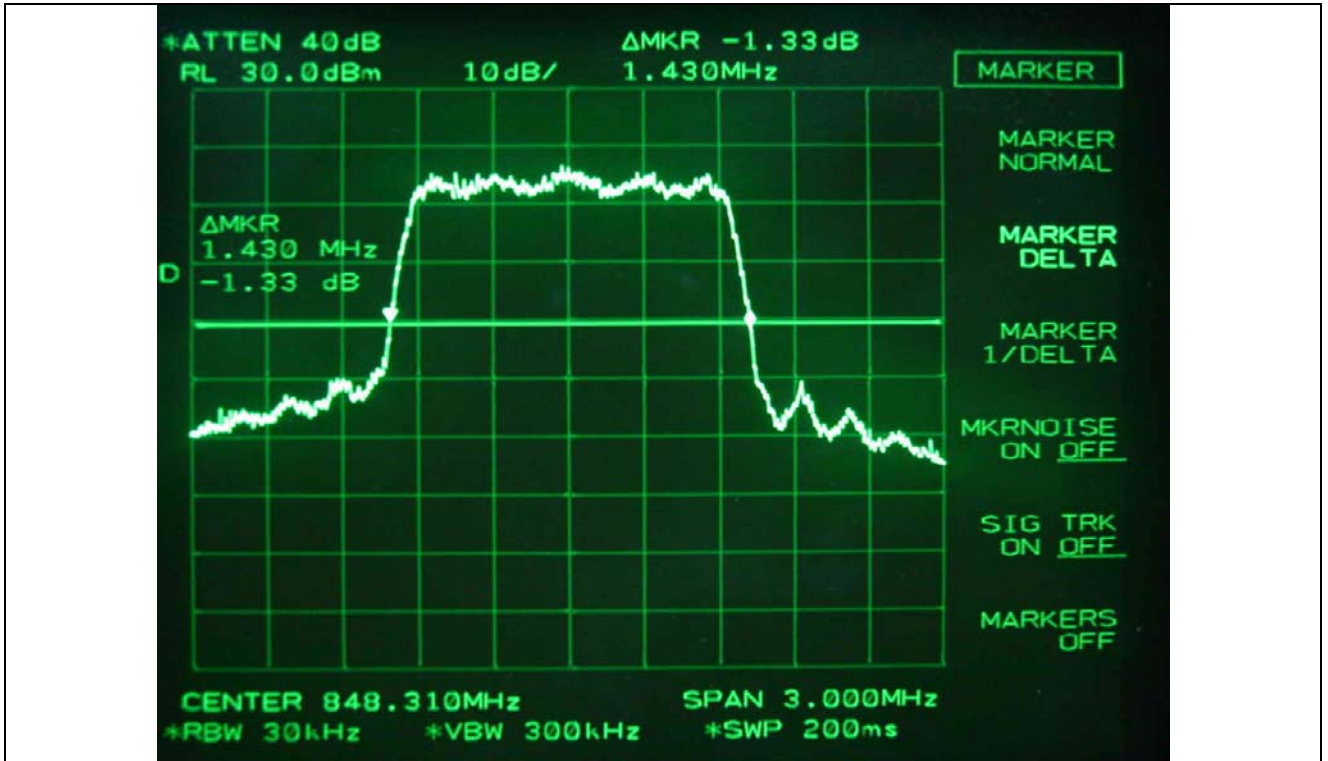
7.6 Data Photo for CDMA 1X EvDO



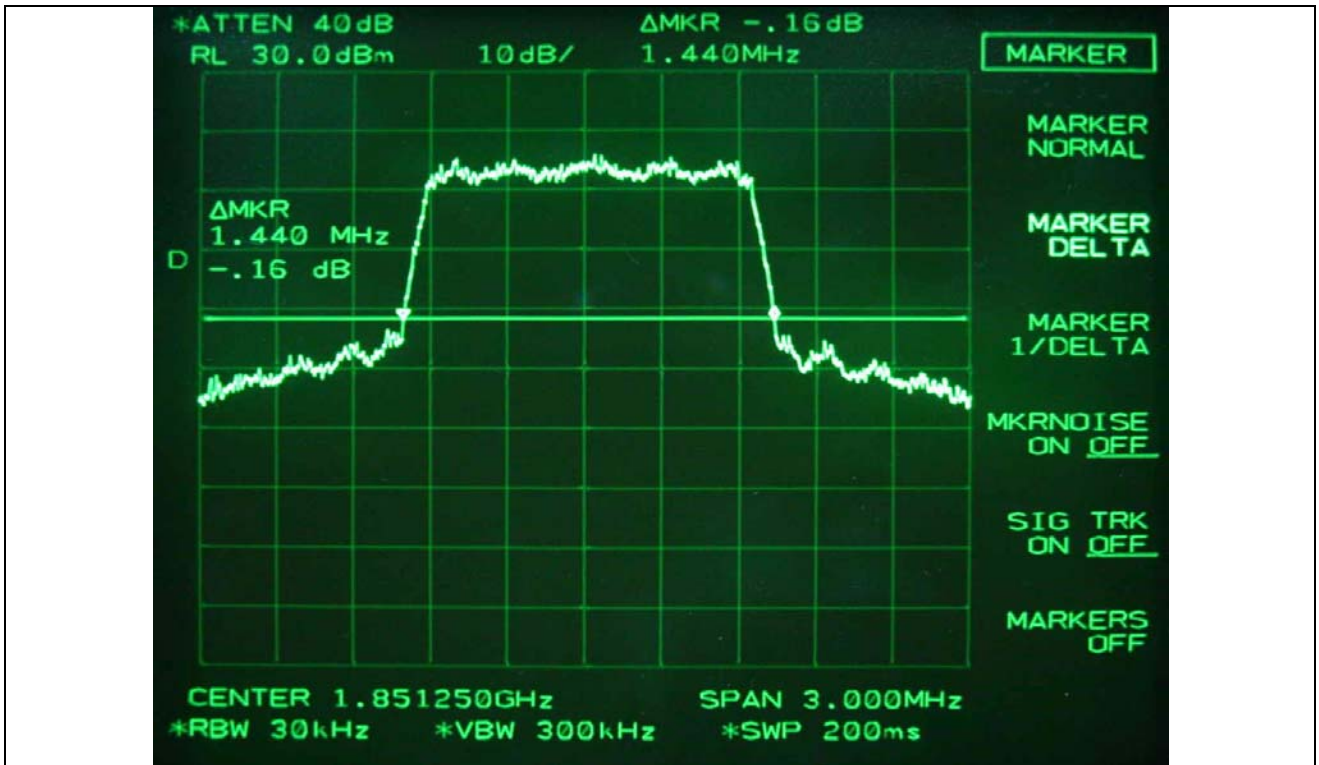
Cellular _ Low Channel



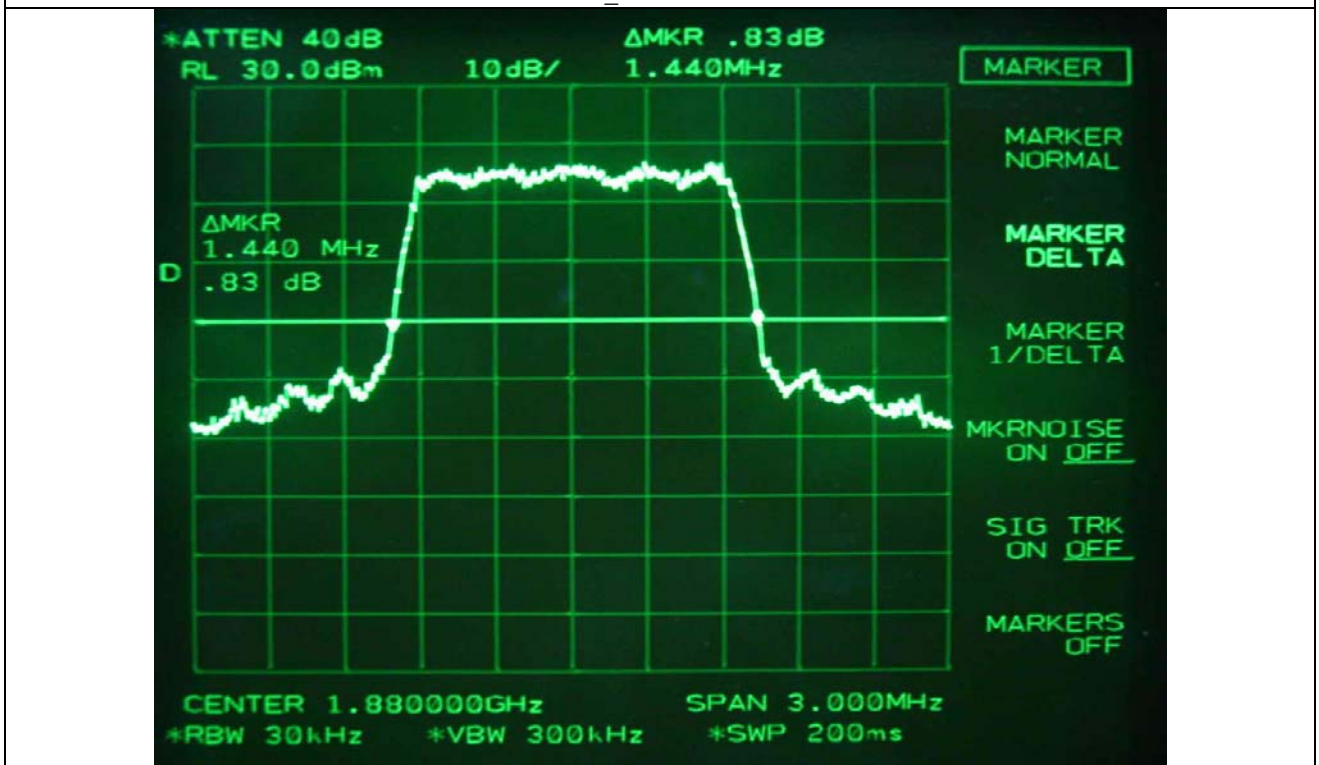
Cellular _ Middle Channel



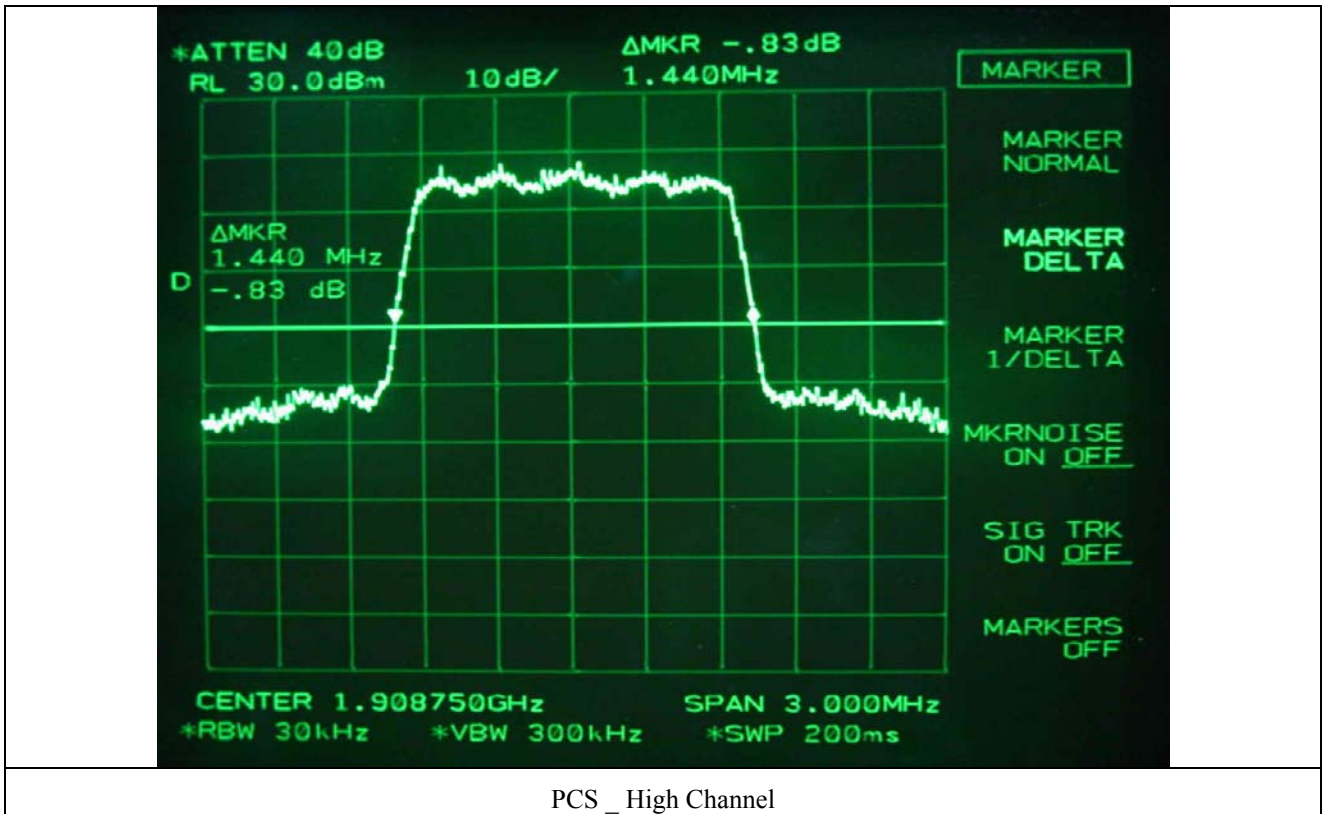
Cellular _ High Channel



PCS_Low Channel



PCS_Middle Channel



PCS _ High Channel

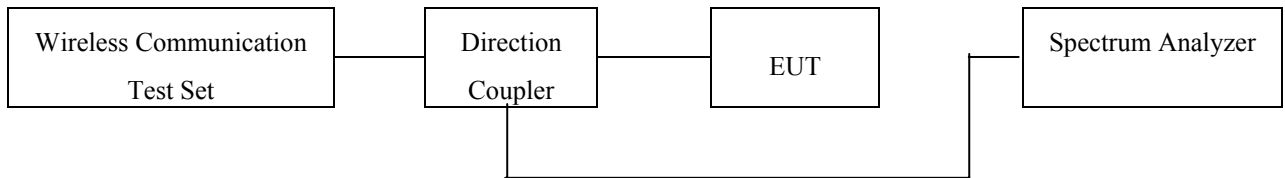
8. SPURIOUS EMISSION AT ANTENNA TERMINAL

8.1 Operating environment

Temperature : 20°C
 Relative humidity : 50 %

8.2 Test set-up for conducted measurement

The RF output port of the EUT was connected to the Directional Coupler and the wanted signal for was supplied by the Wireless Communication Test Set using directional coupler. Also the output of the directional coupler was connected to the input of the spectrum analyzer. The test was performed at three frequencies (low, middle, and high channels) for each mode.



8.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 22, 2006
■ -	E5515C	Agilent	Wireless Communication Test Set	GB44051419	August 30, 2006
■ -	778D	HP	Directional Coupler	N/A	June 23, 2006

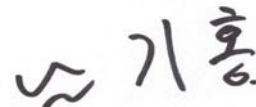
All test equipment used is calibrated on a regular basis.

8.4 Test data for CDMA IS-2000

- Test Date : December 7, 2006
- Frequency range : 30 MHz ~ 20 GHz
- Result : PASSED BY – 6.34 dB at Low Channel in PCS Mode

Bands	Channel	Frequency (MHz)	Measured Level (dBm)	Cable Loss (dB)	TOTAL (dBm)
Cellular	Low	1645.00	-32.17	0.34	-31.83
		2471.00	-26.50	0.66	-25.84
		3288.00	-30.17	0.90	-29.27
	Middle	1670.00	-29.33	0.34	-28.99
		2500.00	-25.33	0.66	-24.67
		3325.00	-28.67	0.90	-27.77
	High	1695.00	-27.00	0.34	-26.66
		2538.00	-24.67	0.66	-24.01
		3375.00	-28.33	0.90	-27.43
PCS	Low	2222.00	-35.67	0.66	-35.01
		3670.00	-25.33	0.90	-24.43
		5530.00	-20.67	1.33	-19.34
	Middle	2359.00	-35.33	0.66	-34.67
		3730.00	-26.50	0.90	-25.60
		5620.00	-25.33	1.33	-24.00
	High	2027.00	-35.67	0.66	-35.01
		3780.00	-21.50	0.90	-20.60
		5710.00	-25.33	1.33	-24.00

According to Part 22H and 24E, out of band emission shall be attenuated by $43 + 10 \log (P)$ dBc, equates to -13.0dBm.



Tested by: Ki-Hong, Nam / Test Engineer

8.5 Test data for CDMA 1xEVDO

- Test Date : December 7, 2006
- Frequency range : 30 MHz ~ 20 GHz
- Result : PASSED BY – 5.84 dB at Low Channel in PCS Mode

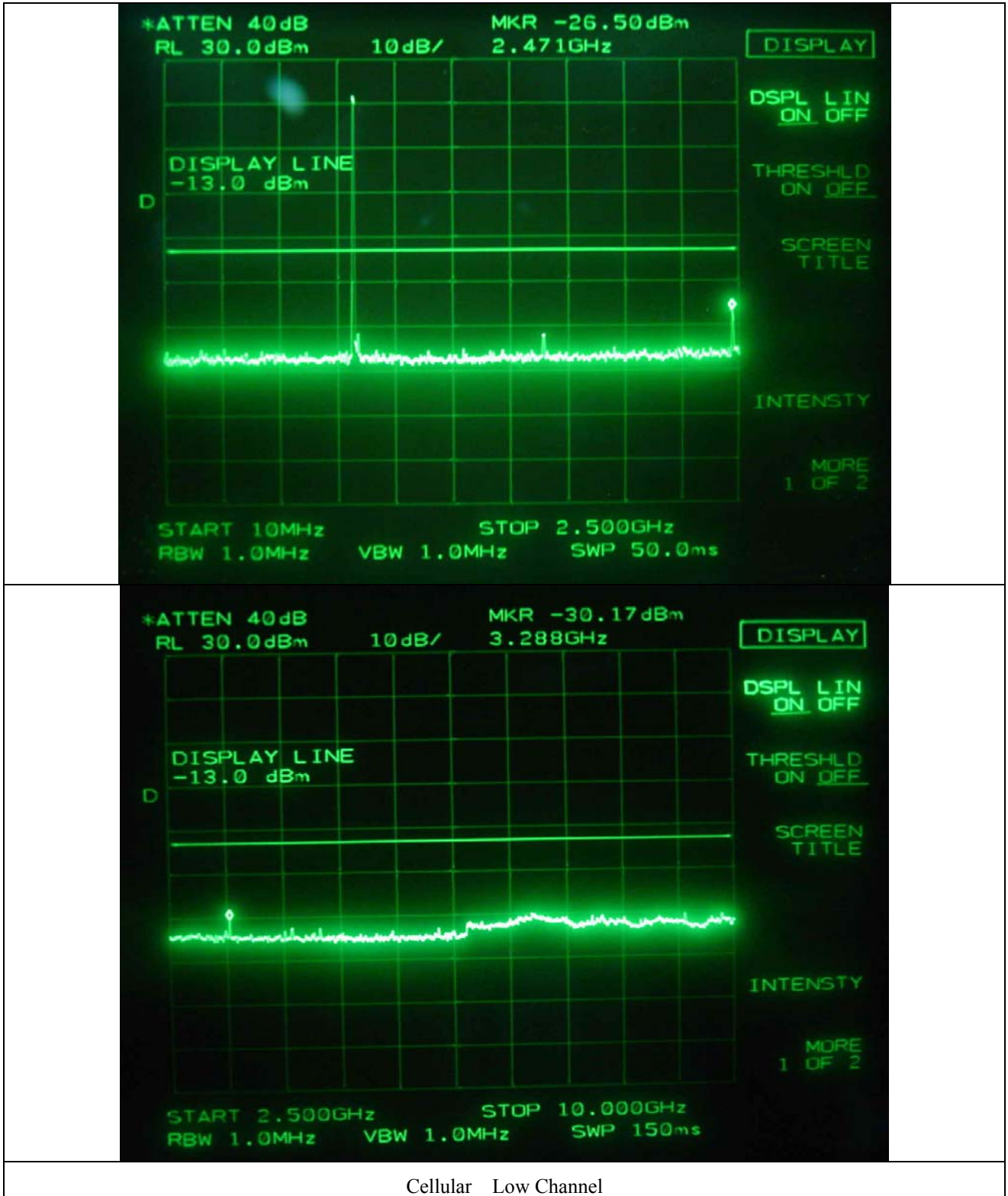
Bands	Channel	Frequency (MHz)	Measured Level (dBm)	Cable Loss (dB)	TOTAL (dBm)
Cellular	Low	1645.00	-32.50	0.34	-32.16
		2471.00	-26.33	0.66	-25.67
		3288.00	-31.17	0.90	-30.27
	Middle	1670.00	-28.33	0.34	-27.99
		2500.00	-24.50	0.66	-23.84
		3325.00	-28.50	0.90	-27.60
	High	1695.00	-26.50	0.34	-26.16
		2538.00	-24.83	0.66	-24.17
		3375.00	-27.50	0.90	-26.60
PCS	Low	2222.00	-34.67	0.66	-34.01
		3670.00	-26.67	0.90	-25.77
		5530.00	-20.17	1.33	-18.84
	Middle	2359.00	-34.00	0.66	-33.34
		3730.00	-25.67	0.90	-24.77
		5620.00	-21.67	1.33	-20.34
	High	2027.00	-35.17	0.66	-34.51
		3780.00	-19.83	0.90	-18.93
		5710.00	-20.67	1.33	-19.34

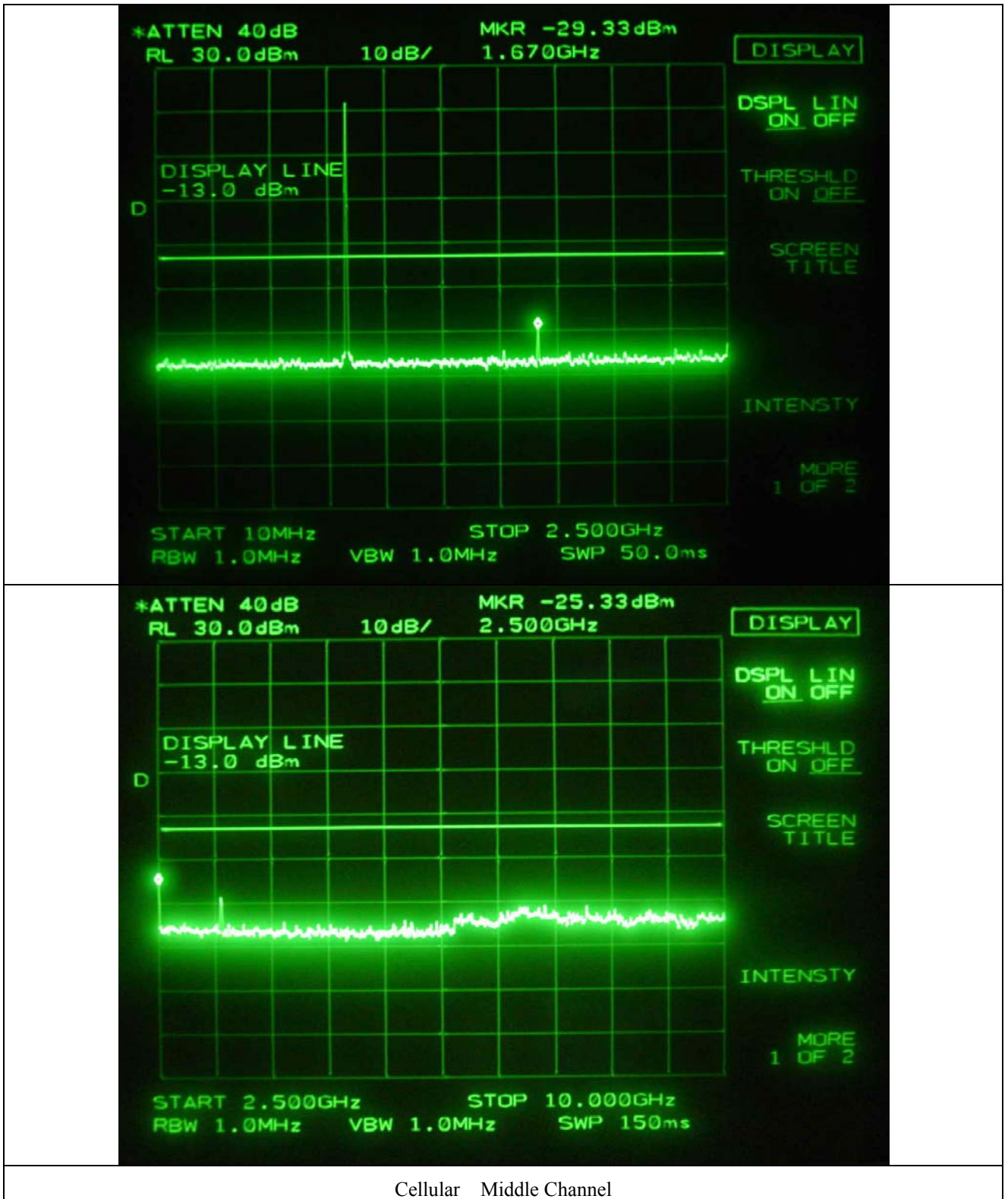
According to Part 22H and 24E, out of band emission shall be attenuated by $43 + 10 \log (P)$ dBc, equates to -13.0dBm.



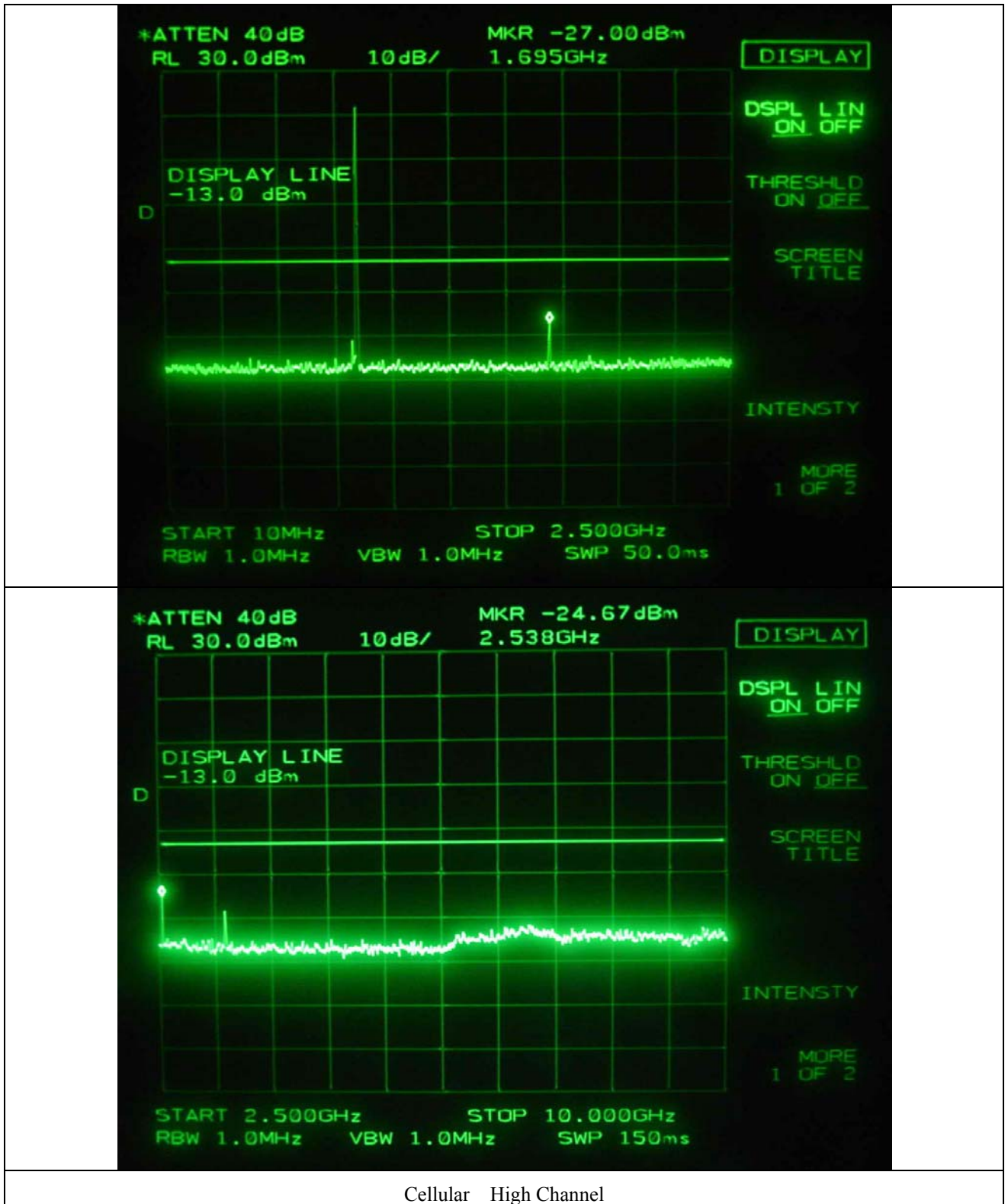
Tested by: Ki-Hong, Nam / Test Engineer

8.5 Data Photo for CDMA IS-2000

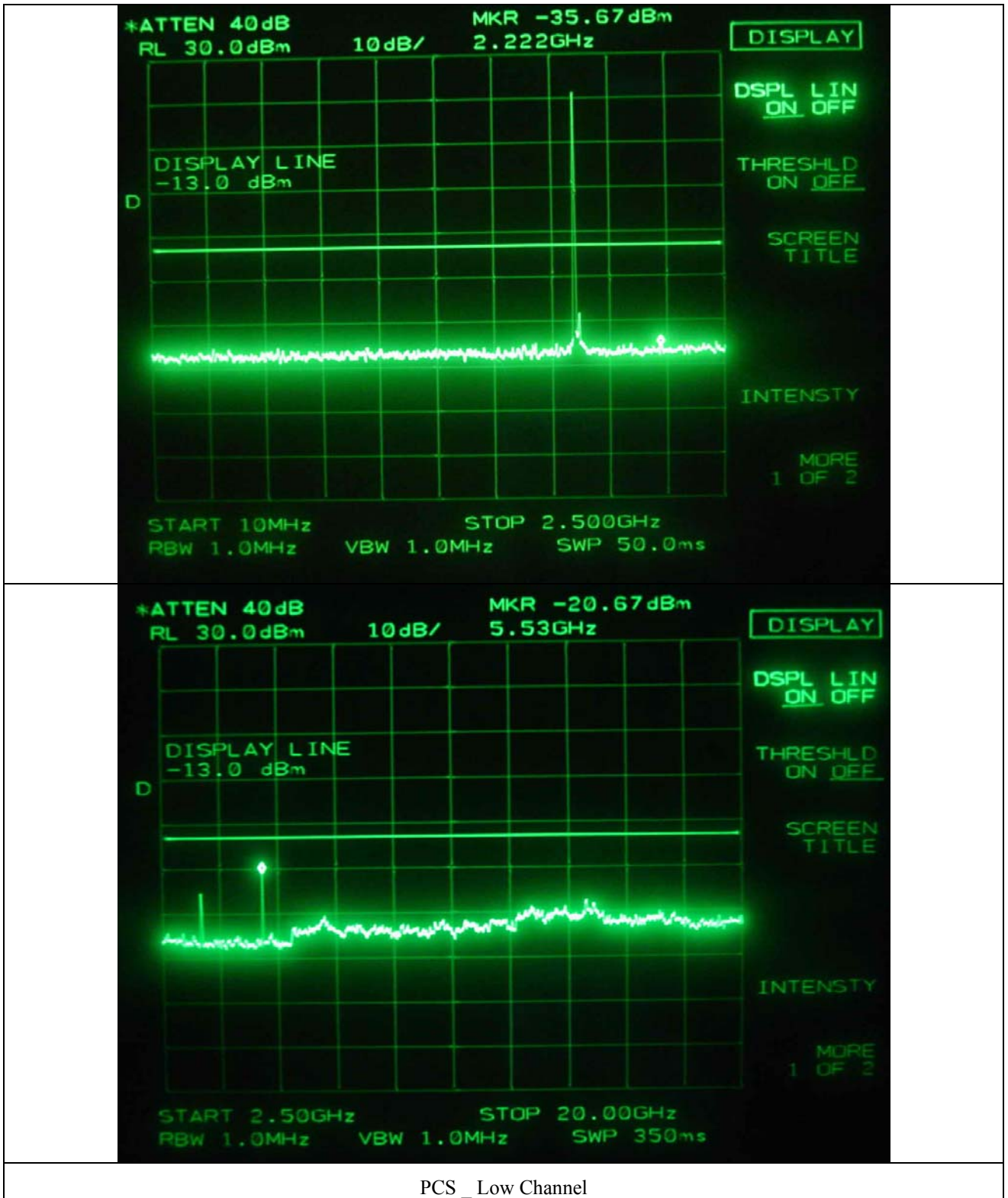




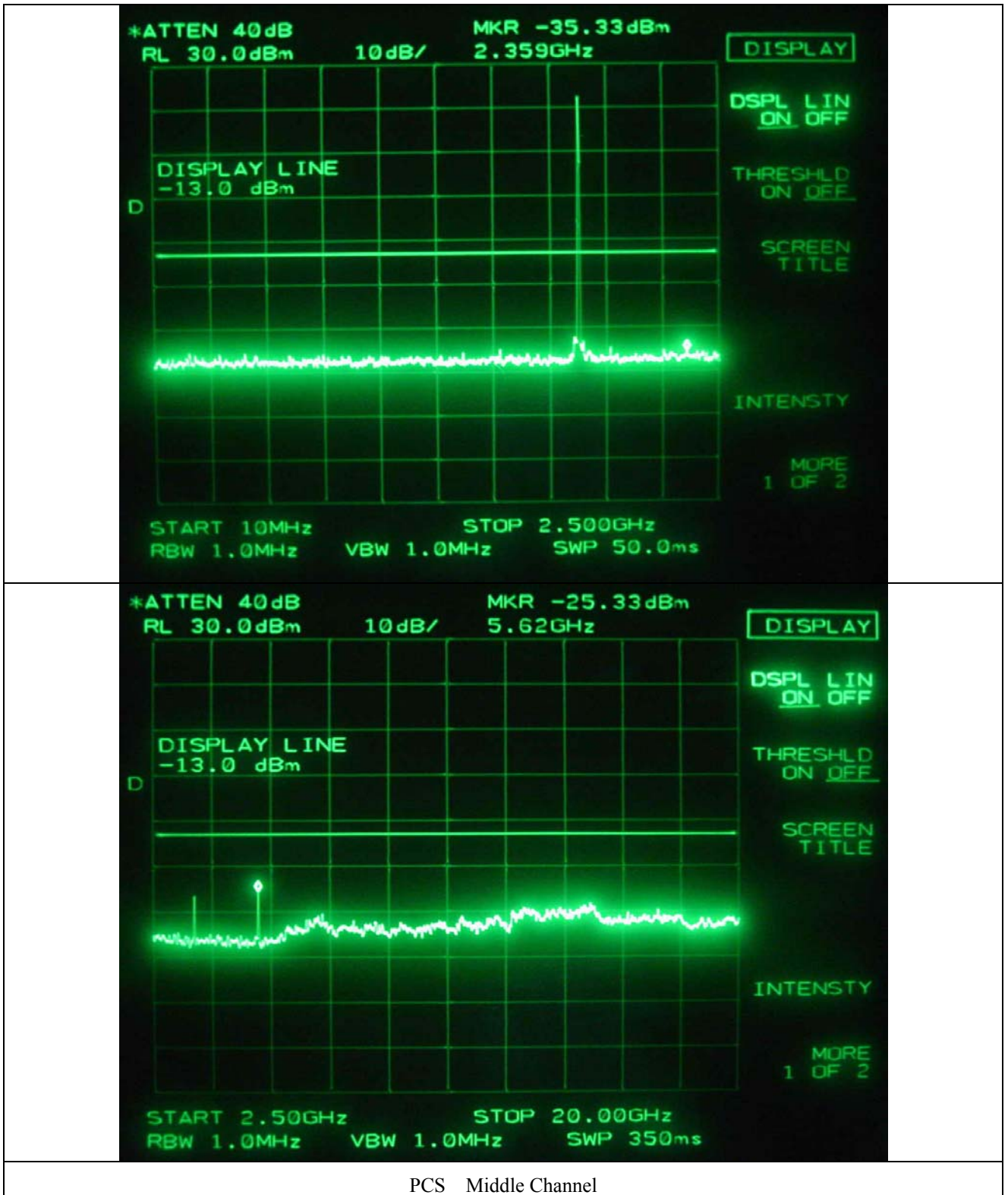
Cellular _ Middle Channel

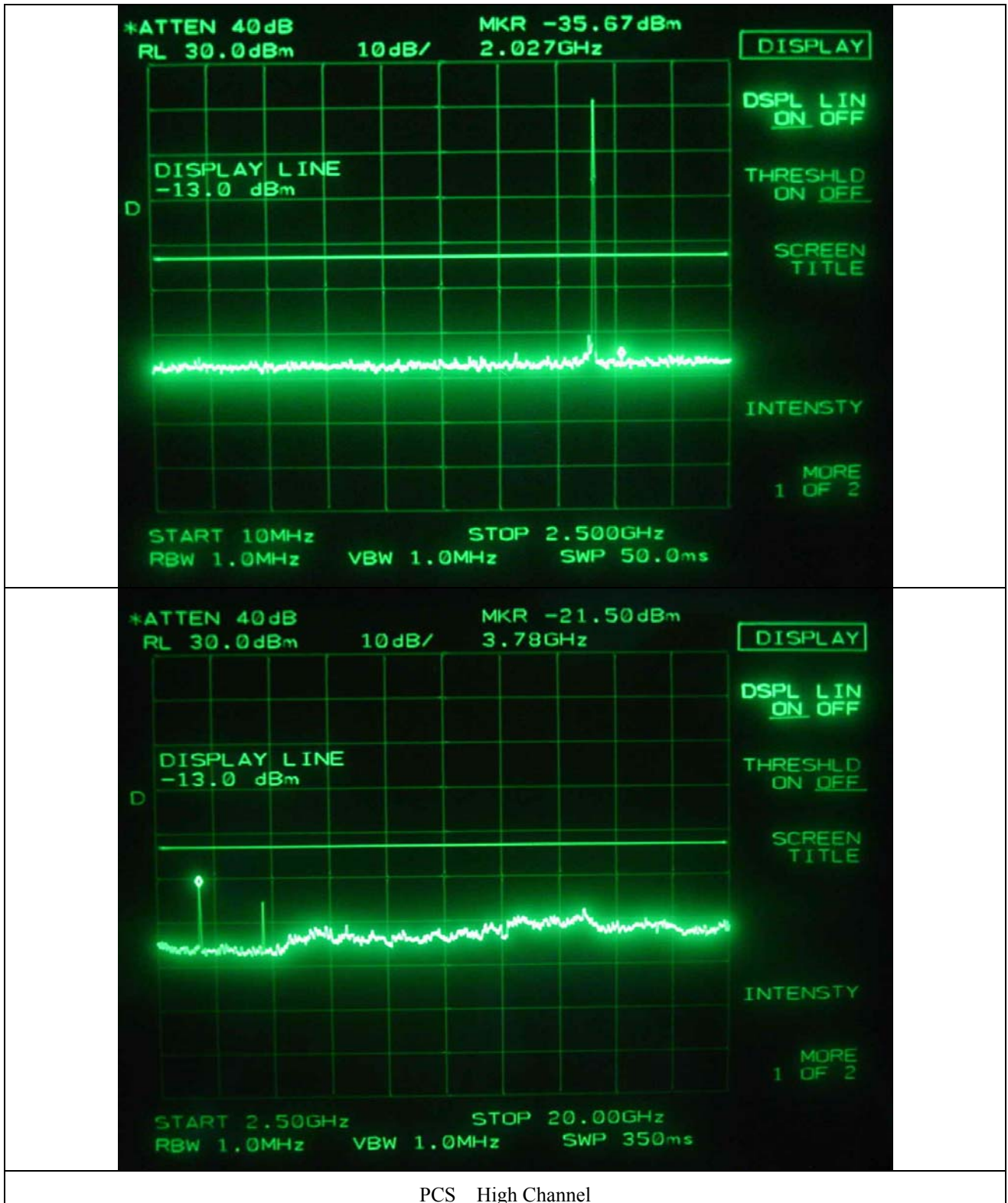


Cellular _ High Channel

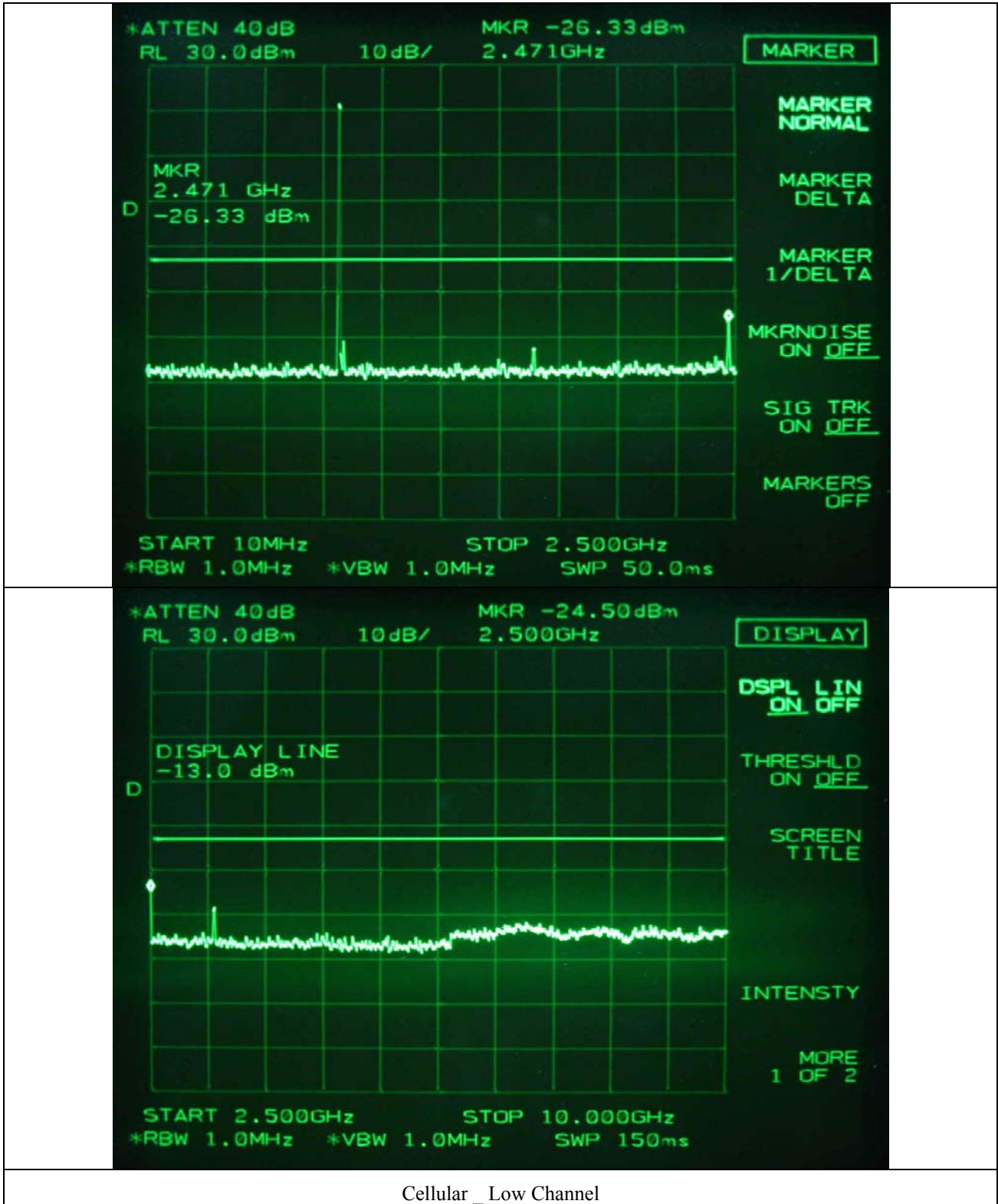


PCS _ Low Channel

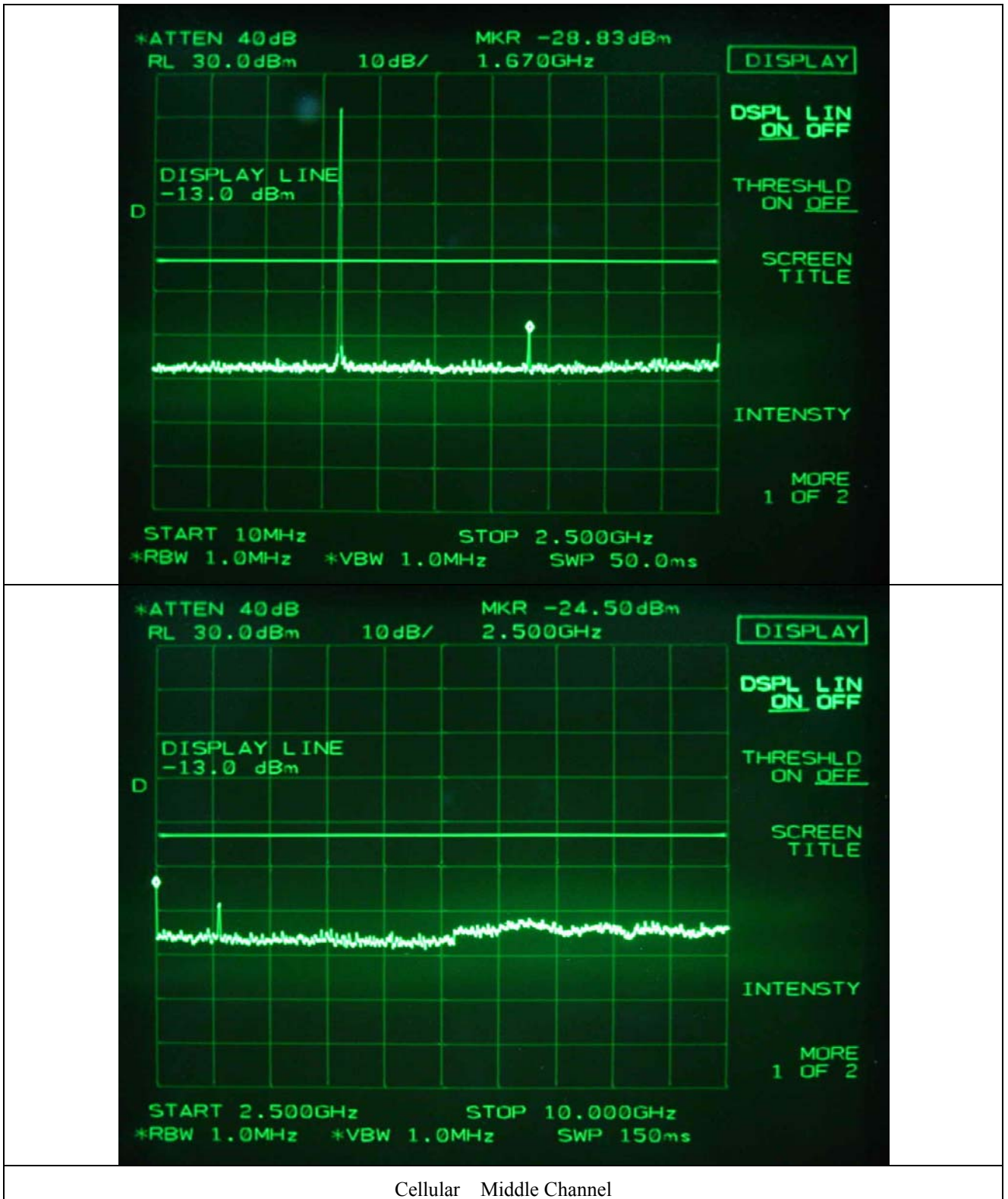




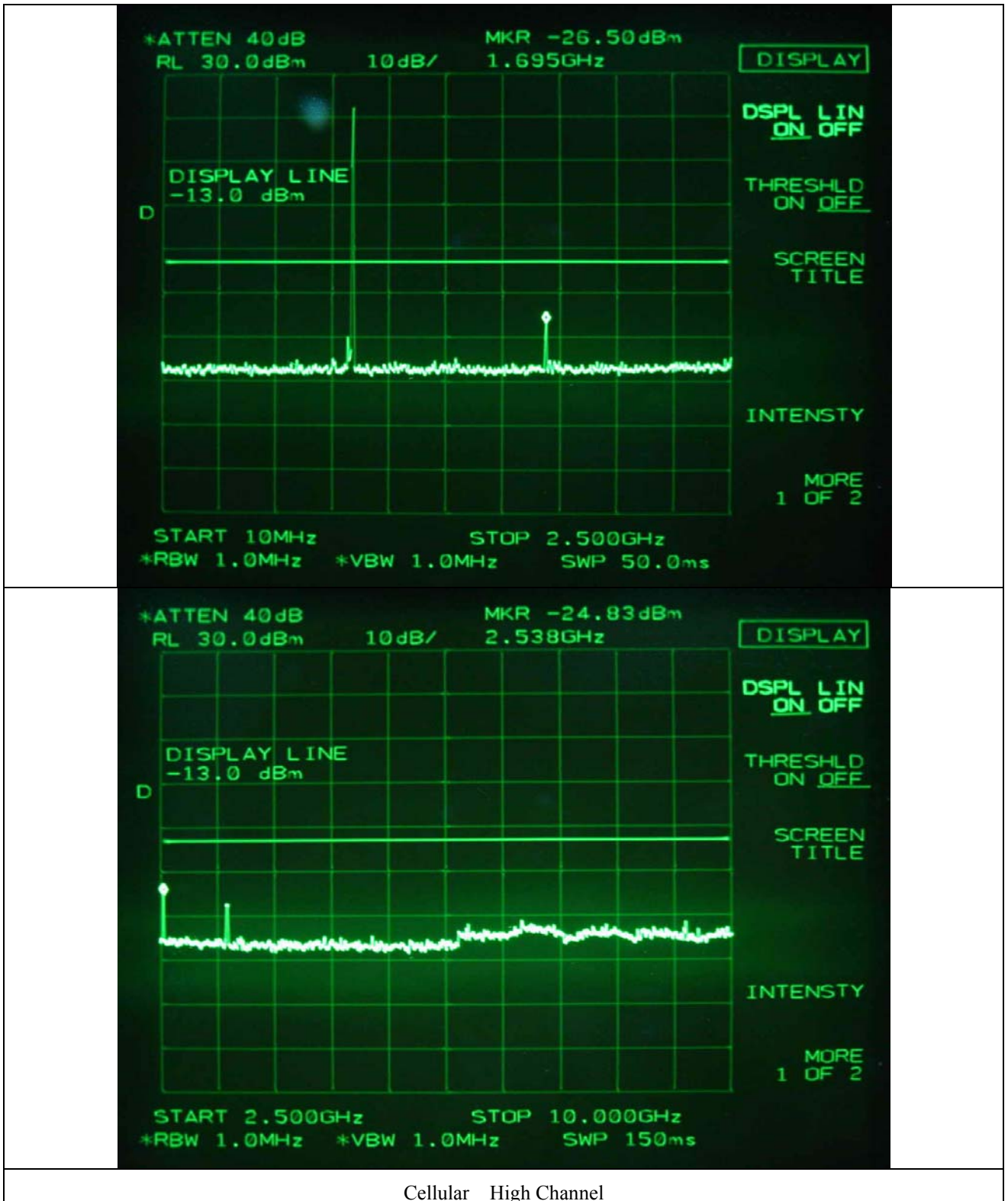
8.6 Data Photo for CDMA 1X EvDO



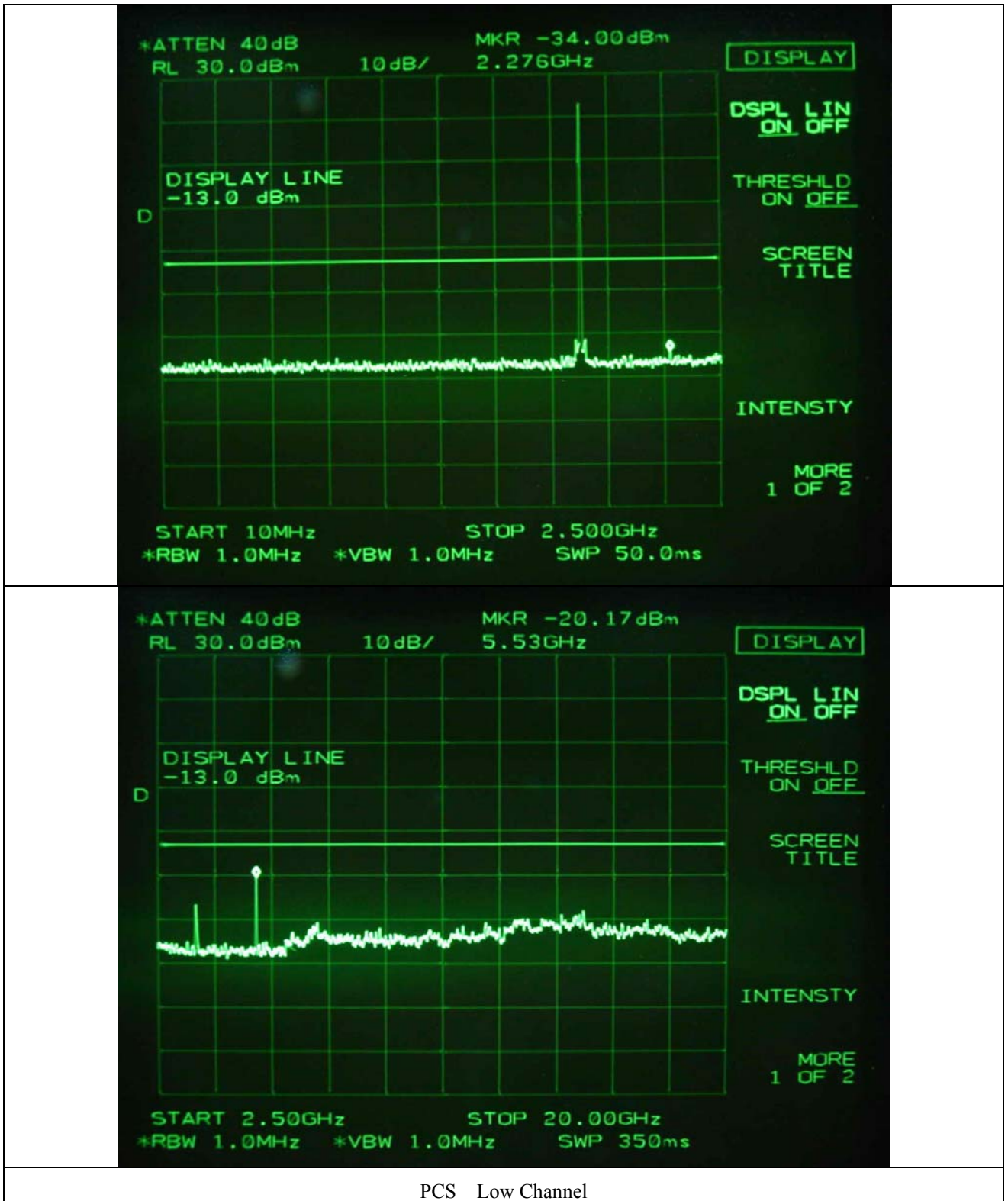
Cellular _ Low Channel



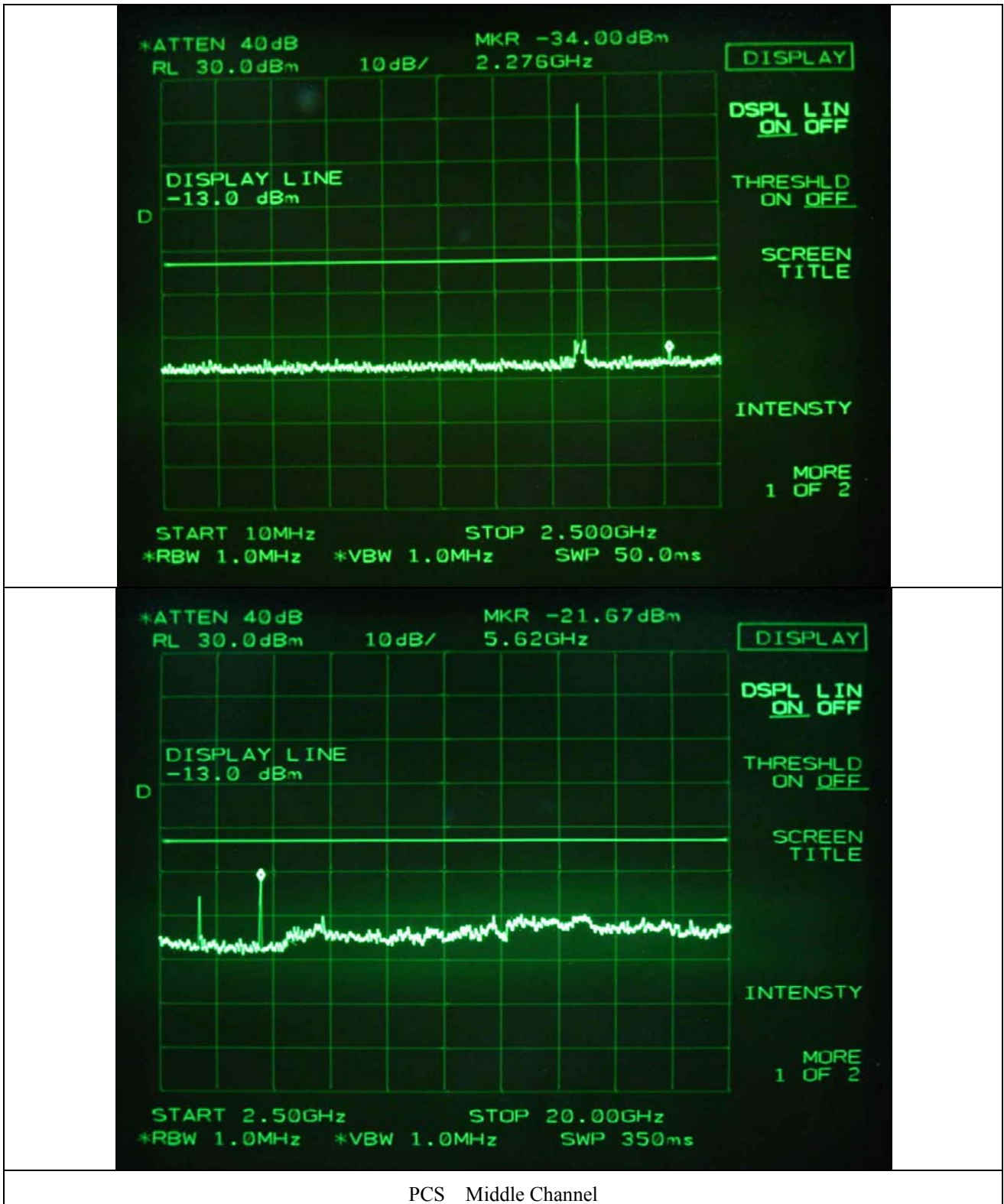
Cellular _ Middle Channel

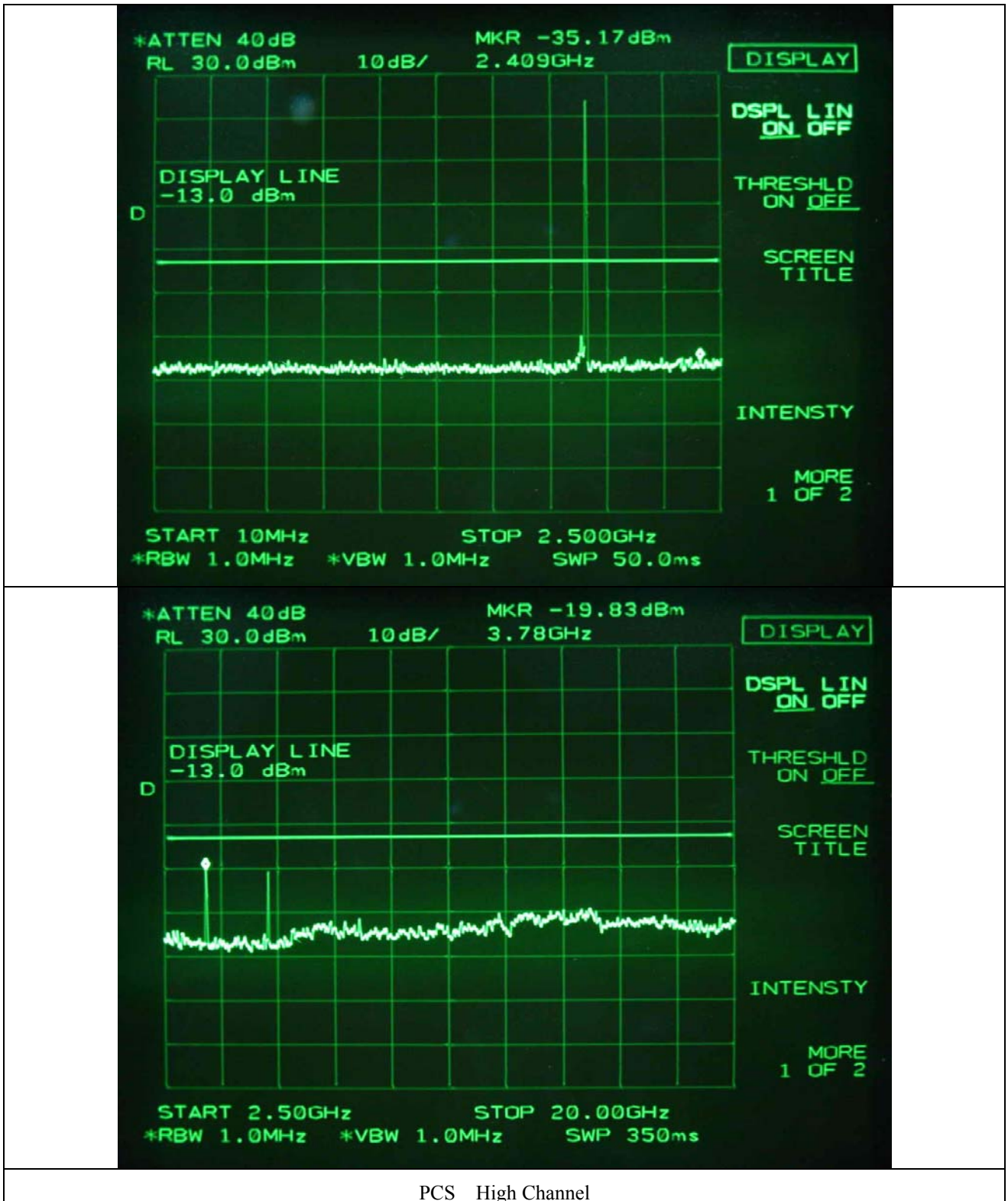


Cellular _ High Channel



PCS_Low Channel





PCS_High Channel

9. SPURIOUS EMISSION AT ANTENNA TERMINAL AT BLOCK EDGES \pm 1 MHz

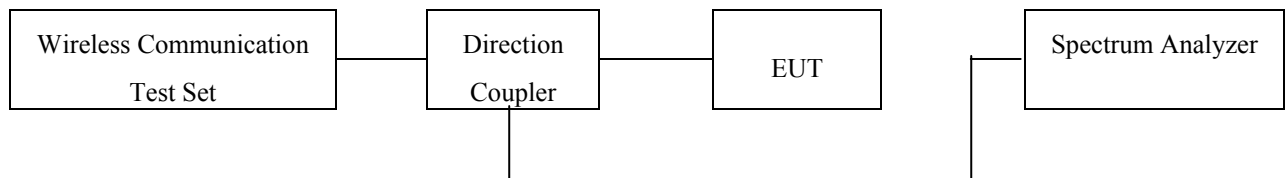
9.1 Operating environment

Temperature : 20 °C

Relative humidity : 50 %

9.2 Test set-up for conducted measurement

The RF output port of the EUT was connected to the Directional Coupler and the wanted signal for was supplied by the Wireless Communication Test Set using directional coupler. Also the output of the directional coupler was connected to the input of the spectrum analyzer. The test was performed at three frequencies (low, middle, and high channels) for each mode.



9.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 22, 2006
■ -	E5515C	Agilent	Wireless Communication Test Set	GB44051419	August 30, 2006
■ -	778D	HP	Directional Coupler	N/A	June 23, 2006

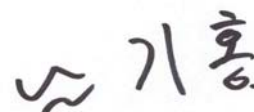
All test equipment used is calibrated on a regular basis.

9.4 Test data

- Test Date : December 7, 2006
- Result : PASSED BY - 7.67 dB at Cellular Mode in 1xEvDO

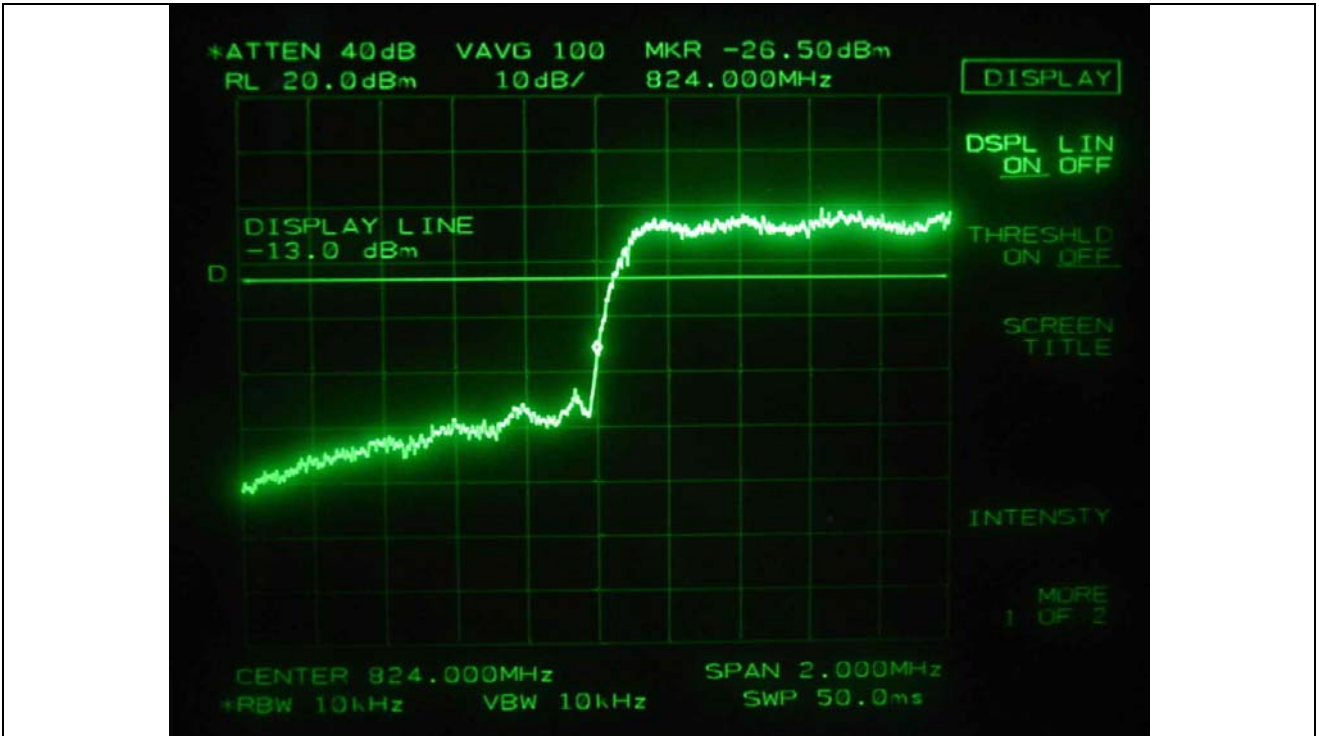
Modulation	Bands	Channel	Frequency (MHz)	Max. Measured Value (dBm)	Limit (dBm)
CDMA IS-2000	Cellular	Low	824.00	-26.50	-13.0
		High	849.00	-21.00	
	PCS	Low	1850.00	-40.50	
		High	1910.00	-45.50	
CDMA 1xEvDO	Cellular	Low	824.00	-26.33	-13.0
		High	849.00	-20.67	
	PCS	Low	1850.00	-41.00	
		High	1910.00	-43.83	

According to Part 22H and 24E, out of band emission shall be attenuated by $43 + 10 \log (P)$ dBc, equates to -13.0dBm.



Tested by: Ki-Hong, Nam / Test Engineer

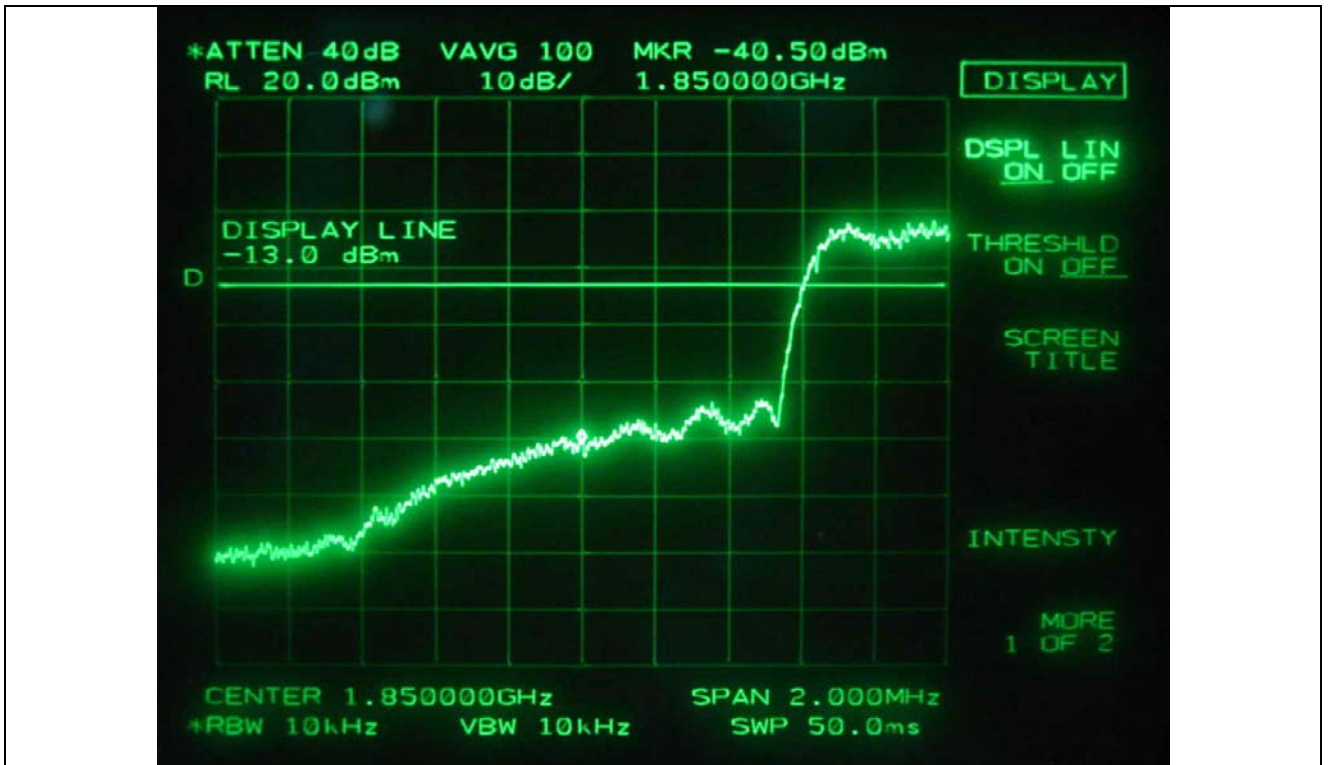
9.5 Data Photo for CDMA 1S-2000



Cellular _ Low Channel



Cellular _ High Channel

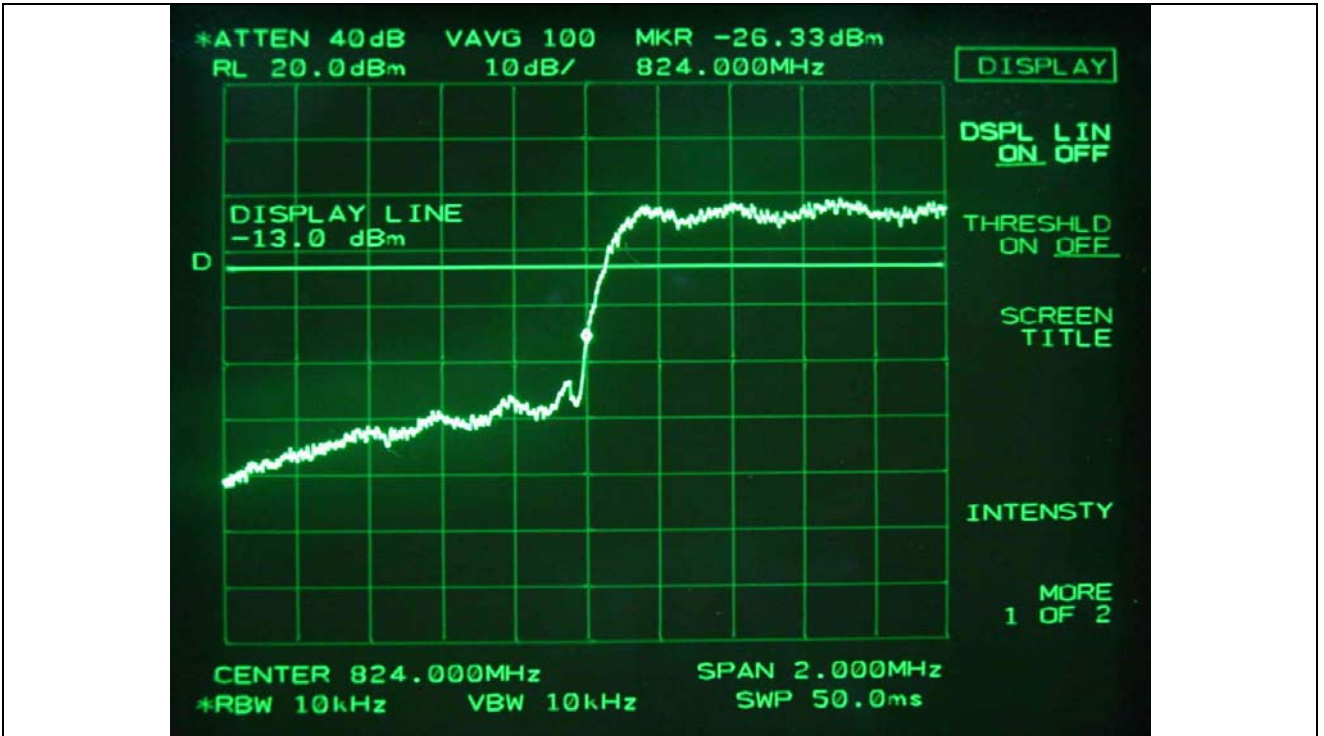


PCS_Low Channel

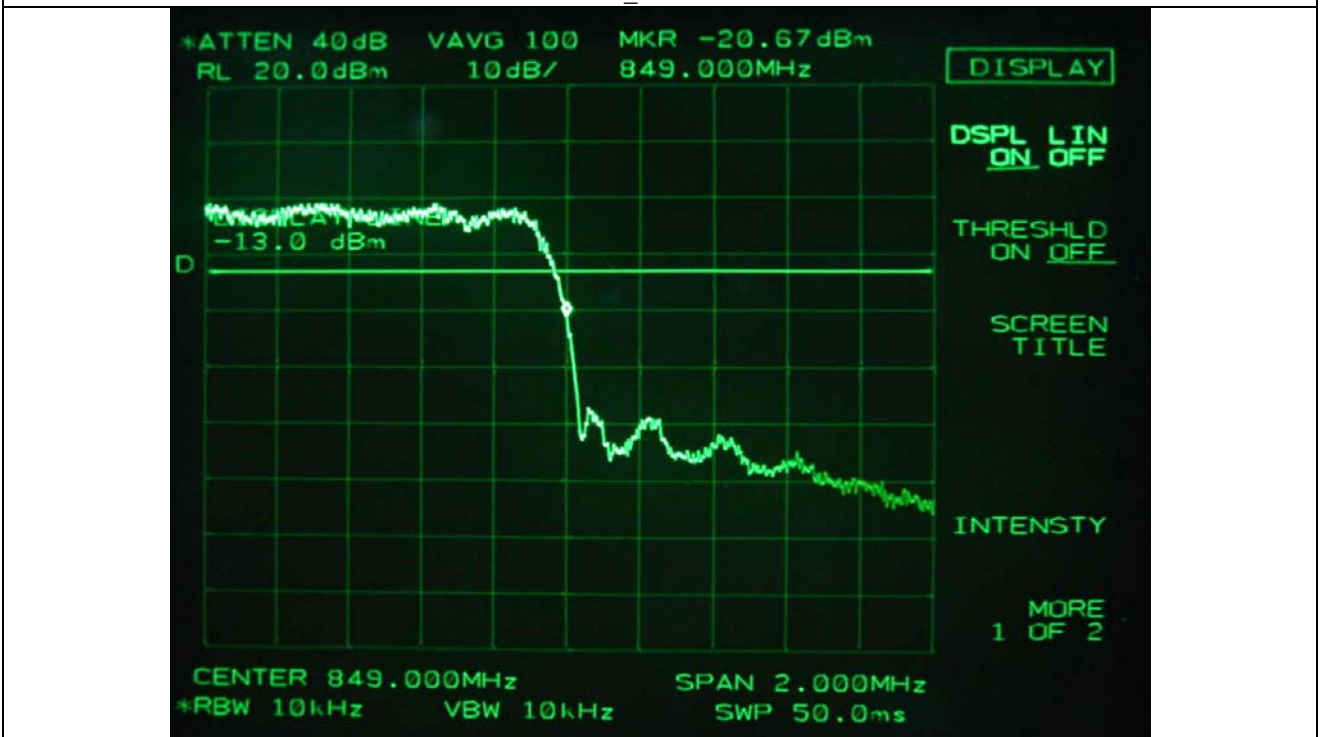


PCS_High Channel

9.6 Data Photo for CDMA 1xEvDO



Cellular _ Low Channel



Cellular _ High Channel



PCS_Low Channel



PCS_High Channel

10. FIELD STRENGTH OF SPURIOUS RADIATION

10.1 Operating environment

Temperature : 14 °C
 Relative humidity : 47 %

10.2 Test set-up

The radiated emissions measurements were on the 3 meters, open-field test site. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30MHz to up to 10th harmonic of the fundamental frequency was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 and 4.0 meters in order to determine the maximum emission levels. The test was performed by placing the EUT on 3-orthogonal axis. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

The maximum radiated emission was recorded and used as reference for the effective radiated power measurement. The EUT was then replaced by a tuned dipole antenna or Horn antenna and was oriented for vertical polarization and then the length was adjusted to correspond to the frequency of the transmitter. The substitution antenna was connected to a signal generator with a coaxial cable. The receiving antenna height was raised and lowered again through the specified range of height until maximum signal level is detected by the measuring receiver. The signal to the substitution antenna was adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the EUT radiated power measured, corrected for the change of input attenuation setting of the measuring receiver. The signal generator level was recorded and corrected by the power loss in the cable between the signal generator and substitution antenna and further corrected for the gain of the dipole antenna or horn antenna used relative to an ideal tuned dipole antenna. The measurement was repeated with the test antenna and the substitution antenna oriented for horizontal polarization. The measure of the effective radiated power is the larger of the two levels recorded.

10.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - ESVS10	Rohde & Schwarz	EMI Test Receiver	827864/005	Dec. 20, 2005
■ - 85650A	Hewlett Packard	Quasi-Peak Adapter	3107A01542	June 20, 2006
■ - 8568B	Hewlett-Packard	Spectrum Analyzer	3109A05456	June 20, 2006
■ - 85685A	Hewlett-Packard	RF Preselector	3107A01264	June 20, 2006
■ - 8564E	Hewlett-Packard	Spectrum Analyzer	3650A00756	June 22, 2006
■ - E4432B	Hewlett-Packard	Signal Generator	US38440950	June 22, 2006
■ - 83650L	Hewlett-Packard	Signal Generator	3844A00415	June 22, 2006
□ - 8447F	Hewlett-Packard	RF Amplifier	2944A12573	June 09, 2006
■ - BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D294	July 03, 2006
■ - BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	July 04, 2006
□ - 8447F	HP	RF Amplifier	2944A12573	June 09, 2006
■ - DS420S	HD GmbH	Turn Table	N/A	N/A
■ - MA240	HD GmbH	Antenna Master	N/A	N/A
■ - VHA9103	Schwarzbeck	Biconical Antenna	91031852	Feb 13, 2006
■ - 9108-A(494)	Schwarzbeck	Log Periodic Antenna	62281001	Feb 13, 2006

All test equipment used is calibrated on a regular basis.

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EMC-003(Rev.0)

HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-705, Korea
 (TEL: 82-31-746-8500 FAX: 82-31-746-8700)

EMC Testing Dept : 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do 464-860 Korea. (TEL: 82-31-765-8289 FAX: 82-31-766-2904)

10.4. Test data for radiated emission for CDMA IS-2000 Mode

10.4.1. Test data for Cellular Mode

- . Test Date : December 20, 2006
 - . Resolution bandwidth : 1 MHz
 - . Frequency range : 1 GHz ~ 20 GHz
 - . Operating Modulation : CDMA signal Transmitting Mode
 - . Result : PASSED BY – 17.52 dB at Middle and High Channel
- . Video bandwidth: 1 MHz
 - . Measurement distance: 3m

Frequency (MHz)	Spectrum Reading (dBuV)	Generator Reading (dBm)	Ant. Pol. (H/V)	Ant. Gain (dBi)	Ant. Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
Test Data for Low Channel									
824.70	99.83	21.00	H	0.00	0.00	0.84	21.84		
	89.67	12.67	V				13.51		
1649.40	37.90	-40.27	H	9.78	7.63	1.33	-36.79	-13.00	-23.79
	45.30	-34.20	V				-30.72	-13.00	-17.72
2474.10	30.50	-45.50	H	6.20	8.35	1.50	-46.15	-13.00	-33.15
	36.33	-38.50	V				-39.15	-13.00	-26.15
Test Data for Middle Channel									
835.89	100.00	21.50	H	0.00	0.00	0.84	22.34		
	89.83	12.83	V				13.67		
1671.78	38.00	-40.83	H	9.94	7.79	1.33	-37.35	-13.00	-24.35
	45.50	-34.00	V				-30.52		-17.52
2507.67	30.67	-45.33	H	10.61	8.46	1.50	-41.68	-13.00	-28.68
	36.50	-38.33	V				-34.68		-21.68
Test Data for High Channel									
848.31	100.17	21.67	H	0.00	0.00	0.84	22.51		
	90.33	13.50	V				14.34		
1696.62	38.17	-41.00	H	10.11	7.96	1.33	-37.52	-13.00	-24.52
	45.50	-34.00	V				-30.52		-17.52
2544.93	30.50	-45.33	H	10.68	8.53	1.50	-41.68	-13.00	-28.68
	36.83	-37.84	V				-34.19		-21.19

Tabulated test data for Restricted Band

10.4.2. Test data for PCS Mode

- Test Date : December 20, 2006
- Resolution bandwidth : 1 MHz
- Frequency range : 1 GHz ~ 20 GHz
- Operating Modulation : CDMA signal Transmitting Mode
- Result : PASSED BY - 7.20 dB at High Channel
- Video bandwidth: 1 MHz
- Measurement distance: 3m

Frequency (MHz)	Spectrum Reading (dBuV)	Generator Reading (dBm)	Ant. Pol. (H/V)	Ant. Gain (dBi)	Ant. Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Test Data for Low Channel									
1851.25	86.33	13.33	H	10.40	8.25	0.34	15.82		
	91.67	21.67	V				24.16		
3702.25	41.33	-32.50	H	12.69	10.54	0.85	-29.50	-13.00	-16.50
	49.00	-25.17	V				-22.17		
5553.75	38.50	-31.83	H	13.15	11.00	1.16	-28.52	-13.00	-15.52
	42.00	-27.00	V				-23.69		
Test Data for Middle Channel									
1880.00	87.83	14.83	H	10.43	8.28	0.34	17.32		
	91.67	21.57	V				24.06		
3760.00	41.50	-32.00	H	12.73	10.58	0.85	-29.00	-13.00	-16.00
	49.50	-24.33	V				-21.33		
5640.00	38.67	-31.66	H	13.14	10.99	1.16	-28.35	-13.00	-15.35
	42.50	-26.50	V				-23.19		
Test Data for High Channel									
1908.75	86.00	13.17	H	10.44	8.29	0.35	15.67		
	91.33	21.16	V				23.66		
3817.50	42.00	-31.00	H	12.74	10.59	0.86	-28.00	-13.00	-15.00
	50.13	-23.20	V				-20.20		
5726.25	38.83	-31.17	H	13.11	10.96	1.16	-27.86	-13.00	-14.86
	42.33	-26.50	V				-23.19		

Tabulated test data for Restricted Band

10.5. Test data for radiated emission for CDMA 1xEvDO Mode

10.5.1. Test data for Cellular Mode

- | | |
|---|-----------------------------|
| -. Test Date : December 20, 2006 | -. Video bandwidth: 1 MHz |
| -. Resolution bandwidth : 1 MHz | |
| -. Frequency range : 1 GHz ~ 20 GHz | |
| -. Operating Modulation : CDMA signal Transmitting Mode | -. Measurement distance: 3m |
| -. Result : <u>PASSED BY – 17.19 dB at Low Channel</u> | |

Frequency (MHz)	Spectrum Reading (dBuV)	Generator Reading (dBm)	Ant. Pol. (H/V)	Ant. Gain (dBi)	Ant. Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
Test Data for Low Channel									
824.70	99.90	21.07	H	0.00	0.00	0.84	21.91		
	89.83	12.83	V				13.67		
1649.40	38.13	-40.04	H	9.78	7.63	1.33	-36.56	-13.00	-23.56
	45.83	-33.67	V				-30.19		-17.19
2474.10	30.33	-45.67	H	6.20	8.35	1.50	-46.32	-13.00	-33.32
	36.00	-38.83	V				-39.48		-26.48
Test Data for Middle Channel									
835.89	100.33	21.83	H	0.00	0.00	0.84	22.67		
	90.00	13.00	V				13.84		
1671.78	38.33	-40.50	H	9.94	7.79	1.33	-37.02	-13.00	-24.02
	45.67	-33.83	V				-30.35		-17.35
2507.67	30.50	-45.50	H	10.61	8.46	1.50	-41.85	-13.00	-28.85
	36.83	-38.00	V				-34.35		-21.35
Test Data for High Channel									
848.31	100.50	22.00	H	0.00	0.00	0.84	22.84		
	90.67	13.67	V				14.51		
1696.62	38.33	-40.84	H	10.11	7.96	1.33	-37.36	-13.00	-24.36
	45.50	-34.00	V				-30.52		-17.52
2544.93	30.83	-45.00	H	10.68	8.53	1.50	-41.35	-13.00	-28.35
	37.00	-37.67	V				-34.02		-21.02

Tabulated test data for Restricted Band

10.5.2. Test data for PCS Mode

- Test Date : December 20, 2006
- Resolution bandwidth : 1 MHz
- Frequency range : 1 GHz ~ 20 GHz
- Operating Modulation : CDMA signal Transmitting Mode
- Result : PASSED BY – 7.00 dB at High Channel
- Video bandwidth: 1 MHz
- Measurement distance: 3m

Frequency (MHz)	Spectrum Reading (dBuV)	Generator Reading (dBm)	Ant. Pol. (H/V)	Ant. Gain (dBi)	Ant. Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Test Data for Low Channel									
1851.25	87.50	14.50	H	10.40	8.25	0.34	16.99		
	92.83	22.83	V				25.32		
3702.25	41.60	-31.70	H	12.69	10.54	0.85	-28.70	-13.00	-15.70
	49.40	-24.77	V				-21.77		-8.77
5553.75	38.90	-31.43	H	13.15	11.00	1.16	-28.12	-13.00	-15.12
	42.30	-26.70	V				-23.39		-10.39
Test Data for Middle Channel									
1880.00	88.00	15.00	H	10.43	8.28	0.34	17.49		
	93.00	22.90	V				25.39		
3760.00	41.80	-31.70	H	12.73	10.58	0.85	-28.70	-13.00	-15.70
	49.67	-24.16	V				-21.16		-8.16
5640.00	38.92	-31.41	H	13.14	10.99	1.16	-28.10	-13.00	-15.10
	42.50	-26.50	V				-23.19		-10.19
Test Data for High Channel									
1908.75	88.50	15.67	H	10.44	8.29	0.35	18.17		
	93.67	23.50	V				26.00		
3817.50	42.17	-30.83	H	12.74	10.59	0.86	-27.83	-13.00	-14.83
	50.33	-23.00	V				-20.00		-7.00
5726.25	39.00	-31.00	H	13.11	10.96	1.16	-27.69	-13.00	-14.69
	42.50	-26.33	V				-23.02		-10.02

Tabulated test data for Restricted Band

11. MAXIMUM PERMISSIBLE EXPOSURE

11.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment is 1mW/cm².

The electric field generated for a 1mW/cm²exposure is calculated as follows:

$$E = \sqrt{(30 * P * G) / d}, \text{ and } S = E^2 / Z = E^2 / 377, \text{ because } 1\text{mW} / \text{cm}^2 = 10\text{W} / \text{m}^2$$

Where

S = Power density in mW/cm², Z = Impedance of free space, 377Ω

E = Electric field strength in Volts/m, G = Numeric antenna gain, and d = distance in meter

Combining equations and rearranging the terms to express the distance as a function of the remaining variable

$$d = \sqrt{(30 * P * G) / (3770 * S)}$$

Changing to units of mW and cm, using P (mW) = P (W) / 1000, d (cm) = 100 * d (m)

$$d = 0.282 * \sqrt{(P * G) / S}$$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

11.2 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Peak Output Power		Antenna Gain		Calculated RF Exposure Separation Distance (cm)
(dBm)	(mW)	Log	Linear	
25.80	380.19	2.0	1.59	6.93

According to above table, separation distance, $D = 0.282 * \sqrt{380.19 * 1.59} = 6.93 \text{ cm}$.

Following Caution on the manual will be described.

“CAUTION: Exposure to Radio Frequency Radiation.

Antenna shall be mounted in such a manner to minimize the potential for human contact during normal operation. The antenna should not be contacted during operation to avoid the possibility of exceeding the FCC radio frequency exposure limit.”

12. FREQUENCY STABILITY OVER TEMPERATURE VARIATION

12.1 Operating environment

Temperature : 20 °C

Relative humidity : 40 %

12.2 Test set-up

The RF output port of the EUT was connected to the input of the spectrum analyzer. The software for RF control on the notebook PC was set to transmit maximum signal gain and bandwidth. The test was performed at center frequency.

Turn EUT off and set chamber temperature to -30°C and then allow sufficient time (approximately 20 to 30 minutes after chamber reach the assigned temperature) for EUT to stabilize. Turn ON EUT and measure the EUT operating frequency and then turn off the EUT after the measurement. The temperature in the chamber was raised 10°C step from -30°C to +50°C. Repeat above method for frequency measurements every 10°C step and then record all measured frequencies on each temperature step.

12.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - 8564E	HP	Spectrum Analyzer	3650A00756	June 22, 2006
■ - 53152A	HP	Frequency Counter	US39270295	Dec. 13, 2005
■ - EY-101	Tabai ESPEC Corp.	Chamber	5104390	N/A

All test equipment used is calibrated on a regular basis.

12.4 Test data for CDMA IS-2000

- Test Date : December 5, 2006
- Result : PASSED by 0.0139 dBm at 30 °C

Bands	Temperature (°C)	Input Freq. (Hz)	Measured Freq. (Hz)	Result (PPM)	Limit
Cellular	-30	835890000	835890007.9	0.0095	Within the Authorized Frequency block
	-20		835890008.5	0.0102	
	-10		835890010.1	0.0121	
	0		835890013.5	0.0162	
	10		835890008.3	0.0099	
	20		835890010.5	0.0126	
	30		835890011.6	0.0139	
	40		835890009.5	0.0114	
	50		835890010.3	0.0123	
PCS	-30	1880000000	1880000022.5	0.0120	Within the Authorized Frequency block
	-20		1880000021.7	0.0115	
	-10		1880000023.3	0.0124	
	0		1880000024.5	0.0130	
	10		1880000021.5	0.0114	
	20		1880000020.8	0.0111	
	30		1880000023.1	0.0123	
	40		1880000021.7	0.0115	
	50		1880000024.3	0.0129	

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Tested by: Ki-Hong, Nam / Test Engineer

12.5 Test data for CDMA 1x EvDO

- Test Date : December 5, 2006
- Result : PASSED by 0.0122 dBm at 40 °C

Bands	Temperature (°C)	Input Freq. (Hz)	Measured Freq. (Hz)	Result (PPM)	Limit
Cellular	-30	835890000	835890008.3	0.0099	Within the Authorized Frequency block
	-20		835890007.9	0.0095	
	-10		835890008.8	0.0105	
	0		835890009.2	0.0110	
	10		835890008.6	0.0103	
	20		835890008.8	0.0105	
	30		835890009.0	0.0108	
	40		835890008.5	0.0102	
	50		835890009.1	0.0109	
PCS	-30	1880000000	1880000020.3	0.0108	Within the Authorized Frequency block
	-20		1880000021.8	0.0116	
	-10		1880000021.5	0.0114	
	0		1880000022.7	0.0121	
	10		1880000022.1	0.0118	
	20		1880000020.6	0.0110	
	30		1880000021.5	0.0114	
	40		1880000022.9	0.0122	
	50		1880000020.5	0.0109	

남기홍

Tested by: Ki-Hong, Nam / Test Engineer

13. FREQUENCY STABILITY OVER VOLTAGE VARIATION

13.1 Operating environment

Temperature : 20 °C

Relative humidity : 40 %

13.2 Test set-up

The RF output port of the EUT was connected to the input of the spectrum analyzer. The software for RF control on the notebook PC was set to transmit maximum signal gain and bandwidth. The test was performed at center frequency.

For the testing, an external variable AC power supply was connected to the AC/DC Adapter of the EUT. The voltage of EUT set to 115% of the nominal value and then was reduced to 85% of nominal voltage. The output frequency was recorded at each step.

13.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - 8564E	HP	Spectrum Analyzer	3650A00756	June 22, 2006
■ - 53152A	HP	Frequency Counter	US39270295	Dec. 13, 2005
■ - 2350A	HP	30 dB Attenuator Assembly	2350A03133	June 22, 2006
■ - 3033B	B&J TMI	DC Power Supply	2056036	N/A

All test equipment used is calibrated on a regular basis.

13.4 Test data

- Test Date : December 5, 2006
- Rated Supply Voltage : 110 Vac
- Result : PASSED BY 0.0110 PPM

Modulation	Bands	Voltage(Vac)	Center Freq. (Hz)	Measured Freq. (Hz)	Result (PPM)	Limit
IS-2000	Cellular	126.5 (115%)	835890000	835890008.3	0.0099	Within the Authorized Frequency block
		110 (100%)		835890007.4	0.0089	
		93.5 (85%)		835890007.8	0.0093	
	PCS	126.5 (115%)	1880000000	1880000020.7	0.0110	
		110 (100%)		1880000012.5	0.0066	
		93.5 (85%)		1880000016.8	0.0089	
1x EvDO	Cellular	126.5 (115%)	835890000	835890008.3	0.0099	Within the Authorized Frequency block
		110 (100%)		835890007.4	0.0089	
		93.5 (85%)		835890007.8	0.0093	
	PCS	126.5 (115%)	1880000000	1880000020.7	0.0110	
		110 (100%)		1880000012.5	0.0066	
		93.5 (85%)		1880000016.8	0.0089	

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Tested by: Ki-Hong, Nam / Test Engineer

14. RADIATED EMISSION TEST FOR DIGITAL DEVICE PART

14.1 Operating environment

Temperature : 15 °C

Relative humidity : 45 %

14.2 Test set-up

The radiated emissions measurements were on the 3 meters, open-field test site. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30MHz to 1000MHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

The test set-up photos are included in appendix VI.

14.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - ESVS10	Rohde & Schwarz	EMI Test Receiver	827864/005	Dec 20, 2005
■ - MA240	HD GmbH	Antenna Master	N/A	N/A
■ - HD100	HD GmbH	Position Controller	N/A	N/A
■ - DS420S	HD GmbH	Turn Table	N/A	N/A
■ - VHA9103	Schwarzbeck	Biconical Antenna	91031852	Feb 13, 2006
■ - 9108-A(494)	Schwarzbeck	Log Periodic Antenna	62281001	Feb 13, 2006

All test equipment used is calibrated on a regular basis.

14.4 Test data for CDMA IS-2000

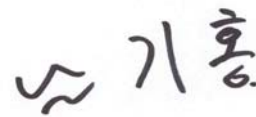
- . Test Date : December 18, 2006
- . Resolution bandwidth : 120 kHz
- . Frequency range : 30MHz ~ 1000MHz
- . Measurement distance : 3m
- . Test result : Passed by – 6.03 dB at 847.90 MHz

Frequency (MHz)	Reading (dBuV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBuV/m)	Limits (dBuV/m)	Margin (dB)
499.98	10.72	H	19.16	5.30	35.18	46.02	-10.84
682.15	10.10	H	21.99	6.29	38.38	46.02	-7.64
721.90	9.80	H	22.44	6.49	38.73	46.02	-7.29
722.90	9.70	H	22.45	6.49	38.64	46.02	-7.38
847.90	9.55	H	23.35	7.09	39.99	46.02	-6.03
968.98	10.17	H	23.64	7.54	41.35	53.97	-12.62

Tabulated test data for Radiated Electromagnetic Field

Remark: "H": Horizontal, "V": Vertical

Low, Middle and High channels for Cellular and PCS modes were tested, but the worst emissions levels were recorded in this test report.



Tested by: Ki-Hong, Nam / Test Engineer

14.5 Test data for CDMA 1xEvDO

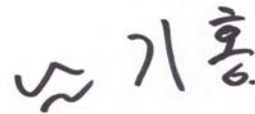
- . Test Date : December 18, 2006
- . Resolution bandwidth : 120 kHz
- . Frequency range : 30MHz ~ 1000MHz
- . Measurement distance : 3m
- . Test result : Passed by - 6.29 dB at 846.90 MHz

Frequency (MHz)	Reading (dBuV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBuV/m)	Limits (dBuV/m)	Margin (dB)
434.00	11.50	H	17.74	4.84	34.08	46.02	-11.94
642.425	10.77	H	21.12	6.05	37.94	46.02	-8.08
664.72	9.75	H	21.62	6.19	37.56	46.02	-8.46
682.20	9.50	H	21.99	6.29	37.78	46.02	-8.24
722.90	9.17	H	22.45	6.49	38.11	46.02	-7.91
846.90	9.33	H	23.32	7.08	39.73	46.02	-6.29

Tabulated test data for Radiated Electromagnetic Field

Remark: "H": Horizontal, "V": Vertical

Low, Middle and High channels for Cellular and PCS modes were tested, but the worst emissions levels were recorded in this test report.



Tested by: Ki-Hong, Nam / Test Engineer

15. CONDUCTED EMISSION TEST

15.1 Operating environment

Temperature : 25°C

Relative humidity : 30 %

15.2 Test set-up

The conducted emission measurements of power line were performed in a shielded room. The EUT was placed on a wooden table, 0.8 meters height above the floor. Power was fed to the EUT through a 50 ohm/ 50 microhenry Line Impedance Stabilization Network (LISN). The ground plane was electrically bonded to the shield room ground system and all power lines entering the shield room were filtered.

15.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007	May 15, 2006
■ -	NSLK 8126	Schwarzbeck	AMN	8126-404	July. 04, 2006
□ -	3825/2	EMCO	AMN	9109-1867	June 23, 2006

All test equipment used is calibrated on a regular basis.

15.4 Test data for CDMA IS-2000

- . Test Date : December 18, 2006
- . Resolution bandwidth : 9 kHz
- . Frequency range : 0.15MHz ~ 30MHz
- . Operating Mode : CDMA Signal Transmitting Mode
- . Result : PASSED BY – 3.13 dB at 6.34 MHz with Average Detector

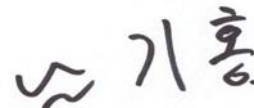
Frequency (MHz)	Line	Peak (dBuV)			Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Detector Mode	Limits		Emission level	Limits	
0.20	H	56.13	P	63.61	-7.48	41.22	53.61	-12.39
0.265	H	49.81	P	61.27	-11.46	-	-	-
0.60	H	38.86	P	56.00	-17.14	38.06	46.00	-7.94
0.665	H	39.34	P	56.00	-16.66	37.78	46.00	-8.22
5.98	N	49.44	P	60.00	-10.56	46.18	50.00	-3.82
6.075	H	49.47	P	60.00	-10.56	46.34	50.00	-3.66
6.34	H	49.45	P	60.00	-10.55	46.87	50.00	-3.13

Line Conducted Emissions Tabulated Data

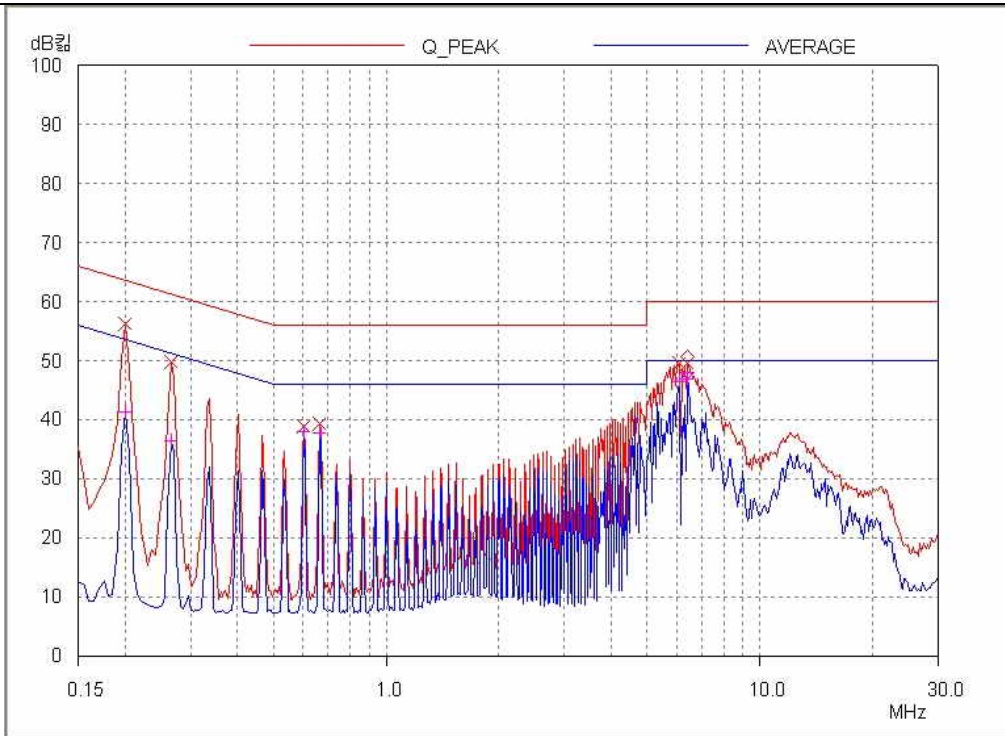
Remark : “H”: Hot Line, “N”: Neutral line, “P”: Peak detector.

Low, Middle and High channels for Cellular and PCS modes were tested, but the worst emissions levels were recorded in this test report.

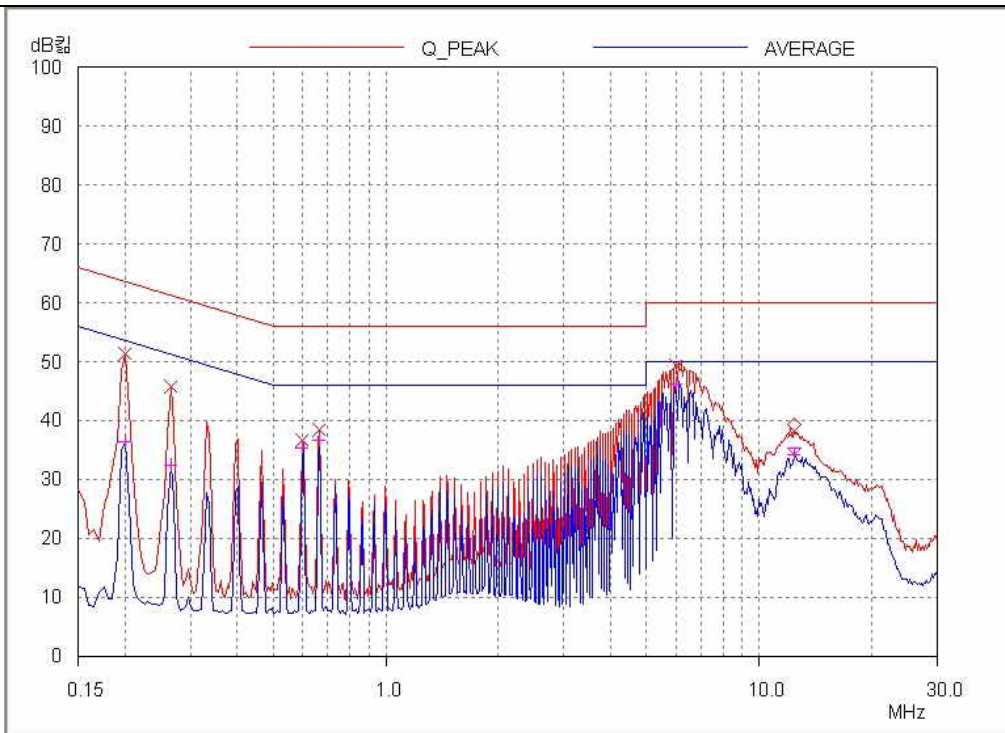
See next page for an overview sweep performed with peak and average detector.



Tested by: Ki-Hong, Nam / Test Engineer



HOT LINE



NEUTRAL LINE

15.5 Test data for CDMA 1xEvDO

- . Test Date : December 18, 2006
- . Resolution bandwidth : 9 kHz
- . Frequency range : 0.15MHz ~ 30MHz
- . Operating Mode : CDMA Signal Transmitting Mode
- . Result : PASSED BY -3.16 dB at 6.255 MHz with Average Detector

Frequency (MHz)	Line	Peak (dBuV)			Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Detector Mode	Limits		Emission level	Limits	
0.20	H	55.75	P	63.61	-7.86	36.81	53.61	-16.80
0.265	H	49.08	P	61.27	-12.19	-	-	-
0.60	H	38.84	P	56.00	-17.16	38.11	46.00	-7.89
0.665	H	39.84	P	56.00	-16.16	38.57	46.00	-7.43
5.725	N	49.15	P	60.00	-10.85	46.34	50.00	-3.66
6.195	N	49.26	P	60.00	-10.74	46.30	50.00	-3.70
6.255	H	49.36	P	60.00	-10.64	46.84	50.00	-3.16

Line Conducted Emissions Tabulated Data

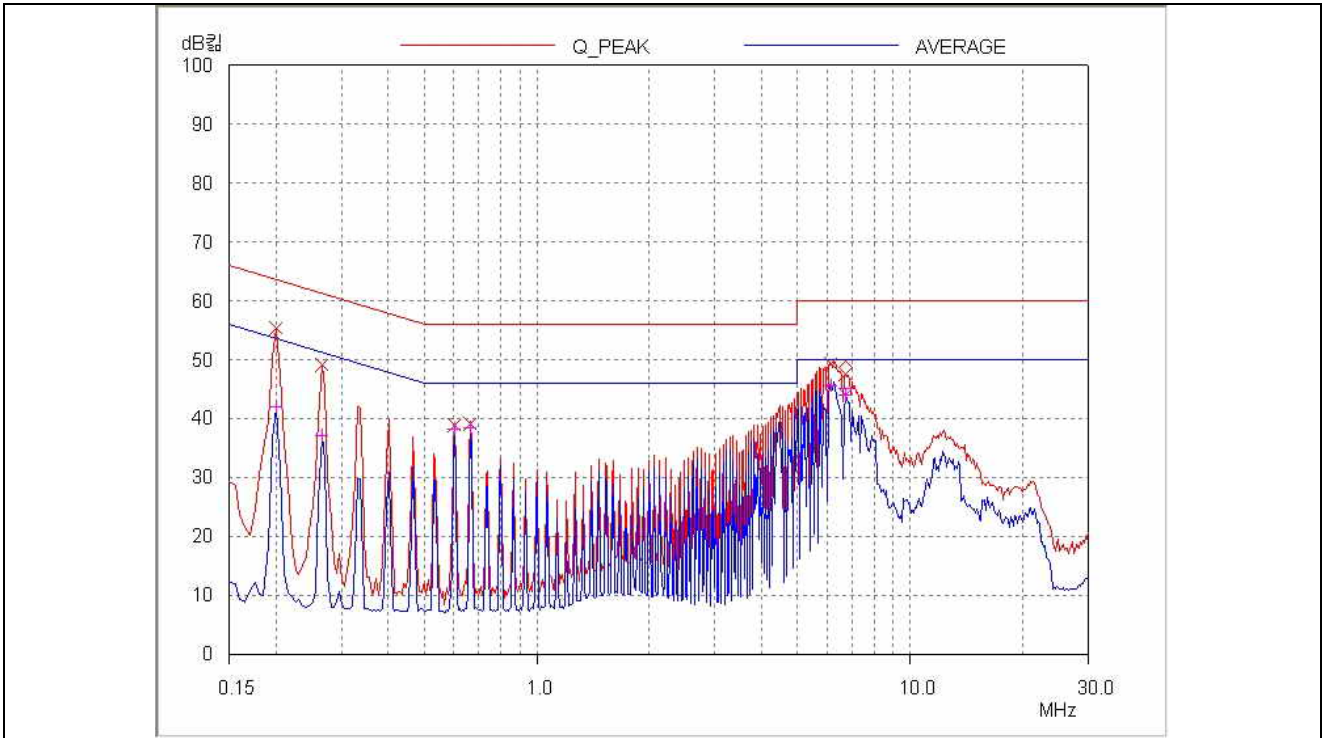
Remark : "H": Hot Line, "N": Neutral line, "P": Peak detector.

Low, Middle and High channels for Cellular and PCS modes were tested, but the worst emissions levels were recorded in this test report.

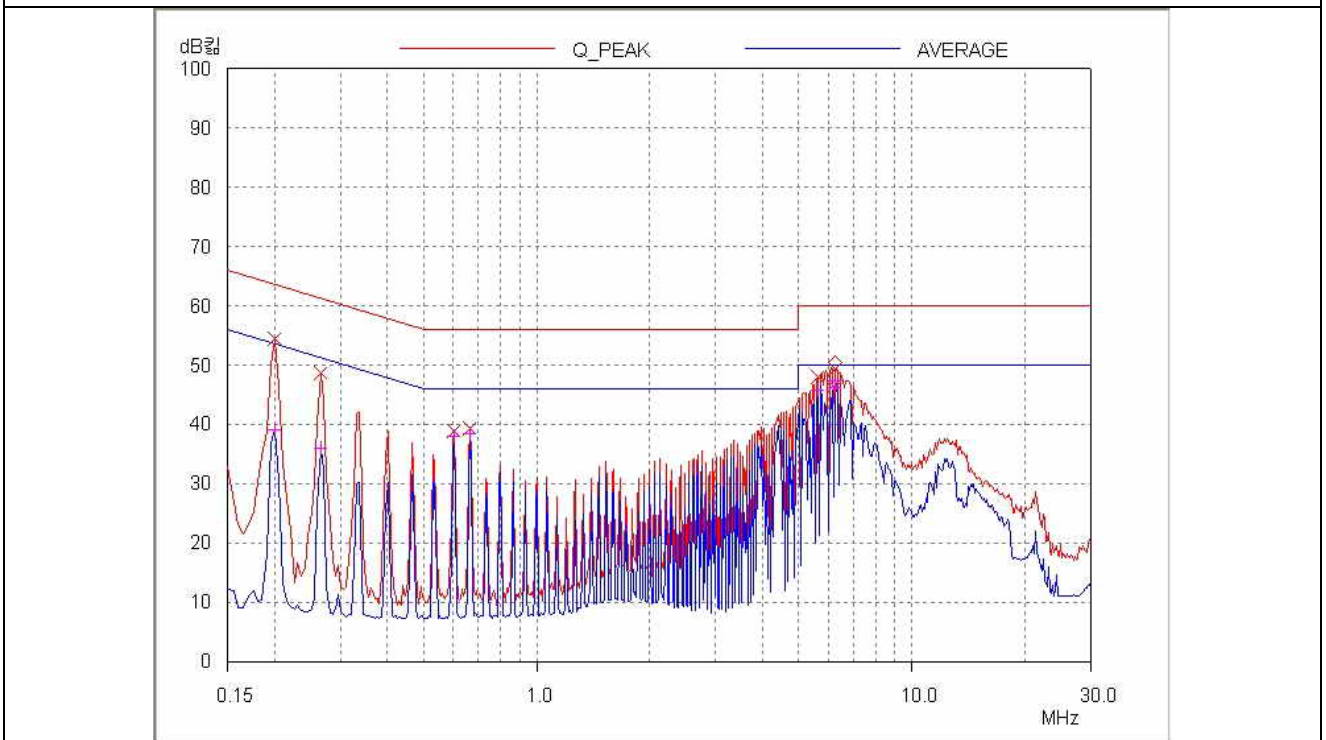
See next page for an overview sweep performed with peak and average detector.



Tested by: Ki-Hong, Nam / Test Engineer



HOT LINE



NEUTRAL LINE