ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR PCS SIGNAL REPEATER

Test report file number	**: E046R-016**
Applicant	**: Korea First Telecom Co., Ltd.**
Address	**: Econocharmant Bldg., 8F., 360-3 Yatap-Dong, Bundang-Gu, Sungnam-Si, Gyeonggi-Do, Korea**
Manufacturer	**: Korea First Telecom Co., Ltd.**
Address	**: Econocharmant Bldg., 8F, 360-3 Yatap-Dong, Bundang-Gu, Seongnam-SI, Gyeonggi-Do, Korea**
Type of Equipment	**: PCS Signal Repeater**
FCC ID.	**: Q2TKFTTCERPCS1900**
Model Name	**: TCER-100**
Serial number	**: None**
Total page of Report	**: 39 pages (including this page)**
Date of Incoming	**: May 24, 2004**
Date of issue	**: June 07, 2004**

SUMMARY

The equipment complies with the regulation; **FCC 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: G. W. Lee/ Chief Engineer
EMC & Telecom Div.
ONETECH Corp.

Reviewed by: Y. K. Kwon/ Director
EMC & Telecom Div.
ONETECH Corp.

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EMC Testing Dept : 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-860 Korea. (TEL: 82-31-765-8289 FAX: 82-31-766-2904)

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1. VERIFICATION OF COMPLIANCE

APPLICANT	: Korea First Telecom Co., Ltd.
ADDRESS	: Econocharmant Bldg., 8F., 360-3 Yatap-Dong, Bundang-Gu, Sungnam-Si, Gyeonggi-Do, Korea
CONTACT PERSON	: Gi-Cho, Kang / Manager
TELEPHONE NO	: +82-31-780-3449
FCC ID	: Q2TKFTTCERPCS1900
MODEL NO/NAME	: TCER-100
SERIAL NUMBER	: N/A
DATE	: June 07, 2004

DEVICE TYPE	Amplifier PCS Signal Repeater
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	TIA/EIA 603, ANSI C63.4/2001
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	PART 24 Subpart E
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER(S) OPEN AREA TEST SITE

-. This device has shown compliance with the conducted emissions limits in 15.207 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 and is not affected by the 15.37(j) transition provisions.

-. 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.

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2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
2.1046, 24.232	RF Power Output at Antenna Terminals	Met the Limit / PASS
2.1049, 24.238	Occupied Bandwidth, Bandwidth Limitation	Met the Limit / PASS
2.1051, 24.238 (a)	Spurious Emissions at Antenna Terminals	Met the Limit / PASS
2.1053, 24.238 (a)	Field strength of Spurious Radiation	Met the Limit / PASS
2.1049	Band Edge	Met the Limit / PASS
2.1047	Modulation Characteristics	Met the requirement/ PASS
2.1055(a)(1), 24.235	Frequency Stability with Temperature variation	Met the requirement/ PASS
2.1055(d), 24.235	Frequency stability with 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 TIA/EIA 603 and ANSI C63.4/2001. 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 426-1 Daessangryung-Ri, Chowol-Myeon, Gwangju-Si, Gyeonggi-Do 464-080 Korea. Description details of test facilities were submitted to the Federal Communications Commission on January 18, 2002 (Registration Number: 92819 and 340658), accredited by KOLAS (Korea Laboratory Accreditation Scheme, No: 85) and approved by TUV, DNV, SEMKO and MIC (Ministry of Information and Communications in Korea) according to the requirement of ISO17025.

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3. GENERAL INFORMATION

3.1 Product Description

The Korea First Telecom Co., Ltd., Model TCER-100 (referred to as the EUT in this report) is a PCS Signal Repeater, which is s an exclusive CDMA repeater in the US PCS band, performing on relaying the received signal from the Base Station and outputting to the mobile terminal (forward), relaying the received signal from the mobile terminal and outputting to the Base Station (Backward). The Repeater system is for the relaying system that can supply the services Tx: 1850~1910MHZ, Rx: 1930~1990MHz by one equipment. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE		PCS Private Land Mobile Data Transceiver
EMISSION DESIGNATOR		CDMA
OPERATING FREQUENCY	Uplink Frequency	1850~1910 MHz
	Downlink Frequency.	1930~1990 MHz
OUTPUT POWER		7mW (8 dBm)
AMPLIFIER GAIN		60dB
ANTENNA	Pattern	Directional
	Gain	8dBi
	Impedance	50 Ohm
LIST OF EACH OSC. ORCRY. FREQ.(FREQ.>=1MHz)		16.0 MHz
NUMBER OF LAYER		Main Board: 6 Layers
POWER REQUIREMENT		DC 7.5V, 0.7A from AC/DC Adapter
EXTERNAL CONNECTOR		Adapter Input Port

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

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Korea First Telecom Co., Ltd.	N/A	N/A
LCD Board	Korea First Telecom Co., Ltd.	N/A	N/A

5.3 Peripheral equipment

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

Model	Manufacturer	FCC ID	Description	Connected to
HSD8000	Korea First Telecom Co., Ltd.	Q2TKFTTCERPCS1900	PCS Signal Repeater (EUT)	-
PP01L	DELL Computer Corp.	DoC	Notebook PC	EUT
E4432B	Agilent	N/A	Signal Generator	EUT
EPA-101M-07A	ENG Electric Co., Ltd.	N/A	AC/DC Adapter	EUT

5.4 Mode of operation during the test

The EUT was connected to a RS232C port on the Notebook PC and a signal generator. The software control RF level by attenuator setting. The attenuator level shall be controlled from zero to 83, because the EUT has AGC (Auto Gain Control) function.

For downlink mode testing, the uplink port of the EUT was connected to the signal generator and the attenuator was set to zero by the software and the downlink port on the EUT was connected to the input of the spectrum analyzer. Otherwise the uplink port of the EUT was connected to the spectrum analyzer and downlink port was connected to the signal generator for measuring uplink mode.

5.5 Modulation Characteristics

The EUT is an amplifier, so the EUT dose not has modulating circuit.

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6. RF POWER OUTPUT at ANTENNA TERMINAL

6.1 Operating environment

Temperature : 20°C

Relative humidity : 37 %

6.2 Test set-up

The RF output port (uplink port or downlink port) of the EUT was connected to the input of the power meter. The software for RF control on the notebook PC was set to zero and signal generator level was tuned for getting 8dBm. The test was performed at three frequencies (low, middle, and high channels) and downlink/uplink mode with modulation type CDMA only.

6.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Due Cal
■ -	437B	HP	Power Meter	3125U25121	July 10, 2004
■ -	8481A	HP	Power Sensor	1550A14928	July 10, 2004
■ -	E4432B	HP	Signal Generator	US38440950	July 23, 2004

All test equipment used is calibrated on a regular basis.

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6.4 Test data

-. Test Date : May 26, 2004
-. Test Result : Pass

Mode	Modulation	Channel	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
Uplink	CDMA	Low	1851.23	-56.32	8.0dBm	0.00064	2
		Middle	1854.375	-57.30	8.0dBm		
		High	1908.77	-53.56	8.0dBm		
Downlink	CDMA	Low	1931.23	-57.10	8.0dBm		
		Middle	1953.0	-58.40	8.0dBm		
		High	1988.77	-56.40	8.0dBm		

Tested by: Dan-Gi Lee / Project Engineer

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7. OCCUPIED BANDWIDTH and BAND EDGE TEST

7.1 Operating environment

Temperature : 20°C

Relative humidity : 35 %

7.2 Test set-up

For downlink mode testing, the Uplink port of the EUT was connected to the signal generator and the downlink port on the EUT was connected to the input of the spectrum analyzer. Otherwise the uplink port of the EUT was connected to the spectrum analyzer and downlink port was connected to the signal generator for measuring uplink mode. The resolution bandwidth, 30 kHz and video bandwidth, 100 kHz of the spectrum analyzer was set as following and the software for RF control on the notebook PC was set to zero.

7.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Due Cal
■ -	8564E	HP	Spectrum Analyzer	3650A00756	July 10, 2004
■ -	E4432B	HP	Signal Generator	US38440950	July 23, 2004

All test equipment used is calibrated on a regular basis.

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7.4 Test data

-. Test Date : May 26, 2004
-. Test Result : Pass

Mode	Modulation	Channel	Occupied Bandwidth (kHz)
Uplink	CDMA	Low	1410
		Middle	1405
		High	1405
Downlink	CDMA	Low	1415
		Middle	1400
		High	1415

Remark. According to above result, the carrier frequency shall be within the frequency block edges.
Please refer to following test data from pages 12 through 16. and pages 22 through 26.

Tested by: Dan-Gi Lee / Project Engineer

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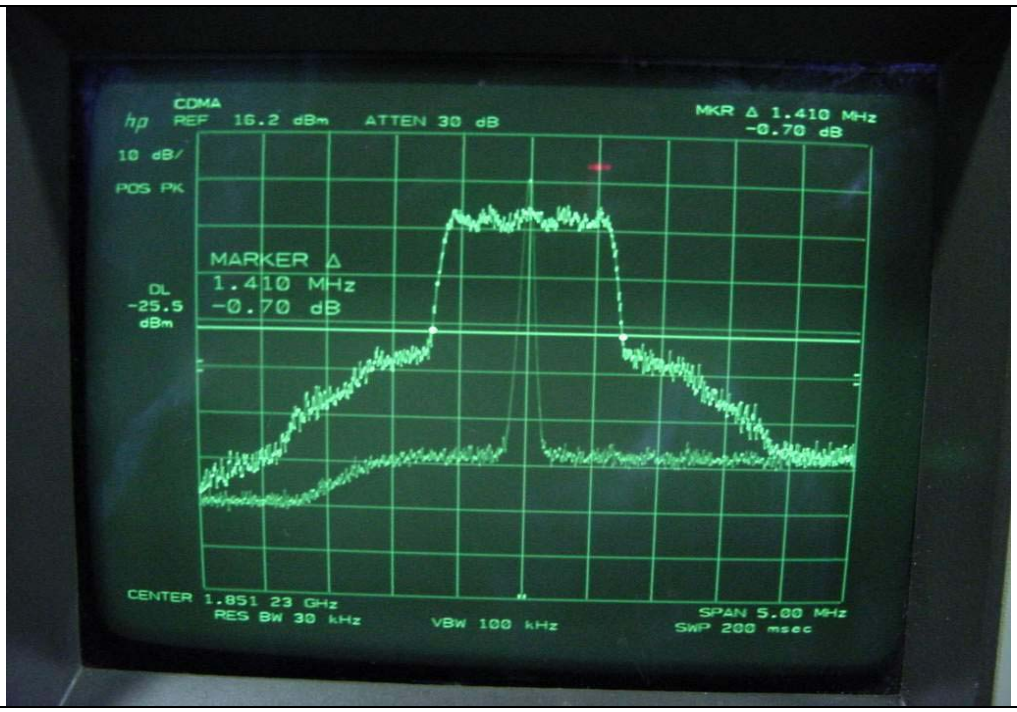

CDMA-Low Channel-Uplink

CDMA-Middle Channel-Uplink

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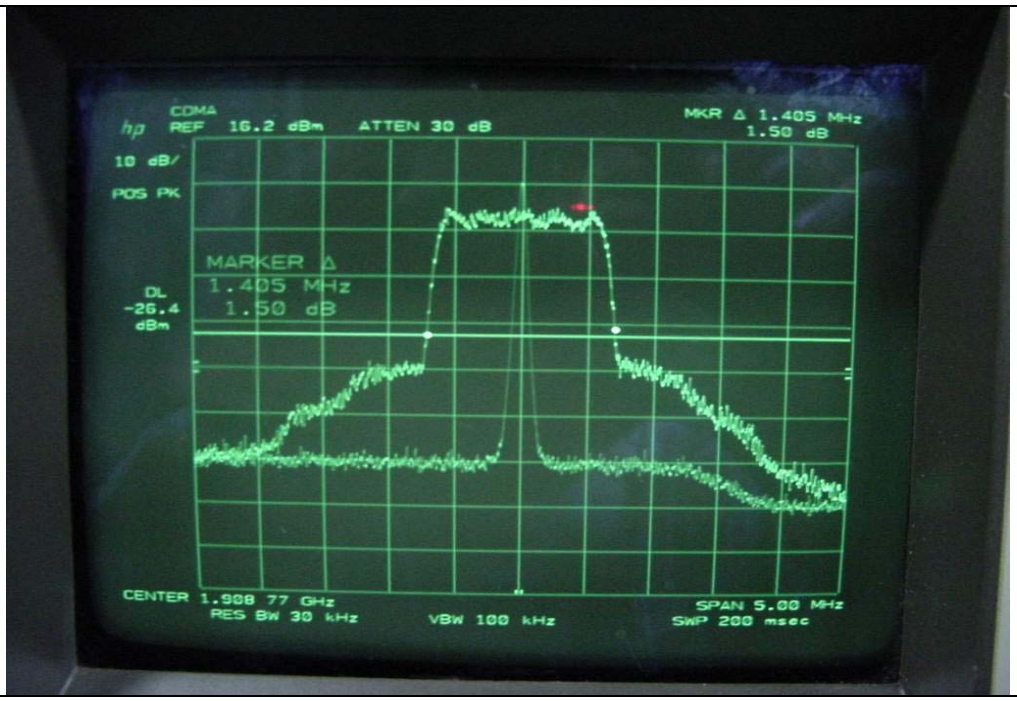
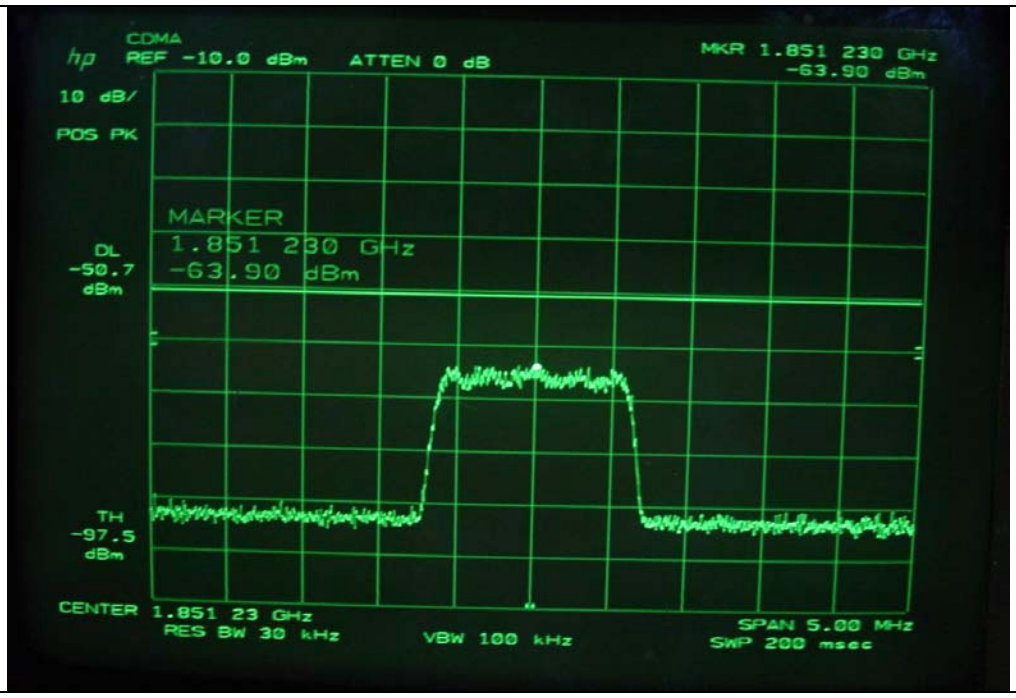
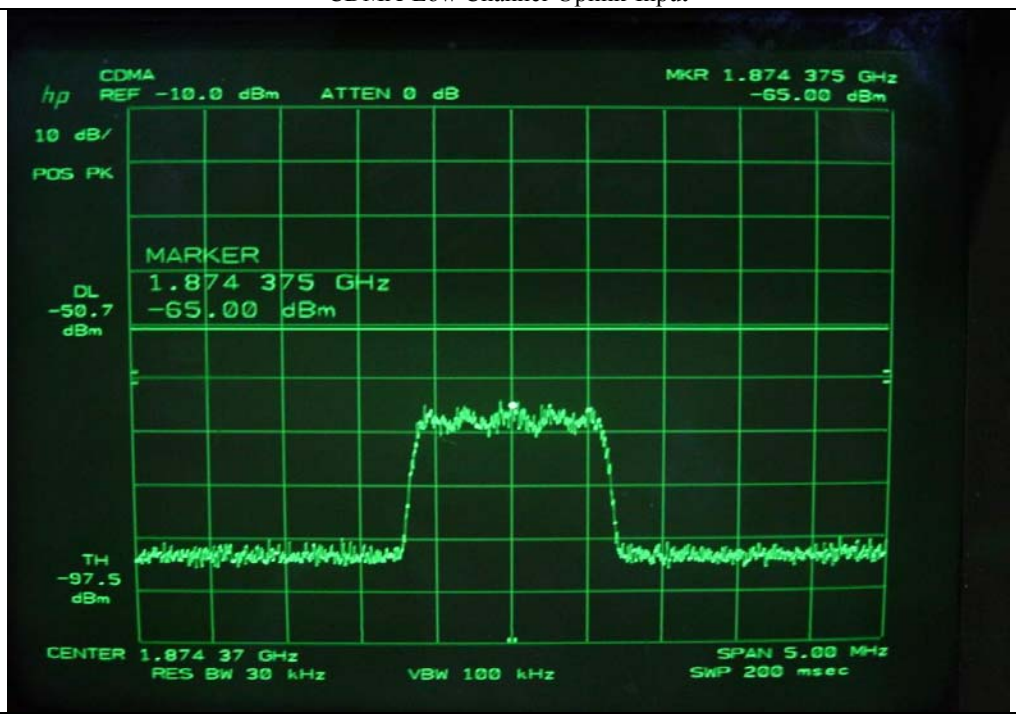


CDMA-High Channel-Uplink



CDMA-Low Channel-Uplink-Input



CDMA-Middle Channel-Uplink-Input

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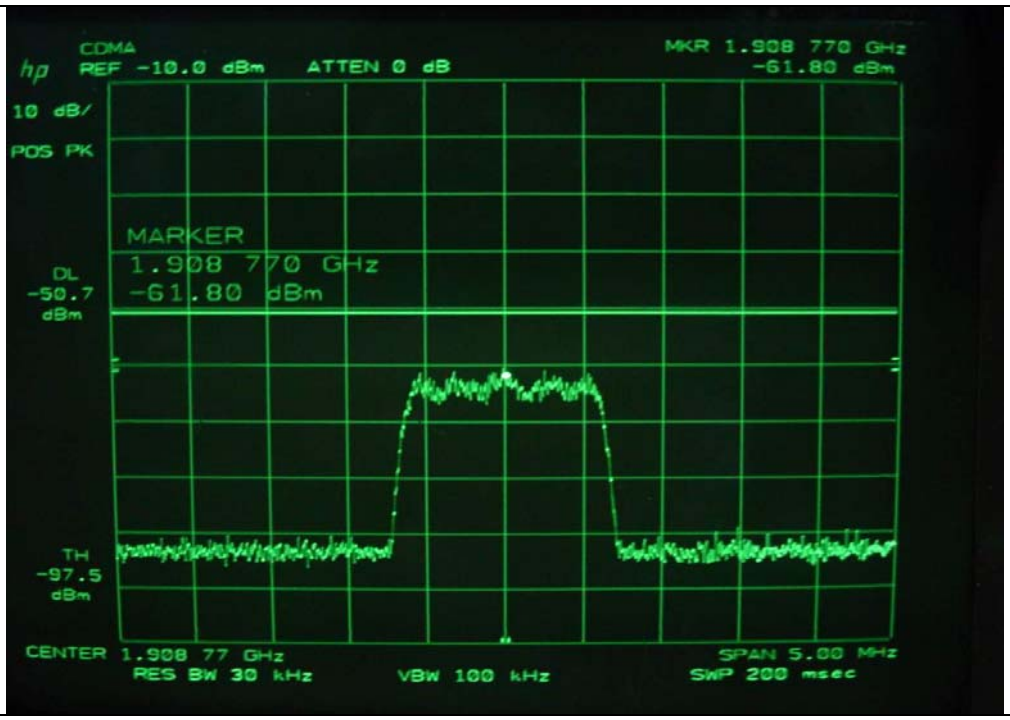

CDMA-High Channel-Uplink-Input

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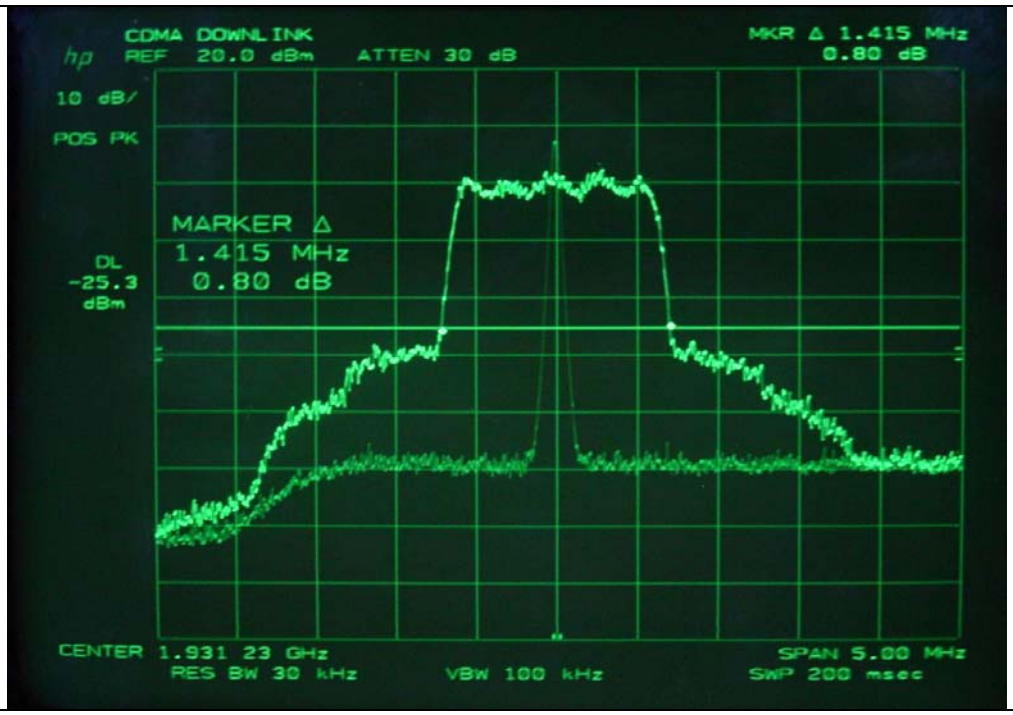
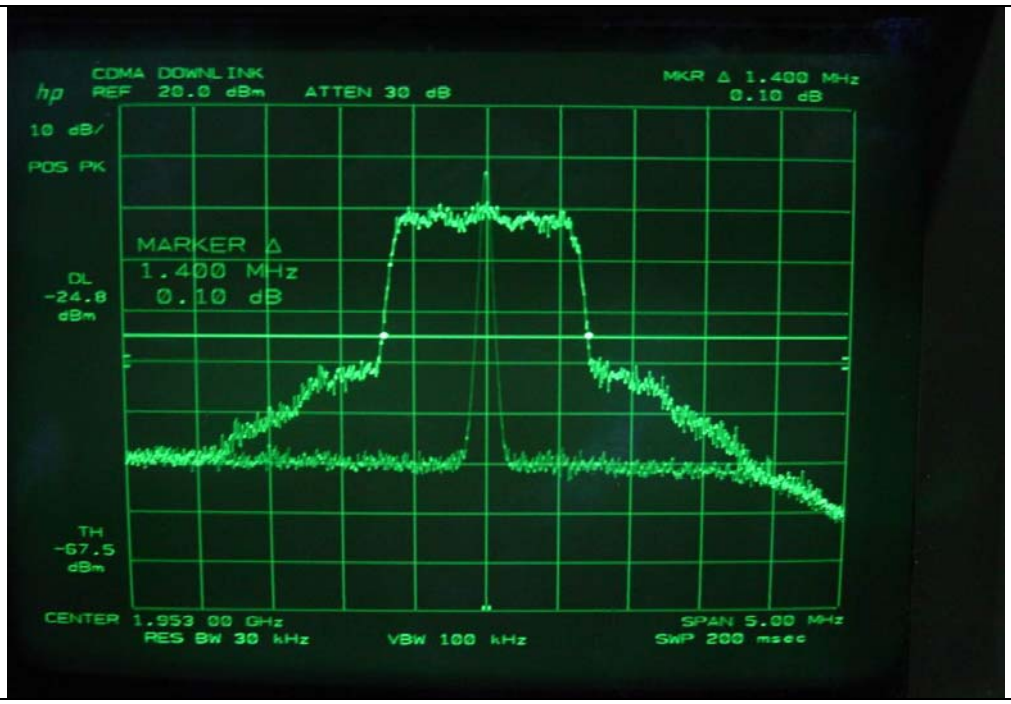


CDMA-Low Channel-Downlink



CDMA-Middle Channel-Downlink

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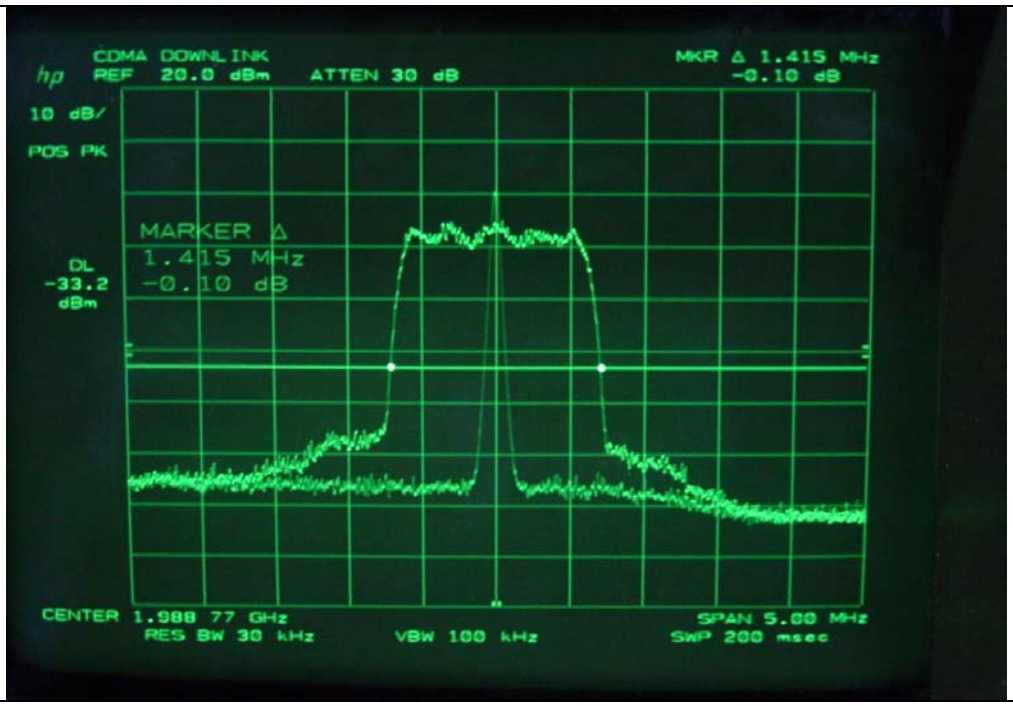

CDMA-High Channel-Downlink

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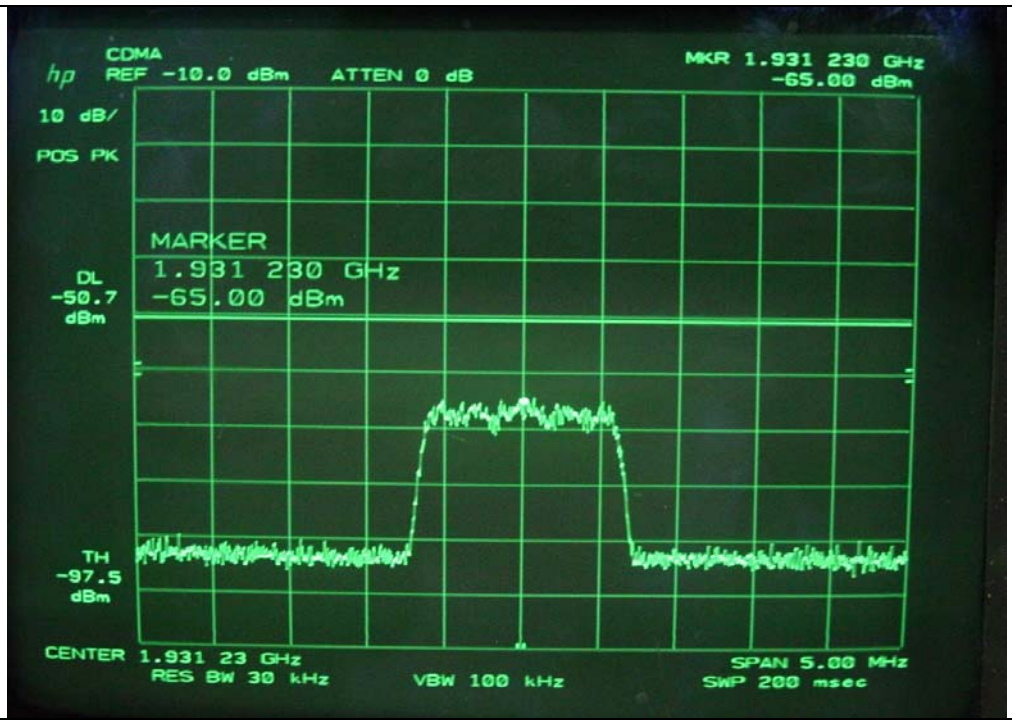
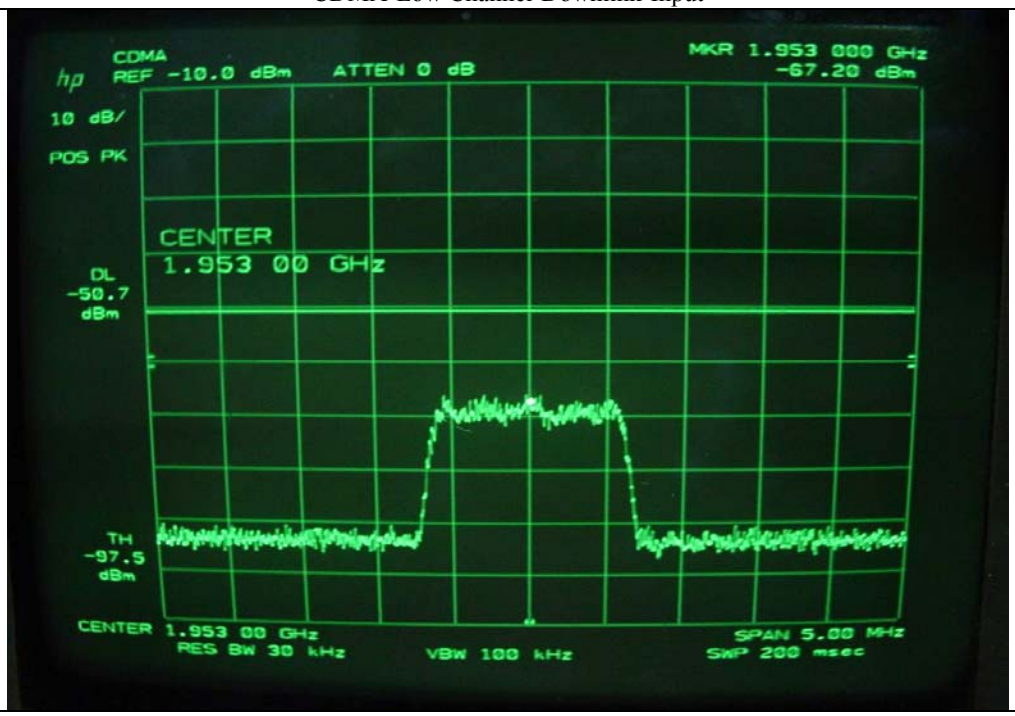
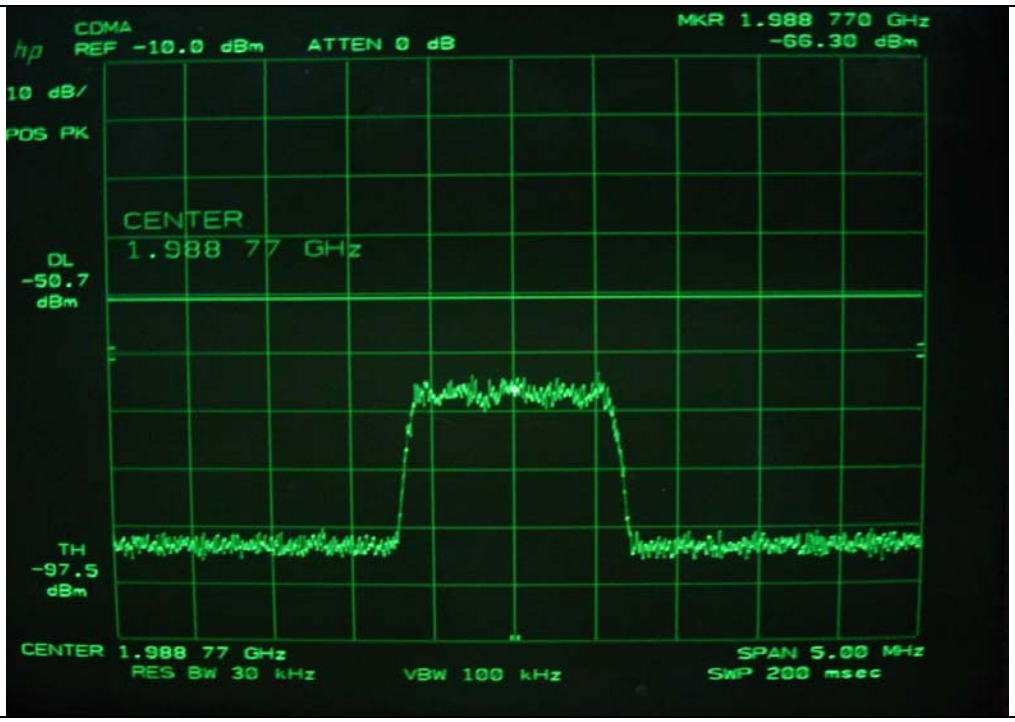


CDMA-Low Channel-Downlink-Input



CDMA-Middle Channel-Downlink-Input



CDMA-High Channel-Downlink-Input

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8. SPURIOUS EMISSION AT ANTENNA TERMINAL

8.1 Operating environment

Temperature	:	19°C
Relative humidity	:	35 %

8.2 Test set-up for conducted measurement

For downlink mode testing, the Uplink port of the EUT was connected to the signal generator and the downlink port on the EUT was connected to the input of the spectrum analyzer. Otherwise the uplink port of the EUT was connected to the spectrum analyzer and downlink port was connected to the signal generator for measuring uplink mode. The resolution bandwidth and video bandwidth of the spectrum analyzer was set at 1 MHz and sufficient scans were taken to show any out of band emissions up to 20 GHz. The software for RF control on the notebook PC was set to zero

8.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Due Cal
■ -	8564E	HP	Spectrum Analyzer	3650A00756	July 10, 2004
■ -	E4432B	HP	Signal Generator	US38440950	July 23, 2004

All test equipment used is calibrated on a regular basis.

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8.4 Test data

-. Test Date : May 26, 2004

-. Frequency range : 30 MHz ~ 20 GHz

-. Result : PASSED BY –9.00 dB at High Channel

Mode	Modulation	Harmonic Frequency (MHz)	Max. Measured Value (dBm)	Limit (dBm)
Uplink	CDMA	Low	-39.17	-13.0
		Middle	-23.70	
		High	-24.20	
Downlink	CDMA	Low	-34.03	-13.0
		Middle	-34.53	
		High	-44.37	

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

Tested by: Dan-Gi Lee / Project Engineer

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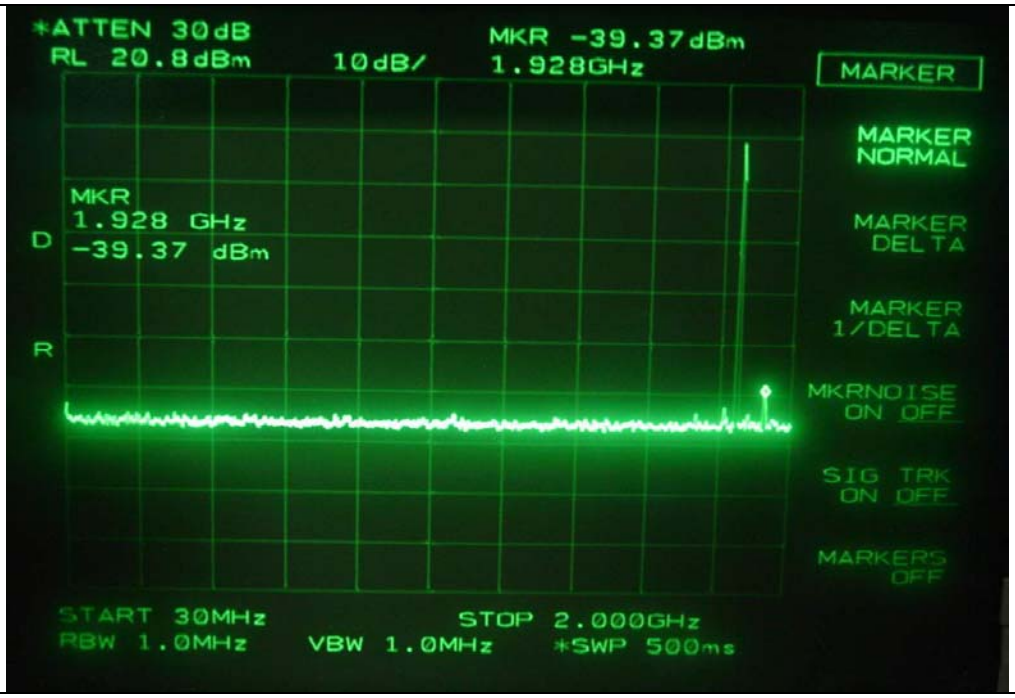
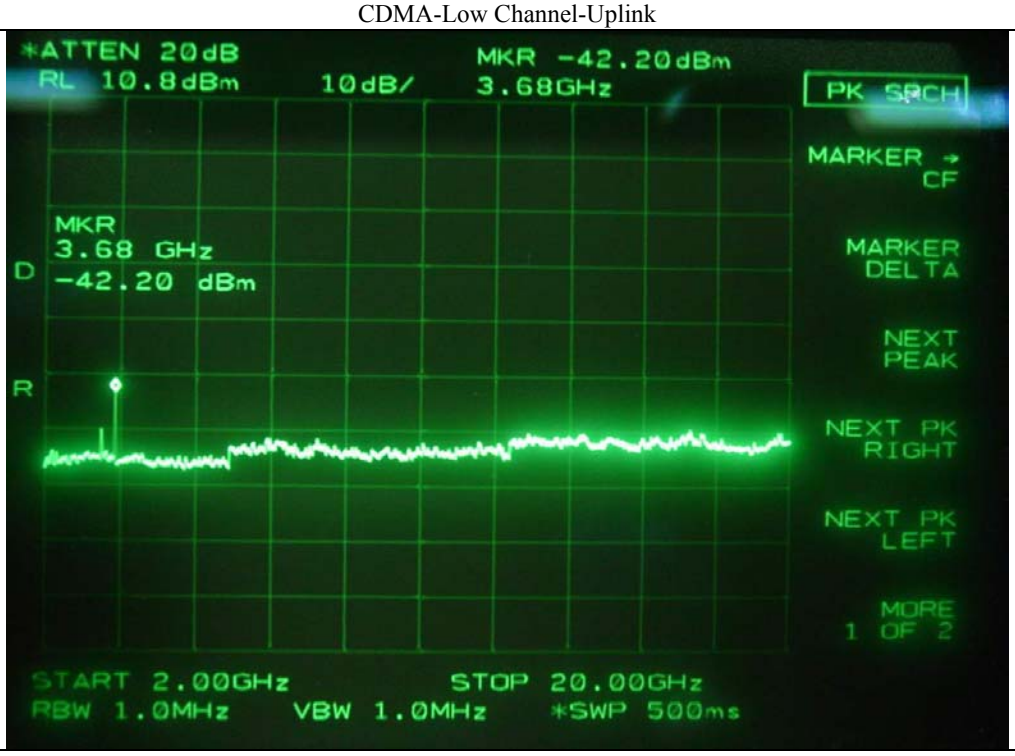
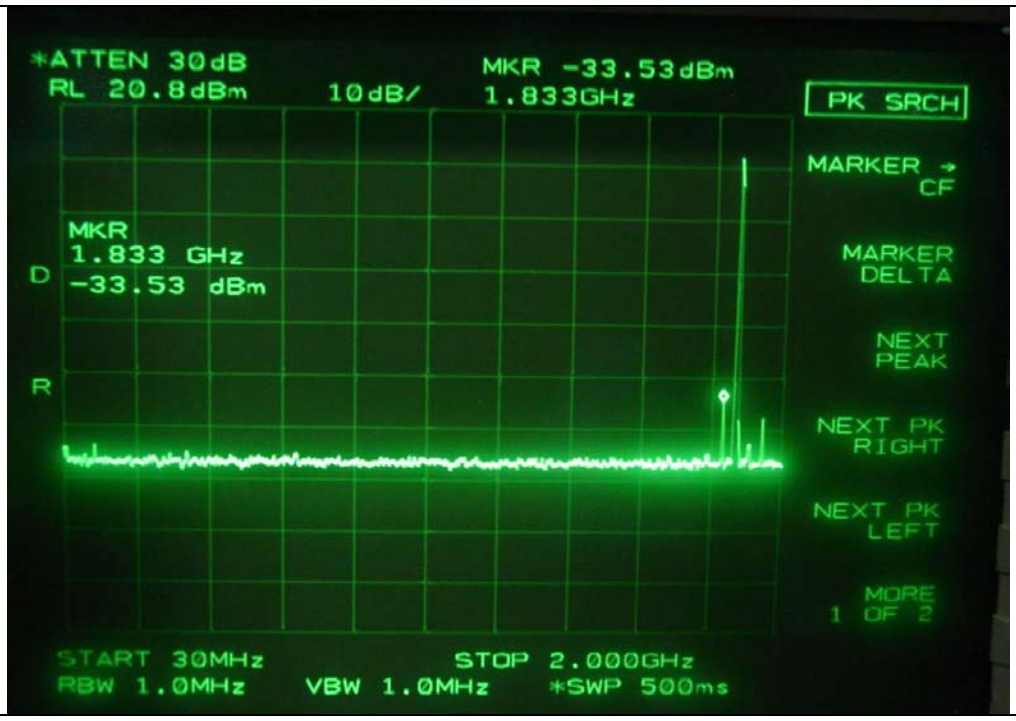


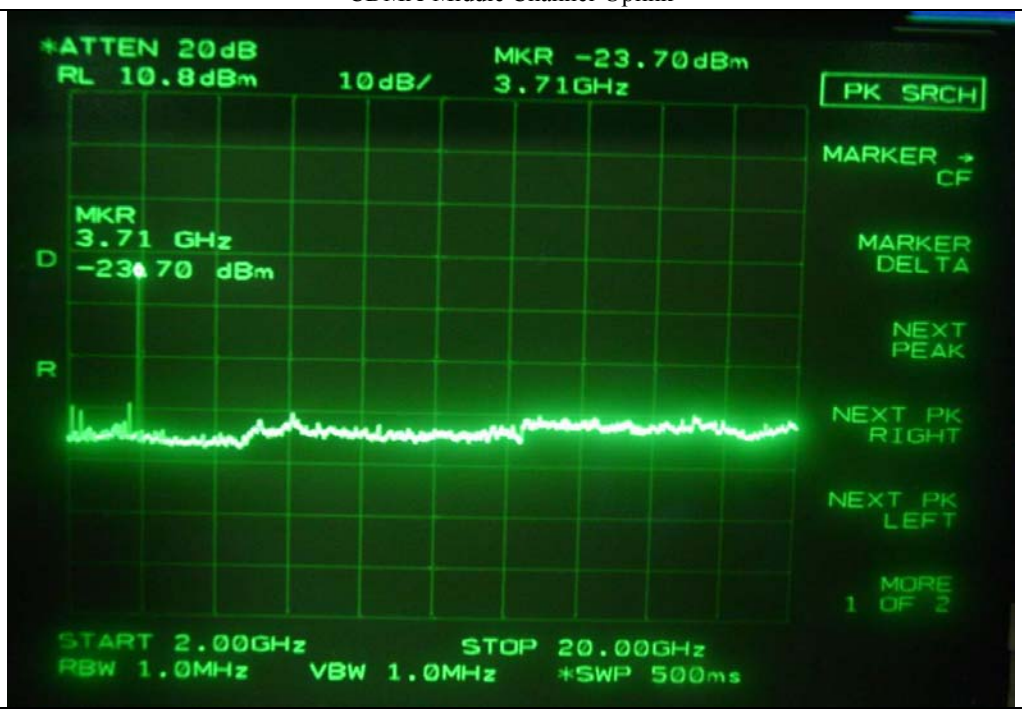
CDMA-Low Channel-Uplink



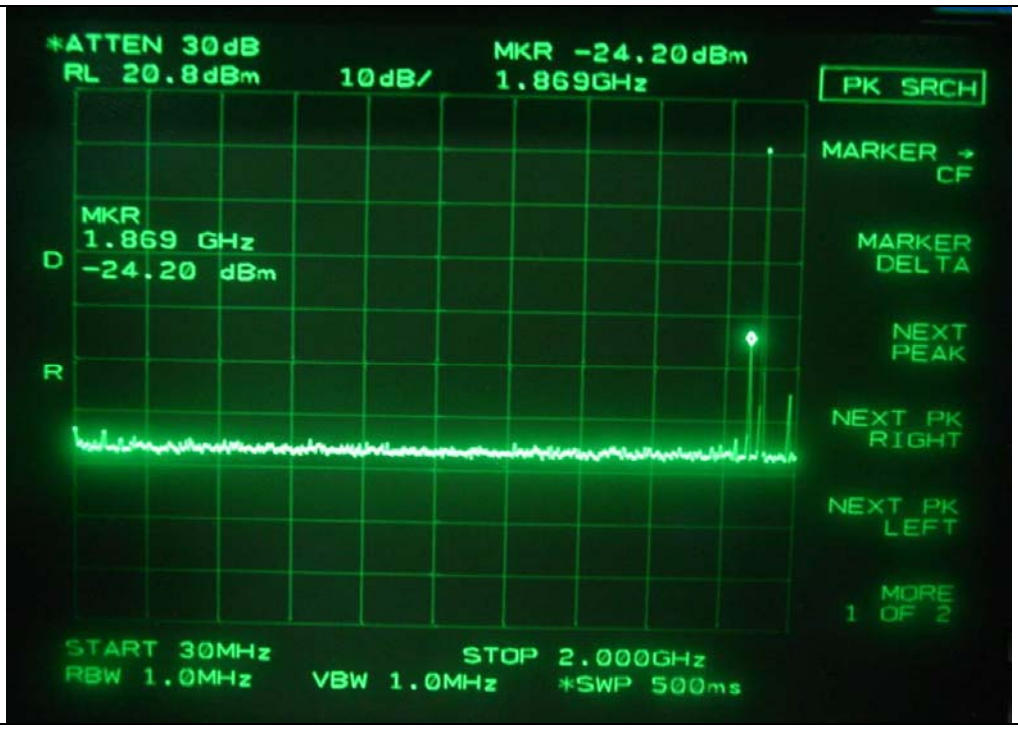
CDMA-Low Channel-Uplink



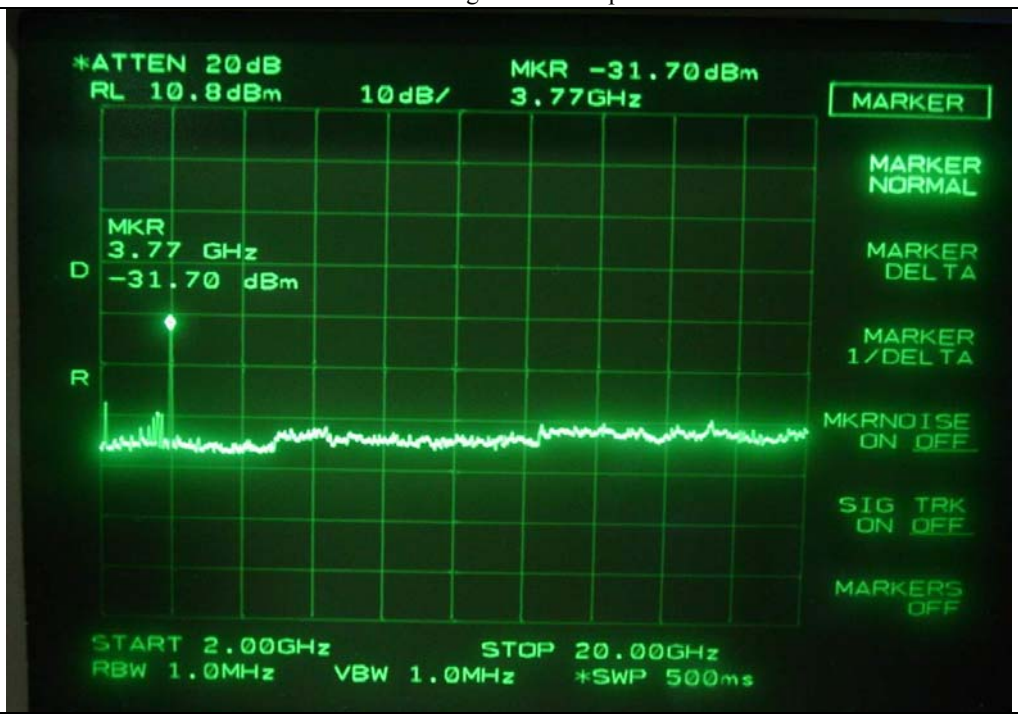
CDMA-Middle Channel-Uplink



CDMA-Middle Channel-Uplink



CDMA-High Channel-Uplink



CDMA-High Channel-Uplink

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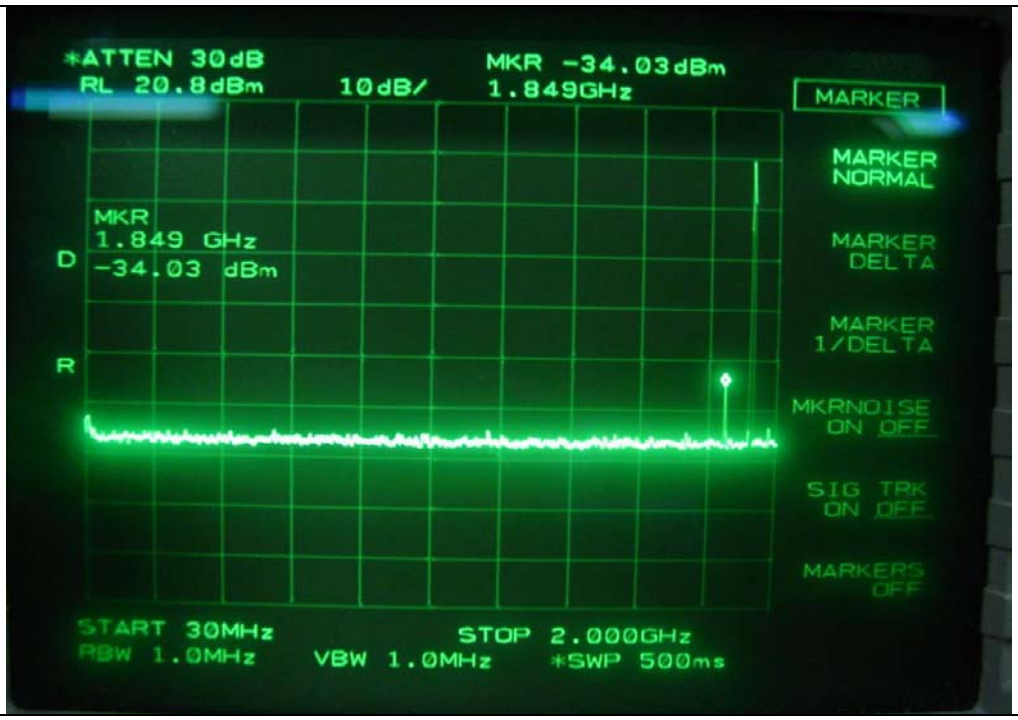
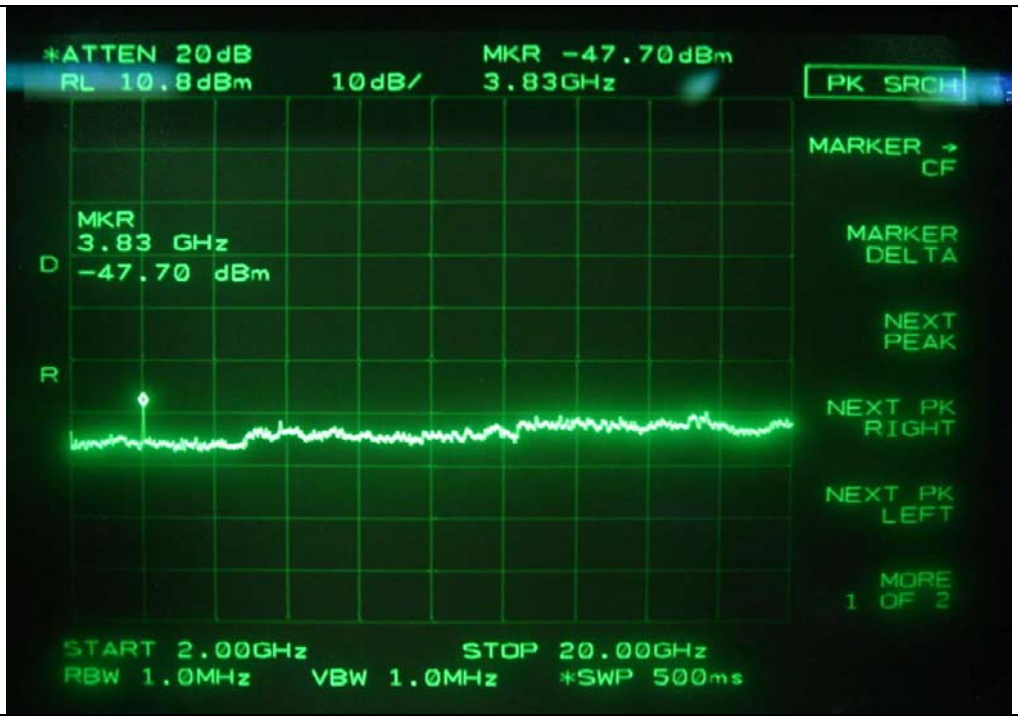
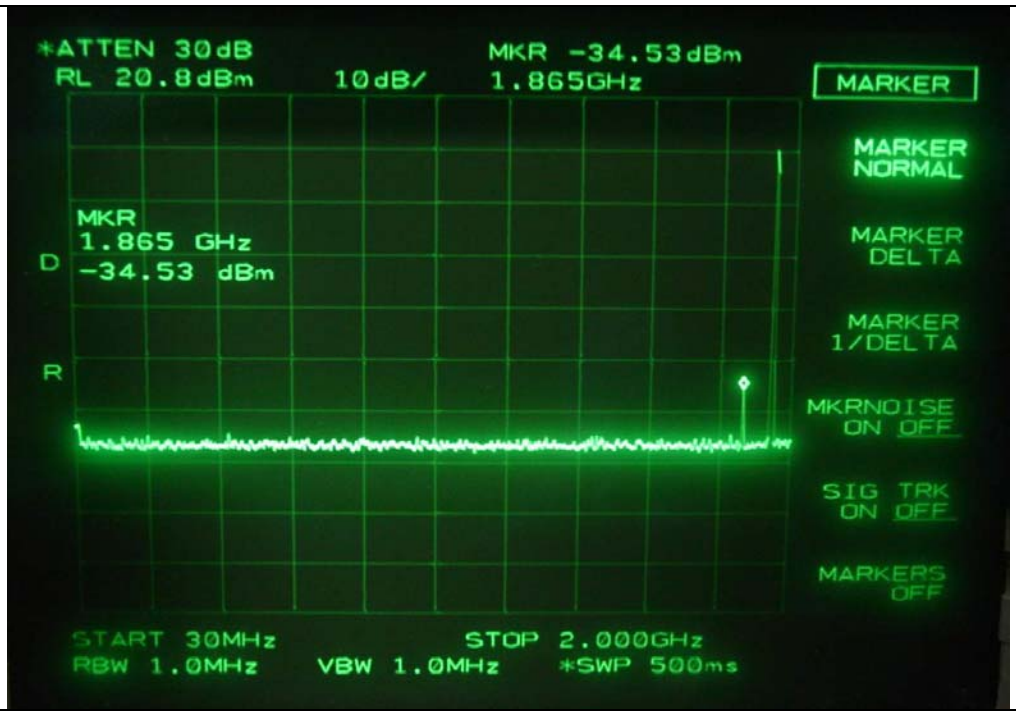


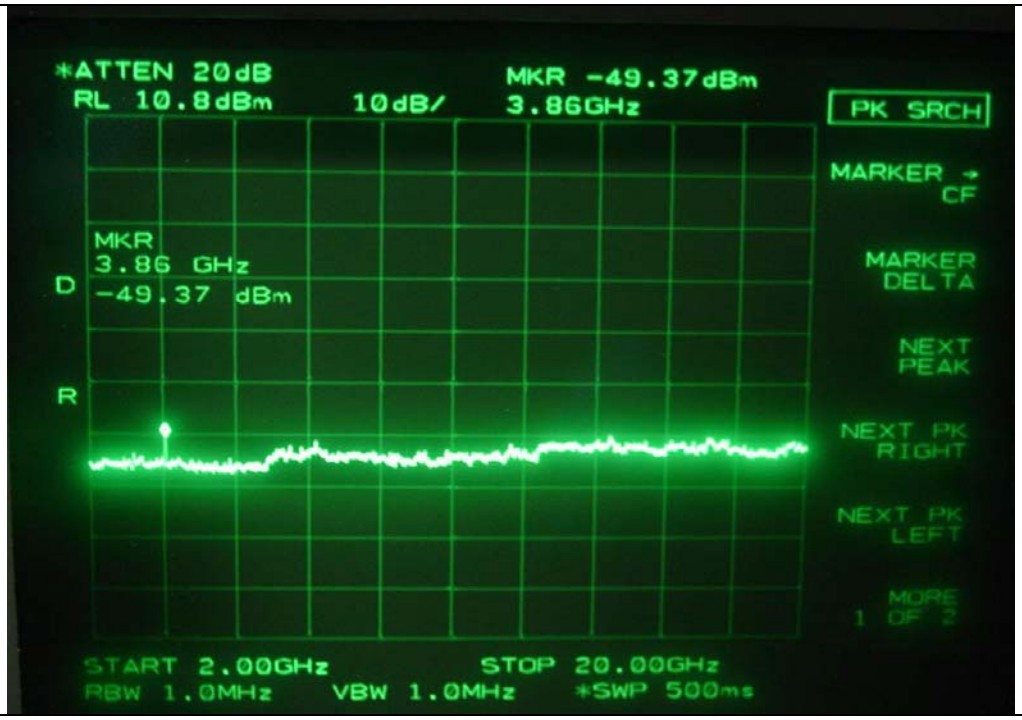
CDMA-Low Channel-Downlink



CDMA-Low Channel-Downlink



CDMA-Middle Channel-Downlink



CDMA-Middle Channel-Downlink

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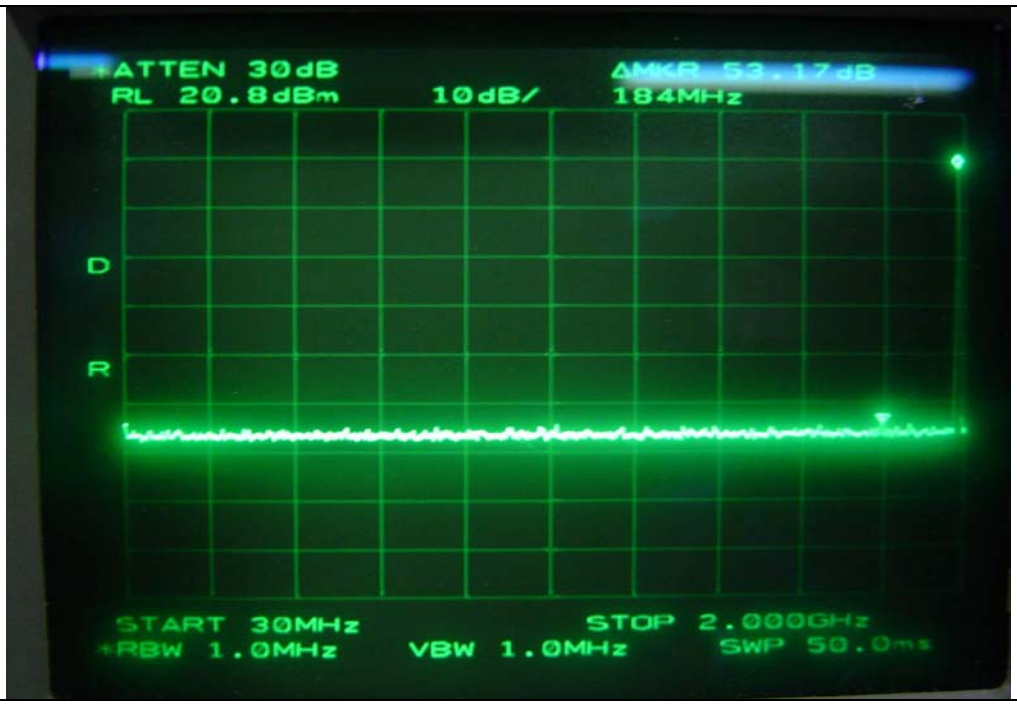
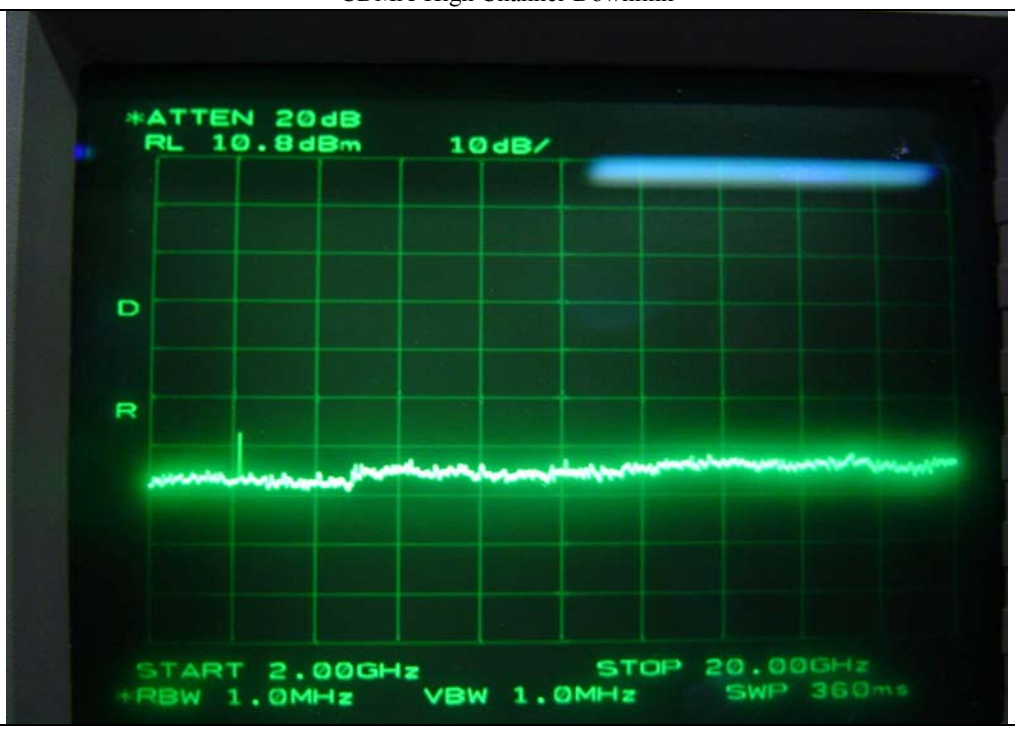


CDMA-High Channel-Downlink



CDMA-High Channel-Downlink

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9. FIELD STRENGTH OF SPURIOUS RADIATION

9.1 Operating environment

Temperature	:	26°C
Relative humidity	:	43 %

9.2 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.

9.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number
■ -	ESVS10	Rohde & Schwarz	EMI Test Receiver	827864/005
■ -	85650A	Hewlett Packard	Quasi-Peak Adapter	3107A01542
■ -	8568B	Hewlett-Packard	Spectrum Analyzer	3109A05456
■ -	85685A	Hewlett-Packard	RF Preselector	3107A01264
■ -	8564E	Hewlett-Packard	Spectrum Analyzer	3650A00756
■ -	8449B	Hewlett-Packard	Preamplifier	3008A00833
■ -	8564E	Hewlett-Packard	Spectrum Analyzer	3650A00756
■ -	E4432B	Hewlett-Packard	Signal Generator	US38440950
■ -	83650L	Hewlett-Packard	Signal Generator	3844A00415
□ -	8449B	Hewlett-Packard	RF Amplifier	3008A00833
□-	8447F	Hewlett-Packard	RF Amplifier	3113A04554
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	294
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	295
□-	8447F	HP	RF Amplifier	3113A04554
■ -	MA220	HD	Turn Table	N/A
■ -	HD240	HD	Antenna Mast	N/A
■ -	3104C	EMCO	Biconical Antenna	9109-4441
■ -	3146	EMCO	Log Periodic Antenna	9109-3214

All test equipment used is calibrated on a regular basis.

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9.4. Test data for radiated emission

9.4.1. Test data for Uplink Mode

-. Test Date : May 28, 2004
-. Resolution bandwidth : 1 MHz
-. Video bandwidth : 1 MHz
-. Frequency range : 1 GHz ~ 20 GHz
-. Operating Modulation : CDMA Mode
-. Measurement distance : 3m
-. Result : PASSED BY –11.02 dB at Middle Channel

Frequency (GHz)	Spectrum Reading (dBuV)	Generator Reading (dBm)	Ant. Gain (dBi)	Ant. Pol. (H/V)	Dipole Gain (dB)	Cable Loss (dB)	Total (dBm)	Limit (dBm)	Margin (dB)
Test Data for Low Channel									
1.851	87.50	8.40	10.40	H	2.15	0.5	16.15		
1.851	75.50	-8.50	10.40	V	2.15	0.5	-0.75		
1.816	39.80	-45.10	10.36	H	2.15	0.5	-37.39	-13.0	-24.39
1.816	37.20	-43.40	10.36	V	2.15	0.5	-35.69	-13.0	-22.69
1.928	40.50	-44.60	10.43	H	2.15	0.5	-36.82	-13.0	-23.82
1.928	39.20	-45.40	10.43	V	2.15	0.5	-37.62	-13.0	-24.62
Test Data for Middle Channel									
1.874	88.50	9.10	10.42	H	2.15	0.5	16.87		
1.874	75.80	-8.30	10.42	V	2.15	0.5	-0.53		
1.833	40.10	-45.60	10.38	H	2.15	0.5	-37.87	-13.0	-24.87
1.833	39.50	-47.30	10.38	V	2.15	0.5	-39.57	-13.0	-26.57
3.710	41.50	-32.90	12.70	H	2.15	1.7	-24.05	-13.0	-11.05
3.710	38.20	-35.20	12.70	V	2.15	1.7	-26.35	-13.0	-13.35
Test Data for High Channel									
1.909	87.80	9.40	10.45	H	2.15	0.5	17.20		
1.909	74.80	-8.00	10.45	V	2.15	0.5	-0.20		
1.869	48.50	-36.10	10.42	H	2.15	0.5	-28.33	-13.0	-15.33
1.869	46.90	-38.30	10.42	V	2.15	0.5	-30.53	-13.0	-17.53
1.980	49.70	-36.20	10.37	H	2.15	0.6	-28.58	-13.0	-15.58
1.980	46.80	-37.10	10.37	V	2.15	0.6	-29.48	-13.0	-16.48
3.770	38.90	-34.50	12.73	H	2.15	1.7	-25.62	-13.0	-12.62
3.770	37.50	-35.80	12.73	V	2.15	1.7	-26.92	-13.0	-13.92

Tabulated test data for Restricted Band

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9.4.2. Test data for Downlink Mode

-. Test Date : May 28, 2004
-. Resolution bandwidth : 1 MHz
-. Video bandwidth : 1 MHz
-. Frequency range : 1 GHz ~ 20 GHz
-. Operating Modulation : CDMA Mode
-. Measurement distance : 3m
-. Result : PASSED BY –17.13 dB at Middle Channel

Frequency (MHz)	Spectrum Reading (dBuV)	Generator Reading (dBm)	Ant. Gain (dBi)	Ant. Pol. (H/V)	Dipole Gain (dB)	Cable Loss (dB)	Total (dBm)	Limit (dBm)	Margin (dB)
Test Data for Low Channel									
1.931	87.80	7.40	10.41	H	2.15	0.6	15.06		
1.931	73.80	-7.90	10.41	V	2.15	0.6	-0.14		
1.849	43.50	-40.50	10.40	H	2.15	0.5	-32.75	-13.0	-19.75
1.849	47.80	-37.60	10.40	V	2.15	0.5	-29.85	-13.0	-16.85
Test Data for Middle Channel									
1.953	87.50	8.70	10.40	H	2.15	0.6	16.45		
1.953	73.30	-7.70	10.40	V	2.15	0.6	0.05		
1.867	41.80	-41.60	10.42	H	2.15	0.5	-33.83	-13.0	-20.83
1.867	41.20	-43.20	10.42	V	2.15	0.5	-30.13	-13.0	-17.13
Test Data for High Channel									
1.988	87.60	9.50	10.36	H	2.15	0.7	17.01		
1.988	75.80	-4.40	10.36	V	2.15	0.7	3.11		
It was not observed any emissions from the EUT on the noise floor.									

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical,
Total = Generator Reading + Antenna Gain – Dipole Gain – Cable Loss
Margin = Total - Limit

Tested by: Dan-Gi Lee / Project Engineer

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10. FREQUENCY STABILITY WITH TEMPERATURE VARIATION

10.1 Operating environment

Temperature : 14°C

Relative humidity : 39 %

10.2 Test set-up

The uplink side of the EUT was connected to a signal generator and the downlink side of the EUT was connected to a frequency counter. The signal generator was set to 1851.23MHz with an unmodulated signal. The downlink side of the EUT was connected to a signal generator and the uplink side of the EUT was connected to a frequency counter. The signal generator was set to 1931.23MHz with an unmodulated signal.

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.

10.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number
■ -	8564E	HP	Spectrum Analyzer	3650A00756
■ -	53152A	HP	Frequency Counter	US39270295
■ -	EY-101	Tabai ESPEC Corp.	Chamber	5104390

All test equipment used is calibrated on a regular basis.

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10.4 Test data

-. Test Date : June 02, 2004

-. Result : PASSED

Temperature (˚C)	Input Freq. (Hz)	Measured Freq. (Hz)	Result (PPM)	Limit
-30	1851230000	1851230120	0.06	Within the Authorized Frequency block
-20		1851230675	0.36	
-10		1851230351	0.19	
0		1851230489	0.26	
10		1851230012	0.01	
20		1851230890	0.48	
30		1851230450	0.24	
40		1851230892	0.48	
50		1851230421	0.23	
-30	1931230000	1931231210	0.63	Within the Authorized Frequency block
-20		1931230560	0.29	
-10		1931230079	0.04	
0		1931229890	-0.06	
10		1931230560	0.29	
20		1931230120	0.06	
30		19312300890	0.46	
40		1931230856	0.44	
50		1931229150	-0.44	

Tested by: Dan-Gi Lee / Project Engineer

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11. FREQUENCY STABILITY WITH VOLTAGE VARIATION

11.1 Operating environment

Temperature : 20°C

Relative humidity : 34 %

11.2 Test set-up

An external variable AC power supply was connected to the AC/DC Adapter of the EUT. The uplink side of the EUT was connected to a signal generator and the downlink side of the EUT was connected to a frequency counter. The signal generator was set to 1851.23MHz with an unmodulated signal. The downlink side of the EUT was connected to a signal generator and the uplink side of the EUT was connected to a frequency counter. The signal generator was set to 1931.23MHz with an unmodulated signal. 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.

11.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number
■ -	8564E	HP	Spectrum Analyzer	3650A00756
■ -	53152A	HP	Frequency Counter	US39270295
■ -	N/A	HP	30 dB Attenuator Assembly	2350A03133
■ -	3033B	B&J TMI	DC Power Supply	2056036

All test equipment used is calibrated on a regular basis.

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11.4 Test data

-. Test Date : June 02, 2004

-. Rated Supply Voltage : 110 Vac

-. Result : PASSED BY 0.70 PPM at 93.5Vac on 1851.23MHz

Voltage (Vac)	Input Freq. (Hz)	Measured Freq. (Hz)	Result (PPM)	Limit
126.5 (115%)	1851230000	1851231200	0.65	Within the Authorized Frequency block
110 (100%)		1851230000	0.0	
93.5 (85%)		1851231300	0.70	
126.5 (115%)	1931230000	1931230030	0.02	
110 (100%)		1931230000	0.0	
93.5 (85%)		1931230700	0.36	

Tested by: Dan-Gi Lee / Project Engineer

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12. CONDUCTED EMISSION TEST

12.1 Operating environment

Temperature : 20°C

Relative humidity : 34 %

12.2 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.

12.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number
■ -	ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007
■ -	3825/2	EMCO	AMN	9109-1869
■ -	N/A	HanKook Shield room	Shield Room	N/A
■ -	YSE 500B	YoungShin Eng.	Frequency Converter	950413001
■ -	ETCR-10	DaeHa	Automatic Voltage Com.	N/A

All test equipment used is calibrated on a regular basis.

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12.4 Test data

12.4.1 Test data for Downlink Mode

-. Test Date : June 01, 2004

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15MHz ~ 30MHz

-. Operating Mode : CDMA Downlink Mode

-. Result : PASSED BY –1.99 dB at 1.75 MHz with Peak Detector

Frequency (MHz)	Line	Quasi-Peak (dBuV)			Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Detector Mode	Limits		Emission level	Limits	
0.49	N	47.97	P	56.17	-8.20	34.60	46.17	-11.57
0.62	H	48.04	P	56.00	-7.96	28.65	46.00	-17.35
0.87	H	49.07	P	56.00	-6.93	31.34	46.00	-14.66
1.51	N	50.53	P	56.00	-5.47	27.44	46.00	-19.59
1.63	N	52.18	P	56.00	-3.82	26.41	46.00	-19.59
1.75	H	54.01	P	56.00	-1.99	29.05	46.00	-16.95
1.97	H	49.17	P	56.00	-6.83	32.06	46.00	-13.94

Line Conducted Emissions Tabulated Data

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

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

Tested by: Dan-Gi Lee / Project Engineer

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HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-121, Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-860 Korea. (TEL: 82-31-765-8289 FAX: 82-31-766-2904)

12.4.2Test data for Uplink Mode

-. Test Date : June 01, 2004

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15MHz ~ 30MHz

-. Operating Mode : CDMA Uplink Mode

-. Result : PASSED BY –1.91dB at 1.70MHz with Peak Detector

Frequency (MHz)	Line	Quasi-Peak (dBuV)			Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Detector Mode	Limits		Emission level	Limits	
0.48	H	47.87	P	56.34	-8.47	34.66	46.34	-11.68
0.60	H	47.50	P	56.00	-8.50	32.82	46.00	-13.18
0.84	N	48.01	P	56.00	-7.99	32.49	46.00	-13.51
1.59	H	51.03	P	56.00	-4.97	25.87	46.00	-20.13
1.70	H	54.09	P	56.00	-1.91	29.42	46.00	-16.58
1.82	H	50.21	P	56.00	-5.79	30.05	46.00	-15.95

Line Conducted Emissions Tabulated Data

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

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

Tested by: Dan-Gi Lee / Project Engineer

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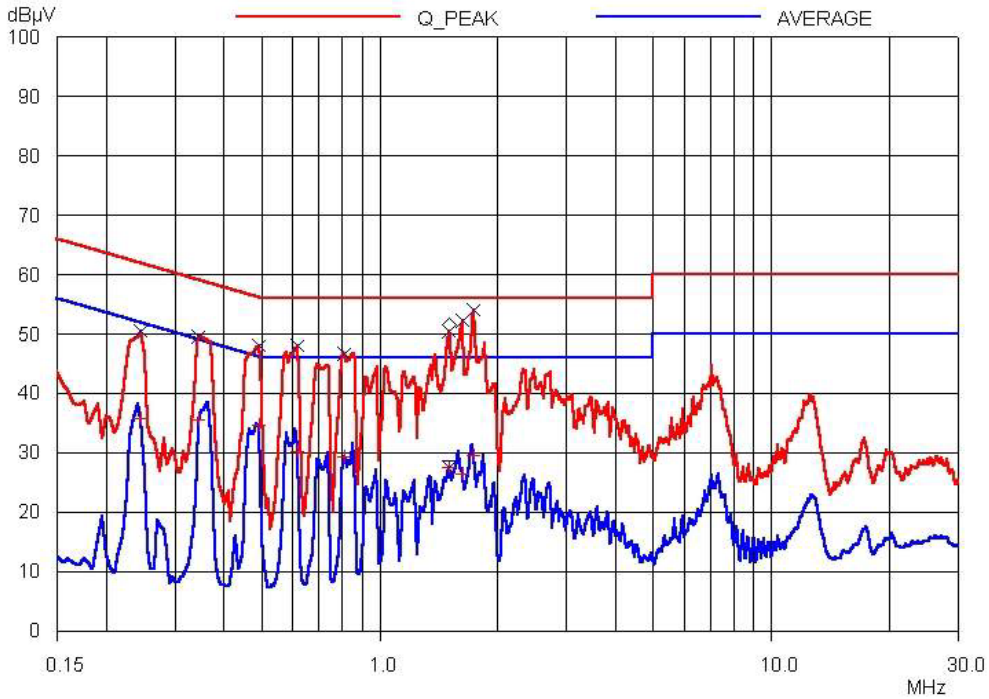
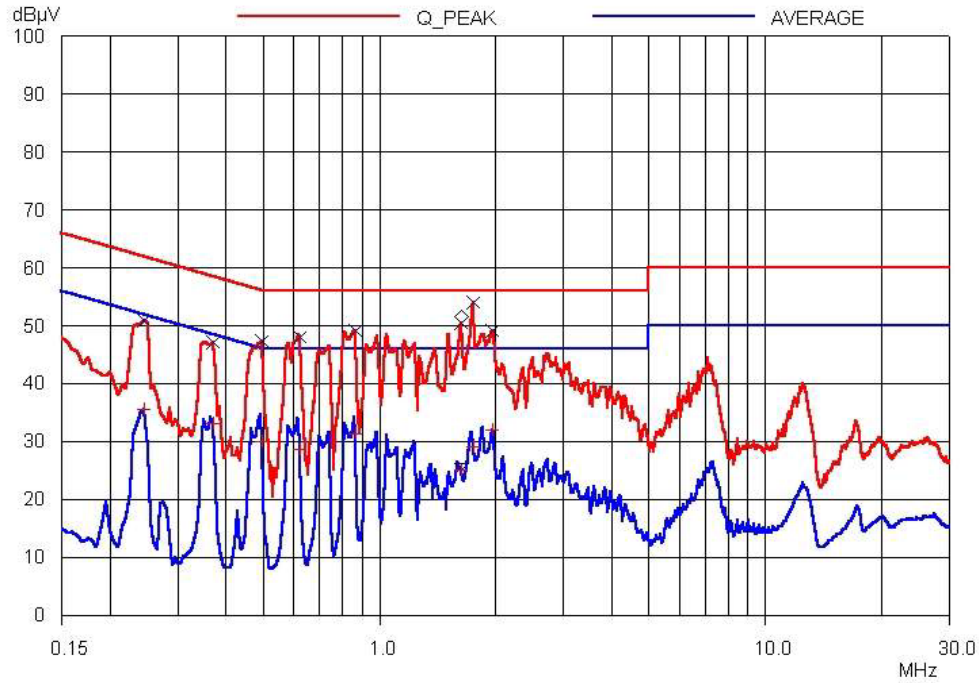
Downlink Mode

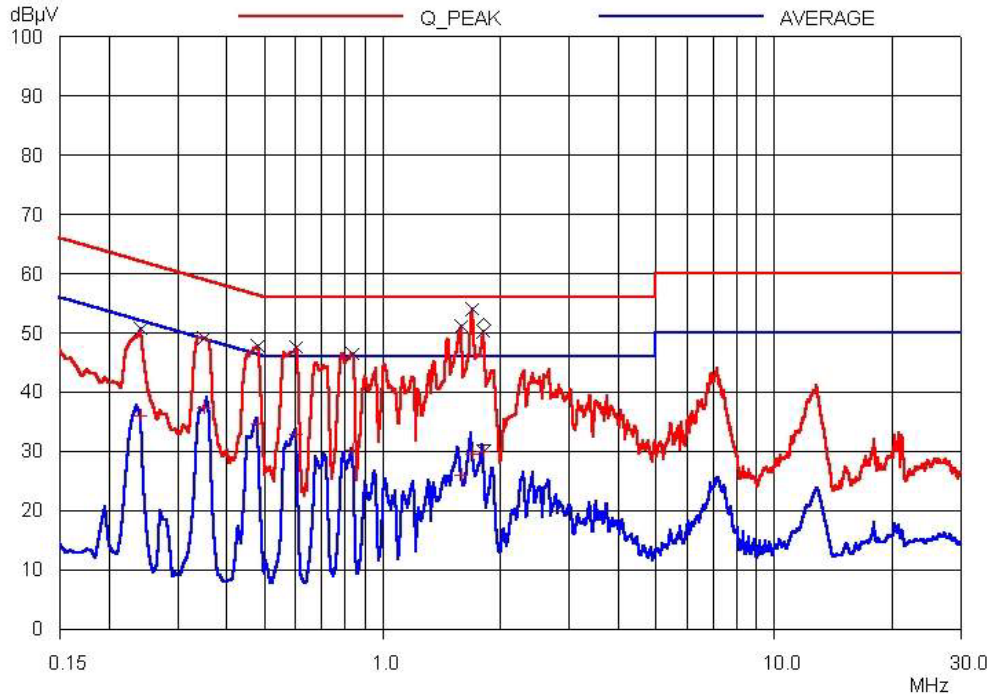


HOT LINE

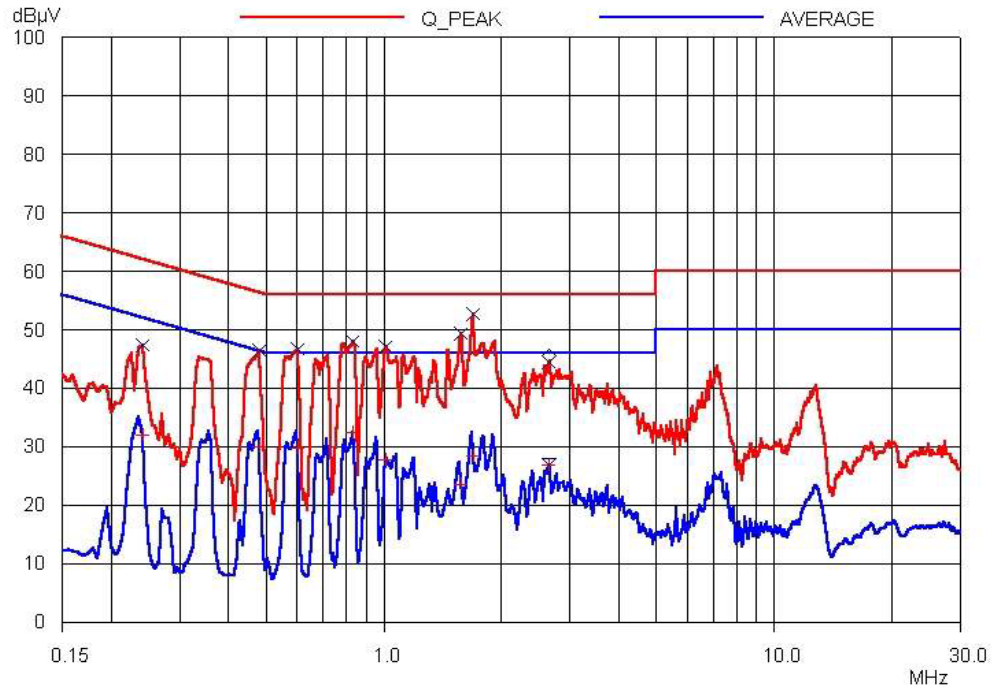


NEUTRAL LINE

Uplink Mode



HOT LINE



NEUTRAL LINE

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