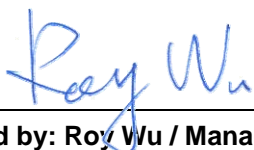


FCC Test Report

EQUIPMENT : Electronic display device
MODEL NAME : D00511
FCC ID : WI5-1210
STANDARD : 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter worn on body (PCT)
Tx/Rx FREQUENCY RANGE : CDMA2000 Cellular :
824.2 ~ 848.8 / 869.2 ~ 893.8 MHz
CDMA2000 PCS :
1850.2 ~ 1910.8 / 1930.2 ~ 1989.8 MHz
MAX. ERP/EIRP POWER : CDMA2000 Cellular :
0.16 W (1xRTT) / 0.20 W (EV DO Rev.A)
CDMA2000 PCS :
0.50 W (1xRTT) / 0.54 W (EV DO Rev.A)
EMISSION DESIGNATOR : 1M25F9W
APPLICANT : Tolman LLC, a Delaware Corporation
110 W 9th Street #358, Wilmington, Delaware 19801

The product sample received on Aug. 24, 2008 and completely tested on Aug. 26, 2008. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Ray Wu / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result
3.1	§2.1046	N/A	Conducted Output Power	N/A	Pass
3.2	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts for FCC (<6.3 Watts for IC)	Pass
3.2	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	Pass
3.3	§2.1049 §22.917(a) §24.238(a)	N/A	Occupied Bandwidth	N/A	Pass
3.3	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Measurement	< 43+10log ₁₀ (P[Watts])	Pass
3.4	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	< 43+10log ₁₀ (P[Watts])	Pass
3.5	§2.1055 §22.355 §24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	Pass

REVISION HISTORY

[illegible]

1 General Description

1.1 Applicant

Tolman LLC, a Delaware Corporation

110 W 9th Street #358, Wilmington, Delaware 19801

1.2 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Electronic display device
Model Name	D00511
Tx Frequency	CDMA2000 Cellular : 824 MHz ~ 849 MHz CDMA2000 PCS : 1850 MHz ~1910 MHz
Rx Frequency	CDMA2000 Cellular : 869 MHz ~ 894 MHz CDMA2000 PCS : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	CDMA2000 Cellular (1xRTT): 24.08 dBm CDMA2000 Cellular (EV-DO): 24.02 dBm (Rev.0) CDMA2000 Cellular (EV-DO): 24.07 dBm (Rev.A) CDMA2000 PCS (1xRTT): 23.93 dBm CDMA2000 PCS (EV-DO): 23.88 dBm (Rev.0) CDMA2000 PCS (EV-DO): 23.87 dBm (Rev.A)
Maximum ERP/EIRP	CDMA2000 Cellular : 0.16 W (21.94 dBm) for 1xRTT 0.20 W (22.95 dBm) for EV-DO (Rev.A) CDMA2000 PCS : 0.50 W (27.03 dBm) for 1xRTT 0.54 W (27.35 dBm) for EV-DO (Rev.A)
Antenna Type	Fixed Internal with gain 0.5 dBi
HW Version	DVT unit
SW Version	Pre-production
Type of Modulation	QPSK
Type of Emission	1M25F9W
EUT Stage	Production Unit

1.3 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH02-HY	03CH07-HY	TW1022/4086B-1

1.4 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- ♦ 47 CFR Part 2, 22(H), 24(E)
- ♦ ANSI C63.4-2003
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ IC RSS-132, RSS-133

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC), recorded in a separate test report.

1.5 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Code
1.	Base Station	Agilent	E5515C	N/A	N/A	Unshielded, 1.8m

2 Test Configuration of Equipment Under Test

2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

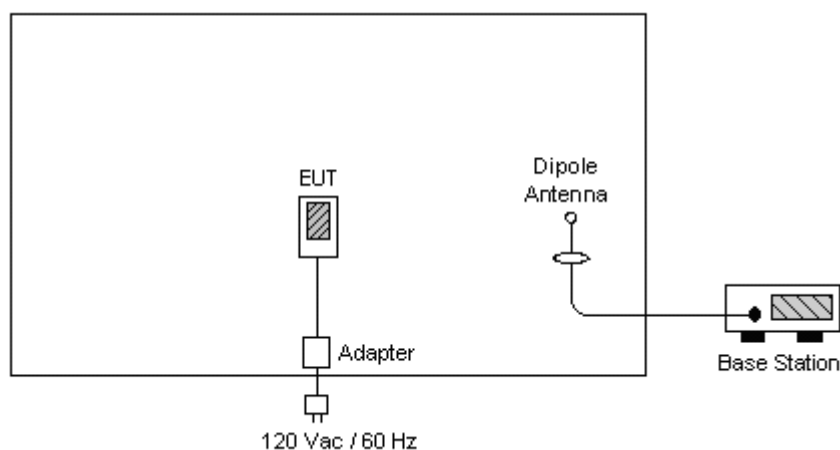
Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for CDMA2000 Cellular
2. 30MHz to 19000 MHz for CDMA2000 PCS.

Test Modes		
Band	Radiated TCs	Conducted TCs
CDMA2000 Cellular	■ 1xRTT Link	■ 1xRTT Link ■ EV-DO(Rev.0) Link ■ EV-DO(Rev.A) Link
CDMA2000 PCS	■ 1xRTT Link	■ 1xRTT Link ■ EV-DO(Rev.0) Link ■ EV-DO(Rev.A) Link

2.2 Connection Diagram of Test System

<CDMA2000 Link Mode>



3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

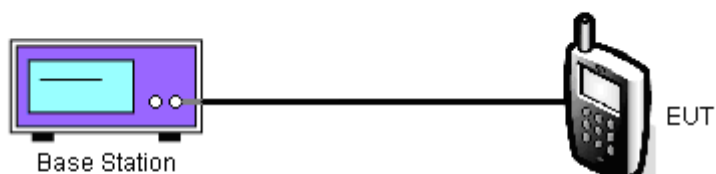
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular					
Modes		Channel	Frequency (MHz)	Conducted Power	
				(dBm)	(Watts)
CDMA 2000 1xRTT	FCH_RC1	1013	824.70 (Low)	23.97	0.25
		384	836.52 (Mid)	23.96	0.25
		777	848.31 (High)	24.03	0.25
	FCH_RC3	1013	824.70 (Low)	23.96	0.25
		384	836.52 (Mid)	23.95	0.25
		777	848.31 (High)	24.05	0.25
	FCH+SCH_RC3	1013	824.70 (Low)	23.96	0.25
		384	836.52 (Mid)	23.97	0.25
		777	848.31 (High)	24.08	0.26
CDMA 2000 EV-DO (Rev.0)	RTPA_9.6Kbps	1013	824.70 (Low)	23.59	0.23
		384	836.52 (Mid)	23.70	0.23
		777	848.31 (High)	23.76	0.24
	RTPA_38.4Kbps	1013	824.70 (Low)	23.77	0.24
		384	836.52 (Mid)	23.80	0.24
		777	848.31 (High)	23.81	0.24
	RTPA_153.6Kbps	1013	824.70 (Low)	23.82	0.24
		384	836.52 (Mid)	24.01	0.25
		777	848.31 (High)	24.02	0.25
CDMA 2000 EV-DO (Rev.A)	RETAP_128Kbps	1013	824.70 (Low)	23.33	0.22
		384	836.52 (Mid)	23.36	0.22
		777	848.31 (High)	23.47	0.22
	RETAP_2048Kbps	1013	824.70 (Low)	23.79	0.24
		384	836.52 (Mid)	23.88	0.24
		777	848.31 (High)	23.94	0.25
	RETAP_12288Kbps	1013	824.70 (Low)	24.07	0.26
		384	836.52 (Mid)	23.98	0.25
		777	848.31 (High)	24.01	0.25
Note:					

PCS					
Modes		Channel	Frequency (MHz)	Conducted Power	
				(dBm)	(Watts)
CDMA 2000 1xRTT	FCH_RC1	25	1851.25 (Low)	23.84	0.24
		600	1880.00 (Mid)	23.89	0.24
		1177	1908.75 (High)	23.59	0.23
	FCH_RC3	25	1851.25 (Low)	23.88	0.24
		600	1880.00 (Mid)	23.91	0.25
		1177	1908.75 (High)	23.60	0.23
	FCH+SCH_RC1	25	1851.25 (Low)	23.90	0.25
		600	1880.00 (Mid)	23.93	0.25
		1177	1908.75 (High)	23.60	0.23
CDMA 2000 EV-DO (Rev.0)	RTPA_9.6Kbps	25	1851.25 (Low)	23.53	0.23
		600	1880.00 (Mid)	23.52	0.22
		1177	1908.75 (High)	23.22	0.21
	RTPA_38.4Kbps	25	1851.25 (Low)	23.50	0.22
		600	1880.00 (Mid)	23.47	0.22
		1177	1908.75 (High)	23.35	0.22
	RTPA_153.6Kbps	25	1851.25 (Low)	23.73	0.24
		600	1880.00 (Mid)	23.81	0.24
		1177	1908.75 (High)	23.47	0.22
CDMA 2000 EV-DO (Rev.A)	RETAP_128Kbps	25	1851.25 (Low)	23.27	0.21
		600	1880.00 (Mid)	23.21	0.21
		1177	1908.75 (High)	22.89	0.19
	RETAP_2048Kbps	25	1851.25 (Low)	23.70	0.23
		600	1880.00 (Mid)	23.88	0.24
		1177	1908.75 (High)	23.32	0.21
	RETAP_12288Kbps	25	1851.25 (Low)	23.87	0.24
		600	1880.00 (Mid)	23.86	0.24
		1177	1908.75 (High)	23.57	0.23
Note:					

3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.2.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 1.2 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

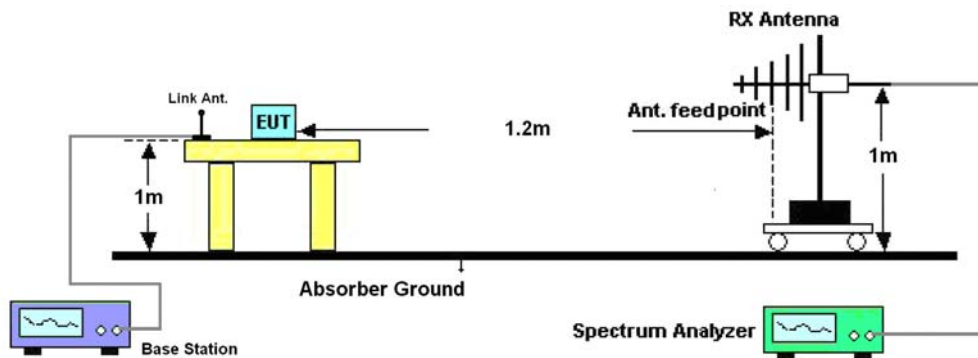
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

R_t : The highest received signal in spectrum analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

3.2.4 Test Setup



3.2.5 Test Result of ERP

CDMA2000 Cellular 1xRTT FCH+SCH_RC3 Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.70	-27.48	-48.12	0.00	-1.08	19.56	0.09
836.52	-27.30	-48.28	0.00	-0.93	20.05	0.10
848.31	-27.18	-48.35	0.00	-0.76	20.41	0.11
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.70	-24.95	-47.97	0.00	-1.08	21.94	0.16
836.52	-25.30	-48.01	0.00	-0.93	21.78	0.15
848.31	-25.46	-48.05	0.00	-0.76	21.83	0.15

CDMA2000 Cellular EV-DO RETAP_12288Kbps Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.70	-26.18	-48.12	0.00	-1.08	20.86	0.12
836.52	-26.88	-48.28	0.00	-0.93	20.47	0.11
848.31	-26.87	-48.35	0.00	-0.76	20.72	0.12
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.70	-23.94	-47.97	0.00	-1.08	22.95	0.20
836.52	-25.11	-48.01	0.00	-0.93	21.97	0.16
848.31	-25.23	-48.05	0.00	-0.76	22.06	0.16

3.2.6 Test Result of EIRP

CDMA2000 PCS 1xRTT FCH+SCH_RC3 Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1851.25	-26.82	-51.88	0.00	1.96	27.02	0.50
1880.00	-27.96	-52.99	0.00	2.00	27.03	0.50
1908.75	-29.92	-54.28	0.00	1.98	26.34	0.43
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1851.25	-27.94	-52.13	0.00	1.96	26.15	0.41
1880.00	-28.58	-53.17	0.00	2.00	26.59	0.46
1908.75	-29.66	-54.13	0.00	1.98	26.45	0.44

CDMA2000 PCS EV-DO RETAP_12288Kbps Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1851.25	-26.87	-51.88	0.00	1.96	26.97	0.50
1880.00	-27.64	-52.99	0.00	2.00	27.35	0.54
1908.75	-29.45	-54.28	0.00	1.98	26.81	0.48
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1851.25	-27.77	-52.13	0.00	1.96	26.32	0.43
1880.00	-28.55	-53.17	0.00	2.00	26.62	0.46
1908.75	-26.57	-54.13	0.00	1.98	26.54	0.45

3.3 Occupied Bandwidth and Band Edge Measurement

3.3.1 Description of Occupied Bandwidth and Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43+10\log_{10}(P[\text{Watts}])$ dB.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

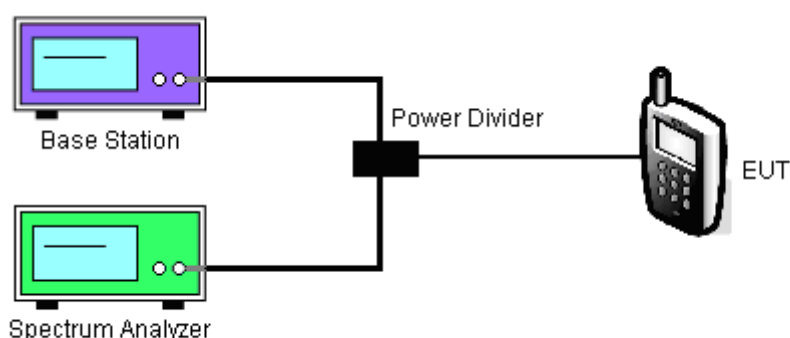
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the low, middle and high channels for the highest RF powers were measured.
3. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
4. The RBW was replaced by 10 kHz, due to the spectrum analyzer IF-Filter including an excess of the limit. A worst case correction factor of $10 \log (1\% \text{ BW/measurement RBW})$ was implemented.

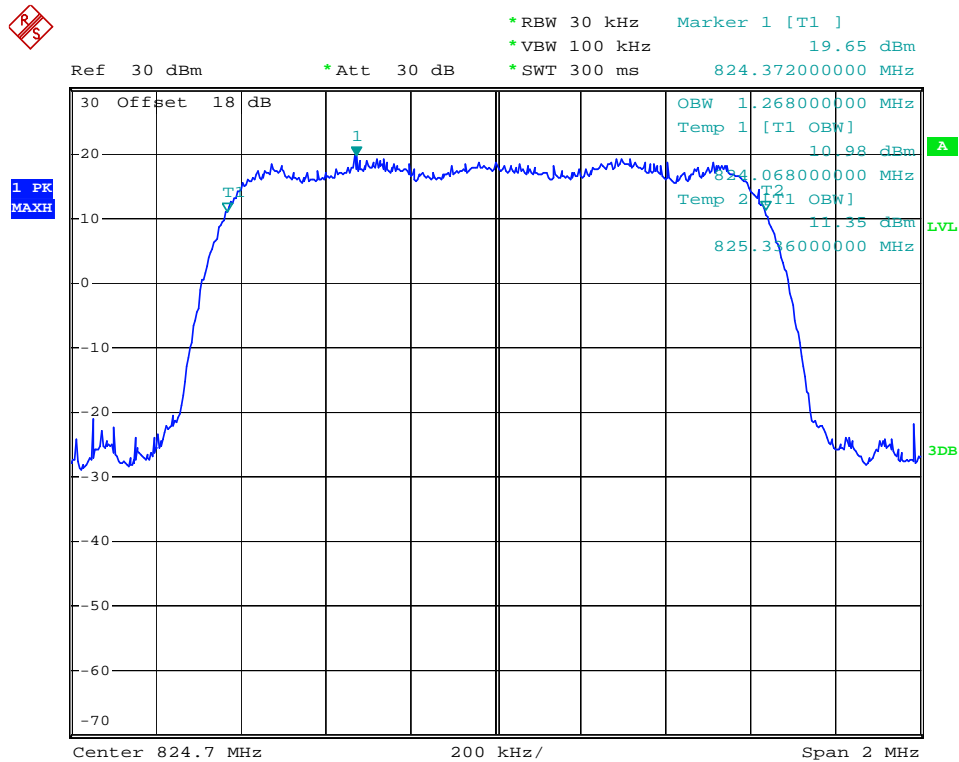
3.3.4 Test Setup



3.3.5 Test Result (Plots) of Occupied Bandwidth

Band :	CDMA2000 Cellular	Power Stage :	High
Test Mode :	1xRTT_FCH+SCH_RC3		

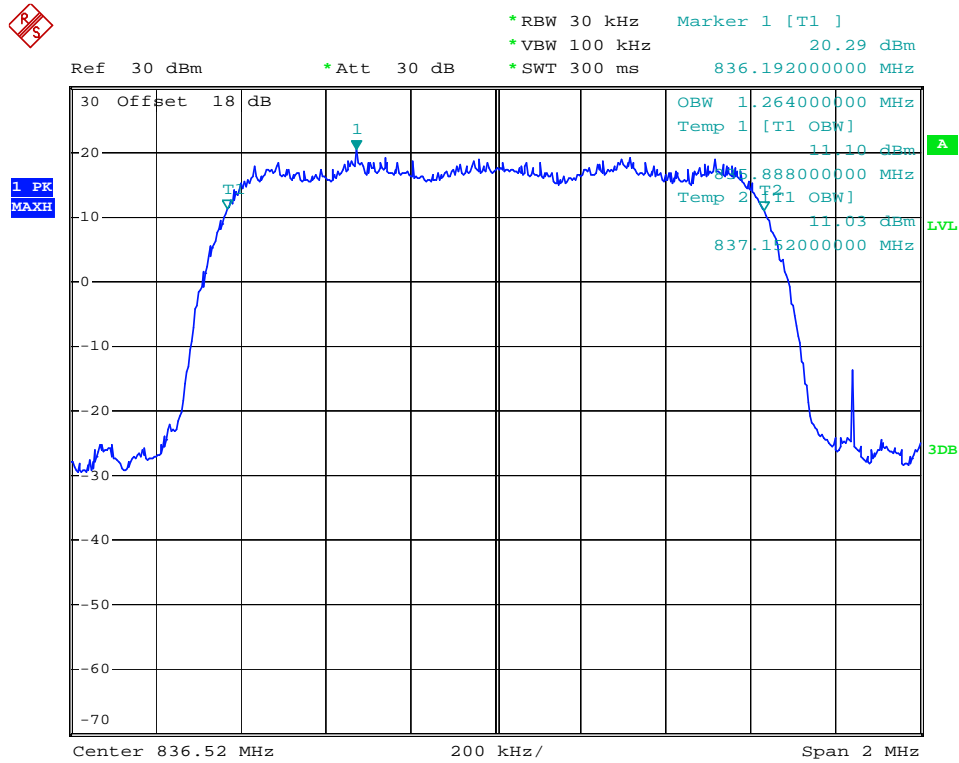
99% Occupied Bandwidth Plot on Channel 1013



Date: 26.AUG.2008 11:32:46



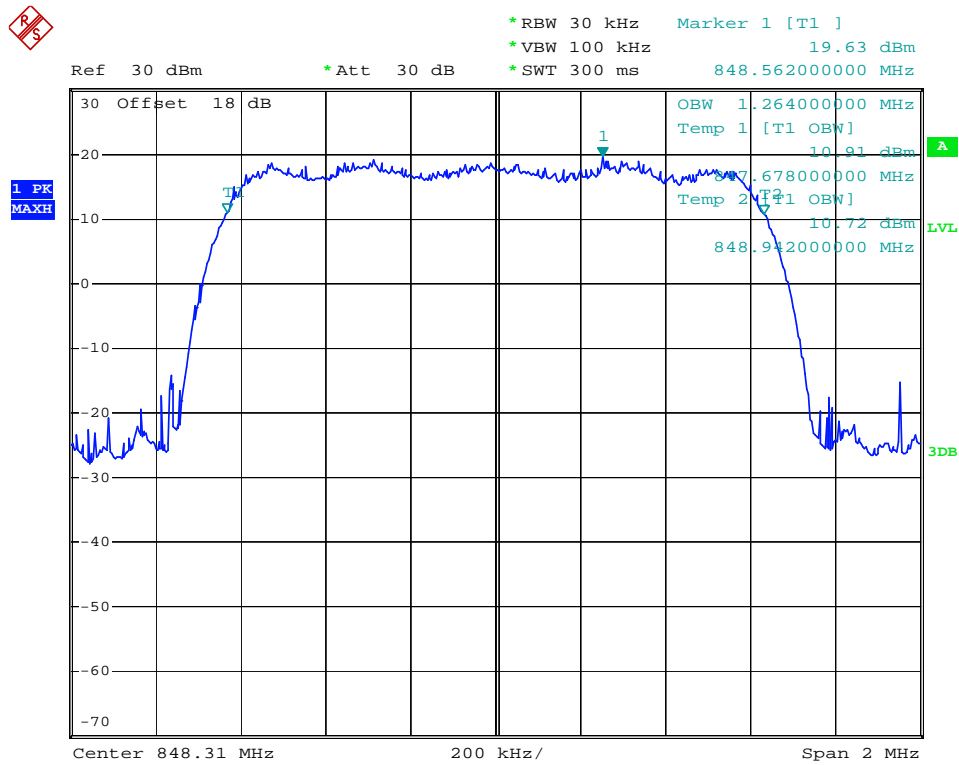
99% Occupied Bandwidth Plot on Channel 384



Date: 26.AUG.2008 11:33:12



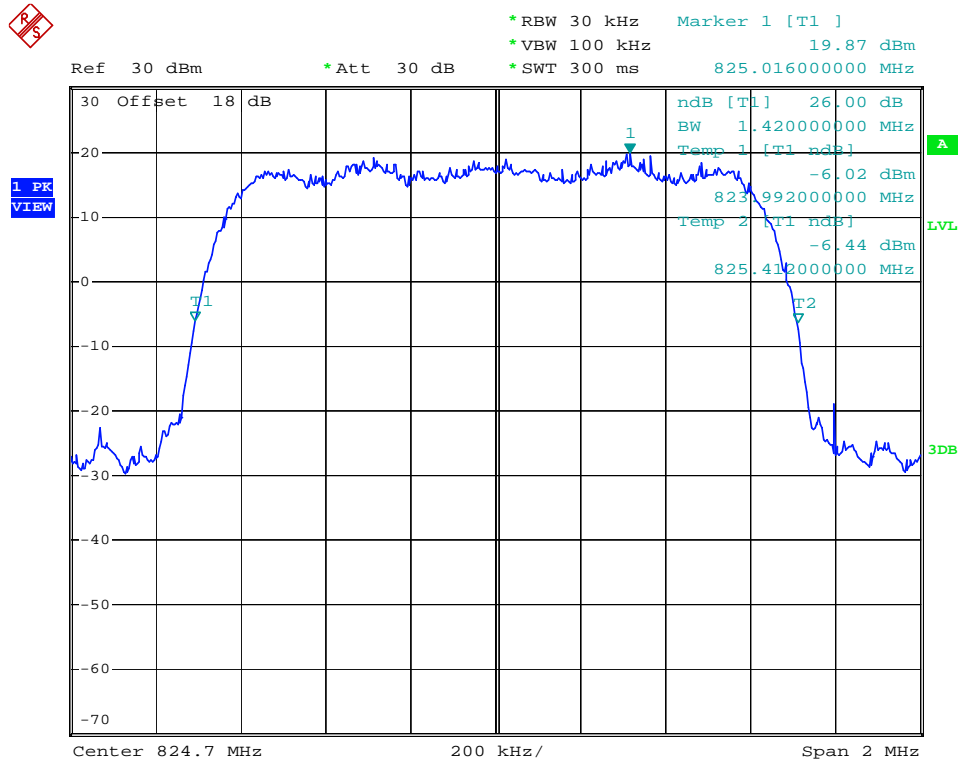
99% Occupied Bandwidth Plot on Channel 777



Date: 26.AUG.2008 11:31:43



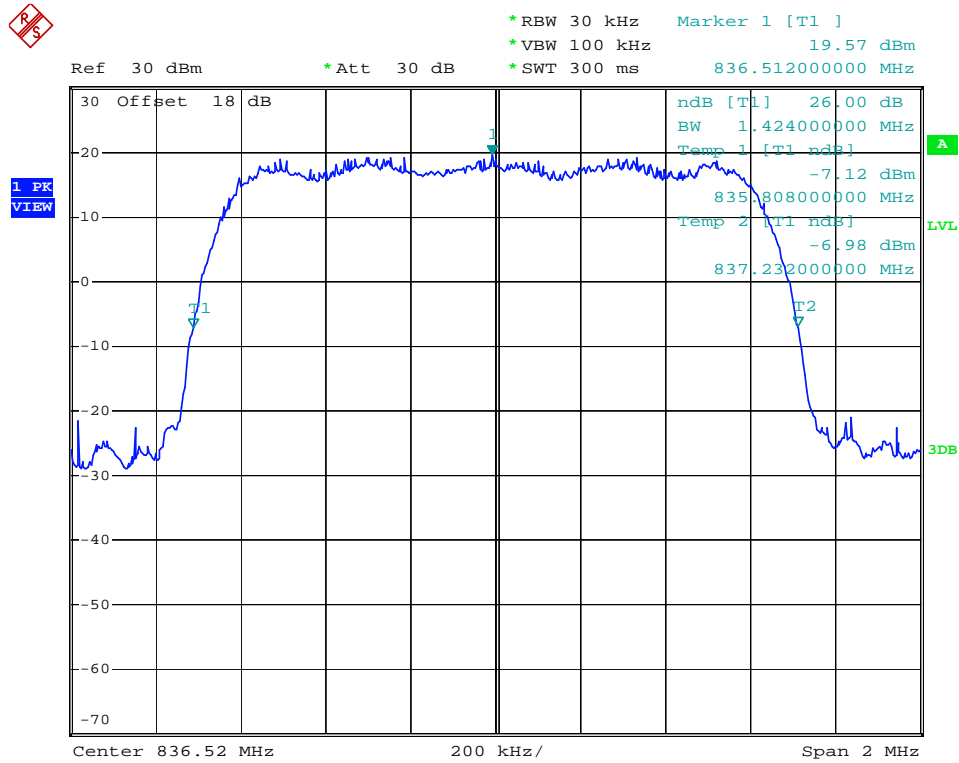
26dB Bandwidth Plot on Channel 1013



Date: 26.AUG.2008 11:29:43



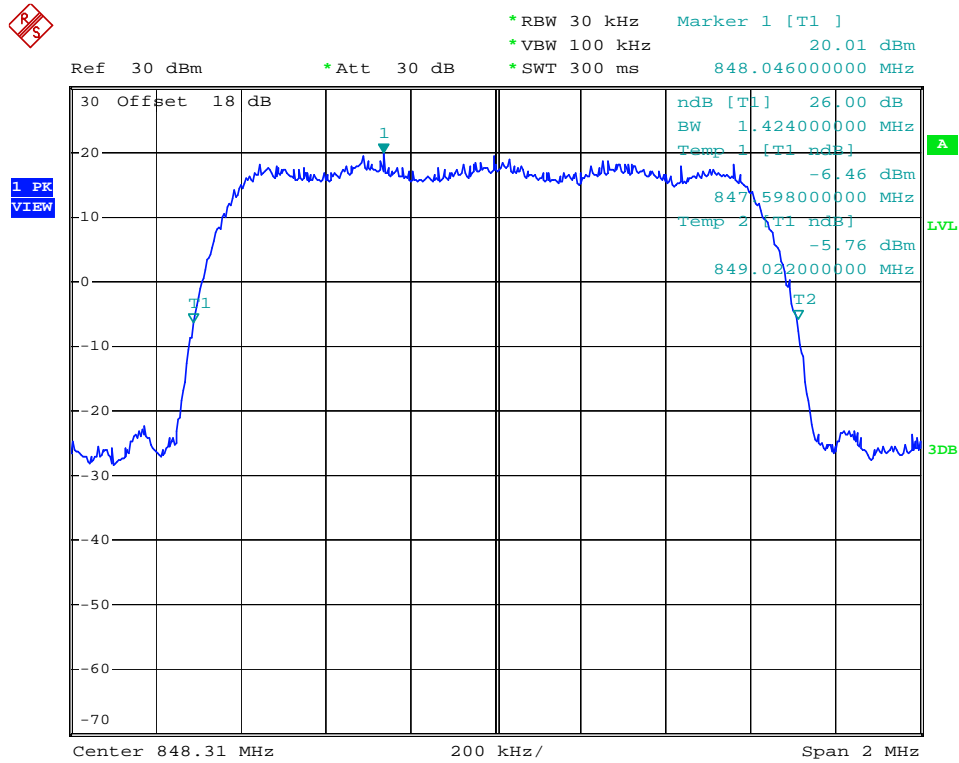
26dB Bandwidth Plot on Channel 384



Date: 26.AUG.2008 11:29:08



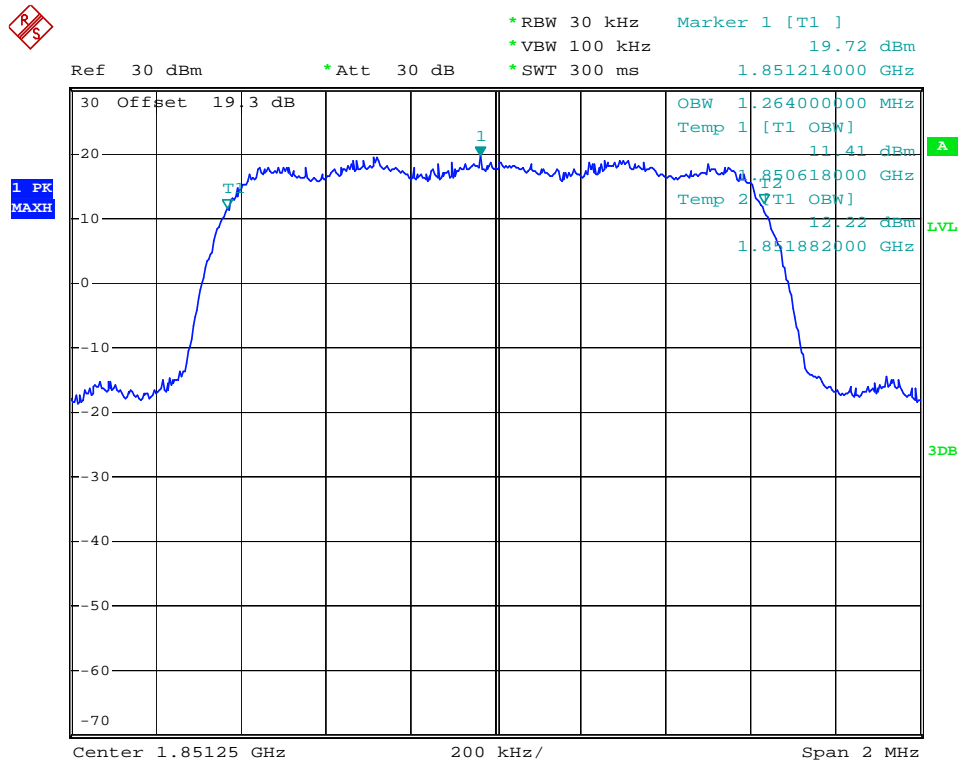
26dB Bandwidth Plot on Channel 777



Date: 26.AUG.2008 11:30:24

3.3.6

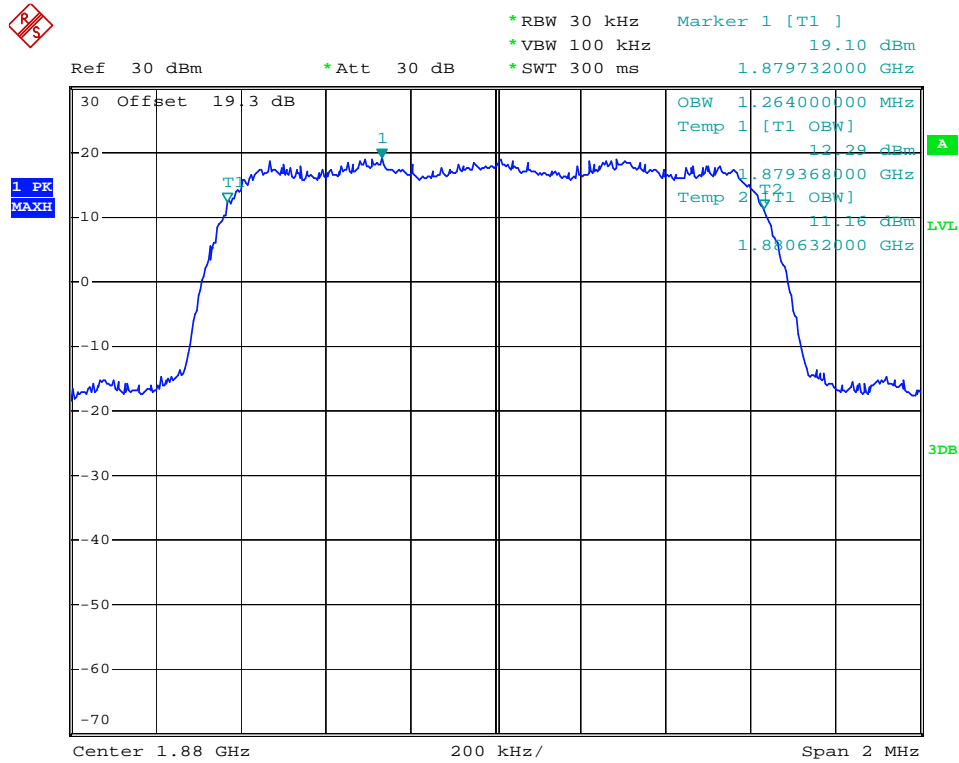
Band :	CDMA2000 PCS	Power Stage :	High
Test Mode :	1xRTT_FCH+SCH_RC3		

99% Occupied Bandwidth Plot on Channel 25


Date: 26.AUG.2008 17:31:06



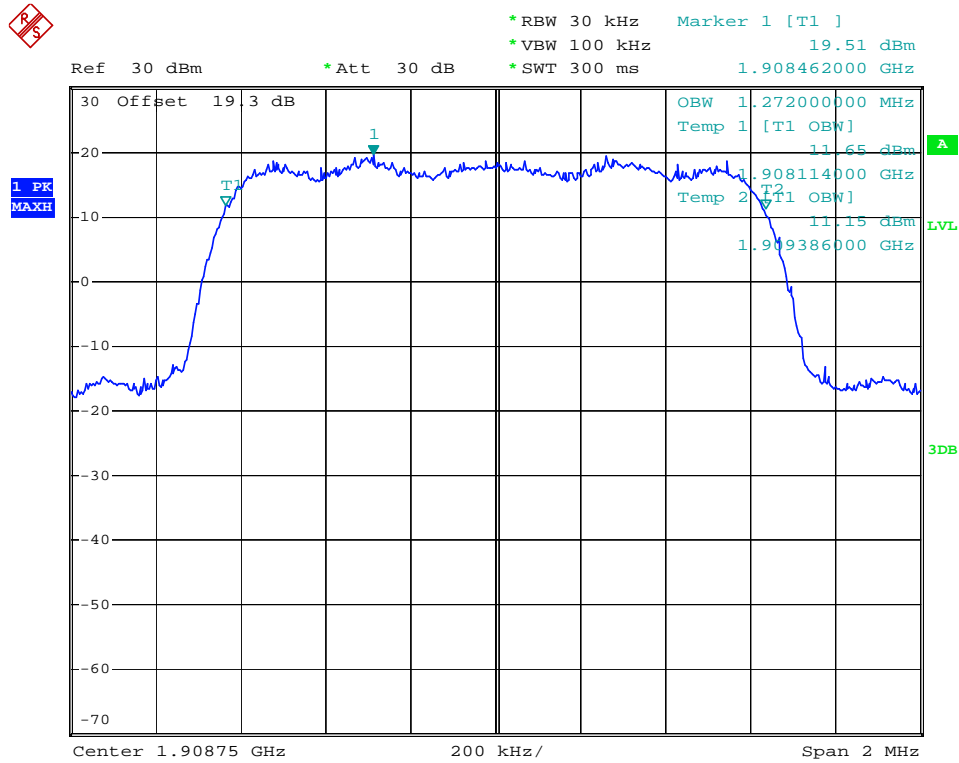
99% Occupied Bandwidth Plot on Channel 600



Date: 26.AUG.2008 17:24:01



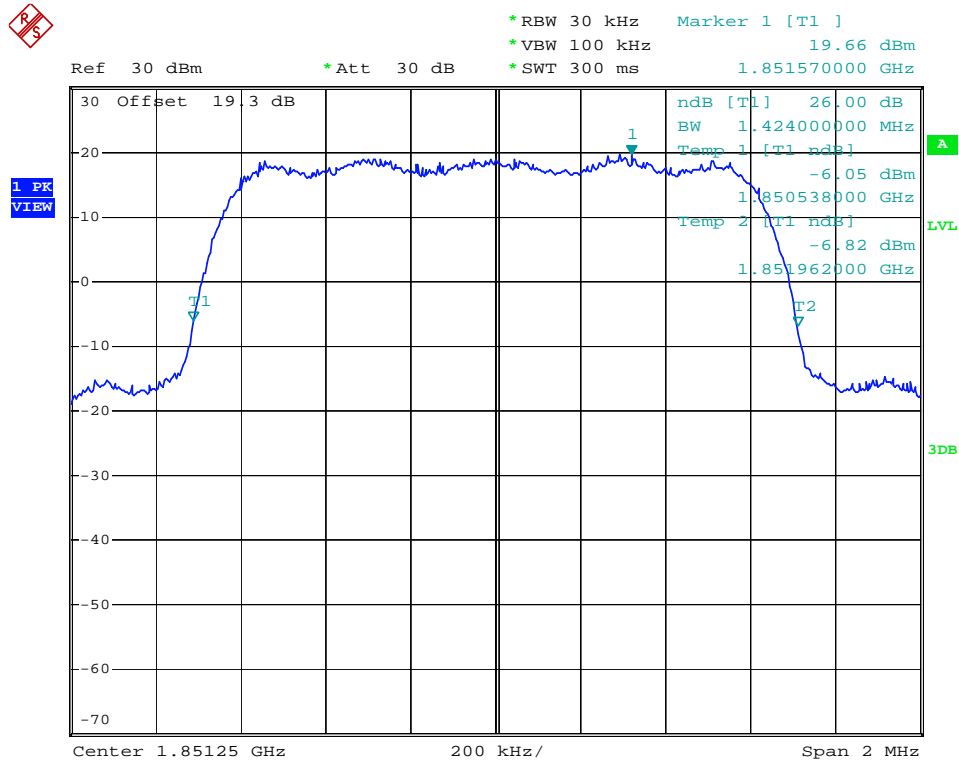
99% Occupied Bandwidth Plot on Channel 1177



Date: 26.AUG.2008 18:08:36



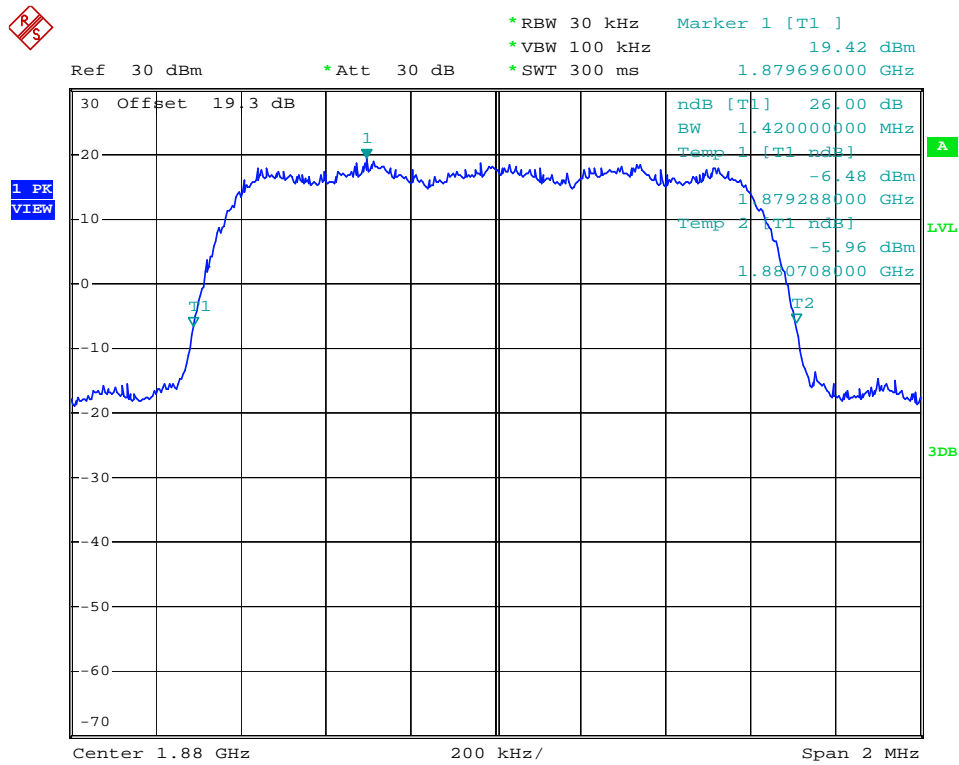
26dB Bandwidth Plot on Channel 25



Date: 26.AUG.2008 17:29:47



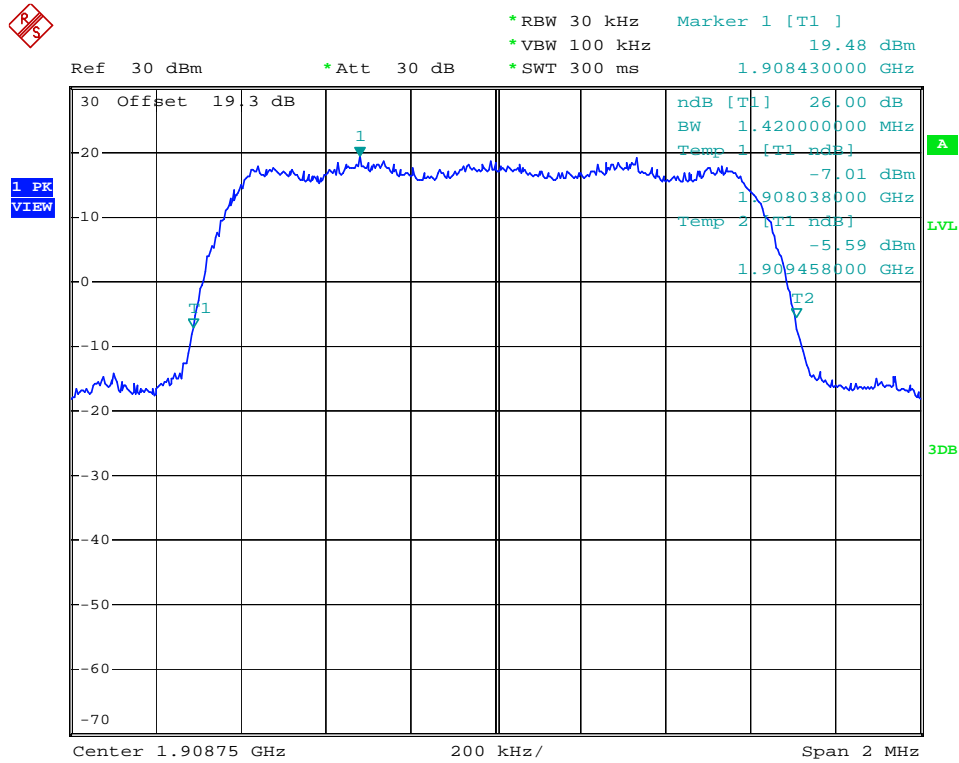
26dB Bandwidth Plot on Channel 600



Date: 26.AUG.2008 17:22:33



26dB Bandwidth Plot on Channel 1177

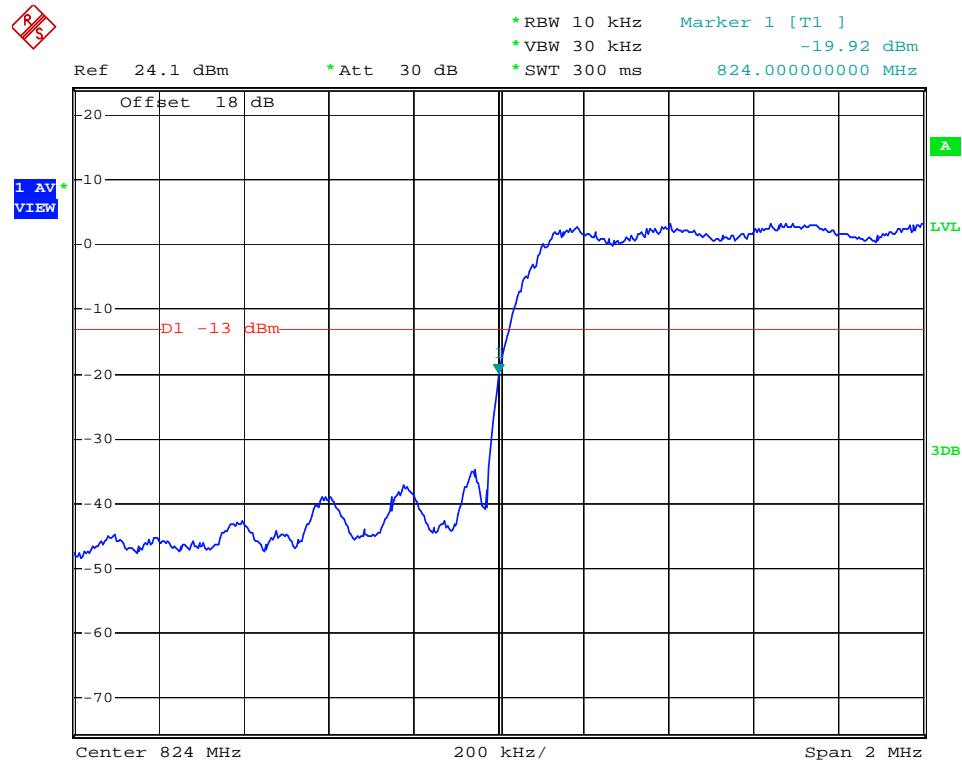


Date: 26.AUG.2008 18:07:07

3.3.7 Test Result (Plots) of Conducted Band Edges

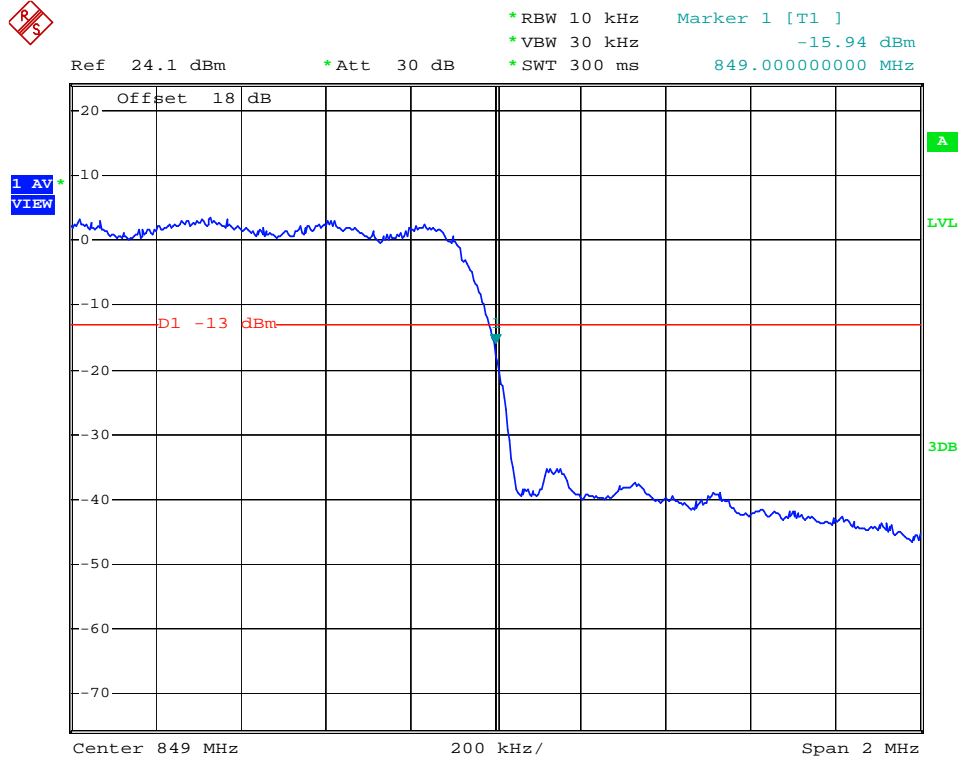
Band :	CDMA2000 Cellular	Power Stage :	High
Test Mode :	1XRTT_FCH_RC1		

Lower Band Edge Plot on Channel 1013



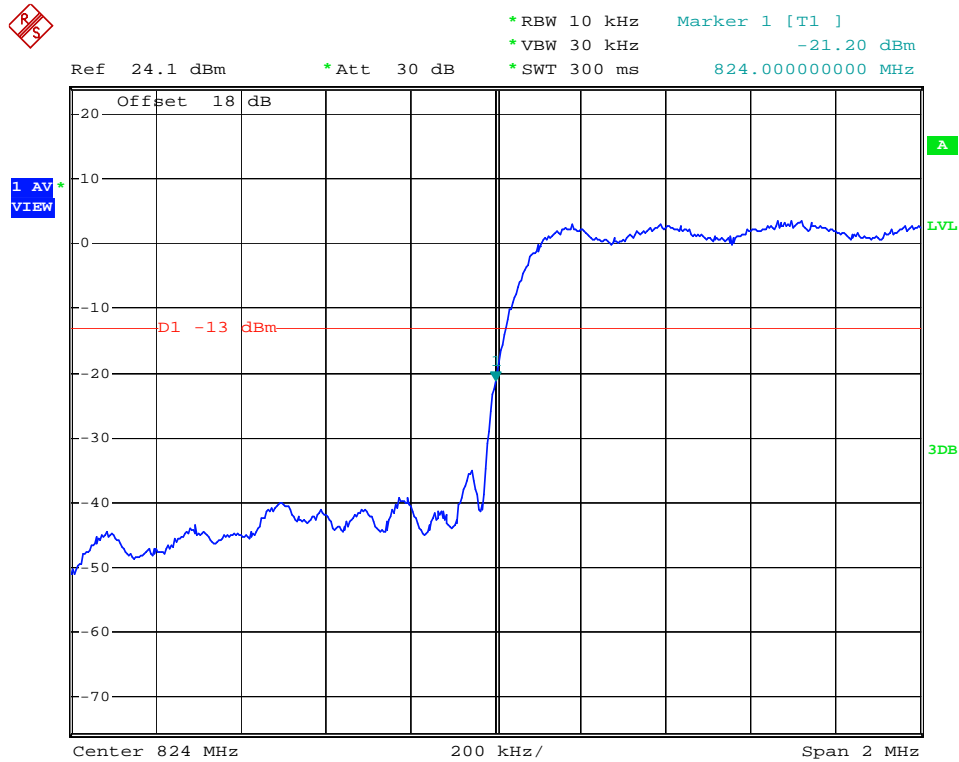
Date: 26.AUG.2008 11:52:55

Higher Band Edge Plot on Channel 777



Date: 26.AUG.2008 11:48:55

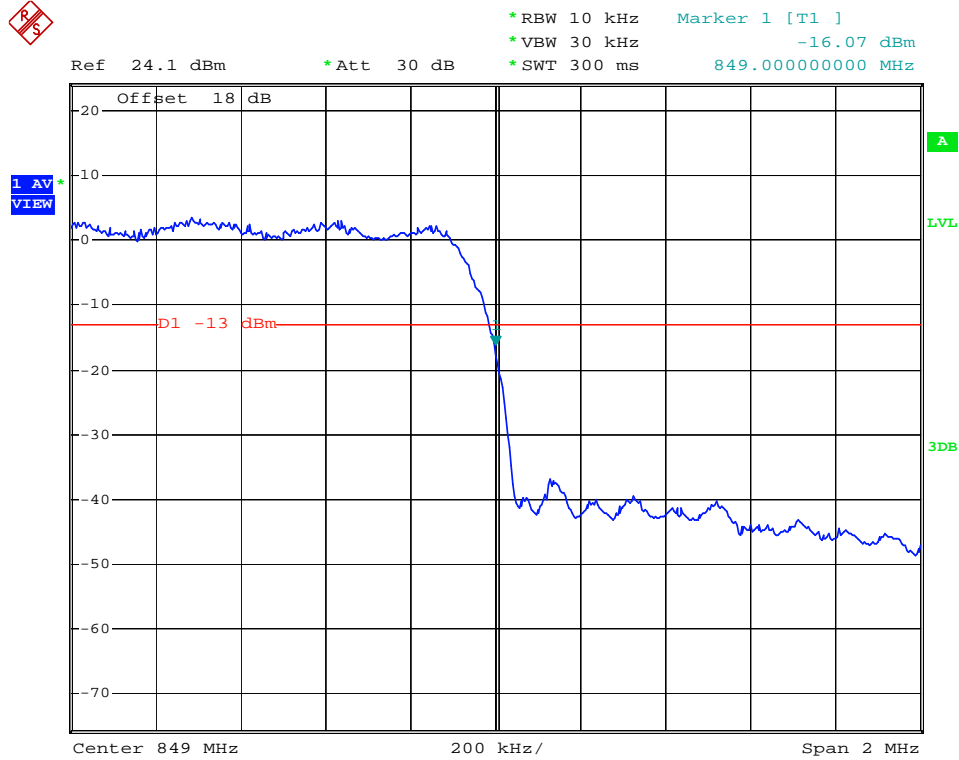
Band :	CDMA2000 Cellular	Power Stage :	High
Test Mode :	1XRTT_FCH_RC3		

Lower Band Edge Plot on Channel 1013


Date: 26.AUG.2008 11:58:37

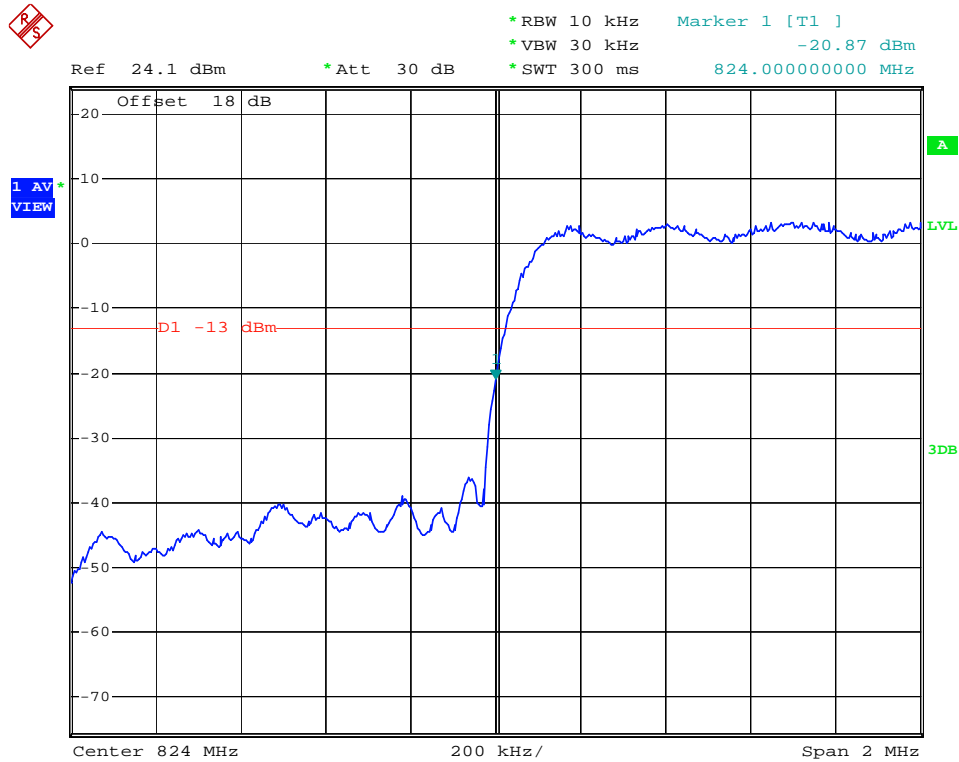


Higher Band Edge Plot on Channel 777



Date: 26.AUG.2008 12:00:17

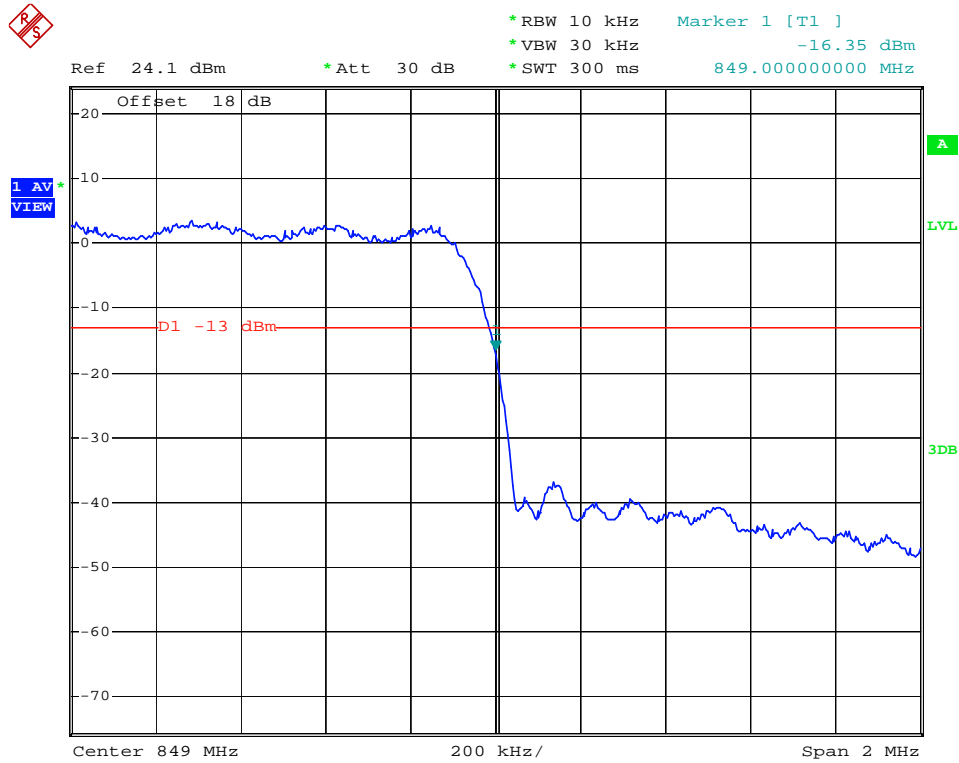
Band :	CDMA2000 Cellular	Power Stage :	High
Test Mode :	1XRTT_ FCH+SCH_RC3		

Lower Band Edge Plot on Channel 1013


Date: 26.AUG.2008 11:40:26



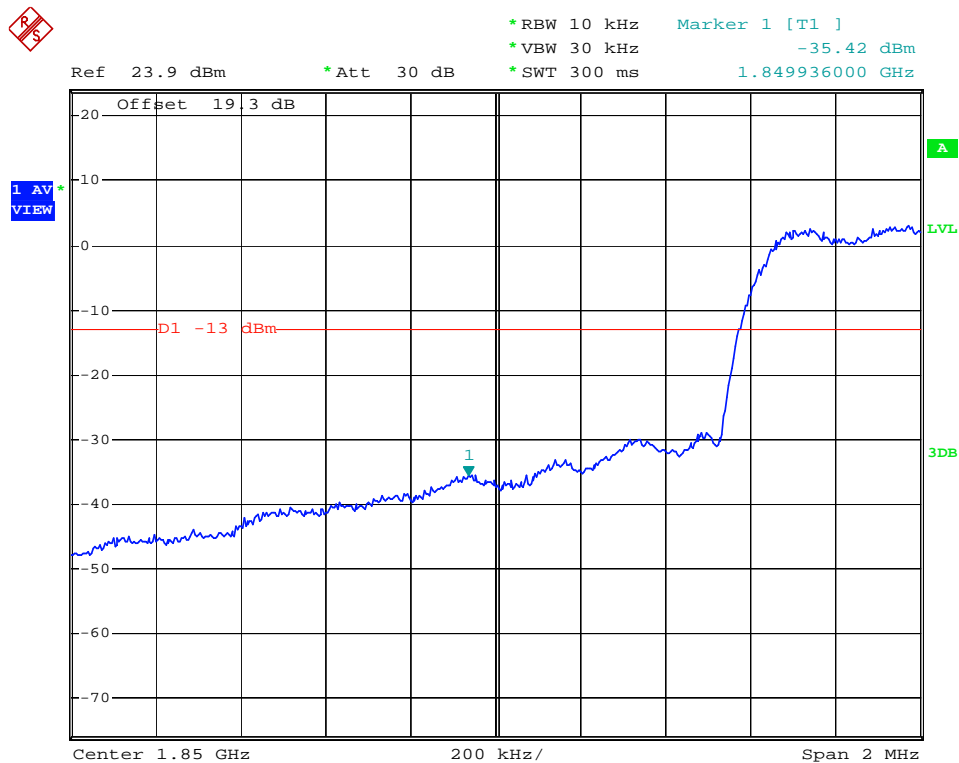
Higher Band Edge Plot on Channel 777



Date: 26.AUG.2008 11:45:52

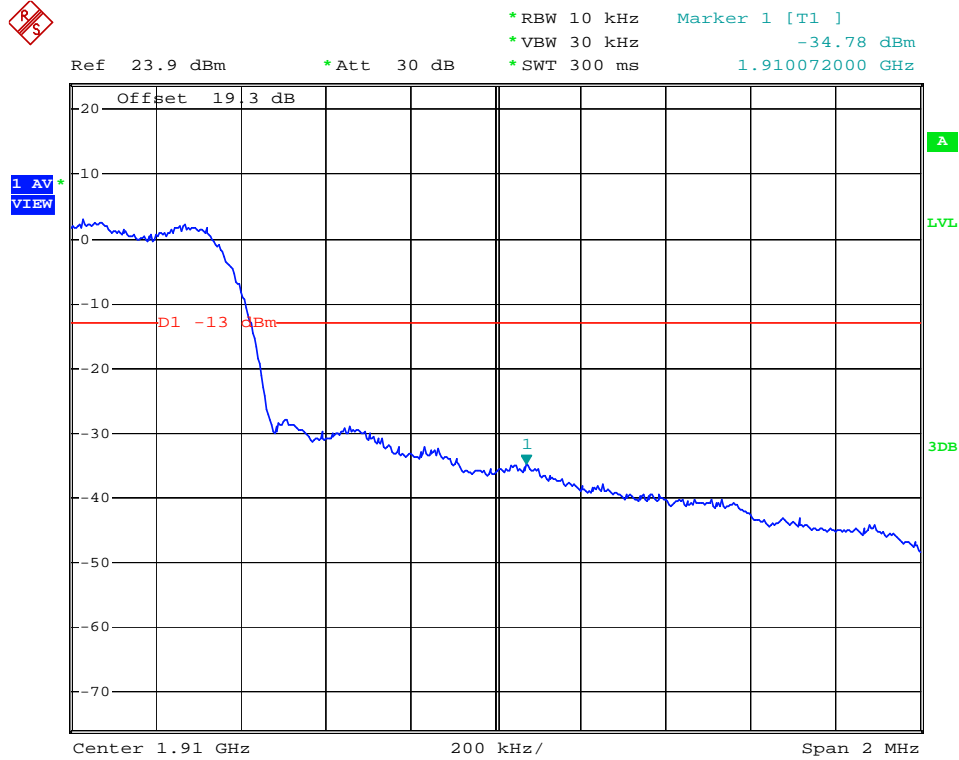
Band :	CDMA2000 PCS	Power Stage :	High
Test Mode :	1xRTT_FCH_RC1		

Lower Band Edge Plot on Channel 25



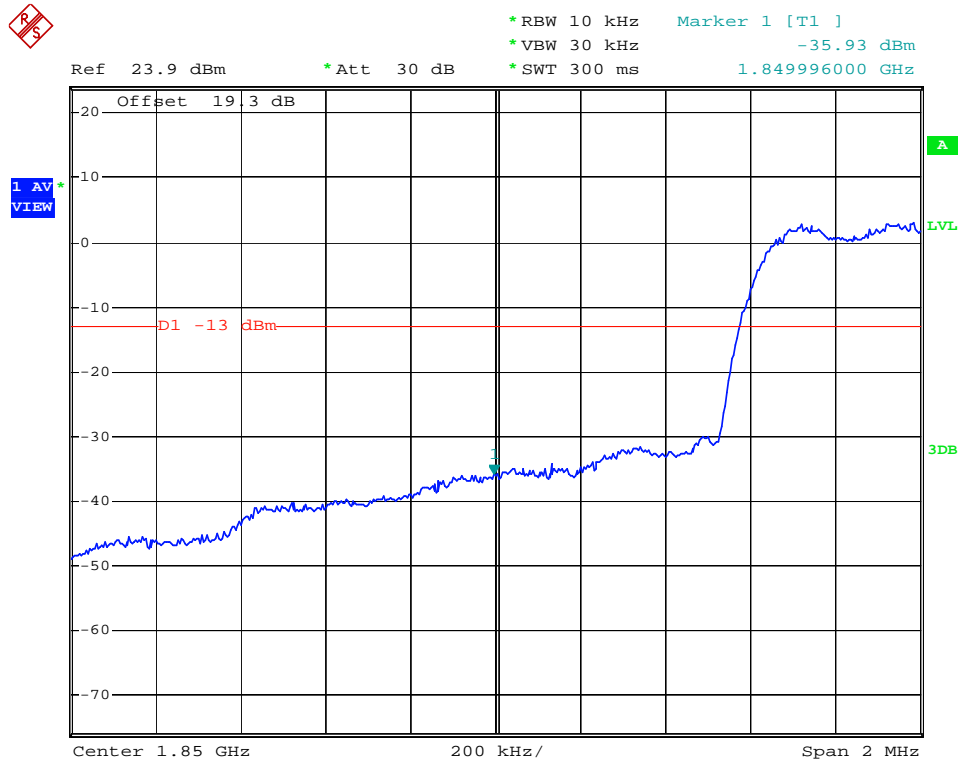
Date: 26.AUG.2008 19:09:29

Higher Band Edge Plot on Channel 1177



Date: 26.AUG.2008 19:14:21

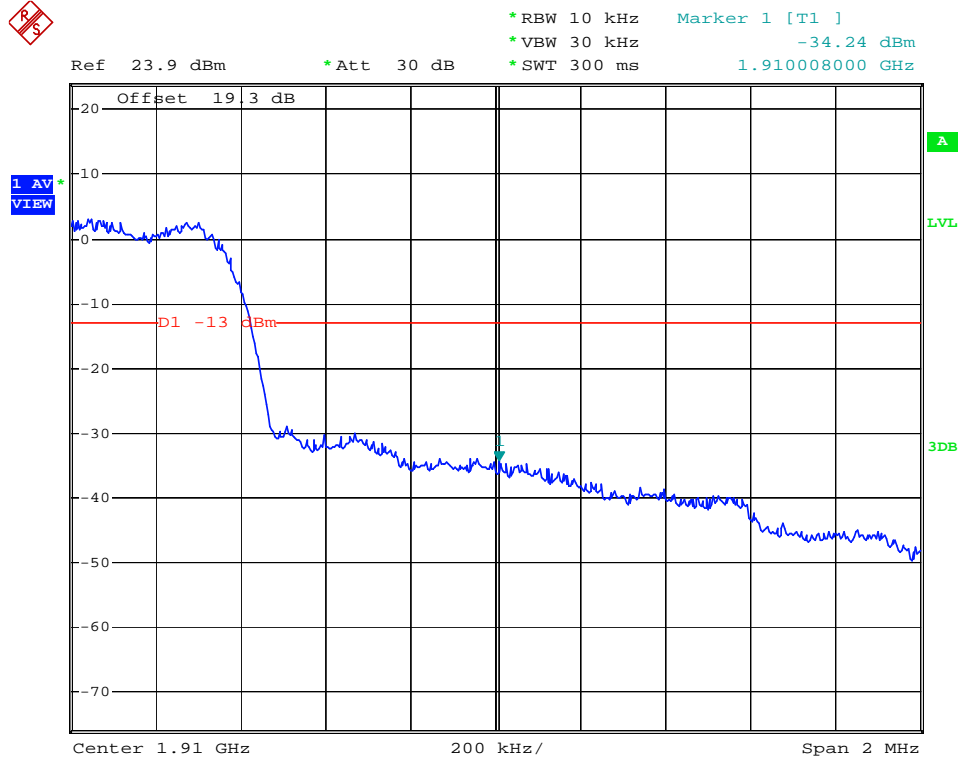
Band :	CDMA2000 PCS	Power Stage :	High
Test Mode :	1xRTT_FCH_RC3		

Lower Band Edge Plot on Channel 25


Date: 26.AUG.2008 19:10:46

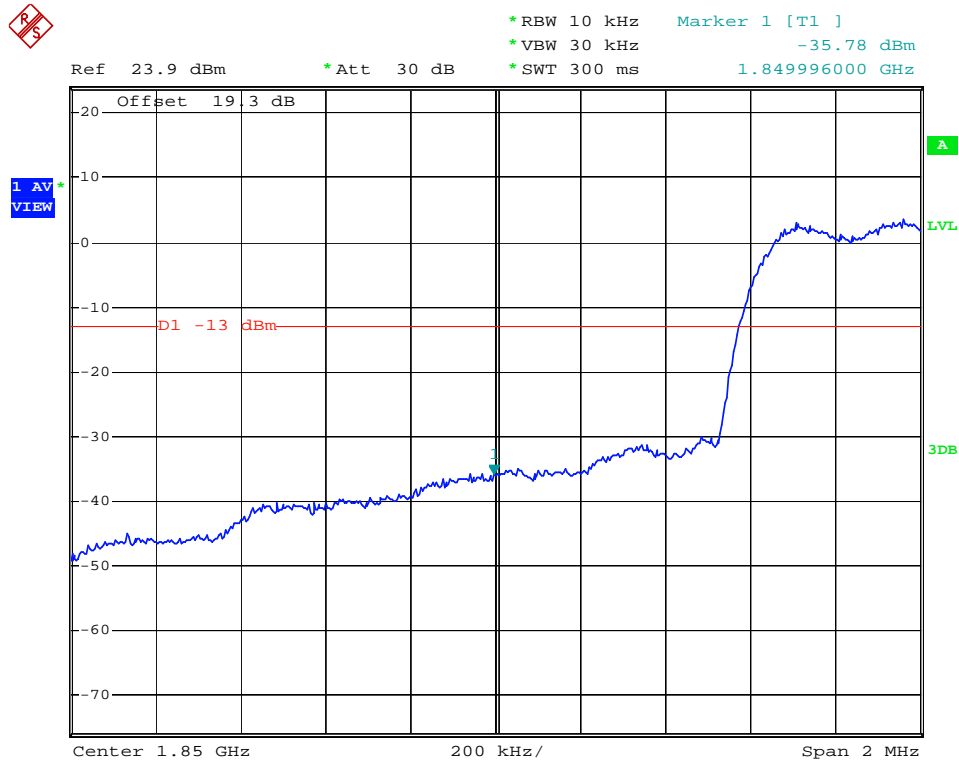


Higher Band Edge Plot on Channel 1177



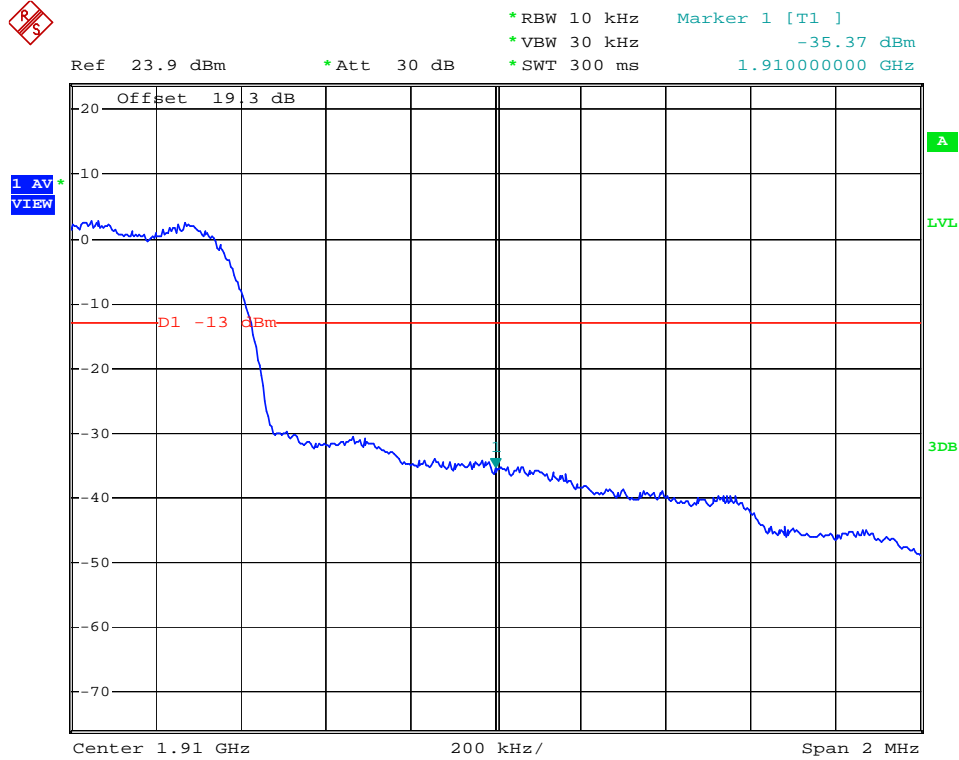
Date: 26.AUG.2008 19:13:24

Band :	CDMA2000 PCS	Power Stage :	High
Test Mode :	1xRTT_ FCH+SCH_RC3		

Lower Band Edge Plot on Channel 25


Date: 26.AUG.2008 18:15:19

Higher Band Edge Plot on Channel 1177



Date: 26.AUG.2008 18:04:17

3.4 Field Strength of Spurious Radiation Measurement

3.4.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43+10\log_{10}(P[\text{Watts}])$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

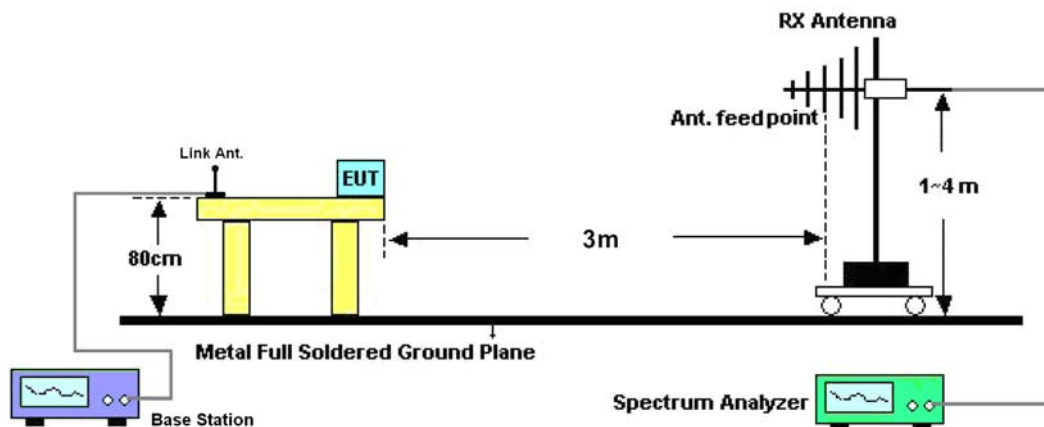
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

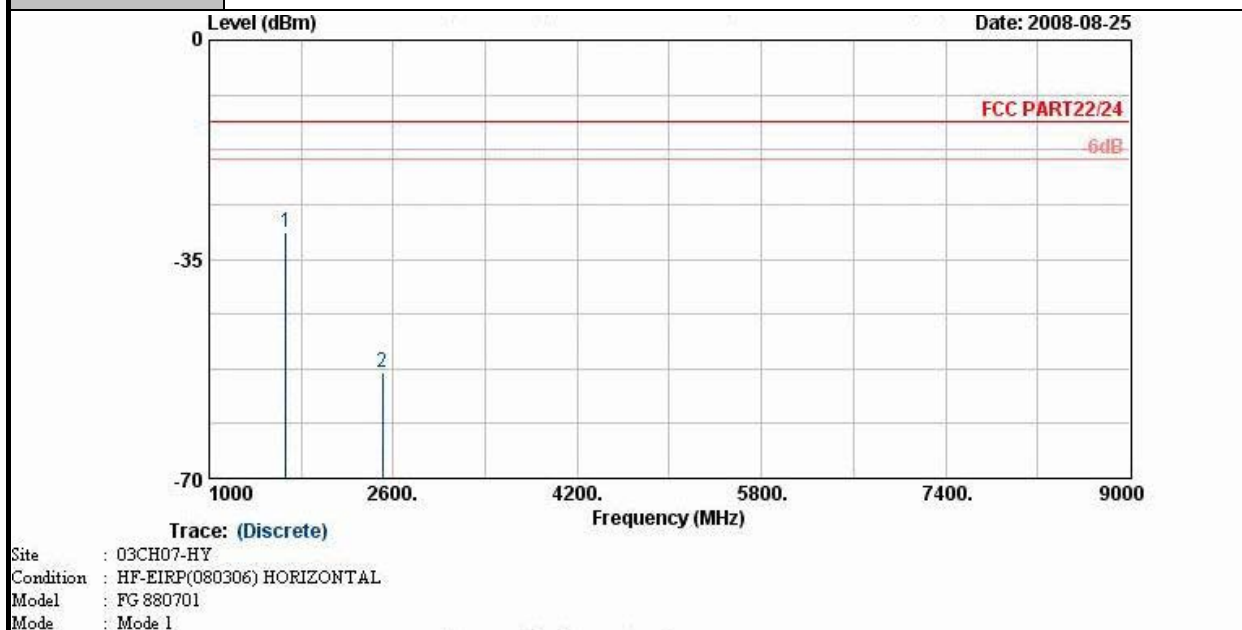
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. Emission level (dBm) = output power + substitution Gain.

3.4.4 Test Setup



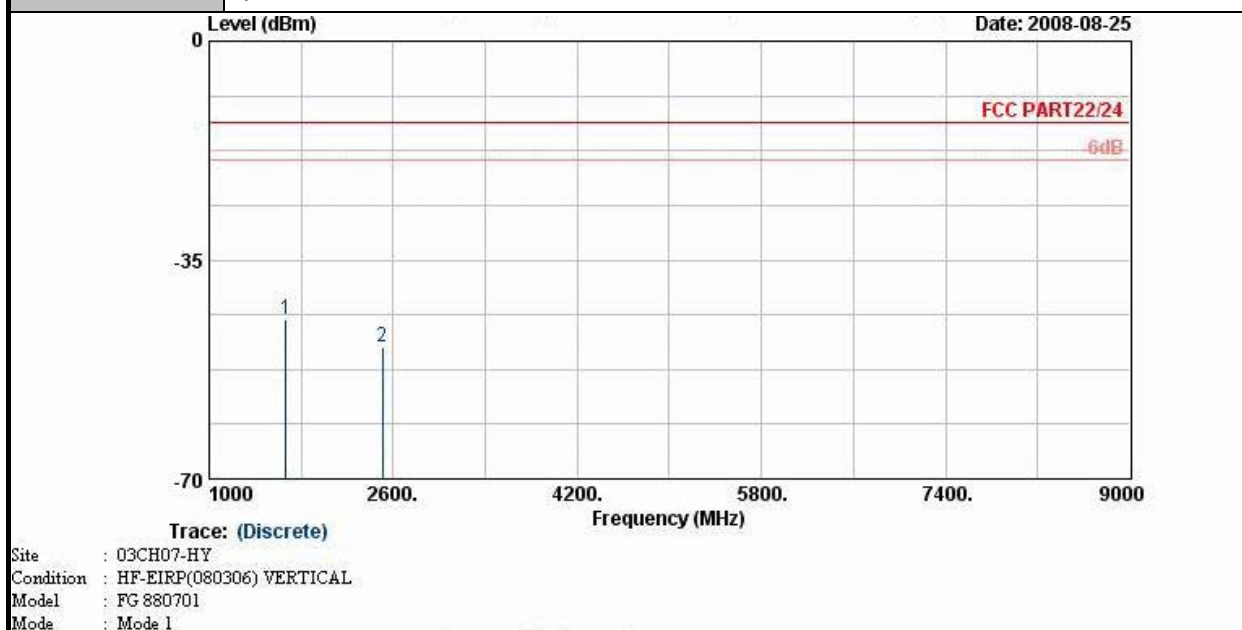
3.4.5 Test Result of Field Strength of Spurious Radiated

Band :	CDMA2000 Cellular	Temperature :	28~30°C
Test Mode :	1xRTT	Relative Humidity :	47~49%
Test Engineer :	Kay	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



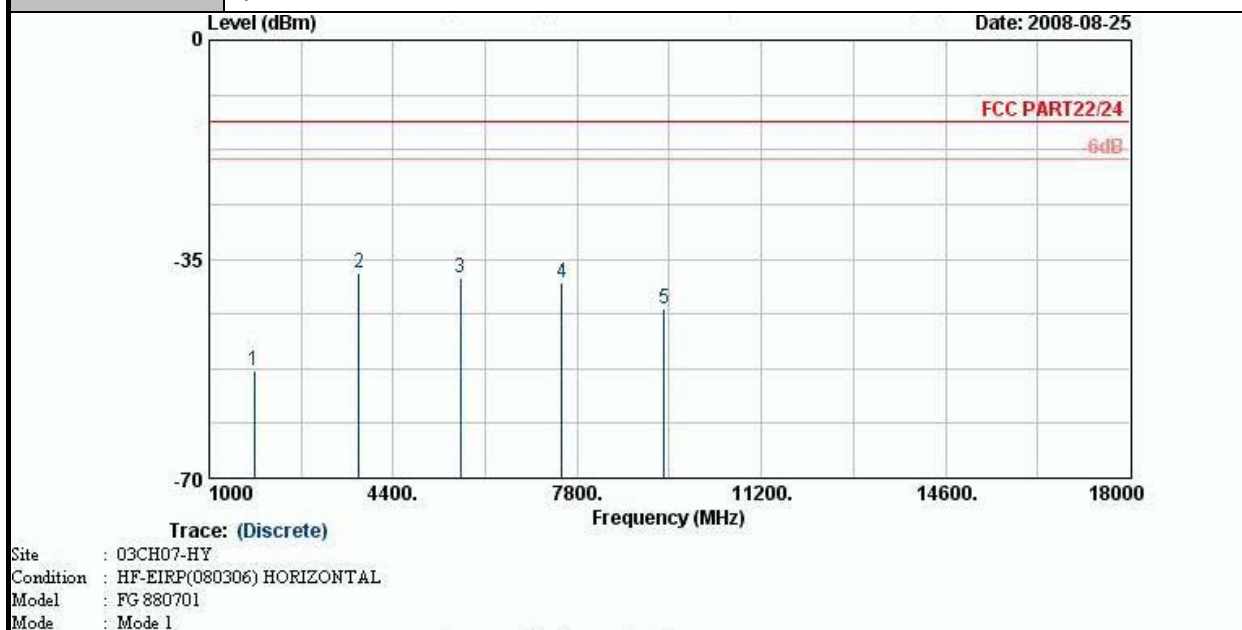
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1669	-30.76	-13	-17.76	-39.07	-29.77	3.39	4.55	H	Pass
2506	-53.18	-13	-40.18	-63.32	-53.24	3.71	5.92	H	Pass

Band :	CDMA2000 Cellular	Temperature :	28~30°C
Test Mode :	1xRTT	Relative Humidity :	47~49%
Test Engineer :	Kay	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



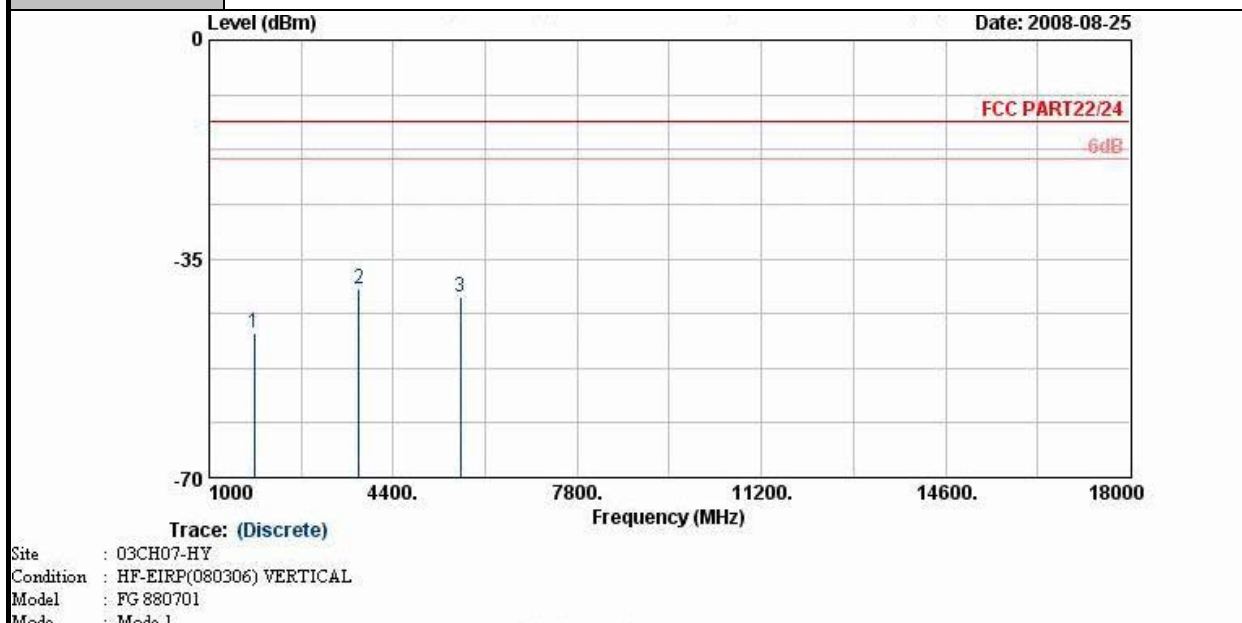
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1669	-44.60	-13	-31.60	-49.98	-43.22	3.39	4.16	V	Pass
2509	-49.03	-13	-36.03	-59.62	-48.89	3.71	5.72	V	Pass

Band :	CDMA2000 PCS	Temperature :	28~30°C
Test Mode :	1xRTT	Relative Humidity :	47~49%
Test Engineer :	Kay	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1838	-52.79	-13	-39.79	-61.49	-52.85	4.16	4.22	H	Pass
3760	-37.17	-13	-24.17	-52.7	-40.54	4.03	7.40	H	Pass
5636	-38.01	-13	-25.01	-59.09	-42.95	3.87	8.81	H	Pass
7520	-38.79	-13	-25.79	-61.13	-42.67	5.83	9.71	H	Pass
9396	-42.82	-13	-29.82	-64.98	-47.52	6.02	10.72	H	Pass

Band :	CDMA2000 PCS	Temperature :	28~30°C
Test Mode :	1xRTT	Relative Humidity :	47~49%
Test Engineer :	Kay	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1838	-46.79	-13	-33.79	-57.79	-46.85	4.16	4.22	V	Pass
3760	-39.89	-13	-26.89	-57.12	-43.77	4.03	7.91	V	Pass
5636	-41.09	-13	-28.09	-62.26	-46.99	3.87	9.77	V	Pass

3.5 Frequency Stability Measurement

3.5.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

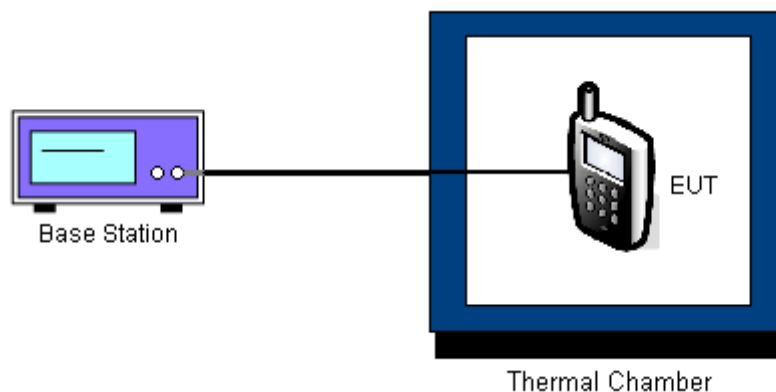
3.5.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT can not be turned on at -30°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.5.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at $25\pm 5^{\circ}\text{C}$ and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.5.5 Test Setup



3.5.6 Test Result of Temperature Variation

Band :	CDMA2000 Cellular	Channel :	384
Test Mode :	1xRTT_FCH+SCH_RC3	Limit (ppm) :	2.5

Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	-	-	PASS
-20	-	-	
-10	-	-	
0	-27	-0.03	
10	-20	-0.02	
20	-16	-0.02	
30	-10	-0.01	
40	-	-	
50	-	-	

Band :	CDMA2000 PCS	Channel :	600
Test Mode :	1xRTT_FCH+SCH_RC3	Limit (ppm) :	2.5

Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	-	-	PASS
-20	-	-	
-10	-	-	
0	-16	-0.01	
10	-23	-0.01	
20	-14	-0.01	
30	-20	-0.01	
40	-	-	
50	-	-	

Remark: The EUT spec is between 0 and 30 °C.

3.5.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
CDMA2000 Cellular CH384	1xRTT FCH+SCH _RC3	3.7	-12.0	-0.01	2.5	PASS
		BEP	-11.0	-0.01		
		4.2	-61.0	-0.07		
CDMA2000 PCS CH600	1xRTT FCH+SCH _RC3	3.7	-14.0	-0.01		
		BEP	-12.0	-0.01		
		4.2	36.0	0.02		

Remark:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.1 V.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum	R&S	FSP40	100055	9KHz~40GHz	Jun. 26, 2008	Jun. 25, 2009	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB412923 44	N/A	Feb. 21, 2008	Feb. 20, 2009	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US404415 48	N/A	Feb. 21, 2008	Feb. 20, 2009	Conducted (TH02-HY)
Thermal Chamber	TEN BILLION	TTH-D35P	TBN-93070 1	N/A	Aug. 01, 2008	Jul. 31, 2009	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz-1GHz	Dec. 01, 2007	Nov. 30, 2008	Radiation (03CH07-HY)
Spectrum Analyzer	R & S	FSP	101067	9KHz~30GHz	Dec. 05, 2007	Dec. 04, 2008	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1G~18G	Aug. 13, 2008	Aug. 12, 2009	Radiation (03CH07-HY)
PreAmplifier	Agilent	8449B	3008A0236 2	1~26.5GHz	Dec. 22, 2007	Dec. 21, 2008	Radiation (03CH07-HY)
PreAmplifier	COM-POWER	PA-103A	161241	10-1000MHz.32d B.GAIN	Mar. 31, 2008	Mar.30, 2009	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	66584	1G~18G	Aug. 06, 2008	Aug. 05, 2009	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
Combined standard uncertainty Uc(y)	1.27		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.54		

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	C_i	$C_i * u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 \Gamma_2)$	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty Uc(y)	2.36				
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	4.72				

6 Certification of TAF Accreditation



Certificate No. : L1190-070110

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2007 to January 09, 2010
Accredited Scope	: Testing Field, see described in the Appendix
Specific Accreditation Program	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory



Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

PI, total 9 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.