DECLARATION OF COMPLIANCE
FCC PART 24(E) & 22(H) EMC MEASUREMENTS

Test Lab

CELLTECH LABS INC.
Testing and Engineering Services
1955 Moss Court
Kelowna, B.C.
Canada V1Y 9L3
Phone: 250-448-7047
Fax: 250-448-7046
e-mail: info@celltechlabs.com
web site: www.celltechlabs.com

Applicant Information

ITRONIX CORPORATION
801 South Stevens Street
Spokane, WA 99210-0179

FCC Rule Part(s):	**47 CFR §24(E), §22(H), §2**
IC Rule Part(s):	**RSS-133 Issue 2, RSS-129 Issue 2**
Test Procedure(s):	**FCC 47 CFR §24(E), §22(H), §2; ANSI TIA/EIA-603-A-2001**
FCC Device Classification:	**PCS Licensed Transmitter (PCB)**
IC Device Classification:	**2GHz Personal Communication Services (RSS-133 Issue 2)** **800MHz CDMA Cellular Transmitter (RSS-129 Issue 2)**
Device Type:	**Rugged Handheld PC (Alpha-numeric & Numeric Keypad types)** **with Sierra Wireless AirCard 555/550 Dual-Band PCS/Cellular CDMA Modem**
FCC ID:	**KBCIX100AC555**
IC Certification No.:	**1943A-IX100555**
Model(s):	**IX100**
Tx Frequency Range:	**1851.25 - 1908.75 MHz (PCS CDMA)** **824.70 - 848.31 MHz (Cellular CDMA)**
Max. RF Output Power:	**0.418 Watts EIRP (PCS CDMA)** **0.263 Watts ERP (Cellular CDMA)**
Max. Conducted Power Tested:	**23.0 dBm (PCS CDMA)** **23.0 dBm (Cellular CDMA)**
Emission Designator(s):	**1M25F9W**
Frequency Tolerance(s):	**150 Hz (PCS CDMA)** **300 Hz (Cellular CDMA)**
Battery Type:	**7.4V Lithium-ion, 2.8Ah**
Antenna Type:	**¼ Wave Helix (Length: 54 mm)**
Keypad Type(s):	**Alpha-numeric & Numeric**

This wireless portable device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR §24(E), §22(H), §2; IC RSS-133 Issue 2, RSS-129 Issue 2; and ANSI TIA/EIA-603-A-2001.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Russell Pipe
Senior Compliance Technologist
Celltech Labs Inc.

TABLE OF CONTENTS

FCC PARTS 24(E) & 22(H) EMC MEASUREMENT REPORT

1.1 SCOPE

Measurement and determination of electromagnetic emissions (EME) from radio frequency devices for compliance with the technical rules and regulations of the Federal Communications Commission and Industry Canada.

2.1 GENERAL INFORMATION - §2.1033(a)

APPLICANT

ITRONIX CORPORATION
801 South Stevens Street
Spokane, WA 99210-0179

FCC ID	KBCIX100AC555
Model(s)	IX100
Serial No.	????
EUT Type	Rugged Handheld PC with Sierra Wireless AirCard 555/550 Dual-Band PCS/Cellular CDMA PCMCIA Modem Card
Rule Part(s)	FCC 47 CFR §24(E), §22(H), §2 IC RSS-133 Issue 2, RSS-129 Issue 2
FCC Classification	PCS Licensed Transmitter (PCB)
IC Classification	2GHz Personal Communication Services (RSS-133 Issue 2) 800MHz CDMA Cellular Transmitter (RSS-129 Issue 2)
Tx Frequency Range	1851.25 - 1908.75 MHz (PCS CDMA) 824.70 - 848.31 MHz (Cellular CDMA)
Max. RF Output Power	0.418 Watts EIRP (PCS CDMA) 0.263 Watts ERP (Cellular CDMA)
Max. RF Conducted Output Power Tested	23.0 dBm (PCS CDMA) 23.0 dBm (Cellular CDMA)
Emission Designator	1M25F9W
Frequency Tolerance	150 Hz (PCS CDMA) 300 Hz (Cellular CDMA)
Battery Type(s)	7.4V Lithium-ion, 2.8Ah
Antenna Type	¼ Wave Helix (Length: 54 mm)

MEASUREMENT PROCEDURES & DATA

3.1 RF OUTPUT POWER MEASUREMENT - §2.1046

The conducted power levels were measured with a Gigatronics 8650A Universal Power Meter using modulated average power mode. An offset was entered into the power meter to correct for the losses of the attenuator and cable installed before the sensor input. The transmitter terminal was coupled to the power meter and the EUT was placed into test mode via internal software. All subsequent tests were performed using the same tune-up procedures.

Frequency (MHz)	Average Power (dBm)
824.70	23.0
835.89	23.0
848.31	23.0
1851.25	23.0
1880.00	23.0
1908.75	23.0

4.1 SPURIOUS EMISSIONS AT ANTENNA TERMINAL - §2.1051

The EUT was placed in test mode via internal software in the “always up” power control mode. An offset was entered into the power meter to correct for all losses of the attenuator and cable installed before the sensor input. The EUT was placed into test mode via internal software. The level of the carrier and the various conducted spurious frequencies were measured by means of a calibrated spectrum analyzer. The resolution bandwidth and video bandwidth were set to 1MHz. The spectrum was scanned from 10MHz to 20GHz at the low, mid, and high channels. The radio transmitter was operating at maximum output power. The antenna output terminal of the EUT was connected to the input of a 50Ω spectrum analyzer through a matched 30dB attenuator and coaxial cable. The reported emissions were below the specified limit of -13dBm. The test plots are shown in Appendix A.

5.1 EMISSION DESIGNATOR - §2.202

CDMA BW = 1.25 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination Audio/Data Transmission

6.1 OCCUPIED BANDWIDTH - §2.1049, §22.917, §24.238

The EUT was placed in test mode via internal software in the "always up" power control mode. The EUT was connected to the input of a 50Ω spectrum analyzer through a matched 30dB attenuator. For both PCS CDMA and cellular CDMA modes the resolution bandwidth was set to 30kHz and the video bandwidth was set to 300kHz. The table below shows the -26dBc occupied bandwidth and 99% bandwidth. Spectrum analyzer plots for -26 dBc occupied bandwidth and 99% emission bandwidth are shown in Appendix A.

Frequency (MHz)	-26 dBc Bandwidth (MHz)
1851.25	1.449
1880.00	1.437
1908.75	1.496
824.70	1.422
835.89	1.423
848.31	1.444

Specified Limits:

§22.917

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
(c) Alternative out of band emission limit. Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas, in lieu of that set forth in this section, pursuant to a private contractual arrangement of all affected licensees and applicants. In this event, each party to such contract shall maintain a copy of the contract in their station files and disclose it to prospective assignees or transferees and, upon request, to the FCC.
(d) Interference caused by out of band emissions. If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.

§24.238

(a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.
(b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
(c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
(d) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.
(e) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

7.1 EFFECTIVE ISOTROPIC RADIATED POWER OUTPUT - §24.232(b)

EIRP measurements were performed using the Signal Substitution Method in accordance with ANSI TIA/EIA-603-A-2001 on a 3-meter open area test site. The EUT was placed on a turntable 3-meters from the receive antenna and placed into test mode via internal software in the "always up" power control mode. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. Once a peak was found the spectrum analyzer was set to peak hold and the value of the emission was extracted. The field strength was recorded for each channel being tested, and for both EUT antenna polarizations. A standard gain horn antenna was substituted in place of the EUT. A CDMA signal was fed through a directional coupler to the antenna and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward conducted power for the horn antenna was determined by measuring the power at the horn antenna feed point and reproducing the coupler power previously measured. The EIRP level was determined by adding the horn forward conducted power and the horn antenna gain.

EUT Keypad Type	Freq. Tuned	EUT Conducted Power	Max. Field Strength of EUT	Antenna Polarization	Horn Gain	Horn Forward Conducted Power	EIRP of EUT Horn Gain + Horn Forward Conducted Power	
	MHz	dBm	dBm	H/V	dBi	dBm	dBm	Watts
Alpha-numeric	1851.25	23.0	-12.52	H	6.55	17.96	24.51	0.282
	1880.00	23.0	-11.81	H	6.58	19.27	25.85	0.385
	1908.75	23.0	-12.01	H	6.61	19.60	26.21	0.418
	1851.25	23.0	-18.39	V	6.55	12.57	19.12	0.082
	1880.00	23.0	-17.94	V	6.58	13.19	19.77	0.095
	1908.75	23.0	-18.15	V	6.61	13.58	20.19	0.104
Numeric	1851.25	23.0	-12.95	H	6.55	17.75	24.30	0.269
	1880.00	23.0	-12.21	H	6.58	18.98	25.56	0.360
	1908.75	23.0	12.04	H	6.61	19.31	25.92	0.391
	1851.25	23.0	-18.53	V	6.55	11.70	18.25	0.067
	1880.00	23.0	-18.27	V	6.58	12.84	19.42	0.087
	1908.75	23.0	-17.96	V	6.61	13.11	19.72	0.094

8.1 EFFECTIVE RADIATED POWER OUTPUT - §22.913

ERP measurements were performed using the Signal Substitution Method in accordance with ANSI TIA/EIA-603-A-2001 on a 3-meter open area test site. The EUT was placed on a turntable 3-meters from the receive antenna and placed into test mode via internal software in the "always up" power control mode. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. Once a peak was found the spectrum analyzer was set to peak hold and the value of the emission was extracted. The field strength was recorded for each channel being tested, and for both EUT antenna polarizations. A half-wave dipole antenna was substituted in place of the EUT. A CDMA signal was fed through a directional coupler to the dipole antenna and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded. This was to account for any mismatch in impedance, which may occur at the dipole antenna. The conducted power at the antenna feed point was recorded. The forward conducted power for the dipole antenna was determined by measuring the power at the dipole antenna feed point and reproducing the coupler power previously measured. The ERP level was determined by adding the dipole forward conducted power and the dipole antenna gain.

EUT Keypad Type	Freq. Tuned	EUT Conducted Power	Maximum Field Strength of EUT	Antenna Polarization	Dipole Gain	Dipole Forward Conducted Power	ERP of EUT Dipole Gain + Dipole Forward Conducted Power	
	MHz	dBm	dBm	H/V	dBd	dBm	dBm	Watts
Alpha-numeric	824.70	23.0	-10.30	H	- 1.44	25.64	24.20	0.263
	835.89	23.0	-12.30	H	- 1.34	25.24	23.90	0.245
	848.31	23.0	-11.22	H	- 1.24	24.81	23.57	0.228
	824.70	23.0	-14.64	V	-1.44	21.26	19.82	0.096
	835.89	23.0	-16.79	V	-1.34	20.79	19.45	0.088
	848.31	23.0	-15.60	V	-1.24	20.48	19.24	0.084
Numeric	824.70	23.0	-10.34	H	- 1.44	25.61	24.17	0.261
	835.89	23.0	-12.33	H	- 1.34	25.19	23.85	0.243
	848.31	23.0	-11.29	H	- 1.24	24.78	23.54	0.226
	824.70	23.0	-14.57	V	-1.44	21.18	19.74	0.094
	835.89	23.0	-16.69	V	-1.34	20.71	19.37	0.086
	848.31	23.0	-15.51	V	-1.24	20.42	19.18	0.083

9.1 FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053

Radiated spurious emissions were measured on a 3-meter open area test site using the Signal Substitution Method in accordance with ANSI TIA/EIA-603-A-2001. The EUT was placed into test mode via internal software in the "always up" power control mode. The EUT was placed on the turntable with the transmitter transmitting into a non-radiating load. A receiving antenna located 3 meters from the turntable received any signal radiated from the transmitter and its operating accessories. The receiving antenna was varied in height from 1 to 4 meters and the polarization was varied (horizontal and vertical) to determine the worst-case emission level. A standard gain horn antenna was substituted in place of the EUT. A CDMA signal was fed through a directional coupler to the antenna and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power was adjusted to read the same power at the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was then recorded. The forward conducted power for the horn antenna was determined by measuring the power at the horn antenna feed point and reproducing the coupler power previously measured. The EIRP level was determined by adding the horn forward conducted power and the horn antenna gain. All spurious emissions from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier were investigated.

Alpha-numeric Keypad Unit

Operating Frequency (MHz):	**1851.25**
Channel:	**25 (Low)**
EUT Conducted Pwr. (dBm):	**23.0**
Measured EIRP (dBm):	**24.51**
Mode:	**PCS CDMA**
Distance:	**3 Meters**
Limit:	**43 + 10 log (W) = 37.50 dBc**

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
3702.50	-72.44	-39.55	6.6	H	-32.95	-35.09	59.60
5553.75	-76.35	-38.55	7.8	H	-30.75	-32.89	57.40
7405.00	-74.27	-37.69	7.8	H	-29.89	-32.03	56.54
9256.25	-75.15	-37.13	7.6	H	-29.53	-31.67	56.18
11107.50	-74.87	-38.51	8.5	H	-30.01	-32.15	56.66
12958.75	-75.45	-37.57	8.8	H	-28.77	-30.91	55.42
14810.00	-71.57	-33.69	9.6	H	-24.09	-26.23	50.74
16661.25	-71.80	-33.97	9.0	H	-24.97	-27.11	51.62
18512.50	-73.80	-37.59	9.3	H	-28.29	-30.43	54.94

FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053 (Cont.)

Alpha-numeric Keypad Unit

Operating Frequency (MHz): 1880.00
Channel: 600 (Mid)
EUT Conducted Pwr. (dBm): 23.0
Measured EIRP (dBm): 25.85
Mode: PCS CDMA
Distance: 3 Meters
Limit: 43 + 10 log (W) = 38.85 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
3760.00	-74.70	-41.81	6.6	H	-35.21	-37.35	63.20
5640.00	-76.28	-38.48	7.8	H	-30.68	-32.82	58.67
7520.00	-74.40	-37.82	7.8	H	-30.02	-32.16	58.01
9400.00	-74.86	-36.84	7.6	H	-29.24	-31.38	57.23
11280.00	-74.82	-38.46	8.5	H	-29.96	-32.10	57.95
13160.00	-74.18	-36.30	8.8	H	-27.50	-29.64	55.49
15040.00	-71.80	-33.92	9.6	H	-24.32	-26.46	52.31
16920.00	-73.39	-35.56	9.0	H	-26.56	-28.70	54.55
18800.00	-72.52	-36.31	9.3	H	-27.01	-29.15	55.00

Alpha-numeric Keypad Unit

Operating Frequency (MHz): 1908.75
Channel: 1175 (High)
EUT Conducted Pwr. (dBm): 23.0
Measured EIRP (dBm): 26.21
Mode: PCS CDMA
Distance: 3 Meters
Limit: 43 + 10 log (W) = 39.21 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
3817.50	-70.11	-37.22	6.6	H	-30.62	-32.76	58.97
5726.25	-76.22	-38.42	7.8	H	-30.62	-32.76	58.97
7635.00	-72.37	-35.79	7.8	H	-27.99	-30.13	56.34
9543.75	-74.18	-36.16	7.6	H	-28.56	-30.70	56.91
11452.50	-75.37	-39.01	8.5	H	-30.51	-32.65	58.86
13361.25	-69.33	-31.45	8.8	H	-22.65	-24.79	51.00
15270.00	-74.68	-36.80	9.6	H	-27.20	-29.34	55.55
17178.75	-73.13	-35.30	9.0	H	-26.30	-28.44	54.65
19087.50	-72.94	-36.73	9.3	H	-27.43	-29.57	55.78

FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053 (Cont.)

Alpha-numeric Keypad Unit

Operating Frequency (MHz): 824.70
Channel: 1013 (Low)
EUT Conducted Pwr. (dBm): 23.0
Measured ERP (dBm): 24.20
Mode: Cellular CDMA
Distance: 3 Meters
Limit: 43 + 10 log (W) = 37.20 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1649.40	-69.11	-36.22	6.6	H	-29.62	-31.76	55.96
2474.10	-74.41	-36.61	7.8	H	-28.81	-30.95	55.15
3298.80	-77.37	-40.79	7.8	H	-32.99	-35.13	59.33
4123.50	-77.47	-39.45	7.6	H	-31.85	-33.99	58.19
4948.20	-76.23	-39.87	8.5	H	-31.37	-33.51	57.71
5772.90	-76.68	-38.80	8.8	H	-30.00	-32.14	56.34
6597.60	-76.15	-38.27	9.6	H	-28.67	-30.81	55.01
7422.30	-75.11	-37.28	9.0	H	-28.28	-30.42	54.62
8247.00	-75.82	-39.61	9.3	H	-30.31	-32.45	56.65

Alpha-numeric Keypad Unit

Operating Frequency (MHz): 835.89
Channel: 363 (Mid)
EUT Conducted Pwr. (dBm): 23.0
Measured ERP (dBm): 23.90
Mode: Cellular CDMA
Distance: 3 Meters
Limit: 43 + 10 log (W) = 36.89 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1671.78	-70.34	-37.45	6.6	H	-30.85	-32.99	56.89
2507.67	-75.11	-37.31	7.8	H	-29.51	-31.65	55.55
3343.56	-76.29	-39.71	7.8	H	-31.91	-34.05	57.95
4179.45	-76.89	-38.87	7.6	H	-31.27	-33.41	57.31
5015.34	-76.84	-40.48	8.5	H	-31.98	-34.12	58.02
5851.23	-75.09	-37.21	8.8	H	-28.41	-30.55	54.45
6687.12	-76.78	-38.90	9.6	H	-29.30	-31.44	55.34
7523.01	-74.19	-36.36	9.0	H	-27.36	-29.50	53.40
8358.90	-75.51	-39.30	9.3	H	-30.00	-32.14	56.04

FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053 (Cont.)

Alpha-numeric Keypad Unit

Operating Frequency (MHz): 848.31
Channel: 777 (High)
EUT Conducted Pwr. (dBm): 23.0
Measured ERP (dBm): 23.57
Mode: Cellular CDMA
Distance: 3 Meters
Limit: 43 + 10 log (W) = 36.58 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1696.62	-65.18	-32.29	6.6	H	-25.69	-27.83	51.40
2544.93	-74.71	-36.91	7.8	H	-29.11	-31.25	54.82
3393.24	-76.44	-39.86	7.8	H	-32.06	-34.20	57.77
4241.55	-76.56	-38.54	7.6	H	-30.94	-33.08	56.65
5089.86	-76.96	-40.60	8.5	H	-32.10	-34.24	57.81
5938.17	-77.06	-39.18	8.8	H	-30.38	-32.52	56.09
6786.48	-73.51	-35.63	9.6	H	-26.03	-28.17	51.74
7634.79	-75.01	-37.18	9.0	H	-28.18	-30.32	53.89
8483.10	-76.11	-39.90	9.3	H	-30.60	-32.74	56.31

10.1 RADIATED MEASUREMENT TEST SETUP

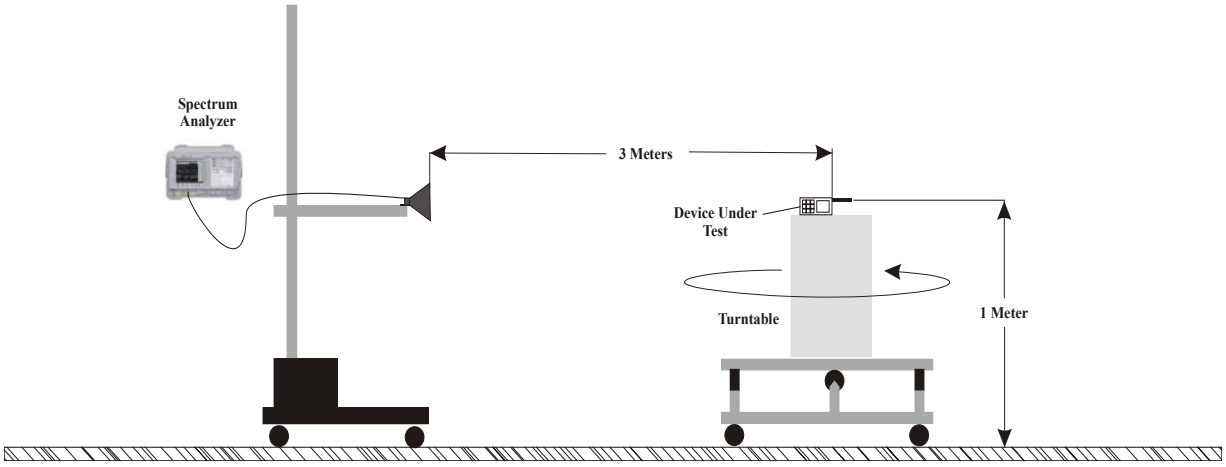


Figure 1. Radiated Measurement Test Setup Diagram - Horn Antenna

11.1 FREQUENCY STABILITY / TEMPERATURE VARIATION - §2.1055, §24.235

The minimum frequency stability shall be ±300Hz (Cellular CDMA) and ±150Hz (PCS CDMA) referenced to a received carrier frequency. This meets the requirement for operational accuracy of 0.00005% for digital mode. An HP 53181A Frequency Counter was used to measure the error in the fundamental frequency. The transmitter was set to maximum power at the center frequency of the band. The EUT was placed inside the temperature chamber.

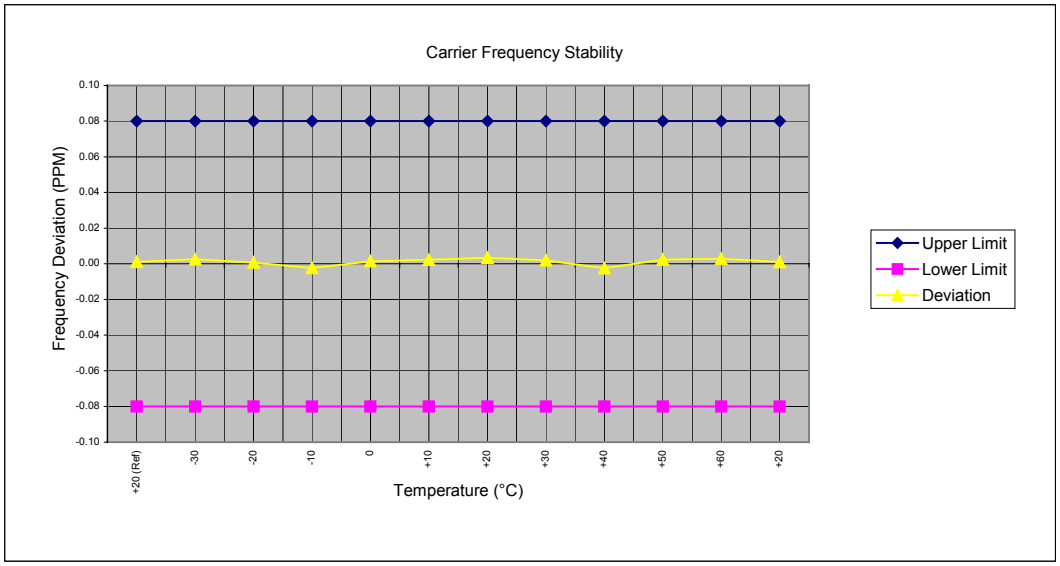
Measurement Method:

The frequency stability of the transmitter was measured by:

1. **Temperature:** The temperature was varied from -30°C to +60°C at intervals no more than 10°C throughout the temperature range using an environmental chamber. A period of time sufficient to stabilize all of the components in the equipment was allowed prior to each frequency measurement.
2. **Primary Supply Voltage:** The primary supply voltage was set at the specified nominal rating and reduced to the battery operating endpoint specified by the manufacturer. The voltage was measured at the terminals of the power supply or at the input to the cable normally provided with the equipment.

Carrier Frequency (GHz): 1.88
Channel: 600
Mode: PCS CDMA
Deviation Limit (PPM): 0.08

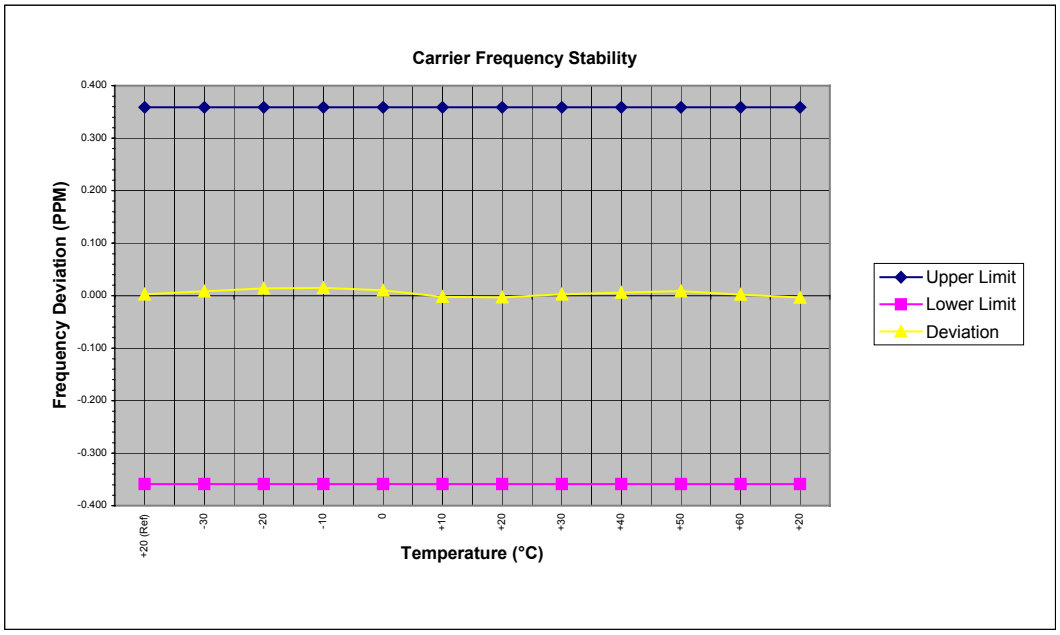
Temperature	Voltage	Power	Carrier Frequency Deviation		Specification	
(°C)	(%)	(VDC)	(Hz)	(PPM)	Lower Limit (PPM)	Upper Limit (PPM)
+20 (Ref)	100	7.4	2.17	0.001	0.08	-0.08
-30	100	7.4	4.60	0.002	0.08	-0.08
-20	100	7.4	1.36	0.001	0.08	-0.08
-10	100	7.4	-4.55	-0.002	0.08	-0.08
0	100	7.4	2.68	0.001	0.08	-0.08
+10	100	7.4	4.14	0.002	0.08	-0.08
+20	100	7.4	6.30	0.003	0.08	-0.08
+30	100	7.4	3.78	0.002	0.08	-0.08
+40	100	7.4	-4.71	-0.003	0.08	-0.08
+50	100	7.4	4.43	0.002	0.08	-0.08
+60	100	7.4	5.26	0.003	0.08	-0.08
+20	Battery Endpoint	6.1	1.80	0.001	0.08	-0.08



FREQUENCY STABILITY / TEMPERATURE VARIATION - §2.1055, §24.235 (Cont.)

Carrier Frequency (MHz): 835.89
Channel: 363
Mode: Cellular CDMA
Deviation Limit (PPM): 0.359

Temperature	Voltage	Power	Carrier Frequency Deviation		Specification	
(°C)	(%)	(VDC)	(Hz)	(PPM)	Lower Limit (PPM)	Upper Limit (PPM)
+20 (Ref)	100	7.4	2.15	0.003	0.359	-0.359
-30	100	7.4	6.93	0.008	0.359	-0.359
-20	100	7.4	11.52	0.014	0.359	-0.359
-10	100	7.4	12.33	0.015	0.359	-0.359
0	100	7.4	8.60	0.010	0.359	-0.359
+10	100	7.4	-1.81	-0.002	0.359	-0.359
+20	100	7.4	-2.43	-0.003	0.359	-0.359
+30	100	7.4	2.11	0.003	0.359	-0.359
+40	100	7.4	5.08	0.006	0.359	-0.359
+50	100	7.4	7.47	0.009	0.359	-0.359
+60	100	7.4	1.97	0.002	0.359	-0.359
+20	Battery Endpoint	6.1	-2.80	-0.003	0.359	-0.359



Time Period and Procedure:

1. The carrier frequency of the transmitter was measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment was subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at -30°C, the measurement of the carrier frequency of the transmitter was made within a three-minute interval after applying power to the transmitter.
4. Frequency measurements were made at 10°C intervals up to +60°C, then back to room temperature. A minimum period of one hour was provided to allow stabilization of the equipment at each temperature level.

12.1 TEST EQUIPMENT LIST

TEST EQUIPMENT LIST			
Equipment Type	**Model**	**Serial No.**	**Calibration Due Date**
HP Signal Generator	8648D (9kHz-4.0GHz)	3847A00611	Feb 2004
Rohde & Schwarz Signal Generator	SMR40 (10MHz-40GHz)	835537/022	Nov 2004
Gigatronics Power Meter	8652A	1835272	Feb 2004
Gigatronics Power Sensor	80701A (0.05-18GHz)	1833535	Feb 2004
Gigatronics Power Sensor	80701A (0.05-18GHz)	1833542	Feb 2004
Amplifier Research Power Amp.	5S1G4 (5W, 800MHz-4.2GHz)	26235	N/A
Microwave System Amplifier	HP 83017A (0.5-26.5GHz)	3123A00587	N/A
Network Analyzer	HP 8753E (30kHz-3GHz)	US38433013	Feb 2004
Audio Analyzer	HP 8903B	3729A18691	Nov 2004
Modulation Analyzer	HP 8901A	3749A07154	July 2004
Frequency Counter	HP 53181A (3GHz)	3736A05175	May 2004
DC Power Supply	HP E3611A	KR83015294	N/A
Multi-Device Controller	EMCO 2090	9912-1484	N/A
Mini Mast	EMCO 2075	0001-2277	N/A
Turntable	EMCO 2080-1.2/1.5	0002-1002	N/A
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	6267	Oct. 2004
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	6276	Oct. 2004
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	9120A-239	Sept 2004
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	9120A-240	Sept 2004
Roberts Dipoles	Compliance Design (2 sets) 3121C		June 2004
Spectrum Analyzer	HP 8594E	3543A02721	Feb 2004
Spectrum Analyzer	HP E4408B	US39240170	Nov 2004
Shielded Screen Room	Lindgren R.F. 18W-2/2-0	16297	N/A
Environmental Chamber	ESPEC ECT-2 (Temperature/Humidity)	0510154-B	Feb 2004

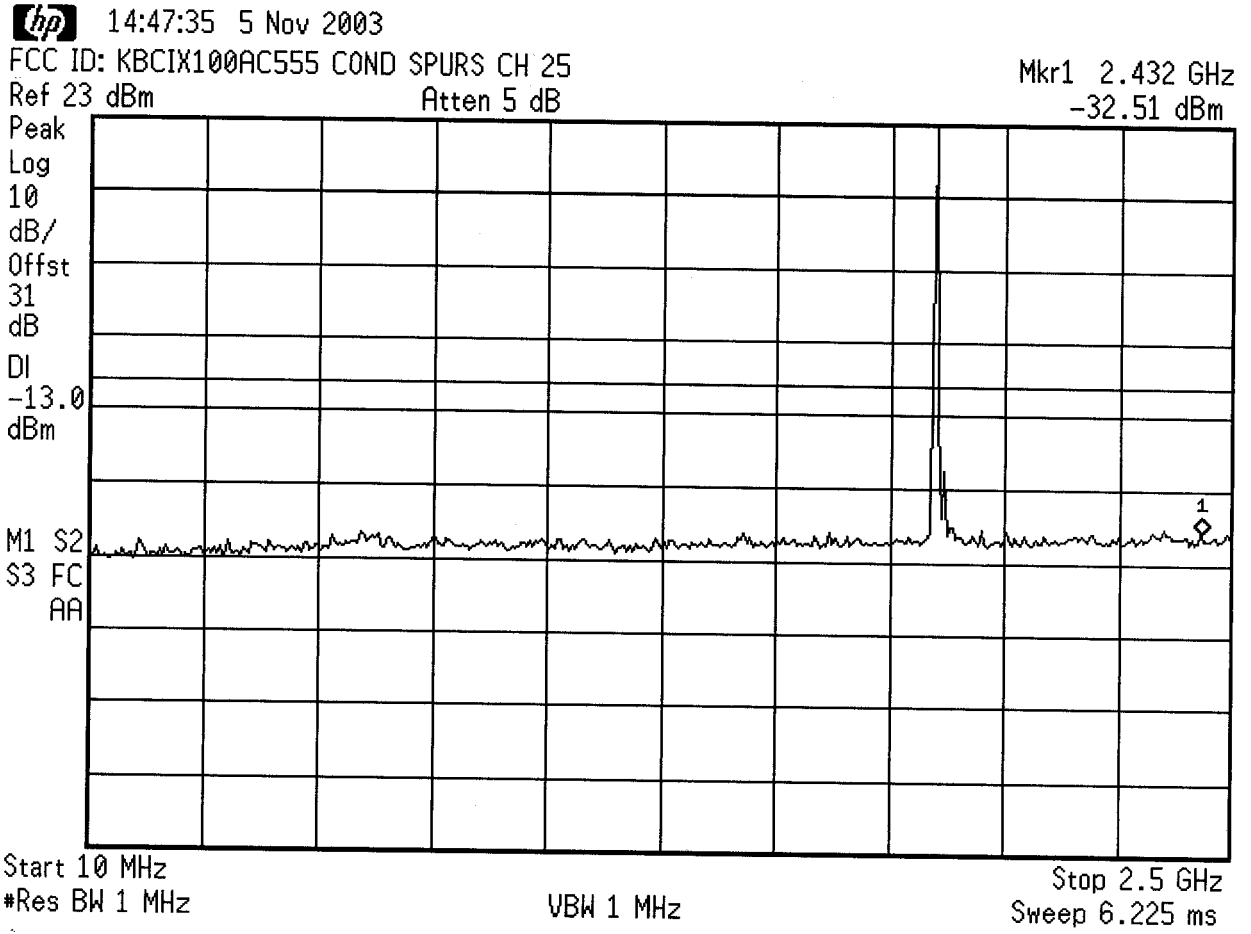
13.1 CONCLUSION

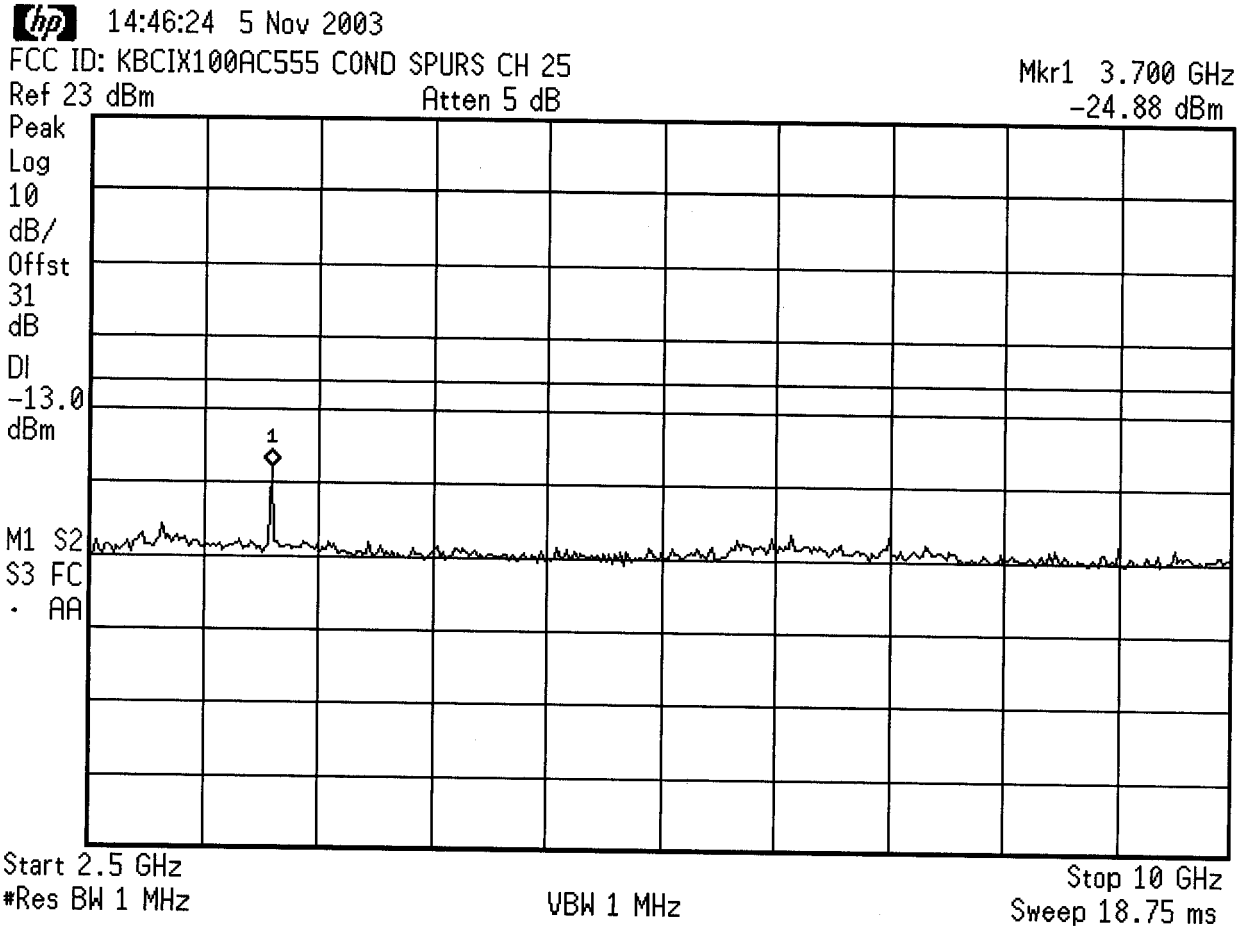
The data in this measurement report shows that the ITRONIX CORPORATION Model: IX100 FCC ID: KBCIX100AC555 Rugged Handheld PC with Sierra Wireless AirCard 555/550 Dual-Band PCS/Cellular CDMA PCMCIA Modem Card complies with the requirements of FCC Rule Parts §24(E), §22(H), and §2.

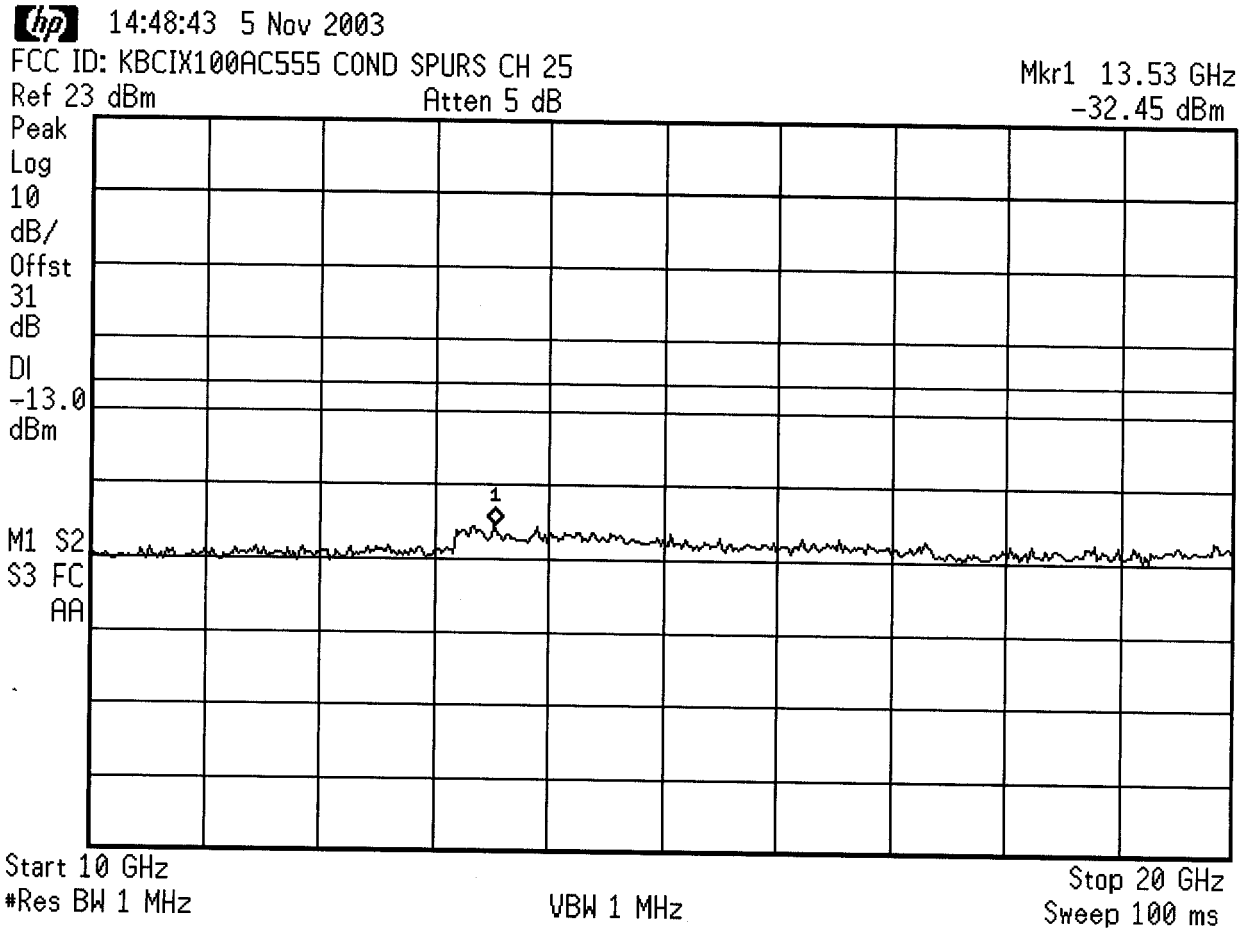
APPENDIX A - TEST PLOTS

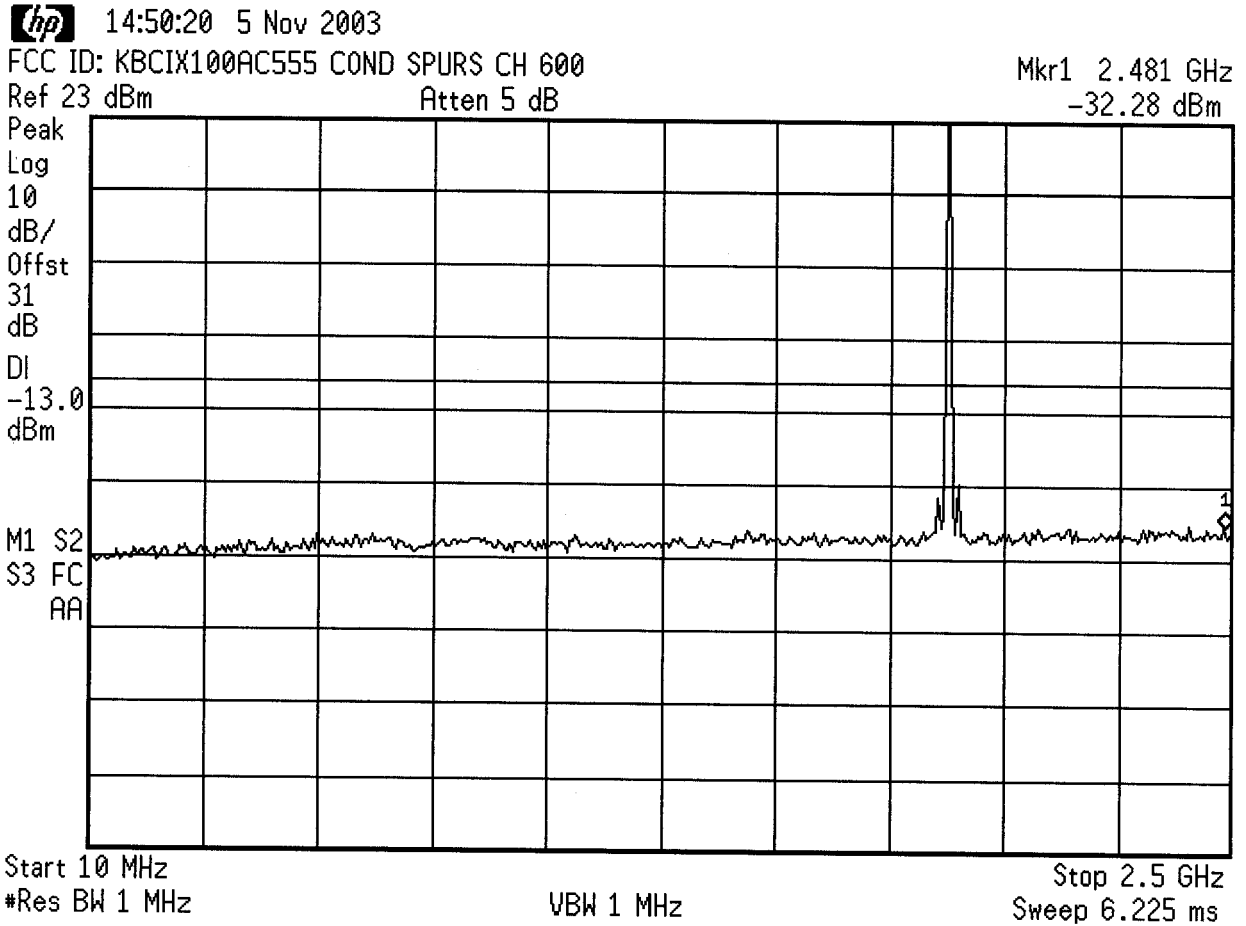
EMC TEST PLOTS - PCS CDMA Mode

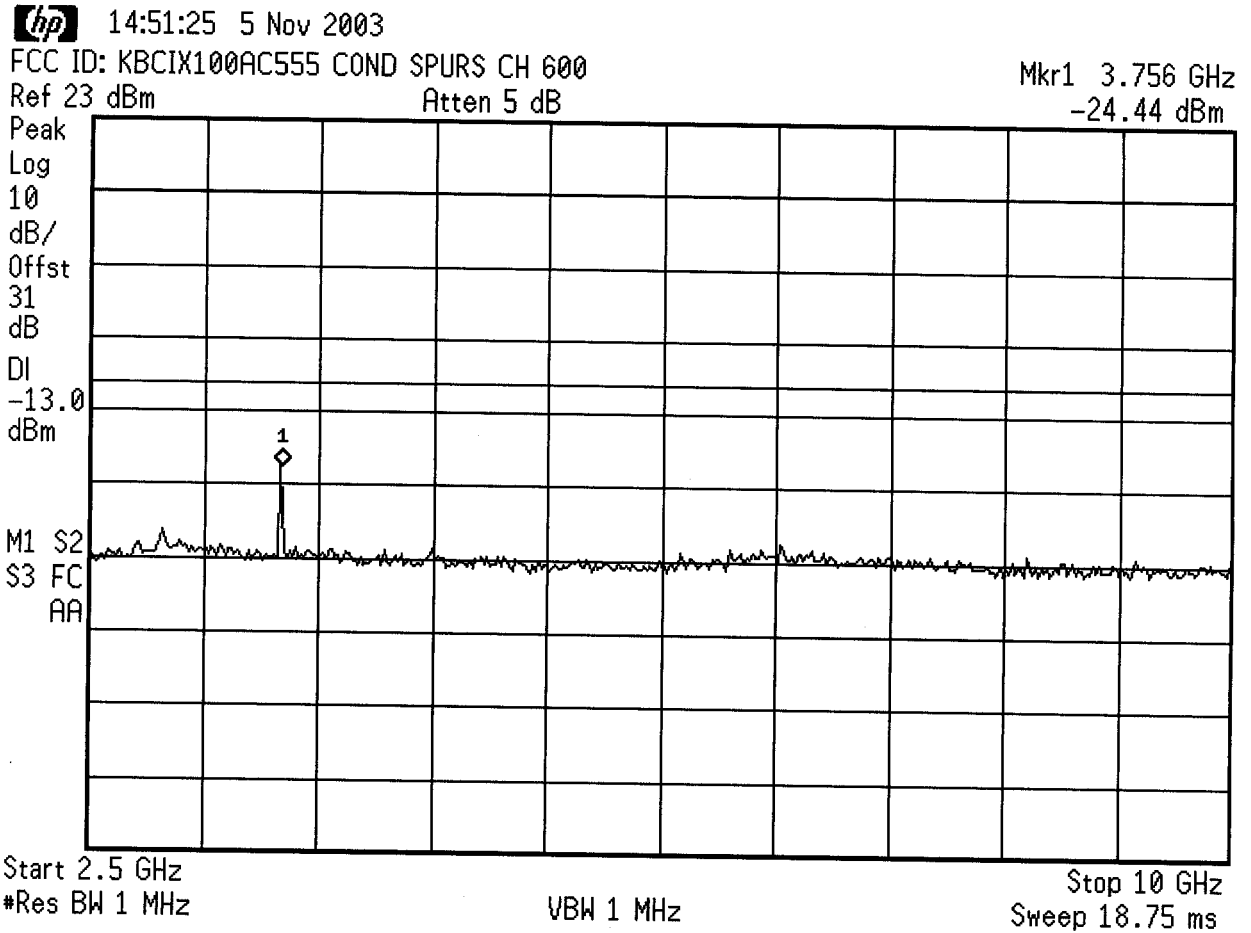
1. Conducted Spurious Emissions
2. Receiver Spurious Emissions
3. 99% Occupied Bandwidth
4. -26dBc Emission Bandwidth
5. Band Edge

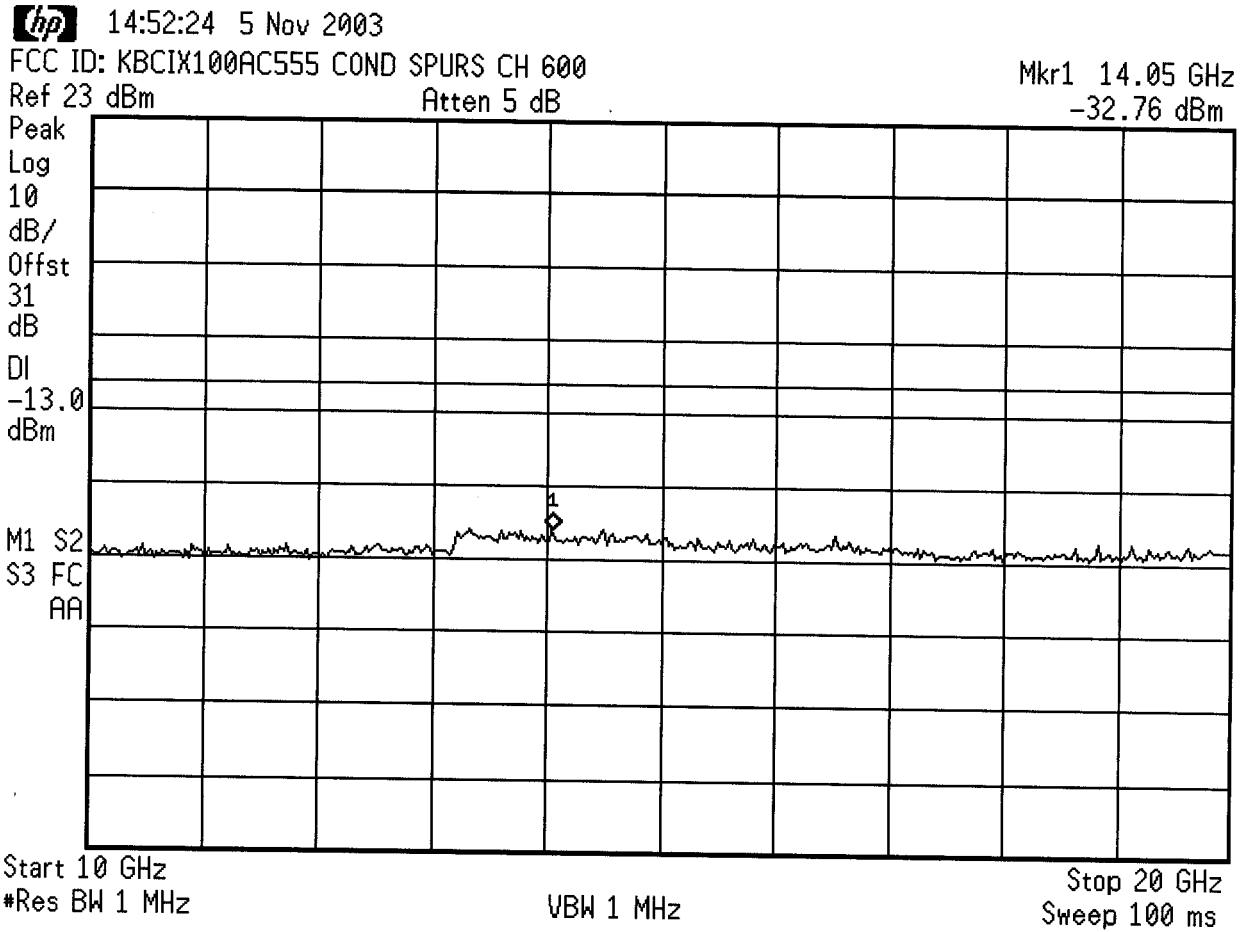

14:47:35 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 25
Ref 23 dBm
Atten 5 dB
Mkr1 2.432 GHz
-32.51 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 MHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.5 GHz
Sweep 6.225 ms

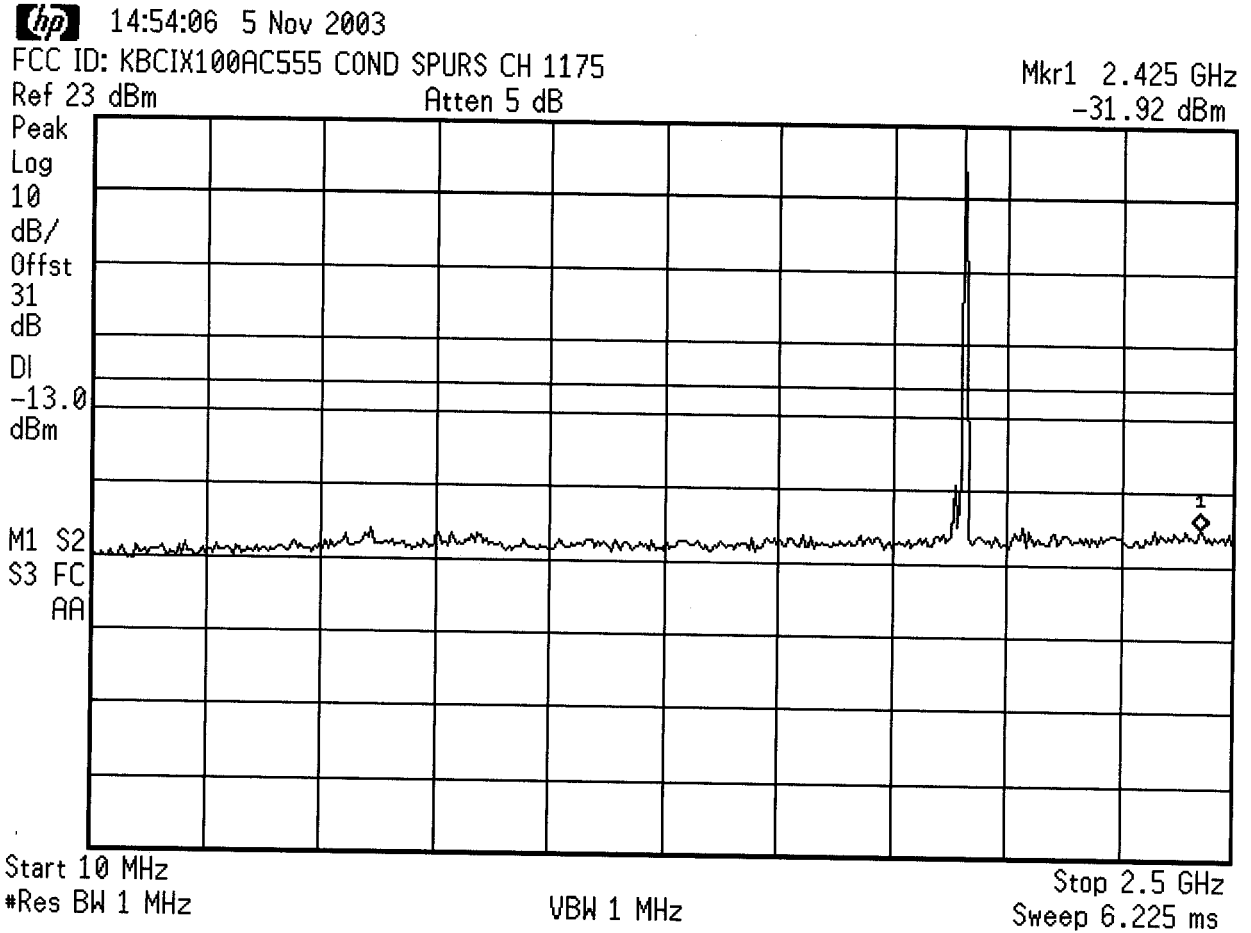

14:46:24 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 25
Ref 23 dBm
Atten 5 dB
Mkr1 3.700 GHz
-24.88 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 18.75 ms

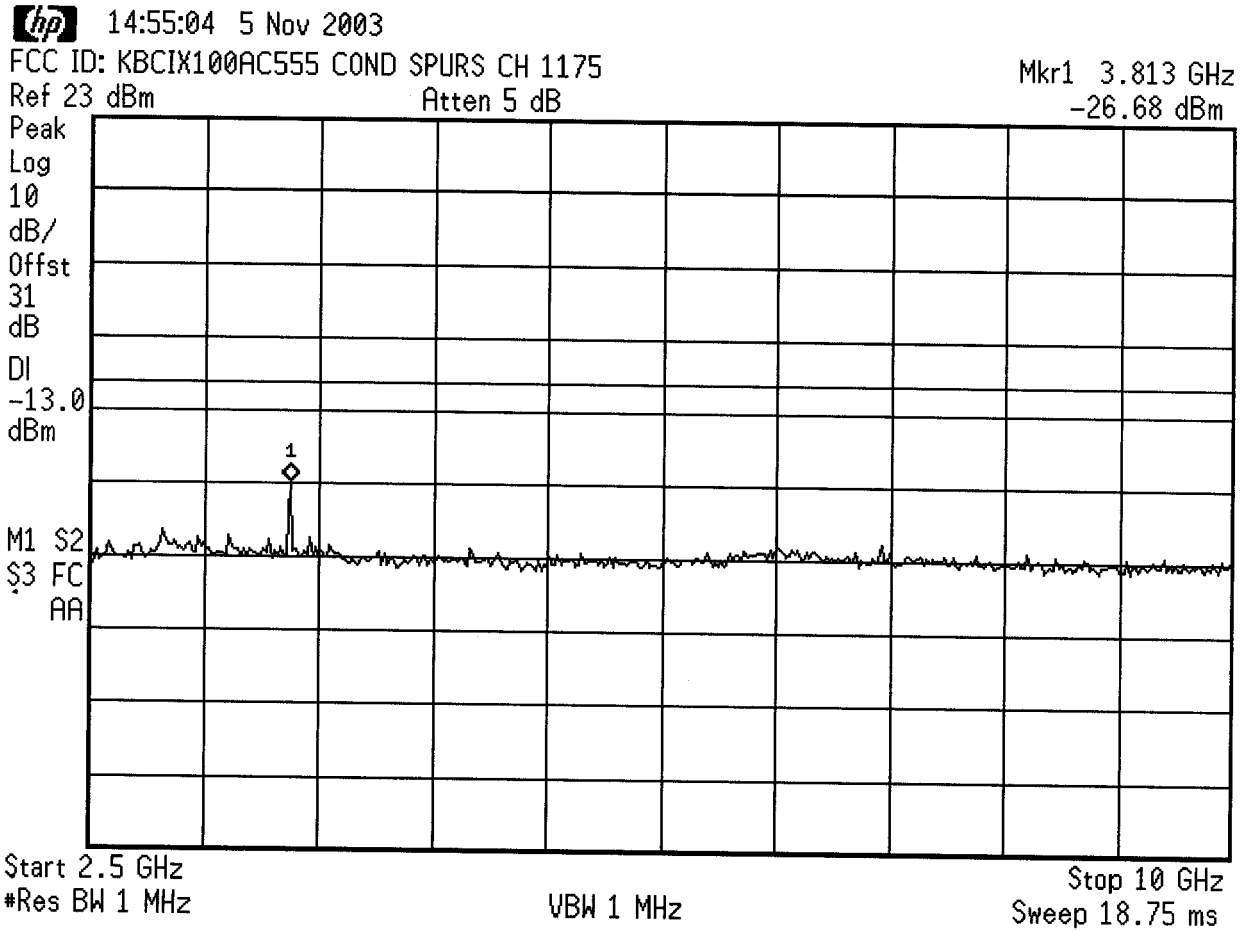

14:48:43 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 25
Ref 23 dBm
Atten 5 dB
Mkr1 13.53 GHz
-32.45 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 10 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 20 GHz
Sweep 100 ms

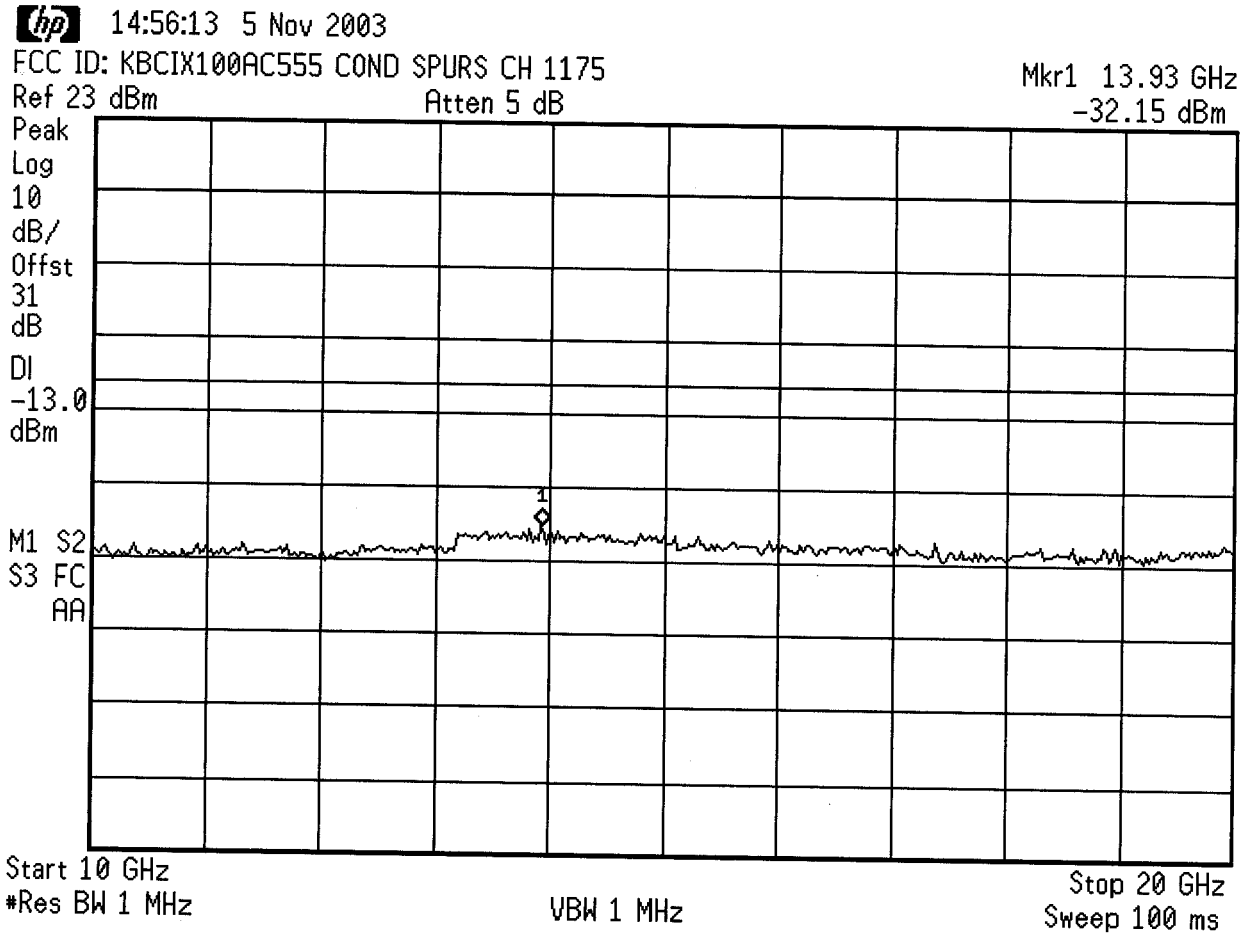

14:50:20 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 600
Ref 23 dBm
Atten 5 dB
Mkr1 2.481 GHz
-32.28 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 10 MHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.5 GHz
Sweep 6.225 ms

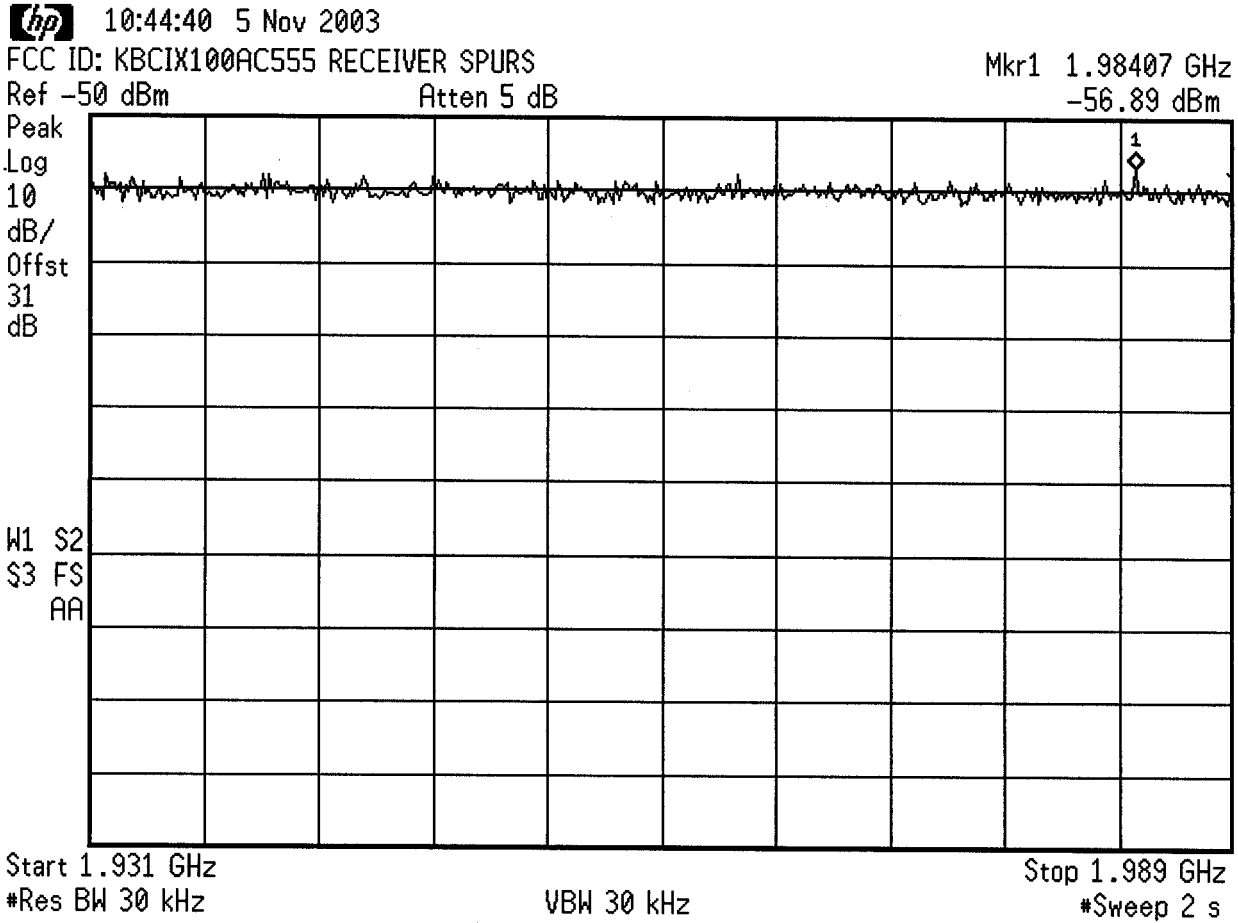

14:51:25 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 600
Ref 23 dBm
Atten 5 dB
Mkr1 3.756 GHz
-24.44 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 18.75 ms

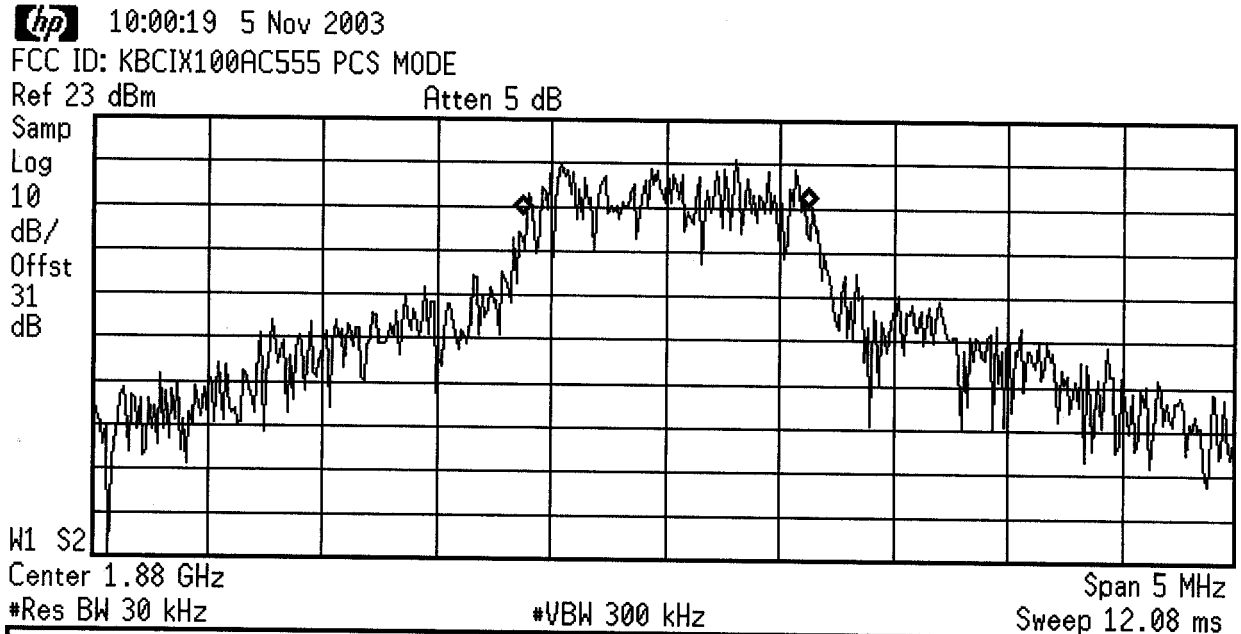

14:52:24 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 600
Ref 23 dBm
Atten 5 dB
Mkr1 14.05 GHz
-32.76 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 20 GHz
Sweep 100 ms


14:54:06 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 1175
Ref 23 dBm
Atten 5 dB
Mkr1 2.425 GHz
-31.92 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 MHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.5 GHz
Sweep 6.225 ms


14:55:04 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 1175
Ref 23 dBm
Atten 5 dB
Mkr1 3.813 GHz
-26.68 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 18.75 ms


14:56:13 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 1175
Ref 23 dBm
Atten 5 dB
Mkr1 13.93 GHz
-32.15 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 10 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 20 GHz
Sweep 100 ms


10:44:40 5 Nov 2003
FCC ID: KBCIX100AC555 RECEIVER SPURS
Mkr1 1.98407 GHz
Ref -50 dBm
Atten 5 dB
-56.89 dBm
Peak
Log
10
dB/
Offst
31
dB
1
W1 S2
S3 FS
AA
Start 1.931 GHz
#Res BW 30 kHz
VBW 30 kHz
Stop 1.989 GHz
#Sweep 2 s



Occupied Bandwidth Results (measuring..)

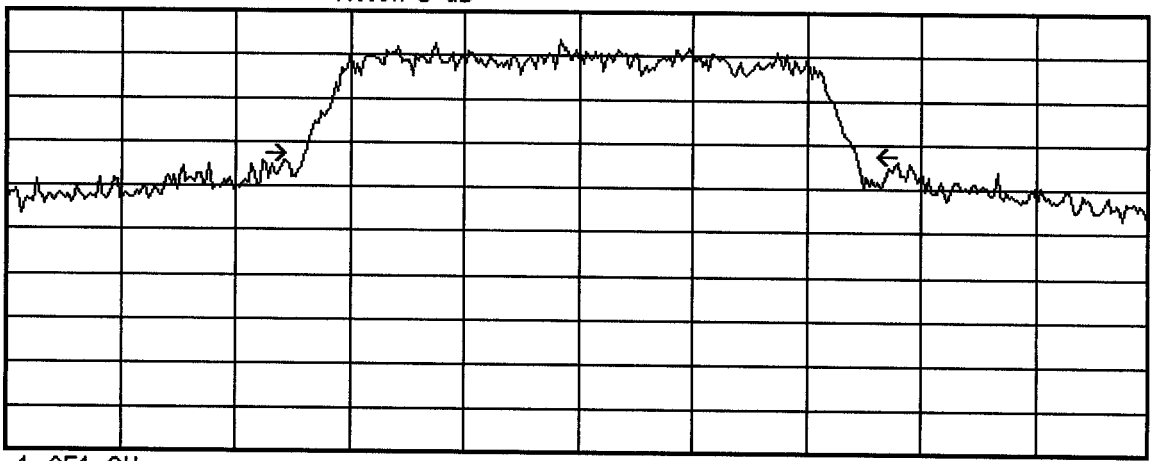
Occupied Bandwidth

1.257 MHz

Occ BW % Pwr 99.00 %

Transmit Freq Error 712.7 Hz

09:58:48 5 Nov 2003
FCC ID: KBCIX100AC555 PCS MODE
Ref 23 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB

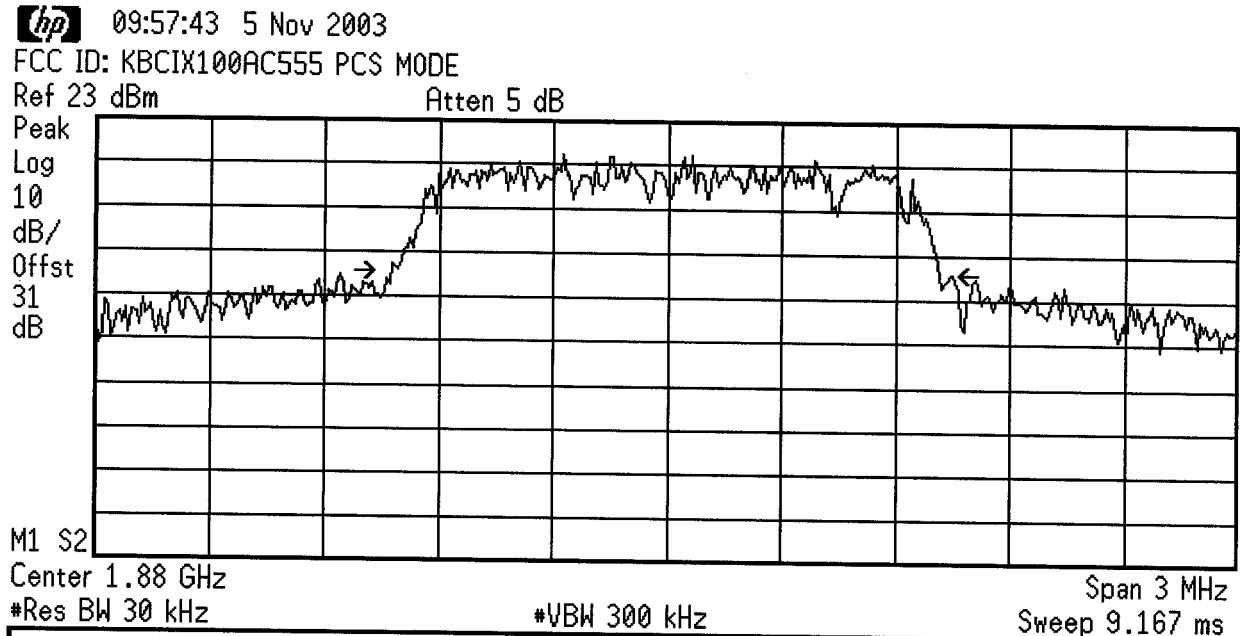


M1 S2
Center 1.851 GHz
#Res BW 30 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 9.167 ms

Emission Bandwidth Results (measuring..)

Emission Bandwidth
1.449 MHz

Emiss BW X dB -26.0 dB

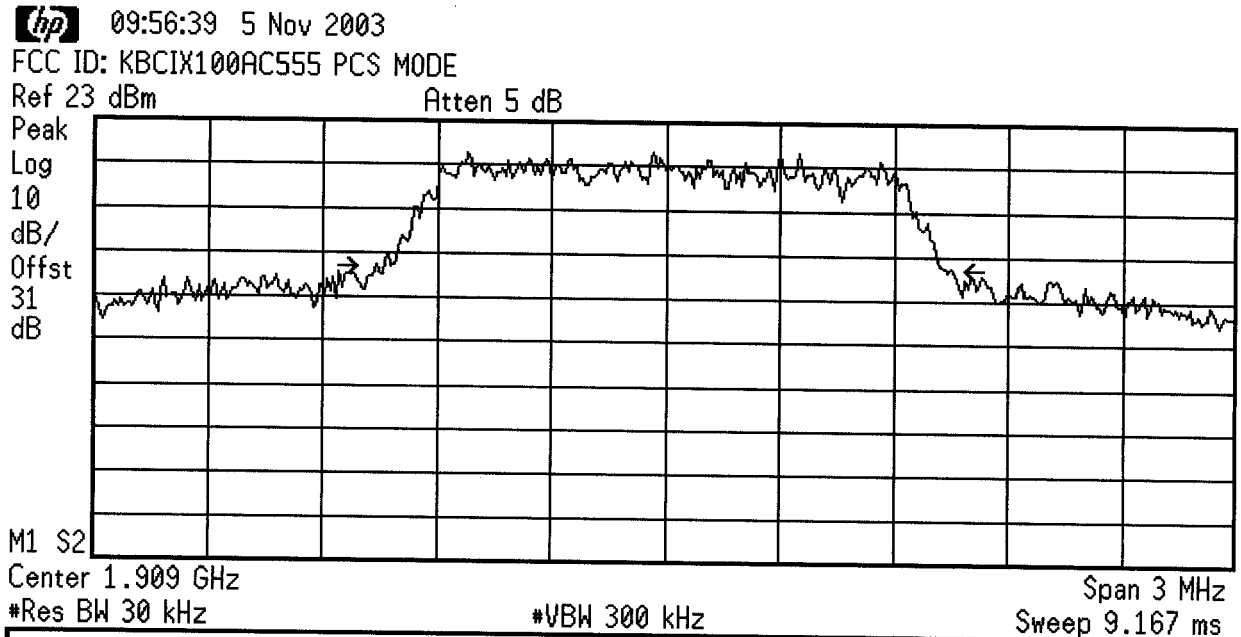


Emission Bandwidth Results (measuring..)

Emission Bandwidth

1.437 MHz

Emiss BW X dB -26.0 dB

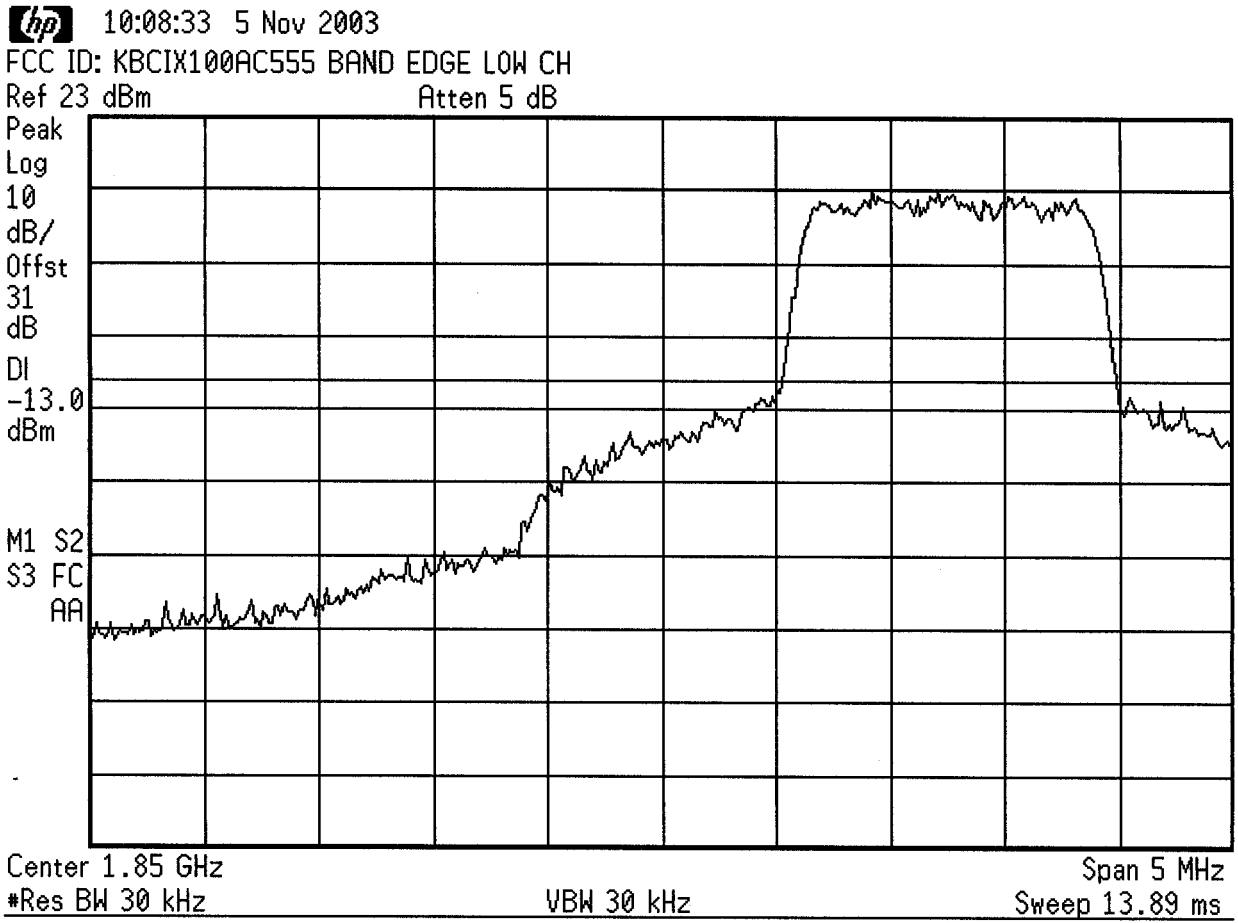


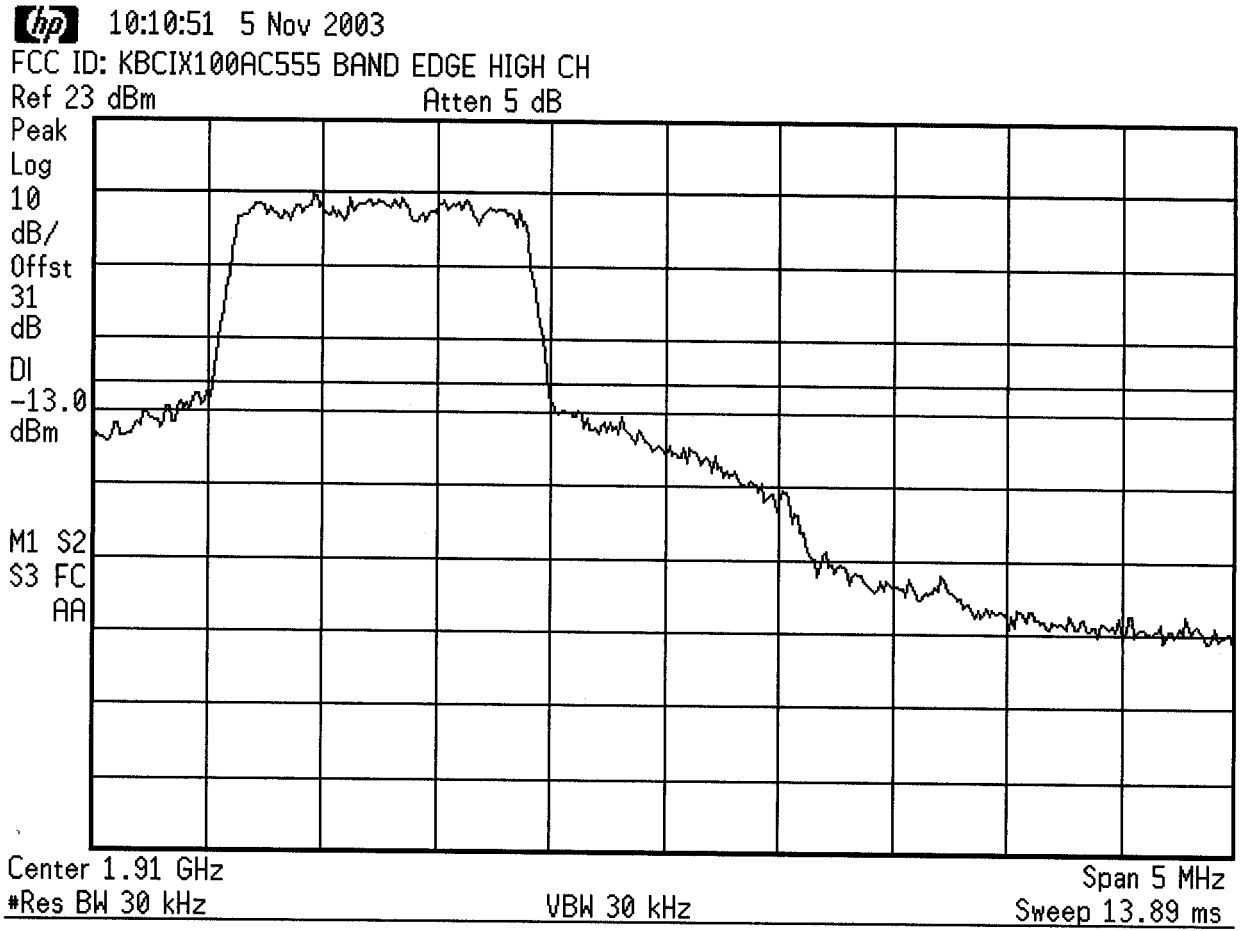
Emission Bandwidth Results (measuring..)

Emission Bandwidth

1.496 MHz

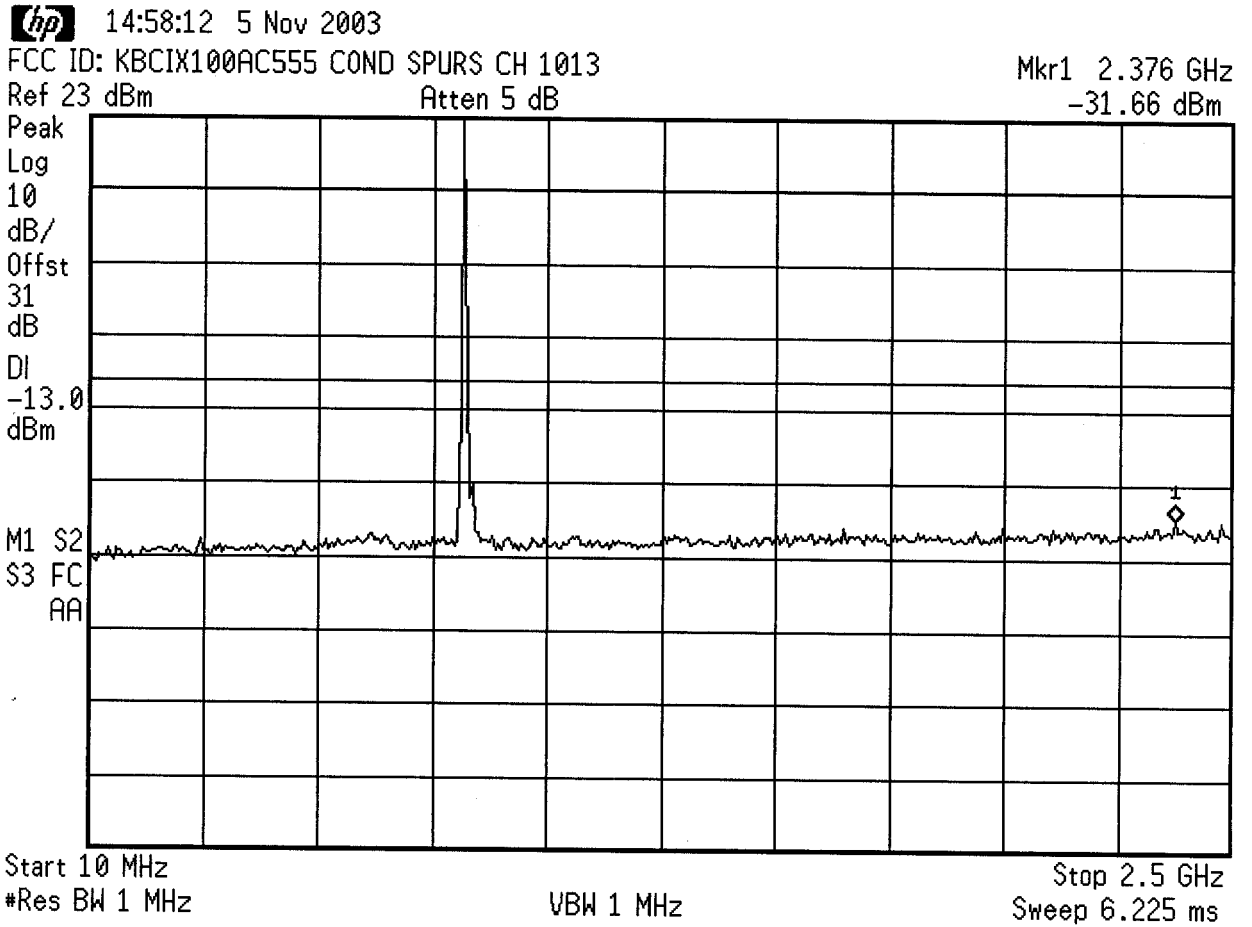
Emiss BW X dB -26.0 dB

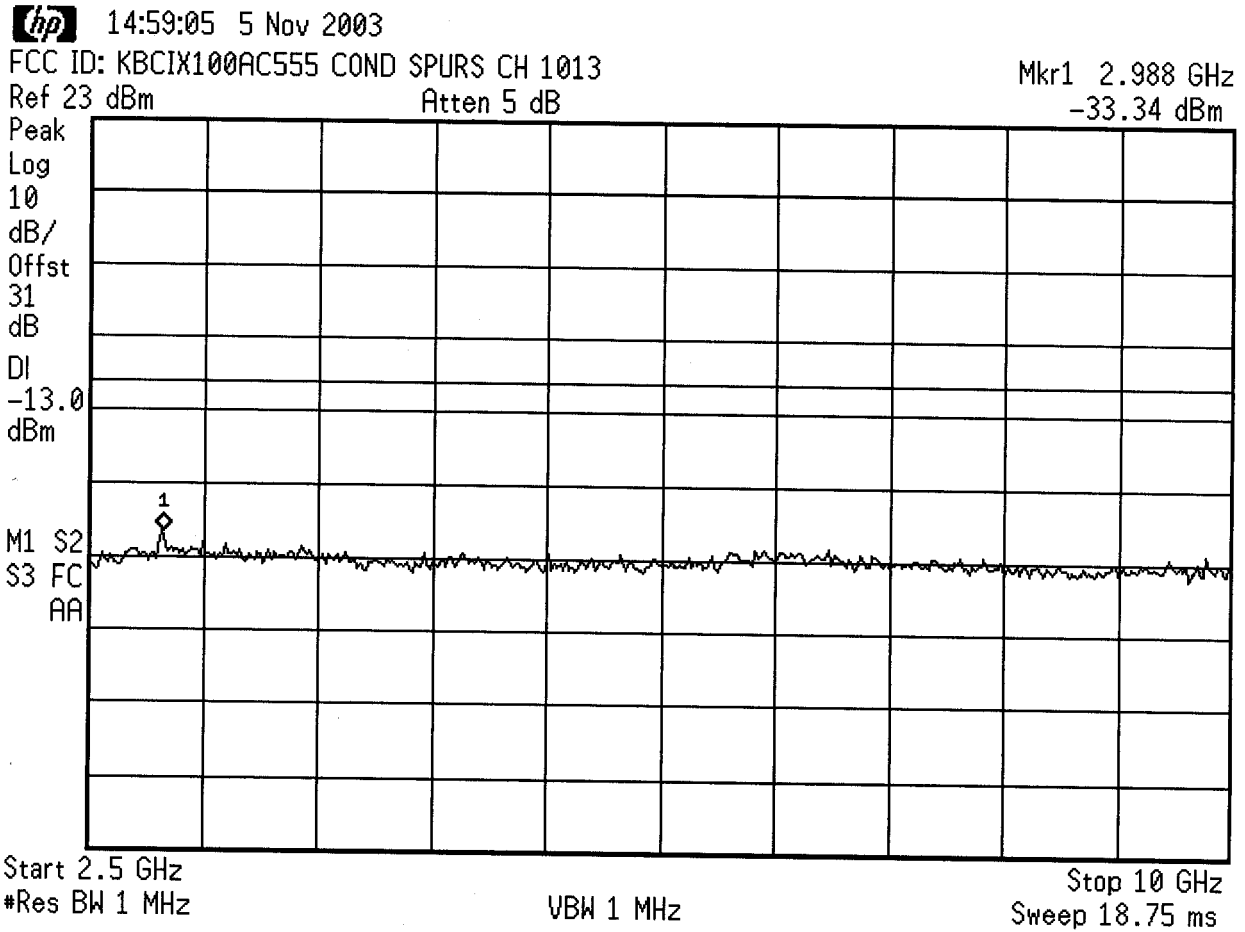

10:08:33 5 Nov 2003
FCC ID: KBCIX100AC555 BAND EDGE LOW CH
Ref 23 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Center 1.85 GHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 13.89 ms

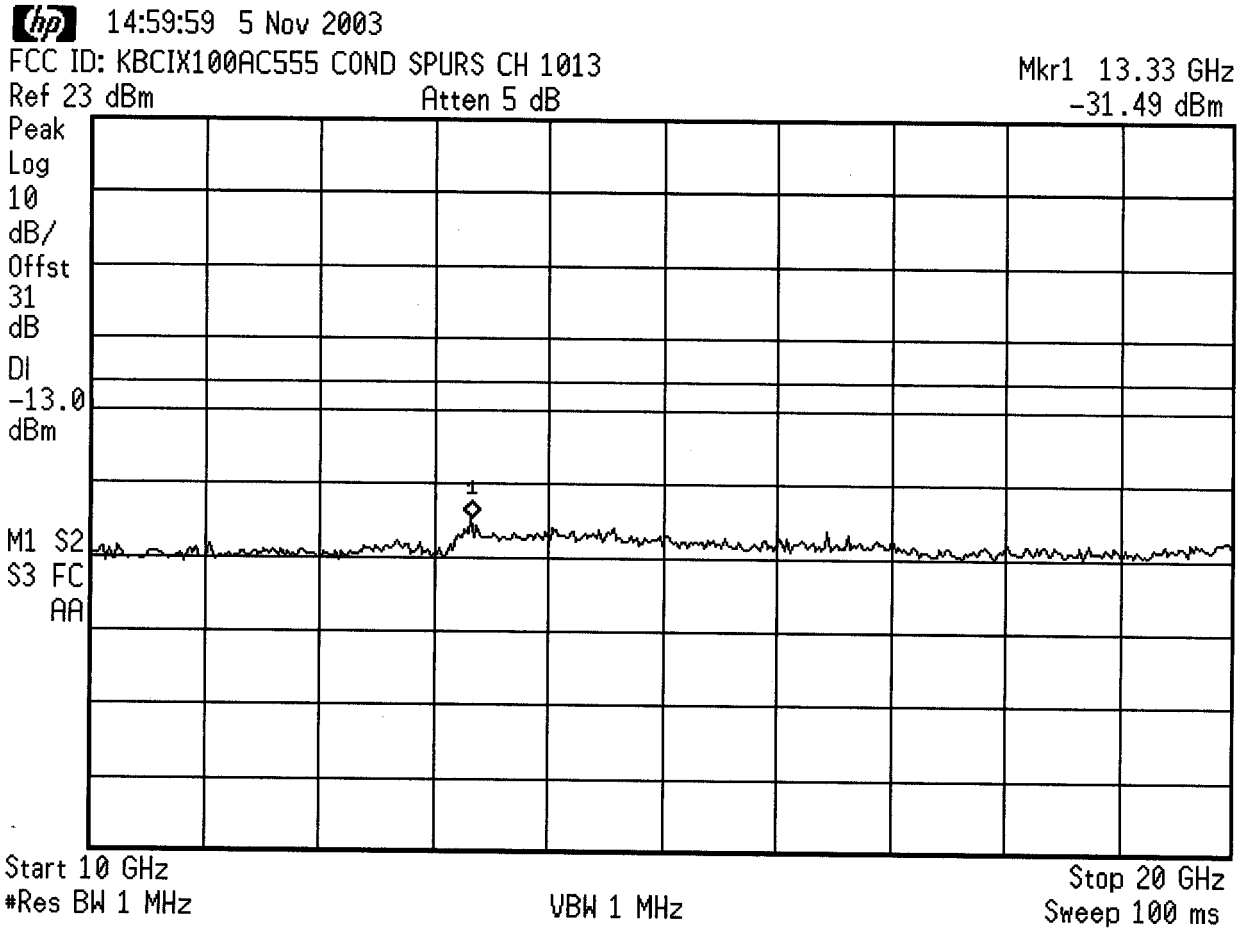

10:10:51 5 Nov 2003
FCC ID: KBCIX100AC555 BAND EDGE HIGH CH
Ref 23 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Center 1.91 GHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 13.89 ms

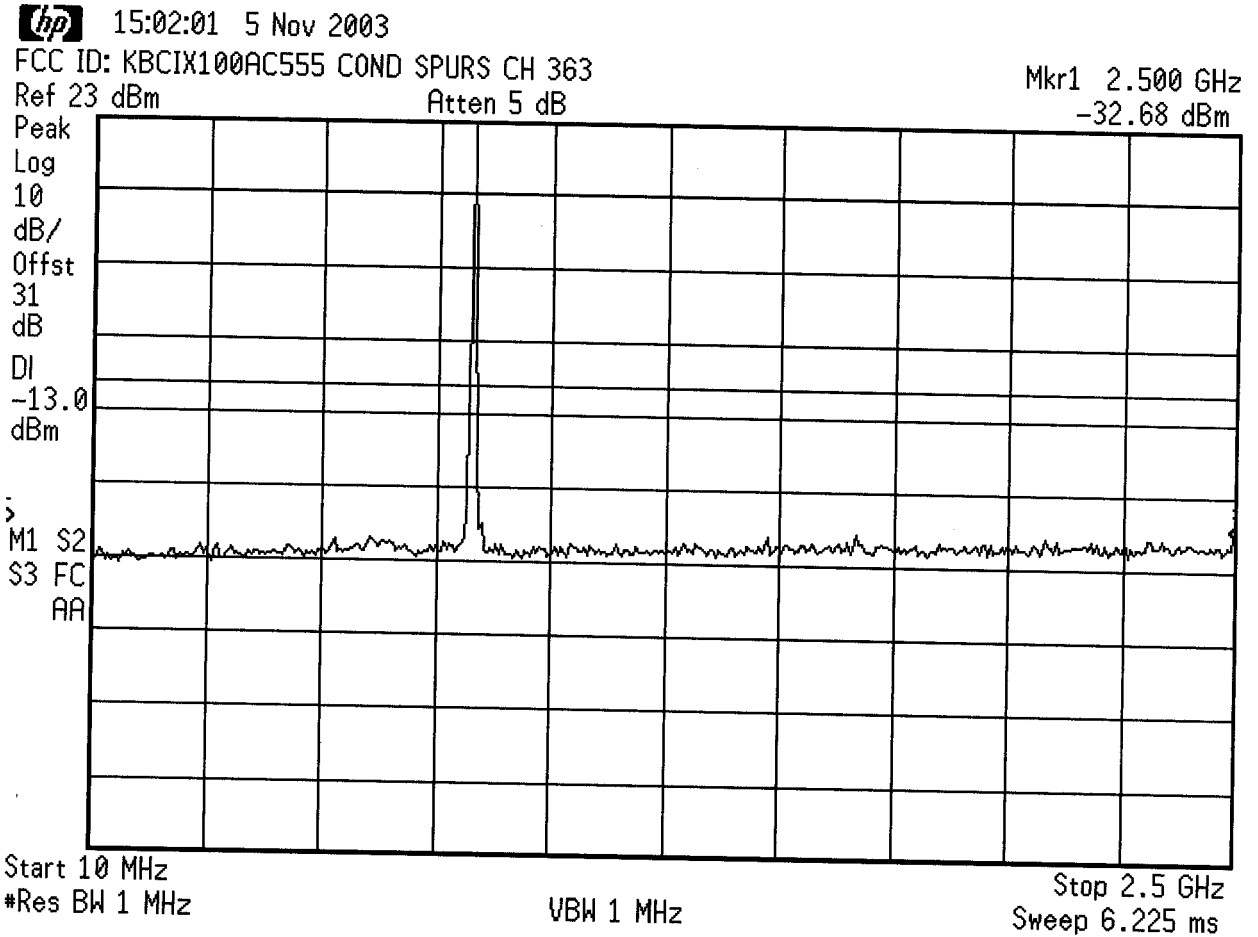
EMC TEST PLOTS - Cellular CDMA Mode

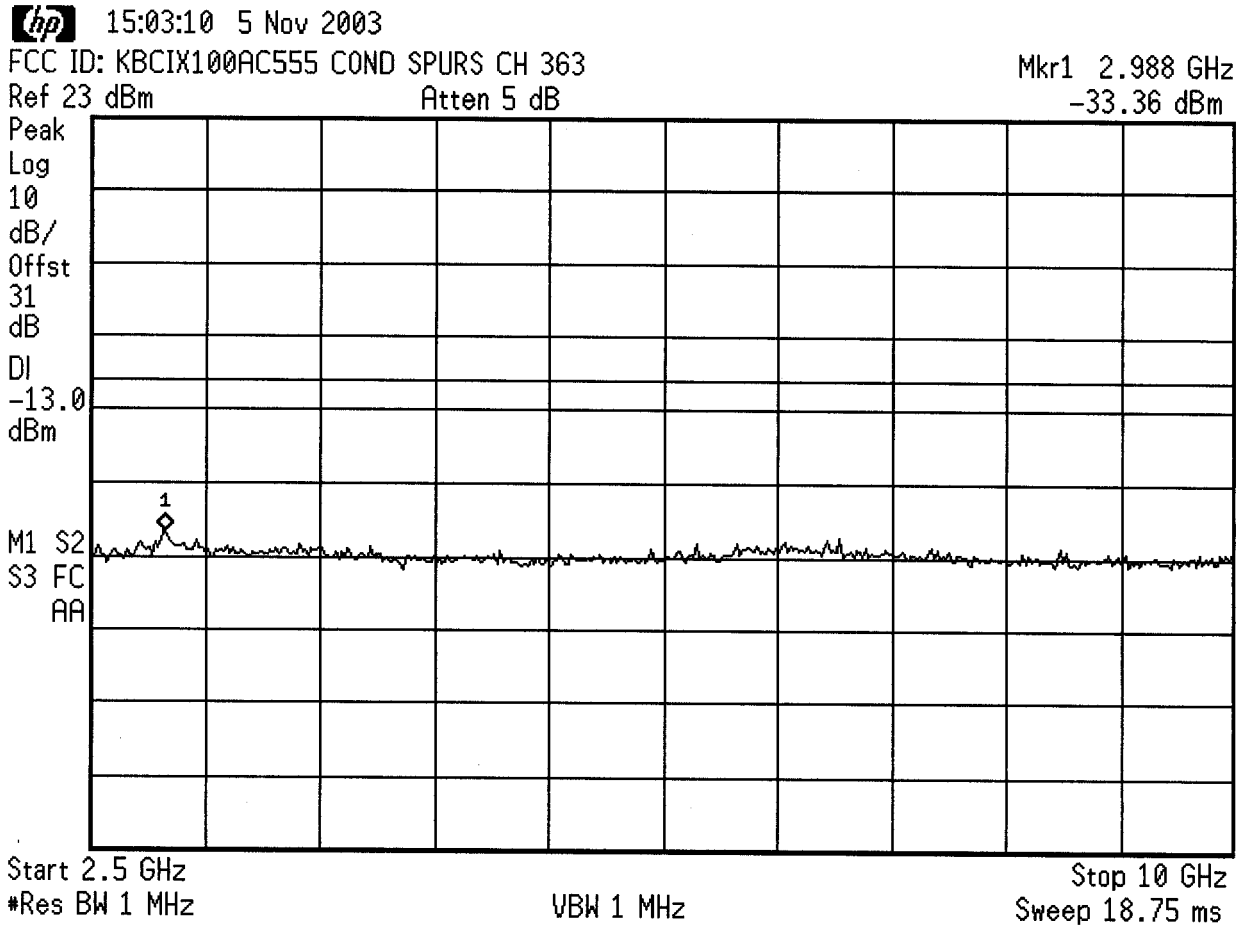
1. Conducted Spurious Emissions
2. Receiver Spurious Emissions
3. 99% Occupied Bandwidth
4. -26dBc Emission Bandwidth
5. Band Edge

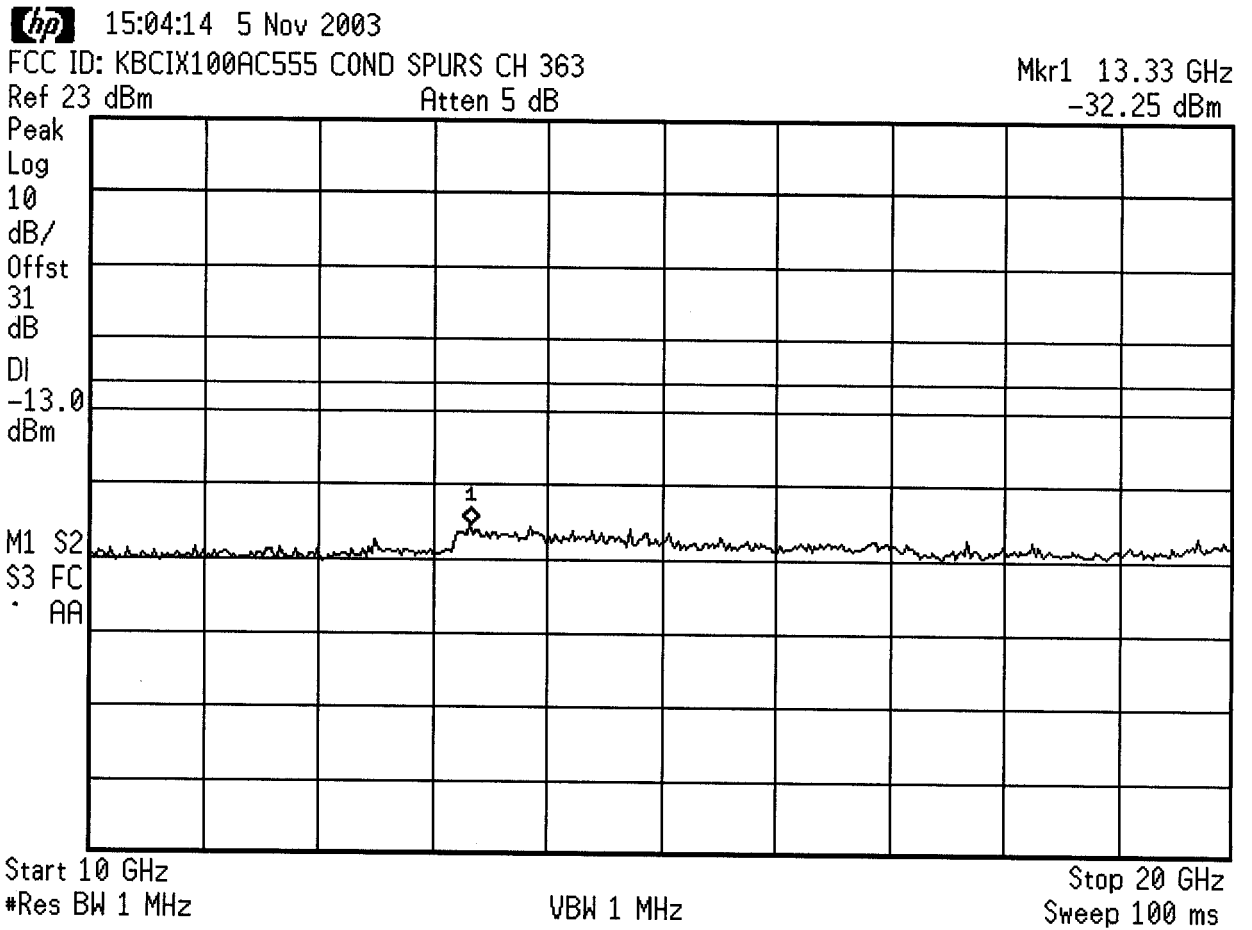

14:58:12 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 1013
Ref 23 dBm
Atten 5 dB
Mkr1 2.376 GHz
-31.66 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 10 MHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.5 GHz
Sweep 6.225 ms

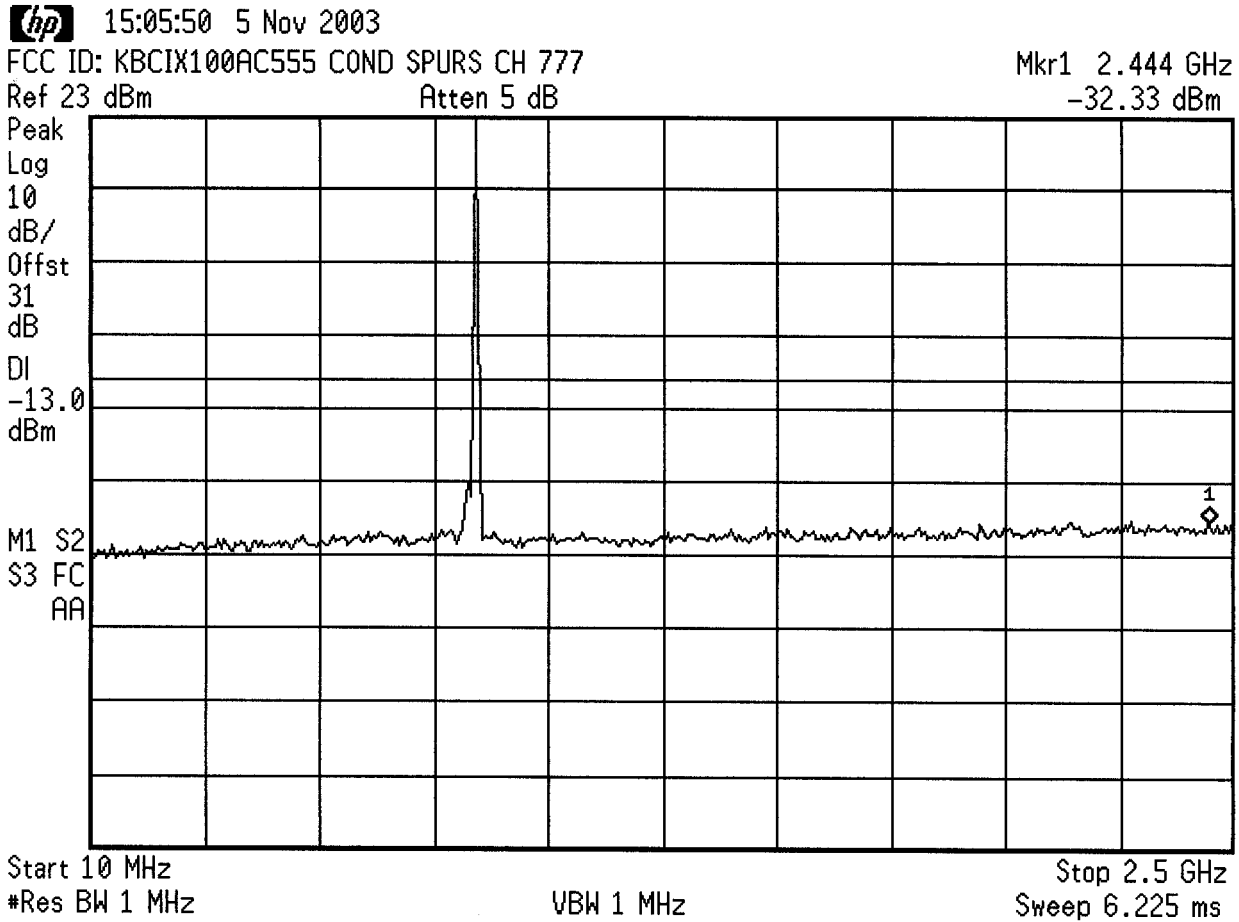

14:59:05 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 1013
Ref 23 dBm
Atten 5 dB
Mkr1 2.988 GHz
-33.34 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 18.75 ms

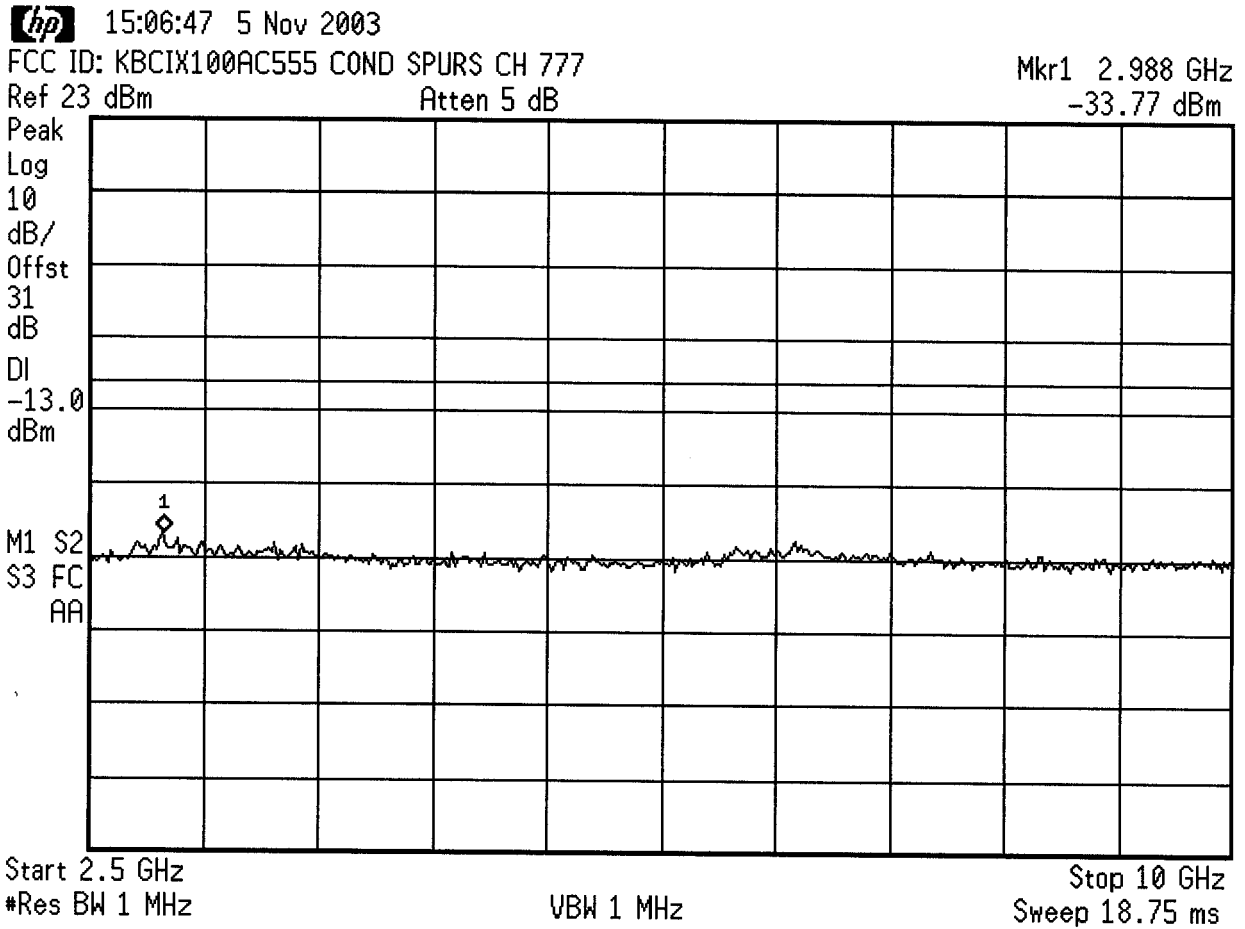

14:59:59 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 1013
Ref 23 dBm
Atten 5 dB
Mkr1 13.33 GHz
-31.49 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 20 GHz
Sweep 100 ms

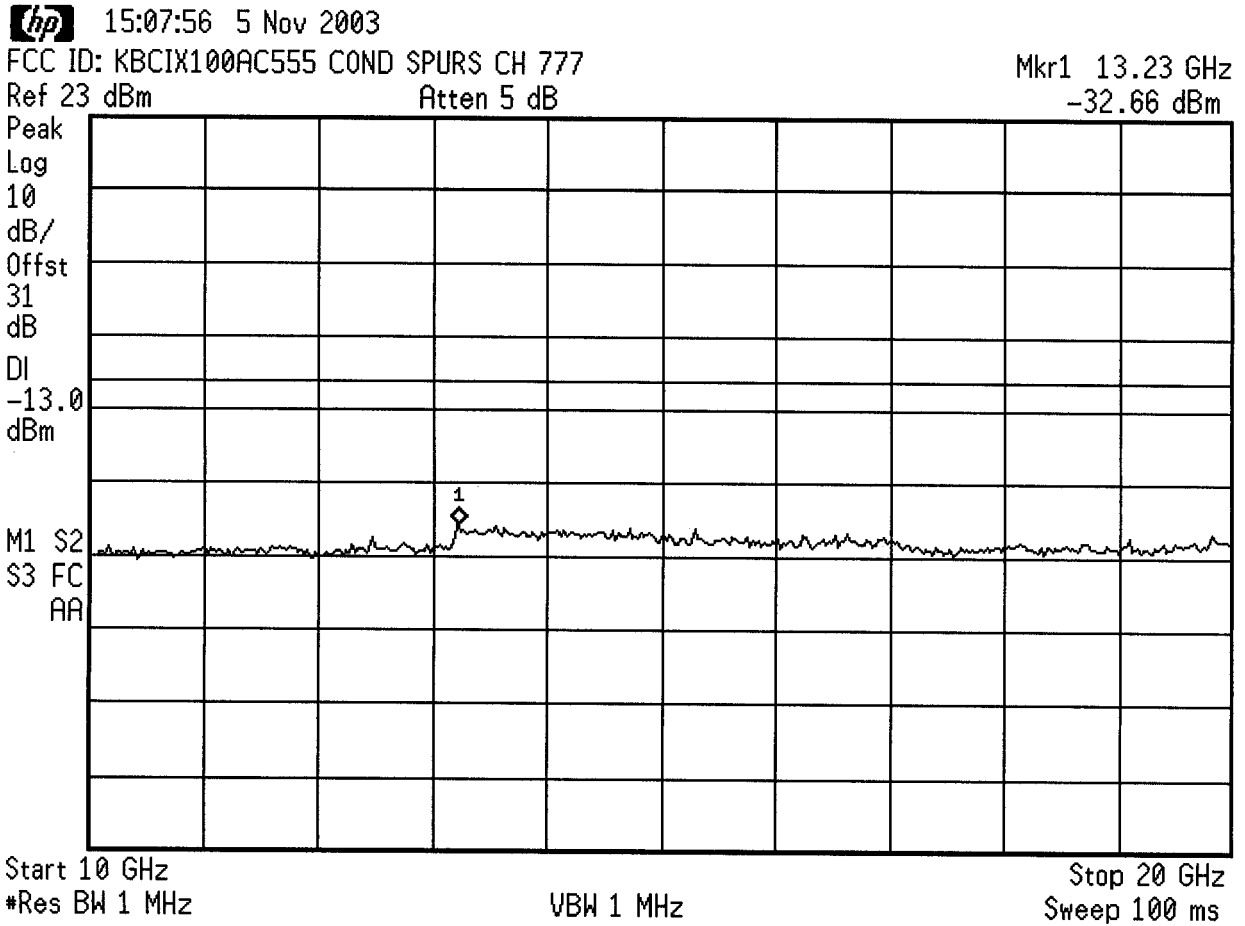

15:02:01 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 363
Ref 23 dBm
Atten 5 dB
Mkr1 2.500 GHz
-32.68 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 10 MHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.5 GHz
Sweep 6.225 ms

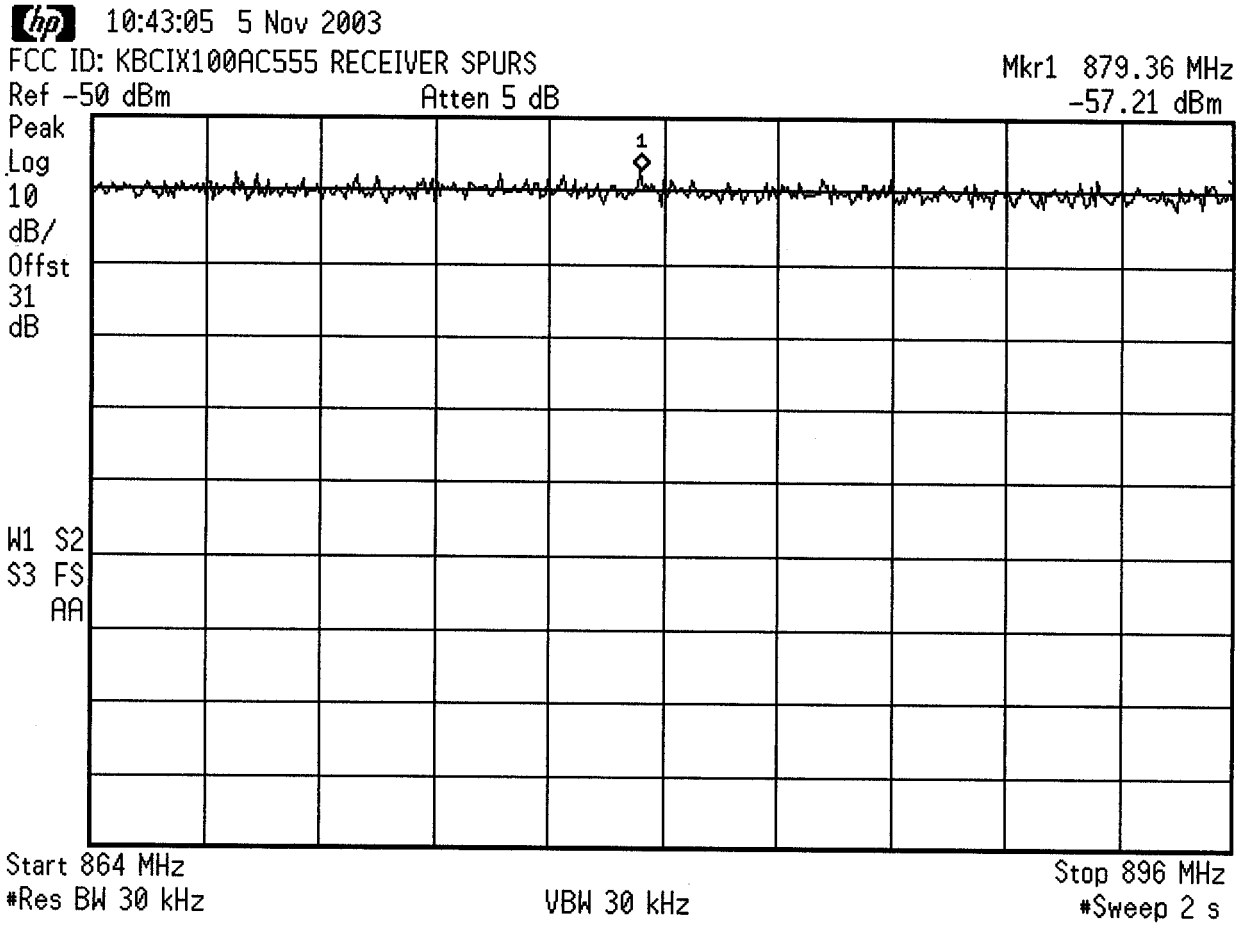

15:03:10 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 363
Mkr1 2.988 GHz
-33.36 dBm
Ref 23 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 18.75 ms

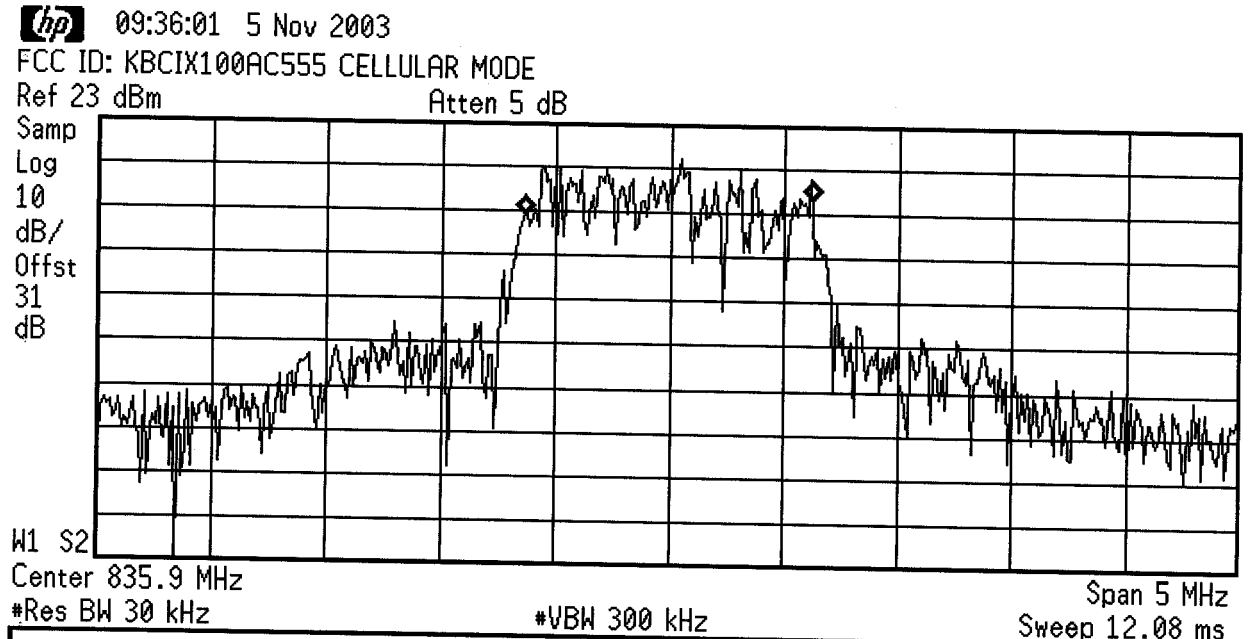

15:04:14 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 363
Ref 23 dBm
Atten 5 dB
Mkr1 13.33 GHz
-32.25 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 20 GHz
Sweep 100 ms

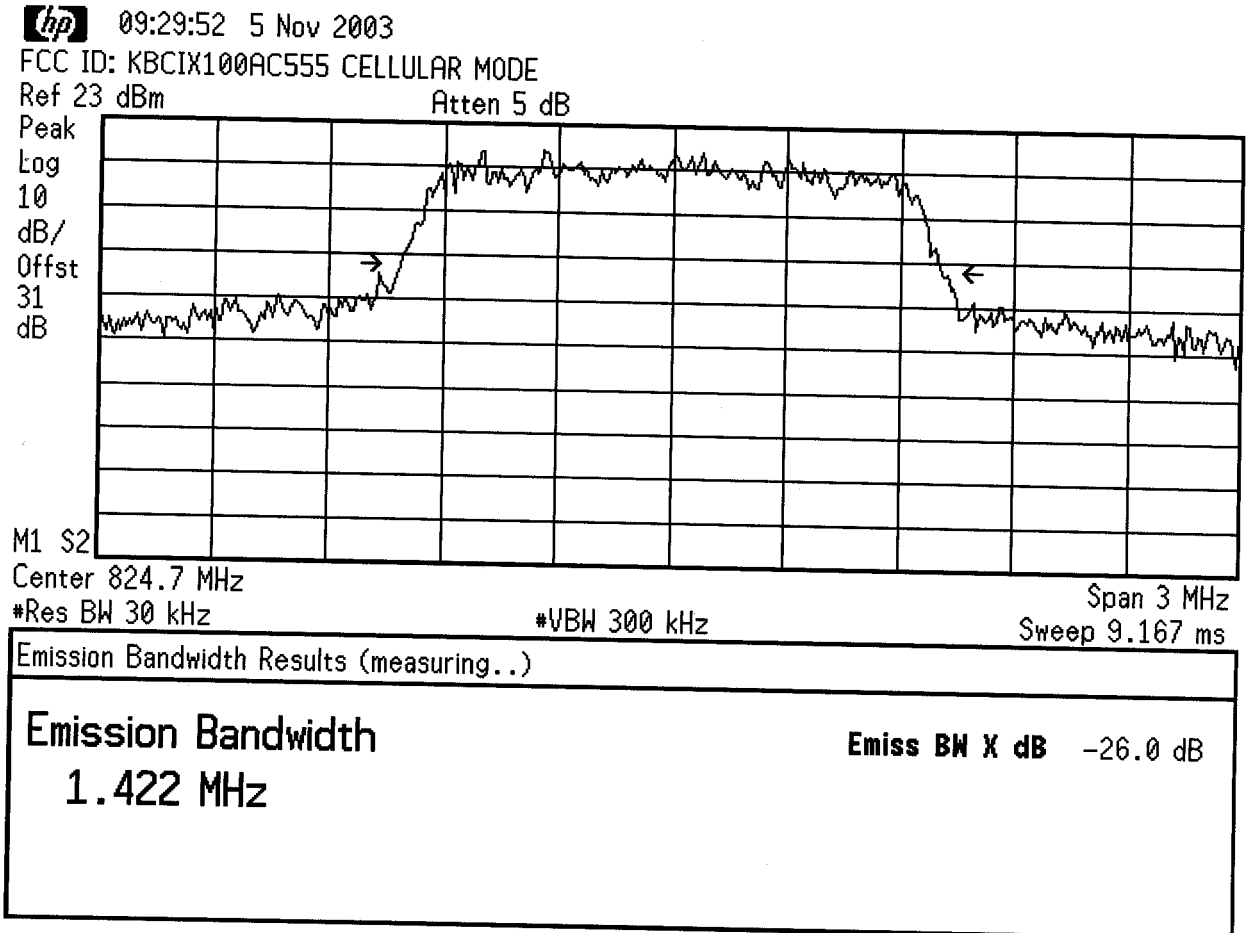

15:05:50 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 777
Mkr1 2.444 GHz
Ref 23 dBm
Atten 5 dB
-32.33 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 MHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.5 GHz
Sweep 6.225 ms

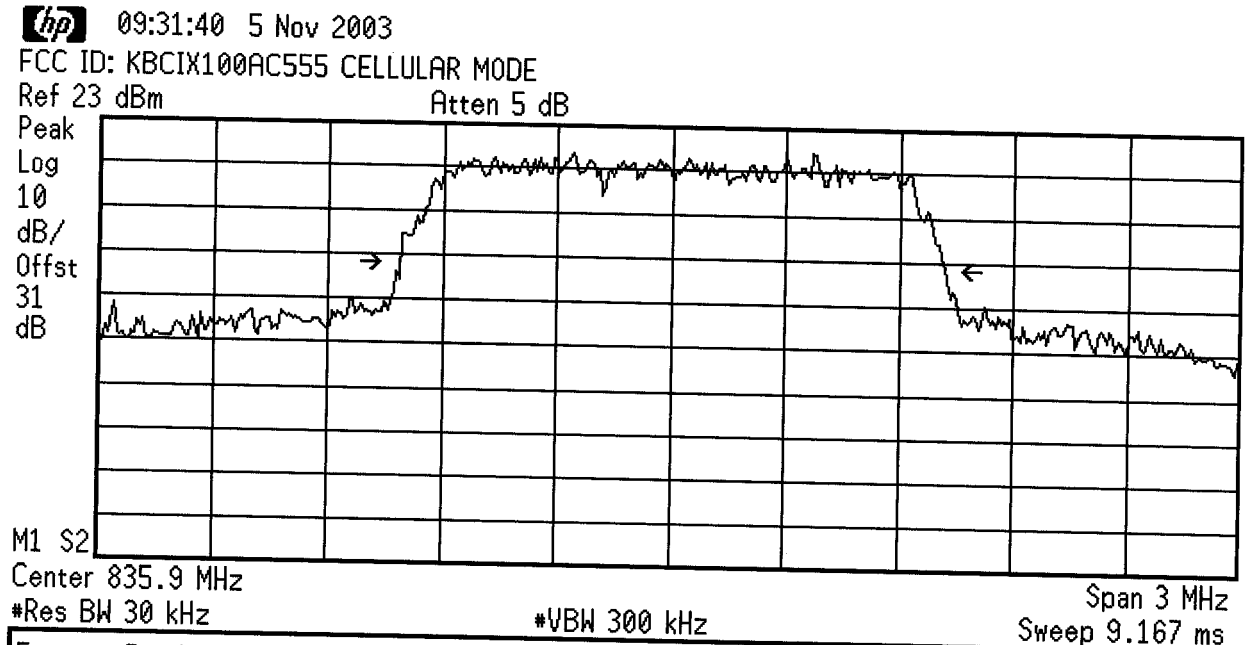

15:06:47 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 777
Mkr1 2.988 GHz
-33.77 dBm
Ref 23 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 18.75 ms


15:07:56 5 Nov 2003
FCC ID: KBCIX100AC555 COND SPURS CH 777
Mkr1 13.23 GHz
-32.66 dBm
Ref 23 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 10 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 20 GHz
Sweep 100 ms


10:43:05 5 Nov 2003
FCC ID: KBCIX100AC555 RECEIVER SPURS
Mkr1 879.36 MHz
-57.21 dBm
Ref -50 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
1
W1 S2
S3 FS
AA
Start 864 MHz
#Res BW 30 kHz
VBW 30 kHz
Stop 896 MHz
#Sweep 2 s


09:36:01 5 Nov 2003
FCC ID: KBCIX100AC555 CELLULAR MODE
Ref 23 dBm
Atten 5 dB
Samp
Log
10
dB/
Offst
31
dB
W1 S2
Center 835.9 MHz
#Res BW 30 kHz
#VBW 300 kHz
Span 5 MHz
Sweep 12.08 ms
Occupied Bandwidth Results (measuring..)
Occupied Bandwidth
1.263 MHz
Occ BW % Pwr 99.00 %
Transmit Freq Error -3.329 kHz


09:29:52 5 Nov 2003
FCC ID: KBCIX100AC555 CELLULAR MODE
Ref 23 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
M1 S2
Center 824.7 MHz
#Res BW 30 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 9.167 ms
Emission Bandwidth Results (measuring..)
Emission Bandwidth
1.422 MHz
Emiss BW X dB -26.0 dB



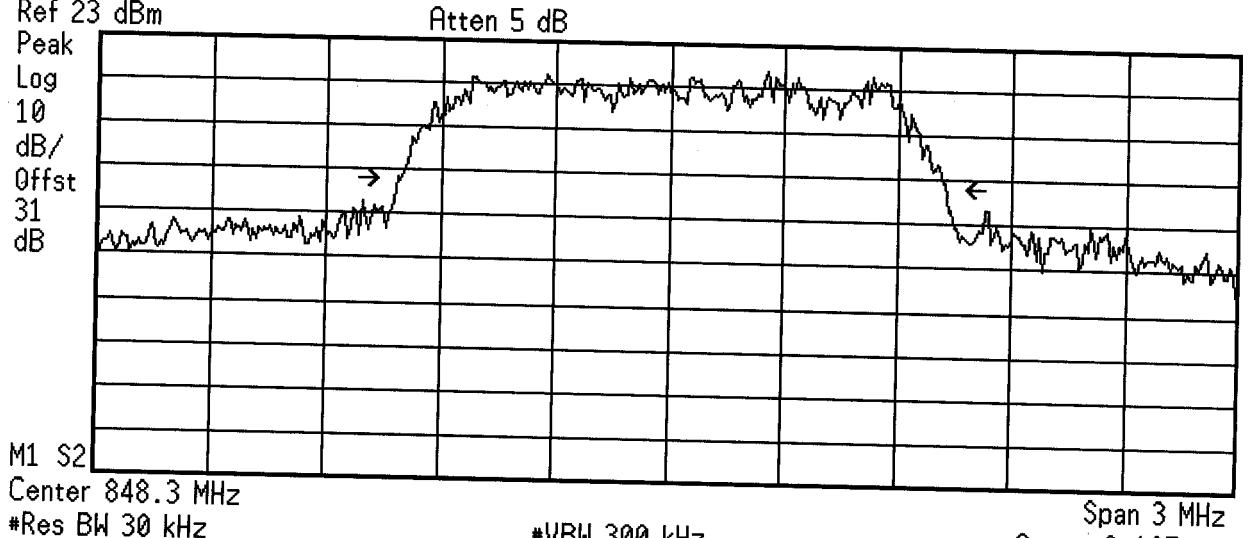
Emission Bandwidth Results (measuring..)

Emission Bandwidth

1.423 MHz

Emiss BW X dB -26.0 dB

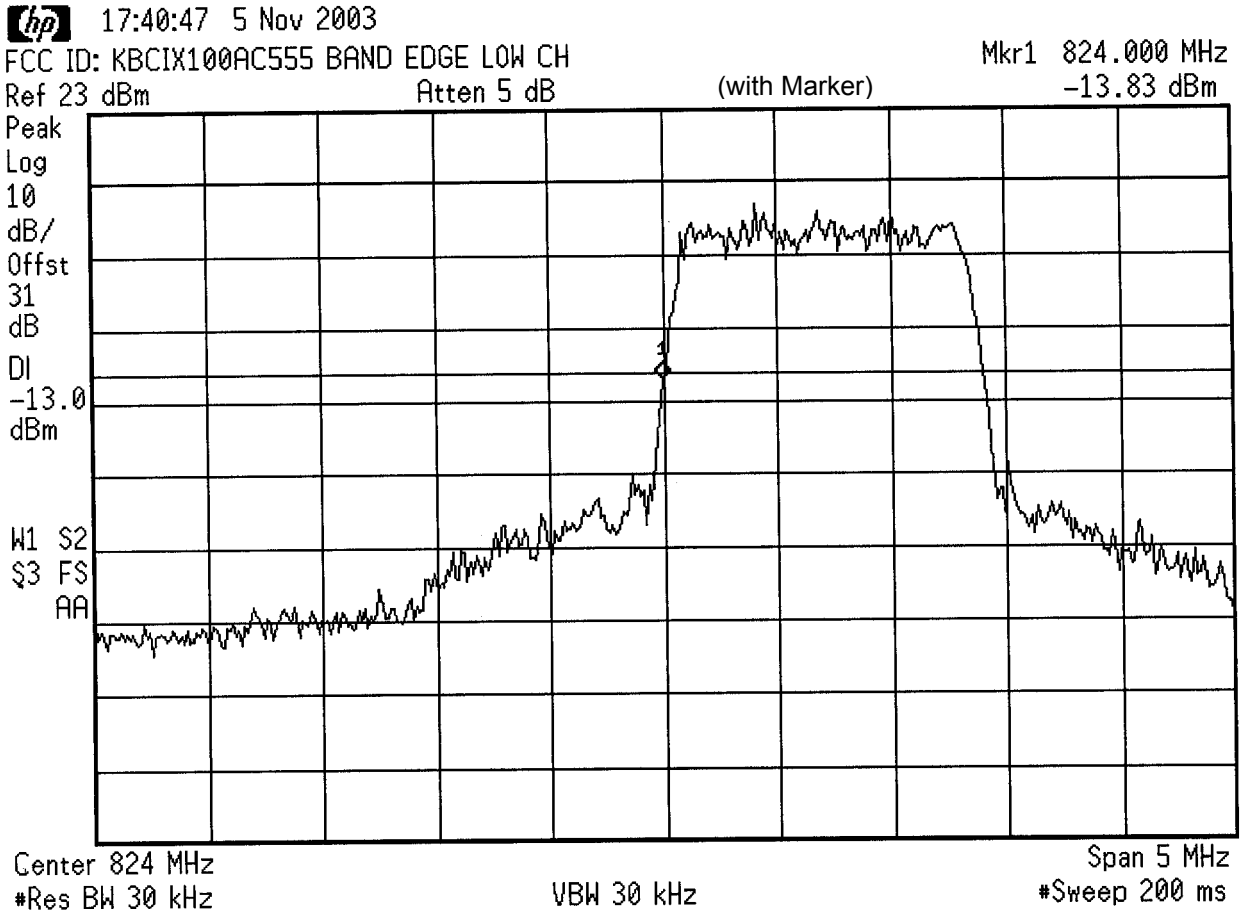
09:32:54 5 Nov 2003
FCC ID: KBCIX100AC555 CELLULAR MODE

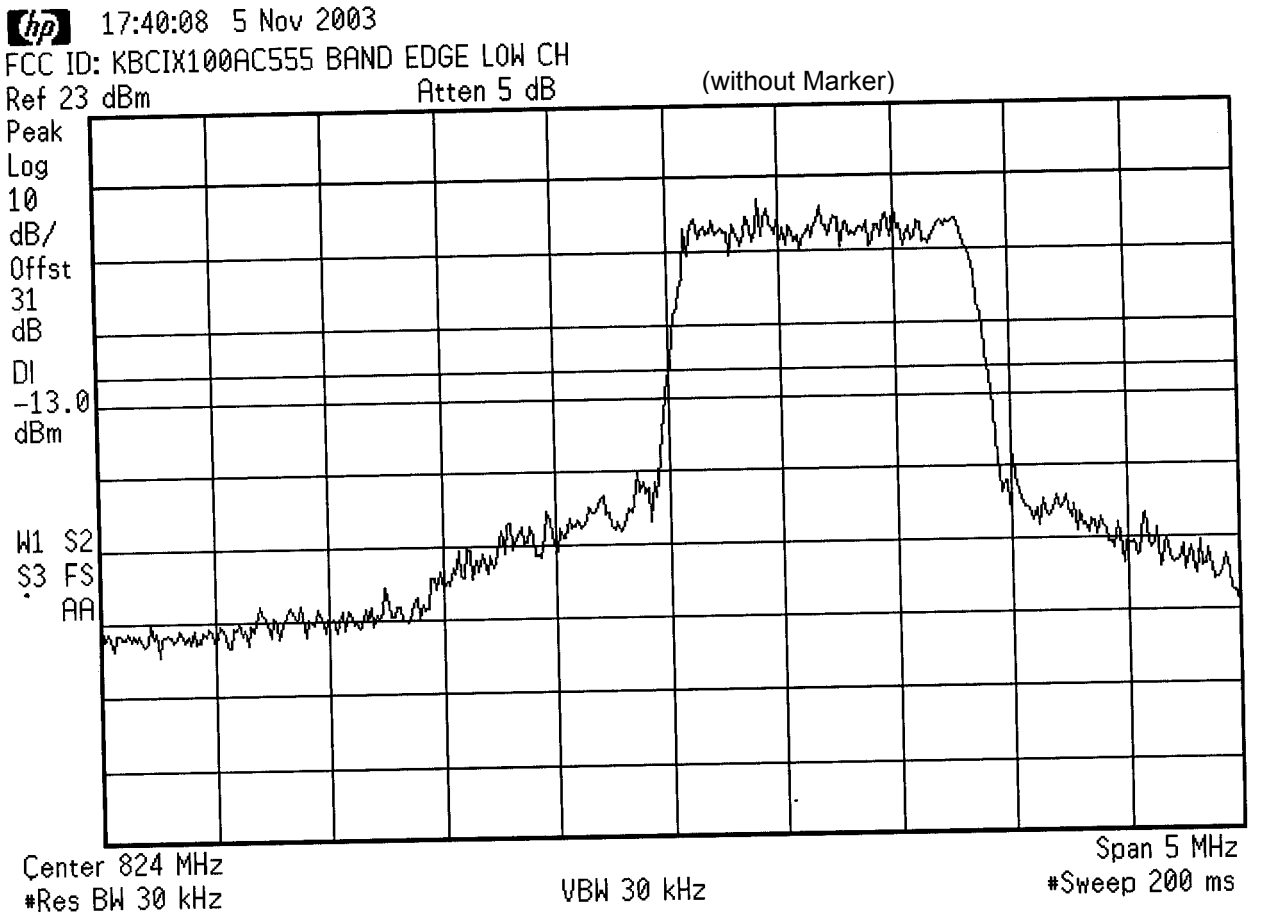


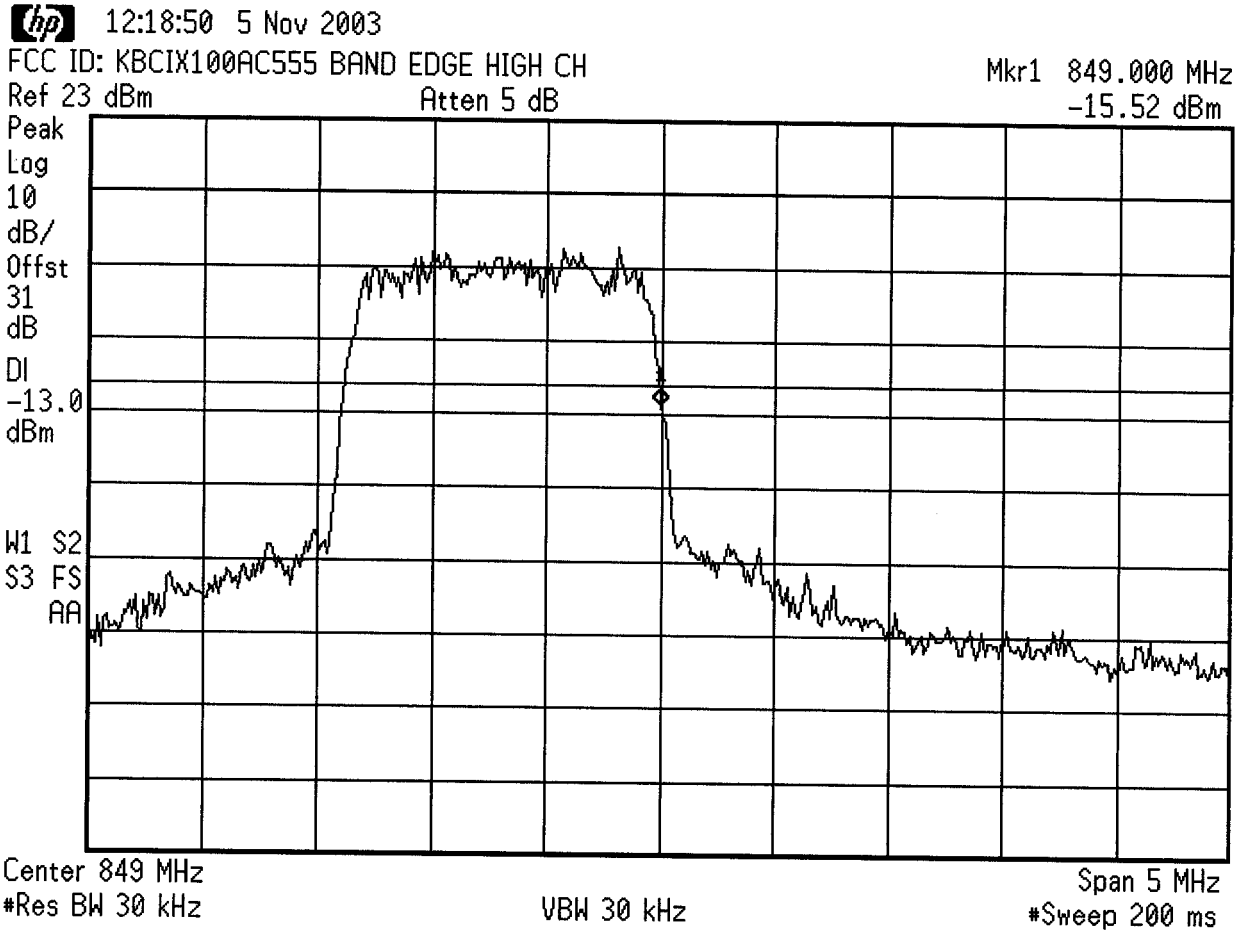
Emission Bandwidth Results (measuring..)

Emission Bandwidth
1.444 MHz

Emiss BW X dB -26.0 dB


17:40:47 5 Nov 2003
FCC ID: KBCIX100AC555 BAND EDGE LOW CH
(with Marker)
Mkr1 824.000 MHz
-13.83 dBm
Ref 23 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
W1 S2
S3 FS
AA
Center 824 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
#Sweep 200 ms


17:40:08 5 Nov 2003
FCC ID: KBCIX100AC555 BAND EDGE LOW CH
Ref 23 dBm
Atten 5 dB
(without Marker)
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
W1 S2
S3 FS
AA
Center 824 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
#Sweep 200 ms


12:18:50 5 Nov 2003
FCC ID: KBCIX100AC555 BAND EDGE HIGH CH
Ref 23 dBm
Atten 5 dB
Mkr1 849.000 MHz
-15.52 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
W1 S2
S3 FS
AA
Center 849 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
#Sweep 200 ms