



FCC Test Report

According to

47 CFR Part 22H, 24E

Equipment : CDMA 2000 1xRTT Mobile Phone
Trade Name : Nokia
Model No. : RH-109
FCC ID : QMNRH-109
Uplink Frequency Range : CDMA2000 Cellular : 824.7~848.31 MHz
CDMA2000 PCS : 1851.25~1908.75 MHz
Max. ERP/EIRP Power : CDMA2000 Cellular : 0.14 W
CDMA2000 PCS : 0.35 W
Emission Designator : 1M25F9W
Applicant : Nokia Inc.
12278 Scripps Summit Dr.San Diego CA92131 USA

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- The data shown in this test report were carried out on Apr. 17, 2008 at **Sporton International Inc. LAB.**
- Report No.: FG820515-A, Report Version: Rev. 05.

Roy 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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History of This Test Report

Report Issue Date: Apr. 22, 2008

Report No.	Description



1. General Information

1.1. Applicant

Nokia Inc.
12278 Scripps Summit Dr.San Diego CA92131 USA

1.2 Manufacturer

Compal Communications(Nanjing) Co., Ltd.
Nanjing Jiangning Export Processing Zone (South Area) No.68-2 Suyuan Street

1.3 Basic Description of Equipment under Test

Equipment		CDMA 2000 1xRTT Mobile Phone
Trade Name		Nokia
Model Name		RH-109
FCC ID		QMNRH-109
AC Adapter	Manufacture	ASTEC
	Brand Name	NOKIA
	Model Name	AC-6U
	Power Rating	I/P: 100-240Vac, 50-60Hz, 150mA O/P: 5.0Vdc, 550mA
	AC Power Cord Type	1.7 meter shielded cable without ferrite core
Car Charger	Manufacture	ASTEC
	Brand Name	NOKIA
	Model Name	DC-6
	Power Rating	I/P: 12V/24V O/P: 5.0Vdc, 550mA
	Power Cord Type	1.8 meter shielded cable without ferrite core
Battery	Manufacture	PANASONIC
	Brand Name	NOKIA
	Model Name	BL-4B
	Power Rating	3.7Vdc, 700mAh
	Type	Li-ion
Earphone 1	Manufacture	Hosiden
	Brand Name	NOKIA
	Model Name	HS-49
	Signal Line Type	1.7 meter non-shielded cable without ferrite core
Earphone 2	Manufacture	Hosiden
	Brand Name	NOKIA
	Model Name	HS-9
	Signal Line Type	1.3 meter non-shielded cable without ferrite core



USB Cable	Manufacture	CHENG UEI
	Brand Name	NOKIA
	Model Name	CA-101
	Signal Line Type	1.1 meter shielded cable with ferrite core

Remark: Above EUT's information was declared by manufacturer. Please refer to the specifications of manufacturer or User's Manual for more detailed features description.

1.4 Feature of Equipment under Test

DUT Type	CDMA 2000 1xRTT Mobile Phone
Trade Name	Nokia
Model Name	RH-109
FCC ID	QMNRH-109
MEID	268435456102522605
Tx Frequency	CDMA2000 Cellular : 824 ~ 849 MHz CDMA2000 PCS : 1850 ~1910 MHz
Rx Frequency	CDMA2000 Cellular : 869 ~ 894 MHz CDMA2000 PCS : 1930 ~ 1990 MHz
Maximum Output Power	CDMA2000 Cellular RC3_SO55 : 24.31 dBm CDMA2000 PCS RC5_SO9 : 24.24 dBm
Maximum ERP/EIRP	CDMA2000 Cellular : 0.14 W (21.45 dBm) CDMA2000 PCS : 0.35 W (25.45 dBm)
Antenna Type	Fixed Internal
HW Version	3200
SW Version	PL_2100T_GEN
Power Rating (Input Current and Voltage for CDMA PA)	500mA, 4.2V
Modulation Type	QPSK
Emission Designator	1M25F9W
Device Power Class	CDMA2000 Cellular : 3 CDMA2000 PCS : 2

1.5 Report Date

EUT Received : Mar. 21, 2008

Report Date : Apr. 22, 2008

2 Test Configuration of Equipment under Test

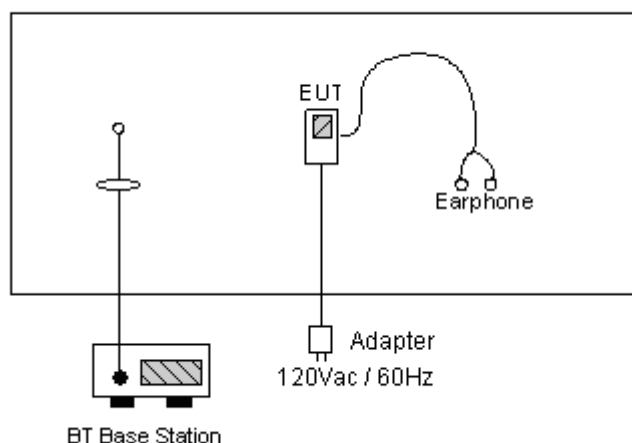
2.1 Test Manner

- The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.
- During all testings, EUT is in link mode with base station emulator at maximum power level.
- Frequency range investigated: radiated emission 30 MHz to 9000 MHz for CDMA2000 Cellular; 30MHz to 19000 MHz for CDMA2000 PCS.

2.2 Test Mode

Application	CDMA2000 Cellular	CDMA2000 PCS
Radiated Emission	☒ Mode 1: 1xRTT Link Mode_CH1013	☒ Mode 4: 1xRTT Link Mode_CH25
	☒ Mode 2: 1xRTT Link Mode_CH384	☒ Mode 5: 1xRTT Link Mode_CH600
	☒ Mode 3: 1xRTT Link Mode_CH777	☒ Mode 6: 1xRTT Link Mode_CH1175
Conducted Measurement	☒ Mode 1: 1xRTT Link Mode_CH1013	☒ Mode 4: 1xRTT Link Mode_CH25
	☒ Mode 2: 1xRTT Link Mode_CH384	☒ Mode 5: 1xRTT Link Mode_CH600
	☒ Mode 3: 1xRTT Link Mode_CH777	☒ Mode 6: 1xRTT Link Mode_CH1175

2.3 Connection Diagram of Test System



2.4 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable / Power Code
1.	Base Station	R&S	CMU200	N/A	Unshielded, 1.8m



3. General Information of Test Site

Test Site Location : No. 52, Hwa Ya 1st 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 : 03CH06-HY, TH02-HY
FCC Designation No. : TW1022
IC Registration No. : 4086B-1

The chamber meets the characteristics of ANSI C63.4-2003.

3.1 Test Voltage

AC 120V / 60Hz

3.2 Test Compliance

47 CFR Part 22H, 24E, Part 2

3.3 Frequency Range

- a. Radiation: from 30MHz to 9000MHz for CDMA2000 Cellular.
- b. Radiation: from 30 MHz to 19000 MHz for CDMA2000 PCS.

3.4 Test Distance

The test distance of radiated emission from antenna to EUT is 3 m.



4. Test Data and Test Result

4.1 List of Measurements and Examinations

FCC Rule	Description Of Test	Result	Section
§2.1046	RF Output Power	Passed	4.2
§ 22.913 §24.232	ERP / EIRP	Passed	4.3
§2.1049, § 22.917, § 24.238(b)	Occupied Bandwidth & Band Edge Measurement	Passed	4.4
§2.1051	Conducted Emission	Passed	4.5
§2.1053	Field Strength of Spurious Radiation	Passed	4.6
§2.1055, § 22.355, §24.235	Frequency Stability vs. Temperature	Passed	4.7
§2.1055, §22.355, §24.235	Frequency Stability vs. Voltage	Passed	4.8

4.2 RF Output Power

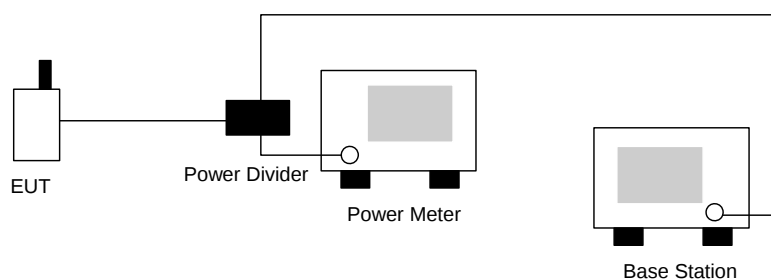
4.2.1 Measurement Instruments

As described in chapter 5 of this test report.

4.2.2 Test Procedure

- a. The transmitter output was connected to power meter and base station through power divider.
- b. Set EUT at maximum power through base station.
- c. Select lowest, middle, and highest channels for each band.

4.2.3 Test Setup Layout



**4.2.4 Test Result**

Bands	Test Mode	Test Status	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
CDMA2000 Cellular	1xRTT	RC3_SO55	1013	824.70 (Low)	24.31	0.27
			384	836.52 (Mid)	24.18	0.26
			777	848.31 (High)	24.15	0.26
CDMA2000 PCS	1xRTT	RC5_SO9	25	1851.25 (Low)	23.94	0.25
			600	1880.00 (Mid)	24.24	0.27
			1175	1908.75 (High)	23.83	0.24

Note:

1. For cellular band, the worst case adopted as maximum output power 24.31dBm, is at CDMA2000 1xRTT RC3 SO55.
2. For PCS band, the worst case adopted as maximum output power 24.24dBm, is at CDMA2000 1xRTT RC5 SO9.

4.3 ERP / EIRP Measurement

Equivalent isotropic radiated power measurements by substitution method according to ANSI/TIA/EIA-603-C.

4.3.1 Measurement Instruments

As described in chapter 5 of this test report.

4.3.2 Test Procedure

- a. The EUT was placed on a tutntable with 1.0 meter height in an fully anechoic chamber.
- b. The EUT was set 1.2 meters from the receiving antenna which was mounted on the antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiated power.
- d. The height of the receiving antenna is also kept at 1.0M height.
- e. Taking the record of maximum ERP/EIRP.
- f. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
- g. The conducted power at the terminal of the dipole antenna is measured.
- h. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
- i. $ERP/EIRP = Ps + Et - Es + Gs = Ps + Rt - Rs + Gs$

Ps (dBm) : Input power to substitution antenna.

Gs (dBi or dBd) : Substitution antenna Gain.

$Et = Rt + AF$

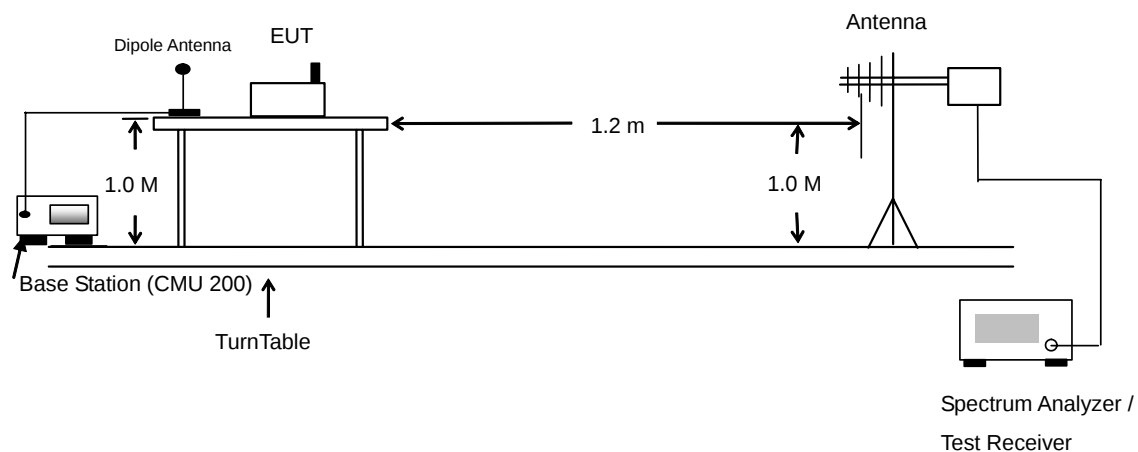
$Es = Rs + AF$

AF (dB/m) : Receive antenna factor

Rt : The highest received signal in Spectrum Analyzer for EUT.

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

4.3.3 Test Setup Layout of ERP/EIRP





4.3.4 Test Result

CDMA2000 Cellular 850 1xRTT RC3 SO55 Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.70	-42.43	-48.12	0.00	-1.08	4.61	0.00
836.52	-43.16	-48.28	0.00	-0.93	4.19	0.00
848.31	-42.42	-48.35	0.00	-0.76	5.17	0.00
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.70	-25.84	-47.97	0.00	-1.08	21.05	0.13
836.52	-26.13	-48.01	0.00	-0.93	20.95	0.12
848.31	-25.84	-48.05	0.00	-0.76	21.45	0.14

CDMA2000 PCS1900 1xRTT RC5 SO9 Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1851.25	-38.84	-51.88	0.00	1.96	15.00	0.03
1880.00	-40.13	-52.99	0.00	2.00	14.86	0.03
1908.75	-40.49	-54.28	0.00	1.98	15.77	0.04
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1851.25	-28.91	-52.13	0.00	1.96	25.18	0.33
1880.00	-29.72	-53.17	0.00	2.00	25.45	0.35
1908.75	-30.93	-54.13	0.00	1.98	25.18	0.33

4.4 Occupied Bandwidth and Band Edge Measurement

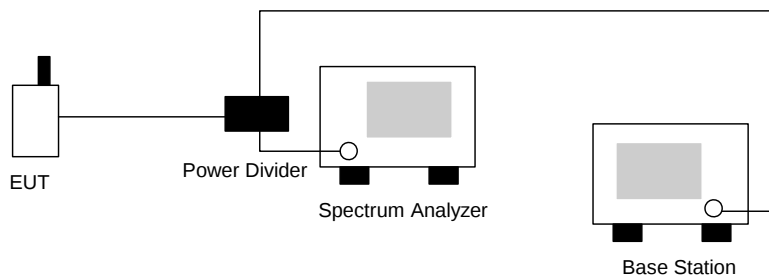
4.4.1 Measurement Instruments

As described in chapter 5 of this test report.

4.4.2 Test Procedure

- The EUT was connected to Spectrum Analyzer and Base Station via power divider.
- The 99% occupied bandwidth and 26 dB Bandwidth of middle channel for the highest RF powers were measured.
- The bandedge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.
- The RBW was replaced 30KHz with 10KHz, due to the spectrum analyzer IF-Filter leading to an exceeding of the limit, a worst case correction factor of $10 \log (1\% \text{ Occupy Bandwidth} / \text{Measured RBW})$ was used.

4.4.3 Test Setup Layout



**4.4.4 Test Data****• Mode 1**

Bands	Test Mode	Test Status	Channel	Frequency (MHz)	Measurement Value (dBm)	Correction Factor (dB)	Band Edge (dBm)
CDMA2000 Cellular	1xRTT	RC3 SO55	1013	824.70 (Low)	-16.53	1.09	-15.44
			777	848.31 (High)	-14.43	1.09	-13.34

Note:

*Occupancy Bandwidth = 1284.00KHz

$$\begin{aligned} \text{*Correction Factor} &= 10 \cdot \log(1\% \text{ Occupancy Bandwidth} / \text{Measurement RBW}) \\ &= 10 \cdot \log[(0.01 \cdot 1284.00\text{KHz}) / 10\text{KHz}] \\ &= 1.09 \text{ dB} \end{aligned}$$

*Band Edge = Measurement Value + Correction Factor

• Mode 2

Bands	Test Mode	Test Status	Channel	Frequency (MHz)	Measurement Value (dBm)	Correction Factor (dB)	Band Edge (dBm)
CDMA2000 PCS	1xRTT	RC5 SO9	25	1851.25 (Low)	-32.39	1.10	-31.29
			1177	1908.75 (High)	-33.57	1.10	-32.47

Note:

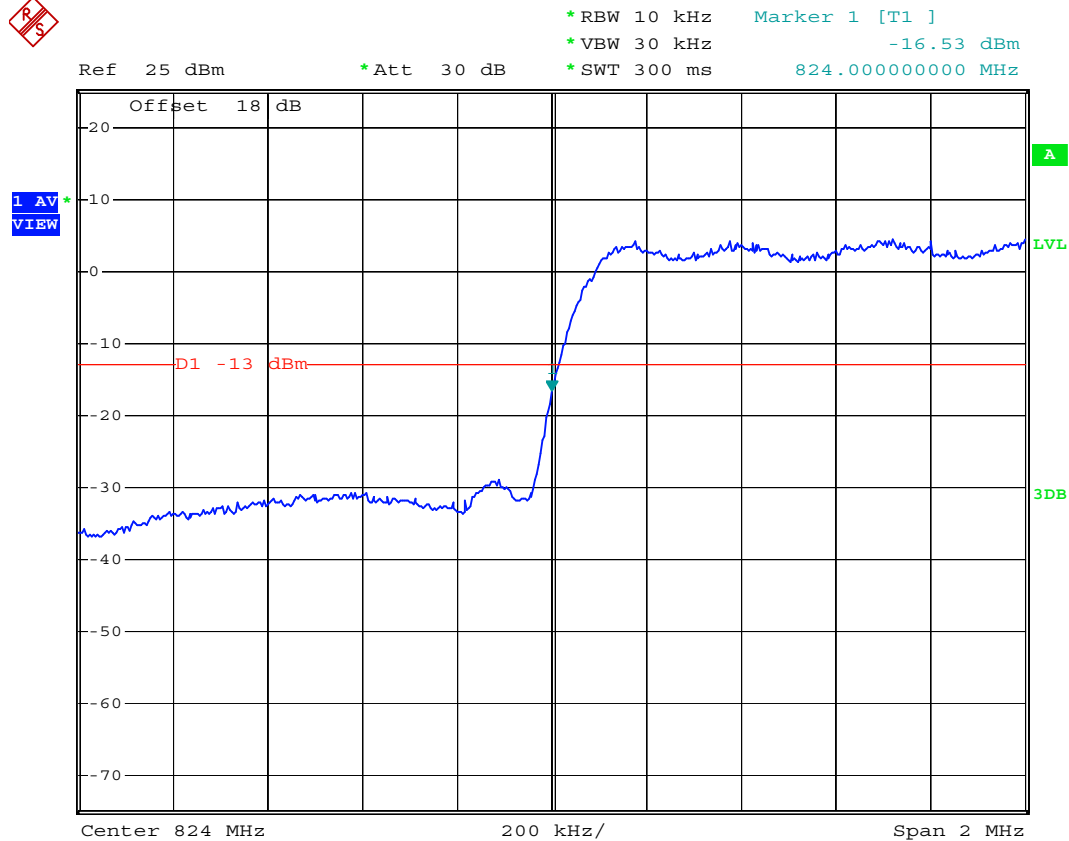
*Occupancy Bandwidth = 1288.00KHz

$$\begin{aligned} \text{*Correction Factor} &= 10 \cdot \log(1\% \text{ Occupancy Bandwidth} / \text{Measurement RBW}) \\ &= 10 \cdot \log[(0.01 \cdot 1288.00\text{KHz}) / 10\text{KHz}] \\ &= 1.10 \text{ dB} \end{aligned}$$

*Band Edge = Measurement Value + Correction Factor

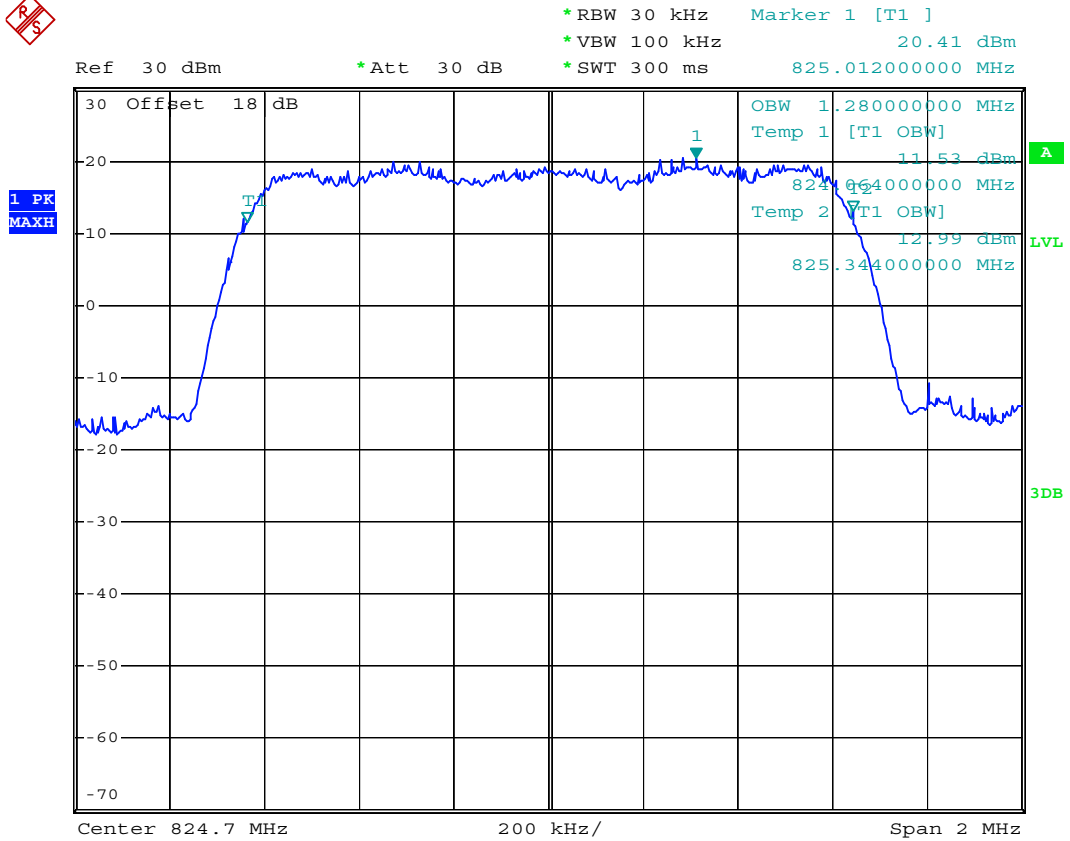
**4.4.5 Test Result**

- Mode 1
- Test Mode : CDMA2000 Cellular Band CH1013 RC3 SO55 Lower Band Edge for 1xRTT
- Power State : High



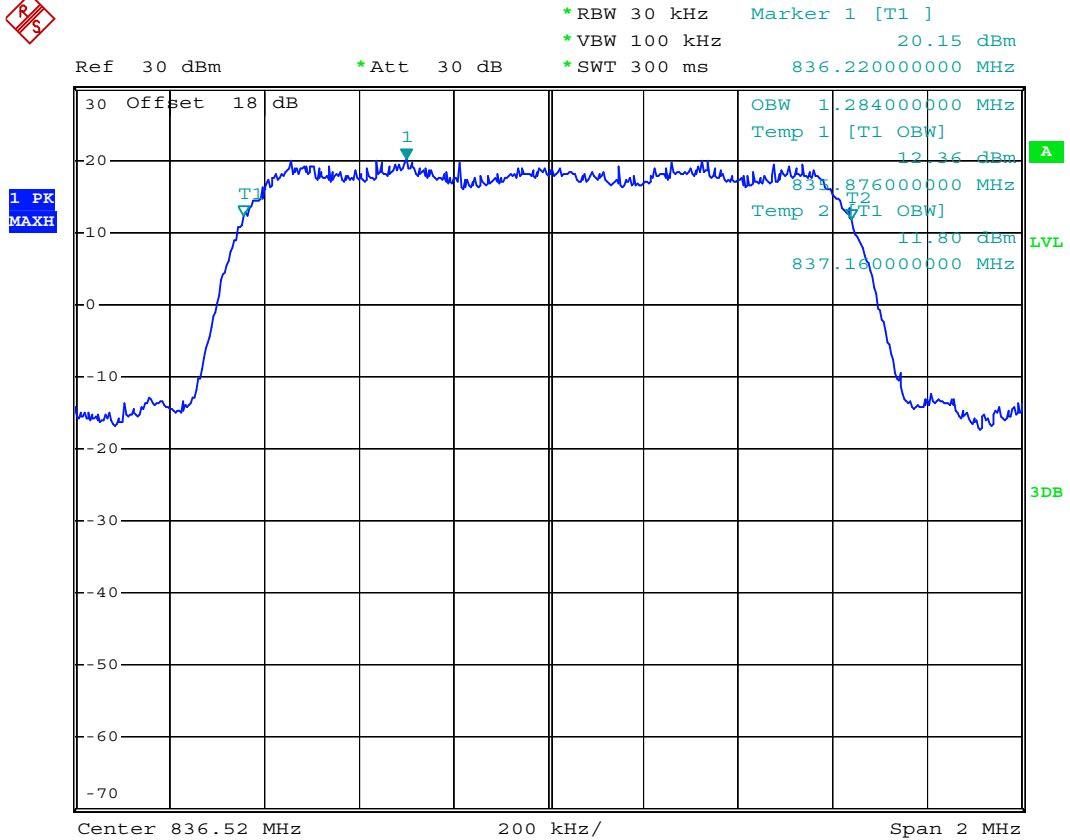


- Test Mode : CDMA2000 Cellular CH1013 RC3 SO55 99% Occupied Bandwidth for 1xRTT
- Power State : High



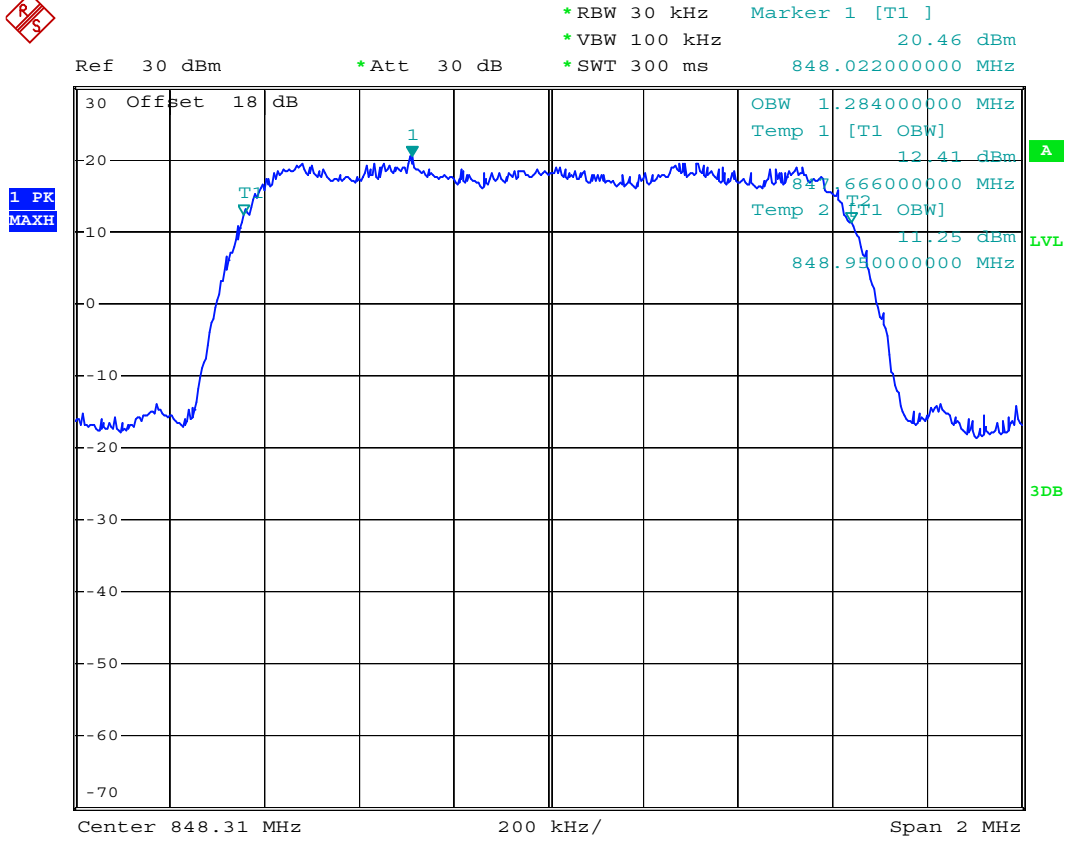


- Test Mode : CDMA2000 Cellular CH384 RC3 SO55 99% Occupied Bandwidth for 1xRTT
- Power State : High



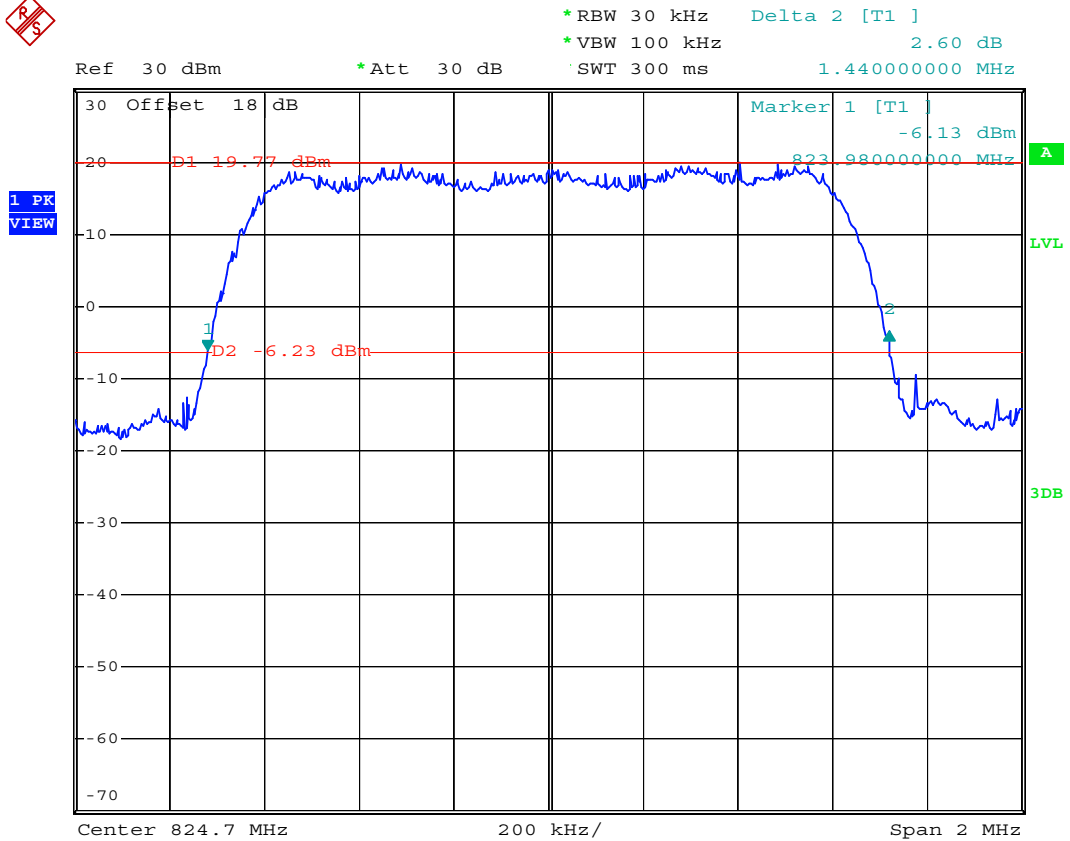


- Test Mode : CDMA2000 Cellular CH777 RC3 SO55 99% Occupied Bandwidth for 1xRTT
- Power State : High



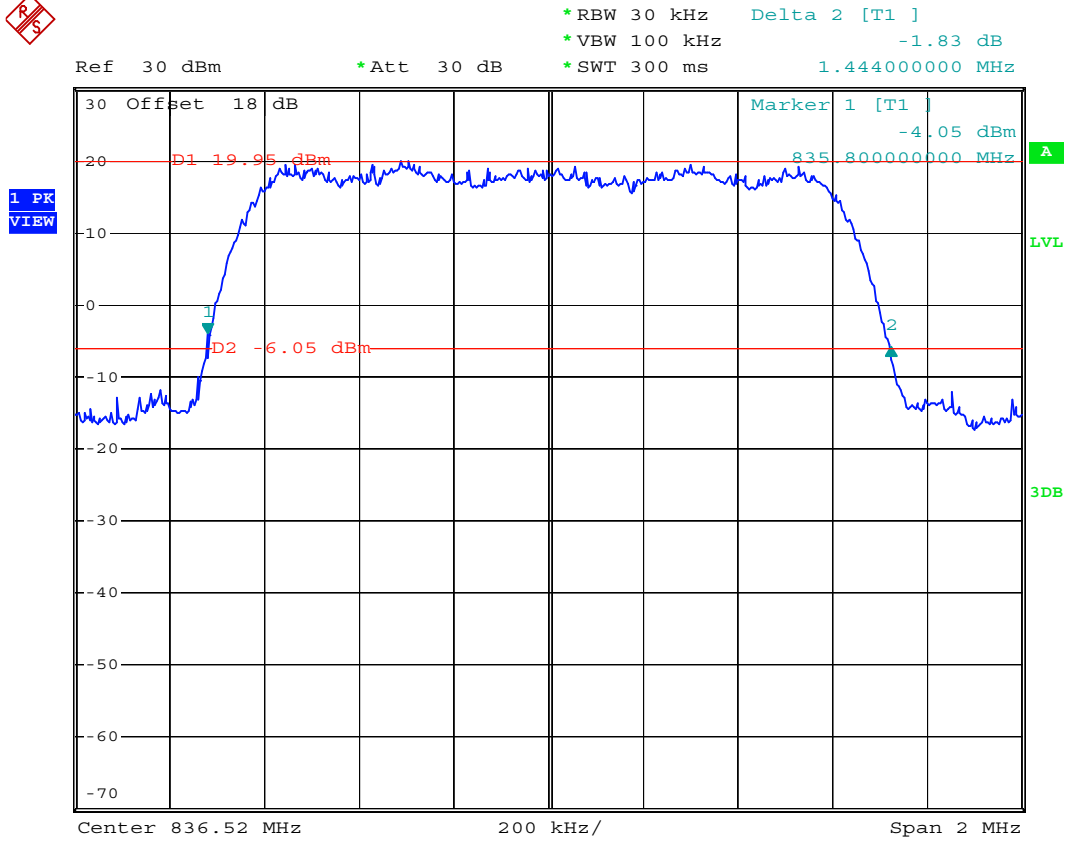


- Test Mode : CDMA2000 Cellular CH1013 RC3 SO55 26 dB Bandwidth for 1xRTT
- Power State : High



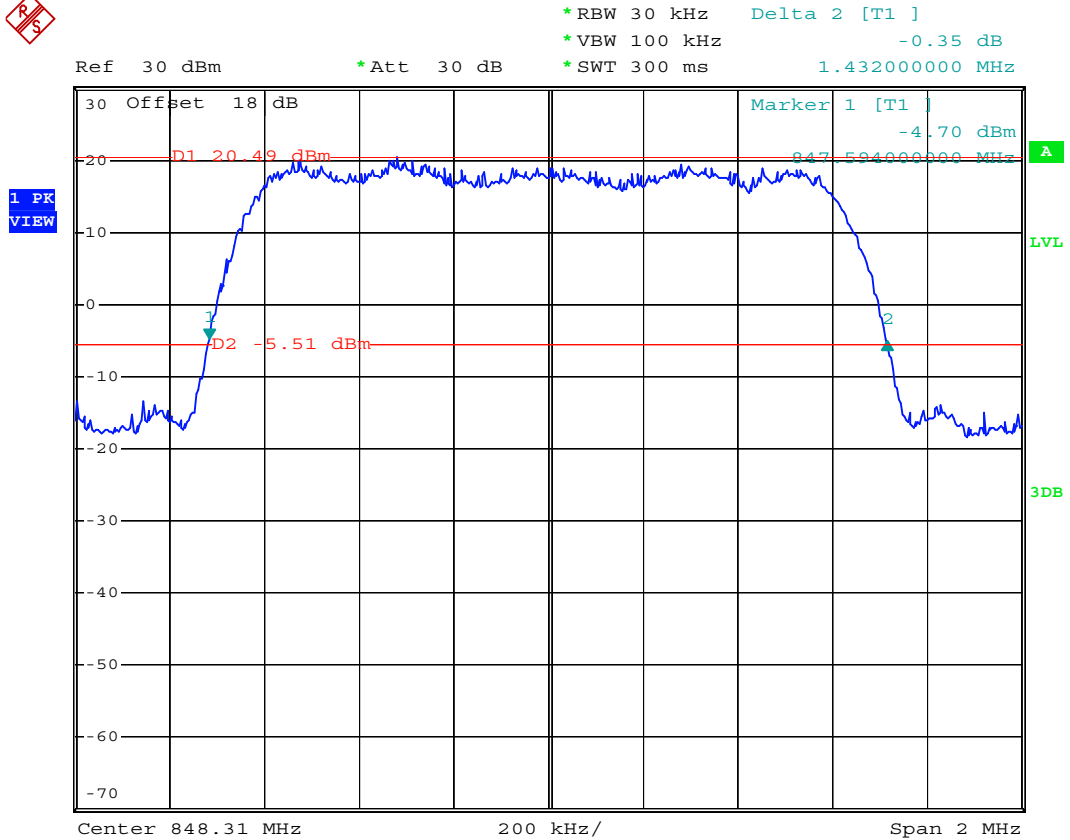


- Test Mode : CDMA2000 Cellular CH384 RC3 SO55 26 dB Bandwidth for 1xRTT
- Power State : High



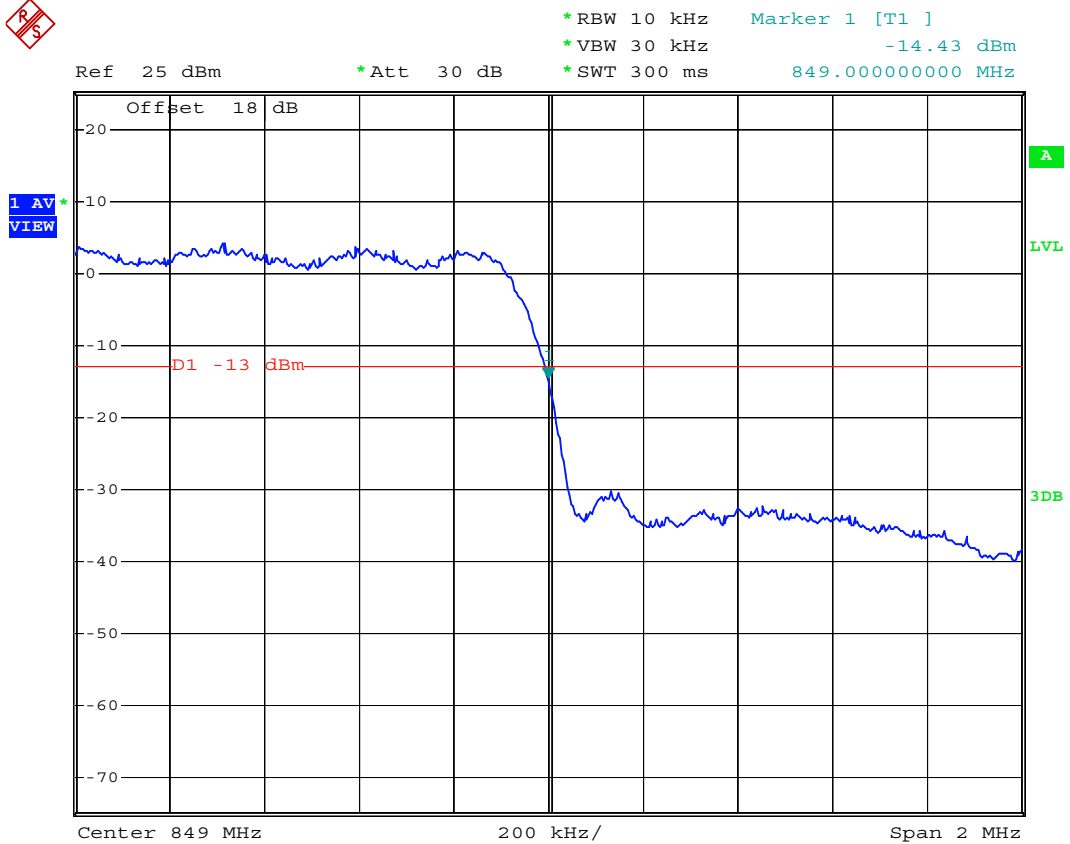


- Test Mode : CDMA2000 Cellular CH777 RC3 SO55 26 dB Bandwidth for 1xRTT
- Power State : High





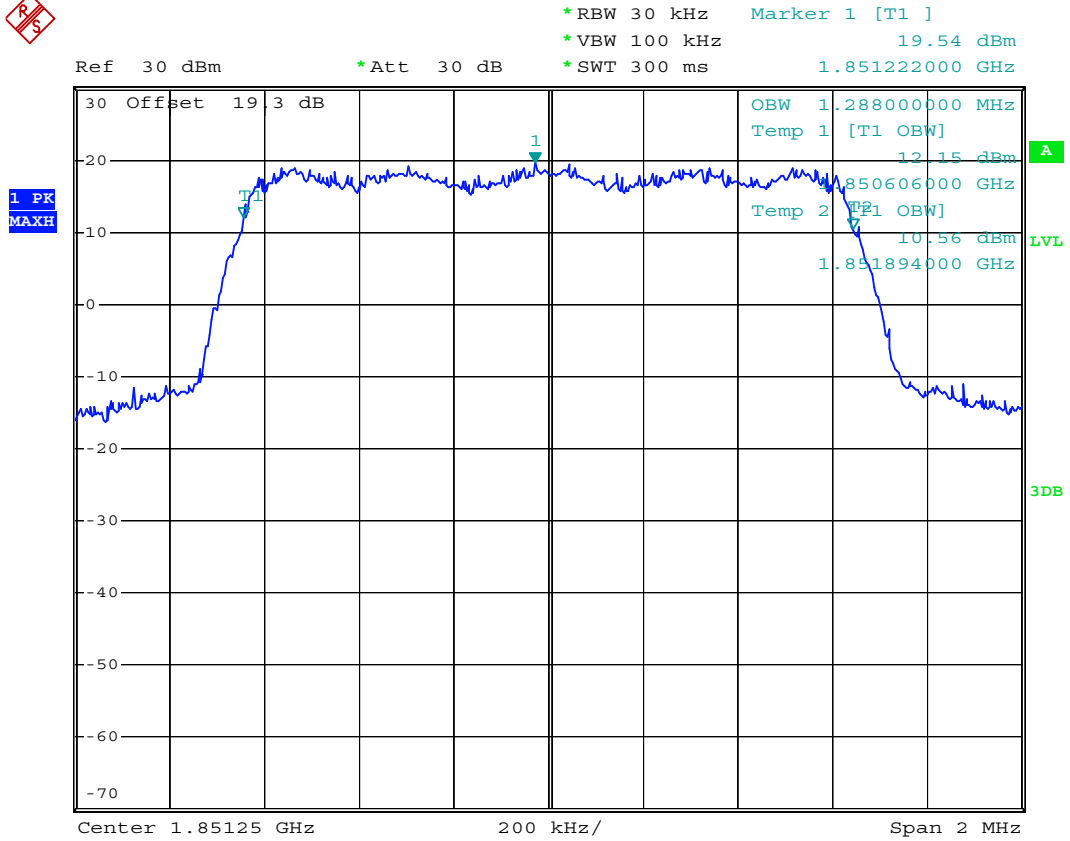
- Test Mode : CDMA2000 Cellular CH777 RC3 SO55 Higher Band Edge for 1xRTT
- Power State : High





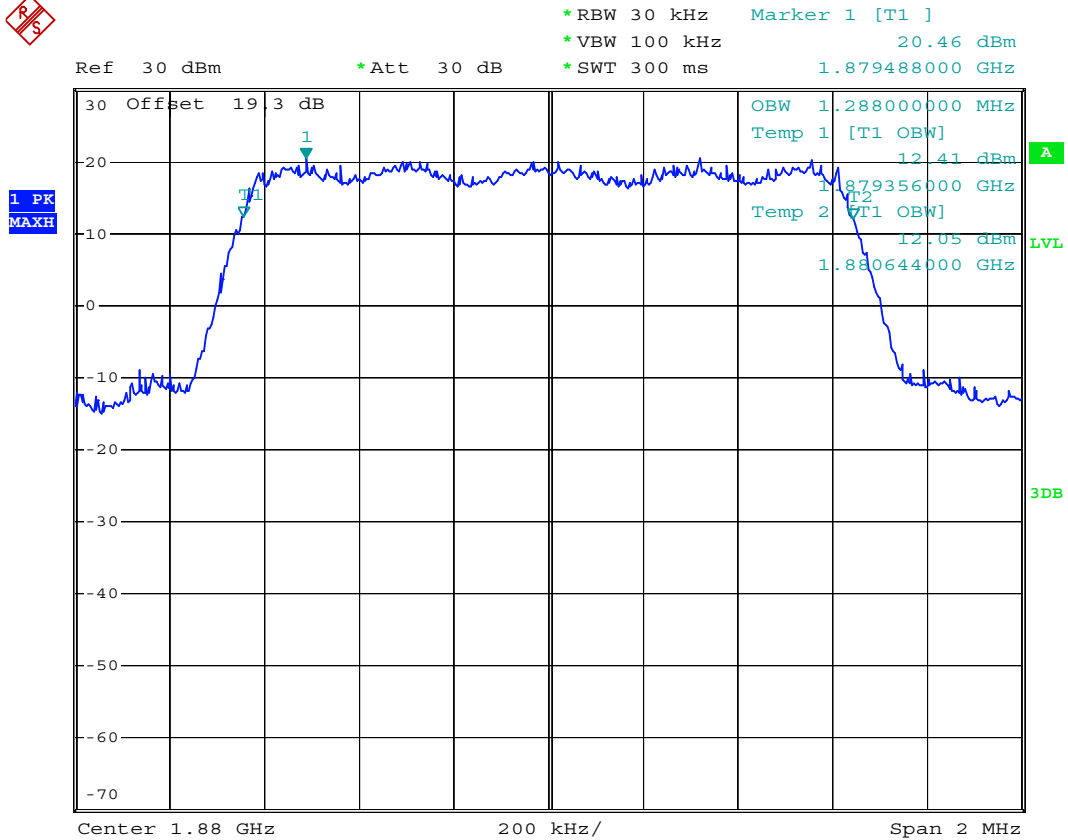


- Test Mode : CDMA2000 PCS Band CH25 RC5 SO9 99% Occupied Bandwidth for 1xRTT
- Power State : High



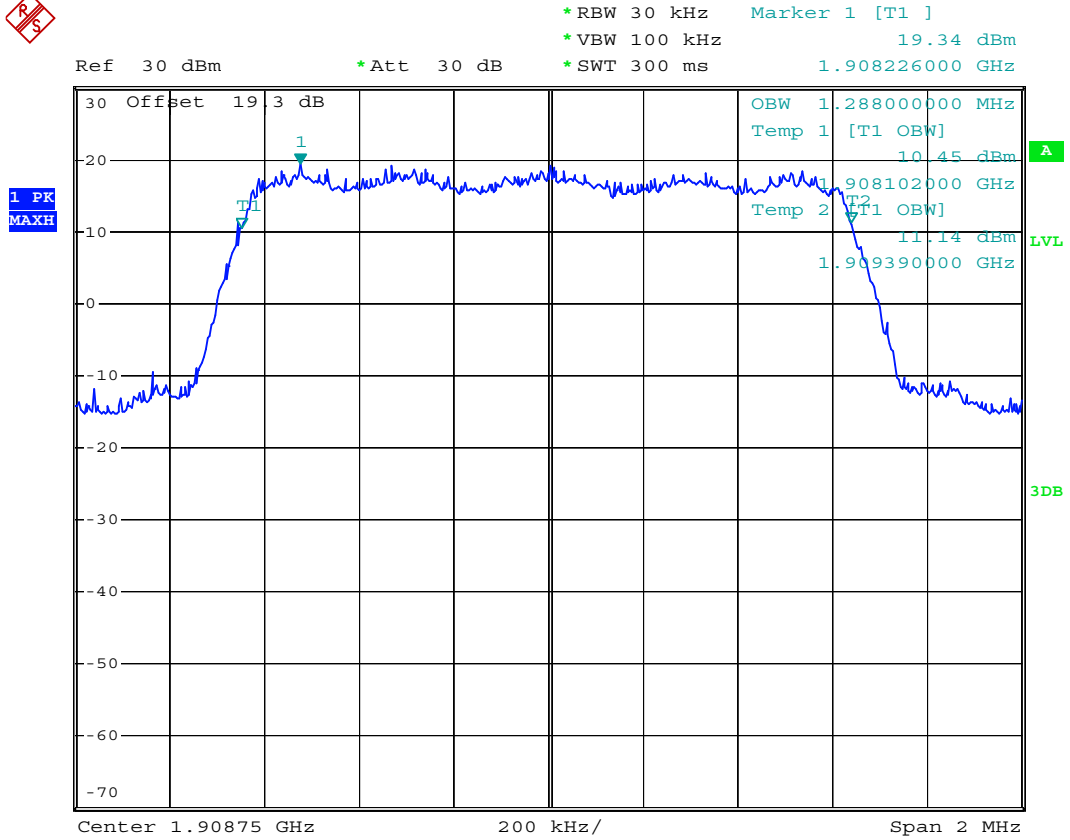


- Test Mode : CDMA2000 PCS Band CH600 RC5 SO9 99% Occupied Bandwidth for 1xRTT
- Power State : High



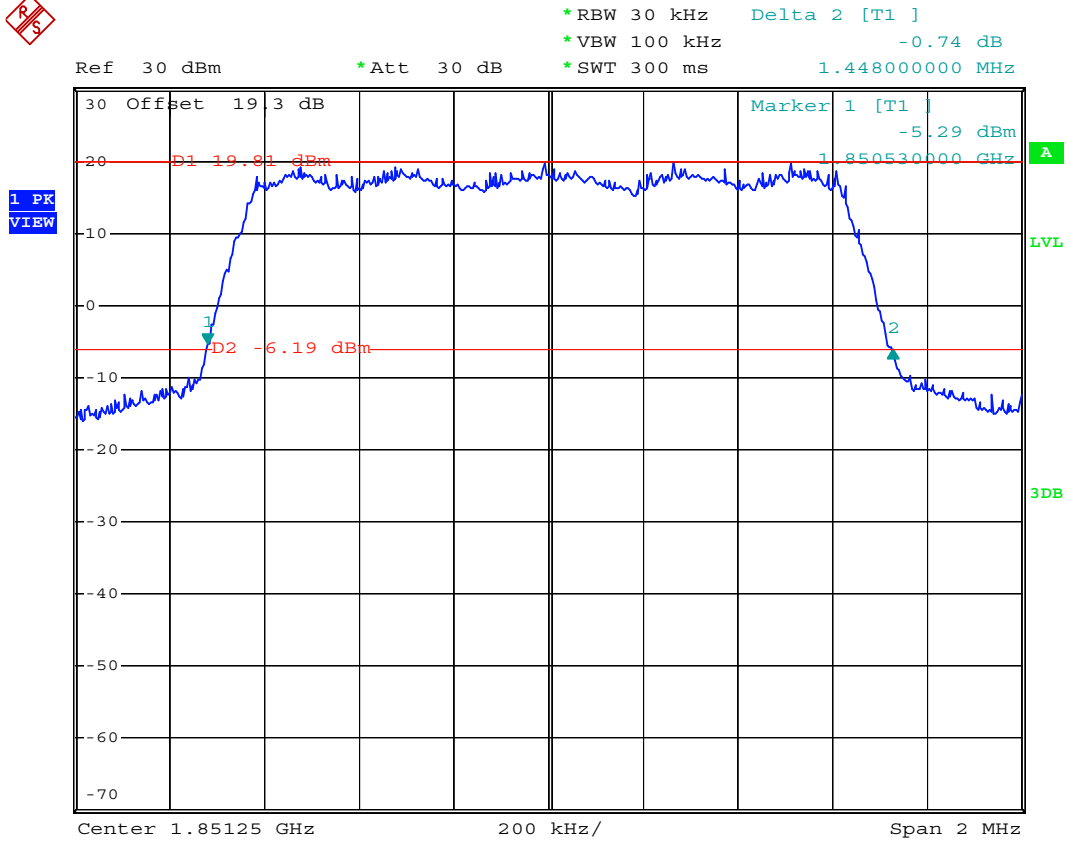


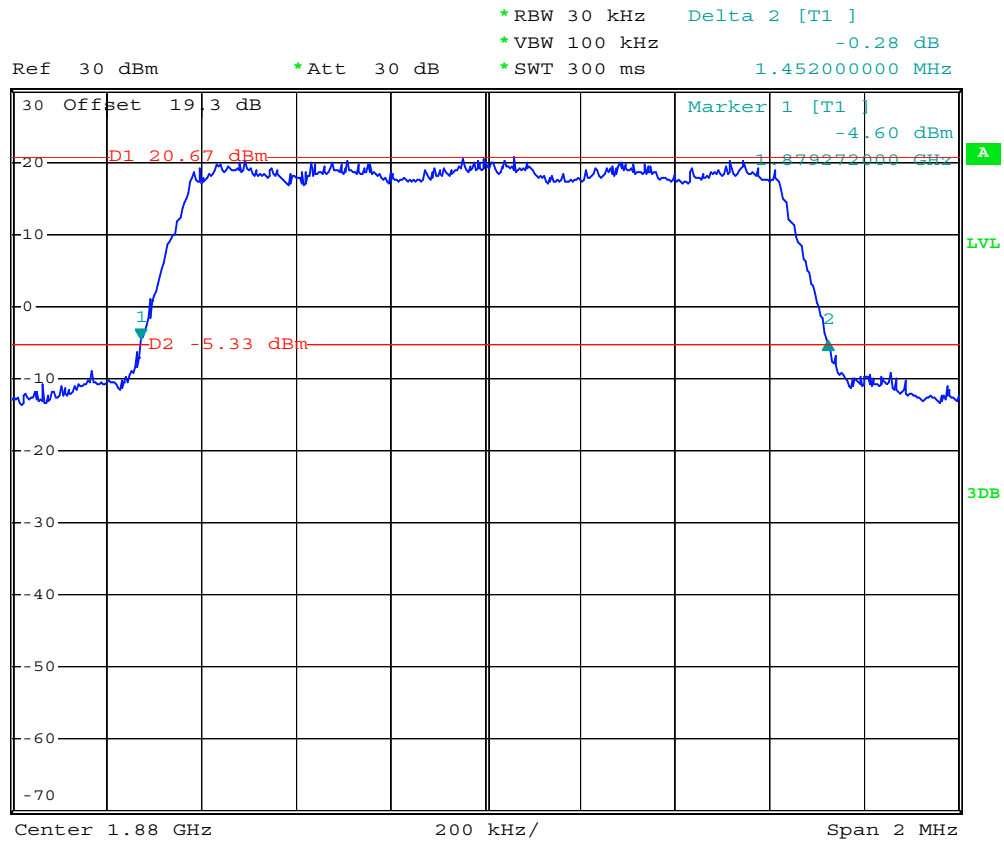
- Test Mode : CDMA2000 PCS Band CH1175 RC5 SO9 99% Occupied Bandwidth for 1xRTT
- Power State : High





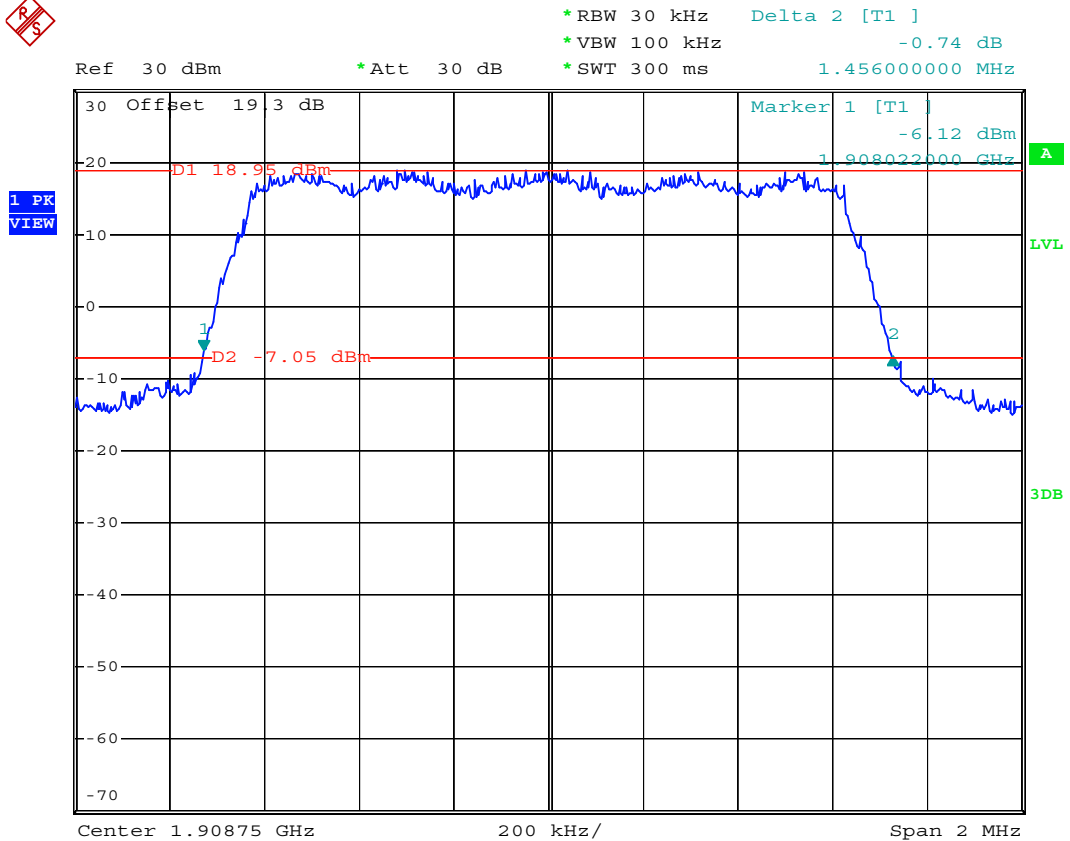
- Test Mode : CDMA2000 PCS Band CH25 RC5 SO9 26 dB Bandwidth for 1xRTT
- Power State : High





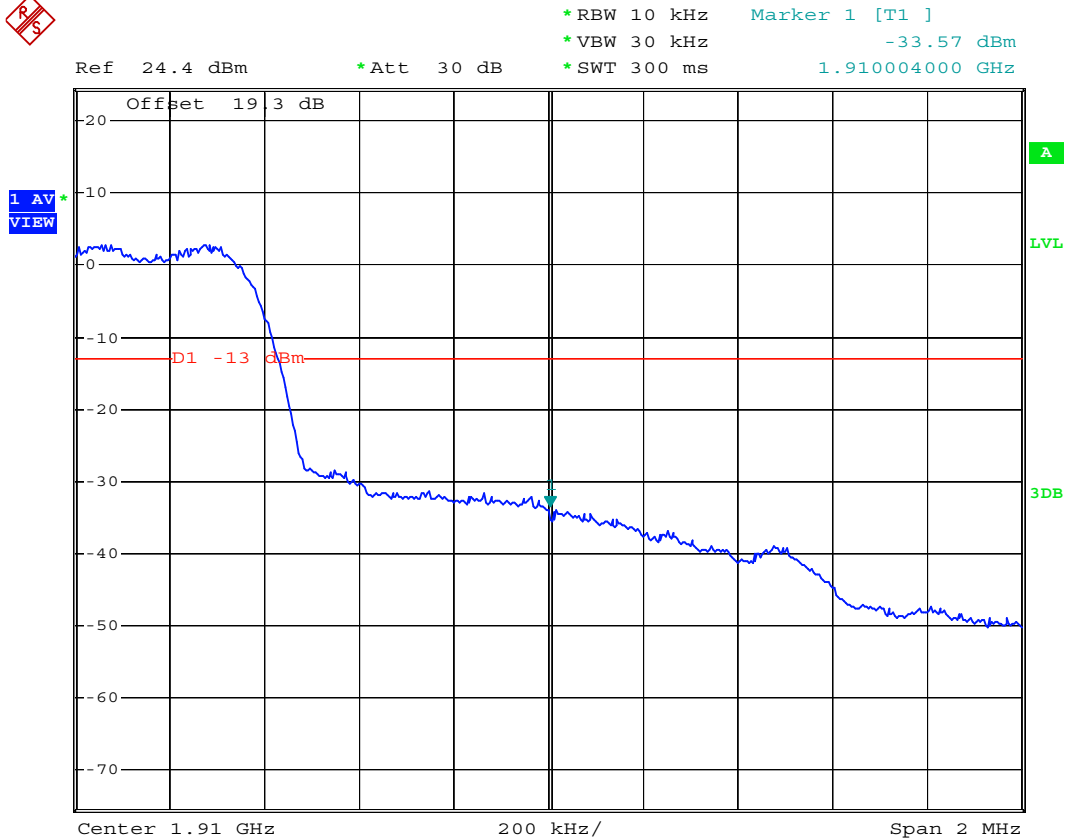


- Test Mode : CDMA2000 CS 1900 Band CH1175 RC5 SO9 26 dB Bandwidth for 1xRTT
- Power State : High





- Test Mode : CDMA2000 PCS Band CH1175 RC5 SO9 Higher Band Edge for 1xRTT
- Power State : High



4.5 Conducted Emission

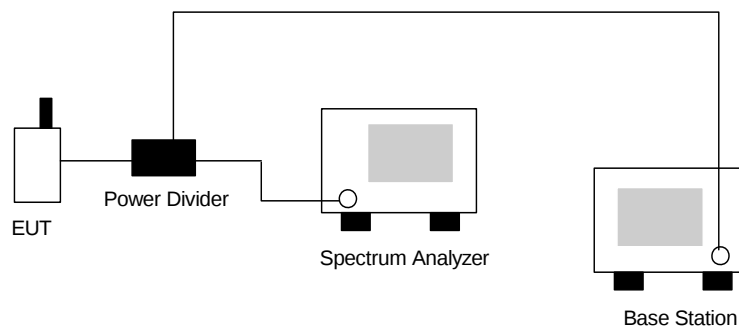
4.5.1 Measurement Instruments

As described in chapter 5 of this test report.

4.5.2 Test Procedure

- The EUT was connected to Spectrum Analyzer and Base Station via power divider.
- The middle channel for the highest RF power within the transmitting frequency was measured.
- The conducted spurious emission for the whole frequency range was taken.

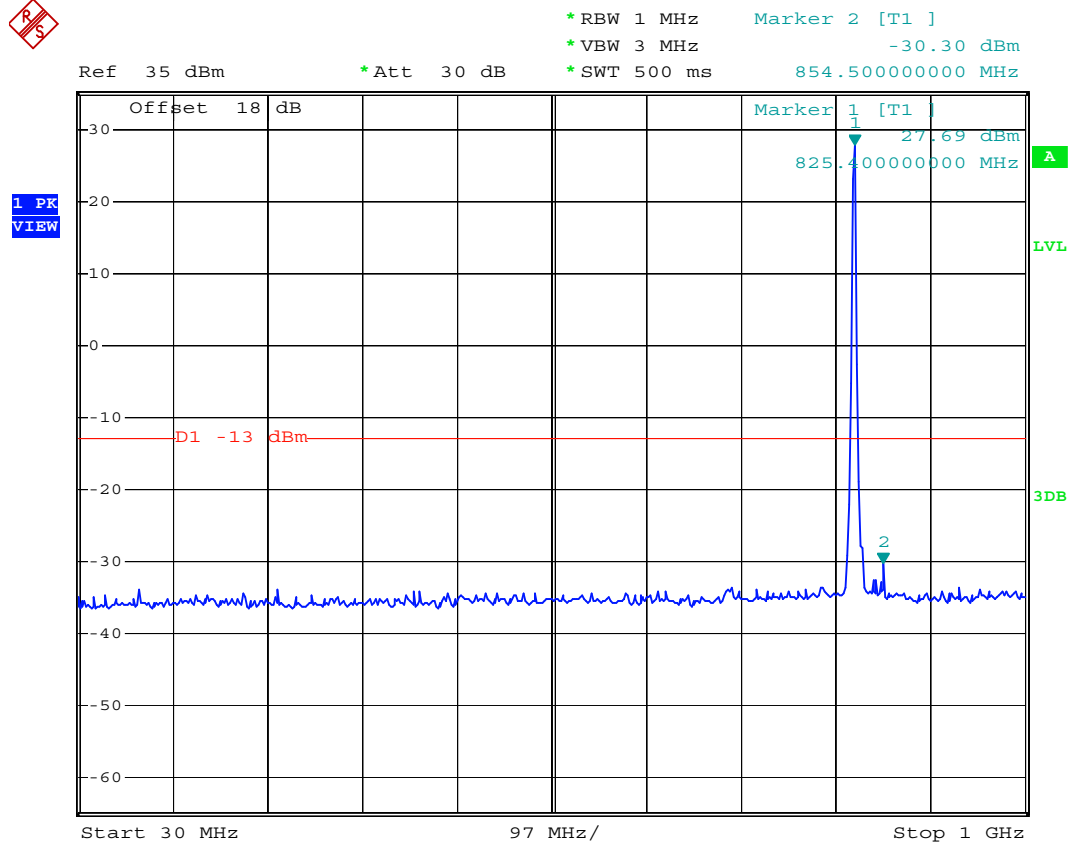
4.5.3 Test Setup Layout





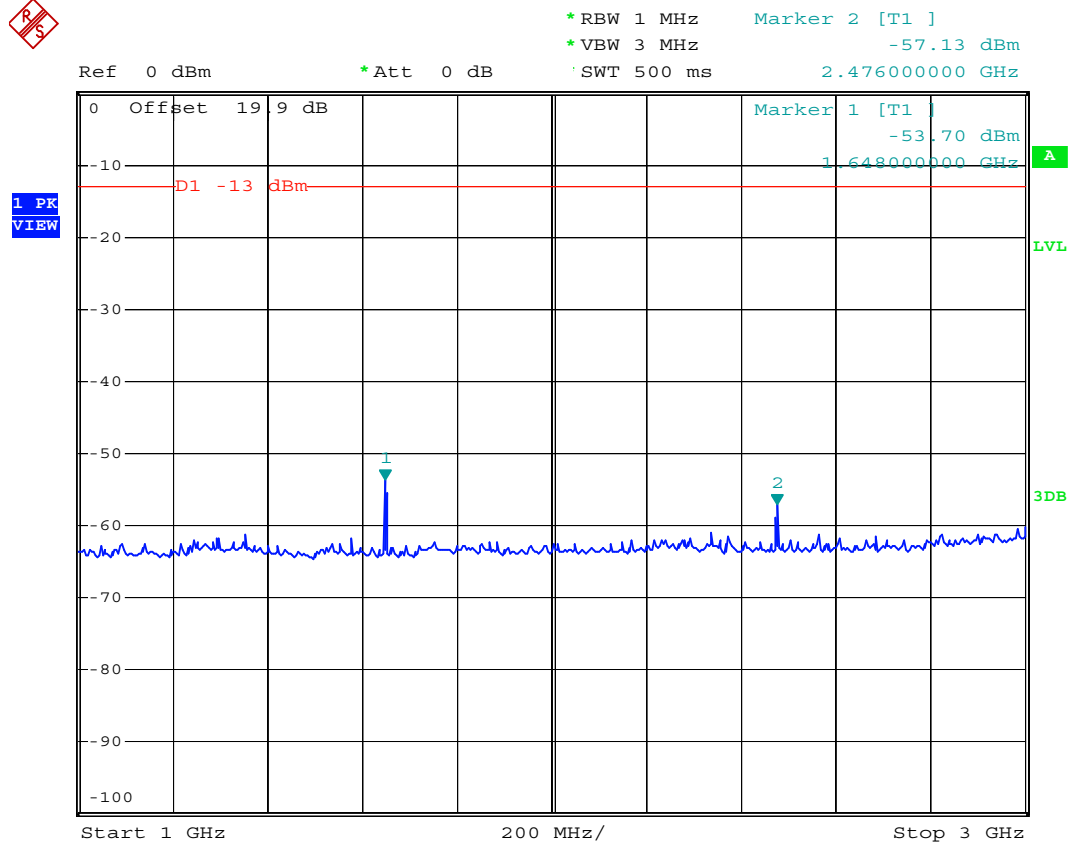
4.5.4 Test Result

- Mode 1
- Test Mode : CDMA2000 Cellular CH1013 for 1xRTT
- Frequency Range : 30M-1G



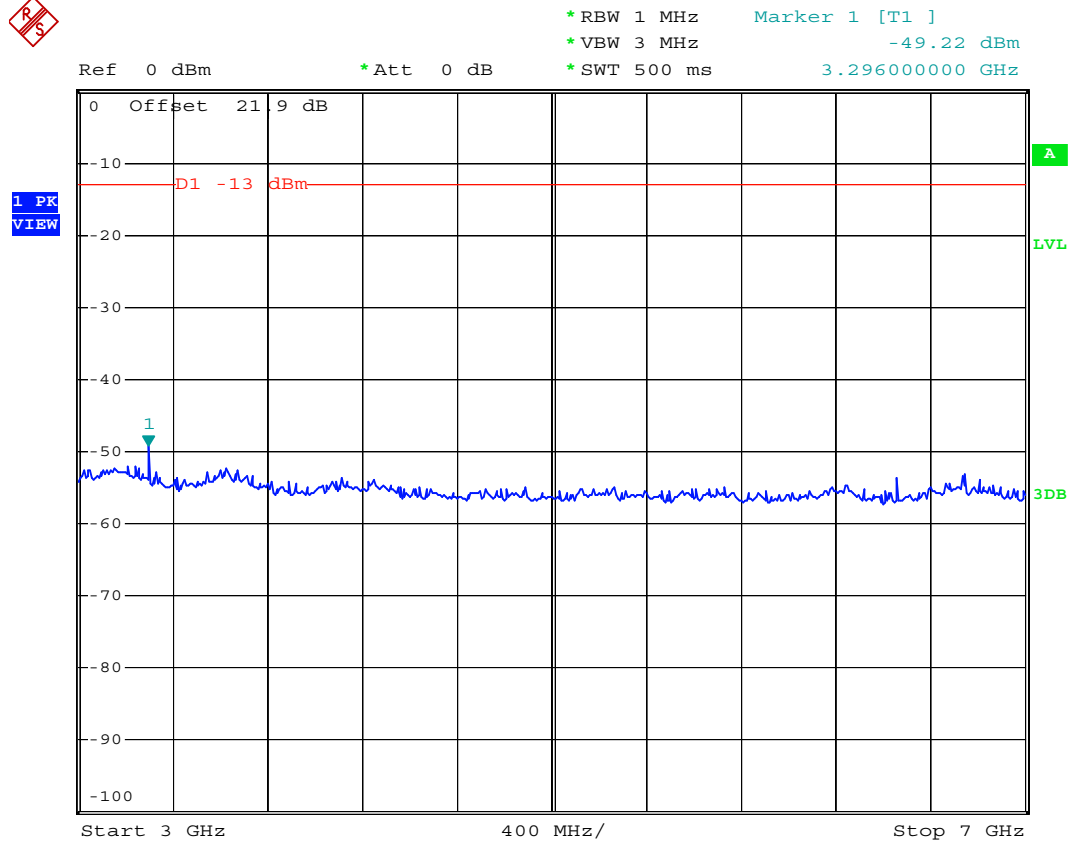


- Test Mode : CDMA2000 Cellular CH1013 for 1xRTT
- Frequency Range : 1G-3G



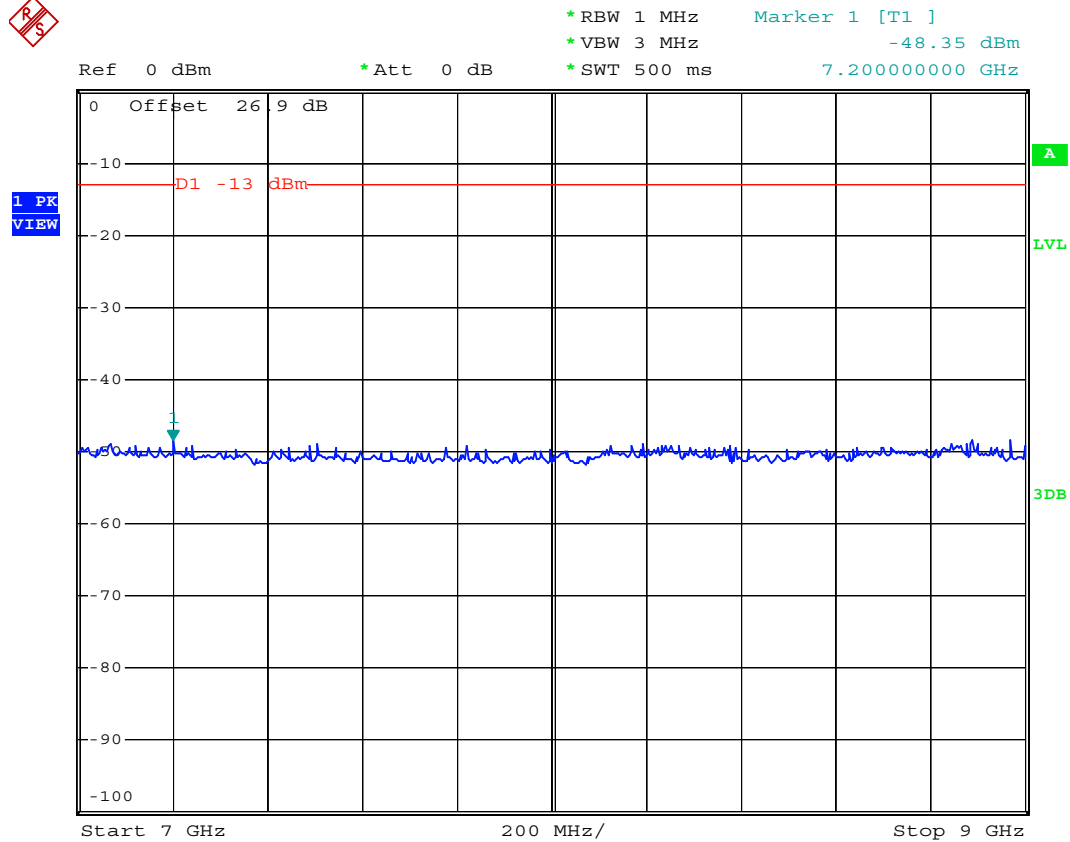


- Test Mode : CDMA2000 Cellular CH1013 for 1xRTT
- Frequency Range : 3G-7G



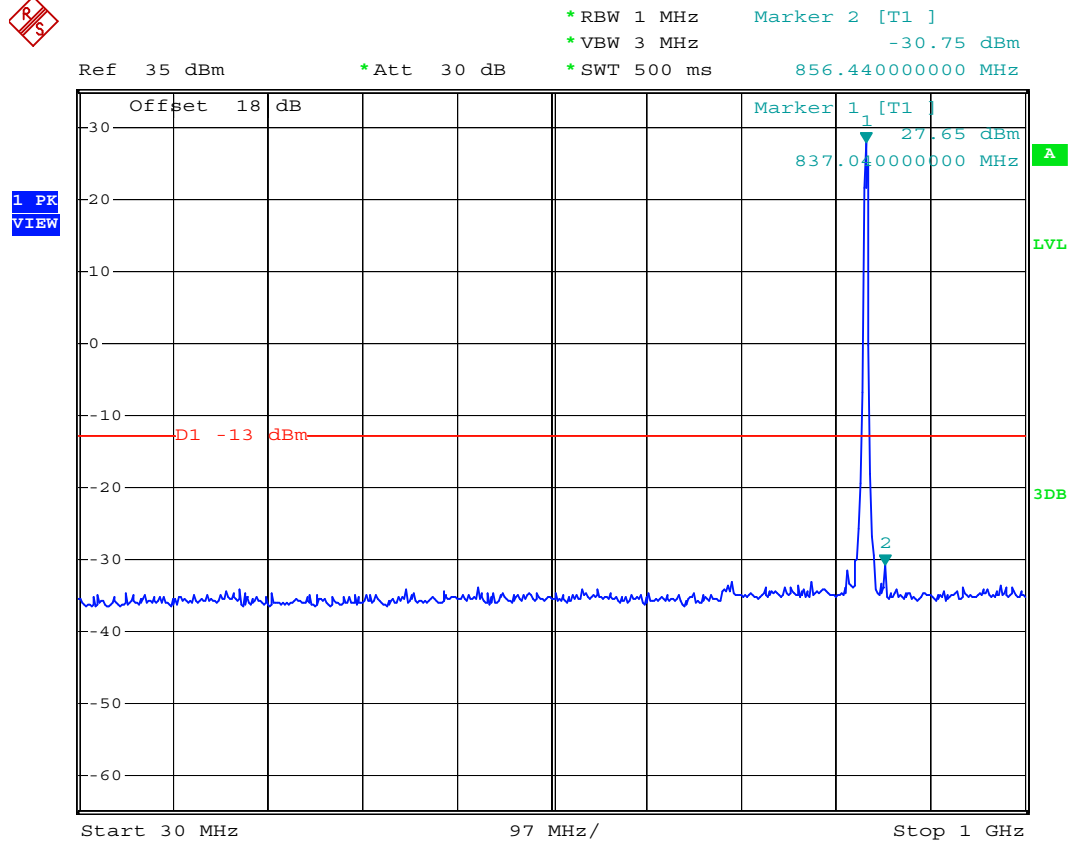


- Test Mode : CDMA2000 Cellular CH1013 for 1xRTT
- Frequency Range : 7G-9G



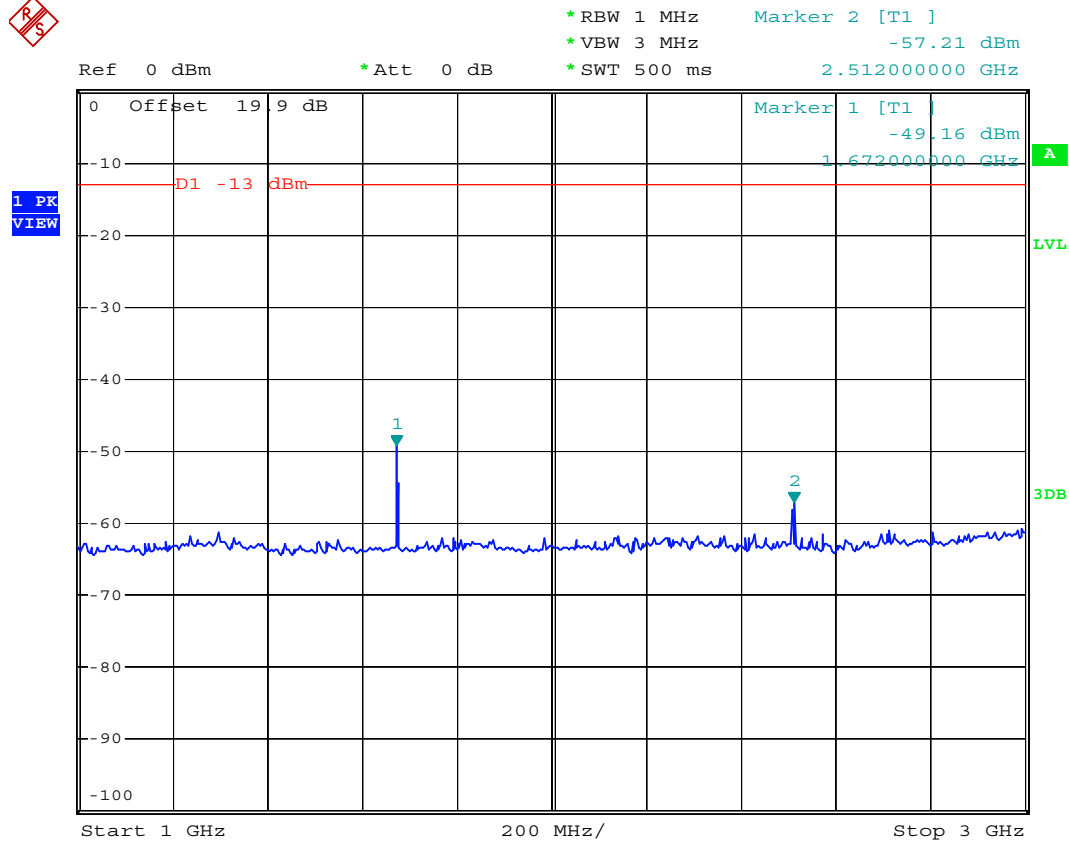


- Mode 2
- Test Mode : CDMA2000 Cellular CH384 for 1xRTT
- Frequency Range : 30M-1G



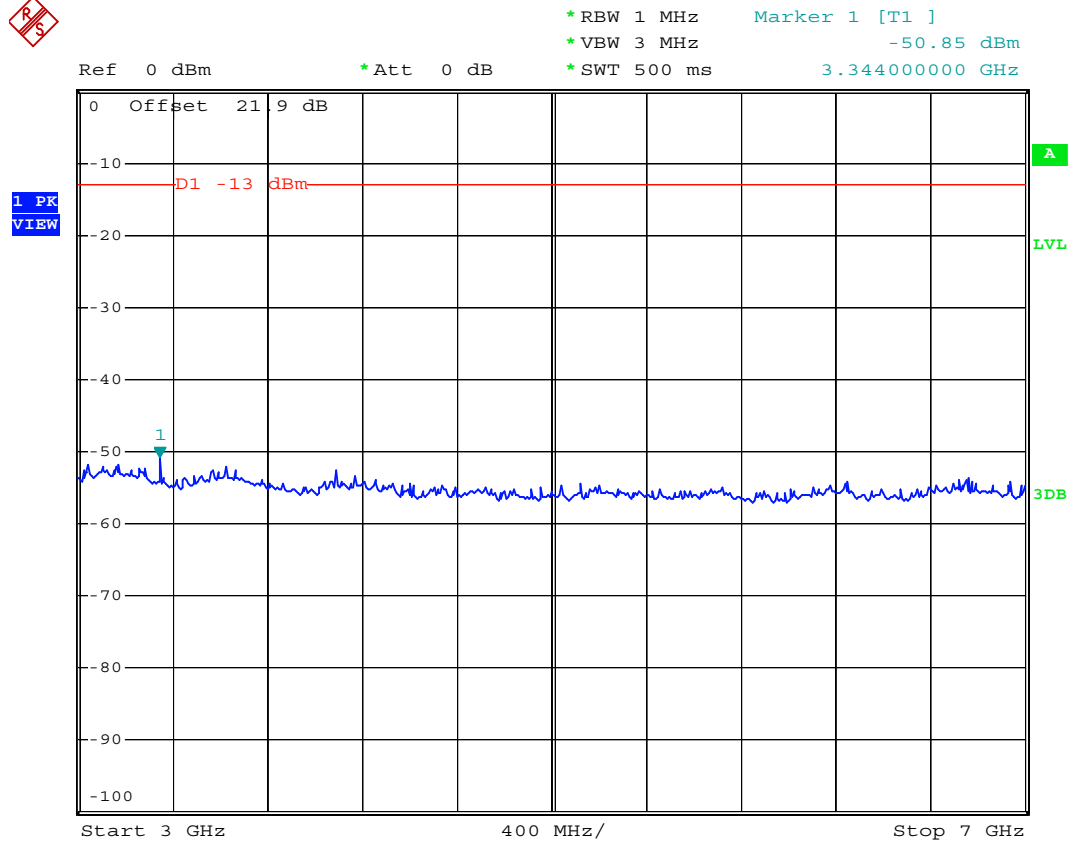


- Test Mode : CDMA2000 Cellular CH384 for 1xRTT
- Frequency Range : 1G-3G



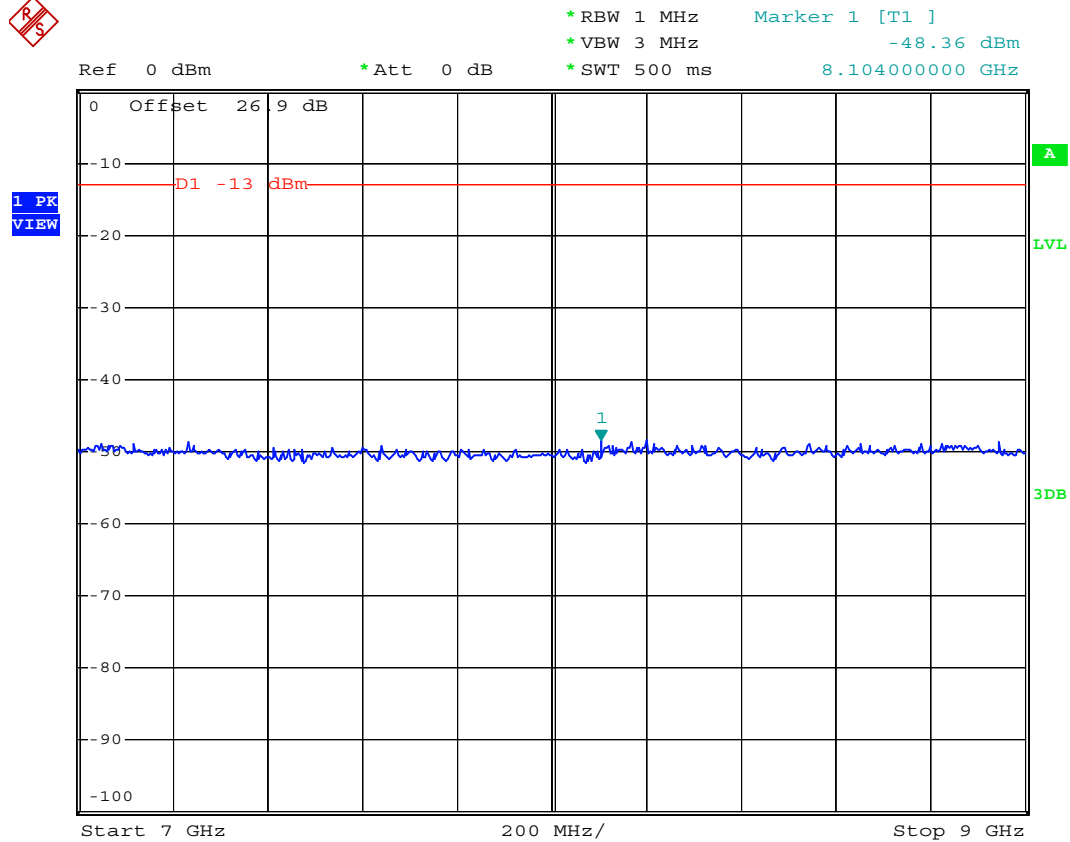


- Test Mode : CDMA2000 Cellular CH384 for 1xRTT
- Frequency Range : 3G-7G



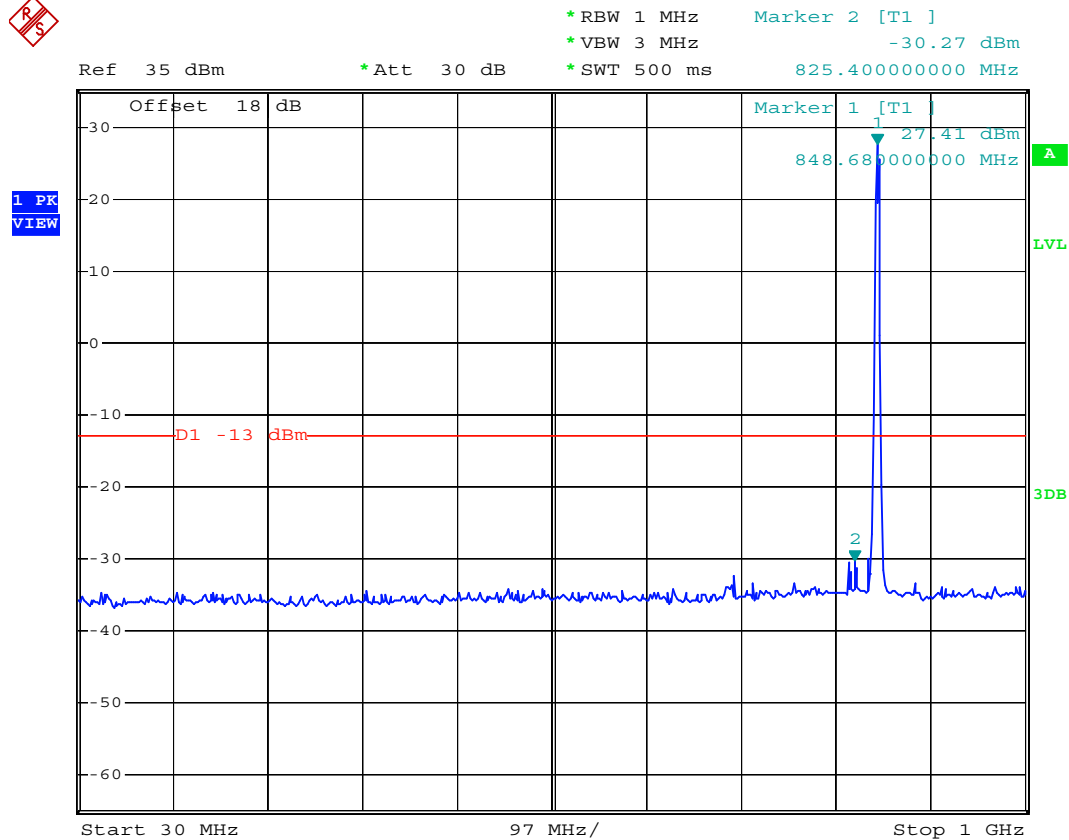


- Test Mode : CDMA2000 Cellular CH384 for 1xRTT
- Frequency Range : 7G-9G



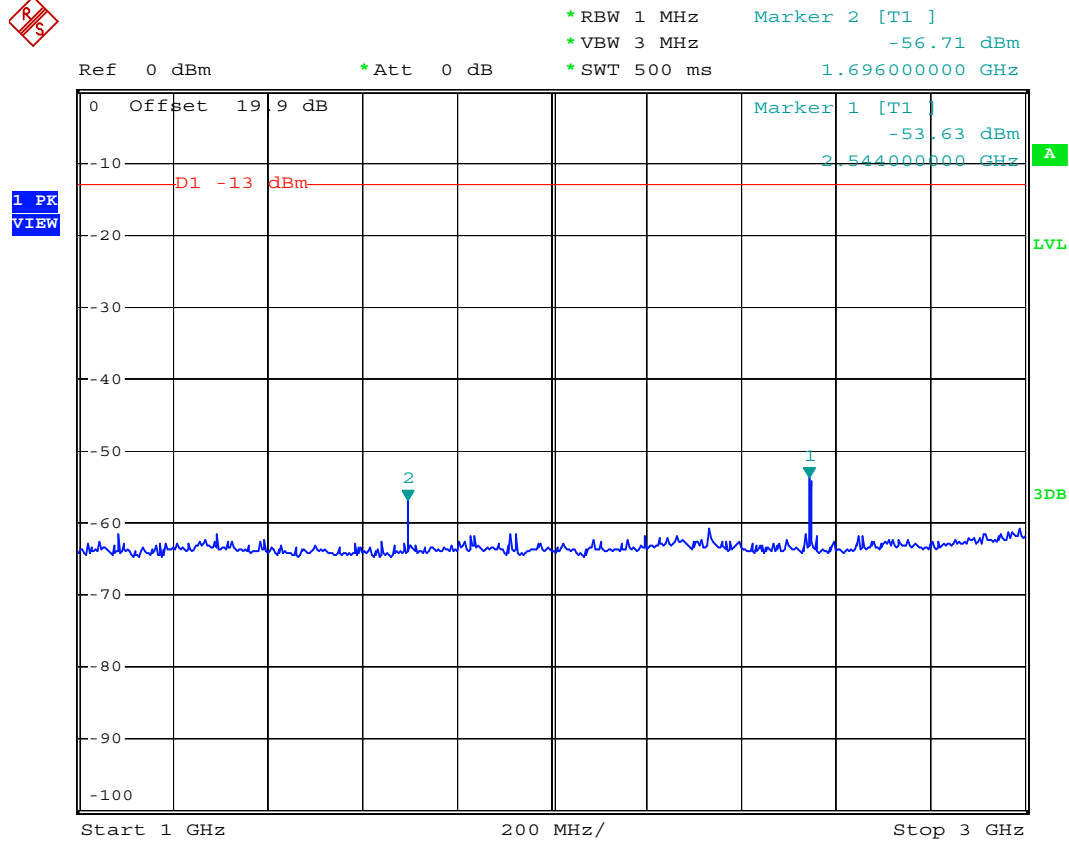


- Mode 3
- Test Mode : CDMA2000 Cellular CH777 for 1xRTT
- Frequency Range : 30M-1G

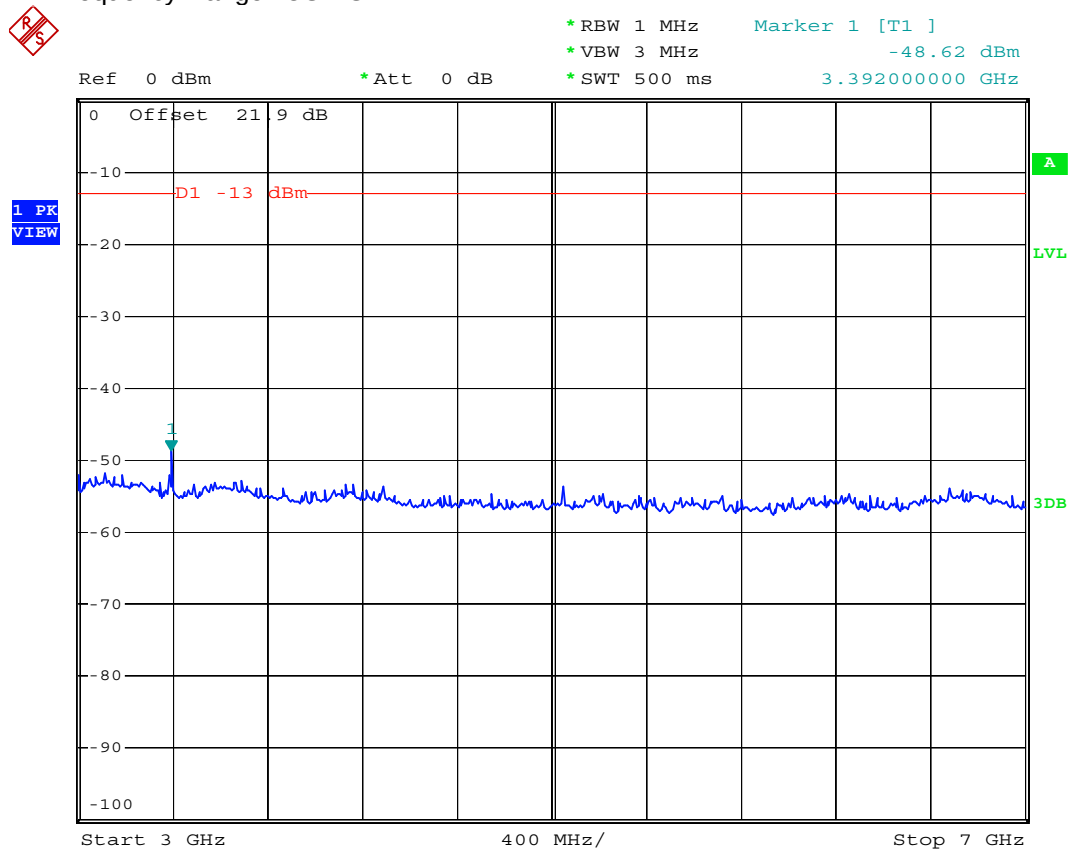




- Test Mode : CDMA2000 Cellular CH777 for 1xRTT
- Frequency Range : 1G-3G

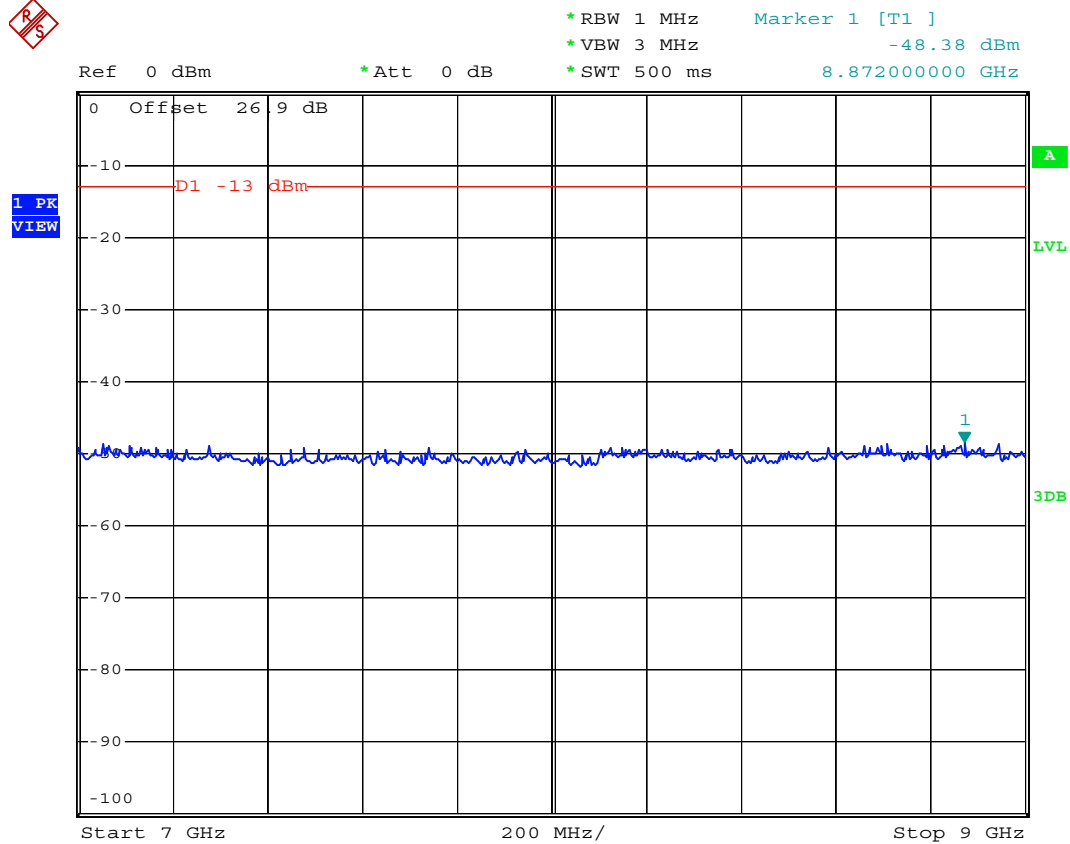


- Test Mode : CDMA2000 Cellular CH777 for 1xRTT
- Frequency Range : 3G-7G



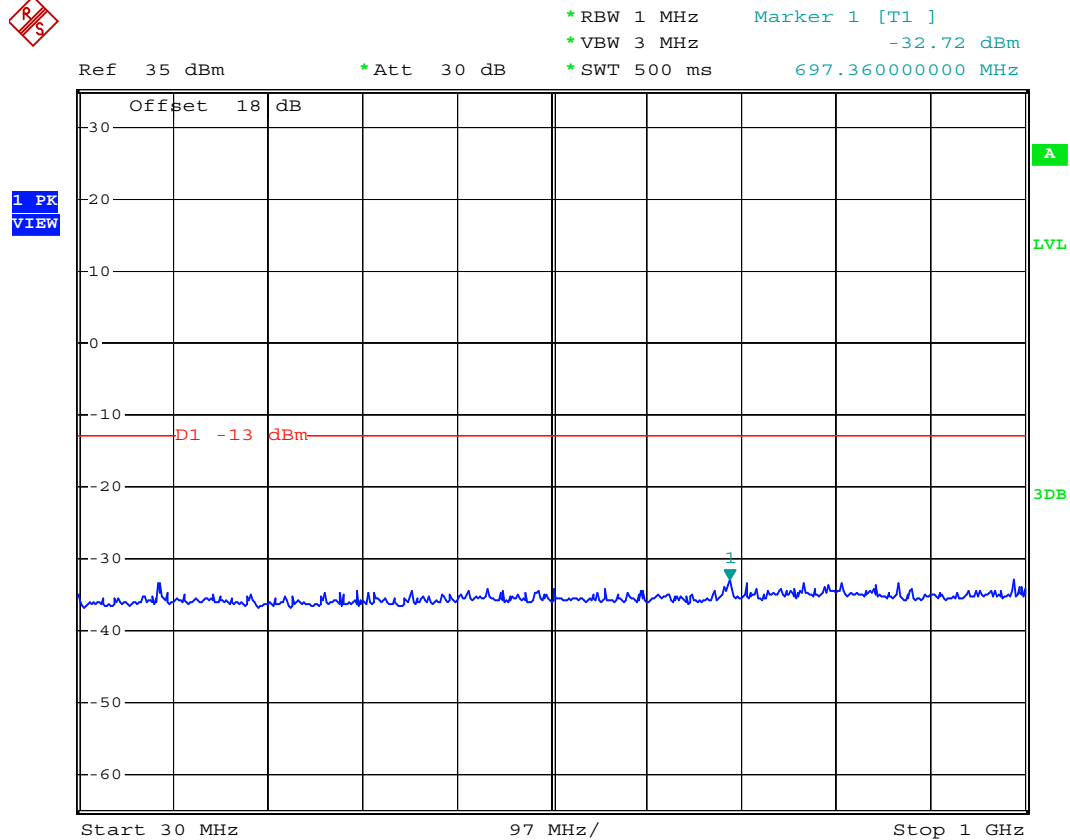


- Test Mode : CDMA2000 Cellular CH777 for 1xRTT
- Frequency Range : 7G-9G



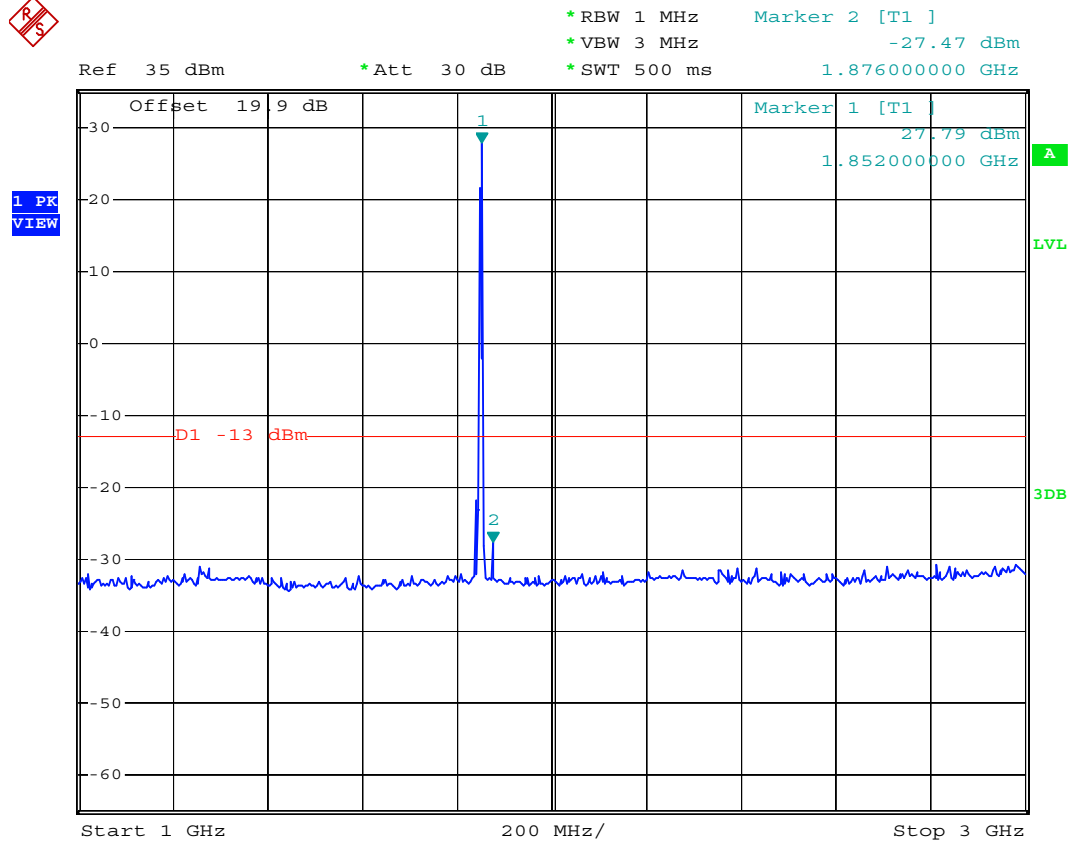


- Mode 4
- Test Mode : CDMA2000 PCS CH25 for 1xRTT
- Frequency Range : 30M-1G



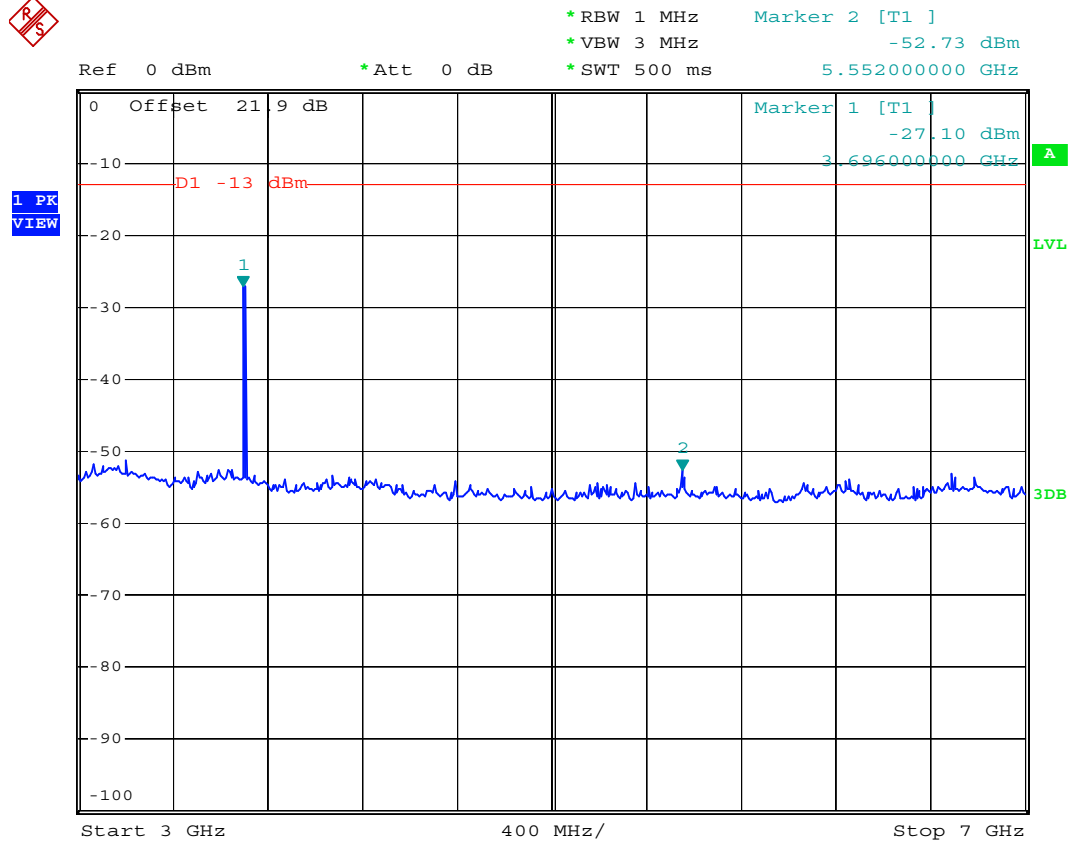


- Test Mode : CDMA2000 PCS CH25 for 1xRTT
- Frequency Range : 1G-3G



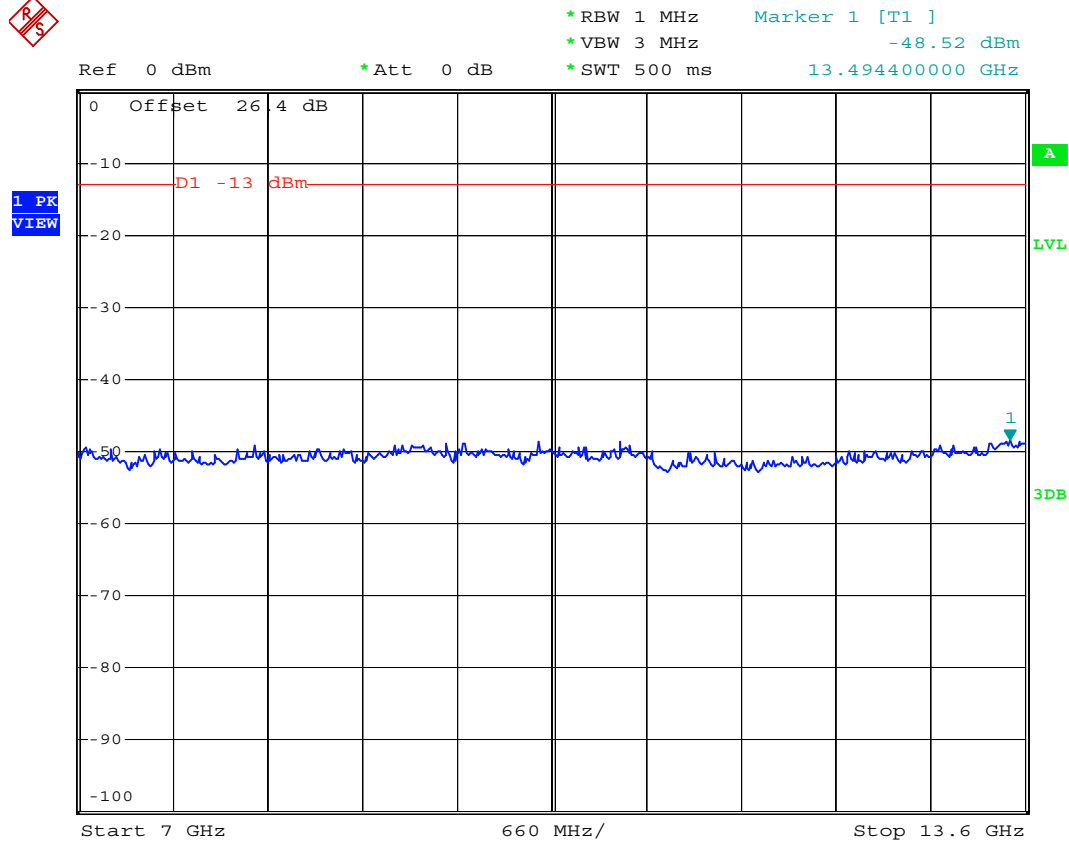


- Test Mode : CDMA2000 PCS CH25 for 1xRTT
- Frequency Range : 3G-7G





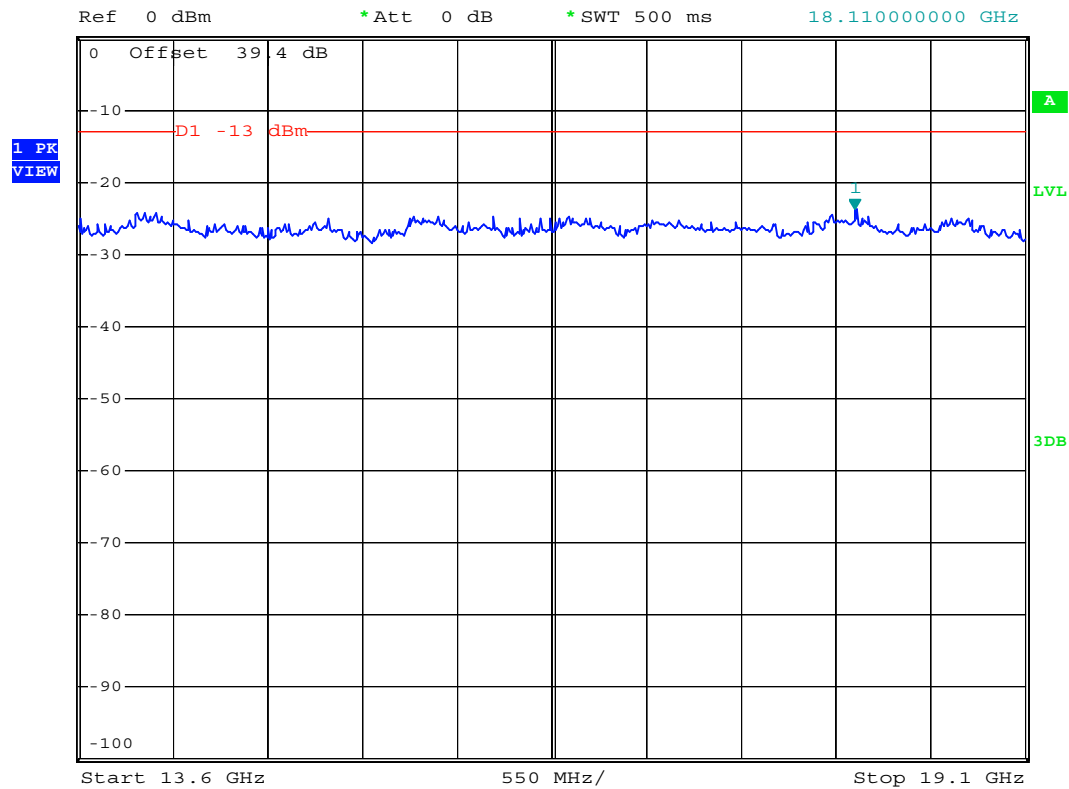
- Test Mode : CDMA2000 PCS CH25 for 1xRTT
- Frequency Range : 7G-13.6G



- Test Mode : CDMA2000 PCS CH25 for 1xRTT
- Frequency Range : 13.6G-19.1G

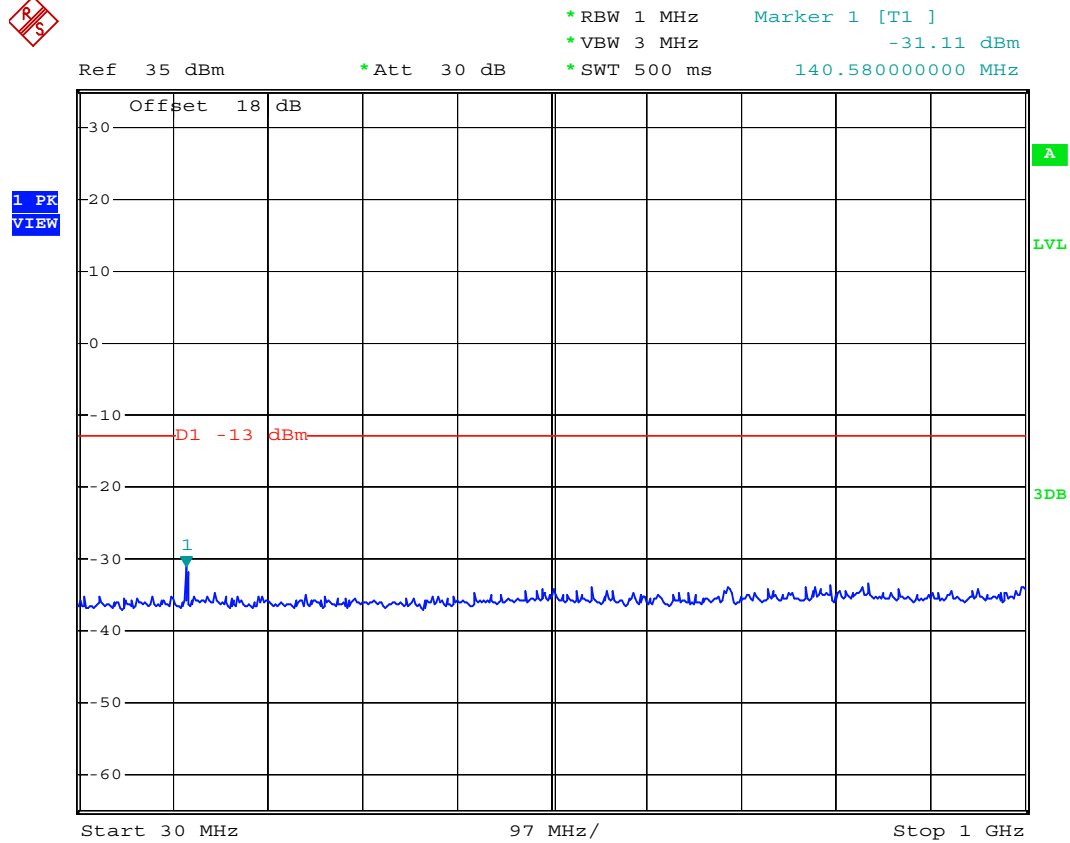


```
* RBW 1 MHz      Marker 1 [T1 ]
* VBW 3 MHz      -23.85 dBm
* SWT 500 ms     18.110000000 GHz
```



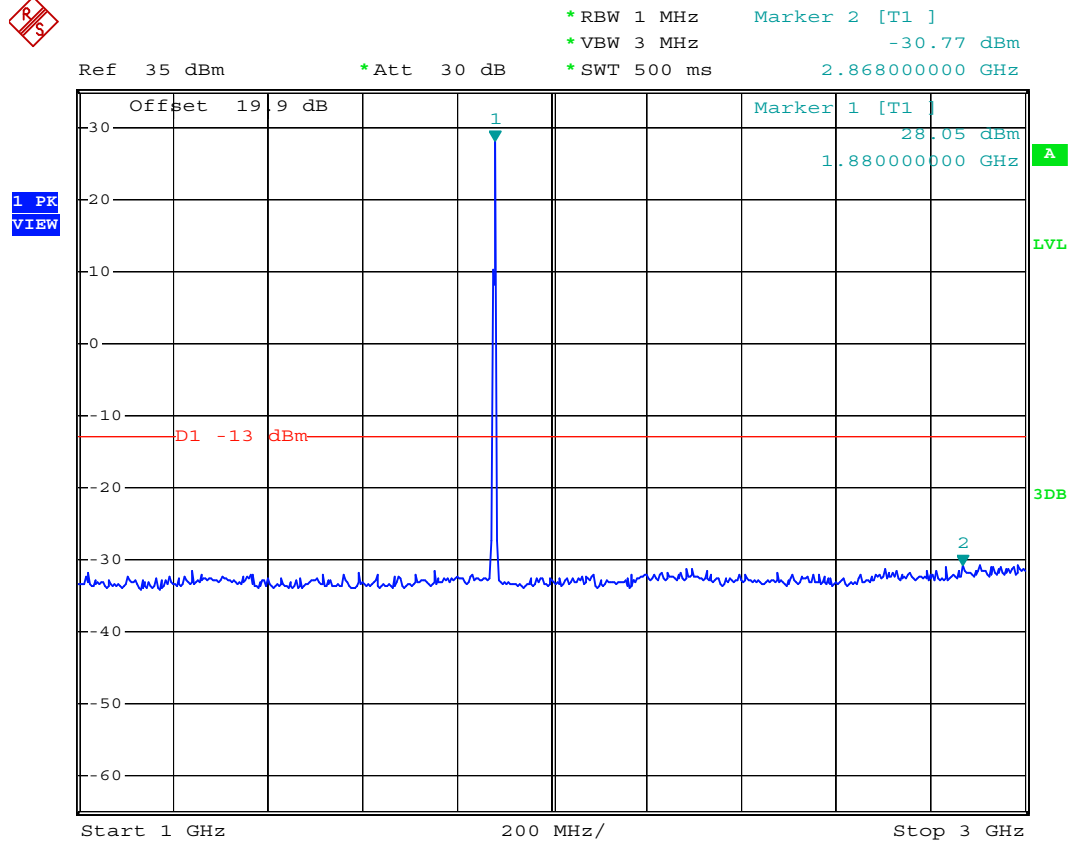


- Mode 5
- Test Mode : CDMA2000 PCS CH600 for 1xRTT
- Frequency Range : 30M-1G



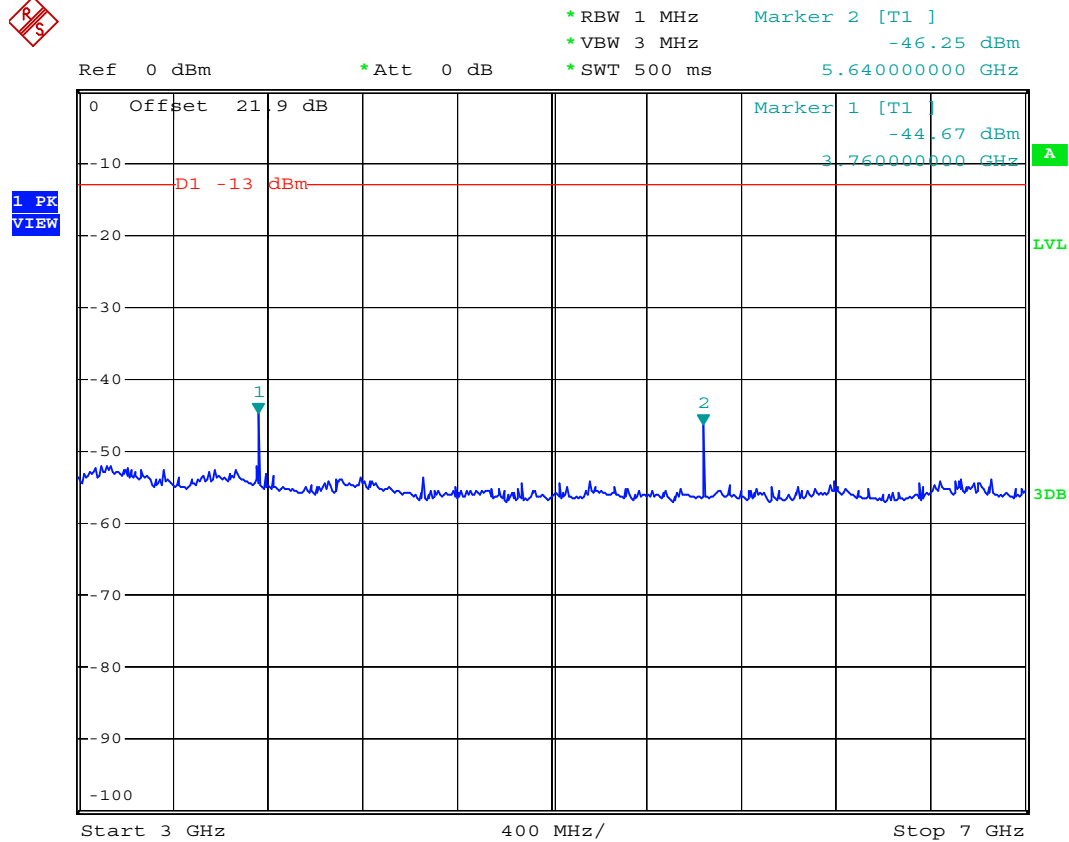


- Test Mode : CDMA2000 PCS CH600 for 1xRTT
- Frequency Range : 1G-3G



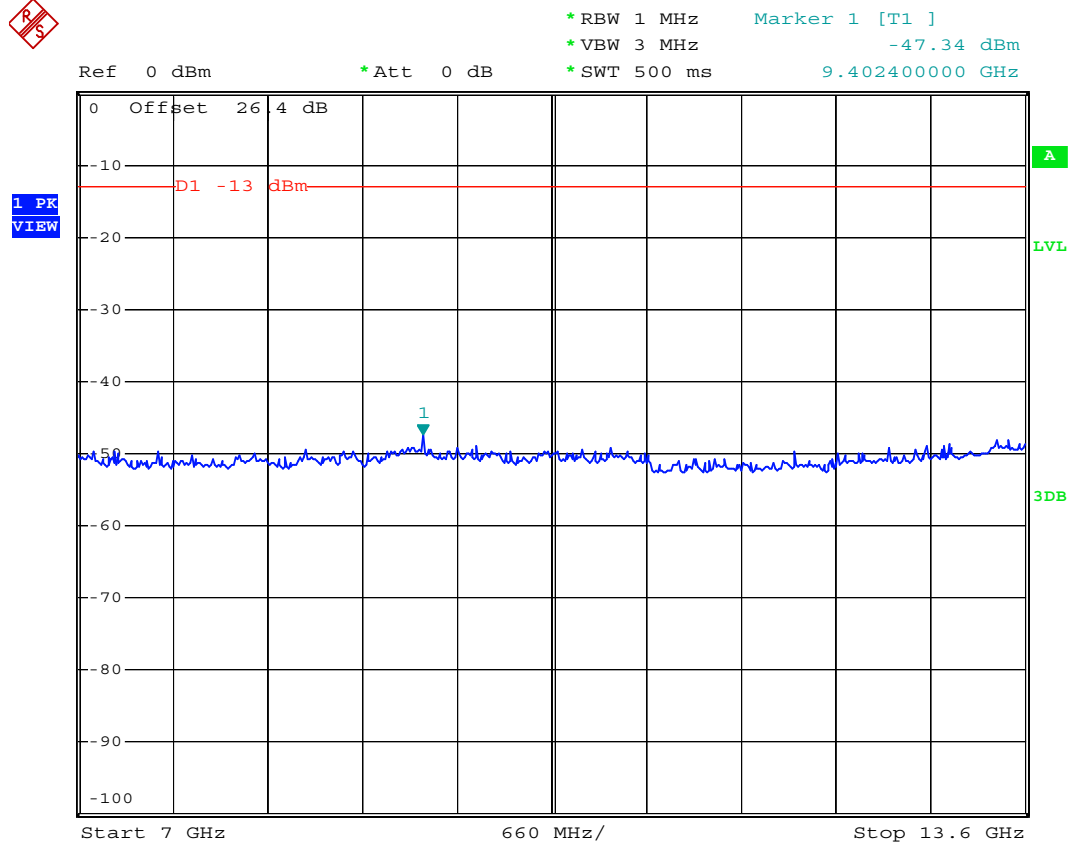


- Test Mode : CDMA2000 PCS CH600 for 1xRTT
- Frequency Range : 3G-7G



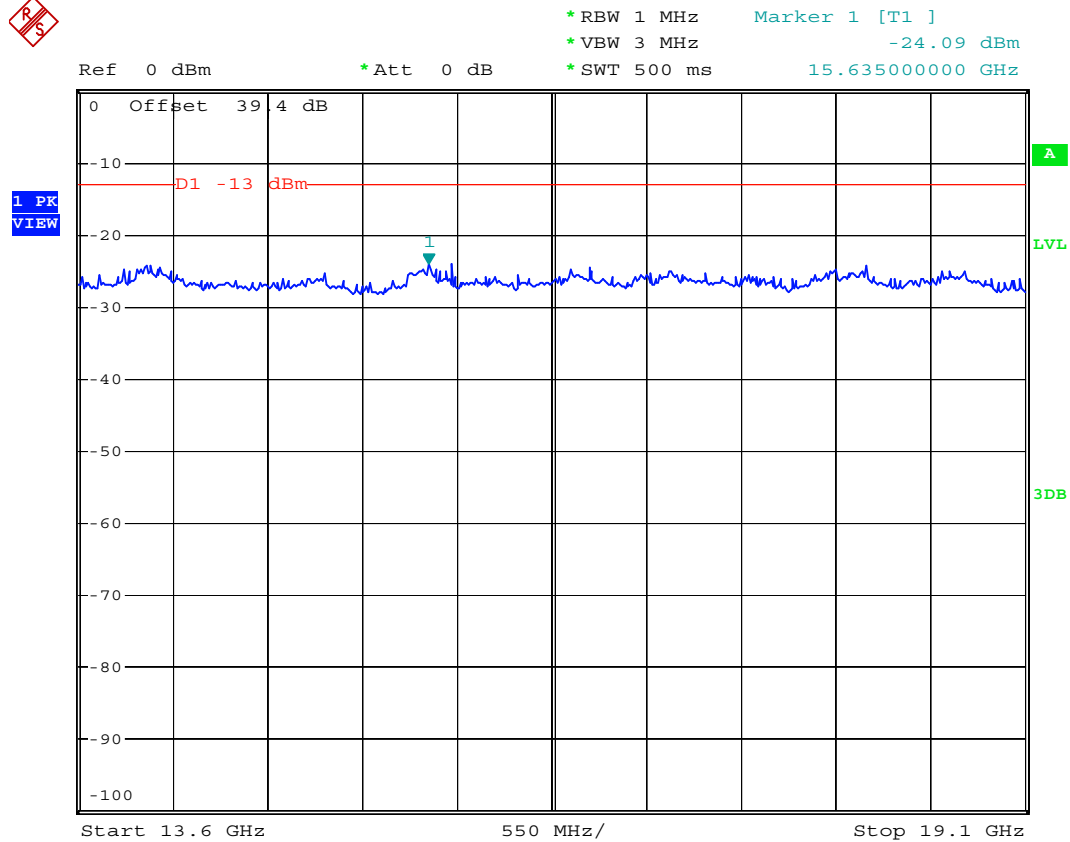


- Test Mode : CDMA2000 PCS CH600 for 1xRTT
- Frequency Range : 7G-13.6G



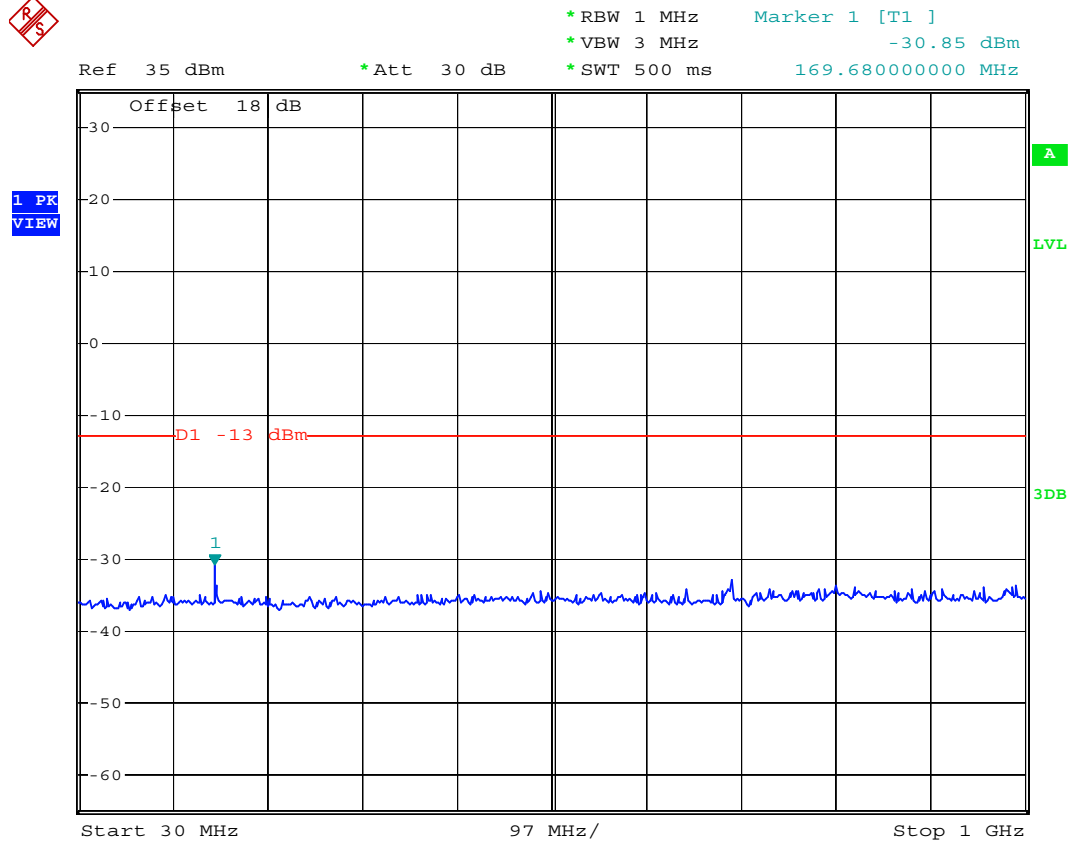


- Test Mode : CDMA2000 PCS CH600 for 1xRTT
- Frequency Range : 13.6G-19.1G



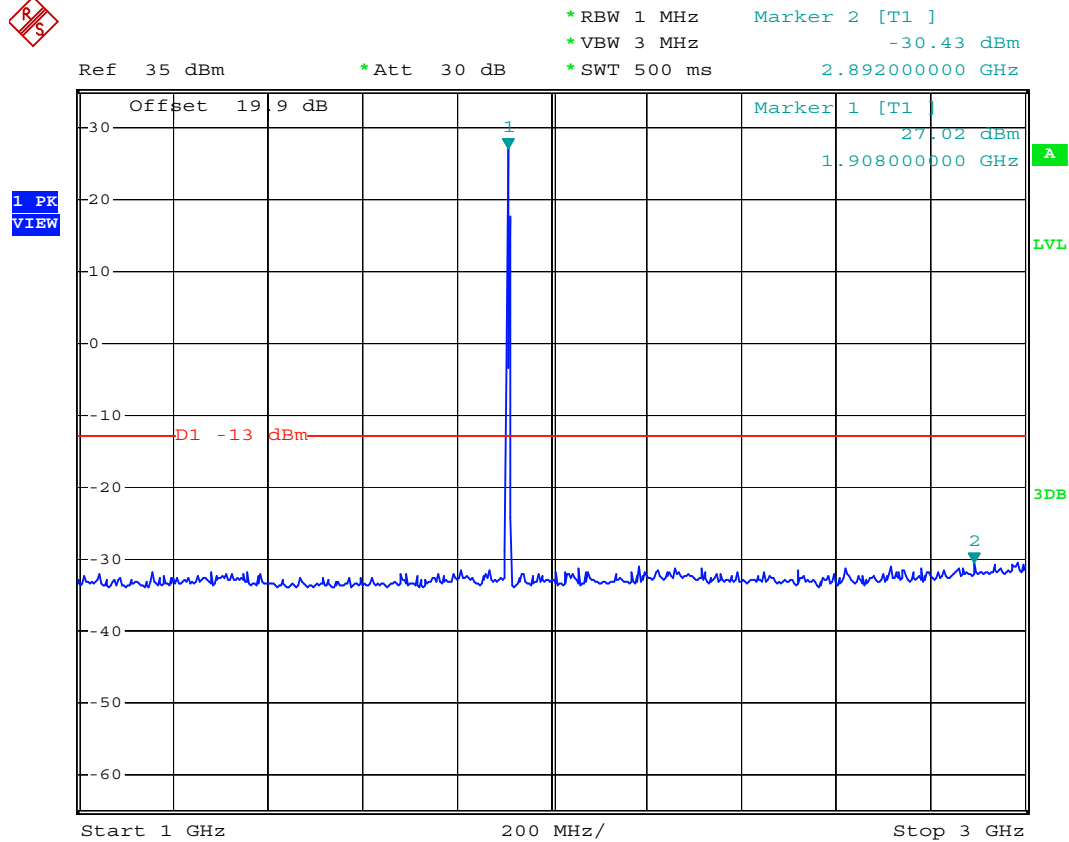


- Mode 6
- Test Mode : CDMA2000 PCS CH1175 for 1xRTT
- Frequency Range : 30M-1G



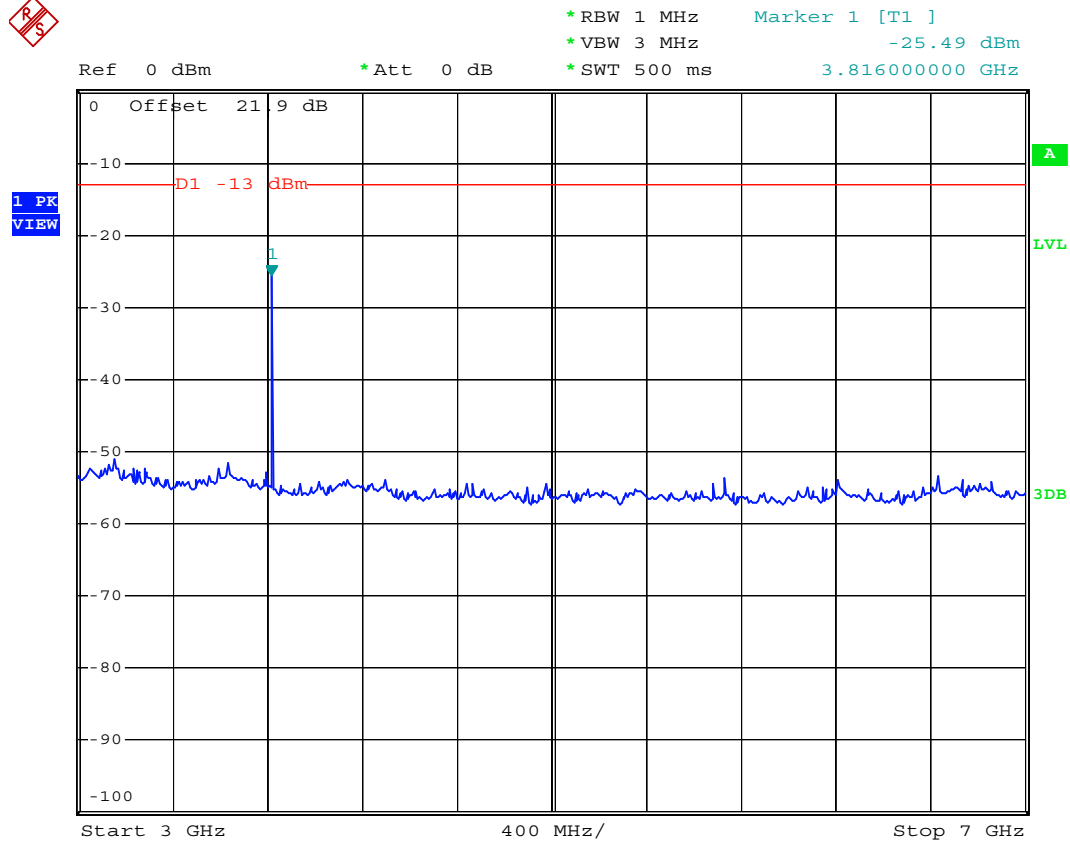


- Test Mode : CDMA2000 PCS CH1175 for 1xRTT
- Frequency Range : 1G-3G



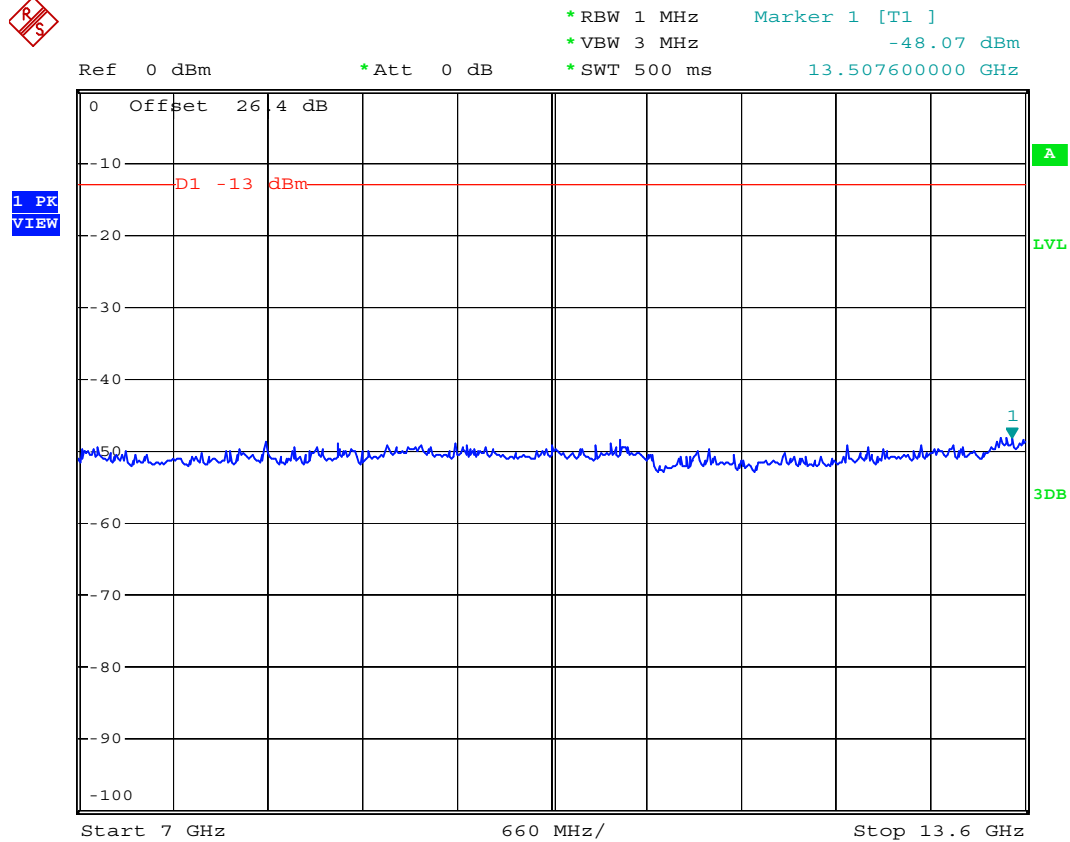


- Test Mode : CDMA2000 PCS CH1175 for 1xRTT
- Frequency Range : 3G-7G





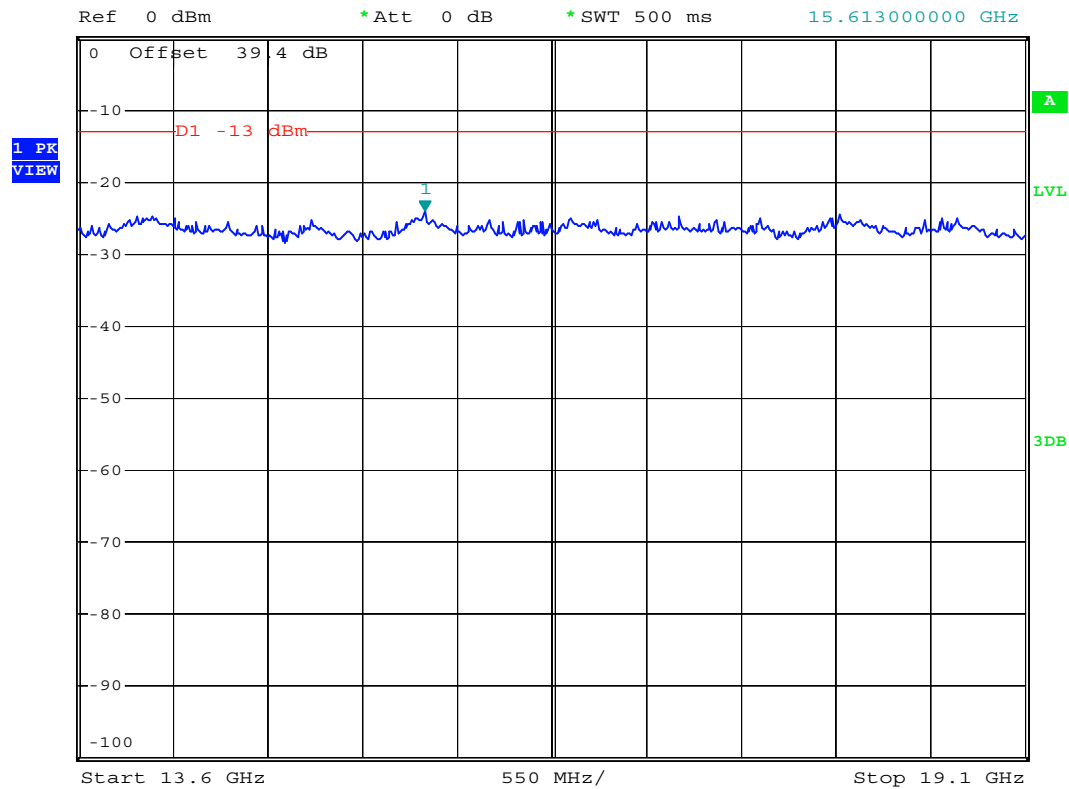
- Test Mode : CDMA2000 PCS CH1175 for 1xRTT
- Frequency Range : 7G-13.6G



- Test Mode : CDMA2000 PCS CH1175 for 1xRTT
- Frequency Range : 13.6G-19.1G



```
* RBW 1 MHz      Marker 1 [T1 ]
* VBW 3 MHz      -24.01 dBm
* SWT 500 ms     15.613000000 GHz
```





4.6 Field Strength of Spurious Radiation

Equivalent isotropic radiated Power Measurements by substitution method according to ANSI/TIA/EIA-603-C.

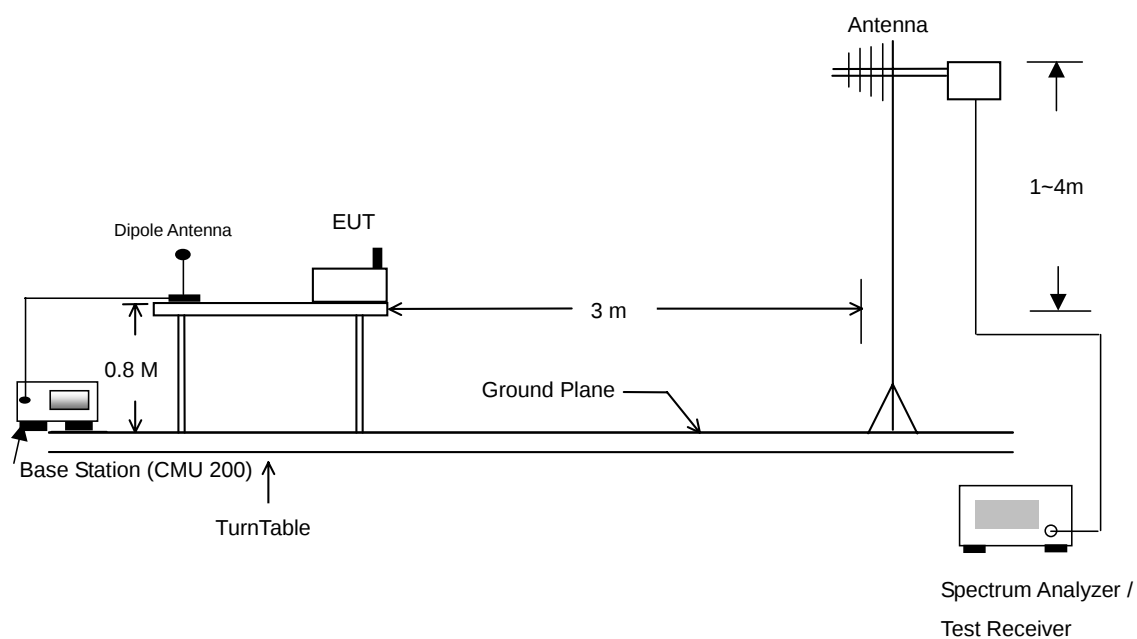
4.6.1 Measurement Instruments

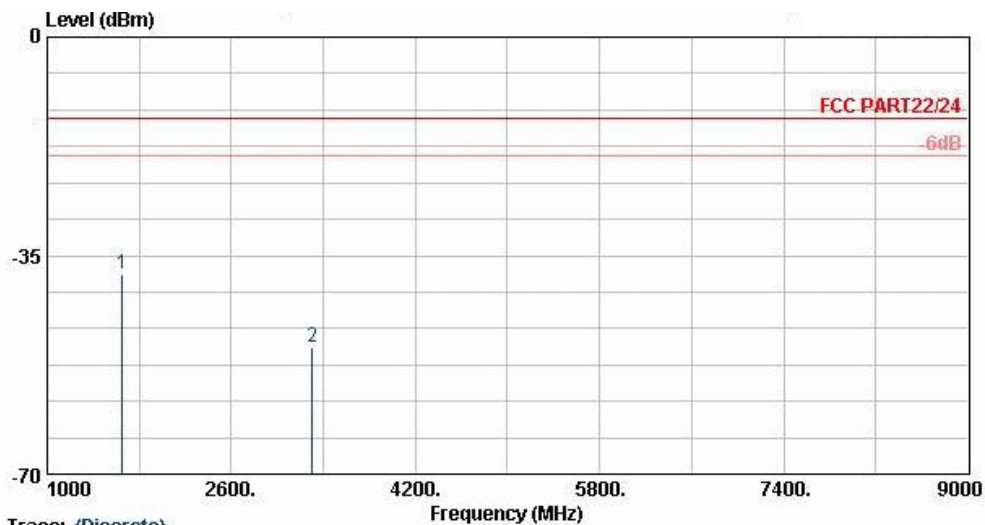
As described in chapter 5 of this test report.

4.6.2 Test Procedure

- a. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
- b. The EUT was set 3 meters from the receiving antenna which was mounted on the antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- d. The height of the receiving antenna is varied between one meter and four meters to reach the maximum spurious emission for both horizontal and vertical polarizations.
- e. Taking the record of maximum spurious emission.
- f. A Horn antenna was substituted in place of the EUT and was driven by a signal generator.
- g. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- h. Taking the record of output power at antenna port.
- i. Repeat step 7 to step 8 for another polarization.
- j. Emission level (dBm) = output power + substitution Gain.

4.6.3 Test Setup Layout

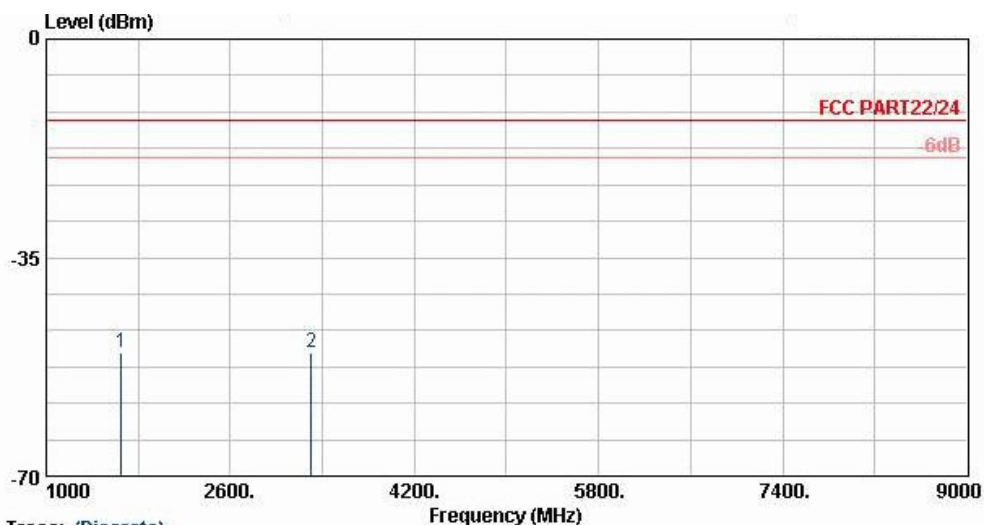


**4.6.4 Test Data****4.6.4.1 Mode 1****Trace: (Discrete)**

Site : D3CH06-HY
Condition : FCC PART22/24 EIRP-071107 HORIZONTAL
EUT : Phc
Power : 120vac/60Hz
Model : FG 820515
Memo : CDMA 1XRTT Cellular Link ; CH1013 +
Adaptor + Earphone
Plane : E2
METS : 268435456102522605

Frequency	ERP	Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Reading	Power	loss	Gain	(H/V)	
1651	-38.05	-13	-42.86	-37.2	5.05	6.35	H	Pass
3301	-49.78	-13	-56.58	-50.65	6.88	9.9	H	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



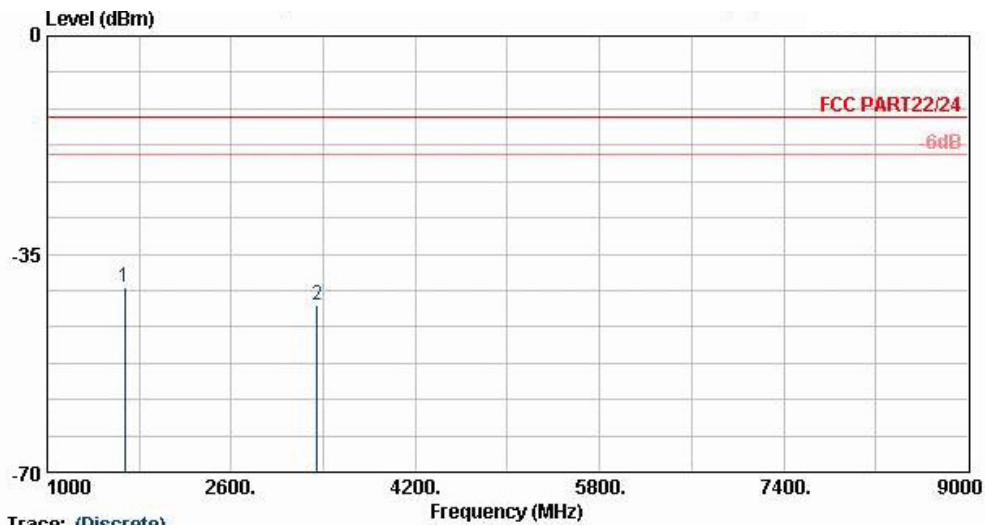
Site : 03CH06-HY
Condition : FCC PART22/24 EIRP-071107 VERTICAL
EUT : Phone
Power : 120Vac/60Hz
Model : FG 820515
Memo : CDMA 1XRTT Cellular Link ; CH1013 +
Adaptor + Earphone
Plane : E2
METS : 268435456102522605

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1651	-50.15	-13	-52.2	-49.3	5.05	6.35	V	Pass
3301	-50.21	-13	-57.74	-51.08	6.88	9.9	V	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



4.6.4.2 Mode 2



Trace: (Discrete)

Site : 03CH06-HY

Condition : FCC PART22/24 EIRP-071107 HORIZONTAL

EUT : Phone

Power : 120Vac/60Hz

Model : FG 820515

Memo : CDMA 1XRTT Cellular Link ; CH384 +

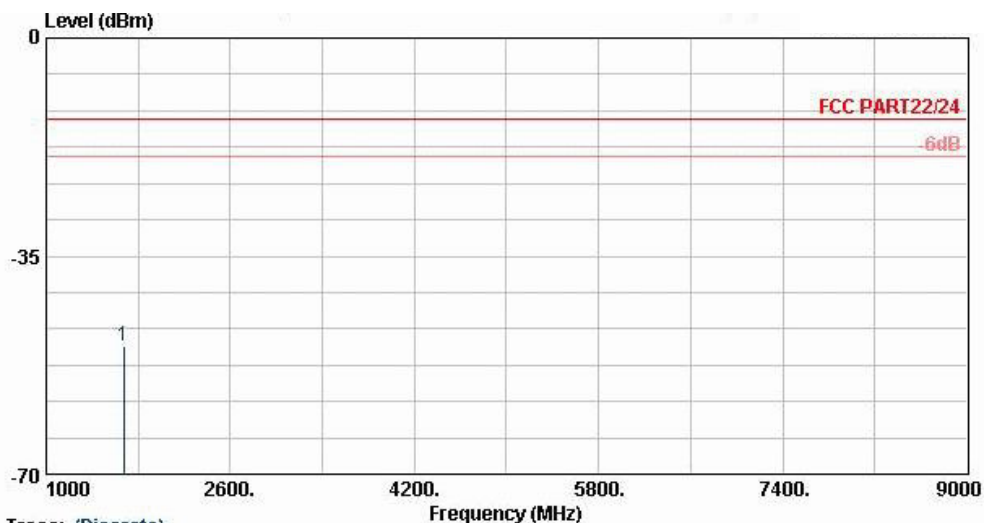
Adaptor + Earphone

Plane : E2

MEID : 268435456102522605

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1673.04	-40.35	-13	-46.95	-39.5	5.05	6.35	H	Pass
3346.08	-43.13	-13	-53.9	-44	6.88	9.9	H	Pass

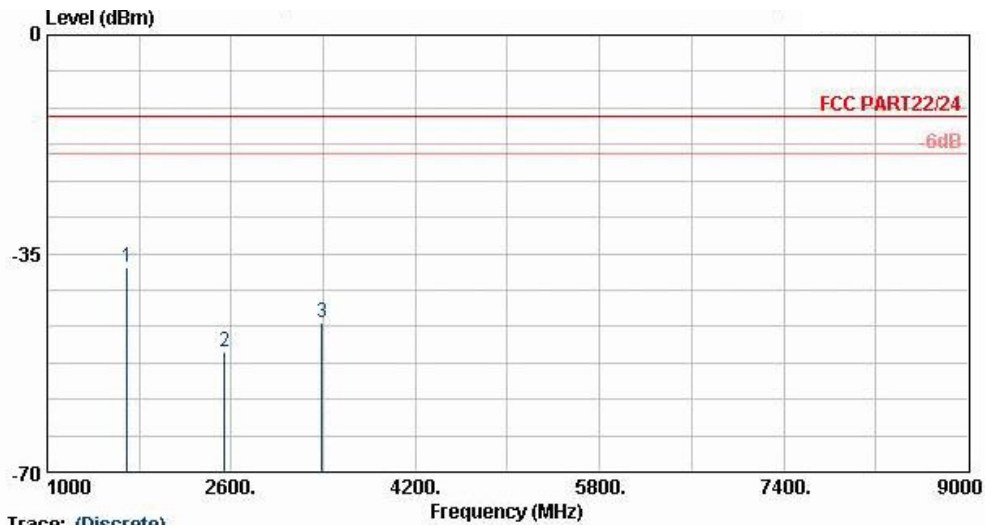
Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



Site : 03CH06-HY
Condition : FCC PART22/24 EIRP-071107 VERTICAL
EUT : Phone
Power : 120Vac/60Hz
Model : FG 820515
Memo : CDMA 1XRTT Cellular Link ; CH384 +
Adaptor + Earphone
Plane : E2
METS : 268435456102522605

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1673.04	-49.35	-13	-51.15	-48.5	5.05	6.35	V	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

**4.6.4.3 Mode 3**

Trace: (Discrete)

Site : 03CH06-HY

Condition : FCC PART22/24 EIRP-071107 HORIZONTAL

EUT : Phone

Power : 120Vac/60Hz

Model : FG 820515

Memo : CDMA 1XRTT Cellular Link ; CH777 +

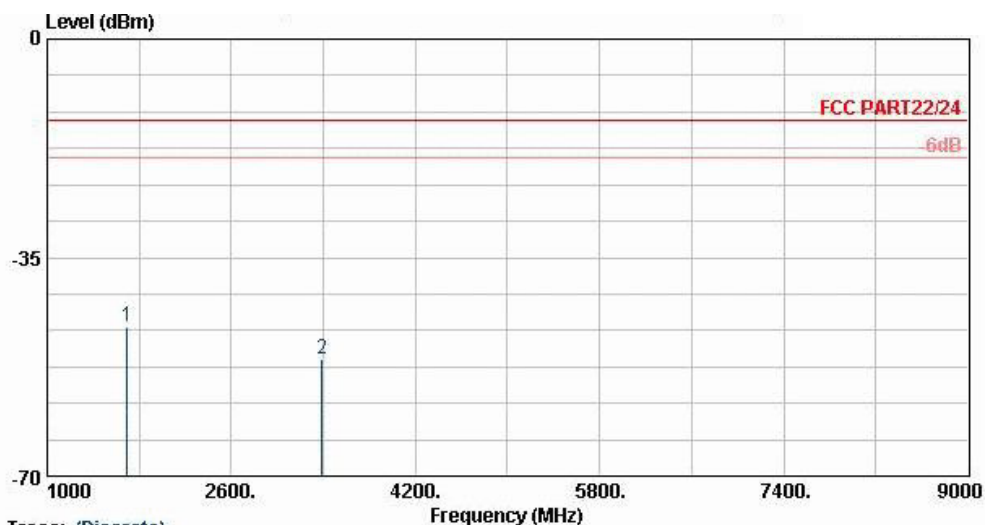
Adaptor + Earphone

Plane : E2

METD : 268435456102522605

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1696	-37.25	-13	-42.44	-36.4	5.05	6.35	H	Pass
2542	-50.65	-13	-56.84	-50.7	5.93	8.13	H	Pass
3391	-45.98	-13	-51.85	-46.85	6.88	9.9	H	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



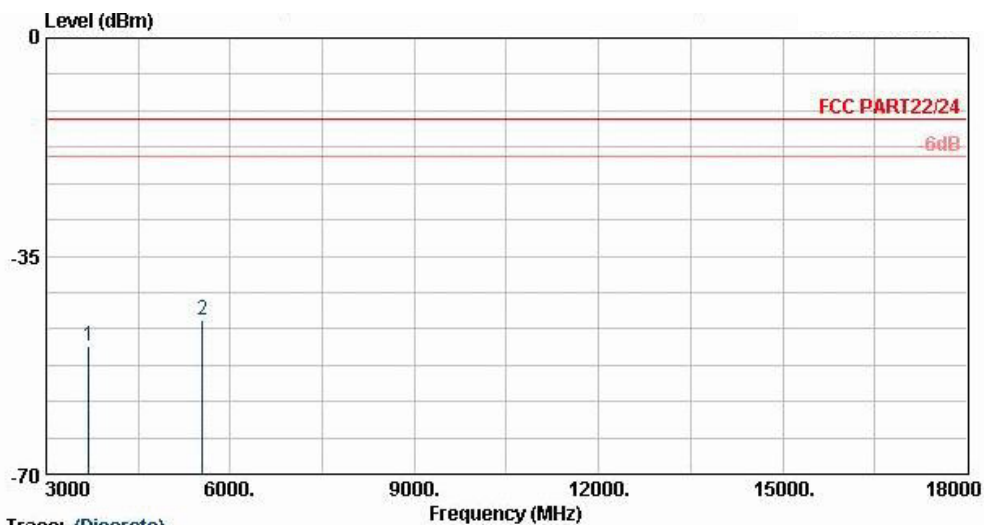
Site : 03CH06-HY
Condition : FCC PART22/24 EIRP-071107 VERTICAL
EUT : Phone
Power : 120Vac/60Hz
Model : FG 820515
Memo : CDMA 1XRTT Cellular Link ; CH777 +
Adaptor + Earphone
Plane : E2
METS : 268435456102522605

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1696	-46.05	-13	-48.36	-45.2	5.05	6.35	V	Pass
3391	-51.2	-13	-58.04	-52.07	6.88	9.9	V	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



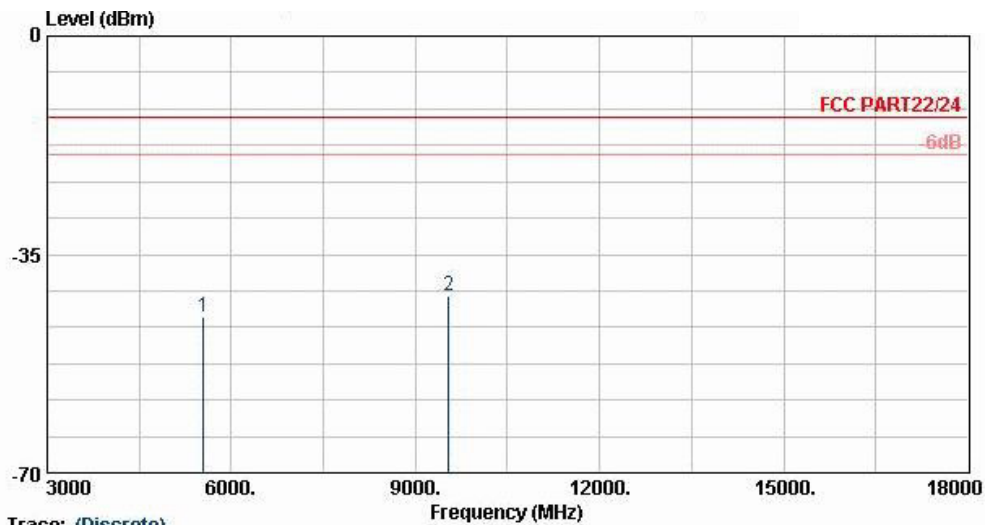
4.6.4.4 Mode 4



Trace: (Discrete)
Site : 03CH06-HY
Condition : FCC PART22/24 EIRP-071107 HORIZONTAL
EUT : Phone
Power : 120Vac/60Hz
Model : FG 820515
Memo : CDMA 1XRTT PCS Link ; CH25 +
Adaptor + Earphone
Plane : E2
METD : 268435456102522605

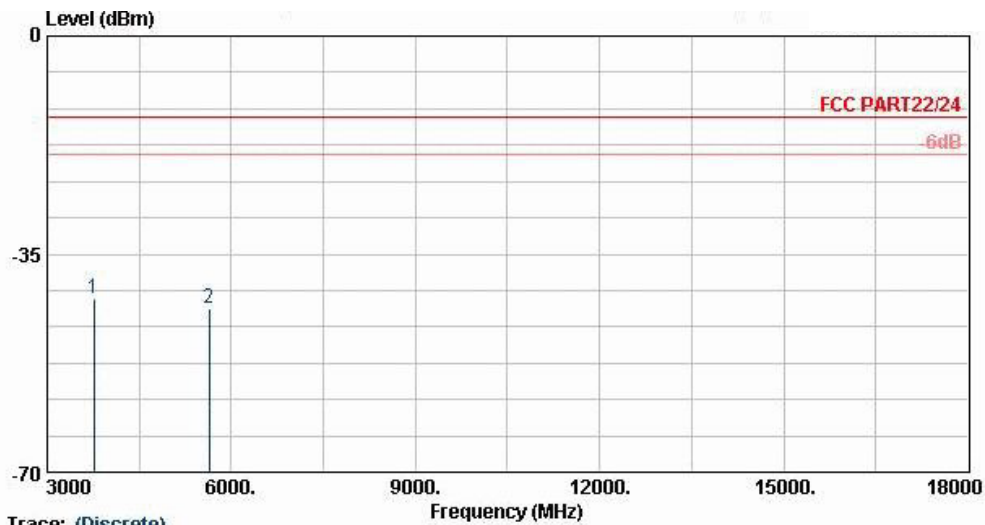
Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3696	-49.5	-13	-57.64	-53.43	7.17	11.1	H	Pass
5548	-45.38	-13	-56.56	-47.17	8.77	10.56	H	Pass

Remark : Spurious emissions within 30-3000MHz were found more than 20dB below limit line.



Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5548	-44.99	-13	-56.5	-46.78	8.77	10.56	V	Pass
9536	-41.56	-13	-59.24	-39.71	11.61	9.76	V	Pass

Remark : Spurious emissions within 30-3000MHz were found more than 20dB below limit line.

**4.6.4.5 Mode 5**

Trace: (Discrete)

Site : 03CH06-HY

Condition : FCC PART22/24 EIRP-071107 HORIZONTAL

EUT : Phone

Power : 120Vac/60Hz

Model : FG 820515

Memo : CDMA 1XRTT PCS Link ; CH600 +

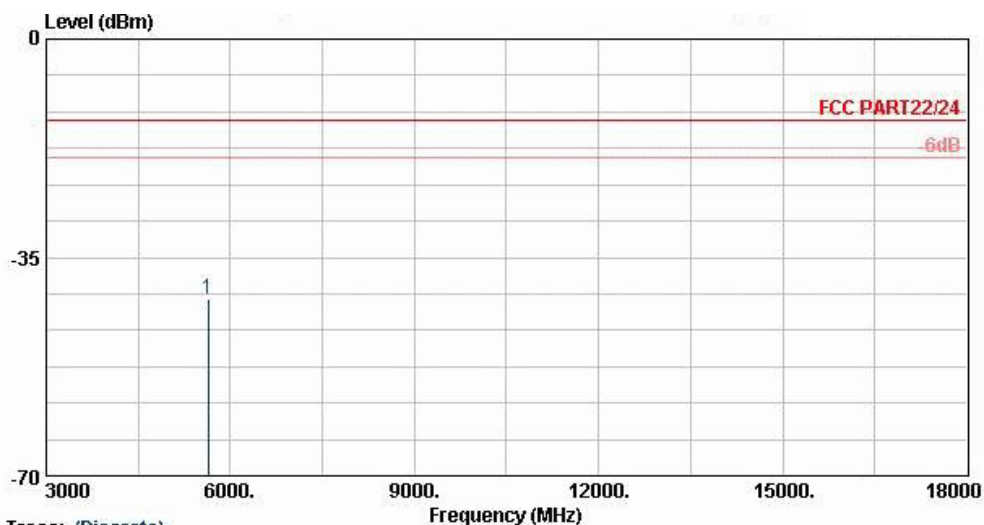
Adaptor + Earphone

Plane : E2

MEID : 268435456102522605

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3756	-42.07	-13	-57.27	-46	7.17	11.1	H	Pass
5636	-43.71	-13	-56.25	-45.5	8.77	10.56	H	Pass

Remark : Spurious emissions within 30-3000MHz were found more than 20dB below limit line.



Site : 03CH06-HY

Condition : FCC PART22/24 EIRP-071107 VERTICAL

EUT : Phone

Power : 120Vac/60Hz

Model : FG 820515

Memo : CDMA 1XRTT PCS Link : CH600 +

Plane : E2

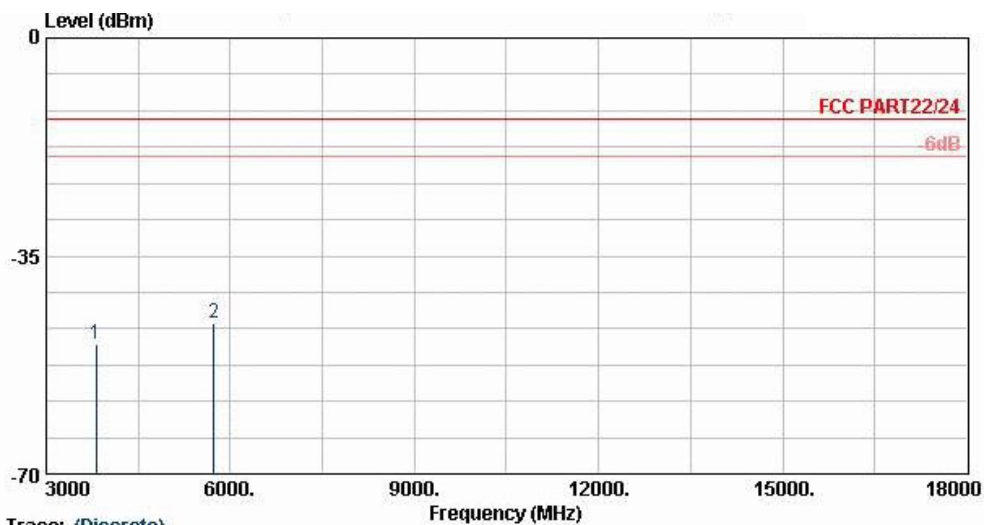
METD : 268435456102522605

Frequency	ERP	Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Reading	Power	loss	Gain	(H/V)	
5636	-41.71	-13	-53.75	-43.5	8.77	10.56	V	Pass

Remark : Spurious emissions within 30-3000MHz were found more than 20dB below limit line.



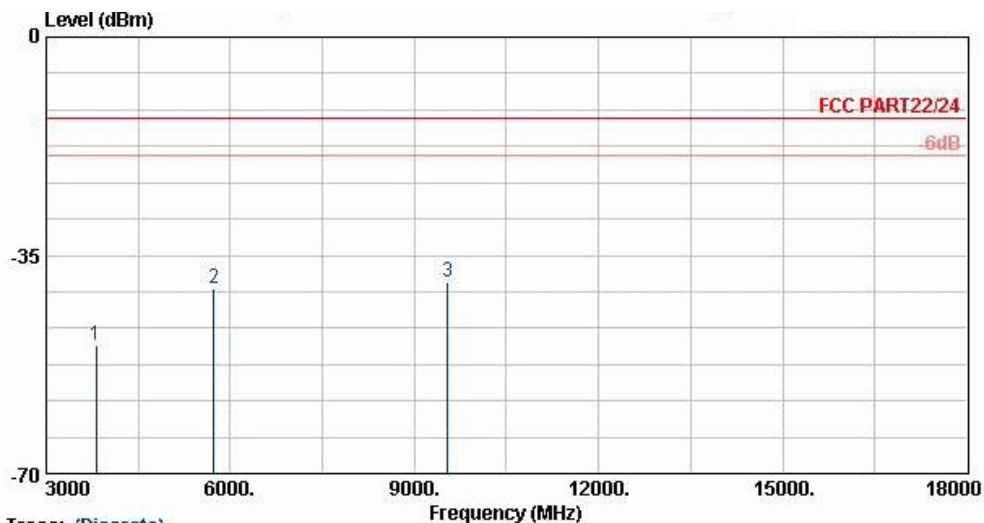
4.6.4.6 Mode 6



Site : 03CH06-HY
Condition : FCC PART22/24 EIRP-071107 HORIZONTAL
EUT : Phone
Power : 120Vac/60Hz
Model : FG 820515
Memo : CDMA 1XRTT PCS Link ; CH1175 +
Adaptor + Earphone
Plane : E2
MEID : 268435456102522605

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3816	-49.29	-13	-56.53	-53.22	7.17	11.1	H	Pass
5728	-45.86	-13	-57.38	-47.65	8.77	10.56	H	Pass

Remark : Spurious emissions within 30-3000MHz were found more than 20dB below limit line.

**Trace: (Discrete)**

Site : 03CH06-HY
Condition : FCC PART22/24 EIRP-071107 VERTICAL
EUT : Phone
Power : 120Vac/60Hz
Model : FG 820515
Memo : CDMA 1XRTT PCS Link ; CH1175 +
Adaptor + Earphone
Plane : E2
NRFD : 268435456102522605

Frequency	ERP	Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Reading	Power	loss	Gain	(H/V)	
3816	-49.33	-13	-57.92	-53.26	7.17	11.1	V	Pass
5728	-40.36	-13	-52.67	-42.15	8.77	10.56	V	Pass
9536	-39.39	-13	-57.06	-37.54	11.61	9.76	V	Pass

Remark : Spurious emissions within 30-3000MHz were found more than 20dB below limit line.

4.7 Frequency Stability (Temperature Variation)

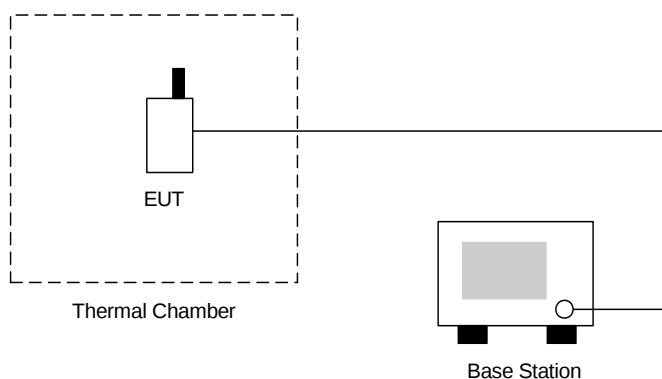
4.7.1 Measurement Instrument

As described in chapter 5 of this test report.

4.7.2 Test Procedure

- The EUT and test equipment were set up as shown on the following section.
- With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
- With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
- The temperature tests were performed for the worst case.
- Test data was recorded.

4.7.3 Test Setup Layout



**4.7.4 Test Result**

- Test Mode : CDMA2000 Cellular 1xRTT RC3 SO55 CH384

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	-16	-0.02	2.5	Passed
-20	15	0.02		
-10	-11	-0.01		
0	5	0.01		
10	-9	-0.01		
20	17	0.02		
30	13	0.02		
40	17	0.02		
50	-18	-0.02		

- Test Mode : CDMA2000 PCS 1xRTT RC5 SO9 CH600

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	-14	-0.01	2.5	Passed
-20	-15	-0.01		
-10	21	0.01		
0	-22	-0.01		
10	-19	-0.01		
20	-17	-0.01		
30	-16	-0.01		
40	-16	-0.01		
50	-17	-0.01		

4.8 Frequency Stability (Voltage Variation)

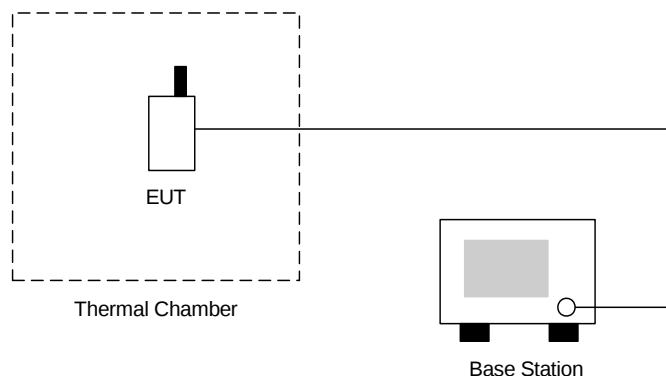
4.8.1 Measurement Instrument

As described in chapter 5 of this test report.

4.8.2 Test Procedure

- The EUT was placed in a temperature chamber at $25\pm5^{\circ}\text{C}$ and connected as the following section.
- The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
- The variation in frequency was measured for the worst case.

4.8.3 Test Setup Layout



4.8.4 Test Result

- Test Mode : CDMA2000 Cellular 1xRTT RC3 SO55 CH384

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	10.0	0.01	2.5	Passed
BEP	-16.0	-0.02		
4.2	-12.0	-0.01		

- Test Mode : CDMA2000 PCS 1xRTT RC5 SO9 CH600

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	-14.0	-0.01	2.5	Passed
BEP	-17.0	-0.01		
4.2	-15.0	-0.01		

Remark:

- Normal Voltage=3.7V.
- Battery End Point (BEP)= 3.2V.



5 List of Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY44211028	9KHz-26.5GHz	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 26, 2007	Jul. 25, 2008	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Dec. 01, 2007	Nov. 30, 2008	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Com-Power	AH118	071025	1G~18G	Jun. 04, 2007	Jun. 03, 2008	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-251	14G - 40G	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Nov. 22, 2007	Nov. 21, 2008	Radiation (03CH06-HY)
PreAmplifier	EMEC	PA303	PA303-SMA-059	100K~3GHz	Nov. 26, 2007	Nov. 25, 2008	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	103937	Third-Band	Oct. 19, 2007	Oct. 18, 2008	Radiation (03CH06-HY)
Thermal Chamber	Tenyi technology	TTH-D35P	TBN-930701	N/A	Aug. 02, 2007	Aug. 01, 2008	Conduction (TH02-HY)
Spectrum	R&S	FSP40	100055	9KHz~40GHz	Jun. 25, 2007	Jun. 24, 2008	Conduction (TH02-HY)
Bluetooth Test	ANRITSU	MT8852A	6K00003939	N/A	N/A	N/A	Conduction (TH02-HY)
Power Divider	ARRA	5200-1	3871	N/A	Oct. 01, 2007	Sep. 30, 2008	Conduction (TH02-HY)
DC Power Supply	TOPWARD	3303D	740889	N/A	May 25, 2007	May 24, 2009	Conduction (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 01, 2008	Jan. 31, 2009	Conduction (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 01, 2008	Jan. 31, 2009	Conduction (TH02-HY)

6 Uncertainty Evaluation

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

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 (1GHz ~ 40GHz)

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				

END OF TEST REPORT