

# CDMA2000 1x Forward Link Measurement

Demonstration using Signal Analyzer and Vector Signal Generator

**MX269024A**

CDMA2000 Forward Link Measurement Software

**MX269024A-001**

All Measure Function

**MS2690A/MS2691A/MS2692A/MS2830A**

Signal Analyzer

**MG3710A**

Vector Signal Generator

## Introduction

This document explains how to output the CDMA2000 Forward Link signal from the MG3710A Vector Signal Generator and measure the signal using the MS2690A/MS2691A/MS2692A/MS2830A Signal Analyzer.

The aim of this guide is to provide an understanding of the following items:

- Output of CDMA2000 Forward Link signal using MG3710A Vector Signal Generator and measurement of Tx characteristics using MS2690A/MS2691A/MS2692A/MS2830A Signal Analyzer
- High-speed measurement of CDMA2000 Forward Link signal Tx characteristics using All Measure Function

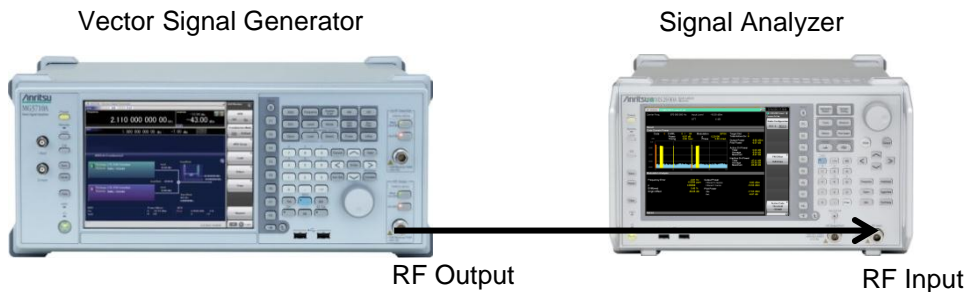
## Preparations

Prepare the following equipment and software for the demonstration.

- MG3710A Vector Signal Generator (Firmware Ver. 2.00.02 or newer)  
Opt-032                                      1stRF 100 kHz to 2.7 GHz (Opt-034, -036 also OK)
- MS2690A/MS2691A/MS2692A/MS2830A Signal Analyzer (Firmware Ver. 5.06.00 or newer)  
MX269024A                                      CDMA2000 Forward Link Measurement Software  
MX269024A-001                                      All Measure Function  
MS2830A-006                                      Analysis Bandwidth 10 MHz (using MS2830A)
- RF Cable                                      1 pc

The CDMA2000 Forward Link signal used in the demonstration uses the standard waveform patterns installed in the MG3710A Vector Signal Generator.

Connect the instruments as shown in the following set-up diagram.



*Fig. 1. Connection Set-up*

## Vector Signal Generator Operation

Use the following procedure to output the CDMA2000 Forward Link signal from the MG3710A Vector Signal Generator.

[Procedure]

1. Press [Preset] -> [F3] Preset All.
2. Press [Load] to display the Waveform List to Load window.
3. Select CDMA2000 from the Packages list at the left side of the window.
4. Select FWD\_RC3-5\_9channel from Patterns in the Packages list at the right side of the window.
5. Press [F6] Load Pattern.
6. Press [Select] to display the Waveform List to Play window.
7. Select CDMA2000 from the Packages list at the left side of the window.
8. Select FWD\_RC3-5\_9channel from Patterns in the Packages list at the right side of the window.
9. Press [F6] Select.
10. Press [Frequency] and set the frequency to 870 MHz.
11. Press [Level] and set the level to -10 dBm.
12. Press RF Output [Mod On/Off] and [On/Off] to output the modulation signal.

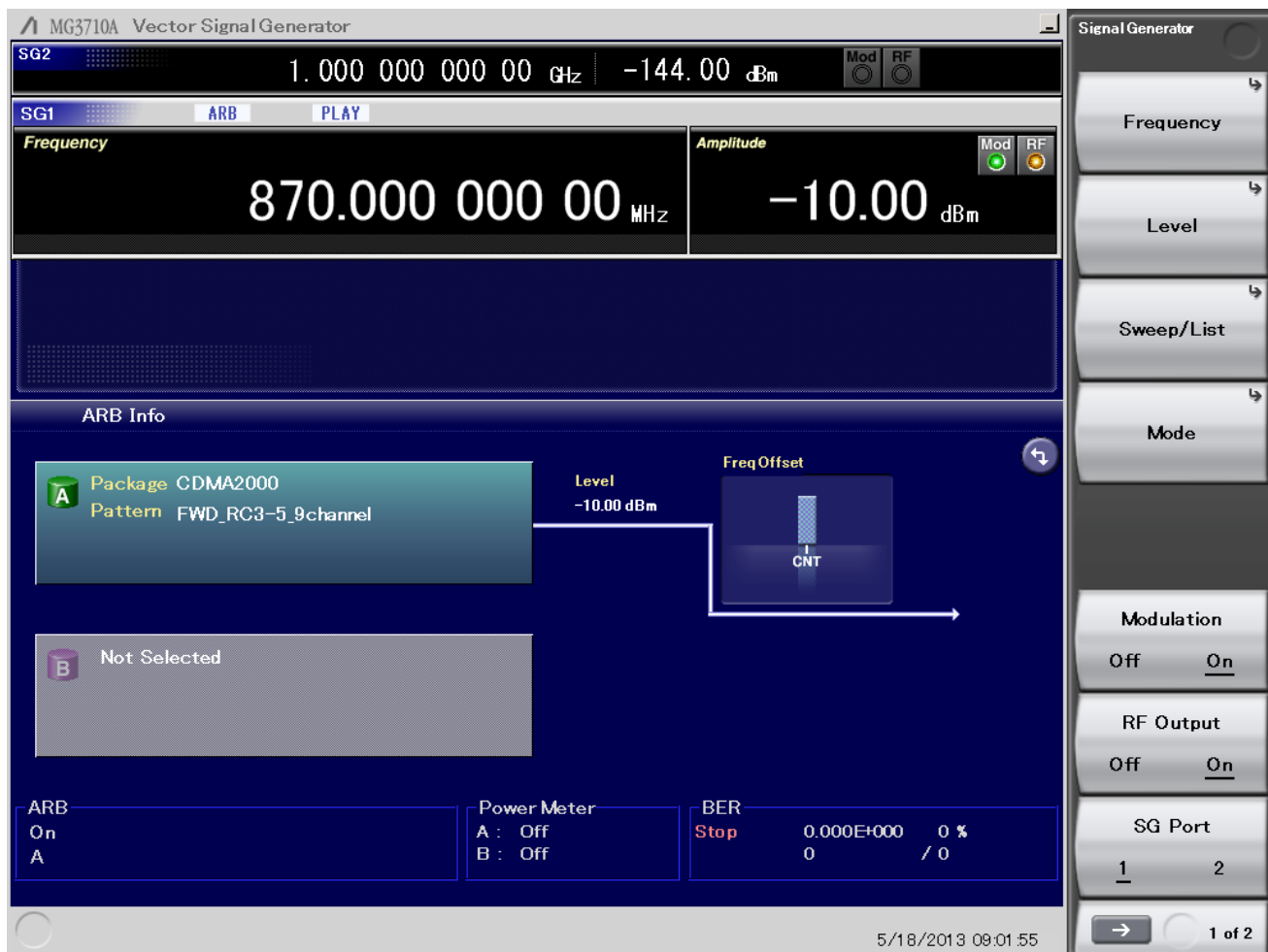


Fig. 2. Vector Signal Generator Settings

## Signal Analyzer Operation

Use the following procedure to measure the Tx characteristics of the CDMA2000 Forward Link signal using the MS2690A/MS2691A/MS2692A/MS2830A Signal Analyzer.

### Modulation Accuracy Measurement

[Procedure]

1. Press [Application Switch] to select CDMA2000 Forward.
2. Press [Preset] -> [F1] Preset.
3. Press [Frequency] and set the frequency to 870 MHz.
4. Press [Amplitude] and set the level to -10 dBm.
5. Press [Measure] -> [F1] Code Domain.
6. Press Function Key Menu Top -> [F3] Common Setting -> [F1] Radio Configuration to set RC3-5.
7. Press [Single] to start measurement.

The above operations measure the frequency error, modulation accuracy and code domain power.



Fig. 3. Frequency Error/Modulation Accuracy/Code Domain Power Measurement Results

## Occupied Bandwidth Measurement

- Press [Measure] -> [F7] OBW (FFT) to measure the occupied bandwidth using the signal analyzer function.

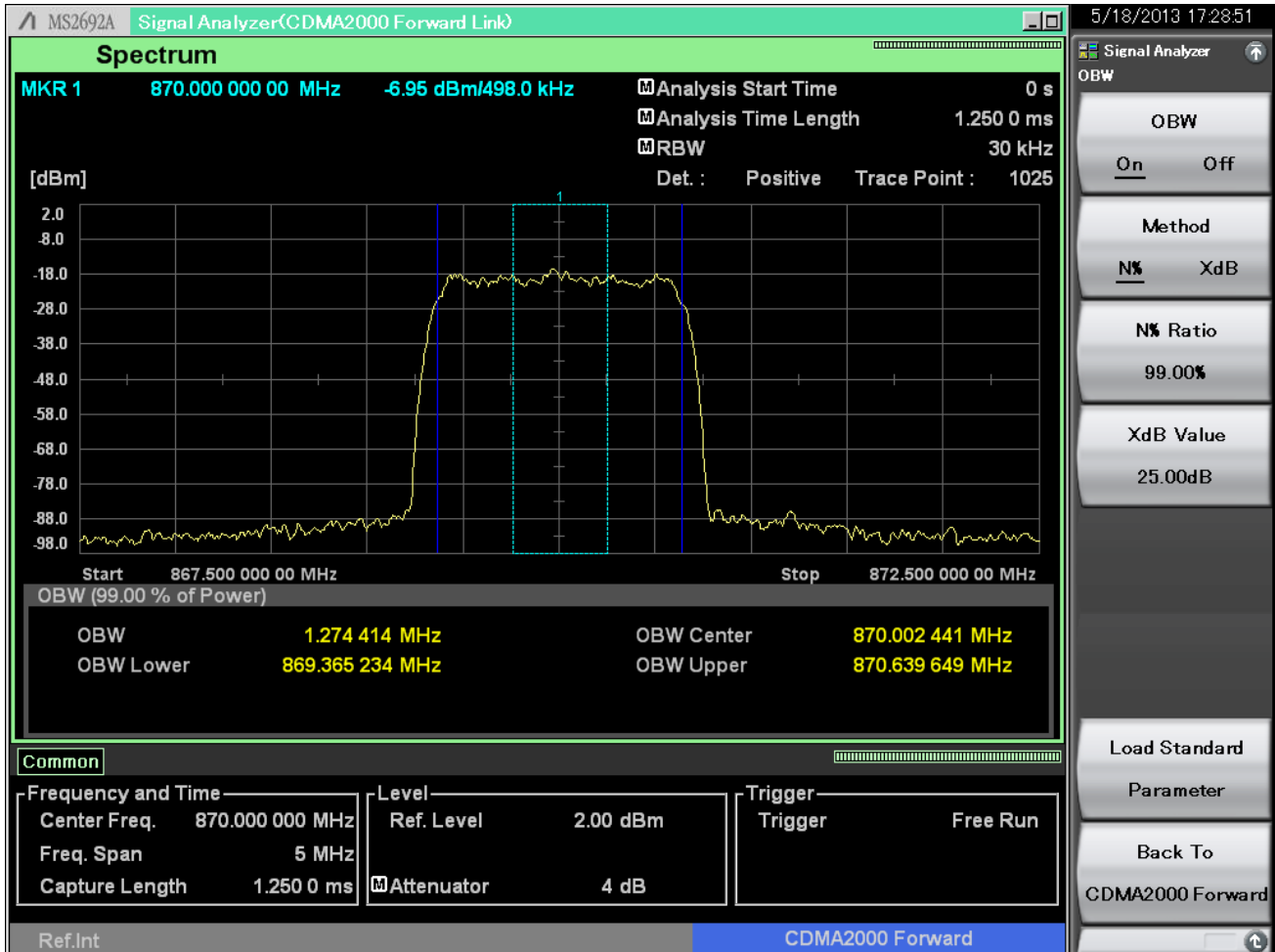


Fig. 4. Occupied Bandwidth Measurement Results

## Emissions Measurement

- Press [Measure] -> [->] (Function Menu page 2) -> [F6] Spectrum Emission Mask (Swept) to measure emissions using the spectrum analyzer function.

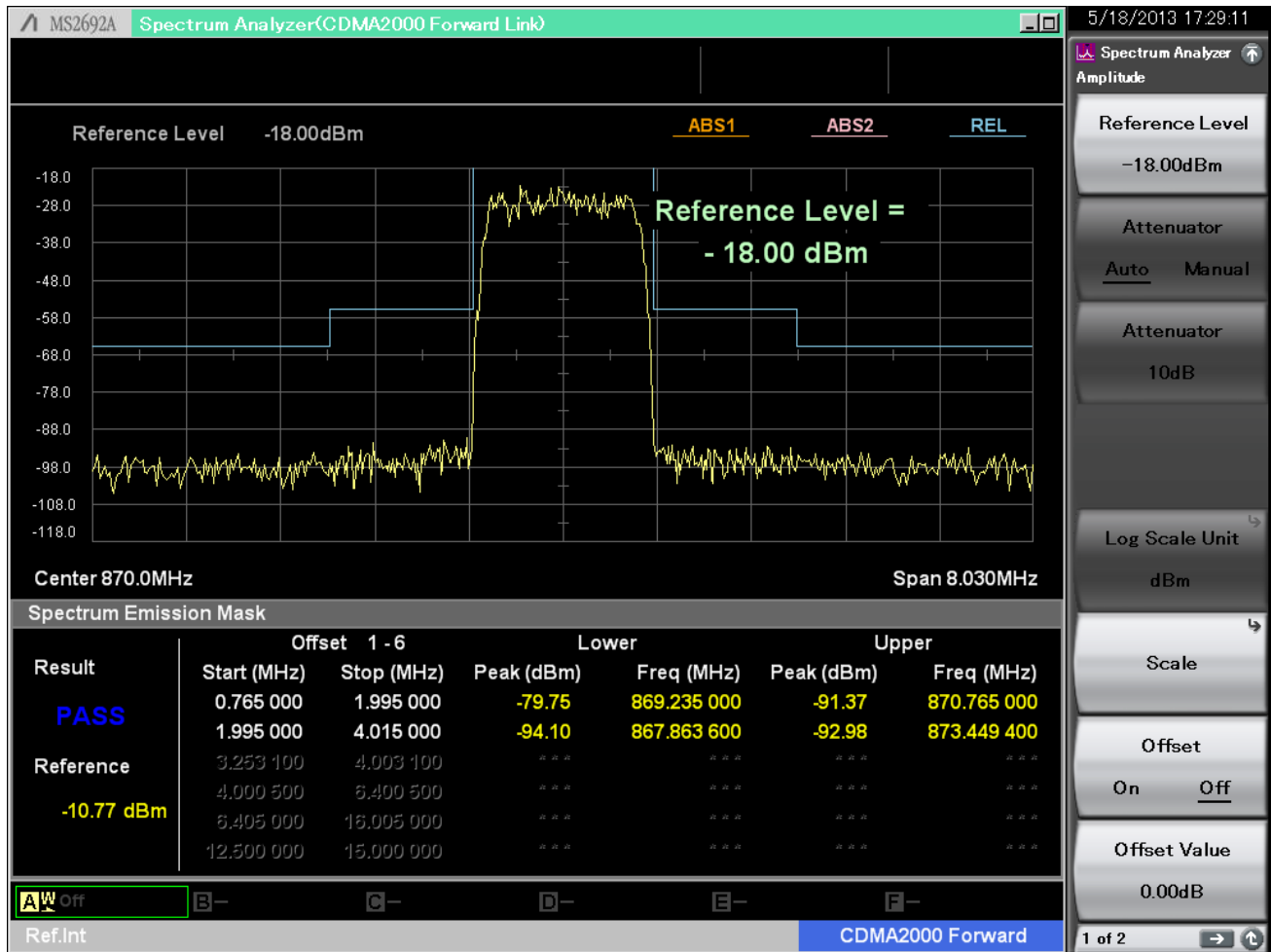


Fig. 5. Emissions Measurement Results

## Batch Measurement of Tx Characteristics

The signal analyzer All Measure function can be used to measure not only the frequency error, modulation accuracy, and code domain power, but also for power vs time and spectrum measurements. Using this function can shorten the measurement time by selecting each function for each measurement item. There are three measurement units: Modulation Analysis, Occupied Bandwidth, and Spectrum Emission; measurement can be enabled/disabled for each, along with the number of measurement averagings.

[Procedure]

10. Press [Measure] -> [F3] All Measure.
11. Press [Single] to start measurement.

The above procedure measures the modulation accuracy, Tx power, occupied bandwidth, and emissions as a single batch measurement.



Fig. 6. All Measure Function Measurement Results

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