Product Introduction

MX370101A/MX269901A
HSDPA/HSUPA IQproducer

MG3710A
Vector Signal Generator

MS269xA/MS2830A
Signal Analyzer
MG3710A Vector Signal Generator
MS269xA-020, MS2830A-020/021 Vector Signal Generator option for MS269xA/MS2830A Signal Analyzer

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HSDPA/HSUPA IQproducer
Product Introduction

MG3710A Vector Signal Generator
MS269xA Signal Analyzer
MS2830A Signal Analyzer

Version 1.00

ANRITSU CORPORATION
What is HSDPA/HSUPA IQproducer?

HSDPA/HSUPA IQproducer is PC application software for generating waveform patterns in compliance with 3GPP HSDPA/HSUPA (uplink, downlink). The software runs under the Windows OS installed in the MG3710A, MS2690A/91A/92A-020, and MS2830A-020/021. It outputs modulation signals by selecting generated waveform patterns.

- Generating waveform patterns using HSDPA/HSUPA IQproducer => The main frame requires a license. The unlicensed software will run on the PC to test waveform pattern generation but an unlicensed SG cannot output signals because it does not recognize the waveform patterns.

- Generating waveform patterns using EDA Tools (C, MATLAB, Microwave Office) => Free license

• MATLAB® is a registered trademark of The MathWorks, Inc.
• Windows® is a registered trademark of Microsoft Corporation in the USA and other countries.
What is HSDPA/HSUPA IQproducer?

IQproducer sets TS25.212-defined HS-PDSCH and HS-DPCCH parameters. Various signals are generated just by changing the Tx process.

**Downlink**
- Scrambling Code
- Channel (CPICH, P-CCPCH, P-SCH, S-SCH, PICH, DPCH, OCNS, HS-SCCH1/2/3/4, HS-PDSCH1/2/3/4)
- DPCH Data

**Uplink**
- Scrambling Code
- Channel (UL-DPCCH, UL-DPDCH, HS-DPCCH, DPCH, E-DPCCH, E-DPDCH, E-DPDCDH)
- DPCH Data

*Read the “MX3701xxA IQproducer” and “MX269xxxA series Software” brochure for detail parameter setting range.*
Downlink: Editing Parameters

When HSDPA/HSUPA Downlink is chosen, various Downlink parameters can be set according to the standard.

In addition, the Downlink Easy Setup function offers default parameter sheets for "Fixed Reference Channel (FRC) of HSDPA defined in 3GPP TS25.101" and "Reference Measurement Channel (RMC) defined in 3GPP TS25.101/TS25.104." Parameters are set just by choosing an item and the waveform pattern is generated.

[Easy Setup]

**FRC:**
- H-Set1 (QPSK)
- H-Set1 (16QAM)
- H-Set2 (QPSK)
- H-Set2 (16QAM)
- H-Set3 (QPSK)
- H-Set3 (16QAM)
- H-Set4
- H-Set5

**RMC:**
- RMC12.2 kbps (for RX test)
- RMC12.2 kbps (for Performance test)
- RMC64 kbps (for Performance test)
- RMC144 kbps (for Performance test)
- RMC384 kbps (for Performance test)
Downlink: Parameter Editing

When HSDPA/HSUPA Downlink is chosen, the following setting screen is displayed.

The P-CCPCH, DPCH, HS-SCCH 1-4, and HS-PDSCH 1-4 parameters are set using the [Edit] menu.

- **Total Power**: Displays total power of all ON channels (except OCNS)
- **Normalize Power**: Sets Total Power to 0 dB, maintaining power ratio of all ON channels
  - Enabled at OCNS = OFF
- **Channel Edit**: Starts parameter setting screen for P-CCPCH and DPCH.
- **Edit**: Performs HS-SCCH 1-4 and HS-PDSCH 1-4 setup and starts parameter setting screen for PCCPCH and DPCH.
Downlink: Parameter Editing Screen

Channel Edit Screen

![Channel Edit Screen](image-url)
Downlink: Parameter Editing Screen

HSDPA Edit Screen

- Channelization Code Offset: 2
- UE Identity: 0
- Number of Physical Channel Code: 5
- CRC Error Insertion: Correct
- Modulation: QPSK
- Number of HARQ Processes: 2
- Transport Block Size Information: 41
- Virtual IR Buffer Size: 9600
- RV information: 0
- Payload Data: PN9fix
- Transmitting Pattern Edit
  - HARQ Process Cycle: 6
  - Inter-TTI Distance: 3
  - TTI Start Offset: 0
  - Process Setting File: [Enter]

[OK] [Cancel]
Downlink: Easy Setup Function

The Downlink Easy Setup function offers default parameter sheets for "Fixed Reference Channel (FRC) of HSDPA defined in 3GPP TS25.101" and "Reference Measurement Channel (RMC) defined in 3GPP TS25.101/TS25.104."

The initial work is easy because the default is displayed for the selected item.

<table>
<thead>
<tr>
<th>FRC:</th>
<th>RMC:</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-Set1 (QPSK)</td>
<td>RMC12.2 kbps (for RX test)</td>
</tr>
<tr>
<td>H-Set1 (16QAM)</td>
<td>RMC12.2 kbps (for Performance test)</td>
</tr>
<tr>
<td>H-Set2 (QPSK)</td>
<td>RMC64 kbps (for Performance test)</td>
</tr>
<tr>
<td>H-Set2 (16QAM)</td>
<td>RMC144 kbps (for Performance test)</td>
</tr>
<tr>
<td>H-Set3 (QPSK)</td>
<td>RMC384 kbps (for Performance test)</td>
</tr>
<tr>
<td>H-Set3 (16QAM)</td>
<td></td>
</tr>
<tr>
<td>H-Set4</td>
<td></td>
</tr>
<tr>
<td>H-Set5</td>
<td></td>
</tr>
</tbody>
</table>
Uplink: Parameter Editing

The following screen is displayed when HSDPA/HSUPA Uplink is chosen. The UL-DPCCH, UL-DPDCH, and HS-DPCCH parameters are set to generate the waveform pattern.

- **Normalize Power:** Sets Total Power to 0 dB, maintaining power ratio of all ON channels. For HS-DPCCH, the greatest value is chosen from ACK, NACK, and CQI and used for calculation.

- **Channel Edit:** Starts Channel Edit screen to set DPCH parameters.

- **HSUPA Edit:** Opens HSUPA Edit screen for setting E-DPDCH/E-DPCCH Physical Layer/Transport Layer parameters.
Uplink: Parameter Editing Screen

Channel Edit Screen

[Image of a software interface showing different parameters for channel editing, such as TrCH, TTI, Max. TrEk Size, and others, with fields for input and selection of values.]
Uplink: Parameter Editing Screen

HSUPA Edit Screen

- E-DPCCH Data: Coded
- E-DPDCH Data: E-DCH
- HS-DSCH Configured: No
- E-DPDCH Channel Codes: SF256
- E-DCH TTI: 10ms
- Information Bit Payload: 18
- E-DCH Payload Data: PN9fix
- E-TFCI Information: 0
- RSN: 0
- Pattern Length: 1
- E-DCH RV Index: 0
- CRC Error Insertion: Correct
- "Happy" Bit: 0
Waveform Generation: Calculation

After setting parameters, click the [Calculation] icon to generate the waveform pattern.

Generates waveform pattern

File name display area

File export destination folder

Name of waveform pattern package 31 characters max.

Name of waveform pattern file 20 characters max.

Comment on screen 38 characters max. per line
Calculation & Load & Play

After setting parameters, click the [Calculation] icon to generate the waveform pattern.

Calculation:
Generates a waveform pattern after parameters are set.
/Calculation/

Calculation & Load:
After waveform generation is finished, the created waveform pattern is loaded into the MG3710A waveform memory.
/Calculation/ > /Load/

Calculation & Play:
After waveform generation is finished, the created waveform pattern is loaded and selected at the MG3710A waveform memory.
/Calculation/ > /Load/ > /Select/
File size of waveform patterns

The presence/absence of the ARB Memory Expansion (option) and Baseband Signal Combination Function (option) is selected. Selecting the ARB Memory Expansion (option) and the Baseband Signal Combination Function (option) generates a bigger waveform pattern, while selecting the Baseband Signal Combination Function (option) generates a waveform pattern. If an uninstalled option is selected, sometimes the created waveform pattern may not be usable. Set the combination of installed options based on the following setting items.

<table>
<thead>
<tr>
<th>Items</th>
<th>Combinations of Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory 64M samples</td>
<td>None</td>
</tr>
<tr>
<td>Memory 64M samples × 2</td>
<td>Option 48 and Option 78</td>
</tr>
<tr>
<td>Memory 256M samples</td>
<td>Option 45 or Option 75</td>
</tr>
<tr>
<td>Memory 256M samples × 2</td>
<td>Option 45 and Option 48 or Option 75 and Option 78</td>
</tr>
<tr>
<td>Memory 1024M samples</td>
<td>Option 46 or Option 76</td>
</tr>
<tr>
<td>Memory 1024M samples × 2</td>
<td>Option 46 and Option 48 or Option 76 and Option 78</td>
</tr>
</tbody>
</table>

The maximum size of the generated waveform pattern for each of the setting items is shown below.

<table>
<thead>
<tr>
<th>Items</th>
<th>Maximum Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory 64M samples</td>
<td>64M samples</td>
</tr>
<tr>
<td>Memory 64M samples × 2 (With Option 48, 78)</td>
<td>128M samples</td>
</tr>
<tr>
<td>Memory 256M samples</td>
<td>256M samples</td>
</tr>
<tr>
<td>Memory 256M samples × 2 (With Option 48, 78)</td>
<td>512M samples</td>
</tr>
<tr>
<td>Memory 1024M samples</td>
<td>512M samples</td>
</tr>
<tr>
<td>Memory 1024M samples × 2 (With Option 48, 78)</td>
<td>512M samples</td>
</tr>
</tbody>
</table>
File size of waveform patterns

MS2830A:

Select whether the ARB memory expansion option 256Msamples is installed.

Selecting With Option27 (Memory 256M samples) supports creation of larger waveform patterns. If the ARB memory expansion option is not installed, the generated waveform pattern may not be able to be used. Waveform patterns cannot be created with a size greater than 64M samples when Without Option27 (Memory 256M samples) is selected. Select either according to the presence of ARB memory expansion option.

<table>
<thead>
<tr>
<th>Model</th>
<th>Items</th>
<th>ARB Memory Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS2830A</td>
<td>With Option27 (Memory 256M samples)</td>
<td>1 GB</td>
</tr>
<tr>
<td></td>
<td>Without Option27 (Memory 256M samples)</td>
<td>256 MB</td>
</tr>
</tbody>
</table>

MS269xA:

ARB Memory Expansion (option) is not available for MS269xA. Only Memory 256M samples, 1 GB is available.