Product Introduction

Features of MG3700A

MG3700A
Vector Signal Generator

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Product Introduction

< Features of MG3700A >

ANRITSU CORPORATION

Features

♦Various communication systems are supported.

♦Pre-installed Waveform Patterns:
W-CDMA/HSDPA, GSM/EDGE, PDC, PHS, CDMA2000 1x/1xEV-DO, AWGN, *Bluetooth*®, GPS, Digital Broadcast(ISDB-T/BS/CS/CATV), WLAN (IEEE802.11a/11b/11g)

♦Optional Waveform Patterns:
- TD-SCDMA
- Public Radio System
(RCR STD-39, ARIB STD-T61/T79/T86)

♦ IQproducer (*Software license is optional)
Waveform generation software
- W-CDMA – AWGN
-3GPP LTE (FDD)* - HSDPA/HSUPA*
- TDMA* (PDC, PHS, ARIB, etc.)
- CDMA2000 1xEV-DO* - Multi-carrier*
- Mobile WiMAX* - DVB-T/H* - Fading*

♦ Arbitral Waveform Generator
IQ sample data files (in ASCII format) programmed by using general EDA (Electronic Design Automation) tools such as MATLAB® can also be converted to waveform patterns for MG3700A. And a custom-made waveform pattern file can be generated arbitrarily.

♦Performance and functions

♦Frequency Range 250 kHz to 6 GHz
250 kHz to 3 GHz (standard)
250 kHz to 6 GHz (option)

♦Wide vector modulation bandwidth
120 MHz (Internal base band generator)
150 MHz (External IQ input)

♦High level accuracy
+/- 0.5 dB (Absolute level accuracy)
+/- 0.2 dB typical (Linearity)

♦Waveform addition function
Two signals, such as wanted signal + interfering signal or wanted signal + AWGN, can be added and outputted.

♦Standard 20 Mbps BERT is built in.

♦40 Gbytes hard disk is built in.

♦Large capacity baseband memory.
1 Gbytes = 256 Msamples (standard)
2 Gbytes = 512 Msamples (option)

♦High speed waveform transmission by 100Base-TX LAN.

Various communication methods are supported

Pre-installed waveform patterns

W-CDMA, GSM/EDGE, PDC, PHS, CDMA2000 1x/1xEV-DO, AWGN, WLAN(IEEE802.11a/b/g), *Bluetooth*®, GPS, Digital Broadcast (ISDB-T/ BS/ CS/ CATV)

Anritsu product

Customer's item

Arbitrary IQ data
- C Language
- MATLAB
- Microwave Office

etc.

The waveform patterns are arbitrarily generated.

IQ sample data files (in ASCII format) programmed by using general EDA (Electronic Design Automation) tools such as MATLAB® can also be converted to waveform patterns for MG3700A. And a custom-made waveform pattern file can be generated arbitrarily.

TD-SCDMA
- RCR STD-39
- ARIB STD-T61/T79/T86

Waveform Pattern (option)

Waveform patterns of fixed parameter

Standard:
W-CDMA, AWGN
Option:
3GPP LTE(FDD), HSDPA/HSUPA, TDMA, CDMA2000 1xEV-DO, Mobile WiMAX, DVB-T/H Multi-carrier, Fading

IQproducer

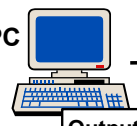
Free Generation of Waveform: EDA tool

Arbitrary waveform generation

For example, simulation result of MATLAB™ and the actual measurement result can be compared.

MATLAB™

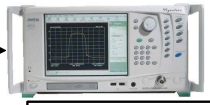
PC



MG3700A

DUT

MS2781A



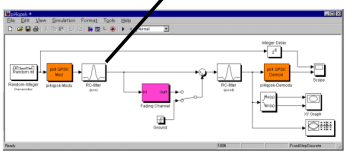
Modeling by MATLAB™, Simulation

Output the baseband (waveform) to the file in a text format.

Using IQproducer™, convert to the waveform data for MG3700A

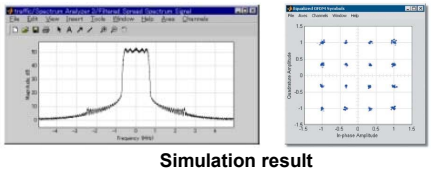
Generate signal by MG3700A. Measure DUT output by Spectrum Analyzer

Retrieve the measurement result to MATLAB™, and compare with the simulation result



Simulation model in MATLAB

Change parameter while confirming the simulation result



Simulation result

What is arbitrary signal generator (1/2)

Arbitrary waveform SG and real-time SG have different data creation methods in digital

●Arbitrary SG

- **Arbitrary waveform SG generates a waveform pattern in the outside PC along the set parameter as a waveform pattern in advance.**
- **The generated waveform pattern is transferred to HDD of the SG body.**
- **Signal is output after waveform pattern transfer from HDD to the waveform memory and selection of the desired waveform pattern.**

Merit

- **Waveform pattern generation enables any signal output.**
  ⇒Easy support for the future communication methods as well as various communication methods such as interfering signal.

Demerit

- **Waveform length is limited by the waveform memory .**
  (Usually, endless output is produced by repeat of fixed waveform pattern.)

●Real-time SG

- **When parameter is set on a screen of the SG body by user, the waveform pattern in line with parameter is generated inside SG to output signal.**

Merit

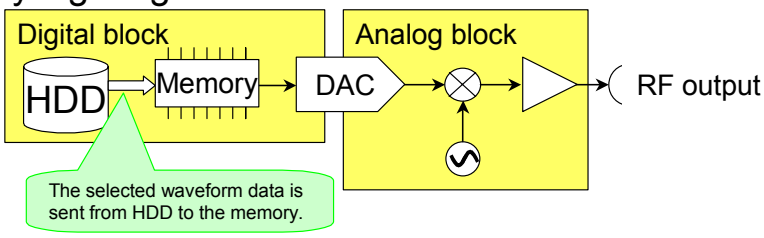
- **Better operability along with parameter setting/change.**

Demerit

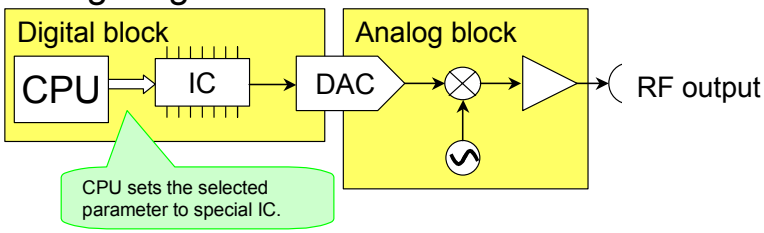
- **Only the signals of systems supportable by hardware can be generated.**
  ⇒Poor extensibility compared to arbitrary waveform SG

What is arbitrary signal generator (2/2)

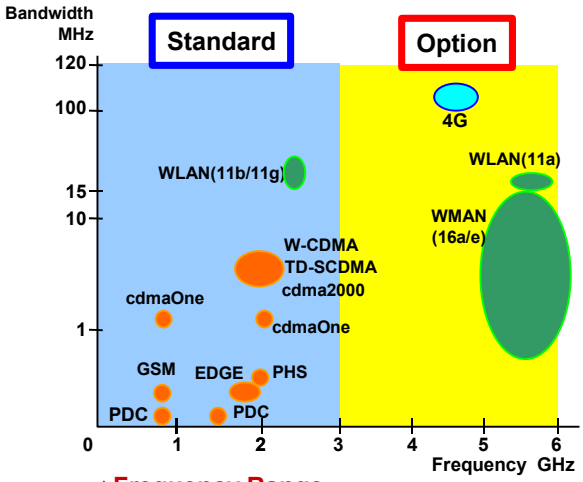
•Arbitrary signal generator



•Real-time signal generator



Basic performance



Realize performances of the frequency of 6GHz and the modulation bandwidth of 120MHz(inside)

Signal generator with hardware capacity to output signals of almost all the present communication methods by single set.

*except UWB

♦**Frequency Range**
250 kHz to 3 GHz (standard)
250 kHz to 6 GHz (option)

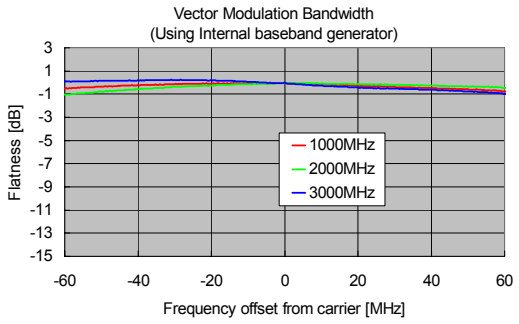
Choose either 250 kHz to 3 GHz (standard) or 250 kHz to 6 GHz (option) for the frequency range. A 6 GHz upper frequency is required for the WLAN 5 GHz band frequency and next-generation communication system support.

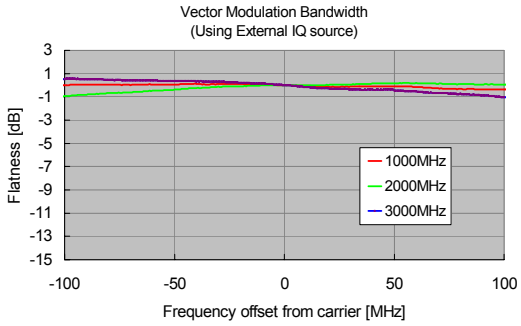
♦**Vector modulation bandwidth:**
150 MHz(Using External IQ input)
120 MHz(Using internal baseband signal generator)

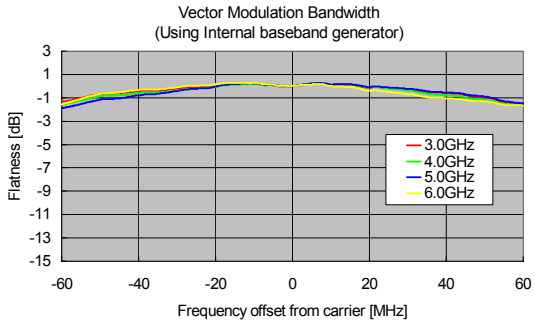
A wider RF modulation bandwidth of 120 MHz is achieved when internal baseband signal generation is used. Furthermore, 150 MHz vector modulation bandwidth is supported for up to 6 GHz frequency when the External IQ input is used.

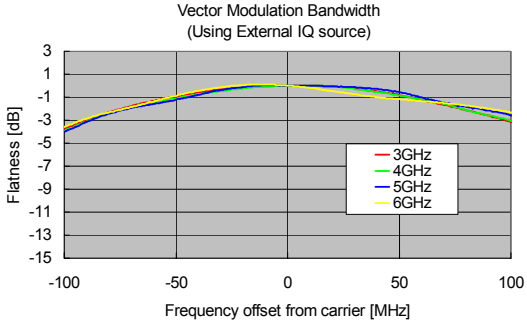
Basic performance

Wide vector modulation bandwidth



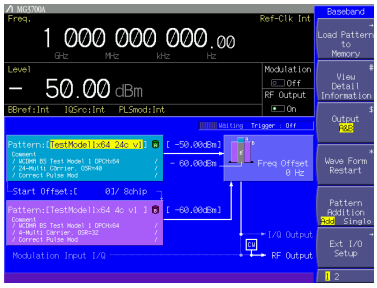


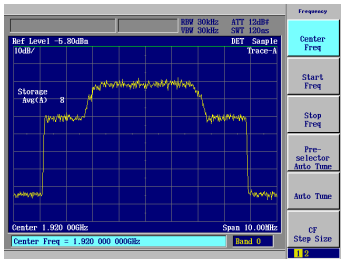




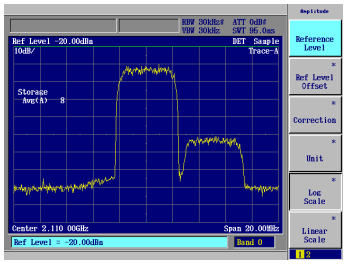
Waveform combine function

MG3700A contains two built-in arbitrary waveform memories, and these two memories can each choose one waveform pattern, respectively. MG3700A can output the signal of either one of the memories, and can also combine and output both signals simultaneously.





Wanted signal + AWGN



Wanted signal + Interfere signal

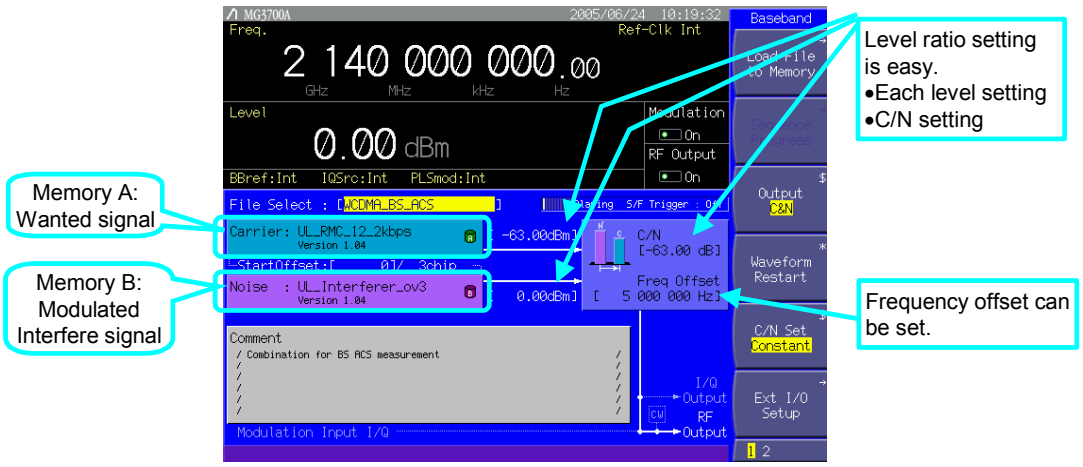
♦The receiving sensitivity test covers measurements using two signals, such as ACS (Adjacent Channel Selectivity) and the blocking characteristic.
♦The waveform combining function enables a single instrument to output a signal such as 'wanted signal + interfering signal' and 'wanted signal + AWGN'.
♦Since S/N adjustment is carried out by digital processing, the level ratio accuracy is excellent.

Waveform combine function

Offset frequency higher limit of each system

Communication system	MG3700A Freq Offset setting range MAX	Standardized frequency offset MAX
ARIB STD-T61 BS/UE	±62911 kHz	±6.25 kHz
ARIB STD-T79 BS/UE	±52416 kHz	±25 kHz
ARIB STD-T86 BS/UE	±36857 kHz	±15 kHz
Bluetooth	±37.9 MHz	-----
CDMA2000	±62.3 MHz	-----
CDMA2000 1xEV-DO	±62.2 MHz	-----
Digital Broadcast (BS)	±43.2 MHz	-----
Digital Broadcast (CATV)	±14.2 MHz	-----
Digital Broadcast (CS)	±48.5 MHz	-----
Digital Broadcast (ISDB-T)	±47.9 MHz	-----
GPS	±51.8 MHz	-----
GSM	±41.4 MHz	-----
PDC	±34.3 MHz	±0.2 MHz
PHS BS/UE	±39.1 kHz	±1.2 MHz
RCR STD-39	±52416 kHz	±25 kHz
TD-SCDMA	±31.9 MHz	-----
W-CDMA BS	±34.944 MHz	±10 MHz
W-CDMA UE	±47.232 MHz	±20 MHz
WLAN IEEE802.11a	±7.7 MHz	±25 MHz
WLAN IEEE802.11b/s	±6.6 MHz	±25 MHz

Waveform combine function



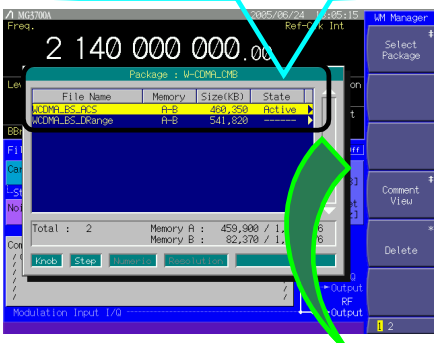
- ***Output 2 signals of "Wanted signal and modulated interfering signal" by a single set.***
- ***Level setting can be made by both each level and C/N***
- ***Frequency off –set can be set by direct input.***

Standard function

Characteristic of Waveform combine function

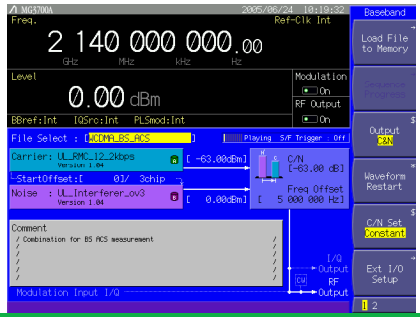
More useful ***Combination function !***

Various types of combination file are standard built-in !
W-CDMA_BS, PDC, PHS



If measurement is performed by combining the waveform patterns of a wanted signal and an interfering signal as in adjacent channel selectivity and blocking measurements, only by selecting a combination file enables to perform automatic settings for such as waveform pattern select, level and frequency offset.

The combination file is generated by selecting Transfer&Setting > Combination file edit function of the standard IQproducer.



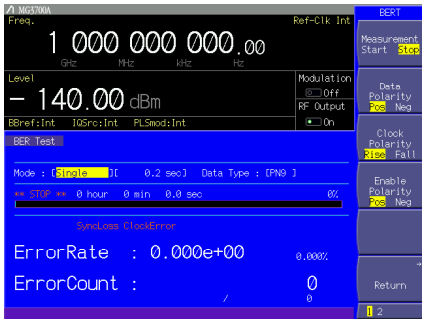
These operations are performed automatically only by selecting a combination file.

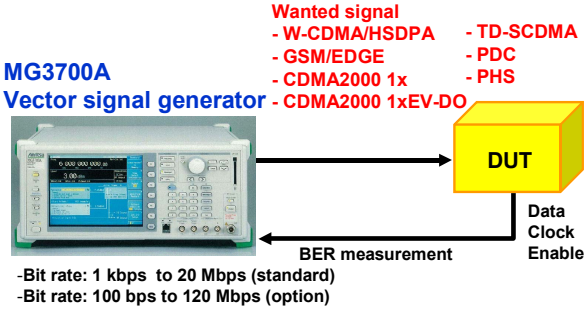
- Two Waveform Patterns
- Level Ratio
- Offset Frequency

Pre-installed BER analyzer

A BER analyzer is a standard feature, allowing BER measurement of the receiving characteristic to be performed.

Connector of the rear panel





♦The receiving sensitivity test covers the measurement item specified by BER (Bit Error Rate).
>>> Examples:W-CDMA, GSM, PHS, and PDC
♦Since the BER analyzer is built in as a standard feature, a receiver test can be carried out easily with a small footprint.

Optional BER analyzer

MG3700A-031: High Speed BER Test Function
Feature upgrade of the BER instrument such as extension of the input bit rate range by adding an optional BER instrument.

Comparison between standard BER measurement function and option BER measurement function

	MG3700A-031/131 High speed BER test function	Case used	Standard BER measurement function (Ver2.02 or later)
Input bit rate	**100 bps to 120 Mbps**	This can be used for WLAN and next-generation high-speed communications systems.	1 kbps to 20 Mbps
Data patterns	**PN9/11/15/20/23, all0, all1, 01, PN9fix/11fix/15fix/20fix/23fix, UserPattern**	PN*fix is a discontinuous PN data. BER measurement can be performed with the small-size waveform pattern using PN*fix even when the continuous data size is too large so that it exceeds MG3700A memory size such as PNPN23. In user pattern, text-stayle bit stream (binary) file can be loaded to the data sotrage. It is available for WiMAX where the voice data test or the fixed-pattern measurement is defined.	PN9/11/15/20/23, all0, all1, 0101
Input threshold level	**Adjustable**	Under the condition of"Auto Resync=OFF", measurement can be performed even at the error rate higher than the allawbvale rate of 1% in the production inspection process of conventional communication systems or the research development of W-CDMA and such. Moreover, The option enables continuous measurement can be performed by adjusting the threshold level in accordance with error frequency.	TTL
SyncLoss count function	**OK**	This can be used for continuous measurement even when synchronization loss occurs.	----

Optional BER analyzer

Comparison between standard BER measurement function and option BER measurement function

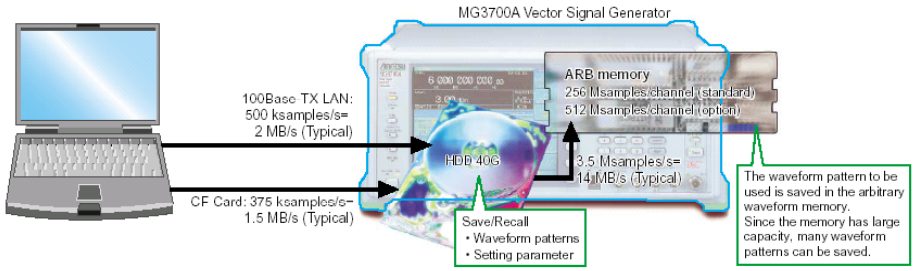
Function	MG3700A-031/131 High speed BER test function	Standard BER measurement function (Ver2.02 or later)
Input bit rate	100 bps to 120 Mbps	1 kbps to 20 Mbps
Measurable patterns	PN9/11/15/20/23, all0, all1, 01, PN9fix/11fix/15fix/20fix/23fix, UserDefine	PN9/11/15/20/23, all0, all1, 01
Input threshold level	Adjustable (0.20 to 3.00 V , 0.05 V step)	TTL
Input signal	Data, Clock, Enable	
Polarity reversal function	The Data, Clock, Enable polarities can be reversed.	
Adjustable range of input timing	–1 to 15 clock (Data/Enable is adjusted for input Clock.)	
Input impedance	50 ohm, High impedance	Hi-Z
Measurable BER	0 to 10% (Reference value. Changed by the condition of the communication system and the data rate.)	0% to 1% (Reference value. Changed by the condition of the communication system and the data rate.)
Auto Resync	On, Off (When On is set, it becomes SyncLoss by the error detecting condition of Threshold and the measurement is stopped. When Off is set, the detection of SyncLoss is not performed.) Threshold setting range: [numerator/denominator] Choose from denominat	On, Off (Threshold: 6 bit/64 bit)
Measurement mode	Single, Continuous, Endless	
Measurable count	error bit: 1 to 2147483647 bits bit count: 1000 to 4294967295 bits	Time: <359999.0 sec bit count: 1000 to 4294967295 bits
Display	Bit Error, SyncLoss, ClockError, Enable Error, SyncLoss Count, Overflow Data Count, Overflow Syncloss, Error Rate, Error Count	Bit Error, SyncLoss, ClockError, Enable Error, Error Rate, Error Count

Optional BER analyzer

Remote command compatibility

Function	Command	Standard BER measurement function (Ver2.02 or later)	MG3700A-031/131 High speed BER test function
BER Measurement Commands			
Clear BER Measurement Bit Count	BERCOUNTCLR	---	v
SyncLoss Count	BERSYNCLOSS?	---	v
BER Sync Loss Threshold	BERSYNCLOSSTHLD	---	v
Set Count Operation at SyncLoss Detection	BERSYNCLOSSACT	---	v
BER Stop Status	BERSTOPSTATUS?	---	v
Measurement condition			
Set Measurement Termination Condition	BERCOUNTMODE	TIME DATBIT	DATABIT ERRORBIT
Set Measurement Time	BERTIME	v	---
Set Measurement Error Bit Count	BERERRORBIT	---	v
PN Type	BERTYPE	PN9 to 23, ALL0/1, ALT	PN9 to 23, ALL0/1, ALT, PN9Fix to PN23Fix, USERPATTERN
I/F Setting			
Set Data Signal Threshold Level	BERDATATHLD	---	v
Set Clock Signal Threshold Level	BERCLKTHLD	---	v
Set Enable Signal Threshold Level	BERENBLTHLD	---	v
Data Delay	BERDATADELAY	---	v
Enable Delay	BERENBLDELAY	---	v
Input Impedance	BERINZ	---	v
PNFix pattern/User define pattern			
Initial Value of PN Pattern Used in PN Fix	BERPNINITIAL	---	v
Length of One Cycle of Pattern Used in PN Fix	BERPNFIXLENG	---	v
BER Sync Start Position on User Pattern	BERSYNCSTARTPOS	---	v
Specify Length of Part Used for Synchronization Judgment in User Defined Pattern	BERSYNCLENG	---	v
Specify User Defined Pattern Loading Source Media	BERLOADMEDIA	---	v
User Pattern File List	BERUSERPATLST?	---	v
Load User Defined Pattern	BERLOADUSERPAT	---	v
Name of Current User Defined Pattern File	BERUSERPAT?	---	v
Bit Length of Current User Defined Pattern File	BERUSERPATLENG?	---	v

Large capacity HDD & Memory



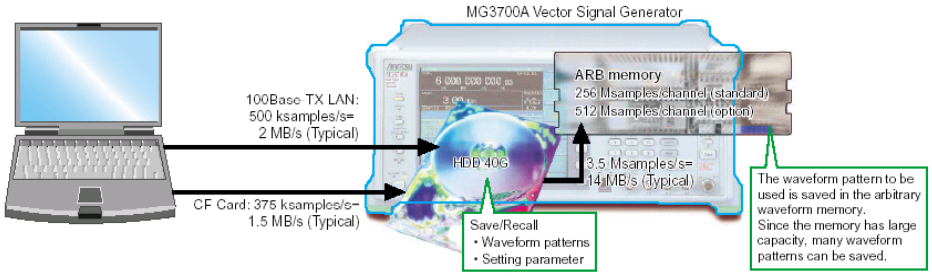
40Gbytes hard disk is built in.

Various large-capacity waveform patterns and MG3700A parameters can be saved to the 40 Gbyte hard disk. The transmission speed between the hard disk and the waveform memory is very high (14 Mbyte/s typical). If a hard disk breaks down, you can exchange it using the "HDD ASSY (option)" optional accessory.

Arbitrary waveform memory supports up to 2Gbytes
1 Gbytes = 256 Msamples/ch (standard)
2 Gbytes = 512 Msamples/ch (option)

Since the arbitrary waveform memory has a large capacity, many waveform patterns can be saved simultaneously. Waveform patterns are read from the hard disk and saved in memory, to be outputted instantly without accessing the hard disk again.
Although the standard MG3700A arbitrary waveform memory can save 256 Msamples/channel (128 Msamples/channel x 2) it is further extensible to 512 Msamples/channel (256 Msamples/channel x 2) as an option.

100Base-TX LAN



Transfer rate of waveform data:

PC to HDD 40G (By CF card)	**375 k sample/s = 1.5 MB/s**
PC to HDD 40G (By 100Base-Tx)	**500 k sample/s = 2 MB/s**
HDD 40G to ARB memory	**3.5 M sample/s = 14 MB/s**

As communication systems evolve into wide-band and high speed transmission, long waveform patterns must be transmitted. To accommodate such long patterns at high speed, the MG3700A supports 100BASE-TX LAN connections. When the waveform patterns of two or more MG3700A systems need to be updated, waveform data can be simultaneously transmitted to all MG3700A via LAN, so update time can be shortened.

Composition guide

Classification	Outline	Standard	Option	Note
Frequency range	250 kHz to 3 GHz	v		
	250 kHz to 6 GHz		v	**MG3700A-011: Upper Frequency 6 GHz**
Reference oscillator	Standard	v		Frequency: 10 MHz, Aging rate: ±1 × 10−7/year
	Rubidium Reference Oscillator		v	**MG3700A-011: Rubidium Reference Oscillator** Frequency: 10 MHz, Aging rate: ±1 × 10−10/Month
Attenuator	Electron Attenuator	v		
	Mechanical Attenuator		v	**MG3700A-002: Mechanical Attenuator** The electron attenuator mounted as standard is changed into mechanical attenuator.
Memory	1 Gbytes = 256 Msamples/ch	v		128 Msamples/channel × 2. It can be used as a maximum of 256 Msamples/channel.
	2 Gbytes = 512 Msamples/ch		v	**MG3700A-021: ARB Memory Upgrade 512 M sample** 256 Msamples/channel × 2. It can be used as a maximum of 512 Msamples/channel.
BER analyzer		v		Input bit rate: 1 kbps to 20 Mbps Measurable Patterns: PN 9/11/15/20/23, ALL0, ALL1, repetition of 0 and 1
			v	**MG3700A-031: High speed BER Test function** Input bit rate: 100 bps to 120 Mbps, Measurable Patterns: PN 9/11/15/20/23, ALL0, ALL1, repetition of 0 and 1, PN9fix/11fix/15fix/20fix/23fix, UserDefine
Base-band generator	Internal/External	v		Vector modulation band-width (Internal): 120 MHz Vector modulation band-width (External): 150 MHz
Hard disk	40 Gbytes	v		A non-volatile hard disk for saving various waveform patterns and parameters of MG3700A.
Waveform patterns software	W-CDMA, GSM/EDGE, PDC, CDMA2000 1x/1xEV-DO, WLAN(IEEE802.11a/b/g), PHS, AWGN, Bluetooth, Digital Broad Cast(BS, CS, CATV, ISDB-T)	v		These waveform patterns are stored in the hard disk as standard. License is not required in order to use these.
	TD-SCDMA		v	**MX370001A TD-SCDMA Waveform Pattern**
	Public Radio System (ARIB STD-T61/T79/T86)		v	**MX370002A Public Radio System Waveform Pattern**
IQproducer License for each system	HSDPA/HSUPA		v	**MX370101A HSDPA IQproducer**
	TDMA		v	**MX370102A TDMA IQproducer**
	1x EV-DO		v	**MX370103A CDMA2000 1xEV-DO IQproducer**
	Multi-carrier		v	**MX370104A Multi-carrier IQproducer**
	Mobile WiMAX		v	**MX370105A Mobile WiMAX IQproducer**
	DVB-T/H		v	**MX370106A Mobile WiMAX IQproducer**
	Fading		v	**MX370107A Fading IQproducer**
	3GPP LTE (FDD)		v	**MX370108A LTE IQproducer**

MG3700A Vector signal generator
Standard accessory software

Introduction of IQproducer

A part of function needs a license for a fee.

Useful functions of the waveform generation software IQproducer 1/7

Functions of IQproducer

IQproducer is PC application software, that can generate waveform patterns and transmit them to MG3700A. IQproducer™ is provided with MG3700A as a standard feature, and has the following four functions.

100Base-TX LAN

IQproducer

MG3700A Vector signal generator

- Parameter setting function
- Simulation function
- File generation function
- Data transfer function

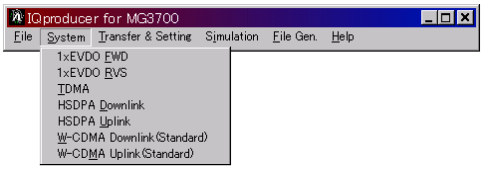
Useful functions of the waveform generation software IQproducer 2/7

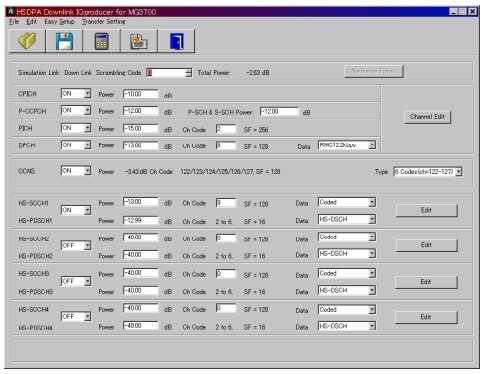
Parameter setting function: System

The IQproducer™ System function has a graphical user interface corresponding to each communication system so you can set up parameters easily. A file with the resulting parameter settings can also be saved and recalled.

After trying the waveform pattern generation function with the IQproducer™ System function, in order to actually use a waveform pattern in MG3700A the license (option) corresponding to each system is required.

[IQproducer (Standard function)]
W-CDMA IQproducer
AWGN IQproducer
[IQproducer (Optional function)]
MX370101A HSDPA IQproducer
MX370102A TDMA IQproducer
MX370103A 1xEV-DO IQproducer
MX370104A Multi-carrier IQproducer
MX370105A Mobile WiMAX IQproducer
MX370106A DVB-T/H IQproducer
MX370107A Fading IQproducer
MX370108A LTE IQproducer



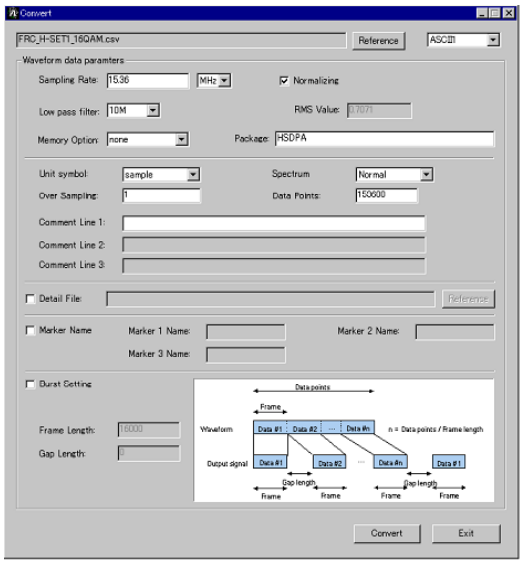


HSDPA IQproducer setting screen sample

Useful functions of the waveform generation software IQproducer 3/7

File generation function: File Gen.>Convert

The IQ sample data files in ASCII format programmed by general signal generation software (such as MATLAB) can also be converted to waveform patterns for MG3700A. This enhances the convenience of MG3700A for research/development simulation use, since custom-made waveform pattern files can be freely generated.

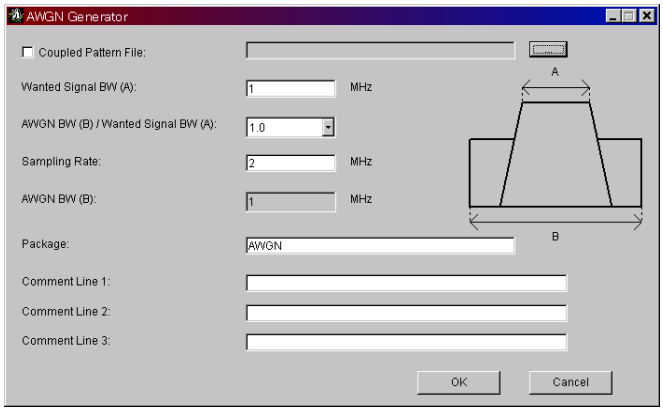


Convert screen

Useful functions of the waveform generation software IQproducer 4/7

File generation function: File Gen.>AWGN

This function establishes the sampling rate and bandwidth, allowing any AWGN waveform pattern to be created. In addition, when the first combined waveform pattern (Wanted Signal) is selected, the Wanted Signal bandwidth and sampling rate are set automatically. The resulting AWGN waveform pattern and an existing waveform pattern can be combined, which is useful for base-station dynamic-range measurements.

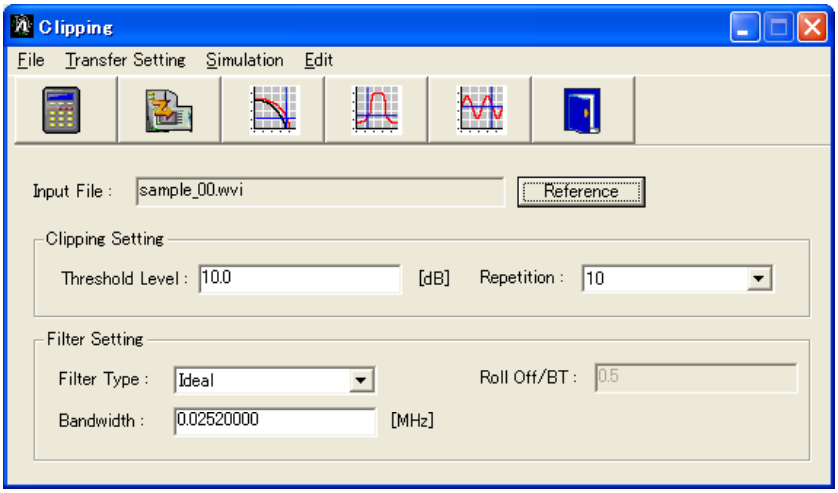


AWGN screen

Useful functions of the waveform generation software IQproducer 5/7

File generation function: File Gen.>Clipping

This function performs clipping of each type of waveform pattern. The clipped waveform pattern is created by setting the filter, bandwidth, and repletion times.

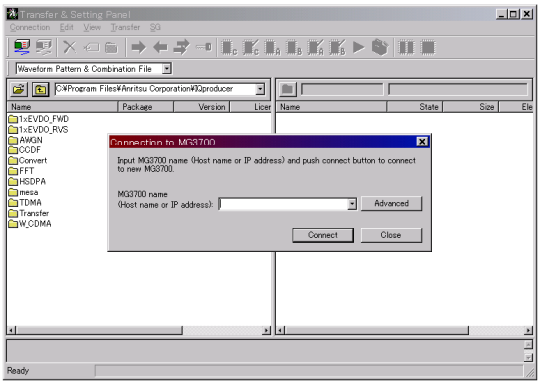


Clipping screen

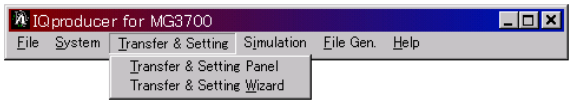
Useful functions of the waveform generation software IQproducer 6/7

Data transfer function: Transfer and Setting

A PC and the MG3700A can be connected via 100BASE-TX Ethernet, and data such as a waveform pattern generated by IQproducer a picture file, or a firmware upgrade file can be transmitted. Since waveform patterns can also be transmitted in a single procedure when multiple MG3700As are connected via a LAN, operating time is reduced. Moreover, waveform patterns on the MG3700A hard disk can be saved by remote control in the arbitrary waveform memory, and a waveform pattern can also be chosen to output.



Transfer & Setting screen



Useful functions of the waveform generation software IQproducer 7/7

Simulation function: CCDF, FFT, Time Domain

This function displays CCDF (Complimentary Cumulative Distribution Function), FFT (Fast Fourier Transform), or Time Domain graphs for the generated waveform pattern on the PC. It allows the waveform pattern to be checked graphically before transfer to the MG3700A.

CCDF graph:

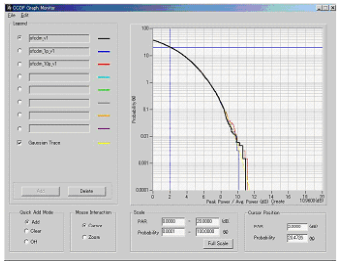
The generated waveform pattern is read automatically and the CCDF graph of a maximum of eight waveform patterns can be displayed.

FFT graph:

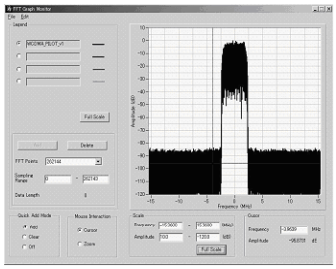
The generated waveform pattern is read automatically and the FFT graph of a maximum of four waveform patterns can be displayed.

Time Domain graph:

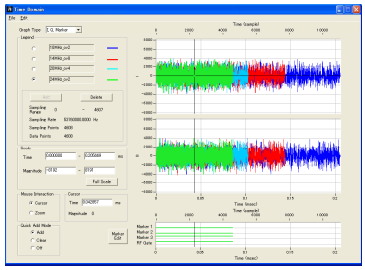
The generated waveform pattern is read automatically and the Time Domain graph for up to four waveform patterns is displayed.



CCDF graph



FFT graph



Time Domain graph

Ordering information

Model/Order No.	Name	Remarks
— Mainframe —		
MG3700A	Vector Signal Generator	
— Standard accessories —		
J0017F	Power cord, 2.6 m	1 pc
J1276	LAN Straight cable	1 pc, 10 cm, For U link connection on Rear panel
P0020	Compact Flash 64 MB	1 pc
J1254	Compact Flash Adapter	1 pc
Z0742	MG3700A CD-ROM	1 pc, Main frame operation manual, IQproducer operation manual, Standard waveform operation manual, IQproducer software
— Options —		
MG3700A-001	Rubidium Reference Oscillator	Aging rate: ±1 × 10–10/Month
MG3700A-002	Mechanical Attenuator	Standard Electron Attenuator is changed into Mechanical Attenuator.
MG3700A-011	Upper Frequency 6 GHz	Standard "250 kHz to 3 GHz" is extended to "250 kHz to 6 GHz."
MG3700A-021	ARB Memory Upgrade 512 M sample	Standard "128 Msample/channel × 2" is extended to "256 Msample/channel × 2."
MG3700A-031	High Speed BER Test Function	Standard "1 kbps to 20 Mbps" is extended to "100 bps to 120 Mbps."
— Softwares (Waveform pattern) —		
MX370001A	TD-SCDMA Waveform Pattern	
MX370002A	Public Radio System Waveform Pattern	RCR STD-39, ARIB STD-T61/T79/T86
— Softwares (License Key for IQproducer system) —		
MX370101A	HSDPA/HSUPA IQproducer	
MX370102A	TDMA IQproducer	
MX370103A	CDMA2000 1xEV-DO IQproducer	
MX370104A	Multi-carrier IQproducer	
MX370105A	Mobile WiMAX IQproducer	
MX370106A	DVB-T/H IQproducer	
MX370107A	Fading IQproducer	
MX370108A	LTE IQproducer	
— Optional accessories —		
J1261D	Ethernet Cable (Shield Type)	Cross, 3 m
Z0777	Standard waveform pattern upgrade kit	DVD set of pre-install wave form pattern of latest version
G0141	HDD ASSY	Exchange HDD when built-in HDD break.
J1277	IQ Output Conversion Adapter	Cable that converts IQ output connector (D-sub) of mainframe into BNC

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Specifications are subject to change without notice.

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