

Data Timing Generator

► DTG5078 • DTG5274 • DTG5334



New serial data standards, expanding networks and ubiquitous computing continually redefine the cutting-edge of technology. The design engineer is challenged to economize without sacrificing performance.

The DTG5000 Series combines the power of a data generator with the capabilities of a pulse generator in a versatile, bench-top form factor, shortening the duration of complex test procedures and simplifying the generation of low-jitter, high-accuracy clock signals, parallel or serial data across multiple channels. Its modular platform allows you to easily

configure the performance of the instrument to your existing and emerging needs to minimize equipment costs. Three mainframes and five plug-in output modules combine to cover a range of applications from legacy devices to the latest technologies. In addition, eight low-current, independently-controlled DC outputs can substitute for external power supplies. Each mainframe incorporates a full complement of auxiliary input and output channels to easily integrate with other instruments, such as oscilloscopes and logic analyzers, to create a flexible and powerful lab.

► Features & Benefits

Versatile Platform Combines Features of Data Generator, Pulse Generator and DC Source

Up to 3.35 Gb/s Data Rate

From 1 to 96 Data Channels (Master/Slave)

Class Leading Delay Resolution of 0.2 ps (DTG5274/DTG5334), 1 ps (DTG5078), Up to 600 ns of Total Delay

Advanced Control Over Signal Parameters to Meet Most Current Testing Needs, Including Stressed Eye Generation

- External Jitter Injection (DTGM31, DTGM32 Modules)
- Level Control with 5 mV Resolution

Easy to Use and Learn Shortens Time to Test

- Easily Configure with Plug-in Modules
- Intuitive Windows User Interface
- Benchtop Form Factor

Up to 64 Mb Pattern Depth Per Channel for Complex Data Patterns

► Applications

Semiconductor Device Functional Test and Characterization

- Support for Semiconductor Technologies from TTL to LVDS

Compliance and Interoperability Testing to Emerging Standards

- PCI-Express
- Serial ATA/2
- InfiniBand
- XAUI
- HDMI/DVI

Magnetic and Optical Storage Design

- Research, Development and Test of Next-generation Devices (HDD, DC/DVD, Blue-ray)

Data Conversion Device Design

- Characterization and Test of Next-generation D/A Convertors

Jitter Transfer and Jitter Tolerance Testing

Data Timing Generator

► DTG5078 • DTG5274 • DTG5334

► Characteristics

Mainframe Characteristics

Basic Features

Platform –

Benchtop mainframe with cold swappable plug-and-play plug-in output modules. Mainframes accept any combination of output modules.

Number of Slots for Output Modules –

DTG5078: 8 slots (A, B, C, D, E, F, G, H).

DTG5274: 4 slots (A, B, C, D).

New DTG5334: 4 slots (A, B, C, D).

Master-Slave Capabilities –

DTG5078: Up to three DTG5078 mainframes can be connected in Master-Slave configuration.

DTG5274: Up to two DTG5274 mainframes can be connected in Master-Slave configuration.

DTG5334: Up to two DTG5334 mainframes can be connected in Master-Slave configuration.

Operating Modes –

Pulse Generator Mode (slots A to D only).

Data Generator Mode.

Output Patterns –

NRZ, RZ, R1, Pulse patterns (DTG5078/5274/5334: Slot A-D; DTG5078 Slot E-H, NRZ only).

Timing Parameters

Data Rate Range –

DTG5078:

NRZ: 50 Kb/s to 750 Mb/s.

RZ, R1, Pulse Mode: 50 Kb/s to 375 Mb/s.

DTG5274:

NRZ: 50 Kb/s to 2.7 Gb/s.

RZ, R1, Pulse Mode: 50 Kb/s to 1.35 Gb/s.

DTG5334:

NRZ: 50 Kb/s to 3.35 Gb/s

RZ, R1, Pulse Mode: 50 Kb/s to 1.675 Gb/s

Data Rate (Setting) Resolution –

Internal Clock: 8 digits.

External Clock: 4 digits.

External Phase Lock In: 4 digits.

Output Timing Controls

Delay Range –

PG Mode: 0 to 3 μ s.

DG Mode:

Long Delay Off: 0 to 5 ns (NRZ, RZ, R1).

Long Delay On: NRZ:

Period ≥ 1.25 ns: 0 to 300 ns (Hardware sequence) or to 600 ns (Software sequence).

Period < 1.25 ns: 0 to (240 ns x period) (Hardware sequence) or to (480 ns x period) (Software sequence).

Long Delay On: RZ/R1:

Period ≥ 2.5 ns: 0 to 300 ns (Hardware sequence) or to 600 ns (Software sequence).

Period < 2.5 ns: 0 to (120 ns x period) (Hardware sequence) or to (240 ns x period) (Software sequence).

Delay Resolution –

DTG5078: 1 ps.

DTG5274/DTG5334: 0.2 ps.

Phase Resolution – 0.1%.

Differential Timing Offset Feature (between pair of two adjacent channels [Odd and Even]) –

Range: –1.0 to 1.0 ns.

Resolution:

DTG5078: 1 ps.

DTG5274/DTG5334: 0.2 ps.

Semiautomatic Deskew Calibration –

Range: 500 ps.

Accuracy (after skew calibration):

100 ps, slots A to D.

200 ps, slots E to H (DTG5078 only).

Duty Cycle Adjustment Range –

0 to 100% (with 0 delay setting, RZ, R1, Pulse mode only).

Duty Cycle Adjustment Resolution – 0.1%.

Pulse Width Maximum Range –

290 ps to (period – 290 ps) (RZ, R1, Pulse mode only).

(Range also depends on delay settings.)

Pulse Width Resolution – 5 ps.

Jitter Performance

(Output Channels)

Clock Pattern (“1010...” Clock Pattern)

Random Jitter –

DTG5078: < 4 ps_{RMS} (at 750 Mb/s with DTGM21, $0.8 V_{pk-pk}$, delay: 0.0 ns).

DTG5274: < 3 ps_{RMS} (at 2.7 Gb/s with DTGM30, $0.8 V_{pk-pk}$, delay: 0.0 ns).

DTG5334: < 3 ps_{RMS} (at 3.35 Gb/s with DTGM30, $0.8 V_{pk-pk}$, delay: 0.0 ns).

Data Pattern (PRBS pattern 2¹⁵-1)

Total Jitter –

DTG5078: at 750 Mb/s

< 18 ps_{RMS}, < 85 ps_{pk-pk} (typical) with DTGM21, $0.8 V_{pk-pk}$, delay: 0.0 ns).

DTG5274: at 2.7 Gb/s

< 16 ps_{RMS}, < 60 ps_{pk-pk} (typical) with DTGM30, $0.8 V_{pk-pk}$, delay: 0.0 ns).

< 14 ps_{RMS}, < 60 ps_{pk-pk} (typical) with DTGM31, $0.8 V_{pk-pk}$, delay: 0.0 ns).

DTG5334: at 3.35 Gb/s.

< 13 ps_{RMS}, 50 ps_{pk-pk} (typical) with DTGM30 and DTGM31, $0.8 V_{pk-pk}$, delay: 0.0 ns).

Signal Control Features

Cross-point Adjustment (Duty Cycle Distortion) –

Range: 30% to 70%.

Resolution: 2%.

(Slots A to D, and DTGM30/DTGM31/DTGM32 used in NRZ mode.)

Jitter Generation –

Jitter All or Partial Pattern.

Jitter Profile: Sine, Gaussian Noise, Square, Triangle.

Jitter Freq./Res.: 0.015 Hz to 1.56 MHz/1 mHz.

Jitter Amplitude: Up to $16.5 U_{pk-pk}$ (depending on data rate and jitter frequency).

(Internal Jitter Generation available on Channel A1 only.)

► Maximum Number of Output Channels

Number of Like Mainframes	DTG5078 ^{†1}			DTG5274, DTG5334 ^{†1}		
	DTGM21	DTGM30	DTGM31 DTGM32	DTGM21	DTGM30	DTGM31 DTGM32
1	32	16	3	8	8	4
2	64	32	6	16	16	8
3	96	48	9	—	—	—

^{†1} The DTG5078 has a limit to the number of modules that may be installed; the total must be less than 100. The coefficient for each module is shown below.
 DTGM30: 8, DTGM21: 10, DTGM31: 33, DTGM32: 32.

Pulse and Data Features
Pulse Generator (PG) Features (Unique to PG Mode) –
 Continuous or Burst.
 Burst Count: 1 to 65,536.
 Pulse Rate: Off, 1/1, 1/2, 1/4, 1/8, 1/16.

Data Patterns
Pattern Length per Channel (Pattern Memory) –
 Minimum:
 DTG5078: 1 bit (software mode) or 240 bits (hardware mode).
 DTG5274 / DTG5334: 1 bit (software mode) or 960 bits (hardware mode).
 Maximum:
 DTG5078: 8,000,000 bits.
 DTG5274: 32,000,000 bits (in multiples of four).
 DTG5334: 64,000,000 bits (in multiples of four).

Built-in Data Patterns –
 Binary Counter, Johnson Counter, Graycode Counter, Walking Ones, Walking Zeros, Checker Board, User Defined Patterns.

Pattern Import Capability –
 Type/Tools:
 Tektronix TLA Data Exchange Format File (*.txt).
 Tektronix HFS Vector File (ASCII) (*.vca).
 Tektronix HFS Vector File (binary) (*.vcb).
 Tektronix AWG2000 Series (*.wfm).
 Tektronix AWG400s/500s/610/710/710B (*.pat).
 Tektronix DG2000 Series (*.dat).

Medium/Pass:
 Import data via GPIB, LAN, CD-ROM, floppy drive, USB memory devices.

Pattern Copy and Paste Capability –
 Copy, paste, and rotation between data listing/waveform editor and spreadsheet software (e.g. Excel) via clipboard.

PRBS/PRWS Data Patterns –
 (Note: Memory supports PRBS/PRWS patterns and user can create errored PRBS.)
 2⁵-1, 2⁶-1, 2⁷-1, 2⁸-1, 2⁹-1, 2¹⁰-1, 2¹¹-1, 2¹²-1, 2¹³-1, 2¹⁴-1, 2¹⁵-1, 2²³-1.

Sequencer Features
Sequence Length –
 1 to 8,000 steps for main sequence.
 1 to 256 steps for sub-sequence.
Max. Number of Blocks – 8,000.
Max. Number of Sub-Sequences – 50.
Repeat Counter – 1 to 65,536 or infinite.
Channel Addition – AND or XOR (slots A to D only).
 Note: DTG5078 slots E, F, G and H do not support the following: RZ, R1, pulse generation modes which includes controls for trail delay/duty cycle/pulse width, channel addition and variable cross-points.

Auxiliary Channels

Clock Out Connector –
 Complementary output (common offset and ground).
 DTG5078/DTG5274: SMA rear panel.
 DTG5334: SMA front panel.

Frequency Range –
 DTG5078: 50 kHz to 750 MHz.
 DTG5274: 50 kHz to 2.7 GHz.
 DTG5334: 50 kHz to 3.35 GHz.

Frequency Resolution –
 8 digit setting resolution.
 Minimum: 1 mHz (e.g. with 50,000.000 Hz setting).
Internal Clock Accuracy – Within ±1 ppm.
Jitter –
 DTG5078: <2 ps_{RMS} at 750 Mb/s, at 0.8 V_{pk-pk} (typical).
 DTG5274: <2 ps_{RMS} at 2.7 Gb/s, at 0.8 V_{pk-pk} (typical).
 DTG5334: <2 ps_{RMS} at 3.35 Gb/s, at 0.8 V_{pk-pk} (typical).
Amplitude/Resolution –
 0.03 V_{pk-pk} to 1.25 V_{pk-pk}/10 mV (50 Ω).
 0.06 V_{pk-pk} to 2.5 V_{pk-pk}/10 mV (1 MΩ).
Output Voltage Window –
 -2.0 to 2.47 V (50 Ω).
 -2.0 to 7.00 V (1 MΩ).
Max. Output Current – ±80 mA.
Transition Times (20% to 80%) –
 DTG5078:
 <85 ps (Amplitude = 0.1 V_{pk-pk}, Offset = 0 V) (typical).
 <100 ps (Amplitude = 1.0 V_{pk-pk}, Offset = 0 V) (typical).
 DTG5274:
 <70 ps (Amplitude = 0.1 V_{pk-pk}, Offset = 0 V) (typical).
 <80 ps (Amplitude = 1.0 V_{pk-pk}, Offset = 0 V) (typical).
 DTG5334:
 <100 ps (Amplitude = 1.0 V_{pk-pk}, Offset = 0 V) (typical).
Overshoot –
 <10%, at High = 1.0 V, Low = 0 V into (50 Ω) (typical).

Data Timing Generator

▶ DTG5078 • DTG5274 • DTG5334

Other Output Channels

Auxiliary DC Outputs –

–3.0 to 5.0 V/10 mV, Max. current: ±30 mA,
8 independently controlled outputs, Connector: 2 x 8
pin header on front panel.

Sync Out –

CML (current mode logic), VOH: 0 V , VOL: –0.4 V
(50 Ω) (typical), SMA Connector, SE, Front panel,
Rise/Fall Time (20 to 80%): 140 ps, Delay to Data
Out: –4.5 ns (typical).

10 MHz Reference Out –

1.2 V_{pk-pk} (50 Ω, AC coupled) (typical), 2.4 V_{pk-pk}
(1 MΩ, AC coupled) (typical), BNC Connector,
Rear Panel.

Input Channels

External Clock In –

Input Ranges:

DTG5078: 1 MHz to 750 MHz. SMA Connector,
Rear Panel.

DTG5274: 1 MHz to 2.7 GHz. SMA Connector,
Rear Panel.

DTG5334: 1 MHz to 3.35 GHz. SMA Connector,
Front Panel.

0.4 V_{pk-pk} to 2 V_{pk-pk} (50 Ω, AC Coupled), 50% ±5%
duty cycle.

10 MHz Reference In –

Input Ranges:

10 MHz ±0.1 MHz, 0.2 V_{pk-pk} to 3 V_{pk-pk} (50 Ω,
AC coupled), BNC Connector, Rear Panel.

Phase Lock In –

Input Ranges:

1 MHz to 200 MHz, 0.2 V_{pk-pk} to 3 V_{pk-pk} (50 Ω,
AC coupled), BNC Connector, Rear Panel.

Skew Cal In –

Single-ended, ECL (into 50 Ω to –2 V), SMA
Connector, Front Panel.

Trigger In –

Input Ranges:

–5 V to 5 V (50 Ω), 0.1 V resolution, –10 V to
10 V (1 kΩ), Min. 0.5 V_{pk-pk} (50 Ω), 1.0 V_{pk-pk} (1 kΩ),
Min. 20 ns pulse width, Positive or Negative edge
trigger, Delay timing: See manuals, BNC Connector,
Front Panel.

Event In –

Input Ranges:

–5 V to 5 V (50 Ω), 0.1 V resolution, –10 V to 10 V
(1 kΩ), 0.1 V resolution, Min. 0.5 V_{pk-pk} (50 Ω),
1.0 V_{pk-pk} (1 kΩ), Polarity: Normal or Invert, Delay
timing: See manuals, BNC Connector, Front Panel.

Instrument Control/Data

Transfer Ports

GPIB –

GPIB for remote control and data transfer. (Conforms
to IEEE 488.1, compatible with IEEE 488.2 and
SCPI-1999.0).

LAN –

LAN for PC interface, remote control and data
transfer (conforms to IEEE 802.3).

▶ Environmental

	Operating	Non-operating
Temperature	+10 °C to +40 °C	–20 °C to +60 °C
Humidity	20% to 80% relative humidity with a maximum wet bulb temperature of 29.4 °C, non-condensing	(no diskette in floppy drive): 5% to 90% relative humidity with a maximum wet bulb temperature of 40 °C, non-condensing
Altitude	3,000 m (10,000 ft.)	12,000 m (40,000 ft.)
Random Vibration	2.65 m/s ² RMS (0.27 G _{RMS}), from 5 Hz to 500 Hz, 10 minutes	22.36 m/s ² _{RMS} (2.28 G _{RMS}) total from 5 Hz to 500 Hz, 10 minutes each axis 3-axes. 30 minutes total

Computer System and Peripherals

CompactPCI based PC, Celeron 566 MHz CPU,
Microsoft Windows 2000 Professional, 128 MB
SDRAM, 20 GB Hard Drive, 1.44 MB floppy drive
on front panel, CD-ROM in rear panel, included
USB compact keyboard and mouse.

PC I/O Ports

USB 1.1 compliant ports (3 total, 1 front, 2 rear),
PS/2 mouse and keyboard connectors (rear panel),
RJ-45 Ethernet connector (rear panel) supports
10Base-T and 100Base-Tx, VGA Out (rear panel),
RS-232C.

Physical Characteristics

Display Characteristics –

LCD color display, 800 (H) x 600 (V) (SVGA).

Mainframe

Dimensions	mm	in.
Height	266	10.5
Width	445	17.5
Length	462	19.7

Output Module

Dimensions	mm	in.
Height	33	1.3
Width	84	3.3
Length	133	5.2

Weight (approx.)	kg	lbs.
DTG5078	17.5	38.6
DTG5274	17.0	37.5
DTG5334	17.0	37.5
DTGM21	0.26	0.57
DTGM30	0.27	0.60
DTGM31	0.27	0.60
DTGM32	0.27	0.60

Mechanical Cooling – Required Clearance

Top and Bottom – 2 cm.

Side – 15 cm.

Rear – 7.5 cm.

Power Supply

Power Source – 100 to 240 VAC, 47 to 63 Hz.

Power Consumption – 560 W.

Safety –

UL61010B-1.

CAN/CSA-22.2 No. 1010.1.

EN61010-1/A2 1995.

Electromagnetic Compatibility (EMC) –

Europe:

EN61326 Class A.

EN61000-3-2, EN61000-3-3.

Australia/New Zealand:

AS/NZS 2064.

► Output Module Characteristics

Basic Features	DTGM21		DTGM30	DTGM31	DTGM32
Output Channels and Connections	4 single-ended (installed in DTG5078) 2 single-ended (DTG5274 / DTG5334) 4 SMA connectors		2 complementary channels 4 SMA connectors	1 complementary channel 2 SMA connectors	
Maximum Data Rate (Calculated by Transition Time)	700 Mb/s	1.1 Gb/s	3.35 Gb/s		350 Mb/s ^{*1}
Normal/Complement (Invert)	Selectable			—	—
Source Impedance	50 Ω	50 Ω/23 Ω (selectable)	50 Ω		
Enable/Disable	Yes (software switch)				
Output Channel Timing					
Transition Times (20% to 80%) (50 Ω)	<540 ps (VOL = 0.0, VOH = 1.0) (typical)	<340 ps (VOL = 0.0, VOH = 1.0) (typical)	<95 ps (VOL = 0.0, VOH = 0.1) (typical) <110 ps (VOL = 0.0, VOH = 1.0) (typical)		
	<1.5 ns (VOL = -1.0, VOH = 2.0) (typical)	<1.0 ns (VOL = -1.65, VOH = 3.7) (typical)			
Transition Time Control	Yes		No		
Slew Rate Control Range	0.65 V/ns to 1.3 V/ns into 50 Ω		—		
Setting Resolution	0.01 V/ns		—		
Channel Output Levels					
Amplitude/ Resolution	0.25 to 3.5 V _{pk-pk} /5 mV (into 50 Ω) 0.50 to 10.0 V _{pk-pk} /5 mV (into 1 MΩ)	0.25 to 5.35 V _{pk-pk} /5 mV (from 23 Ω source impedance into 50 Ω) 0.25 to 3.9 V _{pk-pk} / 5 mV (from 50 Ω source impedance into 50 Ω) 0.50 to 7.8 V _{pk-pk} / 5 mV (from 50 Ω source impedance into 1 MΩ)	0.03 to 1.25 V _{pk-pk} /5 mV (into 50 Ω) ^{*2} 0.06 to 2.5 V _{pk-pk} /5 mV (into 1 MΩ) ^{*2}		
Output Voltage Window	-1.5 V to 2.0 V (into 50 Ω) -3.0 V to 7.0 V (into 1 MΩ)	-1.65 V to 3.70 V (from 23 Ω source impedance into 50 Ω) -1.2 V to 2.7 V (from 50 Ω source impedance into 50 Ω) -2.4 V to 5.4 V (from 50 Ω source impedance into 1 MΩ)	-2.0 V to 2.47 V (into 50 Ω) -2.0 V to 7.0 V (into 1 MΩ)		
DC Accuracy	(±3% of the set value) ±50 mV into 50 Ω to GND				
Limit Setting	High and low level limits can be set				
Maximum Output Current	±40 mA		±80 mA		
Overshoot	<16% (typical) at High = 1.0 V, Low = 0 V	<15% (typical) at High = 1.0 V, Low = 0 V	<10% (typical) at High = 1.0 V, Low = 0 V		
Typical Support Native Logic	TTL, CMOS	TTL, CMOS, (P)ECL, LVPECL	LVDS, CMOS, (P)ECL, LVPECL, CML		
External Jitter Control	No			Yes	

*1 Minimum pulse width >2.86 ns.

*2 Maximum output amplitude is dependent on output voltage window (offset). (See Figure 1, next page.)

Data Timing Generator

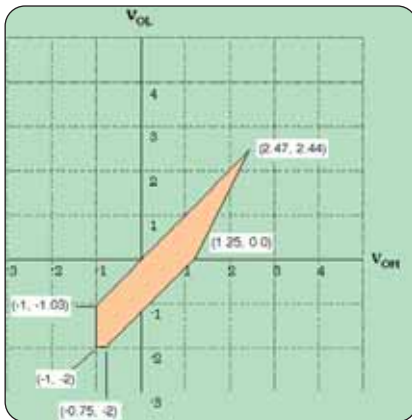
▶ DTG5078 • DTG5274 • DTG5334

▶ Output Module Characteristics (continued)

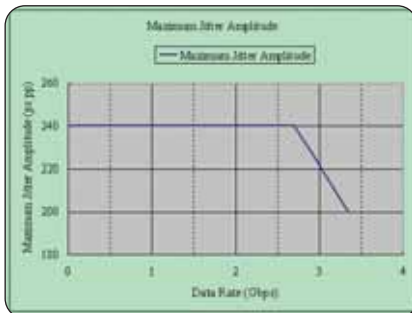
Basic Features	DTGM21	DTGM30	DTGM31	DTGM32
External Jitter Control Input Channels and Connectors			1 single-ended channel 1 SMA connector	2 single-ended channels 2 SMA connectors
Input Range			-0.5 V to +0.5 V (typical) Max input: -1.0 V to +1.0 V	-0.5 V to +0.5 V
Jitter Frequency			DC to 250 MHz ^{*3}	DC to 50 MHz
Jitter Amplitude			240 ps _{pk-pk} for 1 V _{pk-pk} input at Data rate ≤2.7 Gb/s ^{*4}	Range 1: Up to 1 ns at 1 V _{pk-pk} Range 2: Up to 2 ns at 1 V _{pk-pk}
External Tri-state (Hi Z) Control	No	Yes (SMB input connector)		No
Tri-state Enable	—	Enable: Hi 3.3 V, disable Lo: 0.0 V		—
Control Channels	—	By output module level		—
Delay Time from Inhibit In to Data Output	—	Active to Inhibit: 13 ns, Inhibit to Active: 12 ns		—

^{*3} up to 400 MHz by overdriving jitter input (max -1.0 V to +1.0 V_{pk-pk}). (See Figure 2.)

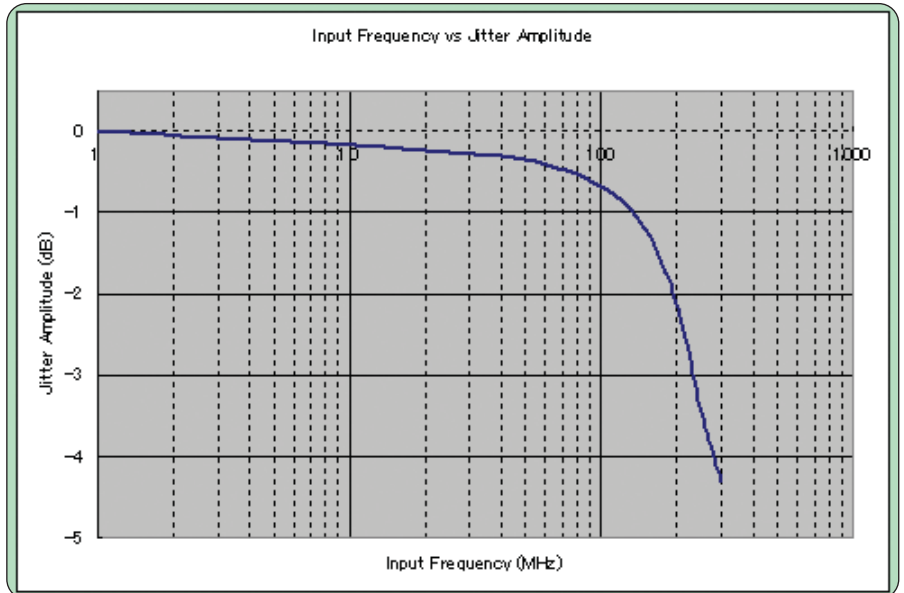
^{*4} Jitter amplitude at data rates >2.7 Gb/s calculated as (240 - 61.5 x (data rate - 2.7)) ps_{pk-pk} for 1 V_{pk-pk} input. (See Figure 3.)



▶ Figure 1. DTGM30, M31, M32 Output Amplitude vs. Offset.



▶ Figure 3. DTGM31 Maximum Jitter Amplitude vs. Data Rate.



▶ Figure 2. DTGM31 Jitter Input Frequency Response.

► Ordering Information

Mainframes

DTG5078

750 Mb/s, 8-slot mainframe.

DTG5274

2.7 Gb/s, 4-slot mainframe.

DTG5334

3.35 Gb/s, 4-slot mainframe.

Mainframes Include: Microsoft Windows 2000 Professional operating system recovery disk, DTG5000 Series application software install disk, user manual (volumes I and II), programmers manual, technical reference, registration card, accessory pouch, front cover, compact USB keyboard, USB mouse, lead set for DC Output, 16-CON, twisted pair, 24 in. (60 cm), 50 Ω SMA terminator (male, DC to 18 GHz), SMA connector cap (10 ea. with DTG5078, 8 ea. with DTG5274/DTG5334), power cord, calibration certificate.

Please specify power cord and language option when ordering.

Mainframe Options

Opt. 1R – Rackmount.

International Power Plugs

Opt. A0 – North America power.

Opt. A1 – Universal EURO power.

Opt. A2 – United Kingdom power.

Opt. A3 – Australia power.

Opt. A5 – Switzerland power.

Opt. A6 – Japan power.

Opt. A10 – China power.

Opt. A99 – No power cord or AC adapter.

Language Options

Opt. L0 – English.

Opt. L5 – Japanese.

Output Modules

DTGM21

4 channels (DTG5078), 2 channels (DTG5274/DTG5334).

5.35 V_{pk-pk} (from 23 Ω to 50 Ω).

3.9 V_{pk-pk} (50 Ω), 7.8 V_{pk-pk} (1 M Ω).

Tr/Tf (20% to 80%) <340 ps (1 V_{pk-pk} , into 50 Ω), fixed.

External Tri-state (Hi_Z) control function.

DTGM30

2 channels.

1.25 V_{pk-pk} (50 Ω), 2.5 V_{pk-pk} (1 M Ω).

Tr/Tf (20% to 80%) <110 ps (1 V_{pk-pk} , into 50 Ω), fixed.

► Cables

Type	Part Number
Lead set for DC Output, 16-CON, twisted pair, 24 in (60 cm)	012-A229-00
Pin header cable, 20 in. (51 cm)	012-1505-00
Pin header SMB cable, 20 in. (51 cm)	012-1503-00
GPIB Cable, double-shielded, 79 in (200 cm)	012-0991-00
Master/Slave Cable Set for Connecting Two Mainframes; set of 4 SMA cables, 51 cm, 50 Ω (174-1427-00), and set of 2 BNC cables, 46 cm (012-0076-00)	012-A230-00
Master/Slave Cable Set for Connecting Three Mainframes; set of 6 SMA cables, 51 cm, 50 Ω (174-1427-00) and set of 3 BNC cables, 46 cm (012-0076-00)	012-A231-00
BNC Cables 50 Ω	
18 in. (46 cm)	012-0076-00
24 in. (61 cm)	012-1342-00
42 in. (107 cm)	012-0057-01
With Shield, 98 in. (250 cm)	012-1256-00
SMA Cables 50 Ω	
12 in (30 cm)	174-1364-00
20 in. (51 cm)	174-1427-00
39 in. (100 cm)	174-1341-00
60 in. (152 cm)	174-1428-00
Delay SMA Cables 50 Ω	
1 ns (male to female)	015-1019-00
2 ns	015-0560-00
2 ns (male to female)	015-1005-00
5 ns	015-0561-00
5 ns (male to female)	015-1006-00

► Adapters and Connectors

Type	Part Number
SMB to BNC Adapter	015-0671-00
50 Ω SMA (male) to BNC (female) Adapter	015-0554-00
50 Ω SMA (female) to BNC (male) Adapter	015-0572-00
50 Ω N (male) to SMA (male) Adapter	015-0369-00
50 Ω SMA Adapter (male to female), DC to 18 GHz, VSWR: 1.2	015-0549-00
50 Ω SMA Adapter (slide on type female to male), DC to 18 GHz, VSWR: 1.05 + 0.002F (GHz)	015-0553-00
50 Ω SMA T-Connector (male to female/female)	015-1016-00
50 Ω SMA Divider (female/female/female), 6 dB, DC to 18 GHz, VSWR: 1.9	015-0565-00

Data Timing Generator

▶ DTG5078 • DTG5274 • DTG5334

DTGM31

1 channel.

1.25 V_{pk-pk} (50 Ω), 2.5 V_{pk-pk} (1 MΩ).

Tr/Tf (20% to 80%) < 110 ps (1 V_{p-p} into 50 Ω), fixed.

External jitter control input.

Jitter frequency DC – 400 MHz.

Jitter amplitude up to 240 ps.

DTGM32

1 channel.

1.25 V_{pk-pk} (50 Ω), 2.5 V_{pk-pk} (1 MΩ).

Tr/Tf (20% to 80%) < 110 ps (1 V_{pk-pk} into 50 Ω), fixed.

2 ch external jitter control input.

Jitter frequency DC – 50 MHz.

Jitter amplitude up to 1 ns/2 ns.

Output Modules Include: Installation sheet (Japanese/English), SMA connector cap (set of 4 with DTGM21, set of 2 with DTGM30), 50 Ω SMA terminator (DC to 18 GHz) (set of 2 with DTGM30, set of 1 with DTGM31/32), registration card.

Service Options

Opt. C3 – Calibration Service 3 years.

Opt. C5 – Calibration Service 5 years.

Opt. D1 – Calibration Data Report (English).

Opt. D3 – Calibration Data Report 3 years (with Opt. C3).

Opt. D5 – Calibration Data Report 5 years (with Opt. C5).

Opt. R3 – Repair Service 3 years.

Opt. R5 – Repair Service 5 years.

Recommended Accessories

Service Manual (English) – Order 071-1285-xx.

Transition Time Converters – Output transition time (10% to 90%).

150 ps – Order 015-0710-00.

250 ps – Order 015-0711-00.

500 ps – Order 015-0712-00.

1000 ps – Order 015-0713-00.

2000 ps – Order 015-0714-00.

Test Adapters

HDMI TPA-R Test Adapter Set – HDMI TPA-R TDR (set of 2), HDMI TPA-R DI (differential), HDMI TPA-R SE (single-ended). Order 013-A012-50.

HDMI TPA-P Test Adapter Set – HDMI TPA-P TDR, HDMI TPA-P DI (differential), HDMI TPA-P SE (single-ended). Order 013-A013-50.

DVI TPA-R Test Adapter Set – DVI TPA-R TDR (set of 2), DVI TPA-R DI (differential), DVI TPA-R SE (single-ended). Order 013-A014-50.

Note: These adapters do not include clock recovery circuits.

Contact Tektronix:

ASEAN / Australasia (65) 6356 3900

Austria +41 52 675 3777

Balkan, Israel, South Africa and other ISE Countries +41 52 675 3777

Belgium 07 81 60166

Brazil & South America 55 (11) 3741-8360

Canada 1 (800) 661-5625

Central East Europe, Ukraine and the Baltics +41 52 675 3777

Central Europe & Greece +41 52 675 3777

Denmark +45 80 88 1401

Finland +41 52 675 3777

France & North Africa +33 (0) 1 69 86 81 81

Germany +49 (221) 94 77 400

Hong Kong (852) 2585-6688

India (91) 80-22275577

Italy +39 (02) 25086 1

Japan 81 (3) 6714-3010

Luxembourg +44 (0) 1344 392400

Mexico, Central America & Caribbean 52 (55) 56666-333

Middle East, Asia and North Africa +41 52 675 3777

The Netherlands 090 02 021797

Norway 800 16098

People's Republic of China 86 (10) 6235 1230

Poland +41 52 675 3777

Portugal 80 08 12370

Republic of Korea 82 (2) 528-5299

Russia & CIS 7 095 775 1064

South Africa +27 11 254 8360

Spain (+34) 901 988 054

Sweden 020 08 80371

Switzerland +41 52 675 3777

Taiwan 886 (2) 2722-9622

United Kingdom & Eire +44 (0) 1344 392400

USA 1 (800) 426-2200

For other areas contact Tektronix, Inc. at: 1 (503) 627-7111

Updated 5 January 2006

Our most up-to-date product information is available at:
www.tektronix.com



Product(s) are manufactured in ISO registered facilities.

Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

Copyright © 2006, Tektronix. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and TEK are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks or registered trademarks of their respective companies.

2/06 HB/WOW

86W-16679-4

Tektronix
Enabling Innovation