

TEKTRONIX

DPO7104C

The Tektronix DPO7104C is a 1 GHz, 4-channel Digital Phosphor Oscilloscope belonging to the high-performance DPO7000C series. It features a real-time sampling rate of up to 40 GS/s on one channel (with option 2SR) and standard 50M record length, running on a 64-bit Windows 7 operating system. Utilizing Pinpoint trigger technology and FastAcq waveform acquisition, it is optimized for high-speed debug, serial data analysis, and signal integrity evaluation.

SPECIFICATIONS

General

Interfaces	USB Host (front/side panels), LAN (10/100/1000BASE-T RJ-45), Video Out, TekVPI Probe Interface
Display	12.1 in (307 mm) Bright XGA Touch Screen Display

Physical

Power Supply	100 to 240 V $\pm 10\%$ (47 to 63 Hz), 115 V $\pm 10\%$ (360 to 440 Hz), <550 W
Operating Temperature	5 °C to +45 °C °C
Dimensions (W×H×D)	457 mm × 292 mm × 265 mm mm
Weight	15 kg kg
Cooling Clearance	76 mm (3 in.) required on left-hand side and rear of instrument

Vertical System

Analog Bandwidth (-3 dB)	1 GHz
Calculated Rise Time (10% to 90%)	350 ps
Number of Input Channels	4
Input Impedance	1 M Ω $\pm 1\%$ with 13 pF ± 2 pF, 50 Ω $\pm 1\%$
Vertical Resolution (ADC)	8 bit (>11 bit with High Res)
Maximum Input Voltage (1 M Ω)	± 150 V CAT I, derate at 20 dB/decade to 9 Vrms above 200 kHz
Maximum Input Voltage (50 Ω)	5 Vrms, with peaks $\leq \pm 24$ V
Hardware Bandwidth Limits	250 MHz or 20 MHz
Input Coupling	AC, DC, GND (1 M Ω); DC, GND (50 Ω)
Vertical Sensitivity Range, 50 Ω	1 mV/div to 1 V/div
Vertical Sensitivity Range, 1 M Ω	1 mV/div to 10 V/div
DC Gain Accuracy	$\pm 1\%$ with offset set to 0 V
Position Range	± 5 divisions
Channel-to-Channel Isolation	$\geq 100:1$ at ≤ 100 MHz and $\geq 30:1$ at > 100 MHz up to rated bandwidth

Horizontal System

Maximum Real-Time Sampling Rate	20 GS/s (1 ch)
Maximum Record Length	50 M standard (1 ch); Up to 250 M with options
Maximum Duration at Highest Real-Time Sampling Rate	2.5 ms standard, up to 12.5 ms with option 10RL
Time Base Range	50 ps/div to 1000 s/div
Channel-to-Channel Deskew Range	±75 ns
Timebase Accuracy	±1.5 ppm (initial accuracy), aging <1 ppm/year

Trigger System

Trigger Delay by Time Range	5 ns to 250 s
Trigger Delay by Events Range	1 to 10,000,000 events
Trigger Level Range (Internal)	±12 divisions from center of screen
Trigger Level (Line)	Fixed at 0 V
Trigger Coupling	DC, AC, HF Rej, LF Rej, Noise Reject
Trigger Holdoff Range	250 ns to 12 s
Main Trigger Modes	Auto, Normal, Single
Standard Trigger Types	Edge, Glitch, Width, Runt, Timeout, Transition, Setup/Hold, Logic Pattern, Logic State, Parallel Bus, Video
Optional Serial Protocol Trigger Types	I2C, SPI, RS-232/422/485/UART, USB 2.0, CAN, Serial Pattern, Comm
Enhanced Triggering	User-selectable; corrects difference in timing between trigger path and acquired data path
Trigger Sequences	Main, Delayed by Time, Delayed by Events, Reset by Time, Reset by State, Reset by Transition

Acquisition System

Maximum Waveform Capture Rate (FastAcq)	>250,000 wfms/s on all 4 channels simultaneously
FastFrame Segmented Memory Capture Rate	>310,000 waveforms per second
Acquisition Modes	Sample, Peak Detect, Averaging, Envelope, Hi Res, Roll, FastAcq, Waveform Database, FastFrame
Peak Detect Min Glitch Width	1/sample rate at ≤10 GS/s
Averaging Factor Range	2 to 10,000 waveforms
Envelope Factor Range	1 to 2x10 ⁹ waveforms
Roll Mode Limits	Up to 10 MS/s with a maximum record length of 40M

Waveform Measurements and Analysis

Automatic Measurements	53 standard (up to 8 displayed simultaneously)
Measurement Statistics	Mean, Minimum, Maximum, Standard Deviation
Cursors	Waveform and Screen
Advanced Search and Mark	Automatically search and mark events based on slopes, glitches, runs, pulse widths, transition rate, setup & hold, timeout, windows, or logic/state patterns

Processor and Storage

Operating System	Microsoft Windows 7 64-bit
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Connectivity and Ports

LXI Compliance	LXI Class C Compliant
Probe Interface	TekVPI Probe Interface

Computer System

Removable Hard Disk Drive	≥500 GB capacity (3.5 in. SATA)
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Environmental

Storage Temperature	-20 °C to +60 °C
Operating Altitude	Up to 3,000 m (9,843 ft.)
Non-operating Altitude	Up to 12,192 m (40,000 ft.)
Operating Humidity	8% to 80% RH at up to +32 °C; 5% to 45% RH above +32 °C up to +45 °C, non-condensing
Non-operating Humidity	5% to 95% RH at up to +30 °C; 5% to 45% RH above +30 °C up to +60 °C, non-condensing

Display

Display Size	12.1 in. (307 mm)
Display Resolution	1024 × 768 pixels (XGA)
Display Type	Color TFT active-matrix liquid crystal with resistive touch screen

Triggering

Trigger Sensitivity (Internal)	0.3 div (DC to 50 MHz), 1.0 div (50 MHz to 1 GHz)
Trigger Sensitivity (Aux In)	250 mV (DC to 50 MHz), 350 mV (50 MHz to 250 MHz)
Trigger Jitter (Typical)	<1.5 ps RMS (A edge trigger, DC coupling)
Trigger Jitter (Enhanced Triggering)	<100 fs RMS

Waveform Math & Analysis

Number of Math Waveforms	4
FFT Window Types	Rectangular, Hamming, Hanning, Kaiser-Bessel, Blackman-Harris, Gaussian, Flattop2

Reference Signals

Reference Output Frequency	10 MHz
Reference Input Frequency	10 MHz

Auxiliary Inputs/Outputs

Auxiliary Trigger Input Impedance	1 M Ω $\pm$ 1% in parallel with 13 pF $\pm$ 2 pF
Auxiliary Output Level	$\geq$ 2.5 V into 1 M Ω , $\geq$ 1.0 V into 50 Ω (Trigger Out, TTL compatible)

TECHNOLOGY

Digital Phosphor Oscilloscope (DPO)

APPLICATIONS

High-speed digital debug, serial bus analysis, jitter analysis, and compliance testing

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