These products are manufactured at a factory which has received quality control system certification in accordance with the ISO 9002 international standard.

CERTIFICATE No.
JMI-0062
ISO 9002/BS 5750Pt2
EN 29002/JIS Z9902

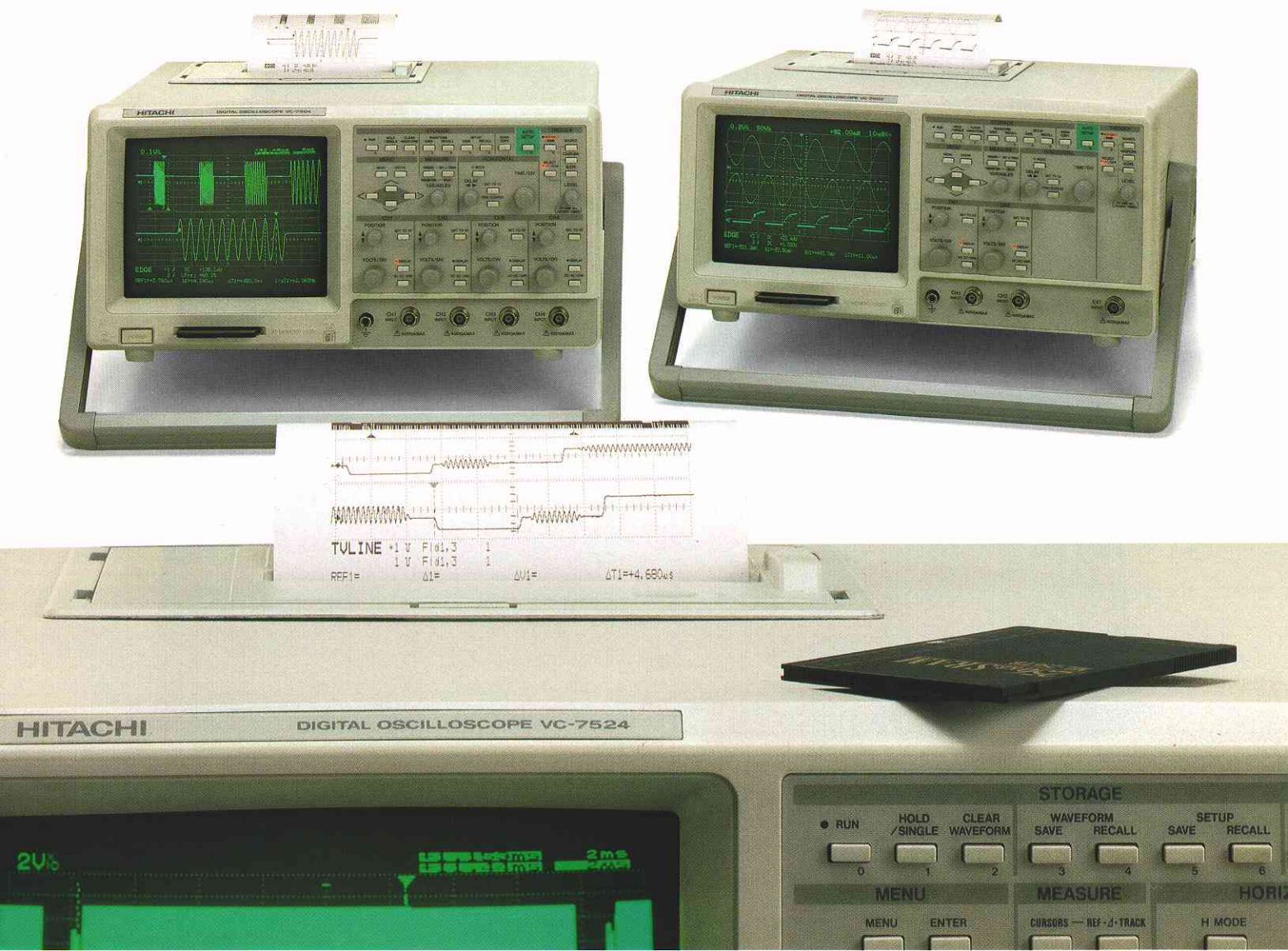
HITACHI

DIGITAL OSCILLOSCOPES

High Performance, Built-in Printer, PCMCIA Interface

- **2Mw/CH Ultra Deep Memory** (VC-7524)
- **100MS/s on 4 Channels**
- **150MHz Bandwidth**
- **10ns Peak Detector** (VC-7504/7502)
- **GP-IB & RS-232C Provided as Standard**
- **Full Programmability**
- **PC Software Support of LabWindows®, LabVIEW®**

4CH,2Mw/CH	4CH,8kw/CH	2CH,8kw/CH
VC-7524	**VC-7504**	**VC-7502**



State-of-the-Art Digital Performance That's Easy-to-Use

To maintain easy-operation, frequently used controls such as the voltage range and position for each channel, sweep time, trigger position, and trigger level, have been implemented using rotary knobs.
Menu operations have been minimized as possible to maintain the familiar feel of an analog oscilloscope.

Large, 7-inch Display

The waveform display area of the large 7-inch raster-scan display has been made as large as possible, providing a blight, easy-to-view waveform display.

Thermal Printer

A built-in thermal printer is provided as standard, enabling instant hardcopies of display screen information.

PCMCIA Memory Card

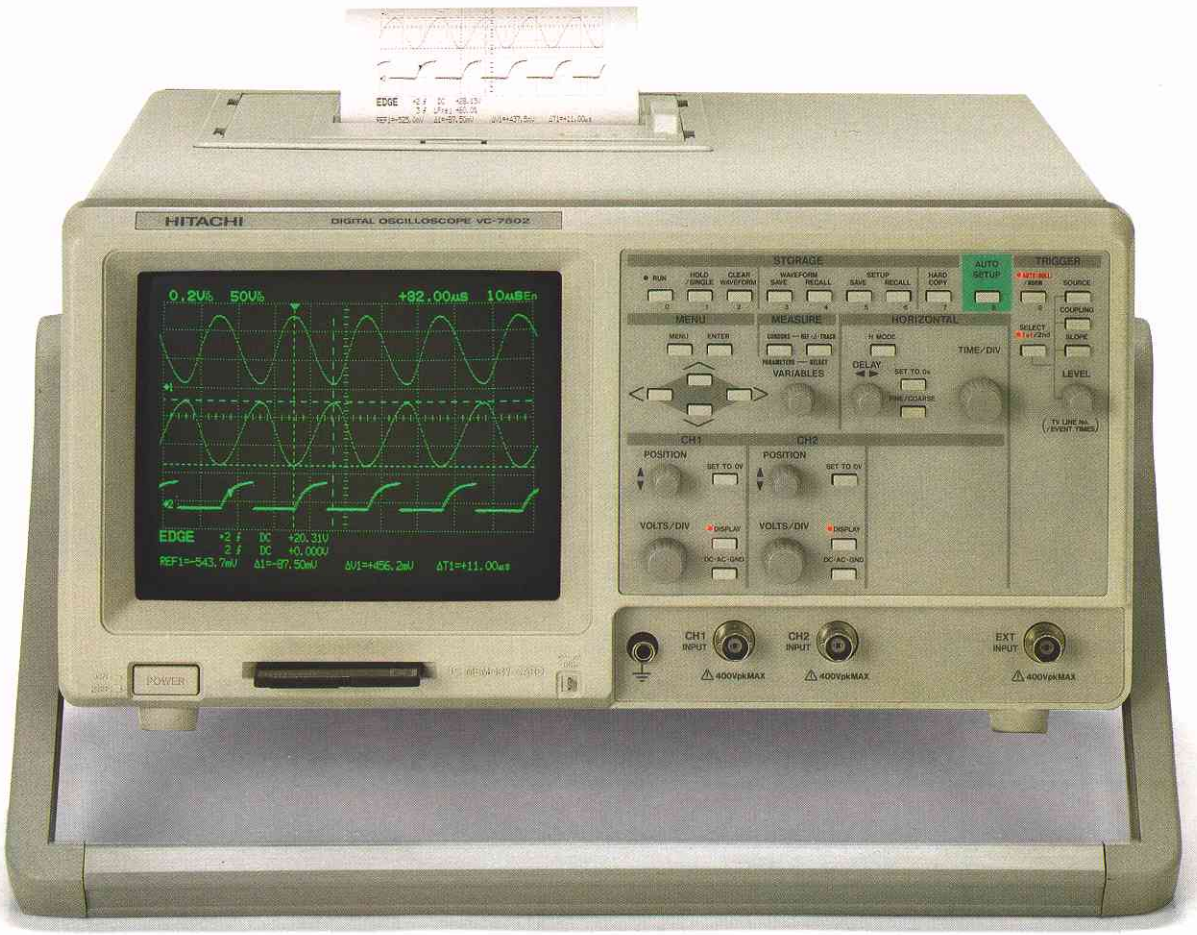
An IC memory card enables storage of large amounts of waveform data with fast access time.

Automatic Setup

Most suitable setup can be made automatically.

Setup Memory

10 setup can be saved and recalled.



VC-7502

2CH, 8kw/CH, 100MS/s, 150MHz

Power of Data Acquisition & Waveform Observation

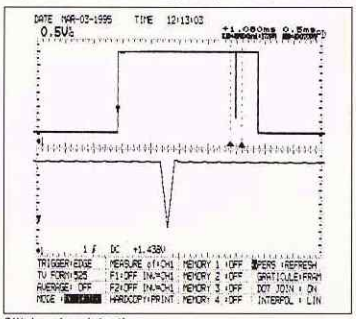
●100MS/s Sampling on 4(2 with VC-7502) Channels Simultaneously

●150MHz Bandwidth

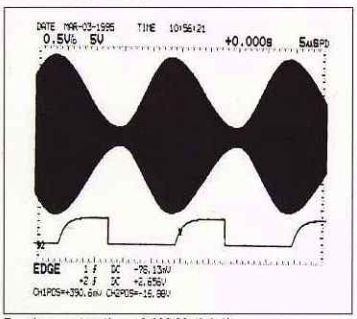
●2mV to 5V/div Vertical Sensitivity on All Channels

●10ns Peak Detector(VC-7504/7502)

A Peak Detector is provided to enable detection of 10ns glitch pulses and extraction of the envelope of high-density signals such as modulation signals and TV signals, even in long time sweep range.



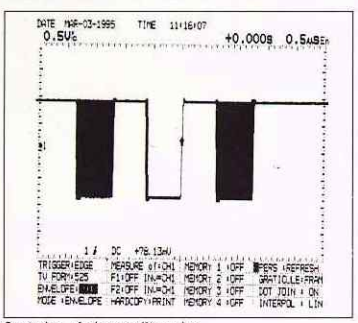
Glitch pulse detection



Envelope extraction of AM Modulation

●Envelope Mode

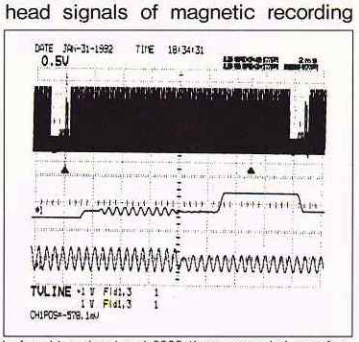
It is possible to calculate the Minimum values and the maximum values for each storage points during specified times of sweep. This mode is useful for capturing of non-periodic abnormality phenomena.



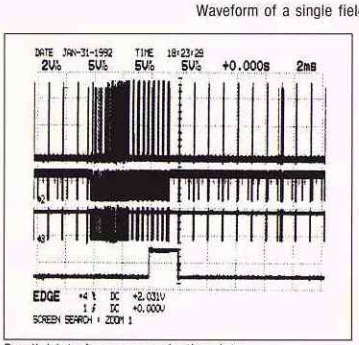
Capturing of abnormality pulse

●2-Megaword Ultra-Deep Memory (VC-7524)

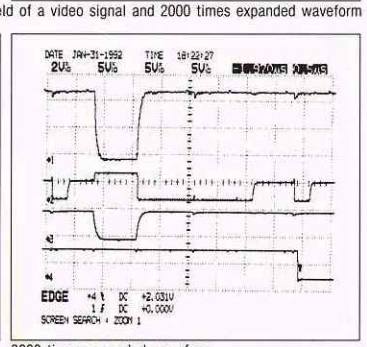
This capability enables capture of high-frequency signals with long periods (20ms capture time at 100MS/s) and capture non-repeating events (more than 2 hours of capture time at 200S/s). This feature makes it effective for such wide applications as head signals of magnetic recording devices (e, g., hard disk or floppy disk drivers), stepping motor controller, communication data from high-speed digital network such as LANs and facsimilies, electronic and servo control in automotive, factory automation, pickup signals in CD and LD equipment, switching power supplies, and destructive materials testing.



Waveform of a single field of a video signal and 2000 times expanded waveform



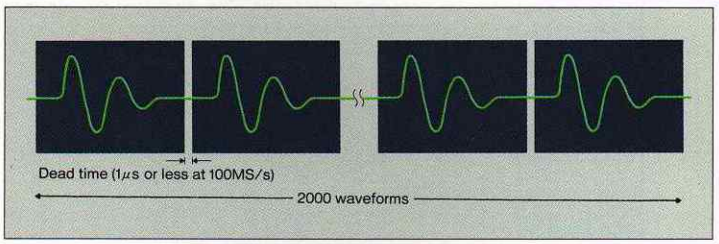
Parallel interface communication data



2000 times expanded waveform

●Memory Partitioned Capture (VC-7524)

The large-capacity memory of the VC-7524 can be partitioned for data capture. Up to 2000 waveform can be continuously captured after the trigger, and no more than 1μs dead time between captured waveforms at 100MS/s.



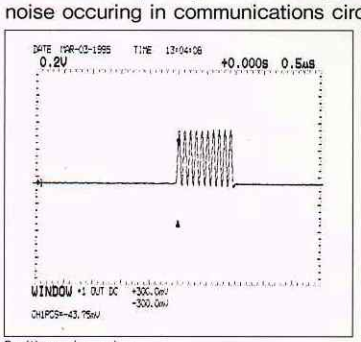
●Versatile Trigger Functions

[Trigger Setup]

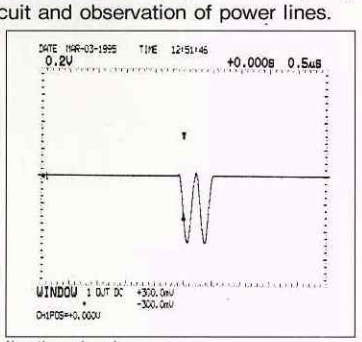
Two sets of trigger conditions are stored, enabling instant recall of either as desired.

[Window Trigger]

Reliable capture is possible of signals which the polarity is uncertain, a convenient capability for use in applications such as capture of irregularly noise occuring in communications circuit and observation of power lines.



Positive-going noise



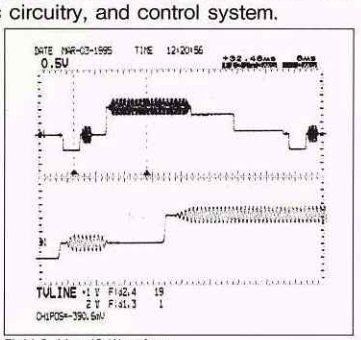
Negative-goin noise

[Trigger After Delay and Trigger After Event]

This feature provides a convenient means of observing time difference or complex or mutually asynchronous signals, such as those encountered in microcomputer peripheral circuit, logic circuitry, and control system.

[TV Line Selector]

It is possible to select a specific line and field of a TV signals of either the 525 or the 625-line system corresponding to PAL and NTSC system.



Field 2, Line 19 Waveform

●Pile Mode Acquisition

A 16-phase pile mode provides a display with a persistence approaching that of a real-time oscilloscope, enabling observation of changes and suddenly occuring abnormalities in waveform.

●Infinite Persistence (overlaid) Display

An overlaid display mode is provided as a convenience for use in display of eye patterns of communication circuit and microcomputer bus signals, and observation of jitter.

●Roll Mode

It is possible to perform continuously observation of slowly changing phenomena up to 500s (10000s with VC-7524) on a single screen.

●Averaging

Exponential averaging with weighting constant settable in the range 2 to 256 is provided, enabling optimization of weighting for particular applications.

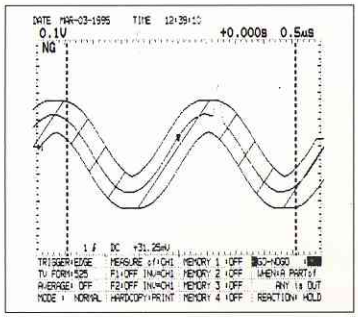
Versatile Waveform Analysis & Automated Measurement

●GP-IB & RS-232C Provided as Standard for Fully Programmable Operation

The provision of both these interface enables connection of the VC-7500 series to a personal computer for both front panel control and output of memory data, making the VC-7500 series an effective component in an auomated measurement system.

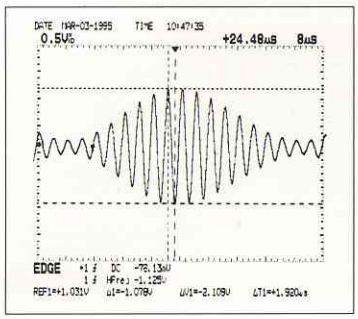
●GO-NOGO Comparison

A GO-NOGO comparison can be made with respect to arbitrarily set limits. Result of this comparison can be used to generate open-collector output, a GP-IB service request, holding of the waveform, saving of the waveform, or printout, thereby providing the flexibility needed for use in ATE applications.



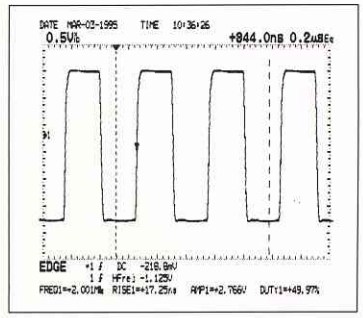
●Cursor Measurements

In addition of the voltage difference between cursors, time difference cursors, and frequency measurement, the VC-7500 series provided cursor measurement of the voltage with respect to ground and time from the trigger point.



●Automatic Pulse Parameter Measurements

Four out of 17 pulse parameters can be selected for automatic measurement.

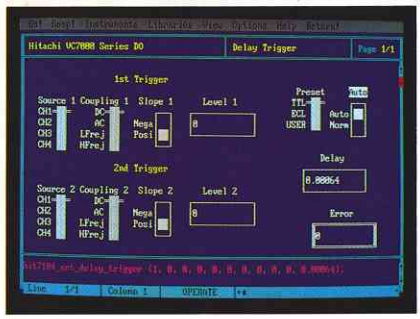


●Waveform Mathematics

It is possible to added, subtract, multiply, and polarity invert waveforms, as well as take the absolute values of waveforms.

●Easy System Configuration by use fo LabWindows® and LabVIEW®

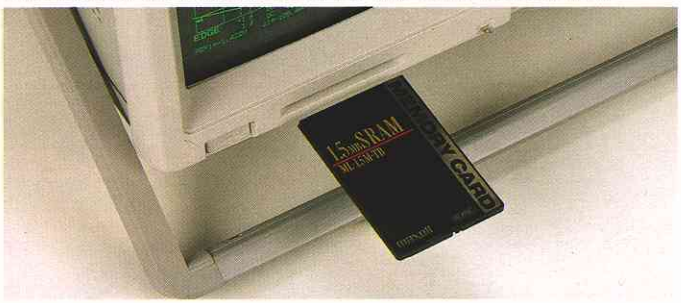
LabWindows® and LabVIEW® are softwares to support the creation of programs for control the instrument, data acquisition, analysis and display. The driven of the VC-7500 series adaptable to LabWindows® and LabVIEW® allows interactive panel settings and waveform data entry. Instrumentation system can be easily configured by a variety of analysis and display libraries.



Fast Storage of Large Amounts of Waveform data (PCMCIA Memory Card)

●Maximum 4MB Card Can be Used for Waveform Storage

A memory card of up to 4M byte capacity can be inserted in the IC memory slot of the VC-7500 series for high-speed storage of large amount of waveform data. Using a 4M byte card, it is possible to store up to 300 waveforms of 8K word each. When performing GO-NOGO comparisons, it is possible to store automatically not only the waveform which caused the no good results, but time stamp result as well.



●MS-DOS™ Format Card

This memory card is in MS-DOS™ Format, enabling direct reading by a PC capable of accommodating an SRAM card.

```
WAVE 0    DAT  8948 95-03-05   10:35
WAVE 1    DAT  8948 95-03-05   10:36
WAVE 2    DAT  8948 95-03-05   10:36
WAVE 15   DAT  8948 95-03-05   11:16
WAVE 16   DAT  8948 95-03-05   15:36
WAVE 17   DAT  8948 95-03-05   16:36
WAVE 16   DAT  8948 95-03-05   17:16
WAVE 105  DAT  8948 95-03-06   15:06
WAVE 192  DAT  8948 95-03-07   13:30
WAVE 105  DAT  8948 95-03-06   15:06
WAVE 192  DAT  8948 95-03-07   13:30
WAVE 256  DAT  8948 95-03-08   09:40
WAVE 289  DAT  8948 95-03-08   10:50
WAVE 297  DAT  8948 95-03-08   14:23
WAVE 298  DAT  8948 95-03-08   14:25
WAVE 299  DAT  8948 95-03-08   14:28
```

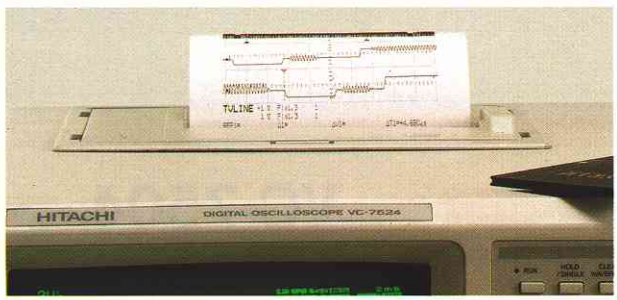
●Pixel Save

It is possible to store display screen data as pixel data, enabling you to save infinite-persistence displays such as eye patterns.

Quick On-Site Printout of Captured Waveforms

●Built-in High-Speed & High-Quality Thermal Printer

A built-in thermal printer is provided as standard, enabling hardcopy output of display screen information. This enables recording of waveforms without the need to provide and connect an external printer or plotter. When performing GO-NOGO comparisons, it is possible to trigger waveform recording on this Printer when a no good result occurs, enabling efficient unmanned recording of infrequently occuring phenomena, abnormal waveforms, and nois.



●Plotter Output

A plotter output (HP-GL™ command set) is provided for use when a color output or waveform from a large screen is needed.

Specifications

Vertical Axis

Resolution	8bit
Sensitivity	2mV/div to 5V/div ±3%, 11ranges
Bandwidth(−3dB)	Repetitive: DC to 150MHz Single shot: DC to 25MHz
Peak Detector	VC-7504/7502, 10ns
Envelope mode	2 to 2048 (power of 2) sweeps and infinite
AC coupling cutoff frequency	10Hz
Number of input channels	VC-7524/7504:4 VC-7502: 2
Input coupling	DC, AC, GND
Input impedance	1MΩ ±1.5%, 15pF±3pF
Input withstand voltage	400V (DC+ACpeak) at 1kHz
Signal delay between channels	Skew correction is possible in 40ps steps Correctable range: ±5ns
Operation mode	Each channel on/off switchable independently

Horizontal Axis

Maximum sampling speed	VC-7524/7504: 100Msample/s (4-channel simultaneous) VC-7502: 100Msample/s (2-channel simultaneous)
Acquisition memory capacity	VC-7524: 2Mword/channel VC-7504/7502: 8kword/channel
Sweep time	VC-7524: 2ns/div to 1000s/div VC-7504/7502: 2ns/div to 50s/div
Swwep accuracy	Real-time sampling: ±0.04% Roll Mode sampling: ±0.25% Equivalent sampling: ±1%
Record length	VC-7524: Selectable 512w, 1kw, 8kw, 10kw, 50kw, 100kw, 500kw, 1Mw, 2Mw VC-7504/7502: Selectable 512w or 8kw
Trigger position	Pre-trigger: 10div max. Post-trigger: 500div max.
Memory partitioning (VC-7524)	Interrupted acquisition is possible of up to 2000 waveforms, onf for each trigger

Trigger

Trigger source	VC-7524/7504:CH1, CH2, CH3, CH4 VC-7502: CH1, CH2, EXT, EXT÷10
Trigger mode	AUTO, NORM
Trigger coupling	DC, AC, HF reject, RF reject
Trigger slope	+or−
Trigger sensitivity	VC-7524/7504:

2mV, 5mV/div	10mV to 5V/div
5mVp-p	0.5div
10mVp-p	1.0div

VC-7502:

CH1, CH2		EXT	EXT÷10
2mV, 5mV/div	10mV, to 5V/div		
5mVp-p	0.5div	50mVp-p	0.5Vp-p
10mVp-p	1.0div	0.1Vp-p	1.0Vp-p

AC coupling cutoff frequency	10Hz
HFrej/LFrej cutoff frequency	Approx. 50kHz
Auto mode lower cutoff	20Hz
Special trigger functions	
Trigger setup	Enables selection and use of two sets of tirgger conditions in the normal edge trigger mode
Window trigger	Triggering is done whne the signal either enters or leaves a range defined by two set trigger levels
Trigger after events	After the 1st priority trigger, triggering is done after the second trigger has occurred as set number of events Number of events: 2 to 4097 Second trigger frequency: 30MHz max.
Trigger after delay	After the 1st priority trigger, the 2nd trigger wait conditon is entered after a set delay time has elapse, after which triggering is done when the 2nd trigger occurs
TV Trigger	Modes: TV-V, TV-H, TV-LINE Sensitivity: 1div min. (sync part of signal) Line selection: By line number (switchable 525/625 lines and 1.3/2.4 fields)

Display Function

	Refresh/Persistence, Pile display (16phase), Waveform clear, Dot/Interpolated (linear/sine) display, X-Y display, Horizontally expanded/shifted display, GND level display, Trigger level display, Scale (grid/Axes/frame) display

Measurement

Cursor measurement	Measurements between cursors, waveform tracking ΔV measurement Measurement items: V (REF, Δ, ΔV), T (REF, Δ, ΔT, 1/ΔT)
Pulse parameter	Any 4 of the following 17 parameters can be measured Measurement item: Frequency, Period, Rise time, Fall time, +width, −width, Duty, Max., Min., Peak-to-peak, Base, Top, Amplitude, Preshoot, Overshoot, RMS, Mean
GO-NOGO comparison	Range setting method:Edit by waveform Proceccing after comparison: Open collector, SRQ (GP-IB), HOLD, print, Save (IC memory card)

Processing

Mathematics	+, −, ×, Invert, Absolute Two types of mathematics (function 1 and function 2) between two waveforms can be executed simultaneously
Averaging	Exponential Weighting: 2 to 256 (power of 2)
Waveform search	It is possible to search for and display part of an already stored waveform that are above (or below) a specified level. Searching is also possible, companing individual waveforms captured into partitioned memory with specified comparison limits, a hit occuring for either coincidence or non-co-incidence with the comparison limits.

Memory

Pixel memory	Can be save all of one display information
Waveform save	By Ic memory card (Max.4MB) 64kbyte card: 8kword × 6-waveform 2Mbyte card: 8kword × 200-waveform, 1Mword × 1-waveform 4Mbyte card: 8kword × 300-waveform, 1Mword × 3-waveform, 2Mword × 1-waveform *1Mword and 2Mword waveform for only VC-7524
Setup memory	10 setup
Panel backup	Panel setup data is stored when power turned off

Input Output Function

Interface	RS-232C and GP-IB
Panel Control	Full Programmable
Plot output	Command: HP-GL™ Interface: RS-232C or GP-IB No.of pens: 6colors Plot size: A6, A5, A4, A3 Paper size: A3, A4 (A/B)
Video output	Digital RGB Monitor used: Multiscan color monitor for IBM PC® H.Frequency: 21.8kHz V.frequency: 60.06Hz
Calibration output	Frequency: 1kHz±20% Voltage: 0.5V±1%

Internal I/O Devices

Thermal printer	Paper width: 112mm Dot configuration: 512dots × 328dots
IC memory card slot	Conform to JEIDA V4 SRAM card Max.4Mbyte card available

Display Screen

Display type	7-inch raster-scan monitor
Scales	10div × 8div

Other Functions

Automatic setup	Automatic optimization of the vertical sensitivity, offset, sweep time, trigger level and trigger position
Real time clock	Real time included on printer/plotter output and on saved waveforms

General Specifications

Environment conditions	
Temperature	Guaranteed performance: 10 to 35℃ (when calibrated at 25℃±5℃) Operating: 0 to 40℃ Storage: -20 to 60℃
Humidity	Operating: 40 to 85% Storage: 35 to 85% (70%max. when the ambient temperature is higher than 50℃) (Printer paper storage condition: 30℃, 60% max. humidity, storage possible for 3 years in a dark location)
Line voltage	180 to 250V, 90 to 132V AC 48 to 440Hz
Power consumption	VC-7524/7504: Approx.110W VC-7502: Approx.80W
Dimensions	Approx.355(W)×170(H)×380(D)mm, 14.0×6.7×15.0 ins.
Weight	Approx. 11.5kg, 25.4lbs.

Standard Accessories

Probe (AT-10AU1.5 10:1)×2, Printer paper×1, Power cord×1,
Operation manual×1, Spare fuse×1

Optional Accessories

IC memory card: No.4310 (256kB), NO.4311 (512kB), No.4312 (1MB), No.4313 (1.5MB)
Dust cover: No.6525 Printer paper (5rolls): No.9001

HITACHI DENSHI (Europa) GmbH

Weiskircher Str. 88
63110 Rodgau, Germany
T. 06106-6992-0
Fax 06106-16906

http://ourworld.compuserve.com/homepages/Hitachi_Denshi
E-Mail: 100443.2014@compuserve.com