IWATSU

Digital Oscilloscopes DS-5600 Series NEW 100MHz to 500MHz

DS-5400 Series

1/ 1

Az

0111 0n

AUTO

ADJUST PUSH FINE / CO

CURSORS

CLOSE

OFFSE SH ZERO C

RINT

MEASUPE

CLEAR

OFFSET

100MHz, 200MHz

Large memory of 5M points (when channels interleaved)

- Pass/Fail judgment waveform parameters increased to four
- Averaging performed a maximum of 65,536 times
- High-resolution mode function providing a vertical resolution equivalent to a maximum of 12 bits
- Supports the UART, I²C and SPI serial triggers
- Double calculations possible (differential calculus, integral calculus and FFT possible after addition, subtraction and multiplication)

IWATSU

Supports transparent PNG image data

DIGITAL OSCILLOSCOPE DS-5654 VIEWGDI 🕅 M 50µs 0.0000s -2048/2048 Trigger Type ∱ ∳ Edge Source CH1 Slope 7 Coupling : 500mV DC1MO DC1MQ 1.02Vofs 340mVofs Off WATSL f:0.00000Hz RTC:2014/08/25 10:09:11

iew/Gol New Functions Providing Additional Power

VIEWGJ

New Functions Providing Additional Power

Functions supporting the DS-5600 series)

NEW

Long memory up to a maximum of 5M points (page 4)

Maximum memory length has been increased from 1M points to 5M points (when channels interleaved).

Enables long-term waveforms to be captured while maintaining high-speed sampling.

NEW

It is now possible to simultaneously set four waveform judgment parameters (page 4)

Waveform parameters used with the judgment function have been increased from one to four.

Performing detailed judgment of measurement signals is now possible.

NEW

Supports the new noise-reduction

function (page 6)

Simple Moving Average

The Simple Moving Average (SMA) function has been added to the digital filters that can be set for each individual channel. This enables smoothing and reduces noise for the sampling points at the specified width.

Averaging Count Increased

The averaging count setting has been increased from 256 times to 65,536 times. This enables non-synchronized random noise signals to be effectively reduced from measured repetitive signals.

High Resolution

This reduces random noise and increases vertical resolution to a level equivalent to a maximum of 12 bits during waveform capturing.



NEW

Supports the UART, SPI and I²C serial triggers

NEW

Other new functions

■ Waveform calculation function strengthened (double calculations) (Page 7) This enables double calculations for performing FFT analysis on CH1 x CH2 multiplied waveforms.

Hard-copy image format strengthened (page 7)

Supports PNG transparency attributes to make waveforms transparent and overlay them when creating documents for use on a PC.

Refined Functions

DS-5600 Series

Waveform mask / Waveform Parameter Judgment, Logging Display

Establishes the Pass/Fail judgment for waveform mask and waveform parameter values and displays a list of the results (parameter/logging function). These results can be saved onto an USB memory.

DS-5600 Series DS-5400 Series

Automatic Measurement for Waveform Parameters

26 types of waveform parameters for automatic measurement are now available. This also supports automatic measurement within ranges specified with the cursor function.

DS-5600 Series DS-5400 Series

Parameter Measurement for All Cycles

The automatic measurement of waveforms for all loaded cycles (on a time axis) is provided. A vast amount of data can be loaded into the long memory, which enables the differentiation between discrepancies in maximum and minimum values.

DS-5600 Series

High-Speed Remote Waveform Transmission

The high-speed transmission of waveform data onto PCs has been continued on from the DS-5500 (A) series. This brings out the best performance on analyses using PCs.

* When the waveform display mode is set at OFF during LAN use.

Speed and ease of use condensed into a compact body

Touch-screen Display

Equipped with a 7.5 inch color liquid crystal display touch screen function to enable intuitive operations.

2 Touch-screen Area

Simple menu selection with one-touch operations.

AUTO SETUP Button

Automatically sets the voltage range, time range and trigger conditions in accordance with the received signals to enable waveforms to be observed and measured easily.

4 REPLAY Knob

Allows waveforms captured in the past to be displayed. DS-5600: Max. 2,048 waveforms DS-5400: Max. 1,024 waveforms

5 MEASURE (Auto-measure) Button

- Automatic waveform parameter measurement
- Waveform mask and waveform parameter judgment
- Measurement and analysis of parameter lists (waveform logs)*
- * Only supported by the DS-5600 Series

6 CLEAR Sweep Button

Clears measurements and the calculation results. Items eligible for clearing: Replay waveforms, averaging process, persistence, auto-measure results (judgment and logging).

HORIZONTAL (ZOOM) Button/Knob

In addition to operating the input for each channel and the horizontal axis for waveform calculations, the ZOOM button enables the simple zoom-in of waveforms.

8 VERTICAL CH/MATH Button/Knob

The buttons and knobs are separately provided for each channel input, which provides smooth operations. The LIGHT TRACE button firmly switches the display ON and OFF.

9 POWER Switch

Provides high-speed start-up within seconds of the power being switched on.

10 USB Terminal (Supports Hi-Speed)

Enables hard copies, waveform data and panel setup data to be saved on a USB memory.

11 Channel Input, External Trigger Input

Automatically detects probe attenuation rates.
 * When probes fitted with lead-out pins are used.

- Equipped with a special external trigger input function.

12 Calibration Signal

Used to adjust probe phasing. * Square-wave output: 1kHz, 3Vp-p

13 GPIB Interface

(DS-576: Factory-delivered option)

Supports IEEE488.2.

14 Expansion Terminal

The terminal to which the DS-579 probe power option and IE-1226 VGA Video Out option are connected.

USB and LAN* Interface

It is possible to connect this to a PC for remote control purposes. Connecting a printer that supports PictBridge to the USB terminal allows screen shots to be printed directly. * Only supported by the DS-5600 Series

16 AUX I/O*

(DS-577/DS-578: Factory-delivered option)

Support CH Out and Trigger Out.

- CH1/CH2 output (DS-577), CH1/TRIG output (DS-578) * Only supported by the DS-5600 Series



Comparison Chart of DS-5600 Series and DS-5400 Series Functions

	DS-5600 Series	DS-5400 Series
Frequency Bands		
100MHz	\checkmark	√
200MHz	\checkmark	\checkmark
350MHz	\checkmark	
500MHz	\checkmark	
Maximum Memory Length		
During Channel interleaved	5M points	500k points
When All Channels are in Use (/CH)	2.5M points	500k points
Maximum Sampling Speed		
During Channel interleaved	2GS/s	2GS/s (DS-542x only)
When All Channels are in Use	1GS/s	1GS/s
Maximum Waveform Capture Tim	e at the Maximum S	Sampling Speed
When All Channels are in Use (2GS/s)	2ms @ 4M points	200µs@400k points
When All Channels are in Use (1GS/s)	2ms @ 2M points	$500 \mu s@500 k$ points
Band Limitation Filters (Analog)		
100MHz	(DS-563x, DS-565x)	
20MHz		✓ <i>✓</i>
2MHz	\checkmark	✓
200kHz	\checkmark	\checkmark

	DS-5600 Series	DS-5400 Series
Band Limitation Filters (Digital)		
LPF	\checkmark	
HPF	\checkmark	
SMA (Simple Moving Average)	\checkmark	
Waveform Capture Mode		
Peak Detection	\checkmark	\checkmark
High-Resolution	\checkmark	
Averaging (units of exponents of 2)	(2 to 65,536)	(2 to 256)
Trigger Function		
Edge Trigger	✓	✓
Edge ALT	\checkmark	
Edge OR	\checkmark	
Event Trigger (cycle, pulse width, dropout)	\checkmark	\checkmark
TV Trigger	✓	✓
Pattern Trigger (AND, NAND, OR, NOR)	~	
Serial Trigger (UART, SPI, I ² C)	\checkmark	

		DS-5600 Series	DS-5400 Series		
	Waveform Calculation Function				
	Addition, Subtraction, Multiplication, FFT	\checkmark	\checkmark		
	Differential Calculus, Integral Calculus	\checkmark			
	Double Calculations (FFT, Differential Calculus, Integral Calculus for Addition, Subtraction and Multiplication)	\checkmark			
	Judgment Function				
	Waveform Mask Judgment	\checkmark			
	Waveform Parameter Judgment (maximum of 4 parameters)	\checkmark			
	Waveform Parameter Logging Function	\checkmark			
	Page Search Function	\checkmark			
	AUX IO (only one of each actually	mounted)			
	CH1/CH2 Output (DS-577)	Factory-delivered Options			
L	CH1/Trig Output (DS-578)	Factory-delivered Options			
	Remote Interface				
	LAN				
	USB	✓	✓		
	GPIB	Factory-delivered Options	Factory-delivered Options		

NEW Long Memory up to a Maximum of 5M points DS-5600 Series

[2.5M points/CH when all channels being used] (Maximum of 500k/CH with the DS-5400 Series)

Enables long-term waveforms to be captured while maintaining high-speed sampling



Memory Length: 1k points Sampling Rate: 100kS/s

Maximum Sampling Rate for the Waveform Capture Time (DS-5600 Series)

Waveform Capture Time	5M points when the channels are interleaved	2.5M points when all channels are in use		
1s	5MS/s	2.5MS/s		
100ms	50MS/s	25MS/s		
10ms	500MS/s	250MS/s		
2ms	2GS/s	1GS/s		
1ms	2GS/s	1GS/s		



Waveform Capture Time: The s/div x 10div time on the time axis range at the width of the time axis displayed on the oscilloscope.

Long Memory Features

With the same waveform capture time Waveform reproduction is excellent when expanding a portion of it in the direction of the time axis leter by zooming because sampling can be carried out at high speed.



With the same sampling speed

It is possible to lengthen the waveform capture time (time range [s/div] x 10div)



NEW Four Waveform Parameter Simultaneous Judgment / Waveform Mask Judgment Functions DS-5600 Series



Page Search Function Using the Judgment Function DS-5600 Series

It is possible to search for the results of waveform Pass/Fail results from waveforms automatically saved in the past (a maximum of 2,048 pages with the DS-5600 Series) with the use of the waveform mask judgment and waveform parameter judgment functions, and then display the matching waveforms. This enables us to search waveforms.



Page search for waveforms for which even one of the four waveform parameters was judged at Fail (replay function)

Logging Function by Automatic Waveform Parameter Measurement (Displayed in List) DS-5600 Series

Up to four random waveform parameters can be logged. The logged data can then be saved on a USB memory. Loading this data onto Excel or similar spreadsheet software allows Histograms (discrepancy distribution) and trends (time-based fluctuations) of the waveform parameters to be displayed. Example of the Automatic Waveform Parameter Measurement at Logging Function



Parameter Auto-measurement for All Cycles*

DS-5600 Series DS-5400 Series

Automatically measures the waveforms for all captured cycles (time axis). Loading large amounts of data into the long memory enables the maximum and minimum amplitudes to be isolated. It is also possible to analyze the areas highlighted with the cursors.



* Onetime/sweep measurement values are displayed at the waveform parameters on the vertical axis

Display

Vector

 $N_{r} = I \Lambda_{r}$

NEW Reinforced Noise Reduction Functions DS-5600 Series

SMA : When OFF

Simple Moving Average

The Simple Moving Average (SMA) enables smoothing and noise reduction at the sampling points of the specified width, through the digital filters that can be set for each channel.

This can also be used on non-repetitive single signals.







Horizontal

SMA : When ON: Width = \pm 3pts

SMA : When ON: Width = ± 20 pts

Averaging Count Increased

High Resolution

maximum of 12 hits

The averaging count setting has been increased from 256 times to 65,536 times. This enables non-synchronized random noise signals to be effectively reduced from measured repetitive signals.

- · When the amplitude ratio for the signal (triangular wave) and noise (random) is 1:1
- · The example of the right shows a measurement with the sampling speed set at 200kS/s and the memory length set at 10k points.

When measurements are taken at a sampling speed

This can also be used on non-repetitive single signals.

lower than the maximum sampling speed, it is possible to average the data captured at the maximum sampling speed, capture the waveforms, reduce random noise, and increase vertical resolution to a level equivalent to a



Averaging process OFF





Averaging process ON (averaging count at 32,768)



When resolution is the equivalent of 12-bit high resolution (Sampling speed of 5MS/s, voltage range of 2mV/div)

Improved Trigger Functions DS-5600 Series DS-5400 Series

The trigger function has been reinforced so that waveforms can be triggered with optimal conditions, even for complex logic signals and serial data signals.

Complex settings performed with pattern triggers can be smoothly set with the use of touch screen operations.

Trigger Types	DS-5600	DS-5400
Edge ALT, Edge OR	\checkmark	
Cycle, Pulse width, Dropout, Edge, Pulse count, TV	\checkmark	\checkmark
Pattern	\checkmark	
NEW Serial (UART, SPI, I ² C)	\checkmark	



Original ≝lt ₹. Pulse Widt waveform Expanded waveform Polarity ના ના Coupling Pulse ₩idth Triggered at Pulse Width Trigger (Example: Detecting abnormal waveforms caused by glitches, etc.)



Pattern Trigger (Example: Counter logic output signal)

Trigge

Signa

SDA

Source

2 2.60V

Coupling

🗘 Data Lenz

1By te

ACK

Serial Trigger (Example: Observing I²C signals on the serial control bus)

NEW Hard Copy Image Format Reinforced

DS-5600 Series

It is now possible to save images that support transparency attributes when selecting the PNG format. As the background of the waveforms becomes transparent, it is possible to overlay them on documents with PCs for comparison purposes without the use of special image processing.





Example of screen hard copy images (three waveforms) with black

Rescale Function

DS-5600 Series DS-5400 Series

It is possible to measure values using current probes, shunt resistance and all types of sensors, etc., and unit-convert each of the output voltage signals acquired so that they can be read directly.



Normal screen hard copy image (black selected for the waveform hackground)

backgrounds overlaid (transparency validated and the images saved)

Automatic Waveform Parameter Measurement (Horizontal Axis Parameters Measured for All Cycles)

DS-5600 Series DS-5400 Series

It is possible to select and display a maximum of four types of waveform parameters from the twenty-six types available (see P10 and P11 of the specifications), in addition to display of maximum values, minimum values and the measurement count. This function also supports automatic measurement within a range specified by the cursor function. Even further wide-ranging analyses can be performed with the use of the judgment function and the logging function*. * Only supported by the DS-5600 Series

PWM Modulated Waveforms	M 5ns 0.0			Measure QMeasure No.
Carrier frequency: 1kHz	ī			8
Modulated frequency: 100Hz				Source CH1
A: Carrier frequency				Heasure Itee
B: Duty ratio	2			Dutý Čýcle
C: Positive pulse width	A Frequence B Duty Cyc	y 1.000kHz 1.0	0004452 839.9452 4 88.3X 11.6X 4	8
D: Positive pulse count	Pulse W	idth 490.9µs 81 Pulse 50 Edge	33.1µs 116.8µs 5 50 50 50 50 60 1.772	Next
•	15 500nV DC1M9	2: 2.00V 37 00mV DC1W9 7 7	4: 100nV M: 100nV DC1K9 CH11 I CH2	(1/2)
A Frequency B Duty Cycle	1.000kHz 49.0%M	1.000kHz 88.3%	999.9Hz 11.6% <mark>N</mark>	49 49
C1+Pulse Width	490. 9μs <mark>a</mark> 50	883. 1µs <mark>i</mark> 50	116.8μs <mark>μ</mark> 50	50

Skew (Time **Difference**) Function **Between Two Signals**

Measures the time difference between the CH1 (rising) and CH2 (falling) logic signals.

The rising/falling parameters and levels for the two signals can be set independently.



Waveform Calculation Function DS-5600 Series DS-5400 Series

Adds, subtracts and multiplies two waveforms, and performs frequency analysis (FFT) on channel waveforms. The DS-5600 Series supports differential and integral calculations.

The calculated waveforms can be saved as data, and can be set as the source for the automatic measurement of waveform parameters.

NEW Supports double calculations (DS-5600 Series)

In addition to the results of addition, subtraction and multiplication, this function also supports the double calculation of FFT, differential calculus and integral calculus.

CH Waveforms	Single Operations	Double Operations
1 to 4CH (4CH unit) 1 to 2CH (2CH unit) 2CH among the above	Addition Subtraction Multiplication	FFT Differential calculus Integral calculus
1 to 4CH (4CH unit) 1 to 2CH (2CH unit) 1CH among the above	FFT Differential calculus Integral calculus	
DS-5600	1	1
DS-5400	(Excluding differential calculus and integral calculus)	

[Examples of Usage]

- Addition/Subtraction: Evaluation of differential signals
- Multiplication: Evaluation of power waveforms from Voltage x Current
- FFT: Analysis of cyclic noise and vibrations, etc., in frequency domains





Differential calculation waveforms for square waveforms (rising 50ns, falling 100ns)

s the size of the time fluctuations (dv/dt) for square waveform edges.)



Measuring Differential Serial Signals

Supported by the DS-5600 Series



Integral calculation waveforms for square waveforms (Displays the results of integral calculus by time () vdt) for the area of square waveforms.)



Frequency spectrum analysis (FFT calculations of switching voltage waveforms).

Probe Selection Function DS-5600 Series DS-5400 Series

Selecting probes manufactured by lwatsu enables attenuation ratios and coupling to be automatically set. The model number, bandwidth of the vertical range and input coupling are displayed.

Eligible Probes

Current Probes:
Voltage Prohes

SS-280 Series, SS-240A, SS-250, SS-260, SS-270 SS-320, SFP-5A, SFP-4A, HV-P30, HV-P60, etc.



Function for Adjusting Skew Between Channels DS-5600 Series DS-5400 Series

Skew can be adjusted up to a maximum of 500ns*1.

For example, it is possible to obtain even more accurate power waveform calculations^{*2} by adjusting the phase between the current probe and voltage probe.

*1 When skew priority is given to the horizontal axis (there are limitations on the number of waveforms that can be used in the replay function).

*2 Difference between power waveform calculations (see the illustration below).

When the Voltage and Current Phases Match







After Skew Adjustment: 0s

Clear Sweep Function DS-5600 Series DS-5400 Series

Resets the measurement data for replay waveforms, averaging processes, persistence, waveform parameter auto-measure, Pass/Fail judgment* and logging*, etc.

** Only supported by the DS-5600 Series



After Clear Sweep

High-Speed Remote Waveform Transfer

Provides a remote waveform transfer rate approximately 100times^{*1} faster than conventional models. This reduces tact time and improves production efficiency when collecting measurement inspection data remotely.

*1: In comparison with the DS-5300 Series using a LAN interface under the waveform display mode set at OFF. (Only supported by the DS-5600 Series)

The special conditions represent the measurement results, and the values are for reference purposes. There are cases in which the actual transmission time will differ depending on the specifications of the PC is use.



Touch screen and independent operation buttons and knobs DS-5600 Series DS-5400 Series

A touch screen function has been mounted on the 7.5-inch color LCD to enable intuitive operations.



Despite its compact size, the independent CH/MATH buttons and knobs enable these functions to be easily used with a single action.



Software Types

Remote Control

Enables vast amounts of data to be collected and high-level analysis to be carried out on PCs.

Scope Viewer (Supplied with Iwatsu Test Instruments Tools)

Download the lwatsu Test Instruments Tools (free of charge) from the lwatsu website download page to enable the use of utility software for easily controlling ViewGo II remotely.

Functions: Oscilloscope operations, cursor measurement, waveform data file output, screen hard copies, printing, etc.

Tool Bar Waveform Display Area Cursor Measurement Results Enables all main operations to Displays the waveforms and parameter information for each channel. Displays measurement results on all channels with the X and Y axes. be carried out swiftly. Cursor operations can also be performed with a mouse. cope Viewer - [Waveform 1] Edit - 0 × 🛓 🖬 💽 🛍 🐜 🛧 4 Cursors **Operation Panel** Operates the oscilloscope settings. Supported **DS-5600 DS-5400** Interface Series Series LAN USB ./ ./ 🐔 USB Scope Viewer Display Screen

Left-hand Pane

Information on the selected window functions are displayed on a tree.

ViewGo I Remote Sample Software

ViewGo II sample software is available on the lwatsu website download page. Some of the programs are provided in source form so that users can customize them. Scope Controller (supplied with lwatsu Test Instruments Tools) is designed to let users make programs with Microsoft Excel, other existing applications, and Microsoft Visual C#, etc., to remote-control ViewGo II via a USB or LAN.

Software for continually loading screen data and CSV data



Measurement screen

Function: Synchronizes the trigger signals and automatically transfers waveforms to a PC and saves them in files (CSV data, PNG images).

Mask Creation Tool

Mask Creator (supplied with Iwatsu Test Instruments Tools)

An application for creating, editing and saving mask data used for Pass/Fail judgment with ViewGo II (DS-5600, DS-5500, DS-5500A Series).



Example of mask creation

DS-5600 Series Specifications

	DS-5654 DS-5652	DS-5634 DS-563	32 DS-5624 DS-5	622 DS-5614 DS-5612	2		
Frequency bandwidth (-3dB)	500MHz	350MHz	200MHz	100MHz			
Rise time (Typical)	750ps	1ns	1.75ns	3.5ns			
Input Channel Count	4 2			4 2			
Maximum Sampling Rate	2G5/s (when 2 channels interfeaved), rG5/s (when all channels are in use)						
Equivalent Sampling Rate	10005/5						
		2 to 65526	times (exponent of 2 step)				
Maximum Memory Length	5	M noints (when 2 channels interle	aved) 2.5M points (when all channels	are in use)			
Vertical Resolution		R-bit (Wan binb-resolution sized) zividi (Maximun 2).					
Input Voltage Range	2mV/div to 10V/div (1MΩ)	$2mV/div$ to $2V/div$ (50 Ω)	2mV/	/div to 10V/div (1MΩ)			
Offset Voltage	2mV/d	iv to 50mV/div : ±1V, 50.2mV/div	to 500mV/div : ±10V、502mV/div to 1	0V/div : ±100V			
DC Gain Accuracy		±(1.5	% + 0.5% full scale)				
Maximum Input Voltage	±400Vpeak CAT I(1	MΩ), 5Vrms (50Ω)	±40	0Vpeak CAT I (1MΩ)			
Band-Limiting Filter	Analog Form: 100MHz, Digital Form: Select either LPF HP	20MHz, 2MHz, 200kHz F or SMA 4 independent channel	Analog Fo	orm: 20MHz, 2MHz, 200kHz Pr LPE HPE or SMA_4 independent chappels			
Input Coupling	GND, DC 1MΩ, A	$C 1M\Omega$, DC 50 Ω	GN	D. DC 1MQ. AC 1MQ			
Input Impedance	1MΩ ±1% // 1	6pF, 50Ω ±1%		1MΩ ±1% // 20pF			
Probe Sense	Automatic Detection:	:1, 10:1, 100:1, 1000:1, Manual S	ettings: 1:1, 5:1, 10:1, 20:1, 50:1, 100:	1, 200:1, 500:1, 1000:1, 2000:1			
Time Axis Range	500ps/div to 50s/div	1ns/div to 50s/div	2ns/div to 50s/div	5ns/div to 50s/div			
Standard Probe	SS-101R (multi-channe	el supplied as standard)	SS-0130R (mu	Ilti-channel supplied as standard)			
Roll Mode		50ms/div to	50s/div (100kS/s max)				
Clock Accuracy			±10ppm				
Trigger Function	Edge, Edge ALT, Edge	OR, Pulse Count, Pulse Width, Cyc	le, Dropout, TV, Pattern (OR, NOR, ANI	D, NAND), Serial (UART, SPI, I ² C)	_		
selection		NTSC, PAL, Cu	stom / Up to 3,000 / 1, 2, 4, 8				
Pulse Count Trigger Setting Range		1	to 9,999 events				
Pulse Width Trigger Time Setting Range			15ns to 50s				
Cycle Trigger Time Setting Range			40ns to 50s				
Dropout Trigger Time Setting Range	50ns to 50s						
Pattern Trigger	ON, NUD, AND, AND, AND						
Serial Trigger							
Tringer Selection		START. STOP. Parity Error. Data Pattern					
Bit Rate		1.000bps to 1	Wbps (set in units of 100bps)				
UART Comparative Data Length			5 to 8 bits				
Signal Source	CH1 to CH4, EXT (CH1, CH2, EXT for 2 channel function)						
Trigger Selection	Data Pattern						
SPI CS Selection	Idling time specified when no positive logic/negative logic or CS						
input: Maximum 20MHz Comparative Data Length	4 to 64 bits						
Signal Source		CH1 to CH4, EXT (CH	1, CH2, EXT for 2 channel function)				
Trigger Selection		START, STOP, F	ESTART, NACK, Data Pattern				
I ² C Address Mode		Selected from	7-bit / 10-bit / EEPROM read				
Comparative Data Length	1 to 50	ytes when the address is 7-bit/10	-bit, 1byte when EEPRUM read (with s	hift comparison)	_		
Signal Source			T, GHZ , EXT for 2 channel function)				
Trigger Slope / Coupling		All chamiles, LAT	ction Low Frequency Rejection Noise	Rejection			
Display / Resolution		7.5-inch Color TET I CD	(touch screen) / VGA: 640×480 Pixels				
Display Mode		Y-	T, XY, XY Trigger				
Vector Connection		Sample Point Int	erpolation Display, Dot Display				
Analog Persistence		Monochrome Gray	scale Display, Spectrum Display				
Persistence Display Time		100ms, 200ms,	500ms, 1s, 2s, 5s, 10s, infinite				
Internal Waveform Storage (REF Memory)			5 Waveforms				
Front Panel Setting Storage		Possible to save five setting	gs in the internal memory, USB memo	ry			
Parameter Measurement, Cursor, Zoom, Calculation, Replay	Functions						
Parameter Measurement	Maximum Value, Minimum Value, Peak-Peak, F Rising Time 10-90%, Falling Time 9	RMS, Cycle RMS, Average, Cycle Average 10-10%, Frequency, Cycle, + Pulse Coun	t, Top, Base, Top-Base, Rising Overshoot, Falli t, - Pulse Count, + Pulse Width, - Pulse Width,	ng Overshoot, Rising Time 20-80%, Falling Time 80-2 , Duty Ratio, Integral, Skew (+, -), Skew at level	20%,		
Simultaneous Measurement Count / Statistic Value Display		Maximum 4 Parameters / Maxim	um Value, Minimum Value, Measureme	ant Count			
Logging Items, Output Destination	Time Recording Ti	, Parameter Measurement Results me: Pop-up menu, internal memor	s (Conditions A, B, C, D), Pass/Fail Jud v (maximum 86,400 records), After Re	gment Results ecordina: USB memory			
Pass/Fail Judgment	Judgment Mode: Parameter Judgme	ent or Mask Judgment, Judgment Page Search Function: Select	Results: Saved on USB, Beep Tone, Pu Pass or Fail and search in ascent or de	Ise Output (DS-578 option required), Logging	g		
Cursor		Time. Amplitude. Time	& Amplitude, Value at Cursor Position				
Zoom	Pre	ss the Zoom button on the front p	anel to display an enlarged waveform o	on a new grid			
Calculation Function	Addition, Subtraction, Multiplication	n, Differential Calculus, Integral Ca	alculus, (FFT (maximum 8k points, rec	tangular, hanning, flat-top window functions))		
	Double calculation of the results of eit	her addition, subtraction or multip	Dication possible with either differentia	al calculus, integral calculus or FFT (9 pattern	ns)		
Rescale / Unit Conversion	• •	A: x + b (x: Input voltage, a, b: Us	er defined) / volt, ampere, watt, ° C, n	o display			
Inchida Frequency Counter	Auto	made waveform logging, storage	6 characters	spiay possible			
Interface	Cunno	rts LISB 2 NHS (device bost) I AM	(100Base-TX) GPIR (factory_delivered	d ontion DS576)			
AUX Interface		Option:	al external connector				

		DS-5654	DS-5652	DS-5634	DS-5632	DS-5624	DS-5622	DS-5614	DS-5612
Optional Accessories									
	DS-577 AUX IO CH1/CH2 Output* (factory-delivered option)	77 AUX 10 CH1/CH2 Output* (factory-delivered option) AUX 101: Outputs the CH1 input signal to which offset voltage has been applied, AUX 102: Outputs the CH2 input signal to which offset voltage h							je has been applied
	DS-578 AUX IO CH1/TRIG Output* (factory-delivered option)	AUX 102 Output 0	AUX 101: Outputs the CH1 input signal to which offset voltage has been applied, AUX 102: Outputs the pulse signal set level H with the following conditions AUX 102 Output Conditions: Output with trigger output (when TRIG output has been selected), Output when Pass/Fail/Pass or Fail has been detected (when Pass/Fail output has been selected)						
	DS-576 GPIB Interface (factory-delivered option)		GPIB: IEEE488.2						
	Power source options for the DS-579 probe		Two-way power source for use with Iwatsu active probes						
W	aveform Data Storage	eform Data Storage Saved on the USB with binary, ASCII, Mathcad, calculation (ASCII), calculation (Mathcad)							
На	ard copy Output	TIFF, BMP and PNG (supporting transparency) images saved on the USB or output to printers that support PictBridge®							
Ca	alibration Signal Output	Square Waveform 1kHz, 3Vp-p							
Рс	ower Source / Power Consumption	AC90V to 264V(47Hz to 63Hz), AC90V to 132V(380Hz to 420Hz) / 95VA(60W)max							
Dimensions / Unit Weight Approximately 330W x 190H x 124D mm / Approximately 3.7kg									
Gı	Jaranteed Performance Temperature	10°C to 35°C							
Operating Temperature / Humidity / Altitude Temperature 0 to 40° C / Humidity 5% to 80% RH≦30° C (no condensation), RH 55% or less at 40° C or					40° C or less (no con	densation) / Altitude	2,000m or less		

DS-5400 Series Specifications

	DS-5424	DS-5422	DS-5414	DS-5412		
Frequency bandwidth (-3dB)	200MF	łz		100MHz		
Rise time(Typical)	1.75n	S		3.5ns		
Input Channel Count	4	2	4	2		
Maximum Sampling Rate	2GS/s (when 2 channels interleaved), 1GS/s (when all channels are in use) 1GS/s 1GS/s					
Equivalent Sampling Rate	100GS/s					
Peak Detect Resolution			1ns			
Averaging Function		2 t	o 256 times			
Maximum Memory Length		500	0k points/ch			
Vertical Resolution			8-bit			
Input Voltage Range		2mV/	/div to 10V/div			
Offset Voltage	2mV/div	to 50mV/div: ±1V, 50.2mV/div to	500mV/div: ±10V, 502mV/div to 10V/div	v: ±100V		
DC Gain Accuracy		土(1.5%	+ 0.5% full scale)			
Maximum Input Voltage		±400	OVpeak CAT I			
Band-Limiting Filter		Analog Form:	20MHz, 2MHz, 200kHz			
Input Coupling		GND, DO	C 1MΩ, AC 1MΩ			
Input Impedance		1ΜΩ	±1% // 20pF			
Probe Sense	Automatic Detection: 1:1, 1	10:1, 100:1, 1000:1, Manual Sett	ings: 1:1, 5:1, 10:1, 20:1, 50:1, 100:1, 20	00:1, 500:1, 1000:1, 2000:1		
Time Axis Range	2ns/div to 5	0s/div	5ns/0	div to 50s/div		
Standard Probe		SS-0130R (multi-ch	nannel supplied as standard)			
Roll Mode		50ms/div to 50	Os/div (100kS/s max)			
Clock Accuracy			±10ppm			
Trigger Function		Edge Pulse Count P	ulse Width Cycle Dropout TV			
TV Trigger (Bated) / Line setting range selection / Field		Lugoj i uloo obulilj i				
selection		NTSC, PAL, Custo	m / Up to 3,000 / 1, 2, 4, 8			
Pulse Count Trigger Setting Range		1 to	9.999 events			
Pulse Width Trigger Time Setting Range		1	5ns to 50s			
Cycle Trigger Time Setting Bange		4	0ns to 50s			
Dropout Trigger Time Setting Range		5	0ns to 50s			
Trigger Source	1	All channels FXT (±0.5V) EXT10 (±5.0V) Line			
Trigger Slope / Coupling	+ -	AC DC High Frequency Rejecti	ion Low Frequency Rejection Noise Reje	ction		
Display / Resolution	· · · ·	7.5-inch Color TET I CD (to	uch screen) / VGA \cdot 640 \times 480 Pixels			
Display Mode		Y-T 2	XY XY Trigger			
Vector Connection		Sample Point Interr	nolation Display Dot Display			
Analog Persistence		Monochrome Gravsc	ale Display, Spectrum Display			
Persistence Display Time	1	100ms 200ms 50	Oms 1s 2s 5s 10s infinite			
Internal Waveform Storage (BEE Memory)		5	Waveforms			
Front Panel Setting Storage		Possible to save five settings	in the internal memory LISB memory			
Parameter Measurement Cursor Zoom Calculation Replay	Functions	l consiste to care into octaingo				
Parameter Measurement	Maximum Value, Minimum Value, Peak-Peak, RMS Bising Time 10-90% Falling Time 90-1	5, Cycle RMS, Average, Cycle Average, To	op, Base, Top-Base, Rising Overshoot, Falling Overshoot, Falli	ershoot, Rising Time 20-80%, Falling Time 80-20%,		
Simultaneous Measurement Count / Statistic Value	Million Constraining million of Million	aximum 4 Parameters / Maximum	Value, Minimum Value, Measurement Co	Junt		
Logging Items, Output Destination			_			
Pass/Fail Judgment			_			
Cursor		Time Amplitude Time & A	Amplitude, Value at Cursor Position			
700m	Press	the Zoom button on the front pane	el to display an enlarged waveform on a r	new arid		
Calculation Function	Addition, Subtract	tion, Multiplication, FFT (maximun	n 8k points, rectangular, hanning, flat-tor	window functions)		
Rescale / Unit Conversion	a*	* x + b (x: Input voltage, a, b: User	defined) / volt, ampere, watt, ° C, no dis	play		
Beplay	Automa	atic waveform logging, storage for	r a maximum of 1.024 waveforms, replay	possible		
Frequency Counter		6 f	characters			
Interface	Si	inports USB 2 0HS (device hos	t) GPIB (factory-delivered option DS5	576)		
AUX Interface		Optional e	external connector			
Optional Accessories						
DS-577 AUX IO CH1/CH2 Output			_			
DS-578 AUX IO CH1/TRIG Output			_			
DS-576 GPIB Interface		GPIB: IFFF488.2	(factory-delivered option)			
Power source options for the DS-579 probe		Two-way power source	for use with Iwatsu active probes			
Waveform Data Storage	Saved	on the USB with binary ASCIL Ma	athcad calculation (ASCII) calculation (M	Aathcad)		
Hard conv Outout		MP and PNG images saved on the	USB or output to printers that support Pic	ctBridge®		
Calibration Signal Output		Square Wa	veform 1kHz 3Vn-n			
Power Source / Power Consumption		90V to 264V(47Hz to 63Hz) ACOC	$V_{13} = \frac{1}{2} 1$	imax		
Dimensions / Unit Weight	AC	Δηρηγιματοίν 2201/1/ × 100	H x 124D mm / Approvimately 3 7kg			
Guaranteed Performance Temperature		1/	1° C to 35° C			
Onerating Temperature / Humidity / Altitude	Temperature 0 to 40° C / Humiditu	5% to 80% RH≤30° C (no condo	nsation) BH 55% or less at 40° C (no cor	adensation) / Altitude 2.000m or less		
oporating Tomporature / Humality / Altitude	interperature 0 to 40 to 7 ridillulty		100001, 111 00 /0 01 1000 at 40 0 (110 cul	autorioacion) / Antitudo 2,000111 01 1655		

*The DS-577 and DS-578 cannot be mounted together.
External appearances and certain performance levels are subject to modification without prior notice for the purpose of product improvement, etc.

Standard DS-5600 Series / DS-5400 Series Prices

Model Name	BW(-3db)	Channel Count	Maximum Sampling Rate	Memory Length (with CH)	Memory Length (Maximum with 2CH interleaved)	Model	Standard	Probes Supplied	Standard Accessories
DS-5654	500MHz	4CH	2GS/s (with 2CH interleaved)	2.5M points	5M points	WOUEI	Quantity	Туре	(Miscellaneous)
DS-5652	500MHz	2CH	2GS/s (with 2CH interleaved)	2.5M points	5M points	DS-5412	2		
DS-5634	350MHz	4CH	2GS/s (with 2CH interleaved)	2.5M points	5M points	DS-5414	4		
DS-5632	350MHz	2CH	2GS/s (with 2CH interleaved)	2.5M points	5M points	DS-5422	2		 Power Cord x1
DS-5624	200MHz	4CH	2GS/s (with 2CH interleaved)	2.5M points	5M points	DS-5424	4	SS-0130R	 Front Panel Cover x1
DS-5622	200MHz	2CH	2GS/s (with 2CH interleaved)	2.5M points	5M points	DS-5012	2		• CD (containing
DS-5614	100MHz	4CH	2GS/s (with 2CH interleaved)	2.5M points	5M points	DS-3014	4		Instruction Manual,
DS-5612	100MHz	2CH	2GS/s (with 2CH interleaved)	2.5M points	5M points	DS-5624	<u> </u>		Remote Control
DS-5424	200MHz	4CH	2GS/s (with 2CH interleaved)	500k points	500k points	DS-5632	2		Manual) x1
DS-5422	200MHz	2CH	2GS/s (with 2CH interleaved)	500k points	500k points	DS-5634	4		 User Guide x1
DS-5414	100MHz	4CH	1GS/s	500k points	500k points	DS-5652	2	SS-101R	
DS-5412	100MHz	2CH	1GS/s	500k points	500k points	DS-5654	4		
* We accept reque	ests for calibration c	ertificates. trace	ability network diagrams and inspectio	n results on a chargeable bas	sis.				

Optional Accessories



Maximum Input Voltage

4kV

6kV

4kV

6kV

6kV

1kV

1kV

2kV

2.8kV

2.8kV

Probe Accessories *The specifications here show the individual characteristics of each probe.(Contact our sales or distributor for details.)

400MHz

400MHz

380MHz

300MHz

150MHz

380MHz

300MHz

150MHz

400MHz

* Contact us with regard to specifications not listed

Length

2m

2m

1.2m

2m

3m

1.2m

2m

3m

2m

3m

100:1

1000:1

100:1

100:1

1000:1

High-Voltage Probe **PHV/PHVS Series**

PHV1000-R0

PHVS1000-R0

PHV-641-LR0

PHV-642-LR0

PHV-643-LRO

PHV661-LR0

PHV662-LR0

PHV663-LR0

PHVS662-LR0

SFP-5A

PHVS663-LR0 250MHz

Standard Probe

SS-0130R Frequency BW: DC to 200MHz Input RC: 10MΩ//12.5pF Attenuation Ratio: 10:1 Length: 1.5m

SS-101R

Frequency BW: DC to 500MHz Input RC: 10MQ//12pF Attenuation Ratio: 10:1 Length: 1.2m

High-Voltage Probe SS-0170R

Frequency BW: DC to 400MHz Maximum Input Voltage: 6kV (DC+ACpk, CAT I) Input RC: 66.7MQ±1%//4pF or less Attenuation Ratio: 100:1, Cable Length: 2m

SS-0171R

Frequency BW: DC to 400MHz Maximum Input Voltage: 4kV(DC+ACpk, CAT I) Input RC: 66.7MQ±1%//4pF or less Attenuation Batio: 100:1 Cable Length: 2m

High-Voltage Probe

HV-P30 30kV DC+AC peak or single-pulse 40kV

HV-P60

60kV DC+AC peak or single-pulse 80kV * Check the de-rating characteristics of the high-voltage probes before selecting them.





PS-25

Current probe (Clamp type)

SS-250

Frequency Bandwidth : DC to 100MHz(-3dB), Maximum input range : 30A rms, Maximum peak current : 50A peak, Measurable wire diameter : \$\phi 5mm

SS-240A

Frequency Bandwidth : DC to 50MHz(-3dB), Maximum input range : 30A rms, Maximum peak current : 50A peak, Measurable wire diameter : ϕ 5mm

SS-270

Frequency Bandwidth : DC to 2MHz(-3dB), Maximum input range : 500A rms, Maximum peak current : 700A peak, Measurable wire diameter : ϕ 20mm SS-260

Frequency Bandwidth : DC to 10MHz(-3dB), Maximum input range : 150A rms, Maximum peak current : 300A peak, Measurable wire diameter : ϕ 20mm

PS-26 Power Source for Current Probes

Power supply for SS-240A, SS-250, SS-260 and SS-270(Input voltage AC100V(AC120V/AC200V/AC220V are factory- delivered options.)

Rogowski Coil Current Probe SS-280A Series



Model	B/M(-3dB)	Maximum current
INIOUCI	DW(-Sub)	Maximum current
SS-281A	110Hz to 30MHz	30A, peak
SS-282A	65Hz to 30MHz	60A, peak
SS-283A	32Hz to 30MHz	120A, peak
SS-284A	9Hz to 30MHz	300A, peak
SS-285A	6Hz to 30MHz	600A, peak
SS-286A	3Hz to 30MHz	1200A neak

Common to all SS-280A series

.5m
Omm
¢1.7mm
deg. to 40deg.
40deg. to 125deg.
NC connector
A battery *4pcs. or AC adaptor

·Some of the products are Regulated Products subject to the Foreign Exchange and Foreign Trade Control Law of Japan. Export should not be allowed without appropriate governmental authorization. Please ask our sales office whether the product concerned is a Regulated Product.

•The products shown in this catalogue are current models at the date of publication. Designs and specifications are subject to change without notice for

improvement.

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