

CS5400 SERIES SPECIFICATIONS

MODEL	CS-5400	CS-5405	CS-5470	CS-5475	CS-5450	CS-5455				
CRT Type/accelerating voltage	150mm rectangular with internal graticule 8x10 div. (1 div.=10mm) /approx. 12kV									
Vertical Axis (CH1, CH2)										
Sensitivity	5mV to 5V/div. 1mV, 2mV/div.		±2%							
Attenuator	1-2-5 step, 12 ranges, fine adjustable within the selected range									
Input Impedance	1MΩ±1%, approx. 20pF									
Frequency Response	5mV to 5V/div. 1Mv, 2Mv/div.	DC	DC to 100MHz (within -3dB)	DC to 70MHz (within -3dB)	DC to 50MHz (within -3dB)					
		AC	5Hz to 100MHz (within -3dB)	5Hz to 70MHz (within -3dB)	5Hz to 50MHz (within -3dB)					
Rising Time	5mV to 5V/div. 1mV, 2mV/div.	DC	Approx. 3.5ns		Approx. 5ns					
		AC	Approx. 17.5ns							
Signal delay Time	Leading edge can be confirmed using a square wave that has a rising time of less than this unit									
Crosstalk	-40dB (at 1kHz)									
Max Input Voltage	800 Vp-p or 400 V (DC + AC peak, 1kHz)									
Vertical Axis (CH3)										
Sensitivity	0.1V to 0.5V/div.		±2%							
Attenuator	0.1V, 0.5V/div		0.1V/div	0.1V, 0.5V/div	0.1V/div	0.1V, 0.5V/div				
Input Impedance	1MΩ±1%, approx. 20pF									
Frequency Response	DC to 100MHz (within -3dB)		DC to 70MHz (within -3dB)		DC to 50MHz (within -3dB)					
Rising Time	Approx. 3.5ns		Approx. 5ns		Approx. 7ns					
Signal delay Time	Leading edge can be confirmed using a square wave that has a rising time of less than this unit									
Max Input Voltage	100 Vp-p or 50 V (DC + AC peak, 1kHz)									
Vertical Axis										
Operation Mode	CH1, CH2, CH3, ADD, ALT, CHOP									
Chopping Frequency	Approx. 250kHz									
Polarity Inversion	CH2 only									
Horizontal (CH2 Input, except x10 MAG)										
Sensitivity	5mV to 5V/div. 1mV, 2mV/div		±3%							
Input Impedance			Same as vertical axis (CH2)							
Frequency Response	DC AC	DC	DC to 1 MHz (-3dB)		5Hz to 1 MHz (-3dB)					
		AC	Less than 3° at 100kHz							
X-Y Phase Difference	Switchable to X-Y mode with H.MODE key (CH1: Y axis, CH2: X axis)									
Operation Mode	Same as vertical axis (CH2)									
Max Input Voltage	Same as vertical axis (CH2)									
SWEEP										
Sweep Mode	A, ALT, B, X-Y									
Sweep Time	±2%, 1-2-5 step, 22 ranges, fine adjustable within the selected range									
A Sweep	0.5 s to 50 ns/div.		±2%, 1-2-5 step, 19 ranges							
B Sweep	50 ms to 50 ns/div.		X10 ±5%, (±8% at 0.5 μs and 50 ns/div.)							
Sweep Magnification	±3% (±5% at x10 MAG mode)									
Linearity	A Sweep, continuously variable from NORM position									
Hold Off	B Sweep is continuously variable ±4div. with respect to A sweep									
Trace Separation	Continuous delay (After Delay)									
Delay Sweep Mode	AFT.D B TRIG'D	Synchronous delay (B TRIG'D): Synchronized with trigger signal								
Delay Time	Continuously variable from 0.2div. to 10div. (0.5s/div. to 50ns/div.)									
Delay Time Error	±(3% of setting value + 1% of full scale) + (0 to 300ns) :CS-5400, CS-5470, CS-5450 ±4% OF READING VALUE :CS-5405, CS-5475, CS-5455									
Delay Jitter	20000 (10 times of A sweep setting value) : 1 (at A sweep 1ms/div. B sweep 1 μs/div.)									
Triggering Mode										
Trigger Mode	AUTO, NORM, FIX, SINGLE, RESET									
Trigger Sources	VERT, CH1, CH2, CH3, LINE									
Trigger Coupling	AC, HF-REJ, DC, TV-F, TV-L									
Trigger Sensitivity (NORM MODE)	AC, HF-REJ, DC, TV-F, TV-L									
Coupling	AC	Frequency	NORM	FIX*	NORM	FIX*	NORM	FIX*		
		10Hz to 50MHz	1.0div	1.5div.	10Hz to 20MHz	1.0div	1.5div.	10Hz to 20MHz	1.0div	1.5div.
	HF-REJ	50MHz to 100MHz	1.5div.	2.0div.	20MHz to 70MHz	1.5div.	2.0div.	20MHz to 70MHz	1.5div.	2.0div.
		10Hz to 10KHz	1.0div.	1.5div.	10Hz to 10KHz	1.0div.	1.5div.	10Hz to 10KHz	1.0div.	1.5div.
	DC	10KHz or more	>min	>min	10KHz or more	>min	>min	10KHz or more	>min	>min
DC to 50MHz		1.0div.	1.5div.	DC to 20MHz	1.0div.	1.5div.	DC to 20MHz	1.0div.	1.5div.	
TV-V, TH-H	50MHz to 100MHz	1.5div.	2.0div.	20MHz to 70MHz	1.5div.	2.0div.	20MHz to 50MHz	1.5div.	2.0div.	
		Composite video signal	1.5div.		Composite video signal	1.5div.	Composite video signal	1.5div.		
(Above values are obtained with the signal input of: AUTO: 40Hz or more, FIX: 50Hz or more. Internal sensitivity indicated as the amplitude on the CRT. Sensitivity in HF-Rej mode ">min" denotes the amplitude required for synchronization will increase.)										
Calibration Signal										
Waveform	Square wave									
Polarity	Positive									
Amplitude	1Vp-p±1%									
Frequency	1kHz±0.1%									

MODEL	CS-5400	CS-5405	CS-5470	CS-5475	CS-5450	CS-5455
Intensity Modulation						
Input Voltage	Dims at TTL high level (+5V)					
Input Impedance	Approx. 10k Ω					
Frequency Response	DC to 5MHz					
Max Input Voltage	84Vp-p or 42 V (DC + AC peak, 1kHz)					
CH1 Signal Output (50Ω Load)						
Output Voltage	Approx. 50m Vp-p/div					
Output Impedance	Approx. 50 Ω					
Frequency Response	5mV to 5V/div 1mV, 2mV/div	100Hz to 100MHz (within -3dB)	100Hz to 70MHz (within -3dB)	100Hz to 20MHz (within -3dB)	100Kz to 50MHz (within -3dB)	
Trace Rotation						
Power Requirements						
Voltage	AC100 / 120 / 220 / 230V (\pm 10%)					
Frequency	50 Hz / 60 Hz					
Power Consumption	MAX.56W, MAX.69VA	MAX.45W, MAX.58VA	MAX.56W, MAX.69VA	MAX.45W, MAX.58VA	MAX.55W, MAX.68VA	MAX.44W, MAX.57VA
Insulator Voltage						
Insulator Resistance						
Dimensions/Weight						
Dimensions (W x H x D)	305x150x400mm / (344x165x459mm, Maximum dimensions)					
Weight	Approx. 9.3kg	Approx. 8.8kg	Approx. 9.3kg	Approx. 8.8kg	Approx. 9.3kg	Approx. 8.8kg
Operating Environment (limited as indoor use)						
Altitude	Below 2000m					
Overvoltage Category	II					
Pollution	2					
Operating Temperature & Humidity	0 to +40°C, 85% or less (with no condensation)					
Storage Temperature	-20to +70°C, 85% or less (with no condensation)					
Accessories						
Probe	PC-51 (2)	PC-59 (2)	PC-51 (2)	PC-59 (2)	PC-53 (2)	PC-54 (2)
	Operational Manual (1) / Adjusting Screwdriver (1) / Power Cable (1) / Replacement Fuse (1)					
■ Readout Section (CS-5400, CS-5470, CS-5450 only)						
Panel Setup Value						
	CH1, CH2 scale factor (with probe detection), CH3 scale factor, V-UNCAL, ADD, INV, A/B Sweep scale factor (MAG conversion, "" is displayed in MAG mode), X-Y Sweep UNCAL, DELAY, TIME, B TRIG'D					
Cursor Measurement						
Cursor Mode	Δ V1only in X-Y mode	Δ V1 : Voltage display by converting CH1 scale factor				
(Measures between Δ REF and cursor except the parameter automatic measurement)		Δ V2 : Voltage display by converting CH2 scale factor				
		Δ V3 : Voltage display by converting CH3(0.1V/div. or 0.5V/div.) scale factor				
		Δ T : Time display by converting A sweep scale factor				
		Δ 1/T : Frequency display by converting sweep scale factor				
DCV, Vp-p, FRQ, PER		Display the parameter measurement value by automatic measurement function				
VARIABLE or A VARIABLE at UNCAL	RATIO PHASE DCV>, Vp-p>	Voltage ratio, time ration display with 5div. on the CRT as 100%				
		Phase difference display with 5div. on the CRT as 360°				
		Display ">" and inform that the input signal is larger than measurement value on CRT				
Resolution/Measurement Error		10bit/ \pm 4%				
Measuring Range		Vertical : More than \pm 3.6div. from the center of CRT. Horizontal : More than \pm 4.6div. from the center of CRT				
Parameter auto setting function						
Frequency (FRQ)		Each parameter is measured and displayed for the signal selected as the trigger signal source from CH1 or CH2				
Frequency Range		Mode selectable in Cursor mode. Measured with internal counter to be displayed.				
Effective Digits/Accuracy		CS-5400:2Hz to 100MHz CS-5470:2Hz to 70MHz CS-5450:2Hz to 50MHz				
Measurement Sensitivity		5 Digits/0.01% \pm 1 digit				
Period (PER)		Same as trigger sensitivity				
Measurement Range		Mode selectable in Cursor mode. Measured with internal counter to be displayed.				
Effective Digits/Accuracy		CS-5400:0.5s to 10ns CS-5470:0.5s to 14ns CS-5450:0.5s to 20ns				
Measurement Sensitivity		5 digits/0.01% \pm 1 digit				
AC Voltage (Vp-p)		Mode selectable in Cursor mode. Peak-to-peak voltage is measured and displayed.				
Measurement Range		10Hz to 1MHz:0.5div. to Effective CRT area. 1MHz to 5MHz:2.0div. to Effective CRT area.				
Frequency Range		10Hz to 5MHz				
Effective Digits		3 digits				
Accuracy	10Hz to 40Hz	\pm [8% + attenuator setup value (V/div) x0.04 div.]				
	40Hz to 1MHz	\pm [3% + attenuator setup value (V/div) x0.04 div.]				
	1MHz to 5MHz	\pm [5% + attenuator setup value (V/div) x0.04 div.]				
DC Voltage (DCV)		Mode selectable in Cursor mode. Average DC voltage is measured and displayed.0.5div. to Effective CRT area				
Sensitivity		0.5div. to Effective CRT area				
Effective Digits		3 digits				
Accuracy		\pm [3% + attenuator setup value (V/div) x0.04 div.]				
Auto Setup						
Period		For CH1, CH2, Vertical axis attenuator, Sweep range, Vertical position, Horizontal position are automatically setup				
Amplitude		1.5 to 5 periods (H.Variable:CAL mode, for input signal up to 10MHz)				
Frequency (Sine wave)		Within effective CRT area (within 1/2 of effective CRT area in dual-trace mode)				
Position		CS-5400:50Hz to 100MHz, CS-5470:50Hz to 70MHz, CS-5450:50Hz to 50MHz				
		Vertical axis:1 channel; almost center of CRT, 2 channel; CH1 approx. \pm 2 div., CH2 approx. -2div. from the center of CRT				
		Horizontal axis: starts from left edge of CRT scale				
Backup						
		Panel setup values are backed up by built-in battery. Battery service life approx. 30,000 hours (with room temperature)				