

SPECIFICATIONS

	CS-1022	CS-1021	CS-1012	CS-1020	CS-1010
CRT	150FTM31	150GTM31A	150GTM31A	150FTM31	150GTM31A
Acceleration Voltage	6 kV	2 kV	2 kV	6 kV	2 kV
Display Area	8 × 10 div (1 div = 10 mm)				
Type	Rectangular, with internal graticule				
VERTICAL AXIS	CH1 and CH2			—	
Sensitivity	1 mV/div to 5 V/div, ±3%				
Attenuator	12 steps, 1 mV/div to 5 V/div in 1-2-5 sequence. Vernier control for fully adjustable sensitivity between steps.				
Input Impedance	1 MΩ ± 2%, approx. 35pF			1 MΩ ± 2%, approx. 32pF	1 MΩ ± 2%, approx. 35pF
Frequency Response 2 mV/div to 5 V/div 1 mV/div	DC; DC to 20 MHz, —3 dB AC; 5 Hz to 20 MHz, —3 dB DC; DC to 10 MHz, —3 dB AC; 5 Hz to 10 MHz, —3 dB	DC; DC to 10 MHz, —3 dB AC; 5 Hz to 10 MHz, —3 dB DC; DC to 7 MHz, —3 dB AC; 5 Hz to 7 MHz, —3 dB	DC; DC to 20 MHz, —3 dB AC; 5 Hz to 20 MHz, —3 dB DC; DC to 10 MHz, —3 dB AC; 5 Hz to 10 MHz, —3 dB	DC; DC to 10 MHz, —3 dB AC; 5 Hz to 10 MHz, —3 dB DC; DC to 7 MHz, —3 dB AC; 5 Hz to 7 MHz, —3 dB	
Rise Time	17.5 nsec or less (20 MHz) 35 nsec or less (10 MHz)	35 nsec or less (10 MHz) 50 nsec or less (7 MHz)	17.5 nsec or less (20 MHz) 35 nsec or less (10 MHz)	35 nsec or less (10 MHz)	35 nsec or less (10 MHz) 50 nsec or less (7 MHz)
Crosstalk	—40 dB minimum			—	
Operating Modes	CH1; single trace CH2; single trace ADD; CH1 + CH2 added display ALT; two waveforms alternating CHOP; two waveforms chopped			—	
Chop Frequency	Approx. 250 kHz			—	
Channel Polarity	Normal or inverted, CH2 only inverted			—	
Maximum Input voltage	500 Vp-p or 250 V (DC + AC peak)				
Non-Distorted Maximum Amplitude	More than 8 div, DC to 20 MHz	More than 5 div, DC to 20 MHz	More than 6 div, DC to 10 MHz	More than 8 div, DC to 20 MHz	More than 6 div, DC to 10 MHz
HORIZONTAL AXIS	(input thru CH2, × 10 MAG not included)			(× 10 MAG not included)	
Operating Mode	With TRIG MODE switch, X-Y operation is selectable. CH1; Y axis CH2; X axis			With TRIG MODE switch, X-Y operation is selectable. VERT. INPUT; Y axis EXT TRIG INPUT; X axis	
Sensitivity	Same as vertical axis (CH2)			100 mV/div	
Input Impedance	Same as vertical axis (CH2)			1 MΩ ± 2%, approx. 32pF	1 MΩ ± 2%, approx. 35 pF
Frequency Response	DC; DC to 1 MHz, —3 dB AC; 5 Hz to 1 MHz, —3 dB	DC; DC to 500 kHz, —3 dB AC; 5 Hz to 500 kHz, —3 dB		DC; DC to 1 MHz, —3 dB	DC; DC to 500 kHz, —3 dB
X-Y Phase Difference	3° or less at 100 kHz	3° or less at 50 kHz		3° or less at 100 kHz	3° or less at 50 kHz
Maximum Input Voltage	Same as vertical axis (CH2)			50 V (DC + AC peak)	
SWEEP					
Type	NORM	Triggering sweep			
	AUTO	Sweep free runs in absence of trigger			

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Sweep Time	0.2 μ s/div to 0.5 s/div, \pm 3% in 20 ranges, in 1-2-5 sequence. Vernier control provides fully adjustable sweep time between steps.	0.5 μ s/div to 0.5 s/div, \pm 3% in 19 ranges, in 1-2-5 sequence. Vernier control provides fully adjustable sweep time between steps.		0.2 μ s/div to 0.5 s/div, \pm 3% in 20 ranges, in 1-2-5 sequence. Vernier control provides fully adjustable sweep time between steps.	0.5 μ s/div to 0.5 s/div, \pm 3% in 19 ranges, in 1-2-5 sequence. Vernier control provides fully adjustable sweep time between steps.											
Sweep Magnification	\times 10 (ten times) \pm 5%															
Linearity	\pm 3% all ranges, \pm 5% on 0.2 μ s/div range at \times 10 magnification.															
TRIGGERING																
Internal Sync	V. MODE; CH1; CH2; LINE;	Triggered by input signal selected by vertical MODE setting. Triggered by CH1 signal Triggered by CH2 signal Triggered by line voltage		INT; Triggered by vertical input signal LINE; Triggered by line voltage												
External Sync	EXT; Triggered by signal applied to EXT TRIG INPUT jack															
External sync Input Impedance	1 M Ω , \pm 2% approx. 32pF	1 M Ω , \pm 2% approx. 35pF		1 M Ω , \pm 2% approx. 30pF	1 M Ω , \pm 2% approx. 30pF											
Maximum External Trigger Voltage	50 V (DC + AC peak)															
Coupling	AC, VIDEO FRAME, VIDEO LINE															
Tigger Sensitivity																
	FREQ. RANGE	INT	EXT	FREQ. RANGE	INT	EXT	FREQ. RANGE	INT	EXT	FREQ. RANGE	INT	EXT				
	AUTO	20Hz to 20MHz	1div	0.1Vp-p	20Hz to 20MHz	1div	0.2Vp-p	20Hz to 10MHz	1div	0.1Vp-p	20Hz to 20MHz	1div	0.1Vp-p	20Hz to 10MHz	1div	0.1Vp-p
	NORM	10Hz to 20MHz	1div	0.1Vp-p	10Hz to 20MHz	1div	0.2Vp-p	10Hz to 10MHz	1div	0.1Vp-p	10Hz to 20MHz	1div	0.1Vp-p	10Hz to 10MHz	1div	0.1Vp-p
	VIDEO	FRAME, LINE	1div	0.1Vp-p	FRAME, LINE	1div	0.2Vp-p	FRAME, LINE	1div	0.1Vp-p	FRAME, LINE	1div	0.1Vp-p	FRAME, LINE	1div	0.1Vp-p
PROBE ADJ. VOLTAGE						0.5 V, \pm 6%, square wave, positive polarity, approx. 1 kHz										
INTENSITY MODULATION																
Sensitivity	TTL compatible Positive voltage increases brightness. Negative voltage decreases brightness.															
Input Impedance	Approx. 10 k Ω															
Usable Frequency Range	DC to 2 MHz		DC to 1 MHz		DC to 2 MHz		DC to 1 MHz									
Maximum Input Voltage	50 V (DC + AC peak)															
VERTICAL AXIS SIGNAL OUTPUT	CH1 SIGNAL OUTPUT		—		CH1 SIGNAL OUTPUT		VERTICAL SIGNAL OUTPUT									
Output Voltage	Approx. 50mV/div (50 Ω load)		—		Approx. 50 mV/div (50 Ω load)											
Output Impedance	Approx. 50 Ω		—		Approx. 50 Ω											
Frequency Response	100 Hz to 20 MHz, — 3 dB (50 Ω load)		—		100 Hz to 10 MHz, — 3 dB (50 Ω load)		100 Hz to 20 MHz, — 3 dB (50 Ω load)		100 Hz to 10 MHz, — 3 dB (50 Ω load)							
TRACE ROTATION						Electrical, adjustable from front panel										
POWER REQUIREMENT						AC 100/120/220/240 V \pm 10% 50/60 Hz										
Power Consumption	Approx. 43 W		Approx. 39 W		Approx. 41W		Approx. 38W		Approx. 36W							
DIMENSIONS						() dimensions include protrusions from basic outline dimensions.										
	Width	260 mm (260 mm)														
	Height	160 mm (180 mm)														
	Depth	400 mm (460 mm)														