

Analog Oscilloscope Selection Guide



Model	TOS-2020CH	TOS-2020CF	TOS-2020CT	TOS-2020	TOS-2020FG	TOS-2100C
	TOS-2040CH	TOS-2040CF	TOS-2040CT	TOS-2040	TOS-2040FG	
	TOS-2050CH	TOS-2050CF	TOS-2050CT	TOS-2050	TOS-2050FG	
Max. bandwidth	20/40/50MHz	20/40/50MHz	20/40/50MHz	20/40/50MHz	20/40/50MHz	100MHz
Attenuator switch	√	√	√	√	√	
Vertical encoder switch						
Vertical pulse switch						√
Vertical sensitivity step	10	10	10	10	10	11
High vertical sensitivity	5mV/DIV	5mV/DIV	5mV/DIV	5mV/DIV	5mV/DIV	2mV/DIV
Low vertical sensitivity	5V/DIV	5V/DIV	5V/DIV	5V/DIV	5V/DIV	5V/DIV
Sweep encoder switch	√	√	√	√	√	
Sweep pulse switch						√
Sweep time base step	20	20	20	20	20	22
Fastest sweep time	0.2us	0.2us	0.2us	0.2us	0.2us	50ns
Slowest sweep time	0.5s	0.5s	0.5s	0.5s	0.5s	0.5s
Dual sweep (Dual time base)						√
Time base step auto-shift						√
Trigger signal output						√
CH1 signal output				√	√	
Z-axis input				√	√	√
Trigger level lock				√	√	
Frequency counter		√			√	
Cursor readout						√
Panel settings save & recall						√
CRT illumination						√
Delayed sweep						√
Component test			√			

Analog Oscilloscope

Economic models

TOS-2020CH/2040CH/2050CH

TOS-2020CF/2040CF/2050CF: with built-in 6 digits frequency counter

TOS-2020CT/2040CT/2050CT: with component test function

Features

- ✓ Dual channel 20MHz/40MHz/50MHz
- ✓ 10 times sweep magnification
- ✓ TV synchronization; X-Y mode
- ✓ High illumination internal graticule CRT
- ✓ Japanese encoded switch, reliable and durable
- ✓ Fully sealed durable attenuation switch
- ✓ ALT triggering function, enabling simultaneous observation of two independent signals

TOS-2020CH



TOS-2020CF



With built-in 6 digits frequency counter

TOS-2020CT



With component test function

Specifications

Model	20MHz	40MHz	50MHz
Vertical system			
Sensitivity	5mV~5V/DIV, 10 steps in 1-2-5 sequence		
Accuracy	≤3%		
Vernier sensitivity	≤1/2.5 of panel indicated value		
Bandwidth	DC (AC 10Hz)~20MHz	DC (AC 10Hz)~40MHz	DC (AC 10Hz)~50MHz
AC coupling	<10Hz (at 100kHz, 8DIV, frequency response -3dB)		
Rise time	Approx. 17.5ns	Approx. 8.75ns	Approx. 7ns
Input impedance	Approx. 1MΩ//Approx. 25pF		
DC balance shift	5mV~5V/DIV: ±0.5DIV		
Vertical mode	CH1, CH2, DUAL (ALT/CHOP), ADD, CH2 INV		
Chopping repetition frequency	Approx. 250kHz		
Input coupling	AC, GND, DC		
Max. Input voltage	400V peak-peak, AC frequency≤1kHz		
Common mode rejection ratio	>50:1 at 50kHz sine wave (set CH1 and CH2 at same sensitivity)		
CH2 INV BAL	Balanced point variation≤1DIV (referred to graticule center)		

Horizontal system					
Sweep time		0.2us~0.5s/DIV, 20 steps in 1-2-5 sequence			
Accuracy		±3%, X10MAG: ±5% (20ns~50ns/DIV uncalibrated)			
Vernier sweep time control		≤1/2.5 of panel indicated value			
Sweep magnification		X10 (fastest sweep time 20ns/DIV)			
Position shift@X10MAG		≤2DIV at CRT screen center			
Linearity		±5%, X10MAG: ±10% (0.2s~1us)			
Trigger system					
Trigger mode		AUTO, NORM, TV-V, TV-H			
Trigger level lock		Not provided			
Trigger source		CH1, CH2, ALT, LINE, EXT			
Trigger coupling		AC: 20Hz to full bandwidth			
Trigger slope		"+" or "-"			
Sensitivity	Frequency	20Hz~2MHz	2MHz~20MHz	20MHz~40MHz	40MHz~50MHz
	CH1, CH2	1DIV	1.5DIV	2.5DIV	3DIV
	ALT	2DIV	3DIV		
	EXT	200mV	800mV		
	TV	Sync pulse>1DIV (EXT: 1V)			
External trigger input					
Input impedance		Approx. 1MΩ//Approx. 25pF			
Max. input voltage		400V (DC+AC peak), AC frequency≤1kHz			
X-Y mode					
Sensitivity		5mV~5V/DIV±3%			
X-axis bandwidth		DC~500kHz (-3dB)			
Phase error		≤3° at DC~50kHz			
Calibration signal output					
Waveform		Positive-going square wave			
Frequency		Approx. 1kHz			
Duty ratio		<48:52			
Output voltage		2Vpp±2%			
Output impedance		Approx. 1kΩ			
Frequency counter (only for TOS-2020CF, TOS-2040CF, TOS-2050CF)					
Display		6 digits LED			
Accuracy		±0.01%			
Component test (only for TOS-2020CT, TOS-2040CT, TOS-2050CT)					
Testing subject		Resistor, Capacitor, Coil, Diode, Zener or simple combination of the components			
Testing voltage		Approx. 9Vac pp			
Testing frequency		50/60Hz			
Testing current		Approx. 0.6mA			
CRT					
Type		6-inch rectangular with internal graticule, 8x10DIV (1DIV=1cm)			
Phosphor		P31			
Accelerating voltage		Approx. 2kV (20MHz); Approx. 12kV (40MHz)			
Trace rotation		Adjustable at front panel			
General					
Power source		AC110V/220V±10%, 50/60Hz, Max. 35VA			
Accessories		Power cord x1, Operation manual x1, Probe x2			
Dimension (WxHxD)		310x150x455mm			
Weight		Approx. 8kg			

Analog Oscilloscope

Standard models

TOS-2020/2040/2050

TOS-2020FG/2040FG/2050FG: with built-in 6 digits frequency counter

Features

- ✓ Dual channel 20MHz/40MHz/50MHz
- ✓ High sensitivity 1mV/DIV
- ✓ 10 times sweep magnification
- ✓ TV synchronization; X-Y mode
- ✓ Z-axis modulation input; CH1 signal output
- ✓ High illumination internal graticule CRT
- ✓ Japanese encoded switch, reliable and durable
- ✓ Fully sealed durable attenuation switch
- ✓ ALT triggering function, enabling simultaneous observation of two independent signals
- ✓ Trigger level lock and auto synchronize function

TOS-2020



Standard model

TOS-2020FG



With built-in 6 digits frequency counter

Specifications

Model	20MHz	40MHz	50MHz
Vertical system			
Sensitivity	5mV~5V/DIV, 10 steps in 1-2-5 sequence		
Accuracy	≤3%; X5MAG: ≤5%		
Vernier sensitivity	≤1/2.5 of panel indicated value		
Bandwidth	DC~20MHz (X5MAG: DC~7MHz)	DC~40MHz (X5MAG: DC~15MHz)	DC~50MHz (X5MAG: DC~15MHz)
AC coupling	<10Hz (at 100kHz, 8DIV, frequency response -3dB)		
Rise time	Approx. 17.5ns (X5MAG: Approx. 50ns)	Approx. 8.75ns (X5MAG: Approx. 25ns)	Approx. 7ns (X5MAG: Approx. 23.3ns)
Input impedance	Approx. 1MΩ//Approx. 25pF		
DC balance shift	5mV~5V/DIV: ±0.5DIV		
Vertical mode	CH1, CH2, DUAL (ALT/CHOP), ADD, CH2 INV		
Chopping repetition frequency	Approx. 250kHz		
Input coupling	AC, GND, DC		
Max. Input voltage	400V peak-peak, AC frequency≤1kHz		
Common mode rejection ratio	>50:1 at 50kHz sine wave (set CH1 and CH2 at same sensitivity)		
CH2 INV BAL	Balanced point variation≤1DIV (referred to graticule center)		

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Horizontal system					
Sweep time	0.2us~0.5s/DIV, 20 steps in 1-2-5 sequence				
Accuracy	±3%, X10MAG: ±5% (20ns~50ns/DIV uncalibrated)				
Vernier sweep time control	≤1/2.5 of panel indicated value				
Sweep magnification	X10 (fastest sweep time 20ns/DIV)				
Position shift@X10MAG	≤2DIV at CRT screen center				
Linearity	±5%, X10MAG: ±10% (0.2s~1us)				
Trigger system					
Trigger mode	AUTO, NORM, TV-V, TV-H				
Trigger level lock	Provided				
Trigger source	CH1, CH2, ALT, LINE, EXT				
Trigger coupling	AC: 20Hz to full bandwidth				
Trigger slope	"+" or "-"				
Sensitivity	Frequency	20Hz~2MHz	2MHz~20MHz	20MHz~40MHz	40MHz~50MHz
	CH1, CH2	1DIV	1.5DIV	2.5DIV	3DIV
	ALT	2DIV	3DIV		
	EXT	200mV	800mV		
	TV	Sync pulse>1DIV (EXT: 1V)			
External trigger input					
Input impedance	Approx. 1MΩ//Approx. 25pF				
Max. input voltage	400V (DC+AC peak), AC frequency≤1kHz				
X-Y mode					
Sensitivity	5mV~5V/DIV±3%				
X-axis bandwidth	DC~500kHz (-3dB)				
Phase error	≤3° at DC~50kHz				
CH1 signal output	At least 20 mV/div at 50Ω terminal, frequency at least 50Hz to 50MHz				
Calibration signal output					
Waveform	Positive-going square wave				
Frequency	Approx. 1kHz				
Duty ratio	<48:52				
Output voltage	2Vpp±2%				
Output impedance	Approx. 1kΩ				
Z-axis input					
Bandwidth	DC~2MHz				
Sensitivity	5Vpp				
Input impedance	Approx. 47kΩ				
Max. input voltage	30V (DC+AC peak), AC frequency≤1kHz				
Frequency counter (only for TOS-2020FG, TOS-2040FG, TOS-2050FG)					
Display	6 digits LED				
Accuracy	±0.01%				
CRT					
Type	6-inch rectangular with internal graticule, 8x10DIV (1DIV=1cm)				
Phosphor	P31				
Accelerating voltage	Approx. 2kV (20MHz); Approx. 12kV (40MHz)				
Trace rotation	Adjustable at front panel				
General					
Power source	AC110V/220V±10%, 50/60Hz, Max. 35VA				
Accessories	Power cord x1, Operation manual x1, Probe x2				
Dimension (WxHxD)	310x150x455mm				
Weight	Approx. 8kg				

Analog Oscilloscope

100MHz standard model with 10 sets panel settings storage TOS-2100C

Features

- ✓ Dual channel 100MHz
- ✓ Time base auto-range
- ✓ Cursor readout with 7 measurements
- ✓ Panel lock function
- ✓ Buzzer alarm
- ✓ LED indicators
- ✓ TV synchronization; X-Y mode
- ✓ Z-axis modulation input; Trigger signal output
- ✓ Signal delay function, monitoring the leading edge
- ✓ Continuously adjustable screen illumination
- ✓ Delayed sweep
- ✓ 10 sets save & recall for panel settings



Specifications

Vertical system	
Sensitivity	2mV~5V/DIV, 11 steps in 1-2-5 sequence
Accuracy	≤3%
Vernier sensitivity	Continuously variable to 1/2.5 or less of panel indicated value
Bandwidth (-3dB)	DC (AC 10Hz)~100MHz (2mV/DIV: DC~20MHz)
AC coupling	<10Hz (at 100kHz, 8DIV, frequency response -3dB)
Rise time	Approx. 3.5ns (2mV/DIV: Approx. 17.5ns)
Input impedance	Approx. 1MΩ//Approx. 25pF
DC balance shift	5mV~5V/DIV: ±0.5DIV
Vertical mode	CH1, CH2, DUAL (ALT/CHOP), ADD, CH2 INV
Chopping repetition frequency	Approx. 250kHz
Input coupling	AC, GND, DC
Max. Input voltage	400V peak-peak, AC frequency≤1kHz
Bandwidth limit	20MHz
Common mode rejection ratio	>50:1 at 50kHz sine wave (set CH1 and CH2 at same sensitivity)
Dynamic range	5DIV at 100MHz
CH2 INV BAL	Balanced point variation≤1DIV (referred to graticule center)
Signal delay	Leading edge can be monitored
Horizontal system	
Horizontal mode	MAIN (A), ALT, DELAY (B)
A (main) sweep time	50ns~0.5s/DIV, continuously variable (UNCAL)
B (delay) sweep time	50ns~50ms/DIV
Accuracy	±3%, X10MAG: ±5%
Sweep magnification	X10 (fastest sweep time 5ns/DIV)
Hold off time	Variable
Delay time	1us~5s
Delay jitter	Better than 1:20000
Alternate separation	Variable
Trigger system	
Trigger mode	AUTO, NORM, TV-V, TV-H
Trigger source	CH1, CH2, LINE, EXT
Trigger coupling	AC, DC, HFR, LFR
Trigger slope	"+" or "-"

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Trigger system						
Sensitivity	Mode	Auto		Norm		TV
	Frequency	10Hz~20MHz	20MHz~100MHz	DC~20MHz	20MHz~100MHz	Sync signal
	INT	0.35DIV	1.5DIV	0.35DIV	1.5DIV	1DIV
	EXT	50mVpp	150mVpp	50mVpp	150mVpp	200mVpp
TV sync		TV-V, TV-H				
Trigger level range		INT: 4DIV or more, EXT: $\pm 0.4V$ or more				
External trigger input						
Input impedance		Approx. 1M Ω //Approx. 25pF				
Max. input voltage		400V (DC+AC peak), AC frequency \leq 1kHz				
X-Y operation						
Mode		X-axis: selectable CH1, CH2, EXT ; Y-axis: selectable CH1, CH2, CH1 and CH				
Sensitivity		2mV~5V/DIV $\pm 3\%$; EXT: 0.1V/DIV $\pm 5\%$				
X-axis bandwidth		DC~500kHz (-3dB)				
Phase error		$\leq 3^\circ$ at DC~50kHz				
Trigger signal output						
Voltage		Approx. 25mV/DIV into 50 Ω terminal				
Frequency response		DC~10MH				
Output impedance		Approx. 50 Ω				
Calibration signal output						
Waveform		Positive-going square wave				
Frequency		Approx. 1kHz				
Duty ratio		<48:52				
Output voltage		2Vpp $\pm 2\%$				
Output impedance		Approx. 2k Ω				
Z-axis input						
Coupling		DC				
Bandwidth		DC~5MHz				
Sensitivity		5V or more				
Max. input voltage		30V (DC+AC peak), AC frequency \leq 1kHz				
Cursor readout						
Cursor measurement		ΔV , $\Delta V\%$, ΔVdB , ΔT , $1/\Delta T$, $\Delta T\%$, $\Delta \theta$				
Cursor resolution		1/25DIV				
Effective cursor range		Vertical: $\pm 3DIV$; Horizontal: $\pm 4DIV$				
Panel setting		Vertical: V/DIV (CH1, CH2), UNCAL, ALT/CHOP/ADD, INV, Probe factor, AC/DC/GND Horizontal: S/DIV (MTB, DTB), UNCAL, X10 MAG, delay time, HO Trigger: source, coupling, slope, level, TV-V, TV-H Others: X-Y, LOCK, Save/recall memory 0-9				
Special function						
Time base auto-range, Panel lock, 10 sets save & recall for panel settings						
CRT						
Display		6-inch rectangular with internal graticule; 0%, 10%, 90% and 100% markers; 8x10DIV (1DIV=1cm)				
Phosphor		P31				
Accelerating voltage		Approx. 16kV				
CRT illumination		Continuously adjustable				
General						
Power source		AC110V/220V $\pm 10\%$, 50/60Hz, Max. 65VA				
Accessories		Power cord x1, Operation manual x1, Probe x2				
Dimension (WxHxD)		310x150x455mm				
Weight		Approx. 8kg				

Specifications are subject to change without prior notice.