Specifications

This section begins with a general description of the traits of the TDS500B, TDS 600B, and TDS700A oscilloscopes. Three sections follow, one for each of three classes of traits: *nominal traits, warranted characteristics,* and *typical characteristics.*

Product Description

The TDS500B, TDS600B and TDS700A Digitizing Oscilloscopes are reportable, four-channel instruments suitable for use in a variety of test and measurement applications and systems. Table 1–1 lists key features.

Table 1–1: Key Features of the TDS500B, 600B and 700A Oscilloscopes

Feature	TDS600B	TDS500B&TDS700A
Digitizing rate, maximum	TDS684B:5GS/s one each of 4 ch TDS680B:5GS/s one each of 2 ch TDS644B:2.5GS/s one each of 4 ch TDS620B:2.5GS/s one each of 2 ch	TDS784A:4GS/s TDS540B,754A,782A:2GS/s TDS520B,724A:1GS/s Opt.1G,TDS540B:1GS/s
Analog bandwidth	TDS680B,684B,782A and 784A:1GHz TDS520B,540B,620B,644B,724A and 754A:500MHz	
No. of Channels	TDS644B&684B:4 TDS620B&680B:2+2 [1]	TDS540B,754A&784A:4 TDS520B,724A&782A:2+2 [1]
Record lengths, maximum	15,000 samples	50,000 samples (500,000 with option 1M)
Acquisition modes	Sample, envelope, peak detect and average	Sample, envelope, average, high-resolution, and peak-detect
Trigger modes	Include: edge, logic, and pulse. Video trigger, with option 05, modes include: NTSC, SECAM, PAL, HDTV, and Flex Format.	
Display	TDS520B,540B,620B,680B:Monochrome TDS644B,684B,724A,754A,782A,784A:Color	
Storage	1.44 Mbyte, 3.5 inch, DOS 3.3-or-later floppy disk (optional on TDS520B, 540B, 620B&680B). NVRAM storage for saving waveforms, hardcopies, and setups	
I/O	Full GPIB programmability. Hardcopy output using GPIB, RS-232, or Centronics ports	

[1] **Two plus Two channel operation allows up to two of the four channels to be displayed simultaneously. Channels not displayed can be used to couple a trigger ring signal to the oscilloscope.**

User Interface

Use a combination of front-panel buttons, knobs, and on-screen menus to control the many functions of the oscilloscope. The front-panel controls are grouped according to function: vertical, horizontal, trigger, and special. Set a function you adjust often, such as vertical positioning or the time base setting, directly by its own front-panel knob. Set a function you change less often, such as vertical coupling or horizontal mode, indirectly using a selected menu.

Menus Pressing one (sometimes two) front-panel button(s), such as vertical menu, displays a *main* menu of related functions, such as coupling and bandwidth, at the bottom of the screen. Pressing a main-menu button, such as coupling, displays a *side* menu of settings for that function, such as AC, DC, or GND (ground) coupling, at the right side of the screen. Pressing a side-menu button selects a setting such as DC.

Indicators On-screen readouts help you keep track of the settings for various functions, such as vertical and horizontal scale and trigger level. Some readouts use the cursors or the automatic parameter extraction feature (called measure) to display the results of measurements made or the status of the instrument.

General Purpose Knob Assign the general purpose knob to adjust a selected parameter function. More quickly change parameters by toggling the **SHIFT** button. Use the same method as for *selecting* a function, except the final side-menu selection assigns the general purpose knob to *adjust* some function, such as the position of measurement cursors on screen, or the setting for a channel fine gain.

GUI The user interface also makes use of a GUI, or Graphical User Interface, to make setting functions and interpreting the display more intuitive. Some menus and status are displayed using iconic representations of function settings, such as those shown here for full, 250 MHz and 20 MHz bandwidth. Such icons allow you to more readily determine status or the available settings.

Signal Acquisition System

The signal acquisition system provides four, full-featured vertical channels with calibrated vertical scale factors from 1 mV to 10 V per division. All channels can be acquired simultaneously.

Each of the full-featured channels can be displayed, vertically positioned, and offset, can have their bandwidth limited (250 MHz or 20 MHz) and their vertical coupling specified. Fine gain can also be adjusted.

Besidesthesechannels,uptothreemathwaveformsandfourreference waveformsareavailablefordisplay.(Amathwaveformresultswhenyouspecify dualwaveformoperations,suchasadd,onanytwochannels.Areference waveformresultswhenyousaveawaveforminareferencememory.)

HorizontalSystem

Therearethreehorizontaldisplaymodes:mainonly,mainintensified,and delayedonly.Youcanselectamongvarioushorizontalrecordlengthsettings.

Afeaturecalled"FittoScreen"allowsyoutoviewentirewaveformrecords withinthe10divisionscreenarea.Waveformsarecompressedtofitonthe screen.SeeTable 1–2.

Boththedelayedonlydisplayandtheintensifiedzoneonthemainintensified displaymaybedelayedbytimewithrespecttothemaintrigger.Bothcanbeset todisplayimmediatelyafterthedelay(delayedrunsaftermainmode).The delayeddisplaycanalsobesettodisplayatthefirstvalidtriggerafterthedelay (delayed-triggerablemodes).

Thedelayeddisplay(ortheintensifiedzone)mayalsobedelayedbyaselected numberofevents.Inthiscase,theeventssourceisthedelayed-triggersource. Thedelayedtriggercanalsobesettooccurafteranumberofeventsplusan amountoftime.

Table1-2:RecordLengthandDivisionsperRecordvs.TDSModel

Models	Record Length	DivisionsperRecord	
		FTS[1]Off[2]	FTS[1]On[3]
AllTD S500B,TDS600B&T DS700 A models; allc hannels[4] Option1 M equipped orn ot	500	10divs	10divs
	1000	20divs	10divs
	2500	50divs	10divs
	5000	100divs	10divs
	15000	300divs	15divs
TDS500B&TDS700A,allchannels	50000	1,000divs	10divs
TDS500B&TDS700A,allchannels Option1Mequippedonly	75000	1,500divs	15divs
TDS500B&TDS700A,allchannels Option1Mequippedonly	100000	2,000divs	10divs
TDS500B&TDS700A,allchannels Option1Mequippedonly	130000	2,600divs	13divs
TDS520B,TDS724A&TDS782A,one channelonly TDS540B,TDS754A&TDS784A,two channelsonly Option1Mequippedonly	250000	5,000divs	10divs
TDS540B,TDS754A&TDS784A,one channelonly Option1Mequippedonly	500000	10,000divs	10divs

1 **FittoScreensetting**

2 **FittoScreenoffpreserves50samples/divisionina1-2-5sec/divisionsequence.**

3 **FittoScreenonletsthesamples/divisionandthesec/divisionsequencevary.**

4 **Allchannelsmeansallthatmaybedisplayedatonetime:fourchannelsforsome models,twoforothers.SeeTable1-1anditsfootnoteonpage1-1.**

TriggerSystem

Thetriggeringsystemsupportsavariedsetoffeaturesfortriggeringthe signal-acquisitionsystem.Triggersignalsrecognizedinclude:

- Edge(main-anddelayed-triggersystems):Thisfamiliartypeoftriggeringis fullyconfigurableforsource,slope,coupling,mode(autoornormal),and holdoff.

- Logic(main-triggersystem):Thistypeoftriggeringcanbebasedonpattern (asynchronous)orstate(synchronous).Ineithercase,logictriggeringis configurableforsources,forbooleanoperatorstoapplytothosesources,for logicpatternorstateonwhichtotrigger,formode(autoornormal),andfor holdoff.Timequalificationmaybeselectedinpatternmode.Anotherclassof logictrigger,setup/hold,triggerswhendatainonetriggersourcechanges statewithinthesetupandholdtimesthatyouspecifyrelativetoaclockin anothertriggersource.
- Pulse(main-triggersystem):Pulsetriggeringisconfigurablefortriggering onruntorglitchpulses,oronpulsewidthsorperiodsinsideoroutsidelimits thatyouspecify.Itcanalsotriggeronapulseedgethathasaslewratefaster orslowerthantherateyouspecify.Thetimeouttriggerwillactwhenevents do *not*occurinadefinedtimeperiod.Thepulsetriggerisalsoconfigurable forsource,polarity,mode,andholdoff.
- Video(withoption05:VideoTrigger):Videotriggeringiscompatiblewith standardNTSC,PAL,SECAM,andHDTVformats.Anadditionalfeature calledFlexFormat™ (flexibleformat)allowstheusertodefinethevideo formatonwhichtotrigger.

Youcanchoosewherethetriggerpointislocatedwithintheacquiredwaveform recordbyselectingtheamountofpretriggerdatadisplayed.Presetsof10%,50%, and90%ofpretriggerdatacanbeselectedinthehorizontalmenu,orthegeneral purposeknobcanbeassignedtosetpretriggerdatatoanyvaluewithinthe0%to 100%limits.

AcquisitionControl

Youcanspecifyamodeandmannertoacquireandprocesssignalsthatmatches yourmeasurementrequirements.

- Selectthemodeforinterpolation(linearorsin(x)/x).Thiscanincreasethe apparentsamplerateonthewaveformwhenthemaximumreal-timerateis exceeded.
- Usesample,envelope,averageandpeakdetectmodestoacquiresignals. WiththeTDS500B/700A,alsousehigh-resolutionmode.
- Settheacquisitiontostopafterasingleacquisition(orsequenceofacquisitionsifacquiringinaverageorenvelopemodes)orafteralimitconditionhas beenmet.
- Selectchannelsourcesforcompliancewithlimittests.Youcandirectthe TDStosignalyouorgeneratehardcopyoutputeithertoaprinterortoa floppy-diskfilebasedontheresults.Also,youcancreatetemplatesforuse inlimittests.

On-BoardUserAssistance

HelpandautosetcanassistyouinsettinguptheDigitizingOscilloscopetomake yourmeasurements.

Help Helpdisplaysoperationalinformationaboutanyfront-panelcontrol.Whenhelp modeisineffect,manipulatinganyfront-panelcontrolcausestheDigitizing Oscilloscopetodisplayinformationaboutthatcontrol.Whenhelpisfirst invoked,anintroductiontohelpisdisplayedonscreen.

Autoset AutosetautomaticallysetsuptheDigitizingOscilloscopeforaviewabledisplay basedontheinputsignal.

MeasurementAssistance

Onceyouhavesetuptomakeyourmeasurements,thecursorandmeasure featurescanhelpyouquicklymakethosemeasurements.

Cursor Threetypesofcursorsareprovidedformakingparametricmeasurementsonthe displayedwaveforms.Horizontalbarcursors(HBar)measureverticalparameters(typicallyvolts).Verticalbarcursors(VBar)measurehorizontalparameters (typicallytimeorfrequency).Pairedcursorsmeasurebothamplitudeandtime simultaneously.Thesearedeltameasurements;thatis,measurementsbasedon thedifferencebetweentwocursors.

BothHBarandVBarcursorscanalsobeusedtomakeabsolutemeasurements. FortheHBars,eithercursorcanbeselectedtoreadoutitsvoltagewithrespect toanychannel'sgroundreferencelevel.FortheVBars,thecursorsmeasuretime withrespecttothetriggerpoint(event)oftheacquisition.Thecursorscanalso controltheportionofthewaveformonwhichautomaticmeasurementsaremade.

Fortimemeasurements,unitscanbeithersecondsorhertz(for1/time).

Withthevideotriggeroptioninstalled(Option05),youcanmeasurethevideo linenumberusingtheverticalcursors.YoucanmeasureIREamplitude(NTSC) usingthehorizontalcursorswithorwithoutthevideotriggeroptioninstalled.

Measure Measurecanautomaticallyextractparametersfromthesignalinputtothe DigitizingOscilloscope.Anyfouroutofthe25parametersavailablecanbe displayedtothescreen.Thewaveformparametersaremeasuredcontinuously withtheresultsupdatedon-screenastheDigitizingOscilloscopecontinues toacquirewaveforms.

Digital Signal Processing (DSP)

An important component of the multiprocessor architecture of this Digitizing Oscilloscope is Tektronix's proprietary digital signal processor, the DSP. This dedicated processor supports advanced analysis of your waveforms when doing such compute-intensive tasks as interpolation, waveform math, and signal averaging. It also teams with a custom display system to deliver specialized display modes (See *Display*, later in this description.)

Storage

Acquired waveforms may be saved in any of four nonvolatile REF (reference) memories or on a 3.5 inch, DOS 3.3-or-later compatible disk. Any or all of the saved waveforms may be displayed for comparison with the waveforms being currently acquired.

The source and destination of waveforms to be saved may be chosen. You can save any of the four channels to any REF memory or move a stored reference from one REF memory to another. Reference waveforms may also be written into a REF memory location via the GPIB interface.

I/O

The oscilloscope is fully controllable and capable of sending and receiving waveforms over the GPIB interface (IEEE Std 488.1–1987/IEEE Std 488.2–1987 standard). This feature makes the instrument ideal for making automated measurements in a production or research and development environment that calls for repetitive data taking. Self-compensation and self-diagnostic features built into the Digitizing Oscilloscope to aid in fault detection and servicing are also accessible using commands sent from a GPIB controller.

The oscilloscope can also output copies of its display using the hardcopy feature. This feature allows you to output waveforms and other on-screen information to a variety of graphic printers and plotters from the TDS front panel, providing hardcopies without requiring you to put the TDS into a system-controller environment. You can make hardcopies in a variety of popular output formats, such as PCX, TIFF, BMP, RLE, EPS, Interleaf, and EPS monoor color. You can also save hardcopies in a disk file in any of the formats above. The hardcopies obtained are based on what is displayed on-screen at the time hardcopy is invoked. The hardcopies can be stamped with date and time and spooled to a queue for printing at a later time. You can output screen information via GPIB, RS-232C, or Centronics interfaces.

Display

TheTDS500B,TDS600BandTDS700ADigitizingOscilloscopesoffer flexibledisplayoptions.Youcancustomizethefollowingattributesofyour display:

- Color(TDS644B,TDS684B,andTDS700A):Waveforms,readouts, graticule,andvariablepersistencewithcolorcoding
- Intensity:waveforms,readouts,andgraticule
- Styleofwaveformdisplay(s):vectorsordots,intensifiedornonintensified samples,infinitepersistence,andvariablepersistence
- Interpolationmethod:Sin(x)/xorLinear
- Displayformat:xyorytwithvariousgraticuleselectionsincludingNTSC andPALtobeusedwithvideotrigger(option05)

Zoom Thisoscilloscopealsoprovidesaneasywaytofocusinonthosewaveform featuresyouwanttoexamineupclose.Byinvokingzoom,youcanmagnifythe waveformusingtheverticalandhorizontalcontrolstoexpand(orcontract)and positionitforviewing.

NominalTraits

Thissectioncontainsacollectionoftablesthatlistthevarious *nominaltraits*that describetheTDS500B,TDS600B,andTDS700Aoscilloscopes.Electricaland mechanicaltraitsareincluded.

Nominaltraits aredescribedusingsimplestatementsoffactsuchas"Four,all identical"forthetrait"InputChannels,Numberof,"ratherthanintermsoflimits thatareperformancerequirements.

Table1-3:NominalTraits—SignalAcquisitionSystem

Name	Description	
BandwidthSelections	20MHz,250MHz,andFULL	
Samplers,Numberof	TDS540B,644B,684B,754A,and784A:Four,simultaneous TDS520B,620B,680B,724A,and782A:Two,simultaneous	
DigitizedBits,Numberof	8bits[1]	
InputChannels,Numberof	Four	
InputCoupling	DC,AC,orGND	
InputImpedanceSelections	1M Ω or50 Ω	
Ranges, Offset	**Volts/DivSetting**	**OffsetRange**
	1mV/div–100mV/div	±1V
	101mV/div–1V/div	±10V
	1.01V/div–10V/div	±100V
Range,Position	±5divisions	
Range,1M ΩSensitivity	1mV/divto10V/div[2]	
Range,50 ΩSensitivity	1mV/divto1V/div [1]	

1 Displayedverticallywith25digitizationlevels(DLs)perdivisionand10.24divisionsdynamicrangewithzoomoff.ADLis thesmallestvoltagelevelchangeoftheoscilloscopeinputthatcanberesolvedbythe8-bitA-DConverter.Expressedasa voltage,aDLisequalto1/25ofadivisiontimesthevolts/divisionsetting.

2 ThesensitivityrangesfromlmV/divto10V/div(forlM Ω)orto1V/div(for50 Ω)inа1–2–5sequenceofcoarsesettings withFit-to-Screenoff.Betweencoarsesettings,thesensitivitycanbefinelyadjustedwitharesolutionequalto1%ofthe moresensitivecoarsesetting.Forexample,between50mV/divand100 mV/div,thevolts/divisioncanbesetwith0.5mV resolution.

Table1–4:NominalTraits—TimeBaseSystem

Name	Description
Range,Sample-Rate[1,3]	TDS684B:5Samples/secto5GSamples/seconfourchannelssimultaneously TDS680B:5Samples/secto5GSamples/secontwochannelssimultaneously TDS644B:5Samples/secto2.5GSamples/seconfourchannelssimultaneously TDS620B:5Samples/secto2.5GSamples/secontwochannelssimultaneously TDS520Band724A:5Samples/secto1GSamples/secwhenacquiring1channel,to 500MSamples/secwhenacquiring2channels TDS540Band782A:5Samples/secto2GSamples/secwhenacquiring1channel,to 1GSample/secwhenacquiring2channels,or,forTDS540Bonly,to500MSamples/sec whenacquiring3or4channels TDS540Bwithoption1G:5Samples/secto1GSamples/secwhenacquiring1channel,to 1GSample/secwhenacquiring2channels,orto500MSamples/secwhenacquiring3or 4channels TDS754A:5Samples/secto2GSamples/secwhenacquiring1or2channels,to 1GSamples/secwhenacquiring3or4channels TDS784A:5Samples/secto4GSamples/secwhenacquiring1channel,to 2GSample/secwhenacquiring2channels,orto1GSamples/secwhenacquiring3or 4channels
Range,InterpolatedWaveformRate [2,3]	TDS600B:10GSamples/secto250GSamples/sec TDS520B,540B,724A,and754A:1GSamples/secto100GSamples/sec TDS782Aand784A:2GSamples/secto250GSamples/sec
Range,Seconds/Division	TDS600B:0.2ns/divto10s/div TDS500B,724A,and754A:0.5ns/divto10s/div TDS782Aand784A:0.2ns/divto10s/div
RecordLengthSelection	500samples,1000samples,2500samples5000samples,15000samples TheTDS520B,724Aand782Aalsooffer:50000samplesand,withoption1M,75000, 100000,130000(1or2channels),or250000(1channel)samples TheTDS540B,754A,and784Aalsooffer:50000samplesand,withoption1M,75000, 100000,130000,250000(1or2channels),or500000(1channel)samples

1 **Therangeofreal-timerates,expressedinsamples/second,atwhichadigitizersamplessignalsatitsinputsandstoresthe samplesinmemorytoproducearecordoftime-sequentialsamples.**

2 **TherangeofwaveformratesforinterpolatedorequivalentoftheTDS700A)waveformrecords.**

3 **TheWaveformRate(WR)istheequivalentsamplerateofawaveformrecord.Forawaveformrecordacquiredbyreal-time samplingofasingleacquisition,thewaveformrateisthesameasthereal-timesamplerate;forawaveformcreatedby interpolationofreal-timesamplesfromasingleacquisitionor,onapplicableproducts,theequivalent-timesamplingof multipleacquisitions,thewaveformratecreatedisfasterthantherealtimesamplerate.Forallthesecases,thewaveform rateis1/(WaveformInterval)forthewaveformrecord,wherethewaveforminterval(WI)isthetimebetweenthesamplesin thewaveformrecord.**

Table1–5:NominalTraits—TriggeringSystem

Name	Description	
Range,DelayedTriggerTimeDelay	16nsto250s	
Range,EventsDelay	TDS600B;2to10,000,000 TDS500B/700A:1to10,000,000	
Range(Time)forPulse-Glitch,Pulse-Width, Time-QualifiedRunt,Timeout,orSlewRate Trigger,DeltaTime	1nsto1s	
Ranges, Setup and Holdfor TimeSetup/HoldV iolationTrigge r	**Feature**	**Mintomax**
	SetupTime	–100nsto100ns
	HoldTime	–1nsto100ns
	Setup+HoldTime	2ns
	ForSetupTime,positivenumbersmeanadatatransitionbeforetheclockedgeand negativemeansatransitionaftertheclockedge. ForHoldTime,positivenumbersmeanadatatransitionaftertheclockedgeandnegative meansatransitionbeforetheclockedge. Setup+HoldTimeisthealgebraicsumoftheSetupTimeandtheHoldTimeprogrammed bytheuser.	
Ranges,Tr iggerL evel orTh reshold	**Source**	**Range**
	AnyChannel	±12divisionsfromcenterofscreen
	Auxiliary	±8V
	Line	±400V
VideoTriggerModesofOperation (Option05VideoTrigger)	Supportsthefollowingvideostandards: ■ NTSC(525/60)–2fieldmonoor4field ■ PAL(625/50)–2fieldmonoorSECAM,8field ■ HDTV– (787.5/60) (1050/60) (1125/60) (1250/60) ■ FlexFormat™(userdefinablestandards) Usercanspecify:fieldrate,numberoflines,syncpulsewidthandpolarity,linerate, andverticalintervaltiming.	

Table1-6:NominalTraits—DisplaySystem

Name	Description
VideoDisplay	7inchdiagonal,withadisplayareaof5.04incheshorizontallyby3.78inchesvertically TDS520B,540B,620B,and680B:Monochromedisplay TDS644B,684B,724A,754A,782A,and784A:Colordisplay
VideoDisplayResolution	640pixelshorizontallyby480pixelsvertically
WaveformDisplayGraticule	SingleGraticule:401 ×501pixels,8× 10divisions,wheredivisionsare1cmby1cm
WaveformDisplayLevels/Colors	TDS520B,540B,620B,and680B:Sixteenlevelsininfinite-persistenceorvariable persistencedisplay TDS644B,684B,724A,754A,782A,and784A:Sixteencolorsininfinite-persistenceor variablepersistencedisplay

Table1-7:NominalTraits—GPIBInterface,OutputPorts,andPowerFuse

Name	Description
Interface,GPIB	GPIBinterfacecomplieswithIEEEStd488-1987
Interface,RS-232	RS-232interfacecomplieswithEIA/TIA574(talkonly) OptionalontheTDS520Band540B
Interface,Centronics	CentronicsinterfacecomplieswithCentronicsinterfacestandardC332-44Feb19//,REV A
Interface,Video	VGAvideooutputwithlevelsthatcomplywithEIARS343Astandard.DB-15connector
LogicPolarityforMain-andDelayed-TriggerOutputs	NegativeTRUE.Hightolowtransitionindicatesthetriggeroccurred.
FuseRating	Eitheroftwofuses[1]maybeused:a0.25 " ×1.25 "(UL198.6,3AG):6AFAST,250Vora 5mm ×20mm(IEC127):5A(T),250 V.

1 **Eachfusetyperequiresitsownfusecap.**

Table1-8:NominalTraits—DataHandlingandReliability

Name	Description
Time,Data-Retention,NonvolatileMemory[1] [2]	Batterylife ≥ 5years
Floppydisk, (optionalontheTDS520Band540B)	3.5inch,720Kor1.44Mbyte,DOS3.3-or-latercompatible

1 **Thetimesthatreferencewaveforms,storedsetups,andcalibrationconstantsareretained.**

2 **Dataismaintainedbysmalllithium-thionyl-chloridebatteriesinternaltothememoryICs.Theamountoflithiumissosmall intheseICsthattheycantypicallybesafelydisposedofwithordinarygarbageinasanitarylandfill.**

Table1-9:NominalTraits—Mechanical

Name	Description
CoolingMethod	Forced-aircirculationwithnoairfilter.Clearanceisrequired.
ConstructionMaterial	Chassispartsconstructedofaluminumalloy;frontpanelconstructedofplasticlaminate; circuitboardsconstructedofglasslaminate.Cabinetisaluminumandiscladin Tektronix Bluevinylmaterial.
FinishType	TektronixBluevinyl-cladaluminumcabinet
Weight	StandardDigitizingOscilloscope 14.1kg(31lbs),withfrontcover. 24.0kg(53lbs),whenpackagedfordomesticshipment RackmountDigitizingOscilloscopes 14.1kg(31lbs)plusweightofrackmountparts,fortherackmountedDigitizing Oscilloscopes(Option1R). Rackmountconversionkit 2.3kg(5lbs),partsonly;3.6kg(8lbs),partspluspackagefordomesticshipping
OverallDimensions	StandardDigitizingOscilloscope Height:193mm(7.6in),withthefeetinstalled Width:445mm(17.5in),withthehandle Depth:434mm(17.1in),withthefrontcoverinstalled RackmountDigitizingOscilloscope Height:178mm(7.0in) Width:483mm(19.0in) Depth:558.8mm(22.0in)

Warranted Characteristics

This section lists the various *warranted characteristics* that describe the TDS500B, TDS600B and TDS700A oscilloscopes. Electrical and environmental characteristics are included.

Warranted characteristics are described in terms of quantifiable performance limits which are warranted.

NOTE. *In these tables, those warranted characteristics that are checked in the procedure* Performance Verification *appear in* ***boldface type*** *under the column* **Name**.

As stated above, this section lists only warranted characteristics. A list of *typical characteristics* starts on page 1–23.

Performance Conditions

The performance limits in this specification are valid with these conditions:

- The oscilloscope must have been calibrated/adjusted at an ambient temperature between +20 ° C and +30 ° C.
- The oscilloscope must be in an environment with temperature, altitude, humidity, and vibration within the operating limits described in these specifications.
- The oscilloscope must have had a warm-up period of at least 20 minutes.
- The oscilloscope must have had its signal-path compensation routine last executed after at least a 20 minute warm-up period at an ambient temperature within ±5 ° C of the current ambient temperature.

Table1-10:WarrantedCharacteristics—SignalAcquisitionSystem

Name	Description		
Accuracy,DCGain	TDS600B: ±1.5%forallsensitivitiesfrom2mV/divto10V/div ±2.0%at1mV/divsensitivity TDS500B,700A: ±1%forallsensitivitiesfrom1mV/divto10V/divwithoffsetfrom0Vto ±100V		
Accuracy, DCVoltage Measurement, Averaged (using Averagemode)	**MeasurementType**	**DCAccuracy**	
	Averageof ≥ 16waveforms	TDS600B: ±((1.5% × |reading–NetOffset [1] |) +OffsetAccuracy)+(0.06div ×V/div)) TDS500B,700A: ±((1.0% × |reading–Net Offset[1] |) +OffsetAccuracy+(0.06div ×V/div))	
	Deltavoltsbetweenanytwoaverages of ≥ 16waveformsacquiredunderthe samesetupandambientconditions	TDS600B: ±((1.5% × |reading|)+ (0.1div ×V/div)+0.3mV) TDS500B,700A: ±((1.0% × |reading|) + (0.1div ×V/div)+0.3mV)	
Accuracy, Offset	**Volts/DivSetting**	**TDS600BOffset Accuracy**	**TDS500B/700AOff-setAccuracy**
	1mV/div–100mV/div	±((0.2% × |NetOff-set[1] |)+1.5mV+ (0.6divxV/div))	±((0.2% × |NetOff-set[1] |) +1.5mV+ (0.1divxV/div))
	101mV/div–1V/div	±((0.25% ×|NetOff-set[1] |)+15mV+ (0.6divxV/div))	±((0.25% ×|NetOff-set[1] |)+15mV+ (0.1divxV/div))
	1.01V/div–10V/div	±((0.25% × |NetOff-set[1] |)+150mV+ (0.6divxV/div))	±((0.25% ×|NetOff-set[1] |) +150mV+ (0.1divxV/div))
Analog Bandwidth, DC-50 ΩCoupled andBandwidthselectionisFULL, TDS600 B	**Volts/Div**	**TDS620B&644B Bandwidth[2]**	**TDS680B&684B Bandwidth[2]**
	10mV/div–1V/div	DC–500MHz	DC–1GHz
	5mV/div–9.95mV/div	DC–450MHz	DC–750MHz
	2mV/div–4.98mV/div	DC–300MHz	DC–600MHz
	1mV/div–1.99mV/div	DC–250MHz	DC–500MHz
Analog Bandwidth, DC-50 ΩCoupled andBandwidthselectionisFULL, TDS500B/700A	**Volts/Div**	**TDS520B,540B, 724A&754A Bandwidth[2]**	**TDS782A&784A Bandwidth[2]**
	10mV/div–1V/div	DC–500MHz	DC–1GHz
	5mV/div–9.95mV/div	DC–500MHz	DC–750MHz
	2mV/div–4.98mV/div	DC–500MHz	DC–600MHz
	1mV/div–1.99mV/div	DC–450MHz	DC–500MHz
Crosstalk(Channelisolation)	≥100:1at100MHzand ≥30:1attheratedbandwidthforthechannel'sVolt/Divsetting,for anytwochannelshavingequalVolts/Divsettings		

Table1-10:WarrantedCharacteristics—SignalAcquisitionSystem(Cont.)

Name	Description
DelayBetweenChannels,Full Bandwidth	TDS600B: ≤100psforanytwochannelswithequalVolts/DivandCouplingsettingsand bothchannels'deskewvaluessetto0 TDS500B/700A: ≤50psforanytwochannelswithequalVolts/DivandCouplingsettings
InputImpedance,DC-1 M ΩCoupled	1M Ω ±0.5%inparallelwith10pF ±3pF
InputImpedance,DC-50 ΩCoupled	50 Ω ±1%withVSWR <1.3:1fromDC-500MHz, ≤1.5:1from500MHz-1GHz
InputVoltage,Maximum,DC-1 M Ω, AC-1 MΩ,orGNDCoupled	±300V(DC+peakAC),400Vpeak;derateat20dB/decadeabove1MHz,CATII
InputVoltage,Maximum,DC-50 Ωor AC-50 ΩCoupled	$5V_{RMS}$,withpeaks ≤ ±30V
LowerFrequencyLimit,ACCoupled	≤10HzwhenAC-1 M ΩCoupled; ≤200kHzwhenAC-50 ΩCoupled [3]

1 **NetOffset=Offset-(Position ×Volts/Div).NetOffsetisthenominalvoltagelevelattheoscilloscopeinputthatcorrespondstothecenteroftheA-Dconverter'sdynamicrange.OffsetAccuracyistheaccuracyofthisvoltagelevel.**

2 **Thelimitsgivenarefortheambienttemperaturerangeof0 °Cto+30 °C.Reducetheupperbandwidthfrequenciesby 5MHzforthcTDS600Borby2.5MHzfortheTDS500B/700Aforeach °Cabove+30 °C.**

3 **TheACCoupledLowerFrequencyLimitsarereducedbyafactorof10when10Xpassiveprobesareused.**

Table1-11:WarrantedCharacteristics—TimeBaseSystem

Name	Description
Accuracy,LongTermSampleRateand DelayTime	TDS600B: ±100ppmoverany ≥1msinterval TDS500B/700A: ±25ppmoverany ≥1msinterval

Table1-12:WarrantedCharacteristics—TriggeringSystem

Name	Description	
Sensitivity, Edge-Type Trigger,Couplin g setto" DC"[1]	**TriggerSource**	**Sensitivity**
	AnyChannel	TDS620B&644B:0.35divisionfromDCto50MHz,increasingto 1 divisionat500MHz
		TDS680B&684B:0.35divisionfromDCto50MHz,increasingto 1 divisionat1GHz
		TDS500B,724A,&754A:0.35divisionfromDCto50MHz, increasingto1 divisionat500MHz
		TDS782A&784A:0.35divisionfromDCto50MHz,increasingto 1 divisionat1GHz
	Auxiliary	TDS600B:250mVfromDCto50MHz,increasingto500mVat 100MHz
		TDS500B,724A,&754A:400mVfromDCto50MHz,increasing to750mVat100MHz
		TDS782A&784A:250mVfromDCto50MHz,increasingto 500mVat100MHz
Accuracy (Time)fo r Pulse-Glitchor Pulse-Width Triggering	**TimeRange**	**Accuracy**
	1nsto1 µs	±(20%ofsetting+0.5ns)
	1.02 µsto1s	±(100ns+0.01%ofSetting)
InputSignalSyncAmplitudeforStable Triggering,NTSCandPALmodes (Option05VideoTrigger)	Fieldselection"Odd","Even",or"All":0.6divisionto4divisions	
	Fieldselection"Numeric":1divisionto4divisions(NTSCmode)	
Jitter(Option05VideoTrigger)	60ns $_{p\text{-}p}$onNTSCorPALsignal	

[1] **Theminimumsensitivityforobtainingastabletrigger.Astabletriggerresultsinauniform,regulardisplaytriggeredonthe selectedslope.Thetriggerpointmustnotswitchbetweenoppositeslopesonthewaveform,andthedisplaymustnot "roll"acrossthescreenonsuccessiveacquisitions.TheTRIG'DLEDstaysconstantlylightedwhentheSEC/DIVsettingis 2msorfasterbutmayflashwhentheSEC/DIVsettingis10msorslower.**

Table1-13:WarrantedCharacteristics—OutputPorts,ProbeCompensator,andPowerRequirements

Name	Description	
LogicLevel s, Main- and Delayed-Trigger Outputs	**Characteristic**	**Limits**
	Vout(HI)	≥2.5 Vopencircuit; ≥1.0Vintoa50 Ωload toground
	Vout(LO)	≤0.7Vintoaloadof ≤4mA; ≤0.25Vintoa50 Ωloadtoground

Table1-13:WarrantedCharacteristics—OutputPorts,ProbeCompensator,andPowerRequirements(Cont.)

Name	Description	
OutputVolt age andF requency, ProbeCompe nsator	**Characteristic**	**Limits**
	OutputVoltage	0.5V(base-top) ±1%intoa ≥50 Ωload
	Frequency	1kHz ±5%
OutputVoltage,SignalOut(CH3 [1])	ForTDS600B: 20 mV/division ±20%intoa1 M Ωload; 10mV/division ±20%intoa50 Ωload ForTDS500B/700A: 22 mV/division ±20%intoa1 M Ωload; 11mV/division ±20%intoa50 Ωload	
SourceVoltage	90to250VAC_{RMS} ,continuousrange CATII	
SourceFrequency	45Hzto440Hz	
PowerConsumption	≤300W(450VA)	

1 **CH3signaloutispresentattherearpanelifCH3(AUX1ontheTDS620Bor680B)isselectedasthetriggersourcefor themainand/ordelayedtriggersystems.Itisnotavailablewhenachannelotherthan CH3(AUX1ontheTDS620Bor 680B)isthesourcefortheVideoTriggerwhenOption05isinstalled.**

Table1-14:WarrantedCharacteristics—Environmental

Name	Description
Atmospherics	Temperature(nodisketteinfloppydrive): TDS600B:Operating:+4 °Cto+45 °C TDS500B/700A:Operating:+4 °Cto+50 °C Nonoperating:–22 °Cto+60 °C Relativehumidity(nodisketteinfloppydrive): Operating:20%to80%,atorbelow +32 °C, upperlimitderatesto30%relativehumidityat+45 °C Nonoperating:5%to90%,atorbelow +41 °C, upperlimitderatesto30%relativehumidityat60 °C Altitude: To4570m(15,000ft.),operating To12190m(40,000ft.),nonoperating
Dynamics	Randomvibration(floppydiskettenotinstalled): 0.31grms,from5to500Hz,10minuteseachaxis,operating 3.07grms,from5to500Hz,10minuteseachaxis,nonoperating

Table1-14:WarrantedCharacteristics—Environmental(Cont.)

Name	Description
Emissions(TDS500B/700A) [1, 2]	Meetsorexceedstherequirementsofthefollowingstandards: FCCCodeofFederalRegulations,47CFR,Part15,SubpartB,ClassA EuropeanCommunityRequirements EN55011 ClassARadiatedEmissions EN55011 ClassAConductedEmissions EN50081-1 EN60555-2 PowerLineHarmonicEmissions
Emissions(TDS600B)[1, 2]	Meetsorexceedstherequirementsofthefollowingstandards: FCCCodeofFederalRegulations,47CFR,Part15,SubpartB,ClassA EN50081-1EuropeanCommunityRequirements EN55022 RadiatedEmissionsClassB EN55022 ClassBConductedEmissions EN60555-2 PowerLineHarmonicEmissions
Susceptibility[1, 2]	MeetsorexceedstheEMCrequirementsofthefollowingstandards: EN50082-1 EuropeanCommunityRequirements IEC801-2 ElectrostaticDischargePerformanceCriteriaB IEC801-3 RadiatedSusceptibility3V/meterfrom27MHzto500MHz unmodulated IEC801-4 FastTransientsPerformanceCriteriaB IEC801-5 ACSurgePerformanceCriteriaB

Table1-14:WarrantedCharacteristics—Environmental(Cont.)

Name	Description
ThirdPartyCertification	Conformstoandiscertifiedwhereappropriateto: UL3111-1[3] CSA22.2no.1010.1 [3]

1 **VGAoutputcableneedstobeterminated,ifconnectedatall,fortheInstrumenttomeetthesestandards.Thetestwillpass withLCOMpart#CTL3VGAMM-5.**

2 **TheGPIBcableconnectedtotheinstrumentforcertainoftheemissionstestsmustbe"lowEMI"havingahigh-quality outershieldconnectedthroughalowimpedancetobothconnectorhousings.AcceptablecablesareTektronixpart numbers012-0991-00,-01,-02,and-03.InordertomaintaintheEMIperformanceconformingtotheaboveregulations,the followingcables,ortheirequivalent,shouldbeused:ashieldedCentronicscable,3metersinlength,partnumber 012-1214-00,andashieldedRS-232cable,2.7metersinlength,CApartnumber0294-9.**

3 **IEC1010,UL3111,CSA1010SafetyCertificationCompliance:**
Temperature(operating)5to+40C
Altitude(maximumoperating):200meters
EquipmentType:TestandMeasurement
SafetyClass:ClassI(asdefinedinIEC1010-1,AnnexH)–groundedproduct
OvervoltageCatregory:OvervoltageCategoryII(asdefinedinIEC1010-1,AnnexJ)
PollutionDegree:PollutionDegree2(asdefinedinIEC1010-1)
Note–Ratedforindooruseonly

Table1-15:CertificationsandCompliances

ECDeclarationofConformity	MeetsintentofDirective89/336/EECforElectromagneticCompatibilityandLowVoltageDirective 73/23/ECCforProductSafety.Compliancewasdemonstratedtothefollowingspecificationsas listedintheOfficialJournaloftheEuropeanCommunities: EMCDirective89/336/EEC: EN55011 ClassARadiatedandConductedEmissions EN55011 ClassBRadiatedandConductedEmissions EN50081-1Emissions: EN55022 ClassBRadiatedandConductedEmissions EN60555-2 ACPowerLineHarmonicEmissions EN50082-1Immunity: IEC801-2 ElectrostaticDischargeImmunity IEC801-3 RFElectromagneticFieldImmunity IEC801-4 ElectricalFastTransient/BurstImmunity IEC801-5 PowerLineSurgeImmunity LowVoltageDirective73/23/EEC EN61010-1 Safetyrequirementsforelectricalequipmentformeasurement, control,andlaboratoryuse EN61010-2-031:1994 Particularrequirementsforhand-heldprobeassembliesforelectrical measurementandtest

TypicalCharacteristics

Thissubsectioncontainstablesthatlistthevarious*typicalcharacteristics*which describcthcTDS500B,TDS600BandTDS700Aoscilloscopes.

Typicalcharacteristics aredescribedintermsoftypicaloraverageperformance. Typicalcharacteristics arenotwarranted.

Table1-16:TypicalCharacteristics—SignalAcquisitionSystem

Name	Description		
Analog Bandwidth, DC-50 ΩCoupled with P6243o r P6245 Probe and Bandwidths election isF ULL TDS520B,540B,724A&754A	**Volts/DivasReadOutonScreen**	**520B,540B,724A&754ABandwidth[1]**	
	10V/div–100V/div	NotApplicable	
	100mV/div–10V/div	DC–500MHz	
	50mV/div–99.5mV/div	DC–500MHz	
	20mV/div–49.8mV/div	DC–500MHz	
	10mV/div–19.9mV/div	DC–450MHz(P6243) DC–500MHz(P6245)	
Analog Bandwidth, DC-50 ΩCoupled with P6245 Probe and Bandwidths election isF ULL TDS782A&784A	**Volts/DivasReadOutonScreen**	**TDS782A&784A**	
	10V/div–100V/div	(NotApplicable)	
	100mV/div–10V/div	DC–1GHz	
	50mV/div–99.5mV/div	DC–750MHz	
	20mV/div–49.8mV/div	DC–600MHz	
	10mV/div–19.9mV/div	DC–500MHz	
Analog Bandwidth, DC-1M ΩCoupled withP6139AProbeandBandwidth selection isFU LL TDS5 20B,5 40B,7 24A,75 4A,7 82A& 784A	**Volts/DivasReadOutonScreen**	**520B,540B,724A,754A,782A&784A Bandwidth[1]**	
	10V/div–100V/div	500MHz	
	100mV/div–10V/div	500MHz	
	50mV/div–99.5mV/div	500MHz	
	20mV/div–49.8mV/div	500MHz	
	10mV/div–19.9mV/div	500MHz	
Analog Bandwidth, DC-50 ΩCoupled withP6243Probe(TDS620B&644B)or P6245 Probe (TDS68 0B&6 84B) and Bandwidths election isF ULL TDS600B	**Volts/DivasReadOutonScreen**	**620B&644B Bandwidth[1]**	**680B&684B Bandwidth[1]**
	10V/div–100V/div	(NotApplicable)	(NotApplicable)
	100mV/div–10V/div	DC–500MHz	DC–1GHz
	50mV/div–99.5mV/div	DC–450MHz	DC–750MHz
	20mV/div–49.8mV/div	DC–300MHz	DC–600MHz
	10mV/div–19.9mV/div	DC–250MHz	DC–500MHz

Table1-16:TypicalCharacteristics—SignalAcquisitionSystem(Cont.)

Name	Description		
Accuracy,DeltaTimeMeasurement	Thelimitsaregiveninthefollowingtableforsignalshavingamplitudegreaterthan 5divisions,referencelevel=50%,filtersetto(sinX/X),acquiredat5mV/divorgreater.For theTDS700A,pulseduration<10div.Channelskewnotincluded. FortheSingleShotcondition,1.4 $\leq T_r/S_i \leq 4$,whereS_i isthesampleintervalandT $_r$isthe displayedrisetime. TDS600B:Fortheaveragedcondition,1.4≤ $T_r/W_i \leq 40$,whereW_i istheWaveform Interval,asdescribedelsewhereinthesespecifications. TDS600B:Extraerrorinthemeasurementwilloccurfortwo-channelmeasurementsdue tochannel-to-channelskew.Thisisdescribedelsewhereinthesespecifications.		
	TimeMeasurementAccuracy		
Conditionsforaccuracylistedatright are:SingleShotorSamplemode(or HiResmodeontheTDS500B/700A), withFullBandwidthselected.	TDS600B: ±((0.20 × sampleinterval)+(100ppm ×|Reading|)+(0.05 × W_i))		
	TDS600Bexample:at5GS/s,5ns/div,measuringa40nswidepulse,accuracy= ±(40 ps+4ps+5ps)=± 49ps.		
	TDS500B/700A: ±≥ 0.15sampleinterval+(25ppm ×|Reading|)+t/div/1000		
	TDS500B/700Aexample:at4Gs/s,accuracy=37.5ps		
Conditionsforaccuracylistedatright are: ≥ 100Averages,willFullBand-widthselected,andforTDS 500B/700A,repetitivemode.	TDS600B: ±(10ps+(100ppm × |Reading|)+(0.25× W_i))		
	TDS500B/700A:20ps+(25ppm× |Reading|)+t/div/1000		
Calculated RiseT ime,TDS600B [2]	**Volts/DivSetting**	**620B&644B RiseTime**	**680B&684B RiseTime**
	10mV/div–1V/div	900ps	450ps
	5mV/div–9.95mV/div	1ns	600ps
	2mV/div–4.98mV/div	1.5ns	750ps
	1mV/div–1.99mV/div	1.8ns	900ps
Calculated RiseT ime, TDS500B/700A [2]	**Volts/DivSetting**	**520B,540B,724A, 754ARiseTime**	**782A&784A RiseTime**
	10mV/div–1V/div	800ps	400ps
	5mV/div–9.95mV/div	800ps	530ps
	2mV/div–4.98mV/div	800ps	600ps
	1mV/div–1.99mV/div	890ps	800ps
EffectiveBits—T DS600B Thechartontherightgivesthetypical effectivebitsfora9-divisionp-p sine-waveinput,50mV/div,10ns/div (5GS/s),witharecordlengthof1000 points	**InputFrequency**	**EffectiveBits**	
	98MHz	6.3bits	
	245MHz	6.0bits	
	490MHz	5.5bits	
	990MHz	5.2bits(TDS680B&684Bonly)	

Table1-16:TypicalCharacteristics—SignalAcquisitionSystem(Cont.)

Name	Description			
EffectiveBits—T DS520B&724 A Thechartontherightgivesthetypical effectiveb itsfo r a sinew ave adjusted to9.2d ivisions at1 MHz,50 mV/div@ 25°C.		SampleRate		
	InputFrequency	1GS/s	10MS/s&HiRes	
	1MHz–9.2divs	6.8bits	9.7bits	
	500MHz	6.8bits	N/A	
EffectiveBits—TD S540B&754A Thechartontherightgivesthetypical effectiveb itsfo r a sinew ave adjusted to9.2d ivisions at1 MHz,50 mV/div@ 25°C.		SampleRate		
	InputFreque ncy	2GS/s	10MS/s&HiRes	
	1MHz–9.2divs	6.8bits	9.7bits	
	500MHz	6.8bits	N/A	
EffectiveBits—TD S782A&TD S784A I hechartontherightgivesthetypical effectivebitsforasinewaveadjusted to9.2divisionsat1MHz,50mV/div@ 25°C.		SampleRate		
	InputFreque ncy	2GS/s(782A) 4GS/s(784A)	10MS/s&HiRes	
	1MHz–9.2divs	6.6bits	9.7bits	
	1GHz–6.5divs	5.5bits	N/A	
FrequencyLimit,Upper,250MHzBand-widthLimited	250MHz			
FrequencyLimit,Upper,20MHzBandwidth Limited	20MHz			
Step ResponseSettlin g Errors			SettlingError(%)[3] at		
	Volts/Div Setting	± Step Amplitude	20ns	100ns	20ms
	1mV/div–100mV/div	≤2V	0.5%	0.2%	0.1%
	101mV/div–1V/div	≤20V	1.0%	0.5%	0.2%
	1.01V/div–10V/div	≤200V	1.0%	0.5%	0.2%

1 **Thelimitsgivenarefortheambienttemperaturerangeof0 °Cto+30 °C.Reducetheupperbandwidthfrequenciesby 5MHzfortheTDS600Borby2.5MHzfortheTDS500B/700Aforeach °Cabove+30 °C.**

2 **Thenumbersgivenarevalid0 °Cto+30 °Candwillincreaseasthetemperatureincreasesduetothedegradationin bandwidth.Risetimeiscalculatedfromthebandwidth.Itisdefinedbythefollowingformula:**

$$TDS\ 600B\ Rise\ Time\ (ns) = \frac{450}{BW\ (MHz)} \qquad TDS\ 500B/700A\ Rise\ Time\ (ns) = \frac{400}{BW\ (MHz)}$$

Notethatifyoumeasurerisetime,youmusttakeintoaccountherisetimeofthetestequipment(signalsource,etc.)that youusetoprovidethetestsignal.Thatis,themeasuredrisetime(RT_m)isdeterminedbytheinstrumentrisetime(RT_i)and therisetimeofthetestsignalsource(RTgen)accordingtothefollowingformula:

$$RT_m^{\ 2} = RT_i^{\ 2} + RT_{gen}^{\ 2}$$

3 **Thevaluesgivenarethemaximumabsolutedifferencebetweenthevalueattheendofaspecifiedtimeintervalafterthe midlevelcrossingofthestepandthevalueonesecondafterthemidlevelcrossingofthestep,expressedasapercentage ofthestepamplitude.**

Table1-17:TypicalCharacteristics—TriggeringSystem

Name	Description			
Accuracy, TriggerLevelo r Threshold, DC Coupled (forsignalshavingriseandfalltimes ≥20ns)	**TriggerSource**	**Accuracy**		
	AnyChannel	±((2% ×|Setting–NetOffset|) +(0.3div × Volts/divSetting)+Offset Accuracy)		
	Auxiliary	Notcalibratedorspecified		
Input,AuxiliaryTrigger	Theinputresistanceis ≥1.5k Ω;themaximumsafeinputvoltageis ±20V(DC+peakAC).			
TriggerPositio n Error, EdgeTrigge ring	**AcquisitionMode**	**Trigger-PositionError[1,2]**		
	Sample,Average	±(1WaveformInterval +1ns)		
	Envelope	±(2WaveformIntervals+1ns)		
Holdoff,Variable,MainTrigger	ForallTime/Divisionranges,theminimumholdoffis250nsandthemaximumholdoffis12 seconds.Theminimumresolutionis8nsforsettings ≤1.2 µs.			
LowestFrequencyforSuccessfulOperation of"SetLevelto50%"Function	30Hz			
Sensitivity, EdgeTr igger, Not DCCo upled[3]	**TriggerSource**	**TypicalSignalLevelforStable Triggering**		
	AC	SameastheDC-coupledlimitsforfrequen-ciesabove60Hz.Attenuatessignalsbelow 60Hz.		
	NoiseReject	ThreetimestheDC-coupledlimits.		
	HighFrequencyReject	Oneandone-halftimestheDC-coupled limitsfromDCto30kHz.Attenuatessignals above30kHz.		
	LowFrequencyReject	Oneandone-halftimestheDC-coupled limitsforfrequenciesabove80kHz. Attenuatessignalsbelow80 kHz.		
Sensitivities,LogicTriggerandEvents Delay,DCCoupled[4]	1.0division,fromDCto500MHz,atverticalsettings > 10mV/divand ≤1V/divatthe BNCinput			
Sensitivities,Pulse-TypeRuntTrigger [5]	1.0division,fromDCto500MHz,atverticalsettings > 10mV/divand ≤1V/divatthe BNCinput			
Sensitivities,Pulse-TypeTriggerWidthand Glitch[6]	1.0division,atverticalsettings > 10mV/divand ≤1V/divattheBNCinput			
Width,MinimumPulseandRearm,forLogic TriggeringorEventsDelay	Forverticalsettings > 10mV/divand ≤1V/divattheBNCinput			
	TriggeringType	**MinimumPulse Width**	**MinimumRe-Arm Width**	**Minimum TimeBetween Channels[7]**
	Logic	NotApplicable	1ns	1ns
	EventsDelay	1ns(foreither+or –pulsewidths)	NotApplicable	2ns

Table1–17:TypicalCharacteristics—TriggeringSystem(Cont.)

Name	Description		
Width, MinimumPulse and Rearm,for PulseTr iggering Theminimumpulsewidthsandrearm widthsandtransitiontimes [8] requiredfor Pulse-Type triggering.	Forverticalsettings>10mV/div.and31V/divattheBNCinput		
	PulseClass	**MinimumPulse Width**	**MinimumRe-ArmWidth**
	Glitch	1ns	2ns+5%ofGlitchWidthSetting
	Runt	2ns	2ns
	Time-QualifiedRunt	2ns	TDS600B:7ns+5%ofWidthSetting TDS700A:8.5ns+5%ofWidthSetting
	Width	1ns	2ns+5%ofWidthUpperLimitSetting
	Timeout	1ns	2ns+5%ofWidthUpperLimitSetting
	SlewRate	600ps[8]	TDS600B:7ns+5%ofDeltaTimeSetting TDS700A:8.5ns+5%ofDeltaTime Setting
InputSignalSyncAmplitudeforStable Triggering,HDTVandFLEXFMTmodes (Option05VideoTrigger)	Allfieldselections:0.6divisionto4divisions		
JitterforHDTVmode (Option05VideoTrigger)	$17ns_{p-p}$		
SyncWidthFlexFormatandHDTV modes(Option05VideoTrigger)	min.400ns		
SyncDutyCycle,FlexFormatandHDTV modes(Option05VideoTrigger)	min.50to1		
HumRejection (Option05VideoTrigger)	NTSCandPAL:–20dBwithoutanytriggerspecdeterioration.Triggeringwillcontinue downto0dBwithsomeperformancedeterioration.		

1 **Thetriggerpositionerrorsaretypicallylessthanthevaluesgivenhere.Thesevaluesarefortriggeringsignalshavinga slewrateatthetriggerpointof ≥ 0.5division/ns.**

2 **Thewaveforminterval(WI)isthetimebetweenthesamplesinthewaveformrecord.Also,seethefootnoteforthe characteristics *SampleRateRangeorInterpolatedWaveformRates* inTable1–4,onpage1–10.**

3 **Theminimumsensitivityforobtainingastabletrigger.Astabletriggerresultsinauniform,regulardisplaytriggeredonthe selectedslope.Thetriggerpointmustnotswitchbetweenoppositeslopesonthewaveform,andthedisplaymustnot "roll"acrossthescreenonsuccessiveacquisitions.TheTRIG'DLEDstaysconstantlylightedwhentheSEC/DIVsettingis 2msorfasterbutmayflashwhentheSEC/DIVsettingis10msorslower.**

4 **Theminimumsignallevelsrequiredforstablelogicorpulsetriggeringofanacquisition,orforstablecountingofa DC-coupled,events-delaysignal.Also,seethefootnotefor *Sensitivity,Edge-TypeTrigger,DCCoupled*inthistable.(Stable countingofeventsiscountingthatmissesnoeventsandproducesnoextra,phantomevents.)**

5 **Theminimumsignallevelsrequiredforstableruntpulsetriggeringofanacquisition.Also,seethefootnotefor *Sensitivity, Edge-TypeTrigger,DCCoupled*inthistable.(Stablecountingofeventsiscountingthatmissesnoevents.)**

6 Theminimumsignallevelsrequiredforstablepulsewidthorglitchtriggeringofanacquisition.Also,seethefootnotefor *Sensitivity,Edge-TypeTrigger,DCCoupled*inthistable.(Stablecountingofeventsiscountingthatmissesnoevents.)

7 ForLogic,timebetweenchannelsreferstothelengthoftimealogicstatederivedfrommorethanonechannelmustexist toberecognized.ForEvents,thetimeistheminimumtimebetweenamainanddelayedeventthatwillberecognizedif morethanonechannelisused.

8 ForSlewRateTriggering,thisistheminimumtransitiontime,definedtobethetimetheuser'ssignalspendsbetweenthe twotriggerthresholdsettings.