Keysight N5411B SATA6G Electrical Compliance Test Application

KEYSIGHT TECHNOLOGIES

Programmer's Reference

Notices

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In This Book

This book is your guide to programming the Keysight Technologies N5411B SATA6G Electrical Compliance Test Application.

- Chapter 1, "Introduction to Programming," starting on page 7 describes compliance application programming basics.
- Chapter 2, "Configuration Variables and Values," starting on page 11, Chapter 3, "Test Names and IDs," starting on page 27, and Chapter 4, "Instruments," starting on page 51 provide information specific to programming the N5411B SATA6G Electrical Compliance Test Application.

How to Use This Book

Programmers who are new to compliance application programming should read all of the chapters in order. Programmers who are already familiar with this may review chapters 2, 3, and 4 for changes.

Contents

1 Introduction to Programming

This chapter introduces the basics for remote programming a compliance application. The programming commands provide the means of remote control. Basic operations that you can do remotely with a computer and a compliance app running on an oscilloscope include:

- Launching and closing the application.
- Configuring the options.
- Running tests.
- Getting results.
- Controlling when and were dialogs get displayed
- Saving and loading projects.

You can accomplish other tasks by combining these functions.

Remote Programming Toolkit

The majority of remote interface features are common across all the Keysight Technologies, Inc. family of compliance applications. Information on those features is provided in the N5452A Compliance Application Remote Programming Toolkit available for download from Keysight here: "www.keysight.com/find/scope-apps-sw". The N5411B SATA6G Electrical Compliance Test Application uses Remote Interface Revision 3.40. The help files provided with the toolkit indicate which features are supported in this version.

In the toolkit, various documents refer to "application-specific configuration variables, test information, and instrument information". These are provided in Chapters 2, 3, and 4 of this document, and are also available directly from the application's user interface when the remote interface is enabled (View>Preferences::Remote tab::Show remote interface hints). See the toolkit for more information.

Licensing

To enable programming of compliance applications on your oscilloscope, please visit "www.keysight.com/find/scope-apps" to purchase an N5452A remote programming option license.

2 Configuration Variables and Values

The following table contains a description of each of the N5411B SATA6G Electrical Compliance Test Application options that you may query or set remotely using the appropriate remote interface method. The columns contain this information:

- GUI Location — Describes which graphical user interface tab contains the control used to change the value.
- Label — Describes which graphical user interface control is used to change the value.
- Variable — The name to use with the SetConfig method.
- Values — The values to use with the SetConfig method.
- Description — The purpose or function of the variable.

For example, if the graphical user interface contains this control on the **Set Up** tab:

- Enable Advanced Features

then you would expect to see something like this in the table below:

Table 1 Example Configuration Variables and Values

GUI Location	Label	Variable	Values	Description
Set Up	Enable Advanced Features	EnableAdvanced	True, False	Enables a set of optional features.

and you would set the variable remotely using:

```
ARSL syntax
-----------
arsl -a ipaddress -c "SetConfig 'EnableAdvanced' 'True'"
```

```
C# syntax
---------
remoteAte.SetConfig("EnableAdvanced", "True");
```

Here are the actual configuration variables and values used by this application:

NOTE Some of the values presented in the table below may not be available in certain configurations. Always perform a "test run" of your remote script using the application's graphical user interface to ensure the combinations of values in your program are valid.

NOTE The file, ""ConfigInfo.txt"", which may be found in the same directory as this help file, contains all of the information found in the table below in a format suitable for parsing.

Table 2 Configuration Variables and Values

GUI Location	Label	Variable	Values	Description
Confgure	#Aligns Dword in one Align Sequence	NumberOfAlignInAlignSequence	0, 2	The number of ALIGNS Dwords for each Align Sequence per 256 Test Pattern Dwords to be inserted when the pattern files are generated. Please note that in order to loopback, 2 aligns option should be selected; the DUT would not loopback if 0 align is selected and it is used for debugging purposes.
Confgure	#Bits On Screen	RiseFall_BitsOnScreen	2, 8	Select the number of bits to be displayed which occupies 80% of the horizontal range of the screen.
Confgure	#Output Refiring per Trigger	PulsegenRefirePerTrigger	(Accepts user-defined text), 1, 3, 10	The number of times the pulse generator channel output refires to improve loopback probability.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	#Suspected Aync COMINIT or Proactive COMRESET Tolerance	AsyncCOMINITTol	(Accepts user-defined text), 00, 01	This applies to 2 cases: 1) Number of Asynchronous COMINIT count to be tolerated when sending out-of-spec COMRESET OOB Gap Lengths/Vthresh to Drive and expecting no response from Drive with the exception of asynchronous COMINIT presence OR 2) Number of Proactive COMRESET count to be tolerated when sending out-of-spec COMINIT OOB Gap Lengths/Vthresh to Host and expecting no response from Host with the exception of proactive retries of COMRESETs.
Confgure	Clock Recovery Damping Factor	Jitter_ClkRevDampFactor	(Accepts user-defined text), 0.707, 0.767, 0.860	Select the damping factor of the Second Order PLL Clock Recovery for jitter measurement. This setting only valid for jitter measurement test in UTD 1.3 and above.
Confgure	Clock Recovery Loop Bandwidth	Jitter_ClkRevBW	(Accepts user-defined text), 1000000, 1550000, 2100000, 3100000, 4200000, 5000000	Select the loop bandwidth of the Second Order PLL Clock Recovery for jitter measurement. Unit : Hz. This setting only valid for jitter measurement test in UTD 1.3 and above.
Confgure	Edge Detection Voltage Threshold %	tVoltThresh	(Accepts user-defined text), 25	This setting determines the % of Vpp during OOB setup low passed filter signal to be used as the edge threshold detection voltage level during OOB Response/Reject Tests. A typical good setting is at the threshold without the disturbance of the low passed filter ripples.
Confgure	FFT Frequency Window, Max (ppm)	ACCommonModeVoltage_FFTWindMax_Gen3	(Accepts user-defined text), 350, 500, 1000, 2000, 5000	Select the maximum FFT frequency window for the Tx AC Common Mode Voltage measurement. Unit : PPM.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	FFT Frequency Window, Min (ppm)	ACCommonModeVoltage_FFTWindMin_Gen3	(Accepts user-defined text), -350, -5350, -5500, -6000, -10000	Select the minimum FFT frequency window for the Tx AC Common Mode Voltage measurement. Unit : PPM.
Confgure	Gap Detection Windows Debug	GapDetectWindowsDebugEnable	true, false	Enable the debug of OOB Gap Detection Windows test. If "Enable" is selected, the OOB Gap Detection Windows test will sweep from the starting gap.
Confgure	Gap Sweep Size	GapDetectWindowsDebugSweepSize	1, 2, 3, 4, 5	Select the sweep size for the debug of OOB Gap Detection Windows test. Unit: UI.
Confgure	ISI Filter Lagging Bit	Jitter_ISILagBit	0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0	Select the number of lagging bits used to calculate the ISI filter for jitter measurement. The lagging bits is greater than or equal to 0. This config only applicable when the "Pattern Length Analysis Mode" config variable is set to "Arbitrary".
Confgure	ISI Filter Leading Bit	Jitter_ISILeadBit	0.0, -1.0, -2.0, -3.0, -4.0, -5.0, -6.0, -7.0, -8.0, -9.0, -10.0	Select the number of leading bits used to calculate the ISI filter for jitter measurement. The leading bits is less than or equal to 0. This config only applicable when the "Pattern Length Analysis Mode" config variable is set to "Arbitrary".
Confgure	Jitter Result	Jitter_ResultReset	1.0, 0.0	Select to reset or not reset jitter result after the jitter measurement completed.
Confgure	M8020A Module	M8020AModule	M1, M2	Select the M8020A module use for pulse generator stimulus.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	OOB Gap and Vthresh Detection Mode	OOBGapVThreshDetectionMode	auto, manual	Selecting Automatic Mode enables the software to automatically test against the various OOB Gap Margins/OOB Voltage Threshold for response or no response validity. Selecting Manual will prompt the user to manually and visually determine if the DUT responds/rejects consistently based on the respective test.
Confgure	OOB Low Pass Filter Bandwidth	OOB_LPF_BW	(Accepts user-defined text), 350.0E+6	Select the low pass filter's bandwidth for the OOB signal detector. Unit: Hz.
Confgure	OOB Sequence	OOBSequence	OOB_With_D102_ALIGN, OOB_Without_D102_ALIGN	OOB stimulus sequence.
Confgure	OOB Trigger Threshold Mode	OOBTriggerThresholdMode	Auto, Manual	OOB signal trigger threshold. If "Auto" is selected, half of the scale is set as trigger level. Else if manual is selected, "OOB Trigger Threshold Voltage" config is set as the absolute trigger level.
Confgure	OOB Trigger Threshold Voltage	OOBTriggerThresholdVoltage	400E-3, 300E-3, 200E-3, 150E-3, 120E-3, 100E-3, 80E-3, 60E-3, 40E-3, 20E-3	If the "OOB Trigger Threshold Mode" config is set to "Manual", this config variable is set to the trigger level of the channel. Unit: volt
Confgure	OOB Vpp Mismatch Tolerance	OOBMismatchWarningPct	(Accepts user-defined text), 10, 15, 20	This defines the OOB Vpp mismatch tolerance in percentage (%) during setup. Mismatches in amplitudes generally reduces noise immunity, and may affect the app to correctly detect the OOB signal. A lower percentage settings give an early warning to the tester to correct the problems, whereas a higher setting may affect the app to correctly detect the OOB signal.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	Override Default	OverrideJitterDefault	Enable, Disable	This configure group requires the user to use the master config variable "Override Default" to enable overriding the jitter config variables under this section. Select "Enable" to override default jitter settings. All options under the "Override Default" node will be asserted.
Confgure	Pattern Check	EnableSignalCheck	1.0, 0.0	Select to enable or disable pattern checking. When pattern checking is enabled, the input signal is pre-tested and verified to be within a reasonable range of timing and voltage limits. This can be useful for detecting problems like cabling errors before a test is run.
Confgure	Pattern Length (Pattern Check)	PatternLengthSignalCheck	(Accepts user-defined text), 20, 80	Select pattern length for pattern checking.
Confgure	Pattern Length Analysis Mode	Jitter_PatternMode	Default, Periodic, Arbitrary	Select the pattern length analysis mode for jitter measurement, either "Periodic" or "Arbitrary" mode. "Periodic" mode is only for purely periodic and repetitive patterns. The pattern length would be automatically detected. "Arbitrary" mode is for non-periodic patterns. "Default" mode set the pattern length to "Arbitrary" mode for BIST-L and "Periodic" mode for BIST-T.
Confgure	Pause In Between Test	PauseBetweenTest	true, false	Select to enable or disable the pause in between the tests. If "Pause" option is selected, the test application will pause for enabling of Far End Retimed Loopback Test Mode whenever it is needed. When choosing "Do not pause" option, Test Application will only pause for enabling of Far End Retimed Loopback Test Mode for the first time.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	RJ Bandwidth	RJBandwidth	Narrow, Wide	Select the RJ bandwidth for jitter measurement.
Confgure	RJ Separation Method	Jitter_RJMethod	BOTH, SPECtral	Select the type of method used to separate the RJ component for jitter measurement.
Confgure	Rejects Starting Gap UI (Max)	COMINITGapDetectRejectDebugStartGapMax	(Accepts user-defined text), 784	Select the starting gap's UI number for the debug of COMINIT/COMRESET gap detection from inconsistent response to reject (no response). The maximum COMINIT/COMRESET Rejects test will sweep up from the starting gap until the 1st encountered reject (no response). Unit: UI.
Confgure	Rejects Starting Gap UI (Max)	COMWAKEGapDetectRejectDebugStartGapMax	(Accepts user-defined text), 259	Select the starting gap's UI number for the debug of COMWAKE gap detection from inconsistent response to reject (no response). The maximum COMWAKE Rejects test will sweep up from the starting gap until the 1st encountered reject (no response). Unit: UI.
Confgure	Rejects Starting Gap UI (Min)	COMINITGapDetectRejectDebugStartGapMin	(Accepts user-defined text), 266	Select the starting gap's UI number for the debug of COMINIT/COMRESET gap detection from inconsistent response to reject (no response). The minimum COMINIT/COMRESET Rejects test will sweep down from the starting gap until the 1st encountered reject (no response). Unit: UI.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	Rejects Starting Gap UI (Min)	COMWAKEGapDetectRejectDebugStartGapMin	(Accepts user-defined text), 56	Select the starting gap's UI number for the debug of COMWAKE gap detection from inconsistent response to reject (no response). The minimum COMWAKE Rejects test will sweep down from the starting gap until the 1st encountered reject (no response). Unit: UI.
Confgure	Responds Starting Gap UI (Max)	COMINITGapDetectResponseDebugStartGapMax	(Accepts user-defined text), 500	Select the starting gap's UI number for the debug of COMINIT/COMRESET gap detection from response to inconsistent response. The maximum COMINIT/COMRESET Responds test will sweep up from the starting gap until the 1st encountered inconsistent response. Unit: UI.
Confgure	Responds Starting Gap UI (Max)	COMWAKEGapDetectResponseDebugStartGapMax	(Accepts user-defined text), 165	Select the starting gap's UI number for the debug of COMWAKE gap detection from response to inconsistent response. The maximum COMWAKE Responds test will sweep up from the starting gap until the 1st encountered inconsistent response. Unit: UI.
Confgure	Responds Starting Gap UI (Min)	COMINITGapDetectResponseDebugStartGapMin	(Accepts user-defined text), 460	Select the starting gap's UI number for the debug of COMINIT/COMRESET gap detection from response to inconsistent response. The minimum COMINIT/COMRESET Responds test will sweep down from the starting gap until the 1st encountered inconsistent response. Unit: UI.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	Responds Starting Gap UI (Min)	COMWAKEGapDetectResponseDebugStartGapMin	(Accepts user-defined text), 155	Select the starting gap's UI number for the debug of COMWAKE gap detection from response to inconsistent response. The minimum COMWAKE Responds test will sweep down from the starting gap until the 1st encountered inconsistent response. Unit: UI.
Confgure	Retrial on Glitch	DifferentialSkew_RetrialGlitch	(Accepts user-defined text), 1, 3, 5	Maximum number of attempts to measure differential skew in a single trial. Reattempts usually needed when measured skew is too large as sometimes there may be glitches in the captured waveform.
Confgure	SSC DFDT Measurement Sample Size	DFDTSamplingCycle	(Accepts user-defined text), 5, 10, 12, 15	The number of SSC cycle(s) to be measured for reporting the SSC DFDT.
Confgure	SSC Measurement Method	DebugSSCMeasurementMethod	auto, manual	Selecting Automatic will let the software automatically taking the measurement based on 10%, 50%, 90% measurement. Selecting Manual method allows user to manually place the marker for desired frequency measurement on complicated SSC waveforms.
Confgure	SSC Measurement Sample Size	SSCSamplingCycle	(Accepts user-defined text), 5, 10, 20	The number of SSC cycle(s) to be measured for reporting the SSC Modulated Frequency and Frequency Deviation.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	SSC Smoothing Point	DebugTrendSmooth	(Accepts user-defined text), 335, 670, 1342	The number of smoothing points determines the width of the moving-average filter, which in turn determines the bandwidth of the effective low-pass filtering effect of smoothing. A larger number of smoothing points will remove the high-frequency content from the trend beginning at a lower frequency. Bandwidth = 0.4428 * (Fs / N) with Fs = The Sample rate and N = Smoothing Points control value.
Confgure	Sample Size	ACCommonModeVoltage_SampleSize	(Accepts user-defined text), 1000, 5000, 10000, 50000	Select the number of UI sample size for the AC Common Mode Voltage test. A larger sample size would yield more confident results but requires longer time to perform. Unit : UI.
Confgure	Sample Size	ChannelSpeed_SampleSize	(Accepts user-defined text), 10000, 50000, 100000, 200000, 400000, 500000	Select the number of UI sample size for the Channel Speed, FBaud & Unit Interval and Frequency Long-Term Stability tests. A larger sample size would yield more confident results but requires longer time to perform. Unit : UI.
Confgure	Sample Size	DifferentialSkew_SampleSize	(Accepts user-defined text), 1000, 5000, 10000, 15000	Select the number of UI sample size for the Differential Skew test. A larger sample size would yield more confident results but requires longer time to perform. Unit : UI.
Confgure	Sample Size	Jitter_DataLength	(Accepts user-defined text), 550000, 600000, 1000000	Select the number of UI sample size for jitter measurement. The application will acquire until it reaches the desired number of UI sample size. For more information about the minimum requirement of the memory depth for jitter measurement, please refer to the Infiniium->Help->Contents->Jitter->Jitter (EZJIT+)->RJ/DJ Record Length Requirements.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	Sample Size	RiseFallImBalance_SampleSize	(Accepts user-defined text), 10000, 50000, 100000, 1000000	Select the number of UI sample size for the Rise/Fall Imbalance test. A larger sample size would yield more confident results but requires longer time to perform. Unit : UI.
Confgure	Sample Size	RiseFall_SampleSize	(Accepts user-defined text), 10000, 50000, 100000, 500000	Select the number of UI sample size for the Rise/Fall Time test. A larger sample size would yield more confident results but requires longer time to perform. Unit : UI.
Confgure	Sample Size	TxVdiff_SampleSize	(Accepts user-defined text), 500, 1000, 1500, 2000	Select the number of UI sample size for the Differential Output Voltage test. A larger sample size would yield more confident results but requires longer time to perform. Unit : UI.
Confgure	Sample Size for HFTP	AmplitudeImbalanceSampleSizeHFTP	(Accepts user-defined text), 10000, 20000	Select the number of UI sample size for the HFTP Amplitude Imbalance test. A larger sample size would yield more confident results but requires longer time to perform. Unit : UI.
Confgure	Sample Size for MFTP	AmplitudeImbalanceSampleSizeMFTP	(Accepts user-defined text), 10000, 20000	Select the number of UI sample size for the MFTP Amplitude Imbalance test. A larger sample size would yield more confident results but requires longer time to perform. Unit : UI.
Confgure	Signal Trigger Level	TriggerThreshold	(Accepts user-defined text), -300.0E-03, -250.0E-03, -200.0E-03, -150.0E-03, -100.0E-03, -50.0E-03, 0.0E-03, 50.0E-03, 100.0E-03, 150.0E-03, 200.0E-03, 250.0E-03, 300.0E-03	Choose the trigger level for the waveform acquisition of all SATA tests. Unit: volt.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	Start Scope Vdiff(V)	VthreshDebugInconsistentToRejectStartVdiff	(Accepts user-defined text), 0.12	This is the start voltage(V) of down sweeping from this defined voltage level voltage to a threshold level that has 1st reject response.
Confgure	Start Scope Vdiff(V)	VthreshDebugResponsetoInconsistentStartVdiff	(Accepts user-defined text), 0.21	This is the start voltage(V) of down sweeping from this defined level voltage to a threshold level that has 1st inconsistent response.
Confgure	Stimulus Frequency Gen1 (Ghz)	PulsegenStimulusFreqGen1	(Accepts user-defined text), 1.500000000	Gen1 Non-OOB Tests Only: The stimulus frequency enables the user to set the offset of the pulse generator stimulus frequency which correspond to the desired frequency measured using the scope. Unit: GHz.
Confgure	Stimulus Frequency Gen2 (Ghz)	PulsegenStimulusFreqGen2	(Accepts user-defined text), 3.000000000	Gen2 Non-OOB Tests Only: The stimulus frequency enables the user to set the offset of the pulse generator stimulus frequency which correspond to the desired frequency measured using the scope. Unit: GHz.
Confgure	Stimulus Frequency Gen3 (Ghz)	PulsegenStimulusFreqGen3	(Accepts user-defined text), 6.000000000	Gen3 Non-OOB Tests Only: The stimulus frequency enables the user to set the offset of the pulse generator stimulus frequency which correspond to the desired frequency measured using the scope. This setting ONLY applies to N4903B JBERT as stimulus. Unit: GHz.
Confgure	Stimulus Vpp Output (mVpp)	81134OOBVpp	(Accepts user-defined text), 250, 300, 350, 400, 450, 500, 600, 850	OOB Tests only: Pulsegen Stimulus Peak to Peak Voltage. Please be sure that the settings can be supported by the DUT. Unit: mVolt.
Confgure	Stimulus Vpp Output (mVpp)	PulsegenStimulusVppOutput	(Accepts user-defined text), 250, 300, 350, 400, 450, 500, 600, 850	Non OOB Tests only: Pulse generator stimulus peak to peak voltage. Please be sure that the settings can be supported by the DUT. Unit: mVolt.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Confgure	Test Pattern for Rise/Fall Time	RiseFallPattern	DEFAULT, LBP, LFTP, MFTP, HFTP	Select the test pattern used for Rise Time and Fall Time measurement tests. When DEFAULT is selected, HFTP will used for UTD 1.2 and 1.3, LFTP will be used for UTD 1.4 and above in rise time and fall time measurement.
Confgure	Transfer Function (Host, i Interface)	TxEmphasisTransferFunctionIHost	(Accepts user-defined text), None, CIC	Set the path of transfer function file for i interface Tx Emphasis measurement. To use custom transfer file, set the complete path of the transfer file in the textbox above.
Confgure	Transfer Function (Host, u Interface)	TxEmphasisTransferFunctionUHost	(Accepts user-defined text), None, CIC	Set the path of transfer function file for u interface Tx Emphasis measurement. To use custom transfer file, set the complete path of the transfer file in the textbox above.
Confgure	Use SATA CIC	UseSATACIC	true, false	Select to enable or disable the SATA Compliance Interconnect Channel (CIC) in the Differential Output Voltage and Jitter measurement (applicable to 6.0Gb/s DUT and "u" interface DUT only). CIC intented to be representative of the highest loss interconnects.
Confgure	Vthresh Reject Debug	VthreshDebugInconsistentToReject	Enable, Disable	If "Enable" is selected, it will down sweep from defined voltage level voltage to a threshold level that has 1st encountered rejected response.
Confgure	Vthresh Response Debug	VthreshDebugResponsetoInconsistent	Enable, Disable	If "Enable" is selected, it will down sweep from defined voltage level to a threshold level that has the 1st encountered inconsistent response.
Run Tests	Event	RunEvent	(None), Fail, Margin < N, Pass	Names of events that can be used with the StoreMode=Event or RunUntil RunEventAction options

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Run Tests	RunEvent=Margin < N: Minimum required margin %	RunEvent_Margin < N_MinPercent	Any integer in range: 0 <= value <= 100	Specify N using the 'Minimum required margin %' control.
Set Up	BIST Mode	BISTMode	BIST-T, BIST-L	With BIST-T, the app will request the tester to configure the DUT manually to output the appropriate pattern to the scope for measurement. With BIST-L, the app will send the appropriate stimulus pattern to the DUT (with 2 aligns inserted per 256 Dwords) for it to be retimed and echo back to the scope for measurement. With BIST-T, the app will request the tester to configure the DUT manually to output the appropriate pattern to the scope for measurement. With BIST-L, the app will send the appropriate stimulus pattern to the DUT (with 2 aligns inserted per 256 Dwords) for it to be retimed and echo back to the scope for measurement.
Set Up	Device Description	DeviceDescription	(Accepts user-defined text)	Edit DUT description. Edit DUT description.
Set Up	Device ID	DeviceID	(Accepts user-defined text)	Edit DUT identifier. Edit DUT identifier.
Set Up	Device Type	DeviceType	Drive, Host	Select DUT type, drive or host. Select DUT type, drive or host.
Set Up	Emphasis Enable	EmphasisEnable	0.0, 1.0	Check if the DUT supports for transmitter emphasis. Check if the DUT supports for transmitter emphasis.
Set Up	Generation	Generation	Gen I, Gen II, Gen III	Select DUT's data speed generation. Select DUT's data speed generation.
Set Up	Hide Info Tests	HideInfoTests	0.0, 1.0	Check to hide all the informative tests. Check to hide all the informative tests.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Set Up	Host ASR	HostASR	0.0, 1.0	Check if the host supports ASR. This setting has no effect for drive. It affects host OOB tests. Check if the host supports ASR. This setting has no effect for drive. It affects host OOB tests.
Set Up	Interface	Interface	i, m, x, u	Select DUT's interface. Select DUT's interface.
Set Up	SSC Modulation	SSCModulation	0.0, 1.0	Check if the DUT supports for SSC modulation. Check if the DUT supports for SSC modulation.
Set Up	Stimulus Device	optPulseGen	81134A, N4903B, M8020A, None	Select stimulus device. Select stimulus device.
Set Up	Stimulus Instrument Connection	optConnection	none, PPG_IP, PPG_Sicl, JBERT_IP, JBERT_Sicl, M8020A_IP, M8020A_Sicl	REMOTE ONLY: Determine whether tests that require a stimulus instrument availability are loaded in the test tree. If the remote user desires to use 81134A as stimulus, the value "PPG_IP" or "PPG_Sicl" is applicable for setting the IP address or Sicl Address respectively. Else if the remote user desires to use N4903B as stimulus, the value "JBERT_IP" or "JBERT_Sicl" is applicable for setting the IP address or Sicl Address respectively.The software will return the state whether the stimulus instrument connection attempt has been successful or failed. In any case, the user has to issue a "none" value again before attempting for another round of pulse generator connection. After the software detects that it is remotely controlled, the Automation panel in the Setup tab would be disabled. There is also a Re-enable button to re-enable the Automation panel for the user to access the Automation panel locally.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Set Up	Stimulus Instrument IP Address	cmbIPaddr	(Accepts user-defined text)	REMOTE ONLY: Sets the IP address for the pulse generator. The IP or Sicl Address must be explicitly set before any stimulus connection attempt. REMOTE ONLY: Sets the IP address for the pulse generator.
Set Up	Stimulus Instrument Sicl Address	cmbSicl	(Accepts user-defined text)	REMOTE ONLY: Sets the Sicl address for the pulse generator stimulus. The IP or Sicl Address must be explicitly set before any stimulus connection attempt. REMOTE ONLY: Sets the Sicl address for the pulse generator stimulus. The IP or Sicl Address must be explicitly set before any stimulus connection attempt.
Set Up	UTD Version	UTDVer	UTD 1.5, UTD 1.4.3, UTD 1.4.2, UTD 1.4.1, UTD 1.4, UTD 1.3, UTD 1.1/1.2	Select the UTD version for the compliance tests. Select the UTD version for the compliance tests.
Set Up	User Comments	UserComments	(Accepts user-defined text)	Edit user comments. Edit user comments.

3 Test Names and IDs

The following table shows the mapping between each test's numeric ID and name. The numeric ID is required by various remote interface methods.

- Name — The name of the test as it appears on the user interface **Select Tests** tab.
- Test ID — The number to use with the RunTests method.
- Description — The description of the test as it appears on the user interface **Select Tests** tab.

For example, if the graphical user interface displays this tree in the **Select Tests** tab:

- All Tests
  - Rise Time
  - Fall Time

then you would expect to see something like this in the table below:

Table 3 Example Test Names and IDs

Name	Test ID	Description
Fall Time	110	Measures clock fall time.
Rise Time	100	Measures clock rise time.

and you would run these tests remotely using:

```
ARSL syntax
-----------
arsl -a ipaddress -c "SelectedTests '100,110'"
arsl -a ipaddress -c "Run"

C# syntax
---------
remoteAte.SelectedTests = new int[]{100,110};
remoteAte.Run();
```

Here are the actual Test names and IDs used by this application:

NOTE The file, ""TestInfo.txt"", which may be found in the same directory as this help file, contains all of the information found in the table below in a format suitable for parsing.

Table 4 Test IDs and Names

Name	TestID	Description
DJ after CIC, HFTP, Clock To Data, fBAUD/1667	21911	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
DJ after CIC, HFTP, Clock To Data, fBAUD/1667	21711	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
DJ after CIC, LBP, Clock To Data, fBAUD/1667	21912	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
DJ after CIC, LBP, Clock To Data, fBAUD/1667	21712	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
DJ after CIC, LFTP, Clock To Data, fBAUD/1667 (Informative)	22134	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
DJ after CIC, LFTP, Clock To Data, fBAUD/1667 (Informative)	22234	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
DJ after CIC, MFTP, Clock To Data, fBAUD/1667 (Informative)	22133	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
DJ after CIC, MFTP, Clock To Data, fBAUD/1667 (Informative)	22233	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
DJ after CIC, SSOP, Clock To Data, fBAUD/1667 (Informative)	22135	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
DJ after CIC, SSOP, Clock To Data, fBAUD/1667 (Informative)	22235	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
Deprecated	20112	Now use ID 20111
Deprecated	20113	Now use ID 20111
Deprecated	20114	Now use ID 20111
Deprecated	20122	Now use ID 20121
Deprecated	20123	Now use ID 20121
Deprecated	20124	Now use ID 20121
Differential Output Voltage (Max), LFTP	801502	Maximum Differential Output Voltage, LFTP
Differential Output Voltage (Max), MFTP	801501	Maximum Differential Output Voltage, MFTP
Differential Output Voltage (Min), HFTP	801403	Minimum Differential Output Voltage, HFTP
Differential Output Voltage (Min), LBP	801401	Minimum Differential Output Voltage, LBP
Differential Output Voltage (Min), MFTP	801402	Minimum Differential Output Voltage, MFTP

Table 4 Test IDs and Names (continued)

Name	TestID	Description
Find Inter-Burst Gap for COMINIT	800300	
Find Inter-Burst Gap for COMWAKE	800400	
Gen3 (6Gb/s) Tx AC Common Mode Voltage Measurement Setup	20429	Maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements. The 1st and 2nd harmonics frequency of the data rate shall be measured.
No test selected	0	Dummy test for development purpose.
OOB-01[a] : Drive Rejects Min Vthresh COMRESET	30141	Send repetitive minimum Vthresh level with nominal gap COMRESET signal to Drive, verify that the Drive does not respond consistently with any signal to each stimulus except for user-defined tolerated #Asynchronous Signal Recovery COMINIT.
OOB-01[a] : Drive Rejects Min Vthresh COMRESET	30142	Send repetitive minimum Vthresh level with nominal gap COMRESET signal to Drive, verify that the Drive does not respond consistently with any signal to each stimulus except for user-defined tolerated #Asynchronous Signal Recovery COMINIT.
OOB-01[a] : Host Rejects Min Vthresh COMINIT	30121	Send repetitive minimum Vthresh level with nominal gap COMINIT signal to Host, verify that: Host without ASR: The Host responds consistently with COMWAKE to each stimulus. Host with ASR: The Host does not respond consistently with any signal to each stimulus except for user-defined tolerated #Proactive COMRESET.
OOB-01[a] : Host Rejects Min Vthresh COMINIT	30122	Send repetitive minimum Vthresh level with nominal gap COMINIT signal to Host, verify that: Host without ASR: The Host responds consistently with COMWAKE to each stimulus. Host with ASR: The Host does not respond consistently with any signal to each stimulus except for user-defined tolerated #Proactive COMRESET.
OOB-01[b] : Drive Responds to Max Vthresh COMRESET	30131	Send repetitive maximum Vthresh level with nominal gap COMRESET signal to Drive, verify that the Drive responds consistently with COMINIT to each stimulus.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
OOB-01[b] : Host Responds to Max Vthresh COMINIT	30111	Send repetitive maximum Vthresh level with nominal gap COMINIT signal to Host, verify that: Host without ASR: The Host responds consistently with COMWAKE to each stimulus. Host with ASR: the Host responds consistently with alternate COMINIT/COMWAKE to each stimulus.
OOB-02 : Drive UI During OOB Signaling	30221	This specifies the operating data period during OOB burst transmission (at Gen1 rate ± 3%).
OOB-02 : Host UI During OOB Signaling	30211	This specifies the operating data period during OOB burst transmission (at Gen1 rate ± 3%).
OOB-03[a] : Drive COMINIT Transmit Burst Length	30321	Send in-spec nominal COMRESET to Drive. Verify Drive responds with 6 bursts of COMINIT signal with burst timing in specification.
OOB-03[a] : Host COMRESET Transmit Burst Length	30311	Verify Host initiates with 6 bursts of COMRESET signal with burst timing in specification.
OOB-03[b] : Drive COMWAKE Transmit Burst Length	30341	Send in-spec nominal COMWAKE to Drive. Verify Drive responds with 6 bursts of COMWAKE signal with burst timing in specification.
OOB-03[b] : Host COMWAKE Transmit Burst Length	30331	Send in-specification nominal COMINIT to Host. Verify Host responds with 6 bursts of COMWAKE signal with burst timing in specification.
OOB-04 : Drive COMINIT Transmit Gap Length	30421	Send in-spec nominal COMRESET to Drive. Verify Drive responds with 6 bursts of COMINIT signal with Inter-burst timing in specification.
OOB-04 : Host COMRESET Transmit Gap Length	30411	Verify Host initiates with 6 bursts of COMRESET signal with Inter-burst timing in specification.
OOB-05 : Drive COMWAKE Transmit Gap Length	30521	Send in-spec nominal COMWAKE to Drive. Verify Drive responds with 6 bursts of COMWAKE signal with Inter-burst timing in specification.
OOB-05 : Host COMWAKE Transmit Gap Length	30511	Send in-specification nominal COMINIT to Host. Verify Host responds with 6 bursts of COMWAKE signal with burst timing in specification.
OOB-06[a] : Drive Responds to Max In-Spec COMWAKE	30671	Send repetitive max In-Spec COMWAKE Gap Windows signal to Drive, verify that the Drive responds consistently with COMWAKE and SPEED NEGOTIATION to each stimulus.
OOB-06[a] : Host Responds to Max In-Spec COMWAKE	30631	Send repetitive nominal gap COMINIT and max In-Spec COMWAKE signal to Host, verify that the Host responds consistently with COMWAKE and SPEED NEGOTIATION to each stimulus.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
OOB-06[b] : Drive Responds to Min In-Spec COMWAKE	30672	Send repetitive min In-Spec COMWAKE Gap Windows signal to Drive, verify that the Drive responds consistently with COMWAKE and SPEED NEGOTIATION to each stimulus.
OOB-06[b] : Host Responds to Min In-Spec COMWAKE	30632	Send repetitive nominal gap COMINIT and min In-Spec COMWAKE signal to Host, verify that the Host responds consistently with COMWAKE and SPEED NEGOTIATION to each stimulus.
OOB-06[c] : Drive Rejects Max Out-Of-Spec COMWAKE	30681	Send repetitive nominal gap COMRESET and max out-of-spec COMWAKE Gap Windows signal to Drive, verify that the Drive responds consistently with COMINIT only to each stimulus.
OOB-06[c] : Host Rejects Max Out-Of-Spec COMWAKE	30641	Send repetitive nominal gap COMINIT and max out-of-Spec COMWAKE sequence to Host, verify that: Host without ASR: The Host responds consistently with COMWAKE only to each stimulus. Host with ASR: The Host responds consistently with alternate COMINIT/COMWAKE only to each stimulus.
OOB-06[d] : Drive Rejects Min Out-Of-Spec COMWAKE	30682	Send repetitive nominal gap COMRESET and min out-of-spec COMWAKE Gap Windows signal to Drive, verify that the Drive responds consistently with COMINIT only to each stimulus.
OOB-06[d] : Host Rejects Min Out-Of-Spec COMWAKE	30642	Send repetitive nominal gap COMINIT and min out-of-Spec COMWAKE sequence to Host, verify that: Host without ASR: The Host responds consistently with COMWAKE only to each stimulus. Host with ASR: The Host responds consistently with alternate COMINIT/COMWAKE only to each stimulus.
OOB-07[a] : Drive Responds to Max In-Spec COMRESET	30651	Send repetitive max In-Spec COMRESET Gap Windows signal to Drive, verify that the Drive responds consistently with COMINIT to each stimulus.
OOB-07[a] : Host Responds to Max In-Spec COMINIT	30611	Send repetitive max In-Spec COMINIT Gap Windows signal to Host, verify that: Host without ASR: The Host responds consistently with COMWAKE to each stimulus. Host with ASR: the Host responds consistently with alternate COMINIT/COMWAKE to each stimulus.
OOB-07[b] : Drive Responds to Min In-Spec COMRESET	30652	Send repetitive min In-Spec COMRESET Gap Windows signal to Drive, verify that the Drive responds consistently with COMINIT to each stimulus.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
OOB-07[b] : Host Responds to Min In-Spec COMINIT	30612	Send repetitive min In-Spec COMINIT Gap Windows signal to Host, verify that: Host without ASR: The Host responds consistently with COMWAKE to each stimulus. Host with ASR: the Host responds consistently with alternate COMINIT-COMWAKE to each stimulus.
OOB-07[c] : Drive Rejects Max Out-Of-Spec COMRESET	30661	Send repetitive max out-of-spec COMRESET Gap Windows signal to Drive, verify that the Drive does not respond consistently with any signal to each stimulus except for user-defined tolerated #Asynchronous Signal Recovery COMINIT.
OOB-07[c] : Host Rejects Max Out-Of-Spec COMINIT	30621	Send repetitive max out-of-spec COMINIT Gap Windows signal to Host, verify that the Host does not respond consistently with any signal to each stimulus except for user-defined tolerated #Proactive COMRESET.
OOB-07[d] : Drive Rejects Min Out-Of-Spec COMRESET	30662	Send repetitive min out-of-spec COMRESET Gap Windows signal to Drive, verify that the Drive does not respond consistently with any signal to each stimulus except for user-defined tolerated #Asynchronous Signal Recovery COMINIT.
OOB-07[d] : Host Rejects Min Out-Of-Spec COMINIT	30622	Send repetitive min out-of-spec COMINIT Gap Windows signal to Host, verify that the Host does not respond consistently with any signal to each stimulus except for user-defined tolerated #Proactive COMRESET.
PHY-01 : Channel Speed, FBaud & Unit Interval	10111	Unit Interval is the operating data period (nominal value architecture specific), excluding jitter. Channel Speed and Fbaud are the reference value showing the nominal rate of data through the channel.
PHY-01 : Channel Speed, FBaud & Unit Interval	10121	Unit Interval is the operating data period (nominal value architecture specific), excluding jitter. Channel Speed and Fbaud are the reference value showing the nominal rate of data through the channel.
PHY-01 : Channel Speed, FBaud & Unit Interval	10131	Unit Interval is the operating data period (nominal value architecture specific), excluding jitter. Channel Speed and Fbaud are the reference value showing the nominal rate of data through the channel.
PHY-02 : Frequency Long-Term Stability	10211	This specifies the allowed frequency variation from nominal. This does not include frequency variation due to jitter, Spread Spectrum Clocking, or phase noise of the clock source.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
PHY-02 : Frequency Long-Term Stability	10221	This specifies the allowed frequency variation from nominal; this does not include frequency variation due to jitter, Spread Spectrum Clocking, or phase noise of the clock source.
PHY-02 : Frequency Long-Term Stability	10231	This specifies the allowed frequency variation from nominal; this does not include frequency variation due to jitter, Spread Spectrum Clocking, or phase noise of the clock source.
PHY-02 : Frequency Long-Term Stability (SSC)	10212	This specifies the allowed frequency variation from nominal. When SSC is present, the measurement is a combination of the long term frequency accuracy and a frequency offset due to the SSC modulation.
PHY-02 : Frequency Long-Term Stability (SSC)	10222	This specifies the allowed frequency variation from nominal. When SSC is present, the measurement is a combination of the long term frequency accuracy and a frequency offset due to the SSC modulation.
PHY-03 : Spread-Spectrum Modulation Frequency	10311	Spread-Spectrum Modulation Frequency specifies the modulation frequency of the Spread Spectrum frequency modulation.
PHY-04[a] : Spread-Spectrum Modulation Deviation (Min)	10411	Spread-Spectrum Modulation Deviation specifies the allowed frequency variation from the nominal Fbaud value when Spread Spectrum Clocking (SSC) is used. This deviation includes the long-term frequency variation of the transmitter clock source, and the SSC frequency modulation on the transmitter output.
PHY-04[b] : Spread-Spectrum Modulation Deviation (Max)	10412	Spread-Spectrum Modulation Deviation specifies the allowed frequency variation from the nominal Fbaud value when Spread Spectrum Clocking (SSC) is used. This deviation includes the long-term frequency variation of the transmitter clock source, and the SSC frequency modulation on the transmitter output.
PHY-04[c] : Spread-Spectrum Modulation DFDT (Min)	10511	Spread-Spectrum Modulation DFDT specifies the minimum short term rate of change (slope) of the spread spectrum modulation profile (df/dt) is within the conformance limit.
PHY-04[d] : Spread-Spectrum Modulation DFDT (Max)	10512	Spread-Spectrum Modulation DFDT specifies the maximum short term rate of change (slope) of the spread spectrum modulation profile (df/dt) is within the conformance limit.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TJ after CIC, HFTP, Clock To Data, fBAUD/1667	21811	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TJ after CIC, HFTP, Clock To Data, fBAUD/1667	21611	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TJ after CIC, LBP, Clock To Data, fBAUD/1667	21812	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TJ after CIC, LBP, Clock To Data, fBAUD/1667	21612	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TJ after CIC, LFTP, Clock To Data, fBAUD/1667 (Informative)	22124	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TJ after CIC, LFTP, Clock To Data, fBAUD/1667 (Informative)	22224	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TJ after CIC, MFTP, Clock To Data, fBAUD/1667 (Informative)	22123	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TJ after CIC, MFTP, Clock To Data, fBAUD/1667 (Informative)	22223	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TJ after CIC, SSOP, Clock To Data, fBAUD/1667 (Informative)	22125	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TJ after CIC, SSOP, Clock To Data, fBAUD/1667 (Informative)	22225	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-01[a] : Differential Output Voltage (Min)	20111	The minimum differential voltage [(TX+) – (TX-)] measured at the transmitter shall comply to the respective electrical specifications. This is measured at mated Serial ATA connector on transmit side including any pre-emphasis.
TSG-01[b] : Differential Output Voltage (Max) (Informative)	20121	The maximum differential voltage [(TX+) – (TX-)] measured at the transmitter shall comply to the respective electrical specifications. This is measured at mated Serial ATA connector on transmit side including any pre-emphasis.
TSG-02[a] : Rise Time	20211	Rise times are measured between 20% and 80% of the signal. The rise requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling.
TSG-02[a] : Rise Time	20212	Rise times are measured between 20% and 80% of the signal. The rise requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling.
TSG-02[a] : Rise Time	20213	Rise times are measured between 20% and 80% of the signal. The rise requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-02[a] : Rise Time	20214	Rise times are measured between 20% and 80% of the signal. The rise requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling.
TSG-02[a] : Rise Time (Informative)	20231	Rise times are measured between 20% and 80% of the signal. The rise requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling. This test change to Informative Test from UTD 1.4.3 and above.
TSG-02[a] : Rise Time (Informative)	20232	Rise times are measured between 20% and 80% of the signal. The rise requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling. This test change to Informative Test from UTD 1.4.3 and above.
TSG-02[a] : Rise Time (Informative)	20233	Rise times are measured between 20% and 80% of the signal. The rise requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling. This test change to Informative Test from UTD 1.4.3 and above.
TSG-02[a] : Rise Time (Informative)	20234	Rise times are measured between 20% and 80% of the signal. The rise requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling. This test change to Informative Test from UTD 1.4.3 and above.
TSG-02[b] : Fall Time	20221	Fall times are measured between 20% and 80% of the signal. Fall time requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling.
TSG-02[b] : Fall Time	20222	Fall times are measured between 20% and 80% of the signal. Fall time requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling.
TSG-02[b] : Fall Time	20223	Fall times are measured between 20% and 80% of the signal. Fall time requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling.
TSG-02[b] : Fall Time	20224	Fall times are measured between 20% and 80% of the signal. Fall time requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-02[b] : Fall Time (Informative)	20241	Fall times are measured between 20% and 80% of the signal. Fall time requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling. This test change to Informative Test from UTD 1.4.3 and above.
TSG-02[b] : Fall Time (Informative)	20242	Fall times are measured between 20% and 80% of the signal. Fall time requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling. This test change to Informative Test from UTD 1.4.3 and above.
TSG-02[b] : Fall Time (Informative)	20243	Fall times are measured between 20% and 80% of the signal. Fall time requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling. This test change to Informative Test from UTD 1.4.3 and above.
TSG-02[b] : Fall Time (Informative)	20244	Fall times are measured between 20% and 80% of the signal. Fall time requirement tr/f applies to differential transitions (TX+ – TX-), for both normal and OOB signaling. This test change to Informative Test from UTD 1.4.3 and above.
TSG-03[a] : Differential Skew, HFTP	20311	TX Differential Skew is the time difference between the single-ended mid-point of the TX+ signal rising/falling edge, and the single-ended mid-point of the TX- signal falling/rising edge. It is an important parameter to control as excessive skew may result in increased high frequency jitter and common mode noise levels seen at the far end of the interconnect.
TSG-03[a] : Differential Skew, HFTP	20312	TX Differential Skew is the time difference between the single-ended mid-point of the TX+ signal rising/falling edge, and the single-ended mid-point of the TX- signal falling/rising edge. It is an important parameter to control as excessive skew may result in increased high frequency jitter and common mode noise levels seen at the far end of the interconnect.
TSG-03[a] : Differential Skew, HFTP (Informative)	20331	TX Differential Skew is the time difference between the single-ended mid-point of the TX+ signal rising/falling edge, and the single-ended mid-point of the TX- signal falling/rising edge. It is an important parameter to control as excessive skew may result in increased high frequency jitter and common mode noise levels seen at the far end of the interconnect. This test change to Informative Test from UTD 1.4.3 and above.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-03[a] : Differential Skew, HFTP (Informative)	20332	TX Differential Skew is the time difference between the single-ended mid-point of the TX+ signal rising/falling edge, and the single-ended mid-point of the TX- signal falling/rising edge. It is an important parameter to control as excessive skew may result in increased high frequency jitter and common mode noise levels seen at the far end of the interconnect. This test change to Informative Test from UTD 1.4.3 and above.
TSG-03[b] : Differential Skew, MFTP	20321	TX Differential Skew is the time difference between the single-ended mid-point of the TX+ signal rising/falling edge, and the single-ended mid-point of the TX- signal falling/rising edge. It is an important parameter to control as excessive skew may result in increased high frequency jitter and common mode noise levels seen at the far end of the interconnect.
TSG-03[b] : Differential Skew, MFTP	20322	TX Differential Skew is the time difference between the single-ended mid-point of the TX+ signal rising/falling edge, and the single-ended mid-point of the TX- signal falling/rising edge. It is an important parameter to control as excessive skew may result in increased high frequency jitter and common mode noise levels seen at the far end of the interconnect.
TSG-03[b] : Differential Skew, MFTP (Informative)	20341	TX Differential Skew is the time difference between the single-ended mid-point of the TX+ signal rising/falling edge, and the single-ended mid-point of the TX- signal falling/rising edge. It is an important parameter to control as excessive skew may result in increased high frequency jitter and common mode noise levels seen at the far end of the interconnect. This test change to Informative Test from UTD 1.4.3 and above.
TSG-03[b] : Differential Skew, MFTP (Informative)	20342	TX Differential Skew is the time difference between the single-ended mid-point of the TX+ signal rising/falling edge, and the single-ended mid-point of the TX- signal falling/rising edge. It is an important parameter to control as excessive skew may result in increased high frequency jitter and common mode noise levels seen at the far end of the interconnect. This test change to Informative Test from UTD 1.4.3 and above.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-04[a] : AC Common Mode Voltage, MFTP	20411	This specifies maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements.
TSG-04[a] : AC Common Mode Voltage, MFTP	20423	This specifies maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements.
TSG-04[a] : AC Common Mode Voltage, MFTP	20413	This specifies maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements.
TSG-04[a] : AC Common Mode Voltage, MFTP	20425	This specifies maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements.
TSG-04[b] : AC Common Mode Voltage, HFTP	20424	This specifies maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements.
TSG-04[b] : AC Common Mode Voltage, HFTP	20414	This specifies maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-04[b] : AC Common Mode Voltage, HFTP	20426	This specifies maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements.
TSG-04[b] : AC Common Mode Voltage, HFTP (Informative)	20412	This specifies maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements.
TSG-05 : Rise/Fall Imbalance, HFTP	20511	This specifies the measure of the match in the simultaneous single-ended rise/fall or fall/rise times of the Transmitter. The match in the rise of TX+ and fall of TX- determined by the functions: absolute value(TX+,rise - TX-,fall)/average where average is (TX+,rise + TX-,fall)/2 and all rise and fall times are 20-80%. The match in the fall of TX+ and rise of TX- determined by the function: absolute value(TX+,fall - TX-,rise)/average where average is (TX+,fall + TX-,rise)/2 and all rise and fall times are 20-80%. This test only available for UTD 1.3 and below.
TSG-05 : Rise/Fall Imbalance, MFTP	20512	This specifies the measure of the match in the simultaneous single-ended rise/fall or fall/rise times of the Transmitter. The match in the rise of TX+ and fall of TX- determined by the functions: absolute value(TX+,rise - TX-,fall)/average where average is (TX+,rise + TX-,fall)/2 and all rise and fall times are 20-80%. The match in the fall of TX+ and rise of TX- determined by the function: absolute value(TX+,fall - TX-,rise)/average where average is (TX+,fall + TX-,rise)/2 and all rise and fall times are 20-80%. This test only available for UTD 1.3 and below.
TSG-06[a] : Amplitude Imbalance, HFTP	20611	This specifies the measure of the match in the single-ended amplitudes of the TX+ and TX- signals. The match in the amplitudes of TX+ and TX- determined by the function: absolute value(TX+ amplitude - TX- amplitude)/average where average is (TX+ amplitude + TX- amplitude)/2 and all amplitudes are determined by mode (most prevalent) voltage. This test only available for UTD 1.3 and below.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-06[b] : Amplitude Imbalance, MFTP	20612	This specifies the measure of the match in the single-ended amplitudes of the TX+ and TX- signals. The match in the amplitudes of TX+ and TX- determined by the function: absolute value(TX+ amplitude - TX- amplitude)/average where average is (TX+ amplitude + TX- amplitude)/2 and all amplitudes are determined by mode (most prevalent) voltage. This test only available for UTD 1.3.
TSG-07 : TJ at Connector, HFTP, Clock To Data, fBAUD/10 (Informative)	22012	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-07 : TJ at Connector, LBP, Clock To Data, fBAUD/10 (Informative)	22011	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-07 : TJ at Connector, LFTP, Clock To Data, fBAUD/10 (Informative)	22014	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-07 : TJ at Connector, MFTP, Clock To Data, fBAUD/10 (Informative)	22013	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-07 : TJ at Connector, SSOP, Clock To Data, fBAUD/10 (Informative)	22015	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-08 : DJ at Connector, HFTP, Clock To Data, fBAUD/10 (Informative)	22022	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-08 : DJ at Connector, LBP, Clock To Data, fBAUD/10 (Informative)	22021	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-08 : DJ at Connector, LFTP, Clock To Data, fBAUD/10 (Informative)	22024	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-08 : DJ at Connector, MFTP, Clock To Data, fBAUD/10 (Informative)	22023	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-08 : DJ at Connector, SSOP, Clock To Data, fBAUD/10 (Informative)	22025	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-09 : TJ at Connector, HFTP, Clock To Data, fBAUD/500	20911	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-09 : TJ at Connector, LBP, Clock To Data, fBAUD/500	20912	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-09 : TJ at Connector, LFTP, Clock To Data, fBAUD/500 (Informative)	22104	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-09 : TJ at Connector, MFTP, Clock To Data, fBAUD/500 (Informative)	22103	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-09 : TJ at Connector, SSOP, Clock To Data, fBAUD/500 (Informative)	22105	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-10 : DJ at Connector, HFTP, Clock To Data, fBAUD/500	21011	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-10 : DJ at Connector, LBP, Clock To Data, fBAUD/500	21012	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-10 : DJ at Connector, LFTP, Clock To Data, fBAUD/500 (Informative)	22114	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-10 : DJ at Connector, MFTP, Clock To Data, fBAUD/500 (Informative)	22113	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-10 : DJ at Connector, SSOP, Clock To Data, fBAUD/500 (Informative)	22115	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-11 : TJ at Connector, HFTP, Clock To Data, fBAUD/500	21111	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-11 : TJ at Connector, LBP, Clock To Data, fBAUD/500	21112	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-11 : TJ at Connector, LFTP, Clock To Data, fBAUD/500 (Informative)	22204	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-11 : TJ at Connector, MFTP, Clock To Data, fBAUD/500 (Informative)	22203	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-11 : TJ at Connector, SSOP, Clock To Data, fBAUD/500 (Informative)	22205	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-12 : DJ at Connector, HFTP, Clock To Data, fBAUD/500	21211	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-12 : DJ at Connector, LBP, Clock To Data, fBAUD/500	21212	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-12 : DJ at Connector, LFTP, Clock To Data, fBAUD/500 (Informative)	22214	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-12 : DJ at Connector, MFTP, Clock To Data, fBAUD/500 (Informative)	22213	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-12 : DJ at Connector, SSOP, Clock To Data, fBAUD/500 (Informative)	22215	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Deterministic Jitter. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[a] : RJ before CIC, MFTP, Clock To Data, JTF Defined	21311	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Random Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[a] : RJ before CIC, MFTP, Clock To Data, JTF Defined (Informative)	21312	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Random Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition. This test change to Informative Test from UTD 1.4.3 and above.
TSG-13[b] : TJ before CIC, HFTP, Clock To Data, JTF Defined (Use RJ)	21415	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[b] : TJ before CIC, LBP, Clock To Data, JTF Defined (Use RJ)	21416	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[b] : TJ before CIC, LFTP, Clock To Data, JTF Defined (Use RJ) (Informative)	22414	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[b] : TJ before CIC, MFTP, Clock To Data, JTF Defined (Use RJ) (Informative)	22413	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-13[b] : TJ before CIC, SSOP, Clock To Data, JTF Defined (Use RJ) (Informative)	22415	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[c] : TJ after CIC, HFTP, Clock To Data, JTF Defined (Use RJ)	21515	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[c] : TJ after CIC, LBP, Clock To Data, JTF Defined (Use RJ)	21516	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[c] : TJ after CIC, LFTP, Clock To Data, JTF Defined (Use RJ) (Informative)	22424	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[c] : TJ after CIC, MFTP, Clock To Data, JTF Defined (Use RJ) (Informative)	22423	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[c] : TJ after CIC, SSOP, Clock To Data, JTF Defined (Use RJ) (Informative)	22425	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[d] : TJ after CIC, HFTP, Clock To Data, JTF Defined (BER=1E-12)	21511	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-13[d] : TJ after CIC, HFTP, Clock To Data, JTF Defined (BER=1E-12) (Informative)	21517	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition. This test change to Informative Test from UTD 1.4.3 and above.
TSG-13[d] : TJ after CIC, LBP, Clock To Data, JTF Defined (BER=1E-12)	21512	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[d] : TJ after CIC, LFTP, Clock To Data, JTF Defined (BER=1E-12) (Informative)	22454	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[d] : TJ after CIC, MFTP, Clock To Data, JTF Defined (BER=1E-12) (Informative)	22453	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[d] : TJ after CIC, SSOP, Clock To Data, JTF Defined (BER=1E-12) (Informative)	22455	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[e] : TJ after CIC, HFTP, Clock To Data, JTF Defined (BER=1E-6)	21513	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[e] : TJ after CIC, HFTP, Clock To Data, JTF Defined (BER=1E-6) (Informative)	21518	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition. This test change to Informative Test from UTD 1.4.3 and above.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-13[e] : TJ after CIC, LBP, Clock To Data, JTF Defined (BER=1E-6)	21514	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[e] : TJ after CIC, LFTP, Clock To Data, JTF Defined (BER=1E-6) (Informative)	22464	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[e] : TJ after CIC, MFTP, Clock To Data, JTF Defined (BER=1E-6) (Informative)	22463	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-13[e] : TJ after CIC, SSOP, Clock To Data, JTF Defined (BER=1E-6) (Informative)	22465	This specifies the transmitters shall meet the Clock-to-Data jitter measurement specification for Total Jitter with JTF defined. Jitter is the difference in time between a data transition and the associated Reference Clock event, taken as the ideal point for a transition.
TSG-14 : Gen3 (6Gb/s) TX Maximum Differential Voltage Amplitude	20125	The maximum differential voltage [(TX+) – (TX-)] measured at the transmitter shall comply to the respective electrical specifications. This is measured at mated Serial ATA connector on transmit side including any pre-emphasis. For Gen3i and Gen3u the maximum differential output voltage is likewise measured at the TX compliance point.
TSG-15 : Gen3 (6Gb/s) TX Minimum Differential Voltage Amplitude (BER=1E-12)	20115	The minimum differential voltage [(TX+) – (TX-)] measured at the transmitter shall comply to the respective electrical specifications. This is measured at mated Serial ATA connector on transmit side including any pre-emphasis. The minimum differential output voltage is measured after the Gen3i CIC.
TSG-15 : Gen3 (6Gb/s) TX Minimum Differential Voltage Amplitude (UI=5E6)	20116	The minimum differential voltage [(TX+) – (TX-)] measured at the transmitter shall comply to the respective electrical specifications. This is measured at mated Serial ATA connector on transmit side including any pre-emphasis. The minimum differential output voltage is measured after the Gen3i CIC.

Table 4 Test IDs and Names (continued)

Name	TestID	Description
TSG-16[a] : Gen3 (6Gb/s) Tx AC Common Mode Voltage, FFT 3GHz	20421	Maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements. The 1st and 2nd harmonics frequency of the data rate shall be measured.
TSG-16[b] : Gen3 (6Gb/s) Tx AC Common Mode Voltage, FFT 6GHz	20422	Maximum sinusoidal amplitude of common mode signal measured at the transmitter connector. This parameter is a measure of common mode noise other than the CM spikes during transitions due to TX+/TX- mismatch and skews which are limited by the rise/fall mismatch and other requirements. The 1st and 2nd harmonics frequency of the data rate shall be measured.
TSG-17 : Gen3 (6Gb/s) Tx Emphasis (Drive)	20721	The emphasis measured at the transmitter shall comply to the respective electrical specifications.
TSG-17 : Gen3 (6Gb/s) Tx Emphasis (Host)	20711	The emphasis measured at the transmitter shall comply to the respective electrical specifications.
Trigger and scale COMINIT	800100	
Trigger and scale COMWAKE	800200	
UTD 1.1/1.2 Test	101	Dummy test for development purpose.
UTD 1.3 Test	102	Dummy test for development purpose.
UTD 1.4 Test	103	Dummy test for development purpose.
UTD 1.4.1 Test	104	Dummy test for development purpose.
UTD 1.4.2 Test	105	Dummy test for development purpose.
UTD 1.4.3 Test	106	Dummy test for development purpose.
UTD 1.5 Test	107	Dummy test for development purpose.
Uses for Development Purpose	500	Dummy test for development purpose.

4 Instruments

The following table shows the instruments used by this application. The name is required by various remote interface methods.

- Instrument Name — The name to use as a parameter in remote interface commands.
- Description — The description of the instrument.

For example, if an application uses an oscilloscope and a pulse generator, then you would expect to see something like this in the table below:

Table 5 Example Instrument Information

Name	Description
scope	The primary oscilloscope.
Pulse	The pulse generator used for Gen 2 tests.

and you would be able to remotely control an instrument using:

```
ARSL syntax (replace [description] with actual parameter)
---------------------------------------------------------------------
arsl -a ipaddress -c "SendScpiCommandCustom 'Command=[scpi
command];Timeout=100;Instrument=pulsegen'"

arsl -a ipaddress -c "SendScpiQueryCustom 'Command=[scpi
query];Timeout=100;Instrument=pulsegen'"


C# syntax (replace [description] with actual parameter)
---------------------------------------------------------------------
SendScpiCommandOptions commandOptions = new SendScpiCommandOptions();
commandOptions.Command = "[scpi command]";
commandOptions.Instrument = "[instrument name]";
commandOptions.Timeout = [timeout];
remoteAte.SendScpiCommand(commandOptions);

SendScpiQueryOptions queryOptions = new SendScpiQueryOptions();
queryOptions.Query = "[scpi query]";
queryOptions.Instrument = "[instrument name]";
```

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```
queryOptions.Timeout = [timeout];
remoteAte.SendScpiQuery(queryOptions);
```

Here are the actual instrument names used by this application:

NOTE The file, ""InstrumentInfo.txt"", which may be found in the same directory as this help file, contains all of the information found in the table below in a format suitable for parsing.

Table 6 Instrument Names

Instrument Name	Description
JBert	N4903B High Performance Serial BERT
M8020A	M8020A High Performance Serial BERT
pulsegen	81134A Pulse Pattern Generator
scope	The primary oscilloscope

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