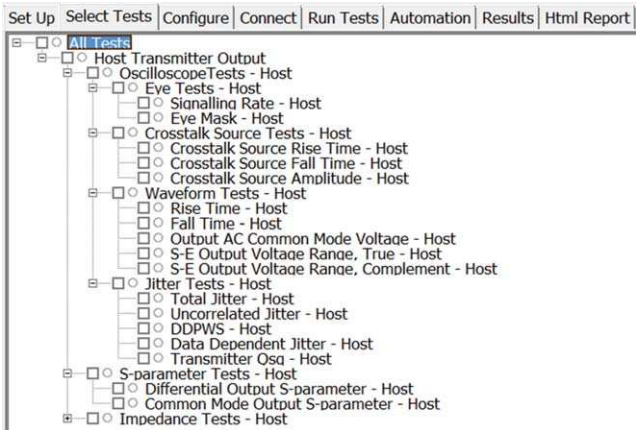
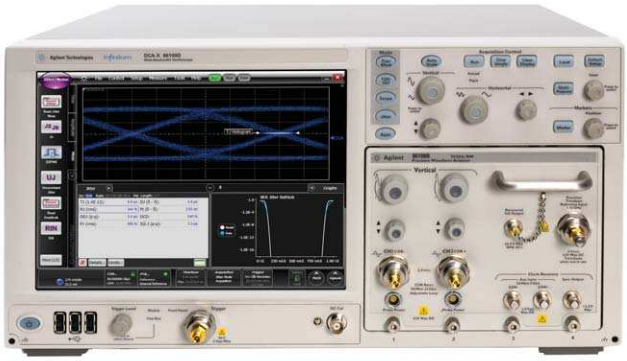
N1014A SFF-8431 Compliance and Debug Application for 86100D DCA-X Oscilloscopes

Data Sheet





Be Confident With Compliant Measurements

Easy-to-use oscilloscope application that lets you:

- Save time in understanding details of standards
- Reduce your SFP+ test times from hours to minutes
- Debug your device using custom configurations

The greatly increased worldwide demand for video and data transfer has created new requirements for network expansion, driving innovative network elements for operation up to 100 Gb/s. New designs are facing more challenges while transferring these signals on printed circuit boards within hosts and modules, even for short distances. Measuring the SFF-8431 parameters can take a full day when manually characterized, and recalculating factors and equation-driven limits adds to the time the designer spends on testing.

Agilent created the N1014A SFF-8431 Compliance and Debug Application to simplify measuring these transmitter parameters and to obtain full results to test limits in a few minutes. This will keep you focused on getting your products to market knowing that your results are built on the heritage and consistency of Agilent measurement technology.

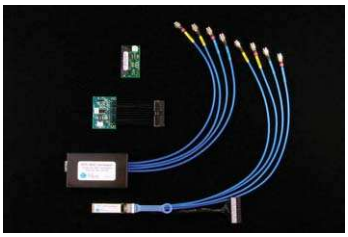
Transform Complexity into Simplicity

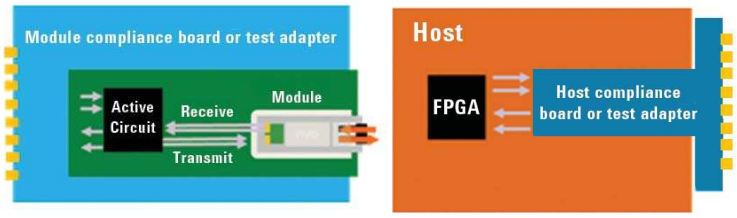
Satisfying the broad requirements of the SFF-8431 Specifications can be very complex. The data rate for each test group varies based on which standard is being addressed in the product design. The tests between each SFF-8431 group vary, as do the test limits. An example of one group of tests is below. The time for your test development team to read and interpret the specification and then implement that understanding into test plans can take several months of effort.

Parameters - B	Symbol	Conditions	Min	Target Value	Max	Units
Crosstalk source rise/fall time (20 to 80%)	Tr, Tf	See 1, 2, D.6		34		ps
Crosstalk source amplitude (p-p differential)		See 1, 2, D.7		1000		mV
Signal rise/fall time (20 to 80%)	Tr, Tf	See D.6	34			ps
Total jitter	TJ	See D.5			0.28	UI (p-p)
Data dependent jitter	DDJ	See D.3			0.1	UI (p-p)
Data dependent pulse width shrinkage	DDPWS				0.055	UI (p-p)
Uncorrelated jitter	UJ	See 3, 2, D.4				
Transmitter Q_{sq}	Q_{sq}	See 4	50			

Parameters - B	Symbol	Conditions	Value	Units
Eye mask	X1	Mask hit ratio of $5x10^{-5}$ See D.2 and Figure 19	0.12	UI
Eye mask	X2		0.33	UI
Eye mask	Y1		95	mV
Eye mask	Y2		350	mV

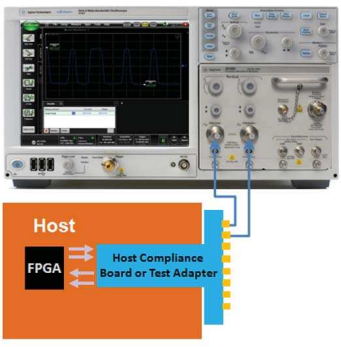
Development and characterization of advanced integrated circuits is time-consuming and expensive. Designers utilize test adapters to fully characterize their parts for use in their own or their customer's circuits. For more information about these adapters, please visit http://shop.wilder-tech.com/category_s/35.htm.





Hosts and modules have unique interface connectors and require compliance boards or test adapters to enable connection to test equipment. Designers endeavor to minimize the trace lengths on the compliance boards and cable lengths.

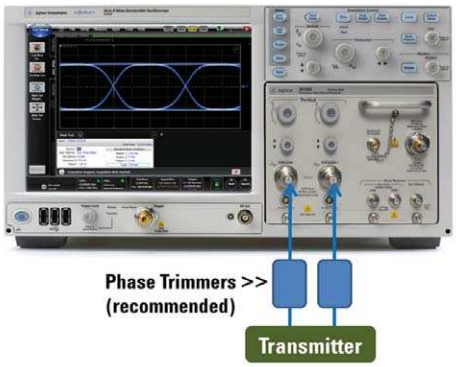
By pairing your test adapter or compliance board with the 86100D, 86108B and N1014A software, you will have the simplest and most powerful solution available to optimize your designs and offer the best products to your customers. Phase trimmers and a pair of cables complement your setup for the most consistent and accurate measurements.



Debug and Verify Your Designs Quickly and Easily

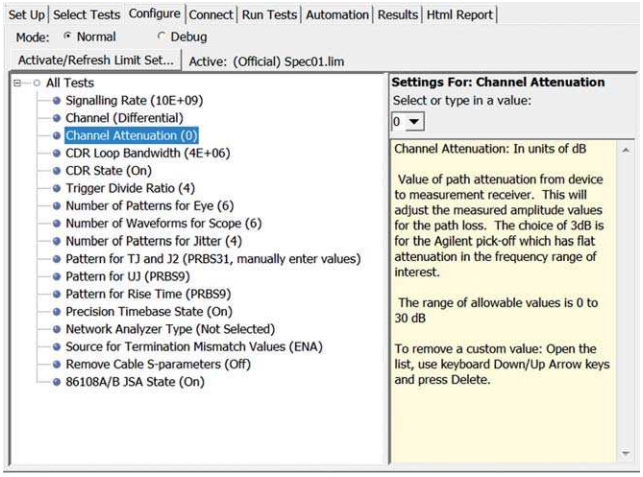
Select Industry-Leading Hardware

Configure your oscilloscope for a single module (as below) or multi-module (listed in ordering guide). Connect your device through the recommended phase trimmers to have access to measurements with intrinsic jitter as low as 50 fs. For return loss, also connect the Economy or Performance Network Analyzer, which are controlled by the DCA-X for S-parameter measurements.



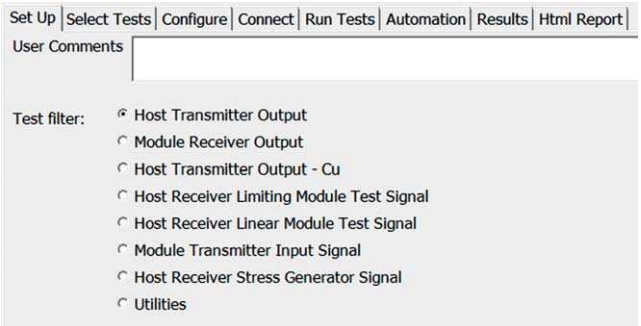
Configure Your Measurements

Customize parameters that are specific to your setup, such as data rate and attenuation. Use default values or enter your own settings including number of waveforms or patterns taken; type of pattern; and whether or not to remove the effects of test cables. Choose Normal mode to test within compliance limits or choose Debug mode to test to your custom limits and adjust other test parameters.



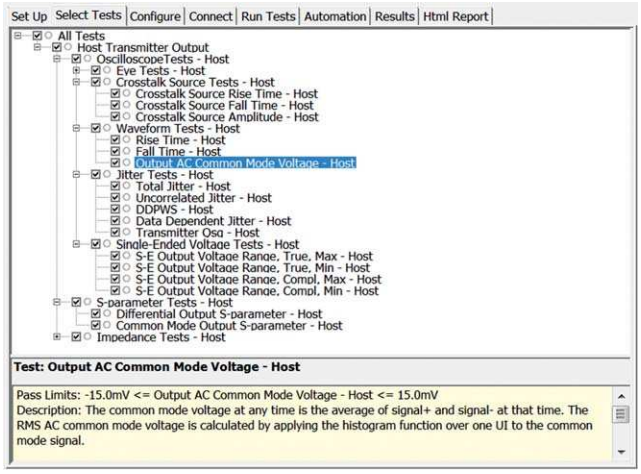
Select Any SFP+ Transmit Interface

The N1014A SFF-8431 Compliance and Debug Application covers all host and module transmitter tests as well as verification of the test signals for receiver compliance. Click on the desired test group, and the appropriate tests are offered in Select Tests.



Choose from More Than 70 Tests

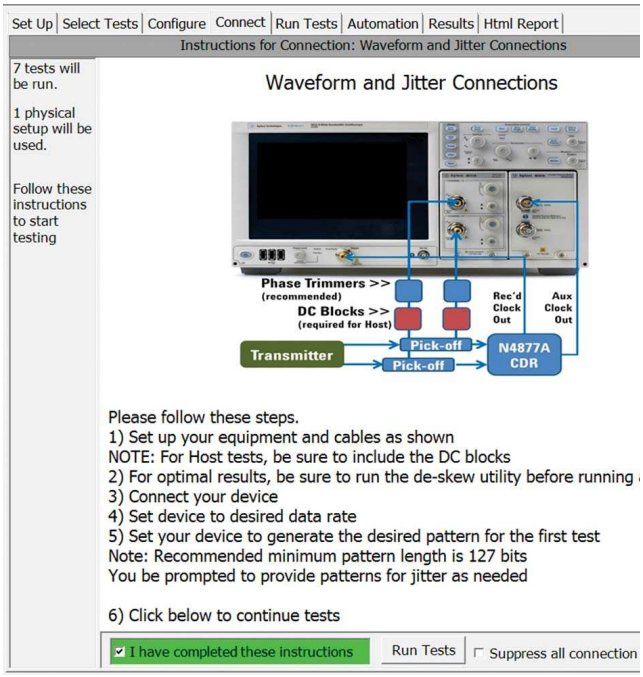
The tests required for each of the transmit and test signal groups are available. You can click on all tests, a group of tests or individual tests. The full test name appears in the test list and is shown in the test results and reports. A description of the test and reference to the SFF-8431 Specifications are shown for each test. You may also measure TWDP by interfacing with your MATLAB ® script.



Debug and Verify Your Designs Quickly and Easily

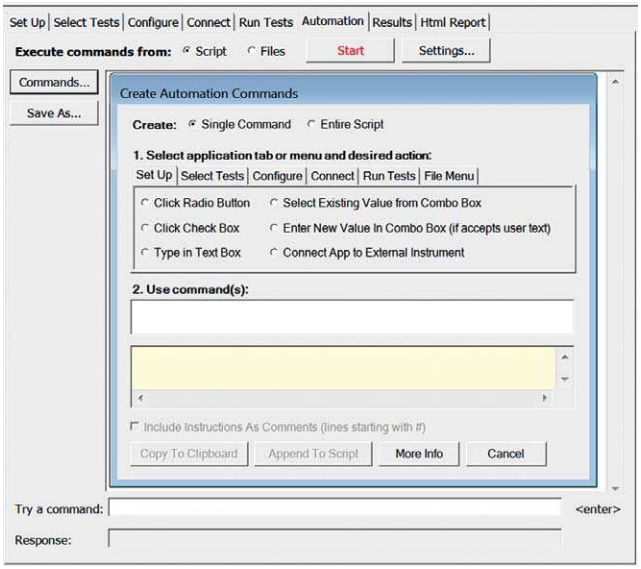
Measure Challenging Parameters Fast

Simply follow the steps and click Run Tests. The N1014A, 86100D DCA-X and ENA/PNA readily measure your device.



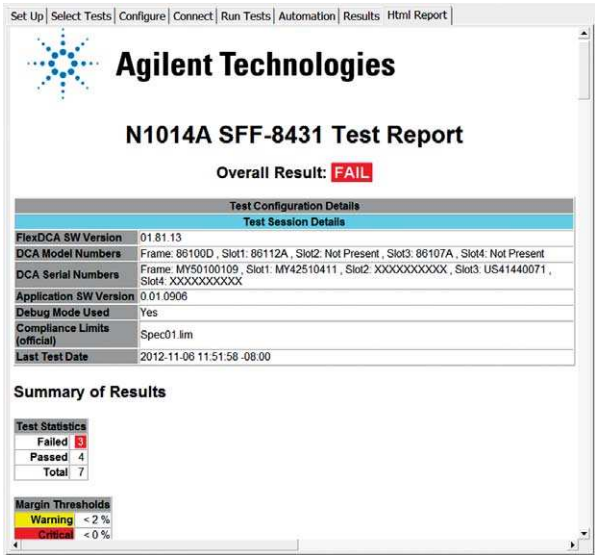
Control Your Device or Other Equipment

The Automation tab lets you enter commands to control external devices or equipment, further sequence your tests, or to control timing.



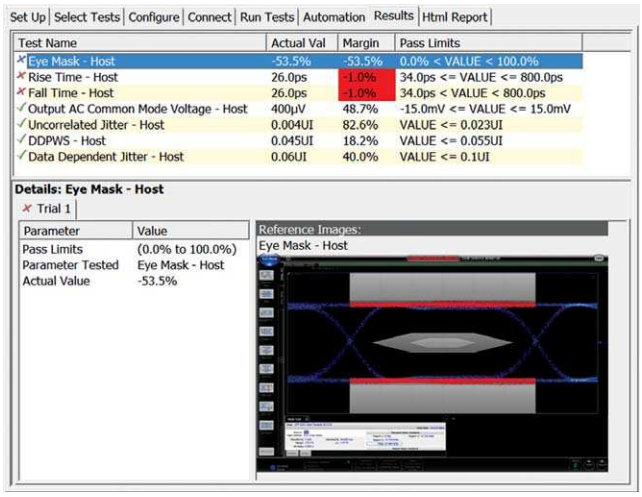
Obtain Concise Compliance Reports

Users and customers are interested in the performance of your devices. Share a report that shows the test conditions, summary of pass/fail, summary of all tests, and details for each test. Many include the appropriate screen shot of the measured parameter.



See Device Performance in One View

In a few minutes, you'll have test results showing which parameters passed or failed and the margin compared to limits. These results will provide immediate insight into how you'll need to improve your design to meet the challenging tests in the SFF-8431 Specifications.

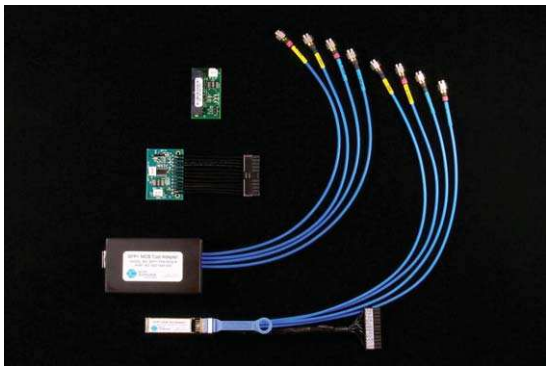


More Features to Further Streamline Your Development

Utilize Compliance Boards

Development and characterization of advanced integrated circuits is time-consuming and expensive. Designers utilize test adapters to fully characterize their parts for use in their or their customer's circuits.

For more information on these adapters, please visit http://shop.wilder-tech.com/category_s/35.htm.



... or Host and Module Compliance Boards

Development and characterization of advanced integrated circuits is time-consuming and expensive. Designers utilize test adapters to fully characterize their parts for use in their or their customer's circuits.

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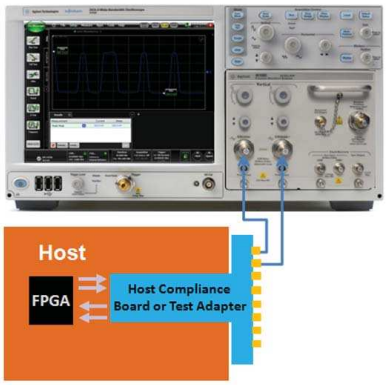
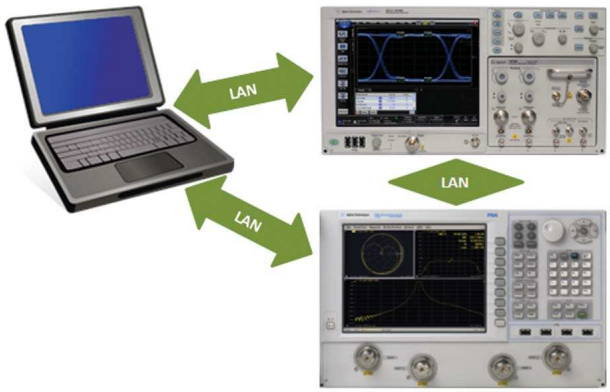


Configure Your Solution in Three Ways

The hardware and software architecture provides wide flexibility. You may install the N1014A on the mainframe, which includes FlexDCA, or the N1014A on your PC, controlling FlexDCA on the DCA, or install both N1010A FlexDCA and N1014A on your PC. This lets you use your PC for more processing power and other applications, or you can have all measurement capability consolidated into a compact solution. The ENA/PNA is controlled by the N1014A via the PC or the DCA.



Conveniently De-Skew Your Cables

Skew between the true and complement signals will often degrade your measured performance. While you need to characterize performance with the DUT skew included, the N1014A guides you to quickly de-skew your test cables using phase trimmers or to de-skew the 86118A-H01 remote heads for best results.

Characterize More Than 70 Parameters

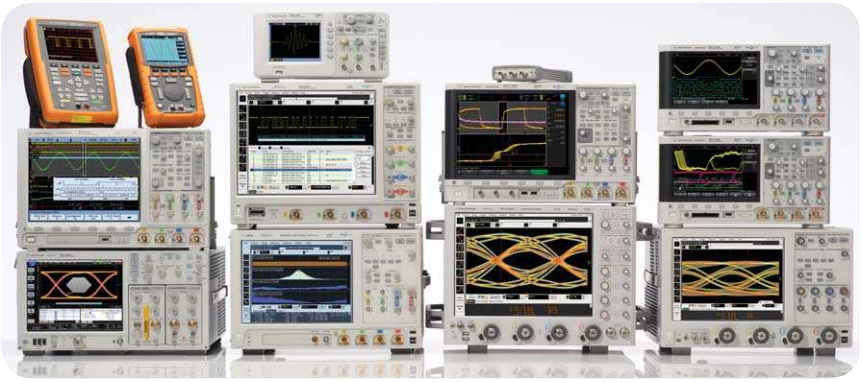
The SFF-8431 Specifications include many challenging tests, and the table below shows each of the transmit and test signal parameters by test group required by the Specifications. The N1014A measures all of these parameters; empty cells indicate that the parameter is not required for that test group.

		Transmit Tests			Receiver Test Signal Verification			
	Parameter	Host Output	Module Output	Host Output-Cu	Host Receiver Limiting	Host Receiver Linear	Module Input	Host Receiver Stress Gen
Measured on DCA	Signaling Rate	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Eye Mask	3.5.1	3.6.2		3.5.2		3.6.1	
	Crosstalk Source Tr	3.5.1	3.6.2		3.5.2	3.5.2	3.6.1	
	Crosstalk Source Tf	3.5.1	3.6.2		3.5.2	3.5.2	3.6.1	
	Crosstalk Source Amplitude	3.5.1	3.6.2		3.5.2	3.5.2	3.6.1	
	Rise Time	3.5.1	3.6.2					
	Fall Time	3.5.1	3.6.2					
	Voltage Modulation Amplitude			E.2		3.5.2 LRM/SR/LR		E.3.1
	Output AC CM Voltage	3.5.1	3.6.2	E.2	3.5.2	3.5.2	3.6.1	E.3.1
	Single-Ended Output Voltage Range	3.5.1	3.6.2					
	Peak-to-Peak Voltage Overload							E.3.1
	Total Jitter	3.5.1	3.6.2		3.5.2		3.6.1	
	Uncorrelated Jitter	3.5.1					3.6.1	
	Transmitter Qsq	3.5.1		E.2				E.3.1
	DDPWS	3.5.1			3.5.2		3.6.1	
	Data Dependent Jitter	3.5.1					3.6.1	
	99% Jitter		3.6.2		3.5.2			
	Post Channel Fixed Noise Source							E.3.1
ENA/PNA	Differential Output/Input S-parameter	3.5.1	3.6.2		3.5.2	3.5.2	3.6.1	
	Common Mode Output S-parameter	3.5.1	3.6.2					
	Termination Mismatch at 1 MHz	3.5.1	3.6.2					
	Reflected Differential to CM Conversion				3.5.2	3.5.2	3.6.1	

Choose Industry-Leading Solutions

Agilent offers a wide range of electrical and optical test solutions to address current and emerging communications standards. For SFF-8431, you may choose a hardware combination that fits the SFP+ tests and other higher rate tests for other standards. Each row shows the recommended configuration of hardware and software to measure the many parameters. The multi-module approach is useful for designers who may already own a plug-in module.

		Recommended Hardware and Software	
		Single Plug-in Module	**Multiple Module Solution**
Digital Communications Analyzer	Oscilloscope Mainframe	86100D DCA-X 86100D-ETR Extended Trigger 86100D-200 Enhanced Jitter Analysis 86100D-201 Advanced Waveform Analysis	
	Plug-in Module	86108A or 86108B LBW/HBW, 216/232	86112A, 54754A, 86117A or 86118A-H01 dual receiver 86107A, any option N4877A-216/232 (for clock recovery)
	Software	N1014A SFF-8431 Compliance Application 86100DU-401 Advanced Eye software, for jitter on PRBS31 Agilent I/O Libraries, 16.2 or higher	
	Matched Cable Set (1)	86108B-CA3	86108B-CA3
	Phase Trimmers (2)	86108B-PT3	86108B-PT3
	DC Blocks (2)	86108B-DC3, N9398C, N9399C or 11742A	
	Pick-offs (2)	N/A	N4915A-015
Network Analyzer	Economy (ENA)	Any 4-port model with a frequency range of at least 12 GHz (also covers the 1 MHz termination mismatch test)	
	Performance (PNA)	Any 4-port model with frequency range of at least 12 GHz	



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