Keysight Technologies U4431A Protocol Analyzer for MIPI™ M-PHY Interfaces

Product Fact Sheet

Industries and Applications

- High-resolution cameras
- High-speed peripherals
- Advanced graphics adapters
- Massive memory buffers

Designers and Validators of

- M-PHY
- IP
- Application processors
- Memory/chipsets
- Mobile devices
- Mobile embedded systems

Product Description

Deep insight to help you win the race to M-PHY

The MIPI™ M-PHY standards are the backbone of nextgeneration mobile computing designs. Because these designs are replacing desktop PCs in many applications, these architectures are much faster and more complex than in the past. The increasing demand for bandwidth has driven the expansion of the M-PHY specification to include four-lane, 6.0-Gbs options. The U4431A offers up to 16 GB of analysis memory on each lane, allowing designers to capture tens of seconds of system traffic, even at these high speeds.

In addition, the Keysight U4431A offers "Raw Mode," a feature that lets designers see the time-correlated 8b/10b data that underlies each protocol. These states can be displayed as a waveform or listing, providing insight into how a packet is formed at the physical layer.



Main Features and Benefits

Power to meet the needs of today's and tomorrow's designs

- Up to gear 3 HS data rates
- Up to 16 GB trace depth
- Up to 4 data lanes
- Complete insight into complex designs
 - Track multiple M-PHY busses from the PHY to the application layer
 - Raw Mode 8b/10b data views
 - Infiniium Oscilloscope integration
 - Powerful interface that allows unlimited customization of system views

Powerful triggers

- N-way if/then/else trigger branching with AND/OR logic
- Over 50 triggering macros
- PHY and protocol error triggers
- Event counters, flags, and timers

Flexible probing



Module Configuration

	U4431A/U Protocol Analyzer		
Analysis options	Single directi Tx OR Rx (det		Bi-directional – Tx AND Rx (612)
Lane options	1-lane (default)	2-lanes (412)	4-lanes (414)
Speed options	Increase to Gear 2	(512) In	crease to Gear 3 (514)
Select memory	1 GB (default)	4 GB (M04)	16 GB (M16)
Select protocols	UniPro (711)	UFS + UniPro (712)	

Specifications

Minimum Vdiff100 mVInput impedance (DC)VU4433A probe + N5246A700 Ω, typicalZIF tips128 Ω, typicalU4432A SMA harness128 Ω, typicalTopologicalUp to 4 with option 414. Analyze 1, 2, 3, or 4-lane systemsClocking architectureType IAnalysis directionTx or Rx (Both Tx and Rx with op- tion 612)Lane mappingUser-selectableLane polarityUser-selectableMultiple blade supportUp to 5 time-correlated blades in one frame (configured as up to 3 separate busses), multiple frames can be correlatedPerformanceG1 to G3PWM Modes supportedG0 to G7 (subject to limitations of individual protocol)Rate Series supported (HS and PWM)A and BSymbol lock time (subject to protocol spec limit)1 symbol, typicalSlow (HS-G2, HS-G3)< 128 symbolsAuto speed detection and trackingSupported (with no RSE-PO-TX support)MemoryUser allocated (shared among analyzer and raw mode)Standard1 GB	Electrical		
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Option M04 4 GB		-	
•	Standard	1 GB	
Option M16 16 GB	Option M04		
	Option M16	16 GB	



Chassis and Probing Configuration

Chassis options			
M9502A	2-slots		
M9505A	5-slots		
M9502A-020	USB 2.0 host connection for either chassis		
M9505A-020	Lower-speed alternative to PC control options, not recommended for > 1 GB memory		
PC control options			
M9536A	Embedded PC module (no cables or adapters needed)		
Connecting via PCIe to a desktop PC			
M9047A	PCIe desktop adapter		
Y1202A	PCIe cable (x8 to x8)		
Connecting via PCIe to a laptop PC			
M9045A	ExpressCard adapter		
Y1200B	PCIe cable (x4 to x8)		
Analyzer probes			
U4433A 1	Probe, ZIF flying leads, MIPI M-PHY (one probe for both directions)		
U4432A	SMA cable, MIPI, M-PHY (one probe for both directions)		
N5426A	ZIF Tip, 12 GHz InfiniiMax – Kit of 10		

Keysight Modular Products

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