

Limit and Mask Test Application Module

DPO4LMT/MDO3LMT Datasheet



Key features

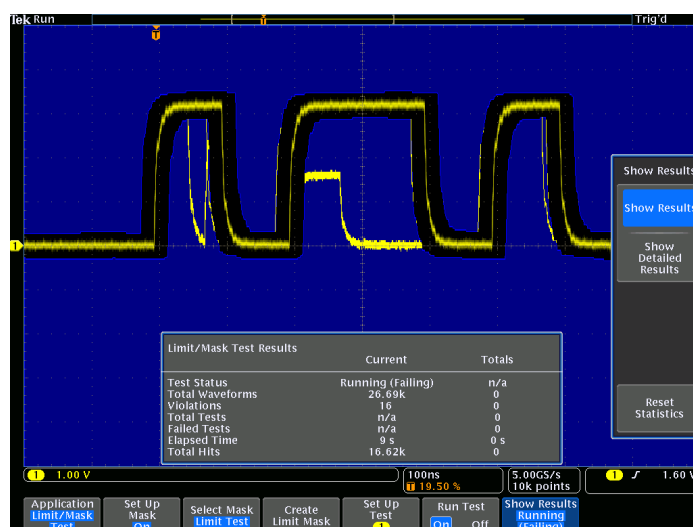
- Conduct limit test Pass/Fail testing against a “golden” waveform with tolerances
- Perform mask testing on ITU-T, ANSI T1.102, and USB standards
- Perform mask testing on custom user-defined masks
- Detailed test statistics provide insight into true signal behavior
- Customizable tests allow for multiple actions upon violations or test failures
- High waveform capture rates enable thousands of waveforms to be tested per second

Automated pass/fail testing

Validating signal quality is an important part of any embedded system design. One way to determine how well your signals conform to expected signal quality is to use mask testing. A mask defines a portion, or portions, of the oscilloscope display that a signal must not enter. Whether you need to test to a well-defined telecommunication or computer standard or are interested in validating how your signals are performing compared to a known good condition, the Limit and Mask Test Application Modules for the MDO/MSO/DPO4000 and MDO3000 Series provide instant automated statistical analysis of signal quality. The Limit and Mask Test capability makes testing against telecommunication and computer industry standards easy by making mask definition quick and accurate, allowing flexible testing configurations, and providing detailed statistical test results.

Limit test

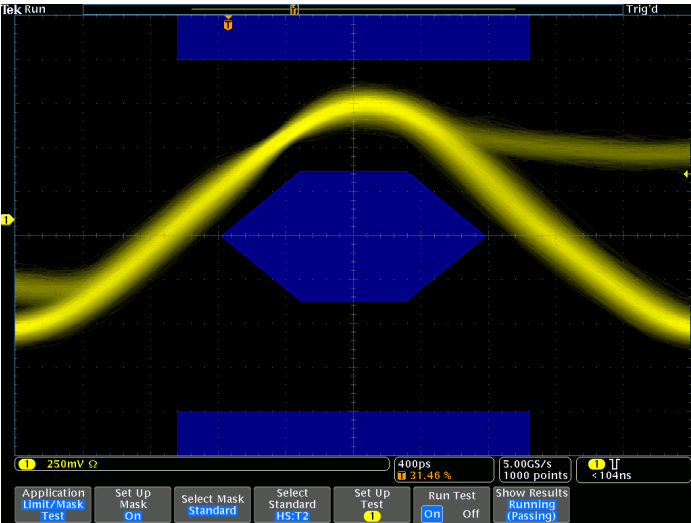
A common method for understanding your signal quality is to test against a known good or “golden” waveform. You can apply horizontal and vertical tolerances to the golden waveform to create a mask that can be used for quick, accurate Pass/Fail testing. This method is also a great way to perform go/no-go testing on a manufacturing line by enabling repeatable, fast decisions on the quality of a component or system. The Limit and Mask Test Application Module allows you to save your limit test mask for use later across multiple oscilloscopes in a lab or on a production line.



Limit Test finds infrequent glitches and runt signals using a mask created by adding vertical and horizontal tolerances around a golden waveform. Quickly test your signals against a golden waveform and quickly gain insight into anomalous behavior.

Standard mask test

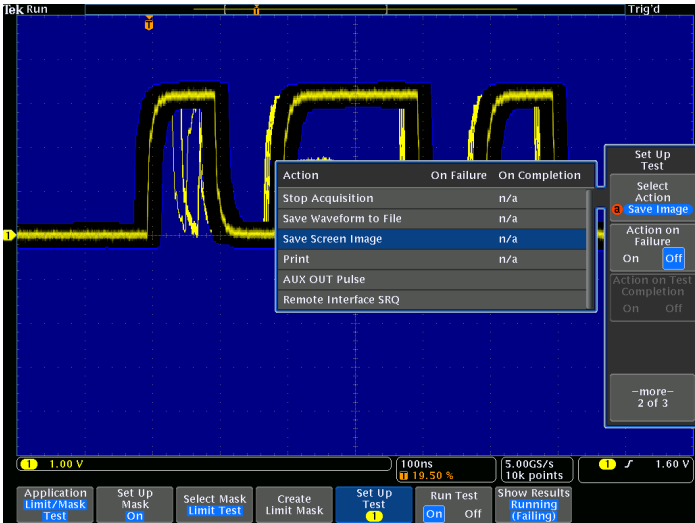
More than 40 standard telecommunications and computer industry standard masks are included with the DPO4LMT application module. Each standard mask is easily loaded from the oscilloscope internal memory and can be immediately used to conduct Pass/Fail testing. Adherence to a standard is determined pixel-by-pixel throughout the display. Masks for ITU-T up to 155 Mb/s data rates, ANSI T1.102 up to 155 Mb/s data rates, and high-speed USB 2.0 are included.



USB 2.0 high-speed standard mask showing results from a mask test. In the DPO4LMT application, a robust set of telecommunications and computer industry standard masks make testing to standards quick and accurate.

Flexible test configuration

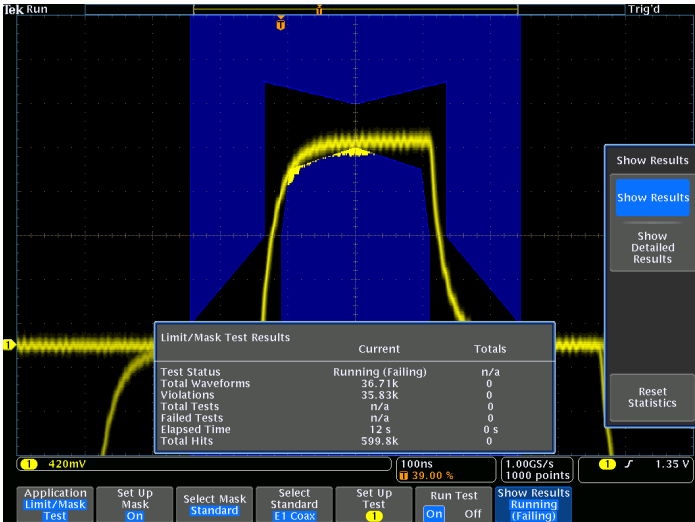
The Limit and Mask Test Application Module provides flexible test definitions, enabling you to tailor the test to your needs. You can run a test for a user-defined number of waveforms (up to 1,000,000) or for a user-defined amount of time (up to 48 hours), or set either criteria to infinity and run the test until you manually stop it. The Repeat Test and Pretest Delay capability enables swapping of test locations before proceeding with a test over multiple cycles of the test. You can set the number of violations that can occur before a test status is considered failed. The oscilloscope can perform a number of actions when a test fails or completes. Actions the oscilloscope can perform when a test fails include stopping the acquisition, saving a screen image to file, saving a waveform to file, printing a screen image, setting a trigger out pulse, and setting a remote interface service request (SRQ). Actions the oscilloscope can perform when a test completes include setting a trigger out pulse and setting a remote interface service request (SRQ).



The Limit and Mask Test Application Module enables multiple actions upon a test failure or the completion of a test, tailoring the test to your specific needs.

Detailed test results

The Limit and Mask Test Application Module provides statistical results from each test conducted. The results include Pass/Fail status of the test, number of waveforms tested, number of violations found, number of total tests run, number of tests that failed, total elapsed time, and the total number of hits within the mask. A detailed results table adds the number of hits for each mask segment enabling you to tell exactly where your signal may be operating out of intended parameters.



Detailed mask test results show statistical information for the current test and accumulated over all tests. The results include information on violations, test duration, total number of hits, and the number of hits in each mask segment.

Characteristics

All specifications apply to all models unless noted otherwise.

Limit test specific

Mask source	Any Ch1 - Ch4 or any R1 - R4
Test source	Any Ch1 - Ch4
Mask creation margins	Vertical tolerance from 0 to 1 division in 1 m (1/1000th) division increments Horizontal tolerance from 0 to 500 m division in 1 m (1/1000th) division increments

Mask test specific

Test source	Any Ch1 - Ch4
-------------	---------------

Mask test specific

Included standard masks (DPO4LMT only)

ITU-T	DS-0 Single (64 Kb/s)
	DS-0 Double (64 Kb/s)
	DS-0 Data Contra (64 Kb/s)
	DS-0 Timing (64 Kb/s)
	DS1 Rate (1.544 Mb/s)
	DS1 G.703 (1.544 Mb/s)
	E1 Sym Pair (2.048 Mb/s)
	E1 Coax Pair (2.048 Mb/s)
	Clk Int Sym (2.048 Mb/s)
	Clk Int Coax (2.048 Mb/s)
	DS2 Rate Sym (6.312 Mb/s)
	DS2 Rate Coax (6.312 Mb/s)
	E2 (8.448 Mb/s)
	32Mb (32.064 Mb/s)
	E3 (34.368 Mb/s)
	DS3 Rate (44.736 Mb/s)
	DS3 G.703 (44.736 Mb/s)
	97Mb (97.728 Mb/s)
	E4 Binary 0 (139.26 Mb/s)
	E4 Binary 1 (139.26 Mb/s)
	STM1E Binary 0 (155.52 Mb/s)
	STM1E Binary 1 (155.52 Mb/s)
	STM-0 HDBx (51.84 Mb/s)
	STM-0 CMI 0 (51.84 Mb/s)
	STM-0 CMI 1 (51.84 Mb/s)
ANSI T1.102	DS1 (1.544 Mb/s)
	DS1A (2.048 Mb/s)
	DS1C (3.152 Mb/s)
	DS2 (6.312 Mb/s)
	DS3 (44.736 Mb/s)
	DS4NA (139.26 Mb/s)
	DS4NA Max Output (138.26 Mb/s)
	STS-1 Pulse (51.84 Mb/s)
	STS-1 Eye (51.84 Mb/s)
	STS-3 (155.52 Mb/s)
USB	STS-3 Max Output (155.52 Mb/s)
	HS:T1 (480 Mb/s)
	HS:T2 (480 Mb/s)
	HS:T3 (480 Mb/s)
	HS:T4 (480 Mb/s)
	HS:T5 (480 Mb/s)
	HS:T6 (480 Mb/s)
Mask creation	Load custom mask from text file with up to eight segments
	DPO4LMT only: Select standard mask from internal memory
	DPO4LMT only: Copy a standard mask to custom mask
Custom mask vertical margin	From -50% to +50%
	A positive value spreads upper and lower segments apart, a negative value brings upper and lower segments closer together.

DPO limit and mask tests

Mask hit highlighting	Hits within a mask are highlighted for easy viewing
Mask scaling	Lock to Source ON: Mask automatically rescales with source-channel settings changes Lock to Source OFF: Mask does not rescale with source-channel settings changes
Test criteria run until	Minimum number of waveforms (from 1 to 1,000,000; Infinity) Minimum elapsed time (from 1 second to 48 hours; Infinity)
Pretest delay	From 0 to 200 s
Repeat on completion	ON: Test will repeat when the minimum number of waveforms or minimum amount of time is reached OFF: Test will run a single time and will not repeat
Violation threshold	Number of violations before a test status is considered failed (from 1 to 1,000,000)
Actions on test failure	Stop acquisition Save screen image to file Save waveform to file Print screen image Trigger out pulse Set remote interface service request (SRQ)
Actions on test complete	Trigger out pulse Set remote interface service request (SRQ)
Results display	All test results include values from the current test and the accumulated values from all tests: Test status Total waveforms tested Number of violations Number of total tests run Number of failed tests Total elapsed time Total hits Detailed results add the number of hits for each segment in the active mask

Ordering information

DPO4LMT or DPO3LMT

The Limit and Mask Testing Application Module for the MDO/MSO/DPO4000 Series (DPO4LMT) or for the MDO3000 Series (MDO3LMT) enables testing against limit masks generated from "golden" waveforms and mask testing using custom user-defined masks. The DPO4LMT module also enables mask testing using standard telecommunication and computer industry masks. ≥ 350 MHz bandwidth models are recommended for mask testing on telecomm standards > 55 Mb/s. 1 GHz bandwidth models are recommended for mask testing on high-speed (HS) USB.

Recommended probes

Please refer to www.tek.com/probes for further information on the recommended models of probes and any necessary probe adapters.



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

ASEAN / Australasia (65) 6356 3900
Belgium 00800 2255 4835*
Central East Europe and the Baltics +41 52 675 3777
Finland +41 52 675 3777
Hong Kong 400 820 5835
Japan 81 (3) 6714 3010
Middle East, Asia, and North Africa +41 52 675 3777
People's Republic of China 400 820 5835
Republic of Korea 001 800 8255 2835
Spain 00800 2255 4835*
Taiwan 886 (2) 2722 9622

Austria 00800 2255 4835*
Brazil +55 (11) 3759 7627
Central Europe & Greece +41 52 675 3777
France 00800 2255 4835*
India 000 800 650 1835
Luxembourg +41 52 675 3777
The Netherlands 00800 2255 4835*
Poland +41 52 675 3777
Russia & CIS +7 (495) 6647564
Sweden 00800 2255 4835*
United Kingdom & Ireland 00800 2255 4835*

Balkans, Israel, South Africa and other ISE Countries +41 52 675 3777
Canada 1 800 833 9200
Denmark +45 80 88 1401
Germany 00800 2255 4835*
Italy 00800 2255 4835*
Mexico, Central/South America & Caribbean 52 (55) 56 04 50 90
Norway 800 16098
Portugal 800 08 12370
South Africa +41 52 675 3777
Switzerland 00800 2255 4835*
USA 1 800 833 9200

* European toll-free number. If not accessible, call: +41 52 675 3777

Updated 10 April 2013

For Further Information. Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tektronix.com.

Copyright © Tektronix, Inc. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and TEK are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks, or registered trademarks of their respective companies.



25 Jun 2014

61W-26121-6

www.tektronix.com

Tektronix

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А