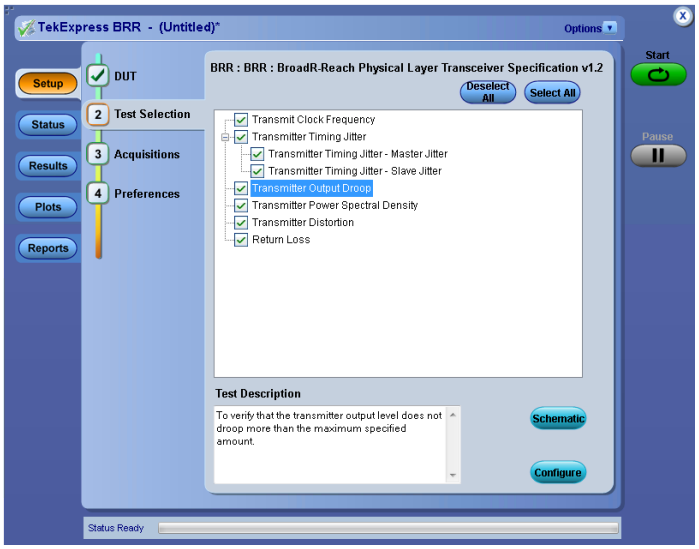
BroadR-Reach Automated Compliance Solution

BroadR-Reach® PHY



Tektronix Option BRR automates compliance measurements for BroadR-Reach 1.2 specifications. Option BRR simplifies test setup and eliminates human error resulting in more rapid compliance testing of BroadR-Reach designs along with reduced human error due to instrument setup. Engineers working on BroadR-Reach can turn to Tektronix for their complete PHY testing solution needs including fixtures.

Key performance specifications

- Automates the full range of compliance measurements for BroadR-Reach 1.2 specifications
- Single instrument analysis of time- and frequency-domain measurements
- Option BRR fixture provides a mechanism to add a disturbing signal, which is mandatory for performing distortion measurement and one of the most important measurements recommended by the specification
- Software solution used on Windows 7-based scopes including MSO/DPO5K, DPO7K, and MSO/DPO70K, providing wide options to engineers working on this technology

Key features

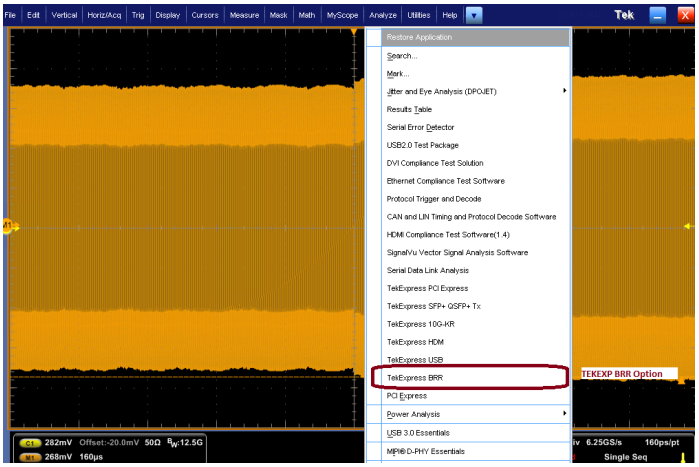
- BRR is a one-box solution, simplifying setup and providing a cost effective solution
  - When performing BroadR-Reach PHY layer testing, engineers can use an oscilloscope rather than a spectrum analyzer or a VNA (for PSD or return loss, for instance)
- User-defined mode enables flexible parameter control for characterization and margin analysis
  - Measurements are grouped on signal types best suited for the measurement, which reduces user intervention
- Design engineers can use many built-in reporting features such as appending the report, auto-incrementing the report, or including user comments, among others
- Option BRR performs automatic signal validation before performing tests and throws an error if the signal does not meet acceptable limits

Measurements

CTS Section	Measurements	Test Mode	Limit		
			Min	Max	Units
5.4 Transmitter electrical specifications					
5.4.1	Transmitter output droop	Test mode 1		45	%
5.4.2	Transmitter distortion	Test mode 4		15	mv
5.4.3	Transmitter timing jitter - Master	Test mode 2		50	ps
5.4.3	Transmitter timing jitter - Slave	TX_TCLK		150	ps
5.4.4	Transmitter power spectral density (PSD)	Test mode 5		-	Mask hits
5.5.5	Transmit clock frequency	Test mode 2	66.663	66.7	MHz
8.0 Link segment characteristics					
8.2.2	Return loss	Test mode 5		-	Mask hits

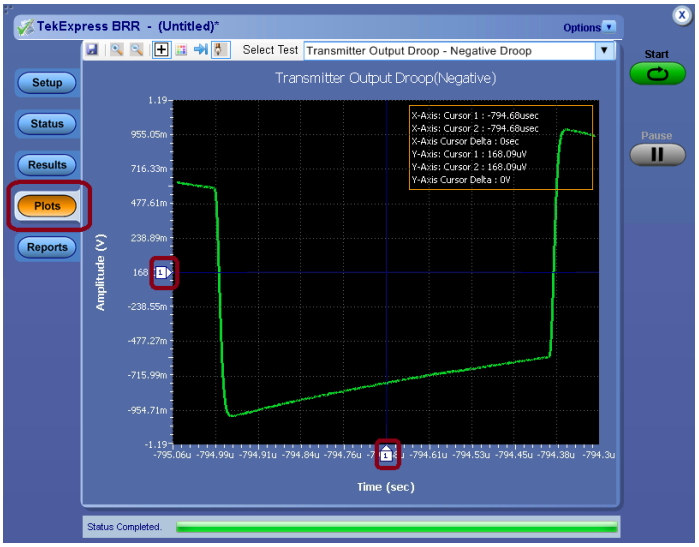
Scope integration

Tektronix option BRR can be launched from the oscilloscope analyze menu.



Interactive plot

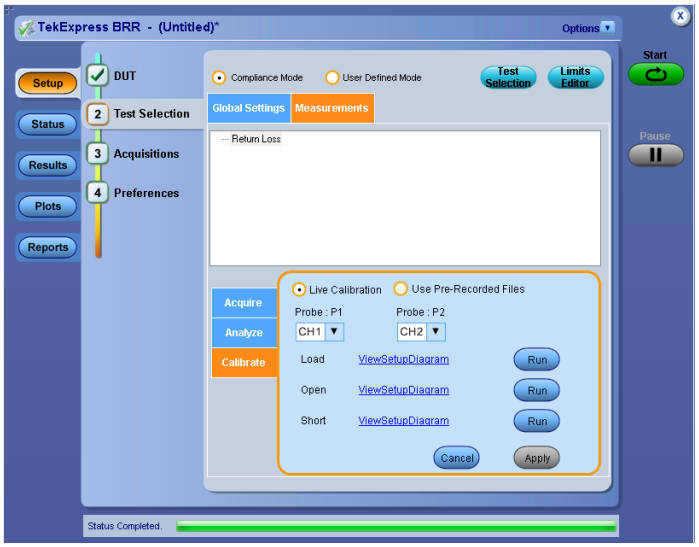
Option BRR is equipped with latest TekExpress interactive plot module. This feature lets you take a look at the signal after a test is performed. With this new plot module, you can move the cursors and find out the delta on the X and Y axes.



Return loss test

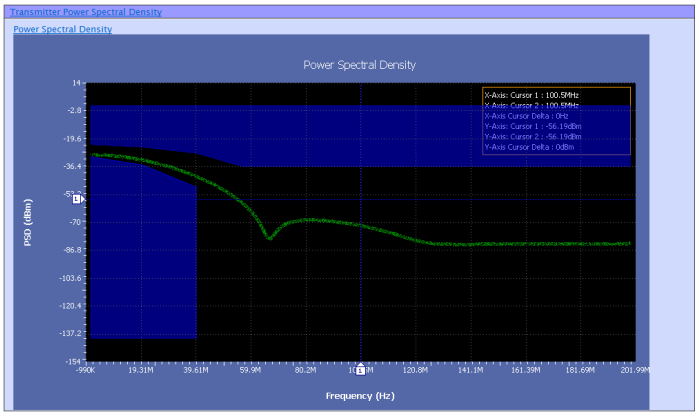
The return loss of the cabling system can also affect interoperability. The standards define the minimum amount of attenuation the reflected signal should have relative to the incident signal. The return loss test measures the impedance across 100 Ω.

Option BRR ingeniously performs the return loss test for 100 Ω impedances as prescribed by the standards, using the same tools such as oscilloscopes and AFG/AWG used for other tests, enabling efficient usage of resources.



Power spectrum density

The spectrum of an input signal is computed using built-in scope MATH functions. Post processing is done on the spectrum to arrive at the PSD. The computed PSD is then compared with the specification - lower and upper masks to arrive at the final result. Plots are available under plot section and screenshot of the plot is embedded in the final report.



Pass/Fail report

A summary report in .MHT (MHTML) format with Pass/Fail status is automatically generated after tests are complete. The report includes test configuration details, waveform plots, and margin analysis to provide more insight into your design.

Tektronix

TekExpress BroadR-Reach
Transmitter Test Report

Setup Information			
DUT ID	DUT001	TekExpress BroadR-Reach	0.0.0.55 (Evaluation Version)
Pre-Recorded Mode	True	FrameWork Version	3.0.0.20
Overall Execution Time	0:02:09	Scope Model	DSA71254C
Overall Analysis Time	0:00:48	FirmWare Version	6.8.1 Build 3
Overall Test Result	Pass		
DUT COMMENT:	General Comment – BroadR-Reach DUT		

Test Name Summary Table	
Transmit Clock Frequency	Pass
Transmitter Timing Jitter – Master Jitter	Pass
Transmitter Timing Jitter – Slave Jitter	Pass
Transmitter Output Droop	Pass
Transmitter Power Spectral Density	Pass
Transmitter Distortion	Pass

Transmit Clock Frequency					
Measurement Details	Measured Value	Test Result	Margin	Low Limit	High Limit
Transmit Clock Frequency	66.6682	Pass	L: -0.0049, H: 0.0018	66.6700	66.6633
COMMENTS	Number of unit Intervals : 33333				

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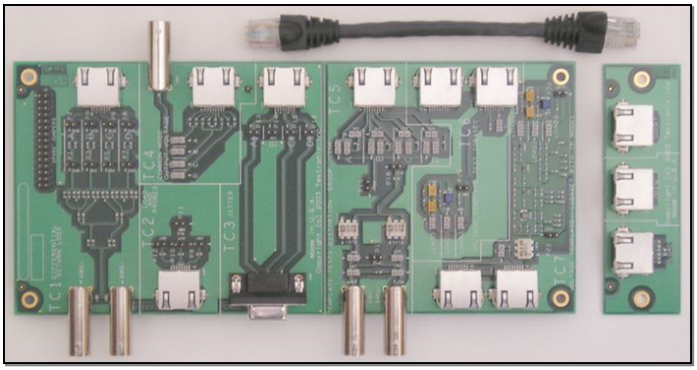
Test fixtures

The TF-GBE-BTP test fixtures supports many of the ethernet compliance tests, providing convenient signal access, test points for accurate removal of disturbing signals, return loss calibration, and cross-connect circuits to connect to traffic generators and link partners.



Ordering Information

Models

Option BRR	Order with MSO/DPO/70000, DPO7000, or MSO/DPO5000 oscilloscopes
DPOFL-BRR (Floating license)	Order with MSO/DPO/70000, DPO7000, or MSO/DPO5000 oscilloscopes
DPOFT-BRR (Floating trial)	Order with MSO/DPO/70000, DPO7000, or MSO/DPO5000 oscilloscopes
DPO-UP BRR (Upgrade)	Upgrade an existing MSO/DPO/70000, DPO7000, or MSO/DPO5000 oscilloscope

Option BRR solution

Platform	MSO/DPO5000, DPO7000, and MSO/DPO70000 Windows 7 oscilloscopes
Probing	For return loss - #2 P6248, P6247 (any model) For all other measurements - #1 P6247, P6248, P6330, TDP1500, TDP3500, P7339, and P7350 (any model)
Signal source	AFG3102, AFG3252, AWG5000, and AWG7000
Fixture	TF-GBE-BTP test package (consists of test fixture PCB set and RJ45 interconnect cable)
Other accessories	2 pair SMA cables #3 SMA-BNC adapter

CE

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

Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

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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.

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