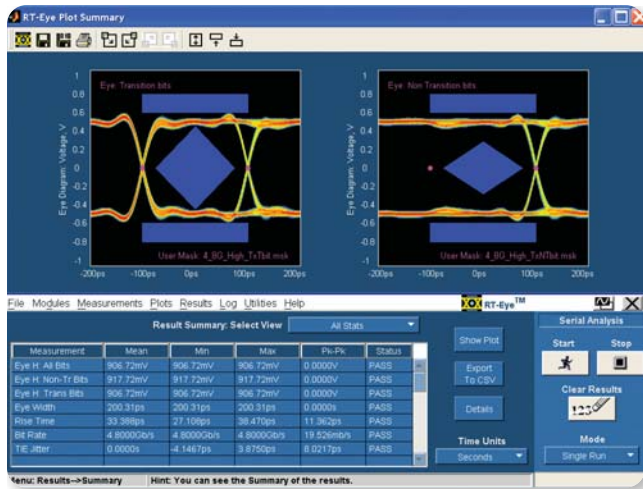# FB-DIMM Compliance and Troubleshooting Solutions

Growing FB-DIMM Demand Means New Challenges for Designers

Designs using fully buffered dual inline memory modules (FB-DIMM) transfer data serially, several times faster than earlier memory buses. Design margins are smaller and protocols are more complex. It adds up to new measurement challenges:

- Transfer rates up to 4.8 GT/s demand faster, more accurate measurement tools

- Testing three different transfer rates at three different amplitude levels complicates efforts to capture, analyze, and document results

- Specialized jitter and compliance tests take time and expertise

- Probing densely-packed FB-DIMM arrays is nearly impossible with conventional tools.

Tektronix has solutions for challenging FB-DIMM measurement needs: oscilloscopes with the bandwidth to handle the fastest FB-DIMMs rates; matching probes and probe fixtures, expert automated measurement software, logic analyzers and more. Tektronix solutions are ready to get down to work on your FB-DIMM design.

Tektronix Solutions For FB-DIMM Design

The Tektronix FB-DIMM solution begins with the uncompromised performance of the new TDS6000C Series DSOs, and goes on to address logic analysis and debug, impedance measurements, and more.

- Record-breaking bandwidth (15 GHz on TDS6154C and high sample rate (40GS/s) ensure accurate eye diagrams and AC measurements.

- 64M record length is the industry's deepest at full 40 GS/s

- P7313 Z-Active™ true differential probe delivers >12.5 GHz bandwidth and uses just one oscilloscope channel.

- Ultra-compact ClipTip™ probing adapters reach tiny, obscure PCB test points

- NEX-TDSFBDP - Oscilloscope FB-DIMM Probe Kit and TDSN4238B - JEDEC Slot Parametric Test Fixture help probe the FB-DIMM signals.

- TDSRT-Eye™ Serial Compliance and Analysis software speeds eye diagram, amplitude, timing, and essential jitter measurements for compliance

- Dedicated FB-DIMM compliance module for TDSRT-Eye v2.0 is a complete solution for prescribed electrical compliance tests

- TDSJIT3 Advanced Jitter Measurement and Analysis software automates characterization of key jitter parameters

- TLA7000 Series Logic Analyzers provide high-resolution capture digital signals and states

- LAI Interposer probe and tools from TLA Partner Nexus Technology LAI capture and deserialize FB-DIMM commands and data

- TDS8200 or CSA8200 Series sampling oscilloscope and 80E04 TDR module tracks down impedance problems on differential signal paths

Tektronix

Enabling Innovation

FB-DIMM Compliance and Troubleshooting Solutions

▶ Application Fact Sheet

FB-DIMM Data Rates Meet Their Match

- 15 GHz (TDS6154C) and 12 GHz (TDS6124C) models easily handle all compliant FB-DIMM transfer rates: 3.2, 4.0, and 4.8 GT/s

- Transition times as low as 30 ps can be displayed with 5% accuracy (typical), ensuring accurate eye diagram measurements

- Random jitter noise floor is 420 fs RMS, minimizing instrument's effect on jitter measurements

- P7313 differential probe can extend to reach between tightly-spaced FB-DIMM components

- NEX-TDSFBDP Oscilloscope Probe Kit enables users to design their own probe fixture to probe at the ball of the AMB. This probe kit can be used to test only southbound receiver and reference clock signals

- TDSN4238B Slot Parametric Fixture helps perform FB-DIMM slot testing for both southbound and northbound lanes

Compliance Software Understands FB-DIMM

- User-definable masks and limits keep pace with evolving specifications (TDSRT-Eye™ Serial Compliance and Analysis software). Pass/Fail compliance in seconds!

- FB-DIMM Compliance module (Opt. FBD) provides specific Pass/Fail waveform masks and measurement limit testing as defined in the JEDEC High Speed PTP Link specification.

- TDSJIT3 automates key jitter measurements

- TDSJIT3 and TDSRT-Eye simplify Rj/Dj measurements and jitter eye opening estimation (Tj @ 10-12 BER)

Troubleshooting Solutions Cut Development Time

- TLA7000 Series logic analyzer and FB-DIMM specific support from Nexus Technology enable efficient troubleshooting of protocol and code errors

- TLA7000 Series iLinkTM Tool Set delivers time-correlated digital and analog views for troubleshooting signal integrity problems

- TDS8200 or CSA8200 Series sampling oscilloscope with 80E04 true differential TDR module detects PCB impedance flaws, forestalls functional problems

Our most up-to-date product information is available at: **www.tektronix.com**