

# DDR, DDR2 and DDR3 SDRAM Solutions

## Powerful, Complete Portfolio for SDRAM Data, Commands and Signal Integrity Test

SDRAM (Synchronous Dynamic Random Access Memory) data rates have doubled approximately every 3 years to 1.6GT/s. At the same time, to reduce power consumption, the power supply voltage has decreased significantly. As a result, SDRAM signals are faster and smaller which increases the need for testing memory systems for reliable operation.

Memory system validation and debug require instruments with superior signal capture, measurement accuracy, powerful triggering and high performance probing. Tektronix is the only supplier of logic analyzer solutions for all speeds of DDR3 and provides a powerful and comprehensive test instrument portfolio for SDRAMs, memory controllers, advanced memory buffers, DIMMs, computer motherboards and embedded systems.

Data	<p><b>Digital Validation and Debug</b></p> <ul style="list-style-type: none"> <li>■ Read and write data analysis</li> <li>■ Export data to simulation programs and other ATE</li> </ul>
Commands	<ul style="list-style-type: none"> <li>■ SDRAM initialization analysis</li> <li>■ SDRAM commands sequences and timing analysis</li> </ul>
Signal Integrity	<ul style="list-style-type: none"> <li>■ Data valid windows analysis with high resolution timing</li> <li>■ Time correlated memory analysis               <ul style="list-style-type: none"> <li>- With oscilloscope waveforms</li> <li>- With other buses (PCIe, QPI, FSB, etc.)</li> </ul> </li> </ul> <p><b>Electrical Validation and Debug</b></p> <ul style="list-style-type: none"> <li>■ Address and command signal integrity</li> <li>■ Address and command timing analysis</li> <li>■ Clock, strobe and data signal integrity</li> <li>■ Clock, strobe and data timing analysis</li> <li>■ MCH to DRAM and system debugging</li> <li>■ Ref clock parametrics and analysis</li> <li>■ Ref clock PLL performance</li> <li>■ Ref clock SSC profile analysis</li> </ul> <p><b>Signal Path Characterization and Circuit Board Verification</b></p> <ul style="list-style-type: none"> <li>■ Cross talk (single-ended and differential)</li> <li>■ Trace impedance (single-ended and differential)</li> <li>■ Trace length (single-ended and differential)</li> </ul>

### Supported SDRAM Standards

SDRAM	Data Rate MT/S	Clock MHz	VDD V
DDR-266	266	133	2.5
DDR-333	333	166	2.5
DDR-400	400	200	2.5
DDR2-400	400	200	1.8
DDR2-533	533	267	1.8
DDR2-667	667	334	1.8
DDR2-800	800	400	1.8
DDR2-1066	1066	533	1.8
DDR3-800	800	400	1.5
DDR3-1066*	1066	533	1.5
DDR3-1333*	1333	667	1.5
DDR3-1600*	1600	800	1.5

\*Contact your Tektronix representative for the latest details.

# DDR, DDR2 and DDR3 SDRAM Solutions

Fast and Accurate Instrument Solutions to get Answers about Your Memory Bugs



## Digital Validation and Debug

### TLA Logic Analyzers with Nexus Technology memory supports

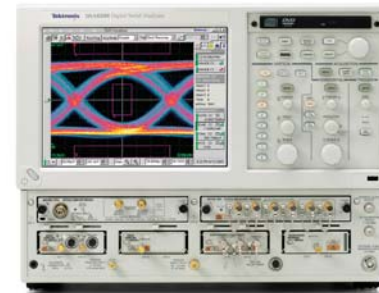
- Only solution available to capture and analyze all DDR3 speeds
- Up to 20 ps timing resolution on all channels, all the time
- SDRAM protocol violation analysis
- Selective clocking stores useful data in the logic analyzer
- Complete system visibility with digital/analog correlation
- Data valid window analysis for setting sample point positions
- No preprocessor is required
- Industry leading high resolution timing



## Analog Validation and Debug

### DPO/DSA real time Oscilloscopes and software

- Pinpoint triggering on DDR reads and writes
- Automatic detection of voltage levels and data rates
- Automated clock jitter measurements based on JEDEC specification
- SDRAM eye diagram measurements for read or write cycles
- Industry leading bandwidth, sample rate and record length



## Signal Path Characterization and Circuit Board Verification

### DSA Sampling Oscilloscopes

- Over 70GHz of sampling bandwidth and the lowest Jitter floor
- Emulate the channel effect on jitter and noise using channels' TDR/TDT or Touchstone® (S-parameter) description
- TDR impedance measurements and S-parameter characterization of the PCB traces



## SDRAM Probing Solutions

- Active differential oscilloscope probes
- Slot interposers
- Midbus probes
- Instrumented DIMMs
- Oscilloscopes can either use direct probing or probing via the logic analyzer with logic analyzer probes

