

# FuturePlus® Systems

*Power Tools for Bus Analysis*



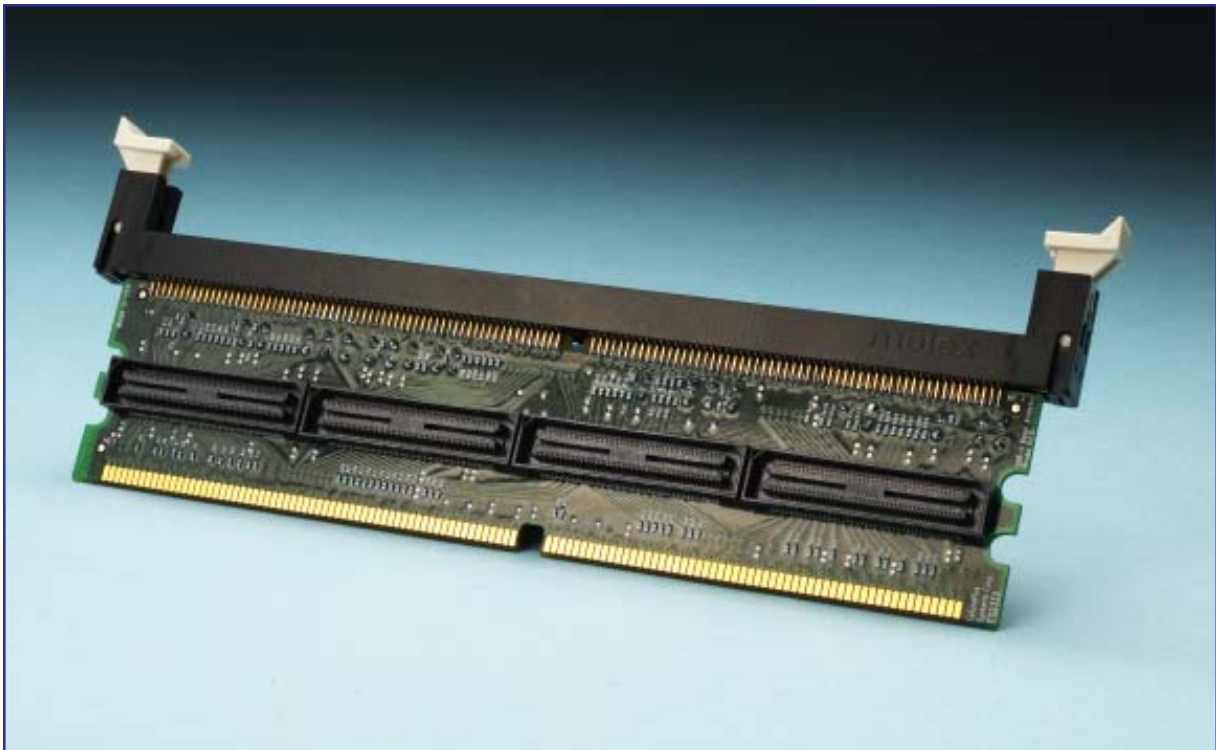
## DDR Memory Analysis Probe

*For use with Agilent Logic Analyzers*

*The FuturePlus® FS2332 is a 667 MT/s Double Data Rate (DDR2) SDRAM bus analysis probe. It provides complete protocol decode of memory transactions using an Agilent logic analyzer as the analysis execution engine. This combination provides powerful triggering, debug and compliance verification measurements. Data is decoded and displayed at any level of detail from the protocol level to binary.*

### FS2332 Key Features

- Quick and easy connection between the DDR2 DIMM connector and Agilent Logic Analyzers
- Up to 667 MT/s protocol decode
- 4 GHz Timing Analysis
- Supports both registered and non-registered DIMMs
- Requires only 750 ps data valid window for state data capture.
- Interposer support
- Compatible with all 240-pin DDR2 SDRAM DIMMs, up to 667 MT/s
- Software only support available for embedded memory systems
- Simultaneous capture of read and write transactions
- Non-intrusive mechanical design



FS2332 DDR2 memory analysis probe with termination adapter



### Supported Memory Modules

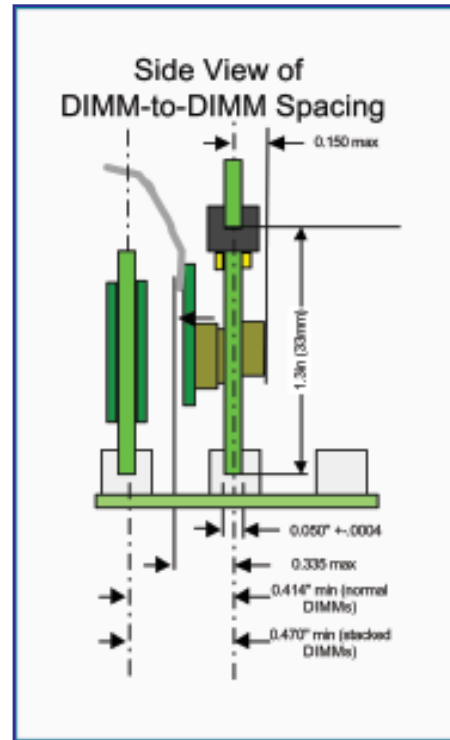
The FS2332 supports the 240-pin, 333 MHz clock (667 MT/s data rate), 64-bit, unbuffered synchronous double data rate (DDR) DRAM, dual in-line memory module (DDR SDRAM DIMM). It also supports slower versions that use a 100 MHz (200 MT/s data rate) or a 133 MHz clock (266 MT/s data rate) DDR SDRAM DIMM. Both registered and non-registered DIMM's are supported.

### Connecting to the Logic Analyzer

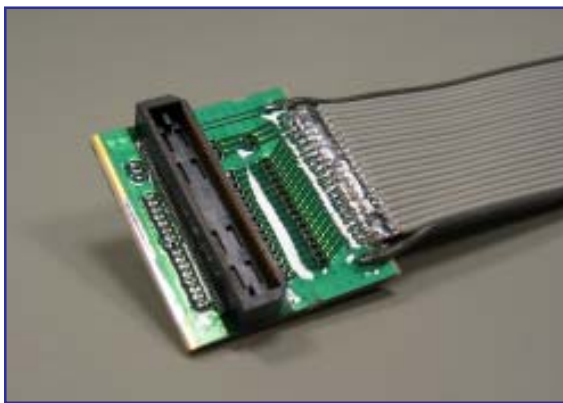
The FS2332 attaches to the logic analyzer with termination adapters. Two are available.

### Connecting the Probe in Confined Spaces

For situations where the probe must be used in a slot adjacent to other DIMM modules, the FS1026 provides right angle egress to the logic analyzer module. The necessary impedance matching networks are included in the Termination Adapters.



The FS1026 termination adapter enables easy connection of the probe in the tight space between two adjacent memory slots.



The FS1026 Right-angle Termination Adapter

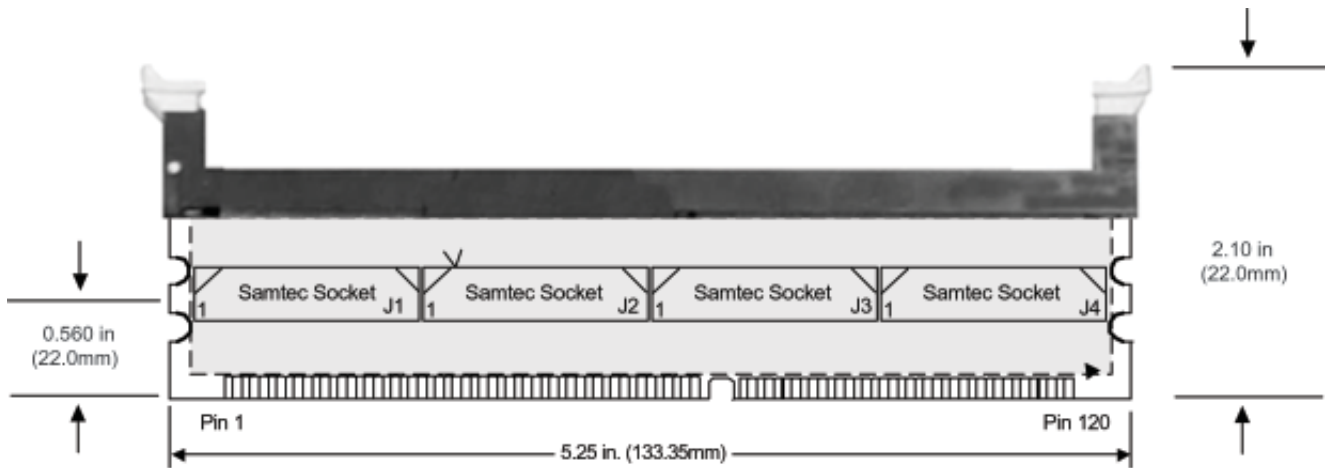
### Power Requirements

Power for the FS2332 is supplied by the logic analyzer. The analysis probe does not require any power from the DDR bus.

62	Active	0	1
	Bank = 0		
	Row Address = FF7		
63		1	1
64		1	1
65		1	1
66		1	1
67		0	1
68	Write	0	1
	Bank = 0		
	Address = FF7 38		
	Data = 80808080	80808080	
	Data = 80808080	80808080	
	Data = 80808080	80808080	
	Data = 80808080	80808080	
69		1	1

This display capture shows the typical output of the protocol decoder. The protocol decoder contains a filter that allows post filtering of any states including the *Not Selected* state, which is defined as a state that has no command or data associated with it.

## FS2332 Mechanical Dimensions



### Agilent Logic Analyzers Supported

#### Supported Logic Analysis Systems:

**Agilent** 16700A/B, 16702A/B, 16900A and 16902A  
(All systems require a logic analysis module)

**Please Note:** For the most up-to-date information about logic analyzer compatibility, please check the FuturePlus Systems web site.

### Logic Analyzer Module Requirements

The FS2332 requires up to four logic analyzer cards depending on whether protocol decode (double probed) or timing analysis is being used. A fifth card may be required if all \*DQS and SPD-EEPROM signals must be observed simultaneously.

### Supported Logic Analysis Modules

- 16717A, 16718A, 16719A (4 pods)
- 16750A, 16751A, 16752A (4 pods)
- 16753A, 16754A, 16755A, 16756A (4 pods)
- 16760A (2 pods)
- 16950A (4 pods)

### Ordering Information

<b>FS2332</b> .....	667 MT/s DDR Analysis Probe
<b>FS1026</b> .....	Termination adapter, right angle egress (4 required)
<b>E5378A</b> .....	Termination adapter - Order from Agilent Technologies (4 required)

**We offer excellent technical support and quick delivery.**

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Also, visit our web site at [www.futureplus.com](http://www.futureplus.com).

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