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# The HP E2474A 200 MHz State Analysis Module

## Technical Specifications



Figure 1 E2474A State Analysis Module

The HP E2474A State Analysis Module is designed to assist high-end computer designers in debugging high speed host and cache buses. It offers up to 200 MHz of state acquisition speed while requiring only a 1 ns setup/hold time window.

### Specifications

#### Setup/Hold (Note 1)

|                          |   |
|--------------------------|---|
| <b>Setup/Hold Window</b> | 1 ns (with manual deskew)<br>2 ns (without manual deskew) |
|--------------------------|---|

|                        |                              |
|------------------------|------------------------------|
| <b>Placement Range</b> | +4.0/-2.0 to<br>-2.0/+4.0 ns |
|------------------------|------------------------------|

#### State Clock Requirements(Note2)

|                         |                   |
|-------------------------|-------------------|
| <b>Single Edge Rate</b> | 60 MHz to 200 MHz |
| <b>Both Edge Rate</b>   | 60 MHz to 100 MHz |

#### Characteristics

|                            |              |
|----------------------------|--------------|
| <b>Input DC Resistance</b> | 700 $\Omega$ |
|----------------------------|--------------|

|                          |        |
|--------------------------|--------|
| <b>Input Capacitance</b> | < 2 pF |
|--------------------------|--------|

|                                |   |
|--------------------------------|---|
| <b>Minimum Input Overdrive</b> | 250 mV or<br>30% of input<br>(whichever is greater) |
|--------------------------------|---|

|                              |            |
|------------------------------|------------|
| <b>Maximum Input Voltage</b> | 7 V, CAT 1 |
|------------------------------|------------|

|                        |           |
|------------------------|-----------|
| <b>Threshold Range</b> | +/- 4.3 V |
|------------------------|-----------|

|   |   |
|---|---|
| <b>Threshold Accuracy</b>               | Depends on user's source impedance            |
| <b>Threshold Resolution</b>             | 10 mV increments                              |
| <b>Threshold Data Granularity</b>       | Adjust per 17 bit pod                         |
| <b>Clock Threshold</b>                  | No threshold adjustment (clock is AC-coupled) |
| <b>Trigger (Note 3) Sequencer Speed</b> | 100 MHz                                       |
| <b>Modes Supported</b>                  | State   |
| <b>Minimum Input Voltage Swing</b>      | 500 mV peak to peak                           |
| <b>Channel Count</b>                    | 170 per HP E2474A (Max 680 with 4 E2474As)    |
| <b>Setup/Hold (Note 1)</b>              |   |
| <b>Resolution Bits Granularity</b>      | 50 ps increments<br>Adjustable in 8/9 bits    |
| <b>State Clock Input</b>                | 1 located on Master Pod1/Pod2 connector       |
| <b>State Clock Duty Cycle Range</b>     | 45 - 55%                                      |

Note1: Minimum setup/hold time measured with 800 mV p-p swing, 500 ps rise time, with threshold centered in waveform, and clock = 50% duty cycle

Note 2: Source may be differential or single ended. Must be free running, periodic. No bursting. Maximum state speed measured with the same conditions as Note 1 above)

Note 3: The E2474A trigger sequencer speed is effectively 200 MHz. The trigger sequencer will capture all single-level sequences, and multi-level sequences provided at least one state separates the multi-level sequences. The sequencer will sometimes miss "A followed immediately by B", regardless of user's clock rate.

HP recommends you use the following "Probe Load Equivalent Circuit" diagram.

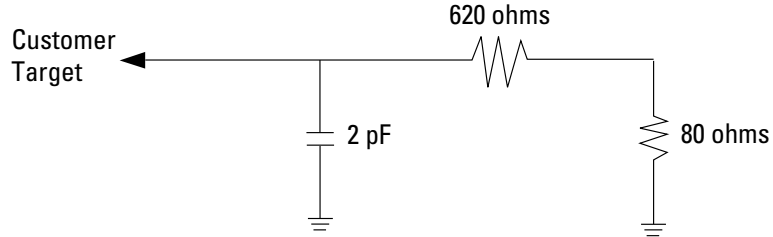


Figure 3. HP E2474A loading effect on target system

HP requires that you use an AMP Mictor-38 connector (AMP #2-767004-2) on your target for connection. The HP part number is E5346-68701. The pin out for connection to the HP E2474A is as follows:

**HP E2474A Connector Pinout**

**Pod 2 Side**

**Pod 1 Side**

|          |     |   |        |   |     |         |
|----------|-----|---|--------|---|-----|---------|
| +5 VDC   | p1  | █ | ●      | █ | p2  | NC      |
| GND DC   | p3  | █ | ●      | █ | p4  | NC      |
| LCLK     | p5  | █ | ●      | █ | p6  | HCLK    |
| D15 even | p7  | █ | ●      | █ | p8  | D15 odd |
| D14 even | p9  | █ | ●      | █ | p10 | D14 odd |
| D13 even | p11 | █ | ●      | █ | p12 | D13 odd |
| D12 even | p13 | █ | ●      | █ | p14 | D12 odd |
| D11 even | p15 | █ | ●      | █ | p16 | D11 odd |
| D10 even | p17 | █ | ●      | █ | p18 | D10 odd |
| D9 even  | p19 | █ | ⊗      | █ | p20 | D9 odd  |
| D8 even  | p21 | █ | ●      | █ | p22 | D8 odd  |
| D7 even  | p23 | █ | ●      | █ | p24 | D7 odd  |
| D6 even  | p25 | █ | ●      | █ | p26 | D6 odd  |
| D5 even  | p27 | █ | ●      | █ | p28 | D5 odd  |
| D4 even  | p29 | █ | ●      | █ | p30 | D4 odd  |
| D3 even  | p31 | █ | ●      | █ | p32 | D3 odd  |
| D2 even  | p33 | █ | ●      | █ | p34 | D2 odd  |
| D1 even  | p35 | █ | ●      | █ | p36 | D1 odd  |
| D0 even  | p37 | █ | ●      | █ | p38 | D0 odd  |
|          |     |   | ●      |   |     |         |
|          |     |   | AC GND |   |     |         |

**Configuration Information**

The HP E2474A configuration uses a HP 16505A prototype analyzer, HP 16500 mainframe, and your choice of HP 16555A/D or HP 16556A/D logic analyzer module. The system is connected to the target in the following manner.

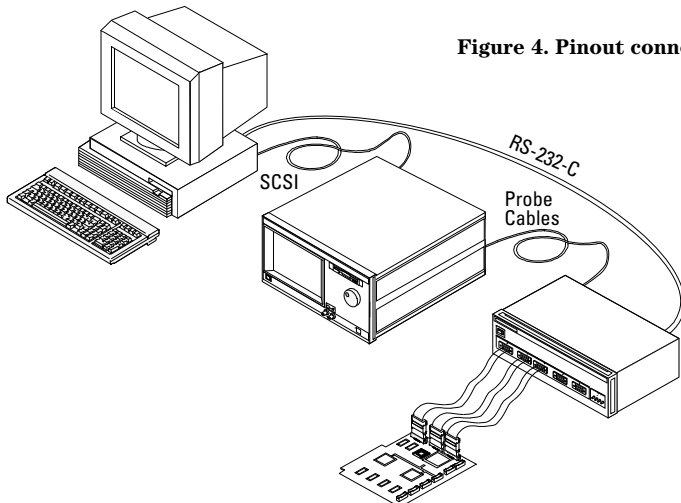


Figure 4. Pinout connection for HP E2474A cables

Figure 2. Logic analysis configuration with E2474A

### HP E2474A Dimensions

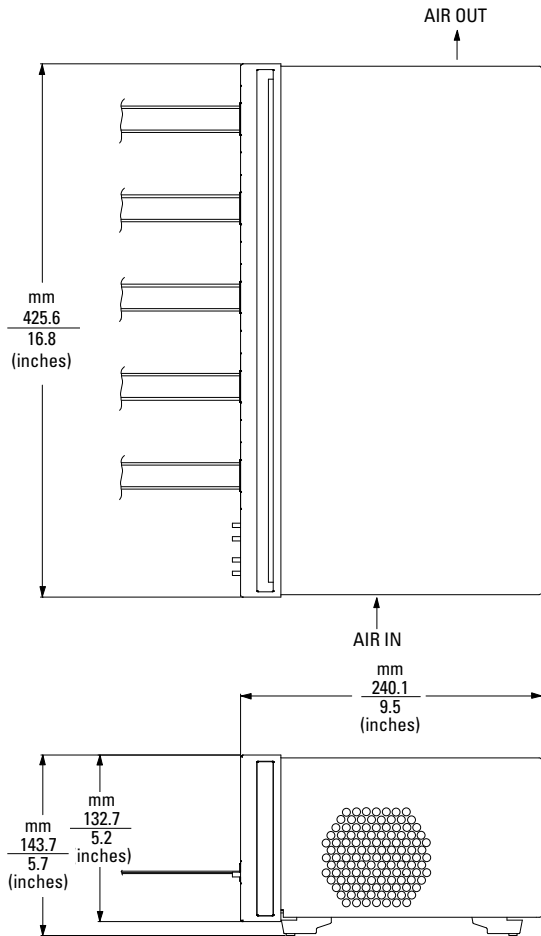


Figure 5. Physical measurements

### Supplied Accessories

| Description         | Part Number    |
|---------------------|----------------|
| User's Guide        | HP E2474-97000 |
| Tip Network Adapter | HP E5365A      |
| RS-232-C Cable      | HP C2932A      |
| SMB Cable           | HP E2474-61605 |



Figure 6. Accessories that ship standard with the HP E2474A

## Related HP Literature

| Title  | Description              | HP Pub Number |
|--|--------------------------|---------------|
| HP E2474A Product Overview   | Product Overview         | 5965-7666E    |
| The HP 16500C Logic Analysis System Mainframe and HP 16501A Expansion Frame                          | Technical Specifications | 5965-3184E    |
| HP 16500C Logic Analysis System - HP 16505A Prototype Analyzer                                       | Product Overview         | 5965-3187E    |
| HP 16500C Logic Analysis System and Measurement Modules - HP 16505A Prototype Analyzer and Tool Sets | Configuration Guide      | 5965-3185E    |
| HP 16505A Prototype Analyzer   | Color Brochure           | 5963-1857E    |
| A Family of State and Timing Analyzers for the HP 16500C Logic Analysis System                       | Product Overview         | 5962-7245E    |

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