

Figure 1. The Agilent E2487C Analysis Probe and E2492B Probe Adapter Connecting the Agilent 16700A Logic Analysis System to the Target System

The Agilent Technologies E2487C analysis probe can greatly reduce your time to insight into critical Intel Celeron, Pentium II, III, and Pentium II, III Xeon processor-based system problems.

The E2487C uses the power of the Agilent Technologies 16700A/702A logic analysis system to present trace and state waveform views of the processor's bus.

The E2487C, with its transaction tracker and inverse assembler, allows you to easily trace the operation of a multiprocessing system. Bus transactions are summarized in the state listing display, allowing rapid interpretation of bus operation. Instruction execution, disassembled into familiar Intel mnemonics, including MMX instructions, can also be displayed.

Displaying Transactions

The E2487C analysis probe keeps track of the processor bus by presenting a state listing of bus activity grouped by complete transactions. Because several transactions can be pending on the processor bus, the analysis probe's transaction tracker monitors the start and end of each bus phase. Each transaction display starts with the request type, such as memory read, I/O write, or code read.

Selecting Transactions

Focus your analysis of the activities on the processor bus by coloring those transactions that give you the best view of the problem.

Included with the E2487C is a complete set of filter options that allow you to selectively list transactions by agent and transaction type. For example, you can list only branch trace messages originating from CPU 0. The filter dialog menu lets you use color to emphasize either transaction type or agent ID.

Pentium is a registered trademark of Intel Corporation. MMX is a trademark of Intel Corporation. Xeon is a trademark of Intel Corporation. Celeron is a trademark of Intel Corporation.



Agilent Technologies Innovating the HP Way

Listing <1>									
 Fil	.e Edit Opti	ons Invas	n Source	Help					
Na	vigate F	Run							
ſs	Search Goto Markers Comments Analysis Mixed Signal								
			Juben Present J Next Preu						
A	dvanced search	ning	Set G1 Set G2						
	Charles Marchard		D						
	State Number	IP Haar	Pentium(R) II processor inverse assembl	.y					
	Decimal	Hex	Mnemonics/Hex						
	159	000FE645	causing: 000FE645 branch trace						
		000FF53E	target: 000FF53E 16-bit code	-,					
		000FF53E	66C1E210 SHL EDX,10h						
		000FF542	BAF80C MOV DX,0CF8h						
		000FF545	6681CB00000080 OR EBX,80000000h						
		000FF54C	6693 XCHG EBX,EAX						
		000FF54E	66C1CB10 ROR EBX,10h						
		000FF552	8BD8 MOV BX,AX						
		000FF554	83E303 AND BX,0003h						
		000FF557	6683E0FC AND EAX,0FFFFFFCh						
		000FF55B	BAF80C MOV DX,0CF8h						
		000FF55E	66EF OUT DX,EAX						
		000FF560	8BD3 MOV DX,BX						
		000FF562	OBC3 OR AX,BX						
		000FF564	66C1CB10 ROR EBX,10h	h					
		000FF568	81CAFCOC OR DX,OCFCh	Ц					
		000FF56C	6693 XCHG EBX, EAX						
		000FF56E	EU IN AX,UX						
		000FF56F	66CIEHIU SHR EDX,IUN						
	057	0000000000	LS KEI near						
	203	000000000	2007/2000 2000/0840 1/0 White	opu0					
	779	00000000	vvvvvvvv vvvv0640 mem rd data	opu0					
	334	000FE573	causing: 000FE573 branch trace	cpu0					
	004	000FF640	target: 000FF648 16-bit code	opuv					
		000FE64A	2500FE AND AX.0FE00h						
		000FE64D	ODE000 OR AX,00E0h						
		000FE650	BC5606 MOV SP,0656h						
		000FE653	E9970F JMP 000FF5EDh						
	372	000FE653	causing: 000FE653 branch trace	cpu0 🔽					

Figure 2. Inverse Assembly Listing Displays Code Execution in Familiar Intel Mnemonics

Viewing Instructions

The E2487C includes an inverse assembler that displays code execution in familiar Intel mnemonics.

The inverse assembler takes advantage of the processor's branch trace message (BTM) bus cycles. BTMs are special bus cycles issued by the CPU (when enabled) that indicate the "from" and "to" addresses of a branch. Using BTMs, the E2487C inverse assembler displays a listing of only the instructions executed by the processor(s).

For inverse assembly, some form of run-control is necessary to enable BTMs and disable caches. See "Ordering Information" for Agilent Technologies run-control model numbers.

Identifying Processors

The E2487C filter options allow you to color instructions by processor. Determining which processor executed a particular code segment in a multiprocessor system is simple. As you follow the assembly instruction listing on the 16700A logic analyzer's display, the color of the trace changes when another processor takes an execution branch. Priority agent (I/O) activity is also displayed in color.

Features

Display Filter Options

Selectively display the most important transactions by using state listing filters. Agents

- igointo	
CPU 0:	Show/Suppress
CPU 1:	Show/Suppress
CPU 2:	Show/Suppress
CPU 3:	Show/Suppress
Priority:	Show/Suppress

Transaction Types

Deferred Replies:ShowInterrupt Acknowledge:ShowSpecial Transactions:ShowBranch Trace Messages:ShowI/O Reads:ShowI/O Writes:ShowMemory Read & Invalidate:ShowMemory Data Reads:ShowCode Reads:ShowMemory Writes:ShowMemory Writes:Show

Show/Suppress Show/Suppress Show/Suppress Show/Suppress Show/Suppress Show/Suppress Show/Suppress Show/Suppress Show/Suppress Show/Suppress

Note: Agents and transaction-type filter terms are combined in display by "ANDing."

Clock Qualification

Expanded Mode

Captures all snoop stalls and data wait states.

Compacted Mode

Maximizes logic analyzer memory use by hiding snoop stalls and data wait states.



SC 242, SC 330, and 370 Pin PGA Probe Adapters

The Agilent Technologies E2492B/C/E probe adapters provide a convenient way to connect to Pentium II, III, Xeon, and Celeron processors. Because the E2492B/C/E probe adapters are fabricated using flexible circuit board technology, they can conform to the probing constraints imposed by adjacent processors, heat sinks, and other tall components.

Figures 3, 4, and 5, illustrate the ability of this unique probing solution to accommodate other components in your system.

The overall dimensions of the E2492B/C/E probe adapters are shown in figures 6, 7, and 8.

Figure 3. Installed View of E2492B SC 242 (Slot 1) Probe Adapter



Figure 4. Installed View of E2492C SC 330 (Slot 2) Probe Adapter



Figure 5. Installation View of E2492E 370 Pin PGA Probe Adapter Dimensions



Figure 6. E2492B SC 242 (Slot 1) Probe Adapter Mechanical Dimensions



Figure 7. E2492C SC 330 (Slot 2) Probe Adapter Mechanical Dimensions



Figure 8. E2492E 370 Pin PGA Probe Adapter Mechanical Dimensions

Operating Characteristics

Analysis Probe	E2487C - probe	Signal Line Loading	
	Interface	©	
Probe Adapter	E2492B - SC 242 probe adapter E2492C - SC 330 probe adapter E2492E - 370 pin PGA	1.2 pF GTL+ Inputs Vt	1) E2492E 66 M 2) Spread Spe disabled.
	probe adapter	·	Warranty In
Processor Package	single edge connector (SEC) cartridge	2.6 pF	Agilent Tecl are warrant
Logic Analysis Pods Required	12 (compatible with 3-card 16555A/E,	Cik Inputs	als and wor year from da
	16556A/E, or 16557D logic analysis modules for the 16700A &		manufactur ucts may co which are e mance. If yo
	16702A logic analysis systems)	Non GTL+ Inputs	ing the warr Technologie
Analysis Probe	state/clock — expanded mode state/clock —	Related Literature	hardware p
	compacted mode	HP 16600A and 16700A Series Logic An HP E2467A Intel APIC Bus Analysis Pro	alysis System be Interface
Clocking Mode	logic analyzer stores	Emulation & Analysis Solutions for Inte	l Pentium II
0	bus state on each	Processors with MMX Technology	
	qualified BCLK	Hewlett-Packard and American Arium I	Deliver

ium Deliver a Highly Integrated Debug Environment

Analysis Probe Cable Length	approximately 1 meter
Clock Frequency	133 MHz ^{1, 2} maxi- mum for external BCLK
Target Signal	800 mV p-p minimum amplitude for all GTL+ signals
Power Requirements	internal power supply is included with analysis probe
Environmental Temperature: Operating	20° to 30° C (+68° to +86° F) 40° to 70° C
Nonoperating	(- 40° to +158° F)
Altitude: Operating Nonoperating	4,600 m (15,000 ft) 15,300 m (50,000 ft)
Humidity	up to 90% noncon- densing (avoid sud- den, extreme tempera- ture changes that could cause conden- sation within the instrument)

1) E2492E 66 MHz maximum for external BCLK. 2) Spread Spectrum Clock (SSC) must be disabled.

Warranty Information

Agilent Technologies hardware products are warranted against defects in materials and workmanship for a period of one year from date of shipment. Some newly manufactured Agilent Technologies products may contain remanufactured parts, which are equivalent to new in performance. If you send notice of defects during the warranty period, Agilent Technologies will either repair or replace hardware products that prove defective.

5966-3107E	
5965-3000E	
5966-3880E	

5968-1661E

www.agilent.com

Analysis Probe (required):

E2487C Analysis Probe for the Intel Celeron, Pentium II, III, and Pentium II, III, Xeon Processor (Note: Inverse Assembly requires run-control. See below.) and E2492B SC 242 Probe Adapter or E2492C SC 330 Probe Adapter or E2492E 370 Pin PGA Probe Adapter

Mainframes (required): 16700A or 16702A Logic Analysis System Mainframe

B4600B (optional) System Performance Analysis

Logic Analysis Modules (required):

16557D (required for 133 MHz) operation (3 cards required) 2-MSa, 135-MHz state/500-MHz timing or 16555A/D (3 cards required) 1 MSa/2 MSa, 110-MHz state/500-MHz timing logic analyzer module or 16556A/D (3 cards required) 1 MSa/2 MSa, 100-MHz state/400-MHz timing logic analyzer module

Emulation Probe or Module

(Recommended. A run-control unit is required for inverse assembly.) • E5900A Option 510 Emulation Module

• E5901A Option 510 Emulation Probe

For more information about Agilent Technologies test & measurement products, applications, services, and for a current sales office listing, visit our web sites at: http://www.agilent.com/go/tmdir

http://www.agilent.com/find/emulator

http://www.agilent.com/find/logicanalyzer

For more information about Agilent Technologies test and measurement products, applications, services, and for a current sales office listing, visit our web site: http://www.agilent.com/find/tmdir

You can also contact one of the following centers and ask for a test and measurement sales representative.

United States: Agilent Technologies Test and Measurement Call Center P.O. Box 4026 Englewood, CO 80155-4026 (tel) 1 800 452 4844

Canada: Agilent Technologies Canada Inc. 5150 Spectrum Way Mississauga, Ontario L4W 5G1 (tel) 1 877 894 4414

Europe: Agilent Technologies European Marketing Organisation P.O. Box 999 1180 AZ Amstelveen The Netherlands (tel) (31 20) 547 9999

Japan:

Agilent Technologies Japan Ltd. Measurement Assistance Center 9-1, Takakura-Cho, Hachioji-Shi, Tokyo 192-8510, Japan (tel) (81) 426 56 7832 (fax) (81) 426 56 7840

Latin America:

Agilent Technologies Latin American Region Headquarters 5200 Blue Lagoon Drive, Suite #950 Miami, Florida 33126 U.S.A. (tel) (305) 267 4245 (fax) (305) 267 4286

Australia/New Zealand:

Agilent Technologies Australia Pty Ltd 347 Burwood Highway Forest Hill, Victoria 3131 (tel) 1-800 629 485 (Australia) (fax) (61 3) 9272 0749 (tel) 0 800 738 378 (New Zealand) (fax) (64 4) 802 6881

Asia Pacific:

Agilent Technologies 24/F, Cityplaza One, 1111 King's Road, Taikoo Shing, Hong Kong (tel) (852) 3197 7777 (fax) (852) 2506 9284

Technical data is subject to change Printed in U.S.A. 11-99 5968-2421E



Agilent Technologies Innovating the HP Way