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Instructions

Tektronix

P6434
Mass Termination Probe

070-9793-04

www.tektronix.com

070979304

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Table of Contents

General Safety Summary v
Preface vii
Contacting Tektronix viii

Operating Basics

Product Description 2
Labels 3
Color Coded Labels 3
Applying Labels 4
Connecting the P6434 Probe to the Target System 7
Direct Connection 7
Low-Profile Extender Connection(Optional Accessory) 9
P6434 Reduced Bias Voltage Adapter Connection 10
Compression-on-PCB to P6434 Mictor Adapter 12
Disconnecting the P6434 Probe from the Target System 14

Designing an Interface Between a P6434 Probe and a Target System

Mictor Connectors and Latch Housings 15
Dimensions and Placement of Compatible Mictor Connectors 17
Direct Connection 17
Low-Profile Extender Connection 18
Mechanical Layout and Pin Numbering Sequence of Compatible Mictor Connectors 19
Pin 1 Indicator 19
AMP Probe Channel Assignments (Preferred) 21
Nonstandard Probe Channel Assignments (Not Recommended) 24
Loading and Equivalent Circuits 27

Reference

Maintenance 29
Circuit Description 30
Specifications 30
Disassembling the Probe 33
Probe Tip 33
Latch Release Grip 34
Module End 35
Reassembling the Probe 36
Probe Tip 36
Latch Release Grip 38
Module End 40
Functional Verification 41

Replaceable Parts

List of Figures

Figure 1: P6434 Mass Termination Probe 2
Figure 2: Locating the probe-tip connector 4
Figure 3: End view of the probe-tip connector 4
Figure 4: Other indicators for pin 1 side 5
Figure 5: Location of the pin 38 side label on the probe-tip connector 5
Figure 6: Applying labels to the module-end connectors 6
Figure 7: Connecting to a surface- or straddle-mounted connector . 8
Figure 8: Connecting the low-profile extender 9
Figure 9: Connecting the Reduced Bias Voltage adapter 10
Figure 10: Connecting the Reduced Bias Voltage adapter to the low-profile extender 11
Figure 11: Compression-on-PCB to P6434 Mictor adapter 12
Figure 12: Clearance for probe connection using Compression-on-PCB to P6434 Mictor adapter 13
Figure 13: Releasing the probe tip from the latch housing 14
Figure 14: Latch housing dimensions 16
Figure 15: Dimensions and placement of a surface-mounted Mictor connector with latch housing 17
Figure 16: Side view and dimensions of the low-profile extender . . . 18
Figure 17: Surface-mounted connector layout (component side) . . . 19
Figure 18: Straddle-mounted connector layout (component side) . . 20
Figure 19: Equivalent circuit for the P6434 probe 27
Figure 20: Equivalent circuit for the P6434 probe with a low-profile extender 28
Figure 21: Vertical dimensions of the P6434 probe and low-profile extender 32
Figure 22: Vertical dimensions of the P6434 probe and Reduced Bias Voltage Adapter 32
Figure 23: Disassembling the P6434 probe tip 33
Figure 24: Disassembling the latch release grip 34
Figure 25: Disassembling the module end 35
Figure 26: Mictor connector circuit board and board holder 36
Figure 27: Positioning the elastomer connector 37
Figure 28: Positioning the circuit board in the probe 37

Figure 29: Reattaching the latch releases and case halves 38
Figure 30: Reattaching the latch release cords to the latch releases . 39
Figure 31: Reconnecting the latch release cords to the latch release grip 39
Figure 32: Reassembling the module end 40
Figure 33: Jumper and connector locations on the test fixture 41
Figure 34: Example of the Activity Indicator dialog box 42
Figure 35: P6434 probe exploded view 49
Figure 36: Optional accessories 50

List of Tables

Table 1: Color coded label combinations (136 and 102 channel module) 3
Table 2: Color coded label combinations (34 and 68 channel module) 3
Table 3: Compatible Mictor connectors 15
Table 4: Preferred pin assignments (AMP) for Mictor connector (component side) 21
Table 5: Pin 1 side probe channel assignments 22
Table 6: Pin 38 side probe channel assignments 22
Table 7: Nonstandard pin assignment for Mictor connector (component side) 24
Table 8: Pin 1 side probe channel assignments (nonstandard) 25
Table 9: Pin 38 side probe channel assignments (nonstandard) . . . 25
Table 10: Lossy delay line values 27
Table 11: Electrical specifications 30
Table 12: Environmental specifications 31
Table 13: Certifications and compliances 31

General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

While using this product, you may need to access other parts of the system. Read the *General Safety Summary* in other system manuals for warnings and cautions related to operating the system.

To Avoid Fire or Personal Injury

Connect and Disconnect Properly. Do not connect or disconnect probes or test leads while they are connected to a voltage source.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

Use Proper AC Adapter. Use only the AC adapter specified for this product.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Use Proper Fuse. Use only the fuse type and rating specified for this product.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:



WARNING. *Warning statements identify conditions or practices that could result in injury or loss of life.*



CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. The following symbols may appear on the product:



WARNING
High Voltage



Protective Ground
(Earth) Terminal



CAUTION
Refer to Manual



Double
Insulated

Preface

These instructions cover the following topics:

- Operating basics
- Designing an interface between the P6434 probe and a target sytem
- Service information
- Replaceable parts list

Information in these instructions assumes your target system is based on a microprocessor. If your target system is not based on a microprocessor, you should substitute the type of device on which your system is based for "microprocessor" throughout these instructions.

For information on how to connect P6434 Mass Termination Probes to a Tektronix microprocessor support (TMS) probe adapter, refer to the instruction manual for the TMS package.

Contacting Tektronix

Phone	1-800-833-9200*
Address	Tektronix, Inc. Department or name (if known) 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA
Web site	www.tektronix.com
Sales support	1-800-833-9200, select option 1*
Service support	1-800-833-9200, select option 2*
Technical support	Email: techsupport@tektronix.com 1-800-833-9200, select option 3* 6:00 a.m. - 5:00 p.m. Pacific time

*** This phone number is toll free in North America. After office hours, please leave a voice mail message.**
Outside North America, contact a Tektronix sales office or distributor; see the Tektronix web site for a list of offices.

Operating Basics

The P6434 Mass Termination Probe allows you to connect 34 logic analyzer channels to a microprocessor probe adapter or directly to your target system in one fourth the physical area needed to connect standard probes.

You can reduce the vertical clearance dimension to less than a half inch if you use the low-profile extender. If you use a P6434 Reduced Bias Voltage adapter, you can reduce the pull-up voltage that the P6434 probe delivers to the system under test. The pull-up voltage reduces from 2.2 volts to 1.1 volts at the same time the DC input resistance changes from 20 kΩ to 10 kΩ. If you are using TLA6xx or TLA7Lx/Mx/Nx/Px/Qx logic analyzer modules you can take advantage of the new compression footprint and eliminate the need for Mictor connectors in your target system with a Compression-on-PCB to P6434 Mictor adapter.

Without a Compression-on-PCB to P6434 Mictor adapter, you must include compatible Mictor connectors in your circuit board design to connect directly to your target system. To do this, be sure you understand the requirements and conform to the guidelines for designing an interface in these instructions. For additional information on designing an interface see the 071-1059-xx *P6810, P6860, and P6880 Logic Analyzer Probes Instruction Manual.*

This section contains information on the following topics and tasks:

- Product description
- Applying labels
- Connecting probes to and disconnecting probes from a target system

Product Description

The P6434 probe can acquire data from 32 input/output signals and two clocks, one clock and one qualifier, or two qualifier signals.

The probe has connectors on each end. One end is called the probe tip and connects to your target system. The other ends are called the module ends and connect to the logic analyzer. Figure 1 shows the P6434 probe.

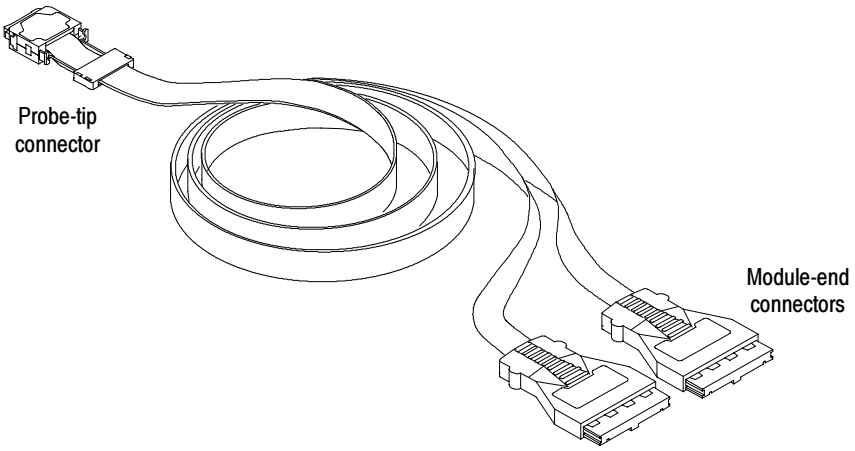


Figure 1: P6434 Mass Termination Probe

Labels

The P6434 probe labels are color coded to match the probe connectors on the logic analyzer. The P6434 probe is shipped with a sheet of labels, a *Read This First* sheet, and a *P6434 Instructions Manual*.

Color Coded Labels

The Table 1 labeling scheme for P6434 probes occurs on most microprocessor support packages and target systems for signal and channel assignments.

***NOTE**. Use one Pin 1 label for each probe connector. Do not use two labels with a pin 1 indicator or two labels without a pin 1 indicator on a single probe.*

Table 1: Color coded label combinations (136 and 102 channel module)

Address	
Color on Pin 1 side	**Tan** (CK:0, A3:7-0, A2:7-0)
Color on Pin 38 side	**Orange** (CK:1, A1:7-0, A0:7-0)
Data	
Color on Pin 1 side	**Blue** (QUAL:0, D3:7-0, D2:7-0)
Color on Pin 38 side	**Yellow** (CK:2, D1:7-0, D0:7-0)
Control	
Color on Pin 1 side	**White** (CK:3, C3:7-0, C2:7-0)
Color on Pin 38 side	**Gray** (QUAL:1, C1:7-0, C0:7-0)
Extended (136 channel module only)	
Color on Pin 1 side	**Green** (QUAL:3, E3:7-0, E2:7-0)
Color on Pin 38 side	**Violet** (QUAL:2, E1:7-0, E0:7-0)

Customizing Labels for a 34 or 68 Channel Module

The labeling scheme for the P6434 probe is shown in Table 2 for a 34 or 68 channel module. Use the extra labels from the label sheet.

Table 2: Color coded label combinations (34 and 68 channel module)

For a 34 channel module	
Color on Pin 1 side (Control)	**White** (CK:3, C3:7-0, C2:7-0)
Color on Pin 38 side (Address)	**Blank** (write in, CK:0, A3:7-0, A2:7-0)
For a 68 channel module	
Color on Pin 1 side (Address)	**Tan** (CK:0, A3:7-0, A2:7-0)
Color on Pin 38 side (Address)	**Orange** (CK:1, A1:7-0, A0:7-0)
Color on Pin 1 side (Control)	**White** (CK:3, C3:7-0, C2:7-0)
Color on Pin 38 side (Data)	**Yellow** (CK:2, D1:7-0, D0:7-0)

Applying Labels

To apply labels to the probe, follow these steps:

1. Locate the labels you need for the P6434 probe from the provided sheet of labels, but do not peel them off yet. If you need help determining which labels to use, see steps a and b.
   a. Look at the logic analyzer module and determine which channel group you want to connect the P6434 probe to.
   b. Look at the sheet of labels and locate the labels that match the logic analyzer channel group you need to use. Notice that there are two different sizes of labels for each channel group.
      - Probe-tip labels (smaller)
      - Module-end labels (larger)
      - Blank labels (custom channel combinations not recommended)
2. Locate the probe-tip end of the P6434 connector (see Figure 2).

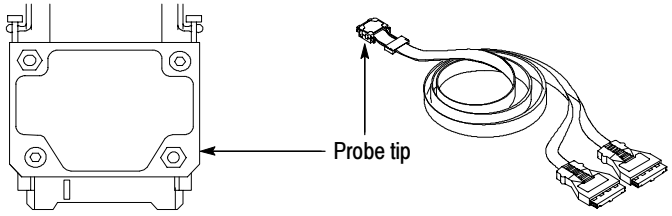
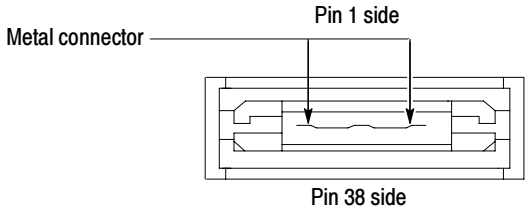


Figure 2: Locating the probe-tip connector

3. Locate the pin 1 side of the probe-tip connector by using Figure 3 (end view of the probe-tip connector).



Note: The position of the bent waves, the angled ends, are up on the Pin 1 side

Figure 3: End view of the probe-tip connector

4. Remove the pin 1 side label that you need from the sheet of labels.
5. Apply the pin 1 side label to the pin 1 side of the probe-tip connector.

***NOTE**. You can also use the small pin 1 recess or the beveled corners on the probe tip end of the connector, but both are difficult to find (see Figure 4).*

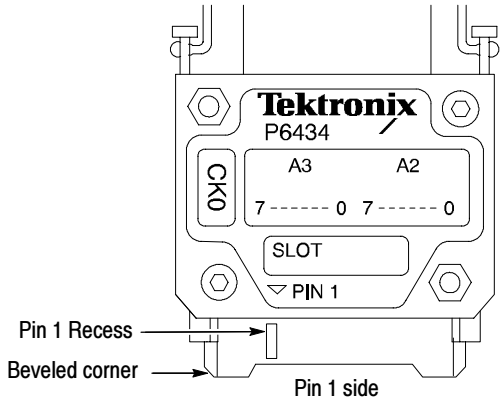


Figure 4: Other indicators for pin 1 side

6. Apply the associated pin 38 side label to the probe tip (see Figure 5). If necessary, see Tables 1 or 2 on page 3 for label information.

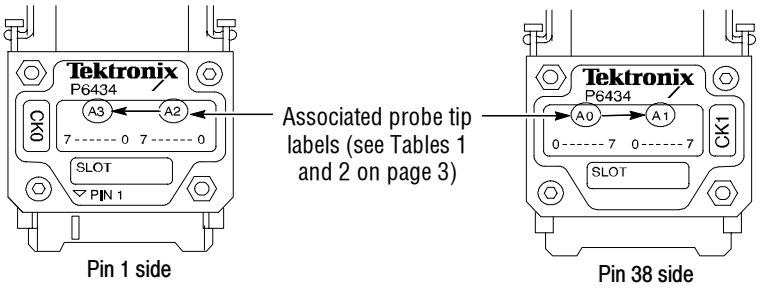


Figure 5: Location of the pin 38 side label on the probe-tip connector

7. Apply the module-end labels to the module-end connectors (see Figure 6). To avoid mislabelling, hold the probe-tip connector in your hand and follow

the cable to the model-end connector. Match the color of the module-end label to the probe-tip label.

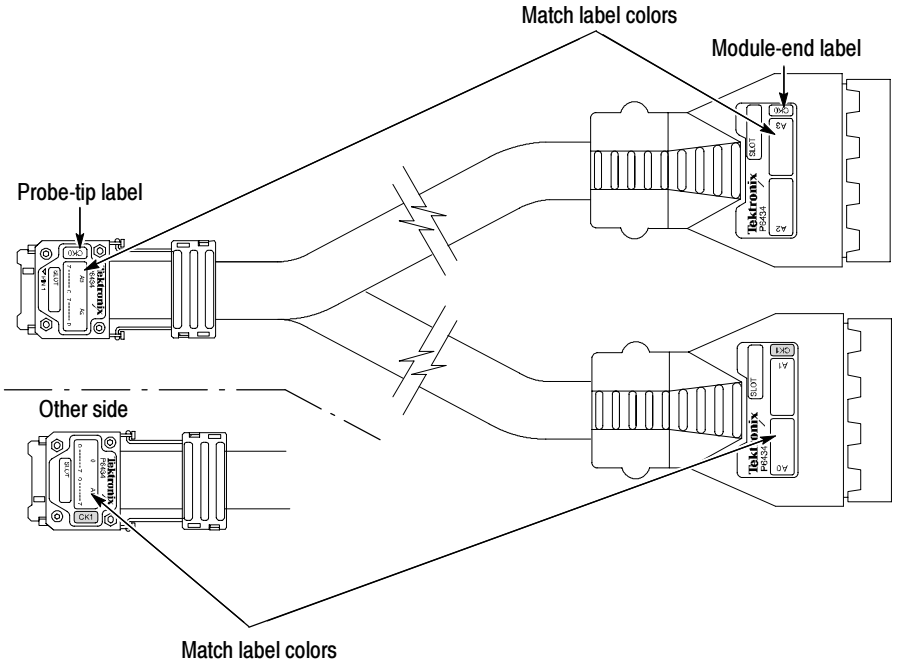


Figure 6: Applying labels to the module-end connectors

Connecting the P6434 Probe to the Target System

The P6434 probe can connect to surface-mounted or straddle-mounted Mictor connectors. You can use the low-profile extender (available as an optional accessory) to connect the probe to systems with as little as a half inch of clearance between circuit boards. You can also install optional latch housings around the connector to provide positive retention of the probe.

In the following procedures, a surface-mounted Mictor connector is shown in the figures. These procedures are the same for the straddle-mounted connector.

Direct Connection

To connect the P6434 probe to a Mictor connector in your target system (or on a TMS probe adapter), follow these steps:

1. Line up the pin 1 indicator on the probe tip with pin 1 on the connector in your target system. The Mictor connector is keyed to prevent incorrect connections.



CAUTION. *To avoid damaging the probe and target system, always position the probe perpendicular to the mating connector and gently connect the probe. Incorrect handling of the probe while connecting it to the target system can result in damage to the P6434 probe or to the mating connector in the target system.*

NOTE. *If you have custom channel combinations for the mictor connector on your target system, use the blank sheet of labels to create your own pin 1 and pin 38 side labels.*

Use one Pin 1 label for each probe connector. Do not use two labels with a pin 1 indicator or two labels without a pin 1 indicator on a single probe.

Custom labeling is an option, though not recommended.

2. Position the probe tip perpendicular to the mating connector, and gently connect the probe as shown in Figure 7.

3. When connected, push down the latch releases on the probe to set the latch.

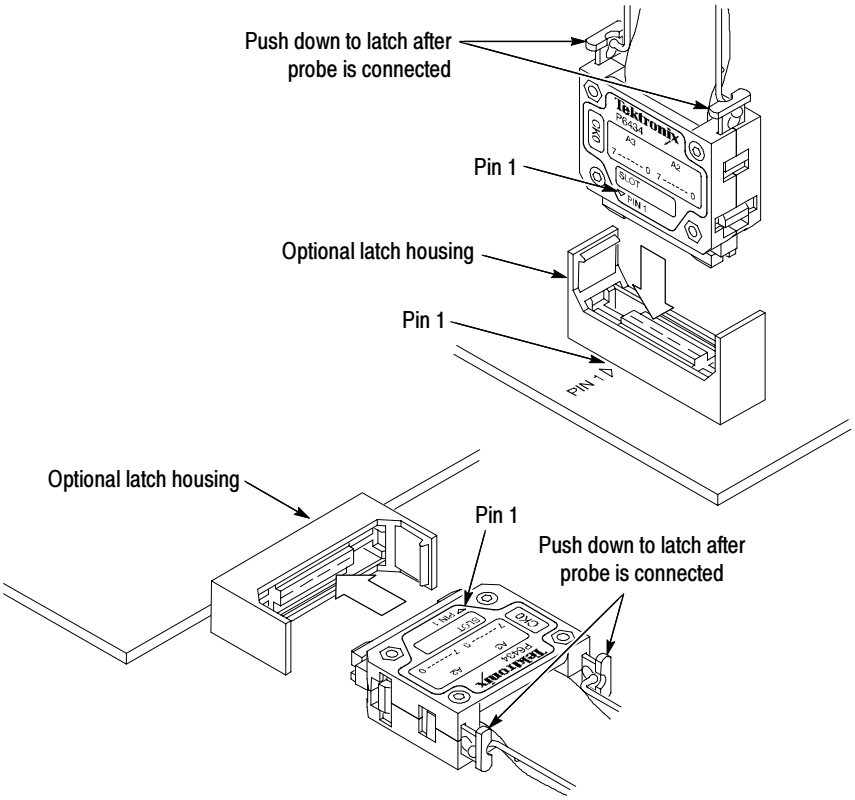


Figure 7: Connecting to a surface- or straddle-mounted connector

4. Connect the module-end connector to the corresponding connector on the logic analyzer module (match the label colors). The module end is keyed.

Low-Profile Extender Connection (Optional Accessory)

Low-profile extenders allow you to connect the P6434 probe to systems with as little as a half inch of clearance between circuit boards. The extender connects to Mictor connectors with or without a latch housing. The low-profile extender part number is in the *Replaceable Parts List* section under *Optional Accessories* on page 48.

To connect the probe using the extender, follow these steps:

1. Line up the pin 1 indicator on the low-profile end of the extender with pin 1 on the connector in your target system. The Mictor connector is keyed to prevent incorrect connections.
2. Position the low-profile end perpendicular to the connector and gently connect the extender as shown in Figure 8.
3. Connect the P6434 probe by lining up the pin 1 indicator on the P6434 probe with the pin 1 indicator on the the other end of the extender and connect the probe to the extender.
4. When connected, push down the latch releases on the probe to set the latch.

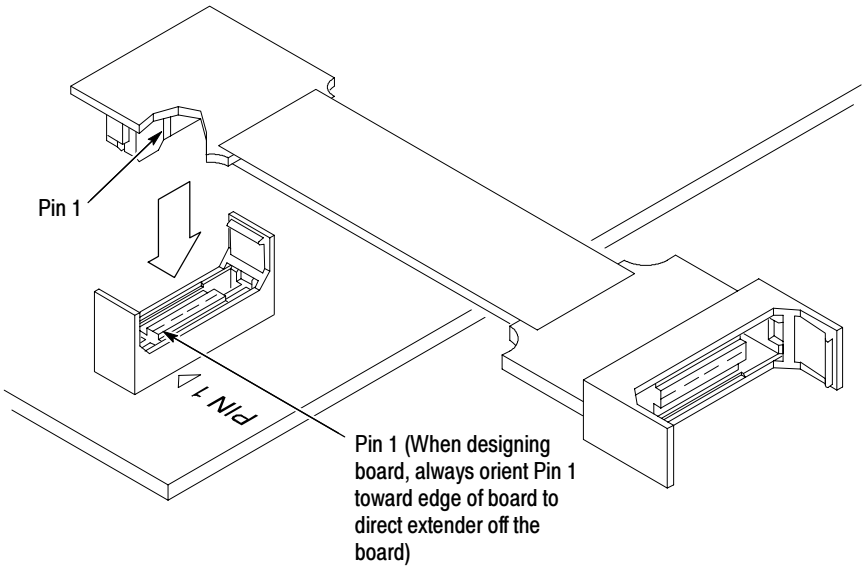


Figure 8: Connecting the low-profile extender

P6434 Reduced Bias Voltage Adapter Connection

Reduced Bias Voltage adapters allow you to reduce the pull-up voltage that the P6434 delivers to the system under test. The P6434 Reduced Bias Voltage adapter connects directly to the Mictor connector or to a low-profile extender. Refer to the *Replaceable Part Lists* section under *Optional Accessories* on page 48 for the Reduced Bias voltage adapter part number.

To connect the probe using the P6434 Reduced Bias Voltage adapter follow these steps:

1. Line up the pin 1 indicator on the adapter with the pin 1 indicator on the Mictor connector.
2. Position the adapter perpendicular to the Mictor connector and connect the adapter as show in Figure 9. The Mictor connector is keyed to prevent incorrect connections.
3. Line up the pin 1 indicator on the adapter with the pin 1 indicator on the P6434 probe. Connect the P6434 probe to the adapter.
4. When connected, push down the latch releases on the probe to set the latch.

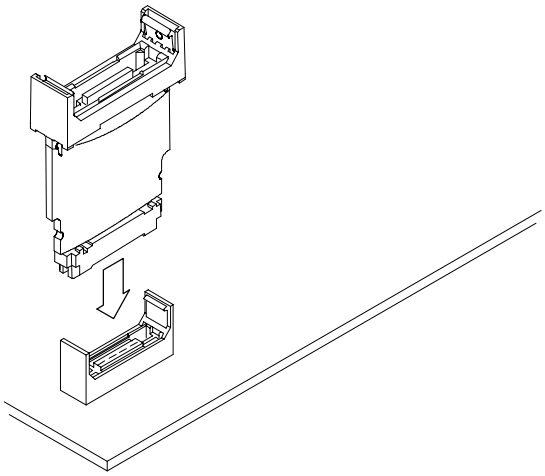


Figure 9: Connecting the Reduced Bias Voltage adapter

If you are using a low-profile extender with the Reduced Bias Voltage adapter follow the instructions on page 9 to connect the low-profile extender and then, follow these steps:

1. Line up the pin 1 indicator on the adapter with the pin 1 indicator on the low-profile extender and connect the adapter to the low-profile extender.
2. Line up the pin 1 indicator on the adapter with the pin 1 indicator on the P6434 probe, and then connect the probe to the adapter.

3. When connected, push down the latch releases on the probe to set the latch.

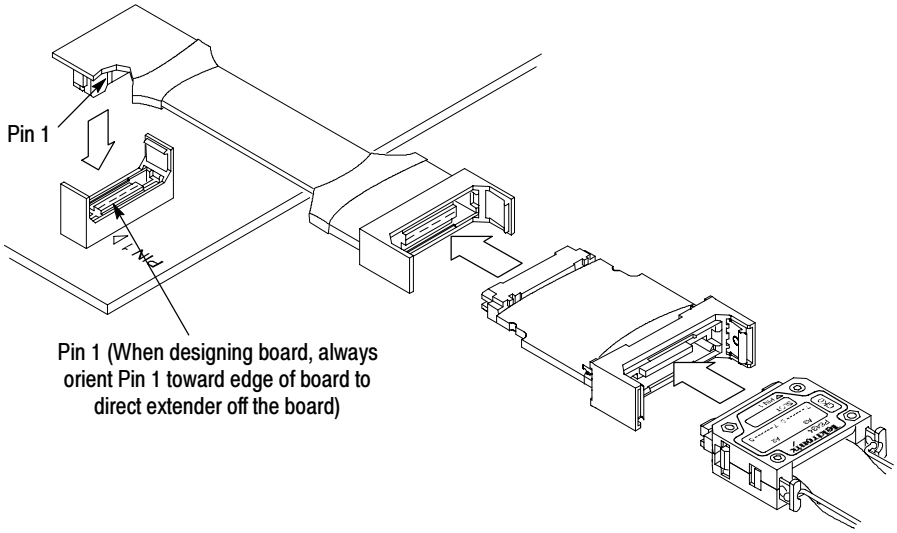


Figure 10: Connecting the Reduced Bias Voltage adapter to the low-profile extender

Compression-on-PCB to P6434 Mictor Adapter

The Compression-on-PCB to P6434 Mictor adapter (see Figure 11) allows the TLA6xx and TLA7Lx/Mx/Nx/Px/Qx logic analyzers using a P6434 Probe to take advantage of the new compression footprint and eliminate the need for Mictor connectors in your target system.

Two different screw lengths are required to accommodate the 0.050-inch – 0.250-inch (1.27 mm - 6.35 mm) PCB thickness range.

This adapter requires the use of the Compression-on-PCB to P6434 Mictor adapter land footprint. See Figure 11 for further dimensional information.

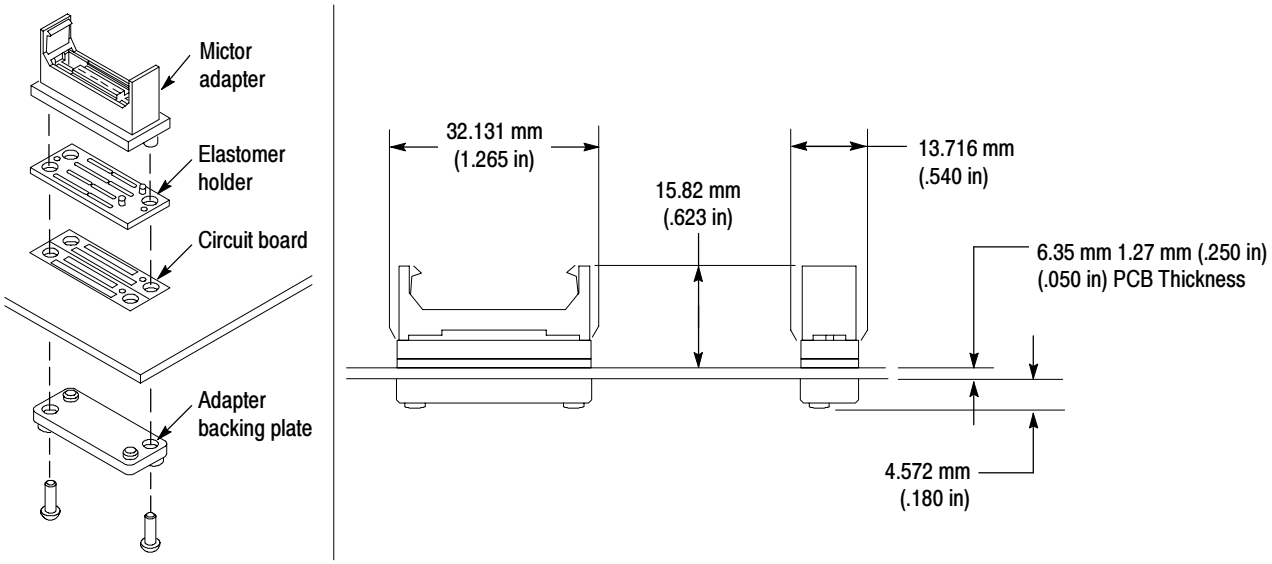


Figure 11: Compression-on-PCB to P6434 Mictor adapter

To compare the clearance between the P6434 Probe connection and the P6434 Probe connection via the Compression-on-PCB to P6434 Mictor adapter refer to Figure 12 on page 13. Note that the difference in clearance between the P6434 Probe connection and the P6434 Probe connection using the Compression-on-PCB to P6434 Mictor adapter is 0.145-inches.

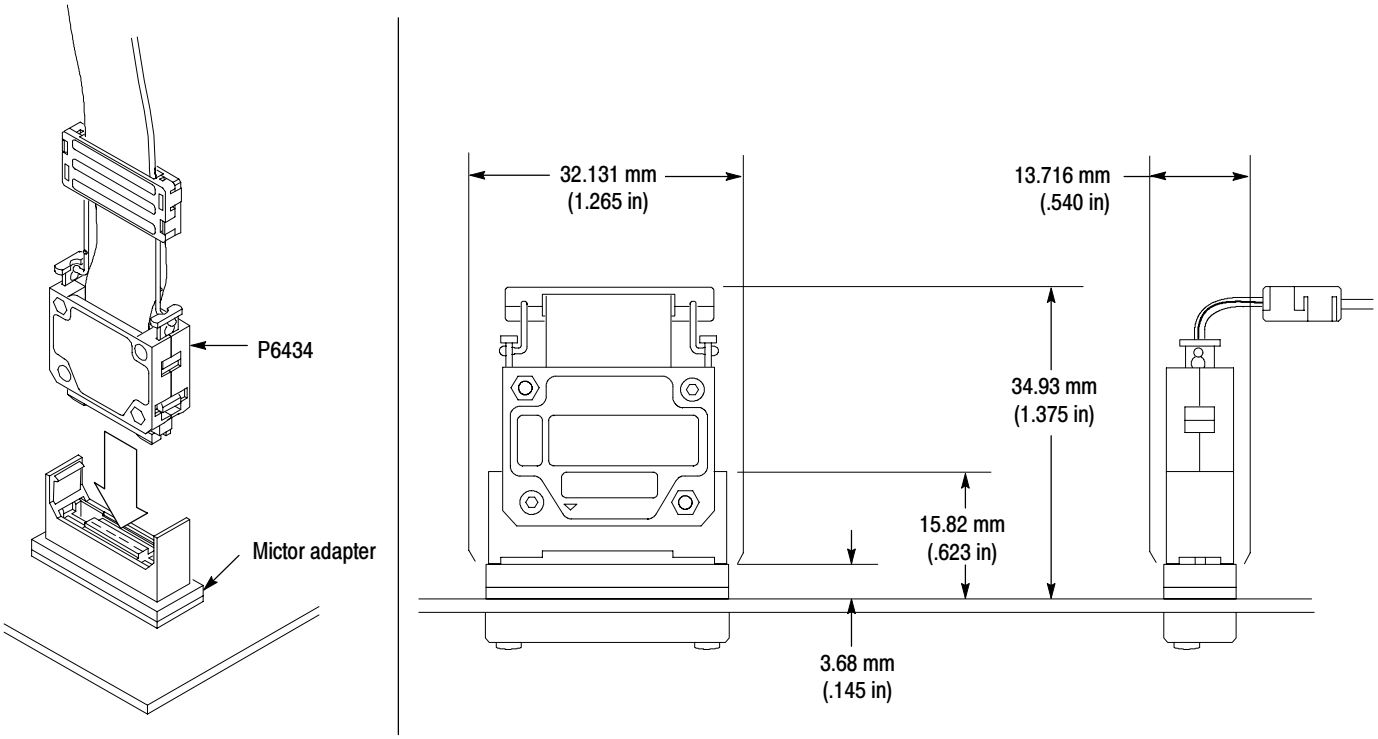


Figure 12: Clearance for probe connection using Compression-on-PCB to P6434 Mictor adapter

Disconnecting the P6434 Probe from the Target System

To disconnect the P6434 probe, follow these steps:

1. Gently pull the latch release grip to release the probe tip from the latch housing as shown in Figure 13.

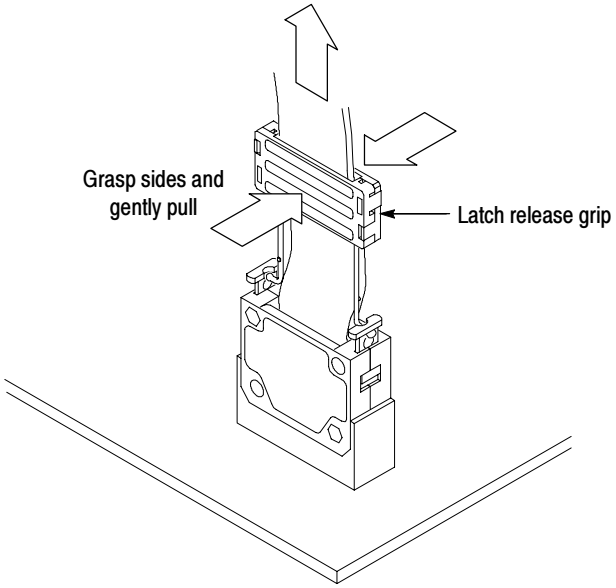


Figure 13: Releasing the probe tip from the latch housing

CAUTION. *To avoid damage to the probe and mating connector, hold on to the latch release grip and gently pull the probe straight out of the connector. Do not tilt the probe in any direction when disconnecting it. Tilting the probe can damage the probe and mating connector.*

2. Continue to gently pull the probe tip straight out of the mating connector using the latch release grip.

   If you are using an extender, grip the corners of the circuit board end attached to the target system, and gently pull it straight out of the connector.

Designing an Interface Between a P6434 Probe and a Target System

This section provides you with some guidelines for designing your own P6434 probe interface on the target system. The guidelines contain information on the following topics:

- Mictor connectors
- Dimensions and placement of connectors
- Mechanical layout and pinout of connectors
  - AMP pinout (preferred)
  - Nonstandard pinout (not recommended)
- Probe channel assignments
- Loading and equivalent circuits

Mictor Connectors and Latch Housings

The P6434 probe contains a 38-pin Mictor connector. Table 3 lists Mictor connectors you can purchase from AMP that are compatible with the probe and compatible latch housings and connectors from Tektronix.

Table 3: Compatible Mictor connectors

AMP part number	Description	Tektronix part number
767054-1*	Palladium-nickel plated, surface mount connector (vertical receptacles)	(For quanitites less than 27) †
767044-1*	Palladium-nickel plated,straddle mount connector(0.062 in circuit board thickness, right-angle receptacles)	(For quanitites less than 27) †
-	Latch housing; straddle mount (0.062 inch circuit board thickness)	†
-	Latch housing; surface mount	†

* **Preferred**

† **See page 48 under Standard Accessories for Tektronix part numbers.**

You can contact AMP for more detailed information on the Mictor connectors. For the address, refer to the *Replaceable Parts* section on page 47.

You can purchase latch housing mechanisms to use with Mictor connectors. The latch housing surrounds the Mictor connector in your target system and provides positive retention of the P6434 probe.

Figure 14 shows the dimensions of the optional latch housings.

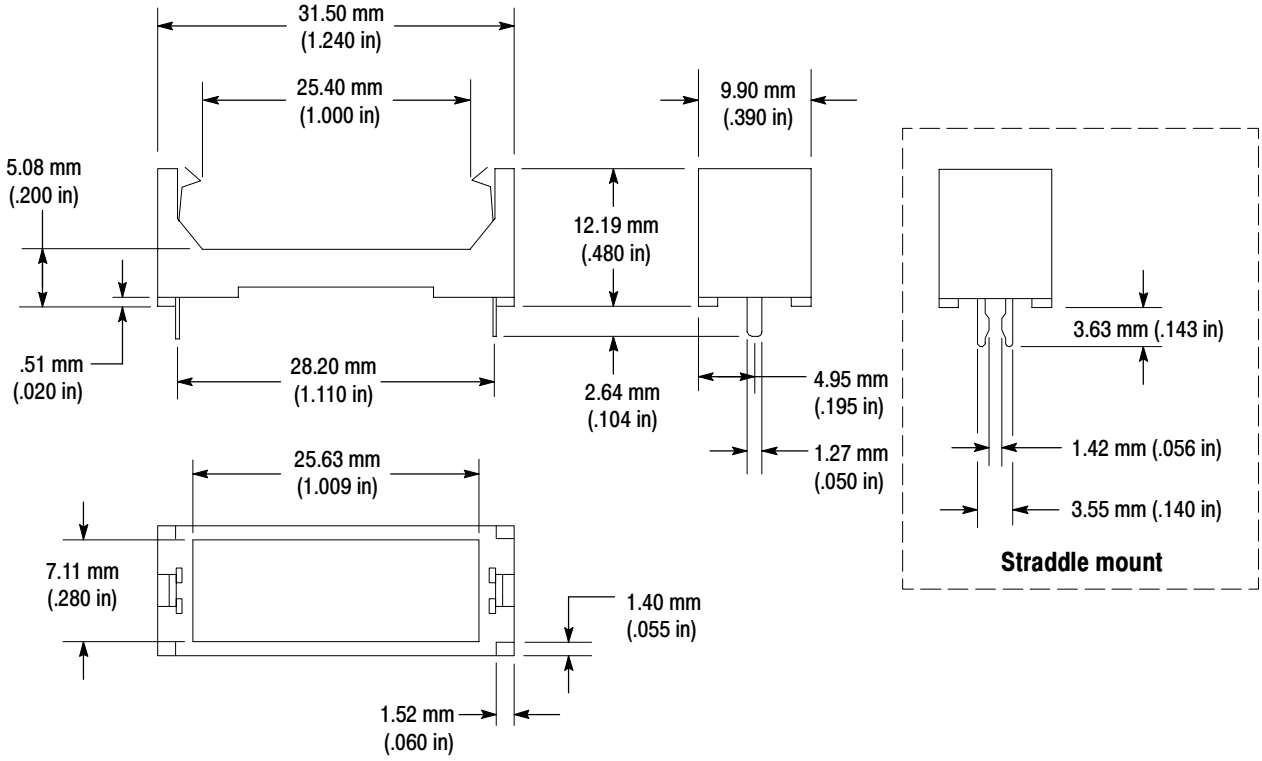


Figure 14: Latch housing dimensions

***NOTE**. Refer to the* Replaceable Parts List *section under* Standard Accessories *on page 48 for information on ordering surface-mounted or straddle-mounted latch housings.*

Dimensions and Placement of Compatible Mictor Connectors

You can use compatible surface-mounted or straddle-mounted Mictor connectors in your circuit board design. The connectors must be placed as close as possible to the device under test.

The placement of Mictor connectors depends on whether you plan to connect the P6434 probe directly to the target system or use the low-profile extender with the probe.

Direct Connection

Figure 15 shows the dimensions and minimum placement of surface-mounted connectors on a target system. The side-to-side dimension between connectors also applies to the straddle-mounted connector.

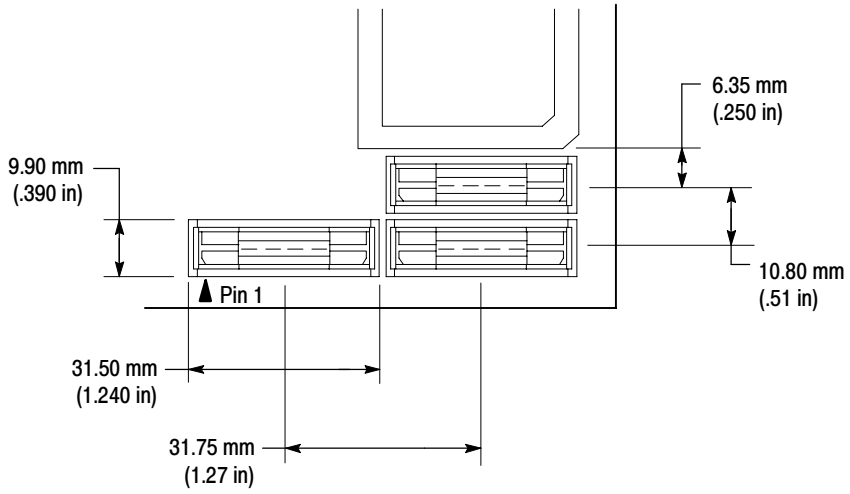


Figure 15: Dimensions and placement of a surface-mounted Mictor connector with latch housing

The vertical clearance dimension for the probe is 1.25 inches. Figure 21 on page 32 shows this dimension.

Low-Profile Extender Connection

When placing Mictor connectors in your target system for use with an extender, you need to keep one inch of clear space on the pin 1 side from the center of the Mictor connector in your target system. The vertical clearance for the one inch of clear space under the extender is 0.2 inches, as shown in Figure 16.

***NOTE**. Be sure to orient pin 1 on the Mictor connector in your target system to direct the extender off the board as shown in Figure 8on page 9.*

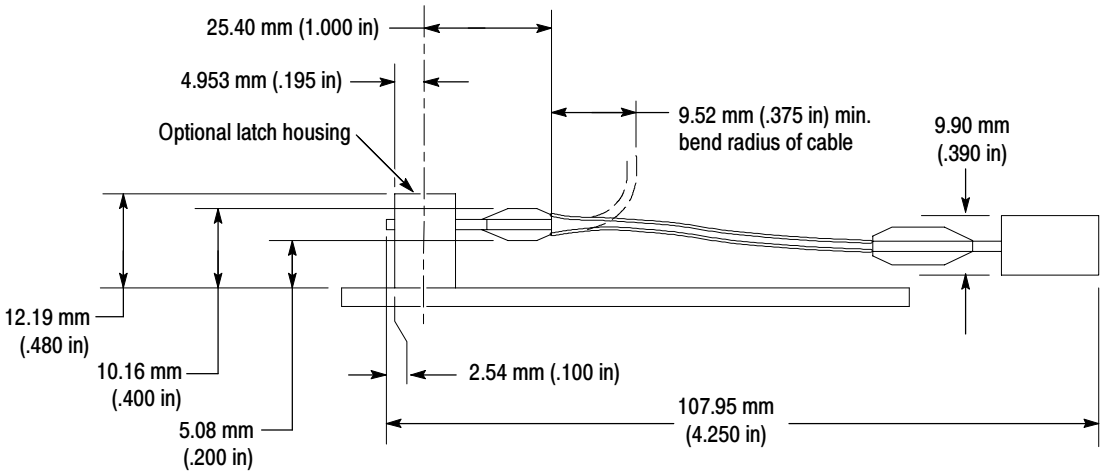


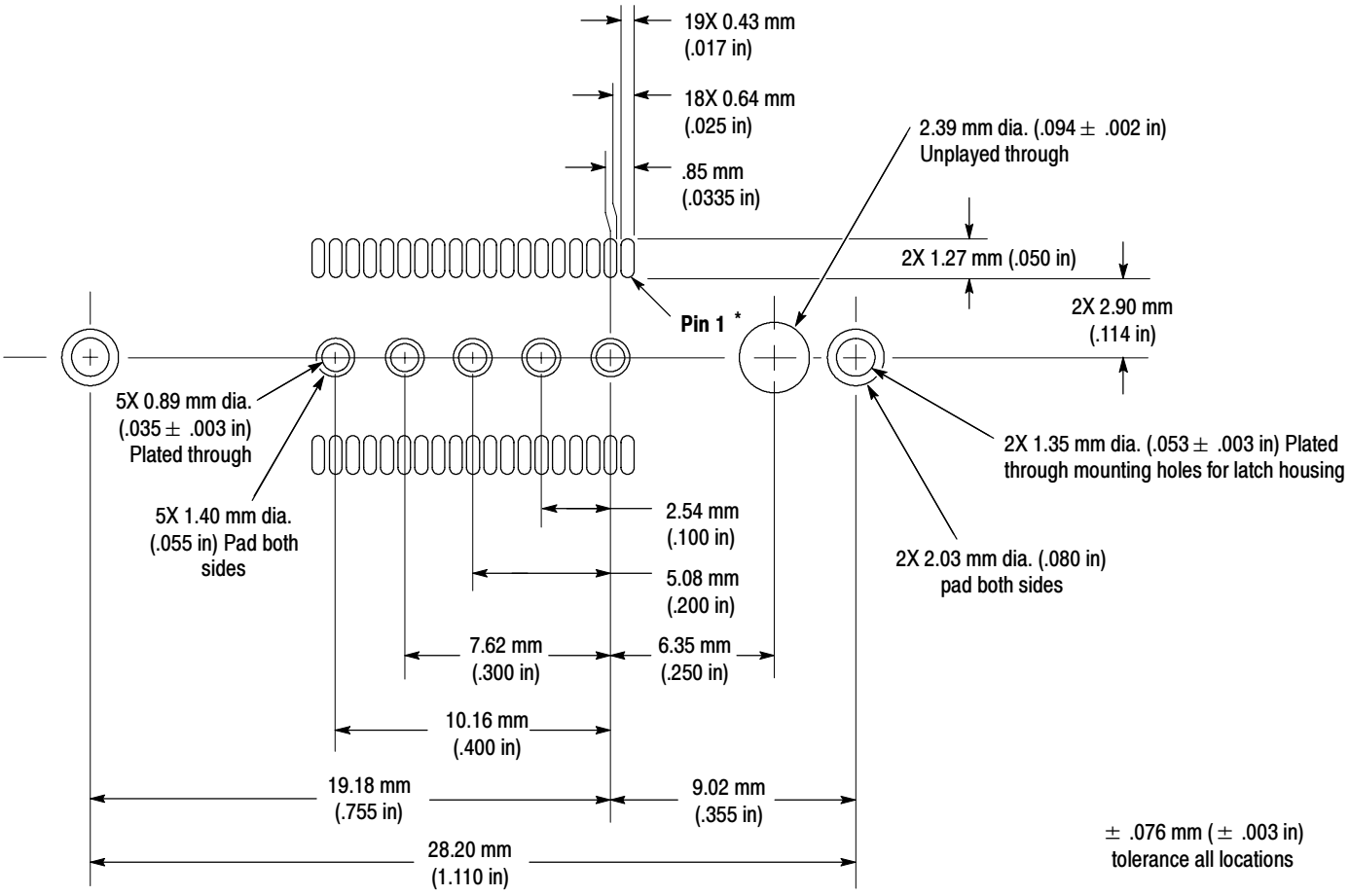
Figure 16: Side view and dimensions of the low-profile extender

Mechanical Layout and Pin Numbering Sequence of Compatible Mictor Connectors

Each compatible Mictor connector has 43 pins; pins 39 through 43 are grounded. Pins 1, 2, 37, and 38 are open. Figure 17 shows the positions and spacing between the pins, the keyhole, and the latch housing mounting holes of a surface-mounted connector. Table 4 on page 21 shows the recommended pin assignments.

Pin 1 Indicator

If you include the latch housing in your design, be sure to place a pin 1 indicator on your circuit board during design because the latch housing obscures the pin 1 indicator on the Mictor connector. Even though the Mictor connector is keyed, you still need to know the location of pin 1 when connecting the P6434 probe.

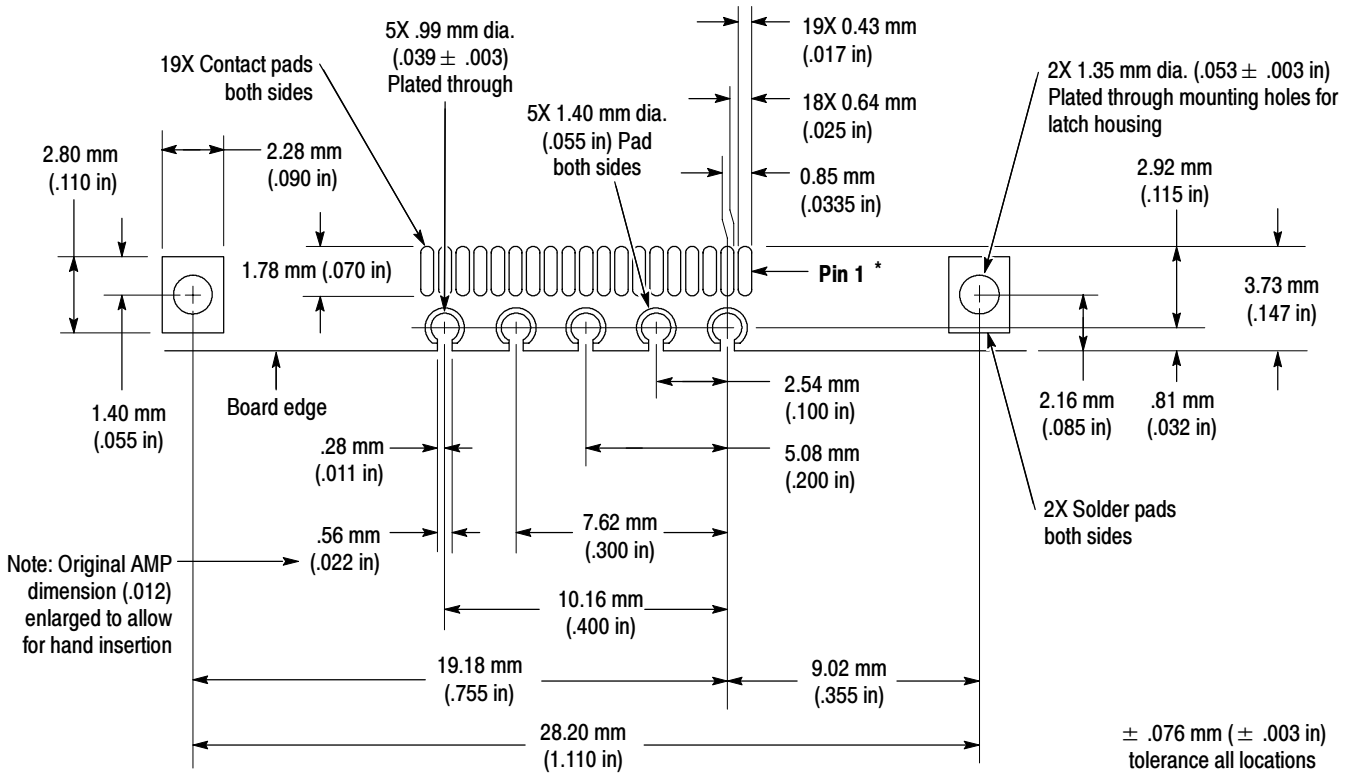


Notes: * The AMP pin assignment, an industry standard, is what we recommend for your circuit board layouts (see Table 4 on page 21).

Figure 17: Surface-mounted connector layout (component side)

Figure 18 shows the positions and spacing between the pins and latch housing mounting holes of a straddle-mounted connector.

***NOTE**. The straddle-mounted connector does not have a keyhole. Be sure to position pin 1 correctly when building the target system to maintain the correct mapping of signals from your target system to the logic analyzer probe sections and channels.*



Note: * The AMP pin assignment, an industry standard, is what we recommend for your circuit board layouts (see Table 4 on page 21).

Figure 18: Straddle-mounted connector layout (component side)

AMP Probe Channel Assignments (Preferred)

The 17 channels to which the module end connects on the logic analyzer cannot be changed. When mapping signals from your target system to channels on the logic analyzer, you must keep the probe section, clock, and/or qualifier channels together as shown in Tables 1 or 2 on page 3.

Each probe connector has 43 pins; pins 39 through 43 are the five ground pins. Pins 1, 2, 3, and 4 are unused, and it is recommended that they be connected to ground.

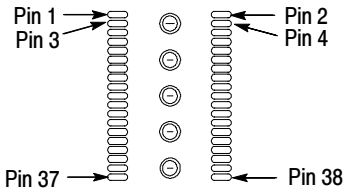
AMP Pin Assignment (Preferred)

The preferred pin assignment is the AMP pin assignment (see Table 4), because other commercial CAD packages use the AMP numbering scheme as the industry standard. Table 4 shows the pin assignments for the surface-mounted connector. Pin assignments are the same for the straddle-mounted connector.

AMP uses an odd-side even-side pin assignment. Pin 1 is located at the top left, and pin 3 is located directly below it. Pin 2 is located on the top right, and pin 4 is located directly below it. Refer to Table 5 on page 22 for the pin assignments.

***NOTE**. When designing Mictor connectors into your target system, always verify which pin-numbering sequence your CAD system uses.*

Table 4: Preferred pin assignments (AMP) for Mictor connector (component side)

Type of pin assignment	Comments
Preferred  **AMP Pin Assignment**	Preferred. This pin assignment is the industry standard and is what we recommend that you use.

Tables 5 and 6 show the sections and channels and the P6434 probe pins to which they connect. Tables 5 and 6 also complies with the labeling schemes in Tables 1 and 2 on page 3, except for the 34 channel module on the Pin 38 side of the probe. The Mictor pin numbers are shown for reference only.

***NOTE**. Table 2 on page 3 shows the labeling scheme for a 34 or 68 channel module.*

Table 5: Pin 1 side probe channel assignments

AMP pin number	Section and channel			
	A probe	C probe	D probe	E probe
5	CLK:0	CLK:3	Q0	Q3
7	A3:7	C3:7	D3:7	E3:7
9	A3:6	C3:6	D3:6	E3:6
11	A3:5	C3:5	D3:5	E3:5
13	A3:4	C3:4	D3:4	E3:4
15	A3:3	C3:3	D3:3	E3:3
17	A3:2	C3:2	D3:2	E3:2
19	A3:1	C3:1	D3:1	E3:1
21	A3:0	C3:0	D3:0	E3:0
23	A2:7	C2:7	D2:7	E2:7
25	A2:6	C2:6	D2:6	E2:6
27	A2:5	C2:5	D2:5	E2:5
29	A2:4	C2:4	D2:4	E2:4
31	A2:3	C2:3	D2:3	E2:3
33	A2:2	C2:2	D2:2	E2:2
35	A2:1	C2:1	D2:1	E2:1
37	A2:0	C2:0	D2:0	E2:0

Table 6: Pin 38 side probe channel assignments

AMP pin number	Section and channel			
	A probe	C probe	D probe	E probe
6	CLK:1	Q1	CLK:2	Q2
8	A1:7	C1:7	D1:7	E1:7

Table 6: Pin 38 side probe channel assignments (cont.)

AMP pin number	Section and channel			
	A probe	C probe	D probe	E probe
10	A1:6	C1:6	D1:6	E1:6
12	A1:5	C1:5	D1:5	E1:5
14	A1:4	C1:4	D1:4	E1:4
16	A1:3	C1:3	D1:3	E1:3
18	A1:2	C1:2	D1:2	E1:2
20	A1:1	C1:1	D1:1	E1:1
22	A1:0	C1:0	D1:0	E1:0
24	A0:7	C0:7	D0:7	E0:7
26	A0:6	C0:6	D0:6	E0:6
28	A0:5	C0:5	D0:5	E0:5
30	A0:4	C0:4	D0:4	E0:4
32	A0:3	C0:3	D0:3	E0:3
34	A0:2	C0:2	D0:2	E0:2
36	A0:1	C0:1	D0:1	E0:1
38	A0:0	C0:0	D0:0	E0:0

Nonstandard Probe Channel Assignments (Not Recommended)

The 17 channels to which the module end connects on the logic analyzer cannot be changed. When mapping signals from your target system to channels on the logic analyzer, you must keep the probe section, clock, and/or qualifier channels together as shown in Tables 1 and 2 on page 3.

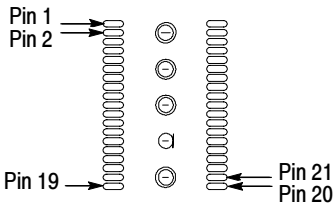
Each probe connector has 43 pins; pins 39 through 43 are the five ground pins. Pins 1, 2, 37, and 38 are unused, and it is recommended that they be connected to ground.

Nonstandard Pin Assignment (Not Recommended)

The nonstandard pin assignment was previously used by Tektronix but is no longer recommended due to incompatibility with other commercial CAD packages (see Table 7 on page 24).

The pin assignment is counterclockwise with Pin 1 located at the top left, and pin 2 located directly below it. Pin 20 is located on the bottom right, and pin 21 is located directly above it.

Table 7: Nonstandard pin assignment for Mictor connector (component side)

Type of pin assignment	Comments
Not Recommended  **Nonstandard Pin Assignment**	Not recommended. This pin assignment was previously used by Tektronix but is no longer recommended due to incompatibility with other commercial CAD packages.

Tables 8 and 9 show the sections and channels and the P6434 probe pins to which they connect. Tables 8 and 9 also comply with the labeling schemes shown in Tables 1 and 2 on page 3, except for the 34 channel module on the Pin 38 side of the probe. The Mictor pin numbers are shown for reference only.

NOTE. *Table 2 on page 3 shows the labeling scheme for a 34 or 68 channel module.*

Table 8: Pin 1 side probe channel assignments (nonstandard)

Nonstandard P6434 probe pin number *	Section and channel			
	A probe	C probe	D probe	E probe
3	CLK:0	CLK:3	Q0	Q3
4	A3:7	C3:7	D3:7	E3:7
5	A3:6	C3:6	D3:6	E3:6
6	A3:5	C3:5	D3:5	E3:5
7	A3:4	C3:4	D3:4	E3:4
8	A3:3	C3:3	D3:3	E3:3
9	A3:2	C3:2	D3:2	E3:2
10	A3:1	C3:1	D3:1	E3:1
11	A3:0	C3:0	D3:0	E3:0
12	A2:7	C2:7	D2:7	E2:7
13	A2:6	C2:6	D2:6	E2:6
14	A2:5	C2:5	D2:5	E2:5
15	A2:4	C2:4	D2:4	E2:4
16	A2:3	C2:3	D2:3	E2:3
17	A2:2	C2:2	D2:2	E2:2
18	A2:1	C2:1	D2:1	E2:1
19	A2:0	C2:0	D2:0	E2:0

*** These pin numbers were previously used by Tektronix but are no longer recommended due to incompatibility with other commercial CAD packages.**

Table 9: Pin 38 side probe channel assignments (nonstandard)

Nonstandard P6434 probe pin number *	Section and channel			
	A probe	C probe	D probe	E probe
36	CLK:1	Q1	CLK:2	Q2
35	A1:7	C1:7	D1:7	E1:7
34	A1:6	C1:6	D1:6	E1:6
33	A1:5	C1:5	D1:5	E1:5
32	A1:4	C1:4	D1:4	E1:4
31	A1:3	C1:3	D1:3	E1:3
30	A1:2	C1:2	D1:2	E1:2

Table 9: Pin 38 side probe channel assignments (nonstandard) (cont.)

Nonstandard P6434 probe pin number *	Section and channel			
	A probe	C probe	D probe	E probe
29	A1:1	C1:1	D1:1	E1:1
28	A1:0	C1:0	D1:0	E1:0
27	A0:7	C0:7	D0:7	E0:7
26	A0:6	C0:6	D0:6	E0:6
25	A0:5	C0:5	D0:5	E0:5
24	A0:4	C0:4	D0:4	E0:4
23	A0:3	C0:3	D0:3	E0:3
22	A0:2	C0:2	D0:2	E0:2
21	A0:1	C0:1	D0:1	E0:1
20	A0:0	C0:0	D0:0	E0:0

*** These pin numbers were previously used by Tektronix but are no longer recommended due to incompatibility with other commercial CAD packages.**

Loading and Equivalent Circuits

The load presented to the target system by the P6434 probe is low. The load is equivalent to a 2 pF capacitance with 20 kΩ resistance returned to a 2.2 V supply. The following approximation of the probe loading is sufficient for most circuit simulation calculations.

Figure 19 shows the equivalent circuit of the P6434 probe. Table 10 shows the values you can use to calculate characteristics of the lossy delay lines shown in the next two figures.

Table 10: Lossy delay line values

Characteristic	Value
C (capacitance)	1.58 pF per inch
L (inductance)	8.9 nH per inch
R (resistance)	0.067 Ω per inch
Z_0 (impedance)	75 Ω

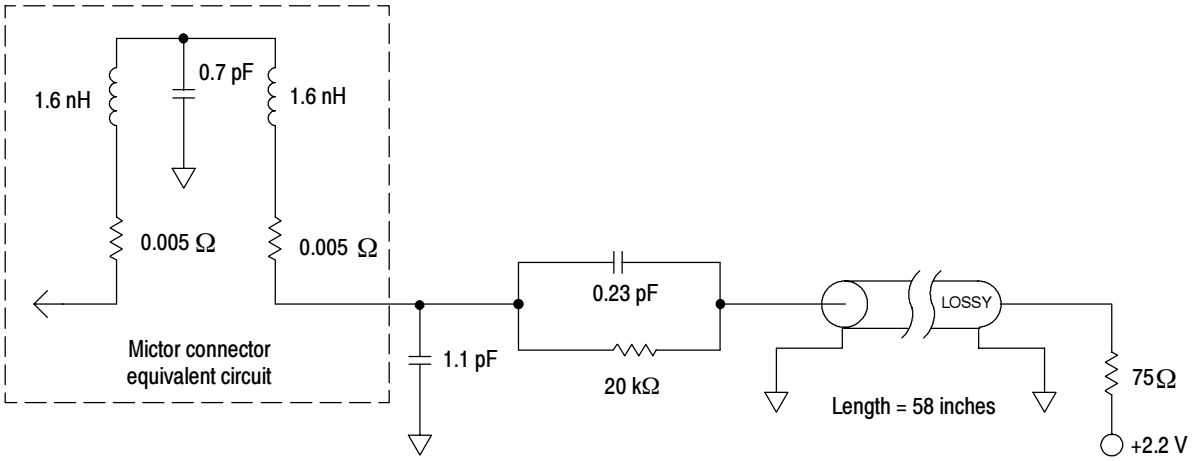


Figure 19: Equivalent circuit for the P6434 probe

The low-profile extender used with the P6434 probe increases the load. The additional load is equivalent to a 100 Ω resistor connected in series with approximately three inches of 75 Ω coaxial cable to the probe tip.

Although the extender can increase the loading significantly, using the extender might be necessary in situations where there is as little as half an inch of clearance.

The extender is useful in a target system where signal risetimes are greater than one or two nanoseconds. Faster risetimes cause transmission line reflections on signals.

Figure 20 shows the equivalent circuit for the P6434 probe with a low-profile extender

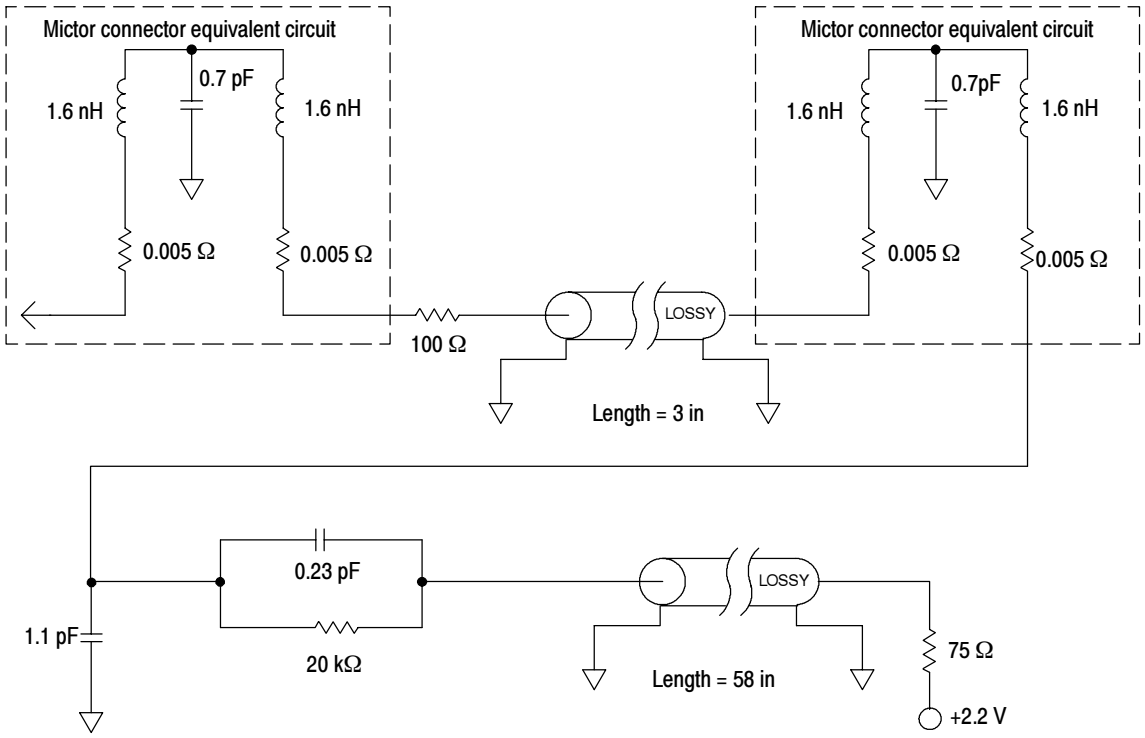


Figure 20: Equivalent circuit for the P6434 probe with a low-profile extender

Reference

This section contains information on the following topics and tasks:

- Probe maintenance
- Probe circuit description
- Specifications
- Disassembly and reassembly procedures
- Functional verification procedure

Maintenance

The P6434 probe does not require scheduled or periodic maintenance. To maintain good electrical contact, keep the probe free of dirt, dust, and contaminants. Also, ensure that any electrically conductive contaminants are removed.

Dirt and dust can usually be removed with a soft brush. For more extensive cleaning, use only a damp cloth. Abrasive cleaners and organic solvents should never be used.



CAUTION. *To prevent damage, service the probe only in a static-free environment. The component devices contained on the P6434 probe are susceptible to static-discharge damage.*

If the probe is connected to the target system, grasp the ground connector on the back of the logic analyzer to discharge your stored static electricity. If the probe is not connected, touch the antistatic bag to discharge stored static electricity from the probe.

Always wear a grounding wrist strap, or similar device, while servicing the probe.

If you connect and disconnect the P6434 probe frequently, occasionally use a magnifying glass to examine the contact points on both the probe tip and on the mating connector. If contacts have been dislocated from their proper position,

you can use a pair of small tweezers (such as a #3 to #5), to carefully move the contacts back into place.

Circuit Description

The P6434 probe contains 34 sets of signal connections (32 used as data channels and two used as clock or qualifier channels). The probe tip connection is a 38-pin Mictor connector by AMP, Inc. Each signal line has a 20 kΩ ± 1% resistor (shunted by a 0.23 pF capacitor) in series with an approximately five foot long section of 75 Ω coaxial cable.

Specifications

These specifications are for a P6434 probe connected between a compatible Tektronix logic analyzer and a target system. Table 11 shows the electrical requirements of the P6434 probe.

Table 11: Electrical specifications

Characteristics	Requirements	
Number of input channels	34 (32 data and 2 clock/qualifier channels)	
Input impedance	20 kΩ ±1% in parallel with 2 pF ± 0.2 pF	
Threshold accuracy	±100 mV	
Channel-to-channel skew	<150 ps	
Delay time from probe tip to module end	7.33 ns (The approximate length of the probe is 1.6 m or 62 in.)	
Max. operating swing time	8 V peak-to-peak	
Probe overdrive	The greater of ± 300 mV or ± 25% of signal swing	
Max. nondestructive input signal to probe	±15 V	
Max. sync clock rate	200 MHz in full speed mode (5 ns between active clock edges)	
Min. sampling period	4 ns (0.5 ns w/MagniVu)	
Measured typical signal loading*	**AC load**	**DC load**
	≈2 pF	≈20 kΩ*

* **The 20 kΩ resistor is returned to +2.2 V.**

Table 12 shows the environmental specifications.

Table 12: Environmental specifications

Characteristic	Description*
Temperature	
Maximum operating	+50 ° C (+122 ° F)†
Minimum operating	0 ° C (+32 ° F)
Non-operating	-55 ° C to +75 ° C (-67 ° F to +167 ° F)
Humidity	10 to 95% relative humidity
Altitude	
Operating	4.5 km (15,000 ft) maximum
Non-operating	15 km (50,000 ft) maximum

* **Designed to meet Tektronix standard 062-2847-00 class 5.**

† **Not to exceed target system thermal considerations. Forced air cooling might be required.**

Table 13 shows the certifications and compliances that apply to the P6434 probe.

Table 13: Certifications and compliances

Category	Standards or description
EC Compliance	There are no current European Directives that apply to this product.

Figure 21 shows the vertical dimensions of the P6434 probe and low-profile extender.

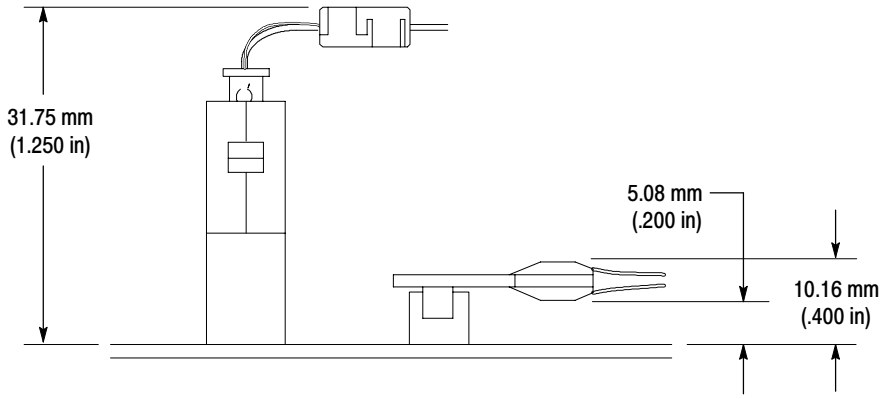


Figure 21: Vertical dimensions of the P6434 probe and low- profile extender

Figure 22 shows the vertical dimensions of the P6434 probe and Reduced Bias Voltage adapter.

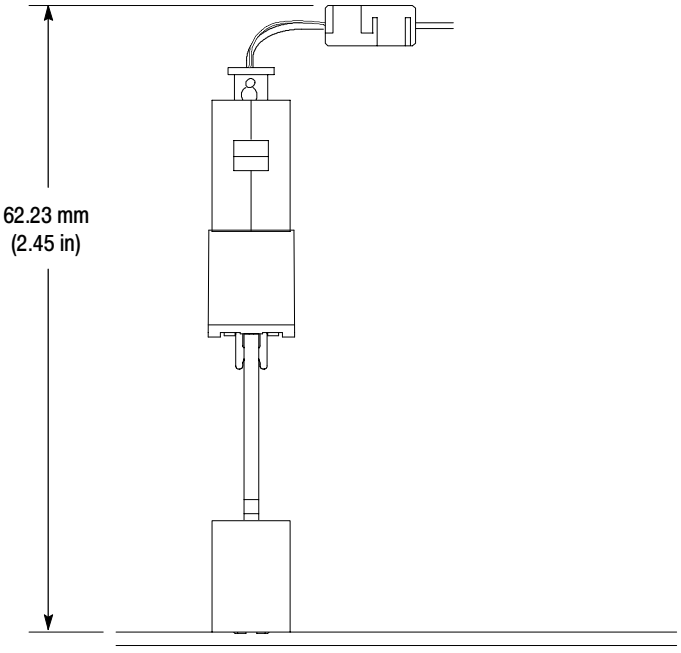


Figure 22: Vertical dimensions of the P6434 probe and Reduced Bias Voltage Adapter

Disassembling the Probe

The following procedures describe disassembling the P6434 probe. If you are installing the connector parts replacement kit, follow the *Probe Tip* procedures on pages 33 and 36. If you are installing either of the cable replacement kits, you must also perform the *Latch Release Grip* and *Module End* procedures.

Probe Tip

To disassemble the probe tip, follow these steps (refer to Figure 23 as a guide):

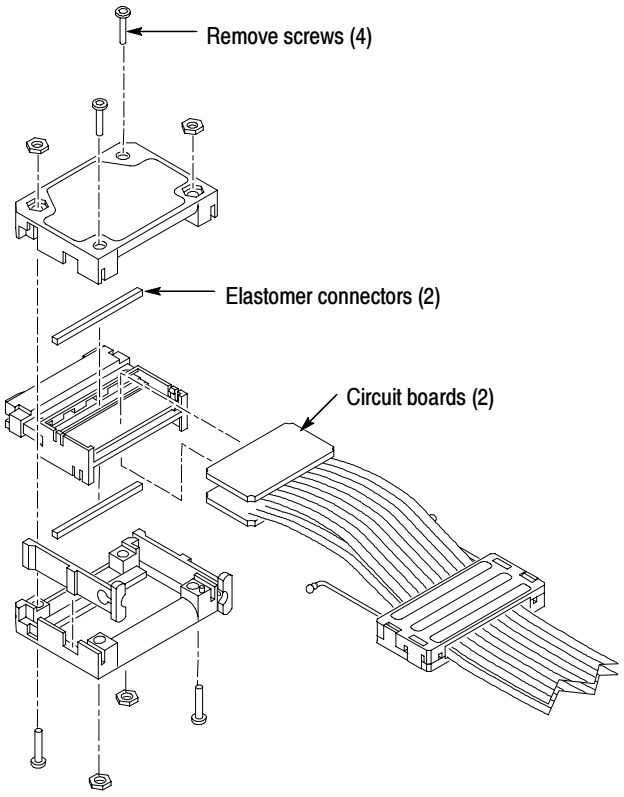


Figure 23: Disassembling the P6434 probe tip

1. Remove the four screws from the outside of the probe case using a 0.050-inch hexagonal screwdriver, and open the case halves.
2. Gently remove the two small circuit boards and cables from the plastic holder. The small circuit boards are held in place by two tab features in the plastic holder.

   The circuit boards hold the elastomer connectors (which are very small) in place. When you remove the circuit boards, the elastomer connectors may fall out of the probe.

CAUTION. *To prevent damage to the elastomer, use tweezers and handle the elastomer connectors on the flat areas adjacent to the gold plated contact pads. The elastomer connectors are very small and are susceptible to contamination by natural skin oils and mishandling.*

3. Using tweezers on the flat areas adjacent to the gold plated contact pads, remove the elastomer connectors. See Figure 27 on page 37.
4. If you are installing either the pin 1 or pin 38 cable kit, follow the *Latch Release Grip* and *Module End* disassembly procedures on pages 34 and 35.
5. If you are only installing the connector parts replacement kit, follow the *Probe Tip* procedure on page 36.

Latch Release Grip

To disassemble the latch release grip, follow these steps:

1. Use two small, flat-bladed screwdrivers in the slots opposite the tabs on each side of the grip as shown in Figure 24.
2. With thumbs placed lightly on the tabs to be released, pry the grip open by carefully levering the screwdrivers down. Do not overstress the tabs beyond deflection required to release the tabs.

   When you open the latch release grip, the latch release cord comes out of the grip, thereby detaching the grip from the latch release on the probe.

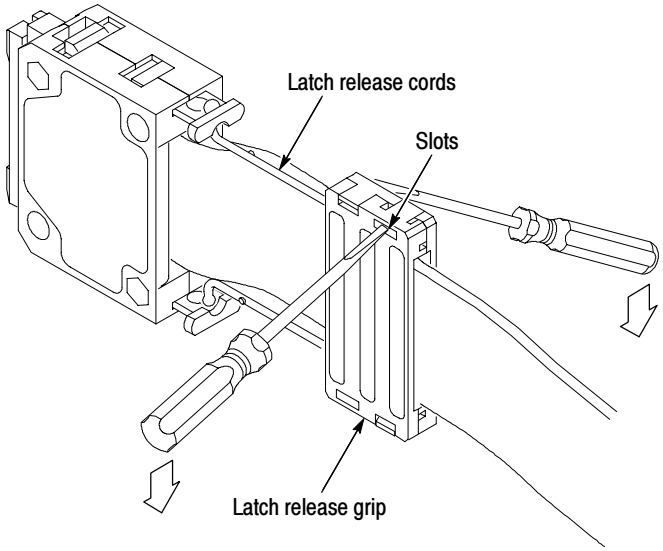


Figure 24: Disassembling the latch release grip

Module End

To disassemble the module end of the probe, refer to Figure 25 and follow these steps:

1. On the module end, remove the four screws from the outside of the connector housing using a 0.050-inch hexagonal screwdriver, and open the housing.
2. Remove the cable with the connector attached.
3. Remove the trim pieces from the connector housing.

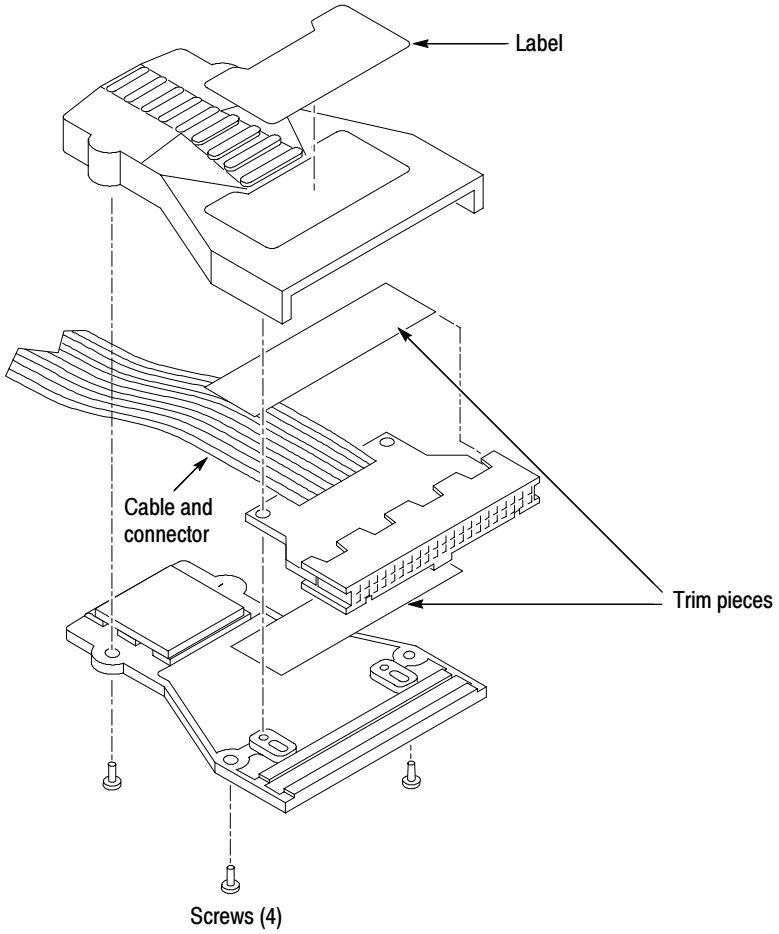


Figure 25: Disassembling the module end

Reassembling the Probe

Use the following procedures to reassemble the P6434 probe.

***NOTE**. When reassembling the probe, you must use both the new board holder and both elastomer connectors included with the service kit. These components have design improvements that must be replaced as a set.*

Probe Tip

To reassemble the probe tip, refer to Figure 26 and follow these steps:

1. If you are reusing the Mictor connector circuit board, remove the old board holder.
2. Install the Mictor connector circuit board into the new board holder.

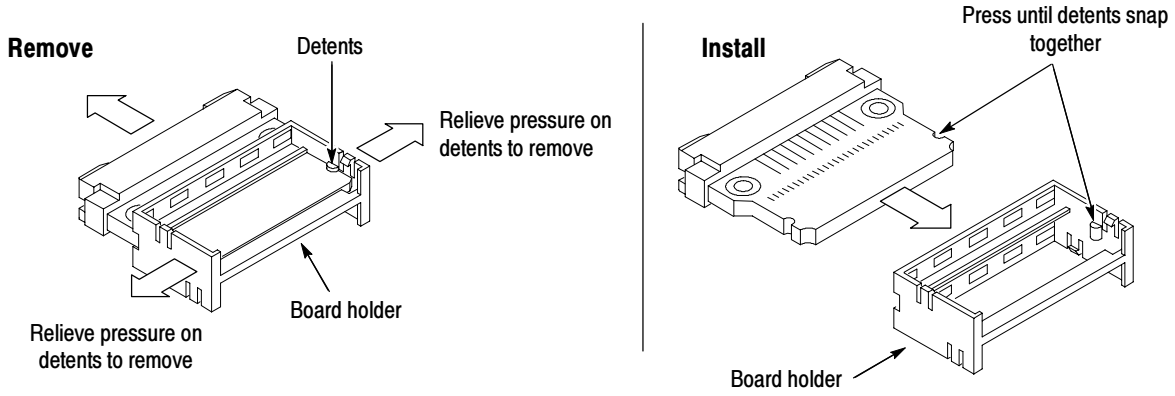


Figure 26: Mictor connector circuit board and board holder

3. Lay the Mictor board assembly on a flat surface with the pin 1 side of the connector facing up. See Figure 28 on page 37 for the correct orientation.

***CAUTION.** To prevent damage to the elastomer, use tweezers and handle the elastomer connectors on the flat areas adjacent to the gold plated contact pads. The elastomer connectors are very small and are susceptible to contamination by natural skin oils and mishandling.*

4. Using tweezers on the flat areas on both sides of the gold plated contact pads, carefully orient the elastomer connector, and place it in the elastomer slot in the board holder as shown in Figure 27.

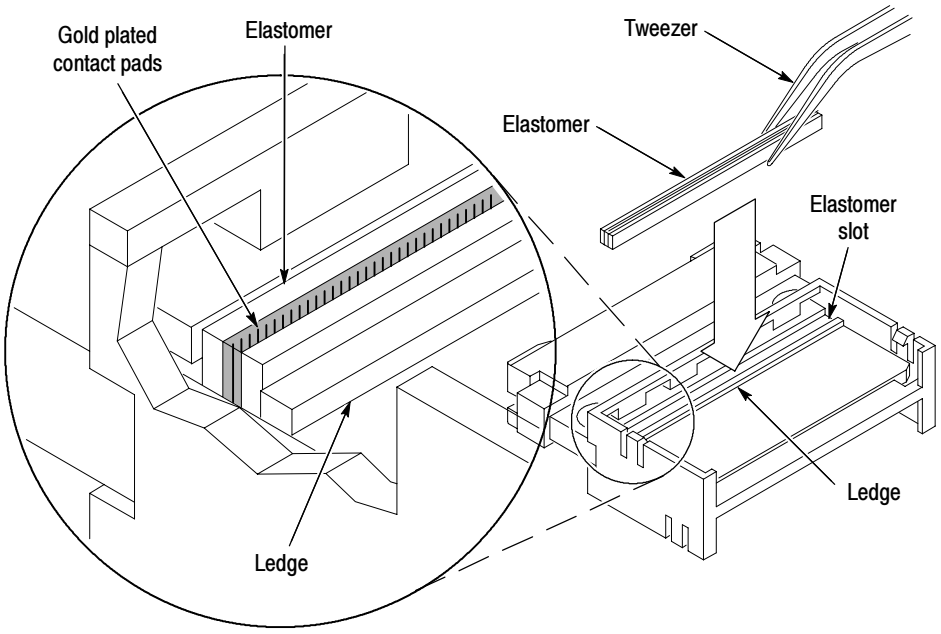


Figure 27: Positioning the elastomer connector

5. Place the circuit board attached to the pin 1 cable into the back (cable side) of the board holder as shown in Figure 28.

6. Press the front (connector side) of the circuit board attached to the cable down until it snaps into place in the board holder.

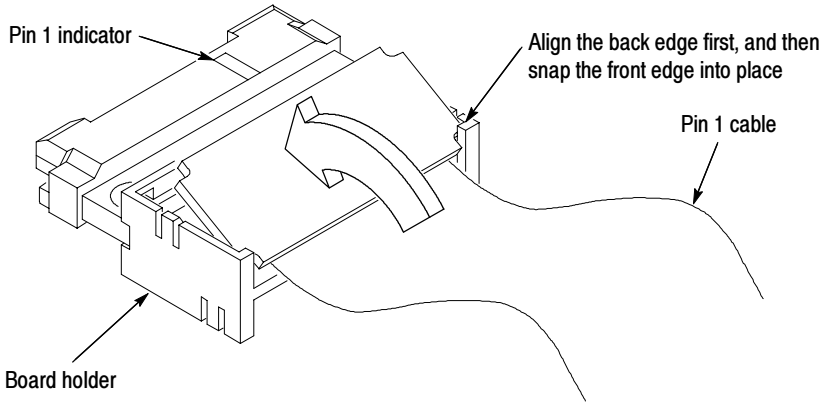


Figure 28: Positioning the circuit board in the probe

7. Turn the probe over and repeat steps 4 through 6 for the pin 38 side of the probe.

8. Position a latch release on each side of the case half. See Figure 29.

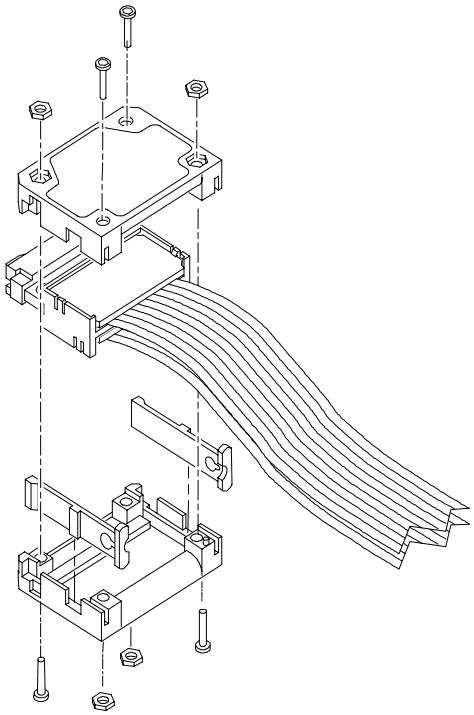


Figure 29: Reattaching the latch releases and case halves

9. Align the pin 1 case half with the pin 1 side of the connector, attach the case halves, and reconnect the screws as shown in Figure 29.

Latch Release Grip

To reassemble the latch release grip, follow these steps:

1. Place the latch release cords into the latch releases as shown in Figure 30.
2. Push the latch release downward to force the latch release cord to snap through the slot and into the small hole.

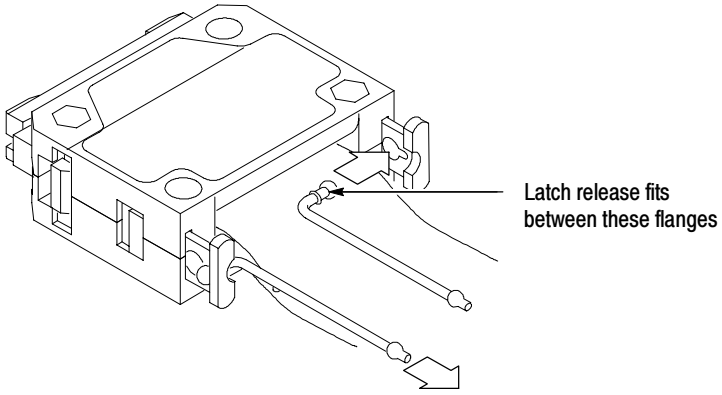


Figure 30: Reattaching the latch release cords to the latch releases

3. Place the other end of the latch release cords into the latch release grip and reconnect the latch release grip as shown in Figure 31.

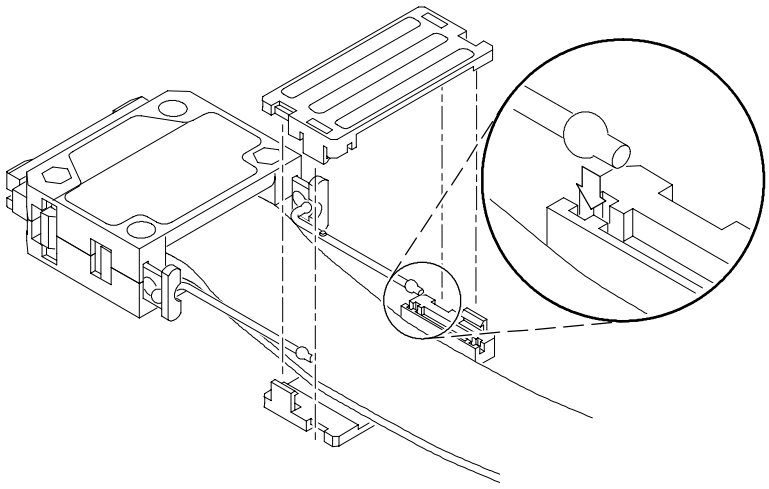


Figure 31: Reconnecting the latch release cords to the latch release grip

4. You may need to reapply labels. Refer to the description of *Labels* on page 3 for information on how to apply labels.

Module End

To reassemble the module end of the probe, follow these steps:

1. If you are installing either the pin 1 or pin 38 cable kit, follow the procedure to reassemble the probe tip.
2. On the module end, position the trim pieces in the connector housing as shown in Figure 32.

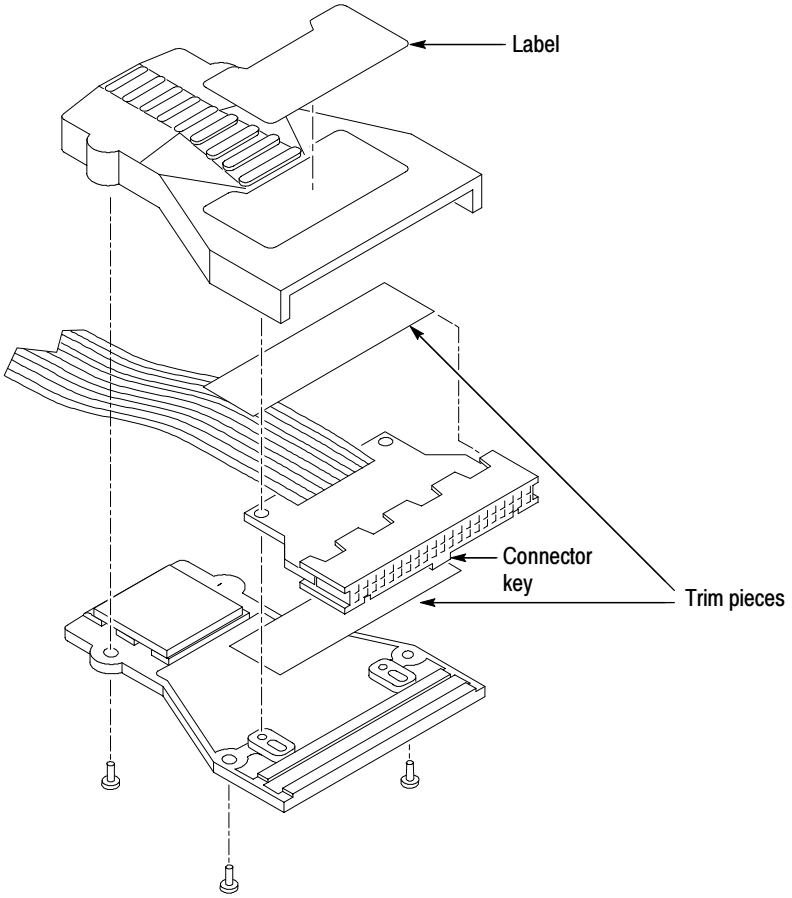


Figure 32: Reassembling the module end

3. Orient the nonkeyed side of the connector to the case half with the label, and position the connector in the case halves.
4. Attach the case halves and reconnect the screws as shown in Figure 32.
5. You may need to reapply labels. Refer to the description of *Labels* on page 3 for information on how to apply labels.

Functional Verification

This procedure checks the basic functionality of the probe by verifying that the probes recognize signal activity at the probe tips. No calibration is necessary.

The functional verification procedure for the P6434 probe requires the following test equipment:

- Adjustment and verification test fixture (refer to the *Replaceable Parts List* section under *Optional Accessories* on page 48 for part number information)
- Power supply for the test fixture (refer to the *Replaceable Parts List* section under *Optional Accessories* on page 48 for part number information)
- Logic analyzer mainframe
- Logic analyzer module

To perform the functional verification procedure, follow these steps:

1. Connect the module ends of the P6434 probe to the logic analyzer module.
2. Connect the probe tip to J5 on the the test fixture as shown in Figure 33.

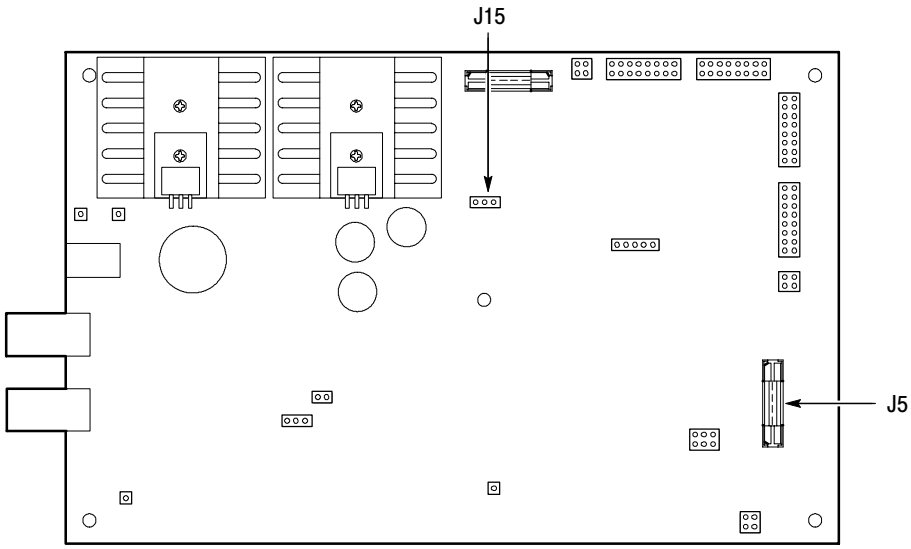


Figure 33: Jumper and connector locations on the test fixture

3. Place J15 in the INT position to select the internal 50 MHz clock.
4. Connect the power adapter to the test fixture and power on the test fixture.
5. Power on the logic analyzer.

6. Verify that the logic analyzer passes the power-on diagnostics.
7. Go to the Setup menu for the logic analyzer module to which the probes are connected.
8. Click the Set Thresholds button to display the threshold settings. Set the threshold for all channels to be 700 mV. Close the Probes Threshold dialog box and click Set All.
9. Click the Show Activity button to display the Activity Indicator dialog box.
10. Visually verify that the Activity Indicator dialog box shows activity on all probe channels that are connected to the test fixture (see Figure 34).

    Note the signal activity for the clock, qualifier and data channels for the C3, C2, C1, and C0 probe sections. Also note that there is no activity on other probe sections because the probes are not connected to a signal source. (The channels are all high.)

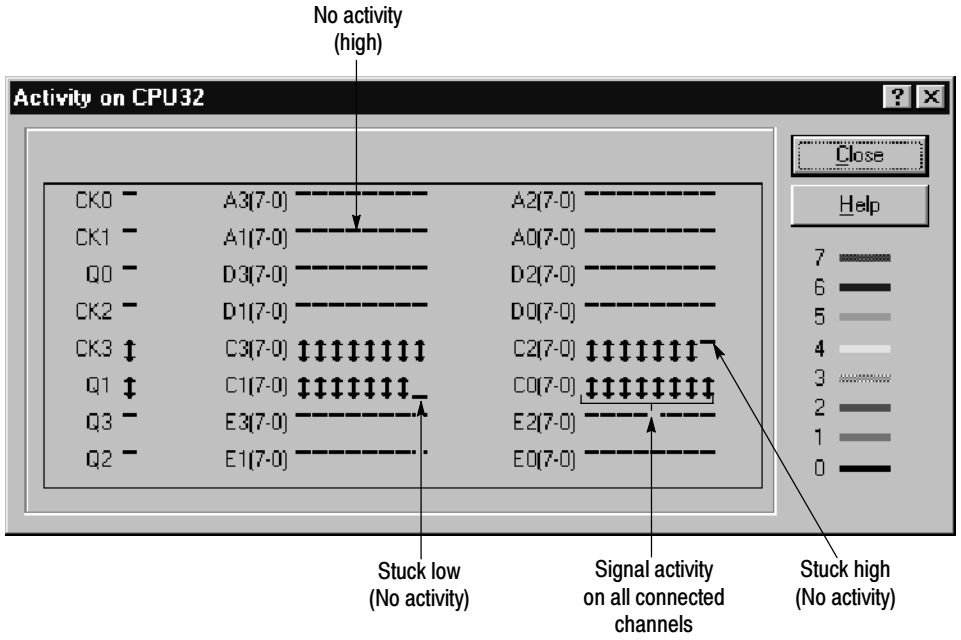


Figure 34: Example of the Activity Indicator dialog box

11. Visually verify in the Activity Indicator dialog box that none of the connected channels are stuck high or stuck low (see Figure 34).



CAUTION. *To prevent damage to the test fixture connector, grasp the mictor connector on the test fixture when wiggling the probe tip end.*

To check for intermittent failures, gently wiggle each of the three probe ends. The test fixture only checks for open channels; therefore, if channels are shorted together, these channels will appear as connected signal activity on the test fixture.

12. Repeat this procedure for additional probes.

13. Close the Show Activity widow.

14. Return the threshold levels to their former values in the Probe Threshold window.

This completes the functional verification.

Replaceable Parts

This chapter contains a list of the replaceable components for the P6434 Probe. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

Using the Replaceable Parts List

The tabular information in the Replaceable Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes the content of each column in the parts list.

Parts list column descriptions

Column	Column name	Description
1	Figure & index number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix part number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entries indicates the part is good for all serial numbers.
5	Qty	This indicates the quantity of parts used.
6	Name & description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
7	Mfr. code	This indicates the code of the actual manufacturer of the part.
8	Mfr. part number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations

Abbreviations conform to American National Standard ANSI Y1.1–1972.

Chassis Parts

Chassis-mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts List.

Mfr. Code to Manufacturer Cross Index

The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers cross index

Mfr. code	Manufacturer	Address	City, state, zip code
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077-0001
00779	AMP INC.	CUSTOMER SERVICE DEPT PO BOX 3608	HARRISBURG, PA 17105-3608
0GV90	GLOBTEK INC	186 VETERANS DRIVE	NORTHVALE, NJ 07647-2303
60381	PRECISION INTERCONNECT CORP.	16640 SW 72ND AVE	PORTLAND, OR 97224

Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
25-0	010-6434-01			1	PROBE; P6434 MASS TERMINATION; 34 CHANNEL	80009	010-6434-01
	118-9479-00			1	SERVICE KIT; MECHANICAL PARTS INCLUDES:	80009	118-9479-00
-1				1	LABEL SHEET; PROBE TIP AND MODULE ENDS, P6434		
-2				4	SCREWS, #1-72 x 0.375 BUTTON HEAD		
-3				4	NUTS, #1-72 HEX		
-4				2	PROBE TIP CASE HALVES		
-9				2	PULL GRIP HALVES		
-10				1	MODULE END CASE HALF, TOP		
-11				2	TRIM, CONNECTOR HOUSING		
-12				1	MODULE END CASE HALF, BOTTOM		
-13				4	SCREWS, #2-56 x 0.187 BUTTON HEAD		
-14				2	PULL CORDS		
-15				2	LATCH RELEASES		
	118-9477-01			1	SERVICE KIT; CABLE PARTS;PIN 1 SIDE INCLUDES:	80009	118-9477-01
-5				2	ELASTOMER CONNECTORS		
-6				1	BOARD HOLDER; MOLDED		
-7				1	PIN 1 SIDE CABLE WITH CIRCUIT BOARD		
-9				2	PULL GRIP HALVES		
-14				2	PULL CORDS		
				1	KIT INSTRUCTIONS		
	118-9487-01			1	SERVICE KIT; CABLE PARTS; PIN 38 SIDE INCLUDES:	80009	118-9487-01
-5				2	ELASTOMER CONNECTORS		
-6				1	BOARD HOLDER; MOLDED		
-8				1	PIN 38 SIDE CABLE WITH CIRCUIT BOARD		
-9				2	PULL GRIP HALVES		

Replaceable parts list (cont.)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
-14				2	PULL CORDS		
				1	KIT INSTRUCTIONS		
	118-9478-01			1	SERVICE KIT; CONNECTOR PARTS INCLUDES:	80009	118-9478-01
-5				2	ELASTOMER CONNECTORS		
-6				1	BOARD HOLDER; MOLDED		
-16				1	MICTOR CONNECTOR CKT BD W MICTOR CONNECTOR		
				1	KIT INSTRUCTIONS		
					STANDARD ACCESSORIES		
	070-9793-XX			1	MANUAL,TECH:INSTRUCTION, P6434 PROBE	80009	070-9793-XX
	105-1088-00 *			1	LATCH HOUSING; STRADDLE MOUNT (NOT SHOWN)	80009	105-1088-00
	105-1089-00 *			1	LATCH HOUSING; SURFACE MOUNT (NOT SHOWN)	80009	105-1089-00
	131-6134-01 †				CONN,RCPT:SMD,MICTOR,FEMALE,STR,38 POS,0.025 CTR,0.240 H,PALLADIUM NICKEL,IMPEDANCE MATCH (NOT SHOWN)	TK0AT	767054-1
	131-6520-00 †				CONN,RCPT:EDGE MOUNT,MICTOR,FEMALE,RTANG,38 POS,0.025 CTR,PD NI,MATCHED IMPEDANCE (NOT SHOWN)	TK0AT	767044-1
					OPTIONAL ACCESSORIES		
-17	010-0612-00			1	LOW-PROFILE EXTENDER, 4.25 INCH OVERALL	80009	010-0612-00
-18	671-5481-00			1	P6434 REDUCED BIAS VOLTAGE ADAPTER	80009	671-5481-00
-19	020-2455-00			1	17CH COMPRESSION-ON-PCB TO P6434 MICTOR ADAPTER	80009	020-2455-00
-20	020-2456-00			1	34CH COMPRESSION-ON-PCB TO P6434 MICTOR ADAPTER	80009	020-2456-00
	671-3599-01			1	ADJUSTMENT/VERIFICATION TEST FIXTURE	80009	671-3599-01
	119-4855-00			1	POWER SUPPLY (US):18W,WALL MOUNT,120VAC 60HZ INPUT,12VDC 1.5A OUTPUT,UNREGULATED,183CM CABLE,STR C (NOT SHOWN)	0GV90	WD1E1500C12CP
	119-4856-00			1	POWER SUPPLY (EC):18W,WALL MOUNT,220VAC 50HZ INPUT,12VDC 1.5A OUTPUT,UNREGULATED,183CM CABLE,STR C (NOT SHOWN)	0GV90	WD13E1500C12CP
	119-4859-00			1	POWER SUPPLY (JP):18W,WALL MOUNT,100VAC 60HZ INPUT,12VDC 1.5A INPUT,UNREGULATED,183CM CABLE,STR CO (NOT SHOWN)	0GV90	WD49E1500C12CP

***Contact your Tektronix representative for pricing of larger quantities of latch housings or Precision Interconnect as listed in the manufacturers cross index.**

† Order from Tektronix for quantities smaller than 27; if larger, from AMP,INC as listed in the manufacturers cross index.

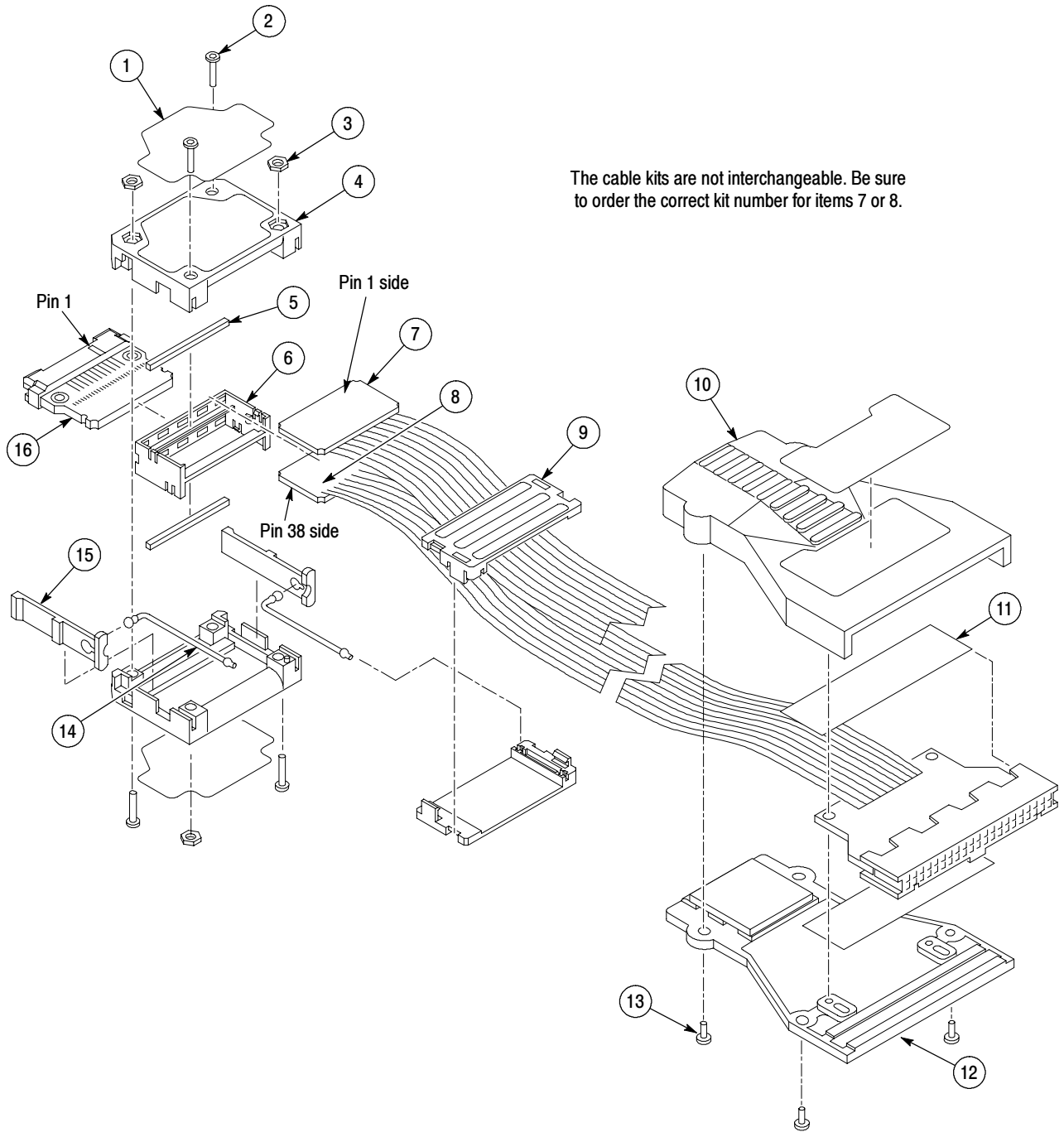


Figure 35: P6434 probe exploded view

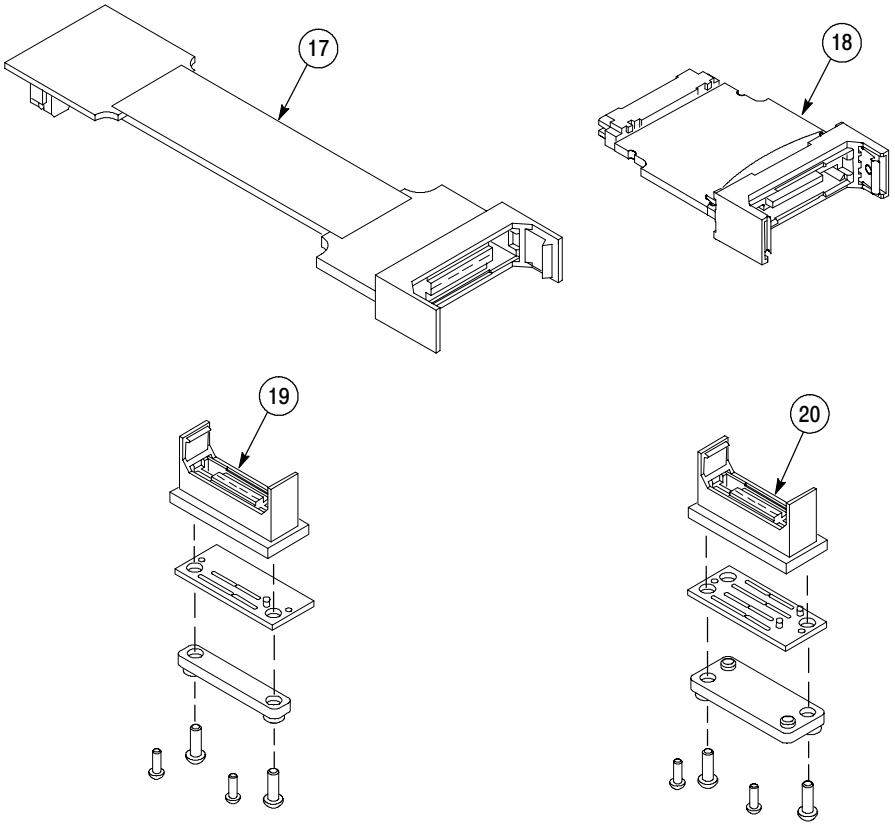


Figure 36: Optional accessories

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