# Installation Note

## Agilent Technologies ESG Family Signal Generators
## CPU/Motherboard Q501 Relocated to Chassis Kit
## Part Number E4400-60229

Agilent Technologies

**Part Number E4400-90379**
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**Notice**

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# E4400-60229 Replacement Kit

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|---|---|
| Product Affected: . . . . . | E4400B, E4420B, E4421B, E4430B/BU, E4431B/BU, E4432B/BU, and E4433B/BU RF Signal Generators. |
| Serial Numbers: . . . . . | All |
| Options: . . . . . | |
| Compatibilities: . . . . . | |
| To Be Performed By: . . . . . | (X) Agilent Technologies Service Center<br>( ) Personnel Qualified by Agilent Technologies<br>( ) Agilent Technologies personnel on-site |
| Estimated Installation Time: . . . . . | 1.0 hour |
| Estimated Performance Test Time: . . . . . | 0.3 hour |

## Description

This ESG and ESG-D B Series RF Signal Generator Q501 Relocation Kit relocates Q501 to the instruments chassis.

**NOTE** These instructions apply to all ESG models with a serial prefix <3934 for models E4400B, E4420B, E4421B, E4422B, E4430B/BU, E4431B/BU, E4432B/BU, and E4433B/BU.

**CAUTION** Failure to follow these instructions may result in a non-functional instrument.

To install this kit, the following major steps need to be performed:

1. Remove the existing A14Q501 from the CPU/Motherboard.
2. Install the 3 pin connector header into the CPU/Motherboard.
3. Relocate Q501 to the instrument's chassis.
4. Measure Q501's output voltage on the CPU/Motherboard.

After installing the hardware, perform the verification procedure as described in this installation note.

## Installation Kit Parts List

| Quantity | Description | Part Number | Comments |
|---|---|---|---|
| 1 | Q501 Assembly | E4400-60221 | Q501/Harness |
| 1 | Q501 Plate with PEM | E4400-00040 | Nut Plate for chassis mount |
| 1 | Q501 Plate without PEM | E4400-00041 | Plate located under Q501 |
| 1 | Insulator bushing | 0340-1162 | Nylon washer insulates screw |
| 1 | Screw 3MMX10 | 0515-0374 | Screw attaches Q501 to chassis |
| 1 | Connector Header 3 pin | 1252-3332 | Inserted into CPU/Motherboard |
| 1 | Screw Machine 3MMX8 | 0515-0372 | Screw attaches Motherboard to chassis |
| 1 | Installation Note | E4400-90379 | |

## Tools Required

- ❏ Hand Torque Driver 6 in-lb
- ❏ Hand Torque Driver 9 in-lb
- ❏ Torxdriver T-10
- ❏ Torxdriver T-15

# Verifying the Functionality of the Signal Generator

## Power on the Signal Generator and Check for Error Messages

This procedure verifies that the signal generator powers up and that the internal instrument check identifies no errors. The internal check evaluates the correctness of operation and returns an error message if a problem is detected.

1. Turn power on to the signal generator by pressing the power switch. The green LED will light. Let the signal generator warm up for one hour.
2. Cycle the power to the signal generator. The green LED should again be lit and the instrument will perform a check.
3. When the display is lit, check to see if the ERR annunciator is on.
4. If the ERR annunciator is on, review the error messages in the queue by pressing **Utility** > **Error Info** > **View Next Error Message**. The first error message in the queue is shown in the text area of the display. Refer to the service guide for information about the error message.

   If there is more than one error message (each message will be designated as 1 of *n*), continue pressing the **View Next Error Message** softkey until you have seen all of the messages.
5. After you have resolved all of the error messages, press **Clear Error Queue(s)** to delete the messages. Then restart this procedure at step two.

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**NOTE** For signal generators with Option 1E5, `ERROR 514, Reference Oven Cold` occurs whenever the signal generator is first connected to AC line power. The `OVEN COLD` annunciator and the ERR annunciator will both turn on. The `OVEN COLD` annunciator will automatically clear after approximately 5 minutes. The error queue *cannot* cleared, however, until the `OVEN COLD` annunciator has turned off.

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# Installation Procedure

Save all hardware so it can be re-installed.

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| **WARNING** | **Before you disassemble the instrument, turn the power switch off and unplug the instrument. Failure to unplug the instrument can result in personal injury.** |
| **CAUTION** | Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation. |

## Remove the Instrument Covers

1. Remove the strap handles (item 1) from each side of the signal generator by loosening the two screws (item 2) on each handle. Refer to Figure 1.
2. Remove the four bottom feet (item 3).
3. Remove the rear four feet (item 4) from the signal generator by removing the four screws (item 5) that secure them.
4. Slide the instrument cover (item 6) off the back of the signal generator.
5. Remove the top cover by removing the 11 screws that secure it.
6. Remove the bottom cover by removing the 15 screws that secure it.

## Remove A14Q501 from the CPU/Motherboard

1. Turn the signal generator upside-down and remove the screw (item 2) from the transistor A14Q501 that is attached to the CPU/Motherboard (A14). Refer to Figure 2.
2. Desolder the three leads of A14Q501 and remove the transistor. Remove all excess solder from the three lead holes.

## Add the 3 Pin Connector Header to the CPU.Motherboard

1. From the top of the CPU/Motherboard, insert the 3 pin connector header (1252-3332) into the three holes vacated by A14Q501. Refer to Figure 5.

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| **NOTE** | Insert the 3 pin connector header so that the large open long slot in the connector is facing towards connector J6. This connector is meant to be positioned one way for polarity purposes regarding Q501. |

2. From the bottom side of the CPU/Motherboard, hand solder the three leads of the 3 pin connector to the CPU/Motherboard.
3. Now insert screw (0515-0372) to secure the CPU/MOtherboard to the chassis into the hole directly adjacent to the previous hole that held A14Q501. Torque the screw to 9 inch-lbs. Refer to Figure 3.

## Relocate Q501 with Wiring Harness to the Instrument Chassis

The purpose of this procedure is to provide a process for attaching a new Q501 to the instrument chassis and then attaching Q501's wiring harness into the new A14 motherboard. The relocation of Q501 to the instrument chassis eliminates mechanical stress imposed upon this component.

**Figure 1**

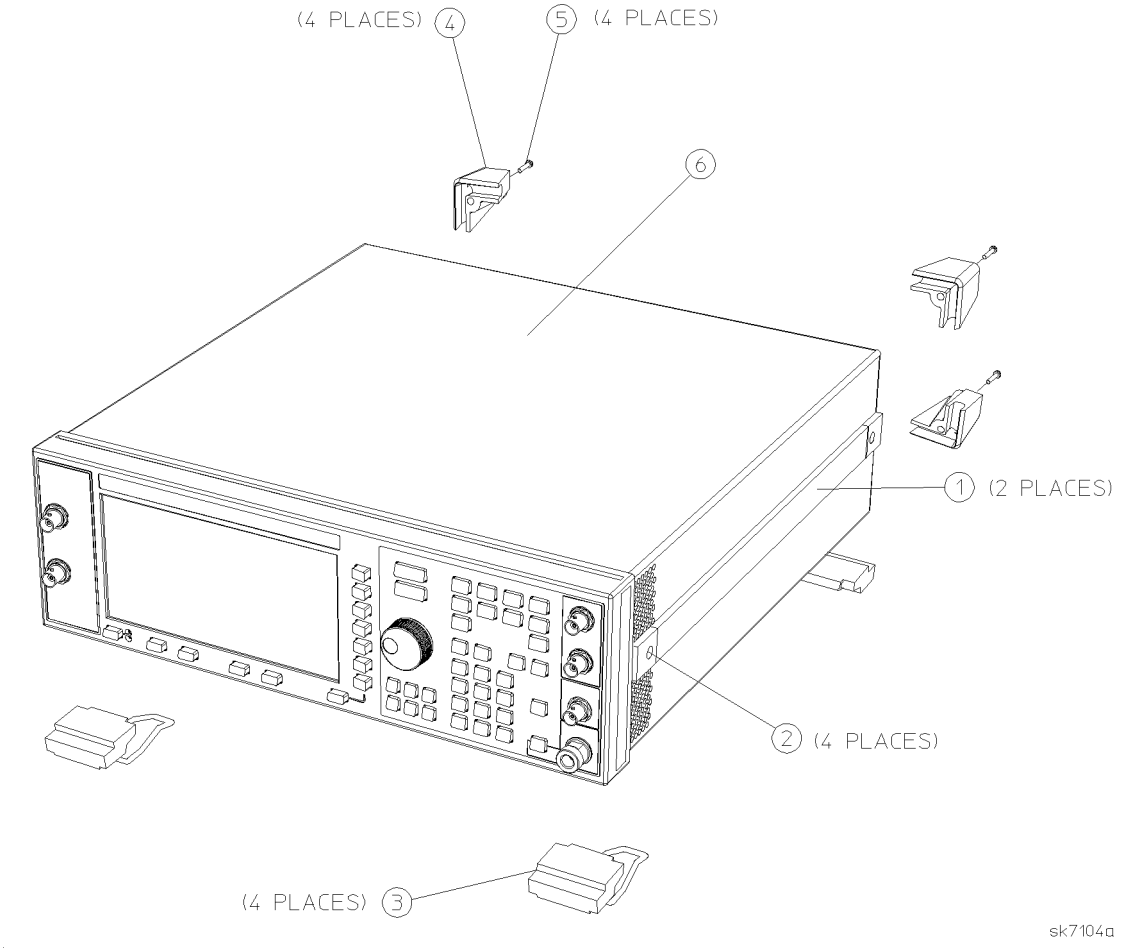


**Figure 2**

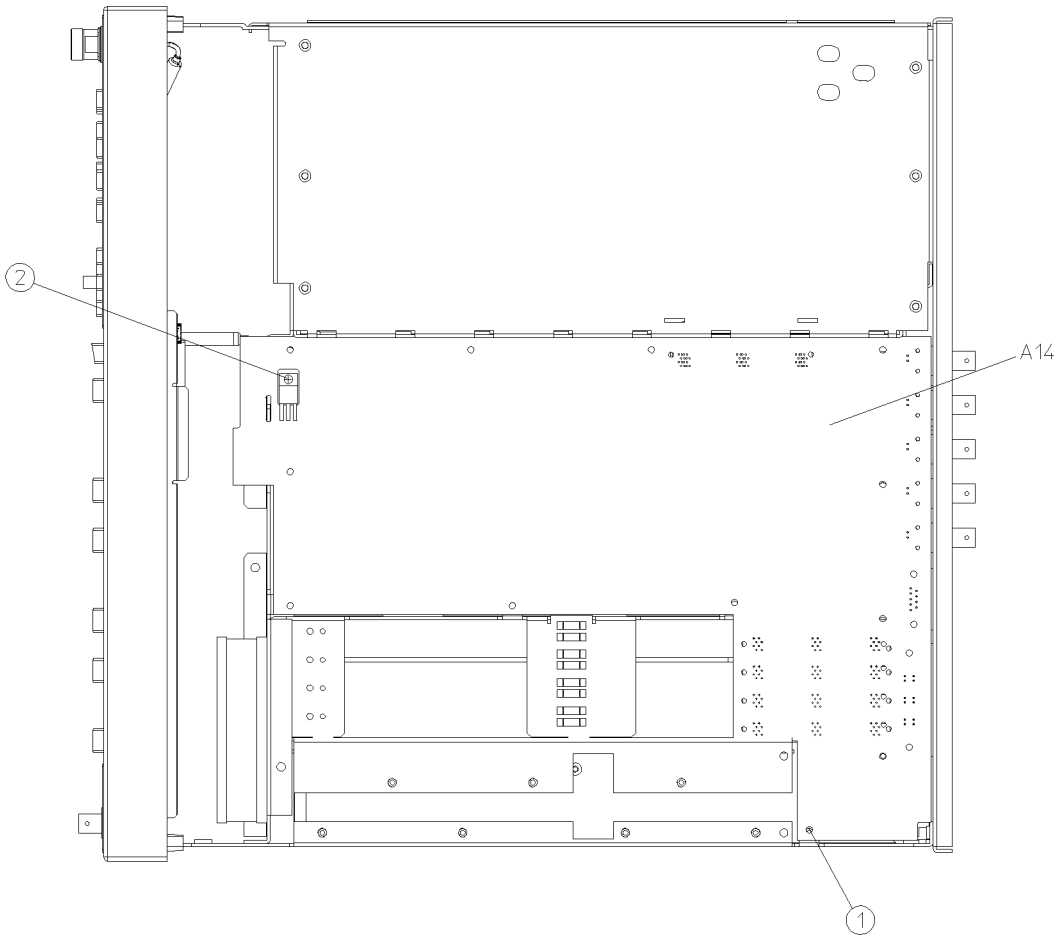
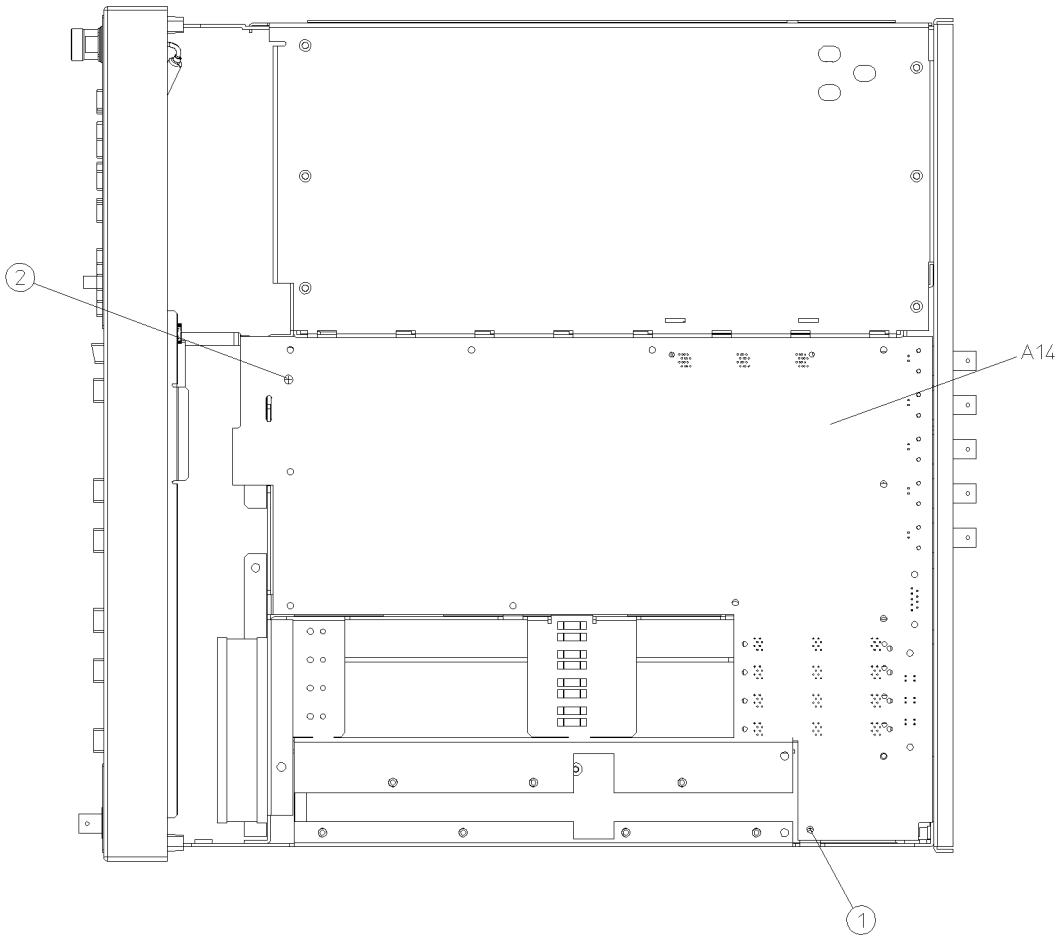


**Figure 3**



## Assemble Q501 to Front Inside of Chassis

1. Place Q501 nut plate with pem, part number E4400-00040, on the outside front of the chassis at slot 3 location. Place pem through slot 3. See Figure 4.
2. Place plate without pem, part number E4400-00041, inside the front chassis over slot 3 while holding Q501 nut plate in position.
3. Place Q501 assembly, part number E4400-60221, on plate as shown in Figure 4.

**NOTE** Make sure the plates and harness are properly seated.

4. Secure Q501 assembly and plates to chassis with insulator bushing, part number 0340-1162, and screw 3MMX10, part number 0515-0374. Torque screw to 9 in-lbs.
5. Now connect the Q501 assembly wiring harness connector to the motherboard as shown in Figure 5. Make sure the harness is dressed and seated properly.

## Measure Q501 Output Voltage on CPU/Motherboard A14

1. Take a digital voltmeter and measure test point TP 507 on the CPU/Motherboard A14. The voltage at TP 507 should read +9 Vdc +- 4% to pass this test.

**NOTE** TP 507 is located on the top right, rear side of the motherboard, next to connector J18.

2. If the voltage is correct at TP 507, turn off the power to the instrument. Unplug the signal generator and turn it upside-down.

## Bottom RF Cover Installation

1. Reinstall the instrument bottom cover with the 15 screws that secure it. Torque all T-10 Torx screws to 9 in-lbs.

## Verification, Turn on the Instrument

1. Plug in the instrument and press the power switch to turn on the signal generator to verify the instrument.
2. Check the front panel display for text or characters. Also check the signal generator for error messages. Let the instrument warm up for at least 5 minutes.
   a. Press the front panel **PRESET** key to reset the RF signal generator.
   b. Repeat the functionality check on page 5.

**Figure 4**

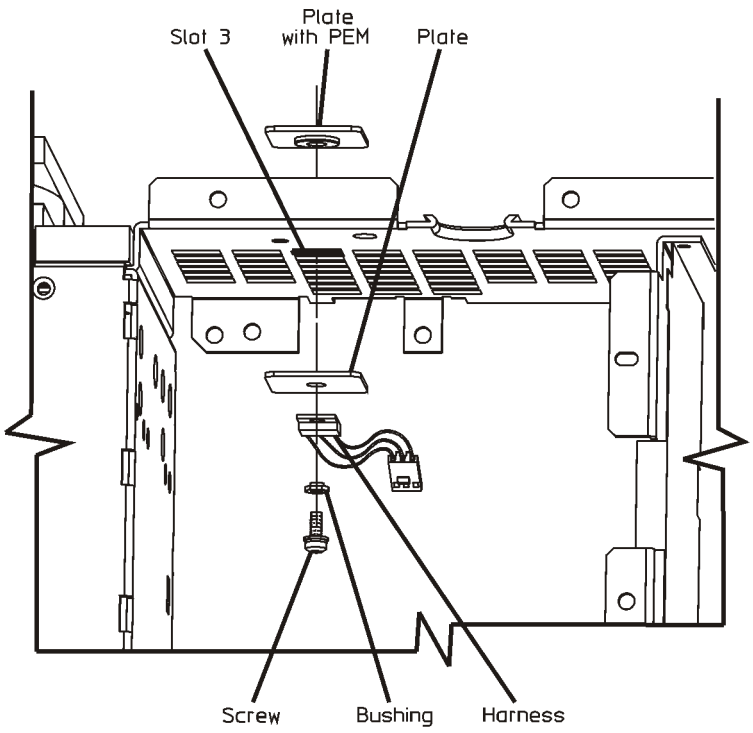
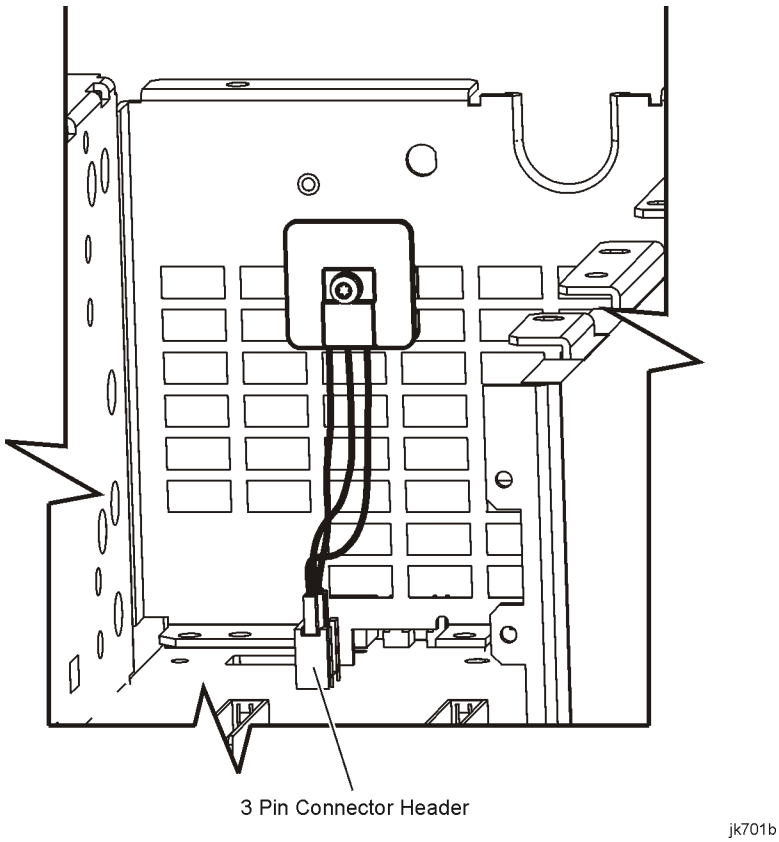



**Figure 5**



## Re-Assemble the Instrument

1. Turn the instrument off and unplug it.
2. Reinstall the instrument top cover with the 11 screws that secure it. Torque all T-10 Torque screws to 9 in-lbs. Refer to Figure 1.
3. Reinstall the instrument's external covers by reversing the removal procedure.
   a. Torque the four rear feet screws to 21 in-lbs.

Torque the strap handle screws to 21 in-lbs.