

Keysight E8257D/57N, E8663D PSG Signal Generators  
Add Option 1E1 (Attenuator)

Kit Part Numbers:

E8251-60384 - For Option 520

E8251-60385 - For Option 532 and 540

E8251-60383 - For Options 550 and 567

For the latest revision of this installation note, go to the following website: [www.keysight.com/find/psg](http://www.keysight.com/find/psg)

# Notices

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## **Manual Part Number**

E8251-90302

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Add Option 1E1 (Attenuator) Kit Part Numbers: E8251-60384, E8251-60385, and E8251-60383

## Add Option 1E1 (Attenuator)

Kit Part Numbers: E8251-60384, E8251-60385, and E8251-60383

Product Affected: .....	E8257D/57N, E8663D
Serial Numbers: .....	All
Options: .....	
To Be Performed By: .....	(X) Keysight Technologies Service Center (X) Personnel Qualified by Keysight Technologies (X) Customer
Estimated Installation Time: .....	1.5 hours
Estimated Verification Time: .....	Option 520 = 8 hours Option 532/540 = 15 hours Option 550 = 16 hours Option 567 = 16 hours

### Introduction

This upgrade kit adds Option 1E1 (Attenuator) to the E8257D (Analog) PSG Signal Generators.

Installation includes the following major steps, starting on [page 7](#):

1. Check signal generator functionality, [page 6](#).
2. Remove the outer and inner signal generator covers, starting on [page 7](#).
3. Install Option 1E1, [page 10](#).
4. Activate Option 1E1, [page 13](#).
5. Verify proper installation of Option 1E1, [page 17](#)
6. Re-assemble the signal generator, [page 17](#).
7. Verify signal generator calibration, [page 17](#).

Add Option 1E1 (Attenuator) Kit Part Numbers: E8251-60384, E8251-60385, and E8251-60383

## Installation Kit Parts List

**Table 1** E8251-60384, for Option 520

Item	Quantity	Description	Part Number
1	1	Installation Note	E8251-90302
2	1	Attenuator 115 dB	E8251-60070
3	1	Semi-Rigid Cable	E8251-20094
4	1	Semi-Rigid Cable	E8251-20026
5	1	Semi-Rigid Cable	E8251-20027
6	1	Semi-Rigid Cable	E8251-20095
7	2	Mounting Screw	0515-1035
8	1	Entitlement Certificate	n/a
9	1	Cable clip	1400-3228

**Table 2** E8251-60385, for Option 532/540

Item	Quantity	Description	Part Number
1	1	Installation Note	E8251-90302
2	1	Attenuator 115 dB	E8251-60070
3	1	Semi-Rigid Cable	E8251-20025
4	1	Semi-Rigid Cable	E8251-20071
5	1	Semi-Rigid Cable	E8251-20072
6	1	Semi-Rigid Cable	E8251-20028
7	2	Mounting Screw	0515-1035
8	1	Entitlement Certificate	n/a
9	1	Cable clip	1400-3228

Add Option 1E1 (Attenuator) Kit Part Numbers: E8251-60384, E8251-60385, and E8251-60383

**Table 3** E8251-60383, for Options 550 and 567

Item	Quantity	Description	Part Number
1	1	Installation Note	E8251-90302
2	1	Attenuator 90 dB	E8251-60393
3	1	Semi-Rigid Cable (for Options 550 and 567)	E8251-20319
4	1	Semi-Rigid Cable	E8251-20320
5	1	Semi-Rigid Cable	E8251-20322
6	1	Semi-Rigid Cable (for Option 567)	E8251-20321
7	1	Semi-Rigid Cable (for Option 550)	E8251-20028
8	2	Mounting Screw	0515-1035
9	1	Entitlement Certificate	n/a
10	1	Cable clip	1400-3228

### Tools Required

- TORX T-10 driver
- TORX T-15 driver
- TORX T-20 driver
- 5/16" open-ended wrench
- Needle-nose pliers
- Scissors

### Safety Considerations

**WARNING** Before you disassemble the instrument, turn the power switch off and unplug the signal generator. Failure to unplug the signal generator can result in personal injury.

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**CAUTION** Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation.

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Add Option 1E1 (Attenuator) Kit Part Numbers: E8251-60384, E8251-60385, and E8251-60383

## Check Signal Generator Functionality

Use the following procedure to confirm that the signal generator powers up and the internal check identifies no errors. The internal check evaluates the operation of the signal generator and returns an error message if it detects a problem.

**NOTE** When the signal generator is first connected to ac line power, the error message `ERROR 514, Reference Oven Cold` occurs which causes both the `OVEN COLD` annunciator and the `ERR` annunciator to turn on.

After approximately five minutes, the `OVEN COLD` annunciator automatically clears, but the `ERR` annunciator remains on until all errors are cleared from the error queue.

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1. Turn on the signal generator and let it warm up for at least five minutes.
2. Run the signal generator self-test by pressing **Utility > Instrument Info/Help Mode > Self Test > Run Complete Self Test**. Upon completion, a summary of the self-test will be displayed. Use the E8257D/67D, E8663D PSG Service Guide to troubleshoot any failures detected by the test.

**NOTE** Some circuits may require up to 50 minutes to warm up before passing the self-test. If self-tests continue to fail after 50 minutes of warm up, troubleshoot the instrument.

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3. Check to see if the `ERR` annunciator is on.
  - If the `ERR` annunciator is on, review the error messages in the error queue by pressing **Utility > Error Info**. The first page of error messages in the error queue appears in the display text area. (Refer to the signal generator error messages document for information about each error message.)

After resolving all problems causing errors, press **Clear Error Queue(s)**.

  - If the `ERR` annunciator is off, the signal generator functionality check has passed.

## Remove the Outer and Inner Signal Generator Covers

### Remove the Outer Cover

Refer to **Figure 1**.

1. Disconnect the power cord.
2. Using a T-20 driver, loosen the two screws (1) and remove the strap handle (2).
3. Using a T-15 driver, remove the center screws (3) on the four rear-panel feet (4).
4. Remove the four bottom feet (5) from the cover by lifting the tab and sliding the foot toward the tab.
5. Place the signal generator on its side.
6. Tilt the signal generator forward and slide the outer cover (6) back to remove it from the frame.

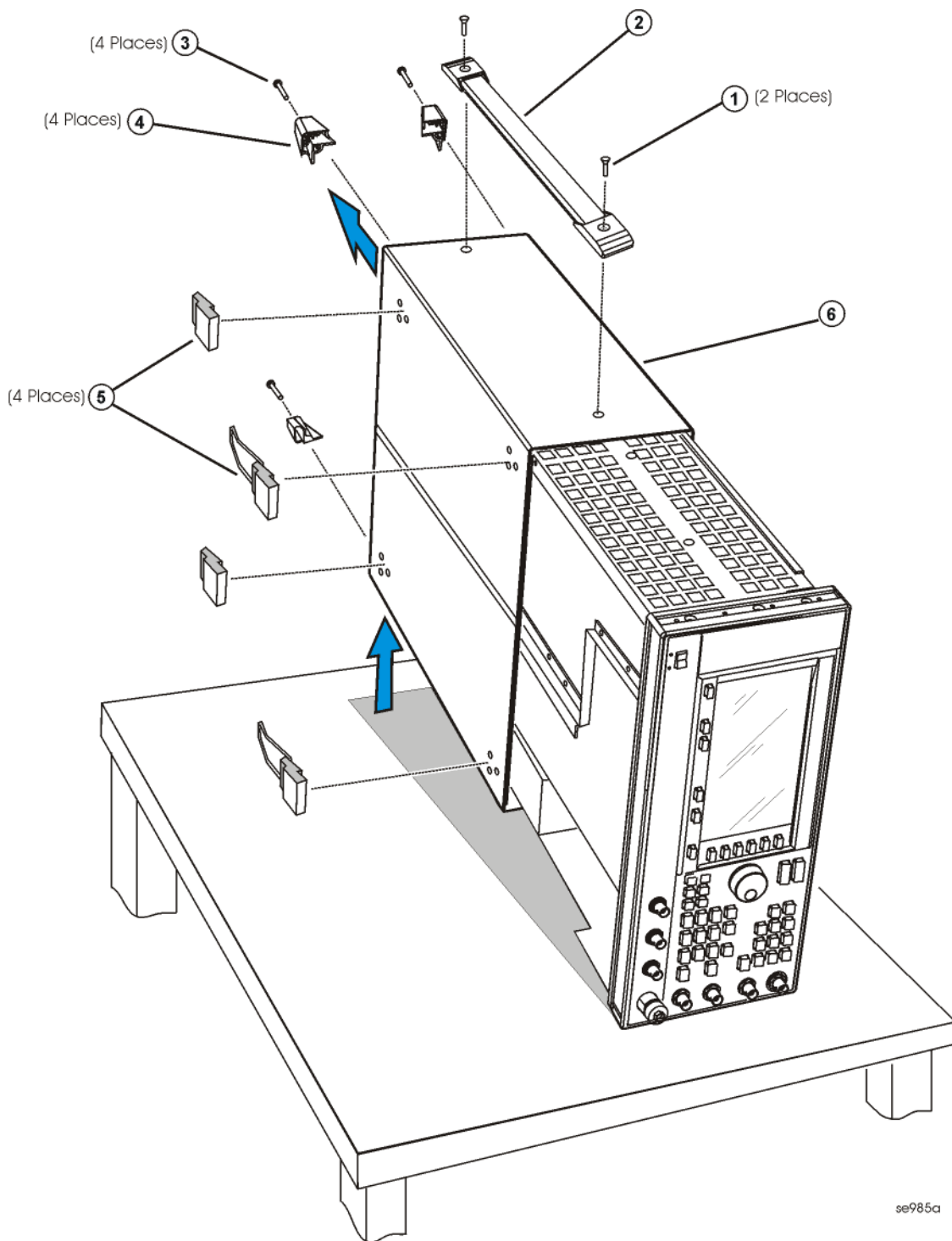
### Remove the Inner Top Cover

Refer to **Figure 2**.

1. Using a T-10 driver, remove the twelve screws (1) from the inner-top cover (2).
2. Remove the inner-top cover.

# Remove the Outer and Inner Signal Generator Covers

Figure 1 Outer Cover Removal

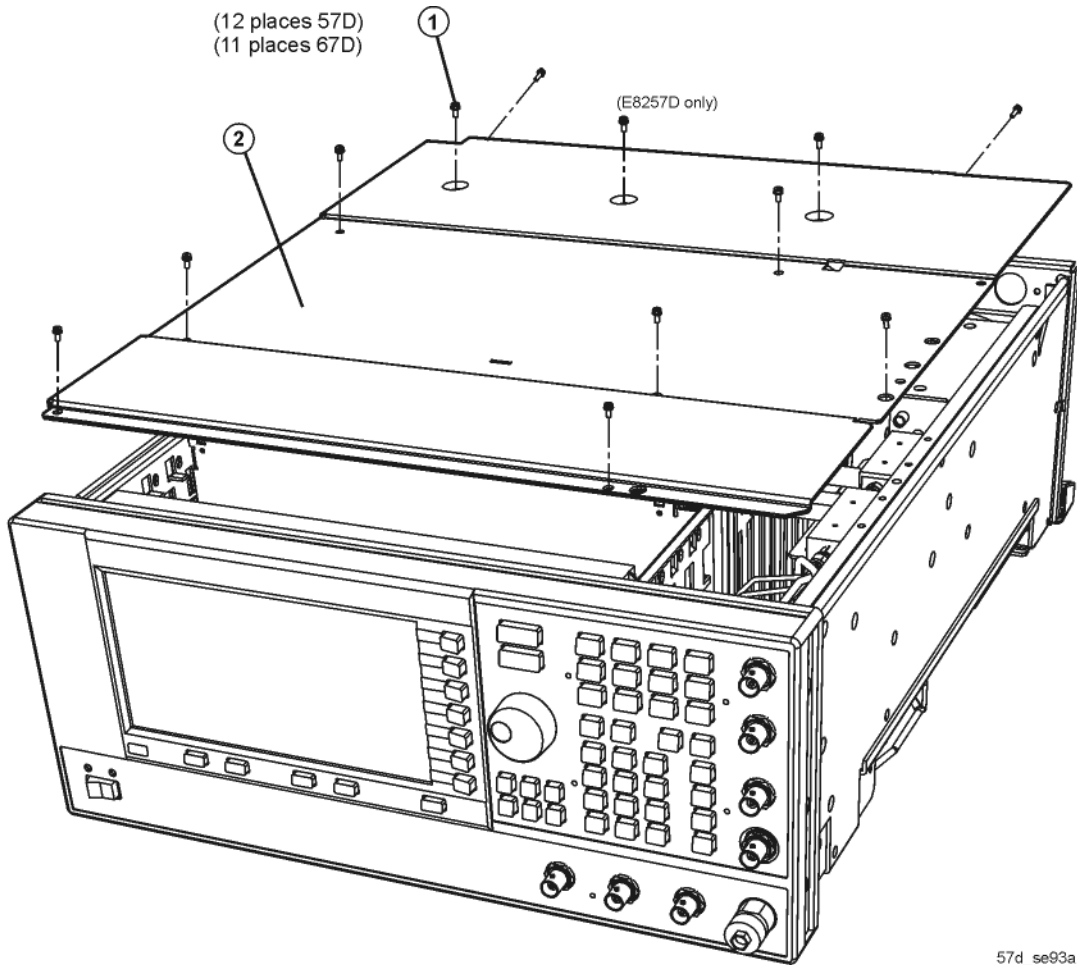


se985a



Figure 2

Inner Top Cover Removal



Remove the Outer and Inner Signal Generator Covers

Install Option 1E1 (Instruments with Front Panel RF Output)

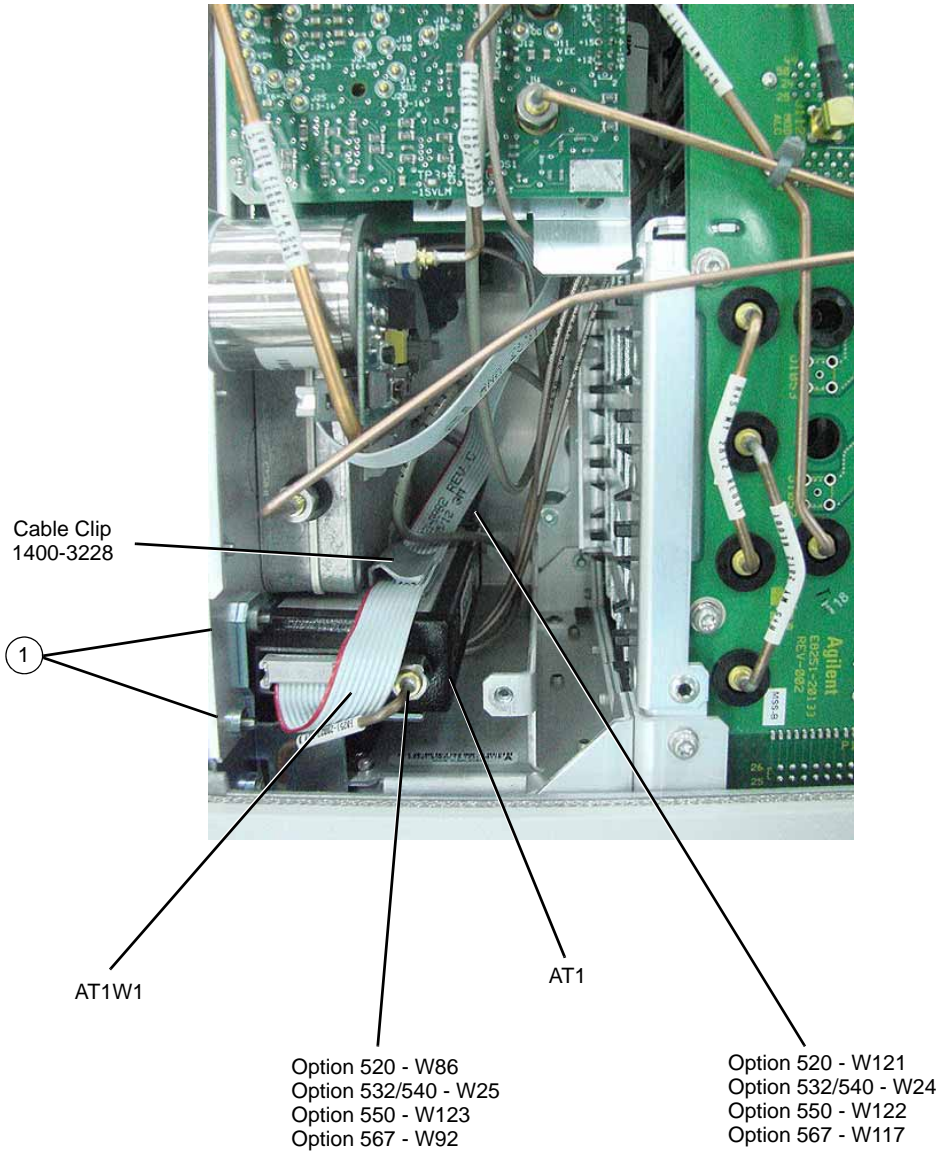
For instruments with rear panel RF output (Option 1EM), go to [page 12](#).

**NOTE** Write down the serial number for the new attenuator.

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1. Position the signal generator with the A31 Motherboard facing you and the RF deck on top.
2. Using a 5/16" open wrench, remove the semi-rigid RF cable connecting the A23 Coupler Detector to the RF output connector.
3. Refer to [Figure 3](#). Position the attenuator so it can be attached to the RF deck.
4. Using the T-10 driver, insert the two screws (1) through the side deck into the metal bracket that is attached to the attenuator. Torque these screws to 9 in-lbs.
5. Using the 5/16" open ended wrench, attach the semi-rigid cable, according to the signal generator you have, between the A23 Coupler Detector output connector and the attenuator input connector; torque to 8 in-lbs.
  - Option 520: W121 (E8251-20026)
  - Option 532/540: W24 (E8251-20025)
  - Option 550/567: W117 (E8251-20319)
6. Using the 5/16" open ended wrench, attach the semi-rigid cable, according to the signal generator you have, between the attenuator and the RF Output connector; torque to 8 in-lbs.
  - Option 520: W86 (E8251-20027)
  - Option 532/540: W25 (E8251-20028)
  - Option 550: W123 (E8251-20028)
  - Option 567: W92 (E9251-20321)
7. Install AT1W1 ribbon cable to A26J13.
8. Refer to [Figure 3](#). Install the cable clip 1400-3228 to the attenuator body and clamp AT1W1 ribbon cable as shown.

Figure 3 Option 1E1 (Front Panel RF Output)



Remove the Outer and Inner Signal Generator Covers

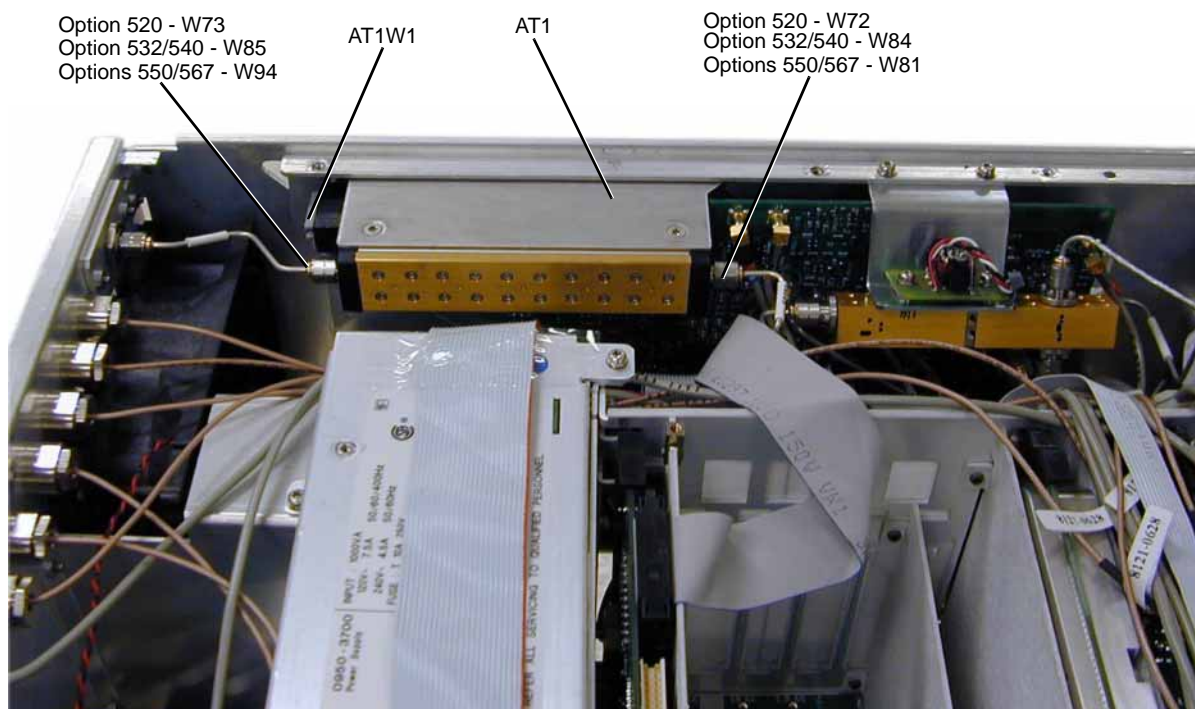
## Install Option 1E1 (Instruments with Rear Panel RF Output)

**NOTE** Write down the serial number for the new attenuator.

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1. Position the signal generator with the RF deck on top.
2. Using a 5/16" open wrench, remove the semi-rigid RF cable connecting the A23 Coupler Detector to the RF output connector.
3. Refer to **Figure 4**. Position the attenuator so it can be attached to the RF deck.
4. Using the T-10 driver, insert the two screws through the side deck into the metal bracket that is attached to the attenuator. Torque these screws to 9 in-lbs.
5. Using the 5/16" open ended wrench, attach the semi-rigid cable, according to the signal generator you have, between the A23 Coupler Detector output connector and the AT1 Attenuator input connector; torque to 8 in-lbs.
  - Option 520: W72 (E8251-20094)
  - Option 532/540: W84 (E8251-20071)
  - Options 550/567: W81 (E8251-20320)
6. Using the 5/16" open ended wrench, attach the semi-rigid cable, according to the signal generator you have, between the attenuator and the RF Output connector; torque to 8 in-lbs.
  - Option 520: W73 (E8251-20095)
  - Option 532/540: W85 (E8251-20072)
  - Options 550/567: W94 (E9251-20322)
7. Install AT1W1 ribbon cable to A26J13.
8. Refer to **Figure 3**. Install the cable clip 1400-3228 to the attenuator body and clamp AT1W1 ribbon cable as shown.

Figure 4 Option 1E1 (Rear Panel RF Output)



### Activate Option 1E1

1. Turn the signal generator on and allow it to warm up for 5 minutes.
2. Connect the instrument to the LAN and write down the IP address.
3. Load the IP address into the instrument, by pressing **Utility > GPIB/RS-232/LAN > LAN Setup > IP Address**. Enter the IP address.
4. Using the web browser on your PC enter the following URL, replacing <ip-address> with the actual IP address you entered into the instrument in step 3: <http://<ip-address>/update>.
5. Scroll to “Update optional Mechanical ATTENUATOR”.
6. For Options 520 and 532/540 select, “add:33328-60006” and enter the serial number for the new attenuator.  
For Option 550 and 567 select, “add:84908-60002” and enter the serial number for the new attenuator.

NOTE If you do not have the attenuator serial number, enter “99999”.

7. Cycle the power to the instrument.
8. Follow the instructions on the Entitlement Certificate to redeem Option 1E1.
9. If error message, 517, Calibration Failure appears, complete the Error: 517, Calibration Failure section.

Remove the Outer and Inner Signal Generator Covers

## Error: 517, Calibration Failure

If error message 517, Calibration Failure appears on the instrument screen, the following two checks and possible updates need to be performed:

- Check the firmware version and update if <C.04.71.
- Update the arrays.

### Check Firmware Version and Update if <C.04.71

1. Press **Utility > Instrument Info/Help Mode > Diagnostic Info.**
2. If the firmware is <C.04.71, upgrade the firmware.

### Update the Arrays

1. Connect the instrument to the LAN and write down the IP address.
2. Load the IP address into the instrument, by pressing: **Utility > GPIB/RS-232/LAN > LAN Setup > IP Address.**
3. Open a web browser on your PC.
4. Enter the following URL, replacing <ip-address> with the actual IP address of your instrument, <http://<ip-address>/update>.
5. Type in or, if using the web to view this installation note, copy the appropriate script from below and paste it into the text area on the update page.

**NOTE**                      The information must be typed exactly as it is shown and it must include “ky” with the value shown. When typing the information in, it might be necessary to enter the information more than once.

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#### For E8257D-520 and E8663D-503/509

```
cs "ATTEN TRIP PWR SWP", 1
cd "ATTEN TRIP PWR SWP", 0, -3.0
cc "ATTEN TRIP PWR SWP"
cs "ATTEN TRIP", 6
cd "ATTEN TRIP", 0, 5.0
cd "ATTEN TRIP", 1, 0.0
cd "ATTEN TRIP", 2, 2.0
cd "ATTEN TRIP", 3, -1.0
cd "ATTEN TRIP", 4, -1.0
cd "ATTEN TRIP", 5, -4.0
cc "ATTEN TRIP"
cs "ATTEN TRIP AM", 6
cd "ATTEN TRIP AM", 0, 2.0
cd "ATTEN TRIP AM", 1, -3.0
cd "ATTEN TRIP AM", 2, -1.0
cd "ATTEN TRIP AM", 3, -4.0
```

cd "ATTEN TRIP AM", 4, -4.0  
cd "ATTEN TRIP AM", 5, -6.0  
cc "ATTEN TRIP AM"  
ky 50279

**For E8257D-532/540**

cs "ATTEN TRIP PWR SWP", 1  
cd "ATTEN TRIP PWR SWP", 0, -3.0  
cc "ATTEN TRIP PWR SWP"  
cs "ATTEN TRIP", 6  
cd "ATTEN TRIP", 0, 2.0  
cd "ATTEN TRIP", 1, -1.0  
cd "ATTEN TRIP", 2, 1.0  
cd "ATTEN TRIP", 3, -2.0  
cd "ATTEN TRIP", 4, -2.0  
cd "ATTEN TRIP", 5, -5.0  
cc "ATTEN TRIP"  
cs "ATTEN TRIP AM", 6  
cd "ATTEN TRIP AM", 0, -1.0  
cd "ATTEN TRIP AM", 1, -4.0  
cd "ATTEN TRIP AM", 2, -2.0  
cd "ATTEN TRIP AM", 3, -5.0  
cd "ATTEN TRIP AM", 4, -5.0  
cd "ATTEN TRIP AM", 5, -7.0  
cc "ATTEN TRIP AM"  
ky 36710

**For E8257D-550/567**

cs "ATTEN TRIP PWR SWP", 1  
cd "ATTEN TRIP PWR SWP", 0, -3.0  
cc "ATTEN TRIP PWR SWP"  
cs "ATTEN TRIP", 6  
cd "ATTEN TRIP", 0, -8.0  
cd "ATTEN TRIP", 1, -8.0  
cd "ATTEN TRIP", 2, -8.0  
cd "ATTEN TRIP", 3, -8.0  
cd "ATTEN TRIP", 4, -8.0  
cd "ATTEN TRIP", 5, -1.1e01  
cc "ATTEN TRIP"  
cs "ATTEN TRIP AM", 6  
cd "ATTEN TRIP AM", 0, -1.0e01  
cd "ATTEN TRIP AM", 1, -1.0e01  
cd "ATTEN TRIP AM", 2, -1.0e01  
cd "ATTEN TRIP AM", 3, -1.1e01  
cd "ATTEN TRIP AM", 4, -1.1e01  
cd "ATTEN TRIP AM", 5, -1.3e01  
cc "ATTEN TRIP AM"  
ky 8356

Remove the Outer and Inner Signal Generator Covers

- 6.** Press Execute, to update the arrays.
- 7.** Cycle the instrument power.



## Verify Proper Installation of Option 1E1

1. Press: **Utility > Instrument Info > Help Info > Options Info.**
2. Make sure Option 1E1 is listed.

**NOTE** If you enable an option that does not have the required hardware installed, the menus for that option will be activated but the option **cannot** operate.

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## Re-Assembling the Instrument

Refer to **Figure 3** and **Figure 4**.

1. Reinstall the inner and outer instrument covers by reversing the order for removal.
2. Torque all T-10 screws to 9 in-lbs.
3. Torque all T-15 and T-20 screws to 21 in-lbs.
4. Cut out an Option 1E1 label and attach it to the rear panel, near the original serial number label.

## Verify Signal Generator Calibration

1. Turn the signal generator on and allow it to warm up for 30 minutes.
2. Perform the following adjustment and performance tests, in the order listed, to verify signal generator calibration. Refer to the PSG Family Signal Generators Service Software.

For units with serial number prefix < US/MY/SG4928:

- Self Tests
- Power Flatness Calibration
- Lowband Attenuator Calibration (<3.2GHz)
- High Band Attenuator Calibration (>3.2GHz)
- V-Band Attenuator Calibration (>50GHz)
- Maximum Leveled Output Power
- Power Level Accuracy

For units with serial number prefix > US/MY/SG4928:

- Self Tests
- High Band Power Flatness Calibration (>3.2GHz)
- Lowband Power Flatness Calibration (<3.2GHz)
- V-Band Power Flatness Calibration (>50GHz)
- Lowband Attenuator Calibration (<3.2GHz)

Remove the Outer and Inner Signal Generator Covers

- High Band Attenuator Calibration (>3.2GHz)
- V-Band Attenuator Calibration (>50GHz)
- Low Power Attenuator Accuracy
- V-Band Low Power Attenuator Accuracy (Opt 567)



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