

**Agilent Technologies
E8257D/67D and E8663D
PSG Signal Generators**

Installation Guide



Agilent Technologies

Notices

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Product Warranty

This Agilent instrument product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, Agilent will, at its option, either repair or replace products which prove to be defective. For warranty service or repair, this product must be returned to a service facility designated by Agilent. Buyer shall prepay shipping charges to Agilent and Agilent shall pay shipping charges, duties, and taxes for products returned to Agilent from another country. Agilent warrants that its software and firmware designated by Agilent for use with an instrument will execute its programming instructions when properly installed on that instrument. Agilent does not warrant that the operation of the instrument, or firmware will be uninterrupted or error free.

Instrument Product Certification

Agilent certifies that this instrument product met its published specifications at the time of shipment from the factory. Agilent further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institute’s calibration facility, and to the calibration facilities of other International Standards Organization members.

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

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Documentation Overview

Installation Guide

- Safety Information
- Getting Started
- Operation Verification
- Regulatory Information

User's Guide

- Signal Generator Overview
- Basic Operation
- Basic Digital Operation
- Optimizing Performance
- Analog Modulation
- Custom Arb Waveform Generator
- Custom Real Time I/Q Baseband
- Multitone Waveform Generator
- Two-Tone Waveform Generator
- AWGN Waveform Generator
- Peripheral Devices
- Troubleshooting

Programming Guide

- Getting Started with Remote Operation
- Using IO Interfaces
- Programming Examples
- Programming the Status Register System
- Creating and Downloading Waveform Files
- Creating and Downloading User-Data Files

SCPI Reference

- Using this Guide
- System Commands
- Basic Function Commands
- Analog Commands
- Digital Modulation Commands
- Digital Signal Interface Module Commands
- SCPI Command Compatibility

Service Guide

- Troubleshooting
- Replaceable Parts
- Assembly Replacement
- Post-Repair Procedures
- Safety and Regulatory Information

Key Reference

- Key function description

1 Safety Information

Instrument Markings

The following markings are used on the signal generator. Familiarize yourself with each marking and its meaning before operating the signal generator.



The instruction manual symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the manual.



The CE mark is a registered trademark of the European Community. If this symbol is accompanied by a year, it is the year when the design was proven.



The CSA mark is a registered trademark of the Canadian Standards Association.



The C-Tick Mark is a trademark registered to the Australian Spectrum Management Agency. This indicates compliance with all Australian EMC regulatory information.



This symbol is used to mark the on position of the power line switch.



This symbol is used to mark the standby position of the power line switch.



This symbol indicates that the input power required is ac.



This is a symbol of an Industrial Scientific and Medical Group 1 Class A product. (CISPER 11, Clause 4)



This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category: With reference to the equipment types in the WEEE Directive Annex 1, this product is classed as a "Monitoring and Control instrumentation" product.

Do not dispose in domestic household waste.

To return unwanted products, contact your local Agilent office, or see <http://www.agilent.com/environment/product/> for more information.

Warnings, Cautions, and Notes

The following safety notations are used throughout this manual. Familiarize yourself with each notation and its meaning before operating the signal generator.

WARNING *Warning* denotes a hazard. It calls attention to a condition or situation that could result in personal injury or loss of life. Do not proceed beyond a warning until the indicated conditions or situations are fully understood.

CAUTION *Caution* calls attention to a possible condition or situation that could result in the loss of a user's work, damage, or destruction of the signal generator. Do not proceed beyond a caution until the indicated conditions are fully understood.

NOTE *Note* calls the user's attention to an important point, or special information, within the text. It provides operational information or additional instructions of which the user should be aware.

General Safety Considerations

WARNING Personal injury may result if the signal generator covers are removed. There are no operator serviceable parts inside. To avoid electrical shock, refer servicing to qualified personnel.

2 Getting Started

Checking the Shipment

1. Inspect the shipping container for damage.
Signs of damage may include a dented or torn shipping container or cushioning material that shows signs of unusual stress or compacting.
2. Carefully remove the contents from the shipping container and verify that your order is complete.
The following items are shipped standard with each instrument:
 - installation guide
 - documentation CD-ROM
CD-ROM contents are also available in hard copy format. Refer to [“E8257D/67D and E8663D PSG Documentation” on page 9](#) for more information.
 - three-prong ac power cord specific to geographic location
3. Verify that any options ordered are included with the shipment by checking the packing literature included with the shipment.

NOTE The serial number label on the signal generator only lists the hardware/firmware options. The packing literature verifies all items shipped.

Front handles and rack mounting hardware are also available for your signal generator. Refer to [“Front Handle and Rack Mount Flange Kits” on page 9](#) for more information.

4. Adapters shipped by Option are shown in the following table.

Table 2-1 Adapters Shipped by Option

| Option | Description | Quantity | Part Number |
|---------|---|----------|-----------------------------|
| 520 | Connector Assembly, 3.5mm (female–female) | 1 | 5061–5311 |
| 520 1ED | Adapter, 3.5mm (female) to Type N (male) | 1 | 1250–1744 |
| 532 | Adapter, 2.4mm (female)–2.92mm (female–K) | 1 | 1250–2187 |
| 540 | | 1 | 33311–82005 or 1250–2188 |
| 544 | | | |
| 550 | | | |
| 567 | Adapter, 1.85mm (female–female) | 1 | 85058–60114 |

Meeting Electrical and Environmental Requirements

Environment

The signal generator is designed for use in the following environmental conditions:

- indoor use
- <15,000 feet (4,572 meters) altitude
- 0 to 55° C temperature, unless otherwise specified
- 80% relative humidity (maximum) for temperatures up to 31° C, decreasing linearly to 50% relative humidity at 40° C

CAUTION This product is designed for use in INSTALLATION CATEGORY II and POLLUTION DEGREE 2, per IEC 61010 and 664, respectively.

Ventilation

Ventilation holes are located on the left side of the signal generator cover and the rear of the signal generator chassis. Do not allow these holes to be obstructed, as they allow air flow through the signal generator.

When installing the signal generator in a cabinet, the convection into and out of the signal generator must not be restricted. The ambient temperature outside the cabinet must be less than the maximum operating temperature of the signal generator by 4° C for every 100 watts dissipated within the cabinet.

CAUTION Damage to the signal generator may result when the total power dissipated in the cabinet is greater than 800 watts. When this condition exists, forced convection must be applied.

Line Settings

The signal generator has an autoranging line voltage input. The available ac power source must meet the following conditions:

- Voltage:** 100/115 volts nominal (100-120 volts)
230/240 volts nominal (220-240 volts)
- Frequency:** for 100/115 volts: 50/60 (400 Hz nominal E8257D and E8663D only)
for 230/240 volts: 50/60 Hz nominal
- Power:** E8257D and E8663D PSG analog models: 350 watts maximum
E8267D PSG vector models: 450 watts maximum

CAUTION Damage to the signal generator may result if the supply voltage is not within the specified range.

Connecting the AC Power Cord

This is a Safety Class 1 Product provided with a protective earth ground incorporated into the power cord. The front panel switch is only a standby switch; it is not a line switch. The AC power cord is the disconnecting device that disconnects the signal generator mains circuits from the mains supply. Alternatively, an external switch or circuit breaker, readily identifiable and easily reached by the operator, may also be used as a disconnecting device.

Disconnecting power to an instrument with a high stability timebase may require a longer warm-up period before it meets specifications. Perform the following steps when connecting the ac power cord:

WARNING **Personal injury may occur if there is any interruption of the protective conductor inside or outside of the signal generator. Intentional interruption is prohibited.**


CAUTION Damage to the signal generator may result without adequate earth grounding. Always use the three-prong AC power cord supplied with the signal generator.

1. Ensure that the power cord is not damaged.
2. Install the signal generator so that one of the following items is readily identifiable and easily reached by the operator: AC power cord, alternative switch, or circuit breaker.
3. Insert the mains plug into a socket outlet provided with a protective earth grounding.


Configuring the Display

You can adjust the LCD display using features such as contrast, brightness, screen saver mode, and the screen saver delay. You can also toggle features such as inverse video, display updating in remote mode, and the screen saver on or off.

Contrast and Brightness

Press  to decrease the display contrast.

Pressing the decrease contrast hardkey and holding it down causes the display background to gradually darken in comparison to the text on the display. The minimum contrast setting is not a completely black display. Some contrast between the background and the text will still be visible.

Press  to increase the display contrast.

Pressing the increase contrast hardkey and holding it down causes the display background to gradually brighten in comparison to the text on the display. If the background does not appear to change, it is probably set to the maximum contrast.

Press **Utility > Display > Brightness**.

This allows you to change the display's brightness.

Brightness can be adjusted using the arrow keys, numeric keypad, or front panel knob. The brightness value is set to 50 (maximum brightness) at the factory. The minimum brightness value is 1.

Inverse Video

Press **Utility > Display > Inverse Video Off On**.

This toggles between inverse video mode and normal display mode.

The normal display mode for the signal generator is dark text on a light background. Inverse video mode is light text on a dark background. Inverse video is a persistent state; it is not affected by a signal generator preset or power cycle.

Screen Saver

Press **Utility > Display > Screen Saver Off On**.

This toggles the operating mode of the screen saver.

You can increase the life expectancy of the signal generator's display light by activating the screen saver. Leaving the display lit for long periods of time or turning the display on and off frequently decreases the life of the bulb. With the screen saver on, the display light is turned off after a defined period of time with no input to the front panel. The display light turns on again when any front panel key is pressed or when a remote command is sent. The screen saver is set to off at the factory.

Press **Utility > Display > Screen Saver Mode**.

This toggles the screen saver mode between light-only mode and light-and-text mode.

Adjust the screen saver mode to turn the light on, off, or to turn both the light and text on and off. Setting the mode to light-only mode turns the display light off, leaving the text visible at a low intensity. If the display remains unchanged for long periods of time, set the mode to light and text to prevent the text from burning the display. This mode turns the display light and the text off.

Press **Utility > Display > Screen Saver Delay**.

This adjusts the amount of elapsed time before the screen saver is activated.

The screen saver delay is set to 1 hour at the factory. The current screen saver delay is displayed in the softkey label and also in the active entry area. To change the delay, enter a new value using the numeric keypad and then press **Enter**, or rotate the front panel knob. The acceptable range of delay values is 1 through 12 hours in 1 hour increments.

The screen saver settings are persistent states; they are not affected by a signal generator preset or power cycle.

Updating the Display During Remote Operation

Press **Utility > Display > Update in Remote Off On**.

This toggles the display-update-in-remote mode on or off.

When toggled on, commands executed via the remote control bus will update the signal generator display accordingly. When toggled off, commands executed via the remote control bus will not update the signal generator's display. Update-in-remote mode is set to off at the factory.

Configuring for Remote Control

GPIB Interface Configuration

1. Press **Utility > GPIB/RS-232 LAN > GPIB Address**.
2. Use the numeric keypad to set the desired address and press **Enter**.

The arrow keys or the front panel knob can be used to set the desired address.

The signal generator's GPIB address is set to 19 at the factory. The acceptable range of addresses is 0 through 30. The GPIB address is a persistent state; it is not affected by a signal generator preset or by a power cycle.

LAN Interface Configuration

Use one of the following procedures to assign a hostname and IP address to the signal generator. The hostname and IP address are persistent states; they are not affected by an instrument preset or a power cycle.

NOTE Verify that the signal generator is connected to the LAN using a 10BASE-T LAN cable.

Manual Configuration

1. Press **Utility > GPIB/RS-232 LAN > LAN Setup**.
2. Press **Hostname**.

NOTE **Hostname** field will only be available when the **DHCP** is off (**Manual** mode).

3. Use the labeled text softkeys and/or numeric keypad to enter the desired hostname.

To erase the current hostname, press **Editing Keys > Clear Text**.

4. Press **Enter**.
5. Set **LAN Config Manual DHCP** to **Manual**.
6. Press **IP Address** and enter a desired address.

Use the left and right arrow keys to move the cursor. Use the up and down arrow keys, front panel knob, or numeric keypad to enter an IP address. To erase the current IP address, press the **Clear Text** softkey.

NOTE To remotely access the signal generator from a different LAN subnet, you must also enter the subnet mask and default gateway. See your system administrator to obtain the appropriate values.

7. Press the **Proceed With Reconfiguration** softkey and then the **Confirm Change (Instrument will Reboot)** softkey.

This action assigns a hostname and IP address (as well as a gateway and subnet mask, if these have been configured) to the signal generator. The hostname, IP address, gateway and subnet mask are not affected by an instrument preset or by a power cycle.

DHCP Configuration

1. Press **Utility > GPIB/RS-232 LAN > LAN Setup**.

NOTE If the DHCP server uses dynamic DNS to link the hostname with the assigned IP address, the hostname may be used in place of the IP address. Otherwise, the hostname is not usable and you may skip steps 2 through 4.

2. Press **Hostname**.

NOTE **Hostname** field will only be available when the **DHCP** is off (**Manual** mode).

3. Use the labeled text softkeys and/or numeric keypad to enter the desired hostname.
To erase the current hostname, press **Editing Keys > Clear Text**.
4. Press **Enter**.
5. Set **LAN Config Manual DHCP** to DHCP.
6. Press the **Proceed With Reconfiguration** softkey and then the **Confirm Change (Instrument will Reboot)** softkey.
This action configures the signal generator as a DHCP client. In DHCP mode, the signal generator will request a new IP address from the DHCP server upon rebooting. You can return to the LAN Setup menu after rebooting to determine the assigned IP address.

RS-232 Interface Configuration

1. Press **Utility > GPIB/RS-232 LAN > RS-232 Setup**.
2. Press **RS-232 Baud Rate**.
3. Press the desired baud rate softkey.
4. Press **RS-232 Echo Off On**.

This toggles the state of the SCPI echoing on the RS-232 connection. Set as desired.

5. Press **Reset RS-232**.

This deletes the data from the RS-232 buffer, discarding any unprocessed SCPI input received over RS-232.

These RS-232 parameters are persistent states; these states are not affected by an instrument preset or power cycle.

Ordering Accessories

The following accessories can be ordered when a signal generator is purchased, or at any time afterward. To order accessories, refer to “[Contacting Agilent Sales and Service Offices](#)” on page 11.

Front Handles and Rack Mount Flanges

Handles can be purchased and attached to the front of the signal generator. These handles can also be purchased with a rack mount kit to facilitate rack installation. Hardware can be ordered as a kit to support either preference. [Table 0-1](#) lists the part numbers for these kits.

Table 2-2 Front Handle and Rack Mount Flange Kits

| Description | Part Number |
|---|-------------|
| Rack Mount Kit without Handles (Option 1CM) | 5063-9215 |
| Front Handle Kit (Option 1CN) | 5063-9228 |
| Rack Mount Kit with Handles (Option 1CP) | 5063-9222 |
| PSG Rack Slide Kit | E8251-60419 |

E8257D/67D and E8663D PSG Documentation

[Table 2-3](#) lists the part numbers and descriptions for documentation available in hardcopy and CD-ROM format.

Table 2-3 Available E8257D/67D and E8663D PSG Documentation

| Document Type | Description | Part Number |
|-----------------------------------|---|-------------|
| Documentation Set (Option ABA) | <ul style="list-style-type: none"> set includes all items listed in this table, with the <i>exception</i> of the Installation Guide, the Service Guide, and the documentation CD-ROM | E8251-90350 |
| Documentation CD-ROM (Option CD1) | <ul style="list-style-type: none"> PDF files of the E8257D/67D and E8663D PSG documentation set, <i>including</i> the Installation Guide and the Service Guide programming examples error messages | E8251-90351 |
| Installation Guide | <ul style="list-style-type: none"> installation instructions and requirements operation verification procedure safety and regulatory information | E8251-90352 |
| E8257D Data Sheet | <ul style="list-style-type: none"> available options warranted specifications and typical performance | 5989-0698EN |
| E8267D Data Sheet | <ul style="list-style-type: none"> available options warranted specifications and typical performance | 5989-0697EN |
| E8663D Data Sheet | <ul style="list-style-type: none"> available options warranted specifications and typical performance | 5989-????EN |

Table 2-3 Available E8257D/67D and E8663D PSG Documentation

| Document Type | Description | Part Number |
|-------------------------------|--|-------------|
| User's Guide | <ul style="list-style-type: none">• description of features and functions• signal generator operation tutorials• optimization procedures• concept information• basic troubleshooting | E8251-90353 |
| Key Reference | <ul style="list-style-type: none">• softkey and hardkey descriptions | E8251-90354 |
| Programming Guide | <ul style="list-style-type: none">• remote operation procedures• programming examples• downloading and using files | E8251-90355 |
| SCPI Command Reference | <ul style="list-style-type: none">• SCPI command descriptions• command compatibility tables | E8251-90356 |
| Service Guide (Option OBW) | <ul style="list-style-type: none">• troubleshooting procedures• assembly replacement procedures• parts information | E8251-90359 |

Proper Usage and Cleaning

The signal generator cover protects against physical contact with internal assemblies that contain hazardous voltages, but does not protect against the entrance of water. To avoid damage and personal injury, ensure that liquid substances are positioned away from your signal generator.

WARNING Personal injury may result if the signal generator is not used as specified. Unspecified use impairs the protection provided by the equipment. The signal generator must be used with all means for protection intact.

Cleaning Suggestions

To ensure good connections, the connectors on the front and rear panels of the signal generator need to be cleaned regularly.

To prevent dust build-up that could potentially obstruct ventilation, clean the signal generator cover periodically. Use a dry cloth, or one slightly dampened with water, to clean the external case parts.

WARNING To prevent electrical shock, disconnect the Agilent PSG E8257D/67D and E8663D Signal Generator from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.

Contacting Agilent Sales and Service Offices

Assistance with test and measurements needs and information on finding a local Agilent office are available on the Internet at:

<http://www.agilent.com/find/assist>

You can also purchase E8257D/67D or E8663D PSG accessories or documentation items on the Internet at: <http://www.agilent.com/find/psg>

If you do not have access to the Internet, please contact your field engineer.

NOTE In any correspondence or telephone conversation, refer to the signal generator by its model number and full serial number. With this information, the Agilent representative can determine whether your unit is still within its warranty period.

Returning a Signal Generator to Agilent Technologies

To return your signal generator to Agilent Technologies for servicing, follow these steps:

1. Gather as much information as possible regarding the signal generator's problem.
2. Call the phone number listed on the Internet (<http://www.agilent.com/find/assist>) that is specific to your geographic location. If you do not have access to the Internet, contact your Agilent field engineer.

After sharing information regarding the signal generator and its condition, you will receive information regarding where to ship your signal generator for repair.

3. Ship the signal generator in the original factory packaging materials, if available, or use similar packaging to properly protect the signal generator.

3 Operation Verification

NOTE For the instrument to meet performance specifications allow a warm up period of 45 minutes within an operational temperature range of 0 to 55 °C. For more information, refer to the PSG signal generator *Data Sheet*.

Operation verification is a series of tests that, when completed, will either ensure that the signal generator is operating correctly, or will assist in pointing to the problem area. Operation verification does not ensure performance to specifications, but should provide a level of confidence that the signal generator is operating correctly within a minimum amount of time.

Operation verification is appropriate for incoming inspection after repair (when a full calibrated performance is not required), or whenever the integrity of the signal generator is in question. Individual tests may be performed in any order, however, the order of the list below is recommended.

Perform the following tests for operation verification:

1. [“Performing a Self-Test” on page 13](#)
2. [“Checking the Maximum Leveled Power” on page 14](#)
3. [“Checking the Output Power” on page 18](#)

NOTE Throughout this section, all references to pressing the **Preset** hardkey assume that the preset state is set to normal (factory-defined preset state).

To ensure that the preset state is set to normal, press **Utility > Power On/Preset > Preset Normal User** until Normal is highlighted.

Performing a Self-Test

The self-test is a series of internal tests that checks different signal generator functions. If this test fails, refer to [“Self-Test Failure” on page 14](#) for further instructions.

Perform the following procedure to run a self-test:

1. Disconnect all external cables, including GPIB, LAN, and RS-232 cables.
2. Press **Preset > Utility > Instrument Info/Help Mode > Self Test**.

The following message should appear:

- The current status of the self-test is: Incomplete. Not all tests have been run.

3. Press **Run Complete Self Test**.

While the self-test is running, an activity bar is displayed on the screen indicating the test progress.

If **Abort** is pressed while the self-test are running, the following message will be displayed:

- The current status of the self-test is: Incomplete. Not all tests have been run.

When the self-test is complete, one of the following messages will be displayed:

- The current status of the self-test is: Passed
- The current status of the self-test is: Failure. One or more tests have failed. System diagnostics indicate this test as the root failure: xxx

The number of tests that passed and failed are displayed in the lower left-hand corner of the display. If the signal generator fails only one test, the display shows the title of the failed test. If the signal generator fails more than one test, the test number of the most significant failure is shown.

Self-Test Failure

If a self-test failure occurs, perform the following procedure:

1. Make sure all external cables, including GPIB, LAN, and RS-232 cables, are disconnected from the signal generator and perform the self-test again.
2. If the self-test continues to fail, send the signal generator to an Agilent service center for repair, with a detailed description of the failed test(s) and any other error messages that appeared on the display.

See “Returning a Signal Generator to Agilent Technologies” on page 11 for return instructions.

Checking the Maximum Leveled Power

Perform the following procedure to check the maximum leveled power.

1. Press **Preset**.
2. Attach a 50Ω load to the RF OUTPUT. A power sensor, attenuator, or 50Ω termination is an example of a 50Ω load.
3. Press **RF On/Off**. The RF On annunciator is now displayed.
4. Press **Mod On/Off**. The Mod Off annunciator is now displayed.
5. Press **Amplitude** and enter a value from [Table 3-1](#) that is applicable to your instrument model and option configuration.

NOTE Some typical option configurations and their maximum output power limits are shown in [Table 3-1](#). For the complete matrix of options or for the latest changes to specifications, refer to the PSG data sheets either on the web at <http://www.agilent.com/find/psg> or on the documentation CD that was shipped with your instrument.

6. If the signal generator is equipped with Option 007, press **Sweep /List > Sweep Type> Step > Configure Step Sweep**.
If the signal generator is not equipped with Option 007, press **Sweep /List > Configure Step Sweep**.
7. Press **Freq Start** and enter the start frequency value listed in [Table 3-1](#) that corresponds to the amplitude value entered in step 5.
8. Press **Freq Stop** and enter the corresponding stop frequency listed in [Table 3-1](#).
9. Press **# Points** and enter the number of corresponding points listed in [Table 3-1](#).

10. Press **Return > Sweep > Freq.** The *SWEEP* annunciator is now on and a continuous sweep will begin. During the sweep, the progress bar becomes active on the display, indicating the status of the current sweep.
11. Watch the display and ensure that the *Unlevel* annunciator does not appear at any time during a full sweep.

The *Unlevel* annunciator may turn on and off, or remain on; both conditions indicate a failure. If this occurs, refer to [“Maximum Leveled Power Check Failure” on page 18](#) for further instructions.
12. Press **Sweep > Off.**
13. Repeat steps 5 through 12 for each frequency range specific to your instrument model number and options.

Table 3-1 Frequency and Power Level Limits (For PSGs with s/n prefixes <US4928/MY4928)

| Instrument Model | Amplitude | | | | Frequency | | # Points |
|---|-----------|-------------------------|------------|---------------------|-----------|----------|----------|
| | Standard | Option 1EA ^a | Option 1E1 | Options 1EA and 1E1 | Start | Stop | |
| E8257D Option 520 | 13 dBm | 16 dBm | 11 dBm | 15 dBm | 250 kHz | 3.2 GHz | 50 |
| | 13 dBm | 20 dBm | 11 dBm | 18 dBm | 3.21 GHz | 20 GHz | 200 |
| E8257D Option 532 | 9 dBm | 15 dBm | 7 dBm | 14 dBm | 250 kHz | 3.2 GHz | 50 |
| | 9 dBm | 18 dBm | 7 dBm | 16 dBm | 3.21 GHz | 20 GHz | 200 |
| | 9 dBm | 14 dBm | 7 dBm | 12 dBm | 20.1 GHz | 31.8 GHz | 200 |
| E8257D Option 540 | 9 dBm | 15 dBm | 7 dBm | 14 dBm | 250 kHz | 3.2 GHz | 50 |
| | 9 dBm | 18 dBm | 7 dBm | 16 dBm | 3.21 GHz | 20 GHz | 200 |
| | 9 dBm | 14 dBm | 7 dBm | 12 dBm | 20.1 GHz | 40 GHz | 200 |
| E8257D Option 550 and Option 567 | 5 dBm | 14 dBm | 3 dBm | 13 dBm | 250 kHz | 3.2 GHz | 50 |
| | 5 dBm | 14 dBm | 3 dBm | 13 dBm | 3.21 GHz | 20 GHz | 200 |
| | 5 dBm | 11 dBm | 3 dBm | 9 dBm | 20.1 kHz | 65 GHz | 200 |
| | 5 dBm | 10 dBm | 3 dBm | 8 dBm | 65.1 GHz | 67 GHz | 100 |
| E8267D Option 520 | 13 dBm | N/A | N/A | N/A | 250 kHz | 3.2 GHz | 50 |
| | 18 dBm | N/A | N/A | N/A | 3.21 GHz | 20 GHz | 200 |
| E8267D Option 532 and Option 544 | 12 dBm | N/A | N/A | N/A | 250 kHz | 3.2 GHz | 50 |
| | 14 dBm | N/A | N/A | N/A | 3.21 kHz | 31.8 GHz | 200 |
| | 12 dBm | N/A | N/A | N/A | 32.1 GHz | 40 GHz | 200 |
| | 10 dBm | N/A | N/A | N/A | 40.1 GHz | 44 GHz | 100 |
| E8663B | 15 dBm | N/A | N/A | N/A | 250 kHz | 3.2 GHz | 50 |
| | 18 dBm | N/A | N/A | N/A | 3.21 GHz | 9 GHz | 100 |

a. Option 1EH or and Option UNW can degrade Option 1EA's maximum power specifications. Refer to the *Data Sheet*.

Table 3-2 Frequency and Power Level Limits (For PSGs with s/n prefixes >=US4928/MY4928)

| Instrument Model | Amplitude | | | | Frequency | | # Points |
|---|-----------|------------|------------|---------------------|------------------------|----------|----------|
| | Standard | Option 1EU | Option 1E1 | Options 1EU and 1E1 | Start | Stop | |
| E8257D Option 520 | 15 dBm | 24 dBm | 13 dBm | 24 dBm | 250.1 kHz ^a | 3.2 GHz | 50 |
| | 15 dBm | 23 dBm | 13 dBm | 22 dBm | 3.21 GHz | 20 GHz | 200 |
| E8257D Option 521 | 21 dBm | N/A | 21 dBm | N/A | 10 MHz | 250 MHz | 10 |
| | 26 dBm | N/A | 26 dBm | N/A | 250.1 MHz | 1 GHz | 50 |
| | 30 dBm | N/A | 30 dBm | N/A | 1.1 GHz ^a | 6 GHz | 100 |
| | 30 dBm | N/A | 28 dBm | N/A | 6.1 GHz | 14 GHz | 100 |
| | 28 dBm | N/A | 27 dBm | N/A | 14.1 GHz | 17.5 GHz | 100 |
| | 27 dBm | N/A | 26 dBm | N/A | 17.51 GHz | 20 GHz | 50 |
| E8257D Option 532 | 11 dBm | 23 dBm | 9 dBm | 20 dBm | 250.1 kHz ^a | 3.2 GHz | 50 |
| | 11 dBm | 19 dBm | 9 dBm | 17 dBm | 3.21 GHz | 20 GHz | 200 |
| | 11 dBm | 19 dBm | 9 dBm | 14 dBm | 20.1 GHz | 31.8 GHz | 200 |
| E8257D Option 540 | 11 dBm | 23 dBm | 9 dBm | 23 dBm | 250.1 kHz ^a | 3.2 GHz | 50 |
| | 11 dBm | 19 dBm | 9 dBm | 17 dBm | 3.21 GHz | 20 GHz | 200 |
| | 11 dBm | 16 dBm | 9 dBm | 16 dBm | 20.1 GHz | 40 GHz | 200 |
| E8257D Option 550 and Option 567 | 5 dBm | 22 dBm | 3 dBm | 22 dBm | 250.1 kHz ^a | 3.2 GHz | 50 |
| | 5 dBm | 17 dBm | 3 dBm | 16 dBm | 3.21 GHz | 20 GHz | 200 |
| | 5 dBm | 14 dBm | 3 dBm | 12 dBm | 20.1 GHz | 65 GHz | 200 |
| | 5 dBm | 14 dBm | 3 dBm | 12 dBm | 65.1 GHz | 67 GHz | 100 |
| E8267D Option 520 | 13 dBm | N/A | N/A | N/A | 250 kHz | 3.2 GHz | 50 |
| | 18 dBm | N/A | N/A | N/A | 3.21 GHz | 20 GHz | 200 |
| E8267D Option 532 and Option 544 | 12 dBm | N/A | N/A | N/A | 250 kHz | 3.2 GHz | 50 |
| | 14 dBm | N/A | N/A | N/A | 3.21 GHz | 31.8 GHz | 200 |
| | 12 dBm | N/A | N/A | N/A | 32.1 GHz | 40 GHz | 200 |
| | 10 dBm | N/A | N/A | N/A | 40.1 GHz | 44 GHz | 100 |
| E8663D | 15 dBm | N/A | N/A | N/A | 250 kHz | 3.2 GHz | 50 |
| | 15 dBm | N/A | N/A | N/A | 3.21 GHz | 9 GHz | 100 |

a. With 1EH low-pass filters below 2 GHz switched off. With filters on, this specification applies >2 GHz.

Maximum Leveled Power Check Failure

If a maximum leveled power check fails, perform the following procedure:

1. Verify the limits for that particular option using the data sheet.
2. If the Unlocked annunciator is displayed, refer to the Troubleshooting chapter of the *E8257D/67D PSG Signal Generators Service Guide*.
3. Ensure that the RF OUTPUT connector is connected to a 50Ω load.
4. Ensure that the power level entered corresponds to the value listed in [Table 0-1](#).
5. Refer to [Table 0-3](#) for the recommended equipment and measure the output power.

If the measured power level is more than the power level listed in [Table 0-1](#), turn the front panel knob counterclockwise until the measured power level equals the power level in [Table 3-1](#).

6. Note the signal generator front-panel amplitude value and use it to repeat the maximum leveled power check.

If you have followed the above steps and the check continues to fail, contact the nearest Agilent Technologies call center for assistance. Refer to [“Contacting Agilent Sales and Service Offices” on page 11](#) for contact information.

Checking the Output Power

This test verifies the CW output power from the signal generator. If this test fails, refer to [“Problems with Output Power” on page 24](#) for further instructions.

[Table 3-3](#) shows the recommended equipment for use with the E8257D signal generator when performing this test.

[Table 3-4](#) shows the recommended equipment for use with the E8267D signal generator when performing this test.

Table 3-3 Recommended Equipment for the E8257D

| E8257D Option 520 | E8257D Option 521 | E8257D Option 532 | E8257D Option 540 | E8257D Option 550 | E8257D Option 567 | Test Equipment | Recommended Agilent Test Equipment |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--|---|
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Power Meter | Agilent E4418B E-Series power meter or Agilent E4419A/B E-Series power meter |
| ✓ | | ✓ | ✓ | ✓ | ✓ | Power Sensor, Input: Type-N (m) | Agilent E9304A E-Series power sensor or Agilent 8482A power sensor |
| ✓ | | | | | | Power Sensor, Input: APC 3.5 (m) | Agilent E4413A E-Series power sensor |

Table 3-3 Recommended Equipment for the E8257D

| E8257D Option 520 | E8257D Option 521 | E8257D Option 532 | E8257D Option 540 | E8257D Option 550 | E8257D Option 567 | Test Equipment | Recommended Agilent Test Equipment |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--|---|
| ✓ | | ✓ | ✓ | ✓ | | Power Sensor, Input: 2.4 mm (m) | Agilent 8487A Option H84 power sensor (Option H84 adds a Standards Lab Calibration) |
| | ✓ | | | | | Power Sensor/ Attenuator (calibrated pair): Type-N (m) | Agilent calibrated pair E9300A H25 and 8493C (010) |
| | | | | | ✓ | V-Band Power Sensor | Agilent V8446A V-Band Power Sensor |
| | | ✓ | ✓ | | | Adapter, 2.4 mm (f) to Type-N (f) | Agilent 11903B 2.4 mm (f) to Type-N (f) adapter |
| | | ✓ | ✓ | ✓ | ✓ | Adapter, 2.4 mm (f) to (f) | Agilent 11900B 2.4 mm (f) to (f) adapter |
| ✓ | ✓ | | | | | Adapter, 3.5 (f) to (f) | Agilent 1250-1749 APC 3.5 (f) to (f) adapter |
| ✓ | ✓ | | | | | Adapter, 3.5 (f) to Type-N (m) | Agilent 1250-1744 APC 3.5 (f) to Type-N (m) adapter |
| | | | | | ✓ | Adapter, 1.85 mm (f) to V-Band | Agilent V281A Coax 1.85 mm (f) to V-Band |

Table 3-4 Recommended Equipment for the E8267D

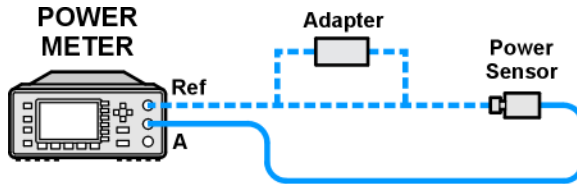
| E8267D Option 520 | E8267D Option 532 | E8667D Option 544 | Test Equipment | Recommended Agilent Test Equipment |
|-------------------|-------------------|-------------------|----------------|--|
| ✓ | ✓ | ✓ | Power Meter | Agilent E4418B E-Series power meter or Agilent E4419A/B E-Series power meter |

Table 3-4 Recommended Equipment for the E8267D

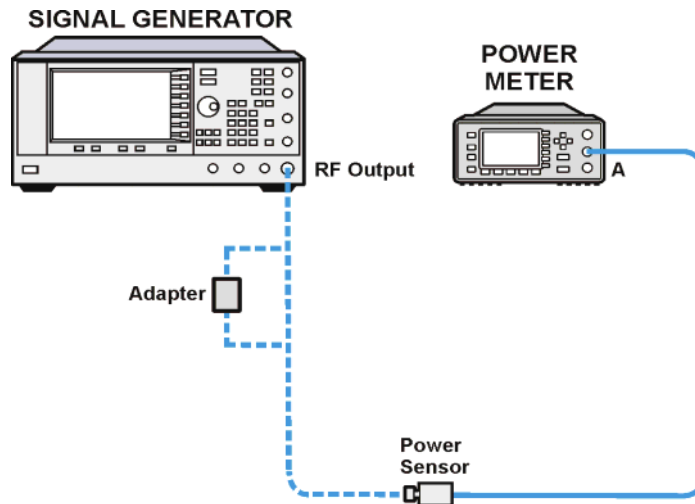
| E8267D Option 520 | E8267D Option 532 | E8667D Option 544 | Test Equipment | Recommended Agilent Test Equipment |
|-------------------------|-------------------------|-------------------------|--|--|
| ✓ | ✓ | ✓ | Power Sensor, Input: Type-N (m) | Agilent E9304A E-Series power sensor or Agilent 8482A power sensor |
| ✓ | | | Power Sensor, Input: APC 3.5 (m) | Agilent E4413A E-Series power sensor |
| ✓ | ✓ | ✓ | Power Sensor, Input: 2.4 mm (m) | Agilent 8487A Option H84 power sensor Option H84 adds a Standards Lab Calibration |
| | | ✓ | Adapter, 2.4 mm (f) to (f) | Agilent 11900B 2.4 mm (f) to (f) adapter |
| ✓ | | | Adapter, APC 3.5 (f) to (f) | Agilent 1250-1749 APC 3.5 (f) to (f) adapter |
| ✓ | | | Adapter, APC 3.5 (f) to Type-N (m) | Agilent 1250-1744 APC 3.5 (f) to Type-N (m) adapter |

Perform the following procedure to check the signal generator output power:

1. Zero and calibrate the power sensor to the power meter as shown:



2. Connect the equipment as shown:



3. Press **Preset**.
4. Press **RF On/Off**. The RF On annunciator is now displayed.
5. Press **Mod On/Off**. The Mod Off annunciator is now displayed.
6. Press **Frequency** and enter the first frequency value listed for your instrument model in [Table 0-5](#).

NOTE Some typical option configurations and their maximum output power limits are shown in [Table 0-5](#). For the complete matrix of options or for the latest changes to specifications, refer to the E8257D, or E8267D data sheets either on the web at <http://www.agilent.com/find/psg> or on the documentation CD that was shipped with your instrument.

7. Press **Amplitude** and enter the amplitude value for your option and frequency.
8. Measure the power level. Record any power levels not within the limits indicated.
9. Repeat steps 6 through 8 and measure the power levels for each remaining frequency listed in [Table 0-5](#).

Table 3-5 Frequency and Power Level Limits (For PSGs with s/n prefixes <US4928/MY4928)

| Instrument Model | Frequency | Amplitude / Limits | | | |
|---|-----------|--------------------|--------------------|--------------------|---------------------|
| | | Standard | Option 1EA | Option 1E1 | Options 1EA and 1E1 |
| E8257D Option 520 | 250 kHz | 13 dBm / ± 0.6 | 16 dBm / ± 0.6 | 11 dBm / ± 0.6 | 15 dBm / ± 0.6 |
| | 3.2 GHz | 13 dBm / ± 0.8 | 16 dBm / ± 0.8 | 11 dBm / ± 0.8 | 15 dBm / ± 0.8 |
| | 20 GHz | 13 dBm / ± 0.8 | 20 dBm / ± 0.8 | 11 dBm / ± 0.8 | 18 dBm / ± 0.8 |
| E8257D Option 540 | 250 kHz | 9 dBm / ± 0.6 | 15 dBm / ± 0.6 | 7 dBm / ± 0.6 | 14 dBm / ± 0.8 |
| | 3.2 GHz | 9 dBm / ± 0.8 | 15 dBm / ± 0.8 | 7 dBm / ± 0.8 | 14 dBm / ± 0.8 |
| | 20 GHz | 9 dBm / ± 0.9 | 18 dBm / ± 1.0 | 7 dBm / ± 0.9 | 16 dBm / ± 1.0 |
| | 40 GHz | 9 dBm / ± 0.9 | 14 dBm / ± 1.0 | 7 dBm / ± 0.9 | 12 dBm / ± 1.0 |
| E8257D Option 550 | 250 kHz | 5 dBm / ± 0.6 | 14 dBm / ± 0.6 | 3 dBm / ± 0.6 | 13 dBm / ± 0.8 |
| | 3.2 GHz | 5 dBm / ± 0.8 | 14 dBm / ± 0.8 | 3 dBm / ± 0.8 | 13 dBm / ± 0.8 |
| | 20 GHz | 5 dBm / ± 0.9 | 14 dBm / ± 1.0 | 3 dBm / ± 0.9 | 13 dBm / ± 1.0 |
| | 40 GHz | 5 dBm / ± 0.9 | 11 dBm / ± 1.0 | 3 dBm / ± 0.9 | 9 dBm / ± 1.0 |
| | 50 GHz | 5 dBm / ± 1.2 | 11 dBm / ± 1.2 | 3 dBm / ± 1.2 | 9 dBm / ± 1.2 |
| E8257D Option 567 | 250 kHz | 5 dBm / ± 0.6 | 14 dBm / ± 0.6 | 3 dBm / ± 0.6 | 13 dBm / ± 0.8 |
| | 3.2 GHz | 5 dBm / ± 0.8 | 14 dBm / ± 0.8 | 3 dBm / ± 0.8 | 13 dBm / ± 0.8 |
| | 20 GHz | 5 dBm / ± 0.9 | 14 dBm / ± 1.0 | 3 dBm / ± 0.9 | 13 dBm / ± 1.0 |
| | 40 GHz | 5 dBm / ± 0.9 | 11 dBm / ± 1.0 | 3 dBm / ± 0.9 | 9 dBm / ± 1.0 |
| | 50 GHz | 5 dBm / ± 1.2 | 11 dBm / ± 1.2 | 3 dBm / ± 1.2 | 9 dBm / ± 1.2 |
| | 60 GHz | 5 dBm / ± 1.2 | 11 dBm / ± 1.2 | 3 dBm / ± 1.2 | 9 dBm / ± 1.2 |
| | 67 GHz | 5 dBm / ± 1.2 | 10 dBm / ± 1.2 | 3 dBm / ± 1.2 | 8 dBm / ± 1.2 |
| E8267D Option 520 | 250 kHz | 13 dBm / ± 0.6 | N/A | N/A | N/A |
| | 3.2 GHz | 13 dBm / ± 0.8 | N/A | N/A | N/A |
| | 20 GHz | 18 dBm / ± 0.8 | N/A | N/A | N/A |
| E8267D Option 532 and Option 544 | 250 kHz | 12 dBm / ± 1.0 | N/A | N/A | N/A |
| | 3.2 GHz | 12 dBm / ± 1.0 | N/A | N/A | N/A |
| | 20 GHz | 14 dBm / ± 1.0 | N/A | N/A | N/A |
| | 40 GHz | 12 dBm / ± 1.0 | N/A | N/A | N/A |
| | 44 GHz | 10 dBm / ± 0.9 | N/A | N/A | N/A |

Table 3-6 Frequency and Power Level Limits (For PSGs with s/n prefixes >US4928/MY4928)

| Instrument Model | Frequency | Amplitude / Limits | | | |
|----------------------|-----------|--------------------|--------------------|--------------------|---------------------|
| | | Standard | Option 1EA | Option 1E1 | Options 1EA and 1E1 |
| E8257D Option 520 | 250 kHz | 13 dBm / ± 0.6 | 16 dBm / ± 0.6 | 11 dBm / ± 0.6 | 15 dBm / ± 0.6 |
| | 3.2 GHz | 13 dBm / ± 0.8 | 16 dBm / ± 0.8 | 11 dBm / ± 0.8 | 15 dBm / ± 0.8 |
| | 20 GHz | 13 dBm / ± 0.8 | 20 dBm / ± 0.8 | 11 dBm / ± 0.8 | 18 dBm / ± 0.8 |
| E8257D Option 521 | 250 MHz | N/A | N/A | 21 dBm / ± 1.0 | N/A |
| | 1 GHz | N/A | N/A | 26 dBm / ± 1.0 | N/A |
| | 6 GHz | N/A | N/A | 30 dBm / ± 1.0 | N/A |
| | 20 GHz | N/A | N/A | 27 dBm / ± 1.0 | N/A |
| E8257D Option 540 | 250 kHz | 9 dBm / ± 0.6 | 15 dBm / ± 0.6 | 7 dBm / ± 0.6 | 14 dBm / ± 0.8 |
| | 3.2 GHz | 9 dBm / ± 0.8 | 15 dBm / ± 0.8 | 7 dBm / ± 0.8 | 14 dBm / ± 0.8 |
| | 20 GHz | 9 dBm / ± 0.9 | 18 dBm / ± 1.0 | 7 dBm / ± 0.9 | 16 dBm / ± 1.0 |
| | 40 GHz | 9 dBm / ± 0.9 | 14 dBm / ± 1.0 | 7 dBm / ± 0.9 | 12 dBm / ± 1.0 |
| E8257D Option 550 | 250 kHz | 5 dBm / ± 0.6 | 14 dBm / ± 0.6 | 3 dBm / ± 0.6 | 13 dBm / ± 0.8 |
| | 3.2 GHz | 5 dBm / ± 0.8 | 14 dBm / ± 0.8 | 3 dBm / ± 0.8 | 13 dBm / ± 0.8 |
| | 20 GHz | 5 dBm / ± 0.9 | 14 dBm / ± 1.0 | 3 dBm / ± 0.9 | 13 dBm / ± 1.0 |
| | 40 GHz | 5 dBm / ± 0.9 | 11 dBm / ± 1.0 | 3 dBm / ± 0.9 | 9 dBm / ± 1.0 |
| | 50 GHz | 5 dBm / ± 1.2 | 11 dBm / ± 1.2 | 3 dBm / ± 1.2 | 9 dBm / ± 1.2 |
| E8257D Option 567 | 250 kHz | 5 dBm / ± 0.6 | 14 dBm / ± 0.6 | 3 dBm / ± 0.6 | 13 dBm / ± 0.8 |
| | 3.2 GHz | 5 dBm / ± 0.8 | 14 dBm / ± 0.8 | 3 dBm / ± 0.8 | 13 dBm / ± 0.8 |
| | 20 GHz | 5 dBm / ± 0.9 | 14 dBm / ± 1.0 | 3 dBm / ± 0.9 | 13 dBm / ± 1.0 |
| | 40 GHz | 5 dBm / ± 0.9 | 11 dBm / ± 1.0 | 3 dBm / ± 0.9 | 9 dBm / ± 1.0 |
| | 50 GHz | 5 dBm / ± 1.2 | 11 dBm / ± 1.2 | 3 dBm / ± 1.2 | 9 dBm / ± 1.2 |
| | 60 GHz | 5 dBm / ± 1.2 | 11 dBm / ± 1.2 | 3 dBm / ± 1.2 | 9 dBm / ± 1.2 |
| | 67 GHz | 5 dBm / ± 1.2 | 10 dBm / ± 1.2 | 3 dBm / ± 1.2 | 8 dBm / ± 1.2 |
| E8267D Option 520 | 250 kHz | 13 dBm / ± 0.6 | N/A | N/A | N/A |
| | 3.2 GHz | 13 dBm / ± 0.8 | N/A | N/A | N/A |
| | 20 GHz | 18 dBm / ± 0.8 | N/A | N/A | N/A |

Table 3-6 Frequency and Power Level Limits (For PSGs with s/n prefixes >US4928/MY4928)

| Instrument Model | Frequency | Amplitude / Limits | | | |
|---|-----------|--------------------|------------|------------|---------------------|
| | | Standard | Option 1EA | Option 1E1 | Options 1EA and 1E1 |
| E8267D Option 532 and Option 544 | 250 kHz | 12 dBm / ±1.0 | N/A | N/A | N/A |
| | 3.2 GHz | 12 dBm / ±1.0 | N/A | N/A | N/A |
| | 20 GHz | 14 dBm / ±1.0 | N/A | N/A | N/A |
| | 40 GHz | 12 dBm / ±1.0 | N/A | N/A | N/A |
| | 44 GHz | 10 dBm / ±0.9 | N/A | N/A | N/A |

NOTE Limit values are due to power measurement uncertainty.

Problems with Output Power

If a problem occurs when verifying output power levels, perform the following procedure:

1. Verify the power sensor being used in this test is the appropriate sensor.
2. Verify the power sensor calibration factors, if required, are correct.
3. Verify the power sensor is properly calibrated to the power meter.

If the problem continues, perform a Power Level Accuracy performance test. Refer to the Troubleshooting chapter of the *E8257D/67D PSG Signal Generators Service Guide*.

4 Regulatory Information

Statement of Compliance

This product has been designed and tested in accordance with IEC Publication 61010, *Safety Requirements for Electronic Measuring Apparatus*, and has been supplied in a safe condition. The instruction documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

Assistance

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies products. For any assistance, contact Agilent Technologies. (Refer to [“Contacting Agilent Sales and Service Offices”](#) on page 11.)

Certification

Agilent Technologies certifies that this product met its published specifications at the time of shipment from the factory. Agilent Technologies further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institute’s calibration facility, and to the calibration facilities of other International Standards Organization members.

Compliance with German Noise Requirements

This is to declare that this instrument is in conformance with the German Regulation on Noise Declaration for Machines (Laermangabe nach der Maschinenlaermrrerordnung - 3.GSGV Deutschland).

Table 4-1 German Noise Requirements

| Acoustic Noise Emission/Geraeuschemission | |
|---|---------------------|
| LpA < 70 dB | LpA < 70 dB |
| Operator position | am Arbeitsplatz |
| Normal position | normaler Betrieb |
| per ISO 7779 | nach DIN 45635 t.19 |

Compliance with Canadian EMC Requirements

This is to declare that this ISM device complies with Canadian ICES-001. (Cet appareil ISM est conforme a la norme NMB du Canada.)

Declaration of Conformity

A copy of the Manufacturer's EU Declaration of Conformity for this instrument can be obtained by contacting your local Agilent Technologies sale representative. (Refer to [“Contacting Agilent Sales and Service Offices”](#) on page 11.)

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