

Tips for Preventing Spectrum Analyzer Damage



1. Ensure Proper Grounding

- Always use the three-prong AC power cord supplied with the analyzer.
- Properly grounding of the instrument will prevent a build-up of electrostatic charge which may be harmful to the instrument and the operator.
- Do not defeat the earth-grounding protection by using an extension cable, power cable, or autotransformer without a protective ground conductor.
- Check AC power quality & polarity; typical AC voltage required is 100,120,220 volt, +/- 10% or 240 volt, +5%/-10%. Typical expected grounding wire resistance <1 ohm, the voltage between neutral & ground line < 1 volt. Install uninterruptible power supply (UPS) if necessary.
For more information, visit <http://metrologyforum.tm.agilent.com/grounding.shtml>.

2. Read the Warning Labels and Specifications

- Do not exceed the values provided in the specifications guide or as indicated by the yellow warning labels on the analyzer.
- Refer to the specifications guide for conditions required to meet with the listed specifications. There will be information regarding stabilization time, instrument settings and calibration/alignment requirements.

For example, the yellow warning label on the front panel of E4440A PSA indicates the maximum RF input power can be applied is 30 dBm (1 Watt) and 0 VDC DC Coupled or 100 VDC AC Coupled.

3. Avoid Overpowering the Analyzer Level

- Avoid front end damage by having some idea of the signal to be measured with the spectrum analyzer. Overpowering the front end can cause damage to the front end components. Typical maximum RF input signal level is 30 dBm (1 watt)
- Before turning on or off the connected equipment or the DUT, turn off or reduce the DUT/source power. This will prevent unexpected voltage swell or sag affecting the input or the output of analyzer.
- When using a LISN device to perform conducted EMI testing, either disconnect the analyzer or place a transient limiter

(11947A) on the RF input of your spectrum analyzer prior to changing the state of either the DUT power or connection to the LISN device.

- Properly apply a DC block, limiter or external attenuator as needed.

For more info visit www.agilent.com/find/mta.

For example, Agilent 11867A RF limiter is available to provide input protection. It will reflect signals up to a level of 10 watt average power and 100 watts peak power. 11867A will provide input protection, within the specified frequency range for the attenuator & mixer for many spectrum analyzer applications. 11742A blocking capacitor blocks DC signals below 45 MHz and passes signals up to 26.5 GHz. Ideal for use with high frequency oscilloscopes or in biased microwave circuits, it will suppress low frequency signals that can damage expensive measuring equipment.

4. Protect the RF Input Connector

- Be careful not to bend, bump or flex any device under test (DUT) connected to the input of the analyzer (such as filters, attenuators, or large cables). This will reduce the amount of strain placed on the input connector and the mounting hardware.
- Insure externally connected items are properly supported (not freely suspended) from the input.
- Don't mix 50 ohm & 75 ohm connectors & cables.

5. Follow Proper RF Cable and Connector Care

- Avoid repeated bending of cables; a single sharp bend can damage a cable instantly.
- Limit the number of connections and disconnections to reduce wear.
- Inspect the connectors prior to using; look for dirt, nicks, and other signs of damage or wear. A bad connector can ruin a good connector instantly.
- Always use torque wrench and gauge tools for connecting RF connectors.



- Clean dirty connectors to prevent poor electrical connections or damage to the connector. For more cable and connector care tips refer to the Connector Care Quick Reference Card found at www.agilent.com/find/cable_care.

6. Follow Electrostatic Discharge Precautions

- Electrostatic discharge (ESD) can damage or destroy electronic components. When ever possible, conduct testing at a static-safe workstation. Keep electrostatic-generating materials at least one meter away from all components. Before connecting any coaxial cable to an analyzer, momentarily short the center and outer conductors of the cable together to ground.
- Install ESD protective covers on all RF connectors prior to shipping and moving equipment.
- For more information visit the Electrostatic Discharge Association www.esda.org.

7. Check for Proper Ventilation & Humidity

- Periodically check and clean the cooling vents of the instrument. Inadequate airflow can result in excessive operating temperatures which can lead to instrument failures. Optimal operating temperature is between 20-30°C
- When installing the product in a cabinet, the convection into and out of the instrument must not be restricted. The ambient temperature must be less than the maximum operating temperature of the product by 4°C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

8. Use Proper Lifting Techniques

- Lift the instrument by the handles when transporting.
- Avoid picking up the instrument with your hand over the front panel. If the instrument slips, damage may occur to the keypad, knob, or input connectors.
- Use a cart or two people to help move heavy instruments.

9. Use Proper Packing for Transport

- Instrument damage can result from using packaging materials other than those specified. Never use styrene pellets in any shape as packaging materials. They do not adequately cushion the equipment and can cause equipment damage by generating static electricity. If possible, retain the original packaging in order to re-use it when shipping the instrument.

10. Check Your Instrument Settings

- Review the measurement procedures and settings needed for a particular application prior to making any measurements (refer to measurement guide).
- Depending on the type of repair, the analyzer settings may have been reset to the factory defaults.

11. Make Sure to Get the Latest Information About Your Product

- Subscribe to the Agilent E-mail updates:
www.agilent.com/find/emailupdate
- Periodically check for firmware upgrades:
www.agilent.com/find/sa_upgrades
- For Worldwide Service Location information visit
www.agilent.com/find/assist
- For more information on Agilent signal and spectrum analyzers visit
www.agilent.com/find/sa.

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

www.agilent.com/find/contactus

Americas

Canada	(877) 894-4414
Latin America	305 269 7500
United States	(800) 829-4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

Europe & Middle East

Austria	01 36027 71571
Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700*
	*0.125 €/minute
Germany	07031 464 6333
Ireland	1890 924 204
Israel	972-3-9288-504/544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200-88 22 55
Switzerland	0800 80 53 53
United Kingdom	44 (0) 118 9276201

Other European Countries:
www.agilent.com/find/contactus

Revised: October 6, 2008

© Agilent Technologies, Inc. 2008
Printed in USA, August 28, 2009
5963-2969



Agilent Technologies