Keysight Technologies
Tips for Preventing Damage to DCA, OSA, TDR Analyzer
Application Brief

Ensure proper grounding

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

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 specification guide for conditions required to meet the listed specification. Note information regarding stabilization time, instrument settings and calibration/alignment requirements.
- For example, the yellow warning label on the front panel of DCA modules indicates the maximum input level should not exceed ±2 V!

Avoid overpowering the analyzer

- Avoid front end damage by having some idea of the signal level to be measured with the analyzer. Overpowering the front end can cause damage to the front end components. Typical maximum input signal level is < ±2 V.
- Before turning on or turning off the connected equipment or the DUT, reduce the signal level to the minimum safety level. This should help to prevent unexpected voltage swell or sag affecting the input or the output of instrument.
- Properly apply a DC block, limiter or external attenuator as required. For more information visit www.keysight.com/find/mta

Protect the input connector

- 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 use; look for dirt, nicks, and other signs of damage or wear. A bad connector can ruin the good connector instantly.
- Clean dirty connectors to prevent poor electrical connections and damage to the connector. For more cable and connector care tips refer to Application Note 326 found at www.keysight.com/find/cable_care.

Follow electrostatic discharge precautions

- Electrostatic discharge (ESD) can damage or destroy electronic components. Whenever possible, conduct testing at a static-safe workstation. Keep static-generating materials at least one meter away from all components.
- When testing passive (non-power) DUT, work on an ESD workstation or utilize an air ionizer. Discharge the test point by using a probe directly grounded to the earth, or to the ground terminal on the DCA mainframe.
- When test active (powered) DUT, be aware that the capacitors can hold charges even after power is removed from the DU. Voltage on the board can exceed the maximum input level of the analyzer. The transient voltage may occur from DUT. Utilize an inline attenuator (e.g. 3 dB) to reduce the voltage entering the analyzer.

KEYSIGHT TECHNOLOGIES

- Loose cables like a capacitor can hold electrostatic charges. The free end of a cable touching surfaces that have voltage levels will cause analyzer input damage. Before connecting any cable to an analyzer input, short the center and outer conductors of the cable together to ground momentarily.
- For example: Utilize the discharge mechanism available on the 54754A.

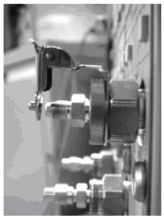

Figure 1. ESD gate.

Figure 2. Shorting test cable.

Figure 3. Cable connection.

- ESD gate p/n 54753-60001, Knurled Attachment Nut p/n 54754-25701.
- Incorporate a Static Protection Unit such as those available from Picosecond ATE. www.picosecondate.com/static_protect.html. This device only connects the module input to your Device Under Test (DUT) after the input cables have been discharged.

- Probe or fixture left out in the air can build up and store electrical charges. Fixture made of plastic can store charges, and probing powered devices can subject analyzer inputs to damaging voltage and power levels. Poor AC power supply connected to analyzer or DUT may create AC transients, insufficient grounding, floating neutral lines which cause damaging currents to flow into or out of DCA analyzer. An inline attenuator should be utilized to reduce the voltage level entering analyzer. Monitor analyzer input signal level with a real-time scope and check for transients that exceed the maximum input level.
- For more information about electrostatic discharge contact the Electrostatic Discharge Association www.esda.org

Check for proper ventilation and 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. Typical optimal operating temperature is 23 °C to -5 °C, always keep instrument ambient temperature at < 35 °C.
- When installing the product in a cabinet, the convection air currents in 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 W dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 W, then forced convection must be used.

Use proper lifting techniques

- Lift the instrument by the handles during transportation.
- Avoid picking up the instrument with your hand over the front panel. If the instrument slips, it may damage the keypad, knob, or input connector.
- Use a cart or two persons to help move any heavy instrument.

Get the latest information about your product

- Check for updated service notes: www.keysight.com/find/servicenotes
- Subscribe to the Keysight e-mail updates: www.keysight.com/find/emailupdate
- Check DCA product information: www.keysight.com/find/dca
- For worldwide service locations information visit: www.keysight.com/find/assist

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