54754A-07

S E R V I C E N O T E

Supersedes:
NONE

54754A - Differential and Single-ended TDR/TDT Module

Serial Numbers: All Units

Reduce ESD/EOS damage on TDR modules using proper ESD protection techniques and Agilent N9355CK01 DC Coupled Limiters.

Parts Recommended:

P/N	Description	Qty.
5989-5624ENA	"Protect Your DCA Module Investment"	1
Agilent N9355CK01	DC Coupled Limiter	2
54753-60001	Discharge Mechanism Assembly (ESD Gate)	2
54754-25701	Knurled Attachment Nut	2

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION: **INFORMATION ONLY**	
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ADDITIONAL INFORMATION:	

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Situation:

High speed instrument inputs are easily damaged by electrostatic discharge (ESD) or electrical over stress (EOS). Voltages in excess of ±2V can destroy high-performance samplers used high speed instruments. It is possible for ESD voltages too small to be felt as a shock to damage sensitive input components resulting in eventual failure.

Solution/Action:

Protection against ESD is essential while removing or connecting cables to the TDR module. Using adequate ESD and EOS techniques can reduce costly failures and system down time.

Static electricity can build up on cables or your body and can easily damage sensitive internal circuit elements when discharged. Static discharges too small to be felt can cause permanent damage. To prevent damage to the instrument:

- **Always** have a grounded, conductive table mat in front of your test equipment.
- **Always** wear a grounded wrist strap, connected to a grounded conductive table mat, having a 1 MΩ resistor in series with it, when making test setup connections.
- **Always** wear a heel strap when working in an area with a conductive floor. If you are uncertain about the conductivity of your floor, wear a heel strap.
- **Always** ground yourself before you clean, inspect, or make a connection to a static-sensitive device or test port. You can, for example, grasp the grounded outer shell of the test port or cable connector briefly.
- **Always** ground the center conductor of a test cable before making a connection to the TDR by shorting the center conductor of the cable to the ESD gate as shown below.

Figure 1. ESD gate.

Figure 2. Shorting test cable.

Figure 3. Cable connection.

- **Incorporate** additional ESD/EOS protective devices such as the new Agilent N9355CK01 DC Coupled Limiter to help prevent damage to the sampler.

Agilent Safety Note “Protect Your DCA Module Investment”, part number 5989-5624ENA provides additional ESD protection tips. This publication can be found online.

http://cp.literature.agilent.com/litweb/pdf/5989-5624ENA.pdf

Agilent N9355CK01 DC Coupled Diode Limiter

The N9355CK01 is a diode limiter to protect sensitive oscilloscope channels from damage due to ESD or EOS. The limiter dramatically reduces the likelihood that such voltages will reach the sensitive part of the instrument.

Instruments with dual electrical channels, such as the 54754A, will need two N9355CK01s for differential measurements. Step generators within the TDR modules use ≤ 0.2 V which is far less than the diode threshold of the N9355CK01 limiter.

The N9355CK01 can also be used to protect the electrical channel of the 86105x and similar modules, as long as the signal does not exceed −0.5 V to +0.5 V.