

E4981A-10

Modification Recommended Service Note

Supersedes:
None

E4981A Capacitance Meter

Serial Numbers: MY48308211, MY48308212, MY48308215, MY48309074, MY48309076, MY48309083, MY48309088, MY48309098

C value deviation issue at 1MHz, 1pF range, 1m/2m cable

Parts Required:

P/N	Description	Qty.
None		

ADMINISTRATIVE INFORMATION

ACTION	<input type="checkbox"/> ON SPECIFIED FAILURE	STANDARDS		
CATEGORY:	<input checked="" type="checkbox"/> AGREEABLE TIME	LABOR:	2.0 Hours	
LOCATION	<input type="checkbox"/> CUSTOMER INSTALLABLE	SERVICE:	<input type="checkbox"/> RETURN	USED <input type="checkbox"/> RETURN
CATEGORY:	<input checked="" type="checkbox"/> ON-SITE (active On-site contract required)	INVENTORY:	<input type="checkbox"/> SCRAP	PARTS: <input type="checkbox"/> SCRAP
	<input checked="" type="checkbox"/> SERVICE CENTER		<input type="checkbox"/> SEE TEXT	<input type="checkbox"/> SEE TEXT
	<input type="checkbox"/> CHANNEL PARTNERS			
AVAILABILITY:	PRODUCT'S SUPPORT LIFE	NO CHARGE AVAILABLE UNTIL:	30-June-2021	
	<input checked="" type="checkbox"/> Calibration Required	PRODUCT LINE:	WN	
	<input type="checkbox"/> Calibration NOT Required	AUTHOR:	jm	

ADDITIONAL INFORMATION:

Situation:

E4981A with the listed serial numbers below may not meet the specification of the measurement accuracy at the following measurement conditions, due to inaccurate correction constants written by improper calibration steps.

Suspected Measurement condition	Indicated C value (at worst case)	Specification
1MHz, 1pF range, 1m cable (16048A)	3.3fF	$\pm 0.85\text{fF}$ equivalent
1MHz, 1pF range, 2m cable (16048D)	3.2fF	$\pm 0.85\text{fF}$ equivalent

For 1MHz, other ranges and other frequency (120 Hz, and 1k Hz), all range have no issue.

Solution/Action:

Customer action:

If a customer meets one of four conditions below, the product is not impacted and can continue to be used. However, Keysight recommends a planned/agreeable time re-calibration to permanently fix the issue.

Condition-1: If a customer executes and turns ON Open/Short/Load correction, the correction constants written at factory shipment is not used and the unit is free from this issue as far as the configuration is unchanged.

Note: If Open/Short correction is executed, this issue remains.

Condition-2: If a customer executes incoming inspection when E4981A is delivered and the results of C value are within the limits, the unit is usable at the customer's discretion.

Condition-3: If a customer has C standards and the results of C value are within the limits, the unit is usable at the customer's discretion.

- measure C value with 16381A (C standard 16380A, 1pF) at 1 MHz with 1m/2m cable, then the results of C value are within the limits.

Step 01. Connect the 1m cable on the UNKNOWN terminal

Step 02. Connect 16181A to the end of 1m cable.

Step 03. Press **[Preset]** key.

Step 04. Press **CLEAR SET&CORR**, then press **OK**

Step 05. Press the down cursor key twice to select **FREQ** field.

Step 06. Press **1MHz** to set the frequency at 1 MHz.

Step 07. Press the down cursor key to select **MEAS TIME** field.

Step 08. Press **INCR +** twice to set the measurement time at 8.

Step 09. Press **[Meas Setup]** key.

Step 10. Press the down cursor keys four times to select **TRIG** field.

Step 11. Press **MAN** to select the manual trigger mode.

Step 12. Press **[Meas Setup]** key.

Step 13. Press **CORRECTION** to show **<CORRECTION>** display.

Step 14. Press the down cursor key, then press the right key to select **CABLE** field.

- Step 15.** Press **1m** to select the 1m cable mode.
- Step 16.** Press **[Display Format]** key to show the measurement display.
- Step 17.** Press **[Trigger]** key to make a single measurement.
- Step 18.** Check if the C value is within the limits.
- Step 19.** Connect the 2m cable on the UNKNOWN terminal
- Step 20.** Connect 16381A to the end of 2m cable.
- Step 21.** Press **[Preset]** key.
- Step 22.** Press **CLEAR SET&CORR**, then press **OK**
- Step 23.** Press the down cursor key twice to select **FREQ** field.
- Step 24.** Press **1MHz** to set the frequency at 1 MHz.
- Step 25.** Press the down cursor key to select **MEAS TIIME** field.
- Step 26.** Press **INCR +** twice to set the measurement time at 8.
- Step 27.** Press **[Meas Setup]** key.
- Step 28.** Press the down cursor keys four times to select **TRIG** field.
- Step 29.** Press **MAN** to select the manual trigger mode.
- Step 30.** Press **[Meas Setup]** key.
- Step 31.** Press **CORRECTION** to show **<CORRECTION>** display.
- Step 32.** Press the down cursor key, then press the right key to select **CABLE** field.
- Step 33.** Press **2m** to select the 2m cable mode.
- Step 34.** Press **[Display Format]** key to show the measurement display.
- Step 35.** Press **[Trigger]** key to make a single measurement.
- Step 36.** Check if the C value is within the limits.

Condition-4: If a customer has a known reliable E4981A and a known reliable sample like “golden device” and then the C values of the known reliable E4981A and the one of the specified serial-numbers listed below are consistent, the unit is usable at the customer’s discretion.

Even though a customer does not meet either of four conditions above, the customer starts to use Open/Short/Load correction, the customer can continue to use the unit.

Keysight service center action:

Make arrangement of re-calibration.

Perform as received Performance test.

If the Performance test fails, then perform full adjustment then perform Performance Test and provide CoC and Measurement Report to the customer.

If the Performance test passes, then provide CoC and Measurement Report to the customer.

Revision History:

Date	Service Note Revision	Author	Reason for Change
18 Oct 2019	E4981A-10	Jun Maruo	As Published