N4010A-08

S E R V I C E N O T E

Supersedes:
NONE

N4010A Wireless Connectivity Test Set

Serial Numbers: MY46320255 / MY47230414
[Note: Additional units outside of this range are listed on the last page of this Service Note]

RF Assembly Reliability Issue

To Be Performed By: Agilent-Qualified Personnel

Parts Required:

P/N	Description	Qty.
0181-0233	Tantalum Capacitor (1uF)	1
or		
N4010-61870	RF Assembly Kit	1

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:

MODIFICATION RECOMMENDED

ACTION CATEGORY: :	X IMMEDIATELY [[]] ON SPECIFIED FAILURE [[]] AGREEABLE TIME	STANDARDS LABOR (REPAIR) : 1.5 Hours (Average) LABOR (CALIBRATE) : 3 Hours (Average)	
LOCATION CATEGORY:	[[]] CUSTOMER INSTALLABLE [[]] ON-SITE X SERVICE CENTER	SERVICE INVENTORY: [[]] RETURN [[]] SCRAP X SEE TEXT	USED PARTS: X RETURN [[]] SCRAP [[]] SEE TEXT
AVAILABILITY: PRODUCTS SUPPORT LIFE		NO CHARGE AVAILABLE UNTIL: 31-Dec-2009	
AUTHOR: FC		PRODUCT LINE: PN	
ADDITIONAL INFORMATION: All affected service inventory has been recalled & replaced/repaired prior to publication of this Service Note			

Agilent Technologies

Situation:

This Service Note addresses a manufacturing defect that was introduced to the N4010A RF Assembly during 2007 that went undetected for several months. This error relates to the placement of a 1uF tantalum capacitor on a low DC voltage supply line – the capacitor was fitted using the wrong polarity, causing it to de-rate over time. If the capacitor de-rates to the point that it fails, the N4010A RF Assembly will no longer work correctly.

In order to minimize the inconvenience that can result from a failing instrument, Agilent would prefer to repair this defect in all affected units prior to failure.

Please note: If the capacitor fails it will not result in a safety issue:
1. It will not result in the generation of dangerous voltages (neither internally nor externally).
2. It will not result in a fire hazard – even though the capacitor will burn-out, it is surrounded by non-combustible materials
3. It will not result in a 'smoke event' – the RF Assembly is encased in a metal RF clamshell, so it is highly unlikely that any smoke and/or odors will be generated.

If the capacitor has failed, the most likely failure mechanism is that the N4010A RF Output will be severely degraded, perhaps non-existent. A simple way to verify whether or not the RF Output is damaged is to run the internal alignment routine by pressing **System**, **Service**, **Calibrate All**:
- Pass = the RF Output is working (i.e. capacitor has not failed).
- Fail = this may be due to a failed capacitor, but it may also be an unrelated fault.

Solution/Action:

Step 1: Determine whether or not the instrument is affected by this issue.

(Note: This can be checked by the customer prior to contacting Agilent).

(a) Check to see if the instrument serial number is within the range shown on the first page of this Service Note, or is listed among the individual instruments shown on the last page.

If the instrument serial number is not included in either the range or the list, then this Service Note does not apply. As such, if the instrument is exhibiting a fault then it will require further debug to trace the issue to root cause.

(b) Send the following remote enquiry to the instrument, and read back the returned data (formatted as a text string):

SERV:HW:INF? FRONTEND

The returned data contains several items that are comma-separated. The 'Serial Number' item is followed by an 11 digit number that signifies the serial number of the RF Assembly PCB.

Example: "Name,Front-End Assembly,Part Number,N4010-61043,Serial Number,**20073501405**,Hardware Rev,104,Firmware Rev,16,Cal Date,190407"

(c) If the serial number of the PCB is in the range of **20063900003** to **20074600975** (inclusive), then the N4010A is at risk of failing due to the capacitor issue, and it must be repaired in accordance with this Service Note.

(d) If the serial number of the PCB begins with '**9**' then the instrument has already been repaired in accordance with this Service Note. Alternatively, if the serial number is outside of the specified range, then this Service Note does not apply. In either case, if it is exhibiting a fault then it will require further debug to trace the issue to root cause.

Step 2: Determine the correct repair method for an affected instrument.

(Note: This can only be checked at an Agilent Service Center).

(a) Remove the RF Assembly from the instrument.

(b) Refer to Figures 1 and 2:
Remove the 14 screws that secure the metal RF shield to the PCB. Carefully remove the top half of the RF shield, and the metal gaskets that are used to provide RF shielding. Please note the position and orientation of these parts, as they will be re-used during the assembly process.

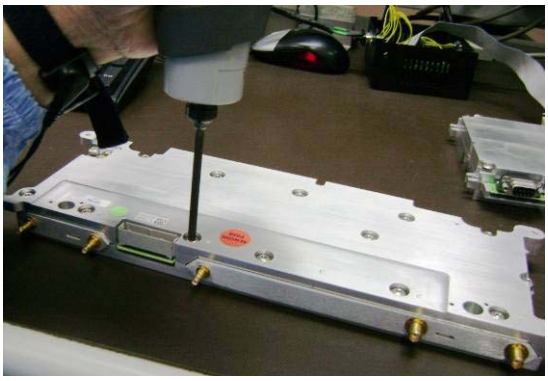

Figure 1

Figure 2

(c) Refer to Figures 3 and 4:
Locate capacitor C160, and check to see if it is burned-out. If it is burned-out then the RF Assembly must be completely replaced (part number N4010-69870).

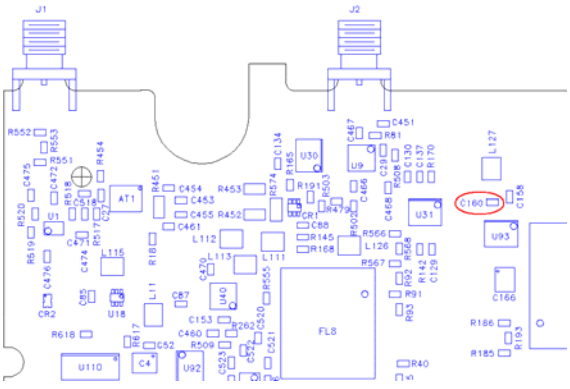

Figure 3

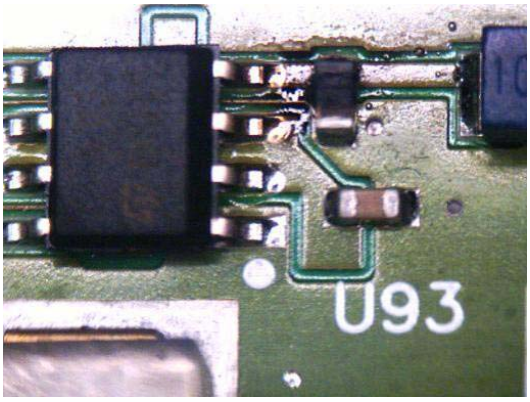

Figure 4

(d) The polarity of C160 is indicated by a dark brown stripe at the positive electrode. The correct orientation of C160 is shown in Figure 5, whilst Figure 6 shows the wrong orientation of C160. If the orientation of C160 is correct, then proceed to step 2(g), otherwise continue to step 2(e).

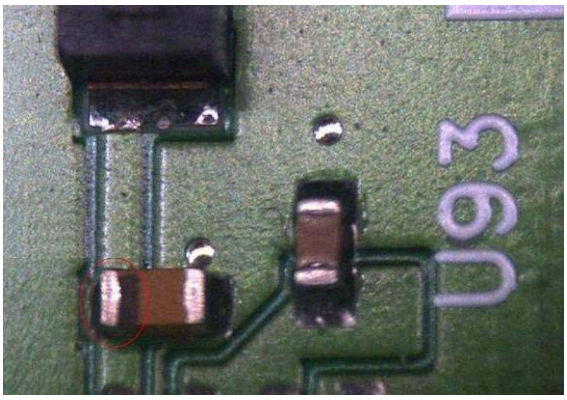

Figure 5

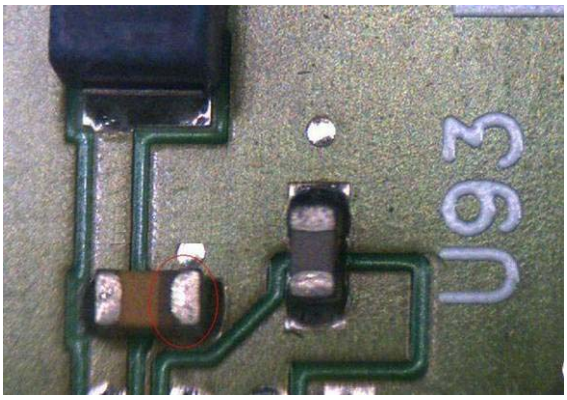

Figure 6

(e) Use a hot air solder station (set to 380°C) & tweezers to remove C160 as shown in Figure 7. Use the same settings to heat the solder on the pad and replace C160 (part number 0181-0233). Note: Do not apply hot air directly to the device, as it may be damaged by over-heating.

Figure 7

(f) Use a manual soldering station (set to a maximum of 370°C) to touch-up the solder fillets on both sides of C160 as shown in Figure 8.
Note: The maximum exposure time is 3 seconds – the device can be damaged by over-heating.

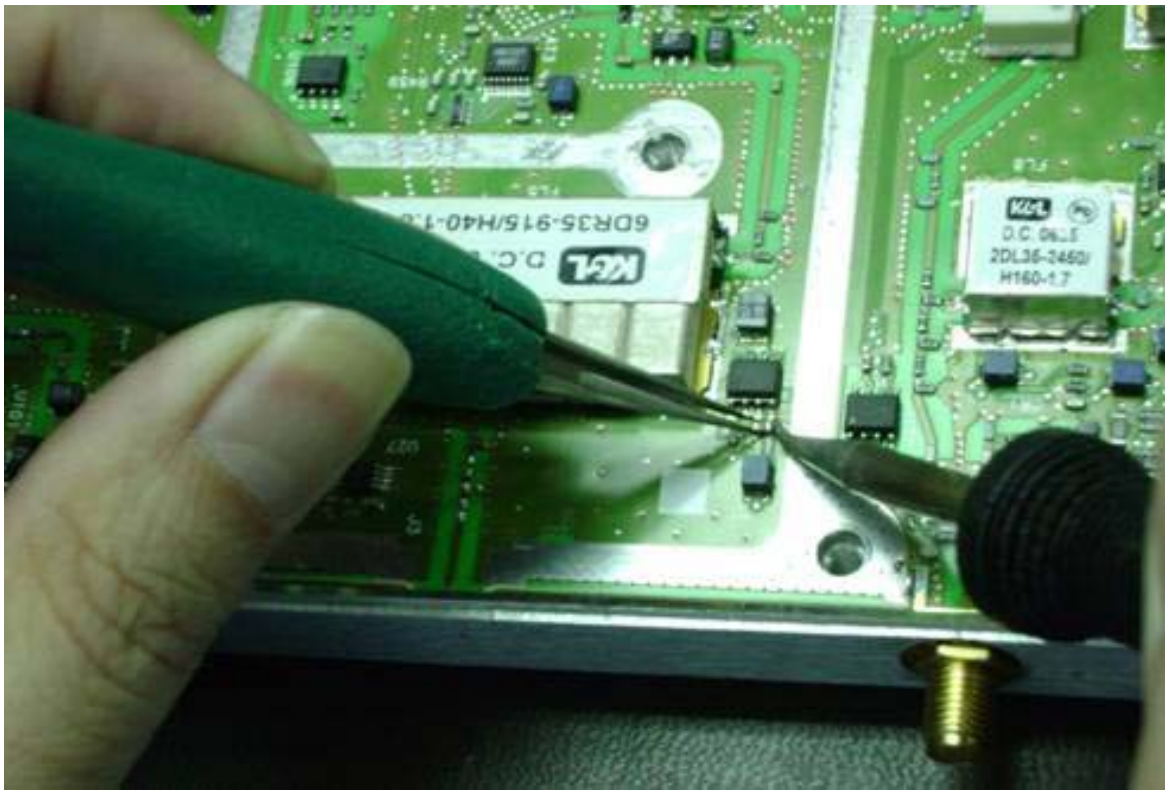

Figure 8

(g) Place the metal gaskets on the PCB, ensuring the position and orientation of each one is correct. Carefully fit the top half of the RF shield, and tighten the 14 screws to 21 in-lbs (2.37 Nm) using the sequence shown in Figure 9.
Note: Repeat the tightening process once more to ensure the RF gasket is fully compressed.

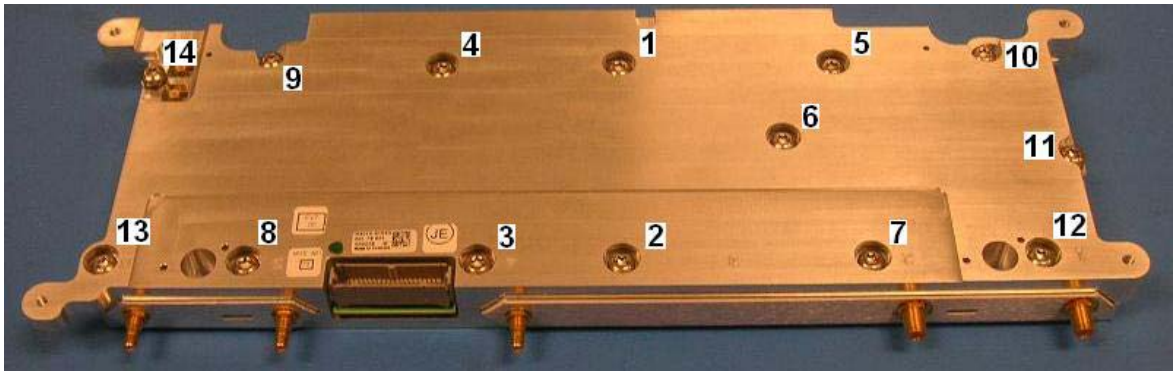

Figure 9

(h) Re-assemble the N4010A, and switch it on. Take the 11 digit serial number that was extracted in step 1(b), change the first digit to '**9**', and update the PCB EEPROM data using the command:
SERV:HW:INF FRONTEND,"*,*,9xxxxxxxxxx,*,*"

(i) The N4010A must now be fully adjusted prior to running the performance verification tests.

Additional Units Covered By This Service Note

The serial number range on the front page of this Service Note refers to instruments that were shipped as-new with this manufacturing defect.

This defect also impacted RF Assemblies that were provided to Agilent's service organization as spare parts – the instruments listed below are at-risk of having been repaired using defective material.

GB44140173	GB45140257	GB45140407	GB45280195	GB46170323
GB44140175	GB45140290	GB45140410	GB45350128	GB46170325
GB44140233	GB45140296	GB45140411	GB45350150	GB46170481
GB44440280	GB45140318	GB45280101	GB45350162	GB46170508
GB44450160	GB45140320	GB45280124	GB45350203	GB46170600
GB44450231	GB45140327	GB45280126	GB45400399	GB46170660
GB44450275	GB45140328	GB45280127	GB45400421	GB46170667
GB44450288	GB45140331	GB45280152	GB45500180	MY46320106
GB45140101	GB45140390	GB45280153	GB45500424	MY46320244
GB45140178	GB45140398	GB45280163	GB45500445	
GB45140254	GB45140402	GB45280166	GB46170321	