

S E R V I C E N O T E

SUPERSEDES: None

E4431B RF Signal Generator

Serial Numbers: 0000A00000/9999Z99999
 (valid for all units with motherboards listed below)

Replacement Procedure for Q501 on Motherboard/CPU**Duplicate Service Notes:**

E4400A-02, E4400B-01
 E4420A-02, E4420B-01
 E4421A-02, E4421B-01
 E4422A-02, E4422B-01
 E4430A-03, E4430B-01
 E4431A-03, E4431B-01
 E4432A-03, E4432B-01
 E4433A-03, E4433B-01

To Be Performed By: Agilent-Qualified Personnel or Customer

Parts Required:

P/N	Description	Quantity
1854-0828	TIP-122 Transistor	1 (see text)

Continued

DATE: March 1999

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:

INFORMATION ONLY

AUTHOR:

ENTITY:

ADDITIONAL INFORMATION:

JV

5320



Situation:

A large proportion of motherboard failures have been caused by stress fractures internal to Q501, the series-pass transistor for the +9 volt power supply.

Since replacement of the motherboard is complex and time consuming, it is best to first check any motherboard failure for proper operation of this supply. If this supply should fail, Error 508 (Synthesizer unlocked) will be generated and no RF power will be seen. The +9 volt LED (DS505) will not be lit, which is easily visible once the cover has been removed. In most cases, replacement of this transistor will restore proper operation with no further calibration required.

This problem only affects motherboards with the following part numbers:

E4400-60001

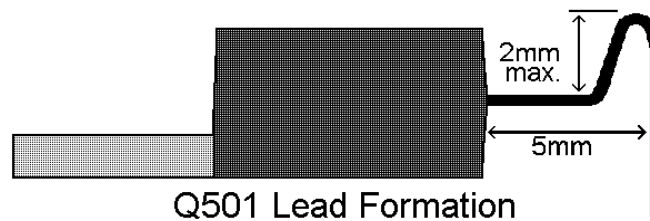
E4400-60124

E4400-60192

Solution / Action:

If the +9 volt LED is not lit, check the voltage on the leads of Q501. Remove the 15 screws holding the bottom shield in place. Q501 is the TO-220 style transistor located on the bottom side of the motherboard, at the front of the instrument, next to the front panel ribbon cable connectors. Viewed with the mounting tab on top, the leads are BCE (left to right). The base should be about +11 volts, the collector should be about +12 volts, and the emitter should be about +9.5 volts. If the base or emitter voltages are incorrect, replace Q501. Unscrew, then unsolder, the old defective transistor. Set aside the shoulder washer (0340-1162) and screw (0515-0372) for later reuse.

Obtain a new transistor and bend all three leads with needle nose pliers as shown in the drawing below. This may take some practice so it helps to order several replacement transistors. This lead formation is done to prevent future failures caused by stress fractures.



Insert the transistor into the motherboard but do NOT solder it yet. Use the shoulder washer and screw to fasten the transistor, making sure the shoulder washer is properly seated. Once the transistor is mechanically secured, it may be soldered from either the top or bottom side of the board. Using an ohmmeter, verify the transistor's tab is not shorted to ground.

Apply power and verify the proper voltages are obtained and the LED is lit. Verify proper RF output. If all is okay, reassemble the instrument. Make sure the bottom shield does not come in contact with the raised leads of the transistor. For extra assurance against shorts, a small piece of mylar tape, properly positioned, may be attached to the shield. No instrument adjustments should be necessary.