

MULTIPLE OUTPUT LINEAR SYSTEM DC POWER SUPPLY

Agilent MODELS 6624A

Date: 2016-JUL-24

Repair - Output Ch3 (40W HV)

Serial-Number: SER# 2631A-00774 (26=1960+26=1986, 31=week 31, A = made in USA)

Installed Option 750 (fault indicator/FLT, remote inhibit(INH and relay control, protection)

Note: 6624A = Output CH3 + CH4 = 40W High Voltage, Output CH1+ CH2 = 40W Low Voltage

Problem: Self-test message "HDW ERR CH 3" means the 40 W High Voltage output CH3.

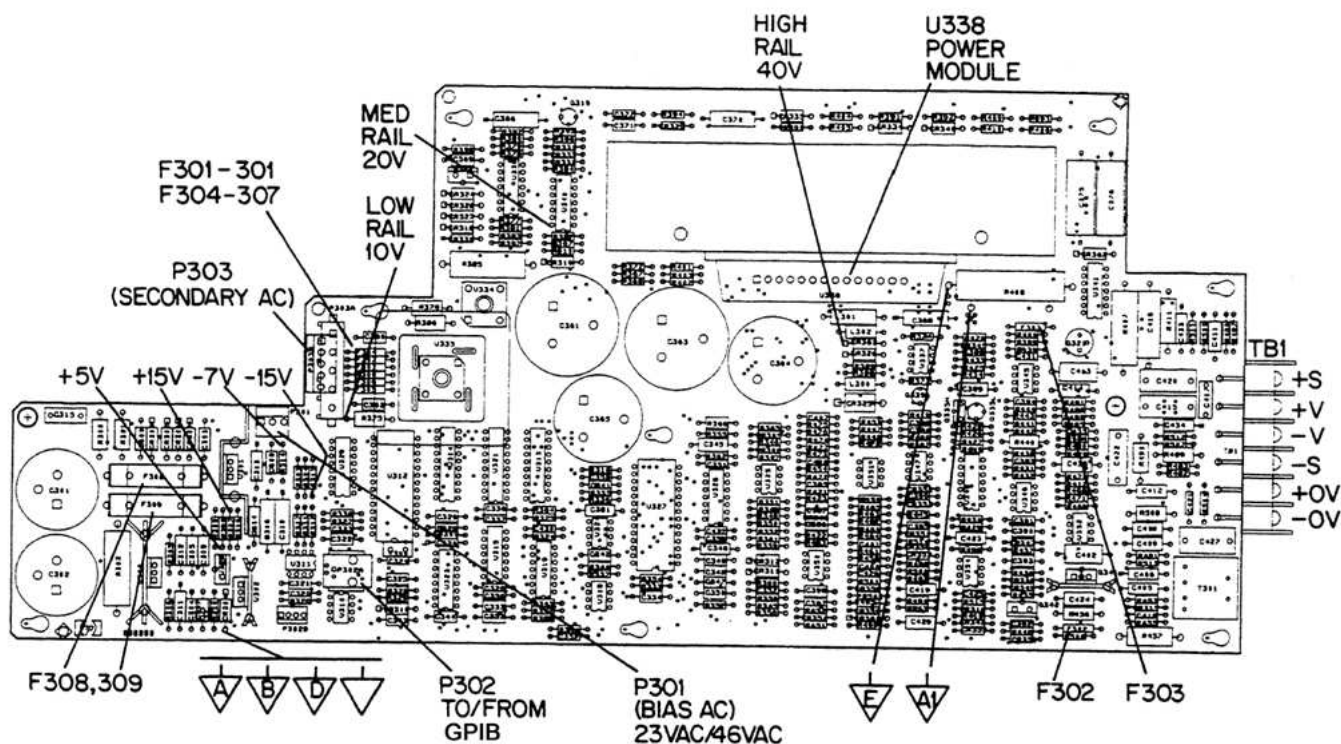


Figure 4-4. 40W Left Hand Output Board, Fuse and Test Point Locations

Test 1: Check if problem is on the GPIB board or the Output-Board CH3 (troubleshooting flow chart Figure 4-6). Exchange at GPIB board the serial data cable of CH3 with the serial data cable of another channel, if the error remains at the same channel.

Result: Shows error at a different channel – error is at the CH3 board not at the GPIB board.

Continue with Output Board CH3 troubleshooting (Paragraph 4-25 and troubleshooting flow chart Figure 4-9)

Test 2: Measure if the supply voltages are in the specified range

Result: +15V = +14.53V (ok)
-15V = -14.68V (ok)
+5V = +4.989V (ok)
-5.75V = -5.790V (ok) – note: documented -7V does not exist.

Test 3: Check if the Reference Voltages are in specified range of 10V +/- 0.5% (9.95V ... 10.05V)
VrefA/B/C are generated by 10V-Ref-IC U318/1826-1369 and 4xOP U319/1826-0315/LM324.
They support U313, U321/12-Bit-DAC/DAC1230LCD and U314/Dual-8-Bit-DAC/AD7528

Result: Vref A (U313 [8] 12-Bit DAC/1826-1488/DAC1230LCD) = 9.99V (ok)
Vref B (U321 [8] 12-Bit DAC/1826-1488/DAC1230LCD) = 9.99V (ok)
Vref C (U314 [4] 2x8-Bit DAC/1826-1231/AD7528) = 9.99V (ok)

Test 4: Check the High, Medium and Low rail voltages at Power Module U338 (see Table 4-17)

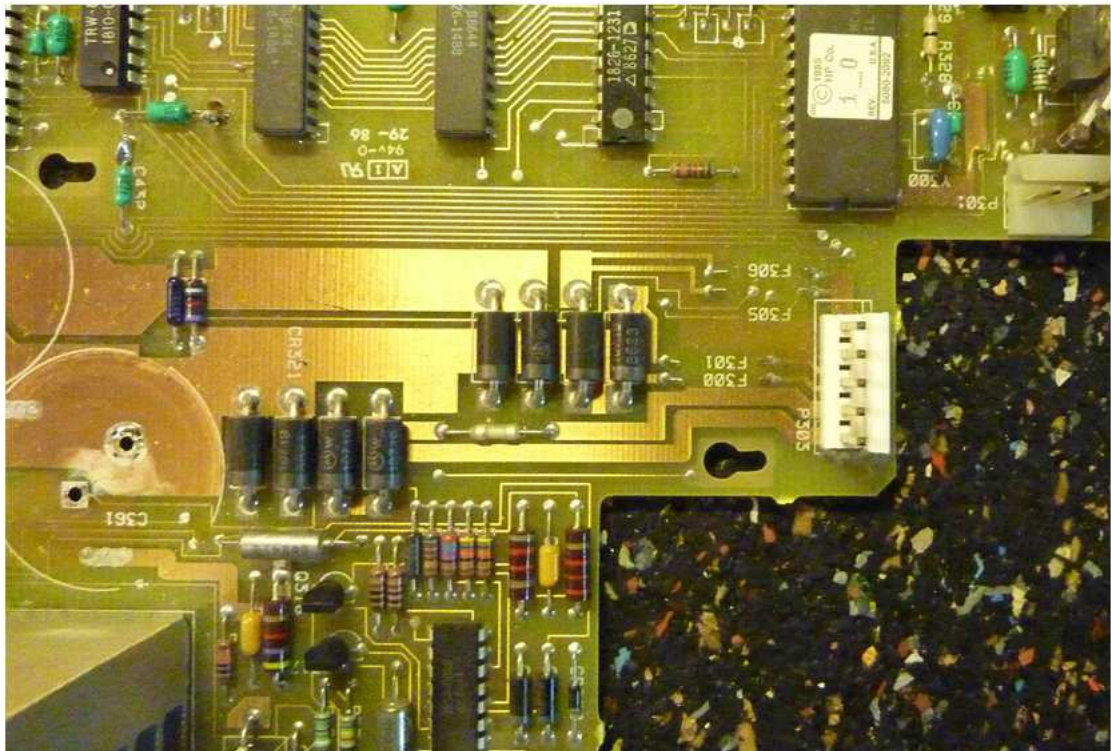
Table 4-17. Typical Power Module U338 Voltage Levels						
U338 Pin No. (Note 3)	Function	Output Board				Voltage Referenced to
		40WLV	40WHV	80WLV	80WHV	
1	Reference	3.5 V	3.5 V	4.1 V	4.1 V	+V
2	Emitter	2.7 V	2.7 V	3.4 V	3.4 V	+V
3	High Rail	39 V	78 V	39 V	78 V	Common
4	Medium Rail	21 V	46 V	21 V	46 V	Common
5	Bypass	2.7 V	2.7 V	3.4 V	3.4 V	+V
6	Low Rail	10.5 V	23 V	10.5 V	23 V	Common
7	Thermistor (Note 4)	4.5 V	4.5 V	4.5 V	4.5 V	Common
8	Collector Output	20 V	50 V	20 V	50 V	Common
9	O V Bias	≈ -0.6 V	≈ -0.6 V	≈ -0.6 V	≈ -0.6 V	pin 3
10	Output Sense	20V	50V	20V	50V	Common
11	OV Gate	0V	0V	0V	0V	Common
12	Common	0V	0V	0V	0V	Common
13	+ Drive	.6 V	.6 V	.6 V	.6 V	+V
14	- Drive	≈ -0.7 V	≈ -0.7 V	≈ -0.7 V	≈ -0.7 V	pin 13

Result: HIGH U338 [3] = ~78V - measured @ CH4 ~77.6V - measured @ CH3 ~12V
MED U338 [4] = ~46V - measured @ CH4 ~45.8 V - measured @ CH 3 ~0V
LOW U338 [6] = ~23V - measured @ CH4 ~31.8 V - measured @ CH 3 ~0V

Test 5: As the rails are not in range, check the fuses, input rectifiers, caps, cables etc.



Result: F300, F301, F305 and F306 (each 7A 125V) and C363 defect (measured 500nF, 220Ω)
C361, C364 are ok.



Replaceable Parts:

CH3, CH4 / 40WHV:

F300/F301/F305/F306 (2110-0916 FUSE 7A 125V RM15)

slow: Bel Fuse Inc. Part no.: MS 7 Digikey: 507-1037-ND

C361 (0180-4038 / 8200μF 50VDC, D=35, H=52, RM=12)

Nichicon # 647-LGY1H822MELB40 8.2mF, Digikey # 493-8664-ND

Nichicon # 647-LGY1H822MELB40 8.2mF, Mouser # LGY1H822MELB40

C362 (0160-4833 / 0.022μF 100V)

C363 (0180-4139 / 7400μF 63VDC, D=35, H=45, RM=12)

Cornell # 598-SLPX822M063H5P3 8.2mF, Digikey # 338-1663-ND

Cornell # 598-SLPX822M063H5P3 8.2mF, Mouser # SLPX822M063H5P3

C364 (0180-4137 / 12000μF 35VDC, D=30, H=51, RM=12)

Nichicon # LLS1V123MELB 12mF, Digikey # 493-7298-ND

Nichicon # LLS1V123MELB 12mF, Mouser # 647-LLS1V123MELB

C365 (unused)

CH1, CH2 / 40WLV:

F300/F301/F302/F303/F304/F305 (2110-0713 FUSE 10A 125V RM15)

slow: Littelfuse Part no.: 0251010.MRT1L Digikey: F3176CT-ND

C361 (0180-4037 / 15000μF 35VDC, D=, H=, RM=)

C362 (0160-4833 / 0.022μF 100V)

C363 (0180-4137 / 12000μF 35VDC, D=30, H=51, RM=12)

Nichicon # LLS1V123MELB 12mF, Digikey # 493-7298-ND

Nichicon # LLS1V123MELB 12mF, Mouser # 647-LLS1V123MELB

C364 (0180-4038 / 24000μF 16V)

C365 (0180-4137 / 12000μF 35VDC, D=30, H=51, RM=12)

Nichicon # LLS1V123MELB 12mF, Digikey # 493-7298-ND

Nichicon # LLS1V123MELB 12mF, Mouser # 647-LLS1V123MELB

