

Item #	Quantity	#Column Name Error:Note	Designator	Description	Footprint	Comment	LibRef
1	1		A1R3	Resistor 196K 1% 0805 1/8W 10ppm/C	RESC2013X70X40LL20T20	RES 196K 1% 0805	CMP-2001-00110-5
2	1		A3A1R1	Resistor 196 1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	464K 1% 0805	CMP-2001-00110-5
3	1		A3R2	Resistor 3K16 1% 0805 1/8W 10ppm/C	RESC2013X70X40LL20T20	RES 3K16 1% 0805	CMP-2001-00110-5
4	1		A3R3	Resistor 316 1% 0805 1/8W 10ppm/C	RESC2013X70X40LL20T20	RES 316 1% 0805	CMP-2001-00110-5
5	1		BNC1	BNC PCB Mount	BNC PCB Plastic	Ref Out	BNC PCB
6	1		BNC2	BNC Ref Out	BNC PCB Plastic	Ref In	BNC PCB
7	2		C1, C9	47uF Tant 4V 1411	FP-TAJB-MFG	47uF TA	CMP-04424-000035-1
8	4		C2, C3, C7, C8	100pF 0805	CAPC2113X88X50NL30T25	100pF 0805	CMP-2007-00001-1
9	3		C4, C12, C14	1206 (3216 Metric) Chip Capacitor	CAPC1206(3216)150_L	3.3uF	CMP-1590-00001-1
10	1		C5	0.1uF 0805	CAPC2113X88X50NL30T25	0.1uF 0805	CMP-2007-00001-1
11	1		C6	0.01uF 0805	CAPC2113X88X50NL30T25	0.01uF 0805	CMP-2007-00001-1
12	1		C10	CAP TANT 100u 10V	FP-TPE-D4-MFG	100u 10V TA	CMP-05428-000010-1
13	1		C11	CAP TANT 10u 25V	FP-TPE-D4-MFG	10u 25V TA	CMP-05428-000010-1
14	1		C13	1uF 0805	CAPC2113X88X50NL30T25	1uF 0805	CMP-2007-00001-1
15	1		CHS-GND	Socket	PIN1	T0 Chassis Gnd	Socket
16	1		Fuse	Fuse	Fuse Holder 20mm PCB with Cover	Fuse 50mA T	Fuse
17	2		IBC1, IBC2	Header, 4-Pin	HDR1X4	Header 4	Header 4
18	1		L1	Inductor 6.8uH	2.5x2 Inductor	6.8uH	Inductor
19	4		L, N, SW-1, SW-2	Socket	PIN1	Socket	Socket
20	1		P6	Header, 2-Pin	HDR1X2	Power In	Header 2
21	1		P7	Header, 2-Pin	HDR1X2	Power Ref	Header 2
22	1		P8	Header, 2-Pin	HDR1X2	Power LED	Header 2
23	1		P9	Header, 8-Pin	HDR1X8	Header 8	Header 8
24	1		P10	Header, 2-Pin	HDR1X2	Ext 18-24V	Header 2
25	2		Q1, Q2	JFET - VHF / UJFET Chopper	ONSC-SOT-23-3-318-08_V	MMBFJ111	CMP-1062-00038-1
26	1		Q3	2SC3837K	SC-59	2SC3837K	NPN
27	1		R1	Resistor 31.6 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 31.6 0.1% 0805	CMP-2001-00110-5
28	1		R2	Resistor 0.02 1% 0805 0.5W 50ppm/C	RESC2013X70X40LL20T20	RES 0.02 1% 0805	CMP-2001-00110-5
29	1		R3	Resistor 68.1 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 68.1 0.1% 0805	CMP-2001-00110-5
30	1		R4	Resistor 0.27 1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 0.27 1% 0805	CMP-2001-00110-5
31	2		R5, R5a	Resistor 432 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 432 0.1% 0805	CMP-2001-00110-5
32	1		R6	Resistor 0.39 1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 0.39 1% 0805	CMP-2001-00110-5
33	1		R7	Resistor 22.6 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 22.6 0.1% 0805	CMP-2001-00110-5
34	1		R8	Resistor 665 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 665 0.1% 0805	CMP-2001-00110-5
35	1		R9	Resistor 2K2 0.5% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 2K2 0.5% 0805	CMP-2001-00110-5
36	1		R10	Resistor 7.32 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 7.32 0.1% 0805	CMP-2001-00110-5
37	1		R11	Resistor 7.15K 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 7.15K 0.1% 0805	CMP-2001-00110-5
38	1		R12	Resistor 59 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 59 0.1% 0805	CMP-2001-00110-5
39	1		R13	Resistor 100 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 100 0.1% 0805	CMP-2001-00110-5
40	2		R14, R14b	Resistor 53.6K 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 53.6K 0.1% 0805	CMP-2001-00110-5
41	2		R15, R15a	Resistor 160 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 160 0.1% 0805	CMP-2001-00110-5
42	2		R16, R16a	Resistor 274K 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 274K 0.1% 0805	CMP-2001-00110-5
43	1		R17	Resistor 2.8K 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 2.8K 0.1% 0805	CMP-2001-00110-5
44	1		R18	Resistor 536K 0.1% 0805 1/8W 10ppm/C	RESC2013X70X40LL20T20	RES 536K 0.1% 0805	CMP-2001-00110-5
45	2		R19, R19a	Resistor 25K 0.1% 0805 0.1W 10ppm/C	RESC2013X70X40LL20T20	RES 25K 0.1% 0805	CMP-2001-00110-5
46	1		R20	Resistor 360K 0.1% 0805 1/8W 10ppm/C	RESC2013X70X40LL20T20	RES 360K 0.1% 0805	CMP-2001-00110-5
47	1		R21	Resistor 3K3 0.1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 3K3 0.1% 0805	CMP-2001-00110-5
48	1		R29	Resistor 196 1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RE196 1% 0805	CMP-2001-00110-5
49	2		R31, R33	Resistor 15 1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 15 1% 0805	CMP-2001-00110-5
50	3		R32, R34, R35	Resistor 1K 1% 0805 0.2W 10ppm/C, Resistor 1K1% 0805 0.2W 10ppm/C, Resistor 1K1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 1K 1% 0805	CMP-2001-00110-5
51	1		R36	Resistor 240 1% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 240 1% 0805	CMP-2001-00110-5
52	1		R37	Resistor 2k2 5% 0805 0.2W 10ppm/C	RESC2013X70X40LL20T20	RES 2k2 5% 0805	CMP-2001-00110-5
53	1		R38	Resistor 10K 5% 0805 0.2W 50ppm/C	RESC2013X70X40LL20T20	RES 10K 5% 0805	CMP-2001-00110-5
54	1		RT1	RES 31.6 250ppm 0805	RESC2013X70X40LL20T20	RES 31.6 250ppm 0805	CMP-2001-00110-5
55	2		SC1, SC2		ScreenConnection	ScreenConnection	ScreenConnection
56	1		SW1	Rotary Switch 10way PCB CKN10954-ND	SW_ROT_4x12	Rotary Switch 10way	Rotary_Switch_1x10
57	1		SW2	DPDT Switch	DPDT Toggle E switch	DPDT Switch POL	DPDT Switch
58	1		SW3	CAL/SDBY DPDT	DPDT Toggle E switch	CAL/SBY DPDT	DPDT Switch
59	1		SW4	DPDT Switch	DPDT Toggle E switch	INT/EXT DPDT	DPDT Switch
60	1		T1	AC-DC Regulated Module 24V	1RM-02 Moule SM	AC-DC Reg	AC-DC Reg Module
61	1		Trm1	Trimmer	3214W Trimmer	Trm 1k	Trimmer
62	1		U1	500mA, Medium Current 1.2 to 37 V Adjustable Voltage Regulator, 3-Pin DPAK, Tape and Reel	TO-252_L	LM317MDT-TR	CMP-0244-00074-1

L. . N

24V DC

M.O.R 11683A

Version 1.1

50mA T Fuse 20x5

T1

R37

Trm1

C11

R36

C14

L1

C13

P7

Do not connect
GND GND to PE

+ Trim for 15.8V

SW-1

P8

R38

Power LED

IBC2 1

SW3

SW4

P6

SW2

M.O.R 11683A
Version 1.1

BNC1

BNC2

GND TP

IBC1

1

A3A1R1

A1R3

Affix Switch Other Side

R19

R19a

R18

R21

R20

R17

R16a

R16

R15

R15a

R14b

R14

R13

R12

P9

C7

C6

A3R3

C4

R29

R31

C2

Q1

R32

C5

A3R2

C8

C1

R3

C3

R33

Q2

R34

R35

RT1

C10

C9

11683A

CHS-GND

M.O.R 11683A
Version 1.1

GND TP

R2

R1

R3

R4

R5

R5a

R6 R7 R8 R9 R10 R11

1

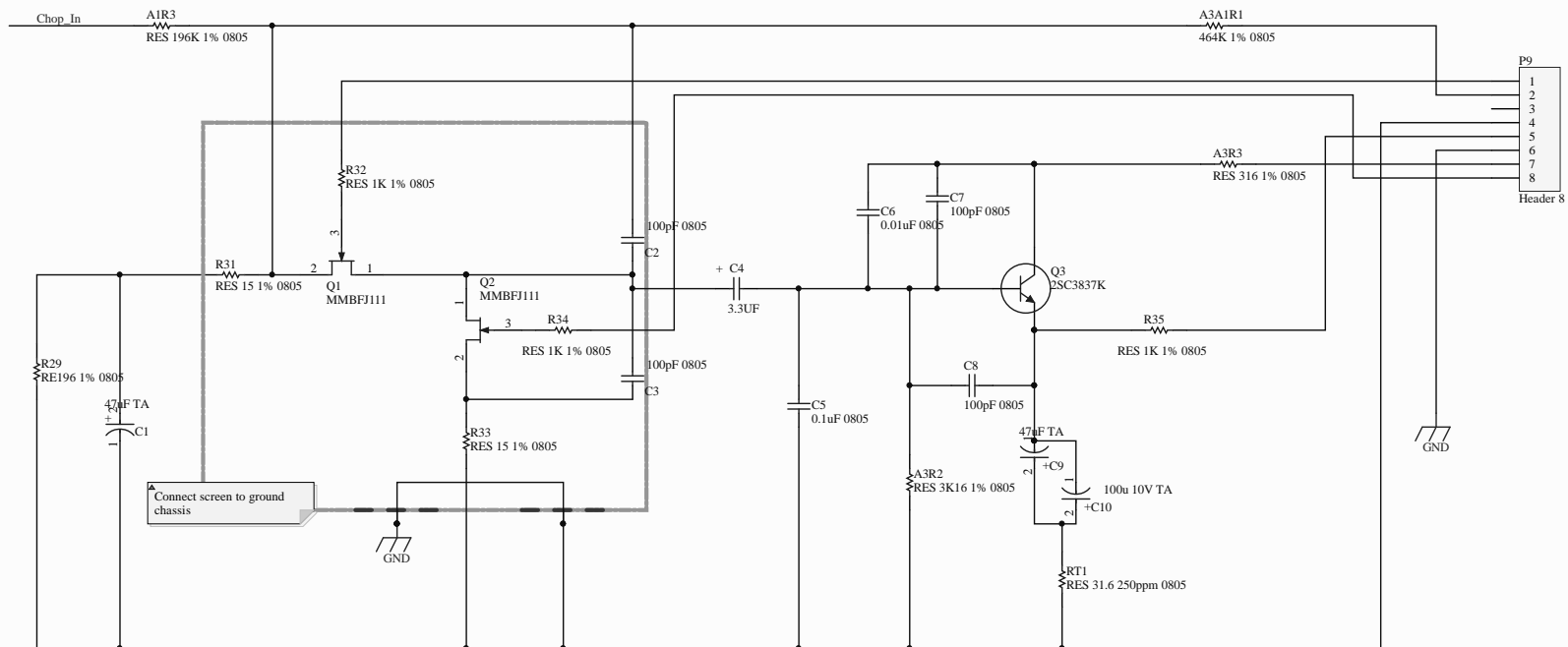
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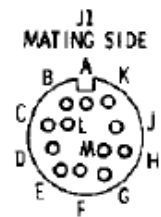
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1 - H 220Hz
 2 - L Auto Zero
 3 -
 4 - E Signal Ground
 5 - D Feedback Return
 6 - M, J F K Guard/Chassis Gnd
 7 - C Samples 220 Output
 8 - G 220HZ gate
 Also Chassis to connector body/screen



C4 may optionally be polarised
 Tant

Title		
ChopperAmp.SchDoc		
Size	Number	Revision
A3		1.1
Date:	07/05/2022	Sheet 1 of
File:	D:\Projects\...\ChopperAmp.SchDoc	Drawn By: P Shersby



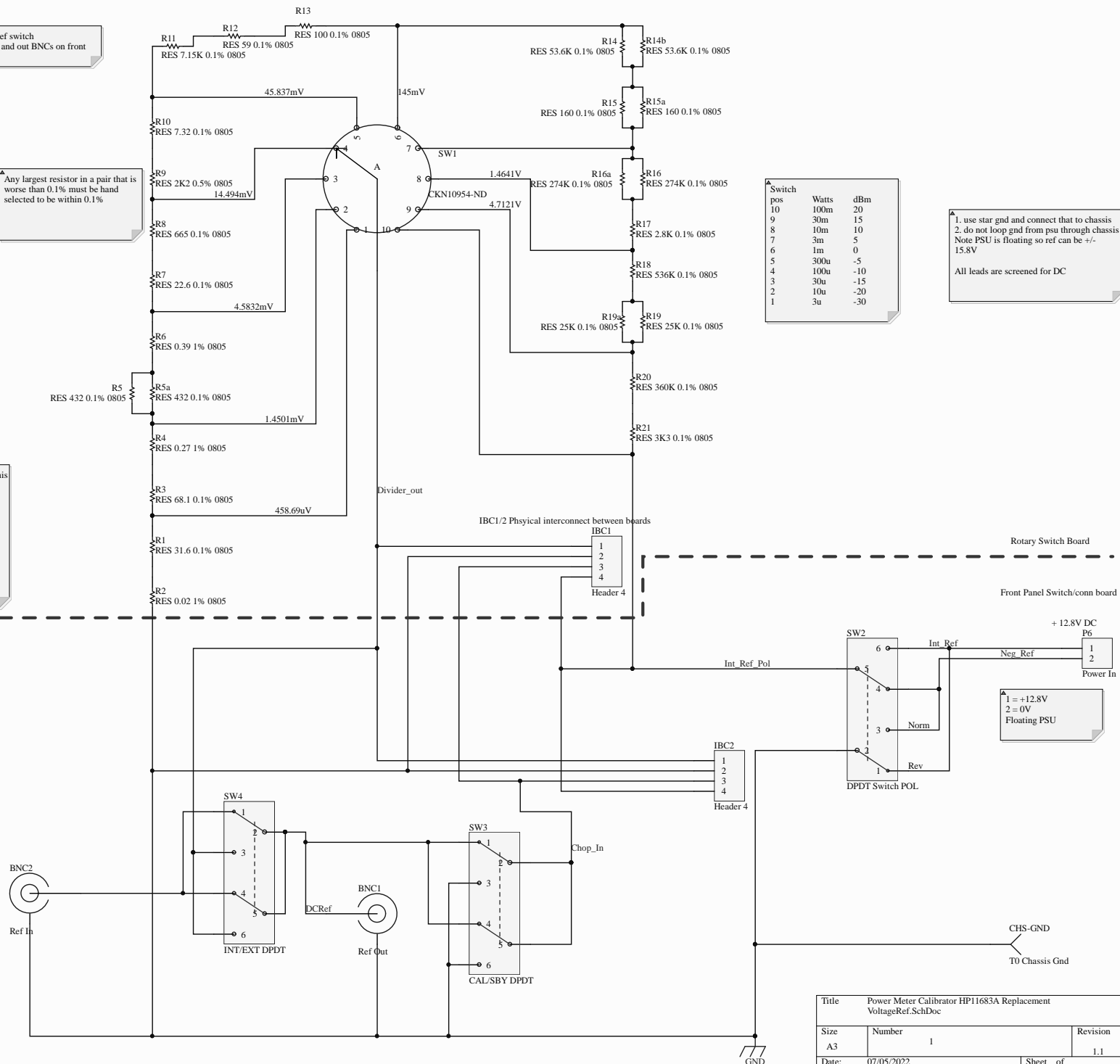
Keysight Model 11683A

Need to add int/ext ref switch
would like the ref in and out BNCs on front
panel

Any largest resistor in a pair that is
worse than 0.1% must be hand
selected to be within 0.1%

Voltages shown on switch are measured from the ref out connection with this
circuit connected to the chopper/amp circuit
Using a 15.8V internal reference
All voltages assume that the reference voltage has trimmed for a value of
145.00mVDC, with range switch set at 1mW position

ICB1/2 Pinout
1 - DividerSelection
2 - Signal Ground
3 - Cal Level For Chopper
4 - Internal Ref power (+/-15.8V) for divider



Title Power Meter Calibrator HP11683A Replacement VoltageRef.SchDoc		
Size A3	Number 1	Revision 1.1
Date: 07/05/2022	Sheet of	
File: D:\Projects\...\VoltageRef.SchDoc	Drawn By: P Shersby	

