

1. Suggested Suppliers.
Valtronic Technologies
2. PCB, Components and Solder must be compliant with the European Union RoHS 2 directive, 2011/65/EU
3. Assembly shall be acceptable and rejectable per IPC-A-610, Class 3.
4. Appropriate ESD precautions shall be used while building, handling and shipping this assembly.
5. Components with pin 1 designator or polarization marking shall be placed as indicated on the assembly drawing.
6. Each PCB must be sequentially serialized and labeled as indicated on the purchase order.
7. Rework, repair or modifications must comply with IPC-7711 and IPC 7721.
8. Must supply testing certificate with every PCB assembly lot.
9. Supplier must notify and receive approval from Synapse Biomedical Inc. before making any modifications to the design process or any changes to the materials used during the manufacturing of this assembly.
10. Printed circuit boards (PCBs) shall be shipped in frames.
11. Do not populate C25, R12 and R30
12. Do not populate R1, R2, R3, R4, R5, R6, R7, and R8

Rev. 4 revisions

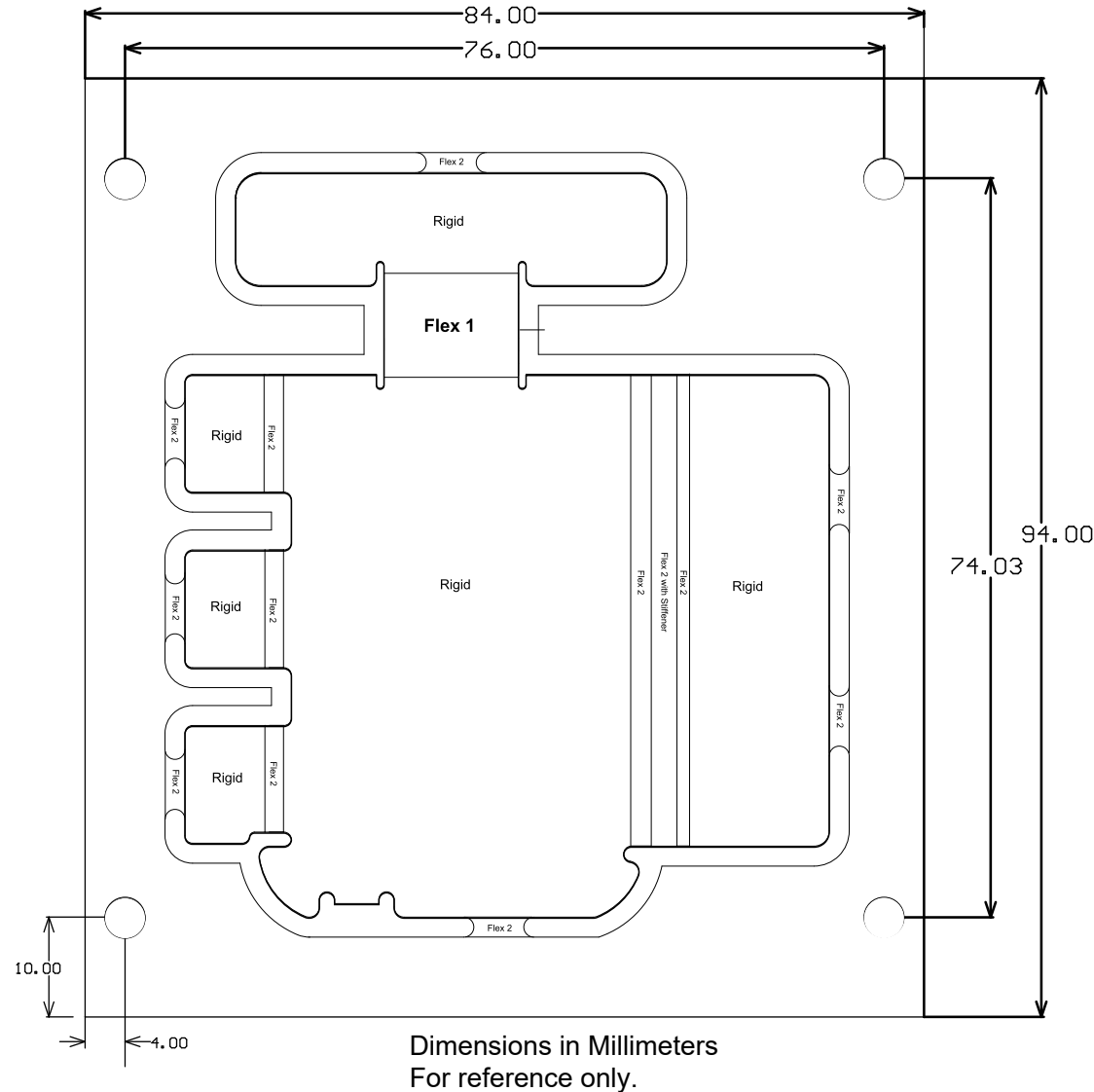
1. Changed values of R51 from 374k ohms to 470K ohms
2. Changed R52 from 43.2k ohm to 69.8K Ohm.
3. Changed resistor R14 from 0.0 ohm to 3k ohm.
4. Changed R106 and R107 from 10.0k ohm to 1.5k ohm.
5. Changed C40, C41, C42 and C56 to a smaller package Capacitor.


Rev. 5 revision

1. Added note to not populate R1-R8
2. Delete R1-R8 from BOM


Note: Program CPLD U7 with PM20 Code


ECN	REV	DESCRIPTION
DCN-104	01	Initial Engineering Released. Never Build.
DCN-110	02	- Updated BOM (refer to Page 1 of the Schematic for changes) - Added component placement - Updated Notes
DCN-120	03	- Updated Notes - Added pin 1 designators on component placement drawing - Added Inspection Criteria Box - Updated BOM
	04	- BOM correction
DCN-145	05	- Delete R1-R8 from BOM and add note to not populate




INSPECTION CRITERIA			BY	DATE	 DOCUMENT NAME NNP Power Module (PM1) PCB Assembly Drawing		
INSPECTION REQUIRED		YES X	DRAWN K. Kowalski	07-18-2022			
CERTIFICATE REQUIRED		YES X	CHECKED T. Crish	07-18-2022			
Insp. Item							
A	Inspect to current 51-2001-08 Inspection Procedure		MATERIAL N/A		SIZE B	DOCUMENT NO. 51-2001	REV 5
B	REF 51-2001-09 Inspect report		FINISH N/A		SCALE: N/A		NEXT ASSY N/A
C	RoHS Certificate required						SHEET 1 OF 6
D							
E							

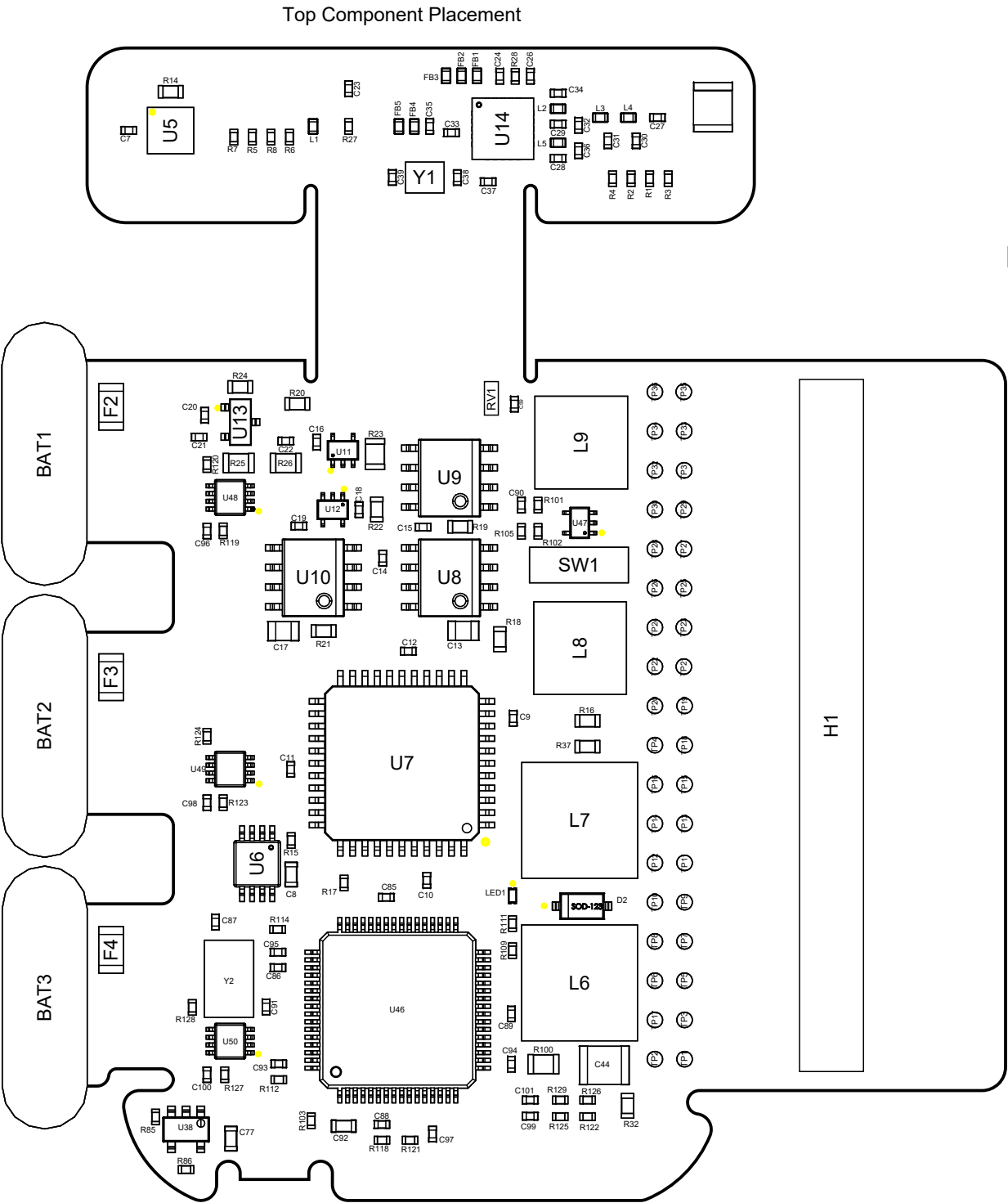
Item	Designator	SBI	Description	Manufacturer	Manufacturer Part Number	Suggested Supplier	Suggested Supplier Part Number
1	Ref.	51-2001-01_4	Module (PM1) PCB Schematic Drawing 51-2001-1_03	N/A	N/A	N/A	N/A
2	Ref.	52-2001_04	NNP Power Module PCB, Unpopulated 52-2001_04	See note #1.	N/A	See Note #1	N/A
3	Ref.	51-2001-07_01	NNP Power Module Pick and Place 51-2001-07_01	N/A	N/A	N/A	N/A
4	C1, C3, C4, C6, C7, C9, C10, C11, C12, C14, C15, C16, C18, C19, C20, C24, C26, C28, C33, C34, C35, C37, C59, C63, C64, C65, C67, C68, C72, C73, C74, C75, C76, C80, C81, C82, C83, C84, C85, C86, C88, C89, C90, C93, C94, C95, C96, C97, C98, C99, C100, C101	53-0040-1	0.1uF, 16V, X7R, 0402, RoHS	Murata Electronics Northh	GRM155R71C104KA88D	Digi-Key	490-3261-6-ND
5	C13, C17	53-0077	4.7uF, 25V, X5R, 10%, 0805, RoHS	Murata Electronics North America	GRM21BR61E475KA12L	Digi-Key	490-3335-6-ND
6	C2, C5, C21, C22, C62, C71, C79	53-0041-2	1000pF, 50V, C0G, 5%, 0402, RoHS	Murata Electronics North America	GRM1555C1H102JA01D	Digi-Key	490-3244-6-ND
7	C23, C66	53-0078	1.0uF, 6.3V, X5R, 20%, 0402, RoHS	Murata Electronics North America	GRM152R60J105ME15D	Digi-Key	490-10006-6-ND
8	C27	53-0041-4	220pF, 50V, C0G 5%, 0402, RoHS	Kemet	C0402C221J5GACTU	Digi-Key	399-7776-6-ND
9	C29	53-0092	1.0pF, 50V, C0G, 25%, 0402, RoHS	Murata Electronics North America	GRM1555C1H1R0CA01D	Digi-Key	490-3199-6-ND
10	C30	53-0044-1	5.6pF, 50V, C0G, 10%, 0402, RoHS	Murata Electronics North America	GRM1555C1H5R6DA01D	Digi-Key	490-5946-1-ND
11	C31	53-0041-5	8.2pF, 50V, C0G, 5%, 0402, RoHS	Kemet	C0402C829J5GACTU	Digi-Key	399-10038-6-ND
12	C32	53-0044-2	3.9pF, 50V, C0G, 10%, 0402, RoHS	Murata Electronics North America	GRM1555C1H3R9CA01D	Digi-Key	490-5940-6-ND
13	C36	53-0041-1	68pF, 50V, C0G, 0402, 5%, RoHS	Murata Electronics North America	GRM1555C1H680JA01D	Digi-Key	490-5876-6-ND
14	C38, C39	53-0041-6	15pF, 50V, C0G, 5%, 0402, RoHS	Murata Electronics North America	GRM1555C1H150JA01D	Digi-Key	490-5888-6-ND
15	C40, C41, C42, C56		CAP CER 10UF 50V X5R 1206, RoHS	Murata Electronics North America	GRT31CR61H106KE01L	Digi-Key	490-12456-1-ND
16	C43	53-0070	0.15uF, 16V, X7R, 10%, 0603, RoHS	Murata Electronics North America	GRM188R71C154KA01D	Digi-Key	490-3292-6-ND
17	C44	53-0080	100uF, 10V, X5R, 20%, 1210, RoHS	Murata Electronics North America	GRM32ER61A107ME20L	Digi-Key	490-9969-6-ND
18	C45, C57	53-0041-7	10pF, 50V, C0G, 5%, 0402, RoHS	Murata Electronics North America	GRM1555C1H100JA01D	Digi-Key	490-5921-6-ND
19	C47	53-0081	10uF, 16V, X5R, 10%, 0805, RoHS	Murata Electronics North America	GRM21BR61C106KE15L	Digi-Key	490-3886-6-ND
20	C48	53-0082	22uF, 6.3V, X5R, 20%, 0805,RoHS	Murata Electronics North America	GRM219R60J226ME47D	Digi-Key	490-9950-6-ND
21	C50	53-0083	1500pF, 50V, X7R, 10%, 0402, RoHS	Murata Electronics North America	GRM155R71H152KA01D	Digi-Key	490-3245-6-ND
22	C53	53-0039	10uF, 6.3V, X5R, 0603_20%, RoHS	Murata Electronics North America	GRM188R60J106ME47J	Digi-Key	490-6405-6-ND
12	C58	53-0072	4700pF, 50V,C0G, 0402, 10%, RoHS	Murata Electronics North America	GRM155R71H472KA01D	Digi-Key	490-1308-6-ND
24	C8, C46, C49, C51, C52, C54, C55, C60, C61, C69, C70, C77, C78	53-0076	4.7uF, 10V, X5R, 10%, 0603, RoHS	Murata Electronics North America	GRM185R61A475KE11D	Digi-Key	490-11988-6-ND
25	C87, C91	53-0041-8	39pF, 50V, C0G, 5%, 0402, RoHS	Murata Electronics North America	GRM1555C1H390JA01D	Digi-Key	490-5871-6-ND

BY	DATE	<div><div>SYNAPSE Biomedical Inc.</div></div>		
DRAWN K. Kowalski	07-18-2022			
CHECKED T. Crish	07-18-2022			
DOCUMENT NAME		NNP Power Module (PM1) PCB Assembly Drawing		
MATERIAL N/A				
FINISH N/A		SIZE B	DOCUMENT NO. 51-2001	REV 5
SCALE: N/A		NEXT ASSY N/A		SHEET 2 OF 6

8		7		6		5		4		3		2		1				
Item	Designator	SBI	Description	Manufacturer	Manufacturer Part Number			Supplier	Supplier Part Number									
53	R26	53-0086	750 ohm, 0.1%, 1/8W, 0805, RoHS	Susumu	RG2012P-751-B-T5			Digi-Key	RG20P750BDKR-ND									
54	R28	53-0049-23	56k ohm, 1%, 1/16 W, 0402, RoHS	Vishay Dale	CRCW040256K0FKED			Digi-Key	541-56.0KLDKR-ND									
55	R34, R62, R79, R94	53-0095	1M ohm, 1/16W, 1%, 0402, RoHS	Vishay Dale	CRCW04021M00FKED			Digi-Key	541-1.00MLDKR-ND									
56	R35	53-0049-24	5.1K ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW04025K10FKED			Digi-Key	541-5.10KLDKR-ND									
57	R36, R54, R71, R86	53-0049-25	374k ohm, 1%, 1/16W, 0402,RoHS	Vishay Dale	CRCW0402374KFKED			Digi-Key	541-374KLDKR-ND									
58	R51		470k ohm, 1%, 1/5W, 0402, RoHS	Vishay Dale	CRCW0402470KFKEDHP			Digi-Key	541-470KYCT-ND									
59	R38, R67, R82, R97	53-0087	0.02 ohm, 1%, 1/10W, 0603, RoHS	Vishay Dale	WSL0603R0200FEA			Digi-Key	WSLJ-.02DKR-ND									
60	R40	53-0049-26	340k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW0402340KFKED			Digi-Key	541-340KLDKR-ND									
61	R41	53-0049-27	15.0k ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW040215K0FKED			Digi-Key	541-15.0KLDKR-ND									
62	R42, R126	53-0049-28	200k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW0402200KFKED			Digi-Key	541-200KLDKR-ND									
63	R43	53-0049-29	60.4k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW040260K4FKED			Digi-Key	541-60.4KLDKR-ND									
64	R44	53-0049-30	24.9k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW040224K9FKED			Digi-Key	541-24.9KLDKR-ND									
65	R52		69.8k, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW040269K8FKTD			Digi-Key	541-CRCW040269K8FKTDCT-ND									
66	R53, R55, R57, R66, R69, R70, R72, R74, R84, R85, R87, R89, R99, R105, R112, R113, R114, R115, R117, R122	53-0049-7	100k ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW0402100KFKED			Digi-Key	541-100KLDKR-ND									
67	R56, R73, R88	53-0049-32	1.0 ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW04021R00FNED			Digi-Key	541-1.00LLCT-ND									
68	R58, R75, R90	53-0049-33	113k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW0402113KFKED			Digi-Key	541-113KLDKR-ND									
69	R59, R76, R91, R103, R108, R109, R110, R111, R116	53-0049-8	10.0k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	6CRCW040210K0FKEDnb			Digi-Key	541-10.0KLDKR-ND									
70	R106, R107		1.5k ohm, 1%, 1/5W, 0402, RoHS	Vishay Dale	CRCW04021K50FKEDHP			Digi-Key	541-1.50KYCT-ND									
71	R63, R80, R95, R119, R120, R121, R123, R124, R127, R128, R129	53-0049-2	49.9k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW040249K9FKED			Digi-Key	541-49.9KLDKR-ND									
72	R64	53-0049-34	232k, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW0402232KFKEDC			Digi-Key	541-4084-6-ND									
73	R9, R33	53-0049-21	30k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW040230K0FKED			Digi-Key	541-30.0KLDKR-ND									
74	RV1	53-0091	Thermistor, 10k, radial, NTC, RoHS	Amphenol Advanced Sensors	MA100BF103A			MOUSER	527-MA100BF103A									
75	SW1	54-0085	Reed SW, RoHS	Coto Technology	CT05-1535-J1			Digi-Key	306-1151-6-ND									
76	U1	54-0086	ADC, 16bit, I2C, SOT23-6, RoHS	Texas Instruments	ADS1110A0IDBVT			Digi-Key	296-14461-6-ND									
77	U11	54-0093	Comparator, 2.7-5.5V, 40ns, SC70-5, RoHS	Maxim Integrated	MAX9140EXK+T			Digi-Key	MAX9140EXK+TDKR-ND									
78	U12	54-0094	Ultra high speed Inverter, SC70-5, RoHS	Fairchild Semiconductor	NC7SZ14P5X			Digi-Key	NC7SZ14P5XDKR-ND									
79	U14	54-0095	Low-Power Sub-1 GHz RF Transceiver, QFN20, RoHS	Texas Instruments	CC1101RGPR			Digi-Key	296-35718-6-ND									
80	U15	54-0096	DC buck, 3.6-36V, 600mA, TSOT23-6, RoHS	Linear Technology	LT1933ES6#TRMPBF			Digi-Key	LT1933ES6#TRMPBFDKR-ND									
81	U16	54-0097	Buck Boost DC/DC, 600mA, DFN, RoHS	Linear Technology	LTC3440EDD#PBF			Digi-Key	LTC3440EDD#PBF-ND									
												BY		DATE		<div><div>SYNAPSE Biomedical Inc.</div></div>		
												DRAWN K. Kowalski		07-18-2022				
												CHECKED T. Crish		07-18-2022				
																DOCUMENT NAME		
												MATERIAL N/A				NNP Power Module (PM1) PCB Assembly Drawing		
												FINISH N/A				SIZE B	DOCUMENT NO. 51-2001	
				SCALE: N/A		NEXT ASSY N/A		SHEET 4 OF 6										
8		7		6		5		4		3		2		1				

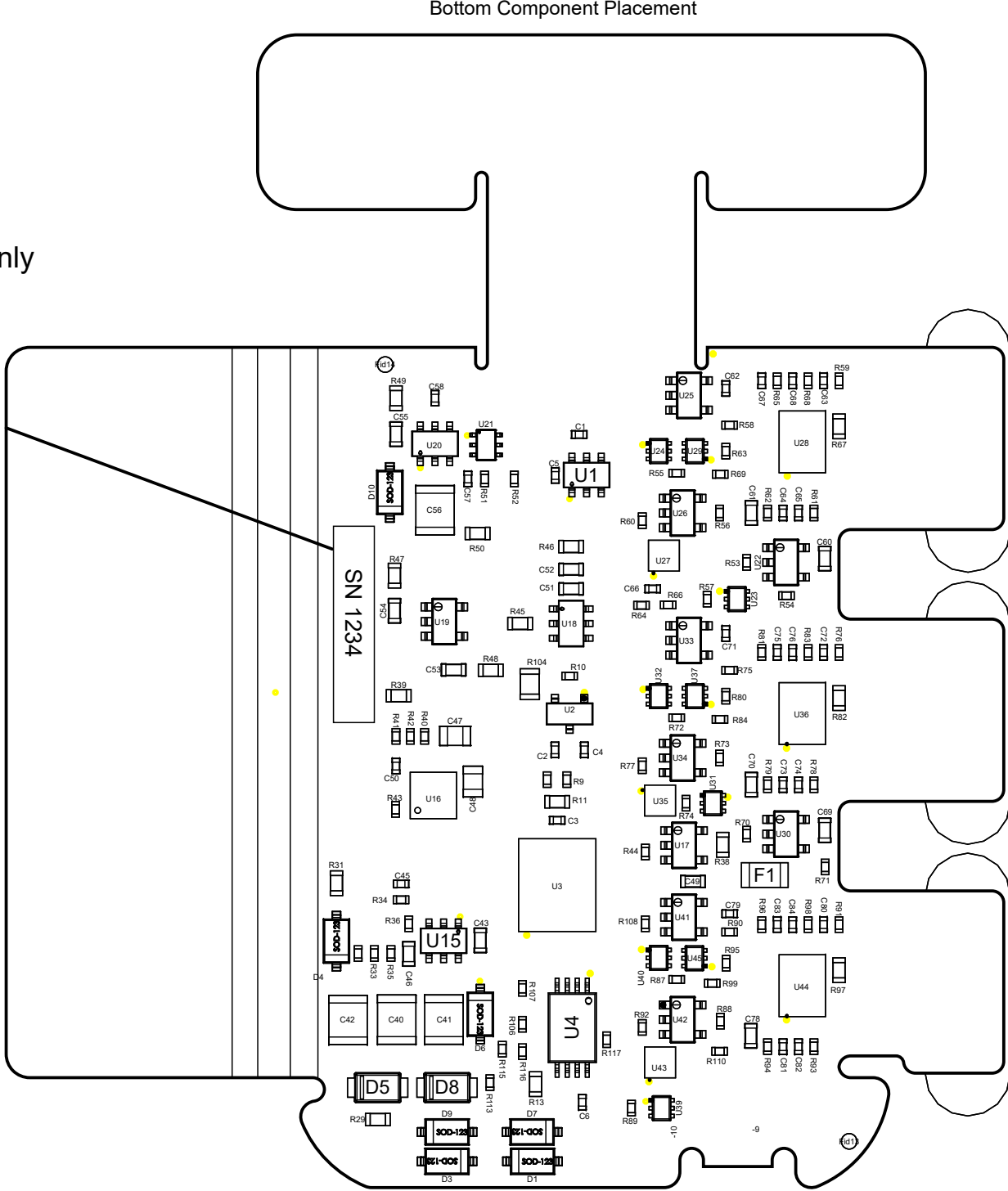
Item	Designator	SBI	Description	Manufacturer	Manufacturer Part Number	Supplier	Supplier Part Number
82	U17, U26, U34, U42	54-0052	Current Monitor, 2.5V-20V, 1%, RoHS	Diodes Incorporated	ZXCT1010E5TA	Digi-Key	ZXCT1010DKR-ND
83	U18	54-0079	Voltage inverter, 1.15-5.5V, 50mA, SOT23-6, RoHS	ON Semiconductor	NCP1729SN35T1G	Digi-Key	NCP1729SN35T1GOSDKR-ND
84	U19	54-0098	Buck Boost, DC/DC, 350mA, SOT23-5, RoHS	Texas Instruments	LM3670MF-1.8/NOPB	Digi-Key	LM3670MF-1.8/NOPBDKR-ND
85	U2, U13	54-0087	Ref, 2.048V, 5uA, SOT23-3, RoHS	Maxim Integrated	MAX6018AEUR21+T	Digi-Key	MAX6018AEUR21+TDKR-ND
86	U20	54-0099	DC, Booster, 2.4-16V, TSOT23	Linear Technology	LT3467AES6#TRMPBF	Digi-Key	LT3467AES6#TRMPBFDKR-ND
87	U21	54-0100	DIGPOT, 100Kohm, I2C, SC70	Analog Devices Inc.	AD5246BKSZ100-RL7	Digi-Key	AD5246BKSZ100RLDKR-ND
88	U22, U30, U38	54-0101	Ideal diode, 2.6-5.5V, 2.6A, SOT23-5, RoHS	Linear Technology	LTC4411ES5#TRMPBF	Digi-Key	LTC4411ES5#TRMPBFDKR-ND
89	U23, U29, U31, U37, U39, U45	54-0102	MOSFET 2N, 60V, 0.305A, RoHS	Vishay Siliconix	SI1026X-T1-GE3	Digi-Key	SI1026X-T1-GE3CT-ND
90	U24, U32, U40	54-0103	Dual P-Channel Mosfet, SOT563, RoHS	Vishay Siliconix	SI1023X-T1-GE3	Digi-Key	SI1023X-T1-GE3CT-ND
91	U25, U33, U41	54-0104	VLDO, 150mA, SOT23-5, RoHS	Linear Technology	LTC1844ES5-SD#TRMPBF	Digi-Key	LTC1844ES5-SD#TRMPBFDKR-ND
89	U27, U35, U43	54-0105	Op Amp, R-R, 1uA, RoHS	Linear Technology	LT6003CDC#TRMPBF	Digi-Key	LT6003CDC#TRMPBFDKR-ND
92	U28, U36, U44	54-0106	LI-ION Gas Guage, I2C, QFN10, RoHS	Texas Instruments	BQ27200DRKR	Digi-Key	296-17521-6-ND
93	U3	54-0088	Flash, 32Mbit, SPI, SO8	Adesto Technologies	AT45DB321E-SHF-T	Digi-Key	1265-1097-6-ND
94	U4	54-0089	RAM, 256Kbit, SPI, TSSOP8, RoHS	MicroChip Technology	23K256T-I/ST	Digi-Key	23K256T-I/STDKR-ND
95	U46	54-0107	uC 1.8Vcore 3.3VIO 16kB RAM 256kB FLA QFP	NXP Semiconductors	LPC2129FBD64/01,15	Digi-Key	568-4315-ND
96	U47	54-0060	Voltage detector Reset, SC70-5, RoHS	Texas Instruments	TPS3805H33DCKR	Digi-Key	296-13407-6-ND
97	U48, U49, U50	54-0108	Analog Switch, DUAL, 2-Channel, SSOP8, RoHS	Texas Instruments	TS5A23166DCUR	Digi-key	296-17906-6-ND
98	U5	54-0074	Tri-axis accelerometer, I2C, LGA10, RoHS	Kionix	KXTE9-2050	MOUSER	912-KXTE9-2050
99	U6	54-0090	Precision µPower Oscillator, ADJ 1.7-5.5V,5MHz, uSOP8, RoHS	Linear Technology	LTC6930IMS8-5.00#PBF	Digi-Key	LTC6930IMS8-5.00#PBF-ND
100	U7	54-0091	CPLD, 3.3V, 10nS, XPLA3, QFP48, RoHS	Xilinx Inc.	XCR3032XL-10VQG44C	Digi-Key	122-1957-ND
101	U8, U9, U10	54-0092	Pin driver, 15nS, 40 MHz, SO8, RoHS	Intersil	EL7156CSZ	Digi-Key	EL7156CSZ-T7DKR-ND
102	Y1	54-0109	Xtal, 26MHz, 2.5x2.0x0.7mm, RoHS	NDK	NX2520SA-26.000000MHZ	Digi-Key	644-1063-6-ND
103	Y2	54-0110	Crystal 10MHz 20pF HC-49US	ECS Inc.	ECS-100-20-30B-TR	Digi-Key	XC1117DKR-ND


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CHECKED T. Crish	07-18-2022			
		DOCUMENT NAME		
		NNP Power Module (PM1) PCB Assembly Drawing		
MATERIAL N/A		SIZE B	DOCUMENT NO. 51-2001	REV 5
FINISH N/A		SCALE: N/A	NEXT ASSY N/A	SHEET 5 OF 6



Drawing for reference only

Serial Number
Arial, Font Size 8
Sticker Size =.2" x 0.65"
Starting at 1000



BY	DATE			
DRAWN K. Kowalski	07-18-2022			
CHECKED T. Crish	07-18-2022	DOCUMENT NAME		
		NNP Power Module (PM1) PCB Assembly Drawing		
MATERIAL N/A			SIZE B	DOCUMENT NO. 51-2001
FINISH N/A			REVISION 5	
SCALE: N/A		NEXT ASSY N/A		SHEET 6 OF 6