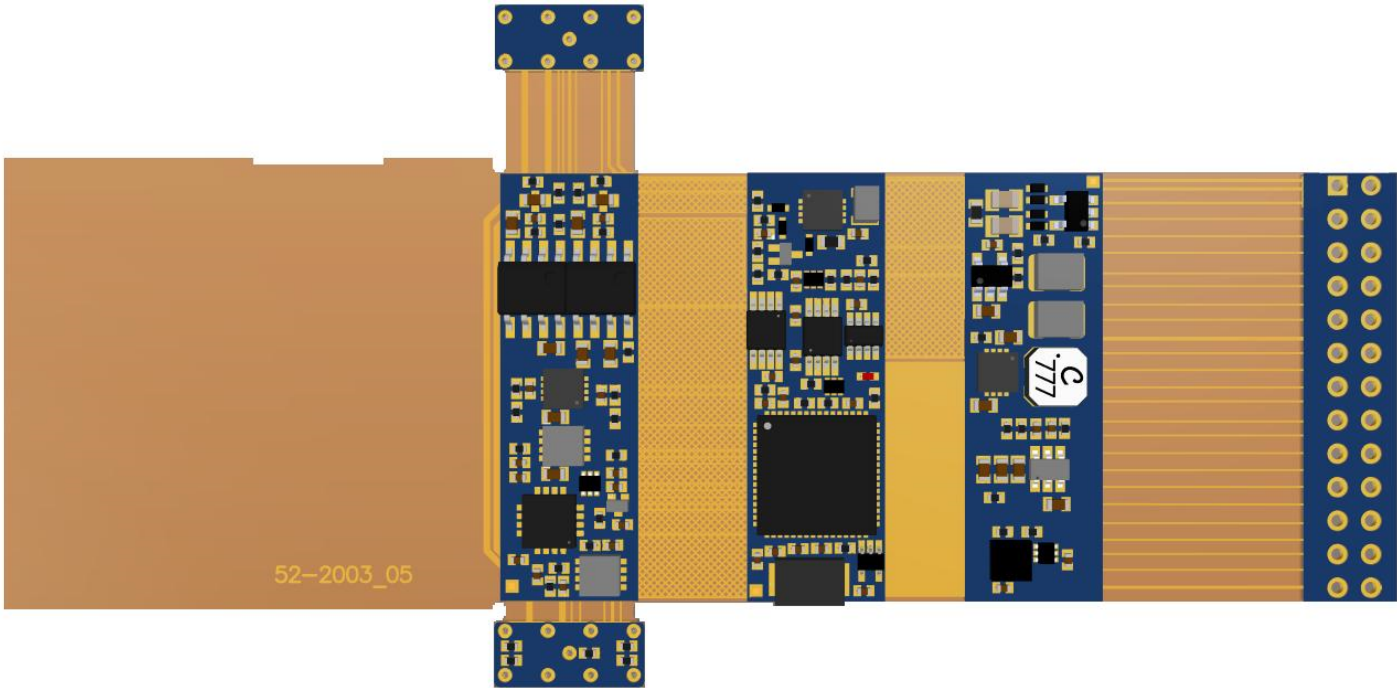



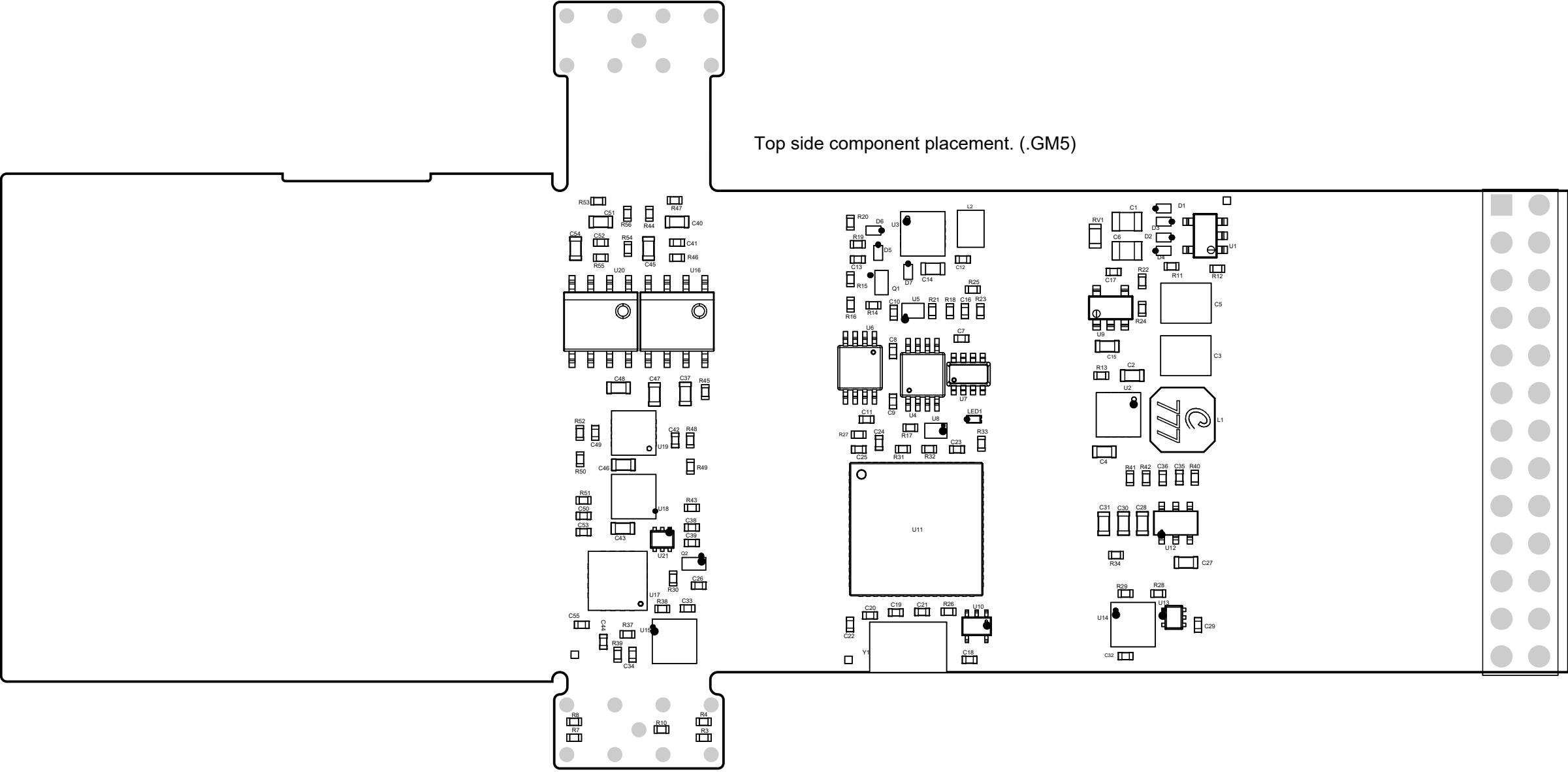
Top View (For Reference Only)




- 1. Approved Manufacture/Suppliers.
Valtronic Technologies
- 2. Appropriate ESD precautions shall be used while building or handling this assembly.
- 3. PCB, Components and Solder must be RoHS 2 compliant.
- 4. Assembly shall be acceptable and rejectable per IPC-A-610, Class 3.
- 5. Components with pin 1 designator or polarization marking shall be placed as indicated on the assembly drawing.
- 6. Rework, repair or modifications must comply with IPC-7711 and IPC 7721.
- 7. Each PCB must be sequentially serialized and labeled as indicated on the purchase order.
- 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. Do not populate C18, R26, and U10.
- 11. Do not populate R1-R10
- 12. Printed circuit boards (PCBs) shall be shipped in frames.
- 13. R57 is hand-soldered across pins 4 and 5 of U12.
- 14. R58 is hand-soldered across the gate and source of Q2.

ECN	REV	DESCRIPTION
---	01	Equivalent to CWRU VT901002
---	02	Build for BP2C Verification
DCN 101	03	- Removed Power-up reset circuit. - Changed values of C1, C3, C5 and C6
DCN 107	04	- Updated BOM (refer to Page 1 of the Schematic for changes) - Updated Manufacturing Notes - Added PCB Frame and Outline Drawings - Added instructions for serial number sticker. - Added quantity to the BOM. - Removed Software reference. - Removed Inspection Criteria Block
DCN 121	05	- Add Pick and Place file to the BOM. - Changed Capacitors C40 and C51 from 100pF to 220pF, (See page 1 of Schematic for additional details). - Removed Vexos from Approved Manufacture/Suppliers - Added Inspection Criteria Block to drawing - Added correct polarity indicators for diodes, transistors and integrated circuits (ICs) on the placement drawing (page 2 of 5)
DCN 151	06	Added R57 and R58 to Bill of Materials Re-corrected values of C3 and C5

INSPECTION CRITERIA			BY	DATE	<div></div>			
INSPECTION REQUIRED		YES X	NO	DRAWN K. Kowalski				11-18-2022
CERTIFICATE REQUIRED		YES X	NO	CHECKED T. Crish				11-18-2022
Insp. Item					DOCUMENT NAME			
A	Inspect to current 51-2003-08 Inspection Procedure				Biopotential (BP2) PCB Assembly Drawing			
B	REF 51-2003-09 Inspect report				MATERIAL N/A			
C	RoHS Certificate required							
D					FINISH N/A			
E								
					SIZE B	DOCUMENT NO. 51-2003	REV 06	
					SCALE: N/A	NEXT ASSY	SHEET 1 OF 5	

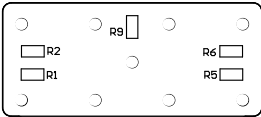


BY		DATE					
DRAWN K. Kowalski		11-18-2022					
CHECKED T. Crish		11-18-2022		DOCUMENT NAME Biopotential (BP2) PCB Assembly Drawing			
MATERIAL							
FINISH				SIZE B	DOCUMENT NO. 51-2003	REV 06	
				SCALE: N/A		NEXT ASSY	SHEET 2 OF 5

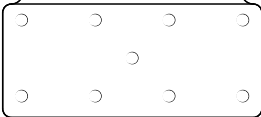
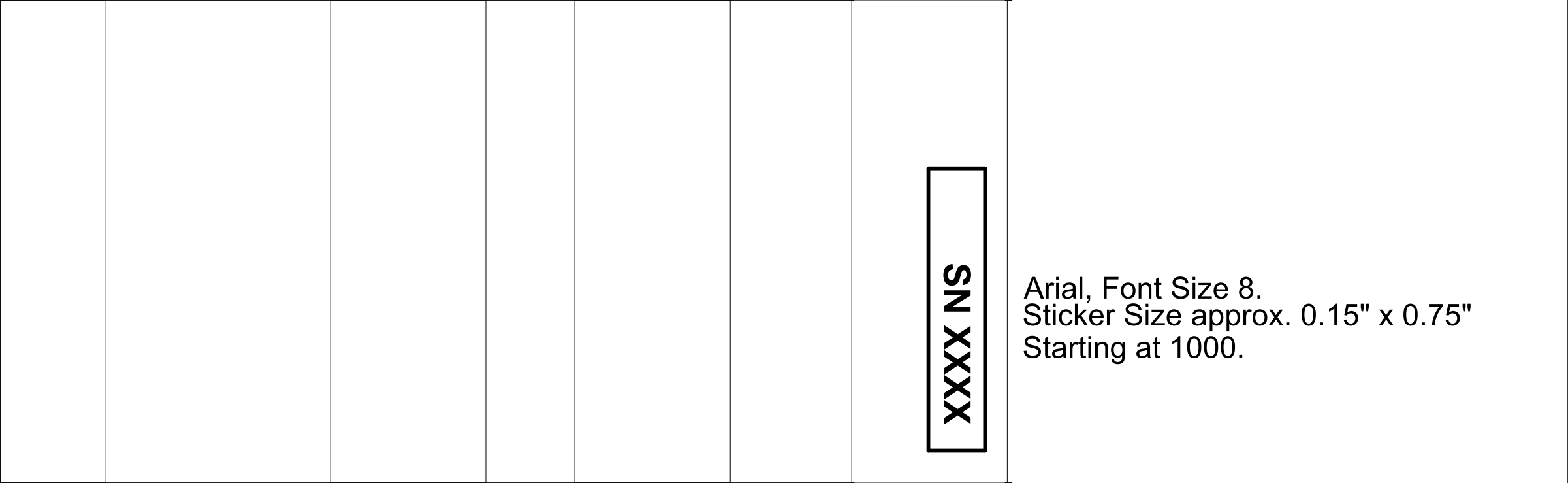
87654321

D

D




Bottom side component placement



SerialNumber Sticker Placement

B

B


BY		DATE		
DRAWN K. Kowalski		11-18-2022		
CHECKED T. Crish		11-18-2022	DOCUMENT NAME	
MATERIAL		----	Biopotential (BP2) PCB Assembly	
FINISH		----	SIZE B	DOCUMENT NO. 51-2003
			SCALE: N/A	REV 06
			NEXT ASSY	SHEET 3 OF 5

A

A

87654321

8		7	6	5	4	3	2	1
Item	Designator	SBI	QTY	Description	Manufacture	Manufacturer Part Number	Suggested Supplier	Supplier Part Number
1	Ref.	51-2003-01_07	N/A	Biopotential (BP2) Schematic Drawing 51-2003-01_07	N/A	N/A	N/A	N/A
2	Ref.	52-2003_05	1	NNP Biopotential PCB, Unpopulated 52-2003_05	See Note 1	N/A	See Note 1	N/A
3	Ref.	51-2003-07_02	N/A	Biopotential (BP2) Pick and Place 51-2003-07_02 Biopotential (BP2)	N/A	N/A	N/A	N/A
4	C1, C6	53-0097	2	0.1uF, 100V, X7R, 0805, 10%, RoHS	Murata Electronics North America	GCM21BR72A104KA37K	Digi-Key	490-8051-2-ND
5	C2, C14, C15, C28, C30, C31	53-0067	6	1.0uF, 50V, X7R, 0603, 20%, RoHs	Taioyo Yuden	UMK107AB7105KA-T	Digi-Key	587-5956-6-ND
6	C3, C5	53-0068	2	22uF, 16V, X5R, 1210, 20%, RoHS	Taioyo Yuden	EMK325BJ226MD-T	Digi-Key	587-2412-1-ND
7	C4, C27	53-0039	2	10uF, 6.3V, X5R, 0603_20%, RoHS	Murata Electronics North America	GRM188R60J106ME47J	Digi-Key	490-6405-6-ND
8	C7, C8, C9, C10, C11, C20, C22, C23, C24, C29, C32, C34, C35, C38, C39, C42, C49, C50, C53	53-0040-1	19	0.1uF, 16V, X7R,10%, 0402, RoHS	Murata Electronics North America	GRM155R71C104KA88D	Digi-Key	490-3261-6-ND
9	C12, C16	53-0042	2	4.7uF, 6.3V, X5R, 20%, 0402, RoHS	Murata Electronics North America	GRM155R60J475ME47D	Digi-Key	490-5915-6-ND
10	C13	53-0041-1	1	68pF, 50V, C0G, 0402, 5%, RoHS	Murata Electronics North America	GRM1555C1H680JA01D	Digi-Key	490-5876-6-ND
11	C17	53-0043	1	0.001uF, 50V, X7R, 20%, 0402, RoHS	Murata Electronics North America	GJM1555C1H1R0BB01D	Digi-Key	490-6073-6-ND
12	C19, C21	53-0044-1	2	8pF, 50V, C0G, 0402, 10%, RoHS	Murata Electronics North America	GRM1555C1H8R0DA01D	Digi-Key	490-5867-6-ND
13	C25	53-0069	1	2.2uF, 6.3V, X5R, 0402, 20%, RoHS	Murata Electronics North America	GRM155R60J225ME15D	Digi-Key	490-4519-6-ND
14	C37, C43, C45, C46, C47, C48, C54	53-0070	7	0.15uF, 16V, X7R, 10%, 0603, RoHS	Samsung-Electro-Mechanics	CL05B154KO5NNNC	Digi-Key	1276-6651
15	C36	53-0041-2	1	1000pF, 50V, C0G, 5%, 0402, RoHS	Murata Electronics North America	GRM1555C1H102JA01D	Digi-Key	490-3244-6-ND
16	C40, C51	53-0071	2	X2Y, 220pF, 50V, X7R, 0603, 20%, RoHS	Johanson Dielectrics Inc.	500X14W221MV4T	Digi-Key	500X14W221MV4T-ND
17	C41, C52	53-0072	2	4700pF, 50V, C0G, 0402_10%, RoHS	Murata Electronics North America	GRM155R71H472KA01D	Digi-Key	490-1308-6-ND
18	C33, C44, C55	53-0040-2	3	0.15uF, 16V, X7R, 10%, 0402, RoHS	Samsung-Electro-Mechanics	CL05B154KO5NNNC	Digi-Key	1276-6651-6-ND
19	C26	53-0078	1	1.0uF, 6.3V, X5R, 0402, 20%, RoHS	Murata Electronics North America	GRM155R60J105ME19D	Digi-Key	490-5955-6-ND
20	D1, D2, D3, D4, D5, D6, D7	54-0075	7	Schottky Diode, 30V, 100mA, RoHS	Panasonic Electronic Components	DB2731600L	Digi-Key	DB2731600LDKR-ND
21	L1	53-0032	1	100uH, 270mA, 20%, RoHS	TDK Corporation	VLCF5020T-101MR27	Digi-Key	445-3203-6-ND
22	L2	53-0033	1	470uH, 35mA, 10%, RoHS	Taiyo Yuden	CB2518T471K	Digi-Key	587-2194-6-ND
23	LED1	53-0035	1	LED, Red, 0402, 20mA ,2V, 140mcd, RoHS	Lumex Opto/Components Inc.	SML-LX0402SIC-TR	Digi-Key	67-1878-6-ND
24	Q1	54-0050	1	PNP, -50V, -100mA, SOT523, 150MHz, RoHS	Panasonic Electronic Components	DSA9001S0L	Digi-Key	DSA9001S0LDKR-ND
25	Q2	54-0078	1	Small Signal MOSFET, -20 V, -760 mA, P-Channel, Gate Zener	ON Semiconductor	NTE4151PT1G	Digi-Key	NTE4151PT1GOSDKR-ND
26	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10	53-0048	10	0.0 ohm, 1/16W, 0402, RoHS	Vishay Dale	CRCW04020000Z0ED	Digi-Key	541-0.0JDKR-ND
27	R11	53-0049-1	1	0.1 ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	RCWE0402R100FNEA	Digi-Key	541-2711-6-ND
28	R12, R17, R18, R19, R22, R25, R42	53-0049-2	7	49.9k ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW040249K9FKED	Digi-Key	541-49.9KLDKR-ND
29	R13	53-0049-3	1	470k ohm, 1% , 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW0402470KFKED	Digi-Key	541-470KLDKR-ND
30	R14, R20, R21, R23	53-0049-4	4	1.0k ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW04021K00FKED	Digi-Key	541-1.00KLDKR-ND

BY		DATE	<div><div>SYNAPSE Biomedical Inc.</div></div>
DRAWN K. Kowalski		11-18-2022	
CHECKED T. Crish		11-18-2022	
MATERIAL -----			
FINISH -----			DOCUMENT NAME Biopotential (BP2) PCB Assembly
SIZE B	DOCUMENT NO. 51-2003		REV 06
SCALE: N/A		NEXT ASSY	SHEET 4 OF 5

Item	Designator	SBI	QTY	Description	Manufacture	Manufacturer Part Number	Supplier	Supplier Part Number
31	R15, R16	53-0049-5	2	5.1K ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW04025K10FKED	Digi-Key	541-5.10KLDKR-ND
32	R24	53-0051	1	84.5k ohm, 1%, 1/10W, 0402, RoHS	Vishay Dale	CRCW040284K5FKED	Digi-Key	541-84.5KLDKR-ND
33	R28, R29, R31, R32, R33, R49, R50	53-0049-8	7	10.0k ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW040210K0FKED	Digi-Key	541-10.0KLDKR-ND
34	R27, R30, R34	53-0049-17	3	20 ohm, 1%, 0402, 1%, RoHS	Vishay Dale	CRCW040220R0FKED	Digi-Key	541-20.0LDKR-ND
35	R35, R36	53-0050	2	0.0 ohm, 1/10W, 0603, RoHS	Vishay Dale	CRCW06030000Z0EA	Digi-Key	541-0.0GDKR-ND
36	R37, R39	53-0049-7	2	100k ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW0402100KFKED	Digi-Key	541-100KLDKR-ND
37	R38	53-0049-18	1	100 ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW0402100RFKED	Digi-Key	541-100LDKR-ND
38	R40, R43, R51	53-0049-10	3	1.6K ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW04021K60FKED	Digi-Key	541-1.60KLDKR-ND
39	R41, R48, R52	53-0049-11	3	150k ohm, 1%, 1/16W, smd, 0402, RoHS	Vishay Dale	CRCW0402150KFKED	Digi-Key	541-150KLDKR-ND
40	R44, R47, R53, R56	53-0073	4	10k ohm, 0.1%, 1/16W, 0402, RoHS	Vishay Dale	TNPW040210K0BEED	Digi-Key	TNP10.0KDADKR-ND
41	R45, R54	53-0049-19	2	332 ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW0402332RFKED	Digi-Key	541-332LDKR-ND
42	R46, R55, R57, R58	53-0049-20	2	1M ohm, 1%, 1/16W, 0402, RoHS	Vishay Dale	CRCW04021M00FKED	Digi-Key	541-1.00MLDKR-ND
43	RV1	53-0066	1	MOV, 12V, 0603, RoHS	BOURNS	CG0603MLC-12E	Digi-Key	CG0603MLC-12EDKR-ND
44	U1	54-0052	1	Current Monitor, 2.5V-20V, 1%, RoHS	Diodes Incorporated	ZXCT1010E5TA	Digi-Key	ZXCT1010DKR-ND
45	U2, U3	54-0053	2	Step Down DC-DC, 4.5V-45V, 50mA, RoHS	Linear Technology	LTC3642EDD-3.3#PBF	Digi-Key	LTC3642EDD-3.3#PBF-ND
46	U4	54-0056	1	Digital Isolator, 3-5.5V, uSOP8, RoHS	NVE Corp/Isolation Products	IL712-1E	Digi-Key	390-1105-5-ND
47	U5	54-0055	1	XOR, 1.65-5.5V, uPAK6, RoHS	Fairchild Semiconductor	NC7SZ86L6X	Digi-Key	NC7SZ86L6XDKR-ND
48	U6	54-0057	1	Silicon delay, 3-3.6V, uSOP8, RoHS	Maxim Integrated	DS1100LU-500+	Digi-Key	DS1100LU-500+-ND
49	U7	54-0054	1	Comparator, 2.7-5.5V, 40nS, SOT23-8, RoHS	Maxim Integrated	MAX9142EKA+T	Digi-Key	MAX9142EKA+TDKR-ND
50	U8	54-0058	1	FLIPFLOP, 1.65-5.5V, uPAk6, RoHS	Fairchild Semiconductor	NC7SZ175L6X	Digi-Key	NC7SZ175L6XFSDKR-ND
51	U9	54-0059	1	Low Droupout negative regulator, -5V, -200mA	Linear Technology	LT1964ES5-BYP#TRMPBF	Digi-Key	LT1964ES5-BYP#TRMPBFDKR-ND
52	U11	54-0061	1	uC, 2.7-5.5V, 8bit, QFN64, RoHS	Atmel	AT90CAN128-16MU	Digi-Key	AT90CAN128-16MURDKR-ND
53	U12	54-0079	1	Voltage inverter, 1.15-5.5V, 50mA, SOT23-6, RoHS	ON SEMICONDUCTOR	NCP1729SN35T1G	Digi-Key	NCP1729SN35T1GOSDKR-ND
54	U13	54-0062	1	Temperature Sensor,12bit I2C, SOT563, RoHS	Texas Instruments	TMP112AIDRLT	Digi-Key	296-24621-6-ND
55	U14	54-0074	1	Tri-axis accelerometer, I2C, LGA10, RoHS	Kionix	KXTE9-2050	Mouser	912-KXTE9-2050
56	U15, U18	54-0080	2	OPA, 1.8-5.5V, DFN8, RoHS	Texas Instruments	OPA2333AIDRBT	Digi-Key	296-19544-6-ND
57	U16, U20	54-0081	2	Op-Amp Instrumentation, 400kHz, SOIC8-N, RoHS	Linear Technology	LT1168ACS8#PBF	Digi-Key	LT1168ACS8#PBF-ND
58	U17	54-0082	1	Digipot, 2.7-3.6V, SPI, QFN16, RoHS	Maxim Integrated	MAX5408ETE+T	Digi-Key	MAX5408ETE+-ND
59	U19	54-0083	1	Op-Amp, Dual, R-R, DFN8, RoHS	Linear Technology	LT1490ACDD#PBF	Digi-Key	LT1490ACDD#PBF-ND
60	U21	54-0066	1	MOSFET 2N, 60V, 0.305A, RoHS	Vishay Siliconix	SI1026X-T1-GE3	Digi-Key	SI1026X-T1-GE3DKR-ND
61	Y1	54-0073	1	Crystal 8MHz SMT, RoHS	NDK	NX5032GA-8.000M	Digi-Key	644-1132-6-ND

BY		DATE	
DRAWN K. Kowalski		11-18-2022	
CHECKED T. Crish		11-18-2022	
DOCUMENT NAME			
Biopotential (BP2) PCB Assembly			
MATERIAL _____		SIZE B	
FINISH _____		DOCUMENT NO. 51-2003	
SCALE: N/A		NEXT ASSY	
		REV 06	
		SHEET 5 OF 5	

