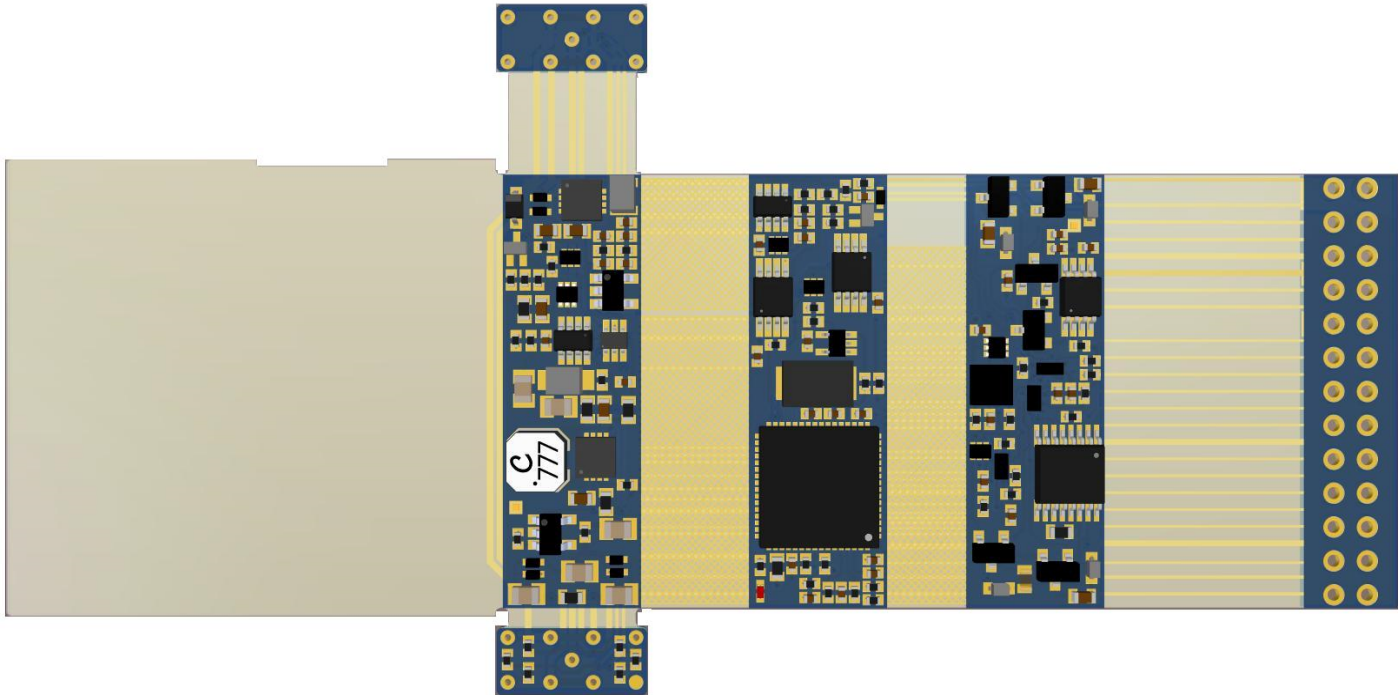
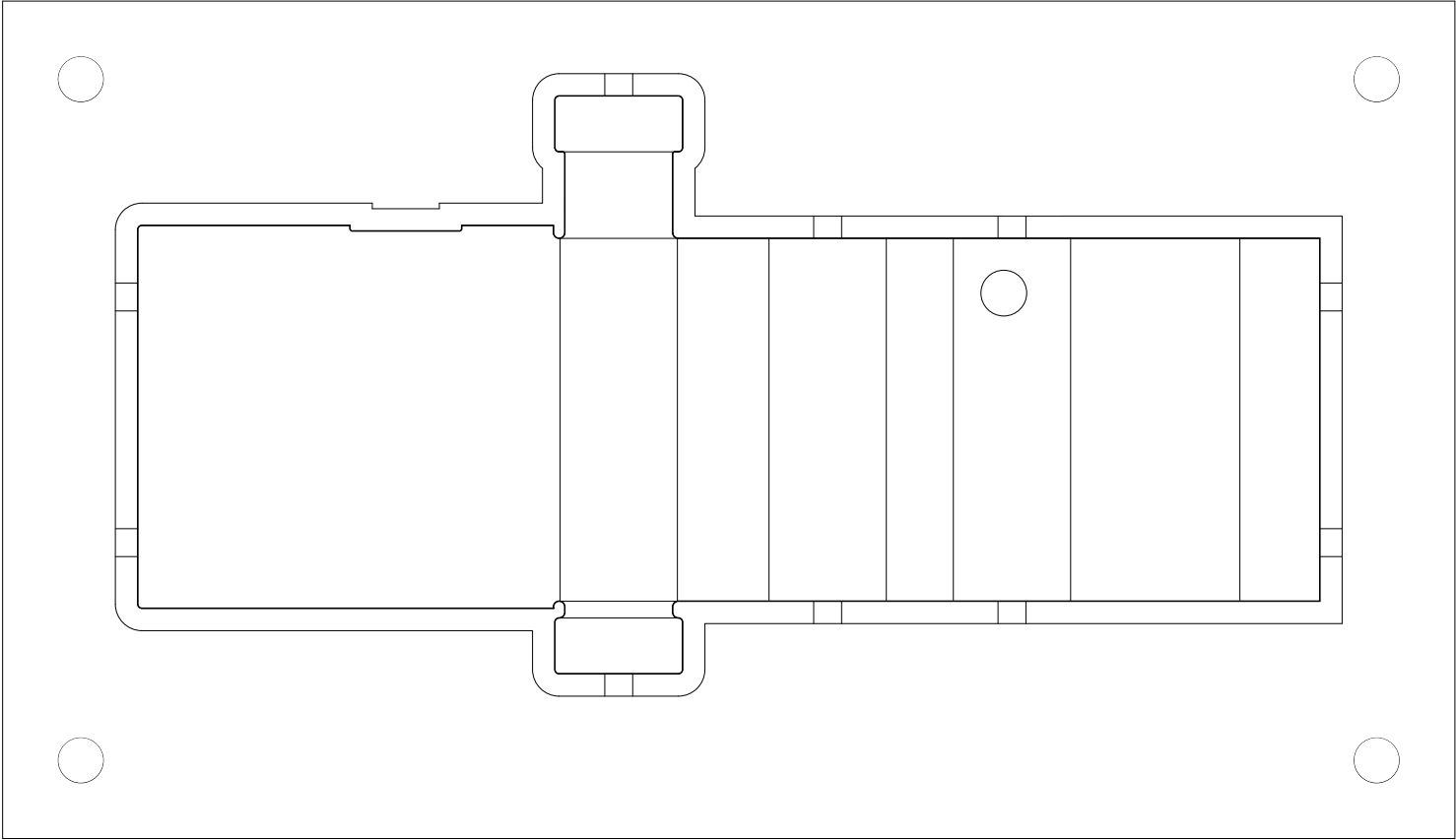



Top Side View (For Reference Only)




1. Approved Suppliers.
Valtronic Technologies
Vexos
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 X2-1 - X2-15 and X2-18 - X2-27

Frame Outline (For Reference Only)




| INSPECTION CRITERIA | | | BY | DATE |  SYNAPSE Biomedical Inc. | | | | | |
|----------------------|--|-----|-----------------|------------------------|---|--|--------------|------------|--|--|
| INSPECTION REQUIERD | | YES | NO | DRAWN R Yoder | 2/19/2020 | <div>DOCUMENT NAME</div> <div>Pulse Generator (PG4) Assembly Drawing</div> | | | | |
| | | X | | | | | | | | |
| CERTIFICATE REQUIERD | | YES | NO | CHECKED A. Zbrzeski | 2/19/2020 | | | | | |
| | | X | | | | | | | | |
| Insp. Item | Description of Inspection | | | | <div>DOCUMENT NAME</div> <div>Pulse Generator (PG4) Assembly Drawing</div> | | | | | |
| A | Inspect to current 51-2002-08 Inspection Procedure | | | | | | | | | |
| B | REF 51-2002-09 Inspect report | | MATERIAL N/A | | <div>SIZE B</div> <div>DOCUMENT NO. 51-2002</div> <div>REV 06</div> | | | | | |
| C | RoHS Certificate required | | | | | | | | | |
| D | | | FINISH N/A | | | | | SCALE: N/A | | |
| E | | | | | | | | | | |
| | | | | | NEXT ASSY N/A | | SHEET 1 OF 6 | | | |


| Item | Designator | SBI | Qty | Description | Manufacturer | Manufacturer Part Number | Suggested Supplier | Supplier Part Number |
|------|--|---------------|-----|---|----------------------------------|--------------------------|---------------------|----------------------|
| 1 | Ref. | 51-2002-01_03 | N/A | 51-2002-01_03 Pulse Generator (PG4) Schematic Drawing | N/A | N/A | N/A | N/A |
| 2 | Ref. | 52-2002_05 | 1 | 52-2002_05, NNP Pulse Generator PCB, Unpopulated | N/A | N/A | Innovative Circuits | N/A |
| 3 | Ref. | 51-2002-07_01 | N/A | 51-2002-07_01 Pulse Generator (PG4) Pick and Place File | N/A | N/A | N/A | N/A |
| 4 | C1, C6 | 56-0036 | 2 | 0.1uF, 100V, X7R, 0805, 10%, RoHS | Murata Electronics North America | GCM21BR72A104KA37K | Digi-Key | 490-8051-6-ND |
| 5 | C2, C14, C15, C30, C38, C40, C41, C42 | 53-0037 | 8 | 1uF, 50V, X5R, 10%, 0603, RoHS | Murata Electronics North America | GRT188R61H105KE13D | Digi-Key | 490-12330-6-ND |
| 6 | C3, C5, C29 | 53-0038 | 3 | 47uF, 10V, X5R, 20%, 0805, RoHS | Murata Electronics North America | GRM21BR61A476ME15L | Digi-Key | 490-9961-6-ND |
| 7 | C4 | 53-0039 | 1 | 10uF, 6.3V, X5R, 0603_20%, RoHS | Murata Electronics North America | GRM188R60J106ME47J | Digi-Key | 490-6405-6-ND |
| 8 | C7, C8, C9, C10, C13, C18, C20, C22, C23, C24, C25, C26, C28, C32, C34, C43, C44, C45, C47 | 53-0040 | 19 | 0.1uF, 16V, X7R, 0402, RoHS | AVX Corporation | 04023C104KAT2A | Digi-Key | 478-7868-6-ND |
| 9 | C11 | 53-0041-1 | 1 | 68pF, 50V, C0G, 0402, 5%, RoHS | Murata Electronics North America | GRM1555C1H680JA01D | Digi-Key | 490-5876-6-ND |
| 10 | C12, C17, C46, C48, C49 | 53-0042 | 5 | 4.7uF, 6.3V, X5R, 20%, 0402, RoHS | Murata Electronics North America | GRM155R60J475ME47D | Digi-Key | 490-5915-6-ND |
| 11 | C16 | 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 | 2 | 8pF, 50V, C0G, 0402, 10%, RoHS | Murata Electronics North America | GRM1555C1H8R0DA01D | Digi-Key | 490-5867-6-ND |
| 13 | C27 | 53-0041-2 | 1 | 1000pF, 50V, C0G, 5%, 0402, RoHS | Murata Electronics North America | GRM1555C1H102JA01D | Digi-Key | 490-3244-6-ND |
| 14 | C31 | 53-0041-3 | 1 | 10pF, 50V, C0G, 5%, 0402, RoHS | Murata Electronics North America | GRM1555C1H100JA01D | Digi-Key | 490-5921-6-ND |
| 15 | C33 | 53-0047 | 1 | 0.33uF, 50V, X7R, 10%, 0805, RoHS | Murata Electronics North America | GRM219R71H334KA88D | Digi-Key | 490-3327-6-ND |
| 16 | D1, D2, D3, D4, D5, D6, D7 | 54-0075 | 7 | Schottky Diode, 30V, 100mA, RoHS | Panasonic Electronic Components | DB2731600L | Digi-Key | DB2731600LDKR-ND |
| 17 | D8 | 54-0076 | 1 | Schottky Diode, 100V, 150mA, SOD323, RoHS | STMicroelectronics | BAT46JFILM | Digi-Key | 497-6653-6-ND |
| 18 | D9, D10, D11, D12 | 54-0077 | 4 | Zener Diode, 4.7V, 150 mW, 0603, RoHS | Comchip Technology | CZRU52C4V7 | Digi-Key | 641-1028-6-ND |
| 19 | L1 | 53-0032 | 1 | 100uH, 270mA, 20%, RoHS | TDK Corporation | VLCF5020T-101MR27 | Digi-Key | 445-3203-6-ND |
| 20 | L2 | 53-0033 | 1 | 470uH, 35mA, 10%, RoHS | Taiyo Yuden | CB2518T471K | Digi-Key | 587-2194-6-ND |
| 21 | L3 | 53-0034 | 1 | 33uH, 120mA, 10%, RoHS | TDK Corporation | NLCV25T-330K-PF | Digi-Key | 445-1759-6-ND |
| 22 | LED1 | 53-0035 | 1 | LED, Red, 0402, 20mA ,2V, 140mcd, RoHS | Lumex Opto/Components Inc. | SML-LX0402SIC-TR | Digi-Key | 67-1878-6-ND |
| 23 | Q1, Q2 | 54-0050 | 2 | PNP, -50V, -100mA, SOT523, 150MHz, RoHS | Panasonic Electronic Components | DSA9001S0L | Digi-Key | DSA9001S0LDKR-ND |
| 24 | Q3, Q4, Q5, Q6, Q7 | 54-0051 | 5 | N-Channel MOSFET, 50V, 300mA, SOT23, RoHS | Diodes Incorporated | DMN5L06K-7 | Digi-Key | DMN5L06KDIDKR-ND |
| 25 | R1, R2, R4, R5, R7, R8, R10, R11, R13 | 53-0048 | 9 | 0.0 ohm, 1/16W, 0402, RoHS | Vishay Dale | CRCW04020000Z0ED | Digi-Key | 541-0.0JDKR-ND |

| | | | | | | | |
|------------------------|--|-----------|--|--|-------------------------|---------------|--------------|
| BY | | DATE | | <div><div>SYNAPSE Biomedical Inc.</div></div> | | | |
| DRAWN R Yoder | | 2/19/2020 | | | | | |
| CHECKED A. Zbrzeski | | 2/19/2020 | | | | | |
| | | | | DOCUMENT NAME | | | |
| | | | | Pulse Generator (PG4) Assembly Drawing | | | |
| MATERIAL N/A | | | | SIZE B | DOCUMENT NO. 51-2002 | REV 06 | |
| FINISH N/A | | | | SCALE: N/A | | NEXT ASSY N/A | SHEET 2 OF 6 |


| Item | Designator | SBI | Qty | Description | Manufacturer | Manufacturer Part Number | Suggested Supplier | Supplier Part Number |
|------|--|------------|-----|---|-------------------------|--------------------------|--------------------|-----------------------|
| 26 | R14 | 53-0049-1 | 1 | 0.1 ohm, 1%, 1/16W, 0402, RoHS | Vishay Dale | RCWE0402R100FNEA | Digi-Key | 541-2711-6-ND |
| 27 | R15, R16, R34, R47, R48, R60 | 53-0050 | 6 | 0.0 ohm, 1/10W, 0603, RoHS | Vishay Dale | CRCW06030000Z0EA | Digi-Key | 541-0.0GDKR-ND |
| 28 | R17, R22, R23, R24, R27, R30, R46 | 53-0049-2 | 7 | 49.9k ohm, 1%, 1/16W, 0402, RoHS | Vishay Dale | CRCW040249K9FKED | Digi-Key | 541-49.9KLDKR-ND |
| 29 | R18 | 53-0049-3 | 1 | 470k ohm, 1% , 1/16W, smd, 0402, RoHS | Vishay Dale | CRCW0402470KFKED | Digi-Key | 541-470KLDKR-ND |
| 30 | R19, R25, R26, R28 | 53-0049-4 | 4 | 1.0k ohm, 1%, 1/16W, smd, 0402, RoHS | Vishay Dale | CRCW04021K00FKED | Digi-Key | 541-1.00KLDKR-ND |
| 31 | R20, R21 | 53-0049-5 | 2 | 5.1K ohm, 1%, 1/16W, smd, 0402, RoHS | Vishay Dale | CRCW04025K10FKED | Digi-Key | 541-5.10KLDKR-ND |
| 32 | R29 | 53-0051 | 1 | 84.5k ohm, 1%, 1/10W, 0402, RoHS | Vishay Dale | CRCW040284K5FKED | Digi-Key | 541-84.5KLDKR-ND |
| 33 | R31, R38, R40, R41, R42, R57, R58, R59, R61, R62, R63, R64, R65, R66 | 53-0049-7 | 14 | 100k ohm, 1%, 1/16W, smd, 0402, RoHS | Vishay Dale | CRCW0402100KFKED | Digi-Key | 541-100KLDKR-ND |
| 34 | R32, R35, R36, R39, R43 | 53-0049-8 | 5 | 10.0k ohm, 1%, 1/16W, smd, 0402, RoHS | Vishay Dale | CRCW040210K0FKED | Digi-Key | 541-10.0KLDKR-ND |
| 35 | R37, R52 | 53-0049-9 | 2 | 15.0k ohm, 1%, 1/16W, smd, 0402, RoHS | Vishay Dale | CRCW040215K0FKED | Digi-Key | 541-15.0KLDKR-ND |
| 36 | R44 | 53-0049-10 | 1 | 1.6K ohm, 1%, 1/16W, smd, 0402, RoHS | Vishay Dale | CRCW04021K60FKED | Digi-Key | 541-1.60KLDKR-ND |
| 37 | R45, R56 | 53-0049-11 | 2 | 150k ohm, 1%, 1/16W, smd, 0402, RoHS | Vishay Dale | CRCW0402150KFKED | Digi-Key | 541-150KLDKR-ND |
| 38 | R49 | 53-0049-12 | 1 | 10 ohm, 1%, 1/16W, 0402, RoHS | Vishay Dale | CRCW040210R0FKED | Digi-Key | 541-10.0LDKR-ND |
| 39 | R51 | 53-0049-13 | 1 | 20k ohm, 1%, 1/16W, 0402, RoHS | Vishay Dale | CRCW040220K0FKED | Digi-Key | 541-20.0KLDKR-ND |
| 40 | R53 | 53-0049-14 | 1 | 953k ohm, 1%, 1/16W, 0402, RoHS | Vishay Dale | CRCW0402953RFKED | Digi-Key | 541-953LDKR-ND |
| 41 | R54 | 53-0049-15 | 1 | 36k ohm , 1%, 1/16W, 0402, RoHS | Vishay Dale | CRCW040236K0FKED | Digi-Key | 541-36.0KLDKR-ND |
| 42 | R67 | 53-0049-16 | 1 | 56 ohm, 0.1%, 1/16W, 0402, RoHS | Vishay Dale | CRCW040256R0FKED | Digi-Key | 541-56.0LDKR-ND |
| 43 | RV1 | 53-0066 | 1 | MOV, 12V, 0603, RoHS | BOURNS | CG0603MLC-12E | Digi-Key | CG0603MLC-12EDKR-ND |
| 44 | U1 | 54-0052 | 2 | 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 | 54-0054 | 1 | Comparator, 2.7-5.5V, 40nS, SOT23-8, RoHS | Maxim Integrated | MAX9142EKA+T | Digi-Key | MAX9142EKA+TDKR-ND |
| 47 | U5 | 54-0055 | 1 | XOR, 1.65-5.5V, uPAK6, RoHS | Fairchild Semiconductor | NC7SZ86L6X | Digi-Key | NC7SZ86L6XDKR-ND |

| | | | | | | | | | | |
|------------------------|--|-----------|--|---|--|--|-------------------------|--|---------------|--|
| BY | | DATE | | <div> DOCUMENT NAME Pulse Generator (PG4) Assembly Drawing</div> | | | | | | |
| DRAWN R Yoder | | 2/19/2020 | | | | | | | | |
| CHECKED A. Zbrzeski | | 2/19/2020 | | | | | | | | |
| MATERIAL N/A | | | | SIZE B | | | DOCUMENT NO. 51-2002 | | REV 06 | |
| FINISH N/A | | | | | | | SCALE: N/A | | NEXT ASSY N/A | |

| Item | Designator | SBI | Qty | Description | Manufacturer | Manufacturer Part Number | Suggested Supplier | Supplier Part Number |
|------|------------|---------|-----|--|-----------------------------|---------------------------|--------------------|-------------------------------|
| 48 | U6 | 54-0056 | 1 | Digital Isolator, 3-5.5V, uSOP8, RoHS | NVE Corp/Isolation Products | IL712-1E | Digi-Key | 390-1105-5-ND |
| 49 | U7 | 54-0057 | 1 | Silicon delay, 3-3.6V, uSOP8, RoHS | Maxim Integrated | DS1100LU-500+ | Digi-Key | DS1100LU-500+-ND |
| 50 | U8 | 54-0058 | 1 | FLIPFLOP, 1.65-5.5V, uPAk6, RoHS | Fairchild Semiconductor | NC7SZ175L6X | Digi-Key | NC7SZ175L6XFSDKR-ND |
| 50 | U9 | 54-0059 | 1 | Low Droupout negative regulator, -5V, -200mA, RoHS | Linear Technology | LT1964IS5-BYP#TRMPBF | Digi-Key | LT1964IS5-BYP#TRMPBFCT-ND |
| 52 | U10 | 54-0060 | 1 | Voltage detector Reset, SC70-5, RoHS | Texas Instruments | TPS3805H33DCKR | Digi-Key | 296-13407-6-ND |
| 53 | U11 | 54-0061 | 1 | uC, 2.7-5.5V, 8bit, QFN64, RoHS | Atmel | AT90CAN128-16MU | Digi-Key | AT90CAN128-16MURDKR-ND |
| 54 | U12 | 54-0062 | 1 | Temperature Sensor,12bit I2C, SOT563, RoHS | Texas Instruments | TMP112AIDRLT | Digi-Key | 296-24621-6-ND |
| 55 | U13 | 54-0074 | 1 | Tri-axis accelerometer, I2C, LGA10, RoHS | Kionix | KXTE9-2050 | Mouser | 912-KXTE9-2050 |
| 56 | U14 | 54-0063 | 1 | BOOST, 2.3-10V, TSOT23-8, RoHS | Linear Technology | LT3464ETS8#TRMPBF | Digi-Key | LT3464ETS8#TRMPBFDKR-ND |
| 57 | U15 | 54-0064 | 1 | DAC 2V5 internal reference, RoHS | Linear Technology | LTC2630CSC6-LM12#TRMPBF | Digi-Key | LTC2630CSC6-LM12#TRMPBFDKR-ND |
| 58 | U16 | 54-0065 | 1 | 2-Input NOR, 1.65-5.5V, uPak6, RoHS | Fairchild Semiconductor | NC7SZ02L6X | Digi-Key | NC7SZ02L6XDKR-ND |
| 59 | U17 | 54-0066 | 1 | MOSFET 2N, 60V, 0.305A, RoHS | Vishay Siliconix | SI1026X-T1-GE3 | Digi-Key | SI1026X-T1-GE3CT-ND |
| 60 | U18 | 54-0067 | 1 | 2-Input Positive OR, 1.65-5.5V, uBGA8, RoHS | Texas Instruments | SN74LVC2G32YZPR | Digi-Key | 296-15350-1-ND |
| 61 | U19 | 54-0068 | 1 | Analog Switch, 10ohm, QUAD SPST, TSSOP16, RoHS | Maxim Integrated | MAX313LCUE+ | Digi-Key | MAX313LCUE+-ND |
| 62 | U20, U21 | 54-0069 | 2 | Dual 2-Input NOR, 1.65-5.5V, uBGA8, RoHS | Texas Instruments | SN74LVC2G02YZPR | Digi-Key | 296-18799-6-ND |
| 63 | U22 | 54-0070 | 1 | UHS Buffer Tri-State, uPAK6, RoHS | Fairchild Semiconductor | NC7SZ126L6X | Digi-Key | NC7SZ126L6XFSDKR-ND |
| 64 | U23 | 54-0071 | 1 | DAC 10bit, uSOP8, RoHS | Maxim Integrated | MAX5355CUA+ | Digi-Key | MAX5355CUA+-ND |
| 65 | U24 | 54-0072 | 1 | REF 1.25V, 3.9uA, SOT23-3, RoHS | Texas Instruments | REF3312AIDBZR | Digi-Key | 296-41484-6-ND |
| 66 | Y1 | 54-0073 | 1 | Crystal 8MHz SMT, RoHS | NDK | NX5032GA-8.000M-STD-CSU-1 | Digi-Key | 644-1132-6-ND |

| | | | | |
|------------------------|-----------|---|-------------------------|--------------|
| BY | DATE | <div> SYNAPSE Biomedical Inc.</div> <div>DOCUMENT NAME</div> <div>Pulse Generator (PG4) Assembly Drawing</div> | | |
| DRAWN R Yoder | 2/19/2020 | | | |
| CHECKED A. Zbrzeski | 2/19/2020 | | | |
| MATERIAL N/A | | | | |
| FINISH N/A | | SIZE B | DOCUMENT NO. 51-2002 | REV 06 |
| SCALE: N/A | | NEXT ASSY N/A | | SHEET 4 OF 6 |

[illegible]

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|------------------------|-----------|---|-------------------------|--------------|
| BY | DATE |  SYNAPSE Biomedical Inc. | | |
| DRAWN R Yoder | 2/19/2020 | | | |
| CHECKED A. Zbrzeski | 2/19/2020 | | | |
| | | | | |
| | | DOCUMENT NAME | | |
| | | Pulse Generator (PG4) Assembly Drawing | | |
| MATERIAL N/A | | | | |
| FINISH N/A | | SIZE B | DOCUMENT NO. 51-2002 | REV 06 |
| | | SCALE: | NEXT ASSY N/A | SHEET 5 OF 6 |

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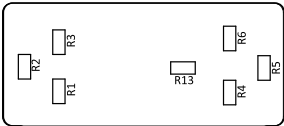
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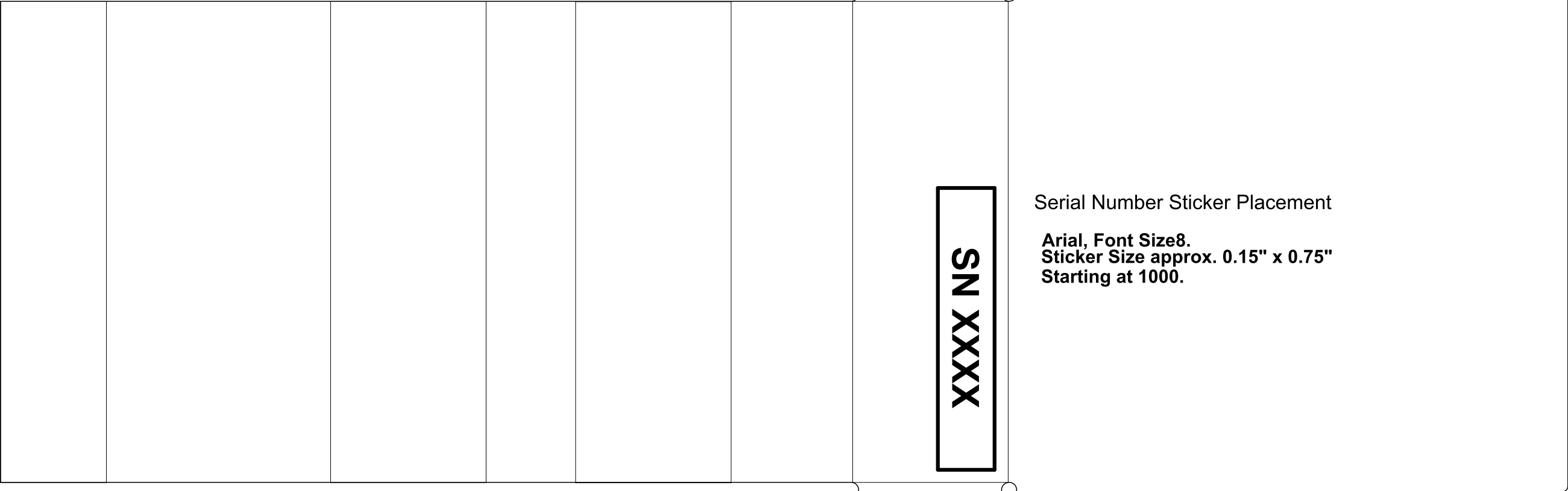
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87654321




Bottom Component Placement, Bottom View



Serial Number Sticker Placement

Arial, Font Size8.
Sticker Size approx. 0.15" x 0.75"
Starting at 1000.

| | | | | | |
|------------------------|--|-----------|---|-------------------------|--------------|
| BY | | DATE |  | | |
| DRAWN R Yoder | | 2/19/2020 | | | |
| CHECKED A. Zbrzeski | | 2/19/2020 | DOCUMENT NAME Pulse Generator (PG4) Assembly Drawing | | |
| | | | | | |
| MATERIAL N/A | | | SIZE B | DOCUMENT NO. 51-2002 | REV 06 |
| FINISH N/A | | | SCALE: N/A | NEXT ASSY N/A | SHEET 6 OF 6 |