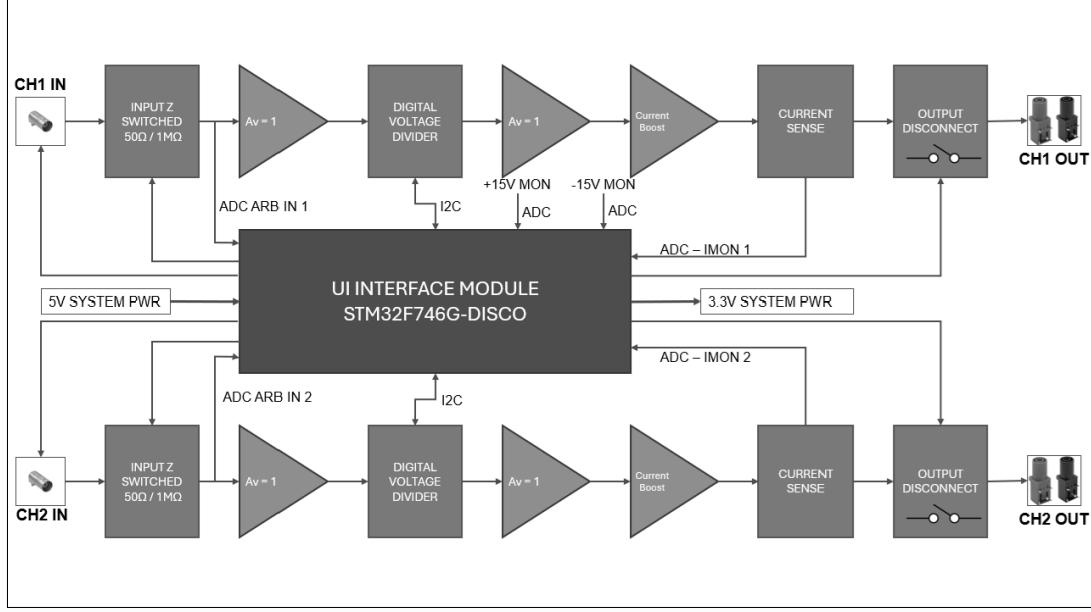
**REVISION HISTORY:**

| REV | ECO | CHANGE DESCRIPTION |
|-----|-----|---|
| 1 | NA | Initial design |
| 2 | NA | Multiple changes to pin-out, circuit protection, Current Boost, and misc. |
| 3 | NA | Correction in ABS divider, change in Current Boost, Cooling and misc. |



| | |
|--------------------------------|---------------------------|
| Title: Arbitrary Power Booster | IMR Engineering |
| Size: B | Number: IMR-005-SCH |
| Date: 05/12/25 | Revision: 3 |
| File: ArbPwrBoost_P1.SchDoc | Snellville GA, 30039 |
| | Engineer: Hab S Collector |

MAIN SWITCH

MAX INPUT +15V

73099-2
1000V 24A

J1 +POS 1
-NEG 1
GND

73099-0
1000V 24A

J2 +POS 1
-NEG 1
GND

73099-2
1000V 24A

J3 +POS 1
-NEG 1
GND

73099-0
1000V 24A

J4 +POS 1
-NEG 1
GND

73099-2
1000V 24A

MAIN PWR EN

MAIN SWITCH

REL1

5V 1.2A D3

1N4148W-7-F
300mA 100V

Q3 2N7002-7-F
60V 115mA

C5 .1uF 50V

C6 .1uF 50V

C7 .1uF 50V

C8 .1uF 50V

R7 10K .25W

R8 1% .25W

BYPASS CAPS

+VSW

-VSW

+VS TO 5V SMPS

NOTES:

SW1 SHOWS 5V PWR IN THE OFF POSITION

SMPS 5V AT 1000mA ESTIMATED LOAD

JPX, TPX FOR PROTOTYPE TESTING ONLY

MAX INPUT ON POWER BANANA CONNECTOR PAIRS IS $\pm 15V$

INPUT POWER MUST BE FROM ISOLATED POWER SUPPLY

INPUT RATIO OF $\pm V_{MON}$ IS 0.110V, MAX INPUT OF 30V

U1 VIN BST SW FB

TPS54202DDCR 4.5V-28V

C13 .1uF .50V

L1 6.8uH 1.7A SRN4018TA-6R8M

C14 68pF 50V

R14 100K .25W

R13 4.7K .25W

R12 1% .25W

R11 10K .25W

R10 13.7K .125W

R9 1% .25W

R8 1% .25W

R7 1% .25W

R6 1% .25W

R5 1.24K .125W

R4 1.24K .125W

R3 1.24K .125W

R2 1.24K .125W

R1 1% .25W

R0 1% .25W

FB1 3A

2508053017Y3 300 Ohm 100MHz

C48 47uF 16V

C15 47uF 16V

R17 13.7K .125W

R16 1.0K .125W

R15 1.24K .125W

R14 1.24K .125W

R13 1.24K .125W

R12 1.0K .125W

R11 1.24K .125W

R10 1.0K .125W

R9 1.24K .125W

R8 1.0K .125W

R7 1.24K .125W

R6 1.0K .125W

R5 1.24K .125W

R4 1.0K .125W

R3 1.24K .125W

R2 1.0K .125W

R1 1.24K .125W

R0 1.0K .125W

TP1 S1751-46R S1751-46R

TP2 S1751-46R S1751-46R

Q1 DMP6050SPS-13
60V 5.7A

Q2 DMP6050SPS-13
60V 5.7A

D1 MMSZ5239BS-7-F
200mW 9.1V

C4 10uF 50V

R1 1% 1W

JP1 1 2

C1 330uF 50V

C2 330uF 50V

C3 330uF 50V

R2 10K .25W

A

Q3 DMP6050SPS-13
60V 5.7A

Q4 DMP6050SPS-13
60V 5.7A

D2 1N4148W-7-F
300mA 100V

R3 1.24K .125W

R4 1.24K .125W

R5 1.24K .125W

D4 1N5819HW-7-F
1A 40V

R6 1.24K .125W

R7 1.24K .125W

R8 1.24K .125W

A

Q5 DMNH6042SPDQ-13
60V 5.7A

Q6 DMNH6042SPDQ-13
60V 5.7A

D3 MMSZ5239BS-7-F
200mW 9.1V

C12 10uF 50V

R9 1% 1W

JP2 1 2

C9 330uF 50V

C10 330uF 50V

C11 330uF 50V

R8 10K .25W

A

Q7 DMNH6042SPDQ-13
60V 5.7A

Q8 DMNH6042SPDQ-13
60V 5.7A

D5 MMSZ5239BS-7-F
200mW 9.1V

C13 10uF 50V

R10 1% 1W

JP3 1 2

C48 47uF 16V

C14 47uF 16V

R11 1% 1W

R12 1.24K .125W

R13 1.24K .125W

R14 1.24K .125W

R15 1.24K .125W

R16 1.24K .125W

A

+VSW

+VS MON

+VS MONITOR

-VSW

-VS MON

+VSW

+VS MON

-VSW

-VS MON

A

Title Arbitrary Power Booster

IMR Engineering
3621 Gin Way
Sneads GA, 30039

IMR Engineering

Number: IMR-005-SCH

Revision: 3

Date: 05/12/25

Time: 08:00

Sheet 2 of 8

Engineer: Hab S Collector

File: ArbPwrBoost_P2.SchDoc

1

2

3

4

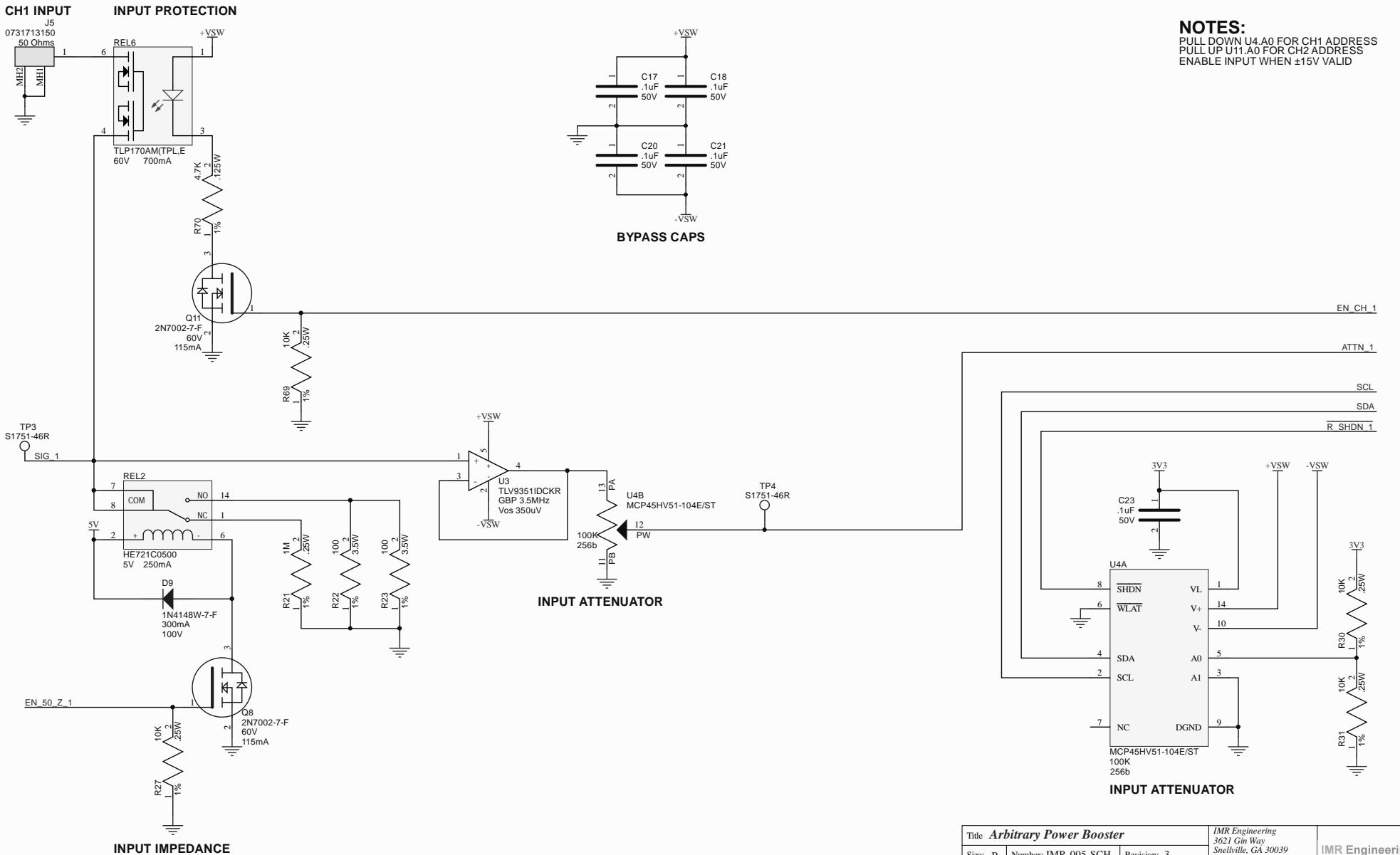
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6

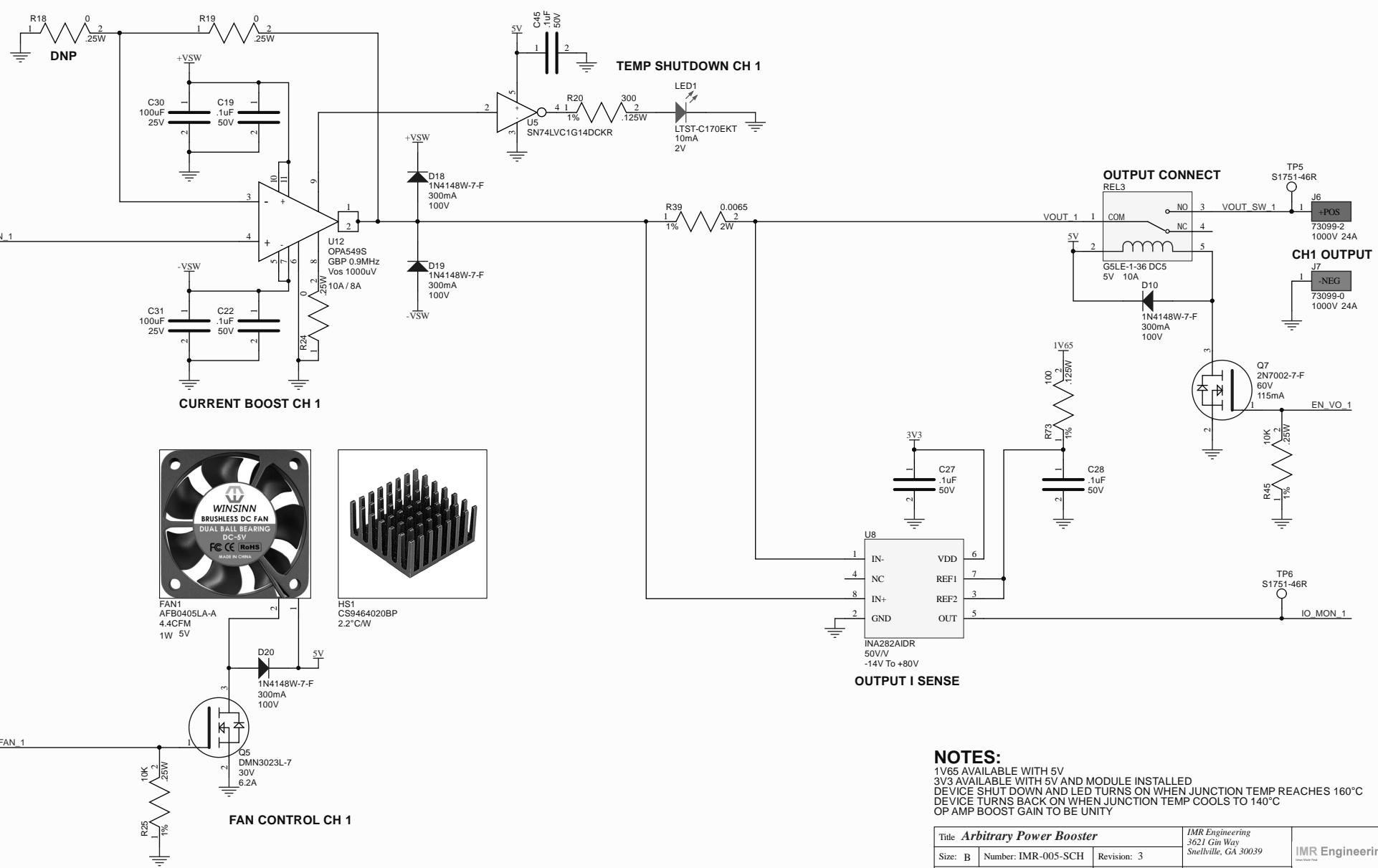
7

8

9



| | | | |
|--------------------------------------|---------------------|--------------|---|
| Title Arbitrary Power Booster | | | IMR Engineering 3621 Gin Way Snellville, GA 30039 |
| Size: B | Number: IMR-005-SCH | Revision: 3 | IMR Engineering |
| Date: 05/12/25 | Time: 08:00 | Sheet 3 of 8 | Engineer: Hab Collector |
| File: ArbPwrBoost_P3.SchDoc | | | Owner Name |



A

A

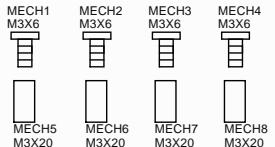
B

B

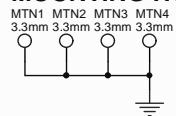
C

C

MOUNTING HARDWARE



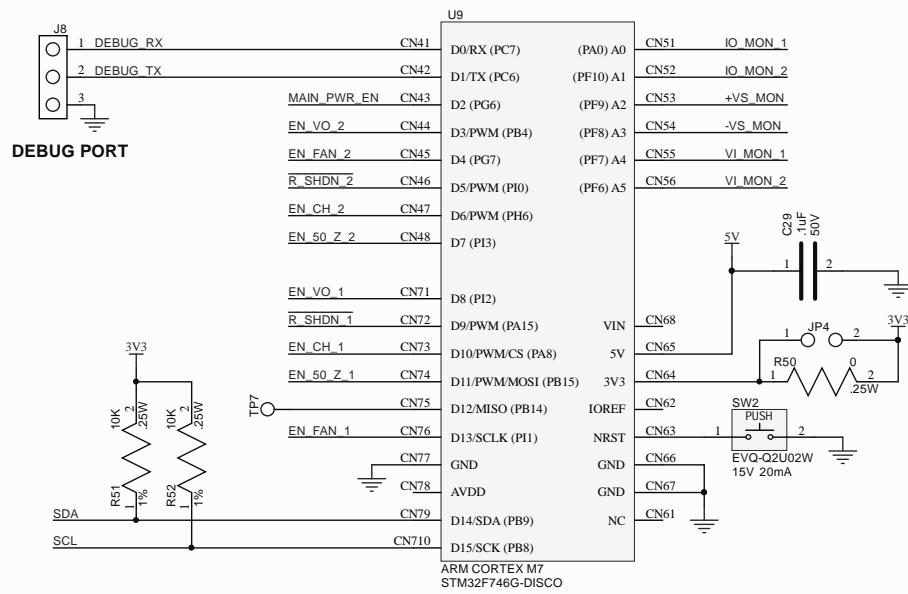
MOUNTING HOLES



MODULE HARDWARE



1 2 3 4 5 6



CONTROLLER MODULE WITH GUI INTERFACE

A0 TO A5 ADC INPUTS

INPUT IMPEDANCE IO_MON1 ESTIMATED < 10 OHMS - OP AMP OUTPUT
 INPUT IMPEDANCE IO_MON2 ESTIMATED < 10 OHMS - OP AMP OUTPUT
 INPUT IMPEDANCE +VS_MON 1.1K OHM
 INPUT IMPEDANCE -VS_MON_2 ESTIMATED < 10 OHMS - OP AMP OUTPUT
 INPUT IMPEDANCE VI_MON_1 2.3K OHM
 INPUT IMPEDANCE VI_MON_2 2.3K OHM

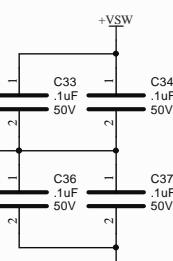
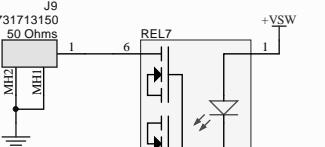
NOTES:

I2C PULL UP ON MODULE - ADDED HERE JUST IN CASE - DNP
 5V IS POWER INPUT TO MODULE
 3V3 IS REGULATED POWER OUTPUT FROM MODULE
 JPx, TPx FOR PROTOTYPE TESTING ONLY
 CHANNEL 1 AND CHANNEL 2 OPERATE INDEPENDENTLY OF EACH OTHER

| | | |
|--------------------------------|---|-------------------------|
| Title: Arbitrary Power Booster | IMR Engineering 3621 Gin Way Snellville, GA 30039 | IMR Engineering |
| Size: B | Number: IMR-005-SCH | Revision: 3 |
| Date: 05/12/25 | Time: 08:00 | Sheet 5 of 8 |
| File: ArbPwrBoost_P5.SchDoc | | Engineer: Hab Collector |

5

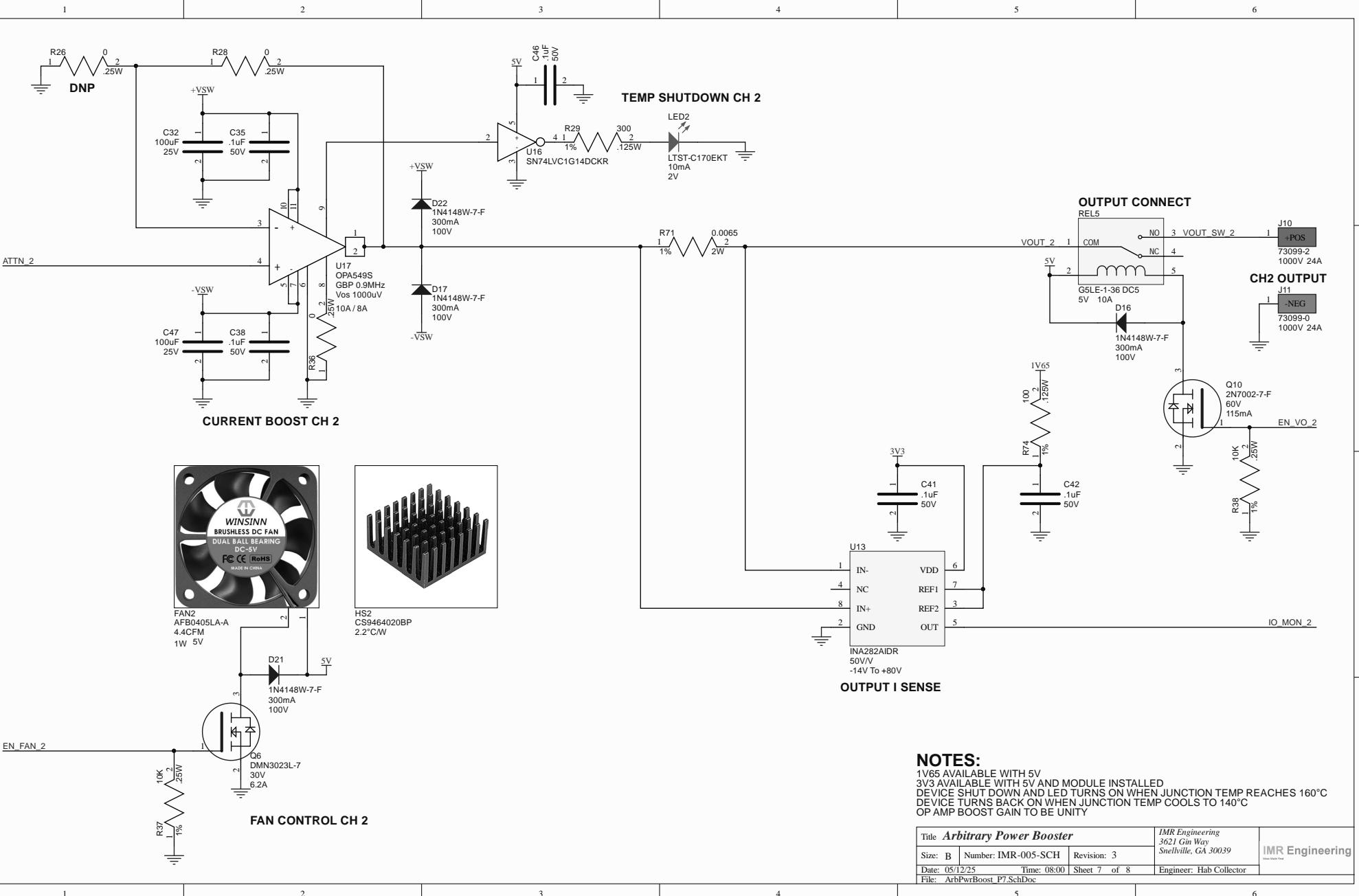
6

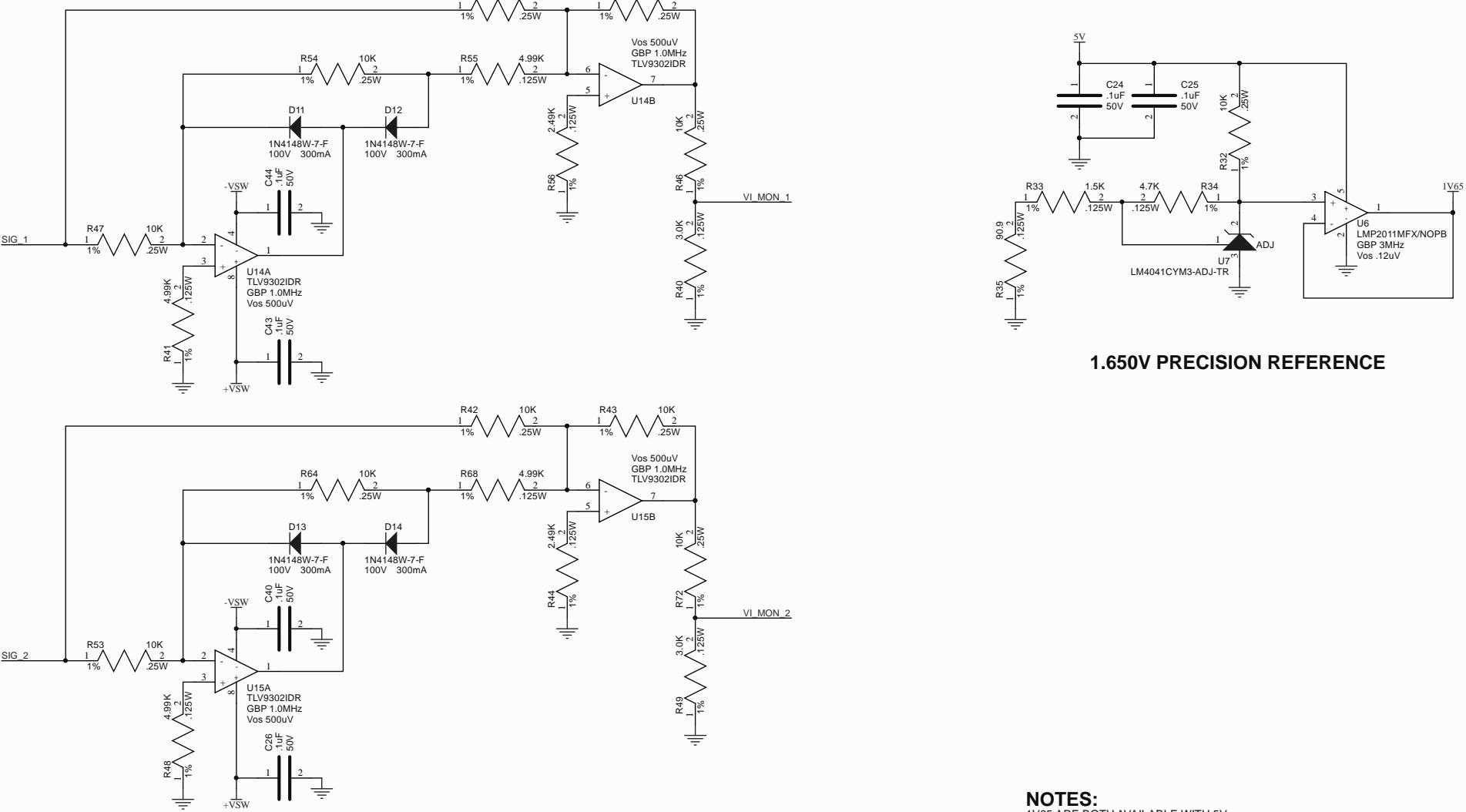
CH2 INPUT**INPUT PROTECTION****NOTES:**

PULL DOWN U4.A0 FOR CH1 ADDRESS
PULL UP U11.A0 FOR CH2 ADDRESS
ENABLE INPUT WHEN $\pm 15V$ VALID

BYPASS CAPS**ATTN CH_2****ATTN 2****SCL****SDA****R SHDN 2****C****INPUT ATTENUATOR****INPUT ATTENUATOR****INPUT IMPEDANCE****D****INPUT IMPEDANCE****D**

| | | |
|--------------------------------|---|---|
| Title: Arbitrary Power Booster | IMR Engineering 3621 Gin Way Snellville, GA 30039 | Size: B Number: IMR-005-SCH Revision: 3 |
| Date: 05/12/25 | Time: 08:00 | Sheet 6 of 8 |
| File: ArbPwrBoost_P6.SchDoc | | Engineer: Hab Collector |





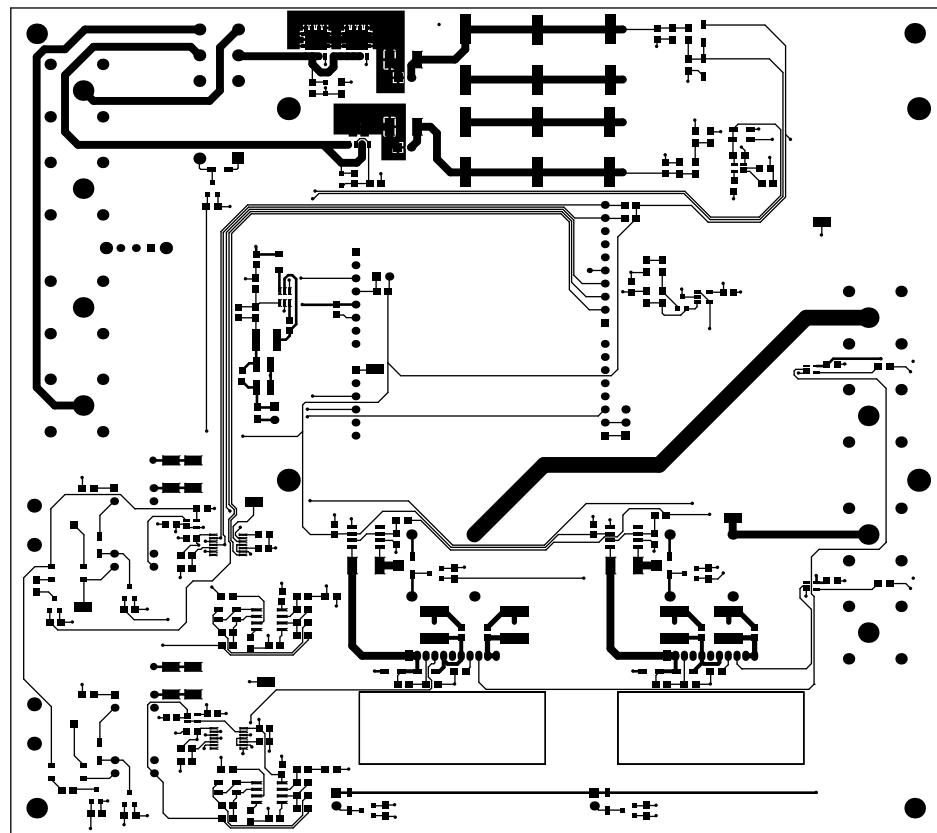
1.650V PRECISION REFERENCE

NOTES:

1V65 ARE BOTH AVAILABLE WITH 5V
3V3 REQUIRES MODULE TO BE INSERTED
ABSOLUTE VALUE DIVIDER RATIO 0.2308V/V

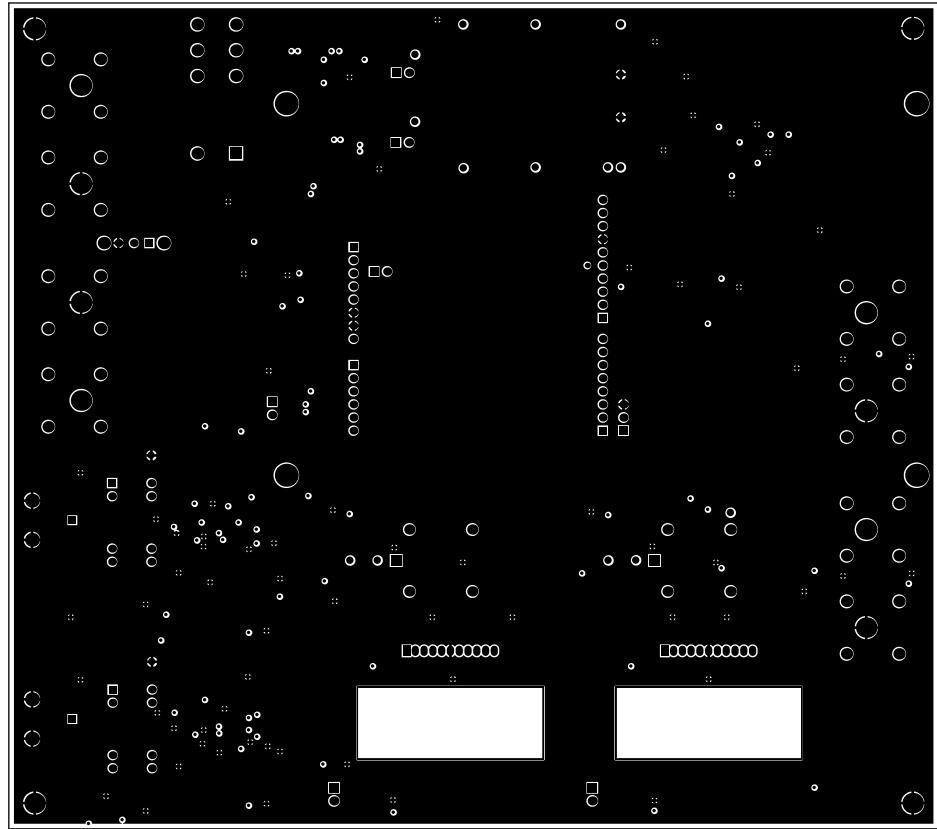
| | | | |
|--------------------------------------|---------------------|--------------|------------------------------------|
| Title Arbitrary Power Booster | | | IMR Engineering |
| Size: B | Number: IMR-005-SCH | Revision: 3 | 3621 Gin Way Sneville, GA 30039 |
| Date: 05/12/25 | Time: 08:00 | Sheet 8 of 8 | Engineer: Hab Collector |
| File: ArbPwrBoost_P8.SchDoc | | | IMR Engineering |

ABSOLUTE VALUE DIVIDER



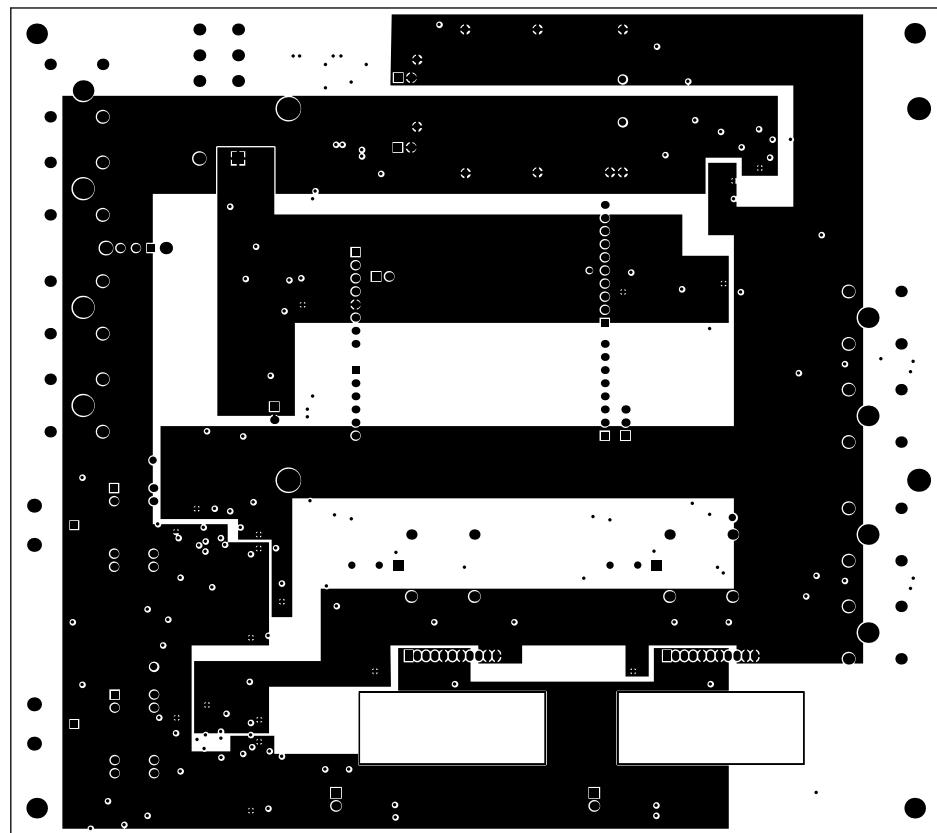
TOP

BOARD OUTLINE

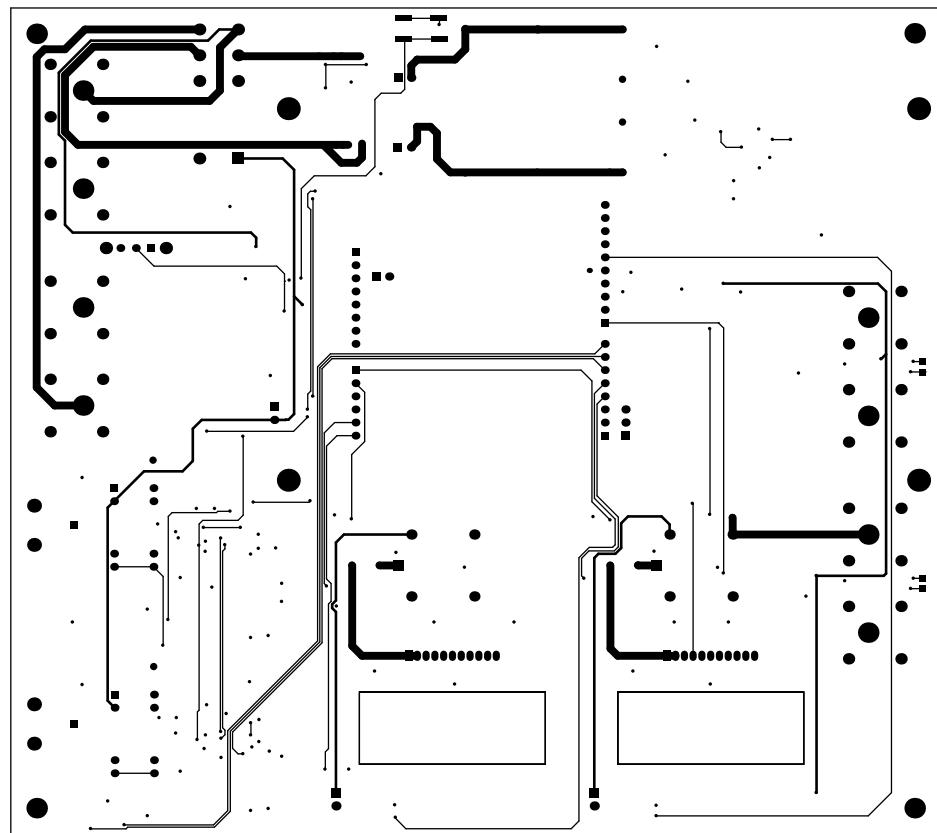


SIGNAL LAYER 1

BOARD OUTLINE

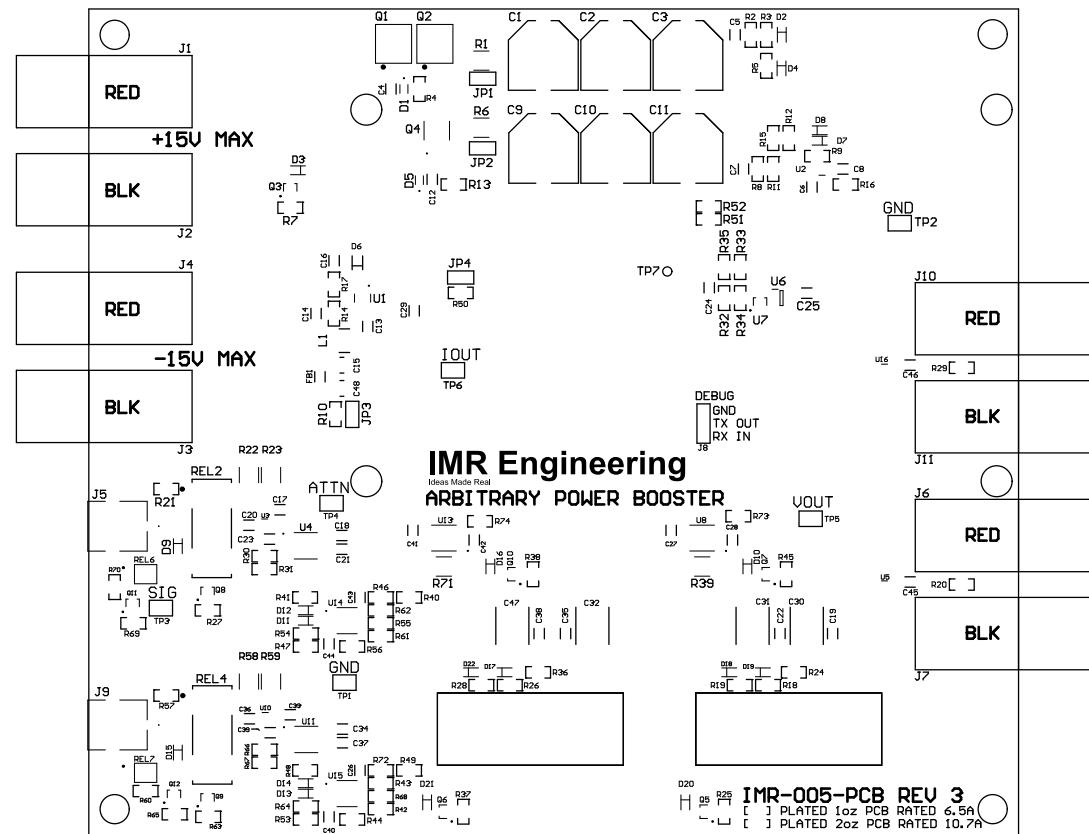


SIGNAL LAYER 2
BOARD OUTLINE



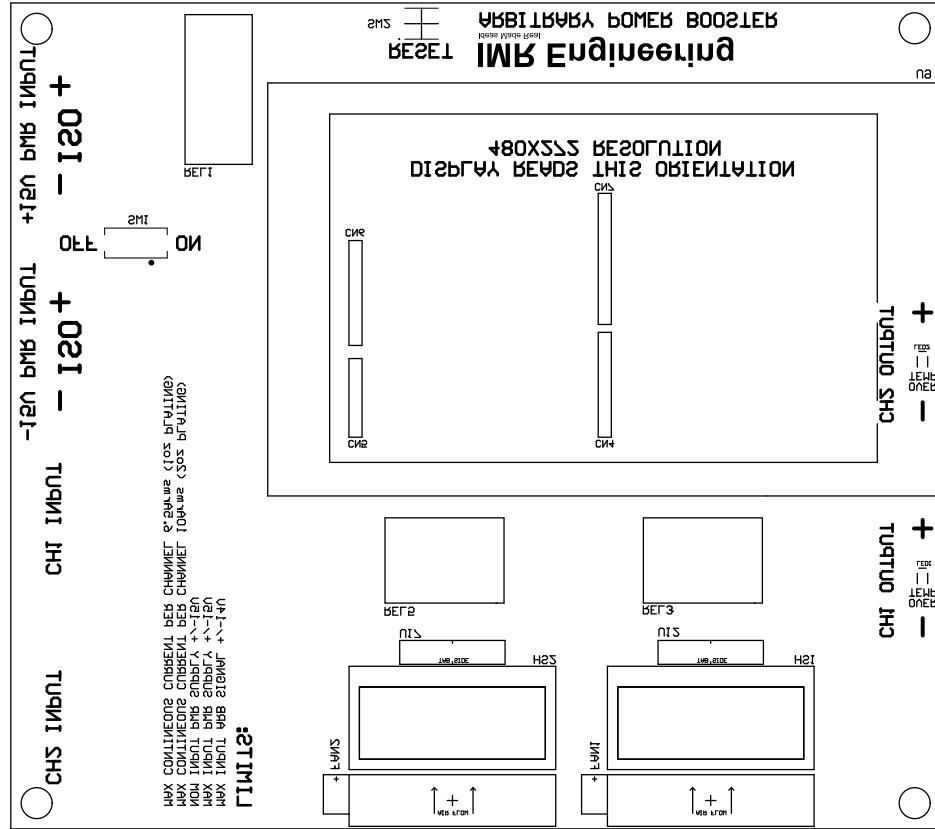
BOTTOM

BOARD OUTLINE



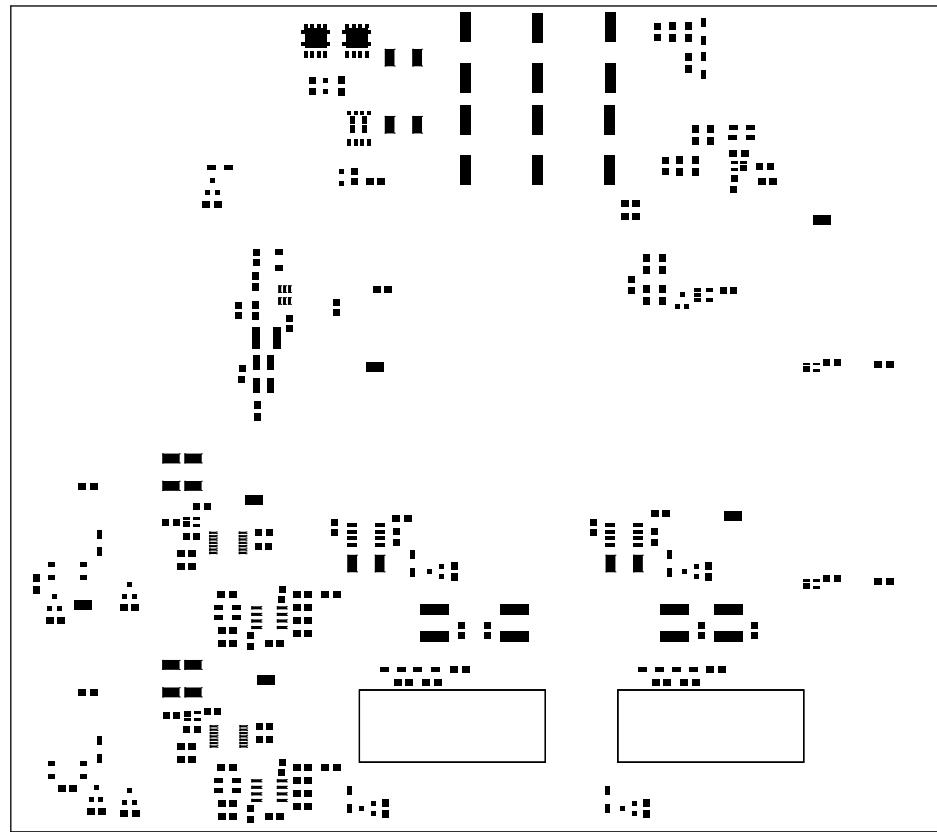
BOARD OUTLINE

TOP SILK



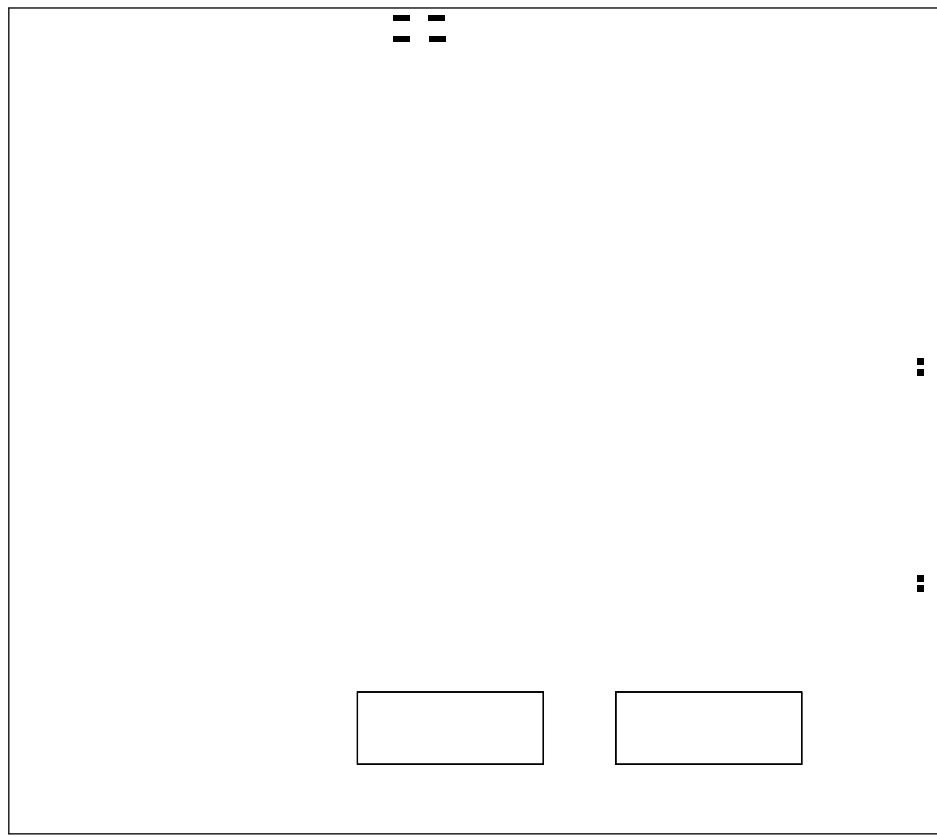
BOTTOM SILK

BOARD OUTLINE



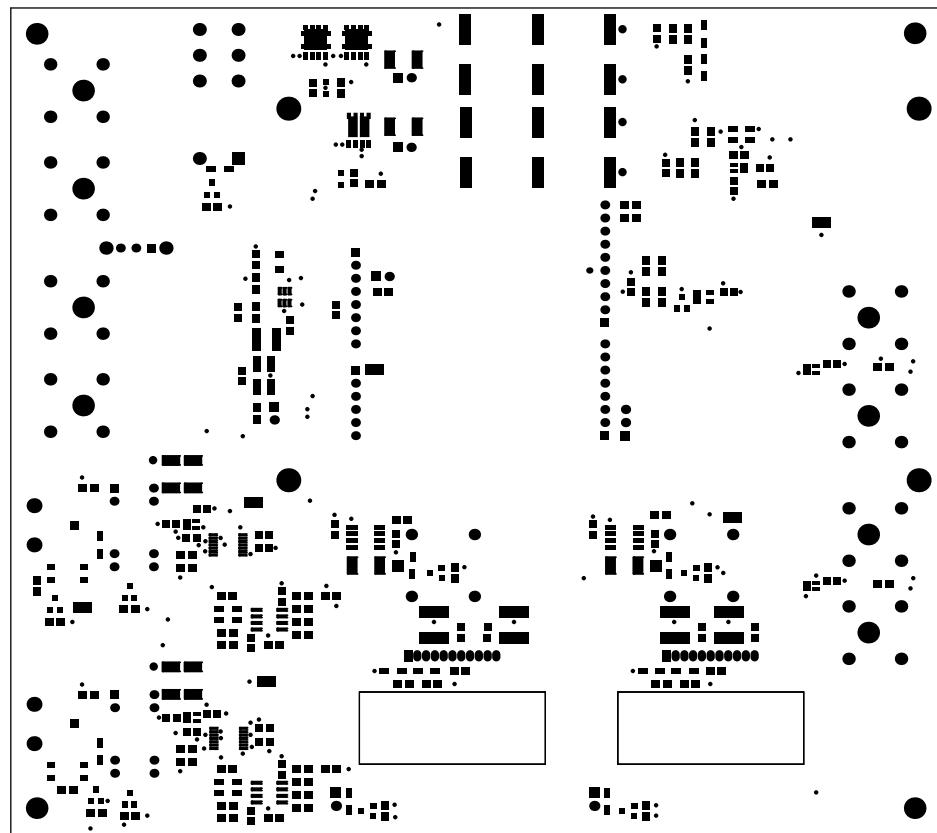
TOP PM

BOARD OUTLINE



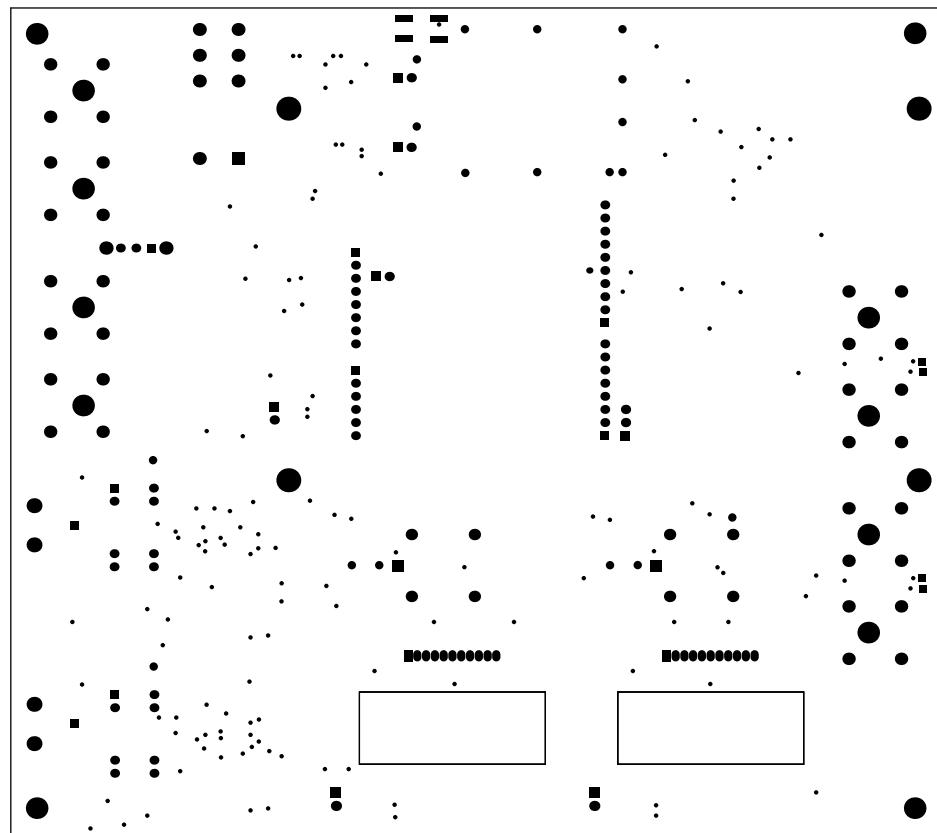
BOTTOM PM

BOARD OUTLINE



TOP SM

BOARD OUTLINE



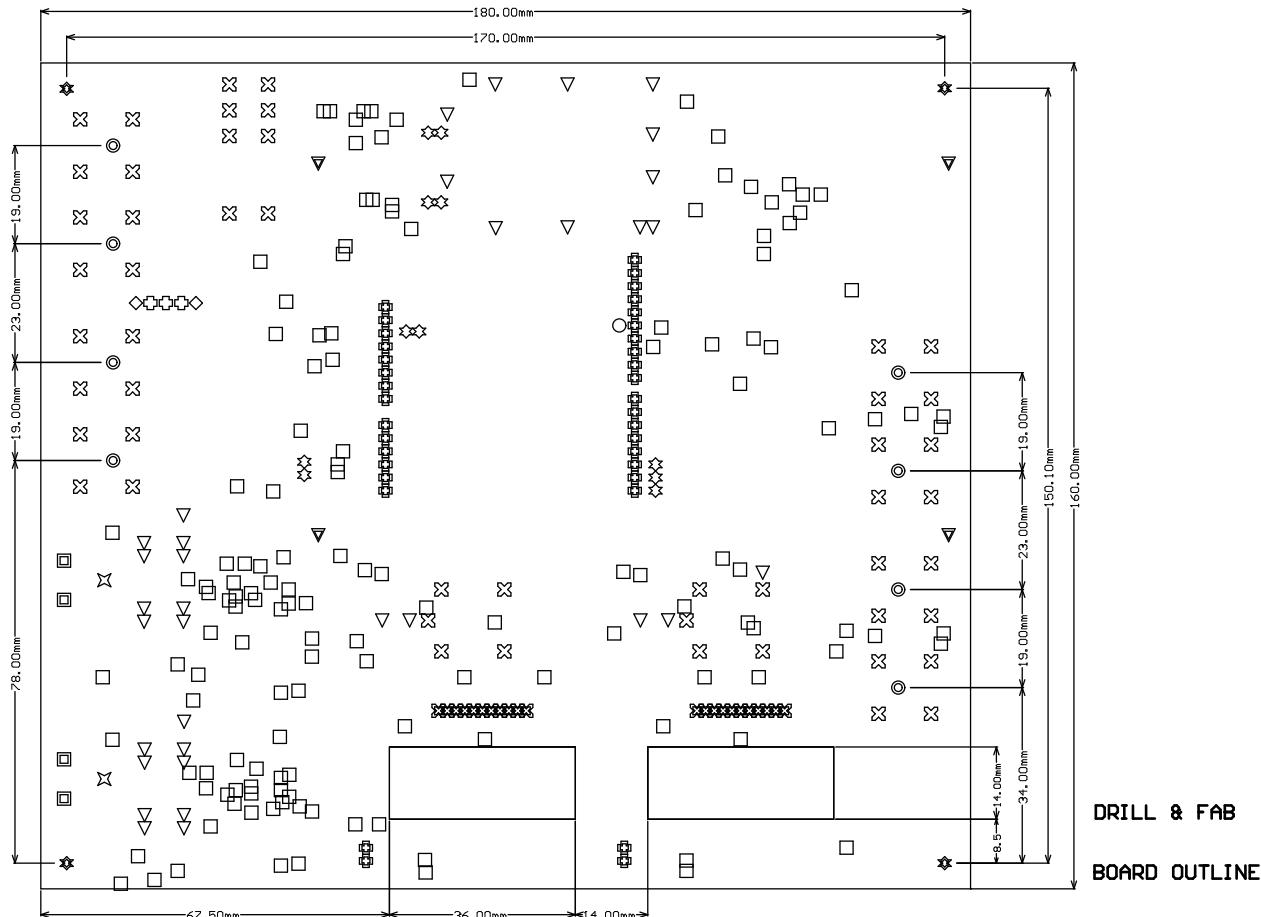
BOTTOM SM

BOARD OUTLINE

| Symbol | Hit Count | Finished Hole Size | Plated | Hole Type |
|---------------|-----------|---------------------|--------|-----------|
| o | 1 | 0.508mm (20.00mil) | PTH | Round |
| x | 2 | 0.920mm (36.22mil) | PTH | Round |
| diamond | 2 | 1.590mm (62.00mil) | PTH | Round |
| circle | 3 | 1.010mm (39.76mil) | PTH | Round |
| square | 4 | 1.800mm (70.87mil) | PTH | Round |
| triangle-down | 4 | 3.175mm (125.00mil) | PTH | Round |
| * | 4 | 3.300mm (129.92mil) | PTH | Round |
| circle | 8 | 2.200mm (86.41mil) | PTH | Round |
| triangle-down | 11 | 0.900mm (35.43mil) | PTH | Round |
| * | 22 | 1.200mm (47.24mil) | PTH | Round |
| triangle-down | 34 | 0.762mm (30.00mil) | PTH | Round |
| circle | 36 | 0.889mm (35.00mil) | PTH | Round |
| square | 50 | 1.300mm (51.18mil) | PTH | Round |
| square | 146 | 0.381mm (15.00mil) | PTH | Round |
| | 327 Total | | | |

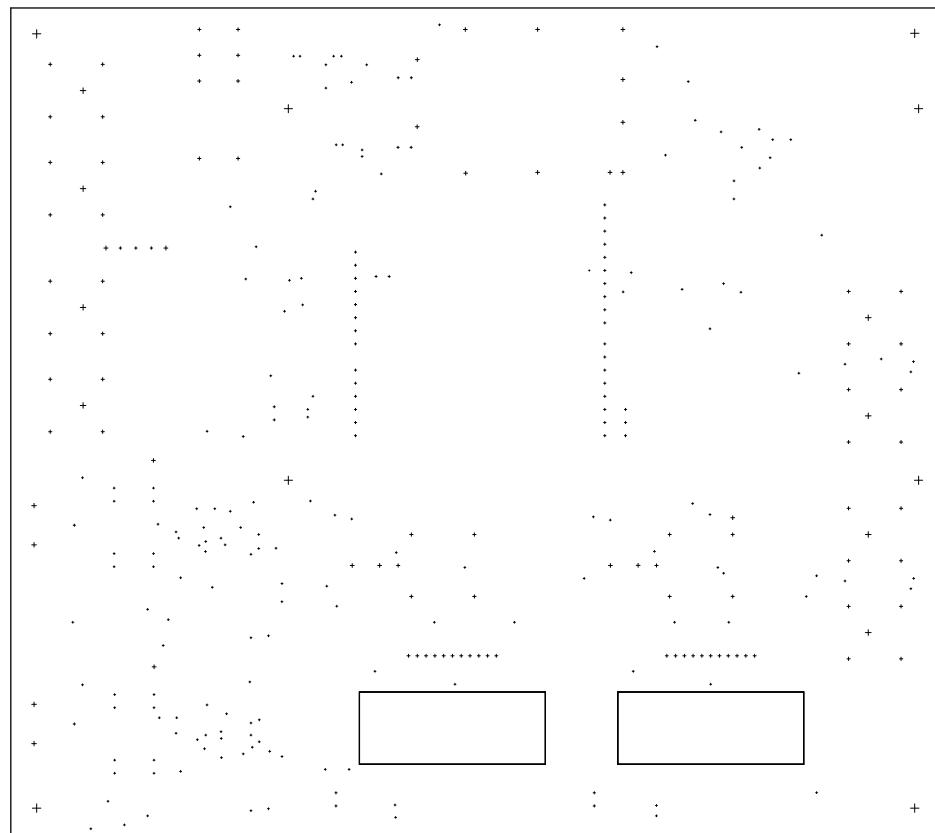
LAYER STACK:
 Top Layer
 Signal Layer 1
 Signal Layer 2
 Bottom Layer

+/- VS TRACE:
 MAX BOARD CURRENT 1oz PLATING: 6.50A RMS
 MAX BOARD CURRENT 2oz PLATING: 10.70A RMS

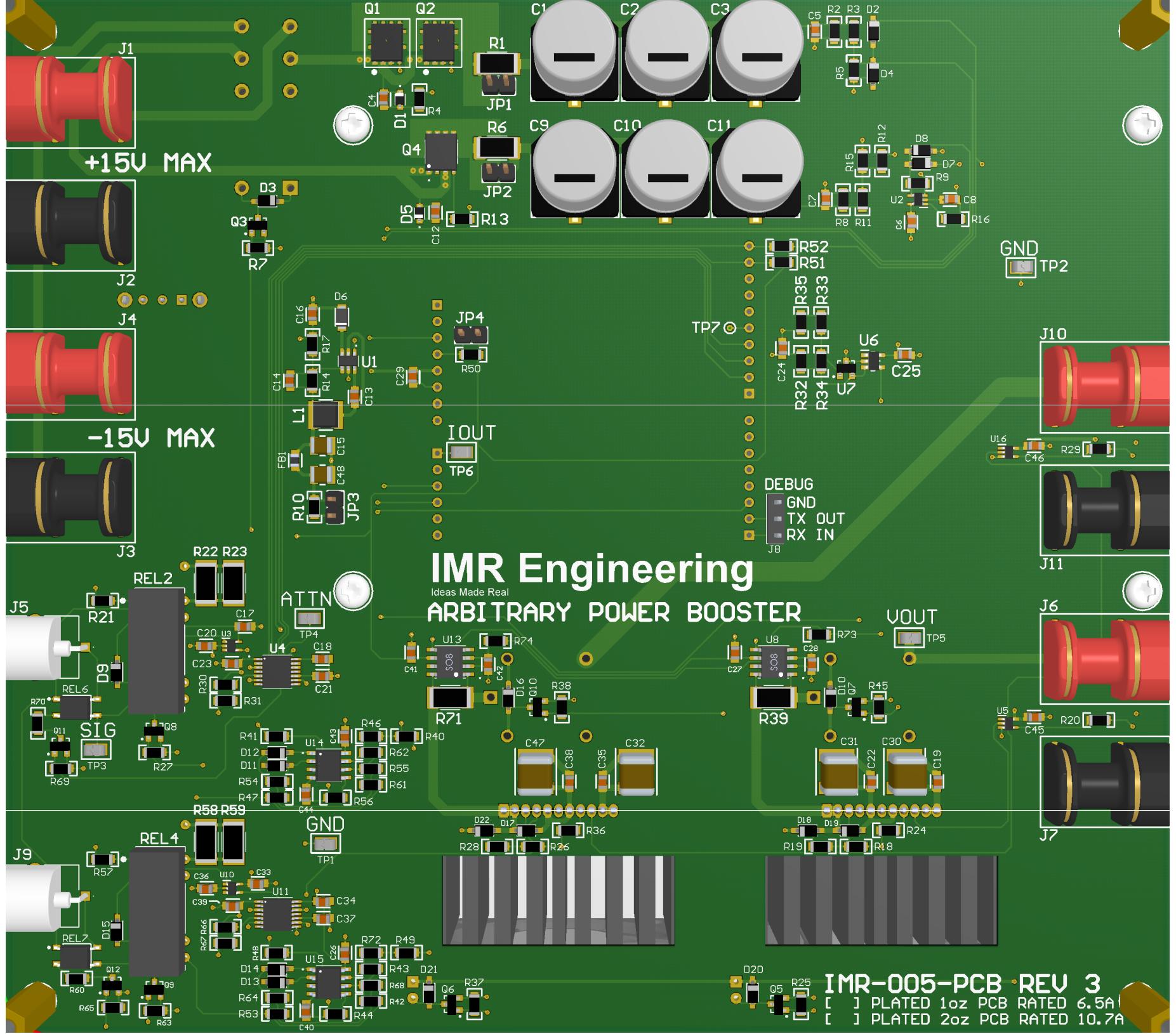


PCB FABRICATION NOTES:

- MATERIAL:
 FR4 (GF per MIL-P-13949) MIN UL 94V0
- Cu WEIGHT:
 OUTER LAYER: 1oz or 2oz PER (PO TO CLARIFY)
 INNER LAYER: 1oz
- SOLDER MASK:
 TYPE: LPI (LIQUID PHOTO-IMAGE)
 COVER: SMOBC (SOLDER MASK OVER BARE Cu)
 COLOR: RED (PROTOTYPE) OR GREEN (PRODUCTION) GLOSS
- OVERALL PCB THICKNESS:
 PCB: 1.6mm (63MIL)
 TOLERANCE: 0.178mm (7MIL)
- PCB ELECTRICAL TEST
 TESTED TO GERBER DATA
 PURCHASE ORDER TO OVERRIDE
- HOLE DIAMETER TOLERANCE:
 PLATED HOLE TOLERANCE: 0.076mm (3MIL)
 NON PLATED HOLE TOLERANCE: 0.076mm (3MIL)
- SILK SCREEN
 SIDES: TOP
 COLOR: WHITE
 TYPE: LPI (PREFERRED)
- SURFACE FINISH:
 PROTOTYPE: HASL OR ENIG
 PRODUCTION: ENIG (ONLY IF SPEC ON PURCHASE ORDER)
- ACCEPTABILITY:
 STANDARD: IPC-A-600 (LATEST REV)
 MFG TO ADD: DATE CODE, UL FLAME CODE



BOARD OUTLINE



PROTOTYPE BOM

Arbitrary Power Booster

Source Data From: Arb_Power_Booster.PjPcb
 Project: Arb_Power_Booster.PjPcb
 Variant: None

Company Part Number: IMR-005-SCH
 PCB Revision: 3
 Engineer: Hab S Collector

IMR Engineering
 Ideas Made Real

| # | Quantity | LibRef | Description | Designator | MFG | MFG PN | Supplier 1 | Supplier Part Number 1 | Unit Price | TOTAL |
|----|----------|--------------------------------|--|--|-----------------------------|------------------------|------------|---------------------------------|------------|---------|
| 1 | 6 | CAP_330UF_50V_ALE | CAP ALDE 330UF 20% 50V SMD | C1, C2, C3, C9, C10, C11 | EEV-FK1H31Q | Panasonic Electronic | DigiKey | PCE3475CT-ND | .41 | \$8.46 |
| 2 | 3 | CAP_SMD_10UF_50V_0805 | CAP CER 10UF 50V X5R 0805 | C4, C12, C16 | Murata Electronics | GRM21BR61H106KE43L | DigiKey | 490-18663-1-ND | .28 | \$0.84 |
| 3 | 32 | CAP_SMD_0.1UF_50V_0805 | CAP CER 0.1UF 50V X7R 0805 | C5, C6, C7, C8, C13, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46 | KYOCERA AVX | KGM21NR71H104KT | DigiKey | 478-KGM21NR71H104KTCT-ND | .1 | \$3.20 |
| 4 | 1 | CAP_SMD_68PF_50V_0805 | CAP CER 68PF 50V X7R 0805 | C14 | KEMET | C0805C680K5RACAUTO | DigiKey | 399-C0805C680K5RACAUTOCT-ND | .24 | \$0.24 |
| 5 | 2 | CAP_SMD_47UF_16V_1210 | CAP CER 47UF 50V X5R 1210 | C15, C48 | Murata Electronics | GRM32ER60J476ME20L | DigiKey | 490-1887-1-ND | .28 | \$0.56 |
| 6 | 4 | CAP_SMD_100UF_25V_SMD | CAP CER 100UF 25V XTS SMD | C30, C31, C32, C47 | Murata Electronics | KCM55WC71E107MH13L | DigiKey | 490-KCM55WC71E107MH13LCT-ND | 5.68 | \$22.72 |
| 7 | 2 | DIODE_ZENER_MMSZ5239BS-7-F | DIODE ZENER 9.1V 200MW SOD323 | D1, D5 | Diodes Inc | MMSZ5239BS-7-F | DigiKey | MMSZ5239BS-FDICT-ND | .18 | \$0.36 |
| 8 | 17 | DIODE_1N4148W-7-F | RELAY REED SPDT 250mA 5V | D2, D3, D7, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22 | Diodes Inc | 1N4148W-7-F | DigiKey | 1N4148W-FDICT-ND | .16 | \$2.72 |
| 9 | 2 | DIODE_SCHOTTKY_IN5819HW-7-F | DIODE SCHOTTKY 40V 1A SOD123 | D4, D8 | Diodes Inc | 1N5819HW-7-F | DigiKey | 1N5819HW-FDICT-ND | .25 | \$0.50 |
| 10 | 1 | DIODE_SCHOTTKY_B240S1F-7 | DIODE SCHOTTKY 40V 2A SOD123F | D6 | Diodes Inc | B240S1F-7 | DigiKey | B240S1F-7DICT-ND | .25 | \$0.25 |
| 11 | 2 | FAN_AFB0405LA-A | FAN AXIAL 40X10MM BALL 5VDC WIRE | FAN1, FAN2 | Delta Electronics | AFB0405LA-A | DigiKey | 603-2014-ND | 7.31 | \$14.62 |
| 12 | 1 | FERRITE_BEAD_2508053017Y3 | FERRITE BEAD 300 OHM 0805 1LN | FB1 | Fair-Field | 2508053017Y3 | DigiKey | 1934-1474-1-ND | .10 | \$0.10 |
| 13 | 2 | HEATSINK_CS9464020BP | Heat Sink Aluminum Top Mount | HS1, HS2 | Cooling Source | CS9464020BP | DigiKey | 4165-CS9464020BP-ND | 3.41 | \$6.82 |
| 14 | 4 | CONN_PANOMA_73099-2 | CONN 4mm Banana Socket Right Angle PCB RED | J1, J4, J6, J10 | Pomona | 73099-2 | DigiKey | 501-73099-2-ND | 10.39 | \$41.56 |
| 15 | 4 | CONN_PANOMA_73099-0 | CONN 4mm Banana Socket Right Angle PCB BLK | J2, J3, J7, J11 | Pomona | 73099-0 | DigiKey | 501-73099-0-ND | 10.39 | \$41.56 |
| 16 | 2 | CONN_MOLEX_071713150 | CONN BNC RPCT/R/A 50 OHM PCB | J5, J9 | Molex | 071713150 | DigiKey | VM20430-ND | 1.40 | \$2.80 |
| 17 | 1 | CONN_HEADER_3P_100ML_VERT | CONN HEADER VERT 3POS 2.54MM | J8 | Sullins Connector Solutions | PREC003SFAN-RC | Digi-Key | S1212EC-03-ND | .07 | \$0.07 |
| 18 | 4 | CONN_JUMPER_2P_100ML_VERT | CONN HEADER VERT 2POS 2.54MM | JP1, JP2, JP3, JP4 | Sullins Connector Solutions | PREC002SFAN-RC | Digi-Key | S1212EC-02-ND | .07 | \$0.28 |
| 19 | 1 | INDUCTOR_SRN4018TA-6R8M | FIXED INDUCTION 6.8UH 1.7A 58 MOHM SMD | L1 | Bourns Inc. | SRN4018TA-6R8M | DigiKey | SRN4018TA-6R8MCT-ND | .48 | \$0.48 |
| 20 | 2 | LED_RED_LTST-C170EKT | LED RED CLEAR SMD | LED1, LED2 | Diodes Inc | LSTST-C170EKT | DigiKey | 160-1178-1-ND | .18 | \$0.36 |
| 21 | 8 | MECHANICAL_SCREW_M3X6_PAN_HEAD | SCREW M3X6 PAN HEAD SS | MECH1, MECH2, MECH3, MECH4, MECH5, MECH6, MECH7, MECH8 | APM Hexseal | RMBX6MM2701 | DigiKey | 335-1156-ND | .58 | \$4.64 |
| 22 | 4 | MECHANICAL_STANDOFF_M3X20 | HEX STANDOFF M3 BRASS 20MM | MECH9, MECH10, MECH11, MECH12 | Keystone Electronics | 24407 | DigiKey | 36-24407-ND | 1.36 | \$5.44 |
| 23 | 2 | MOSFET_PCH_DM8605SPS-13 | MOSFET P-CH 60V 5.7A PWRDE06-08 | Q1, Q2 | Diodes Inc | DM8605SPS-13 | DigiKey | DM8605SPS-13DICT-ND | 1.07 | \$2.14 |
| 24 | 7 | MOSFET_NCH_2N7002-7-F | MOSFET N-CH 60V 115MA SOT23-3 | Q3, Q7, Q8, Q9, Q10, Q11, Q12 | Diodes Inc | 2N7002-7-F | DigiKey | 2N7002-FDICT-ND | .20 | \$1.40 |
| 25 | 1 | MOSFET_NCH_DMNH6042SPDQ-13 | MOSFET NCH 60V 5.7A POWERDI | Q4 | Diodes Inc | DMNH6042SPDQ-13 | DigiKey | DMNH6042SPDQ-13DICT-ND | 1.36 | \$1.36 |
| 26 | 2 | MOSFET_NCH_DMN3023L-7 | MOSFET N-CH 30V 6.2A SOT23-3 | Q5, Q6 | Diodes Inc | DMN3023L-7 | DigiKey | DMN3023L-7DICT-ND | .48 | \$0.96 |
| 27 | 2 | RES_SMD_0.2512_1W_1% | RES SMD 0 OHM 1% 1W 2512 | R1, R6 | Yageo | RC2512JK-070RL | DigiKey | YAG1232CT-ND | .2 | \$0.40 |
| 28 | 30 | RES_SMD_10K_0805_1/4W_1% | RES SMD 10K OHM 1% 1/4W 0805 | R2, R3, R7, R8, R11, R25, R27, R30, R31, R32, R37, R38, R42, R43, R45, R46, R47, R51, R52, R53, R54, R61, R62, R63, R64, R65, R66, R67, R69, R72 | Yageo | RC0805FR-7W10KL | DigiKey | 13-RC0805FR-7W10KLCT-ND | .10 | \$3.00 |
| 29 | 2 | RES_SMD_47K_0805_1/8W_1% | RES SMD 47K OHM 1% 1/8W 0805 | R4, R13 | Yageo | RC0805FR-1347KL | DigiKey | 13-RC0805FR-1347KLCT-ND | .1 | \$0.20 |
| 30 | 2 | RES_SMD_1.24K_0805_1/8W_1% | RES SMD 1.24K OHM 1% 1/8W 0805 | R5, R15 | Yageo | RC0805FR-071K24L | DigiKey | 311-1.24KCRCT-ND | .1 | \$0.20 |
| 31 | 1 | RES_SMD_2.1K_0805_1/8W_1% | RES SMD 2.1K OHM 1% 1/8W 0805 | R9 | Yageo | RC0805FR-072K1L | DigiKey | 311-2.10KCRCT-ND | .1 | \$0.10 |
| 32 | 8 | RES_SMD_0.0805_1/8W_1% | RES SMD 0 OHM 1% 1/8W 0805 | R10, R18, R19, R24, R26, R28, R36, R50 | Yageo | RC0805JR-070RL | DigiKey | 311-0.0ARCT-ND | .1 | \$0.80 |
| 33 | 2 | RES_SMD_1.0K_0805_1/8W_1% | RES SMD 1.0K OHM 1% 1/8W 0805 | R12, R16 | Yageo | RC0805FR-071KL | DigiKey | 311-1.00KCRCT-ND | .1 | \$0.20 |
| 34 | 1 | RES_SMD_100K_0805_1/4W_1% | RES SMD 100K OHM 1% 1/4W 0805 | R14 | Yageo | RC0805FR-07100KL | DigiKey | 311-100KCRCT-ND | .13 | \$0.13 |
| 35 | 1 | RES_SMD_13.7K_0805_1/8W_1% | RES SMD 13.7K OHM 1% 1/8W 0805 | R17 | Yageo | RC0805FR-0713K7L | DigiKey | 311-13.7KCRCT-ND | .10 | \$0.10 |
| 36 | 2 | RES_SMD_300_0805_1/8W_1% | RES SMD 300 OHM 1% 1/8W 0805 | R20, R29 | Yageo | RC0805FR-07300RL | DigiKey | 311-300CRCT-ND | .1 | \$0.20 |
| 37 | 2 | RES_SMD_1.0M_0805_1/8W_1% | RES SMD 1.0M OHM 1% 1/8W 0805 | R21, R57 | Yageo | RC0805FR-7W1ML | DigiKey | 13-RC0805FR-7W1MLCT-ND | .10 | \$0.20 |
| 38 | 4 | RES_SMD_10_0805_3.5W_1% | RES SMD 100 OHM 1% 3.5W 2512 | R22, R23, R58, R59 | Omnite | ALN2512F100RE-1 | DigiKey | 273-ALN2512F100RE-1CT-ND | 1.50 | \$6.00 |
| 39 | 1 | RES_SMD_1.5K_0805_1/8W_1% | RES SMD 1.5K OHM 1% 1/8W 0805 | R33 | Yageo | RC0805FR-071K5L | DigiKey | 311-1.50KCRCT-ND | .1 | \$0.10 |
| 40 | 3 | RES_SMD_4.7K_0805_1/8W_1% | RES SMD 4.7K OHM 1% 1/8W 0805 | R34, R60, R70 | Yageo | RC0805FR-1347KL | DigiKey | 13-RC0805FR-1347KLCT-ND | .1 | \$0.30 |
| 41 | 1 | RES_SMD_90.9_0805_1/8W_1% | RES SMD 90.9 OHM 1% 1/8W 0805 | R35 | Yageo | RC0805FR-0790R9L | DigiKey | 311-90.9CRCT-ND | .1 | \$0.10 |
| 42 | 2 | RES_SMD_0.0065_2512_2W_1% | RES SMD 0.0065 OHM 1% 2W 2512 | R39, R71 | Vishay Dale | WLS2512BL25126500FAE18 | DigiKey | 541-WLS2512BL25126500FAE18CT-ND | 1.76 | \$3.52 |
| 43 | 2 | RES_SMD_3.0K_0805_1/8W_1% | RES SMD 3.0K OHM 1% 1/8W 0805 | R40, R49 | Yageo | RC0805FR-133KL | DigiKey | 13-RC0805FR-133KLCT-ND | .1 | \$0.20 |
| 44 | 4 | RES_SMD_4.99K_0805_1/8W_1% | RES SMD 4.99K OHM 1% 1/8W 0805 | R41, R48, R55, R68 | Yageo | RC0805FR-134K9L | DigiKey | 13-RC0805FR-134K9LCT-ND | .1 | \$0.40 |
| 45 | 2 | RES_SMD_2.49K_0805_1/8W_1% | RES SMD 2.49K OHM 1% 1/8W 0805 | R44, R56 | Yageo | RC0805FR-132K49KL | DigiKey | 13-RC0805FR-132K49LCT-ND | .1 | \$0.20 |
| 46 | 2 | RES_SMD_100_0805_1/8W_1% | RES SMD 100 OHM 1% 1/8W 0805 | R73, R74 | Yageo | RC0805FR-07100RL | DigiKey | 911-100CRCT-ND | .1 | \$0.20 |
| 47 | 1 | RELAY_A7733-2A-E5DE | RELAY REED SPDT 250mA 5V | REL1 | American Zettler | A7733-2A-E5DE | DigiKey | 3385-AZ7733-2A-E5DE-nd | 2.18 | \$2.18 |
| 48 | 2 | RELAY_HE7210500 | RELAY REED SPDT 250mA 5V | REL2, REL4 | Littleuse | HE7210500 | DigiKey | HE112-ND | 3.77 | \$7.54 |
| 49 | 2 | RELAY_G5LE-1-36_DCS | RELAY GEN PURPOSE SPDT 10A 5V | REL3, REL5 | Omron | G5LE-1-36 DCS | DigiKey | G5LE-1-36DCS-ND | 1.24 | \$2.48 |
| 50 | 2 | RELAY_TLP170A/MT/PLE | SSR RELAY SPST-NO 700mA 0-6V | REL6, REL7 | Toshiba | TLP170A/MT/PLE | DigiKey | 264-TLP170A/MT/PLECT-ND | 1.33 | \$2.66 |
| 51 | 1 | SWITCH_SWL-12689-4A-N-D | SWITCH SLIDE SPDT 300mA 50V | SW1 | Same Sky | SLW-12689-4A-N-D | DigiKey | 2223-SLW-12689-4A-N-D-ND | .48 | \$0.48 |
| 52 | 1 | SWITCH_EVO-Q2U02W | SWITCH TACTILE SPST-NO 0.02A 15V | SW2 | American Zettler | EVO-Q2U02W | DigiKey | P12954SCT-ND | .25 | \$0.25 |
| 53 | 6 | CONN_TEST_POINT_S1751-46R | PCB TEST POINT CONNECT | TP1, TP2, TP3, TP4, TP5, TP6 | Harw in Inc | S1751-46R | Digi-Key | 952-1478-1-ND | .28 | \$1.68 |
| 54 | 1 | IC_TPS4202DDCR | IC REG BUCK ADU 2A SOT23 | U1 | Texas Instruments | TPS4202DDCR | Digi-Key | 296-TPS4202DDCRCT-ND | .97 | \$0.97 |
| 55 | 3 | OPAMP_TLV9351IDCR | IC OPAMP 2.5MHz 350uV C70-5 | U2, U3, U10 | Texas Instruments | TLV9351IDCR | Digi-Key | 296-TLV9351IDCRCT-ND | .49 | \$1.47 |
| 56 | 2 | IC_MCP45HV51-104EST | IC DGT/OTP 100kOHM 256TP 14TSSOP | U4, U11 | Microchip | MCP45HV51-104EST | Digi-Key | MCP45HV51-104EST-ND | 2.00 | \$4.00 |
| 57 | 2 | IC_SN74LV1G1D4OKDR | IC INV/ERT SN74LV1G1D4OKDR | U5, U16 | Texas Instruments | SN74LV1G1D4OKDR | Digi-Key | 296-11608-1-ND | .10 | \$0.20 |
| 58 | 1 | OPAMP_LMP2011MF/NOPB | IC OPAMP GP 3MHz -12uV CIRCUIT SOT23-5 | U6 | Texas Instruments | LMP2011MF/NOPB | Digi-Key | LMP2011MF/NOPBCT-ND | 2.33 | \$2.33 |
| 59 | 1 | IC_LM4041CYM5-ADJ-TR | IC VREF SHUNT ADJ 0.5% SOT23-3 | U7 | Microchip | LM4041CYM5-ADJ-TR | Digi-Key | 576-1049-1-ND | .39 | \$0.39 |
| 60 | 2 | ICINA282AIDR | IC CURRENT SENSE 0.4% 50V/V SOIC-8 | U8, U13 | Texas Instruments | INA282AIDR | Digi-Key | 296-27820-1-ND | 4.13 | \$8.26 |
| 61 | 1 | MODULE_STM32F46G-DISCO | DISCOVERY STM32F47 EVAL BRD | U9 | ST Microelectronics | STM32F46G-DISCO | Digi-Key | 497-15680-5-ND | 57.50 | \$57.50 |
| 62 | 2 | OPAMP_OPA549S | IC OPAMP POWER 1 CIRC 11W PWRPACK | U10, U17 | Texas Instruments | OPA549S | Digi-Key | OPA549S-ND | 26.94 | \$53.88 |
| 63 | 2 | OPAMP_TLV9302IDR | IC OPAMP GP 2 CIRCUIT 8SOIC | U14, U15 | Texas Instruments | TLV9302IDR | Digi-Key | 296-53513-1-ND | .66 | \$1.32 |

Approved

Notes

Bill of Cost (Unit Buy): \$328.58