



# Linear Technology Corporation

LTC3371EFE

ENGR: M. Merchant (011-087)

4 CHANNEL 8A DC-DCS WITH WATCHDOG AND POWER - ON RESET

## BILL OF MATERIALS

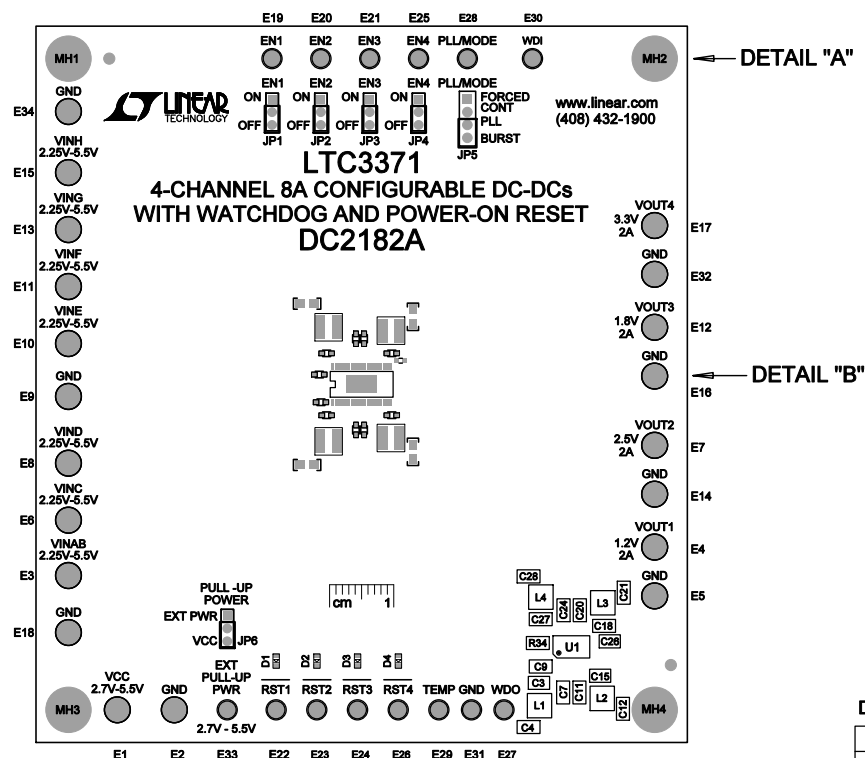
DC2182A-2

12/12/2014

| Item | Qty | Reference                        | Part Description                             | Manufacturer / Part #             | Kit Qty    |
|------|-----|----------------------------------|--|-----------------------------------|------------|
|      |     |                                  |  | <b>NUMBER OF BOARDS =</b>         | <b>200</b> |
| 1    | 1   | C1                               | CAP, CHIP, X5R, 22μF, ±20%, 6.3V, 0805       | TAIYO YUDEN, JMK212ABJ226MG-T     |            |
| 2    | 1   | C2                               | CAP, POSCAP, 100μF, ±20%, 6.3V, SMT          | PANASONIC, 6TPG100MG              |            |
| 3    | 9   | C3,C7,C9,C11,C15,C18,C20,C24,C27 | CAP, CHIP, X5R, 10μF, ±20%, 6.3V, 0603       | TDK, C1608X5R0J106M               |            |
| 4    | 4   | C4,C12,C21,C28                   | CAP, CHIP, X5R, 47μF, ±20%, 6.3V, 0805       | MURATA, GRM21BR60J476ME15L        |            |
| 5    | 0   | C5,C13,C22,C29 (OPT)             | CAP, CHIP, 0805                              |                                   |            |
| 6    | 6   | C6,C10,C14,C17,C19,C23           | CAP, POSCAP, 47μF, ±20%, 6.3V, SMT           | PANASONIC, 6TPC47M                |            |
| 7    | 4   | C8,C16,C25,C30                   | CAP, CHIP, NPO, 10pF, ±5%, 50V, 0402         | MURATA, GRM1555C1H100JA01D        |            |
| 8    | 1   | C26                              | CAP, CHIP, X7R, 0.01μF, ±10%, 25V, 0402      | MURATA, GRM155R71E103KA01D        |            |
| 9    | 4   | D1-D4                            | DIODE, LED, SUPER RED DIFF, 0603 SMD         | LUMEX, SML-LX0603SRW-TR           |            |
| 10   | 20  | E1-E18,E32,E34                   | TURRET, 0.09 DIA                             | MILL-MAX, 2501-2-00-80-00-00-07-0 |            |
| 11   | 13  | E19-E31,E33                      | TURRET, 0.061 DIA                            | MILL-MAX, 2308-2-00-80-00-00-07-0 |            |
| 12   | 5   | JP1-JP4,JP6                      | 2mm to HEADER 1X3, 2mm                       | SAMTEC, TMM-103-02-L-S            |            |
| 13   | 1   | JP5                              | 2mm to HEADER 1X4, 2mm                       | SAMTEC, TMM-104-02-L-S            |            |
| 14   | 6   | JP1-JP6                          | SHUNT, 2mm                                   | SAMTEC, 2SN-KB-G                  |            |
| 15   | 4   | L1-L4                            | IND, SMT, 2.2μH, 38mΩ, ±20%, 5.5A, 4mmX4mm   | COILCRAFT, XAL4020-222MEC         |            |
| 16   | 4   | R1,R4,R8,R15                     | RES, CHIP, 20Ω, ±1%, 1/16W, 0402             | VISHAY, CRCW040220R0FKED          |            |
| 17   | 2   | R2                               | RES, CHIP, 232KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603232KFKEA          |            |
| 18   | 1   | R3                               | RES, CHIP, 464KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603464KFKEA          |            |
| 19   | 1   | R5                               | RES, CHIP, 665KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603665KFKEA          |            |
| 20   | 1   | R6                               | RES, CHIP, 309KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603309KFKEA          |            |
| 21   | 0   | R7,R11,R14 (OPT)                 | RES, CHIP, 1/10W, 0603                       |                                   |            |
| 22   | 3   | R9,R13,R16                       | RES, CHIP, 0Ω JUMPER, 1/10W, 0603            | VISHAY, CRCW06030000Z0EA          |            |
| 23   | 1   | R10                              | RES, CHIP, 806KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603806KFKEA          |            |
| 24   | 1   | R12                              | RES, CHIP, 649KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603649KFKEA          |            |
| 25   | 10  | R17,R20-R23,R26,R28,R30,R32,R35  | RES, CHIP, 1KΩ, ±5%, 1/16W, 0402             | VISHAY, CRCW04021K00JNED          |            |
| 26   | 1   | R18                              | RES, CHIP, 511KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603511KFKEA          |            |
| 27   | 7   | R19,R24,R27,R29,R31,R33,R36      | RES, CHIP, 1.0MΩ, ±5%, 1/16W, 0402           | VISHAY, CRCW04021M00JNED          |            |
| 28   | 1   | R25                              | RES, CHIP, 162KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603162KFKEA          |            |
| 29   | 1   | R34                              | RES, CHIP, 402KΩ, ±1%, 1/10W, 0603           | VISHAY, CRCW0603402KFKEA          |            |
| 30   | 1   | U1                               | 4-CHANNEL 8A CONFIGURABLE BUCK DC-DCs, TSSOP | LINEAR TECH., LTC3371EFE          |            |
| 31   | 4   |                                  | STAND-OFF NYLON, 0.375" TALL (SNAP-ON)       | KEYSTONE, 8832 (SNAP ON)          |            |
| 32   | 1   |                                  | FAB,PRINTED CIRCUIT BOARD                    | DEMO CIRCUIT DC2182A-2            |            |
| 33   | 2   |                                  | TOP & BOTTOM STENCILS                        | STENCILS, #DC2182A-2              |            |

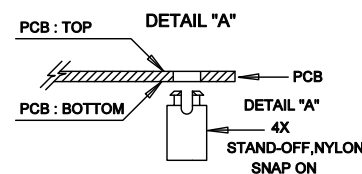
| Item   | Qty | Reference                            | Part Description   | Manufacturer / Part #             |
|--|-----|--------------------------------------|--|-----------------------------------|
|  |     |                                      |  |                                   |
|  |     |                                      |  |                                   |
|  |     |                                      |  |                                   |
| <b>REQUIRED CIRCUIT COMPONENTS:</b>              |     |                                      |  |                                   |
| 1  | 1   | C1                                   | CAP, CHIP, X5R, 22 $\mu$ F, $\pm$ 20%, 6.3V, 0805              | TAIYO YUDEN, JMK212ABJ226MG-T     |
| 3  | 9   | C3,C7,C9,C11,C15,<br>C18,C20,C24,C27 | CAP, CHIP, X5R, 10 $\mu$ F, $\pm$ 20%, 6.3V, 0603              | TDK, C1608X5R0J106M               |
| 4  | 4   | C4,C12,C21,C28                       | CAP, CHIP, X5R, 47 $\mu$ F, $\pm$ 20%, 6.3V, 0805              | MURATA, GRM21BR60J476ME15L        |
| 7  | 4   | C8,C16,C25,C30                       | CAP, CHIP, NPO, 10pF, $\pm$ 5%, 50V, 0402                      | MURATA, GRM1555C1H100JA01D        |
| 8  | 1   | C26                                  | CAP, CHIP, X7R, 0.01 $\mu$ F, $\pm$ 10%, 25V, 0402             | MURATA, GRM155R71E103KA01D        |
| 15   | 4   | L1-L4                                | IND, SMT, 2.2 $\mu$ H, 38m $\Omega$ , $\pm$ 20%, 5.5A, 4mmX4mm | COILCRAFT, XAL4020-222MEC         |
| 17   | 2   | R2                                   | RES, CHIP, 232K $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603232KFKEA          |
| 18   | 1   | R3                                   | RES, CHIP, 464K $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603464KFKEA          |
| 19   | 1   | R5                                   | RES, CHIP, 665k $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603665KFKEA          |
| 20   | 1   | R6                                   | RES, CHIP, 309K $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603309KFKEA          |
| 23   | 1   | R10                                  | RES, CHIP, 806K $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603806KFKEA          |
| 24   | 1   | R12                                  | RES, CHIP, 649K $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603649KFKEA          |
| 26   | 1   | R18                                  | RES, CHIP, 511K $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603511KFKEA          |
| 28   | 1   | R25                                  | RES, CHIP, 162K $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603162KFKEA          |
| 29   | 1   | R34                                  | RES, CHIP, 402K $\Omega$ , $\pm$ 1%, 1/10W, 0603               | VISHAY, CRCW0603402KFKEA          |
| 30   | 1   | U1                                   | 4-CHANNEL 8A CONFIGURABLE BUCK DC-DCs, TSSOP                   | LINEAR TECH., LTC3371EFE          |
|  |     |                                      |  |                                   |
| <b>ADDITIONAL DEMO BOARD CIRCUIT COMPONENTS:</b> |     |                                      |  |                                   |
| 2  | 1   | C2                                   | CAP, POSCAP, 100 $\mu$ F, $\pm$ 20%, 6.3V, SMT                 | PANASONIC, 6TPG100MG              |
| 5  | 0   | C5,C13,C22,C29 (OPT)                 | CAP, CHIP, 0805  |                                   |
| 6  | 6   | C6,C10,C14,C17,C19,<br>C23           | CAP, POSCAP, 47 $\mu$ F, $\pm$ 20%, 6.3V, SMT                  | PANASONIC, 6TPC47M                |
| 9  | 4   | D1-D4                                | DIODE, LED, SUPER RED DIFF, 0603 SMD                           | LUMEX, SML-LX0603SRW-TR           |
| 16   | 4   | R1,R4,R8,R15                         | RES, CHIP, 20 $\Omega$ , $\pm$ 1%, 1/16W, 0402                 | VISHAY, CRCW040220R0FKED          |
| 21   | 0   | R7,R11,R14 (OPT)                     | RES, CHIP, 1/10W, 0603   |                                   |
| 22   | 3   | R9,R13,R16                           | RES, CHIP, 0 $\Omega$ JUMPER, 1/10W, 0603                      | VISHAY, CRCW06030000Z0EA          |
| 25   | 10  | R17,R20-R23,R26,R28,<br>R30,R32,R35  | RES, CHIP, 1K $\Omega$ , $\pm$ 5%, 1/16W, 0402                 | VISHAY, CRCW04021K00JNED          |
| 27   | 7   | R19,R24,R27,R29,R31,<br>R33,R36      | RES, CHIP, 1.0M $\Omega$ , $\pm$ 5%, 1/16W, 0402               | VISHAY, CRCW04021M00JNED          |
|  |     |                                      |  |                                   |
| <b>HARDWARE</b>                                  |     |                                      |  |                                   |
| 10   | 20  | E1-E18,E32,E34                       | TURRET, 0.09 DIA   | MILL-MAX, 2501-2-00-80-00-00-07-0 |
| 11   | 13  | E19-E31,E33                          | TURRET, 0.061 DIA  | MILL-MAX, 2308-2-00-80-00-00-07-0 |
| 12   | 5   | JP1-JP4,JP6                          | 2mm to HEADER 1X3, 2mm   | SAMTEC, TMM-103-02-L-S            |
| 13   | 1   | JP5                                  | 2mm to HEADER 1X4, 2mm   | SAMTEC, TMM-104-02-L-S            |
| 14   | 6   | JP1-JP6                              | SHUNT, 2mm   | SAMTEC, 2SN-KB-G                  |
| 31   | 4   |                                      | STAND-OFF NYLON, 0.375" TALL (SNAP-ON)                         | KEYSTONE, 8832 (SNAP ON)          |
|  |     |                                      |  |                                   |

| REVISION HISTORY |     |                |          |          |
|------------------|-----|----------------|----------|----------|
| ECO              | REV | DESCRIPTION    | APPR     | DATE     |
| -                | 2   | PRODUCTION FAB | MARTY M. | 11-12-14 |

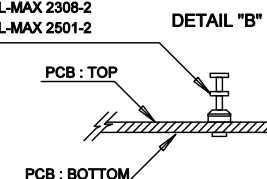


## NOTES: UNLESS OTHERWISE SPECIFIED

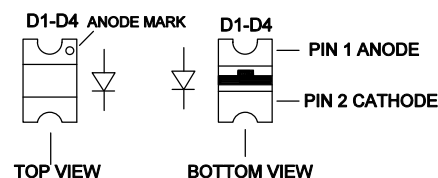
1. WORKMANSHIP SHALL BE IN ACCORDANCE WITH IPC-A-610.
2. ASSEMBLY REFLOW PROFILE SHALL BE IN ACCORDANCE WITH J-STD-020 WITH MAXIMUM SOLDER TEMPERATURE OF 250 DEGREES CELSIUS.
3. PARTS TO OMIT WILL BE SPECIFIED ON THE BILL OF MATERIALS. LOCATIONS OF OMITTED PARTS SHALL BE FREE OF SOLDER. MASK THE SOLDER STENCIL WHERE SMT PARTS ARE OMITTED.
4. INSTALL SHUNTS AS SHOWN ON ASSY DRAWING.
5. DEPANELIZE BOARDS AFTER ASSEMBLY AND ROUTE-OUT THE BREAKOUT TABS ON FOUR SIDES OF THE BOARD EDGE.
6. DO NOT APPLY ANY KIND OF ASSEMBLY STAMP OR QA STAMP TO ANY BOARD.
7. INSTALL TURRETS, STAND-OFFS AND BANANA JACKS AS SHOWN BELOW:




(14 PLCS) : MILL-MAX 2308-2  
(21 PLCS) : MILL-MAX 2501-2



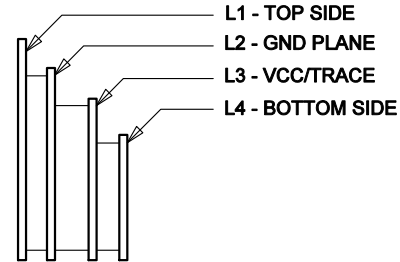
## 8. INSTALL LED D1-D4 AS SHOWN:



| APPROVALS    |          | LINEAR TECHNOLOGY   |                    |
|--------------|----------|---|--------------------|
| PCB DES.     | NC       | 1630 MCCARTHY BLVD<br>MILPITAS, CA 95035<br>PH: (408) 432-1900<br>www.Linear.com                            |                    |
| APP ENG.     | MARTY M. | TITLE: TOP ASSEMBLY DRAWING:<br>4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs<br>WITH WATCHDOG AND POWER - ON RESET |                    |
|              |          | SIZE  | IC NO.             |
|              |          | N/A   | LTC3371            |
|              |          |   | DEMO CIRCUIT 2182A |
|              |          |   | REV. 2             |
| SCALE = NONE |          | FILENAME: DC2182A-2.PCB   | SHT 1 of 2         |

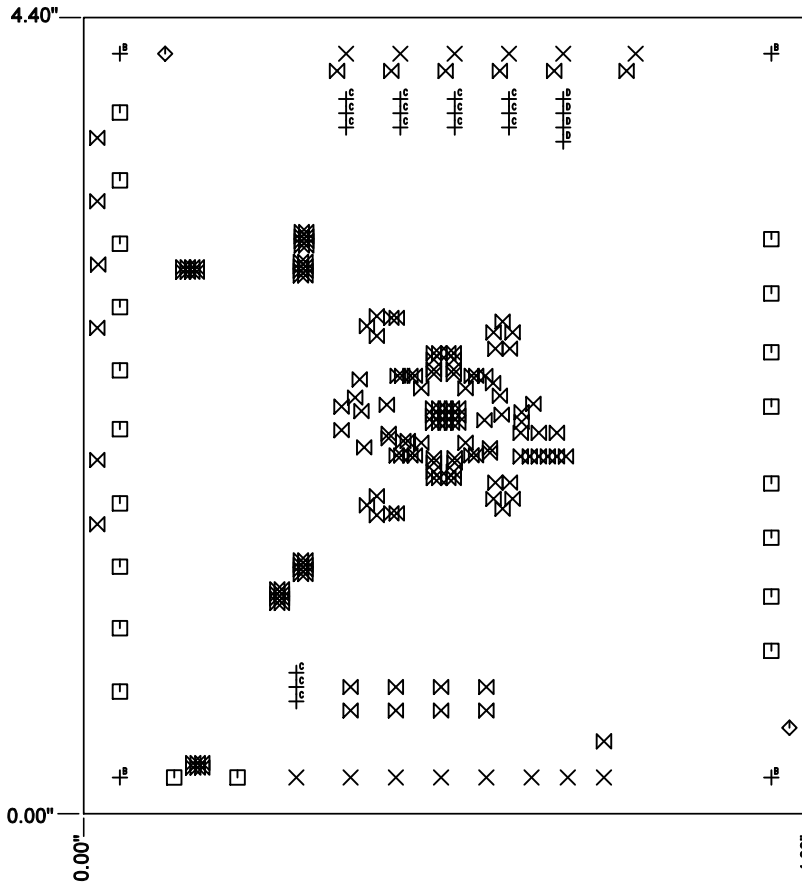
|              |          |   |                    |   |            |   |
|--------------|----------|---|--------------------|---|------------|---|
| APPROVALS    |          |  |                    | 1630 MCCARTHY BLVD<br>MILPITAS, CA 95035<br>PH: (408)432-1900<br>www.Linear.com<br>LTC CONFIDENTIAL-<br>FOR CUSTOMER USE ONLY |            |   |
| PCB DES.     | NC       |   |                    | TITLE: BOTTOM ASSEMBLY DRAWING:<br>4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs<br>WITH WATCHDOG AND POWER - ON RESET                |            |   |
| APP ENG.     | MARTY M. |   |                    |   |            |   |
|              |          |   |                    |   |            |   |
|              |          |   |                    |   |            |   |
|              |          |   |                    |   |            |   |
|              |          | SIZE  | IC NO.             | LTC3371   | REV.       |   |
|              |          | N/A   | DEMO CIRCUIT 2182A |   |            | 2 |
| SCALE = NONE |          | FILENAME:DC2182A-2.PCB  |                    |   | SHT 2 of 2 |   |

## LAYER STRUCTURE



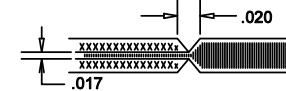
## REVISION HISTORY

| ECO | REV | DESCRIPTION    | APPR     | DATE     |
|-----|-----|----------------|----------|----------|
| -   | 2   | PRODUCTION FAB | MARTY M. | 11-12-14 |





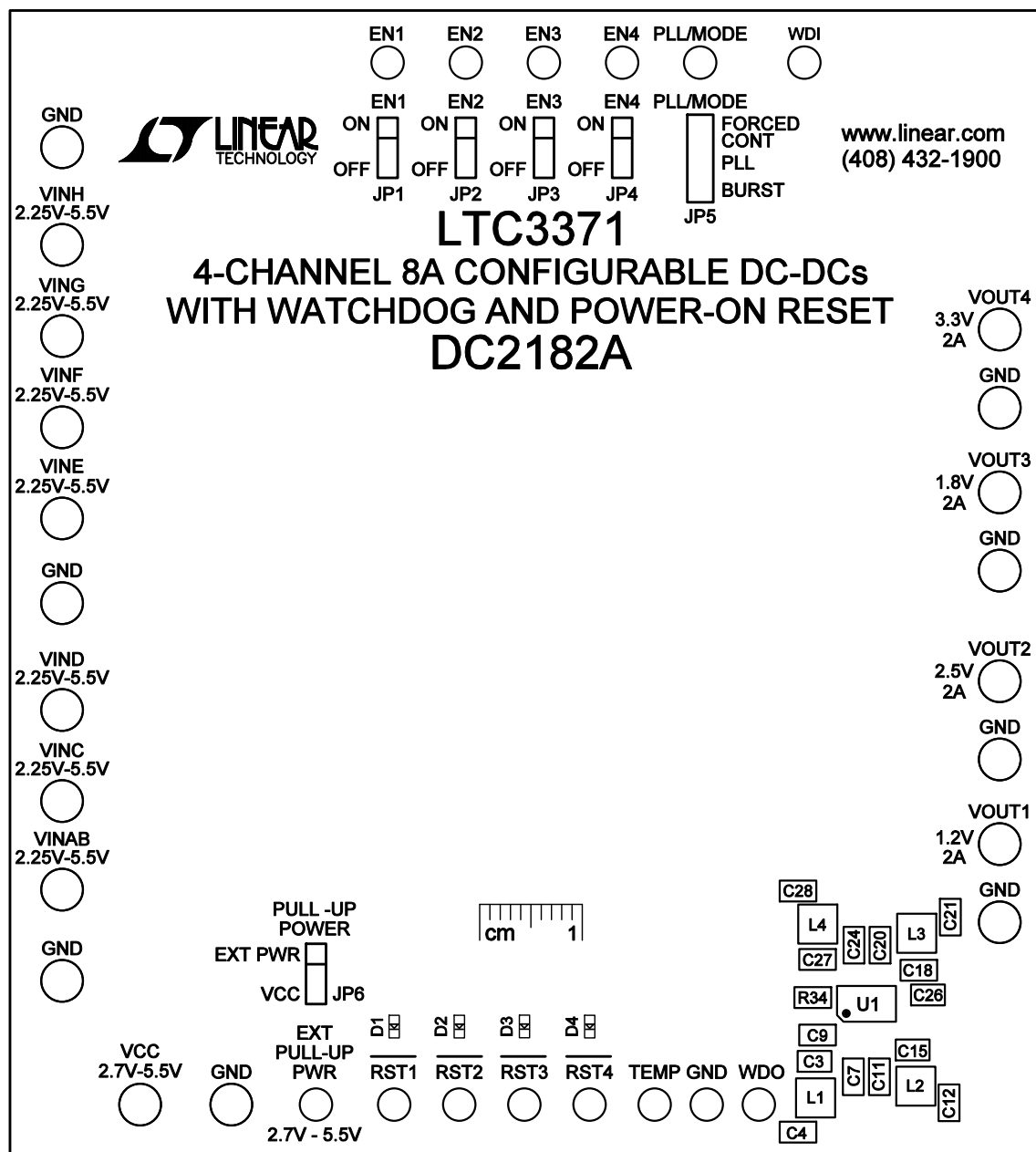
## NOTES: UNLESS OTHERWISE SPECIFIED

- FAB PER IPC-A-600.
- MATERIAL: -EPOXY FIBERGLASS, NEMA GRADE FR-4  
-FINISHED THICKNESS TO BE 0.062" +/- .005"  
-TOTAL OF 4 LAYERS WITH 2 OZ. CU ON THE OUTER LAYERS  
AND 2 OZ. CU ON THE INNER LAYERS.  
-FLAMMABILITY RATING: 94 V-0 MINIMUM.
- SIZE: CUT TO DIMENSIONS AND TOLERANCES SHOWN.  
0.00 ARE PRIMARY DATUMS.
- DRILLING: -DRILL HOLES PER SCHEDULE. PLATE THROUGH  
HOLES WITH COPPER, 0.001" THICK MIN.  
-ALL HOLE SIZES ARE SPECIFIED AFTER PLATING.  
-HOLE LOCATION TOLERANCES ARE +/-0.003"  
IN RELATION TO CENTER
- FINISH: -SMOBC USING LPI BOTH SIDES, COLOR GREEN.  
-GOLD IMMERSION BOTH SIDES.  
(LEAD FREE SOLDER CAN BE USED FOR PROTOTYPE)  
-FOR SILKSCREEN: BOTH SIDES USE WHITE NON-CONDUCTIVE INK.
- DO NOT ALTER ARTWORK e.g. TO ADD LOGO OR DATE CODE.  
PAD SIZE CAN BE MODIFIED TO MEET END FINISH.
- PCBS ARE TO BE RoHS COMPLIANT.
- DO NOT ALTER SOLDER MASK MAINTAIN .0018" OVERSIZE  
ON SMT PADS. A .005" WEBBING IS REQUIRED BETWEEN SMD PADS.
- SCORING FOR PANELIZED PCB: "PRODUCTION FAB ONLY"

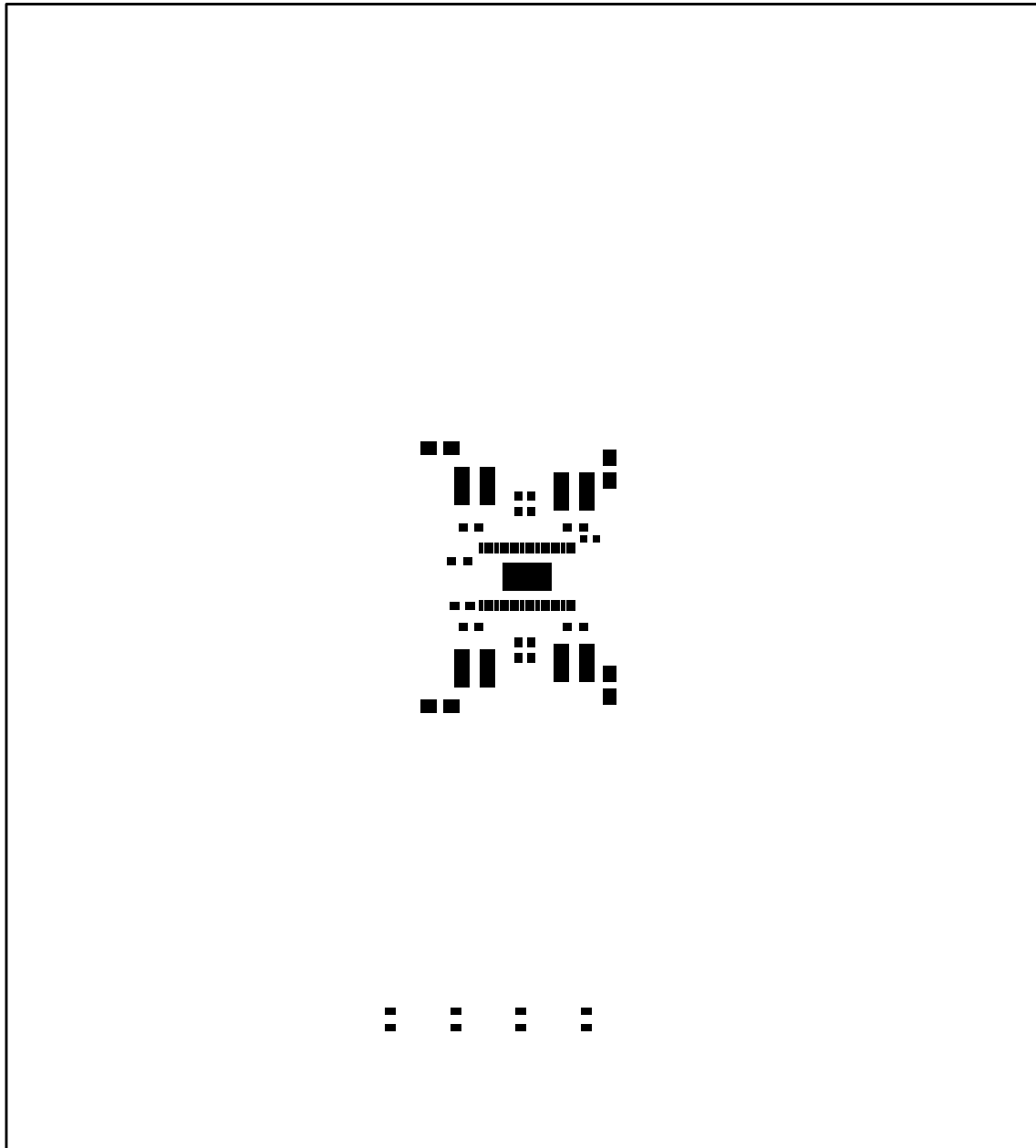


| SIZE  | QTY | SYM            | PLATED | TOL       |
|-------|-----|----------------|--------|-----------|
| 0.063 | 14  | X              | YES    | +/- .003" |
| 0.094 | 20  | □              | YES    | +/- .003" |
| 0.07  | 2   | ◇              | NO     | +/- .003" |
| 0.01  | 168 | ⊠              | YES    | +/- .003" |
| 0.187 | 4   | ⊠ <sup>B</sup> | YES    | +/- .003" |
| 0.031 | 15  | ⊠ <sup>C</sup> | YES    | +/- .003" |
| 0.037 | 4   | ⊠ <sup>D</sup> | YES    | +/- .003" |

|   |  |          |   |   |            |
|---|--|----------|---|---|------------|
| UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS ARE IN INCHES<br>TOLERANCES ON ANGLE:±1<br>0.XX" ±0.01"<br>0.XXX" ±0.005"<br>INTERPRET DIM AND TOL<br>PER ASME Y14.5M-1994 | APPROVALS  |          |  <b>LINEAR</b><br>TECHNOLOGY | 1630 MCCARTHY BLVD<br>MILPITAS, CA 95035<br>PH: (408)432-1900<br>www.Linear.com<br>LTC CONFIDENTIAL-<br>FOR CUSTOMER USE ONLY |            |
|   | PCB DES.   | NC       |   |   |            |
|   | APP ENG.   | MARTY M. |   |   |            |
|   | TITLE: FABRICATION DRAWING:<br>4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs<br>WITH WATCHDOG AND POWER - ON RESET |          |   |   |            |
|   | SIZE IC NO. LTC3371<br>N/A DEMO CIRCUIT 2182A  |          |   | REV.<br>2   |            |
| THIRD ANGLE PROJECTION  |  |          |   |   |            |
|    |  |          |   |   |            |
| DO NOT SCALE DRAWING  | SCALE: NONE  |          | FILENAME: DC2182A-2.PCB   |   | SHT 1 of 1 |

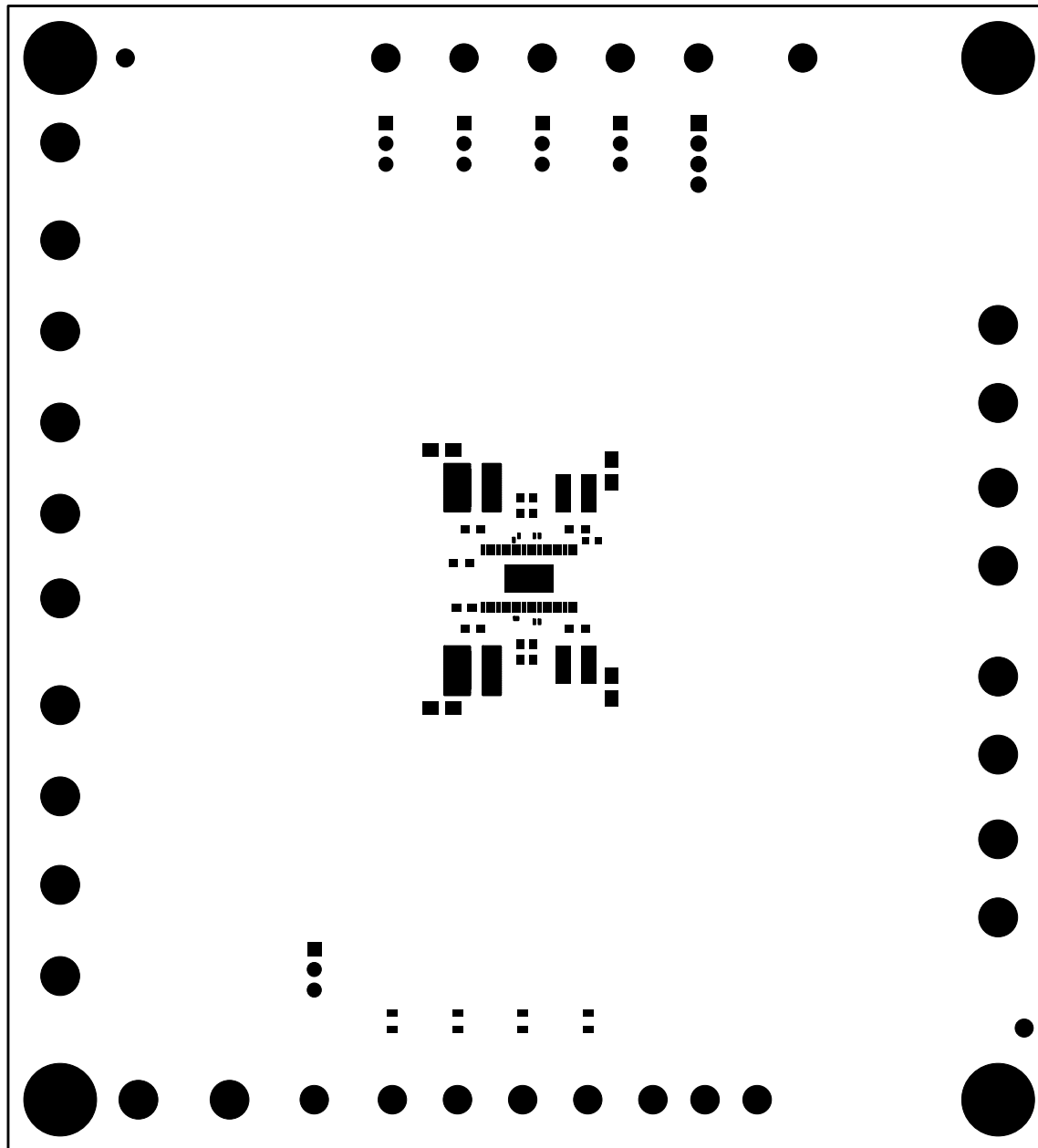


TOP SILKSCREEN  
 LINEAR TECHNOLOGY  
 DC2182A-2 \* LTC3371  
 4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
 WITH WATCHDOG AND POWER - ON RESET  
 11-12-14

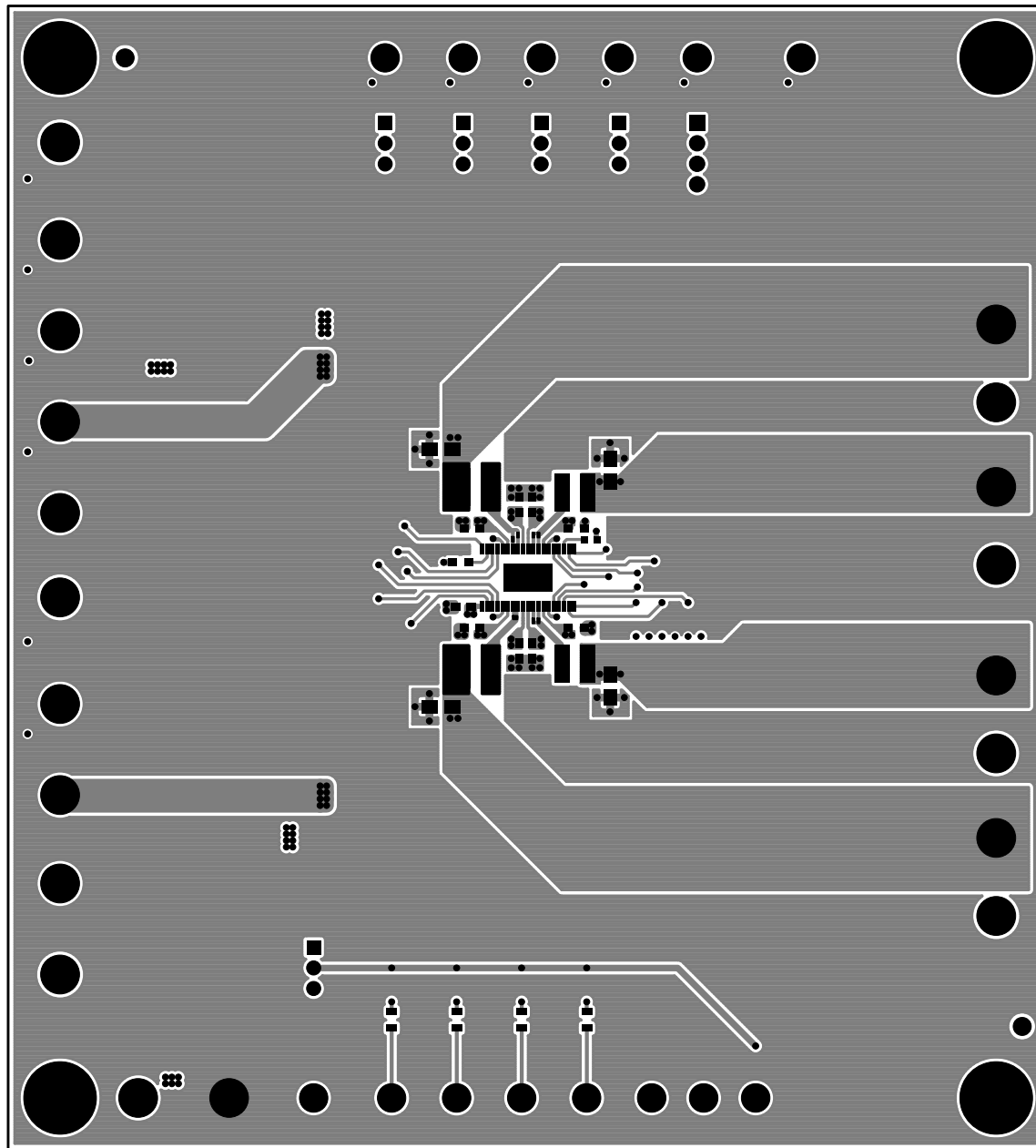


TOP SOLDER PASTE  
LINEAR TECHNOLOGY  
DC2182A-2 \* LTC3371  
4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
WITH WATCHDOG AND POWER - ON RESET  
11-12-14

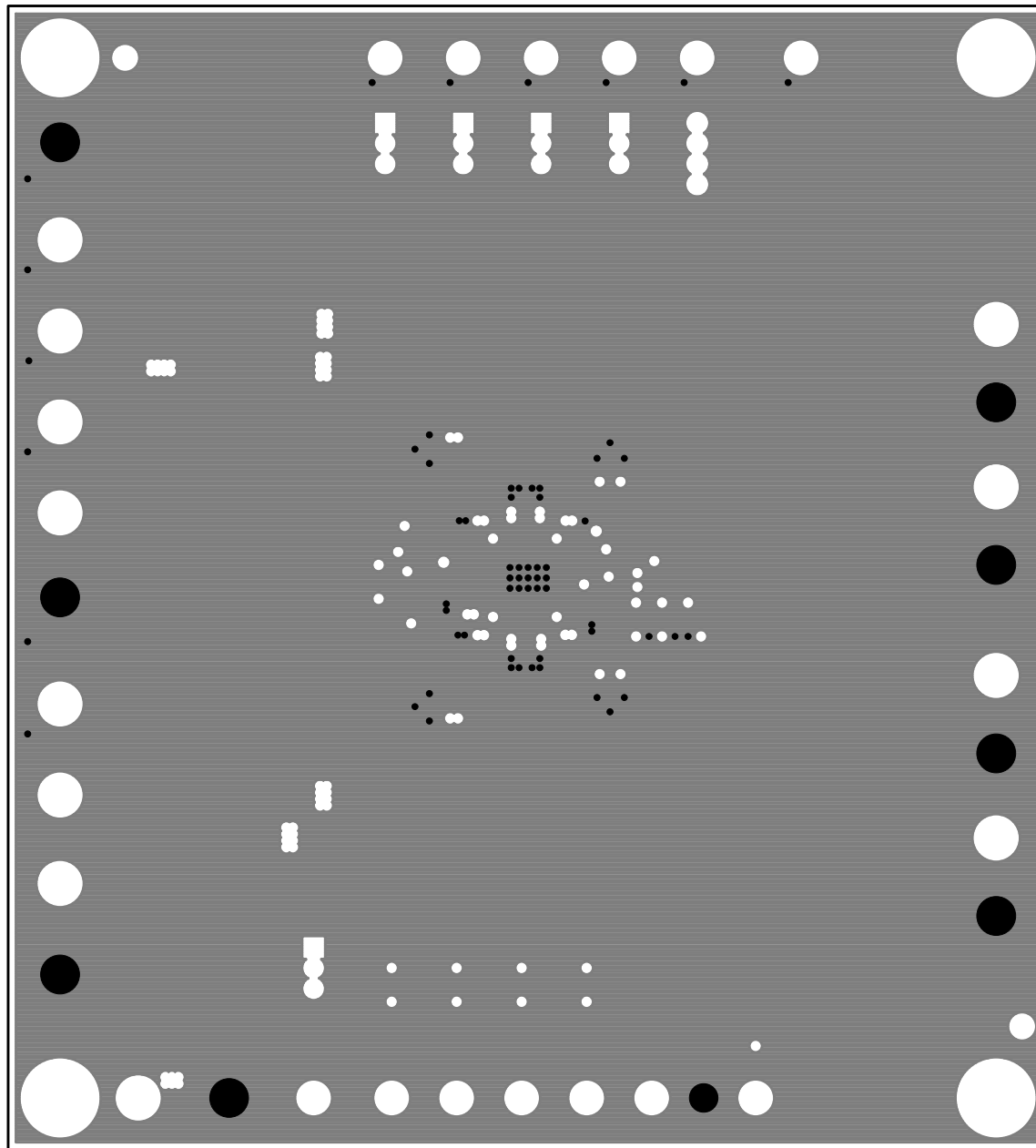




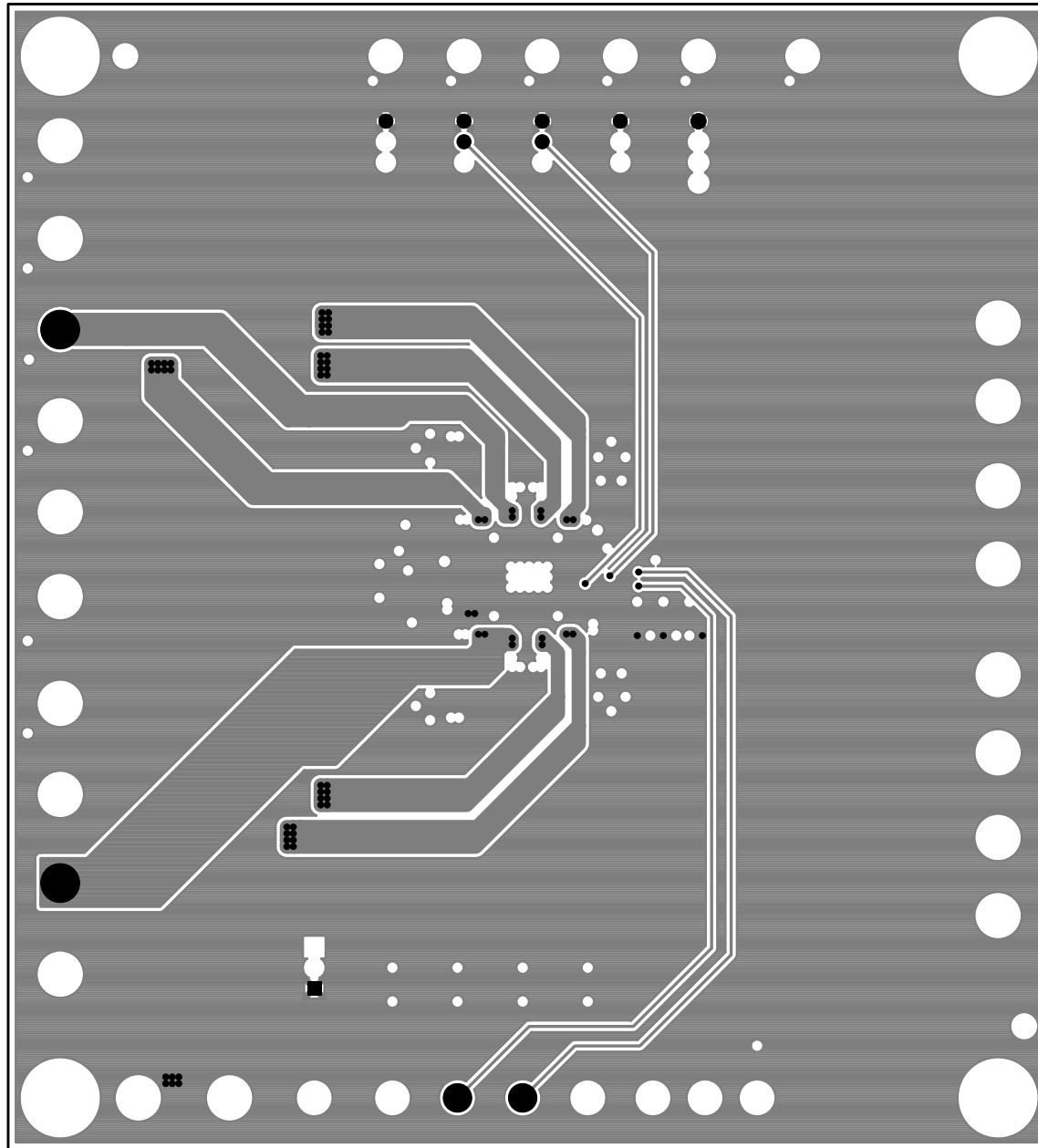
TOP SOLDER MASK  
LINEAR TECHNOLOGY  
DC2182A-2 \* LTC3371  
4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
WITH WATCHDOG AND POWER - ON RESET  
11-12-14



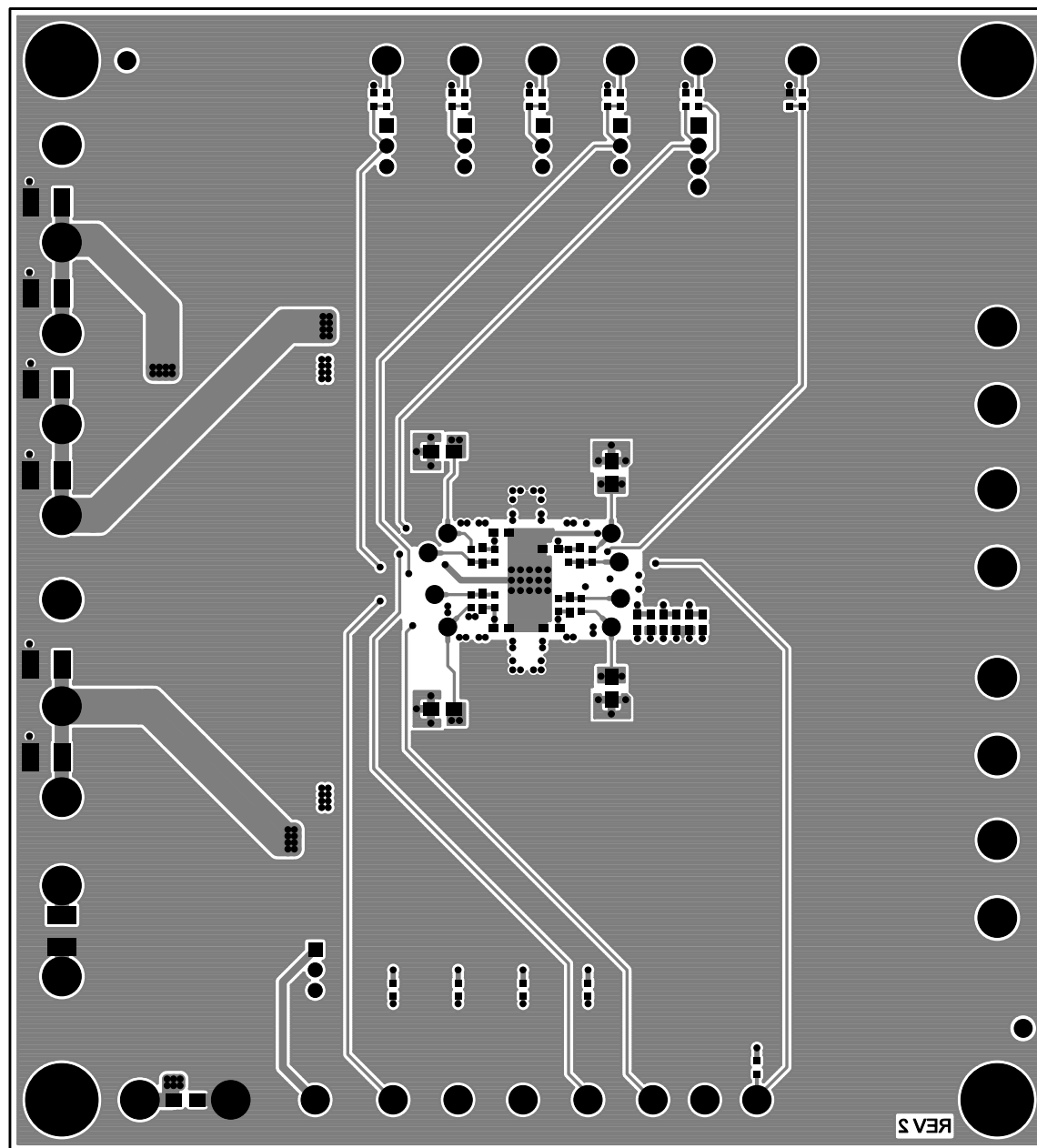
LAYER 1 - TOP SIDE  
LINEAR TECHNOLOGY  
DC2182A-2 \* LTC3371  
4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
WITH WATCHDOG AND POWER - ON RESET  
11-12-14



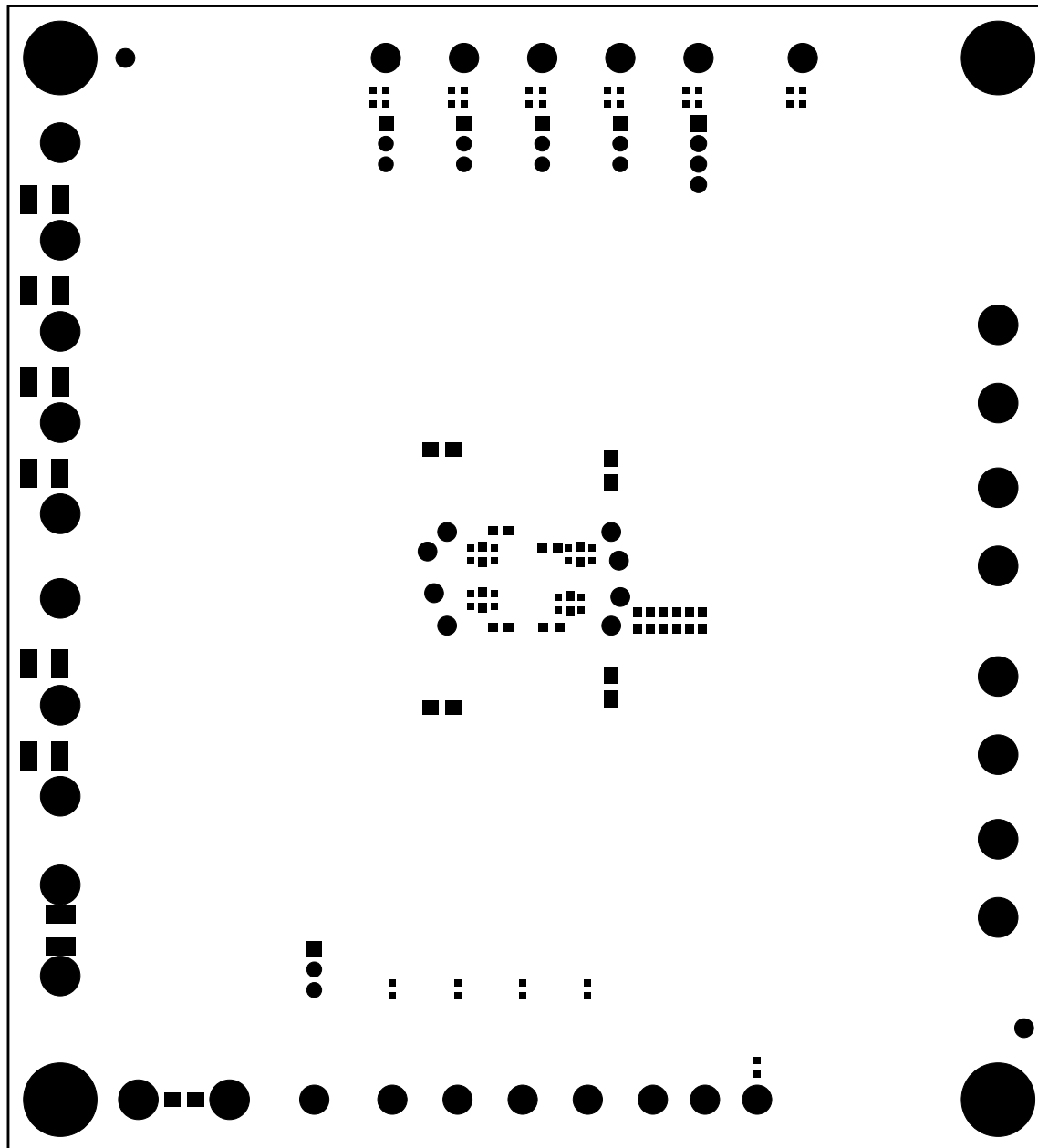
LAYER 2 - GND PLANE  
LINEAR TECHNOLOGY  
DC2182A-2 \* LTC3371  
4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
WITH WATCHDOG AND POWER - ON RESET  
11-12-14



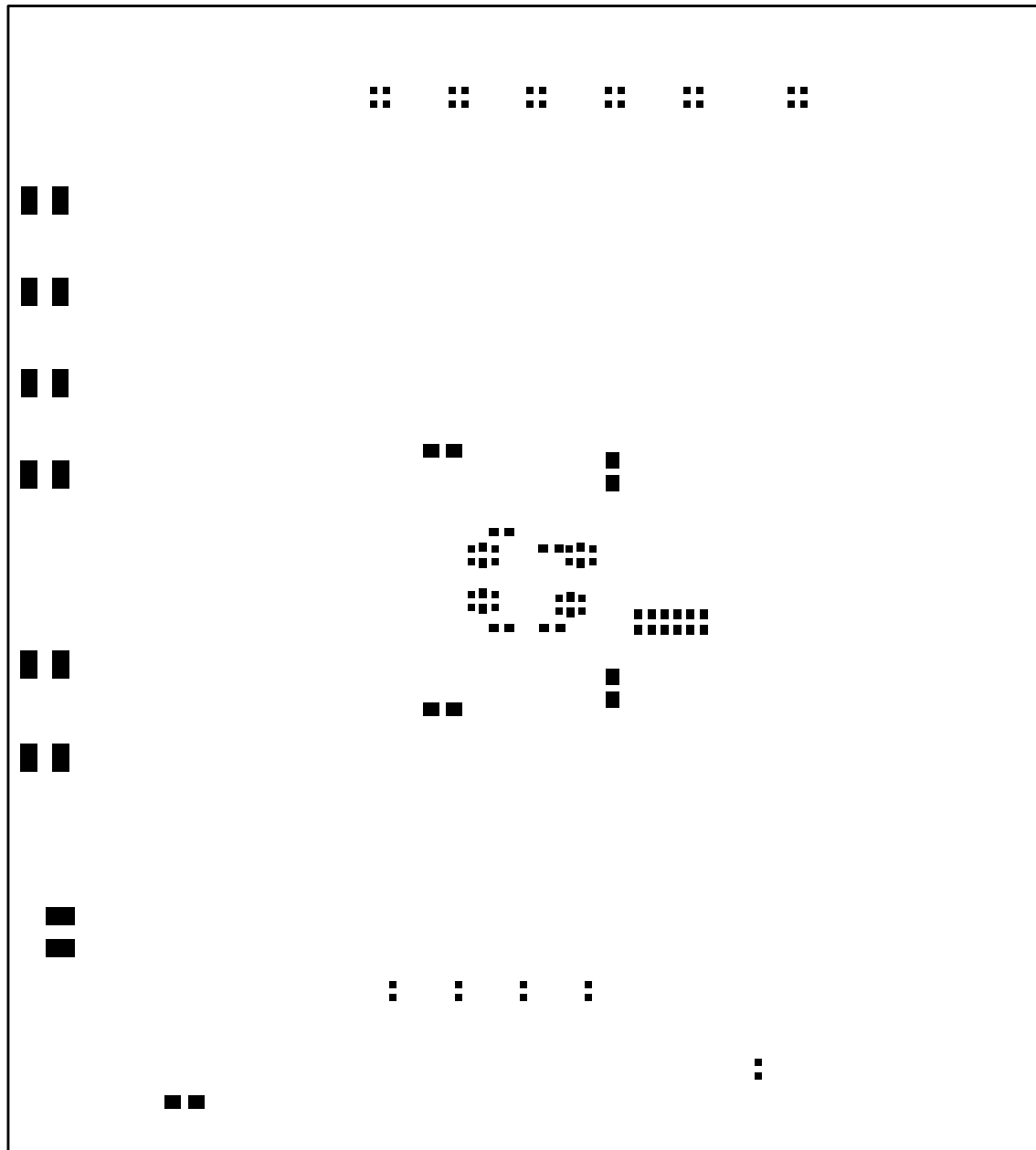
LAYER 3 - VINA-VINH / VCC PLANE  
LINEAR TECHNOLOGY  
DC2182A-2 \* LTC3371  
4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
WITH WATCHDOG AND POWER - ON RESET  
11-12-14



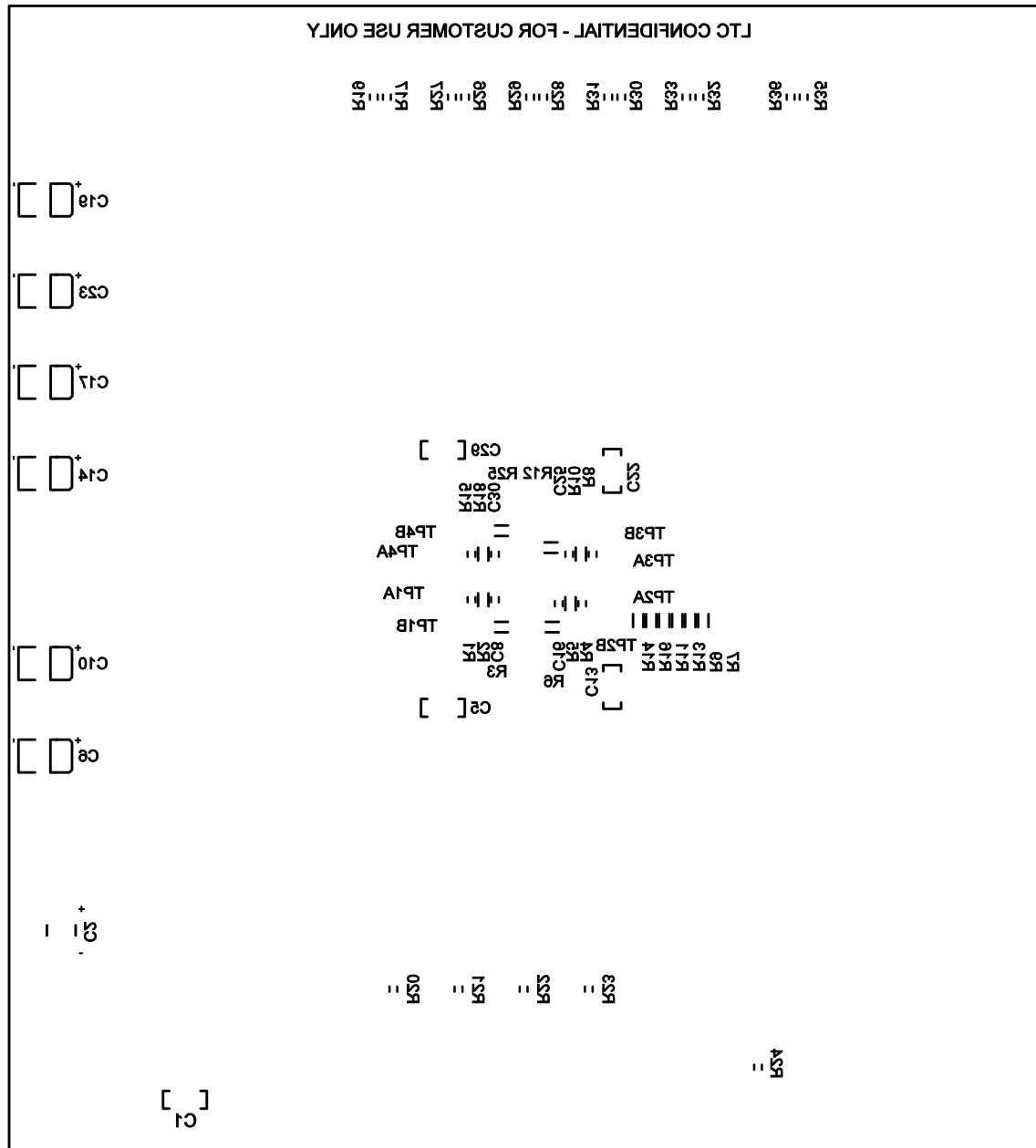
LAYER 4 - BOTTOM SIDE  
LINEAR TECHNOLOGY  
DC2182A-2 \* LTC3371  
4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
WITH WATCHDOG AND POWER - ON RESET  
11-12-14



BOTTOM SOLDER MASK  
LINEAR TECHNOLOGY  
DC2182A-2 \* LTC3371  
4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
WITH WATCHDOG AND POWER - ON RESET  
11-12-14



BOTTOM SOLDER PASTE  
LINEAR TECHNOLOGY  
DC2182A-2 \* LTC3371  
4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
WITH WATCHDOG AND POWER - ON RESET  
11-12-14



BOTTOM SILKSCREEN  
 LINEAR TECHNOLOGY  
 DC2182A-2 \* LTC3371  
 4-CHANNEL 8A CONFIGURABLE BUCK DC/DCs  
 WITH WATCHDOG AND POWER - ON RESET  
 11-12-14