



The Future of Analog IC Technology®

# EV2015A-JE\_Q\_G-00A

## 24V, 150mA, Low Quiescent Current Linear Regulator Evaluation Board

### DESCRIPTION

The EV2015A-JE\_Q\_G-00A is an evaluation board for the MP2015A, a low linear regulator that supplies power to systems with high voltage batteries.

MP2015A includes a wide 2.5V to 24V input range, low dropout voltage and low quiescent supply current. The low quiescent current and low dropout voltage allow operations at extremely low power levels. Therefore, the MP2015A is an ideal for the low power microcontrollers and the battery-powered equipments.

The EV2015A-JE\_Q\_G-00A is a fully assembled and tested evaluation board. It generates a +5V output voltage at load current up to 150mA from a 6V to 24V input range.

### ELECTRICAL SPECIFICATIONS

| Parameter      | Symbol    | Value  | Units |
|----------------|-----------|--------|-------|
| Input Voltage  | $V_{IN}$  | 6 – 24 | V     |
| Output Voltage | $V_{OUT}$ | 5      | V     |
| Output Current | $I_{OUT}$ | 150    | mA    |

### FEATURES

- 2.5V to 24V Input Range
- 3.3 $\mu$ A Quiescent Supply Current
- Stable With low-value output ceramic capacitor (> 0.47 $\mu$ F)
- 150mA specified current
- 700mV Dropout at 150mA Load
- Available in Fixed 3.3V Output and Adjustable Output (1.215V to 15V) versions
- Output  $\pm$ 2% Accuracy
- Specified current limit
- Thermal Shutdown and Short-Circuit Protection
- Available in TSOT23-4, QFN-6 (2mmx2mm), or QFN-8 (3mmx3mm) Packages

### APPLICATIONS

- Portable/Battery-Powered Equipment
- Ultra low power Microcontrollers
- Cellular Handsets

All MPS parts are lead-free and adhere to the RoHS directive. For MPS green status, please visit MPS website under Products, Quality Assurance page.

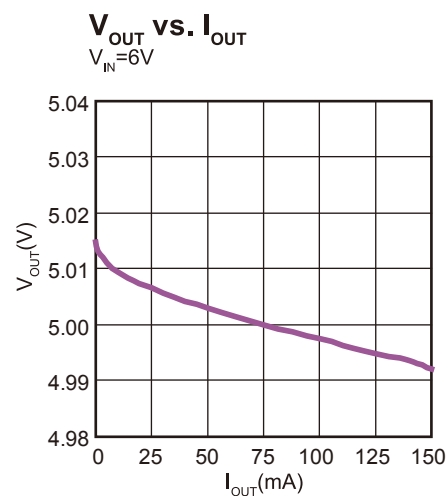
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## EV2015A-JE\_Q\_G-00A EVALUATION BOARD

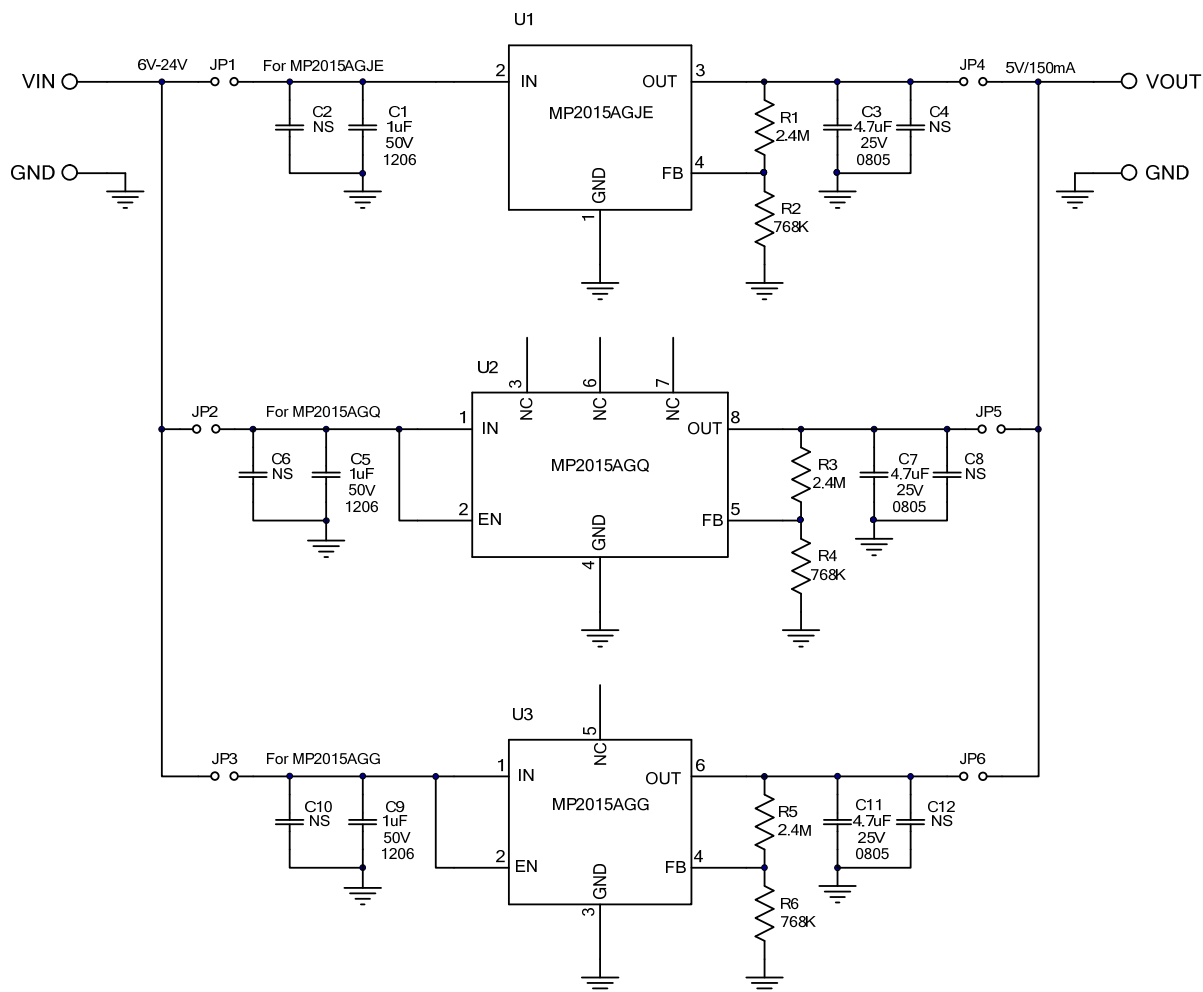


(L x W x H) 2.5" x 2.5" x 0.4"  
(6.4cm x 6.4cm x 1.0cm)

| Board Number       | MPS IC Number     |
|--------------------|-------------------|
| EV2015A-JE_Q_G-00A | MP2015A-GJE/GQ/GG |



## EVALUATION BOARD SCHEMATIC



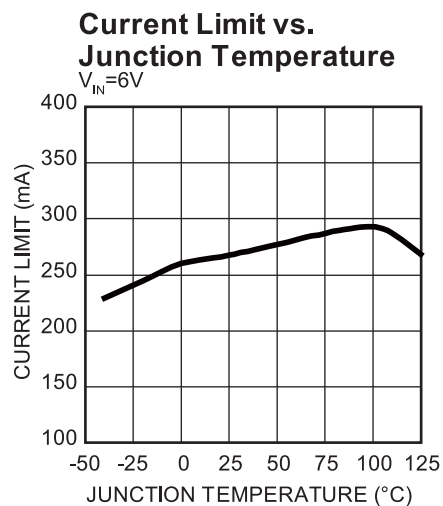
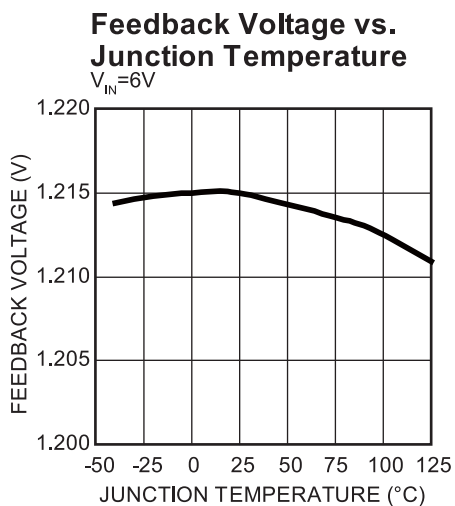
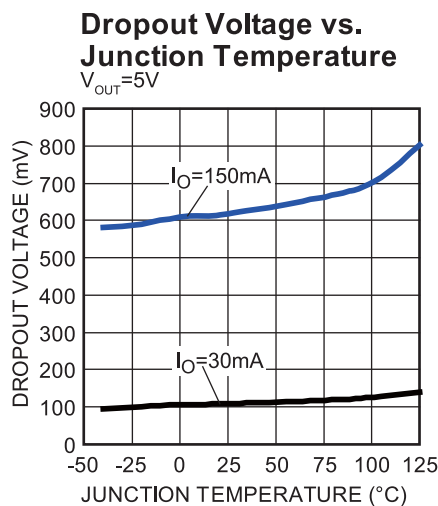
## EV2015A-JE\_Q\_G-00A BILL OF MATERIALS

| Qty | RefDes                      | Value      | Description            | Package  | Manufacturer | Manufacturer_P/N   |
|-----|-----------------------------|------------|------------------------|----------|--------------|--------------------|
| 3   | C1, C5, C9                  | 1μF        | Ceramic Cap., 50V, X7R | 1206     | muRata       | GRM31MR71H105KA88L |
| 3   | C3, C7, C11                 | 4.7μF      | Ceramic Cap., 25V, X5R | 0805     | muRata       | GRM21BR61E475KA12L |
| 0   | C2, C4, C6, C8, C10, C12    | NS         |                        |          |              |                    |
| 3   | R1, R3, R5                  | 2.4M       | Film Res., 1%          | 0603     | Yageo        | RC0603FR-072M4L    |
| 3   | R2, R4, R6                  | 768k       | Film Res., 1%          | 0603     | Yageo        | RC0603FR-07768KL   |
| 6   | JP1, JP2, JP, JP4, JP5, JP6 |            | Jumper                 |          |              |                    |
| 1   | U1                          | MP2015AGJE |                        | TSOT23-4 | MPS          | MP2015AGJE         |
| 1   | U2                          | MP2015AGQ  |                        | QFN8-3x3 | MPS          | MP2015AGQ          |
| 1   | U3                          | MP2015AGG  |                        | QFN6-2x2 | MPS          | MP2015AGG          |

## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

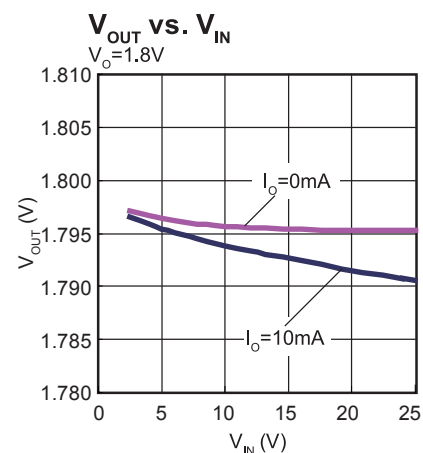
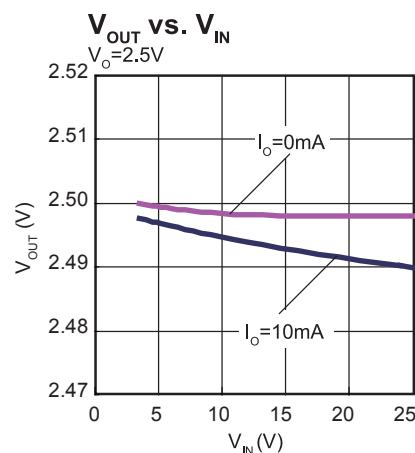
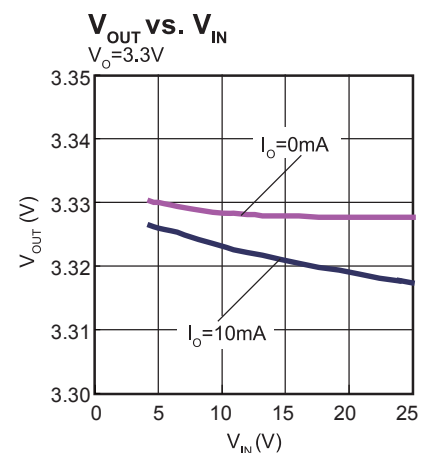
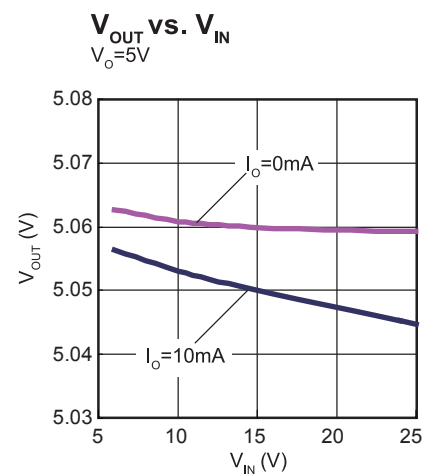
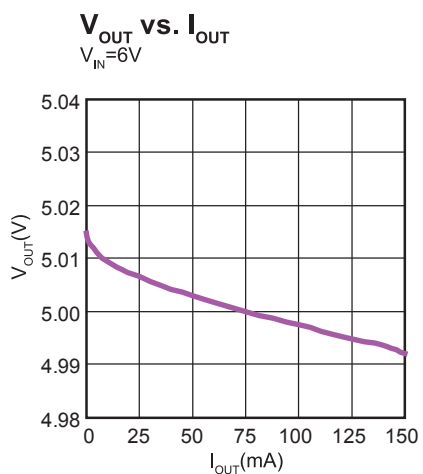
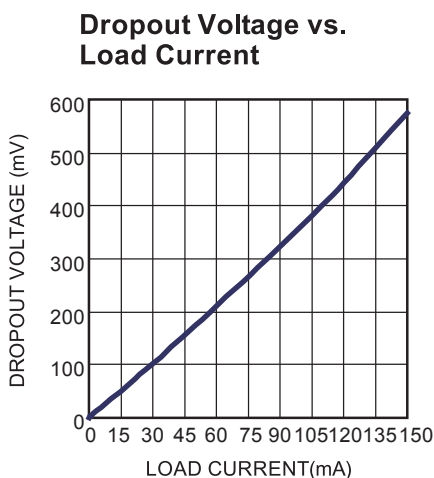
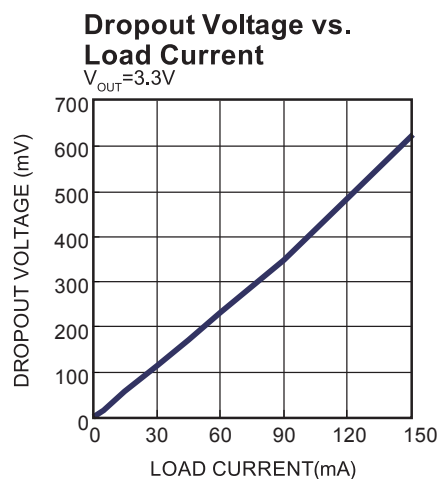
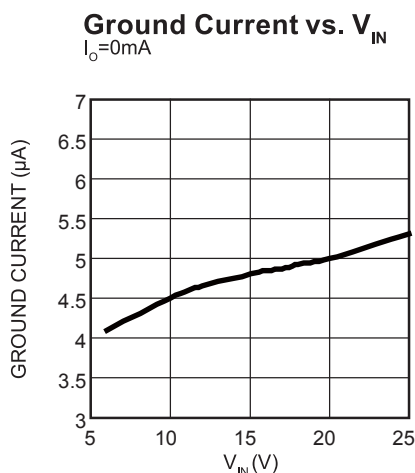
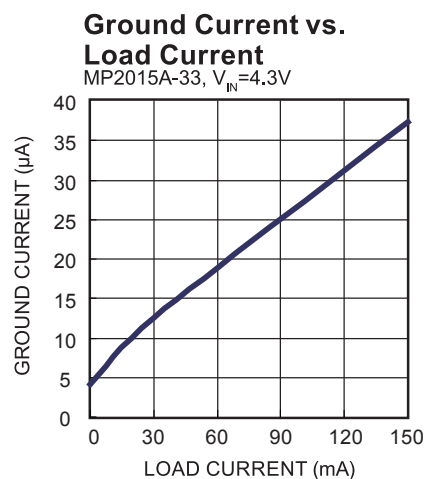
$V_{OUT} = 5V$ ,  $T_A = 25^{\circ}C$ , unless otherwise noted.



## EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

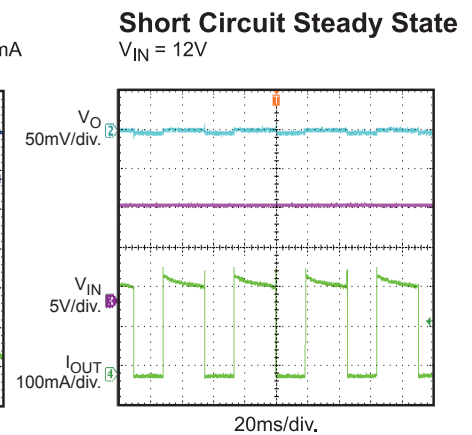
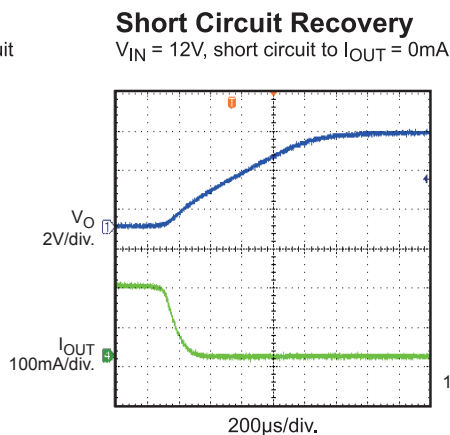
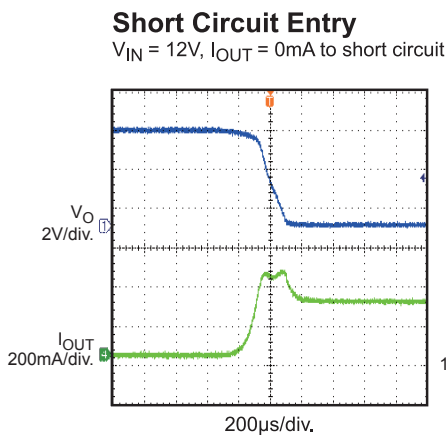
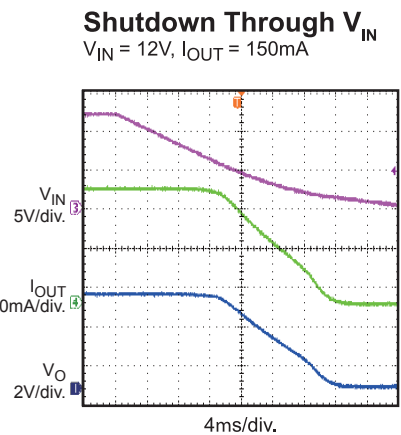
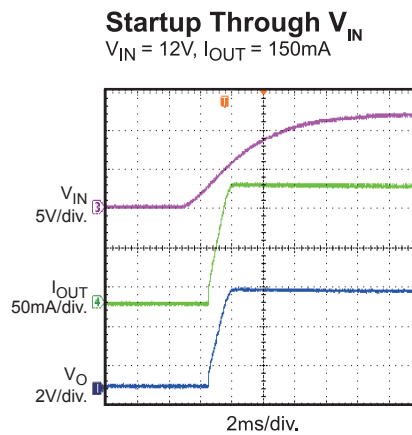
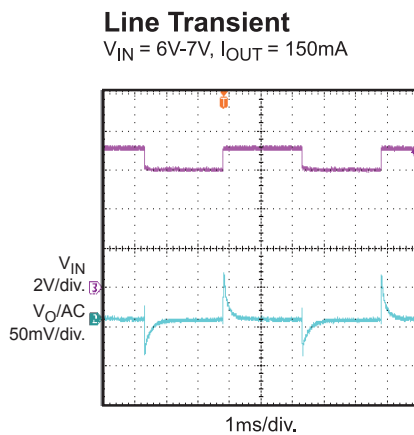
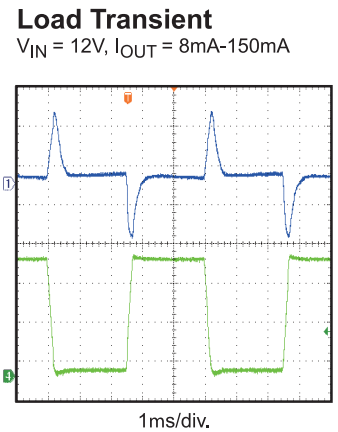
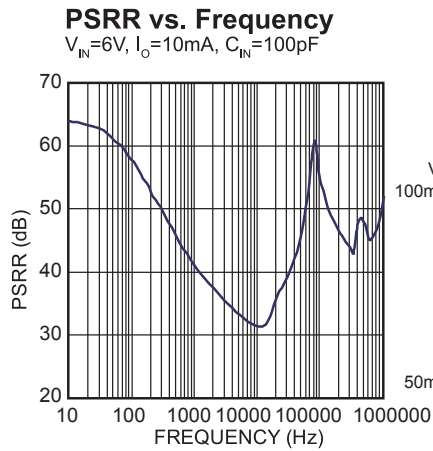
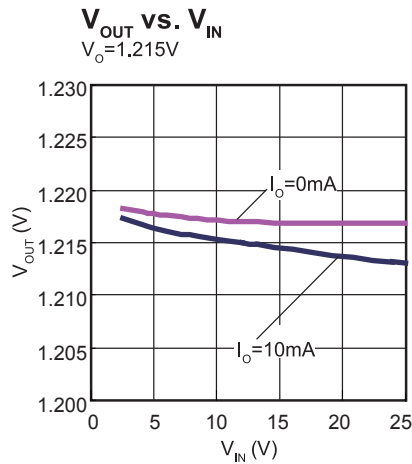
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## EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

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## PRINTED CIRCUIT BOARD LAYOUT

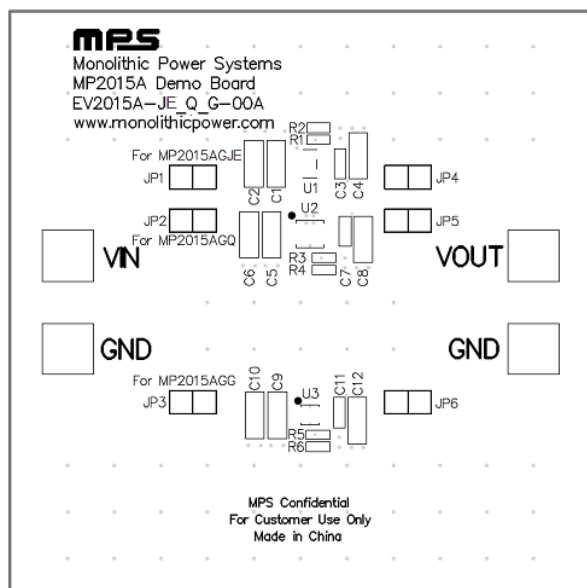


Figure 1—Top Silk Layer

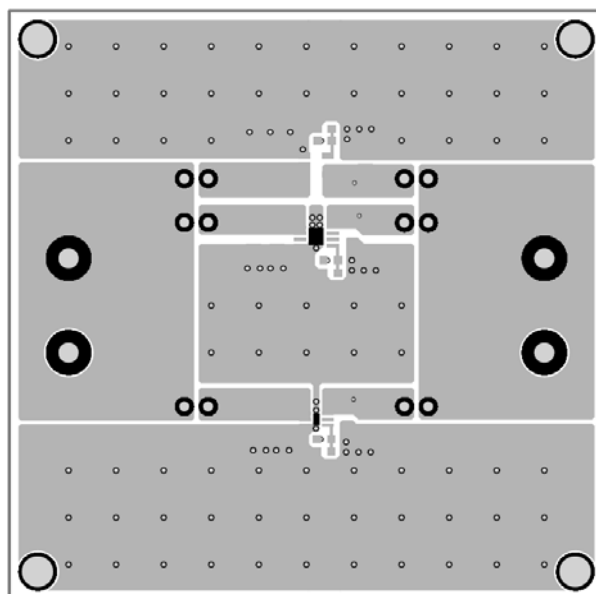


Figure 2—Top Layer

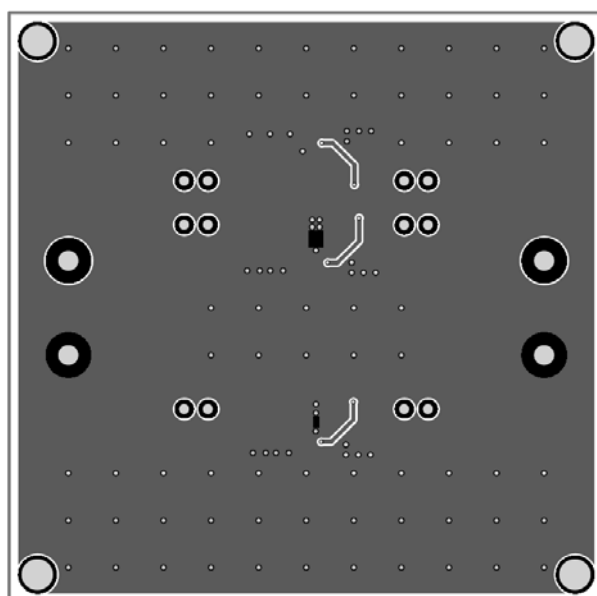


Figure 3—Bottom Layer

## QUICK START GUIDE

1. Connect different jumpers to select different MP2015A ICs with different packages for evaluation:

| Connected Jumpers | Selected IC |
|-------------------|-------------|
| JP1, JP4          | MP2015AGJE  |
| JP2, JP5          | MP2015AGQ   |
| JP3, JP6          | MP2015AGG   |

2. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
3. Preset the power supply output between 6V and 24V, and then turn it off.
4. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
5. Turn the power supply on. The MP2015A will automatically startup.
6. To lower the additional current dissipation, resistors of FB divider on the demo board are chosen to high value. If part would operate under no load, FB dividers should be lower to maintain a minimum load to draw the leakage current from OUT pin. The recommend value of R2/R4/R6 is 1MΩ in room temperature. When part is working in high temperature, the recommended maxim value of R2/R4/R6 is 506kΩ when Ta≤105°C and 173kΩ when Ta≤125°C. Once R2/R4/R6 is determined, R1/R3/R5 can be calculated by below formula (take R1 as an example):

$$R1 = R2 \times \left( \frac{V_{OUT}}{1.215V} - 1 \right)$$

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