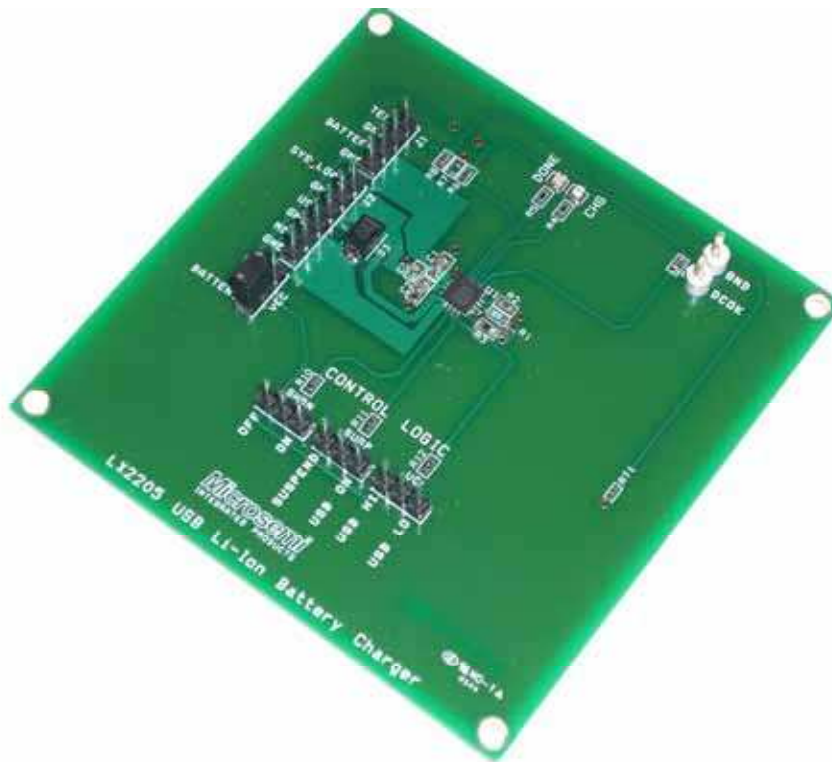


LX2205 BATTERY CHARGER & POWER INTERFACE



INTRODUCING TO PRODUCT

The LX2205 Evaluation Board is available from Microsemi for evaluating the performance of the LX2205 Battery Charger Integrated Circuit. The component sizes used on the evaluation board facilitate easy probing, however, in practice, smaller component sizes are recommended to minimize the circuit physical size.

KEY FEATURES

- Charging up to 1A.
- Charging from USB port.
- USB current compliance
- Auto battery switchover
- CC/CV w thermal Feedback
- Battery temp monitor
- Precision Charge Termination

APPLICATIONS

- Navigation Devices
- Portable USB Devices
- Multi-Media Player
- PDA Phones
- Digital Cameras

PART SPECIFIC INFORMATION

| Part Number | Product |
|-------------|-------------------------------------|
| LX2205ILQ | Battery Charger and Power Interface |

TABLE 1 – PART INFORMATION

| IC | EVALUATION BOARDS |
|-----------|-------------------|
| LX2205ILQ | LX2205 EVAL KIT |

TABLE 2 – EVALUATION BOARD INFORMATION

SCHEMATIC FOR EVB

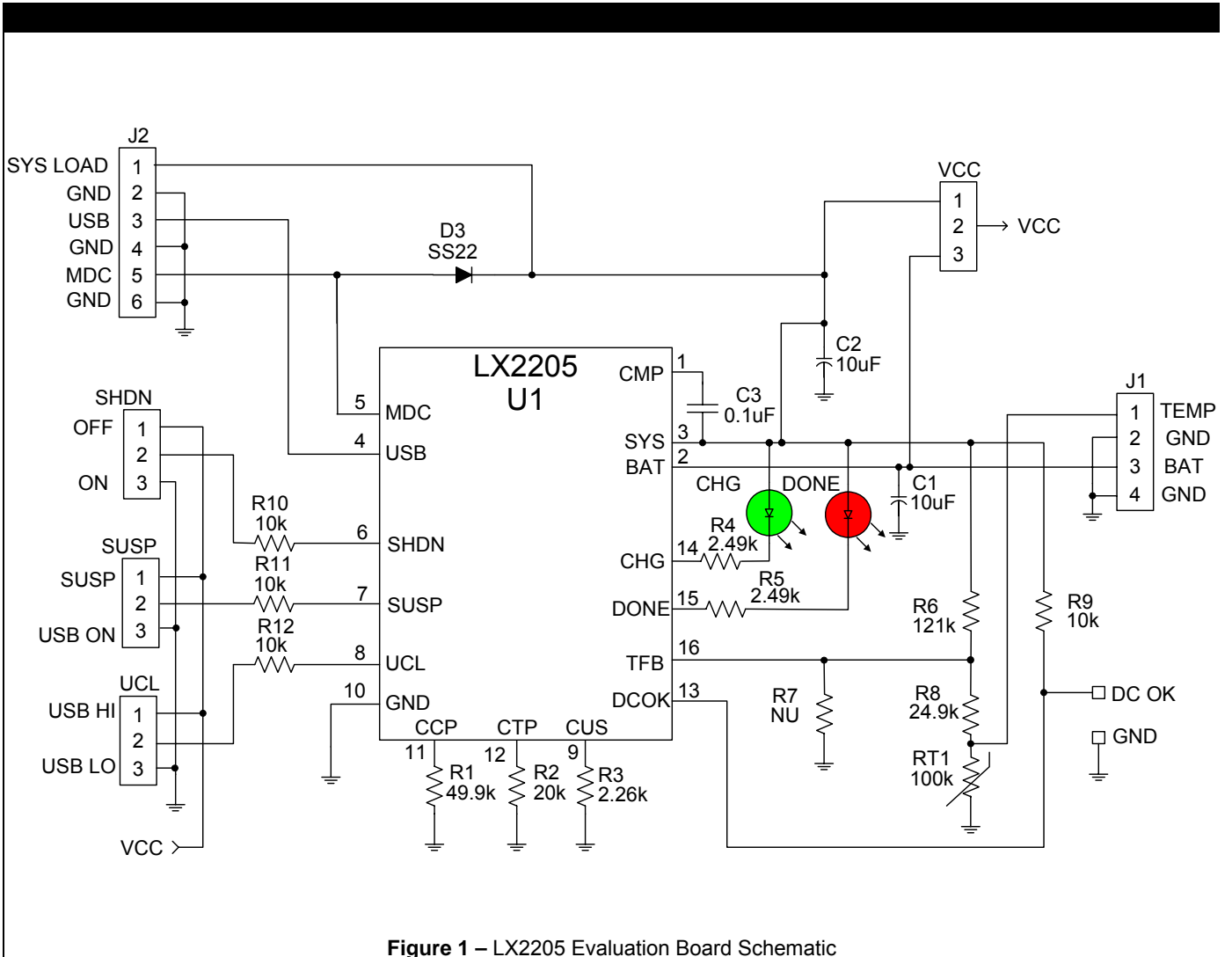


Figure 1 – LX2205 Evaluation Board Schematic

IC BLOCK DIAGRAM

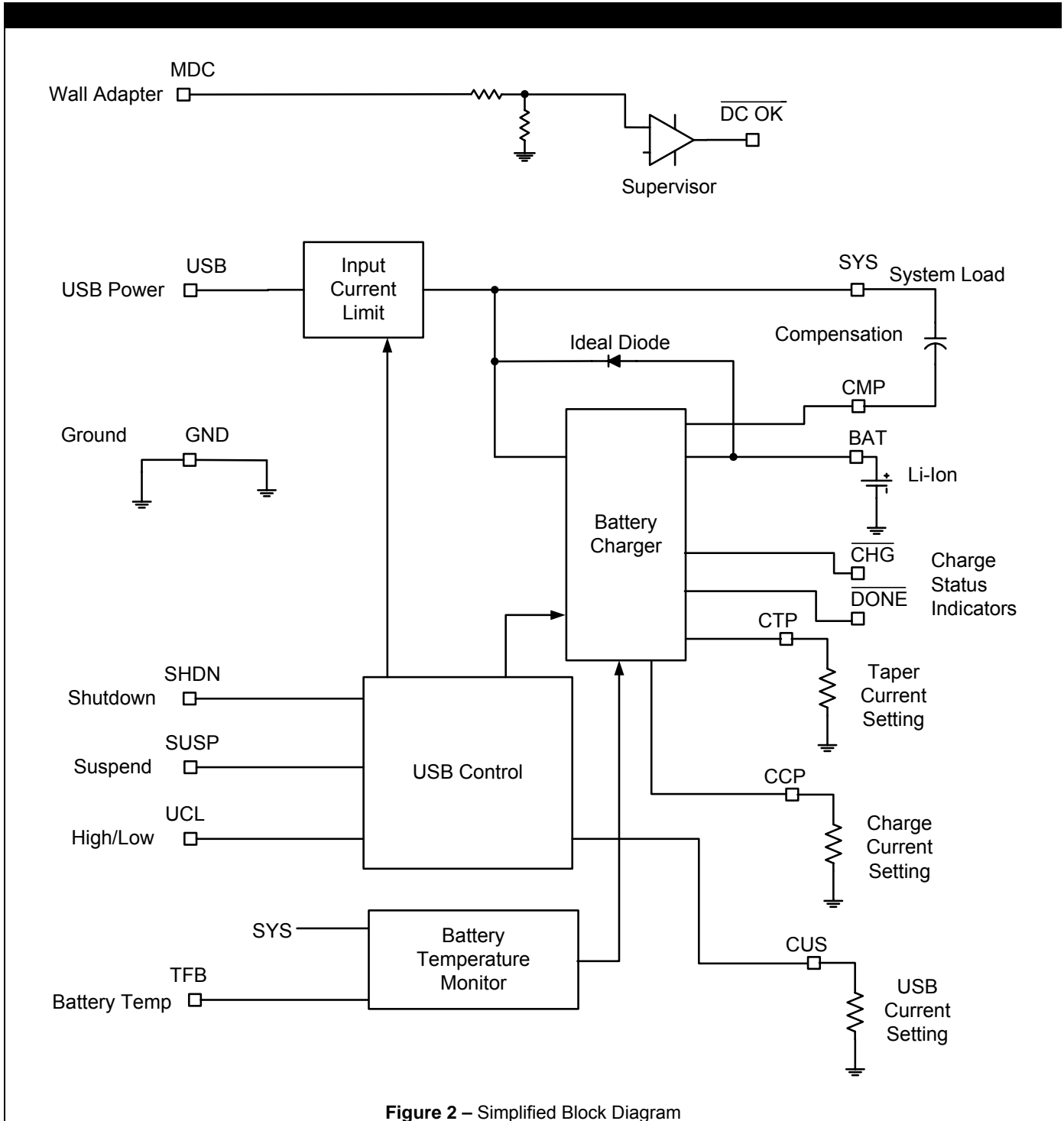


Figure 2 – Simplified Block Diagram

LX2205 EVB TEST PROCEDURE

Connections. The LX2205 Evaluation Board has two power input and two power output connections. GND is the return for all inputs and outputs.

| FUNCTION | PIN NAME | VOLTAGE |
|---------------|----------|--------------------------------|
| Adapter Power | MDC | 5V +/- 0.65V |
| USB Power | USB | 5V +/- 0.65V |
| Battery + | BAT+ | 0V to 4.3V |
| System Load | SYS LOAD | $2.8\Omega \leq R \leq \infty$ |

The following is a test procedure for the LX2205 evaluation board:

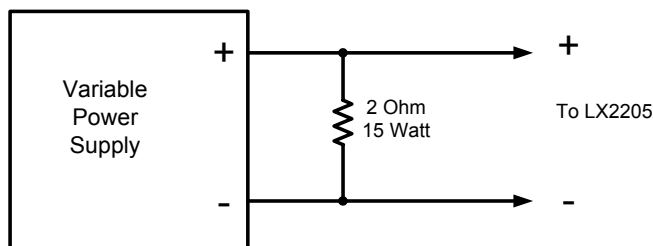
- Place the jumpers in the following positions:

| | |
|------|--------------------------------|
| VCC | Place in the BATTERY position. |
| SHDN | Place in the ON position. |
| SUSP | Place in the USB ON position. |
| UCL | Place in the USB HI position. |

- Apply the Battery Simulator (referred to below as the battery) between the BAT terminal and GND terminal. Adjust the battery voltage to 3.9V.

3)

Battery Simulator



- Verify the DCOK pin is $>3.7V$.
- Apply a 5.0V power source between the MDC terminal and GND terminal.
- Verify the CHG LED is illuminated.
- Verify the voltage at the DCOK test point is $<100mV$.
- Verify the current flowing into the battery is $1000 \pm 150mA$.
- Place the VCC jumper in the SYS position and verify the CHG LED is illuminated. Then place the VCC jumper in the BATTERY position.
- Place the SHDN jumper in the OFF position and verify the current flowing into the battery drops to $0mA \pm 1mA$. Then place the SHDN jumper in the ON position.
- Slowly adjust the battery voltage to 4.25V while monitoring the current flowing into the battery and verify the Battery Charge current drops to $0mA \pm 1mA$, the CHG LED shuts off and the DONE LED turns on. Just before the CHG LED turns off, verify the current flowing into the battery is less than 100mA but greater than 40mA.
- Set the battery voltage to 3.9V.
- Remove the 5.0V power source from the MDC terminal and apply it to the USB terminal.
- Verify the current flowing into the battery is between 425mA and 500mA.
- Place the UCL jumper in the USB LO position and verify the current flowing into the battery is between 85mA and 100mA.
- Place the SUSP jumper in the SUSPEND position and verify the current flowing into the battery drops to $0mA \pm 1mA$. Then place the SUSPEND jumper in the USB ON position.
- Place a 20Ω load from the SYS terminal and GND terminal and verify the CHG

LED and DONE LED are off. Verify the current flowing into the USB pin is 90mA +/- 10mA. Then remove the 20Ω load.

- 18) Monitor the battery current and apply heat (from a heat gun) to RT1. Verify that when RT1 gets hot, that the battery current drops to 0mA +/- 1mA. Verify

when the heat is removed, after a short wait to cool, that the battery current flowing into the battery is between 85mA and 100mA.

- 19) Place the jumpers in their initial positions.
- 20) Test COMPLETE.

LX2205 TYPICAL TEST HOOKUP

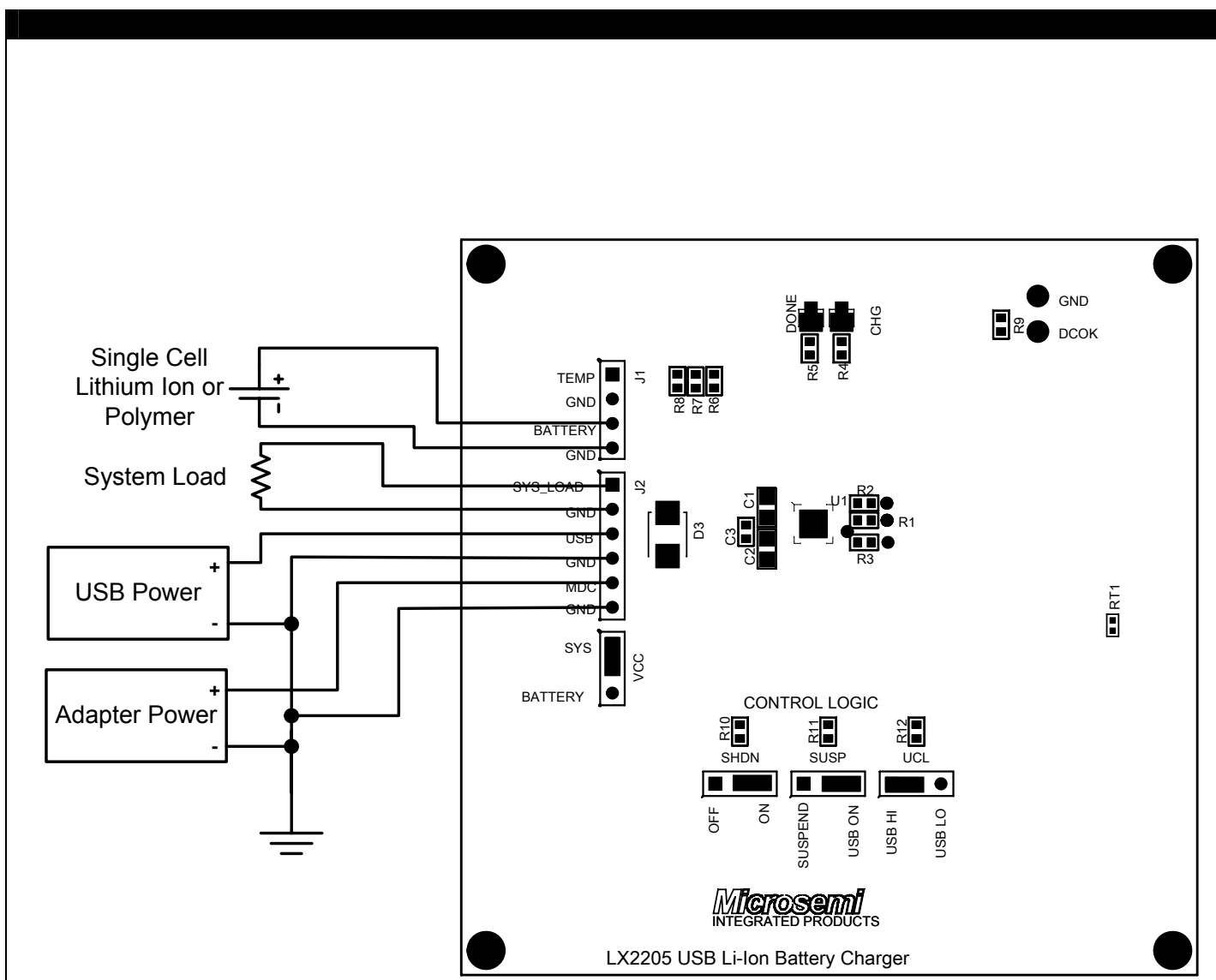
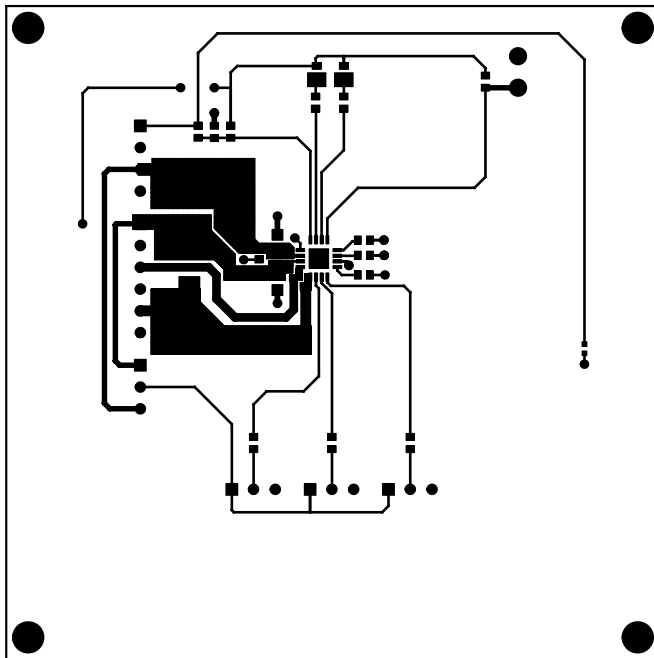


Figure 3 – LX2205 Typical Test Hookup

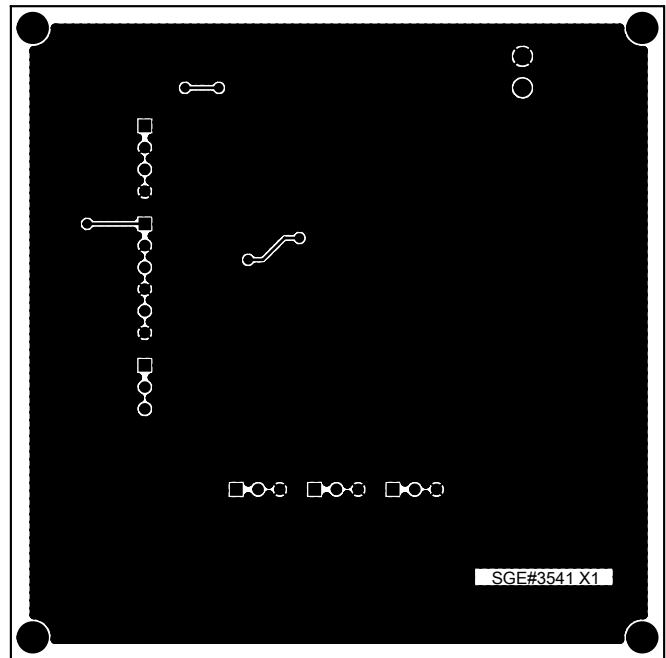
PCB LAYOUT RECOMMENDATIONS

It is recommended that C1 and C2 be located within 1cm of the LX2205. The CMP capacitor should be located close to the SYS and CMP pins. Also the high impedance summing node connecting to the TMP pin should be kept relatively short to prevent the coupling of noise into this node. It is important that

the LX2205 have a good thermal path to ambient to dissipate heat. The simplest way to do this is to heatsink the LX2205 bottom pad directly to the ground plane by placing 4 or more vias in the ground pad directly under the LX2205 footprint.



SGE#3541 X1
TOP LAYER RR



SGE#3541 X1
BOTTOM LAYER WR

LX2205 PRINTED CIRCUIT BOARD LAYOUT

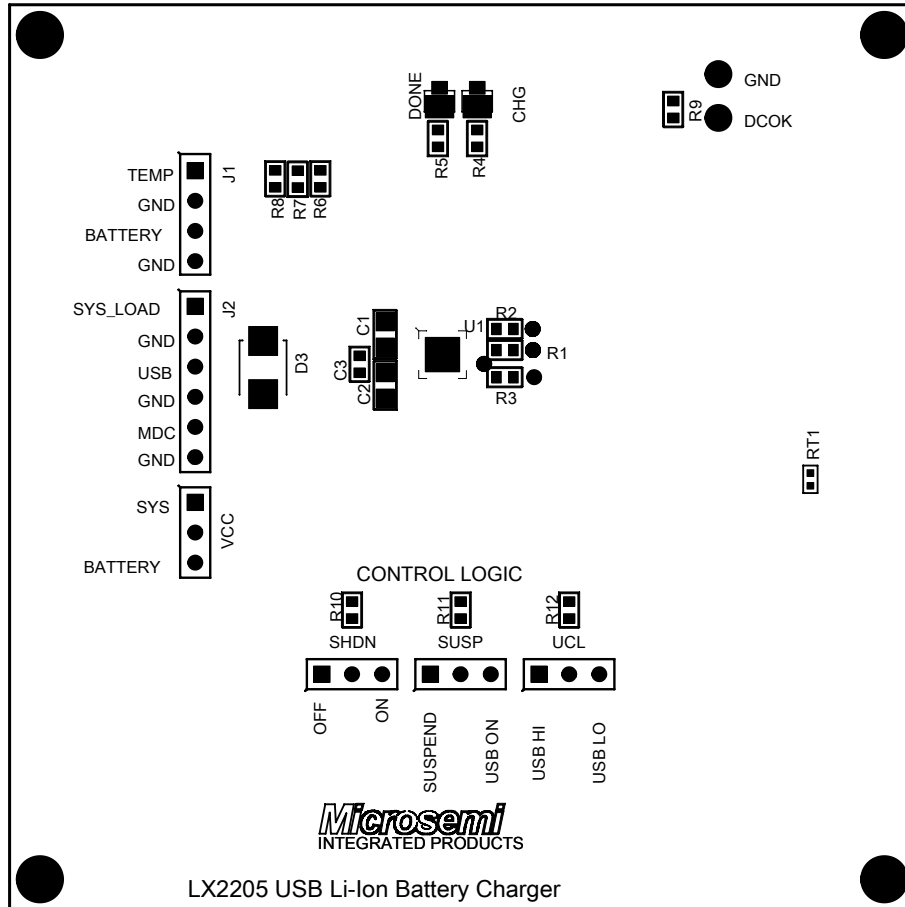


Figure 3 – LX2205 Evaluation Board Layout

LX2205 EVALUATION BOARD BILL OF MATERIALS

MISCELLANEOUS COMPONENTS

| Line Item | Part Description | Manufacturer & Part # | Case | Reference Designators | Qty |
|-----------|--------------------------------|--------------------------|---------|-------------------------|-----|
| 1 | Microsemi IC – Battery Charger | MICROSEMI LX2205ILQ | 4x4 MLP | U1 | 1 |
| 2 | LED - Red | Panasonic LNJ214K8ARA | 0603 | DONE | 1 |
| 3 | LED - Green | Panasonic LNJ314G8TRA | 0603 | CHG | 1 |
| 4 | Thermistor – NTC, 100k | Vishay NTHS0402N01N1003J | 0402 | RT1 | 1 |
| 5 | Diode, Schottky, 2A, 20V | On Semi SS22 | SMB | D3 | 1 |
| 6 | Test Point | Keystone 5007 | | DCOK, GND | 2 |
| 7 | Header 6 pin 0.100in spacing | | | J2 | 1 |
| 8 | Header 3 pin 0.100in spacing | | | VCC, SHDN, SUSP, UCL | 4 |
| 9 | Header 4 pin 0.100in spacing | | | J1 | 1 |
| 10 | Printed Circuit Board | Microsemi SGE#3541 X1 | | | 1 |

CAPACITORS

| Line Item | Part Description | Part Number | Case | Reference Designators | Qty |
|-----------|---------------------------------|-----------------------------|------|-----------------------|-----|
| 1 | Capacitor, X5R, 10uF, 10V, 10% | Taiyo Yuden LMK212BJ106KD-T | 0805 | C1,2 | 2 |
| 2 | Capacitor, X7R, 0.1uF, 16V, 20% | Taiyo Yuden EMK107BJ104KA-T | 0603 | C3 | 1 |

RESISTORS

| Line Item | Part Description | Part Number | Case | Reference Designators | Qty |
|-----------|----------------------------|-------------------------|------|-----------------------|-----|
| 1 | Resistor, 49.9k, 1%, 1/10W | Panasonic ERJ-3EKF4992V | 0603 | R1 | 1 |
| 2 | Resistor, 20.0k, 1%, 1/10W | Panasonic ERJ-3EKF2002V | 0603 | R2 | 1 |
| 3 | Resistor, 2.26k, 1%, 1/10W | Panasonic ERJ-3EKF2261V | 0603 | R3 | 1 |
| 4 | Resistor, 2.49k, 1%, 1/10W | Panasonic ERJ-3EKF2491V | 0603 | R4-5 | 2 |
| 5 | Resistor, 121k, 1%, 1/10W | Panasonic ERJ-3EKF1213V | 0603 | R6 | 1 |
| 6 | Resistor, 24.9k, 1%, 1/10W | Panasonic ERJ-3EKF2492V | 0603 | R8 | 1 |
| 7 | Resistor, 10k, 1%, 1/10W | Panasonic ERJ-3EKF1002V | 0603 | R9-12 | 4 |