

LX2201 SINGLE CELL LITHIUM ION BATTERY CHARGER EVALUATION BOARD USER GUIDE



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INTRODUCING TO PRODUCT

The LX2201 Evaluation Board is available from Microsemi for evaluating the performance of the LX2201 battery charger integrated circuit. (See picture 1) The Evaluation Board contains a small amount of support circuitry that enhances performance in different power configurations. (See schematic 1.) In a typical application, a subset of the support circuitry could be utilized.

KEY FEATURES OF THE LX2201

- USB compliant Charging States
- Small, High Power 20-lead MLP package
- Internal Pass element can function as a reverse direction load switch
- No Sense Resistor Required
- Full Capacity Charging
- Always Cool Running
- 4.1 or 4.2V Applications
- Tolerates 5V + 10% Wall Supply Regulation
- Conditioning Mode For Deep Discharge
- Built In MOSFET Driver For Easy AC Adapter/USB Implementation
- Topping Charge For Long Periods Of Non-Use.
- Inherent Load Disconnect

APPLICATIONS

- Batteries with 350mAH to 2AH ratings
- Cell Phones
- PDAs
- Charging cradles
- Digital Cameras
- Low Cost Single L-Ion Cell Chargers

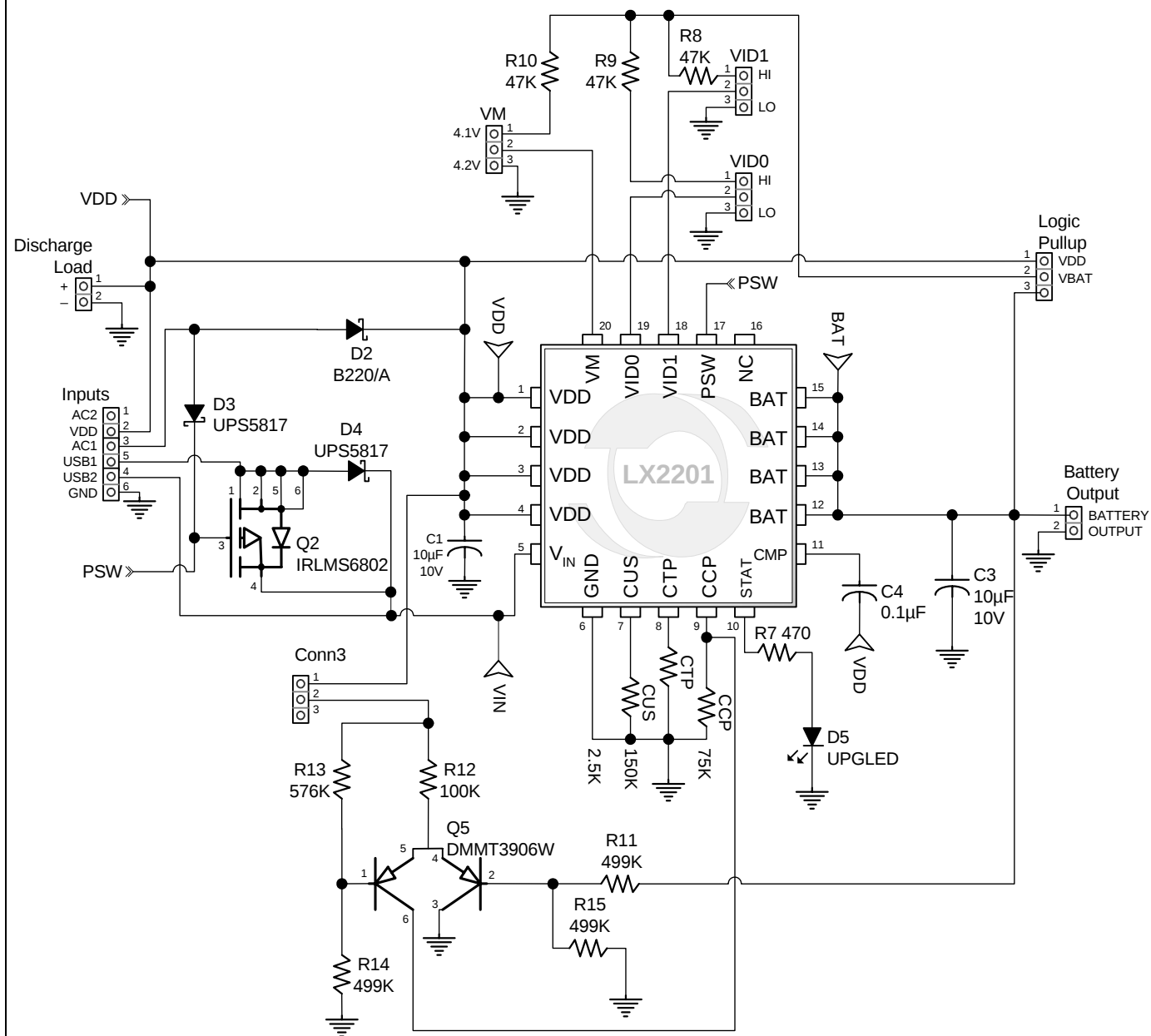
PART SPECIFIC INFORMATION

Part Number	Temp Range	Product Description
LX2201	-65 to 150°C	USB Li-Ion Battery Charger

Table 1 – Part Information

IC	EVALUATION BOARDS
LX2201	LX2201 Eval

Table 2 – Evaluation Board Information



IC BLOCK DIAGRAM

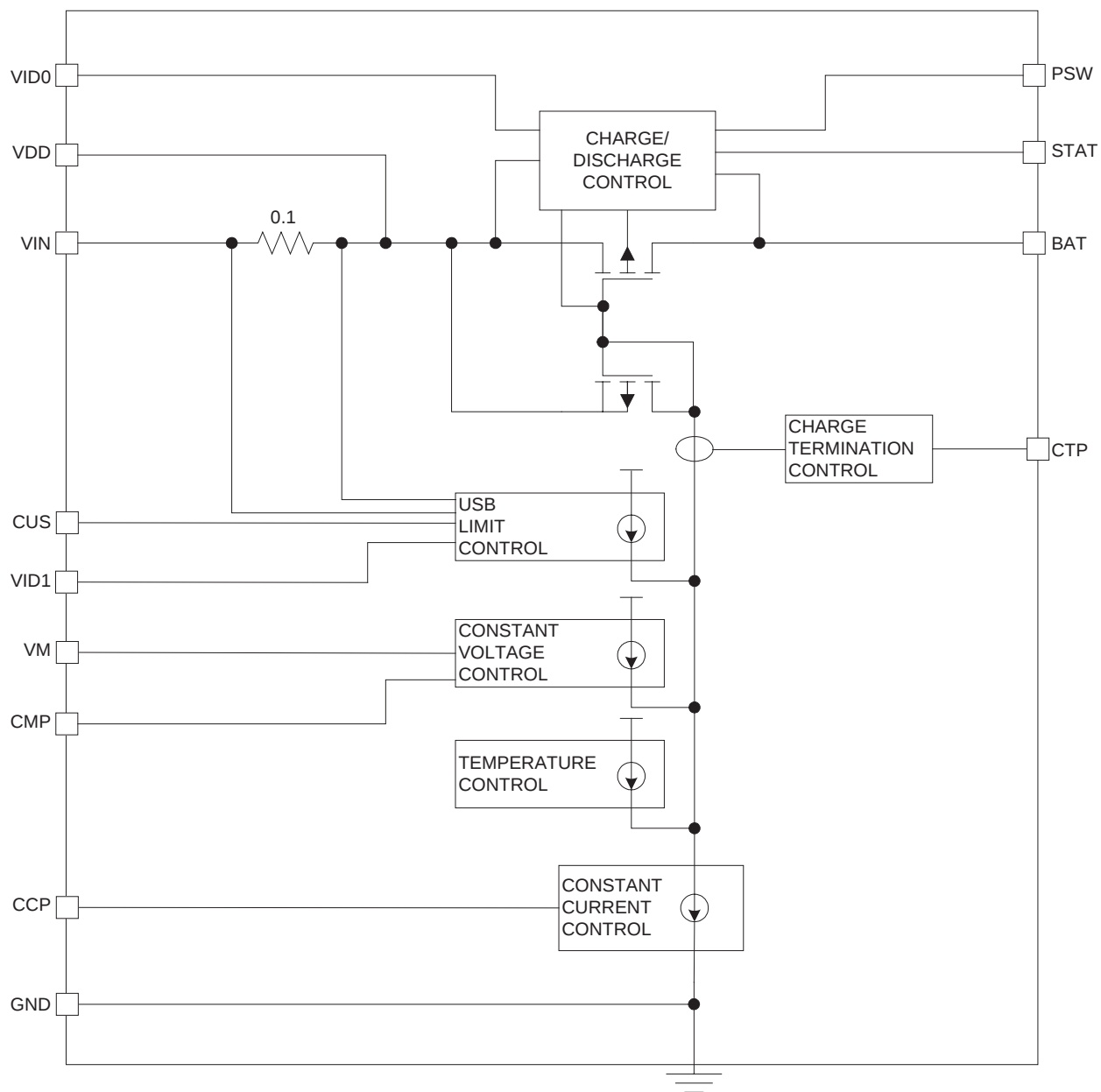


Figure 2 – Simplified Block Diagram

EVALUATION BOARD

CONNECTORS

The LX2201 Evaluation board has three connectors.

Function	Label on Board
Input Power	P1
Battery	Battery Output
System Load	Discharge Load

Table 3 – Connector Types

PRECAUTIONS: Before connecting or disconnecting the Battery or System Load, set the VID0 and VID1 jumpers to the LO state and put CON7 in the BAT position. Make sure the System Load is less than 3 Amperes continuous current. Make sure the Battery polarity and System Load polarity are connected properly.

The following pins are designated on the P1, Input Power connector:

P1 Pin	Label	Connection
1	AC2	No connect. Do not use.
2	VDD	Test point for IC pin VDD.
3	AC1	Connect to AC adapter Power (5.25V +/- 0.75V)
4	USB1	Connect to USB power (5V +/- 0.5V)
5	USB2	Test point for IC pin VIN.
6	GND	Connect to common ground.

Table 4 – P1 Pins

Either AC1 or USB1 or both may be applied. The ORing circuit will select AC1 if both AC1 and USB1 are applied at the same time.

JUMPERS

The LX2201 Evaluation Board has five (5) jumpers. These jumpers have two (2) possible positions and are designed to always be installed in one position or the other. The function of the jumpers is as follows:

Jumper	Position	Connection
VID0	LO	Disable Discharge Mode.
	HI	Enable Discharge Mode.
VID1	LO	USB Low current Mode. (Charger disable when VID0 = 0)
	HI	USB High Current Mode.
VM	LO	4.1V Battery terminal voltage
	HI	4.2V Battery terminal voltage
CON3	IN ¹	Enables the Headroom Regulation circuit.
	OUT	Disables the Headroom Regulation circuit.
CON7	VDD	Input Logic pulled up to VDD.
	VBAT ²	Input Logic pulled up to VBAT.

Table 5 – Jumper Configuration

¹ The headroom enable circuit prevents disable switch chatter if the input power is current limited (weak) source. This jumper is normally IN.

² The Logic is normally referenced to VBAT, but can be referenced to VDD in some cases. This jumper is normally VBAT

HOOKUP

The following is a demonstration scenario that can be used to evaluate the LX2201, using the LX2201 Evaluation board.

Directions for hook up (AC adapter only mode):

1. Place jumpers VID0 and VID1 in the LO position. Place the LOGIC PULLUP jumper in the VBAT position. Place the Vm jumper in the 4.1 or 4.2V position depending on the battery chemistry.
2. Connect a 1AH or greater single cell Lithium Ion battery to the Battery Output terminal.
3. If desired, apply a 10 ohm resistor across the Discharge load connector terminals.
4. Apply a 5.25V power supply (>2A) to the P1 AC1 input.
5. To begin charging, change VID0 from LO to HI.
6. Remove and reapply the AC1 power source and observe the battery switch from charge to discharge mode.
7. To prevent battery discharge mode change VID1 from LO to HI and VID0 from HI to LO.
8. The HEADROOM CKT jumper should be installed in the IN position if a power supply less than 4.5V is applied to AC1.
9. Other configurations are shown in the LX2201 specification and can be demonstrated by applying the inputs to the appropriate pins on connector P1:
USB only – apply power input to USB1.
AC adapter and USB – apply AC adapter to AC1 and USB power to USB1.

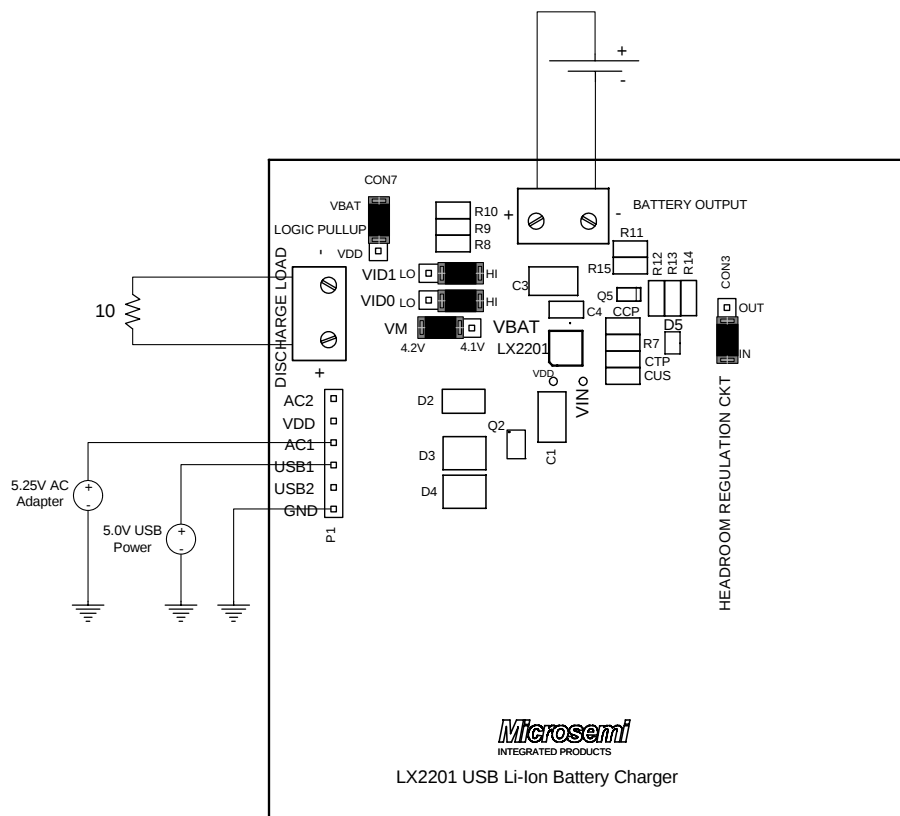


Figure 3 – LX2201 Evaluation Board Hook up

LX2201 EVALUATION BOARD PRINTED CIRCUIT BOARD LAYOUT

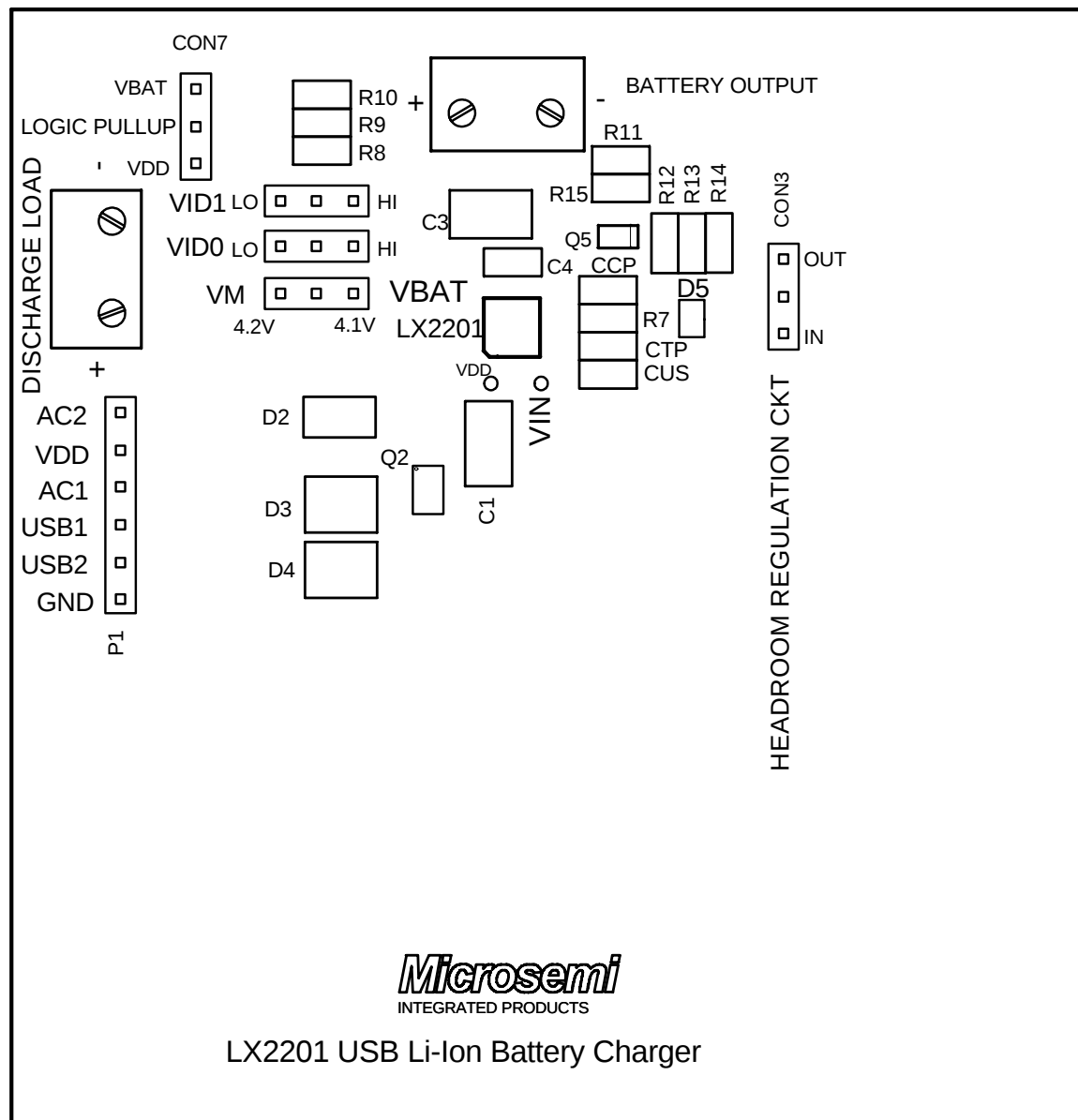


Figure 4 – LX2201 Evaluation Board

LX2201 EVALUATION BOARD BILL OF MATERIALS

MISCELLANEOUS COMPONENTS

Line Item	Part Description	Manufacturer & Part #		Case	Reference Designators	Qty
1	USB battery Charger	MICROSEMI	LX2201	MLP	U1	1
2	Diode, Schottky, 20V, 2A	Microsemi	B220A-13		D2	1
3	Diode, Schottky, 20V, 1A	Microsemi	UPS5817	PowerMite	D3, D4	2
4	Diode, LED Green	Microsemi	UPGLED	0603	D5	1
5	P MOSFET 5.6A	Intl Rectifier	IRLMS6802	TSOP-6	Q2	1
6	PNP Dual matched	Diodes Inc	DMMT3906W	SOT-363	Q5	1
7	3 Pin Header, .100					5
8	Jumpers					5
9	6 Pin Header, .100					1
10	Terminal Lug					2

CAPACITORS

Line Item	Part Description	Part Description	Case	Reference Designators	Qty
1	Capacitor, 10 μ F, 16V, X7R	Murata GRM32DR71C106MA01L	1210	C1, C3	2
2	Capacitor, 0.1 μ F, 16V, X7R	Murata GRM219R71C104KA01D	0805	C4, C5	2

RESISTORS

Line Item	Part Description	Part Description	Case	Reference Designators	Qty
1	Resistor, 470 Ohm	Panasonic ERA-6YEB471V	0805	R7	1
2	Resistor, 47K	Panasonic ERA-6YEB473V	0805	R8, R9, R10	3
3	Resistor, 499K	Panasonic ERJ-6ENF4993V	0805	R11, R14, R15	3
4	Resistor, 100K	Panasonic ERJ-6ENF1003V	0805	R12	1
5	Resistor, 576K	Panasonic ERJ-6ENF5763V	0805	R13	1
6	Resistor, 75K	Panasonic ERJ-6ENF7502V	0805	RCCP	1
7	Resistor, 2.49K	Panasonic ERJ-6ENF2491V	0805	RCUS	1
8	Resistor, 150K	Panasonic ERJ-6ENF1503V	0805	RCTP	1