

Figure 1 Evaluation board components' layout

DESCRIPTION

The ZXCT1080EV1 evaluation board is intended for the evaluation of the ZXCT1080 device. The ZXCT1080 is a wide input common mode range current monitor. Because this wide input common mode range includes ground, the device is able to measure short circuit currents. It has a fixed gain of ten and requires no additional components thus making it a versatile device with a minimal components count.

The evaluation board is delivered with the values shown in Figure 2 below. As can be seen, R_S consists of two resistors (R1 and R2) which are configured in parallel such that either one or both resistors could be connected by completing the solder-bridge link next to each one. R2 (0.1R) is connected by default.

R3 consists of two pads with a hole in each pad and provides means for connecting an external R_S .

With the values shown, the board produces an output of 1V/A

The printed circuit board is common to other devices in the ZXCT family and contains redundant component positions which will not be discussed here as they are not relevant.

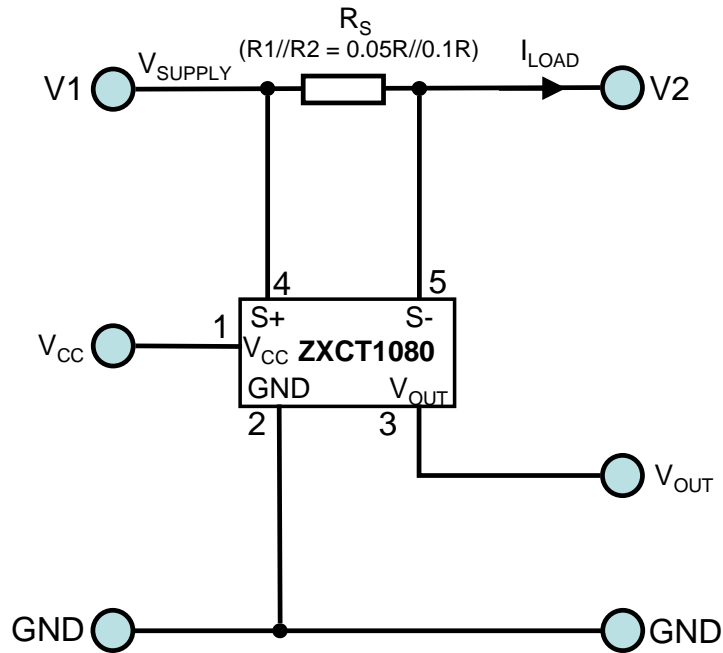


Figure 2 Equivalent circuit diagram for evaluation board ZXCT1080EV1

V_{CC} range 4.5V to 12V
 Supply Range 3V to 60V

ORDERING INFORMATION

ORDER NUMBER
ZXCT1080EV1

Please note that evaluation boards are subject to availability and qualified leads.

PAD NAMES AND DEFINITIONS

NAME	DESCRIPTION
V1	Supply Voltage
V2	Connection to Load
VOUT	Output Voltage
FLAG	Not used
GND	0V / Ground
SL1,SL2	Solder Links
V _{CC}	Device supply

The target applications are battery chargers, power supply units and other applications where high side current measurement is a requirement along with ability to measure down to 0V.

The input voltage (voltage on V1) range for the ZXCT1080EV1 is from 3V to 60V whilst V_{CC} ranges from 4.5V to 12V.

ZXCT1080EV1 Summary

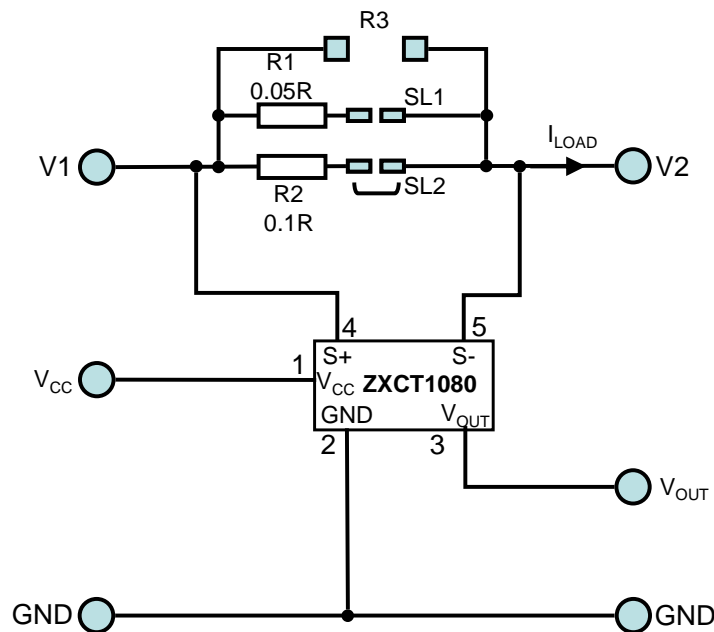


Figure 3 Actual circuit diagram for ZXCT1080EV1

Sense resistor

The board has been designed with two selectable values of sense resistor. The value of the sense resistor can be chosen by using the solder links SL1 and SL2.

The board is also tracked for a user defined through hole resistor (R3).

The 50mΩ resistor (R1) is selected by shorting SL1 and opening SL2. This results in an output of 0.5 V/A.

The 100mΩ resistor (R2) is selected by shorting SL2 and opening SL1, resulting in an output of 1V/A.

If both links are shorted the effective resistance is 33.33mΩ giving an output of 333.3mV/A.

If both links are open, the optional leaded resistor R3 can be exclusively used as the sense resistor. The maximum power dissipation rating of the resistor must be appropriate to the load current level.

For further information on choosing a value of sense resistor please refer to the ZXCT1080 datasheet.

Configuration table for ZXCT1080EV1

LOAD CURRENT (A)	R_{SENSE} (mΩ)	V_{OUT} (V)	SOLDER LINK CONFIGURATION
1.0	100	1.0	Short SL2
1.0	50	0.5	Short SL1
1.0	33.33	0.33	Short SL1 & SL2

Configuration for different LOAD currents.

The board can be configured for different load currents by changing the SMD resistors or fitting a suitable wire ended resistor and opening both solder links. It is important to ensure an appropriate value of R_S is selected to obtain the desired accuracy for a given output current.

The value of V_{OUT} is the voltage dropped across the sensing resistor multiplied by ten.

Choosing a larger value for R_S gives a higher output voltage for a given current resulting in better resolution but at the expense of increased voltage drop and higher dissipation in R_S .

The ZXCT1080 is optimized for values of V_{SENSE} between 10mV and 150mV.

Accuracy

The ZXCT1080 has a typical 3% accuracy for a V_{SENSE} of 100mV. The accuracy of the output voltage will be influenced by the tolerance of the external sense used. The ZXCT1080EV1 utilizes 1% sense resistors.

COMPONENTS LIST

Ref	Value	Package	Part Number	Manufacturer	Notes
R1	50mΩ	2512	LR2512-R050FW	Welwyn	SMD Sense Resistor 1%
R2	100mΩ	2512	LR2512-R100FW	Welwyn	SMD Sense Resistor 1%
R5,R6	0R	Link/0805	0805 1% generic		
I/O's		Test loops	100-108	Hughes	Rapid 17-1835 (6-off)
PCB			ZDB341R2	Zetex	
ZXCT		SOT23-5	ZXCT1080E5	Zetex	

SET-UP AND TEST

The board is preset to give an output Voltage of 1V for a load current of 1A (SL2 is shorted to connect in the 100mΩ (R2) sense resistor). To change the board to give an output Voltage of 1V for a current of 2.0A, de-solder SL2 and short SL1. This connects the 50mΩ (R1) sense resistor.

Required Equipment

1. 1 x 10R 5W resistor (load).
2. 2 x adjustable bench PSUs.
3. 2 x DVMs (one for voltage measurement and one for current measurement)

Note: BUT = Board Under Test

500mA load test

1. Ensure SL2 is shorted.
2. Limit PSU1's current to between 10mA and 40mA.
3. Limit PSU2's current to 0.6A.
4. Set PSU1 to 5V ±0.1V and connect it to V_{CC} on BUT.
5. Set PSU2 to 0V and connect between the V1 and GND terminals .
6. Connect the resistor in series with the ammeter between the V2 and GND terminals (10R 5W resistor is suggested, if using a different value, make sure it's power rating is $P \geq 2 \cdot I^2 \cdot R$).
7. Switch on PSU1, followed by PSU2.
8. Adjust PSU2 until the ammeter reads 500 mA ±1 mA,
9. Measure V_{OUT} with a DVM. The output voltage should read 0.5V ± 25mV.

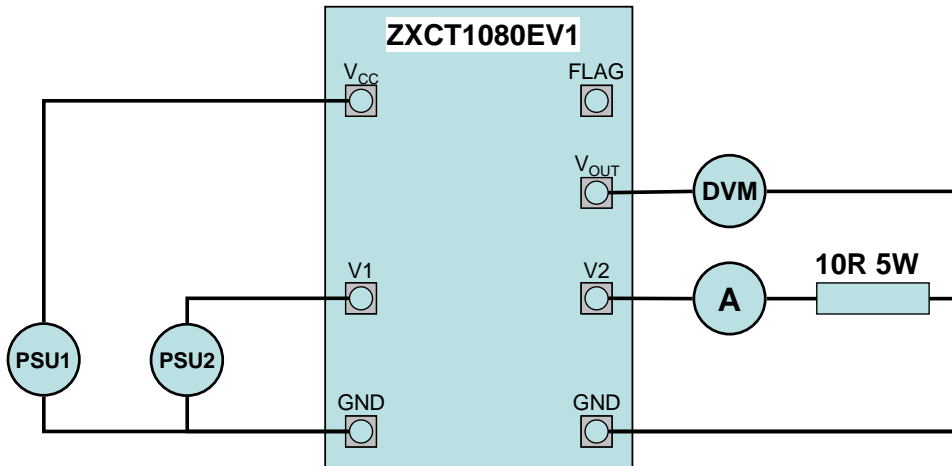
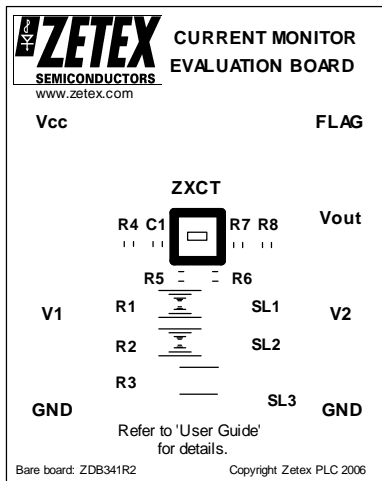
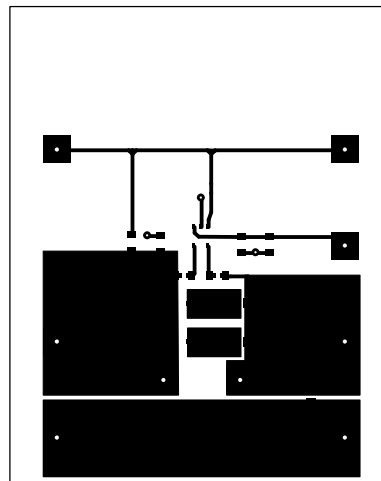


Figure 4 Test diagram for ZXCT1080EV1

EVALUATION BOARD



Top Silk



Top Copper

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