

Description

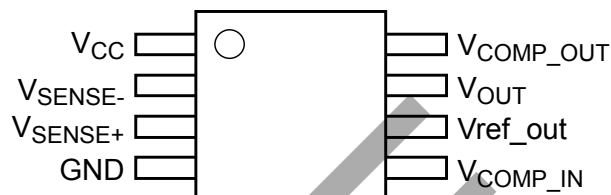
The ZXCT1030 is a high side current sense monitor containing an internal reference and comparator with a non-latching output. Using this device eliminates the need to disrupt the ground plane when sensing a load current.

The wide input voltage range of 20V down to as low as 2.2V make it suitable for a range of applications. Dynamics and supply current are optimized for the processing of fast pulses, associated with switch mode applications.

Features

- Low cost, accurate high-side current sensing
- Output voltage scaling
- Up to 18V output
- 2.2V - 20V supply range
- Voltage reference on chip
- Comparator on chip
- SO8 package

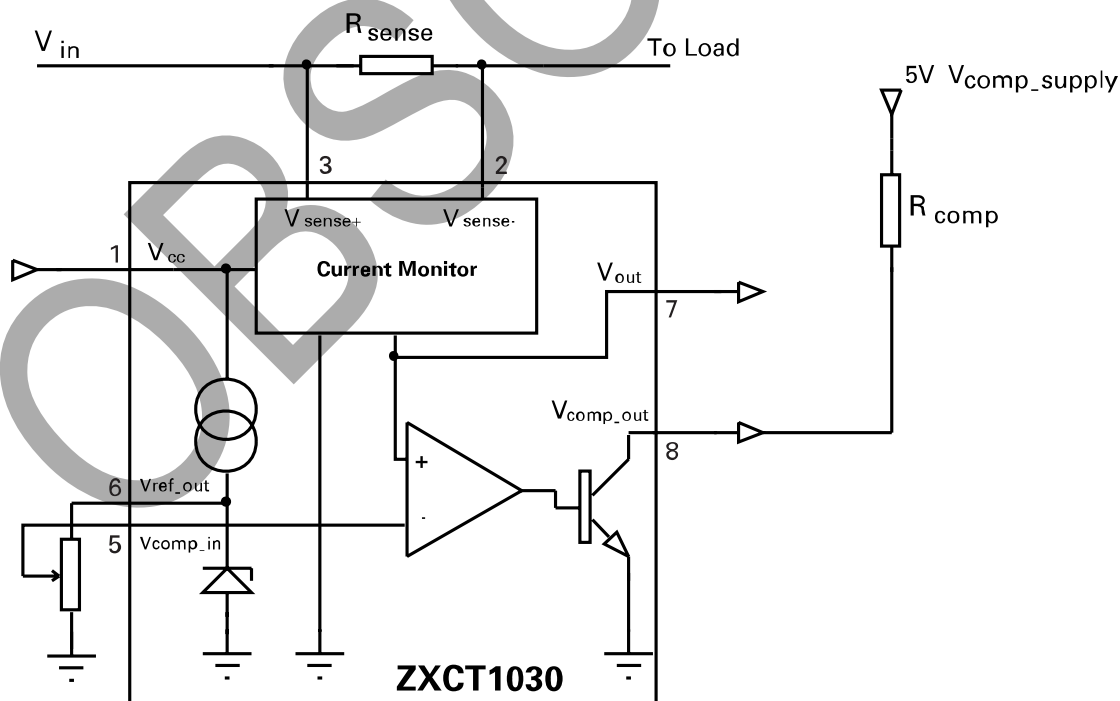
Pin Assignments



Applications

- Battery chargers
- Electronic fuse
- DC motor control
- Over current monitor
- Power management
- Inrush current limiting

Typical Application Circuit



Pin Description

| Pin Name | Function |
|-----------------------|--|
| V _{CC} | Supply voltage |
| V _{SENSE-} | Negative sense input |
| V _{SENSE+} | Positive sense input |
| GND | Ground |
| V _{COMP_IN} | Comparator input, usually a ratio of the reference or other control signal |
| V _{REF_OUT} | Reference output |
| V _{OUT} | Current monitor output voltage |
| V _{COMP_OUT} | Open collector comparator output |

Absolute Maximum Ratings

| Parameter | Rating | Unit |
|---------------------------|-------------------------------|------|
| Voltage on any pin | -0.6 and V _{CC} +0.6 | V |
| Operating Temperature | -40 to 85 | °C |
| Storage Temperature | -55 to 125 | °C |
| Package Power Dissipation | (T _{AMB} = 25) | °C |
| SO8 | 700 | mW |

Recommended Operating Conditions

| Parameter | Min | Max | Units |
|-----------------------------------|-------|-------------------------|-------|
| V _{CC} | 2.2 | 20 | V |
| V _{SENSE+} | 2.2 | V _{CC} | V |
| V _{SENSE} ^(a) | 10 | 500 | mV |
| V _{OUT} | 0 | V _{SENSE-} -1V | V |
| V _{COMP_IN} | 0.005 | 10 | V |
| T _{AMB} | -40 | 85 | °C |

Electrical Characteristics (ZXCT1030N8) – Test conditions $T_{AMB} = 25^{\circ}\text{C}$, $V_{IN} = V_{CC} = 15\text{V}$, $R_{COMP} = 10\text{k}\Omega$,

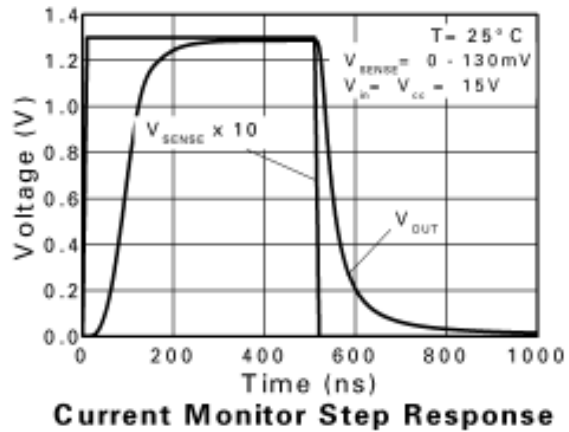
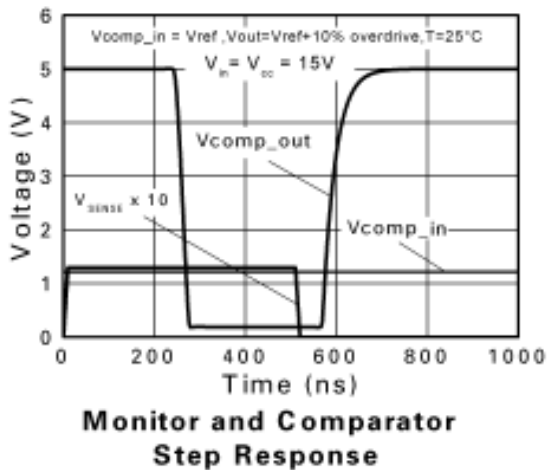
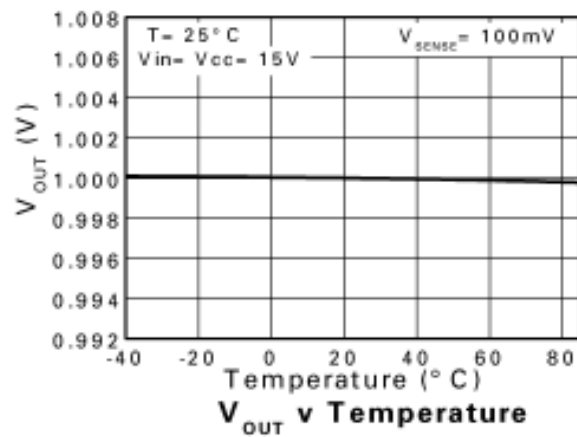
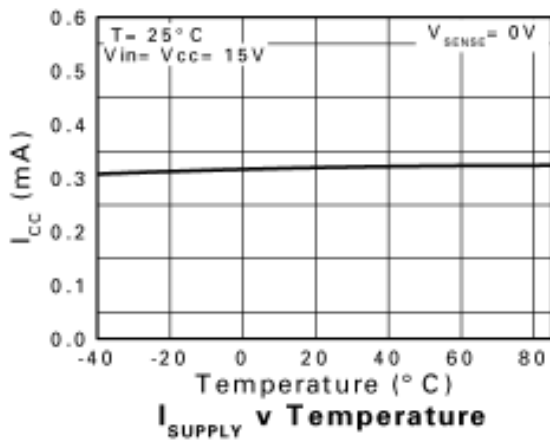
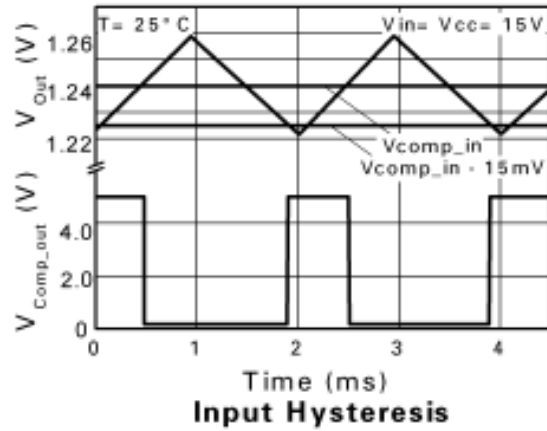
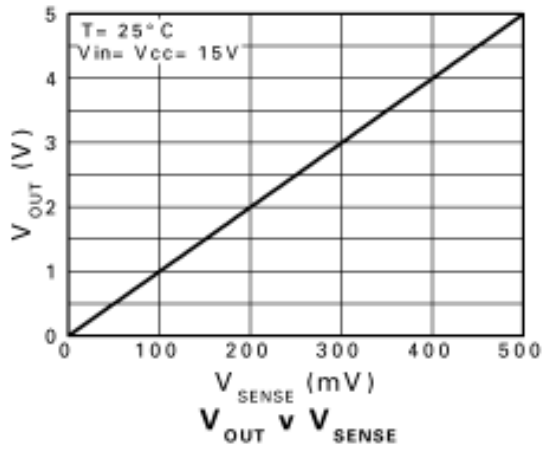
 $V_{COMP_SUPPLY} = 5\text{V}$ unless otherwise stated.

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|--------------------------|--------------------------------------|---|--------------------------------------|--|---|-------------------------|
| V_{CC} | V_{CC} Range | | 2.2 | | 20 | V |
| V_{SENSE+} | Sense+ Range | | 2.2 | | V_{CC} | |
| V_{OUT} | Output Voltage | $V_{SENSE} = 0$ $V_{SENSE} = 10$ $V_{SENSE} = 30$ $V_{SENSE} = 50$ $V_{SENSE} = 100$ $V_{SENSE} = 500$ | 0 88 284 480 970 4500 | 2 100 300 500 1000 5000 | 10 112 316 520 1030 5500 | mV |
| R_{OUT} | Output Resistance | $V_{SENSE-} = 15\text{V}$, $V_{OUT} = 1\text{V}$ | 1.2 | 1.5 | 1.8 | k Ω |
| V_{OUT} T_C | V_{OUT} Temperature Coefficient | | | 30 | | ppm/ $^{\circ}\text{C}$ |
| I_{CC} | Supply Current | $V_{SENSE-} = 15\text{V}$ | 170 | 270 | 350 | μA |
| I_{SENSE+} | V_{SENSE+} Input Current | | | 48 | 90 | μA |
| I_{SENSE-} | V_{SENSE-} Input Current | $V_{SENSE-} = 14.9\text{V}$ | | 70 | 220 | nA |
| $V_{CM(MIN)}^{(B)}$ | Minimum Active Common Mode Voltage | $V_{CC} = 15\text{V}$ $V_{COMP_SUPPLY} = 5\text{V}$ $V_{COMP_IN} = V_{REF}$ $V_{SENSE} = 10\text{mV}$ | 2.8 | | | V |
| A_{CC} | Accuracy | $V_{SENSE} = 100\text{mV}$ | -3 | | 3 | % |
| GAIN | V_{OUT}/V_{SENSE} | $V_{SENSE} = 100\text{mV}$ | 9.7 | 10.0 | 10.3 | |
| BW | Bandwidth | $V_{SENSE} = 10\text{mVp-p}$ $V_{SENSE} = 100\text{mVp-p}$ | | 3 6 | | MHz |
| COMPARATOR | | | | | | |
| V_{COMP_IN} | Input Voltage | | 0.005 | | 10 | V |
| V_H | Hysteresis | | | 15 | | mV |
| I_B | Input Bias | | 5 | 80 | 150 | nA |
| T_D | Propagation Delay | | | 100 | | ns |
| V_{OL} | Output Voltage Low | | 30 | 150 | 200 | mV |
| V_{OH} | Output Voltage High | | | | V_{COMP_SUPPLY} | |
| I_{OL} | Output Sink Current | $V_{ol} = 0.4\text{V}$ | 2 | | | mA |
| I_{OH} | Output High Leakage Current | | | | 1.0 | μA |
| Voltage Reference | | | | | | |
| V_{REF} | | Reference Current = +300 μA to -5 μA | 1.200 | 1.240 | 1.280 | V |
| Delta V_{REF} | Change in V_{REF} | SOURCE 5 μA to SINK 300 μA | | 10 | | mV |
| T_C | | | | 30 | | ppm/ $^{\circ}\text{C}$ |
| PSR | Supply Rejection | | | 0.01 | | %/V |

Notes: (a) $(V_{SENSE+}) - (V_{SENSE-})$
 (b) Level of V_{SENSE+} where comparator output defaults to 'off'.

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Typical Application Circuits

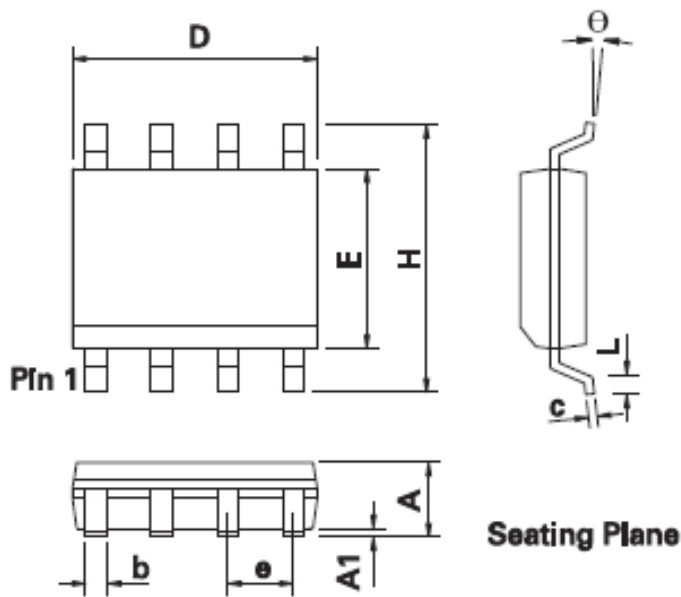


Ordering Information*

| Device | Status(*) | Package | Device Marking | Reel Size (inches) | Tape Width (mm) | Quantity Per reel |
|--------------|-----------|---------|----------------|--------------------|-----------------|-------------------|
| ZXCT1030X8TA | Obsolete | MSOP8 | ZXCT1030 | 7 | 12 | 1000 |
| ZXCT1030N8TA | Active | SO8 | ZXCT1030 | 7 | 12 | 500 |

Notes: *ZXCT1030X8TA is obsolete for more device information please check our obsolete products search on diodes website

Package Outline – SO8



Seating Plane

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|-----|--------|-------|-------------|------|-------|-----------|-------|-------------|------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.053 | 0.069 | 1.35 | 1.75 | e | 0.050 BSC | | 1.27 BSC | |
| A1 | 0.004 | 0.010 | 0.10 | 0.25 | b | 0.013 | 0.020 | 0.33 | 0.51 |
| D | 0.189 | 0.197 | 4.80 | 5.00 | c | 0.008 | 0.010 | 0.19 | 0.25 |
| H | 0.228 | 0.244 | 5.80 | 6.20 | theta | 0° | 8° | 0° | 8° |
| E | 0.150 | 0.157 | 3.80 | 4.00 | h | 0.010 | 0.020 | 0.25 | 0.50 |
| L | 0.016 | 0.050 | 0.40 | 1.27 | - | - | - | - | - |

Note: Controlling dimensions are in inches. Approximate dimensions are provided in millimeters

OBSOLETE – PART DISCONTINUED

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