

Isolated Current Sensors Feature High Speed And High Accuracy

From [Crocus Technology](#), a supplier of switch, angle sensors and current sensors, the CT430 and CT431 XtremeSense TMR devices are isolated current sensors with 1-MHz bandwidth and <1% total error over the full temperature range. The high-speed operation and accurate output allow customers to optimize system design for smaller size and higher efficiency. In contrast to existing designs that utilize a Hall Sensor, the XtremeSense TMR sensors are said to enable a no-compromise design solution by combining high bandwidth response and high accuracy (see the figure).

The CT43x products are coreless devices which utilize Crocus' XtremeSense TMR technology to detect extremely small variations in ac or dc currents while achieving an unprecedented total output error of less than $\pm 1.0\%$ over the full temperature range from -40°C to $+125^{\circ}\text{C}$. In addition, the CT43x has robust built-in immunity to common-mode fields, which allows the device to reject >99% of stray fields with the need for external shielding.

Crocus' TMR technology inherently offers very high signal-to-noise ratio (SNR) which allow for high resolution measurements required for precision control or monitoring applications. The linear error and offset performance is intrinsically more accurate permitting the elimination of system-level calibration normally done with an external voltage reference, thus freeing up processor time and simplifying system design.

"I'm excited to introduce this truly differentiated current sensor product which highlights the benefits the Crocus XtremeSense TMR technology can bring," states Zack Deiri, president and CEO of Crocus Technology.

"Our customers have been astounded by the level of performance we are able to deliver in their applications. The combination of high response time and accuracy provides system designers the flexibility they have been eager to achieve without any compromises."

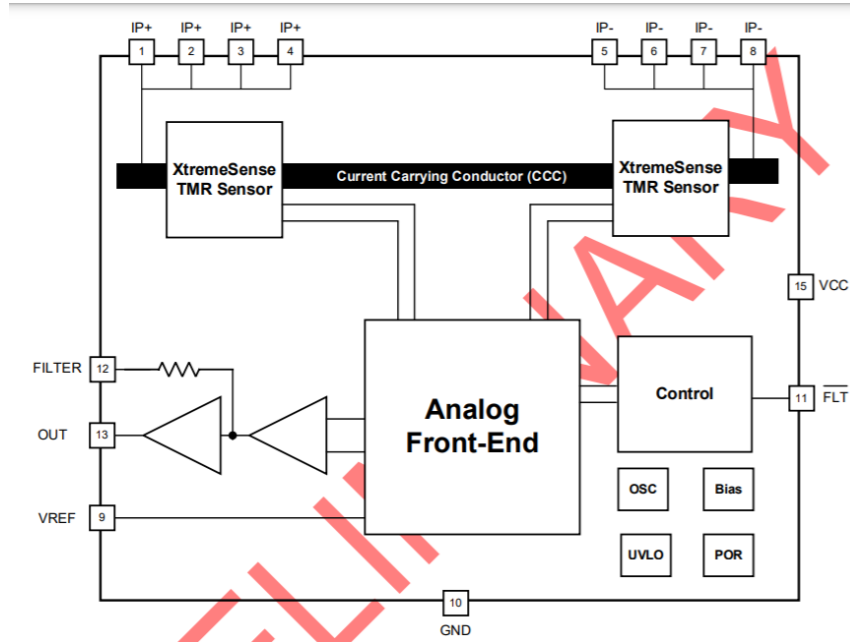
Product features and performance:

- Operation from a 5-V (CT430) or 3.3-V supply (CT431)
- Integrated $0.5\text{-m}\Omega$ conductor enabling 20-A, 30-A and 50-A applications
- Total error output $\pm 0.7\%$ (typ) 300-ns response time, 1-MHz bandwidth
- Low noise 9-mArms integrated common-mode field rejection (CMFR) with >99% immunity
- Overcurrent detection output pin.

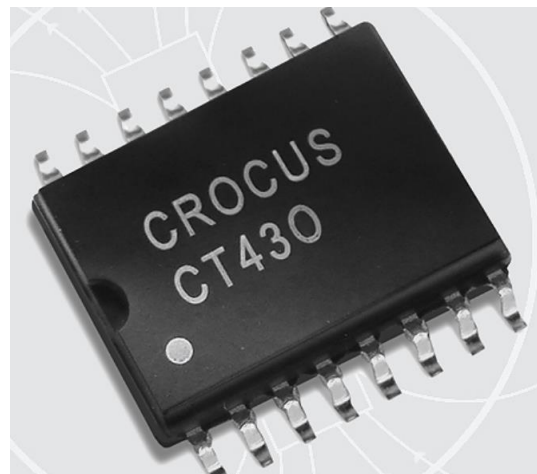
Investments made last year to expand our production capacity has enabled Crocus to be prepared to support high volume production today. To date, the company has shipped over 50M XtremeSense TMR sensors, and our customer base continues to rapidly expand. Products like the CT430 and CT431 which have an industry-standard footprint enable customers to easily upgrade their existing products and accelerate product adoption.

Targeted applications include solar power inverters, power factor correction circuits, battery management systems, smart appliances, IoT devices, and power supplies. These state-of-the-art devices are well suited to emerging applications using GaN and SiC power devices where the fast response time of the Crocus TMR current sensors will ensure the highest operational efficiency.

The CT430 and CT431 are available in an industry-standard 16-lead SOIC-Wide package with dimensions of $10.20 \times 10.31 \times 2.54$ mm. Samples and evaluation boards are currently available, and the devices are in full production. The CT43x products are available now from authorized distributors with pricing at \$3.34 each in quantities of 1,000. For more information, see the [CT430](#) and [CT431](#) product pages.



(a)



(b)

Figure. The CT430 and CT431 are high-bandwidth and ultra-low-noise integrated contact current sensors that use Crocus Technology's XtremeSense TMR technology to enable high-accuracy current measurements for many consumer, enterprise and industrial applications. Each sensor IC supports six current ranges where the integrated current carrying conductor (CCC) will handle up to 50 A of current and generates a current measurement as a linear analog output voltage. The sensor chips achieve a total output error of less than $\pm 1.0\%$ full-scale over voltage and the full temperature range. The CT430 and CT431 offer operation from a 5-V supply and a 3.3-V supply, respectively. A block diagram for the CT430 IC is shown here (a) along with a photo of the device's 16-pin SOIC package (b).