

 Press Information

Magnetic Sensors

TDK introduces new high-performance Hall-based current sensor IC for C-core concentrators for high power conversion systems

- Customer-programmable linear Hall-effect current sensor IC optimized for C-core concentrators.
- Selectable 250 kHz / 500 kHz bandwidth and user-adjustable 2.5 V quiescent output for fast bi-directional current sensing.
- AEC-Q100 Grade 0 qualified with EEPROM trimming, protection functions, and diagnostics including broken-wire detection.

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TDK Corporation (TSE: 6762) announces the Micronas CUR 3020, a new customer-programmable, low-noise, high-accuracy linear Hall-effect current sensor IC optimized for use with a C-core concentrator. The device is designed for current measurement in xEV traction inverters, 2-/3-wheelers and high-power inverters, battery management and disconnect systems, and industrial current sensor modules *. The CUR 3020's wafers are manufactured at TDK's own fabrication facility in Freiburg, Germany, ensuring greater control over production and supporting long-term supply stability. Samples are available upon request.

The CUR 3020 is a customer-programmable, low-noise, high-accuracy linear Hall effect current sensor IC with 250 kHz / 500 kHz selectable bandwidth options. This Hall-effect sensor IC provides a voltage output that is proportional to the applied magnetic field. The quiescent voltage output is centered at 2.5 V for bi-directional applications and is user-adjustable. The output sensitivity is programmable within a wide range of 4.2 to 67.4 mV/mT for various max current levels.

The accuracy of the device can be enhanced using one of three versatile programming methods outlined in the CUR 3020 programming guide. The device uses an EEPROM to optimize the device sensitivity and the QVO for a given application. The CUR 3020 is pre-optimized for performance over temperature providing low sensitivity and offset drift errors over the full automotive grade 0 range. There are various programming options available and outlined in the CUR 3020 programming guide, which can be shared by request.

It is housed in a 4-pin TO-92 package (UM) with a high-sensitivity Hall element for maximum accuracy. With user-selectable output voltage clamps that can be enabled or disabled, broken ground and wire detection, and over temperature diagnostics, the CUR 3020 is ideal for automotive applications. The hot ambient operating temperature of the part has increased to 165°C to support harsher xEV traction inverter environments for short periods of time.

Glossary

- AEC-Q100 Grade 0: Automotive qualification grade with extended high-temperature requirements
- C-core concentrator: Magnetic concentrator core used to guide magnetic flux from a current conductor to the Hall sensor element for current measurement
- CSM: Current Sensor Module, a sensor module with an IC and peripherals (concentrator, shielding, electronics/logic, connectors, housing); commonly used in industrial applications
- MPPT: Maximum power point tracking
- QVO: Quiescent voltage output (output voltage at zero magnetic field)
- xEV: Electrified vehicle (hybrid or battery electric)

Main applications*

- xEV traction inverter
- Personal mobility & AUX inverter
- Battery management and disconnect systems
- Industrial CSMs

Main features and benefits**

- Max sensitivity drift error 1% over –40 to 150°C
- Max offset drift error 5 mV over –40 to 150°C
- Programmable bandwidth 250 or 500 kHz
- Selectable sensitivity range between 4.2 and 67.4 mV/mT
- Integrated protections
 - Undervoltage and overvoltage detection
 - Optional output clamps (can be enabled or disabled separately)
 - Open-circuit detection on ground pin and VSUP (broken wire)
 - Reverse-voltage protection
 - Programmable overtemperature diagnostics
- AEC-Q100 Qualification Grade 0, with increased TA = 165°C

Parameter	CUR 3020		
	Min.	Typ.	Max.
Sensitivity over temp. (–40 to 150°C)	–1%	0.75%	1%
Sensitivity over lifetime		0.5%	
Sensitivity ratiometric errors	–0.25%		0.25%
Offset over temp (–40 to 150°C)	–5 mV	2 mV	5 mV
Offset over lifetime		0.5 mV	
Offset ratiometric errors	–2.5 mV		2.5 mV
Noise (output referred) @ 25°C for 10 mV/mT		0.75 mV _{RMS} (250kHz) 1.5 mV _{RMS} (500kHz)	
Linearity error	–0.2%	0.05%	0.2%
Bandwidth (programmable)		250 kHz	500 kHz
Response time (500 kHz)		0.86 μs	1.5 μs
Ambient Operating Temp.	–40 °C		165 °C

*Any mention of target applications for our products is made without a claim for fit for purpose as this has to be checked at system level.

**All operating parameters must be validated for each customer application by customer's technical experts.

About TDK Corporation

TDK Corporation (TSE:6762) is a global technology company and innovation leader in the electronics industry, based in Tokyo, Japan. With the tagline "In Everything, Better" TDK aims to realize a better future across all aspects of life, industry, and society. For over 90 years, TDK has shaped the world from within; from the pioneering ferrite cores to cassette tapes that defined an era, to powering the digital age with advanced components, sensors, and batteries, leading the way towards a more sustainable future. United by TDK Venture Spirit, a start-up mentality built on visions, courage and mutual trust, TDK's passionate team members around the globe pursue better—for ourselves, customers, partners, and the world. Today, the state-of-the-art technologies of TDK are in everything, from industrial applications, energy systems, electric vehicles, to smartphones and gaming, at the core of modern life. TDK's comprehensive, innovative-driven portfolio includes cutting-edge passive components, sensors and sensor systems, power supplies, lithium-ion and solid-state batteries, magnetic heads, AI and enterprise software solutions, and more—featuring numerous market-leading products. These are marketed under the product brands TDK, InvenSense, Micronas, Tronics, TDK-Lambda, TDK SenseEI, and ATL. Positioning the AI ecosystem as a key strategic area, TDK leverages its global network across the automotive, information and communication technology, and industrial equipment sectors to expand its business in a wide range of fields. In fiscal 2026, TDK posted total sales of USD 16.6 billion and employed about 107,000 people worldwide.

About TDK-Micronas

TDK-Micronas is the center of competence for magnetic-field sensors and CMOS integration within the TDK group. TDK-Micronas has gained operational excellence for sensors and actuators production in over 25 years of in-house manufacturing. It was the first company to integrate a Hall-effect based sensor into CMOS technology in 1993. Since then, TDK-Micronas has shipped over eight billion Hall sensors to the automotive and industrial market. The operational headquarters are located in Freiburg im Breisgau (Germany). Currently, TDK-Micronas employs around 1,000 people.

You can download this text and associated images from <https://www.micronas.tdk.com/en/tradenews/pr2605>.

Further information on the products can be found under <https://www.micronas.tdk.com/en/products/current-sensing/cur-30xy>.

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