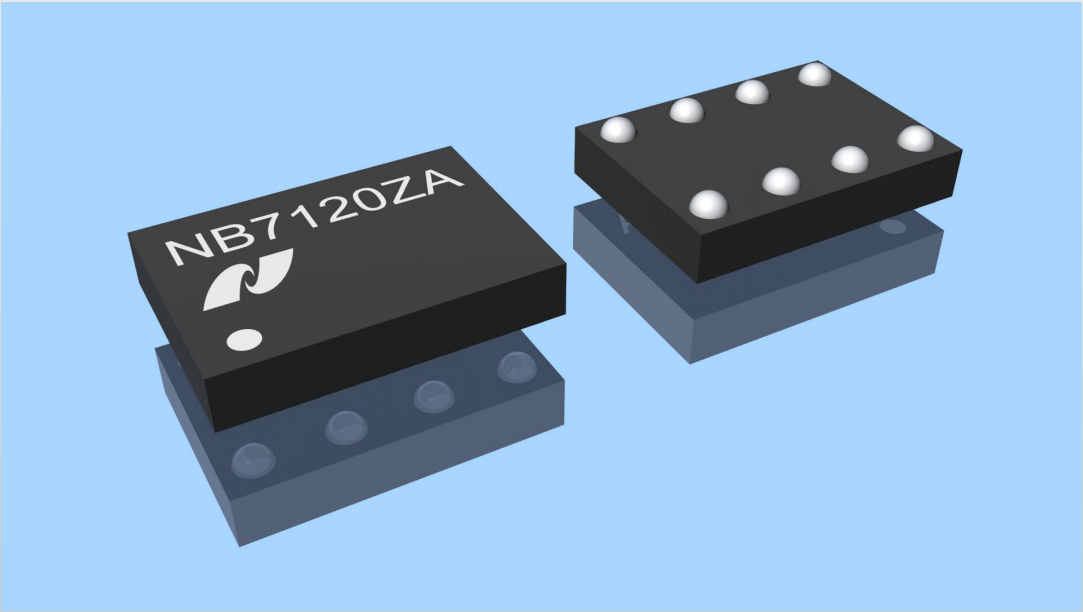
Press RELEASES

PR-No. 08 – 11. June 2024

A cutting-edge 1-Cell Li-Ion Battery Protection IC for use with High-Side MOSFETs and more Safety Features

Tokyo, Japan, May 8th, 2024—Nisshinbo Micro Devices, a leader in innovative semi-conductor products, is proud to announce the release of the NB7120ZA. A state-of-the-art single-cell Li-Ion battery protection IC in an ultra-small WLCSP package with advanced features and additional safety measures, ideal for a wide range of applications, including hearing aids and wearable devices, smartphones, and handheld data terminals.

The NB7120 is an exceptional protection IC equipped with all standard safety features, such as overcharge/over-discharge voltage, charge/discharge overcurrent and short circuit detection, making the application highly reliable. The additional safety measures are mainly focused on the improved accuracy level of these measurements, which is particularly important for small devices worn on or in the human body to prevent un-intentional injuries when the Li-Ion battery fails, such as:



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- High-accuracy overcharge and over-discharge detection (OVP & UVP)
  Both support extending battery life as the battery voltage can be nearer to the threshold level
- High-accuracy overcurrent detection (OCP)
  A lower sense voltage and more accurate overcurrent detection enables the use of a smaller (Rsense) sense resistor, resulting in a lower heat generation at high currents
- High-accuracy 0 V Battery Charging Inhibition Voltage
  Charging a deep discharged battery (0 V) can cause an internal short circuit, the inhibition threshold voltage can be set in a 0.05 V step rate from a safety point of view
- A TIN pin was added to connect a temperature sensor and monitor the temperature of the battery cell.

A unique feature of the NB7120 is the use of high-side MOSFETs which allow the ground of the protection circuit to be connected directly to the battery's negative terminal. This simplifies the design complexity as all measurement and control signals can be referenced to the same ground potential. While using high-side MOSFETs offers advantages, they typically require a more complex gate control circuitry, as the gate voltage must be higher than the source voltage. Therefore, a dedicated charge pump is integrated, and no additional external components are required.

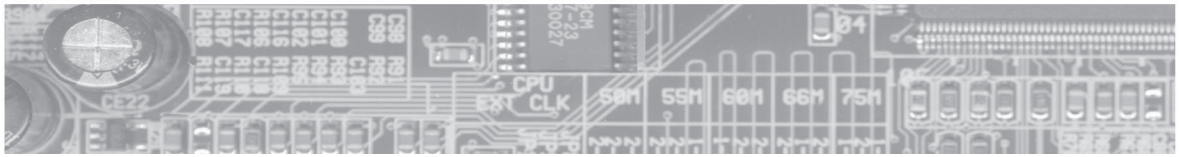
Finally, the additional CTL input offers a Forced Standby Function to control the product into standby mode without over-discharging the battery. Power consumption can be significantly reduced in this way and returns to the normal mode when a charger is connected.

Availability and Pricing

The NB7120 is available in a space-saving WLCSP-8-P15 package, suitable for use in small-sized applications and gadgets. More Information about availability, samples and pricing, please visit email: sales.europe@macnica.com.

NB7120ZA Specifications:

- Supply Current: Normal mode: Typ. 5.0μA / Max. 8.0 μA,
  Standby mode: Max. 0.04 μA



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Detector Selectable Range and Accuracy:

- Overcharge Detection Voltage (V_{DET1}): 4.2 V to 4.6 V, ±10 mV
- Over-discharge Detection Voltage (V_{DET2}): 2.0 V to 3.4 V, ±35 mV
- Discharge Overcurrent Detection Voltage (V_{DET3}):

0.0080 V to 0.0800 V

0.0080 V to 0.030 V: ±1.5 mV

0.0301 V to 0.060V: ±5%

0.0601 V to 0.0800 V: ±3 mV

- Charge Overcurrent Detection Voltage (V_{DET4}):

–0.080 V to –0.008 V

–0.008 V to –0.0325 V: ±1.5 mV

–0.0326 V to –0.0600 V: ±5%

–0.0601 V to –0.0800 V: ± 3mV

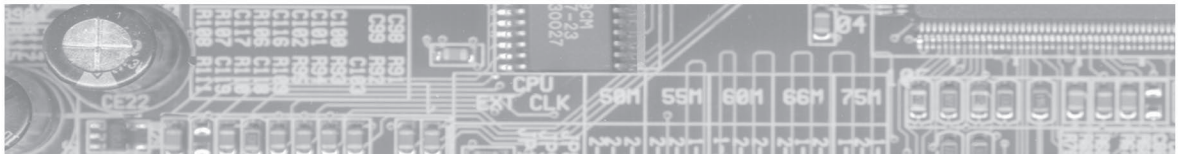
- Short Circuit Detection Voltage (V_{SHORT}): 0.025 V to 0.125 V, ±2.5 mV
- 0 V Battery Charging: Inhibition
- 0 V Battery Charging Inhibition Voltage (V_{NOCHG}): 1.25 V to 2.00 V, ±50 mV
- Over-discharge Release Type: Latch
- Discharge Overcurrent Release Type options: Auto Release / Latch
- NB7120ZA Package: WLCSP-8-P15 (1.50 × 1.08 × 0.38 mm)
- Datasheet NB7120ZA: Consumer version

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About Nisshinbo Micro Devices Inc.:
Established in January 2022, Nisshinbo Micro Devices Inc. is a merger of the former companies Ricoh Electronic Devices Co, Ltd., and New Japan Radio Co, Ltd, both members of the Nisshinbo Group.

The history of the two companies goes back to 1959, resulting in more than 60 years of experience in the electronics industry. Today, it is one of the leading global suppliers of advanced analogue products. Its portfolio offers a comprehensive range of ICs for Power Management, Supervisory, Operational Amplifiers, Battery Management, RF, Audio & Video, Optoelectronic devices, Motor drivers to name a few. These products enable electronics engineers to design advanced applications for consumer, industrial and automotive markets.

The company is headquartered in Tokyo, Japan, and has development, sales, and manufacturing facilities across the country. In addition, it has regional sales and support offices in North America, Europe, and Asia. For further information, please visit website https://www.nisshinbo-microdevices.co.jp/en/

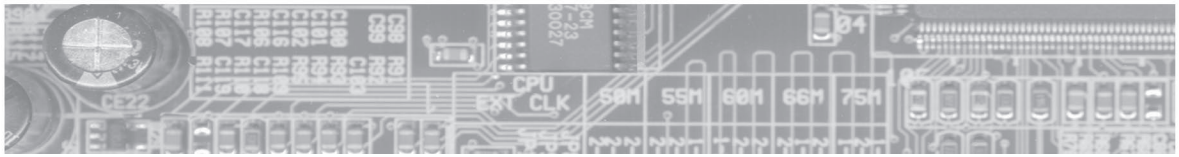
About Macnica ATD Europe GmbH
Macnica's ATD Europe GmbH, (former Macnica GmbH), was originally established in the UK in 2006, and moved to Germany in July 2008, to increase efficacy of its service for European customers.

By it's acquisition of the Munich based company Scantec Mikroelektronik in 2014 Macnica Europe formed a powerful semiconductor distribution with headquarter in Ingolstadt and offices in Munich, Regensburg, Milton Keynes (UK) and Warsaw offering an attractive and competitive portfolio of highly sophisticated devices.

Macnica provides end to end support from design-in to production through its global service network to its customers, regardless of the final destination of the product shipment to customers' manufacturing locations.

About Macnica ATD Europe S.A.S.
Founded in 1990 as ATD Electronique, Macnica ATD Europe headquarter offers innovative components dedicated to imaging applications for the European market. Its product portfolio includes: image sensors (CCD, CMOS, InGaAs, Thermal etc.), optics, interface circuits, FPGA & IPs, imaging processors, cables and OLED microdisplays.

It also covers development tools and design services enabling fast and efficient realization of new high-performance camera systems for markets such as machine vision, medical, life sciences, surveillance, automotive and others. After the acquisition of the



company by Macnica Inc. as of October 1, 2020 the company operates under the name Macnica ATD Europe.

About Macnica, Inc.

Macnica was established in 1972 as a semiconductor distribution company headquartered in Yokohama, Japan, and has over 85 sales offices worldwide in eastern Asia, Europe and the USA. Total number of employees is over 3,900 and its consolidated revenue for fiscal 2021 was approximately US$ 7.6 B.

Macnica is famous for having an excellent engineering team of more than 900 application support engineers, IC designers and software developers with strong focus on providing technical support for its customers including custom design services. Macnica is continuing to extend its presence globally by having successful partners in strategic areas in the electronics market.

More information about Macnica: https://www.macnica.com/global/en/home.html.

