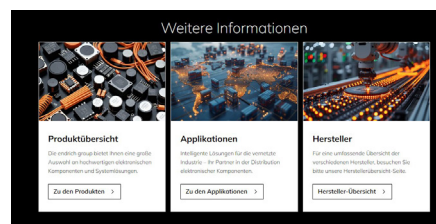
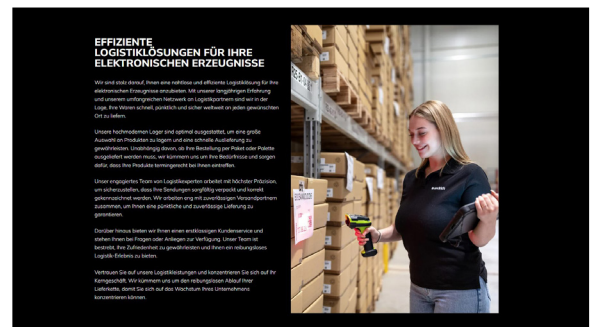
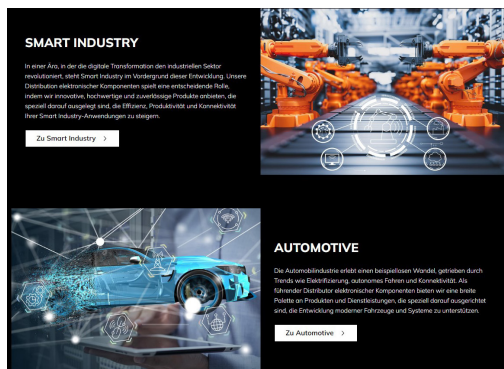


07 & 08/2024

endrich NEWS

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Dr. Christiane Endrich

HIGHLY SENSITIVE AVALANCHE PHOTO-DIODES (APDS) FOR OPTICAL MEASURE-MENT TECHNOLOGY

A photodiode is used, among other things, to convert light into an electrical voltage or an electrical current or to receive information transmitted with light.

Photodiodes can be used in the following three operating modes:

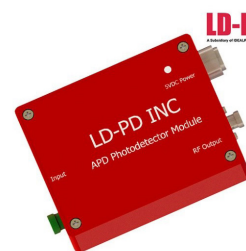
1. operation in the forward direction as a large-area photodiode (solar cells)
2. operation in the quasi short circuit, for brightness measurement
3. operation in the blocking range to increase the cut-off frequency

Avalanche photodiodes (APDs) are photodiodes that consist of highly sensitive semiconductor elements for detecting photons. They have similar structures to PIN photodiodes, but operate under a high reverse bias voltage, resulting in a multiplication of electrons and holes created by the impact of photons. They allow the development of devices for measuring low light levels where these signals are converted into electrical signals. The high sensitivity of APDs in photon detection is often used for applications where high light sensitivity is required, e.g. in confocal microscopy and PET scanners.

Avalanche photodiodes work on the principle of avalanche propagation, which enables internal signal amplification in the device. These devices are best suited for applications where low intensity optical signals are measured, such as: laser microscopy, PET scanners, laser scanners, laser range finders, barcode readers, optical fiber receivers for communications, Optical Time Domain Reflectometers (OTDR) These features enable a wide range of applications in various industries, including telecommunications, aerospace, biomedical analysis, scientific research,

environmental monitoring, manufacturing, security and surveillance.

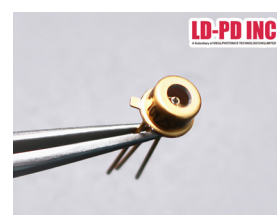
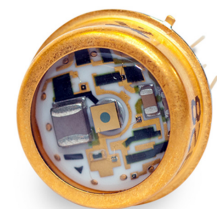
The APD modules from LD-PD are based on low-noise avalanche photodiodes made of silicon or InGaAs with a built-in preamplifier and high-voltage supply. A temperature compensation function enables the APD to operate at constant gain over a wide operating temperature range. The APD modules from LD-PD have the following features: Planar APD with vertical illumination, Low dark current, High responsiveness, Built-in high voltage power supply, Built-in power supply with low noise isolation



LD-PD INC
A DIVISION OF ENDRICH TECHNOLOGIES

InGaAS APD photodiode module, response wavelength 900-1700nm, bandwidth AC-50m; material InGaAs, responsivity 9A/W, module; 100*100*25mm

Si-APD receiver with amplifier, 0.8mm, 50MHz, TO-8 response between 400 and 1100nm



LD-PD INC
A DIVISION OF ENDRICH TECHNOLOGIES

Ø1.8mm 905nm silicon avalanche photodiode, active area 1.8 mm; response spectrum 400-1100nm, material Si, response time 1.0ns, TO5 housing

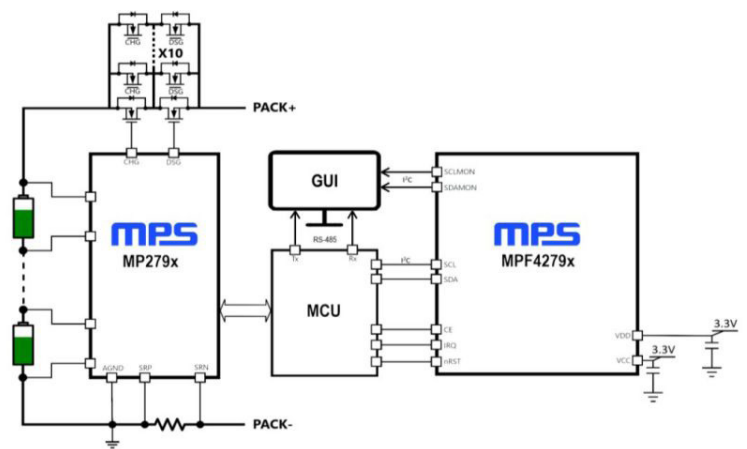
NEWS

HIGH-POWER BATTERY MANAGEMENT SYSTEM SOLUTION MODULE MBMXXS-P100-X

The MBMxxS-P100-x is a complete solution design for the BMUxxS-P100-x, a board for high-current designs with a 7-cell to 16-cell series battery management unit. This board uses the MP279x ICs, a robust family of battery management analog front-ends (AFEs) that provide a complete AFE monitoring and protection solution. The MP279x supports up to 16 cells in series, and provides two separate analog-to-digital converters (ADCs) for synchronous voltage and current measurements.

The high-side MOSFET (HS-FET) driver and robust hardware (HW) protection functions come with configurable thresholds. Protections include over-current protection (OCP), short-circuit protection (SCP), battery and cell over-voltage protection (OVP), battery and cell under-voltage protection (UVP), over-temperature protection (OTP), and under-temperature protection (UTP).

The MP279x also integrates internal balancing FETs to equalize mismatched cells, while offering the option to control external FETs for a higher balancing current.



The board also features the MPF4279x, a standalone battery fuel gauge IC that performs state-of-charge (SoC), time-to-full, time-to-empty, and unavailable energy estimation using a custom battery model obtained through exhaustive characterization and voltage, current, and temperature readings. This solution is fast, simple, and easy to configure through the graphic user interface (GUI). The board offers a high-power solution with up to 100A of constant current and up to 150A of peak current. Each board offers a different combination of the MP279x and MPF4279x.

FEATURES

- High-side charge and discharge (including pre-charge function) MOSFETs
- 7 cells, up to 16 cells in series
- Up to 100A of constant charge/discharge current and up to 150A of peak current
- True hardware protections
- 5V, CAN Bus and UART availability for external devices
- External Fault Indicator LED and Pack Voltage Status LED
- Configurable Alarm Reactions and Thresholds: OVP/UVP, OCP/SCP & OTP
- Cell-Balancing with Internal MP279x FETs with Option of External Balancing FET for Higher Current
- Sleep Mode with Standby Discharge FET for Lower Current Consumption with Automatic Wake-p when a Load/Charger is Detected
- Load/Charger Detection Option in Safe Mode

APPLICATIONS

- Battery Management Unit

MEASURING CURRENTS WITH MAGNETIC SENSORS

A summary of technologies and products

The manufacturer

Sensitec is a German semiconductor manufacturer for TMR, GMR, AMR as well as Hall-Sensors with production locations in Wetzlar (HQ) and Mainz. System solutions are produced in Wetzlar, while the semiconductor chips are developed and produced in their own waver fab in Mainz under cleanroom conditions.

In 2020 the Chinese company Sinomags acquired Sensitec and Sinomags' exceptional expertise in the field of current sensors as well as Sensitec's chip-know-how make Sensitec-Sinomags a manufacturer of a wide range of high-quality current sensors that does not have to shy away from competition with other manufacturers.

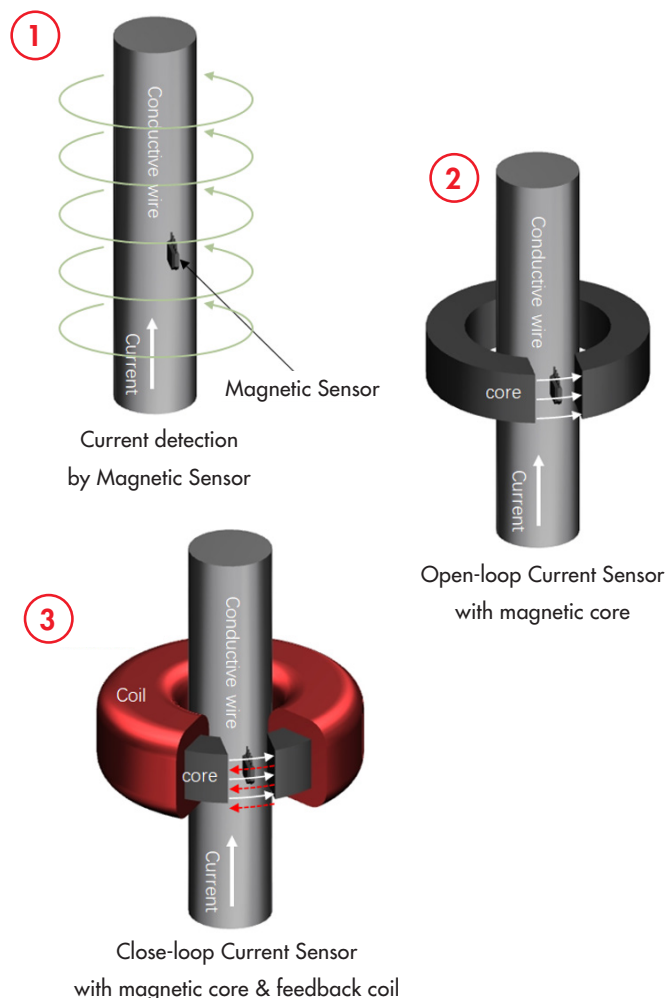
The Technologies

Sensitec mainly uses TMR- and Hall technologies for current sensor elements. For residual current sensors, which is a special variant of the current sensors, the magnetic fields are very low and therefore the flux-gate principle is applied in these cases.

The current sensors can be divided into two classes: coreless detection types (1), where the bare sensor IC is exposed to the magnetic field of the current without any ferrite core and core-types (2+3), where the magnetic flux is collected in a ferrite core with the sensing element positioned in the air gap of the core.

For core type current sensors, so called open-loop sensors (2) must be distinguished from closed-loop types (3).

Open-loop-sensors measure the amount of magnetic flux concentrated in the core. In closed-loop-sensors, there is a coil wound around the ferrite core. A current through this coil generates an additional magnetic field in the core. By choosing the amount and direction of this current property the magnetic field of the current can be compensated to zero. By this compensation current, the current in question can be calculated.



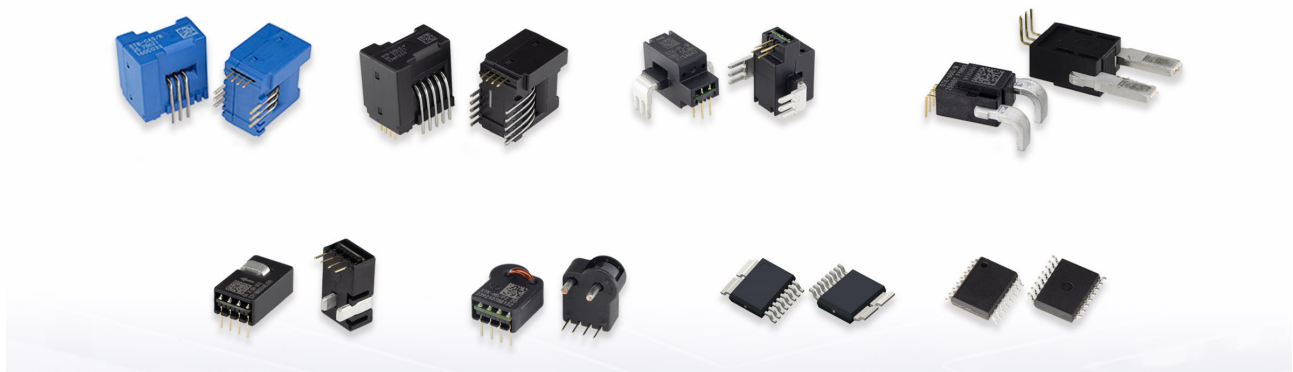
NEWS

Core- and coreless current sensors for universal use: STK-PL, STK-CTS, STB-CAS and STK-HD-Serie

- Open and closed loop available
- Measurement range up to 200A
- Accuracy 0.1 ... 2%
- Response time down to 50 ns
- Frequency bandwidth up to 1.5 MHz
- Current sensors on chip-level: STK-616 Series

APPLICATIONS

- Charging stations
- Motor control
- Battery charging



Residual current sensors: Series SFG-P, SFG-CPL and STK-P/M Series

- ac and dc leakage current protection
- mainly fluxgate-measuring principle
- typical tripping thresholds: 6mA dc and 30 mA ac
- Single and three phase designs
- 1 mA full temperature range accuracy
- Switching digital output
- Compliant to many EC and UL- standards

APPLICATIONS

- EV Charging stations
- Photovoltaic power generation



GIGADEVICE'S GD32VW553 RISC-V CORE WI-FI 6 MCU



The GD32VW553 series MCU supports Wi-Fi 6 and Bluetooth LE 5.2 wireless connectivity. It features advanced Radio Frequency Integrated Circuits (RFIC), enhanced security mechanisms, generous storage capacity, and a wide range of universal interfaces. Leveraging a mature process platform and cost-effective optimization, it consistently delivers solutions for market applications demanding efficient wireless capabilities.

With its excellent edge processing and connectivity features, GD32VW553 applies to various wireless application scenarios, including smart home appliances, smart home systems, industrial Internet, and communication gateways. This series of MCUs is also well suited for scenarios with budget constraints, making it an ideal choice for office equipment, payment terminals, and various IoT products.

Key features of the GD32VW553:

- RISC-V core running up to 160MHz
- Supports Wi-Fi 6 and Bluetooth LE5.2
- Two package options: QFN40 and QFN32
- Up to 4MB of Flash, 320KB of SRAM
- Industrial temperature support: up to 105 degrees
- Wealth of security features: WPA3, Hardware encryption/decryption engine, Public Key Cryptographic Acceleration Unit, TRNG

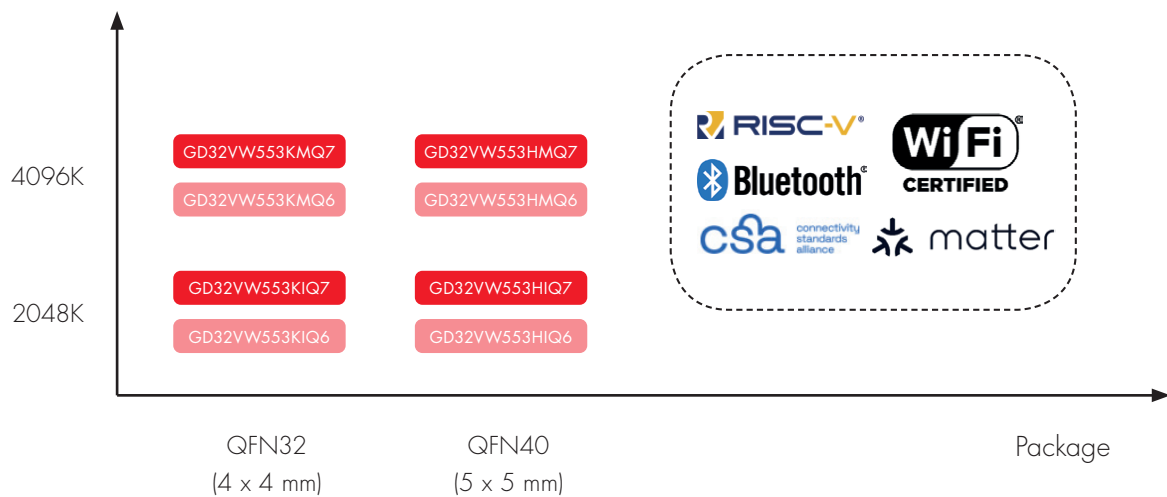
Target application areas:

- Smart home appliances
- Smart home system
- Industrial internet
- Communication gateways

NEWS

GD32VW553 Combo Wireless Series

Flash / SRAM Size (Bytes)



Development Tools

Development Boards	Ordering Part Number	MCU Part Numbers
Evaluation Boards	GD32VW553H-EVAL	GD32VW553HMQ7
Starter Kit	GD32VW553K-START	GD32VW553KMQ7

The full-featured evaluation board is based on the QFN40 package and supports complete functional demonstration, development and debugging. The start kit is based on the QFN32 package, which supports the test for RF performance.



FSC-BT631D NRF5340 LE AUDIO MODULE



The FSC-BT631D module, based on the Nordic Semiconductor nRF5340 chipset, supports both Bluetooth Classic (BR/EDR) and LE Audio.

By default, the FSC-BT631D comes with Feasycom's powerful firmware, which simplifies Bluetooth functionality through easy-to-use ASCII commands over a serial interface. This firmware makes the module act like a Bluetooth modem, streamlining the integration process for developers.

Overall, the FSC-BT631D provides an ideal solution for integrating advanced Bluetooth wireless technology into new product designs, catering to applications ranging from wireless headphones and speakers to smart home devices and industrial IoT systems.

APPLICATIONS

- LE Audio
- Speakers
- Headphones
- Auracast
- Home automation

FEATURES

- BLE 5.3+BR/EDR
- LE Audio
- Low Latency Audio

Bluetooth Module Model	FSC-BT631D
Bluetooth version	Bluetooth 5.3
Chipset	Nordic nRF5340
Interface	UART/I ² S/USB
Dimension	12mm x 15mm x 2.2mm
Transmit Power	nRF5340 :+3 dBm
Profiles	GAP, ATT, GATT, SMP, L2CAP
Operating temperature	-30°C to +85°C
Frequency	2.402 - 2.480 GHz
Supply voltage	3.3V



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