

11/2023

endrich NEWS

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OUR PRODUCT OF THE MONTH

IOT CONTROLLER FOR HARSH ENVIRONMENTAL CONDITIONS

iEP-7020E Series
INDUSTRIAL IOT CONTROLLER

13th Gen Intel® CPU AI Acceleration Rich I/Os/Expansions 4G/5G/WIFI 6E Rugged Design

The iEP-7020E series industrial IoT controller is based on 13th generation Intel® Core™ embedded industrial processors and offers scalable performance in a fan-less and robust design.

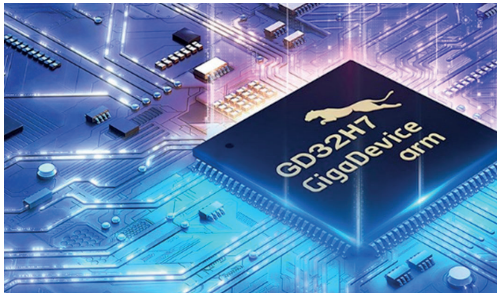
The controller supports fast AI processing through Intel® Iris Xe Graphic technology. The series can be operated stably under harsh conditions (-40 °C to 70 °C) with 9-36 VDC. Three Intel® i226-IT LAN (supports vPro) and two Intel® i210-AT LAN (supports IEEE 802.3AF PoE and Intel® TCC/TSN) are available for communication.

The iEP-7020E series is ideal for use as an edge controller and IoT gateway for applications such as automation, intelligent manufacturing, robotics and smart city.

The iEP-7020E series is now available from Endrich.

Contact: displays@endrich.com

GIGADEVICE GD32H737 FAMILY ARM® CORTEX®-M7 32-BIT MCU



GD32H737/757/759 Series Cortex®-M7 Ultra-high Performance MCUs

Delivering Exceptional Performance
for Embedded Systems

Innovative Applications

- Complex Computation
- Edge Computing
- Multimedia Processing
- ML/AI Algorithms

The GD32H7 MCU series adopts an Arm® Cortex®-M7 high-performance core based on Armv7E-M architecture, with up to 600MHz clock frequency. Its performance is further enhanced by the high bandwidth AXI + AHB bus and the six-stage pipeline architecture with branch prediction capability. The integrated advanced Digital Signal Processing (DSP) hardware accelerator and double-precision Floating-Point Unit (FPU), as well as the hardware Trigonometric Mathematic Unit (TMU) and Filter ACcelerator (FAC), significantly reduce the CPU loading and increase its processing efficiency. The GD32H7 MCU series can operate up to 1552 DMIPS at its highest frequency, and achieve an outstanding performance of 2888 points in CoreMark® benchmark tests, improving code execution efficiency by approximately 10% compared to similar products in the market running at the same frequency. The product's performance is more than 40% higher than that

of Cortex®-M4 products. The integrated memories on GD32H7 MCU series are 1024 KB to 3840 KB Flash and 1024 KB SRAM, including 512 KB of configurable Tightly Coupled Memory (TCM) for zero-wait state execution of critical instructions and data. The 64KB high-speed L1-Cache (I-Cache, D-Cache) further increases CPU processing efficiency and real-time performance. Its EXternal Memory Controller (EXMC) enables access to various external memory types such as SDRAM, SRAM, ROM, NOR Flash, and NAND Flash. The built-in Embedded Trace Macrocell (ETM) can trace instructions and data in real time, providing advanced debug functions without interfering with normal CPU operations. The GD32H7 MCU series internal large memory space can support rich operatin systems, embedded ML /AI, and other advanced algorithms, thus enabling high-performance and low-latency real-time control.

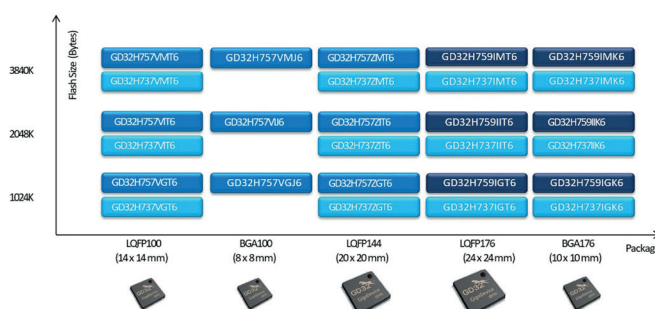
GD32H7 High Performance MCU (Engineering Sample Now)

GD32H737
 CAN 2.0

GD32H757
 CANFD

GD32H759

- GD32H7 Cortex®-M7 High performance line
- 1024-3840K Flash, 1024K SRAM
- 1.71V-3.6V supply; 5V tolerance I/Os
- Series pin to pin compatible and flexible S/W compatible



The GD32H7 product family is compatible with existing GD32 MCU products, and it offers three product types with different system resources configuration: the GD32H737 product type supports three channels of CAN 2.0B, while the GD32H757 and GD32H759 support three channels of high-speed CAN-FD. From the packaging point of view, GD32H757 is offered in BGA100 and LQFP144/100 package options, while GD32H759 is available in BGA176 and LQFP176.

NEWS

ALLIANCE 2GB, 4GB, 8GB, AND 16GB LPDDR4X SDRAMs

Alliance Memory has expanded its offering of high-speed CMOS mobile low-power SDRAMs with four new LPDDR4X devices. Offering an extension to the company's fourth-generation 2Gb up to 16Gb LPDDR4 SDRAMs deliver ~50% lower power consumption to increase battery life in portable electronics.

Device Specification Table

PART	AS4C128M16MD4V-062BAN	AS4C256M16MD4V-062BAN	AS4C512M16MD4V-053BIN	AS4C512M16MD4V-053BIN
DENSITY	2GB	4GB	8GB	16GB
ORGANIZATION	128M x 16	256M x 16	512M x 16	512M x 32
VDD1/VDD2/VDDQ	1.8V / 1.1V / 0.6V	1.8V / 1.1V / 0.6V	1.8V / 1.1V / 0.6V	1.8V / 1.1V / 0.6V
PACKAGE	200-ball TFBGA	200-ball TFBGA	200-ball TFBGA	200-ball TFBGA
CLOCK FREQUENCY	1600MHz	1600MHz	1866MHz	1866MHz
DATA RATE	3200Mbps	3200Mbps	3733Mbps	3733Mbps
TEMPERATURE RANGE	-40°C to +105°C	-40°C to +105°C	-40°C to +85°C	-40°C to +85°C

APPLICATIONS

- 5G, AI, and IoT devices
- Portable electronics for the consumer, commercial, and industrial markets including smart phones, smart speakers, security surveillance systems
- Automotive ADAS systems
- advanced audio and ultra-high-resolution video in embedded applications

BENEFITS

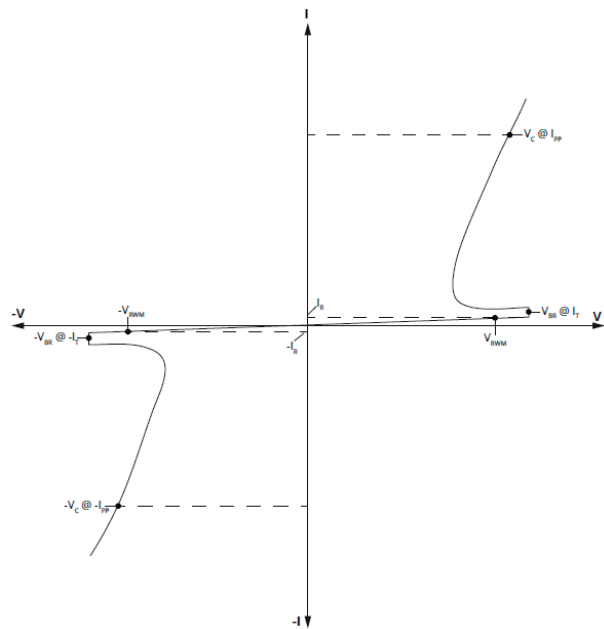
- Available in densities from 2Gb to 16Gb
- Low-voltage operation of 0.6V
- Fast clock speeds up to 1.86GHz
- Extremely high transfer rates of 3.7Gbps
- AEC-Q100-qualified with on-chip ECC for increased reliability (AS4C128M16MD4V-062BAN and AS4C256M16MD4V-062BAN)
- Available in automotive (-40°C to +105°C) and industrial (40°C to +85°C) temperature ranges
- Organized as single-channel (AS4C512M16MD4V-053BIN, AS4C128M16MD4V-062BAN, and AS4C256M16MD4V-062BAN) and dual-channel (AS4C512M32MD4V-053BIN) devices
- Eight internal x16 banks per channel
- Fully synchronous operation
- Programmable read and write burst lengths of 16, 32, and on the fly
- Selectable output drive strength
- On-chip temperature sensor controls the self-refresh rate
- Offered in the 200-ball FBGA package for higher power efficiency



LOW CLAMPING HYBRID TVS COMPONENTS TARGET CIRCUIT PROTECTION IN ELECTRIC VEHICLES

ProTek Devices has introduced a couple of TVS components targeted at delivering circuit protection across a variety of electric vehicle (EV) systems including hybrid electric vehicles, charging systems, and automotive electronic control units (ECU). One is a 7,000 Watt TVS component and the other is 11,000 Watts. The 7,000 Watt TVS is the PAM7KSMDJ24CAP and is suited for circuit protection across the belt starter (BSG) generator circuit, the integrated starter generator (ISG) circuit, and hybrid electric vehicles at large.

The 11,000 Watt TVS is the PAM11KLD8S24CAP, and it is ideal for delivering circuit protection in automotive ECUs. The PAM7KSMDJ24CAP and PAM11KLD8S24CAP each share achieving AEC-Q101 standards qualification. Both components also allow bidirectional configuration and are RoHS and REACH compliant. They also boast a competitively very low clamping voltage.



Current – voltage characteristic

APPLICATIONS

- Belt Starter (BSG) Generator Circuit
- Integrated Starter (ISG) Generator Circuit
- Hybrid Electric Vehicles
- Automotive ECU Protection
- EV Charging Systems

FEATURES

- AEC-Q101 Qualified
- Junction Passivation Optimized Design Passivated Anisotropic Rectifier Technology
- Bidirectional Configuration
- Lower Clamping Voltage Compared to Existing Solutions
- High Surge Capability
- 7,000 resp. 11,000 Watts Peak Pulse Power per Line ($t_p = 10/1000\mu s$)
- Meets ISO 16750-2 Surge Specification (Varied by Test Condition)
- Meets MSL Level 1, Per J-STD-020, LF Maximum Peak of 245°C
- RoHS and REACH Compliant

NEWS



In addition, the PAM7KSMDJ24CAP is also IEC compatible with standards 61000-4-2 (ESD), 61000-4-4 (EFT), and with 61000-4-5 (surge). It is a glass passivated chip offering 7,000 Watts peak pulse power per line (typical = 10/1000 microseconds) and providing low leakage current.

Meanwhile, the PAM11KLD8S24CAP possesses a junction passivation optimized design with passivated anisotropic rectifier technology. The operating junction temperature equals 175 degrees Celsius capability, ensuring suitability for high reliability and automotive requirements.

This TVS features 11,000 Watts peak pulse power per line (typical = 10/1000 microseconds) and is high surge capable. In addition, the PAM11KLD8S24CAP meets standards ISO 16750-2 surge specification (varied by test condition) and MSL level one, per J-STD-020, LF maximum peak of 245 degrees Celsius.

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (NOTES 1-2)	DEVICE MARKING	REVERSE STAND-OFF VOLTAGE V_{RWM} Volts	BREAKDOWN VOLTAGE $V_{(BR)} @ I_T$ Volts		TEST CURRENT $@ I_T$ mA	MAXIMUM CLAMPING VOLTAGE (Fig.2) $@ I_P$ V_C Volts	MAXIMUM REVERSE SURGE CURRENT $@ I_{PP}$ AMPS	MAXIMUM REVERSE LEAKAGE CURRENT $@ V_{RWM}$ I_R μA
			MIN	MAX				
PAM7KSMDJ24CAP	7K24	24.0	26.7	29.5	1.0	28.0	200	1.0

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (NOTES 1-2)	DEVICE MARKING	REVERSE STAND-OFF VOLTAGE V_{RWM} Volts	BREAKDOWN VOLTAGE $V_{(BR)} @ I_T$ Volts		TEST CURRENT $@ I_T$ mA	MAXIMUM CLAMPING VOLTAGE (Fig.2) $@ I_P$ V_C Volts	MAXIMUM REVERSE SURGE CURRENT $@ I_{PP}$ AMPS	MAXIMUM REVERSE LEAKAGE CURRENT $@ V_{RWM}$ I_R μA	MAXIMUM REVERSE LEAKAGE CURRENT (Note 2) $@ V_{RWM}$ 175°C I_R μA
			MIN	MAX					
PAM11KLD8S24CAP	LD824C	24.0	26.7	29.5	5.0	26.0	300	10	150

HAL302X FAST STRAY-FIELD ROBUST MOTOR POSITION SENSOR FAMILY WITH ANALOG OUTPUT

HAL 302x is a fast 2D angular position sensor family addressing the need for stray-field robust motor position sensing as well as the ISO 26262 compliant development. This new sensor family features differential or single-ended sine and cosine analog outputs with integrated wire-break detection. The rotation angle of a magnet can be calculated by an external A/D converter and a microcontroller/ ECU.

This new family has two members (HAL3020 and HAL3021). Both members measure, based on Hall-effect technology, vertical magnetic-field components (B_z). Speciality of HAL 3021 is that the device offers a higher robustness against static and dynamic mechanical tolerances. Both devices are able to suppress external stray fields by using the array of Hall plates. Only a simple two-pole magnet in an end-of-shaft configuration is required to measure the absolute angular position. The

magnet can be placed above or below the sensor.

The measuring principle of the Hall plate array minimizes errors due to supply voltage and temperature variations.

Major characteristics like sine and cosine gain, offset, (absolute) 0-angle, orthogonality and bandwidth can be adjusted using the integrated signal path by programming the nonvolatile memory of HAL 302x. This product is defined as Safety Element out of Context (SEooC) ASIL C ready according to ISO 26262:2018. HAL 302x contains on-board diagnostic features, such as overvoltage and undervoltage detection as well as wire-break monitoring during normal operation.

The device is designed for automotive and industrial applications. It operates in the ambient temperature range from $-40\text{ }^{\circ}\text{C}$ to $150\text{ }^{\circ}\text{C}$.

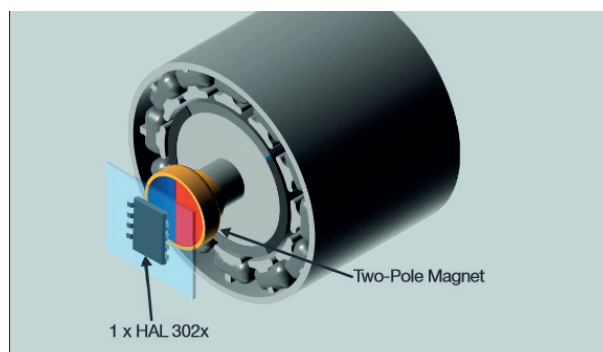
The sensor is available in the eight-pin SOIC8 SMD package.

APPLICATIONS

- Thanks to the sensor's fast analog signal path and its stray-field robustness, HAL 302x is a potential solution for the following application examples:
- Rotary position measurement for BLDC motor commutation
- Clutch and transmission actuators
- Starter/generator systems
- Electromechanical brake booster
- Electric pumps
- Electric valves

HAL 302x Family Overview

TYPE	Device-Specific Features
HAL 3020	Lower current consumption
HAL 3021	<ul style="list-style-type: none"> • Higher robustness against static and dynamic mechanical tolerances • Higher signal-to-noise ratio • Lower inherent angular error Drifts • Support of closer air gaps and smaller target magnets



Sensor Application Setup

NEWS



FEATURES

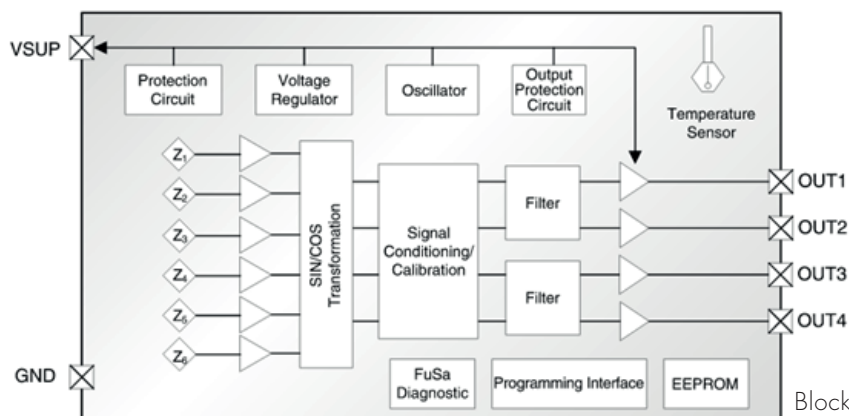
DEVELOPMENT TOOLS:

HAL 302x can be programmed during the final manufacturing process by adjusting the output signals directly to the input signal. With this calibration procedure, the tolerances of the sensor, the magnet, and the mechanical positioning can be compensated in the final assembly. TDK-Micronas offers an easy-to-use evaluation kit for engineering:

- Micronas programmer board (TDK-MSP V1.x)
- USB programming kit
- LabVIEW™ programming software for Windows®

Samples are available now, with the start of production planned for the first half of 2024

- High-speed 360° contactless angle measurement
- EMC robust differential or single-ended sine/cosine analog output signals
- Non-ratiometric or ratiometric analog outputs related to the supply voltage
- Robust against DC and AC magnetic strayfields (according to ISO 11452-8:2015)
- SEooC ASIL C ready according to ISO 26262:2018 to support Functional Safety applications (The device can be integrated in automotive safety-related systems up to ASIL D)
- Various integrated diagnostic mechanisms ensure correct operation and enable simplified external safety supervision
- Operates from 3.0 V up to 5.5 V supply voltage
- Fast response time and high output bandwidth for applications up to 150,000 rpm
- Operates from -40 °C up to 170 °C junction temperature
- Programming via the sensor's output pin. No additional programming pin required
- Programmable characteristics in a nonvolatile memory (EEPROM) with redundancy and lock function
- Configurable signal processing parameters, like output gain, offset, (absolute)
- 0-angle, orthogonality and magnetic signal bandwidth
- Overvoltage and reverse-voltage protection
- Under- and overvoltage detection of VSUP
- Passive wire-break detection working with external pull-up or pull-down resistor
- On-chip temperature sensor for overtemperature supervision
- Qualification according to AEC-Q100



Block diagram of HAL 3021

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ROBUST SOUNDERS FOR CARGO- & E-BIKES, LIGHT VEHICLES, TWO-WHEELERS, ETC

In the Light Vehicle Sector (including for example pedelecs, scooters, cargo bikes, e-Bikes, etc), there is regularly a need for robust sound signalling devices, to either make aware or warn other people.

In order to attract attention, Endrich offers suitable acoustic "stand-alone" sound units for use in harsh "every-day" conditions, to be operated by simply applying to a DC voltage that is regularly available onboard the vehicle.

Two available examples are:

CDA63A928TE1W1000

Which is designed as a "ready-to-mount" singular unit with connection wires as needed. Because of using a wide-band speaker inside, it can not only reproduce human voice, but could also do different kind of acoustic signalling (tones, melodies, jingles etc) upon request, if needed by customer. – Please talk to us!



CPA36D948TM29SQR

Which has corrosion proof design, including stainless steel membrane and Quick-Tabs for easy fitting. This unit is mainly to produce an ultra loud, well-noticeable alarm sound of around 2.900 Hz frequency.



Following the available space individually: If there is need for special other housing dimensions, shapes or designs, we can develop it along your requirements, so they will be available upon your request. – Please contact us accordingly. Endrich can also provide speakers in a customized housing/box, soldering harnesses, and other accessories, including items like sponges, capacitors, and other passive components if needed. Specific solutions (including NDAs to be kept strictly) will be decided on a case-by-case basis.

We are open to exploring various forms of collaboration, including technical partnerships, or other mutually beneficial arrangements to drive and advance the development of these modern acoustic solutions.



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Chinasound

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