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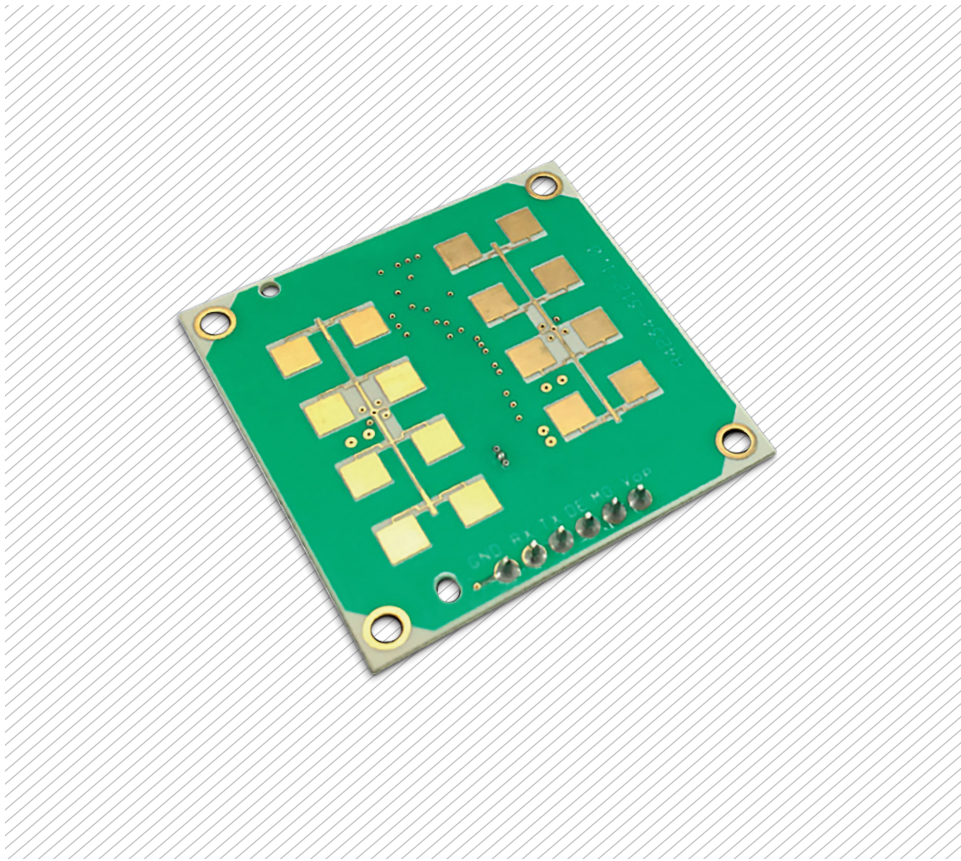
OUR PRODUCT OF THE MONTH: NJR4234BW – THE 24 GHz MICROWAVE DISTANCE MEASUREMENT SENSOR MODULE

FEATURES

- 24 GHz microwave distance measurement sensor for stationary and moving objects up to 30 m for a pedestrian
- Antenna, microwave RF circuit, base-band IF circuit, MCU and also signal processing are integrated in low-profile package (38 x 38 x 4.2 mm)
- Low-power-consumption
- High sensitivity mobile object detection (patented technology)
- Distance measurement signal processing
- Automatic calibration and gain control
- Radio interference prevention
- UART interface and digital CMOS output

The HVC 4223F is a highly integrated, intelligent embedded BLDC motor and stepper motor driver for direct 12 V-battery operation with six integrated half-bridges. All modules to directly drive PMSM, BLDC or stepper motors are on chip. The CPU is a 32-bit ARM® Cortex®-M3 with 1.25 DMIPS / MHz including a nested vectored interrupt controller (NVIC).

The IC features a debug interface, timers/counters, capture compare units, a multichannel A/D converter with integrated programmable gain amplifier, an advanced LIN-UART with a LIN 2.x compliant physical layer, linear temperature sensors, Back Electromotive Force Comparators (BEMFC), and PWM outputs with diagnostic functions for Permanent Magnet Synchronous Motors (PMSM), Brushless Direct Current (BLDC) motors, Brush-type DC (BDC) motors or bipolar- and 3-phase stepper motor control. The computation capacity supports complex motor control algorithms such as Space Vector Modulation (SVM) for PMSMs. The hardware supports voltage controlled or current regulated bipolar stepper motor control for full-stepping, half-stepping and micro-stepping mode.

The integrated digital and analog features reduce the number of necessary external components to a minimum. Different operating modes make it possible to minimize the current consumption according to the system needs.

The HVC 4223F features a flash program memory with a size of 32 Kbyte, providing high flexibility in code development, production ramp-up, and in-system re-programmability.

The HVC 4223F is part of TDK-Micronas' high voltage controller family (HVC 42xy) validated and qualified according to the latest valid AECQ-100 standard.

FEATURES

- Direct and universal brush- / brushless-DC / stepper motor control (sensored / sensorless)
  - Integrated half bridges for small motors up to 1 Amp.
  - Virtual star point and comparators
  - Current scaling and shaping
- Direct Vbat-Supply up to 18 V
  - Automotive OEM requirements including load-dump 40 V
  - Switchable BVDD power supply output
- 32-bit ARM® Cortex®-M3 and toolchain
  - 32 kB Flash, 2 kB RAM, 512 byte of EEPROM
  - Extensive support to store diagnostic data
  - On-chip oscillators with active EMI suppression
- Built-in safety features
  - Protection logic, supply / clock / temp supervision, start-stop retention mode
  - Several diagnostic features to supervise internal as well as application status
  - ASILA
- Host interface
  - LIN 2.1 & SAE J2602-2 compliant transceiver
  - PWM, UART, analog
- PQFN40 6 x 6 mm² package
  - Operation -40 °C to 150 °C ambient temperature
- Tool chain – software and documentation available

Block diagram
HVC4223F
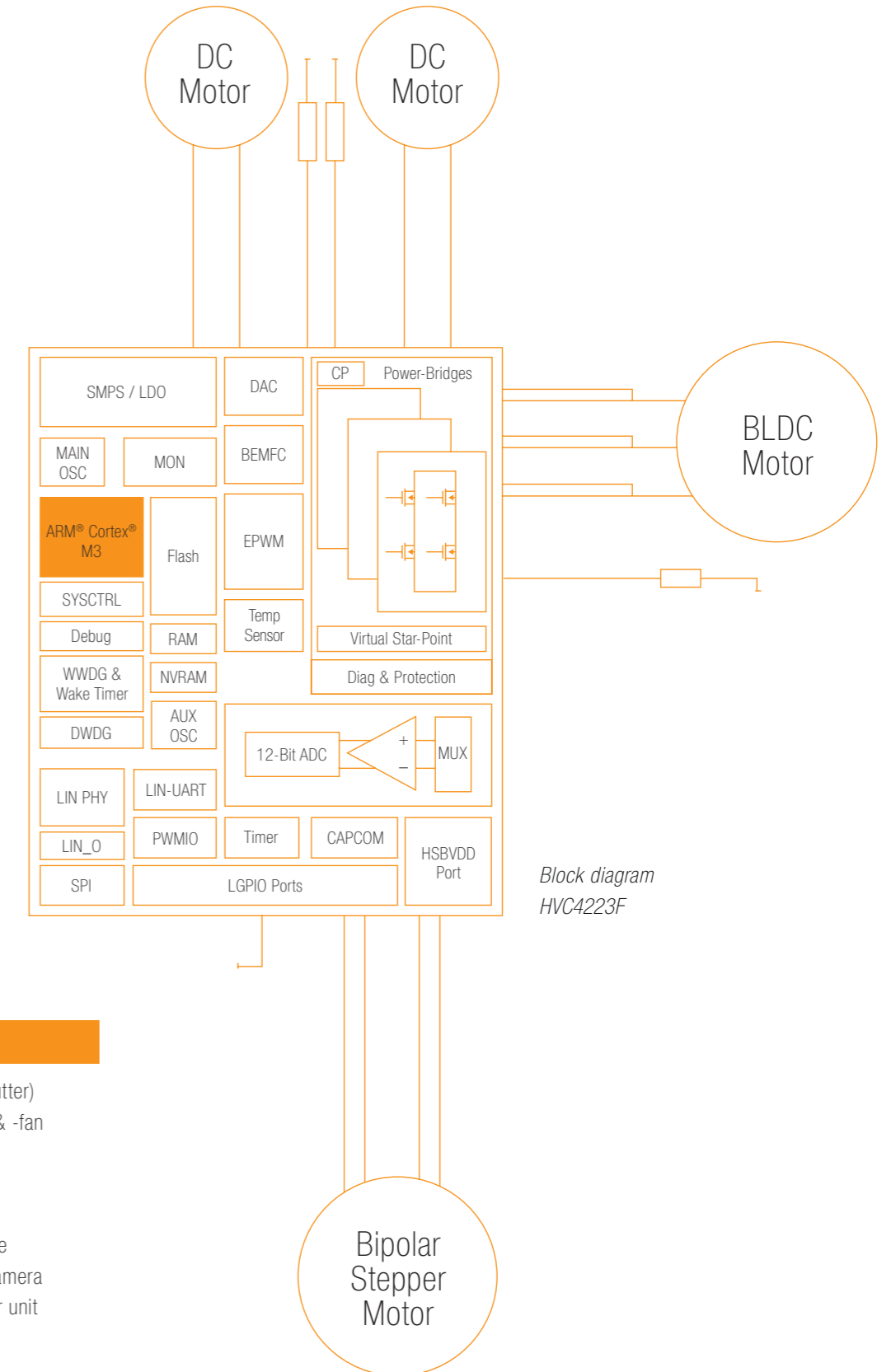
APPLICATIONS

- AGM / AGS (grille shutter)
- Adaptive headlights & -fan
- HVAC flap control
- EPS force feedback
- Automatic flap
- Exhaust gas / re-circle
- Cover of rear view camera
- Milimetric wace radar unit
- Etc.

NJR4234BW – INTELLIGENT K-BAND DISTANCE MEASUREMENT SENSOR MODULE FOR STATIONARY AND MOVING OBJECTS
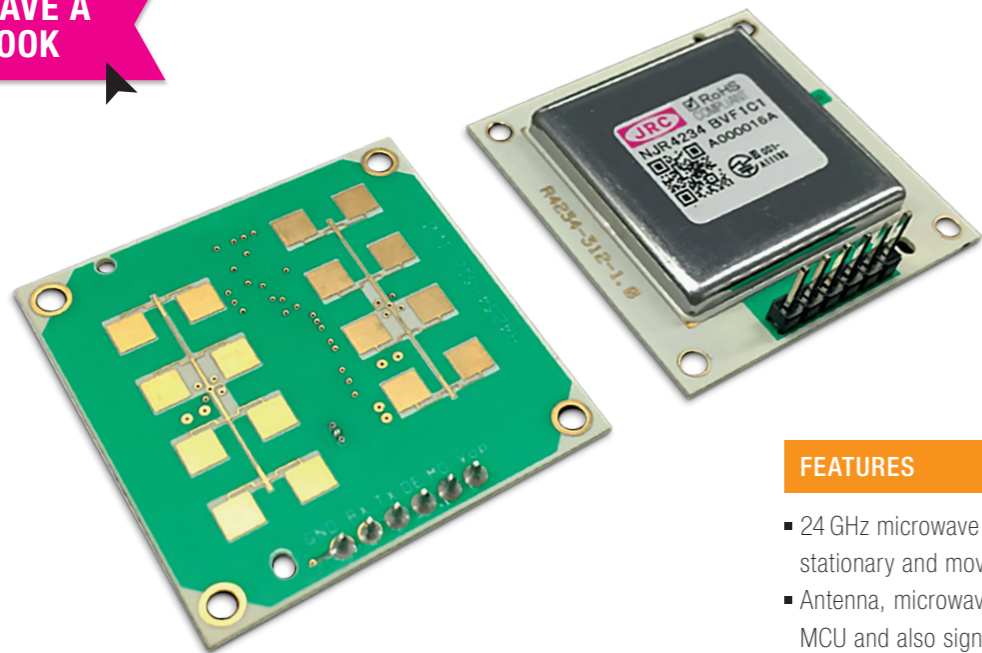
The NJR4234BW is a sensor module that can measure the distance to stationary as well as to moving objects such as a pedestrian up to 30 m ahead.

It incorporates a 24 GHz band microwave circuit, antenna, and signal processing circuit in a low profile package of 38 x 38 x 4.2 mm.

As a sensor capable of distance measurement using microwave, it is possible to detect stationary as well moving objects by innovative proprietary signal processing and also has the function to calculate and output the distance to the objects in indoor and outdoor environments.

Furthermore, it has the unique algorithm to prevent radio interference, making it thus possible to use multiple sensors under the same location.

It can be used as a sensor front end with built-in primary signal processing for distance measurement.

In addition, since it can be easily connected to other equipment via the UART interface, it can be used in a wide range of applications.

FEATURES

- 24 GHz microwave distance measurement sensor for stationary and moving objects up to 30 m for a pedestrian
- Antenna, microwave RF circuit, base-band IF circuit, MCU and also signal processing are integrated in low-profile package (38 x 38 x 4.2 mm)
- Low-power-consumption
- High sensitivity mobile object detection (patented technology)
- Distance measurement signal processing
- Automatic calibration and gain control
- Radio interference prevention
- UART interface and digital CMOS output

APPLICATIONS

- Various equipment controlled by stationary and moving objects detection and distance measurement
- Security equipment
- Traffic control system
- Industrial drone
- Parking management system
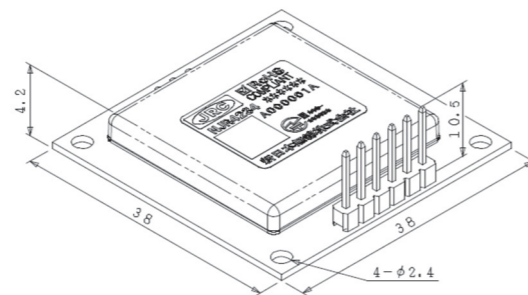
MEMS OSCILLATORS – PRECISE TIMING FOR HIGH RELIABILITY APPLICATIONS

SiTime's MEMS oscillators set new benchmarks in dynamic performance, environmental immunity, and high reliability in all environments. Our revolutionary technology allows for robust and durable oscillators, delivering the most stable timing while operating under demanding conditions – airflow, temperature perturbation, vibration, shock, power supply noise, and electromagnetic interference (EMI).

AEC-Q100
-55 to +125°C

BENEFITS

- Accurate timing in extreme environments due to best frequency stability over temperature, shock/vibration immunity, and highest quality
- Perfect solution for any application with combination of frequency, stability, and voltage to ensure the best performance
- Minimal need for maintenance and calibration due to industry leading aging and drift

MEMS OUTPERFORMS QUARTZ

Vibration sesitivity

0.1 ppb / g

3 ppb / g

Shock sensivity

0.5 ppm

7.5 ppm

Quality

< 2 dppm

50 dppm

Reliability

< 1 Failure

> 30 Failures

APPLICATIONS

- Command / control
- Avionics & drones
- Industrial robotics
- IOT sensors
- Satellite / GNSS
- Telemetry

FEATURES

Highest robustness and reliability
- ±500 ppb 20 year aging
- 0.1 ppb / g low vibration sensitivity
- 50,000 g shock, 70 g vibration resistance
- 1 billion hour MTBF, <1 FIT

Exceptional dynamic stability under airflow, fast temp ramp
- ±1 ppb / °C frequency slope (ΔF / ΔT), 10 °C / min ramp
- 3e-11 ADEV at τ = 10 seconds, under still air and airflow
- No activity dips or micro jumps

Maximum flexibility with factory programmable devices
- 32 kHz to 725 MHz (any frequency)
- ±0.1 ppm to ±150 ppm over temp stability
- -55 °C to 125 °C maximum operating temperature range
- On-chip regulators eliminate the need for an external LDO

Integrated MEMS resonator, quartz free
- MEMS resonator encapsulated in silicon at 1100 °C
- Resonator designed to never age or fatigue
- Ultra-low mass, immune to shock and vibration

The GD32E230xx device belongs to the value line of GD32 MCU family. It is a new 32-bit general-purpose microcontroller based on the ARM® Cortex®-M23 RISC core. The Cortex®-M23 processor is an energy-efficient processor with a very low gate count. It is intended to be used for microcontroller and deeply embedded applications that require an area-optimized processor. The processor delivers high energy efficiency through a small but powerful instruction set and extensively optimized design,

providing high-end processing hardware including a single-cycle multiplier and a 17-cycle divider.

The GD32E230x operates from a 1.8 V to 3.6 V power supply and available in 40 °C to +85 °C temperature range. Several power saving modes provide the flexibility for maximum optimization between wakeup latency and power consumption, an especially important consideration in low power applications.
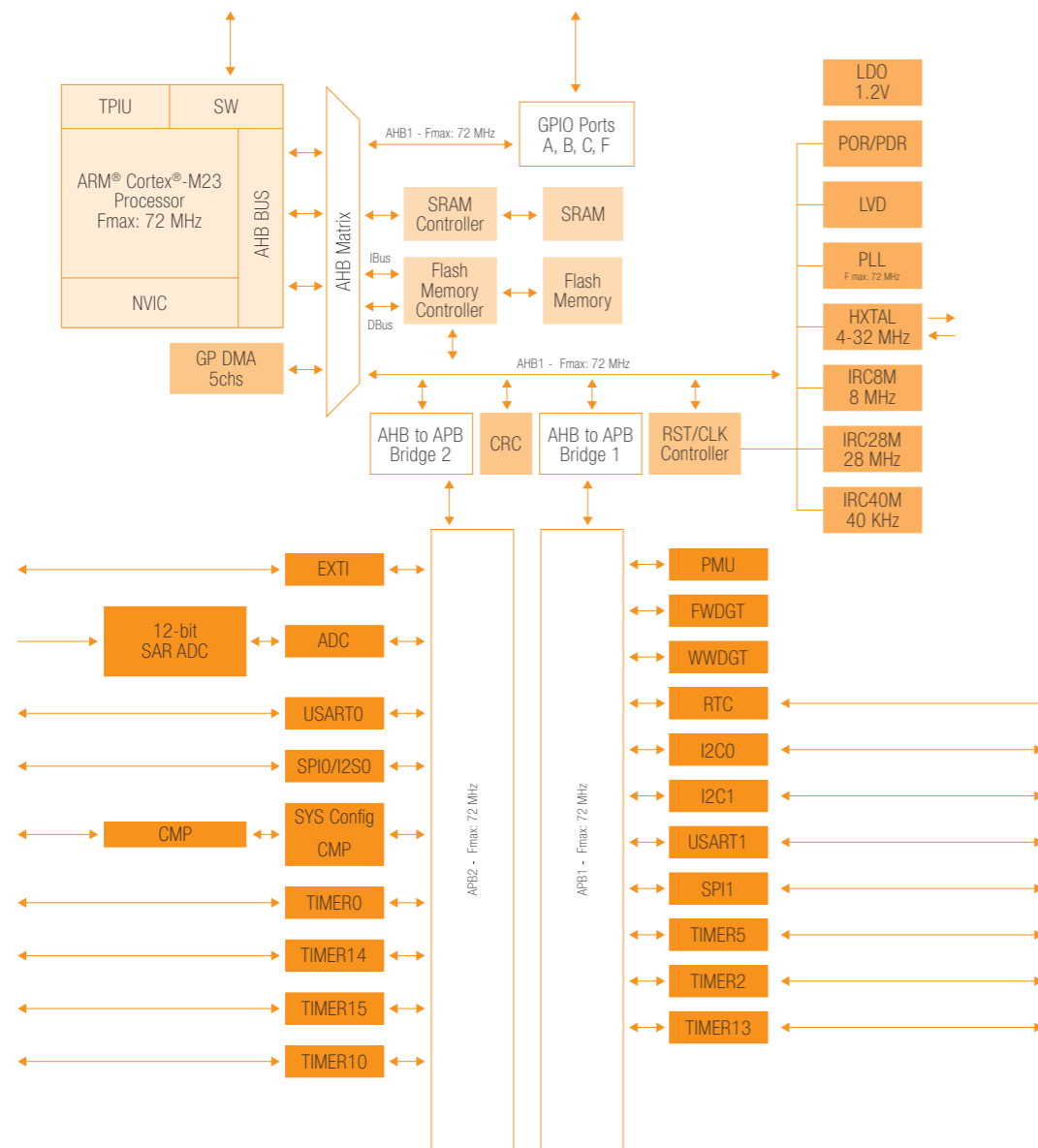
TYPE	MAX SPEED MHz	MEMORY (BYTES)		I/O	TIMER				WDG	RTC	CONNECTIVITY					ANALOGUE	PACKAGE
		FLASH	SRAM		GPTM 16bit	ADVANCE 16bit	BASIC 16bit	SYS 16bit			USART	I²C	SPI	I²S	COMP	12bit ADC (CHs)	
GD32E230F4P6	72	16K	4K	15	4	1	1	1	2	1	1	1	1	1	1	1(9)	TSSOP20
GD32E230F6P6	72	32K	6K	15	4	1	1	1	2	1	2	1	1	1	1	1(9)	TSSOP20
GD32E230F8P6	72	64K	8K	15	4	1	1	1	2	1	2	2	2	1	1	1(9)	TSSOP20
GD32E230F4U6	72	16K	4K	15	4	1	1	1	2	1	1	1	1	1	1	1(9)	QFN20
GD32E230F6U6	72	32K	6K	15	4	1	1	1	2	1	2	1	1	1	1	1(9)	QFN20
GD32E230F8U6	72	64K	8K	15	4	1	1	1	2	1	2	2	2	1	1	1(9)	QFN20
GD32E230G4U6	72	16K	4K	23	4	1	1	1	2	1	1	1	1	1	1	1(10)	QFN28
GD32E230G6U6	72	32K	6K	23	4	1	1	1	2	1	1	1	1	1	1	1(10)	QFN28
GD32E230G8U6	72	64K	8K	23	5	1	1	1	2	1	2	2	2	1	1	1(10)	QFN28
GD32E230K4U6	72	16K	4K	27	4	1	1	1	2	1	1	1	1	1	1	1(10)	QFN32
GD32E230K6U6	72	32K	6K	27	4	1	1	1	2	1	2	1	1	1	1	1(10)	QFN32
GD32E230K8U6	72	64K	8K	27	5	1	1	1	2	1	2	2	2	1	1	1(10)	QFN32
GD32E230K4T6	72	16K	4K	25	4	1	1	1	2	1	1	1	1	1	1	1(10)	LQFP32
GD32E230K6T6	72	32K	4K	25	4	1	1	1	2	1	2	1	1	1	1	1(10)	LQFP32
GD32E230K8T6	72	64K	8K	25	5	1	1	1	2	1	2	2	2	1	1	1(10)	LQFP32
GD32E230C4T6	72	16K	4K	39	4	1	1	1	2	1	2	1	1	1	1	1(10)	LQFP48
GD32E230C6T6	72	32K	6K	39	4	1	1	1	2	1	2	1	1	1	1	1(10)	LQFP48
GD32E230C8T6	72	64K	8K	39	5	1	1	1	2	1	2	2	2	1	1	1(10)	LQFP48

DG55M DURAKOOL MAGNETIC ARC BLOW OUT RELAY

The exceptional design of the DG55M automotive general purpose, magnetic arc blow out relay, is exclusive to Durakool and switches up to 20A @ 80 VDC, operating at 40 A continuous capacity (at 23 °C). This mini ISO relay's special terminal arrangement ensures HVDC safety while fitting standard ISO relay sockets such as Durakool's DZ85AB-5-WH2.

The Durakool team was extremely clever in their design of this relay. By positioning the arc quenching magnet where they have, it allows the relay to sit flush against the mounting bracket, still using the same standard socket, unhindered by the socket mounting bolt head! Even better, the special terminal arrangement enables this 80 VDC relay to be placed alongside banks of 12 V and 24 V relays, in sockets of the same footprint. Once the HV socket is correctly wired, if a 12 V or 24 V relay is plugged into the HV socket, it will simply not work. However, if the DG55M is plugged into the correctly wired HV socket, it will work perfectly. A safeguard for any user.

The magnet inside the relay is positioned such, that as the contacts open and an arc begins to form, the magnet simply stretches that arc away from the contacts (blows it out). The arc paths become stretched to an unsustainable level thus the arc is quenched – or blown out.

Advantageously, if a service engineer dealing with multiple relays in a control panel were unfamiliar with the setup, or mistakenly were to plug a 12 V or 24 V relay in the high voltage socket, rather than blowing the relay and socket, potentially causing extended damage, the terminal arrangement would prevent the 12 V or 24 V relay from operating in the HV wired socket. The DG55M special terminal configuration stops a problem occurring when the contacts are closed in the safely wired HV mini ISO socket.

The Durakool team really are looking at what engineers need and how to help them achieve the best performance with each application, they are impressively 'driving full speed ahead' in the automotive and electric vehicle market.

FEATURES

- General purpose automotive or electric vehicle relays
- Up to 20 A @ 80 VDC switch capability (100 K ops.)
- 40 A continuous DC current capacity (at 23 °C)
- Fits standard Mini-ISO relay sockets
- Special terminal arrangement – "ordinary" Mini-ISO relay inserted in DG55M socket will be safe
- RoHS compliant

APPLICATIONS

General purpose: Automotive or electric vehicle relays

- Head lights
- Fog lamp
- Horn
- Starter
- Air cooling motor control
- Radiator cooling
- Window control and ABS systems
- E-Vehicle: battery management systems

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