



Eric Jin
Mar/2017



About GigaDevice

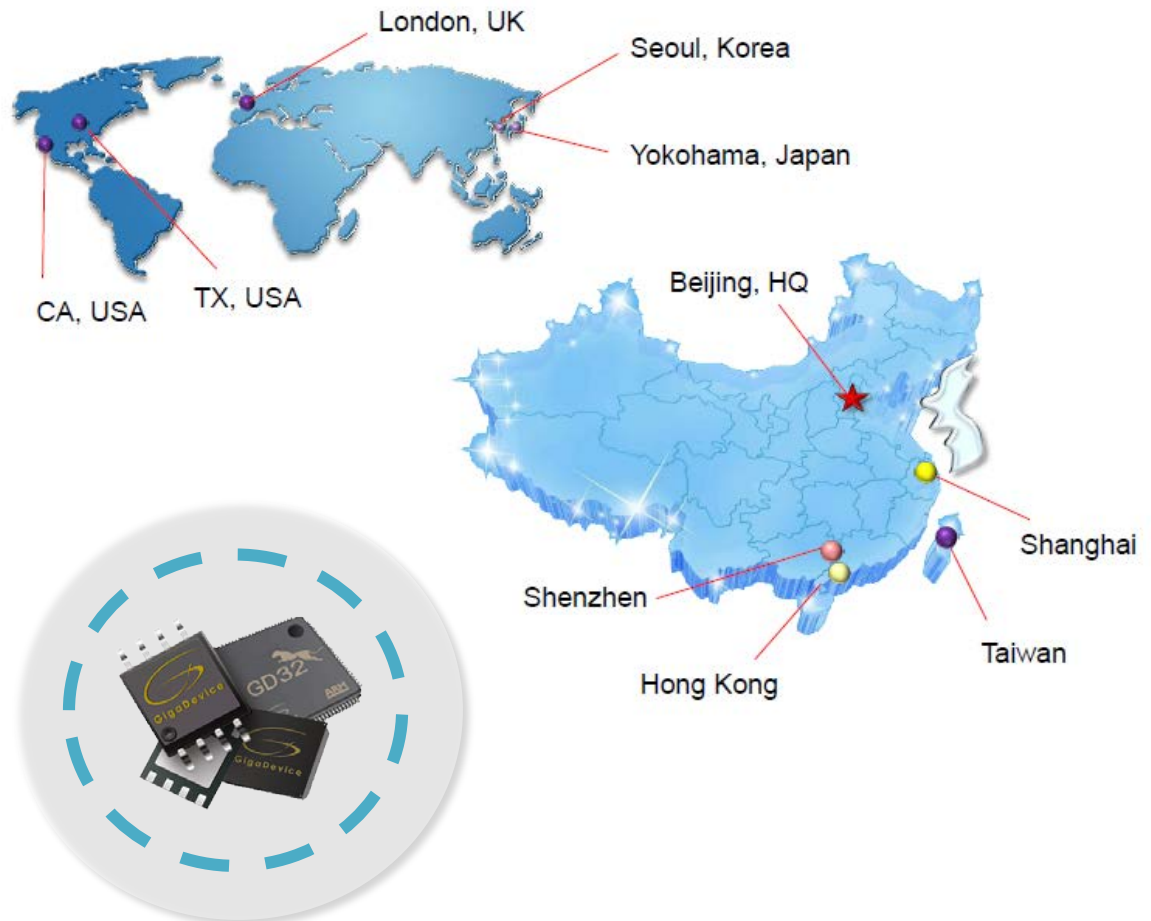
Founded in 2005

The Largest Volume
Fabless SPI NOR Flash
Supplier, World Wide

The 1st GD32 ARM[®]
Cortex[®]-M MCU in China

Gigadevice Innovation:
The 1st 8-pin SPI NAND
Flash in the World

Sales Office Worldwide



With GigaDevice rich memory and controller IC design experiences...

- 2005 – SRAM
- 2008 – SPI NOR Flash
- 2013 – 32-bit Cortex[®]-M3 MCU
- 2016 – 32-bit Cortex[®]-M4 MCU

**All the No.1 Product
in mainland China**

GD32 Family of 32-bit ARM[®] MCUs

- ✓ Latest 32-bit ARM[®] Cortex[®]-M core
- ✓ 17 complete product lines
- ✓ >300 P/Ns for selection
- ✓ Excellent performance & real-time response
- ✓ Optimized active power consumption
- ✓ Outstanding ESD & EMC level
- ✓ Rich peripherals & interface combination
- ✓ Comprehensive IDE & software compatible

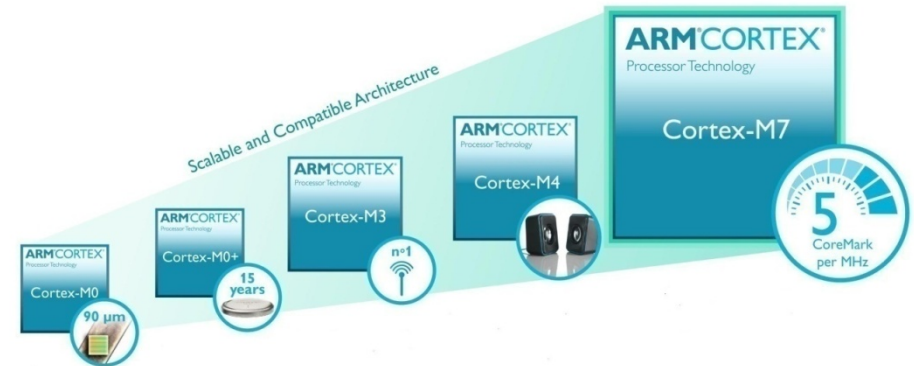
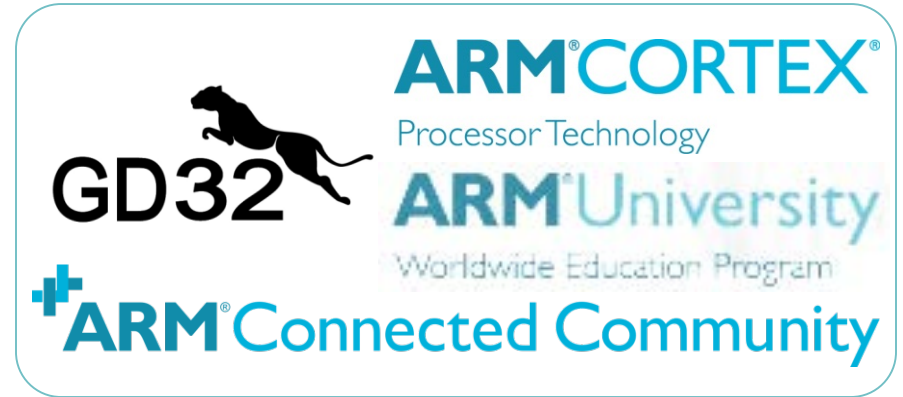


- Standard ARM® Cortex® -M core
- Multiple integrated peripherals
- Complete product lines for selection
- IDE & software compatible

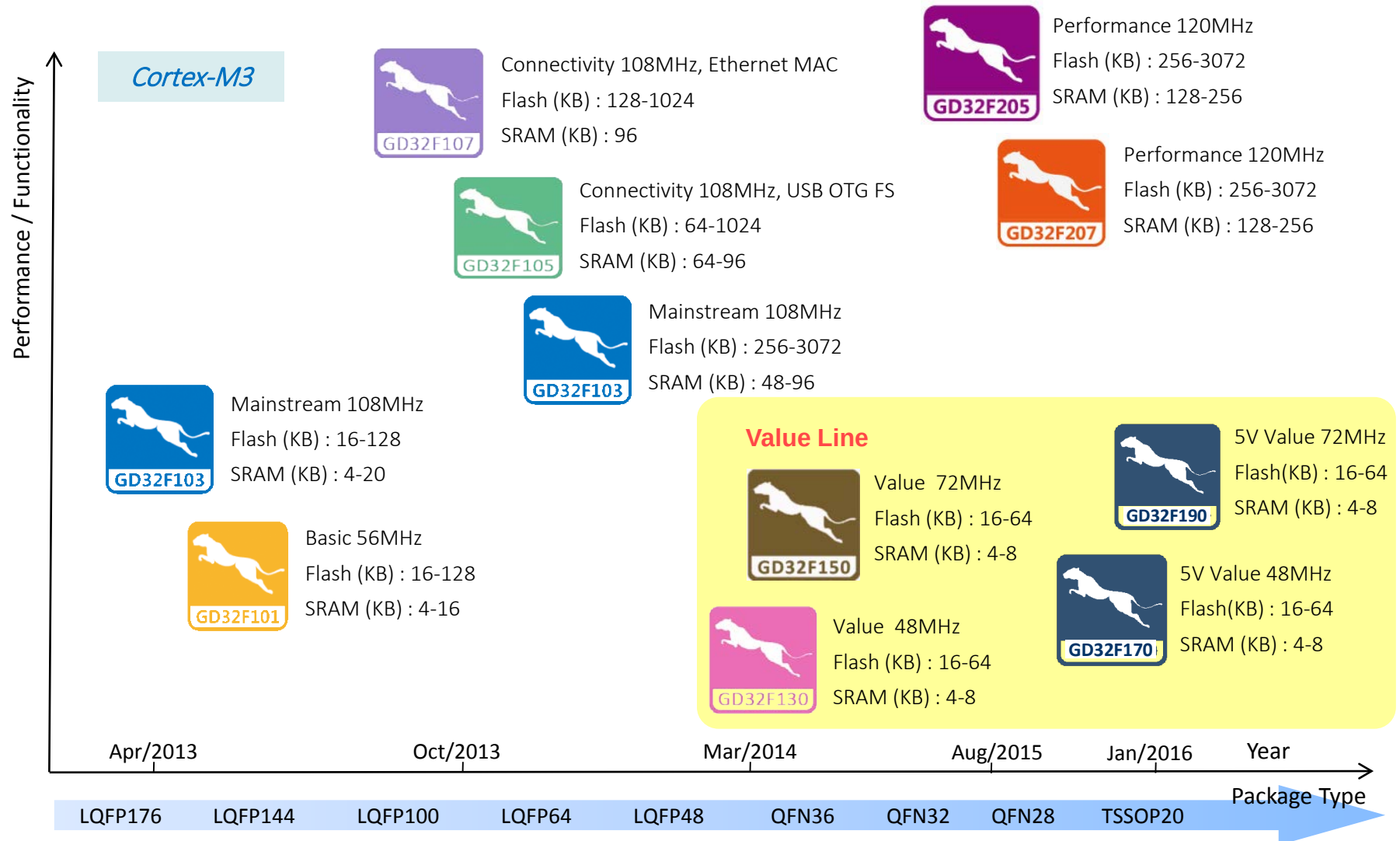
All Series Compatible



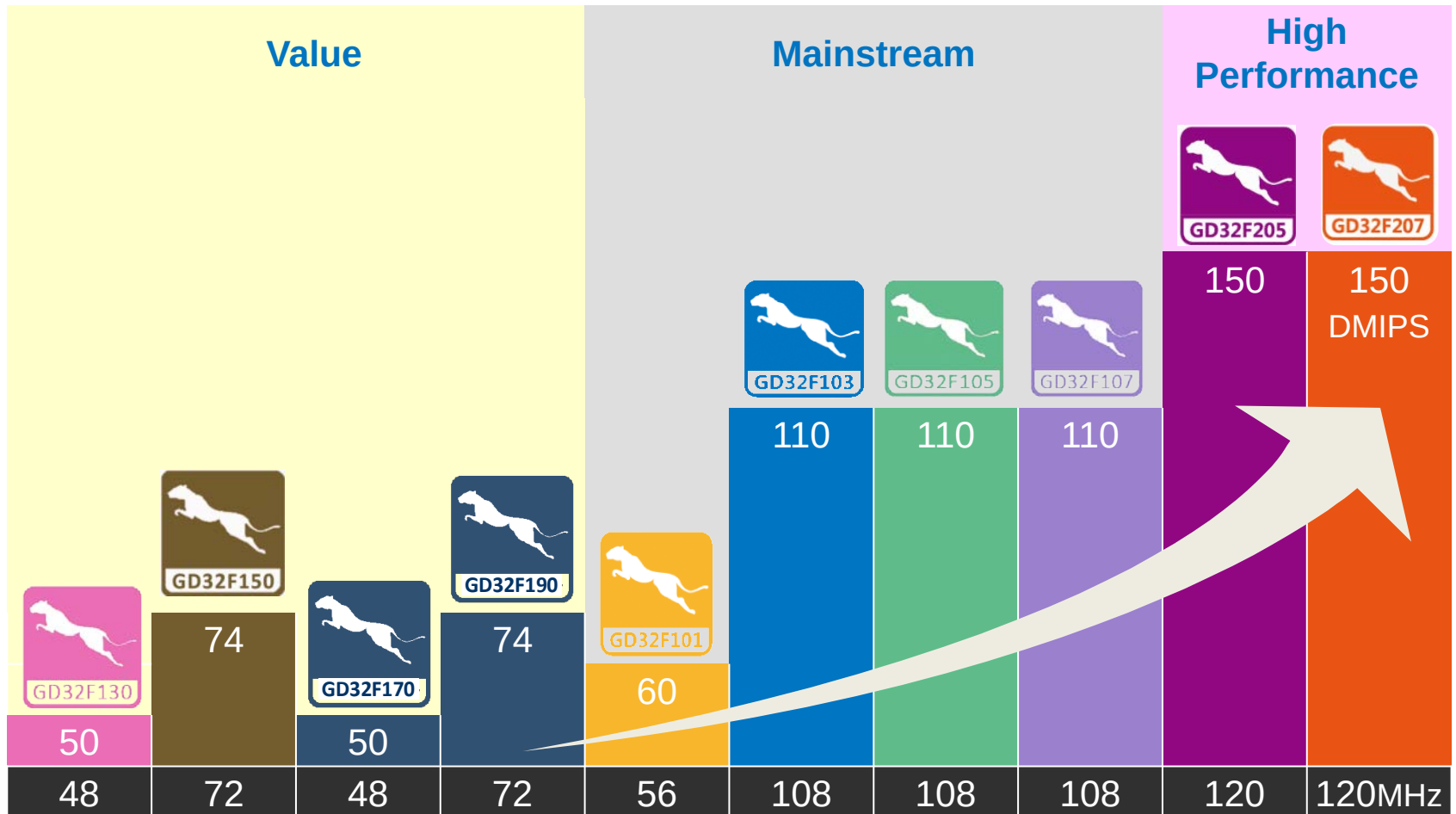
- Scalable architecture
- Fit for simple to complex application
- Same development experiences
- Consolidated development costs



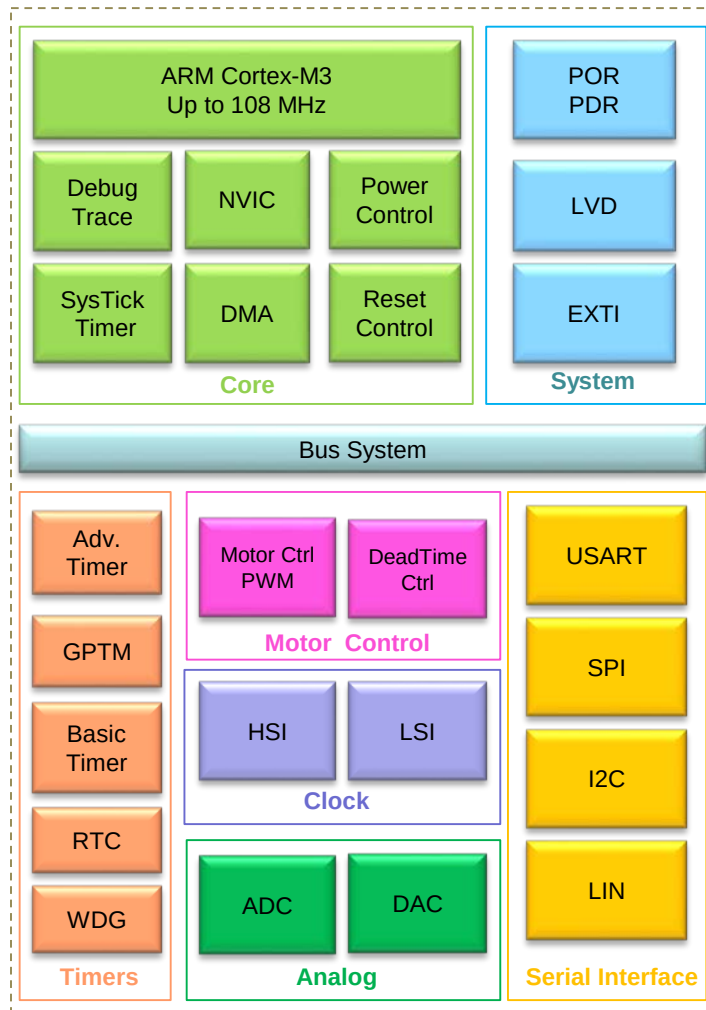
GD32 Cortex[®]-M3 MCU Roadmap



GD32 M3 Portfolio ~200P/N



GD32F1 Configuration



GD32F107 Connectivity Line

108 MHz Frequency	Up to 1 MB Flash	Up to 96KB SRAM	CAN 2.0B	USB 2.0 FS OTG	Ethernet
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GD32F105 Connectivity Line

108 MHz Frequency	Up to 1 MB Flash	Up to 96KB SRAM	CAN 2.0B	USB 2.0 FS OTG
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GD32F103 Mainstream Line

108 MHz Frequency	Up to 3 MB Flash	Up to 96KB SRAM	CAN 2.0B	USB 2.0 FS	SDIO
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GD32F101 Basic Line

56 MHz Frequency	Up to 3 MB Flash	Up to 80KB SRAM
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GD32F190 5V Value Line

72 MHz Frequency	Up to 64KB Flash	Up to 8KB SRAM	CAN 2.0B	Segment LCD	Advanced Analog
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GD32F170 5V Value Line

48 MHz Frequency	Up to 64KB Flash	Up to 8KB SRAM	CAN 2.0B
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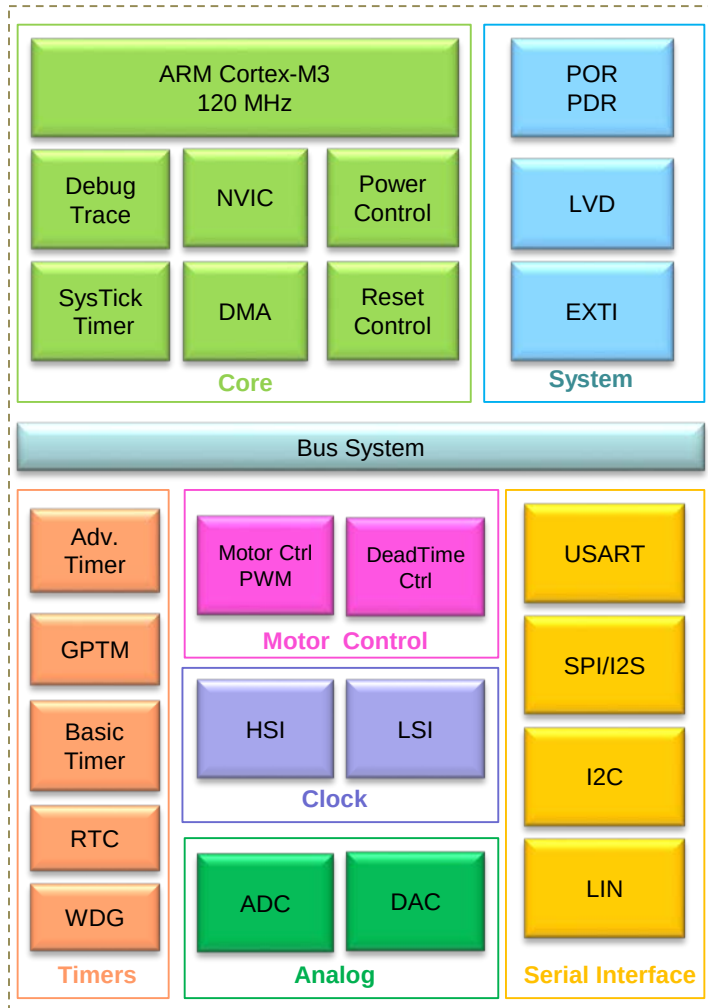
GD32F150 Value Line

72 MHz Frequency	Up to 64KB Flash	Up to 8KB SRAM	USB 2.0 FS	HDMI-CEC
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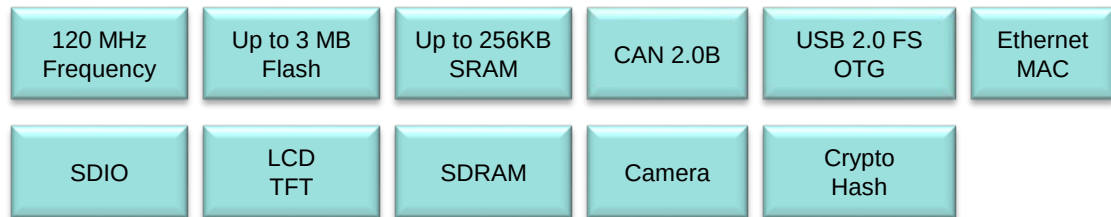
GD32F130 Value Line

48 MHz Frequency	Up to 64KB Flash	Up to 8KB SRAM
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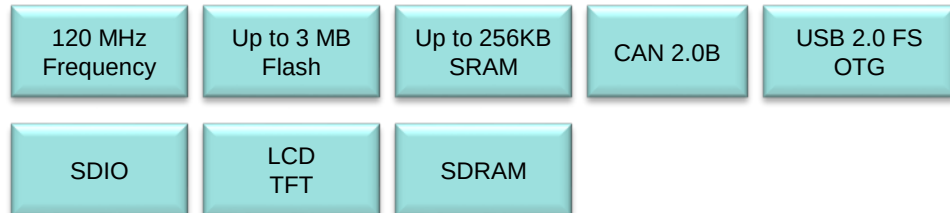
GD32F2 Configuration



GD32F207 Performance Line



GD32F205 Performance



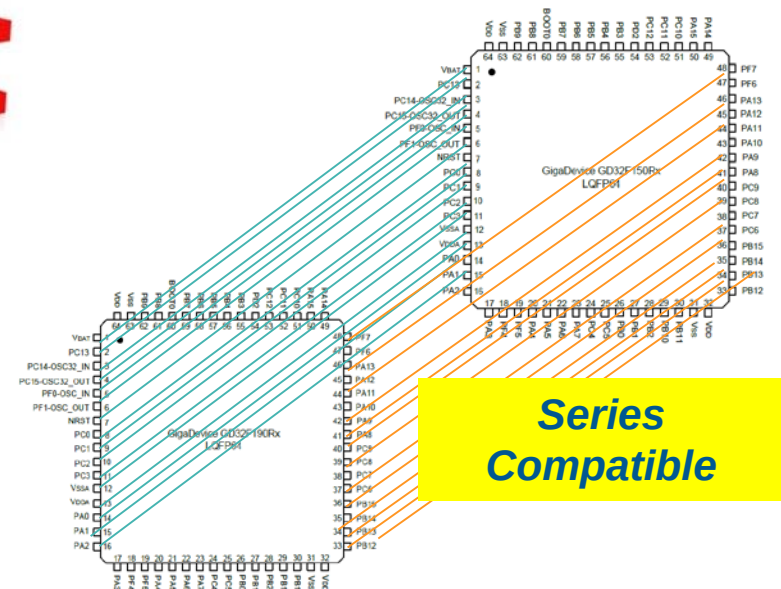
GD32F1x0 Value line Cortex®-M3 MCU

- ◆ Same cost with Cortex®-M0+ MCU by optimized IC design method & process
- ◆ Same system development experience with Cortex®-M0+ MCU
- ◆ Replace Cortex®-M0+ MCU with more cost-effective way



GD32F130/150 VS GD32F170/190 Series:

- ◆ More flexible & easy use
- ◆ Hardware Pinout compatible
- ◆ Software Register compatible



GD32F1x0 Advantage

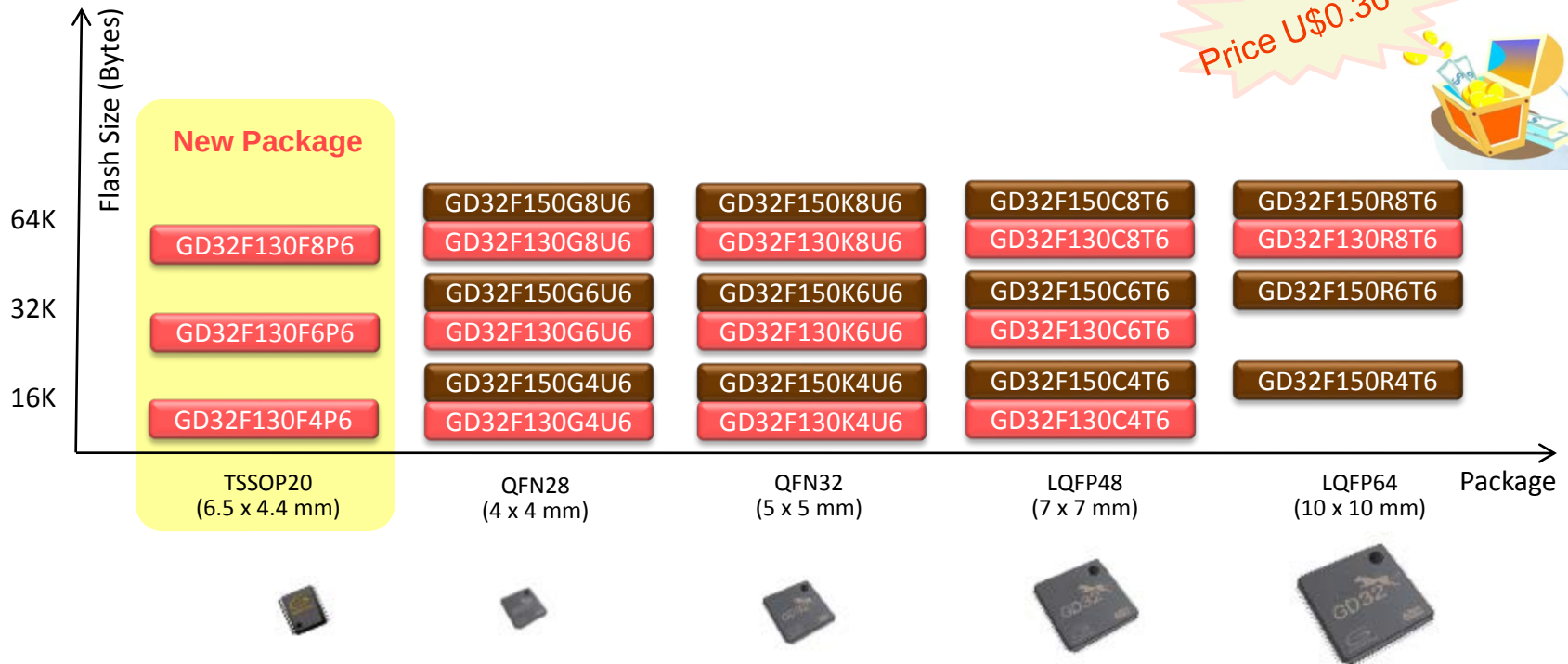
GD32F1x0 series of value line Feature	Advantage
◆ ARM® Cortex-M3® 32-bit Core ◆ Flash access Zero wait-state ◆ 7 Channel DMA	Brings valued high-performance with higher real-time response speed
◆ 5 x 16-bit GP. Timer with PWM output ◆ 1 x 32-bit GP. Timer with PWM output ◆ 1 x Adv. Timer for 3-phase complementary output ◆ 1 x Basic counting Timer	Best choice for industrial control
4.5Mbit/s USART, 18Mbit/s SPI, 400KHz I2C	Basic communication interface integrated
◆ 12-bit ADC ◆ 12-bit DAC ◆ OP-AMP, Comparator, I_{REF}/V_{REF}, etc.	Advanced analog peripherals integrated
2 * Watchdog, Calendar RTC POR/PDR/LVD, PLL, HSI/LSI	System cost down
Lowest Price down to U\$0.30/ea	BOM cost down for 8-bit & 16-bit upgrade

GD32F130/150 Portfolios



- ☑ GD32F130 and GD32F150 value line
- ☑ 16K-64K Flash, 4K-8K SRAM
- ☑ 2.6-3.6V supply; 5V tolerance I/Os
- ☑ -40°C to +85°C industrial level operating temperature
- ☑ Series pin to pin compatible and flexible S/W compatible

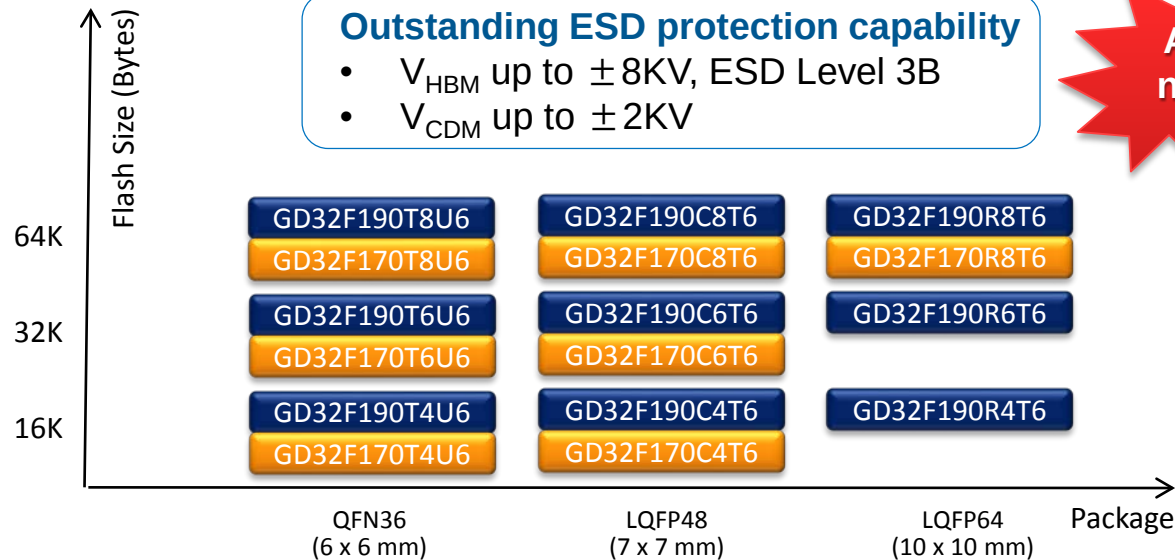
Price U\$0.30



GD32F170/190 Portfolios



- ✓ GD32F170 and GD32F190 5V value line
- ✓ 16K-64K Flash, 4K-8K SRAM
- ✓ 2.5-5.5V supply; 5V tolerance I/Os
- ✓ -40°C to +85°C industrial level operating temperature
- ✓ Series pin to pin compatible and flexible S/W compatible



Advanced Analog:

- ✓ ADC + DAC
- ✓ 3 x OP-AMP
- ✓ 2 x COMP
- ✓ 2 x CAN 2.0B
- ✓ 1 x CAN PHY



GD32F130FxP6 Introduction



GD32F130F8P6

GD32F130F6P6

GD32F130F4P6

TSSOP-20



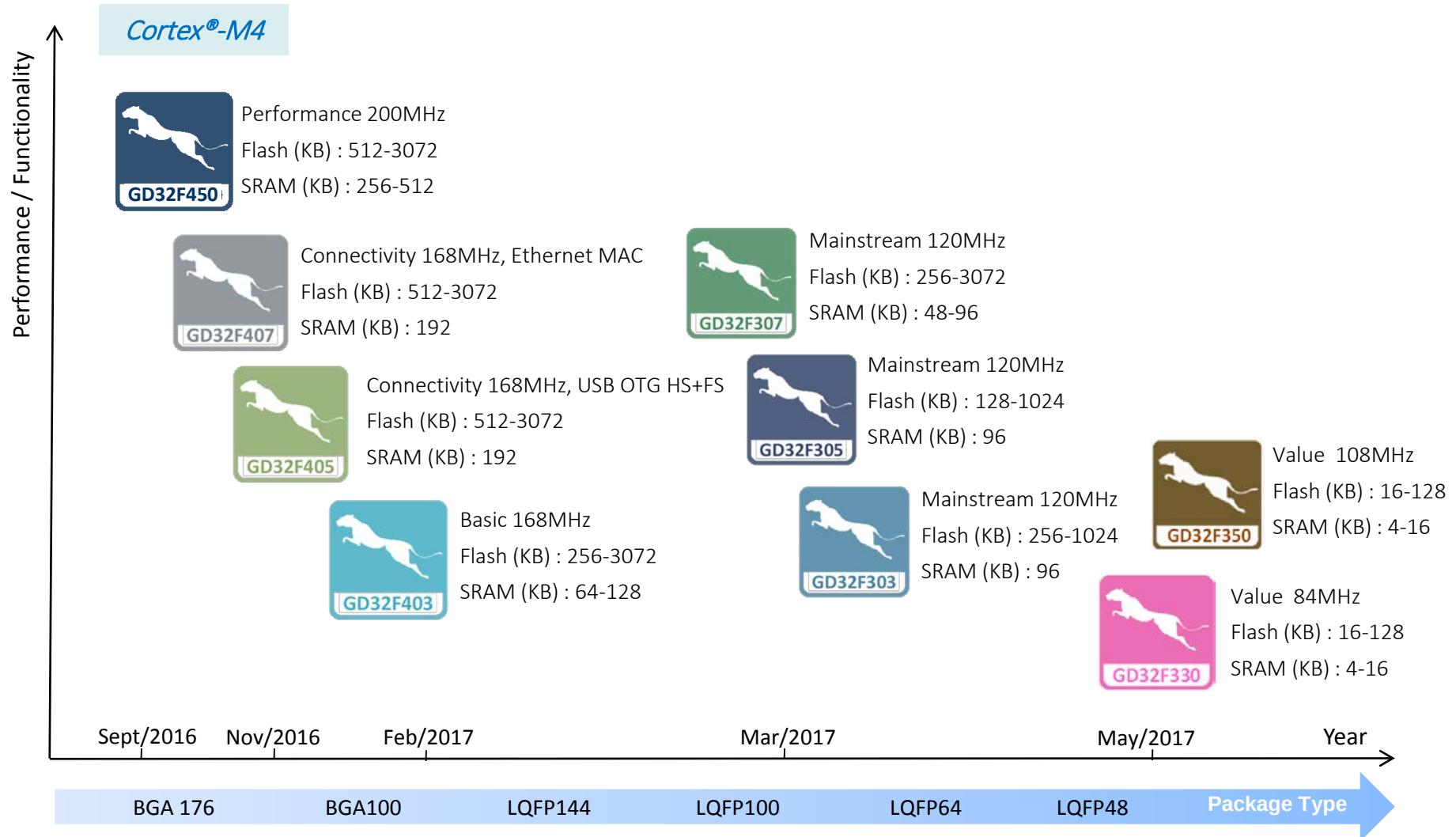
Simply entry with the best price!

- Cortex®-M3 Core @ 48 MHz
- Flash from 16 KB to 64 KB
- SRAM from 4 KB to 8 KB
- Up to 18KB ISP loader ROM
- Up to 2 x USART (9Mbit/s)
- Up to 2 x SPI (30Mbit/s)
- Up to 2 x I2C (400Kbit/s)
- 1 x 12bit, 1M SPS ADC (up to 9 chs),
- Three Power saving mode
- Battery supply for RTC and backup register
- Standby Current @ 1uA

Price U\$0.30



GD32 Cortex[®]-M4 MCU Roadmap



GD32F4

3 new families to expand F4 series and re-enforce leading position on high performance 32-bit MCUs.



GD32F450 Stretch Performance – 200MHz Fcpu

- Cortex-M4 with Graphic TFT display engine
- Support image accelerator with external SDRAM



GD32F407 Innovative Connectivity – 168MHz Fcpu

- Support Ethernet and two USB OTG: FS+HS
- BGA176 10x10mm for more IO extension



GD32F405 Balance Connectivity – 168MHz Fcpu

- Best balance between performance, connectivity and cost
- Smaller CM4, BGA100 7x7mm for a 3072KB



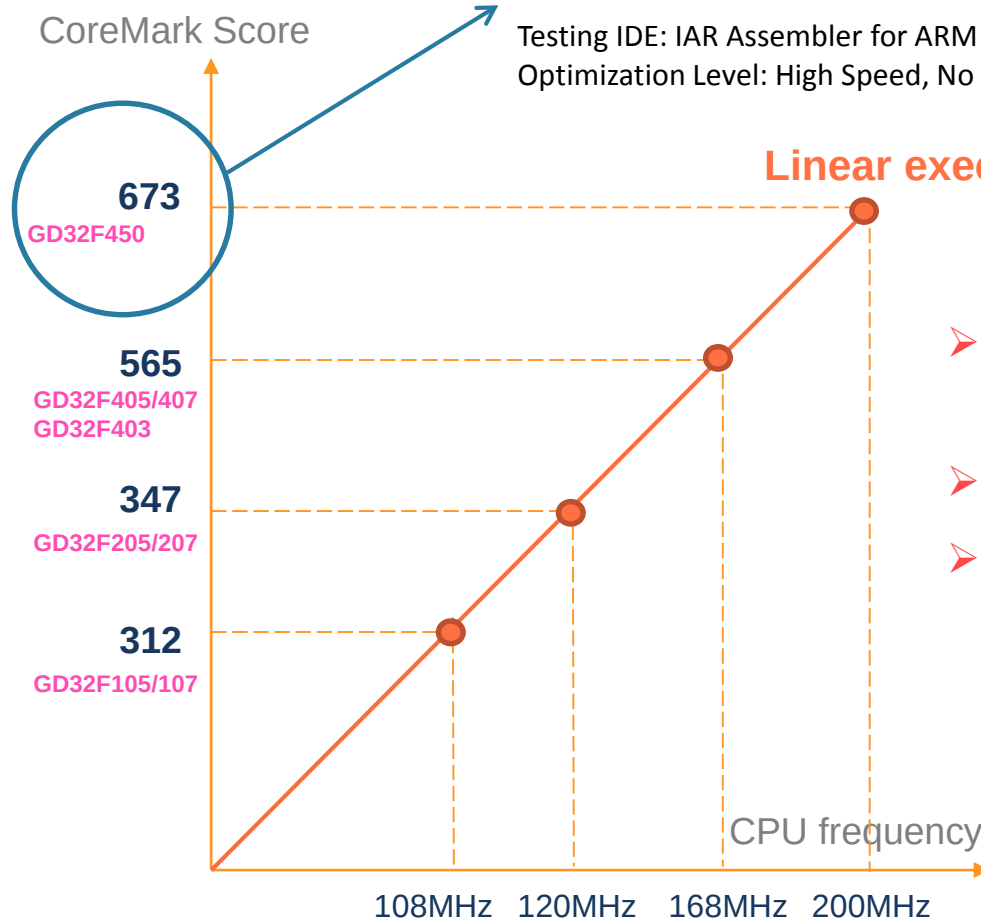
GD32F403 Performance Entry – 168MHz Fcpu

- Basic level with balance of performance and cost
- Smaller CM4, BGA100 7x7mm for a 3072KB

New GD32F4, Leading Performance

#1 Cortex®-M4 rank on CoreMark®

Testing IDE: IAR Assembler for ARM 7.40.2.8542
Optimization Level: High Speed, No size constraint



- Up to 200 MHz / 250 DMIPS with **Flash access Zero wait-state**
- Up to 673 CoreMark Result
- ARM Cortex-M4 DSP + floating-point unit (FPU)

New GD32F450, High Integration

Stretch Performance of GD32F4



BGA176 (10 x 10 mm)
LQFP144 (20 x 20 mm)
LQFP100 (14 x 14 mm)

- Cortex®-M4 Core @ 200 MHz
- Support H/W DSP instructions + FPU
- Zero-wait state execution from Flash memory
- Flash from 512 KB to 3072 KB
- SRAM from 256KB to 512KB
- EXMC interface support external SDRAM & SRAM
- Up to 8 x UART (9Mbit/s)
- Up to 6 x SPI (30Mbit/s)
- Up to 3 x I2C (400Kbit/s)
- Up to 2 x CAN2.0B
- Up to 2 x I2S
- Support SDIO, Ethernet MAC
- Support USB OTG FS + HS
- 8-14bit Camera Interface + IPA
- LCD-TFT controller up to XGA resolution
- Up to 3 x 12bit, 2.6M SPS ADCs (up to 24 chs)
- Up to 2 DACs
- Standby Current @ 2uA

GD32F450 Portfolios



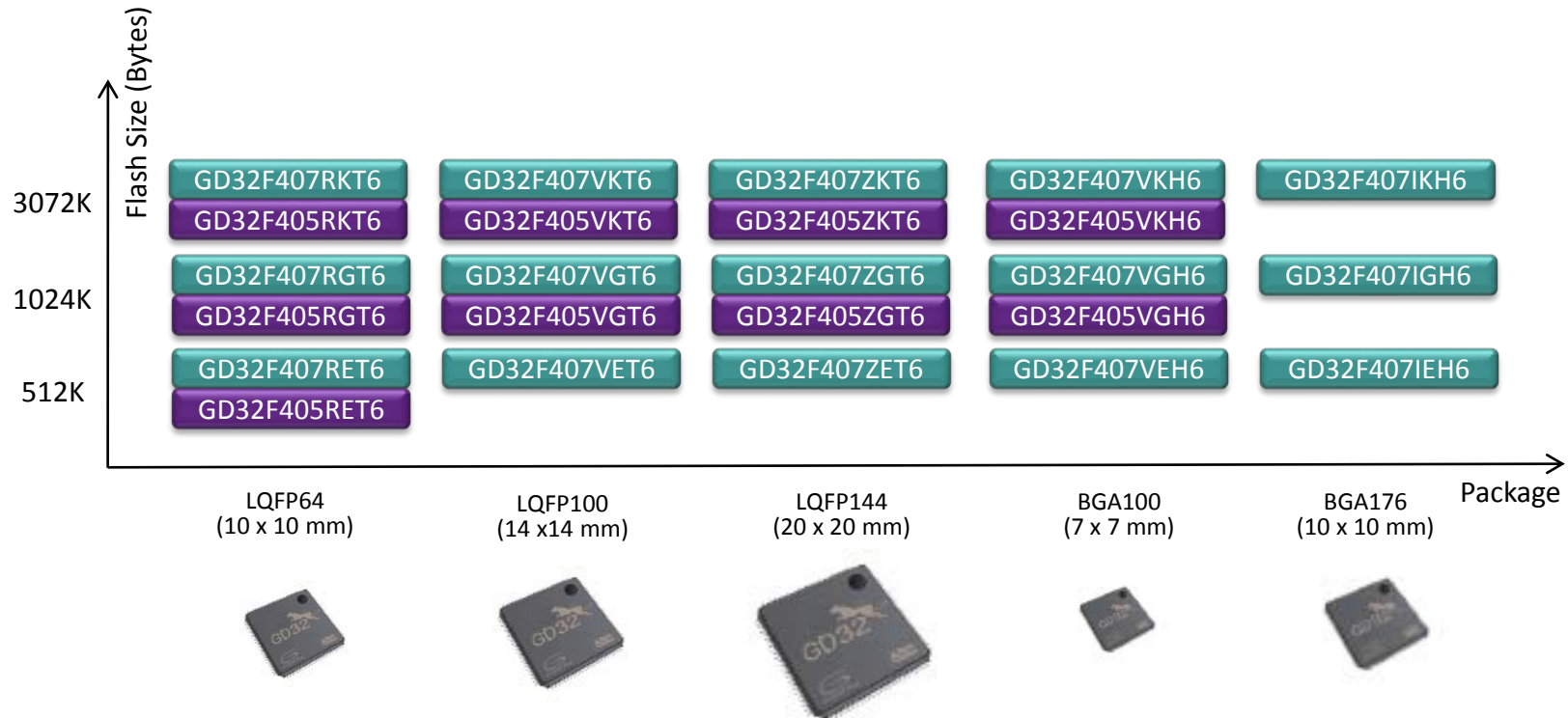
- ✓ GD32F450 Cortex®-M4 stretch performance line
- ✓ 256K-3072K Flash, 256K-512K SRAM
- ✓ 2.6-3.6V supply; 5V tolerance I/Os
- ✓ -40°C to +85°C industrial level operating temperature
- ✓ Series pin to pin compatible and flexible S/W compatible



GD32F405/407 Portfolios



- ✓ GD32F405 and GD32F407 Cortex®-M4 connectivity line
- ✓ 512K-3072K Flash, 192K SRAM
- ✓ 2.6-3.6V supply; 5V tolerance I/Os
- ✓ -40°C to +85°C industrial level operating temperature
- ✓ Series pin to pin compatible and flexible S/W compatible



GD32F403 Portfolios



- ✓ GD32F403 Cortex®-M4 performance entry line
- ✓ 256-3072KB Flash, 64-128KB SRAM
- ✓ 2.6-3.6V supply; 5V tolerance I/Os
- ✓ -40°C to +85°C industrial level operating temperature
- ✓ Series pin to pin compatible and flexible S/W compatible

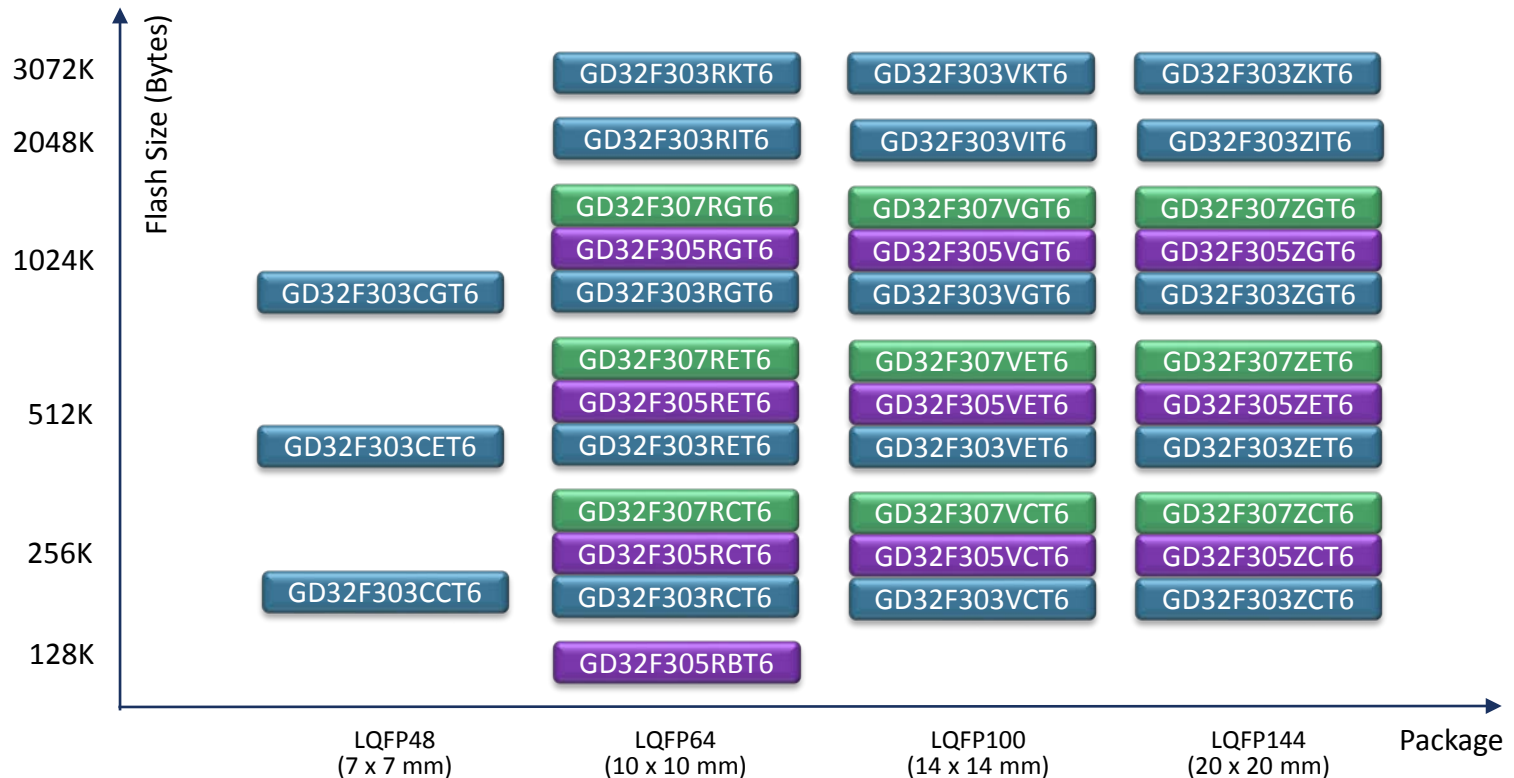
Performance
Entry



GD32F30x Mainstream Portfolios



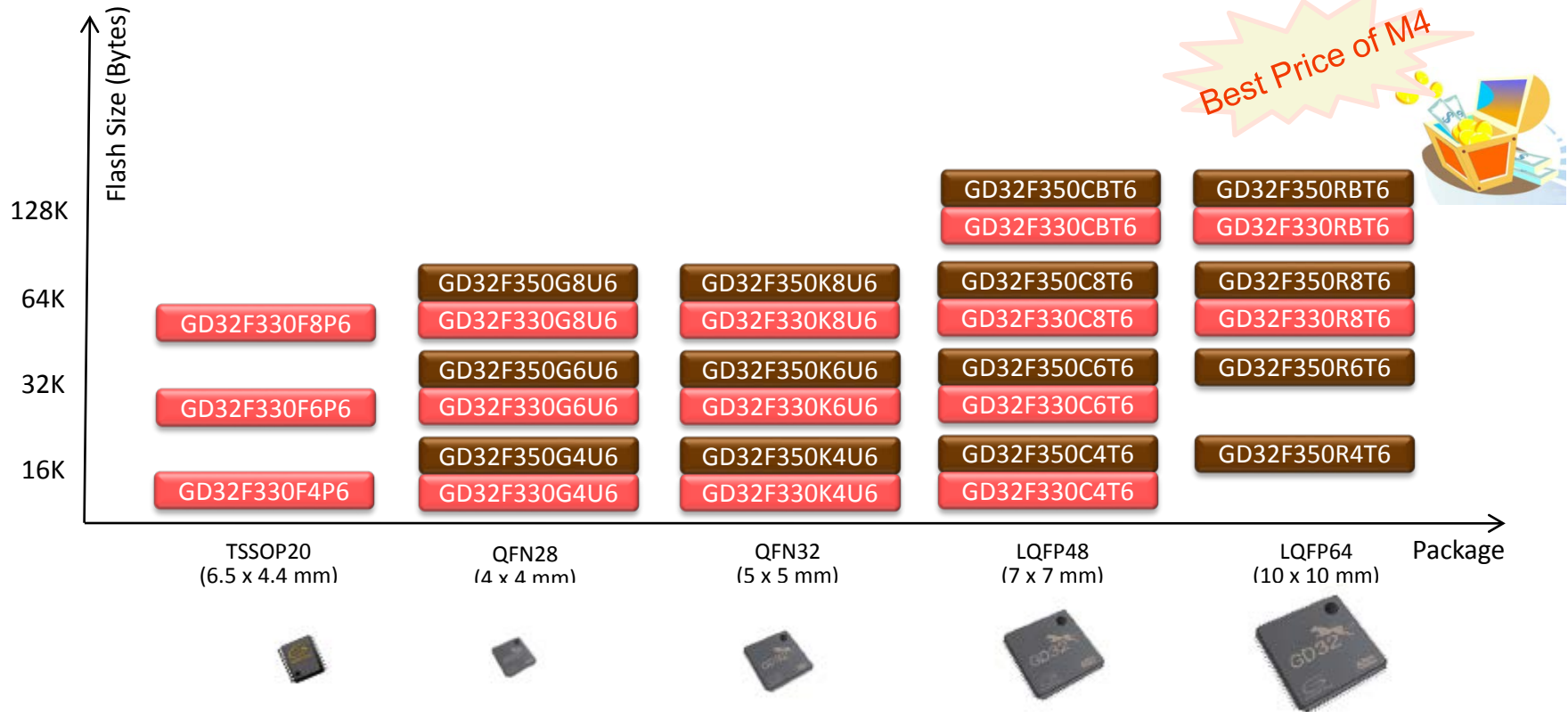
- ☑ GD32F303/305/307 Cortex®-M4 mainstream line
- ☑ 128-3072KB Flash, 48-96KB SRAM
- ☑ 2.6-3.6V supply; 5V tolerance I/Os
- ☑ -40°C to +85°C industrial level operating temperature
- ☑ Series pin to pin compatible and flexible S/W compatible



GD32F330/350 Value Portfolios



- ✓ GD32F330 and GD32F350 value line
- ✓ 16K-128K Flash, 4K-16K SRAM
- ✓ 2.6-3.6V supply; 5V tolerance I/Os
- ✓ -40°C to +85°C industrial level operating temperature
- ✓ Series pin to pin compatible and flexible S/W compatible



MCU is IoT “Node”



- High performance
- Cost-effective
- Easy use

GD32 MCU IOT End-Product

Intelligent Home



Intelligent lighting



Intelligent socket



Hoverboard



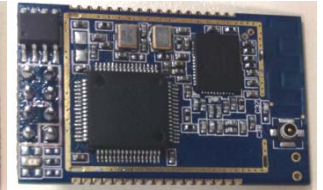
Health gateway



Drone

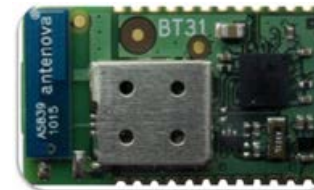


Vacuum Robot



Embedded WIFI module

Industry Connectivity



BLE Module



RFID label



Barcode scanning



OBD

Card Reader

- IC & RFID card reader
- Access Control
- ETC



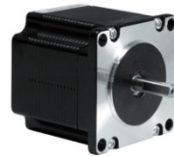
New Energy Control

- Battery Charging & discharging
- LED road lamp, LED display Wall
- Solar power station & MPPT



Industrial Control

- Motor Control
- Inverter
- Industrial PLC



Security & Surveillance

- Alarm
- Video surveillance dome
- Fire and CO monitor



Micro Printer

- POS
- Embedded printer
- Electronic payment



Medical & Health

- Oximeter, ECG
- Blood pressure meter
- Portable personal monitor



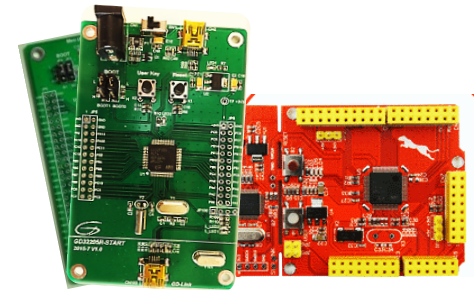
GD32 MCU full function Eval-board

- For on-chip function fully evaluation, including interfaces, external memory bus and LCD, etc.
- Extension header for available I/Os for quick connection to prototyping board and easy probing with onboard GD-link.

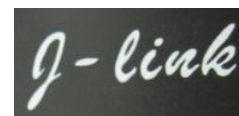


GD32 MCU learning starter kit

- Based on GD32 series MCU entry level starter kit, extension header for all package pins for quick connection to prototyping board and easy probing with onboard GD-link or other compatible simulators.
- Support Arduino compatible interface in selected model



Build GD32 development environment with H/W and S/W compatible



GD32 Development Tools



Products of Development Tools and Boards



Events & Activities



Programs for Teaching & Learning

- 01_GPIO_LED
- 02_GPIO_KeyBoard_Polling_mode
- 03_GPIO_KeyBoard_Interrupt_mode
- 04_USART1_Printf
- 05_USART1_Echo_Interrupt_mode
- 06_USART1_DMA
- 07_I2C_EEPROM
- 08_SPI_QSPI_Flash
- 09_EXMC_NandFlash
- 10_SDIO_SDCardTest
- 11_RTC_Calendar
- 12_ADC_Temperature_Sensor_REFINT_Channel
- 13_DAC_Output_Voltage_Value
- 14_CAN_Dual_CAN
- 15_CRYPT
- 16_HASH
- 17_RNG
- 18_TLDI_without_GUI
- 19_Tamper_Waveform_Detection
- 20_USB_OTG_Device_Mouse
- 21_USB_OTG_Device_Usb_disk
- 22_USB_OTG_Device_VirtualCOMPort
- 23_USB_OTG_Host_Accesses_Usb_disk
- 24_ETH

GD32 Handle Industry Challenges Easily

Product Line

Multiplex products
Best peripherals

Service

Sufficient Capacity
Fast lead time

Series compatible
Easy to use

High Performance
Cost-effective

Eco-system

Quality



Thanks!



*Outstanding Value
Innovation Choice*

