



MindMotion Microelectronics

(Application)

2019.

MindMotion[®] MM32[™] - Target Application



◆ Automotive

- ◆ OBD / OBD II
- ◆ CAN Adapter
- ◆ Car Infotainment
- ◆ Networking
- ◆ Window/Tailgate con.



◆ Industrial & Motor

- ◆ Power Tool
- ◆ Meter
- ◆ E-Vehicle
- ◆ Robot
- ◆ Water Pump/Cooling



◆ HA & Healthy

- ◆ BLDC Fan
- ◆ Vacuum
- ◆ Food Processor
- ◆ Glucose monitor
- ◆ Wearable device

MindMotion[®] MM32[™] - Target Application con.



◆ Consumer & Toy

- ◆ E-Cig
- ◆ RC Toy
- ◆ Smart Door Locker
- ◆ Gaming accessory
- ◆ Barcode Scanner/Printer



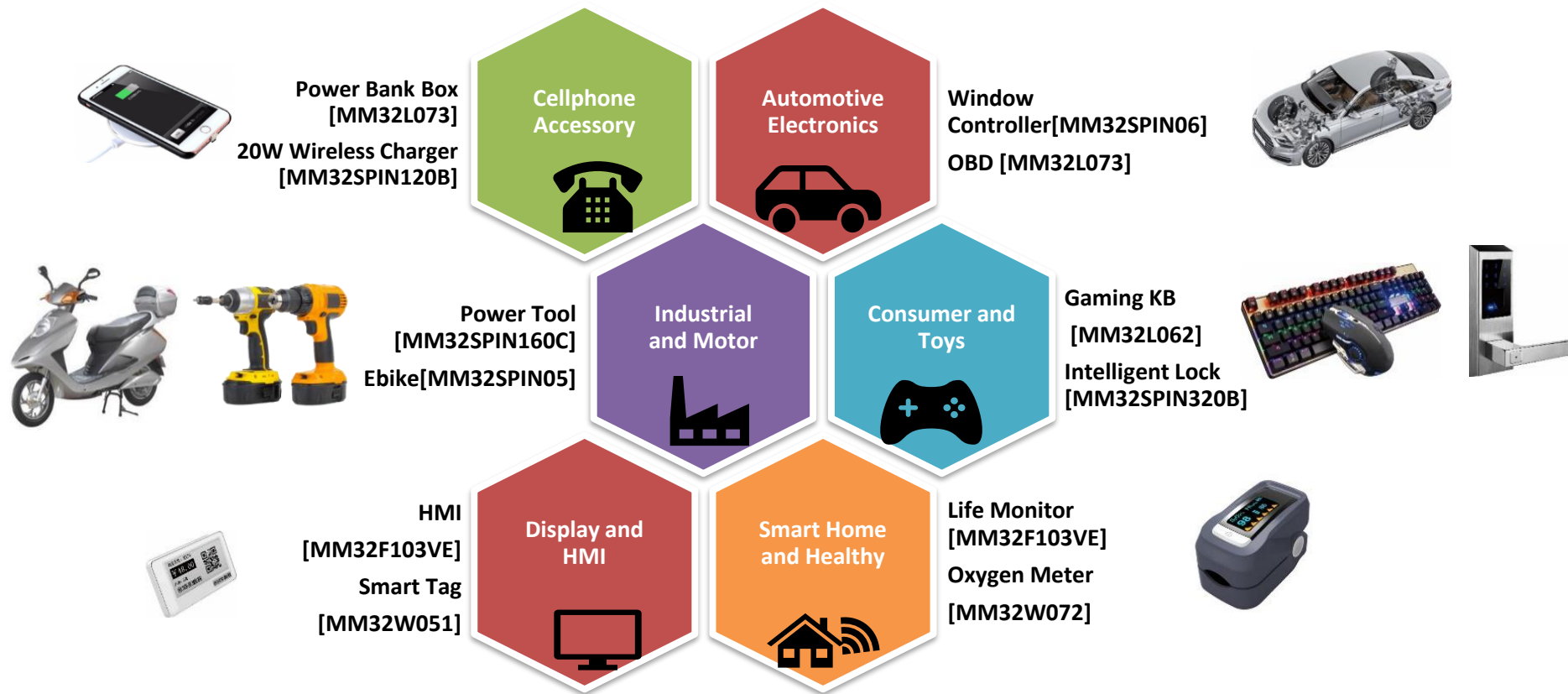
◆ Accessories

- ◆ Wireless Charger
- ◆ Power Bank
- ◆ Adapter
- ◆ Protocol Switch
- ◆ Smart Speaker



◆ Display & HMI

- ◆ HMI
- ◆ Digital Signage
- ◆ E-label
- ◆ LED Display
- ◆ E-paper Display





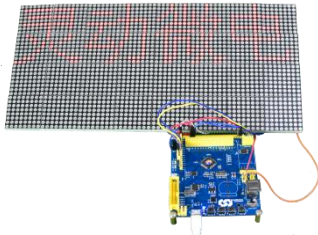
Success Stories



Drone



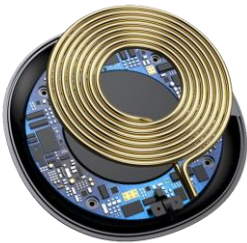
LCD Display



LED Display



E-tag



Wireless Charger



BLE Lighting



Smoke Detector



Thermal Printer



E-Cig



BLDC Motor



eVehicle



Power Tool



Vacuum



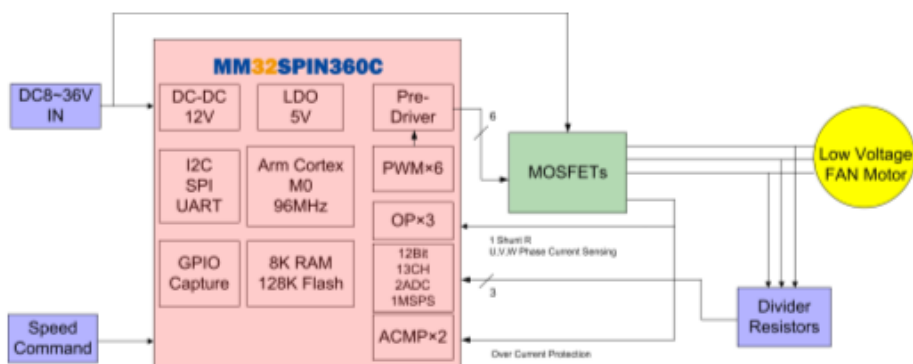
Servo

MindMotion[®] MM32[™] MM32SPIN Application : Low-Voltage Fan

MM32 MCU

MINDMOTION MICROELECTRONICS

Low Voltage Fan



MM32 MCU Parts

MM32SPIN360C

Specification

- Up to 96MHz computing power ARM Cortex M0.
- FOC control
- SMO methodology for the rotor angle detection
- Single/Dual resistor third phases current sensing

Function Block

Features

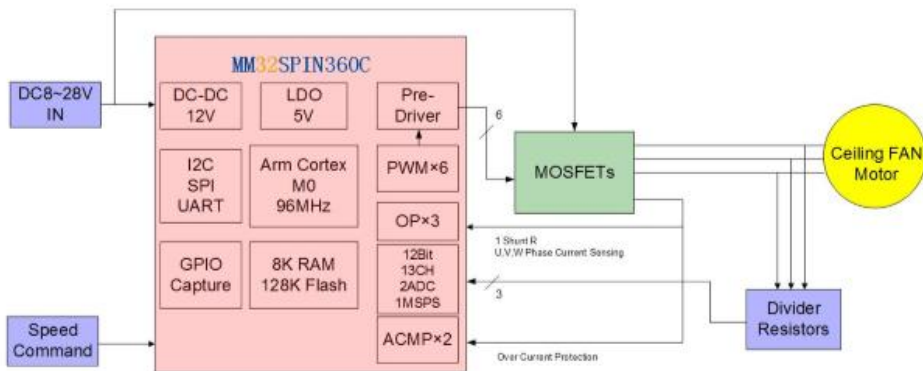
- High efficiency
- Quietly operation
- Continuously variable speed adjustment
- Constant power control
- Support initial localization
- Support forward/backward start, with or w/o loading start.
- Over current, voltage and block rotor protection.
- Voltage range : 8~36V
- Rotating speed : 100~28800RPM (2poles)

MindMotion[®] MM32[™] MM32SPIN Application : Ceiling Fan

MM32 MCU

MINDMOTION MICROELECTRONICS

Ceiling Fan



MM32 MCUParts

MM32SPIN360C

Specification

- Up to 96MHz computing power ARM Cortex M0
- Hall sensor less FOC control
- SMO methodology for the rotor angle detection
- Single resistor third phase current sensor

Function Block

Features

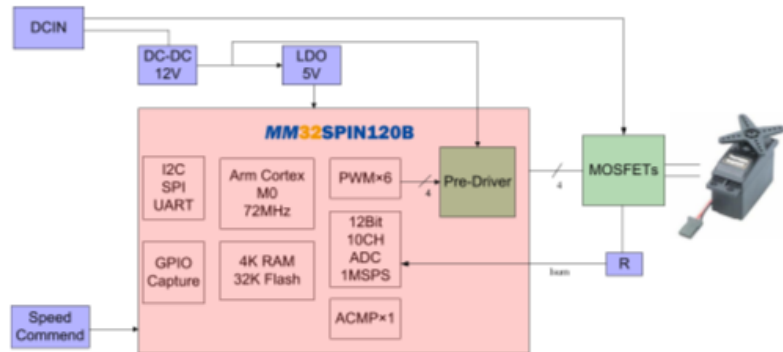
- High efficiency
- Quietly operation
- Continuously variable speed adjustment
- Constant power/speed control
- Support initial localization
- Support forward/backward start, with or w/o loading start.
- Over current, voltage and block rotor protection
- Voltage range : 8~36V
- Rotating speed : 10~360RPM





Servo Motor

Function Block



MM32 MCU Parts

MM32SPIN120B

Features

- High efficiency
- High integration

Specification

- Up to 72MHz computing power ARM Cortex M0
- Embedded two Gate drivers
- Embedded 32Bits Hardware multiplier / divider
- Position/speed control
- Over current protection
- Voltage range : 4.5~15V

MindMotion[®] MM32[™] MM32SPIN Application : Edu Robot

MINDMOTION MICROELECTRONICS

Educational Robot



MM32 MCU Parts

MM32F031K8U6
MM32SPIN120B

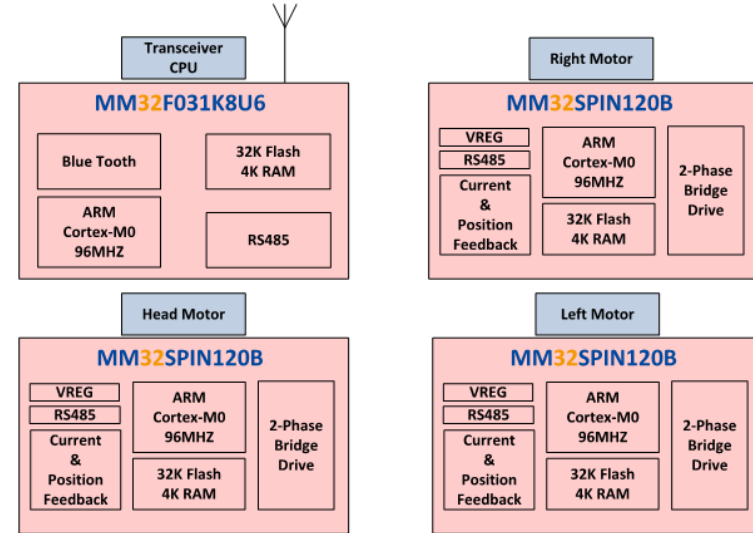
Specification

- Up to 72MHz computing power ARM Cortex M0
- Embedded Gate driver
- Embedded 5V LDO
- Rotating speed at 420rpm w/o loader
- Spin torque at 0.05N*M
- Block torque at 0.25N*M

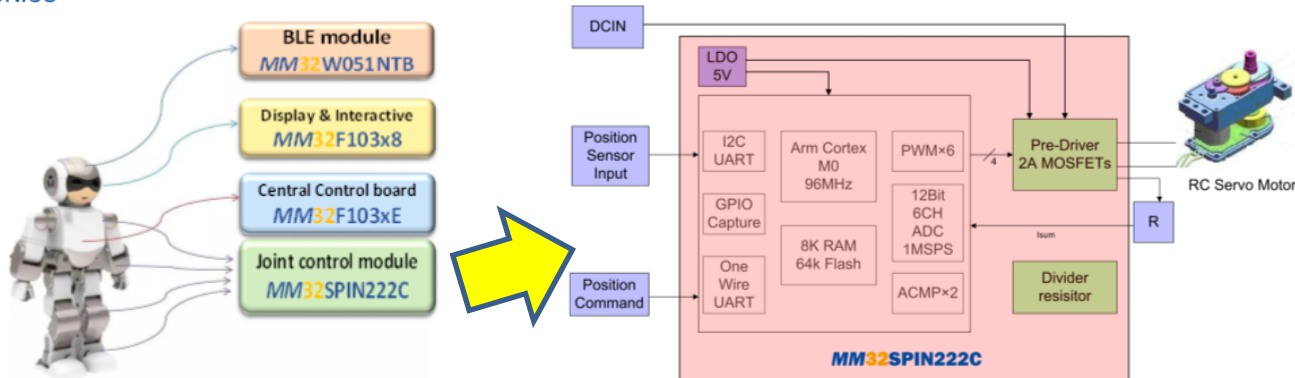
Features

- Close-loop BLDC control
- On line programmable
- suitable for the education propose
- Integrated touch sensor, IR sensor
- Easy to install
- BLE conectivity

Function Block



AI Robot Toy



MM32 MCU Parts

MM32SPIN222C
MM32F103
MM32W051NTB

Specification

- Up to 96MHz computing power ARM Cortex M0
- Embedded Gate driver And six 20V/2A MOS
- Embedded 5V LDO
- Supported single wire Half-Duplex UART transmission

Features

- High efficiency
- High integration
- Position/Speed control
- Over current protection
- Voltage range : 5~15V



MindMotion[®] MM32[™] MM32F031 Application : Smoke Detector

◆ Background

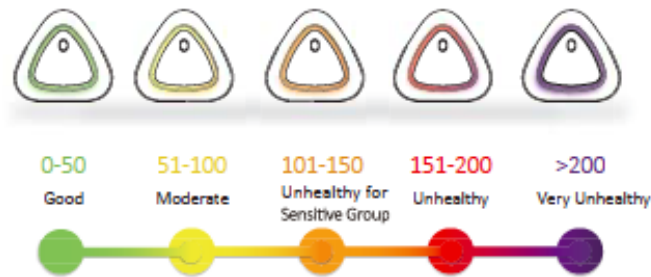
- Application: Smart Detector
- MindMotion P/N: MM32F031K8U6/MM32W051NT

◆ Parameters

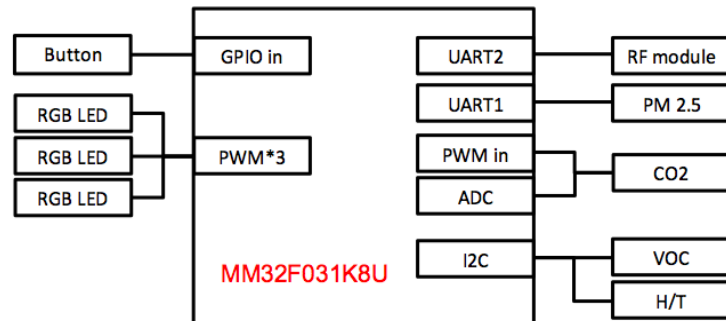
- Cortex-M0, computing power up to 72MHz
- Support CO2/ VOC/ H+T/ PM2.5 detection
- LED lighting display
- Wireless connection – BLE

◆ Features

- High integration
- High efficiency



使用者可以透過 APP 調整呼吸燈亮度,同時也可以設定睡眠模式。



MindMotion[®] MM32[™] MM32SPIN Application : High-Voltage Fan

MM32 MCU

MINDMOTION MICROELECTRONICS

High Voltage Fan



MM32 MCU Parts

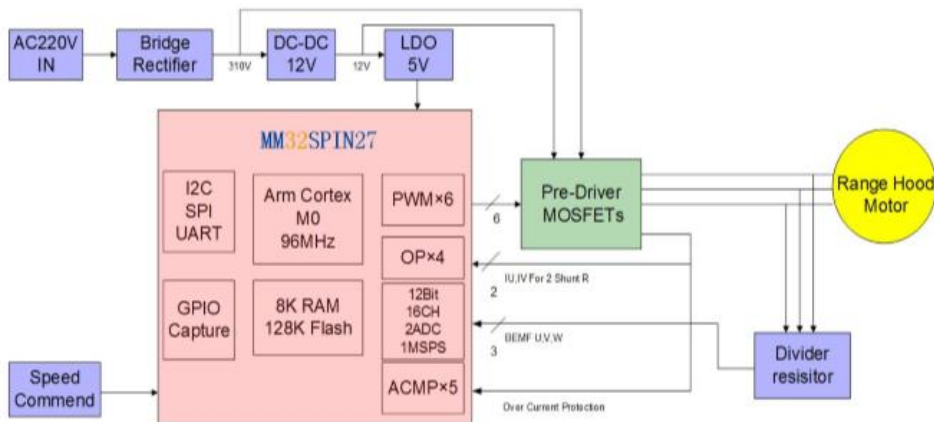
MM32SPIN27

Features

- High efficiency
- Constant power control

Specification

- Up to 96MHz computing power ARM Cortex M0
- Sensor-less FOC control
- SMO methodology for the rotor angle detection
- Dual resistor third phases current sensing
- Support forward/backward start, with or w/o loading start.
- Over current, voltage and block rotor protection
- Voltage range : 180~260VAC
- Rotating speed : 300~1800RPM (8poles)



MindMotion[®] MM32[™] MM32F103 Application : Blender

MM32 MCU

MINDMOTION MICROELECTRONICS

Hight Speed Blender



MM32 MCU Parts

MM32F103

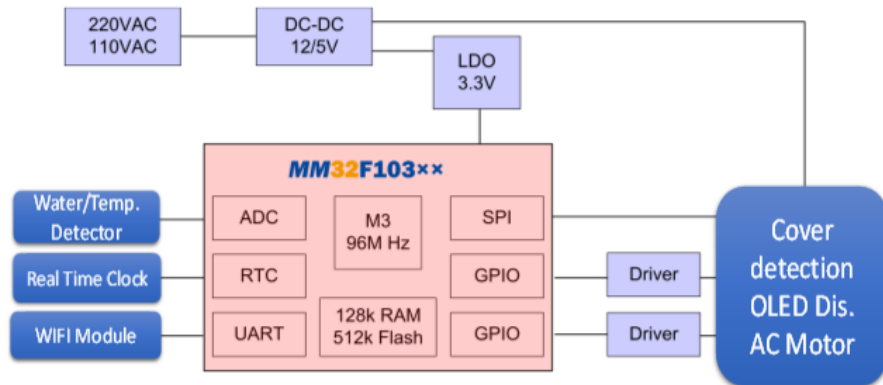
Specification

- Up to 96MHz computing power ARM Cortex M3
- Up to 128KB Flash RoM and 20KB SRAM
- Support UART In Application Programming (IAP) / In System Programming (ISP)

Features

- OLED Display
- WIFI remote control
- Programmable cooking methods presetting
- Touch control panel

Function Block



MindMotion[®] MM32[™] MM32F031 Application : Trash Can

MM32 MCU

MINDMOTION MICROELECTRONICS

Automatic Trash Can



Function Block

MM32 MCU Parts

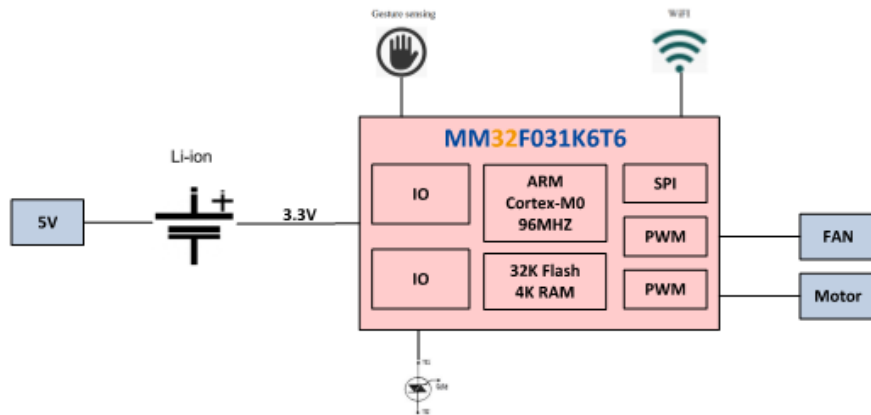
MM32F031K6T6

Features

- Intelligent
- Automatically

Specification

- Up to 72MHz computing power ARM Cortex M0
- Ultra low power consumption at 0.6uA
- WIFI connectivity
- User gesture sensing
- Auto packing



MindMotion[®] MM32[™] MM32SPIN Application : Vacuum

MM32 MCU

MINDMOTION MICROELECTRONICS

Vacuum Cleaner



MM32 MCU Parts

MM32SPIN05

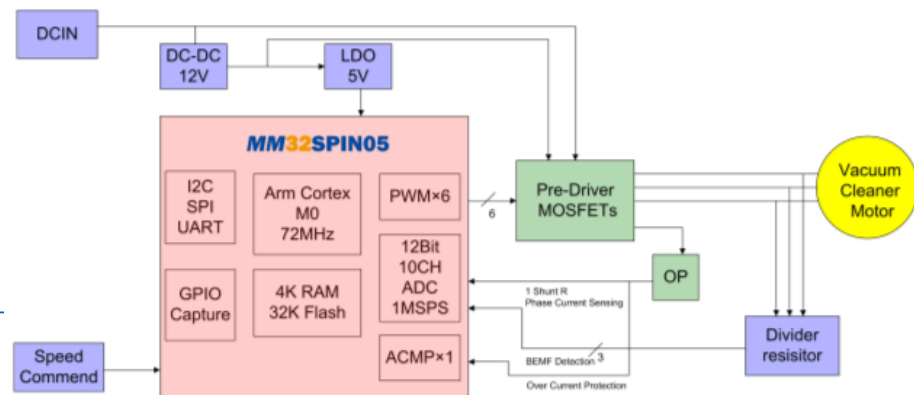
Specification

- Up to 72MHz computing power ARM Cortex M0
- Sensor-less FOC control
- SMO methodology for the rotor angle detection
- Single resistor third phases current sensing
- Support forward/backward start, with or w/o loading start.
- Over current, voltage and block rotor protection.
- Voltage range : 18~32V
- Rotating speed : Up to 120000RPM (2poles)

Features

- High efficiency
- High rotating speed
- Constant power, rotating speed control.

Function Block



MindMotion[®] MM32[™] MM32SPIN Application : Power Tool

MM32 MCU

MINDMOTION MICROELECTRONICS

Power Tool

Function Block



MM32 MCUParts

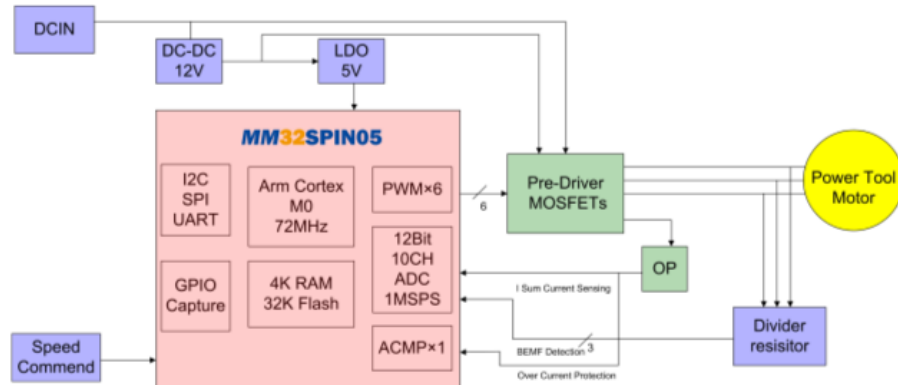
MM32SPIN05

Features

- High rotating speed
- Embedded comparator
- Fast boot up

Specification

- Up to 72MHz computing power ARM Cortex M0
- Hall sensor less square wave driving methodology
- Over current, voltage and block rotor protection
- Supply Voltage : 24V



MindMotion[®] MM32[™] MM32F103 Application : E-Tag

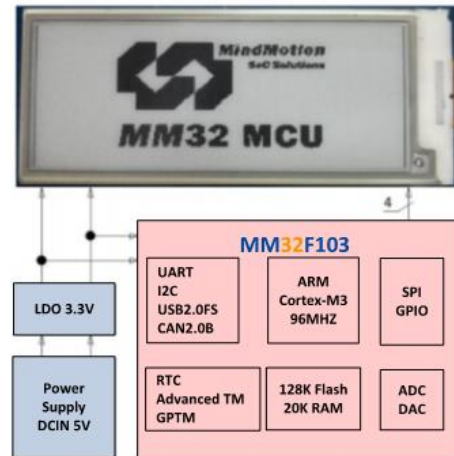
MM32 MCU

MINDMOTION MICROELECTRONICS

Smart Tag



Function Block



MM32 MCU Parts

MM32F103RBT6

Features

- Variable content display
- E-paper display for power saving

Specification

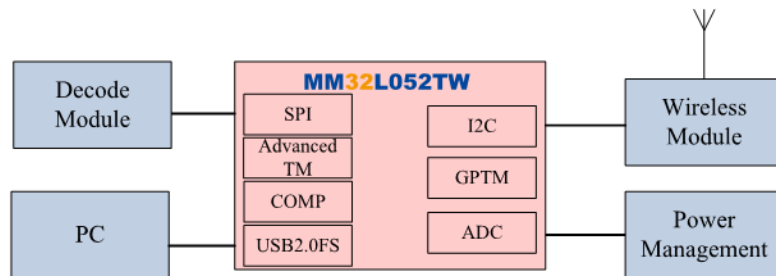
- Up to 96MHz computing power ARM Cortex-M3
- Rich density for data access and display buffering
- Data refresh thru interface : USB, UART, I2C...,etc.

MindMotion[®] MM32[™] MM32L0 Application : Barcode Scanner

MM32 MCU

MINDMOTION MICROELECTRONICS

Barcode Scanner



MM32 MCU Parts

MM32L052TW

Specification

- Up to 48MHz computing power ARM Cortex M0
- Low battery alarm : less than 3.4 +/- 0.05V
- Scanned size: 18.6mm * 14.2mm * 6mm (L*H*W)
- Multiple languages supported : Chinese, English, French, Spanish, Italian...,etc.
- Support ANSI(TXT, EXCEL), Unicode(Word) coding

Features

- Support wired (USB) and wireless (RF)
- 100m transmission range in 2.4G RF mode
- 300m transmission range in 433MHz RF mode

MindMotion[®] MM32[™] MM32F103 Application : Thermal Printer

MM32 MCU

MINDMOTION MICROELECTRONICS

Thermal Printer



MM32 MCUParts

MM32F103VET6

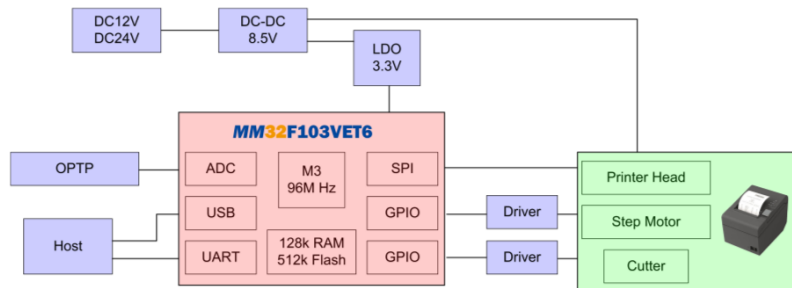
Specification

- Up to 168MHz computing power ARM Cortex M3
- Support SEKIO Thermal head
12V : CAPD-245 / CAPD-345 / LTP01-245
24V : CAPD-247/ CAPD-347

Features

- 1D/2D code printing
- Ticket/Receipt printing
- Wired/wireless printing

Function Block



MindMotion[®] MM32[™] MM32SPIN Application : E-Bike

MINDMOTION MICROELECTRONICS

E-Bike



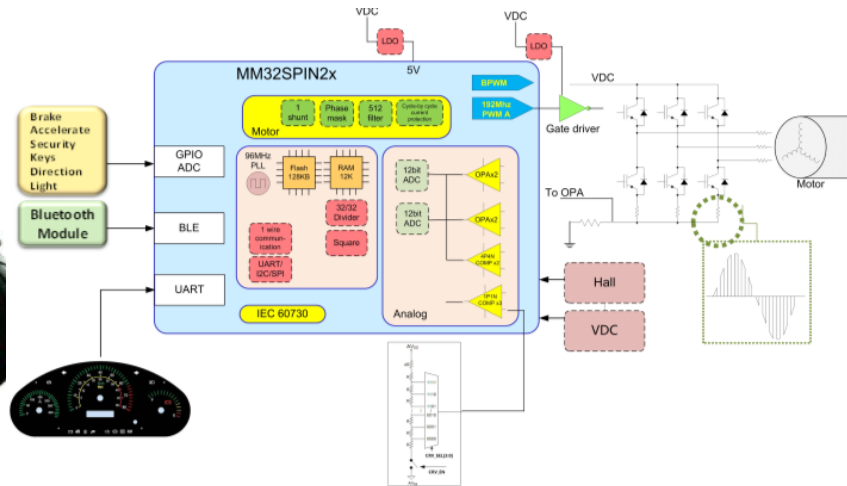
Features

- Extreme Speed : 100km/h
- Accelerate performance : 0~100km @ 17s
- 32-bits MCU used for main controller and dash board.
- High torque Center motor system
- TFT-LCD dash board
- Cooling system is unnecessary
- High quality parking stand
- Dual disc brakes

Key Parameters

- **MCU: MM32SPIN27PS**
- **MOSFET: 18 x 100A N type**
- **64V, 72V Voltage Supply**
- **Security**
- **Third-way driving support**

- **ABS breaks system control**
- **Self detection and recover for Hall sensor**
- **Over current, voltage and block rotor protection**
- **Single resistor third phases current sensing**
- **Hall sensor less FOC control**



◆ MM32F003 for the Fingerprint capture module

- ▶ Alarm detection
- ▶ Data collection

◆ MM32FPR for the Fingerprint recognition

- ▶ Fingerprint capture
- ▶ Previous processing
- ▶ Characteristic capture
- ▶ Identification and classify

◆ MM32W0 for BLE

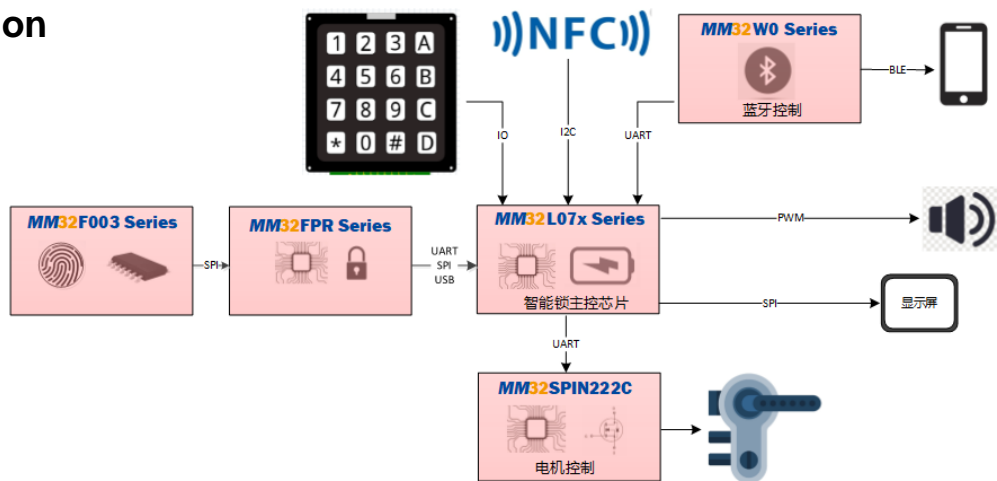
- ▶ Unlock thru BLE
- ▶ OTA

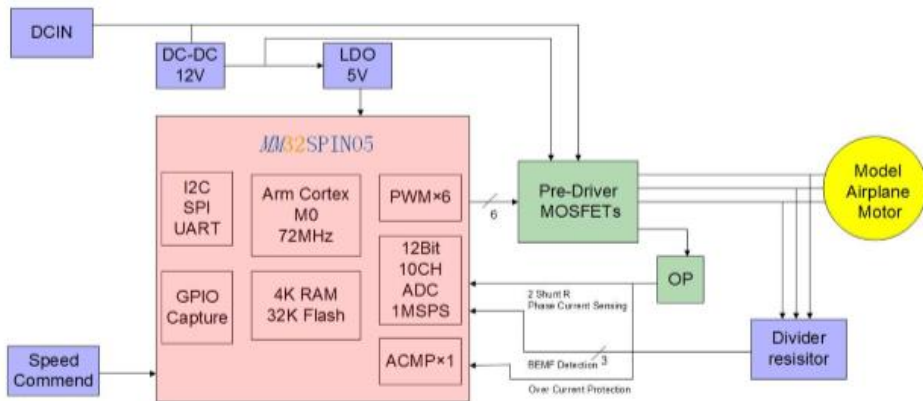
◆ MM32SPIN222C for the motor control

- ▶ Locker motor control
- ▶ Handshake with main chip

◆ MM32L07x for the main board

- ▶ Handshake with modules
- ▶ Communicate the functional block





MM32 MCU Parts

MM32SPIN05

Specification

- Up to 72MHz computing power ARM Cortex M0.
- Hal sensor less FOC control
- SMO methodology for the rotor angle detection
- Single/Dual resistor third phases current sensor supported

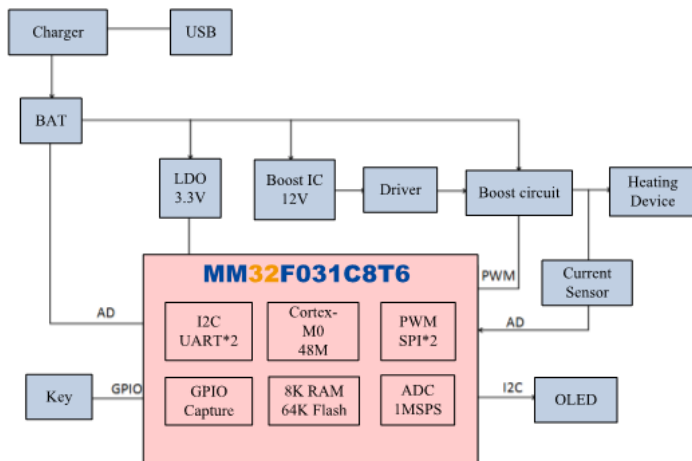
Function Block

Features

- High efficiency
- High integration
- Constant power/rotating speed control
- Support forward/backward start, with or w/o loading start.
- Over current, voltage and block rotor protection
- Voltage range : 12~18V
- Rotating speed : Up to 100000RPM (2poles)



Function Block



MM32 MCU Parts

MM32F031C8T6



Features

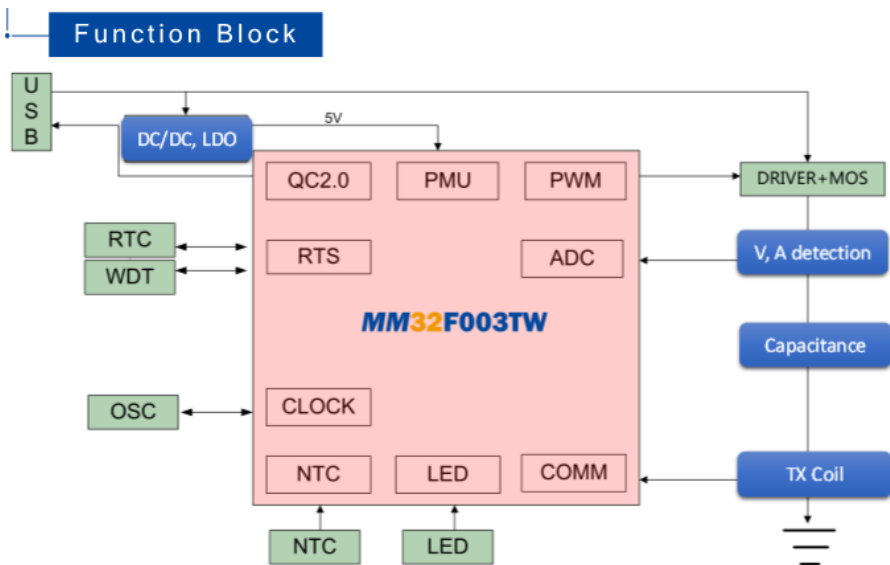
- Ultra low consumption - Idle mode
- Variable output power
- OLED display

Specification

- Up to 72MHz computing power ARM Cortex-M0
- Adjust driving power switch
- Support 0.1Ω~1Ω large power heating wire
- Idle consumption less than 6uA

- BLE extender port
- Support In System Programming
- Over voltage, current protection





MM32 MCU Parts

MM32F003TW

Specificaition

- Up to 48MHz computing power ARM Cortex M0
- Support 10W Wireless charger
- Support Apple Iphone 7.5W wireless charger

Features

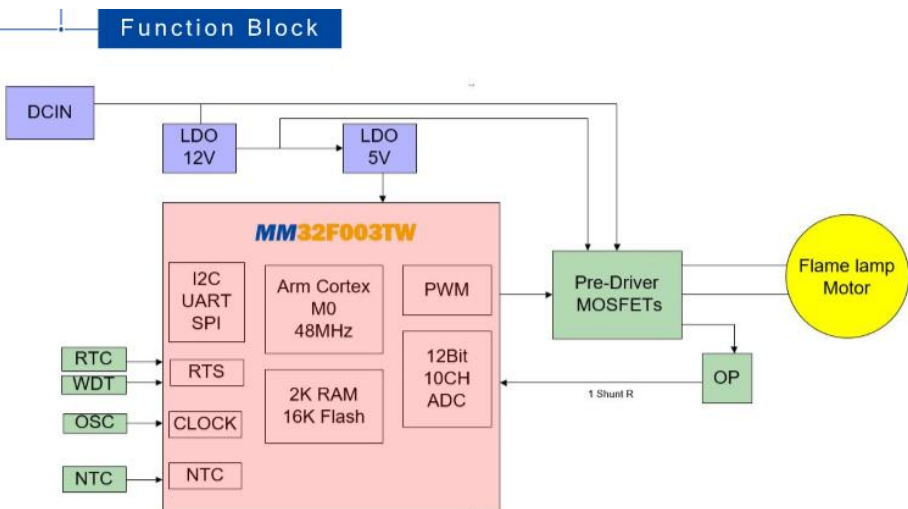
- Support QC3.0 · Samsung AFC protocol
- Integrated Half bridge, driver and MOS
- Fulfilled WPC · Qi protocol
- Up to 83.58% efficiency



MM32 MCU

MINDMOTION MICROELECTRONICS

Fascia gun



MM32 MCU Parts

MM32F003TW



Features

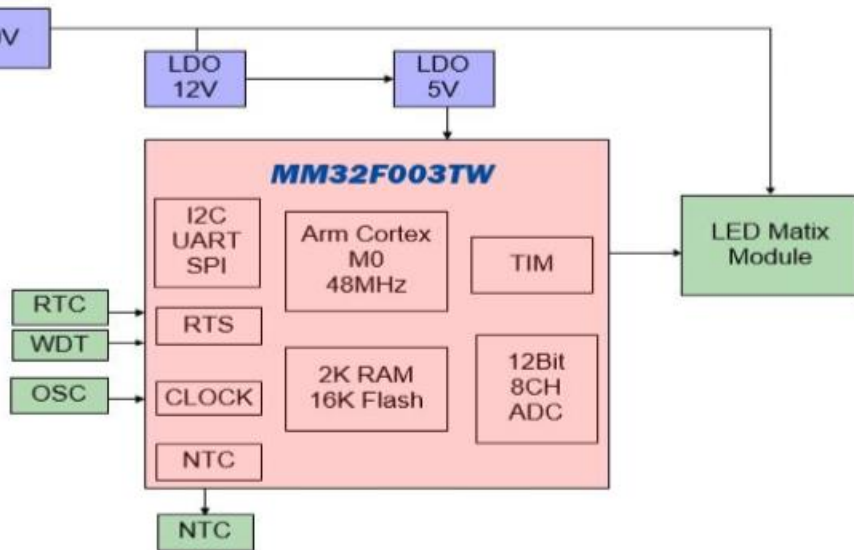
- Multiple massage mode selection
- Low battery alarm
- Capacitive Touch switch
- Higher stability and opinions

Specificaition

- Up to 48MHz computing power ARM Cortex M0
- Hall sensor less square wave driving method
- Powerful initiate torque and fast response



Function Block



MM32 MCU Parts

MM32F003TW

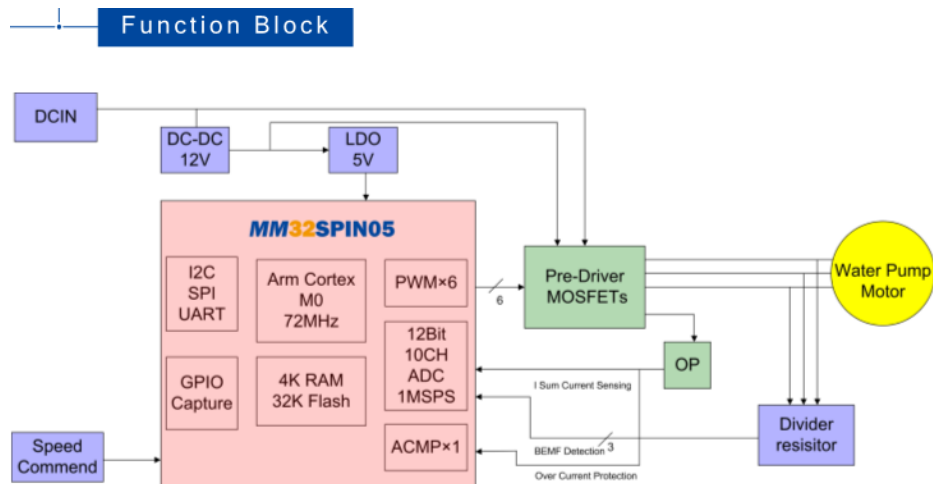
Specificaition

- Up to 48MHz computing power ARM Cortex M0
- Support EE12 lamp and 270pcs LED control
- Higher integration

Features

- Fast image display switching
- Unique flame simulation
- Higher integration





MM32 MCU Parts

MM32SPIN05

Specification

- Up to 72MHz computing power ARM Cortex M0
- Hall sensor less square wave driving
- Over current, voltage and block rotor protection
- Voltage range : 7~28V

Features

- High rotating speed
- Embedded comparator
- Fast boot up





THANK YOU !