





2022

Holtek eBook

HOLTEK SEMICONDUCTOR INC.

About Holtek

Holtek Semiconductor is a leading professional IC design house in Taiwan having its major business activities focused in the area of microcontroller and peripheral component design and marketing. From its origins in 1998, the company has continuously focused its energies in the advancement of new product development and skills innovation. The company's ability to keep in line with market trends, has given Holtek the means of releasing a wide range of highly successful and extremely competitive IC devices.

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PRODUCT NEWS

HT45F8650/HT45F8662 Second Generation Li-Battery Protection MCUs

Holtek wishes to announce the release of its new second generation Li-battery protection Flash MCUs, the HT45F8650 and HT45F8662. When compared with the first generation HT45F85xx series, these new devices also have Li-battery voltage detection circuitry with an accuracy of ±24mV, new add zero standby power consumption function, passive balance circuitry, high voltage MOSFET gate-drivers in addition to other functions. One additional special feature is that the internal LDO now has an increased output current capability of up to 50mA. The devices are suitable for 3 to 8-cell Li-battery products, such as BMS boards, power tools, wireless vacuum cleaners and so on.

The devices contain 8K×16/16K×16 of Flash Program Memory, 512×8/1024×8 of Data Memory and a 128×8/1024×8 EEPROM as well as 21/25 multi-function I/Os. Each device includes a 12-bit multi-channel A/D converter and a comparator function. Communication interfaces include fully integrated SPI, I²C and UART interfaces, which can be used together with the internal IAP function to implement online program updates. Two integrated low-side gatedriver circuits and a single high-side gatedriver circuit are used to drive MOSFET transistors. The integrated zero standby power consumption and high voltage wake-up functions can be used to increase the battery standby time. Together with the integrated passive balance circuitry, all of these features combine to greatly reduce the number of external component requirements, which results in reduced PCB areas.

With regard to packaging, the HT45F8650 is supplied in a 28-pin SSOP and a 48-pin LQFP-EP package types while the HT45F8662 is supplied in a 48-pin LQFP-EP package type. The EV devices, the HT45V8650 and HT45V8662, use an OCDS EV architecture which offer convenience and flexibility for product development.



PRODUCT NEWS HT74153 6V/2A/1.2MHz Synchronous Step-Down Converter

Holtek is delighted to announce the release of its new synchronous stepdown converter, the HT74153. The device can operate with an input voltage range of 2.5V~6V and is thus suitable for use in products powered by 3 to 4 cell dry batteries or a single Li-battery. With an output current of up to 2A, the new device can provide a stable output voltage for driving high current load applications such as a low voltage DC motors or a laser diode. These features combine to ensure the device is suitable for portable products which include massagers, toys and laser projectors etc.

The HT74153 has a 100% duty cycle operation feature, extending the end product durability. If the battery voltage should become lower than the target output voltage, then the output voltage will track the input voltage. The HT74153 has a current consumption only 50µA under no load conditions.

With regard to packaging, the HT74153 is available in 8-pin SOP-EP and 5-pin SOT23 package types. For the 8-pin SOP-EP package, the system power and

the IC power are separated independently. The HT74153 is able to provide a highly stable power source for products whose systems operate in high power noise environments such as in products like massagers and toys which have motor loads. If a shorted load condition occurs, then the surface temperature of the 8-pin SOP-EP package will increase by only one degree, which can improve greatly the battery safety. The 8-pin SOP-EP package can also provide an external MCU with a PG signal which indicates whether the output voltage is at its target output voltage level. The MCU can then turn the load on or off, depending upon this PG signal. The 5-pin SOT23 package is suitable for use in portable products which may have limited space requirements. The fully integrated Schottky diode and the use of 1µH/2.2µH small size inductors contribute to effective reductions in circuit area.



BS84C12CA High Noise Immunity Enhanced Touch A/D MCU

Holtek is delighted to announce the release of its new Enhanced Touch A/D Flash MCU, the BS84C12CA. This new device incorporates all the excellent noise immunity features of the previous BS84C12C series and additionally has full pin compatibility with the BS84C12x. This new device however, provides a higher range of system resources and is also suitable for use as a master MCU. These features combine to ensure the device is suitable for use in applications which require touch keys, LED display and temperature measurement. Applicable products could be electric teapots, air fryers and smoke exhaust ventilators, etc.

This new device provides 12 touch keys all of which have passed the conductive susceptibility dynamic 10V test. The device has an operating voltage of 1.8V~5.5V, a 4K×16 Flash Program Memory, a 512×8 Data Memory, a 512×8 EEPROM, an IAP function, a 12bit A/D converter with a high accuracy reference voltage up to±1%, a high speed UART interface and SPI/I²C interfaces. Holtek also fully supports the device with a comprehensive suite of hardware and software development tools as well as a touch key function library which enables designers to develop their products more rapidly.



BA45F6640 Human Body Motion Detection MCU

Holtek is delighted to announce the release of its new integrated PIR/ Microwave AFE and LDO Flash MCU, the BA45F6640. By only adding an external PIR sensor or a microwave module, a human body motion detection function can be implemented. The device has a long detection range of up to 12 meters and also has excellent anti-RF interference making it suitable for use in Internet of Things products, security and lighting application areas, such as wireless human body sensors, intelligent doorbells, PIR wireless network cameras and PIR/microwave sensing bulbs etc.

The BA45F6640 has an operating voltage of 2.2V~5.5V. The device contains a 4K×16 Flash program memory, a 384×8 RAM and a 64×8 EEPROM. With regards to peripheral features, the device also includes an 8-channel 12-bit A/D Converter as well as SPI/I²C and UART communication interfaces. The device includes an integrated auto conversion function which can implement auto periodic detection when in the power-saving mode. An internal temperature sensor

is used to compensate the sensitivity of the detection function. Using this device results in a large reduction in the required number of external components, thus greatly simplifying the circuit design.

The device is supplied in 24/28-pin SSOP and 28-pin QFN package types. Compared with the previous BA45F6630/6622 device, the BA45F6640 contains the same PIR/ Microwave AFE circuit, however this new device provides increased Flash program memory and RAM memory capacity, allowing it to meet the requirements of an even more diverse range of human body motion detection products.



PRODUCT NEWS BH67F2142 Ultra-Low Voltage R to F MCU

Holtek announces the release of its new Ultra Low Voltage R to F Flash MCU, the BH67F2142. Inheriting the excellent feature of the BH67F2132, this new BH67F2142 has a richer set of MCU resources and a minimum operating voltage of 1.1V, making it suitable for a wide range of single-battery powered temperature measurement products, such as thermometers and indoor/ outdoor temperature measurement applications.

The BH67F2142 includes an integrated resistance/frequency (R/F) conversion circuit and an EL backlight function. In having a high level of functional integration, the device requires few peripheral components, which significantly reduces manufacturing

costs. The device has an integrated Flash program memory and Data EEPROM which can store various parameters and increase the product flexibility.

The device includes 4K words of Flash Program Memory, 256 bytes of Data Memory and 128 bytes of EEPROM Memory. As for packaging, the device is supplied in a 48-pin LQFP package type.



PRODUCT NEWS BM32S2031-1 Proximity Sensing Module

Holtek is pleased to announce the release of its new generation proximity sensing module, the BM32S2031-1. This new device includes fully integrated active IR emission, reception, and optical functions. When compared with the previous generation BM32S2022-1, this new module has a reduced size of 37% and retains its low power consumption and long sensing detect distance original characteristics. Having a modular design ensures much reduced product development time. These features combine to ensure that this proximity sensing module is suitable used for all types of smart home electronic products, such as smart door locks, smart makeup mirrors, smart sanitary ware and automatic dryers.

The module supports object detection with a distance of up to 100cm and has a low standby power consumption of 14µA at 3.3V, allowing the device to meet the requirements of a large number of product applications with different power designs. The module provides two user selectable output modes, namely I/O and UART types. When used together with a dedicated development platform, the required module characteristics can be rapidly setup and adjusted to implement fast and convenient product development.

With regard to pin connections, this new module has only four stamp holes, which can be increased by adding a pin header to implement connections at different angles, for example upright at 90 degrees. The high degree of flexibility offered by this module provides for a wide range of application possibilities. In addition to supplying a dedicated development platform, Holtek also provides a technical service team who can be called upon for assistance.



BD66FM5250 Brushless DC Motor Flash MCU

In expanding its presence in the Brushless DC (BLDC) Motor controller application area, Holtek is delighted to announce its new BLDC Flash MCU, the BD66FM5250. This new device includes a back-electromotive force filter to ensure more stable control of the sensor-less square wave during startup and low speed conditions and also includes a hardware MDU to provide increased calculation speed. These features make the device suitable for use in various square wave and sinusoidal wave BLDC motor applications.

The device contains 8K×16 of Flash Program Memory, 2048 bytes of RAM Data Memory, 512 bytes of EEPROM, an operating frequency of up to 20MHz, a (10+1)-channel high speed 12-bit analog to digital converter and four timers which can implement PWM output/ capture input functions. For BLDC control, the device provides a BLDC motor control circuit, which contains a 16-bit timer for rotational speed monitoring, three 10-bit complementary PWM outputs with a dead-time function as well as an over current protection (OCP) function.

The device integrates three comparators for Hall element or sensor-less position detection. The device also provides a hardware cycle-by-cycle current protection control function. These features allow users to setup the output current limit directly allowing the motor to maintain running within the maximum protection current parameters. The BD66FM5250 is available in 24/28-pin SSOP and 32pin QFN (4×4) package types. Holtek also provides a BD66FM Series BLDC Workshop to assist users to reduce their product development time.



PRODUCT NEWS BD66FM6550G BLDC SoC MCU

Holtek is delighted to announce its new Brushless DC motor control SoC microcontroller, the BD66FM6550G. This new device integrates an MCU, an LDO and a 3-channel 48V gatedriver making it suitable for products with small PCB requirements. It is able to support both square wave and sine wave control. With sensor-less enhanced filters to provide more stable start-ups and low speed running, the device is ideal for applications such as power tools, pumps and fans with less than 8 lithium battery strings.

The device includes 8K×16 of Flash Program Memory, 2K×8 of RAM Data Memory, 512×8 of EEPROM and an operating frequency of up to 20MHz. A (10+1)-channel 12-bit A/D converter is included along with four 16-bit and 10-bit timers. The BLDC motor control circuit includes a 16-bit speed monitoring timer, three groups of 10bit complementary PWM outputs with a dead-time function as well as an Over Current Protection (OCP) function. Three internal comparators are provided for use either in Hall sensor or sensor-less rotor position detection. A back EMF noise suppression filter circuit is also included. The hardware cycle-by-cycle current protection control function can directly set the output current limit allowing the motor to continue run at less than the maximum protection current value. The device is supplied in 32-pin QFN(4×4) and 48-pin LQFP-EP package types. Holtek also provides a BLDC motor Workshop to accelerate product development and reduce product evaluation time.

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PRODUCT NEWS HT32F65532G 1-shunt FOC BLDC SoC MCU

Holtek is delighted to announce the release of its new integrated Arm[®] Cortex[®]-M0+ Brushless DC motor control MCU, the HT32F65532G. By combining a 32-bit microcontroller, an LDO and a three-phase 48V gate-driver into a single chip, this device forms an extremely suitable solution for singleshunt FOC and sensor-less square wave motor control product applications which have to fit the requirements of small area PCBs. Applicable products include handheld vacuum cleaners, low voltage ceiling fans, electric scooters, electric bicycles, pumps and fans, etc.

The device has an operating frequency of up to 60MHz and contains a 32KB Flash memory and a 4KB SRAM memory. For single-shunt FOC control, the device provides two internal comparators, an operational amplifier, a 2Msps SAR A/D converter as well as a powerful MCTM, GPTM, hardware divider and other peripheral functions. The device also includes a filter which can be used for sensor-less square wave control to execute a more stable startup. Additionally, there are a range of communication interfaces including UART, USART, I²C and SPI, which can be combined with the 6-channel PDMA and CRC-16/32 to improve communication response and security. The device also includes a gate-driver which has integrated bootstrap diodes and features under voltage, over temperature and shoot-through protection mechanisms.

The device is available in 32-pin QFN (4×4) and 48-pin LQFP-EP package types with up to 28 GPIOs, providing a high level of functional integration and excellent price/ performance ratio. Holtek also provides a HT32F Series BLDC Motor Workshop to assist users with a more rapid product development and evaluation process.



PRODUCT NEWS HT32F65540G 2-shunt FOC BLDC SoC MCU

Holtek is delighted to announce the release of its new integrated Arm[®] Cortex[®]-M0+ Brushless DC motor control MCU, the HT32F65540G. By combining a 32-bit microcontroller, an LDO and a three-phase 48V gate-driver into a single chip, this device forms an extremely suitable solution for dualshunt FOC product applications which have to fit the requirements of small area PCBs, such as air purifiers, DC floor fans, exhaust fans, duct fans and other products that need to operate in silence.

The device has an operating frequency of up to 60MHz and contains a 64KB Flash memory and an 8KB SRAM memory. For dual-shunt FOC control, the device provides three internal comparators, two operational amplifiers, two 1Msps SAR A/D converters as well as a powerful MCTM, GPTM, hardware divider and other peripheral functions. Additionally, there are a range of communication interfaces including UART, USART, I²C and SPI, which can be combined with the 6-channel PDMA and CRC-16/32 to improve communication response and security. The device also includes a gate-driver which has integrated bootstrap diodes and features under voltage, over temperature and shoot-through protection mechanisms.

The device is available in a 48-pin LQFP-EP package type with up to 26 GPIOs, providing a high level of functional integration and excellent price/ performance ratio. Holtek also provides a HT32F Series BLDC Motor Workshop to assist users with a more rapid product development and evaluation process.





Best Modules was established in the year 2016. As a professional electronic module designer it provides a range of high quality electronic modular products for use by electronic professionals and enthusiasts alike, enabling them to rapidly and easily implement their product designs.

The products provided by Best Modules are purchased online for which we have setup our unique website www.bestmodulescorp. com on which customers can, no matter where they are, conveniently procure our products. By using express delivery service providers, after completing their order and under normal conditions, customers can expect to have the product in their hands within a few days. Fully tested products will be shipped directly to you from our own warehouse.

Our many years of accumulated product planning, design and volume production experience in the electronic industry both in Taiwan and China, has enabled us to release hundreds of products onto the market. With our rigorous working approach we hope to release onto the market new products different to those from other related companies. Product characteristics will be those of high quality, clear specification, highly functionally integrated and ease of volume production. In using Best Modules' products we hope that our customers can not only rapidly implement their creative product idea but also ensure a guick transition into volume production.

As for customer service and support for our products, Best Modules is very willing to share both our skill and experience and will provide a full customer support to enable our customers to become familiar with our products as quickly as possible. For customers that might wish to order custom spec modules beyond our standard product range, we also offer a custom design module service.

Best Modules promises to maintain a trustworthy, responsible and creative approach as it strives ahead with the continual design of new modules. The future will see a release of high quality and diverse electronic modules providing customers with a wide range of solutions for their IoT, robotic and other as yet unimagined application areas, whether it be for their professional applications or for their hobby DIY projects.







Integrated Water Atomization Module (16W) BM52O5221-1

The BM52O5221-1 is an integrated atomizer module. It integrates a piezoelectric transducer, control circuit board, and structural components.

The principle of an ultrasonic atomizer is to use the highfrequency mechanical oscillation of a piezoelectric transducer to convert the water particles into tiny droplets. The product circuit is the externaldriving type. Therefore, it has

the advantages of high effect when atomizing, tiny size, and less heat generation. It's suitable for applications of humidifiers, aroma diffusers, and other related products.

The BM52O5221-1 also provides a water-shortage detection function to prevent the transducer from being damaged when working in the absence of water.

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Recommended Products



Weight Sensor Module 20kg BMH01220

The BMH01220 is a weight measurement module. It includes 4 half-bridge strain gauge load sensors and a measurement module. The module uses Holtek MCU BH66F5232 which integrates a 24-bit Delta Sigma ADC. The module has built-in algorithms so that an external MCU can directly read the weight value through the I²C or UART interface.

The maximum measuring weight of the BMH01220 is 20kg. Calibration is required before use to ensure accurate measurements. The calibration process has two steps. The first is zero-point calibration, nothing is placed on the weighing plate. Then, the maximum value calibration, and accurate weight (eg, a standard weight) for that maximum value is placed on the weighing plate.



Recommended Products



BC2161/BC5162 Transmitter with Encoder IC Development Board BCE-EFUSEK8-001

The BCE-EFUSEK8-001 is a development board designed for BC2161 and BC5162. It needs to use with the modules, the BCM-2161-X01 or BCT-5162-G01, and the configuration wizard, RF chip parameters setting tool. The development is faster and easier with the configuration wizard.

Users can adjust multiple parameters on the configuration wizard and

download or program them to the development board. Parameters can also be uploaded to the configuration wizard.

It operates the I2C mode when using with the BCM-2161-X01. Therefore, the parameters of Encoder and LED_SWD can only be set as I2C mode and Tx.



BC45B4523 NFC Reader Controller Development Board BCE-45B4523-001

The BCE-45B4523-001 is an NFC reader IC development board. It is compatible with the ISO14443A, ISO14443B, and ISO15693 protocols, and supports the Crypto_M encryption, and decryption functions.

- ISO14443A and ISO14443B are suitable for secure data transmission in a short distance, such as mobile payments and access cards.

- ISO15693 is suitable for secure data transmission long distances

and is commonly applied in warehouse management.

The BCE-45B4523-001 is composed of three ICs, main control MCU HT32F52241, USB to UART Bridge IC HT42B534-2, and 13.56MHz NFC Reader IC BC45B4523. Holtek provides software, NFCReader_TK, for the development board and NFC tags to make development faster and easier.



Sharing Success Through Excellence

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