KBMB360172IC User Manual

1、Summary of functions

The KBMB360172IC is designed to offer high integration, ultra-low power application capabilities. It integrates strong 32-bit MCU, BLE/2.4G Radio, 16KB SRAM, 512KB external FLASH (TLSR8266) or 512KB internal Flash (TLSR8266F512), 14bit ADC with PGA, 6-channel PWM, three quadrature decoders, a hardware keyboard scanner (Keyscan), abundant GPIO interfaces, multi-stage power management module and nearly all the peripherals needed for Bluetooth Low Energy applications development.

2、Technical parameters

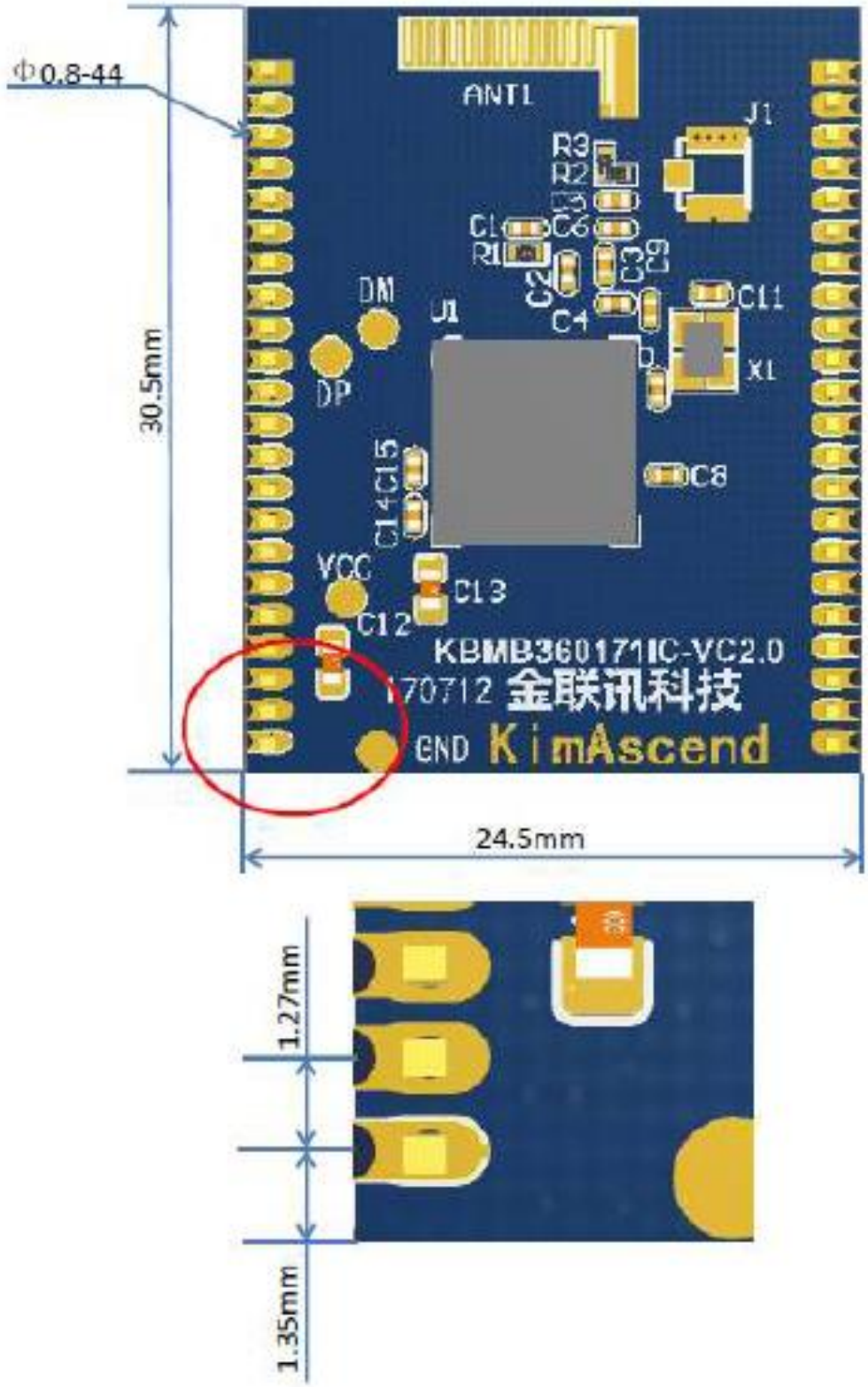
RF features include

1) BLE/2.4GHz RF transceiver embedded, working in worldwide 2.4GHz ISM band.
2) Bluetooth 4.0 Compliant, 1Mbps and 2.4GHz 2Mbps Boost Mode.
3) -92dBm BT4.0 Rx Sensitivity.
4) RF link data rate up to 2Mbps.
5) Tx output power: +7dBm.
6) Single-pin antenna interface.
7) RSSI monitoring

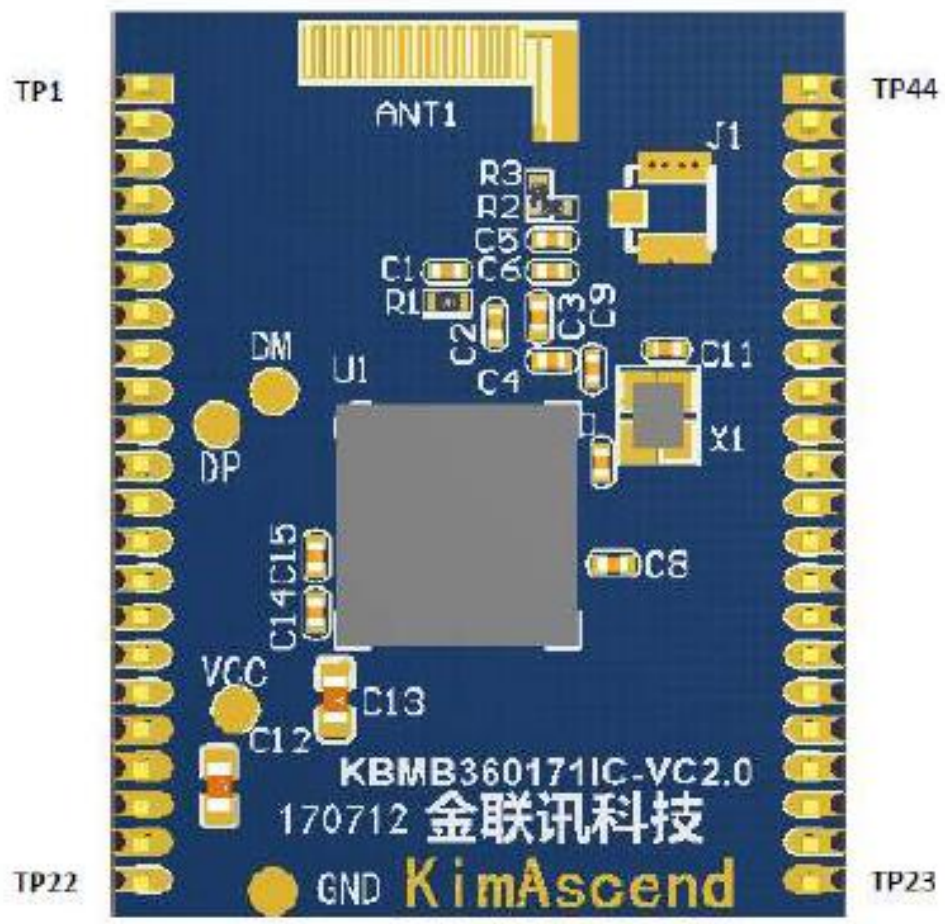
Features of power management module include:

1) Embedded LDO.
2) Battery monitor: Supports low battery detection.
3) Chip power supply: 1.9V~3.6V (with external flash), 2.7V~3.6V (with internal flash)
4) Multiple stage power management to minimize power consumption.
5) Low power consumption:
- Receiver mode current: 13mA
- Transmitter mode current: 13mA @ 0dBm power, 19mA @ max power
- Suspend mode current: 20uA (IO wakeup)/22uA (Timer wakeup)
- Deep sleep mode current: 0.7uA

3、 Outline Dimension (mm)



4、Pin configuration



Pin No	Name	Type	Description
TP1	RESETB	RESETB	Power on reset, active low
TP2	GPIO5	Digital I/O	GPIO5/ANA_D<3>
TP3	GPIO6	Digital I/O	GPIO6/ANA_D<4>
TP4	PWM0	Digital I/O	PWM0 output/GPIO/ANA_D<5>
TP5	PWM1	Digital I/O	PWM1 output/GPIO /ANA_D<6>
TP6	PWM2	Digital I/O	PWM2 output/GPIO /ANA_D<7>
TP7	SDM_P	Digital I/O	PWM0 output/GPIO /SDM Positive output/ANA_E<0>
TP8	SDM_N	Digital I/O	PWM1 output/GPIO /SDM Negative output /ANA_E<1>
TP9	DM	Digital I/O	USB data Minus/GPIO/ ANA_E<2>

TP10	DP	Digital I/O	USB data Positive/GPIO/ ANA_E<3>
TP11	DMIC_DI	Digital I/O	DMIC data input/PWM0/GPIO/ ANA_A<0>
TP12	DMIC_CLK	Digital I/O	DMIC clock/GPIO/ANA_A<1>
TP13	DO	Digital I/O	SPI data output/PWM0 inverting output/ GPIO/ANA_A<2>
TP14	DI	Digital I/O	SPI data input/PWM1 output/GPIO/ ANA_A<3>/I2C_SDA (I2C serial data)
TP15	CK	Digital I/O	SPI clock/PWM1 inverting output/GPIO/ ANA_A<4>/I2C_SCK (I2C serial clock)
TP16	CN	Digital I/O	SPI chip select (Active low)/PWM2 inverting output/GPIO/ANA_A<5>
TP17	UART_TX	Digital I/O	UART_TX/GPIO/ ANA_A<6>
TP18、19	VDD	PWR	3.0V IO supply
TP20、21、23、43、44	GND	GND	Digital LDO ground
TP22	UART_RX	Digital I/O	UART_RX/Single Wire Master/ GPIO/ANA_A<7>
TP24	SWS	Digital I/O	PWM2 output/Single wire slave/GPIO/ ANA_B<0>
TP25	PWM2_N	Digital I/O	PWM2 inverting output /GPIO/ANA_B<1>
TP26	UART_TX	Digital I/O	UART_TX/PWM3 output/GPIO/ANA_B<2>
TP27	UART_RX	Digital I/O	UART_RX/PWM3 inverting output/GPIO/ANA_B<3>
TP28	CN	Digital I/O	SPI chip select (Active low)/PWM4 output/GPIO/ ANA_B<4>
TP29	DO	Digital I/O	SPI data output/PWM4 inverting output/GPIO/ ANA_B<5>
TP30	DI	Digital I/O	SPI data input/PWM5 output/ GPIO/ ANA_B<6>/I2C_SDA (I2C serial data)
TP31	CK	Digital I/O	SPI clock/ PWM5 inverting output/ GPIO/ ANA_B<7>/I2C_SCK (I2C serial clock)
TP32	I2C_SDA	Digital I/O	I2C serial data /PWM0 output/ GPIO/ ANA_C<0>

TP33	I2C_SCK	Digital I/O	I2C serial clock/PWM1 output/ GPIO/ ANA_C<1>
TP34	UART_TX	Digital I/O	UART_TX/PWM2 output/ GPIO/ANA_C<2> /(optional) 32KHz crystal output
TP35	UART_RX	Digital I/O	UART_RX/PWM3 output/ GPIO /ANA_C<3>/(optional) 32KHz crystal input
TP36	UART_RTS	Digital I/O	UAR_RTS/PWM4 output/ GPIO/ANA_C<4>
TP37	UART_CTS	Digital I/O	UART_CTS/PWM5 output/ GPIO /ANA_C<5>
TP38	GPIO0	Digital I/O	GPIO0/ANA_C<6>
TP39	GPIO1	Digital I/O	GPIO1/ANA_C<7>
TP40	GPIO2	Digital I/O	GPIO2/ANA_D<0>
TP41	GPIO3	Digital I/O	GPIO3/ANA_D<1>
TP42	GPIO4	Digital I/O	GPIO4/ANA_D<2>

FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two cond itions:

(1) this device may not cause harmful interference, and (2) this device must accept any interferen ce received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could v oid the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital de vice, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protec tion against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructi ons, may cause harmful interference to radio communications. However, there is no guarantee th at interference will not occur in a particular installation. If this equipment does cause harmful int erference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
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-Consult the dealer or an experienced radio/TV technician for help important announcement

Important Note:

Radiation Exposure Statement

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Any company of the host device which install this modular with limit modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C:15.247 and 15.209 requirement, only if the test result comply with FCC part 15.247 and 15.209 requirement, then the host can be sold legally.

End Product Labeling

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: Contains Transmitter Module FCC ID: 2ANG4-360172IC.

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

The modular is not intended to be fielded serviceable as without shielding, host manufacturer must be considered shielding when integrating a module.

When the module is installed inside another device, the user manual of this device must contain below warning statements;

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
   (1) This device may not cause harmful interference.
   (2) This device must accept any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.