ST17H65BF

Embed Find My network ADK 1.0

Key Features

- ARM® Cortex™-M0 32-bit processor
- Memory
  - 512KByte-2MByte in-system flash memory
  - 64KB SRAM, all programmable retention in sleep mode
  - 4-way instruction cache with 8KB Cache RAM
  - 96KB ROM
  - 256bit efuse
- 20 general purpose I/O pins
  - GPIO status retention in off/sleep mode
  - configurable as serial interface and programmable IO MUX function mapping
  - All pins can be configured for wake-up
  - All pins for triggering interrupt
  - 3 quadrature decoder(QDEC)
  - 6-channel PWM
  - 2-channel PDM/I2C/SPI/UART
  - 4-channel DMA
- DMIC/AMIC with microphone bias
- 8-channel 12bit ADC with low noise voice PGA
- 6-channel 24bit timer, one watchdog timer
- Real timer counter (RTC)
- Power, clock, reset controller
- Flexible power management
  - Operating Voltage range 1.8V to 3.6V
  - Embedded buck DC-DC and LDOs
  - Battery monitor
- Power consumption
  - 0.3μA @ OFF Mode(IO wake up only)
  - 1μA @ Sleep Mode with 32KHz RTC
  - 4uA @ Sleep Mode with 32KHz RTC and all SRAM retention
  - Receive mode: 4mA @3.3V power supply
  - Transmit mode: 4.7mA(0dBm output power) @3.3V power supply
  - MCU: <60uA/MHz
- Secure Vault
  - ECC-224,ECC-256
  - HMAC-SHA256
  - AES128,AES256
  - Public key cryptography
  - TRNG
- RC oscillator hardware calibrations
  - Internal High/Low frequency RC osc
  - 32KHz RC osc for RTC with +/-500ppm accuracy
  - 32MHz RC osc for HCLK with 3% accuracy
- High Speed Throughput
  - Support BLE 2Mbps Protocol
  - Support Data Length Extension
  - Throughput up to 1.6Mbps(DLE+2Mbps)
- BLE 5.2 feature
- AoA/AoD Direction Finding
- Support SIG-Mesh Multi-Feature
  - Friend Node
  - Low Power Node
  - Proxy Node
  - Relay Node
- Apple Findmy
  - Findmy pairing key roll 600ms@16MHZ
  - Findmy separate key roll 2ua/15min
  - Findmy Nearby 18ua@2s adv period
  - Findmy separate 18ua@2s adv period
- 2.4 GHz transceiver
  - Compliant to Bluetooth 5.2
  - Sensitivity:
    -97dBm@BLE 1Mbps data rate
    -103dBm@BLE 125Kbps data rate
  - TX Power -20 to +10dBm in 3dB steps
  - Single-pin antenna: no RF matching or RX/TX switching required
  - RSSI (1dB resolution)
  - Antenna array and optional off-chip RF PA/LNA control interface
- AES-128 encryption hardware
- Link layer hardware
  - Automatic packet assembly
  - Automatic packet detection and validation
  - Auto Re-transmit
  - Auto ACK

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  - Hardware Address Matching
  - Random number generator
- Operating temperature: -40 ℃~125℃
- RoHS Package: QFN32(4mm x 4mm)
- Applications: FindMyNetwork(IOS),Wearables, beacons, Home and building, Health and medical, Industrial and manufacturing, Data transmission, PC/mobile/TV peripherals, Internet of things (IoT)

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1 Introduction

ST17H65BF is a System on Chip (SoC) for Bluetooth® low energy applications. It has ARM® Cortex™-M0 32-bit processer with 64K retention SRAM, 512KB-2MB flash, 96KB ROM, 256bit efuse, and an ultra-low power, high performance, multi-mode radio. Also, ST17H6x can support BLE with security, application and over-the-air download update. Serial peripheral IO and integrated application IP enables customer product to be built with minimum bill-of-material (BOM) cost.

2 Pin Assignments and Functions

This section describes the pin assignment and the pin functions for the package type of QFN32.

2.1 Pin Assignment(QFN32)

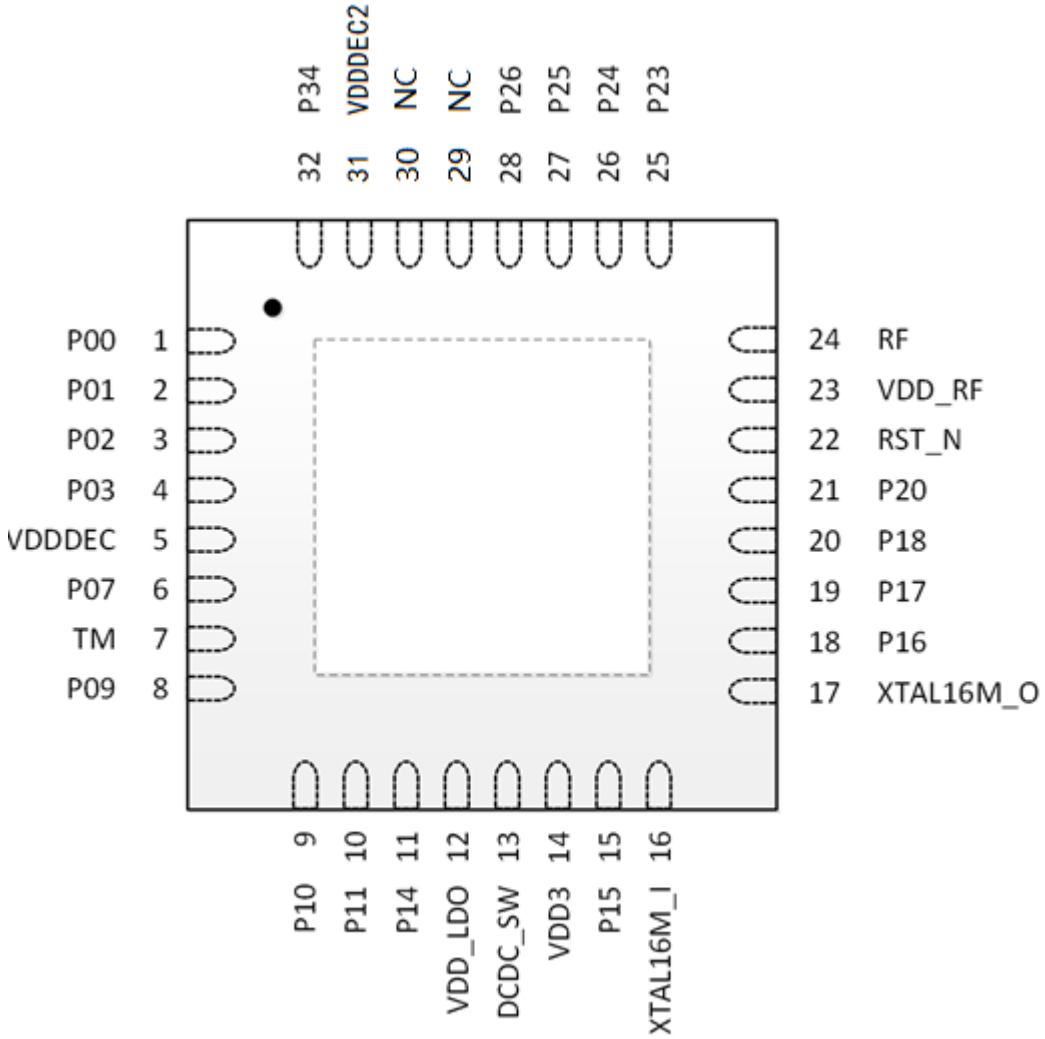


Figure 1: Pin assignment – ST17H65BF QFN32 package

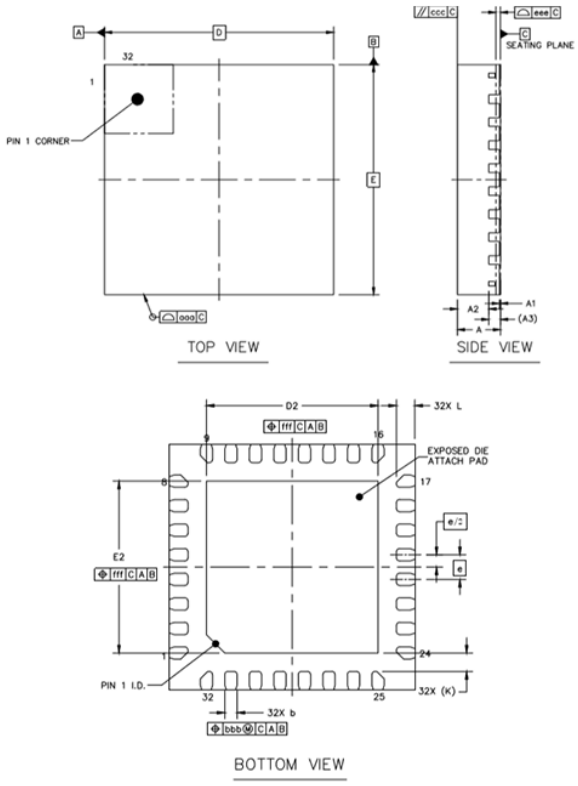
2.2 Pin Functions

Pin	Pin name	Description
1	P0	GPIO 0
2	P1	GPIO 1
3	P2	GPIO 2
4	P3	GPIO 3
5	VDDDEC	1.2V decoupling pin
6	P7	GPIO 7
7	TM	test mode enable
8	P9	GPIO 9
9	P10	GPIO 10
10	P11/AIO_0	GPIO 11/ADC input 0
11	P14/AIO_3	GPIO 14/ADC input 3
12	VDD_LDO	Internal LDO power supply/DCDC feedback
13	DCDC_SW	DCDC output
14	VDD3	3.3V power supply
15	P15/AIO_4	GPIO 15/ADC input 4/ micbias output
16	XTAL16M_I	16MHz crystal input
17	XTAL16M_O	16MHz crystal output
18	XTAL32K_I	32.768KHz crystal input
19	XTAL32K_O	32.768KHz crystal output
20	P18/AIO_7	GPIO 18/ADC input 7/ PGA negative input
21	P20/AIO_9	GPIO 20/ADC input 9/ PGA positive input
22	RST_N	reset, active low
23	VDD_RF	power supply decoupling for RF transceiver
24	RF	RF antenna
25	P23/AIO_1	GPIO 23/ADC input 1/micbias reference
26	P24/AIO_2	GPIO 24/ADC input 2
27	P25/AIO_8	GPIO 25/ADC input 8
28	P26	GPIO 26
29	NC	
30	NC	
31	VDDDEC2	
32	P34	GPIO 34

*Note： All gpio support 1M/150kΩ pull up, 150kΩ pull down.

Table 1: Pin functions of ST17H6x QFN32 package

3 Package dimensions



		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A	0.7	0.75	0.8
STAND OFF		A1	0	0.02	0.05
MOLD THICKNESS		A2	---	0.55	---
L/F THICKNESS		A3		0.203 REF	
LEAD WIDTH		b	0.15	0.2	0.25
BODY SIZE	X	D		4 BSC	
	Y	E		4 BSC	
LEAD PITCH		e		0.4 BSC	
EP SIZE	X	D2	2.7	2.8	2.9
	Y	E2	2.7	2.8	2.9
LEAD LENGTH		L	0.2	0.3	0.4
LEAD TIP TO EXPOSED PAD EDGE		K		0.3 REF	
PACKAGE EDGE TOLERANCE		aaa		0.1	
MOLD FLATNESS		ccc		0.1	
COPLANARITY		eee		0.08	
LEAD OFFSET		bbb		0.07	
EXPOSED PAD OFFSET		fff		0.1	

Figure 2: QFN32 package dimensions

Note: dimensions are in mm, angels are in degree.