YF52H54BP

OTP Microcontroller with Built-in NMOS driver and Lithium Battery Charger

Product Specification

1. General Description

YF52H54BP is an EPROM based 8-bit MCU, built-in with a lithium battery charger and NMOS driver, tailored for applications like lithium charging control and motor driver. YF52H54BP adopts advanced CMOS technology to provide customers remarkable solution with low cost and high performance benefits. RISC architecture is applied to YF52H54BP and it provides 55 instructions.All instructions are executed in single instruction cycle except program branch and skip instructions which will take two instruction cycles.Therefore, YF52H54BP is very suitable for those applications that are sophisticated but compact program size is required.

In terms of I/O resources, YF52H54B has 4 flexible bidirectional I/O pins and each I/O pin has a separate register to control it as an input or output pin. Moreover, each I/O pin can be configured through relevant registers to enable features such as, like Pull-High/Pull-Low resistor and open-drain output type through programming,and at the same time, provides 1 set of Pulse Width Modulation (PWM) output. Moreover, YF52H54B has built-in infrared (IR) carrier generator with selectable IR carrier frequency and polarity for applications which demand remote control feature.

The YF52H54BP integrates an NMOS driver circuit, which enables high-current switch control for motors, LED modules, and other products.

The YF52H54BP also features a built-in single-cell lithium battery charging management circuit. The charging current can be adjusted through an external resistor. It offers characteristics such as charging current monitoring, under-voltage lockout, and automatic recharging. It is suitable for operation with USB power and adapter power, making it an ideal choice for portable applications.

1.1 Features

- Wide operating voltage range:：(Instruction Clock is 4 CPU clock, also known as 4T mode)
  2.0V ~ 5.5V @system clock ≦8MHz.
  2.2V ~ 5.5V @system clock ＞8MHz.
- Wide operating temperature: -25°C ~ 85°C.
- High ESD over ±5KV.
- Built-in 16 high-precision Low-Voltage Detector (LVD).
- 1Kx14 bits EPROM。
- 48 bytes SRAM。
- 4 general purpose I/O pins (GPIO), PB[3:0], with independent direction control. Additionally, there is 1 NMOS control pin and 1 charging status detection pin.
- All I/O pins can be configured to output either normal sink current or small sink current.
- Except for PB3, all I/O pins can be configured to output either normal sink current or small sink current,.
- Dual-clock oscillation: System clock can switch between high oscillation and low oscillation.
- Four kinds of operation mode to reduce system power consumption:

Normal mode, Slow mode, Standby mode and Halt mode.

● Built-in NMOS driver circuit

1：Drain Current ID: 3A

2：Drain-Source Voltage VDS: 21V

3：On-Resistance RDS（on）: 33mΩ

4：Gate Threshold Voltage VGS: 0.7V

5：Gate-Source Leakage Current IGSS：±100nA

● Built-in single-cell lithium battery charging management circuit

1：Programmable charging current up to 500mA

2：No need for MOSFET, sense resistor, and blocking diode

3：Constant current/constant voltage operation and thermal regulation maximize battery management efficiency without the risk of excessive heat

4：Preset charging voltage of 4.2V±1%

5：Maximum input voltage of 6.5V

6：Automatic recharging

7：C/10 charge termination

8：Supply current of 200uA in standby mode and 25uA in shutdown mode

9：Trickle charging threshold voltage of 2.9V

10：ESD(HBM)>7KV

11：Compliant with the latest IEC62368 standard.

2. Pin Assignment

YF52H54BP ESOP8

PROG 1	8 V-IN
BATT+VDD 2	7 VSS
PB3/VPP 3	6 PB0/SDI
PB2/SCK 4	5 PB1/SDO
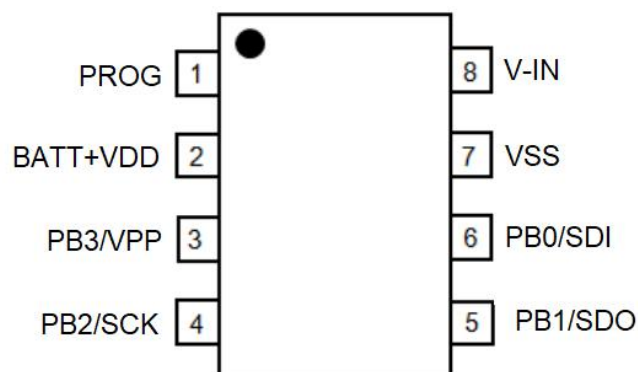
The bottom heat sink of ESOP8 is connected to the D terminal of NMPS.

2.1Pin Description

Pin Name		Description
2:VDD/BAT		Battery positive terminal/internal power supply positive terminal
3: PB3/ RSTb/ Vpp		PB3 is a bidirectional I/O pin. PB3 can be reset pin RSTb. If RSTb pin is low, it will reset the IC. PB3 can be programming pad VPP.
5: PB1/ IR/ SDO		PB1 is a bidirectional I/O pin. If IR mode is enabled, this pin is IR carrier output. PB1 can be programming pad SDO.
4: PB2 / EX_CKI / PWM1 / BZ1 / SCK		PB2 is a bidirectional I/O pin. PB2 can also be timer clock source EX_CKI. PB2 can also be PWM output. PB2 can also be BUZZER output. PB2 can also be programming pad SCK. PB2 can also be comparator output
6：PB0/ INT/ SDI		PB0 is a bidirectional I/O pin. PB0 is input pin of external interrupt when EIS=1 & INTIE=1. PB0 can be programming pad SDI.
1: PROG		Charging current adjustment terminal Rprog=10K(100MA), Rprog=2K(500MA)
8:VIN	-	Charging input power positive terminal
7:VSS/GND		Power supply negative terminal/battery negative terminal
* PB4		NMOS G terminal control pin
* PB5		CHRG charging status detect pin
*Bottom heat sink		NMOS D terminal pin

3. Package Dimension

3.1 ESOP8 Dimension

	COMMON DIMENSIONS (UNITS OF MEASURE IS mm)		
	MIN	NORMAL	MAX
A	4.800	4.900	5.000
B	3.800	3.900	4.000
C	1.350	1.450	1.550
C1	0.650	0.700	0.750
D	6.140	6.200	6.260
A1	3.200	3.300	3.400
B1	2.300	2.400	2.500
L	0.400	0.600	0.800
b	0.350	0.400	0.450
h	0.040	0.070	0.100
e	1.270TYPE		
θ_1	7° TYPE(8R)	12° TYPE(12R)	
θ_2	7° TYPE(8R)	10° TYPE(12R)	
θ_3	8° TYPE(8R)	12° TYPE(12R)	
θ_4	8° TYPE(8R)	10° TYPE(12R)	
θ	0° ~ 8°		

SCALE	1:1	UNIT	mm	ESOP8
APPROVALS		DATE		
工 且 铒		2022.01.22		
		DRG NO.		JY-RE-022-11