

### Product description

The HT4928S is a highly integrated mobile power supply Management chip, built-in charge management module, LED indicator Block, boost discharge management module, and use small SOP8 Package, the periphery can be composed of very few components Powerful mobile power solution.

### Main features

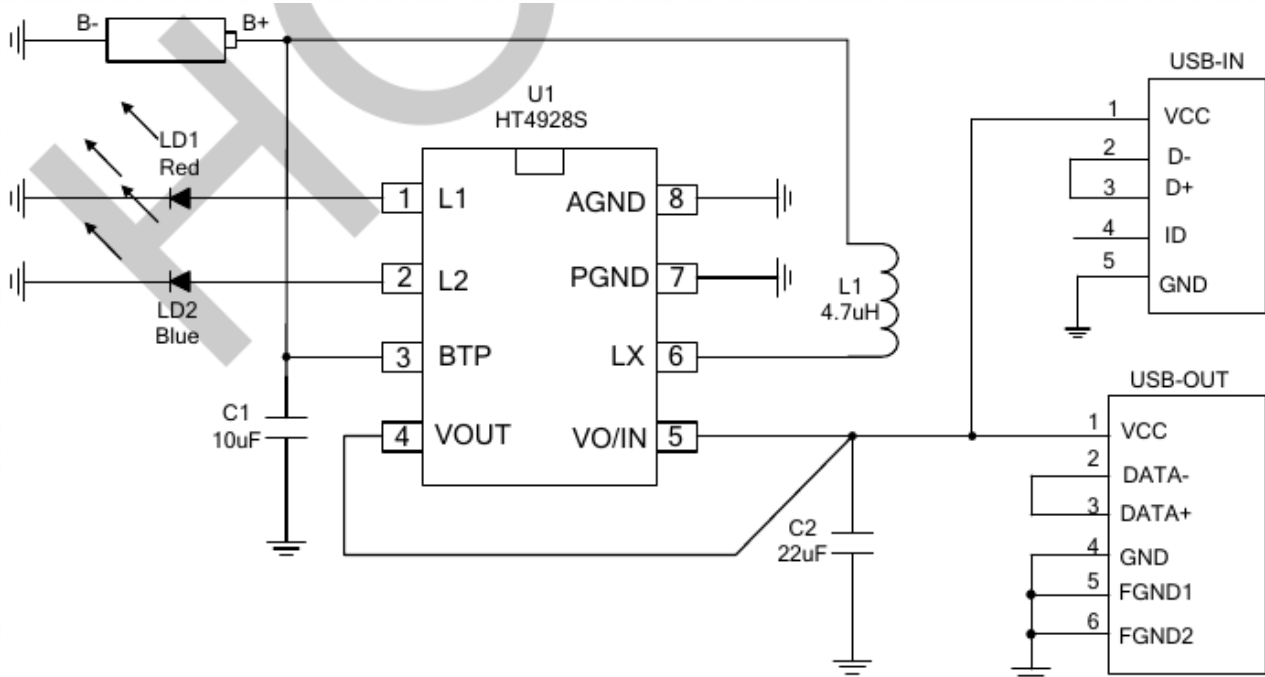
- ◆ Highly integrated, few peripheral components;
- ◆ Built-in fixed 0.8A linear charging mode;
- ◆ turbulent / constant current / constant voltage three-stage charging, constant voltage 4.20V (typical), supporting charging of 0V battery;
- ◆ Built-in charging can automatically reduce the charging current according to the temperature rise. 130 degrees begins to decline, and the minimum can be reduced to 0;
- ◆ The charging input has anti-backflow function, no need for anti-reverse irrigation diode;
- ◆ Boost uses synchronous rectification circuit, the efficiency is up to 91%, Low heat, fixed 5.1V output, no external resistor required

- ◆ Output current 0.8A (typical value at 3.6V battery), with Constant power output function, complete overcurrent, short circuit protection
- ◆ Load insertion automatically starts boost, load removal Automatic sleep
- ◆ Battery low voltage reminder function;
- ◆ Single/dual lamp charging and discharging instructions;
- ◆ Common input/output port, intelligent identification charging/discharging of electricity;
- ◆ 4KV ESD;
- ◆ Fixed switching frequency 1MHZ;
- ◆ Battery overcharge and over discharge protection;
- ◆ SOP8 small package

### Typical application

- ◆ Mobile power
- ◆ LED lighting system
- ◆ Toys

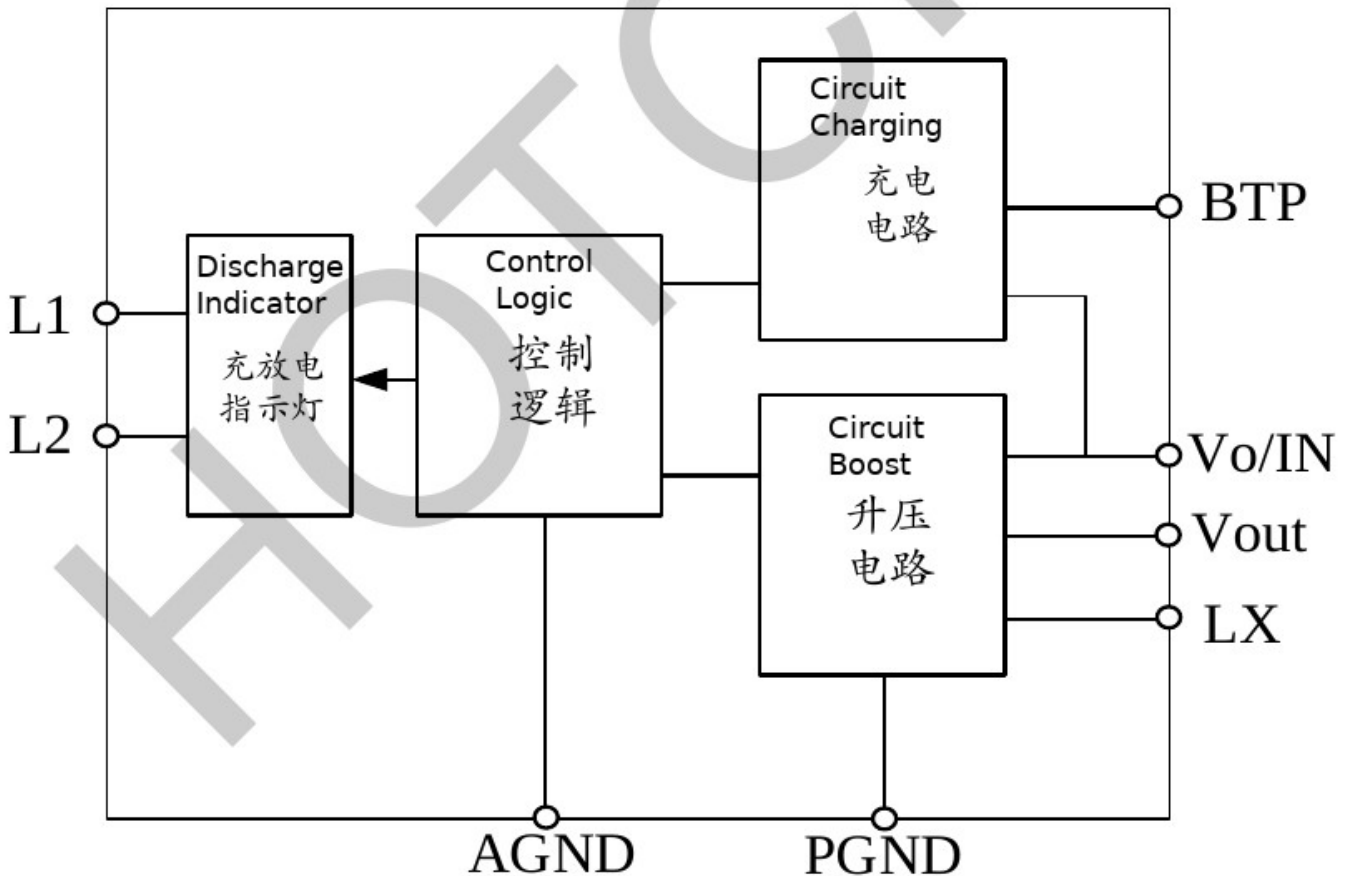
### Typical application circuit diagram



### Pin definition

SOP8	Pin name	Pin number	Function Description
	L1	1	Indicator light 1
	L2	2	Indicator light 2
	BTP	3	Battery end
	VOUT	4	Output voltage feedback
	VO/IN	5	Output/input
	LX	6	Inductance
	PGND	7	Power ground
	AGND	8	Analog ground

### Circuit internal structure block diagram



### Typical parameters

(Except for special instructions, all parameters are measured at room temperature and the potential at the GND terminal is 0)

Symbol	Description	Test Conditions	Unit	Min	Typ	Max
<b>System parameters</b>						
V IN	Input voltage range		V	4.5	5	5.5
Vbat	Battery voltage		V	2.95		4.4
<b>Charging parameter</b>						
V IN power down monitor	VIN from low to high	Vin>BAT	mV		250	
	VIN from high to low	Vin>BAT	mV		50	
V float	Floating charge threshold voltage		V	4.158	4.20	4.242
Ichg	Recharging current	VIN=4.75-5.25V	A		0.8	
V TRKL	Turbulent flow	VBAT from low to high	V		2.8	
V TRHYS	Trickle charging hysteresis voltage		mV		100	
V RECHG	Recharge threshold voltage		V		4.1	
<b>Discharge parameter</b>						
V o	Boost system output voltage		V	4.95	5.1	5.25
Iout	Output current	BAT=3.6V Vout>4.8V	A		0.8	
V OVP	Output overvoltage protection		V		5.8	
V OVP_DIS			V		5.4	
V UVLO	Boost undervoltage protection	BAT from high to low	V		2.95	
V UVLO_R	Boost undervoltage recovery	BAT from low to high	V		3.20	
I BAT1		Vout=5.5V No Switching	mA		0.2	
I BAT2		Vout=4.5V Switching	mA		1	
Iauto_off	Automatic shutdown load current	BAT=3.6V Cout=20uF	mA		60	
Iq	Quiescent Current	BAT=3.6V	uA		13	30
F OSC	Working frequency		MHz		1	
OTP	Over temperature protection		degC		150	
OTP_HYS	Hysteresis		degC		20	



### Function and parameters

#### Charging management module

1. The charging current is internally set to 0.8A
2. Battery voltage is lower than 2.8V with pre-charging function (current =  $I_{ch} * 10\%$ )
3. Support charging 0V battery
4. Three-stage charging: turbulent, constant current, constant voltage charging
5. The charging current decreases with the increase of temperature, and it is opened at 130 °C. Start to decrease;

#### Boost module

1. Standby state detection load is greater than 10uA (typ) current When the boost is automatically started, when the output load is less than 60mA (Type value) delays 8 seconds to automatically enter standby mode
2. Synchronous rectification boost, up to 91% conversion efficiency, output Fixed voltage 5.1V
3. After the output current exceeds 0.8A, the voltage starts to decrease.
4. Overvoltage protection is performed after the output voltage is greater than 5.8V, when the output is Automatic recovery after the voltage drops to 5.4V
5. With output overcurrent protection and short circuit protection, through plugging and unplugging Automatic load release
6. Switching frequency 1MHz
7. During the discharge process, if the temperature reaches 150 degrees, the overheat protection Automatically turn off the output and enter standby.

#### Automatic conversion module

1. Support side charging, that is, the external charger simultaneously charges the mobile phone Electricity, also charging mobile power
2. During the boosting process, automatically detect whether the external charger is plugged in. In, after detecting the insertion of the charger, according to the external current Automatically distribute current to charge mobile power and mobile phones
3. If the charger is removed, the boost is automatically started.

#### Charge and discharge indicator

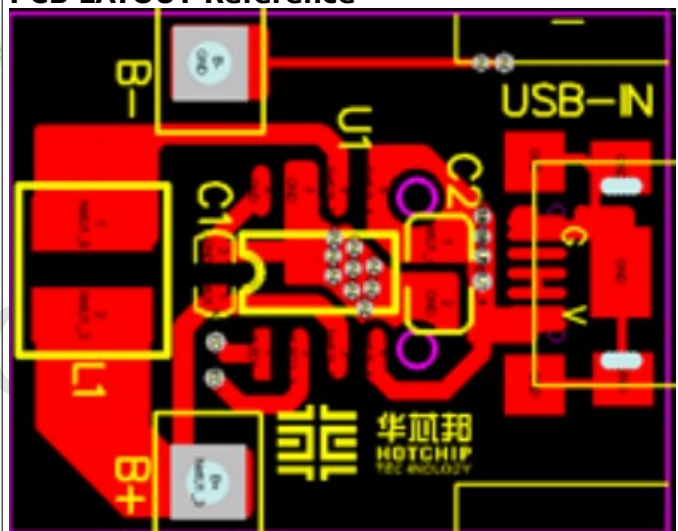
1. When charging, the indicator lights LD1 and LD2 flash alternately. The indicator light LD2 is on;

2. When the battery is fully charged, plug in the charging indicator LD2 during charging. On, the LD2 indicator goes off after unplugging the phone for 8 seconds.
3. If the battery voltage is lower than 3.2V during discharge, the indicator light LD2 Flashes until 2.95V undervoltage shutdown; when the battery voltage rises to Before 3.2V, the load LD2 indicator will flash for 8 seconds, but Boost will not start.
4. If LD1 is not connected, it will be in single LED mode.

#### Charger detection during single port discharge

1. During the charging process of the mobile phone, the system will generate a week at the output. a charger detection signal with a pulse width of 4 mS for 2 seconds;
2. When there is no charger inserted, at 4mS pulse, output The voltage was reduced to 4.7V, and it was judged that the charger was not inserted outside.
3. When the charger is inserted, when the voltage is greater than 4.7V, the system automatically enters 4mS pulse, output voltage trickle state.

#### PCB LAYOUT Reference



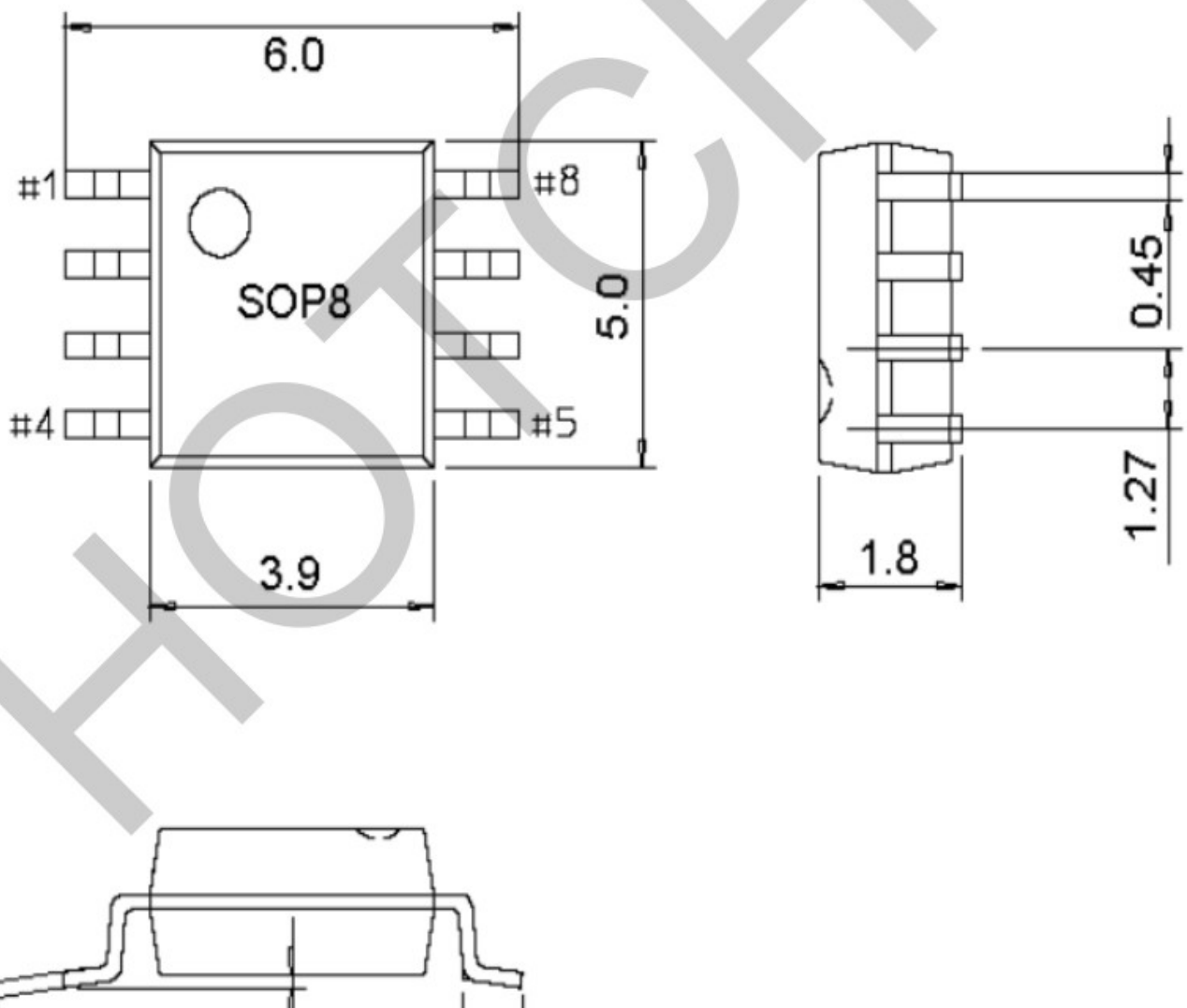
C1, C2 should be close to the chip within 2mm, and go to the chip pin The line is as short as possible; to prevent the heat of L1 from affecting the chip, L1 can be a little farther away. Connected by thick wire at around 5-10mm

**Electrostatic protection**

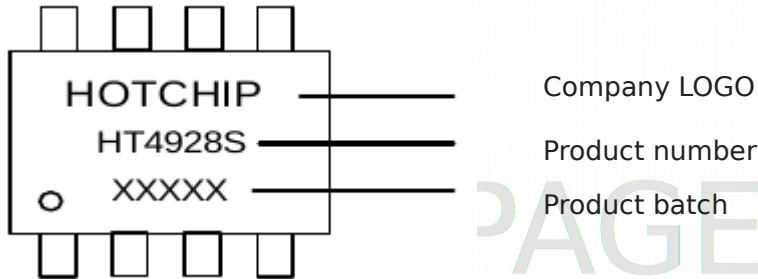
CMOS circuits are electrostatically sensitive devices that are manufactured and shipped. The following precautions must be taken during the process to prevent CMOS circuit damage due to electrostatic discharge

## Check:

1. The operator should be grounded through the static-discharge wrist strap;
2. The outer casing of the production equipment must be grounded;
3. The tools used in the assembly process must be grounded;
4. Must be packaged or shipped in semiconductor packaging or antistatic materials.

**Package information****SOP8 package appearance**

## Device identification and ordering information



Package form	Chip surface identification	Procurement device name	Package style	Minimum package quantity
SOP8 Pb-free	HT4928S	HT4928S-F0	disk mounted	4000PCS

## Important statement

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