Battery Monitor and Protective Discharge IC

Please email: powerictechsupport@vishay.com for more information or to request a full datasheet.

DESCRIPTION

The SiP31001 protects a single cell Li-Ion battery from over voltage under elevated temperature condition.

Elevated temperature and allowing the battery to sit at the maximum charge voltage for extended periods of time will cause shorter than expected battery life. SiP31001 enables the battery to relax after charged even when kept on float or trickle charge.

The SiP31001 discharges battery at constant 100 mA when pre-set safe guard limits of both battery voltage and temperature are exceeded. The discharge will stop once either the battery voltage or temperature falls below the thresholds.

The SiP31001 wakes up to monitoring mode when battery voltage is over 4 V. Under this state, the monitoring circuit is on every 2 s for a 5 ms duration, conducts precise comparison of voltage and temperature to pre-set limits. Such design scheme minimizes the power consumption.

The SiP31001 integrates an over temperature protection that will switch off the constant current discharge switch when the device is over heated.

TST pin enables the production test of discharge switch without forcing excessive voltage.

The SIP31001 is available in compact WCSP9 of 1.25 mm x 1.25 mm.

FEATURES

- Wide operation voltage range: 2.3 V to 5.5 V
- Low quiescent current: 330 nA
- Constant current discharge: 100 mA
- Precision battery voltage and temperature monitoring circuit thresholds
- ESD
  - Human body model: 4 kV
  - Machine model: 400 V
  - Air discharge: 15 kV
  - Contact discharge: 8 kV
- Ultra compact WCSP9, 1.25 mm x 1.25 mm

APPLICATIONS

- Cellular phones, smart phone
- Tablet devices
- Portable media players
- Digital cameras
- One cell Li-Ion battery power devices

TYPICAL APPLICATION CIRCUIT

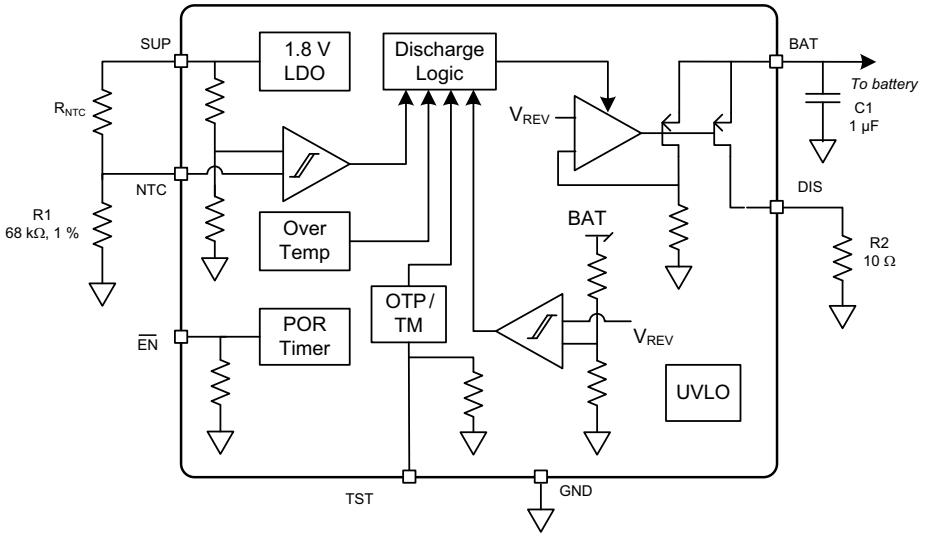
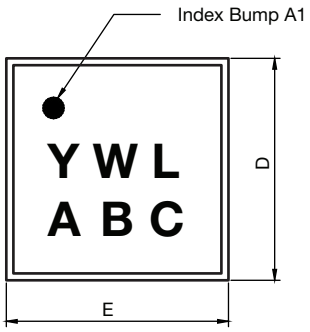


Fig. 1 - Typical Application Circuit

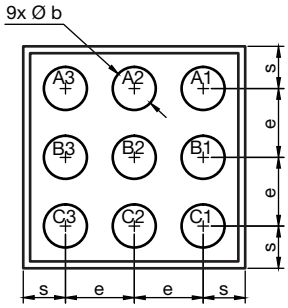
Note

- Above design example targets 60 °C over temperature trigger and 55 °C over temperature release. R1 is 68 kΩ 1%, and R_{NTC} is Murata, NCP03WF104F05RL

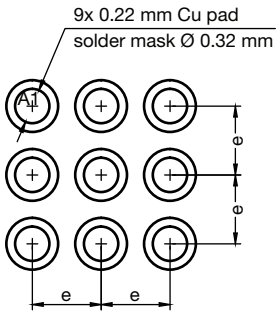
WLCSP9 3 x 3 (9 Bumps) POD (for 17 mil Die thickness)



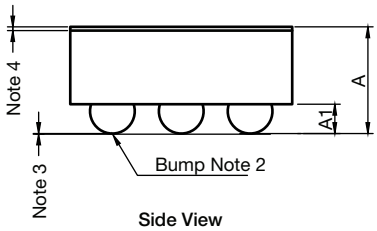
Top View



Bottom View



Recommanded
Land Pattern
(NSMD)



Side View

DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.600	0.620	0.640	0.0236	0.0244	0.0252
A1	0.144	0.170	0.196	0.0057	0.0067	0.0077
b	0.220	0.250	0.280	0.0087	0.0098	0.0110
e		0.400			0.0157	
s	0.205	0.225	0.245	0.0081	0.0089	0.0096
D	1.220	1.250	1.280	0.0480	0.0492	0.0504
E	1.220	1.250	1.280	0.0480	0.0492	0.0504

Notes (unless otherwise specified)

1. Laser mark on the silicon die back, coated with an epoxy film.
2. Bumps are SAC396.
3. 0.050 mm max. co-planarity.
4. Laminate tape thickness is 0.022 mm.
5. Use millimeters as the primary measurement

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DWG: 6030

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