

The R5402Nx Series are high input voltage CMOS-based protection ICs for over-charge/discharge of rechargeable one-cell Lithium-ion (Li-ion) / Lithium polymer excess load current, further include a short circuit protector for preventing large external short circuit current and excess charge/discharge-current.

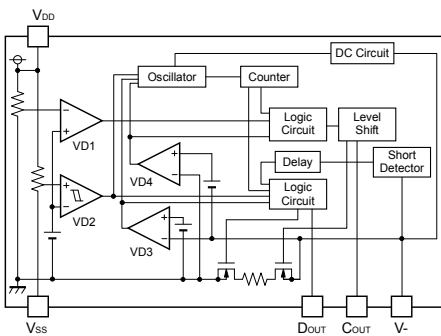
Each of these ICs is composed of four voltage detectors, reference units, a delay circuit, a short circuit protector, an oscillator, a counter, and a logic circuit. SOT-23-5 package is available.

FEATURES

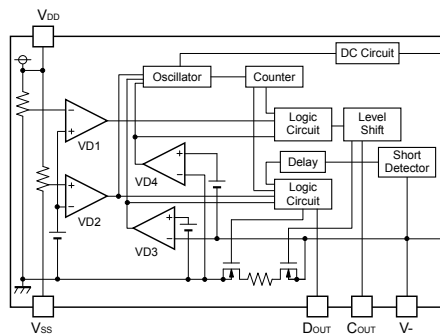
- Supply Voltage (V_{DD}) 12V (Absolute Maximum Rating)
- Charger Negative Input Voltage (V_-) -35V (Absolute Maximum Rating)
- Operating Input Voltage Range (V_{DD}) 1.5V to 5.0V
- Supply Current (I_{DD}) Typ. 4.0 μ A
- Standby Current (I_s) Max. 0.1 μ A (C Version)
Max. 2.0 μ A (B, D Version)
- Over-charge (V_{DET1}) Detector Threshold Range 4.0V to 4.5V (0.005V steps)
Detector Threshold Accuracy ± 25 mV (25 $^{\circ}$ C)
 ± 30 mV (-5 to 55 $^{\circ}$ C)
Output Delay Time ($t_{V_{DET1}}$) Typ. 1.0s or 0.25s
- Over-discharge (V_{DET2}) Detector Threshold Range 2.0V to 3.0V (0.1V steps)
Detector Threshold Accuracy $\pm 2.5\%$
Output Delay Time ($t_{V_{DET2}}$) Typ. 20ms
- Excess discharge-current (V_{DET3}) Detector Threshold Range 0.05V to 0.20V (0.005V steps)
Detector Threshold Accuracy ± 15 mV
Output Delay Time ($t_{V_{DET3}}$) Typ. 6ms or 12ms
- Excess charge-current (V_{DET4}) Detector Threshold Range -0.1V
Detector Threshold Accuracy ± 30 mV
Output Delay Time ($t_{V_{DET4}}$) Typ. 8ms or 16ms
- Short Protection Voltage (V_{short}) Typ. 0.8V
Output Delay Time (t_{short}) Typ. 200 μ s or 300 μ s
- 0V-battery charge Available
- Package SOT-23-6

BLOCK DIAGRAMS

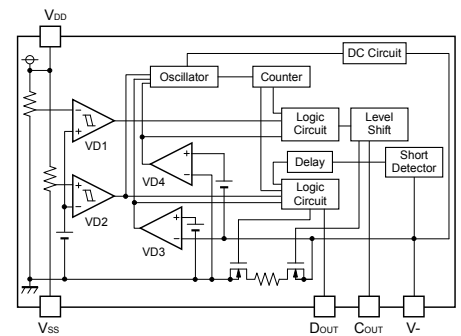
R5402NxxxxB



R5402NxxxxC



R5402NxxxxD



SELECTION GUIDE

Package	Quantity per Reel	Part No.
SOT-23-6	3,000 pcs	R5402Nxxx\$*-TR-FE

xxx: Serial Number for the R5402 Series designating input four threshold for over-charge, over-discharge, excess discharge-current, and excess charge-current detectors

\$: Designation of Output delay time option of over-charge, excess discharge-current, and excess charge-current.

(C) $t_{V_{DET1}}=1.0s$, $t_{V_{DET3}}=12ms$, $t_{V_{DET4}}=16ms$

(E) $t_{V_{DET1}}=1.0s$, $t_{V_{DET3}}=6ms$, $t_{V_{DET4}}=8ms$

(F) $t_{V_{DET1}}=0.25s$, $t_{V_{DET3}}=12ms$, $t_{V_{DET4}}=16ms$

(K) $t_{V_{DET1}}=1.0s$, $t_{V_{DET3}}=12ms$, $t_{V_{DET4}}=8ms$

*: Designation of version symbols

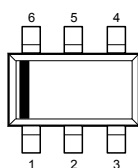
(B) With Latch function after Over-charge, Auto Release after Over-discharge

(C) With Latch function after Over-charge and Over-discharge

(D) Auto Release after Over-charge and Over-discharge

PACKAGE (Top View)

SOT-23-6



1	DOUT
2	V-
3	COUT
4	NC
5	VDD
6	VSS

APPLICATIONS

- Li-ion / Li polymer protector of over-charge, over-discharge, excess discharge-current, excess charge-current for battery pack
- High precision protectors for cell-phones and any other gadgets using on board Li-ion / Li polymer battery