

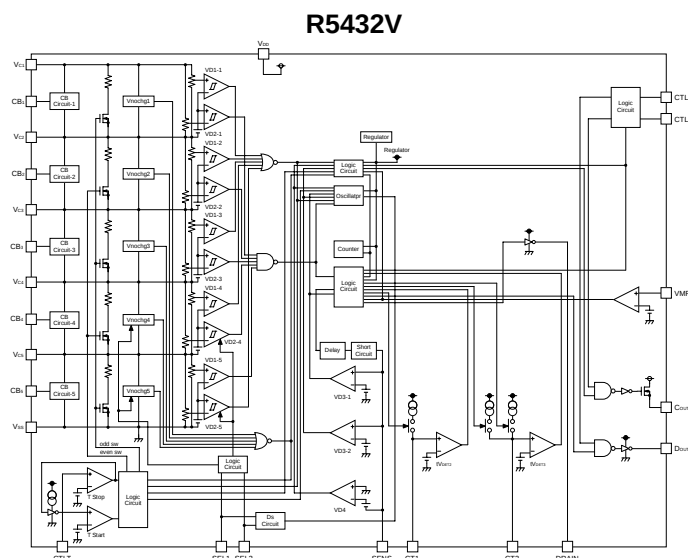
Li-ion/polymer 3/4/5Cell Batteries protector

The R5432V Series are high voltage CMOS-based protection ICs for over-charge/discharge of rechargeable 3/4/5cell Li-ion/Lithium polymer battery. Each of these ICs is composed of voltage detectors, reference units, a delay circuit, a short circuit protector, an oscillator, a counter, and logic circuits. A more than 6 Cells battery is available by Cascade connection. Disconnection detection and cell-balance function, which can reduce cell-unbalance, are available. SSOP-24 package is available.

FEATURES

- Supply Voltage (V_{DD}) 30V (Absolute Maximum Rating)
- Charger Negative Input Voltage (V_-) 30V (Absolute Maximum Rating)
- Operating Input Voltage Range (V_{DD}) Max. 25.0V
- Supply Current (I_{DD}) Typ. 12.0 μ A
- Over-charge (V_{DET1})
 - Detector Threshold Range 3.6V to 4.5V (0.005V Steps)
 - Voltage Accuracy ± 25 mV
 - Output Delay Time (t_{VDET1}) 1.0s
- Over-discharge (V_{DET2})
 - Detector Threshold Range 2.0 to 3.0V (0.1V Steps)
 - Voltage Accuracy $\pm 2.5\%$
 - Output Delay Time (t_{VDET2}) Settable by outside capacitance1
- Excess discharge-current (V_{DET3})
 - Detector Threshold Voltage1 0.1V to 0.3V (0.01V Steps)
 - Detector Threshold Voltage2 0.6V
 - Voltage Accuracy1 ± 20 mV
 - Voltage Accuracy2 ± 0.1 V
 - Output Delay Time ($t_{VDET3-1}$) Settable by outside capacitance2
 - Output Delay Time ($t_{VDET3-2}$) Settable by outside capacitance2
- Excess charge-current (V_{DET4})
 - Detector Threshold -0.05V, -0.1V, -0.2V, -0.4V
 - Voltage Accuracy ± 30 mV (at -0.05V, -0.1V, -0.2V)
 - ± 40 mV (at -0.4V)
- Cell-balance
 - Detector Threshold Range 3.45V to 4.45V (0.005V Steps)
 - Output Delay Time (t_{VDET4}) 8ms
- Short Protection
 - Detector Threshold (V_{short}) 1.0V
 - Output Delay Time 300 μ s
- 0V-battery charge Available
- Packages SSOP-24

BLOCK DIAGRAMS



SELECTION GUIDE

Halogen Free	Package	Quantity per Reel	Part No.
H/F	SSOP-24	3,000pcs	R5432Vxxx\$*-E2-FE

xxx: Serial Number for the R5432V Series designing input four threshold for over-charge, over-discharge, excess discharge-current and excess charge-current detectors.

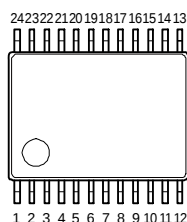
*: Designation of protection type.

(A) Auto release after Over-charge and Over-discharge. 0V battery is available.

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

(B) t_{VDET1} : 1s, t_{VDET2} : $38.8 \times C1$ (nF), $t_{VDET3-1}$: $32.6 \times C2$ (nF), $t_{VDET3-2}$: $t_{VDET3}/6$, t_{VDET4} : 8ms, t_{Short} : 300 μ s

PACKAGE



SSOP-24

1	CTLC	9	VSS	17	VC4
2	CTLD	10	CT1	18	CB3
3	COUT	11	CT2	19	VC3
4	VMP	12	SEL1	20	CB2
5	DRAIN	13	SEL2	21	VC2
6	DOUT	14	CB5	22	CB1
7	SENS	15	VC5	23	VC1
8	CTLT	16	CB4	24	VDD

APPLICATIONS

- Li-ion/Li polymer protector of over-charge, over-discharge, excess discharge-current, excess charge-current for battery pack
- Over-charge, discharge and current protections for notebook PCs, power tools, and any other gadgets using on board Li-ion/Li Polymer battery.



1. The products and the product specifications described in this document are subject to change or discontinuation of production without notice for reasons such as improvement. Therefore, before deciding to use the products, please refer to Ricoh sales representatives for the latest information thereon.
2. The materials in this document may not be copied or otherwise reproduced in whole or in part without prior written consent of Ricoh.
3. Please be sure to take any necessary formalities under relevant laws or regulations before exporting or otherwise taking out of your country the products or the technical information described herein.
4. The technical information described in this document shows typical characteristics of and example application circuits for the products. The release of such information is not to be construed as a warranty of or a grant of license under Ricoh's or any third party's intellectual property rights or any other rights.
5. The products listed in this document are intended and designed for use as general electronic components in standard applications (office equipment, telecommunication equipment, measuring instruments, consumer electronic products, amusement equipment etc.). Those customers intending to use a product in an application requiring extreme quality and reliability, for example, in a highly specific application where the failure or misoperation of the product could result in human injury or death (aircraft, spacevehicle, nuclear reactor control system, traffic control system, automotive and transportation equipment, combustion equipment, safety devices, life support system etc.) should first contact us.
6. We are making our continuous effort to improve the quality and reliability of our products, but semiconductor products are likely to fail with certain probability. In order to prevent any injury to persons or damages to property resulting from such failure, customers should be careful enough to incorporate safety measures in their design, such as redundancy feature, firecontainment feature and fail-safe feature. We do not assume any liability or responsibility for any loss or damage arising from misuse or inappropriate use of the products.
7. Anti-radiation design is not implemented in the products described in this document.
8. Please contact Ricoh sales representatives should you have any questions or comments concerning the products or the technical information.

RICOH COMPANY., LTD. Electronic Devices Company



■ Ricoh presented with the Japan Management Quality Award for 1999.
Ricoch continually strives to promote customer satisfaction, and shares the achievements of its management quality improvement program with people and society.



■ Ricoh awarded ISO 14001 certification.

The Ricoh Group was awarded ISO 14001 certification, which is an international standard for environmental management systems, at both its domestic and overseas production facilities. Our current aim is to obtain ISO 14001 certification for all of our business offices.

<http://www.ricoh.com/LSI/>

RICOH COMPANY, LTD. Electronic Devices Company

● Higashi-Shinagawa Office (International Sales)
3-32-3, Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-8655, Japan
Phone: +81-3-5479-2857 Fax: +81-3-5479-0502

RICOH EUROPE (NETHERLANDS) B.V.

● Semiconductor Support Centre
Prof. W.H.Keesomlaan 1, 1183 DL Amstelveen, The Netherlands
P.O.Box 114, 1180 AC Amstelveen
Phone: +31-20-5474-309 Fax: +31-20-5474-791

RICOH ELECTRONIC DEVICES KOREA Co., Ltd.

11 floor, Haesung 1 building, 942, Daechidong, Gangnamgu, Seoul, Korea
Phone: +82-2-2135-5700 Fax: +82-2-2135-5705

RICOH ELECTRONIC DEVICES SHANGHAI Co., Ltd.

Room403, No.2 Building, 690#Bi Bo Road, Pu Dong New district, Shanghai 201203,
People's Republic of China
Phone: +86-21-5027-3200 Fax: +86-21-5027-3299

RICOH COMPANY, LTD. Electronic Devices Company

● Taipei office
Room109, 10F-1, No.51, Hengyang Rd., Taipei City, Taiwan (R.O.C.)
Phone: +886-2-2313-1621/1622 Fax: +886-2-2313-1623



Ricoh completed the organization of the Lead-free production for all of our products. After Apr. 1, 2006, we will ship out the lead free products only. Thus, all products that will be shipped from now on comply with RoHS Directive.