

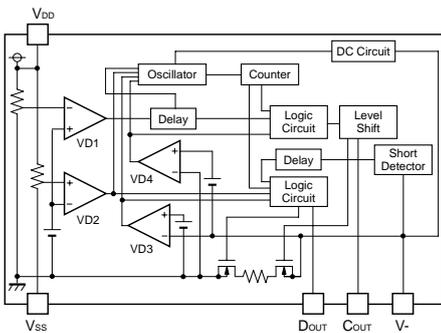
R5403x/R5405x Series are high input voltage CMOS-based protection ICs for over-charge/discharge of rechargeable one-cell Lithium-ion (Li-ion) / Lithium polymer excess load current, further include a short circuit protector for preventing large external short circuit current and excess charge/discharge-current. Each of these ICs is composed of four voltage detectors, a reference unit, a delay circuit, a short circuit protector, an oscillator, a counter, and a logic circuit. In addition to SOT-23-5 and SOT-23-6 packages, DFN(PLP)1616-6, DFN(PLP)1820-6 and DFN1814-6 are also available.

### FEATURES

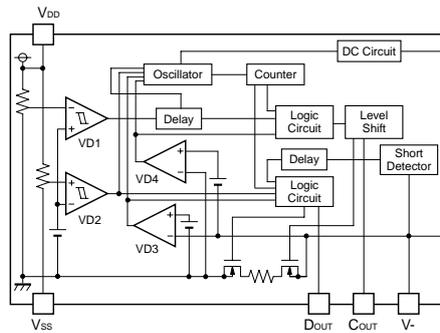
- Supply Voltage ( $V_{DD}$ ) ..... 12V (Absolute Maximum Rating)
- Charger Negative Input Voltage ( $V_{-}$ )... -30V (Absolute Maximum Rating)
- Operating Input Voltage Range ( $V_{DD}$ )... 1.5V to 5.0V
- Supply Current ( $I_{DD}$ ) ..... Typ. 4.0 $\mu$ A
- Standby Current ( $I_s$ ) ..... Max. 0.1 $\mu$ A (C, E, G Version)  
Typ. 1.2 $\mu$ A (D, F Version)
- Over-charge ( $V_{DET1}$ ) Detector Threshold Range ..... 4.0V to 4.5V (0.005V steps)  
Detector Threshold Accuracy...  $\pm 25$ mV (25 $^{\circ}$ C)  
 $\pm 30$ mV (-5 $^{\circ}$ C to 55 $^{\circ}$ C)  
Output Delay Time ( $t_{VDET1}$ ) ..... Typ. 1.0s
- Over-discharge ( $V_{DET2}$ ) Detector Threshold Range ..... 2.0V to 3.0V (0.1V steps)  
Detector Threshold Accuracy...  $\pm 2.5$ %  
Output Delay Time ( $t_{VDET2}$ ) ..... Typ. 20ms
- Excess discharge-current ( $V_{DET3}$ )
- Excess charge-current ( $V_{DET4}$ )
- Short Protection
- 0V-battery charge..... Selectable
- Packages ..... DFN1814-6,  
DFN(PLP)1616-6,  
DFN(PLP)1820-6,  
SOT-23-5, SOT-23-6
- Detector Threshold Range... 0.05V to 0.20V (0.005V steps)  
Detector Threshold Accuracy...  $\pm 15$ mV  
Output Delay Time ( $t_{VDET3}$ ) ... Typ. 6ms or 12ms or 18ms
- Detector Threshold Range... -0.05V to -0.20V (0.005V steps)  
Detector Threshold Accuracy...  $\pm 30$ mV  
Output Delay Time ( $t_{VDET4}$ ) ... Typ. 8ms or 16ms
- Voltage ( $V_{short}$ ) ..... Typ. 0.8V  
Output Delay Time ( $t_{short}$ ) ..... Typ. 200 $\mu$ s or 300 $\mu$ s or 400 $\mu$ s

### BLOCK DIAGRAMS

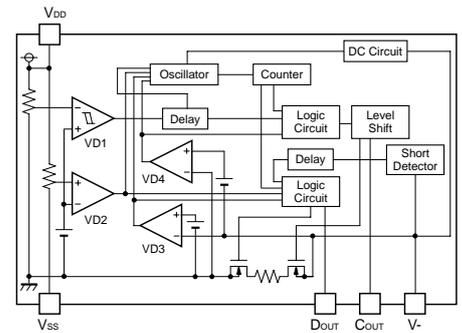
R5403/05xxxxCC/EC/KG/PG



R5403/05xxxxKD/KF



R5403/05xxxxKE



### SELECTION GUIDES

Package	Quantity per Reel	Part No.
DFN(PLP)1820-6	5,000 pcs	R5403Kxxx\$* -TR
SOT-23-5	3,000 pcs	R5403Nxxx\$* -TR-FE

Package	Quantity per Reel	Part No.
DFN1814-6	5,000 pcs	R5405Lxxx\$* -TR
DFN(PLP)1616-6	5,000 pcs	R5405Kxxx\$* -TR
SOT-23-6	3,000 pcs	R5405Nxxx\$* -TR-FE

xxx: Serial Number for the R5403x/R5405x Series designating input four threshold for over-charge, over-discharge, excess discharge-current, and excess charge-current detectors

\*: Designation of protection type and 0V-battery charge is available or unavailable

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

- (C) With Latch function after Over-charge and Over-discharge. 0V-battery charge is available
- (D) Auto Release after Over-charge and Over-discharge. 0V-battery charge is available.
- (E) Auto Release after Over-charge and with latch function after Over-discharge. 0V-battery charge is available.
- (F) Auto Release after Over-charge and Over-discharge. 0V-battery charge is unavailable.
- (G) With Latch function after Over-charge and Over-discharge. 0V-battery charge is unavailable.

### PACKAGES (Top View)

DFN1814-6	DFN(PLP)1616-6	DFN(PLP)1820-6	SOT-23-5	SOT-23-6																																																										
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\*) The tab is substrate level ( $V_{DD}$ )

### 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



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**RICOH ELECTRONIC DEVICES CO., LTD.**

**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**  
"Nieuw Kronenburg" Prof. W.H. Keesomlaan 1, 1183 DJ, 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 ELECTRONIC DEVICES CO., LTD.**

**Taipei office**  
Room109, 10F-1, No.51, Hengyang Rd., Taipei City, Taiwan (R.O.C.)  
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