

## Dual 150mA LDO with 2 input pins

The RP153L Series are CMOS-based dual output LDO regulators featuring 150mA output with 2 input pins. Various basic performances of the RP Series have been improved by adopting a new manufacturing process. RP153L features a supply current as low as 40 $\mu$ A per output, a minimum input voltage from 1.4V and the output voltage can be set from 0.8V to 3.6V (in 0.1V steps). Due to the low minimum input voltage, RP153L is able to extend battery life, additionally the LDO has less power dissipation by the low dropout voltage between input and output. The enhanced load transient response version available. RP153L is available in DFN1216-8 package.

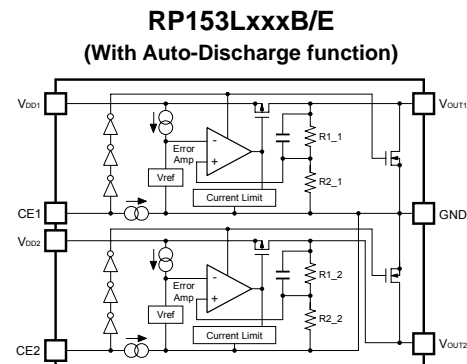
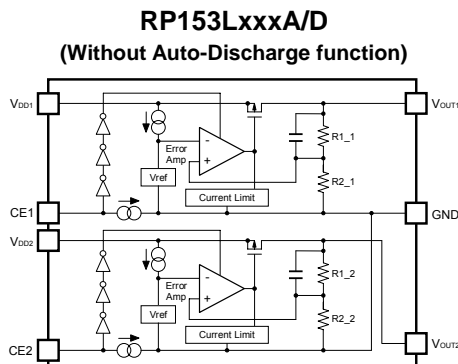
### FEATURES

- Supply Current ( $I_{SS}$ ) ..... Typ. 40 $\mu$ A  $\times$  2  
(A/B Version,  $V_{IN} = SET V_{OUT} + 1V$ )
- Supply Current ( $I_{SS}$ ) ..... Typ. 85 $\mu$ A  $\times$  2  
(D/E Version,  $V_{IN} = SET V_{OUT} + 1V$ )
- Standby Current ( $I_{standby}$ ) ..... Typ. 0.1 $\mu$ A  $\times$  2 (Same as above, at standby)
- Dropout Voltage ( $V_{DIF}$ ) ..... Typ. 0.22V ( $I_{OUT} = 150mA$ ,  $V_{OUT} = 2.8V$ )
- Ripple Rejection (RR) ..... Typ. 70dB ( $f = 1kHz$ )
- Input Voltage Range ( $V_{IN}$ ) ..... 1.4V to 5.25V
- Output Voltage Range ( $V_{OUT}$ ) ..... 0.8V to 3.6V\* (internally fixed)
- Output Voltage Accuracy .....  $\pm 1\%$
- Temp. coeff. of Output Voltage ..... Typ.  $\pm 80ppm/^{\circ}C$
- Line Regulation ..... Typ. 0.02%/V
- Fold-back Protection Circuit ..... Current limit Typ. 40mA
- Auto-Discharge function ..... B/E Version
- Enhanced load transient response ..... D/E Version
- Package ..... DFN1216-8
- Ceramic Capacitor can be used. .... 0.22 $\mu$ F or more

\* For information about combination of output voltage, visit our website to check.

(The above shows specification at  $T_{opt} = 25^{\circ}C$ . Design assurance value at  $-40^{\circ}C \leq T_{opt} \leq 85^{\circ}C$  is also available. For details, please refer to the datasheet.)

### BLOCK DIAGRAMS



### SELECTION GUIDES

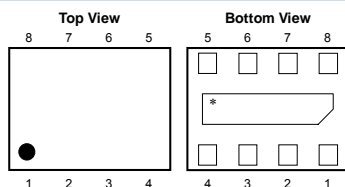
| Package   | Quantity per reel | Part No.      |
|-----------|-------------------|---------------|
| DFN1216-8 | 5,000 pcs         | RP153Lxxx*-E2 |

xxx : Specify a combination of output voltage for each output using serial numbers.

- \* : Select from (A) without auto-discharge function or (B) with auto-discharge function or (D) enhanced load transient response and without auto-discharge function or (E) enhanced load transient response and with auto-discharge function.

### PACKAGE

#### DFN1216-8



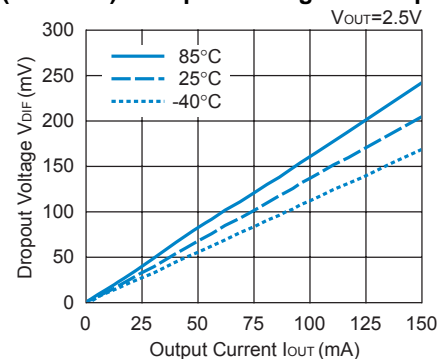
|   |       |   |      |
|---|-------|---|------|
| 1 | GND*1 | 5 | CE2  |
| 2 | VOUT1 | 6 | VDD2 |
| 3 | VOUT2 | 7 | VDD1 |
| 4 | GND*1 | 8 | CE1  |

\* The tab is substrate level (GND).

\*1) The GND pin must be wired together when it is mounted on board.

### TYPICAL CHARACTERISTIC

#### RP153L (VR1/VR2) Dropout Voltage vs. Output Current



### APPLICATIONS

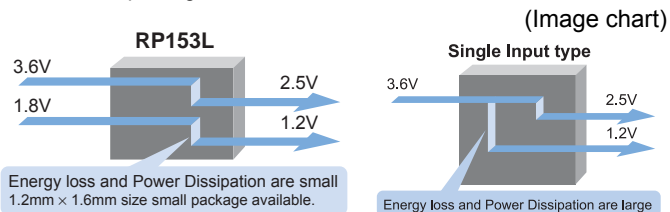
- Power source for hand-held communication equipment, cameras, and VCRs
- Power source for home appliances
- Power source for battery-powered equipment

### Dual 150mA LDO with 2 input pins

## Dual 150mA LDO with 2 input pins

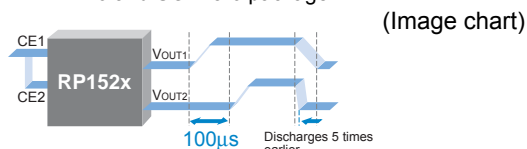
### Dual input and dual output

Due to the low minimum input voltage RP153L is able to extend battery life, additionally the LDO has less power dissipation by the low dropout voltage between input and output. RP153L uses a small DFN1216-8 package.



### Single input type RP152x has a sequence control

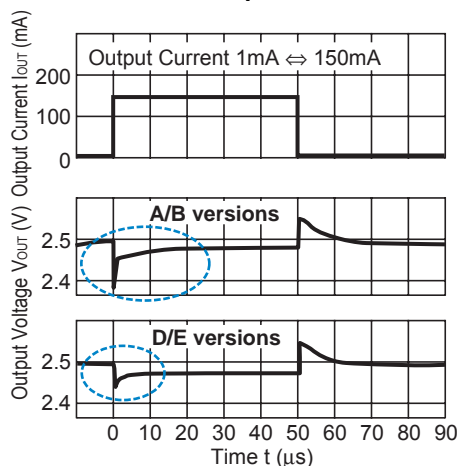
Another dual LDO RP152x is available with similar electrical specifications like RP153L but with one shared input pin. The RP152x has a new optional start-up sequence offers output VR2 to start-up 100μs delayed after VR1. As for the shut-down sequence, the discharge period for VR2 is 5 times shorter compared to VR1. It uses a small DFN1212-6 and SOT23-6 package.



### Enhanced load transient version

The RP153LxxxD/E versions have enhanced load transient response characteristics. In case of an increase in output current, the voltage drop and recovery period is significantly lower compared to the RP153LxxxA/B versions.

#### Load Transient Response of RP153L



### Dual 150mA LDO Regulator Comparison

|                         | RP152x Series  | RP153L Series   | R5323x Series                        |
|-------------------------|--|---|--------------------------------------|
| Output Current (Min.)   | 150mA  | 150mA   | 150mA                                |
| Supply Current (Typ.)   | 40μA×2   | 40μA×2 / 85μA×2*  | 90μA×2                               |
| Standby Current (Typ.)  | 0.1μA×2  | 0.1μA×2   | 0.1μA×2                              |
| Dropout Voltage         | 0.22V  | 0.22V   | 0.22V                                |
| Input Voltage Range     | 1.4V to 5.25V  | 1.4V to 5.25V   | 2.0V to 6.0V                         |
| Output Voltage Range    | 0.8V to 3.6V   | 0.8V to 3.6V  | 1.5V to 4.0V                         |
| Output Voltage Accuracy | ±1%  | ±1%   | ±2%                                  |
| Ripple Rejection (Typ.) | 70dB   | 70dB  | 70dB                                 |
| Protection Circuits     | Fold-back Protection Circuit                                       | Fold-back Protection Circuit  | Fold-back Protection Circuit         |
| Operation Temperature   | -40°C to 85°C  | -40°C to 85°C   | -40°C to 85°C                        |
| Packages                | DFN1212-6, SOT-23-6  | DFN1216-8   | WLCSP-6-P1, DFN(PLP)1820-6, SOT-23-6 |
| etc.                    | With Auto-Discharge function,<br>With Sequence control<br>function | With Auto-Discharge function,<br>With enhanced load transient<br>response | With Auto-Discharge function         |

Note) RP152x is not pin compatible to R5323x.

\*) Supply current for the enhanced load transient version is 85μA × 2.

## Ricoh Co.,LTD. Electronic Devices Company



■ Ricoh presented with the Japan Management Quality Award for 1999.  
Ricoh 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.



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.

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

RICOH COMPANY,LTD.  
ELECTRONIC DEVICES COMPANY  
● Shin-Yokohama Office(International Sales)  
3-2-3, Shin-Yokohama, Kouhoku-ku, Yokohama City, Kanagawa 222-8530, Japan  
Phone +81-45-477-1697 FAX +81-45-477-1694