

## Tiny Package, 1.3MHz, Step-up DC/DC Converter

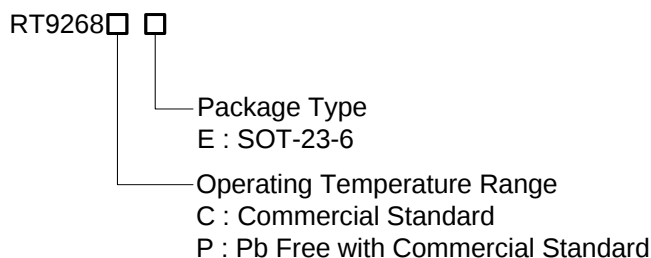
### General Description

The RT9268 is a compact, 1.3MHz, step-up DC/DC converter with a current mode PWM control loop, providing a stable and efficient operation without external compensation.

The high switching frequency makes RT9268 suitable for ADSL applications providing sufficient output current for variant types of line drivers. This device is available in space-saving SOT-23-6 package.

The output voltage is set with 2 external resistors. Both internal 2A switch and driver for driving external power devices (NMOS or NPN) are provided.

### Ordering Information



Note :

RichTek Pb-free products are :

- RoHS compliant and compatible with the current requirements of IPC/JEDEC J-STD-020.
- Suitable for use in SnPb or Pb-free soldering processes.
- 100%matte tin (Sn) plating.

### Marking Information

For marking information, contact our sales representative directly or through a RichTek distributor located in your area, otherwise visit our website for detail.

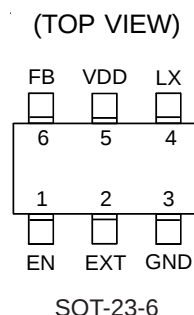
### Features

- 1.3MHz Switching Frequency
- Below 2V Low Start-up Input Voltage
- Sufficient Supply Capability for Supplying XDSL Line Drivers
- Zero Shutdown Mode Supply Current
- Providing Flexibility for Using Internal and External Power Switches
- Small SOT-23-6 Package
- RoHS Compliant and 100% Lead (Pb)-Free

### Applications

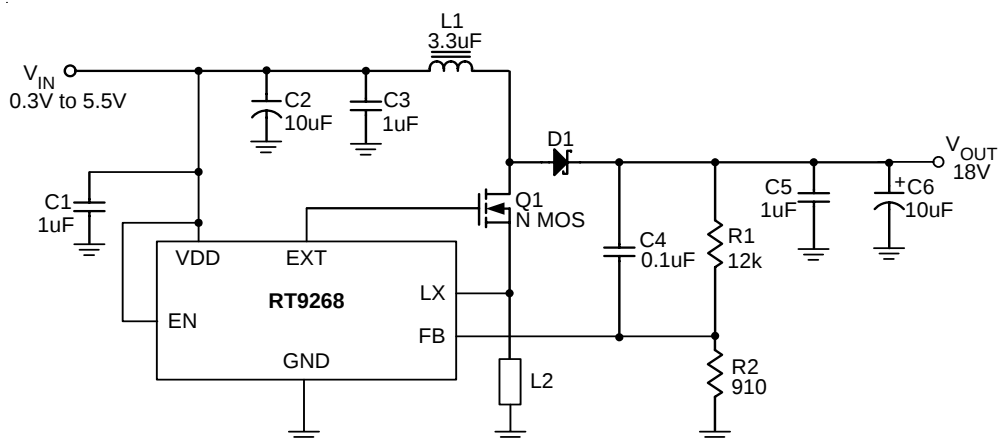
- XDSL Line Drivers
- USB Devices
- PCMCIA Cards
- Mini-PCI Cards

### Pin Configurations



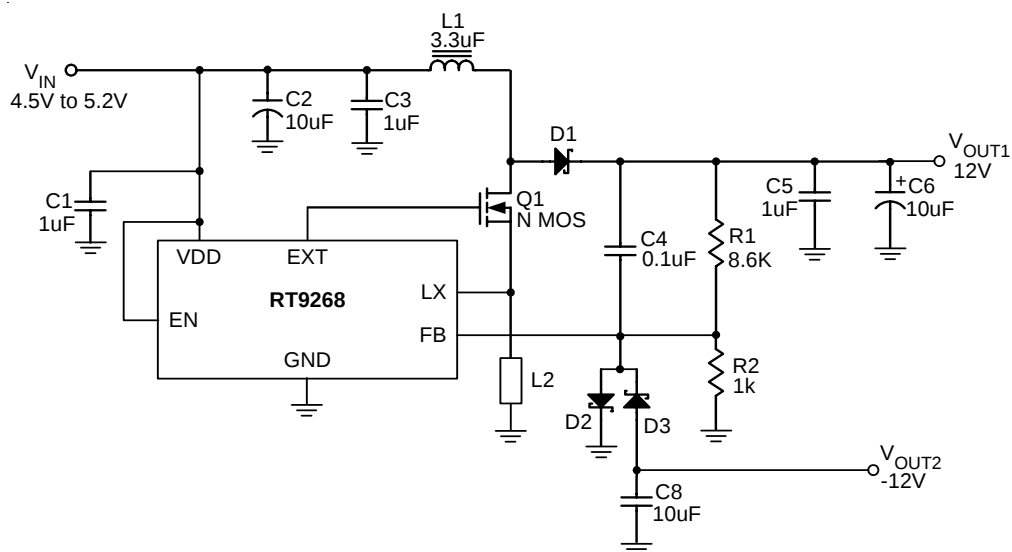
**Note :** There is no pin1 indicator on top mark for SOT-23-6 type, and pin 1 will be lower left pin when reading top mark from left to right.

## Typical Application Circuit



L2 : CL321611T-R22K-S/ YAGEO

Figure 1. RT9268 Application for XDSL 18V Line Drivers



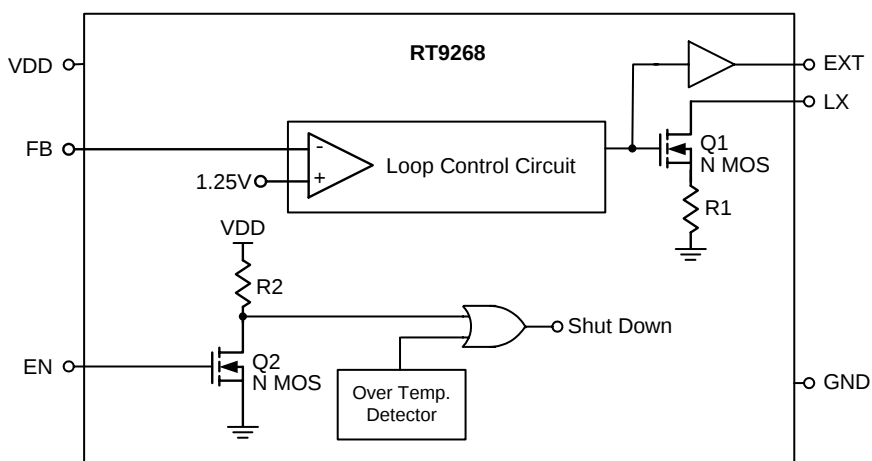
L2 : CL321611T-R22K-S/ YAGEO

Figure 2. RT9268 Application for USB-XDSL  $\pm 12V$  Line Drivers

## Functional Pin Description

| Pin No. | Pin Name | Pin Function                                                                    |
|---------|----------|---------------------------------------------------------------------------------|
| 1       | EN       | Chip Enable (Active High)                                                       |
| 2       | EXT      | Output Pin for Driving External NMOS                                            |
| 3       | GND      | Ground                                                                          |
| 4       | LX       | Pin for Switching                                                               |
| 5       | VDD      | Input Positive Power Pin of RT9268                                              |
| 6       | FB       | Feedback Input Pin Internal reference voltage for the error amplifier is 1.25V. |

## Function Block Diagram



## Absolute Maximum Ratings

- Supply Voltage ----- -0.3V to 7V
- LX Pin Switch Voltage ----- -0.3V to ( $V_{DD} + 0.8V$ )
- Other I/O Pin Voltages ----- -0.3V to ( $V_{DD} + 0.3V$ )
- LX Pin Switch Current ----- 2.5A
- EXT Pin Driver Current ----- 200mA
- Power Dissipation,  $P_D$  @  $T_A = 25^\circ C$   
   SOT-23-6 ----- 0.25W
- Package Thermal Resistance  
   SOT-23-6,  $\theta_{JA}$  -----  $250^\circ C/W$
- Operating Junction Temperature -----  $125^\circ C$
- Storage Temperature Range -----  $-65^\circ C$  to  $+150^\circ C$

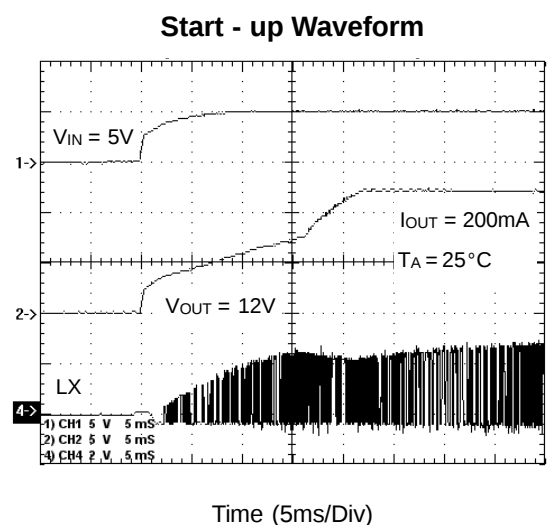
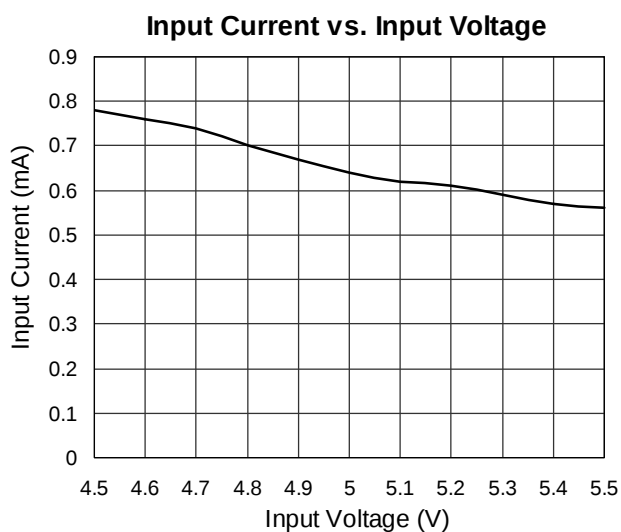
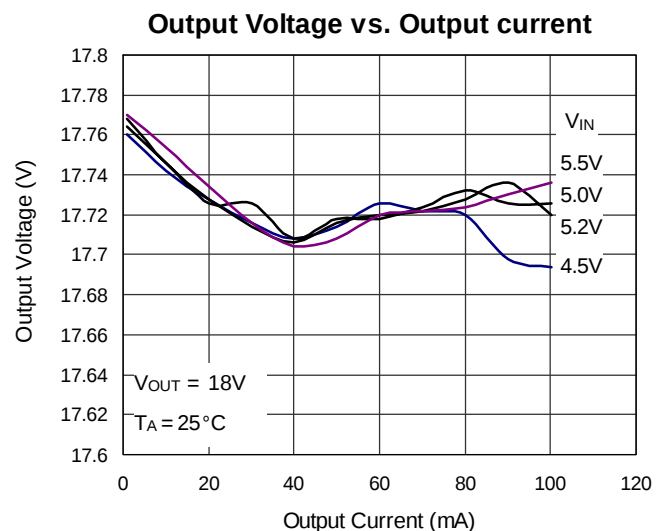
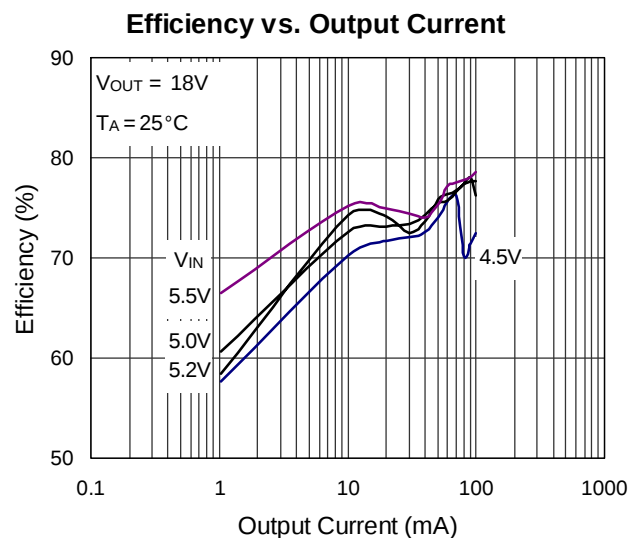
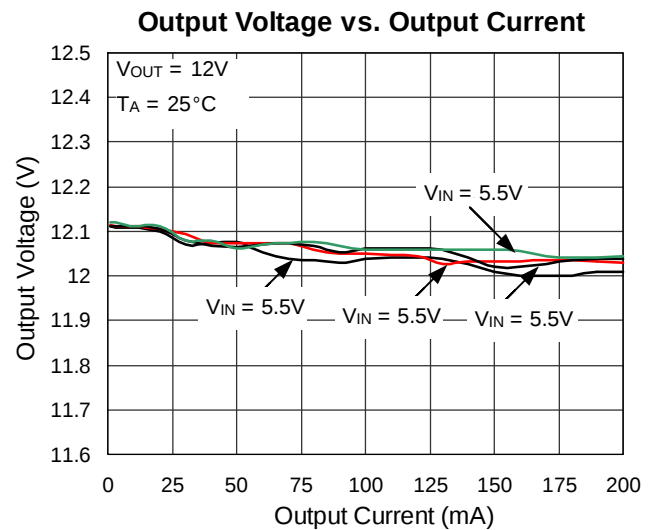
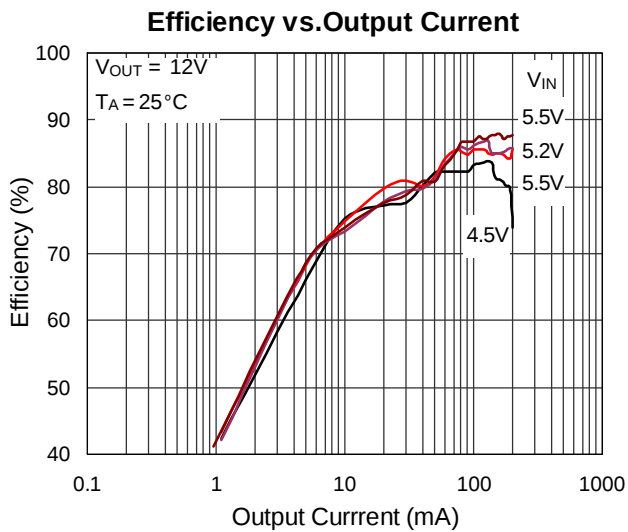
## Electrical Characteristics

( $V_{IN} = 3.3V$ ,  $V_{DD}$  set to 5V, Load Current = 0,  $T_A = 25^\circ C$ , unless otherwise specified)

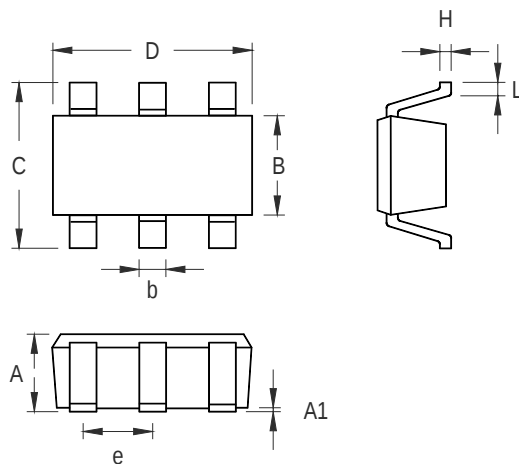
| Parameter                           | Symbol            | Test Conditions                        | Min   | Typ  | Max   | Units           |
|-------------------------------------|-------------------|----------------------------------------|-------|------|-------|-----------------|
| Start-UP Voltage                    | $V_{ST}$          | $I_L = 1mA$                            | --    | --   | 2     | V               |
| Operating $V_{DD}$ Range            | $V_{DD}$          | $V_{DD}$ pin voltage                   | 2     | --   | 6.5   | V               |
| No Load Current I ( $V_{IN}$ )      | $I_{NO\,LOAD}$    | $V_{IN} = 3.3V$ , $V_{OUT} = 5V$       | --    | 3    | --    | mA              |
| Switch-off Current I ( $V_{DD}$ )   | $I_{SWITCH}$      | $V_{IN} = 6V$                          | --    | 1    | --    | mA              |
| Shutdown Current I ( $V_{IN}$ )     | $I_{OFF}$         | EN Pin = 0V, $V_{IN} = 6V$             | --    | 0.1  | 1     | $\mu A$         |
| Feedback Reference Voltage          | $V_{REF}$         |                                        | 1.225 | 1.25 | 1.275 | V               |
| Switching Frequency                 | $F_S$             | $V_{DD} = 5V$                          | --    | 1.3  | --    | MHz             |
| Maximum Duty                        | $D_{MAX}$         | $V_{DD} = 5V$                          | --    | 95   | --    | %               |
| LX ON Resistance                    |                   | $V_{DD} = 5V$                          | --    | 0.3  | --    | $\Omega$        |
| Current Limit Setting               | $I_{LIMIT}$       | $V_{DD} = 5V$                          | --    | 2    | --    | A               |
| EXT ON Resistance to $V_{DD}$       |                   | $V_{DD} = 5V$                          | --    | 5    | --    | $\Omega$        |
| EXT ON Resistance to GND            |                   | $V_{DD} = 5V$                          | --    | 5    | --    | $\Omega$        |
| Line Regulation                     | $\Delta V_{LINE}$ | $V_{IN} = 2 \sim 4V$ , $I_L = 1mA$     | --    | 10   | --    | mV/V            |
| Load Regulation                     | $\Delta V_{LOAD}$ | $V_{IN} = 3.3V$ , $I_L = 1 \sim 100mA$ | --    | 0.25 | --    | mV/mA           |
| EN Pin Trip Level                   |                   | $V_{DD} = 5V$                          | 0.4   | 0.8  | 1.2   | V               |
| Temperature Stability for $V_{out}$ | $T_S$             | Guaranteed by Design                   | --    | 50   | --    | ppm/ $^\circ C$ |
| Thermal Shutdown                    | $T_{SD}$          | Guaranteed by Design                   | --    | 165  | --    | $^\circ C$      |
| Thermal Shutdown Hysteresis         | $\Delta T_{SD}$   | Guaranteed by Design                   | --    | 10   | --    | $^\circ C$      |

\* **Note.** The EN pin shall be tied to  $V_{DD}$  pin and inhibit to act the ON/OFF state whenever the  $V_{DD}$  pin voltage may reach to 5.5V or above.

# Typical Operating Characteristics



## Outline Dimension



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.889                     | 1.295 | 0.031                | 0.051 |
| A1     | 0.000                     | 0.152 | 0.000                | 0.006 |
| B      | 1.397                     | 1.803 | 0.055                | 0.071 |
| b      | 0.250                     | 0.560 | 0.010                | 0.022 |
| C      | 2.591                     | 2.997 | 0.102                | 0.118 |
| D      | 2.692                     | 3.099 | 0.106                | 0.122 |
| e      | 0.838                     | 1.041 | 0.033                | 0.041 |
| H      | 0.080                     | 0.254 | 0.003                | 0.010 |
| L      | 0.300                     | 0.610 | 0.012                | 0.024 |

SOT-23-6 Surface Mount Package

## RICHTEK TECHNOLOGY CORP.

Headquarter

5F, No. 20, Taiyuen Street, Chupei City

Hsinchu, Taiwan, R.O.C.

Tel: (8863)5526789 Fax: (8863)5526611

## RICHTEK TECHNOLOGY CORP.

Taipei Office (Marketing)

8F-1, No. 137, Lane 235, Paochiao Road, Hsintien City

Taipei County, Taiwan, R.O.C.

Tel: (8862)89191466 Fax: (8862)89191465

Email: marketing@richtek.com