



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## LV59033M — Bi-CMOS LSI 3.3V Constant-Voltage Power Supply IC

### Overview

The LV59033M is a constant-voltage power supply IC incorporating the output ON/OFF function, which offers advantages such as small current drain when output OFF and saves power dissipation of the equipment.

### Features

- 3.3V output
- Output voltage ON/OFF function with the control pin (active, high)
- Output current of 1A obtainable ( $V_{IN1}$ ,  $V_{IN2} \geq 4.3V$ )
- Small current drain (1 $\mu$ A max) when output OFF and optimum for power saving
- MFP8 (200mil) package, ensuring easy mounting design
- Full compliment of protection circuits incorporated (including overcurrent protection, thermal protection)

### Specifications

#### Absolute Maximum Ratings at $T_a = 25^\circ C$

| Parameter                   | Symbol    | Conditions                     | Ratings     | Unit       |
|-----------------------------|-----------|--------------------------------|-------------|------------|
| Maximum power supply        | $V_{IN1}$ | $V_{IN1}$ pin                  | 6.2         | V          |
|                             | $V_{IN2}$ | $V_{IN2}$ pin                  | 6.2         | V          |
| Allowable power dissipation | $P_d$ max | Mounted on a specified board.* | 1.45        | W          |
| Operating Temperature       | $T_{opr}$ |                                | -30 to +85  | $^\circ C$ |
| Storage Temperature         | $T_{stg}$ |                                | -40 to +125 | $^\circ C$ |

\* Specified board: 50mm  $\times$  50mm  $\times$  1.6mm, glass epoxy both sides

#### Recommended Operating Ranges at $T_a = 25^\circ C$

| Parameter      | Symbol    | Conditions    | Ratings  | Unit |
|----------------|-----------|---------------|----------|------|
| power supply   | $V_{IN1}$ | $V_{IN1}$ pin | 3.4 to 6 | V    |
|                | $V_{IN2}$ | $V_{IN2}$ pin | 3.4 to 6 | V    |
| Output current | $I_O$     |               | 0 to 1   | A    |

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# LV59033M

**Electrical Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{IN1} = V_{IN2} = 5\text{V}$

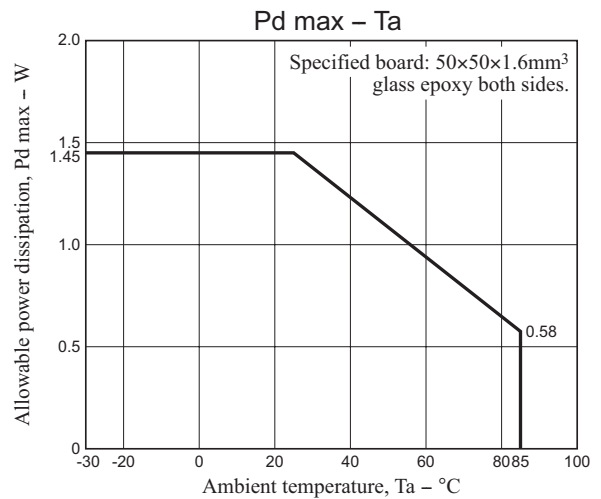
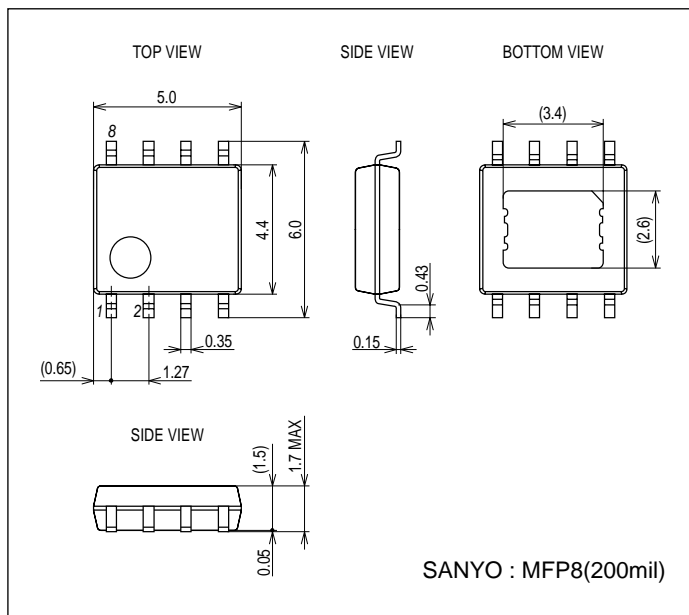
| Parameter                       | Symbol         | Conditions   | Ratings |           |       | Unit                  |
|---------------------------------|----------------|--|---------|-----------|-------|-----------------------|
|                                 |                |  | min     | typ       | max   |                       |
| Current drain                   | $I_{VIN}$      | LDO ON   |         | 110       | 160   | $\mu\text{A}$         |
| Standby current                 | $I_{STBY}$     | CTL = Low  |         |           | 1     | $\mu\text{A}$         |
| <b>Output</b>                   |                |  |         |           |       |                       |
| Output voltage                  | $V_O$          | $I_O = 10\text{mA}$  | 3.234   | 3.3       | 3.366 | V                     |
| Dropout voltage                 | $V_{drop1\_1}$ | $I_O = 1\text{A}$  |         |           | 1.0   | V                     |
|                                 | $V_{drop1\_2}$ | $I_O = 0.3\text{A}$  |         |           | 0.4   | V                     |
| Load Regulation                 | $V_{LD}$       | $I_O = 5\text{mA}$ to $1\text{A}$                                      |         | 10        | 50    | mV                    |
| Line Regulation                 | $V_{LN}$       | $V_{IN1} = V_{IN2} = 3.4\text{V}$ to $6\text{V}$ , $I_O = 10\text{mA}$ |         | 10        | 50    | mV                    |
| Voltage temperature coefficient | $\Delta VT$    | $T_a = -30$ to $+85^\circ\text{C}$ , $I_O = 10\text{mA}$               | *       | $\pm 100$ |       | ppm/ $^\circ\text{C}$ |
| Ripple Rejection                | $V_{RL}$       | $I_O = 10\text{mA}$ , $V_{Rpp}=1\text{V}$ , $f_{RR} = 1\text{kHz}$     | *       | 60        |       | dB                    |
| Output Noise Voltage            | $V_{ON}$       | $20\text{Hz} < f < 20\text{kHz}$                                       | *       | 150       |       | $\mu\text{Vrms}$      |
| <b>CTL pin</b>                  |                |  |         |           |       |                       |
| High level voltage              | $V_{CTLH}$     |  | 1.5     |           | 5     | V                     |
| Low level voltage               | $V_{CTLL}$     |  | 0       |           | 0.3   | V                     |
| Input current                   | $I_{CTL}$      | $V_{CTL} = 6\text{V}$  |         |           | 8.5   | $\mu\text{A}$         |

\* Design guarantee

## Package Dimensions

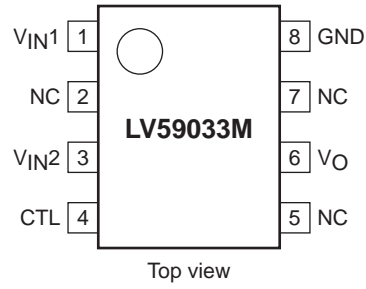
unit : mm (typ)

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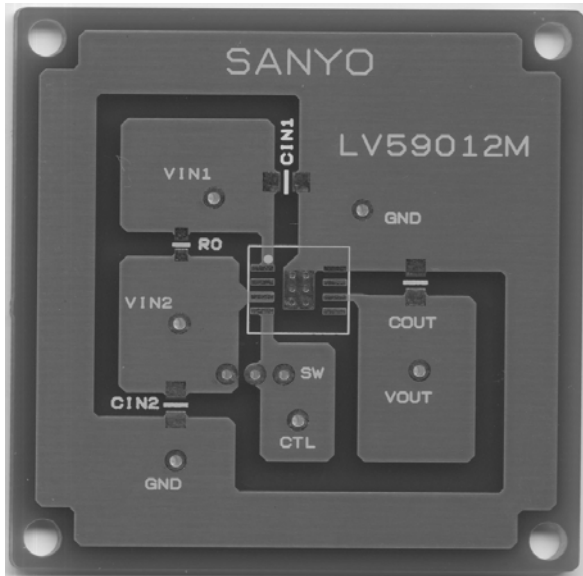


# LV59033M

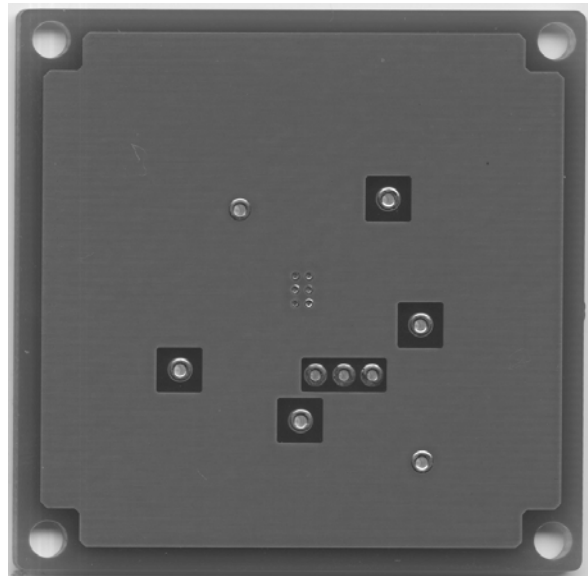
## Pin Assignment



Specified Board (Top side)

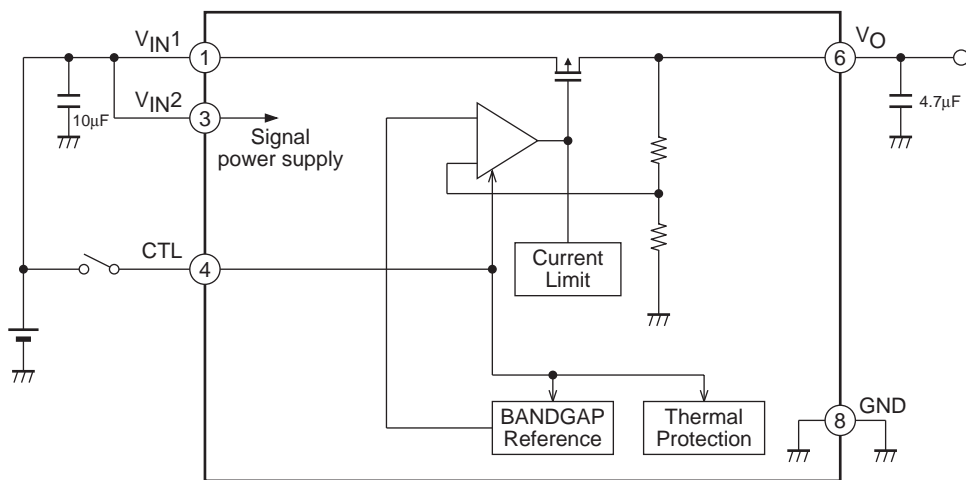


Specified Board (Bottom side)



Note: The substrate is common with LV59012M.

## Block Diagram

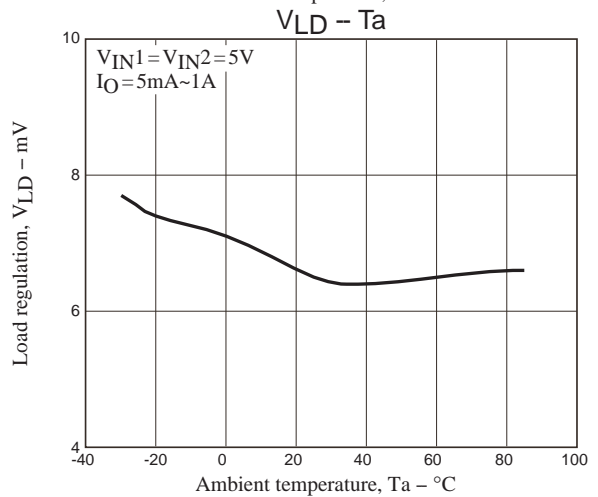
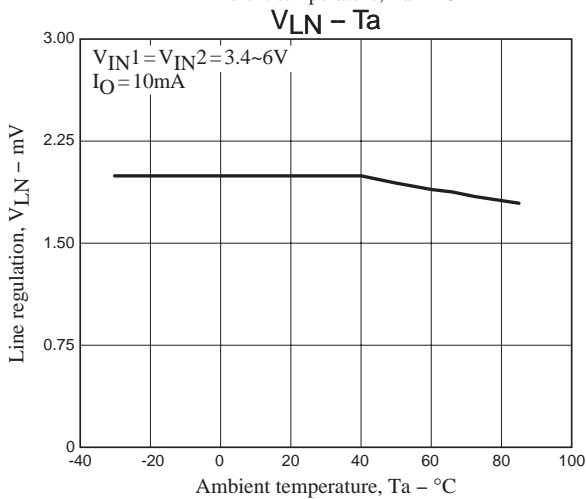
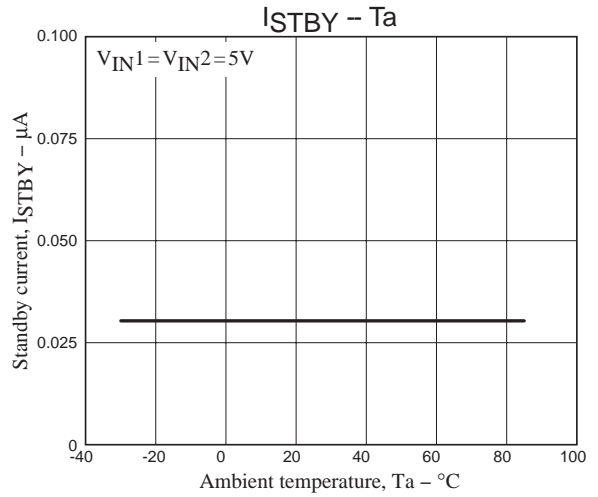
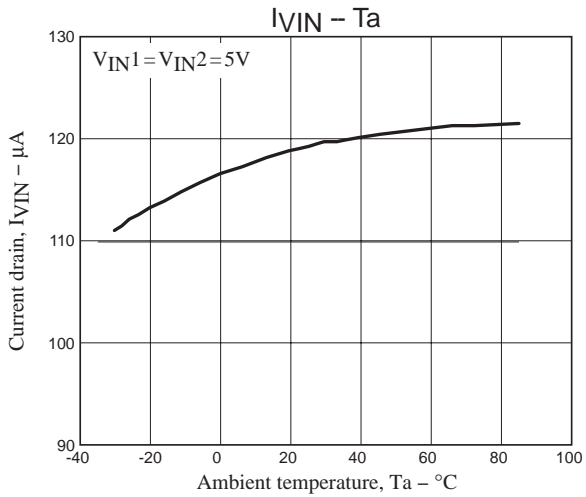


Pins 2,5,7 NC  
Connect and use V<sub>IN1</sub> and V<sub>IN2</sub>.

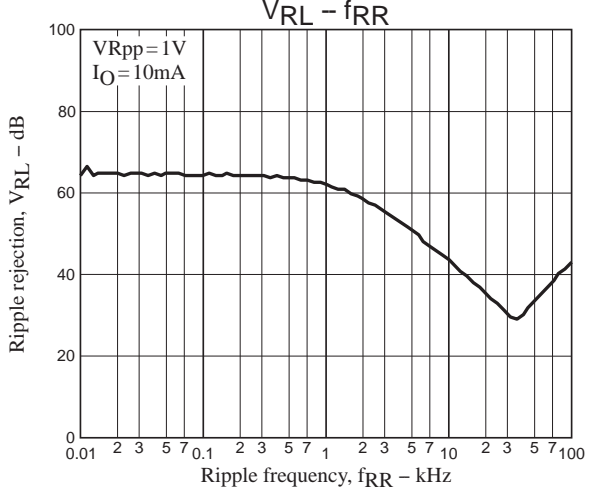
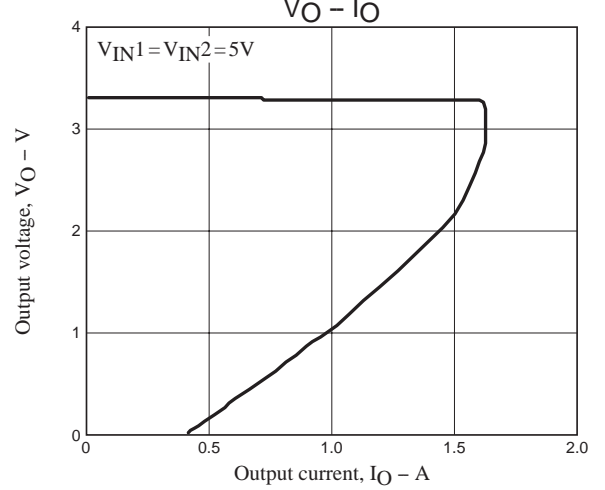
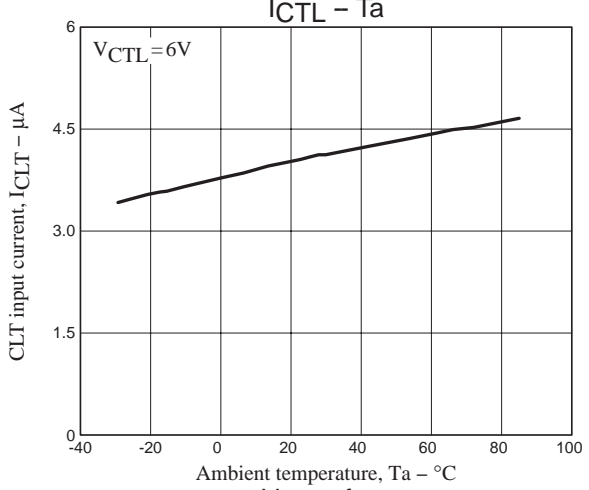
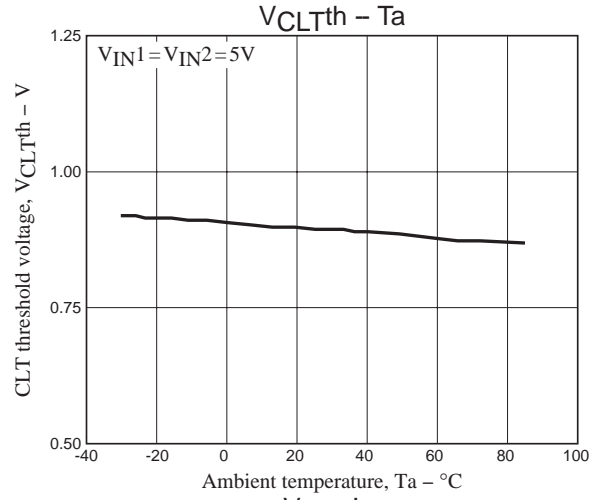
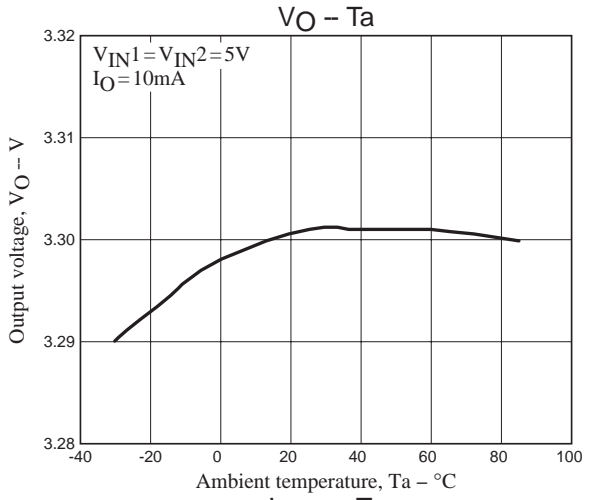
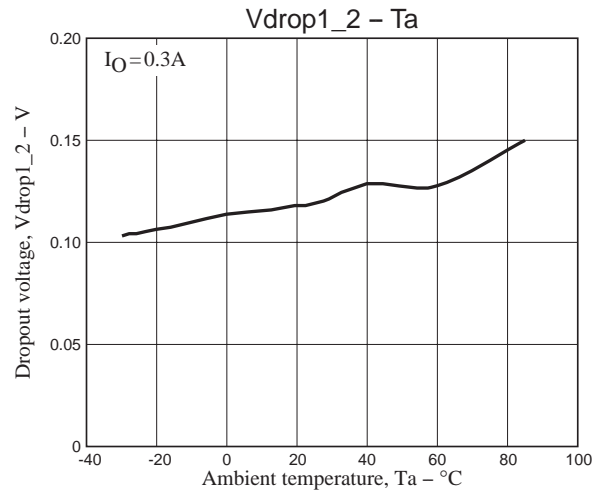
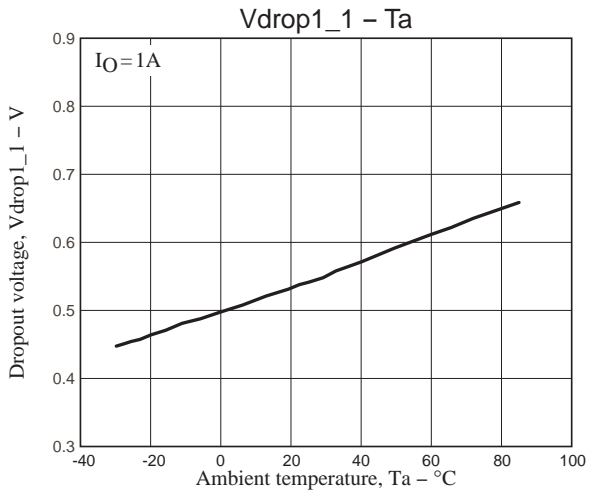
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## Pin Function

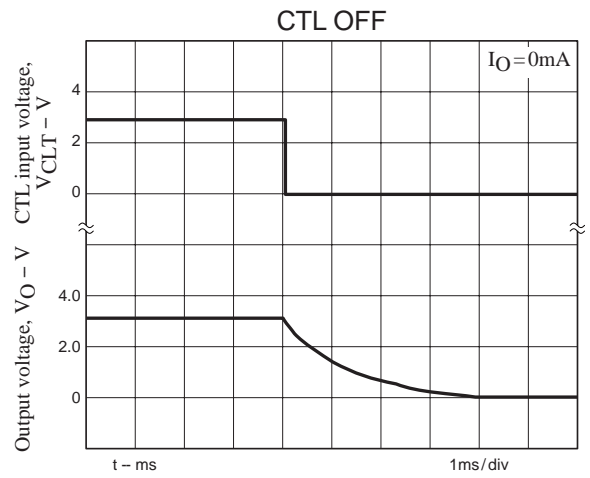
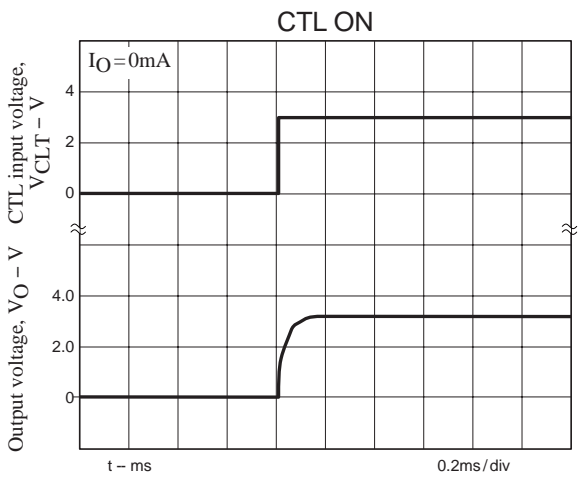
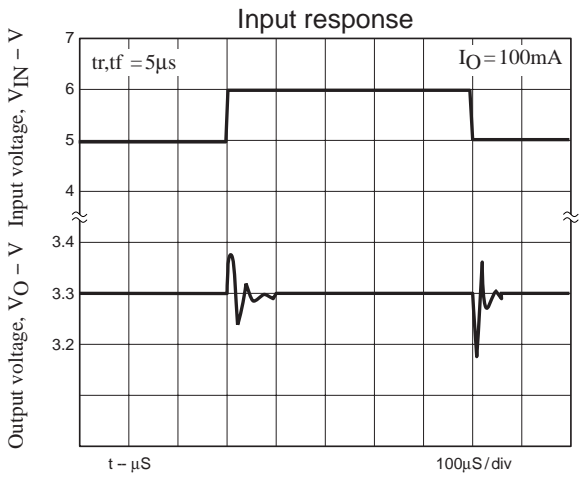
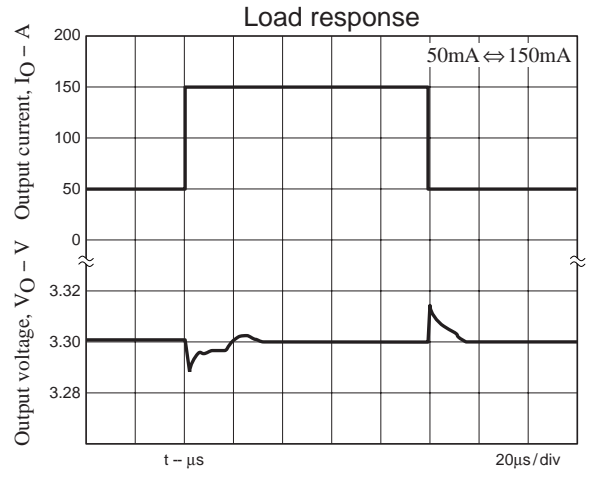
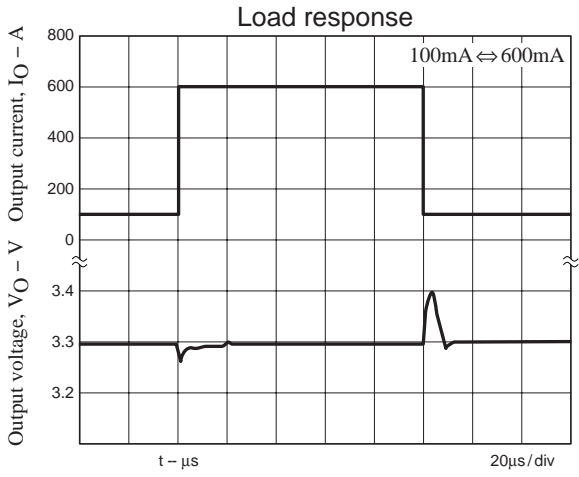
| Pin No. | Pin name         | Function                        | Equivalent circuit |
|---------|------------------|---------------------------------|--------------------|
| 1       | V <sub>IN1</sub> | Power system supply pin.        |                    |
| 6       | V <sub>O</sub>   | Output voltage pin.             |                    |
| 2       | NC               | No contact.                     |                    |
| 3       | V <sub>IN2</sub> | Signal system power supply pin. |                    |
| 4       | CTL              | ON/OFF control pin.             |                    |
| 5       | NC               | No contact.                     |                    |
| 7       | NC               | No contact.                     |                    |
| 8       | GND              | Ground pin.                     |                    |



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## Radiation Pad

- Radiation pad is high impedance and connected with a substrate of IC.
- Use radiation pad by GND or opening.

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