


**SANYO Semiconductors**

# DATA SHEET

An ON Semiconductor Company

## Bi-CMOS LSI

# LV59012M — 1.2V Constant-Voltage Power Supply IC

### Overview

The LV59012M 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

- Output voltage ON/OFF function with the control pin (active, high)
- Output current of 1A obtainable
- 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 $T_a = 25^\circ\text{C}$

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	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-40 to +150	$^\circ\text{C}$

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

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

Parameter	Symbol	Conditions	Ratings	Unit
power supply	$V_{IN1}$	$V_{IN1}$ pin	1.6 to 6	V
	$V_{IN2}$	$V_{IN2}$ pin	1.8 to 6	V
Output current	$I_O$		0 to 1	A

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# LV59012M

**Electrical Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{IN1} = V_{IN2} = 3\text{V}$

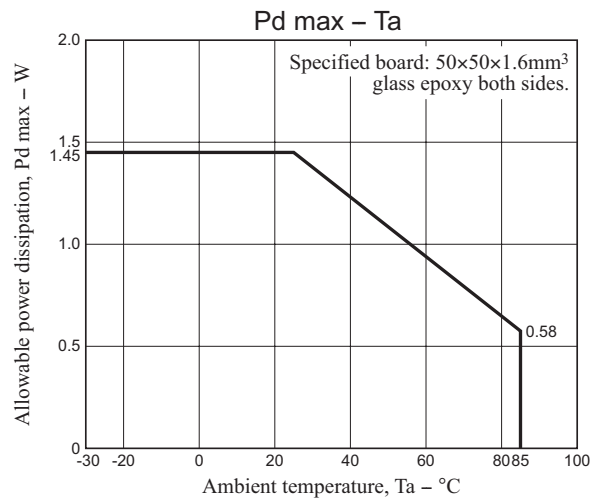
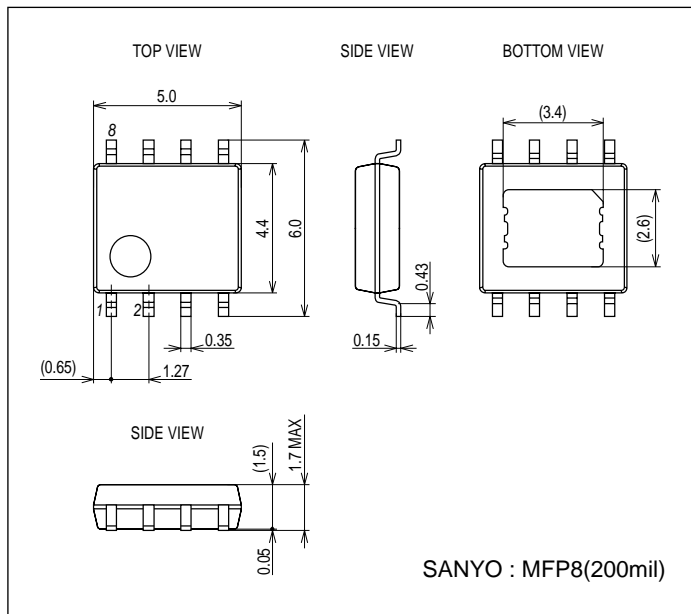
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	$I_{VIN}$	LDO ON		110	160	$\mu\text{A}$
Standby current	$I_{STBY}$	CTL = Low			1	$\mu\text{A}$
<b>Output</b>						
Output voltage	$V_O$	$I_O = 10\text{mA}$	1.176	1.2	1.224	V
Dropout voltage 1	$V_{drop1\_1}$	$I_O = 1\text{A}$ , $V_{IN1} = V_{IN2}$			1	V
	$V_{drop1\_2}$	$I_O = 0.3\text{A}$ , $V_{IN1} = V_{IN2}$			0.6	V
Dropout voltage 2	$V_{drop2\_1}$	$I_O = 1\text{A}$ , $V_{IN2} = 3\text{V}$ , $V_{IN1}$ dropout voltage			1	V
	$V_{drop2\_2}$	$I_O = 0.3\text{A}$ , $V_{IN2} = 3\text{V}$ , $V_{IN1}$ dropout voltage			0.4	V
Load Regulation	$V_{LD}$	$I_O = 5\text{mA}$ to $1\text{A}$		10	50	mV
Line Regulation	$V_{LN}$	$V_{IN1} = V_{IN2} = 1.8\text{V}$ 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	$V_{RL}$	$I_O = 10\text{mA}$ , $V_{Rpp} = 1\text{V}$ , $f_{RR} = 1\text{kHz}$	*	70		dB
Output Noise Voltage	$V_{ON}$	$I_O = 10\text{mA}$ , $20\text{Hz} < f < 20\text{kHz}$	*	60		$\mu\text{Vrms}$
<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

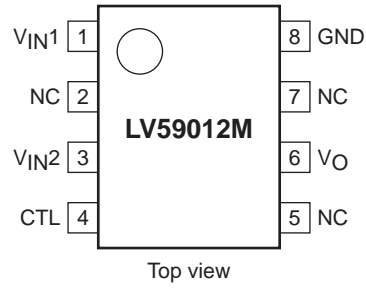
unit : mm (typ)

3372

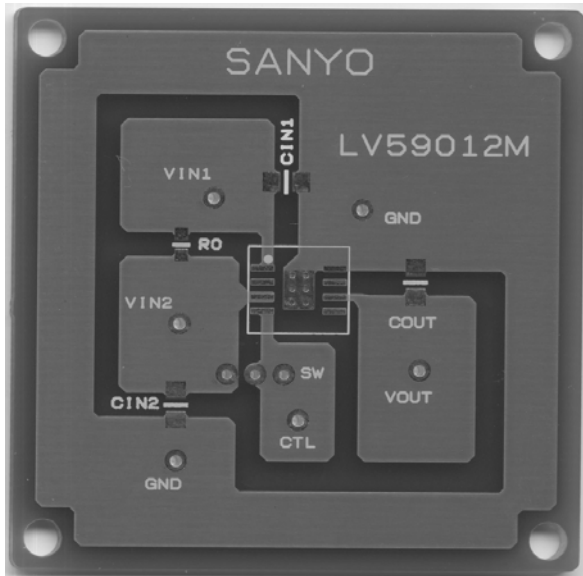


# LV59012M

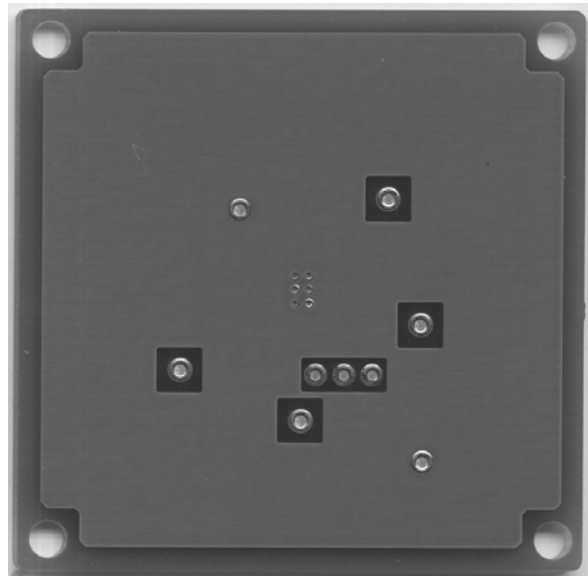
## Pin Assignment



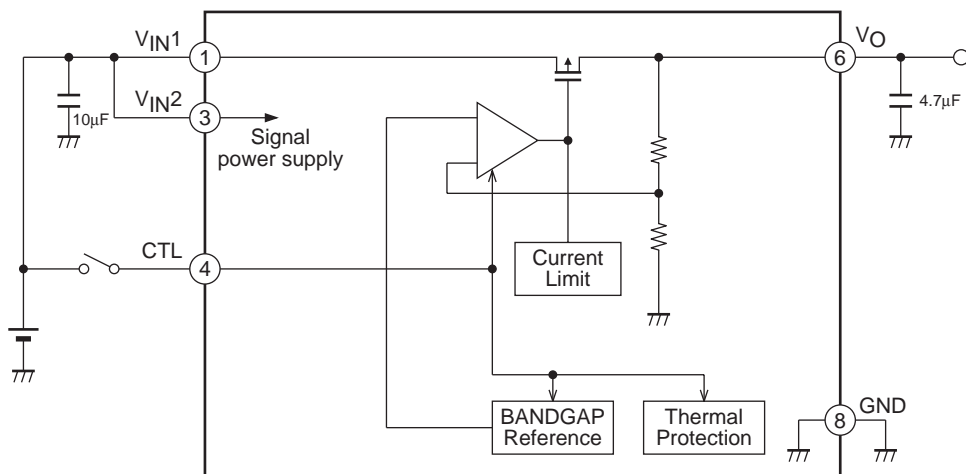
Specified Board (Top side)



Specified Board (Bottom side)



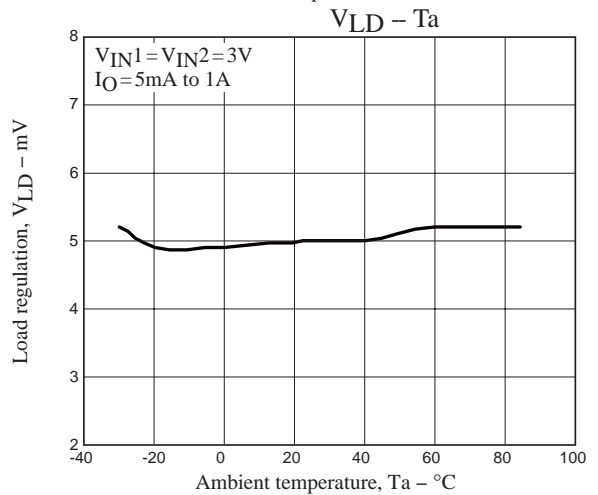
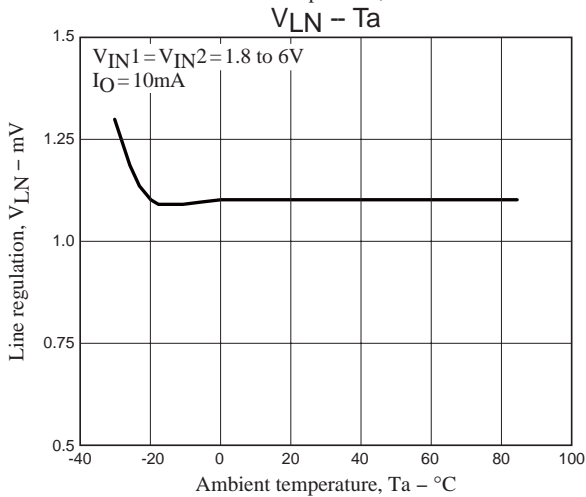
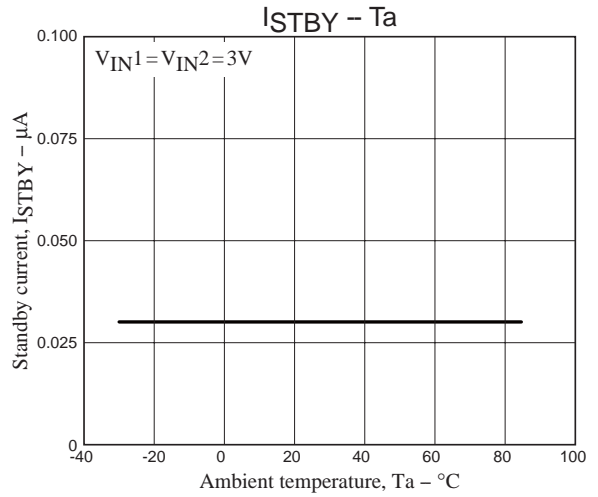
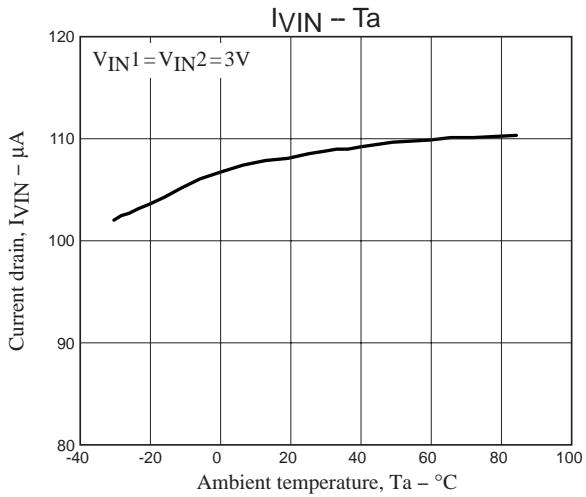
## Block Diagram



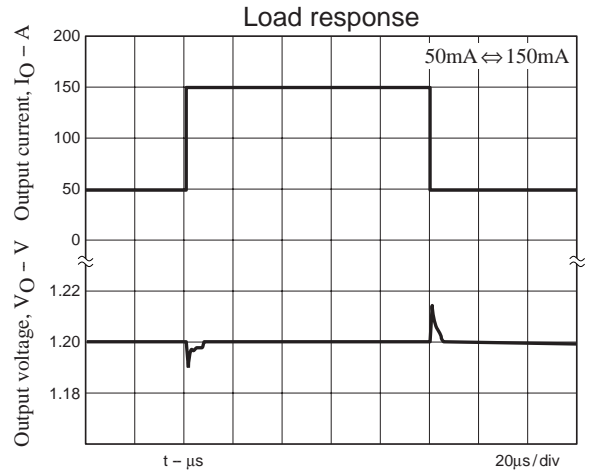
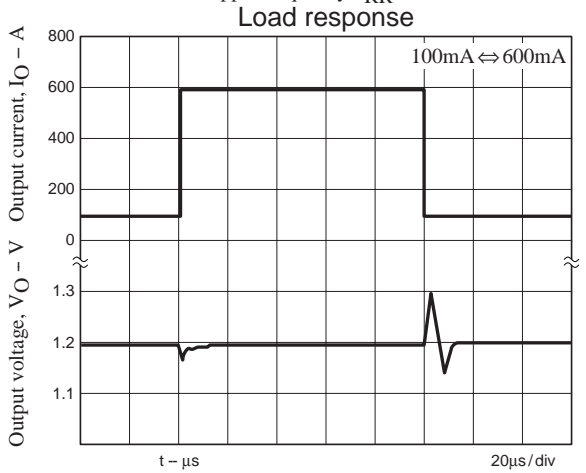
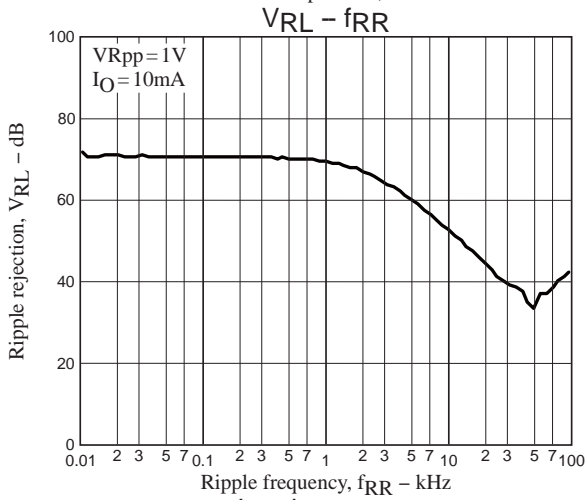
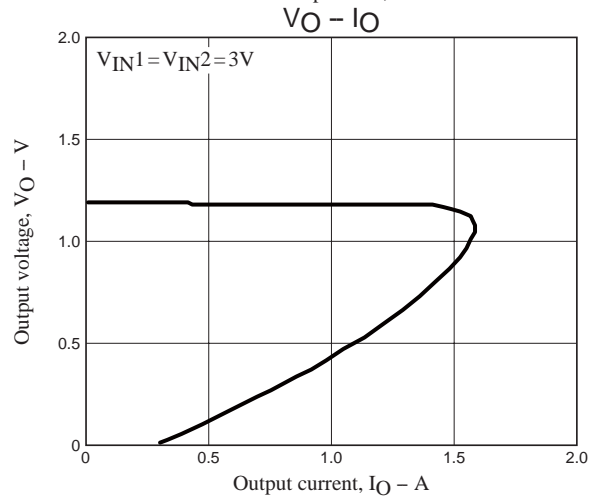
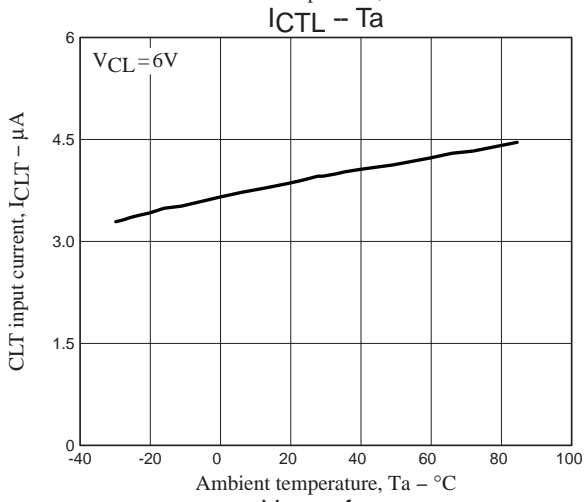
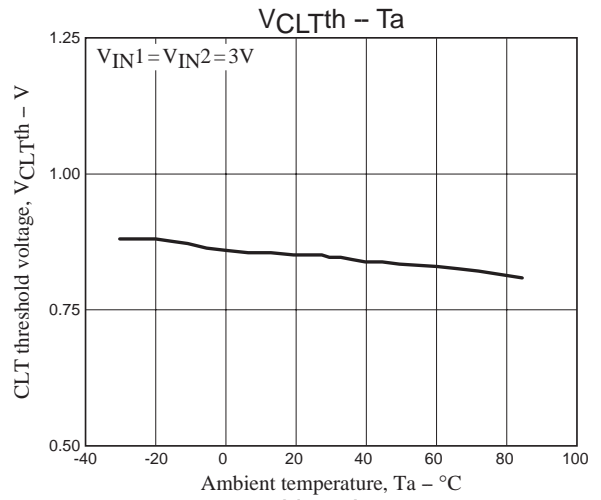
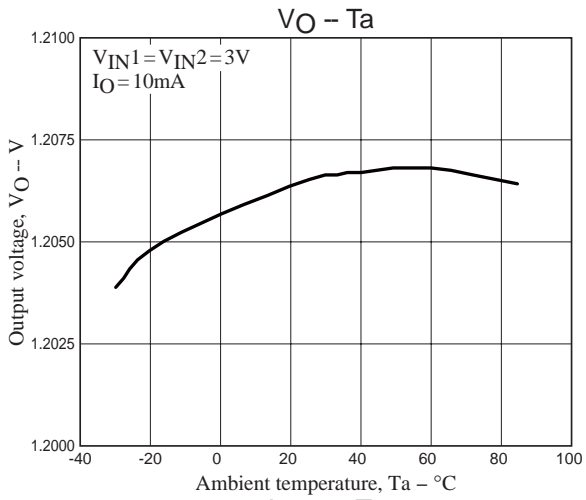
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## Pin Function

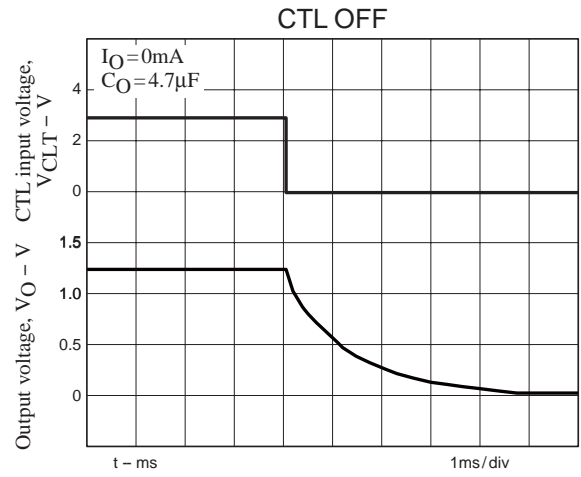
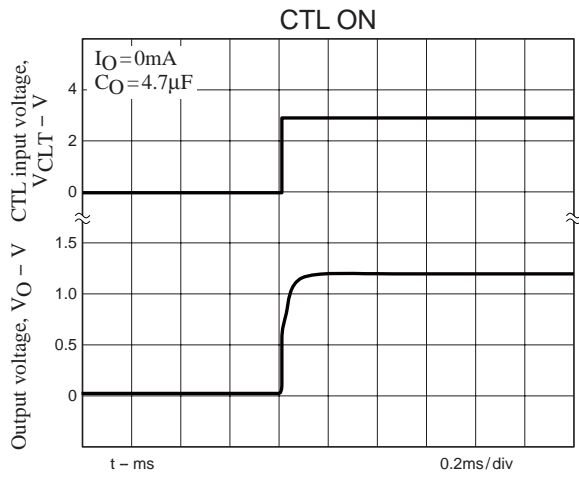
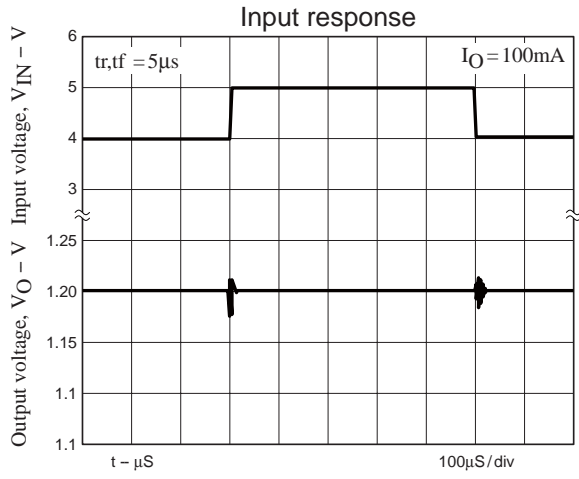
Pin No.	Pin name	Function	Equivalent circuit
1	V <sub>IN1</sub>	Power system supply pin.	
6	V <sub>O</sub>	Output voltage pin.	
2	NC	No contact.	
3	V <sub>IN2</sub>	Signal system power supply pin.	
4	CTL	ON/OFF control pin.	
5	NC	No contact.	
7	NC	No contact.	
8	GND	Ground pin.	



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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.

## V<sub>IN1</sub> and V<sub>IN2</sub>

The dropout voltage can be lowered by making V<sub>IN1</sub> and V<sub>IN2</sub> another power supply within a some current range. Refer to Figure 1.

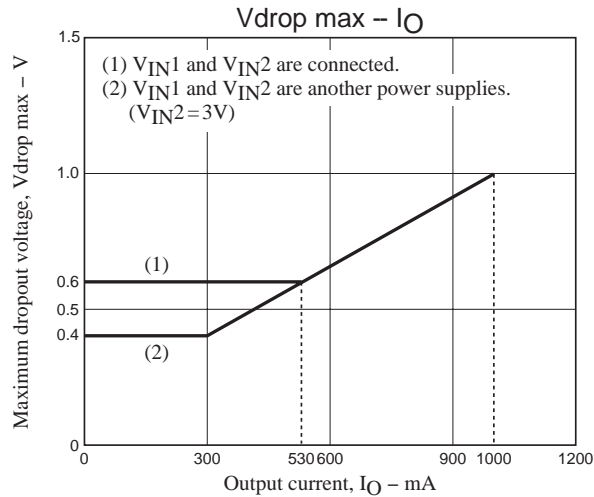


Figure 1

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