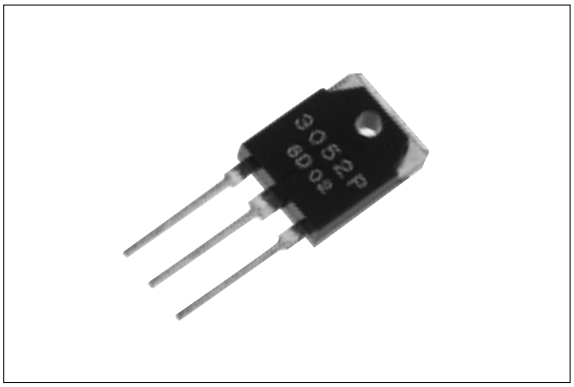
## *SI-3000P Series*

# 3-Terminal, Dropper Type

### ■Features

- TO-3P package 3-terminal regulator
- Output current: 2.0A
- Wide range of DC input voltage
- Built-in foldback overcurrent protection circuit




### ■Applications

- For stabilization of the secondary stage of switching power supplies
- Electronic equipment

### ■Absolute Maximum Ratings

($T_a$=25°C)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| DC Input Voltage | $V_{IN}$ | 45 | V |
| DC Output Current | $I_O$ | 2.0 | A |
| Power Dissipation | $P_{D1}$ | 50($T_C$=25°C) | W |
| | $P_{D2}$ | 2.0(Without heatsink, stand-alone operation) | W |
| Junction Temperature | $T_j$ | –30 to +125 | °C |
| Ambient Operating Temperature | $T_{op}$ | –20 to +80 | °C |
| Storage Temperature | $T_{stg}$ | –30 to +125 | °C |
| Thermal Resistance (junction to case) | $R_{th(j-c)}$ | 2.0 | °C/W |

## ■Electrical Characteristics

(Ta=25°C)

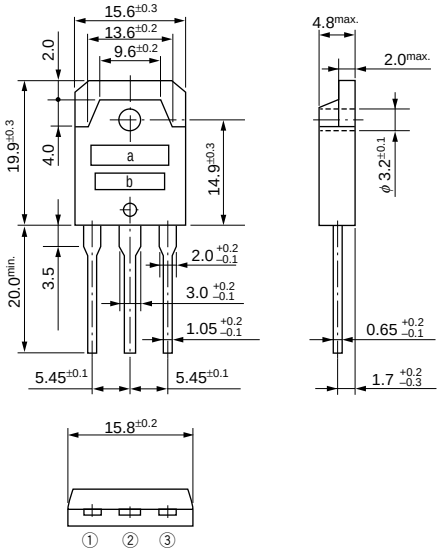
| Parameter | Symbol | Ratings | | | | | | | | | | | | unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI-3052P | | | SI-3122P | | | SI-3152P | | | SI-3242P | | | |
| | | min. | typ. | max. | min. | typ. | max. | min. | typ. | max. | min. | typ. | max. | |
| Input Voltage | $V_{IN}$ | 8 | | 30 | 15 | | 35 | 18 | | 40 | 27 | | 40 | V |
| Output Voltage | $V_O$ | 4.9 | 5.0 | 5.1 | 11.8 | 12.0 | 12.2 | 14.8 | 15.0 | 15.2 | 23.8 | 24.0 | 24.2 | V |
| | Conditions | $V_{IN}$=10V, $I_O$=0.5A | | | $V_{IN}$=19V, $I_O$=0.5A | | | $V_{IN}$=23V, $I_O$=0.5A | | | $V_{IN}$=33V, $I_O$=0.5A | | | |
| Dropout Voltage | $V_{DIF}$ | | | 3 | | | 3 | | | 3 | | | 3 | V |
| | Conditions | $I_O$=2.0A | | | | | | | | | | | | |
| Line Regulation | $\Delta V_{OLINE}$ | | 2 | 10 | | 10 | 30 | | 10 | 30 | | 25 | 50 | mV |
| | Conditions | $V_{IN}$=8.5 to 11.5V, $I_O$=0.5A | | | $V_{IN}$=16 to 22V, $I_O$=0.5A | | | $V_{IN}$=19.5 to 26.5V, $I_O$=0.5A | | | $V_{IN}$=28 to 38V, $I_O$=0.5A | | | |
| Load Regulation | $\Delta V_{OLOAD}$ | | 40 | 100 | | 80 | 200 | | 80 | 200 | | 120 | 300 | mV |
| | Conditions | $V_{IN}$=10V, $I_O$=0 to 2.0A | | | $V_{IN}$=19V, $I_O$=0 to 2.0A | | | $V_{IN}$=23V, $I_O$=0 to 2.0A | | | $V_{IN}$=33V, $I_O$=0 to 2.0A | | | |
| Temperature Coefficient of Output Voltage | $\Delta V_O/\Delta T_a$ | | ±0.5 | | | ±1.5 | | | ±1.5 | | | ±2.5 | | mV/°C |
| Ripple Rejection | $R_{REJ}$ | 60 | | | 60 | | | 60 | | | 60 | | | dB |
| | Conditions | f=100 to 120Hz | | | | | | | | | | | | |
| Overcurrent Protection Starting Current | $I_{S1}$ | 2.4 | | | 2.4 | | | 2.4 | | | 2.4 | | | A |
| | Conditions | $V_{IN}$=10V | | | $V_{IN}$=19V | | | $V_{IN}$=23V | | | $V_{IN}$=33V | | | |
| Limited Current at Overcurrent Protection | $I_{S2}$ | | | 0.6 | | | 0.6 | | | 0.6 | | | 0.6 | A |
| | Conditions | $V_{IN}$=10V | | | $V_{IN}$=19V | | | $V_{IN}$=23V | | | $V_{IN}$=33V | | | |

A foldback type overcurrent protection circuit is built into the IC regulator. Therefore, avoid using it for the following applications as it may cause starting errors:

(1) Constant current load (2) Plus/minus power (3) Series power (4) $V_O$ adjustment by raising ground voltage

## ■External Dimensions

(unit:mm)

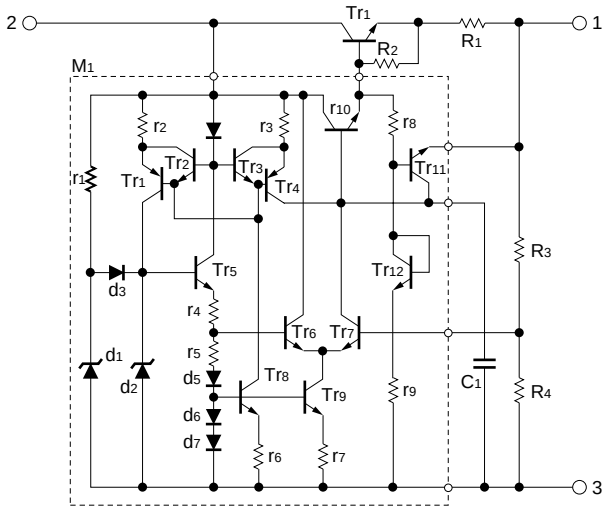



a. Part Number
b. Lot Number

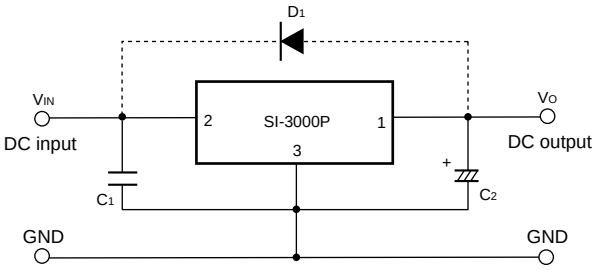
Pin Arrangement
① $V_O$
② $V_{IN}$ (backside of case)
③ GND

Plastic Mold Package Type (TO-3P)
Flammability: UL94V-0
Weight: Approx. 6g

## ■Block Diagram




## ■Standard External Circuit




$C_1$: Oscillation prevention capacitor (approx. 0.33µF)
Connection to terminal No.2 must be made as short as possible.

$C_2$: Output capacitor (47 to 100µF)
Connection to terminal No.1 must be made as short as possible.

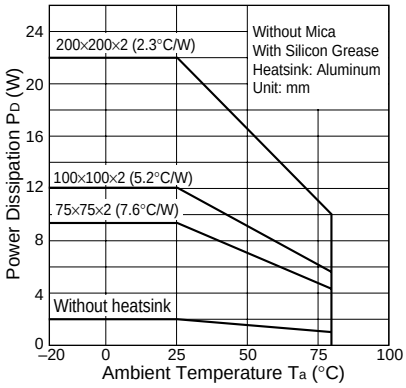
$D_1$: Protection diode (RM1Z)
Required for protection against reverse biasing of input and output.

Note 1: Connect a 47µF to 100µF capacitor to both sides of the load if the wiring between the output terminal and the load is long.

Note 2: An isolation type diode is provided from input to ground and also from output to ground. These may be destroyed if the device is reverse biased. In this case, use a diode with low $V_F$ to protect them.

Note 3: The output voltage may not be adjusted by raising the ground voltage (using a diode or resistor).

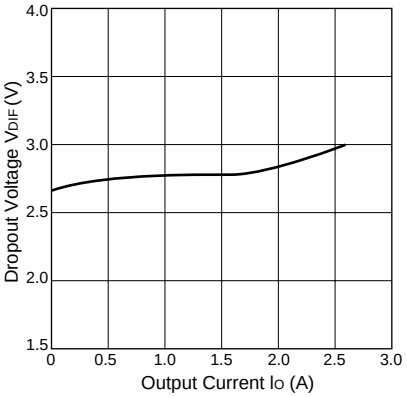
## ■$T_a$-$P_D$ Characteristics



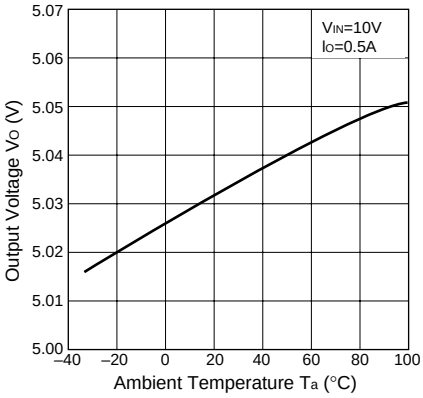
## ■Typical Characteristics

($T_a$=25°C)

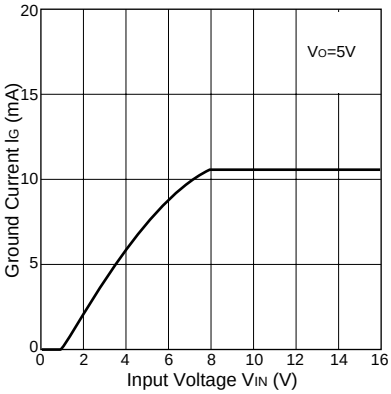
**Io vs. VDIF Characteristics**



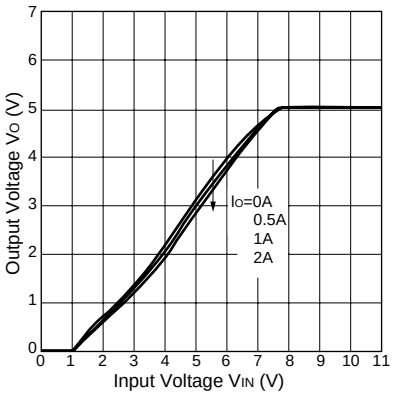

**Temperature Coefficient of Output Voltage(SI-3052P)**



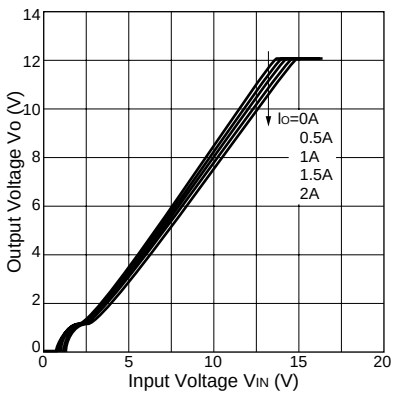

**Circuit Current(SI-3052P)**



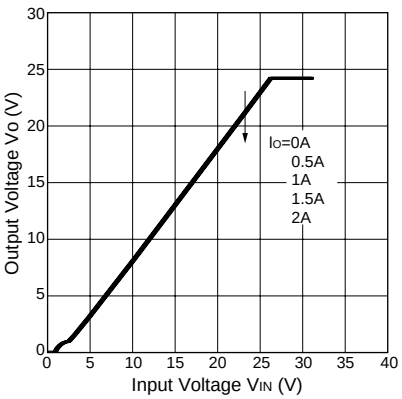

**Output Voltage(SI-3052P)**



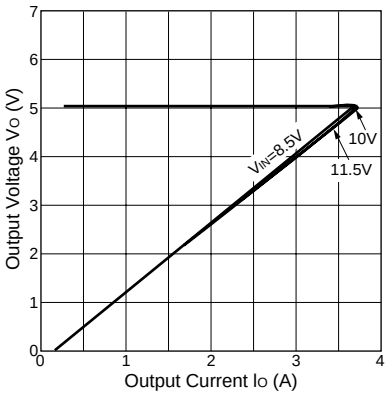

**Output Voltage(SI-3122P)**



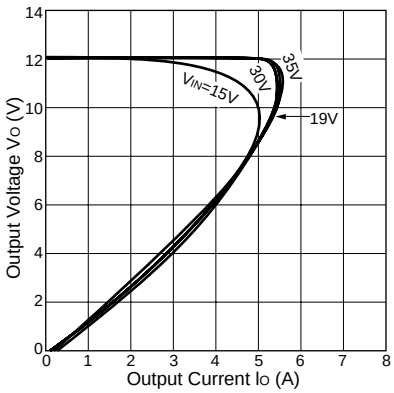

**Output Voltage(SI-3242P)**

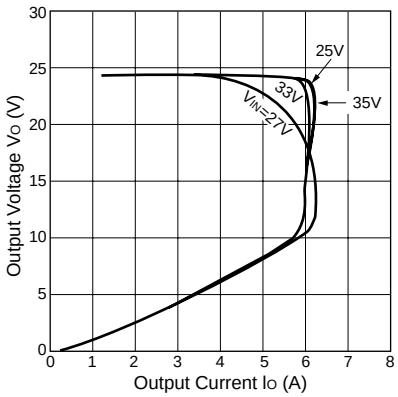



**Overcurrent Protection Characteristics(SI-3052P)**




**Overcurrent Protection Characteristics(SI-3122P)**




**Overcurrent Protection Characteristics(SI-3242P)**