

SI-3000R Series

5-Terminal, Multi-Function, Full-Mold, Low Dropout Voltage Dropper Type with Reset Function

■Features

- Reset signal output (As the output rises it sends a reset signal to the micro-computer to secure normal operation of the system. As the output drops a reset signal is also sent out to protect the system.)
- Reset signal detection output voltage level V_{0th} is 92% of output voltage in the standard specification. Models with different setting values for different needs are scheduled to be added to the series.
- Delay time for reset signal can be adjusted freely by external capacitor.
- Compact full-mold package (equivalent to TO220)
- Output current: 1.5A
- Low dropout voltage : $V_{DIF} \leq 1V$ (at $I_o = 1.5A$)
Applicable to battery driven equipment with built-in microcomputer.
- Built-in dropping type overcurrent, overvoltage, thermal protection circuits
- Low circuit current $I_D = \text{typ.} 1.5mA (I_o = 0A)$



■Applications

- Microcomputer-controlled equipment
- Battery-driven micro-computer-controlled equipment

■Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
		SI-3050R	
DC Input Voltage	V_{IN}	35	V
Voltage of Rest Signal Output Terminal	V_{RST}	V_{IN}	V
DC Output Current	I_o	1.5 ¹	A
Power Dissipation	P_{D1}	18(With infinite heatsink)	W
	P_{D2}	1.5(Without heatsink, stand-alone operation)	W
Junction Temperature	T_j	-30 to +125	$^\circ\text{C}$
Ambient Operating Temperature	T_{OP}	-30 to +105	$^\circ\text{C}$
Storage Temperature	T_{stg}	-30 to +125	$^\circ\text{C}$
Thermal Resistance (junction to case)	$R_{th(j-c)}$	5.5	$^\circ\text{C/W}$
Thermal Resistance (junction to ambient air)	$R_{th(j-a)}$	66.7(Without heatsink, stand-alone operation)	$^\circ\text{C/W}$

■Electrical Characteristics

(Ta=25°C unless otherwise specified)

Parameter	Symbol	Ratings			Unit	
		SI-3050R				
		min.	typ.	max.		
Input Voltage	V _{IN}	6 ²		30 ¹	V	
Output Voltage	V _O	4.80	5.00	5.20	V	
	Conditions	V _{IN} =8V, I _O =1.0A				
Dropout Voltage	V _{DIF}			0.5	V	
	Conditions	I _O ≤1.0A				
	Conditions	I _O ≤1.5A				
Line Regulation	ΔV _{OLINE}			30	mV	
	Conditions	V _{IN} =6 to 15V, I _O =1.0A				
Load Regulation	ΔV _{OLOAD}			100	mV	
	Conditions	V _{IN} =8V, I _O =0 to 1.5A				
Ripple Rejection	R _{REJ}		54		dB	
	Conditions	V _{IN} =8V, f=100 to 120Hz				
Quiescent Circuit Current	I _q		1.5	5.0	mA	
	Conditions	V _{IN} =8V, I _O =0A				
Overcurrent Protection Starting Current (Drooping Type)	I _{S1}	1.6			A	
	Conditions	V _{IN} =8V				
Limited Current at Overcurrent Protection Operation	I _{S2}	1.6			A	
	Conditions	V _{IN} =8V				
DLY Terminal	Threshold	V _{DLYth}	2.7	2.9	3.1	V
	Source	I _{DLY}	25	35	45	μA
Reset Threshold Voltage Level (V _{oth} : Threshold Output Voltage)	V _{oth} /V _O	90	92	94	%	
Reset Threshold Voltage Hysteresis	ΔV _{oth}	50	100	150	mV	
V _{RST} Terminal*4	H-level Output Voltage	V _{RSTH}	V _{CC} -1		V	
	L-level Output Voltage	V _{RSTL}		0.8	V	
	Sink Current at H level	I _{RSTH}		-20	μA	
	Source Current at L level	I _{RSTL}	-16		mA	

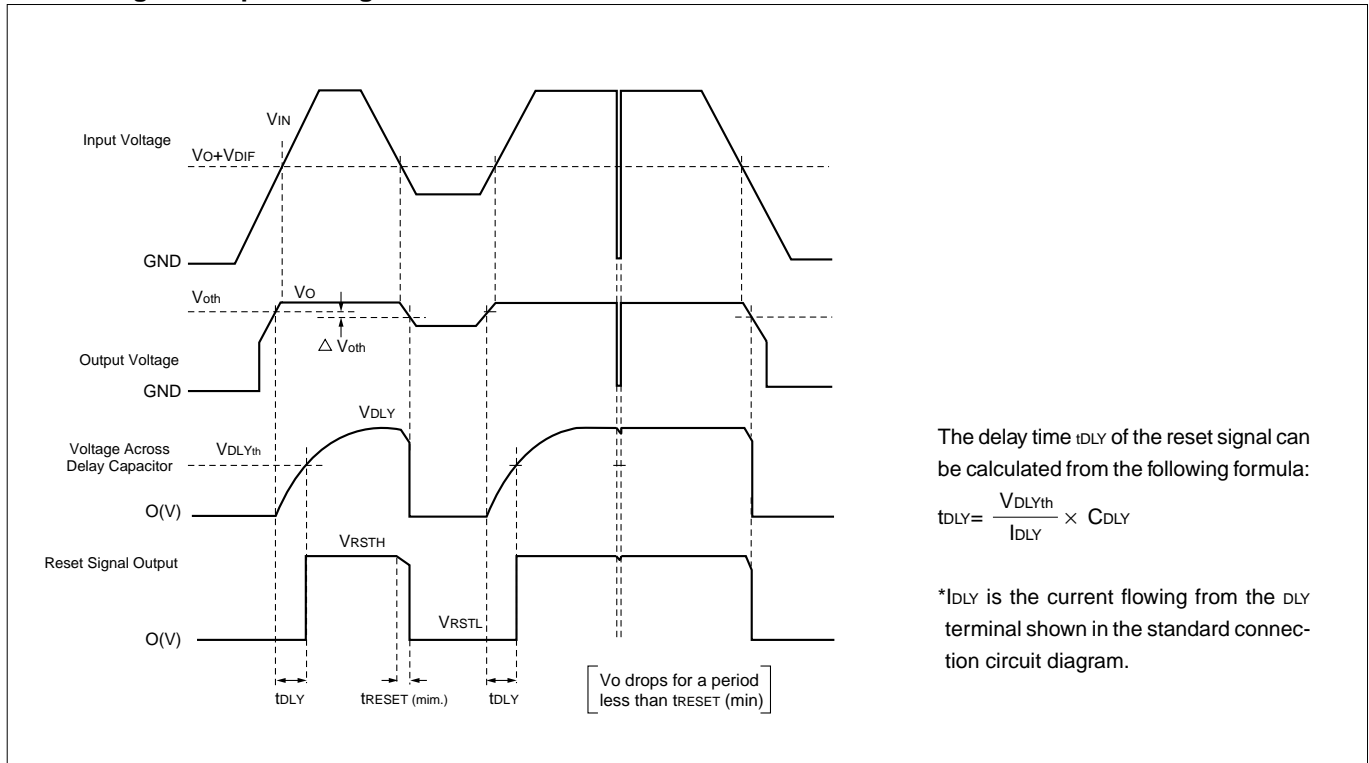
*1: V_{IN(max)} and I_{O(max)} are restricted by the relation P_{D(max)}=(V_{IN}-V_O)•I_O=18(W).

*2: Refer to the dropout voltage.(Refer to Setting Dc Input Voltage on page 7.)

*3: I_{S1} is specified at -5(%) drop point of output voltage V_O on the condition that V_{IN}=8V, I_O=1.0A.

*4: Reset signal output terminal V_{RST} is an open-collector output. Use a pull-up resistor when connecting it to a logic circuit.

■Reset Signal Output Timing Chart



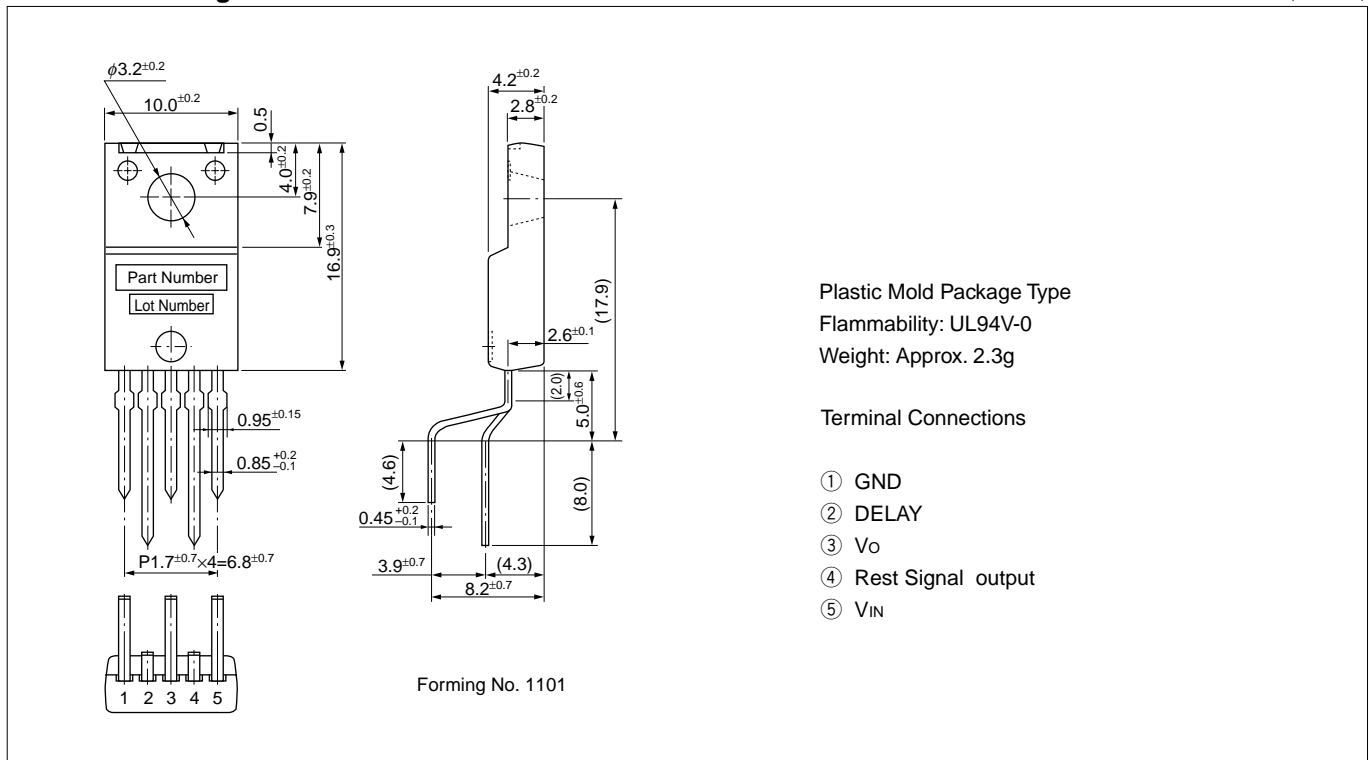
The delay time t_{DLY} of the reset signal can be calculated from the following formula:

$$t_{DLY} = \frac{V_{DLYth}}{I_{DLY}} \times C_{DLY}$$

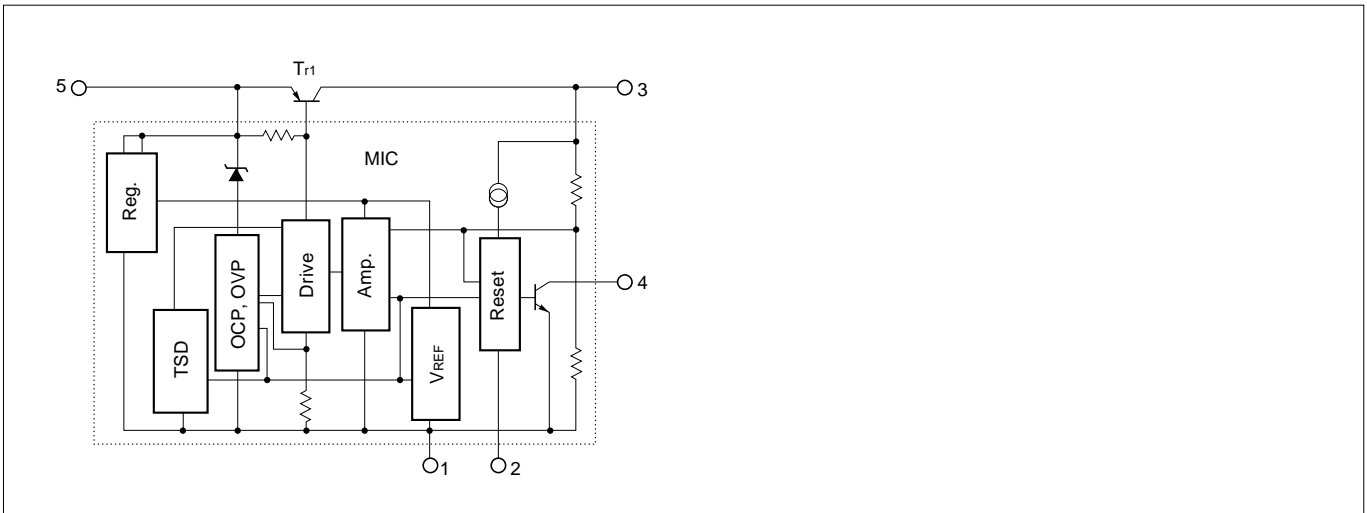
* I_{DLY} is the current flowing from the DLY terminal shown in the standard connection circuit diagram.

■Outline Drawing

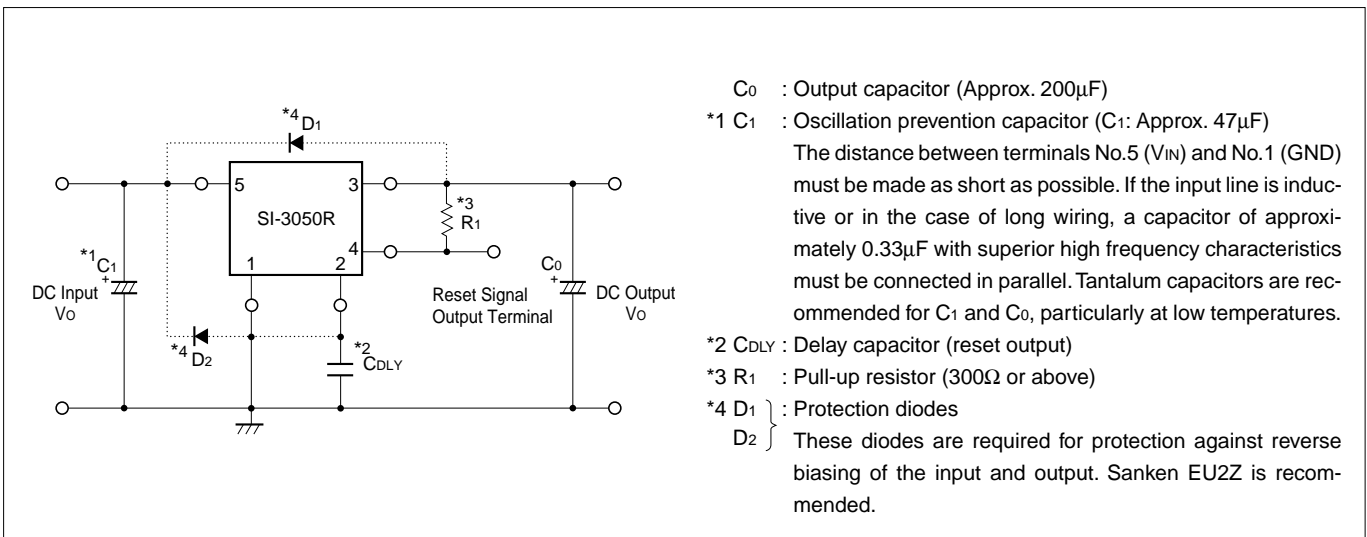
(unit:mm)



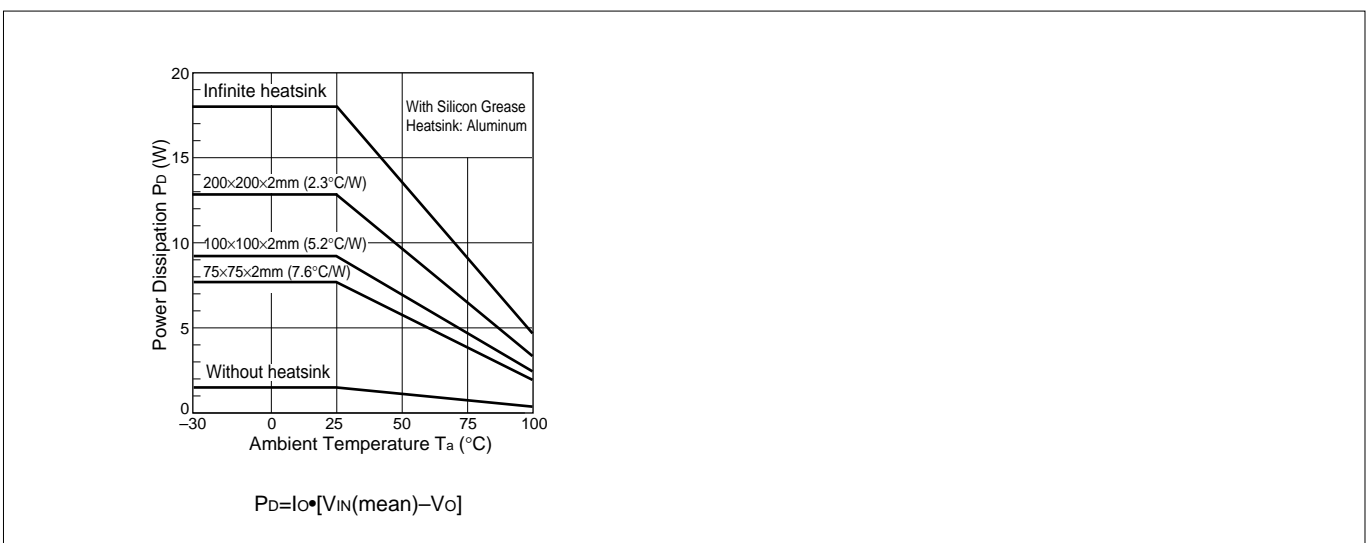
■Block Diagram



■Standard External Circuit



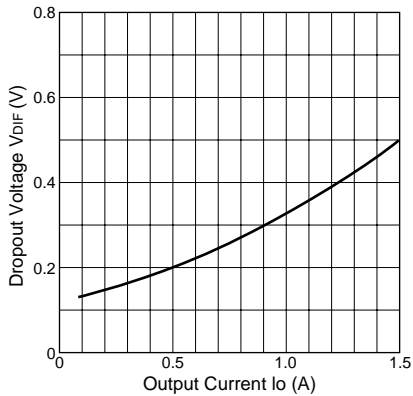
■ T_a - P_D Characteristics



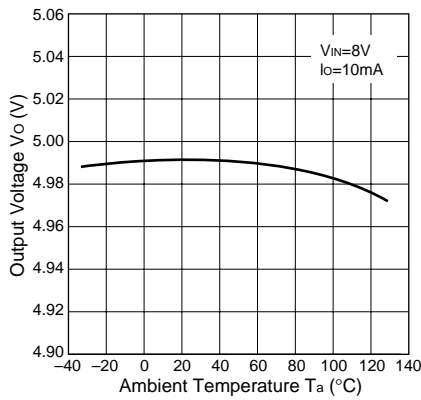
Typical Characteristics

($T_a=25^\circ\text{C}$)

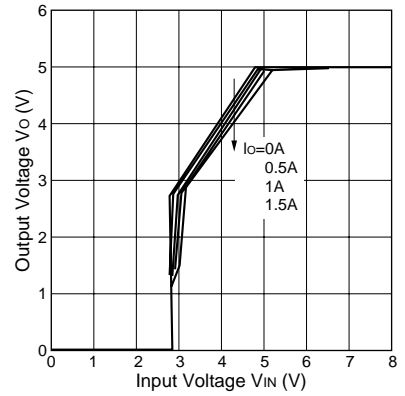
I_o vs. V_{DIF} Characteristics



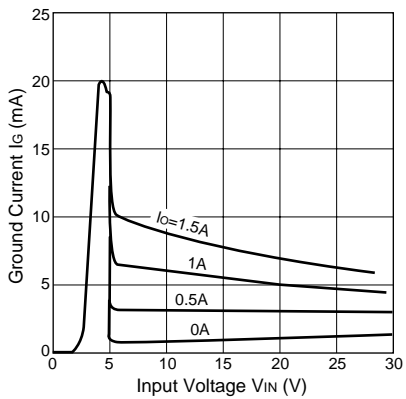
Temperature Coefficient of Output Voltage



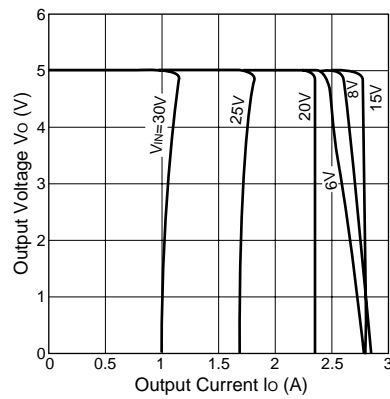
Rise Characteristics



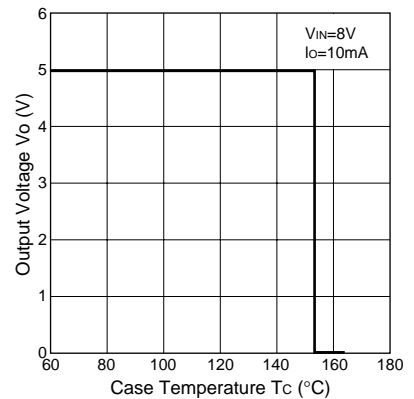
Circuit Current



Overcurrent Protection Characteristics



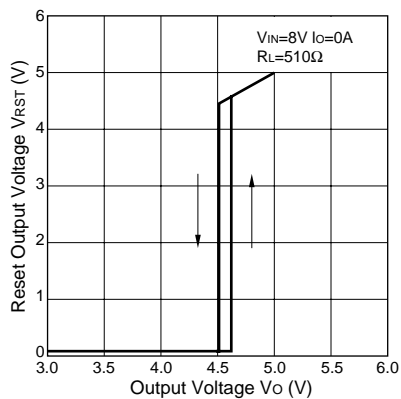
Thermal Protection Characteristics



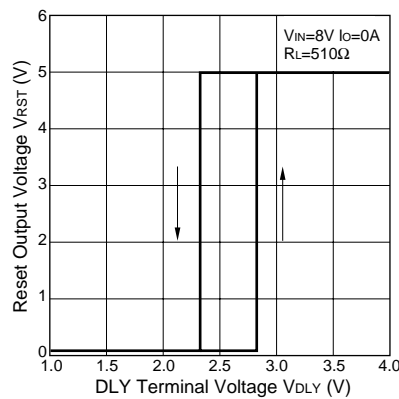
Note on Thermal Protection:

The thermal protection circuit is intended for protection against heat during instantaneous short-circuiting. Its operation is not guaranteed for short-circuiting over extended periods of time.

Reset Output vs. V_o Characteristics



Reset Output vs. V_{DLY} Terminal Voltage Characteristics



Reset Signal Delay Time t_{DLY} (sec)

