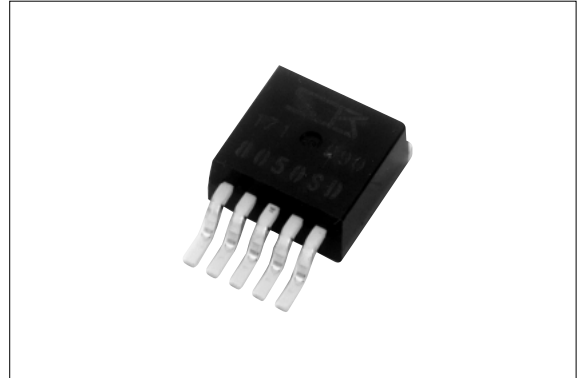


## SI-8000SD Series

# Surface Mount, Separate Excitation Switching Type

### ■Features

- Surface-mount package (TO263-5)
- Output current: 3.0 A
- High efficiency: 79% typ. (SI-8033SD), 84% typ. (SI-8050SD)
- Requires 4 external components
- Phase correction and output voltage adjustment performed internally
- Built-in reference oscillator (60 kHz)
- Built-in overcurrent protection, thermal protection circuit
- Output ON/OFF capable
- Soft start possible via ON/OFF pin



### ■Applications

- Power supplies for telecommunication equipment
- Onboard local power supplies

### ■Lineup

Part Number	SI-8033SD	SI-8050SD
Vo (V)	3.3	5.0
Io (A)	3	

### ■Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
DC Input Voltage	$V_{IN}$	43	V	
Power Dissipation*	$P_D$	3	W	Glass epoxy board mounting in a 40 x 40 mm (copper area: 100%)
Junction Temperature	$T_j$	+125	°C	
Storage Temperature	$T_{stg}$	-40 to +125	°C	
Thermal Resistance (Junction to Case)	$R_{th(j-c)}$	3	°C/W	
Thermal Resistance (Junction to Ambient Air)	$R_{th(j-a)}$	33.3	°C/W	Glass epoxy board mounting in a 40 x 40 mm (copper area: 100%)

\*: Limited by thermal protection circuit.

### ■ Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		SI-8033SD	SI-8050SD	
DC Input Voltage Range	$V_{IN1}$	5.5 to 28	7 to 40	V
Output Current Range*	$I_o$	0 to 3.0		A
Operating Junction Temperature Range	$T_{jop}$	-30 to +125		°C
Operating Temperature Range*	$T_{op}$	-30 to +125		°C

\*: Limited by  $T_a$ - $P_D$  characteristics.

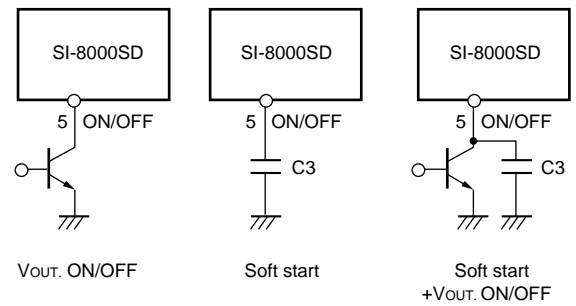
■Electrical Characteristics

(Ta=25°C)

Parameter	Symbol	Ratings						Unit	
		SI-8033SD			SI-8050SD				
		min.	typ.	max.	min.	typ.	max.		
Output Voltage	Vo	3.17	3.3	3.43	4.8	5.0	5.2	V	
	Conditions	VIN=15V, Io=1A			VIN=20V, Io=1A				
Efficiency	η		79			84		%	
	Conditions	VIN=15V, Io=1A			VIN=20V, Io=1A				
Switching Frequency	f		60			60		kHz	
	Conditions	VIN=15V, Io=1A			VIN=20V, Io=1A				
Line Regulation	ΔV <sub>OLINE</sub>		25	80		40	100	mV	
	Conditions	VIN=8 to 28V, Io=1A			VIN=10 to 30V, Io=1A				
Load Regulation	ΔV <sub>OLOAD</sub>		10	30		10	40	mV	
	Conditions	VIN=15V, Io=0.5 to 1.5A			VIN=20V, Io=0.5 to 1.5A				
Temperature Coefficient of Output Voltage	ΔVo/ΔTa		±0.5			±0.5		mV/°C	
Overcurrent Protection Starting Current	IS1	3.1			3.1			A	
	Conditions	VIN=15V			VIN=20V				
Soft Start Pin*	Low-Level Voltage	VSSL		0.2		0.2		V	
	Low-State Output Current	ISSL	20	30	40	30	40		
		Conditions	VSSL=0.2V						μA

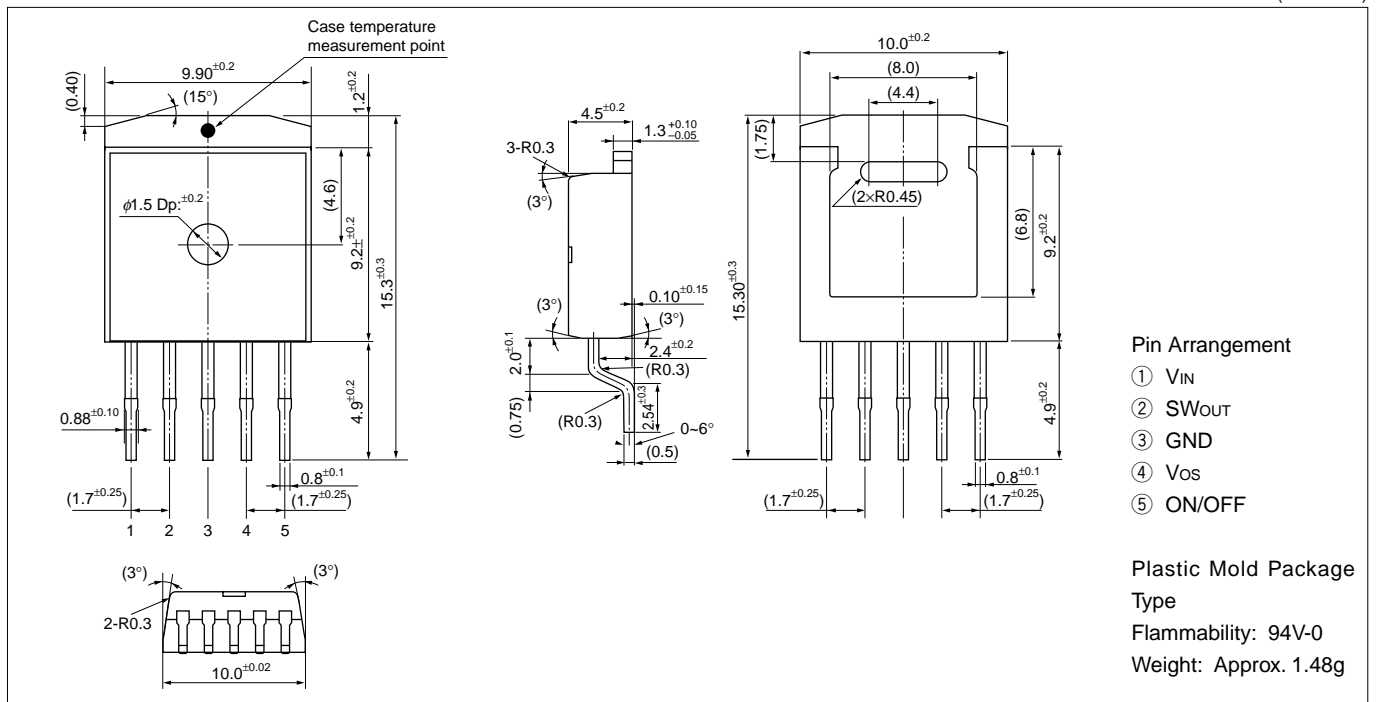
\* Pin 5 is a soft start pin. Connecting a capacitor to this pin enables a soft start at power-on. By using this pin, the output can also be turned on or off. By setting the voltage of this pin to V<sub>SSL</sub> or lower, the output is stopped. Driving a transistor with an open collector can perform switching of the potential of the soft start pin.

When using both the soft-start and ON/OFF functions together, the discharge current from C3 flows to the ON/OFF control transistor, so ensure that this current is limited for protection. The soft start pin is pulled up to the power supply in the IC, so no external voltage can be applied. If this pin is not used, leave it open.

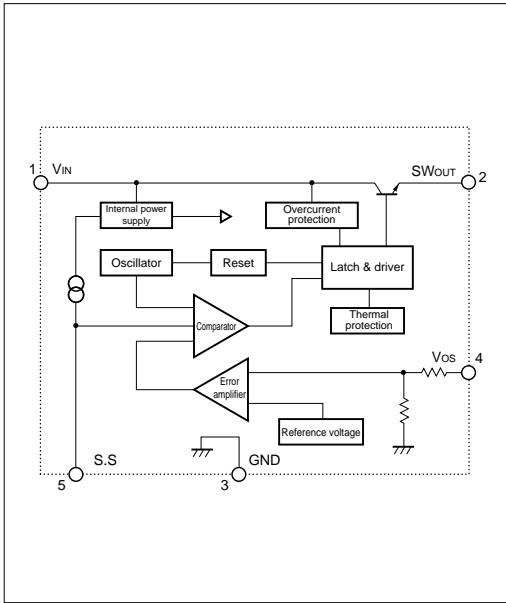


■External Dimensions

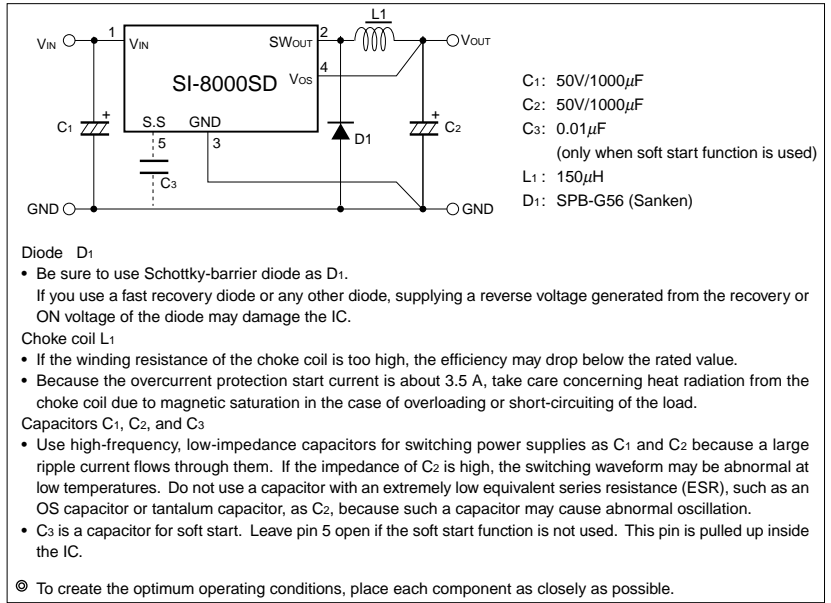
(Unit : mm)



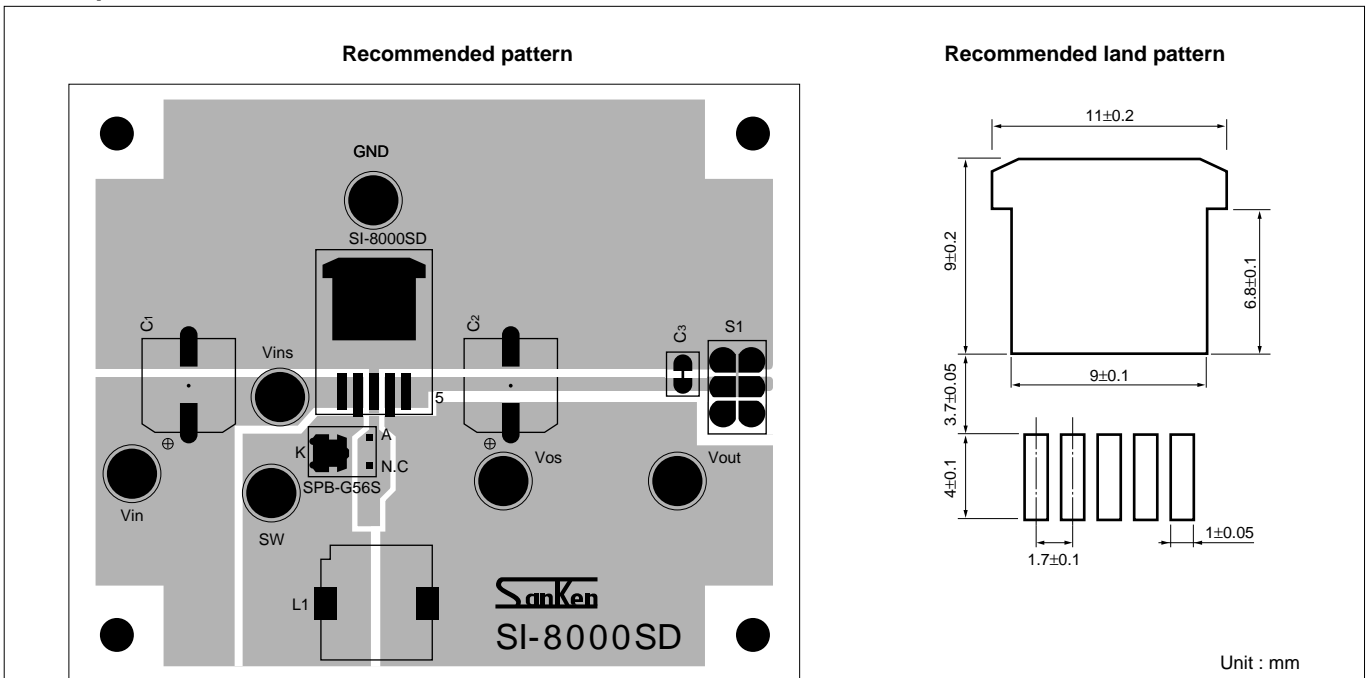
■Block Diagram



■Standard Connection Circuit Diagram

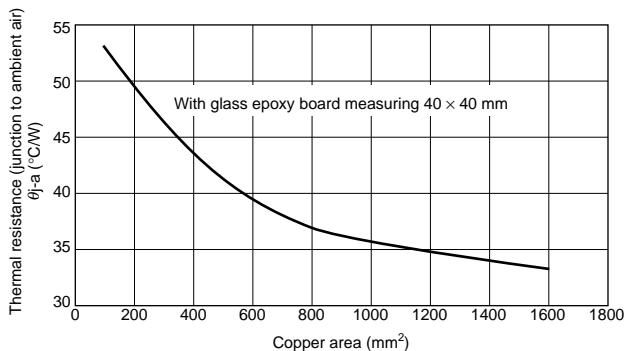


■Example of Pattern on PC Board



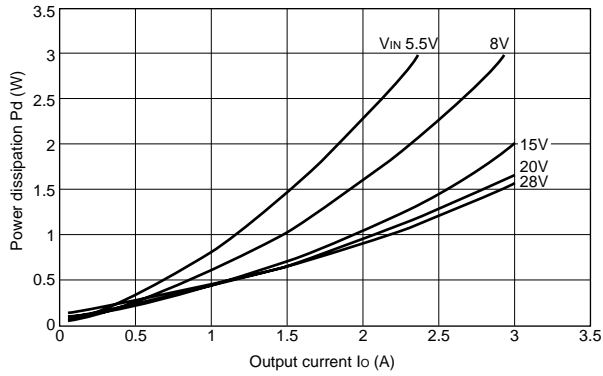
\* For the optimum operating conditions, use one-point GND wiring centering on pin 3, and place each component as closely as possible.

Area of copper on glass epoxy board vs. thermal resistance (junction to ambient air) (typical value)

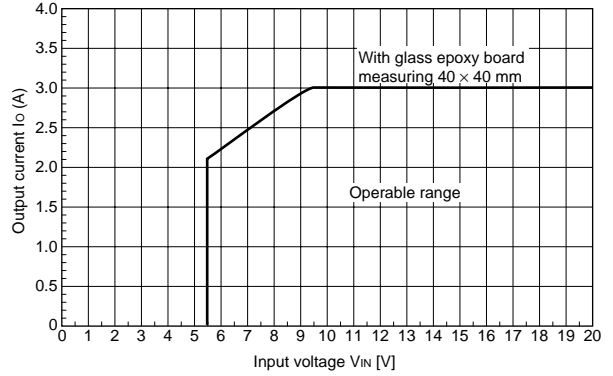


SI-8033SD

Power dissipation vs. Output current (typical value)

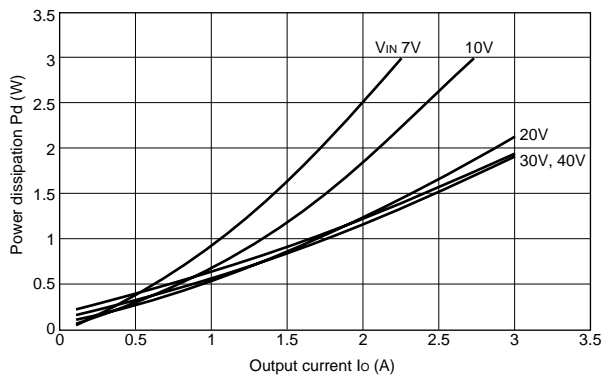


Output current vs. Input voltage (typical value)

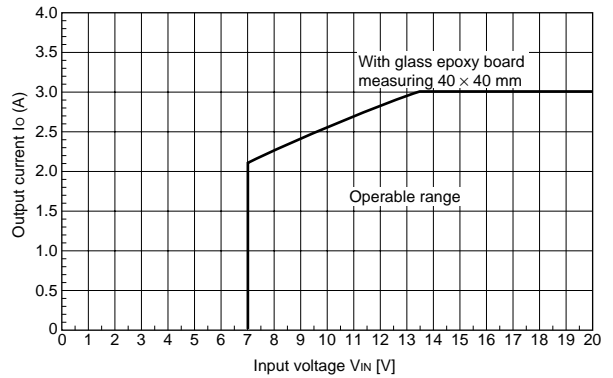


SI-8050SD

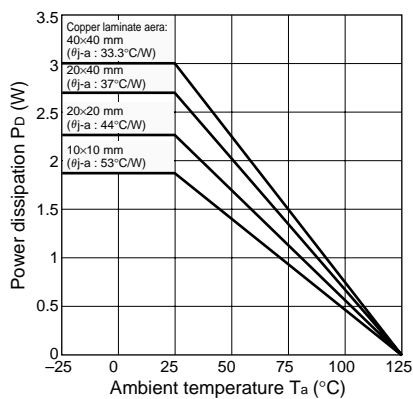
Power dissipation vs. Output current (typical value)



Output current vs. Input voltage (typical value)



PD-Ta Characteristics



When mounted on glass epoxy board measuring 40 x 40 mm

$$P_D = V_O \cdot I_O \left( \frac{100}{\eta \chi} - 1 \right) - V_F \cdot I_O \left( 1 - \frac{V_O}{V_{IN}} \right)$$

Find the efficiency from the efficiency curve and substitute in the percentage, because the efficiency varies depending on the input voltage and output current.

- Vo : Output voltage
- VIN: Input voltage
- Io : Output current
- $\eta \chi$ : Efficiency
- V<sub>F</sub> : Forward voltage of D<sub>1</sub>  
0.4V (Io=2A) ... SPB-G56S (Sanken)

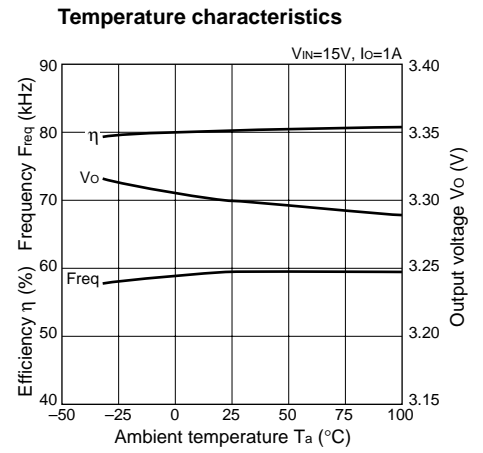
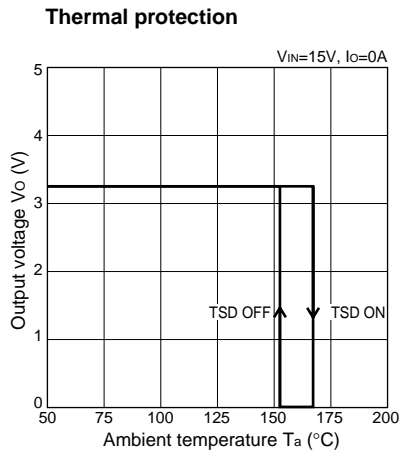
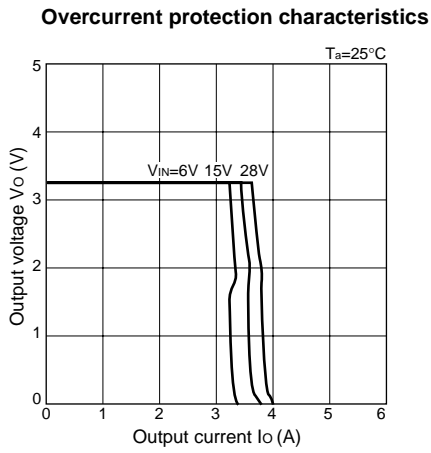
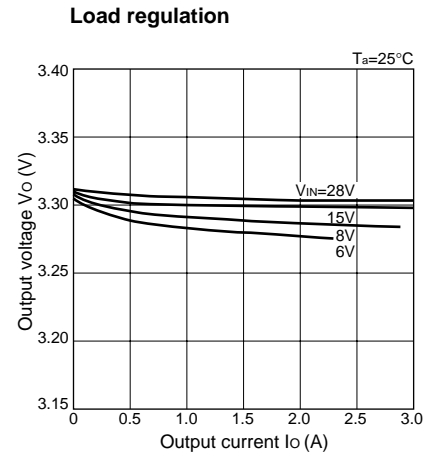
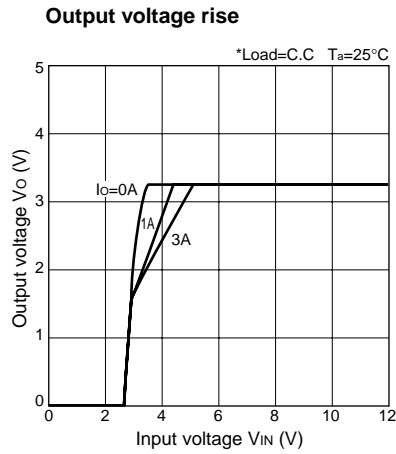
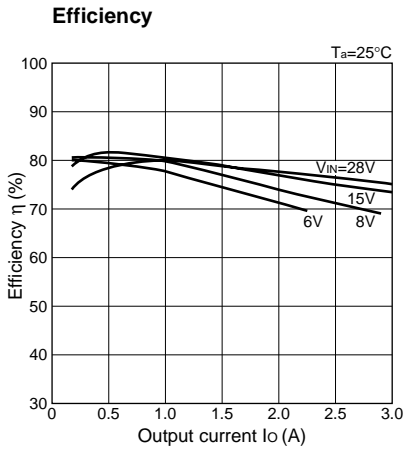
Thermal design for D<sub>1</sub> must be performed separately.

Applications

Varying output voltage

The output voltage can be varied in the same manner as SI-8000S. Refer of the catalog.

■Typical Characteristics Examples (SI-8033SD)



■Typical Characteristics Example (SI-8050SD)

