THE DATASHEET OF

SI-8401L

SI-8400L/8500L Series Separate Excitation Switching Mode Regulator ICs with Coil

■Features

- Switching ICs/Coil combined type
- Requires only 2 discrete components
- Low switching noise
- No heatsink required
- Built-in overcurrent and thermal protection circuits
- Built-in soft start circuit (Output ON/OFF available)...SI-8500L Series

■Applications

- Telephone power supplies
- Onboard local power supplies

■Lineup

Part Number	SI-8401L	SI-8501L
V_O(V)	5.0	5.0
I_O(A)	0.5	1.0

■Absolute Maximum Ratings

Parameter	Symbol	Ratings		Unit
		SI-8400L	SI-8500L	
DC Input Voltage	V_{IN}	35		V
Power Dissipation	P_D	1.25	3	W
Junction Temperature	T_j	+100		°C
Storage Temperature	T_{stg}	–25 to +85		°C

■Recommended Operating Conditions

Parameter	Symbol	Ratings	Unit
		SI-8401L	
DC Input Voltage Range	V_{IN}	7 to 33	V
Output Current Range	I_O	0 to 0.5	A
Operating Temperature Range	T_{op}	–20 to +85	°C

Parameter	Symbol	Ratings	Unit
		SI-8501L	
DC Input Voltage Range	V_{IN}	7 to 33	V
Output Current Range	I_O	0 to 1.0	A
Operating Temperature Range	T_{op}	–20 to +85	°C

■Electrical Characteristics

(T_a=25°C)

Parameter	Symbol	Ratings SI-8401L			Unit
		min.	typ.	max.	
Output Voltage	V_O	4.80	5.00	5.20	V
	Conditions	V_{IN}=20V, I_O=0.3A			
Efficiency	η		80		%
	Conditions	V_{IN}=20V, I_O=0.3A			
Oscillation Frequency	f		60		kHz
	Conditions	V_{IN}=20V, I_O=0.3A			
Line Regulation	ΔV_{OLINE}		80	100	mV
	Conditions	V_{IN}=10 to 30V, I_O=0.3A			
Load Regulation	ΔV_{OLOAD}		30	40	mV
	Conditions	V_{IN}=20V, I_O=0.1 to 0.4A			
Temperature Coefficient of Output Voltage	$\Delta V_O/\Delta T_a$		±0.5		mV/°C
Switching Ripple Voltage (C_2=470μF)	ΔV_r		20	40	mV_{p-p}
	Conditions	V_{IN}=20V, I_O=0.3A			
Overcurrent Protection Starting Current	I_{S1}	0.55			A
	Conditions	V_{IN}=10V			

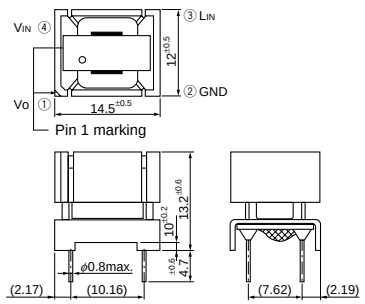
(T_a=25°C)

Parameter	Symbol	Ratings SI-8501L			Unit
		min.	typ.	max.	
Output Voltage	V_O	4.80	5.00	5.20	V
	Conditions	V_{IN}=20V, I_O=0.5A			
Efficiency	η		83		%
	Conditions	V_{IN}=20V, I_O=0.5A			
Oscillation Frequency	f		60		kHz
	Conditions	V_{IN}=20V, I_O=0.5A			
Line Regulation	ΔV_{OLINE}		70	130	mV
	Conditions	V_{IN}=10 to 30V, I_O=0.5A			
Load Regulation	ΔV_{OLOAD}		30	55	mV
	Conditions	V_{IN}=20V, I_O=0.2 to 0.8A			
Temperature Coefficient of Output Voltage	$\Delta V_O/\Delta T_a$		±0.5		mV/°C
Switching Ripple Voltage (C_2=470μF)	ΔV_r		45		mV_{p-p}
	Conditions	V_{IN}=20V, I_O=0.5A			
Overcurrent Protection Starting Current	I_{S1}	1.1			A
	Conditions	V_{IN}=18V			

■External Dimensions (Non-package type [EI-12.5 core/EI-19 core])

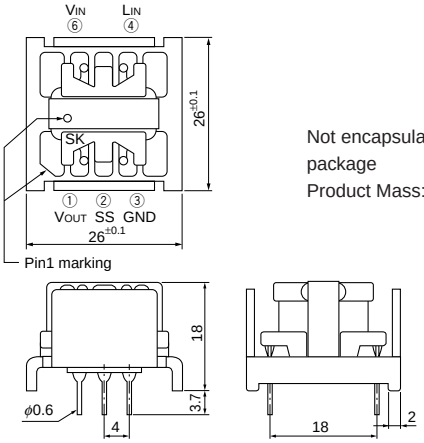
(Unit : mm)

SI-8400L



Not encapsulated in a plastic package
Product Mass: Approx. 5.1g

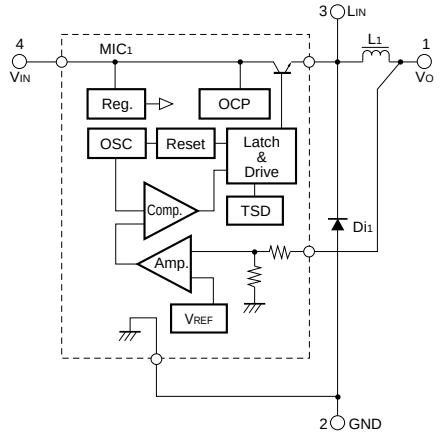
SI-8500L



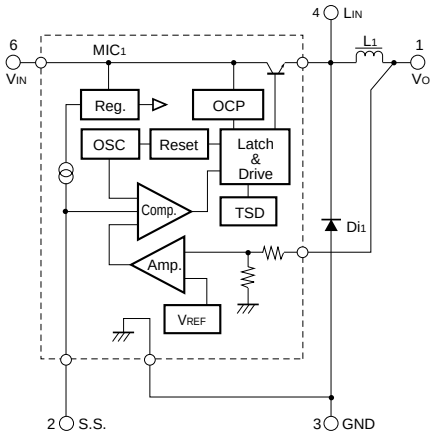
Not encapsulated in a plastic package
Product Mass: Approx. 14.5g

■Block Diagram

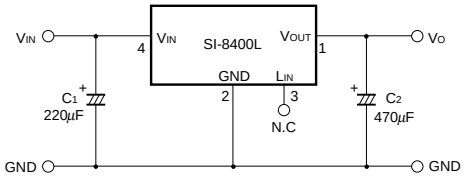
SI-8400L

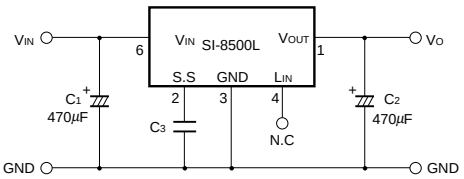


SI-8500L



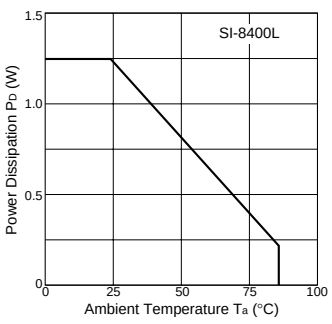
■Typical Connection Diagram

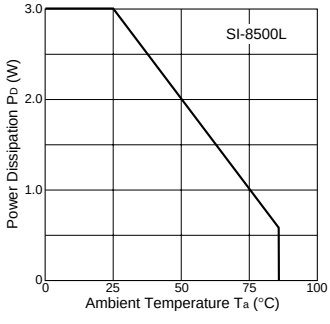




C3 is necessary only for using soft start function.

■Ta-PD Characteristics





$$P_D = V_O \bullet I_O \left(\frac{100}{\eta\chi} - 1 \right)$$

VO : Output voltage
IO : Output current
ηχ : Efficiency (%)

The efficiency depends on the input voltage and the output current. Therefore, obtain the value from the efficiency graphs and substitute the percentage in the formula above.

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