SI-8800L/8900L Series

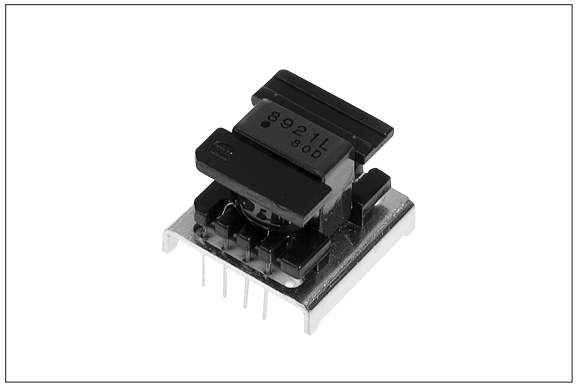
Separate Excitation Switching Type with Transformer

■Features

- Integrated switching IC and transformer construction
- Requires only input/output and soft start capacitors as external components
- Low switching noise
- Heatsink not required
- Built-in overcurrent protection circuit (+5V)
- ±2–output lineup (SI-8811L, SI-8911L)

■Applications

- Telephone power supplies
- Onboard local power supplies



■Lineup

Part Number	Ch1		Ch2	
	V_O(V)	I_O(A)	V_O(V)	I_O(A)
SI-8811L	+5	0.45	–5	0.05
SI-8911L	+5	0.3	–5	0.1
SI-8921L/8922L	+5	0.6	———	

■Absolute Maximum Rating

Parameter	Symbol	Ratings				Unit
		SI-8811L	SI-8911L	SI-8921L	SI-8922L	
DC Input Voltage	V_{IN}	35	60			V
Power Dissipation	P_D	1.15	1.3	1.67	1.67	W
Junction Temperature	T_j	+100				°C
Storage Temperature	T_{stg}	–25 to +85				°C

■Recommended Operating Conditions

Parameter	Symbol	Ratings												Unit
		SI-8811L			SI-8911L			SI-8921L			SI-8922L			
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
DC Input Voltage Range	V_{IN}	12	20	30	24	40	55	24	40	55	20	40	55	V
Output Current Range 1	I_{O1}	50	250	450	20	150	300*2	0	300	600	0	300	600	mA
Output Current Range 2	I_{O2}	0	–20	–50*1	0	–50	–100	———			———			mA
Operating Temperature Range	T_{op}	–10		+70	–10		+60	–10		+65	–10		+65	°C

*1: Output current 2 depends on the input/output conditions

*2: If I_{O2}=50mA or more, the condition I_{O1}>0.5×I_{O2} is recommended.

■Electrical Characteristics

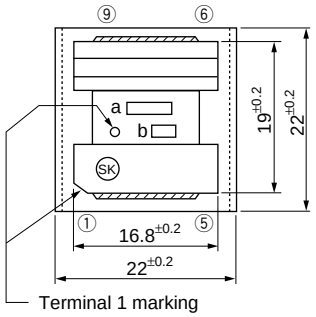
(T_a=25°C)

Parameter	Symbol	Ratings												Unit
		SI-8811L			SI-8911L			SI-8921L			SI-8922L			
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Output Voltage 1	V_{O1}	4.75	5.00	5.25	4.75	5.00	5.25	4.95	5.10	5.20	4.95	5.10	5.20	V
	Conditions	Recommended operating conditions												
Output Voltage 2	V_{O2}	–4.75	–5.00	–5.25	–4.75	–5.00	–5.25	———			———			
	Conditions	Recommended operating conditions						———			———			
Efficiency	η		72			65			72			72		%
	Conditions	Recommended operating conditions (typ.)												
Switching Frequency	f		50			68		60	68	80	60	68	80	kHz
Switching Ripple Voltage 1	ΔV_{r1}		50			50			50	80		50	80	mV_{p-p}
	Conditions	Recommended operating conditions (typ.)												
Switching Ripple Voltage 2	ΔV_{r2}		50			50		———			———			mV_{p-p}
	Conditions	Recommended operating conditions (typ.)						———			———			
Operation Starting Voltage	V_{St}	———			22		24	22		24	17		20	V
	Conditions	———			Recommended operating conditions (typ.)									

■Outline Drawing

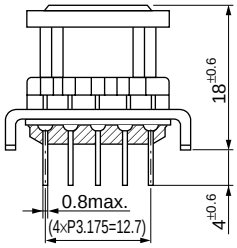
(unit: mm)

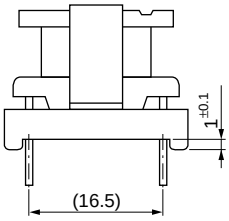
SI-8811L, 8911L, 8921L, 8922L



a. Part Number
b. Lot Number

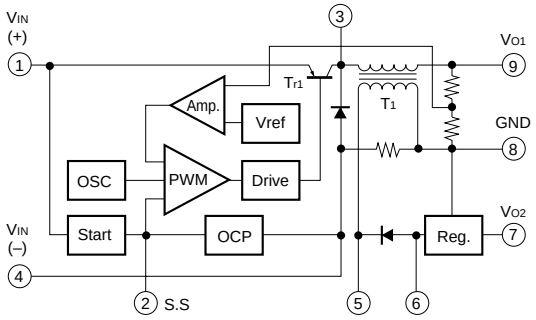
Open Air Type
Weight: Approx. 9.3g



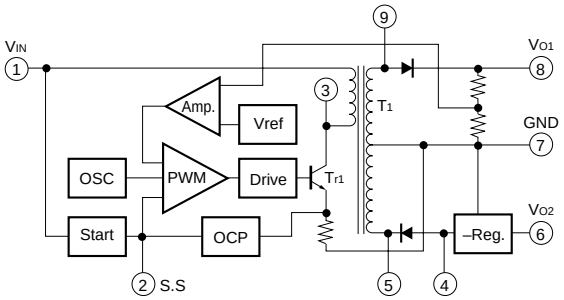


■Block Diagram

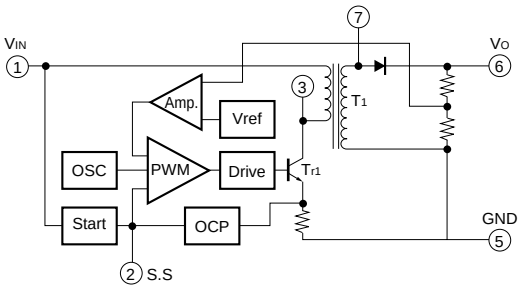
SI-8811L



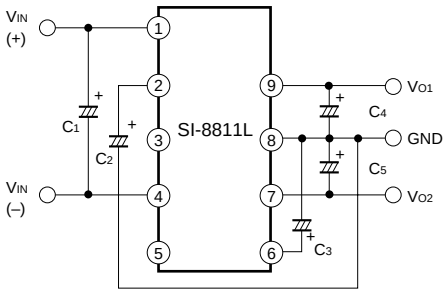
SI-8911L



SI-8921L/8922L

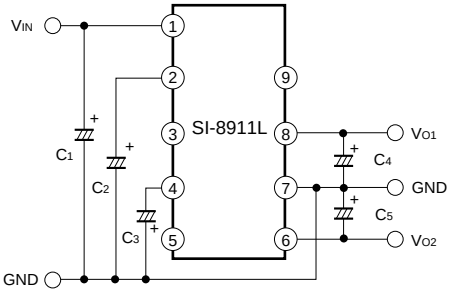


■Standard External Circuit



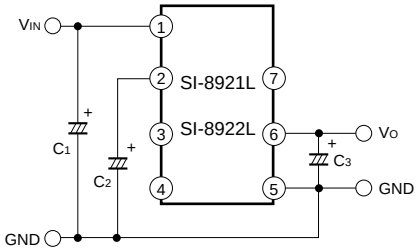
C_1(for smoothing V_{IN}) : 35V/470µF
C_2(for soft start) : 16V/10µF
C_3(for smoothing V_{O2}Reg input) : 10V/220µF
C_4(for smoothing V_{O1}) : 16V/1200µF
C_5(for smoothing V_{O2}) : 10V/47µF

$C_{1,2,3,5}$: Nippon Chemi-con SME Series or equivalent
C_4 : Nippon Chemi-con SXE Series or equivalent



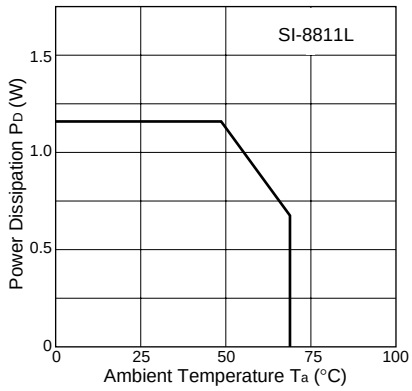
C_1(for smoothing V_{IN}) : 63V/220µF
C_2(for soft start) : 10V/33µF
C_3(for smoothing V_{O2}Reg input) : 10V/220µF
C_4(for smoothing V_{O1}) : 16V/1200µF
C_5(for smoothing V_{O2}) : 10V/100µF

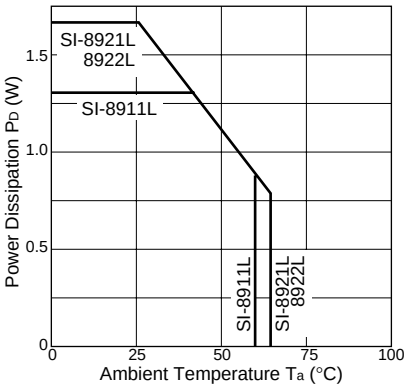
$C_{1,2,3,5}$: Nippon Chemi-con SME Series or equivalent
C_4 : Nippon Chemi-con SXE Series or equivalent



$C_{1,2}$: Nippon Chemi-con SME Series or equivalent
C_3 : Nippon Chemi-con SXE Series or equivalent

■T_a-P_D Characteristics





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

V_O : Output voltage
I_O : Output current
$\eta\chi$: Efficiency (%)

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

■Caution

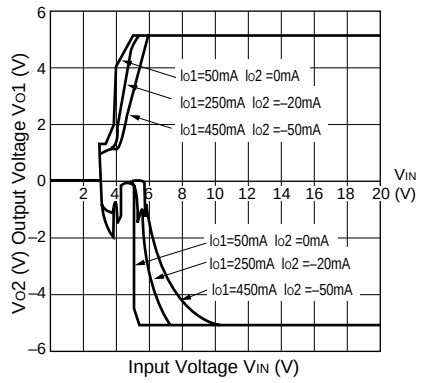
1. A low-impedance capacitor suitable for switching applications must be used for the external capacitor and must be connected as close to the IC as possible in order to assure low ripple voltage and stable switching operation.
2. The SI-881L/8911L series does not have a built-in overcurrent protection circuit on terminal V_{O2}(–5V). Thus, avoid short-circuit conditions that may cause an overcurrent.
3. Do not connect V_{IN}(–) of SI-8811L to GND. The overcurrent protection circuit may not work if they are connected.
4. Terminals left unconnected in the connection diagram must not be connected to other circuits.
5. The IC's metallic heatsink is electrically floating. Do not connect it to GND or any other circuit.
6. Since the SI-8800L and 8900L series have an open-package construction, they can be operated in specific environments. Verify the operating environment and use the IC within the conditions indicated in the reliability data.

■Typical Characteristics

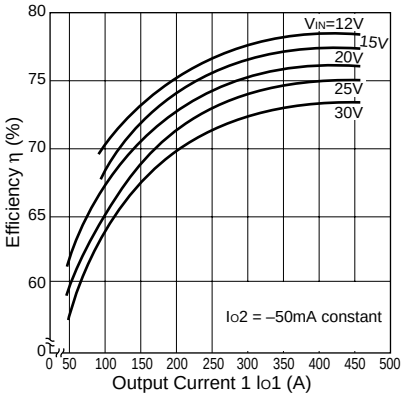
(T_a=25°C)

SI-8811L

Rise Characteristics

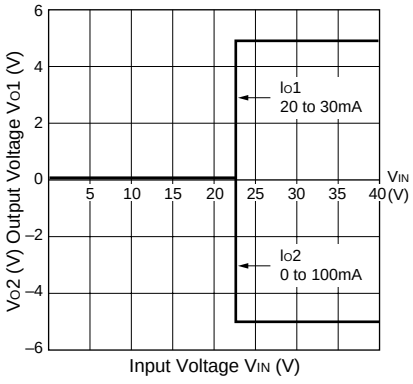


Efficiency Characteristics

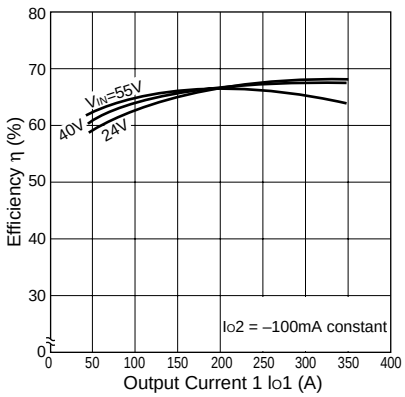


SI-8911L

Rise Characteristics

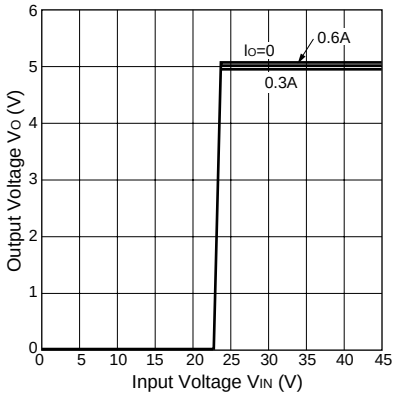


Efficiency Characteristics

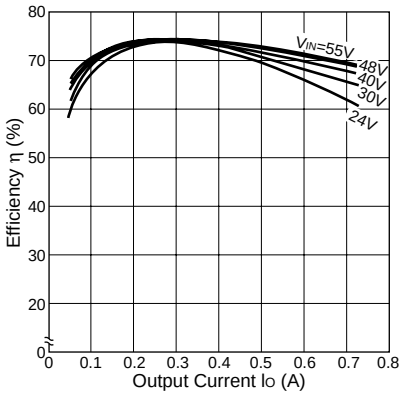


SI-8921L

Rise Characteristics

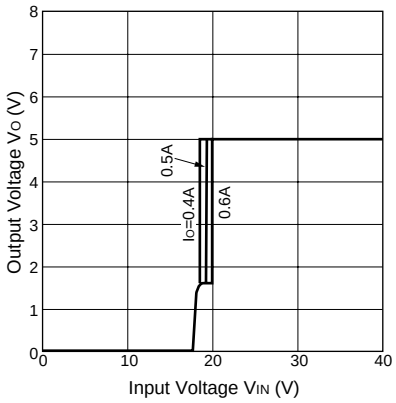


Efficiency Characteristics



SI-8922L

Rise Characteristics



Efficiency Characteristics