

SI-8000JF Series Full-Mold, Separate Excitation Step-down Switching Mode

Features

- Compact full-mold package (equivalent to TO220)
- Output current: 1.5A
- High efficiency: 67 to 88%
- Requires only 4 discrete components
- Internally-adjusted phase correction and output voltage
- Capable of downsize a choke-coil due to IC's high switching frequency (125kHz). (Compared with conventional Sanken devices)
- Built-in foldback-overcurrent and thermal protection circuits
- Output ON/OFF available (circuit current at output OFF: 200 μ A max.)
- Soft start available by ON/OFF pin

Lineup

Part Number	SI-8015JF	SI-8033JF	SI-8050JF	SI-8120JF
V _O (V)*	1.59	3.3	5.0	12.0
I _O (A)	1.5			

* V_{REF}(V) for SI-8015JF

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V _{IN}	43	V
Power Dissipation	P _{D1}	16.6 (with infinite heatsink)	W
	P _{D2}	1.5 (without heatsink, standalone operation)	W
Junction Temperature	T _j	+125	°C
Storage Temperature	T _{stg}	-40 to +125	°C
Thermal Resistance (Junction to Case)	θ_{j-c}	6.0	°C/W

Applications

- Power supplies for telecommunication equipment
- Onboard local power supplies

Recommended Operating Conditions

Parameter	Symbol	Ratings				Unit	Conditions
		SI-8015JF*	SI-8033JF	SI-8050JF	SI-8120JF		
DC Input Voltage Range	V _{IN1}	V _O +2 to 40	5.3 to 40	7 to 40	14 to 40	V	I _O =0 to 1A
	V _{IN2}	V _O +3 to 40	6.3 to 40	8 to 40	15 to 40	V	I _O =0 to 1.5A
Output Current Range	I _O	0 to 1.5				A	V _{IN} ≥V _O +3V
Operating Junction Temperature Range	T _{top}	-30 to +125				°C	

* SI-8015JF is a variable output voltage type. The variable output voltage range is from 2.5 V to 24 V.

Electrical Characteristics

(T_a=25°C)

Parameter	Symbol	Ratings										Unit		
		SI-8015JF			SI-8033JF			SI-8050JF			SI-8120JF			
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Output Voltage ¹	V _O ²	1.558	1.59	1.622	3.234	3.30	3.366	4.90	5.00	5.10	11.76	12.00	12.24	V
	Conditions	V _{IN} =12V, I _O =0.5A			V _{IN} =15V, I _O =0.5A			V _{IN} =20V, I _O =0.5A			V _{IN} =24V, I _O =0.5A			
Efficiency	η	67			77			82			88			%
	Conditions	V _{IN} =12V, I _O =0.5A			V _{IN} =15V, I _O =0.5A			V _{IN} =20V, I _O =0.5A			V _{IN} =24V, I _O =0.5A			
Oscillation Frequency	f	125			125			125			125			kHz
	Conditions	V _{IN} =12V, I _O =0.5A			V _{IN} =15V, I _O =0.5A			V _{IN} =20V, I _O =0.5A			V _{IN} =24V, I _O =0.5A			
Line Regulation	ΔV_{OLINE}	25 80			25 80			40 100			60 130			mV
	Conditions	V _{IN} =8 to 30V, I _O =0.5A			V _{IN} =8 to 30V, I _O =1.0A			V _{IN} =10 to 30V, I _O =1.0A			V _{IN} =18 to 30V, I _O =1.0A			
Load Regulation	ΔV_{OLOAD}	10 30			10 30			10 40			10 40			mV
	Conditions	V _{IN} =12V, I _O =0.2 to 0.8A			V _{IN} =15V, I _O =0.5 to 1.5A			V _{IN} =20V, I _O =0.5 to 1.5A			V _{IN} =24V, I _O =0.5 to 1.5A			
Temperature Coefficient of Output Voltage ³	$\Delta V_O/\Delta T_a$ ⁴	±0.5			±0.5			±0.5			±1.0			mV/°C
Overcurrent Protection Starting Current	I _{SI}	1.6			1.6			1.6			1.6			A
ON/OFF ⁵ Terminal	Low Level Voltage	V _{SSL}			0.5			0.5			0.5			V
	Outflow Current at Low Voltage	I _{SSL}			100			100			100			μ A
Quiescent Circuit Current	I _q	7			7			7			7			mA
	Conditions	V _{IN} =12V, I _O =0A			V _{IN} =15V, I _O =0A			V _{IN} =20V, I _O =0A			V _{IN} =24V, I _O =0A			
	I _{q(OFF)}}	200			200			200			200			μ A
Conditions	V _{IN} =12V, V _{ON/OFF} =0.3V			V _{IN} =15V, V _{ON/OFF} =0.3V			V _{IN} =20V, V _{ON/OFF} =0.3V			V _{IN} =24V, V _{ON/OFF} =0.3V				

¹: Reference voltage for SI-8015JF

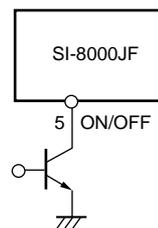
³: Temperature Coefficient of Reference Voltage for SI-8015JF

²: V_{REF} for SI-8015JF

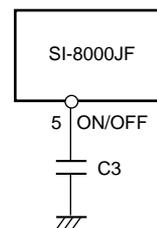
⁴: $\Delta V_{REF}/\Delta T_a$ for SI-8015JF

⁵: Pin 5 is the ON/OFF pin. Soft start at power on can be performed with a capacitor connected to this pin.

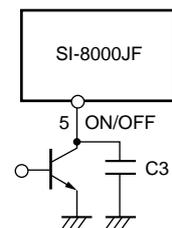
The output can also be turned ON/OFF with this pin. The output is stopped by setting the voltage of this pin to V_{SSL} or lower. ON/OFF-pin voltage can be changed with an open-collector drive circuit of a transistor. When using both the soft-start and ON/OFF functions together, the discharge current from C₃ flows into the ON/OFF control transistor. Therefore, limit the current securely to protect the transistor if C₃ capacitance is large. The ON/OFF pin is pulled up to the power supply in the IC, so applying the external voltage is prohibited. If this pin is not used, leave it open.



V_{OUT}. ON/OFF



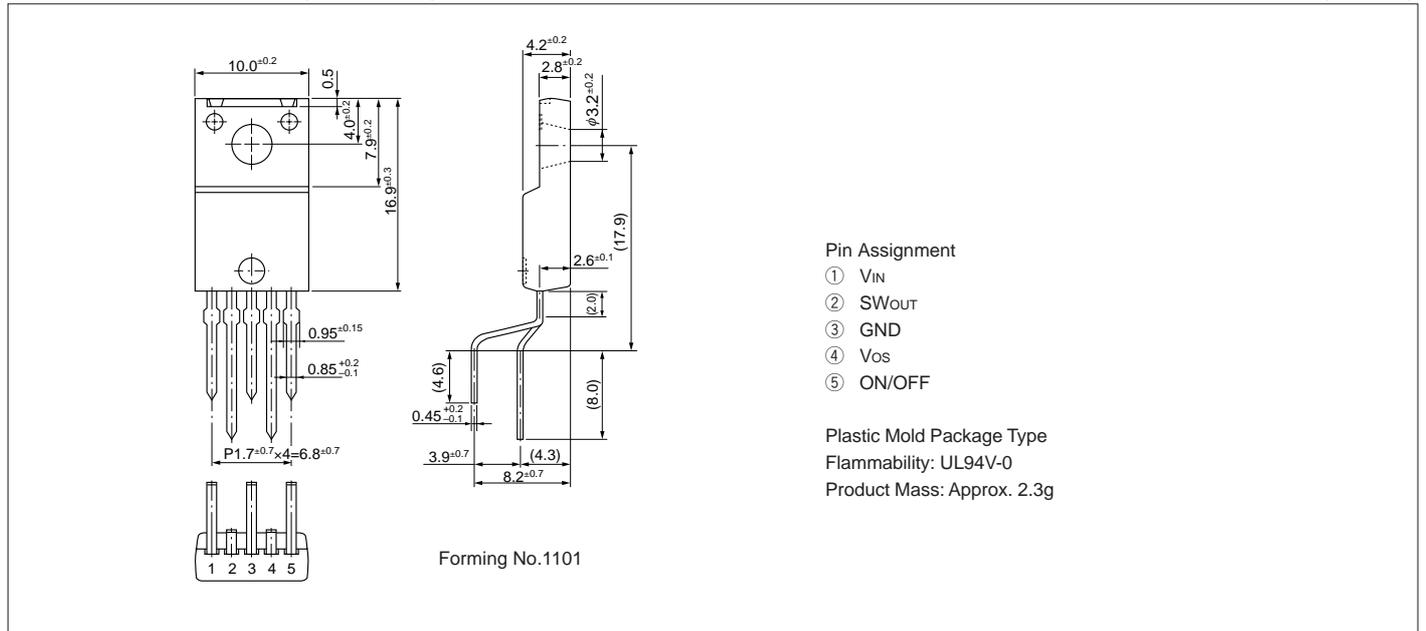
Soft start



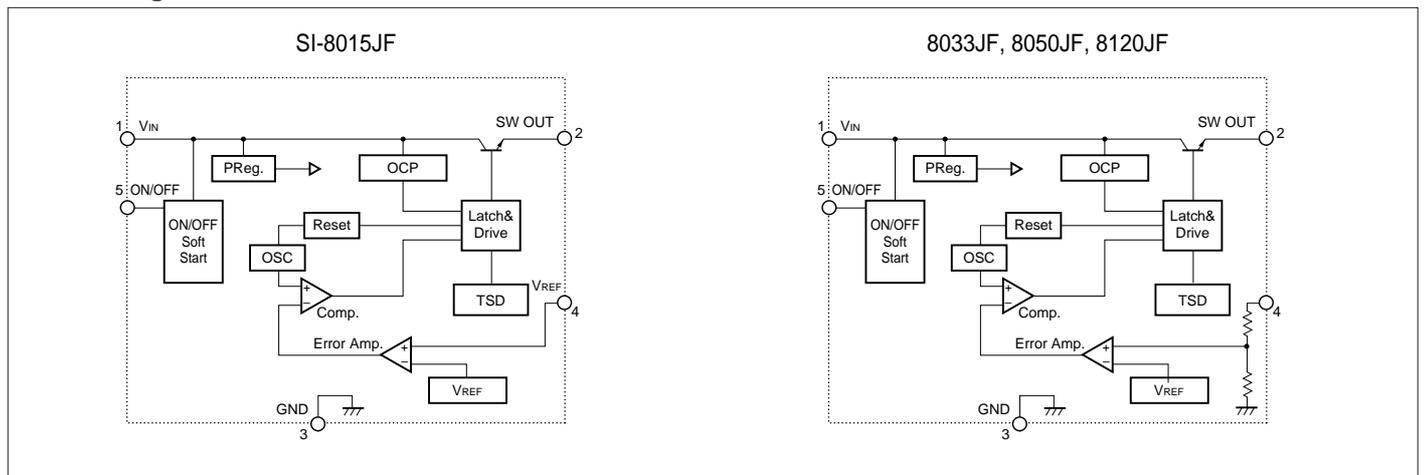
Soft start +V_{OUT}. ON/OFF

External Dimensions (TO220F-5)

(Unit : mm)



Block Diagram



Typical Connection Diagram

