

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

Features

- Compact full-mold package (equivalent to TO220)
- Output current: 3.5 A
- High efficiency: 83% (Vo = 5 V, VIN = 15 V, Io = 2 A)
- Requires only 6 discrete components
- Built-in reference oscillator (300 kHz)
- Built-in drooping-type overcurrent and thermal protection circuits
- Built-in soft start circuit (Output ON/OFF available)

Applications

- DVD recorder, FPD-TV
- OA equipment, such as printers
- Onboard local power supplies

Lineup

Part Number	SI-8001FFE
Vo (V)	Variable (0.8 to 24)
Io (A)	3.5
Function	Soft start

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
		SI-8001FFE		
Input Voltage	VIN	43	V	
Power Dissipation (With infinite heatsink)	PD1-1 PD1-2	22.7 18.2	W	Limited by thermal protection circuit, Tj=150°C Tj=125°C
Power Dissipation (Without heatsink)	PD2-1 PD2-2	2.15 1.72	W	Limited by thermal protection circuit, Tjmax=150°C Tj=125°C
Junction Temperature ¹⁾	Tj	+150	°C	
Storage Temperature	Tstg	−40 to +150	°C	
Thermal Resistance (Junction to Case)	θj-c	5.5	°C/W	
Thermal Resistance (Junction to Ambient Air)	θj-a	58	°C/W	

*: This product has built-in thermal protection circuits that may activate when the junction temperature exceeds 130°C. The recommended design for the junction temperature during IC operation is below 125°C.

Recommended Operating Conditions

Parameter	Symbol	Ratings	Unit
		SI-8001FFE	
Input Voltage Range	VIN	Vo+3 ¹⁾ to 40	V
Output Voltage Range	Vo	0.8 to 24	V
Output Current Range	Io	0 to 3.5	A
Operating Junction Temperature Range	Tjop	−30 to +125	°C
Operating Temperature Range	Top	−30 to +85	°C

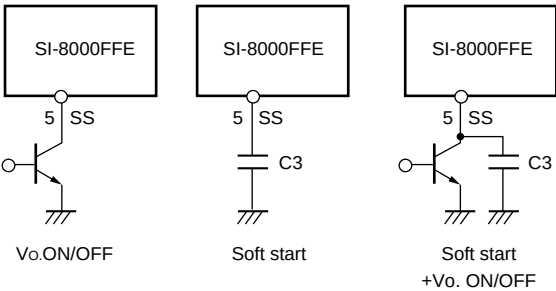
*: The minimum value of the input voltage range is 4.5 V or Vo +3 V, whichever is higher.

Electrical Characteristics

(R1=4.2kΩ, R2=0.8kΩ when Ta=25°C and Vo=5V)

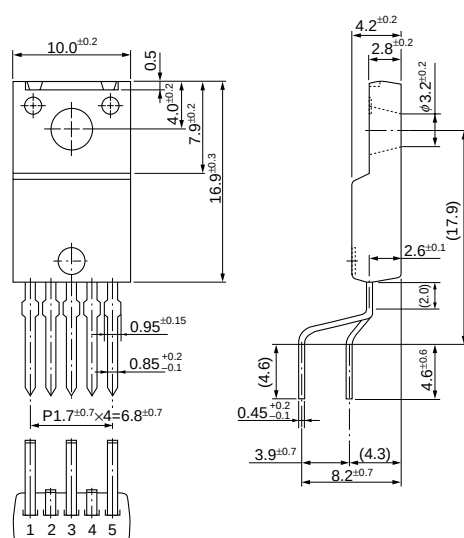
Parameter		Symbol	Ratings			Unit
			SI-8001FFE			
			min.	typ.	max.	
Reference Voltage		V _{ADJ}	0.784	0.800	0.816	V
		Conditions	V _{IN} =15V, I _o =0.2A			
Temperature Coefficient of Reference Voltage		ΔV _{ADJ} /ΔT		±0.1		mV/°C
		Conditions	V _{IN} =15V, I _o =0.2A, T _c =0 to 100°C			
Efficiency		η		83		%
		Conditions	V _{IN} =15V, I _o =2A			
Oscillation Frequency		f _o	270	300	330	kHz
		Conditions	V _{IN} =15V, I _o =2A			
Line Regulation		ΔV _{OLINE}		55	80	mV
		Conditions	V _{IN} =10 to 30V, I _o =2A			
Load Regulation		ΔV _{OLOAD}		15	50	mV
		Conditions	V _{IN} =15V, I _o =0.2 to 3.5A			
Overcurrent Protection Starting Current		I _s	3.6			A
		Conditions	V _{IN} =15V			
SS Pin	Low Level Voltage	V _{SSL}			0.5	V
	Outflow Current at Low Voltage	I _{SSL}		6	30	μA
Conditions			V _{IN} =15V, V _{SS} =0V			
Quiescent Circuit Current		I _q		6		mA
			Conditions	V _{IN} =15V, I _o =0A		
		I _q (OFF)		200	600	μA
Conditions	V _{IN} =15V, V _{SS} =0V					

*: Pin 5 is the SS 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 VSSL or lower. SS-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 SS pin is pulled up (3.7 V typ.) to the power supply in the IC, so applying the external voltage is prohibited. If this pin is not used, leave it open.



External Dimensions (TO220F-5)

(Unit : mm)

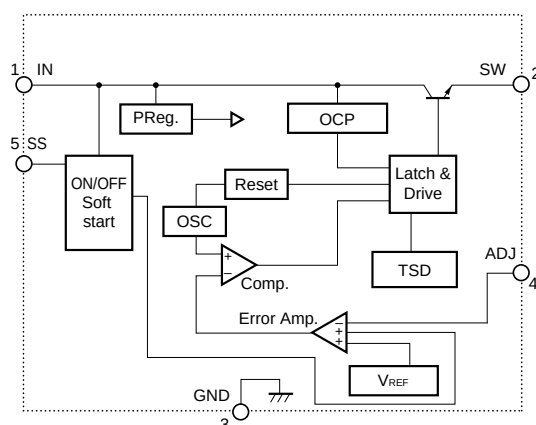


Pin Assignment

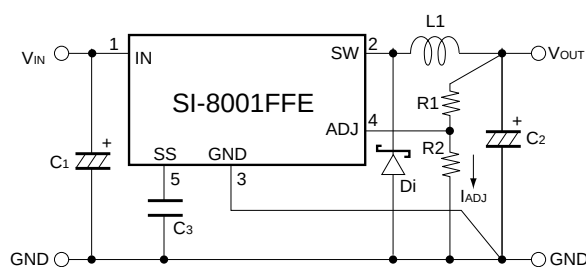
- ① IN
- ② SW
- ③ GND
- ④ ADJ
- ⑤ SS

Plastic Mold Package Type
 Flammability: UL 94V-0
 Product Mass: Approx. 2.3 g

Block Diagram



Typical Connection Diagram



- C1 : 470μF
- C2 : 680μF
- C3 : 0.1μF(Only when using soft-start function)
- L1 : 47μH
- D1 : RK46(Sanken)