

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

Features

- Compact full-mold package (equivalent to TO220)
- Output current: 1.5 A
- High efficiency: 81% typ. (at Vo = 5 V)
- Requires only 4 discrete components
- Built-in reference oscillator (300 kHz)
- Built-in dropping-type-overcurrent and thermal protection circuits
- Output ON/OFF available (circuit current at output OFF: 200μA typ.)
- Soft start available by ON/OFF pin

Applications

- Onboard local power supplies
- AV equipment
- OA equipment

Lineup

Part Number	SI-8008TFE	SI-8050TFE
Vo (V)	Variable (0.8 to 24)	5
Io (A)		1.5

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
DC Input Voltage	VIN	43	V	
Power Dissipation	PD1-1	17.8 (with infinite heatsink)	W	Limited by thermal protection, Tjmax=150°C
	PD1-2	14.2 (with infinite heatsink)		Tjmax=125°C
	PD2-1	2.15 (without heat sink, standalone operation)		Limited by thermal protection, Tjmax=150°C
	PD2-2	1.72 (without heatsink, standalone operation)		Tjmax=125°C
Junction Temperature*	Tj	-30 to +150	°C	
Storage Temperature	Tstg	-40 to +150	°C	
Thermal Resistance (Junction to Case)	θj-c	7	°C/W	
Thermal Resistance (Junction to Ambient Air)	θj-a	58	°C/W	

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

Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		SI-8008TFE	SI-8050TFE	
Input Voltage Range	VIN	Vo+3 ¹ to 40	8 to 40	V
Output Voltage Range	Vo	0.8 to 24	5.0	V
Output Current Range	Io	0 to 1.5		A
Operating Junction Temperature Range	Tjop	-20 to +125		°C
Operating Temperature Range	Top	-20 to +85		°C

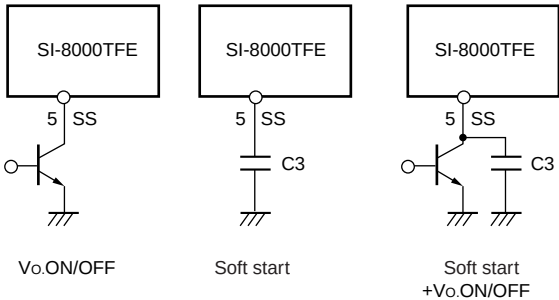
*1: The minimum value of an input voltage range is the higher of 4.5 V or Vo + 3 V.

Electrical Characteristics

(Ta=25°C)

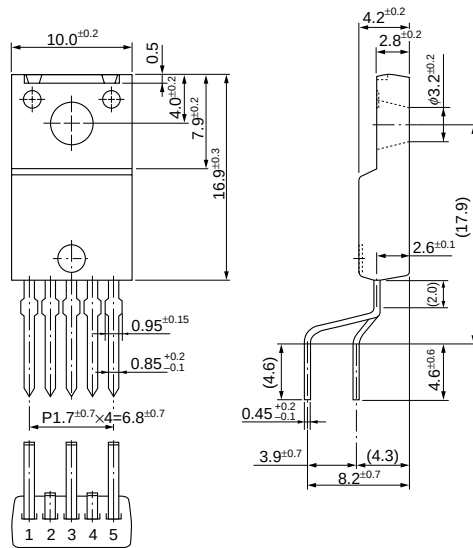
Parameter		Symbol	Ratings			Ratings			Unit
			SI-8008TFE			SI-8050TFE			
			min.	typ.	max.	min.	typ.	max.	
Output Voltage		Vo				4.90	5.00	5.10	V
Reference Voltage		V _{ADJ}	0.784	0.800	0.816				
		Conditions	V _{IN} =15V, I _o =0.1A			V _{IN} =15V, I _o =0.1A			
Temperature Coefficient of Output Voltage		ΔVo/ΔT					±0.5		mV/°C
Temperature Coefficient of Reference Voltage		ΔV _{REF} /ΔT		±0.1					
		Conditions	V _{IN} =15V, I _o =0.1A, T _c =0 to 100°C			V _{IN} =15V, I _o =0.1A, T _c =0 to 100°C			
Efficiency		η		81			81		%
		Conditions	V _{IN} =15V, I _o =0.5A			V _{IN} =15V, I _o =0.5A			
Oscillation Frequency		f _o		300			300		kHz
		Conditions	V _{IN} =15V, I _o =0.5A			V _{IN} =15V, I _o =0.5A			
Line Regulation		ΔV _{OLINE}		60	80		60	80	mV
		Conditions	V _{IN} =10 to 30V, I _o =0.5A			V _{IN} =10 to 30V, I _o =0.5A			
Load Regulation		ΔV _{LOAD}		10	40		10	40	mV
		Conditions	V _{IN} =15V, I _o =0.2 to 1.5A			V _{IN} =15V, I _o =0.2 to 1.5A			
Overcurrent Protection Starting Current		I _s	1.6			1.6			A
		Conditions	V _{IN} =15V			V _{IN} =15V			
ON/OFF Pin*	Low Level Voltage	V _{SSL}			0.5			0.5	V
	Outflow Current at Low Voltage	I _{SSL}		10	40		10	40	μA
		Conditions	V _{SSL} =0V			V _{SSL} =0V			
Quiescent Circuit Current		I _q		6			6		mA
		Conditions	V _{IN} =15V, I _o =0A			V _{IN} =15V, I _o =0A			
		I _{q(OFF)}		200	400		200	400	μA
		Conditions	V _{IN} =15V, V _{SS} =0V			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 to the power supply in the IC, so applying the external voltage is prohibited. If the pin is not used, leave it open.



External Dimensions (TO220F-5)

(Unit : mm)

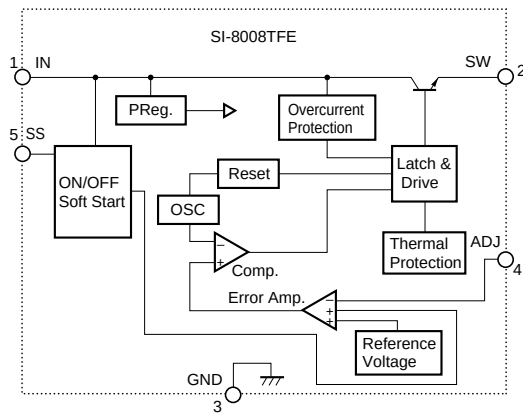


Pin Assignment

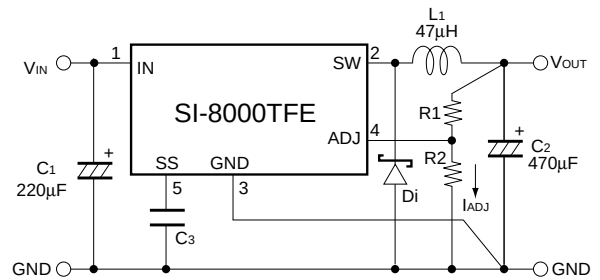
- ① IN
- ② SW
- ③ GND
- ④ ADJ
- ⑤ SS

Plastic Mold Package Type
 Flammability: UL94V-0
 Product Mass: Approx. 2.3g

Block Diagram



Typical Connection Diagram



C1 : 220µF
 C2 : 470µF
 C3 : 1µF (Only when using soft-start function)
 L1 : 47µH
 Di : RK16 (Sanken)