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# 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: 200 μA 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				
lo (A)	1.5					

### ■Absolute Maximum Ratings

		3			
Parameter	Symbol	Ratings	Unit	Conditions	
DC Input Voltage	VIN	43	V		
	P <sub>D1-1</sub>	17.8 (with infinite heatsink)		Limited by thermal protection, T <sub>jmax</sub> =150°C	
Power Dissipation	P <sub>D1-2</sub>	14.2 (with infinite heatsink)	w	T <sub>jmax</sub> =125°C	
Fower Dissipation	PD2-1	2.15 (without heat sink, standalone operation)	l vv	Limited by thermal protection, T <sub>jmax</sub> =150°C	
	PD2-2	1.72 (without heatsink, standalone operation)		T <sub>jmax</sub> =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)	$\theta$ j-a	58	°C/W		

<sup>\*:</sup> 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

		Rat			
Parameter	Symbol	SI-8008TFE	SI-8050TFE	Unit	
Input Voltage Range	Vin	Vo+3 <sup>*1</sup> to 40	8 to 40	V	
Output Voltage Range	Vo	0.8 to 24	5.0	V	
Output Current Range	lo	0 to 1.5		Α	
Operating Junction Temperature Range	Tjop	–20 to	°C		
Operating Temperature Range	Top	–20 t	°C		

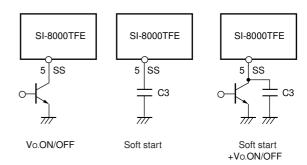
<sup>\*1:</sup> The minimum value of an input voltage range is the higher of 4.5 V or  $V_0 + 3$  V.

### **■**Electrical Characteristics

(Ta=25°C)

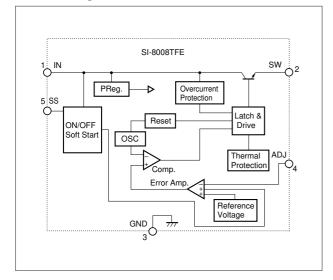
Parameter		Symbol		Ratings		Ratings			Unit		
				SI-8008TFE		SI-8050TFE					
				min.	typ.	max.	min.	typ.	max.		
Output Voltage		Vo					4.90	5.00	5.10		
Reference Voltage		VADJ		0.784	0.800	0.816				V	
			Conditions	Vin=15V, Io=0.1A		V <sub>IN</sub> =15V, I <sub>0</sub> =0.1A					
Temperature Coefficie	nt of Output Voltage	ΔVo/ΔΤ						±0.5			
Temperature Coefficie	ent of Reference Voltage	$\Delta V_{REF}/\Delta$	.T		±0.1					mV/°C	
Temperature Coefficient of Reference Voltage	ent of Helerence voltage		Conditions	VIN=15V,	Io=0.1A, Tc=0	to 100°C	VIN=15V, Io=0.1A, Tc=0 to 100°C				
Efficiency		η			81			81		- %	
Linoidriby			Conditions	\	IN=15V, Io=0.5	A		VIN=15V, Io=0.5	A	%	
Oscillation Freq	llency	fo			300			300		- kHz	
Oscillation req	lucitoy		Conditions	VIN=15V, Io=0.5A		VIN=15V, Io=0.5A			KHZ		
Line Regulation		$\Delta V$ OLINE			60	80		60	80	mV	
			Conditions	VIN=10 to 30V, Io=0.5A		VIN=10 to 30V, Io=0.5A			l IIIV		
Load Regulation	n	ΔVOLOAD	)		10	40		10	40	mV	
Load Regulation			Conditions	VIN=	15V, I <sub>0</sub> =0.2 to	1.5A	VIN	/IN=15V, Io=0.2 to 1.5A		mv	
Overcurrent Protection Starting Current		Is		1.6			1.6			Α	
			Conditions		VIN=15V			Vin=15V		A	
ON/OFF Pin*	Low Level Voltage	Vssl				0.5			0.5	V	
	Outflow Current at Low Voltage	Issl			10	40		10	40	μΑ	
			Conditions		Vssl=0V		Vssl=0V		μΛ		
Quiescent Circuit Current		Iq			6			6		- mA	
			Conditions		VIN=15V, Io=0A	١	Vin=15V, Io=0A		HIZ		
		Iq(OFF)			200	400		200	400		
			Conditions	\	/IN=15V, Vss=0	V		VIN=15V, VSS=0V		. μΑ	

<sup>\*:</sup> 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) 10.0<sup>10.2</sup> 28.0<sup>12</sup> 28.0<sup>12</sup> 28.0<sup>12</sup> 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

