Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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SI-8000FD Series Surface Mount, Separate Excitation Step-down Switching Mode

■Features

- Surface-mount package (TO263-5)
- Output current: 3.5 A
- High efficiency: 83% (Vo = 5 V, V_{IN} = 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)
  - SI-8001FDE
- Built-in on/off function (active Low)
  - SI-8001FDL
- Low current consumption during off
  - SI-8001FDL

■Applications

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

■Lineup

Part Number	SI-8001FDE	SI-8001FDL
V_O(V)	Variable(0.8 to 24)	
Io(A)	3.5	
Function	Soft start	ON/OFF

■Absolute Maximum Ratings

Parameter	Symbol	Ratings		Unit	Conditions
		SI-8001FDE	SI-8001FDL		
Input Voltage	V_{IN}	43		V	
ON/OFF Control Voltage	V_C	–	V_{IN}	V	
Power Dissipation*1	P_D	3		W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)
Junction Temperature*2	T_j	+150		°C	
Storage Temperature	T_{stg}	–40 to +150		°C	
Thermal Resistance (Junction to Case)	$\theta_{j\text{-}c}$	3*1		°C/W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)
Thermal Resistance (Junction to Ambient Air)	$\theta_{j\text{-}a}$	33.3*1		°C/W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)

*1 : Limited by thermal protection circuit

*2 : 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-8001FDE	SI-8050FDL	
Input Voltage Range	V_{IN}	Vo+3*1 to 40		V
Output Voltage Range	V_O	0.8 to 24		V
Output Current Range	I_O	0 to 3.5		A
Operating Junction Temperature Range	T_{jop}	–30 to +100		°C
Operating Temperature Range	T_{op}	–30 to +85		°C

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

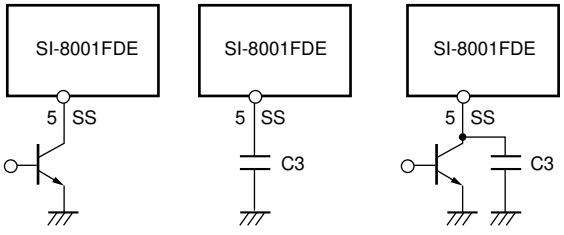
■Electrical Characteristics

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

Parameter		Symbol	Ratings						Unit
			SI–8001FDE			SI–8001FDL			
			min.	typ.	max.	min.	typ.	max.	
Reference Voltage		V_{ADJ}	0.784	0.800	0.816	0.784	0.800	0.816	V
		Conditions	V_{IN}=15V, Io=0.2A			V_{IN}=15V, Io=0.2A			
Temperature Coefficient of Reference Voltage		$\Delta V_{ADJ}/\Delta T$		±0.1			±0.1		mV/°C
		Conditions	V_{IN}=15V, Io=0.2A, Tc=0 to 100°C			V_{IN}=15V, Io=0.2A, Tc=0 to 100°C			
Efficiency		η		83			83		%
		Conditions	V_{IN}=15V, Io=2A			V_{IN}=15V, Io=2A			
Oscillation Frequency		fo	270	300	330	270	300	330	kHz
		Conditions	V_{IN}=15V, Io=2A			V_{IN}=15V, Io=2A			
Line Regulation		ΔV_{OLINE}			80			80	mV
		Conditions	V_{IN}=10 to 30V, Io=2A			V_{IN}=10 to 30V, Io=2A			
Load Regulation		ΔV_{OLOAD}			50			50	mV
		Conditions	V_{IN}=15V, Io=0.2 to 3.5A			V_{IN}=15V, Io=0.2 to 3.5A			
Overcurrent Protection Starting Current		Is	3.6			3.6			A
		Conditions	V_{IN}=15V			V_{IN}=15V			
SS Pin*1	Low Level Voltage	V_{SSL}			0.5	–	–	–	V
	Outflow Cuurent at Low Voltage	I_{SSL}		6	30	–	–	–	μA
		Conditions	V_{IN}=15V, V_{SS}=0V			–	–	–	
ON/OFF Pin*2	ON/OFF Control Voltage (Output on)	Vc, IH	–	–	–			0.8	V
	ON/OFF Control Voltage (Output off)	Vc, IL	–	–	–	2.0			V
	ON/OFF Controll Current (Output on)	Ic, IH	–	–	–		6	100	μA
		Conditions	–			V_C=2V			
Quiescent Circuit Current		Iq		6			6		mA
		Conditions	V_{IN}=15V, Io=0A			V_{IN}=15V, Io=0A			
		Iq(OFF)		200	600		30	200	μA
		Conditions	V_{IN}=15V, Vss=0V			V_{IN}=15V, V_C=2V			

*1: 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.

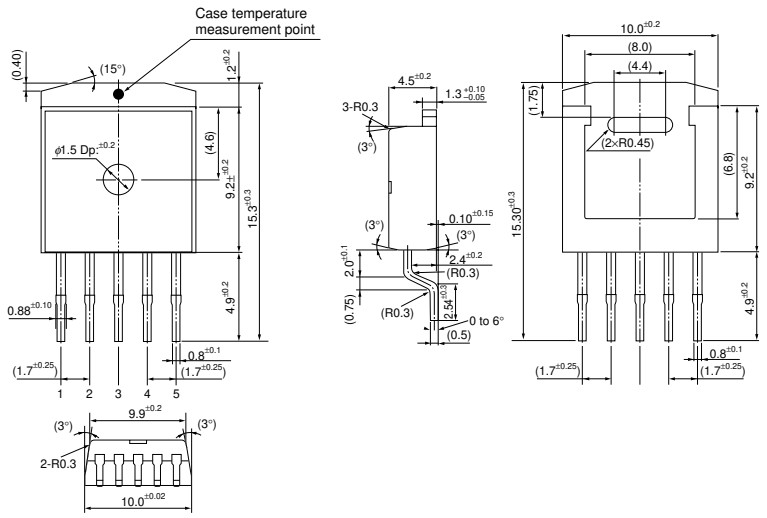
*2: Output is OFF when the output control terminal VC is open. Each input level is equivalent to LS-TTL. Therefore, the device can be driven directly by LS-TTLs.



Vo.ON/OFF　　Soft start　　Soft start +Vo. On/OFF

■External Dimensions (TO263-5)

(Unit : mm)

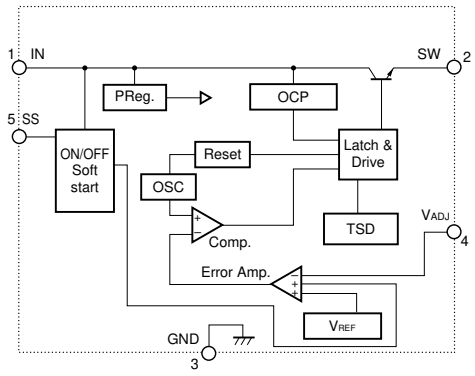


Pin Assignment
① IN
② SW
③ GND (Common to the rear side of the product)
④ V_{ADJ}
⑤ SS or Vc

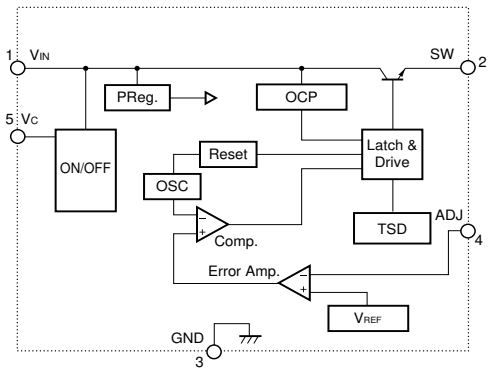
Plastic Mold Package Type
Flammability: UL 94V-0
Product Mass: Approx. 1.48g

■Block Diagram

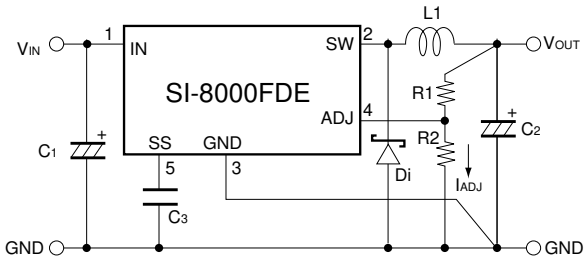
SI-8001FDE



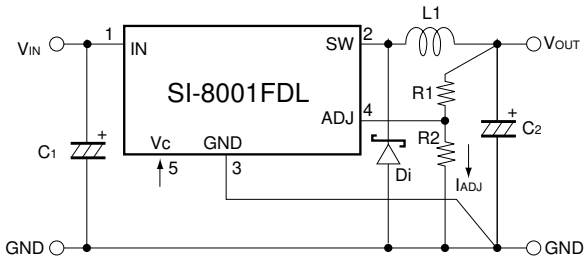
SI-8001FDL



■Typical Connection Diagram



C1 : 470μF
C2 : 680μF
C3 : 0.1μ (Only when using soft-start function)
L1 : 47μH
Di : SPB-G56S (Sanken)



C1 : 470μF
C2 : 680μF
L1 : 47μH
Di : SPB-G56S (Sanken)