

## SI-3000KF Series Low Current Consumption, Low Dropout Voltage Linear Regulator ICs

### Features

- Compact full-mold package (equivalent to TO220)
- Output current: 1.0A
- Low dropout voltage:  $V_{DIF} \leq 0.5V$  (at  $I_o = 1.0A$ )
- High ripple rejection: 75dB
- Low circuit current at output OFF:  $I_q$  (OFF)  $\leq 1\mu A$
- Built-in overcurrent and thermal protection circuits

### Applications

- Secondary stabilized power supply (local power supply)

### Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		SI-3010KF		
Input Voltage Range	$V_{IN}$	2.4 <sup>*2</sup> to 27 <sup>*1</sup>		V
Output Current Range	$I_o$	0 to 1.0 <sup>*1</sup>		A
Output Voltage Variable Range	$V_{O}ADJ$	1.1 to 16		V
Operating Ambient Temperature	$T_{op}$	-30 to +85		°C
Operating Junction Temperature	$T_j$	-20 to +100		°C

\*1:  $V_{IN}$  (max) and  $I_o$  (max) are restricted by the relationship  $P_d$  (max) =  $(V_{IN} - V_o) \times I_o = 16.6W$ .

\*2: Refer to the Dropout Voltage parameter.

### Electrical Characteristics

Parameter	Symbol	Ratings			Unit	
		SI-3010KF				
		min.	typ.	max.		
Reference Voltage	$V_{ADJ}$	0.98	1.00	1.02	V	
	Conditions	$V_{IN}=7V, I_o=0.01A, V_C=2V, V_o=5A$				
Line Regulation	$\Delta V_{OLINE}$			30	mV	
	Conditions	$V_{IN}=6$ to $15V, I_o=0.01A, V_C=2V, V_o=5A$				
Load Regulation	$\Delta V_{OLOAD}$			75	mV	
	Conditions	$V_{IN}=7V, I_o=0$ to $1A, V_C=2V, V_o=5A$				
Dropout Voltage	$V_{DIF}$			0.3	V	
	Conditions	$I_o=0.5A, V_C=2V, V_o=5V$				
	Conditions	$I_o=1.0A, V_C=2V, V_o=5V$				
Quiescent Circuit Current	$I_q$			600	$\mu A$	
	Conditions	$V_{IN}=7V, I_o=0A, V_C=2V$				
Circuit Current at Output OFF	$I_q$ (OFF)			1	$\mu A$	
	Conditions	$V_{IN}=7V, V_C=0V$				
Temperature Coefficient of Output Voltage	$\Delta V_o/\Delta T_a$		$\pm 0.5$		mV/°C	
	Conditions	$V_{IN}=7V, I_o=0.01A, V_C=2V, T_j=0$ to $100^\circ C, V_o=2.5V$				
Ripple Rejection	$R_{REJ}$		75		dB	
	Conditions	$V_{IN}=7V, I_o=0.1A, V_C=2V, f=100$ to $120Hz, V_o=5V$				
Overcurrent Protection Starting Current <sup>3</sup>	$I_{S1}$	1.1			A	
	Conditions	$V_{IN}=7V, V_C=2V$				
V <sub>C</sub> Terminal	Control Voltage (Output ON) <sup>4</sup>	$V_C, I_H$	2		V	
		Conditions	$V_{IN}=7V$			
	Control Voltage (Output OFF)	$V_C, I_L$			0.8	V
		Conditions	$V_{IN}=7V$			
	Control Current (Output ON)	$I_C, I_H$			40	$\mu A$
		Conditions	$V_{IN}=7V, V_C=2V$			
Control Current (Output OFF)	$I_C, I_L$	-5	0		$\mu A$	
	Conditions	$V_{IN}=7V, V_C=0V$				
Input Overvoltage Shutdown Voltage	$V_{OVP}$	33			V	
	Conditions	$I_o=0.01A$				

\*3:  $I_{S1}$  is specified at the 5% drop point of output voltage  $V_o$  on the condition that  $V_{IN}$  = overcurrent protection starting current,  $I_o = 10$  mA.

\*4: Output is OFF when the output control terminal  $V_C$  is open. Each input level is equivalent to LS-TTL level. Therefore, the device can be driven directly by LS-TTLs.

\*5: SI-3000KFE cannot be used in the following applications because the built-in foldback-type overcurrent protection may cause errors during start-up stage.

(1) Constant current load (2) Positive and negative power supply (3) Series-connected power supply (4)  $V_o$  adjustment by raising ground voltage

### Absolute Maximum Ratings

( $T_a=25^\circ C$ )

Parameter	Symbol	Ratings		Unit	Remarks
		SI-3010KF			
DC Input Voltage	$V_{IN}$	35 <sup>*1</sup>		V	
Output Control Terminal Voltage	$V_C$	$V_{IN}$		V	
DC Output Current	$I_o$	1.0		A	
Power Dissipation	$P_{D1}$	16.6		W	With infinite heatsink
	$P_{D2}$	1.72		W	Without heatsink, stand-alone operation
Junction Temperature	$T_j$	-40 to +125		°C	
Storage Temperature	$T_{stg}$	-40 to +125		°C	
Operating Ambient Temperature	$T_{op}$	-40 to +100		°C	
Thermal Resistance (Junction to Case)	$\theta_{j-c}$	6.0		°C/W	
Thermal Resistance (Junction to Ambient Air)	$\theta_{j-a}$	58		°C/W	Without heatsink, stand-alone operation

\*1: A built-in input-overvoltage-protection circuit shuts down the output voltage at the Input Overvoltage Shutdown Voltage of the electrical characteristics.

