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-3000KS Series — Surface-Mount, Low Current Consumption, Low Dropout Voltage

■Features

- Compact surface-mount package (SOP8)
- Output current: 1.0 A
- Compatible with low ESR capacitor
- Low circuit current at output OFF Iq ≤ 350 μA (I_O = 0 A, V_C = 2 V)
- Low current consumption Iq (OFF) ≤ 1 μA (V_C = 0 V)
- Low dropout voltage V_{DIF} ≤ 0.6 V (I_O = 1 A)
- 3 types of output voltages (2.5 V, 3.3 V, and variable type) available
- Output ON/OFF control terminal voltage compatible with LS-TTL
- Built-in drooping-type-overcurrent and thermal protection circuits

■Applications

- Local power supplies
- Battery-driven electronic equipment

■Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V_{IN}[*1]	17	V
Output Control Terminal Voltage	V_C	V_{IN}	V
DC Output Current	I_O[*1]	1.0	A
Power Dissipation	P_D[*1, *2]	0.76	W
Junction Temperature	T_j	−40 to +125	°C
Storage Temperature	T_{stg}	−40 to +125	°C
Thermal Resistance (Junction to Ambient Air)	$\theta_{j\text{-}a}$	130	°C/W
Thermal resistance (Junction to Lead (pin 7))	$\theta_{j\text{-}L}$	22	°C/W

*1: V_{IN} (max) and I_O (max) are restricted by the relation $P_D = (V_{IN} - V_O) \times I_O$. Please calculate these values referring to the Copper laminate area vs. Power dissipation data as shown hereinafter.
*2: When mounted on a glass epoxy board of 1600 mm^2 (copper laminate area 2%).

■Electrical Characteristics

(Ta=25°C, Vc=2 V, unless otherwise specified)

| Parameter		Symbol	SI-3012KS (variable type)			SI-3025KS			SI-3033KS			Unit
			min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Input Voltage		V_{IN}	2.4			*1			*1			V
Output Voltage (Reference voltage V_{ADJ} for SI-3012KS)		V_O (V_{ADJ})	1.24	1.28	1.32	2.45	2.50	2.55	3.234	3.300	3.366	V
		Conditions	V_{IN}=3.3V, I_O=10mA			V_{IN}=3.3V, I_O=10mA			V_{IN}=5V, I_O=10mA			
Dropout Voltage		V_{DIF}			0.3			0.4			0.4	V
		Conditions	I_O=0.5A (V_O=2.5V)			I_O=0.5A			I_O=0.5A			
					0.6			0.6			0.6	
		Conditions	I_O=1A (V_O=2.5V)			I_O=1A			I_O=1A			
Line Regulation		ΔV_{OLINE}			10			10			15	mV
		Conditions	V_{IN}=3.3 to 8V, I_O=10mA (V_O=2.5V)			V_{IN}=3.3 to 8V, I_O=10mA			V_{IN}=5 to 10V, I_O=10mA			
Load Regulation		ΔV_{OLOAD}			40			40			50	mV
		Conditions	V_{IN}=3.3V, I_O=0 to 1A (V_O=2.5V)			V_{IN}=3.3V, I_O=0 to 1A			V_{IN}=5V, I_O=0 to 1A			
Quiescent Circuit Current		I_q			350			350			350	μA
		Conditions	V_{IN}=3.3V, I_O=0A, V_C=2V, R2=24kΩ			V_{IN}=3.3V, I_O=0A, V_C=2V			V_{IN}=5V, I_O=0A, V_C=2V			
Circuit Current at Output OFF		I_q (OFF)			1			1			1	μA
		Conditions	V_{IN}=3.3V, V_C=0V			V_{IN}=3.3V, V_C=0V			V_{IN}=5V, V_C=0V			
Temperature Coefficient of Output Voltage		$\Delta V_O/\Delta T_a$		±0.3			±0.3			±0.3		mV/°C
		Conditions	T_j=0 to 100°C (V_O=2.5V)			T_j=0 to 100°C			T_j=0 to 100°C			
Ripple Rejection		R_{REJ}		55			55			55		dB
		Conditions	V_{IN}=3.3V, f=100 to 120Hz (V_O=2.5V)			V_{IN}=3.3V, f=100 to 120Hz			V_{IN}=5V, f=100 to 120Hz			
Overcurrent Protection Starting Current[*2]		I_{S1}	1.2			1.2			1.2			A
		Conditions	V_{IN}=3.3V (V_O=2.5V)			V_{IN}=3.3V			V_{IN}=5V			
V_C Terminal	Control Voltage (Output ON)[*3]	V_C, IH	2.0			2.0			2.0			V
	Control Voltage (Output OFF)	V_C, IL			0.8			0.8			0.8	
	Control Current (Output ON)	I_C, IH			40			40			40	μA
		Conditions	V_C=2V									
	Control Current (Output OFF)	I_C, IL	−5	0		−5	0		−5	0		μA
		Conditions	V_C=0V									

*1: Refer to the Dropout Voltage parameter.
*2: The I_{S1} is specified at the 5% drop point of output voltage V_O on the condition that V_{IN} = V_O + 1 V, and I_O = 10 mA.
*3: 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.

■External Dimensions (SOP8)

(Unit : mm)
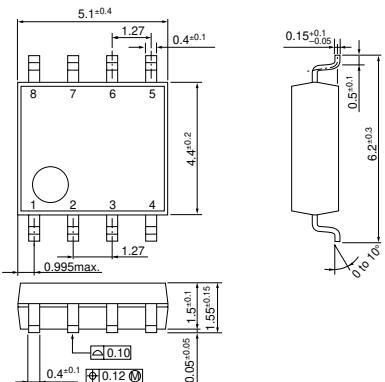
Pin Assignment
① V_C
② V_{IN}
③ V_O
④ Sence (ADJ for SI-3012KS)
⑤ GND
⑥ GND
⑦ GND
⑧ GND

Plastic Mold Package Type
Flammability: UL 94V-0
Product Mass: Approx. 0.1 g

■Block Diagram

●SI-3012KS
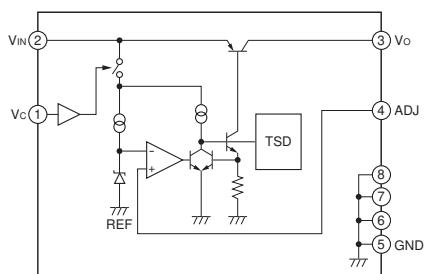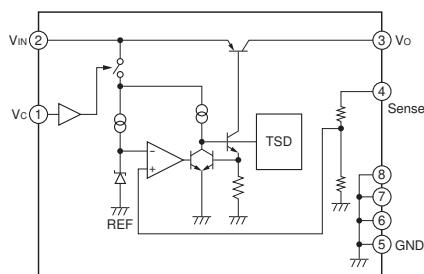
●SI-3025KS, SI-3033KS

■Typical Connection Diagram

●SI-3012KS
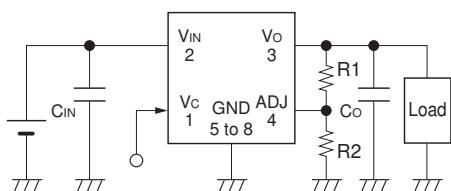
●SI-3025KS, SI-3033KS

R_1, R_2: Output voltage setting resistors
The output voltage can be set by connecting R_1 and R_2 as shown above.
The recommended value of R_2 is 24 kΩ .

$R_1=(V_O-V_{ADJ})\div(V_{ADJ}/R_2)$
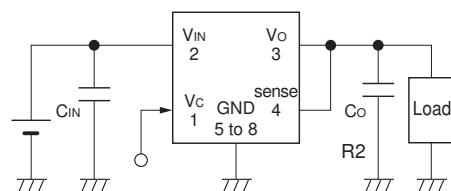
C_{IN}: Input capacitor (22 μF or larger)
C_O: Output capacitor (22 μF or larger)
For SI-3000KS series, Co has to be a low ESR capacitor.
When using the electrolytic capacitor, the SI-3000KS series may oscillate at a low temperature.

■Reference Data

Copper Laminate Area vs. Thermal Resistance

Area of PC board : 40×40mm

Thermal resistance θ_{j-a} (°C/W)

Copper laminate area (mm²)
(GND terminal)

Copper Laminate Area vs. Power Dissipation

Tj=100°C   Area of PC board : 40×40mm

Ta=25°C
Ta=50°C
Ta=80°C
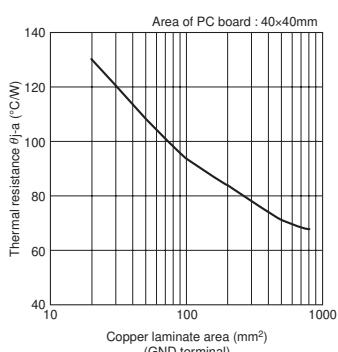
Power dissipation P_D (W)

Copper laminate area (mm²)
(GND terminal)
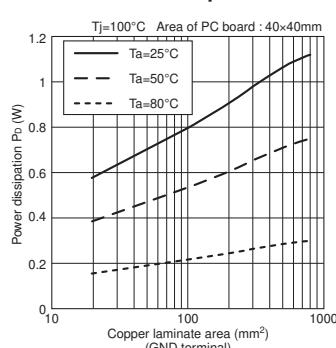
• Obtaining the junction temperature
Measure the temperature T_L at the lead part of the GND pin (pin 7) with a thermocouple, etc. Then, substitute this value in the following formula to obtain the junction temperature.

$T_j=P_D \times \theta_{j-L} + T_L$ ($\theta_{j-L} = 22°C/W$)