

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 $I_q \leq 350 \mu\text{A}$ ($I_o = 0 \text{ A}$, $V_c = 2 \text{ V}$)
- Low current consumption $I_q (\text{OFF}) \leq 1 \mu\text{A}$ ($V_c = 0 \text{ V}$)
- Low dropout voltage $V_{\text{DIF}} \leq 0.6 \text{ V}$ ($I_o = 1 \text{ A}$)
- 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

■ Absolute Maximum Ratings

($T_a=25^\circ\text{C}$)

| 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 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -40 to +125 | $^\circ\text{C}$ |
| Thermal Resistance (Junction to Ambient Air) | θ_{j-a} | 130 | $^\circ\text{C/W}$ |
| Thermal resistance (Junction to Lead (pin 7)) | θ_{j-L} | 22 | $^\circ\text{C/W}$ |

*1: V_{IN} (max) and I_o (max) are restricted by the relation $P_D = (V_{\text{IN}} - V_o) \times I_o$. 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 mm² (copper laminate area 2%).

■ Applications

- Local power supplies
- Battery-driven electronic equipment

■ Electrical Characteristics

($T_a=25^\circ\text{C}$, $V_c=2 \text{ V}$, unless otherwise specified)

| Parameter | Symbol | Ratings | | | | | | | | | Unit |
|--|--|--|-----------|------|---|-----------|------|---|-----------|-------|----------------------|
| | | SI-3012KS (variable type) | | | SI-3025KS | | | SI-3033KS | | | |
| | | 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) | $V_o (V_{\text{ADJ}})$ | 1.24 | 1.28 | 1.32 | 2.45 | 2.50 | 2.55 | 3.234 | 3.300 | 3.366 | V |
| Dropout Voltage | V_{DIF} | | | 0.3 | | | 0.4 | | | 0.4 | V |
| | Conditions | $V_{\text{IN}}=3.3\text{V}$, $I_o=10\text{mA}$ | | | $V_{\text{IN}}=3.3\text{V}$, $I_o=10\text{mA}$ | | | $V_{\text{IN}}=5\text{V}$, $I_o=10\text{mA}$ | | | |
| | Conditions | $I_o=0.5\text{A}$ ($V_c=2.5\text{V}$) | | | $I_o=0.5\text{A}$ | | | $I_o=0.5\text{A}$ | | | |
| Line Regulation | ΔV_{OLINE} | | | 10 | | | 10 | | | 15 | mV |
| | Conditions | $V_{\text{IN}}=3.3$ to 8V , $I_o=10\text{mA}$ ($V_c=2.5\text{V}$) | | | $V_{\text{IN}}=3.3$ to 8V , $I_o=10\text{mA}$ | | | $V_{\text{IN}}=5$ to 10V , $I_o=10\text{mA}$ | | | |
| Load Regulation | ΔV_{LOAD} | | | 40 | | | 40 | | | 50 | mV |
| | Conditions | $V_{\text{IN}}=3.3\text{V}$, $I_o=0$ to 1A ($V_c=2.5\text{V}$) | | | $V_{\text{IN}}=3.3\text{V}$, $I_o=0$ to 1A | | | $V_{\text{IN}}=5\text{V}$, $I_o=0$ to 1A | | | |
| Quiescent Circuit Current | I_q | | | 350 | | | 350 | | | 350 | μA |
| | Conditions | $V_{\text{IN}}=3.3\text{V}$, $I_o=0\text{A}$, $V_c=2\text{V}$, $R_2=24\text{k}\Omega$ | | | $V_{\text{IN}}=3.3\text{V}$, $I_o=0\text{A}$, $V_c=2\text{V}$ | | | $V_{\text{IN}}=5\text{V}$, $I_o=0\text{A}$, $V_c=2\text{V}$ | | | |
| Circuit Current at Output OFF | $I_q (\text{OFF})$ | | | 1 | | | 1 | | | 1 | μA |
| | Conditions | $V_{\text{IN}}=3.3\text{V}$, $V_c=0\text{V}$ | | | $V_{\text{IN}}=3.3\text{V}$, $V_c=0\text{V}$ | | | $V_{\text{IN}}=5\text{V}$, $V_c=0\text{V}$ | | | |
| Temperature Coefficient of Output Voltage | $\Delta V_o/\Delta T_a$ | | ± 0.3 | | | ± 0.3 | | | ± 0.3 | | mV/ $^\circ\text{C}$ |
| | Conditions | $T_j=0$ to 100°C ($V_o=2.5\text{V}$) | | | $T_j=0$ to 100°C | | | $T_j=0$ to 100°C | | | |
| Ripple Rejection | R_{REJ} | | 55 | | | 55 | | | 55 | | dB |
| | Conditions | $V_{\text{IN}}=3.3\text{V}$, $f=100$ to 120Hz ($V_c=2.5\text{V}$) | | | $V_{\text{IN}}=3.3\text{V}$, $f=100$ to 120Hz | | | $V_{\text{IN}}=5\text{V}$, $f=100$ to 120Hz | | | |
| Overcurrent Protection Starting Current ² | I_{S1} | 1.2 | | | 1.2 | | | 1.2 | | | A |
| | Conditions | $V_{\text{IN}}=3.3\text{V}$ ($V_c=2.5\text{V}$) | | | $V_{\text{IN}}=3.3\text{V}$ | | | $V_{\text{IN}}=5\text{V}$ | | | |
| 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 | $V_c=2\text{V}$ | | | | | | | | | |
| | Control Current (Output OFF) | I_c, IL | -5 | 0 | | -5 | 0 | | -5 | 0 | |
| Conditions | $V_c=0\text{V}$ | | | | | | | | | | |

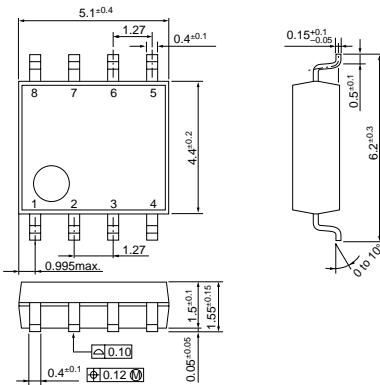
*1: Refer to the Dropout Voltage parameter.

*2: The I_{S1} is specified at the 5% drop point of output voltage V_o on the condition that $V_{\text{IN}} = V_o + 1 \text{ V}$, and $I_o = 10 \text{ mA}$.

*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)

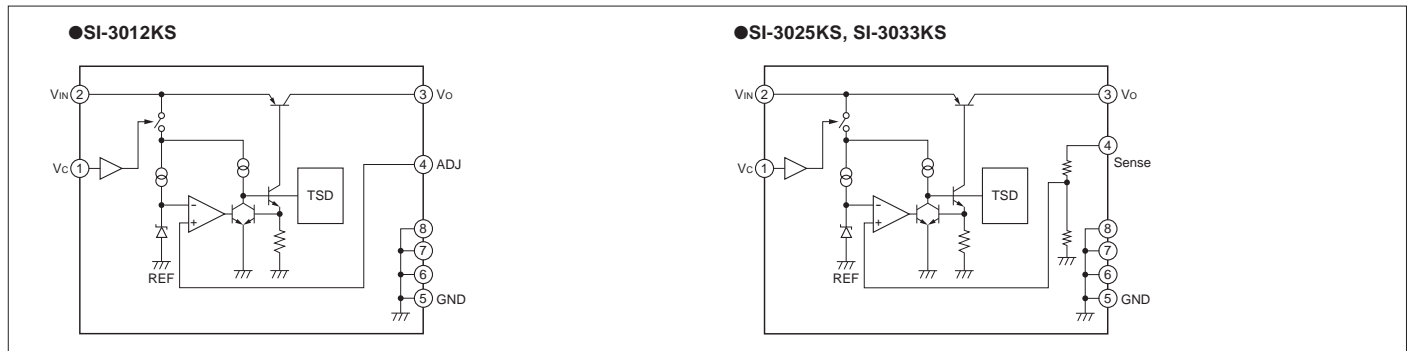


Pin Assignment

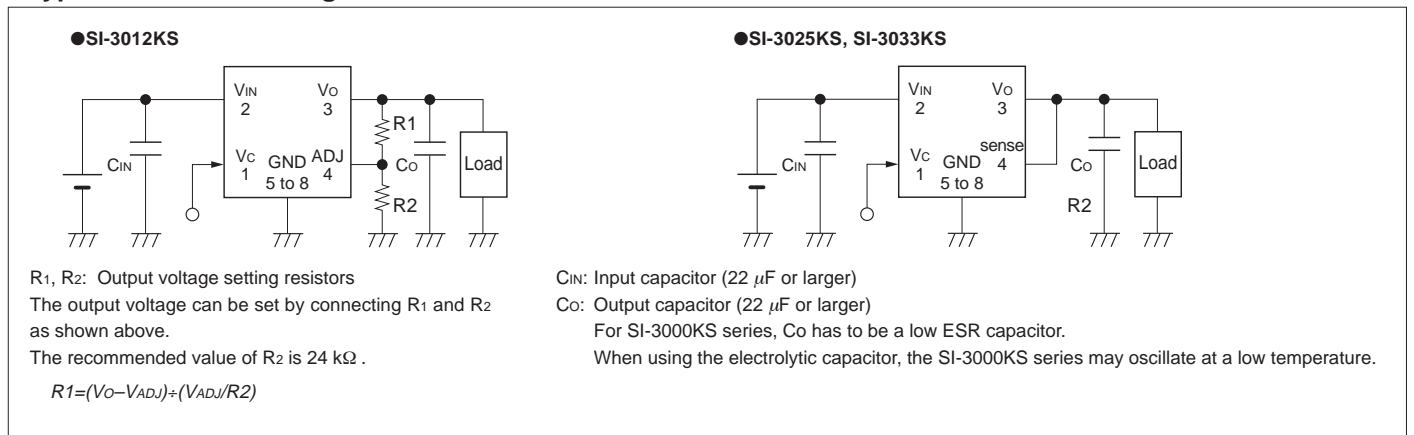
- ① Vc
- ② VIN
- ③ Vo
- ④ Sense (ADJ for SI-3012KS)
- ⑤ GND
- ⑥ GND
- ⑦ GND
- ⑧ GND

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

Block Diagram



Typical Connection Diagram



Reference Data

