



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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SAI Series Surface-Mount, Separate Excitation Step-down Switching Mode Regulator ICs

■ Features

- Surface-mount power package
- Output current: 0.4 to 0.5A
- High efficiency: 75 to 88%
- Requires only 4 discrete components
- Internally-adjusted phase correction and output voltage
- Built-in reference oscillator (60kHz)
- Built-in overcurrent and thermal protection circuits

■ Line up

Part Number	SAI01	SAI02	SAI03
V _o (V)	5.0	3.3	12.0
I _o (A)	0.5		0.4

■ Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V _{IN}	35	V
Power Dissipation	P _D	0.75	W
Junction Temperature	T _J	+125	°C
Storage Temperature	T _{stg}	-40 to +125	°C
Thermal Resistance(junction to case)	θ _{J-C}	20	°C/W

■ Applications

- Power supplies for telecommunication equipment
- Onboard local power supplies

■ Recommended Operating Conditions

Parameter	Symbol	Ratings			Unit
		SAI01	SAI02	SAI03	
DC Input Voltage Range	V _{IN}	7 to 33	5.3 to 28	15 to 33	V
Output Current Range	I _o	0 to 0.5			A
Operating Junction Temperature Range	T _{JOP}	-30 to +125			°C

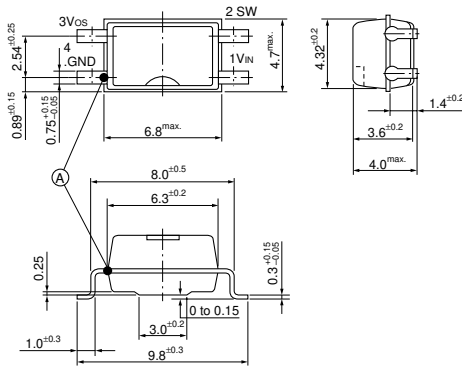
■ Electrical Characteristics

(T_a=25°C)

Parameter	Symbol	Ratings									Unit
		SAI01			SAI02			SAI03			
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Output Voltage	V _o	4.80	5.00	5.20	3.17	3.30	3.43	11.40	12.00	12.60	V
	Conditions	V _{IN} =20V, I _o =0.3A			V _{IN} =15V, I _o =0.3A			V _{IN} =24V, I _o =0.3A			
Efficiency	η	80			75			88			%
	Conditions	V _{IN} =20V, I _o =0.3A			V _{IN} =15V, I _o =0.3A			V _{IN} =24V, I _o =0.3A			
Oscillation Frequency	f	60			60			60			kHz
	Conditions	V _{IN} =20V, I _o =0.3A			V _{IN} =15V, I _o =0.3A			V _{IN} =24V, I _o =0.3A			
Line Regulation	ΔV _{OLINE}	80			60			100			mV
	Conditions	V _{IN} =10 to 30V, I _o =0.3A			V _{IN} =8 to 28V, I _o =0.3A			V _{IN} =18 to 30V, I _o =0.3A			
Load Regulation	ΔV _{OLOAD}	30			20			70			mV
	Conditions	V _{IN} =20V, I _o =0.1 to 0.4A			V _{IN} =15V, I _o =0.1 to 0.4A			V _{IN} =24V, I _o =0.1 to 0.4A			
Temperature Coefficient of Output Voltage	ΔV _O /ΔT _a	±0.5			±0.5			±1.5			mV/°C
	R _{REJ}	45			45			45			
Ripple Rejection	f	100 to 120Hz			100 to 120Hz			100 to 120Hz			dB
	Conditions	f=100 to 120Hz			f=100 to 120Hz			f=100 to 120Hz			
Overcurrent Protection Starting Current	I _{SI}	0.55			0.55			0.45			A
	Conditions	V _{IN} =10V			V _{IN} =8V			V _{IN} =18V			

External Dimensions (PS4)

(unit : mm)



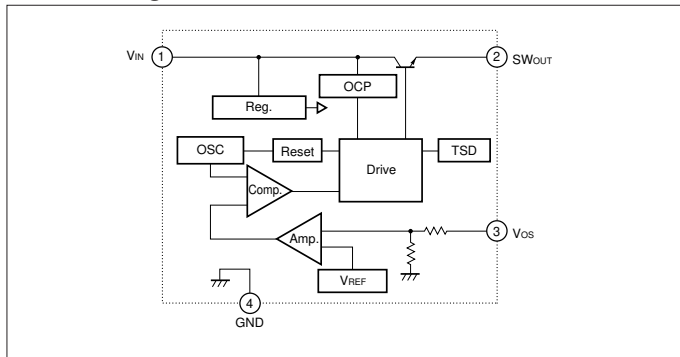
Ⓐ Case Temperature Measuring Point

Pin Assignment

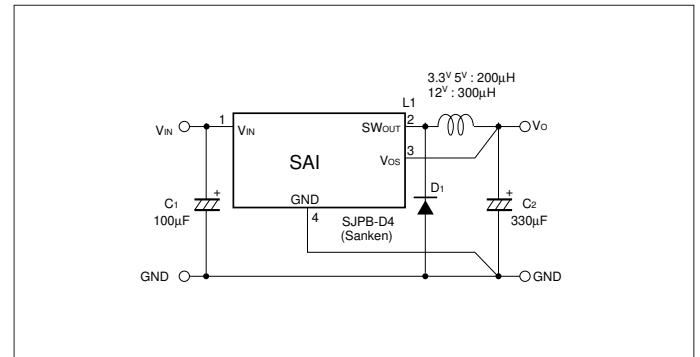
- ① VIN
- ② SWout
- ③ Vos
- ④ GND

Plastic Mold Package Type
 Flammability: UL94V-0
 Product Mass: Approx. 0.22g

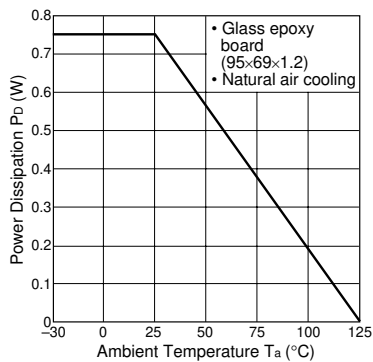
Block Diagram



Typical Connection Diagram



Ta-Pd Characteristics



$$P_D = V_O \cdot I_O \left(\frac{100}{\eta \chi} - 1 \right) - V_F \cdot I_O \left(1 - \frac{V_O}{V_{IN}} \right)$$

The efficiency depends on the input voltage and the output current. Therefore, obtain the value from the efficiency graph and substitute the percentage in the formula above.

- VO : Output voltage
- IO : Output current
- ηχ : Efficiency (%)
- VF : Diode D1 forward voltage
SJPB-D4-0.3V

Thermal design for D1 must be considered separately.