

SI-3000LSA Series

Surface-Mount, Low Current Consumption, Low Dropout Voltage Dropper Type

■Features

- Compact surface-mount package (SOP-8)
- Output current: 1 A
- Low current consumption: $I_{Q(Off)}$ (1 μA ($V_C = 0 V$))
- Low dropout voltage: $V_{DIF} \leq 0.8 V$ (at $I_O = 1 A$) for SI-3018LSA
 $V_{DIF} \leq 1.2 V$ ($I_O = 1 A$) for SI-3018LSA
- 4 types of output voltages (1.8 V, 2.5 V, 3.3 V, 5.0 V) available
- Output ON/OFF control compatible with LS-TTL
- Built-in foldback overcurrent, thermal protection circuits

■Applications

- Auxiliary power supply for PC
- Battery-driven electronic equipment



■Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V_{IN}	16	V
DC Output Current	I_O	1	A
Power Dissipation	P_{D1}^{*1}	1.16	W
	P_{D2}^{*2}	1.1	W
Junction Temperature	T_J^{*3}	-30 to +150	°C
Ambient Operating Temperature	T_{op}	-30 to +150	°C
Storage Temperature	T_{stg}	-30 to +150	°C
Thermal Resistance (Junction to Lead (pin 8))	θ_{J-L}	36	°C/W
Thermal Resistance (Junction to Ambient Air)	θ_{J-a}^{*2}	100	°C/W

*1: When mounted on glass-epoxy board 56.5 × 56.5 mm (copper laminate area 100%)

*2: When mounted on glass-epoxy board 40 × 40 mm (copper laminate area 100%).

*3: Thermal protection circuits may operate if the junction temperature exceeds 135°C

■Recommended Operating Conditions

Parameter	Symbol	Ratings				Unit
		SI-3018LSA	SI-3025LSA	SI-3033LSA	SI-3050LSA	
DC Input Voltage Range	V_{IN}	3.1 to 3.5 ^{*1}	^{*2} to 3.5 ^{*1}	^{*2} to 5.2 ^{*1}	^{*2} to 8.0	V
DC Output Current Range	I_O	0 to 1				A
Operating Junction Temperature	T_{Jop}	-20 to +125				°C
Ambient Operating Temperature	T_{aop}	-30 to +85				°C

*1: V_{IN} (max) and I_O (max) are restricted by the relationship $P_D = (V_{IN} - V_O) \times I_O$.
Calculate these values referring to the reference data.

*2: Refer to the dropout voltage section.

■Electrical Characteristics

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

Parameter		Symbol	Ratings												Unit
			SI-3018LSA			SI-3025LSA			SI-3033LSA			SI-3050LSA			
			min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Output Voltage		V _O	1.764	1.800	1.836	2.450	2.500	2.550	3.234	3.300	3.366	4.90	5.00	5.10	V
		Conditions	V _{IN} =3.3V, I _O =0.5A			V _{IN} =3.3V, I _O =0.5A			V _{IN} =5V, I _O =0.5A			V _{IN} =6.5V, I _O =0.5A			
Dropout Voltage		V _{DIF}		–				0.4			0.4			0.4	V
		Conditions	–			I _O ≤0.5A			I _O ≤0.5A			I _O ≤0.5A			
				0.6	1.2			0.8			0.8			0.8	
		Conditions	I _O ≤1A												
Line Regulation		ΔV _{LINE}		2	10		2	10		3	10			15	mV
		Conditions	V _{IN} =3.1 to 3.5V, I _O =0.3A			V _{IN} =3.1 to 3.5V, I _O =0.3A			V _{IN} =4.5 to 5.5V, I _O =0.3A			V _{IN} =6 to 7V, I _O =0.3A			
Load Regulation		ΔV _{LOAD}		10	20		10	20		10	20			30	mV
		Conditions	V _{IN} =3.3V, I _O =0 to 1A			V _{IN} =3.3V, I _O =0 to 1A			V _{IN} =5V, I _O =0 to 1A			V _{IN} =6.5V, I _O =0 to 1A			
Temperature Coefficient of Output Voltage		ΔV _O /ΔT _a		±0.3			±0.3			±0.3			±0.5		mV/°C
		Conditions	V _{IN} =3.3V, I _O =5mA, T _J =0 to 100°C			V _{IN} =3.3V, I _O =5mA, T _J =0 to 100°C			V _{IN} =5V, I _O =5mA, T _J =0 to 100°C			V _{IN} =6.5V, I _O =5mA, T _J =0 to 100°C			
Ripple Rejection		R _{REJ}		60			57			55			55		dB
		Conditions	V _{IN} =3.3V, f=100 to 120Hz			V _{IN} =3.3V, f=100 to 120Hz			V _{IN} =5V, f=100 to 120Hz			V _{IN} =6.5V, f=100 to 120Hz			
Quiescent Circuit Current		I _q		1.7	2.5		1.7	2.5		1.7	2.5		1.7	2.5	mA
		Conditions	V _{IN} =3.3V, I _O =0A			V _{IN} =3.3V, I _O =0A			V _{IN} =5V, I _O =0A			V _{IN} =6.5V, I _O =0A			
OFF Circuit Current		I _q (OFF)			1			1			1			1	μA
		Conditions	V _{IN} =3.3V, I _O =0A, V _C =0V			V _{IN} =3.3V, I _O =0A, V _C =0V			V _{IN} =5V, I _O =0A, V _C =0V			V _{IN} =6.5V, I _O =0A, V _C =0V			
Overcurrent Protection Starting Current ^{*1,3}		I _{S1}	1.2			1.2			1.2			1.2			A
		Conditions	V _{IN} =3.3V			V _{IN} =3.3V			V _{IN} =5V			V _{IN} =6V			
V _C Pin	Control Voltage (Output ON) ^{*2}	V _C , I _H	2.0			2.0			2.0			2.0			V
	Control Voltage (Output OFF) ^{*2}	V _C , I _L			0.8			0.8			0.8			0.8	
	Control Current (Output ON)	I _C , I _H		40	80		40	80		40	80		40	80	μA
	Conditions	V _C =2V													
	Control Current (Output OFF)	I _C , I _L		0	–5		0	–5		0	–5		0	–5	μA
	Conditions	V _C =0V													
Output OFF Voltage		V _O			0.5			0.5			0.5			0.5	V
		Conditions	V _{IN} =3.3V, I _O =0A			V _{IN} =3.3V, I _O =0A			V _{IN} =5V, I _O =0A			V _{IN} =6.5V, I _O =0A			

*1: Is1 is specified as the 5% drop point of output voltage Vo on the condition that VIN = 3.3 V (5 V for SI-3033LSA), and Io = 0.5 A.

*2: Output is OFF when the output control terminal Vc is open. Each input level is equivalent to that for LS-TTL. Therefore, it is possible to be driven directly by an LS-TTL circuit.

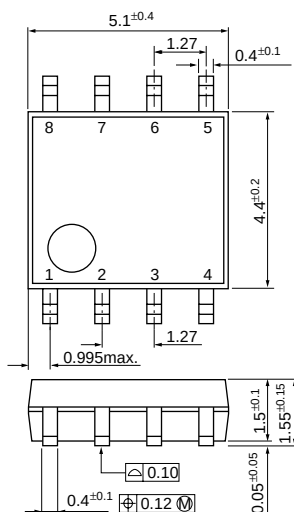
The SI-3000LSA series employs a foldback-type overcurrent protection circuit.

*3: In applications in which a certain current is required for start-up, this circuit may cause a start-up error, and therefore the SI-3000LSA series is not recommended for use in such applications.

(1) Constant current load (2) Dual polarity power supply (3) Series power supply (4) Vo adjustment by raising ground voltage

■External Dimensions

(Unit : mm)



Pin Arrangement

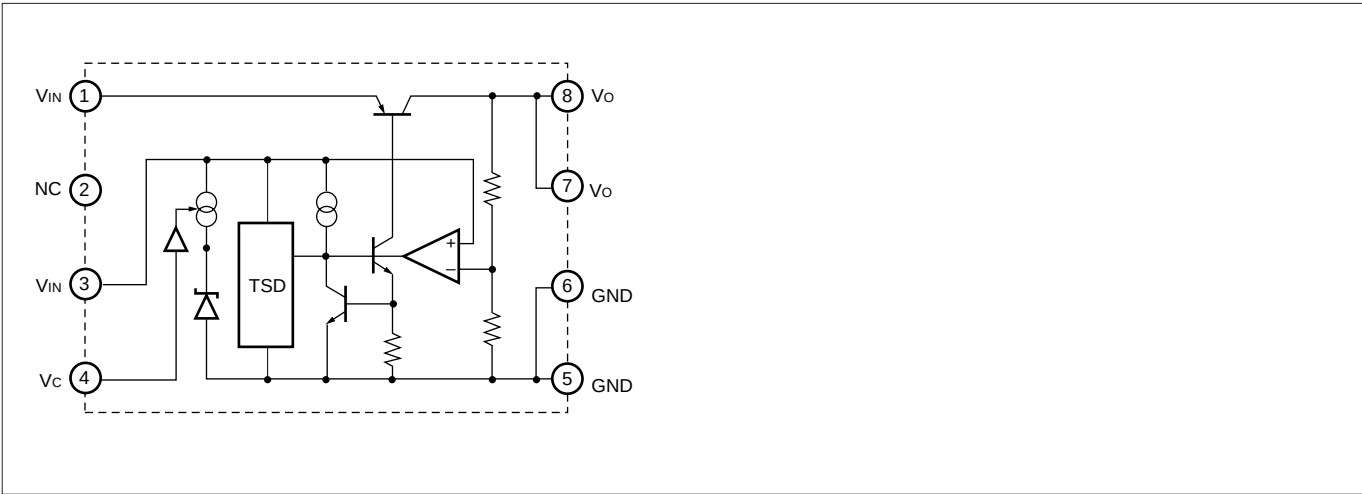
- ① VIN
- ② NC (Leave open)
- ③ VIN
- ④ Vc
- ⑤ GND
- ⑥ GND
- ⑦ Vo
- ⑧ Vo

Plastic Mold Package Type

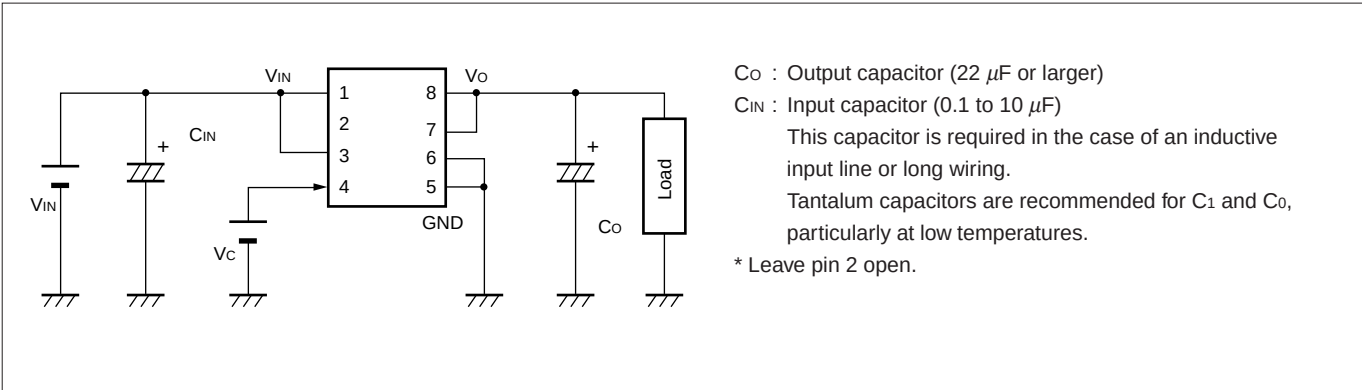
Flammability: UL94V-0

Weight: Approx. 0.1g

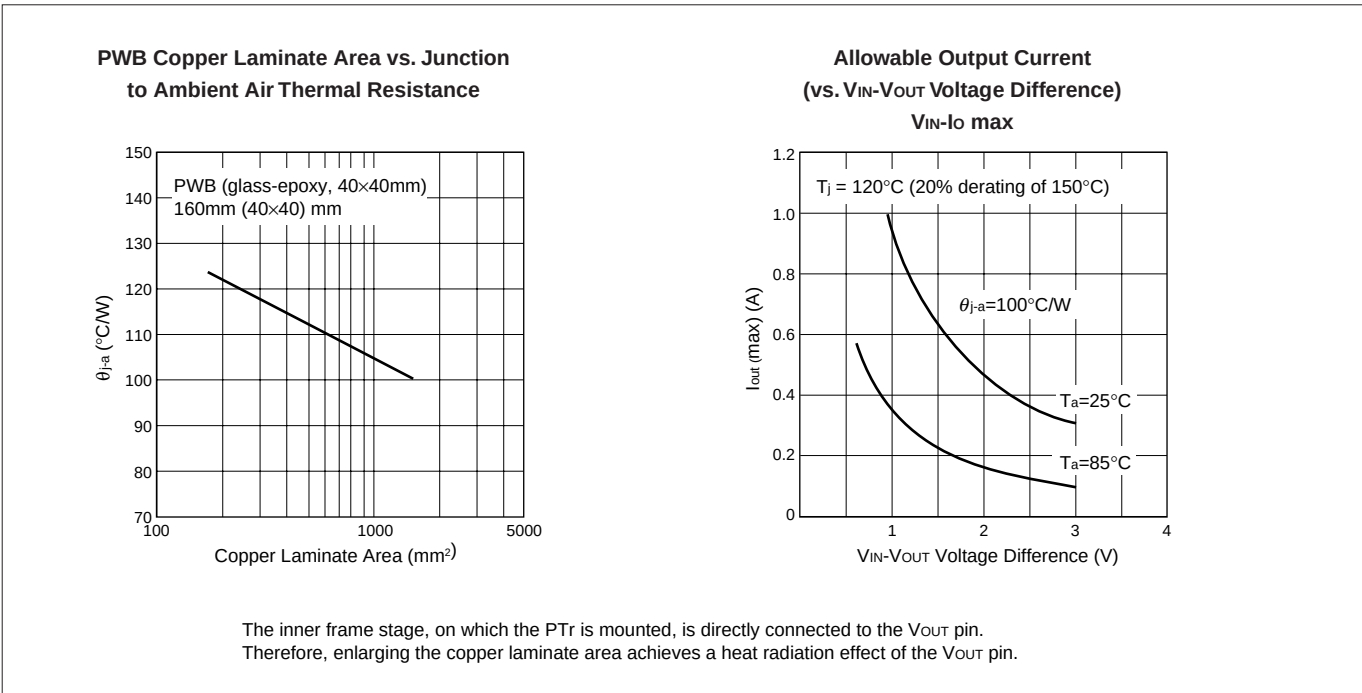
■Block Diagram



■Standard External Circuit



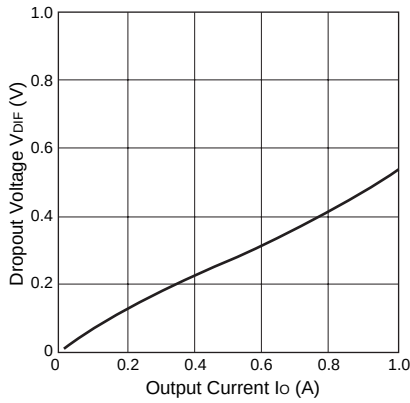
■Reference Data



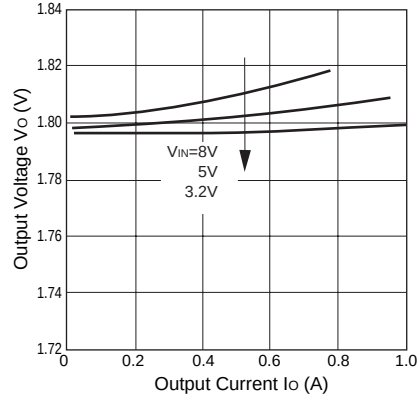
■Typical Characteristics of SI-3018LSA

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

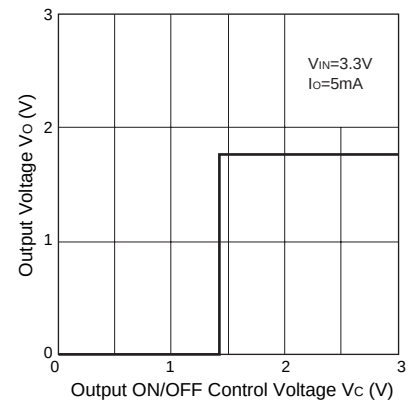
I_o vs. V_{DIF} Characteristics



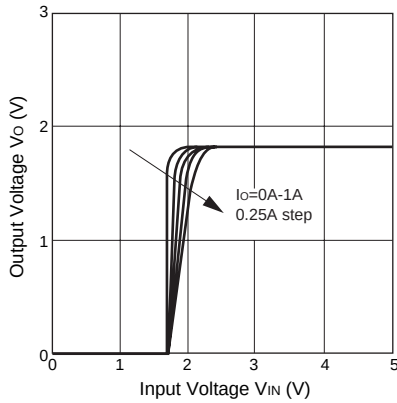
Load Regulation



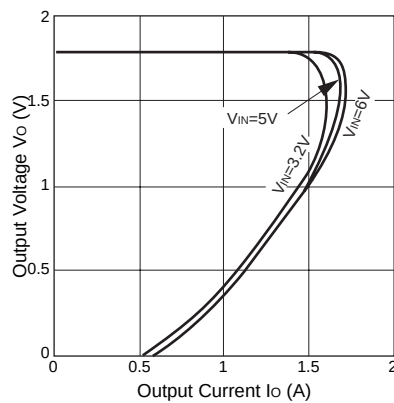
Output ON/OFF Control



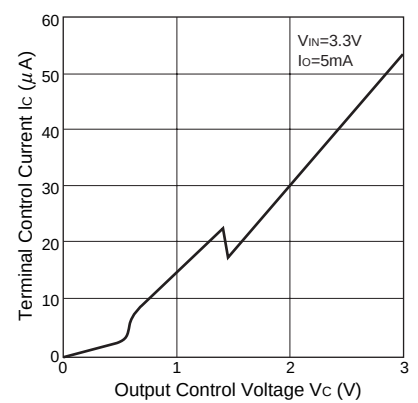
Output Voltage Characteristics



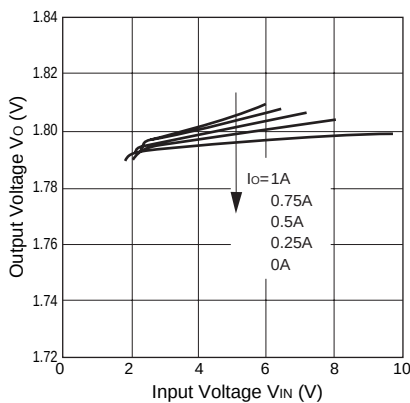
Overcurrent Protection Characteristics



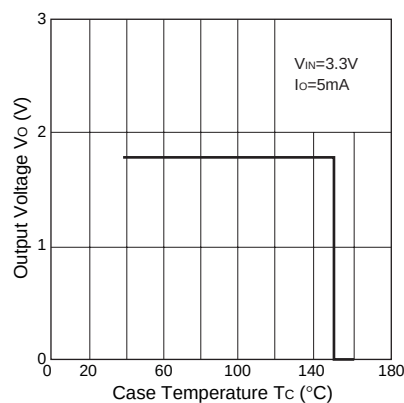
Output ON/OFF Control Current



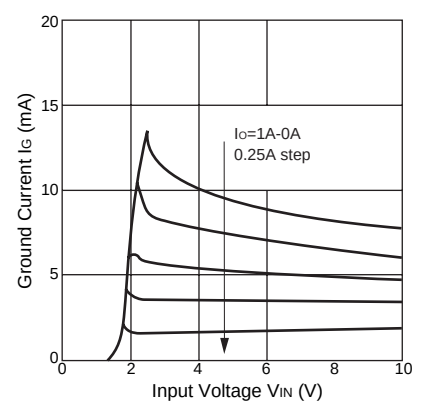
Line Regulation



Thermal Protection Characteristics



Circuit Current



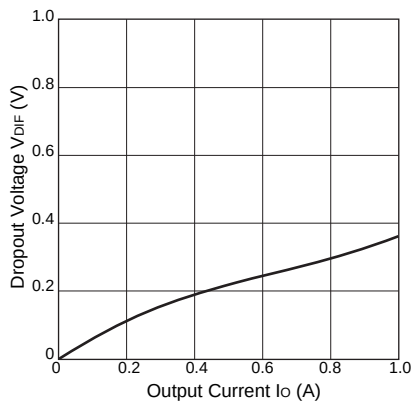
[Note on Thermal Protection]

The thermal protection circuit is intended for protection against heat during instantaneous short-circuiting. Its operation is not guaranteed for continuous heating conditions such as short-circuiting over extended periods of time.

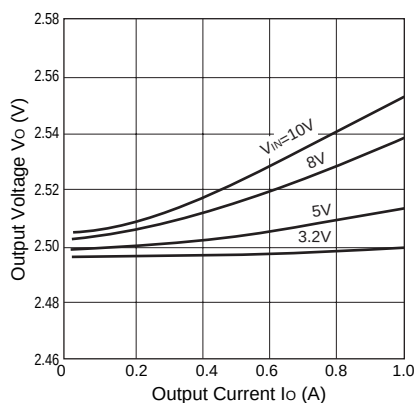
■Typical Characteristics of SI-3025LSA

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

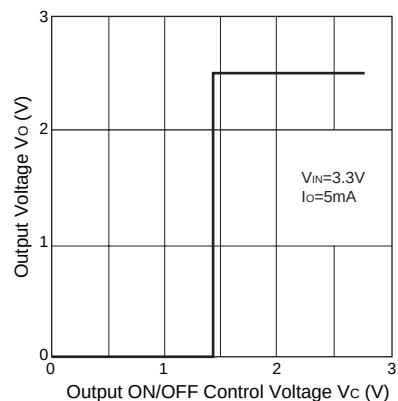
I_o vs. V_{DIF} Characteristics



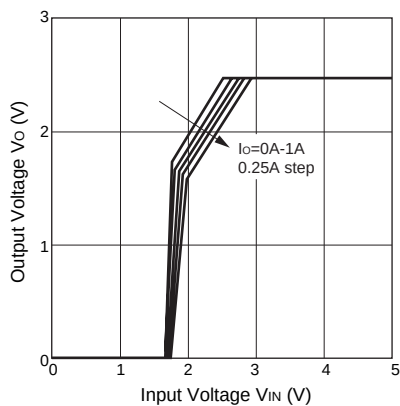
Load Regulation



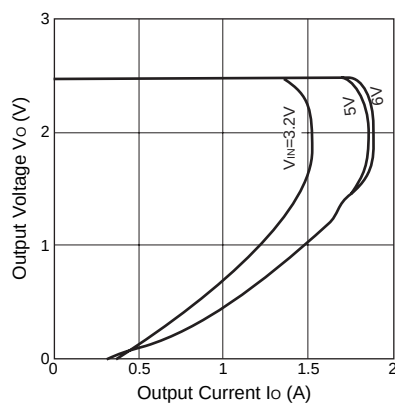
Output ON/OFF Control



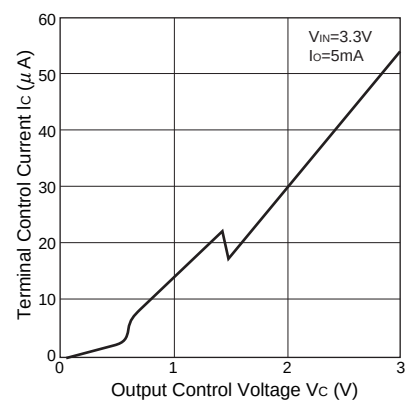
Output Voltage Characteristics



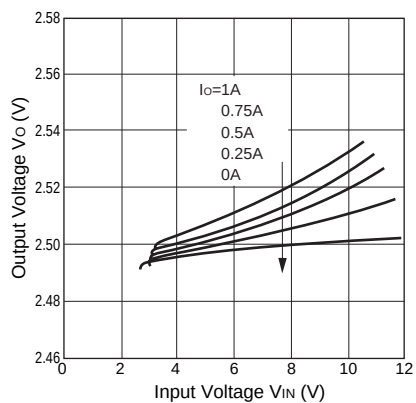
Overcurrent Protection Characteristics



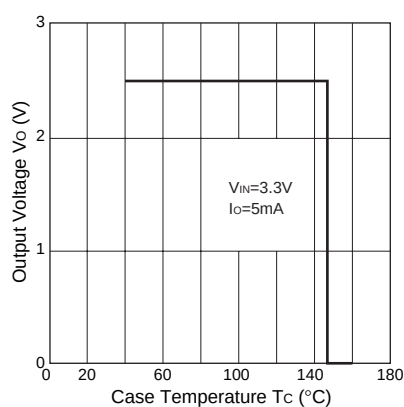
Output ON/OFF Control Current



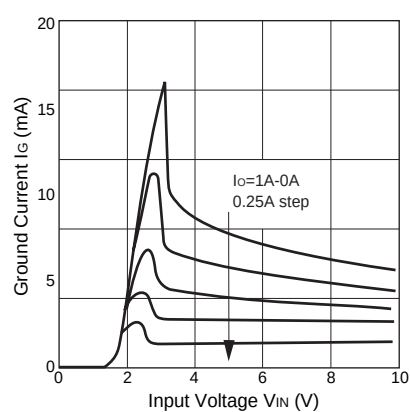
Line Regulation



Thermal Protection Characteristics



Circuit Current



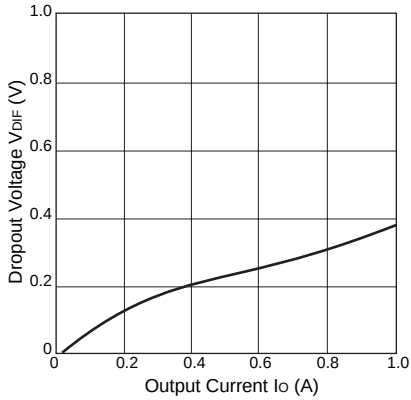
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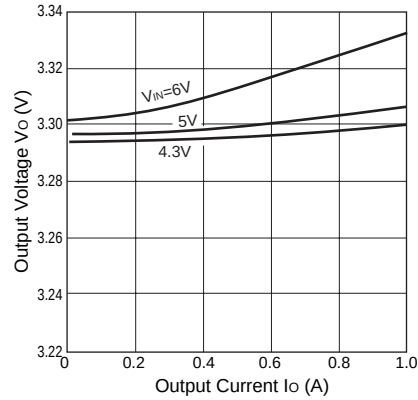
■Typical Characteristics of SI-3033LSA

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

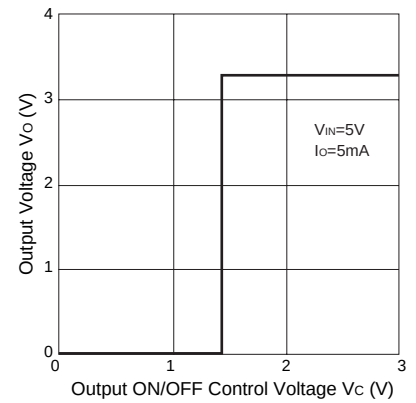
I_o vs. V_{DIF} Characteristics



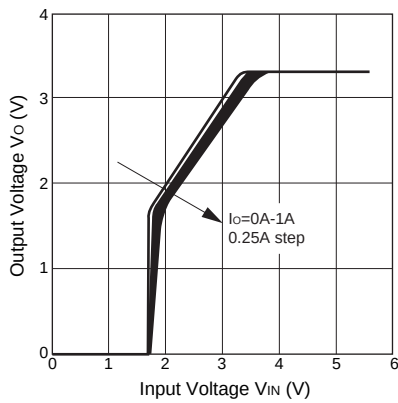
Load Regulation



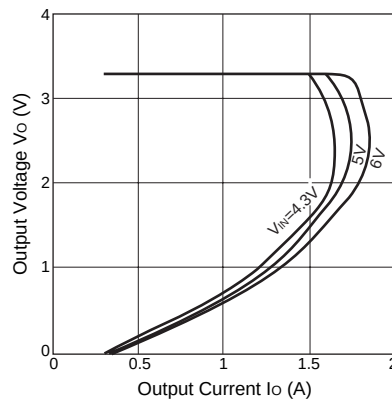
Output ON/OFF Control



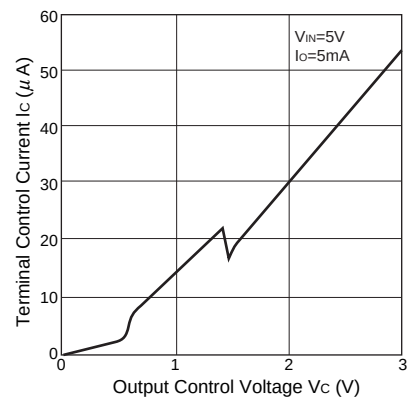
Output Voltage Characteristics



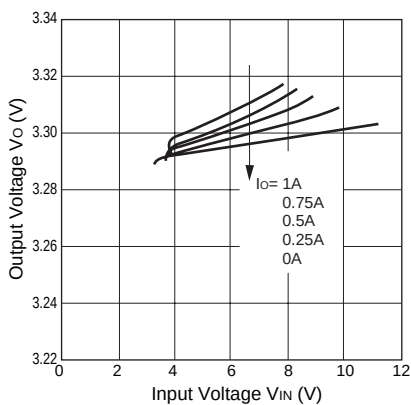
Overcurrent Protection Characteristics



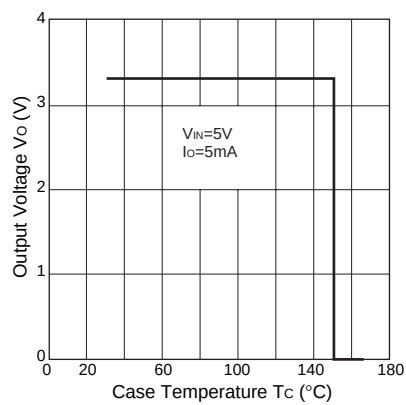
Output ON/OFF Control Current



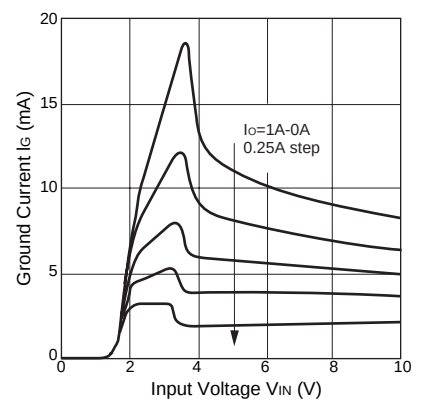
Line Regulation



Thermal Protection Characteristics



Circuit Current



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