POWER SUPPLY PWM SUPERVISOR SDC4818

General Description

The SDC4818 controller is designed for switching mode power supply for desktop PCs. Utilizing minimum number of external components, the SDC4818 includes all of the functions for push-pull and/or half-bridge topology,decreasing the production cost and PCB space, and increasing the MTBF for power supply.

Two internal TL431 shunt regulators provide stable reference voltage for 3.3V and 5Vstandby regulator.

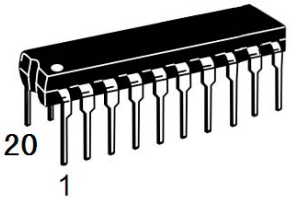
Applications

- ATX Power Supply
- SFX(MICRO-ATX) Power Supply
- NLX Power Supply

Features

- Over-voltage/Under-voltage protection for 3.3V/±5V/±12V
- Over-power protection
- Short-circuit protection
- AC input under voltage protection
- Power good circuitry
- PSON for remote controller
- Delay time for PSON and PG signal
- Two internal TL431 shunt regulators providestable reference voltage for 3.3V and 5Vstandby regulator
- Soft-start and maximum 93% duty cycle

Pin Configuration



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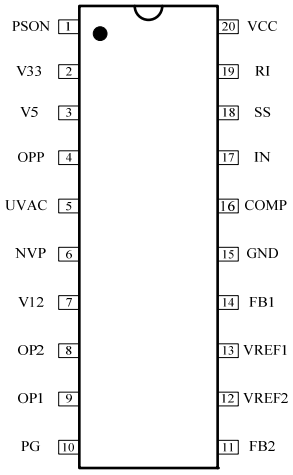


Figure 1. Pin Configuration

Pin Number	Pin Name	Function
1	PSON	Remote on/off input
2	V33	OVP/UVP sense input for 3.3V
3	V5	OVP/UVP sense input for 5V
4	OPP	Over-power sense input
5	UVAC	Power good detection input

6	NVP	UVP sense input for negative voltage
7	V12	OVP/UVP sense input for 12V
8	OP2	PWM totem-pole output 2
9	OP1	PWM totem-pole output 1
10	PG	Power good signal
11	FB2	Output for second Opamp loop
12	VREF2	Input for second Opamp loop
13	VREF1	Input for first Opamp loop
14	FB1	Output for first Opamp loop
15	GND	Ground
16	COMP	Error amplifier output
17	IN	Input of error amplifier
18	SS	The soft-start function set through an external capacitor
19	RI	Reference setting by an external resistor
20	VCC	Supply voltage

Table 1. Pin Description

Functional Block Diagram

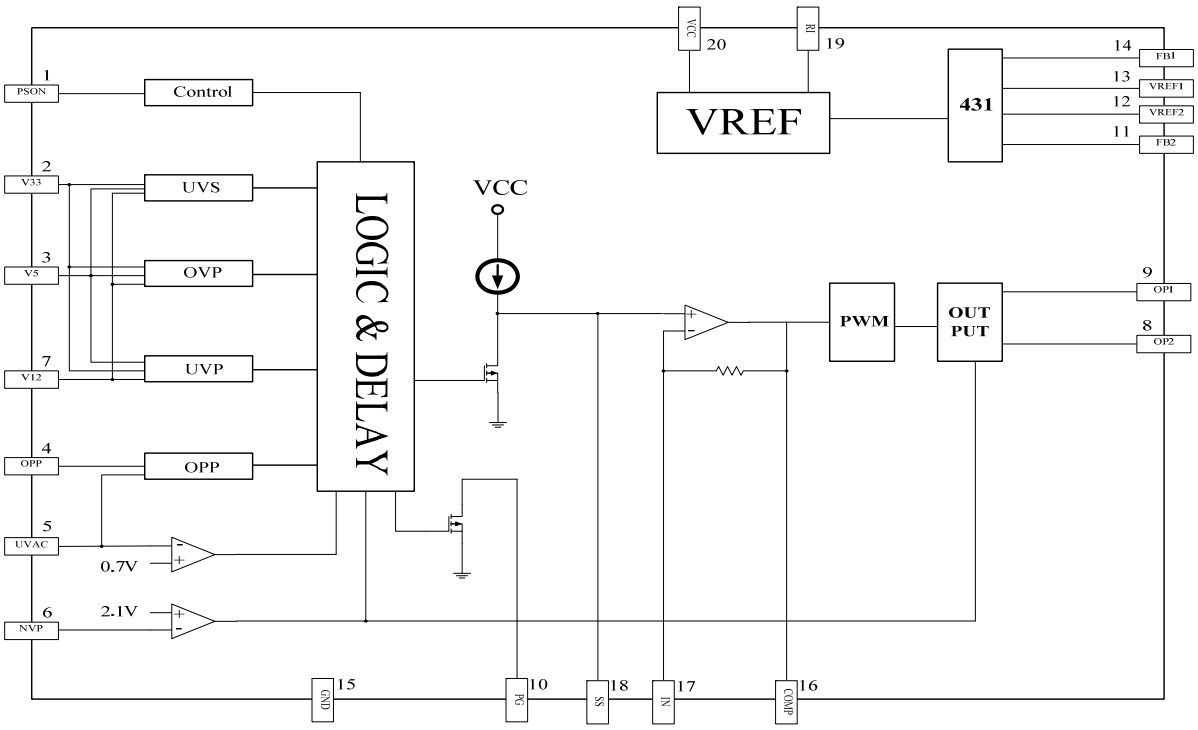


Figure 2.Functional Block Diagram

Absolute Maximum Ratings

（NOTE：Stresses greater than those listed under Absolute Maximum Ratings may cause permanent

damage to the device.）

Symbol	Parameter	Value	Unit
Vcc	Supply voltage	12	V
VFB	FB1，FB2 Output	16	V
IOUT	PG Output	30	mA
	FB1，FB2 Output	30	mA
PD	Power dissipation（Ta=25℃）	1.5	W
PD	Power dissipation（Ta=90℃）	0.5	W
RθJA	thermal resistance	82.5	℃/W
Tamb	Operating temperature	-30~+125	℃
TSTG	Storage temperature	-55~+155	℃

Table 2. absolute maximun ratings

Electrical Characteristics (Vcc=5.0V, Ta=25℃, unless otherwise specified）

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
VCC	Supply voltage		4.5	5.0	7.0	V
ICC	Standby supply current	PG=High	—	5	10	mA
VOVP1	3.3VOVP	—	3.9	4.1	4.3	V
VOVP2	5VOVP	—	5.8	6.1	6.5	V
VOVP3	12VOVP	—	13.9	14.5	14.9	V
VUVP1	3.3VUVP	—	2.0	2.6	2.8	V
VUVP2	5VUVP	—	3.0	3.6	3.9	V
VUVP3	12VUVP	—	6.0	7.2	8.0	V
VUVS1	3.3VUVS	—	2.5	2.8	3.0	V
VUVS2	5VUVS	—	4.0	4.3	4.5	V
VUVS3	12VUVS	—	9.4	10.1	10.4	V
VOPPS	Over power protection with delay time	VUVAC=1.5V	2.02	2.4	2.66	V
VNVP	Negative voltage protection	—	1.9	2.05	2.2	V
INVP	NVP Source current	RI=75KΩ	50	61	72	uA
TOVP	OVP debounce Time	RI=75KΩ	0.5	0.7	1.3	ms
TUVP	UVP debounce Time	RI=75KΩ	35	60	80	ms
TUVS	UVS debounce Time	RI=75KΩ	0.5	0.7	1.3	ms
TOPP	OPP debounce Time	RI=75KΩ	4.0	7.0	10.0	ms
TNVP	NVP debounce Time	RI=75KΩ	4.0	7.0	10.0	ms
REFERENCE						
VREF	Reference voltage	IFB=0.5mA, Ta=25℃	2.475	2.5	2.525	V
REGLI-FB	Regulation	4<VFB<16V	—	1	—	mV/V
IOUT-FB	Output pull current	VFB>2V	10	—	—	mA

PG						
TPG	PG delay time	RI=75KΩ	200	300	400	ms
VUVAC	UVAC sense voltage	—	0.65	0.7	0.75	V
TR	PG output rise time	CL=100pF,VPULLUP=5 V,RPULLUP=1KΩ	—	1	—	us
TF	PG output fall time		—	300	—	ns
VOL2	Output low voltage	IPG=5mA	—	—	0.5	V
ION2	Sink current of PG	VPG=5V	—	—	1	uA
REMOTE ON/OFF SECTION						
VPSON	PSON input voltage	—	1	1.4	2.0	V
IPSON	PSON drive current	—	—	—	0.5	mA
TPSON (ON)	PSON to ON debounce time	RI=75KΩ	20	40	50	ms
TPSON (OFF)	PSON to OFF debounce time	RI=75KΩ	10	20	30	ms
TPSOFF	PSON to OFF delay time	RI=75KΩ	2	4.8	6.5	ms
ERROR AMP SECTION						
V2.5	Reference voltage	—	2.45	2.5	2.55	V
IIB	Bias current	—	—	—	0.1	uA
AVOL	Open loop voltage gain	—	50	60	—	dB
BW	Unit gain bandwidth	—	0.3	1	—	MHz
PSRR	Power supply rejection ratio	—	50	—	—	dB
OSCILLATION SECTION						
FOSC	Oscillation frequency	RI=75KΩ	60	65	70	KHz
SOFT START SECTION						
ISS	Charge current	RI=75KΩ	4.0	5.7	7.0	uA
PWM OUTPUT SECTION						
VOL	Output voltage low	Io=5mA	—	0.25	0.5	V
VOH	Output voltage high	V12=12V	4	—	—	V
RO	Output restance	—	2.0	3.9	4.2	KΩ
DMAX	Max duty	—	85	—	93	%

Table 3. electrical characteristics

Function Description

The SDC4818 is a power management IC for computers. It integrates various monitoring functions and protections, such as AC fail detection, over power protection, negative voltage protection, over/under voltage protection and provides power down signal for PG. Built-in high precision oscillator provides accurate protection and delay time for monitoring. And internal regulators TL431 are used for stable output 3.3V and 5V standby, with few peripheral components. Built-in soft-start decreases stress of transformer against saturation. SD4818 used for pull-push or half-bridge power system with high efficiency and stability.

Remote Switch Control (PSON)

The PC generates the remote switch control signal which is connected to PSON. When the control signal is low, PC power is on. And when the control signal is high, PC power is off.

AC Fails Detection (UVAC)

The AC line voltage is coupled from the primary side to the secondary side through the main transformer, and UVAC is connected to the secondary side by a resistor. When UVAC voltage drops below 0.7V and maintains this situation over 200us, the PG signal will be pulled low , and it indicates that the AC line is power-down. The voltage amplitude of the PWM switching signal from the secondary side is proportional to the AC line voltage. Adjusting the ratio of the voltage divider can set the threshold for the power-down.

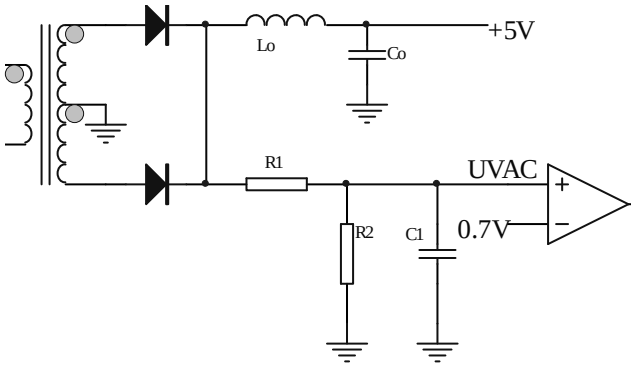


Figure 3. AC fails detection

Over Power Protection (OPP)

The over power protection is designed to detect over power and short circuit.. When the voltage of OPP is higher than 2.4V and maintain this situation over 7msec, PG will be pulled low and the power outputs will be locked.

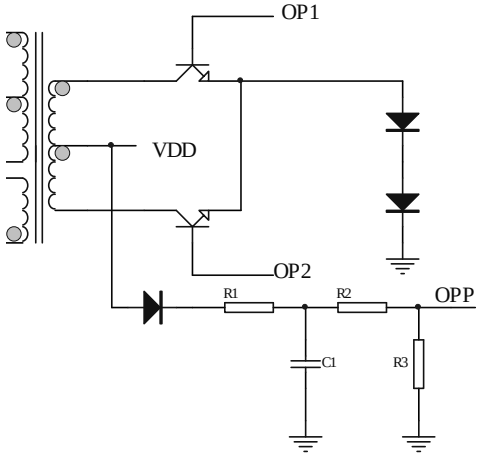


Figure 4. over power protection

Negative Voltage Protection (NVP)

The negative voltage protection is designed to provide under voltage protection for negative voltage output. Overload and short circuit can cause under voltage of negative voltage output.. When the voltage of NVP is higher than 2.1V and this situation exists for longer than 7msec, the power outputs will be off and be locked. Adjusting the resistor will set the threshold for locking the power outputs off. The threshold is determined by:

$V_{NVP}=I_{NVP}\times (R_1+R_2)+V_{-12V}$

$V_{NVP}=I_{NVP}\times R_1+V_{-5V}-0.7V$

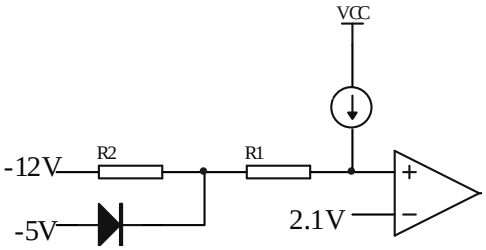


Figure 5. negative voltage protection

Timing Diagram

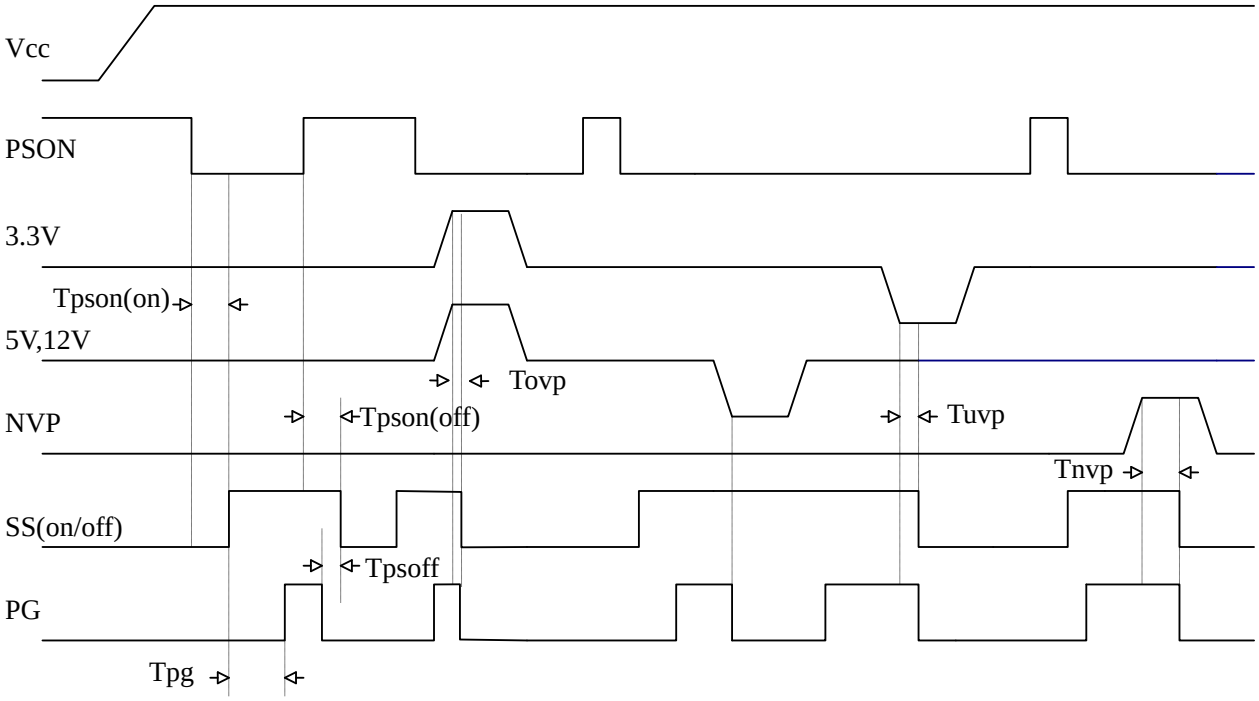


Figure 6

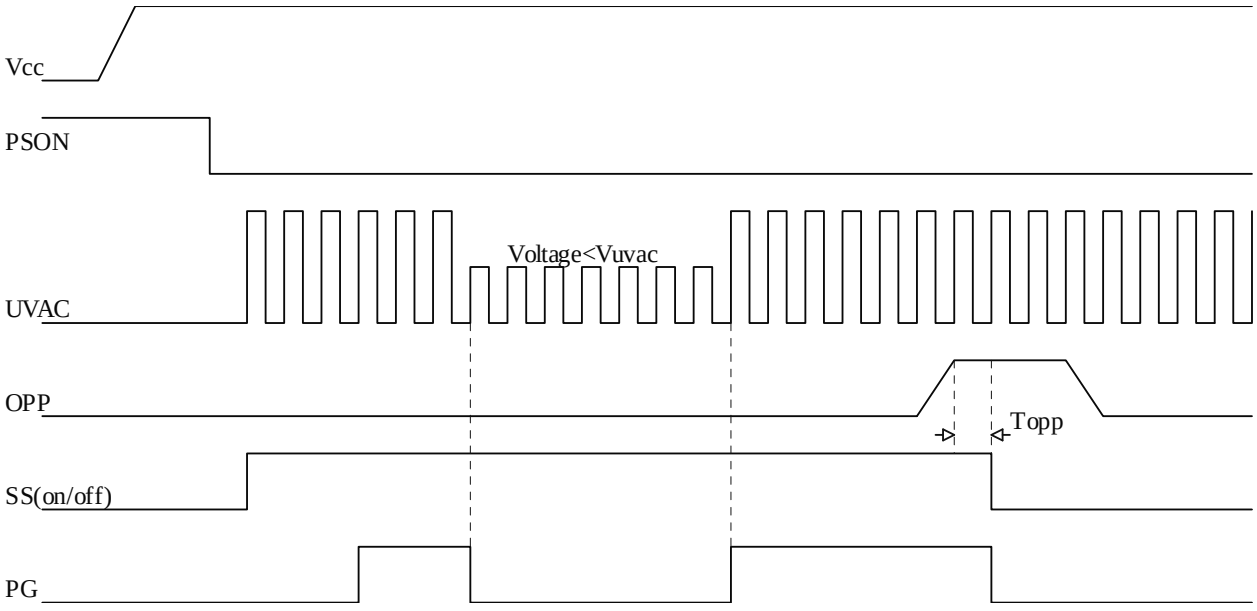
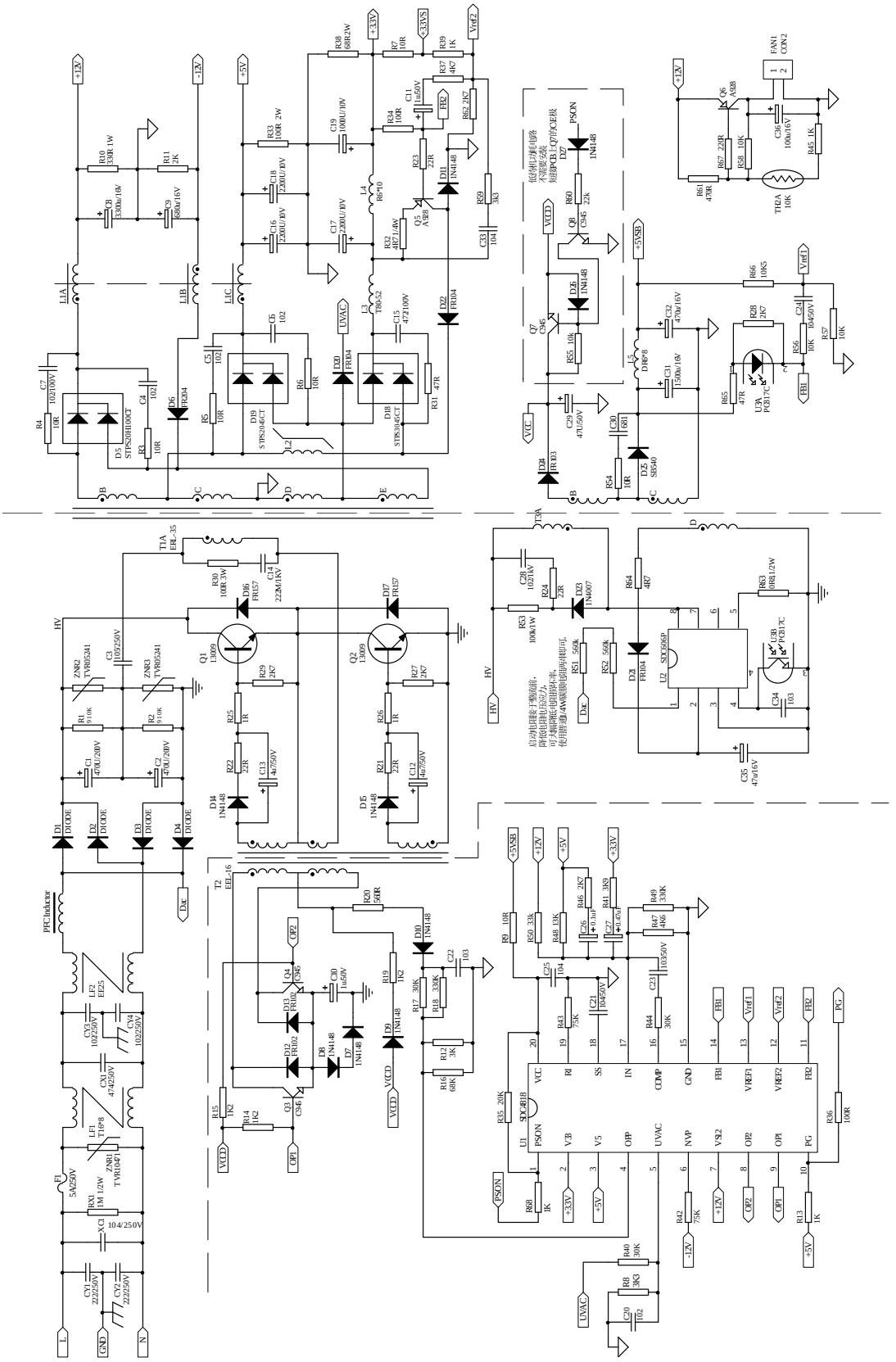


Figure 7

POWER SUPPLY PWM SUPERVISOR **SDC4818**

Typical Application



Package Dimension

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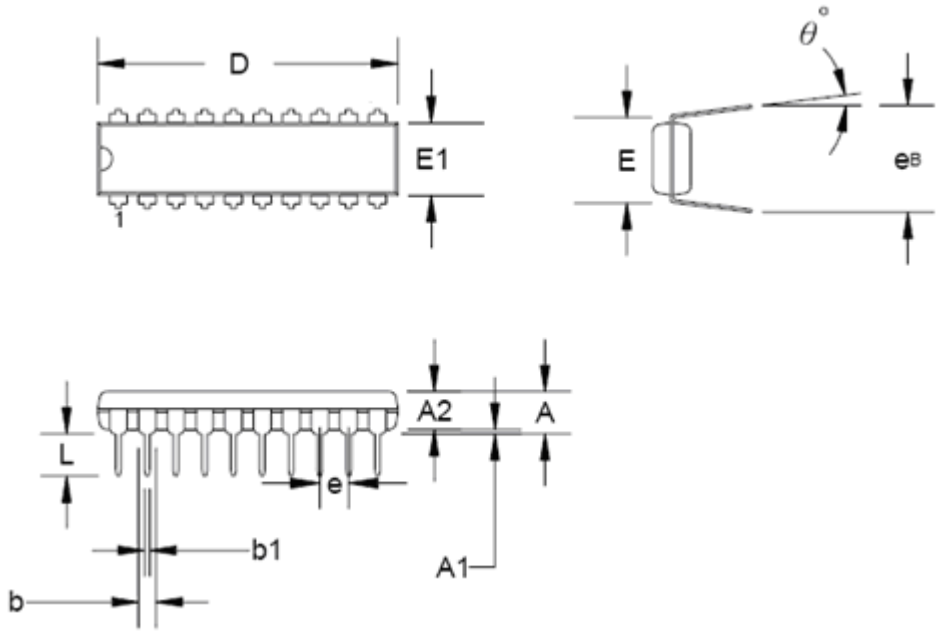

SYMBOL	mm			inch		
	MIN	TYP	MAX	MIN	TYP	MAX
A			5.334			0.210
A1	0.381			0.015		
A2	3.175	3.302	3.429	0.125	0.130	0.135
B		1.524			0.060	
b1		0.457			0.018	
D	24.892	26.162	26.924	0.980	1.030	1.060
E		7.620			0.300	
E1	6.233	6.350	6.477	0.245	0.250	0.255
E		2.540			0.100	
L	2.921	3.302	3.810	0.115	0.130	0.150
Eb	8.509	9.017	9.525	0.335	0.355	0.375
θ(单位：度)	0	7	15	0	7	15

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