

Super-Small Package PWM Control Step-up Switching Regulator

General Description

The LN2266 is a compact, high efficiency, and low voltage step-up DC/DC converter with an Adaptive Current Mode PWM control loop, includes an error amplifier, ramp generator, comparator, switch pass element and driver in which providing a stable and high efficient operation over a wide range of load currents. It operates in stable waveforms without external compensation.

The low start-up input voltage below 0.9V makes LN2266 suitable for 1 to 4 battery cells applications of providing up to 1100mA output current. Besides, the 17 μ A low quiescent current together with high efficiency maintains long battery lifetime. The output voltage is set with two external resistors. Both internal 2.5A switch and driver for driving external power devices (NMOS or NPN) are provided.

Features

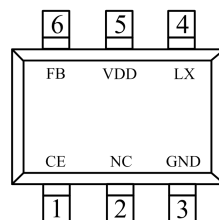
- 0.9V (I_{out}=1mA) Low start-up input voltage
- 1000kHz fixed switching frequency
- 90% efficiency

Ordering Information

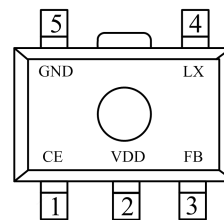
LN2266P①②③④

Designator	Symbol	Description	Designator	Symbol	Description
①	A	CE with EXT	③	M	SOT-23-6L
	B	CE without EXT		P	SOT-89-5L
②	1	Reference accuracy:±1%	④	R	Embossed Tape :Standard Feed
	2	Reference accuracy:±2%		L	Embossed Tape : Reverse Feed
	4	Reference accuracy:±4%			

Pin Configuration



SOT-23-6L
(Top View)



SOT-89-5L
(Top View)

- High supply capability to deliver 3.3V 300mA with 1 alkaline cell or deliver 5V 1100mA with 1 Li-ion Cell
- 17 μ A quiescent (switch-off) supply current
- 0.01 μ A shutdown mode supply current
- Providing flexibility for using internal and external power switches
- Output voltage: settable to between 2.0V to 6.0V ,accuracy of 2%

Applications

- MP3
- PDA
- DSC
- LCD panel
- RF-Tags
- Portable instrument
- Wireless equipment

Package

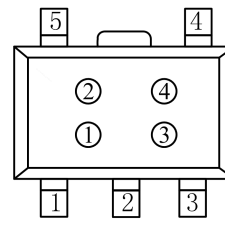
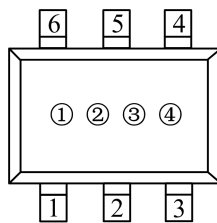
- SOT-23-6L
- SOT-89-5L

Pin Assignment

Pin Number		Pin Name	Function
SOT-23-6	SOT-89-5		
1	1	CE	Chip enable
2	-	NC	Floating or connected to GND
3	5	GND	Ground
4	4	LX	Pin for switching
5	2	VDD	Input positive power pin of LN2266
6	3	FB	Feedback input pin

Marking Rule

- SOT-23-6L, SOT-89-5L



- ① Represents the product name

Symbol	Product Name
A	LN2266P****

- ② Represents the type of regulator

Symbol	A	B
Type	CE with EXT	CE without EXT

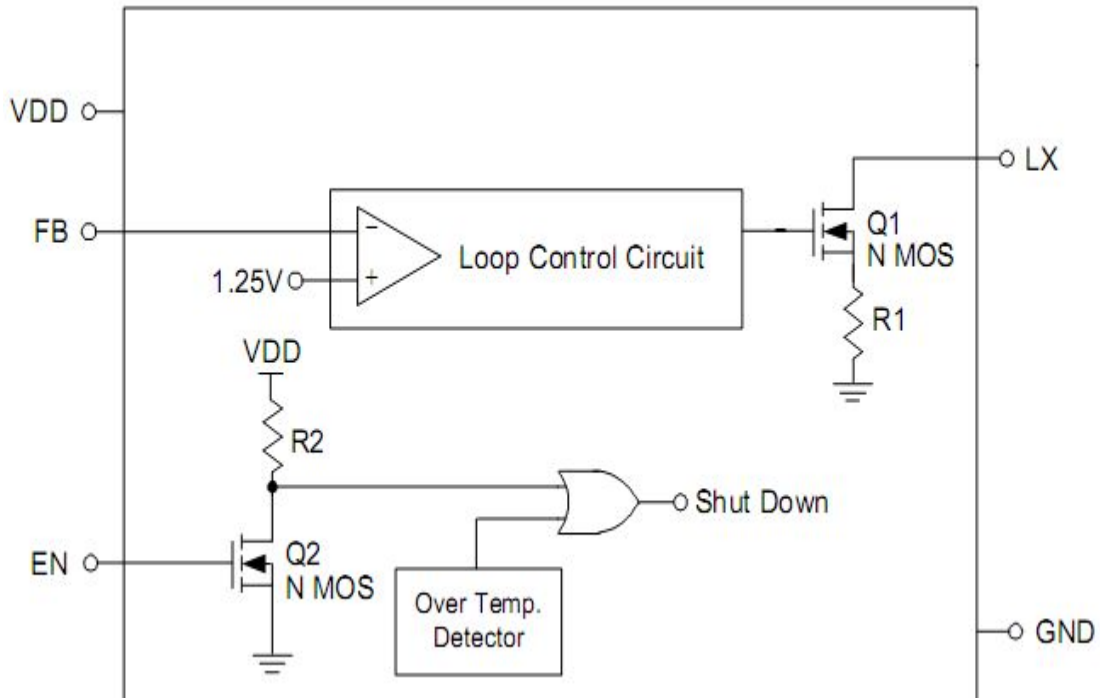
- ③ Represents the accuracy of reference voltage

Symbol	Reference Accuracy
1	1%
2	2%
4	4%

- ④ Represents the assembly lot No.

0-9, A-Z; 0-9, A-Z mirror writing, repeated (G, I, J, O, Q, W exception)

■ Function Block Diagram

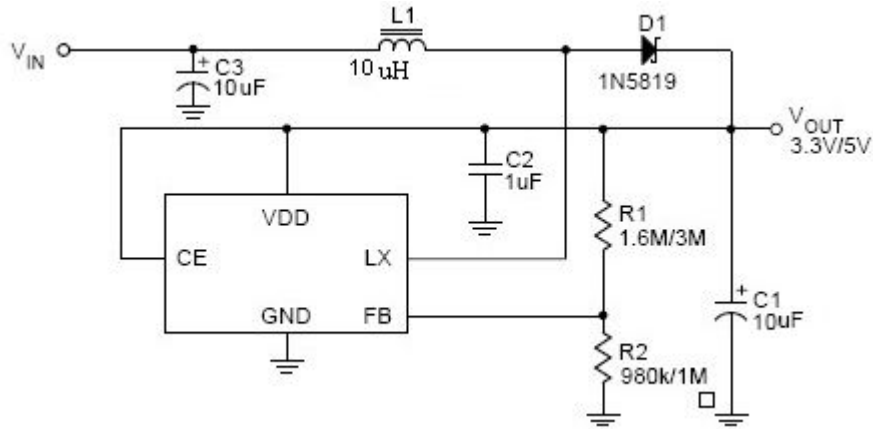


■ Absolute Maximum Ratings

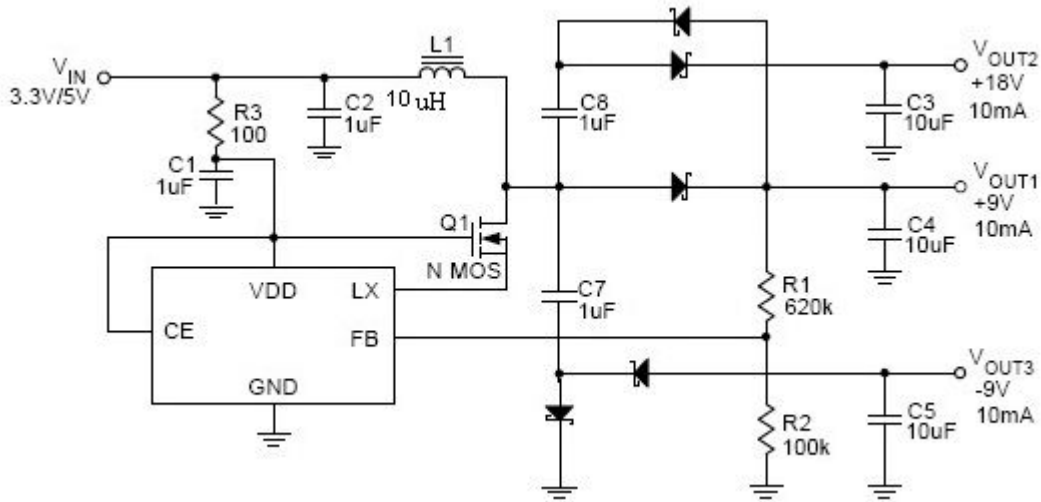
Parameter	Symbol	Maximum Rating	Unit	
Input voltage	V_{DD}	$V_{SS}-0.3 \sim V_{SS}+7$	V	
Output voltage	V_{OUT}	$V_{SS}-0.3 \sim V_{SS}+7$		
		V_{LX}	$V_{SS}-0.3 \sim V_{SS}+7$	
LX pin Switch Current	I_{LX}	2.5	A	
Power dissipation	PD	SOT-23-6	150	mW
		SOT-89-5	500	
Operating ambient temperature	T_{opr}	$-40 \sim +80$	°C	
Storage ambient temperature	T_{stg}	$-40 \sim +125$		

Caution : The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

■ Typical Application Circuit



Circuit 1. LN2266 Typical Application for Portable Instruments



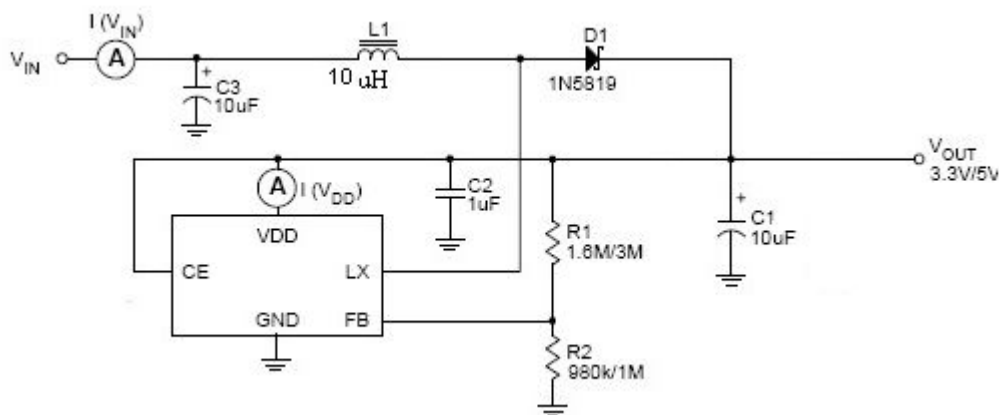
Circuit 2. LN2266 for multi-output Application

Electrical Characteristics

(VIN=1.5V, VDD=3.3V, I_{Load}=0, Ta=25°C, unless otherwise noted)

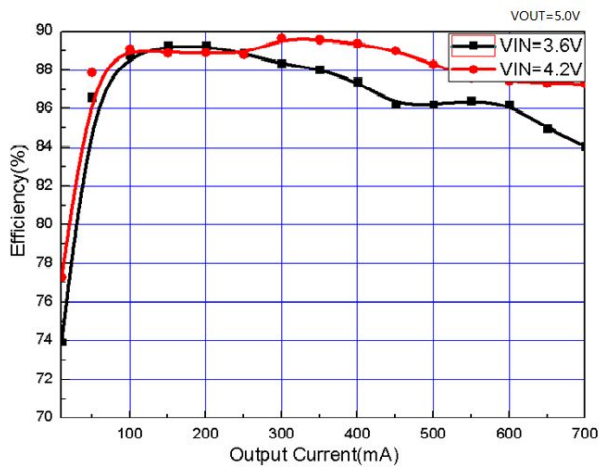
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operation start voltage	V _{ST}	I _{OUT} =1mA	-	0.9	1.00	V
VDD supply voltage	V _{DD}	VDD pin voltage	2		6	
Shut down current	I _{OFF}	CE=0, VIN=4.5V	—	0.01	1	μA
Switch-off Current	I _{switch-off}	VIN=6V	—	17	25	μA
Continuous Switching Current	I _{switch}	VIN=CE=3.3V, VFB=GND	—	500	—	μA
No load Current	I _{no-load}	VIN=1.5V, VOUT=3.3V	—	56	—	μA
Feedback Reference Voltage	V _{ref}	Close Loop Vdd=3.3V	1.225	1.25	1.275	V
Switching Frequency	F _s	Vdd=3.3V	800	1000	1250	KHz
Maximum Duty	D _{max}	Vdd=3.3V	70	75	80	%
LX on resistance		Vdd=3.3V	—	0.18	0.25	Ω
Current Limit Setting	I _{limit}	Vdd=3.3V	2.3	2.5	2.7	A
EXT on resistance to VDD		Vdd=3.3V	—	4	8.0	Ω
EXT on resistance to GND		Vdd=3.3V	—	2.15	8.0	Ω
Line Regulation	ΔV _{line}	Vin=3.5~6V, IL=1mA	—	0.25	5	mV/V
Load Regulation	ΔV _{load}	VIN=2.5V, IL=1~100mA	—	0.5	—	mV/mA
CE pin Trip level		VDD=3.3V	0.4	0.8	1.2	V
Temperature Stability for Vout	T _s		—	50	—	Ppm/°C
Thermal Shut down Hysterises	ΔT _{sd}		—	10	—	°C

Test Circuits

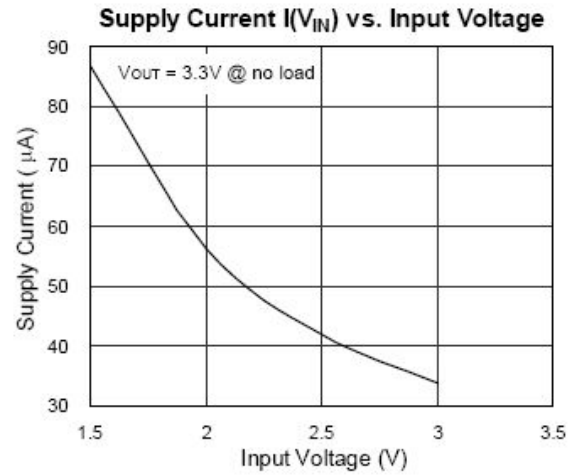


Typical Performance Characteristics

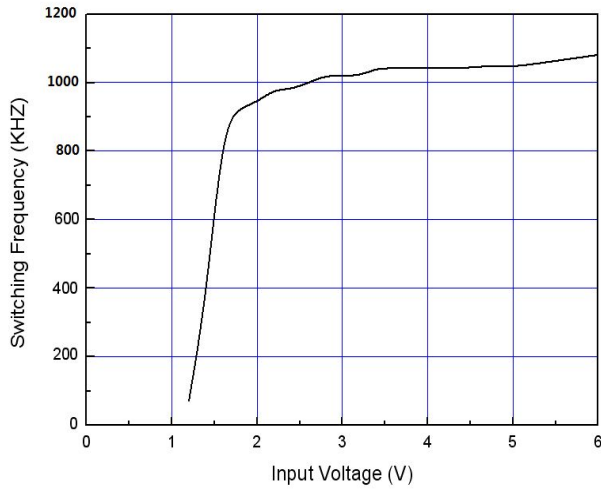
1. Efficiency vs. Output Current



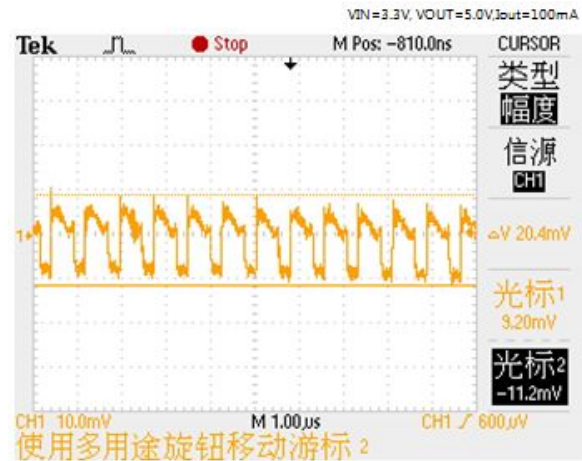
2. Supply Current vs. Input Voltage



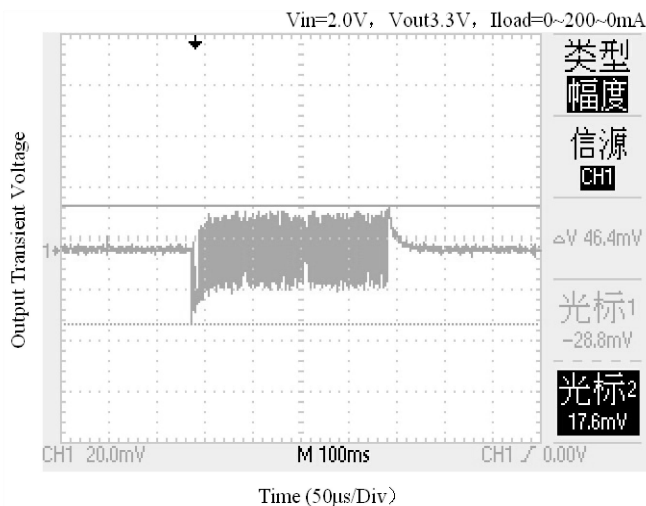
3. Switching Frequency vs. Vdd pin Voltage



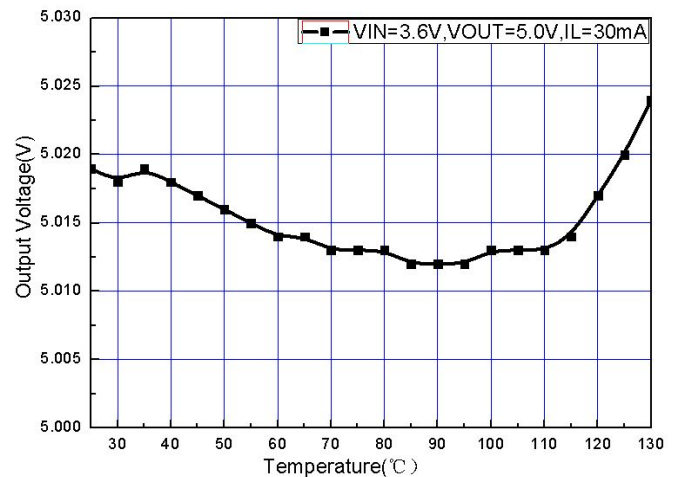
4. LX pin wave form & Output Ripple



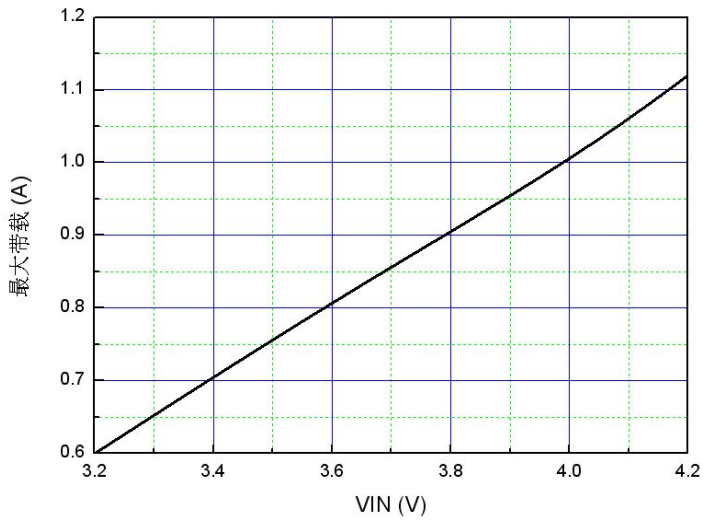
5. Transient Response



6. Output Voltage vs. Temperature

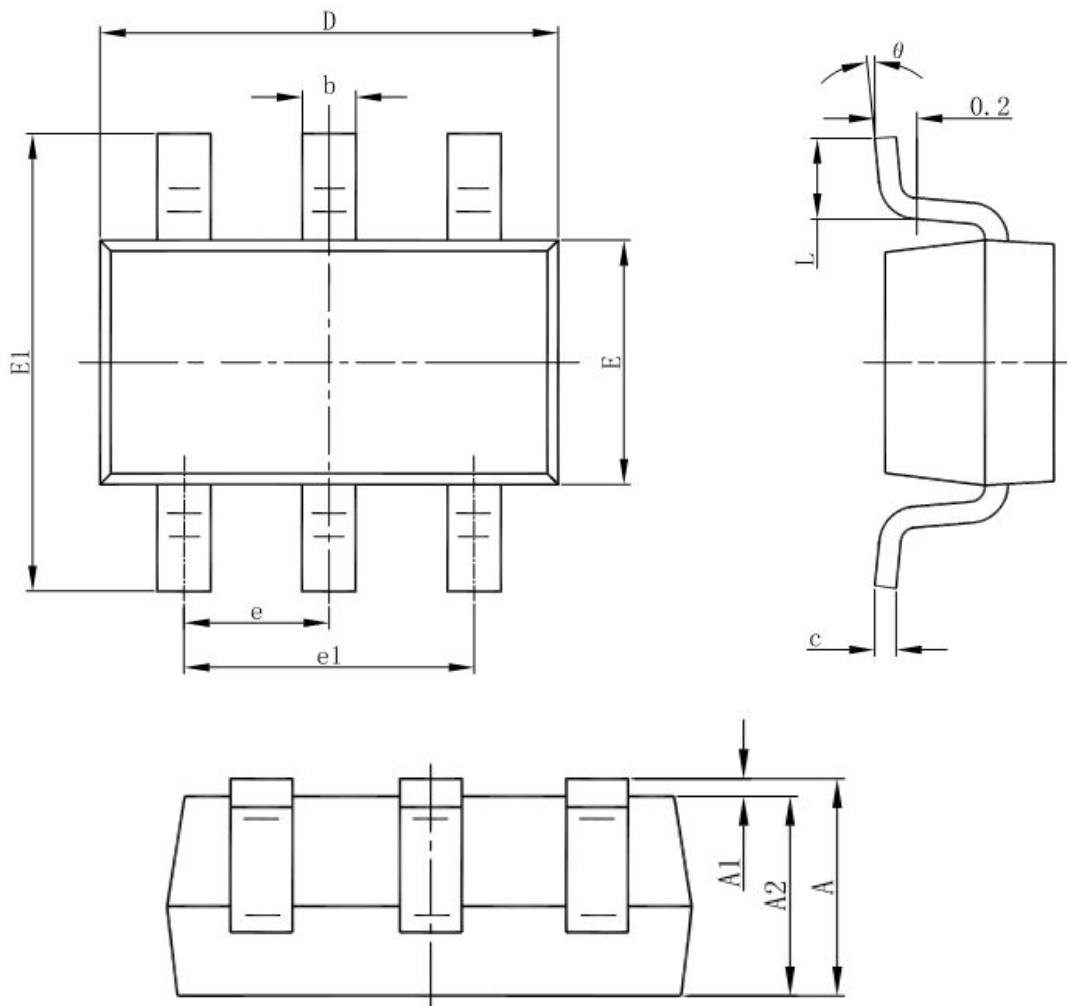


7. VIN VS The Max Output Current (VOUT=5.0V)



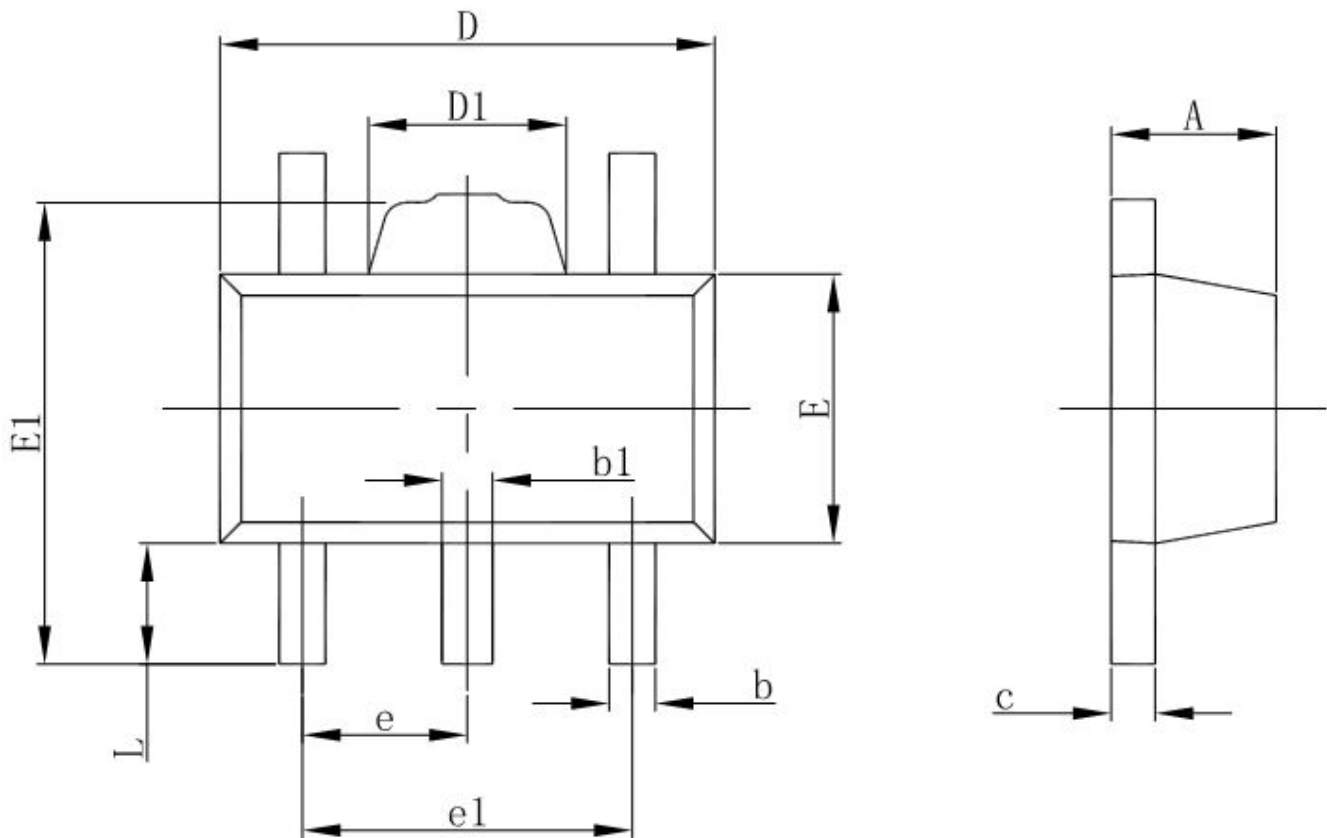
■ Package Information

- SOT-23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

● SOT-89-5L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.360	0.560	0.014	0.022
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.400	1.800	0.055	0.071
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	2.900	3.100	0.114	0.122
L	0.900	1.100	0.035	0.043