

Features

- Low quiescent current : 0.2uA
- Wide input voltage range : 1.2V to 6.0V
- High output current : 500mA
- Low dropout voltage : 130mV at 100mA
- PSRR: 60dB/1kHz
- Fixed output voltages : 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V, 3.6V.
- Output voltage tolerance : $\pm 2\%$
- Current limit protection
- Short circuit protection
- Thermal shutdown protection
- Available packages: SOT23-5,SOT89-3,DFN1×1

Applications

- Battery-powered equipment
- Smoke detector and sensor
- Micro controller applications
- Home appliance

Description

The WL9005H series is an ultra-small, low dropout (LDO) linear regulator that can source 500mA of output current. The WL9005H has fast response to input voltage transient and load current transient, and ensures no overshoot voltage during WL9005H startup and short circuit recovery.

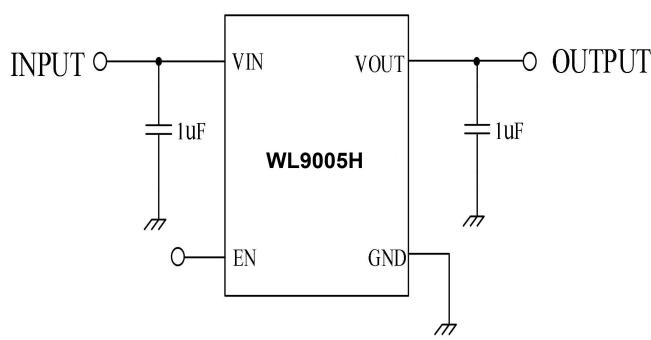
The WL9005H series has thermal shutdown, current limit, and short circuit protections for added safety.

The WL9005H series contains eight fixed output voltages of 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V, 3.6V.

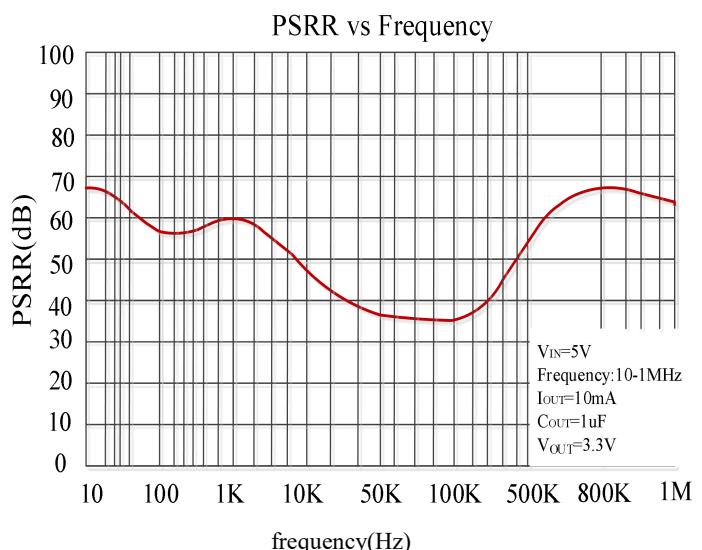
PART NUMBER	PACKAGE	BODY SIZE(NOM)
WL9005HS5	SOT23-5	2.9mm*2.8mm
WL9005HP3	SOT89-3	4.5mm*4.2mm
WL9005HD4	DFN1×1	1mm*1mm
WL9005HS3	SOT23-3	2.9mm*2.8mm

(1) For all available packages, see the order infomation table.

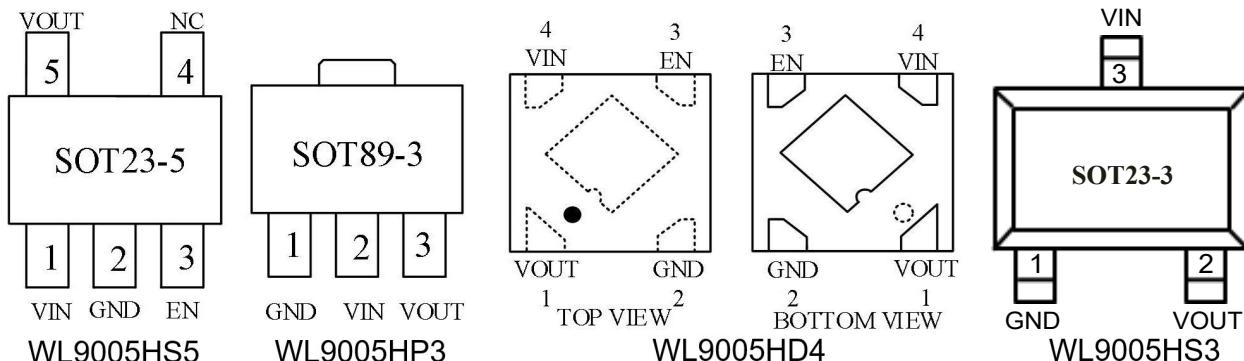
Typical Application



PSRR



Pin Configuration and Functions



Pin Functions

Name	SOT23-5	SOT89-3	DFN1x1	SOT23-3	Description
	WL9005HS5	WL9005HP3	WL9005HD4	WL9005HS3	
VIN	1	2	4	3	Input pin
GND	2	1	2	1	Ground pin
EN	3		3		Enable pin
NC	4				No connection
VOUT	5	3	1	2	Output pin

Order Information

WL9005H①②-③④

Designator	Symbol	Description
①②	S5/P3/D4/S3	SOT23-5L/SOT89-3/DFN1x1-4L/SOT23-3L
③④	Integer	Output Voltage (12、15、18、25、28、30、33、36)

Model	Marking**	Description	Package	T/R Qty
WL9005HS5-XX*	----		SOT23-5L	3,000 PCS
WL9005HP3-XX*	----		SOT89-3L	1,000 PCS
WL9005HD4-XX*	----	WL9005H, 0.2μA IQ ,500mA Low-Dropout LDO	DFN1x1-4L	10,000 PCS
WL9005HS3-XX*	----		SOT23-3L	3,000 PCS

Note: (*) XX Represents the Output Voltage

(**) For marking information, contact our sales representative directly

Absolute Maximum Ratings

Parameter	Description	Min	Max	Unit
Input voltage	VIN to GND	-0.3	6	V
	VOUT to GND	-0.3	5	V
	VIN to VOUT	-0.3	5	V
	EN to GND	-0.3	6	V
Current	Peak output current	Internally limited		
Temperature	Operating temperature range	-40	125	°C
	Storage temperature	-40	150	°C
Thermal resistance (Junction to ambient)	SOT23-5	200		°C/W
	SOT89-3	130		°C/W
	DFN1x1	300		°C/W
	SOT23-3	240		°C/W
Power dissipation	SOT23-5	600		mW
	SOT89-3	900		mW
	DFN1x1	400		mW
	SOT23-3	500		mW

Note:

exceeding the range specified by the rated parameters will cause damage to the chip, and the working state of the chip beyond the range of rated parameters cannot be guaranteed. Exposure outside the rated parameter range will affect the reliability of the chip.

ESD Ratings

Parameter	Description	Range	Unit
V_{ESD}	Human body model(HBM)	4	KV
	Charged device model(CDM)	200	V

Electrical Characteristics

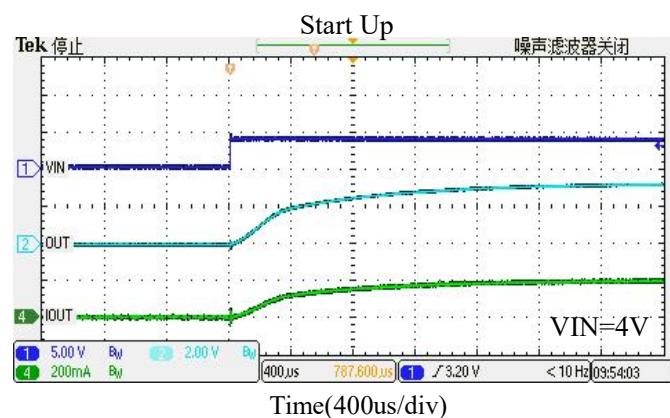
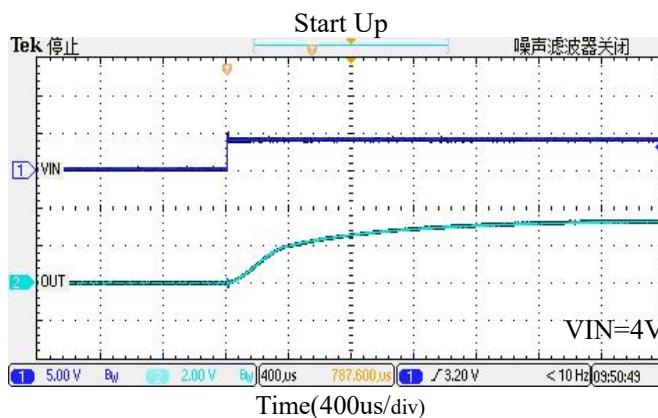
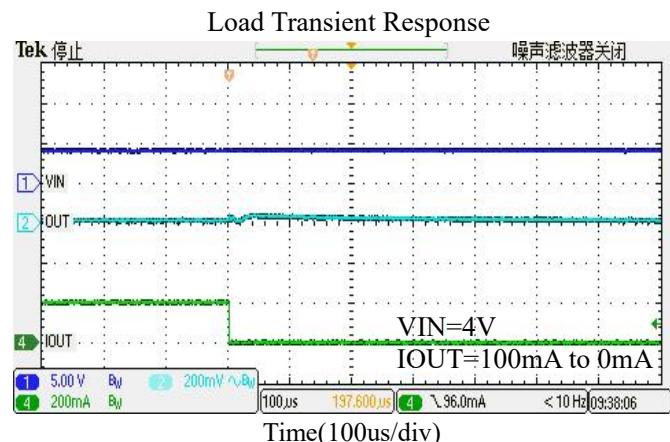
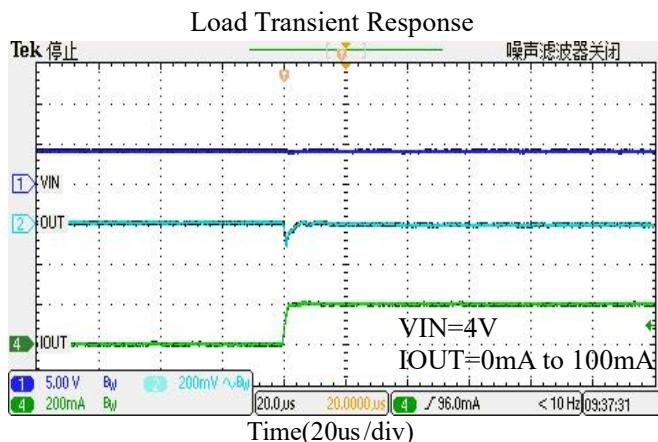
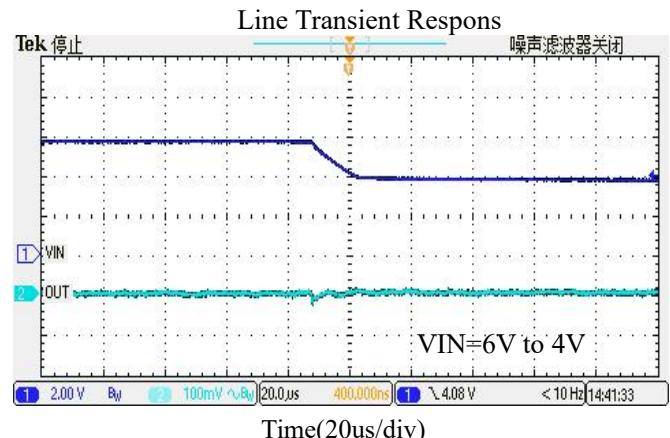
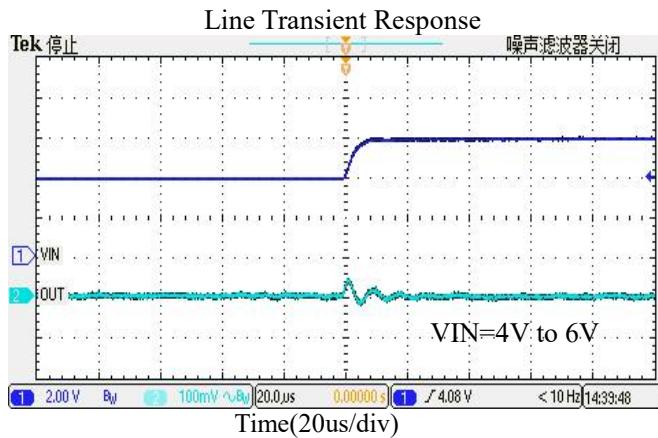
(At $T_A=25^\circ\text{C}$, $C_{IN}=1\mu\text{F}$, $V_{IN}=V_{OUTNOM}+1\text{V}$, $C_{OUT}=1\mu\text{F}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{IN}	Operating input voltage		1.2	—	6.0	V
I_{GND}	Quiescent current	$V_{IN}=5\text{V}$, No load	—	0.2	—	μA
V_{OUT}	Output voltage	$V_{IN}=5\text{V}$, $I_{OUT}=10\text{mA}$	$V_{OUTNOM} * 0.98$	V_{OUTNOM}	$V_{OUTNOM} * 1.02$	V
I_{OUT_MAX}	Output current		—	—	500	mA
V_{DROP}	Dropout voltage	$I_{OUT}=100\text{mA}$, $V_{IN}=V_{OUTNOM}-0.1\text{V}$	—	130	—	mV
$\Delta V_{OUT}/\Delta I_{OUT}$	Load regulation	$V_{IN}=V_{OUTNOM}+1\text{V}$, $1\text{mA} \leq I_{OUT} \leq 200\text{mA}$	—	0.1	—	mV/mA
$\Delta V_{OUT}/\Delta V_{IN}$	Line regulation	$I_{OUT}=1\text{mA}$, $V_{OUTNOM}+1\text{V} \leq V_{IN} \leq 6\text{V}$	—	0.1	—	mV/V
I_{LIMIT}	Current limit	$V_{IN}=V_{OUTNOM}+1\text{V}$	—	550	—	mA
I_{SHORT}	Short current		—	80	—	mA
T_{SHDN}	Thermal shutdown temperature	Shutdown, temperature increasing	—	150	—	$^\circ\text{C}$
		Reset, temperature decreasing	—	120	—	
V_{ENH}	EN high level	Enabled	0.83	—	—	V
V_{ENL}	EN low level	Shutdown	—	—	0.78	V

Note : (1) Dropout Voltage is the voltage difference between the input and the output at which the output voltage drops 2% below its nominal value.

Typical Characteristics

(Test condition: $T_A=25^\circ\text{C}$, $C_{IN}=1\mu\text{F}$, $V_{IN}=V_{OUTNOM}+1\text{V}$, $C_{OUT}=1\mu\text{F}$ unless otherwise note)

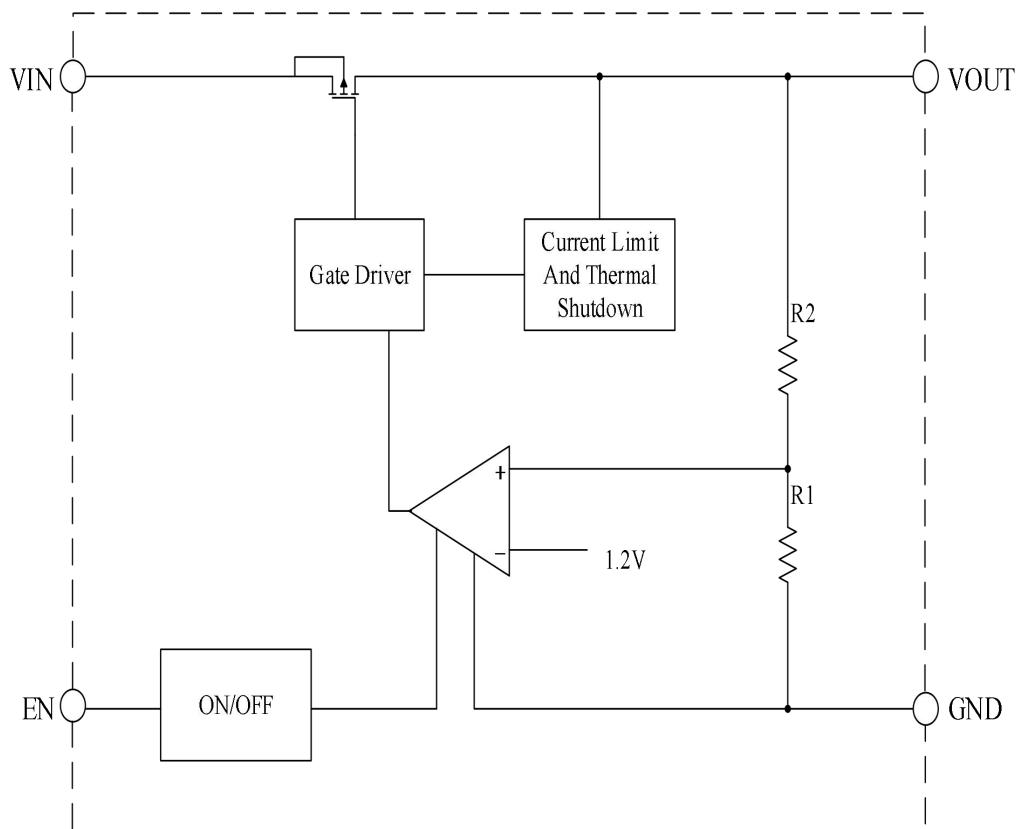


Detailed Description

Overview

The WL9005H series is an ultra-small, low dropout (LDO) linear regulator that can source 500mA of output current. The WL9005H has fast response to input voltage transient and load current transient, and ensures no overshoot voltage during WL9005H startup and short circuit recovery. The WL9005H series has thermal shutdown, current limit, and short circuit protections for added safety. The WL9005H series contains eight fixed output voltages of 1.2V, 1.5, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V, 3.6V.

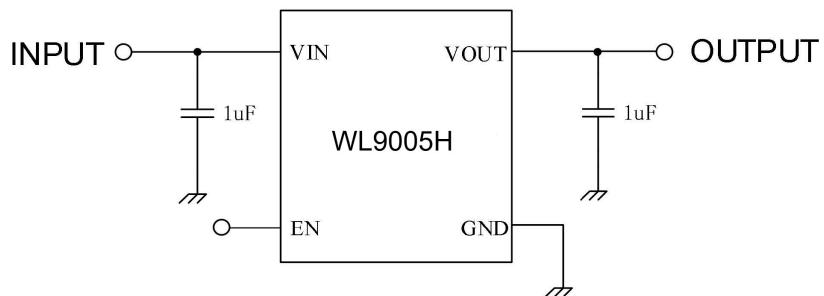
Functional Block Diagram



Functional block diagram

Input Capacitor and Output Capacitor

A 1uF ceramic capacitor is recommended to connect between VIN and GND pins to decouple input power supply glitch and noise. The amount of the capacitance may be increased without limit. This input capacitor must be located as close as possible to the device to assure input stability and less noise. For PCB layout, a wide copper trace is required for both VIN and GND.

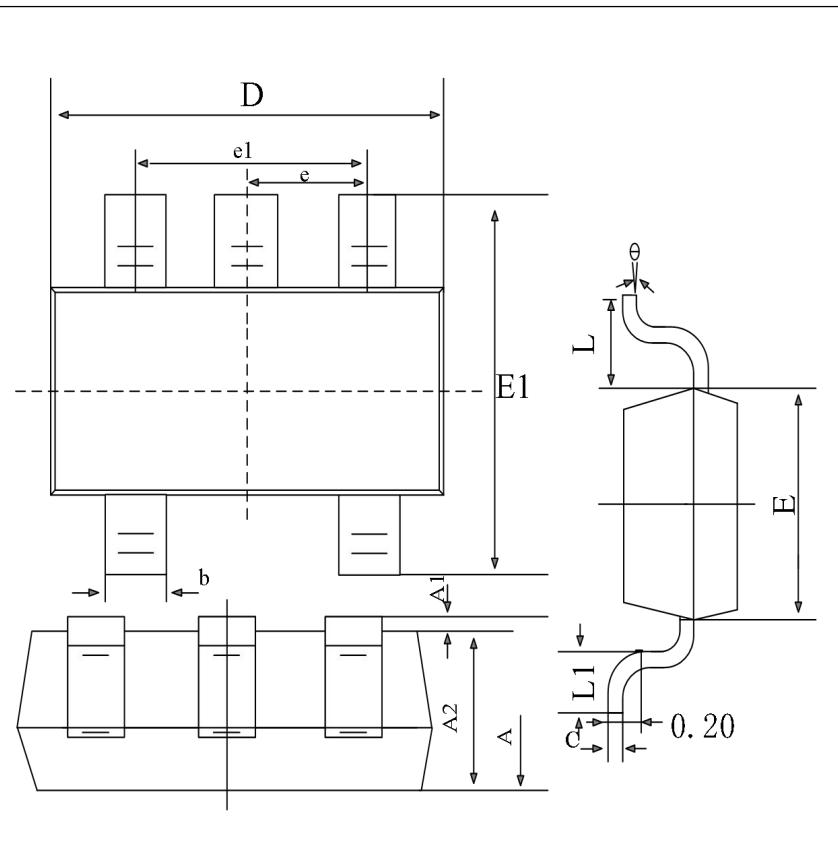


For the stability of LDO, an output capacitor is required. The recommended minimum output capacitance is 1 u F. It is recommended to use Ceramic capacitor with a temperature characteristic of X5R or X7R. A higher capacitance value helps to improve the transient response of the load/line. The output capacitance can be increased to maintain a lower down/overshoot. Place the output capacitor as close as possible to the VOUT and GND pins.

Current Limit and Short Circuit Protection

When output current at VOUT pin is higher than current limit threshold or the VOUT pin is direct short to GND, the current limit protection will be triggered and clamp the output current at a pre-designed level to prevent over-current and thermal damage.

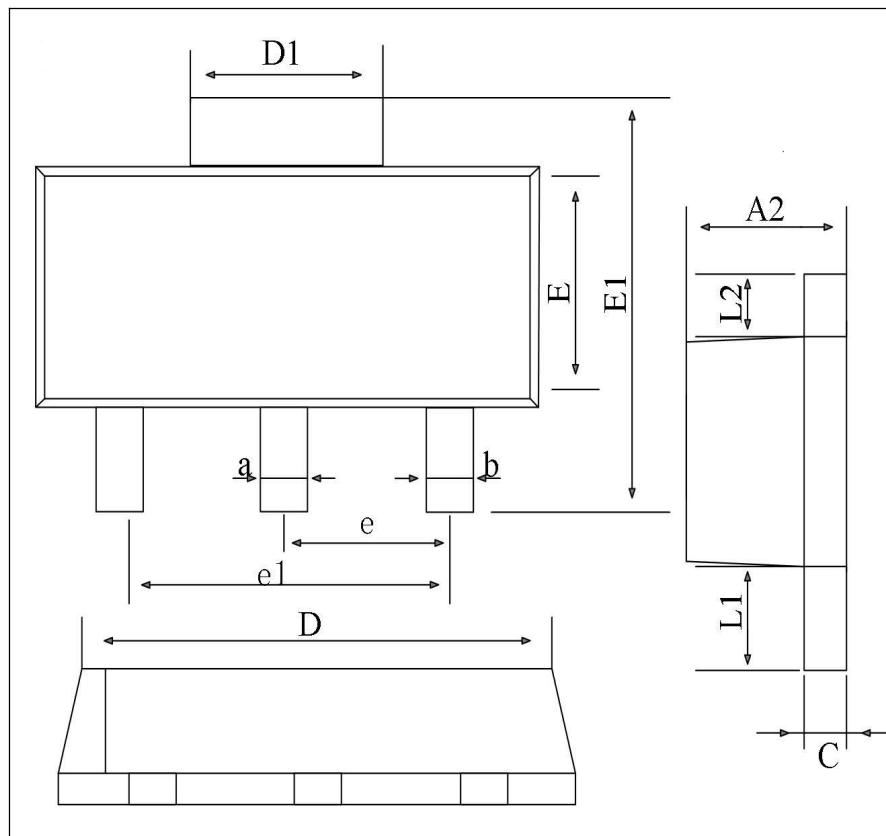
Package Outline SOT23-5



The diagram illustrates the SOT23-5 package outline. The top view shows the package in a rectangular package with three leads. Dimensions include D (width), e1 (lead spacing), e (lead thickness), and E1 (lead height). The side view shows the lead profile with height L, angle θ, and lead thickness 0.20. Lead details include lead length L1, lead width C, and lead height A2.

REF.	Millimeter	
	Min.	Max.
A	1.05	1.25
A1	0	0.1
A2	1.05	1.15
b	0.3	0.5
c	0.1	0.2
D	2.85	3.05
E	1.5	1.7
E1	2.65	2.95
e	0.95 (BSC)	
e1	1.8	2.0
L	0.3	0.6
θ	0°	8°

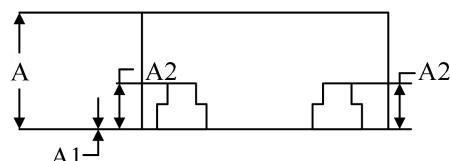
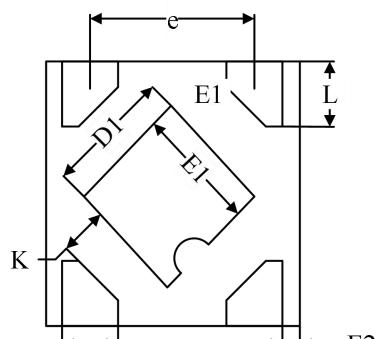
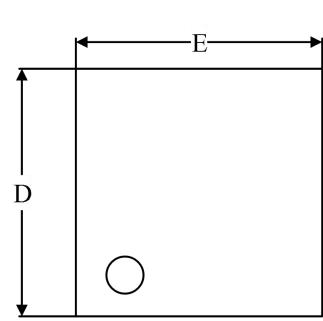
SOT89-3



The diagram illustrates the SOT89-3 package outline. The top view shows the package in a rectangular package with three leads. Dimensions include D1 (width), E1 (lead height), A2 (lead width), L1 (lead height), L2 (lead width), and C (lead thickness). The side view shows the lead profile with height E, angle A2, lead height L1, and lead width C.

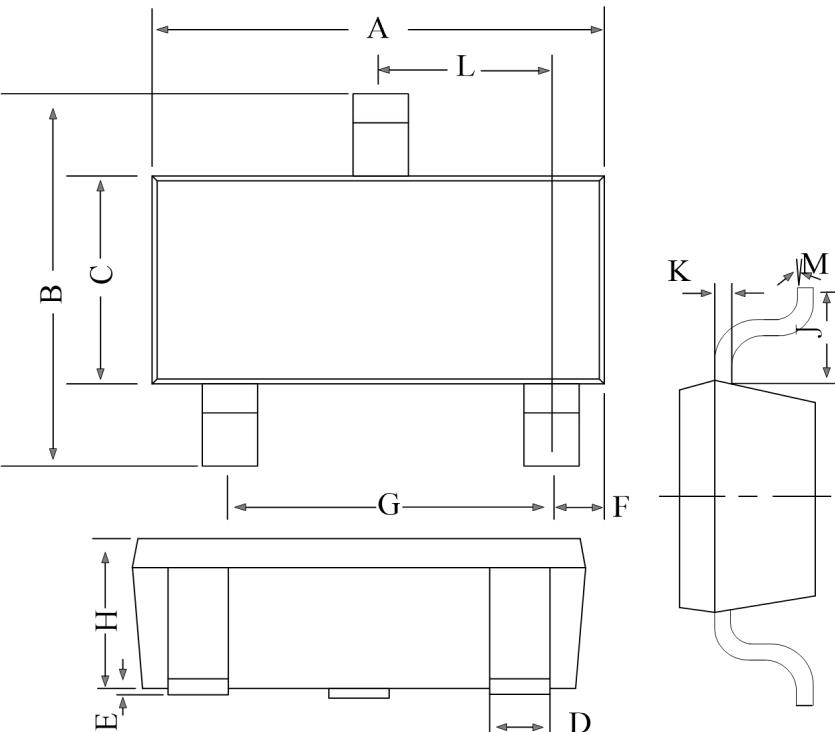
REF.	Millimeter	
	Min.	Max.
A2	1.4	1.6
a	0.45	0.55
b	0.38	0.48
c	0.36	0.46
D	4.40	4.60
D1	1.60	1.80
E	2.40	2.60
E1	4.00	4.30
e	1.00	2.00
e1	2.95	3.05
L1	0.80	1.00
L2	0.65	0.75

DFN1×1



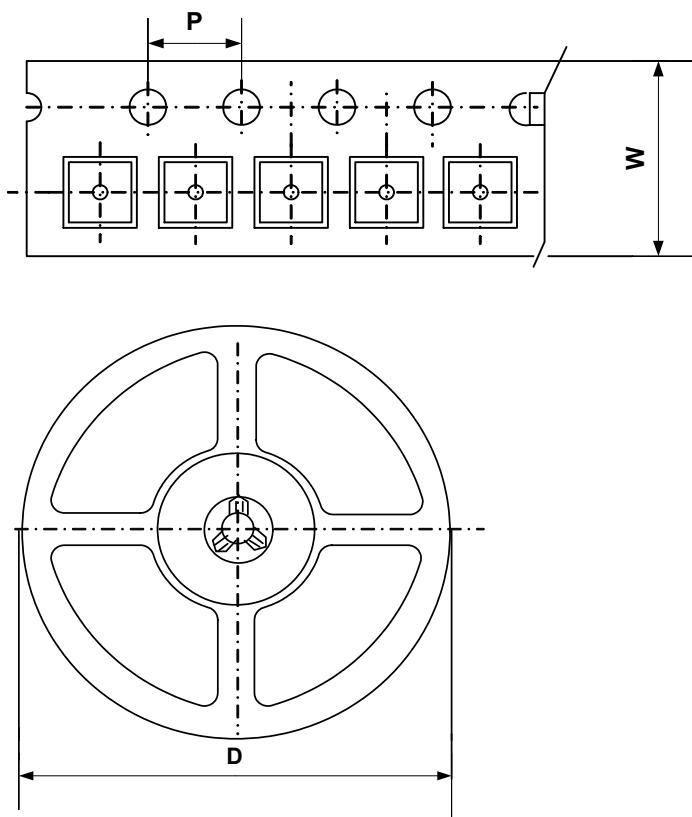
REF.	Millimeter		
	Min.	Nom.	Max.
A	0.45	0.50	0.55
	0.50	0.55	0.60
A1	0.00	--	0.05
A2	0.203 TIY		
b	0.17	0.22	0.27
D	0.95	1.00	1.05
D1	0.43	0.48	0.53
E	0.95	1.00	1.05
E1	0.43	0.48	0.53
E2	0.065 TIY		
e	0.65 BSC		
k	0.20 BSC		
L	0.20	0.25	0.30

SOT-23-3



REF.	Millimeter	
	Min.	Max.
A	2.82	2.92
B	2.65	2.95
C	1.56	1.60
D	0.35	0.55
E	0	0.1
F	0.45	0.55
G	1.90 REF.	
H	1.0	1.3
K	0.10	0.20
J	0.40	—
L	0.85	1.15
M	0°	10°

Packing Information



Type	W(mm)	P(mm)	D(mm)	Qty (pcs)
SOT23-5	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	3000pcs
SOT89-3	12.0±0.1 mm	4.0±0.1 mm	180±1 mm	1000pcs
DFN1×1	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	10000pcs
SOT23-3	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	3000pcs

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