1A Low-Dropout Linear Regulator

1. Description

The FLD6118 is a CMOS low-dropout linear regulator. It supports up to 1A output current and has an absolute maximum voltage rating of +33V. Fixed output versions are available from +1.8V to +5.0V. The CMOS process provides low dropout voltage and low quiescent current.

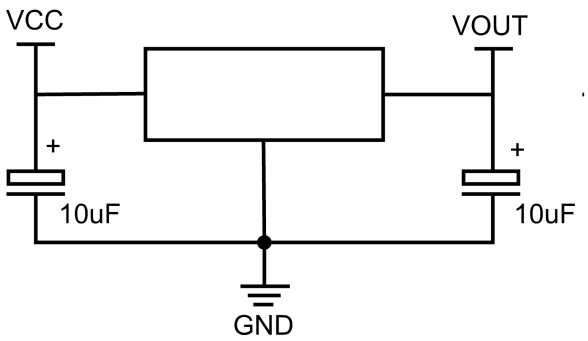
The device integrates over-voltage current limiting, thermal protection, short-circuit protection, and maximum output current limiting, making it suitable for battery-powered, communication, wireless, Bluetooth, audio, and video equipment.

2. Features

- Low power consumption and low dropout voltage
- Over-voltage current limit, thermal protection, short-circuit protection, and maximum output current limit
- Maximum operating voltage: 28V
- Absolute maximum voltage rating: +33V
- Typical quiescent current: 3.5uA
- Maximum output current: 1A
- Output voltage accuracy: ±1.5%
- Packages: SOT23-3, SOT23-5, SOT-89-3L, SOT-223, TO-252, ESOP8

3. Applications

- Battery-powered equipment
- Communication equipment
- Wireless network and Bluetooth devices
- Audio/video equipment

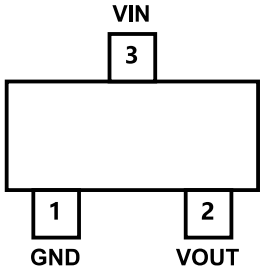


4. Order Information

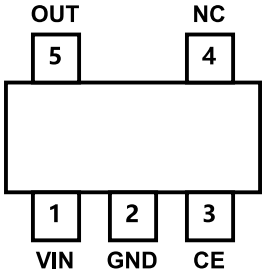
Mode	Output Voltage (V)	Package Description	Ordering Code	Packing Quantity
FLD6118- 1.8	1.8	SOT23-3	FLD6118-SBA18CT	Tape and Reel,3000
	1.8	SOT23-5	FLD6118-SCA18CT	Tape and Reel,3000
	1.8	SOT-89-3L(SEA)	FLD6118-SEA18CT	Tape and Reel,1000
	1.8	SOT-89-3L(SEB)	FLD6118-SEB18CT	Tape and Reel,1000
	1.8	SOT-223(SFC)	FLD6118-SFC18CT	Tape and Reel,3000
	1.8	SOT-223(SFA)	FLD6118-SFA18CT	Tape and Reel,3000
	1.8	TO-252(TOB)	FLD6118-TOB18CT	Tape and Reel,2500
	1.8	TO-252(TPB)	FLD6118-TPB18CT	Tape and Reel,2500
	1.8	ESOP8	FLD6118-EPA18CT	Tape and Reel,4000
FLD6118-2.5	2.5	SOT23-3	FLD6118-SBA25CT	Tape and Reel,3000
	2.5	SOT23-5	FLD6118-SCA25CT	Tape and Reel,3000
	2.5	SOT-89-3L(SEA)	FLD6118-SEA25CT	Tape and Reel,1000
	2.5	SOT-89-3L(SEB)	FLD6118-SEB25CT	Tape and Reel,1000
	2.5	SOT-223(SFC)	FLD6118-SFC25CT	Tape and Reel,3000
	2.5	SOT-223(SFA)	FLD6118-SFA25CT	Tape and Reel,3000
	2.5	TO-252(TOB)	FLD6118-TOB25CT	Tape and Reel,2500
	2.5	TO-252(TPB)	FLD6118-TPB25CT	Tape and Reel,2500
	2.5	ESOP8	FLD6118-EPA25CT	Tape and Reel,4000
FLD6118-3.0	3.0	SOT23-3	FLD6118-SBA30CT	Tape and Reel,3000
	3.0	SOT23-5	FLD6118-SCA30CT	Tape and Reel,3000
	3.0	SOT-89-3L(SEA)	FLD6118-SEA30CT	Tape and Reel,1000
	3.0	SOT-89-3L(SEB)	FLD6118-SEB30CT	Tape and Reel,1000
	3.0	SOT-223(SFC)	FLD6118-SFC30CT	Tape and Reel,3000
	3.0	SOT-223(SFA)	FLD6118-SFA30CT	Tape and Reel,3000
	3.0	TO-252(TOB)	FLD6118-TOB30CT	Tape and Reel,2500
	3.0	TO-252(TPB)	FLD6118-TPB30CT	Tape and Reel,2500
	3.0	ESOP8	FLD6118-EPA30CT	Tape and Reel,4000
FLD6118-3.3	3.3	SOT23-3	FLD6118-SBA33CT	Tape and Reel,3000
	3.3	SOT23-5	FLD6118-SCA33CT	Tape and Reel,3000
	3.3	SOT-89-3L(SEA)	FLD6118-SEA33CT	Tape and Reel,1000
	3.3	SOT-89-3L(SEB)	FLD6118-SEB33CT	Tape and Reel,1000
	3.3	SOT-223(SFC)	FLD6118-SFC33CT	Tape and Reel,3000
	3.3	SOT-223(SFA)	FLD6118-SFA33CT	Tape and Reel,3000

	3.3	TO-252(TOB)	FLD6118-TOB33CT	Tape and Reel,2500
	3.3	TO-252(TPB)	FLD6118-TPB33CT	Tape and Reel,2500
	3.3	ESOP8	FLD6118-EPA33CT	Tape and Reel,4000
FLD6118-3.6	3.6	SOT23-3	FLD6118-SBA36CT	Tape and Reel,3000
	3.6	SOT23-5	FLD6118-SCA36CT	Tape and Reel,3000
	3.6	SOT-89-3L(SEA)	FLD6118-SEA36CT	Tape and Reel,1000
	3.6	SOT-89-3L(SEB)	FLD6118-SEB36CT	Tape and Reel,1000
	3.6	SOT-223(SFC)	FLD6118-SFC36CT	Tape and Reel,3000
	3.6	SOT-223(SFA)	FLD6118-SFA36CT	Tape and Reel,3000
	3.6	TO-252(TOB)	FLD6118-TOB36CT	Tape and Reel,2500
	3.6	TO-252(TPB)	FLD6118-TPB36CT	Tape and Reel,2500
	3.6	ESOP8	FLD6118-EPA36CT	Tape and Reel,4000
FLD6118-4.4	4.4	SOT23-3	FLD6118-SBA44CT	Tape and Reel,3000
	4.4	SOT23-5	FLD6118-SCA44CT	Tape and Reel,3000
	4.4	SOT-89-3L(SEA)	FLD6118-SEA44CT	Tape and Reel,1000
	4.4	SOT-89-3L(SEB)	FLD6118-SEB44CT	Tape and Reel,1000
	4.4	SOT-223(SFC)	FLD6118-SFC44CT	Tape and Reel,3000
	4.4	SOT-223(SFA)	FLD6118-SFA44CT	Tape and Reel,3000
	4.4	TO-252(TOB)	FLD6118-TOB44CT	Tape and Reel,2500
	4.4	TO-252(TPB)	FLD6118-TPB44CT	Tape and Reel,2500
	4.4	ESOP8	FLD6118-EPA44CT	Tape and Reel,4000
FLD6118-5.0	5.0	SOT23-3	FLD6118-SBA50CT	Tape and Reel,3000
	5.0	SOT23-5	FLD6118-SCA50CT	Tape and Reel,3000
	5.0	SOT-89-3L(SEA)	FLD6118-SEA50CT	Tape and Reel,1000
	5.0	SOT-89-3L(SEB)	FLD6118-SEB50CT	Tape and Reel,1000
	5.0	SOT-223(SFC)	FLD6118-SFC50CT	Tape and Reel,3000
	5.0	SOT-223(SFA)	FLD6118-SFA50CT	Tape and Reel,3000
	5.0	TO-252(TOB)	FLD6118-TOB50CT	Tape and Reel,2500
	5.0	TO-252(TPB)	FLD6118-TPB50CT	Tape and Reel,2500
	5.0	ESOP8	FLD6118-EPA50CT	Tape and Reel,4000

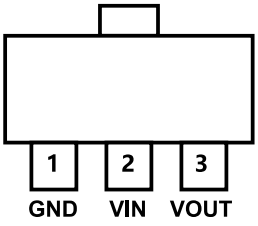
5. Pin Configuration and Functions



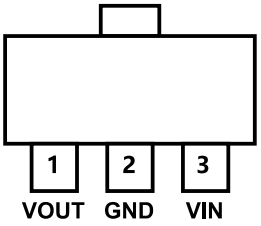
SOT23-3



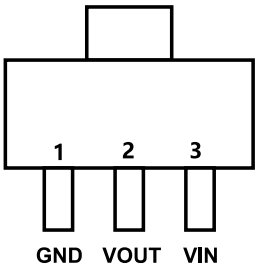
SOT23-5



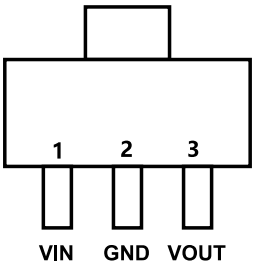
SOT-89-3L(SEA)



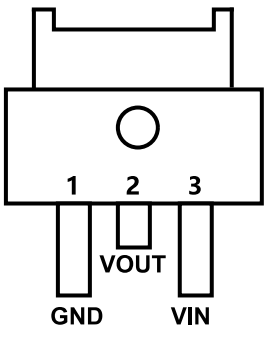
SOT-89-3L(SEB)



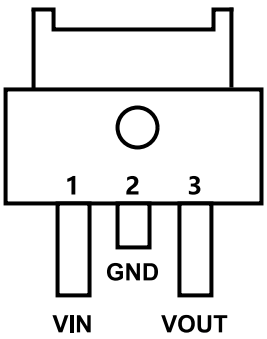
SOT-223(SFC)



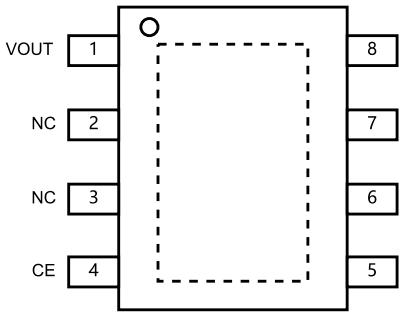
SOT-223(SFA)



TO-252(TOB)



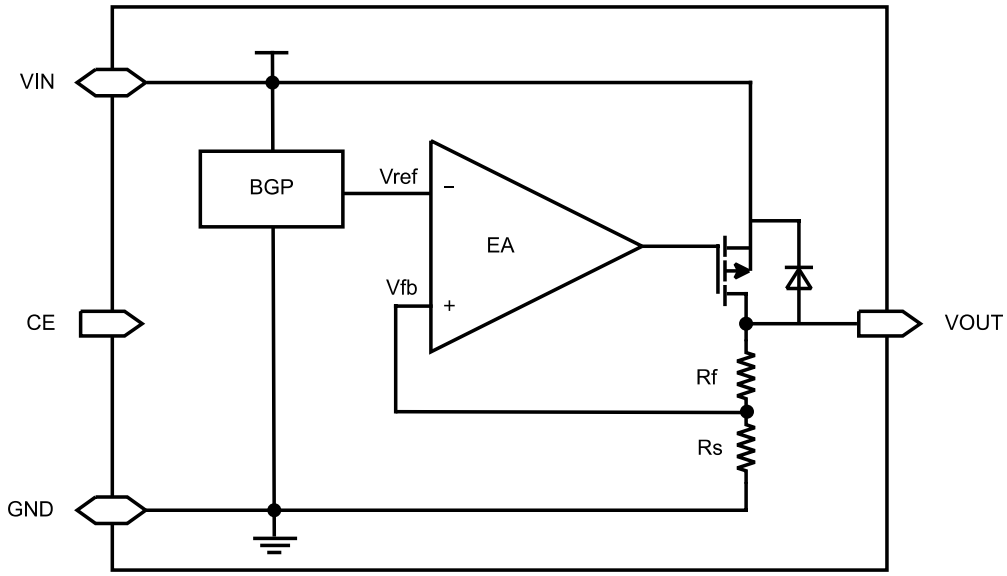
TO-252(TPB)



ESOP8

Pin Name	Description
GND	Ground
VOUT	Output pin
VIN	Input pin
CE	Enable pin (active high)
NC	No connect

6. Functional block diagram



7. Absolute Maximum Ratings

Stresses beyond the absolute maximum ratings may cause permanent damage to the device. Functional operation outside the specified operating range is not implied, and long-term exposure to conditions beyond the ratings may affect device reliability.

Parameter	Description	Range	Unit
V_{IN}	Input Voltage	0~+30	V
V_{OUT}	Output Voltage	1.8~5.0	V
T_{STG}	Storage Temperature	-45~+140	°C
T_{wk}	Operating Temperature	-40~+85	°C
ESD_{HBM}	Human Body Model	±5KV-±8KV	V
Latch up	Latch-up maximum current	200	mA

8. Recommended Operating Conditions

Parameter	Description	Range	Unit
V_{IN}	Input Voltage	+2.5~+28	V
I_{OUT}	Output Current	0~ 1000	mA
T_A	Operating Temperature	-40~+85	°C
C_{IN}	Input Capacitor	10	uF
C_{OUT}	Output Capacitor	10	uF
ESR	Equivalent Series Resistance of Input/Output Capacitors	5~ 100	mΩ

9. Thermal Information

Symbol	Parameter	Package Type	Max	Unit
θ_{JA}	Thermal resistance, junction-to-ambient (no airflow, no heat sink)	SOT23-3	416	°C/W
		SOT23-5	416	°C/W
		SOT-89-3L	250	°C/W
		SOT-223	69	°C/W
		TO-252	55	°C/W
		ESOP8	69	°C/W
P_D	Power Dissipation	SOT23-3	0.3	W
		SOT23-5	0.3	W
		SOT-89-3L	0.5	W
		SOT-223	1.8	W
		TO-252	2.25	W
		ESOP8	1.8	W

Note: The P_D value was measured at Ta = 25°C

10. Electrical Characteristics

(V_{IN}=V_{OUT}+1V, C_{IN} = 10μF, C_{OUT} = 10μF, T_A = 25 °C, Packages:TO-252(TPB), unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage	-	+2.5	-	+28	V
V_{OUT}	Output Voltage	I_{OUT} = 10mA	- 1%		+1%	V
		I_{OUT} = 500mA	-1.5%		+1.5%	V
V_{DROP}	Dropout Voltage (V_{OUT}=3.3V)	I_{OUT} = 100mA	-	79	-	mV
		I_{OUT} = 300mA	-	236	-	mV
		I_{OUT} = 500mA	-	405	-	mV
		I_{OUT} = 1000mA	-	937	-	mV
I_{OUT}	Output Current	V_{IN} = V_{OUT}+1V, V_{OUT} = ±1.5%	-	1000	-	mA
I_LMT	Current Limit	V_{IN} = V_{OUT}+1V	-	1400	-	mA
$Load_{Reg}$	Load Regulation	1mA≤I_{OUT}≤1000mA V_{IN} = V_{OUT}+1V	-	45	-	mV
I_{SHORT}	Short-Circuit Current Limit	V_{OUT} = 0V	-	50	-	mA
I_Q	Quiescent Current	No load(I_{OUT} = 0mA)	-	3.5	5.0	uA
PSRR	Power Supply Ripple Rejection	V_{IN} = V_{OUT}+1V, I_{OUT} = 30mA f = 1KHz	-	61	-	dB
eN	Output Noise Voltage	V_{IN} = V_{OUT}+1V, I_{OUT} = 1mA f= 10Hz~100KHz (V_{OUT}=3V) C_{OUT} = 10uF	-	100	-	uVrms
ΔV_{OUT}	Line Regulation	V_{OUT} +1V≤V_{IN}≤28V I_{OUT} = 1mA	-	1	-	mV
$\frac{\Delta V_{OUT}}{\Delta T_A * V_{OUT}}$	Temperature Coefficient	I_{OUT} = 10mA -40°C≤T_A≤+85°C	-	175	-	ppm/°C

Note:

1.Under V_{IN}=V_{OUT}+2V and a fixed load condition, the dropout voltage is the difference between the input voltage and output voltage when the output voltage drops by 2%.

2.Load and line regulation are specified at constant junction temperature. Change in VD due to heating effects must be taken into account separately.

10. Electrical Characteristics

(V_{IN}=V_{OUT}+1V, C_{IN} = 10μF, C_{OUT} = 10μF, T_A = 25 °C, Packages:SOT-89-3L(SEA), unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage	–	+2.5	–	+28	V
V_{OUT}	Output Voltage	I_{OUT} = 10mA	- 1%		+1%	V
		I_{OUT} = 500mA	-1.5%		+1.5%	V
V_{DROP}	Dropout Voltage (V_{OUT}=3.3V)	I_{OUT} = 100mA	–	68	–	mV
		I_{OUT} = 300mA	–	208	–	mV
		I_{OUT} = 500mA	–	363	–	mV
I_{OUT}	Output Current	V_{IN} = V_{OUT}+1V, V_{OUT} = ±1.5%	–	800	–	mA
I_LMT	Current Limit	V_{IN} = V_{OUT}+1V	–	1200	–	mA
$Load_{Reg}$	Load Regulation	1mA≤I_{OUT}≤800mA V_{IN} = V_{OUT}+1V	–	18	–	mV
I_{SHORT}	Short-Circuit Current Limit	V_{OUT} = 0V	–	42	–	mA
I_Q	Quiescent Current	No load(I_{OUT} = 0mA)	–	3.5	5.0	uA
PSRR	Power Supply Ripple Rejection	V_{IN} = V_{OUT}+1V, I_{OUT} = 30mA f = 1KHz	–	61	–	dB
eN	Output Noise Voltage	V_{IN} = V_{OUT}+1V, I_{OUT} = 1mA f= 10Hz~100KHz (V_{OUT}=3V) C_{OUT} = 10uF	–	100	–	uVrms
ΔV_{OUT}	Line Regulation	V_{OUT} +1V≤V_{IN}≤28V I_{OUT} = 1mA	–	2	–	mV
$\frac{\Delta V_{OUT}}{\Delta T_A * V_{OUT}}$	Temperature Coefficient	I_{OUT} = 10mA -40°C≤T_A≤+85°C	–	175	–	ppm/°C

Note: Under V_{IN}=V_{OUT}+2V and a fixed load condition, the dropout voltage is the difference between the input voltage and output voltage when the output voltage drops by 2%.

10. Electrical Characteristics

(V_{IN}=V_{OUT}+1V, C_{IN} = 10μF, C_{OUT} = 10μF, T_A = 25 °C, Packages:SOT-89-3L(SEB), unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage	–	+2.5	–	+28	V
V_{OUT}	Output Voltage	I_{OUT} = 10mA	- 1%		+1%	V
		I_{OUT} = 500mA	-1.5%		+1.5%	V
V_{DROP}	Dropout Voltage (V_{OUT}=5.0V)	I_{OUT} = 100mA	–	63	–	mV
		I_{OUT} = 300mA	–	202	–	mV
		I_{OUT} = 500mA	–	352	–	mV
		I_{OUT} = 1000mA	–	855	–	mV
I_{OUT}	Output Current	V_{IN} = V_{OUT}+1V, V_{OUT} = ±1.5%	–	1000	–	mA
I_LMT	Current Limit	V_{IN} = V_{OUT}+1V	–	1400	–	mA
$Load_{Reg}$	Load Regulation	1mA≤I_{OUT}≤1000mA V_{IN} = V_{OUT}+1V	–	25	–	mV
I_{SHORT}	Short-Circuit Current Limit	V_{OUT} = 0V	–	54	–	mA
I_Q	Quiescent Current	No load(I_{OUT} = 0mA)	–	3.5	5.0	uA
PSRR	Power Supply Ripple Rejection	V_{IN} = V_{OUT}+1V, I_{OUT} = 30mA f = 1KHz	–	61	–	dB
eN	Output Noise Voltage	V_{IN} = V_{OUT}+1V, I_{OUT} = 1mA f= 10Hz~100KHz (V_{OUT}=3V) C_{OUT} = 10uF	–	100	–	uVrms
ΔV_{OUT}	Line Regulation	V_{OUT} +1V≤V_{IN}≤28V I_{OUT} = 1mA	–	1	–	mV
$\frac{\Delta V_{OUT}}{\Delta T_A * V_{OUT}}$	Temperature Coefficient	I_{OUT} = 10mA -40°C≤T_A≤+85°C	–	175	–	ppm/°C

Note: Under V_{IN}=V_{OUT}+2V and a fixed load condition, the dropout voltage is the difference between the input voltage and output voltage when the output voltage drops by 2%.

2.Load and line regulation are specified at constant junction temperature. Change in VD due to heating effects must be taken into account separately.

10. Electrical Characteristics

(V_{IN}=V_{OUT}+1V, C_{IN} = 10μF, C_{OUT} = 10μF, T_A = 25 °C, Packages:SOT23-5, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage	–	+2.5	–	+28	V
V_{OUT}	Output Voltage	I_{OUT} = 10mA	- 1%		+1%	V
		I_{OUT} = 500mA	-1.5%		+1.5%	V
V_{DROP}	Dropout Voltage (V_{OUT}=5.0V)	I_{OUT} = 100mA	–	69	–	mV
		I_{OUT} = 300mA	–	218	–	mV
		I_{OUT} = 500mA	–	381	–	mV
I_{OUT}	Output Current	V_{IN} = V_{OUT}+1V, V_{OUT} = ±1.5%	–	700	–	mA
		V_{IN} = V_{OUT}+1V, V_{OUT} = ±5%	–	800	–	mA
I_LMT	Current Limit	V_{IN} = V_{OUT}+1V	–	1200	–	mA
$Load_{Reg}$	Load Regulation	1mA≤I_{OUT}≤700mA V_{IN} = V_{OUT}+1V	–	65	–	mV
I_{SHORT}	Short-Circuit Current Limit	V_{OUT} = 0V	–	50	–	mA
I_Q	Quiescent Current	No load(I_{OUT} = 0mA)	–	3.5	5.0	uA
PSRR	Power Supply Ripple Rejection	V_{IN} = V_{OUT}+1V, I_{OUT} = 30mA f = 1KHz	–	61	–	dB
eN	Output Noise Voltage	V_{IN} = V_{OUT}+1V, I_{OUT} = 1mA f= 10Hz~100KHz (V_{OUT}=3V) C_{OUT} = 10uF	–	100	–	uVrms
ΔV_{OUT}	Line Regulation	V_{OUT} +1V≤V_{IN}≤28V I_{OUT} = 1mA	–	1	–	mV
$\frac{\Delta V_{OUT}}{\Delta T_A * V_{OUT}}$	Temperature Coefficient	I_{OUT} = 10mA -40°C≤T_A≤+85°C	–	175	–	ppm/°C

Note: Under V_{IN}=V_{OUT}+2V and a fixed load condition, the dropout voltage is the difference between the input voltage and output voltage when the output voltage drops by 2%.

10. Electrical Characteristics

(V_{IN}=V_{OUT}+1V, C_{IN} = 10μF, C_{OUT} = 10μF, T_A = 25 °C, Packages:SOT-223(SFC), unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage	–	+2.5	–	+28	V
V_{OUT}	Output Voltage	I_{OUT} = 10mA	- 1%		+1%	V
		I_{OUT} = 500mA	-1.5%		+1.5%	V
V_{DROP}	Dropout Voltage (V_{OUT}=3.3V)	I_{OUT} = 100mA	–	71	–	mV
		I_{OUT} = 300mA	–	229	–	mV
		I_{OUT} = 500mA	–	414	–	mV
I_{OUT}	Output Current	V_{IN} = V_{OUT}+1V, V_{OUT} = ±2%	–	700	–	mA
I_LMT	Current Limit	V_{IN} = V_{OUT}+1V	–	1200	–	mA
$Load_{Reg}$	Load Regulation	1mA≤I_{OUT}≤700mA V_{IN} = V_{OUT}+1V	–	57	–	mV
I_{SHORT}	Short-Circuit Current Limit	V_{OUT} = 0V	–	51	–	mA
I_Q	Quiescent Current	No load(I_{OUT} = 0mA)	–	3.5	5.0	uA
PSRR	Power Supply Ripple Rejection	V_{IN} = V_{OUT}+1V, I_{OUT} = 30mA f = 1KHz	–	61	–	dB
eN	Output Noise Voltage	V_{IN} = V_{OUT}+1V, I_{OUT} = 1mA f= 10Hz~100KHz (V_{OUT}=3V) C_{OUT} = 10uF	–	100	–	uVrms
ΔV_{OUT}	Line Regulation	V_{OUT} +1V≤V_{IN}≤28V I_{OUT} = 1mA	–	1	–	mV
$\frac{\Delta V_{OUT}}{\Delta T_A * V_{OUT}}$	Temperature Coefficient	I_{OUT} = 10mA -40°C≤T_A≤+85°C	–	175	–	ppm/°C

Note: Under V_{IN}=V_{OUT}+2V and a fixed load condition, the dropout voltage is the difference between the input voltage and output voltage when the output voltage drops by 2%.

11. Typical Performance Characteristics

The following data were obtained during testing at TO-252 V_{OUT}= 3.3 V.

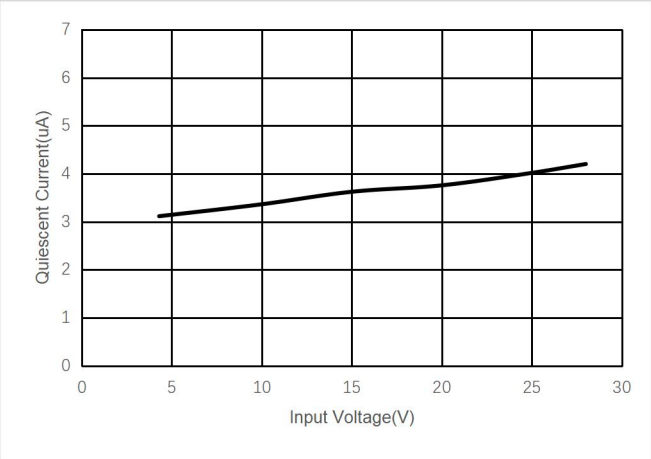


Figure 1. Quiescent Current vs. Input Voltage
V_{IN} = 4.3V-28V, I_{OUT} = 0mA

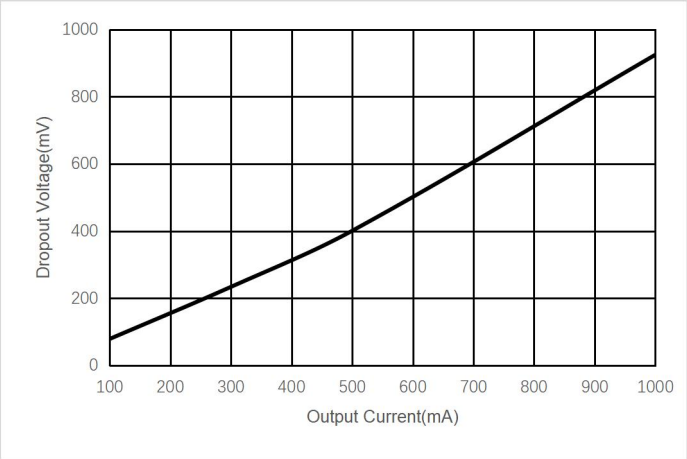


Figure 2. Dropout Voltage vs. Output Current
V_{IN} = 4.3V, I_{OUT} = 100mA - 1A

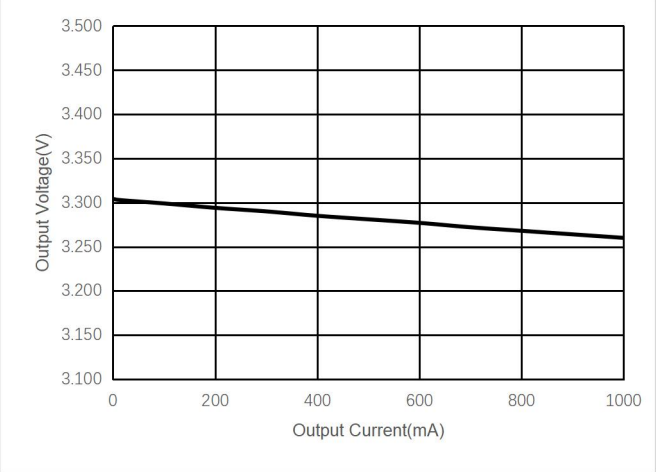


Figure 3. Output Voltage vs. Output Current
V_{IN} = 4.3V, I_{OUT} = 0mA - 1A

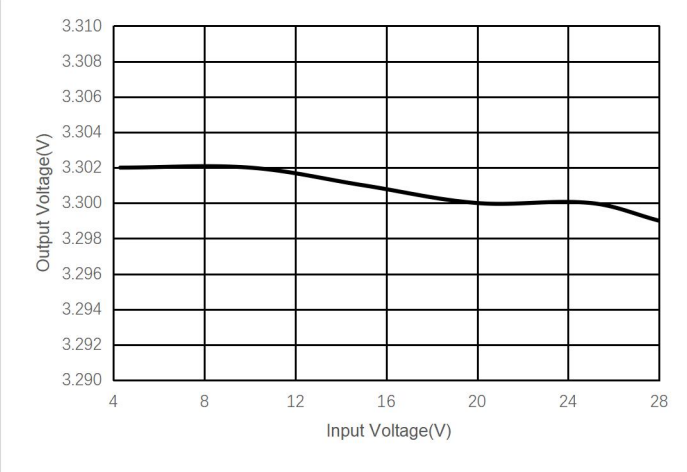


Figure 4. Output Voltage vs. Input Voltage
V_{IN} = 4.3V - 28V, I_{OUT} = 10mA

starting characteristic ：

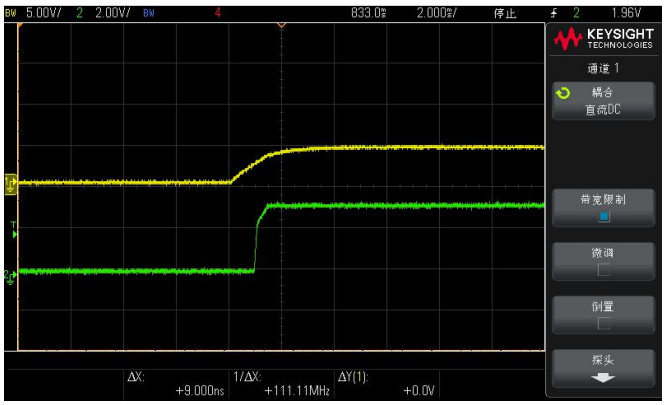


Figure 8. Vin=4.3V, Iout=0mA, Cout= 10uF

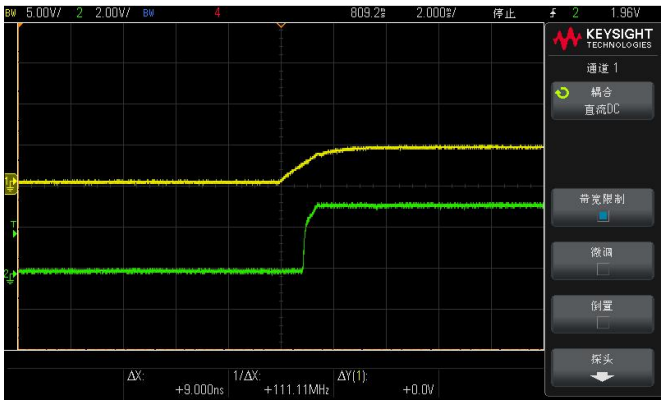


Figure 9. Vin=4.3V, Iout=800mA, Cout= 10uF

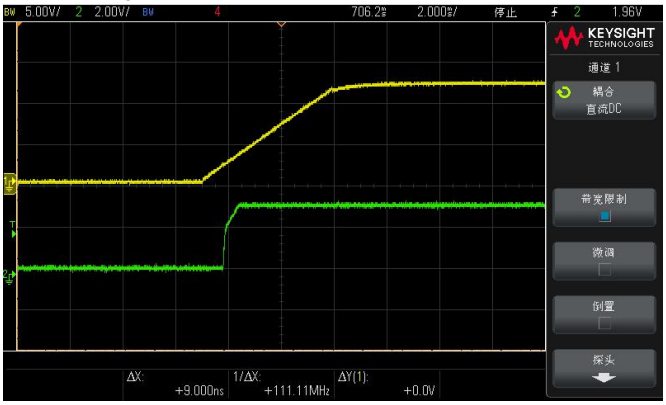


Figure 10. Vin= 12V, Iout=0mA, Cout= 10uF

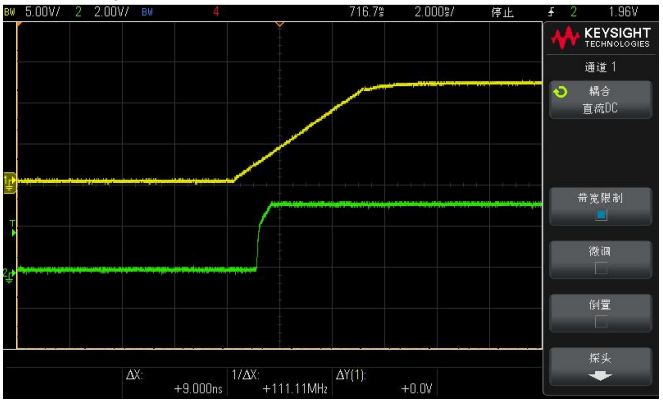


Figure 11. Vin= 12V , Iout= 100mA, Cout= 10uF

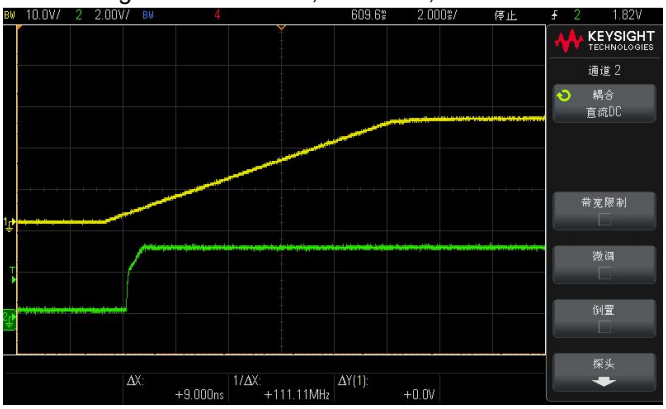


Figure 12. Vin=25V, Iout=0mA, Cout= 10uF

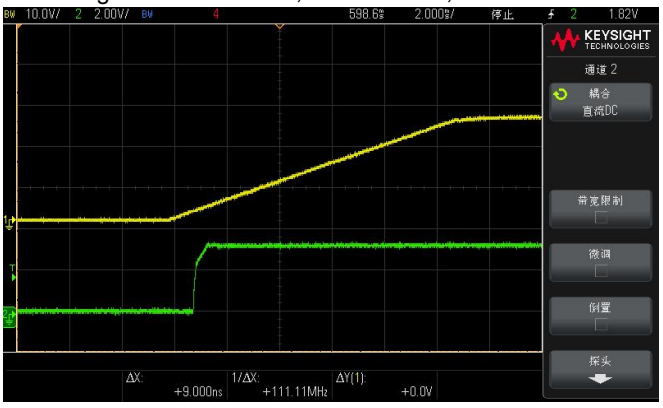


Figure 13. Vin=25V, Iout=30mA, Cout= 10uF

12. Function Description

Overvoltage Current-Limit Protection

The FLD6118 provides overvoltage current-limit protection. When the input voltage is greater than 15V, the output current is limited to a maximum of 250mA to prevent device damage.

Thermal Current-Limit Protection

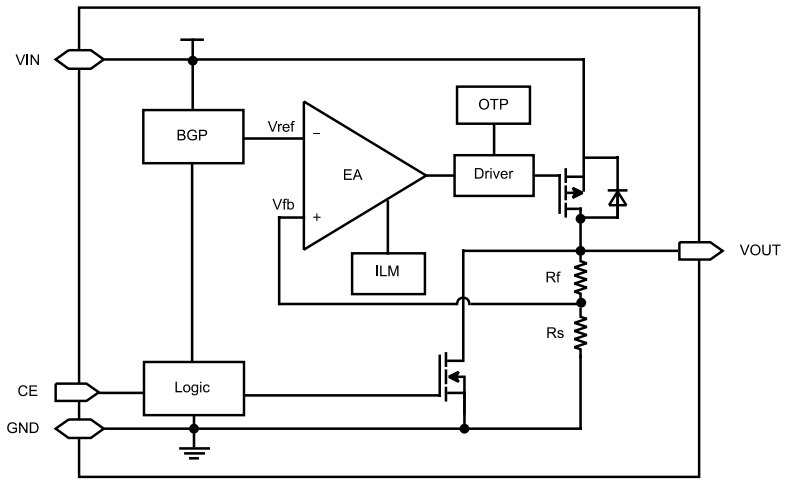
The FLD6118 provides thermal current-limit protection. When the internal junction temperature rises to about 160 ° C, the output is shut down. The output recovers when the temperature falls to about 140°C.

Output Short-Circuit Protection

The FLD6118 provides output short-circuit protection. When the output is shorted, the internal circuit turns off the output. Normal operation resumes after the short circuit is removed.

Functional Description

The error amplifier compares the input voltage V_{FB} from the resistor divider formed by feedback resistors R_S and R_F with the reference voltage V_{REF}. The amplifier supplies the required gate voltage to the output transistor so the output voltage remains constant against input-voltage and temperature variations.



The internal circuit uses phase compensation and the ESR of the output capacitor for stability. Use an electrolytic output capacitor larger than 10uF.

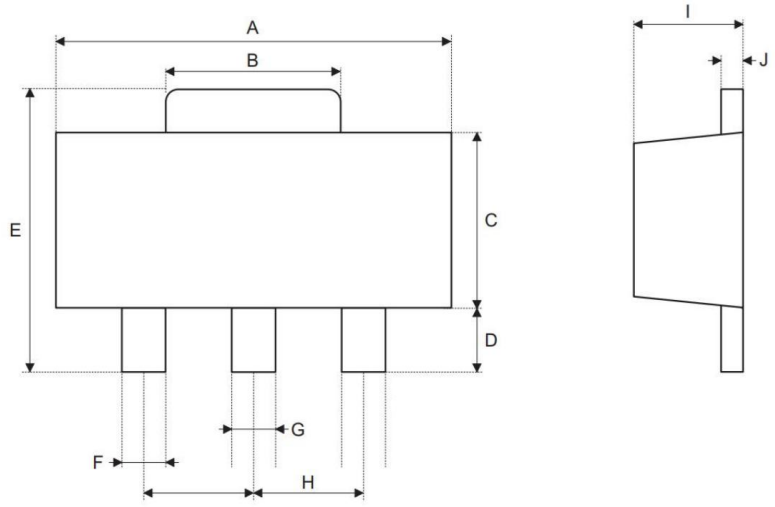
A 10uF polarized capacitor is recommended at both the input and output. Place the capacitors as close as possible to the V_{IN} and V_{OUT} pins of the LDO.

Check the input voltage, output voltage, and load-current conditions to prevent the internal power dissipation (P_D) from exceeding the maximum allowed by the package. P_D is calculated as $P_D = (V_{IN} - V_{OUT}) \times I_{OUT}$.

Example: for FLD6118-5.0 in an SOT89 package, when V_{IN}= 12V and I_{OUT}= 100mA, P_D=(12-5) × 100mA=0.7W, which exceeds the 0.5W package rating and may damage the IC. Refer to the Thermal Information section for P_D values of different packages.

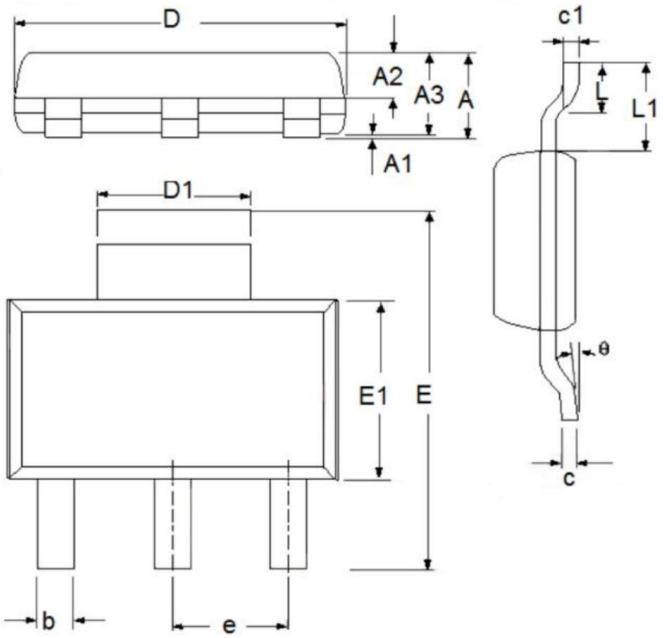
13. Package Information

(1) SOT-89-3L Package Dimensions:



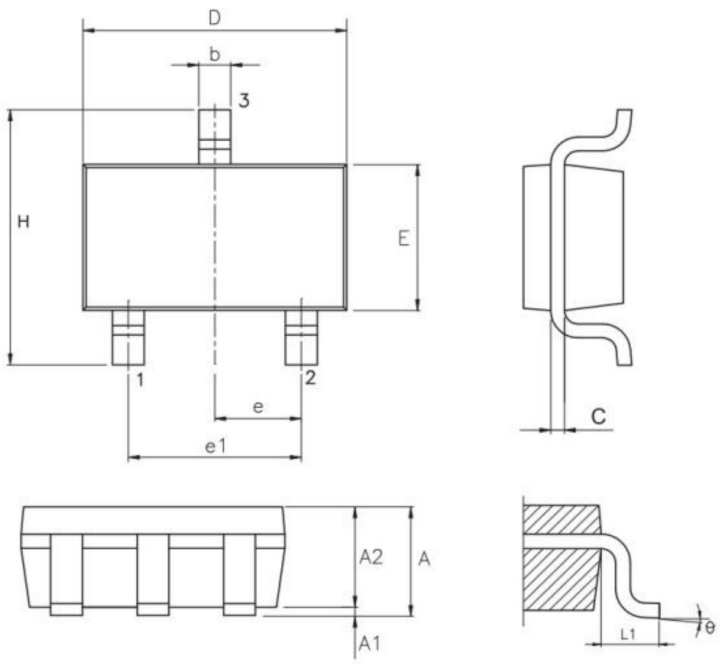
Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	4.40	—	4.60
B	1.35	—	1.83
C	2.29	—	2.60
D	0.89	—	1.20
E	3.94	—	4.25
F	0.36	—	0.48
G	0.44	—	0.56
H	—	1.50 BSC	—
I	1.40	—	1.60
J	0.35	—	0.44

(2) SOT-223 Package Dimensions:



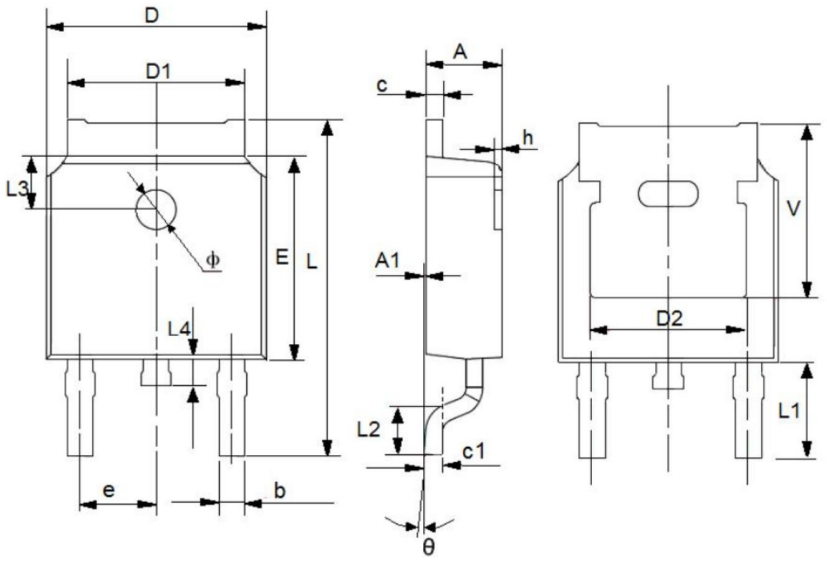
Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	1.48	—	1.8
A1	—	—	0.15
A2	0.6	—	0.95
A3	1.45	—	1.75
b	0.6	—	0.82
c	0.2	—	0.35
D	6.2	—	6.6
D1	2.9	—	3. 1
E	6.7	—	7.3
E1	3.3	—	3.7
e	—	2.3 BSC	—
L	0.76		1.16
L1	—	1.75 BSC	—
θ	0 °	—	10 °
c1	—	0.25 BSC	—

(3) SOT23-3 Package Dimensions:



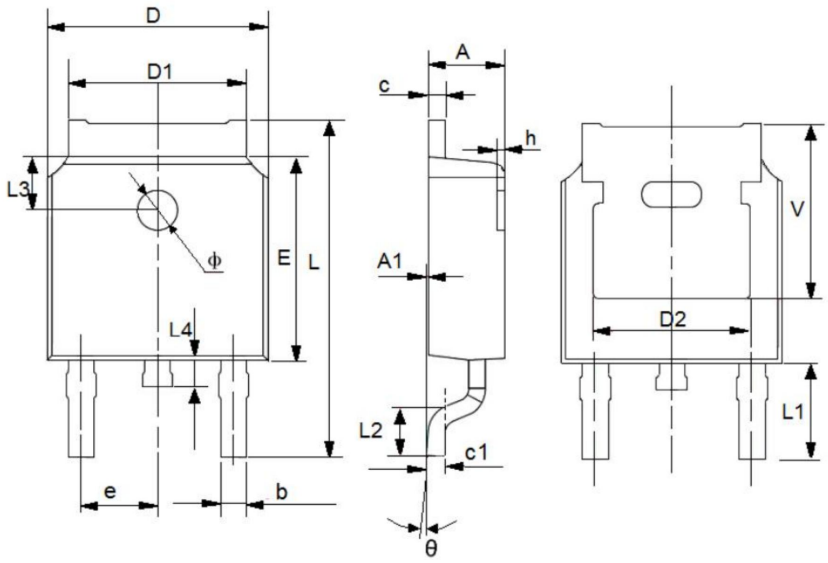
Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	—	—	1.45
A1	—	—	0.15
A2	0.90	1.15	1.30
b	0.30	—	0.50
C	0.08	—	0.22
D	—	2.90 BSC	—
E	—	1.60 BSC	—
e	—	0.95 BSC	—
e1	—	1.90 BSC	—
H	—	2.80 BSC	—
L1	—	0.60 BSC	—
θ	0 °	—	8 °

(4) SOT23-5 Package Dimensions:



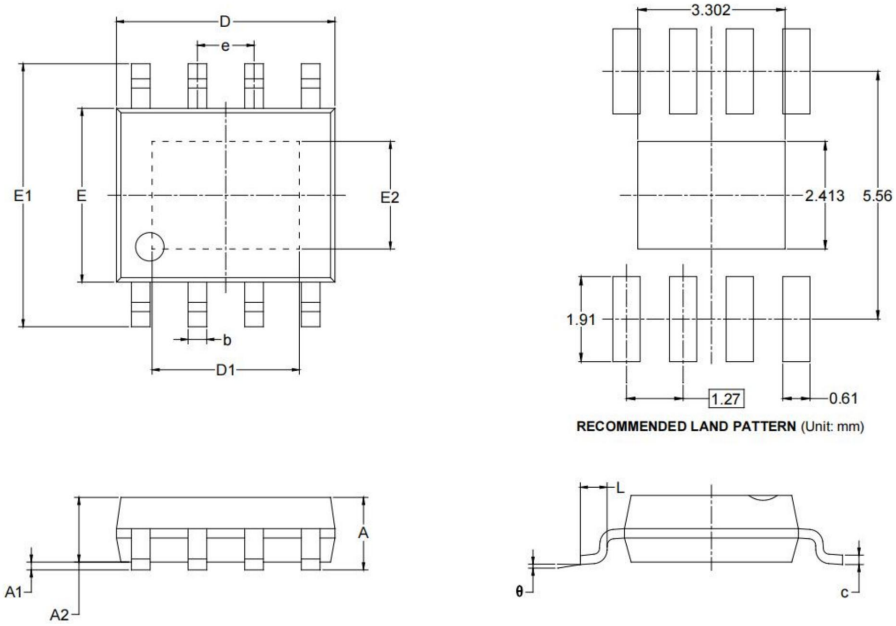
Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	—	—	1.45
A1	—	—	0.15
A2	0.90	1.15	1.30
b	0.30	—	0.50
C	0.08	—	0.22
D	—	2.90 BSC	—
E	—	1.60 BSC	—
e	—	0.95 BSC	—
e1	—	1.90 BSC	—
H	—	2.80 BSC	—
L1	—	0.60 BSC	—
θ	0 °	—	8 °

(5) TO-252 Package Dimensions:



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	2.2	—	2.4
A1	—	—	0.127
b	0.66	—	0.86
c	0.46	—	0.58
cl	0.498	—	0.6
D	6.5	—	6.7
D1	—	5.33 BSC	—
D2	—	4.83 BSC	—
E	6	—	6.2
e	—	2.286 BSC	—
L	9.8	—	10.4
L1	—	2.9 BSC	—
L2	1.4	—	1.7
L3	—	1.8 BSC	—
L4	0.6	—	1
h	—	—	0.3
Φ	1.1	—	1.3
V	—	5.3 BSC	—
θ	0°	—	8°

(6) ESOP8 Package Dimensions:



Symbol	Dimensions (unit: mm)	
	Min	Max
A	—	1.700
A1	0.000	0.100
A2	1.350	1.550
b	0.330	0.510
C	0.170	0.250
D	4.700	5.100
D1	3.202	3.402
E	3.800	4.000
E1	5.800	6.200
E2	2.313	2.513
e	1.27BSC	
L	0.400	1.270
θ	0°	8°

14. Important Notice And Disclaimer

- We reserve the right to change the instruction manual without prior notice.
- Any semiconductor product has a certain possibility of failure or malfunction under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design and overall manufacturing to avoid potential failure risks that may cause personal injury or property damage.
- The improvement of product quality is endless, our company will be dedicated to provide customers with better products.

15. Version Modification Record

Version Number	Revision
first edition	/
V0.1	1.Update the Order Information on page 2.
V0.2	2.Update the Electrical Characteristics on page 11.