General Description

The LTP3558 is a high voltage, low power consumption and high performance LDO. The family uses an advanced CMOS process and a P-MOSFET pass device to achieve fast start-up, with high output voltage accuracy. The LTP3558 is stable with a 1.0μF~10μF ceramic output capacitor, and uses a precision voltage reference and feedback loop to achieve a worst-case accuracy of 2% over all load, line, process, and temperature variations.

Features

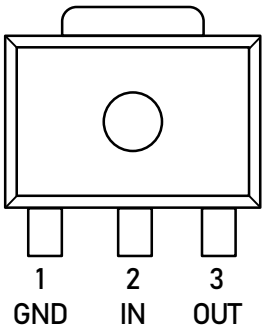
- Wide Input Voltage Range: up to 36V
- Output Current: 200mA
- Standard Fixed Output Voltage Options: 1.8V, 2.5V, 3.0V, 3.3V, 3.6V, and 5.0V
- Other Output Voltage Options Available on Request
- Low Iα: 1.5μA
- Low Dropout Voltage
- Short current protection: 100mA
- Excellent Load and Line Transient Response
- Line Regulation: 0.01%/V Typically
- Available Packages:

Order Information

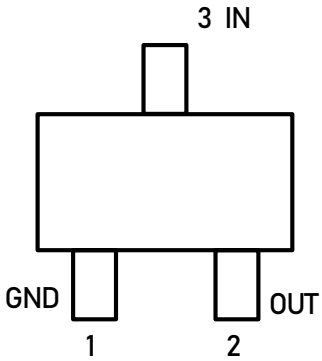
Model	Package	Ordering Number Note1	Packing Option
LTP3558	SOT23-3L	LTP3558-xxXT3	Tape and Reel, 3000
	SOT23-5L	LTP3558-xxXT5	Tape and Reel, 3000
	DFN1x1-4L	LTP3558-xxXF4	Tape and Reel, 10000
	SOT89-3	LTP3558-xxXT4	Tape and Reel, 1000

Notel: xx stands for output voltage, e.g. if xx = 18, the output voltage is 1.8V; if xx = 30, the output voltage is 3.0V.

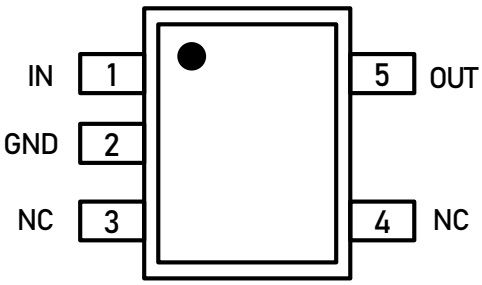
Pin Configuration



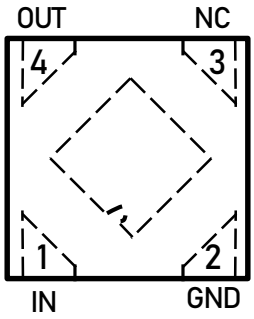
SOT89-3



SOT23-3L



SOT23-5L



DFN1×1-4L

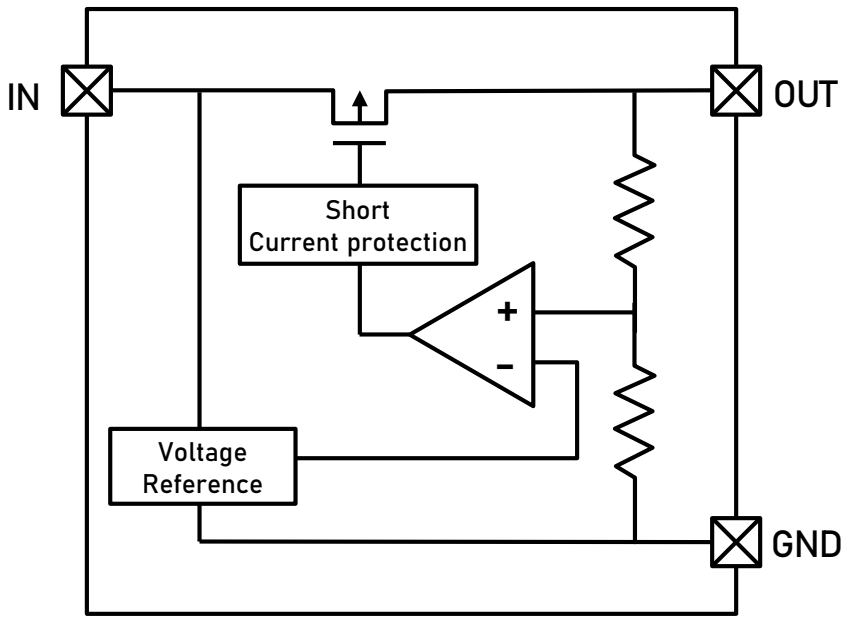
TOP VIEW

Pin Function

Pin No.		Pin Name	Pin Function
SOT-89	SOT23-3L		
1	1	GND	Ground.
2	3	IN	Supply input pin. Must be closely decoupled to GND with a 1μF or greater ceramic capacitor.
3	2	OUT	Output pin. Bypass a 1μF or greater ceramic capacitor from this pin to ground.

Pin No.		Pin Name	Pin Function
SOT23-5L	DFN1x1-4L		
1	1	IN	Supply input pin. Must be closely decoupled to GND with a 1µF or greater ceramic capacitor.
2	2	GND	Ground.
3	3	NC	No connection.
4		NC	No connection.
5	4	OUT	Output pin. Bypass a 1µF or greater ceramic capacitor from this pin to ground.

Block Diagram



Functional Description

Input Capacitor

A 1µF-10µF 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.

Output Capacitor

An output capacitor is required for the stability of the LDO. The recommended output capacitance is from 1μF to 10μF, Equivalent Series Resistance (ESR) is from 5mΩ to 100mΩ, and temperature characteristics are X7R or X5R. Higher capacitance values help to improve load/line transient response. The output capacitance may be increased to keep low undershoot/overshoot. Place output capacitor as close as possible to OUT and GND pins.

Low Quiescent Current

The LTP3558, consuming only around 1.5μA for all input range and output loading, provides great power saving in portable and low power applications.

Short Current Limit Protection

When output current at the OUT pin is higher than current limit threshold or the OUT pin is short-circuit to GND, the short current limit protection will be triggered and clamp the output current to approximately 100mA to prevent over-current and to protect the regulator from damage due to overheating.

Absolute Maximum Ratings

Parameter	Rating		Unit
IN pin to GND pin	-0.3 to 40		V
OUT pin to GND pin	-0.3 to 6		V
Thermal Resistance (Junction to Ambient)	SOT23-3L	360	°C/W
	SOT23-5L	250	
	DFN1X1-4L	180	
	SOT-89	135	
Operating Junction Temperature	-40 to 125		°C
Storage Temperature	-65 to 150		°C
Lead Temperature (Soldering, 10 sec)	300		°C
ESD (HBM mode)	ESDA/JEDEC JS-001-2017		±2000V

Electrical Characteristics

(V_{IN}= V_{OUT}+2V, T_a= 25°C, C_{IN}=10uF, C_{OUT}=10uF unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage Operation Range	V_{IN}				36	V
Dropout Voltage	V_{DROP}	V_{OUT}= 5V, I_{OUT} = 150mA		720		mV
		V_{OUT}= 5V, I_{OUT} = 100mA		420		
		V_{OUT}= 3.3 V, I_{OUT} = 150mA		820		
		V_{OUT}= 3.3 V, I_{OUT} = 100mA		520		
DC Supply Quiescent Current	I_Q			1.5	3	µA
Regulated Output Voltage	V_{OUT}	I_{OUT}=1mA	V_{OUT} X 0.98		V_{QUT}X1.02	V
Output Voltage Line Regulation	Reg_{LINE}	V_{IN} = V_{OUT} +1V to 30V, IOUT = 10mA ($\triangle V_{OUT}/\triangle V_{IN}/V_{OUT}$)		0.01	0.04	%/V
Output Voltage Load Regulation	Reg_{LOAD}	I_{OUT} from 1mA to 150mA V_{IN}=V_{OUT}+2V		5	20	mV
		I_{OUT} from 1mA to 150mA V_{IN}=10V		25	60	mV
Maximum Output Current	I_{OUT}	V_{IN} = V_{OUT} +1V	200			mA
Short Current Protection	I_{SHORT}	OUT short to GND		100		mA
Output Noise	e_N	10Hz to 100kHz, I_{OUT} = 30mA,		90		μV_{RMS}

TYPICAL PERFORMANCE CHARACTERISTICS

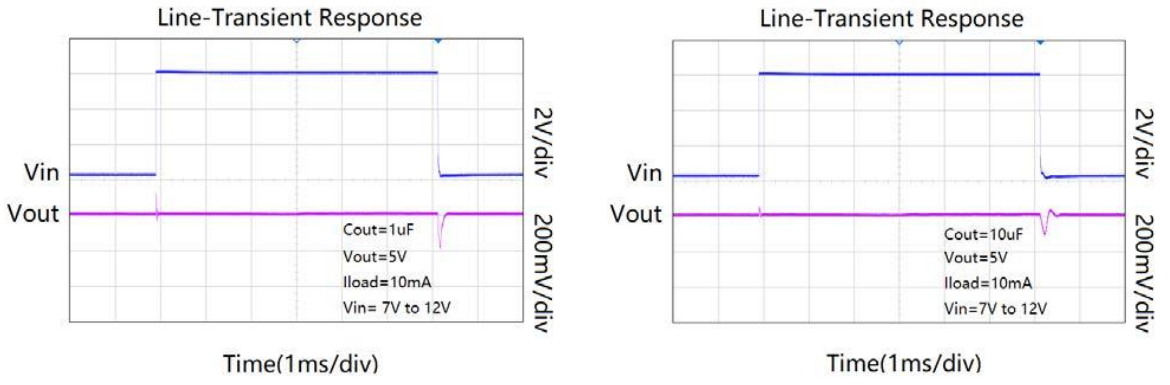


Fig1. Line-Transient Response

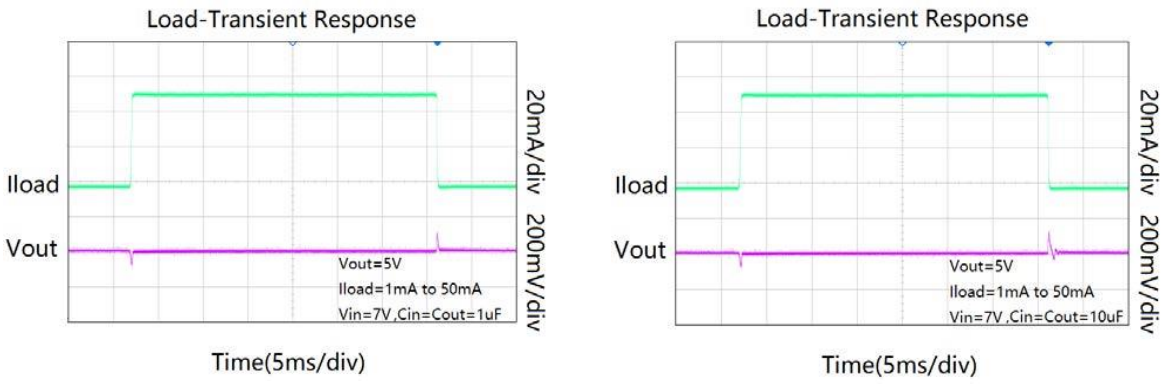


Fig2.Load-Transient Response

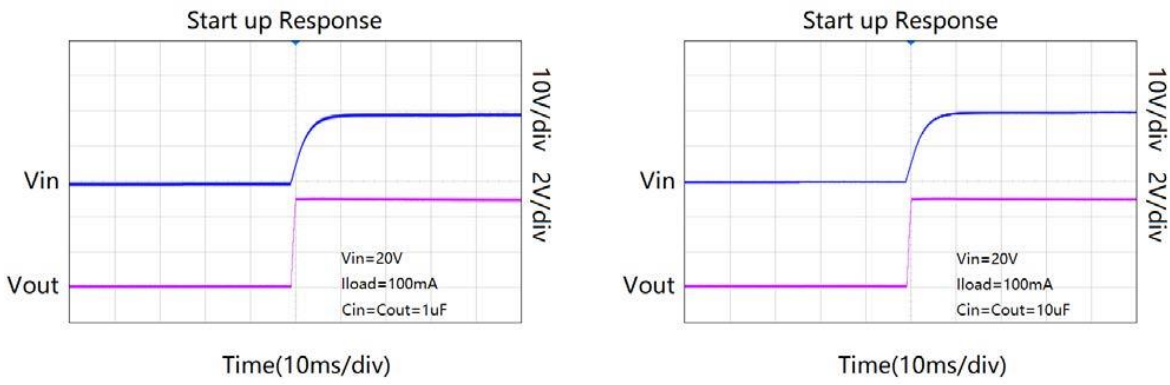


Fig3.StartupResponse

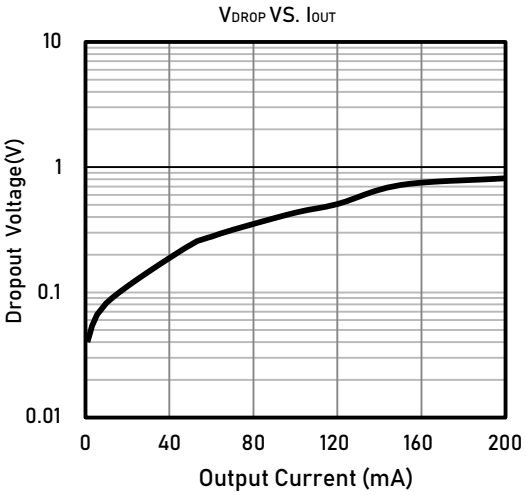


Fig4. Dropout Voltage VS Output Current

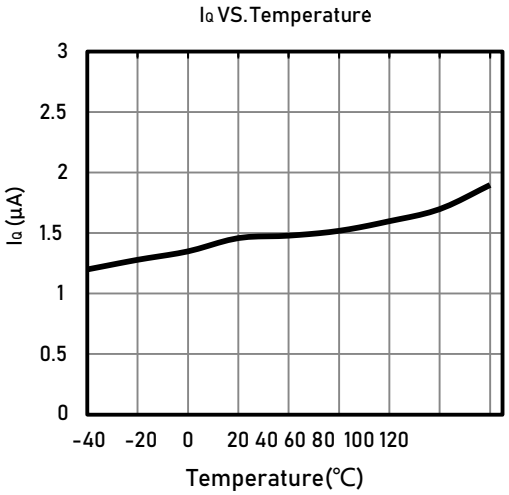
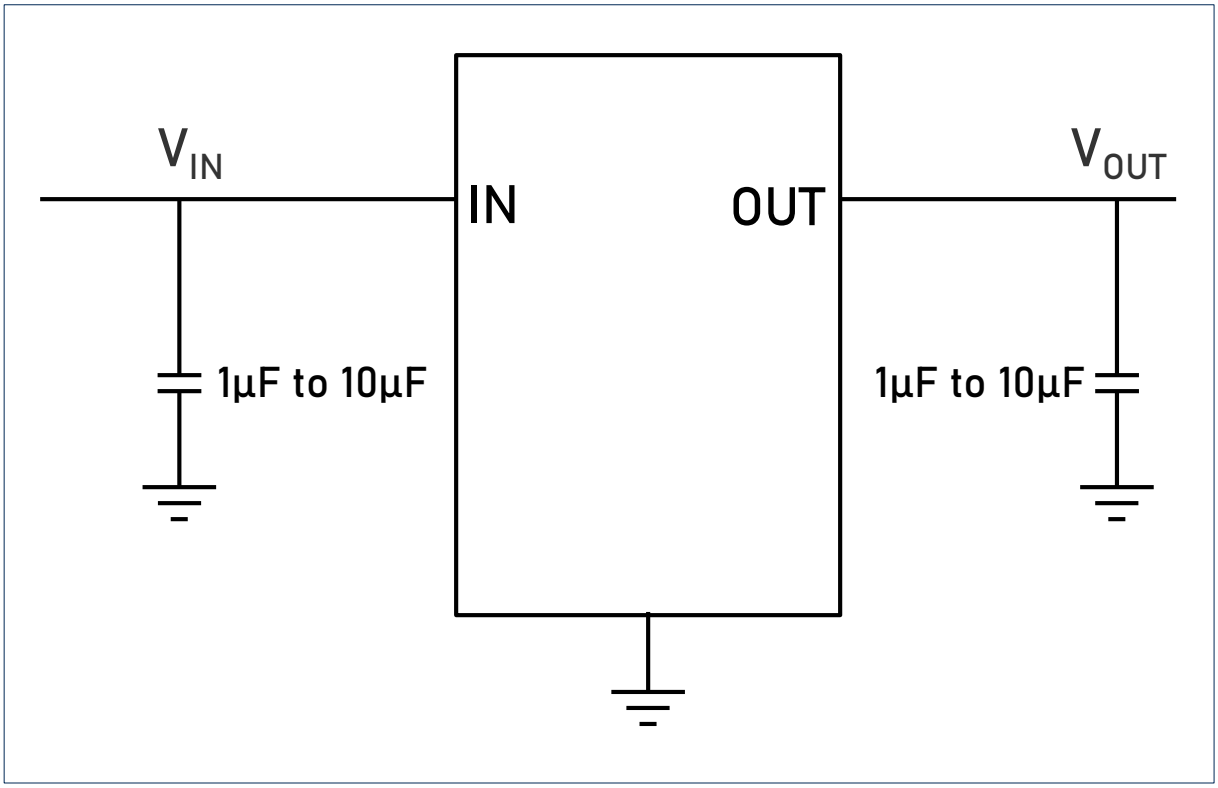


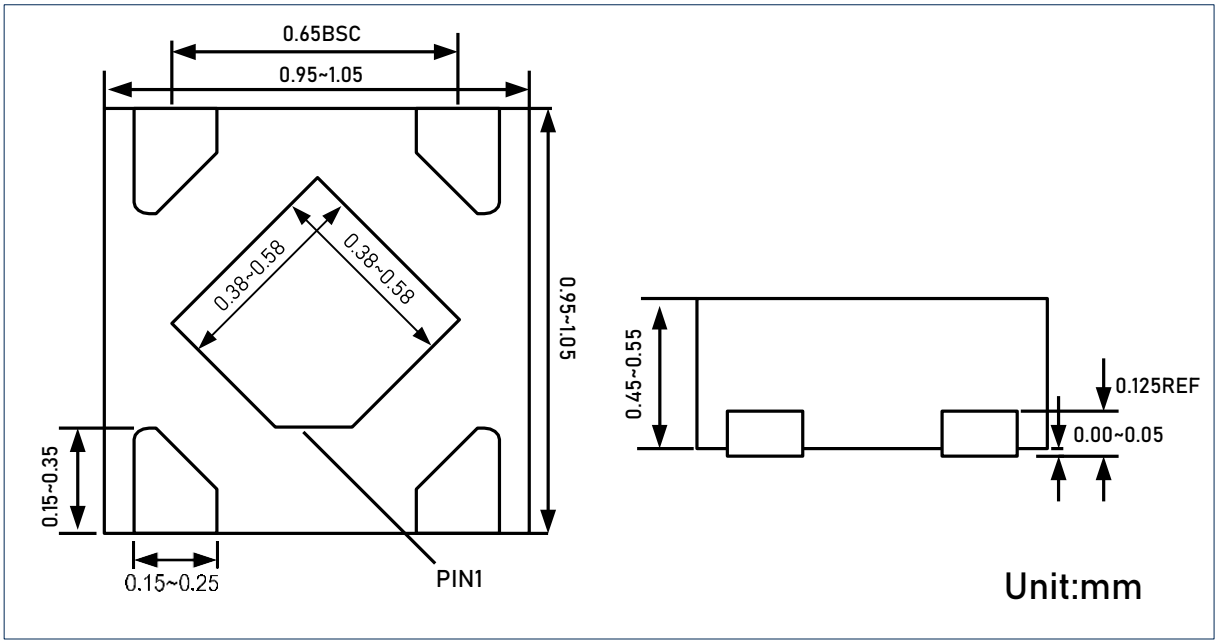
Fig5. DC Supply Quiescent Current VS Temperature

Application Circuits

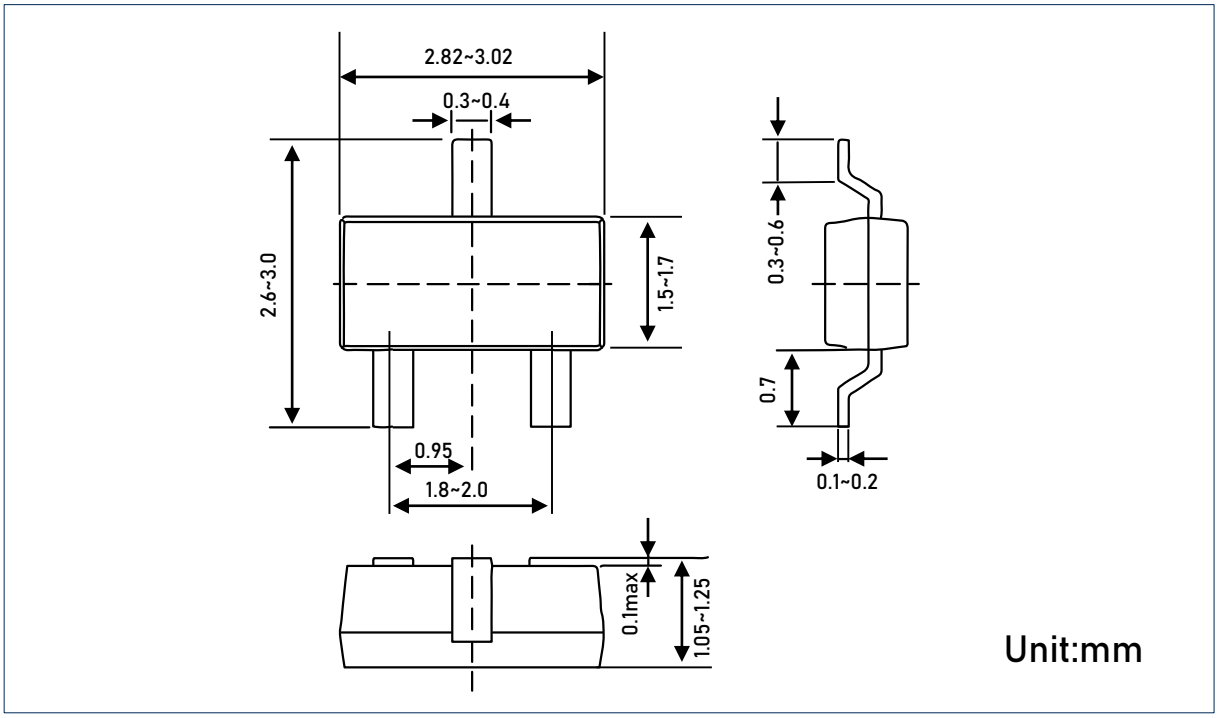


Package Dimension

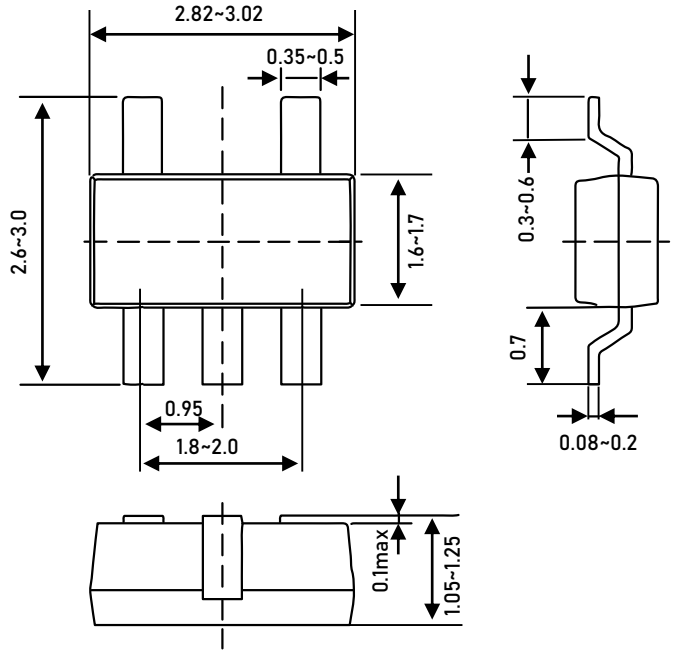
DFN1x1-4L



SOT23-3L

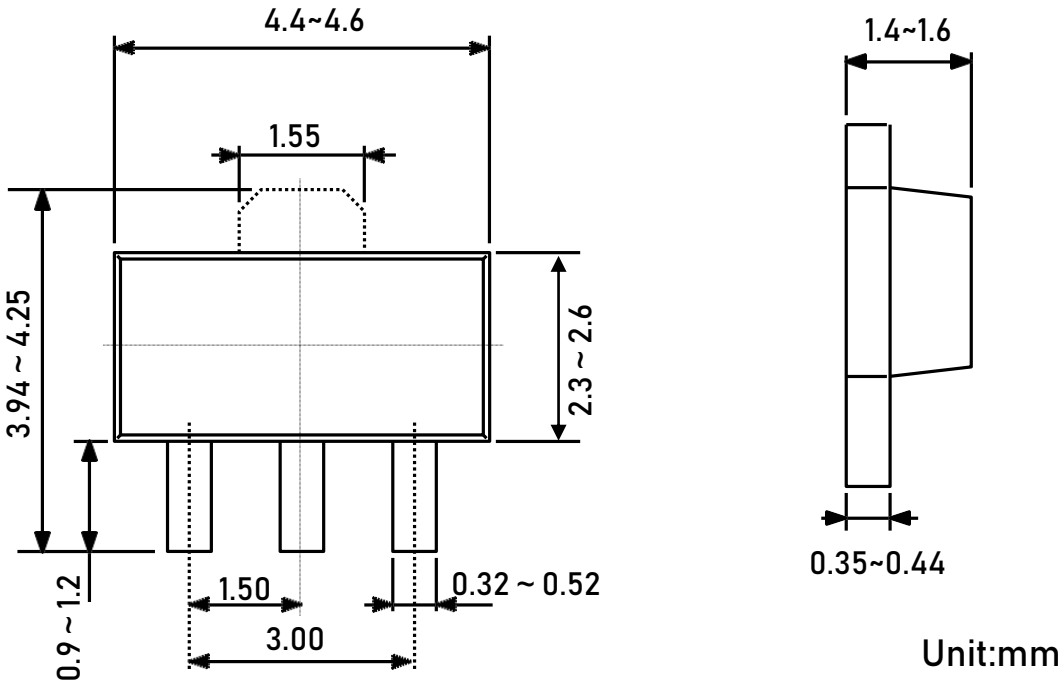


SOT23-5L



Unit:mm

SOT-89



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