General Description

The LTP6202 family are the 300 mA CMOS low dropout regulator using a type of outstanding CMOS process to minimize the supply current. The low consumption of typical 6 µA makes it ideal for most power-saving systems. The maximum input voltage is 7 V and the range of fixed output voltage is 2.8V, 3.0V and 3.3V.

The LTP6202 family offer short-circuit protection circuit to ensure safe operation and extended life.

The LTP6202 family are available in SOT23 packages.

Features

- Wide Input Voltage Range: 2.8 to 7.0 V
- Up to 300 mA Load Current
- Standard Fixed Output Voltage Options: 2.8 V, 3.0 V, 3.3 V
- More Output Voltage Options Available on Request
- Low Dropout: 320 mV at 100 mA Load
- Low Quiescent Current: 6 µA Typically
- Available in SOT23 Packages

Applications

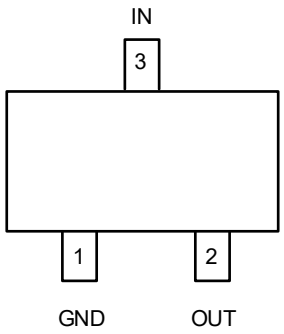
- Smart Phones and Cellular Phones
- Portable Devices
- Battery-Powered Equipment
- Communication equipment
- Audio and video equipment
- Power Supply System for Consumer Electronics

Ordering Information

Model Note1	Package	Ordering Number Note1	Package Option
LTP6202	SOT-23	LTP6202-xxYT3	Tape and Reel, 3000

Note： xx stands for output voltage, e.g. if xx = 18, the output voltage is 1.8 V; if xx = 30, the output voltage is 3.0 V. The device with suffix "N" is shutdown version with enable control input.

Pin Configurations (Top View)

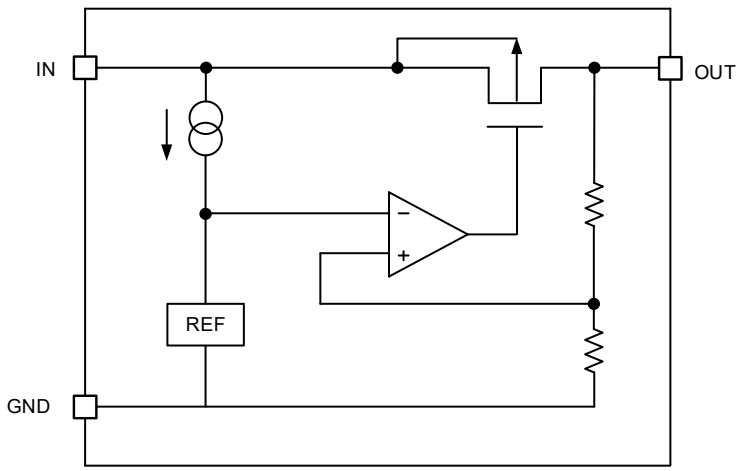


SOT23

Pin Function

SOT23	Symbol	Function
3	IN	Supply input pin.
1	GND	Ground.
2	OUT	Output pin..

Block Diagram



Functional Description

Input Capacitor

At least 1 µF ceramic capacitor is recommended to connect between IN and GND pins to decouple input power supply glitch and noise, To achieve better temperature coefficient and lower ESR. 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 IN and GND.

Output Capacitor

An output capacitor is required for the stability of the LDO. The recommended output capacitance shall be at least 1 µF, and temperature characteristics is 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.

Short Current Limit Protection

LTP6202 family realize the functions of short-circuit protection. The SCP current is set to 25 mA. Even if the output is short circuited to ground, IC damage can be prevented. When the output is short circuited to ground, the output current will be clamped to I_{SCP}.

Power Dissipation and Heat sinking

The maximum power dissipation supported by the device is dependent upon board design and layout. Mounting pad configuration on the PCB, the board material and the ambient temperature affect the rate of junction temperature rise for the part. The maximum power dissipation the LTP*** device can handle is given by:

$$P_{D(MAX)} = (T_{J(MAX)} - T_A) / \theta_{JA}$$

Where $T_{J(MAX)}$ is the maximum junction temperature, T_A is the ambient temperature, and θ_{JA} is the junction to ambient thermal resistance. For recommended operating condition specifications the maximum junction temperature is 125°C and T_A is the ambient temperature. The junction to ambient thermal resistance, θ_{JA}, is layout dependent. The maximum power dissipation depends on the operating ambient temperature for fixed $T_{J(MAX)}$ and thermal resistance, θ_{JA}.

Absolute Maximum Ratings

Parameter	Rating	Unit
Input Voltage	8	V
Maximum Load Current	500	mA
Junction to Ambient Thermal Resistance (θ_{JA})	250	°C/W
Operation Temperature	–40 to 85	°C
Storage Temperature	–40 to 125	°C
Electrostatic Discharge Voltage (ESD)	2000	V

NOTE: Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Recommended Operating Conditions

Parameter	Rating	Unit
Operating Temperature Range	–40 to 85	°C

Caution

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. LINEARIN recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

LINEARIN reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time. Please contact LINEARIN sales office to get the latest datasheet.

Electrical Characteristics

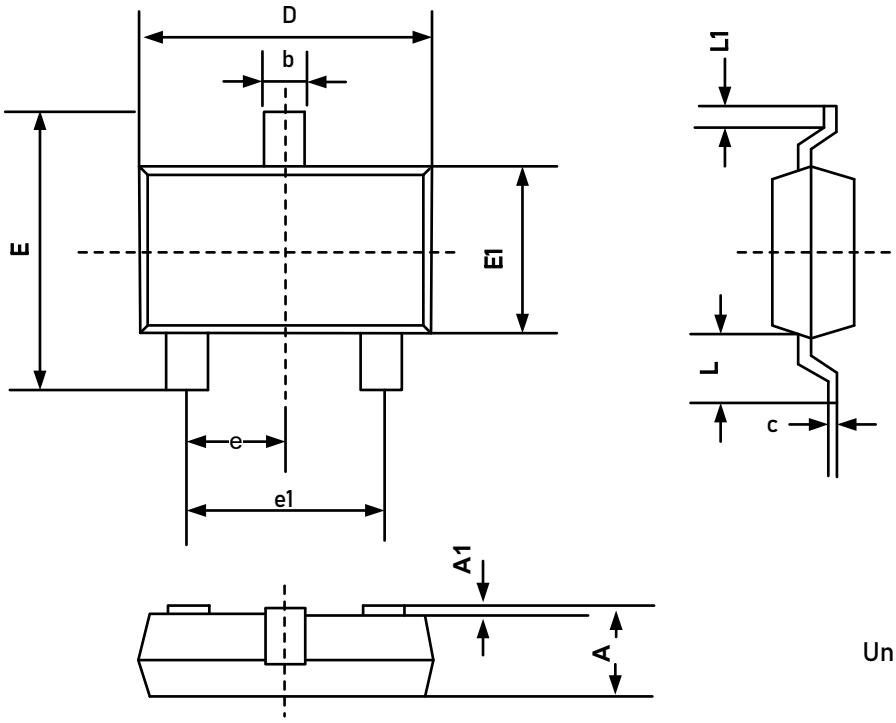
(C_{IN} = C_{OUT} = 1 µF, T_A = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input Voltage Operation Range	V_{IN}	I_{SS} = 5 µA	2.8		7.0	V
Dropout Voltage	V_{DROP}	ΔV_{OUT} = ±2%*V_{OUT}, I_{OUT} = 50 mA		150		mV
		ΔV_{OUT} = ±2%*V_{OUT}, I_{OUT} = 100 mA		320		
Output Current	I_{OUT}	V_{IN} = V_{OUT} + 1 V		300		mA
Output Voltage	V_{OUT}	V_{IN} = V_{OUT} + 1 V, I_{OUT} = 10 mA	–2		2	%
Output Voltage Line Regulation	R_{egLINE}	V_{IN} = V_{OUT} + 1 to 7 V, I_{OUT} = 10 mA		10	20	mV
Output Voltage Load Regulation	R_{egLOAD}	V_{IN} = V_{OUT} + 1V, I_{OUT} from 1 to 100 mA		20	40	mV
Power Supply Rejection Ratio	PSRR	f = 100 Hz, V_{IN} = V_{OUT} + 1V, I_{OUT} = 10 mA		75		dB
		f = 1 kHz, V_{IN} = V_{OUT} + 1V, I_{OUT} = 10 mA		55		
		f = 10 kHz, V_{IN} = V_{OUT} + 1V, I_{OUT} = 10 mA		40		
Quiescent Current	I_Q	V_{IN} = V_{OUT} + 1 V,		6	12	µA
Short-circuit Current	I_{SCP}			25	50	mA
Temperature Coefficient	$\Delta V_{OUT}/(\Delta T_A * V_{OUT})$	V_{IN} = V_{OUT} + 1 V, I_{OUT} = 10 mA, T_A from -40°C to 85°C		±50	±100	ppm/°C

Note: Production test at + 25°C. Specifications over the temperature range are guaranteed by design and characterization.

Package Dimension

SOT23



Unit: mm

Symbol	Dimensions In Millimeters	
	MIN	MAX
A	0.900	1.150
A1	0.000	0.100
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	2.250	2.550
E1	1.200	1.400
e	0.950BSC	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°