

General Description

LTP3570 is a high voltage (up to 40 V) ultra-low quiescent current low dropout voltage regulator (LDO) manufactured in CMOS processes. It can deliver up to 500 mA of current while consuming only 2.5 μ A of quiescent current. It consists of a reference voltage generator, an error amplifier, a current foldback circuit, and a phase compensation circuit plus a driver transistor. The LTP3570 is designed specifically for applications where very-low IQ is a critical parameter. This device maintains low quiescent current consumption even in dropout mode to further increase the battery life.

Features

- Wide Input Voltage Range: up to 40V
- Ultra – low Quiescent Current: 2.5 μ A
- Output Voltage Accuracy: $\pm 2\%$
- Max Output Current: 500mA
- Dropout Voltage: 300mV@ $I_{OUT}=100mA$
- Temperature Stability: ± 50 ppm/ $^{\circ}C$
- Fixed Output Voltage: 12V
- Protection Circuits: Current Limit, Thermal shutdown
- Output Capacitor: Low ESR Ceramic Capacitor Compatible
- Available Packages: SOT89-3

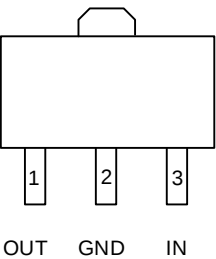
Applications

- Mobile device
- Cameras
- Wireless communication equipment
- Battery-powered device

Order Information

Model	Package	Ordering Number ^{Note1}	Packing Option
LTP3570	SOT89-3	LTP3570-12RXT4	Tape and Reel, 1000

Pin Configuration (Top View)



SOT89-3

Pin Function

Pin	Symbol	Description
1	OUT	Output pin.
2	GND	Ground.
3	IN	Power supply input pin.

RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Rating	Unit
Operating Ambient Temperature	T _A	-40 to 125	°C

ABSOLUTE MAXIMUM RATINGS

Parameter	Rating	Value	Unit
V _{IN}	Input Voltage ⁽¹⁾	-0.3 to 45	V
V _{OUT}	Output Voltage	-0.3 ~ V _{IN} +0.3	V
P _D	Power Dissipation	1000	mW
T _{STG}	Storage Temperature	-65 to 150	°C
θ _{JA}	Thermal Resistance (Junction to Ambient) SOT89-3 ⁽²⁾	135	°C/W
ESD (HBM mode)	ESD Protection	5000	V

NOTES:

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.

- (1) Refer to ELECTRICAL CHARACTERISTICS and APPLICATION INFORMATION for Safe Operating Area.
- (2) This particular frame decreases the total thermal resistance of the package and increases its ability to dissipate power when an appropriate area of copper on the printed circuit board is available for heat-sinking.

CAUTION: These devices are sensitive to electrostatic discharge; follow proper IC Handling Procedures.
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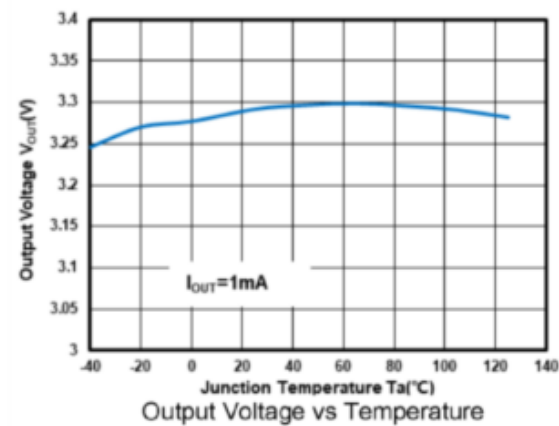
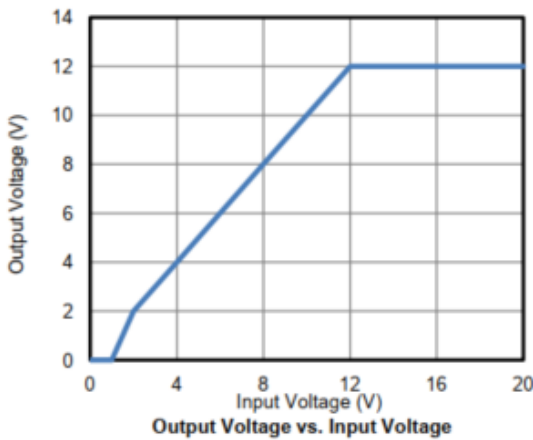
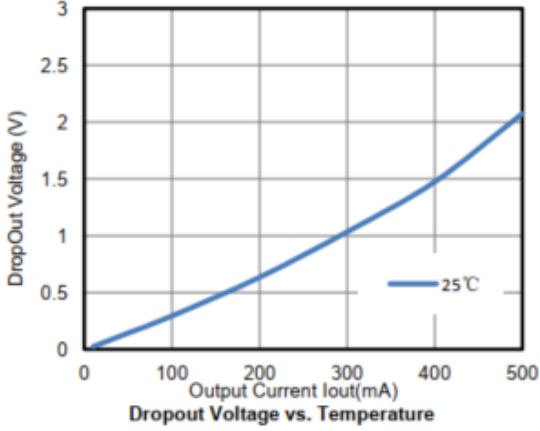
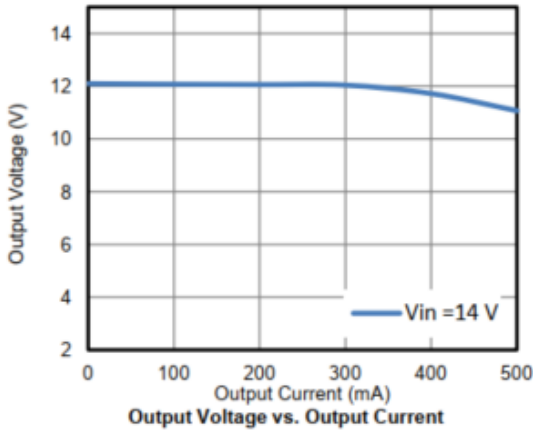
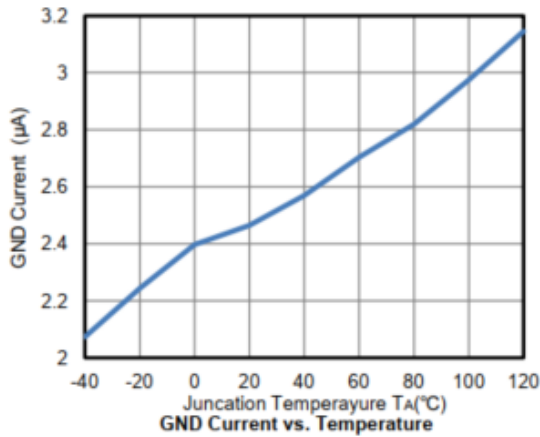
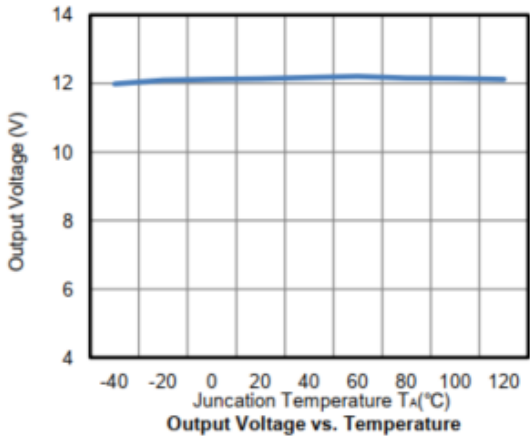
Electrical Characteristics

(Typical values are tested at T_a= 25 °C)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
V _{IN}	Input Voltage		12		40	V
V _{OUT}	Output Voltage	V _{IN} = V _{OUT} +2V, I _{OUT} = 1mA	-2%		+2%	V
Reg _{LINE}	Line Regulation	V _{OUT} +2V ≤ V _{IN} ≤ 35V, I _{OUT} = 1 mA		0.01	0.02	%V
V _{DROP}	Dropout Voltage	I _{OUT} =1mA		4	8	mV
		I _{OUT} =300mA		1200	1800	
Reg _{LOAD}	Load Regulation	1 mA ≤ I _{OUT} ≤ 400 mA, V _{IN} = V _{OUT} + 2 V		50	80	mV
I _q	Quiescent Current	V _{IN} ≤ 40V, I _{OUT} = 0 mA		2.5	3.5	μA
I _{OUTMAX}	Maximum Output Current			500		mA
I _{LMT}	Current Limit	V _{IN} =V _{OUT} +2V, V _{OUT} =0.95V _{OUT}		550		mA
PSRR	Power Supply Rejection Ratio	f=1kHz		62		dB
		f=100kHz		48		
		f=1MkHz		40		
OTP	Over Temperature Protection			170		°C

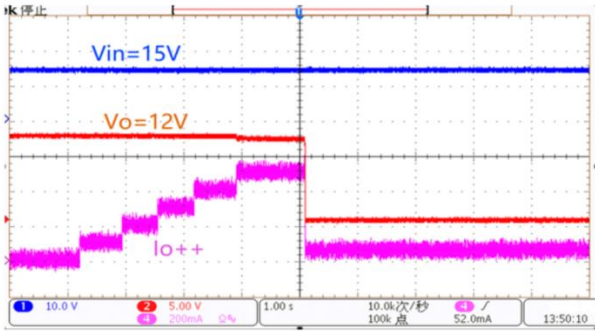
TYPICAL PERFORMANCE CHARACTERISTICS

Note: Voltage set 12V ($V_{IN} = V_{OUT} + 2V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 2.2\mu F$, $T_A = +25^\circ C$)

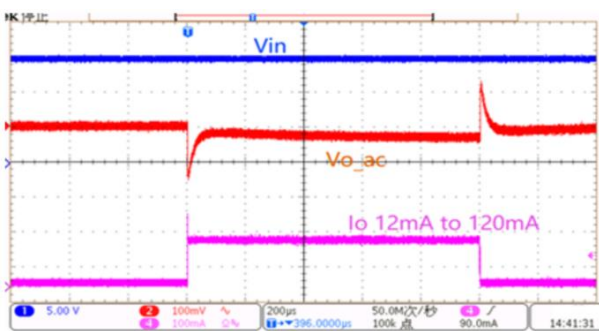


TYPICAL PERFORMANCE CHARACTERISTICS

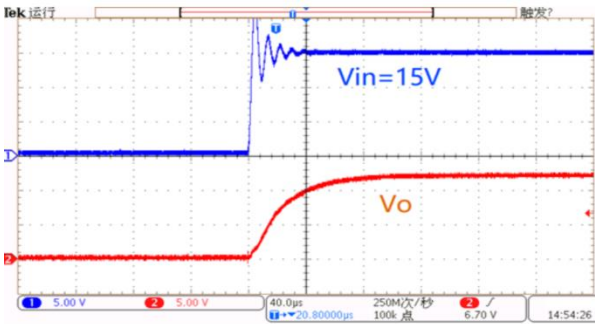
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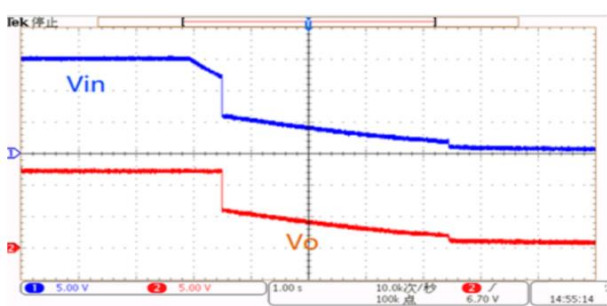
Output Voltage VS Output Current, $C_{IN} = C_{OUT} = 1\mu F$, $I_{LIMIT} = 550\text{ mA}$



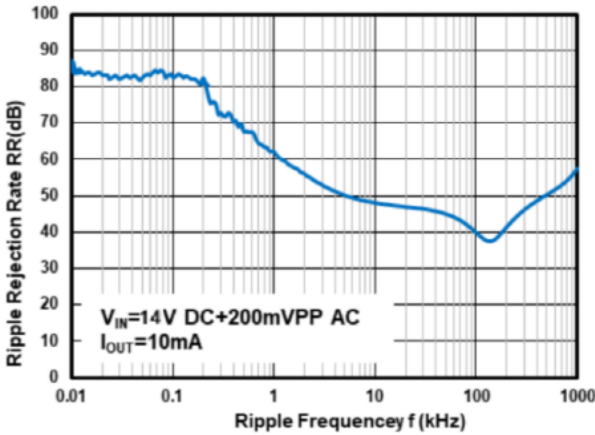
Load Transient, $C_{IN} = C_{OUT} = 1\mu F$, $I_{OUT} = 12\text{ mA} \sim 120\text{ mA}$



Power On, $C_{IN} = C_{OUT} = 1\mu F$, $I_{OUT} = 0\text{ mA}$, V_{IN} VS V_{out}

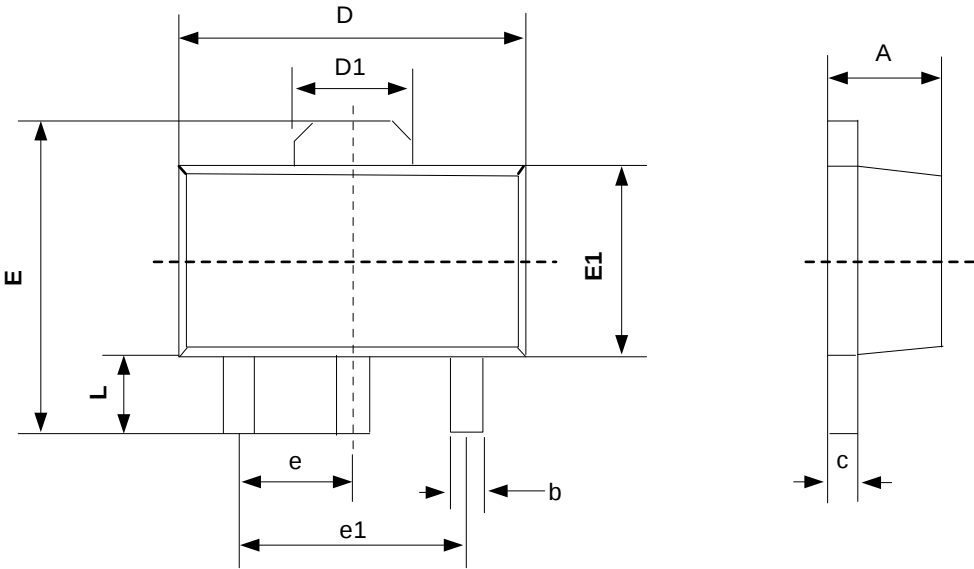


Power Off, $C_{IN} = C_{OUT} = 1\mu F$, $I_{OUT} = 0\text{ mA}$, V_{IN} VS V_{out}



Power Supply Rejection Ratio at $V_{OUT}=12\text{ V}$

SOT89-3



Unit: mm

Symbol	Dimensions In Millimeters	
	Min	Max
A	1.400	1.600
b	0.320	0.520
c	0.350	0.440
D	4.400	4.600
D1	1.550REF	
E	3.940	4.250
E1	2.300	2.600
e	1.500BSC	
e1	3.000BSC	
L	0.900	1.200