



**GP**  
ELECTRONICS

**GPL6388V120SKE**

50V Low Current Consumption 150mA CMOS Voltage Regulator

**Product Summary**

The GPL6388V120SKE is positive voltage regulators manufactured by CMOS technologies with low power consumption and low dropout voltage, which provide large output currents even when the difference of the input-output voltage is small. The GPL6388V120SKE can deliver 150mA output current and allow an input voltage as high as 50V. The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

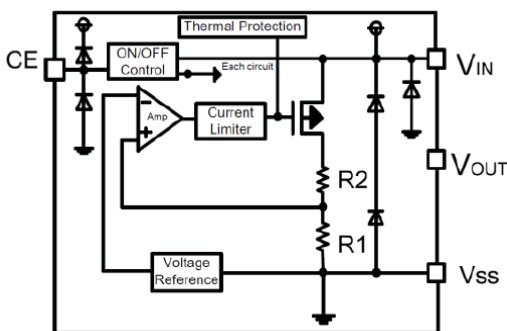
**Features**

- Low Quiescent Current: 3μA
- Operating Voltage Range: 2.5V~50V
- Output Current: 150mA
- Low Dropout Voltage: 500mV@50mA(V<sub>OUT</sub>=3.3V)
- Output Voltage: 12V
- High Accuracy: ±2%/±1% (Typ.)
- High Ripple Rejection: 80dB@1kHz
- Low Output Noise: 27xV<sub>OUT</sub> μ V<sub>RMS</sub> (10Hz~100kHz)
- Excellent Line and Load Transient Response
- Built-in Current Limiter, Short-Circuit Protection
- Over-Temperature Protection

**Applications**

- Cordless Phones
- Radio control systems
- Laptop, Palmtops and PDAs
- Single-lens reflex DSC
- PC peripherals with memory
- Wireless Communication Equipment
- Portable Audio Video Equipment
- Car Navigation Systems
- LAN Cards
- Ultra-low Power Microcontrollers

**Block Diagram**

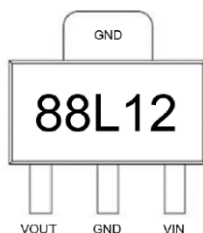


**Order Information**

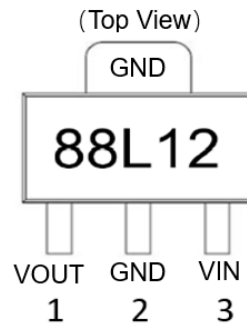
GPL6388V①S②

Designator	Description
①	Output Voltage e.g. 12V=120
②	Package: SOT-23-3L=K3 SOT-23-5L=K5 SOT-89-3L=KE SOT-89-5L=KT SOT-223=DT

**Marking:**



## PIN CONFIGURATION



SOT-89-3L (S-Type)

PIN NUMBER	PIN NAME	FUNCTION
1	V <sub>OUT</sub>	Output
2	G <sub>ND</sub>	Ground
3	V <sub>IN</sub>	Power Input

### Absolute Maximum Ratings<sup>1)</sup> (T<sub>A</sub>=25°C, unless otherwise noted)

Parameter	Symbol	Ratings	Units
Input Voltage <sup>2)</sup>	V <sub>IN</sub>	-0.3~ 65	V
Output Voltage <sup>2)</sup>	V <sub>OUT</sub>	0.3~ 15	V
CE Pin Voltage <sup>2)</sup>	V <sub>CE</sub>	0.3~ V <sub>IN</sub> +0.3	V
Output Current	I <sub>OUT</sub>	400	mA
Power Dissipation	P <sub>D</sub>	1.5	W
Operating Junction Temperature Range <sup>3)</sup>	T <sub>j</sub>	-40~125	°C
Storage Temperature	T <sub>stg</sub>	-40~125	°C
Lead Temperature(Soldering, 10 sec)	T <sub>solder</sub>	260	°C
ESD Rating	Human Body Model-(HBM)	2	kV
	Machine Model-(MM)	200	V

- 1) 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 under *recommended operating conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- 2) All voltages are with respect to network ground terminal.
- 3) ESD testing is performed according to the respective JESD22 JEDEC standard. The human body model is a 100 pF capacitor discharged through a 1.5kΩ resistor into each pin. The machine model is a 200pF capacitor discharged directly into each pin.

### Recommended Operating Conditions

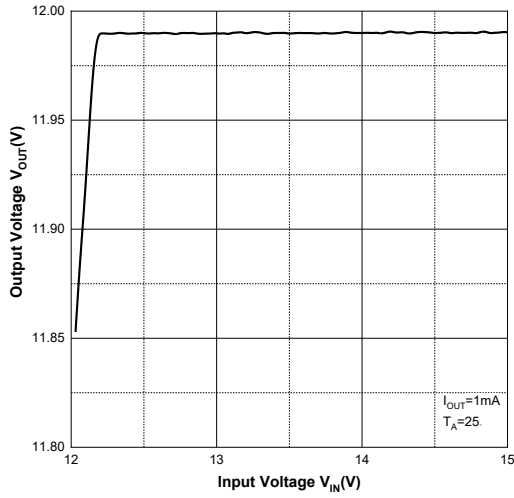
Parameter	Min.	Nom.	Max.	Units
Supply voltage at V <sub>IN</sub>	2.5		50	V
Operating junction temperature range, T <sub>j</sub>	-40		125	°C
Operating free air temperature range, T <sub>A</sub>	-40		85	°C

## Electrical Characteristics ( $V_{IN}=14V$ , $C_{IN}=C_{OUT}=1\mu F$ , $T_A=25^\circ C$ , unless otherwise specified)

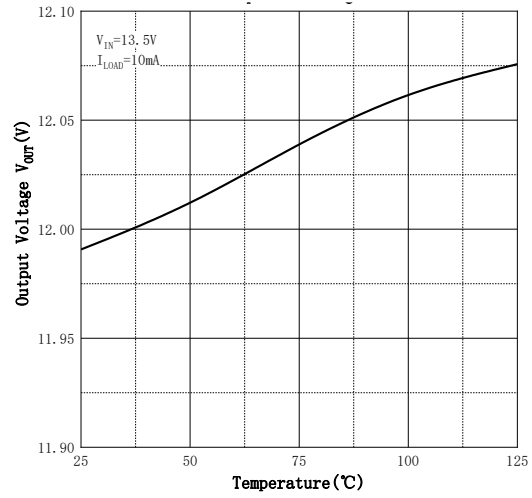
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units	
Input Voltage	$V_{IN}$		2.5	—	50	V	
Output Voltage Range	$V_{OUT}$	$I_{OUT}=1mA$		12		V	
Dropout Voltage	$V_{dif}$	$I_{OUT}=50mA, V_{OUT}=3.3V$	—	500	—	mV	
Supply Current	$I_{SS}$	$I_{OUT}=0A$	—	5	10	$\mu A$	
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	$I_{OUT}=10mA$ $V_{OUT}+1V \leq V_{IN} \leq 18V$	—	0.01	0.3	%/V	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=13V,$ $1mA \leq I_{OUT} \leq 100mA$	—	10	—	mV	
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta T_A}$	$I_{OUT}=10mA, -$ $40^\circ C < T_A < 125^\circ C$		50		ppm	
Output Current Limit	$I_{LIM}$	$V_{OUT}=6V, V_{IN}=5V$	150	250		mA	
Short Current	$I_{SHORT}$	$V_{OUT}=V_{SS}$	—	20	—	mA	
Power Supply Rejection Ratio	PSRR	$I_{OUT}=50mA$	100Hz		75		dB
			1kHz	—	80	—	
			10kHz	—	60		
			100Khz		45		
Output Noise Voltage	$V_{ON}$	BW =10Hz to 100kHz		324		$\mu V_{RMS}$	
Thermal Shutdown Temperature	$T_{SD}$			170		$^\circ C$	
Thermal Shutdown Hysteresis	$\Delta T_{SD}$			20		$^\circ C$	
CE “High” Voltage	$V_{CE}“H”$		1.5		14	V	
CE “Low” Voltage	$V_{CE}“L”$				0.3	V	

## Typical Performance Characteristics

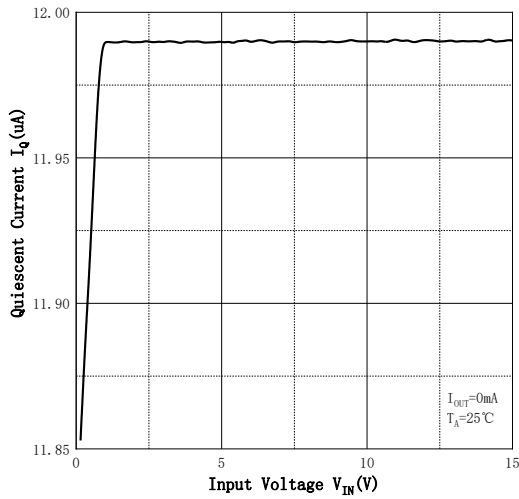
### Line Regulation



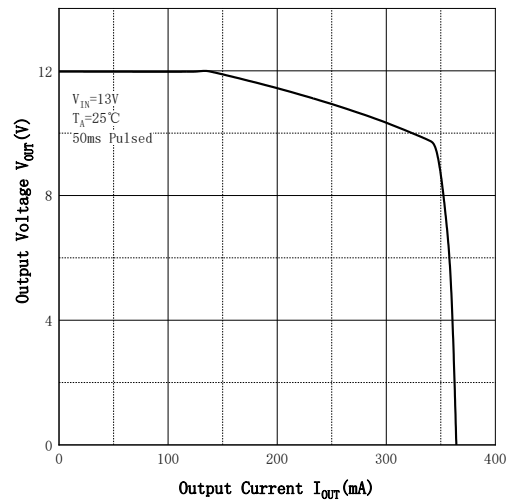
### Temperature Regulation



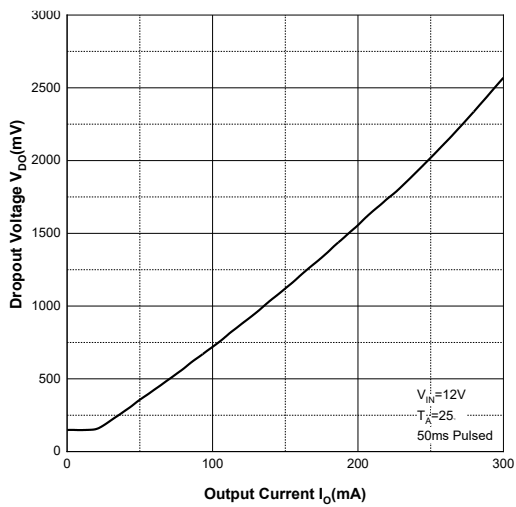
### Quiescent Current



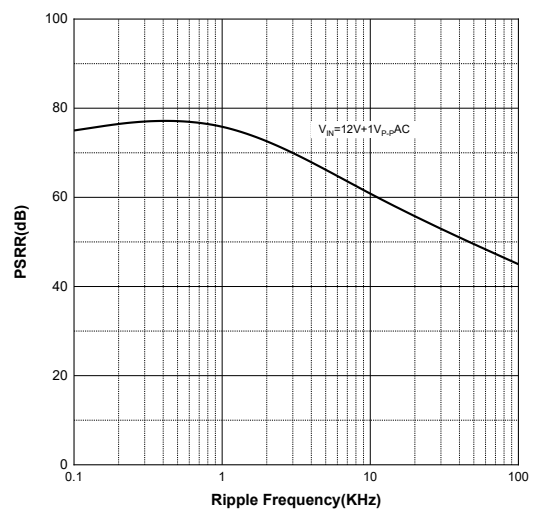
### Load Regulation



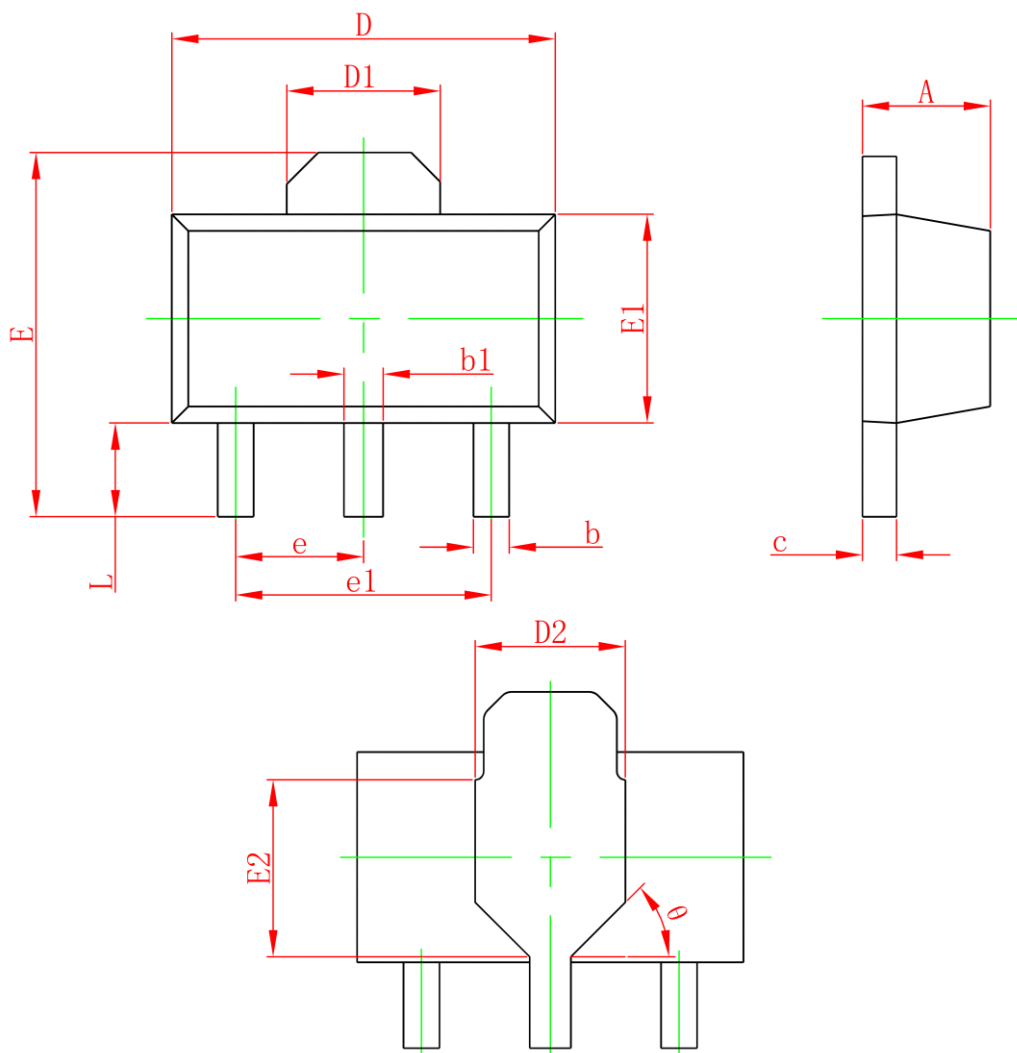
### Dropout Voltage



### PSRR vs. Frequency



## SOT-89-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.380	0.580	0.015	0.023
c	0.350	0.500	0.014	0.020
D	4.400	4.600	0.173	0.181
D1	1.650REF		0.065REF	
D2	1.650	1.850	0.065	0.073
E	3.900	4.400	0.154	0.173
E1	2.300	2.600	0.091	0.102
E2	1.900REF		0.075REF	
e	1.500TYP		0.059TYP	
e1	3.000TYP		0.118TYP	
L	0.900	1.200	0.035	0.047
θ	45°		45°	