



Product Summary

The GPL6376 series are a group of 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 GPL6376 series can deliver 300mA output current and allow an input voltage as high as 28V. The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

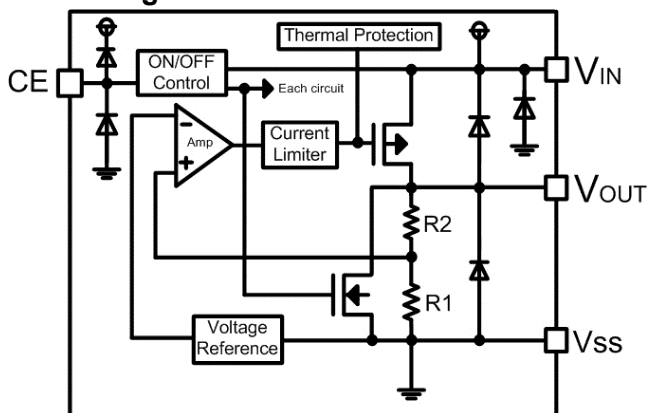
Features

- Low Quiescent Current: 2μA
- Operating Voltage Range: 2.5V~28V
- Output Current: 300mA
- Low Dropout Voltage: 200mV@100mA(V_{OUT}=3.3V)
- Output Voltage: 1.2~12V
- High Accuracy: ±2%(Typ.)
- High Power Supply Rejection Ratio: 70dB@1kHz
- Low Output Noise: 27xV_{OUT} μV_{RMS} (10Hz~100kHz)
- Excellent Line and Load Transient Response
- Built-in Current Limiter, Short-Circuit Protection
- Over-Temperature Protection
- Stable with Ceramic or Tantalum Capacitor

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

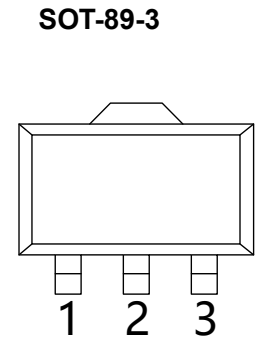
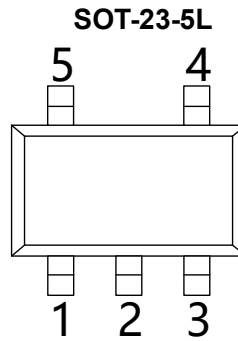
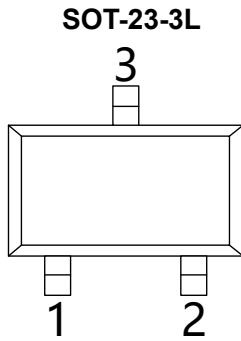


Order Information

GPL6376V①②

Designator	Description
①	Output Voltage e.g. 3.3V=33
②	Package: SOT-23-3L=K3 SOT-23-5L=K5 SOT-89-3L=KE

PIN CONFIGURATION



SOT-23-3 & SOT-89-3

PIN NUMBER				PIN NAME	FUNCTION
SOT-23-3		SOT-89-3			
K3	YK3	KE	SKE		
1	3	1	2	V_{SS}	Ground
2	1	3	1	V_{OUT}	Output
3	2	2	3	V_{IN}	Power input

SOT-23-5

PIN NUMBER			SYMBOL	FUNCTION
K5	SK5	FK5		
1	2	1	V_{IN}	Power Input Pin
2	1	2	V_{SS}	Ground
3	5	/	CE	Chip Enable Pin
4	4	3&4	NC	No Connection
5	3	5	V_{OUT}	Output Pin

Absolute Maximum Ratings¹⁾ (T_a=25°C, unless otherwise noted)

Parameter	Symbol	Ratings	Units
Input Voltage ²⁾	V _{IN}	-0.3~33	V
Output Voltage ²⁾	V _{OUT}	-0.3~13	V
CE Pin Voltage ²⁾	V _{CE}	-0.3~33	V
Power Dissipation	P _D	SOT-23-3/5	0.4
		SOT-89-3	0.6
Operating Junction Temperature Range ³⁾	T _j	-45~125	°C
Storage Temperature	T _{stg}	-65~150	°C
Lead Temperature(Soldering, 10 sec)	T _{solder}	260	°C

- 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) This IC includes over temperature protection that is intended to protect the device during momentary overload. Junction temperature will exceed 125°C when over temperature protection is active. Continuous operation above the specified maximum operating junction temperature may impair device reliability.

Recommended Operating Conditions

Parameter	Min.	Nom.	Max.	Units
Supply voltage at V _{IN}	2.5		28	V
Operating junction temperature range, T _j	-40		125	°C
Operating free air temperature range, T _A	-40		85	°C

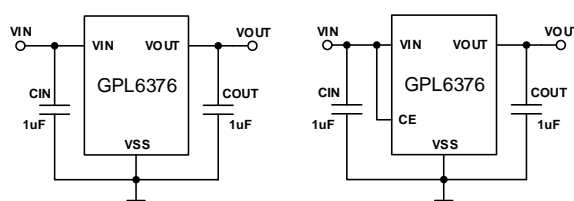
Electrical Characteristics ($V_{IN}=V_{OUT}+2V$, $C_{IN}=C_{OUT}=1\mu F$, $T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP. ⁽⁴⁾	MAX.	UNITS	
Input Voltage	V_{IN}		2.5	—	28	V	
Output Voltage Range	V_{OUT}		1.2	—	12	V	
Output Voltage Accuracy		$I_{OUT}=1mA$	-2	—	2	%	
			-1	—	1	%	
Dropout Voltage	$V_{dif}^{(5)}$	$I_{OUT}=100mA, V_{OUT}=3.3V$	—	200	—	mV	
Supply Current	I_{SS}	$I_{OUT}=0$	$1.2V \leq V_{OUT} \leq 7.0V$	—	2	5	μA
			$7.0V < V_{OUT} \leq 12.0V$	—	3	6	μA
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	$I_{OUT}=10mA$ $V_{OUT}+1V \leq V_{IN} \leq 28V$	—	0.01	0.3	%/V	
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$, $1mA \leq I_{OUT} \leq 100mA$	—	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}	$V_{OUT}=0.5 \times V_{OUT(Normal)}$, $V_{IN}=5V$	350	600	-	mA	
Short Current	I_{SHORT}	$V_{OUT}=V_{SS}$	—	100	—	mA	
Power Supply Rejection Ratio	PSRR	$I_{OUT}=50mA$	100Hz	—	75	—	dB
			1kHz	—	70	—	
			10kHz	—	55	—	
			100kHz	—	40	—	
Output Noise Voltage	V_{ON}	BW=10Hz to 100kHz	—	$27 \times V_{OUT}$	—	μV_{RMS}	
Thermal Shutdown Temperature	T_{SD}	—	—	160	—	$^\circ C$	
Thermal Shutdown Hysteresis	ΔT_{SD}	—	—	20	—	$^\circ C$	
Standby Current	I_{STBY}	$CE = V_{SS}$	—	—	0.5	μA	
CE "High" Voltage	$V_{CE}^{“H”}$		1.5	—	V_{IN}	V	
CE "Low" Voltage	$V_{CE}^{“L”}$		—	—	0.3	V	
C_{OUT} Auto-Discharge Resistance	$R_{DISCHRG}$	$V_{IN}=5V, V_{OUT}=3.0V$, $V_{CE}=V_{SS}$	—	150	—	Ω	

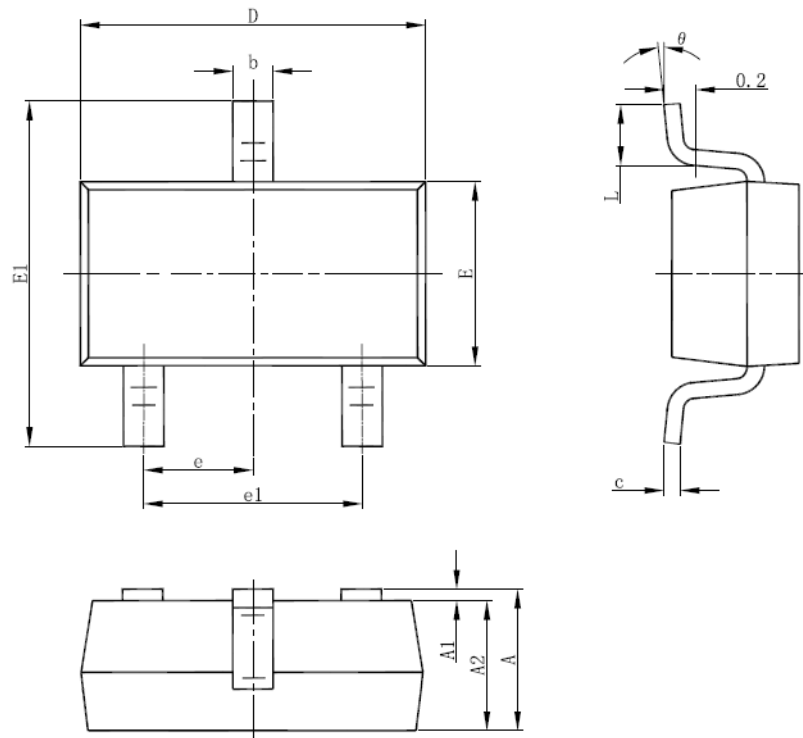
4) Typical numbers are at 25°C and represent the most likely norm.

5) V_{dif} : The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of V_{OUT} (E).

Typical Application

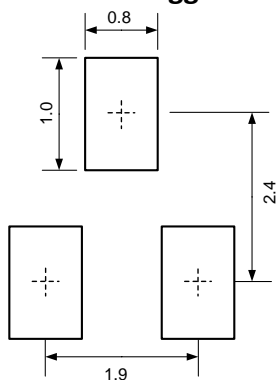


SOT-23-3L Package Outline Dimensions



Symbol	Dimensions in millimeters		
	Min.	Typ.	Max.
A	1.050	-	1.250
A1	0.000	-	0.100
A2	1.050	-	1.150
b	0.300	-	0.500
c	0.100	-	0.200
D	2.820	-	3.020
E	1.500	-	1.700
E1	2.650	-	2.950
e	0.950TYP		
e1	1.800	-	2.000
L	0.300	-	0.600
θ	0°	-	8°

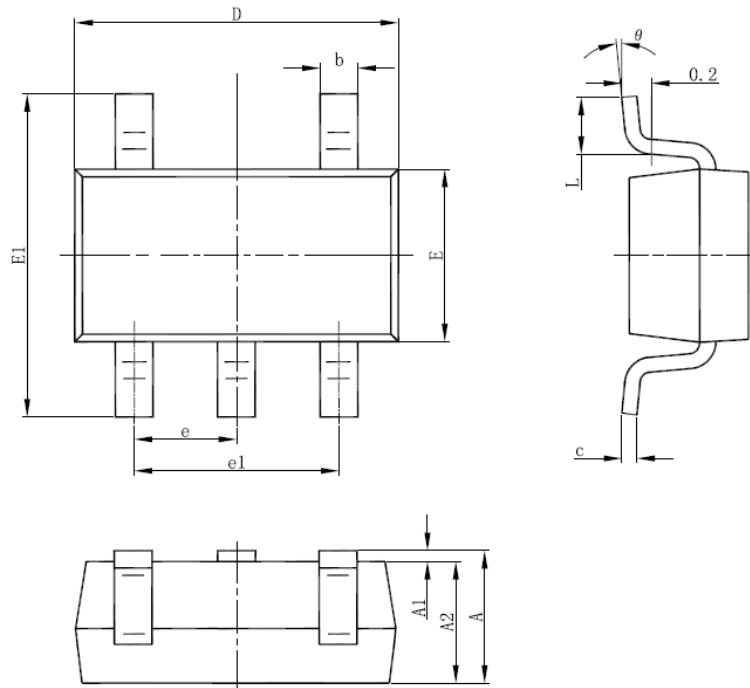
SOT-23-3L Suggested Pad Layout (Unit: mm)



Notes:

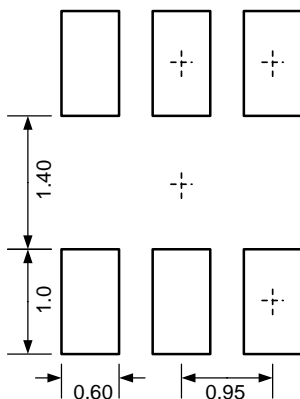
1. General tolerance: $\pm 0.05\text{mm}$.
2. The pad layout is for reference purposes only.

SOT-23-5L Package Outline Dimensions



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°

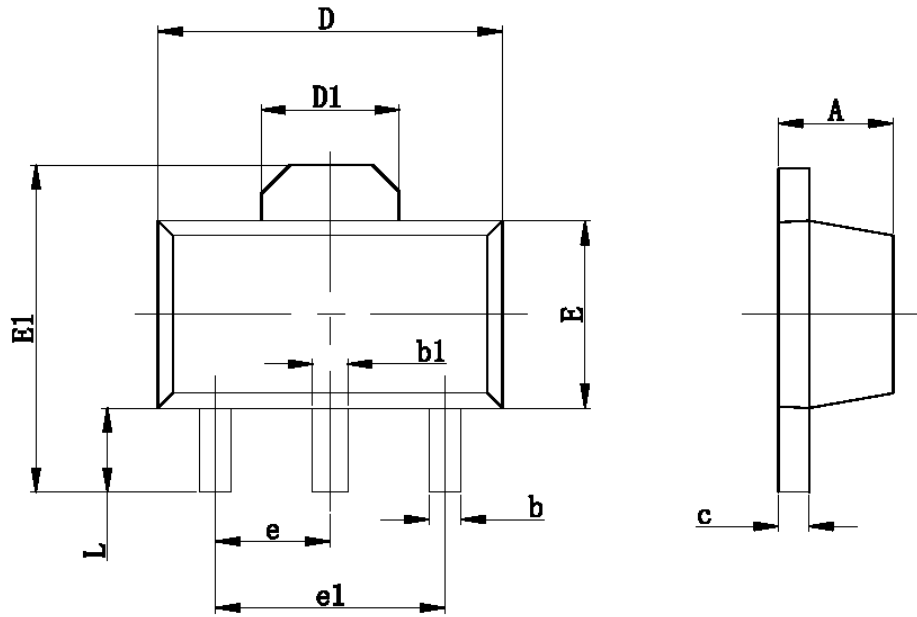
SOT-23-5L Suggested Pad Layout (Unit: mm)



Notes:

1. General tolerance: ± 0.05 mm.
2. The pad layout is for reference purposes only.

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	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550REF		0.061REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP		0.060TYP	
e1	3.000TYP		0.118TYP	
L	0.900	1.200	0.035	0.047