



PL5800

Low Loss Power Distribution Switch TARGET DESIGN SPECIFICATION Preliminary Spec

General Description

The PL5800 develops ultra-low $R_{ds(on)}$ switch with programmable current limiting to protect the power source from over current and short circuit conditions. It integrates the over temperature protection and discharges the output capacitor during the shutdown. In case the output is pulled higher than the input voltage under the shutdown, the PL5800 can block the current flowing from the output to the input.

Features

- Distribution voltages: 2.4V to 5.5V
- Programmable current limit
- Enable polarity: active high
- Over temperature shutdown and automatic retry
- Reverse blocking (no body diode)
- At shutdown, OUT can be forced higher than IN
- Automatic output discharge at shutdown
- Compact SOT23 packages minimize the board space.

Applications

- USB 3G Datacard
- USB Dongle
- MiniPCI Accessories

Typical Applications

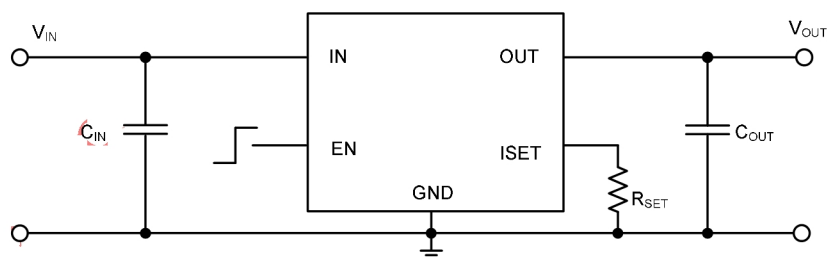
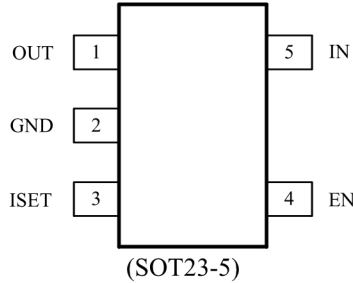


Figure 1. Schematic Diagram



Pinout (top view)



Top mark: **COxyz** (Device code: CO, *x*=year code, *y*=week code, *z*=lot number code)

Pin Name	Pin number	Pin Description
IN	5	Input pin
GND	2	Ground pin
OUT	1	Output pin
EN	4	ON/OFF control. Pull high to enable IC. Do not float.
ISET	3	Current limit programming pin. Connect a resistor Rset from this pin to GND to program the current limit: $I_{lim} (A) = 6800/R_{set} (ohm)$

Absolute Maximum Ratings (Note 1)

All pins----- 6V
 Power Dissipation, $P_D @ T_A = 25^\circ C$ SOT23-5, ----- 0.6W
 Package Thermal Resistance (Note 2)
 θ_{JA} ----- 200°C/W
 θ_{JC} ----- 130°C/W
 Junction Temperature Range ----- 150°C
 Lead Temperature (Soldering, 10 sec.) ----- 260°C
 Storage Temperature Range ----- -65°C to 150°C
 ESD Susceptibility (Note 2)
 HBM (Human Body Mode) ----- 2kV
 MM (Machine Mode) ----- 200V

Recommended Operating Conditions (Note 3)

IN----- 2.4V to 5.5V
 All other pins ----- 0-5.5V
 Junction Temperature Range ----- -40°C to 125°C
 Ambient Temperature Range ----- -40°C to 85°C



Electrical Characteristics

($V_{IN} = 5V$, $C_L = 1\mu F$, per channel, $T_A = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	V_{IN}		2.4		5.5	V
Shutdown Input Current	I_{SHDN}	Open load, IC Disabled.		0.1	1	μA
Quiescent Supply Current	I_Q	Open load, IC Enabled.		25		μA
FET RON	$R_{DS(ON)1}$			80		m Ω
EN Rising Threshold	$V_{EN(H)}$		2			V
EN Falling Threshold	$V_{EN(L)}$				0.8	V
EN Leakage	I_{EN}	$V_{EN} = 5.5V$			1	μA
IN UVLO Threshold	$V_{IN,UVLO}$				2.3	V
IN UVLO Hysteresis	$V_{IN,HYS}$			0.1		V
Over Current Limit	I_{LIM}	$R_{SET} = 6.8k\Omega$	0.75	1	1.25	A
	$I_{LIM(min)}$			0.4		A
	$I_{LIM(max)}$			2		A
Turn-ON Time	T_{ON}	$R_L = 10\Omega$		120		us
Turn-OFF Time	T_{OFF}	$R_L = 10\Omega$, $C_L = 1\mu F$		10		us
OUT Shutdown Discharge Resistance	R_{DIS}			150		Ω
Thermal Shutdown Temperature	T_{SD}			130		$^\circ C$
Thermal Shutdown Hysteresis				20		$^\circ C$

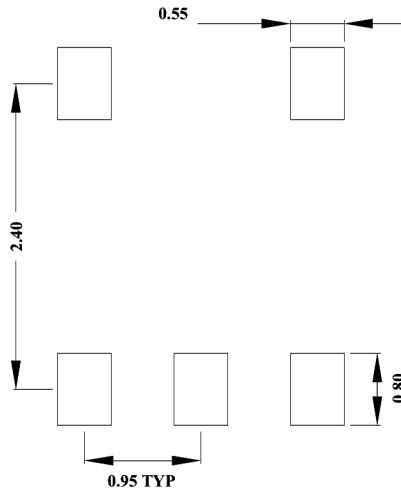
Note 1: Stresses listed as the above “Absolute Maximum Ratings” may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2: θ_{JA} is measured in the natural convection at $T_A = 25^\circ C$ on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard. Pin 2 of SOT23-5 packages is the case position for θ_{JC} measurement.

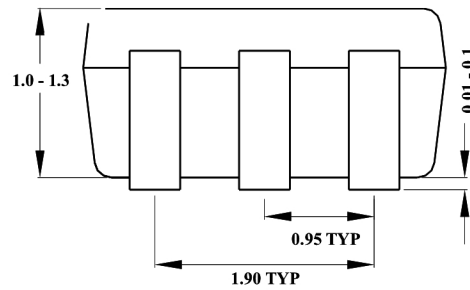
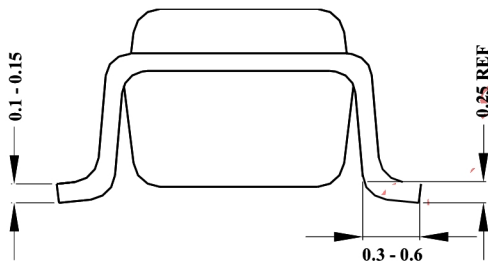
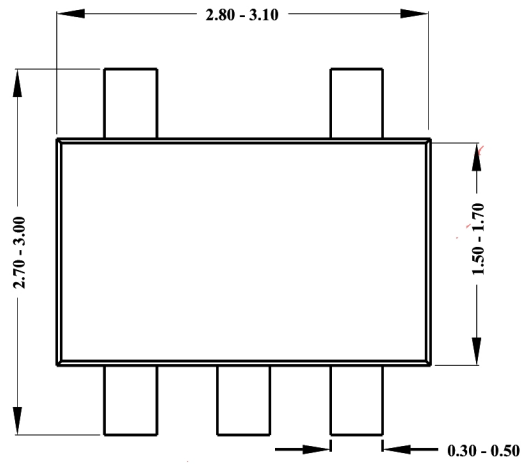
Note 3: The device is not guaranteed to function outside its operating conditions



SOT23-5 Package outline & PCB layout design



Recommended Pad Layout



Notes: All dimensions are in millimeters.
All dimensions don't include mold flash & metal burr.