

80mΩ,Adjustable Fast Response Current-Limited Power-Distribution Switch

FEATURES

- Compliant to USB Specifications
- Integrated 80mΩ Power MOSFET
- Low Supply Current
25μA Typical at Switch On State
<1μA Typical at Switch Off State
- Wide Input Voltage Range:2.4V to 5.5V
- Fast Transient Response
- Reverse Current Flow Blocking
- Thermal Shutdown Protection
- Hot Plug-In Application
- Available in a 5-Pin SOT23-5 Package

APPLICATIONS

- USB Bus/Self Powered Hubs
- USB Peripherals
- Notebook Computers
- Battery-Charger Circuits
- Personal Communication Devices

GENERAL DESCRIPTION

The SY6280 is a cost-effective, low voltage, single P-MOSFET load switch, optimized for self-powered and bus-powered Universal Serial Bus (USB) applications. This switch operates with inputs ranging from 2.4V to 5.5V, making it ideal for both 3V and 5V systems. The switch's low $R_{DS(ON)}$, 80mΩ, meets USB voltage drop requirements. The SY6280 is also protected from thermal overload which limits power dissipation and junction temperatures. Current limit threshold is programmed with a resistor from SET to ground. The quiescent supply current is typically 25μA at switch on state. At switch off state the supply current decreases to less than 1μA. The SY6280 is available in SOT23-5 package.

TYPICAL APPLICATION

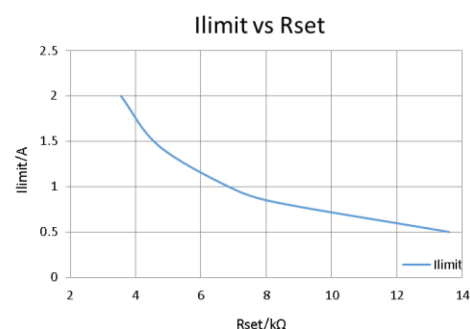
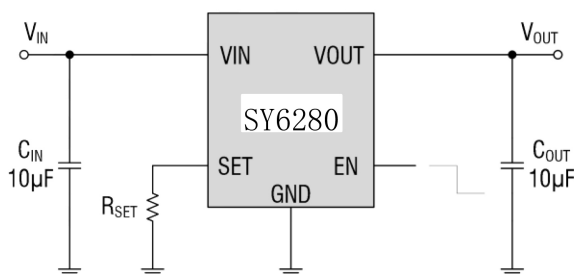
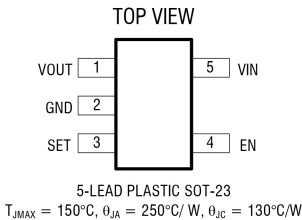


Figure 1. Basic Application Circuit

ABSOLUTE MAXIMUM RATINGS (Note 1)

Input Supply Voltage.....	-0.3V to 7V	Junction Temperature(Note2).....	150°C
EN Voltages.....	-0.3V to ($V_{IN}+0.3V$)	Operating Temperature Range....	-40°C to 85°C
SET Voltage.....	-0.3V to ($V_{IN}+0.3V$)	Lead Temperature(Soldering,10s).....	300°C
Power Dissipation.....	0.4W	Storage Temperature Range.....	-65°C to 150°C
Thermal Resistance θ_{JC}	130°C/W	ESD HBM(Human Body Mode).....	2kV
Thermal Resistance θ_{JA}	250°C/W	ESD MM(Machine Mode).....	200V

PACKAGE/ORDER INFORMATION

	Order Part Number	Package	Top Marking
	SY6280AAC	SOT23-5	D00HAW

PIN DESCRIPTION

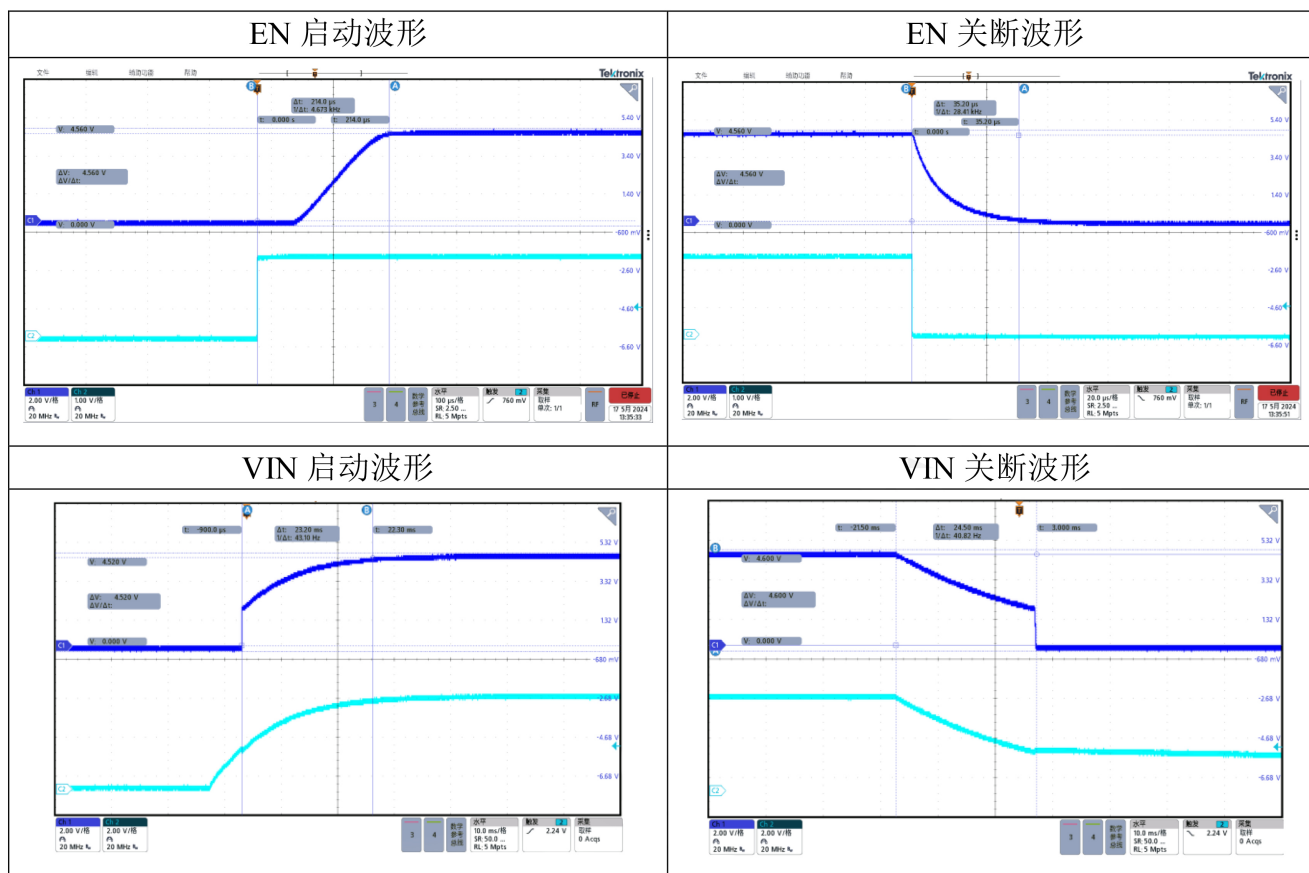
Pin Name	Pin Number	Description
VOUT	1	Power-switch output
GND	2	Ground connection; connect externally to Power PAD
SET	3	External resistor used to set current-limit threshold
EN	4	Enable input, logic high turns on power switch
VIN	5	Input voltage; connect a 10uF or greater ceramic capacitor from VIN to GND as close to the IC as possible

ELECTRICAL CHARACTERISTICS (Note 3)(V_{IN}=5V, T_A =-40°C to 85°C, unless otherwise noted.)

PARAMETER		SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage Range		V _{IN}		2.4		5.5	V
Switch On Resistance		R _{DS(ON)}	V _{IN} =5V		80	100	mΩ
Operation Quiescent Current		I _Q	V _{IN} =5V, EN=Active, No load		25		μA
Shutdown Supply Current		I _{Q(OFF)}	V _{IN} =5V, EN=Inactive		0.1	1	μA
Under-voltage Lockout		V _{UVLO}	V _{IN} Increasing			2.2	V
Under-voltage Lockout Hysteresis		ΔV _{UVLO}	V _{IN} decreasing		0.1		V
Current Limit Threshold		I _{LIM}	R _{SET} =6.8kΩ	0.75	1	1.25	A
		I _{LIM (min)}			0.4		A
		I _{LIM (max)}			2		A
Turn-ON Time		T _{ON}	R _L =10Ω		120		us
Turn-OFF Time		T _{OFF}	R _L =10Ω, C _L =1uF		10		us
EN Threshold	Logic-Low Voltage	V _{IL}	V _{IN} =2.5V to 5.5V			0.8	V
	Logic-High Voltage	V _{IH}	V _{IN} =2.5V to 5.5V	2			V
Shutdown Pull-Low Resistance		R _{DS}	EN=0V, VOUT=5V		200		Ω
Thermal Shutdown Protection		T _{SD}			135		°C
Thermal Shutdown Hysteresis		ΔT _{SD}			20		°C

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.**Note 2:** T_J is calculated from the ambient temperature T_A and power dissipation P_D according to the following formula: T_J = T_A + (P_D) × (250°C/W).**Note 3:** 100% production test at 25°C. Specifications over the temperature range are guaranteed by design and characterization.

TYPICAL PERFORMANCE CHARACTERISTICS



FUNCTIONAL BLOCK DIAGRAM

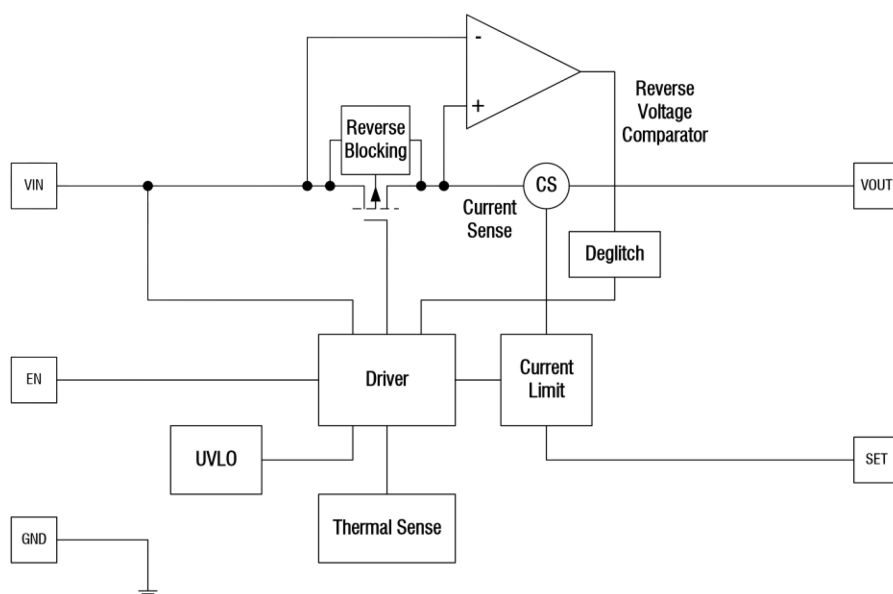
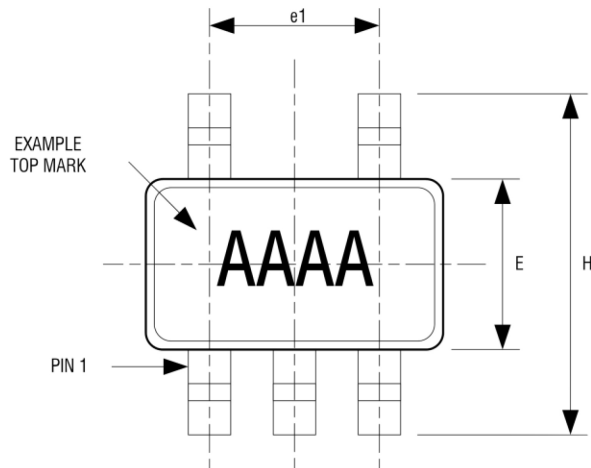


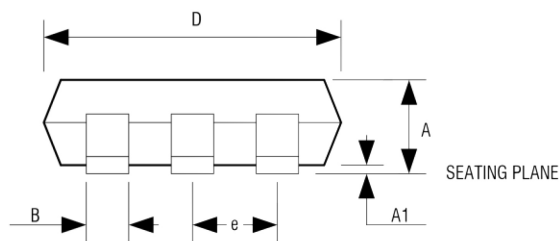
Figure 2. SY6280 Block Diagram

PACKAGE DESCRIPTION

SOT23-5



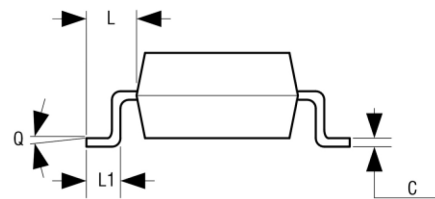
TOP VIEW



FRONT VIEW

5LD SOT-23 PACKAGE OUTLINE DIMENSIONS

Dimension	Min.	Max.
A	1.05	1.35
A1	0.04	0.15
B	0.3	0.5
C	0.09	0.2
D	2.8	3.0
H	2.5	3.1
E	1.5	1.7
e	0.95 REF.	
e1	1.90 REF.	
L1	0.2	0.55
L	0.35	0.8
Q	0°	10°



SIDE VIEW

- NOTE:
- 1.DIMENSIONS ARE IN MILLIMETERS
 - 2.DRAWING NOT TO SCALE
 - 3.DIMENSIONS ARE INCLUSIVE OF PLATING
 - 4.DIMENSIONS ARE EXCLUSIVE OF MOLD FLASH AND METAL BURR