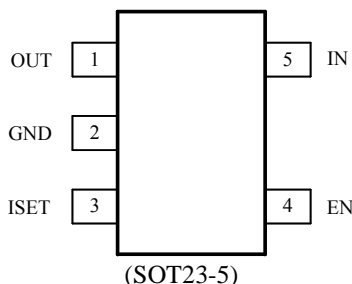






SY6280/SY6280A

Pinout (top view)



(SOT23-5)

Top mark: **CO**xyz for SY6280 (Device code: CO, x=year code, y=week code, z=lot number code)

QWxyz for SY6280A (Device code: QW, x=year code, y=week code, z=lot number code)

Pin Name	Pin number	Pin Description
IN	5	Input pin, decoupled with a 10μF capacitor to GND
GND	2	Ground pin
OUT	1	Output pin, decoupled with a 10μF capacitor to GND
EN	4	ON/OFF control. Pull high to enable IC. Do not leave it floating
ISET	3	Current limit programming pin. Connect a resistor R _{SET} from this pin to ground to program the current limit: I _{LIM} (A)=6800/R _{SET} (Ω)

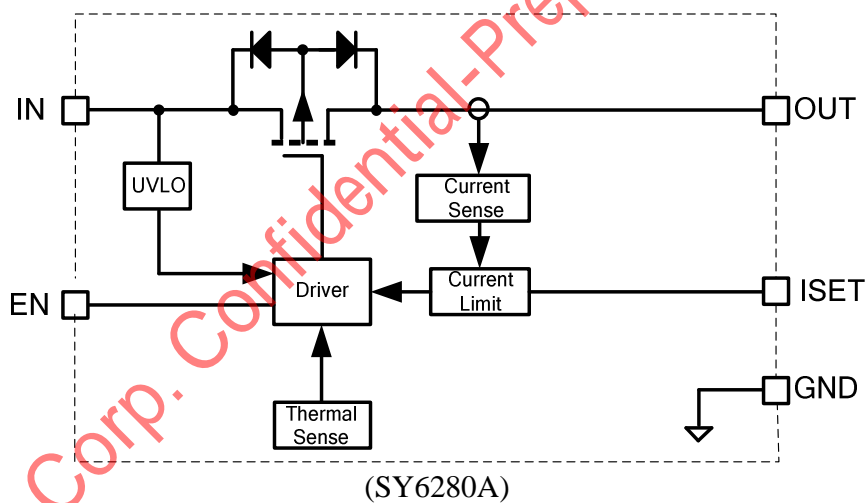
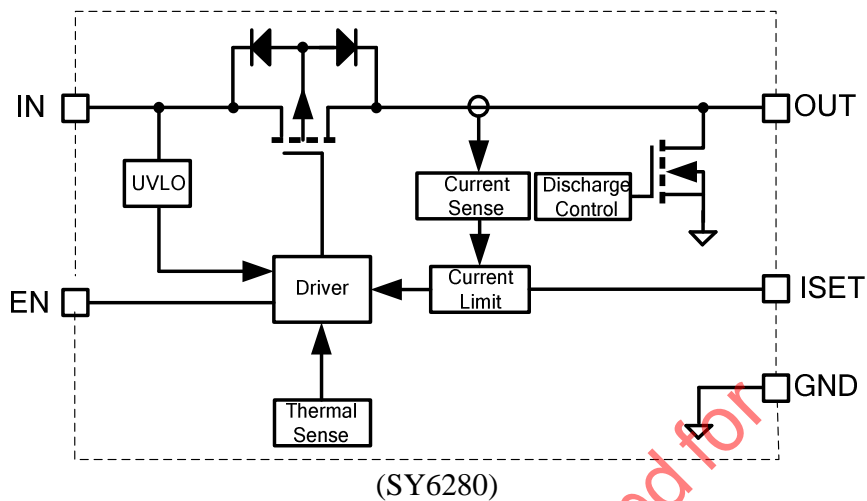
Absolute Maximum Ratings (Note 1)

All pins	-0.3V to 6V
Power Dissipation, P _D @ T _A = 25°C SOT23-5,	0.6W
Package Thermal Resistance (Note 2)	
θ _{JA}	200°C/W
θ _{JC}	130°C/W
Junction Temperature	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	0V to 5.5V
Junction Temperature Range	-40°C to 125°C
Ambient Temperature Range	-40°C to 85°C

Block Diagram





SY6280/SY6280A

Electrical Characteristics

($V_{IN} = 5V$, $C_{OUT} = 10\mu F$, $T_A = 25^\circ C$ 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.		0.2	1	μA
Quiescent Supply Current	I_Q	Open load, IC Enabled.		38		μA
FET RON	$R_{DS(ON)}$			63		m Ω
EN Rising Threshold	$V_{EN(H)}$		2			V
EN Falling Threshold	$V_{EN(L)}$				0.8	V
EN Leakage Current	I_{EN}	$V_{EN} = 5.0V$			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
Turn-on Time	T_{ON}	$R_L = 10\Omega$, $C_{OUT} = 1\mu F$		130		μs
Turn-off Time	T_{OFF}	$R_L = 10\Omega$, $C_{OUT} = 1\mu F$		20		μs
OUT Shutdown Discharge Resistance	R_{DIS}	SY6280 Only		120		Ω
Thermal Shutdown Temperature	T_{SD}			130		$^\circ C$
Thermal Shutdown Hysteresis				20		$^\circ C$

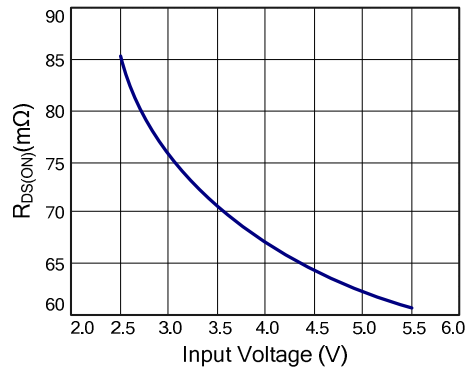
Note 1: Stresses beyond the “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specification is not implied. Exposure to absolute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

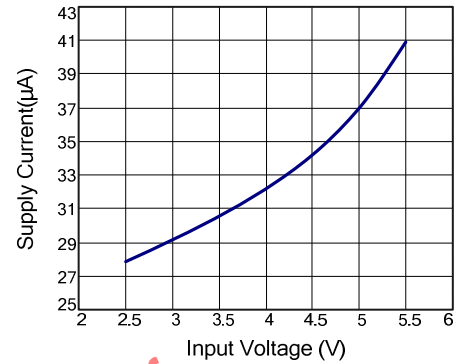
Note 3: The device is not guaranteed to function outside its operating conditions.

Typical Operating Characteristics

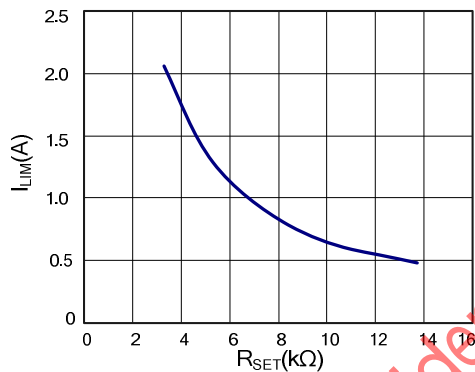
$R_{DS(ON)}$ vs Input Voltage



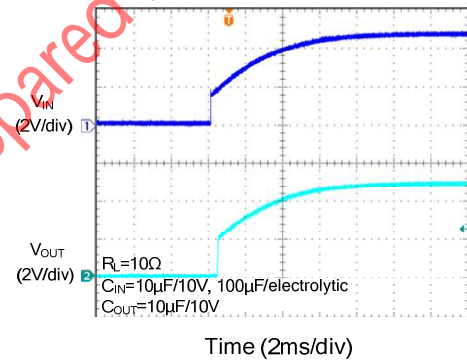
Supply Current vs Input Voltage



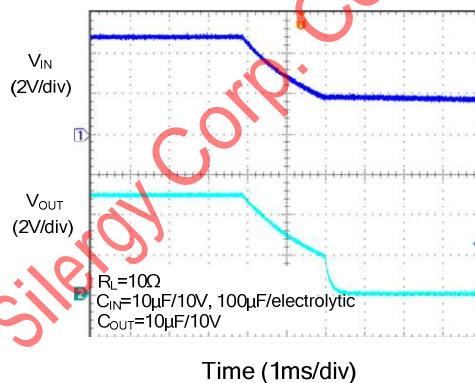
I_{LIM} vs R_{SET}



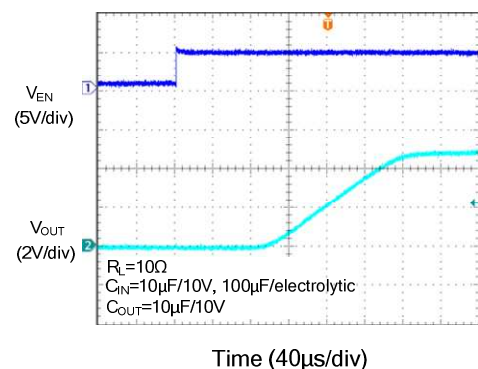
UVLO at Rising



UVLO at Falling

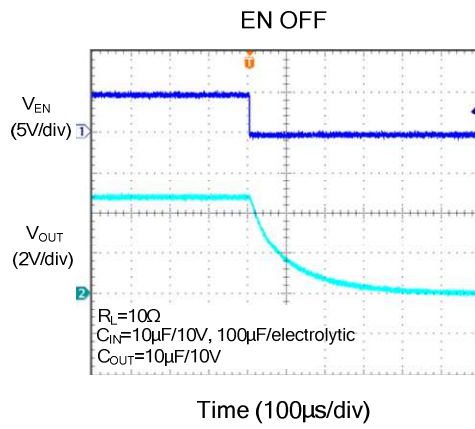


EN ON





SY6280/SY6280A





SY6280/SY6280A

Operation

SY6280/A是限流P沟道MOSFET电源开关，具有过流和过热保护功能。MOSFET的漏极和源极之间没有体二极管。禁止芯片禁用后电流从输出流向输入。

SY6280/A is a current limited P-channel MOSFET power switch with over current and over temperature protections. There is no body diode across the drain and the source of the MOSFET. It prevents the current flow from the output to the input after the chip is disabled.

Over-current protection

When the over-current condition is detected, the switch is regulated to achieve constant output current. If the over current condition lasts for a long time, and results in a junction temperature over 130°C, the switch will be shutdown. Once the junction temperature drops to 110°C, the part will restart.

当检测到过电流情况时，调节开关以实现恒定的输出电流。如果过电流状态持续很长时间，并导致结温超过130°C，则开关将关闭。一旦结温降至110°C，该器件将重新启动。

Supply Filter Capacitor

In order to prevent the input voltage from dropping during hot-plug condition, a 10μF ceramic capacitor from VIN to GND is strongly recommended. However, higher capacitance could help reduce the voltage drop. Furthermore, an output short will cause ringing on the input without the input capacitor. It could destroy the internal circuitry when the input transient voltage exceeds the absolute maximum supply voltage even for a short duration.

Current Limiting Setting

为了防止在热插拔条件下输入电压下降，强烈建议在VIN至GND之间连接一个10μF陶瓷电容器。但是，较高的电容可以帮助减少电压降。此外，输出短路会在没有输入电容器的情况下导致输入振铃。当输入瞬态电压超过绝对最大电源电压时，即使持续很短的时间，也可能损坏内部电路。

电流限制是可编程的，以保护电源免受电流和短路情况的影响。在ISET引脚与GND之间连接一个电阻RSET以设置电流限制：
 $I_{LIM} (A) = 6800 / R_{set} (\Omega)$
最小电流限制为0.4A。不建议电流限制超过2A。

Current limit is programmable to protect the power source from over current and short circuit conditions. Connect a resistor R_{SET} from ISET pin to GND to program the current limit:

$$I_{LIM} (A) = 6800 / R_{set} (\Omega)$$

The minimum current limit is 0.4A. Current limit beyond 2A is not recommended.

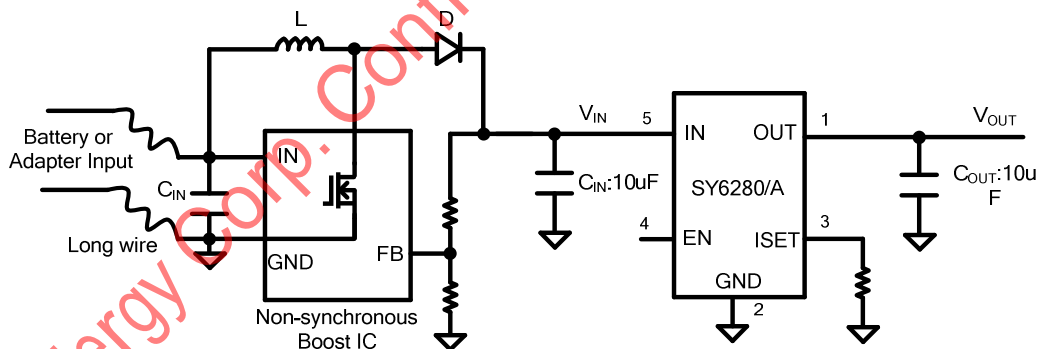
Maximum input voltage consideration:

For any application, input voltage for SY6280/A should not be allowed to exceed the maximum recommended value (5.5V).

Below is a typical application circuit for SY6280/A. The front stage is a non-synchronous boost stage and the input power supply can be a battery or an adapter.

Some adapters may have poor output voltage tolerance, or may have large output voltage overshoot if the adapter is not plug in directly. The voltage overshoot higher than VIN(5.5V) will significantly reduce the reliability of SY6280/A and may even lead to IC EOS failure.

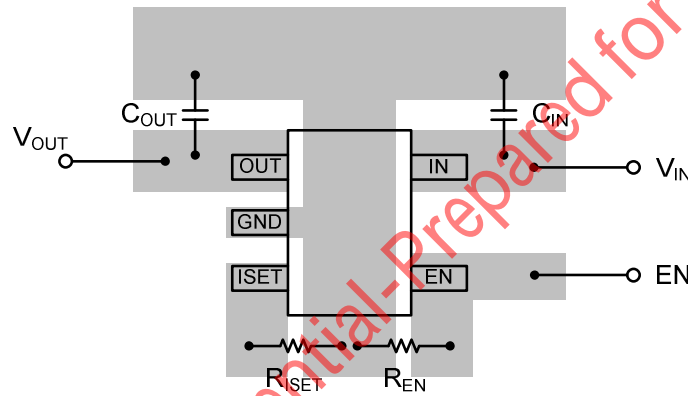
考虑最大输入电压：对于任何应用，SY6280 / A的输入电压均不得超过最大建议值（5.5V）。
以下是SY6280 / A的典型应用电路。
前级是一个非同步升压级，输入电源可以是电池或适配器。
如果适配器直接热插拔，则某些适配器的输出电压容限可能较差，或者输出电压过冲可能较大。高于VIN（5.5V）的电压过冲会大大降低SY6280 / A的可靠性，甚至可能导致IC EOS故障。



PCB Layout Guide

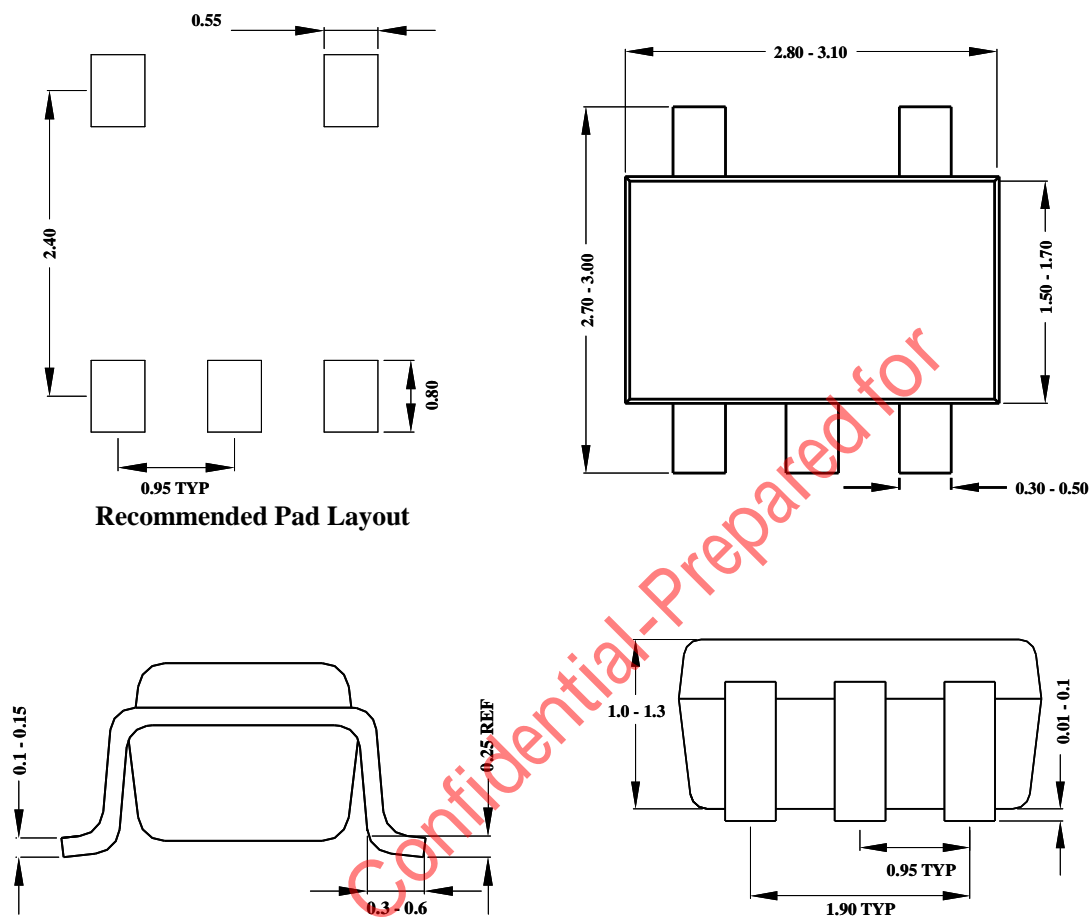
To achieve a better performance, the following guidelines must be strictly followed:

- Keep all power traces as short and wide as possible and use at least 2 ounce copper for all power traces.
- Place a ground plane under all circuitry to lower both resistance and inductance and improve DC and transient performance.
- Locate the output capacitors as close to the connectors as possible to lower the impedance (mainly inductance) between the port and the capacitor and improve transient performance.
- Input and output capacitors should be placed close to the IC and connected to the ground plane to reduce noise coupling.
- Locate the ceramic bypass capacitors as close as possible to the IN pin and OUT pin of SY6280/A.



Top View: PCB Layout Guide(SOT23-5)

SOT23-5 Package outline & PCB layout design



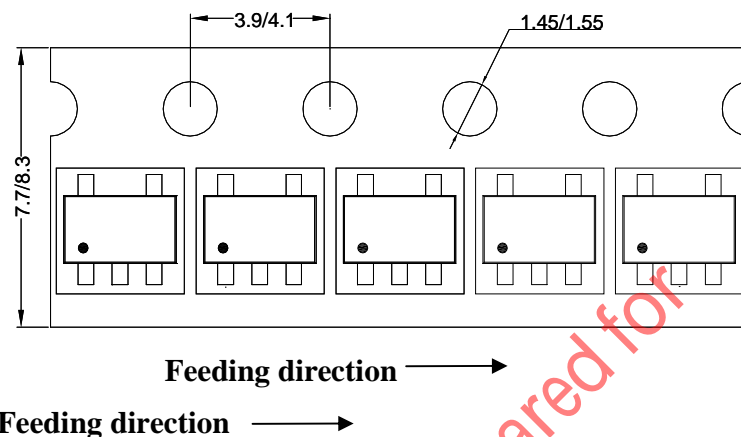
Notes: All dimensions are in millimeters.

All dimensions don't include mold flash & metal burr.

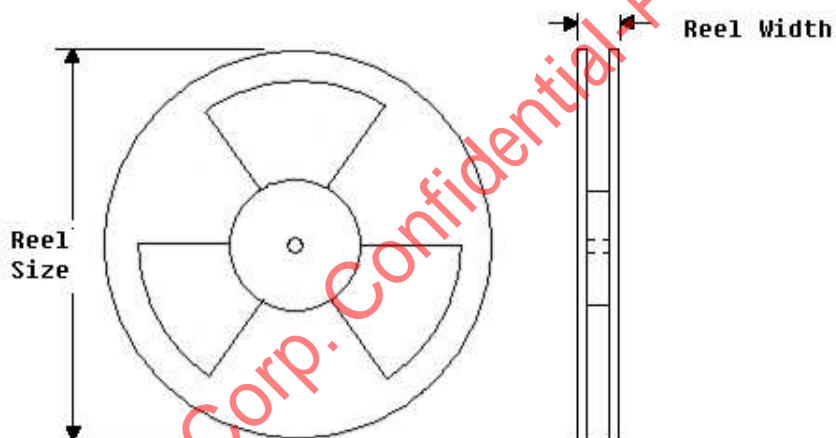
Taping & Reel Specification

1. Taping orientation

SOT23-5



2. Carrier Tape & Reel specification for packages



Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Reel width(mm)	Trailer length(mm)	Leader length (mm)	Qty per reel
SOT23-5	8	4	7"	8.4	280	160	3000

3. Others: NA