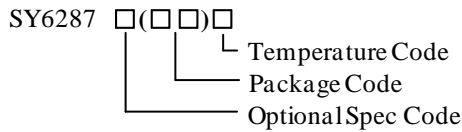


### General Description

SY6287C is an ultra-low  $R_{DS(ON)}$  power distribution switch with current limit to protect the power source from over current and short circuit conditions. It incorporates over temperature protection and reverse blocking function.

### Ordering Information



Ordering Number	Package Type	Note
SY6287CABC	SOT23-6	
SY6287CDEC	DFN2x2-6	

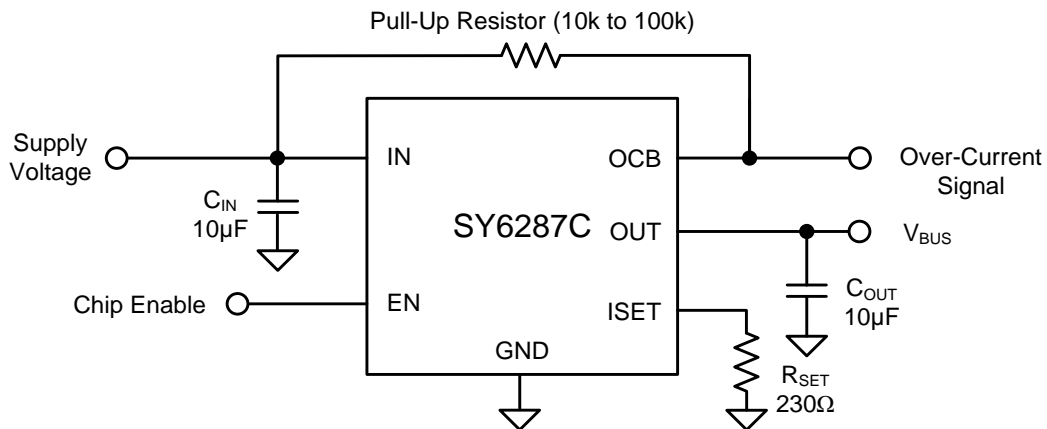
### Features

- Input Voltage: 2.5V to 5.5V
- Extremely Low Power Path Resistance: 65mΩ (Typ.)
- Adjustable Current Limit Up to 2.0A
- Over Temperature Shutdown and Automatic Retry
- Reverse Blocking (No Body Diode)
- Fault Flag (OCB) Output for Over Current and Fault Conditions
- Built-in Soft-start
- Compact Package Minimizes the Board Space: SOT23-6/DFN2x2-6
- RoHS Compliant and Halogen Free
- UL(CB) Certification NO. E491480

### Applications

- USB 3.1 Application
- USB 3G Data Card
- USB Dongle
- Mini PCI Accessories
- USB Charger
- Public Place Multi-USB Charger
- PC Card Hot Swap Applications

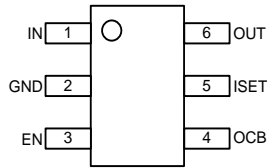
### Typical Application Circuit



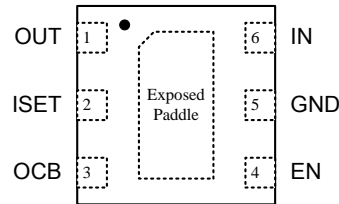
Note: If 1μF input cap will lead to large  $V_{in}$  voltage spike, it is strongly recommended to add additional 10μF ceramic cap.

Figure1. Schematic Diagram

## Pinout (Top view)



SY6287CABC, SOT23-6



SY6287CDEC, DFN2x2-6

Part Number	Package Type	Top Mark <sup>①</sup>
SY6287CABC	SOT23-6	cLxyz
SY6287CDEC	DFN2x2-6	cMxyz

Note ①: x=year code, y=week code, z=lot number code.

Pin Name	Pin Number		Pin Description
	SY6287C SOT23-6	SY6287C DFN2x2-6	
IN	1	6	Input pin, decoupled with a 10μF capacitor to GND.
GND	2	5, Exposed Paddle	Ground pin.
OUT	6	1	Output pin, decoupled with a 10μF capacitor to GND.
EN	3	4	ON/OFF control, active high. Do not leave it floating.
ISET	5	2	Current limit programming pin. Connect a resistor R <sub>SET</sub> from this pin to ground to program the current limit: I <sub>LIM</sub> (A)=230/R <sub>SET</sub> (Ω).
OCB	4	3	Open drain fault flag.

## Block Diagram

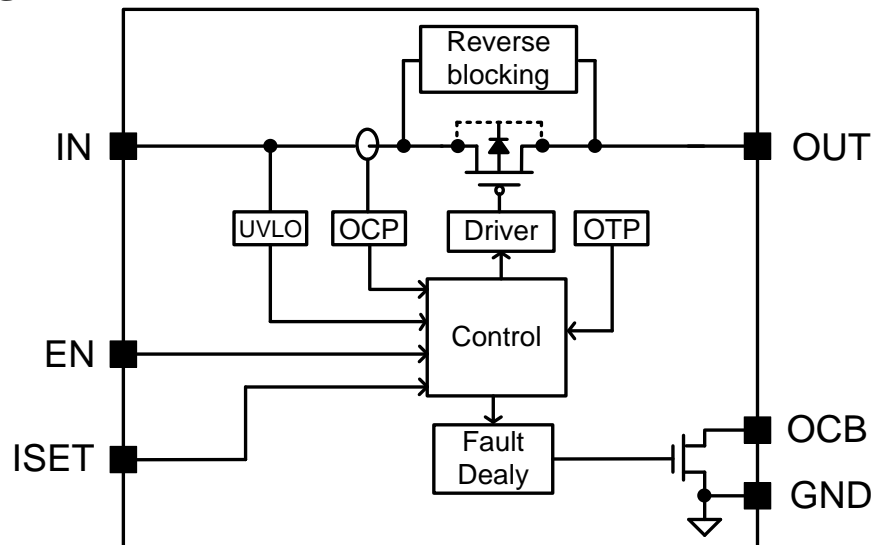


Figure2. Block Diagram

## Absolute Maximum Ratings (Note 1)

IN, OUT-----	7V
ISET, OCB, EN -----	7V
Power Dissipation, P <sub>D</sub> @ T <sub>A</sub> = 25°C SOT23-6/DFN2x2-6 -----	0.94W/1.53W
Package Thermal Resistance (Note 2)	
SOT23-6/DFN2x2-6, $\theta_{JA}$ -----	106.4°C/W/65.3°C/W
SOT23-6/DFN2x2-6, $\theta_{JC}$ -----	41.7°C/W/16.2°C/W
Junction Temperature -----	150°C
Lead Temperature (Soldering, 10 sec.) -----	260°C
Storage Temperature Range -----	-65°C to 150°C

## Recommended Operating Conditions (Note 3)

IN, OUT-----	2.5V 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

## Electrical Characteristics

(V<sub>IN</sub> = 5V, C<sub>OUT</sub>=10μF, T<sub>A</sub> = 25°C, BOLD values indicate -40°C to 85°C, unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	V <sub>IN</sub>		2.5		5.5	V
IN UVLO Threshold	V <sub>IN,UVLO</sub>				<b>2.45</b>	V
IN UVLO Hysteresis	V <sub>IN,HYS</sub>			0.1		V
Shutdown Input Current	I <sub>SHDN</sub>	Open load, switch off		0.1	<b>5</b>	μA
		Output grounded, switch off		0.1	<b>5</b>	μA
Reverse Leakage Current		IN tied to GND, V <sub>OUT</sub> =5V		0.1	<b>5</b>	μA
Quiescent Supply Current	I <sub>Q</sub>	Open load, switch on		45	<b>100</b>	μA
FET R <sub>DS(ON)</sub>	R <sub>DS(ON)</sub>	V <sub>IN</sub> =5V, I <sub>OUT</sub> =0.5A		65	<b>100</b>	mΩ
Current Limit	I <sub>LIM</sub>	V <sub>OUT</sub> =4V, R <sub>SET</sub> =460Ω (Note5)	0.425	0.5	0.575	A
		V <sub>OUT</sub> =4V, R <sub>SET</sub> =153.3Ω(Note5)	1.382	1.5	1.617	A
EN/ $\overline{\text{EN}}$ Threshold	Logic-low Voltage	V <sub>IL</sub>			<b>0.4</b>	V
	Logic-high Voltage	V <sub>IH</sub>	<b>1.0</b>			V
EN Input Cap	C <sub>EN</sub>	(Note4)		1		pF
Output Turn On Time	t <sub>ON</sub>	R <sub>L</sub> =10Ω, C <sub>L</sub> =1μF. Measure from EN ON to V <sub>OUT</sub> reach V <sub>IN</sub> ×90%	1	2	5	ms
Output Turn On Rise Time	t <sub>R</sub>	R <sub>L</sub> =10Ω, C <sub>L</sub> =1μF. Measure from V <sub>OUT</sub> =10% of V <sub>IN</sub> to 90% of V <sub>IN</sub>	1	2	5	ms
Output Turn Off Time	t <sub>OFF</sub>	R <sub>L</sub> =10Ω, C <sub>L</sub> =1μF. Measure from EN OFF to V <sub>OUT</sub> reach V <sub>IN</sub> ×10%		22		μs
Output Turn Off Fall Time	t <sub>F</sub>	R <sub>L</sub> =10Ω, C <sub>L</sub> =1μF. Measure from V <sub>OUT</sub> =90% of V <sub>IN</sub> to 10% of V <sub>IN</sub>		21		μs
OCB Low Resistance	R <sub>OCB</sub>	V <sub>IN</sub> =5V, I <sub>L</sub> =10μA		9		Ω
		V <sub>IN</sub> =3.3V, I <sub>L</sub> =10μA		12		Ω



# SY6287C

OCB Leakage Current	$I_{LKG\_OCB}$	$V_{OCB}=5V$		0.01	1	$\mu A$
Thermal Shutdown Temperature	$T_{SD}$			150		$^{\circ}C$
Thermal Shutdown Hysteresis	$T_{HYS}$			20		$^{\circ}C$
Current-limit Response Time	$t_{OC\_res}$	$V_{OUT}=0V$ (Note5)		25		$\mu s$
Over Current Flag Response Time	$t_{OCB}$	$V_{OUT}=V_{IN}/2$ to FLG low	4	8	12	$\mu s$

**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.

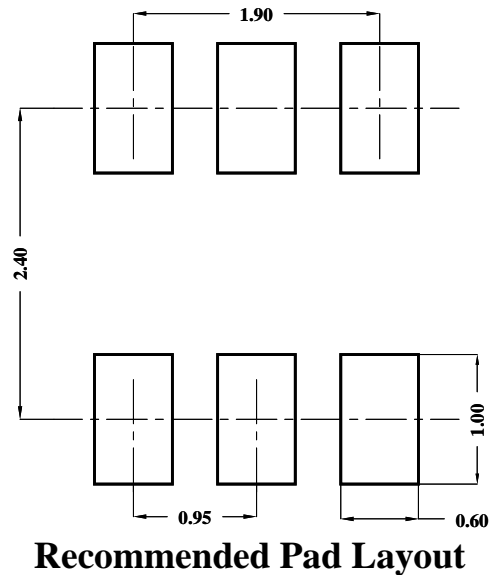
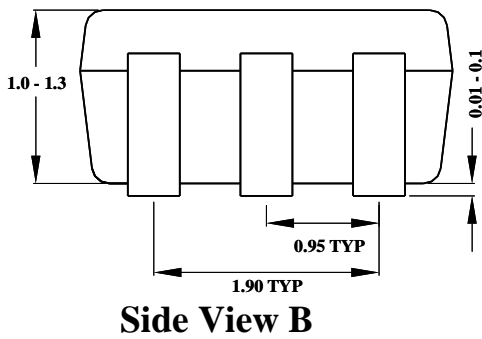
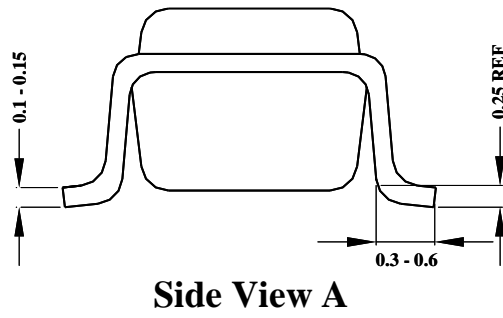
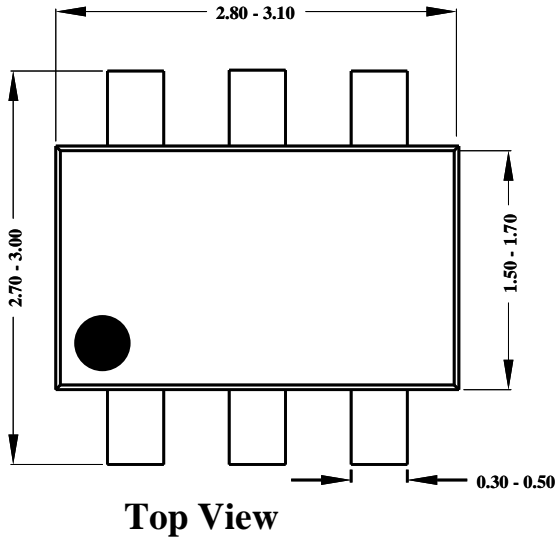
**Note 2:**  $\theta_{JA}$  is measured in the natural convection at  $T_A = 25^{\circ}C$  on a Silergy’s test board. Pin 2 of SOT23-6 packages is the case position for  $\theta_{JC}$  measurement.

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

**Note 4:** Guaranteed by design but not production tested.

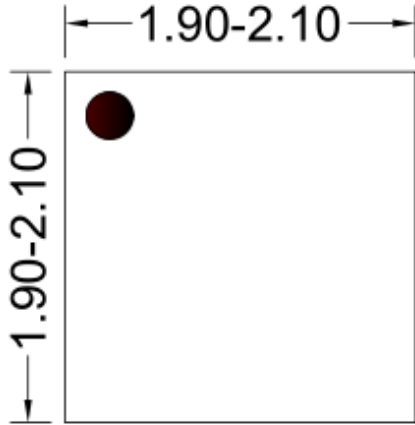
**Note5:** Current limit threshold is determined by  $I_{LMT}=230V/R_{SET}$ , where  $R_{SET}$  is in ohms.

**SOT23-6L Package Outline & PCB Layout**

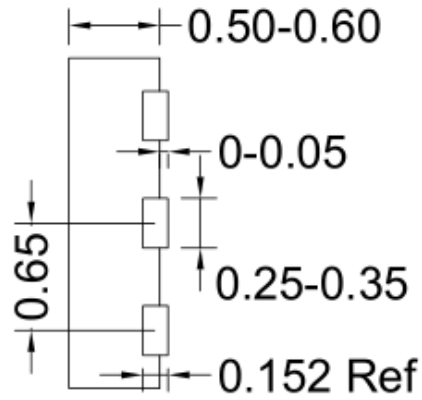


**Notes:** All dimension in millimeter.  
All dimension don't include mold flash & metal burr.

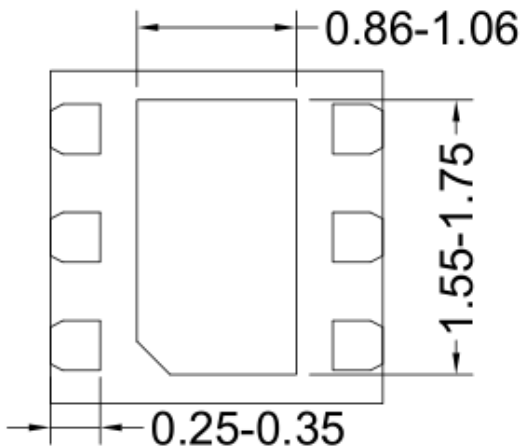
**DFN2x2-6 Package Outline**



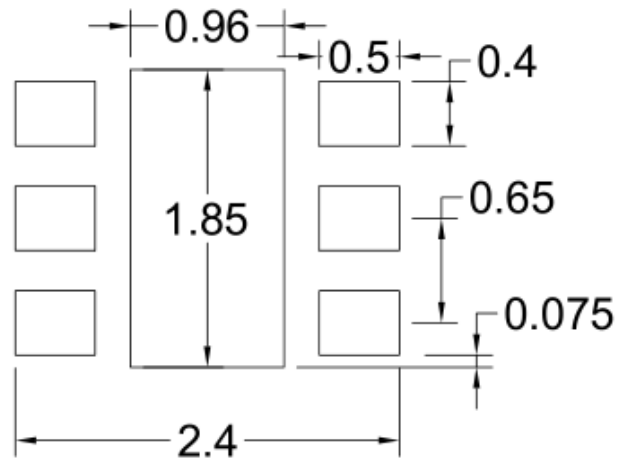
Top View



Side View



Bottom View



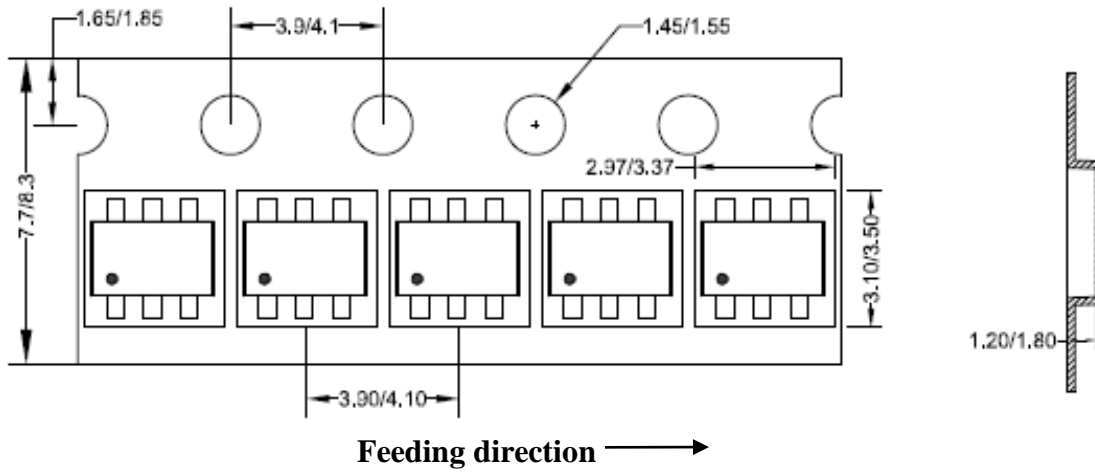
Recommended PCB layout

**Notes: All dimension in millimeter and exclude mold flash & metal burr**

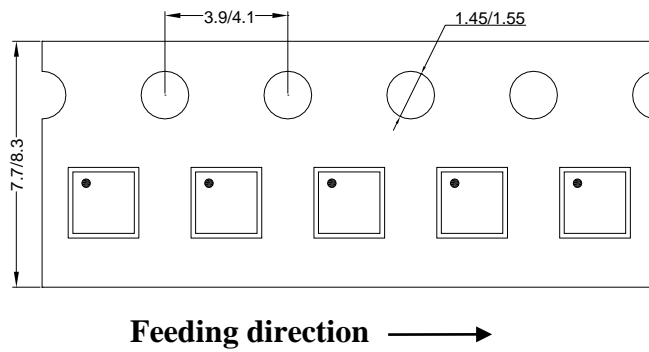
## Taping & Reel Specification

### 1. Taping Orientation

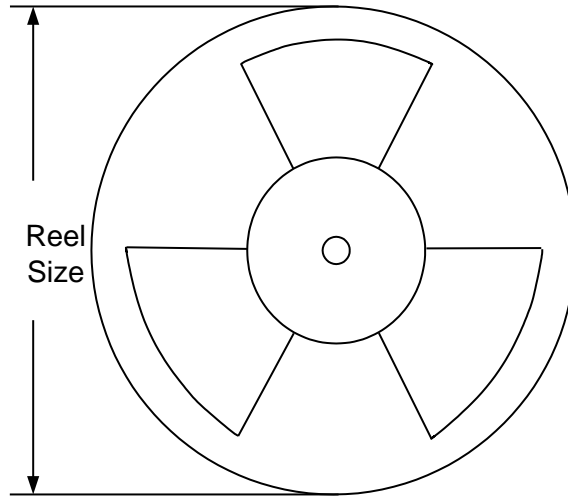
SOT23-6



DFN2x2 taping orientation



**2. Carrier Tape & Reel Specification for Packages**



Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer length(mm)	Leader length (mm)	Qty per reel
SOT23-6	8	4	7"	280	160	3000
DFN2x2	8	4	7"	400	160	3000

**3. Others: NA**