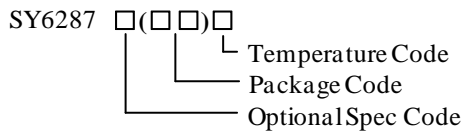


Low Loss Power Distribution Switch with Programmable Current limit

General Description

SY6287B 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
SY6287BDEC	DFN2x2-6	

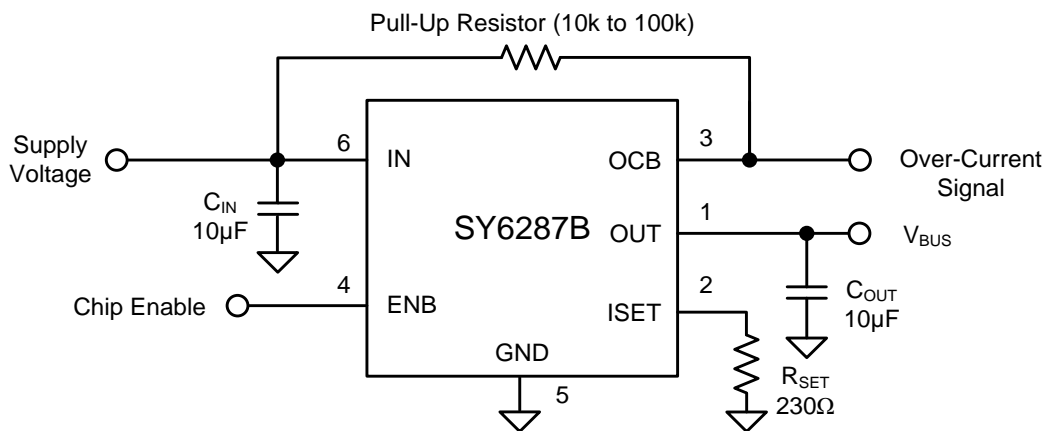
Features

- 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: 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

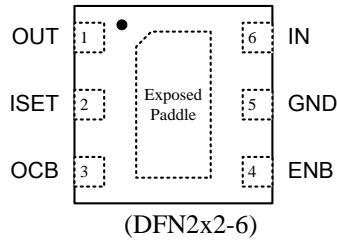
Typical Application Circuit



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)



Top Mark: mKxyz (device code: mK, *x=year code*, *y=week code*, *z=lot number code*)

Pin Name	Pin Number	Pin Description
OUT	1	Output pin, decoupled with a 10μF capacitor to GND.
ISET	2	Current limit programming pin. Connect a resistor R_{SET} from this pin to ground to program the current limit: $I_{LIM} (A) = 230/R_{SET} (\Omega)$.
OCB	3	Open drain fault flag.
ENB	4	ON/OFF control, active low. Do not leave it floating.
GND	5, Exposed Paddle	Ground pin.
IN	6	Input pin, decoupled with a 10μF capacitor to GND.

Block Diagram

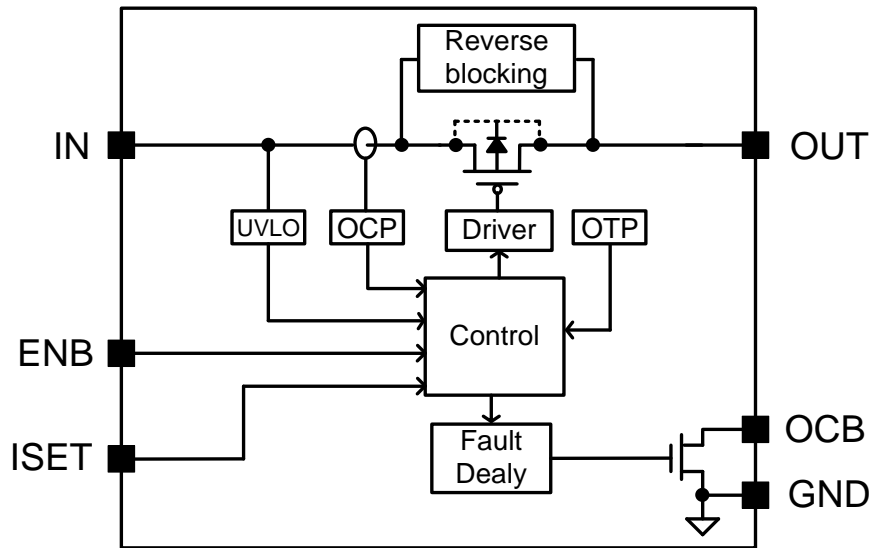


Figure2. Block Diagram



Absolute Maximum Ratings (Note 1)

IN, OUT	-0.3V to 7V
ISET, OCB, ENB	-0.3V to 7V
Power Dissipation, P_D @ $T_A = 25^\circ\text{C}$ DFN2x2-6	1.53W
Package Thermal Resistance (Note 2)	
DFN2x2-6, θ_{JA}	65.3°C/W
DFN2x2-6, θ_{JC}	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

($V_{IN} = 5V$, $C_{OUT} = 10\mu F$, $T_A = 25^\circ C$, BOLD values indicate $-40^\circ C$ to $85^\circ C$, unless otherwise specified.)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range		V_{IN}		2.5		5.5	V
IN UVLO Threshold		$V_{IN,UVLO}$				2.45	V
IN UVLO Hysteresis		$V_{IN,HYS}$			0.1		V
Shutdown Input Current		I_{SHDN}	Open load, switch off		0.1	5	μA
			Output grounded, switch off		0.1	5	μA
Reverse Leakage Current			IN tie to GND, $V_{OUT} = 5V$		0.1	5	μA
Quiescent Supply Current		I_Q	Open load, switch on		45	100	μA
FET $R_{DS(ON)}$		$R_{DS(ON)}$	$V_{IN} = 5V$, $I_{OUT} = 0.5A$		65	100	m Ω
Current Limit		I_{LIM}	$V_{OUT} = 4V$, $R_{SET} = 460\Omega$ (Note5)	0.425	0.5	0.575	A
			$V_{OUT} = 4V$, $R_{SET} = 153.3\Omega$ (Note5)	1.382	1.5	1.617	A
ENB Threshold	Logic-low Voltage	V_{IL}				0.4	V
	Logic-high Voltage	V_{IH}		1.0			V
ENB Input Cap		C_{ENB}	(Note4)		1		pF
Output Turn On Time		t_{ON}	$R_L = 10\Omega$, $C_L = 1\mu F$. Measure from ENB ON to V_{OUT} reach $V_{IN} \times 90\%$	1	2	5	ms
Output Turn On Rise Time		t_R	$R_L = 10\Omega$, $C_L = 1\mu F$. Measure from $V_{OUT} = 10\%$ of V_{IN} to 90% of V_{IN}	1	2	5	ms
Output Turn Off Time		t_{OFF}	$R_L = 10\Omega$, $C_L = 1\mu F$. Measure from ENB OFF to V_{OUT} reach $V_{IN} \times 10\%$		22		μs
Output Turn Off Fall Time		t_F	$R_L = 10\Omega$, $C_L = 1\mu F$. Measure from $V_{OUT} = 90\%$ of V_{IN} to 10% of V_{IN}		21		μs
OCB Low Resistance		R_{OCB}	$V_{IN} = 5V$, $I_L = 10\mu A$		9		Ω
			$V_{IN} = 3.3V$, $I_L = 10\mu A$		12		Ω
OCB Leakage Current		I_{LKG_OCB}	$V_{OCB} = 5V$		0.01	1	μA
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		μs
Over Current Flag Response Time		t_{OCB}	$V_{OUT} = V_{IN}/2$ to FLG low	4	8	12	μs

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.

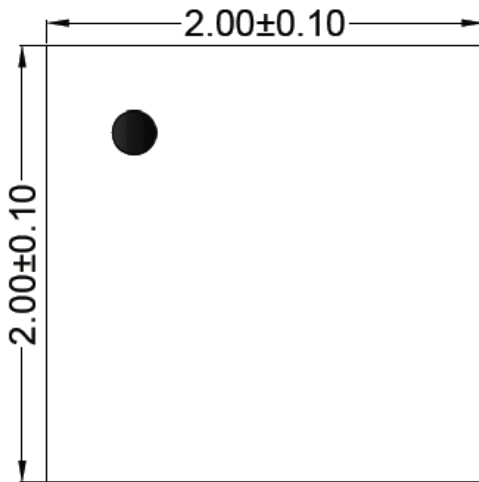
Note 2: θ_{JA} is measured in the natural convection at $T_A = 25^\circ C$ on a Silergy’s test board. Pin 5 of DFN2x2-6 packages is the case position for θ_{JC} measurement.

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

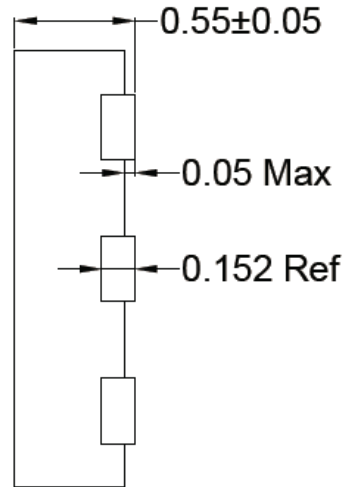
Note 4: Guaranteed by design but not production tested.

Note 5: Current limit threshold is determined by $I_{LMT} = 230V/R_{SET}$, where R_{SET} is in ohms.

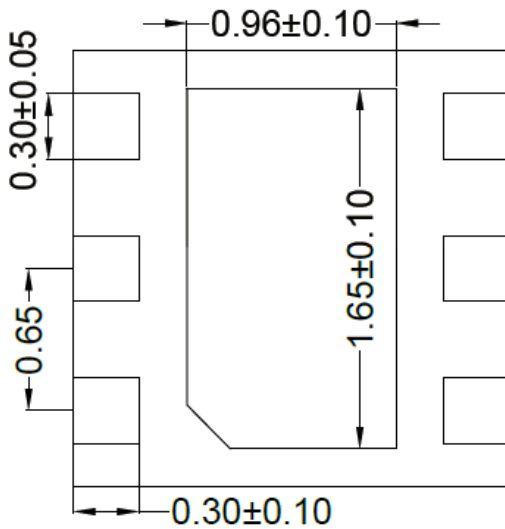
DFN2x2-6 Package outline



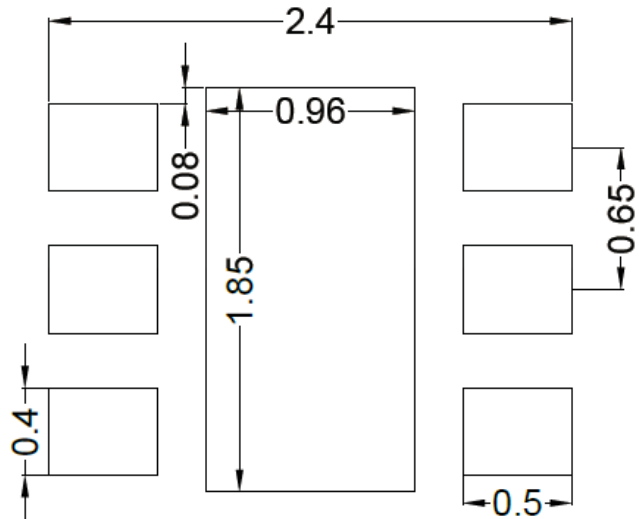
Top View



Side View



Bottom View



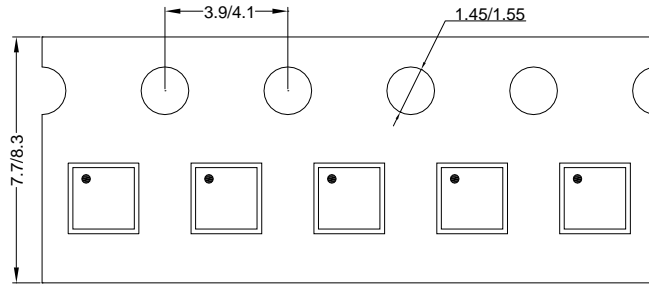
Recommended PCB layout

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

Taping & Reel Specification

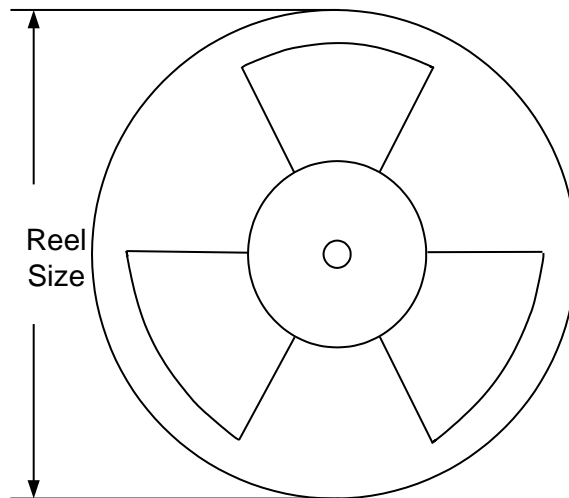
1. Taping Orientation

DFN2x2 taping orientation



Feeding direction →

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
DFN2x2	8	4	7"	400	160	3000

3. Others: NA