Low Loss Power Distribution Switch

1. Description

IP2680 is an ultra-low Rds (on) switch with current limiting threshold programmable function, protecting power source from overcurrent and short circuit conditions. It supports over temperature protection and can block the current flowing from the output to the input under the shutdown, in case the output voltage is higher than the input voltage.

2. Application

- USB 3G Datacard
- USB Dongle
- MiniPCI Accessories

3. Features

- Ultra-low low Rds(on) resistance: 40mohm
- Distribution voltage: 2.4V to 5.5V
- Programmable current limit: from 0.3A to 2.1A
- Enable polarity: active high
- Over temperature shutdown and automatic recovery
- Reverse blocking (no body diode)
- Under shutdown, current is blocked when OUT is higher than IN
- Package: SOT23-5

4. Typical Application Schematic

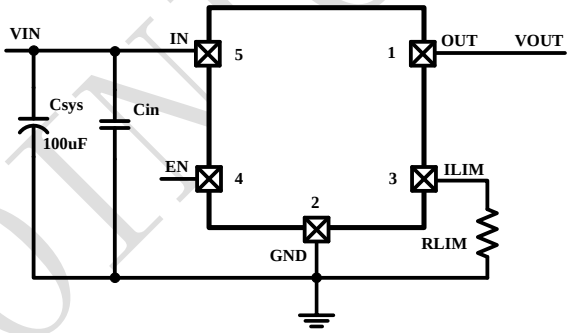
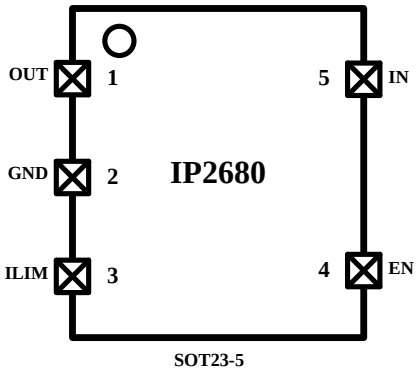


Figure 1 IP2680 Typical Application Circuit

5. PIN Description



SOT23-5

Pin Name	Pin Number	Pin Description
OUT	1	Output pin
GND	2	Ground pin
ILIM	3	Current limit program pin. Connect to a resistor Rilim to GND to program the current limit. Current limit threshold is fixed to 2.1A when floating this pin.
EN	4	ON/OFF control, pull high to enable, pull low to disable. Do not float.
IN	5	Input pin

6. Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
IN,OUT,EN Voltage Range		-0.3 ~ 6	**V**
Junction Temperature Range	T_J	-40 ~ 150	℃
Storage Temperature Range	Tstg	-60 ~ 150	℃
Lead Temperature (Soldering, 10sec.)	Ts	260	℃
Ambient Temperature Range	T_A	-40 ~ 150	℃
Package Thermal Resistance	θ_{JA}	250	**℃/W**
Package Thermal Resistance	θ_{JC}	110	**℃/W**
Human Body Model (HBM)	ESD	2	**KV**

*Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to Absolute Maximum Rated conditions for extended periods may affect device reliability.

*Voltages are referenced to GND unless otherwise noted.

7. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Input Voltage	VIN	2.4		5.5	V
Ambient Temperature	T_A	-40		85	℃

*Devices' performance cannot be guaranteed when working beyond those Recommended Operating Conditions.

8. Electrical Characteristics

Unless otherwise specified, T_A=25℃, VIN=5V

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input Voltage	VIN		2.4		5.5	V
Shutdown input current	ISHDN	Open load, IC Disabled		0.6	1	uA
Quiescent supply current	IQ	Open load, IC Enabled		75		uA

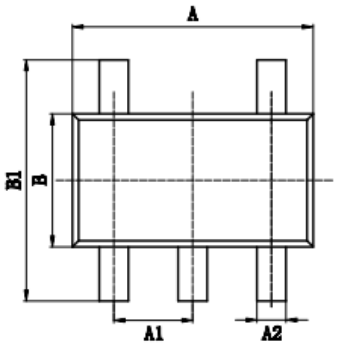
FET Ron	Rds(on)			40		mohm
EN rising threshold	VEN(high)		1.5			V
EN falling threshold	VEN(low)				1.4	V
Input UVLO Threshold	VIN_UVLO	VIN Falling			2.3	V
IN UVLO Threshold	VIN_HYS			0.1		V
Current limit program range	Ilim		0.3		3.5	A
Over current limit	ILIM(Rilim)	Rilim=110k	1.0	1.2	1.4	A
	ILIM(def)	Rilim floating	2.1	2.3	2.5	A
Turn-ON time	TON	RL=10ohm,CL=1uF		2.3	5	ms
Turn-OFF time	TOFF	RL=10ohm,CL=1uF		0		us
Thermal shutdown temperature	TSD			130		℃
Thermal shutdown hysteresis	TSD_HYS			20		℃

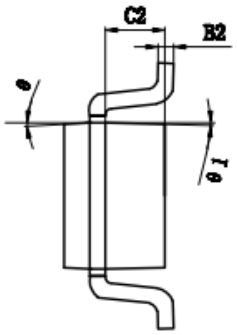
9. Current Rilim Selections

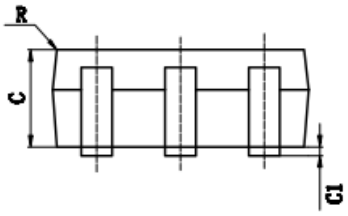
Rilim(kOhm)	Ilim(A)	Rilim(kOhm)	Ilim(A)
39	3.6	86.6	1.6
43	3.3	95	1.5
47	3	100	1.4
51	2.9	110	1.2
56	2.5	120	1.1
61	2.4	130	1.0
62	2.3	150	0.9
64	2.2	160	0.8
68	2.1	180	0.7
71.5	2.0	220	0.6
75	1.9	240	0.5
78	1.8	300	0.4
82	1.7	360	0.3

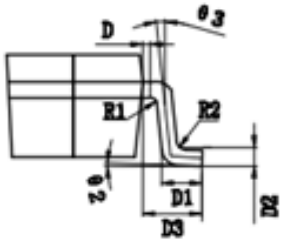
Note: data in this table is laboratory measured, and Rilim resistor tolerance is 5% resistor values. It is important to use higher tolerance resistors of 0.5% or higher, when precision current limiting is desired.

10.Package









SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.82		3.02
A1	0.90		1.00
A2	0.35		0.45
B	1.52		1.72
B1	2.80		3.00
B2	0.119		0.135
C	1.05		1.15
C1	0.03		0.13.
C2	0.60		0.70
D	0.03		0.13
D1	0.40		0.50
D2		0.254TYP	
D3	0.60		0.70
θ		9 °TYP4	
θ1		10 °TYP4	
θ2	0 °		8 °
θ3		6 °TYP	
R			0.2TYP
R1		0.08 TYP	
R2		0.08TYP	

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