

■ Description

SP8301是USB Type-C端口控制器, 完全兼容USB Type-C V1.1规范.

SP8301适用于Source端应用, 是专为电源适配器, 车充电源设计.可动态配置USB Type-C电流模式. VBUS, CC1和CC2, 支持30V耐压, 以保护它免受高压的冲击, 能兼容所有的高电压快速充电标准.

SP8301超低待机电流.仅8uA.

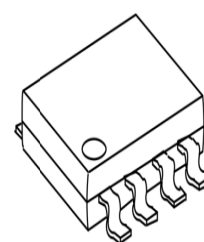
■ Feature

- 支持 USB Type-C V1.1 标准
- 支持 Source 端应用
- VBUS, CC1, and CC2 支持 30V 耐压
- 支持 USB Type-C 充电电流: 标准, 1.5A, 和 3.0A
- 8uA 超低静态电流
- TSSOP-8 封装, 3.0mm x 6.4mm x 1.2mm
- ESD 符合 JESD22 标准

-2000-V Human Body Model (A114-A)

- 200-V Machine Model (A115-A)

- 1000-V Charged-Device Model (C101)



TSSOP-8

■ Applications

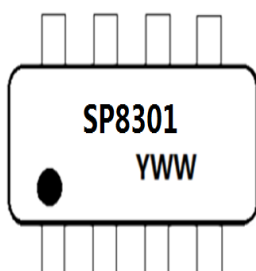
- 车载充电器
- 电源适配器

■ Pin Functional Description

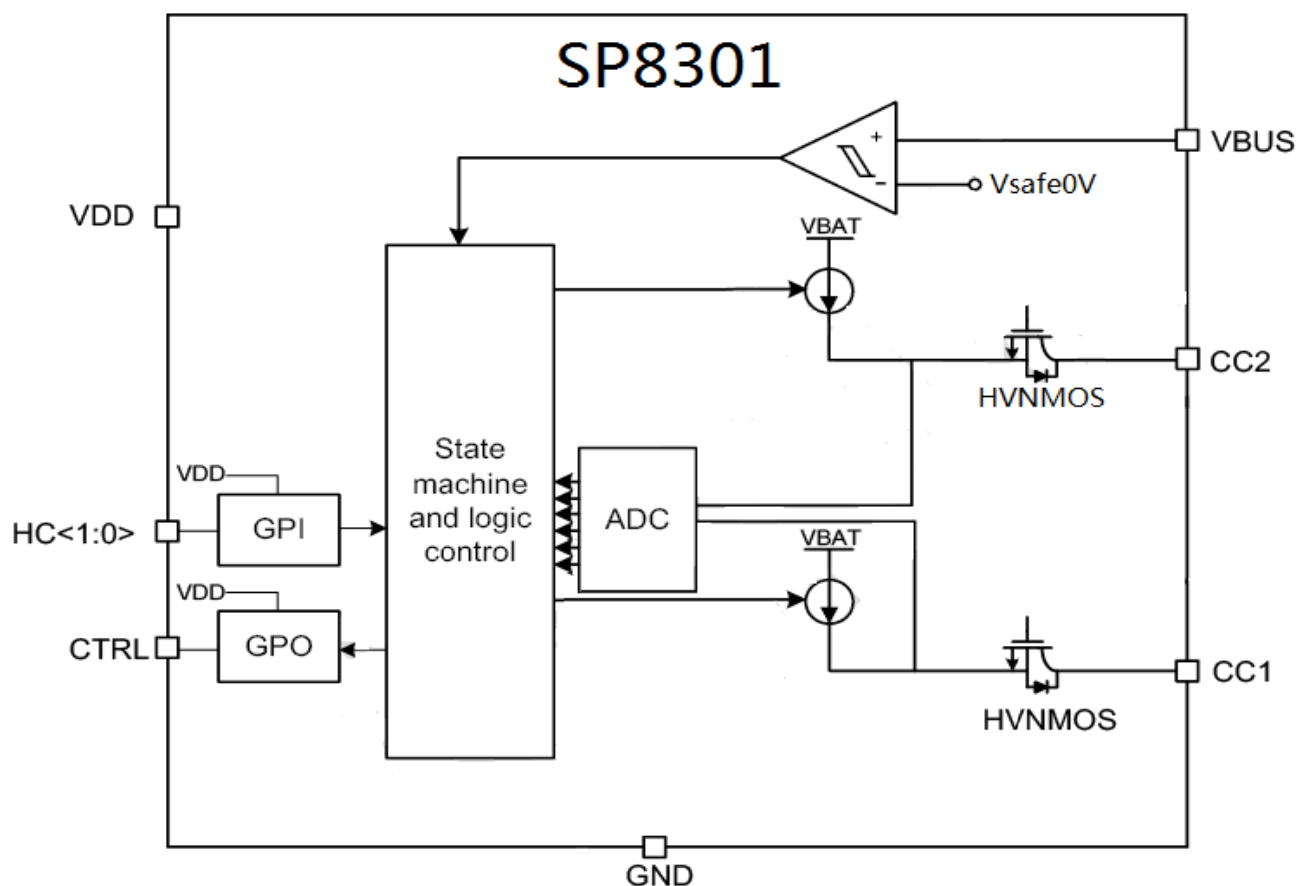


PIN	NAME	DISCRIPTION
1	CTRL	External PMOS control : 0: Switch on PMOS 1: Switch off PMOS
2	VDD	Power supply, maximum 6V
3-4	HC<1:0>	Controls output current capability : 00/01: Default USB Power 10: 1.5A @ 5V 11: 3.0A @ 5V
5	GND	GND
6	CC1	Configuration channel 1, connect to CC1 of Type-C receptacle
7	CC2	Configuration channel 2, connect to CC2 of Type-C receptacle
8	VBUS	VBUS detection input to detect VBUS presence, this is not power supply

■ ORDER/MARKING INFORMATION

Order Information	Top Marking
<p>SP8301 - X - X</p> <p>Product Number</p> <p>Package</p> <p>TS: TSSOP-8</p> <p>Packing</p> <p>R: Tape Reel</p>	 <p>Y: Year (5=2015, 6=2016)</p> <p>WW: Weekly (01-54)</p>

■ Block Diagram



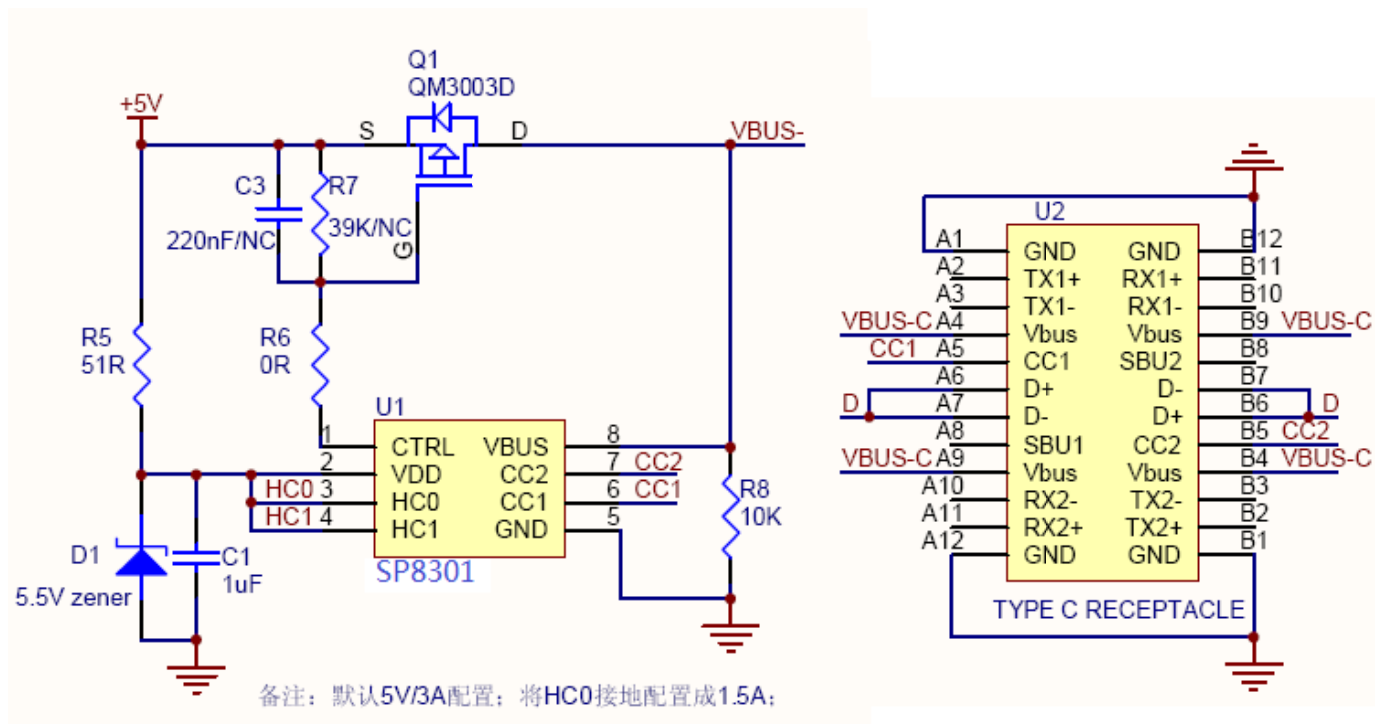
■ ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Rating	Unit
Power supply	VDD	-0.3 ~ 6	V
Input voltage range (HC)	V_i	-0.3 ~ 6	V
Output voltage range (CTRL)	V_{out}	-0.3 ~ 6	V
Type C interface voltage range	VBUS/CC	-0.3 ~ 30	V
Storage temperature	T_s	-65 ~ 150	°C
Free air temperature	T_a	-40 ~ 85	°C
ESD	VESD	HBM ± 2000 CDM ± 1000	V

■ ELECTRICAL CHARACTERISTICS

符号	参数	测试条件	最小值	典型值	最大值	单位
VDD	Power supply	-	2.7		6	V
VUVLO	Chip active threshold voltage	VBAT rising	2.25	2.5	2.75	V
	Chip active hysteresis	VBAT falling		0.3		V
VBUS	VBUS effective threshold voltage	VBAT rising	2.92	3.25	3.58	V
	VBUS comparator hysteresis	VBAT falling		0.25		V
IVDD_IDLE	VDD current in idle state			8		μA
VIL	low level input voltage		-0.3		0.4	V
VIH	high level input voltage		0.7*VDD			V
VOL	low level output voltage	IOL=4mA	-0.3		0.4	V
VOH	high level output voltage	IOH=-4mA	0.7*VDD			V
CC_DFT	Detection current from CC in USB current mode	HC<1:0>=00/01	-8%	80	+8%	μA
ICC_1A5	Detection current from CC in 1.5A high current mode	HC<1:0>=10	-8%	180	+8%	μA
ICC_3A0	Detection current from CC in 3.0A high current mode	HC<1:0>=11	-8%	330	+8%	μA
Tcc	Time a port shall wait before it can determine it' s attached		100	150	200	ms
TVbus	Time for VBUS pin deglitch			2		ms

Typical Application Schematic

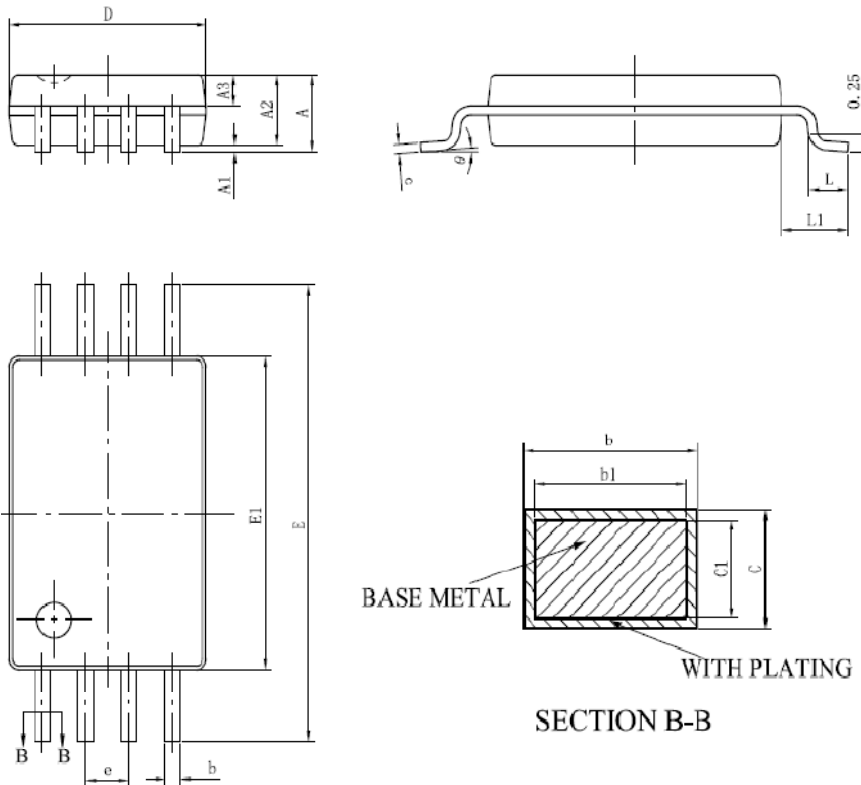


Functional Description

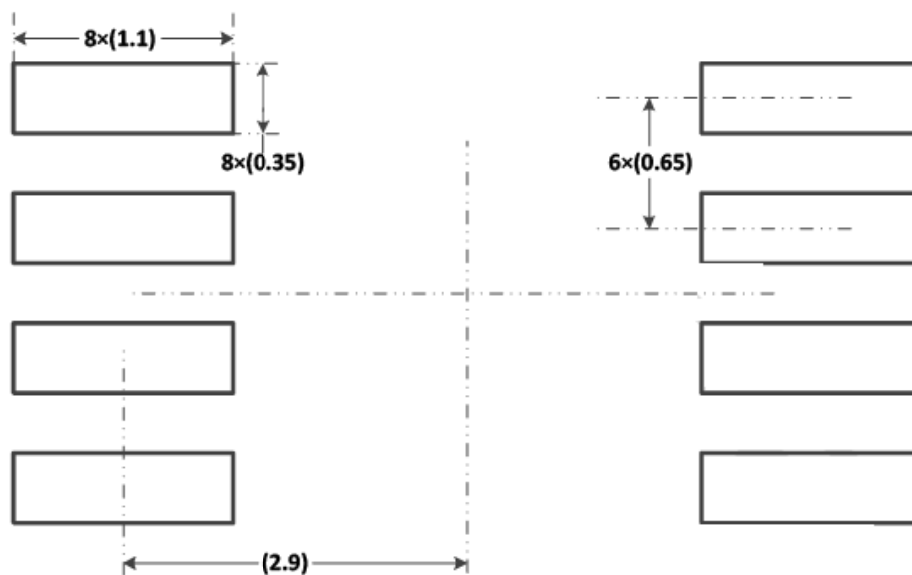
SP8301 配置为 Source 端，检测流程以下：

1. 最初，Source 端未接触时，SP8301 的 Ctrl 键将被设置为高电平，它会通知外部开关 MOSFET 禁止 VBUS 输出。
2. SP8301 供应电流在 CC1 和 CC2 端，并监控这两个引脚是否有 Sink 端接入。在任意 CC 引脚有 RD 下拉电阻的存在，表明有 Sink 设备连接。SP8301 的电流值指示 Type-C 电流适配器的输出能力。
3. 一旦检测到有 Sink 端接入（CC 电压下降到规定范围 150ms 和 VBUS 低于 vsafe0v），SP8301 将 Ctrl 置于低电平，并通知外部开关 MOSFET 启用 VBUS 输出。
4. 连接后 SP8301 持续监测 Sink 端，一旦发现连接分离，SP8301 将 Ctrl 置于高电平，并通知外部开关 MOSFET 关闭 VBUS 输出，恢复到初始状态。

PACKAGE INFORMATION

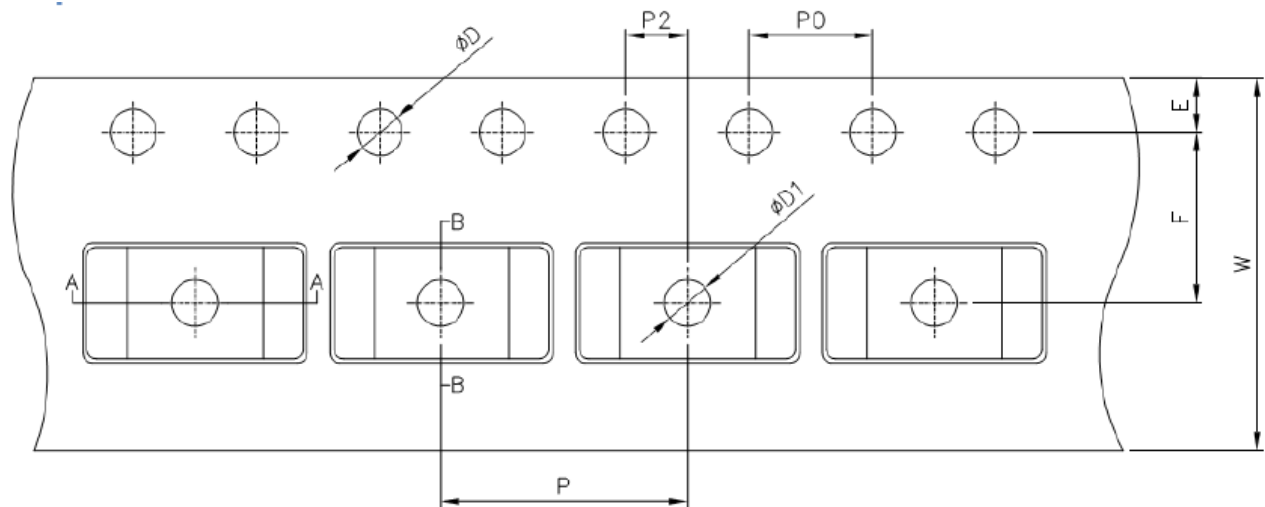


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.20
A1	0.05	—	0.15
A2	0.90	1.00	1.05
A3	0.39	0.44	0.49
b	0.21	—	0.30
b1	0.20	0.22	0.25
c	0.13	—	0.19
c1	0.12	0.13	0.14
D	2.90	3.00	3.10
E1	4.30	4.40	4.50
E	6.20	6.40	6.60
e	0.65BSC		
L	0.45	—	0.75
L1	1.00BSC		
θ	0	—	8°
L/F载体尺寸 (mil)	82*82	126*87	
	94*61.5 (双载体)		



LAND PATTERN EXAMPLE

■ TAPE AND REEL INFORMATION



Package Type	Pins	SPQ	E (mm)	F (mm)	P2 (mm)	D (mm)	D1 (mm)	P0 (mm)	10P0 (mm)
TSSOP	8	3000	1.75	5.5	2.0	1.5	1.5	4.0	40.0