

Features

- D+/D- DCP Mode per USB Battery Charging Specification 1.2
- D+/D- Short Mode per Telecommunication Industry Standard YD/T1591-2009 (Chinese)
- Supports non-BC1.2 Charging Modes by Automatic Selection
 - D+/D- Option for Apple Device
 - D+/D- Option for Samsung Device
- Operating Voltage Range: 4.5V to 5.5V
- Power Consumption
 - 5uA When VDD<POR threshold
 - 180uA When VDD>POR threshold
- Lead(Pb)-Free, Halogen-Free, SOT23-5 Package
- 8kV HBM ESD Rating on D+/D- Pins

General Description

The ZS5887 is the USB dedicated charging controller IC, which is fully compatible with BC1.2 and other non-BC1.2 standards like YT/D1591-2009, Apple charging specification (for i-Pad & i-Phones) and specs from Samsung Galaxy family.

The IC is used to facilitate charging procedure when most of the mainstream handheld devices are detected.

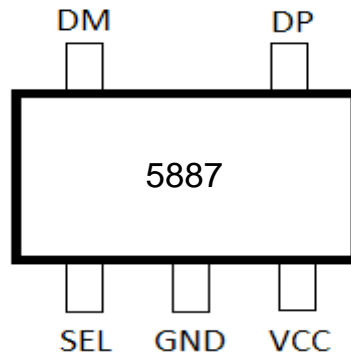
The ZS5887 is suitable for all the charger products using USB interface like power bank, wall adapter and even MID device with OTG function. The IC is provided with enhanced ESD protection up to +/-8kV with application on D+/D- Pins.

ZS5887 is available in tiny SOT23-5 package.

Applications

- Power bank
- USB Ports (Hosts and Hubs)
- MID OTG Port
- Wall Charging Adapters

Pin Arrangement and Description

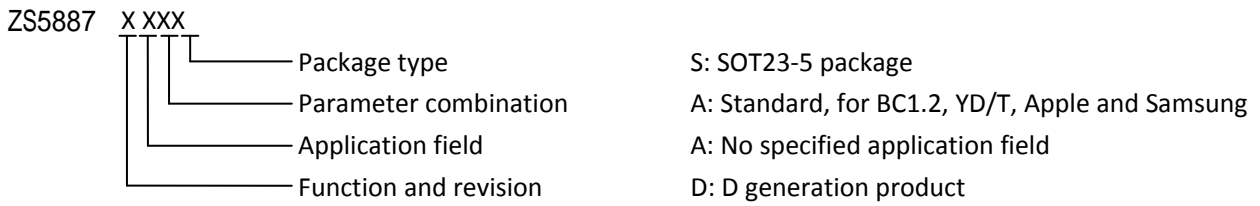


Pin No.	Pin Name	Description
1	SEL	Work Mode Selection with 1uA pull up current
2	GND	Ground
3	VCC	Power
4	DP	USB positive data-channel to external USB device
5	DM	USB negative data-channel to external USB device

Order Information

Name	Operation Temperature	Package	Package Mark
ZS5887	-30°C to 80°C	SOT23-5	5887

Type number



Function Block Diagram

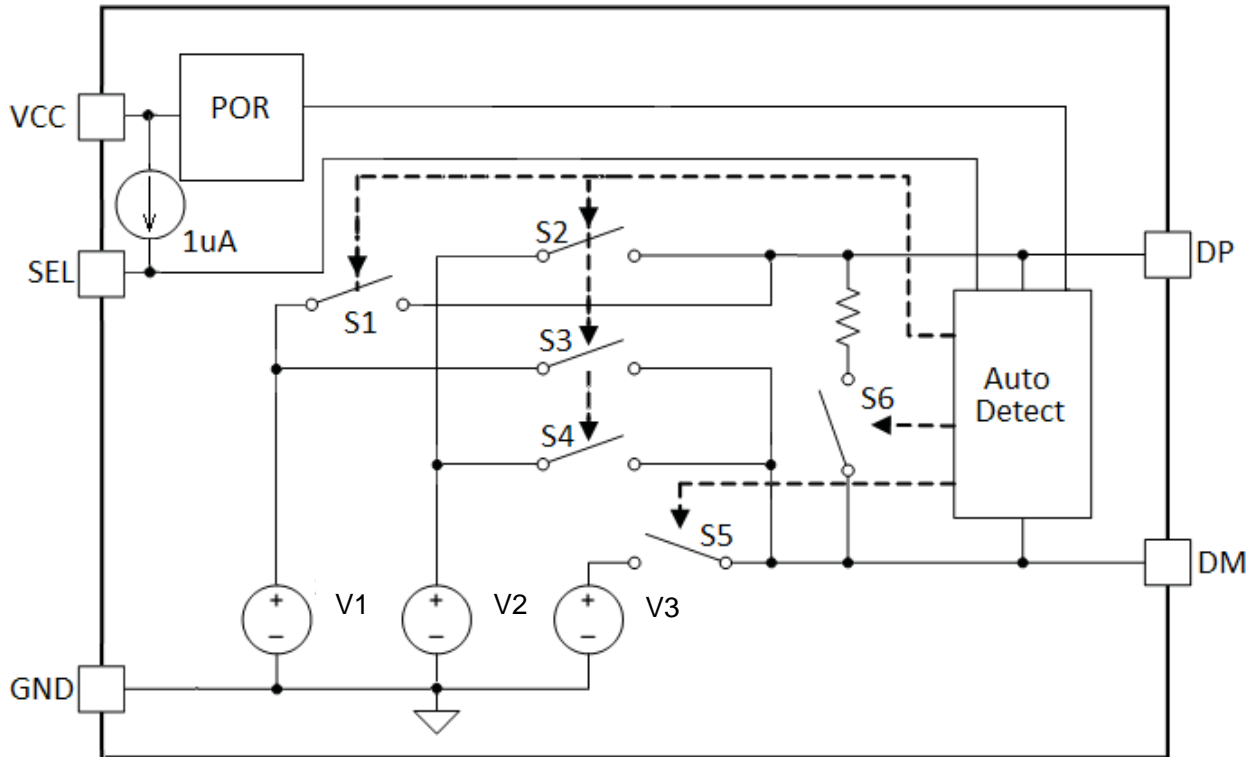


Fig1. Block diagram

Absolute Maximum Ratings

Voltage on VCC Pin Relative to GNDGND-0.3 toGND+6V
Voltage on SEL Pin Relative to GNDGND-0.3 to VCC+0.3V
Voltage on DP DM Relative to GND GND-0.3 to VCC+0.3V
Operating Temperature Range-30°C to80°C
Junction Temperature150°C
Store Temperature Range-55°C to 125°C

Caution:

Stresses beyond "Absolute Maximum Ratings" condition may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Electrical Characteristics Recommended DC Operating Conditions(4.5≤VCC≤5.5, T_A= -40~80°C, unless otherwise specified.)

PARAMETER	SYMBOL	CONDITIONS	Min.	Typ.	Max.	UNITS
VCC Voltage			4.5		5.5	V
VCC POR Voltage	VCC _{POR}		3.5		3.9	V
	VCC _{POR_HYS}			250		mV

DC Electrical Characteristics(4.5≤VDD≤5.5, T_A= -30~80°C, unless otherwise specified.)

PARAMETER	SYMBOL	CONDITIONS	Min.	Typ.	Max.	UNITS
DC Current Consumption	I _{VCC}			180	240	μA
Output Resistance on DP/DM pin	R _{OUT}	Output voltage=2.0		30		kΩ
		Output voltage=2.7		23		kΩ
Short Condition Resistance	R _{DMDP}			50		Ω
SEL pull up current	I _{SEL_PU}			1		μA

* Actual charging current is programmed by the external resistor connected to the Ichg pin

Function

ZS5887 is a specified USB charger controller IC for external device charging. ZS5887 integrated with intelligent USB detection circuits, can identify most of the handheld equipment in market, such as Apple, Samsung, HTC mobile phones and other USB supplied devices.

ZS5887 monitors the D+/D- voltage all the time, and automatically emulates the corresponding USB type for the attached device. Then, the attached device can employ a big current as MAX as 2.4A to charge itself.

ZS5887 only changes the D+/D- voltage to suitable value for different devices; it does not control the charging current loop. The actual charge current is

determined by the power supply and the charge management IC in attached device.

SEL Pin

ZS5887 uses a SEL pin to choose the different Apple charge current.

Pull low through a resistor less than (or equal to) 1kΩ is for 1A option; Pull high or pull low through a resistor between 2MΩ and 5MΩ are all for 2.4A option.

SEL potential	Option
1	2.4A
0 (R < 1kΩ)	1A/2.1A
H (2MΩ < R < 5MΩ)	2.4A

Table4. SEL pin for different current option

Application Circuits

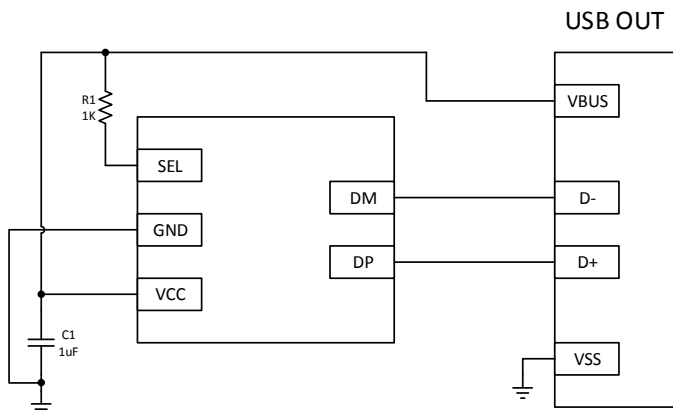


Fig2. 2.4A Configuration 1 / typical application circuits

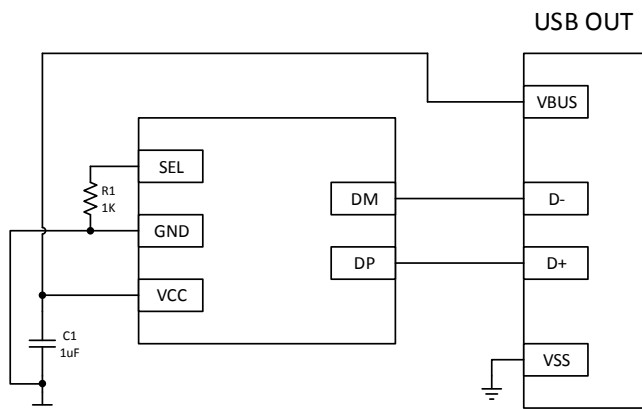


Fig3. 1A Configuration / typical application circuits

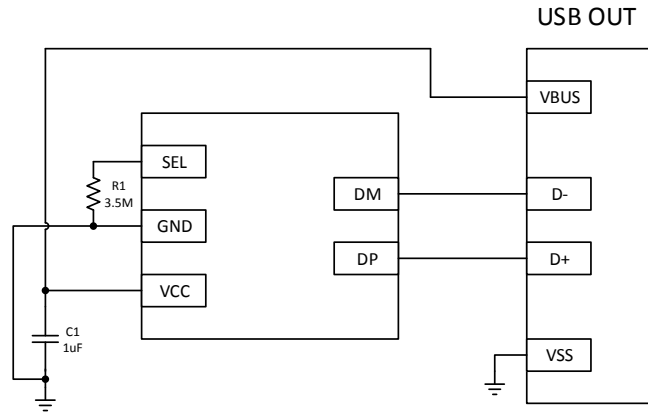


Fig4. 2.4A Configuration 2 / typical application circuits

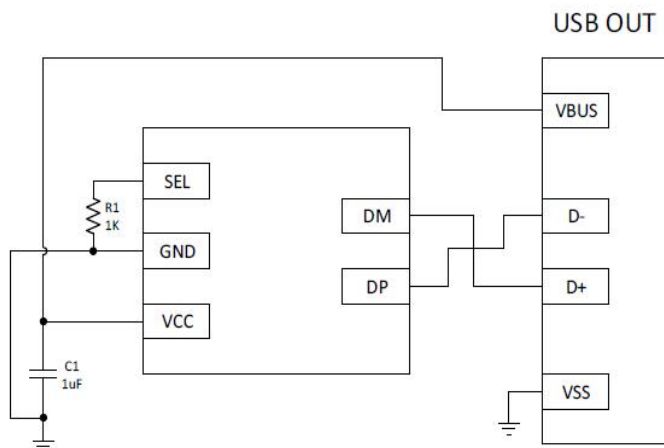
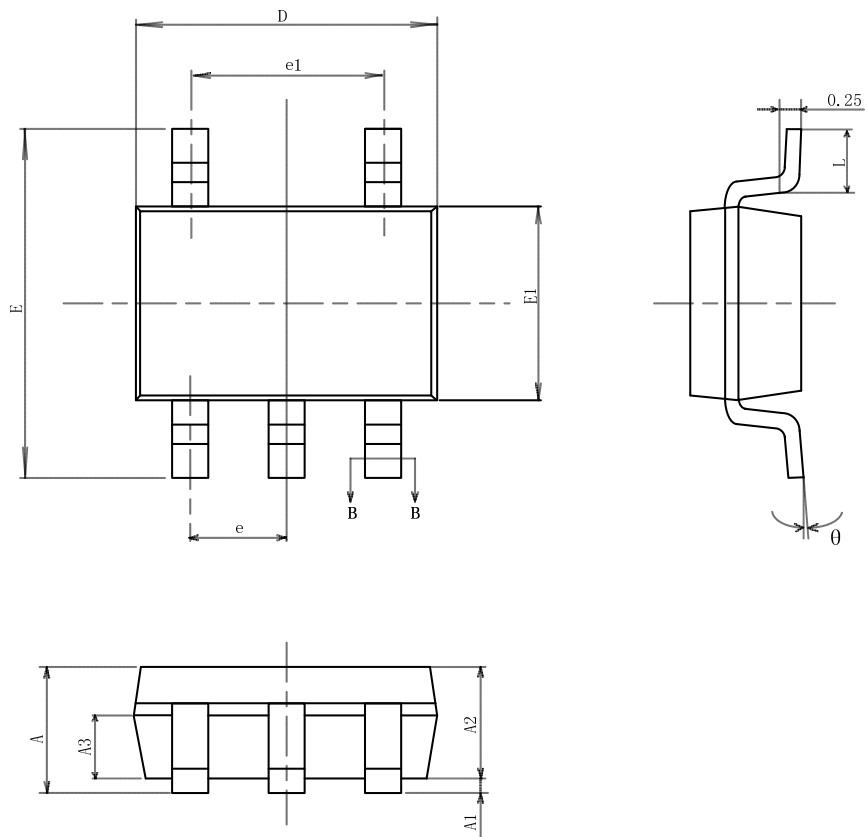


Fig5. 2.1A Configuration 2 / typical application circuits

Package Information



SYMBOL	MILLIMETER		
	MIN	TYP	MAX
A	—	—	1.35
A1	0.04	—	0.15
A2	1.00	1.10	1.20
A3	0.55	0.65	0.75
b	0.38	—	0.48
b1	0.37	0.40	0.43
c	0.11	—	0.21
c1	0.10	0.13	0.16
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95BSC		
e1	1.90BSC		
L	0.30	—	0.60
θ	0	—	8°
L/F size (mil)	47*47	—	46*64