FASTSOC

FS312B

USB Type-C PD Fast Charging Protocol Intelligent Trigger Chip

Product Features

- Compatible with USB Type-C PD3.0 protocol (supports 5V, 9V, 12V, etc. in PPS).
- Compatible with USB Type-C PD3.1 protocol (supports 5V, 9V, 12V, etc. in PPS).
- Compatible with QC protocol
- The highest voltage of the adapted system is optional
- The highest voltage of the adapted system is optional
- Voltage required for automatic triggering
- Support for emaker mode
- Packaging: DFN2X2-6L packaging

Product Overview

FS312B automatically shakes hands with the charging device according to the voltage set by the peripheral circuit, such as 5V, 9V, 12V, 15V, 20V, to complete the application for the set voltage.

FS312B supports TypeC PD3.0 and QC protocols, and can automatically complete handshake with the charger according to protocol priority, as well as select the set voltage.

If the set voltage cannot be found for FS312B, the closest voltage can be selected according to the setting.

If the set voltage cannot be found for FS312B, the closest voltage can be selected according to the setting.

FS312BL can support the PD3.1 protocol and can apply for a maximum voltage of 20V.

FS312BH can support the PD3.1 protocol and support voltage applications of 28V, 36V, and 48V.

FS312BL/H-E supports analog emaker mode and can be used for wire.

FS312B provides DFN2X2-6L packaging.

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Application field

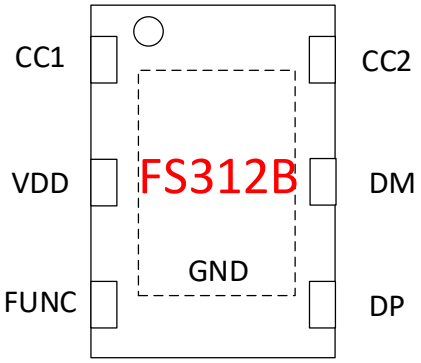
- Wireless charging
- Bluetooth speaker
- Car mounted equipment
- Energy storage power supply
- Other USB Type-C power input devices

V1.3(202411)

Order information

Part No	Package	Pcs/Reel
FS312BL	DFN2X2-6L	3000
FS312BH	DFN2X2-6L	3000
FS312BLE	DFN2X2-6L	3000
FS312BHE	DFN2X2-6L	3000

Chip packaging and pin definition



DFN2X2-6L

Pic 1. Pin definition

Table 1. FS312B Pin function description

FS312B	Name of the pin	Description
1	CC1	Connect Type-C socket
2	VDD	Chip power supply
3	FUNC	External resistor, prefabricated trigger voltage
4	DP	Connect Type-C socket
5	DM	Connect Type-C socket
6	CC2	Connect Type-C socket
EP	GND	Chip ground

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Extreme operating range

Table 2. Maximum operating range

Parameter	Value
VDD	-0.3V~5.5V
CC1, CC2, DP, DM	-0.3V~5.5V
FUNC	-0.3V~5.5V

The maximum operating range listed in the table above, if the limit is exceeded, the chip may be permanently damaged. Users should try to avoid it.

Normal operating range

Table 3. Normal operating range

Parameter	Value
VDD	3V~5.1V
CC1, CC2, DP, DM	0V~5V
FUNC	0V~3.3V
Working temperature range	-40°~105°

Device selection

FS312BL supports PD and QC, with a maximum setting of 20V.

FS312BH supports PD and QC, with a maximum setting of 48V.

FS312BLE/FS312BHE, supports simulating emarkers.

The PD protocol has higher priority than the QC protocol.

Pin definition and instructions

VDD

VDD supplies power to the chip, supporting a minimum of 3V and a maximum of 5.1V.
It can be directly connected to the VBUS of the USB port using a 3.3K resistor, and an external LDO is required when using FS312BH/FS312BHE.

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FUNC

The functions of FS312BL and FUNC pins are shown in the table below.

Table 4. FUNC pin functions

FUNC external resisto	Set application voltage
Hang in the air	5V
200K	9V
120K	12V
51K	15V
Grounding	20V

The functions of FS312BH and FUNC pins are shown in the table below.

Table 5. FUNC pin functions

FUNC external resisto	Set application voltage
Hang in the air	5V
200K	20V
120K	28V
51K	36V
Grounding	48V

The chip supports automatic searching for the closest PD voltage. For example, using FS312BH, if it is set to 48V and the charger only supports 9V, FS312BH will automatically lure it to 9V.

DP and DM

DP and DM are connected to the Type-C interface.

CC1 and CC2

CC1 and CC2 are connected to the Type-C interface.
If connected to the Type-C mother socket, both CC1 and CC2 need to be connected to the Type-C interface.
If connecting to the Type-C male connector, simply select one CC to connect to the Type-C interface, with the other CC pin suspended.
If FS312BL/H-E with emarker function is selected, then either CC is connected to the Type-C interface, and the other CC is connected to 1K to ground.
For specific connections, please refer to the application examples..

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Application example

The typical application of FS312B is shown in the following figure, where the chip is powered by the output of the power system.

If connected to Type-C mother socket, the connection method is as follows: CC1 or CC2 of the chip can be connected to any CC1 or CC2 of the mother socket.

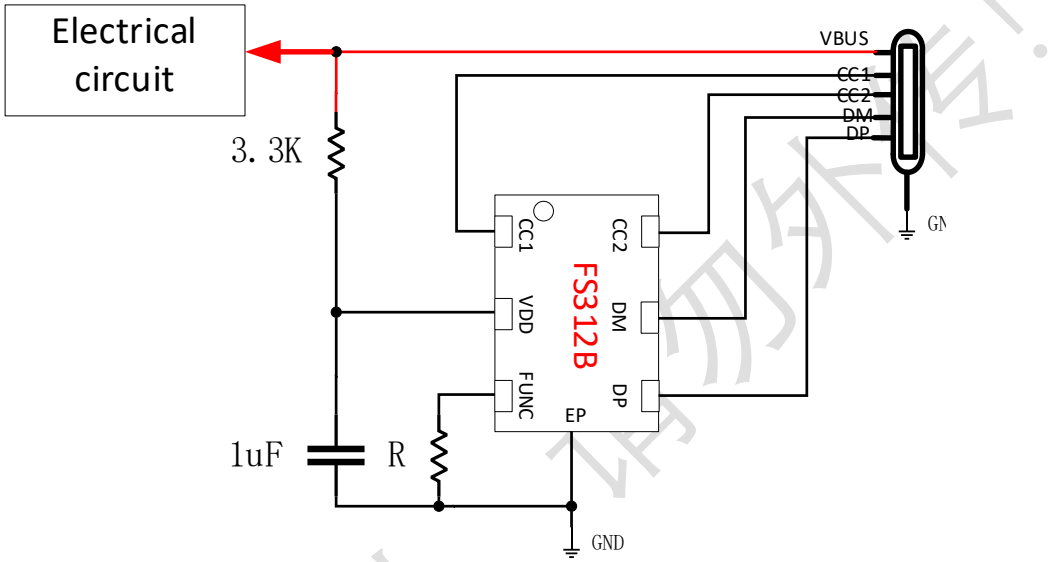


Figure 2. Application diagram

If connecting Type-C male, the connection method is as follows: select any CC1 or CC2 and connect it to CC1 or CC2 within the male. Another CC is suspended.

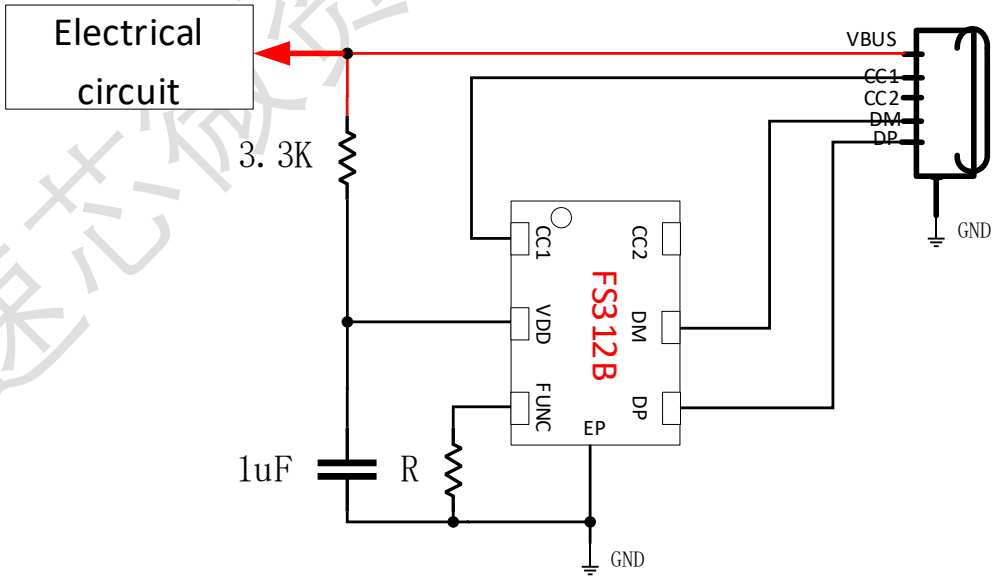


Figure 3. Application diagram

If the Type-C male connector is connected and the emaker function needs to be simulated, the connection method is as follows: select any CC1 or CC2 and connect it to CC1 or CC2 within the male connector. The other CC is connected to a 1K resistor to ground. Note that FS312BE needs to be selected at this time.

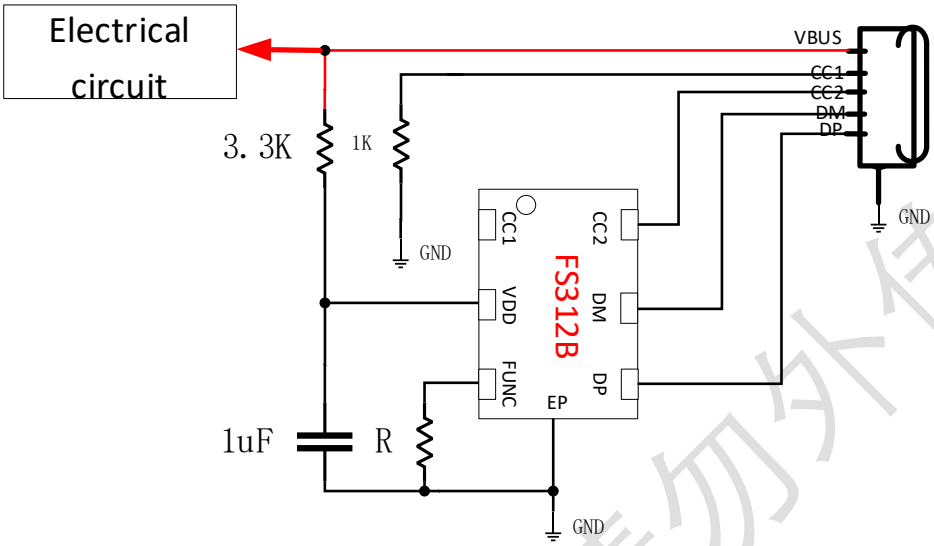


Figure 4. Application diagram

Note: If FS312BH/FS312BHE is required, VDD needs to be powered by LDO (FS7533 is recommended), taking FS312BHE as an example.

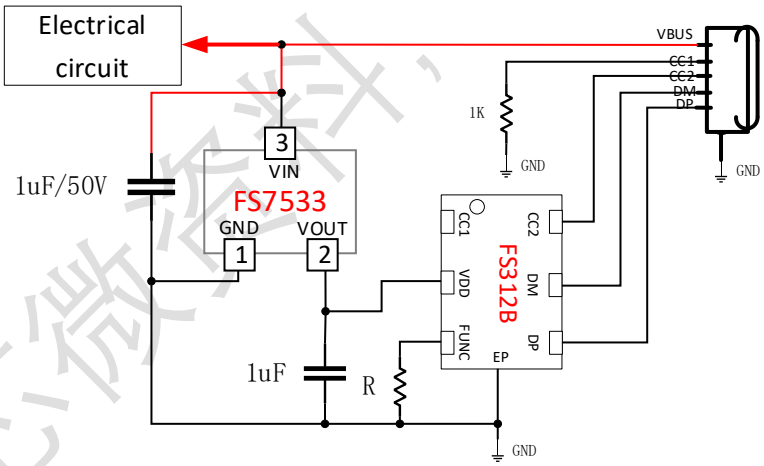
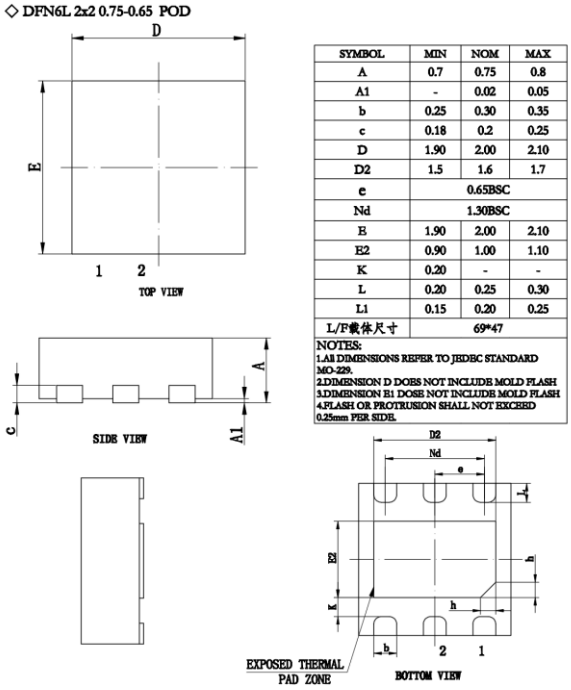


Figure 5. Application diagram

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Package outline drawing

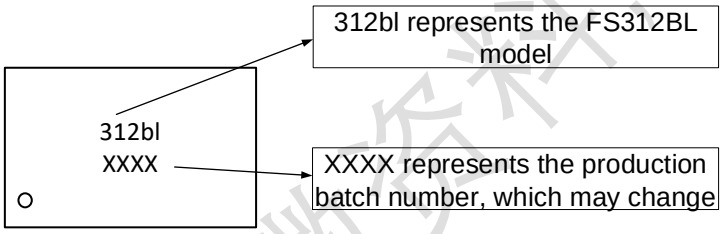
DFN2X2-6L



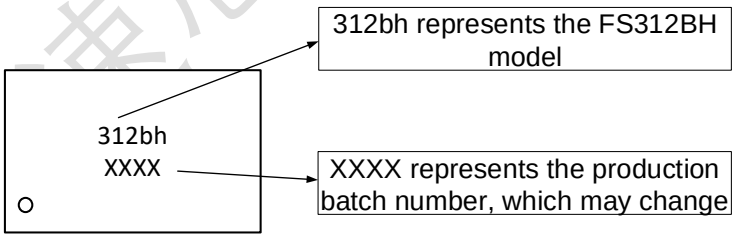
SYMBOL	MIN	NOM	MAX
A	0.7	0.75	0.8
A1	-	0.02	0.05
b	0.25	0.30	0.35
c	0.18	0.2	0.25
D	1.90	2.00	2.10
D2	1.5	1.6	1.7
e	0.65BSC		
Nd	1.30BSC		
E	1.90	2.00	2.10
E2	0.90	1.00	1.10
K	0.20	-	-
L	0.20	0.25	0.30
L1	0.15	0.20	0.25
L/F载体尺寸	69*47		

NOTES:
1.All DIMENSIONS REFER TO JEDEC STANDARD MO-229.
2.DIMENSION D DOES NOT INCLUDE MOLD FLASH
3.DIMENSION E1 DOSE NOT INCLUDE MOLD FLASH
4.FLASH OR PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.

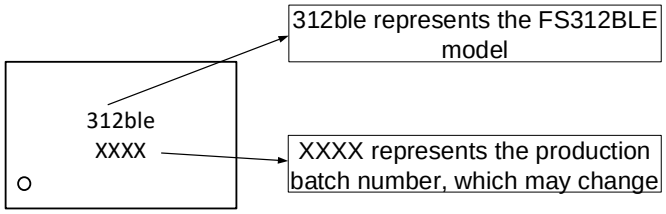
Screen printing instructions：



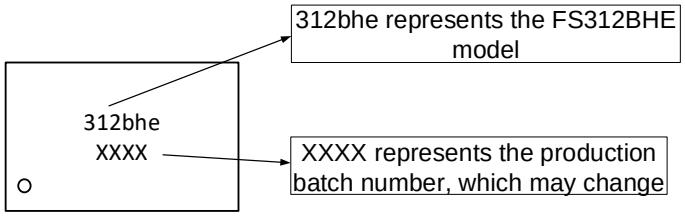
1. FS312BL model information: 312bl, fixed and unchanged
2. The production batch number code is used to distinguish the batch number information each time, based on changes in the production batch



1. FS312BH model information: 312bh, fixed and unchanged
2. The production batch number code is used to distinguish the batch number information each time, based on changes in the production batch



1. FS312BLE model information: 312ble, fixed and unchanged
2. The production batch number code is used to distinguish the batch number information each time, based on changes in the production batch



1. FS312BHE model information: 312bhe, fixed and unchanged
2. The production batch number code is used to distinguish the batch number information each time, based on changes in the production batch

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Company information and statement

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