USB Type-C PD3.0 Fast charging protocol intelligent management chip

Product Features

- Be compatible with various USB Type-C protocols, including Type-C protocol, Type-C PD2.0, Type-C PD3.0
- No need for external MOSFETs, no need for complex peripherals, minimal application, and extremely low BOM cost
- Support customized customer Typec PD PDO
- Minimal packaging method
- Package：SOT23-6

Product Overview

FS212C belongs to FASTSOC FSFC series，the chip selectively compatible with the mainstream charging protocols. The chip can intelligently identify the type of phone inserted and use PD protocol or TYPEC protocol to quickly charge the phone.

FS212C provides FUNC pins that can be selected for PDO.

FS212C supports customized Typec PD PDO，for example:FS212C-15W5V, etc.

FS212C only requires external power supply resistors and capacitors, and does not require other peripherals. The application solution is extremely simple, and the BOM cost is extremely low.

Application field

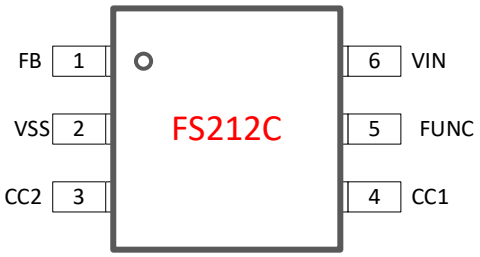
- Charger
- USB panel
- USB HUB
- Car charger
- Portable power source
- Other USB Type-C power output devices

Order information

Part No	Package	Pcs/Reel
FS212C	SOT23-6	3000

V0.4(202506)

Chip packaging and pin definition



SOT23-6

Pic 1. Pin definition

Table 1. FS212C Pin function description

SOT23-6	Name of the pin	Description
1	FB	External compensation network
2	VSS	Chip ground, connected to the system ground
3	CC2	Connect the USB Type-C CC2 pin
4	CC1	Connect the USB Type-C CC1 pin
5	FUNC	Set PDO
6	VIN	Chip power supply (see application diagram for connection details)

Extreme operating range

Table 2. Maximum working range

Parameter	value
CC1, CC2	-0.3V~6V
FB, VIN	-0.3V~6V
ESD（HBM）	±4KV

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
VIN	3V~5.6V
CC1，CC2，FB	0V~3.3V
Operating temperature range	-40°~105°
Working current	<1mA

Pin definition and instructions

VIN

VIN supplies power to the chip and requires an external 750 Ω resistor to be pulled up to VBUS.
External 0.47uF capacitor.

CC1 and CC2

CC1 and CC2 Connect to CC1 and CC2 in the Type-C port. The CC pin is responsible for PD communication, and the quality of communication signals depends on factors such as wire resistance, board resistance, and the actual charging current of the phone. If it exceeds the protocol specifications (refer to the PD protocol specifications for details), it may cause PD communication failure. Suggest choosing wires with lower internal resistance and conducting thorough testing.

FUNC

FUNC pin external resistance, different PDO and system characteristics can be selected, as shown in the table below. It is recommended to use a 100K Ω resistor with 1% accuracy.

Table 4. FUNC Pin function

Example of FUNC value	PDO
No Connection	20W, 5V3A 9V2.22A 12V1.67A
51K	18W, 5V3A 9V2A
100K	15W, 5V2.4A 9V1.67A 12V1.25A
200K	20W, 5V3A 9V2.22A
Ground	18W，5V3A 9V2A 12V1.5A

FB

FB is connected to the power system to control the VBUS voltage of USB. After negotiating the protocol and required voltage between the terminal device and FS212C through CC, FS212C initiates voltage regulation through FB.

The FB is connected with an external resistor R1 to VBUS and an external resistor R2 to ground. The usual

calculation formula is as follows,

$$R_2=\frac{R_1 V_{FB}}{V_{VBUS}-V_{FB}}$$

For instance,

V_{VBUS} take 5V

V_{FB} can be found in the manual of the power IC, for example, take 0.8V

The typical value of R_1 is 100 KΩ. The precision must meet system requirements, for example, 1%

So we can figure out R2.

Application example

The typical application of FS212C is shown in the right figure, where the chip is powered by the output of the power supply.

FB external power supply system.

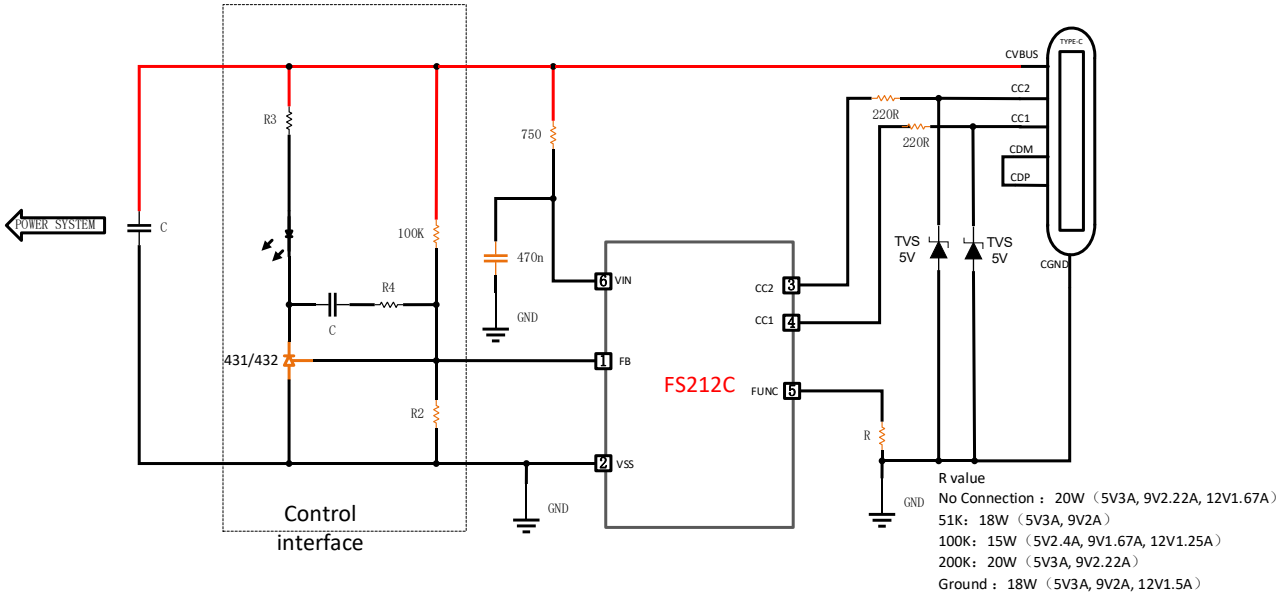
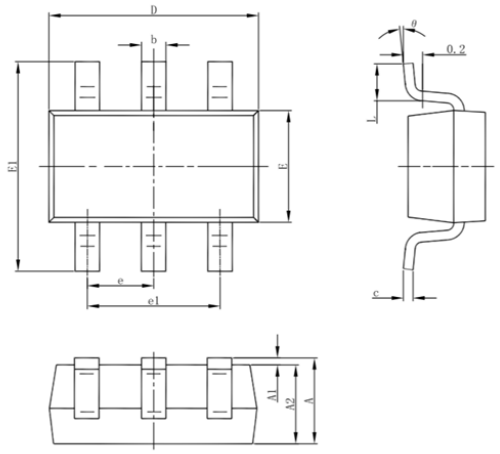


Figure 2. Application diagram of FS212C

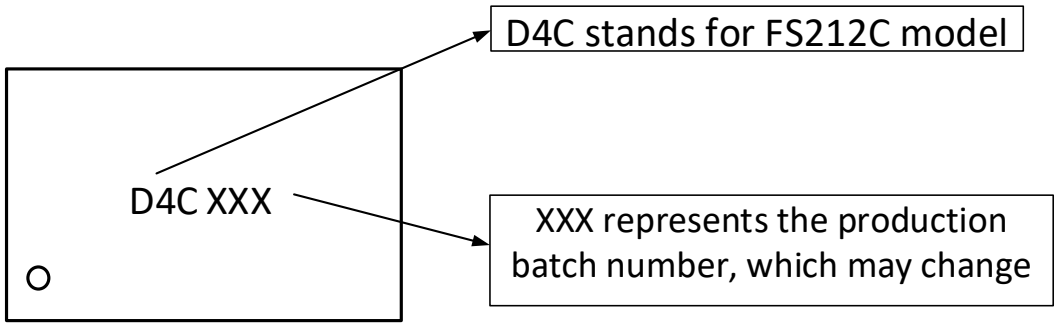
Package outline drawing

SOT23-6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Chip silk screen information



1. FS212C model information: D4C, 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

Company information and statement

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