# USB Type-C PD3.2 Fast charging protocol intelligent management chip

## Product Features

- Compatible with multiple types of USB Type-C protocols, including TypeC protocol, TypeC PD2.0, TypeC PD3.0, TypeC PD3.2, and other protocols.
- The maximum current of the adapted system is optional
- VBUS voltage regulation range 3.3V~21V
- VIN withstand voltage up to 36V, CC withstand voltage up to 30V
- Support Discharge
- Internal integration of LDO
- Integrated OPTO output, Connected to the optocoupler through a resistor
- Support common Typec PD PDO pin settings
- Package：SOT23-6

## Product Overview

FS213A belongs to the Fast Chip Micro FSFC series, and the chip is selectively compatible with mainstream charging protocols. The chip can intelligently identify the type of phone inserted and select the most suitable protocol to meet the fast charging needs of the phone.

The voltage regulation range of FS213A is from a minimum of 3.3V to a maximum of 21V, suitable for output voltages of various fast charging protocols.

The voltage resistance of VIN is as high as 36V, greatly improving reliability.

CC withstand voltage up to 30V.

Internally integrated with LDO, low loss during high-voltage output, chip power supply can be directly connected to the power supply.

FS213A comes with a built-in discharge.

FS213A is packaged in SOT23-6.



## Application field

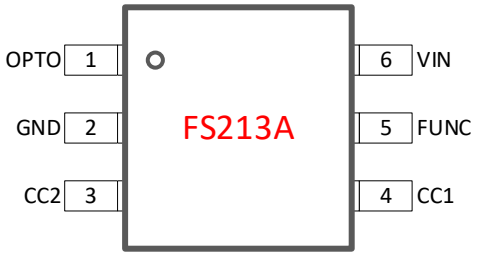
- Travel Charge
- USB panel
- USB socket
- Other USB Type-C power output devices

## Order information

| Part No | Package | Pcs/Reel |
|---|---|---|
| FS213AL | SOT23-6 | 3000 |
| FS213AH | SOT23-6 | 3000 |

**V1.7(202511)**

## Chip packaging and pin definition




SOT23-6

Pic 1. Pin definition

Table 1. FS213A Pin function description

| FS213A | Name of the pin | Description |
|---|---|---|
| 1 | OPTO | OPTO feedback, Connected to the optocoupler through a resistor |
| 2 | GND | 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 | This foot can be suspended in the air. At the same time, external resistors can be connected to set PDO |
| 6 | VIN | Chip power supply, connected to the output of the power system |

## Extreme operating range

Table 2. Maximum operating range

| Parameter | Value |
|---|---|
| FUNC | -0.3V~8V |
| CC1, CC2 | -0.3V~30V |
| VIN | -0.3V~36V |
| ESD（HBM） | ±2KV |

**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 | 3.3V~21V |
| FUNC, CC1,CC2 | 0V~3.3V |
| Operating temperature range | -40°~105° |
| Static power consumption,Iq | <1.2mA@5V |

## Device Configuration

The FSFC series chips have a wide range of configuration options, including several major categories: protocol types, declared power and voltage capabilities. Please introduce them separately below.

**Declared power and voltage**

Chips offer a variety of power and voltage options for customers to choose from. Users can set different power and PDO according to the support list through FUNC.

The FSFC series provides dedicated FUNC pins, which allow users to set partial PDOs by connecting an external resistor to ground, enhancing the flexibility of chip applications.

FS213AL and FS213AH, the difference is described in the FUNC pin introduction.

## Pin definition and instructions

### VIN

VIN can withstand voltage up to 36V and can be directly connected to a power source.
VIN requires an external capacitor to ensure strong and stable power supply. A 1uF capacitor is recommended.

### CC1 and CC2

CC1/2 is connected to CC1/CC2 in the Type-C port, and the CC withstand voltage is as high as 30V, providing reliability. 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 external resistors can choose different PDO and system characteristics, as shown in the table below. It is recommended to use 1% accuracy resistors. Note: For analog MOS functionality, when using a DC-DC power supply, ensure that the selected DC-DC converter supports a minimum output voltage ≤2.5V (it is recommended to leave a 10% margin). If using AC-DC power supply, it is recommended to use a dual winding transformer design.

**FS213AL**

Table 4. FUNC pin functions.

| Example of FUNC value | PDO |
|---|---|
| 18K | 20W,5V/3A,9V/1.8A,12V/1.67A,5-9V/1.6A |
| 39K | 18W,5V/3A,9V/2A,12V/1.5A,3.3-5.9V/3A,3.3-11V/2A |
| 75K | 20W,5V/3A,9V/2.22A |
| 150K | 20W,5V/3A,9V/2.22A,12V/1.67A,3.3-5.9V/3A,3.3-11V/2A |
| 300K<br>(Can simulate external MOS) | 20W,5V/3A,9V/2.22A,12V/1.67A,3.3-5.9V/3A,3.3-11V/2.75A |
| 620K | 30W,5V/3A,9V/3A,12V/2.5A |
| 910K | 25W,5V/3A,9V/2.77A,3.3~5.9V/3A,3.3~11V/2.75A |
| Suspended | 20W,5V/3A,9V/2.22A,12V/1.67A,3.3~5.9V/3A,3.3~11V/1.8A |

**FS213AH**

Table 5. FUNC pin functions

| **Example of FUNC value** | **PDO** |
|---|---|
| 18K | 15W,5V/2.4A,9V/1.67A,3.3~5.9V/2.4A,3.3~11V/4.5A |
| 39K | 18W,5V/3A,9V/2A,12V/1.5A,3.3~5.9V/3A,3.3~11V/4.5A |
| 75K<br>(Can simulate external MOS) | 20W,5V/3A,9V/2.22A,12V1.67A,3.3~5.9V/3A,3.3~11V/4.5A |
| 150K | 25W,5V/3A,9V/2.77A,3.3~5.9V/3A,3.3~11V/4.5A |
| 300K | 30W,5V/3A,9V/3A,12V/2.5A,3.3~5.9V/3A,3.3~11V/4.5A |
| 620K<br>(Reduce power in one minute) | 25W,5V/3A,9V/2.77A,12V/2.08A,3.3~5.9V/3A,3.3~11V/2.75A<br>One minute later:20W,5V/3A,9V/2.22A,12V/1.67A,3.3-5.9V/3A, |

| | |
|---|---|
| | 3.3-11V2A |
| **910K**<br>(Reduce power in one minute) | 20W，5V/3A，9V/2.22A，12V/1.67A<br>One minute later:15W,5V/2.4A,9V/1.67A,12V/1.25A |
| Suspended | 45W,5V/3A,9V/3A,15V/3A,20V/2.25A,3.3~11V/5A,3.3~16V/3A,<br>3.3-21V/2.25A |

## OPTO

Connected to the optocoupler through a 100Ω resistor..

## Application example

The typical application of FS213A is shown in the following figure.
Connect to the optocoupler.

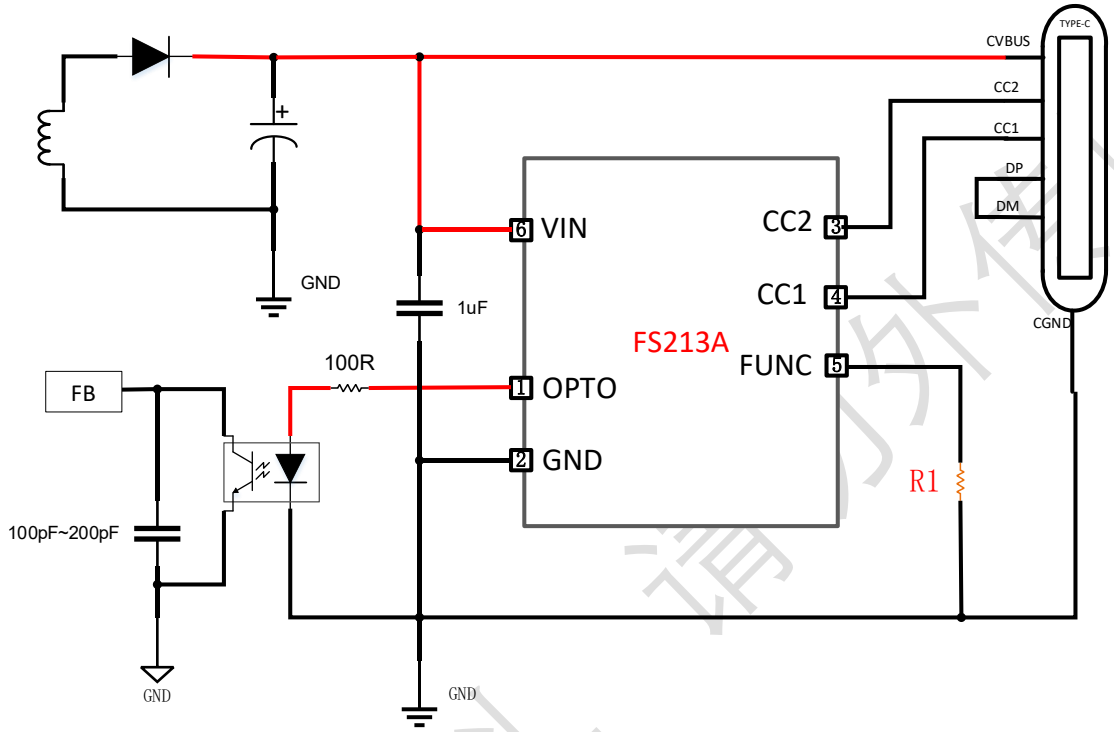



Figure 2. Application diagram

The application chart for simulating MOS is as follows.

Note: This application chart is only needed when using provincial MOS mode.

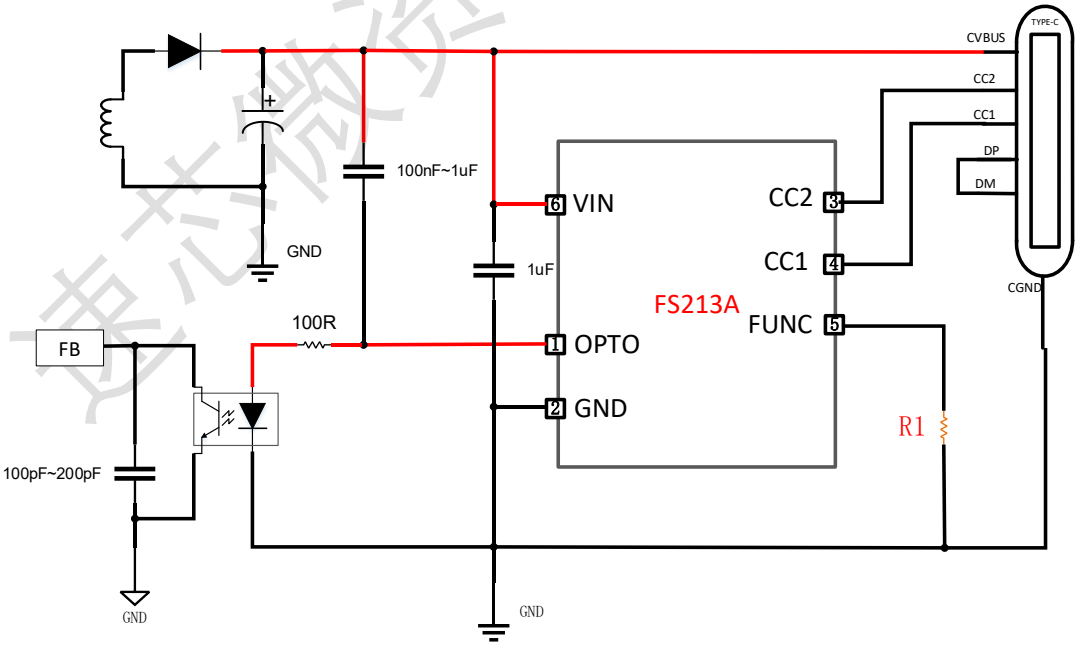
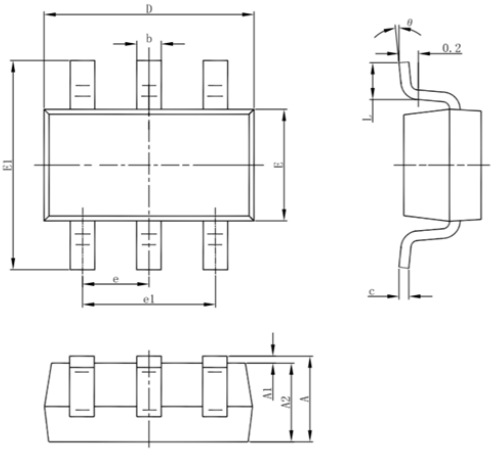



Figure 3. FS213A simulation MOS application diagram

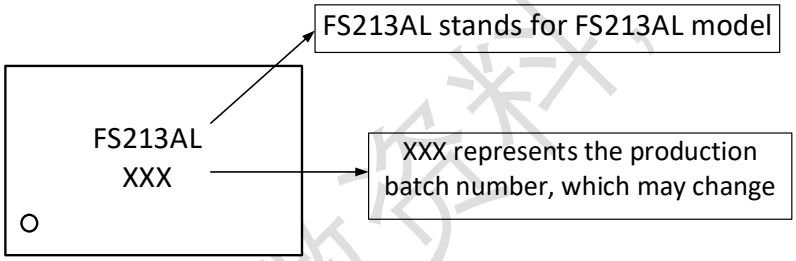
## Package outline drawing

### SOT23-6

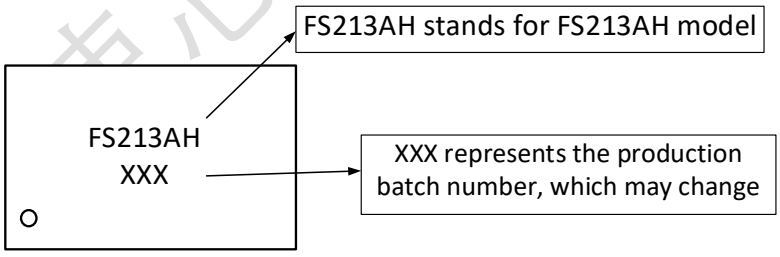


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| 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. FS213AL model information: FS213AL, 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. FS213AH model information: FS213AH, 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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