

## USB Type-A fast charging protocol intelligent management chip

### Product Features

- Compatible with common USB Type-A fast charging protocols, BC1.2 , Apple 2.4A, QC2.0/QC3.0, FCP, SCP, HISC, Low voltage direct charging, etc.
- Support dynamic shutdown of fast charging output
- VIN withstand voltage 40V, D ± withstand voltage 22V
- Internal integration of LDO
- Package: SOT23-6

### Product Overview

The FS112JA (abbreviated as FSFA series) chip is selectively compatible with mainstream charging protocols. The chip can intelligently recognize the type of phone inserted and select the most suitable protocol to meet the needs of the phone.

The D ± of the USB Type-A port is connected to the FSFA chip. After the phone is inserted into the USB Type-A port, according to the agreements of various protocols, the phone and FSFA will start to recognize each other. Once the recognition is successful, FSFA can respond to the phone's request.

The VIN withstand voltage of FS112JA is as high as 40V, and the D ± withstand voltage is as high as 22V, which improves the reliability of the system.

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

FS112JA uses SOT23-6 packaging.

### Application field

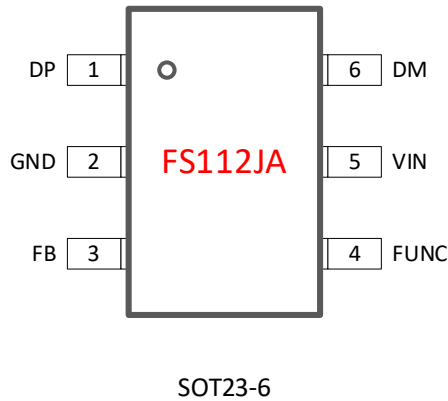
- Travel Charge
- Wall filling
- Socket
- Other USB Type-A power output devices

### Order information

| Part No | Package | Pcs/Reel |
|---------|---------|----------|
| FS112JA | SOT23-6 | 3000     |

V1.0(202412)

## Chip packaging and pin definition



Pic 1. Pin definition

Table 1. FS112JA Pin function description

| FS112JA | Name of the pin | Description   |
|---------|-----------------|---|
| 1       | DP              | USB DP, DP connected to USB Type-A port   |
| 2       | GND             | Chip ground, connected to system ground   |
| 3       | FB              | FB feedback, connected to the R terminal of 432/431 or the VFB of DC-DC                       |
| 4       | FUNC            | GND: Shielded fast charging<br>68K: Maximum 10.2V<br>180K: Maximum 13.2V<br>NC: Maximum 12.2V |
| 5       | VIN             | Chip power supply   |
| 6       | DM              | USB DP, DM connected to USB Type-A port   |



## Extreme operating range

Table 2. Maximum operating range

| Parameter | Value     |
|-----------|-----------|
| VIN       | -0.3V~40V |
| D±        | -0.3V~22V |
| FUNC      | -0.3V~6V  |
| 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                       | 2.9V~12V  |
| D±                        | 0V~3.3V   |
| FUNC                      | 0V~3.3V   |
| Working temperature range | -40°~105° |
| Working current           | <2mA      |

## Device Configuration

The protocols compatible with FS112JA are shown in the table below.

Table 4. Compatibility Protocol

|         | Agreement                                  |
|---------|--|
| FS112JA | BC1.2 APPLE2.4A、QC2.0/QC3.0/QC3.0+、AFC、FCP |



## Pin definition and instructions

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### VIN

VIN has a withstand voltage of up to 40V and can be directly connected to the power system. At the same time, VIN has an external capacitor connected to ground. The capacitance size is 1uF.

### DP and DM

DP/M is connected to the USB Type-A port, and both pins can withstand a voltage of 22V.

### FUNC

NC : Maximum 12.2V

68K: Maximum 10.2V

180K: Maximum 13.2V

Grounding: Shielded fast charging

### FB

Connect to the R terminal of 431 or the VFB of DC-DC, as shown in the application diagram below.

Calculation formula:  $V_{FB} = 2.5V * R2 / (R1 + R2)$

At the same time, customers can adjust R1/R2 to adjust the no-load voltage.

## Application example

The typical application of FS112JA is shown in the following figure, where the chip power supply is directly connected to the output of the power supply.

FB is connected to the R terminal of 431/432 or the VFB of DC-DC.

### Travel Charge Application

FS112JA is applied to 431, and VIN power supply can be connected with resistors according to the actual situation.

The front-end can be paired with a non constant power controller, with FB connected to the R end of 431. The application diagram is shown below

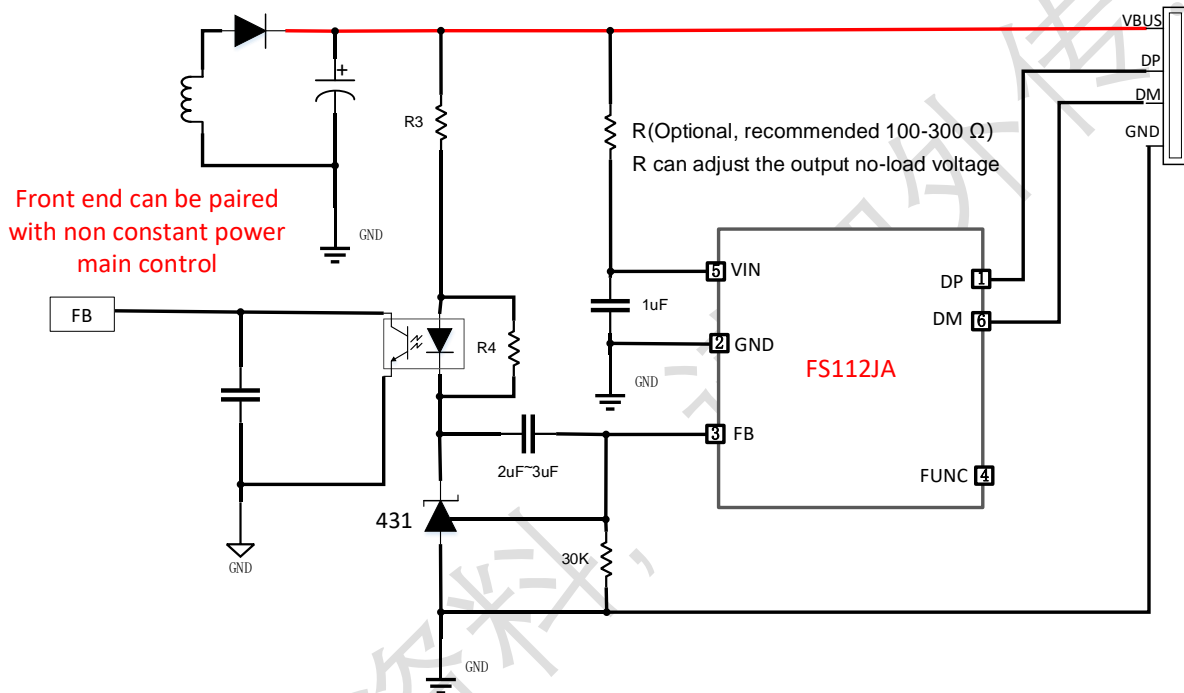


Figure 2. FS112JA travel charger application diagram



**Car charging application**

If the VFB of DC-DC is 2V, then R1=3K, R2=12K

If the VFB of DC-DC is 1.25V, then R1 is 15K, R2=15K

If the VFB of DC-DC is 1.2V, then R1 is 15K, R2=14K

If the VFB of DC-DC is 1V, then R1 is 15K, R2=10K

If the VFB of DC-DC is 0.8V, then R1=16K, R2=7.5K

If the VFB of DC-DC is 0.6V, then R1=31.6K, R2=10K

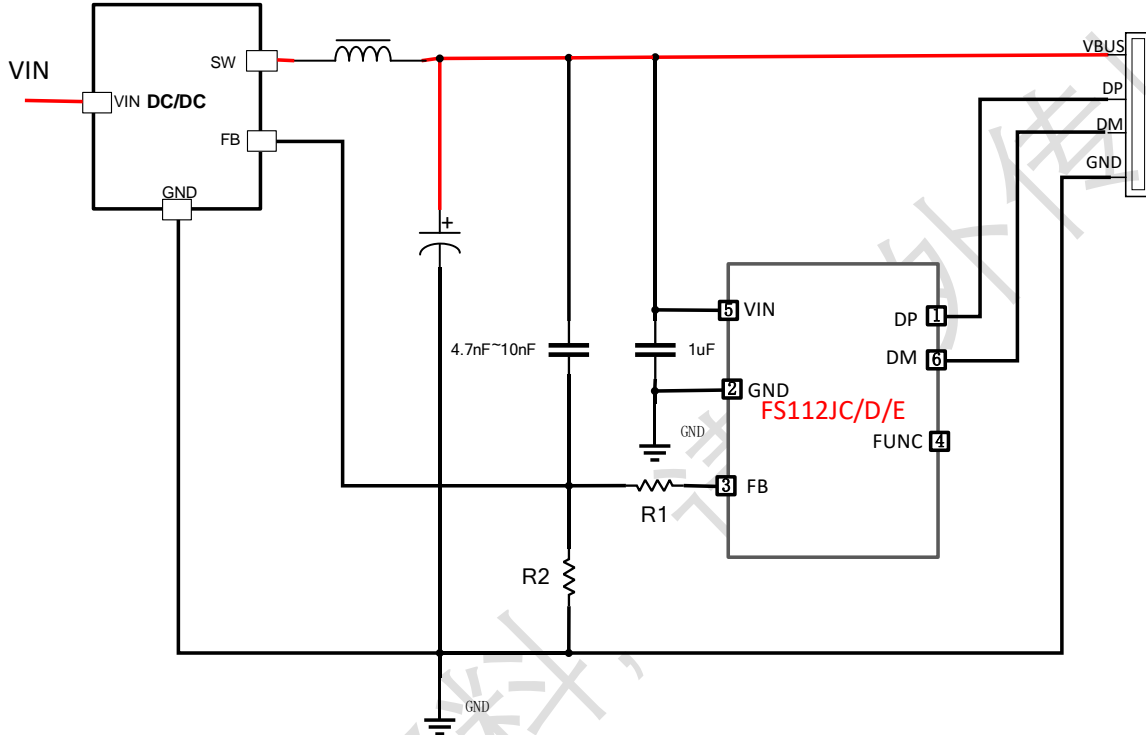
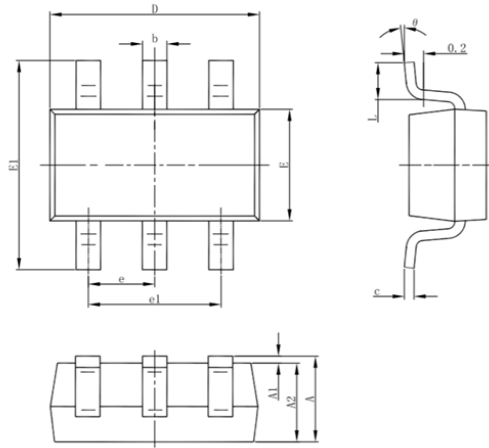


Figure 3. Application diagram of car charger



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



## Company information and statement

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