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, HISCP, 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 FS112J (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 FS112J 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.

FS112J uses SOT23-6 packaging.

Application field

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

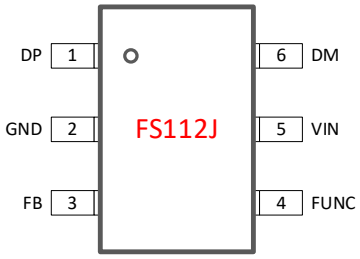
Order information

Part No	Package	Pcs/Reel
FS112JC	SOT23-6	3000
FS112JD	SOT23-6	3000
FS112JE	SOT23-6	3000

Note: Please refer to the "Device Selection" section for details

V1.1(202412)

Chip packaging and pin definition



SOT23-6

Pic 1. Pin definition

Table 1. FS112J Pin function description

FS112J	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 68K: Maximum 10.2V 180K: Maximum 13.2V 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 identification method of FS112J series is: FS112J-X.

X represents compatible protocols, commonly defined in the table below.

Table 4. Named X Values

X value	Agreement
C	BC1.2 APPLE2.4A、QC2.0/QC3.0/QC3.0+、AFC、FCP、HW、VOOC（5V），VIVO（some）
D	BC1.2 APPLE2.4A、QC2.0/QC3.0/QC3.0+、AFC、FCP、HW、SVOOC 120W、VIVO（some）
E	BC1.2 APPLE2.4A、QC2.0/QC3.0/QC3.0+、AFC、FCP、HW、SVOOC 120W、VIVO（some）、Itel 180W

Pin definition and instructions

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 431/432 or the VFB of DC-DC, as shown in the application diagram below.

Calculation formula: VFB=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 FS112J 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

FS112JC/D/E is applied to 432, and the front-end needs to be equipped with a constant power main control. FB is connected to the R end of 432, and the application diagram is shown below

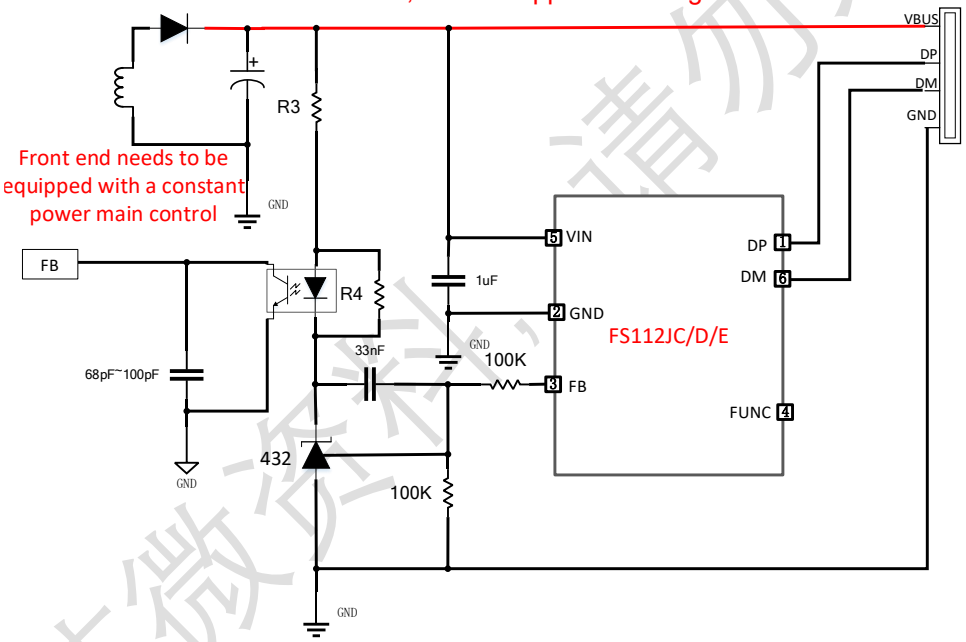


Figure 2. Application diagram of FS112JC/D/E travel charger

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

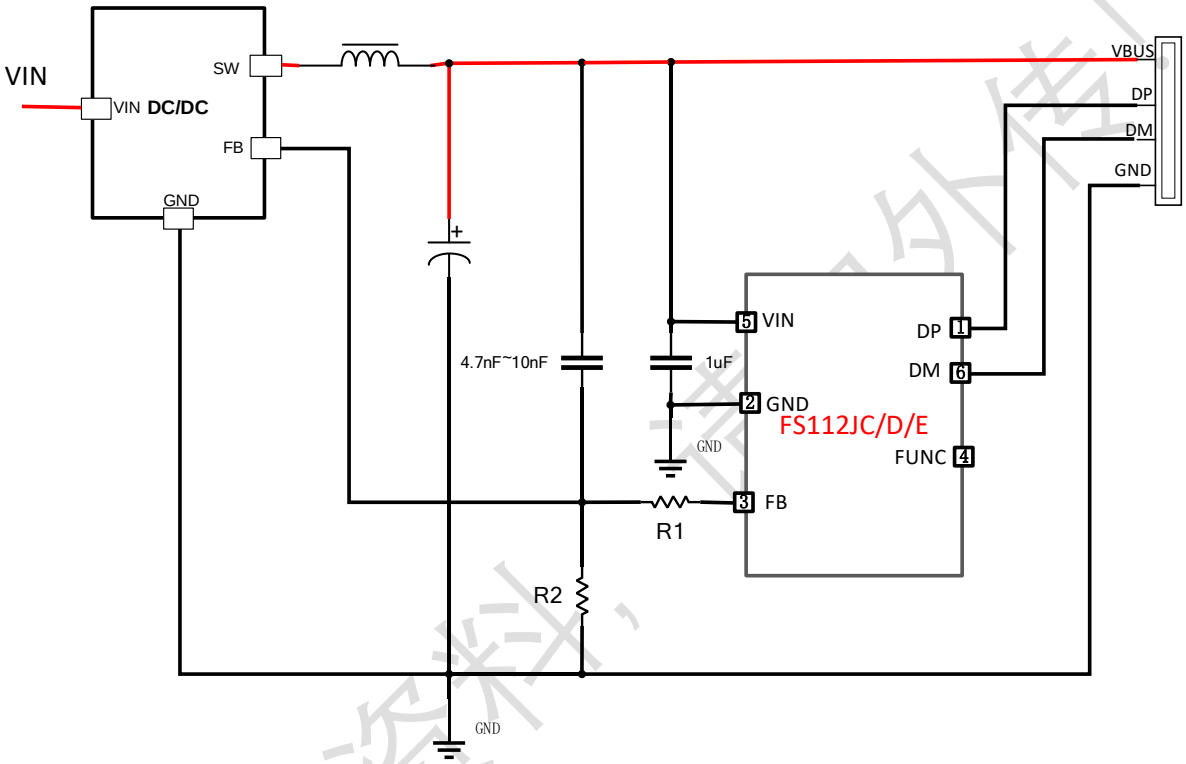
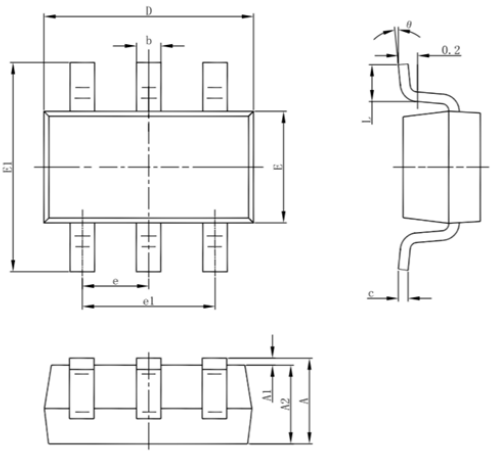


Figure 3. Application diagram of car charger

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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