

## 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 30V, D ± withstand voltage 23V
- Internal integration of LDO
- Integrated OPTO output, connected to optocoupler through resistor
- Package: SOT23-6

### Product Overview

The FS118M (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 FS118M is as high as 30V, and the D ± withstand voltage is as high as 23V, 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.

FS118M uses SOT23-6 packaging.

### Application field

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

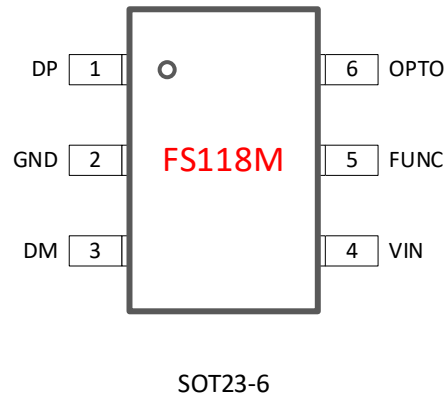
### Order information

Part No	Package	Pcs/Reel
FS118M	SOT23-6	3000
FS118ME	SOT23-6	3000
FS118MD	SOT23-6	3000
FS118MC	SOT23-6	3000

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

V1.2(202412)

## Chip packaging and pin definition



Pic 1. Pin definition

Table 1. FS118M Pin function description

FS118M	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	DM	USB DP, DM connected to USB Type-A port
4	VIN	Chip power supply Enable fast charging Suspended: maximum 13.5V
5	FUNC	180K: Maximum 21V 68K: Maximum 10.5V Grounding: Shielded fast charging
6	OPTO	OPTO feedback control, connected to the optocoupler through a resistor of 1K or less

## Extreme operating range

Table 2. Maximum operating range

Parameter	Value
VIN	-0.3V~30V
D±	-0.3V~23V
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~21V
D±	0V~3.3V
FUNC	0V~3.3V
Working temperature range	-40°~105°
Working current	<2mA

## Device Configuration

The identification method for the FS118M series is FS118X.

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

Table 4. Named X Values

X value	Agreement
M	BC1.2,APPLE2.4A,QC2.0/QC3.0 CLASSB,AFC,FCP,SCP,HISCP,HW,High voltage direct charging, others, etc
ME	BC1.2,APPLE2.4A,QC2.0/QC3.0 CLASSB,AFC,FCP,SCP,HISCP,High voltage direct charging, others, etc
MD	BC1.2,APPLE2.4A,QC2.0/QC3.0 CLASSB,AFC,FCP,SCP,HISCP,High voltage direct charging
MC	BC1.2,APPLE2.4A,QC2.0/QC3.0 CLASSB,AFC,FCP,SCP,HISCP, Low voltage direct charging

## Pin definition and instructions

### VIN

The voltage resistance of VIN can reach up to 30V and can be directly connected to the power system. At the same time, the VIN is externally connected to the ground with a capacitor. 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 23V.



## FUNC

Suspended: maximum 13.5V  
180K: Maximum 21V  
68K: Maximum 10.5V  
Grounding: Shielded fast charging

## OPTO

The resistance is selected according to the power system, such as 1K  $\Omega$ .  
Connect a resistor of 1K or less in series to the optocoupler.

## Application example

The typical application of FS118M is shown in the figure on the right.  
**Connect a resistor of 1K or less in the OPTO string to the optocoupler.**

### Application Structure 1:

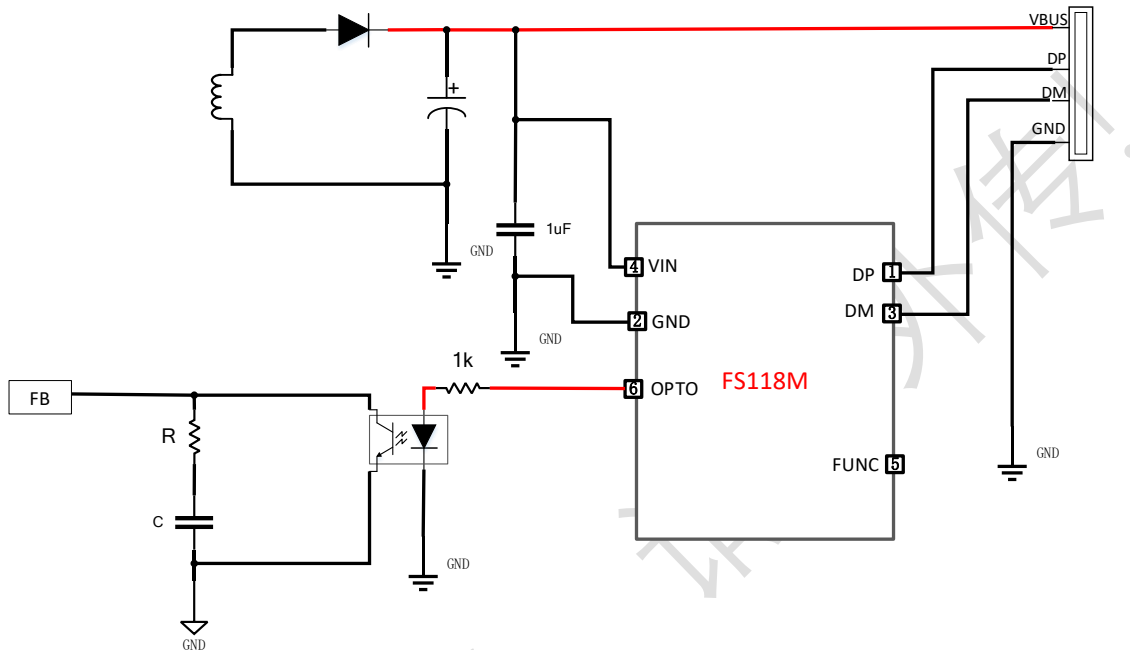


Figure 2. Application diagram

Scene compensation combination, users can try it out. The detailed master control type in the table can be obtained by following the Speedcore micro official account.

Main control type code (Follow the quick core micro official account for details)	Output capacitor	R	C
A/F	Solid CAP 470uF	1K	33nF
G	Solid CAP 470uF	1K	47nF
D	Solid CAP 470uF	0	4.7nF
E	Solid CAP 470uF	0	47nF
H	Solid CAP 470uF	0	10nF
B	Solid CAP 470uFx2	0	68nF
G	Solid CAP 470uFx2	750	100nF
A	E-Cap 680uF	1K	33nF
D	E-Cap 680uF	0	4.7nF
G	E-Cap 680uF	1K	47nF
H	E-Cap 680uF	0	10nF
B	E-Cap 1000uF	0	10nF
C	E-Cap 1000uF	NC	NC
E	E-Cap 1000uF	0	47nF
F	E-Cap 1000uF	0	100nF

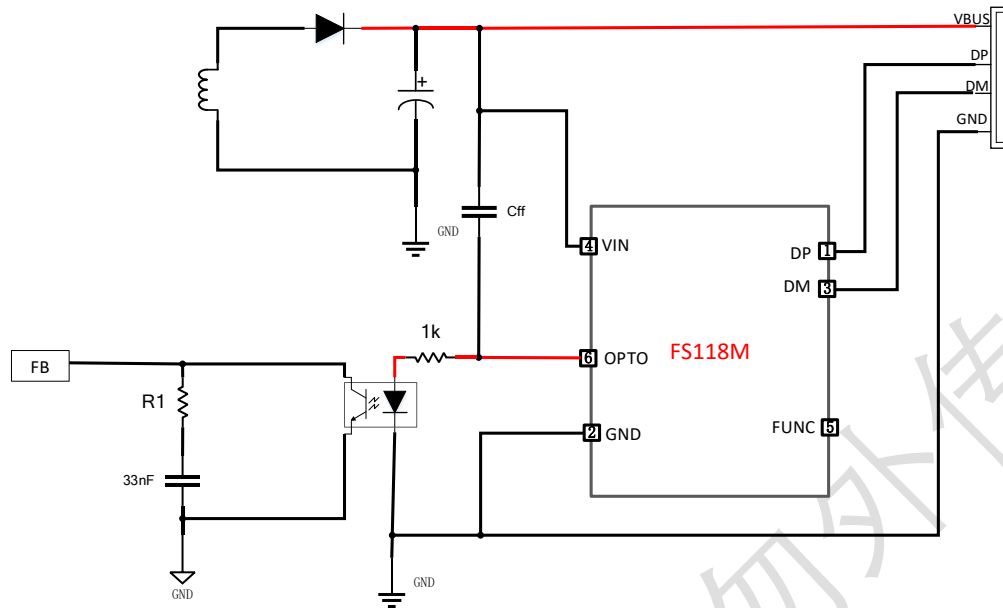
**Application Structure 2:**


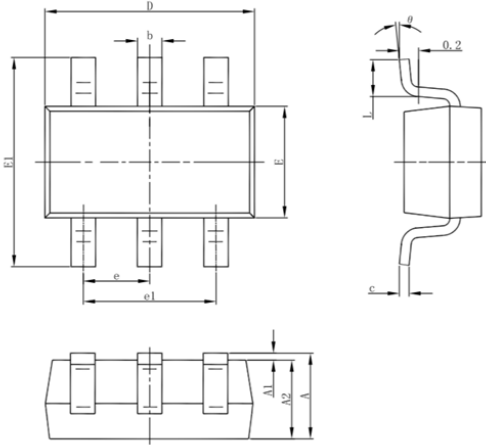
Figure 3. Application diagram

Scene compensation combination, users can try it out. The detailed master control type in the table can be obtained by following the Speedcore micro official account.

Main control type code (Follow the quick core micro official account for details)	Output capacitor	Cff	R	C
A	Solid CAP 470uF	10uF	NC	NC
B	Solid CAP 680uF	10uF	510	100nF
C	Solid CAP 470uF	10uF	1K	68nF
B	E-Cap 1000uF	10uF	750	100nF
C	E-Cap 680uF	10uF	1K	68nF

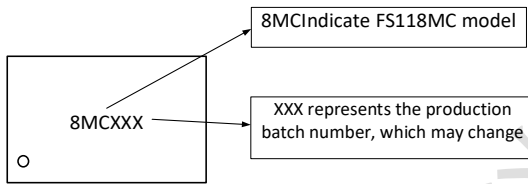
## Package outline drawing

### SOT23-6

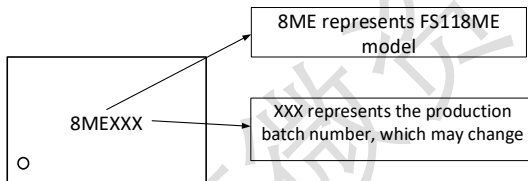


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)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

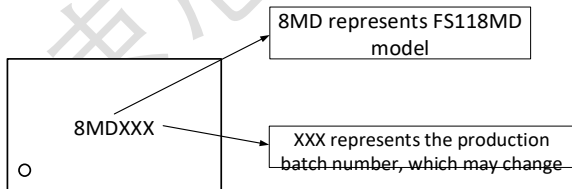
### Chip silk screen information



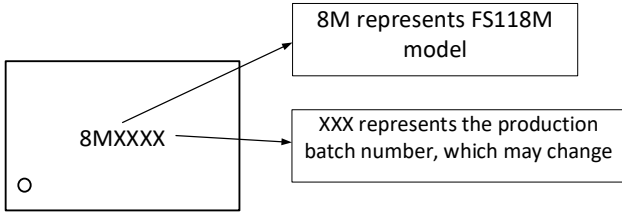
**FS118MC model information:** 8MC, fixed and unchanged; The production batch number code is used to distinguish the batch number information each time, based on changes in the production batch



**FS118ME model information:** 8ME, fixed and unchanged; The production batch number code is used to distinguish the batch number information each time, based on changes in the production batch



**FS118MD model information:** 8MD, fixed and unchanged; The production batch number code is used to distinguish the batch number information each time, based on changes in the production batch



FS118M model information: 8M, fixed and unchanged; 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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