

## USB Dedicated Charging Port Controller

Single Channel: IP2111 / Dual Channel: IP2112

### 1. Features

- IP2112 support dual channel USB ports charging control
- IP2111 support single channel USB port charging control
- Support Apple 2.0A: DP = 2.7V, DM = 2.0V
- Support Apple 1.0A(Reverse DP, DM): DP = 2.7V, DM = 2.0V
- Support Samsung 2.0A: DP = 1.2V, DM = 1.2V
- Support BC1.2: DP short to DM automatically
- Support auto-detect and auto-switching charging standards
- Very low power consumption  $I_Q = 66\mu\text{A}(\text{Typ.})$
- Working voltage: 3V~5.5V
- Package: SOT23-6

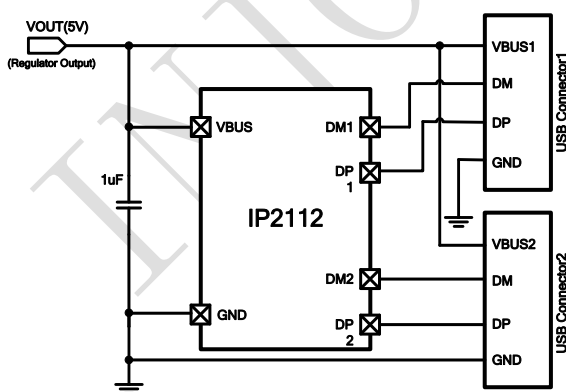
### 2. Description

IP2111/IP2112 is a low-cost dedicated charging Physical Layer IC dedicated for USB ports, which supports Apple 2.0A/1.0A, Samsung 2.0A and BC1.2. IP2112 support dual channel USB port charging control and IP2111 support single channel. An auto-detect feature monitors USB data line voltage, and automatically provides the correct electrical signatures on the data lines to charge compliant devices. SEL pin used to configure the maximum allotment current.

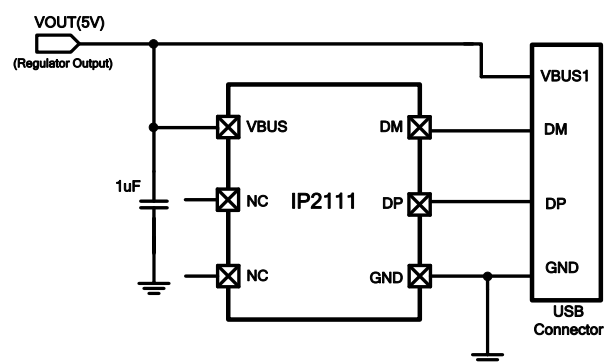
### 3. Application

- USB power output ports for AC adapters, Power Bank, Car chargers
- Battery chargers for smart phones, tablets, netbooks, digital cameras, and Bluetooth accessories

### 4. Typical Application Schematic

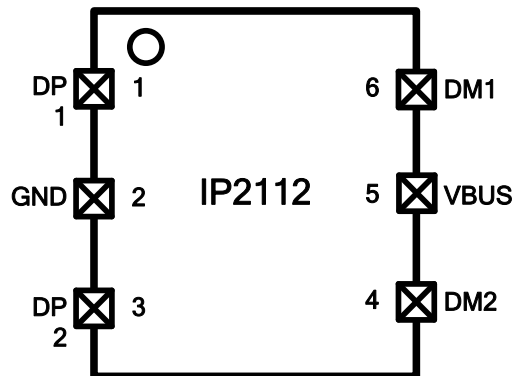


IP2112 Typical Application Circuit

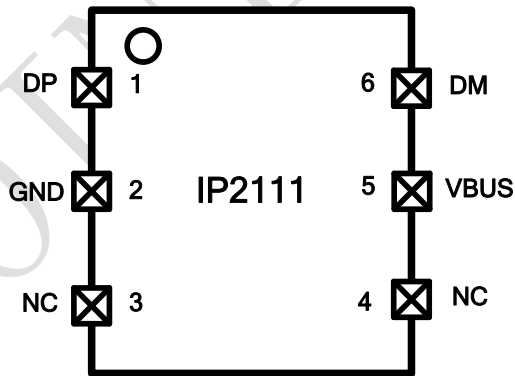


IP2111 Typical Application Circuit

## 5. PIN Description



引脚名	引脚编号	引脚描述
DP1	1	Connect to USB1 DP data line
GND	2	Ground
DP2	3	Connect to USB2 DP data line
DM2	4	Connect to USB2 DM data line
VBUS	5	Power supply input, connect with 1uF capacitor to GND
DM1	6	Connect to USB1 DM data line



引脚名	引脚编号	引脚描述
DP	1	Connect to USB DP data line
GND	2	Ground
NC	3	NC pin, floating
NC	4	NC pin, floating
VBUS	5	Power supply input, connect with 1uF capacitor to GND
DM	6	Connect to USB DM data line

## 6. IP Series Products List

### Power Bank IC

IC Part No.	Charge /Discharge		Features							Package	
	Charge	Dis-charge	LED Num	Lighting	Keys	I2C	DCP	Type-C	QC Certificate	Package	Compa tibility
IP5303	1.0A	1.2A	1,2	√	√	-	-	-	-	eSOP8	PIN2PIN
IP5305	1.0A	1.2A	1,2,3,4	√	√	-	-	-	-	eSOP8	
IP5306	2.4A	2.1A	1,2,3,4	√	√	-	-	-	-	eSOP8	
IP5206	2A (Max)	1.5A	3,4,5	√	√	-	-	-	-	eSOP16	PIN2PIN
IP5108E	2.0A	1.0A	3,4,5	√	√	-	-	-	-	eSOP16	
IP5108	2.0A	2.0A	3,4,5	√	√	√	-	-	-	eSOP16	
IP5207	1.2A	1.2A	3,4,5	√	√	-	-	-	-	QFN24	PIN2PIN
IP5207T	1.2A	1.2A	1,2,3,4	√	√	√	√	-	-	QFN24	
IP5109	2.1A	2.1A	3,4,5	√	√	√	-	-	-	QFN24	
IP5209	2.4A	2.1A	3,4,5	√	√	√	√	-	-	QFN24	
IP5219	2.4A	2.1A	1,2,3,4	√	√	√	√	√	-	QFN24	
IP5310	3.1A	3.0A	1,2,3,4	√	√	√	√	√	-	QFN32	
IP5312	15W	3.6A	2,3,4,5	√	√	√	√	-	-	QFN32	
IP5318Q	18W	4.0A	2,3,4,5	√	√	√	√	-	√	QFN40	PIN2 PIN
IP5318	18W	4.0A	2,3,4,5	√	√	√	√	√	√	QFN40	
IP5322	18W	4.0A	1,2,3,4	√	√	√	√	-	√	QFN32	
IP5328	18W	4.0A	1,2,3,4	√	√	√	√	√	√	QFN40	

### USB Charging Port Control IC

IC Part No.	Channel Num	Standards Supported											Package
		BC1.2 & APPLE	QC3.0 & QC2.0	FCP	SCP	AFC	SFCP	MTK PE+ 2.0&1.1	Type-C	NTC	QC Certificate	PD3.0	
IP2110	1	√	-	-	-	-	-	-	-	-	-	-	SOT23-5
IP2111	1	√	-	-	-	-	-	-	-	-	-	-	SOT23-6
IP2112	2	√	-	-	-	-	-	-	-	-	-	-	SOT23-6
IP2161	1	√	√	-	-	-	√	-	-	-	√	-	SOT23-6
IP2163	1	√	√	√	-	√	√	√	-	√	√	-	SOP8
IP2701	1	√	√	√	-	√	√	-	√	-	-	-	SOP8
IP2703	1	√	√	√	-	√	√	√	√	√	-	-	DFN10

IP2705	1	√	√	√	-	√	√	√	√	√	-	-	DFN12
IP2707	2	√	√	√	-	√	√	√	√	√	-	-	QFN16
IP2716	1	√	√	√	√	√	-	1.1	√	-	√	√	QFN32

## 7. Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
VBUS Input Voltage Range	VBUS	-0.3 ~ 7	V
DP, DM Input Voltage Range	V <sub>DP</sub> , V <sub>DM</sub>	-0.3 ~ 11	V
Junction Temperature Range	T <sub>J</sub>	-40 ~ 150	°C
Storage Temperature Range	T <sub>stg</sub>	-60 ~ 150	°C
Ambient Temperature Range	T <sub>A</sub>	-40 ~ 150	°C
Human Body Model (HBM)	ESD	4	KV

\*Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to Absolute Maximum Rated conditions for extended periods may affect device reliability.

\*Voltages are referenced to GND unless otherwise noted.

## 8. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Input Voltage	VBUS	3		5.5	V
Ambient Temperature	T <sub>A</sub>	-40		85	°C

\*Devices' performance cannot be guaranteed when working beyond those Recommended Operating Conditions.

## 9. Electrical Characteristics

Unless otherwise specified, T<sub>A</sub>=25°C, 4.5V ≤ VBUS ≤ 5.5V

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Quiescent Current	I <sub>Q</sub>	No load, VBUS=5V	50	66	100	uA
Startup Time	T <sub>S</sub>		8	10	12	ms
DP1/DP2 Voltage	V <sub>DP1</sub> /V <sub>DP2</sub>	Connect to Apple device		2.7		V
		Connect to Samsung device		2.0		V
DM1/DM2 Voltage	V <sub>DM1</sub> /V <sub>DM2</sub>	Connect to Apple device		2.7		V
		Connect to Samsung device		2.7		V

## 10. Function Description

### Charging Standards

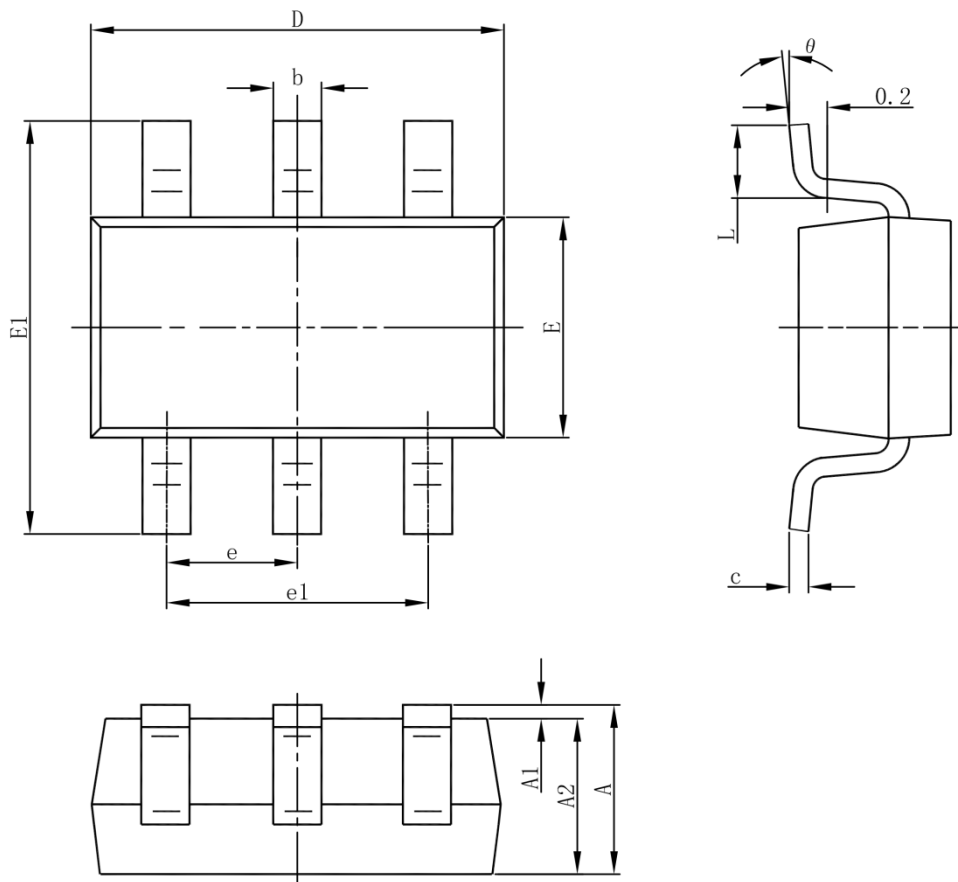
IP2111/IP2112 is a low-cost dedicated charging Physical Layer IC dedicated for charging applications where charging standards required to be negotiated between USB ports. IP2111/IP2112 is needed at the host-side, when the attached portable client-side devices negotiate the power allotment from the power source host-side.

IP2112 support dual channel USB port charging control, in control of two independent USB port. IP2111 support single USB port charging control.

IP2111/IP2112 auto-detect feature monitors USB data line voltage, and automatically provides the correct electrical signatures on the data lines to charge compliant devices. IP2111/IP2112 supports Apple 2.0A/1.0A, Samsung 2.0A and BC1.2. IP2111/IP2112 is not in control of the charging power loop, the actual charging loop and charging current is determined by the host-side power source and the client-side USB port device.

The maximum current allotment of IP2111/IP2112 is 2.0A. IP2111/IP2112 support reverse connect DP, DM pin on PCB board to realize the maximum current allotment of 1.0A.

## 11.Package



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°

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