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 = 66uA(Typ.)
- Working voltage: 3V~5.5V
- Package: SOT23-6

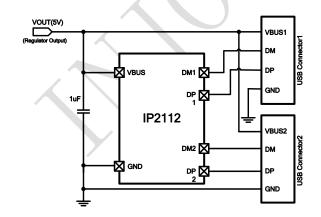
2. Description

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.

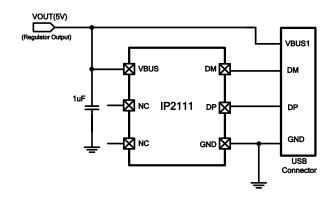
3. Application

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

4. Typical Application Schematic



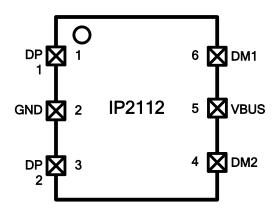
IP2112 Typical Application Circuit



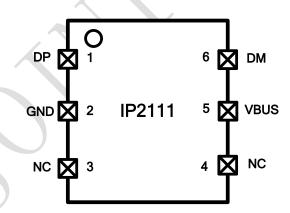
IP2111 Typical Application Circuit



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	Cha /Disch	_		Features						Package	
Part No.	Charge	Dis- charge	LED Num	Lighting	Keys	I2C	DCP	Type-C	QC Certificate	Package	Compa tibility
IP5303	1.0A	1.2A	1,2	٧	٧	-	-	-	-	eSOP8	Z
IP5305	1.0A	1.2A	1,2,3,4	٧	٧	-	-	-	<u></u>	eSOP8	PIN2PIN
IP5306	2.4A	2.1A	1,2,3,4	٧	٧	-	-	-	-	eSOP8	E
IP5206	2A (Max)	1.5A	3,4,5	٧	٧	-	-	-	-	eSOP16	PINZPIN
IP5108E	2.0A	1.0A	3,4,5	٧	٧	-	-	-	-	eSOP16	PIN2
IP5108	2.0A	2.0A	3,4,5	٧	٧	٧	-	-	-	eSOP16	_
IP5207	1.2A	1.2A	3,4,5	٧	٧	-	-	-	-	QFN24	
IP5207T	1.2A	1.2A	1,2,3,4	٧	٧	٧	٧	-	-	QFN24	PIN2PIN
IP5109	2.1A	2.1A	3,4,5	٧	٧	٧	-	-	-	QFN24	J NZ
IP5209	2.4A	2.1A	3,4,5	٧	٧	٧	٧	-	-	QFN24	_
IP5219	2.4A	2.1A	1,2,3,4	٧	٧	٧	٧	٧	-	QFN24	
IP5310	3.1A	3.0A	1,2,3,4	٧	٧	٧	٧	٧	-	QFN32	
IP5312	15W	3.6A	2,3,4,5	٧	٧	٧	٧	-	-	QFN32	
IP5318Q	18W	4.0A	2,3,4,5	٧	٧	٧	٧	-	٧	QFN40	2 z
IP5318	18W	4.0A	2,3,4,5	٧	٧	٧	٧	٧	٧	QFN40	PIN2 PIN
IP5322	18W	4.0A	1,2,3,4	٧	٧	٧	٧	-	٧	QFN32	
IP5328	18W	4.0A	1,2,3,4	٧	٧	٧	٧	٧	٧	QFN40	

USB Charging Port Control IC

		Standards Supported											
IC Part No.	Channel Num	BC1.2 & APPLE	QC3.0 & QC2.0	FCP	SCP	AFC	SFCP	MTK PE+ 2.0&1.1	Type-C	NTC	QC Certi- ficate	PD3.0	Package
IP2110	1	٧	-	-	-	-	-	-	-	-	-	-	SOT23-5
IP2111	1	٧	-	-	-	-	-	-	-	-	-	-	SOT23-6
IP2112	2	٧	ı	-	-	-	-	-	-	-	-	-	SOT23-6
IP2161	1	٧	٧	-	-	-	٧	-	-	-	٧	-	SOT23-6
IP2163	1	٧	٧	٧	-	٧	٧	٧	-	٧	٧	-	SOP8
IP2701	1	٧	٧	٧	-	٧	٧	-	٧	-	-	-	SOP8
IP2703	1	٧	٧	٧	-	٧	٧	٧	٧	٧	-	-	DFN10

IP2705	1	٧	٧	٧	-	٧	٧	٧	٧	٧	-	-	DFN12
IP2707	2	٧	٧	٧	-	٧	٧	٧	٧	٧		•	QFN16
IP2716	1	٧	٧	٧	٧	٧	-	1.1	٧	-	٧	٧	QFN32

7. Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
VBUS Input Voltage Range	VBUS	-0.3 ~ 7	V
DP, DM Input Voltage Range	V_{DP} , V_{DM}	-0.3 ~ 11	V
Junction Temperature Range	TJ	-40 ~ 150	°
Storage Temperature Range	Tstg	-60 ~ 150	v °C
Ambient Temperature Range	T _A	-40 ~ 150	${\mathbb C}$
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.

8. Recommended Operating Conditions

Parameter	Symbol	Min.	Тур.	Max.	Unit
Input Voltage	VBUS	3		5.5	V
Ambient Temperature	T _A	-40		85	$^{\circ}$

^{*}Devices' performance cannot be guaranteed when working beyond those Recommended Operating Conditions.

9. Electrical Characteristics

Unless otherwise specified, $T_A=25\,^{\circ}\text{C}$, $4.5\text{V} \leq \text{VBUS} \leq 5.5\text{V}$

Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Quiescent Current I _Q		No load, VBUS=5V	50	66	100	uA
Startup Time	Ts		8	10	12	ms
DP1/DP2 Voltage	V/V	Connect to Apple device		2.7		V
Dr 1/ Dr 2 Voltage	V_{DP1}/V_{DP2}	Connect to Samsung device		2.0		V
DM1/DM2 Voltage	v N	Connect to Apple device		2.7		V
DIVIT/DIVIZ VOITAGE	V_{DM1}/V_{DM2}	Connect to Samsung device		2.7		V

^{*}Voltages are referenced to GND unless otherwise noted.

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.

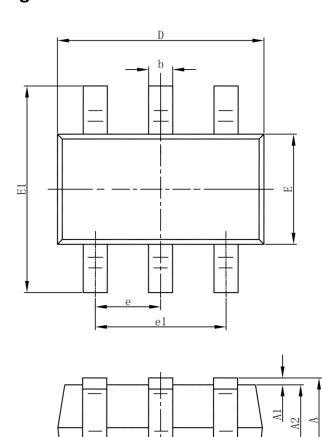
IP2112 support dual channel USB port charging control, in control of two independent USB port. IP2111 support single USB port charging control.

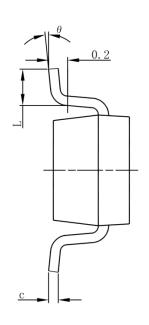
IP2111/IP2112 auto-detect feature monitors USB data line voltage, and automatically provides the correct electrical signatures on the data lines to charge compliant devices. IP2111/IP2112 supports Apple 2.0A/1.0A, Samsung 2.0A and BC1.2. IP2111/IP2112 is not in control of the charging power loop, the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





Ch a l	Dimensions Ir	n Millimeters	Dimensions	s In Inches
Symbol	Min	Max	Min	Max
Α	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
С	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
е	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°



12.IMPORTANT NOTICE

INJOINIC TECHNOLOGY and its subsidiaries reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to INJOINIC TECHNOLOGY's terms and conditions of sale supplied at the time of order acknowledgment.

INJOINIC TECHNOLOGY assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using INJOINIC TECHNOLOGY's components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of INJOINIC TECHNOLOGY's components in its applications, notwithstanding any applications-related information or support that may be provided by INJOINIC TECHNOLOGY. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify INJOINIC TECHNOLOGY and its representatives against any damages arising out of the use of any INJOINIC TECHNOLOGY's components in safety-critical applications.

Reproduction of significant portions of INJOINIC TECHNOLOGY's information in INJOINIC TECHNOLOGY's data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. INJOINIC TECHNOLOGY is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

INJOINIC TECHNOLOGY will update this document from time to time. The actual parameters of the product may vary due to different models or other items. This document voids all express and any implied warranties.

Resale of INJOINIC TECHNOLOGY's components or services with statements different from or beyond the parameters stated by INJOINIC TECHNOLOGY for that component or service voids all express and any implied warranties for the associated INJOINIC TECHNOLOGY's component or service and is an unfair and deceptive business practice. INJOINIC TECHNOLOGY is not responsible or liable for any such statements.

7/7