Description

The P14C2ND is an Over-Voltage-Protection (OVP) load switch with fixed OVLO threshold voltage. The OVLO threshold voltage is fixed 6.0V. The device will switch off internal MOSFET to disconnect IN to OUT to protect load when any of input voltage over the threshold. The Over temperature protection (OTP) function monitors chip temperature to protect the device. The OCP function turns off OUTPUT if the load current is over the threshold and recovers when VIN re-plug. The OCP current limit threshold is adjustable by an external R_{ILIM}.

The P14C2ND is available in DFN1.2x1.2-4L. Standard products are Pb-free and Halogen-free.

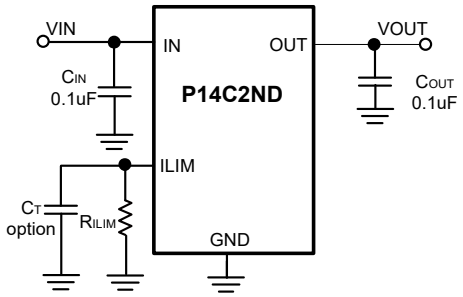


Figure 1: Typical Application

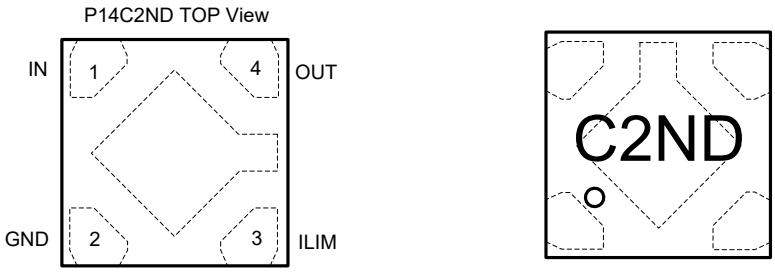


Figure 2: Pin Configuration(DFN1.2x1.2-4L) and Marking (Top view)

Feature

- Maximum input voltage : 32V
- Ultra fast OVP response time: 50ns (Typ.)
- Fixed OVLO threshold voltage: 6.0V, ±3%
- Adjustable over-current protection:
  100mA-1.8A
- Supports up to 1.5 A Load Current
- Thermal Shutdown
- Available in Green DFN1.2×1.2-4L Package

Application

- Mobile Handsets and Tablets
- Portable Media Players
- Low-Power Handheld Devices

Pin Definitions

Pin No.	Symbol	Descriptions
1	IN	Switch Input and Device Power Supply.
2	GND	Ground Terminal. Connect to the thermal pad and to the ground rail of the circuit.
3	ILIM	Current limit adjustment. Connect a resistor to GND to set over current threshold. $I_{Lim} = 25/R_{ILIM}$. (current in A, resistance in kΩ) Short ILIM to GND will disable current limitation.
4	OUT	Switch output Terminal to the Charging System.

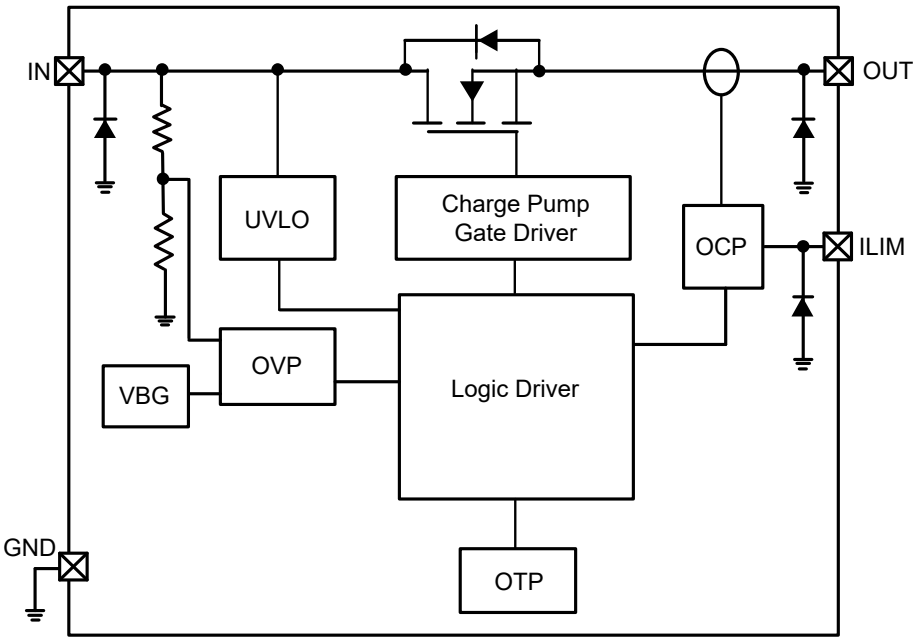


Figure 3: IC Block Diagram

Absolute maximum rating

Parameter(Note1)	Symbol	Value	Units
Input voltage (IN pin)	V_{IN}	-0.3 ~ 32	V
Output voltage (OUT pin)	V_{OUT}	-0.3 ~ 6.0	V
Junction temperature	T_J	150	℃
Lead temperature(10s)	T_L	260	℃
Storage temperature	Tstg	-55~150	℃

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

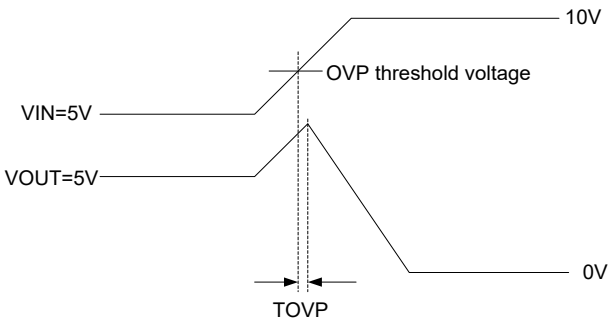
Parameter	Symbol	Value	Units
Input voltage	V_{IN}	3.5~32	V
MAX Continuous Output current	I_{OUT}	1.5	A
Ambient operating temperature	Topr	-40~85	℃

Electrical Characteristics

（T_A=25℃，V_{IN}=5V，C_{IN}=0.1uF，C_{OUT}=0.1uF，RLIM=24KΩ，unless otherwise specified.）

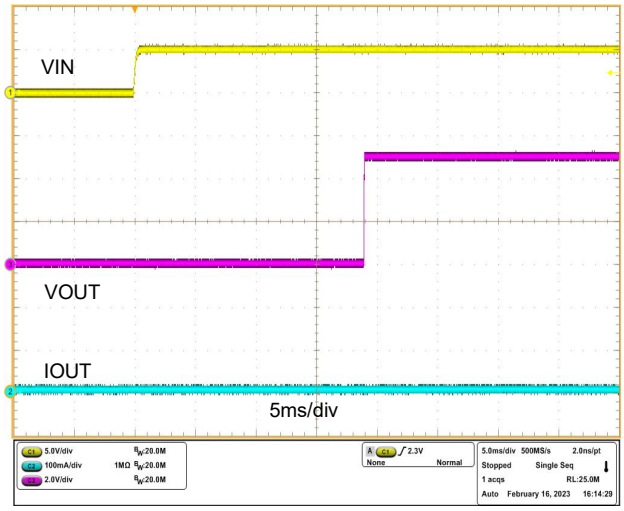
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Input voltage range	V_{IN}		3.5		32	V
Quiescent current	I_Q	NO Load, /CE=GND, V_{IN}=5V		120	200	uA
Over voltage quiescent current	I_{Q_OVP}	NO Load, /CE=GND, V_{IN}=30V		200		uA
Drop Voltage from IN to OUT	V_{DROP}	V_{IN}=5V, I_{OUT}=0.5A		85		mV
OVP response time	t_{OVP}	V_{IN} rising, C_{IN}=C_L=0pF (Note2)		50		ns
OVP voltage	V_{OVLO}	VIN rising	5.82	6.0	6.18	V
UVLO threshold voltage	VUVLO	VIN rising		2.35		V
UVLO hysteresis voltage	VUVLO_HYS	VIN falling		25		mV
OCP setting range	IOCP_RANG		100		1800	mA
OCP Accuracy	IOCP_ACY	IOCP_SET<=200mA		±30		mA
		IOCP_SET=300mA		±15		%
		IOCP_SET>=500mA		±10		%
Debounce Time	TDEB	VIN>UVLO to VOUT=VIN*10%	10	18	30	ms
Turn On Time	TON	VOUT=VIN*10% to VOUT=VIN*90%		40		us
OTP threshold temperature	TOTP	VIN=5V		150		℃
OTP hysteresis temperature	THYS	VIN=5V		20		℃

Note 2: Guaranteed by design

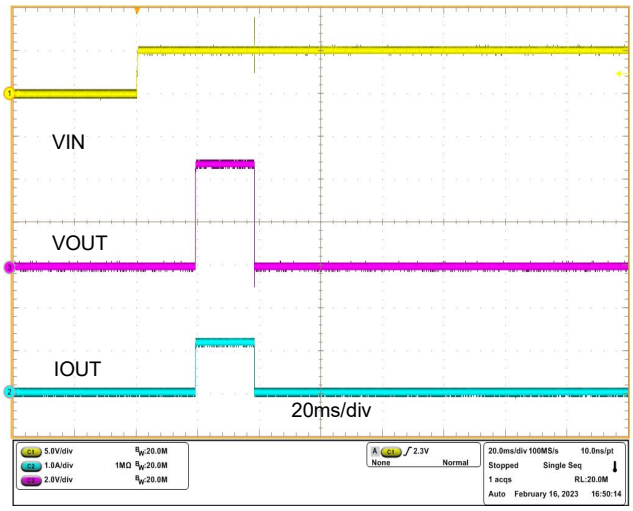


OVP response time test

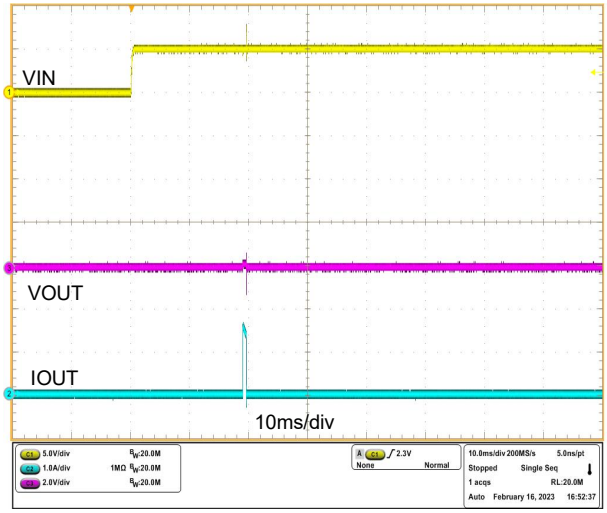
Typical Operating Performance



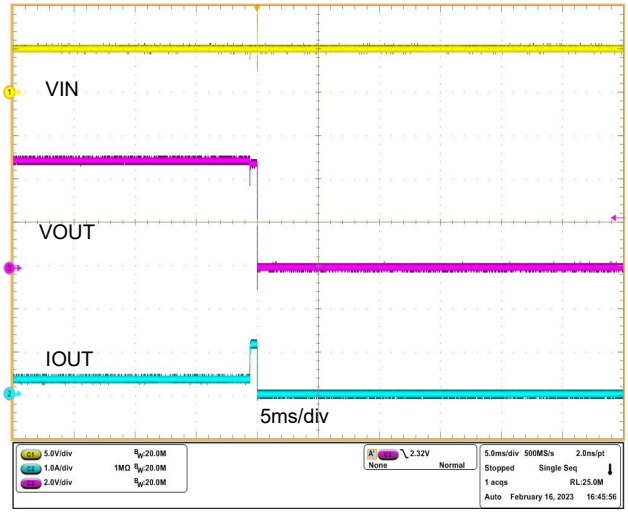
Power on Response(No Load,R_{ILIM}=24kΩ)



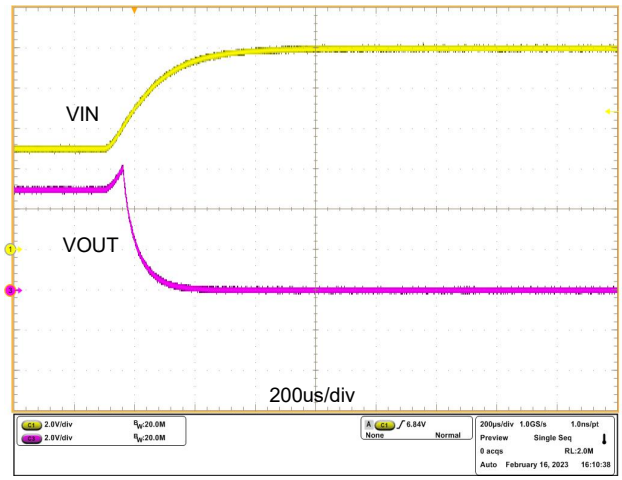
Power on OCP Response(Rout=4Ω,R_{ILIM}=24kΩ)



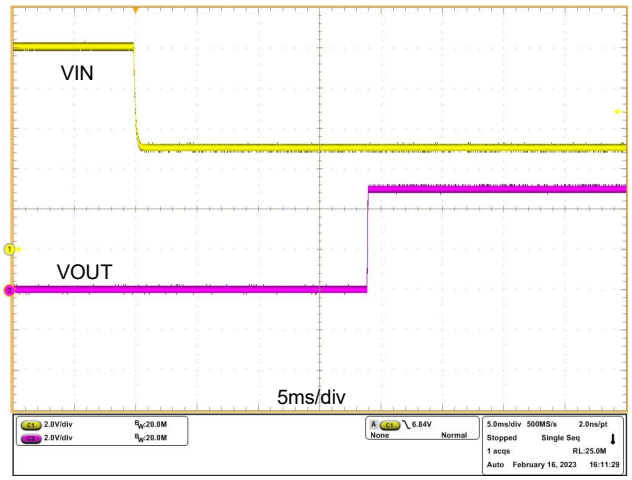
Power on Response with Output Short



OCP Response



OVP Response



OVP Recovery

Function Descriptions

1. Under-voltage Lockout (UVLO)

The under-voltage lockout (UVLO) circuit disables the power switch until the input voltage reaches the UVLO turn on threshold. Built-in hysteresis prevents unwanted on and off cycling because of input voltage droop during turn on.

2. Over Current Protection (OCP)

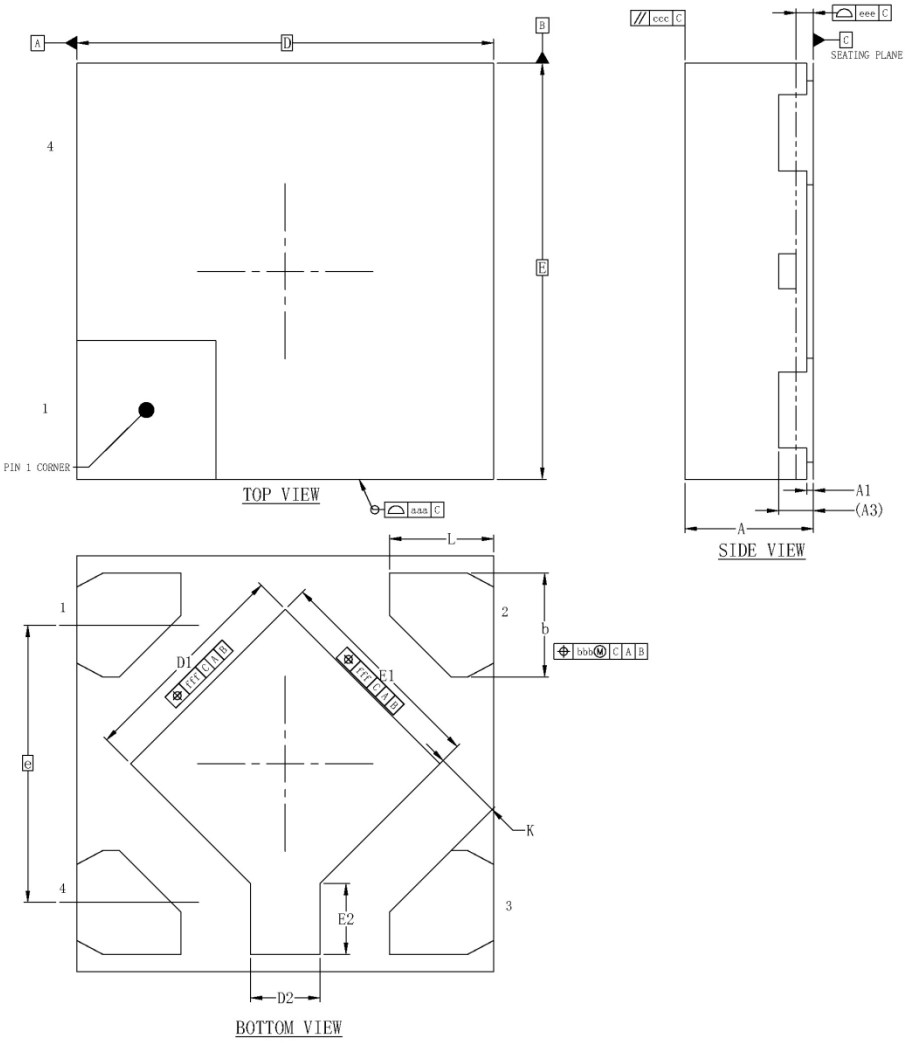
If the load current rises to the OCP threshold, the device will cut off the output voltage. It takes 18ms after power on for OCP begins to detect. After Power Good, the OCP active time is dozens to hundreds microseconds.

The OCP threshold is calculated by the equation: $I_{LIM} = 25/R_{ILIM}$ (current in A, resistance in kΩ).

3. Over-voltage Lockout (OVLO)

When VIN exceeds the OVP threshold voltage, the over-voltage lockout (OVLO) circuit turns off the protected power switch.

Product dimension (DFN1.2X1.2-4L)



Dim	Millimeters		
	MIN	Typ.	MAX
A	0.32	0.37	0.40
A1	0.00	0.02	0.05
A3		0.102REF	
b	0.25	0.3	0.35
D	1.1	1.2	1.3
E	1.1	1.2	1.3
e		0.8BSC	
D1	0.53	0.63	0.73
E1	0.53	0.63	0.73
D2	0.1	0.2	0.3
E2		0.18REF	
L	0.25	0.3	0.35
K		0.2REF	

IMPORTANT NOTICE

and Prisemi® are registered trademarks of **Prisemi Electronics Co., Ltd (**Prisemi**)** ,Prisemi reserves the right to make changes without further notice to any products herein. Prisemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Prisemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. “Typical” parameters which may be provided in Prisemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including “Typical” must be validated for each customer application by customer’s technical experts. Prisemi does not convey any license under its patent rights nor the rights of others. The products listed in this document are designed to be used with ordinary electronic equipment or devices, Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

Prisemi reserves the right to change the circuitry and/or specifications without notice at any time. Customers should obtain the latest relevant information and datasheets before placing orders and should verify that such information is current and complete.

Website: http://www.prisemi.com

For additional information, please contact your local Sales Representative.

©Copyright 2009, Prisemi Electronics

Prisemi® is a registered trademark of Prisemi Electronics.

All rights are reserved.