Over-Voltage-Protection Load Switch internal 6.05V OVP trip level

Description

CFP7014 is an Over-Voltage-Protection (OVP) IC with an ultra-low Rdson high current high voltage MOSEFT. It can sustain voltage as high as 36V DC, protecting downstream devices from high voltage surges.

When input voltage of CFP7014 exceed the OVP trip level, it responses quickly and shuts off the MOSFET. The OVP trip level can be externally adjusted with resistors at OVLO pin. It also has an over-temperature protection feature that turns off the MOSFET.

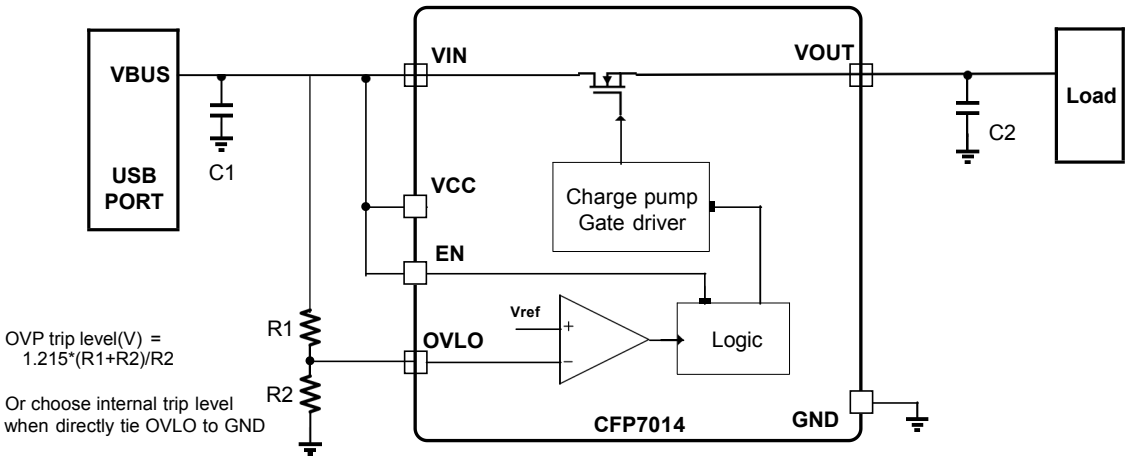
Features

- Supply voltage range from 2.7V to 20V
- 36V VBUS voltage tolerance
- Maximum DC switching current up to 3.5A
- Adjustable over voltage protection (OVP)
- 6.05V OVP trip level when OVLO=0V
- Fast turnoff transient response
- Over temperature protection (OTP)
- On chip slew rate control for inrush current
- On-The-Go (OTG) functionality
- ESD:
  - Human Body Model (HBM) > 2kV
  - Charged Device Model (CDM) >750V
  - Machine Model (MM) > 200V
  - IEC61000-4-2 on VBUS pin, Air discharge >15kV
  - IEC61000-4-2 on VBUS pin, contact discharge > 8kV

Applications

- Mobile Phone
- Mobile handsets
- Portable device
- Notebooks and Tablets

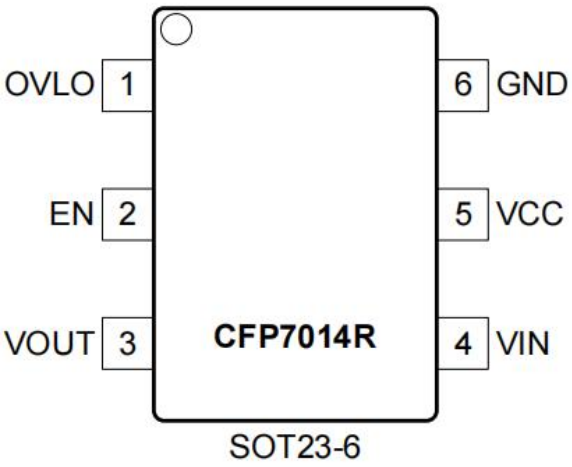
Typical Application

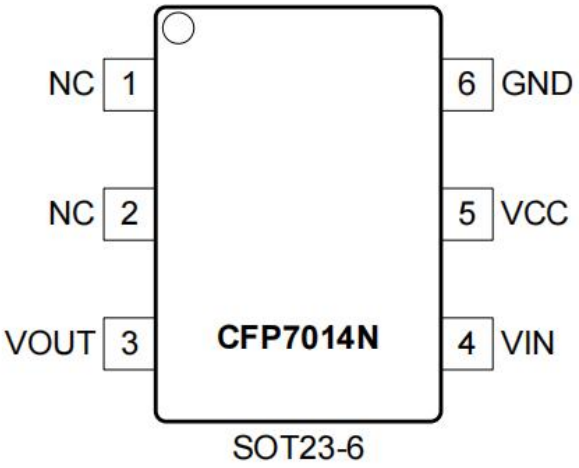


Order Information

Part No.	Package Type	Top Mark	Pcs/Reel	Internal Bonding Wire
CFP7014R	SOT23-6	7014/YWWL	3000	
CFP7014N	SOT23-6	7014/YWWL	3000	EN=VCC, OVLO=GND

Pin Description





Pin	R	N	I/O	Description
1	OVLO	/	I	OVP feedback input pin. It can be used to adjust the OVP trip level. Or it can be tied to GND to use internal OVP trip level. Caution: cannot float for CFP7014R !
2	EN	/	I	Enable pin. Pull high to turn on the chip and pull low to shut down the chip. Caution: cannot float for CFP7014R !
3	3	VOUT	O	OUTPUT pin. Bypass with a 1uF capacitor from this pin to ground.
4	4	VIN	I	Voltage Input. Bypass with a 0.1uF/50V ceramic capacitor as close to the device as possible.
5	5	VCC	P	The independent supply voltage for control logic and charge pump, tied to IN in normal application
6	6	GND	G	GND

Absolute Maximum Ratings

Parameter	Rating	Unit	Remarks
VCC, VIN Voltage	-0.3 ~ 36	V	
EN, OVLO Voltage	-0.3 ~ VCC+0.3	V	
VOUT	-0.3 ~ 24	V	
Continuous switch current	<4	A	Tamb=25°C
Operational temperature range	-40 ~ 85	°C	
Storage temperature range	-55 ~ 150	°C	
ESD Air Gap	15	KV	
ESD Contact	8	KV	
ESD HBM	2.5	KV	
ESD CDM	0.5	KV	

Recommended Operating Condition

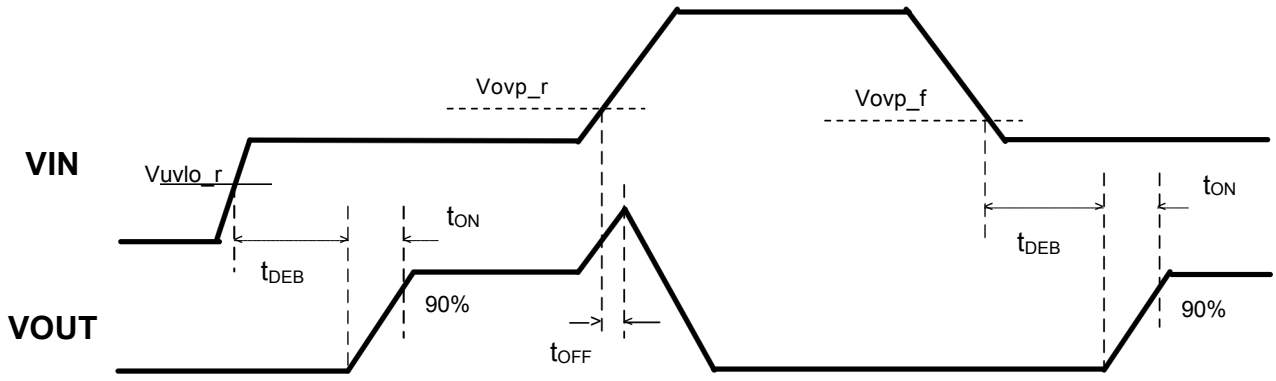
Parameter	Rating	Unit	Remarks
VBUS Voltage	3 ~ 20	V	
Ambient Operating Temperature	-40 ~ 85°C	V	
VOUT Load Capacitor	<1000	μF	

Electrical Characteristics

Test conditions: Tamb=25°C, VBUS=5V unless otherwise noted.

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Quiescent Current	IQ	50	68	120	uA	VBUS=5V, OVLO=0V
Internal OVP trip level	Vovp_r	5.9	6.05	6.25	V	VBUS rise, OVLO=0V
	Vovp_f	5.75	5.9	6.1	V	VBUS fall, OVLO=0V
Adjustable OVLO threshold	Vovp_rng	4		20	V	
Threshold voltage at OVLO	Vovlo	1.185	1.215	1.245	V	
Under voltage lockout trip level	Vuvlo_r	2.3	2.47	2.6	V	VBUS rise, OVLO=0V
	Vuvlo_f	2.15	2.3	2.5	V	VBUS fall, OVLO=0V
Resistance from VBUS to VOUT	Rdson		50	70	mΩ	MOSFET on
Leakage current on OVLO	IL_ovlo			2	μA	
Over temperature protection			130		°C	
Over temperature hysteresis			20		°C	
Debounce Time	t_{DEB}		16		ms	
VOUT rise time	t_{ON}		1.5		ms	
OVLO turn off time	t_{OFF}		100		ns	RL=100Ω, CL=0μF
Start-up Time	t_{START}		30		ms	

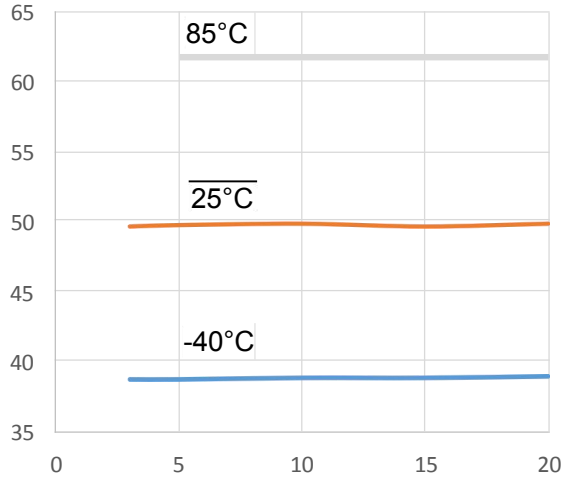
Timing Diagrams



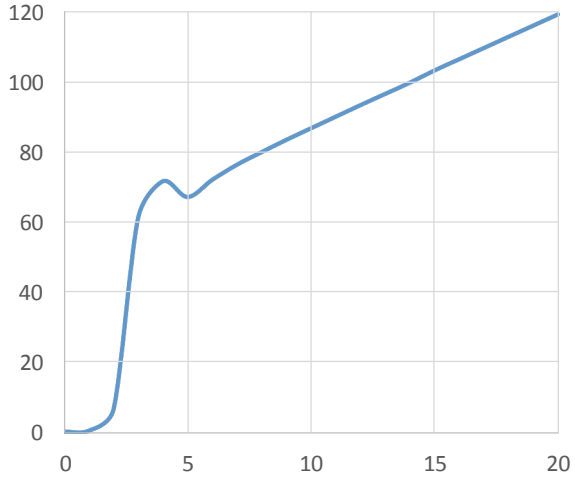
Typical Characteristics

Test conditions: Tamb=25°C, VBUS=5V, C_{IN}=C_{OUT}=1μF, unless otherwise noted.

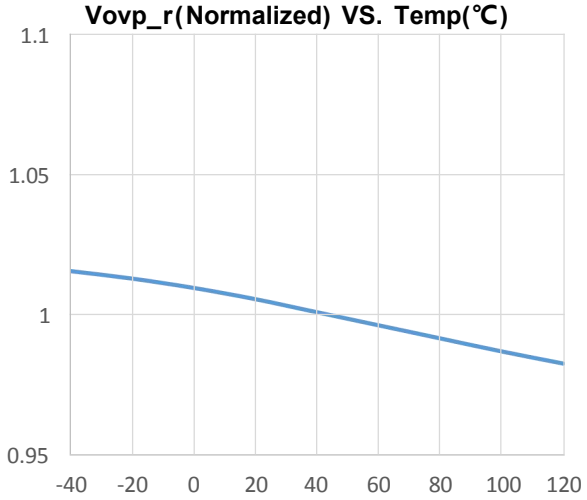
Rdson(mΩ) VS. VCC(V)



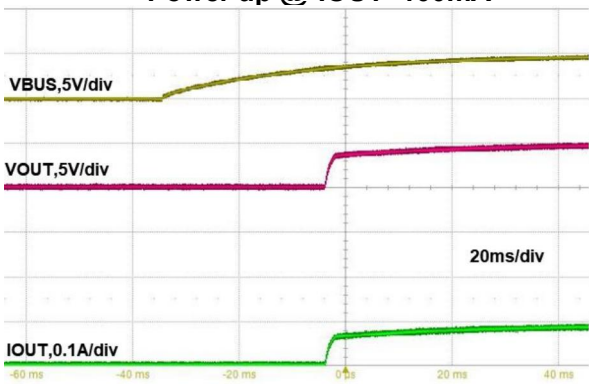
IQ(uA) VS. VCC(V)



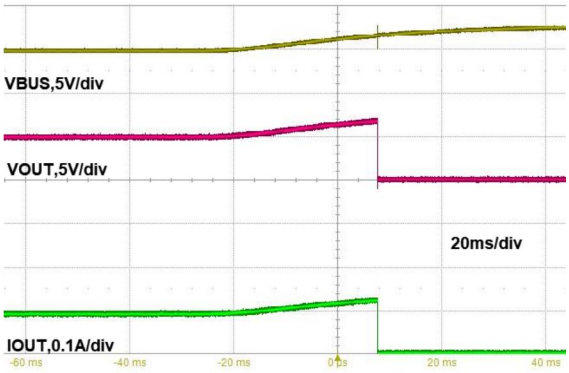
Vovp_r(Normalized) VS. Temp(℃)



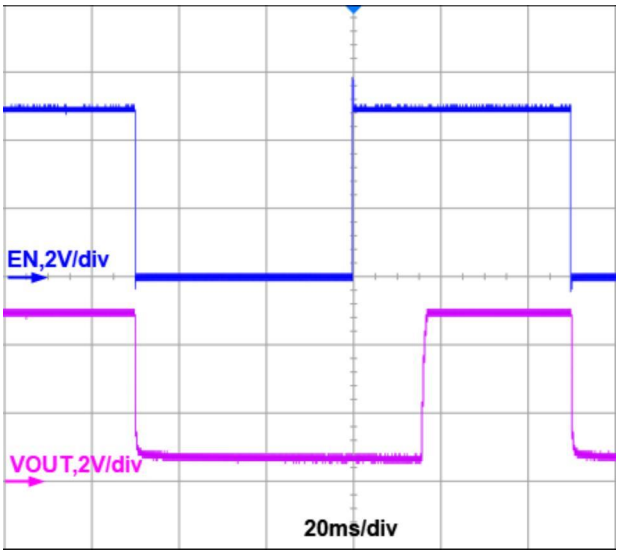
Power up @ IOUT=100mA



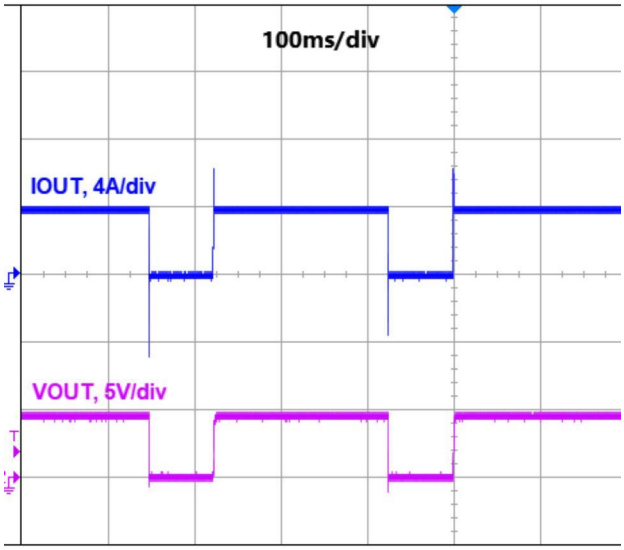
OVP Response



EN Function

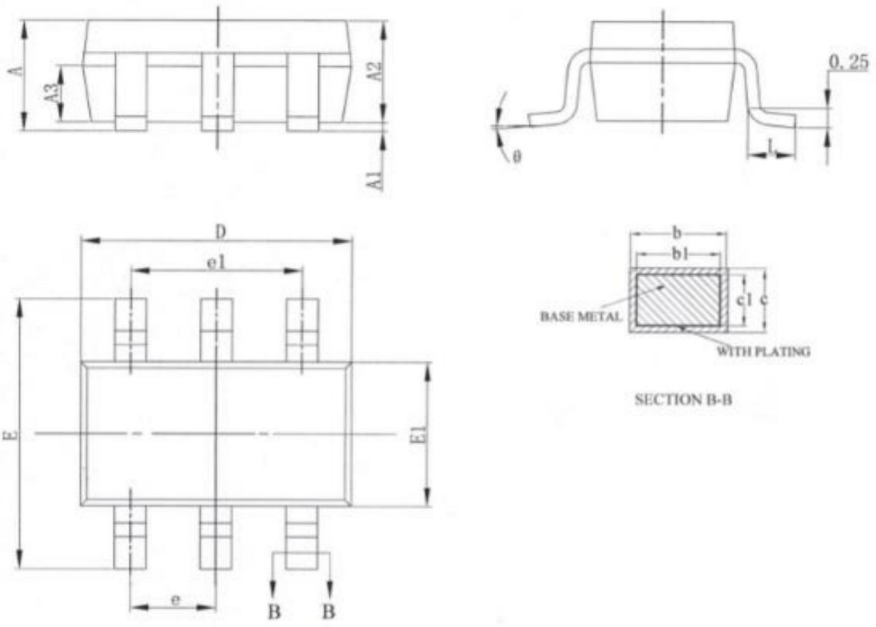


OTP Function



Package Outline

SOT23-6



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.25
A1	0.04	—	0.10
A2	1.00	1.10	1.20
A3	0.55	0.65	0.75
b	0.38	—	0.48
b1	0.37	0.40	0.43
c	0.11	—	0.21
c1	0.10	0.13	0.16
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95BSC		
e1	1.90BSC		
L	0.30	—	0.60
θ	0	—	8°