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

Description

RLCP1236 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 RLCP1236 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.

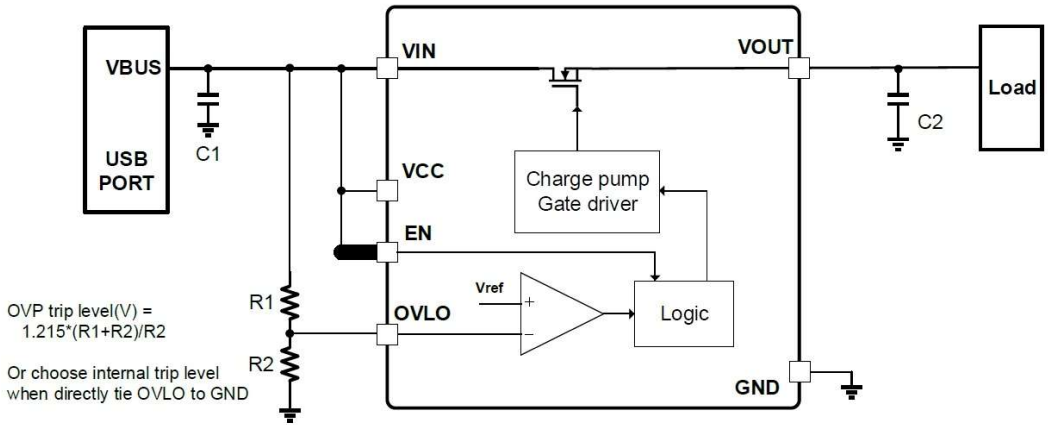
Features

- 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

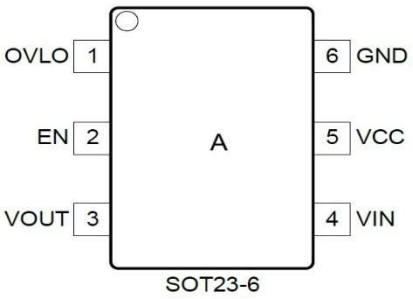
Typical Application

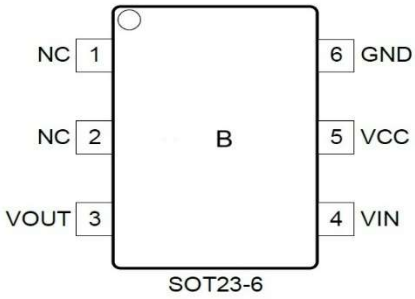


Order Information

Part NO	Vision	Package	Top-Mark	Pcs/Reel	Internal Bonding Wire
RLCP1236AST6/R6	A	SOT23-6	7014/YWWL	3000	
RLCP1236BST6/R6	B	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 RLCP1236A!
2	EN	/	I	Enable pin. Pull high to turn on the chip and pull low to shut down the chip. Caution: cannot float for RLCP1236A!
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

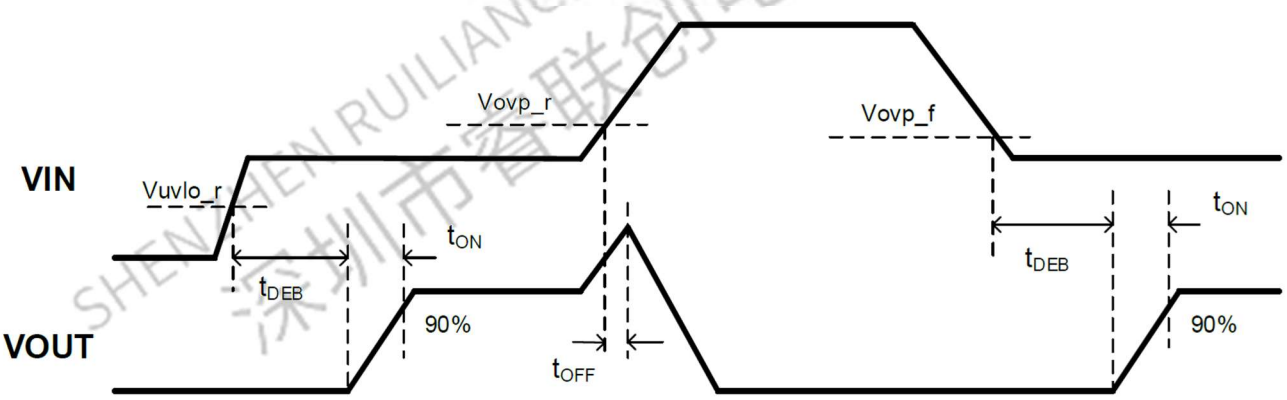
Parameter	Rating	Unit	Remarks
VBUS Voltage	3 ~ 20	V	
Ambient Operating Temperature	-40 ~ 85°C	V	
VOUT Load Capacitor	<1000	μF	

Electrical Characteristics

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

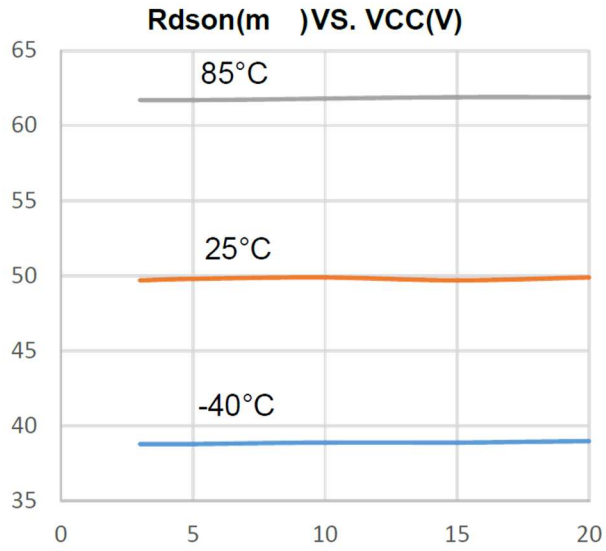
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Quiescent Current	IQ	50	68	120	uA	VBUS=5V, OVLO=0V
Internal OVP trip level	Vovp_r	5.9	6.05	6.25	V	VBUS rise, OVLO=0V
	Vovp_f	5.75	5.9	6.1	V	VBUS fall, OVLO=0V
Adjustable OVLO threshold	Vovp_rng	4		20	V	
Threshold voltage at OVLO	Vovlo	1.185	1.215	1.245	V	
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	m	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=100 , CL=0μF
Start-up Time	t_{START}		30		ms	

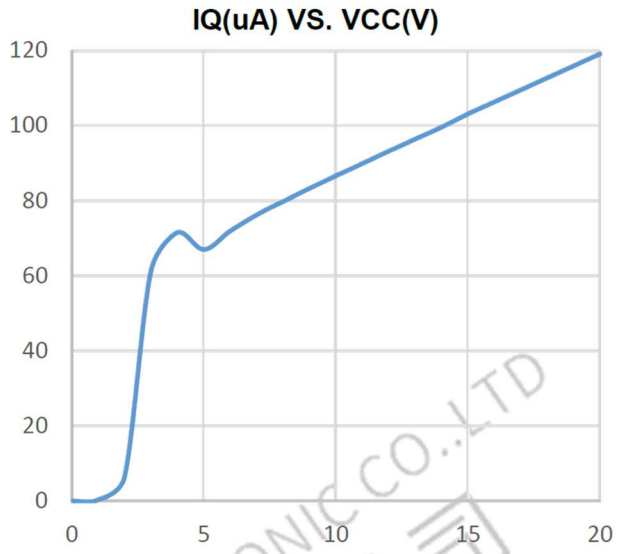
Timing Diagrams

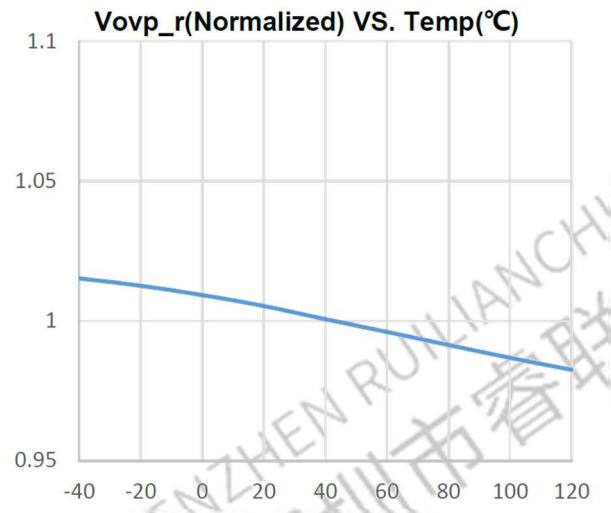


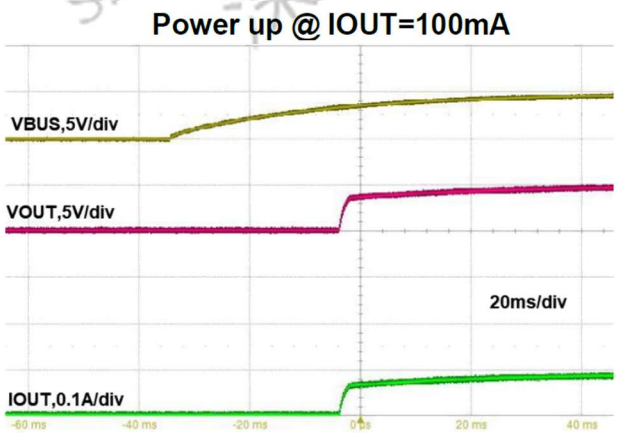
Typical Characteristics

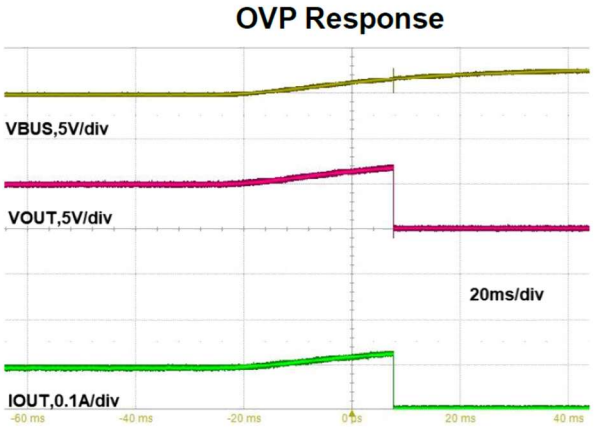
Test conditions: Tamb=25°C, VBUS=5V, CIN=COUT=1μF, unless otherwise noted.



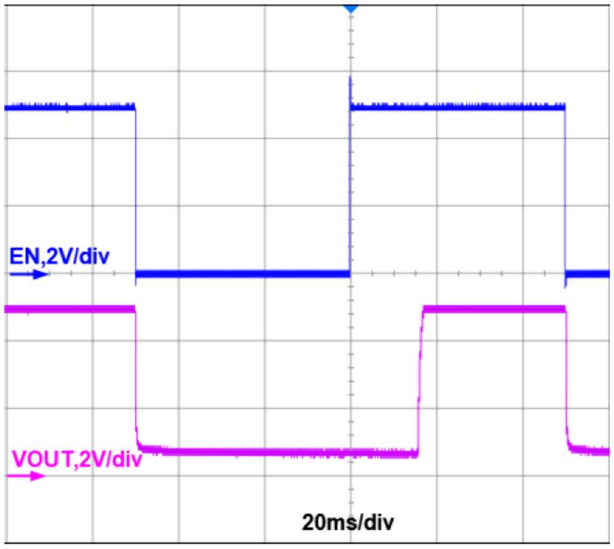




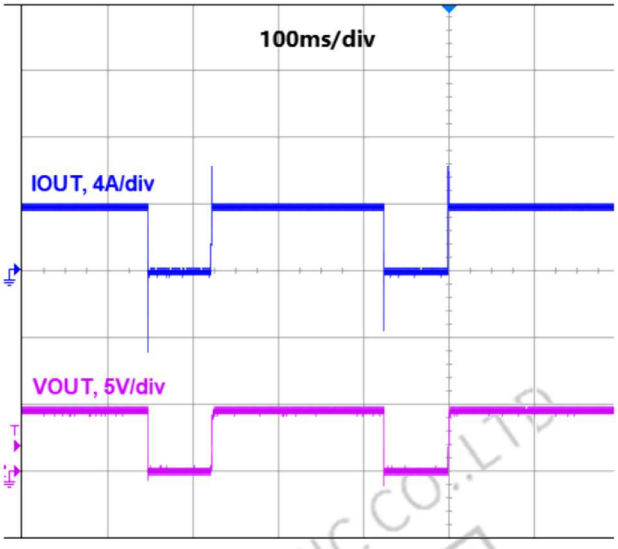




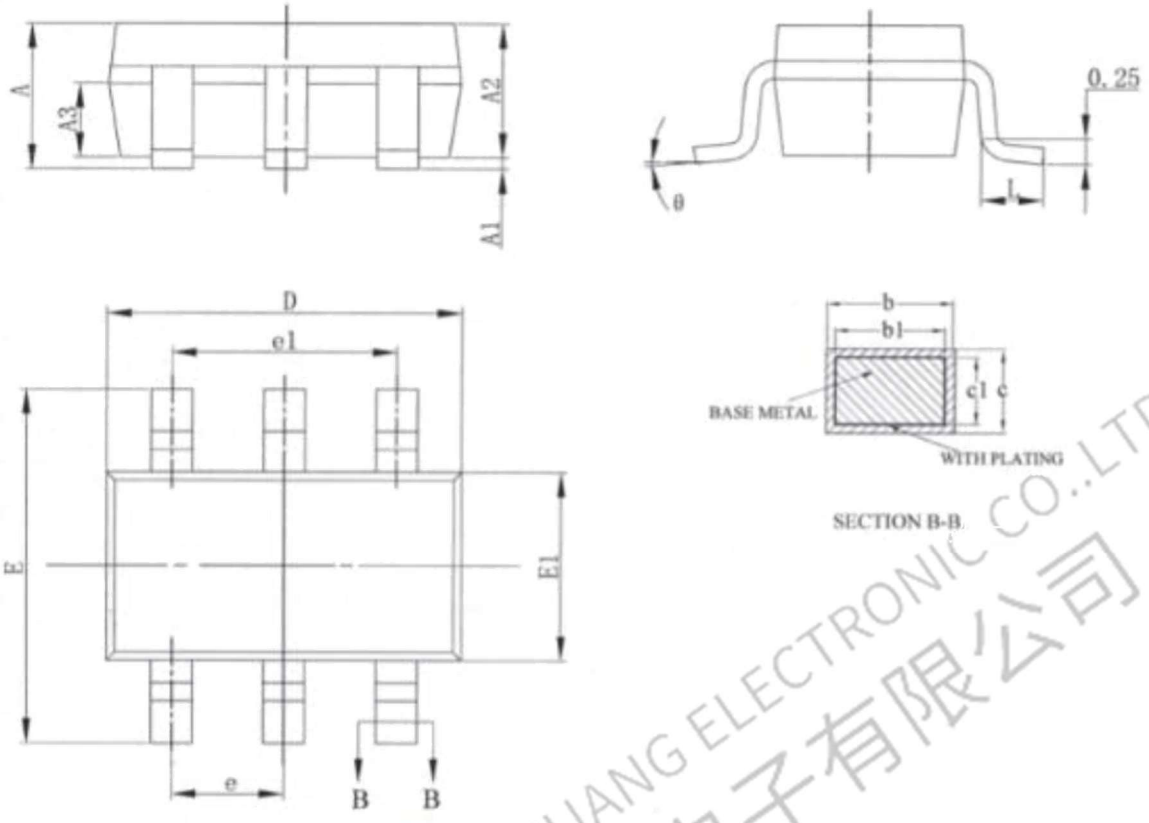
EN Function



OTP Function



Package Outline Dimensions (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°

Important Note

As the RLC product continues to improve gradually, we may experience significant changes. RLC reserves the right to correct, modify, enhance, and amend the products and services they provide, as well as the right to discontinue any product or service. Before placing an order, customers should obtain the latest information to verify that it is current and complete. All products sold must comply with RLC's terms and conditions in order to ensure proper processing of orders. RLC guarantees that the products they sell conform to the terms and conditions applicable to semiconductor sales. Only under this guarantee does RLC consider it necessary to employ testing and quality control measures for their products. Unless mandated by applicable laws requiring strict compliance, there is no obligation for testing all product parameters. RLC does not assume responsibility for customer product design or application. The materials provided contain circuit examples and usage methods solely for reference purposes; they do not guarantee suitability for volume production designs. Additionally, these materials may contain errors that could result in damages incurred by customers; therefore, RLC disclaims any liability in such cases. Customers are advised to use products within the limits specified in these materials while paying particular attention to absolute maximum ratings, operating voltages, and voltage characteristics. Any use of products outside of these specifications absolves RLC from responsibility; customers must accept full responsibility themselves. To minimize risks associated with customer-designed applications, adequate design safety measures should be implemented. When using RLC products, please ensure compliance with relevant laws and regulations pertaining to your country or region regarding application standards as well as testing requirements related to safety performance. For exports of RLC products overseas, it is essential that you adhere strictly to foreign exchange regulations and transaction laws throughout all necessary procedures involved in exportation processes. In case of disposal of any abandoned RLC product(s), please follow appropriate rules and regulations for proper disposal.

RLC products are not designed to be radiation - resistant. Based on the intended usage, customers can incorporate radiation protection measures during the product design process. Under normal circumstances, RLC products do not harm human health. However, since they contain chemicals and heavy metals, do not put them in your mouth. Additionally, the fracture surfaces of wafers and chips can be sharp. When touching them with bare hands, please be careful to avoid injury.Semiconductor products have a certain probability of failure or malfunction. To prevent disruptions and social damages resulting from personal accidents, fire accidents, etc., as well as to avoid malfunctions, customers are required to be responsible for comprehensive design, implementing fire - spread prevention measures, and safety design against misoperation. Please conduct a full assessment of the entire system, and customers can determine its applicability on their own.

This material also includes content related to the company's copyright and know - how. The records in this material are not intended to promise or guarantee the implementation and use of the company's and third - party intellectual property and other rights. Without the permission of our company, it is strictly prohibited to reprint, copy any part of this work, or disclose the material information to third parties.

RLC shall not be held responsible for any damage or harm that occurs which is not related to the product itself, as well as for any infringement of third - party rights such as intellectual property rights.

For more details about this material, please contact our sales office.