Unidirectional and Bidirectional configurable 20V Over-Voltage Protector

DESCRIPTION

ETA7011 is an innovative over voltage protector which can be used either in unidirectional or bidirectional mode, by only change the external connecting. In bidirectional mode, the switch integrated in ETA7011 can shut off with the reverse blocking function, no body diode anymore.

ETA7011 consists of a charge pump, a configurable power MOSFET, a voltage reference, a gate driver and some logics and protection modules. ETA7011 can react to an input surge very fast and shut off the switch in 0.5us and stand the voltage spike as high as 20V.

ETA7011 is in SOT23-6 package.

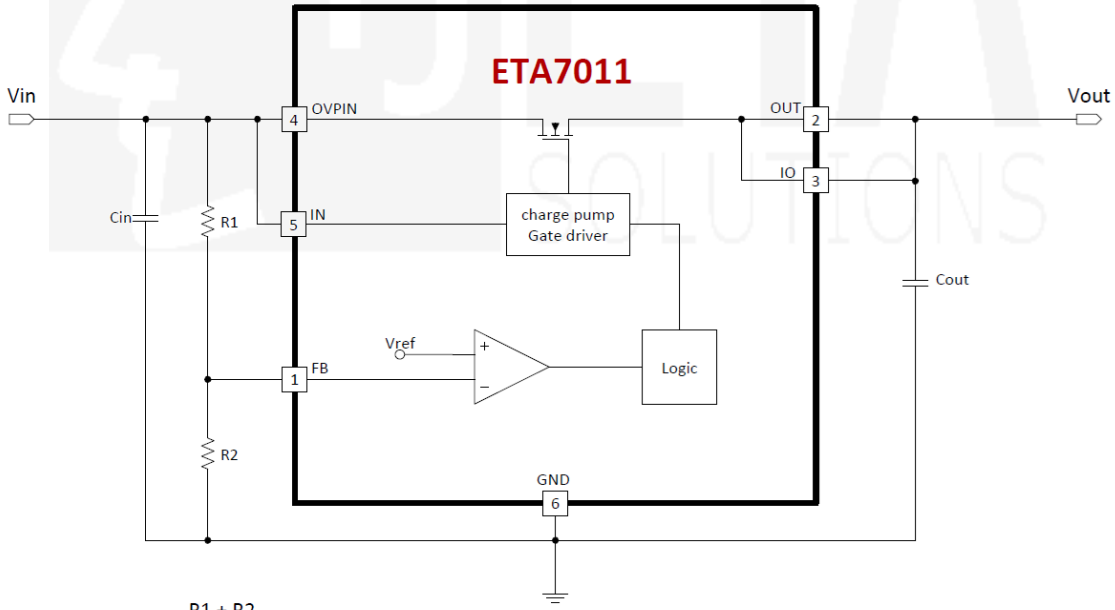
FEATURES

- Unidirectional and Bidirectional configurable
- Input OVP with 0.1us reaction time
- Input standoff voltage up to 20V
- 10mohm Rdson in Unidirectional mode
- 40mohm Rdson in Bidirectional mode
- Protection voltage programmable by Vfb=1.26V
- SCP and OTP

APPLICATIONS

- All electronic devices with input DC power plug

TYPICAL APPLICATION

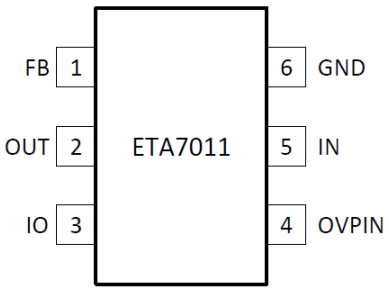


$$Vovp\ (V) = 1.26 \times \frac{R1 + R2}{R2}$$

ORDERING INFORMATION

PART	PACKAGE	TOP MARK	Pcs/Reel
ETA7011S2G	SOT23-6	MZ|YW (YW: date code)	3000

PIN CONFIGURATION



SOT23-6

ABSOLUTE MAXIMUM RATINGS

(Note: Exceeding these limits may damage the device. Exposure to absolute maximum rating conditions for long periods may affect device reliability.)

FB Voltage.....–0.3V to 6V
IN, OUT, IO, OVPIN Voltage .....–0.3V to 20V
Operating Temperature Range .....–40°C to 85°C
Storage Temperature Range .....–55°C to 150°C

Thermal Resistance	θ_{JC}	θ_{JA}	
SOT23-6	50	100	°C/W

Lead Temperature (Soldering, 10sec) .....260°C
ESD HBM (Human Body Mode) 2KV
ESD MM (Machine Mode) 200V

ELECTRICAL CHACRACTERISTICS

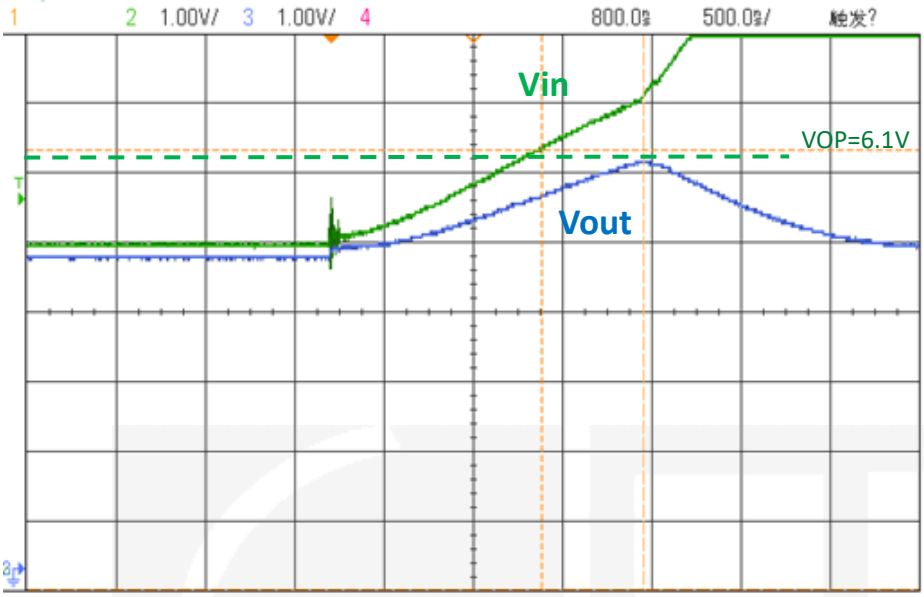
(V_{IN} = 5V, unless otherwise specified. Typical values are at TA = 25oC.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage		3.35		20	V
UVLO	Hys=400mV		3.35		V
OVP	Default OVP=6.1V when floating fb, Vfb=1.26V	5.8	6.1	6.4	V
FB_OVP		1.21	1.26	1.31	V
Ron	NMOS in bidirectional mode		40		
	NMOS in unidirectional mode		10		mΩ
Output Current	Maximum current		5		A
Iq	Standby current		150		uA
Isd	Shutdown current		10		uA
Thermal Shutdown	Rising, Hys=50°C		135		°C

PIN DESCRIPTION

PIN #	NAME	DESCRIPTION
1	FB	OVP feedback input pin. A resistor divider from IN to AGND thru this pin. VFB=1.26V. When FB floating, default OVP=6.1V.
2	OUT	OUTPUT pin, Bypass with a 1uF capacitor from this pin to ground.
3	IO	A power supply pin. When use this pin as power input pin, connect it to IN. Then the internal power NMOS are connect in series. When use this pin as power output pin, connect IO with OUT. Then the internal power NMOS are connect in parallel.
4	OVPIN	An input power supply pin. When use this pin as power input pin, connect it to IN. Connect IO and OUT together, then the internal power NMOS are connect in parallel.
5	IN	A Bias voltage input pin. Bypass with a 1uF capacitor from this pin to ground.
6	GND	Ground

OVER VOLTAGE PORTECTION CHRACTERISCTICS



APPLICATION NOTE

Default OVP level when FB Float

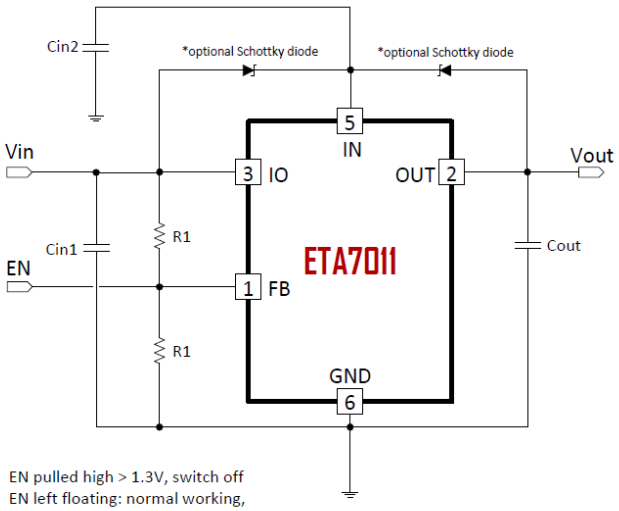
One can leave FB pin float if only want to set over voltage level at 6.1V.

Bi-directional Mode

ETA7011 can also configured to have the OVP switch capable of reverse blocking function, which is named "bi-directional mode", Pin4 is no longer needed and the circuit is shown on the right.

If there is no guarantee, whether input or output supply the voltage, one need to add 2 small schottky diodes (<0,5A) to have input power automatically selected to supply the pin "IN". But if input voltage is always available, then such input voltage can be connected to IN directly without the schottky diode.

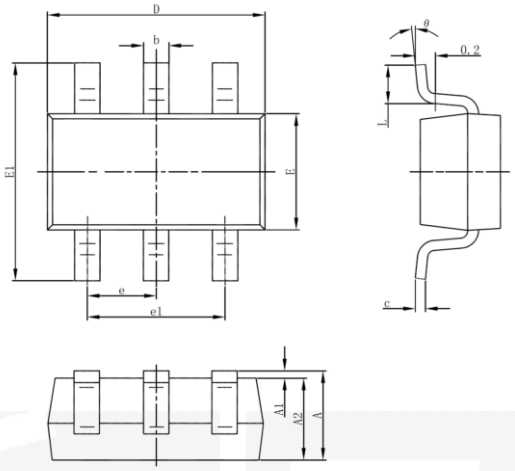
FB pin can also be used as an ENABLE input. The switch is turned off if FB is pulled high, but must be high impedance to have ETA7011 back to its normal function.



EN pulled high > 1.3V, switch off
EN left floating: normal working,
monitor input voltage for protection

Package Outline

Package: SOT23-6



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°