36V Surge Voltage High Side Over-Voltage Protector with 500V 7V TVS in DFN3x3

DESCRIPTION

ETA7016 is a 36V surge voltage over voltage protector (OVP) integrated with a 500V TVS diode, which has a very low 33mohm on resistance. It can be used as an OVP device or a high voltage switch at power input port.

ETA7016 consists of a charge pump, a configurable power MOSFET, a voltage reference, a gate driver, some logics, protection modules and a 500V TVS diode. ETA7016 can react to an input surge very fast and shut off the switch in less than 0.1us and stand the voltage spike as high as 36V.

ETA7016 is in DFN3x3-12 package.

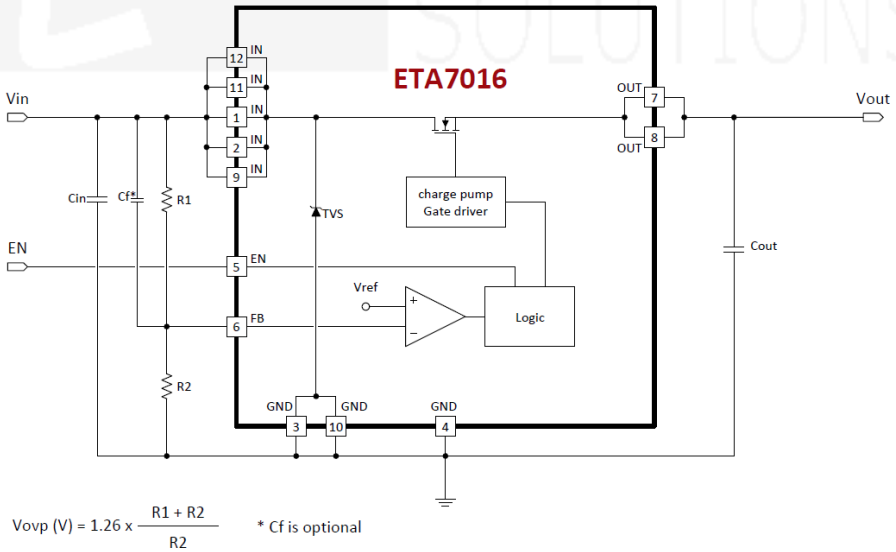
FEATURES

- Operation Voltage up to 7V
- 36V surge voltage
- 33mohm on resistance
- Input OVP with 0.1us reaction time
- 500V TVS
- Protection voltage programmable by Vfb=1.26V
- SCP and OTP
- Enable pin available for switch on and off

APPLICATIONS

- All electronic devices with input DC power plug
- Cellphone
- E-Cigarette
- Car Camera

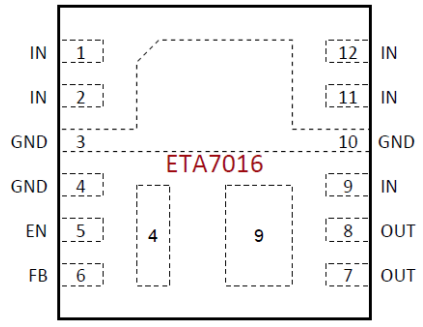
TYPICAL APPLICATION



ORDERING INFORMATION

PART	PACKAGE	TOP MARK	Pcs/Reel
ETA7016D3M	DFN3x3-12	ETA7016 YWW2L	5000

PIN CONFIGURATION



DFN3x3-12

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.EN Voltage (internally clamped).....–0.3V to 7V
Operating Temperature Range .....–40°C to 85°C
Storage Temperature Range .....–55°C to 150°C

Thermal Resistance	θ_{JC}	θ_{JA}	
DFN3x3-12	10	30	°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 = 25°C.)

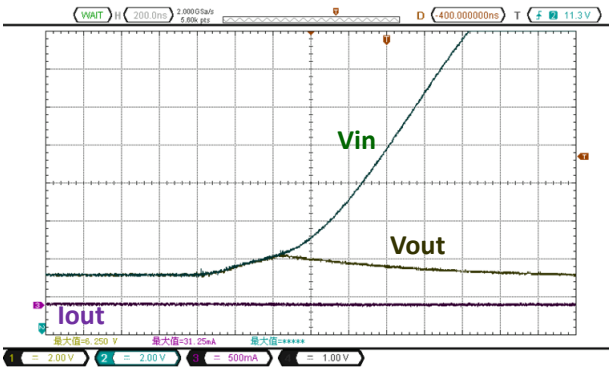
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
IN Range		3.35		7	V
UVLO	Hys=400mV		3.35		V
OVP	Default OVP=6.1V when FB short to GND	5.9	6.1	6.3	V
OVP FB	Vin=5V	1.21	1.26	1.31	V
OVP Range		3.5		7	V
Ron	Vin=5V, Iout=2A		33		mΩ
Iout_max	The maximum output peak current		4		A
Vsurge	Surge Voltage protected by internal TVS		500		V
Iq	Standby current, Vin < 7V voltage, EN=high		160		uA
Isd	Shutdown current, Vin=5V		30		uA
Thermal Shutdown	Rising, Hys=50°C		135		°C

PIN DESCRIPTION

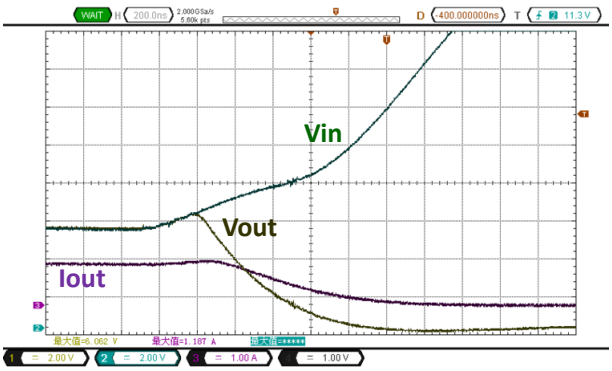
PIN #	NAME	DESCRIPTION
1, 2, 9, 11, 12	IN	Connected to the power input port of a system. Bypass with a 1uF capacitor from this pin to GND.
3, 4, 10	GND	Ground
5	EN	Enable pin, pull high to turn on the chip and pull low to shut down the chip.
6	FB	OVP feedback input pin. A resistor divider from IN to AGND thru this pin. VFB=1.26V. When FB floating, default OVP=6.1V.
7, 8	OUT	OUTPUT pin, Bypass with a 1uF capacitor from this pin to ground.

Over Voltage Protection Waveforms (with Cf=47pF, Cout=0.1uF, externally setting Vovp=6.1V)

Iout = 0A

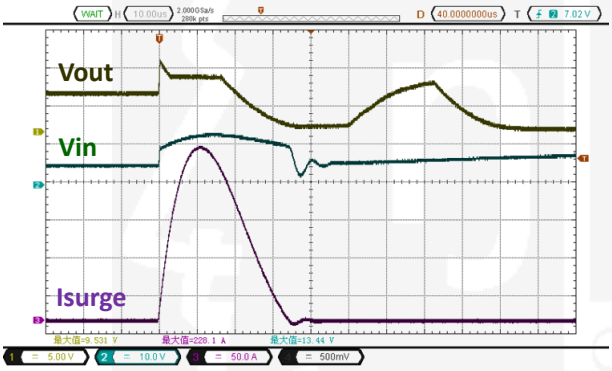


Iout = 1A

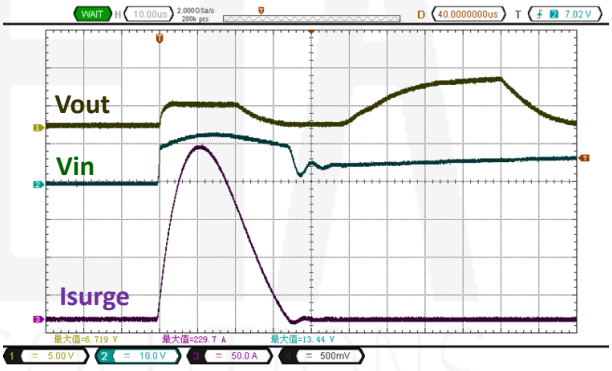


450V Surge Voltage OVP Waveforms (with Cin=1uF, Cout=0.1uF, FB short to GND, Vovp=6.1V)

Vin Surge from 5V, Iout = 0A

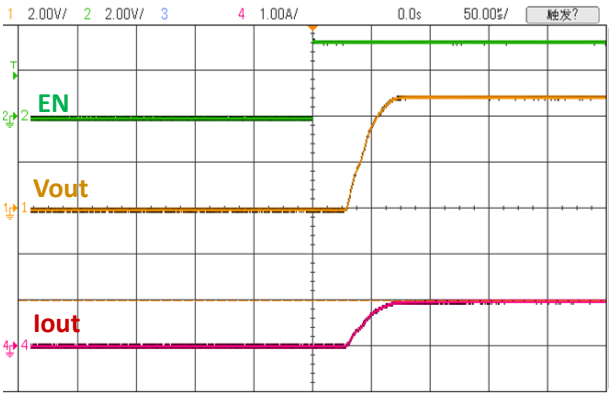


Vin Surge from 0V, Iout = 0A

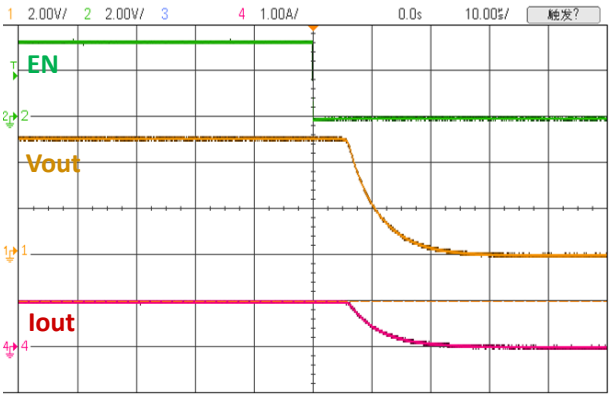


Enable ON and OFF Waveforms

Enable ON

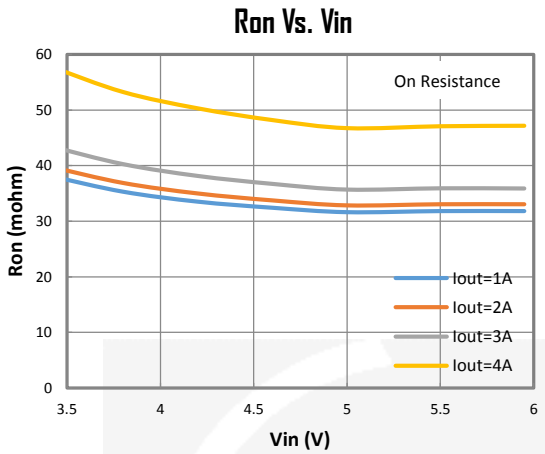


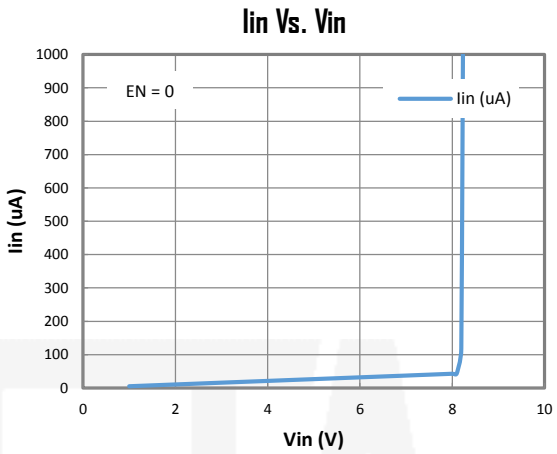
Enable OFF



TYPICAL CHARACTERISTICS

(Typical values are at T_A=25°C unless otherwise specified.)





APPLICATION NOTE

Default OVP level when FB Float

One can short FB to GND if only want to set over voltage level at 6.1V.

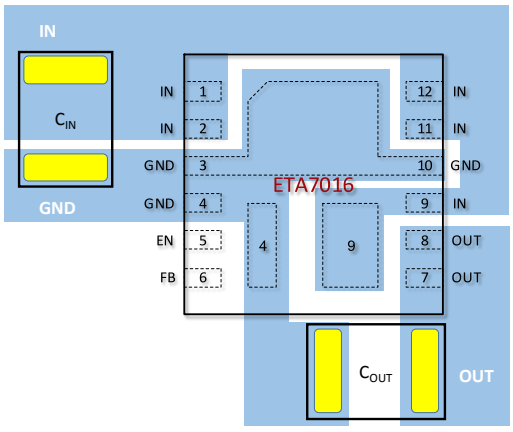
Setting OVP level when connecting resistor divider on FB pin

$\mathrm{Vovp} = 1.26 \times \frac{R1+R2}{R2}\ (V)$ where Vovp has to be within the range from 3.5 to 7V.

PCB GUIDE

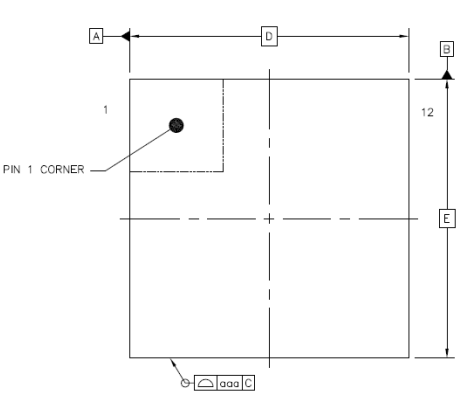
A PCB guide is shown on the right hand, with only 2 small capacitors are needed for ETA7016, if OVP is set internally and EN is pulled high to input.

Please be aware of the three exposed pads are better be connected to IN (the exposed pad connected to pin 9) and to GND (the exposed pad connected to pin 3 and 10, and the exposed pad connected to pin 4).

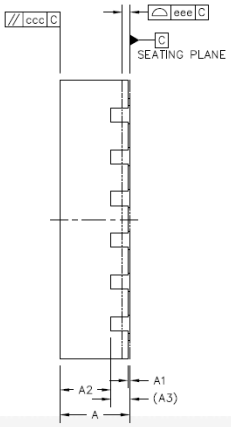


PACKAGE OUTLINE

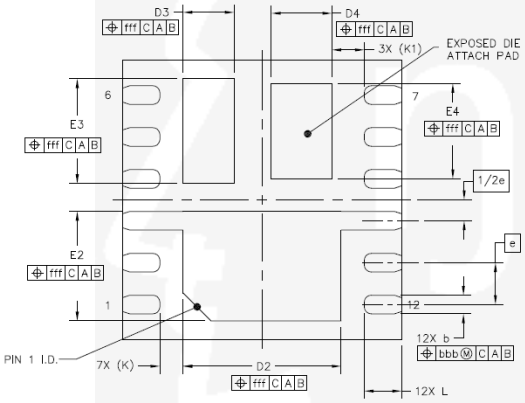
Package: DFN3x3-12



TOP VIEW



SIDE VIEW



BOTTOM VIEW

		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A	0.7	0.75	0.8
STAND OFF		A1	0	0.02	0.05
MOLD THICKNESS		A2	---	0.55	---
L/F THICKNESS		A3		0.203 REF	
LEAD WIDTH		b	0.15	0.2	0.25
BODY SIZE	X	D		3 BSC	
	Y	E		3 BSC	
LEAD PITCH		e		0.45 BSC	
EP SIZE	X	D2	1.6	1.7	1.8
		D3	0.45	0.55	0.65
		D4	0.55	0.65	0.75
	Y	E2	1.075	1.175	1.275
		E3	1.025	1.125	1.225
		E4	0.925	1.025	1.125
LEAD LENGTH		L	0.3	0.4	0.5
LEAD TIP TO EXPOSED PAD EDGE		K		0.25 REF	
LEAD TIP TO EXPOSED PAD EDGE		K1		0.35 REF	
PACKAGE EDGE TOLERANCE		aaa		0.1	
MOLD FLATNESS		ccc		0.1	
COPLANARITY		eee		0.08	
LEAD OFFSET		bbb		0.1	
EXPOSED PAD OFFSET		fff		0.1	