ETA6122

CSP2x3-6 and SOT23-5 30V Over-Voltage-Protection IC

DESCRIPTION

ETA6122 is an Over-Voltage-Protection (OVP) IC with an ultra-low 45mΩ RDSON high current high voltage MOSEFT. It can sustain voltage as high as 32V DC, protecting downstream devices from high voltage surges.

When input voltage of ETA6122 exceed the OVP threshold, it responses quickly and shuts off the MOSFET. The OVP threshold can be externally adjusted with resistors at OVLO pin. There is also an over-current-protection feature for the switch. When overload condition occurs, it goes into a hiccup mode to protect the IC from over-heating. It also has an over-temperature protection feature that turns off the MOSFET.

ETA6122 is available in SOT23-5 and CSP2x3-6.
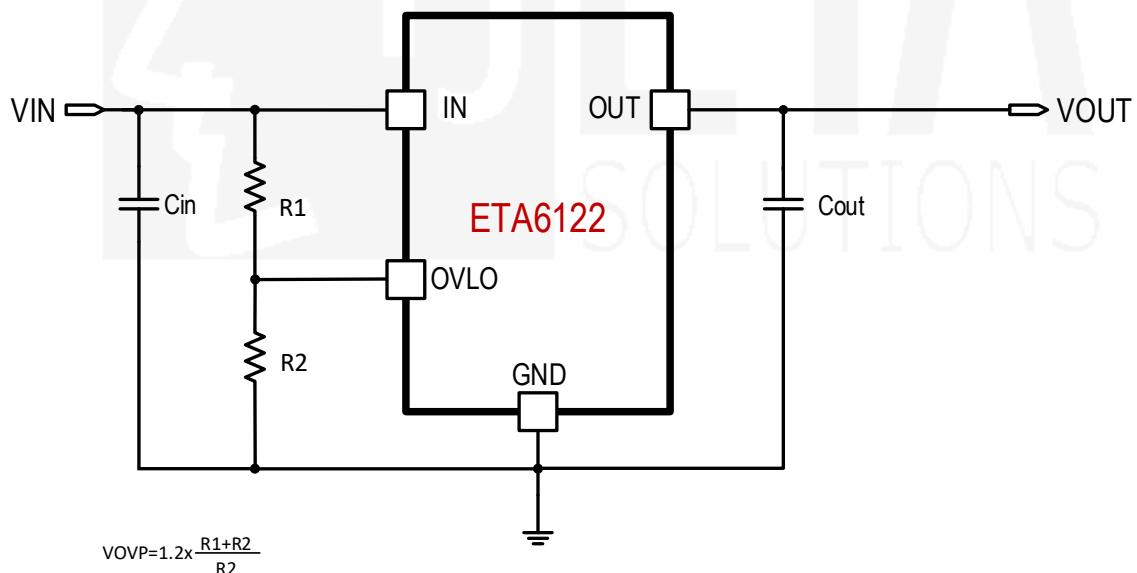
FEATURES

◆ Over voltage protection up to 32V
◆ 45mohm switch resistance
◆ Externally adjustable OVP voltage
◆ 60ns Fast Transient response
◆ Internally set current limit

APPLICATIONS

◆ Tablet, MID
◆ Smart Phone
◆ Car camera
◆ Power bank
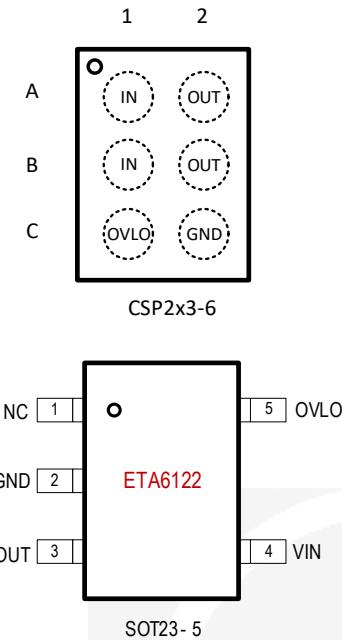
### TYPICAL APPLICATION

$$VOVP=1.2 \times \frac{R1+R2}{R2}$$

ORDERING INFORMATION

PART No.	PACKAGE	TOP MARK	Pcs/Reel
ETA6122S2F	SOT23-5	GWYW	3000
ETA6122CSG	CSP2x3-6	6122	3000
		YWWL	

PIN CONFIGURATION

CSP2x3-6

SOT23- 5

ABSOLUTE MAXIMUM RATINGS

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

IN Pin …..…….........……....................-0.3V to 32V

OUT Pin ....-0.3V to IN+0.3V

OVLO Pin …………….…………………………..6V

IN Current (10mS) …………….…...…………… 6A

IN Current (Continues) ….……….…….………. 3A

Operating Temperature Range ……....…–40°C to 85°C

Storage Temperature Range …………–55°C to 150°C

Thermal Resistance θ_{JA}

CSP2x3-6……………..…..120…….…..………°C /W

SOT23-5……………….......180………..……….°C /W

Lead Temperature (Soldering, 10ssec) ………..260°C

ESD HBM (Human Body Mode) …………..….….2KV

ELECTRICAL CHACRACTERISTICS

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

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT Operation					
INPUT Range		4.1		28	V
INPUT UVLO	Rising, Hys=300mV		3.84		V
INPUT Quiescent Current	V_{IN}=5V OUT floating		130		µA
OVP					
Vin_ovlo	Internal over voltage trip level, rising	6.528	6.8	7.072	V
Vin_ovlo_hys	Internal over voltage trip level, hysteresis		0.53		V
Vovlo_th	OVLO pin threshold	1.145	1.2	1.255	V
Vovlo_sel	External OVLO select threshold		0.3		V
RDSON	Switch On Resistance. VIN=5V, IOUT=1A, 25°C		45		mΩ
Iovlo	OVLO pin input current. Vovlo=2V		0.41		µA
Rdis	VOUT discharge resistance		197		Ω
Thermal shutdown	V_{IN}=5V OUT floating		130		°C
Thermal shutdown hysteresis	V_{IN}=5V OUT floating		20		°C
Dynamic Characteristics					
Tpower-on	Power ON delay V_{IN} > UVLO to 90% V_{OUT}		20		mS
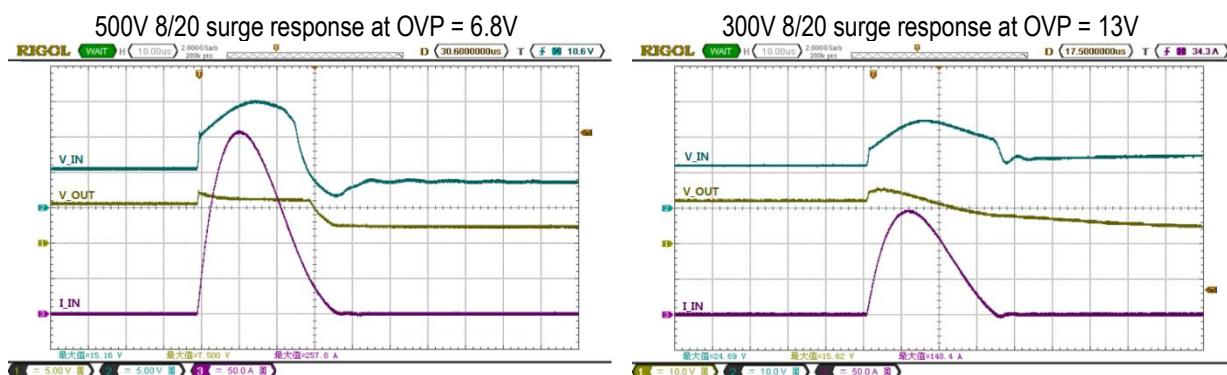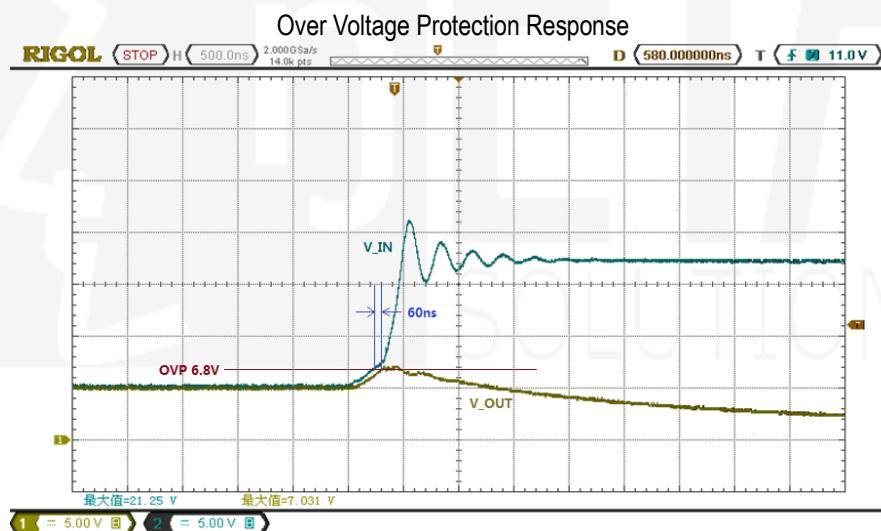
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Tovp	Over-voltage response time. $V_{IN}>V_{OVLO}$ to V_{OUT} stop rising		60		nS

PIN DESCRIPTION

PIN #	PIN	NAME	DESCRIPTION
A1,B1	4	IN	Input pin. Bypass with a 1μF capacitor to GND.
A2,B2	3	OUT	Output Power Pin.
C1	5	OVLO	External OVLO adjustment. Connect OVLO to GND when using the internal threshold. Connect a resister divider to OVLO to set a different OVLO threshold.
C2	2	GND	Ground Pin.
NA	1	NC	Not Connect.

TYPICAL CHARACTERISTICS

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

Over Voltage Protection Response

500V 8/20 surge response at OVP = 6.8V

300V 8/20 surge response at OVP = 13V

APPLICATION INFORMATION

Over Voltage Threshold Setting

The Over-Voltage-Protection trip point can be externally set by the OVLO pin. Connecting a resistor divider from IN to OVLO to ground sets up the OVP trip point. The OVLO has a typical threshold of 1.20V. Connect this pin to ground, the OVP threshold is internally set at 6.8V

UVLO

There is a UVLO feature that the input voltage has to rise above the UVLO threshold typically 3.84V to turn on the switch.
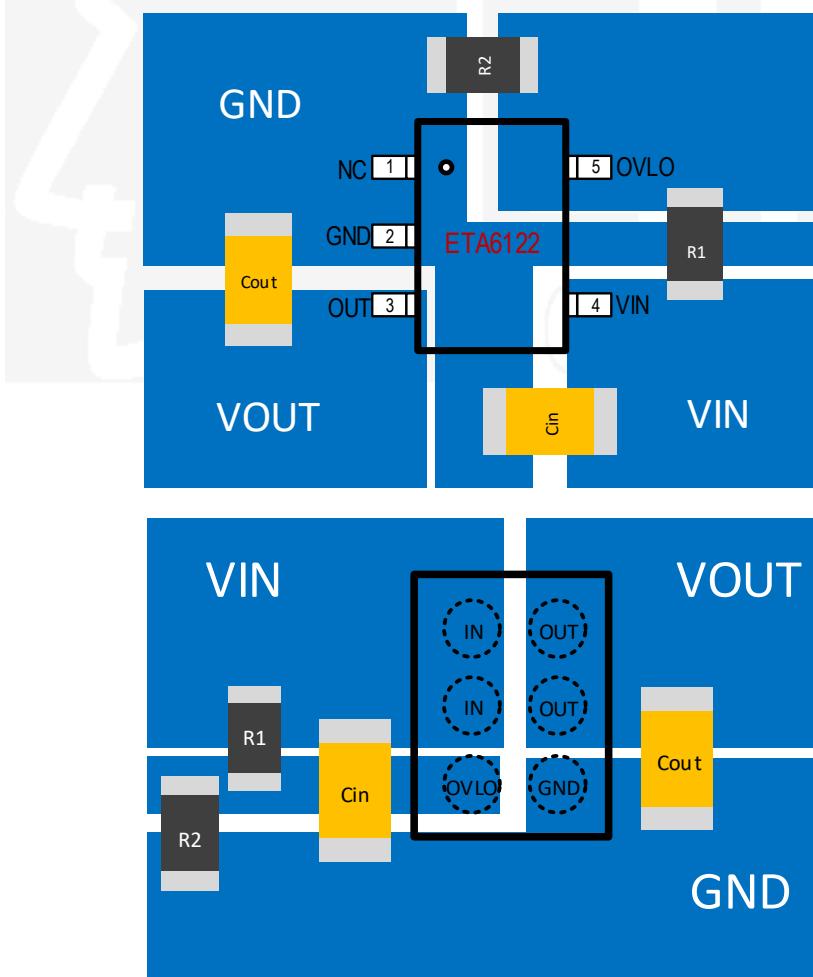
Over Current Protection and Hiccup mode

When the output is overloaded, or the current limit is reached, the IC goes into a hiccup mode to protect the IC from overheating.

Thermal Shutdown
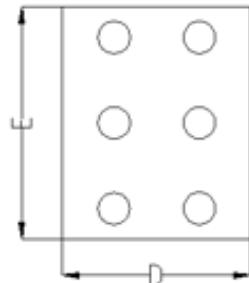
Thermal-overload protection limits total power dissipation in the device. When the junction temperature exceeds T_J= +130°C, a thermal sensor forces the device into shutdown, allowing the die to cool. The thermal sensor turns the device on again after the junction temperature cools by 20°C, resulting in a pulsed output during continuous overload conditions.

PCB GUIDELINES
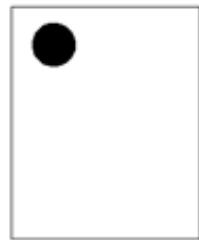
PACKAGE OUTLINE
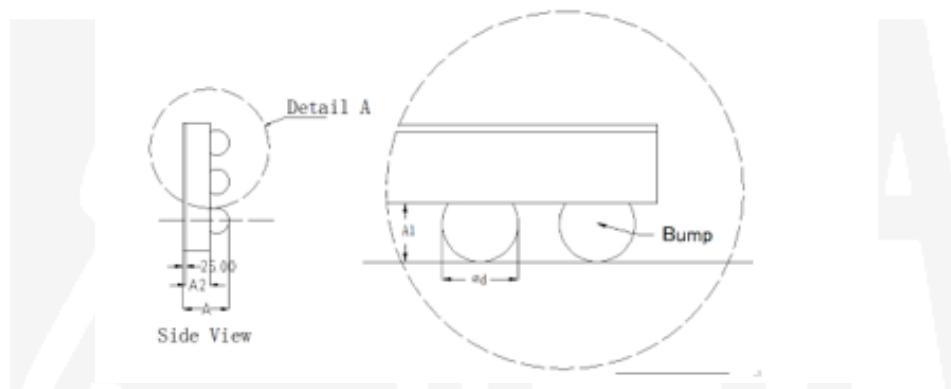
Package: CSP2x3-6

Bottom View(Bump side up)   Top View(Bump side down)
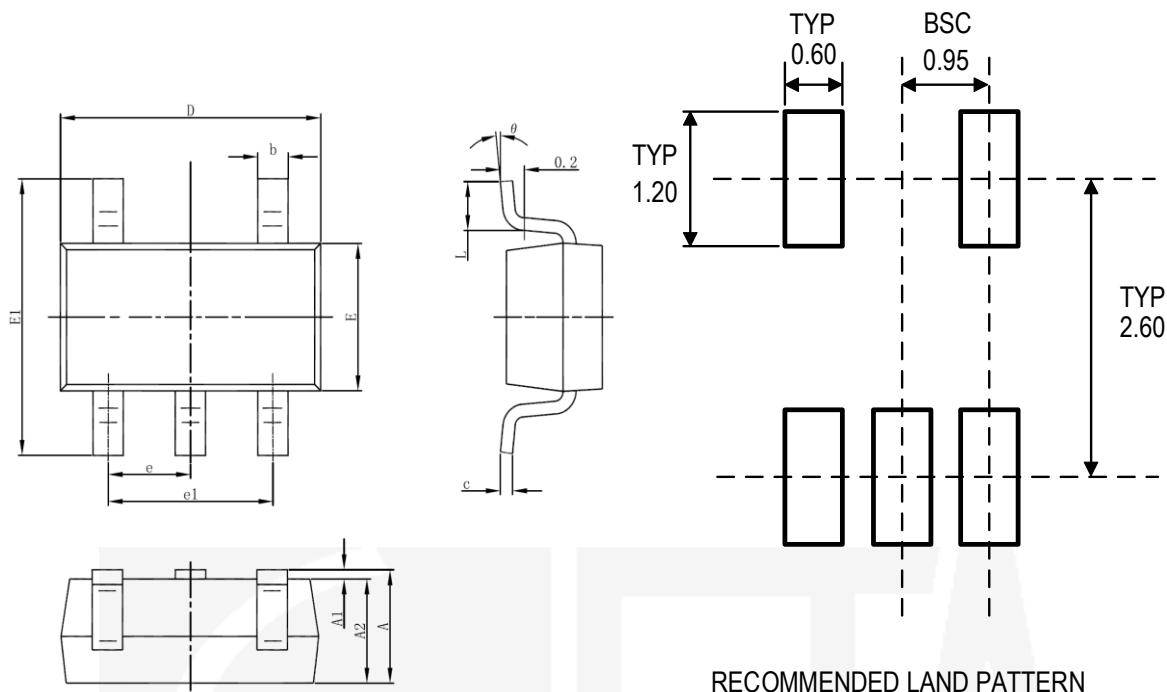
Detail A

Side View

SYMBOL	DIMENSIONS(mm)		
	MIN	NOM	MAX
A	0.49	0.52	0.55
A1	0.12	0.14	0.16
A2	0.3425	0.355 (Si)	0.3675
E	1.04	1.06	1.08
D	0.834	0.854	0.874
Min Pitch	0.4		
d	0.16	0.18	0.2

ETA6122
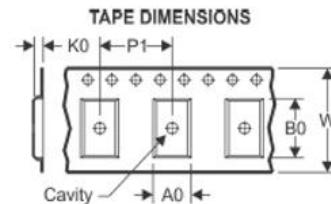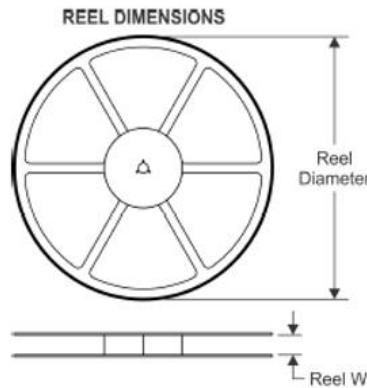
Package: SOT23-5
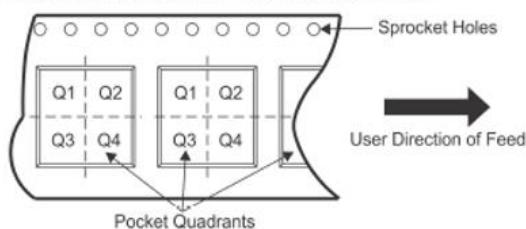
RECOMMENDED LAND PATTERN

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°

ETA6122

TAPE AND REEL INFORMATION

REEL DIMENSIONS

TAPE DIMENSIONS

A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

Device	Package Type	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
ETA6122S2F	SOT23-5	5	3000	180	9.5	3.17	3.23	1.37	4	8	Q3
ETA6122CSG	CSP2x3-6	6	3000	178	9.5	0.95	1.2	0.62	4	8	Q1