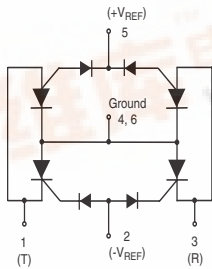


Batrax[®] Single Port Positive/Negative SLIC Protector

RoHS

Littelfuse[®]



This six-pin surface mount package contains programmable protection devices for both negative and positive voltage references.

It is constructed using four SCRs and four gate diodes. The SCRs conduct when a voltage that is more negative than $-V_{REF}$ or more positive than $+V_{REF}$ is applied to Pin 1 or 3 of the SCR. During conduction, the SCRs appear as a low-resistive path which forces all transients to be shorted to ground.

For a diagram of a *Batrax* application, see Figure 6.49 in Section 6, "Reference Designs" of this *Telecom Design Guide*.

SIDACtor Devices

Electrical Parameters

Part Number *	V_{DRM} Volts	V_S Volts	V_T Volts	I_{DRM} μ Amps	I_{GT} mAmps	I_T Amps	I_H mAmps
B3104U_L	$ -V_{REF} + \pm 1.2V $	$ -V_{REF} + \pm 10V $	4	5	100	2.2	100
B3164U_L	$ -V_{REF} + \pm 1.2V $	$ -V_{REF} + \pm 10V $	4	5	100	2.2	160
B3204U_L	$ -V_{REF} + \pm 1.2V $	$ -V_{REF} + \pm 10V $	4	5	100	2.2	200

* "L" in part number indicates RoHS compliance. For non-RoHS compliant device, delete "L" from part number. For individual "UA" and "UC" surge ratings, see table below.

General Notes:

- All measurements are made at an ambient temperature of 25 °C. I_{PP} applies to -40 °C through +85 °C temperature range.
- I_{PP} is a repetitive surge rating and is guaranteed for the life of the product.
- I_{PP} ratings assume a $V_{REF} = \pm 48$ V.
- V_{DRM} is measured at I_{DRM} .
- V_S is measured at 100 V/ μ s.
- Positive *Batrax* information is preliminary data.
- V_{REF} maximum value for the negative *Batrax* is -200 V.
- V_{REF} maximum value for the positive *Batrax* is 110 V.

Surge Ratings in Amps

Series	I_{PP}									I_{TSM} 50 / 60 Hz	di/dt
	0.2x310 * 0.5x700 **	2x10 * 2x10 **	8x20 * 1.2x50 **	10x160 * 10x160 **	10x560 * 10x560 **	5x320 * 9x720 **	10x360 * 10x360 **	10x1000 * 10x1000 **	5x310 * 10x700 **		
	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps/ μ s
A	20	150	150	90	50	75	75	45	75	20	500
C	50	500	400	200	150	200	175	100	200	50	500

* Current waveform in μ s

** Voltage waveform in μ s

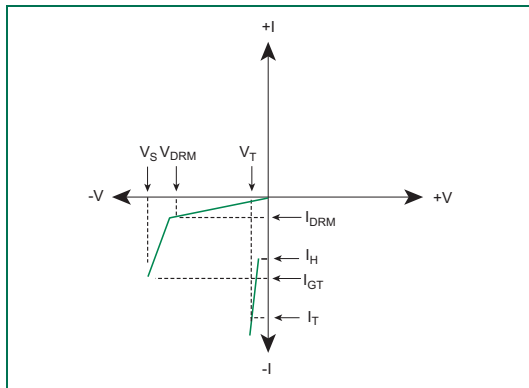
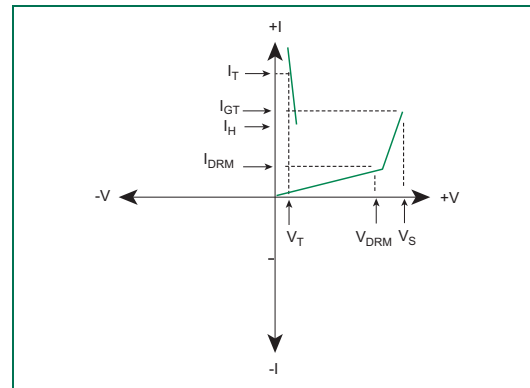
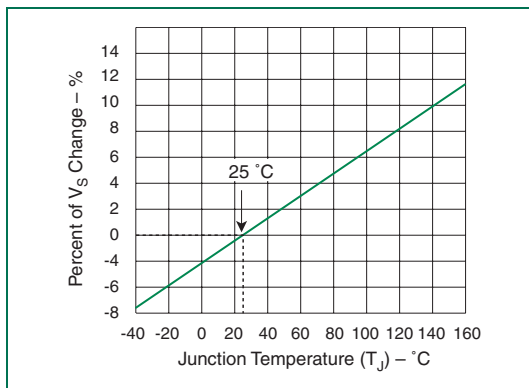
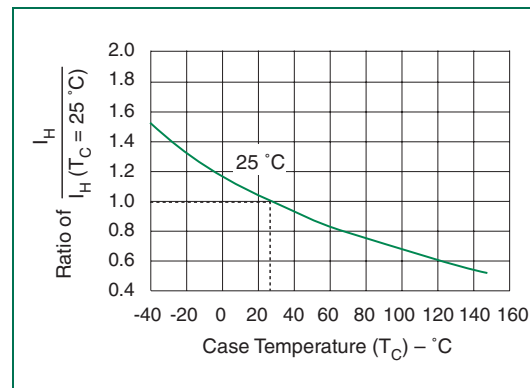


Thermal Considerations

Package	Symbol	Parameter	Value	Unit
	T_J	Operating Junction Temperature Range	-40 to +125	°C
	T_S	Storage Temperature Range	-65 to +150	°C
	$R_{\theta JA}$	Thermal Resistance: Junction to Ambient	60	°C/W

Capacitance Values

Part Number	pF	
	MIN	MAX
B3104UAL	50	200
B3104UCL	50	200
B3164UAL	50	200
B3164UCL	50	200
B3204UAL	50	200
B3204UCL	50	200

 Note: Off-state capacitance (C_O) is measured at 1 MHz with a 2 V bias.

 V-I Characteristics for Negative *Batrax*

 $t_r \times t_d$ Pulse Waveform

 Normalized V_S Change versus Junction Temperature


Normalized DC Holding Current versus Case Temperature