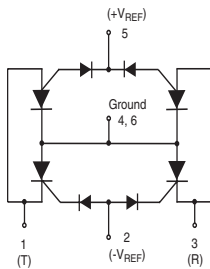


## Battrax<sup>®</sup> Single Port Positive/Negative SLIC Protector



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 *Battrax* 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	$I_{DRM}$ $\mu$ Amps	$I_{GT}$ mAmps	$I_T$ Amps	$I_H$ mAmps
<b>B3104U_L</b>	$ -V_{REF}  +  \pm 1.2V $	$ -V_{REF}  +  \pm 10V $	4	5	100	2.2	100
<b>B3164U_L</b>	$ -V_{REF}  +  \pm 1.2V $	$ -V_{REF}  +  \pm 10V $	4	5	100	2.2	160
<b>B3204U_L</b>	$ -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/ $\mu$ s.
- Positive *Battrax* information is preliminary data.
- $V_{REF}$  maximum value for the negative *Battrax* is -200 V.
- $V_{REF}$  maximum value for the positive *Battrax* 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/ $\mu$ 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  $\mu$ s

\*\* Voltage waveform in  $\mu$ s

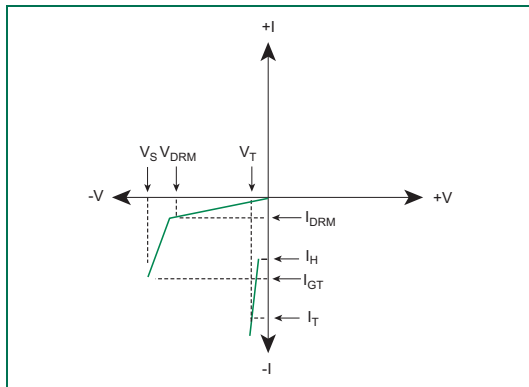
**Thermal Considerations**

Package	Symbol	Parameter	Value	Unit
	T <sub>J</sub>	Operating Junction Temperature Range	-40 to +125	°C
	T <sub>S</sub>	Storage Temperature Range	-65 to +150	°C
	R <sub>θJA</sub>	Thermal Resistance: Junction to Ambient	60	°C/W

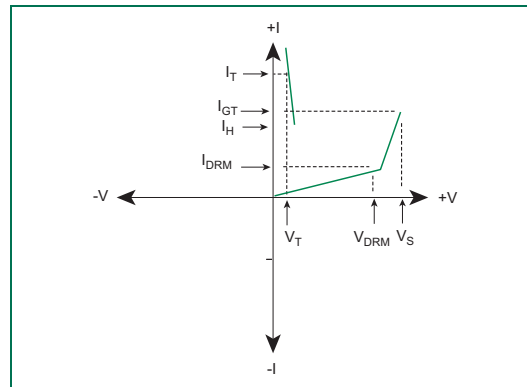
**Capacitance Values**

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

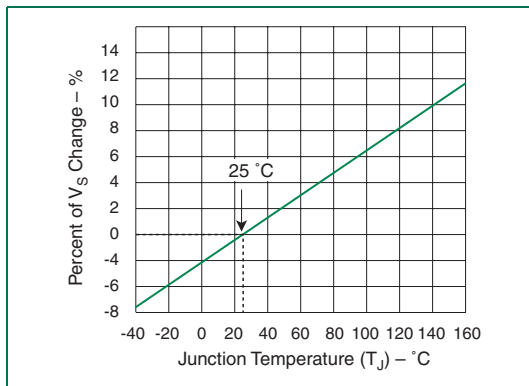
Note: Off-state capacitance (C<sub>O</sub>) is measured at 1 MHz with a 2 V bias.



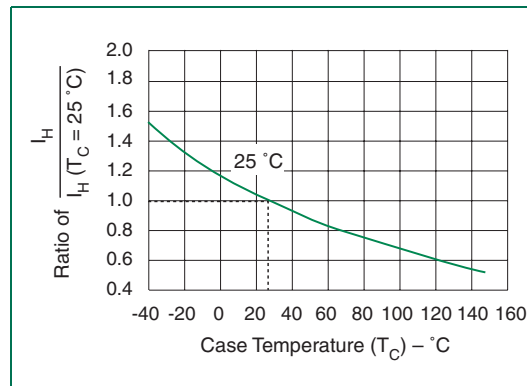
V-I Characteristics for Negative Battrax



t<sub>r</sub> x t<sub>d</sub> Pulse Waveform



Normalized V<sub>S</sub> Change versus Junction Temperature



Normalized DC Holding Current versus Case Temperature