



**Solid State Devices, Inc.**

14830 Valley View Blvd \* La Mirada, Ca 90638  
 Phone: (562) 404-7855 \* Fax: (562) 404-1773  
 ssdi@ssdi-power.com \* www.ssdi-power.com

**Designer's Data Sheet**

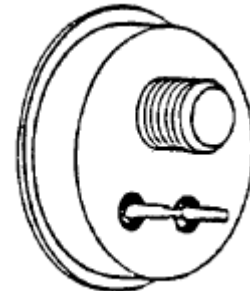
**FEATURES:**

- Power Dissipation 1 kW @ 25°C Case
- Extremely Large SOA
- Ultra Fast Switching,  $t_s = 100$  ns typical (Outperforms IGBT)
- OFHC Copper Package
- Ideal for Motor Control/Power Systems
- Extremely Low  $R_{\theta JC}$ : 0.1°C/W
- Can Be Driven From Low Level Logic
- Higher Current and Voltages Available. Consult Factory
- Alternate Packages Available. Consult Factory.
- TX, TX-V, and S-Level Screening Available. Consult Factory.

**SHA489**

**IGBT REPLACEMENT  
 ULTRA FAST SWITCHING DEVICE**

**200 Amps  
 250 Volts  
 1000 Watts**



MAXIMUM RATINGS	Symbol	Value	Units
Output Voltage (Collector – Emitter)	$V_{3-1}$	250	V
Out/In Isolation (Collector – Gate)	$V_{3-2}$	250	V
Input Voltage (Gate – Emitter)	$V_{2-1}$	±20	V
Current Sink Capabilities (peak)	$I_3$	200	A
Input Current (transistor switched off)*	$I_2$	-5	A
Total Device Power Dissipation @ $T_c = 25^\circ\text{C}$ Derate above 75°C	$P_D$	1000 8	W W/°C
Storage Temperature	$T_{stg}$	-55 to +150°C	°C

THERMAL CHARACTERISTICS	Symbol	Value	Units
Thermal Resistance (Junction – Case) Power Section	$R_{\theta JC}$	0.1	°C/W

ELECTRICAL CHARACTERISTICS	Symbol	Min	Max	Units
Output Breakdown (Collector – Emitter) ( $I_3 = 10$ mA, $V_{2-1} = -4$ V)	$BV_{3-1}$	250	—	Volts
Out/In Isolation (Collector – Gate) ( $I_3 = 300$ $\mu\text{A}$ , $I_1 = 0$ V)	$BV_{3-2}$	250	—	Volts
Input Breakdown Voltage ( $I_1 = -100$ $\mu\text{A}$ , $I_3 = 0$ V) ( $I_1 = 100$ $\mu\text{A}$ , $I_3 = 0$ V)	$BV_{2-1}$	19 -8	22 —	Volts
Output Leakage Current ( $V_{2-1} = -4$ V, $V_{3-1} \leq 250$ V)	$I_3$	—	5	mA

**NOTE:** All specifications are subject to change without notification. SCD's for these devices should be reviewed by SSDI prior to release.

**DATA SHEET #: PM0020A**

**DOC**



**Solid State Devices, Inc.**

14830 Valley View Blvd \* La Mirada, Ca 90638  
 Phone: (562) 404-7855 \* Fax: (562) 404-1773  
 ssdi@ssdi-power.com \* www.ssdi-power.com

**SDA489**

ELECTRICAL CHARACTERISTICS		Symbol	Min	Max	Units	
Saturation Voltage	( $I_3 = 100 \text{ A}_{DC}, V_{2-1} = 12 \text{ V}$ )*	$V_{3-1}(\text{SAT})$	—	3.2	Volts	
	( $I_3 = 200 \text{ A}_{DC}, V_{2-1} = 12 \text{ V}$ )		—	7.0		
	( $I_3 = -100 \text{ A}_{DC}, V_{2-1} = -4 \text{ V}$ )*		—	1.6		
Output Reverse Recovery	( $I_F = I_3 = 0.5 \text{ A}, I_R = I_3 = -1 \text{ A}, \text{ to } I_{RR} = I_3 = 0.25 \text{ A}$ )	$t_{rr}$	—	70	ns	
Capacitance	Output ( $V_{3-1} = 10 \text{ V}, V_{2-1} = -4 \text{ V}$ )	$C_{3-1}$	—	5000	pF	
	Input ( $V_{3-1} = 0 \text{ V}, V_{2-1} = 0 \text{ V}$ )	$C_{2-1}$	—	5000		
SOA No Heatsink	( $I_3 = 100 \text{ A}_{DC}, V_{2-1} = 12 \text{ V}$ ) ( $I_3 = 60 \text{ A}_{DC}, V_{2-1} = 12 \text{ V}$ )		—	1 6	sec	
On Time	$V_{3-1} = 100 \text{ V}_{DC}, I_3 = 10 \text{ A}$ Load Limited, $V_{2-1}$ adjusted for 20 A $I_3$ without load = ( $I_{B1}$ ), $I_2 = (I_{B2}) = 2 \text{ A}$	$t_{(on)}$	$t_d$	—	500	ns
Storage Time			$t_r$			
Fall Time		$t_{(off)}$	$t_s$	—	200	ns
			$t_f$	—	250	ns

**NOTES:**  
 \* Pulse Test: Pulse Width = 300µsec, Duty Cycle = 2%  
 1. Maximum forward voltage measured with instantaneous forward pulse of 300 µsec minimum.  
 2. Unless Otherwise Specified, All Electrical Characteristics @25°C

**PACKAGE OUTLINE: SHA489**

PHYSICAL DIMENSIONS

Schematic Drawing

**Available Part Numbers**  
**SHA489**

PIN ASSIGNMENT (Standard)			
Package	Collector	Emitter	Gate
SHA489	Pin 3	Pin 1	Pin 2