Solid State Devices, Inc.
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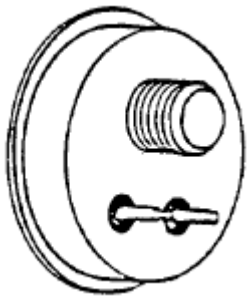
SHA489

IGBT REPLACEMENT
ULTRA FAST SWITCHING DEVICE
200 Amps
250 Volts
1000 Watts

Designer's Data Sheet

FEATURES:

- **Power Dissipation 1 kW @ 25°C Case**
- **Extremely Large SOA**
- **Ultra Fast Switching, ts = 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.**



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 = 25ºC Derate above 75ºC	P_D	1000 8	W W/ºC
Storage Temperature	T_{stg}	-55 to +150°C	ºC

THERMAL CHARACTERISTICS	Symbol	Value	Units
Thermal Resistance (Junction – Case) Power Section	$R_{\theta JC}$	0.1	ºC/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 µA, I_1 = 0 V)	BV_{3-2}	250	—	Volts
Input Breakdown Voltage	(I_1 = -100 µA, I_3 = 0 V) (I_1 = 100 µA, 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

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SDA489

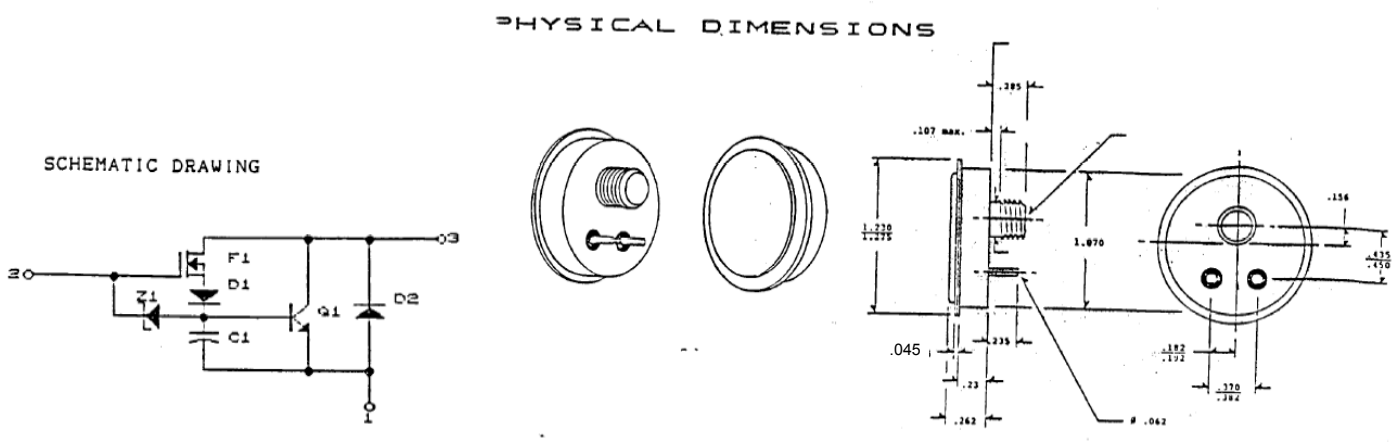
ELECTRICAL CHARACTERISTICS		Symbol		Min	Max	Units
Saturation Voltage	(I_3 = 100 A_{DC}, V_{2-1} = 12 V)* (I_3 = 200 A_{DC}, V_{2-1} = 12 V) (I_3 = -100 A_{DC}, V_{2-1} = -4 V)*	$V_{3-1\ (SAT)}$		— — —	3.2 7.0 1.6	Volts
Output Reverse Recovery	(I_F = I_3 = 0.5 A, I_R = I_3 = -1 A, to I_{RR} = I_3 = 0.25 A)	t_{rr}		—	70	ns
Capacitance	Output (V_{3-1} = 10 V, V_{2-1} = -4 V) Input (V_{3-1} = 0 V, V_{2-1} = 0 V)	C_{3-1} C_{2-1}		— —	5000 5000	pF
SOA **No Heatsink**	(I_3 = 100 A_{DC}, V_{2-1} = 12 V) (I_3 = 60 A_{DC}, V_{2-1} = 12 V)			— —	1 6	sec
On Time	V_{3-1} = 100 V_{DC}, I_3 = 10 A Load Limited, V_{2-1} adjusted for 20 A I_3 without load = (I_{B1}), I_2 = (I_{B2})= 2 A	$t_{(on)}$	t_d	—	500	ns
			t_r			
Storage Time		$t_{(off)}$	t_s	—	200	ns
Fall Time			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 @25ºC

PACKAGE OUTLINE: SHA489



Available Part Numbers

SHA489

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