

Product data sheet

1. General description

Planar passivated Silicon Controlled Rectifier (SCR) in a SOT78 (TO-220AB) plastic package intended for use in applications requiring high bidirectional blocking voltage capability, high current inrush capability and high thermal cycling performance.

2. Features and benefits

- AC power control
- High bidirectional blocking voltage capability
- High thermal cycling performance
- Planar passivated for voltage ruggedness and reliability
- High junction operating temperature capability (T_{i(max)} = 150 °C)
- Package meets UL94V0 flammability requirement
- Package is RoHS compliant
- IEC 61000-4-4 fast transient

3. Applications

- Capacitive Discharge Ignition (CDI)
- Crowbar protection
- Inrush protection
- Motor control
- Voltage regulation
- High junction operating temperature capability (T_{j(max)} = 150 °C)

4. Quick reference data

Table 1. Quic	k reference data			
Symbol	Parameter	Conditions	Values	Unit
Absolute m	aximum rating			
V _{DRM}	repetitive peak off-state voltage		800	V
I _{T(RMS)}	RMS on-state current	half sine wave; T _{mb} ≤ 128°C; <u>Fig. 1</u> ; <u>Fig. 2; Fig. 3</u>	25	A
I _{TSM}	non-repetitive peak on- state current	half sine wave; $T_{j(init)} = 25 \text{ °C};$ $t_p = 10 \text{ ms}; \frac{\text{Fig. 4}}{25}; \frac{\text{Fig. 5}}{25}$	300	A
		half sine wave; $T_{j(init)} = 25 \text{ °C};$ $t_p = 8.3 \text{ ms}$	330	A
T _j	junction temperature		150	°C

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SCR

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Static cha	racteristics					
I _{GT}	gate trigger current	V_{D} = 12 V; I _T = 0.1 A; T _j = 25 °C; <u>Fig. 7</u>	1.5	-	10	mA
I _H	holding current	V _D = 12 V; T _j = 25 °C; <u>Fig. 9</u>	-	-	60	mA
V _T	on-state voltage	I _T = 30 A; T _j = 25 °C; <u>Fig. 10</u>	-	1.10	1.50	V
Dynamic	characteristics	·				
dV _D /dt	rate of rise of off-state voltage	V_{DM} = 536 V; T _j = 150 °C; (V _{DM} = 67% of V _{DRM}); exponential waveform; gate open circuit	80	-	-	V/µs

5. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	К	cathode	mb	А 🕂 К
2	А	anode		G sym037
3	G	gate		Symoor
mb	A	mounting base; connect to anode		

6. Ordering information

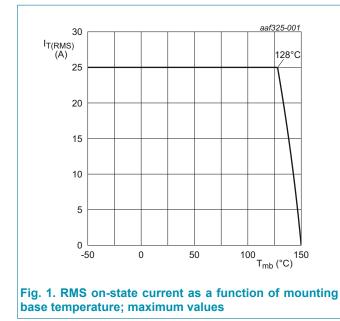
Table 3. Ordering information						
Type number	Package	(age				
	Name	Description	Version			
BT145-800RT	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78			

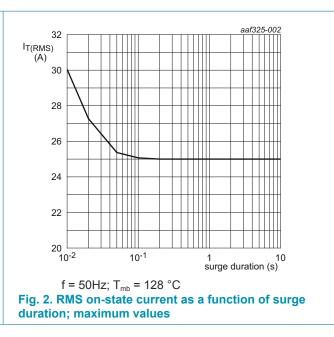
7. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

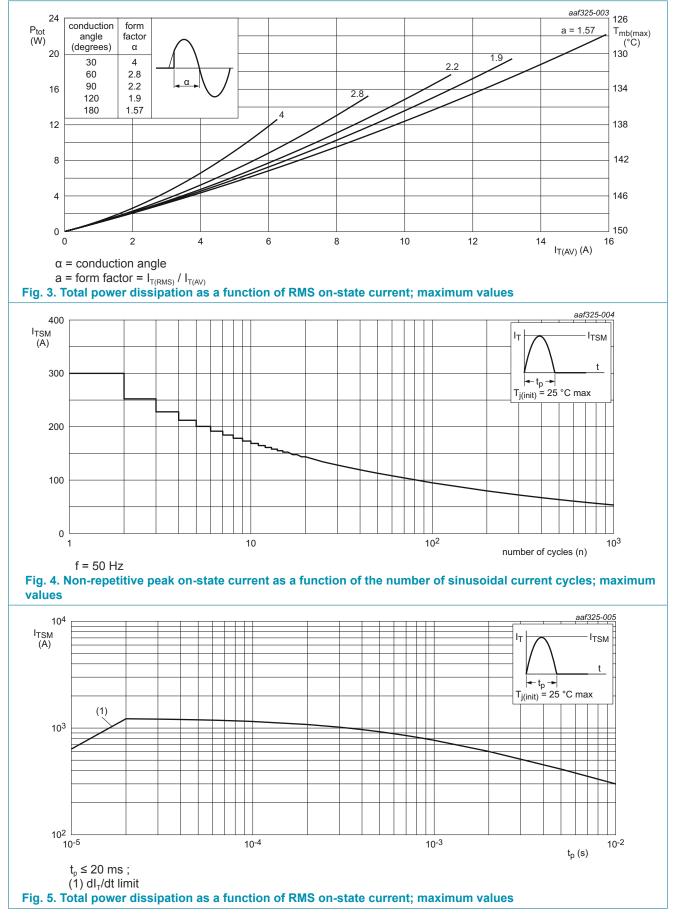
Symbol	Parameter	Conditions	Values	Unit
V_{DRM}	repetitive peak off-state voltage		800	V
V_{RRM}	repetitive peak reverse voltage		800	V
I _{T(AV)}	average on-state current	half sine wave; T _{mb} ≤ 128°C;	16	А
I _{T(RMS)}	RMS on-state current	half sine wave; T _{mb} ≤ 128°C; <u>Fig. 1</u> ; <u>Fig. 2</u> ; <u>Fig. 3</u>	25	A
I _{TSM}	non-repetitive peak on- state current	half sine wave; $T_{j(init)}$ = 25 °C; t_p = 10 ms; Fig. 4; Fig. 5	300	A
		half sine wave; $T_{j(init)}$ = 25 °C; t_p = 8.3 ms	330	A
l²t	I ² t for fusing	t _p = 10ms; sine wave	450	A²s
dl _⊤ /dt	rate of rise of on-state current	I _G = 20mA	200	A/µs
I _{GM}	peak gate current		5	А
V_{GM}	peak gate voltage		5	V
P _{GM}	peak gate power		20	W
P _{G(AV)}	average gate power	over any 20 ms period	0.5	W
T _{stg}	storage temperature		-40 to 150	°C
Tj	junction temperature		150	°C





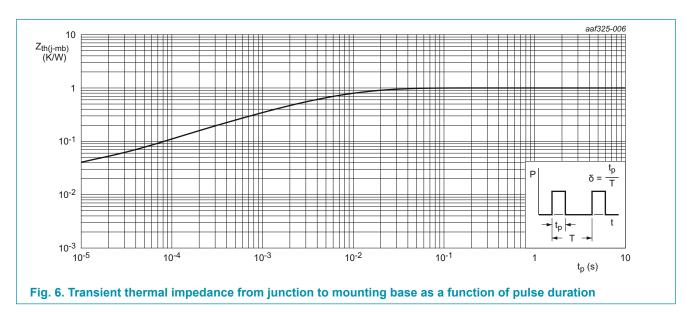
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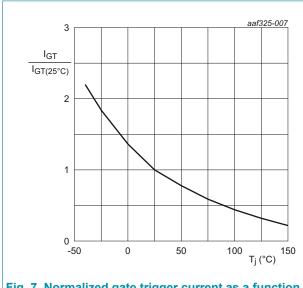
8. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$R_{\text{th(j-mb)}}$	thermal resistance from junction to mounting base	<u>Fig. 6</u>	-	-	1	K/W
$R_{\text{th(j-a)}}$	thermal resistance from junction to ambient free air	in free air	-	60	-	K/W



9. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
	racteristics			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	max	
I _{GT}	gate trigger current	V _D = 12 V; I _T = 0.1 A; T _i = 25 °C; <u>Fig. 7</u>	1.5	-	10	mA
I _L	latching current	V _D = 12 V; I _T = 0.1 A; T _j = 25 °C; <u>Fig. 8</u>	-	-	80	mA
I _H	holding current	V _D = 12 V; T _j = 25 °C; <u>Fig. 9</u>	-	-	60	mA
V _T	on-state voltage	I _T = 30 A; T _j = 25 °C; <u>Fig. 10</u>	-	1.10	1.50	V
V _{GT}	gate trigger voltage	$V_{D} = 12 \text{ V}; \text{ I}_{T} = 0.1 \text{ A}; \text{ T}_{j} = 25 \text{ °C};$ Fig. 11	-	0.6	1	V
		V _D = 400 V; I _T = 0.1 A; T _j = 125 °C; Fig. 11	0.25	0.4	-	V
I _D	off-state current	V _D = 800 V; T _j = 150 °C	-	-	2	mA
I _R	reverse current	V _D = 800 V; T _j = 150 °C	-	-	2	mA
Dynamic o	characteristics	·				_
dV _D /dt	rate of rise of off-state voltage	V_{DM} = 536 V; T _j = 150 °C; (V_{DM} = 67% of V_{DRM}); exponential waveform; gate open circuit	80	-	-	V/µs
t _{gt}	gate-controlled turn-on time	$I_{TM} = 40 \text{ A}; \text{ V}_{D} = 800 \text{ V}; \text{ I}_{G} = 0.1 \text{ mA}; \\ dI_{G}/dt = 5 \text{ A}/\mu\text{s}; \text{ T}_{j} = 25 ^{\circ}\text{C}$		2	-	μs
t _q	commutated turn-off time	$V_{DM} = 536 \text{ V}; \text{ T}_{j} = 125 \text{ °C}; \text{ I}_{TM} = 50 \text{ A};$ $V_{R} = 25 \text{ V}; \text{ dI}_{T}/\text{dt} = 30 \text{ A}/\mu\text{s}; \text{ dV}_{D}/\text{dt} = 50 \text{ V}/\mu\text{s}$		70	-	μs



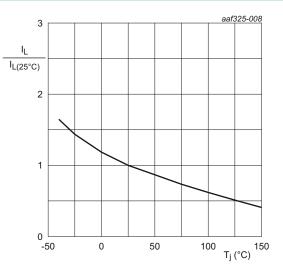
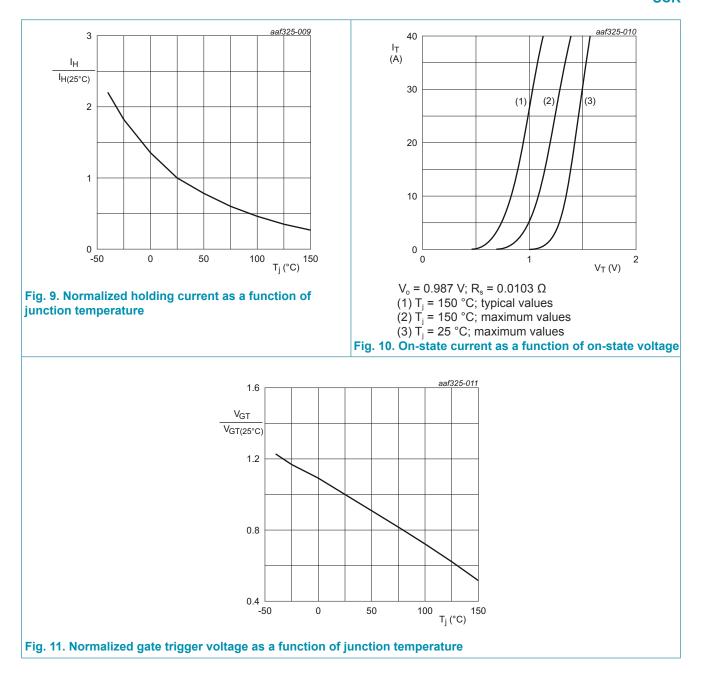


Fig. 7. Normalized gate trigger current as a function of junction temperature

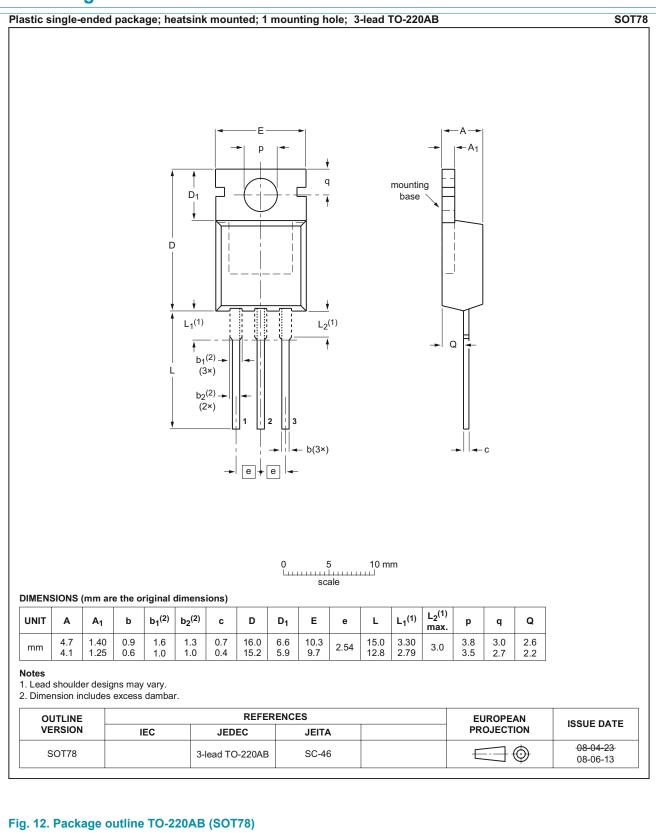


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10. Package outline



11. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

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