

SCSB501200WT

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SCSB501200WT

50A 1200V Power Schottky Silicon Carbide Diode

Features

- Zero reverse recovery current.
- Temperature independent switching.
- High frequency operation.
- Extremely fast switching.
- Higher efficiency.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates halogen free parts, ex. SCSB501200WT-H.

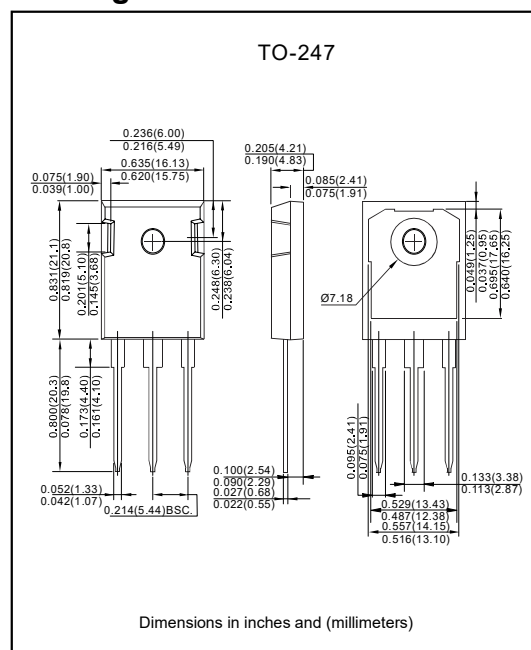
Applications

- Switch mode power supplies.
- Boost diodes in PFC or DC/DC stages.
- AC/DC converters.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, TO-247.
- Terminals: Solder plated, solder able per MIL-STD-750, Method 2026.

Package outline



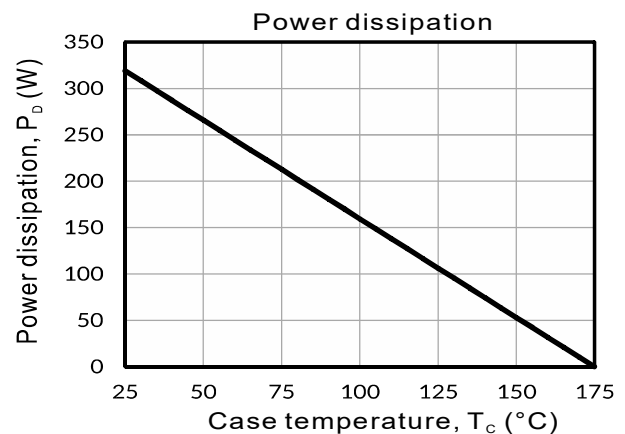
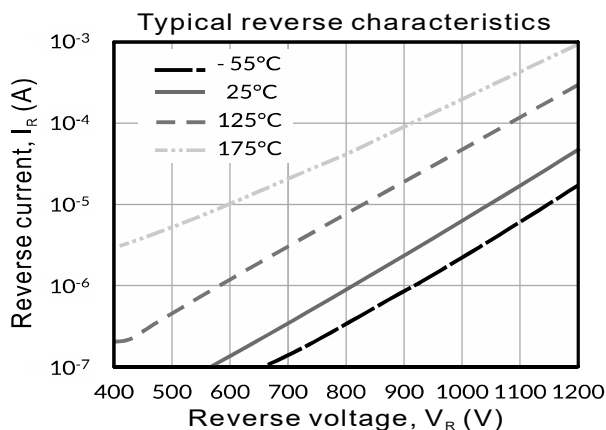
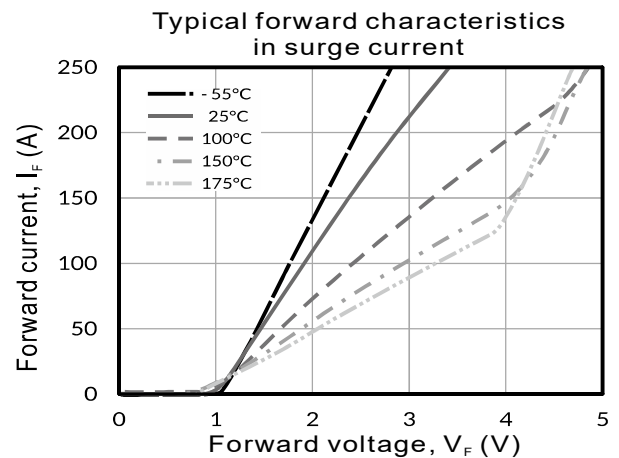
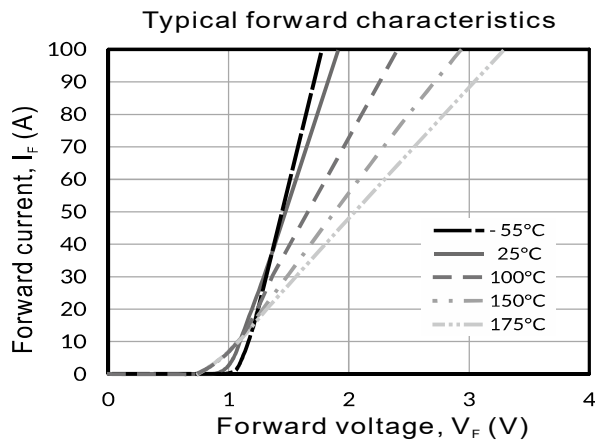
Maximum ratings (At $T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Repetitive peak reverse voltage ($T_j=25^\circ\text{C}$)	V_{RRM}	1200	V
Surge peak reverse voltage	V_{RSM}	1200	V
DC blocking voltage	V_R	1200	V
DC forward current ($T_c=112^\circ\text{C}$)	I_F	50	A
Non-repetitive peak forward surge current ($T_c=25^\circ\text{C}$, $t_p=10\mu\text{s}$) ($T_c=110^\circ\text{C}$, $t_p=10\mu\text{s}$)	$I_{F(max.)}$	2400	A
		2400	
Repetitive peak forward surge current ($T_c=25^\circ\text{C}$, $t_p=10\text{ms}$, $D=0.1$, sine half wave) ($T_c=110^\circ\text{C}$, $t_p=10\text{ms}$, $D=0.1$, sine half wave)	I_{FRM}	163.5	A
		99.6	
Non-repetitive peak forward surge current ($T_c=25^\circ\text{C}$, $t_p=10\text{ms}$, sine half wave)	I_{FSM}	275	A
		275	
Power dissipation ($T_c=25^\circ\text{C}$) ($T_c=112^\circ\text{C}$)	P_D	319	W
		134	
i^2t value ($T_c=25^\circ\text{C}$, $t_p=10\text{ms}$)	$\int i^2 dt$	378	A^2s
Thermal resistance, junction to case	$R_{\theta JC}$	0.47	$^\circ\text{C/W}$
Soldering temperatures, wavesoldering only allowed at leads (1.6mm from case for 10 seconds)	T_{Sld}	260	$^\circ\text{C}$
Operating junction temperature	T_J	+175	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to +175	$^\circ\text{C}$

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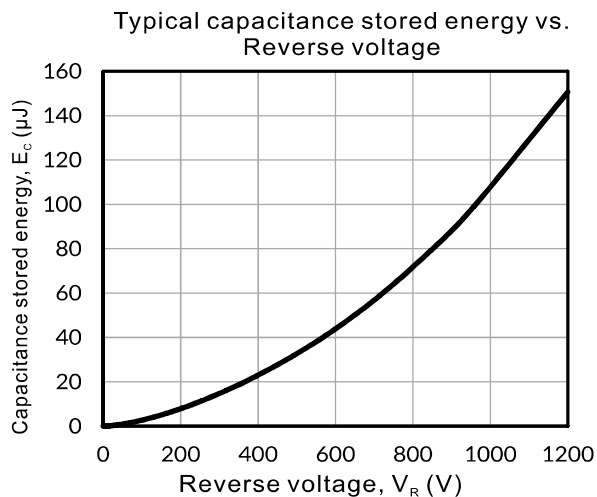
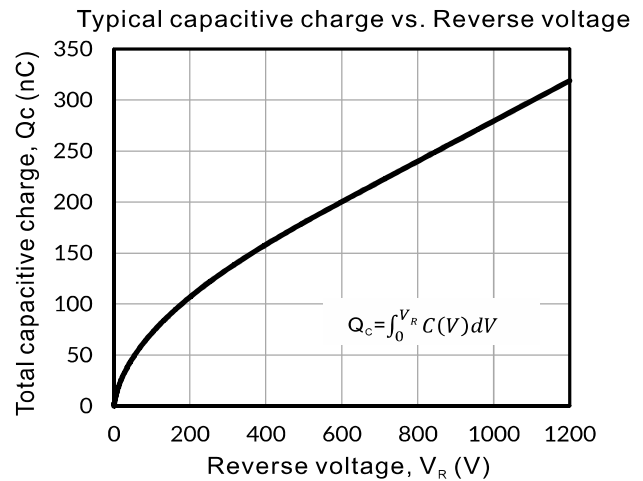
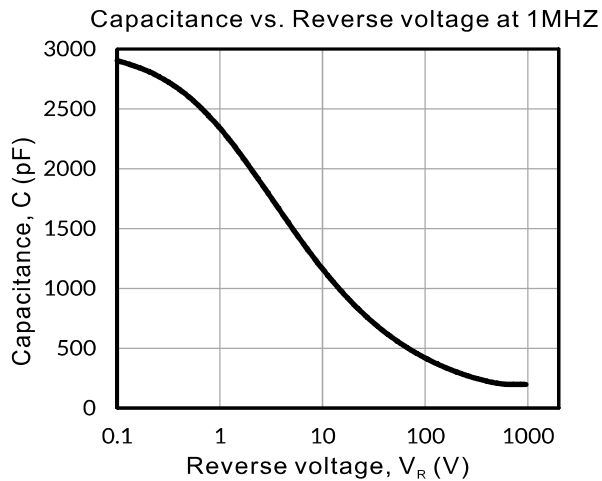
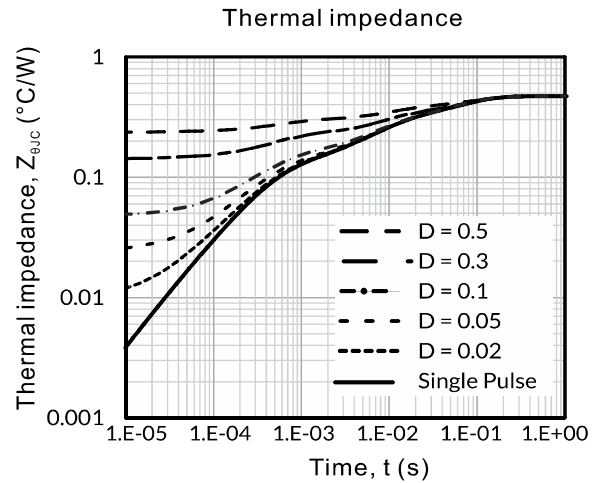
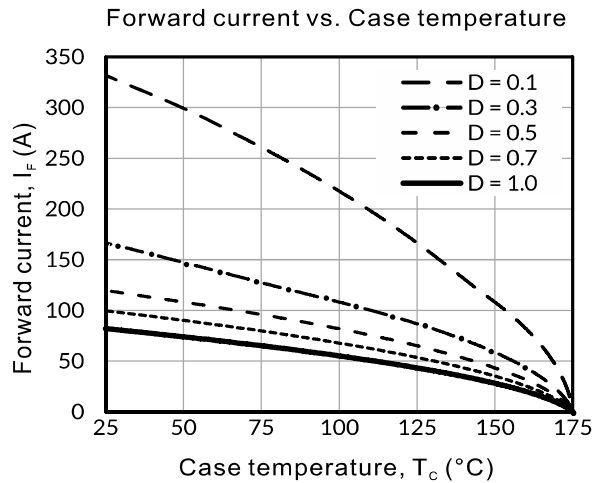
Electrical characteristics (At $T_J=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward voltage	V_F	$I_F = 50\text{A}$		1.5	1.7	V
		$I_F = 50\text{A}, T_J = 150^\circ\text{C}$		1.95	2.4	
		$I_F = 50\text{A}, T_J = 175^\circ\text{C}$		2.2	2.7	
Reverse current	I_R	$V_R = 1200\text{V}$		52	400	μA
		$V_R = 1200\text{V}, T_J = 175^\circ\text{C}$		900		
Total capacitance charge (Note1)	Q_C	$V_R = 800\text{V}$		240		nC
Total capacitance	C	$V_R = 1\text{V}, f=1.0\text{MHz}$		2340		pF
		$V_R = 400\text{V}, f=1.0\text{MHz}$		224		
		$V_R = 800\text{V}, f=1.0\text{MHz}$		198		
Capacitance stored energy	E_C	$V_R = 800\text{V}$		72		μJ

Rating and characteristic curves

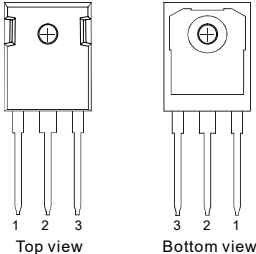
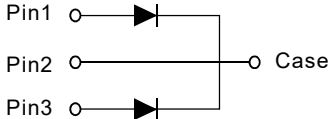
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Rating and characteristic curves



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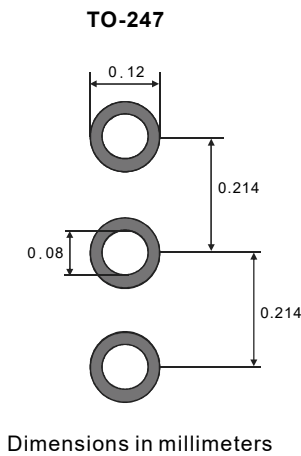
Pinning information

Pin	Simplified outline	Symbol
Pin1 Anode Pin2 Cathode Pin3 Anode		

Marking

Type number	Marking code
SCSB501200WT	FSC501200WT

Suggested solder pad layout



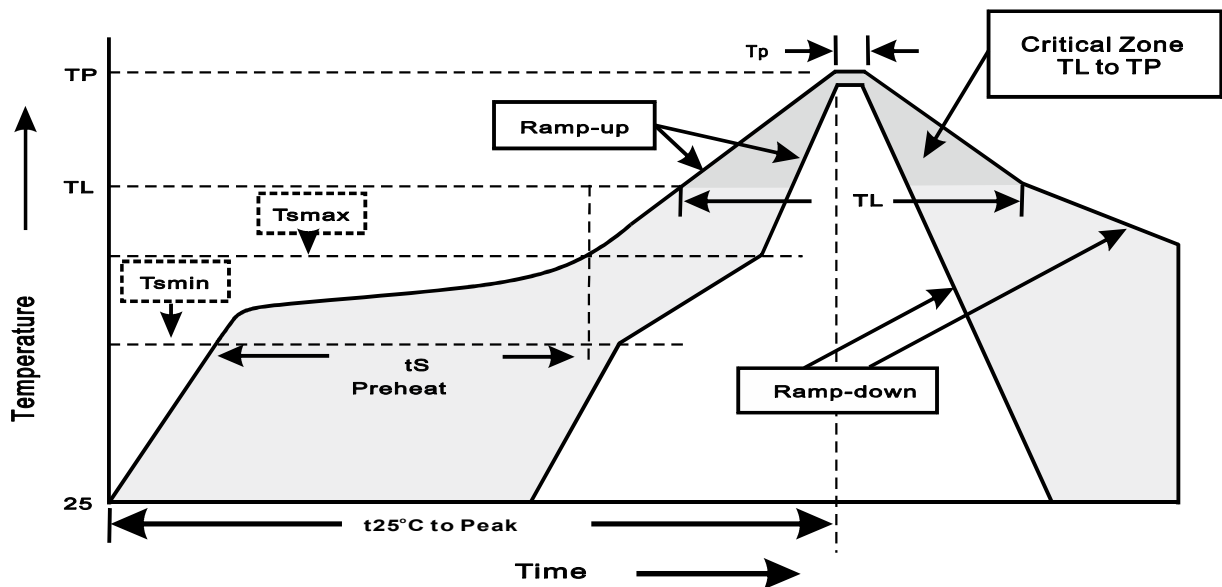
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Package information

Device	Outline	Device Package	Tube (PCS)	Inner Box (PCS)	Per Carton (PCS)
SCSB501200WT	Tube	TO-247	30	450	3,600

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min($T_{\text{smín}}$) -Temperature Max($T_{\text{smáx}}$) -Time(min to max)(t_s)	150°C 200°C 60~120sec
$T_{\text{smáx}}$ to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	$<3^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	<6minutes