

SCSB8A650J

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SCSB8A650J

8A, 650 V Power Schottky Silicon Carbide Diode

Features

- Zero reverse recovery current.
- Zero forward recovery voltage.
- Positive temperature coefficient on V_F .
- Temperature-independent switching.
- 175°C Operating junction temperature.
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC.
- Suffix "-H" indicates Halogen free parts, ex. SCSB8A650J-H.

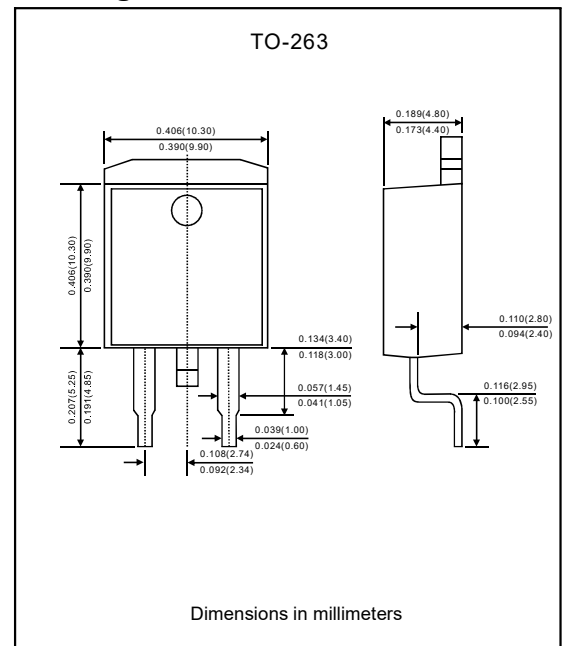
Applications

- Switch mode power supplies.
- Power factor correction.
- Motor drive, PV Inverter, Wind power station.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, TO-263.
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Polarity : Indicated by cathode band.
- Mounting Position : Any.

Package outline



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

Parameter	Symbol	Value	Unit
Maximum repetitive peak reverse voltage	V_{RRM}	650	V
Maximum RMS voltage	V_{RMS}	460	V
Maximum DC blocking voltage	V_{DC}	650	V
Continuous forward current (Current at $T_c \leq 25^\circ\text{C}$)	I_F	24	A
(Current at $T_c \leq 135^\circ\text{C}$)		11	
(Current at $T_c \leq 153^\circ\text{C}$)		8	
Non-repetitive peak forward surge current ($t_p=8.3\text{ms}$, Half sine wave)	I_{FSM}	72	A
Power dissipation ($T_c=110^\circ\text{C}$)	P_D	107	W
Thermal resistance from junction to ambient	$R_{\theta JA}$	80	$^\circ\text{C/W}$
Typical thermal resistance junction to case	$R_{\theta JC}$	1.16	$^\circ\text{C/W}$
Operating junction temperature range	T_J	+175	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +175	$^\circ\text{C}$
Soldering temperature	T_{sold}	260	$^\circ\text{C}$

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

Parameter	Symbol	Test conditions	Typ.	Max.	Unit
Forward voltage	V_F	$I_F = 8\text{A}$	1.40	1.65	V
		$I_F = 8\text{A}, (T_J = 175^\circ\text{C})$	1.70	2.30	
Reverse current	I_R	$V_R = 650\text{V}$	1	20	μA
		$V_R = 650\text{V} (T_J = 175^\circ\text{C})$	5	100	μA
Total capacitive charge	Q_C	$V_R = 650\text{V}, I_F=8\text{A}, di/dt = 200\text{A}/\mu\text{s}$	22		nC
Total capacitance	C_J	$V_R = 0\text{V}, f = 1\text{MHz},$	520		pF
		$V_R = 200\text{V}, f = 1\text{MHz}$	50		
		$V_R = 400\text{V}, f = 1\text{MHz}$	41		

Rating and characteristic curves

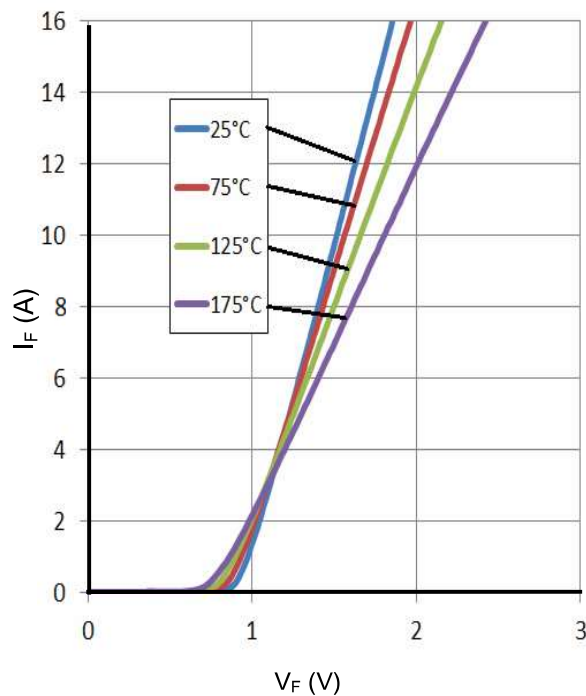


Figure 1. Forward Characteristics

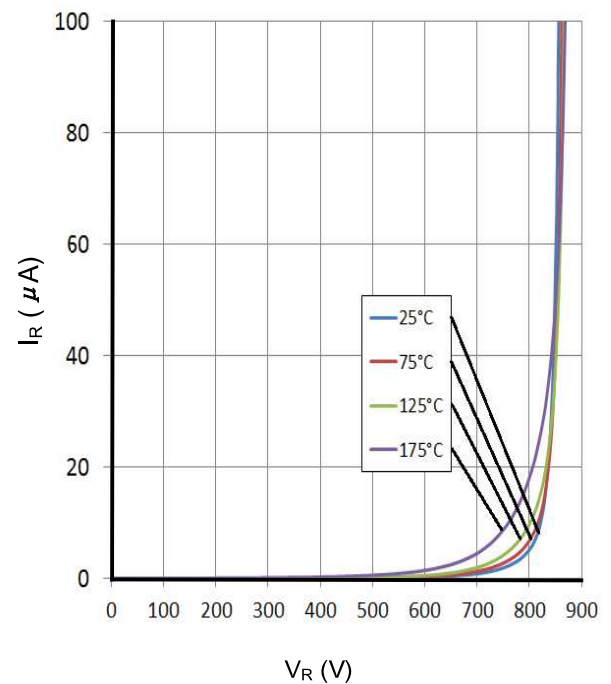


Figure 2. Reverse Characteristics

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Rating and characteristic curves

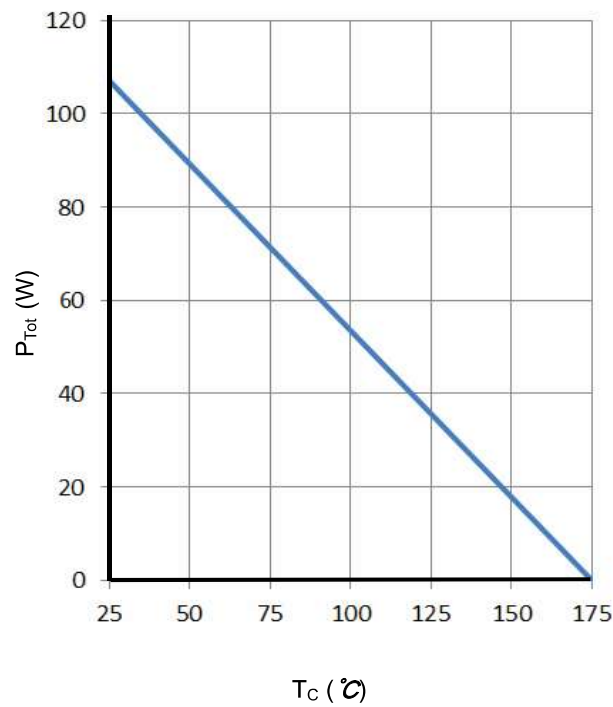


Figure 3. Power Derating

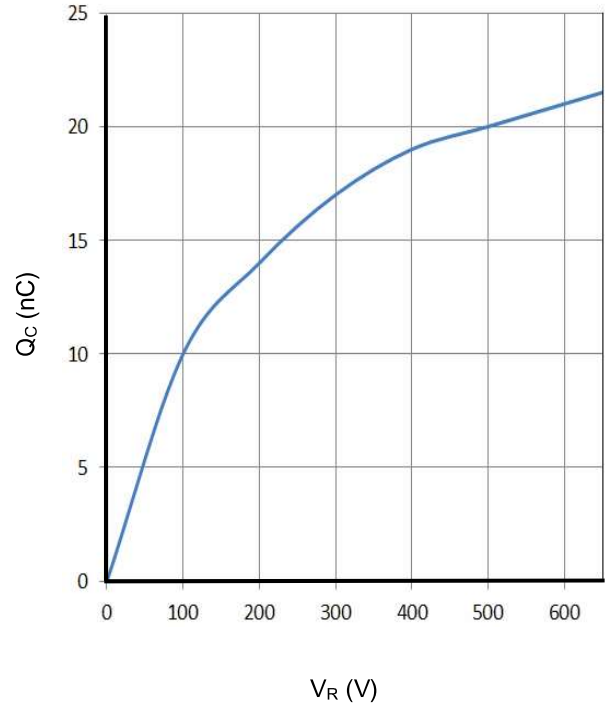


Figure 4. Total Capacitive Charge vs. Reverse Voltage

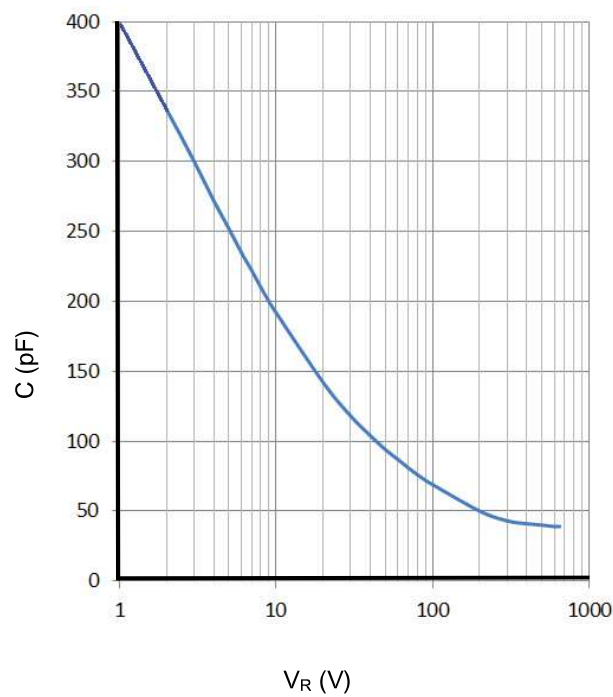


Figure 5. Total Capacitance vs. Reverse Voltage

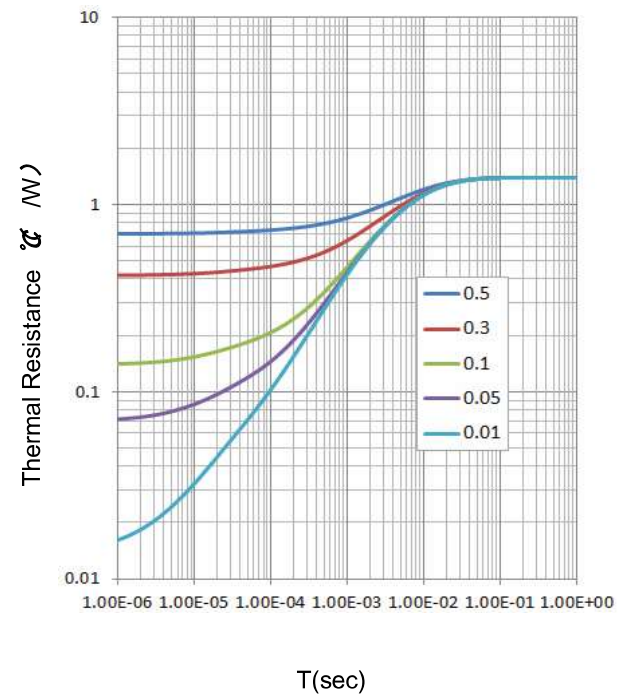
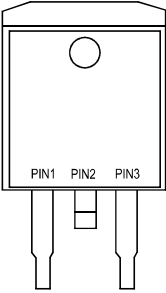
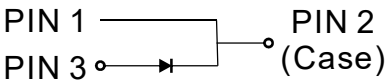


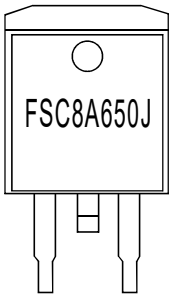
Figure 6. Transient Thermal Impedance

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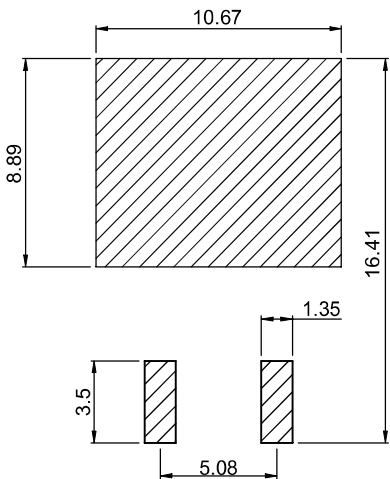
Pinning information

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Cathode Pin3 Anode		

Marking



Suggested solder pad layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.1 mm.
3.The pad layout is for reference purposes only.

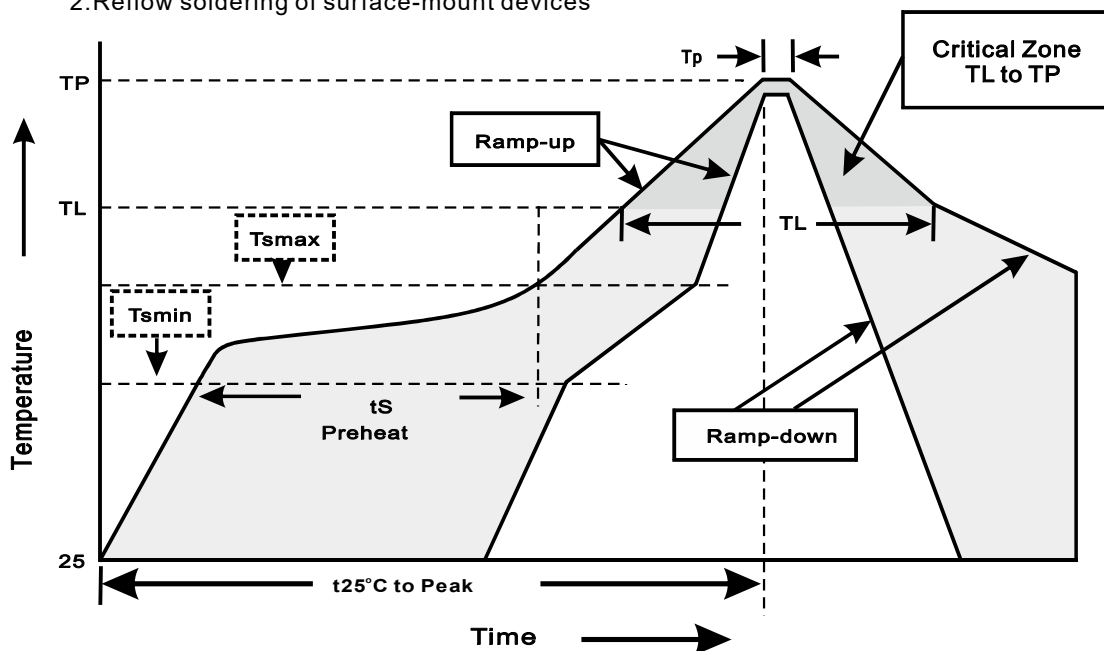
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Reel packing

Package	Reel Size	Reel (pcs)	Component Spacing (m/m)	Box (pcs)	Inner Box	Reel DIA, (m/m)	Carton Size (m/m)	Carton (pcs)	Approx. Cross Weight (kg)
TO-263	13"	800	16.0	800	335x335x38	330	350x330x360	6,400	15.0

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	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$