

SCSB4A650E

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SCSB4A650E

8A 650V Power Schottky Silicon Carbide Diode

Features

- $V_{RRM}=650V$, $I_F=8A@T_c\leq 135^\circ C$.
- New thin wafer technology.
- Low forward voltage drop, (V_F).
- Zero reverse recovery current.
- Zero forward recovery voltage.
- Positive temperature coefficient on V_F .
- Temperature-independent switching.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. SCSB4A650E-H.

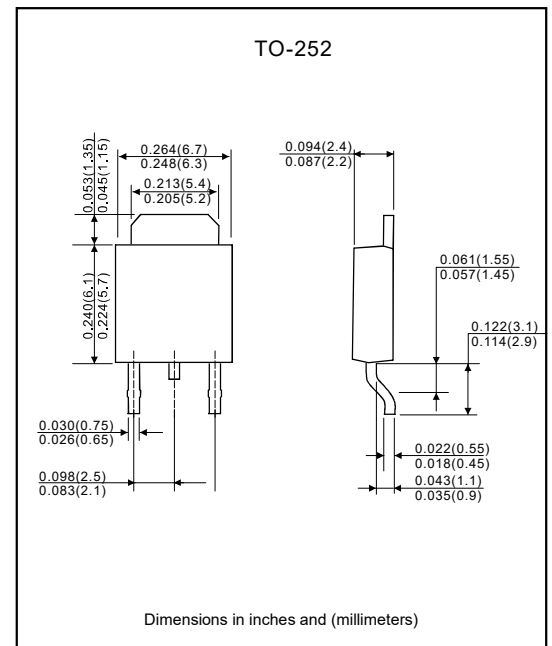
Applications

- Switch mode power supplies.
- Uninterruptible power supplies.
- Motor drive, PV inverter, Wind power station.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, TO-252.
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



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

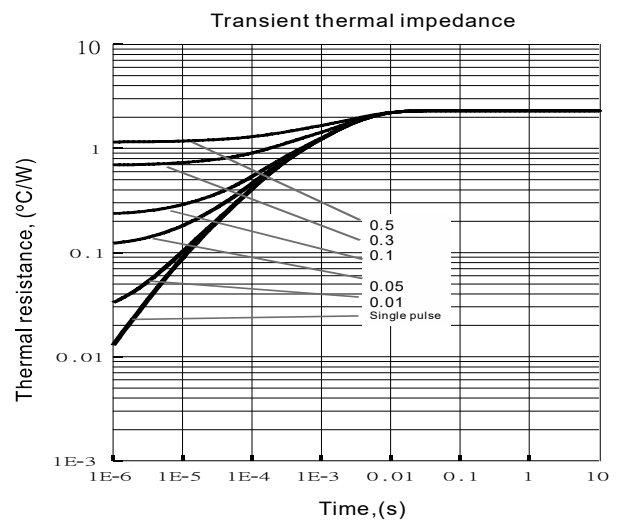
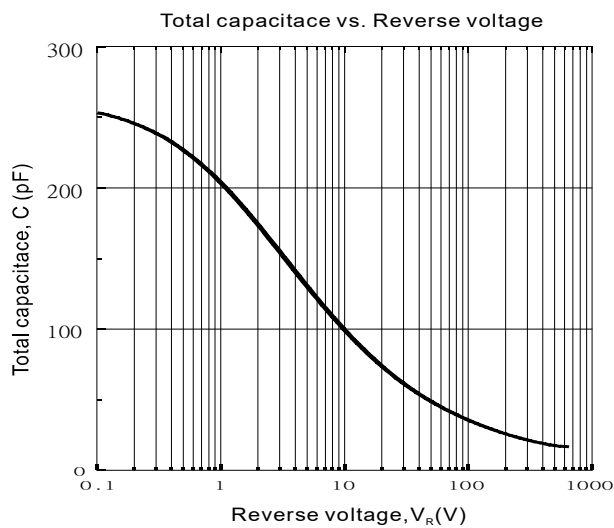
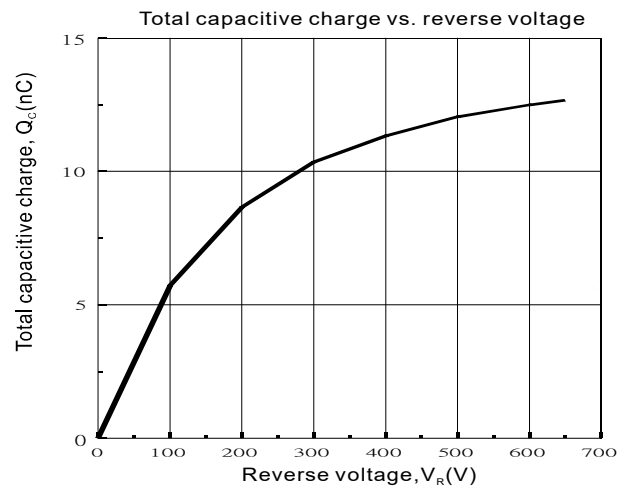
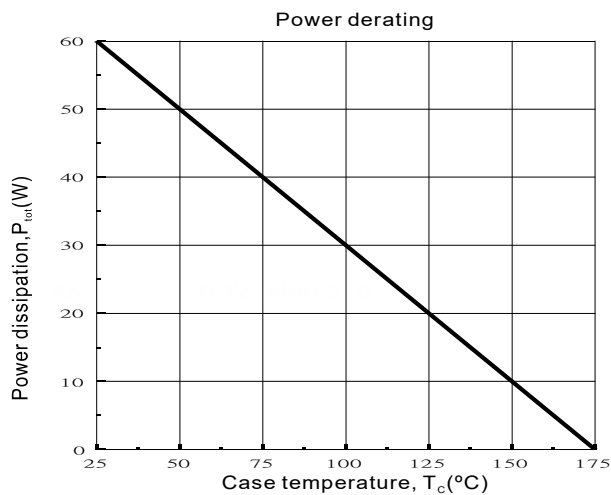
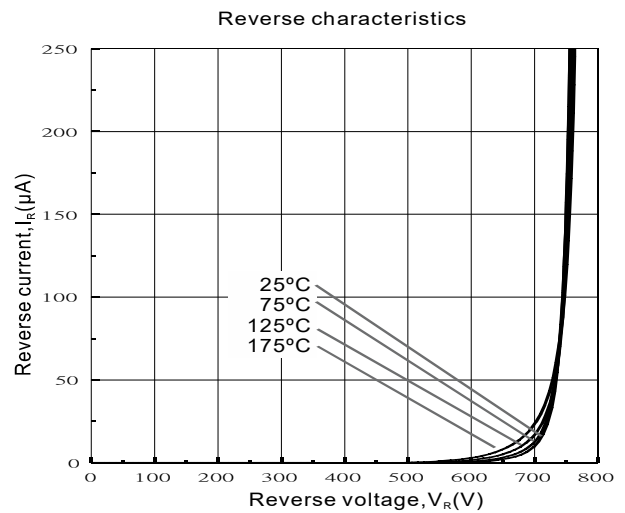
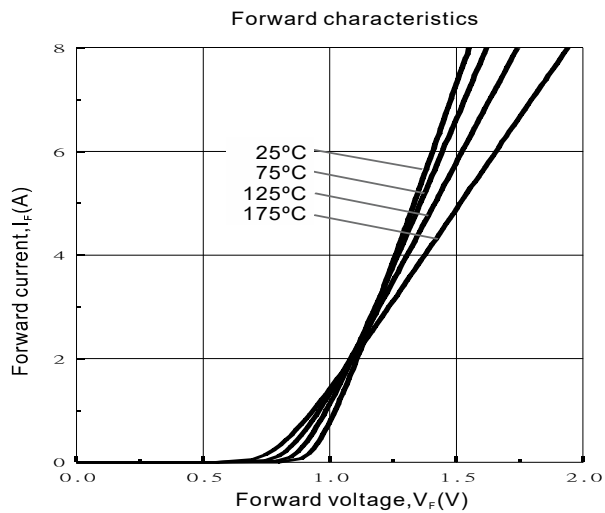
Parameter	Symbol	Ratings	Unit
Maximum repetitive peak reverse voltage	V_{RRM}	650	V
Surge peak reverse voltage	V_{RSM}	650	V
DC blocking voltage	V_R	650	V
Continuous forward current ($T_c \leq 135^\circ C$) ($T_c \leq 160^\circ C$)	I_F	8	A
		4	
Non-repetitive forward surge current ($t_p=8.3ms$, half sine wave)	I_{FSM}	32	A
Power dissipation	P_{tot}	60	W
Operating junction temperature	T_J	-55 to +175	$^\circ C$
Storage temperature range	T_{STG}	-55 to +175	$^\circ C$
Soldering temperature	T_{sld}	260	$^\circ C$
Thermal resistance junction to ambient	$R_{\theta JA}$	120 (Typ.)	$^\circ C/W$
Thermal resistance junction to case	$R_{\theta JC}$	2.5 (Typ.)	$^\circ C/W$

SCSB4A650E**Electrical characteristics** (At $T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Forward voltage	V_F	$I_F = 4\text{A}$		1.28	1.5	V
		$I_F = 4\text{A}, T_J = 175^{\circ}\text{C}$		1.4	1.6	
Reverse current	I_R	$V_R = 650\text{V}$		4	50	μA
		$V_R = 650\text{V}, T_J = 175^{\circ}\text{C}$		20	200	
Total capacitance	C	$V_R=0.1\text{V}, f=1.0\text{MHz}$		250		pF
		$V_R=200\text{V}, f=1.0\text{MHz}$		26		
		$V_R=400\text{V}, f=1.0\text{MHz}$		19		
Total capacitive charge	Q_C	$I_F = 4\text{A}, V_R = 400\text{V}, di/dt=200\text{A}/\mu\text{s}$		11.5		nC

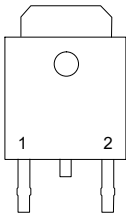
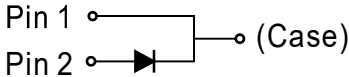
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Rating and characteristic curves



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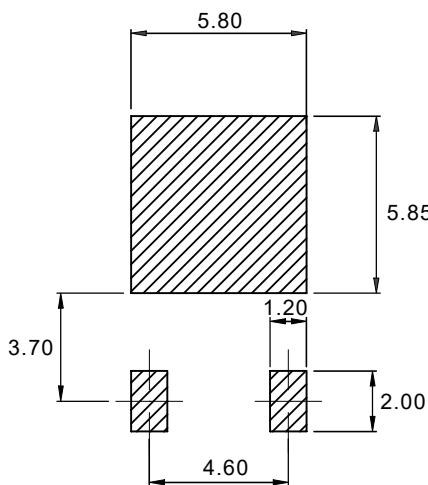
Pinning information

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Anode		

Marking

Type number	Marking code
SCSB4A650E	FSC4A650E

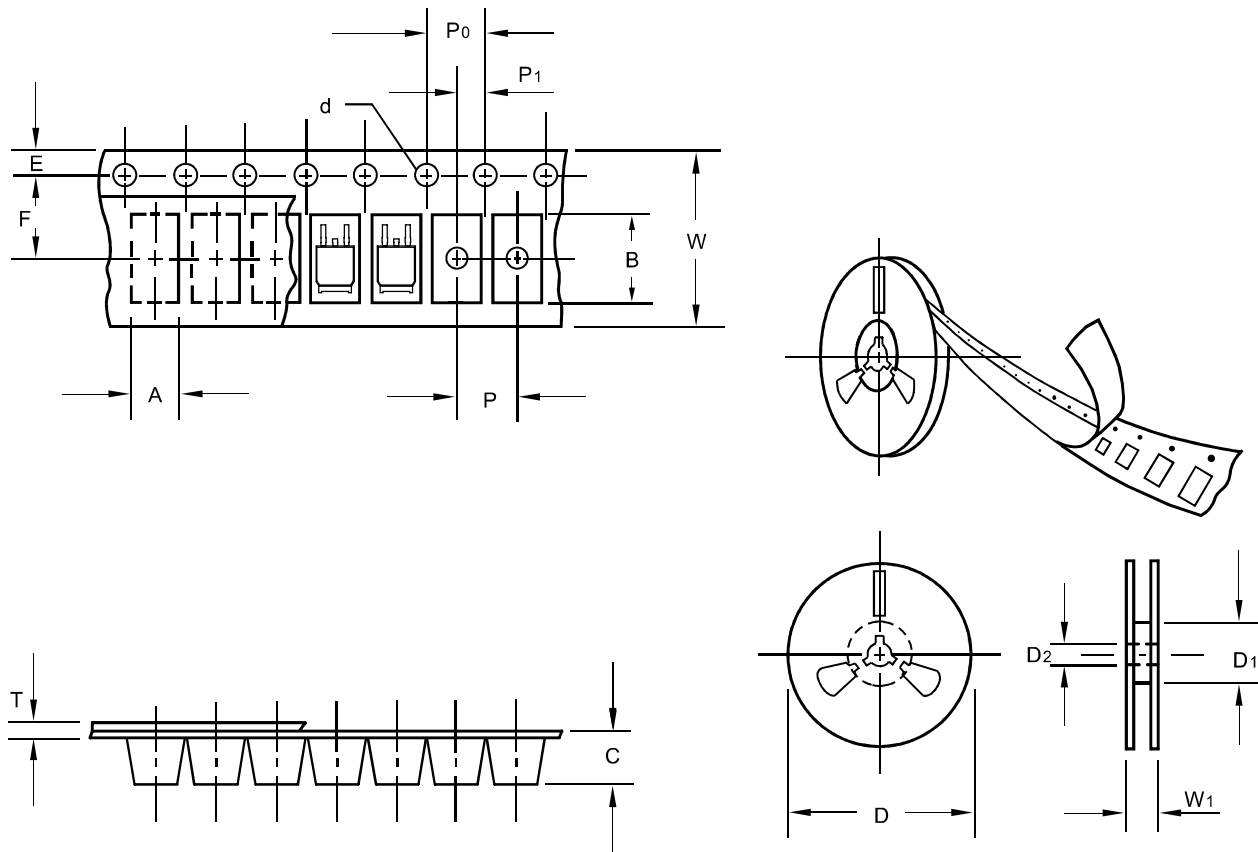
Suggested solder pad layout



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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Packing information



unit:mm

Item	Symbol	Tolerance	TO-252
Carrier width	A	0.1	6.90
Carrier length	B	0.1	10.50
Carrier depth	C	0.1	2.70
Sprocket hole	d	0.1	1.55
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	50.00
7" Reel outside diameter	D	2.0	-
7" Reel inner diameter	D1	min	-
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	7.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.30
Tape width	W	0.3	16.00
Reel width	W1	1.0	22.00

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

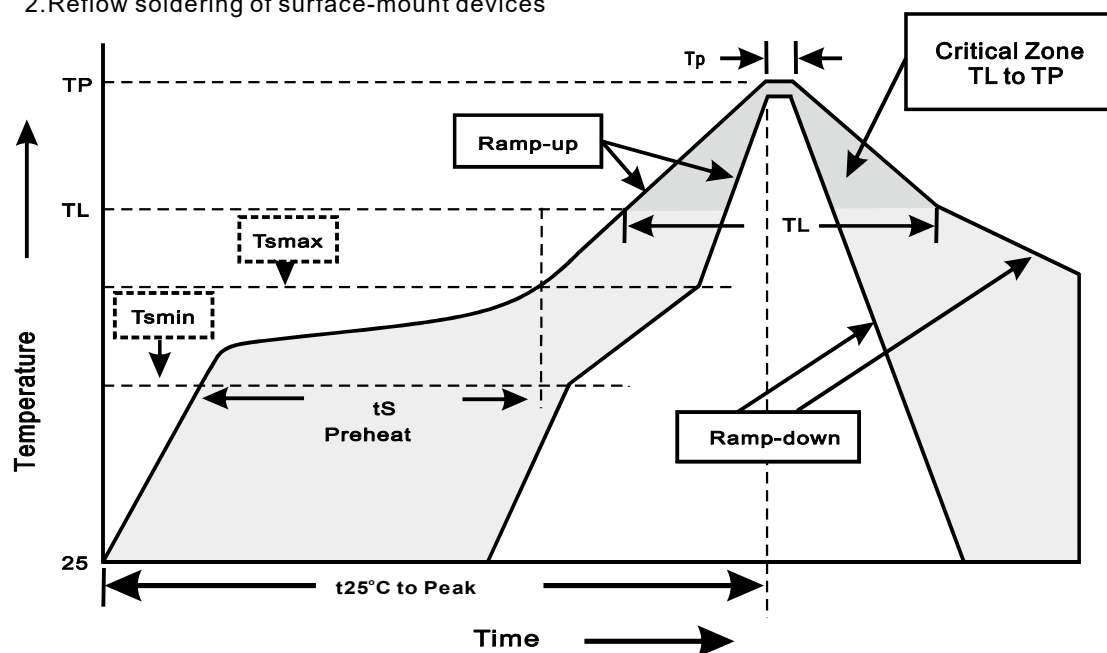
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
TO-252	13"	2,500	8.0	5,000	335*335*38	330	350*350*225	25,000

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°C/sec
Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(min to max)(t_s)	150°C 200°C 60~120sec
T_{smax} to T_L -Ramp-upRate	<3°C/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°C/sec
Time 25°C to Peak Temperature	<6minutes