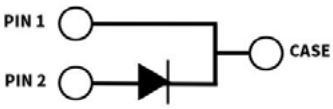
CSD01060E

600 V, 1 A, Silicon Carbide Schottky Diode

TO-252-2



Package Types: TO-252-2
PN's: CSD01060

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Features

- 600-volt Schottky rectifier
- Zero reverse recovery current
- Zero forward recovery voltage
- High-frequency operation
- Temperature-independent switching behavior
- Extremely fast switching
- Positive temperature coefficient on V_F

Typical Applications

- Switch mode power supplies (SMPS)
- Power factor correction
  - Typical PFC P_{out} : 100 W-200 W
- Motor drives
  - Typical power : 0.25 HP-0.5 HP

Benefits

- Replace bipolar with unipolar rectifiers
- Essentially no switching losses
- Higher efficiency
- Reduction of rectifier heat sink
- Parallel devices without thermal runaway

Maximum Ratings (T_C = 25 °C Unless Otherwise Specified)

Parameter	Symbol	Value	Unit	Test Conditions	Note
Repetitive Peak Reverse Voltage	V_{RRM}	600	V		
Surge Peak Reverse Voltage	V_{RSM}	600			
DC Blocking Voltage	V_{DC}	600			
Continuous Forward Current	I_F	4	A	T_C = 25 °C	
		2		T_C = 135 °C	
		1		T_C = 158 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	7		T_C = 25 °C, t_P = 10 ms, Half Sine Wave	
		5.5		T_C = 125 °C, t_P = 10 ms, Half Sine Wave	
Non-Repetitive Peak Forward Surge Current	I_{FSM}	9		T_C = 25 °C, t_P = 1.5 ms, Half Sine Wave	
		32		T_C = 25 °C, t_P = 10 µs, Pulse	
Power Dissipation	P_{tot}	21.4	W	T_C = 25 °C	
		7.1		T_C = 125 °C	
Operating Junction and Storage Temperature	T_J, T_{stg}	-55 to +175	°C		

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Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Note
Forward Voltage	V_F	1.6	1.8	V	I_F = 1 A, T_J = 25 °C	
		2.0	2.4		I_F = 1 A, T_J = 175 °C	
Reverse Current	I_R	20	100	µA	V_R = 600 V, T_J = 25 °C	
		40	500		V_R = 600 V, T_J = 150 °C	
Total Capacitive Charge	Q_C	3.3		nC	V_R = 600 V, I_F = 1 A di/dt = 500 A/µS T_J = 25 °C	
Total Capacitance	C	80		pF	V_R = 0 V, T_J = 25 °C, f = 1 MHz	
		11			V_R = 200 V, T_J = 25 °C, f = 1 MHz	
		8.5			V_R = 400 V, T_J = 25 °C, f = 1 MHz	

Note: This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

Parameter	Symbol	Typ.	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	7	°C/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	60	°C/W

Typical Performance

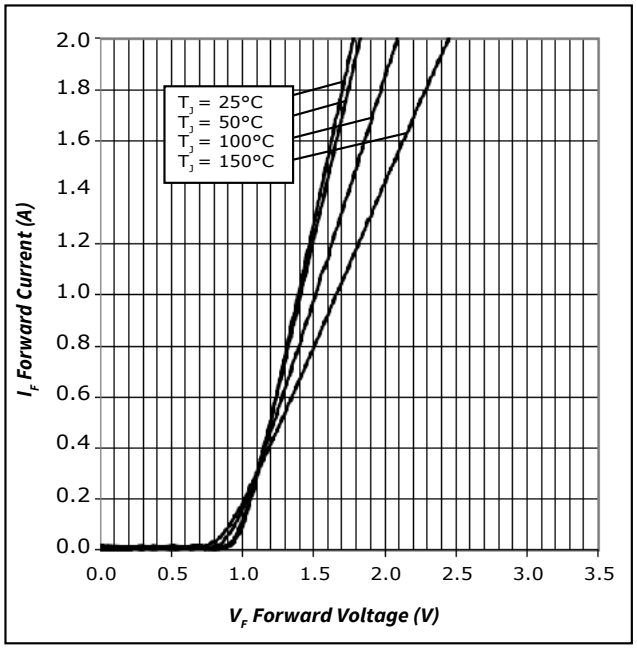

Figure 1. Forward Characteristics

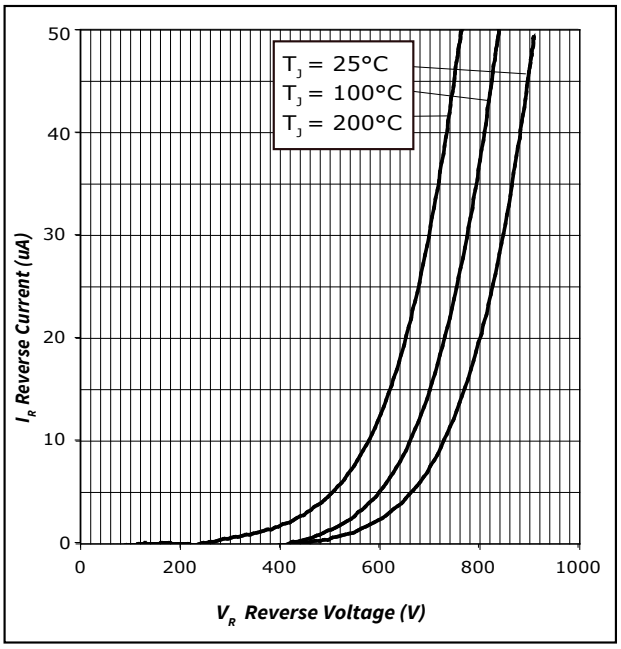

Figure 2. Reverse Characteristics

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Typical Performance

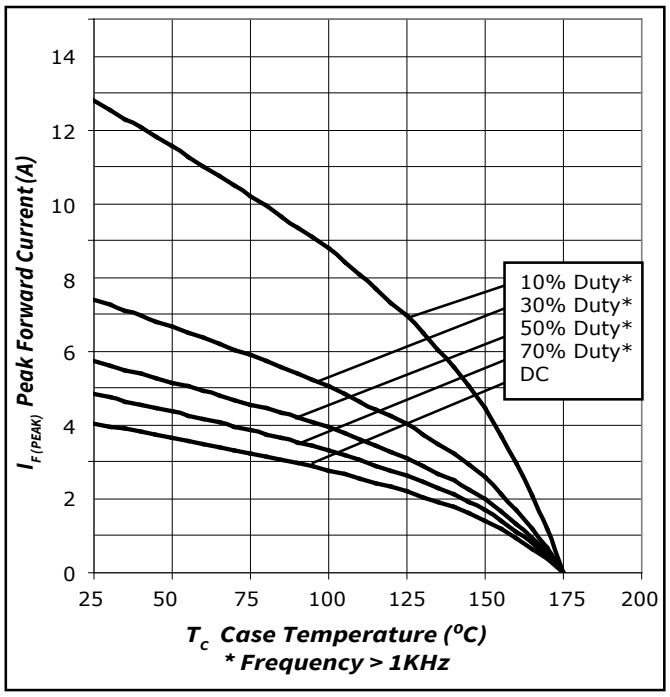

Figure 3. Current Derating

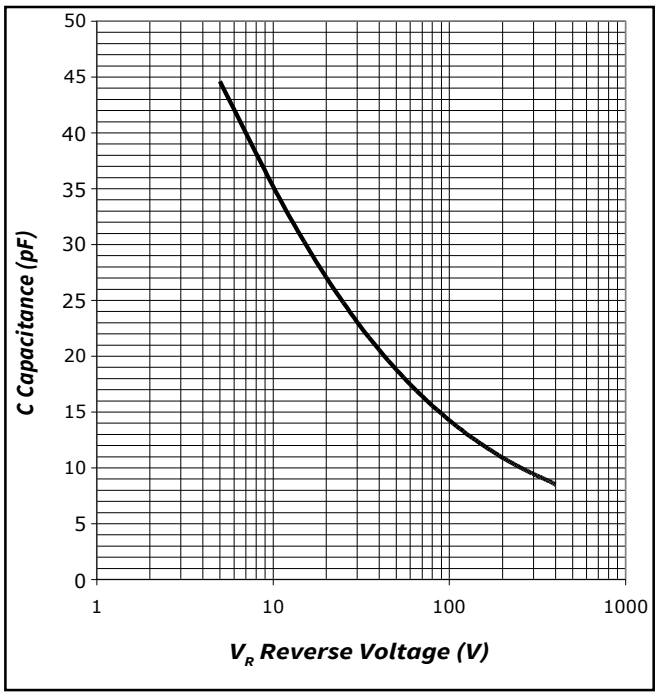

Figure 4. Capacitance vs. Reverse Voltage

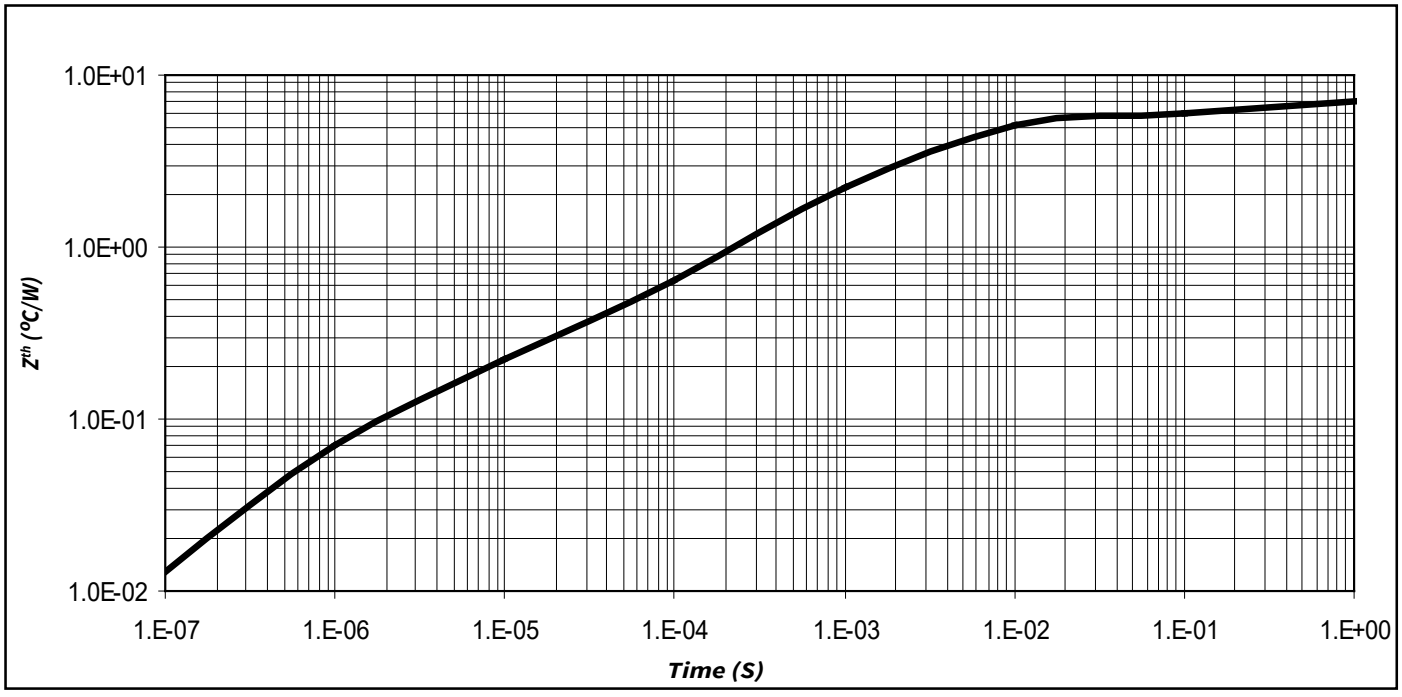

Figure 5. Transient Thermal Impedance

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Typical Performance

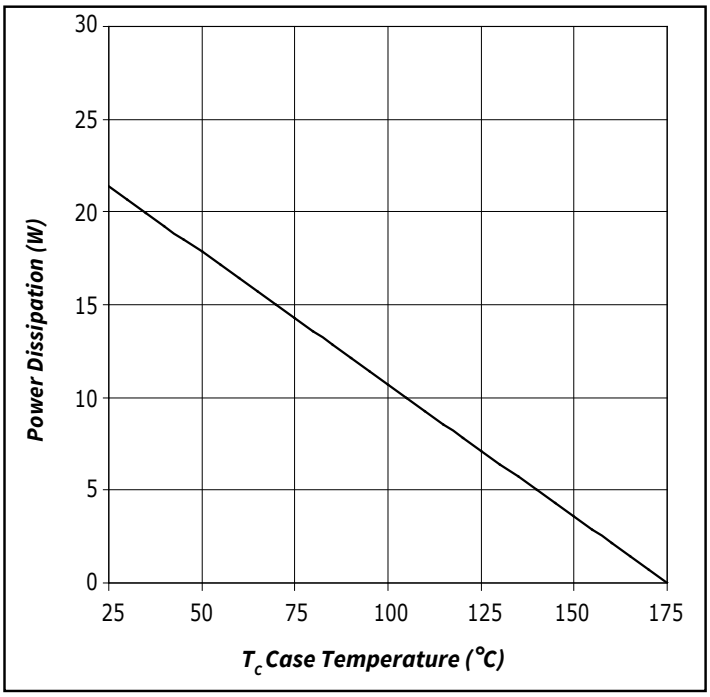

Figure 6. Power Derating

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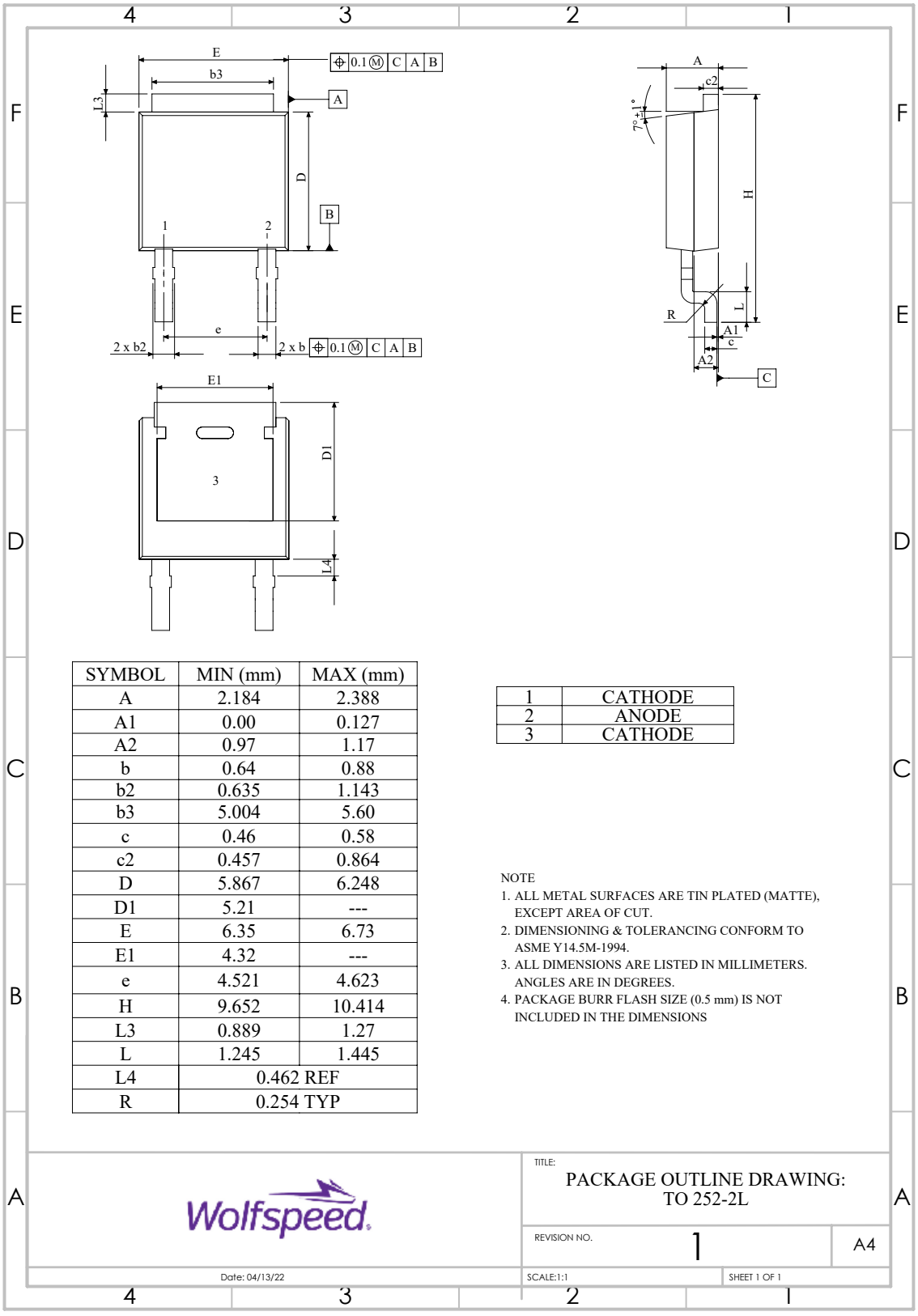
Package Dimensions

Package: TO-252-2



SYMBOL	MIN (mm)	MAX (mm)
A	2.184	2.388
A1	0.00	0.127
A2	0.97	1.17
b	0.64	0.88
b2	0.635	1.143
b3	5.004	5.60
c	0.46	0.58
c2	0.457	0.864
D	5.867	6.248
D1	5.21	---
E	6.35	6.73
E1	4.32	---
e	4.521	4.623
H	9.652	10.414
L3	0.889	1.27
L	1.245	1.445
L4	0.462 REF	
R	0.254 TYP	

1	CATHODE
2	ANODE
3	CATHODE

NOTE
1. ALL METAL SURFACES ARE TIN PLATED (MATTE), EXCEPT AREA OF CUT.
2. DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
3. ALL DIMENSIONS ARE LISTED IN MILLIMETERS. ANGLES ARE IN DEGREES.
4. PACKAGE BURR FLASH SIZE (0.5 mm) IS NOT INCLUDED IN THE DIMENSIONS

TITLE: PACKAGE OUTLINE DRAWING: TO 252-2L

REVISION NO. 1 | A4

Date: 04/13/22 | SCALE:1:1 | SHEET 1 OF 1

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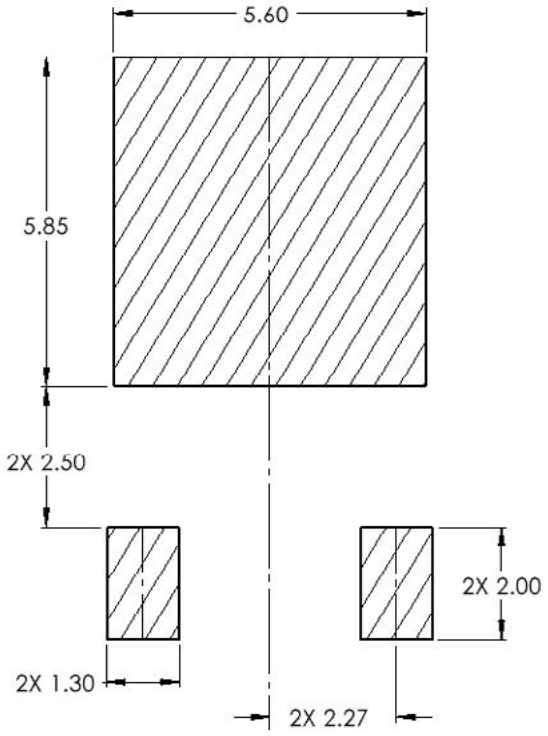
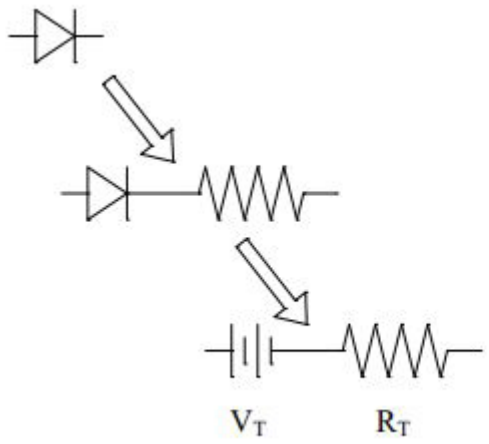
Recommended Solder Pad Layout



Part Number	Package	Marking
CSD01060E	TO-252-2	CSD01060

Diode Model



$$Vf_T = V_T + If * R_T$$

$$V_{T=} 0.94 + (T_j * -1.2*10^{-3})$$
$$R_{T=} 0.015 + (T_j * 6.4*10^{-3})$$

Note: T_j = Diode Junction Temperature In Degrees Celsius

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Revision History

Current Revision	Date of Release	Description of Changes
Q	October-2019	N/A
1	September-2023	Updated Wolfspeed branding, package drawing, and solder pad layout Removed TO-252-2 information
2	November - 2024	Legal Disclaimer

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