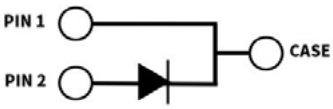
CSD01060E

600 V, 1 A, Silicon Carbide Schottky Diode

TO-252-2



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

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

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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

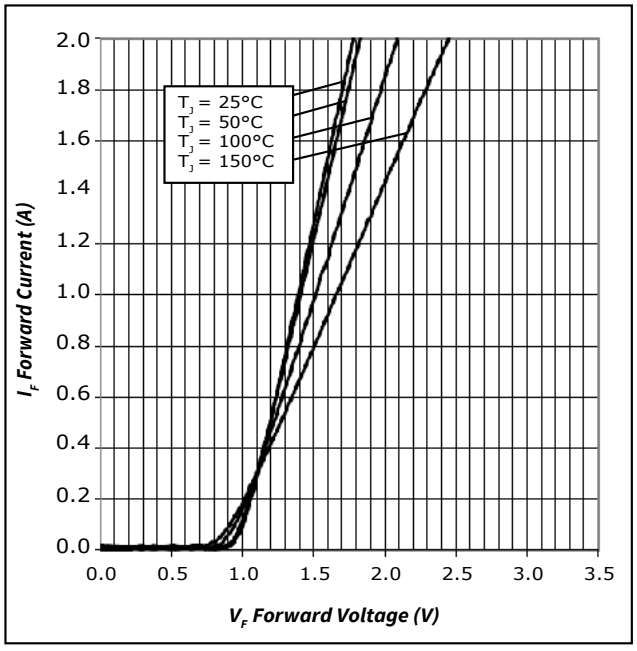


Figure 1. Forward Characteristics

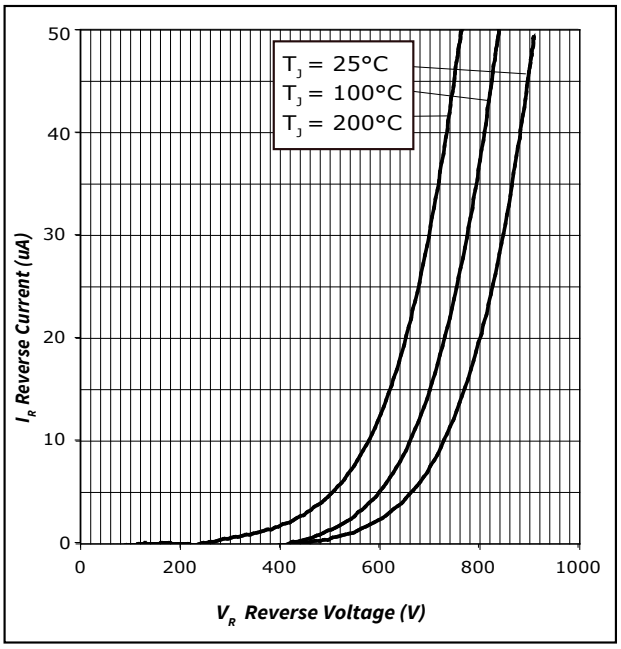


Figure 2. Reverse Characteristics

Typical Performance

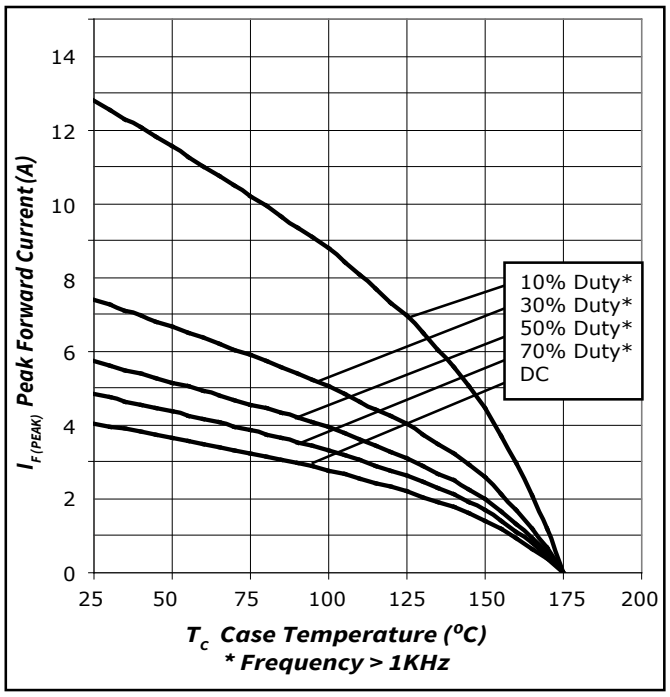


Figure 3. Current Derating

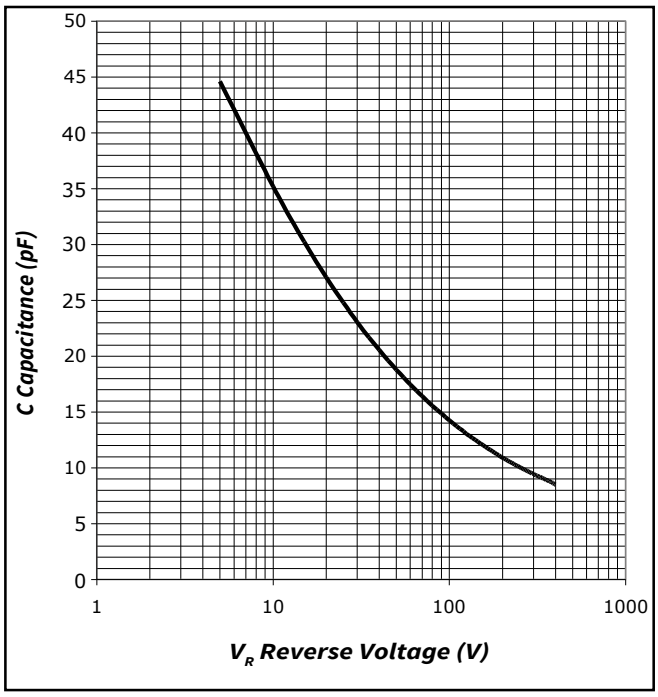


Figure 4. Capacitance vs. Reverse Voltage

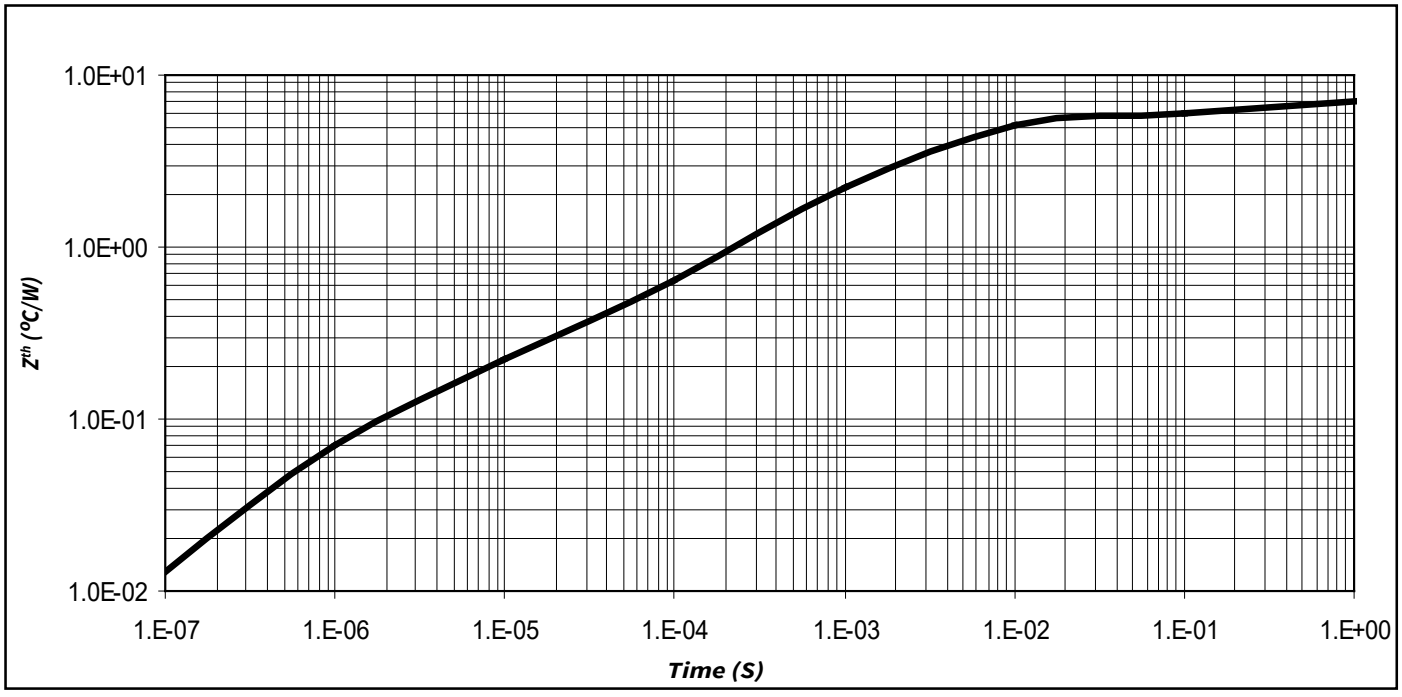


Figure 5. Transient Thermal Impedance

Typical Performance

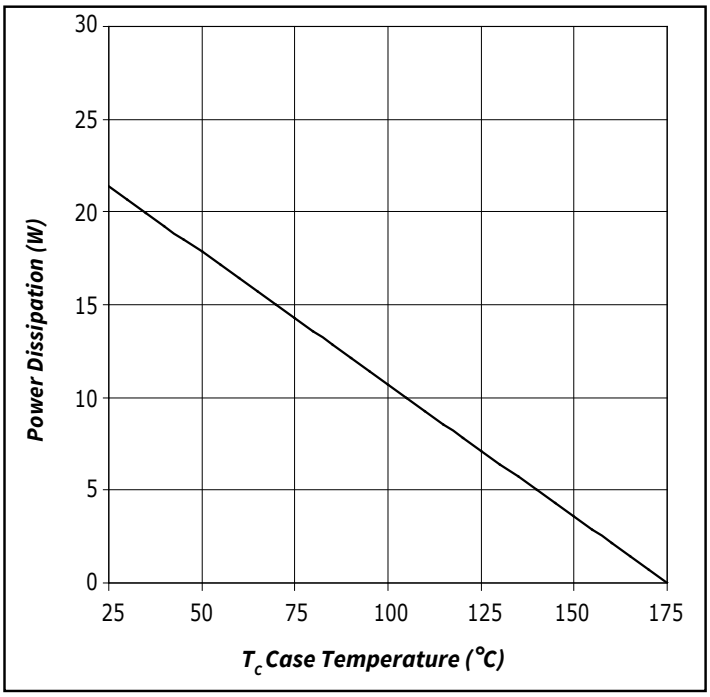
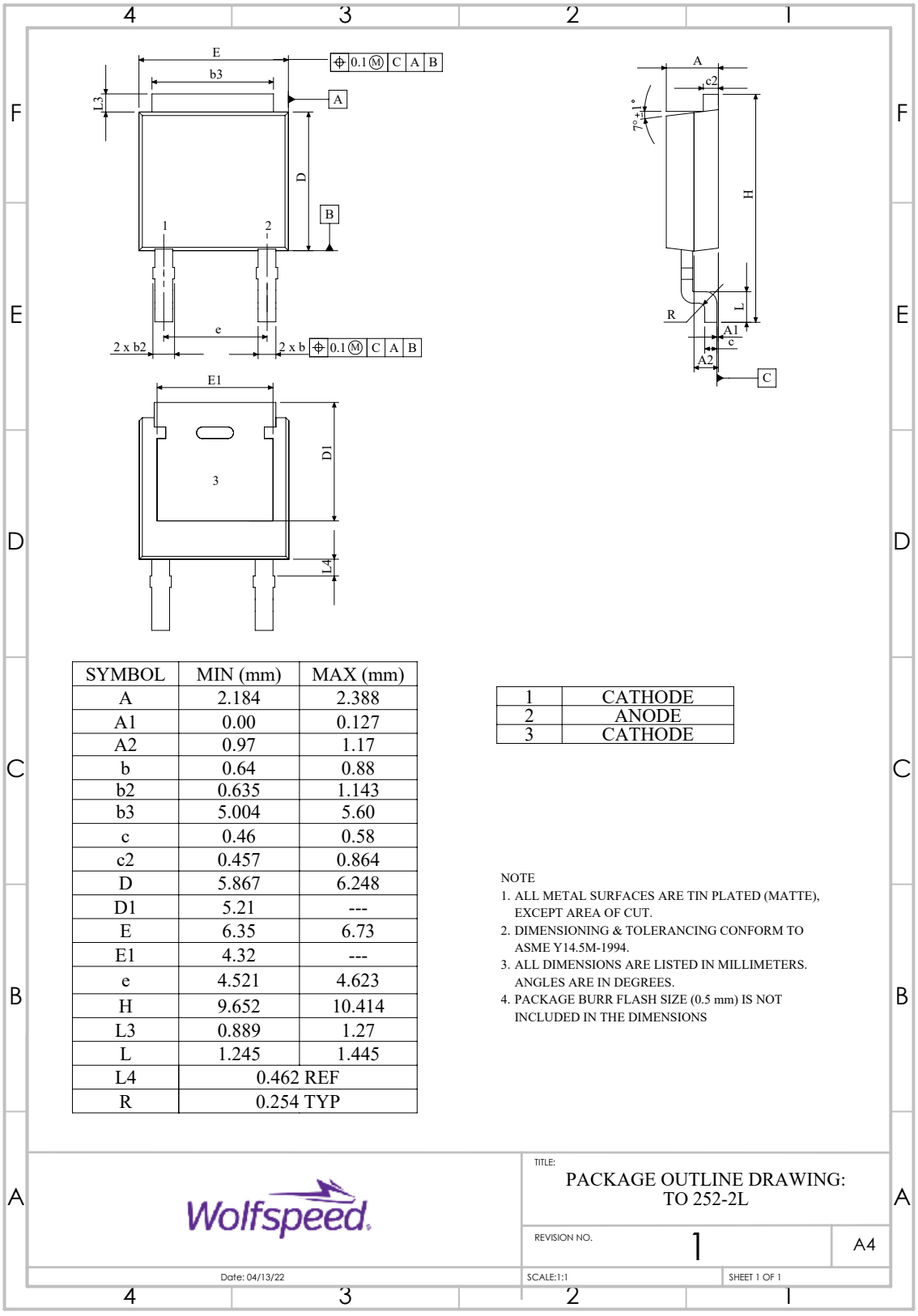


Figure 6. Power Derating

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

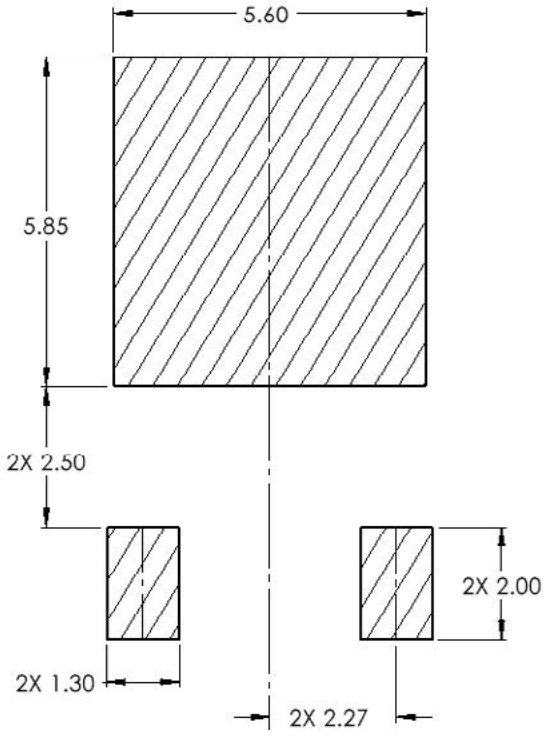
NOTE
1. ALL METAL SURFACES ARE TIN PLATED (MATTE), EXCEPT AREA OF CUT.
2. DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
3. ALL DIMENSIONS ARE LISTED IN MILLIMETERS. ANGLES ARE IN DEGREES.
4. PACKAGE BURR FLASH SIZE (0.5 mm) IS NOT INCLUDED IN THE DIMENSIONS

TITLE: PACKAGE OUTLINE DRAWING: TO 252-2L

REVISION NO. 1 | A4

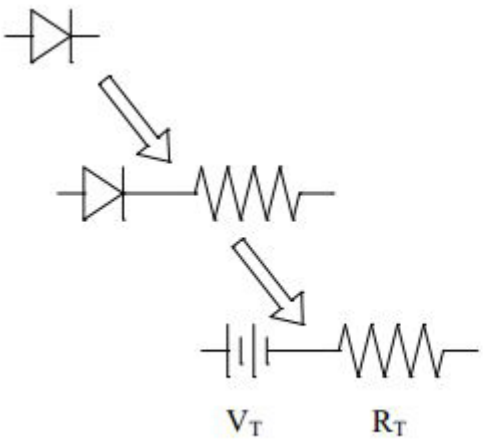
Date: 04/13/22 | SCALE:1:1 | SHEET 1 OF 1

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

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

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