C4D10120E–Silicon Carbide Schottky Diode

Z-Rec™ Rectifier

V_{RRM}	= 1200 V
$I_{F,\ T_C<135^\circ C}$	= 16 A
Q_c	= 66 nC

Features

- 1200-Volt Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Positive Temperature Coefficient on V_F

Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Solar Inverters
- Power Factor Correction

Package

TO-252-2

Halogen-Free

RoHS COMPLIANT

Part Number	Package	Marking
C4D10120E	TO-252-2	C4D10120

Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V		
V_{RSM}	Surge Peak Reverse Voltage	1300	V		
V_{DC}	DC Blocking Voltage	1200	V		
I_F	Continuous Forward Current	16	A	T_C=135°C; No AC component	
I_{FRM}	Repetitive Peak Forward Surge Current	47 31	A	T_C=25°C, t_p=10 ms, Half Sine pulse T_C=110°C, t_p=10 ms, Half Sine pulse	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	71 59	A	T_C=25°C, t_p=10 ms, Half Sine pulse T_C=110°C, t_p=10 ms, Half Sine pulse	
P_{tot}	Power Dissipation	170 74	W	T_C=25°C T_C=110°C	
T_c	Maximum Case Temperature	135	°C		
T_J	Operating Junction Range	-55 to +175	°C		
T_{stg}	Storage Temperature Range	-55 to +135	°C		

Subject to change without notice.
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Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.5 2.2	1.8 3	V	I_F = 10 A T_J=25°C I_F = 10 A T_J=175°C	
I_R	Reverse Current	30 55	250 350	µA	V_R = 1200 V T_J=25°C V_R = 1200 V T_J=175°C	
Q_C	Total Capacitive Charge	66		nC	V_R = 1200 V, I_F = 10A di/dt = 200 A/µs T_J = 25°C	
C	Total Capacitance	754 45 38		pF	V_R = 0 V, T_J = 25°C, f = 1 MHz V_R = 400 V, T_J = 25°C, f = 1 MHz V_R = 800 V, T_J = 25°C, f = 1 MHz	

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

Thermal Characteristics

Symbol	Parameter	Typ.	Unit
$R_{\theta JC}$	TO-252 Package Thermal Resistance from Junction to Case	0.88	°C/W

Typical Performance

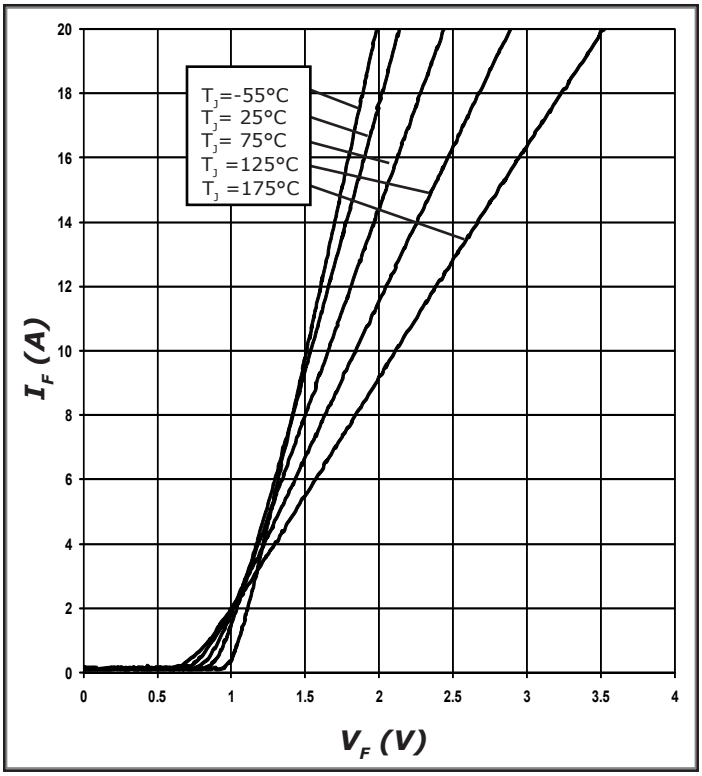


Figure 1. Forward Characteristics

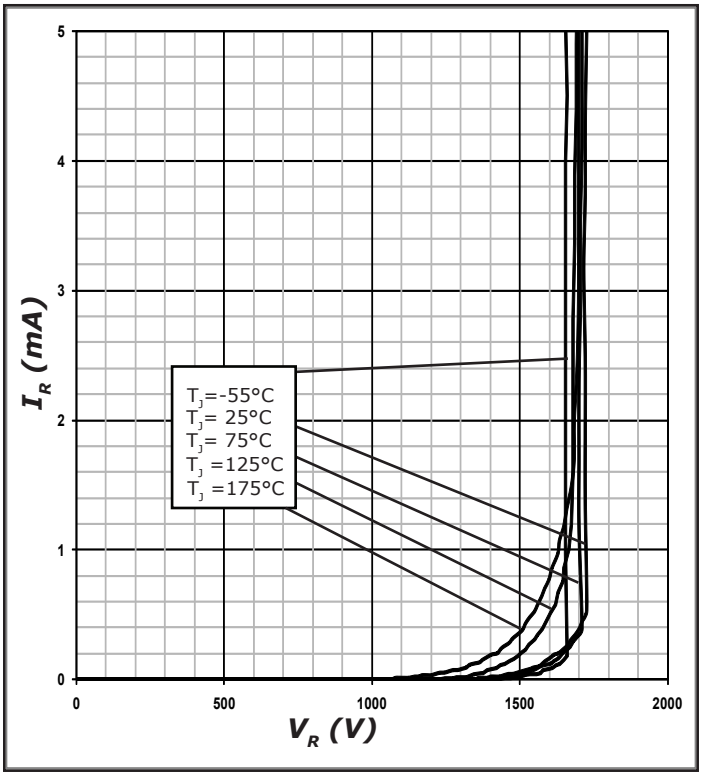


Figure 2. Reverse Characteristics

Typical Performance

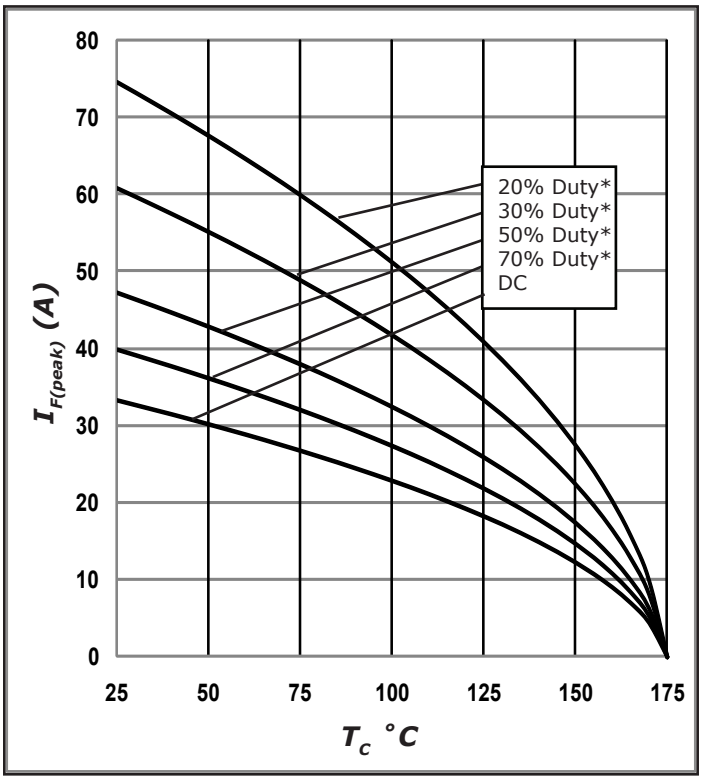


Figure 3. Current Derating

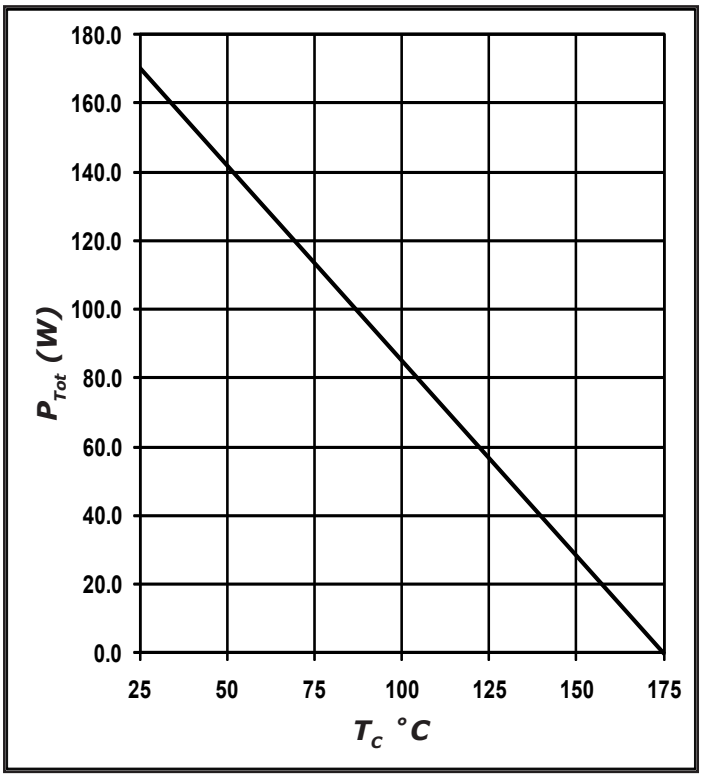


Figure 4. Power Derating

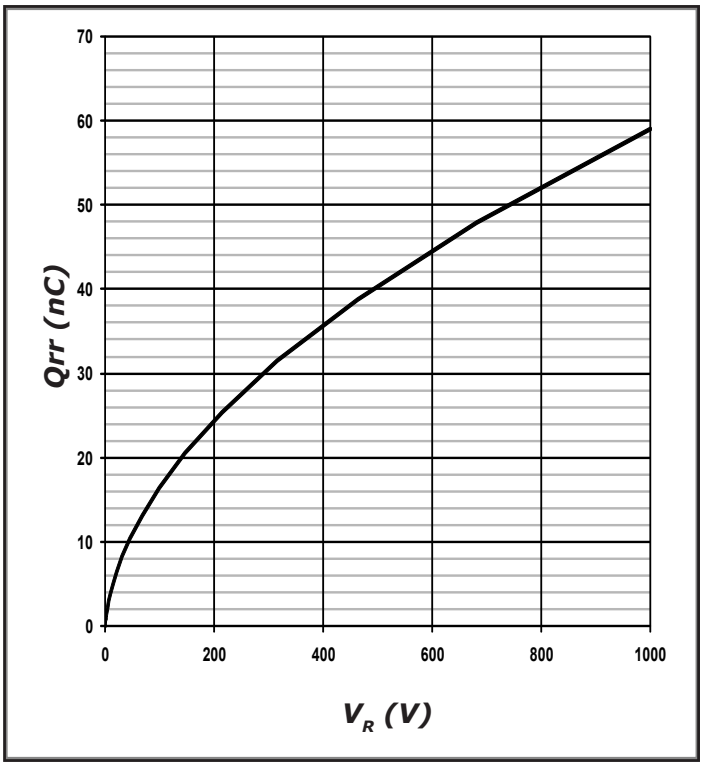


Figure 5. Recovery Charge vs. Reverse Voltage

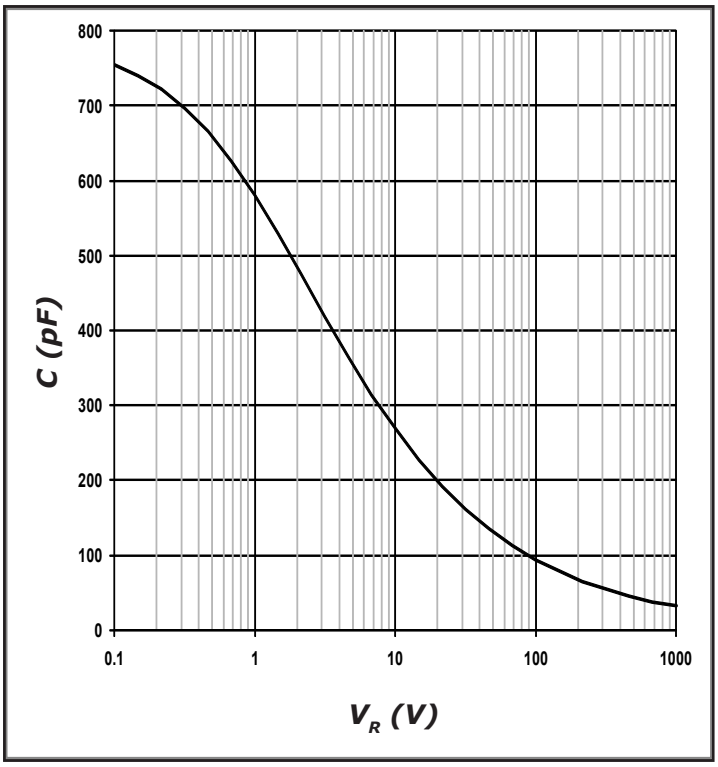


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

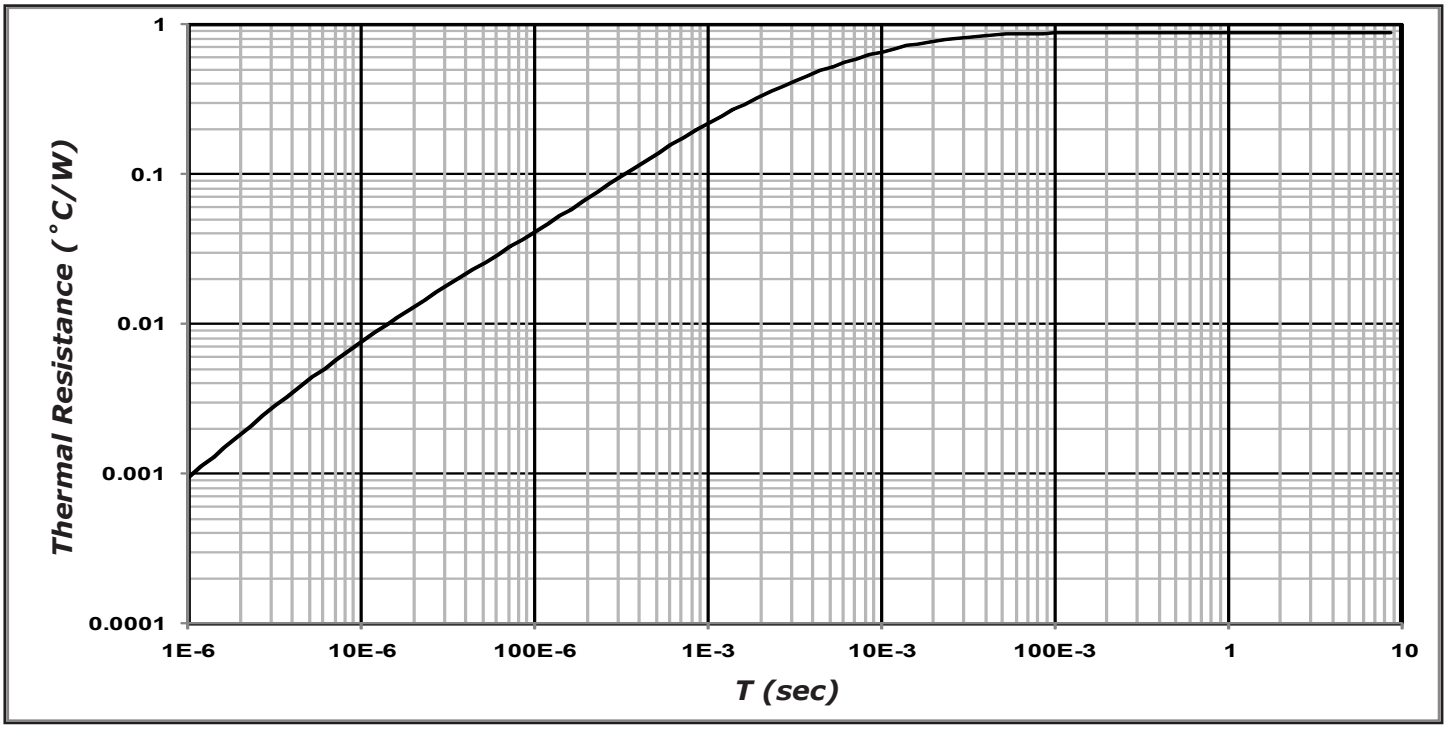
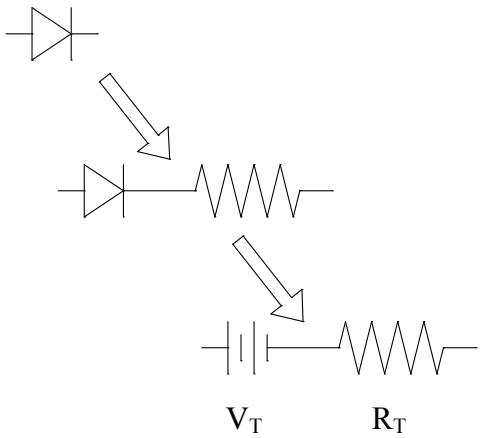


Figure 7. Transient Thermal Impedance

Diode Model

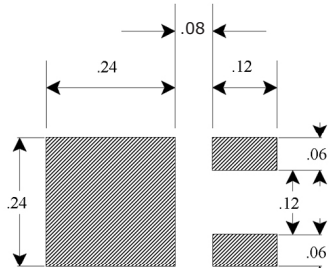


$$V_{fT} = V_T + If * R_T$$

$$V_T = 0.98 + (T_J * -1.71 * 10^{-3})$$
$$R_T = 0.040 + (T_J * 5.32 * 10^{-4})$$

Note: T_j = Diode Junction Temperature In Degrees Celcius

Recommended Solder Pad Layout

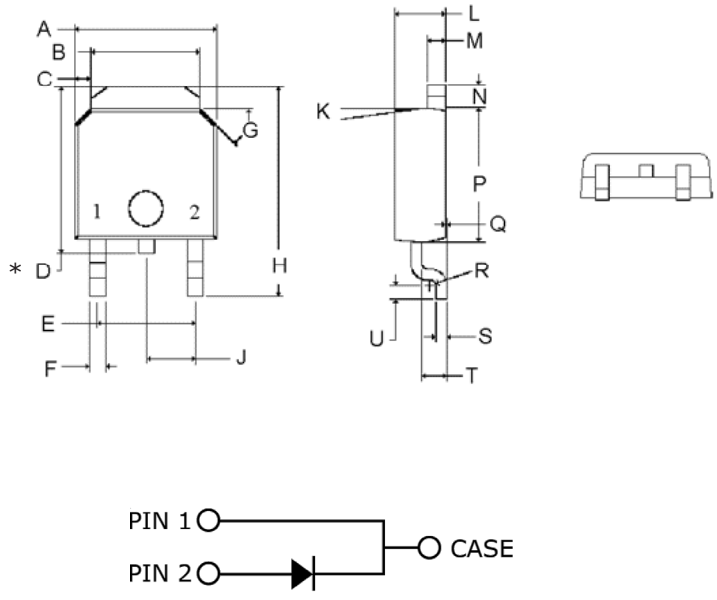


TO-252-2

Part Number	Package	Marking
C4D10120E	TO-252-2	C4D10120

Package Dimensions

Package TO-252-2



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.250	.289	6.350	7.341
B	.197	.215	5.004	5.461
C	.027	.050	.686	1.270
D*	.270	.322	6.858	8.179
E	.178	.182	4.521	4.623
F	.025	.045	.635	1.143
G	44°	46°	44°	46°
H	.380	.410	9.652	10.414
J	.090 TYP		2.286 TYP	
K	6°	8°	6°	8°
L	.086	.094	2.184	2.388
M	.018	.034	.457	.864
N	.035	.050	.889	1.270
P	.231	.246	5.867	6.248
Q	0.00	.005	0.00	.127
R	R0.010 TYP		R0.254 TYP	
S	.017	.023	.432	.584
T	.038	.045	.965	1.143
U	.021	.029	.533	.737

Note:
* Tab "D" may not be present

"The levels of environmentally sensitive, persistent biologically toxic (PBT), persistent organic pollutants (POP), or otherwise restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), as amended through April 21, 2006.

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