

KN3D02120F

Silicon Carbide Schottky Diode

V_{RRM}	=	1200 V
$I_F (T_c=162\text{ }^\circ\text{C})$	=	2 A
Q_c	=	11 nC

Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching

Benefits

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

Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives

Package



TO-252-2



Part Number	Package	Marking
KN3D02120F	T0-252-2	KN3D02120F

Maximum Ratings (T_c = 25 °C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V		
V_{RSM}	Surge Peak Reverse Voltage	1200	V		
V_R	DC Peak Reverse Voltage	1200	V		
I_F	Continuous Forward Current	11 5 2	A	T _c =25 °C T _c =135 °C T _c =162 °C	Fig. 3
I_{FSM}	Non-Repetitive Forward Surge Current	18	A	T _c =25 °C, t _p =10 ms, Half Sine Pulse	
P_{tot}	Power Dissipation	68 29	W	T _c =25 °C T _c =110 °C	Fig. 4
T_J	Operating Junction Range	-55 to +175	°C		
T_{stg}	Storage Temperature Range	-55 to +175	°C		

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.45 1.9	1.65 2.8	V	$I_F = 2\text{ A}$, $T_J = 25\text{ }^\circ\text{C}$ $I_F = 2\text{ A}$, $T_J = 175\text{ }^\circ\text{C}$	Fig. 1
I_R	Reverse Current	3 10	20 100	μA	$V_R = 1200\text{ V}$, $T_J = 25\text{ }^\circ\text{C}$ $V_R = 1200\text{ V}$, $T_J = 175\text{ }^\circ\text{C}$	Fig. 2
Q_c	Total Capacitive Charge	11		nC	$V_R = 800\text{ V}$, $I_F = 2\text{ A}$, $T_J = 25\text{ }^\circ\text{C}$	Fig. 6
C	Total Capacitance	131 11 9		pF	$V_R = 0\text{ V}$, $T_J = 25\text{ }^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 400\text{ V}$, $T_J = 25\text{ }^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 800\text{ V}$, $T_J = 25\text{ }^\circ\text{C}$, $f = 1\text{ MHz}$	Fig. 5
E_c	Capacitance Stored Energy	2.8		μJ	$V_R = 800\text{ V}$	Fig. 7

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

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case		2.2		$^\circ\text{C/W}$	Fig. 8

Typical Performance

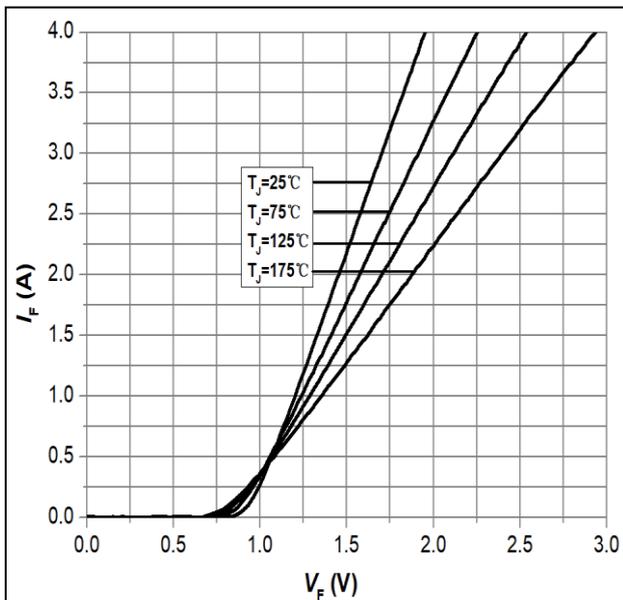


Figure 1: Forward Characteristics

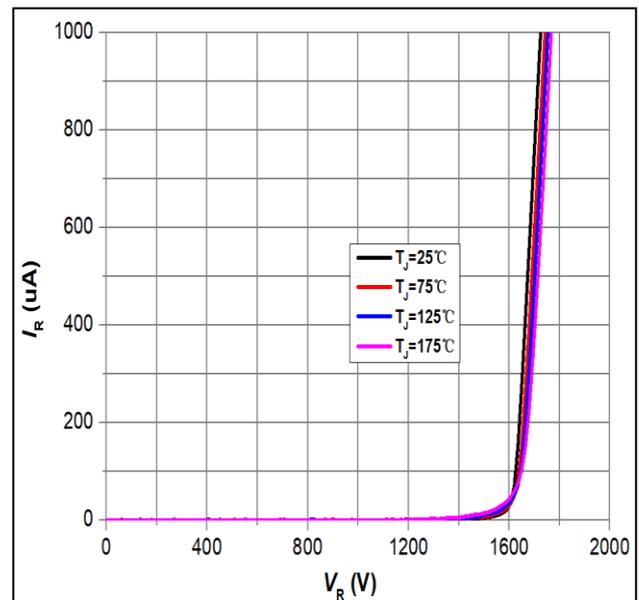


Figure 2: Reverse Characteristics

Typical Performance

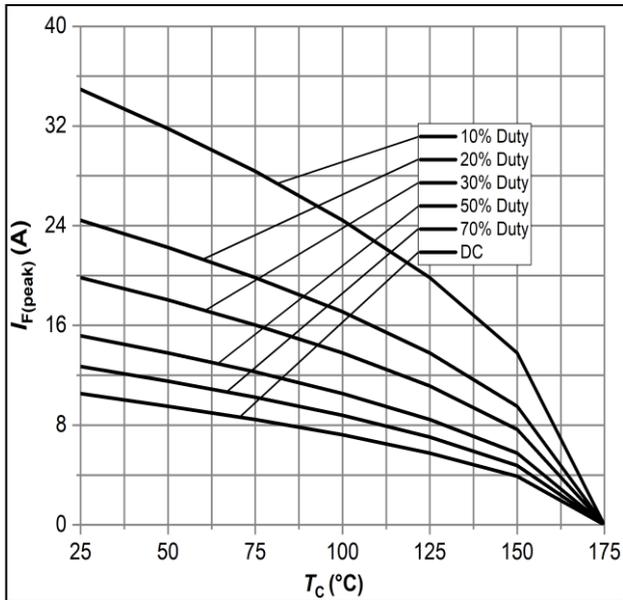


Figure 3: Current Derating

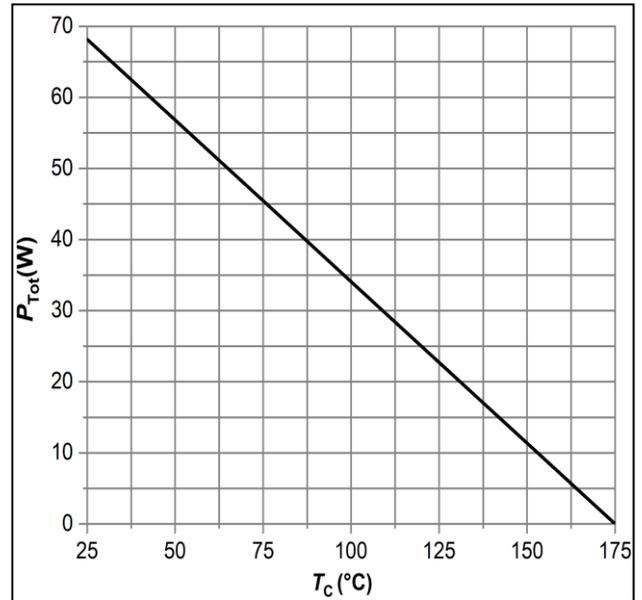


Figure 4: Power Derating

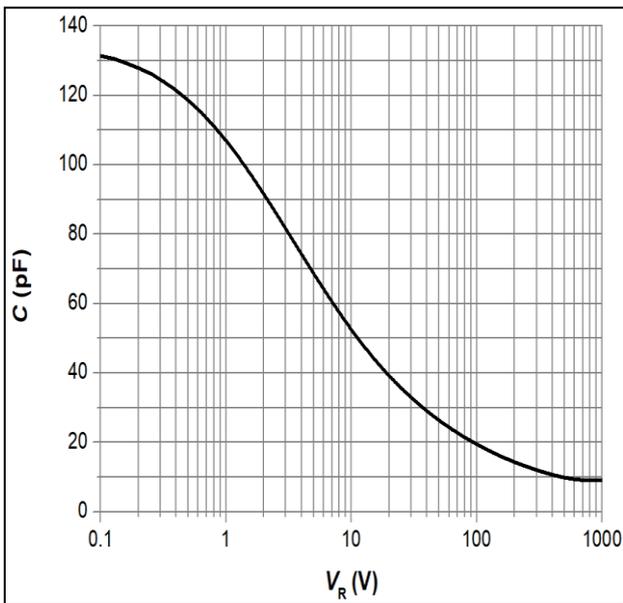


Figure 5: Capacitance vs. Reverse Voltage

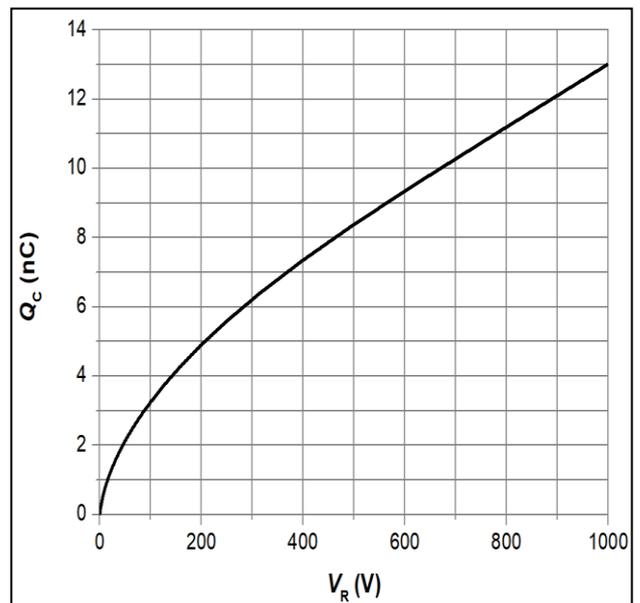


Figure 6: Total Capacitance Charge vs. Reverse Voltage

Typical Performance

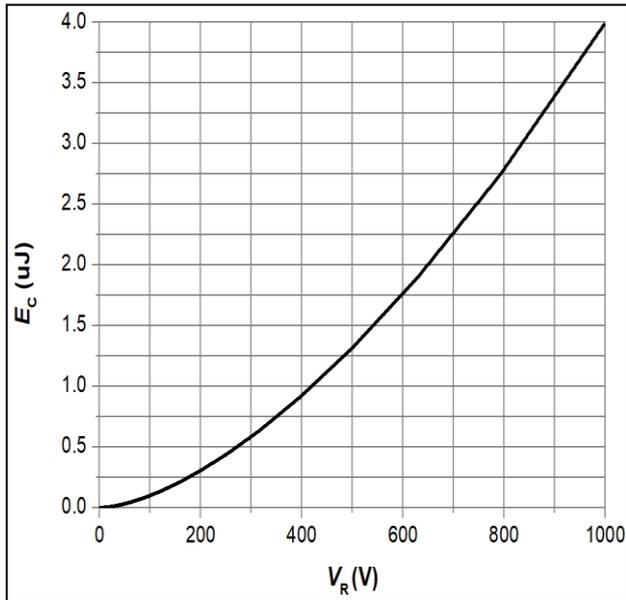


Figure 7: Typical Capacitance Stored Energy

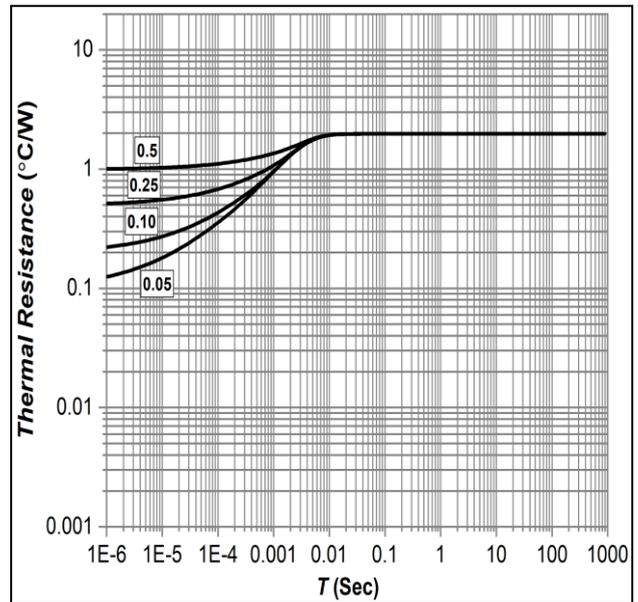
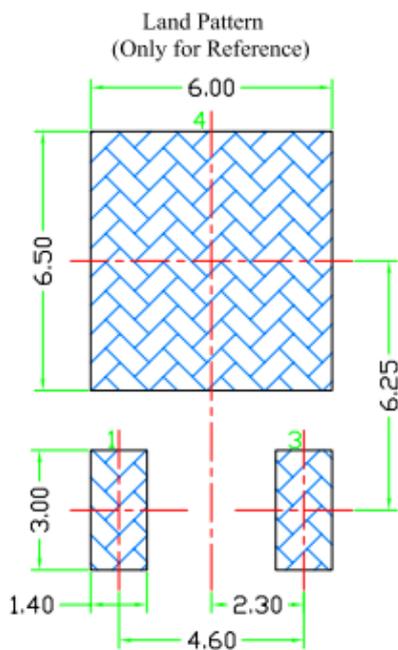
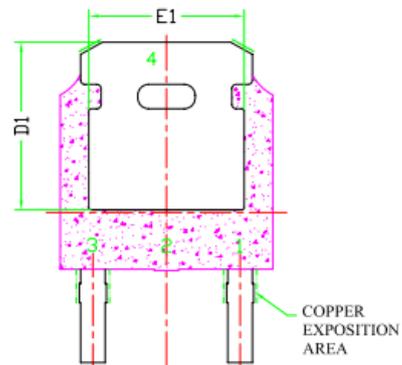
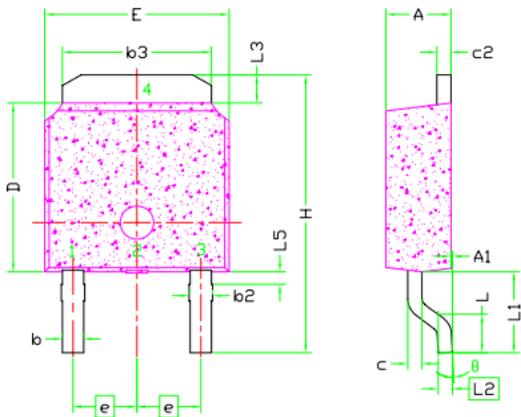


Figure 8: Transient Thermal Impedance

Package Dimensions

package: TO-252-2



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1	2.743 REF		
L2	0.508 BSC		
L3	0.89	--	1.27
L5	--	--	--
D	6.00	6.10	6.223
H	9.40	10.00	10.40
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
e	2.286 BSC		
A	2.20	2.30	2.38
A1	0	--	0.127
c	0.46	0.50	0.60
c2	0.46	0.50	0.58
D1	5.21	--	--
E1	4.40	--	--
θ	0°	--	10°