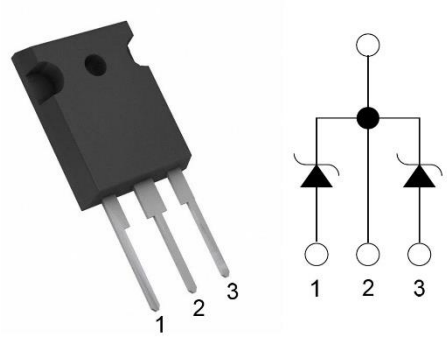
KNSCHA

KN3D20065D
Silicon Carbide Schottky Diode

Product Summary

V_R = 650 V
I_F = 20A (T_C=150ºC) **
Qc = 49nC (V_R=400V) **



TO-247-3

Features

- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on V_F
- Temperature Independent Switching Behavior

Benefits

- Higher System Efficiency
- Parallel Device Convenience without thermal runaway
- Higher Temperature Application
- No Switching loss
- Hard Switching & Higher Reliability
- Environmental Protection

Applications

- Servo Drives
- Solar / Wind Inverters
- AC/DC converters
- DC/DC converters
- Uninterruptable power supplies

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

Parameter	Symbol	Test conditions	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Peak Reverse Surge Voltage	V_{RSM}		650	V
DC Blocking Voltage	V_R		650	V
Continuous Forward Current (per leg / per device)	I_F	T_C=25°C T_C=135°C T_C=150°C	30/60 14/28 10/20	A
Non repetitive Forward Surge Current *	I_{FSM}	T_C = 25°C, t_p=10 ms, Half Sine Pulse T_C = 110°C, t_p=10 ms, Half Sine Pulse T_C = 25°C, t_p=10 us, Square Pulse	65 55 500	A
Repetitive peak Forward Surge Current *	I_{FRM}	T_C = 25°C, t_p=10 ms, Freq = 0.1Hz, 100 cycles, Half Sine Pulse T_C = 110°C, t_p=10 ms, Freq = 0.1Hz, 100 cycles, Half Sine Pulse	55 45	A
Total power dissipation (per leg / per device)	P_D	T_C=25°C	100	W
Operating Junction Temperature	T_J		-55 to 175	°C
Storage Temperature	T_{STG}		-55 to 175	°C

Note : * Per leg ** Per device

Electrical Characteristics

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
DC Blocking Voltage *	V_{DC}	T_J = 25°C	650			V
Forward Voltage *	V_F	I_F = 10A, T_J = 25°C		1.45	1.75	V
		I_F = 10A, T_J = 125°C		1.6		
		I_F = 10A, T_J = 175°C		1.7		V
Reverse Current *	I_R	V_R = 650V, T_J = 25°C		10	80	uA
		V_R = 650V, T_J = 125°C		40		uA
		V_R = 650V, T_J = 175°C		110		uA
Total Capacitive Charge *	Q_C	V_R = 400V, T_J = 25°C		24.5		nC
Total Capacitance *	C	V_R = 1V, T_J = 25°C, Freq = 1MHz		405		pF
		V_R = 200V, T_J = 25°C, Freq = 1MHz		48		
		V_R = 400V, T_J = 25°C, Freq = 1MHz		35		

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

Thermal Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Thermal Resistance (per device)	$R_{th(j-c)}$	junction-case		0.75		^{0}C/W

Note : * Per leg ** Per device

Typical Electrical Curves (Per Leg)

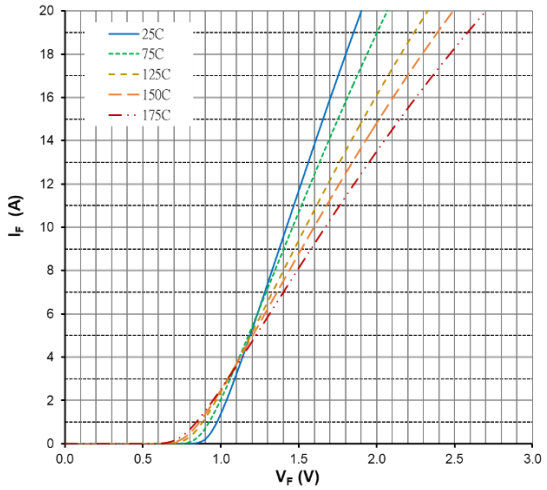


Figure 1. Forward CharacteristicsFigure

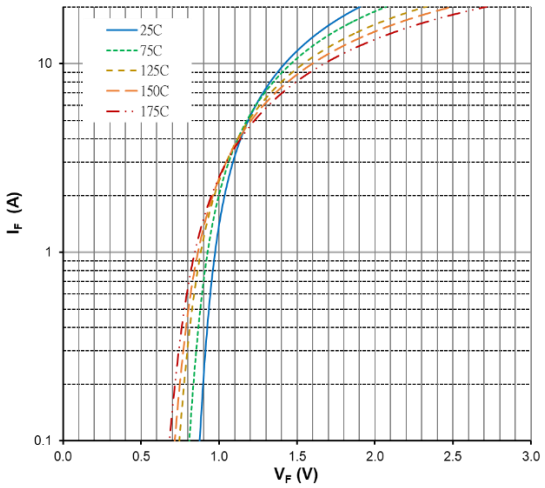
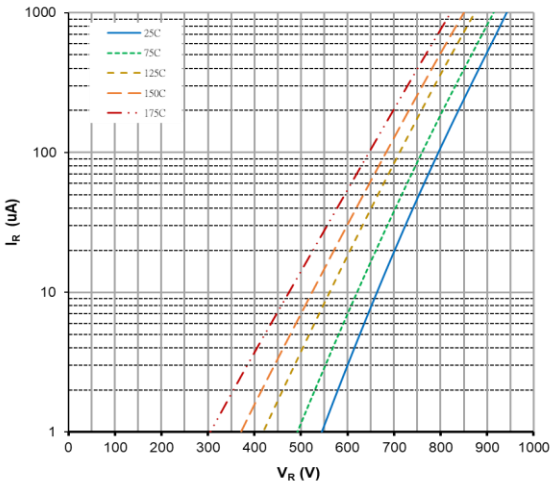


Figure 2. Forward Characteristics



3. Reverse Characteristics

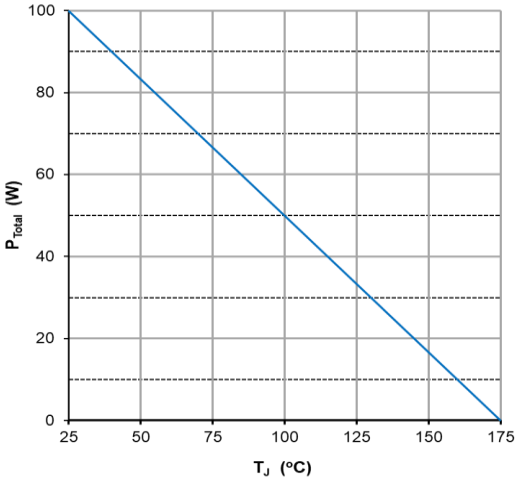


Figure 4. Power Derating

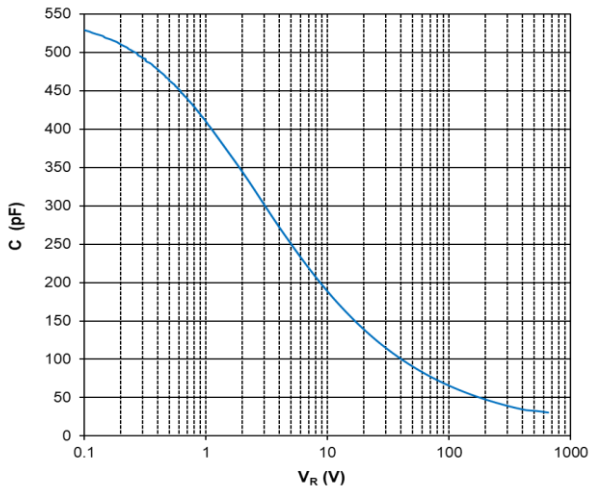


Figure 5. Capacitance vs. V_R

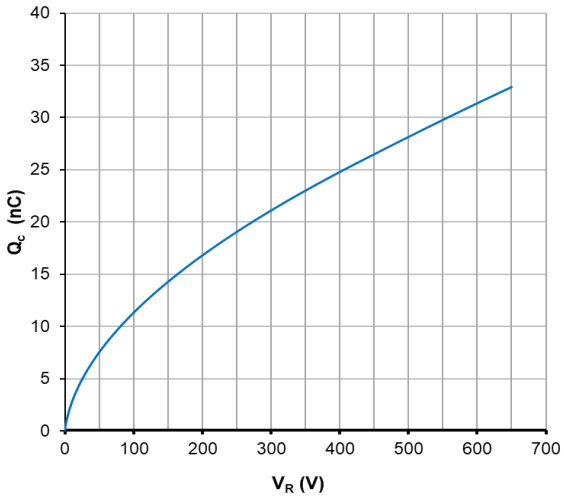
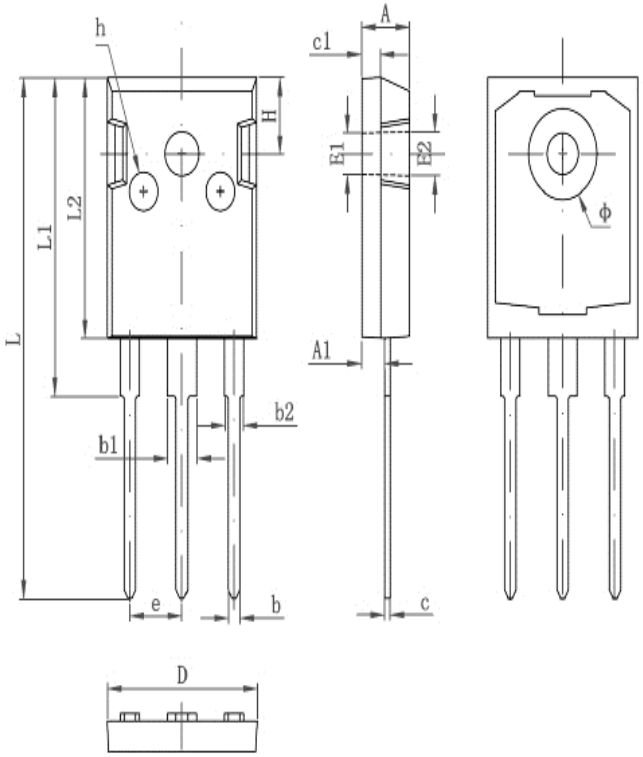


Figure 6. Capacitance vs. V_R

Package Dimensions

(TO-247-3 Package)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	
h	0.000	0.300	0.000	0.012