S3D065V012D

SiC Schottky Diode

Features:

- 650V Schottky Diode
- Zero Reverse Recovery Current
- High Frequency Operation
- Positive Temperature Coefficient
- Temperature independent Switching

Benefits:

- Unipolar Rectifier
- Minimal switching loss
- Higher Efficiency
- Low cooling requirement

Symbol	Value	Unit
V_{RRM}	650	V
$I_{F\ (Tc=160^{o}C)}$	12	A
*Q_C	26	nC

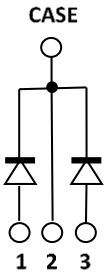
Applications:

- Switch Mode Power Supply
- Booster diodes in PFC, DC/DC
- AC/DC converters

Outline

TO-247-3

Circuit



Maximum Ratings (*Per Leg)

Symbol	Parameter	Value	Unit	Test Conditions
V_R	DC Peak Reverse Voltage	650	V	T_J =25°C
V_{RRM}	Repetitive Peak Reverse	650	V	T_J =25°C
V_{RSM}	Surge Peak Reverse Voltage	650	V	T_J =25°C
I_F	Continuous Forward Current	*25.5 / 51 *11.8 / 23.6 *6 / 12	A	T_C =25°C T_C =135°C T_C =160°C
I_{FRM}	Repetitive Peak Forward Surge Current	*56 *50	A	T_C =25°C, T_P=10ms, Half Sine Wave Tc=125°C, T_P =10ms, Half Sine Wave
I_{FSM}	Non-Repetitive Peak Forward Surge Current	*74 *67	A	T_C =25°C, T_P =10ms, Half Sine Wave Tc=125°C, T_P =10ms, Half Sine Wave
P_D	Power Dissipation	*114 / 228 *38 / 76	W	T_C =25°C Tc=125°C
$T_{J,max}$	Operating Junction Temperature	175	°C	
T_{stg}	Storage Temperature Range	-55 to 175	°C	

Thermal characteristics (*Per Leg)

Symbol	Parameter	Min.	Typ.	Max.	Unit
R_{thJC}	Thermal Resistance		*1.32/0.66		°C/W

Electrical Characteristics (Per Leg)

Symbol	Parameter	Value			Unit	Test Conditions
		Min.	Typ.	Max.		
V_{DC}	DC Blocking Voltage	650			V	I_R = 100μA, T_J = 25°C
V_F	Forward Voltage		1.4 1.65	1.6 1.9	V	I_F = 6A, T_J = 25°C I_F = 6A, T_J = 175°C
I_R	Reverse Current		1 10	30 100	μA	V_R = 650V, T_J = 25°C V_R = 650V, T_J = 175°C
Q_C	Total Capacitive Charge		26		nC	I_F = 6A, dI/dt = 400A/μs T_J = 25°C, V_R = 400V
C	Total Capacitance		329 45 43		pF	V_R = 1V, T_J = 25°C, f = 1 MHz V_R = 200V, T_J = 25°C, f = 1 MHz V_R = 400V, T_J = 25°C, f = 1 MHz

Typical Performance (Per Leg)

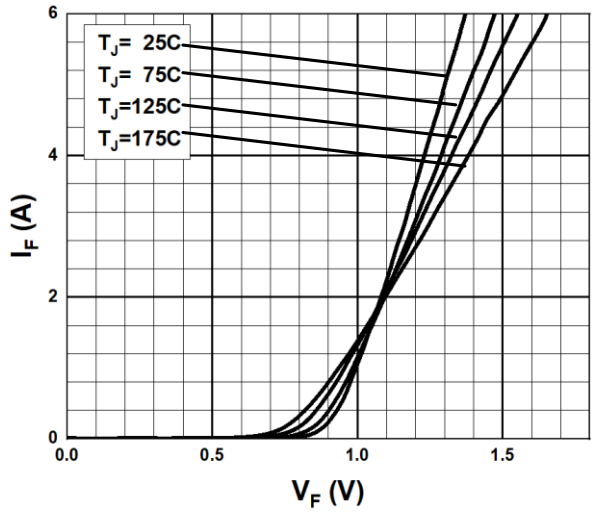


Fig. 1 Forward Characteristics

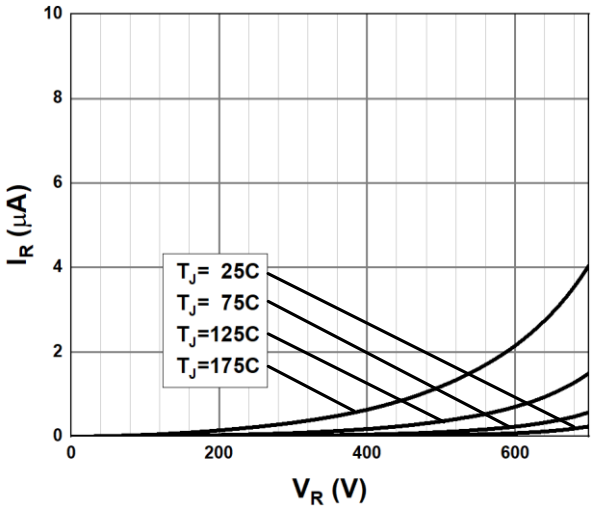


Fig. 2 Reverse Characteristics

Typical Performance (Per Leg)

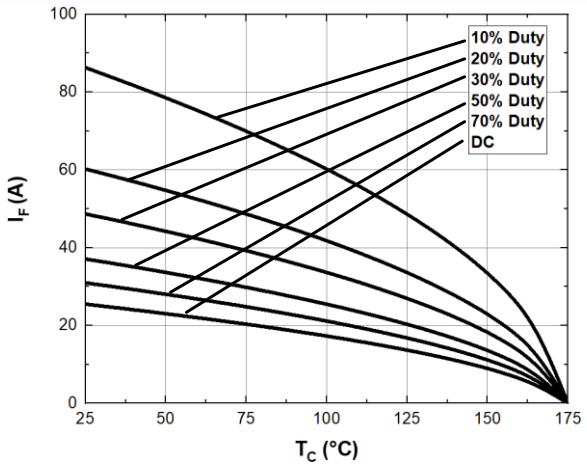


Fig. 3 Current Derating

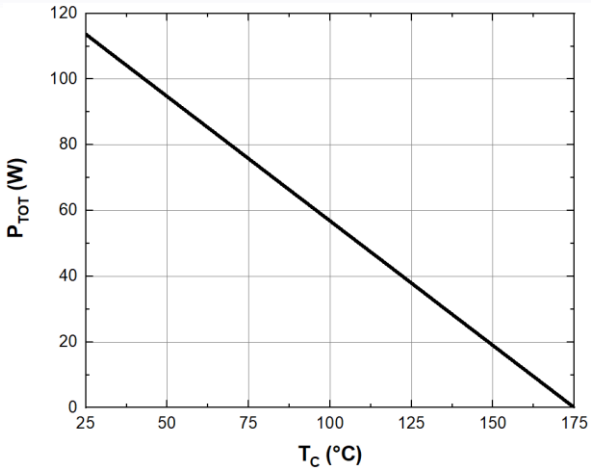


Fig. 4 Power Derating

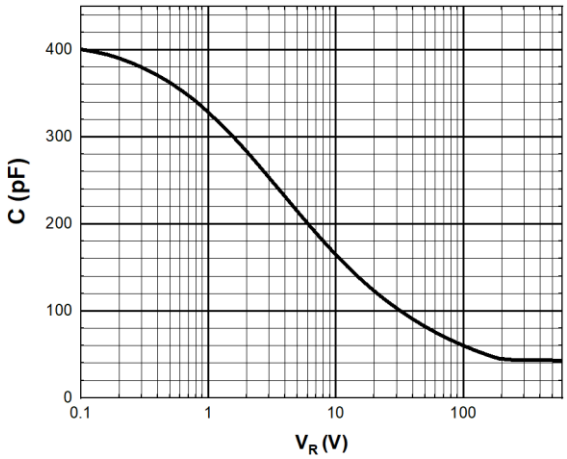


Fig. 5 Capacitance vs. Reverse Voltage

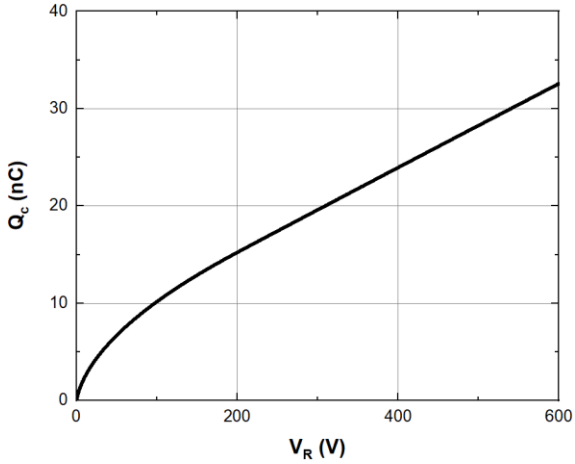


Fig. 6 Recovery Charge vs. Reverse Voltage

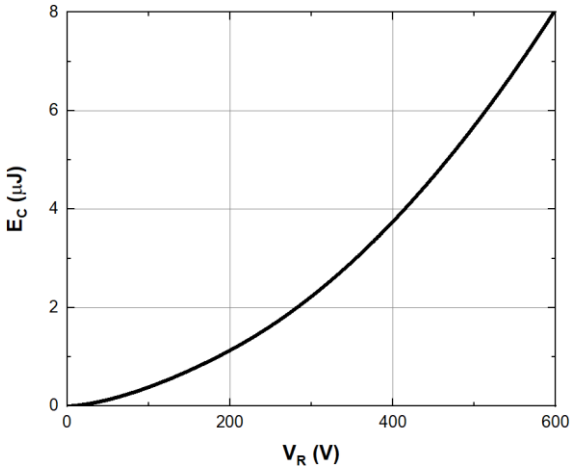


Fig. 7 Capacitance stored Energy

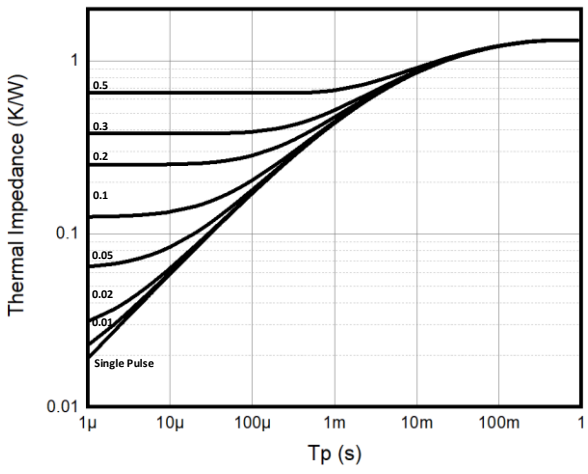
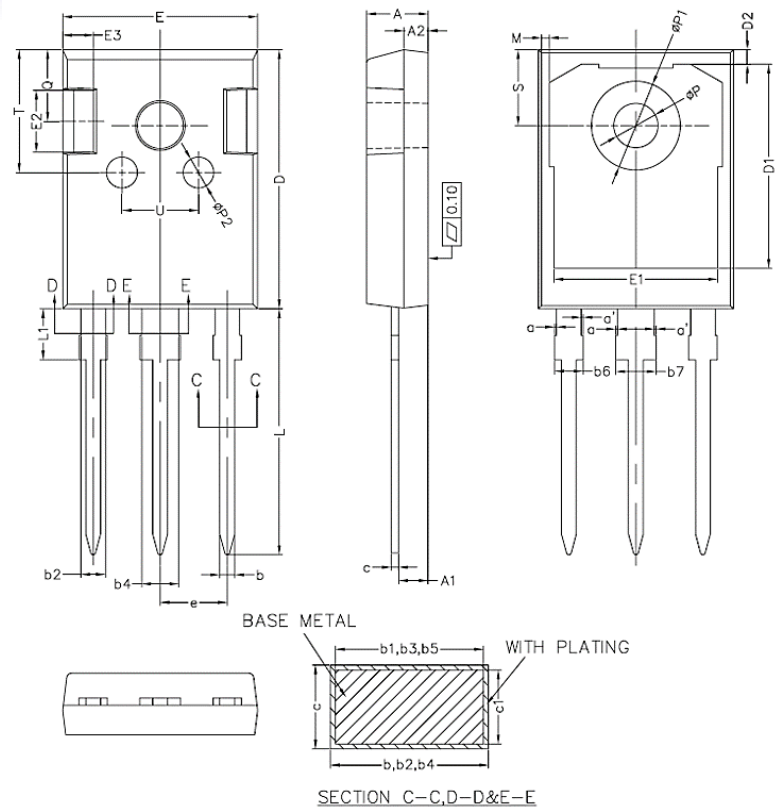


Fig. 8 Thermal Impedance

Package TO-247-3 （Unit: mm）



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0	–	0.15
a'	0	–	0.15
b	1.16	–	1.26
b1	1.15	1.2	1.22
b2	1.96	–	2.06
b3	1.95	2.00	2.02
b4	2.96	–	3.06
b5	2.95	3.00	3.02
b6	–	–	2.25
b7	–	–	3.25
c	0.59	–	0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.20	1.35
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
e	5.34	5.44	5.54
L	19.80	19.92	20.10
L1	–	–	4.30
M	0.35	–	0.95
P	3.50	3.60	3.70
P1	7.00	–	7.40
P2	2.40	2.50	2.60
Q	5.60	–	6.00
S	6.05	6.15	6.25
T	9.80	–	10.20
U	6.00	–	6.40

NOTES:
1.ALL DIMENSIONS REFER TO JEDEC STANDARD TO-247 AD DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
2.EJECTION MARK DEPTH $0.10^{+0.15}_{0.05}$.

This Product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, systems, or air-traffic control systems.

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