

TD5G20065RA

Silicon Carbide Schottky Diode

V_{RRM}	=	650 V
$I_F (T_C=139\text{ }^\circ\text{C})$	=	20 A
Q_C	=	75 nC

Features

- 650 V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching

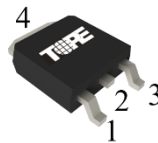
Benefits

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

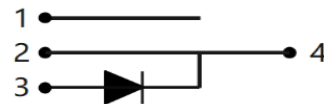
Applications

- Switching Mode Power Supply
- Boost Diodes in PFC
- DC/DC Converters
- AC/DC Converters
- Free Wheeling Diodes in Inverter

Package



TO-252-3



Part Number	Package	Marking
TD5G20065RA	TO-252-3	TD5G20065RA

Maximum Ratings ($T_c = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V		
V_{RSM}	Surge Peak Reverse Voltage	650	V		
V_R	DC Peak Reverse Voltage	650	V		
I_F	Continuous Forward Current	49 22 20	A	$T_c=25\text{ }^\circ\text{C}$ $T_c=135\text{ }^\circ\text{C}$ $T_c=139\text{ }^\circ\text{C}$	Fig. 3
I_{FSM}	Non-Repetitive Forward Surge Current	160	A	$T_c=25\text{ }^\circ\text{C}$, $t_p=10\text{ ms}$, Half Sine Pulse	
P_{tot}	Power Dissipation	136 59	W	$T_c=25\text{ }^\circ\text{C}$ $T_c=110\text{ }^\circ\text{C}$	Fig. 4
T_J	Operating Junction Range	-55 to +175	$^\circ\text{C}$		
T_{stg}	Storage Temperature Range	-55 to +175	$^\circ\text{C}$		

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.4 1.65	1.7 2.2	V	$I_F = 20\text{ A}, T_J = 25\text{ }^\circ\text{C}$ $I_F = 20\text{ A}, T_J = 175\text{ }^\circ\text{C}$	Fig. 1
I_R	Reverse Current	5 25	100 300	μA	$V_R = 650\text{ V}, T_J = 25\text{ }^\circ\text{C}$ $V_R = 650\text{ V}, T_J = 175\text{ }^\circ\text{C}$	Fig. 2
Q_C	Total Capacitive Charge	75		nC	$V_R = 400\text{ V}, I_F = 20\text{ A},$ $T_J = 25\text{ }^\circ\text{C}$	Fig. 6
C	Total Capacitance	1559 143 111		pF	$V_R = 0\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 200\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 400\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	Fig. 5
E_C	Capacitance Stored Energy	9.6		μJ	$V_R = 400\text{ V}$	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		1.1		$^\circ\text{C/W}$	Fig.8

Typical Performance

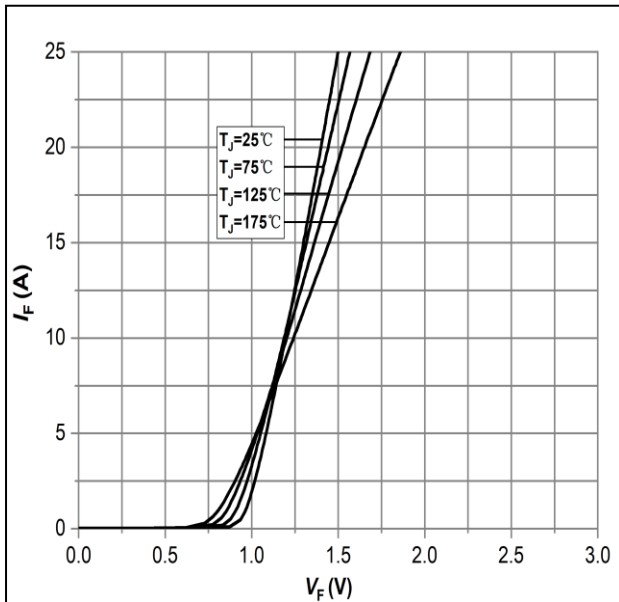


Figure 1: Forward Characteristics

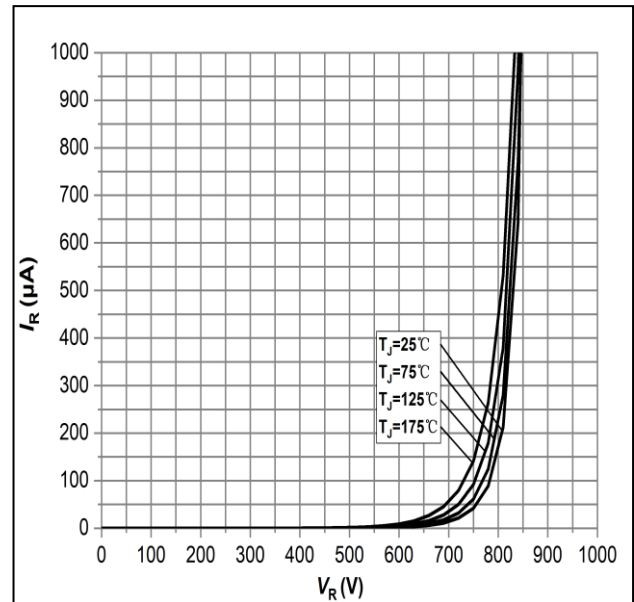


Figure 2: Reverse Characteristics

Typical Performance

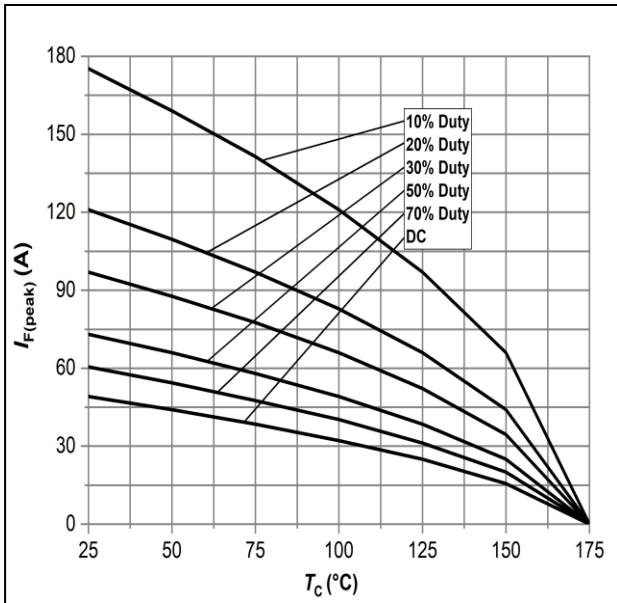


Figure 3: Current Derating

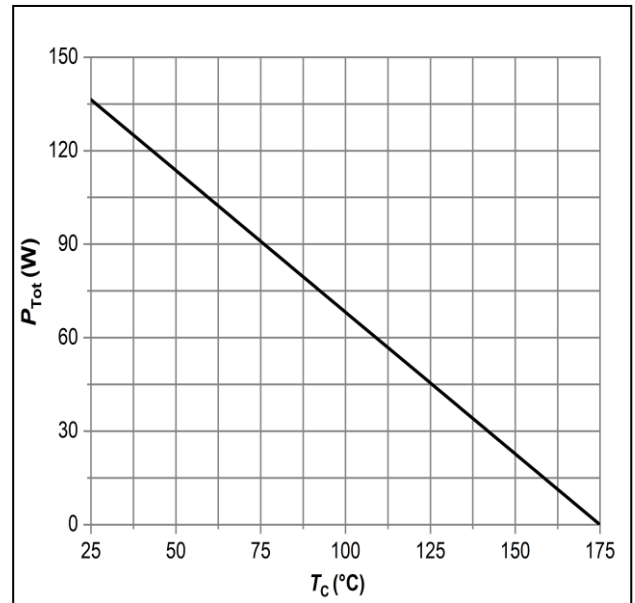


Figure 4: Power Derating

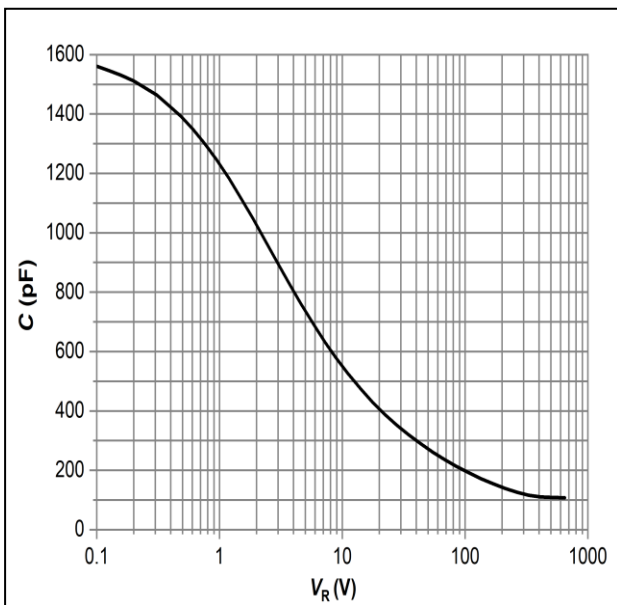


Figure 5: Capacitance vs. Reverse Voltage

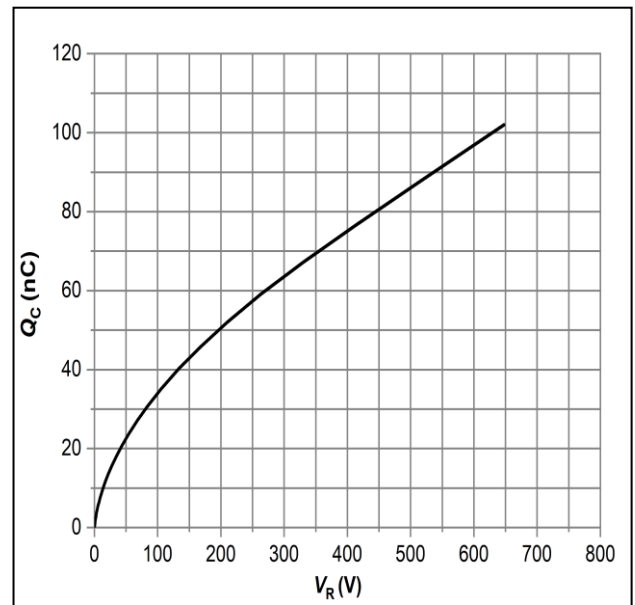


Figure 6: Total Capacitance Charge vs. Reverse Voltage

Typical Performance

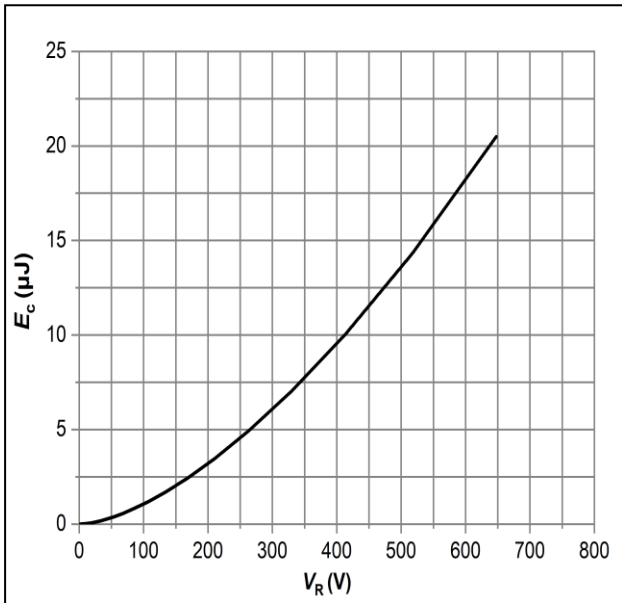


Figure 7: Typical Capacitance Stored Energy

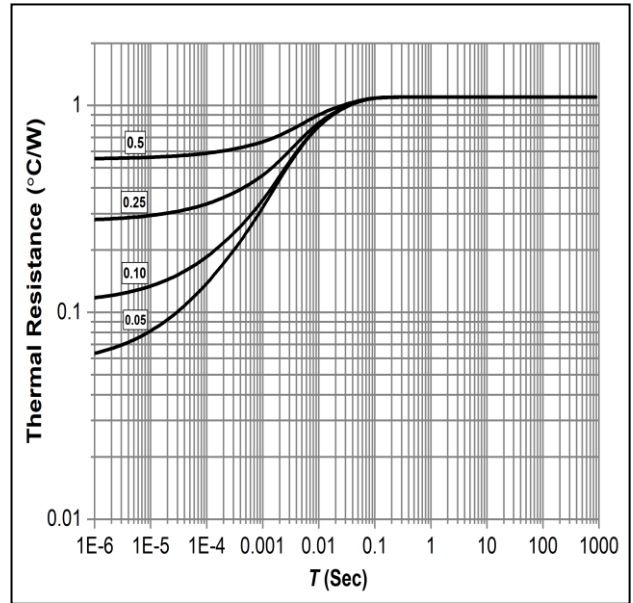
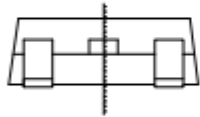
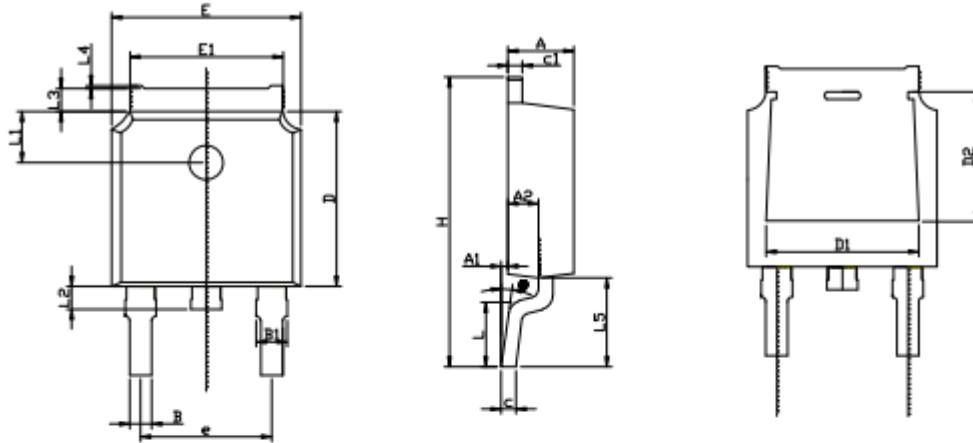


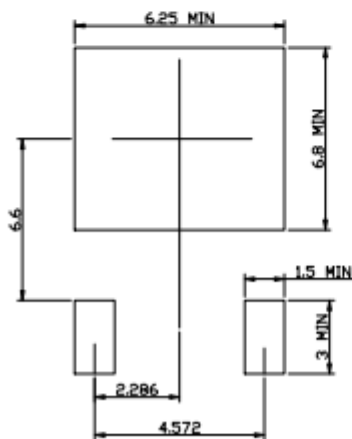
Figure 8: Transient Thermal Impedance

Package Dimensions

Package: TO-252-3



RECOMMENDED LAND PATTERN



	MIN	NOM	MAX
A	2.15	2.30	2.45
A1	0.05	0.10	0.20
A2	0.91	1.07	1.22
B	0.66	0.76	0.86
B1	0.93	1.08	1.23
C	0.40	0.50	0.60
C1	0.40	0.50	0.60
D	5.95	6.10	6.25
D1	-	4.8REF	-
D2	-	3.8REF	-
E	6.45	6.60	6.75
E1	5.12	5.32	5.52
L		1.65	
L1	1.58	1.78	1.98
L2	0.60	0.80	1.00
L3	0.70	0.85	1.00
L4	0.00	0.05	0.20
L5	2.80	3.10	3.40
H	9.80	10.10	10.40
Θ	0°		8°
e		4.572REF	

UNIT: mm

Revision History

Document Version	Description of Changes
Rev.1.0	Released

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