

## Silicon Carbide Schottky Diode

PDDC020N120W

1200V / 20A TO-247-2

Please read the "IMPORTANT NOTICE "  
at the end of this document

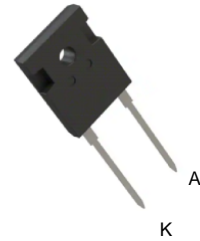
Rev 1.1 2023-12

## Description:

- 1200V 20A Silicon Carbide Schottky Diode

## Features:

- No Reverse Recovery Current
- High Surge Current Capability
- High-Frequency Operation
- Temperature-Independent Switching
- High Non-reperitive Peak Forward Surge Current( $I_{FSM}$ )



## Applications:

- PFC Boost Topology
- Free Wheeling Diodes in Inverter Stages
- AC/DC Converters
- Data Center



## Key Performance and Package Parameters:

Type	$V_{DS}$	$I_F$	$P_D$	$T_J$	Package	Packing
PDDC020N120W	1200 V	20 A	330 W	175 °C	TO-247-2	30

## Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Steady-State	0.45	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient, Steady-State	40	°C/W

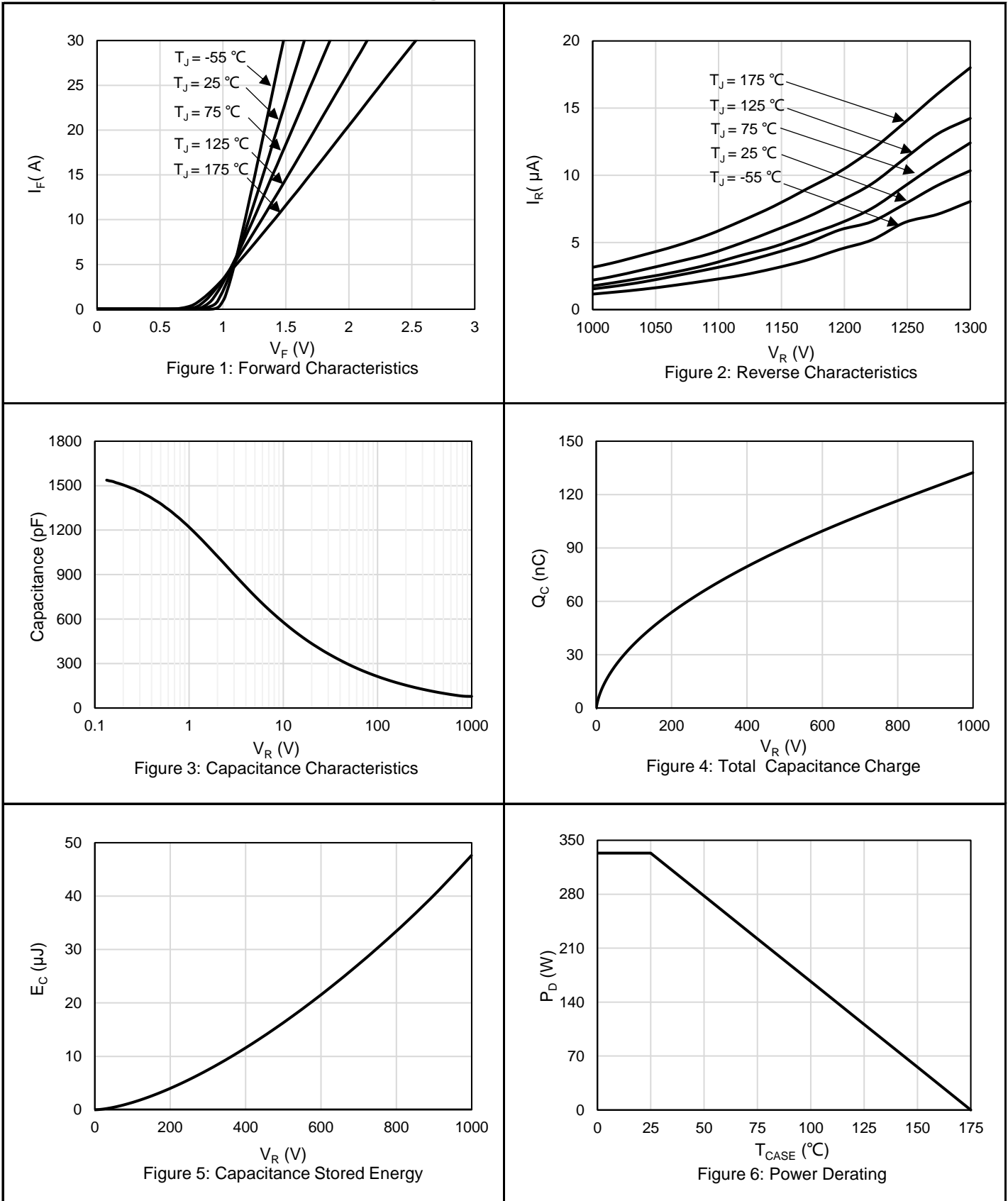
**Maximum Ratings** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

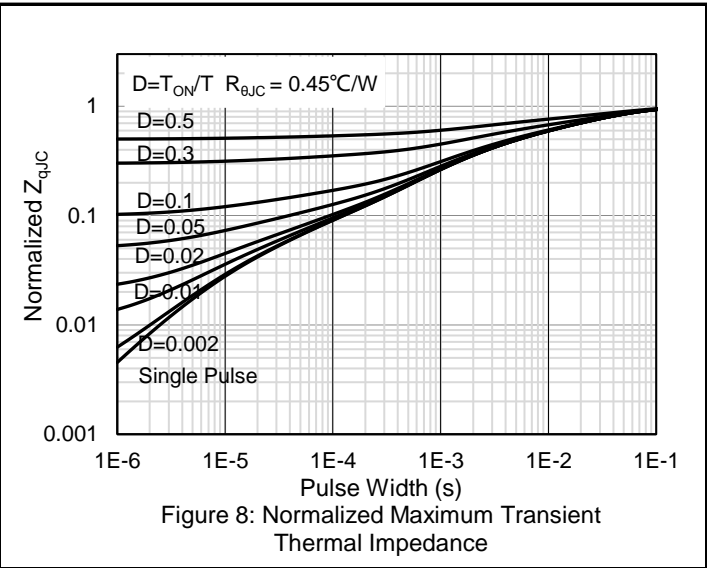
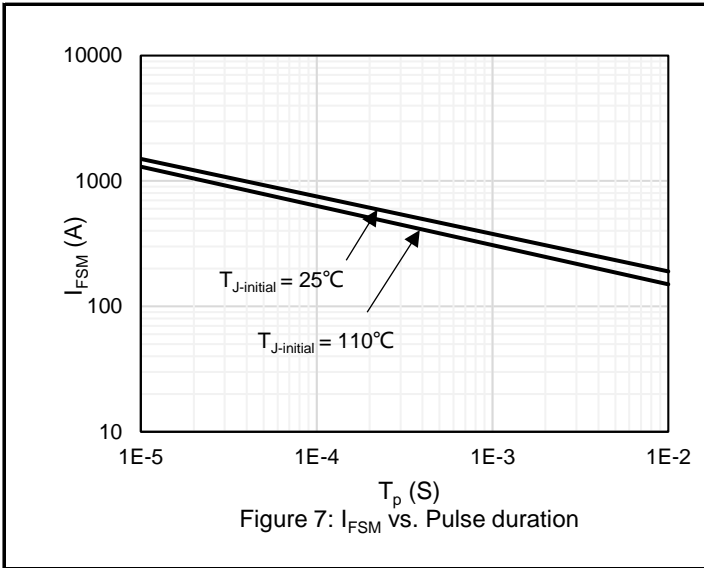
Symbol	Parameter		Value	Units
$V_{RRM}$	Repetitive Peak Reverse Voltage		1200	V
$I_F$	Continues Forward Current	$T_C = 25^\circ\text{C}$	89	A
		$T_C = 125^\circ\text{C}$	41	A
		$T_C = 155^\circ\text{C}$	20	A
$I_{FRM}$	Repetive Peak Forward Surge Current	$T_C = 25^\circ\text{C}$ , $t_p = 10\text{ ms}$ , Half Sine Wave	120	A
		$T_C = 110^\circ\text{C}$ , $t_p = 10\text{ ms}$ , Half Sine Wave	80	A
$I_{FSM}$	Non-Repetive Peak Forward Surge Current	$T_C = 25^\circ\text{C}$ , $t_p = 10\text{ ms}$ , Half Sine Wave	190	A
		$T_C = 110^\circ\text{C}$ , $t_p = 10\text{ ms}$ , Half Sine Wave	150	A
$I_{F,max}$	Non-Repetive Peak Forward Surge Current	$T_C = 25^\circ\text{C}$ , $t_p = 10\text{ }\mu\text{s}$ , Pulse	1500	A
		$T_C = 110^\circ\text{C}$ , $t_p = 10\text{ }\mu\text{s}$ , Pulse	1200	A
dv/dt	Diode dv/dt	$V_R = 0\text{--}960\text{V}$	200	V/ns
$\int i^2 dt$	$i^2 t$ value	$T_C = 25^\circ\text{C}$ , $t_p = 10\text{ ms}$	180	A
		$T_C = 110^\circ\text{C}$ , $t_p = 10\text{ ms}$	112	A
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	330	W
		$T_C = 110^\circ\text{C}$	140	W
$T_J, T_{STG}$	Operating and Storage Temperature Range		-55 to +175	$^\circ\text{C}$

**Electrical Characteristics** ( $T_J = 25^\circ\text{C}$  unless otherwise noted)

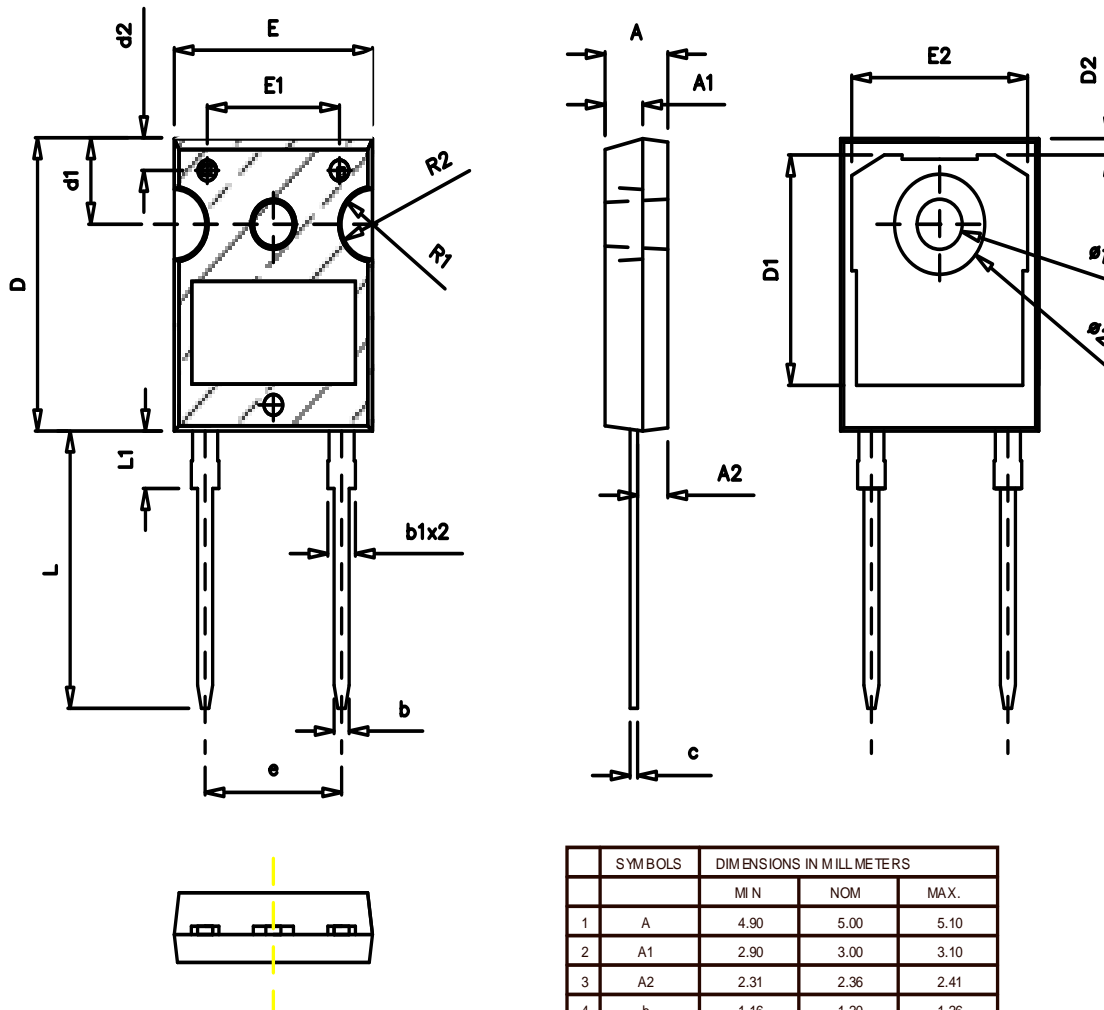
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$V_F$	Forward Voltage	$I_F = 20\text{ A}, T_J = 25^\circ\text{C}$	-	1.4	1.65	V
		$I_F = 20\text{ A}, T_J = 175^\circ\text{C}$	-	2.2	-	V
$I_R$	Reverse Current	$V_R = 1200\text{ V}, T_J = 25^\circ\text{C}$	-	10	200	$\mu\text{A}$
		$V_R = 1200\text{ V}, T_J = 175^\circ\text{C}$	-	65	400	$\mu\text{A}$
$Q_C$	Total Capacitance Charge	$V_R = 800\text{V}, I_F = 20\text{ A}$ $Q_C = \int_0^{V_R} C(V_R) dV(V_R)$	-	110	-	nC
C	Total Capacitance	$V_R = 0\text{ V}, f = 1\text{ MHz}$	-	1530	-	pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}$	-	107	-	pF
		$V_R = 800\text{ V}, f = 1\text{ MHz}$	-	81	-	pF
$E_C$	Capacitance Stored Energy	$V_R = 800\text{ V}$	-	32	-	$\mu\text{J}$

## Electrical Characteristics Diagrams





## Package Outlines



	SYMBOLS	DIMENSIONS IN MILL METERS		
		MIN	NOM	MAX.
1	A	4.90	5.00	5.10
2	A1	2.90	3.00	3.10
3	A2	2.31	2.36	2.41
4	b	1.16	1.20	1.26
5	b1	2.05	-	2.20
6	b2	-	-	-
7	c	0.58	0.60	0.66
8	D	20.9	21.00	21.1
9	D1	16.46	16.56	16.76
10	D2		1.17	
11	d1	6.05	6.15	6.25
12	d2	2.2	2.3	2.4
13	E	15.7	15.8	15.9
14	E1		10.5	
15	E2		14.02	
16	e	-	2.54bcs	-
17	L	19.82	19.92	20.02
18	L1	1.88	1.98	2.08
19	theta	0°	7°	8°
20	R1	-	2.7	-
21	R2	-	2.5	-
22	phi1		3.6	
23	phi2	-	7.19	-

## Revision History

Revision	Release Date	Remarks
Rev 1.0	2023-09	Initial Release
Rev 1.1	2023-12	Electrical Characteristics Update

### IMPORTANT NOTICE

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