

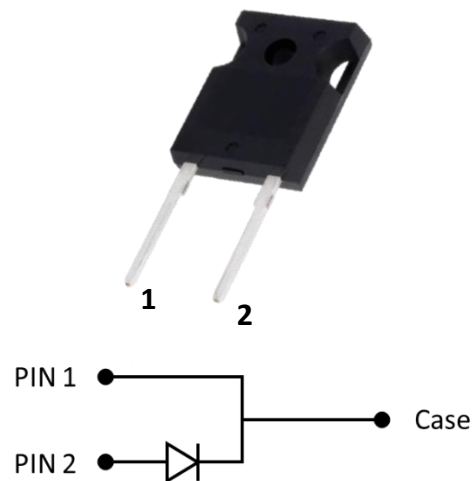
## NW12040IJ1

1200 V 40 A SiC Schottky diodes

Parameter	Value	Unit
$I_F; T_c = 145\text{ °C}$	40	A
$V_F; I_F = 40\text{ A}$	1.40	V
$Q_C; V_R = 800\text{ V}$	182	nC

### Features

- Zero reverse recovery
- High-speed switching
- Temperature independent switching behavior
- $V_{RPM} = 1200\text{ V}$
- $I_F = 40\text{ A}$  (155 °C)
- $V_F = 1.40\text{ V}$  (25 °C)
- $Q_C = 182\text{ nC}$
- Junction temperature -55 °C to 175 °C
- Package type: TO-247-2L
- RoHS compliant



### Applications

- Industrial power supplies
- Battery chargers
- Solar inverters
- Switch mode power supplies

### Description

The NW12040IJ1 Schottky barrier diode (SBD) is based on NovaWave's advanced SiC power technology resulting in high performance and long-term reliability. It supports high-temperature operation while showing minimal losses, zero reverse recovery, and low leakage current up to 1200V.

**Table 1 Maximum Ratings**
 $T_j = 25\text{ °C}$ , unless otherwise specified.

Parameter	Symbol	Value	Unit	Test conditions
Repetitive peak reverse voltage	$V_{RRM}$	1200	V	$T_C = 25\text{ °C}$
Surge peak reverse voltage	$V_{RSM}$	1200		
DC reverse voltage	$V_{DC}$	1200		
Continuous forward current	$I_F$	98	A	$T_C = 25\text{ °C}$
		47		$T_C = 135\text{ °C}$
		40		$T_C = 145\text{ °C}$
Surge non-repetitive forward current	$I_{FSM}$	365	A	$T_C = 25\text{ °C}$ , $t_p = 10\text{ ms}$ , half sine wave $D = 0.1$
Surge repetitive forward current	$I_{FRM}$	205	A	$T_C = 25\text{ °C}$ , $t_p = 10\text{ ms}$ , half sine wave $D = 0.1$
Power dissipation	$P_{tot}$	428	W	$T_C = 25\text{ °C}$
$i^2t$ value	$\int i^2 dt$	666	$A^2s$	$T_C = 25\text{ °C}$ , $t_p = 10\text{ ms}$ ,
Operating Junction Temperature	$T_J$	-55 to +175	$^{\circ}C$	-
Storage Temperature	$T_S$	-55 to +150	$^{\circ}C$	-
Mounting torque	M	1	Nm	M3 screw

**Table 2 Thermal Characteristics**

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-to-Case – (bottom side)	$R_{TH,J-C}$	0.35	$^{\circ}C/W$

**Table 3 Static Electrical Characteristics**

Parameters	Symbol	Min	Typ	Max	Unit	Condition
DC blocking voltage	$V_{DC}$	1200	-	-	V	$I_R = 100 \mu A$
Forward voltage	$V_F$	-	1.40	1.60	V	$I_F = 40 A, T_j = 25 \text{ }^\circ C$
		-	1.95	2.50		$I_F = 40 A, T_j = 175 \text{ }^\circ C$
Reverse current	$I_R$	-	5	96	$\mu A$	$V_R = 1200 V, T_j = 25 \text{ }^\circ C$
		-	40	640		$V_R = 1200 V, T_j = 175 \text{ }^\circ C$

**Table 4 Dynamic Electrical Characteristics**

Total capacitance	C	-	2648	-	$\mu F$	$V_R = 0 V, f = 1 \text{ MHz}$
		-	171	-		$V_R = 400 V, f = 1 \text{ MHz}$
		-	122	-		$V_R = 800 V, f = 1 \text{ MHz}$
Total capacitive charge	$Q_C$	-	182	-	nC	$V_R = 800 V$
Capacitive stored energy	$E_C$	-	52	-	$\mu J$	$V_R = 800 V$

## Electrical Performance Graphs

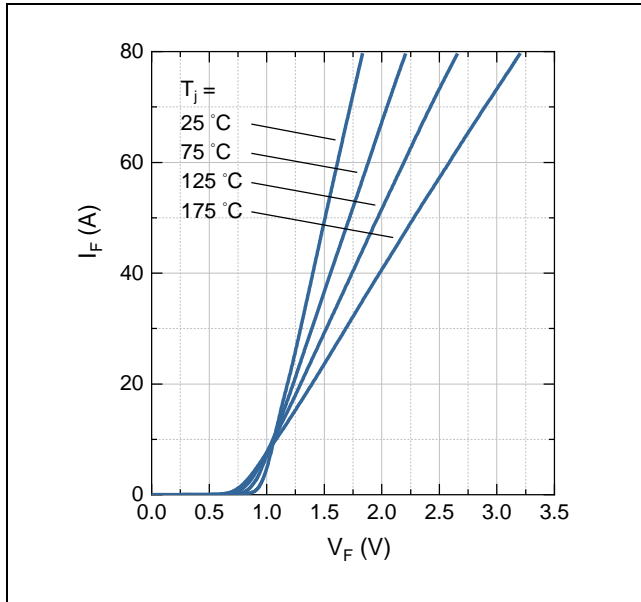


Figure 1: Typical Forward characteristics

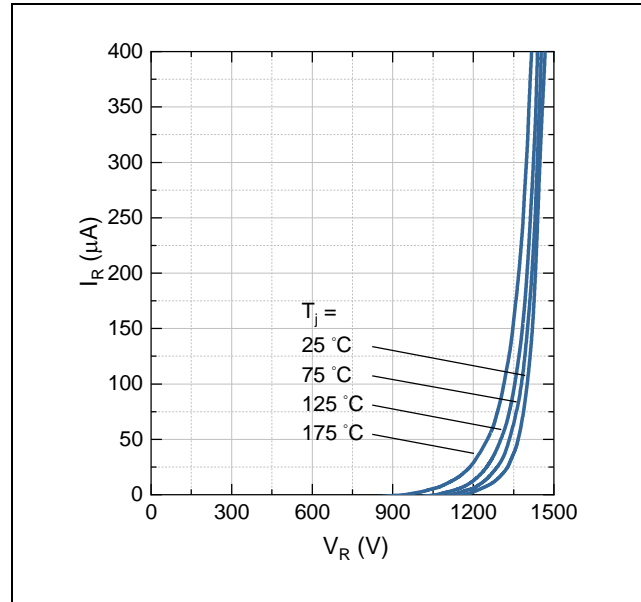


Figure 2: Typical Reverse characteristics

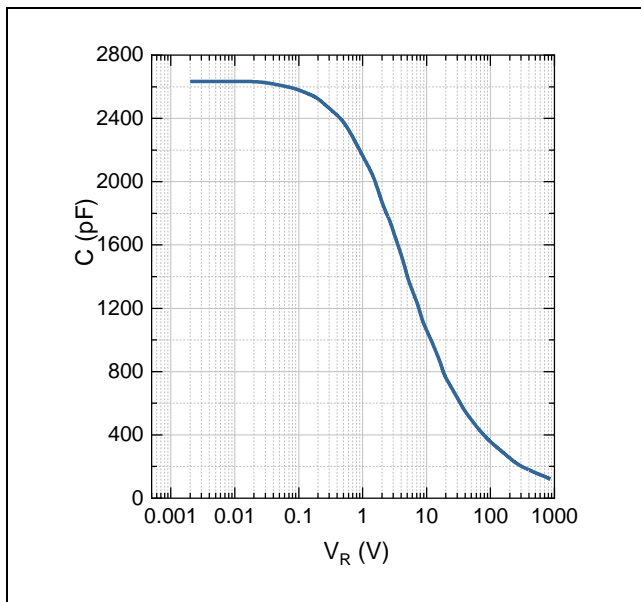


Figure 3: Typical Junction Capacitance vs. Reverse Voltage

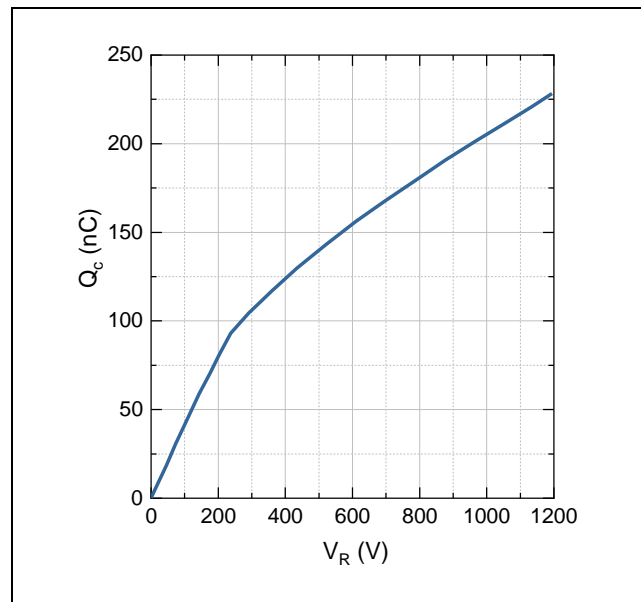


Figure 4: Typical Capacitive Charge vs. Reverse Voltage

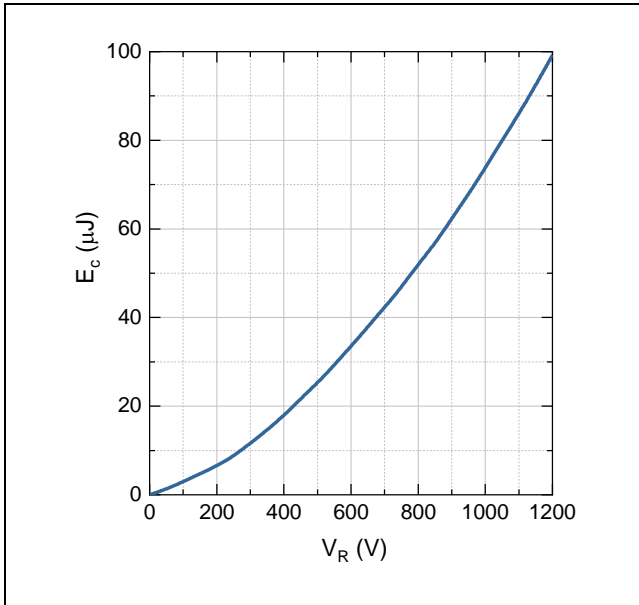


Figure 5: Typical Capacitive Energy vs. Reverse Voltage

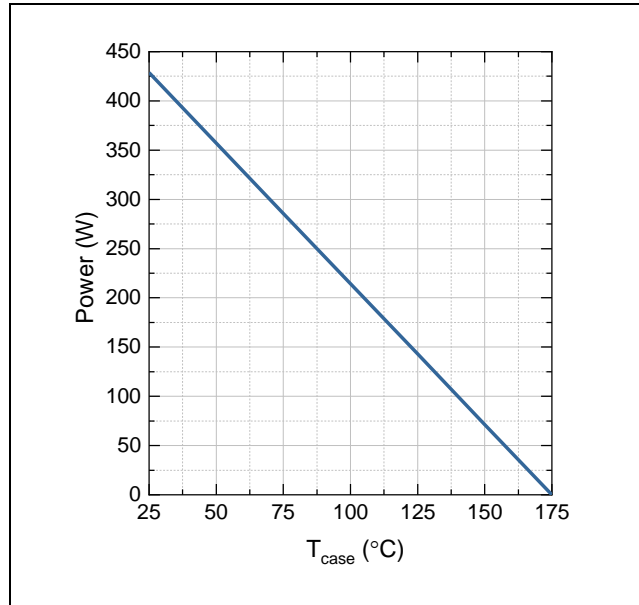


Figure 6: Power Derating vs.  $T_{\text{case}}$

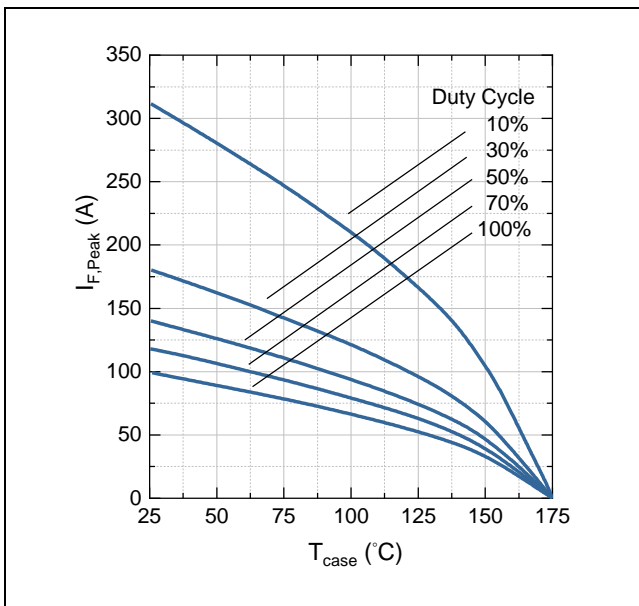
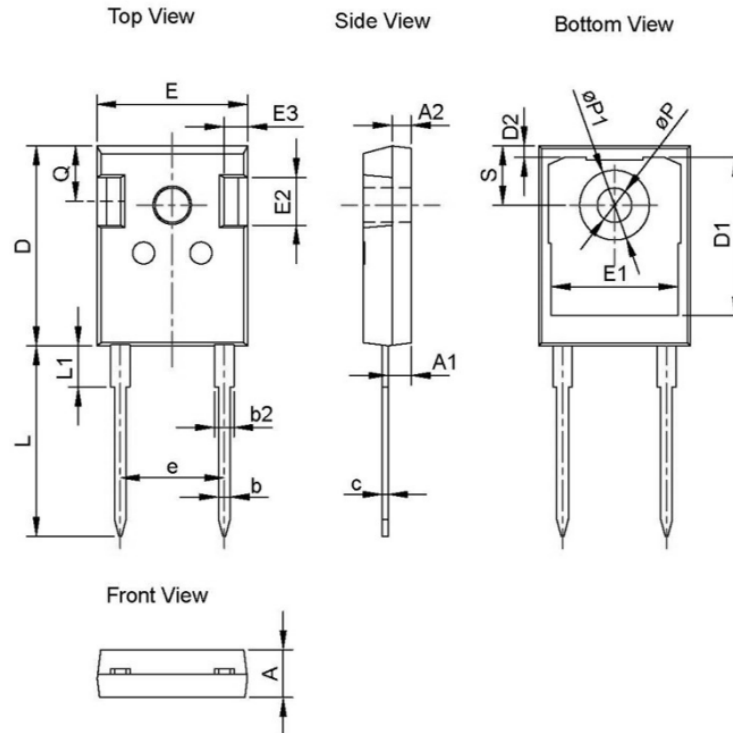


Figure 7: Current Derating vs.  $T_{\text{case}}$

## Package Information



Dimension unit: [mm]			
Symbol	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
c	0.51	0.60	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
D2	1.00	1.20	1.35
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	10.88 BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
øP	3.40	3.60	3.80
øP1	-	-	7.30
Q	5.40	5.80	6.20
S	6.20 BSC		

## Recommended Solder Pad Layout

Note: all dimensions are in mm



TO-247-2L

## Ordering information

Parameters	Symbol
Part number	NW12040IJ1
Package	TO-247-2L
Unit quantity	300 ea
Package type	Tube

## Disclaimer

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