

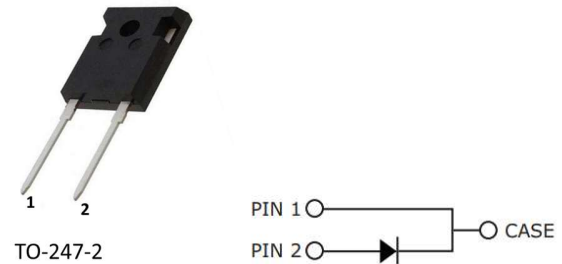
NWK730TJ1-2

1700V Silicon Carbide Schottky Diode

Parameter	Value	Unit
V_{RRM}	1700	V
Q_C	309	nC
I_F ($T_C = 155^\circ\text{C}$)	30	A

Features

- 1700 V Schottky Rectifier
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Excellent Surge Current Capability
- Positive Temperature Coefficient on V_F
- Temperature-Independent Switching
- High Frequency Operation



Applications

- Switch Mode Power Supplies
- Uninterruptible Power Supplies
- Power Factor Correction
- Motor Drivers

Description

The NWK730TJ1-2 is a 1700V, SiC Schottky Barrier Diode (SBD) 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.

Part Description

Part Number	Package	Marking
NWK730TJ1-2	TO-247-2	NWK730TJ1-2

Absolute Maximum Ratings

$T_J = 25^\circ\text{C}$ except as noted. Exceeding the maximum ratings may damage the device.

Parameter	Symbol	Value	Unit	Test conditions
Repetitive Peak Reverse Voltage	V_{RRM}	1700	V	
Continuous Forward Current	I_F	103 50 30	A	$T_C = 25^\circ\text{C}$ $T_C = 135^\circ\text{C}$ $T_C = 155^\circ\text{C}$
Non-Repetitive Forward Surge Current	I_{FSM}	410 390	A	$T_C = 25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave $T_C = 150^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave
Non-Repetitive Forward Surge Current	$I_{F,max}$	2400	A	$T_C = 25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave
i^2t value	$\int i^2 dt$	840 760	A^2s	$T_C = 25^\circ\text{C}$, $t_p = 10$ ms $T_C = 150^\circ\text{C}$, $t_p = 10$ ms
Power Dissipation	P_{tot}	600 260	W	$T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$
Non-Repetitive Avalanche Switching Energy	E_{AS}	1512	mJ	$V_{DD} = 50\text{V}$, $L = 1\text{mH}$, $I_D = 55\text{A}$
Operating Junction Range	T_J	-55 to +175	$^\circ\text{C}$	-
Storage Temperature Range	T_{stg}	-55 to +175	$^\circ\text{C}$	-
Soldering Temperature	T_{sold}	260	$^\circ\text{C}$	1.6mm (0.063") from Case for 10s
Mounting Torque	M	0.7	Nm	M3 Screw

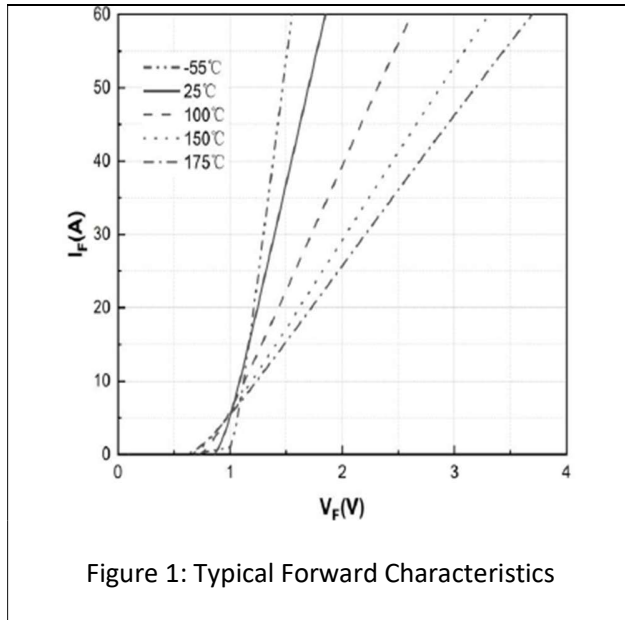
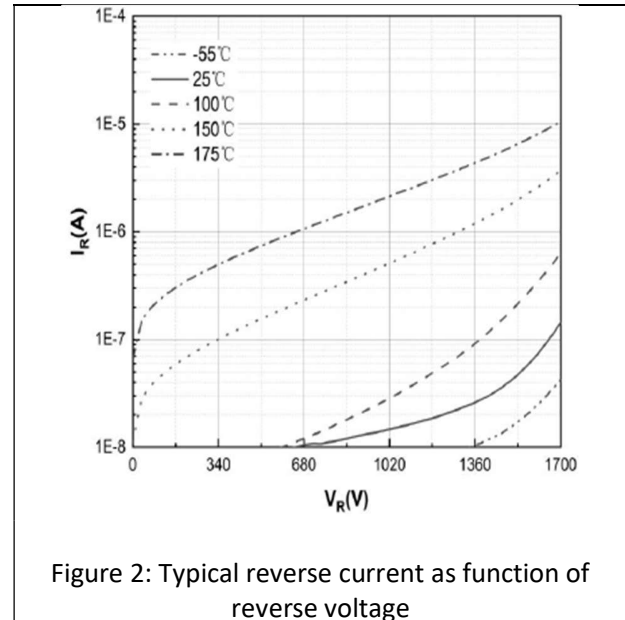
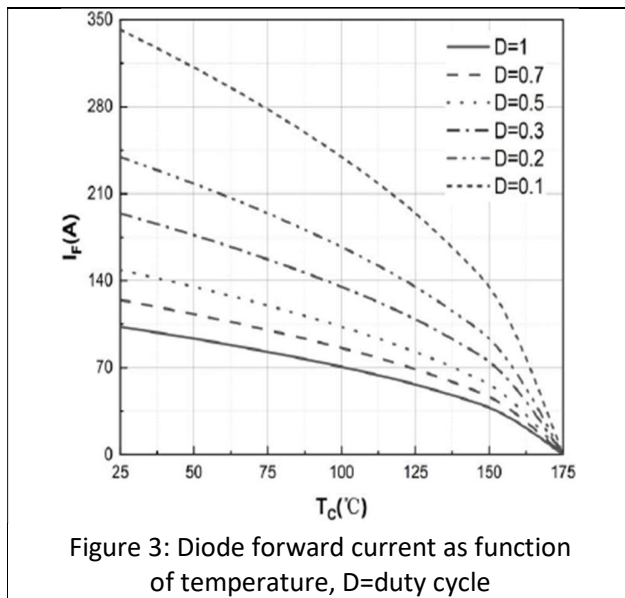
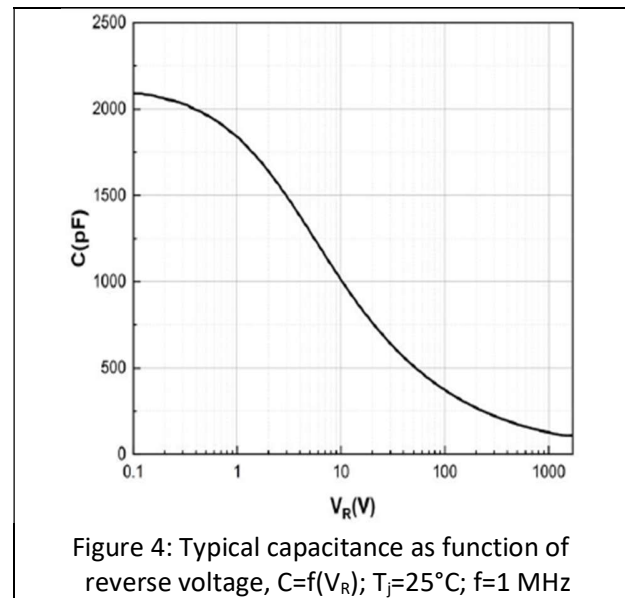
Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance from Junction to Case	$R_{TH,J-C}$		0.25	0.30	$^\circ\text{C/W}$

Electrical Characteristics

Parameters	Symbol	Min	Typ	Max	Unit	Condition
DC blocking voltage	V_{DC}	1700	--	--	V	$T_C = 25\text{ }^{\circ}\text{C}$
Forward Voltage	V_F	--	1.39 1.93 2.21	1.73 2.57 3.15	V	$I_F=30\text{ A}$, $T_C = 25\text{ }^{\circ}\text{C}$ $I_F=30\text{ A}$, $T_C = 135\text{ }^{\circ}\text{C}$ $I_F=30\text{ A}$, $T_C = 175\text{ }^{\circ}\text{C}$
Reverse Current	I_R	--	5 20	50 200	μA	$V_R=1700\text{ V}$, $T_C = 25\text{ }^{\circ}\text{C}$ $V_R=1700\text{ V}$, $T_C = 175\text{ }^{\circ}\text{C}$
Total Capacitive Charge	Q_C	--	309	--	nC	$V_R=1700\text{ V}$, $T_C = 25\text{ }^{\circ}\text{C}$, $Q_C=\int_0^{V_R} C(V)dV$
Total Capacitance	C	--	1843 146 109	--	pF	$V_R=1\text{ V}$, $T_C = 25\text{ }^{\circ}\text{C}$, $f=1\text{ MHz}$ $V_R=800\text{ V}$, $T_C = 25\text{ }^{\circ}\text{C}$, $f=1\text{ MHz}$ $V_R=1700\text{ V}$, $T_C = 25\text{ }^{\circ}\text{C}$, $f=1\text{ MHz}$
Capacitance Stored Energy	E_C	--	168	--	μJ	$V_R=1700\text{ V}$, $T_C = 25\text{ }^{\circ}\text{C}$

Electrical Performance Graphs



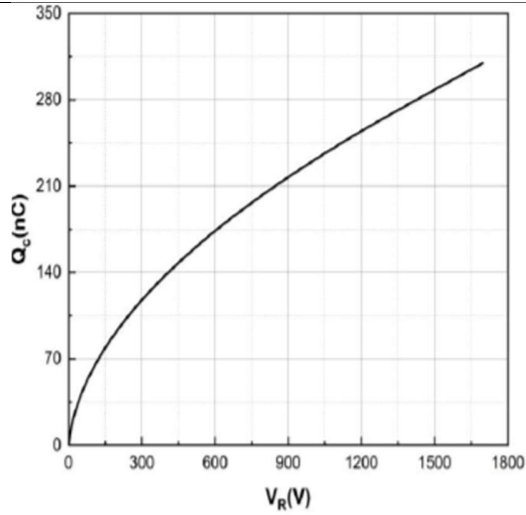


Figure 5: Typical reverse charge as function of reverse voltage

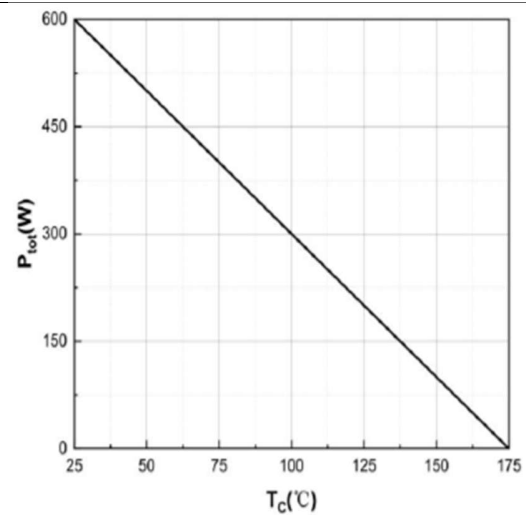


Figure 6: Power dissipation as function of case temperature

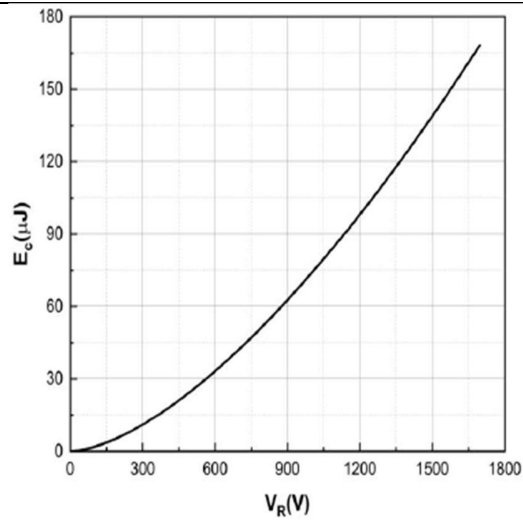


Figure 7: Typical Capacitance Stored Energy

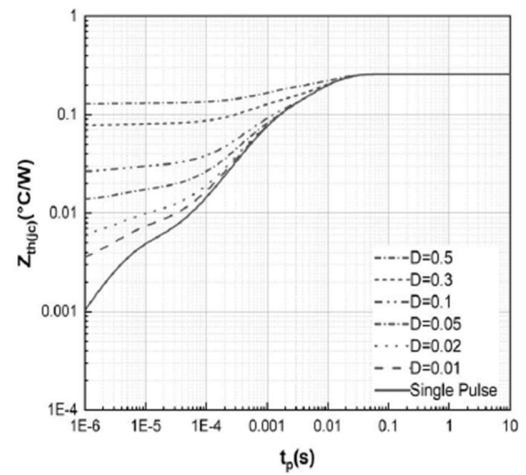
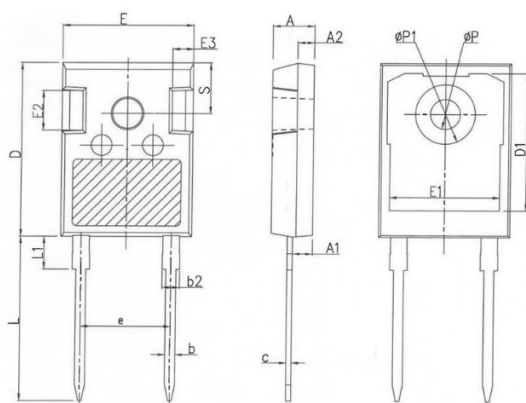


Figure 8: Max. transient thermal impedance, $Z_{th(jc)} = f(t_p)$, parameter: $D = t_p/T$

Package Dimensions

Package: TO-247-2



SYMBOL	Unit:mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
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
ϕP	3.40	3.60	3.80
$\phi P1$	-	-	7.30
S	6.15 BSC		



Disclaimer

The information given in this document is intended as a reference only and shall not in any event be regarded as a guarantee of performance. Novawave does not assume any liability arising out of the use of any product described herein, including but not limited to any personal injury, death, or property or environmental damage. The products shown herein are not designed for use as critical components in medical, life-saving, or life-sustaining applications, whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness. No licenses, patent rights, or any other intellectual property rights is granted or conveyed. Novawave reserves the right to make changes without further notice to any products herein to improve reliability, function, or design. Novawave standard terms and conditions apply. All rights reserved.