N2S065010PJ2

Silicon Carbide Schottky Diode

V_{RRM}	=	650V
$I_F(T_C \leq 135℃)$	=	19A
Q_c	=	25nC

Features

- New Thin Wafer Technology
- Low Forward Voltage Drop (V_F)
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on V_F
- Temperature-independent Switching

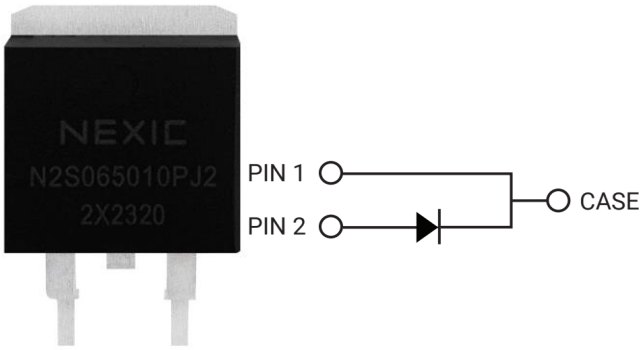
Benefits

- Replace Bipolar with Unipolar Device
- Reduction of Heat Sink Size
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

Applications

- Switch Mode Power Supplies
- Uninterruptible Power Supplies
- Motor drive, PV Inverter, Wind Power Station

Package



TO-263-2

Part Number	Package	Marking
N2S065010PJ2	TO-263-2	N2S065010PJ2

Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V	T_C = 25℃	
V_{RSM}	Surge Peak Reverse Voltage	650	V	T_C = 25℃	
V_R	DC Blocking Voltage	650	V	T_C = 25℃	
I_F	Forward Current	38 19 10	A	$T_C \leq$ 25℃ $T_C \leq$ 135℃ $T_C \leq$ 158℃	
I_{FSM}	Non-Repetitive Forward Surge Current	86	A	T_C = 25℃, t_p = 8.3ms, Half Sine Wave	
P_{tot}	Power Dissipation	150	W	T_C = 25℃	Fig.3
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to 175	℃		

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Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.27 1.38	1.5 1.6	V	I_F = 10A, T_J = 25℃ I_F = 10A, T_J = 175℃	Fig.1
I_R	Reverse Current	6 25	50 200	μA	V_R = 650V, T_J = 25℃ V_R = 650V, T_J = 175℃	Fig.2
C	Total Capacitance	640 66 48	/	pF	V_R = 0.1V, T_J = 25℃, f = 1MHz V_R = 200V, T_J = 25℃, f = 1MHz V_R = 400V, T_J = 25℃, f = 1MHz	Fig.5
Q_C	Total Capacitive Charge	25	/	nC	V_R = 400V, I_F = 10A di/dt = 200A/μs, T_J = 25℃	Fig.4

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1	℃/W	Fig.6
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	80	℃/W	
T_{sold}	Soldering Temperature	260	℃	

Typical Performance

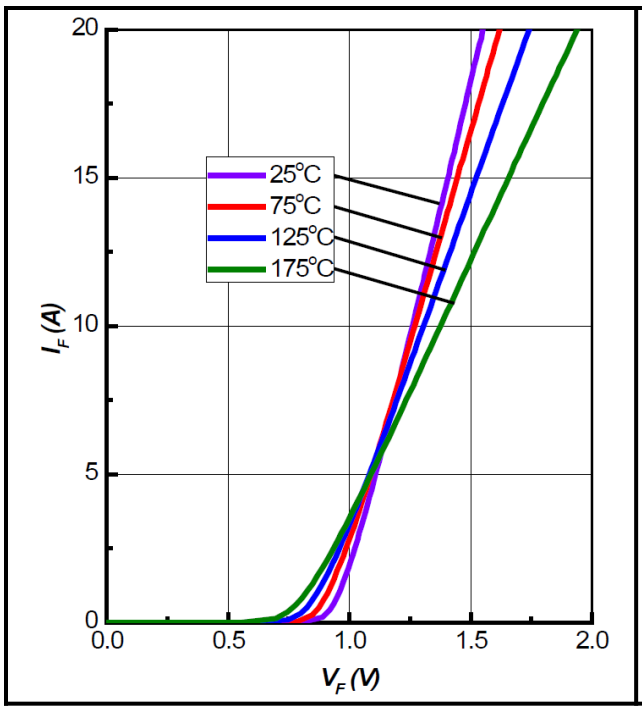

Figure 1. Forward Characteristics

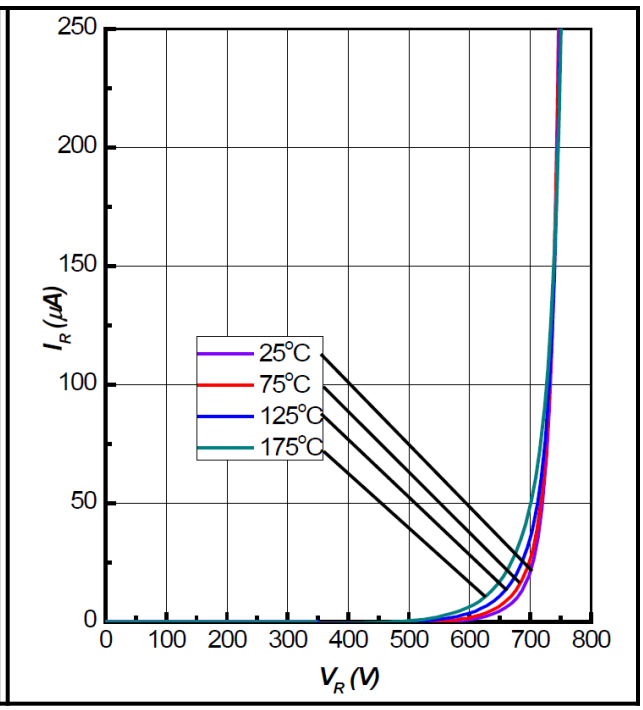

Figure 2. Reverse Characteristics

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Typical Performance

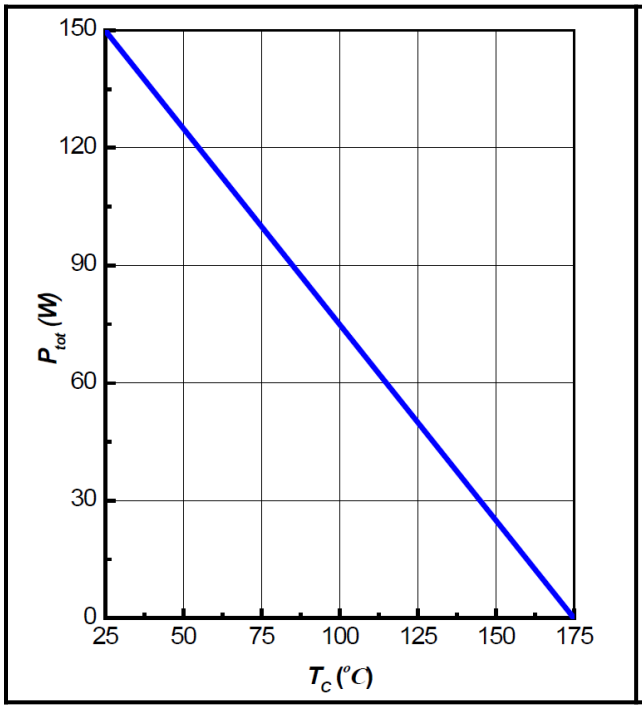

Figure 3. Power Derating

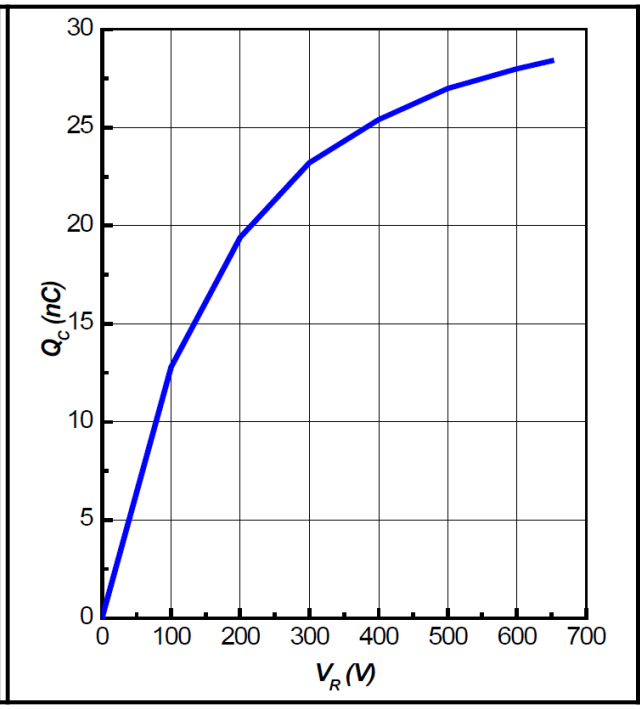

Figure 4. Total Capacitive Charge vs. Reverse Voltage

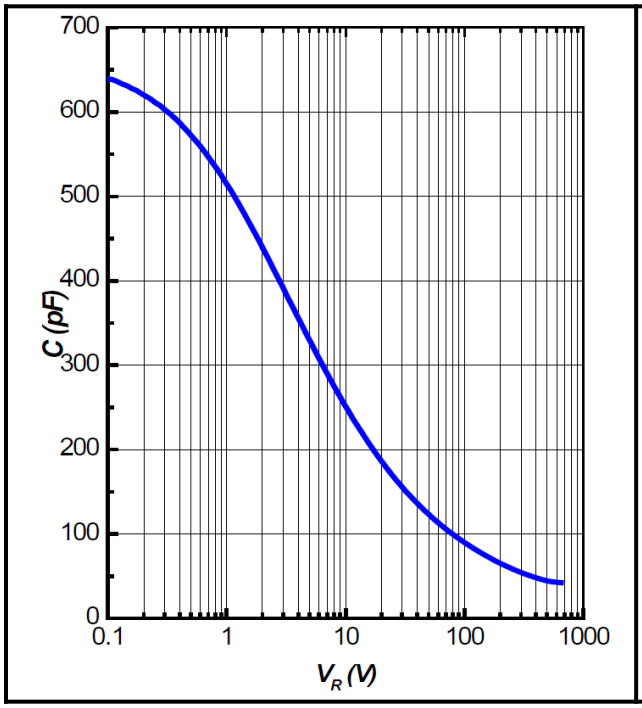

Figure 5. Total Capacitance vs. Reverse Voltage

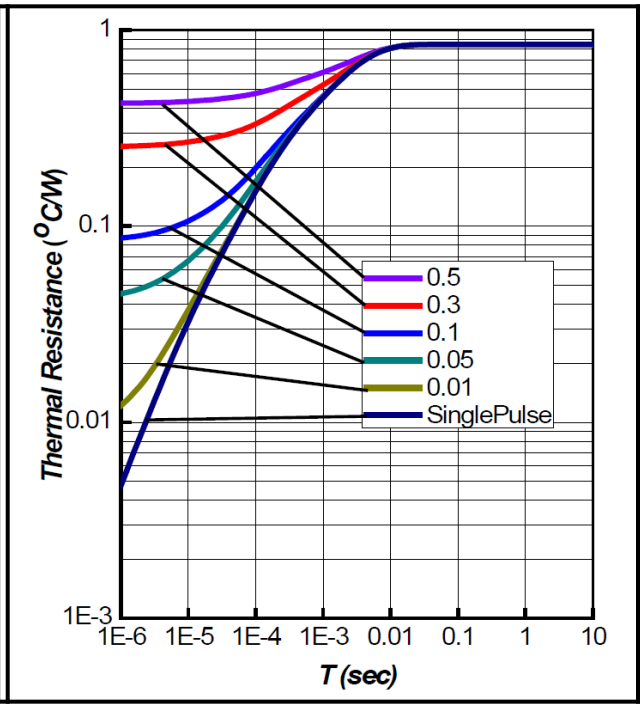

Figure 6. Transient Thermal Impedance

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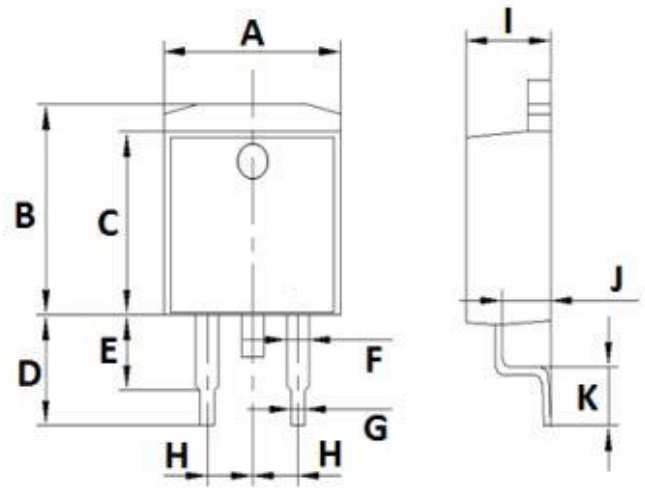
Package Dimensions

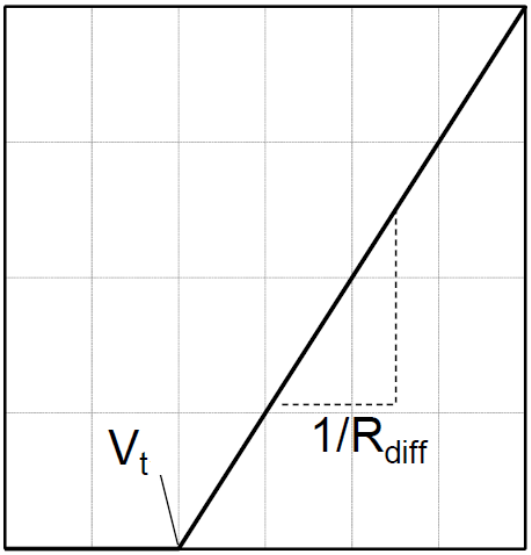
Package TO-263-2



SYMBOL	mm		
	MIN	NOM	MAX
A	9.80	10.10	10.40
B	9.40	9.90	10.40
C	8.46	8.66	8.86
D	4.85	5.35	5.80
E	/	3.20	/
F	1.05	1.25	1.45
G	0.60	0.80	1.00
H	2.34	2.54	2.74
I	4.40	4.65	4.90
J	2.40	2.60	2.80
K	2.30	2.55	2.80

Simplified Diode Model

Equivalent IV Curve for Model



Mathematical Equation

$$V_F = V_t + I_F \times R_{diff}$$

$$V_t = -0.001 \times T_j + 0.99 \text{ [V]}$$
$$R_{diff} = 6.9 \times 10^{-7} \times T_j^2 + 4.3 \times 10^{-5} \times T_j + 0.28 \text{ [}\Omega\text{]}$$

Note:

T_j = Diode Junction Temperature In Degrees Celsius, valid from 25°C to175°C
I_F= Forward Current Less than 20A

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