



# PSC20120L

1200 V, 20 A SiC Schottky diode in TO247 R2P

8 December 2025

Product data sheet

## 1. General description

Nexperia introduces leading edge Silicon Carbide (SiC) Schottky diode for ultra high performance, low loss, high efficiency power conversion applications. The SiC Schottky diode encapsulated in a Real-2-Pin TO247 R2P (TO-247-2) through-hole power plastic package offers temperature independent capacitive turn-off, zero recovery switching behavior combined with an outstanding figure-of-merit ( $Q_C \times V_F$ ). The Merged PIN Schottky (MPS) diode improves the robustness expressed in a high  $I_{FSM}$ .

## 2. Features and benefits

- Zero forward and reverse recovery
- Temperature independent fast and smooth switching performance
- Outstanding figure of merit ( $Q_C \times V_F$ )
- High  $I_{FSM}$  capability
- High power density
- Reduced system costs
- System miniaturization
- Reduced EMI

## 3. Applications

- Switch Mode Power Supply (SMPS)
- AC-DC and DC-DC converter
- Battery charging infrastructure
- Server and telecom power supply
- Uninterruptible Power Supply (UPS)
- Photovoltaic inverters

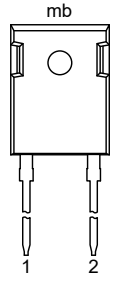
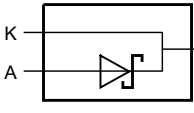
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_c \leq 135\text{ °C}$ ; $\delta = 1$	-	-	20	A
<b>Static characteristics</b>						
$V_{DC}$	DC blocking voltage	$T_j = 25\text{ °C}$	1200	-	-	V
<b>Dynamic characteristics</b>						
$Q_C$	total capacitive charge	$V_R = 800\text{ V}$ ; $di_F/dt = 200\text{ A}/\mu\text{s}$ ; $I_F = 20\text{ A}$ ; $T_j = 25\text{ °C}$	-	85	-	nC

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 <p>TO-247-2 (SOT8022)</p>	 <p>aaa-033312</p>
2	A	anode		
mb	K	mounting base; connected to cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PSC20120L</a>	TO-247-2	Plastic, single-ended package (heatsink mounted, 1 mounting hole) (TO-247-2); 2 leads; 10.88 mm pitch; 20.95 mm x 15.94 mm x 5.02 mm body	<a href="#">SOT8022</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code
PSC20120L	PSC20120L

## 8. Limiting values

**Table 5. Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage	$T_j = 25\text{ °C}$	-	1200	V
$I_F$	forward current	$T_c \leq 135\text{ °C}; \delta = 1$	-	20	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10\text{ }\mu\text{s}$ ; square wave; $T_c = 25\text{ °C}$	-	710	A
		$t_p = 10\text{ ms}$ ; half-sine wave; $T_c = 25\text{ °C}$	-	135	A
		$t_p = 10\text{ ms}$ ; half-sine wave; $T_c = 150\text{ °C}$	-	100	A
$\int i^2 dt$	$i^2 t$ value	$t_p = 10\text{ ms}$ ; $T_c = 25\text{ °C}$	-	91	A <sup>2</sup> s
		$t_p = 10\text{ ms}$ ; $T_c = 150\text{ °C}$	-	50	A <sup>2</sup> s
$P_{tot}$	total power dissipation	$T_c \leq 25\text{ °C}$	-	190	W
$T_j$	junction temperature		-55	175	°C
$T_{amb}$	ambient temperature		-55	175	°C
$T_{stg}$	storage temperature		-65	175	°C

## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-c)}$	thermal resistance from junction to case		-	0.65	0.8	K/W

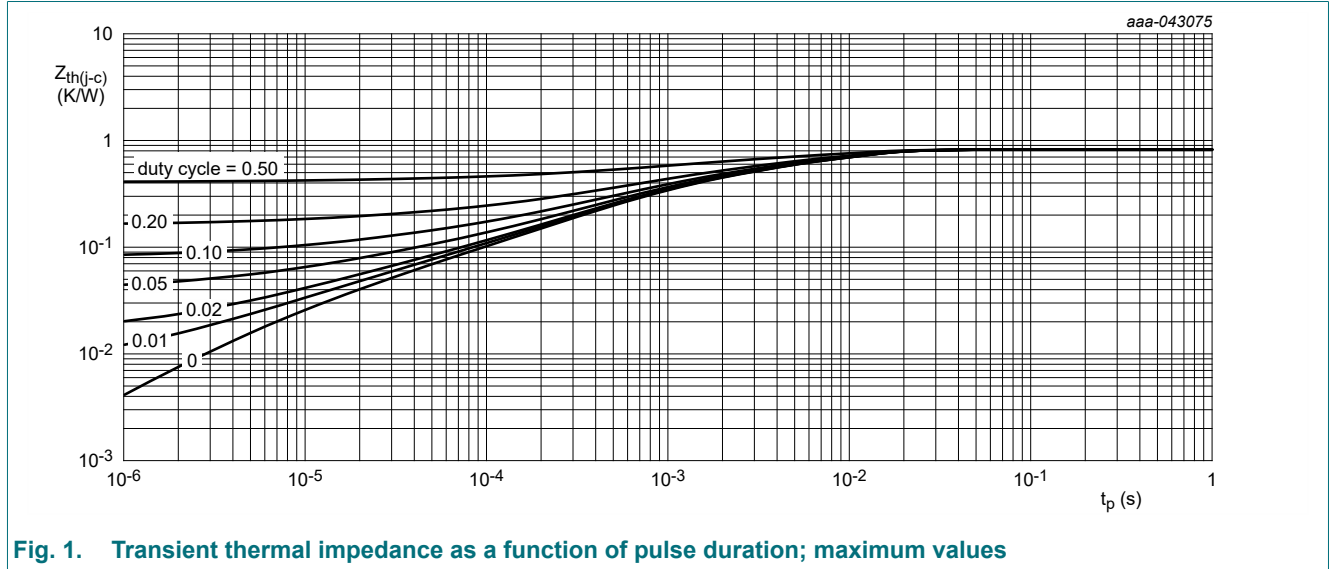


Fig. 1. Transient thermal impedance as a function of pulse duration; maximum values

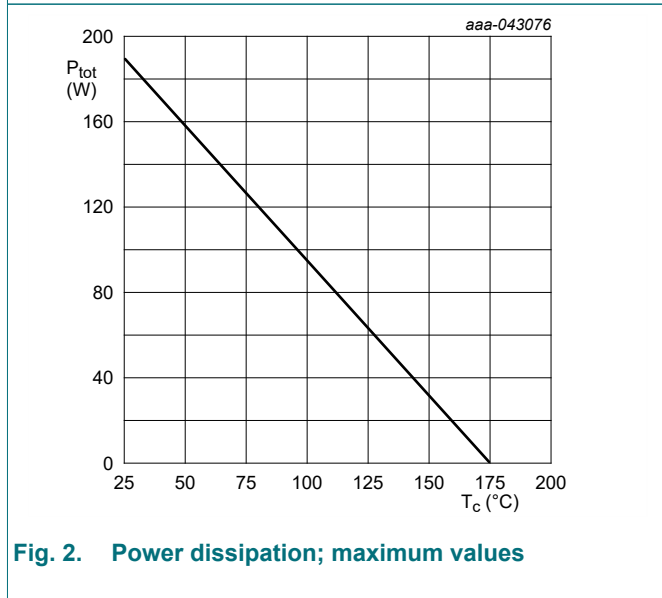


Fig. 2. Power dissipation; maximum values

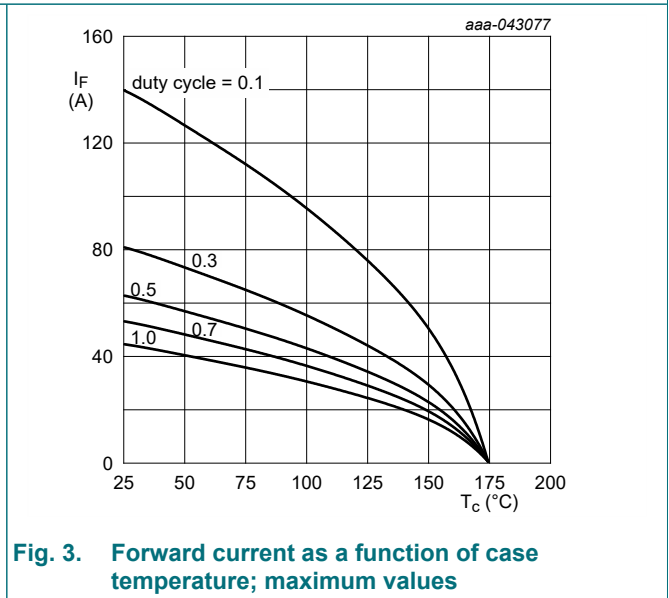
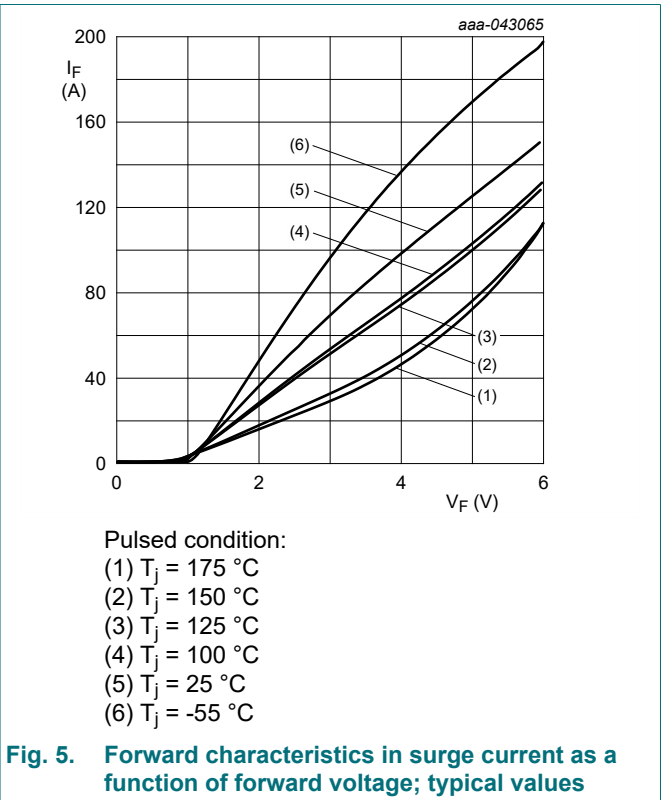
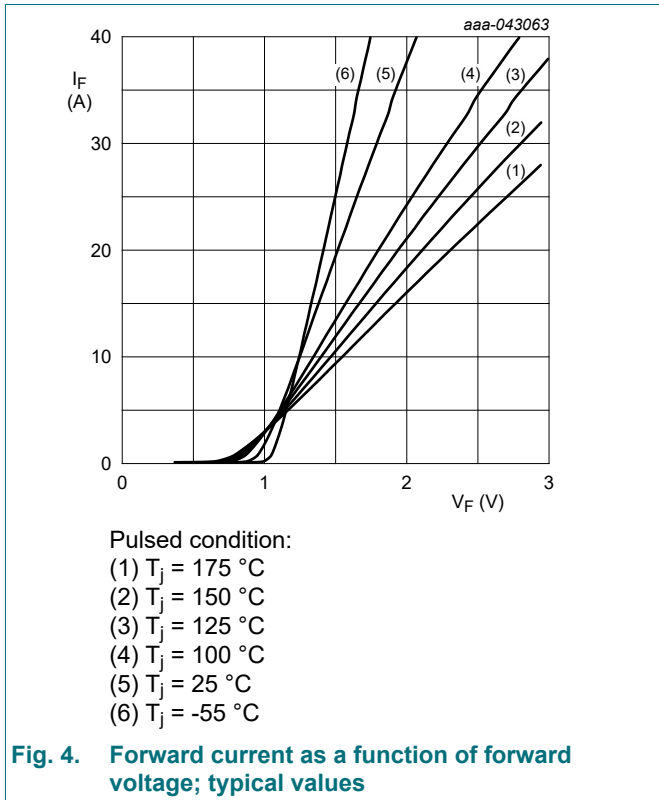


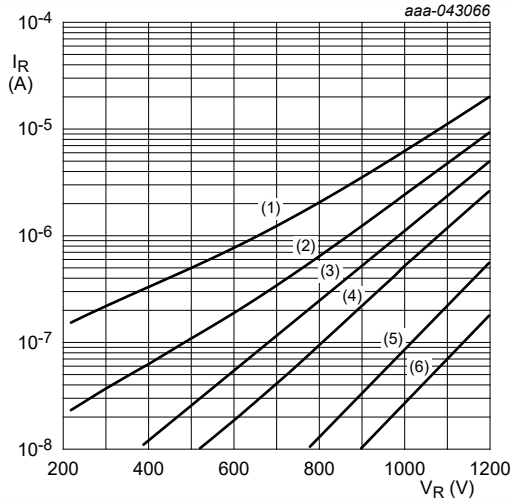
Fig. 3. Forward current as a function of case temperature; maximum values

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_{DC}$	DC blocking voltage	$T_j = 25\text{ °C}$	1200	-	-	V
$V_F$	forward voltage	$I_F = 20\text{ A}; T_j = 25\text{ °C}$	-	1.5	1.8	V
		$I_F = 20\text{ A}; T_j = 150\text{ °C}$	-	2.2	2.6	V
$I_R$	reverse current	$V_R = 1200\text{ V}; T_j = 25\text{ °C}$	-	1	180	$\mu\text{A}$
		$V_R = 1200\text{ V}; T_j = 150\text{ °C}$	-	10	500	$\mu\text{A}$
<b>Dynamic characteristics</b>						
$C_d$	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}; T_j = 25\text{ °C}$	-	1150	-	pF
		$V_R = 800\text{ V}; f = 1\text{ MHz}; T_j = 25\text{ °C}$	-	70	-	pF
$Q_C$	total capacitive charge	$V_R = 800\text{ V}; dI_F/dt = 200\text{ A}/\mu\text{s}; I_F = 20\text{ A}; T_j = 25\text{ °C}$	-	85	-	nC

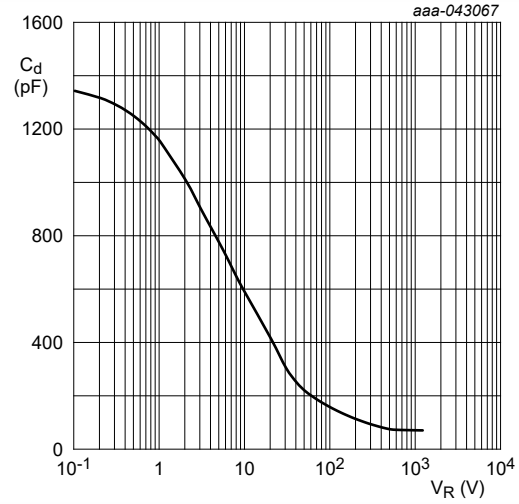




Pulsed condition:

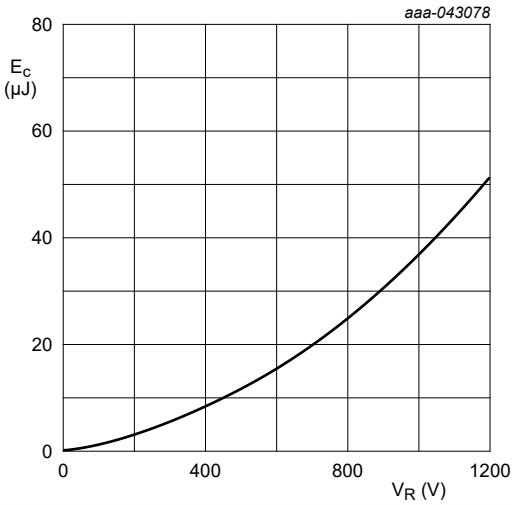
- (1)  $T_j = 175\text{ °C}$
- (2)  $T_j = 150\text{ °C}$
- (3)  $T_j = 125\text{ °C}$
- (4)  $T_j = 100\text{ °C}$
- (5)  $T_j = 25\text{ °C}$
- (6)  $T_j = -55\text{ °C}$

**Fig. 6. Reverse current as a function of reverse voltage; typical values**

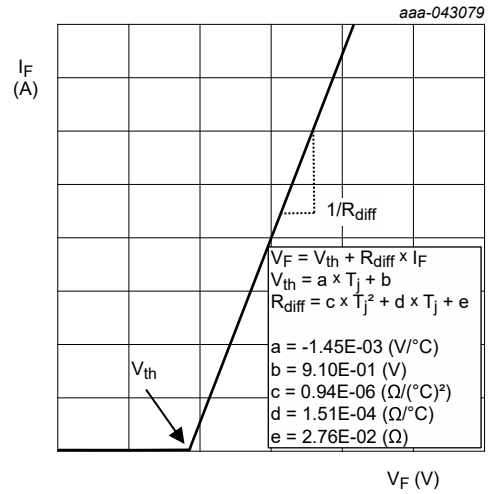


$f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$

**Fig. 7. Diode capacitance as a function of reverse voltage; typical values**



**Fig. 8. Capacitance stored energy as a function of reverse voltage; typical values**



**Fig. 9. Simplified forward characteristics mode**

### 11. Test information

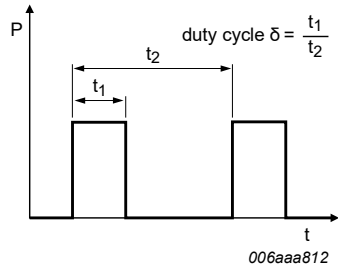


Fig. 10. Duty cycle definition

### 12. Package outline

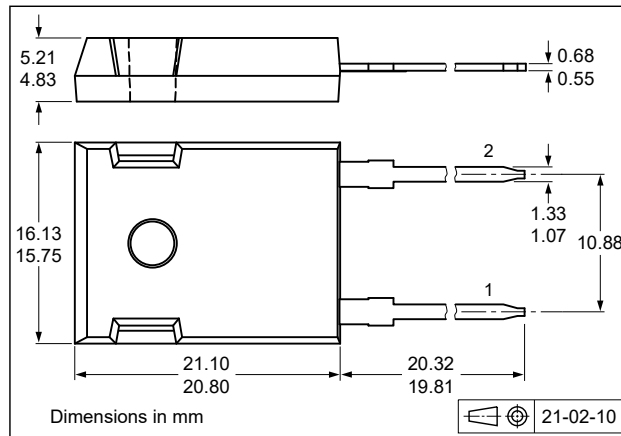


Fig. 11. Package outline TO-247-2 (SOT8022)

## 13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PSC20120L v.2	20251208	Product data sheet	-	PSC20120L v.1
Modifications:	• Characteristics: Graph in Fig 6 adapted			
PSC20120L v.1	20250430	Product data sheet	-	-

## 14. Legal information

### Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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