

# PESC20120BB-R

Silicon Carbide 1200V Schottky Diode



重庆平伟半导体股份有限公司

## Features

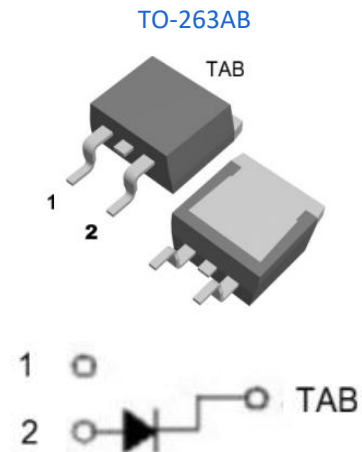
- Revolutionary semiconductor material - Silicon Carbide
- Benchmark switching behavior
- No reverse recovery/ No forward recovery
- Temperature independent switching behavior
- Optimized for high temperature operation
- Qualified according to JEDEC criteria

## Applications

- Switch mode power supply
- Power factor correction
- Solar inverter
- Uninterruptible power supply

## Description

- System efficiency improvement over Si diodes
- Enabling higher frequency / increased power density solutions
- System size/cost savings due to reduced heatsink requirements and smaller magnetics
- Reduced EMI
- Highest efficiency across the entire load range
- Robust diode operation during surge events
- High reliability



## Key performance parameters

### Product Summary

$V_{DC}$	1200V
$I_F$	20A
$T_{j,max}$	175°C

## Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
PESC20120BB-R	PESC20120BB	TO-263AB	Tape&Reel	13 inches	24mm	800pcs

### Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	$V_{RRM}$	1200	V
Continuous forward current for $T_C = 150^\circ\text{C}$	$I_F$	20	A
Non-Repetitive Peak Forward Surge Current $T_C=25^\circ\text{C}, t_p=8.3\text{ ms}$ , Half Sine Pulse $T_C=150^\circ\text{C}, t_p=8.3\text{ ms}$ , Half Sine Pulse	$I_{FSM}$	180 150	A
$i^2t$ value $T_C = 25^\circ\text{C}$ , $t_p=8.3\text{ ms}$	$\int i^2 dt$	134	$\text{A}^2\text{s}$
$i^2t$ value $T_C = 150^\circ\text{C}$ , $t_p=8.3\text{ ms}$		93	
Total power dissipation $T_C = 25^\circ\text{C}$	$P_D$	189	W
Operating junction and storage temperature	$T_j, T_{stg}$	-55 to +175	$^\circ\text{C}$



### Thermal Resistance

Parameter	Symbol	Condition	Value			Unit
			min.	typ.	max.	
Thermal resistance, junction - case.	$R_{thJC}$		-	0.5	0.8	°C/W
Thermal resistance, junction - ambient(min. footprint)	$R_{thJA}$		-	-	62	°C/W

### Electrical Characteristic

#### Static Characteristic ( $T_j=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
DC blocking voltage	$V_{DC}$	$I_R=100\mu\text{A}$	1200	-	-	V
Forward voltage	$V_F$	$I_F=10\text{A}, T_j=25^\circ\text{C}$	-	1.5	1.8	V
		$I_F=10\text{A}, T_j=150^\circ\text{C}$	-	2.30	3.0	V
Reverse current	$I_R$	$V_R=650\text{V}, T_j=25^\circ\text{C}$		0.2	10	$\mu\text{A}$
		$V_R=650\text{V}, T_j=150^\circ\text{C}$	-	20	100	

#### Dynamic Characteristic ( $T_j=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Total capacitance	C	$V_R=0.1\text{V}, f=1\text{MHz}$	-	1300	-	pF
		$V_R=400\text{V}, f=1\text{MHz}$	-	84	-	
		$V_R=800\text{V}, f=1\text{MHz}$	-	68	-	
Total capacitive charge	$Q_C$	$V_R=800\text{V}, Q_c = \int_0^{V_R} C(V)dV$	-	92	-	nC

### Typical Performance Characteristics

Fig 1: Forward Characteristics

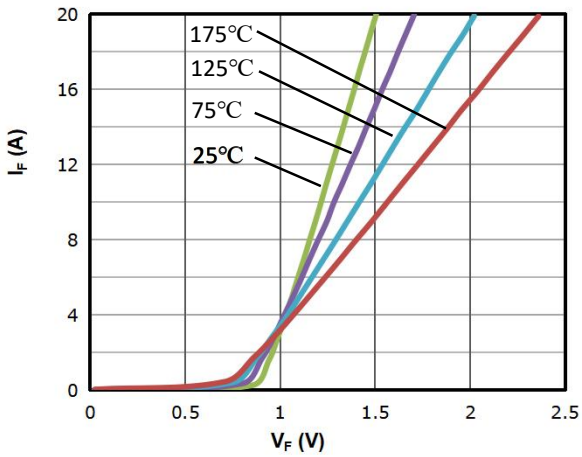


Fig 2: Reverse Characteristics

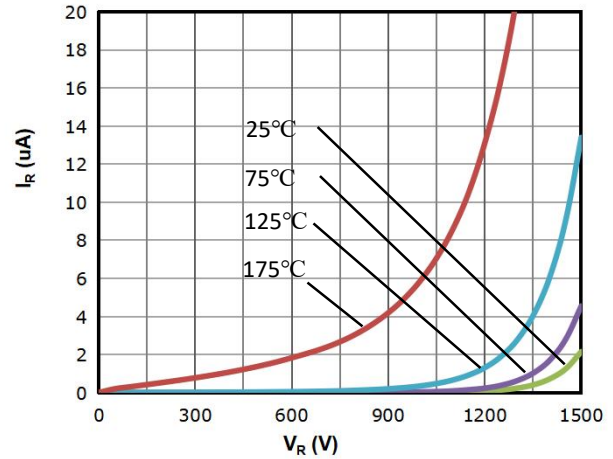


Fig 3: Total Capacitance Charge VS. Reverse Voltage

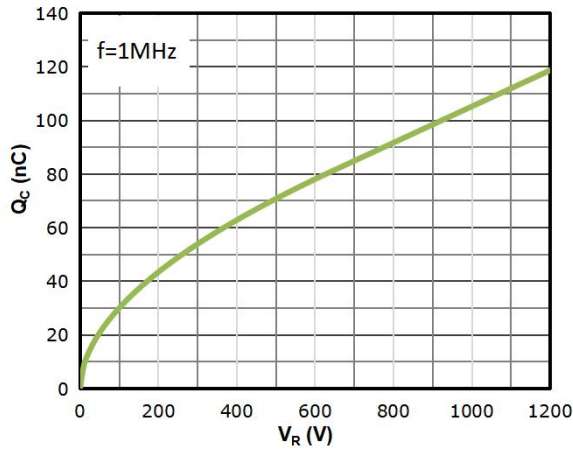


Fig 4: Capacitance Characteristics

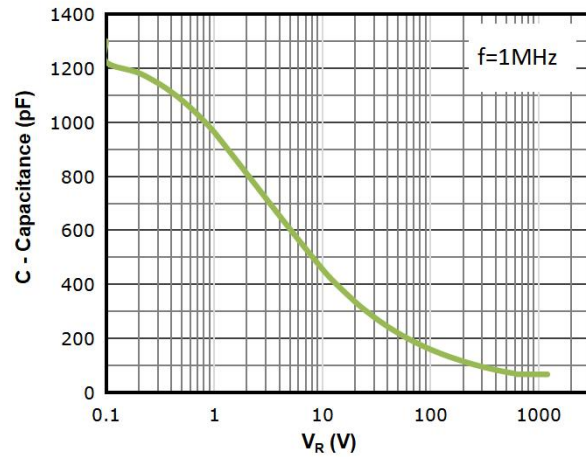


Fig 5: Power Dissipation

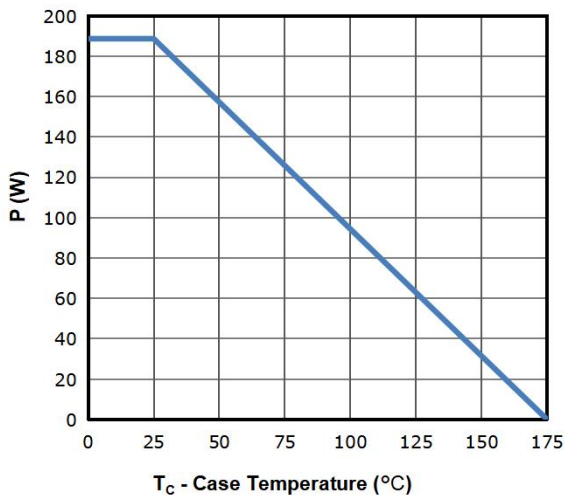
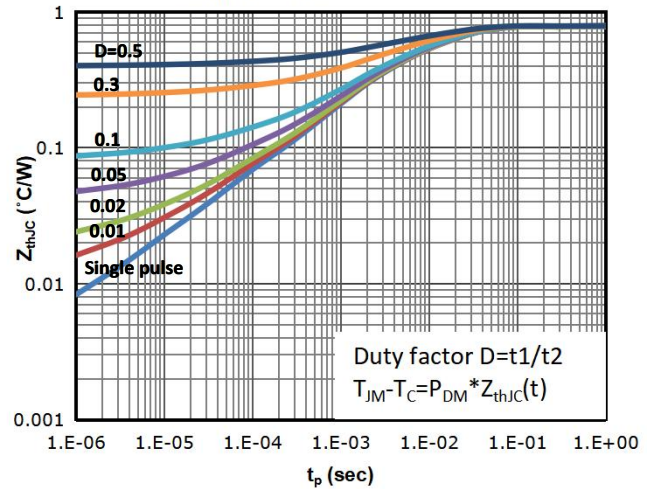
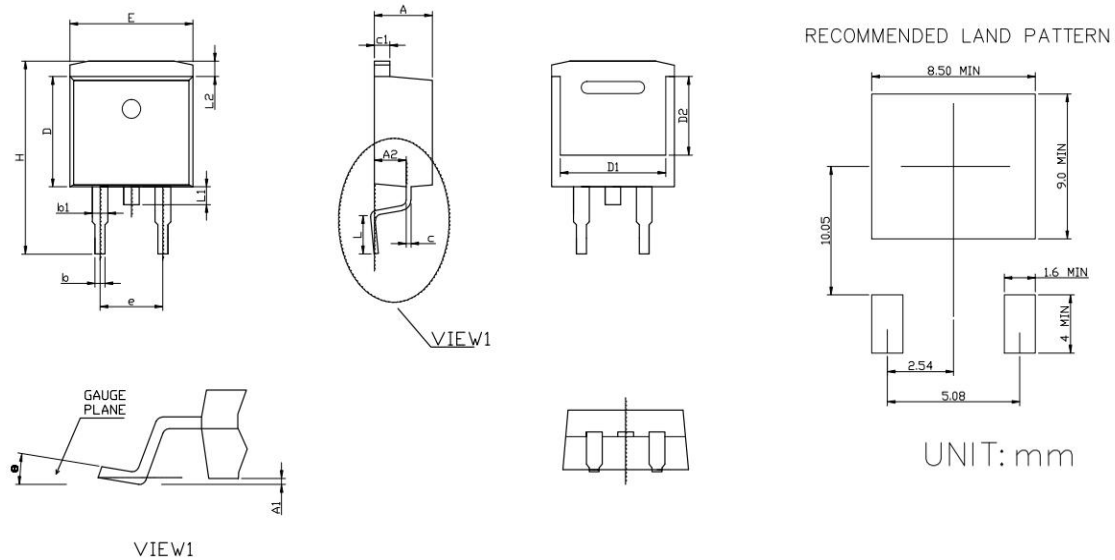


Fig 6: Max. Transient Thermal Impedance



### Package Outline: TO-263AB



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.40	4.80	0.173	0.189
A1	0.05	0.30	0.002	0.012
A2	2.25	2.55	0.089	0.100
b	0.72	0.92	0.028	0.036
b1	1.12	1.42	0.044	0.056
c	0.40	0.60	0.016	0.024
c1	1.20	1.40	0.047	0.055
D	8.80	9.40	0.346	0.370
D1	7.75	8.15	0.305	0.321
D2	6.55	6.95	0.258	0.274
E	9.65	10.35	0.380	0.407
e	5.08		0.200	
H	14.70	15.60	0.579	0.614
L	2.30	2.60	0.091	0.102
L1	1.20	1.60	0.047	0.063
L2	0.95	1.30	0.037	0.051
θ	0°	8°	0°	8°



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