

PESC40120Y-R

Silicon Carbide 1200V Schottky Diode

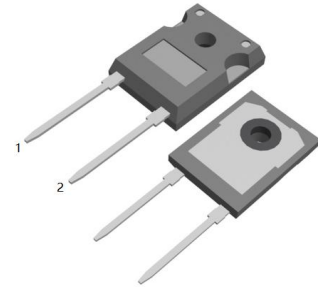


重庆平伟半导体股份有限公司

Features

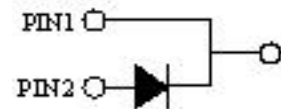
- Revolutionary semiconductor material - Silicon Carbide
- Benchmark switching behavior
- No reverse recovery/ No forward recovery
- Temperature independent switching behavior
- Optimized for high temperature operation
- Qualified according to JEDEC criteria

TO-247-2L



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	40A
$T_{j,max}$	175°C

Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
PESC40120Y-R	PESC40120Y	TO-247-2L	Tube	N/A	N/A	30pcs

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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	40	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}	330 310	A
i^2t value $T_C = 25^\circ\text{C}$, $t_p=8.3\text{ ms}$ i^2t value $T_C = 150^\circ\text{C}$, $t_p=8.3\text{ ms}$	$\int i^2 dt$	452 399	A^2s
Total power dissipation $T_C = 25^\circ\text{C}$	P_D	278	W
Operating junction and storage temperature	T_j, T_{stg}	-55 to +175	$^\circ\text{C}$
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	T_{sld}	260	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Condition	Value			Unit
			min.	typ.	max.	
Thermal resistance, junction - case.	R_{thJC}		-	0.43	0.5	°C/W
Thermal resistance, junction - ambient(min. footprint)	R_{thJA}		-		50	°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	$I_F=40\text{A}, T_j=25^\circ\text{C}$	-	1.35	1.65	V
		$I_F=40\text{A}, T_j=150^\circ\text{C}$	-	1.62	1.90	V
Reverse current	I_R	$V_R=1200\text{V}, T_j=25^\circ\text{C}$		5	10	μA
		$V_R=1200\text{V}, T_j=150^\circ\text{C}$	-	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	$V_R=0.1\text{V}, f=1\text{MHz}$	-	5351	-	pF
		$V_R=400\text{V}, f=1\text{MHz}$	-	189	-	
		$V_R=800\text{V}, f=1\text{MHz}$	-	135	-	
Total capacitive charge	Q_C	$V_R=800\text{V}, Q_c = \int_0^{V_R} C(V)dV$	-	232	-	nC



Typical Performance Characteristics

Fig 1: Forward Characteristics

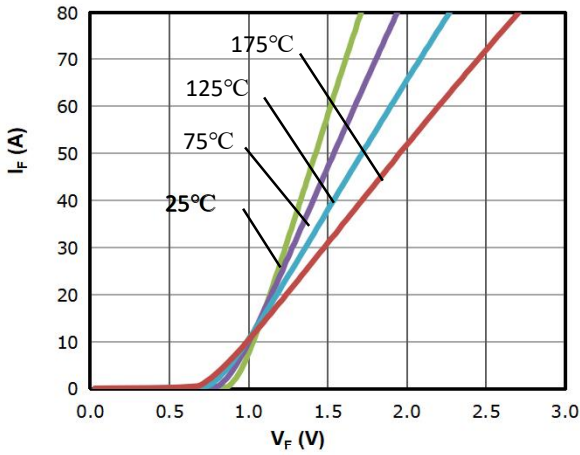


Fig 2: Reverse Characteristics

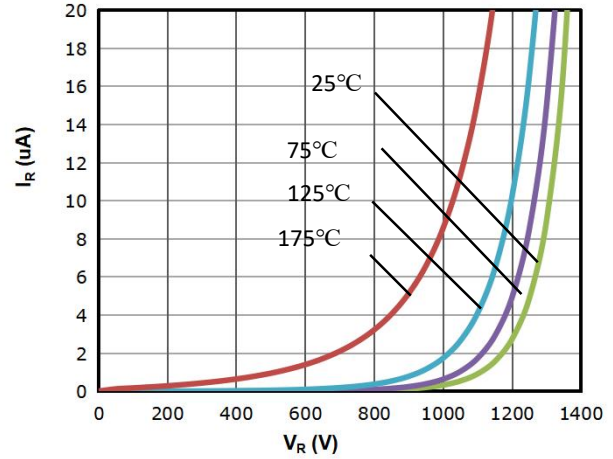


Fig 3: Total Capacitance Charge VS. Reverse Voltage

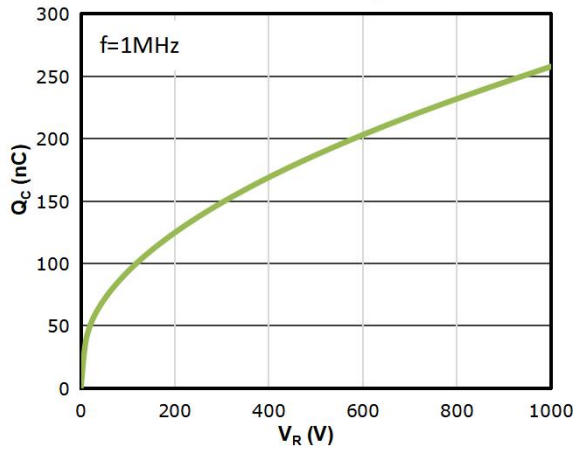


Fig 4: Capacitance Characteristics

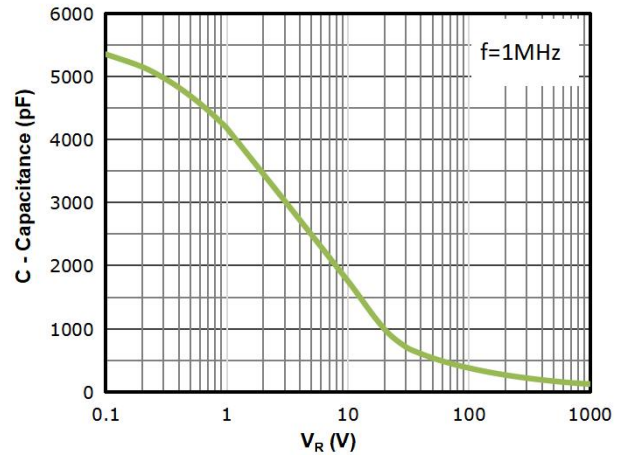


Fig 5: Power Dissipation

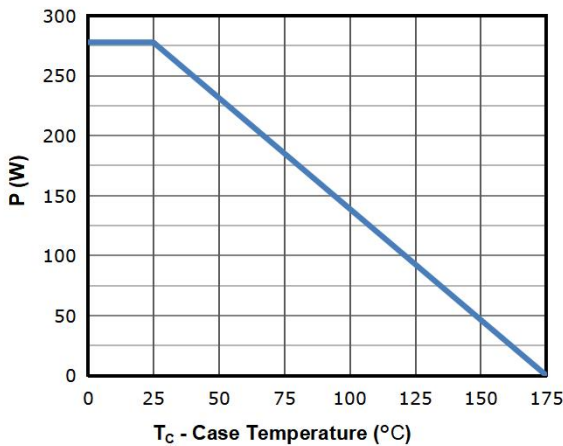
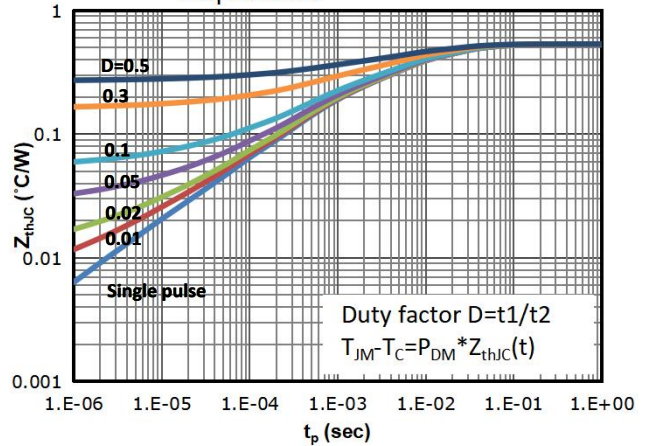


Fig 6: Max. Transient Thermal Impedance



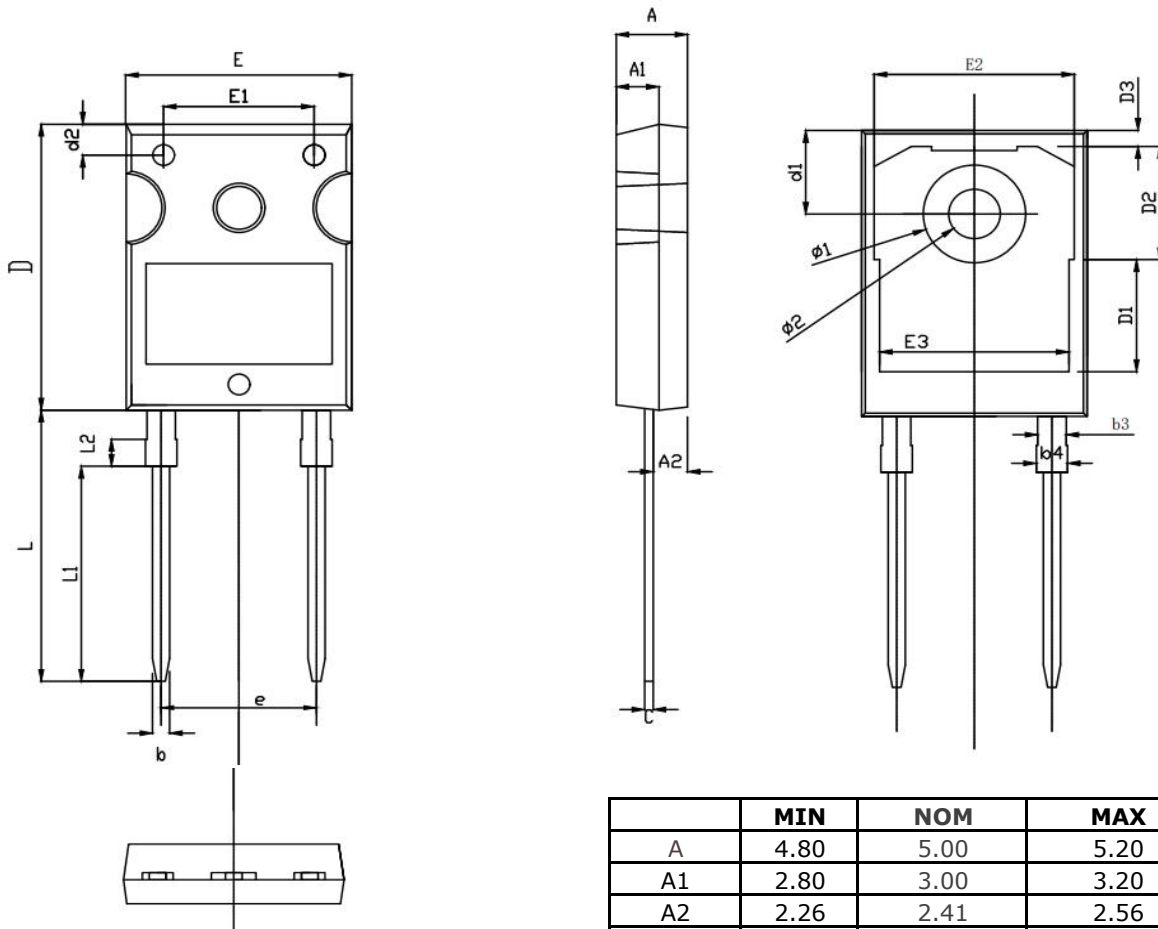
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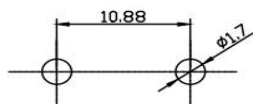


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Package Outline: TO-247-2L



RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.80	3.00	3.20
A2	2.26	2.41	2.56
b	1.10	1.20	1.30
b3	1.90	2.00	2.10
b4	2.00	-	2.20
C	0.50	0.60	0.70
D	20.80	21.00	21.20
D1	8.03	8.23	8.43
D2	8.12	8.32	8.52
D3	0.97	1.17	1.37
d1	6.00	6.15	6.30
d2	2.20	2.30	2.40
E	15.60	15.80	16.00
E1	10.30	10.50	10.70
E2	13.82	14.02	14.22
E3	13.30	13.50	13.70
e	10.68	10.88	11.08
L	19.72	19.92	20.12
L1	15.59	15.79	15.99
L2	1.78	1.98	2.18
Ø1	7.10	7.19	7.30
Ø2	3.50	3.60	3.70



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