

ProAsia Semiconductor Corporation

1200V/40A Silicon Carbide Schottky Diode

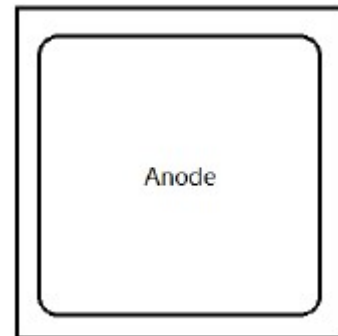
Features

- Zero or negligible reverse recovery
- Low forward voltage
- Positive temperature coefficient
- Extended surge current capability
- High junction temperature
- Temperature invariant switching behavior

V_{RRM}	1200V
I_F	40A
Q_c	260nC

Applications

- Solar inverters
- Motor drivers
- Power Factor Correction
- SMPS



Electrical Specifications

$T_C=25^{\circ}\text{C}$, unless otherwise specified.

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V_R	Reverse Blocking Voltage	$I_R=250\mu\text{A}$	1200			V
I_R	Reverse Current	$V_R=1200\text{V}$ $T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$		1 50	100 200	μA
V_F	Forward Voltage	$I_F=40\text{A}$ $T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$		1.5 2.2	1.7 2.5	V

Note: All characteristics are tested with the parts assembled in To-247-2L package.

Absolute Maximum Ratings

$T_C=25^{\circ}\text{C}$, unless otherwise specified.

Symbol	Parameter	Rating
V_{RRM}	Repetitive Peak Reverse Voltage	1200 V
I_F	Continuous Forward Current $T_C=25^{\circ}\text{C}$, $D=1$ $T_C=100^{\circ}\text{C}$, $D=1$ $T_C=140^{\circ}\text{C}$, $D=1$	92 A 63 A 40 A
I_{FSM}	Non-Repetitive Forward Surge Current $T_C=25^{\circ}\text{C}$, $t_P=10\text{ms}$ $T_C=125^{\circ}\text{C}$, $t_P=10\text{ms}$	227 A 96 A
I_{FRM}	Repetitive Forward Surge Current $T_C=25^{\circ}\text{C}$, $t_P=10\text{ms}$ $T_C=125^{\circ}\text{C}$, $t_P=10\text{ms}$	164 A 69 A
P_{TOT}	Power dissipation for $R_{th(j-c,max)}$, $T_C=25^{\circ}\text{C}$	450 W
EAS	Avalanche energy, $T_J=25^{\circ}\text{C}$, $L=0.5\text{ mH}$, $V=50\text{ V}$	430 mJ
T_J, T_{stg}	Operating and Storage Temperature	-55°C to 175°C

Note: All characteristics are tested with the parts assembled in To-247-2L package, and exposure to absolute maximum ratings for prolonged time periods may affect device reliability.

Dynamic Characteristics

$T_C=25^{\circ}\text{C}$, unless otherwise specified.

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
C_j	Typical Junction Capacitance	$V_R=0.1\text{ V}$, $f=1\text{ MHz}$ $V_R=400\text{ V}$, $f=1\text{ MHz}$ $V_R=800\text{ V}$, $f=1\text{ MHz}$		2500 180 160		pF
Q_C	Total Capacitive Charge	$V_R=400\text{V}$ $V_R=800\text{V}$		135 200		nC
E_C	Capacitive Stored Energy,	$V_R=400\text{V}$ $V_R=800\text{V}$		15 55		μJ

Note: All characteristics are tested with the parts assembled in To-247-2L package.

Thermal Resistances

T_c=25°C, unless otherwise specified.

Symbol	Parameter	Min	Typ	Max	Unit
R _{th(j-c)}	Thermal Resistance, Junction – Case		0.33	0.38	°C/W
R _{th(j-a)}	Thermal Resistance, Junction – Ambient			30.8	°C/W

Note: All characteristics are tested with the parts assembled in To-247-2L package.

Mechanical Parameters

Parameter	Typical Value	Unit
Wafer Size	150	mm
Die Thickness	175	um
Top Metallization (Al)	4.2	μm
Back Metallization (Ti/Ni/Ag)	1.4	μm
Frontside Passivation	Polyimide	
Cut line	100	um

