

ProAsia Semiconductor Corporation

1200V/20A Silicon Carbide Schottky Diode

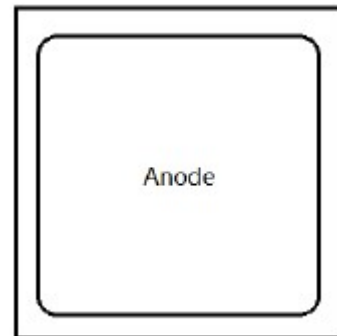
Features

- 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	20A
Q_c	140nC

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	$V_R=1200\text{V}$ $T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$		0.7 5.5	50 100	μA
V_F	Forward Voltage	$I_F=20\text{A}$ $T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$		1.5 2.1	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	1200V
I_F	Continuous Forward Current $T_C=25^{\circ}\text{C}$, $D=1$ $T_C=100^{\circ}\text{C}$, $D=1$ $T_C=140^{\circ}\text{C}$, $D=1$	54 A 32 A 20 A
I_{FSM}	Non-Repetitive Forward Surge Current $T_C=25^{\circ}\text{C}$, $t_P=10\text{ms}$ $T_C=150^{\circ}\text{C}$, $t_P=10\text{ms}$	140 A 130 A
I_{FRM}	Repetitive Forward Surge Current $T_C=25^{\circ}\text{C}$, $t_P=10\text{ms}$ $T_C=150^{\circ}\text{C}$, $t_P=10\text{ms}$	95 A 63 A
P_{TOT}	Power dissipation for $R_{th(j-c,max)}$, $T_C=25^{\circ}\text{C}$	280 W
EAS	Avalanche energy, $T_J = 25^{\circ}\text{C}$, $L = 0.5\text{ mH}$, $V = 50\text{ V}$	315 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	Typical Junction Capacitance	$V_R=0.1\text{ V}$, $f=1\text{ MHz}$ $V_R=400\text{ V}$, $f=1\text{ MHz}$ $V_R=800\text{ V}$, $f=1\text{ MHz}$		1420 100 89		pF
Q_C	Total Capacitive Charge	$V_R=400\text{ V}$ $V_R=800\text{ V}$		73 110		nC
E_C	Capacitive Stored Energy,	$V_R=400\text{ V}$ $V_R=800\text{ V}$		8.5 29		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		0.36	0.465	°C/W
R _{th(j-a)}	Thermal Resistance, Junction –Ambient				°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

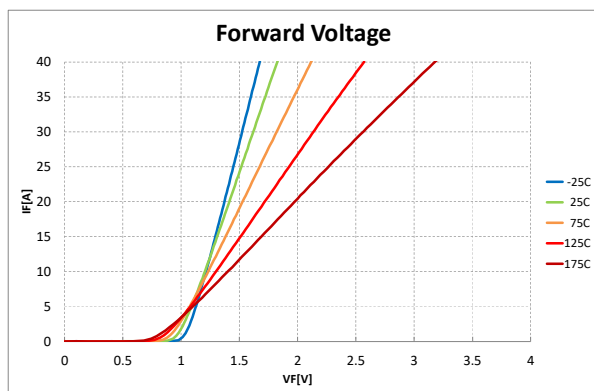


Figure 1. Forward Characteristics

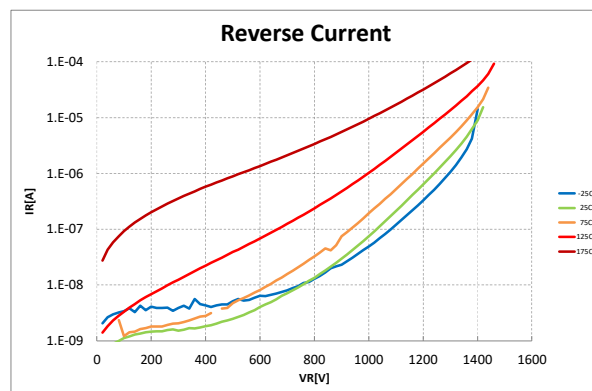


Figure 2. Reverse Characteristics

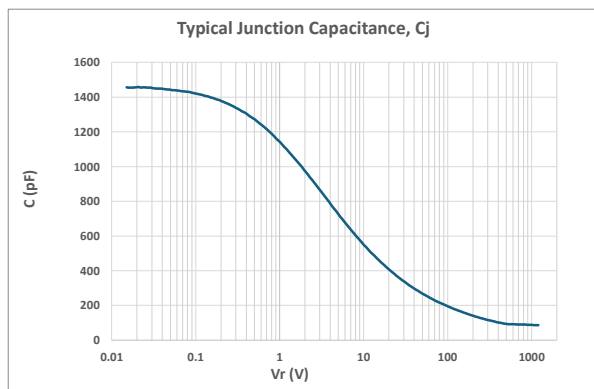


Figure 3. Typical Junction Capacitance

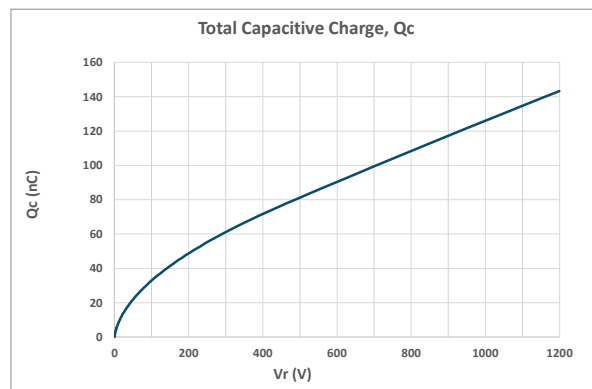


Figure 4. Total Capacitance Charge

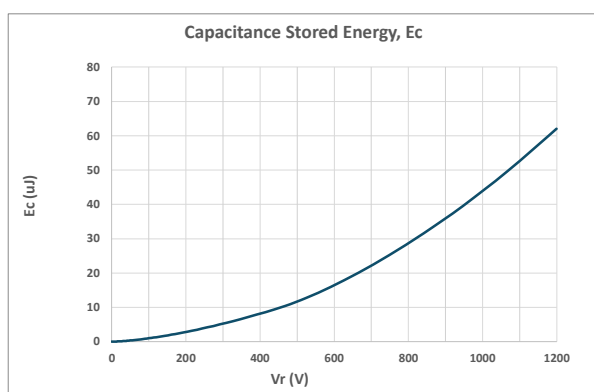


Figure 5. Capacitance Stored Energy

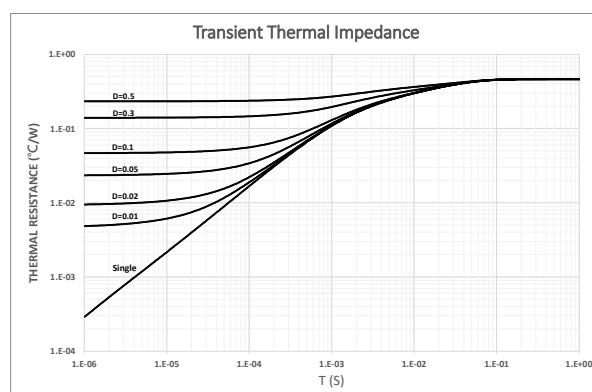


Figure 6. Transient Thermal Impedance