

Silicon Carbide Schottky Diode

Features

- 1200V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching

$$V_{RRM} = 1200 \text{ V}$$

$$I_F (T_C=153^\circ\text{C}) = 20 \text{ A}$$

$$V_F = 1.35 \text{ V}$$

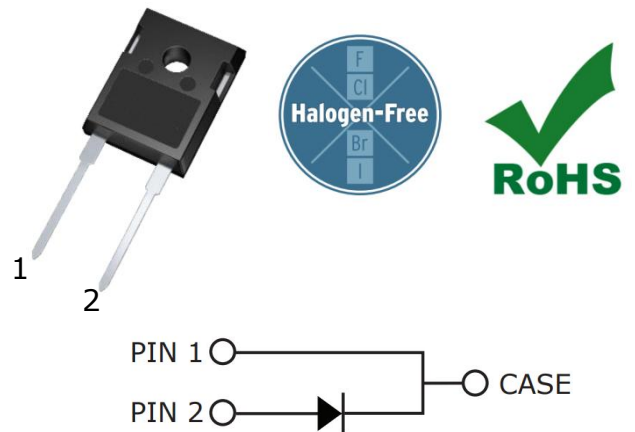
Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Switch Mode Power Supplies (SMPS)
- Power Factor Correction
- Motor Drives

Package



Maximum Ratings (at $T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V
Surge Peak Reverse Voltage	V_{RSM}	1200	V
DC Peak Reverse Voltage	V_R	1200	V
Continuous Forward Current $T_c = 25^{\circ}\text{C}$ $T_c = 135^{\circ}\text{C}$ $T_c = 153^{\circ}\text{C}$	I_F	54 27 20	A
Repetitive Peak Forward Surge Current $T_c = 25^{\circ}\text{C}, t_p=10\text{ms}$, Half Sine Pulse $T_c = 110^{\circ}\text{C}, t_p=10\text{ms}$, Half Sine Pulse	I_{FRM}	86 58	A
Non-Repetitive Forward Surge Current $T_c = 25^{\circ}\text{C}, t_p=10\text{ms}$, Half Sine Pulse $T_c = 110^{\circ}\text{C}, t_p=10\text{ms}$, Half Sine Pulse	I_{FSM}	160 130	A
i^2dt value $T_c = 25^{\circ}\text{C}, t_p=10\text{ms}$, Half Sine Pulse $T_c = 110^{\circ}\text{C}, t_p=10\text{ms}$, Half Sine Pulse	$\int i^2 dt$	128 84	A^2s
Power dissipation $T_c = 25^{\circ}\text{C}$ $T_c = 110^{\circ}\text{C}$	P_{tot}	214 93	W
Operating junction Range	T_j	-55 to +175	$^{\circ}\text{C}$
Storage temperature Range	T_{stg}	-55 to +150	$^{\circ}\text{C}$

Thermal Resistance

Parameter	Symbol	Typ.	Unit
Thermal resistance, junction – case.	R_{thJC}	0.7	$^{\circ}\text{C/W}$

Electrical Characteristic (at T_c = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V _F	-	1.35	1.7	V	I _F =20A T _J =25°C T _J =175°C
Reverse Current	I _R	-	-	200	μA	V _R =1200V T _J =25°C T _J =175°C
Total Capacitive Charge	Q _C	-	97	-	nC	V _R =800V, T _J =25°C $Q_C = \int_0^{V_R} C(V) dV$
Total Capacitance	C	-	1318	-	pF	T _J =25°C, f=1MHz V _R =0V V _R =400V V _R =800V

Characteristics Curve:

Fig 1: Forward Characteristics

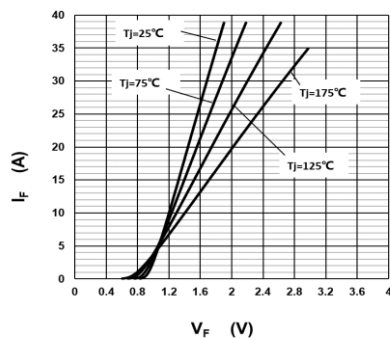


Fig 2: Reverse Characteristics

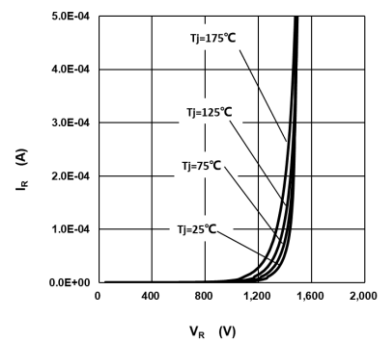


Fig 3: Current Derating

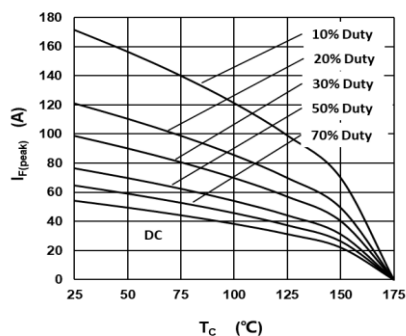


Fig 4: Power Derating

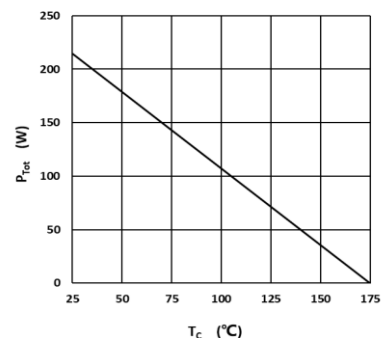


Fig 5: Capacitance vs. Reverse Voltage

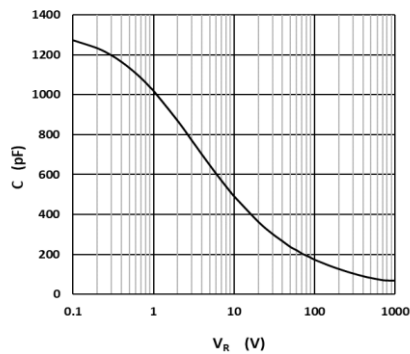


Fig 6: Reverse Charge vs. Reverse Voltage

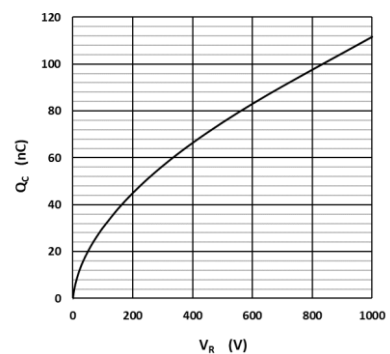


Fig 7: Typical Capacitance Stored Energy

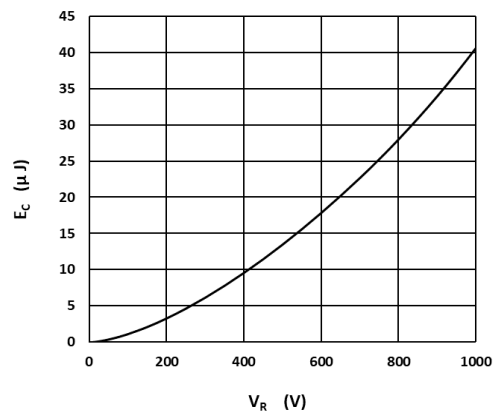
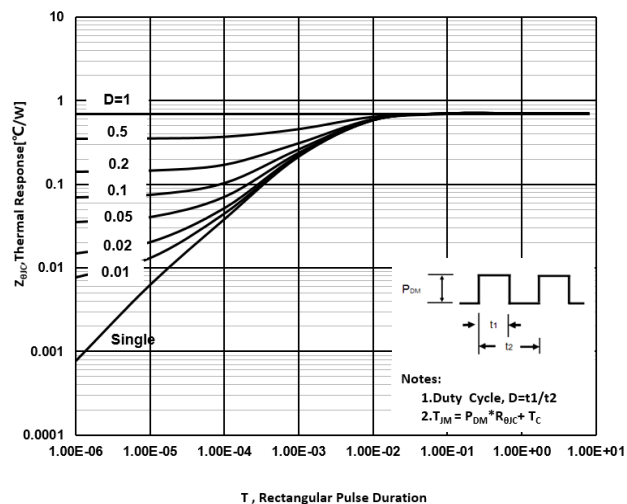
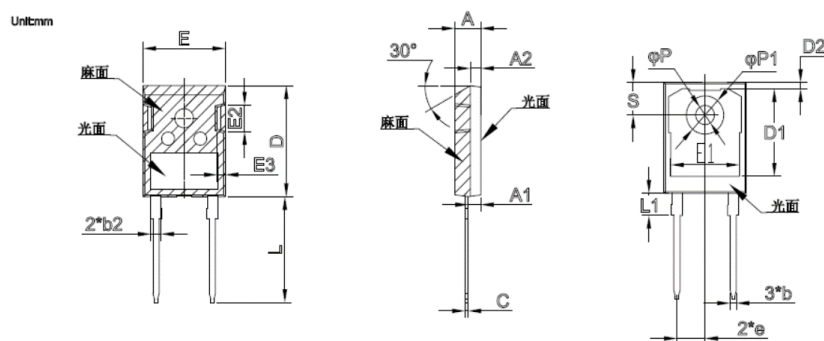


Fig 8: Transient Thermal Impedance



Mechanical Dimensions:



TO247-2L							
	Min	Nom	Max		Min	Nom	Max
A	4.70	5.00	5.20	E1	13.06	13.26	13.56
A1	2.30		2.50	E2	4.90	5.00	5.10
A2	1.90	2.00	2.10	E3	1.50	1.60	1.70
b	1.10	1.20	1.30	e	5.34	5.44	5.54
b2		2.00		L	19.80	20.00	20.32
				L1		4.17	4.50
C	0.5	0.6	0.7	P	3.50	3.60	3.70
D	20.8	20.95	21.1	P1	7.00	7.19	7.40
D1		16.55		S	6.04	6.15	6.3
D2	0.95	1.17	1.35				
E	15.48	15.88	16.28				