

SiC Schottky Barrier Rectifier

Features

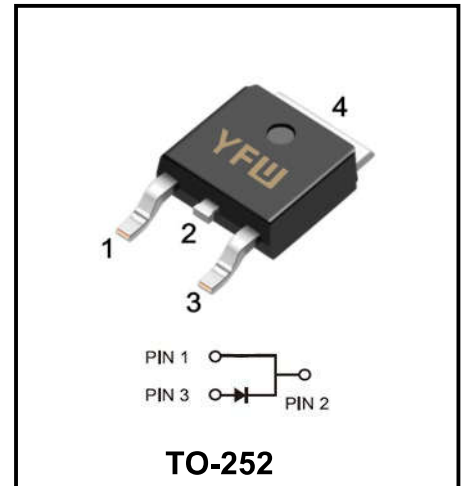
- ◆ Reverse withstand voltage 650V
- ◆ Zero reverse recovery current
- ◆ High working frequency
- ◆ Switch characteristics are not affected by temperature
- ◆ Fast switching speed
- ◆ Positive temperature coefficient of positive pressure drop

Advantages

- ◆ Very low switching loss
- ◆ Higher efficiency
- ◆ Low dependence of the system on the heat sink
- ◆ No thermal collapse in parallel devices

Application

- ◆ Switching mode power supply, AC/DC converter
- ◆ Power factor correction
- ◆ Motor drive
- ◆ PV inverter and wind turbine



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Test conditions	Value	Unit
Peak repetitive reverse voltage	V_{RRM}		650	V
Working Peak Reverse voltage	V_{RWM}		650	V
DC Blocking Voltage	V_{DC}		650	V
Average rectified output current	$I_{F(AV)}$	Ta=25°C	35	A
		Ta=125°C	16	
		Ta=150°C	13	
Forward repetitive peak current	I_{FRM}	T _C =25°C, tp=10ms, Half Sine Wave	52	A
		T _C =110°C, tp=10ms, Half Sine Wave	34	
Forward surge current	I_{FSM}	T _C =25°C, tp=10ms, Half Sine Wave	104	A
		T _C =110°C, tp=10ms, Half Sine Wave	82	
Power dissipation	P_{tot}	Ta=25°C	166	W
		Ta=110°C	72	
Junction temperature	T _j		-55 ~ +175	°C
Storage temperature	T _{stg}		-55 ~ +175	°C

Thermal characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance - Junction to Case	R _{θJC}	1.1	°C/W

Electrical Characteristics (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Forward voltage	V_F	$I_F = 13\text{ A}, T_j = 25^\circ\text{C}$ $I_F = 13\text{ A}, T_j = 175^\circ\text{C}$		1.5 2.0	1.8 2.4	V
Reverse current	I_R	$V_R = 650\text{V}, T_j = 25^\circ\text{C}$ $V_R = 650\text{V}, T_j = 175^\circ\text{C}$		15 30	75 300	μA
Total capacitive charge	Q_C	$V_R = 400\text{V}, I_F = 10\text{A}$ $di/dt = 500\text{A}/\mu\text{s}, T_j = 25^\circ\text{C}$		39		nC
Total capacitance	C	$V_R = 0\text{V}, T_j = 25^\circ\text{C}, f = 1\text{MHz}$ $V_R = 200\text{V}, T_j = 25^\circ\text{C}, f = 1\text{MHz}$ $V_R = 400\text{V}, T_j = 25^\circ\text{C}, f = 1\text{MHz}$		650 57 47		pF
Capacitance stored energy	E_C	$V_R = 400\text{V}$		4.8		μJ

Typical Characteristic

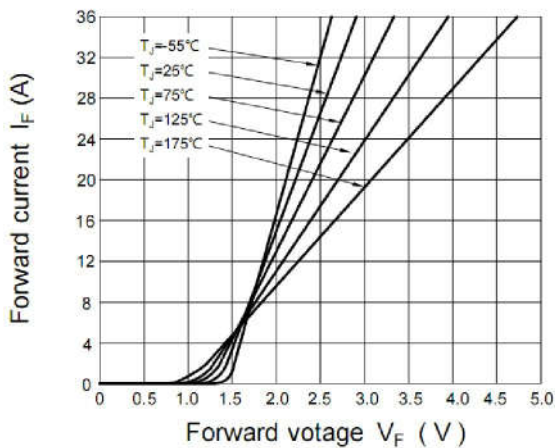


Figure 1. Forward Characteristics

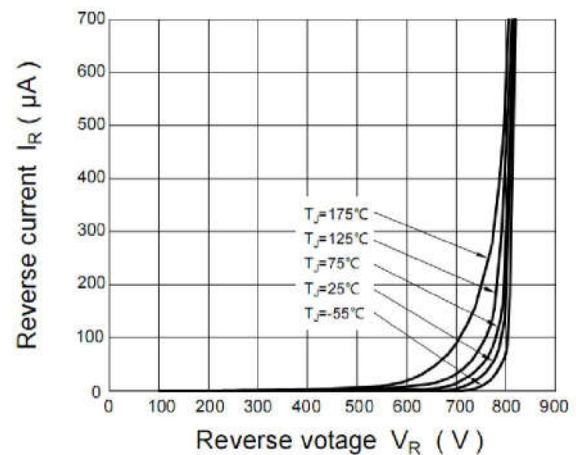


Figure 2. Reverse Characteristics

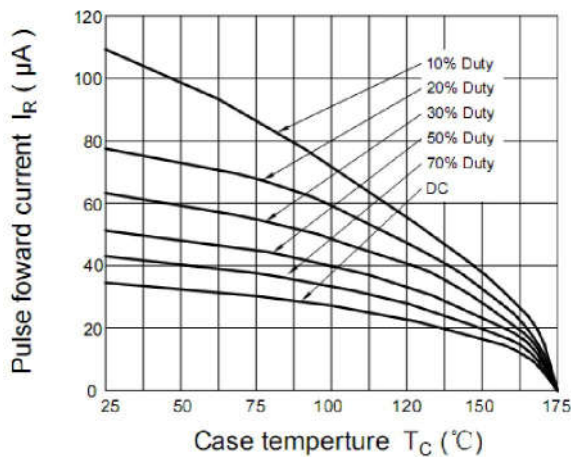


Figure 3. Current Derating

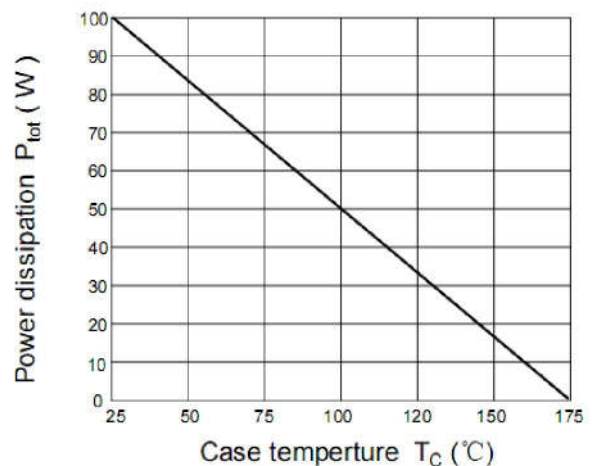


Figure 4. Power Derating

Typical Characteristic

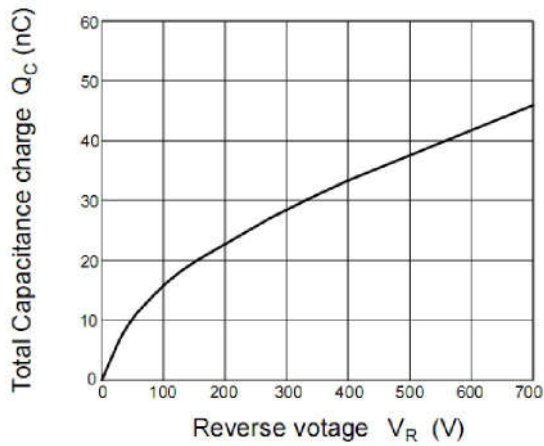


Figure 5. Total Capacitance charge vs. reverse voltage

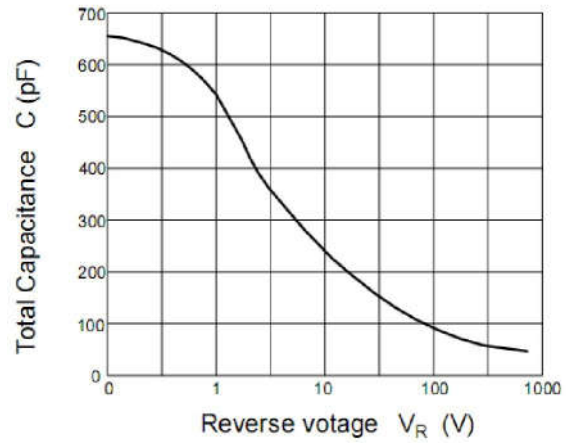


Figure 6. Capacitance vs reverse voltage

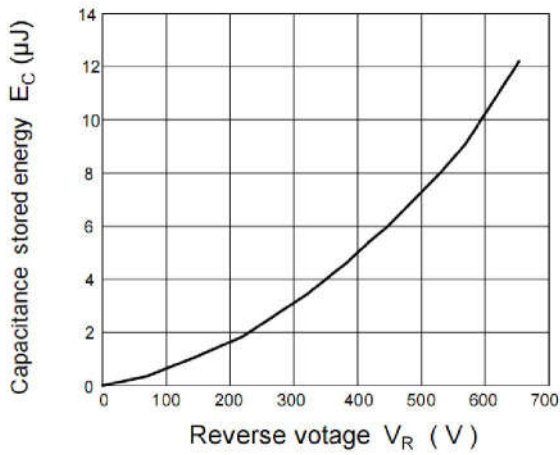


Figure 7. Capacitance stored energy

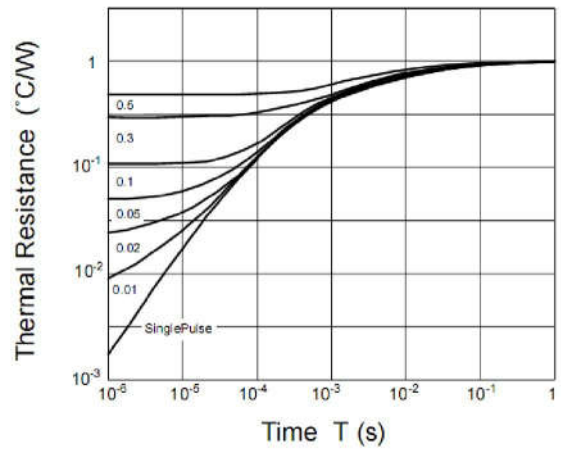
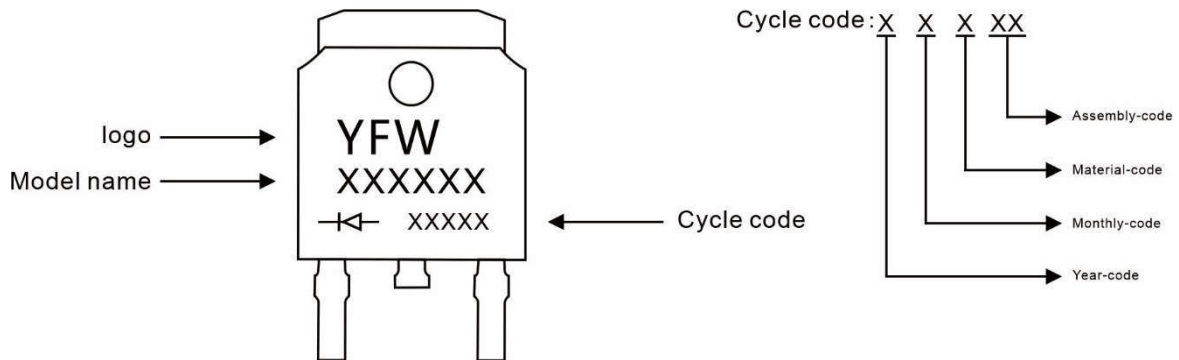


Figure 8. Transient Thermal Impedance

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWD313065CS	TO-252	0.011oz(0.32g)	2500pcs/reel	5000pcs/box 25000pcs/Carton

Package Dimensions

TO-252

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.50	0.087	0.098
A1	0.00	0.12	0.000	0.005
A2	2.20	2.40	0.087	0.094
B	1.20	1.60	0.047	0.063
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.40	0.60	0.016	0.024
c1	0.40	0.60	0.016	0.024
D	6.35	6.65	0.250	0.262
D1	5.20	5.40	0.205	0.213
E	5.40	5.70	0.213	0.224
e	2.20	2.40	0.087	0.094
e1	4.40	4.80	0.173	0.189
L	10.00	11.00	0.393	0.433
L1	2.70	3.10	0.106	0.122
L2	1.40	1.80	0.055	0.071
L3	0.90	1.50	0.035	0.059

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