

SIC SCHOTTKY BARRIER DIODE

Reverse Voltage - 650 V

Forward Current - 20 A

FEATURES

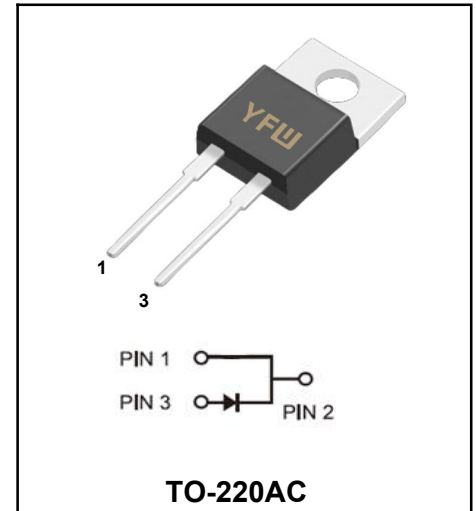
- ◆650-Volt SiC JBS Rectifier
- ◆Zero Reverse Recovery
- ◆Positive Temperature Coefficient on VF
- ◆Temperature-Independent Switching Behavior
- ◆Extremely Fast Switching
- ◆Extremely Low Leakage Current

APPLICATIONS

- ◆Uninterruptible power supply
- ◆Switch mode power supply
- ◆Power factor correction
- ◆Solar inverter

BENEFITS

- ◆High-speed switching
- ◆Low heat dissipation requirements
- ◆Reduced EMI
- ◆High-reliability



Maximum Ratings at T_C=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Maximum Repetitive Peak Reverse Voltage	V_{RRM}	650	V
Continuous Forward Current for Rth(j-c,max) TC = 25°C	I_F	51	A
Continuous Forward Current for Rth(j-c,max) TC = 110°C		31	A
Continuous Forward Current for Rth(j-c,max) TC = 143°C		20	A
Non-Repetitive Forward Surge Current, Sine Half-Wave	I_{FSM}	TC = 25°C, tp = 10ms	130 A
		TC = 110°C, tp = 10ms	120 A
Repetitive Forward Surge Current, Sine Half-Wave	I_{FRM}	TC = 25°C, tp = 10ms	120 A
		TC = 110°C, tp = 10ms	100 A
Single Pulse Avalanche Energy TC = 25°C, L = 0.5mH, V _{DD} = 50V, I _{peak} = 12.5A	E_{AS}	39	mJ
Operating Temperature Range	T_J	175	°C
Storage Temperature Range	T_{STG}	-55 to +175	°C
Typical Thermal Resistance	$R_{\theta JC}$	0.86	°C/W

Electrical Characteristics unless otherwise specified

Characteristics		Symbol	Value			Unit
Forward Voltage Drop(Note2)			Min	Typ	Max	
$I_R = 100\mu A$		V_{DC}	650	-	-	V
at $I_F=20A$	$T_A=25^{\circ}C$	V_F	-	1.34	1.65	V
	$T_A=175^{\circ}C$		-	1.61	-	
Maximum Reverse Current at $V_R=650V$	$T_A=25^{\circ}C$	I_R	-	1.5	60	μA
	$T_A=175^{\circ}C$		-	8	-	μA
Total capacitive charge	$V_R = 400V$	Q_C	-	62	-	nC
Total capacitance	$V_R = 1V, f = 1MHz$	C	-	844	-	pF
	$V_R = 200V, f = 1MHz$		-	118	-	
	$V_R = 400V, f = 1MHz$		-	86	-	
Capacitance stored energy	$V_R = 400V$	E_C	-	10	-	μJ

Note2:Pulse test: 300 μs pulse width, 1 % duty cycle

RATINGS AND CHARACTERISTIC CURVES

Figure 1. V_F Typical Forward Characteristics

$I_F = 0 \sim 40A$

T_{VJ} ranges from 25 °C to 175 °C

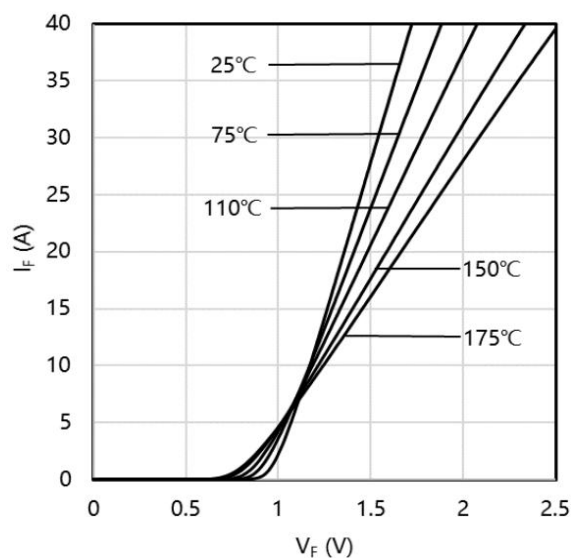


Figure 2. I_R Typical Reverse Characteristics

$V_R = 300 \sim 700 V$

T_{VJ} ranges from 25 °C to 175 °C

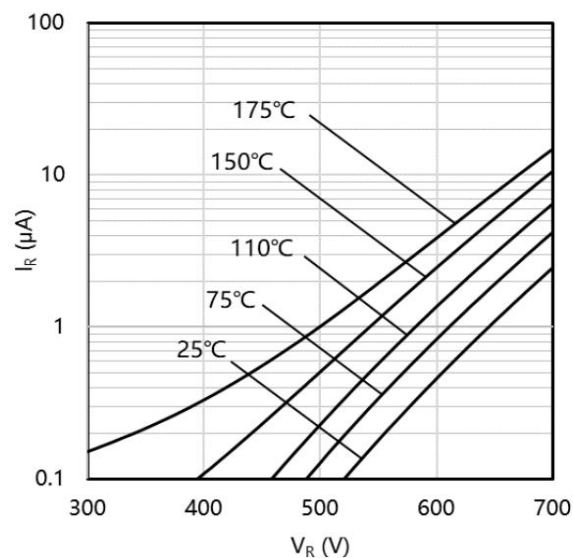


Figure 3. Total Capacitance Charge Characteristics

$V_R = 0 \sim 650 V$

$T_{VJ} = 25 ^\circ C$

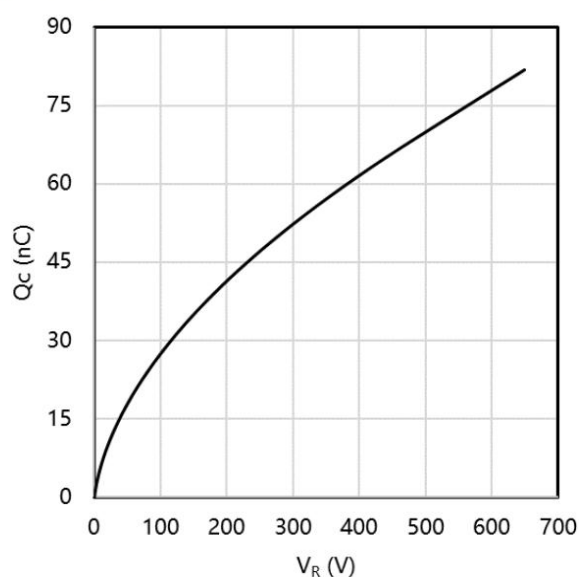
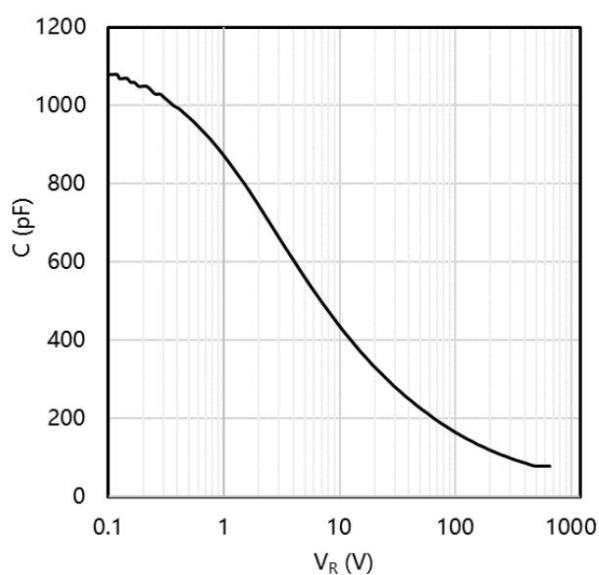


Figure 4. Total Capacitance Characteristics

$V_R = 0 \sim 650 V$

$T_{VJ} = 25 ^\circ C$



RATINGS AND CHARACTERISTIC CURVES

Figure 5. Power dissipation as function of case temperature

T_{VJ} ranges from 25 °C to 175 °C

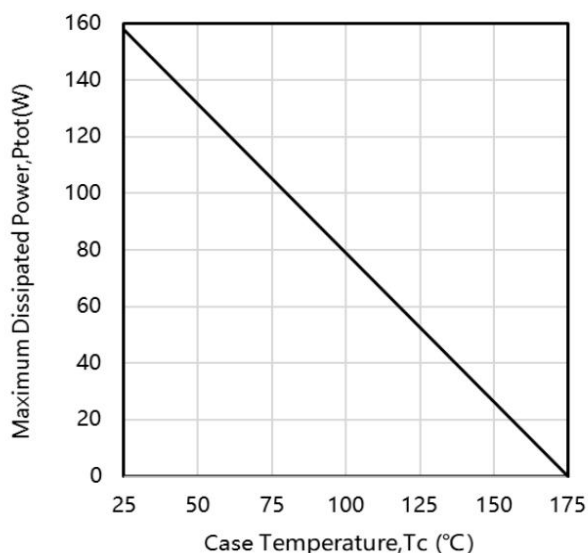


Figure 6. Capacitance Stored Energy

$V_R = 0 \sim 650$ V

$T_{VJ} = 25$ °C

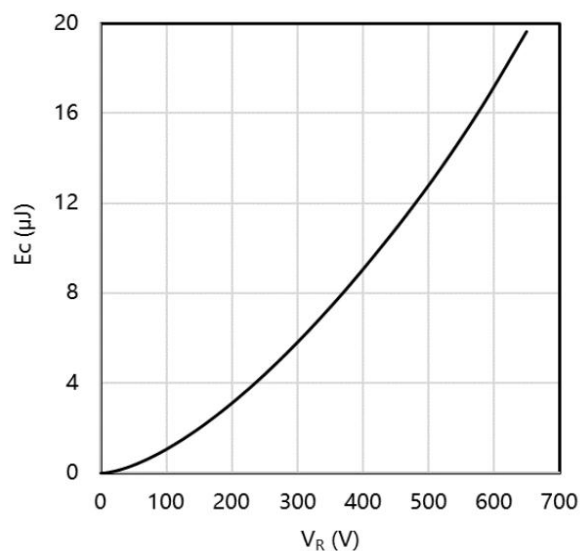
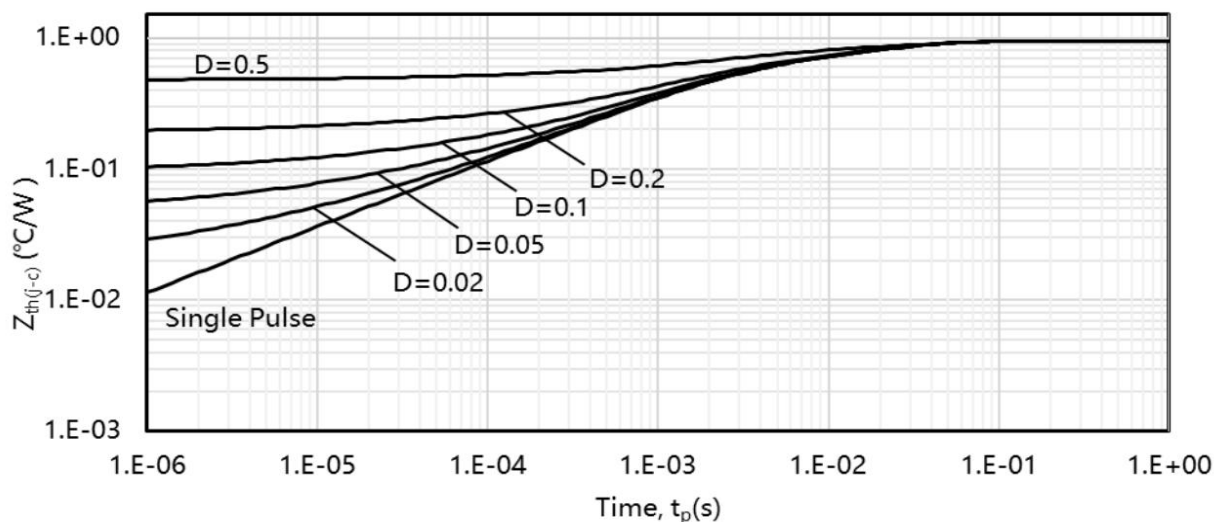
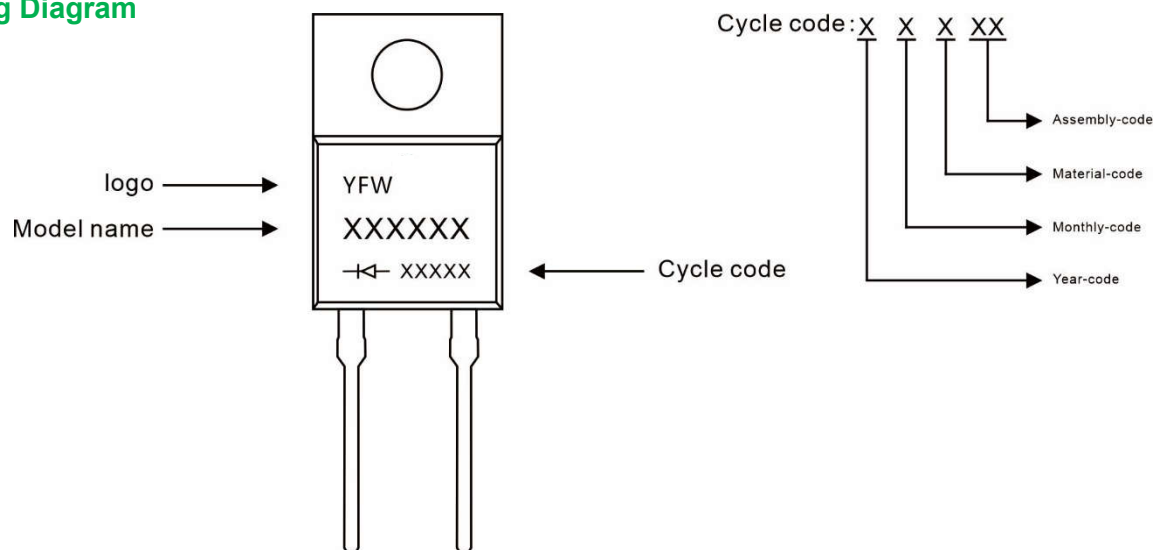


Figure 7. Max. transient thermal impedance, $Z_{th,j-c}=f(t_p)$, parameter: $D=t_p/T$



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWD320065AC	TO-220AC	0.067oz(1.9g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

Package Dimensions

TO-220AC

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.34	4.67	0.171	0.184
A1	2.52	2.82	0.099	0.111
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.30	0.50	0.012	0.020
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
E1	12.00	12.50	0.472	0.492
e	4.88	5.28	0.192	0.208
F	2.60	2.80	0.102	0.110
L	13.20	13.80	0.520	0.543
L1	3.80	4.20	0.150	0.165
Φ	3.60	3.96	0.142	0.156

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