

SIC SCHOTTKY BARRIER DIODE

Reverse Voltage - 650 V

Forward Current - 20 A

FEATURES

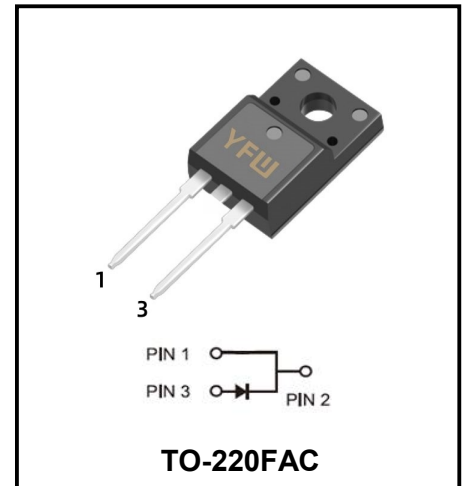
- ◆650-Volt SiC JBS Rectifier
- ◆Zero Reverse Recovery
- ◆Positive Temperature Coefficient on VF
- ◆Temperature-Independent Switching Behavior
- ◆Extremely Fast Switching
- ◆Extremely Low Leakage Current

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

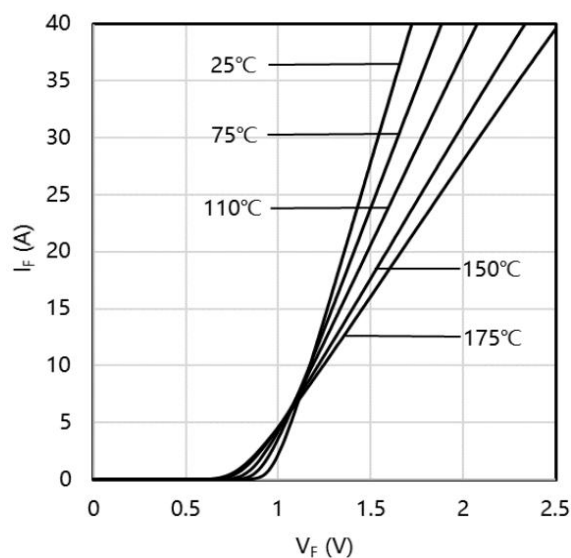


Figure 2. I_R Typical Reverse Characteristics

$V_R = 300 \sim 700 V$

T_{VJ} ranges from 25 °C to 175 °C

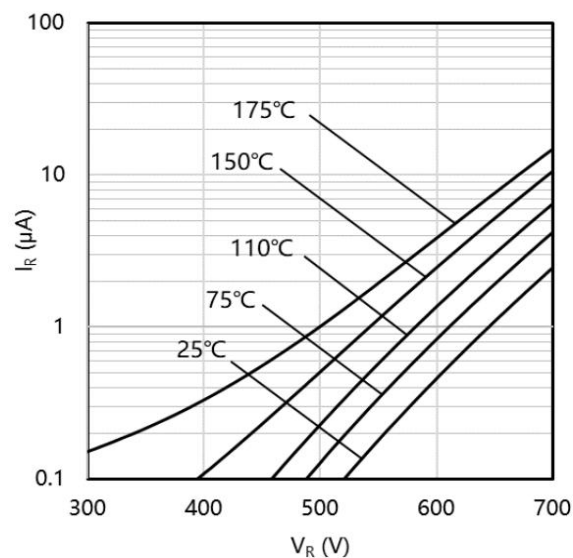


Figure 3. Total Capacitance Charge Characteristics

$V_R = 0 \sim 650 V$

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

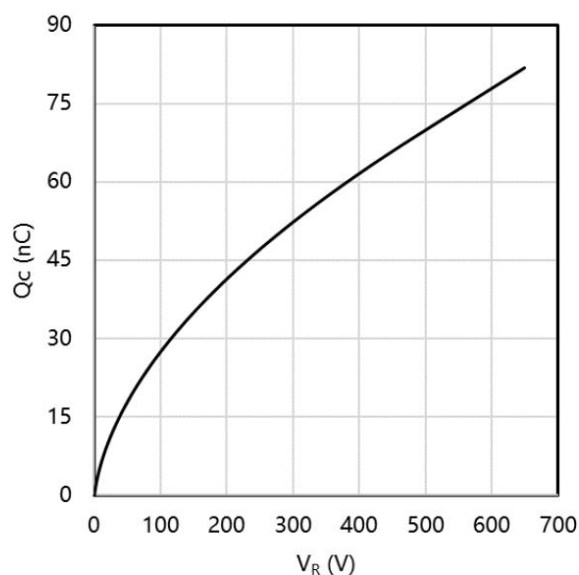
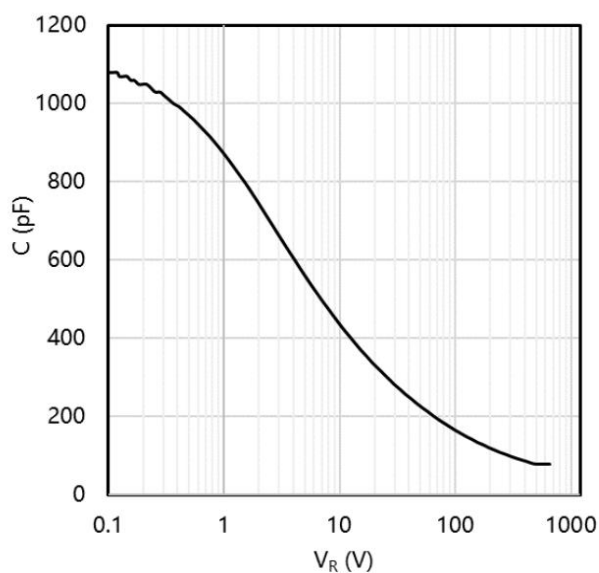


Figure 4. Total Capacitance Characteristics

$V_R = 0 \sim 650 V$

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



RATINGS AND CHARACTERISTIC CURVES

Figure 5. Power dissipation as function of case temperature

T_{VJ} ranges from 25 °C to 175 °C

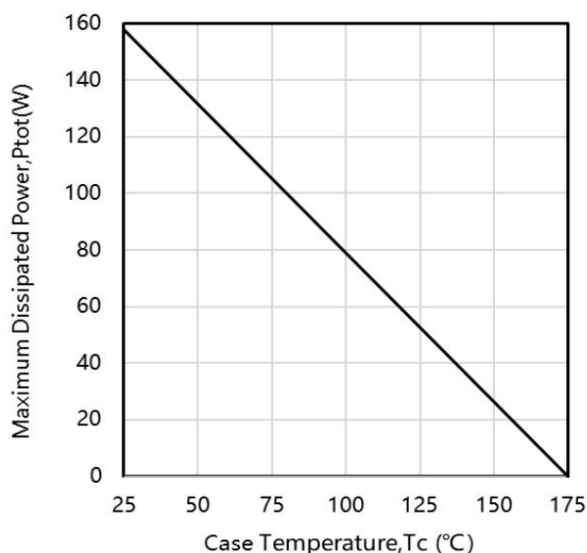


Figure 6. Capacitance Stored Energy

$V_R = 0 \sim 650$ V

$T_{VJ} = 25$ °C

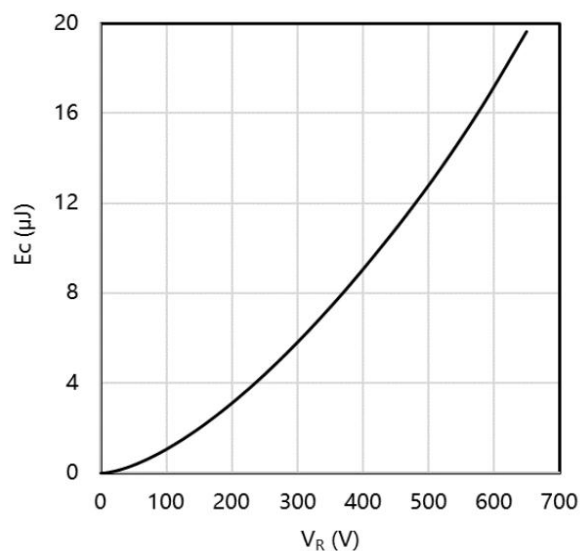
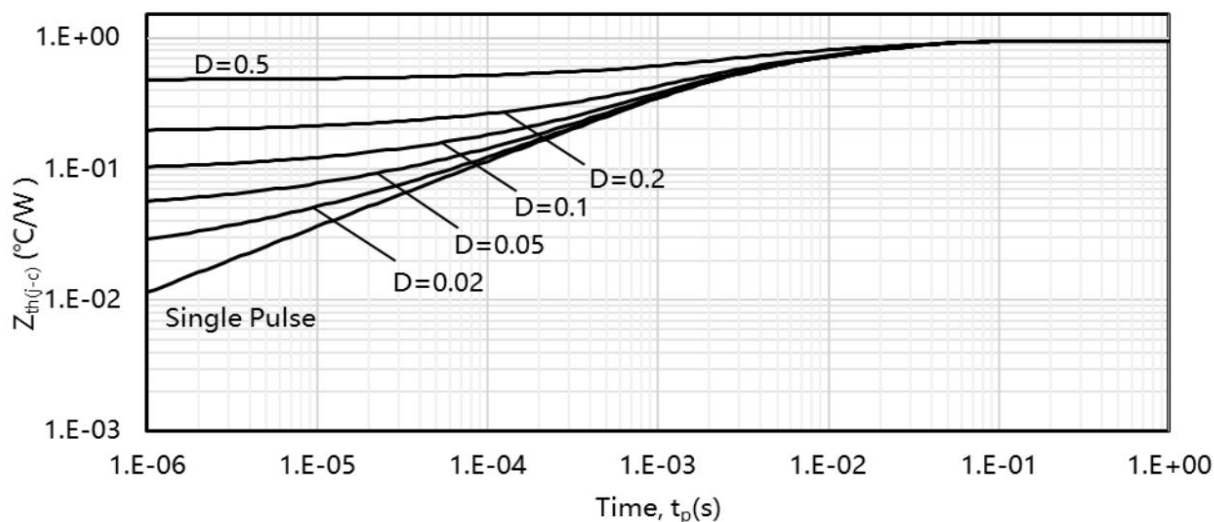
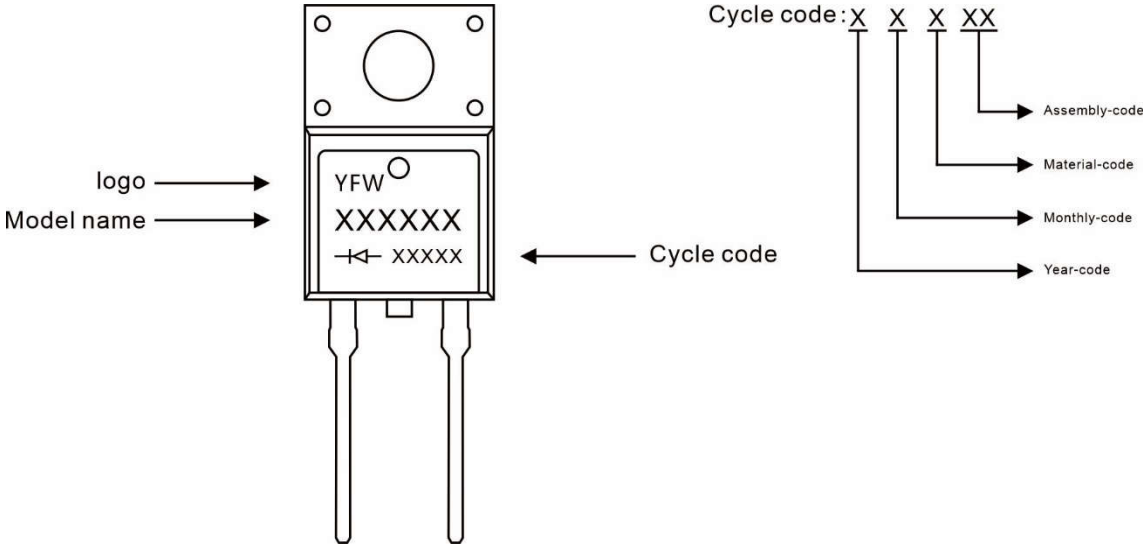


Figure 7. Max. transient thermal impedance, $Z_{th,j-c}=f(t_p)$, parameter: $D=t_p/T$



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWD320065FAC	TO-220FAC	0.06oz(1.7g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

Package Dimensions

TO-220FAC

Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	9.95	10.25	0.392	0.404
B	2.95	3.25	0.116	0.128
C	1.25	1.45	0.049	0.057
E	12.95	13.25	0.51	0.52
F	0.40	0.60	0.016	0.024
G	1.30	1.45	0.051	0.057
H	TYP2.54		TYP 0.1	
I	TYP5.08		TYP 0.2	
J	4.60	4.75	0.181	0.187
K	2.45	2.65	0.097	0.104
L	6.5	6.8	0.256	0.268
M	15.4	16.0	0.606	0.630
N	2.75	3.05	0.108	0.120
O	0.45	0.55	0.018	0.022
P	0.6	0.8	0.024	0.032
Q	0.76	0.84	0.030	0.033

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