Pb Free Plating Product

FFA40UP20DN

40Ampere,200Volt Planar Passivation Ultra Fast Recovery Rectifiers

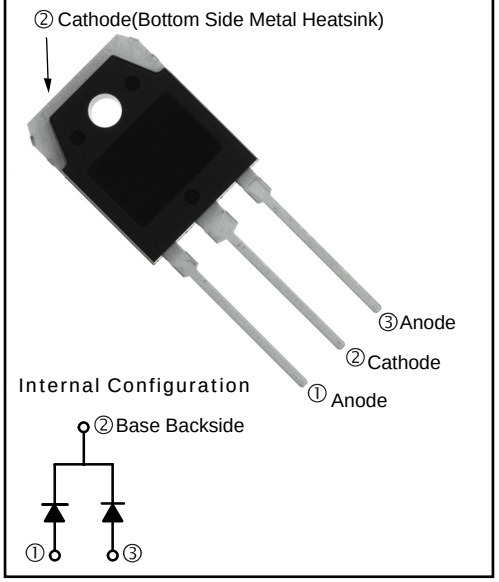
APPLICATION

- Freewheeling, Snubber, Clamp
- Inversion Welder
- PFC
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- UPS

PRODUCT FEATURE

- Ultrafast Recovery Time
- Soft Recovery Characteristics
- Low Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Low Leakage Current

TO-3PB(TO-3PN)



GENERAL DESCRIPTION

FFA40UP20DN using lastest FRED FAB process(or planar passivation pellet) with ultrafast and soft recovery characteristics.

Absolute Maximum Ratings (per diode) T_C = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{RRM}	Peak Repetitive Reverse Voltage	200	V
V_{RWM}	Working Peak Reverse Voltage	200	V
V_R	DC Blocking Voltage	200	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 120°C	20	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	200	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 65 to +150	°C

Thermal Characteristics

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	1.9	°C/W

Electrical Characteristics (per diode) T_C = 25°C unless otherwise noted

Symbol	Parameter		Min.	Typ.	Max.	Units
V_{FM} *	I_F = 20A I_F = 20A	T_C = 25 °C T_C = 100 °C	- -	- -	1.15 1.0	V V
I_{RM} *	V_R = 200V V_R = 200V	T_C = 25 °C T_C = 100 °C	- -	- -	100 500	μA μA
t_{rr}	I_F =1A, di/dt = 100A/μs, V_{CC} = 30V I_F =20A, di/dt = 200A/μs, V_{CC} = 130V	T_C = 25 °C T_C = 25 °C	- -	- -	35 45	ns ns
t_a t_b Q_{rr}	I_F =20A, di/dt = 200A/μs, V_{CC} = 130V	T_C = 25 °C T_C = 25 °C T_C = 25 °C	- - -	11 13 21	- - -	ns ns nC
W_{AVL}	Avalanche Energy (L = 40mH)		20	-	-	mJ

* Pulse Test: Pulse Width=300μs, Duty Cycle=2%

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

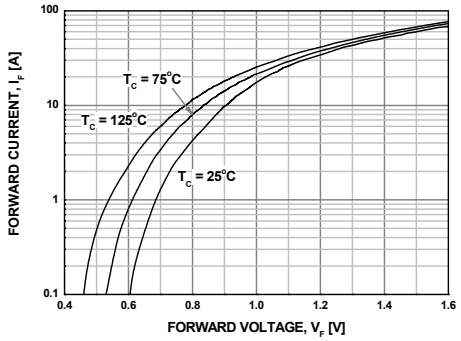


Figure 2. Typical Reverse Current

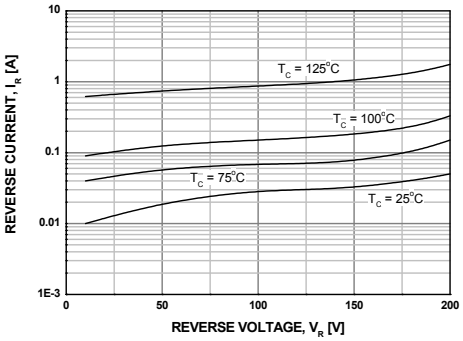


Figure 3. Typical Junction Capacitance

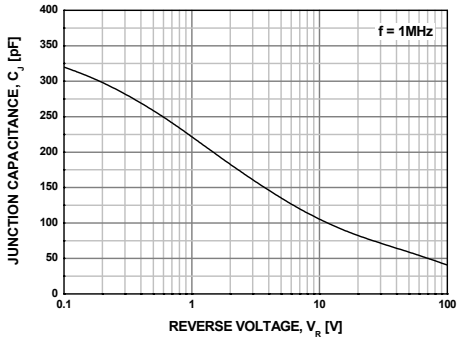


Figure 4. Typical Reverse Recovery Time

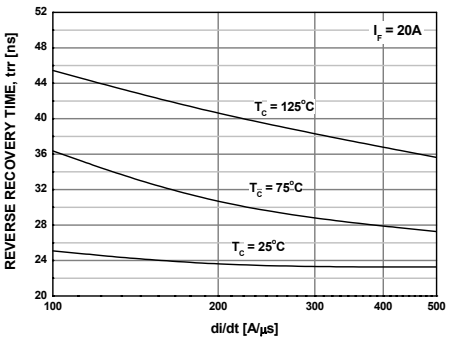


Figure 5. Typical Reverse Recovery Current

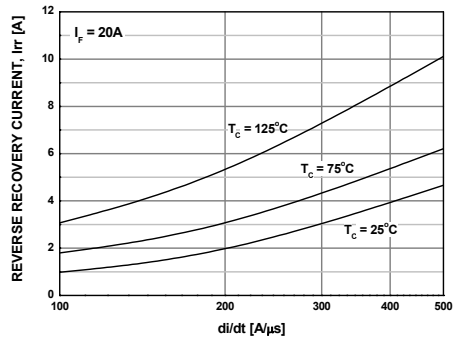
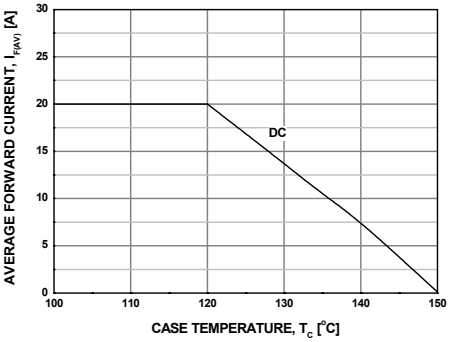
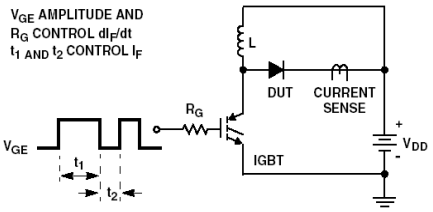


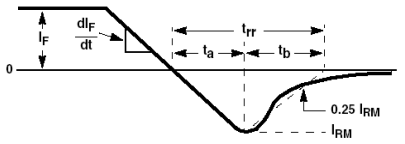
Figure 6. Forward Current Deration Curve



Test Circuit and Waveforms

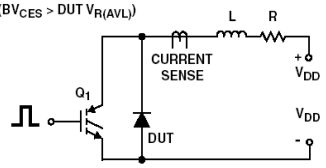


t_{rr} TEST CIRCUIT

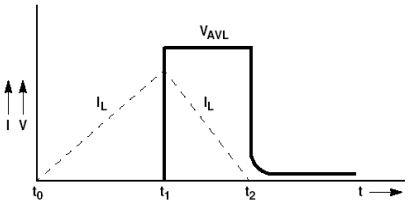


t_{rr} WAVEFORMS AND DEFINITIONS

I_{MAX} = 1A
L = 40mH
R < 0.1Ω
$E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
Q_1 = IGBT (BV_{CES} > DUT $V_{R(AVL)}$)



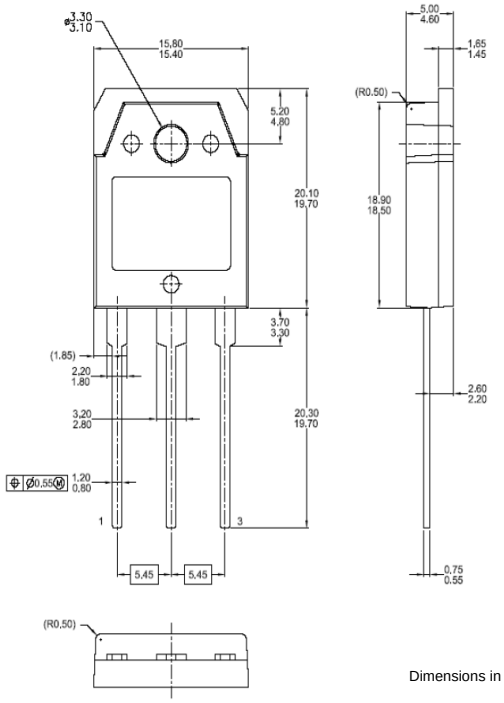
AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Mechanical Dimensions

TO-3PB(TO-3PN)



Dimensions in Millimeters