

Pb Free Plating Product

## F40UP20DN



40Ampere,200Volt Planar Passivation Ultra Fast Recovery Rectifiers

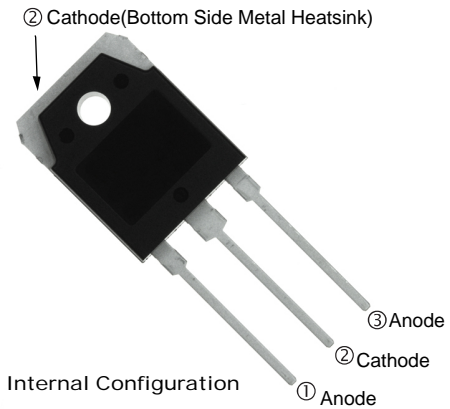
### APPLICATION

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

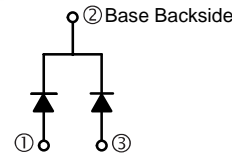
### PRODUCT FEATURE

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

### TO-3PB(TO-3PN)



Internal Configuration



### GENERAL DESCRIPTION

F40UP20DN using latest FRED FAB process(or planar passivation pellet) with ultrafast and soft recovery characteristics.

### Absolute Maximum Ratings (per diode) $T_C = 25^\circ\text{C}$ 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 @ $T_C = 120^\circ\text{C}$	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	$^\circ\text{C}$

### Thermal Characteristics

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

### Electrical Characteristics (per diode) $T_C = 25^\circ\text{C}$ unless otherwise noted

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

\* Pulse Test: Pulse Width=300 $\mu\text{s}$ , Duty Cycle=2%

## Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

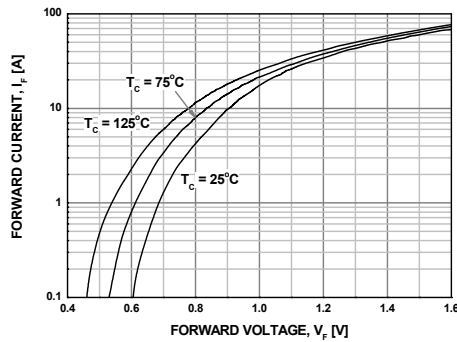


Figure 2. Typical Reverse Current

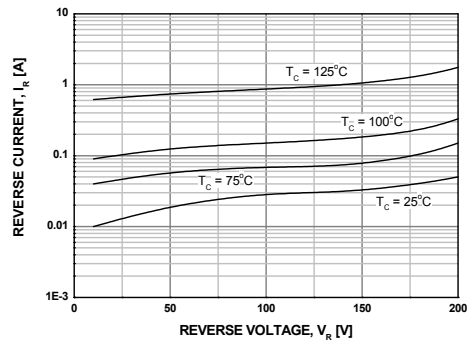


Figure 3. Typical Junction Capacitance

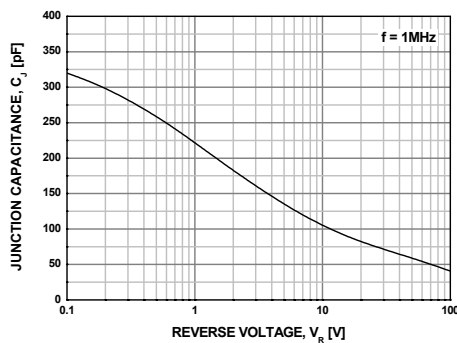


Figure 4. Typical Reverse Recovery Time

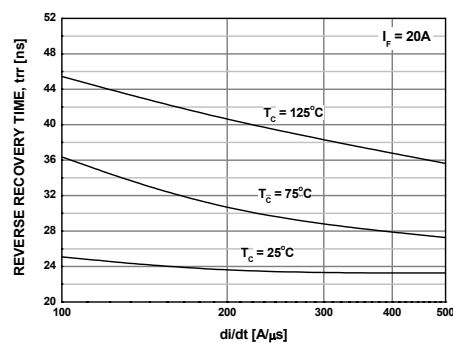


Figure 5. Typical Reverse Recovery Current

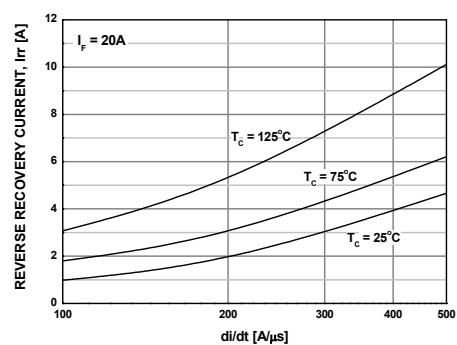
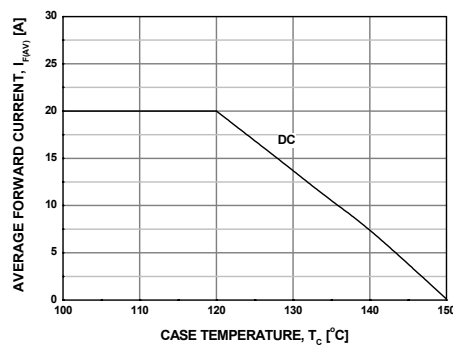
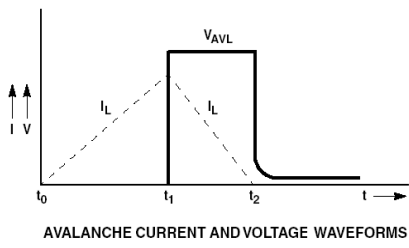
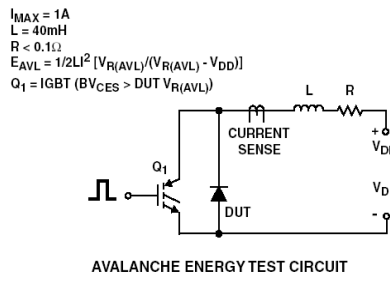
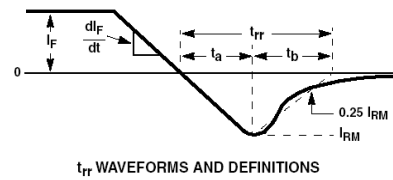
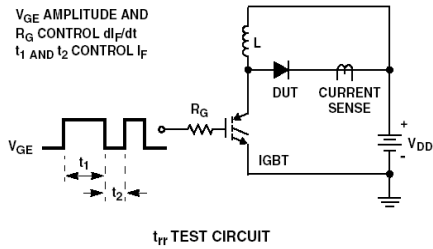


Figure 6. Forward Current Deration Curve



## Test Circuit and Waveforms



## Mechanical Dimensions

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