

Pb Free Plating Product

FFAF40UP20DNTU



40Ampere,200Volt Insulated Package Epitaxial Ultrafast Recovery Power Rectifier

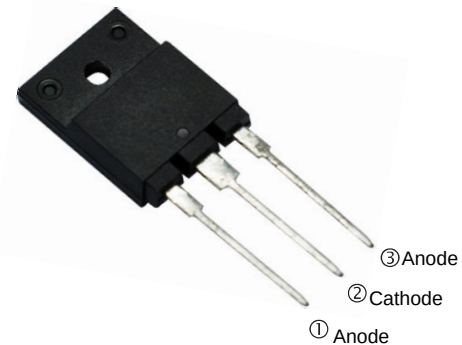
APPLICATION

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

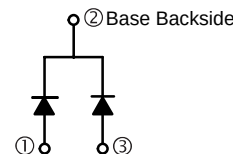
PRODUCT FEATURE

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

TO-3PF(TO-3PML)



Internal Configuration



GENERAL DESCRIPTION

FFAF40UP20DNTU using latest FRED FAB process(or planar passivation chip) with ultrafast and soft recovery characteristic.

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 @ $T_C = 110^\circ\text{C}$	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	2.2	$^\circ\text{C/W}$

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
	$I_F = 20\text{A}$	$T_C = 100^\circ\text{C}$	-	-	1.0	V
I_{RM}^*	$V_R = 200\text{V}$	$T_C = 25^\circ\text{C}$	-	-	100	μA
	$V_R = 200\text{V}$	$T_C = 100^\circ\text{C}$	-	-	500	μA
t_{rr}	$I_F = 1\text{A}, di/dt = 100\text{A}/\mu\text{s}, V_{CC} = 30\text{V}$	$T_C = 25^\circ\text{C}$	-	-	35	ns
	$I_F = 20\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 130\text{V}$	$T_C = 25^\circ\text{C}$	-	-	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 ($L = 40\text{mH}$)		20	-	-	mJ

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

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

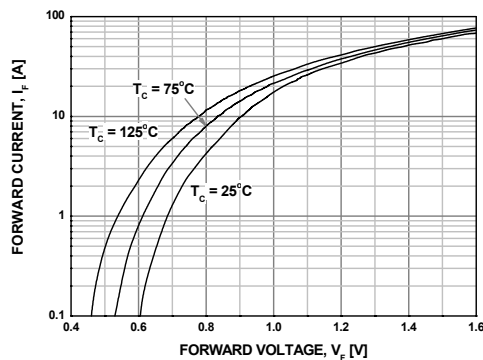


Figure 2. Typical Reverse Current

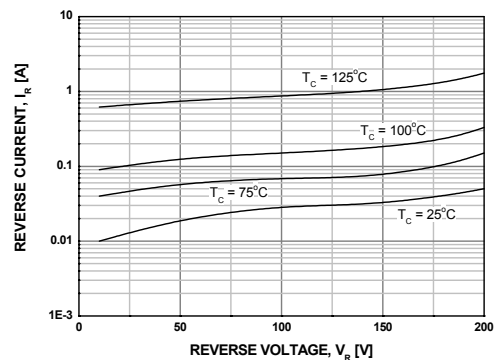


Figure 3. Typical Junction Capacitance

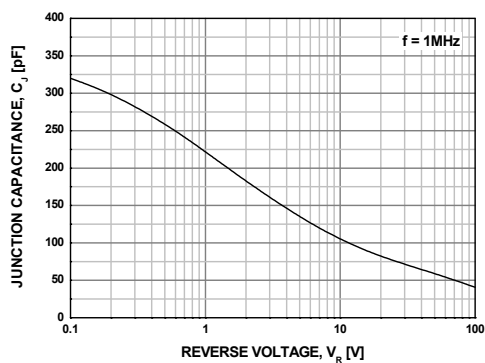


Figure 4. Typical Reverse Recovery Time

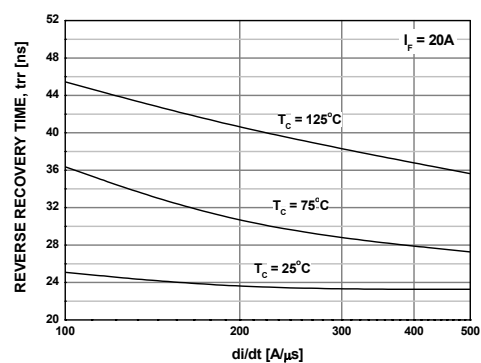


Figure 5. Typical Reverse Recovery Current

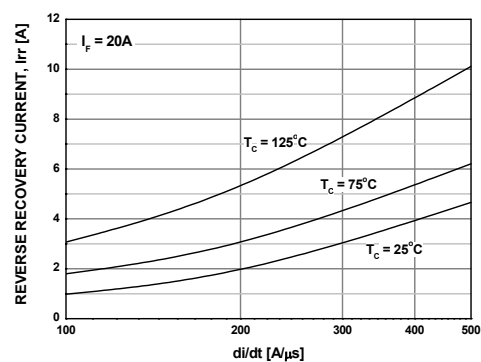
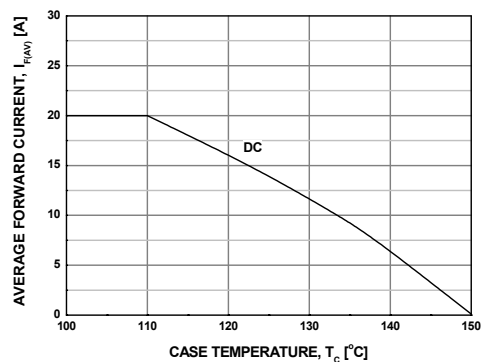
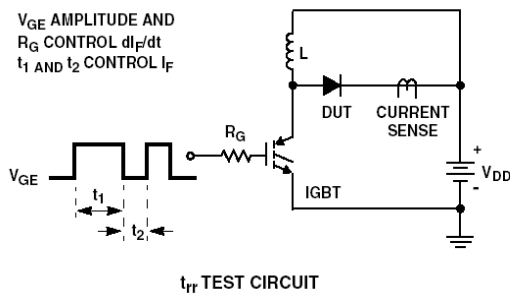
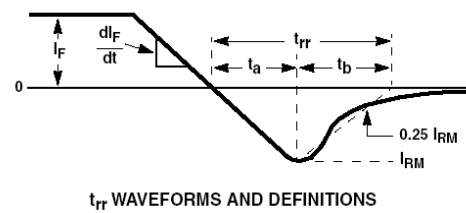
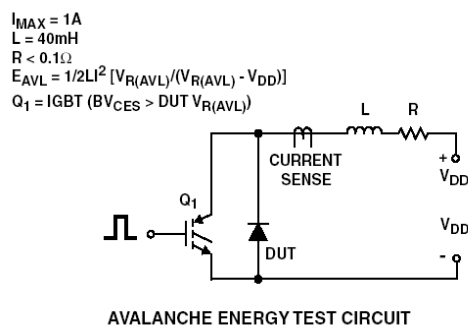
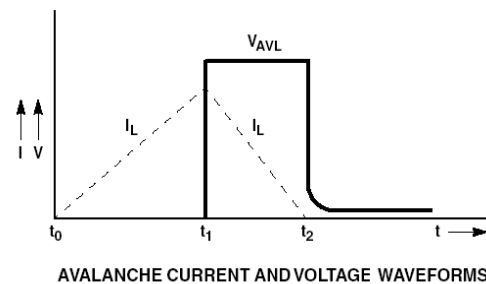


Figure 6. Forward Current Deration Curve

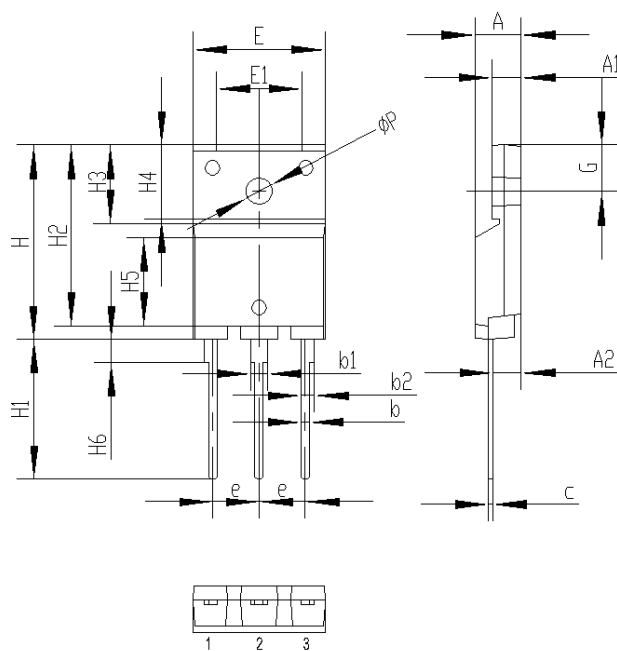


Test Circuit and Waveforms



Package Information

TO-3PF(TO-3PML) Outline



	mm		
	MIN	NOM	MAX
A	5.3	5.5	5.7
A1	3.25	3.45	3.65
A2	3.15	3.35	3.55
b	0.85	1.0	1.15
b1	1.85	2.0	2.15
b2	1.45	1.6	1.75
c	0.4	0.5	0.6
e	5.3	5.45	5.6
E	15.40	15.60	15.80
E1	10.00	10.20	10.40
H	22.80	23.00	23.20
H1	16.00	16.50	17.00
H2	21.20	21.40	21.60
H3	9.10	9.30	9.50
H4	8.55	8.75	8.95
H5	10.20	10.40	10.60
H6	2.55	2.70	2.85
G	5.3	5.5	5.7
ØP	3.05	3.2	3.35