

FAIRCHILD

A Schlumberger Company

FRP800 Series T-03-17
Ultra-fast POWERplanar™
Rectifiers 8 A, 50-200 V

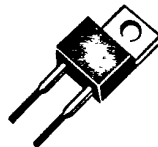
Power And Discrete Division

Description

Designed for use in switching power supplies, inverters and as free-wheeling diodes, these state-of-the-art devices have the following features:

- Ultrafast 35 ns Recovery Time
- Soft Recovery ($S > 0.5$)
- Low $I_{R(REC)}$
- 150°C Operating Junction Temperature
- Popular TO-220AC Package
- Low V_{FM}

TO-220AC



FRP805
FRP810
FRP815
FRP820

2

Maximum Ratings

Symbol	Rating	FRP805	FRP810	FRP815	FRP820	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	50	100	150	180	V
V_{RSM}	Non-repetitive Peak Reverse Voltage	50	100	150	200	
V_R	DC Blocking Voltage	50	100	150	180	
$I_{F(AV)}$	Average Rectified Forward Current, $T_C = 130^\circ\text{C}$, Rated V_R	8	8	8	8	A
I_{FRM}	Peak Repetitive Forward Current Rated V_R , 50% Duty Cycle, Square Wave, 20 kHz, $T_C = 130^\circ\text{C}$	16	16	16	16	A
I_{FSM}	Non-repetitive Peak Surge Current per Diode, Surge Applied at Rate Load Conditions Halfwave, Single Phase, 60 Hz	100	100	100	100	A
T_J, T_{stg}	Operating Junction Temperature and Storage Temperature	-55 to +150	-55 to +150	-55 to +150	-55 to +150	$^\circ\text{C}$

Maximum Thermal Characteristics

$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	2.5	2.5	2.5	2.5	$^\circ\text{C/W}$
$R_{\theta JA}$	Maximum Thermal Resistance, Junction to Ambient	60	60	60	60	

Notes

For information concerning connection diagram and package outline, refer to Section 7.

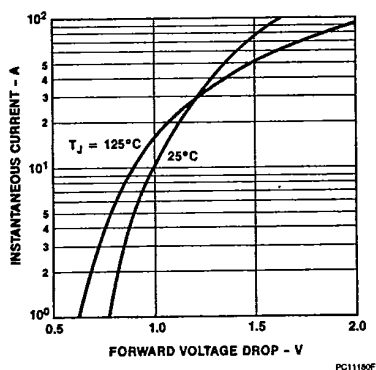
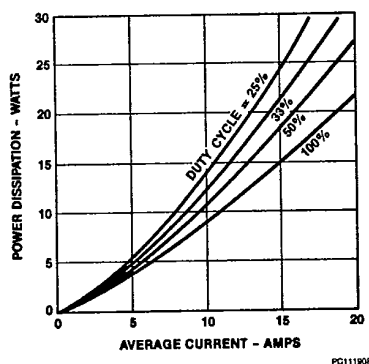
FRP800 Series

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Symbol	Rating	FRP805	FRP810	FRP815	FRP820	Unit
Electrical Characteristics						
V_{FM}^1	Maximum Instantaneous Forward Voltage $I_F = 8.0 \text{ A}$, $T_C = 150^\circ\text{C}$ $I_F = 8.0 \text{ A}$, $T_C = 25^\circ\text{C}$	0.80 0.95	0.80 0.95	0.80 0.95	0.80 0.95	V
I_{RRM}^1	Maximum Instantaneous Repetitive Reverse Current Rated DC Voltage, $T_C = 125^\circ\text{C}$ Rated DC Voltage, $T_C = 25^\circ\text{C}$	5.0 10	5.0 10	5.0 10	5.0 10	mA μA
t_{rr}	Maximum Reverse Recovery Time $I_F = 1.0 \text{ A}$, $di_F/dt = 50 \text{ A}/\mu\text{s}$ $I_F = 8 \text{ A}$, $di_F/dt = 100 \text{ A}/\mu\text{s}$	35 50	35 50	35 50	35 50	ns
$I_{R(REC)}^2$	Maximum Reverse Recovery Current $I_F = 8 \text{ A}$, $di_F/dt = 100 \text{ A}/\mu\text{s}$, $V_R = V_{RRM}$	2.5	2.5	2.5	2.5	A

Notes

1. Pulse Test: Pulse Width = 300 μs . Duty Cycle $\leq 2.0\%$
2. See Figure 10 for test conditions.

Performance Curves**Figure 1 Maximum Forward Voltage Drop****Figure 2 Maximum Power Dissipation**

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Performance Curves (Cont.)

Figure 3 Transient Thermal Resistance

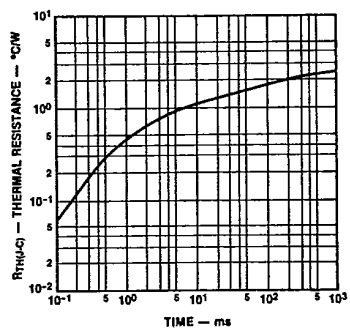


Figure 4 Typical Reverse Leakage Current

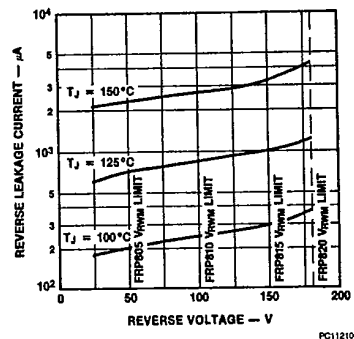


Figure 5 Power Derating

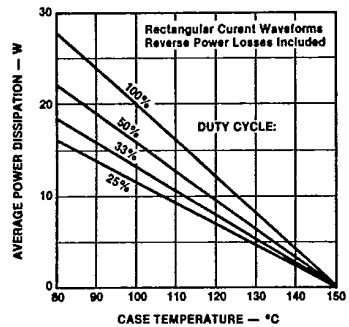


Figure 6 Reverse Recovery Charge

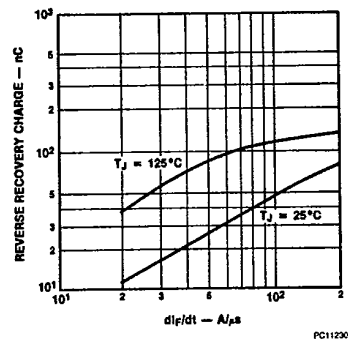
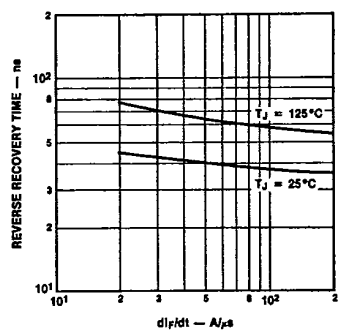


Figure 7 Reverse Recovery Time



Performance Curves (Cont.)

Figure 8 Reverse Recovery Current

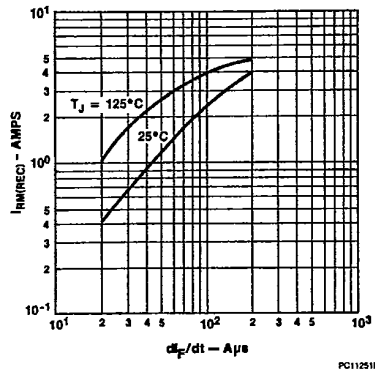


Figure 9 Reverse Recovery Softness

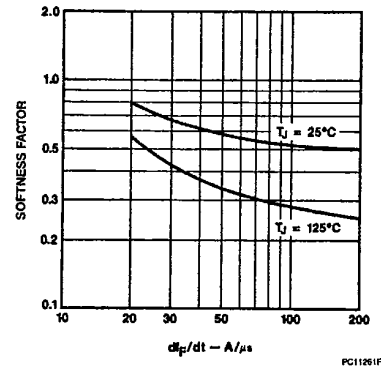
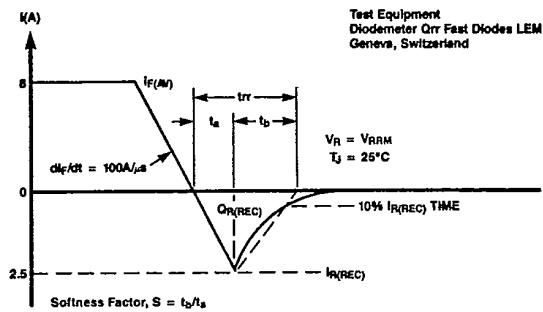


Figure 10 Reverse Recovery Test Waveform



WF00020F