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

IS00030F

FRP805
FRP810
FRP815
FRP820

Maximum Ratings

Symbol	Rating	FRP805	FRP810	FRP815	FRP820	Unit
V_{RRM} V_{RSM} V_R	Peak Repetitive Reverse Voltage Non-repetitive Peak Reverse Voltage DC Blocking Voltage	50 50 50	100 100 100	150 150 150	180 200 180	V
$I_{F(AV)}$	Average Rectified Forward Current, $T_C = 130°C$, Rated V_R	8	8	8	8	A
I_{FRM}	Peak Repetitive Forward Current Rated V_R, 50% Duty Cycle, Square Wave, 20 kHz, $T_C = 130°C$	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	°C

Maximum Thermal Characteristics

$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	2.5	2.5	2.5	2.5	°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

T-03-17

Symbol	Rating	FRP805	FRP810	FRP815	FRP820	Unit
Electrical Characteristics						
V_{FM}[1]	Maximum Instantaneous Forward Voltage I_F = 8.0 A, T_C = 150°C I_F = 8.0 A, T_C = 25°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°C Rated DC Voltage, T_C = 25°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 A, dI_F/dt = 50 A/μs I_F = 8 A, dI_F/dt = 100 A/μs	 35 50	 35 50	 35 50	 35 50	 ns
$I_{R(REC)}$[2]	Maximum Reverse Recovery Current I_F = 8 A, dI_F/dt = 100 A/μs, $V_R = V_{RRM}$	2.5	2.5	2.5	2.5	A

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

Performance Curves

Figure 1 Maximum Forward Voltage Drop

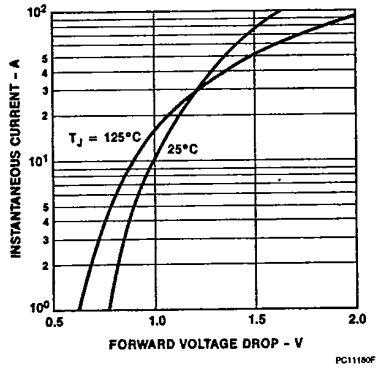
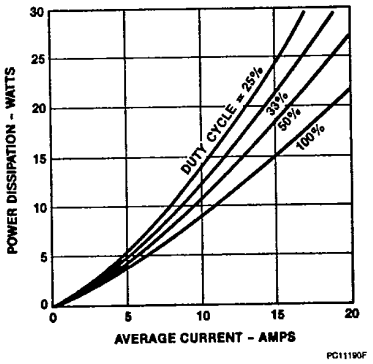


Figure 2 Maximum Power Dissipation



Performance Curves (Cont.)

Figure 3 Transient Thermal Resistance

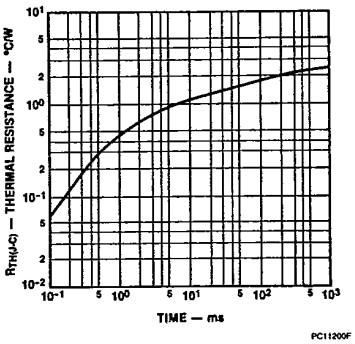


Figure 4 Typical Reverse Leakage Current

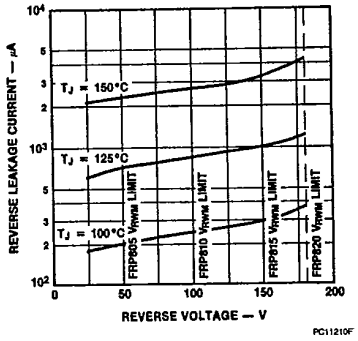


Figure 5 Power Derating

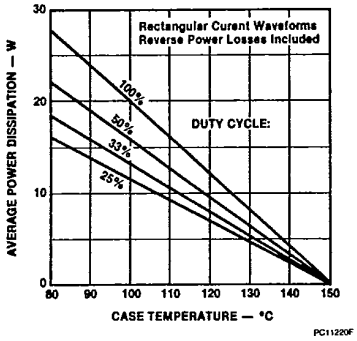


Figure 6 Reverse Recovery Charge

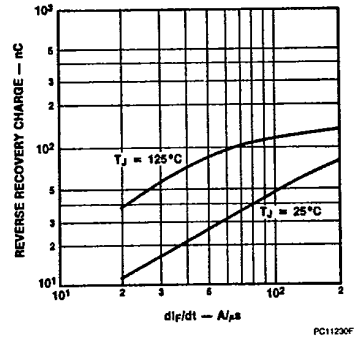
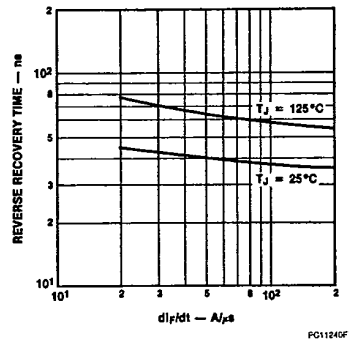


Figure 7 Reverse Recovery Time



Performance Curves (Cont.)

Figure 8 Reverse Recovery Current

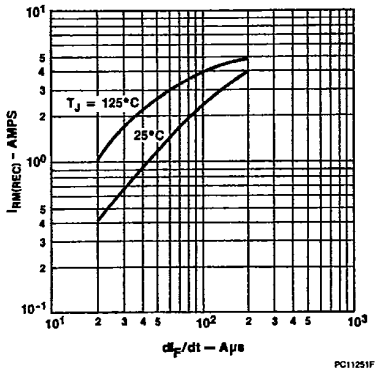


Figure 9 Reverse Recovery Softness

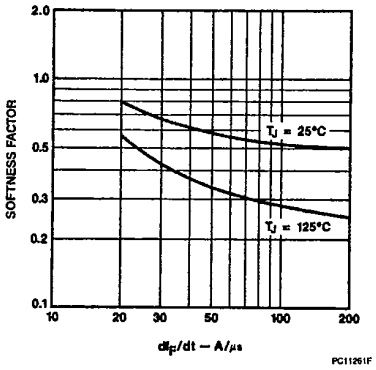


Figure 10 Reverse Recovery Test Waveform