FAIRCHILD
A Schlumberger Company

FRP1600CC Series
Ultra-fast POWERplanar™ Rectifiers 16 A, 50-200 V

Power And Discrete Division

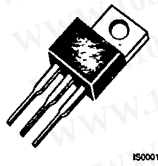
T-03-17

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

TO-220AB



IS00010F

FRP1605CC
FRP1610CC
FRP1615CC
FRP1620CC

2

Maximum Ratings

Symbol	Rating	FRP1605CC	FRP1610CC	FRP1615CC	FRP1620CC	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	16	16	16	16	A
I_{FRM}	Peak Repetitive Forward Current Rated V_R, 50% Duty Cycle, Square Wave, 20 kHz, T_C = 130°C	32	32	32	32	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.

Symbol	Rating	FRP1605CC	FRP1610CC	FRP1615CC	FRP1620CC	Unit
Electrical Characteristics per Diode						
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 per Diode

Figure 1 Maximum Forward Voltage Drop

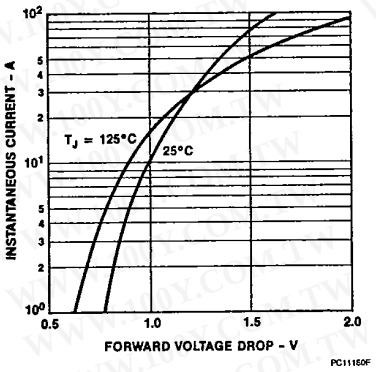
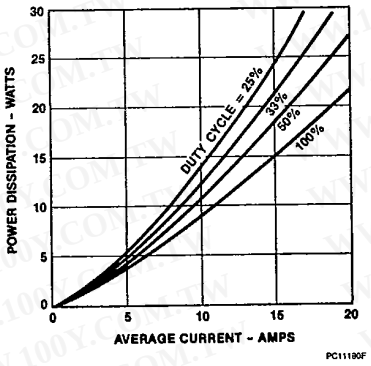


Figure 2 Maximum Power Dissipation



Performance Curves per Diode (Cont.)

Figure 3 Transient Thermal Resistance

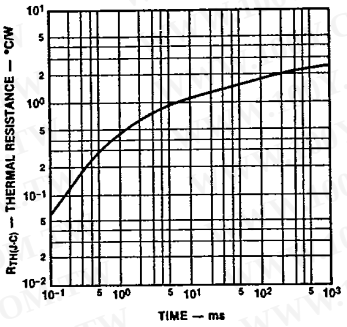


Figure 4 Typical Reverse Leakage Current

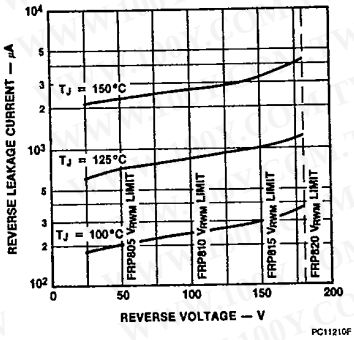


Figure 5 Power Derating

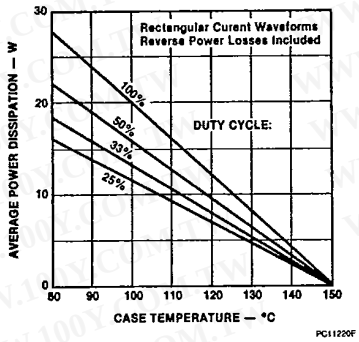


Figure 6 Reverse Recovery Charge

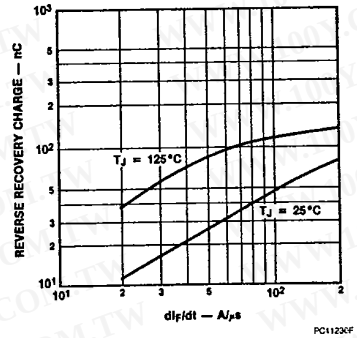
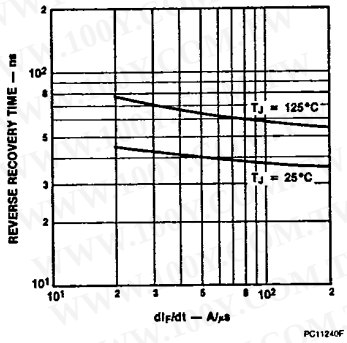


Figure 7 Reverse Recovery Time



Performance Curves per Diode (Cont.)

Figure 8 Reverse Recovery Current

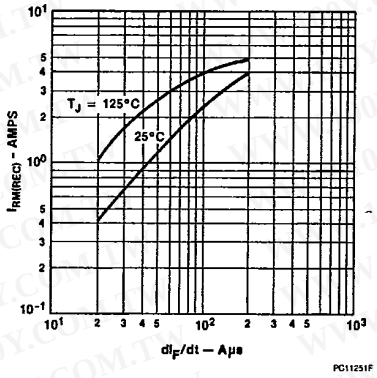


Figure 9 Reverse Recovery Softness

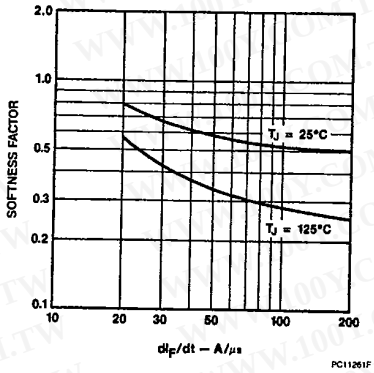


Figure 10 Reverse Recovery Test Waveform