



A Schlumberger Company

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

Power And Discrete Division

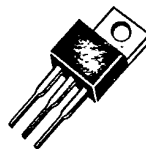
T-03-17

**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



1500010F

FRP1605CC  
 FRP1610CC  
 FRP1615CC  
 FRP1620CC

**Maximum Ratings**

Symbol	Rating	FRP1605CC	FRP1610CC	FRP1615CC	FRP1620CC	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 $V_R$	16	16	16	16	A
$I_{FRM}$	Peak Repetitive Forward Current Rated $V_R$ , 50% Duty Cycle, Square Wave, 20 kHz, $T_C = 130^\circ\text{C}$	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	$^\circ\text{C}$

**Maximum Thermal Characteristics**

Symbol	Rating	FRP1605CC	FRP1610CC	FRP1615CC	FRP1620CC	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	2.5	2.5	2.5	2.5	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Maximum Thermal Resistance, Junction to Ambient	60	60	60	60	

**Notes**

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

FRP1600CC Series 7-03-17

Symbol	Rating	FRP1605CC	FRP1610CC	FRP1615CC	FRP1620CC	Unit
<b>Electrical Characteristics per Diode</b>						
$V_{FM}^1$	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 $\mu\text{A}$
$t_{rr}$	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  $\mu\text{s}$ . Duty Cycle  $\leq 2.0\%$   
 2. See Figure 10 for test conditions.

Performance Curves per Diode

Figure 1 Maximum Forward Voltage Drop

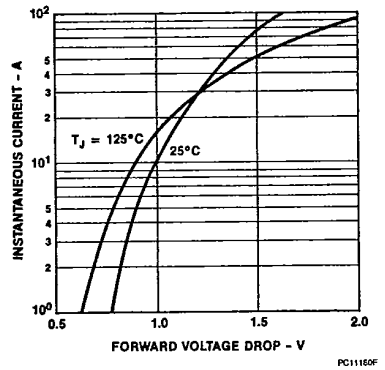
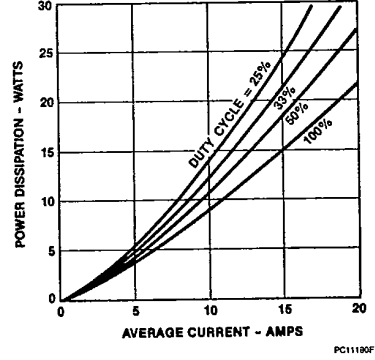


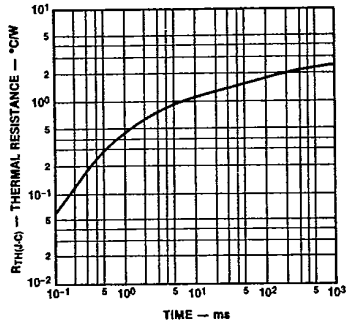
Figure 2 Maximum Power Dissipation



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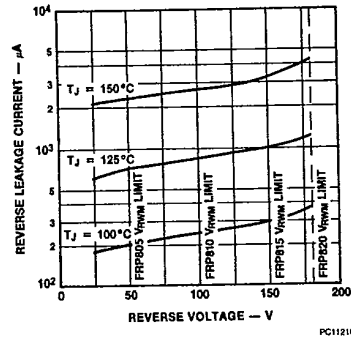
Performance Curves per Diode (Cont.)

Figure 3 Transient Thermal Resistance



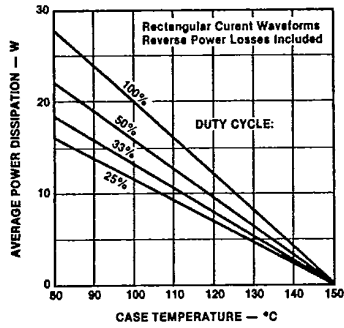
PC11200F

Figure 4 Typical Reverse Leakage Current



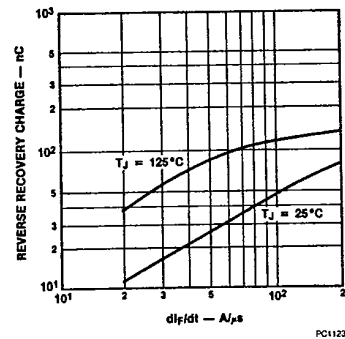
PC11210F

Figure 5 Power Derating



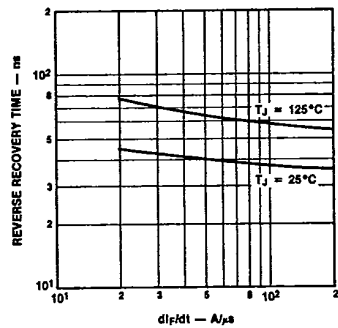
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Figure 6 Reverse Recovery Charge



PC11230F

Figure 7 Reverse Recovery Time



PC11240F

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Performance Curves per Diode (Cont.)

Figure 8 Reverse Recovery Current

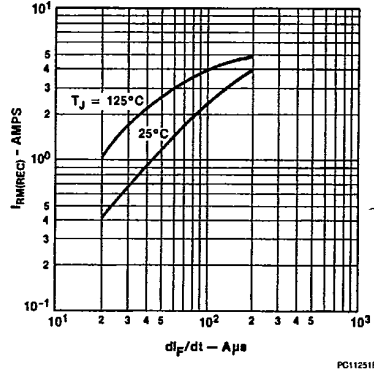


Figure 9 Reverse Recovery Softness

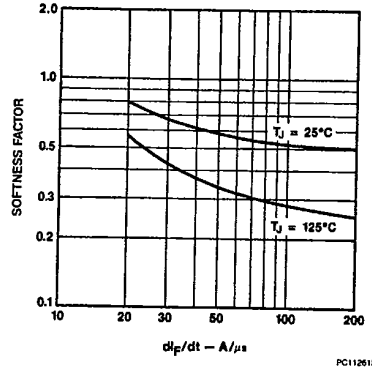
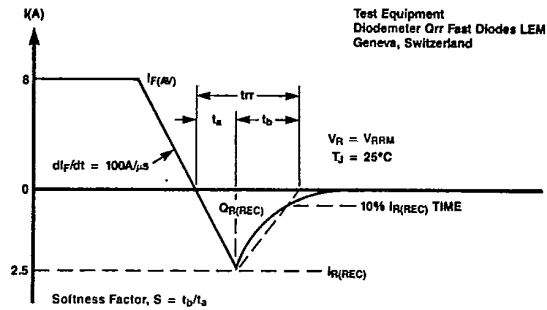


Figure 10 Reverse Recovery Test Waveform



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