

FAIRCHILD

A Schlumberger Company

FRP1600CC Series

Ultra-fast POWERplanar™

Rectifiers 16 A, 50-200 V

Power And Discrete Division

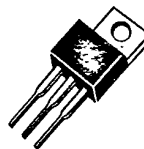
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Description

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

2

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

$R_{\theta JC}$	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.

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

Figure 1 Maximum Forward Voltage Drop

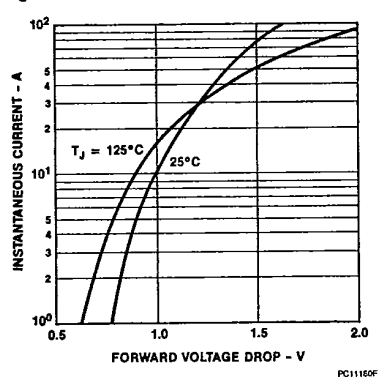
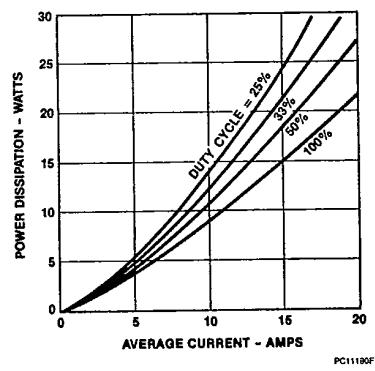


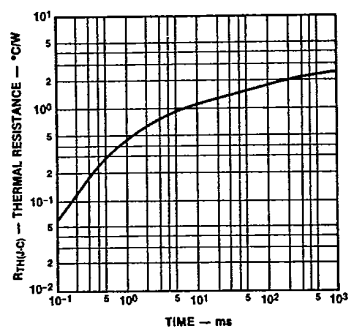
Figure 2 Maximum Power Dissipation



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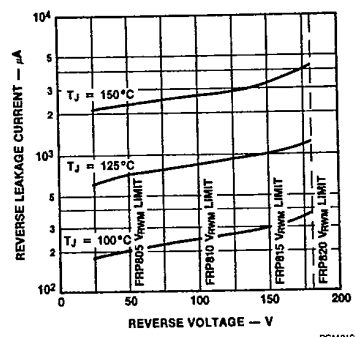
Performance Curves per Diode (Cont.)

Figure 3 Transient Thermal Resistance



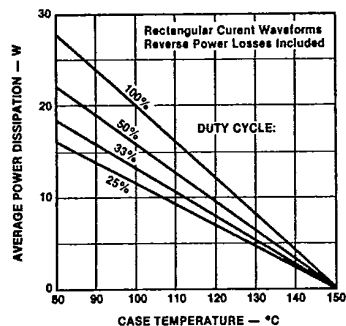
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Figure 4 Typical Reverse Leakage Current



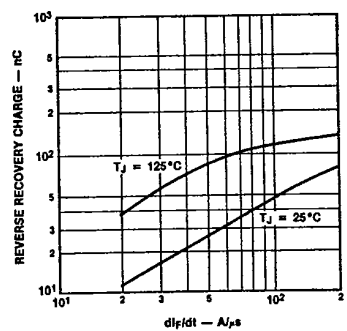
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Figure 5 Power Derating



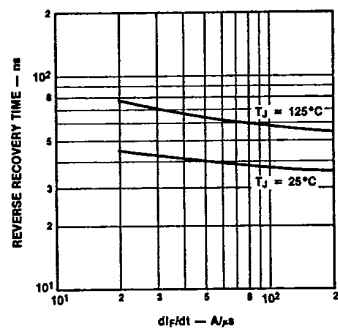
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Figure 6 Reverse Recovery Charge



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Figure 7 Reverse Recovery Time

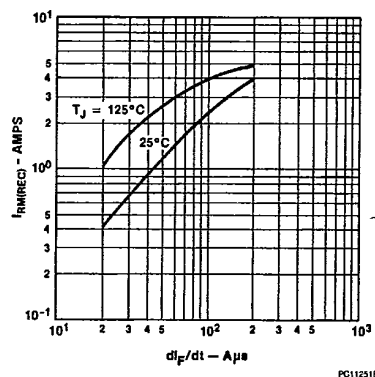


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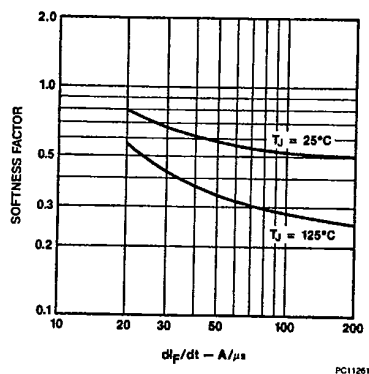
Performance Curves per Diode (Cont.)

Figure 8 Reverse Recovery Current



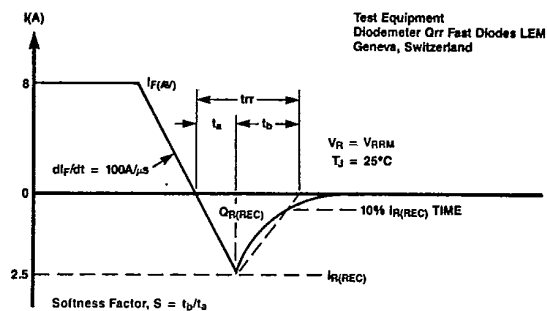
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Figure 9 Reverse Recovery Softness



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Figure 10 Reverse Recovery Test Waveform



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