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3469674 FAIRCHILD SEMICONDUCTOR

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FAIRCHILD

A Schlumberger Company

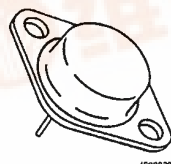
FRM3200CC Series T-03-19
Ultra-fast POWERplanar™
Rectifiers 32 A, 50-200 V

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 Reverse Recovery Time
- Soft Recovery ($S > 0.5$)
- Low $I_{R(REC)}$
- 150°C Operating Junction Temperature
- Popular TO-204AA Package (Formerly TO-3)
- Low V_{FM}

TO-204AA

US00020F

FRM3205CC
FRM3210CC
FRM3215CC
FRM3220CC

2

Maximum Ratings

Symbol	Rating	FRM3205CC	FRM3210CC	FRM3215CC	FRM3220CC	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, $T_C = 107^\circ\text{C}$, Rated V_R	32	32	32	32	A
I_{FRM}	Peak Repetitive Forward Current Rated V_R , Square Wave, 50 kHz, $T_C = 107^\circ\text{C}$	64	64	64	64	A
I_{FSM}	Non-repetitive Peak Surge Current per Diode, Surge Applied at Rate Load Conditions Halfwave, Single Phase, 60 Hz	200	200	200	200	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	1.0	1.0	1.0	1.0	$^\circ\text{C/W}$
$R_{\theta JA}$	Maximum Thermal Resistance, Junction to Ambient	60	60	60	60	

Notes

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

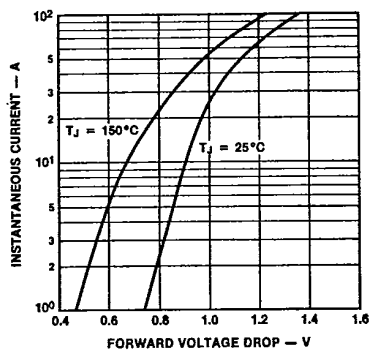
FRM3200CC Series

T-03-19

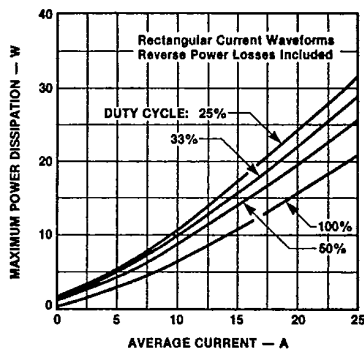
Symbol	Rating	FRM3205CC	FRM3210CC	FRM3215CC	FRM3220CC	Unit
Electrical Characteristics per Diode						
V_{FM}^1	Maximum Instantaneous Forward Voltage per Diode $I_F = 16\text{ A}$, $T_C = 150^\circ\text{C}$ $I_F = 16\text{ A}$, $T_C = 25^\circ\text{C}$	0.80 0.95	0.80 0.95	0.80 0.95	0.80 0.95	V
I_{RRM}^1	Maximum Instantaneous Reverse Current per Diode Rated DC Voltage, $T_C = 125^\circ\text{C}$ Rated DC Voltage, $T_C = 25^\circ\text{C}$	10 25	10 25	10 25	10 25	mA μA
t_{rr}	Maximum Reverse Recovery Time $I_F = 1.0\text{ A}$, $di_F/dt = 50\text{ A}/\mu\text{s}$ $I_F = 16\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$	35 50	35 50	35 50	35 50	ns
$I_{R(REC)}^2$	Maximum Reverse Recovery Current $I_F = 16\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = V_{RRM}$	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**

PC11290F

Figure 2 Maximum Power Dissipation

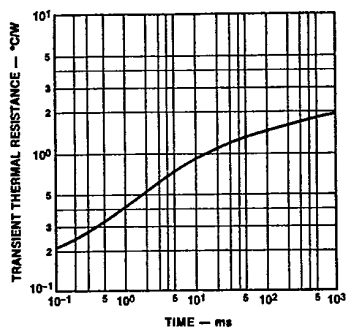
PC11300F

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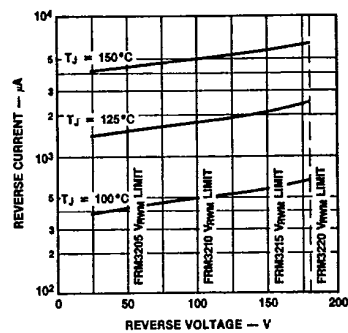
Performance Curves per Diode (Cont.)

Figure 3 Transient Thermal Resistance



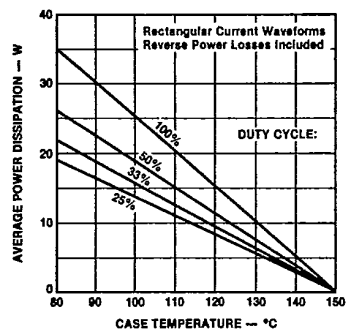
PC11380F

Figure 4 Typical Reverse Leakage Current



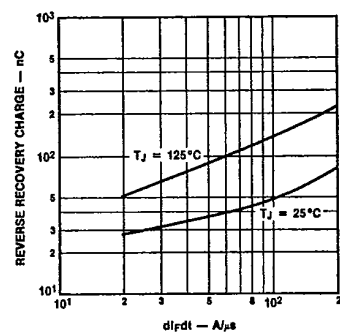
PC11390F

Figure 5 Average Power Derating



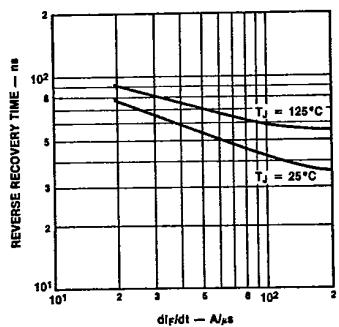
PC11400F

Figure 6 Reverse Recovery Charge



PC11340F

Figure 7 Reverse Recovery Time



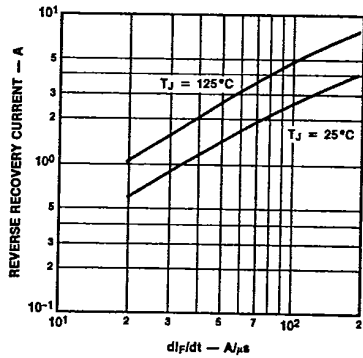
PC11350F

FRM3200CC Series

T-03-19

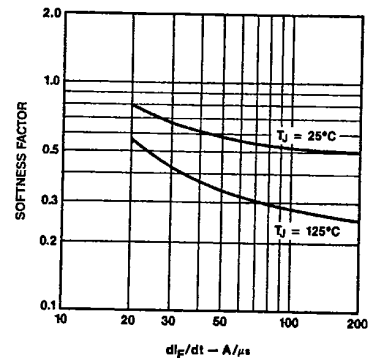
Performance Curves per Diode (Cont.)

Figure 8 Reverse Recovery Current



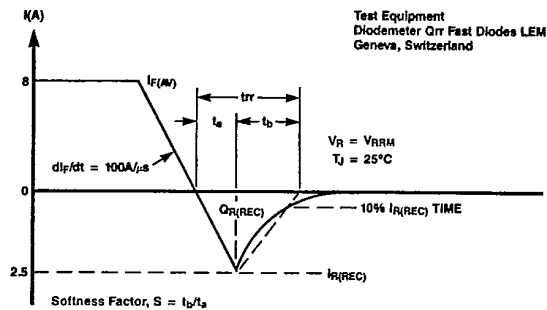
PC11360F

Figure 9 Reverse Recovery Softness



PC11261F

Figure 10 Reverse Recovery Test Waveform



WF00620F