

### APPLICATIONS

- Freewheel Diode
- D.C. Motor Drives
- Welding
- High Frequency Rectification
- Power Supplies

### KEY PARAMETERS

$V_{RRM}$	4500V
$I_{F(AV)}$	2130A
$I_{FSM}$	20000A
$Q_r$	2200 $\mu$ C
$t_{rr}$	6.0 $\mu$ s

### FEATURES

- Double side cooling
- High surge capability
- Low recovery charge

### VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage $V_{RRM}$ V	Conditions
MDFB85 45	4500	$V_{RSM} = V_{RRM} + 100V$

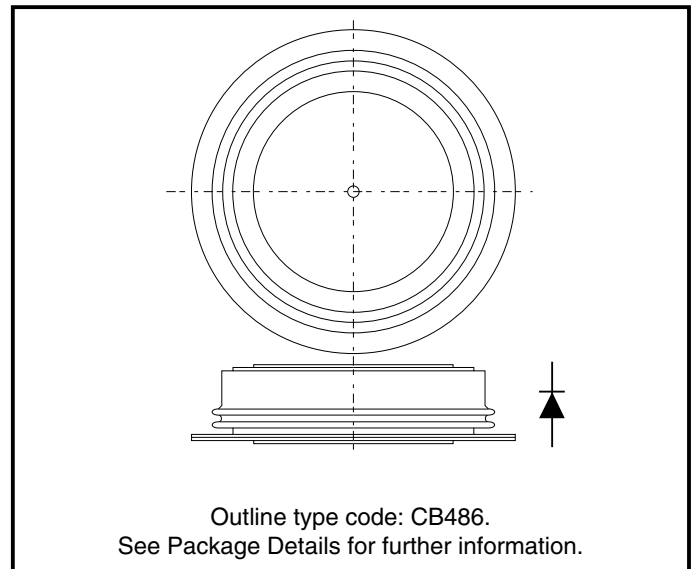
Lower voltage grades available.

### ORDERING INFORMATION

When ordering, select the required part number shown in the Voltage Ratings selection table, e.g.:

#### MDFB85 45

Note: Please use the complete part number when ordering and quote this number in any future correspondence relating to your order.



**Fig. 1 Package outline**

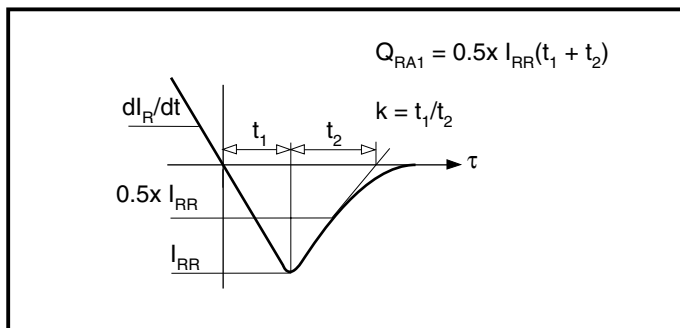
**CURRENT RATINGS**

Symbol	Parameter	Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	2130	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	3350	A
$I_F$	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	3020	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	1340	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	2110	A
$I_F$	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	1810	A

**SURGE RATINGS**

Symbol	Parameter	Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 0% $V_{RRM}$ , $T_j = 150^{\circ}C$	20.0	kA
$I^2t$	$I^2t$ for fusing		$2.0 \times 10^6$	$A^2s$
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 50% $V_{RRM}$ , $T_j = 150^{\circ}C$	16.0	kA
$I^2t$	$I^2t$ for fusing		$1.28 \times 10^6$	$A^2s$
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 100% $V_{RRM}$ , $T_j = 150^{\circ}C$	-	kA
$I^2t$	$I^2t$ for fusing		-	$A^2s$

**DEFINITION OF K FACTOR AND  $Q_{RA1}$**



**THERMAL AND MECHANICAL DATA**

Symbol	Parameter	Conditions		Min.	Max.	Units	
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.011	°C/W	
		Single side cooled	Anode dc	-	0.021	°C/W	
			Cathode dc	-	0.023	°C/W	
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 40.0kN with mounting compound		Double side	-	0.003	°C/W
				Single side			°C/W
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	150	°C	
$T_{stg}$	Storage temperature range			-55	175	°C	
-	Clamping force			36.0	44.0	kN	

**CHARACTERISTICS**

Symbol	Parameter	Conditions	Typ.	Max.	Units
$V_{FM}$	Forward voltage	At 2000A peak, $T_{case} = 25^{\circ}C$	-	2.2	V
$I_{RRM}$	Peak reverse current	At $V_{RRM}$ , $T_{case} = 150^{\circ}C$	-	200	mA
$t_{rr}$	Reverse recovery time	$I_F = 1000A$ , $di_{RR}/dt = 100A/\mu s$ $T_{case} = 150^{\circ}C$ , $V_R = 100V$	-	6.0	$\mu s$
$Q_{RA1}$	Recovered charge (50% chord)		-	1200	$\mu C$
$I_{RM}$	Reverse recovery current		400	-	A
K	Soft factor		1.8	-	-
$V_{TO}$	Threshold voltage	At $T_{vj} = 150^{\circ}C$	-	1.5	V
$r_T$	Slope resistance	At $T_{vj} = 150^{\circ}C$	-	0.35	m $\Omega$
$V_{FRM}$	Forward recovery voltage	$di/dt = 1000A/\mu s$ , $T_j = 125^{\circ}C$	-	80	V

CURVES

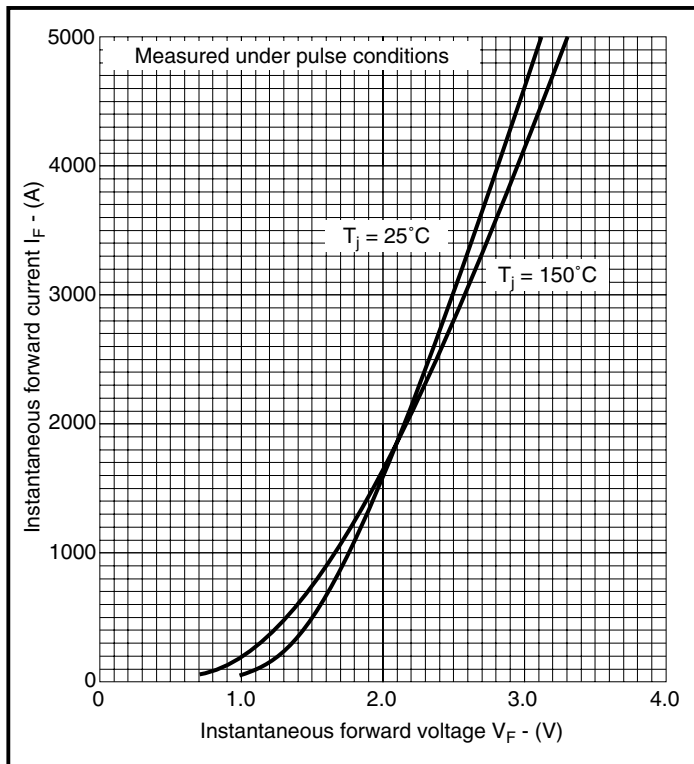


Fig.2 Maximum (limit) forward characteristics

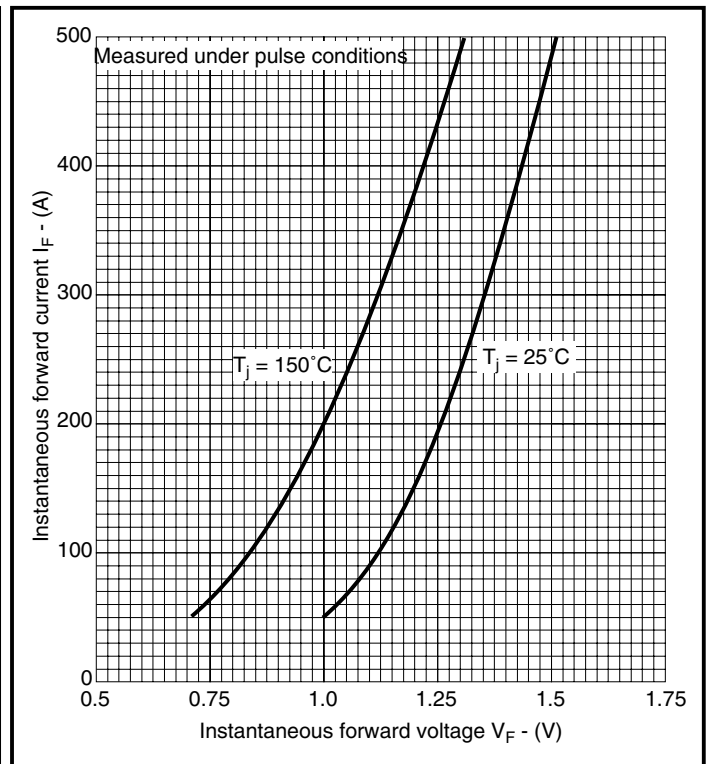


Fig.3 Maximum (limit) forward characteristics

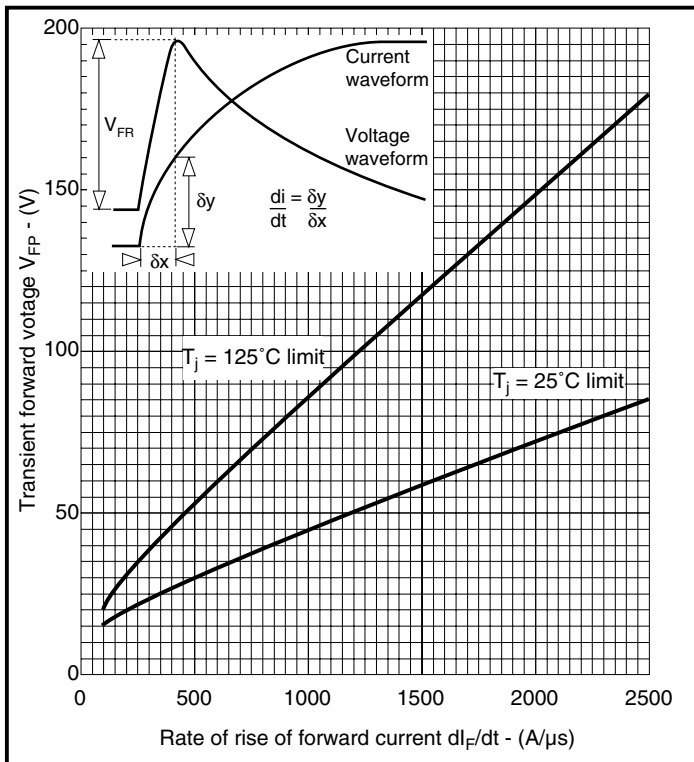


Fig.4 Transient forward voltage vs rate of rise of forward current

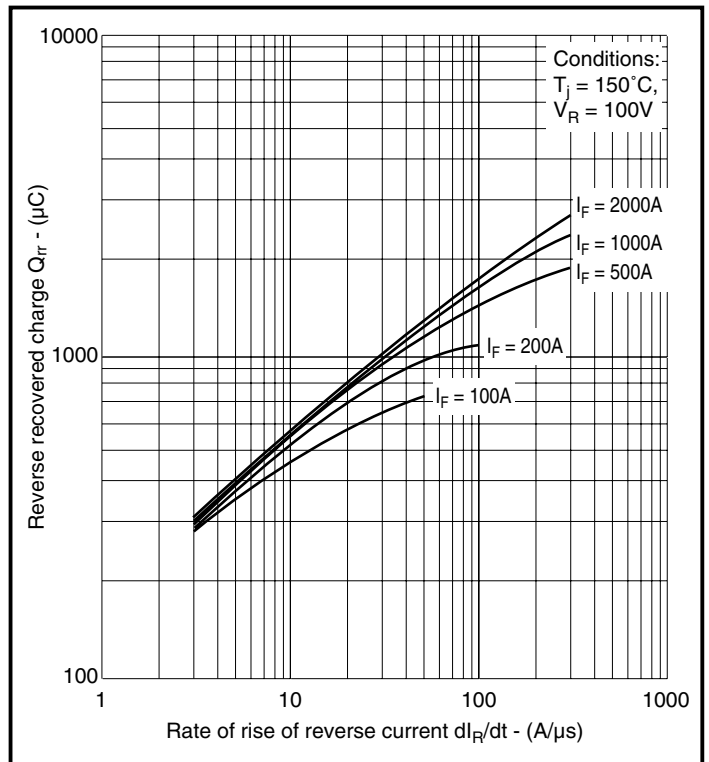
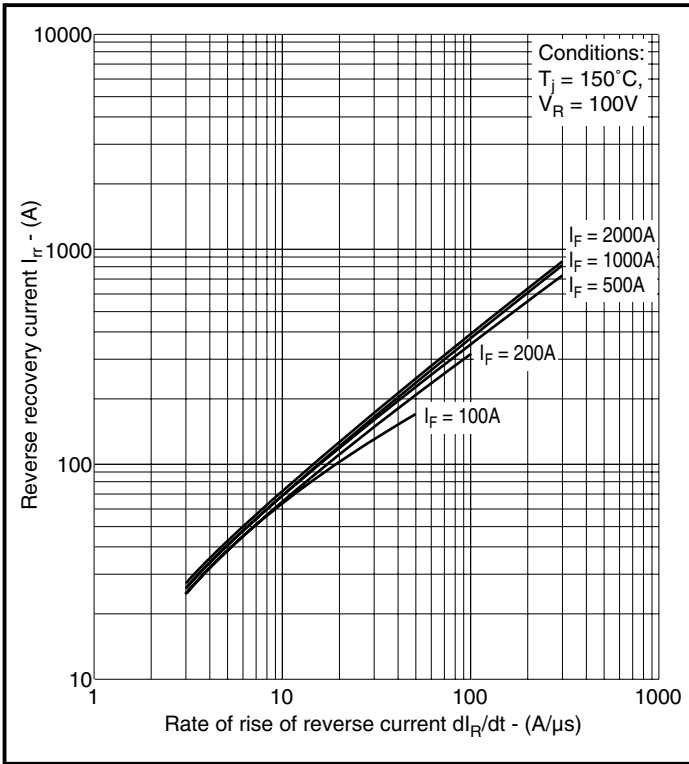
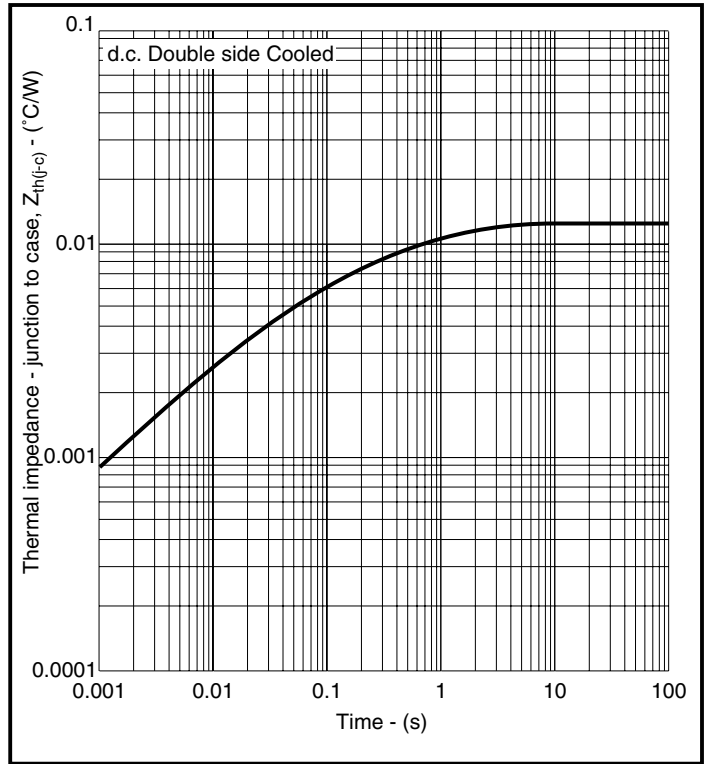


Fig.5 Recovered charge



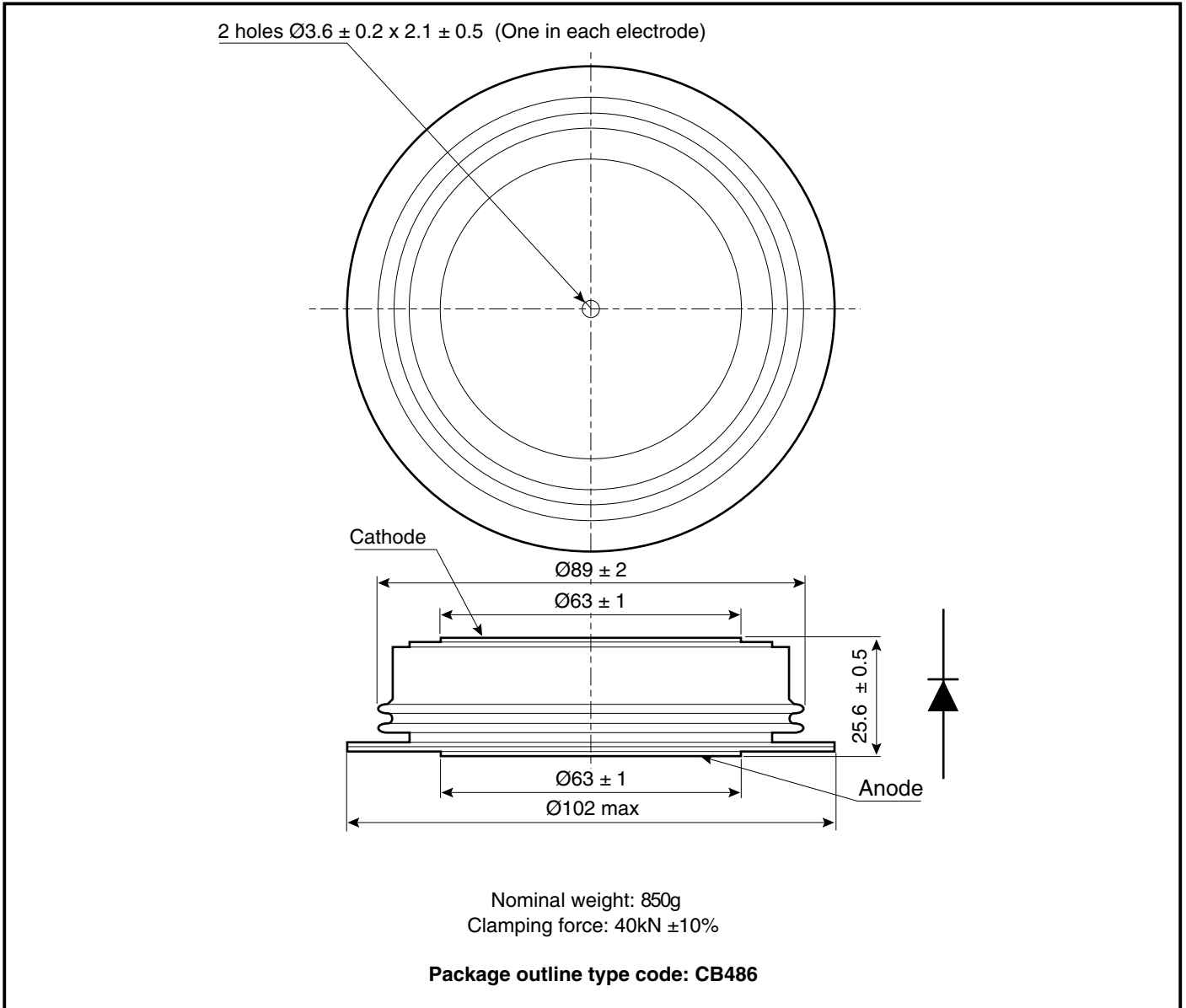
**Fig.6 Typical reverse recovery current vs rate of rise of forward current**



**Fig.7 Maximum (limit) transient thermal impedance - junction to case - ( $^\circ\text{C/W}$ )**

**PACKAGE DETAILS**

For further package information, please contact Customer Services. All dimensions in mm, unless stated otherwise.  
DO NOT SCALE.



## POWER ASSEMBLY CAPABILITY

The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink and clamping systems in line with advances in device voltages and current capability of our semiconductors.

We offer an extensive range of air and liquid cooled assemblies covering the full range of circuit designs in general use today. The Assembly group offers high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

Using the latest CAD methods our team of design and applications engineers aim to provide the Power Assembly Complete Solution (PACs).

## HEATSINKS

The Power Assembly group has its own proprietary range of extruded aluminium heatsinks which have been designed to optimise the performance of Dynex semiconductors. Data with respect to air natural, forced air and liquid cooling (with flow rates) is available on request.

For further information on device clamps, heatsinks and assemblies, please contact your nearest sales representative or Customer Services.

Stresses above those listed in this data sheet may cause permanent damage to the device. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture of the package. Appropriate safety precautions should always be followed.



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