

# MDFB51

## FAST RECOVERY DIODE

### APPLICATIONS

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

### KEY PARAMETERS

$V_{RRM}$	2500V
$I_{F(AV)}$	2212A
$I_{FSM}$	24000A
$Q_r$	1000 $\mu$ C
$t_{rr}$	6.0 $\mu$ s

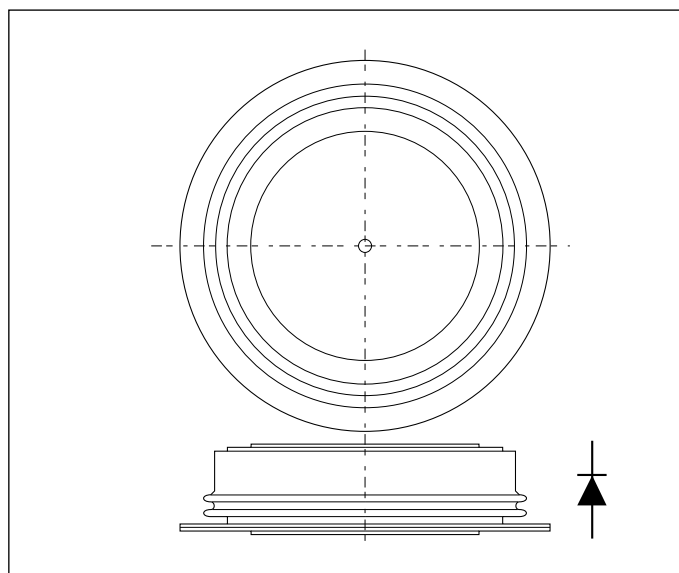
### FEATURES

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

### VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage $V_{RRM}$ V	Conditions
MDFB51 25 MDFB51 24 MDFB51 22 MDFB51 20	2500 2400 2200 2000	$V_{RSM} = V_{RRM} + 100V$

Lower voltage grades available.



Outline type code: CB486. Turn to page 8 for further information.

### CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	2212	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	3850	A
$I_F$	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	3560	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	1627	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	2555	A
$I_F$	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	2272	A

## SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 0% $V_{RRM}$ , $T_j = 150^\circ\text{C}$	24.0	kA
$I^2t$	$I^2t$ for fusing		$2880 \times 10^3$	$\text{A}^2\text{s}$
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 50% $V_{RRM}$ , $T_j = 150^\circ\text{C}$	19.2	kA
$I^2t$	$I^2t$ for fusing		$1843 \times 10^3$	$\text{A}^2\text{s}$
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 100% $V_{RRM}$ , $T_j = 150^\circ\text{C}$	-	kA
$I^2t$	$I^2t$ for fusing		-	$\text{A}^2\text{s}$

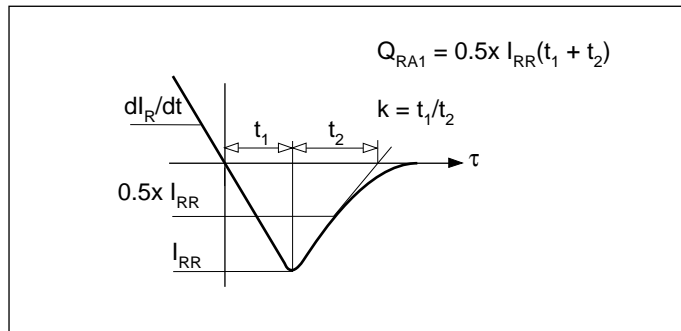
## THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.011	$^\circ\text{C/W}$
		Single side cooled	Anode dc	-	0.021	$^\circ\text{C/W}$
			Cathode dc	-	0.023	$^\circ\text{C/W}$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 44.0kN with mounting compound	Double side	-	0.03	$^\circ\text{C/W}$
			Single side	-	0.06	$^\circ\text{C/W}$
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	150	$^\circ\text{C}$
$T_{stg}$	Storage temperature range			-55	175	$^\circ\text{C}$
-	Clamping force			40.0	44.0	kN

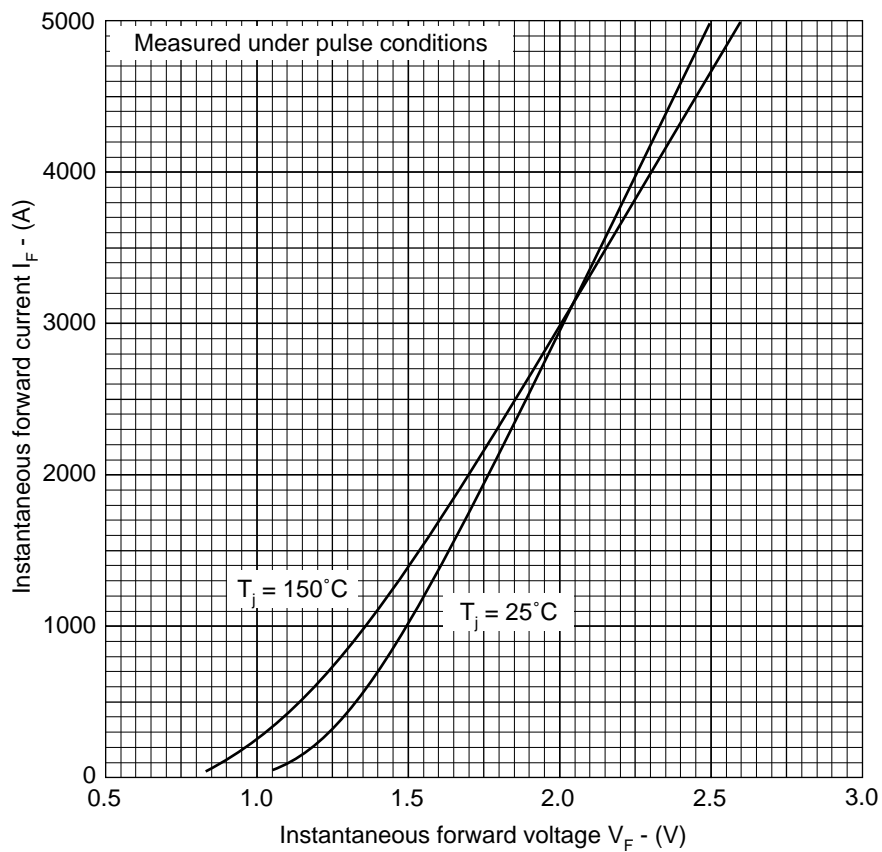
## CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
$V_{FM}$	Forward voltage	At 1500A peak, $T_{case} = 25^{\circ}C$	-	1.6	V
$I_{RRM}$	Peak reverse current	At $V_{RRM}$ , $T_{case} = 150^{\circ}C$	-	100	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)		-	1000	$\mu C$
$I_{RM}$	Reverse recovery current		-	400	A
K	Soft factor		1.8	-	-
$V_{TO}$	Threshold voltage	At $T_{vj} = 150^{\circ}C$	-	1.1	V
$r_T$	Slope resistance	At $T_{vj} = 150^{\circ}C$	-	0.3	$m\Omega$
$V_{FRM}$	Forward recovery voltage	$di/dt = 1000A/\mu s$ , $T_j = 125^{\circ}C$	-	40	V

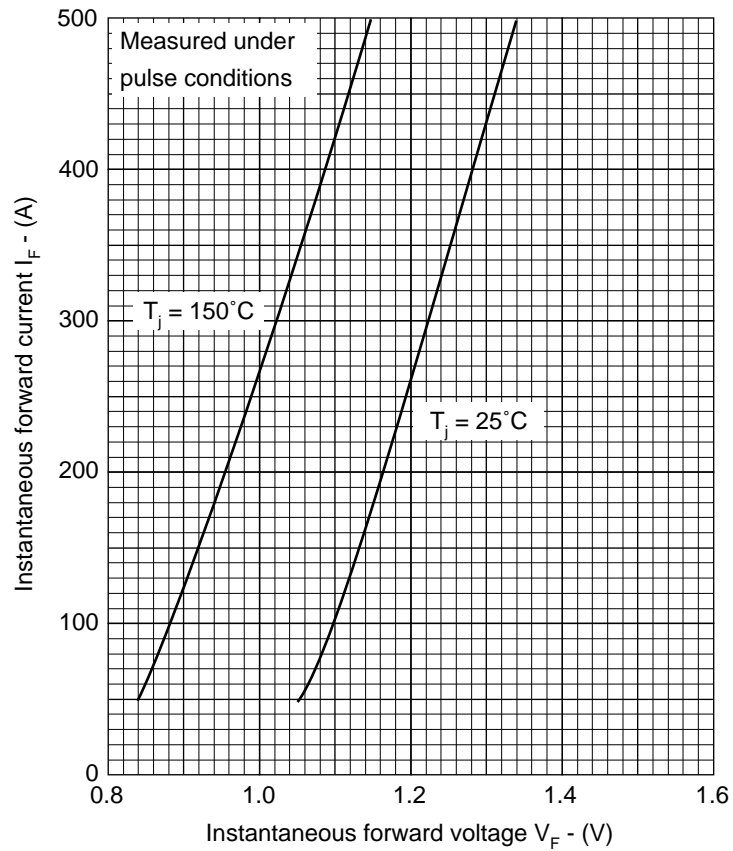
## DEFINITION OF K FACTOR AND $Q_{RA1}$



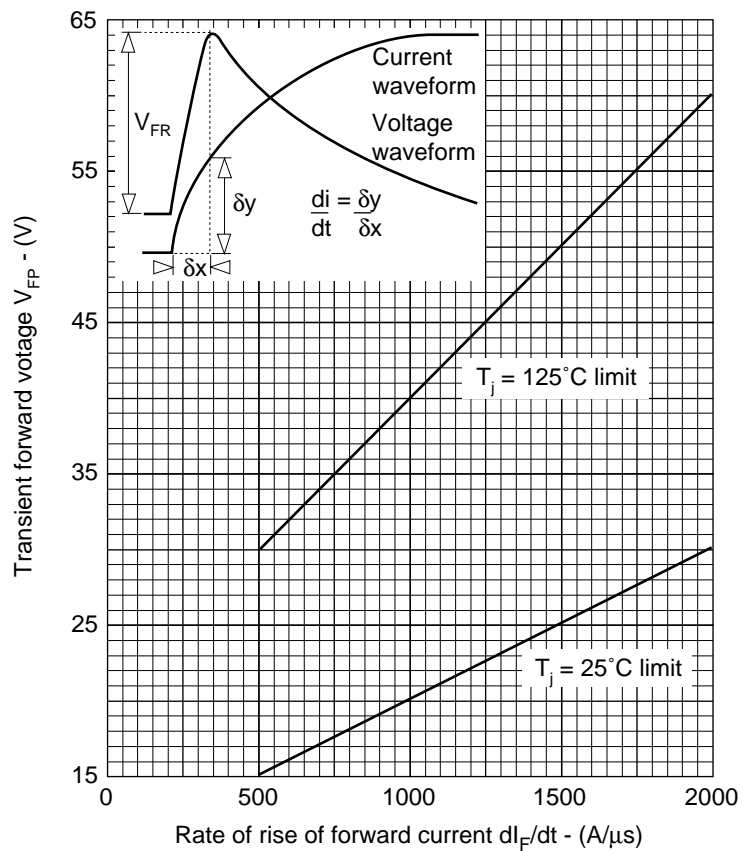
CURVES



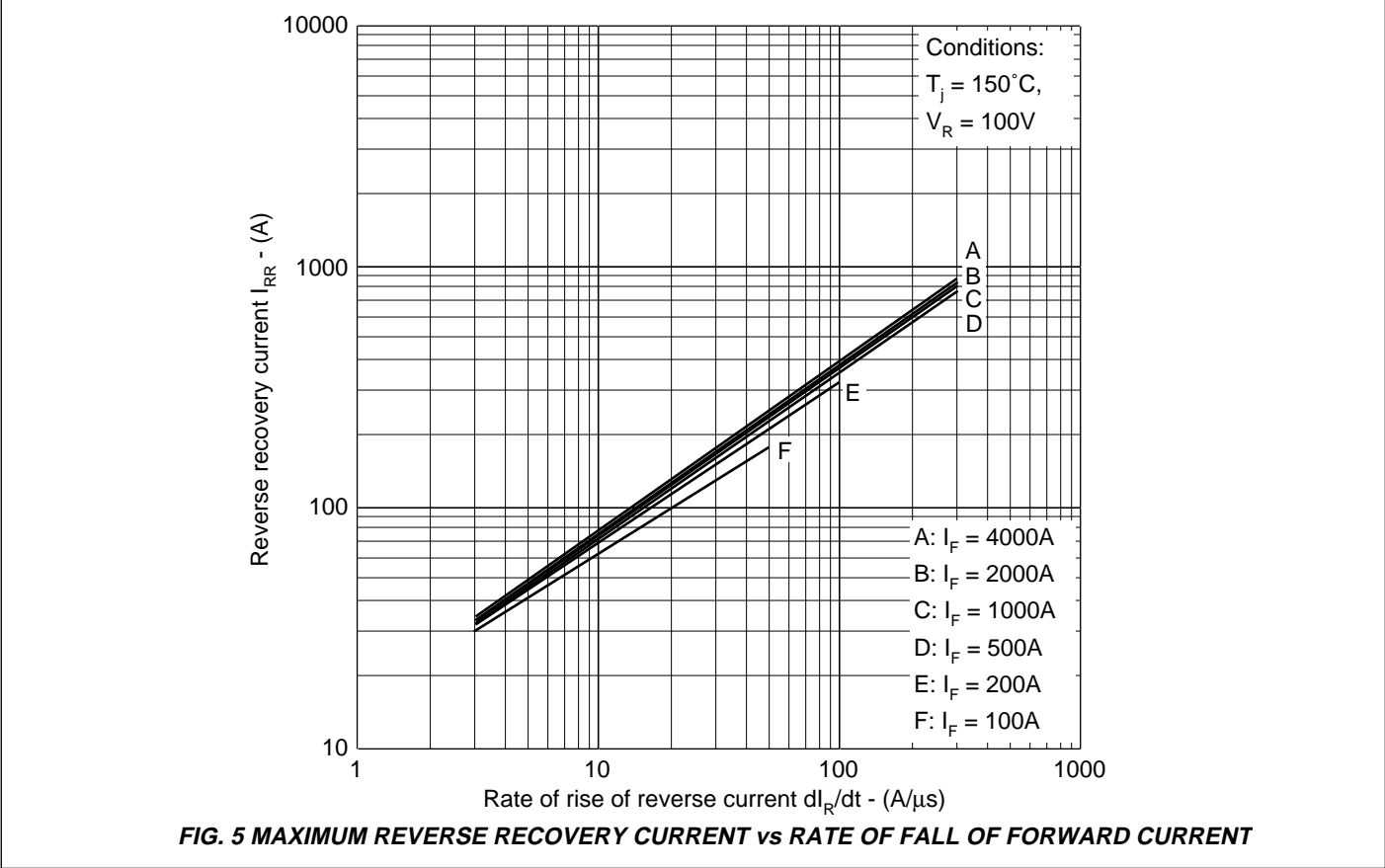
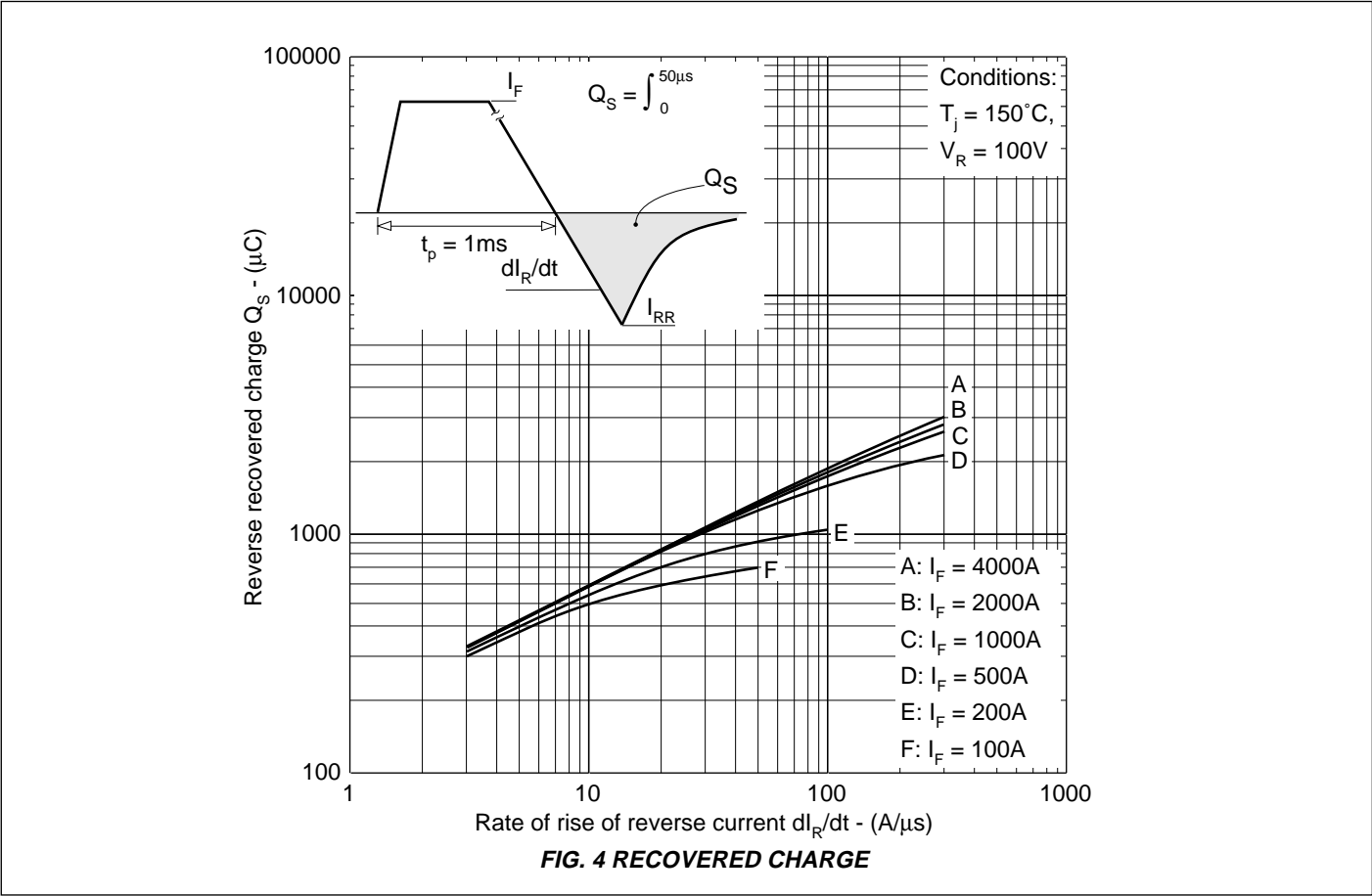
**FIG. 1 MAXIMUM (LIMIT) FORWARD CHARACTERISTICS**

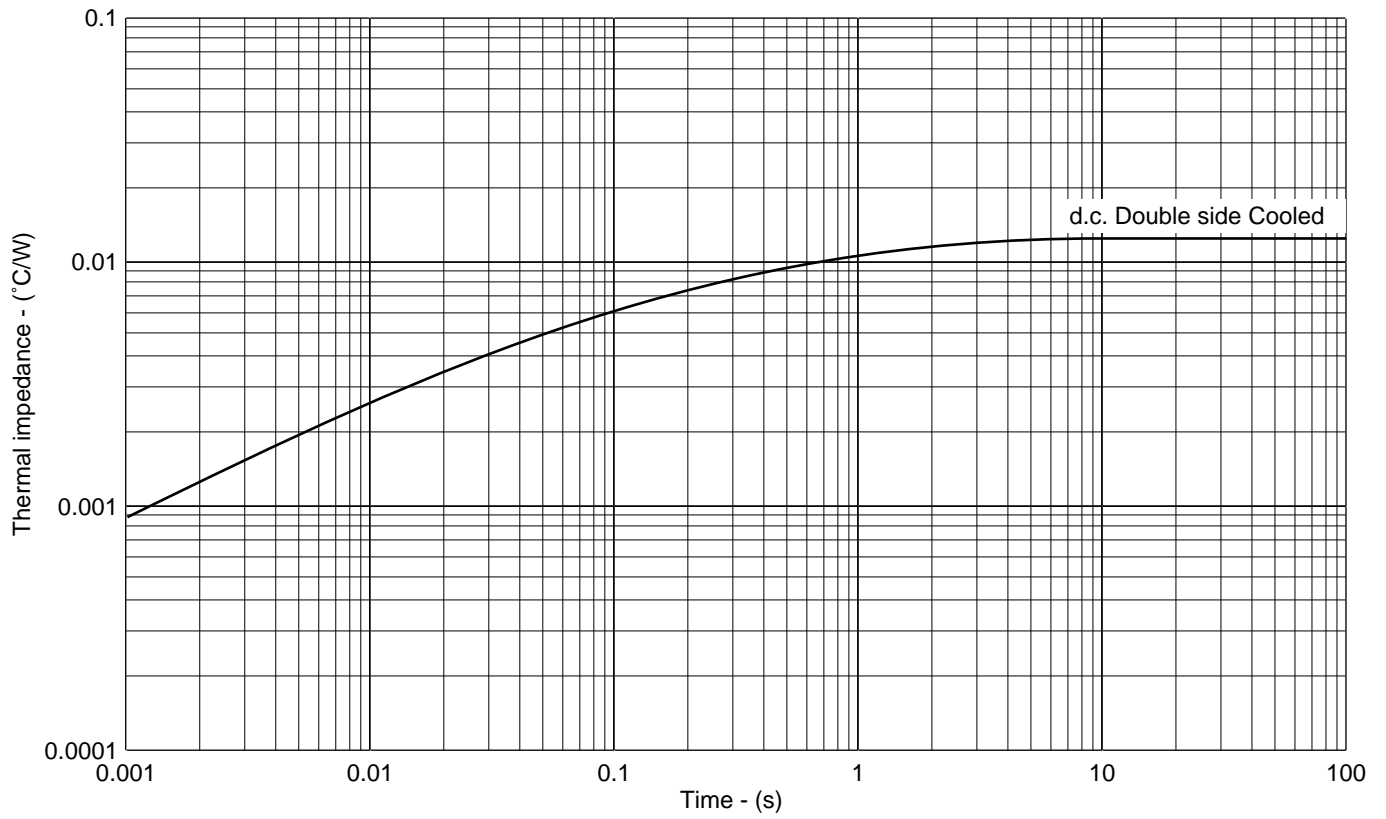


**FIG. 2 MAXIMUM (LIMIT) FORWARD CHARACTERISTICS**



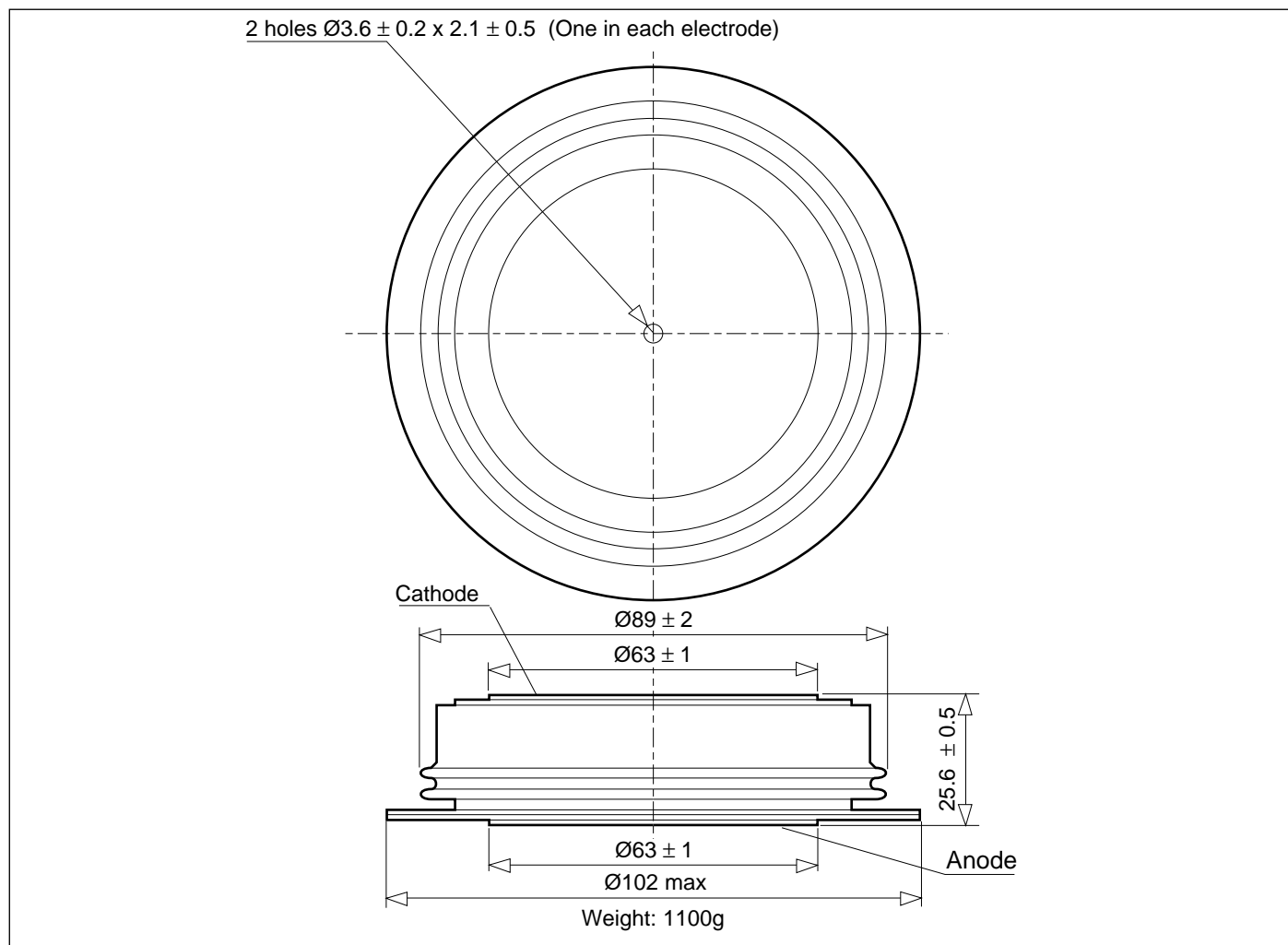
**FIG. 3 TRANSIENT FORWARD VOLTAGE vs RATE OF RISE OF FORWARD CURRENT**





**PACKAGE DETAILS - CB486**

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



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