

# NDF653

## FAST RECOVERY DIODE

### APPLICATIONS

- Induction Heating.
- A.C. Motor Drives.
- Inverters And Choppers.
- Welding.
- High Frequency Rectification.
- UPS.

### KEY PARAMETERS

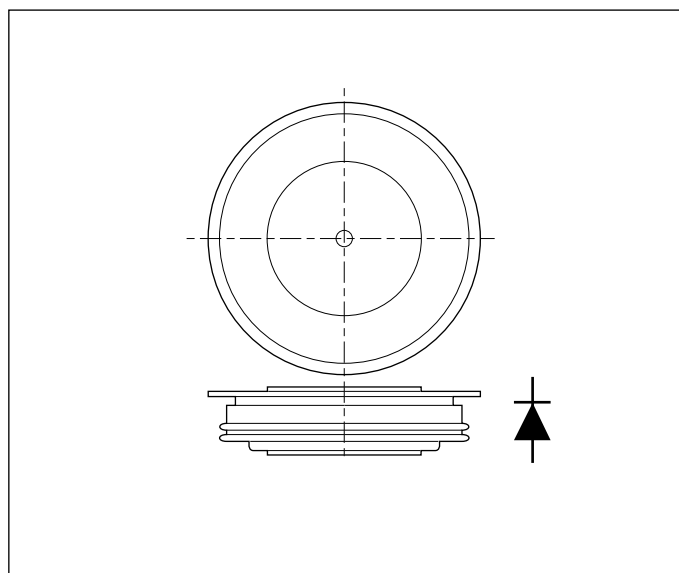
$V_{RRM}$	1600V
$I_{F(AV)}$	660A
$I_{FSM}$	6500A
$Q_r$	45μC
$t_{rr}$	1.4μs

### FEATURES

- Double Side Cooling.
- High Surge Capability.
- Low Recovery Charge.

### VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage $V_{RRM}$ V	Conditions
NDF653 16 NDF653 14 NDF653 12 NDF653 10	1600 1400 1200 1000	$V_{RSM} = V_{RRM} + 100V$



Outline type code: CB479. See package outlines 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, $T_{case} = 65^{\circ}C$	660	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	1030	A
$I_F$	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	870	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	955	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	400	A
$I_F$	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	630	A

## SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 0% $V_{RRM}$ , $T_j = 125^\circ\text{C}$	6.5	kA
$I^2t$	$I^2t$ for fusing		$211 \times 10^3$	$\text{A}^2\text{s}$
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 50% $V_{RRM}$ , $T_j = 125^\circ\text{C}$	5.2	kA
$I^2t$	$I^2t$ for fusing		$13.52 \times 10^3$	$\text{A}^2\text{s}$

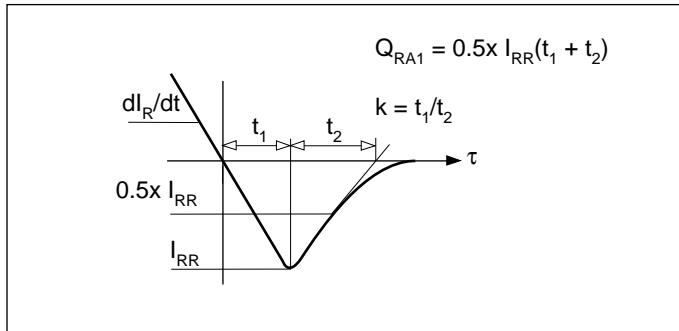
## THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.03	$^\circ\text{C/W}$
		Single side cooled	Anode dc	-	0.058	$^\circ\text{C/W}$
			Cathode dc	-	0.063	$^\circ\text{C/W}$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 10kN with mounting compound	Double side	-	0.01	$^\circ\text{C/W}$
			Single side	-	0.02	$^\circ\text{C/W}$
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	125	$^\circ\text{C}$
$T_{stg}$	Storage temperature range			-55	175	$^\circ\text{C}$
-	Clamping force			9.0	11.0	kN

## CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
$V_{FM}$	Forward voltage	At 450A peak, $T_{case} = 25^{\circ}C$	-	2.65	V
$I_{RRM}$	Peak reverse current	At $V_{RRM}$ , $T_{case} = 125^{\circ}C$	-	100	mA
$t_{rr}$	Reverse recovery time	$I_F = 500A$ , $di_{RR}/dt = -80A/\mu s$ $T_{case} = 125^{\circ}C$ , $V_R = 100V$	-	1.4	$\mu s$
$Q_{RA1}$	Recovered charge (50% chord)		-	45	$\mu C$
$I_{RM}$	Reverse recovery current		-	60	A
K	Soft factor		1.8	-	-
$V_{TO}$	Threshold voltage	At $T_{vj} = 125^{\circ}C$	-	1.7	V
$r_T$	Slope resistance	At $T_{vj} = 125^{\circ}C$	-	1.7	$m\Omega$
$V_{FRM}$	Forward recovery voltage	$di/dt = 1000A/\mu s$ , $T_j = 125^{\circ}C$	-	-	V

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



CURVES

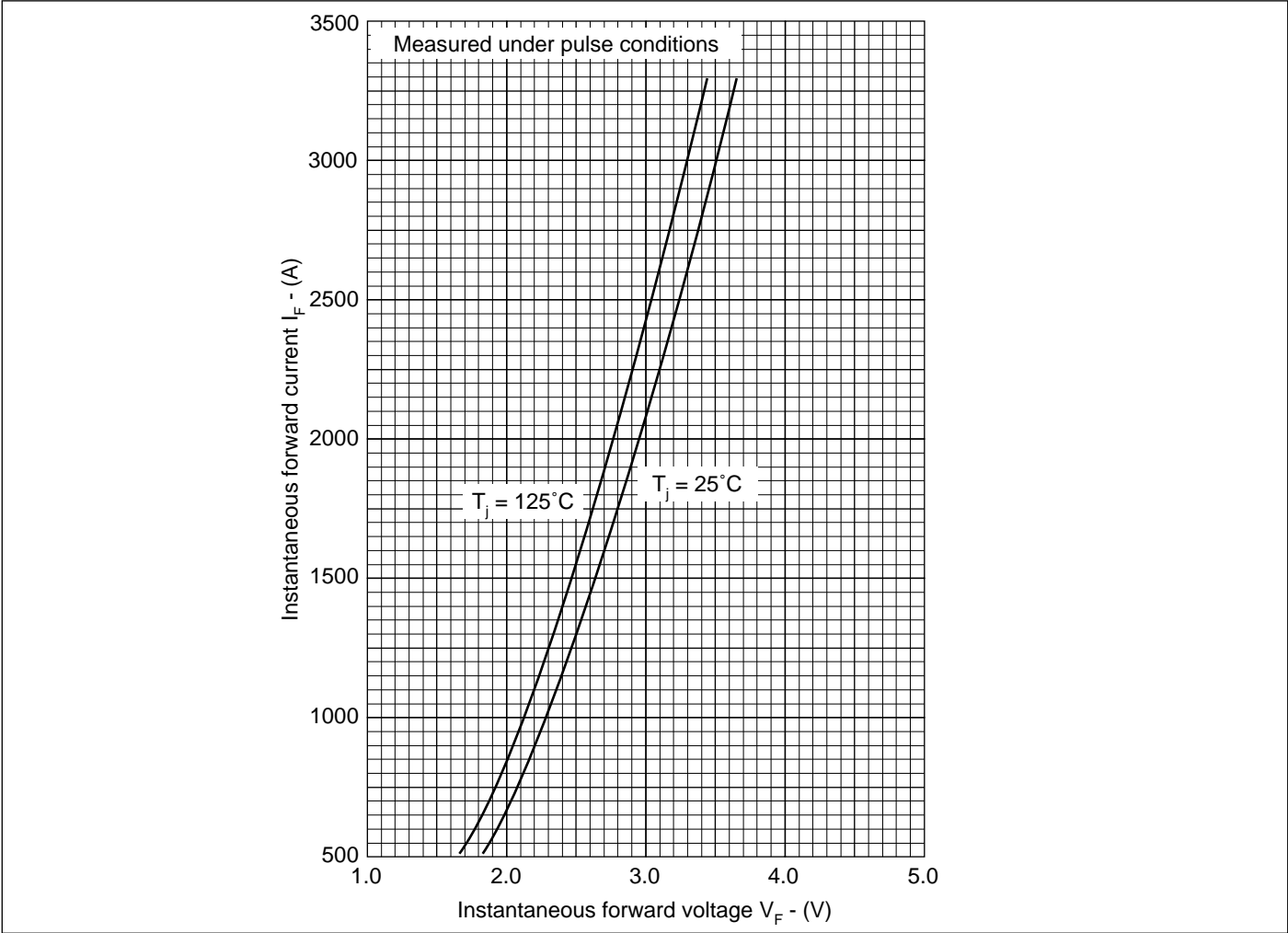


Fig.1 Maximum (limit) forward characteristics

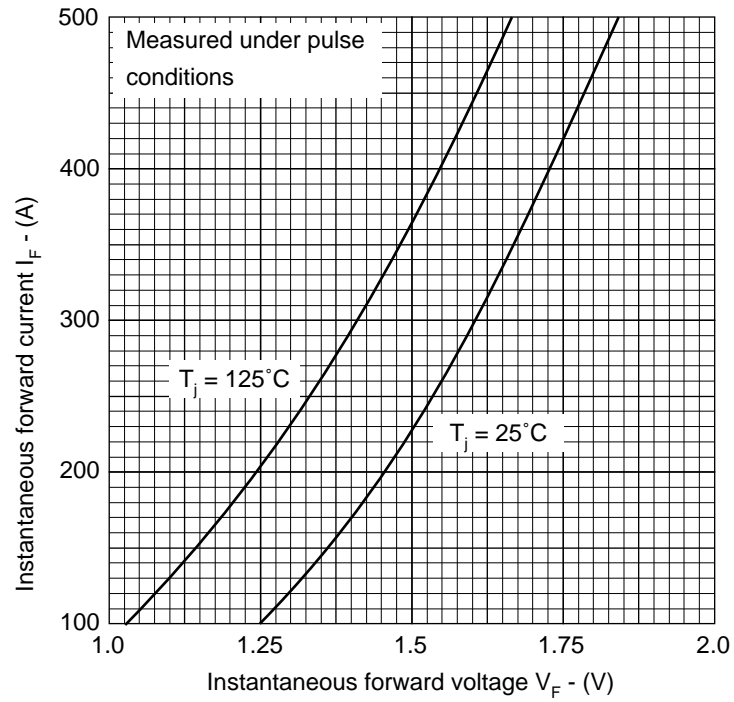


Fig.2 Maximum (limit) forward characteristics

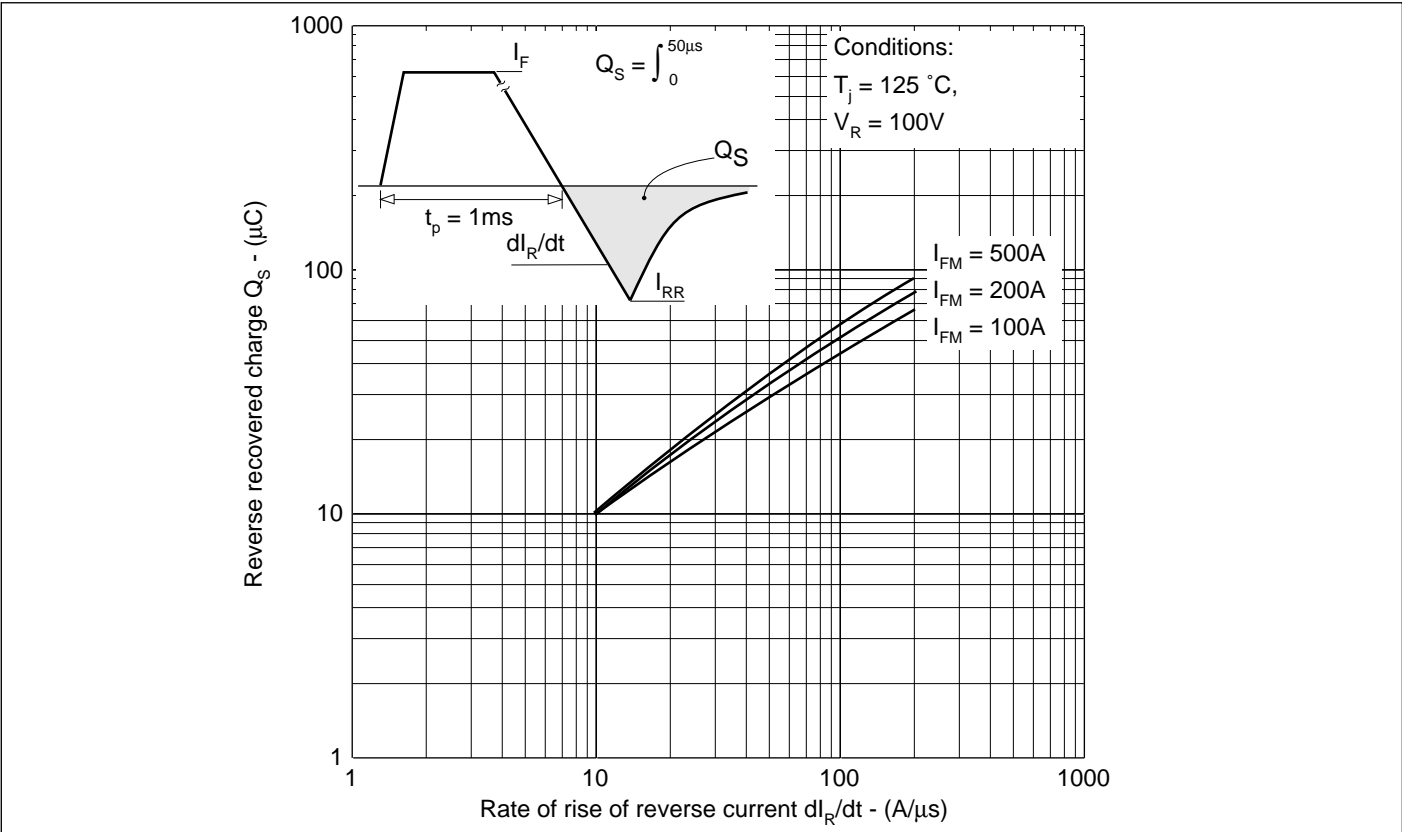


Fig.3 Recovered charge

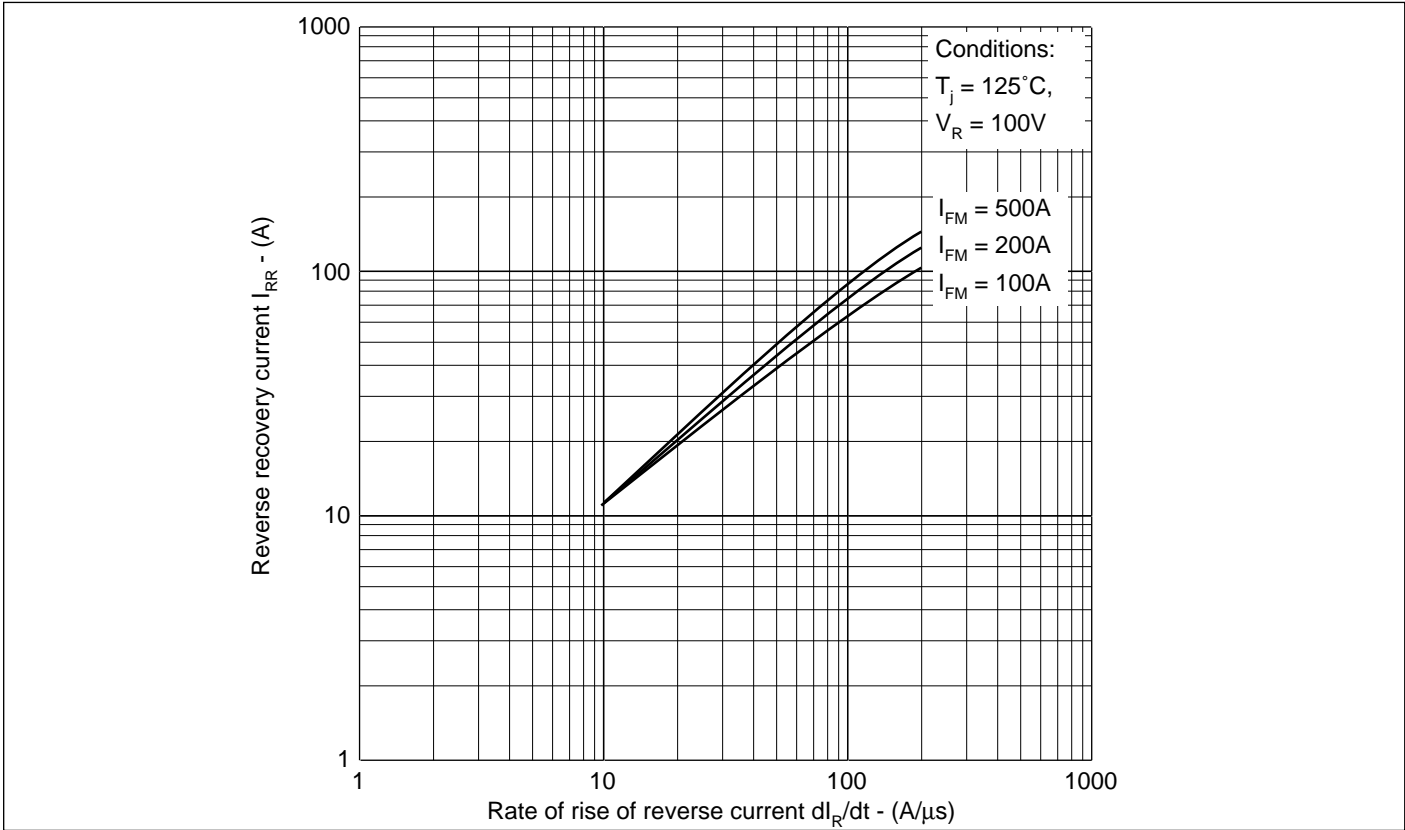


Fig.4 Typical reverse recovery current vs rate of rise of forward current

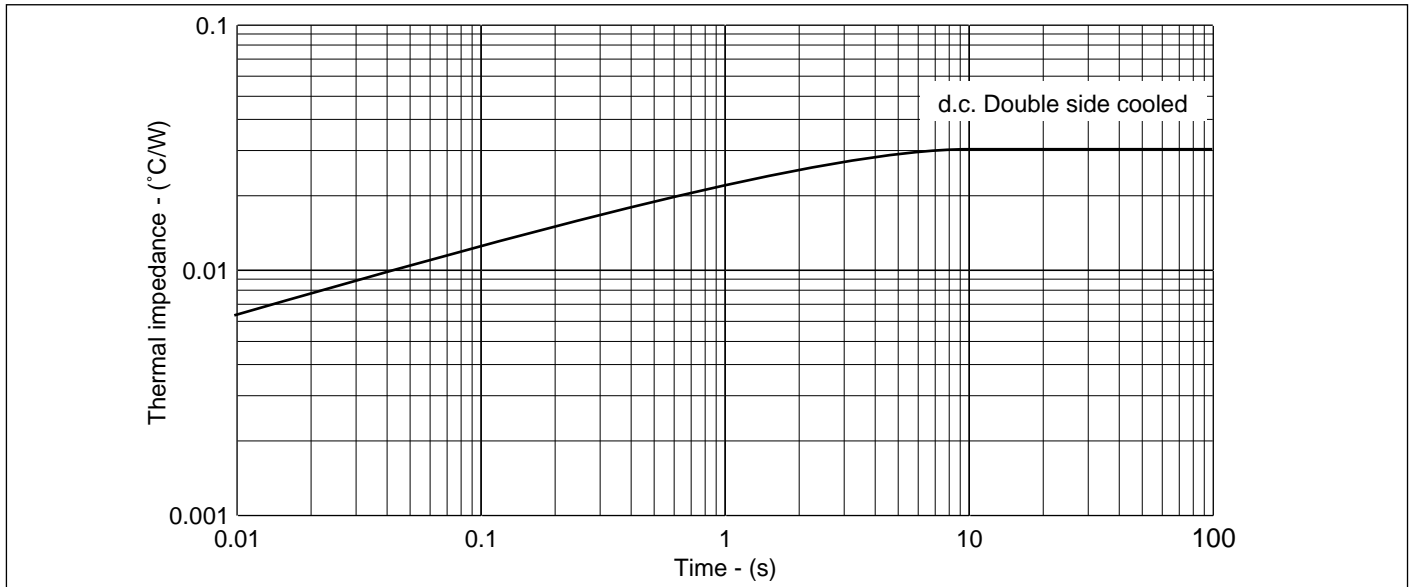
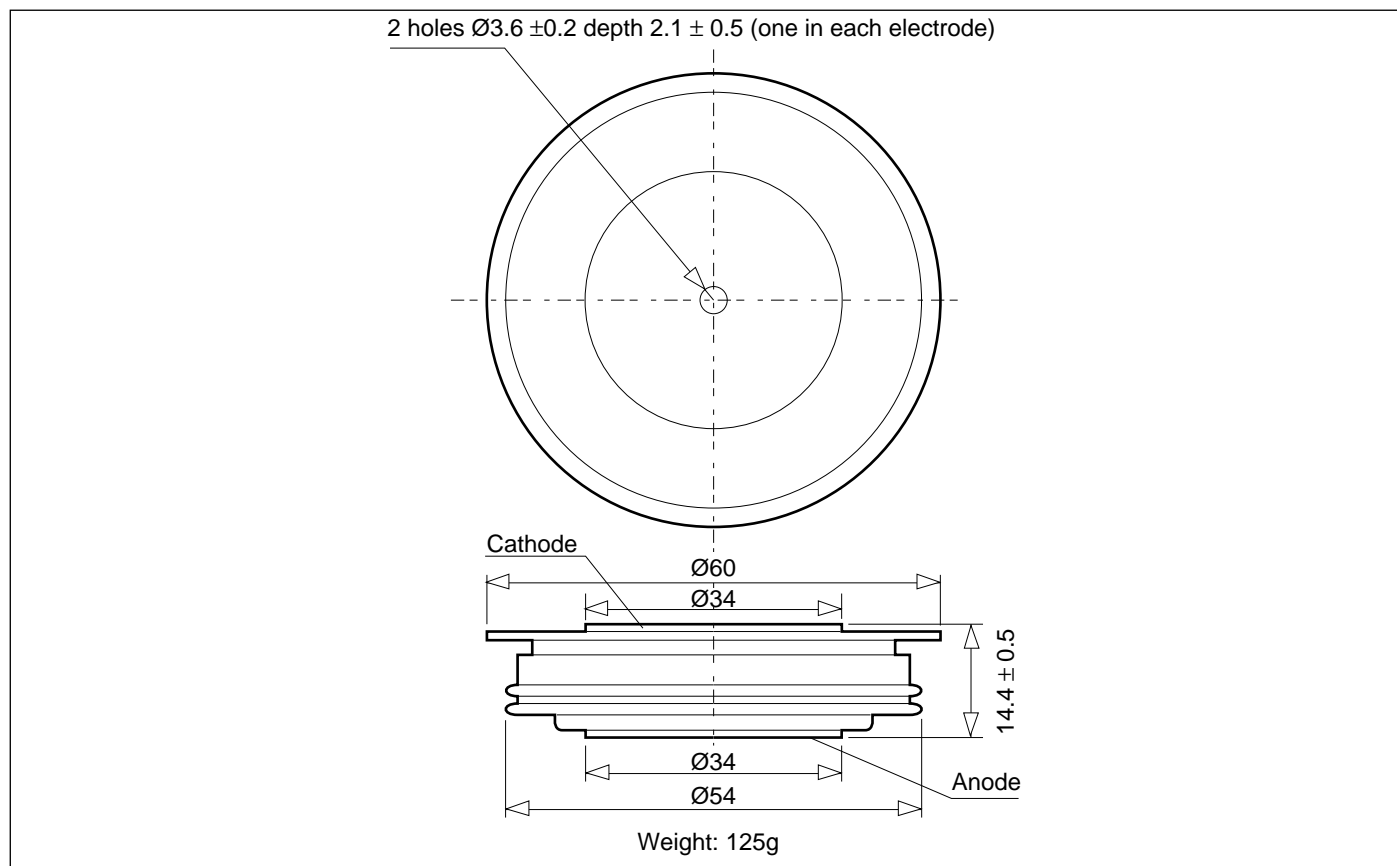


Fig.5 Maximum (limit) transient thermal impedance - junction to case - ( $^{\circ}\text{C/W}$ )

**PACKAGE DETAILS - CB479**

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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