

# DS2002SF

## RECTIFIER DIODE

### APPLICATIONS

- Rectification.
- Freewheel Diode.
- DC Motor Control.
- Power Supplies.
- Welding.
- Battery Chargers.

### KEY PARAMETERS

$V_{RRM}$	1800V
$I_{F(AV)}$	2320A
$I_{FSM}$	41250A

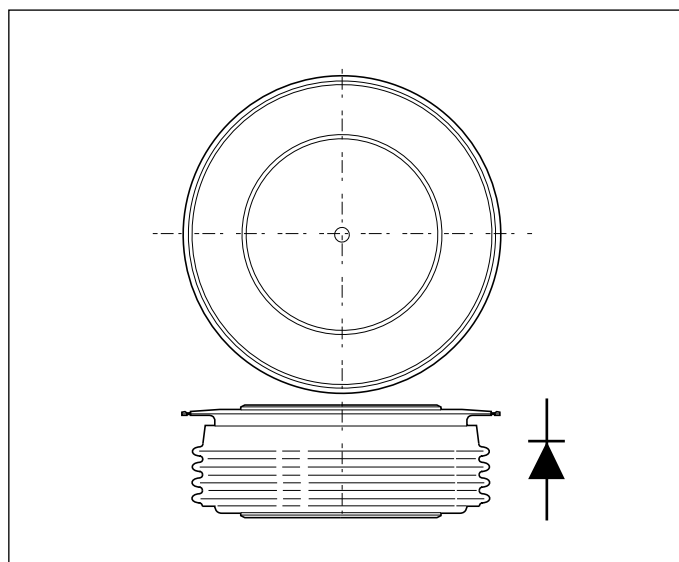
### FEATURES

- Double Side Cooling.
- High Surge Capability.

### VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage $V_{RRM}$ V	Conditions
DS2002SF18	1800	$V_{RSM} = V_{RRM} + 100V$
DS2002SF17	1700	
DS2002SF16	1600	
DS2002SF15	1500	
DS2002SF14	1400	
DS2002SF13	1300	

Lower voltage grades available.



Outline type code: F. Turn to page 7 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, $T_{case} = 100^{\circ}C$	2320	A
$I_{F(RMS)}$	RMS value	$T_{case} = 100^{\circ}C$	3644	A
$I_F$	Continuous (direct) forward current	$T_{case} = 100^{\circ}C$	3300	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 100^{\circ}C$	1345	A
$I_{F(RMS)}$	RMS value	$T_{case} = 100^{\circ}C$	2110	A
$I_F$	Continuous (direct) forward current	$T_{case} = 100^{\circ}C$	1630	A

## SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_{case} = 175^{\circ}C$ $V_R = 50\% V_{RRM} - 1/4$ sine	33.0	kA
$I^2t$	$I^2t$ for fusing		$5.44 \times 10^6$	A <sup>2</sup> s
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_{case} = 175^{\circ}C$ $V_R = 0$	41.25	kA
$I^2t$	$I^2t$ for fusing		$8.5 \times 10^6$	A <sup>2</sup> s

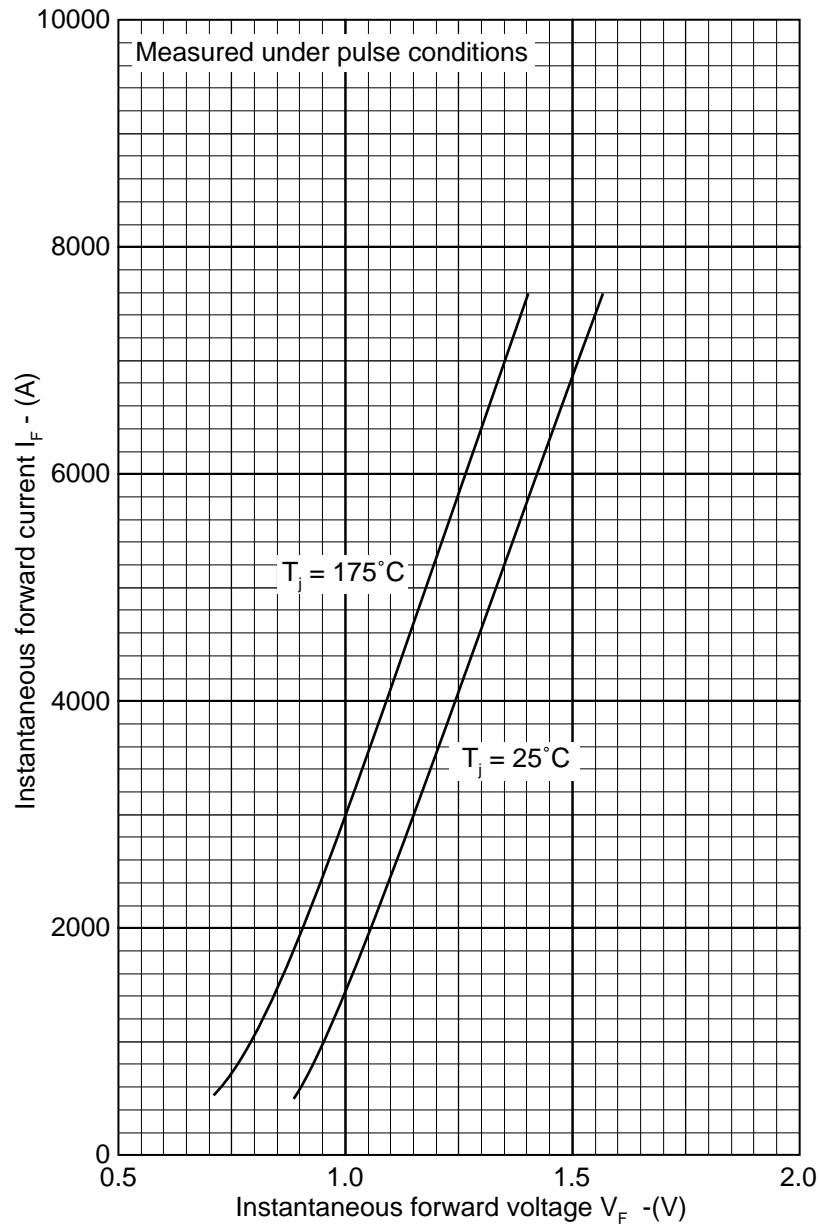
## THERMAL AND MECHANICAL DATA

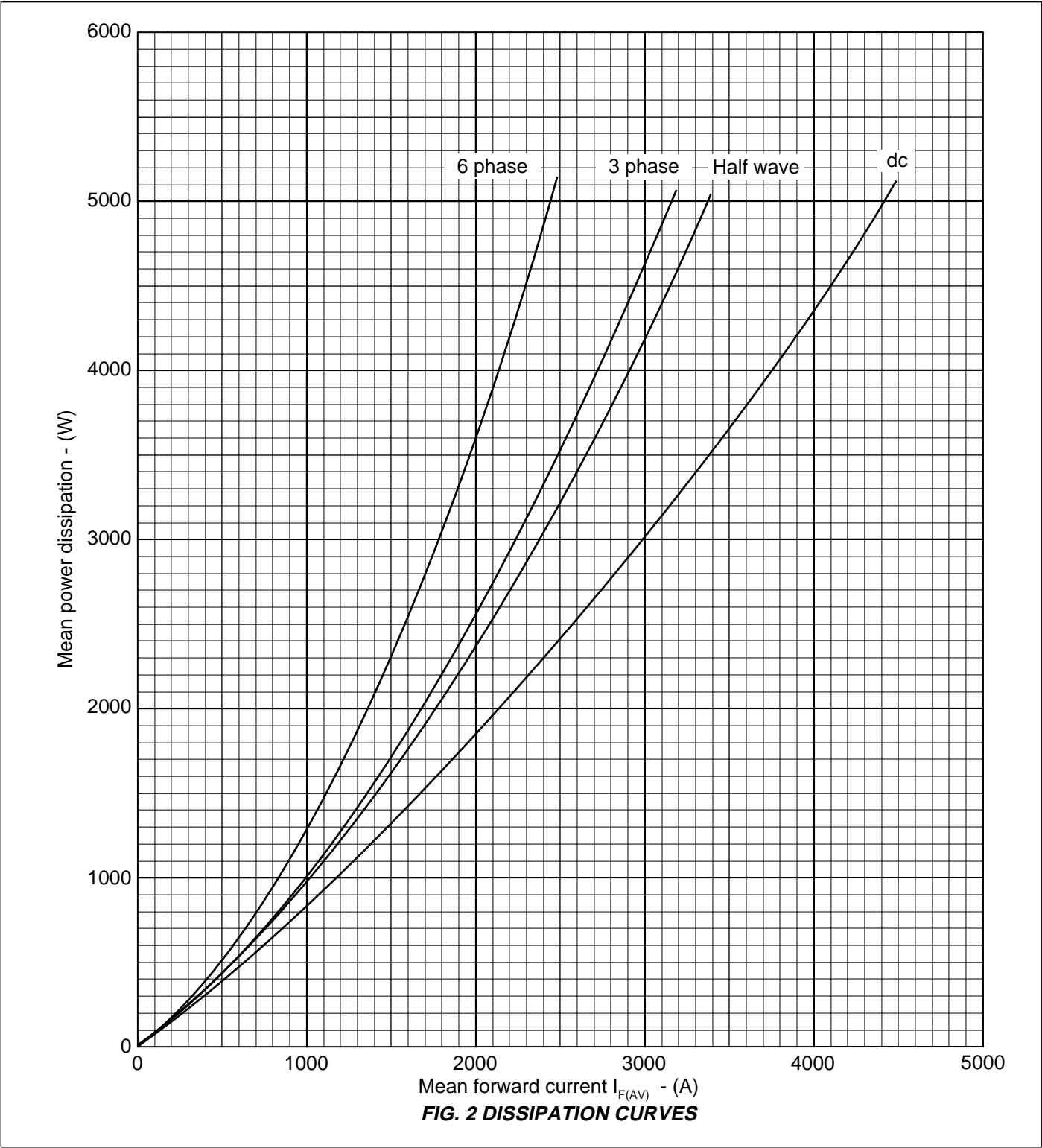
Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.022	$^{\circ}C/W$
		Single side cooled	Anode dc	-	0.038	$^{\circ}C/W$
			Cathode dc	-	0.052	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 19.5kN with mounting compound	Double side	-	0.004	$^{\circ}C/W$
			Single side	-	0.008	$^{\circ}C/W$
$T_{vj}$	Virtual junction temperature	Forward (conducting)		-	185	$^{\circ}C$
		Reverse (blocking)		-	175	$^{\circ}C$
$T_{stg}$	Storage temperature range			-55	200	$^{\circ}C$
-	Clamping force			18.0	22.0	kN

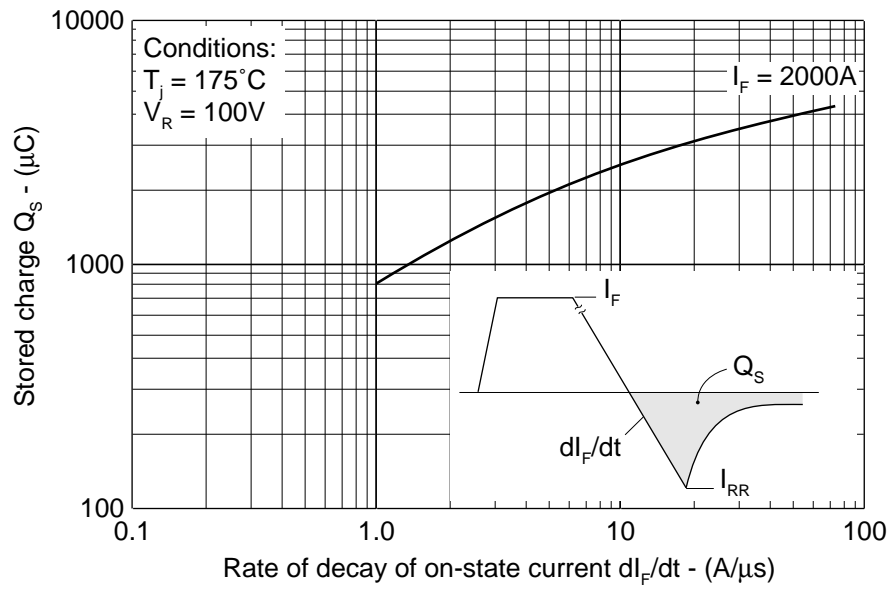
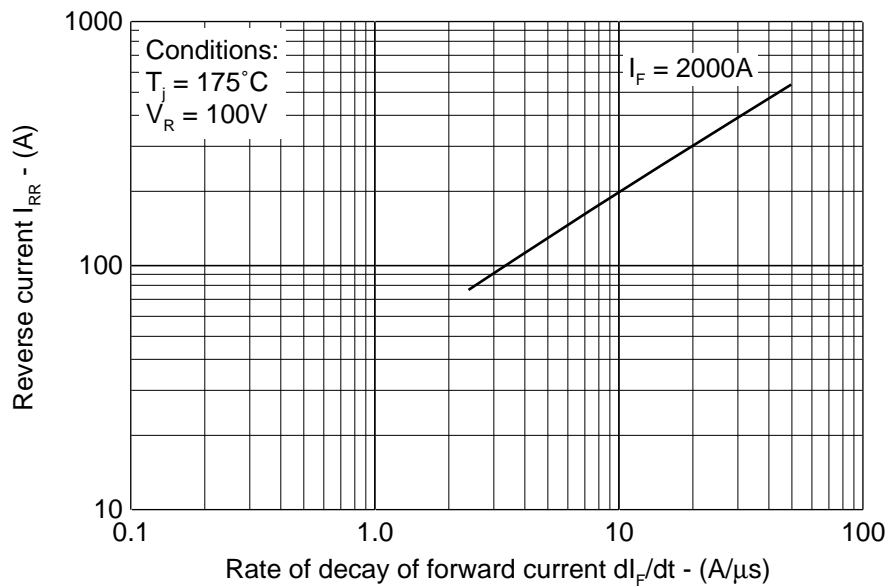
## CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Max.	Units
$V_{FM}$	Forward voltage	At 3400A peak, $T_{case} = 25^{\circ}C$	-	1.18	V
$I_{RRM}$	Peak reverse current	At $V_{RRM}$ , $T_{case} = 175^{\circ}C$	-	50	mA
$Q_S$	Total stored charge	$I_F = 2000A$ , $di_{RR}/dt = 3A/\mu s$ $T_{case} = 175^{\circ}C$ , $V_R = 100V$	-	1500	$\mu C$
$I_{RR}$	Peak recovery current		-	90	A
$V_{TO}$	Threshold voltage	At $T_{vj} = 175^{\circ}C$	-	0.74	V
$r_T$	Slope resistance	At $T_{vj} = 175^{\circ}C$	-	0.088	m $\Omega$

## CURVES

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



**FIG. 3 MAXIMUM TOTAL STORED CHARGE****FIG. 4 MAXIMUM REVERSE RECOVERY CURRENT**

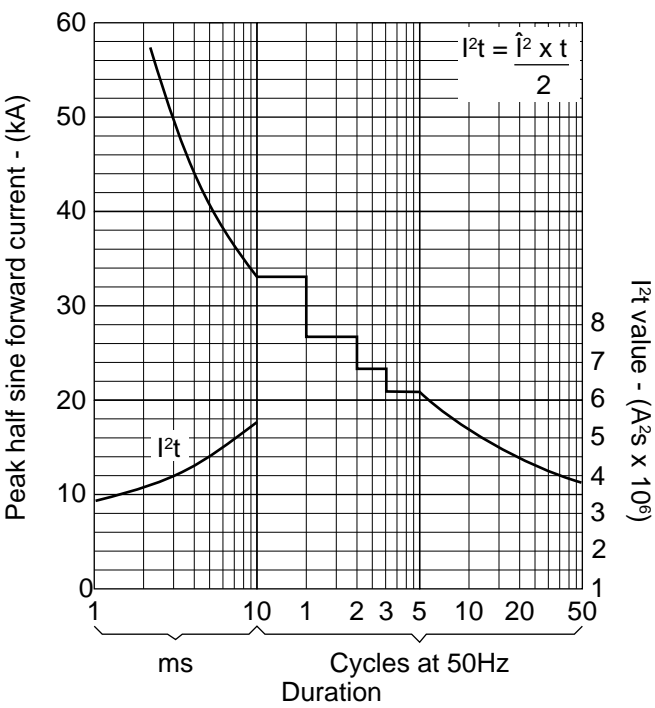


FIG. 5 SURGE (NON-REPETITIVE) FORWARD CURRENT vs TIME (WITH 50%  $V_{RRM}$   $T_{case} = 175^{\circ}C$ )

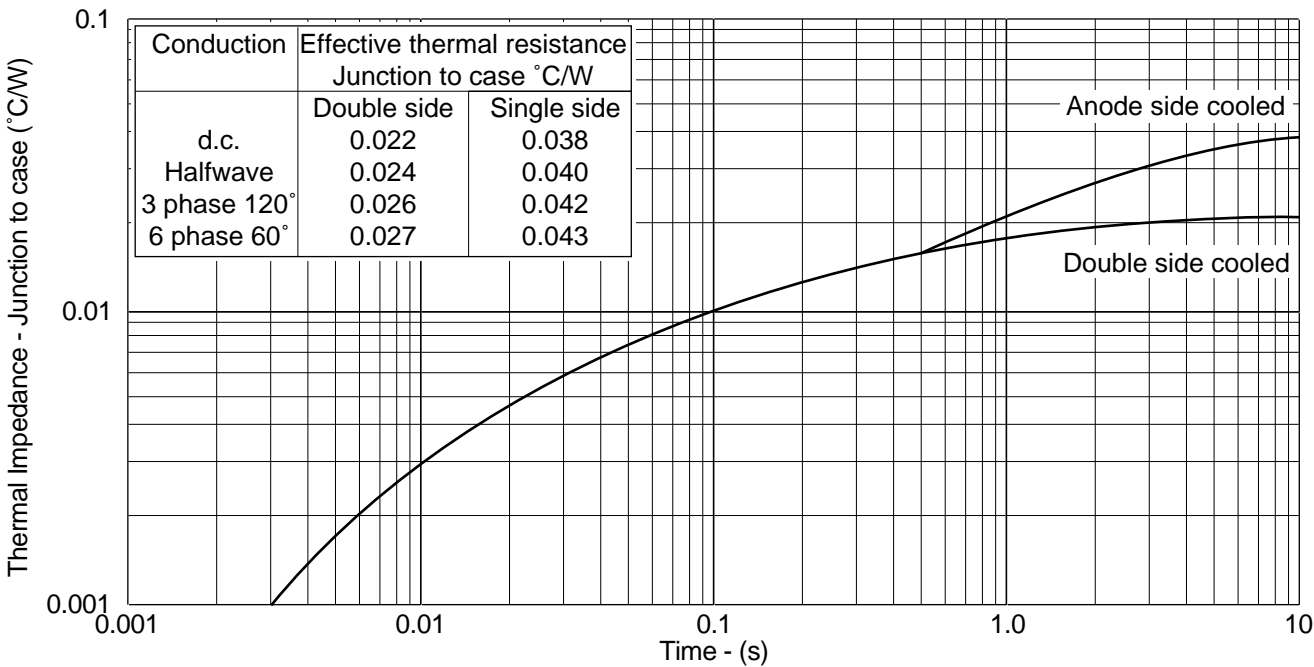
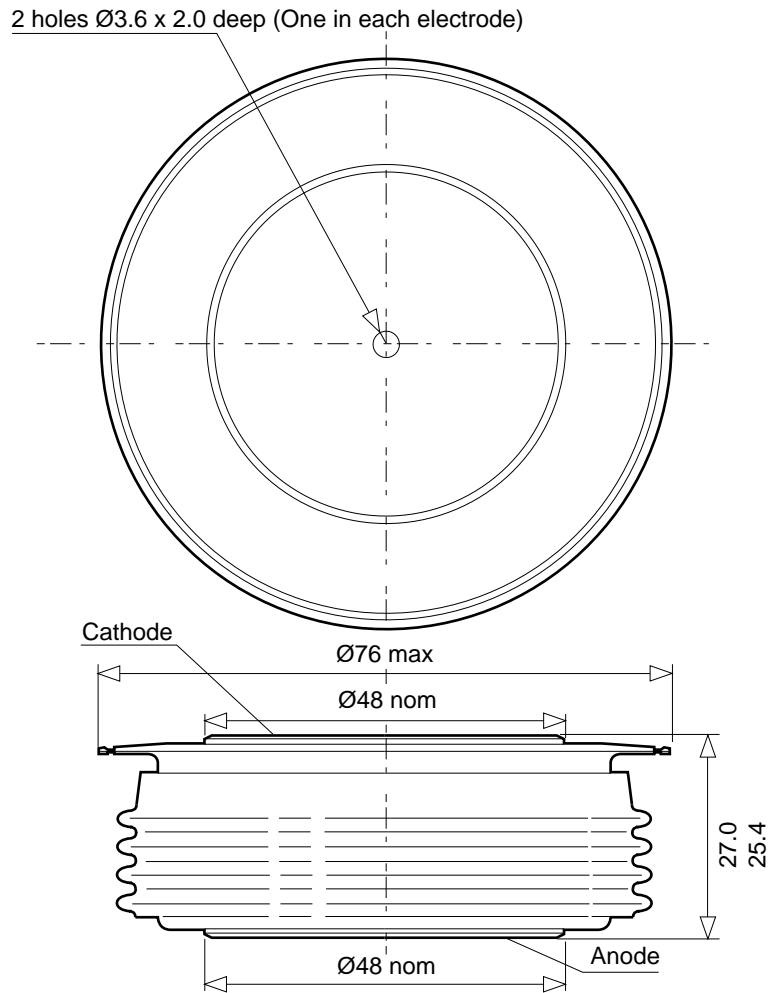


FIG. 6 TRANSIENT THERMAL IMPEDANCE - JUNCTION TO CASE - ( $^{\circ}C/W$ )

**PACKAGE DETAILS - F**

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



Weight: 500g



#### HEADQUARTERS OPERATIONS

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