

**APPLICATIONS**

- High Power Inverters And Choppers
- UPS
- Railway Traction
- Induction Heating
- AC Motor Drives
- Cycloconverters

**KEY PARAMETERS**

$V_{DRM}$	<b>3500V</b>
$I_{T(RMS)}$	<b>1350A</b>
$I_{TSM}$	<b>13000A</b>
$dV/dt$	<b>500V/<math>\mu</math>s</b>
$dI/dt$	<b>500A/<math>\mu</math>s</b>
$t_q$	<b>120<math>\mu</math>s</b>

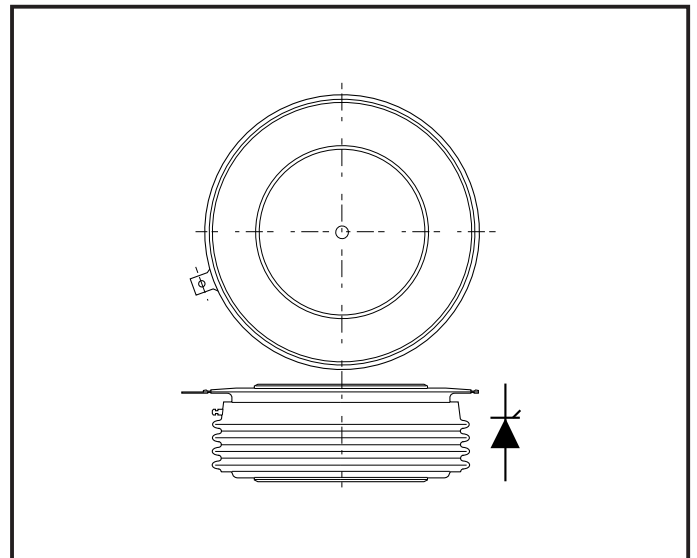
**FEATURES**

- Double Side Cooling
- High Surge Capability
- High Voltage

**VOLTAGE RATINGS**

Type Number	Repetitive Peak Voltages $V_{DRM}$ $V_{RRM}$	Conditions
TF944 35H	3500	$V_{RSM} = V_{RRM} + 100V$  $I_{DRM} = I_{RRM} = 100mA$  at $V_{RRM}$ or $V_{DRM}$ & $T_{vj}$
TF944 34H	3400	
TF944 32H	3200	
TF944 30H	3000	

Lower voltage grades available.



Outline type code: MU169  
See Package Details for further information.

**CURRENT RATINGS**

Symbol	Parameter	Conditions	Max.	Units
$I_{T(AV)}$	Mean on-state current	Half sinewave, 50Hz, $T_{case} = 80^{\circ}C$	850	A
$I_{T(RMS)}$	RMS value	Half sinewave, 50Hz, $T_{case} = 80^{\circ}C$	1350	A

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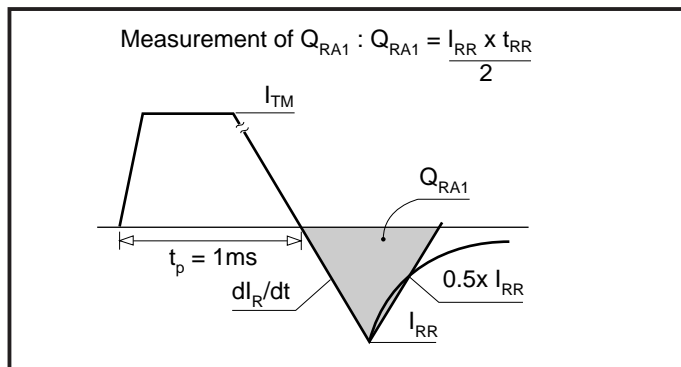
## SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{TSM}$	Surge (non-repetitive) on-state current	10ms half sine; $V_R = 0\% V_{RRM}$ , $T_j = 125^\circ\text{C}$	13.0	kA
$I^2t$	$I^2t$ for fusing	10ms half sine; $V_R = 0\% V_{RRM}$ , $T_j = 125^\circ\text{C}$	$845 \times 10^3$	$\text{A}^2\text{s}$

## THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.02	$^\circ\text{C/W}$
		Single side cooled	Anode dc	-	-	$^\circ\text{C/W}$
			Cathode dc	-	-	$^\circ\text{C/W}$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 23.5kN with mounting compound	Double side	-	0.006	$^\circ\text{C/W}$
			Single side	-	0.012	$^\circ\text{C/W}$
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	135	$^\circ\text{C}$
		Reverse (blocking)		-	125	$^\circ\text{C}$
$T_{stg}$	Storage temperature range			-40	150	$^\circ\text{C}$
-	Clamping force			22.3	24.6	kN

## MEASUREMENT OF RECOVERED CHARGE - $Q_{RA1}$



## DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Max.	Units	
$V_{TM}$	Maximum on-state voltage	At 1500A peak, $T_{case} = 25^{\circ}C$	-	2.4	V	
$I_{RRM}/I_{DRM}$	Peak reverse and off-state current	At $V_{RRM}/V_{DRM}$ , $T_{case} = 125^{\circ}C$	-	100	mA	
$dV/dt$	Maximum linear rate of rise of off-state voltage	Linear to 60% $V_{DRM}$ , $T_j = 125^{\circ}C$ , Gate open circuit	-	500	V/ $\mu$ s	
$di/dt$	Rate of rise of on-state current	Gate source 20V, 20 $\Omega$	Repetitive 50Hz	-	500	A/ $\mu$ s
		$t_r \leq 0.5\mu$ s, $T_j = 125^{\circ}C$	Non-repetitive	-	800	A/ $\mu$ s
$V_{T(TO)}$	Threshold voltage	At $T_{vj} = 125^{\circ}C$	-	1.35	V	
$r_T$	On-state slope resistance	At $T_{vj} = 125^{\circ}C$	-	0.5	m $\Omega$	
$t_{gd}$	Delay time	$T_j = 25^{\circ}C$ , $I_T = 50A$ , $V_D = 300V$ , $I_G = 1A$ , $di/dt = 50A/\mu$ s, $dI_G/dt = 1A/\mu$ s	-	-*	$\mu$ s	
$t_{(ON)TOT}$	Total turn-on time		-	-*	$\mu$ s	
$I_H$	Holding current	$T_j = 25^{\circ}C$ , $I_{TM} = 1A$ , $V_D = 12V$	100*	-	mA	
$I_H$	Holding current	$T_j = 25^{\circ}C$ , $I_G = 0.5A$ , $V_D = 12V$	300*	-	mA	
$t_q$	Turn-off time	$T_j = 125^{\circ}C$ , $I_T = 500A$ , $V_R = 100V$ , $dV/dt = 20V/\mu$ s to 66% $V_{DRM}$ , $dI_R/dt = 50A/\mu$ s.	$t_q$ code: H	-	120	$\mu$ s
$Q_{RR}$	Reverse recovery charge		-	-	$\mu$ C	

\*Typical value.

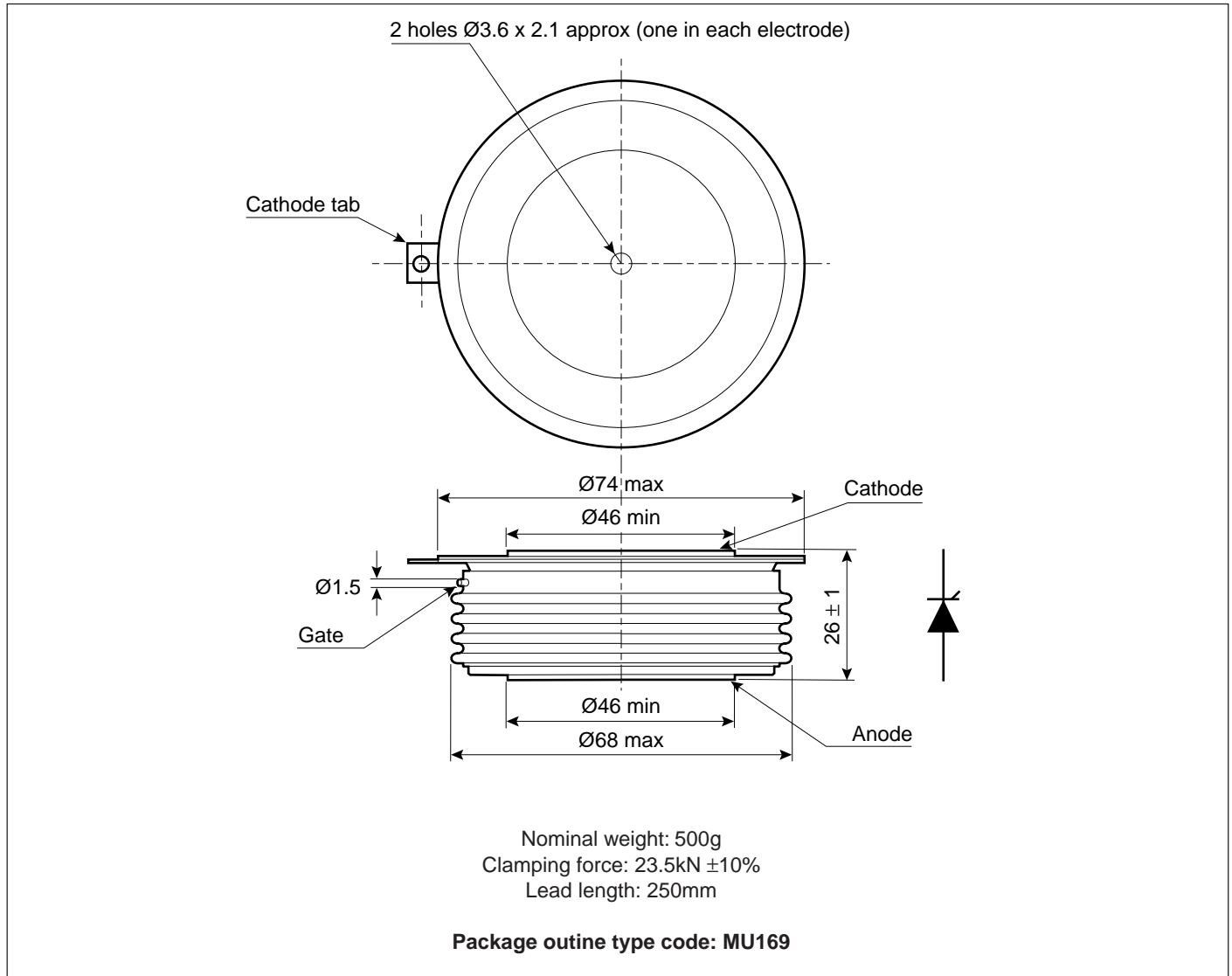
## GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Typ.	Max.	Units
$V_{GT}$	Gate trigger voltage	$V_{DRM} = 12V$ , $T_{case} = 25^{\circ}C$ , $R_L = 6\Omega$	-	3.0	V
$I_{GT}$	Gate trigger current	$V_{DRM} = 12V$ , $T_{case} = 25^{\circ}C$ , $R_L = 6\Omega$	-	250	mA
$V_{GD}$	Gate non-trigger voltage	At $V_{DRM}$ , $T_{case} = 125^{\circ}C$ , $R_L = 1k\Omega$	-	0.25	V
$V_{FGM}$	Peak forward gate voltage	Anode positive with respect to cathode	-	30	V
$V_{FGN}$	Peak forward gate voltage	Anode negative with respect to cathode	-	0.25	V
$V_{RGM}$	Peak reverse gate voltage		-	5.0	V
$I_{FGM}$	Peak forward gate current	Anode positive with respect to cathode	-	10	A
$P_{GM}$	Peak gate power		-	50	W
$P_{G(AV)}$	Mean gate power		-	3.0	W

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## PACKAGE DETAILS

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



## ASSOCIATED PUBLICATIONS

Title	Application Note Number
Calculating the junction temperature or power semiconductors	AN4506
Gate triggering and the use of gate characteristics	AN4840
Recommendations for clamping power semiconductors	AN4839
The effect of temperature on thyristor performance	AN4870
Thyristor and diode measurement with a multi-meter	AN4853
Turn-on performance of thyristors in parallel	AN4999
Use of $V_{TO}$ , $r_T$ on-state characteristic	AN5001