

TF944..H

FAST SWITCHING THYRISTOR

APPLICATIONS

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

KEY PARAMETERS

V_{DRM}	3500V
$I_{T(RMS)}$	1350A
I_{TSM}	13000A
dV/dt	500V/ μ s
dI/dt	500A/ μ s
t_q	120 μ s

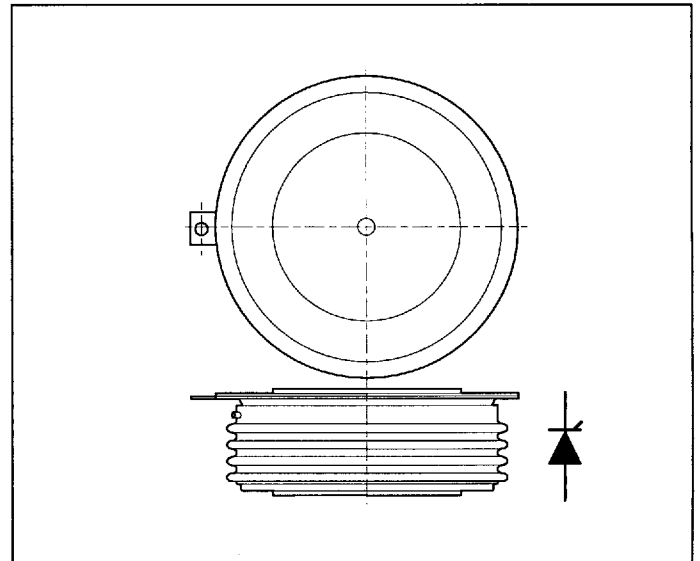
FEATURES

- Double Side Cooling.
- High Surge Capability.
- High Voltage.

VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages		Conditions
	V_{DRM}	V_{RRM}	
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 outline 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

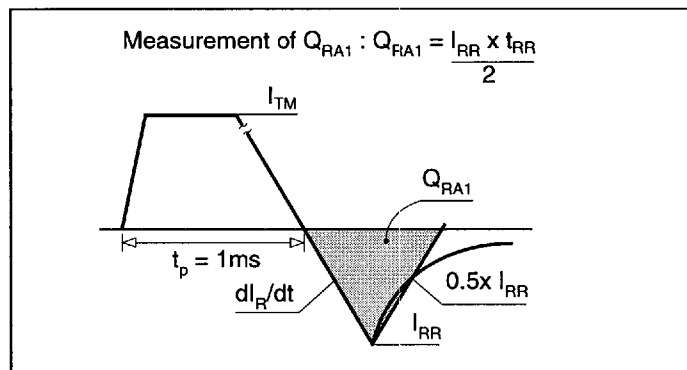
SURGE RATINGS

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; $V_R = 0\% V_{RRM}$, $T_j = 125^\circ\text{C}$	845×10^3	A^2s

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/ μ s	
dI/dt	Rate of rise of on-state current	Gate source 20V, 20 Ω	Repetitive 50Hz	-	500	A/ μ s
		$t_r \leq 0.5\mu$ s, $T_j = 125^{\circ}C$	Non-repetitive	-	800	A/ μ 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 Ω	
t_{gd}	Delay time	$T_j = 25^{\circ}C$, $I_T = 50A$, $V_D = 300V$, $I_G = 1A$, dI/dt = 50A/ μ s, dI _G /dt = 1A/ μ s	-	-*	μ s	
$t_{(ON)TOT}$	Total turn-on time		-	-*	μ 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/ μ s to 66% V_{DRM} , dI _R /dt = 50A/ μ s.	t_q code: H	-	120	μ s
Q_{RR}	Reverse recovery charge		-	-	μ 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

CURVES

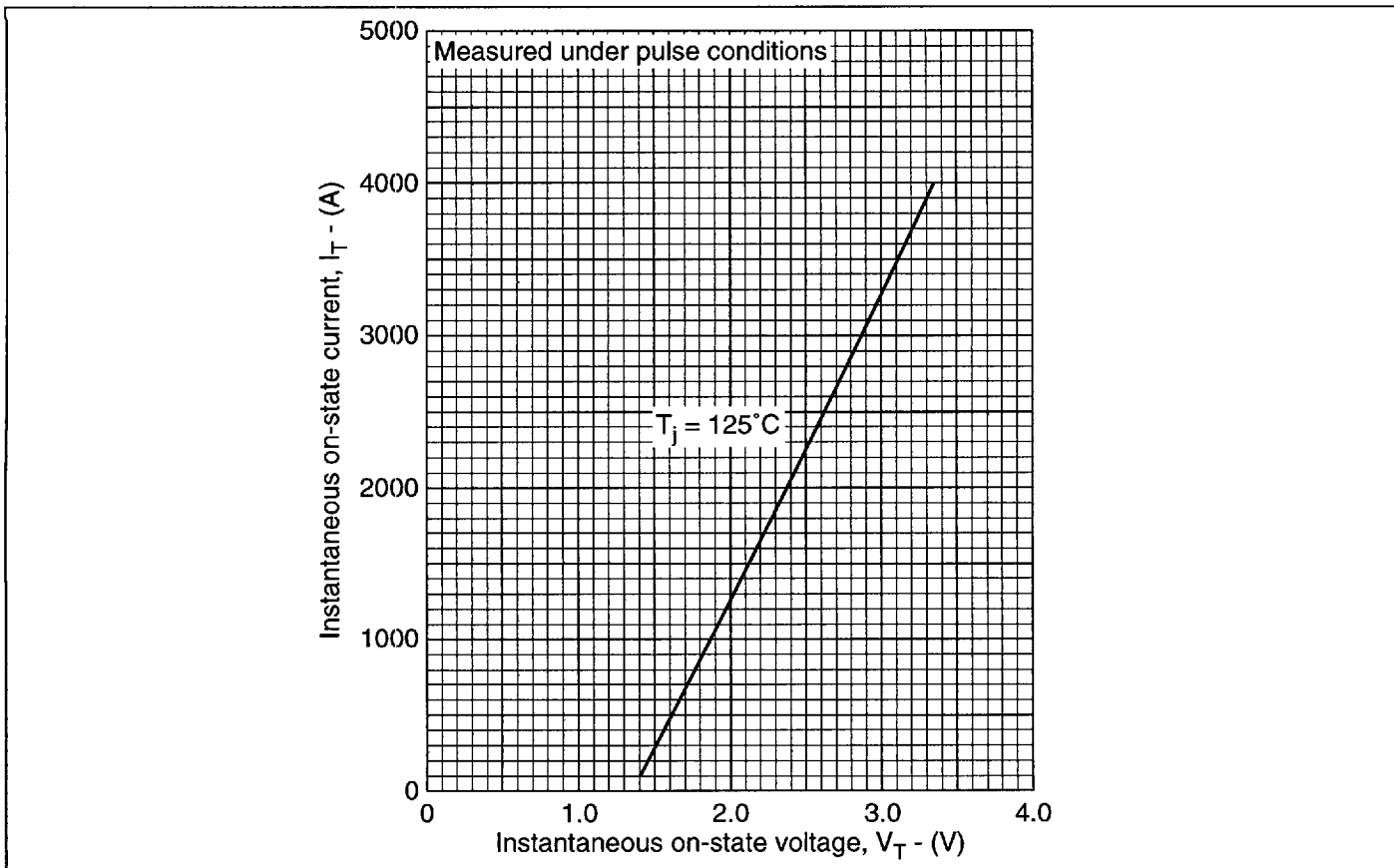


Fig.1 Maximum (limit) on-state characteristics

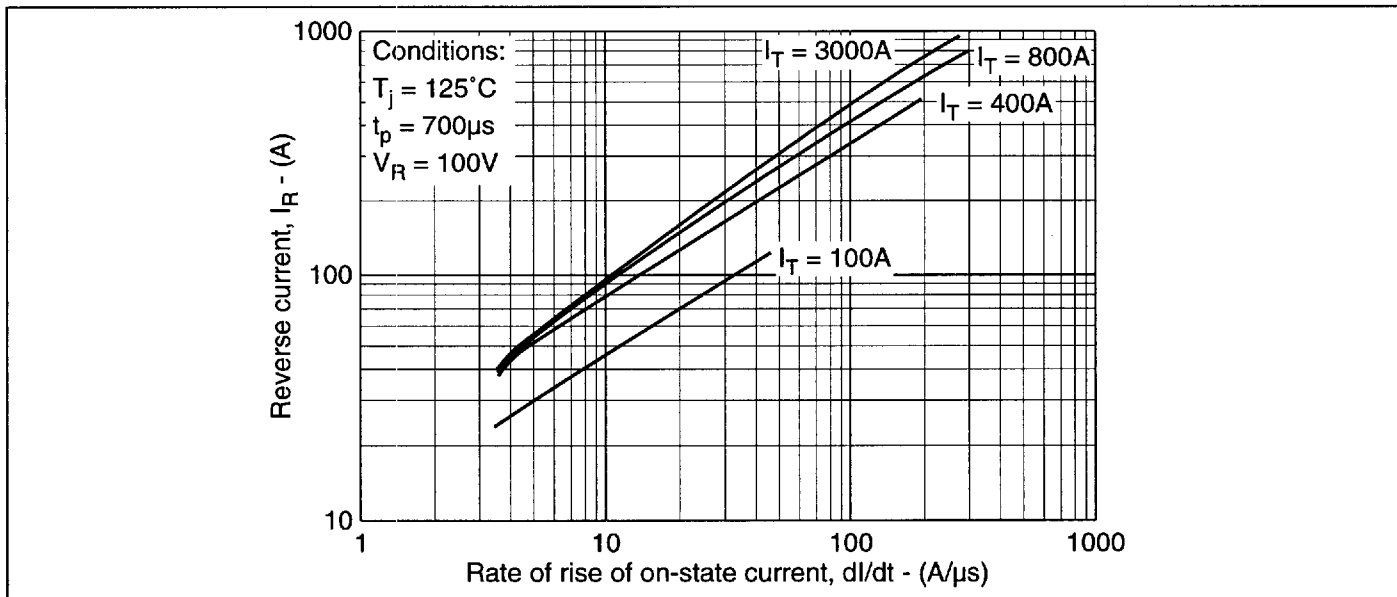


Fig.2 Reverse current vs rate of rise of on-state current

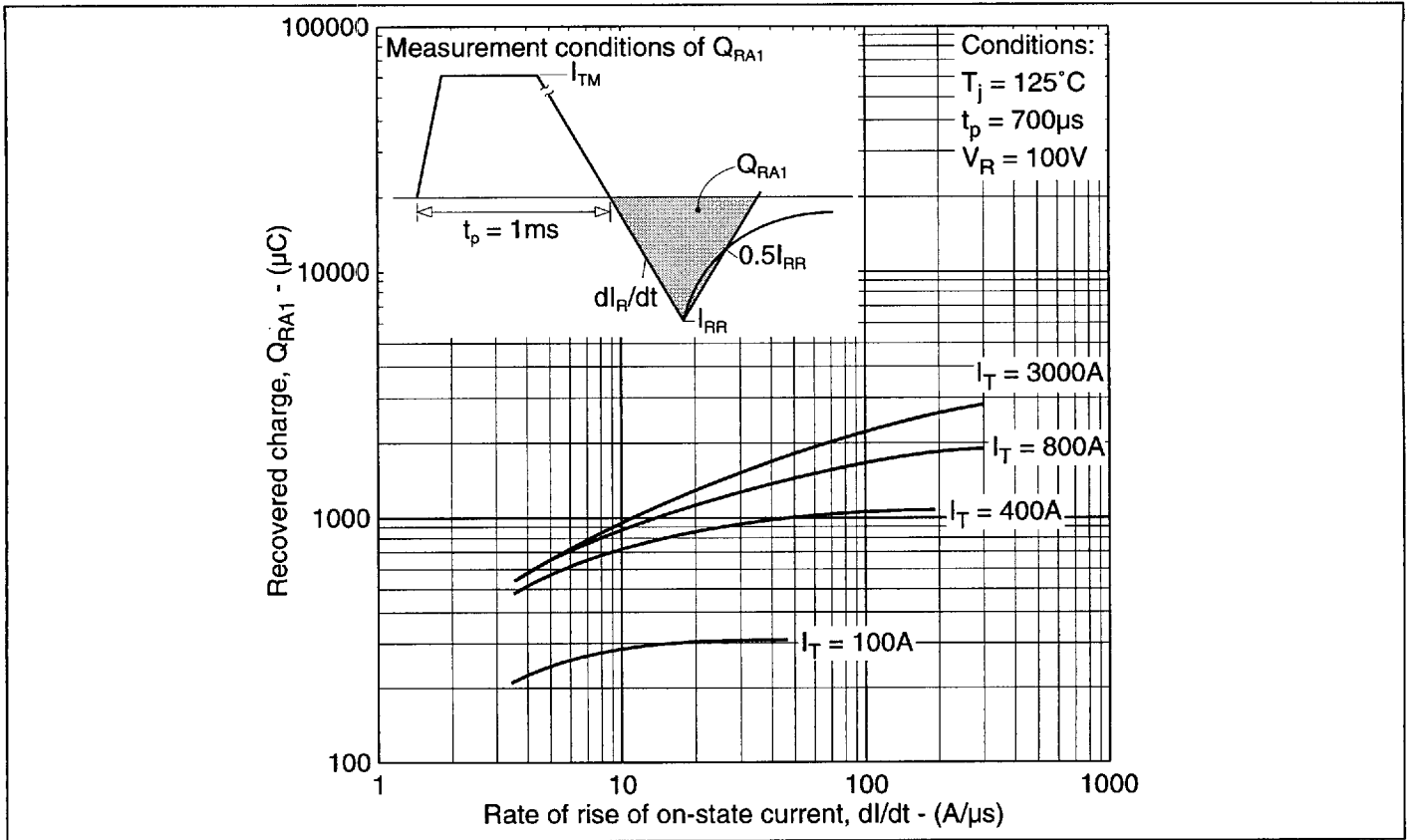
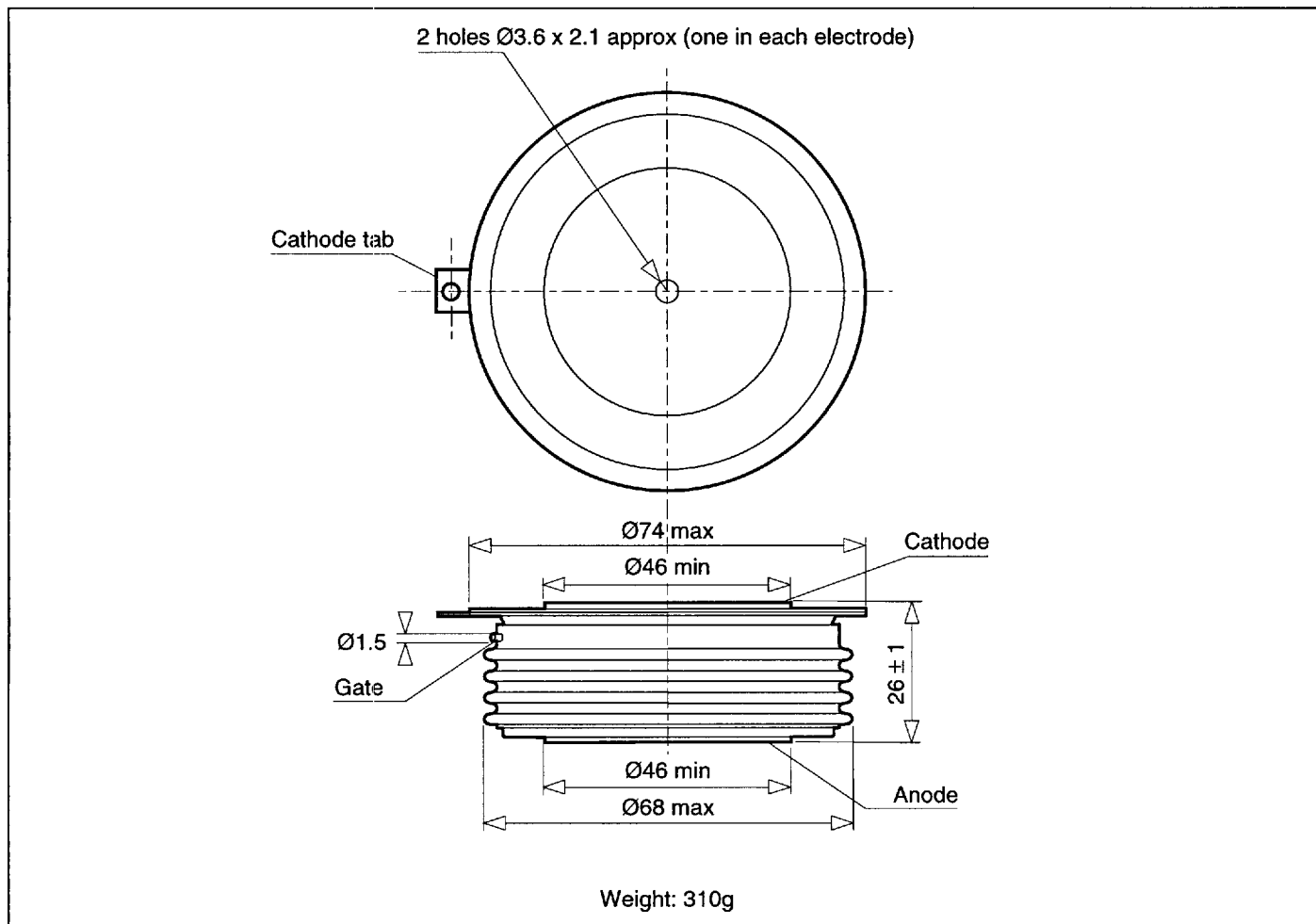


Fig.3 Recovered charge vs rate of rise of on-state current

PACKAGE DETAILS - MU169

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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