GEC PLESSEY
SEMICONDUCTORS

JANUARY 1996

DS4280-2.1

TF921..H

FAST SWITCHING THYRISTOR

KEY PARAMETERS

V_{DRM}	2500V
$I_{T(RMS)}$	1570A
I_{TSM}	13600A
dV/dt	500V/µs
dI/dt	500A/µs
t_q	120µs

APPLICATIONS

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

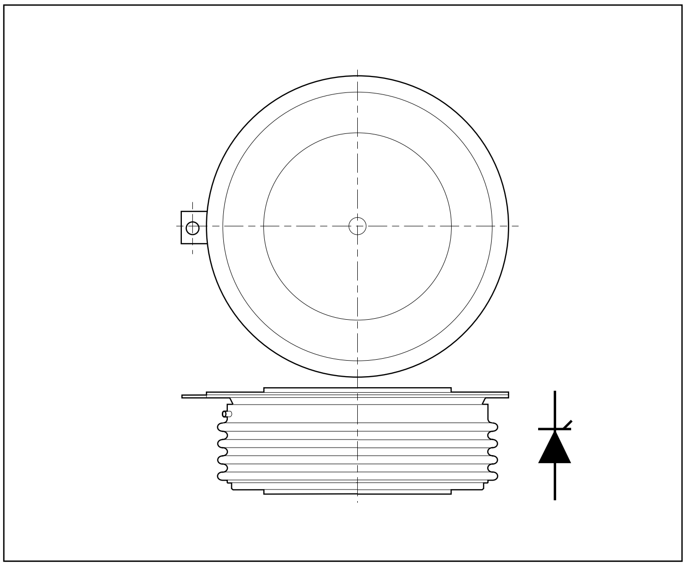
FEATURES

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

VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages V_{DRM} V_{RRM}	Conditions
TF921 25H TF921 24H TF921 22H	2500 2400 2200	$V_{RSM} = V_{RRM}$ + 100V $I_{DRM} = I_{RRM}$ = 100mA at V_{RRM} or V_{DRM} & T_{vj}

Lower voltage grades available.



Outline type code: MU169. See package outlines for further information.

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{T(AV)}$	Mean on-state current	Half sinewave, 50Hz, $T_{case} = 80^oC$	1000	A
$I_{T(RMS)}$	RMS value	Half sinewave, 50Hz, $T_{case} = 80^oC$	1570	A

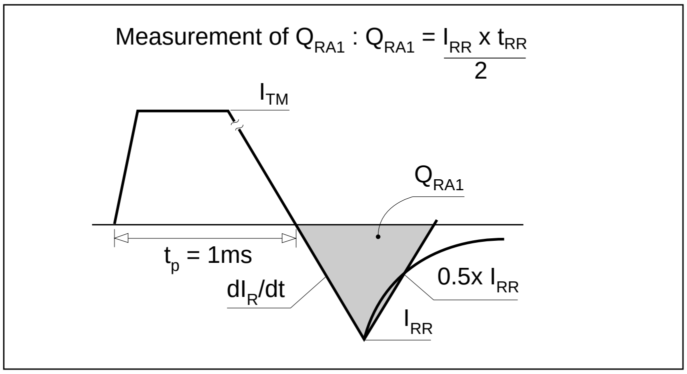
SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $V_R = 0\% \ V_{RRM}$, $T_j = 125^\circ C$	13.6	kA
I^2t	I^2t for fusing	10ms half sine; $V_R = 0\% \ V_{RRM}$, $T_j = 125^\circ C$	930×10^3	A^2s

THERMAL AND MECHANICAL DATA

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

MEASUREMENT OF RECOVERED CHARGE - Q_{RA1}



Measurement of Q_{RA1} : $Q_{RA1} = \frac{I_{RR} \times t_{RR}}{2}$

DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions		Min.	Max.	Units
V_{TM}	Maximum on-state voltage	At 1500A peak, T_{case} = 25°C		-	1.85	V
I_{RRM}/I_{DRM}	Peak reverse and off-state current	At V_{RRM}/V_{DRM}, T_{case} = 125°C		-	100	mA
dV/dt	Maximum linear rate of rise of off-state voltage	Linear to 60% V_{DRM} T_j = 125°C, Gate open circuit		-	500	V/µs
dI/dt	Rate of rise of on-state current	Gate source 20V, 20Ω $t_r \le 0.5\mu s$, T_j = 125°C	Repetitive 50Hz	-	500	A/µs
			Non-repetitive	-	800	A/µs
$V_{T(TO)}$	Threshold voltage	At T_{vj} = 125°C		-	1.1	V
r_T	On-state slope resistance	At T_{vj} = 125°C		-	0.375	mΩ
t_{gd}	Delay time	T_j = 25°C, I_T = 50A, V_D = 300V, I_G = 1A, dI/dt = 50A/µs, dI_G/dt = 1A/µs		1.5*	-	µs
$t_{(ON)TOT}$	Total turn-on time			3*	-	µs
I_H	Holding current	T_j = 25°C, I_{TM} = 1A, V_D = 12V		100*	-	mA
I_L	Latching current	T_j = 25°C, I_G = 0.5A, V_D = 12V		300*	-	mA
t_q	Turn-off time	T_j = 125°C, I_T = 1380A, V_R = 100V, dV/dt = 20V/µs to $0.6V_{DRM}$, dI_R/dt = 50A/µs, t_p = 1ms.	t_q code: H	-	120	µs
Q_{RR}	Reverse recovery charge			-	2200	µC

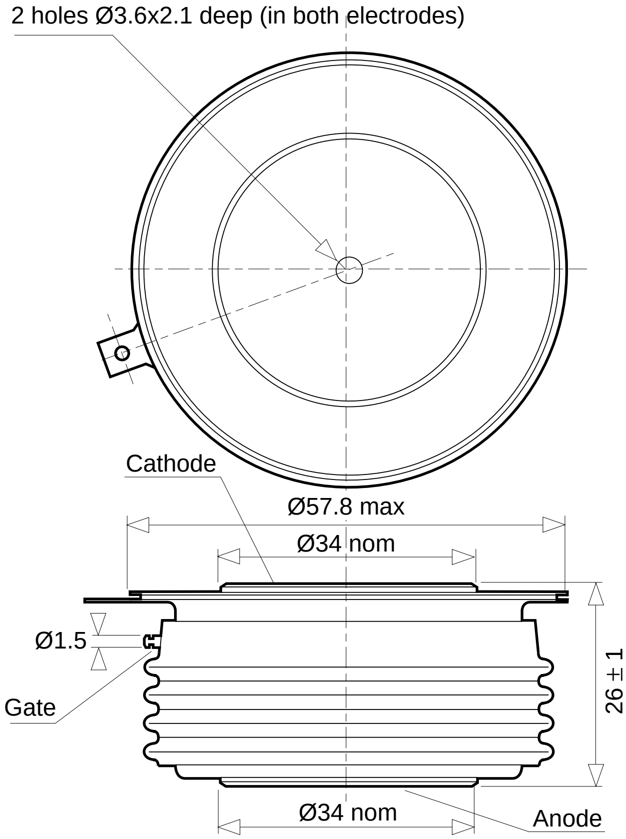
Typical value.

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{GT}	Gate trigger voltage	V_{DRM} = 12V, T_{case} = 25°C, R_L = 6Ω	-	3.0	V
I_{GT}	Gate trigger current	V_{DRM} = 12V, T_{case} = 25°C, R_L = 6Ω	-	250	mA
V_{GD}	Gate non-trigger voltage	At V_{DRM} T_{case} = 125°C, R_L = 1kΩ	-	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

PACKAGE DETAILS - MU169

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



Weight: 310g

GEC PLESSEY
SEMICONDUCTORS

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