DCR1576SY

PHASE CONTROL THYRISTOR

APPLICATIONS

- High Power Drives.
- High Voltage Power Supplies.
- DC Motor Control.

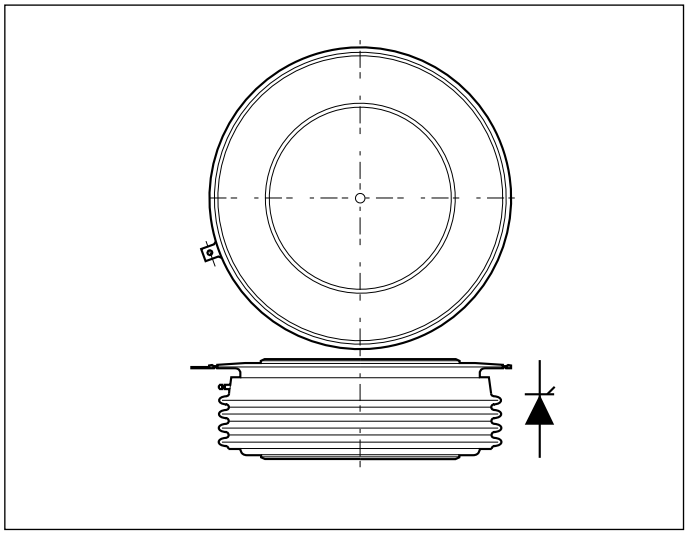
KEY PARAMETERS

V_{DRM}	5000V
$I_{T(AV)}$	1770A
I_{TSM}	40000A
dVdt*	1000V/μs
dI/dt	300A/μs

***Higher dV/dt selections available**

FEATURES

- Double Side Cooling.
- High Surge Capability.
- High Mean Current.
- Fatigue Free.



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VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages V_{DRM} V_{RRM} V	Conditions
DCR1576SY5050	5000	T_{vj} = 0° to 125°C, I_{DRM} = I_{RRM} = 500mA, V_{DRM}, V_{RRM} t_p = 10ms, V_{DSM} & V_{RSM} = V_{DRM} & V_{RRM} + 100V Respectively
DCR1576SY4848	4800	
DCR1576SY4646	4600	
DCR1576SY4444	4400	
DCR1576SY4242	4200	
DCR1576SY4040	4000	

Lower voltage grades available.

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, T_{case} = 80°C	1770	A
$I_{T(RMS)}$	RMS value	T_{case} = 80°C	2700	A
I_T	Continuous (direct) on-state current	T_{case} = 80°C	2500	A
Single Side Cooled (Anode side)				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, T_{case} = 80°C	1120	A
$I_{T(RMS)}$	RMS value	T_{case} = 80°C	1760	A
I_T	Continuous (direct) on-state current	T_{case} = 80°C	1510	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; T_{case} = 125°C	32.0	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - 1/4 sine	5.12 x 10^6	A^2s
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; T_{case} = 125°C	40.0	kA
I^2t	I^2t for fusing	V_R = 0	8.0 x 10^6	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	-	0.0095	°C/W
		Single side cooled	Anode dc	-	0.019	°C/W
			Cathode dc	-	0.019	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 50.0kN with mounting compound	Double side	-	0.002	°C/W
			Single side	-	0.004	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	135	°C
		Reverse (blocking)		-	125	°C
T_{stg}	Storage temperature range			-55	150	°C
-	Clamping force			45.0	55.0	kN

DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions		Min.	Max.	Units
V_{TM}	Maximum on-state voltage	At 6500A peak, T_{case} = 25°C		-	2.9	V
I_{RRM}/I_{DRM}	Peak reverse and off-state current	At V_{RRM}/V_{DRM}, T_{case} = 125°C		-	300	mA
dV/dt	Maximum linear rate of rise of off-state voltage	To 67% V_{DRM} T_j = 125°C.		-	1000	V/µs
dI/dt	Rate of rise of on-state current	From 67% V_{DRM} to 2x $I_{T(AV)}$ Gate source 20V, 20Ω t_r < 1µs.	Repetitive 50Hz	-	150	A/µs
			Non-repetitive	-	300	A/µs
$V_{T(TO)}$	Threshold voltage	At T_{vj} = 125°C		-	1.05	V
r_T	On-state slope resistance	At T_{vj} = 125°C		-	0.34	mΩ
t_{gd}	Delay time	V_D = 67% V_{DRM}, Gate source 30V, 15Ω Rise time 0.5µs, T_j = 25°C		-	2.5	µs
I_L	Latching current	T_j = 25°C, V_D = 5V		-	550	mA
I_H	Holding current	T_j = 25°C, R_{g-k} = ∞		-	150	mA
t_q	Turn-off time	I_T = 800A, t_p = 1ms, T_j = 125°C, V_{RM} = 50V, dI_{RR}/dt = 20A/µs, V_{DR} = 67% V_{DRM}, dV_{DR}/dt = 20V/µs linear		1.0	-	ms

**Typical value.*

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{GT}	Gate trigger voltage	V_{DRM} = 5V, T_{case} = 25°C	-	3.0	V
I_{GT}	Gate trigger current	V_{DRM} = 5V, T_{case} = 25°C	-	300	mA
V_{GD}	Gate non-trigger voltage	At V_{DRM} T_{case} = 125°C	-	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	V
I_{FGM}	Peak forward gate current	Anode positive with respect to cathode	-	30	A
P_{GM}	Peak gate power	t_p = 100µs	-	150	W
$P_{G(AV)}$	Mean gate power		-	10	W

CURVES

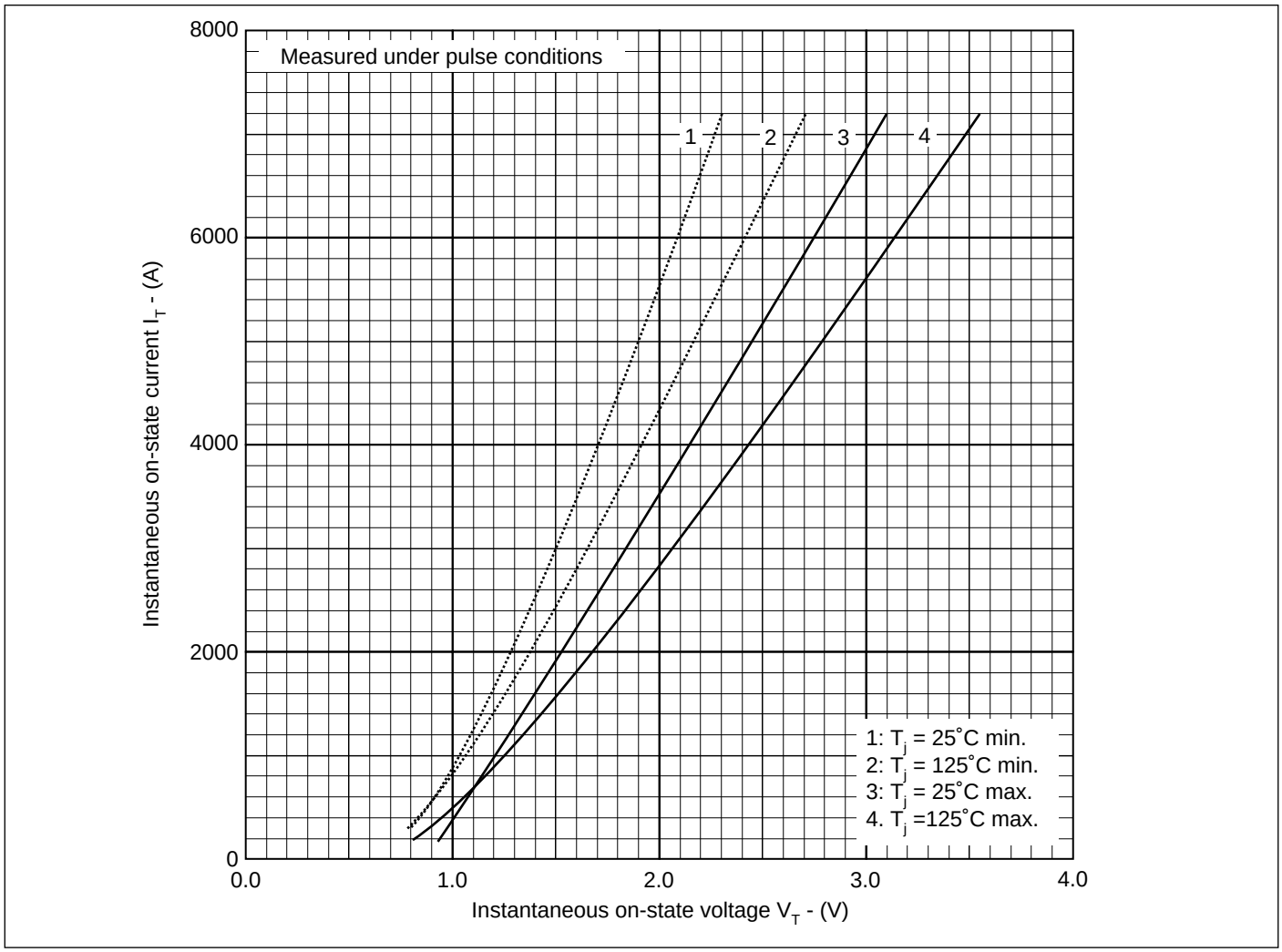


Fig.1 Maximum (limit) on-state characteristics

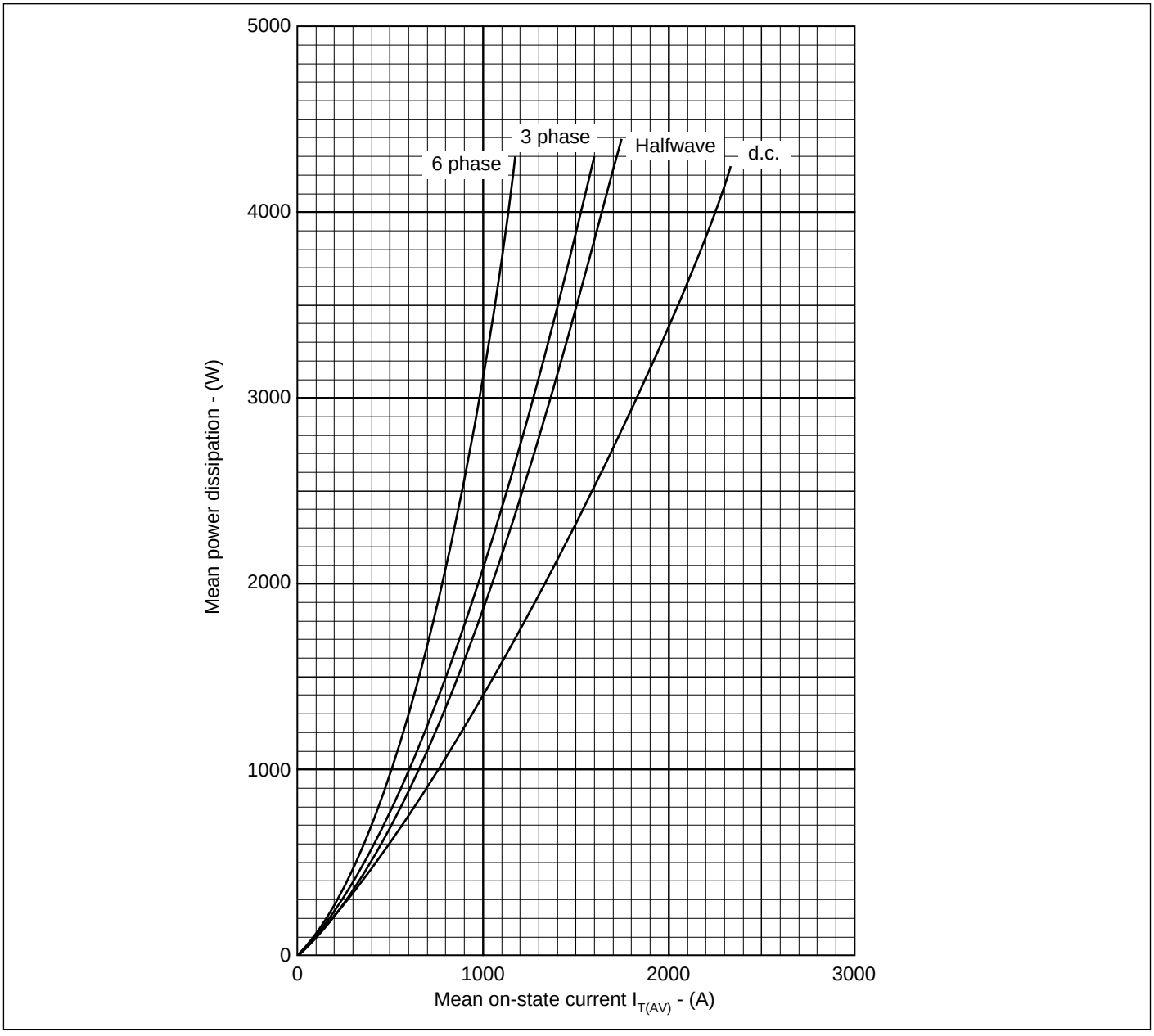


Fig.2 Dissipation curves

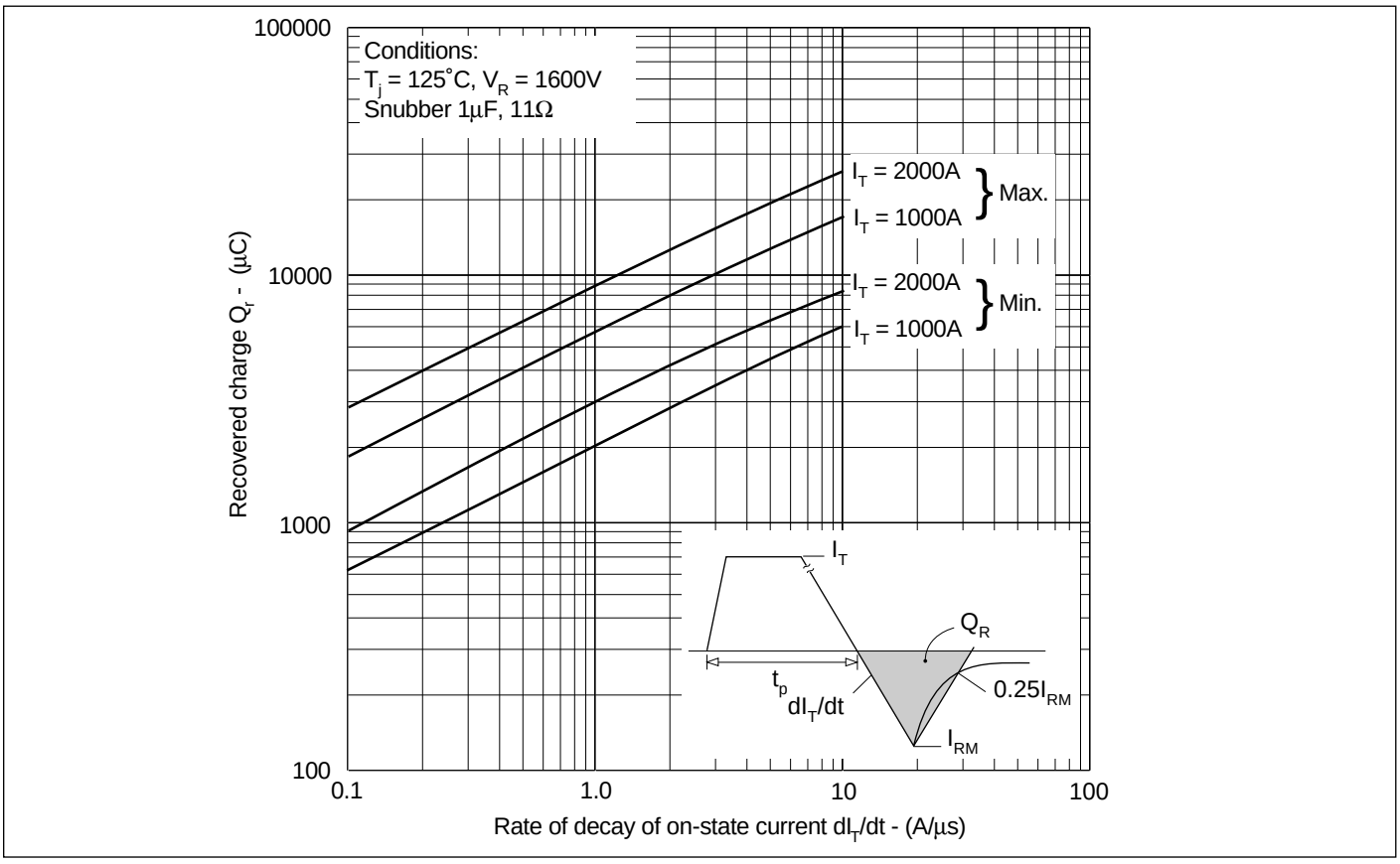


Fig.3 Recovered charge

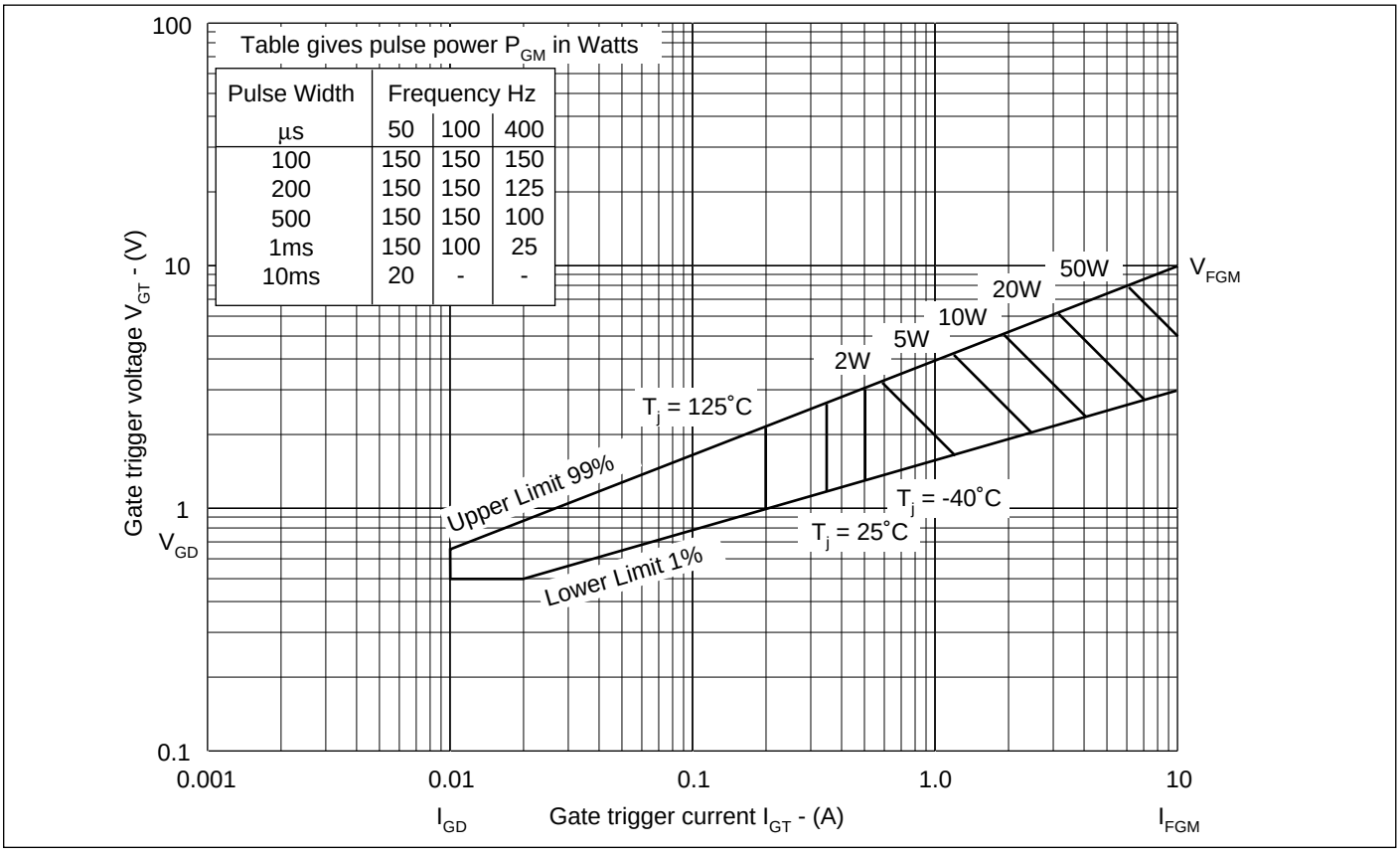


Fig.4 Gate characteristics

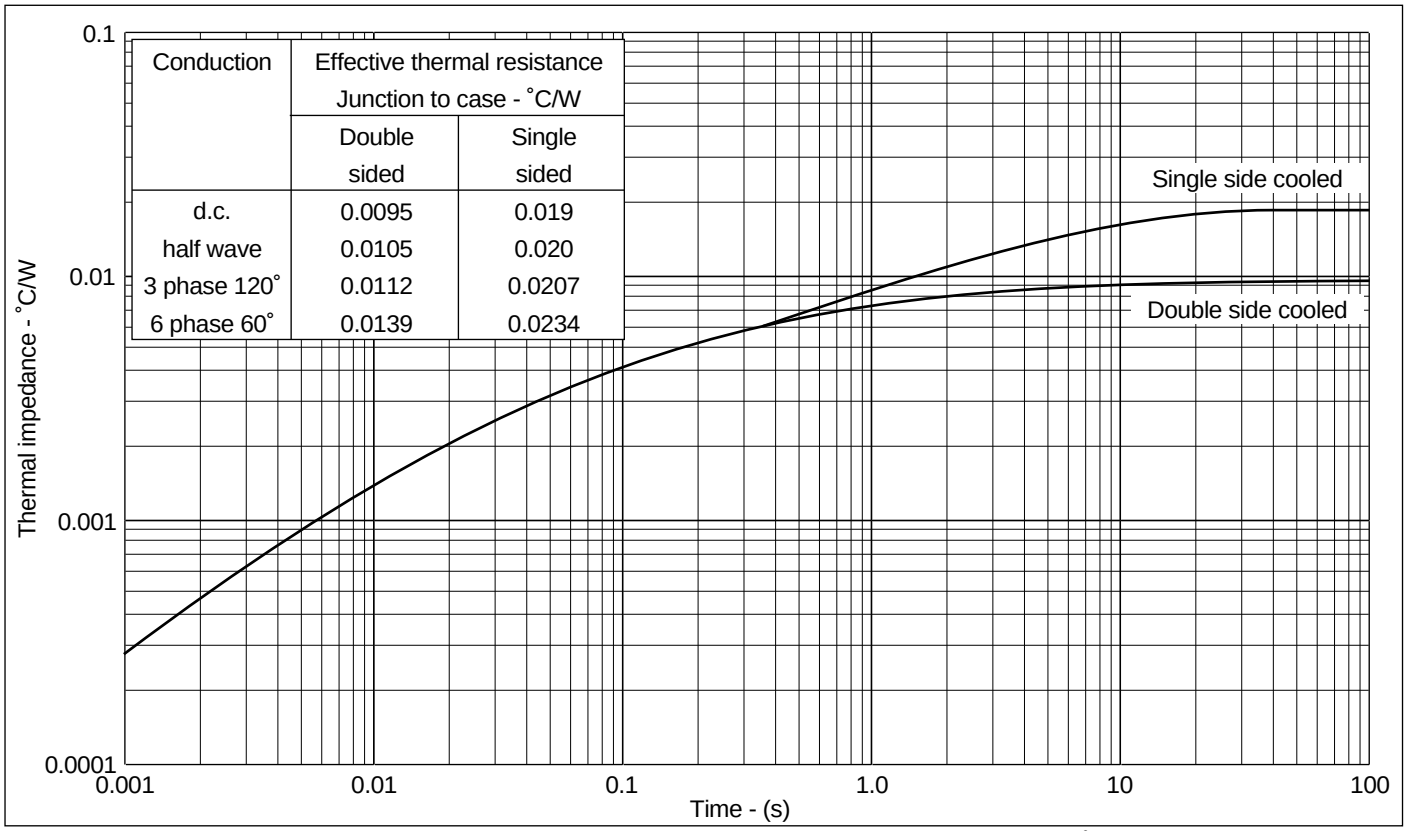


Fig.5 Maximum (limit) transient thermal impedance - junction to case - (˚C/W)

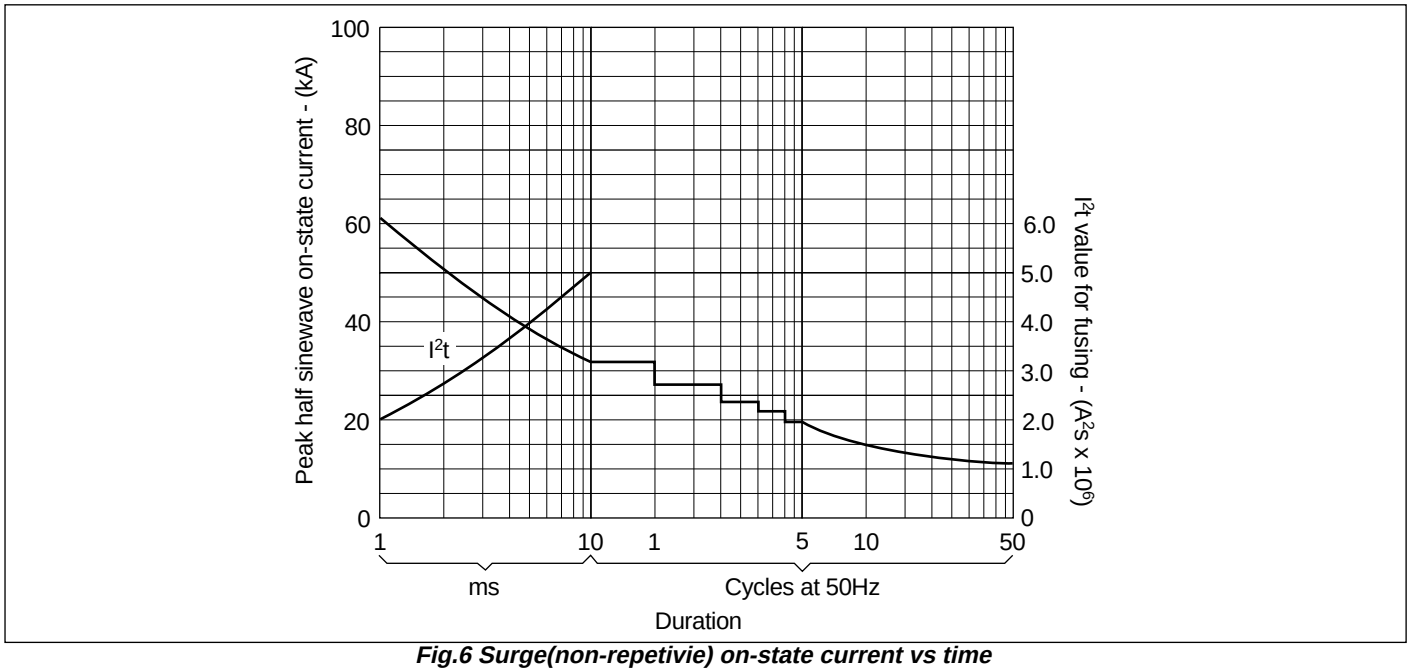
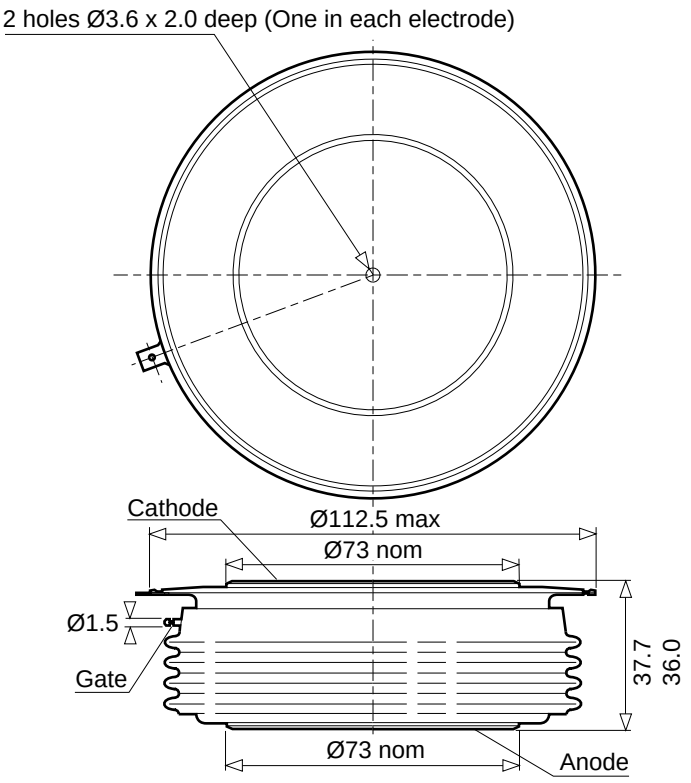


Fig.6 Surge(non-repetivie) on-state current vs time

PACKAGE DETAILS - Y

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



Weight: 1600g

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