

# DCR1475SY

## PHASE CONTROL THYRISTOR

### APPLICATIONS

- High Power Drives.
- High Voltage Power Supplies.
- DC Motor Control.
- Welding.
- Battery Chargers.

### KEY PARAMETERS

$V_{DRM}$	<b>3000V</b>
$I_{T(AV)}$	<b>2220A</b>
$I_{TSM}$	<b>46000A</b>
$dV/dt^*$	<b>1000V/<math>\mu</math>s</b>
$dI/dt$	<b>300A/<math>\mu</math>s</b>

\*Higher dV/dt selections available

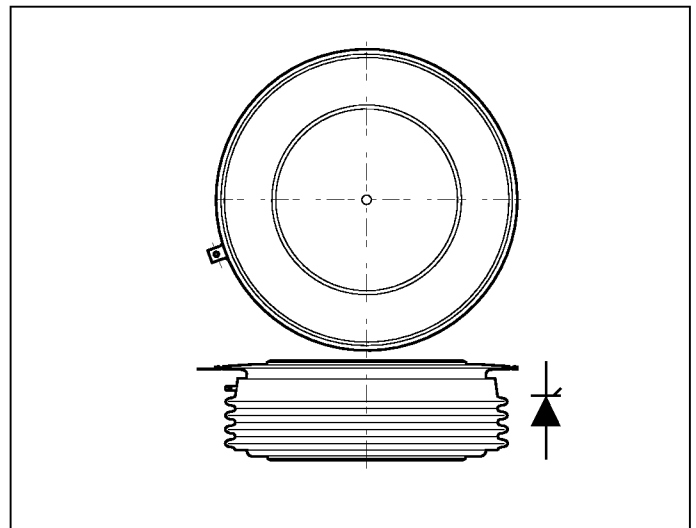
### FEATURES

- Double Side Cooling.
- High Surge Capability.

### VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages $V_{DRM}$ $V_{RRM}$ V	Conditions
DCR1475SY30	3000	$T_{vj} = 0^\circ$ to $125^\circ C$ , $I_{DRM} = I_{RRM} = 250mA$ , $V_{DRM}, V_{RRM} t_p = 10ms$ , $V_{DSM}$ & $V_{RSM} =$ $V_{DRM}$ & $V_{RRM} + 100V$ Respectively
DCR1475SY29	2900	
DCR1475SY28	2800	
DCR1475SY27	2700	
DCR1475SY26	2600	
DCR1475SY25	2500	

Lower voltage grades available.



Outline type code: Y. See package outline for further information.

### CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, $T_{case} = 80^\circ C$	2220	A
$I_{T(RMS)}$	RMS value	$T_{case} = 80^\circ C$	3490	A
$I_T$	Continuous (direct) on-state current	$T_{case} = 80^\circ C$	3175	A
<b>Single Side Cooled (Anode side)</b>				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, $T_{case} = 80^\circ C$	1420	A
$I_{T(RMS)}$	RMS value	$T_{case} = 80^\circ C$	2230	A
$I_T$	Continuous (direct) on-state current	$T_{case} = 80^\circ C$	1850	A

## SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{TSM}$	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}C$	36.8	kA
$I^2t$	$I^2t$ for fusing	$V_R = 50\% V_{RRM}$ - 1/4 sine	$6.7 \times 10^6$	A <sup>2</sup> s
$I_{TSM}$	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}C$	46.0	kA
$I^2t$	$I^2t$ for fusing	$V_R = 0$	$10.6 \times 10^6$	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	-	0.0095	$^{\circ}C/W$
		Single side cooled	Anode dc	-	0.019	$^{\circ}C/W$
			Cathode dc	-	0.019	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 43.0kN with mounting compound	Double side	-	0.002	$^{\circ}C/W$
			Single side	-	0.004	$^{\circ}C/W$
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	135	$^{\circ}C$
		Reverse (blocking)		-	125	$^{\circ}C$
$T_{stg}$	Storage temperature range			-55	125	$^{\circ}C$
-	Clamping force			41.0	49.0	kN

## DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units	
$I_{RRM}/I_{DRM}$	Peak reverse and off-state current	At $V_{RRM}/V_{DRM}$ , $T_{case} = 125^{\circ}C$	-	250	mA	
dV/dt	Maximum linear rate of rise of off-state voltage	To 67% $V_{DRM}$ , $T_j = 125^{\circ}C$	-	1000	V/ $\mu$ s	
dI/dt	Rate of rise of on-state current	From 67% $V_{DRM}$ to 1000A Gate source 20V, 10 $\Omega$ $t_r < 0.5\mu$ s, $T_j = 125^{\circ}C$	Repetitive, 50Hz	-	150	A/ $\mu$ s
			Non-repetitive	-	300	A/ $\mu$ s
$V_{T(TO)}$	Threshold voltage	At $T_{vj} = 125^{\circ}C$	-	0.885	V	
$r_T$	On-state slope resistance	At $T_{vj} = 125^{\circ}C$	-	0.191	m $\Omega$	
$t_{gd}$	Delay time	$V_D = 67\% V_{DRM}$ , Gate source 30V, 15 $\Omega$ Rise time 0.5 $\mu$ s, $T_j = 25^{\circ}C$	-	2.0	$\mu$ s	
$I_L$	Latching current	$T_j = 25^{\circ}C$ , $V_D = 5V$	100	300	mA	
$I_H$	Holding current	$T_j = 25^{\circ}C$ , $R_{g-k} = \infty$	30	100	mA	
$t_q$	Turn-off time	$I_T = 800A$ , $t_p = 1ms$ , $T_j = 125^{\circ}C$ , $V_{RM} = 50V$ , $dI_{RR}/dt = 20A/\mu$ s, $V_{DR} = 67\% V_{DRM}$ , $dV_{DR}/dt = 20V/\mu$ s linear	400	-	$\mu$ s	

## GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Max.	Units
$V_{GT}$	Gate trigger voltage	$V_{DRM} = 5V$ , $T_{case} = 25^{\circ}C$	4.0	V
$I_{GT}$	Gate trigger current	$V_{DRM} = 5V$ , $T_{case} = 25^{\circ}C$	400	mA
$V_{GD}$	Gate non-trigger voltage	At $V_{DRM}$ , $T_{case} = 125^{\circ}C$	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	See table, fig.4	150	W
$P_{G(AV)}$	Mean gate power		10	W

CURVES

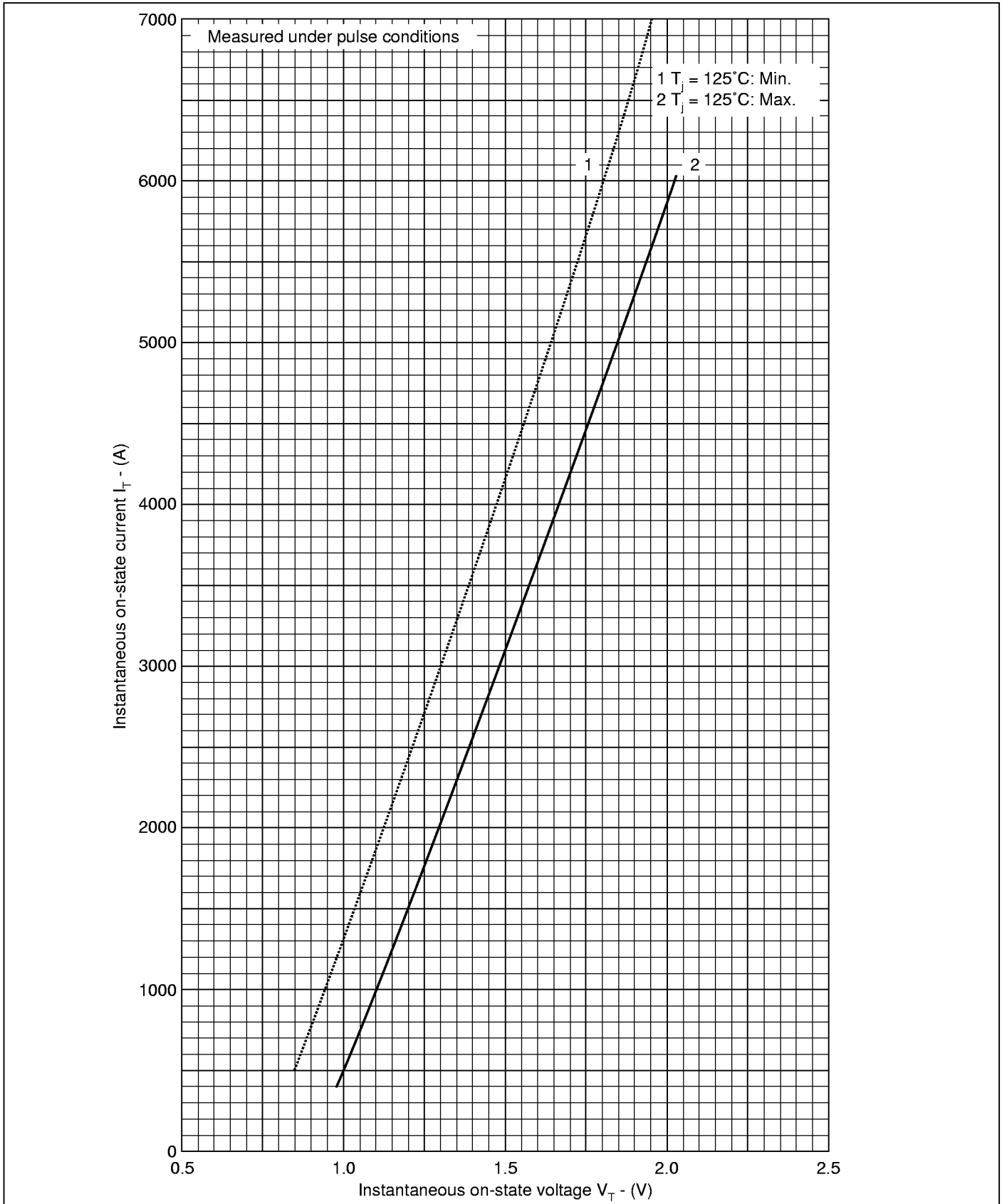


Fig.1 On-state characteristics

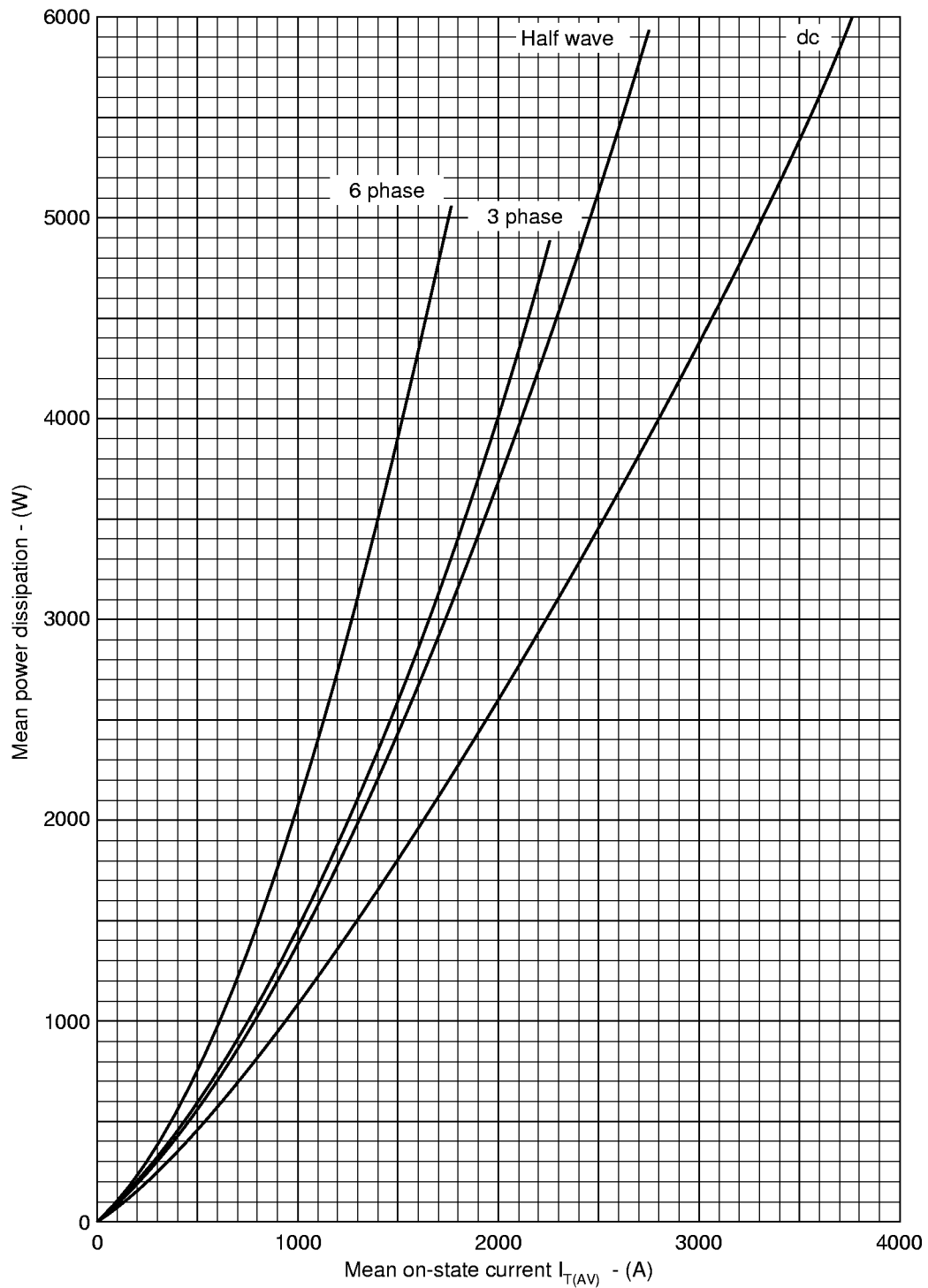


Fig.2 Dissipation curves

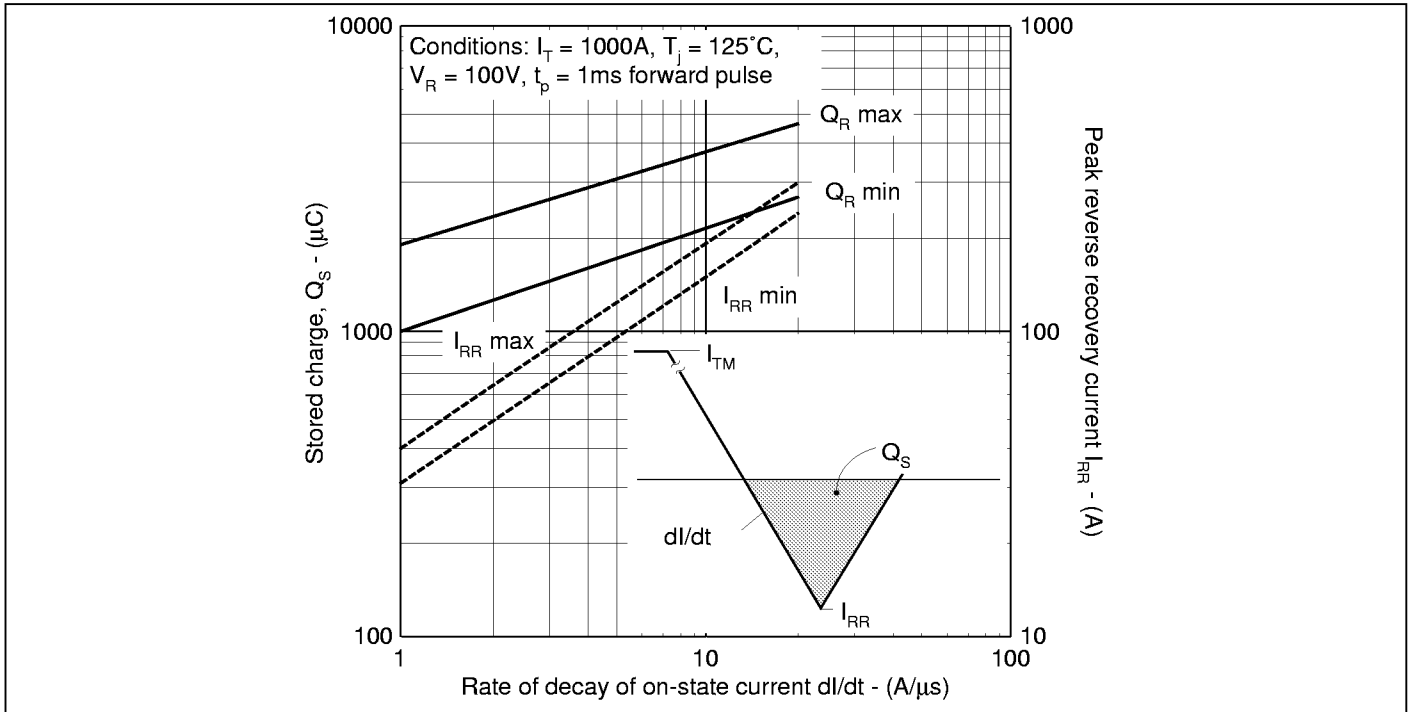


Fig.3 Variation of stored charge

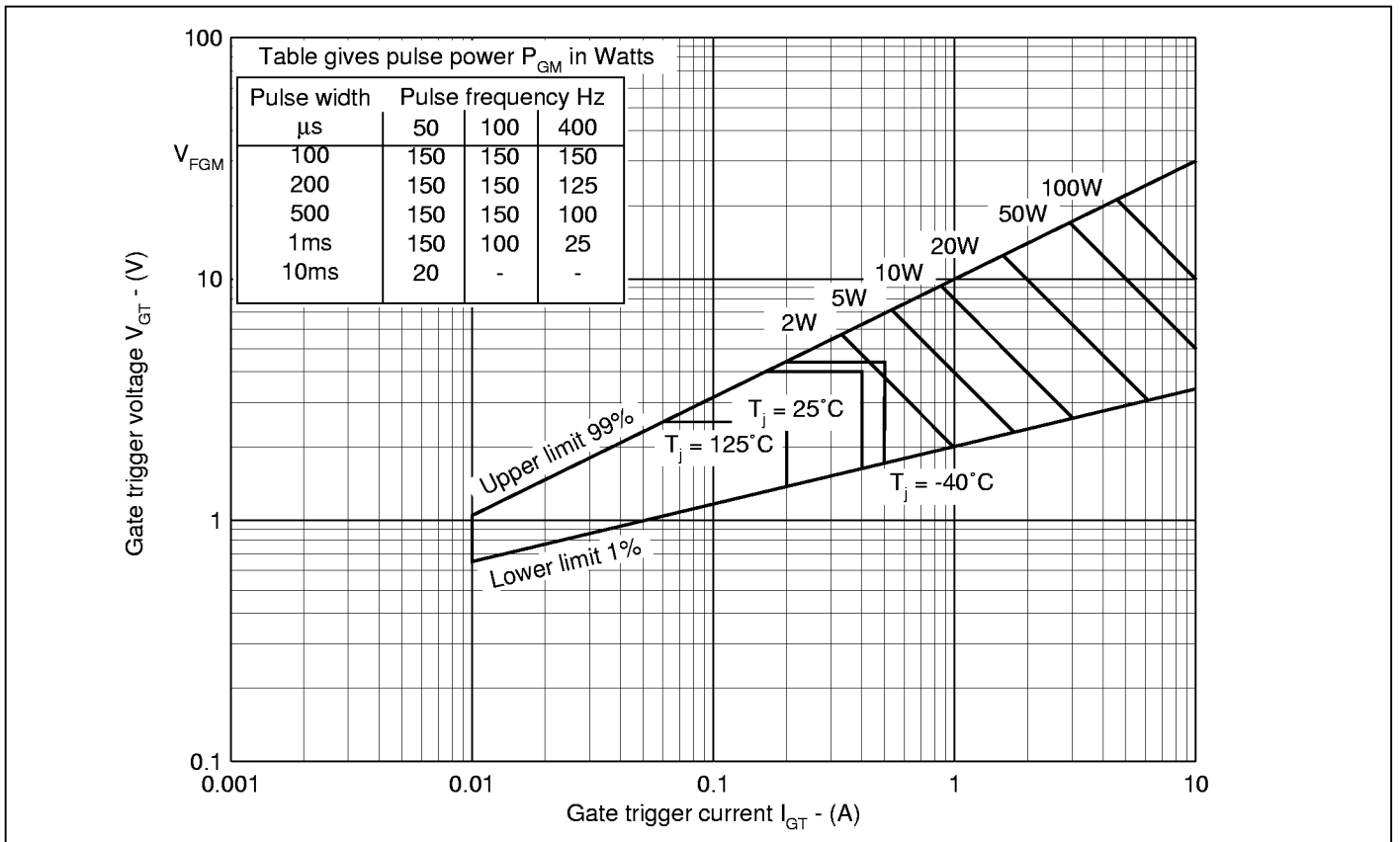


Fig.4 Gate characteristics

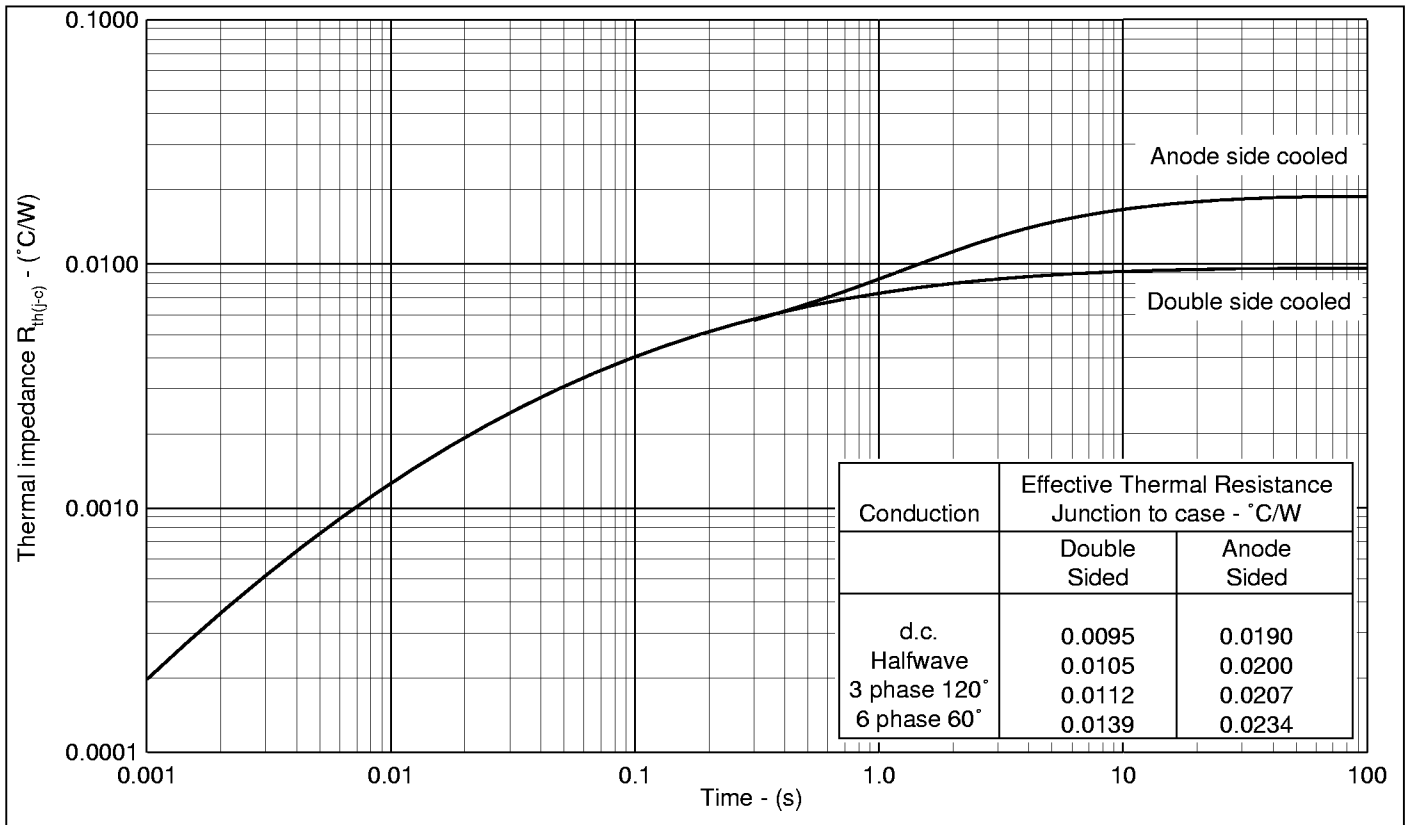


Fig.5 Maximum (limit) transient thermal impedance - junction to case - ( $^{\circ}C/W$ )

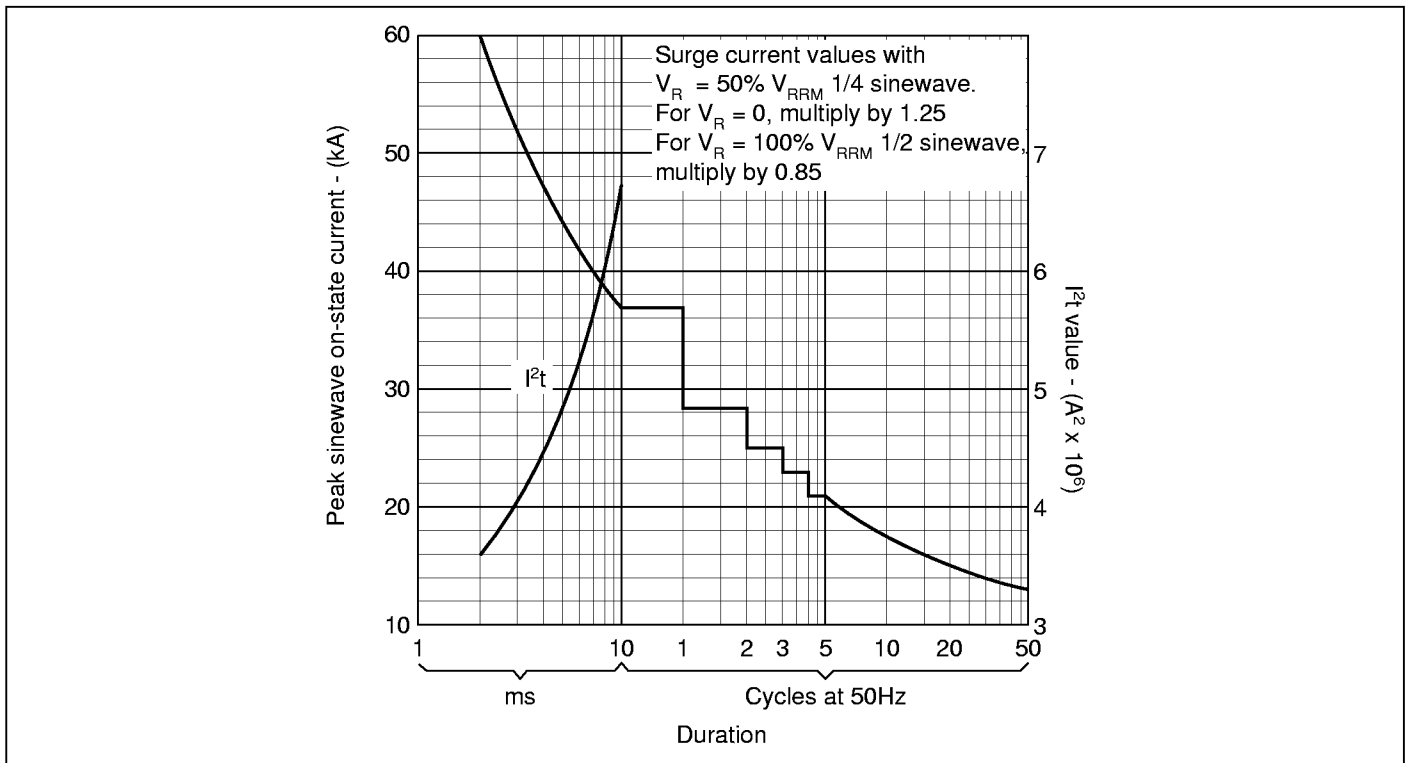
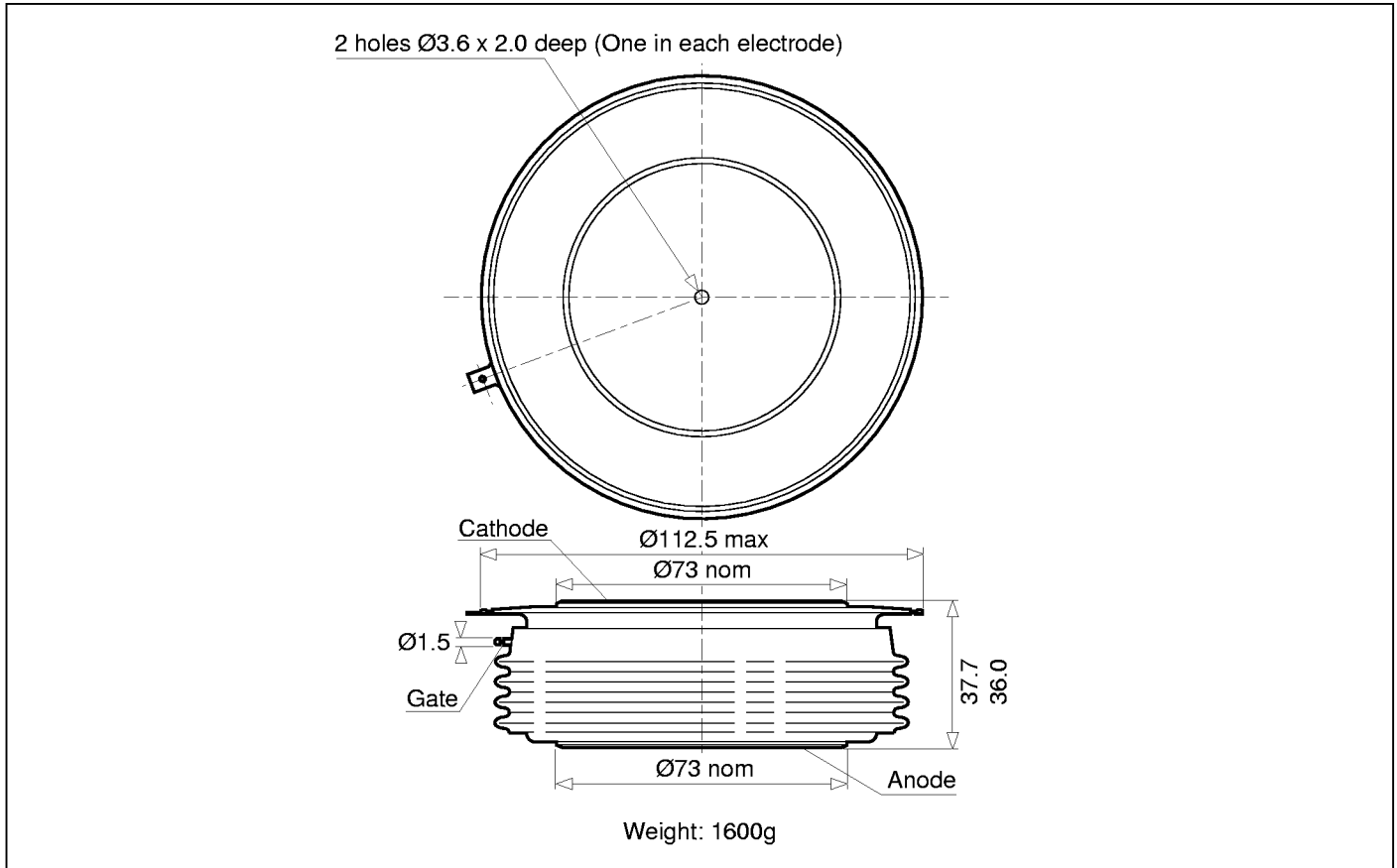


Fig.6 Surge (non-repetitive) on-state current vs time ( $T_{case} = 125^{\circ}C$ )

**PACKAGE OUTLINE - Y**

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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