

# DCR1279SD

## PHASE CONTROL THYRISTOR

### APPLICATIONS

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

### KEY PARAMETERS

$V_{DRM}$	<b>4800V</b>
$I_{T(AV)}$	<b>860A</b>
$I_{TSM}$	<b>15000A</b>
$dV/dt^*$	<b>300V/<math>\mu</math>s</b>
$di/dt$	<b>200A/<math>\mu</math>s</b>

\*Higher dV/dt selections available

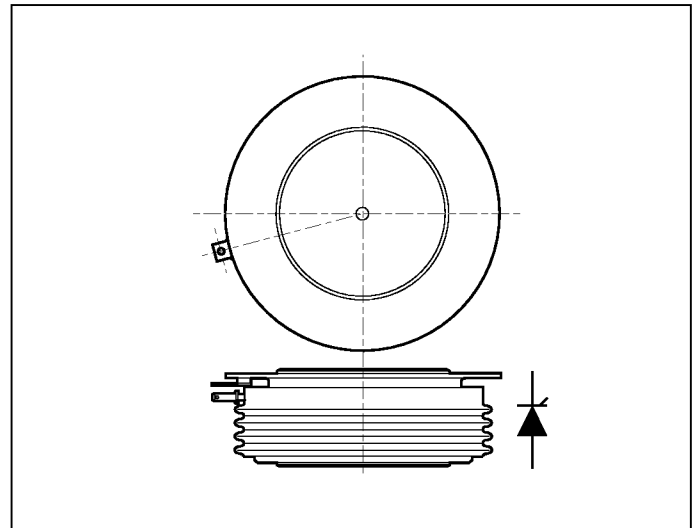
### FEATURES

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

### VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages $V_{DRM}$ $V_{RRM}$ V	Conditions
DCR1279SD48	4800	$T_{vj} = 0^\circ$ to $125^\circ$ C, $I_{DRM} = I_{RRM} = 150$ mA, $V_{DRM}, V_{RRM} t_p = 10$ ms, $V_{DSM}$ & $V_{RSM} =$ $V_{DRM}$ & $V_{RRM} + 100$ V Respectively
DCR1279SD47	4700	
DCR1279SD46	4600	
DCR1279SD45	4500	
DCR1279SD44	4400	

Lower voltage grades available.



Outline type code: D. 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	860	A
$I_{T(RMS)}$	RMS value	$T_{case} = 80^\circ$ C	1350	A
$I_T$	Continuous (direct) on-state current	$T_{case} = 80^\circ$ C	1055	A
<b>Single Side Cooled (Anode side)</b>				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, $T_{case} = 80^\circ$ C	590	A
$I_{T(RMS)}$	RMS value	$T_{case} = 80^\circ$ C	930	A
$I_T$	Continuous (direct) on-state current	$T_{case} = 80^\circ$ C	860	A

## DCR1279SD

### SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{TSM}$	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}C$	12.0	kA
$I^2t$	$I^2t$ for fusing	$V_R = 50\% V_{RRM}$ - 1/4 sine	$0.72 \times 10^6$	A <sup>2</sup> s
$I_{TSM}$	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}C$	15.0	kA
$I^2t$	$I^2t$ for fusing	$V_R = 0$	$1.12 \times 10^6$	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	-	0.020	$^{\circ}C/W$
		Single side cooled	Anode dc	-	0.036	$^{\circ}C/W$
			Cathode dc	-	0.044	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 22.0kN with mounting compound	Double side	-	0.004	$^{\circ}C/W$
			Single side	-	0.008	$^{\circ}C/W$
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	135	$^{\circ}C$
		Reverse (blocking)		-	125	$^{\circ}C$
$T_{slg}$	Storage temperature range		-55	125	$^{\circ}C$	
-	Clamping force		22.0	24.0	kN	

## DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units	
$I_{RRM}/I_{DRM}$	Peak reverse and off-state current	At $V_{RRM}/V_{DRM}$ , $T_{case} = 125^{\circ}C$	-	150	mA	
dV/dt	Maximum linear rate of rise of off-state voltage	To 67% $V_{DRM}$ , $T_j = 125^{\circ}C$ . Gate open circuit.	-	300	V/ $\mu$ s	
dI/dt	Rate of rise of on-state current	From 67% $V_{DRM}$ to 1000A Gate source 10V, 5 $\Omega$ $t_r \leq 0.5\mu$ s, $T_j = 125^{\circ}C$	Repetitive 50Hz	-	100	A/ $\mu$ s
			Non-repetitive	-	200	A/ $\mu$ s
$V_{T(TO)}$	Threshold voltage	At $T_{vj} = 125^{\circ}C$	-	1.14	V	
$r_T$	On-state slope resistance	At $T_{vj} = 125^{\circ}C$	-	0.587	m $\Omega$	
$t_{gd}$	Delay time	$V_D = 67\% V_{DRM}$ , Gate source 30V, 15 $\Omega$ $t_r = 0.5\mu$ s, $T_j = 25^{\circ}C$	-	2.5	$\mu$ s	
$I_L$	Latching current	$T_j = 25^{\circ}C$ , $V_D = 5V$	300	1000	mA	
$I_H$	Holding current	$T_j = 25^{\circ}C$ , $R_{g-k} = \infty$	-	500	mA	

## 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	10	A
$P_{GM}$	Peak gate power	See table, fig.4	150	W
$P_{G(AV)}$	Mean gate power		5	W

CURVES

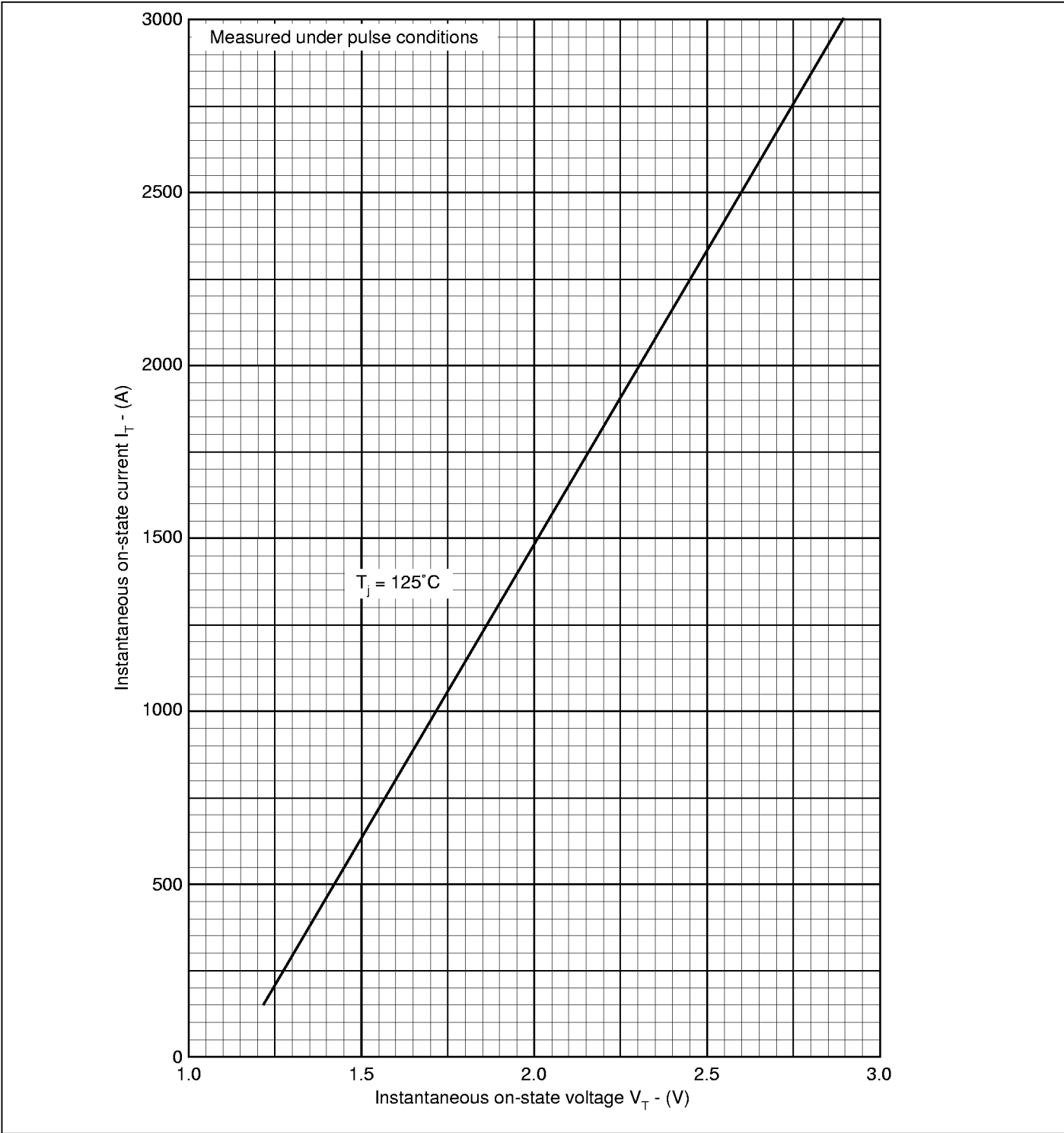


Fig.1 Maximum (limit) on-state characteristics

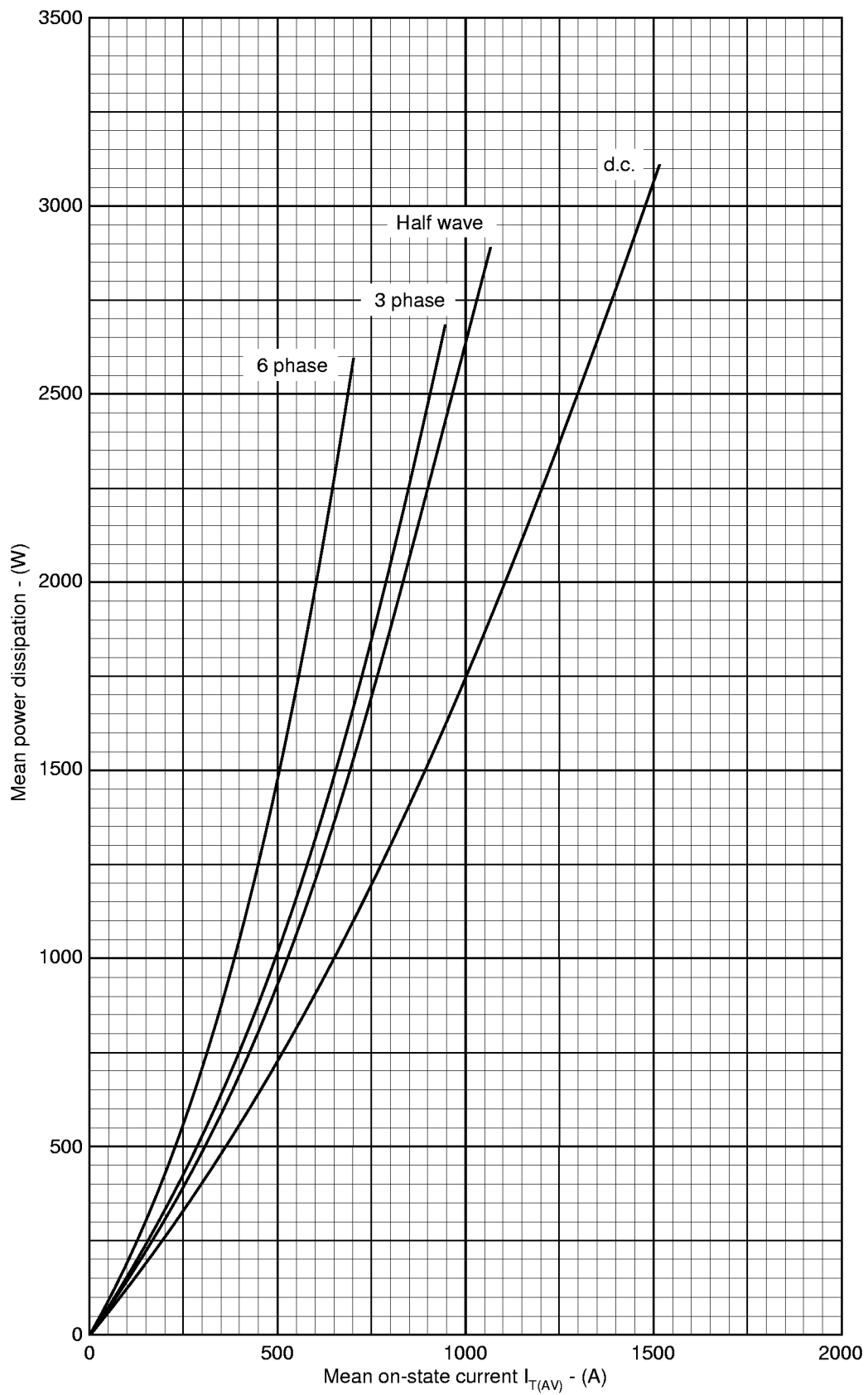


Fig.2 Dissipation curves

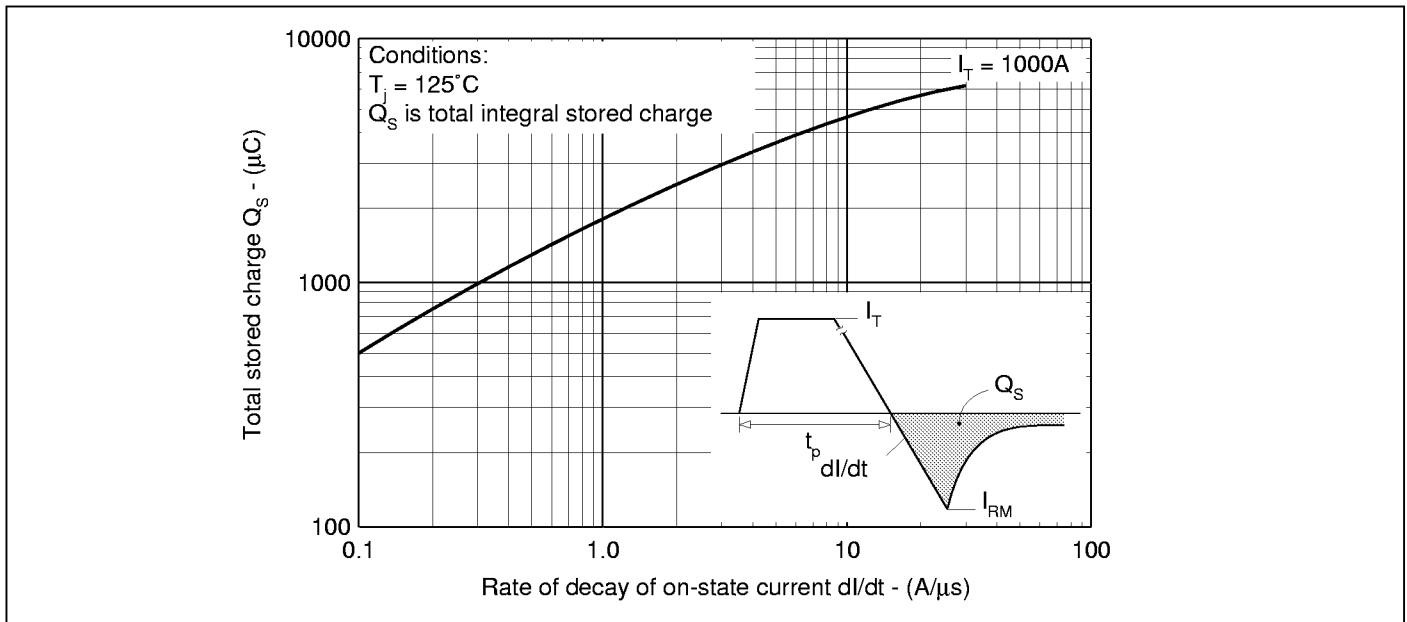


Fig.3 Stored charge

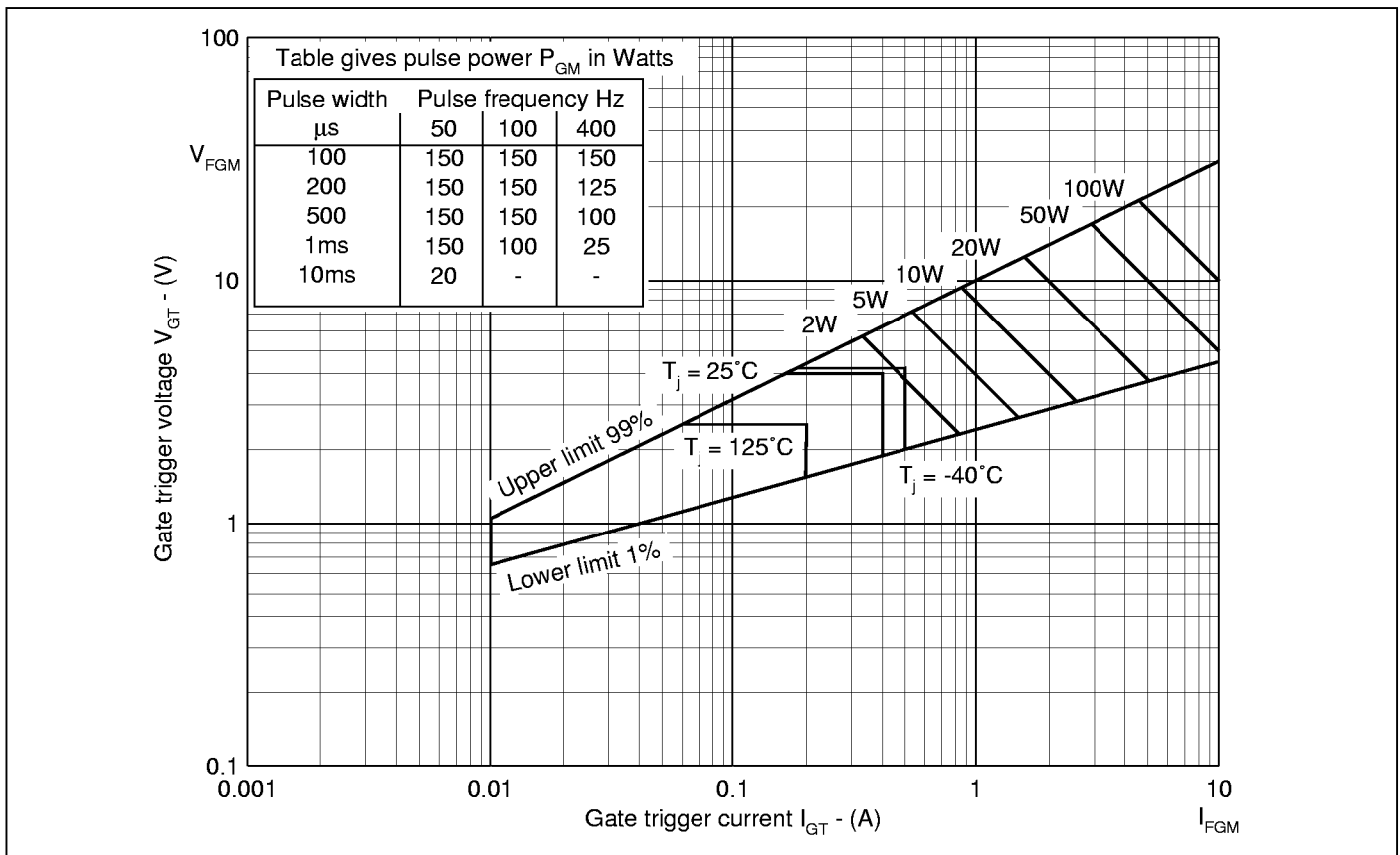


Fig.4 Gate characteristics

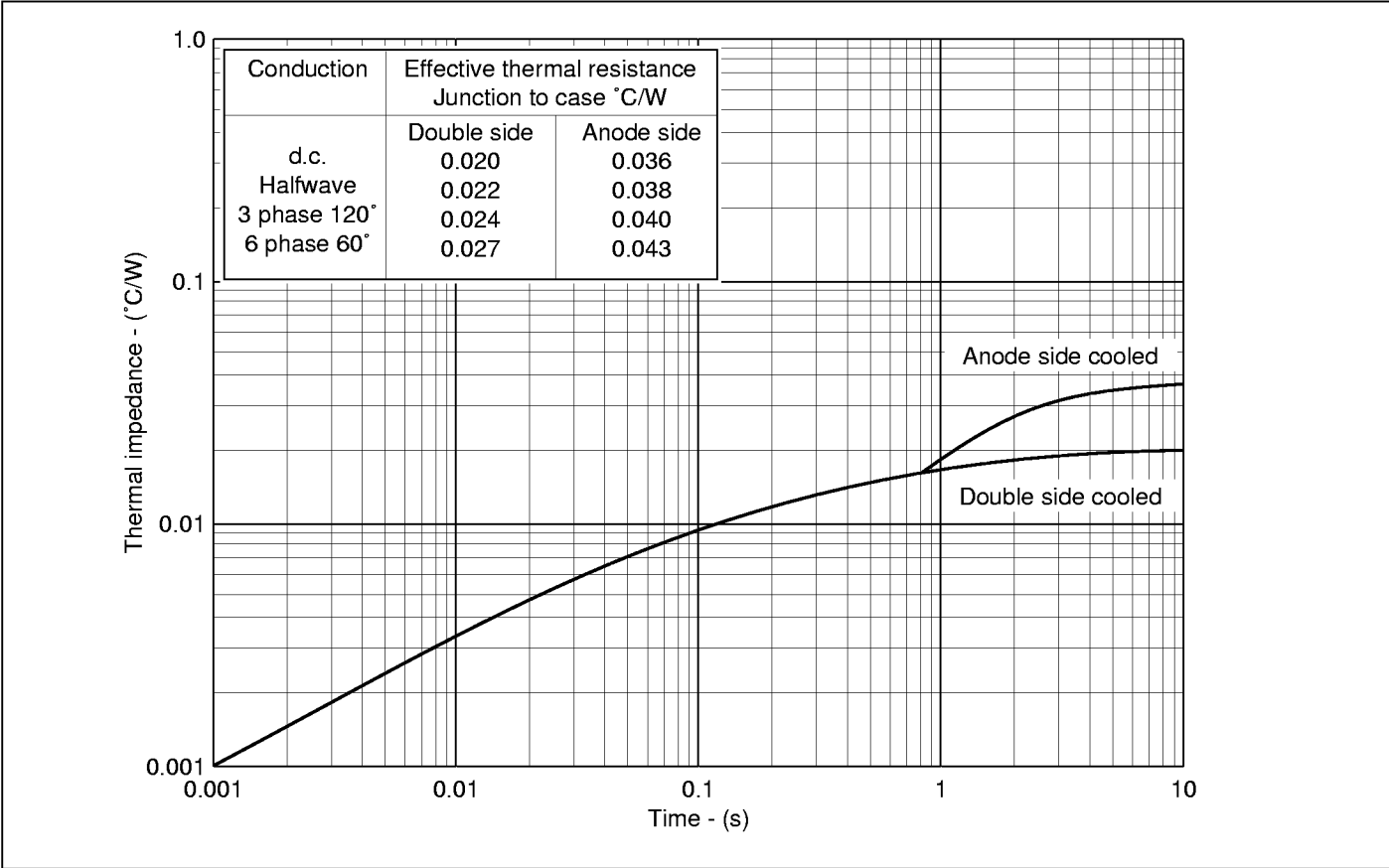


Fig.5 Maximum (limit) transient thermal impedance - junction to case

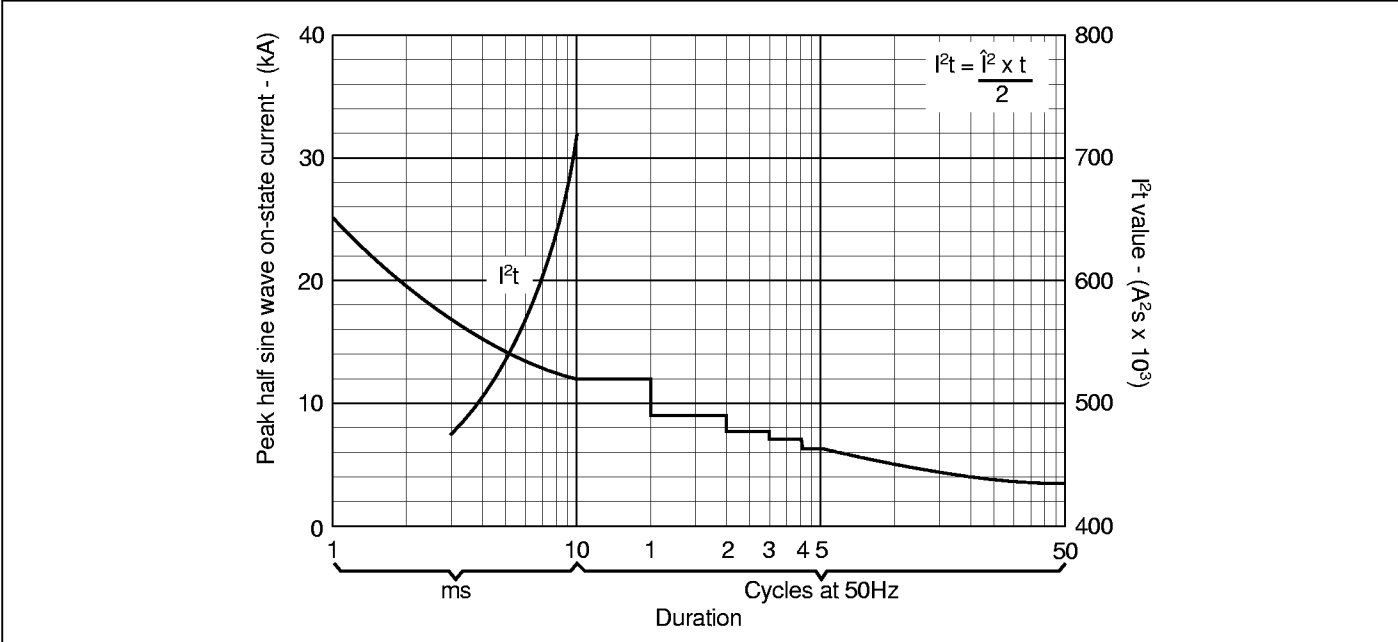
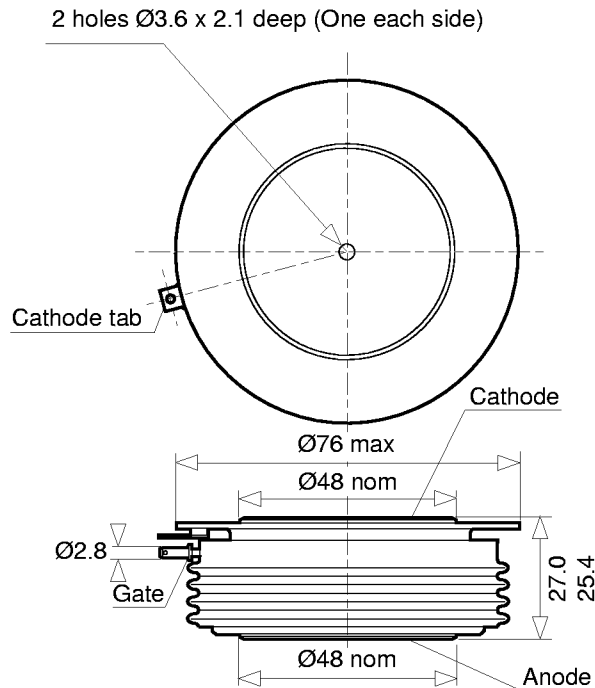


Fig.6 Surge (non-repetitive) on-state current vs time (with 50%  $V_{RRM}$  at  $T_{case} 125^{\circ}C$ )

## DCR1279SD

### PACKAGE OUTLINE - D

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



Weight: 500g



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