

FEATURES

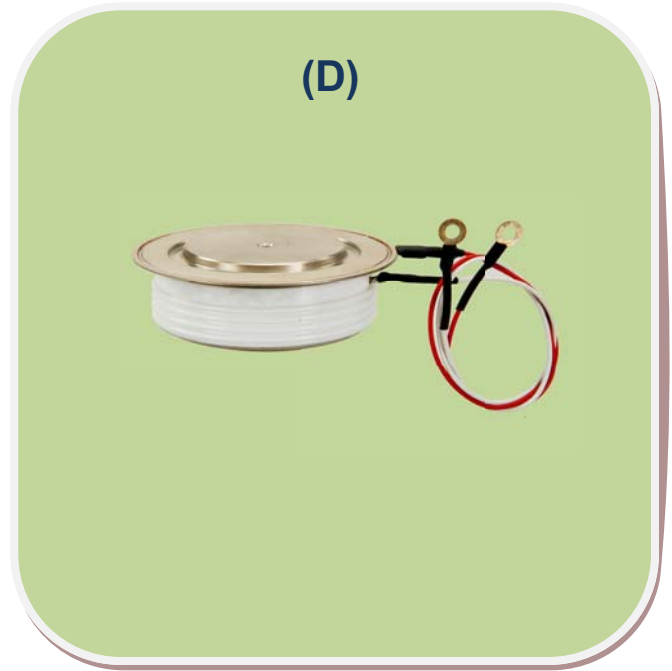
- Double Side Cooling
- High Surge Capability
- High Mean Current
- Fatigue Free

TYPICAL APPLICATIONS

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

TECHNICAL DATA

DEVICE TYPE	V_{DRM}/V_{RRM} (V)	V_{RSM} (V)
DCR1277SD3232	3200	3300
DCR1277SD3434	3400	3500
DCR1277SD3636	3600	3700



CURRENT RATINGS

$T_{case} = 60^{\circ}C$ unless stated otherwise.

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	1259	A
$I_{T(RMS)}$	RMS value	-	1977	A
I_T	Continuous (direct) on-state current	-	1832	A
Single Side Cooled (Anode side)				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	885	A
$I_{T(RMS)}$	RMS value	-	1390	A
I_T	Continuous (direct) on-state current	-	1209	A

CURRENT RATINGS

$T_{case} = 80^{\circ}\text{C}$ unless stated otherwise.

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	995	A
$I_{T(RMS)}$	RMS value	-	1565	A
I_T	Continuous (direct) on-state current	-	1420	A
Single Side Cooled (Anode side)				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	690	A
$I_{T(RMS)}$	RMS value	-	1085	A
I_T	Continuous (direct) on-state current	-	920	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}\text{C}$	19.0	kA
I^2t	I^2t for fusing	$V_R = 50\% V_{RRM} - 1/4$ sine	1.8×10^6	A^2s
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}\text{C}$	23.75	kA
I^2t	I^2t for fusing	$V_R = 0$	2.82×10^6	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	-	0.020	$^{\circ}\text{C}/\text{W}$
		Single side cooled	Anode dc	-	0.036	$^{\circ}\text{C}/\text{W}$
			Cathode dc	-	0.044	$^{\circ}\text{C}/\text{W}$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 22.0kN with mounting compound	Double side	-	0.004	$^{\circ}\text{C}/\text{W}$
			Single side	-	0.008	$^{\circ}\text{C}/\text{W}$
T_{vj}	Virtual junction temperature	On-state (conducting)		-	135	$^{\circ}\text{C}$
		Reverse (blocking)		-	125	$^{\circ}\text{C}$
T_{stg}	Storage temperature range		-55	125	$^{\circ}\text{C}$	
-	Clamping force		20.0	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} , $T_j = 125^{\circ}C$.	-	300	V/ μs	
di/dt	Rate of rise of on-state current	From 67% V_{DRM} to 1000A Gate source 10V, 5 Ω $t_i \leq 0.5\mu s$, $T_j = 125^{\circ}C$	Repetitive 50Hz	-	100	A/ μs
			Non-repetitive	-	150	A/ μs
$V_{T(To)}$	Threshold voltage	At $T_{vj} = 125^{\circ}C$	-	0.95	V	
r_T	On-state slope resistance	At $T_{vj} = 125^{\circ}C$	-	0.45	m Ω	
t_{gd}	Delay time	$V_D = 67\% V_{DRM}$, Gate source 30V, 15 Ω $t_i = 0.5\mu s$, $T_j = 25^{\circ}C$	-	2.5	μs	
t_q	Turn-off time	$I_T = 2000A$, $t_D = 1ms$, $T_j = 125^{\circ}C$, $V_R = 50V$, $di_{RR}/dt = 5A/\mu s$, $V_{DR} = 67\% V_{DRM}$, $dV_{DR}/dt = 20V/\mu s$ linear	500	650	μs	
I_L	Latching current	$T_j = 25^{\circ}C$, $V_D = 5V$	700	1000	mA	
I_H	Holding current	$T_j = 25^{\circ}C$, $R_{g-k} = \infty$	200	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

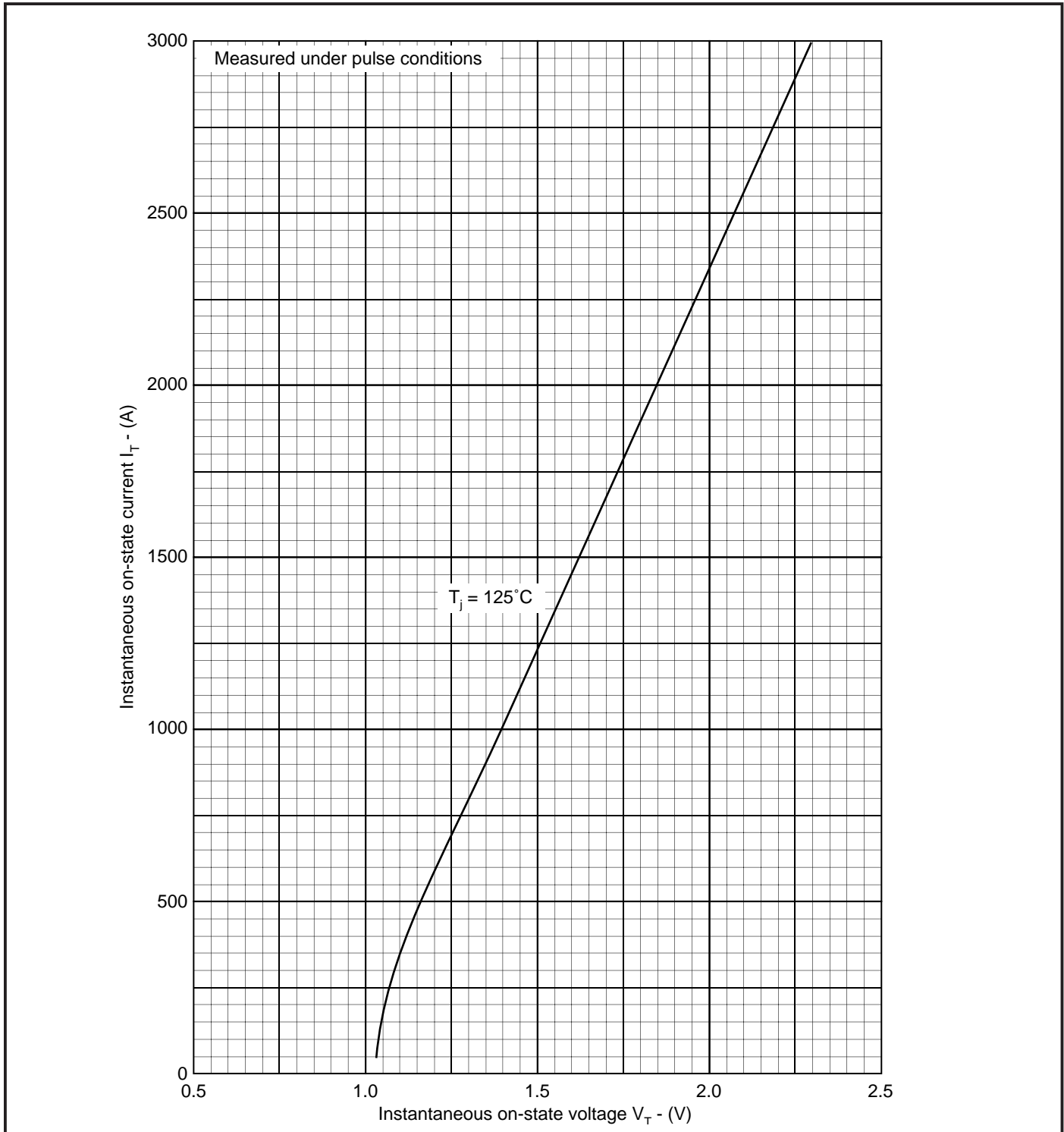


Fig.1 Maximum (limit) on-state characteristics

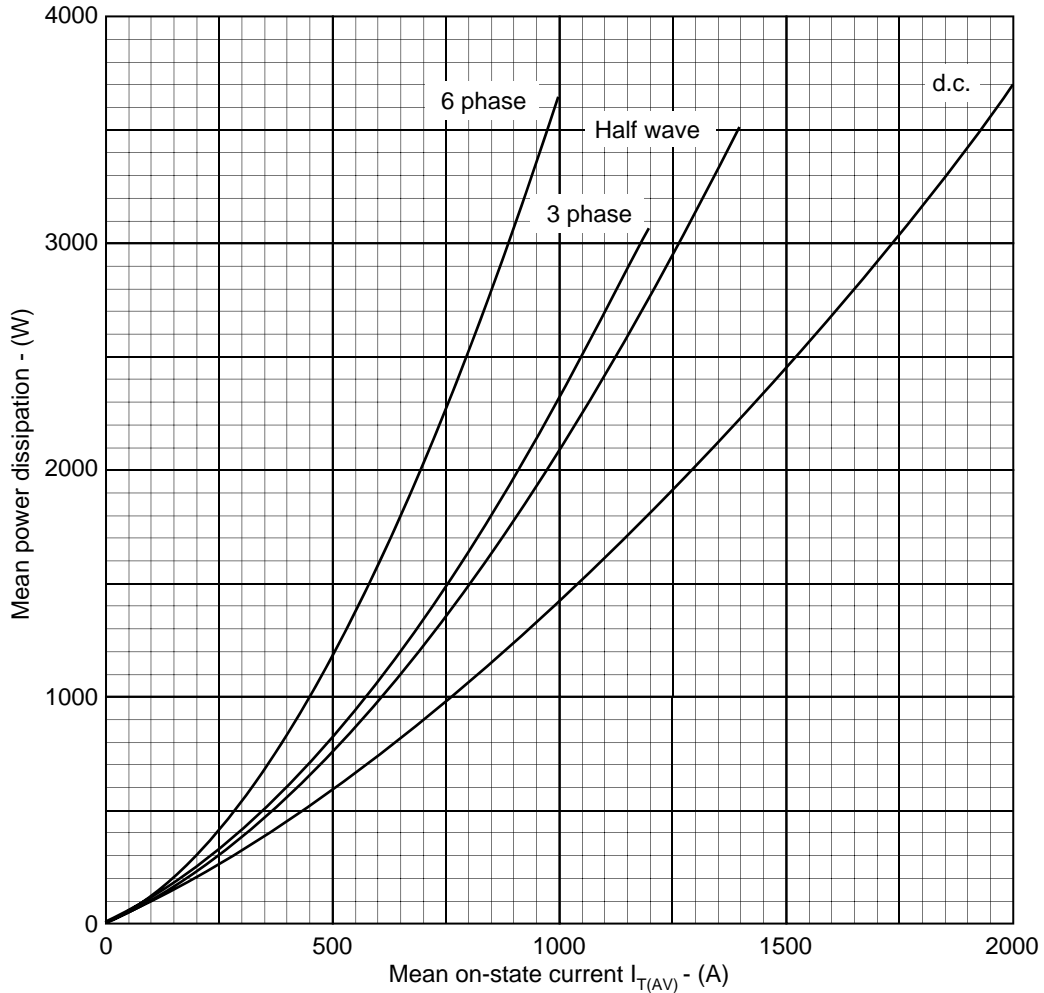


Fig.2 Dissipation curves

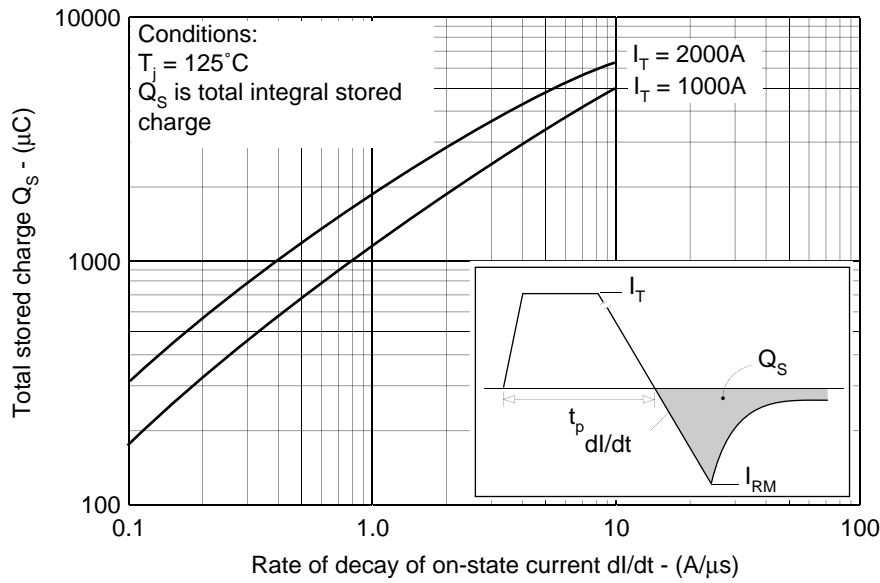


Fig.3 Stored charge

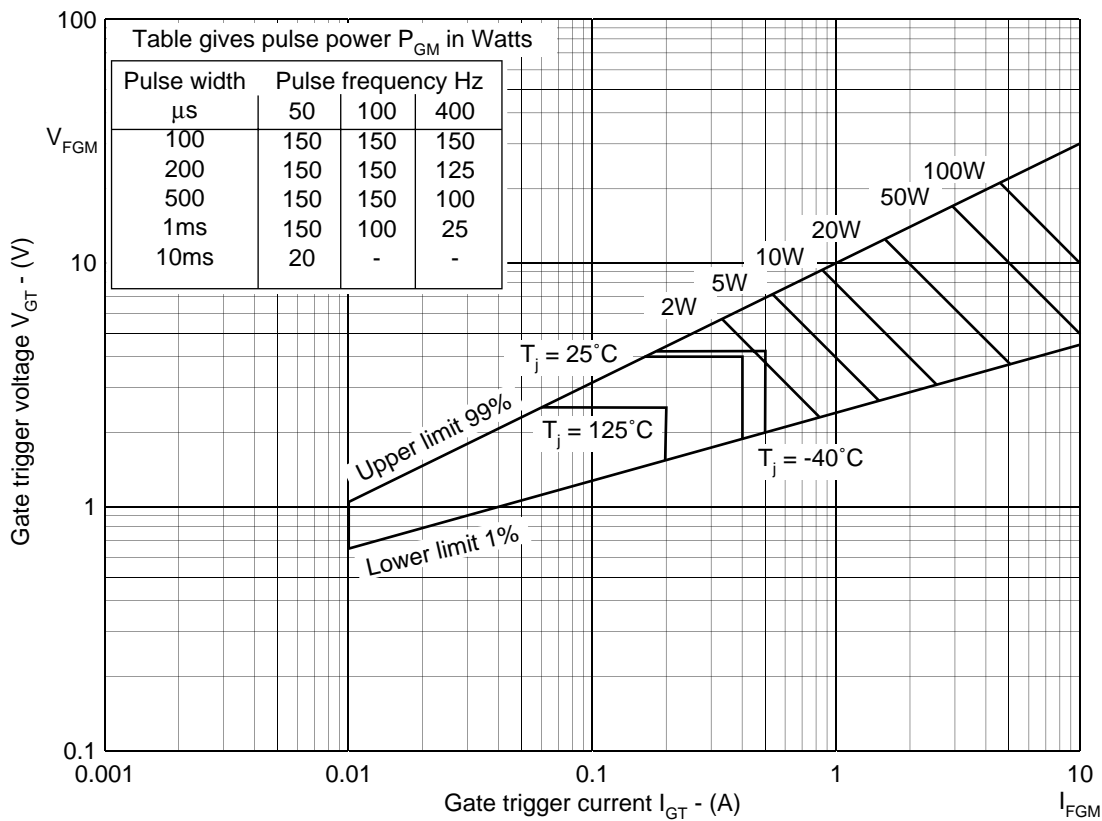


Fig.4 Gate characteristics

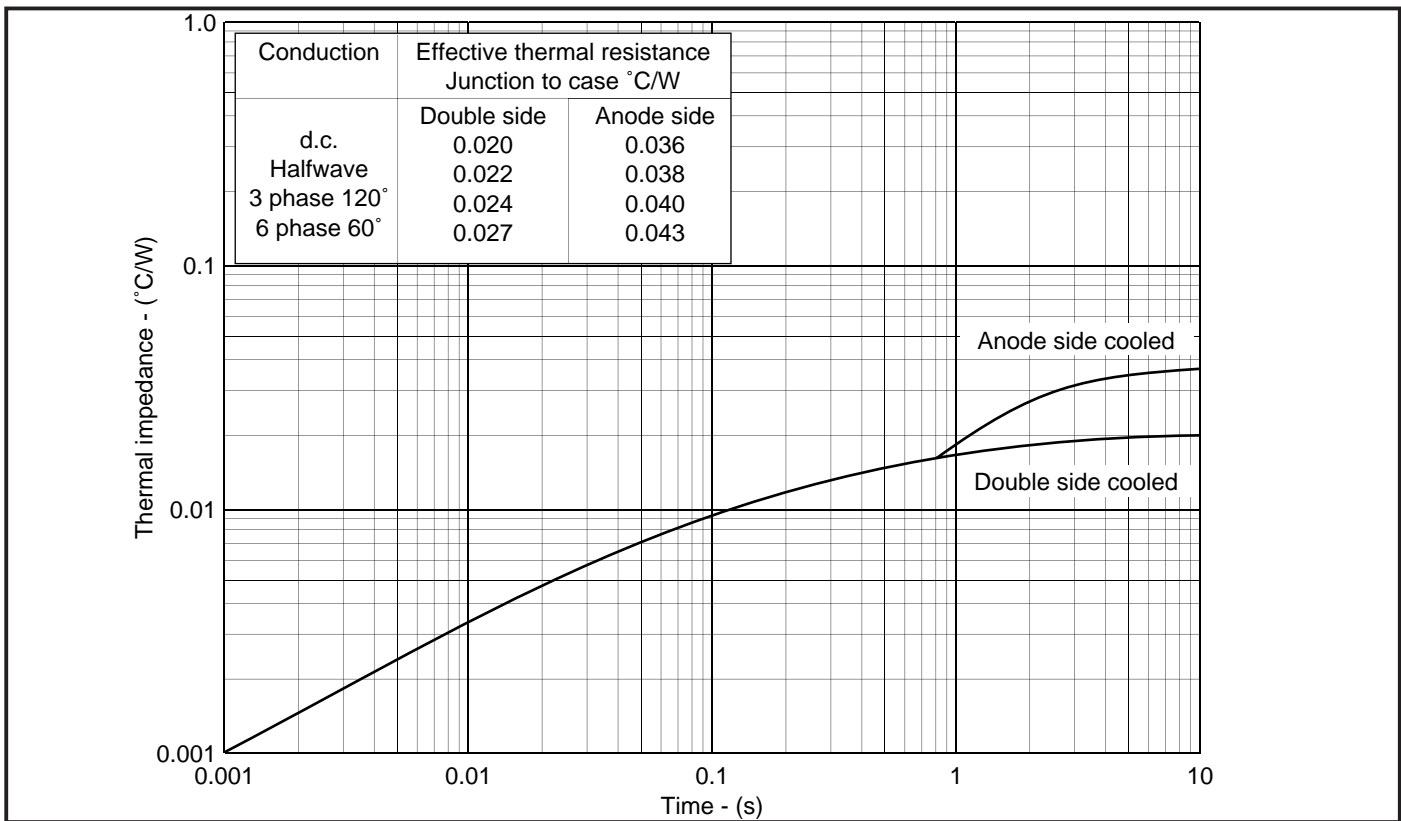


Fig.5 Maximum (limit) transient thermal impedance - junction to case

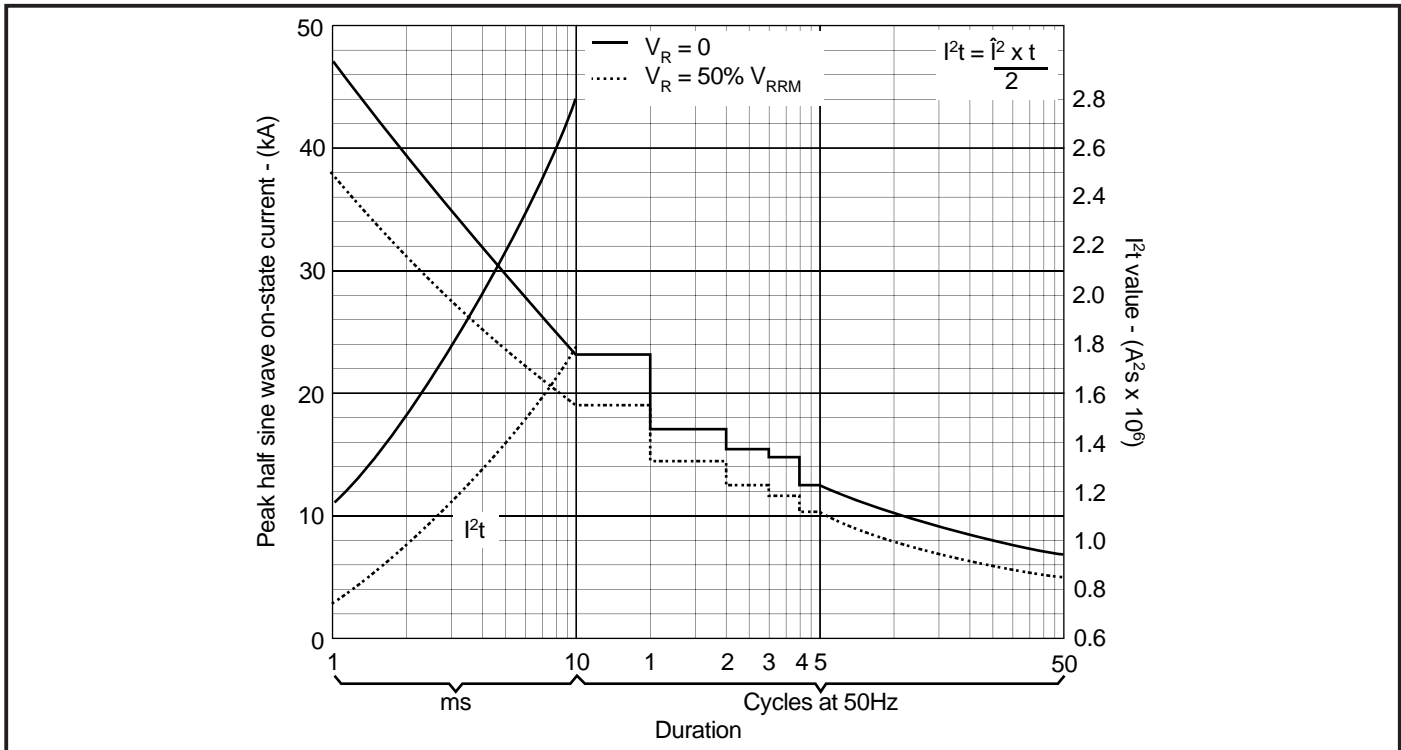
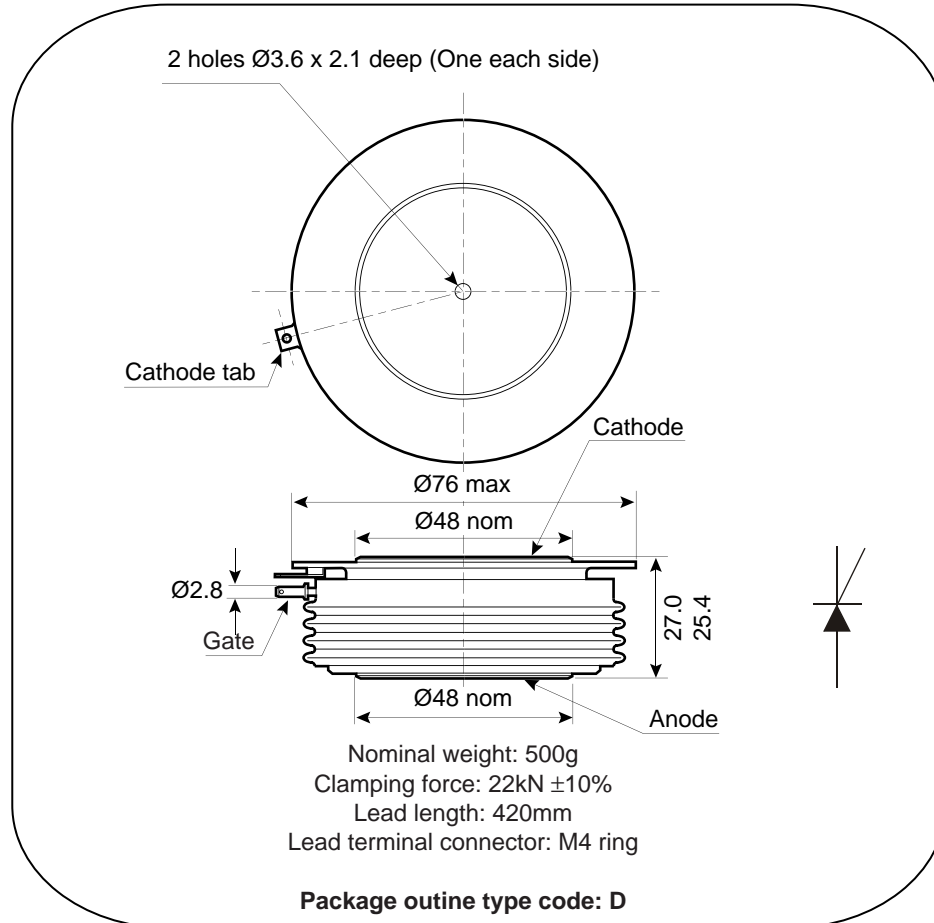


Fig.6 Surge (non-repetitive) on-state current vs time at $T_{case} = 125^{\circ}C$

PACKAGE OUTLINE



All dimensions are in mm.

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