

DCR1675SZ

PHASE CONTROL THYRISTOR

APPLICATIONS

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

FEATURES

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

VOLTAGE RATINGS

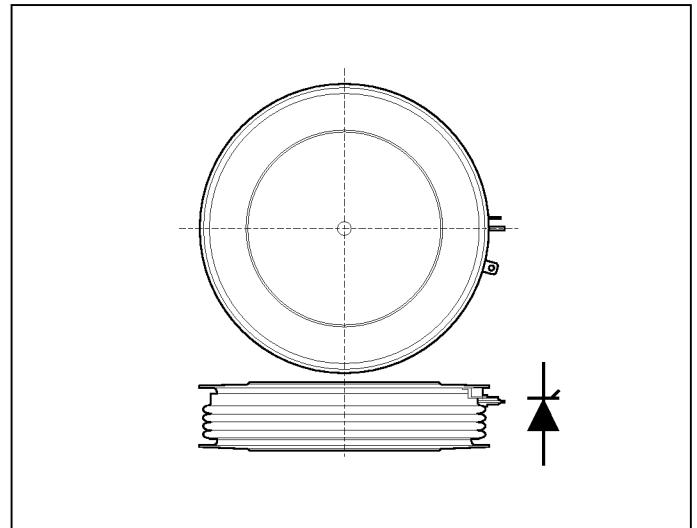
Type Number	Repetitive Peak Voltages V_{DRM} V_{RRM} V	Conditions
DCR1675SZ52	5200	$T_{vj} = 0^\circ$ to 125°C , $I_{DRM} = I_{RRM} = 500\text{mA}$, $V_{DRM}, V_{RRM} t_p = 10\text{ms}$, V_{DSM} & $V_{RSM} =$ V_{DRM} & $V_{RRM} + 100\text{V}$ Respectively
DCR1675SZ51	5100	
DCR1675SZ50	5000	
DCR1675SZ49	4900	
DCR1675SZ48	4800	

Lower voltage grades available.

KEY PARAMETERS

V_{DRM}	5200V
$I_{T(AV)}$	3000A
I_{TSM}	50000A
dV/dt^*	1000V/ μs
di/dt	300A/ μs

*Higher dV/dt selections available



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

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, $T_{case} = 80^\circ\text{C}$	3000	A
$I_{T(RMS)}$	RMS value	$T_{case} = 80^\circ\text{C}$	4710	A
I_T	Continuous (direct) on-state current	$T_{case} = 80^\circ\text{C}$	4200	A
Single Side Cooled (Anode side)				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, $T_{case} = 80^\circ\text{C}$	1920	A
$I_{T(RMS)}$	RMS value	$T_{case} = 80^\circ\text{C}$	3015	A
I_T	Continuous (direct) on-state current	$T_{case} = 80^\circ\text{C}$	2500	A

DCR1675SZ

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}C$	40.0	kA
I^2t	I^2t for fusing	$V_R = 50\% V_{RRM}$ - 1/4 sine	8.0×10^6	A ² s
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}C$	50.0	kA
I^2t	I^2t for fusing	$V_R = 0$	12.5×10^6	A ² s

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units	
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.0065	°C/W
		Single side cooled	Anode dc	-	0.013	°C/W
			Cathode dc	-	0.013	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 83.0kN with mounting compound	Double side	-	0.001	°C/W
			Single side	-	0.002	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	135	°C
		Reverse (blocking)		-	125	°C
T_{slg}	Storage temperature range		-55	125	°C	
-	Clamping force		74.0	91.0	kN	

DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units	
I_{RRM}/I_{DRM}	Peak reverse and off-state current	At V_{RRM}/V_{DRM} , $T_{case} = 125^{\circ}C$	-	500	mA	
dV/dt	Maximum linear rate of rise of off-state voltage	To 67% V_{DRM} , $T_j = 125^{\circ}C$, gate open circuit.	-	1000	V/ μ s	
dI/dt	Rate of rise of on-state current	From 67% V_{DRM} to 1000A Gate source 30V, 10 Ω $t_r = 0.5\mu$ s to 1A, $T_j = 125^{\circ}C$	Repetitive 50Hz	-	150	A/ μ s
			Non-repetitive	-	300	A/ μ s
$V_{T(To)}$	Threshold voltage	At $T_{vj} = 125^{\circ}C$	-	1.0	V	
r_T	On-state slope resistance	At $T_{vj} = 125^{\circ}C$	-	0.15	m Ω	
t_{gd}	Delay time	$V_D = 67\% V_{DRM}$, Gate source 20V, 10 Ω $t_r = 0.5\mu$ s, $T_j = 25^{\circ}C$	-	1.1	μ s	
I_L	Latching current	$T_j = 25^{\circ}C$, $V_D = 5V$	-	650	mA	
I_H	Holding current	$T_j = 25^{\circ}C$, $R_{g-k} = \infty$	-	200	mA	

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Max.	Units
V_{GT}	Gate trigger voltage	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	3.5	V
I_{GT}	Gate trigger current	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	500	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

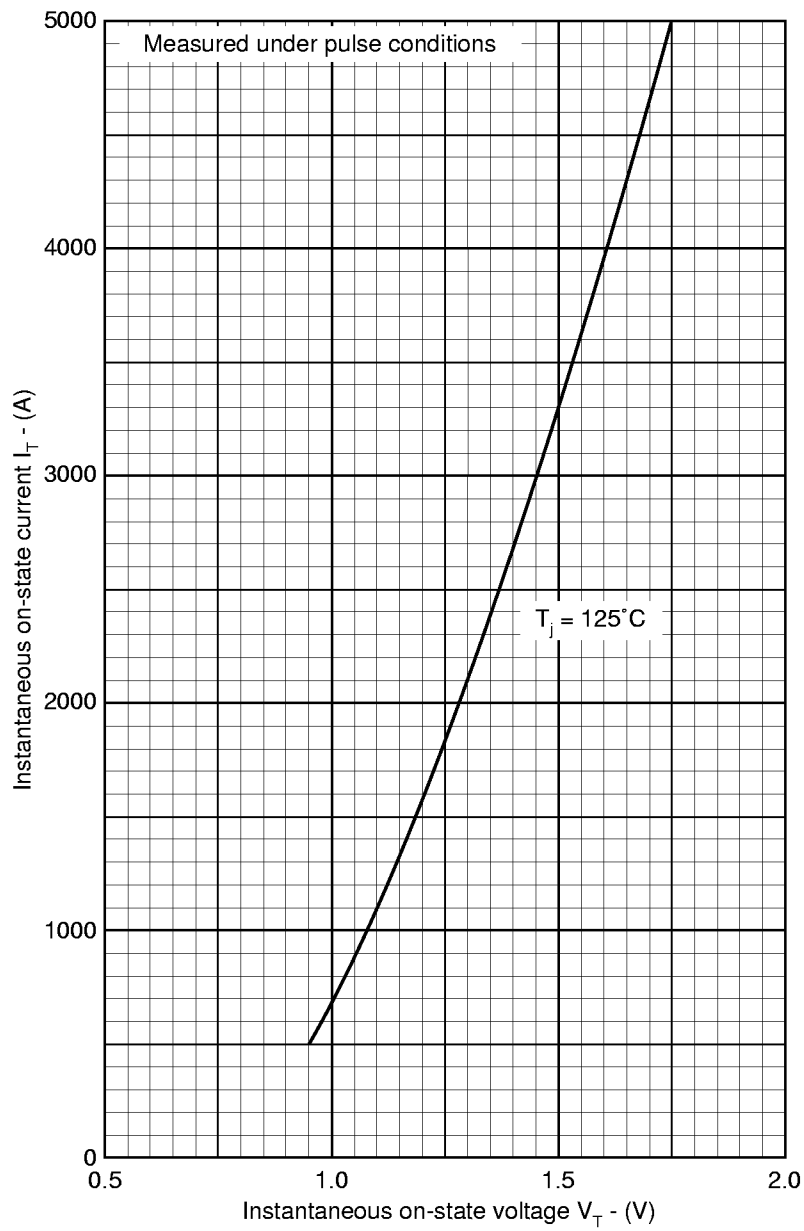


Fig.1 Maximum (limit) on-state characteristics

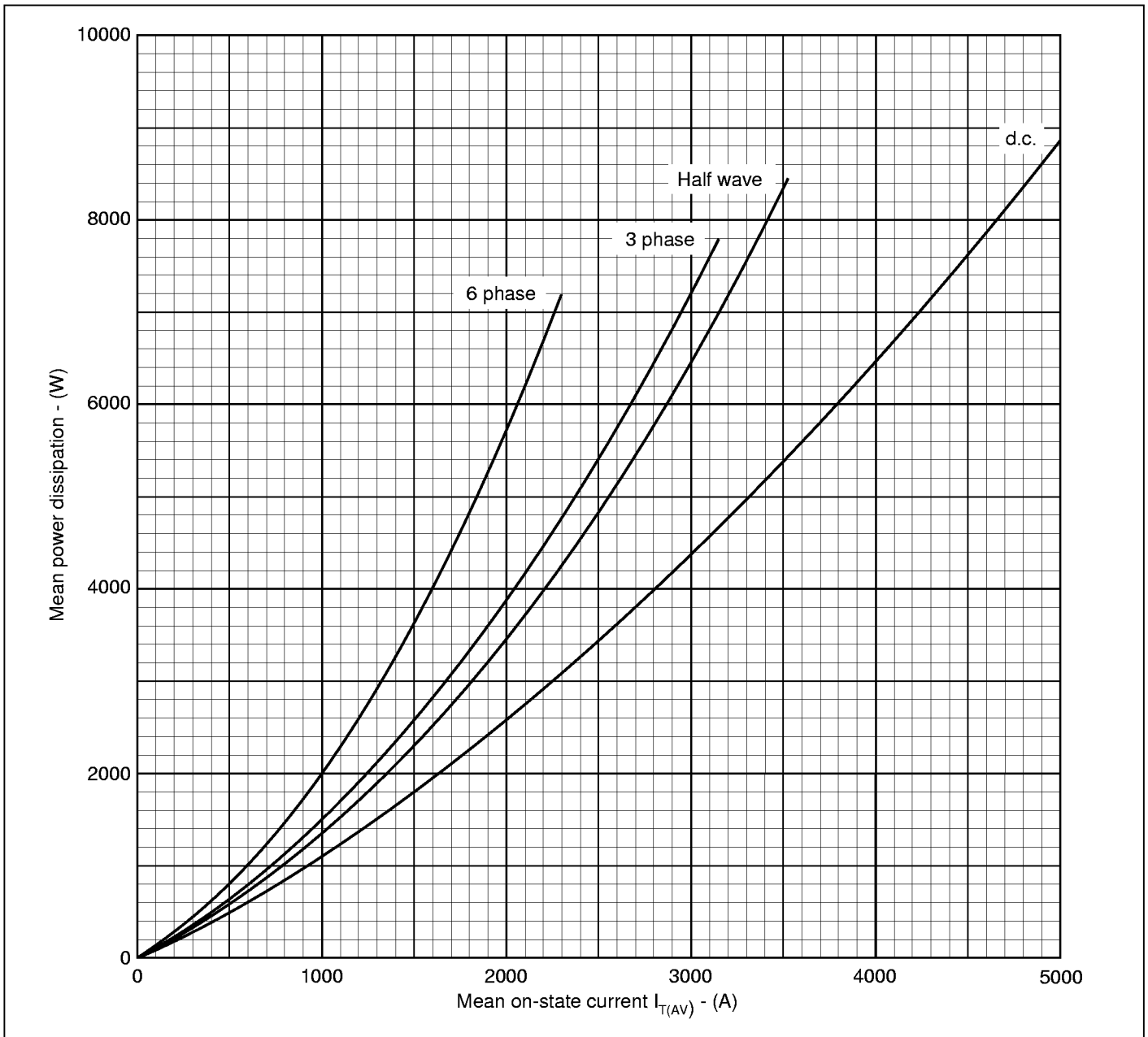


Fig.2 Dissipation curves

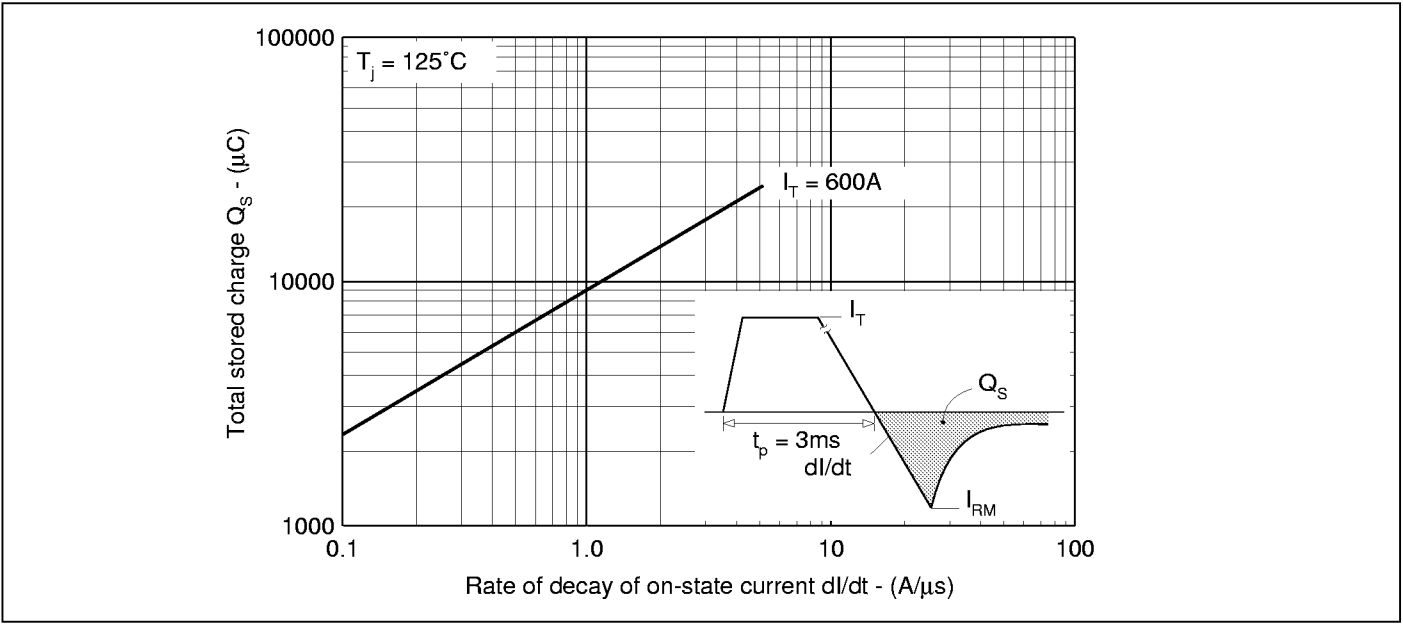


Fig.3 Stored charge

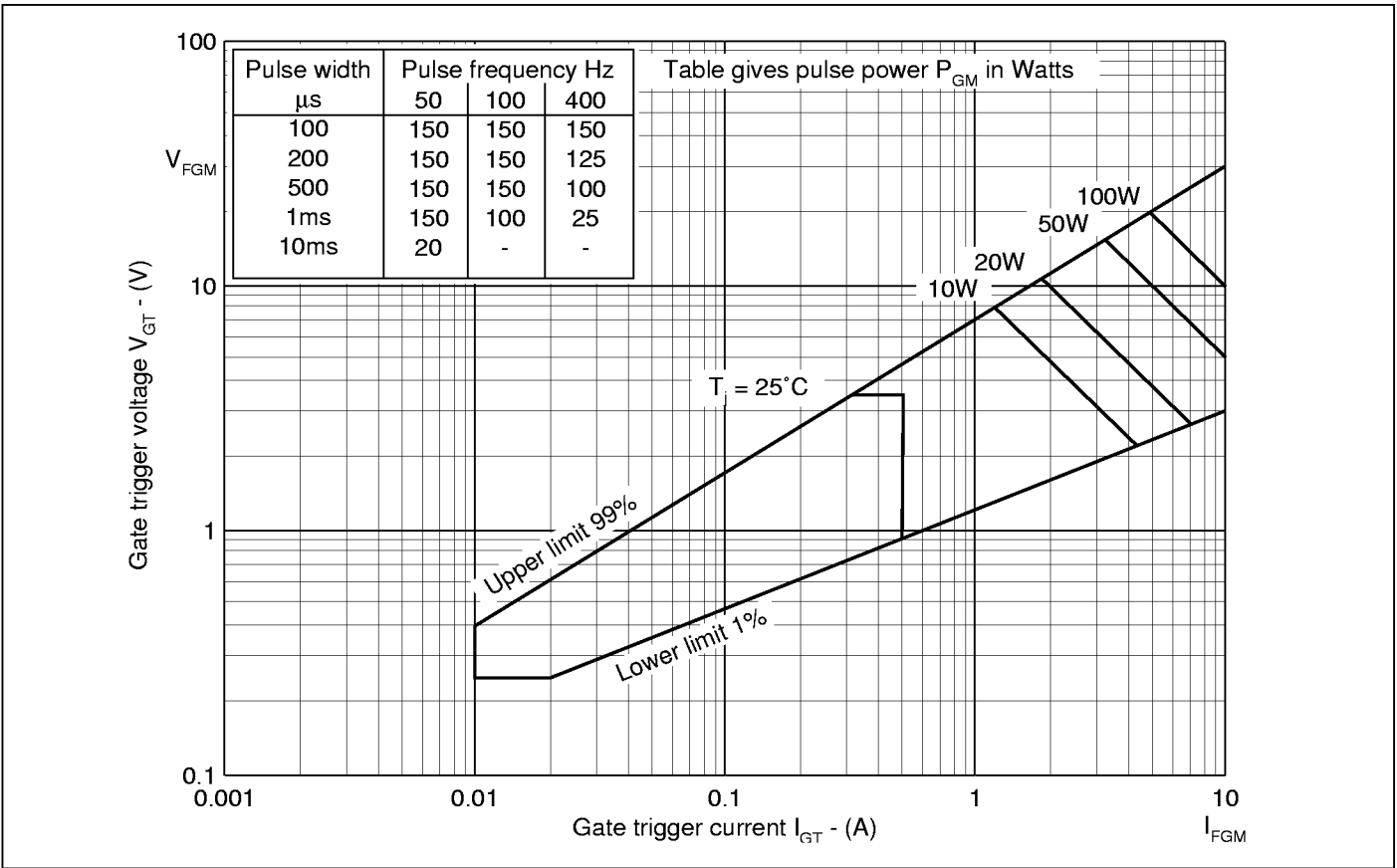


Fig.4 Gate characteristics

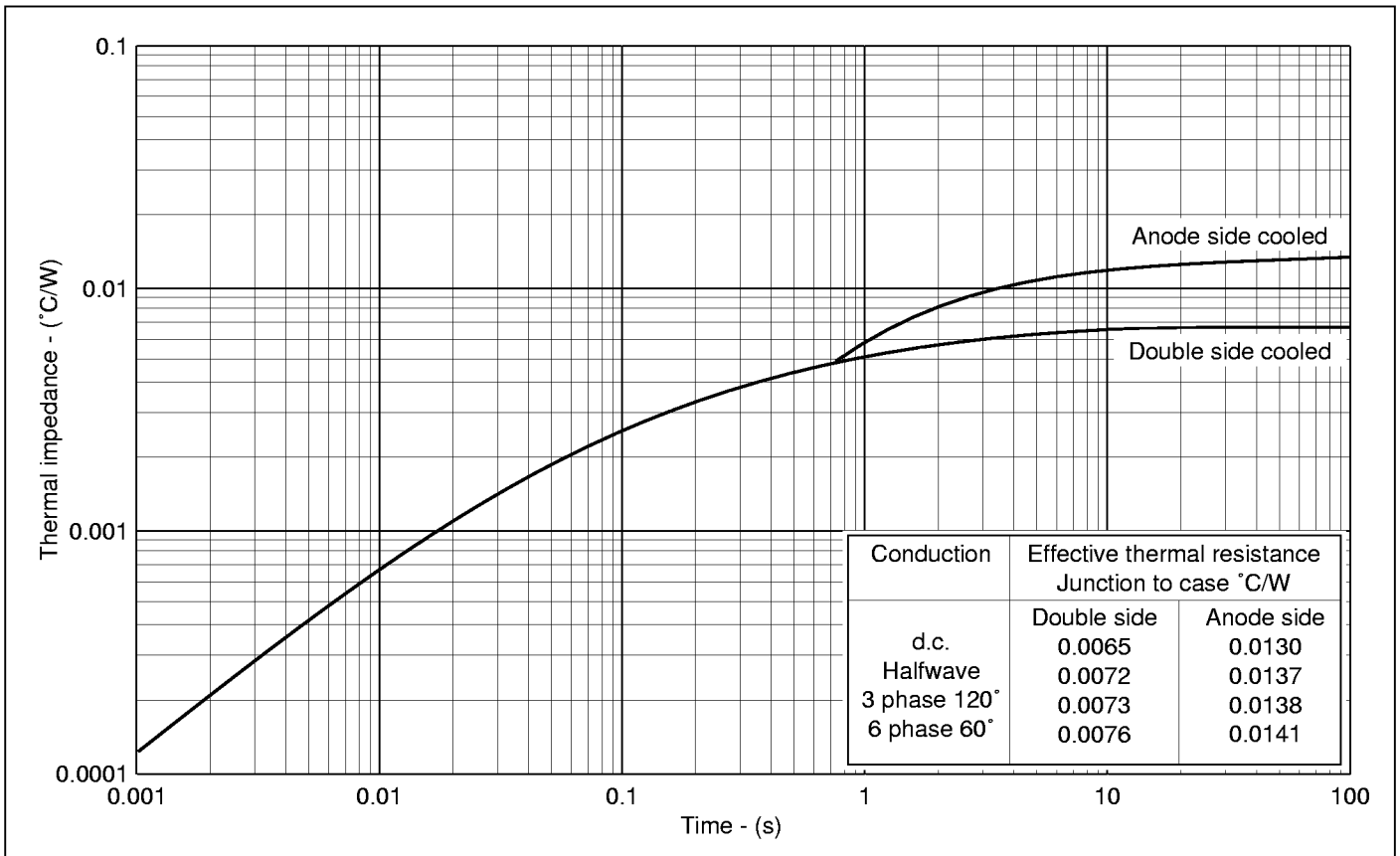


Fig.5 Maximum (limit) transient thermal impedance - junction to case

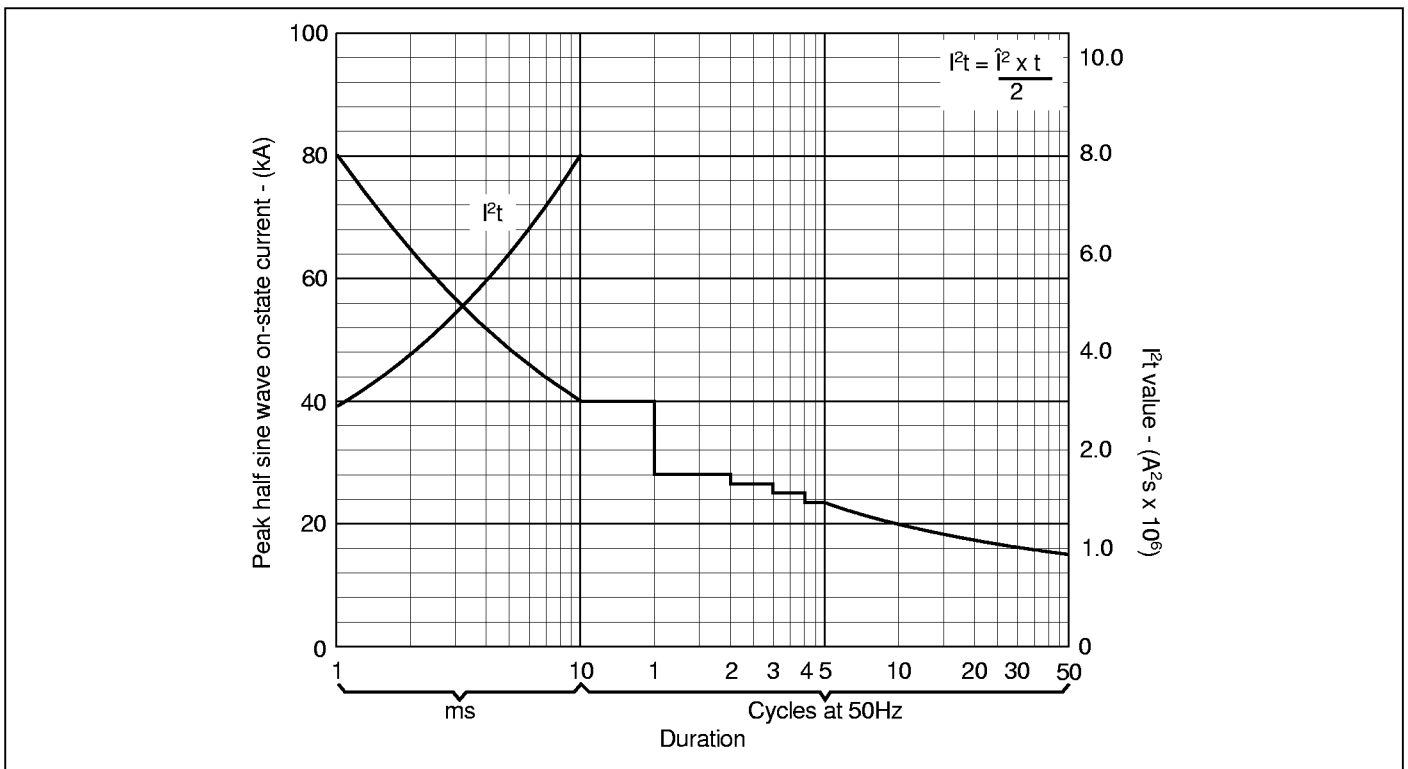
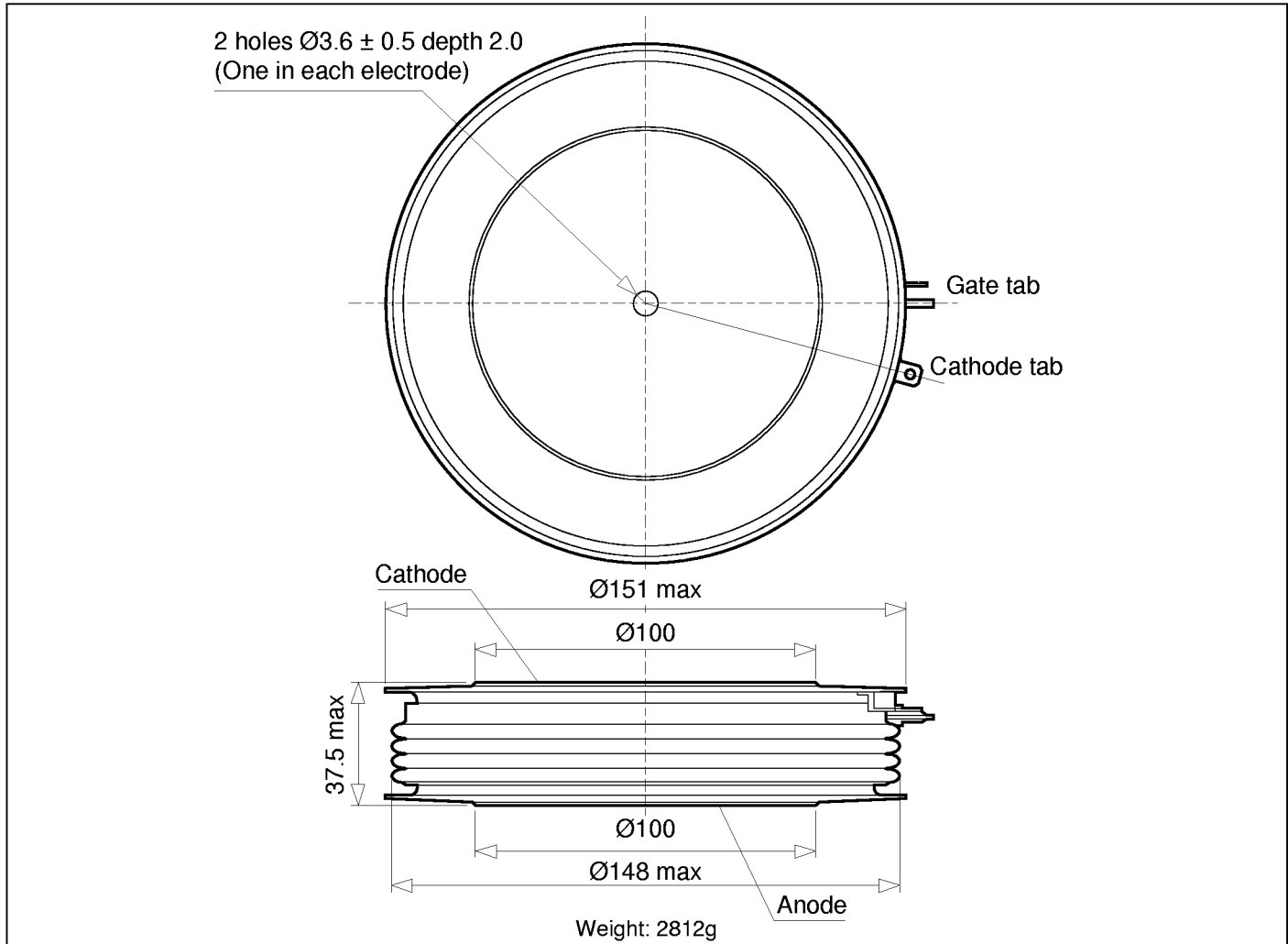


Fig.6 Surge (non-repetitive) on-state current vs time (with 50% V_{RRM} at $T_{case} 125^\circ C$)

DCR1675SZ

PACKAGE OUTLINE - Z

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



HEADQUARTERS OPERATIONS
GEC PLESSEY SEMICONDUCTORS
Cheney Manor, Swindon,
Wiltshire, SN2 2QW, United Kingdom.
Tel: + 44 (0)1793 518000
Fax: + 44 (0)1793 518411

GEC PLESSEY SEMICONDUCTORS
P.O. Box 660017
1500 Green Hills Road,
Scotts Valley, California 95066-4922,
United States of America.
Tel: + 1 (408) 438 2900
Fax: + 1 (408) 438 5576/6231

<http://www.gpsemi.com>
POWER PRODUCT CUSTOMER SERVICE CENTRES

- **FRANCE, BENELUX & SPAIN.** 2 rue Henri-Bergson, 92665 Asnieres Cedex.
Tel: + 33 1 40 80 54 00. Fax: + 33 1 40 80 55 87.
- **GERMANY.** Ungererstrasse 129, 80505 München.
Tel: + 49 (0)89 36 09 060. Fax: + 49 (0)89 36 09 06 55.
- **NORTH AMERICA.** At Dedham Place, Suite 125, 3 Allied Drive, Dedham. MA 02026.
Tel: + 1 617 251 0126. Fax: + 1 617 251 0106.
- **UNITED KINGDOM.** Doddington Road, Lincoln. LN6 3LF.
Tel: + 44 (0)1522 500500. Fax: + 44 (0)1522 510550.

These are supported by Agents and Distributors in major countries world-wide.

© GEC Plessey Semiconductors 1997 Publication No. DS4648-5 Issue 5.2 June 1997
TECHNICAL DOCUMENTATION - NOT FOR RESALE. PRINTED IN UNITED KINGDOM.

This publication is issued to provide information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose nor form part of any order or contract nor to be regarded as a representation relating to the products or services concerned. No warranty or guarantee express or implied is made regarding the capability, performance or suitability of any product or service. The Company reserves the right to alter without prior notice the specification, design or price of any product or service. Information concerning possible methods of use is provided as a guide only and does not constitute any guarantee that such methods of use will be satisfactory in a specific piece of equipment. It is the user's responsibility to fully determine the performance and suitability of any equipment using such information and to ensure that any publication or data used is up to date and has not been superseded. These products are not suitable for use in any medical products whose failure to perform may result in significant injury or death to the user. All products and materials are sold and services provided subject to the Company's conditions of sale, which are available on request.