

**FEATURES**

- Double Side Cooling
- High Surge Capability

**APPLICATIONS**

- High Power Drives
- High Voltage Power Supplies
- Static Switches

**VOLTAGE RATINGS**

Part and Ordering Number	Repetitive Peak Voltages $V_{DRM}$ and $V_{RRM}$ V	Conditions
DCR4440W22	2200	$T_{vj} = -40^{\circ}\text{C}$ to $125^{\circ}\text{C}$ , $I_{DRM} = I_{RRM} = 400\text{mA}$ , $V_{DRM}, V_{RRM} t_p = 10\text{ms}$ , $V_{DSM} \& V_{RSM} =$ $V_{DRM} \& V_{RRM} + 100\text{V}$ respectively
DCR4440W20	2000	
DCR4440W18	1800	

Lower voltage grades available.

**ORDERING INFORMATION**

When ordering, select the required part number shown in the Voltage Ratings selection table.

For example:

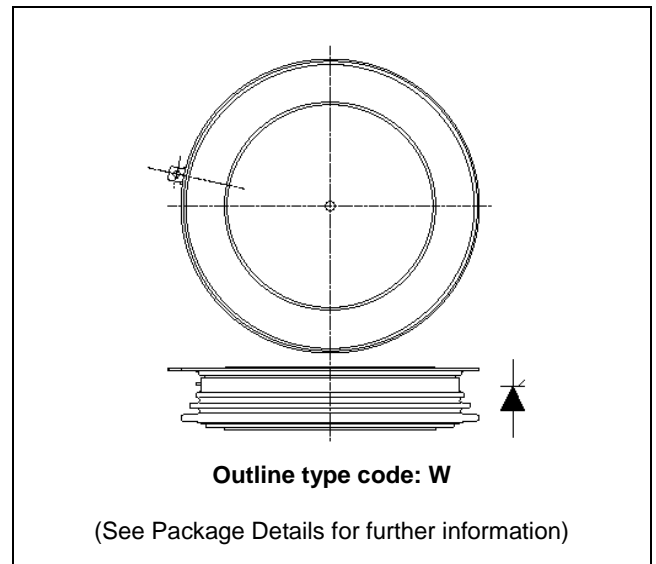
**DCR4440W22**

Note: Please use the complete part number when ordering and quote this number in any future correspondence relating to your order.

**KEY PARAMETERS**

$V_{DRM}$	<b>2200 V</b>
$I_{T(AV)}$	<b>4440 A</b>
$I_{TSM}$	<b>64500 A</b>
$dV/dt^*$	<b>1000 V/<math>\mu\text{s}</math></b>
$dI/dt$	<b>250 A/<math>\mu\text{s}</math></b>

\* Higher  $dV/dt$  selections available



**Fig. 1 Package outline**

## CURRENT RATINGS

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

Symbol	Parameter	Test Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	4440	A
$I_{T(RMS)}$	RMS value	-	6970	A
$I_T$	Continuous (direct) on-state current	-	6280	A

## SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
$I_{TSM}$	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 125^{\circ}\text{C}$	64.5	kA
$I^2t$	$I^2t$ for fusing	$V_R = 0$	20.80	$\text{MA}^2\text{s}$

## THERMAL AND MECHANICAL RATINGS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance – junction to case	Double side cooled      DC	-	0.007	$^{\circ}\text{C/W}$
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Double side cooled      DC	-	0.002	$^{\circ}\text{C/W}$
$T_{vj}$	Virtual junction temperature	Blocking $V_{DRM}/V_{RRM}$	-	125	$^{\circ}\text{C}$
$T_{stg}$	Storage temperature range		-40	140	$^{\circ}\text{C}$
$F_m$	Clamping force		62	78	kN

## DYNAMIC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
$I_{RRM}/I_{DRM}$	Peak reverse and off-state current	At $V_{RRM}/V_{DRM}$ , $T_{case} = 125^{\circ}C$	-	400	mA
$dV/dt$	Max. linear rate of rise of off-state voltage	To 67% $V_{DRM}$ , $T_j = 125^{\circ}C$ , gate open	1000	-	V/ $\mu$ s
$dI/dt$	Rate of rise of on-state current	From 67% $V_{DRM}$ to 4000A Gate source 30V, 10 $\Omega$ , $t_r < 0.5\mu$ s, $T_j = 125^{\circ}C$			
		Repetitive 50Hz	-	250	A/ $\mu$ s
		Non-repetitive	-	1000	A/ $\mu$ s
$V_T$	On-state voltage	$I_T = 3000A$ , $T_{case} = 125^{\circ}C$		1.15	V
$V_{T(TO)}$	Threshold voltage	$T_{case} = 125^{\circ}C$	-	0.86	V
$r_T$	On-state slope resistance	$T_{case} = 125^{\circ}C$	-	0.095	m $\Omega$
$t_{gd}$	Delay time	$V_D = 67\% V_{DRM}$ , gate source 30V, 10 $\Omega$ $t_r = 0.5\mu$ s, $T_j = 25^{\circ}C$	-	3.0	$\mu$ s
$t_q$	Turn-off time	$T_j = 125^{\circ}C$ , $V_R = 100V$ , $dI/dt = 5A/\mu$ s, $dV_{DR}/dt = 20V/\mu$ s linear to 67% $V_{DRM}$	-	400	$\mu$ s
$Q_s$	Stored charge	$I_T = 4000A$ , $t_p = 1000\mu$ s, $T_j = 125^{\circ}C$ , $dI/dt = 5A/\mu$ s,	-	5000	$\mu$ C
$I_L$	Latching current	$T_j = 25^{\circ}C$ ,	-	1	A
$I_H$	Holding current	$T_j = 25^{\circ}C$ ,	-	200	mA

## GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
$V_{GT}$	Gate trigger voltage	$V_{DRM} = 5V$ , $T_{case} = 25^{\circ}C$	3	V
$V_{GD}$	Gate non-trigger voltage	At 40% $V_{DRM}$ , $T_{case} = 125^{\circ}C$	0.3	V
$I_{GT}$	Gate trigger current	$V_{DRM} = 5V$ , $T_{case} = 25^{\circ}C$	300	mA
$I_{GD}$	Gate non-trigger current	At 40% $V_{DRM}$ , $T_{case} = 125^{\circ}C$	20	mA

CURVES

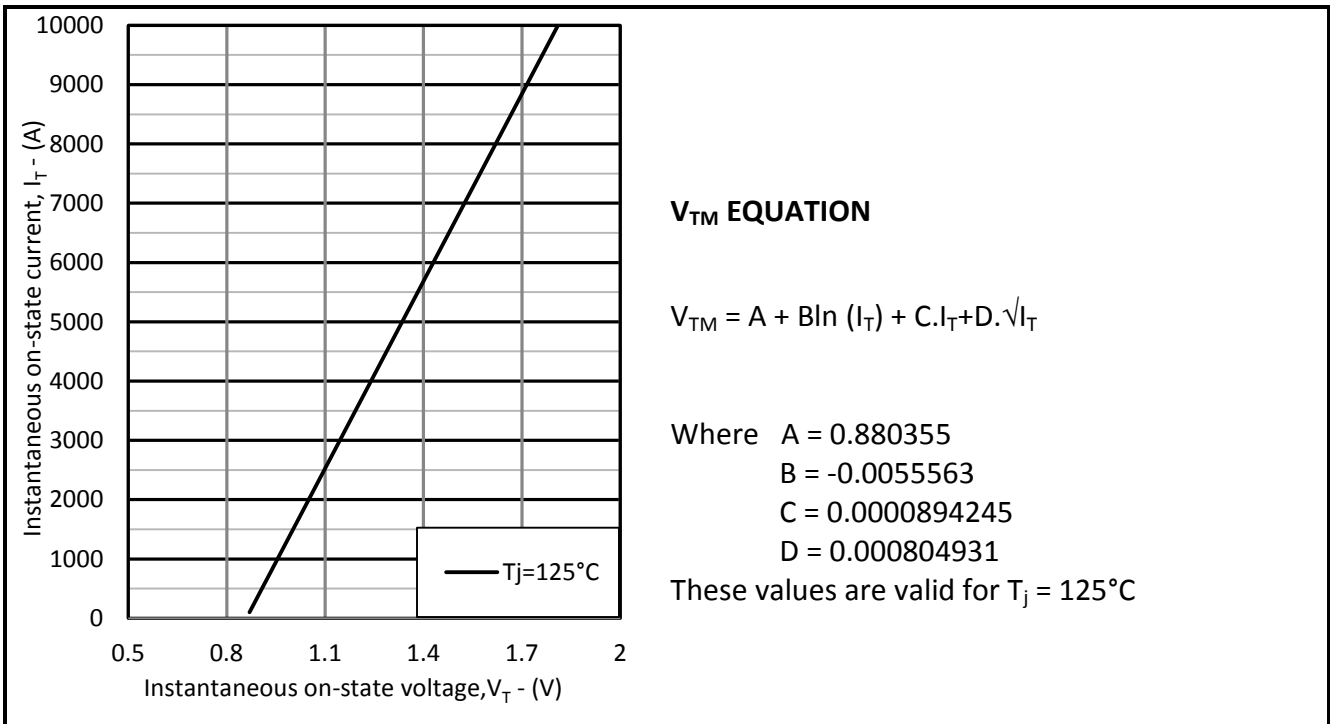


Fig.2 Maximum & minimum on-state characteristics

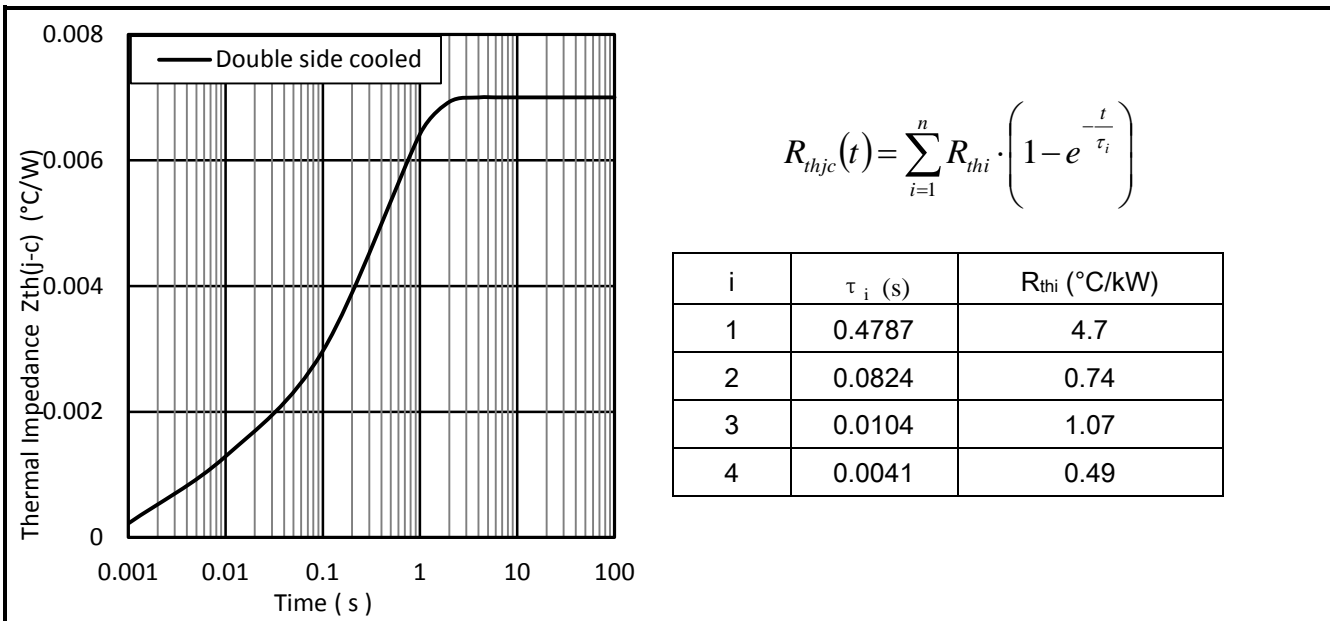


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)

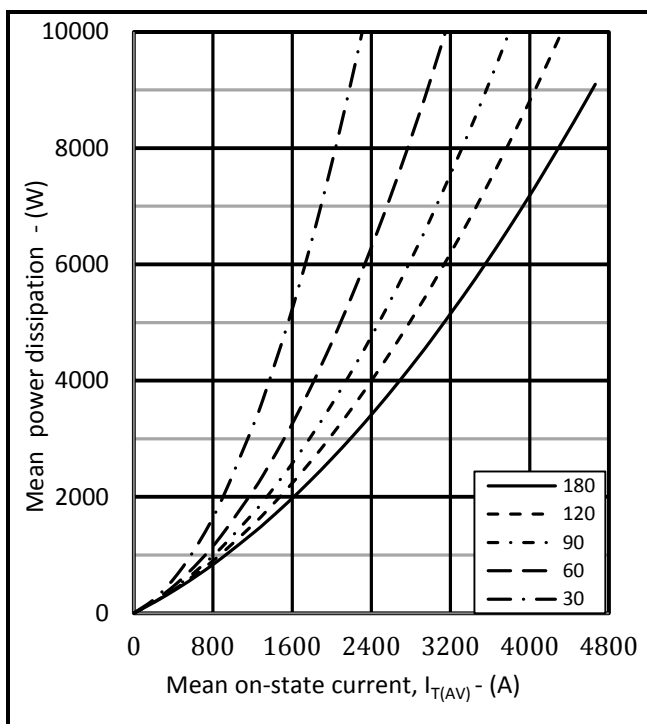


Fig.4 On-state power dissipation – sine wave

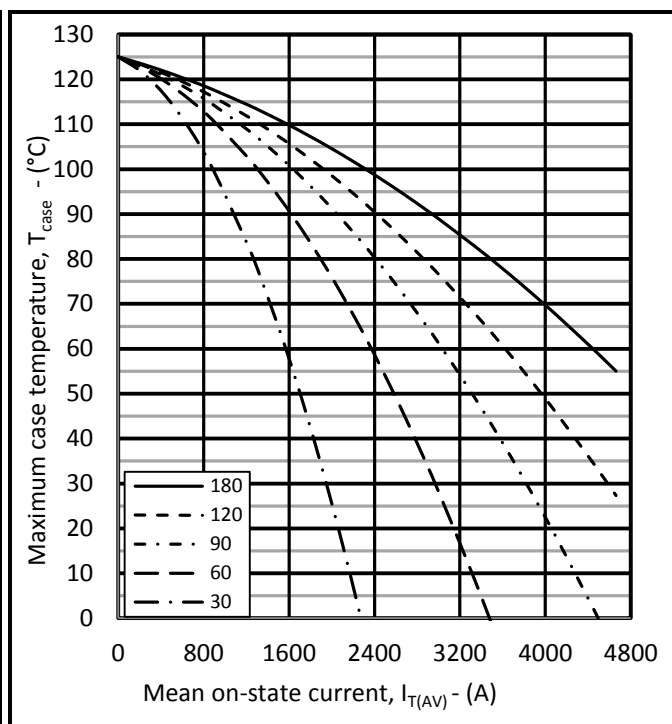


Fig.5 Maximum permissible case temperature, double side cooled – sine wave

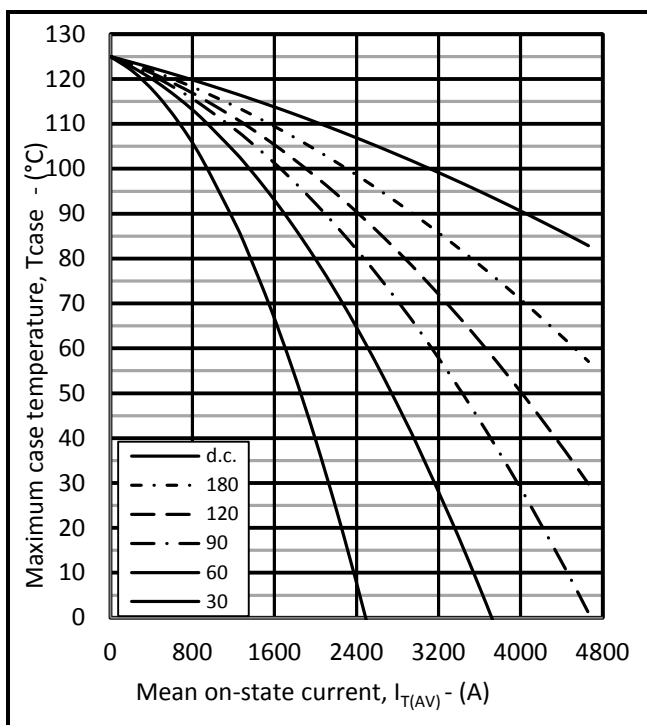


Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave

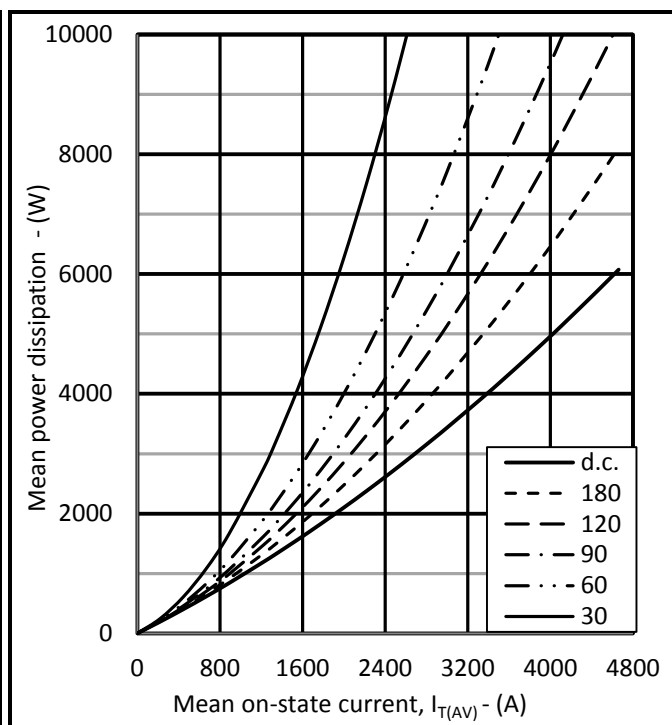


Fig.7 On-state power dissipation – rectangular wave

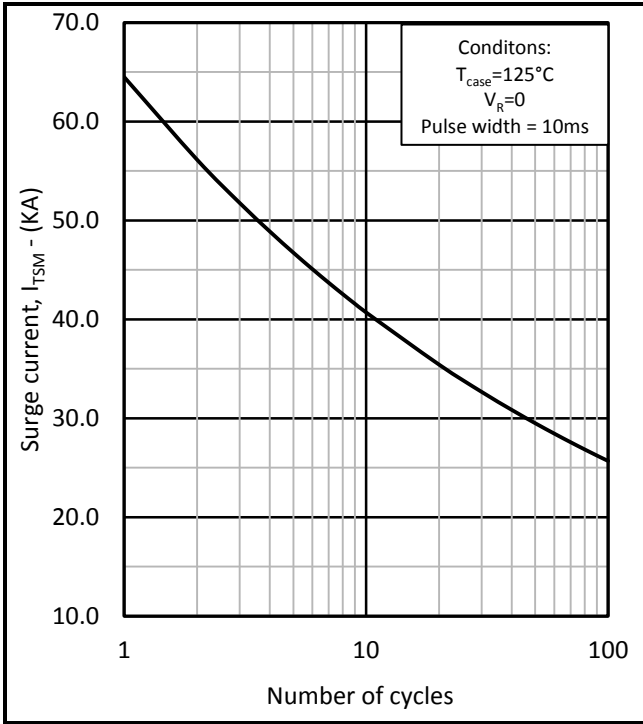


Fig.8 Multi-cycle surge current

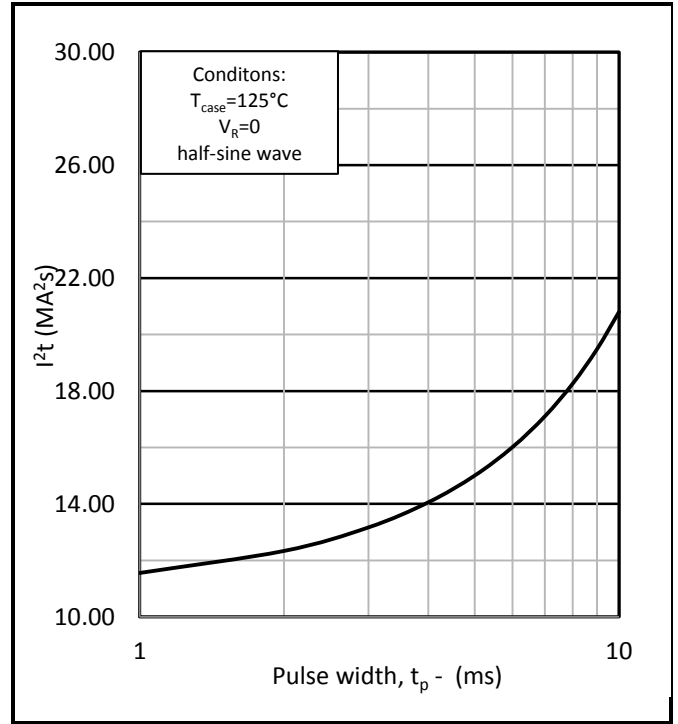


Fig.9 Single-cycle  $I^2t$

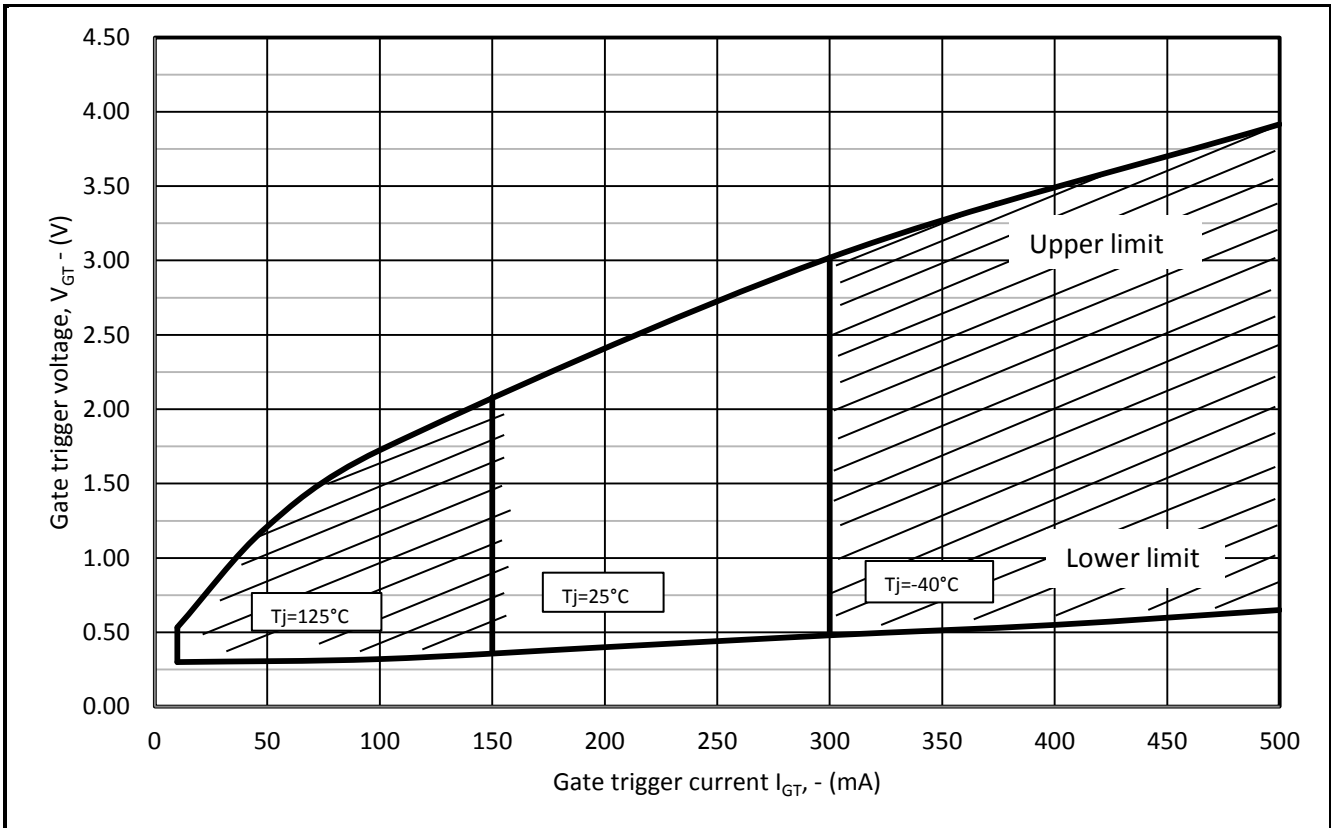


Fig.12 Gate characteristics

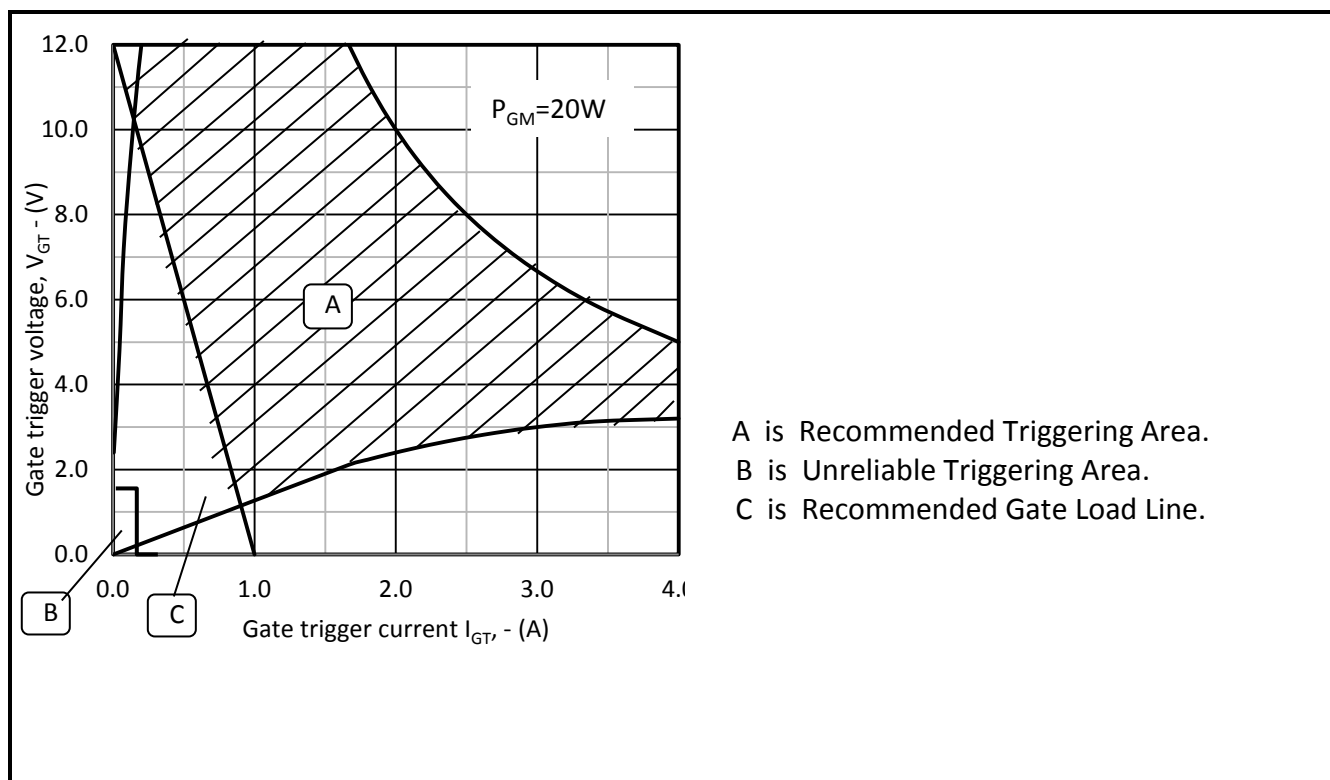


Fig.13 Gate characteristics

PACKAGE DETAILS

For further package information, please contact Customer Services. All dimensions in mm, unless stated otherwise. DO NOT SCALE.

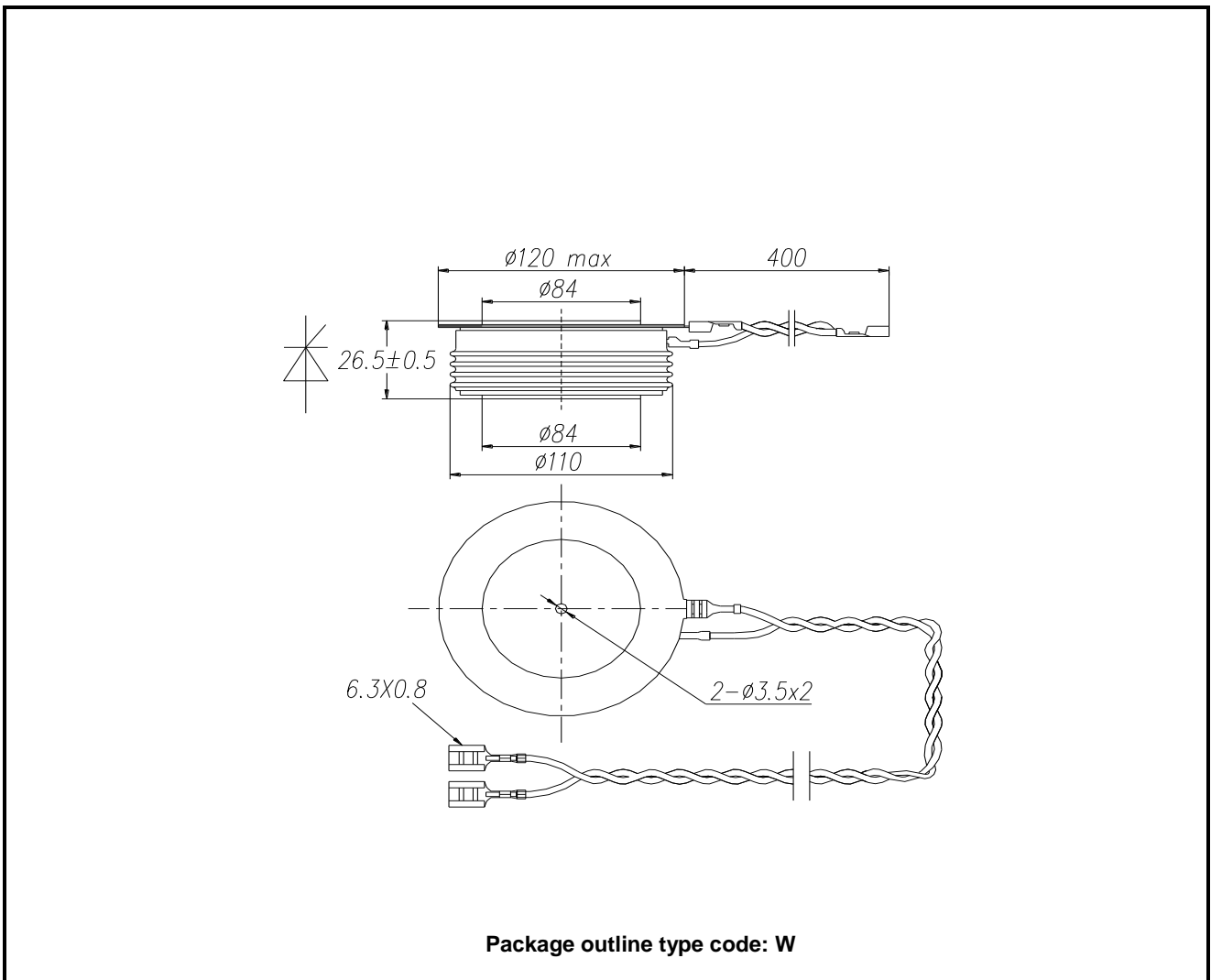


Fig.14 Package outline



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Extended exposure to conditions outside the product ratings may affect reliability leading to premature product failure. Use outside the product ratings is likely to cause permanent damage to the product. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture, a large current to flow or high voltage arcing, resulting in fire or explosion. Appropriate application design and safety precautions should always be followed to protect persons and property.

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<b>Preliminary Information:</b>	The product design is complete and final characterisation for volume production is in progress. The datasheet represents the product as it is now understood but details may change.
<b>No Annotation:</b>	The product has been approved for production and unless otherwise notified by Dynex any product ordered will be supplied to the <b>current version of the data sheet prevailing at the time of our order acknowledgement.</b>

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