

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_{DSM} and V_{RSM} V	Conditions
DCR4540H52	5200	$T_{vj} = -40^{\circ}\text{C}$ to 110°C , $I_{DRM} = I_{RRM} = 700\text{mA}$, $V_{DRM}, V_{RRM} t_p = 10\text{ms}$, V_{DRM} & $V_{RRM} =$ V_{DSM} & $V_{RSM} - 600\text{V}$ respectively
DCR4540H50	5000	
DCR4540H48	4800	
DCR4540H46	4600	

Lower voltage grades available.

ORDERING INFORMATION

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

For example:

DCR4540H52

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}	5200 V
$I_{T(AV)}$	4540 A
I_{TSM}	80000 A
dV/dt^*	2000 V/μs
dI/dt	200 A/μs

* Higher dV/dt selections available

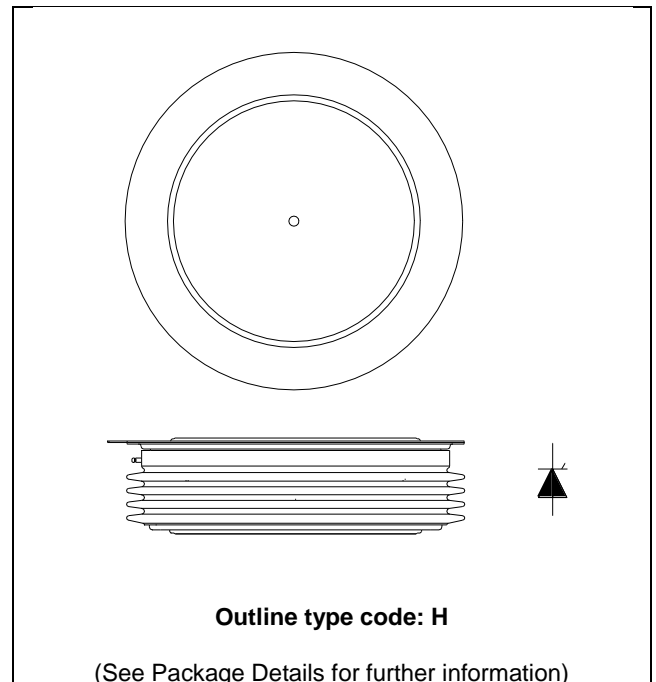


Fig. 1 Package outline

CURRENT RATINGS

T_{case} = 60°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
I _{T(AV)}	Mean on-state current	Half wave resistive load	4540	A
I _{T(RMS)}	RMS value	-	7130	A
I _T	Continuous (direct) on-state current	-	6420	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I _{TSM}	Surge (non-repetitive) on-state current	10ms half sine, T _{case} = 110°C	80.0	kA
I ² t	I ² t for fusing	V _R = 0	32.00	MA ² 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	-	0.004	°C/W
R _{th(c-h)}	Thermal resistance – case to heatsink	Double side cooled DC	-	0.0008	°C/W
T _{vj}	Virtual junction temperature	Blocking V _{DRM} / V _{RRM}	-40	110	°C
T _{stg}	Storage temperature range		-40	140	°C
F _m	Clamping force		110	130	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} , $T_{case} = 110^{\circ}C$	-	700	mA	
dV/dt	Max. linear rate of rise of off-state voltage	To 67% V_{DRM} , $T_j = 110^{\circ}C$, gate open	2000	-	V/ μs	
di/dt	Rate of rise of on-state current	From 67% V_{DRM} to 4000A Gate source 30V, 10 Ω , $t_r < 0.5\mu s$, $T_j = 110^{\circ}C$	Repetitive 50Hz	-	200	A/ μs
			Non-repetitive	-	1000	A/ μs
V_T	On-state voltage	$I_T = 3000A$, $T_{case} = 110^{\circ}C$		1.46	V	
$V_{T(TO)}$	Threshold voltage	$T_{case} = 110^{\circ}C$	-	1.08	V	
r_T	On-state slope resistance	$T_{case} = 110^{\circ}C$	-	0.127	m Ω	
t_{gd}	Delay time	$V_D = 67\% V_{DRM}$, gate source 30V, 10 Ω $t_r = 0.5\mu s$, $T_j = 25^{\circ}C$	-	3.0	μs	
t_q	Turn-off time	$T_j = 110^{\circ}C$, $V_R = 100V$, $di/dt = 1.5A/\mu s$, $dV_{DR}/dt = 20V/\mu s$ linear to 67% V_{DRM}	-	800	μs	
Q_s	Stored charge	$I_T = 2000A$, $t_p = 1000\mu s$, $T_j = 110^{\circ}C$, $di/dt = 1.5A/\mu s$,	-	5500	μC	
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	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	2.6	V
V_{GD}	Gate non-trigger voltage	At 40% V_{DRM} , $T_{case} = 110^{\circ}C$	TBD	V
I_{GT}	Gate trigger current	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	400	mA
I_{GD}	Gate non-trigger current	At 40% V_{DRM} , $T_{case} = 110^{\circ}C$	TBD	mA

CURVES

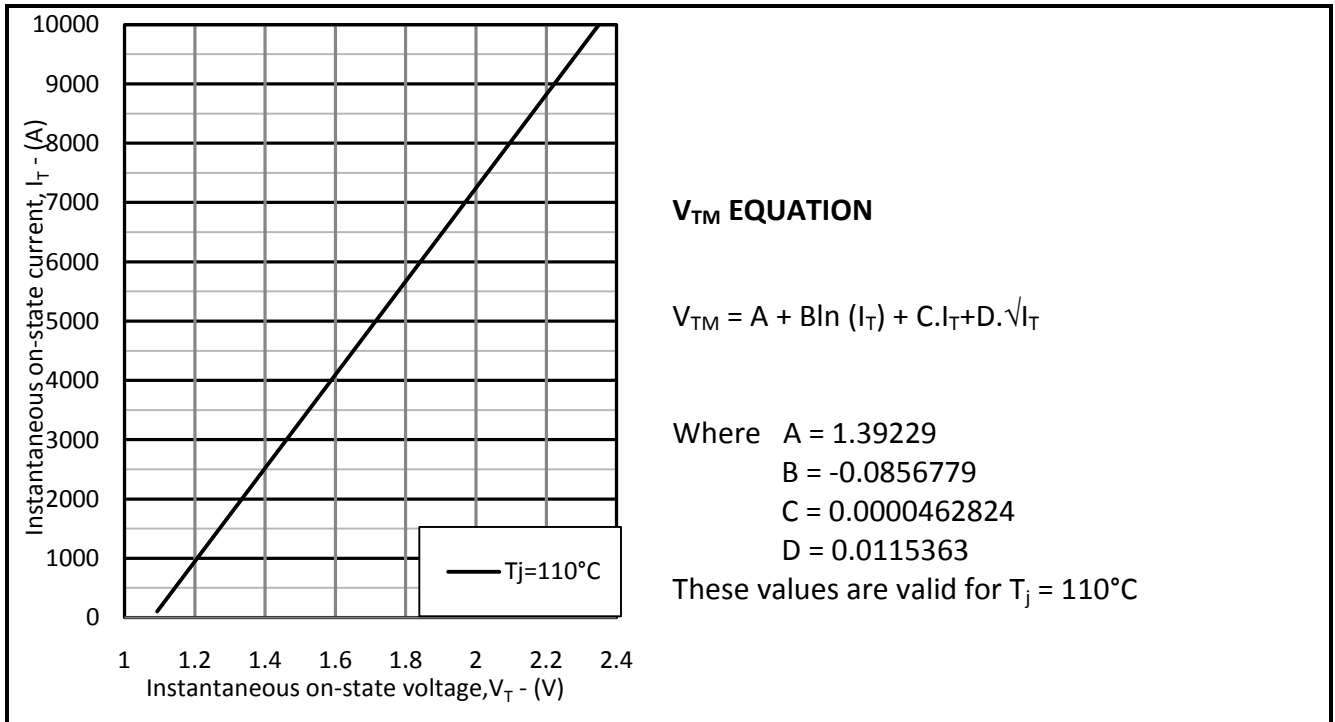


Fig.2 Maximum & minimum on-state characteristics

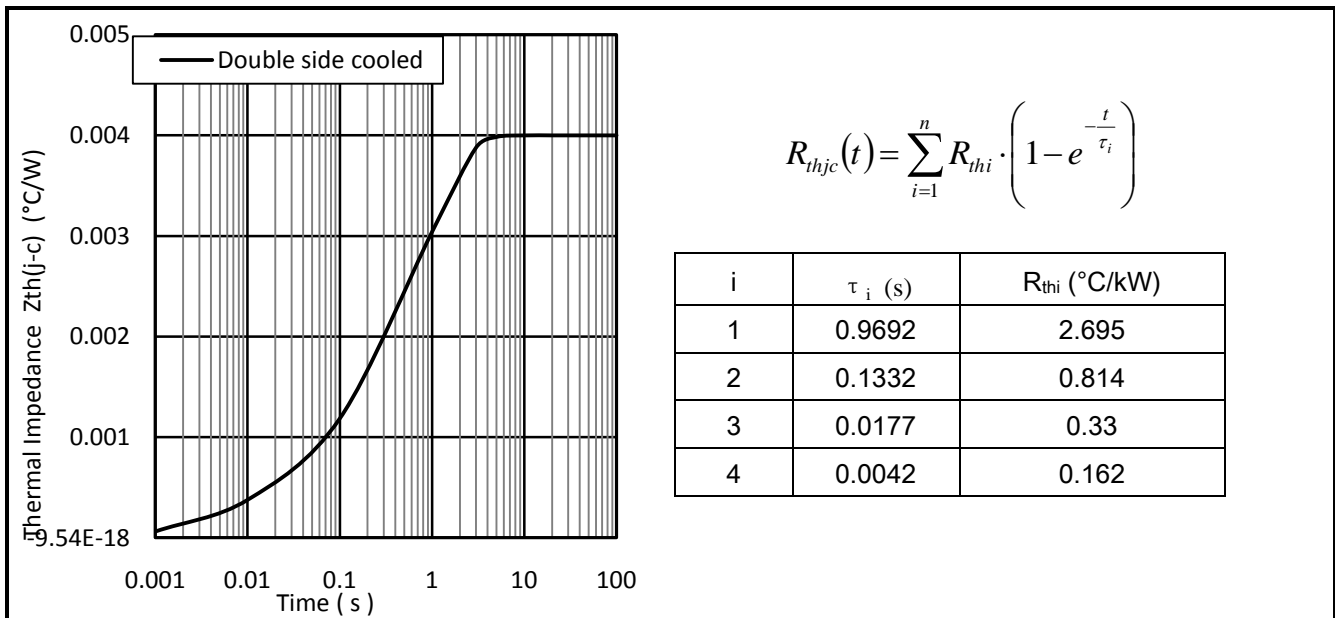


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)

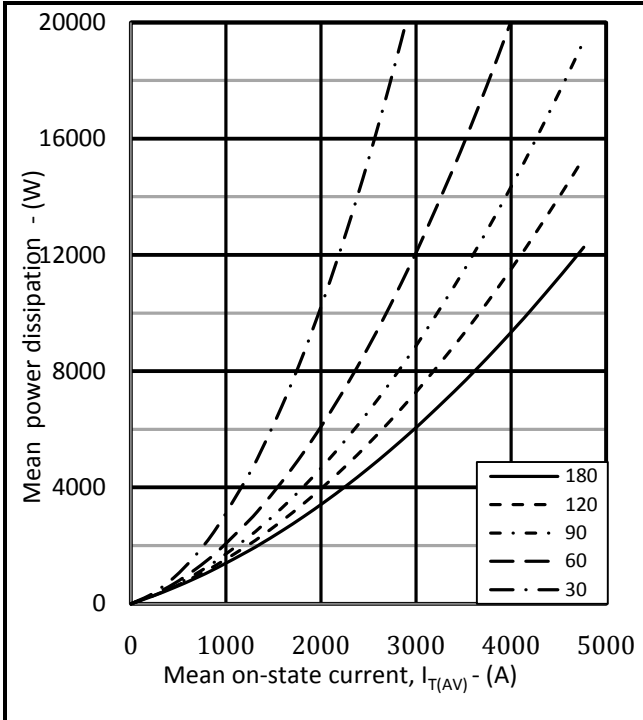


Fig.4 On-state power dissipation – sine wave

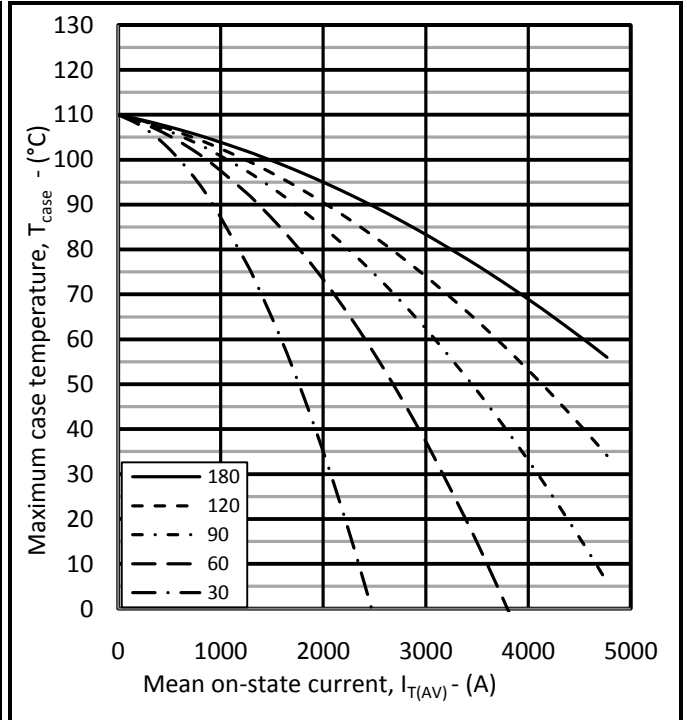


Fig.5 Maximum permissible case temperature, double side cooled – sine wave

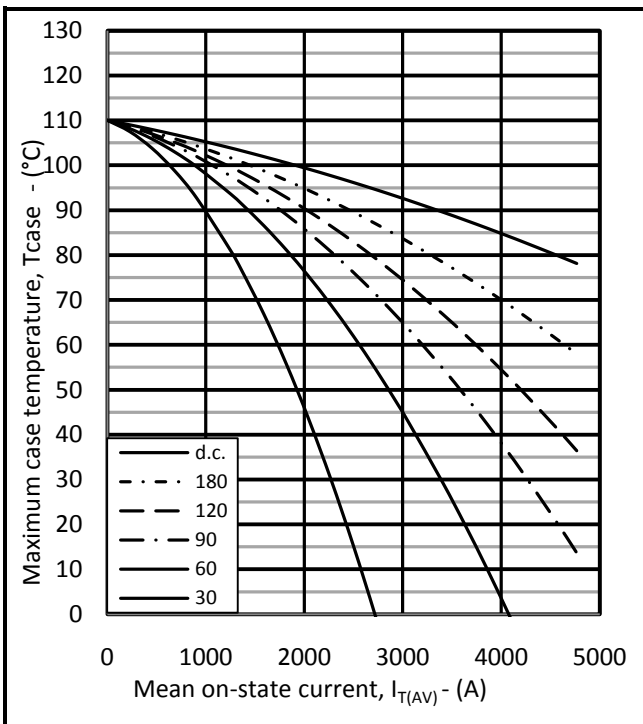


Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave

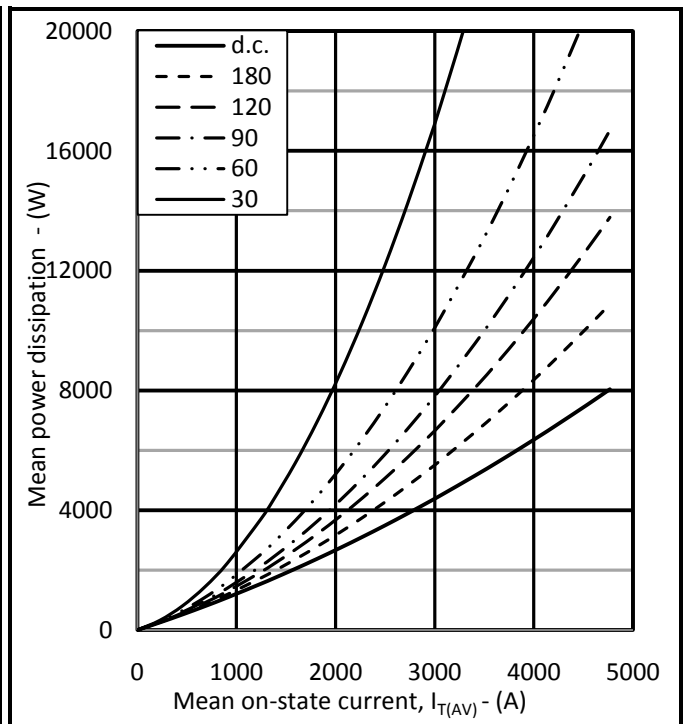


Fig.7 On-state power dissipation – rectangular wave

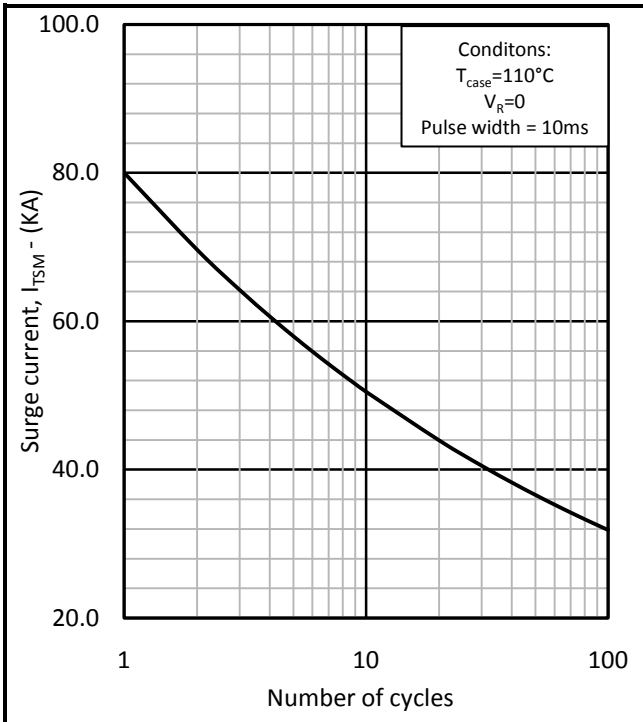


Fig.8 Multi-cycle surge current

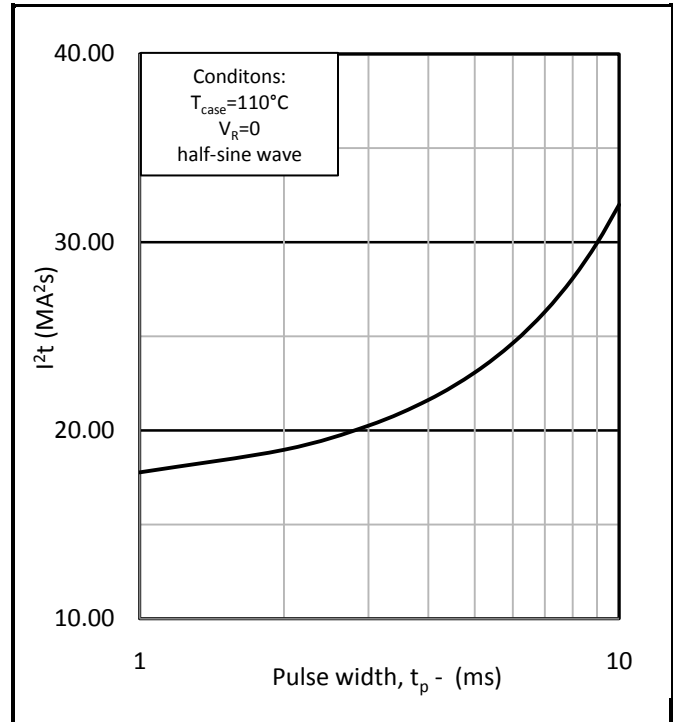


Fig.9 Single-cycle I^2t

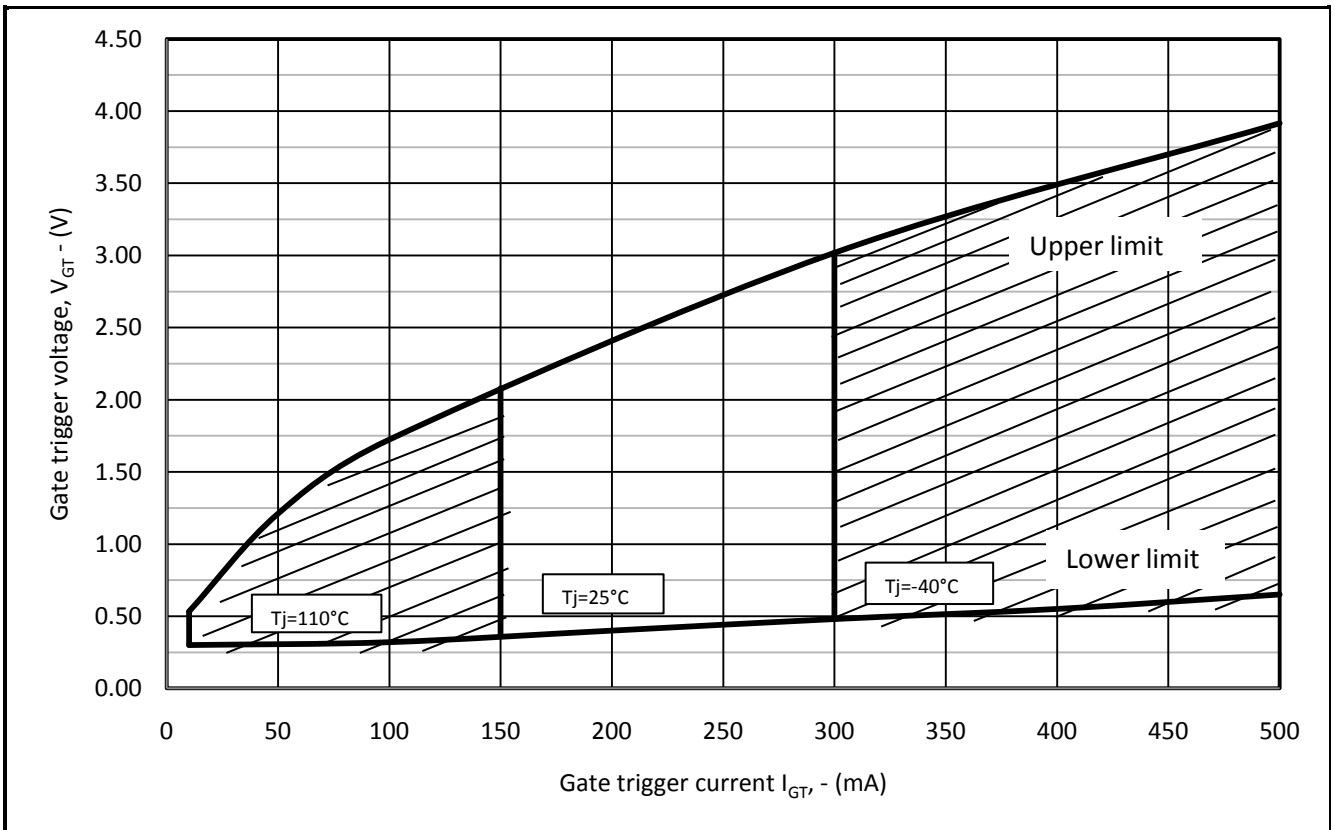


Fig.10 Gate characteristics

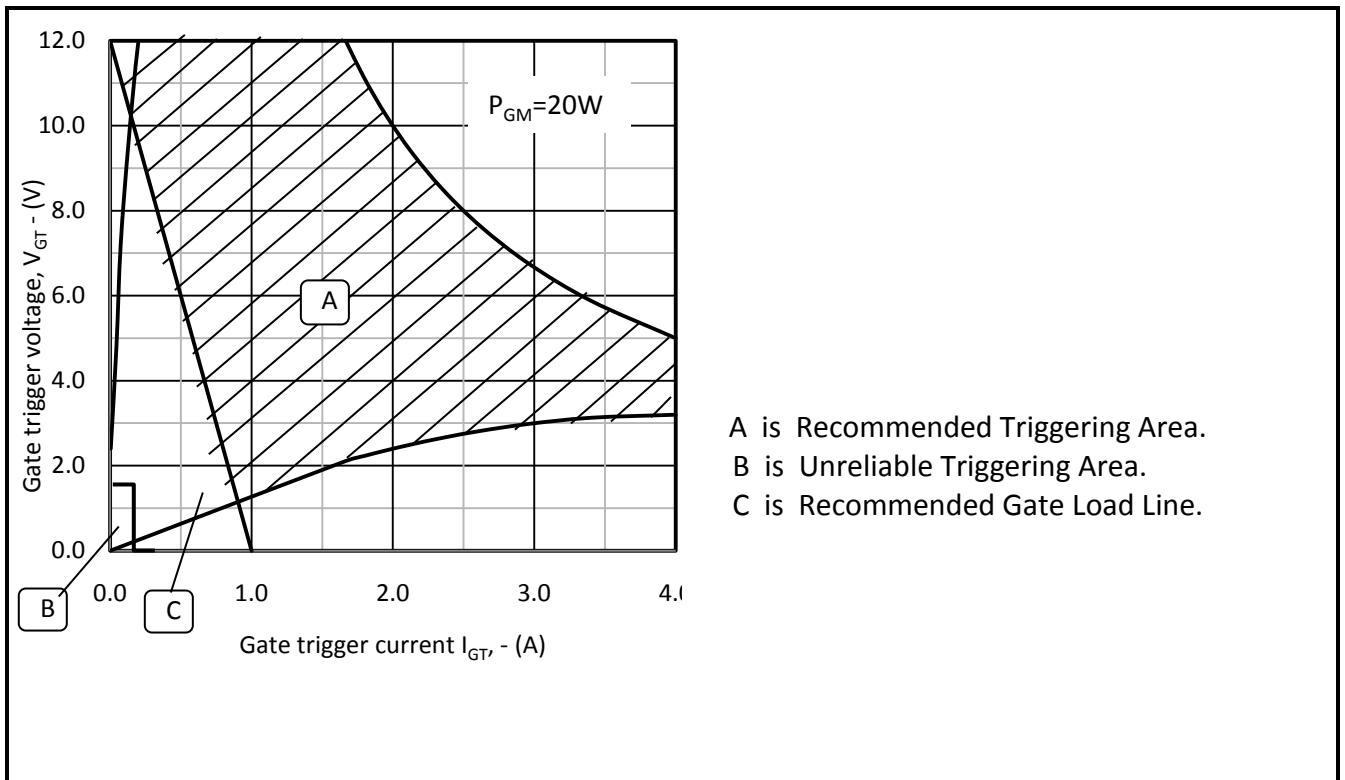


Fig.11 Gate characteristics

PACKAGE DETAILS

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

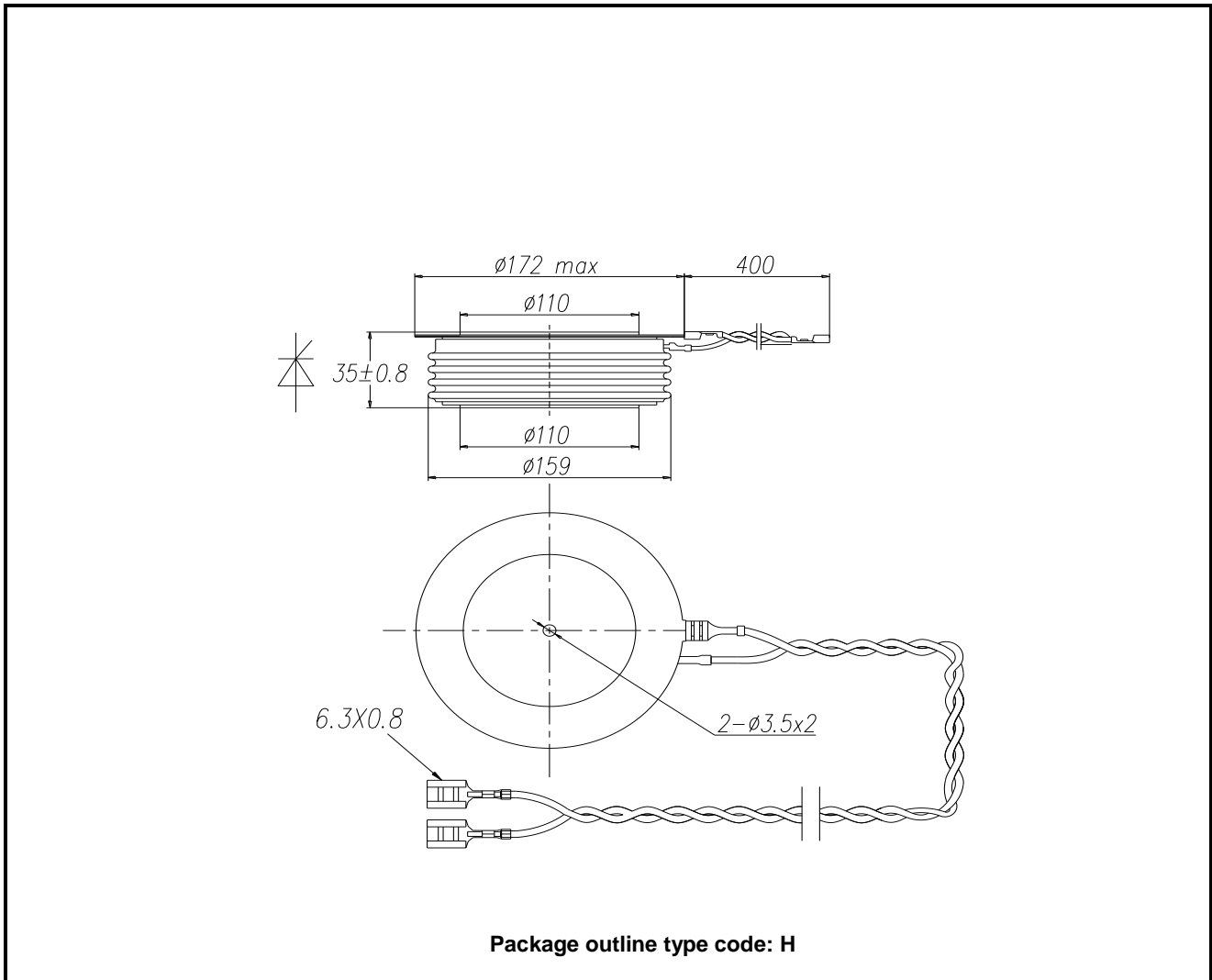


Fig.12 Package outline

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The products must not be touched when operating because there is a danger of electrocution or severe burning. Always use protective safety equipment such as appropriate shields for the product and wear safety glasses. Even when disconnected any electric charge remaining in the product must be discharged and allowed to cool before safe handling using protective gloves.

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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Target Information:	This is the most tentative form of information and represents a very preliminary specification. No actual design work on the product has been started.
Preliminary Information:	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.
No Annotation:	The product has been approved for production and unless otherwise notified by Dynex any product ordered will be supplied to the current version of the data sheet prevailing at the time of our order acknowledgement.

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