

Phase Control Thyristor

DS6047-1 April 2011 (LN28258)

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
DCR470E34	3400	$T_{vj} = -40^{\circ}\text{C}$ to 125°C , $I_{DRM} = I_{RRM} = 30\text{mA}$, $V_{DRM}, V_{RRM} t_p = 10\text{ms}$, $V_{DSM} \& V_{RSM} =$ $V_{DRM} \& V_{RRM} +100\text{V}$ respectively
DCR470E32	3200	
DCR470E30	3000	
DCR470E28	2800	
DCR470E26	2600	
DCR470E24	2400	

Lower voltage grades available.

ORDERING INFORMATION

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

For example:

DCR470E34

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}	3400 V
$I_{T(AV)}$	470 A
I_{TSM}	6300 A
dV/dt^*	1000 V/ μs
dI/dt	150 A/ μs

* Higher dV/dt selections available

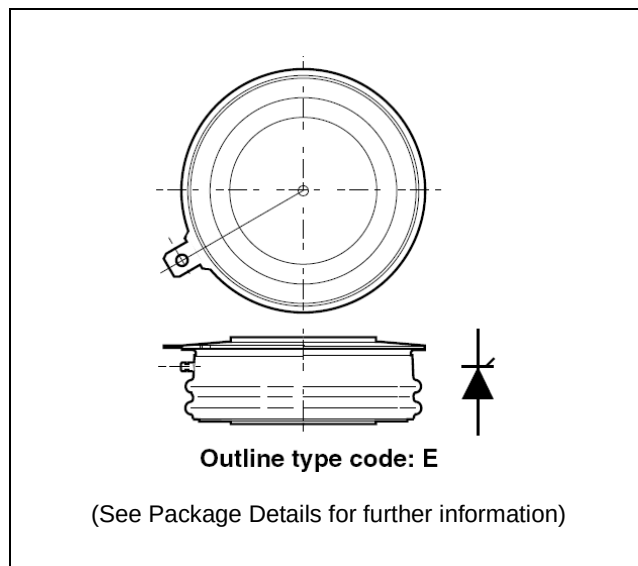


Fig. 1 Package outline

CURRENT RATINGS

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

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	470	A
$I_{T(RMS)}$	RMS value	-	740	A
I_T	Continuous (direct) on-state current	-	660	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 125^{\circ}\text{C}$	6.3	kA
I^2t	I^2t for fusing	$V_R = 0$	0.198	MA^2s

THERMAL AND MECHANICAL RATINGS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance – junction to case	Double side cooled	-	0.041	$^{\circ}\text{C/W}$
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Double side cooled	-	0.01	$^{\circ}\text{C/W}$
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		4	6	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°C		-	30	mA
dV/dt	Max. linear rate of rise of off-state voltage	To 67% V _{DRM} , T _j = 125°C, gate open		1000	-	V/μs
dI/dt	Rate of rise of on-state current	From 67% V _{DRM} to1000A	Repetitive 50Hz	-	150	A/μs
		Gate source 30V, 10Ω, t _r < 0.5μs, T _j = 125°C	Non-repetitive	-	1000	A/μs
V _T	On-state voltage	IT = 1500A, T _{case} = 125°C			3.63	V
V _{T(To)}	Threshold voltage	T _{case} = 125°C		-	1.04	V
r _T	On-state slope resistance	T _{case} = 125°C		-	1.725	mΩ
t _{gd}	Delay time	V _D = 67% V _{DRM} , gate source 30V, 10Ω t _r = 0.5μs, T _j = 25°C		-	3.0	μs
I _L	Latching current	T _j = 25°C,		-	1	A
I _H	Holding current	T _j = 25°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} , $T_{case} = 125^{\circ}C$	TBD	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} , $T_{case} = 125^{\circ}C$	TBD	mA

CURVES

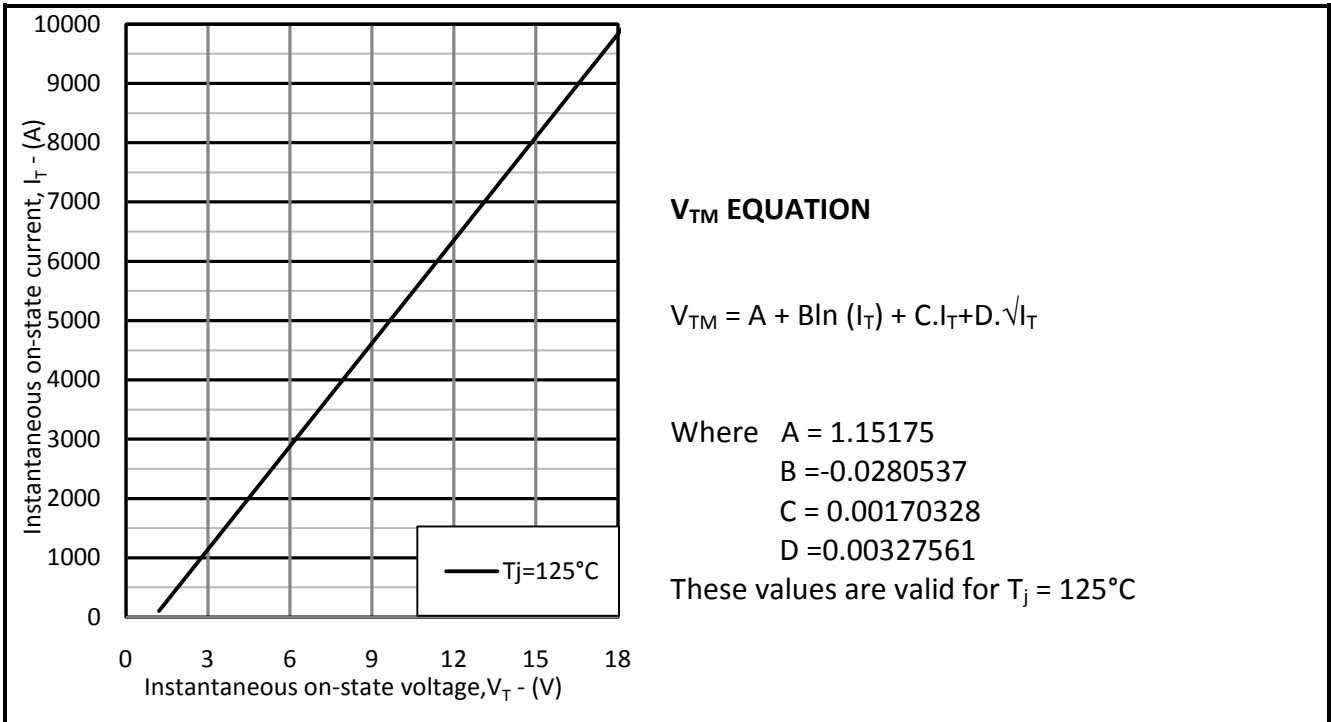


Fig.2 Maximum & minimum on-state characteristics

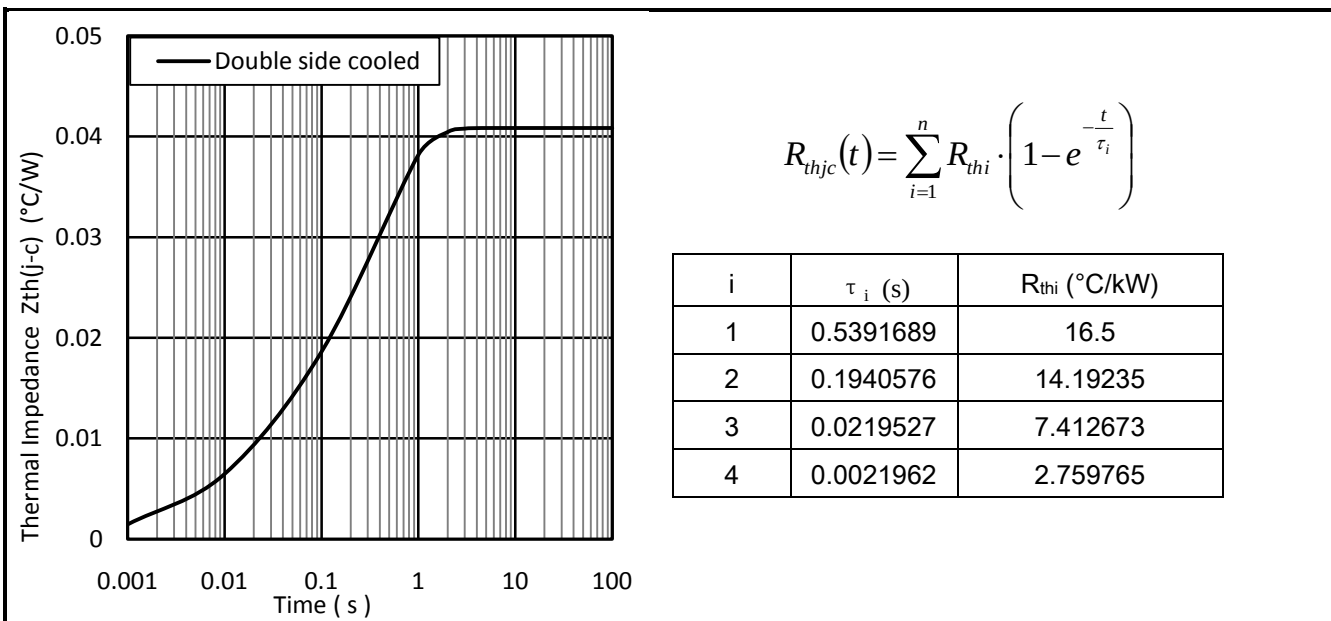


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)

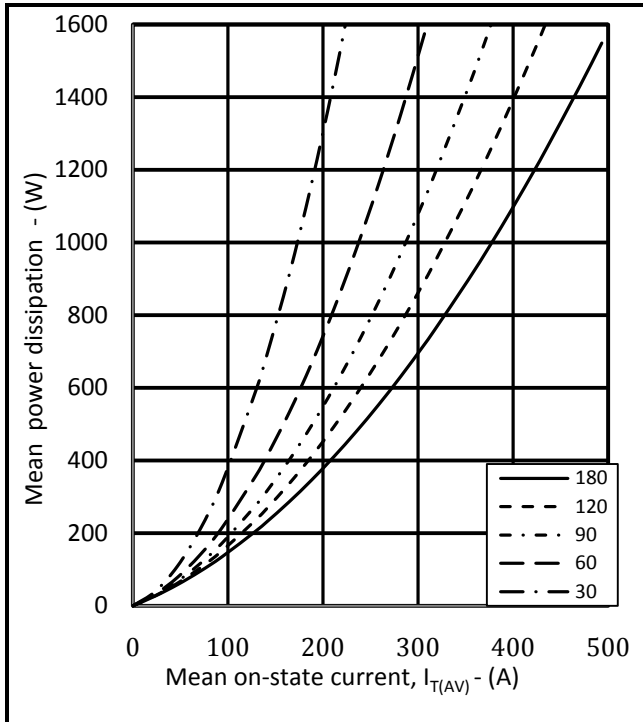


Fig.4 On-state power dissipation – sine wave

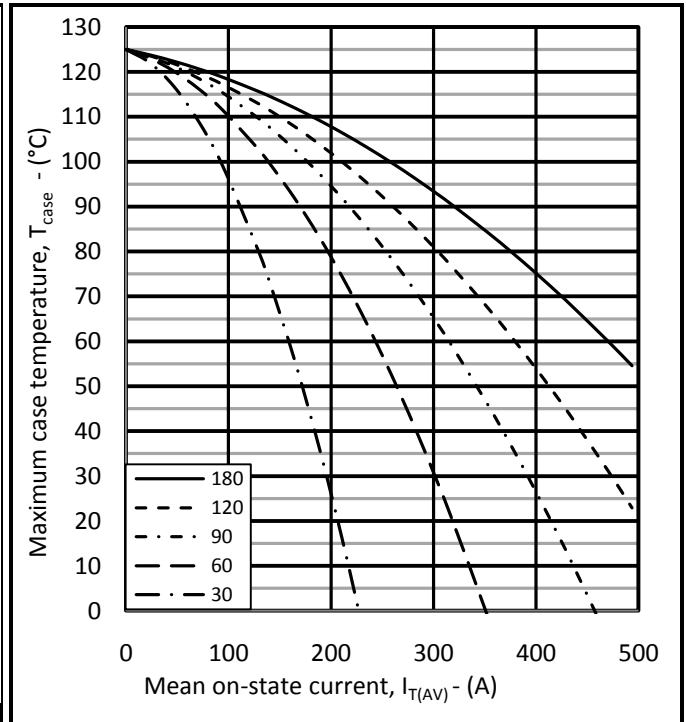


Fig.5 Maximum permissible case temperature, double side cooled – sine wave

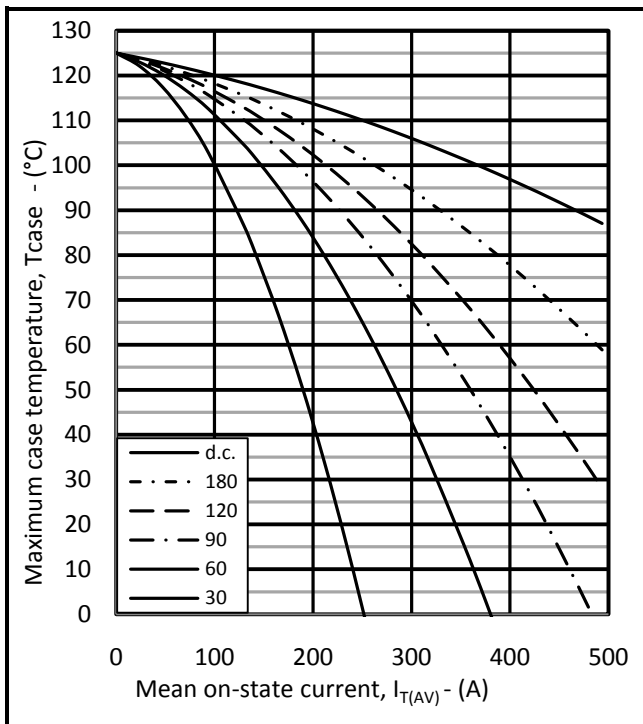


Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave

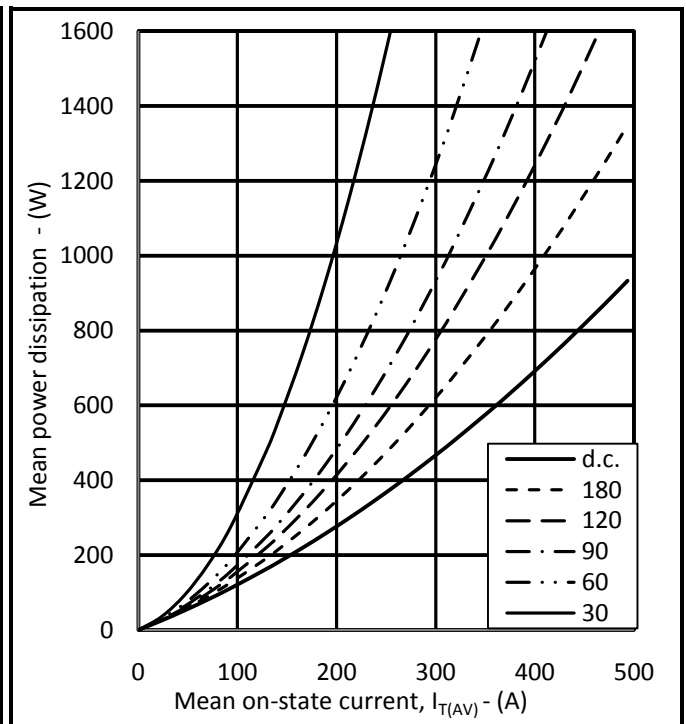


Fig.7 On-state power dissipation – rectangular wave

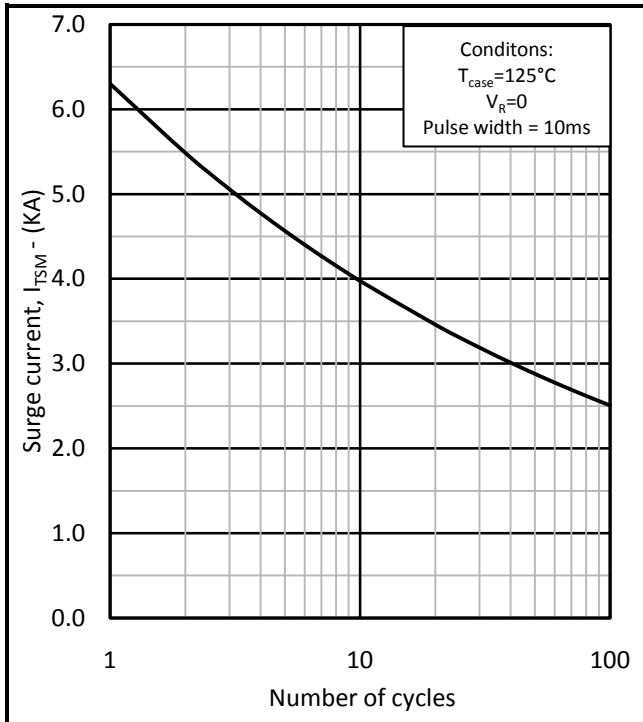


Fig.8 Multi-cycle surge current

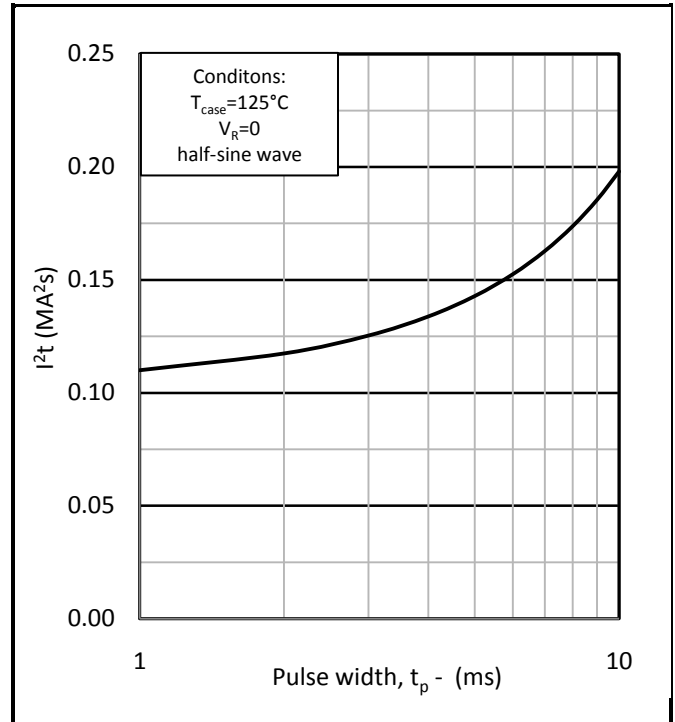


Fig.9 Single-cycle I^2t

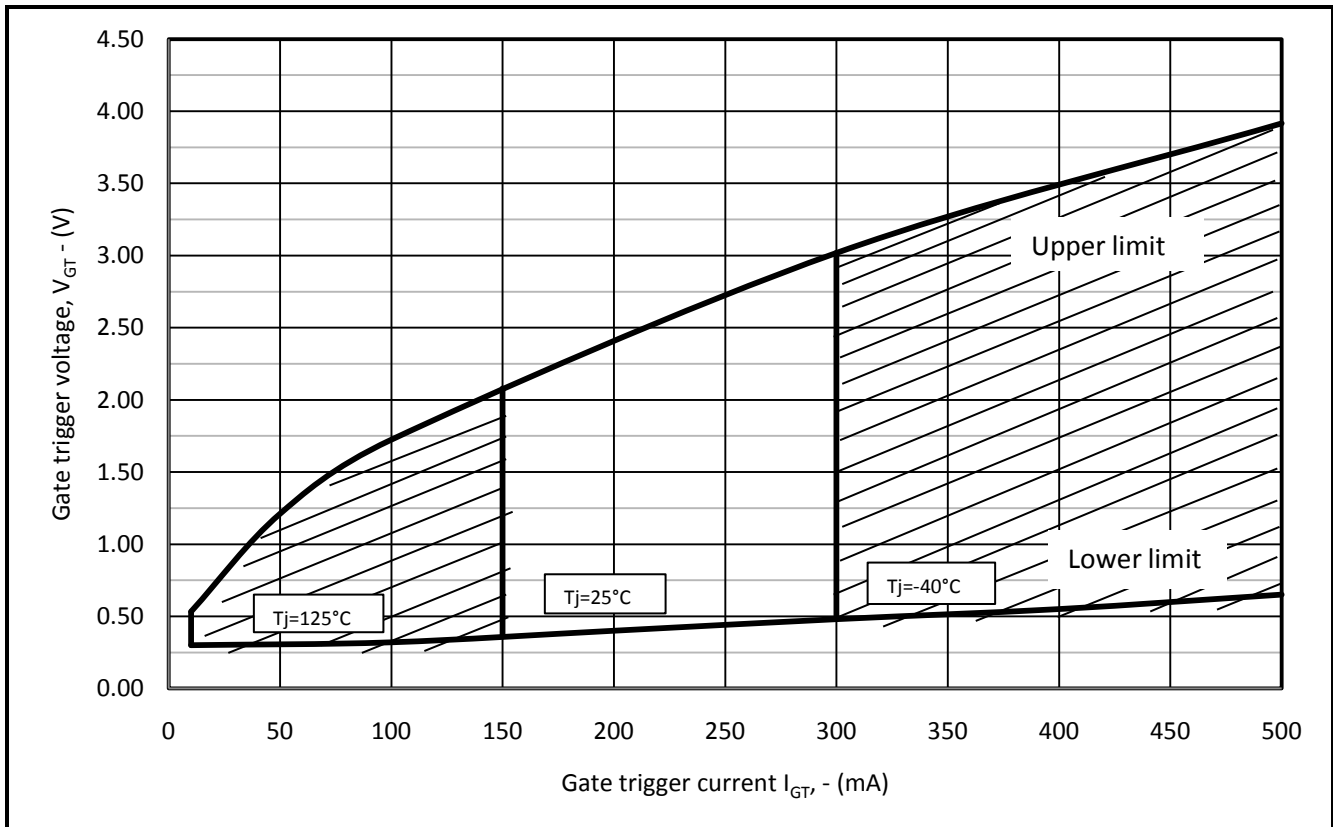


Fig.10 Gate characteristics

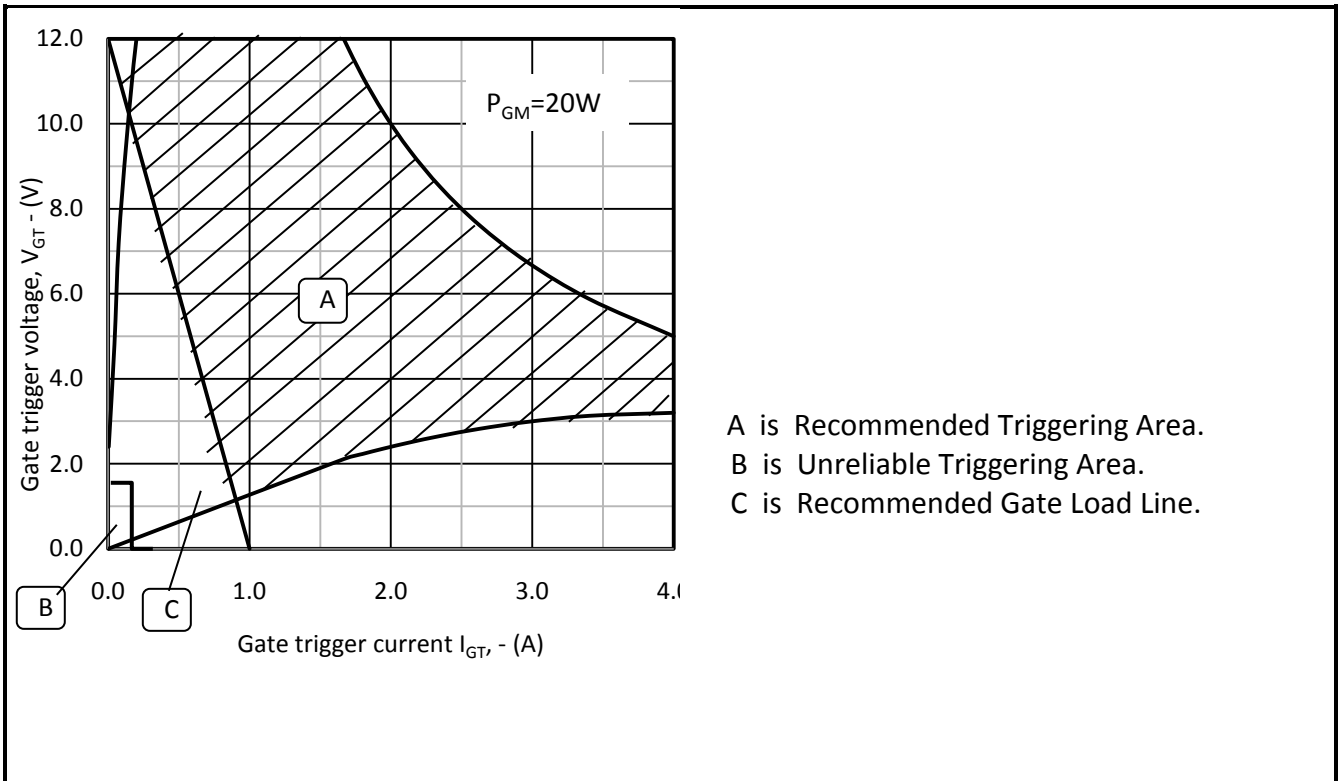
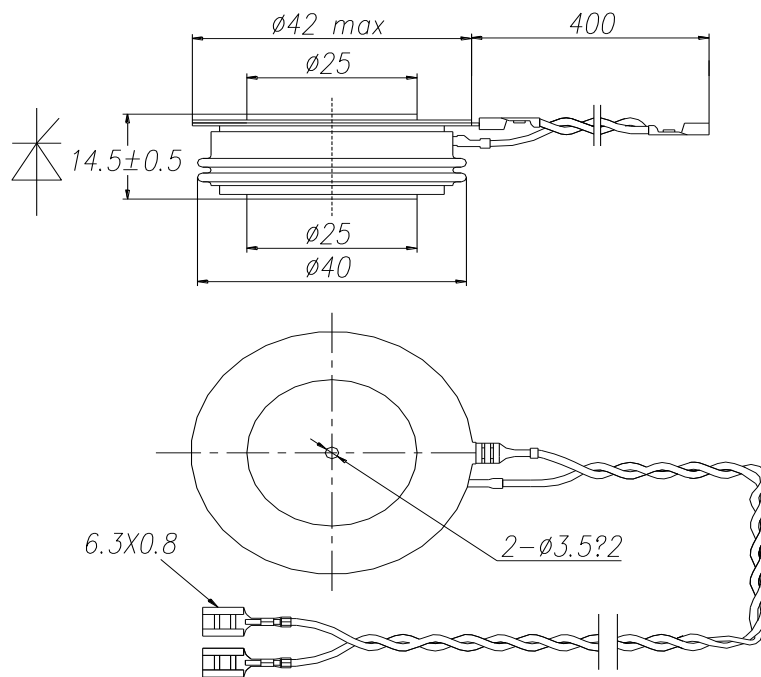


Fig.11 Gate characteristics

PACKAGE DETAILS

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



Package outline type code: E

Fig.12 Package outline

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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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