DCR2060X16

Phase Control Thyristor

Source 2401 DS6441-1 May 2024 (LN43378)

FEATURES

- Double Side Cooling
- High Power Capability
- Low Loss

APPLICATIONS

- Traction Drives
- Motor Drives
- Industry Converters

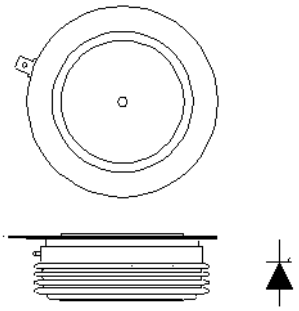
KEY PARAMETERS

V_{DRM}	**1600V**
$I_{T(AV)}$	**2060A**
I_{TSM}	**29000A**
dV/dt*	**1000V/µs**
dI/dt	**200A/µs**

*** Higher dV/dt selections are available on request**

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V_{DRM} and V_{RRM} (V)	Conditions
DCR2060X16 DCR2060X14 DCR2060X12 DCR2060X10	1600 1400 1200 1000	T_{vj} = -40°C to 125°C, I_{DRM} = I_{RRM} = 150mA, V_{DRM}, V_{RRM} t_p = 10ms V_{DSM} & V_{RSM} = V_{DRM} & V_{RRM} + 100V respectively



Outline type code: X

(See Package Details for further information)

Fig. 1 Package outline

ORDERING INFORMATION

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

For example:

DCR2060X16

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

CURRENT RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, T_{case} = 60°C	2060	A
$I_{T(RMS)}$	RMS value	T_{case} = 60°C	3240	A
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, T_{case} = 70°C	1850	A
$I_{T(RMS)}$	RMS value	T_{case} = 70°C	2905	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 125°C V_R = 0	29.0	kA
I^2t	I^2t for fusing		4.21	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	DC	-	18.0	°C/kW
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Double side cooled	DC	-	5.0	°C/kW
T_{vj}	Virtual junction temperature	Blocking V_{DRM} / V_{RRM}		-40	125	°C
T_{stg}	Storage temperature range			-40	140	°C
F_m	Clamping force			26	34	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_j = 125°C	-	150	mA
V_{TM}	Instantaneous forward voltage	At 3000A peak, T_j = 25°C	-	1.40	V
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	T_j = 125°C, V_{DM} = 67% V_{DRM}, f = 50Hz, I_{TM} = 2000A, I_{FG} = 2A, t_r = 0.5µs	-	200	A/µs
$V_{T(TO)}$	Threshold voltage	T_j = 125°C	-	0.84	V
r_T	On-state slope resistance	T_j = 125°C	-	0.13	mΩ
I_L	Latching current	T_j = 25°C	-	1.0	A
I_H	Holding current	T_j = 25°C	-	200	mA

Symbol	Parameter	Test Conditions	Typ.	Max.	Units
t_q	Turn-off time	T_j = 125°C, V_{DM} = 67% V_{DRM}, I_T = 2000A, dV/dt = 20V/µs, V_R = 200V, dI/dt = 10A/µs	250	-	µs
Q_S	Stored charge	T_j = 125°C, dI/dt = 10A/µs, I_T = 2000A, V_R = 200V	3000	-	µC

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Test Conditions	Min	Max.	Units
I_{GT}	Gate trigger current	T_j = 25°C	-	300	mA
V_{GT}	Gate trigger voltage	T_j = 25°C	-	3.0	V
V_{GD}	Gate non-trigger voltage	T_j = 125°C, V_D = 40% V_{DM}	0.3	-	V
V_{FGM}	Peak forward gate voltage		-	12	V
V_{RGM}	Peak reverse gate voltage		-	5	V
I_{FGM}	Peak forward gate current		-	4	A
P_{GM}	Peak gate power		-	20	W
$P_{G(AV)}$	Average gate power		-	4	W

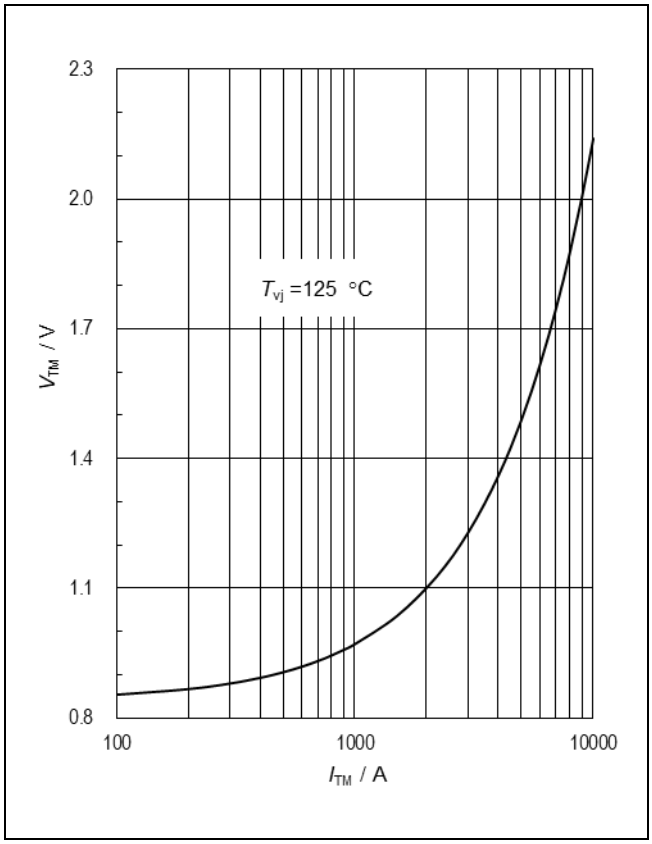


Fig. 2 Maximum on state characteristics

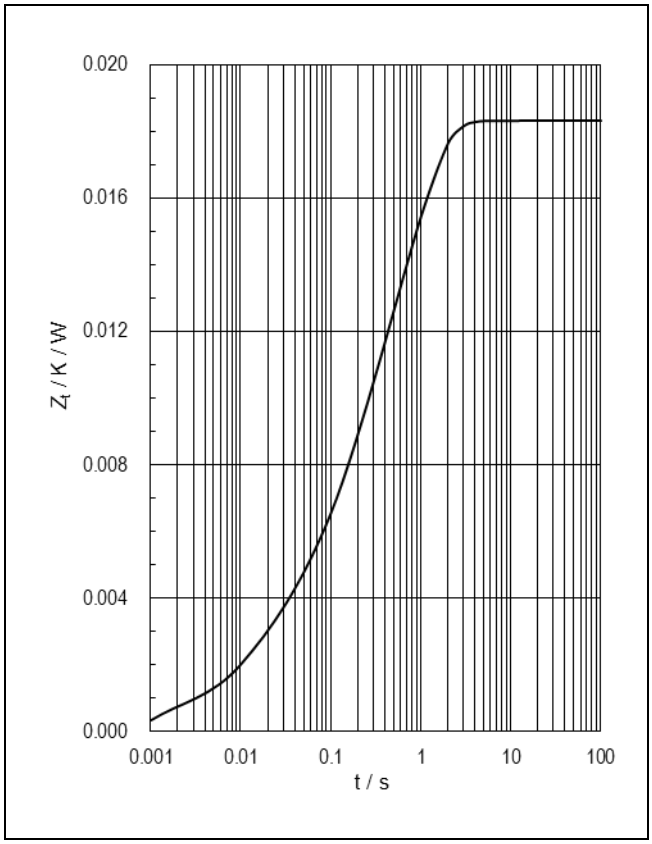


Fig. 3 Maximum (limit) transient thermal impedance - junction to case (degC/W)

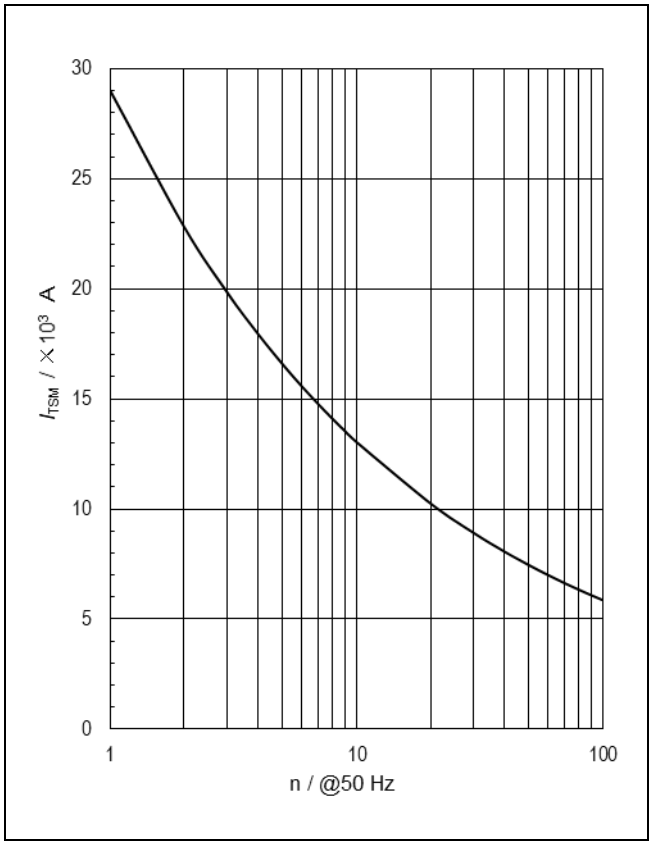


Fig. 4 Multi-cycle surge current

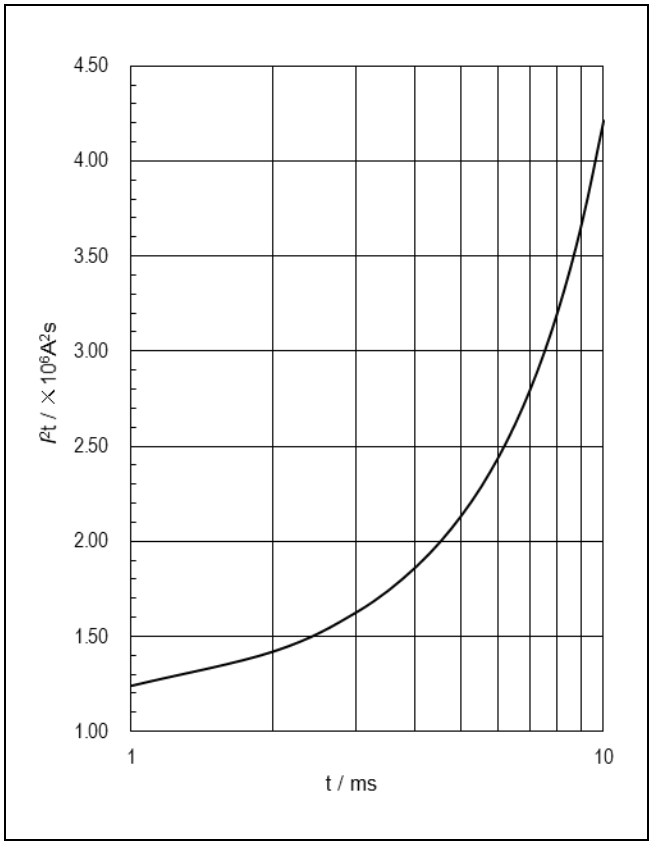


Fig. 5 Single-cycle I²t

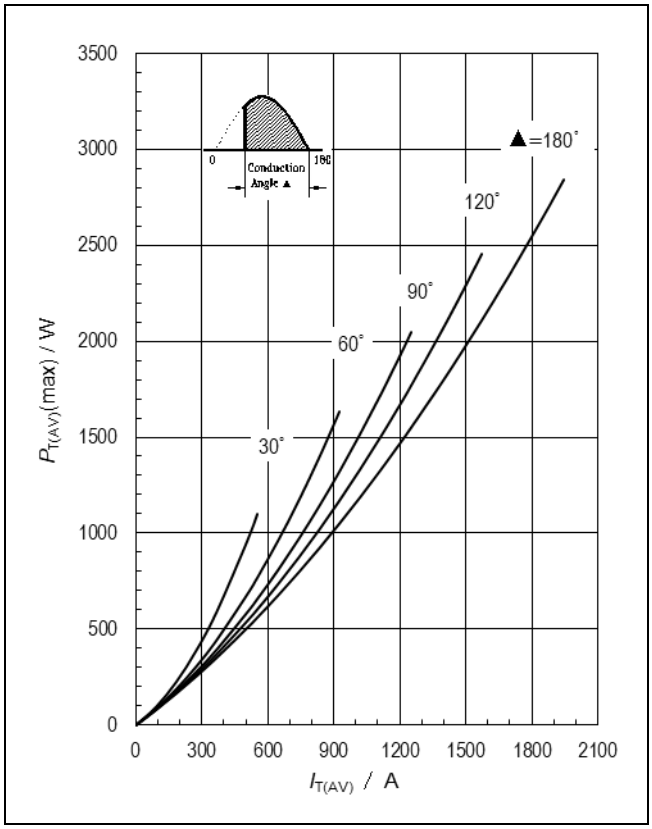


Fig. 6 On-state power dissipation - sine wave

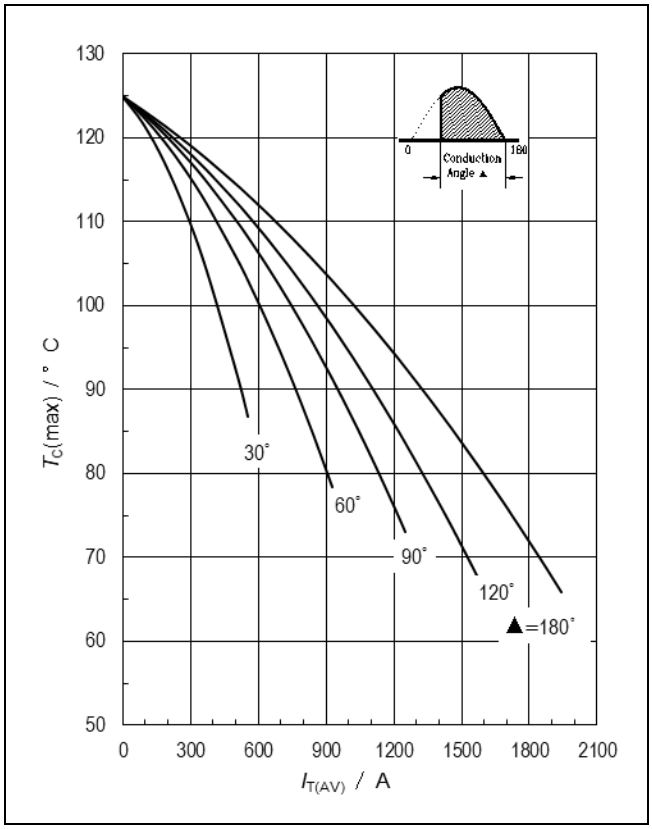


Fig. 7 Maximum permissible case temperature, double side cooled - sine wave

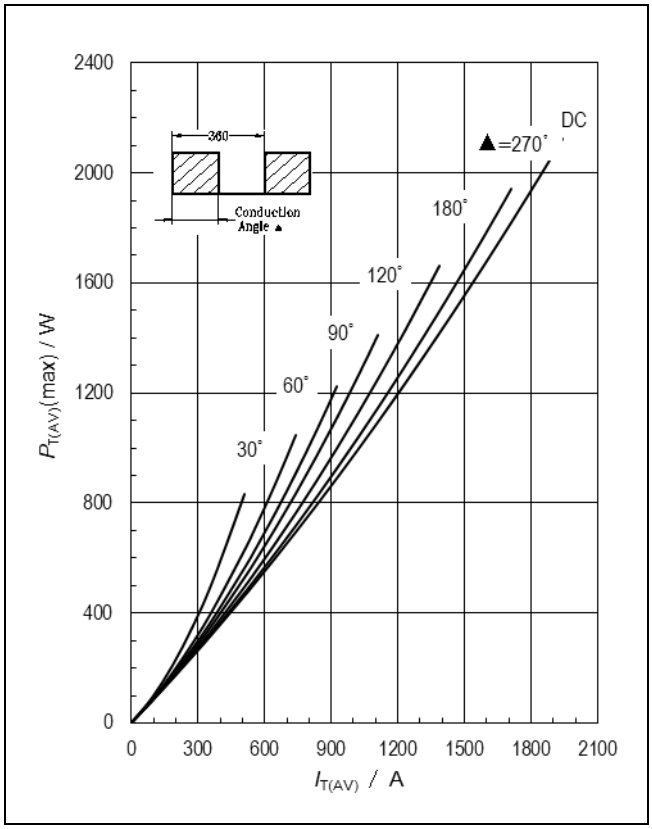


Fig. 8 On-state power dissipation - rectangular wave

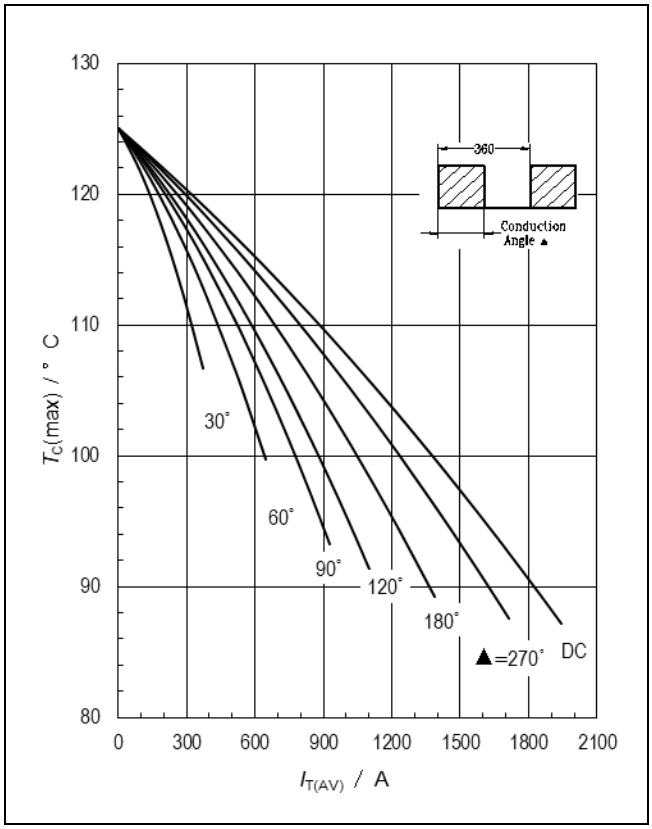


Fig. 9 Maximum permissible case temperature, double side cooled - rectangular wave

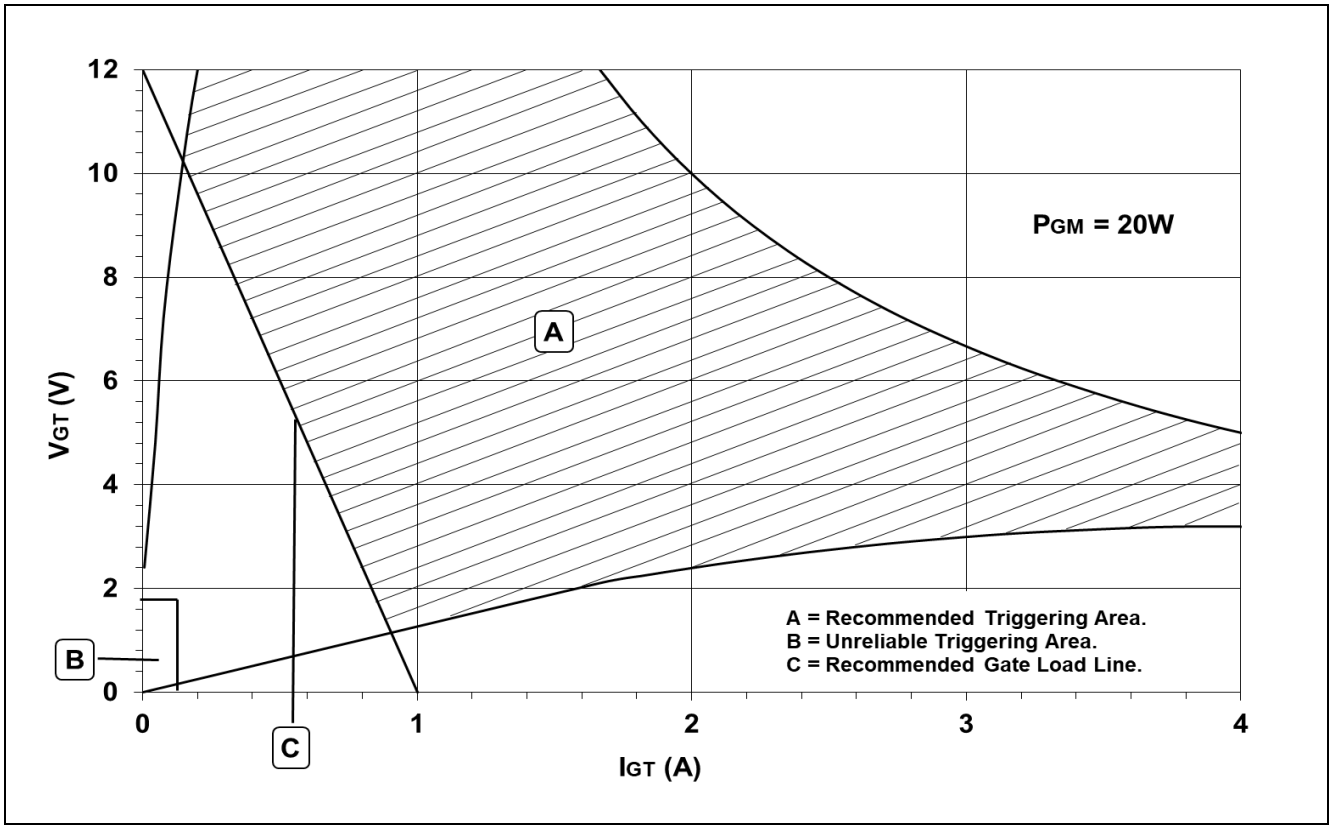


Fig. 10 Gate characteristics

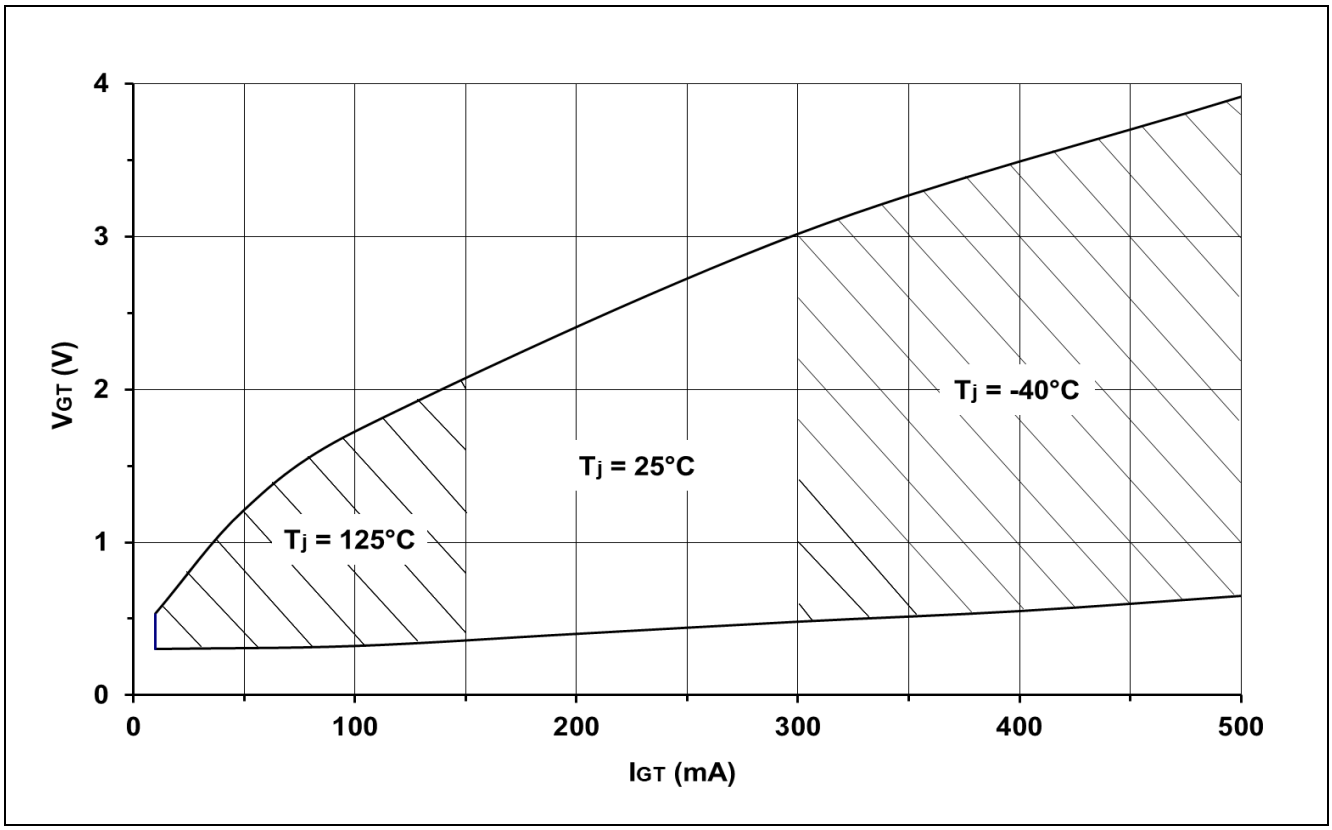


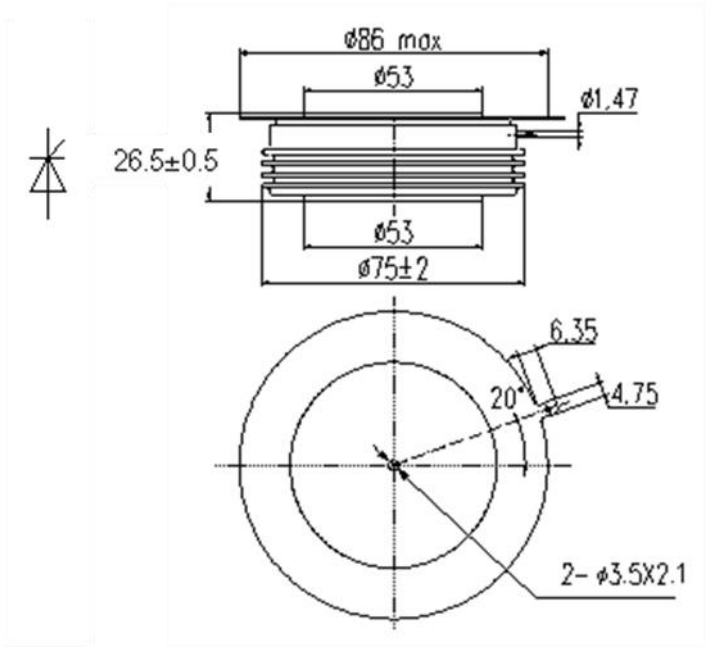
Fig. 11 Gate characteristics

PACKAGE DETAILS

For further package information, please contact Customer services.

All dimensions in mm, unless stated otherwise.

DO NOT SCALE



Weight: 600g

Package outline type code: X

Fig. 12 Package outline

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