

### APPLICATIONS

- High Frequency Applications
- Regulated Power Supplies
- Capacitor Discharge
- Ultrasonic Generators
- Induction Heating

### KEY PARAMETERS

$V_{DRM}$	<b>1600V</b>
$I_{T(AV)}$	<b>44A</b>
$I_{TSM}$	<b>550A</b>
$dV/dt^*$	<b>600V/<math>\mu</math>s</b>
$di/dt$	<b>2000A/<math>\mu</math>s</b>
$t_q$	<b>6.0<math>\mu</math>s</b>

\* $dV/dt$  Available to 1000V/ $\mu$ s

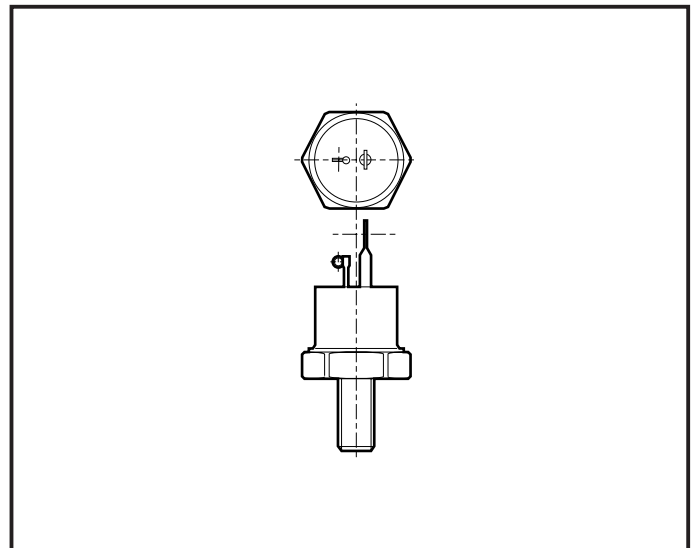
### FEATURES

- The ACR44U is a glass passivated asymmetric thyristor which has exceptionally fast turn-off capabilities combined with good turn-on characteristics.

### VOLTAGE RATINGS

Type Number	Repetitive Peak Off-state Voltage $V_{DRM}$ V	Repetitive Peak Reverse Voltage $V_{RRM}$ V
ACR44U 16LE	1600	2
ACR44U 14LE	1400	2
ACR44U 12LE	1200	2
ACR44U 10LE	1000	2
ACR44U 08LE	800	2

Lower voltage grades available.



Outline type code: SO28.  
See Package Details for further information.

### CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, $T_{case} = 80^{\circ}C$	44	A
$I_{T(RMS)}$	RMS value	$T_{case} = 70^{\circ}C$	69	A
$I_T$	Continuous (direct) on-state current	$T_{case} = 85^{\circ}C$	57	A

# ACR44U

## SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{TSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_{case} = 125^{\circ}C$	550	A
$I^2t$	$I^2t$ for fusing		1500	A <sup>2</sup> s

## THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	d.c.	-	0.35	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Mounting torque 3.5Nm with mounting compound	-	0.25	$^{\circ}C/W$
$T_{vj}$	Virtual junction temperature	On-state (conducting)	-	125	$^{\circ}C$
$T_{stg}$	Storage temperature range		-55	125	$^{\circ}C$
-	Mounting torque		3.5	4.0	Nm

## DYNAMIC CHARACTERISTICS

$T_{case} = 125^{\circ}C$  unless otherwise stated.

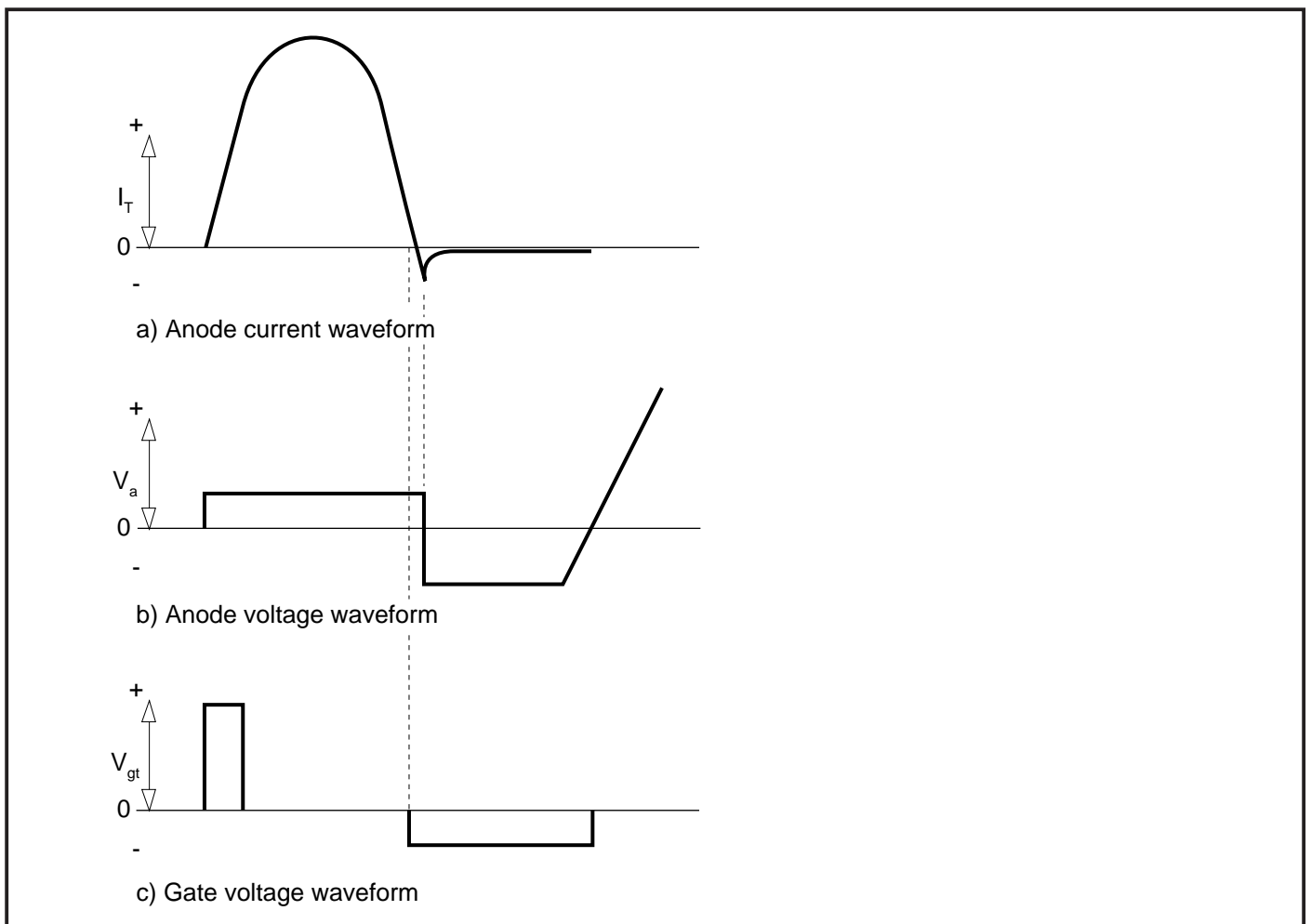
Symbol	Parameter	Conditions	Typ.	Max.	Units
$V_{TM}$	Maximum on-state voltage	At 100A peak, $T_{case} = 25^{\circ}C$	-	2.7	V
$I_{RRM}/I_{DRM}$	Peak reverse and off-state current	At $V_{RRM}/V_{DRM}$ , $T_{case} = 125^{\circ}C$	-	20/10	mA
dV/dt	Maximum linear rate of rise of off-state voltage	To $V_{DRM}$ , $T_j = 125^{\circ}C$ , gate open circuit	-	600*	V/ $\mu$ s
dI/dt	Rate of rise of on-state current	From $V_{DRM}$ to 125A. Gate source 15V, 15 $\Omega$ $t_r = 50ns$	-	2000	A/ $\mu$ s
$V_{T(TO)}$	Threshold voltage	-	-	1.5	V
$r_T$	On-state slope resistance	-	-	13.3	m $\Omega$
$I_L$	Latching current	-	120	-	mA
$I_H$	Holding current	-	25	-	mA
$t_d$	Delay time	$V_D = 300V$ , gate source = 15V, 15 $\Omega$	-	250	ns
$t_q$	Turn-off time (with antiparallel diode)	$I_T = 50A$ , square wave $t_p = 50\mu$ s, $T_j = 120^{\circ}C$ , $dI_R/dt = 50A/\mu$ s, $dV/dt = 600V/\mu$ s to $V_{DRM}$ , gate voltage at turn-off 3.5-4.5V. $V_R = -1V$ .	-	6.0	$\mu$ s

\* Available to 1000V/ $\mu$ s.

**GATE TRIGGER CHARACTERISTICS AND RATINGS**

Symbol	Parameter	Conditions	Typ.	Max.	Units	
$V_{GT}$	Gate trigger voltage	$V_{DWM} = 12V, R_L = 30\Omega, T_{case} = 25^\circ C$	0.9	3.0	V	
$I_{GT}$	Gate trigger current	$V_{DWM} = 12V, R_L = 30\Omega, T_{case} = 25^\circ C$	60	200	mA	
$V_{FGM}$	Peak forward gate voltage	-	-	40	V	
$V_{RGM}$	Peak reverse gate voltage	-	-	10	V	
$I_{FGM}$	Peak forward gate current	-	-	10	A	
$P_{GM}$	Peak gate power	-	-	40	W	
$P_{G(AV)}$	Average gate power	Average time 10ms max	Forward	-	10	W
			Reverse	-	6	W

**WAVEFORM OF GATE VOLTAGE AT TURN-OFF**



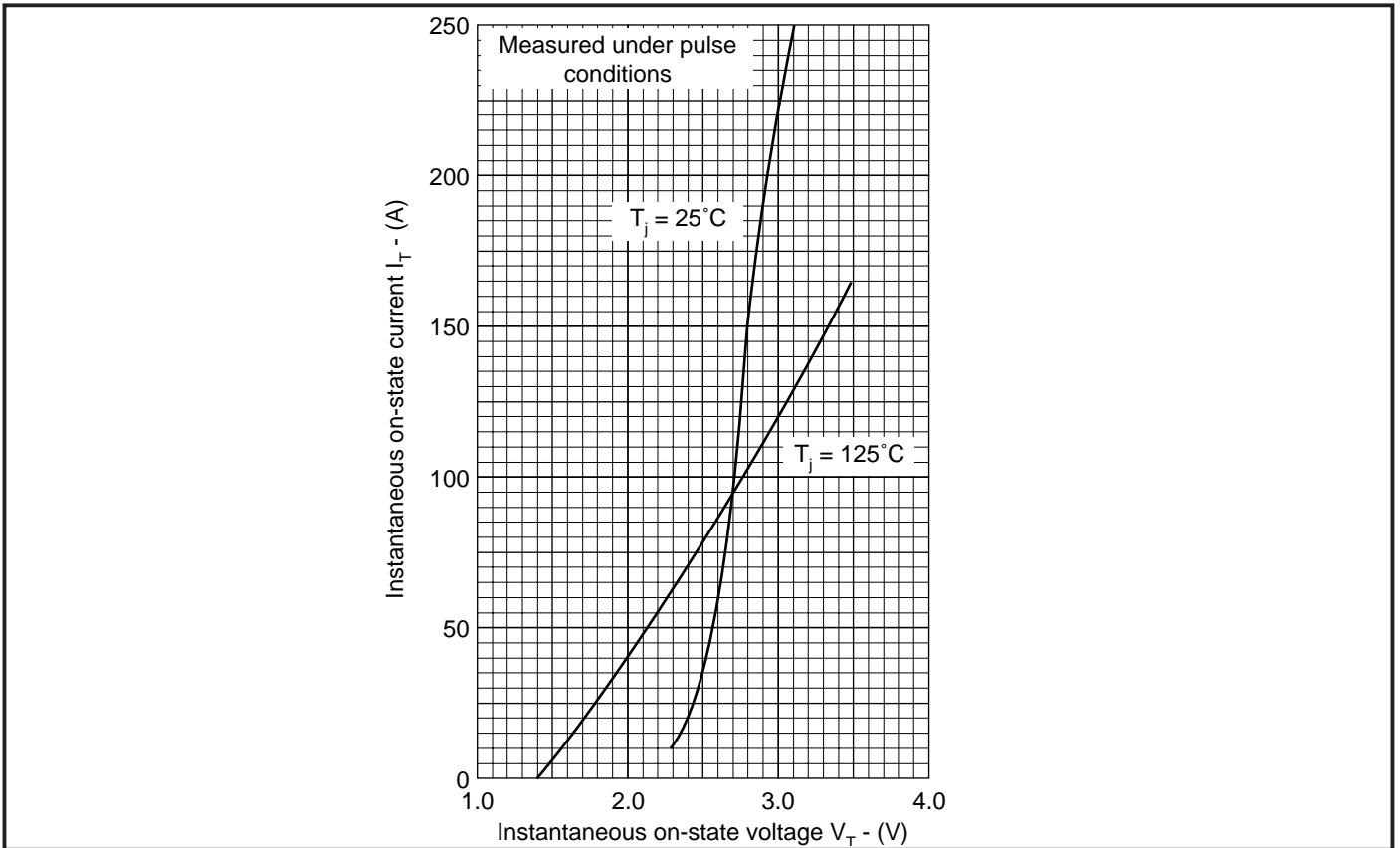


Fig.1 Maximum (limit) on-state characteristics

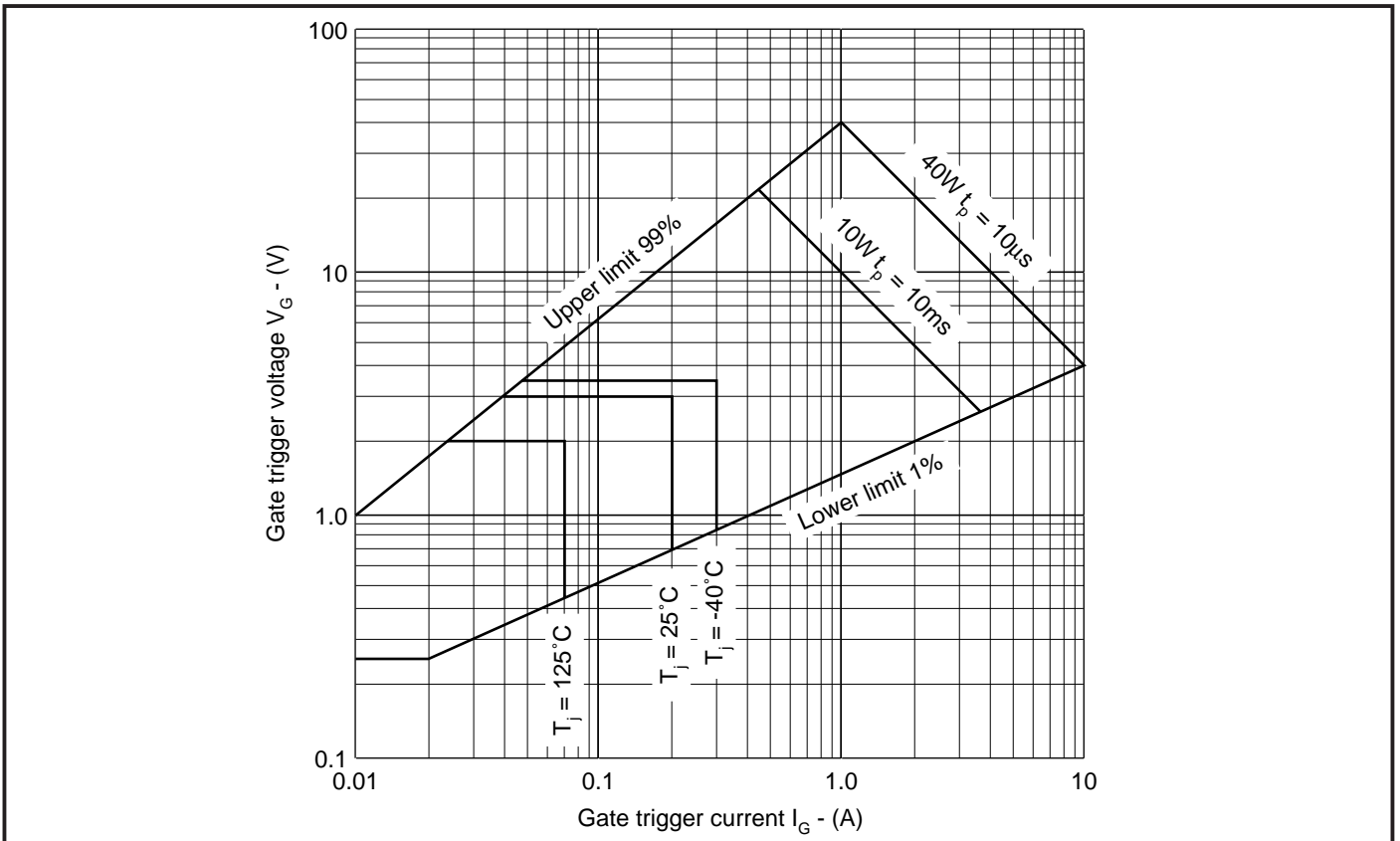


Fig.2 Gate characteristics

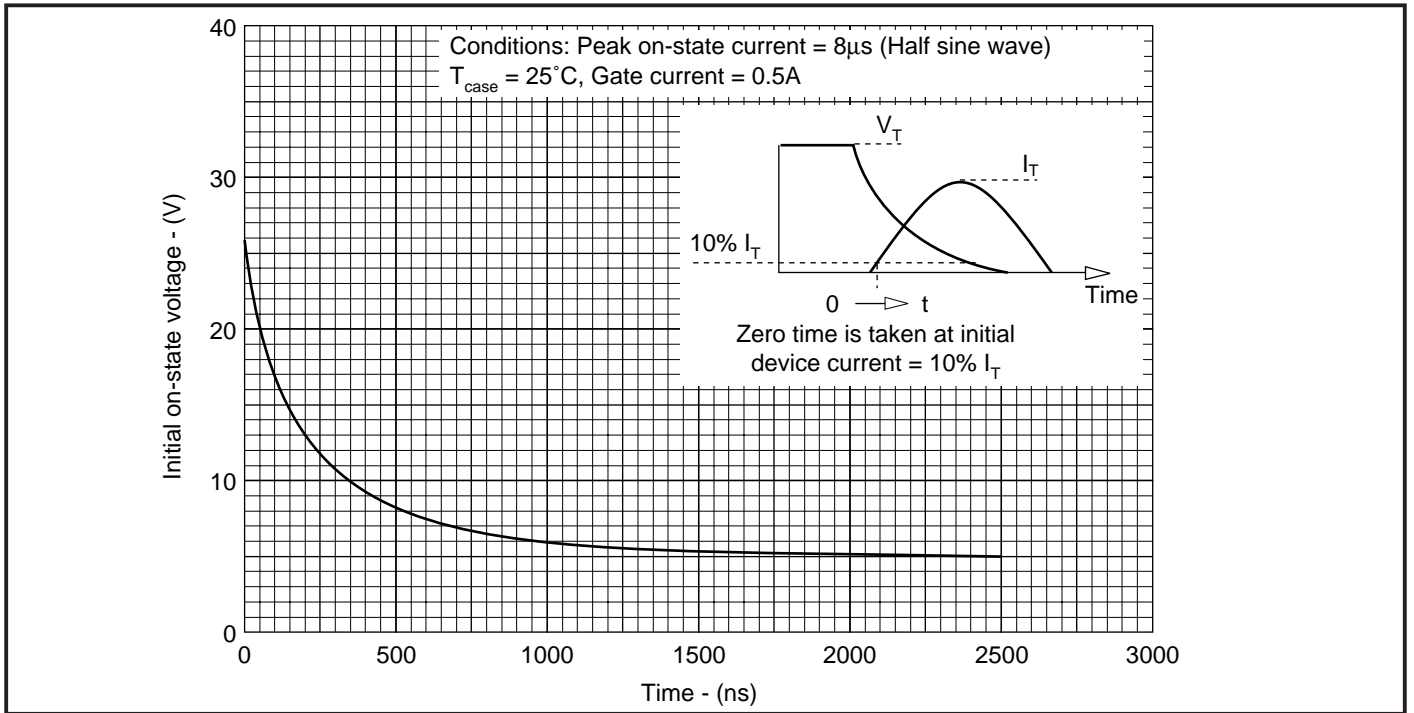


Fig.3 Typical initial on-state voltage vs time

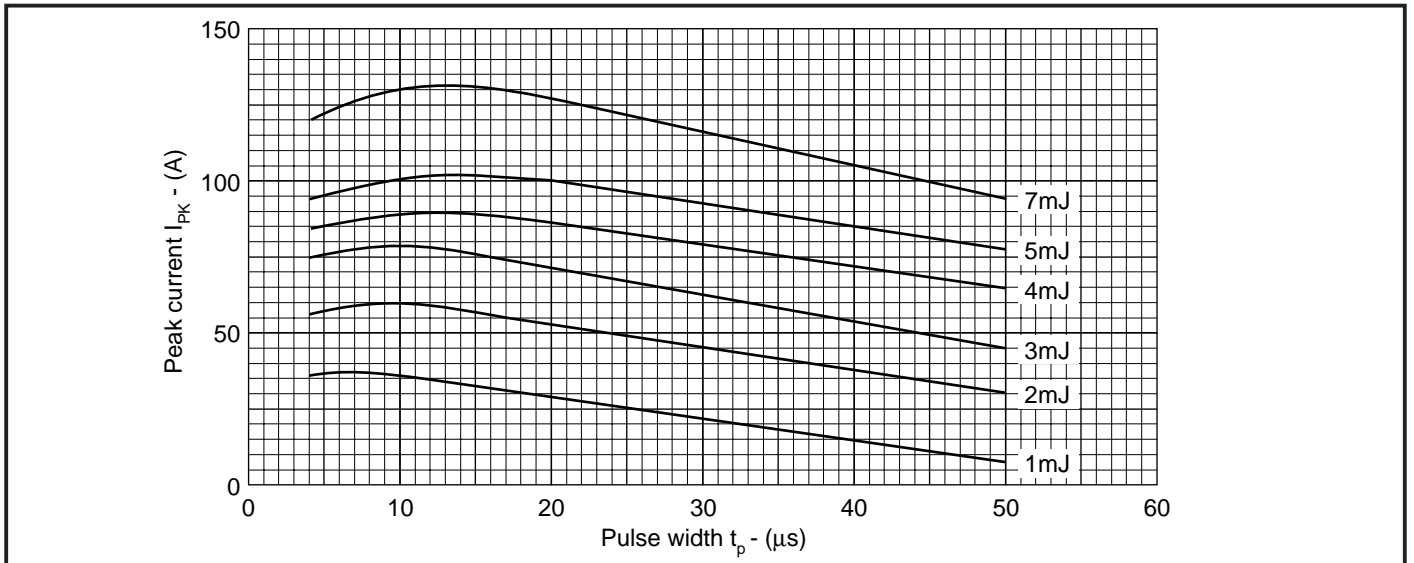


Fig.4 Maximum energy loss per pulse when switching a half sinusoidal pulse from 600V

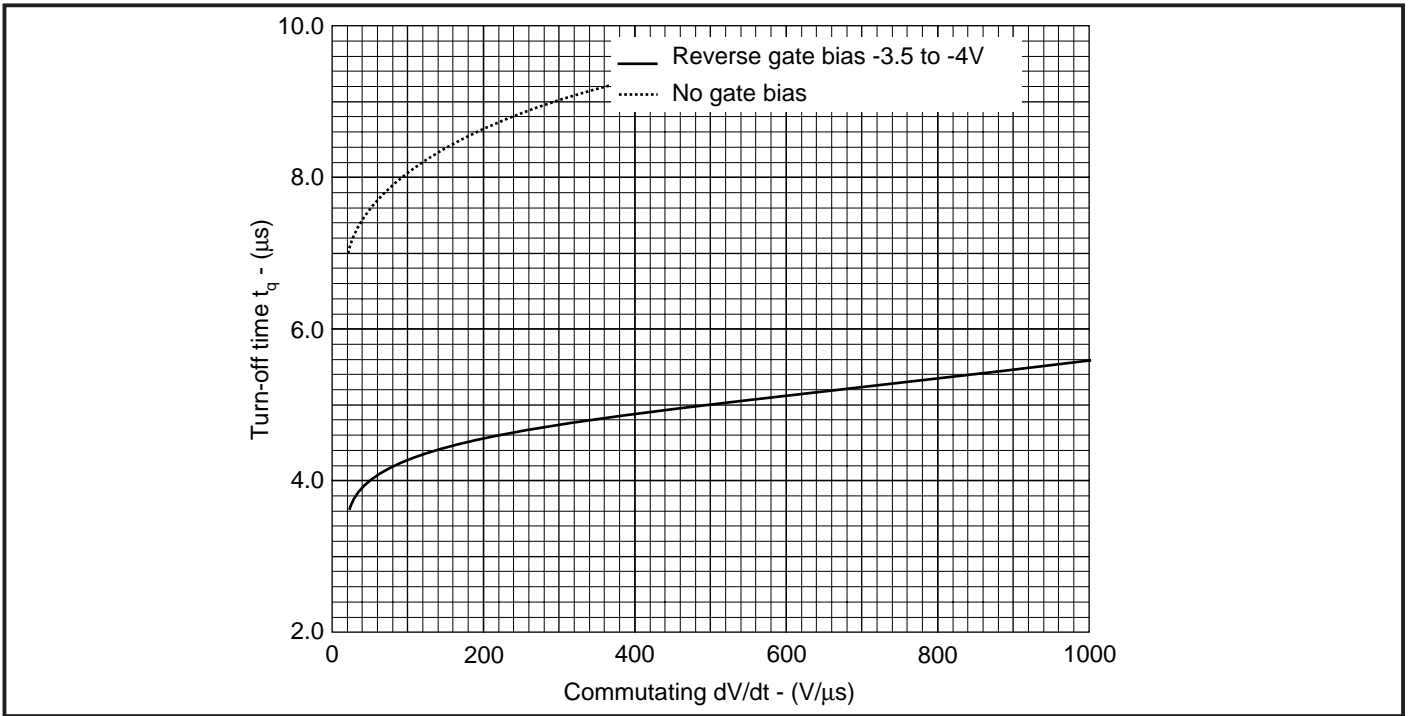


Fig.5 Variation of turn-off time with commutating  $dV/dt$

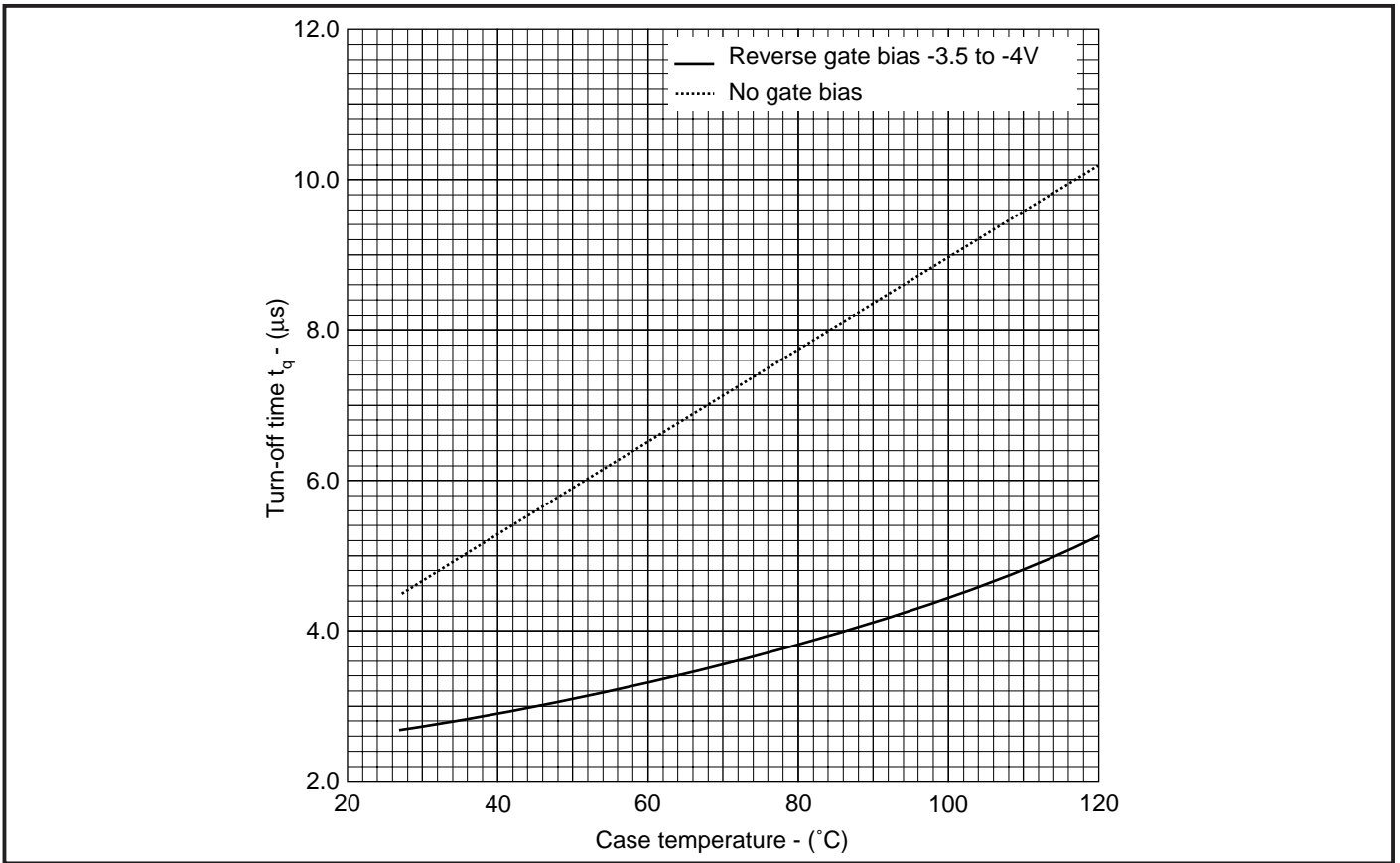
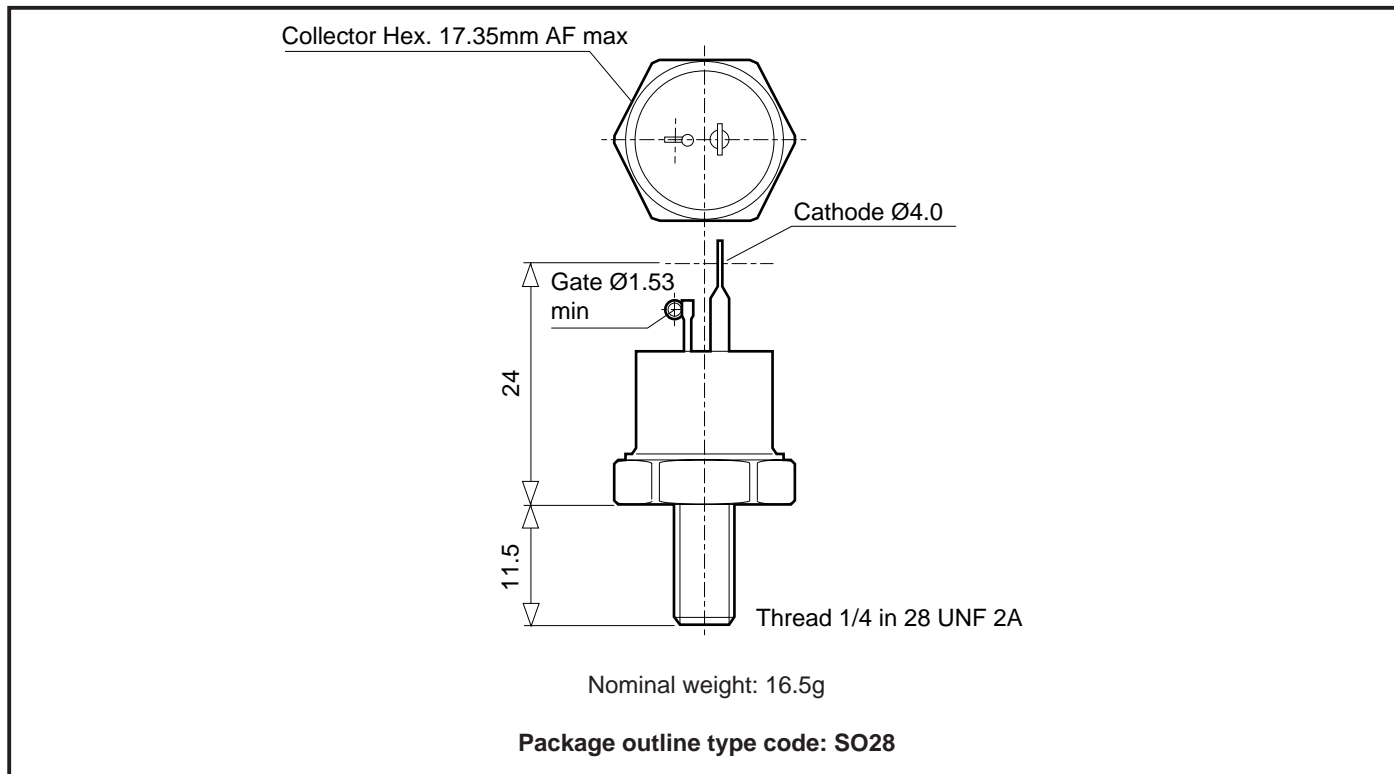


Fig.6 Variation of turn-off time with case temperature

**PACKAGE DETAILS**

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



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