

APPLICATIONS

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

KEY PARAMETERS

V_{DRM}	1600V
$I_{T(AV)}$	44A
I_{TSM}	550A
dV/dt^*	600V/ μ s
dI/dt	2000A/ μ s
t_q	6.0 μ s

*dV/dt Available to 1000V/ μ s

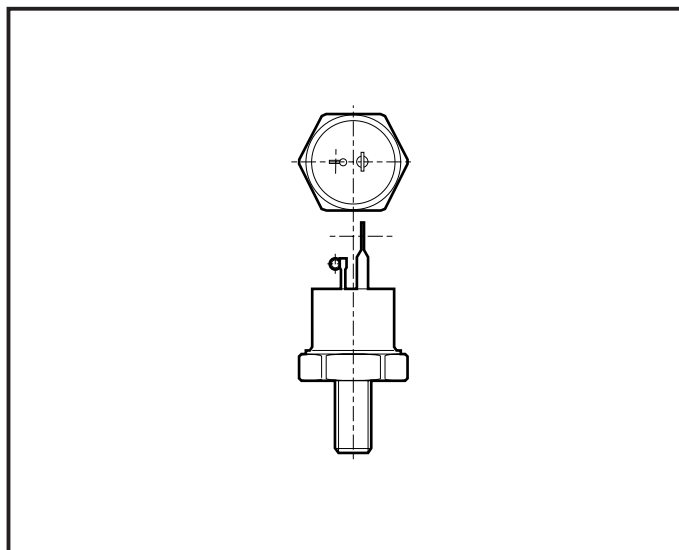
FEATURES

- 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 ² 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.

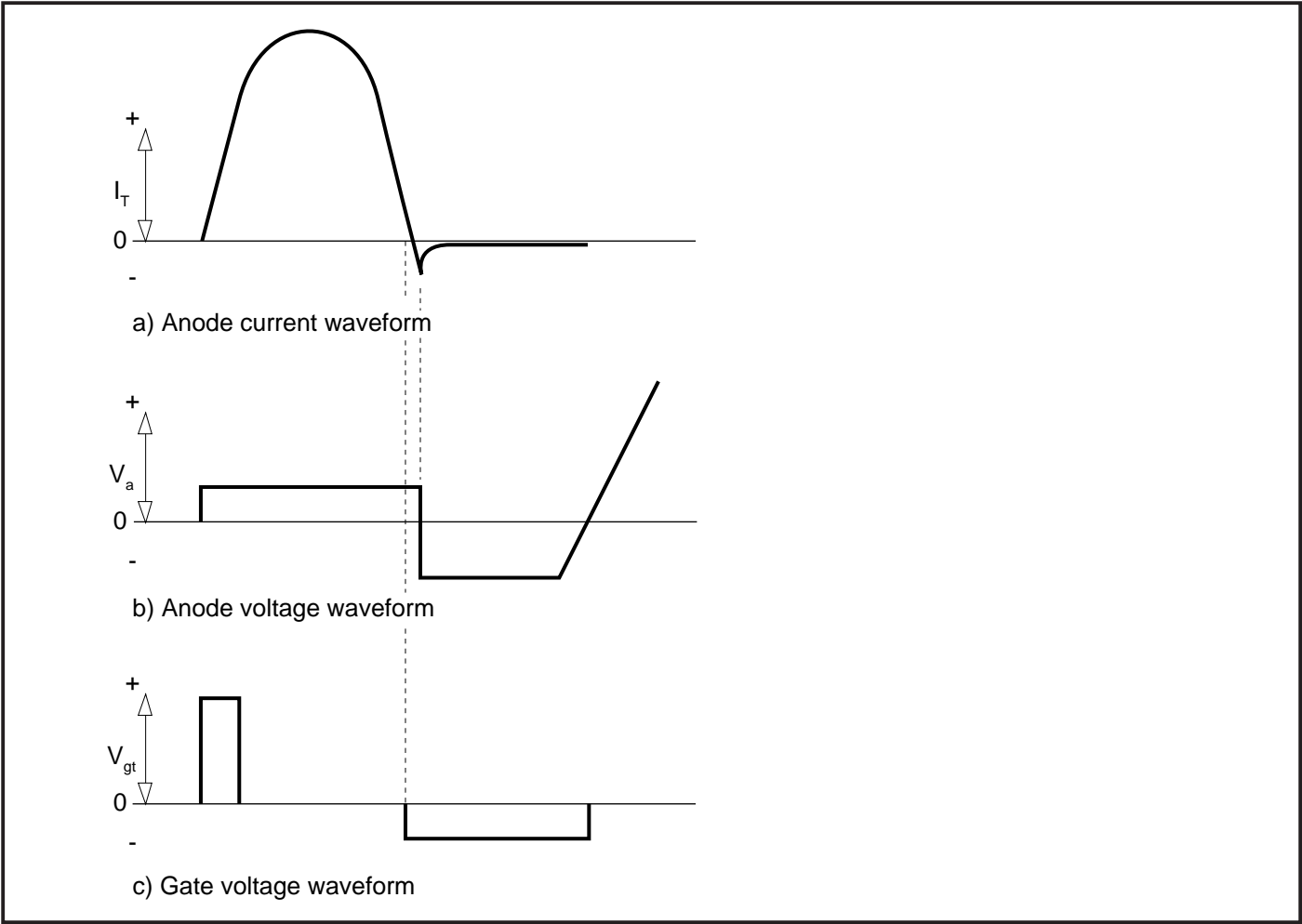
Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{TM}	Maximum on-state voltage	At 100A peak, $T_{case} = 25^{\circ}C$	-	2.7	V
I_{RRM}/I_{DRM}	Peak reverse and off-state current	At V_{RRM}/V_{DRM} , $T_{case} = 125^{\circ}C$	-	20/10	mA
dV/dt	Maximum linear rate of rise of off-state voltage	To V_{DRM} $T_j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

* Available to 1000V/ μ 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



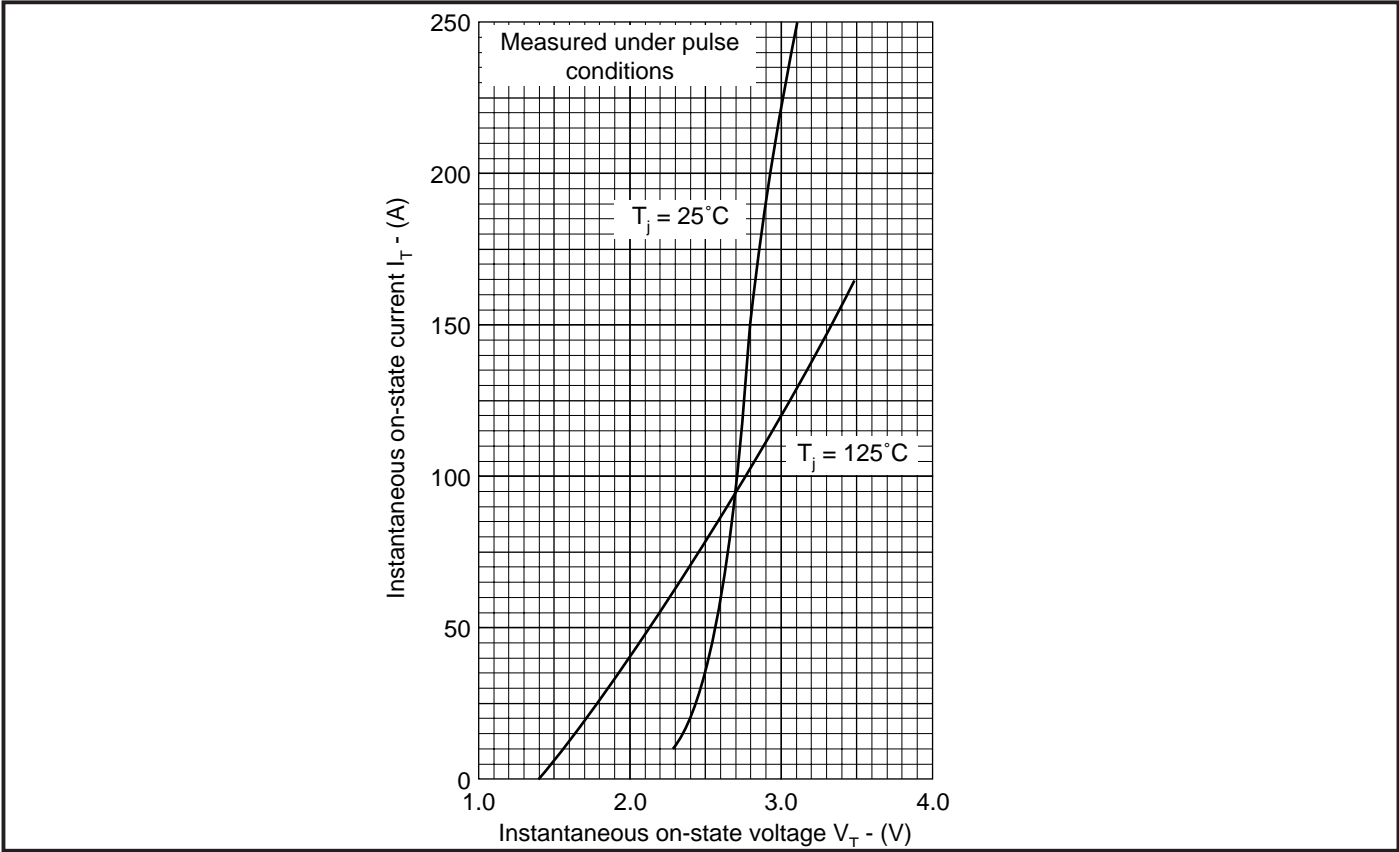


Fig.1 Maximum (limit) on-state characteristics

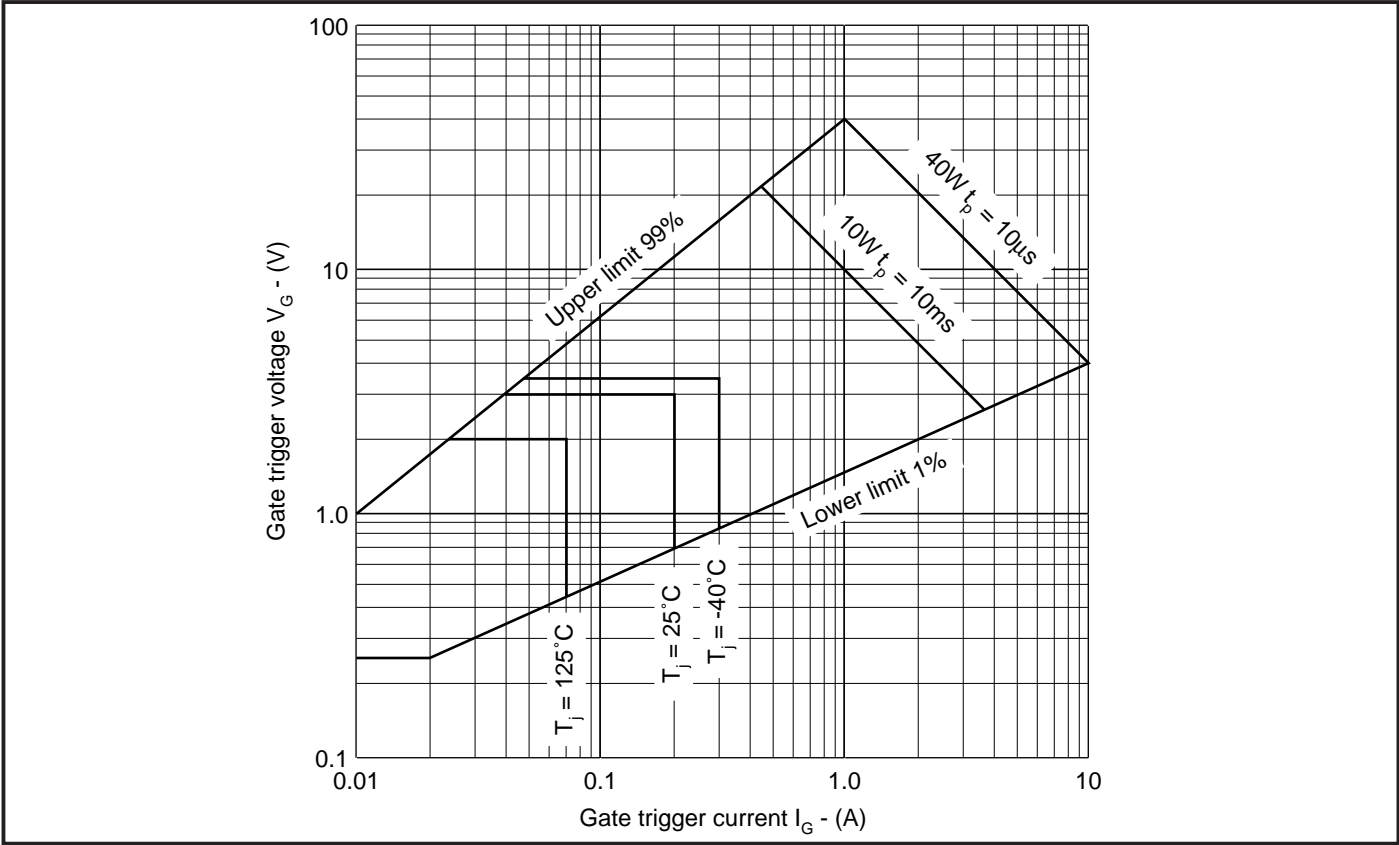


Fig.2 Gate characteristics

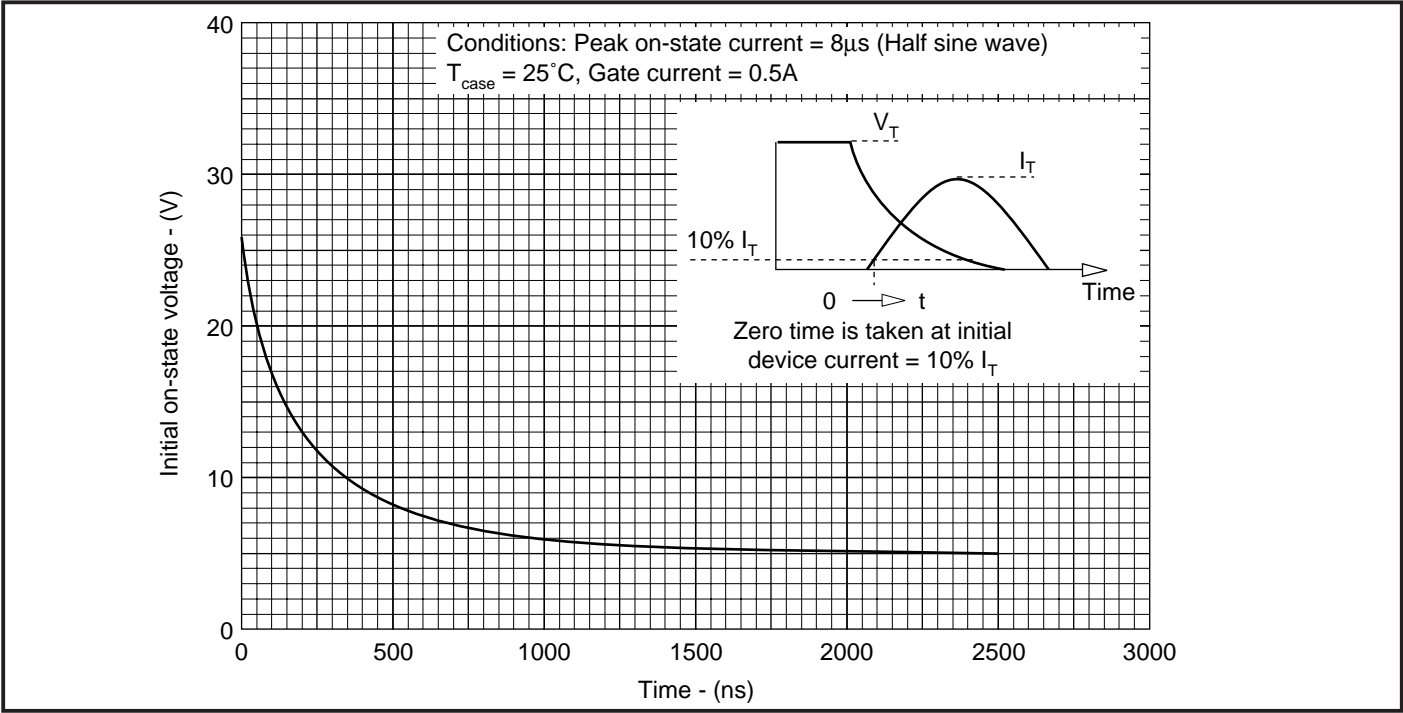


Fig.3 Typical initial on-state voltage vs time

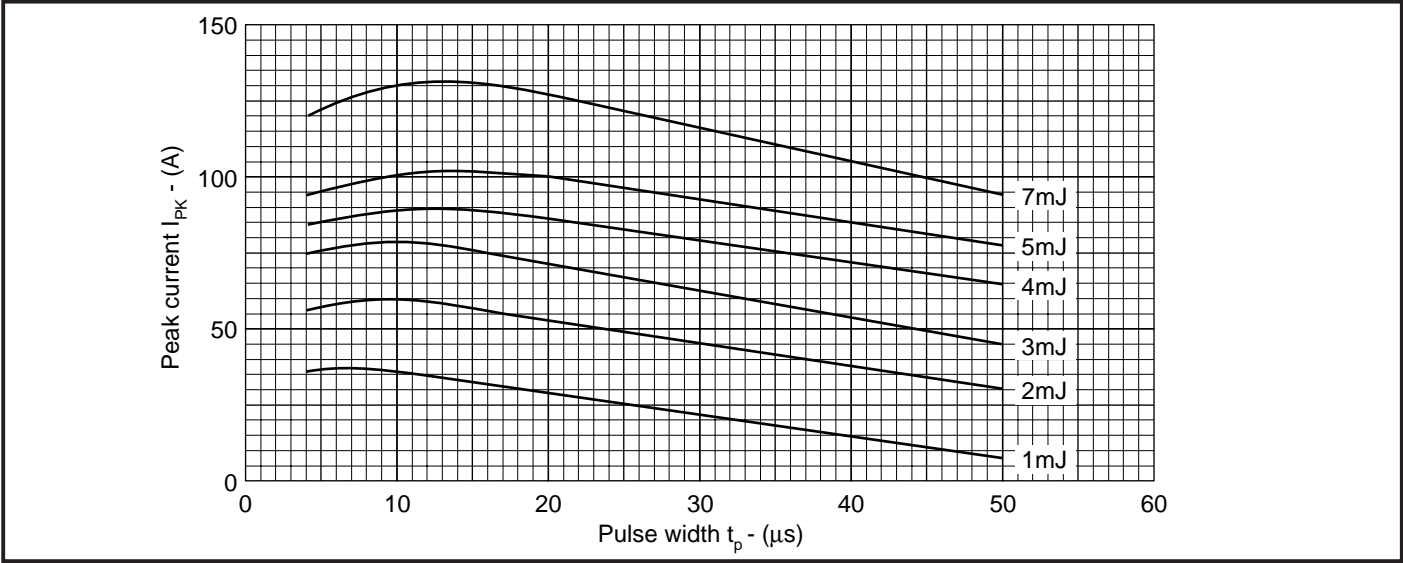


Fig.4 Maximum energy loss per pulse when switching a half sinusoidal pulse from 600V

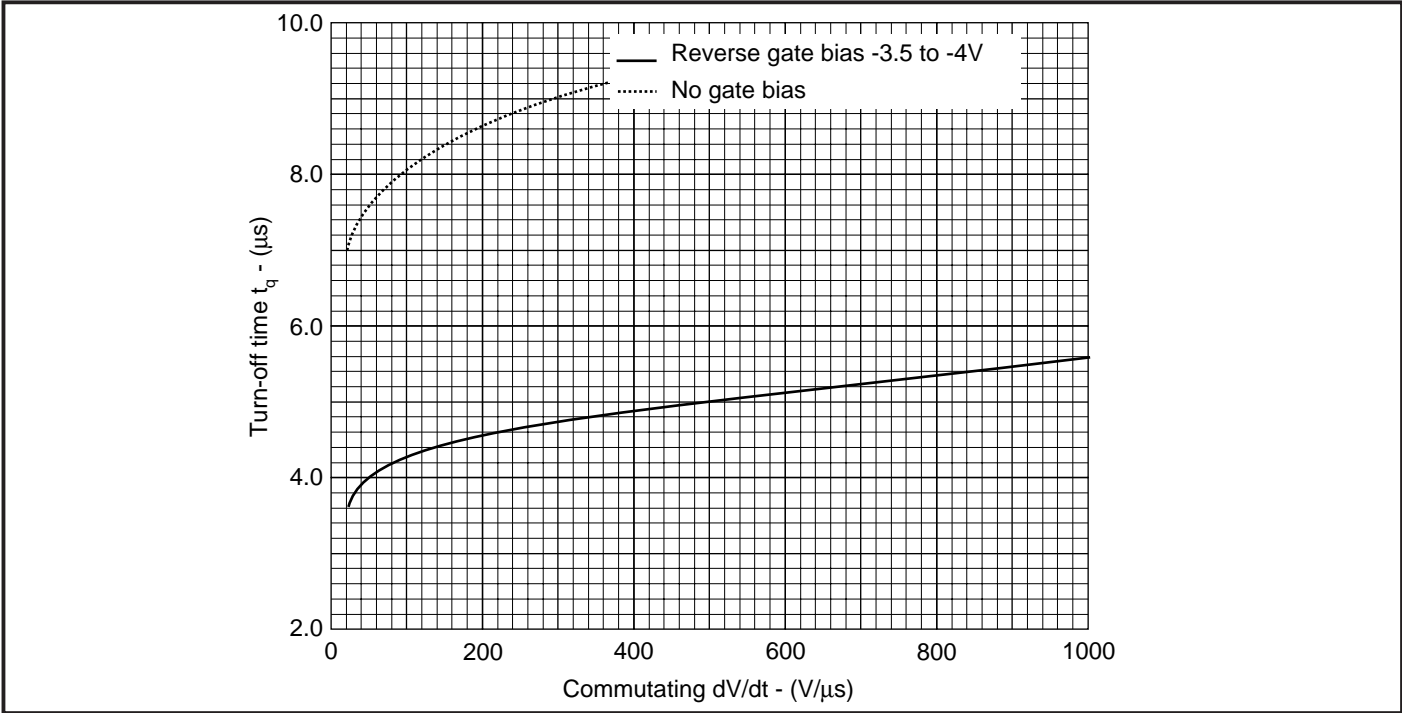


Fig.5 Variation of turn-off time with commutating dV/dt

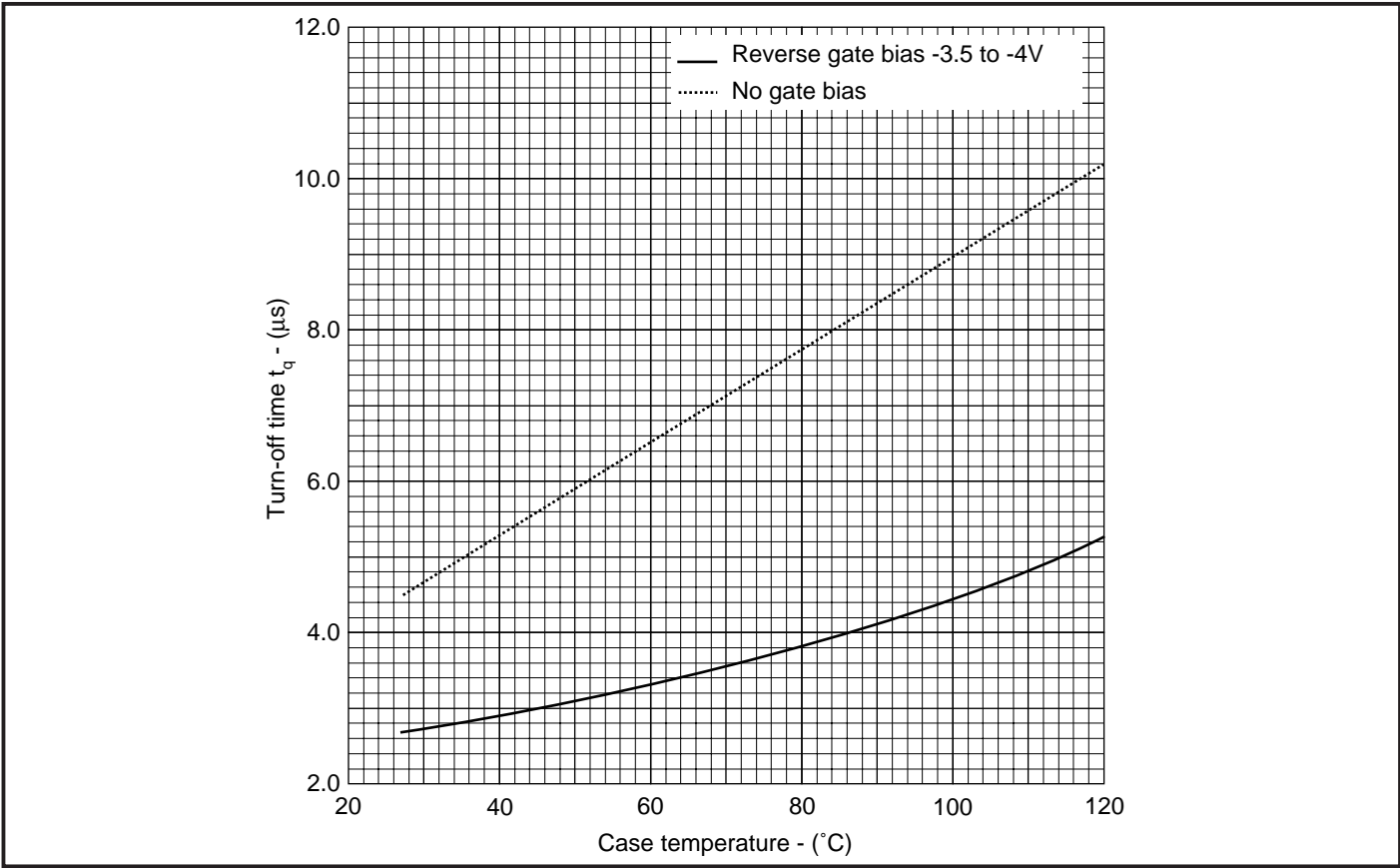
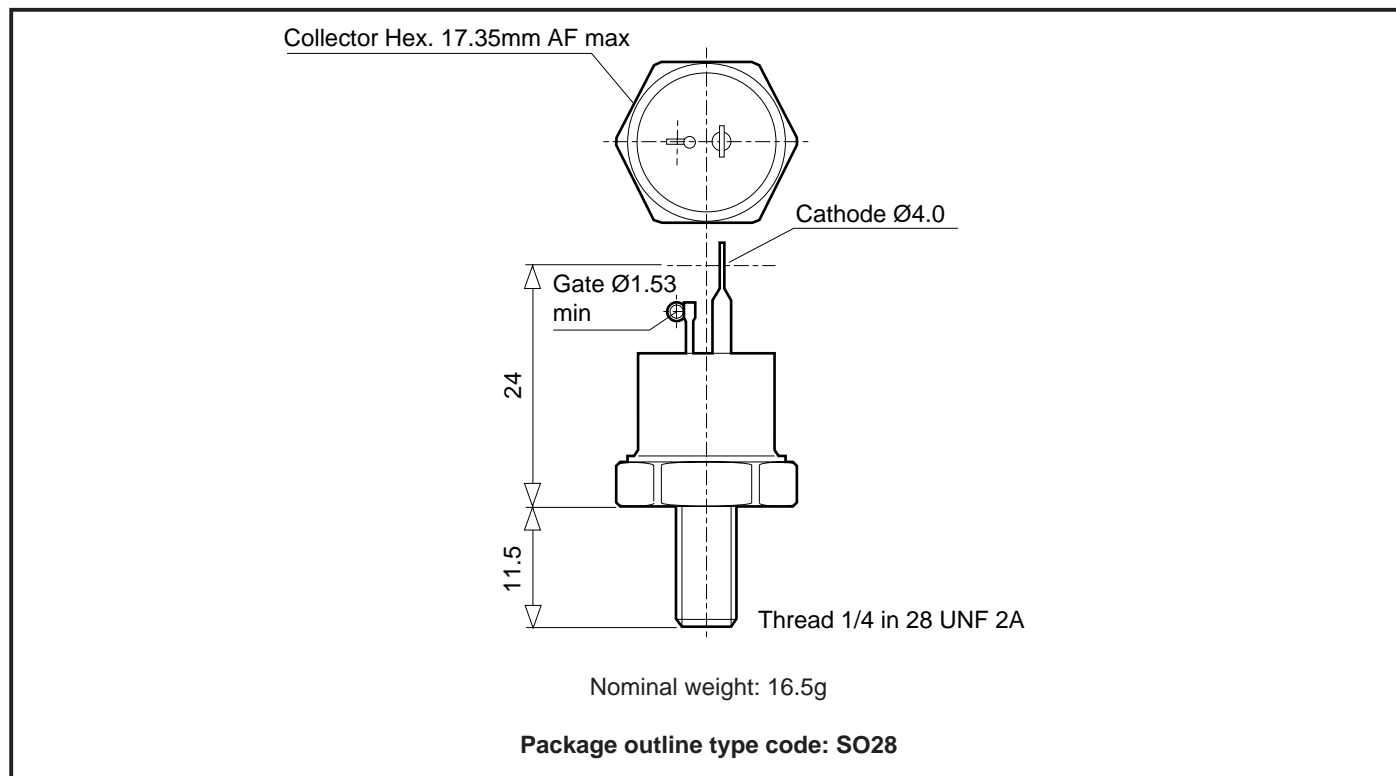


Fig.6 Variation of turn-off time with case temperature

PACKAGE DETAILS

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



<http://www.dynexsemi.com>

e-mail: power_solutions@dynexsemi.com

HEADQUARTERS OPERATIONS
DYNEX SEMICONDUCTOR LTD
 Doddington Road, Lincoln.
 Lincolnshire. LN6 3LF, United Kingdom.
 Tel: 00-44-(0)1522-500500
 Fax: 00-44-(0)1522-500550

DYNEX POWER INC.
 Unit 7 - 58 Antares Drive,
 Nepean, Ontario, Canada K2E 7W6.
 Tel: 613.723.7035
 Fax: 613.723.1518
 Toll Free: 1.888.33.DYNEX (39639)

CUSTOMER SERVICE CENTRES
France, Benelux, Italy and Spain Tel: +33 (0)1 69 18 90 00. Fax: +33 (0)1 64 46 54 50
North America Tel: 011-800-5554-5554. Fax: 011-800-5444-5444
UK, Germany, Scandinavia & Rest Of World Tel: +44 (0)1522 500500. Fax: +44 (0)1522 500020

SALES OFFICES
France, Benelux, Italy and Spain Tel: +33 (0)1 69 18 90 00. Fax: +33 (0)1 64 46 54 50
Germany Tel: 07351 827723
North America Tel: (613) 723-7035. Fax: (613) 723-1518. Toll Free: 1.888.33.DYNEX (39639) /
 Tel: (831) 440-1988. Fax: (831) 440-1989 / Tel: (949) 733-3005. Fax: (949) 733-2986.
UK, Germany, Scandinavia & Rest Of World Tel: +44 (0)1522 500500. Fax: +44 (0)1522 500020
 These offices are supported by Representatives and Distributors in many countries world-wide.
 © Dynex Semiconductor 2000 Publication No. DS4222-4 Issue No. 4.0 January 2000
 TECHNICAL DOCUMENTATION – NOT FOR RESALE. PRINTED IN UNITED KINGDOM

Datasheet Annotations:

Dynex Semiconductor annotate datasheets in the top right hand corner of the front page, to indicate product status. The annotations are as follows:-

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 is in design and development. The datasheet represents the product as it is understood but details may change.

Advance Information: The product design is complete and final characterisation for volume production is well in hand.

No Annotation: The product parameters are fixed and the product is available to datasheet specification.

This publication is issued to provide information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose nor form part of any order or contract nor to be regarded as a representation relating to the products or services concerned. No warranty or guarantee express or implied is made regarding the capability, performance or suitability of any product or service. The Company reserves the right to alter without prior notice the specification, design or price of any product or service. Information concerning possible methods of use is provided as a guide only and does not constitute any guarantee that such methods of use will be satisfactory in a specific piece of equipment. It is the user's responsibility to fully determine the performance and suitability of any equipment using such information and to ensure that any publication or data used is up to date and has not been superseded. These products are not suitable for use in any medical products whose failure to perform may result in significant injury or death to the user. All products and materials are sold and services provided subject to the Company's conditions of sale, which are available on request.

All brand names and product names used in this publication are trademarks, registered trademarks or trade names of their respective owners.