ACR44U



Fast Turn-off Asymmetric Thyristor

Replaces March 1998 version, DS4222-3.4

DS4222-4.0 January 2000

KEY PARAMETERS

 V_{DRM}

I_{T(AV)}

dVdt*

dl/dt

1600V

44A

550A

6.0μ**s**

600V/μs

2000A/μs

APPLICATIONS

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

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	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.

$t_{\rm q}$ $6.0 \mu s$ *dV/dt Available to 1000V/ μs

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

CURRENT RATINGS

Symbol	Parameter	Conditions		Units
I _{T(AV)}	Mean on-state current	Half wave resistive load, T _{case} = 80°C		А
I _{T(RMS)}	RMS value	$T_{case} = 70^{\circ}C$		А
I _T	Continuous (direct) on-state current	T _{case} = 85°C	57	А

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SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I _{TSM}	Surge (non-repetitive) forward current	40 1 1 1 1 1 1 1 1 1	550	А
l ² t	I ² t for fusing	10ms half sine; T _{case} = 125°C	1500	A ² s

THERMAL AND MECHANICAL DATA

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

DYNAMIC CHARACTERISTICS

 $T_{case} = 125$ °C unless otherwise stated.

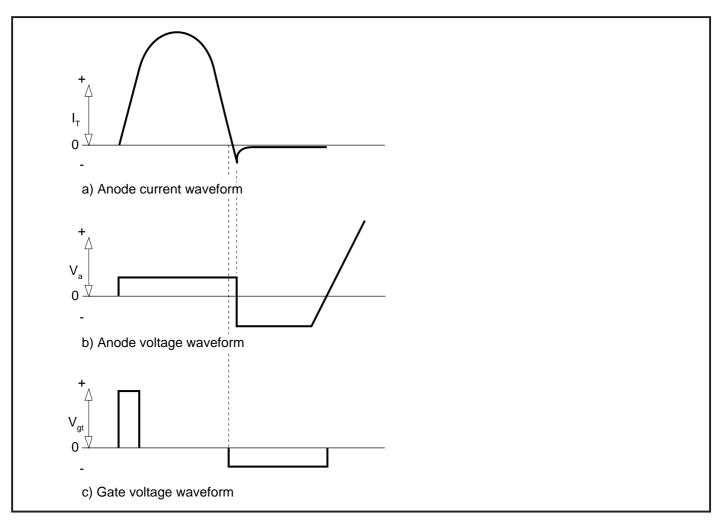
Symbol	Parameter	Conditions	Тур.	Max.	Units
V _{TM}	Maximum on-state voltage	At 100A peak, T _{case} = 25°C		2.7	V
I _{RRM} /I _{DRM}	Peak reverse and off-state current	At V _{RRM} /V _{DRM} , T _{case} = 125°C	-	20/10	mA
dV/dt	Maximum linear rate of rise of off-state voltage	To $V_{DRM} T_j = 125$ °C, gate open circuit	-	600°	V/μs
dl/dt	Rate of rise of on-state current	From V_{DRM} to 125A. Gate source 15V, 15 Ω t _r = 50ns	-	2000	A/μs
V _{T(TO)}	Threshold voltage	-		1.5	V
r _T	On-state slope resistance	-		13.3	mΩ
I _L	Latching current	-		-	mA
I _H	Holding current	-		-	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/µs.

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions		Тур.	Max.	Units
V _{GT}	Gate trigger voltage	$V_{DWM} = 12V, R_L = 30\Omega, T_{case} = 100$	$V_{DWM} = 12V, R_{L} = 30\Omega, T_{case} = 25^{\circ}C$		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	А
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



ACR44U

CURVES

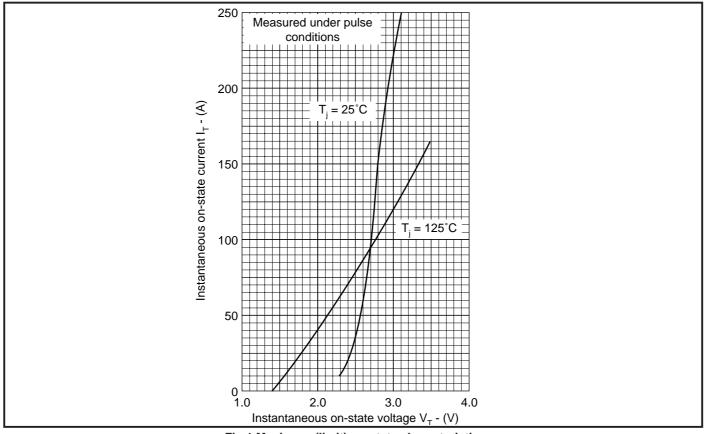


Fig.1 Maximum (limit) on-state characteristics

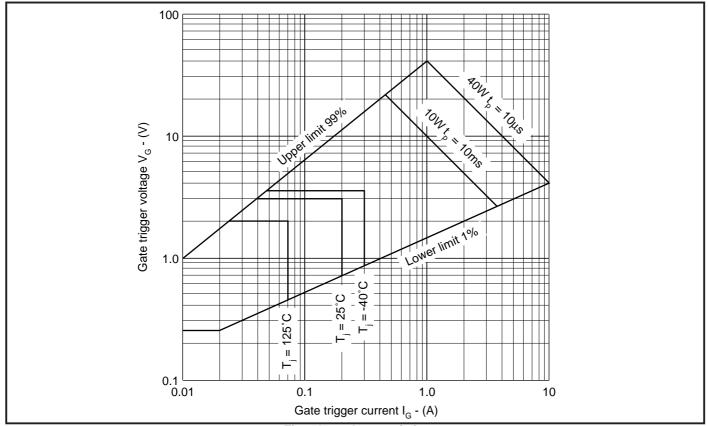


Fig.2 Gate characteristics

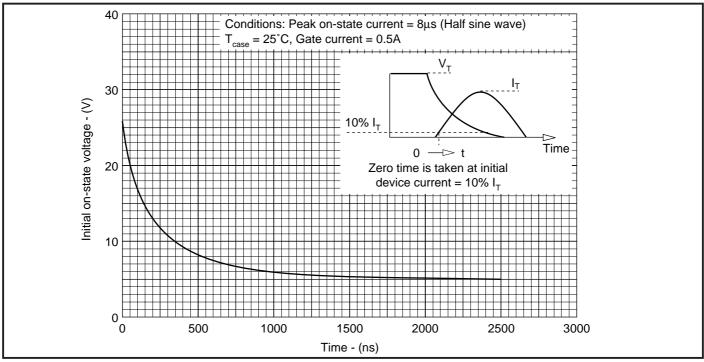


Fig.3 Typical initial on-state voltage vs time

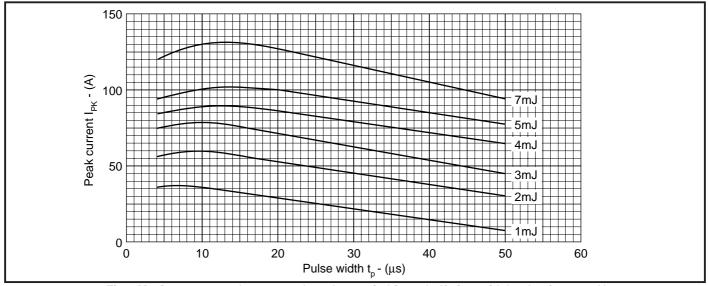


Fig.4 Maximum energy loss per pulse when switching a half sinusoidal pulse from 600V

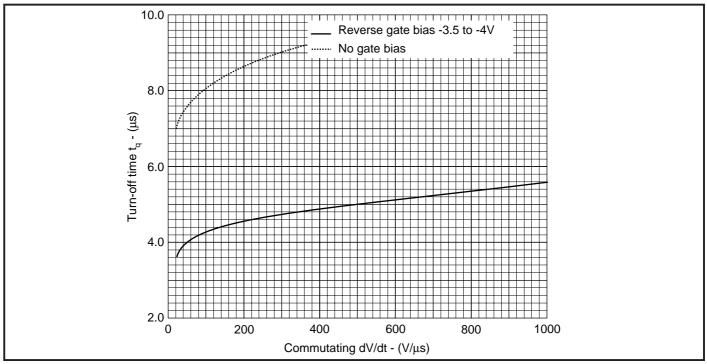


Fig.5 Variation of turn-off time with commutating dV/dt

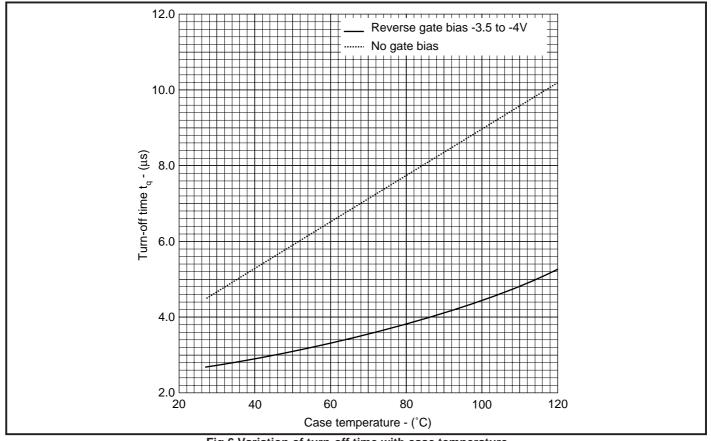
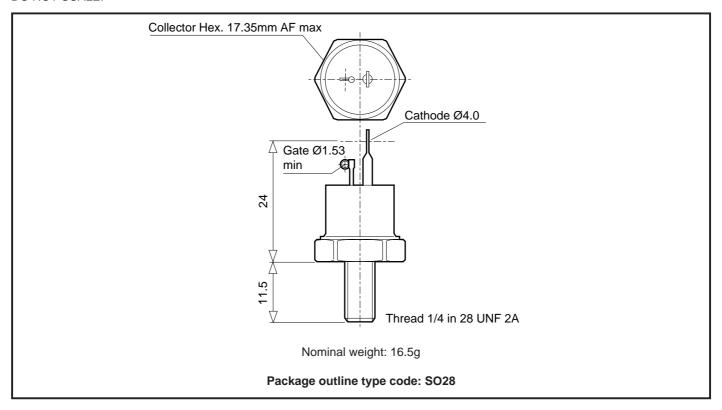


Fig.6 Variation of turn-off time with case temperature

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

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

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