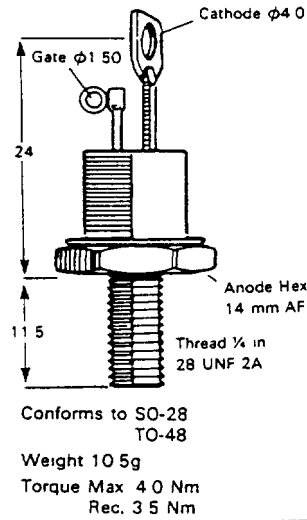


FAST TURN-OFF ASYMMETRICAL THYRISTOR

ACR 22U
 $I_T(AV) = 22A$
 $t_q = 5.5\mu s$

VOLTAGE RATINGS	Repetitive peak voltages		Crest (peak) working voltages	
	V_{DRM}	V_{RRM}	V_{DWM}	V_{RWM}
ACR22U04LG	400	10	400	10
ACR22U06LG	600	10	600	10
ACR22U08LG	800	10	800	10
ACR22U10LG	1000	10	1000	10
ACR22U12LG	1200	10	1200	10



Applications

- High frequency inverters
- Regulated Power Supplies
- Cycloconverters
- Ultrasonic Generators
- Induction Heaters
- Electronic Welding

Features

The ACR22U is a glass passivated asymmetrical thyristor. This device has exceptionally fast turn-off capabilities combined with good turn-on characteristics.

Current Ratings

Symbol	Description	Conditions	Units
$I_T(AV)$	Mean on-state current	Half wave resistive load $T_{case} = 70^\circ C$	22 A
I_T	Continuous (direct) on-state current	$T_{case} = 85^\circ C$	22A
I_{RMS}	RMS value	Max value	35A

Surge Ratings

I_{TSM}	Surge (non-repetitive) on-state current	$T_j = 125^\circ C$	220 A
I^2t	I^2t for fusing	10ms half sine	242 A ² s
di/dt	Rate of rise of on-state current	From V_{DRM} to 125A, Gate source 15V, 15Ω, rise time, 50ns	2000 A/μs
dv/dt	Min linear rate of rise of off-state voltage	Gate open circuit $T_{case} = 125^\circ C$	†500V/μs

†Available up to 1000V/μs

Gate Ratings

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	Mean gate power	Forward = 10W Reverse = 6W

Averaging time = 10ms max.

Temperature & Frequency Ratings

T_{vj}	Virtual junction temperature	125°C
T_{sig}	Store temperature range	-55 to 125°C

Characteristics $T_{case} = 25^\circ C$ unless otherwise stated

V_{TM}	On-state voltage	$I_T = 100A$	Fig. 5
I_{DM}	Peak off-state current	$T_{case} = 125^\circ C @ V_{DRM}$	
I_{RM}	Peak reverse current	$T_{case} = 125^\circ C @ V_{RRM}$	Fig. 6
I_L	Latching current		
I_H	Holding current		
I_{GT}	Gate trigger current	$V_{DWM} = 12V, R_L = 30\Omega$	
V_{GT}	Gate trigger voltage	$V_{DWM} = 12V, R_L = 30\Omega$	
t_d	Delay time	$V_D = 300V$, gate source = 15V, 15Ω	
t_q	Circuit commutated turn-off time	$I_T = 50A$ sq. wave 50μs pulse, $T_c = 120^\circ C$, $di/dt = 50A/\mu s$, $dv/dt = 600V/\mu s$ to V_{DRM}	
$R_{th(j-h)}$	Thermal resistance	Gate voltage at turn-off > -1V Mounting torque 3.5 Nm (with mounting grease)	

LIMIT			
Min	Typ.	Max	Units
-	-	2.7	V
-	-	10	mA
-	-	10	mA
-	45	-	mA
-	35	-	mA
-	60	200*	mA
-	0.9	3	V
-	-	250	ns
-	-	5.5	μs
-	-	1.05	°C/W

*Recommended gate source is 15V, 15Ω with 50ns rise time or minimum gate current 500mA

ACR 22U

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Fig. 5.
ON-STATE CHARACTERISTICS

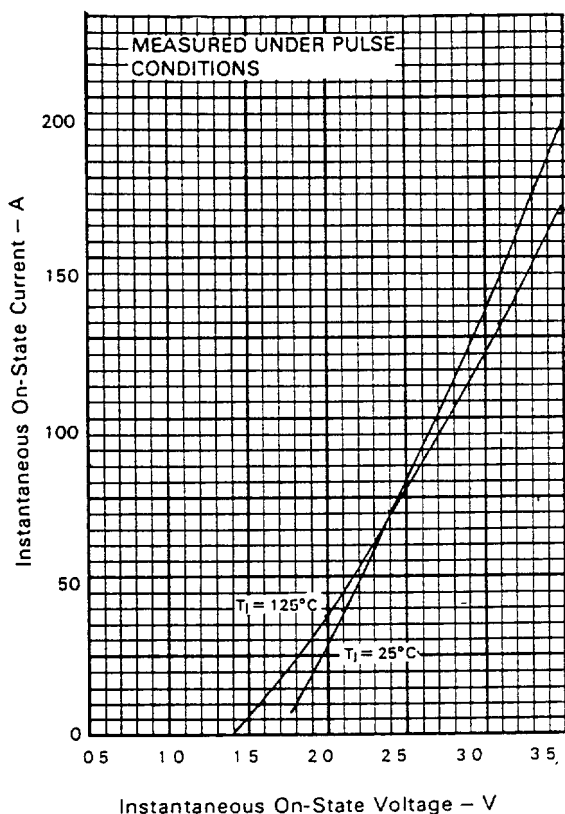


Fig. 6. TYPICAL CIRCUIT COMMUTATED TURN-OFF TIME VS. GATE VOLTAGE AT TURN-OFF

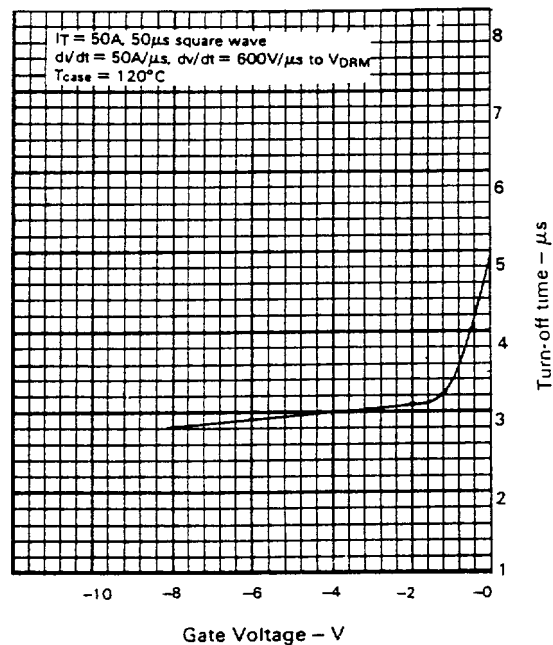
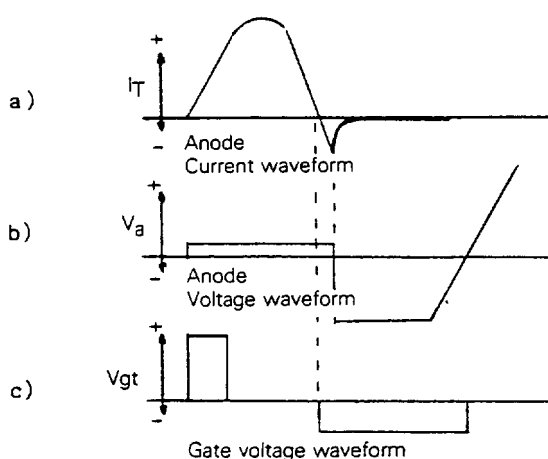
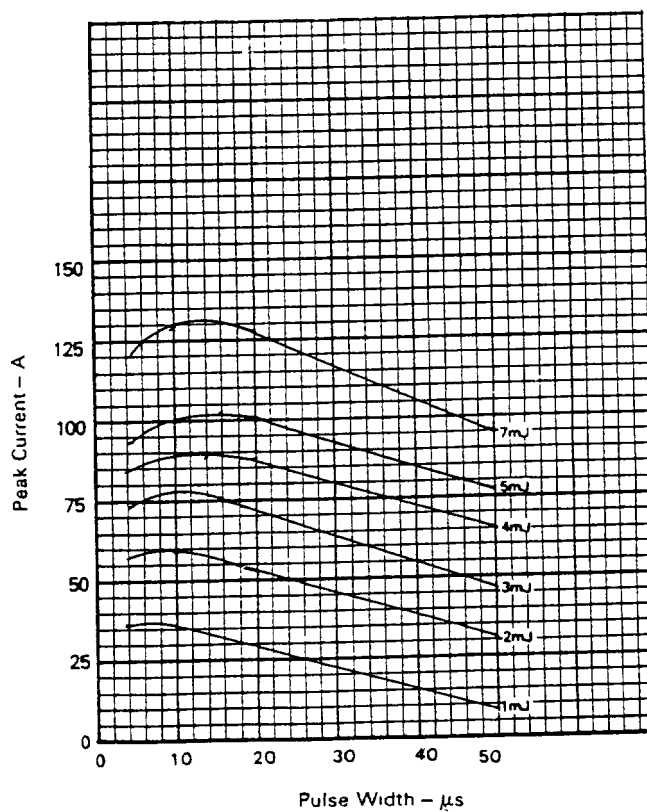


Fig. 7 MAXIMUM ENERGY LOSS/PULSE WHEN SWITCHING A HALF SINUSOIDAL PULSE FROM 600V



WAVEFORM OF GATE VOLTAGE AT TURN-OFF



ACR 22U

$I_T(AV) = 22A$

$t_q = 5.5\mu s$

Fig. 1 MINIMUM LINEAR CRITICAL RATE OF RISE OF OFF-STATE VOLTAGE VS GATE VOLTAGE

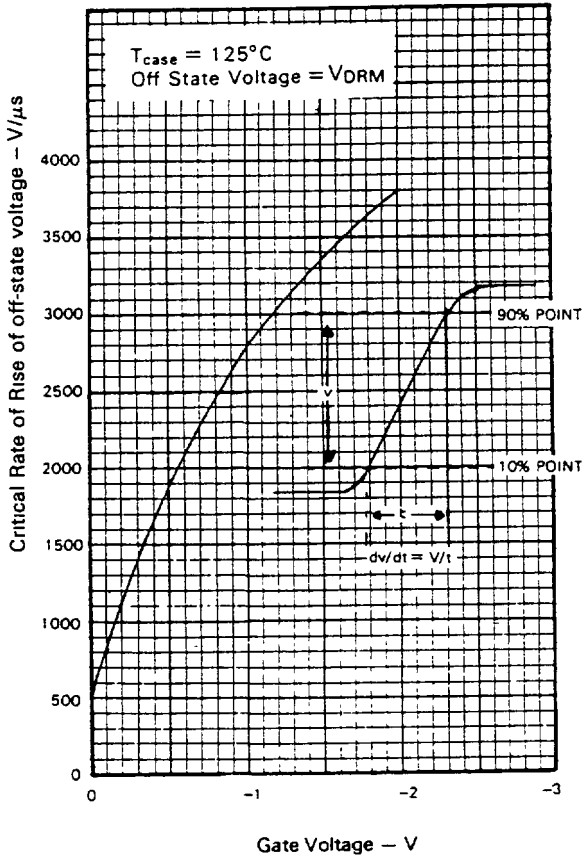


Fig. 3 REVERSE GATE CHARACTERISTICS

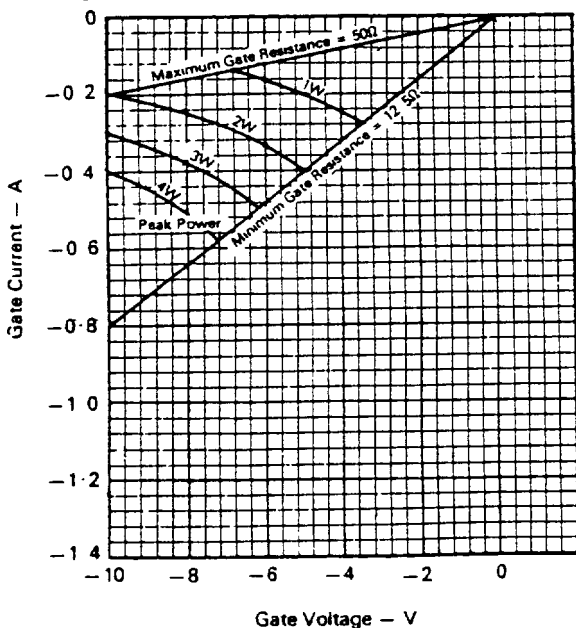


Fig. 2. GATE CHARACTERISTICS

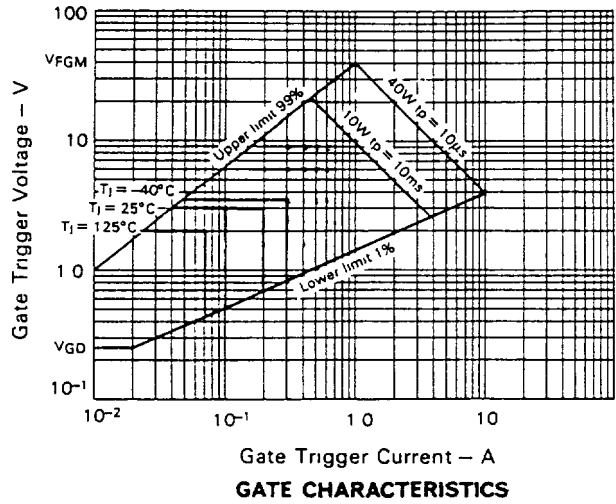
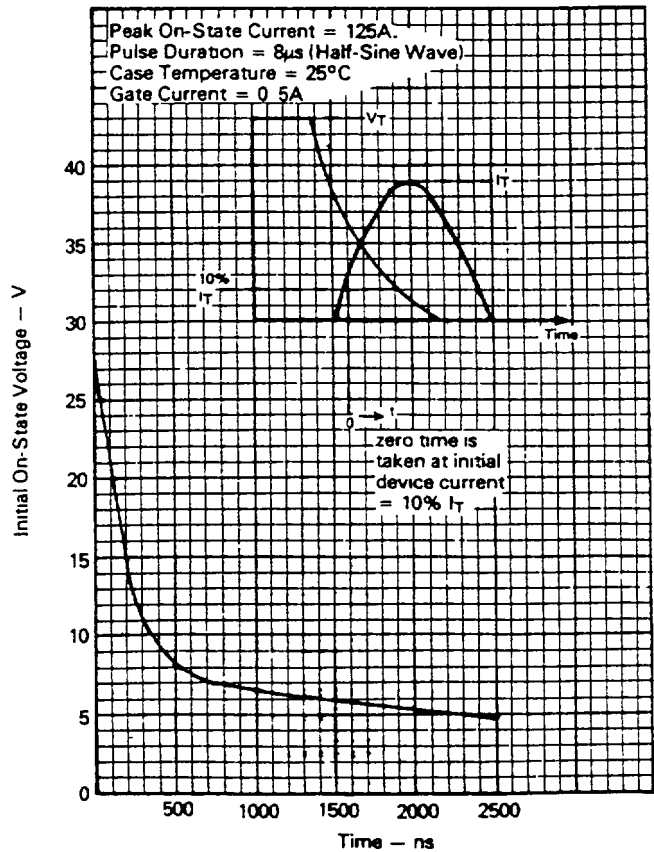


Fig. 4. TYPICAL INITIAL ON-STATE VOLTAGE VS TIME



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