

FAST TURN-OFF ASYMMETRICAL THYRISTOR

ACR 22U

$I_T(AV) = 22A$

$t_q = 5.5\mu s$

VOLTAGE RATINGS

Type Number

Repetitive peak
voltages
 V_{DRM} V_{RRM}

Crest (peak)
working voltages
 V_{DWM} V_{RWM}

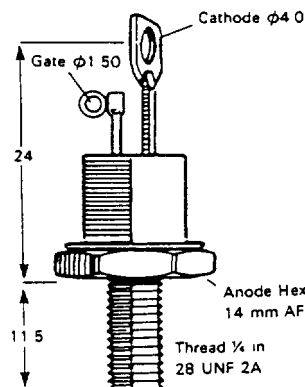
ACR22U04LG	400	10	400	10
ACR22U06LG	600	10	600	10
ACR22U08LG	800	10	800	10
ACR22U10LG	1000	10	1000	10
ACR22U12LG	1200	10	1200	10

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.



Conforms to SO-28
TO-48

Weight 10.5g

Torque Max 4.0 Nm
Rec. 3.5 Nm

Current Ratings

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

Surge Ratings

I_{TSM}	Surge (non-repetitive) on-state current	$T_J = 125^\circ C$	220 A
$I^2 t$	$I^2 t$ 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		To V_{DRM}	Fig. 1

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
F_G	Mean gate power	Forward = 10W Reverse = 6W
		Averaging time = 10ms max.

Temperature & Frequency Ratings

T_J	Virtual junction temperature	125°C
T_{stg}	Store temperature range	-55 to 125°C

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

V_{TM}	On-state voltage	$I_T = 100A$
I_{DM}	Peak off-state current	$T_{case} = 125^\circ C @ V_{DRM}$
I_{RM}	Peak reverse current	$T_{case} = 125^\circ C @ V_{RRM}$
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 computed 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}
$R_{\theta(j-h)}$	Thermal resistance	Gate voltage at turn-off > -1V Mounting torque 3.5 Nm (with mounting grease)

Fig. 5

Fig. 6

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

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Fig. 5.
ON-STATE CHARACTERISTICS

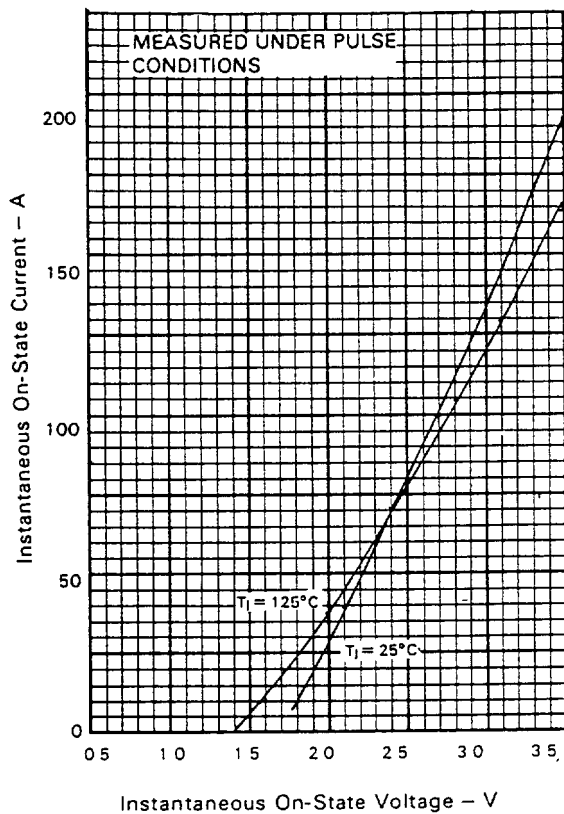


Fig. 6. TYPICAL CIRCUIT COMMUTATED TURN-OFF TIME VS. GATE VOLTAGE AT TURN-OFF

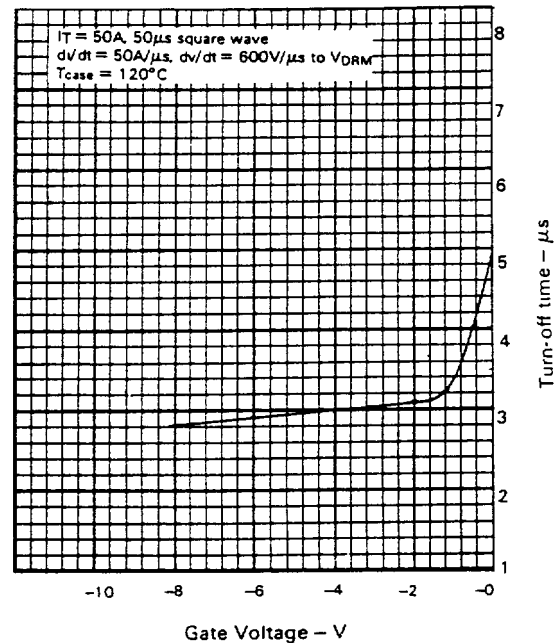
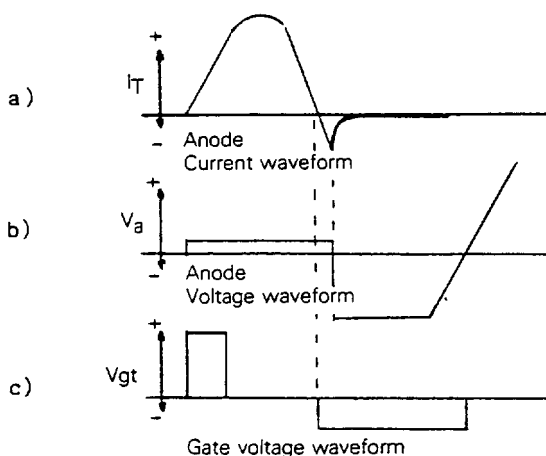
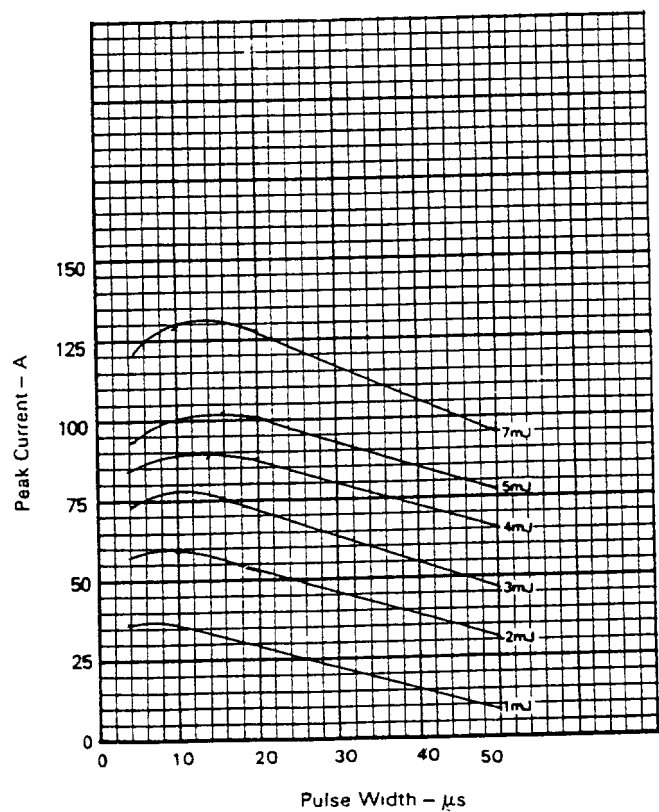


Fig. 7 MAXIMUM ENERGY LOSS/PULSE WHEN SWITCHING A HALF SINUSOIDAL PULSE FROM 600V



WAVEFORM OF GATE VOLTAGE AT TURN-OFF

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

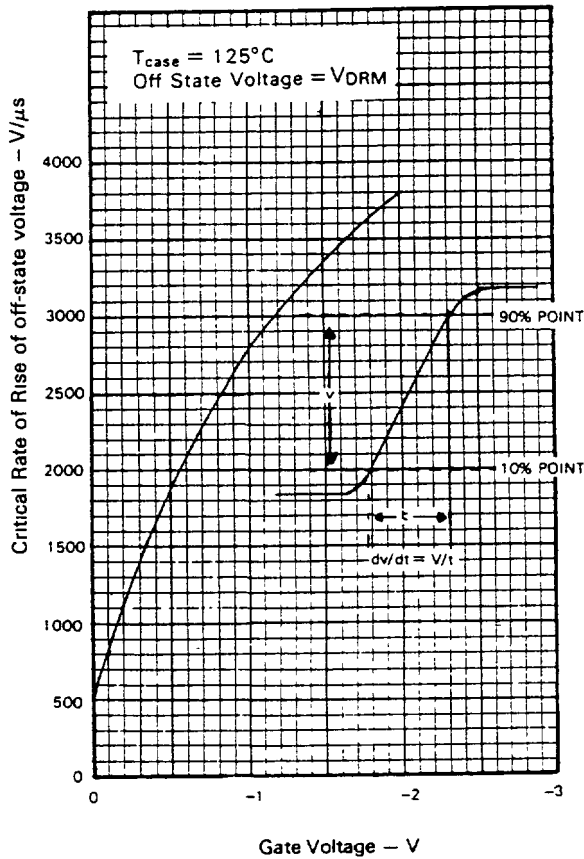


Fig. 3 REVERSE GATE CHARACTERISTICS

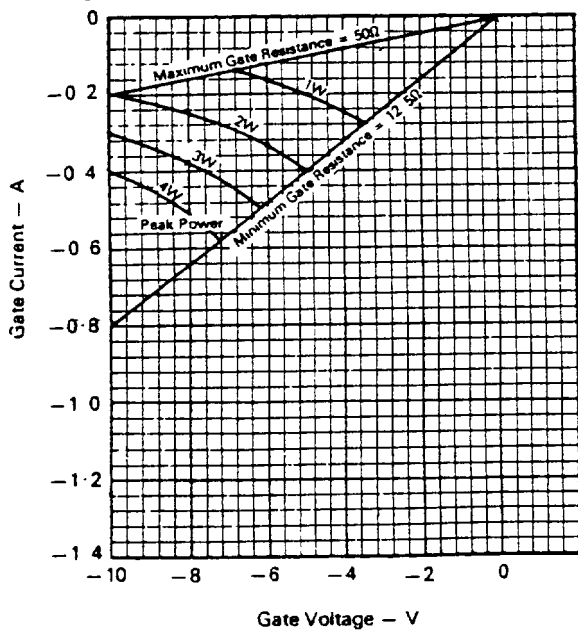


Fig. 2. GATE CHARACTERISTICS

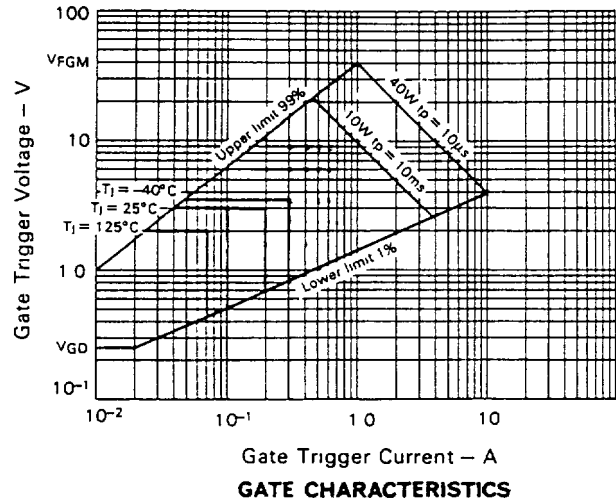
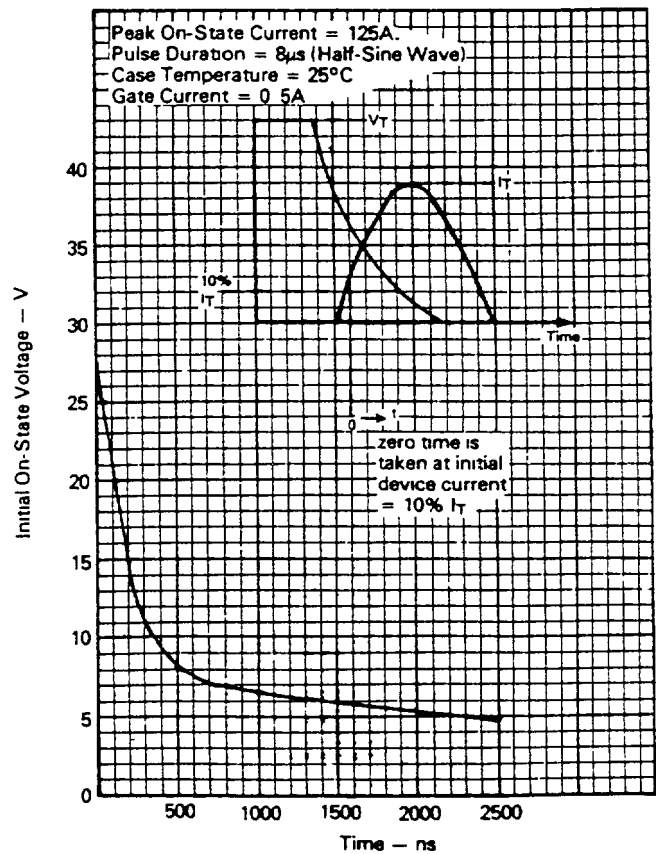


Fig. 4. TYPICAL INITIAL ON-STATE VOLTAGE VS TIME



**Marconi Electronic Devices Ltd.,
Power Semiconductor Division**

Carholme Road
Lincoln LN1 1SG

Telephone (0522) 510500 Telex 56163 Fax 0522 510550

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