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C38 SERIES

Type	Minimum Forward Breakover Voltage (V _{BO})* T _J = -65°C to +150°C	Repetitive Peak Reverse Voltage (PRV)* T _J = -65°C to +150°C	Transient Peak Reverse Voltage (Non-recurrent < 5.0 Millisec.)* T _J = -65°C to +150°C
C38U	25 volts	25 volts	35 volts

*Values apply for zero or negative gate voltage only. Maximum case to ambient thermal resistance for which maximum PRV ratings apply — equals 11°C/watt.

MAXIMUM ALLOWABLE RATINGS

RMS Forward Current	35 amperes (all conduction angles)
Average Forward Current (I _O)	Depends on conduction angle (see charts 3 & 5)
Peak One-cycle Non-recurrent Surge Current (i _{surge})	150 amperes
Peak Non-recurrent Surge Current during Turn-on time Interval	See Chart 10
I ² t (for fusing)	75 ampere ² seconds (for times ≥ 1.5 milliseconds)
Peak Gate Power (p _G)	12 watts
Average Gate Power (P _G)	0.5 watt
* Peak Gate Current (i _G)	2.0 amperes
** Peak Gate Voltage (v _G) (Forward and Reverse)	10 volts
Storage Temperature	-65°C to +150°C
Operating Temperature	-65°C to +150°C
Stud Torque	30 inch-pounds

**NOT TO EXCEED GATE POWER RATINGS

CHARACTERISTICS

Test	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Peak Reverse and Forward Blocking Current* C38U	i _R and i _S	—	6.0	10.0	ma	T _J = 25°C v _{AC} = v _{CA} = 25v peak
Peak Reverse and Forward Blocking Current* C38U	i _R and i _S	—	9.0	13.0	ma	T _J = 150°C v _{AC} = v _{CA} = 25v peak
Rate of Rise of Forward Voltage that Will Not Turn on SCR**	dv/dt	20.0	40.0	—	volts/ μsec	T _J = 150°C. Gate open circuited. v _{AC} = Rated.
Gate Current to Fire	I _{GF}	—	15	40	mA dc	T _J = 25°C, V _{AC} = 6 Vdc, R _L = 50 ohms
		—	35	80	mA dc	T _J = -65°C, V _{AC} = 6 Vdc, R _L = 50 ohms
		—	7.5	20	mA dc	T _J = 150°C, V _{AC} = 6 Vdc, R _L = 50 ohms
Gate Voltage to Fire	V _{GF}	—	1.2	3.0	Vdc	V _{AC} = 6 Vdc, T _J = 25°C, R _L = 50 ohms
		—	2.0	3.0	Vdc	V _{AC} = 6 Vdc, T _J = -65°C, R _L = 50 ohms
		0.15	—	—	Vdc	v _{AC} = Rated, T _J = 150°C, R _L = 1000 ohms
Forward Voltage Drop	v _F	—	1.7	2.0	v	i _F = 50a peak, T _J = 25°C
Holding Current	I _H	—	10	80	mA dc	T _J = 25°C, Anode Supply = 6 Vdc
Turn-on Time	t _d + t _r	—	1.4	—	μsec	T _J = 25°C, i _F = 5.0 A dc, v _{AC} = Rated. Gate supply: 10 volt open circuit, 25 ohm, 0.1 μsec. max. rise time.
Turn-off Time	t _{off}	—	24	—	μsec	T _J = 150°C, i _F = 10a, i _R = 5a, v _{AC} (reapplied) = Rated, dv/dt = 20v/μsec Linear
Thermal Resistance	θ _{J-C}	—	.75	1.5	°C/watt	Junction to case

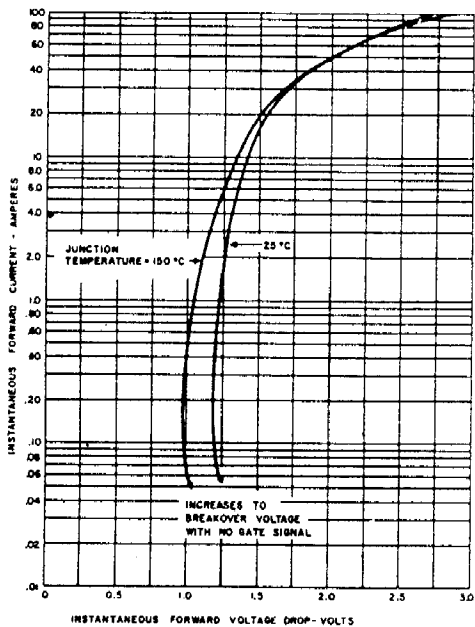
*Values apply for zero or negative gate voltage. Max. case to ambient thermal resistance for which max. PRV ratings apply = 11°C per watt.

**See Chart 8.

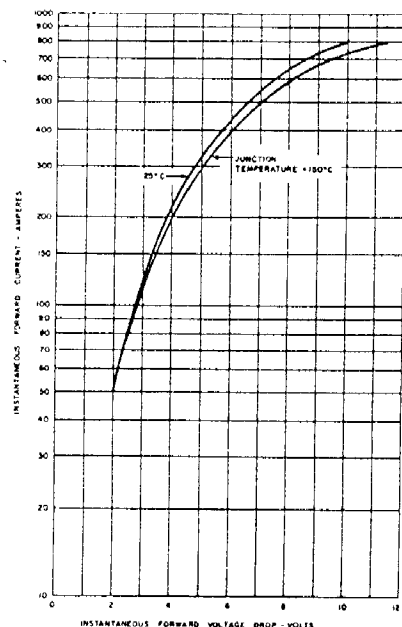
CHARACTERISTICS

Test	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Peak Reverse and Forward Blocking Current*	i_R and i_S					$T_J = 25^\circ\text{C}$ $V_{AC} = V_{CA} = 25\text{v peak}$
C38U		—	6.0	10.0	ma	50
C38F		—	5.5	10.0	ma	100
C38A		—	5.0	10.0	ma	150
C38G		—	4.5	10.0	ma	200
C38B		—	4.0	8.0	ma	250
C38H		—	3.0	6.0	ma	300
C38C		—	2.5	5.0	ma	400
C38D		—	2.0	4.0	ma	500
C38E		—	1.5	3.0	ma	
Peak Reverse and Forward Blocking Current*	i_R and i_S					$T_J = 150^\circ\text{C}$ $V_{AC} = V_{CA} = 25\text{v peak}$
C38U		—	9.0	13.0	ma	50
C38F		—	8.9	13.0	ma	100
C38A		—	7.8	13.0	ma	150
C38G		—	7.7	13.0	ma	200
C38B		—	7.5	12.0	ma	250
C38H		—	7.3	11.0	ma	300
C38C		—	6.8	10.0	ma	400
C38D		—	5.3	8.0	ma	500
C38E		—	2.6	6.0	ma	
Rate of Rise of Forward Voltage that Will Not Turn on SCR**	dv/dt	20.0	40.0	—	volts/ μsec	$T_J = 150^\circ\text{C}$, Gate open circuited, $V_{AC} = \text{Rated}$.
Gate Current to Fire	I_{GF}	—	15	40	mAdc	$T_J = 25^\circ\text{C}$, $V_{AC} = 6\text{ Vdc}$, $R_L = 50\text{ ohms}$
		—	35	80	mAdc	$T_J = -65^\circ\text{C}$, $V_{AC} = 6\text{ Vdc}$, $R_L = 50\text{ ohms}$
		—	7.5	20	mAdc	$T_J = 150^\circ\text{C}$, $V_{AC} = 6\text{ Vdc}$, $R_L = 50\text{ ohms}$
Gate Voltage to Fire	V_{GF}	—	1.2	3.0	Vdc	$V_{AC} = 6\text{ Vdc}$, $T_J = 25^\circ\text{C}$, $R_L = 50\text{ ohms}$
		—	2.0	3.0	Vdc	$V_{AC} = 6\text{ Vdc}$, $T_J = -65^\circ\text{C}$, $R_L = 50\text{ ohms}$
		0.15	—	—	Vdc	$V_{AC} = \text{Rated}$, $T_J = 150^\circ\text{C}$, $R_L = 1000\text{ ohms}$
Forward Voltage Drop	V_F	—	1.7	2.0	v	$i_F = 50\text{a peak}$, $T_J = 25^\circ\text{C}$
Holding Current	I_H	—	10	80	mAdc	$T_J = 25^\circ\text{C}$, Anode Supply = 6 Vdc
Turn-on Time	$t_d + t_r$	—	1.4	—	μsec	$T_J = 25^\circ\text{C}$, $I_F = 5.0\text{ Adc}$, $V_{AC} = \text{Rated}$. Gate supply: 10 volt open circuit, 25 ohm, 0.1 μsec max. rise time.
Turn-off Time	t_{off}	—	24	—	μsec	$T_J = 150^\circ\text{C}$, $i_F = 10\text{a}$, $i_R = 5\text{a}$, V_{AC} (reapplied) = Rated, $dv/dt = 20\text{v}/\mu\text{sec}$ Linear
Thermal Resistance	θ_{J-C}	—	.75	1.5	$^\circ\text{C}/\text{watt}$	Junction to case

*Values apply for zero or negative gate voltage. Max. case to ambient thermal resistance for which max. PRV ratings apply = 11°C per watt.
**See Chart 8.



1. MAXIMUM FORWARD CHARACTERISTICS CONDUCTING STATE



2. MAXIMUM FORWARD CHARACTERISTICS HIGH CURRENT LEVEL, CONDUCTING STATE