

Description

Glass passivated, sensitive gate thyristors in a plastic envelope, intended for use in general purpose switching and phase control applications. These devices are intended to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.

Symbol 		Simplified outline  TO-220	
Pin	Description		
1	Cathode		
2	Anode		
3	Gate		

Applications:

- ◆ Motor control
- ◆ Industrial and domestic lighting
- ◆ Heating
- ◆ Static switching

Features

- ◆ Blocking voltage to 800 V
- ◆ On-state RMS current to 10 A
- ◆ Ultra low gate trigger current

SYMBOL	PARAMETER	Value	UNIT
V_{DRM}	Repetitive peak off-state voltages ($T_j = -40$ to 110°C 1/2 Sine Wave, $R_{GK} = 1K\Omega$)	MCR310-6 400	V
		MCR310-8 600	V
		MCR310-10 800	V
$I_T (RMS)$	On-state rms current	10	A
I_{TSM}	Peak non-repetitive surge current	100	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{th j-c}$	Thermal resistance Junction to Case		-	-	2.2	$^\circ\text{C/W}$
$R_{th j-a}$	Thermal resistance Junction to ambient		-	-	60	$^\circ\text{C/W}$

Limiting values in accordance with the Maximum system(IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state Voltages	$T_j = -40$ to 110 , 1/2 Sine Wave, $R_{GK} = 1k\Omega$) MCR310-6 MCR310-8 MCR310-10	-	400 600 800	V
$I_{T(RMS)}$	RMS on-state current	180° C conduction angles; $TC = 75^\circ C$	-	10	A
I_{TSM}	Non-repetitive peak On-state current	1/2 Cycle. 60 Hz, $T_j = -40$ to $110^\circ C$	-	100	A
I^2t	I^2t for fusing	$T = 8.3ms$	-	40	A^2S
I_{GM}	Forward peak gate current	$T \leq 10\mu s$, $TC = 83^\circ C$	-	1.0	A
V_{GM}	Peak gate voltage	$T \leq 10\mu s$, $TC = 83^\circ C$	-	± 5	V
P_{GM}	Peak gate power	$T \leq 10\mu s$, $TC = 83^\circ C$	-	5	W
$P_{G(AV)}$	Average gate power	$T \leq 10\mu s$, $TC = 83^\circ C$	-	0.75	W
T_{stg}	Storage temperature		-40	+150	$^\circ C$
T_j	Operating junction Temperature Range		-40	+110	$^\circ C$

$T_j = 25^\circ C$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
I_{GT}	Gate trigger current	$V_D = 12V$; $R_L = 100\Omega$	-	30	200	μA
I_{DRM}	Peak Forward Blocking current $T_j = 110^\circ C$, $V_D = \text{Rated } V_{DRM}$	$TC = 110^\circ C$ $TC = 25^\circ C$	-	-	500 10	μA
I_{RRM}	Peak Reverse Blocking current $T_j = 110^\circ C$, $V_R = \text{Rated } V_{RRM}$	$TC = 110^\circ C$ $TC = 25^\circ C$	-	-	500 10	μA
I_H	Holding current	$V_D = 12V$; $I_{TM} = 100mA$	-	-	6	mA
V_{TM}	Peak forward on-state voltage	$I_{TM} = 20A$ peak, pulse width $\leq 1ms$	-	1.7	2.2	V
V_{GT}	Gate trigger voltage	$V_D = 12V$; $R_L = 100\Omega$	-	0.5	1.5	V
V_{GD}	Gate non-trigger voltage	$V_D = \text{Rated } V_{DRM}$; $R_L = 10K\Omega$ $T_j = 110^\circ C$	0.1	-	-	V

Dynamic Characteristics

D_v/dt	Critical rate of rise of Off-state voltage	$V_D = \text{Rated } V_{DRM}$, $R_{GK} = 1K$; $T_j = 110^\circ C$; Exponential waveform;	-	10	-	V/ μs
t_{gt}	Gate controlled turn-on time	$I_{TM} = 16A$; $V_D = \text{Rated } V_{DRM}$; $I_G = 2mA$	-	1	-	μs
t_g	Crcuit commutated tum-off time		-	-	-	μs

Description

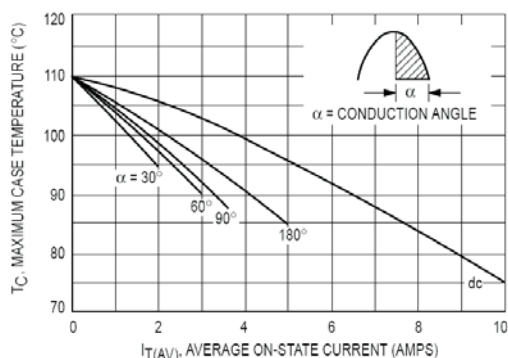


Figure 1. Average Current Derating

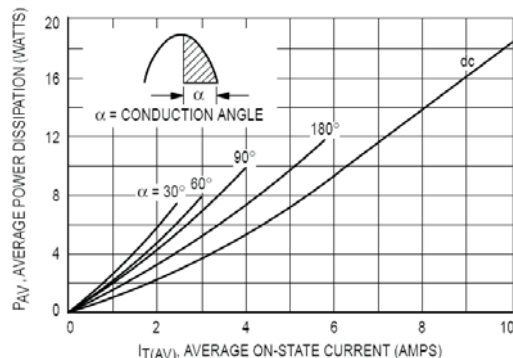


Figure 2. On-State Power Dissipation

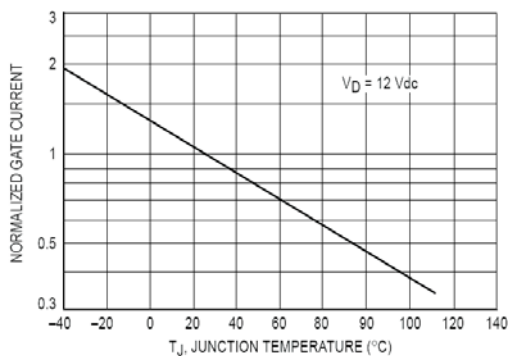


Figure 3. Normalized Gate Current

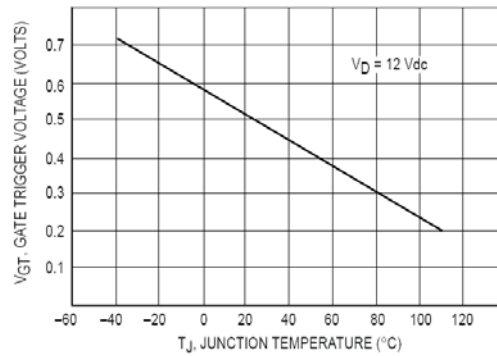
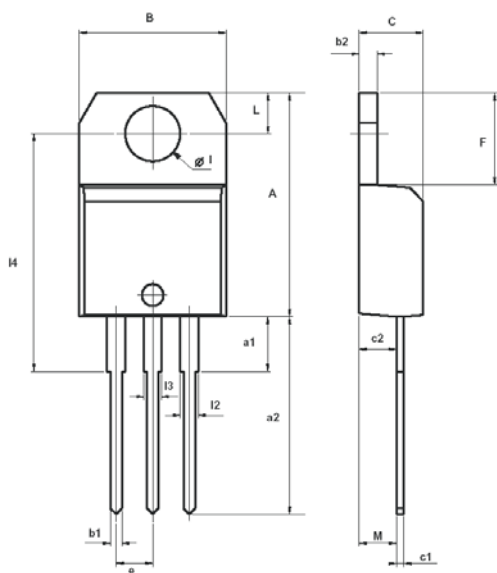


Figure 4. Gate Voltage

MECHANICAL DATA

Dimensions in mm
Net Mass: 2 g
TO-220AB



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
I	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	