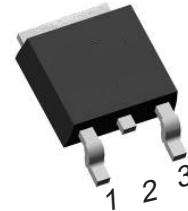


Simplified outline
TO-252

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.

Features

- Blocking voltage to 600 V
- On-state RMS current to 5 A
- Ultra low gate trigger current

Symbol

Applications

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

Pin	Description
1	cathode
2	anode
3	gate
TAB	anode

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages CR5AS-8G CR5AS-12G	400 600	V
$I_{T(RMS)}$	RMS on-state current (full sine wave)	5	A
I_{TSM}	Non-repetitive peak on-state current (full cycle, T_j initial=25°C)	90	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Rth j-c	Thermal resistance Junction to mounting base		-	-	3.0	°C/W
Rth j-a	Thermal resistance Junction to ambient	In free air	-	70	-	K/W

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

SYMBOL	PARAMETER	CONDITIONS	MIN	Value	UNIT
V_{RRM}	Repetitive peak reverse voltage	CR5AS-8 CR5AS-12	-	400 600	V
$I_{T(AV)}$	Average on-state current	Commercial frequency,sine half wave, 180° conduction.Tc=88°C	-	5	A
$I_{T(RMS)}$	RMS on-state current		-	7.8	A
I_{FGM}	Peak gate forward current		-	0.3	A
I^2t	I^2t for fusing	Value corresponding to 1 cycle of half wave 60Hz,surge on-state current	-	33	A ² s
I_{TSM}	Surge on-state current	60Hz sine half wave 1 full cycle,peak value,non-repetitive	-	90	A
$P_{G(AV)}$	Average gate power dissipation		-	0.1	W
T_j	Junction temperature		-40	125	°C
T_{stg}	Storage temperature		-40	125	°C
P_{GM}	Peak gate power dissipation		-	0.5	W

 $T_j = 25^\circ\text{C}$ unless otherwise stated

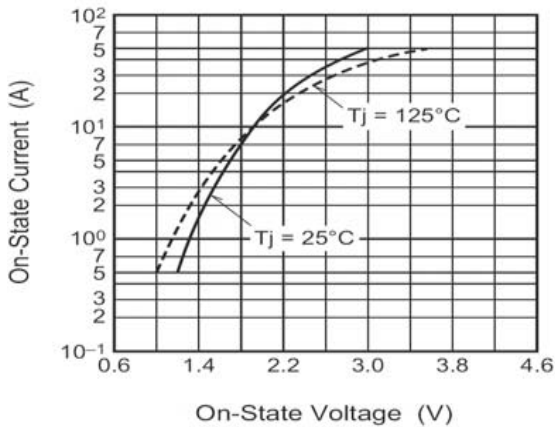
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
I_{GT}	Gate trigger current	$T_j=25^\circ\text{C}, V_D=6\text{V}, I_T=0.1\text{A}$	1	-	200	μA
V_{GT}	Gate trigger voltage	$T_j=25^\circ\text{C}, V_D=6\text{V}, I_T=0.1\text{A}$	-	-	0.8	V
V_{GD}	Gate non-trigger voltage	$T_j=125^\circ\text{C}, V_D=1/2V_{DRM}, R_{GK}=220\Omega$	0.1	-	-	V
V_{TM}	On-state voltage	$T_c=25^\circ\text{C}, I_{TM}=15\text{A}$, instantaneous value	-	-	1.8	V
I_H	Holding current	$T_j=25^\circ\text{C}, V_D=12\text{V}, R_{GK}=220\Omega$	-	3.5	-	mA
I_{DRM}	Repetitive peak off-state current	$T_j=125^\circ\text{C}, V_{DRM}$ applied, $R_{GK}=220\Omega$	-	-	2.0	mA
I_{RRM}	Repetitive peak reverse current	$T_j=125^\circ\text{C}, V_{RRM}$ applied	-	-	2.0	mA

Dynamic Characteristics

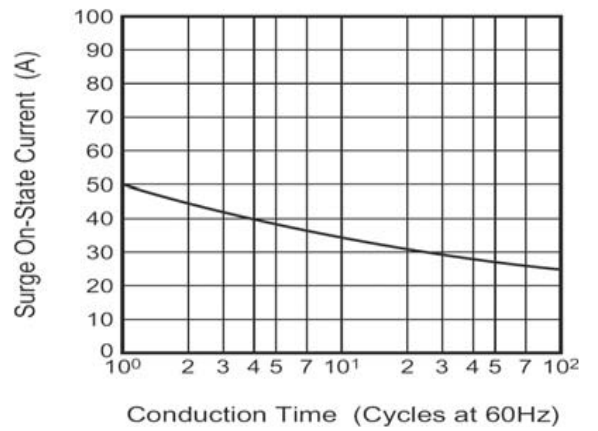
D_{VD}/dt	Critical rate of rise of Off-state voltage	$V_{DM}=67\% V_{DRM(max)}$; $T_j=125^\circ\text{C}$; Exponential wave form; $R_{GK}=100\Omega$	50	100	-	V/ μs
t_{gt}	Gate controlled turn-on time	$I_{TM}=10\text{A}, V_G=V_{DRM(max)}$; $I_G=5\text{mA}$; $dI_G/dt=0.2\text{A}/\mu\text{s}$	-	2	-	μs
t_g	Crcuit commutated tum-off time	$V_{DM}=67\% V_{DRM(max)}$; $T_j=125^\circ\text{C}$; $I_{TM}=12\text{A}$ $V_R=24\text{V}; dI_{TM}/dt=10\text{A}/\mu\text{s}$ $dv_{Dj}/dt=2\text{V}/\mu\text{s}; R_{GK}=1\text{k}\Omega$	-	100	-	μs

Description

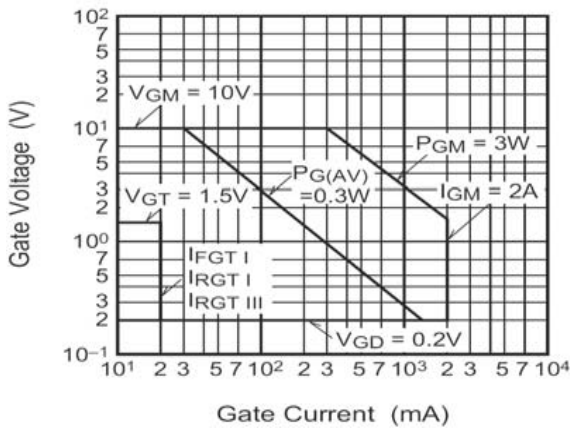
Maximum On-State Characteristics



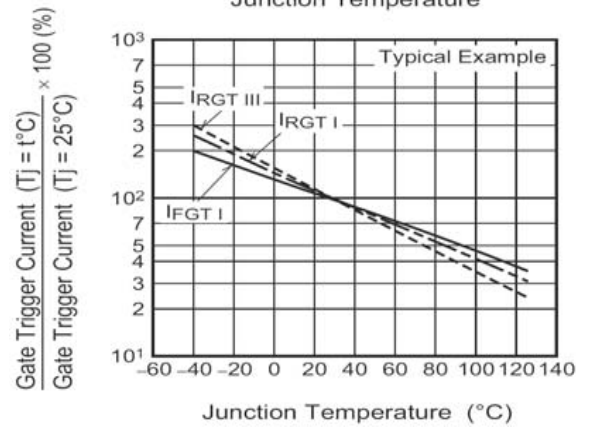
Rated Surge On-State Current



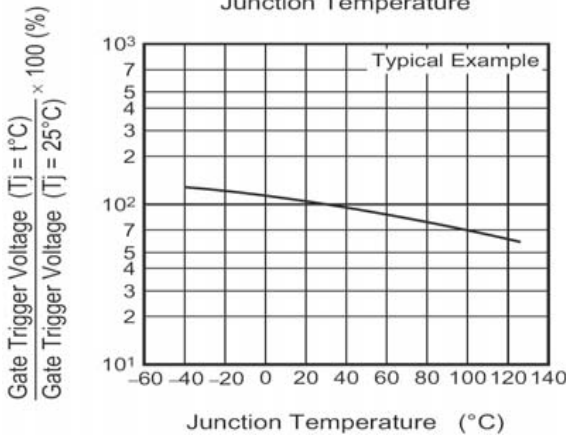
Gate Characteristics (I, II and III)



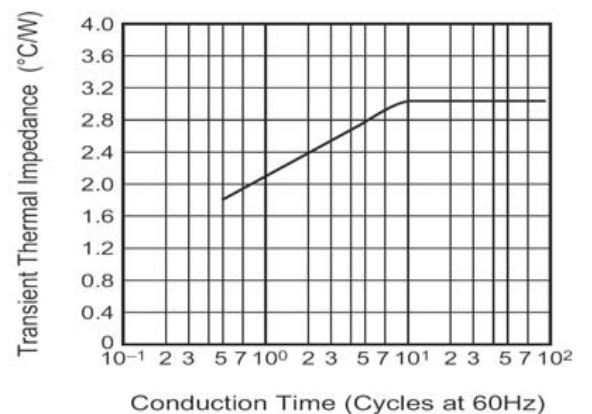
Gate Trigger Current vs. Junction Temperature

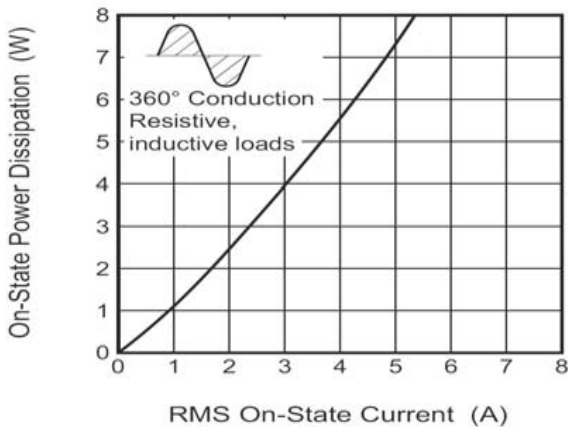
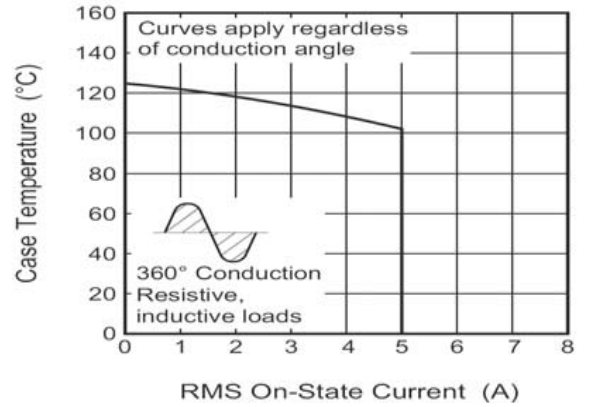
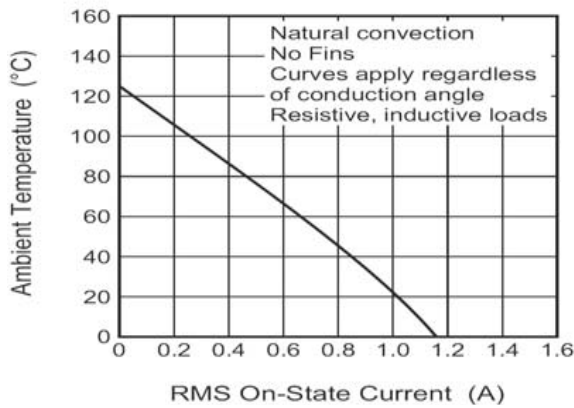
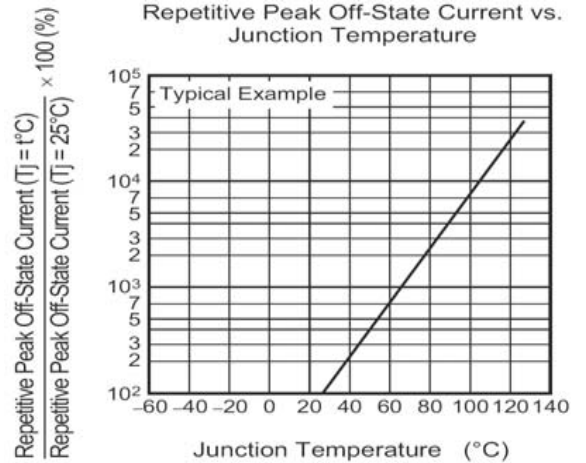
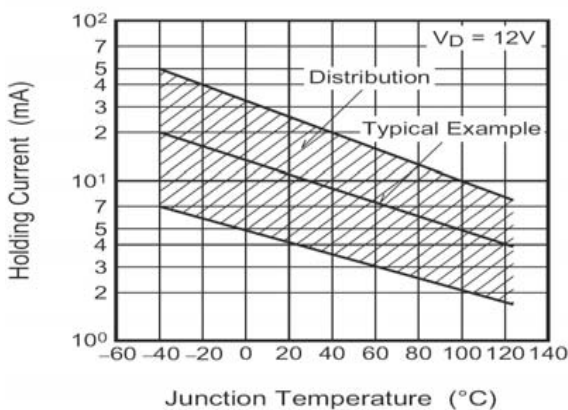
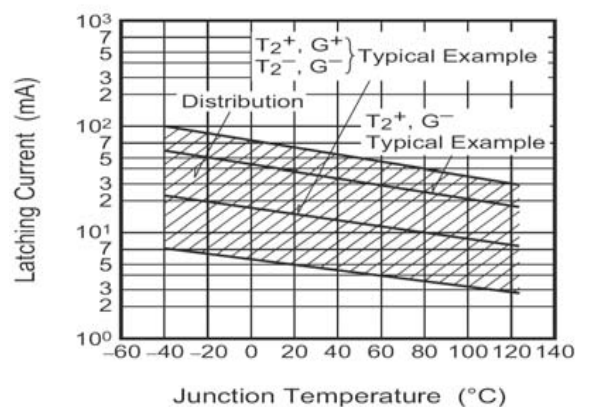


Gate Trigger Voltage vs. Junction Temperature



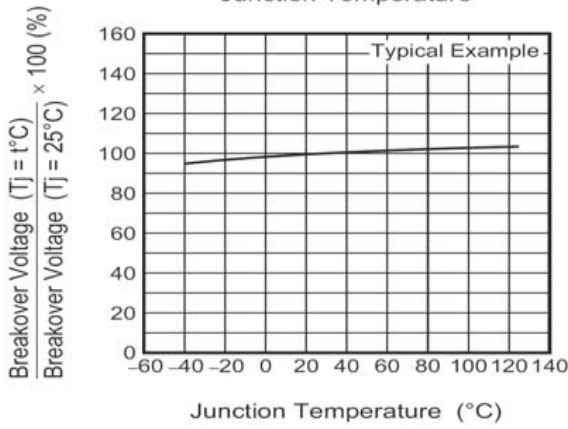
Maximum Transient Thermal Impedance Characteristics (Junction to case)



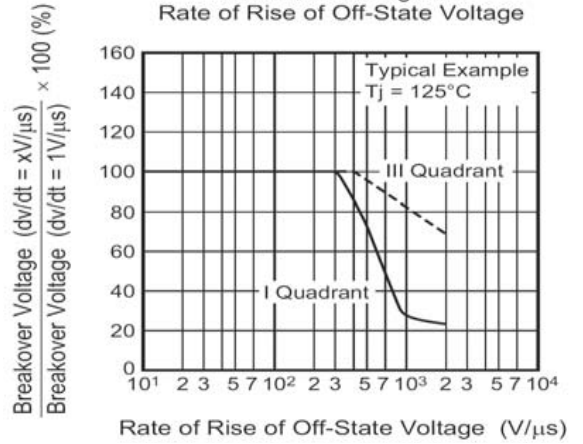
Description
Maximum On-State Power Dissipation

Allowable Case Temperature vs. RMS On-State Current

Allowable Ambient Temperature vs. RMS On-State Current

Repetitive Peak Off-State Current vs. Junction Temperature

Holding Current vs. Junction Temperature

Latching Current vs. Junction Temperature


Description

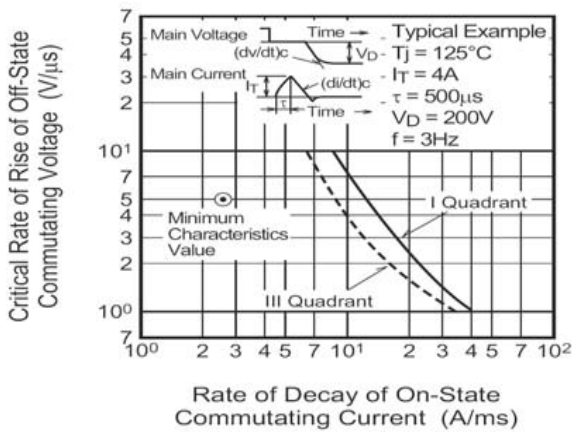
Breakover Voltage vs. Junction Temperature



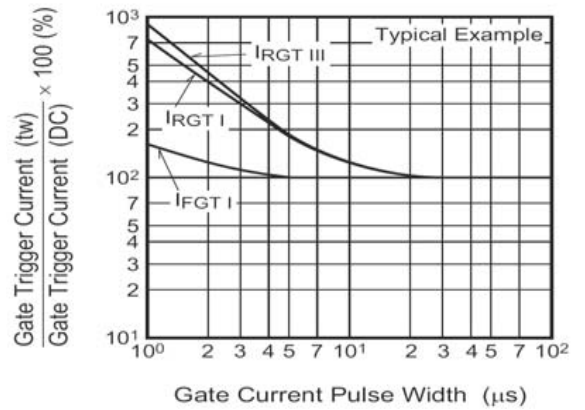
Breakover Voltage vs. Rate of Rise of Off-State Voltage



Commutation Characteristics

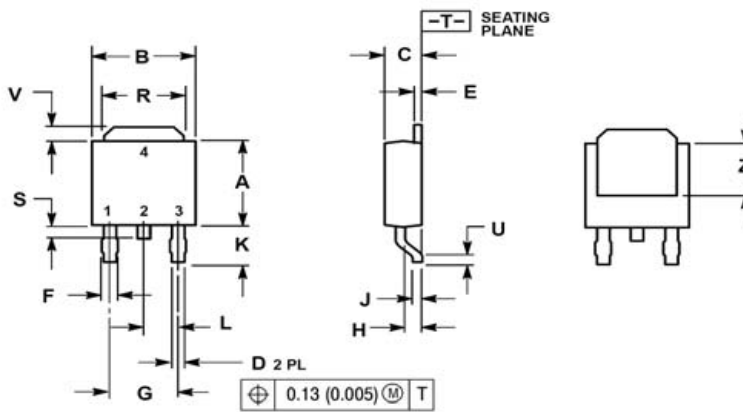


Gate Trigger Current vs. Gate Current Pulse Width



Mechanical Data
TO-252

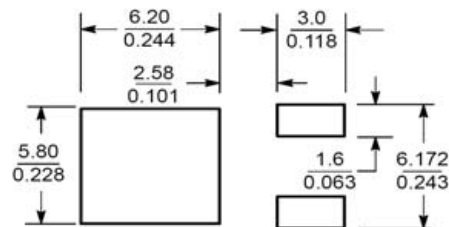
Dimensions in mm
Net Mass: 0.45 g



NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.245	5.97	6.22
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.180	0.215	4.57	5.45
S	0.025	0.040	0.63	1.01
U	0.020	---	0.51	---
V	0.035	0.050	0.89	1.27
Z	0.155	---	3.93	---

STYLE 6:
 PIN 1. MT1
 2. MT2
 3. GATE
 4. MT2

SOLDERING FOOTPRINT


SCALE 3:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$