

# DATA SHEET

**2N5064**  
Thyristor  
sensitive gate

Product specification

October 1997



# Thyristor sensitive gate

2N5064

## GENERAL DESCRIPTION

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

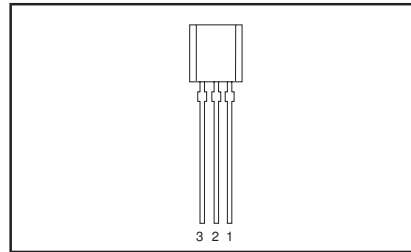
## QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
$V_{DRM}, V_{RRM}$	Repetitive peak off-state voltages	200	V
$I_{T(AV)}$	Average on-state current	0.5	A
$I_{T(RMS)}$	RMS on-state current	0.8	A
$I_{TSM}$	Non-repetitive peak on-state current	10	A

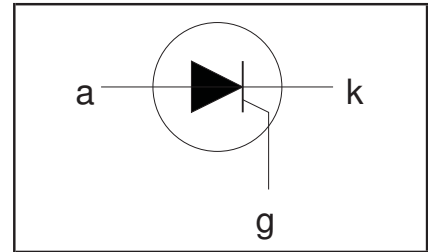
## PINNING - TO92 variant

PIN	DESCRIPTION
1	anode
2	gate
3	cathode

## PIN CONFIGURATION



## SYMBOL



## LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DRM}, V_{RRM}$	Repetitive peak off-state voltages		-	200	V
$I_{T(AV)}$	Average on-state current	half sine wave $T_c \leq 67^\circ\text{C}$	-	0.51	A
$I_{T(RMS)}$	RMS on-state current	$T_c \leq 102^\circ\text{C}$	-	0.255	A
$I_{TRM}$	Repetitive peak on-state current	all conduction angles	-	0.8	A
$I_{TSM}$	Non-repetitive peak on-state current		-	8	A
$I^2t$	$I^2t$ for fusing	half sine wave; $T_a = 25^\circ\text{C}$ prior to surge; $t = 8.3\text{ ms}$	-	10	A
$I^2t$	$I^2t$ for fusing	$t = 8.3\text{ ms}$	-	0.4	A <sup>2</sup> s
$I_{GM}$	Peak gate current	$T_a = 25^\circ\text{C}, t_p = 300\mu\text{s}; f = 120\text{ Hz}$	-	1	A
$V_{GM}$	Peak gate voltage		-	5	V
$V_{RGM}$	Peak reverse gate voltage		-	5	V
$P_{GM}$	Peak gate power	$T_a = 25^\circ\text{C}$	-	0.1	W
$P_{G(AV)}$	Average gate power	$T_a = 25^\circ\text{C}$ , over any 16 ms period	-	0.01	W
$T_{stg}$	Storage temperature		-65	150	$^\circ\text{C}$
$T_j$	Operating junction temperature		-65	125	$^\circ\text{C}$

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## THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-c}$	Thermal resistance junction to case	see note: <sup>1</sup>	-	-	75	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient		-	200	-	K/W

## STATIC CHARACTERISTICS

$T_c = 25\text{ }^\circ\text{C}$ ,  $R_{GK} = 1\text{ k}\Omega$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{GT}$	Gate trigger current	$T_c = 25\text{ }^\circ\text{C}$ $T_c = -65\text{ }^\circ\text{C}$ $V_D = V_{DRM(max)}$ ; $R_L = 100\ \Omega$ ; gate open circuit	-	-	200 350	$\mu\text{A}$ $\mu\text{A}$
$I_L$	Latching current	$V_D = 12\text{ V}$ ; $R_{GK} = 1\text{ k}\Omega$	-	-	6	mA
$I_H$	Holding current	$V_D = 12\text{ V}$ ; $R_{GK} = 1\text{ k}\Omega$	-	-	5	mA
$V_T$	On-state voltage	$I_T = 1.2\text{ A peak}$ ; $t_p = 300\ \mu\text{s}$ ; $\delta \leq 0.01$	-	-	1.7	V
$V_{GT}$	Gate trigger voltage	$T_j = 25\text{ }^\circ\text{C}$ $T_j = -65\text{ }^\circ\text{C}$ $T_j = 125\text{ }^\circ\text{C}$ $V_D = V_{DRM(max)}$ ; $R_L = 100\ \Omega$ ; gate open circuit	-	-	0.8 1.2 -	V V V
$I_D, I_R$	Off-state leakage current	$V_D = V_{DRM(max)}$ ; $V_R = V_{RRM(max)}$ $T_j = 25\text{ }^\circ\text{C}$ $T_j = 125\text{ }^\circ\text{C}$	-	-	10 50	$\mu\text{A}$ $\mu\text{A}$

## DYNAMIC CHARACTERISTICS

$T_c = 25\text{ }^\circ\text{C}$ ,  $R_{GK} = 1\text{ k}\Omega$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$dV_D/dt$	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}$ ; $T_j = 125\text{ }^\circ\text{C}$ ; exponential waveform; $R_{GK} = 1\text{ k}\Omega$	-	25	-	V/ $\mu\text{s}$
$t_{gt}$	Gate controlled turn-on time	$I_{TM} = 2\text{ A}$ ; $V_D = V_{DRM(max)}$ ; $I_G = 10\text{ mA}$ ; $dI_G/dt = 0.1\text{ A}/\mu\text{s}$	-	2	-	$\mu\text{s}$
$t_q$	Circuit commutated turn-off time	$V_{DM} = 67\% V_{DRM(max)}$ ; $T_j = 125\text{ }^\circ\text{C}$ ; $I_{TM} = 1.6\text{ A}$ ; $V_R = 35\text{ V}$ ; $dI_{TM}/dt = 30\text{ A}/\mu\text{s}$ ; $dV_D/dt = 2\text{ V}/\mu\text{s}$ ; $R_{GK} = 1\text{ k}\Omega$	-	100	-	$\mu\text{s}$

<sup>1</sup> This measurement is made with the case mounted "flat side down" on a heatsink and held in position by means of a metal clamp over the curved surface.

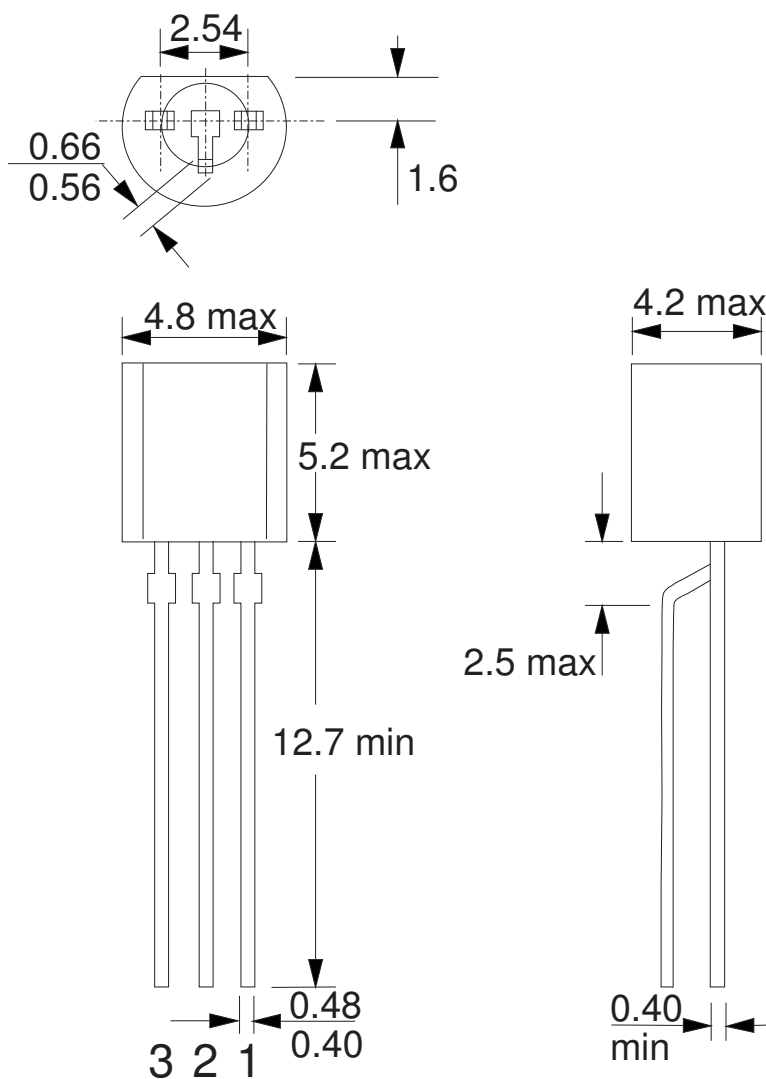
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**MECHANICAL DATA**

*Dimensions in mm*

*Net Mass: 0.2 g*



*Fig.1. TO92; plastic envelope.*

**Notes**

1. Epoxy meets UL94 V0 at 1/8".

## Legal information

### DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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