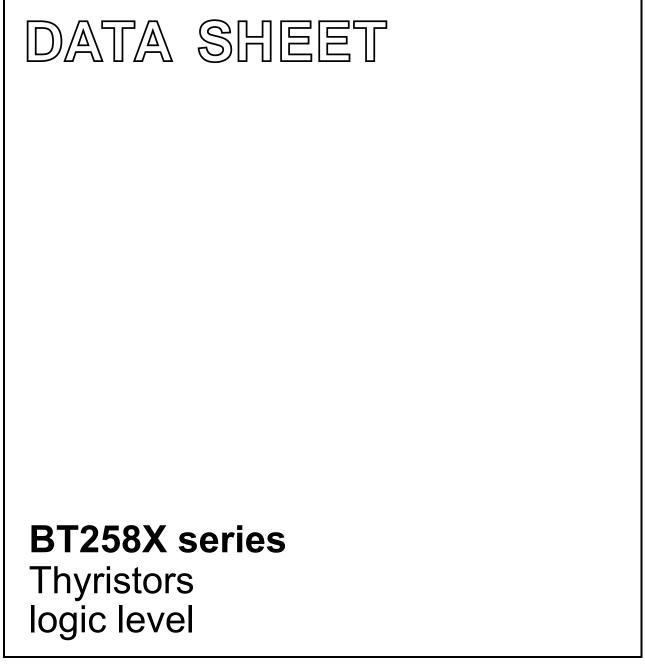
DISCRETE SEMICONDUCTORS



Product specification

October 2002



### Thyristors logic level

### **GENERAL DESCRIPTION**

Passivated, sensitive gate thyristors in a full pack, 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.

DESCRIPTION

### **PINNING - SOT186A**

cathode

anode

gate

PIN

1

2

3

case

# C cas

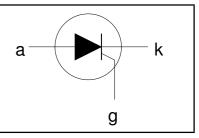
**PIN CONFIGURATION** 

QUICK REFERENCE DATA

### **BT258X series**

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
$\begin{array}{c} V_{\text{DRM}},\\ V_{\text{RRM}}\\ I_{\text{T(AV)}}\\ I_{\text{T(RMS)}}\\ I_{\text{TSM}} \end{array}$	BT258X- Repetitive peak off-state voltages Average on-state current RMS on-state current Non-repetitive peak on-state current	500R 500 5 8 75	600R 600 5 8 75	800R 800 5 8 75	V A A A

### **SYMBOL**



### LIMITING VALUES

isolated

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

SYMBOL	PARAMETER	CONDITIONS	MIN.		MAX.		UNIT
$V_{\text{drm}}, V_{\text{rrm}}$	Repetitive peak off-state voltages		-	<b>-500R</b> 500 <sup>1</sup>	<b>-600R</b> 600 <sup>1</sup>	<b>-800R</b> 800	×
I <sub>T(AV)</sub> I <sub>T(RMS)</sub> I <sub>TSM</sub>	Average on-state current RMS on-state current Non-repetitive peak on-state current	half sine wave; $T_{hs} \le 90$ °C all conduction angles half sine wave; $T_j = 25$ °C prior to surge	-		5 8		A A
l²t dl <sub>⊤</sub> /dt	I <sup>2</sup> t for fusing Repetitive rate of rise of on-state current after	$\begin{array}{l} t = 10 \text{ ms} \\ t = 8.3 \text{ ms} \\ t = 10 \text{ ms} \\ I_{TM} = 10 \text{ A}; I_G = 50 \text{ mA}; \\ dI_G/dt = 50 \text{ mA}/\mu s \end{array}$	- - -		75 82 28 50		A A A²s A/µs
$\begin{matrix} I_{GM} \\ V_{RGM} \\ P_{GM} \\ P_{G(AV)} \\ T_{stg} \\ T_{j} \end{matrix}$	triggering Peak gate current Peak reverse gate voltage Peak gate power Average gate power Storage temperature Operating junction temperature	over any 20 ms period	- - -40 -		2 5 0.5 150 125 <sup>2</sup>		o°o°≤≤<

<sup>1</sup> Although not recommended, off-state voltages up to 800V may be applied without damage, but the thyristor may switch to the on-state. The rate of rise of current should not exceed 15 A/ $\mu$ s.

**<sup>2</sup>** Note: Operation above 110°C may require the use of a gate to cathode resistor of  $1k\Omega$  or less.

Product specification

### Thyristors logic level

BT258X series

### **ISOLATION LIMITING VALUE & CHARACTERISTIC**

 $T_{hs}$  = 25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V <sub>isol</sub>	R.M.S. isolation voltage from all three terminals to external heatsink	f = 50-60 Hz; sinusoidal waveform; R.H. ≤ 65% ; clean and dustfree	-	-	2500	V
C <sub>isol</sub>	Capacitance from T2 to external heatsink	f = 1 MHz	-	10	-	pF

### **THERMAL RESISTANCES**

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
R <sub>th j-hs</sub> R <sub>th j-a</sub>	Thermal resistance junction to heatsink Thermal resistance junction to ambient	with heatsink compound without heatsink compound in free air	-	- - 55	5.0 6.9 -	K/W K/W K/W

### STATIC CHARACTERISTICS

 $T_i = 25$  °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>GT</sub>	Gate trigger current	$V_{\rm D} = 12 \text{ V}; \text{ I}_{\rm T} = 0.1 \text{ A}$	-	50	200	μA
	Latching current	$V_{\rm D}^{\rm B} = 12 \text{ V}; \text{ I}_{\rm GT} = 0.1 \text{ A}$	-	0.4	10	mΑ
I I <sub>H</sub>	Holding current	$V_{\rm D} = 12 \text{ V}; \text{ I}_{\rm GT} = 0.1 \text{ A}$	-	0.3	6	mA
İΫ <sub>T</sub>	On-state voltage	$I_{T} = 16 A$	-	1.3	1.6	V
V <sub>GT</sub>	Gate trigger voltage	$\dot{V}_{\rm D} = 12 \text{ V}; \text{ I}_{\rm T} = 0.1 \text{ A}$	-	0.4	1.5	V
		$V_{\rm D} = V_{\rm DBM(max)}; I_{\rm T} = 0.1 \text{ A}; T_{\rm i} = 110 \ ^{\circ}\text{C}$	0.1	0.2	-	V
I <sub>D</sub> , I <sub>R</sub>	Off-state leakage current	$V_D^{D} = V_{DRM(max)}^{DRM(max)}; V_R = V_{RRM(max)}; T_j = 125 \text{°C}$	-	0.1	0.5	mA

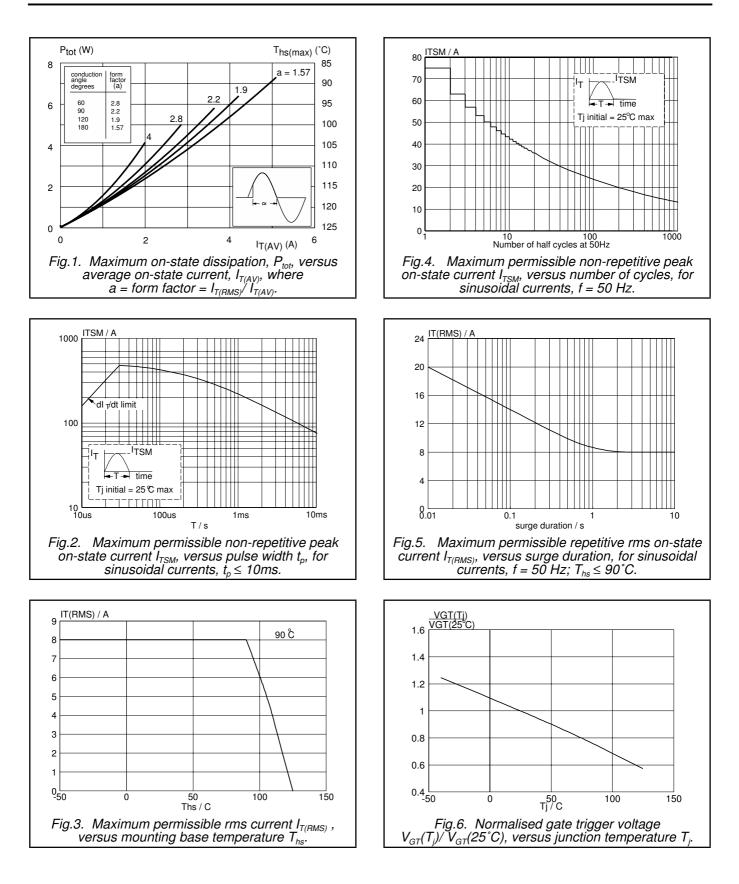
### **DYNAMIC CHARACTERISTICS**

 $T_i = 25$  °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
dV <sub>D</sub> /dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}; T_j = 125 °C;$ exponential waveform; $R_{GK} = 100 \Omega$	50	100	-	V/µs
t <sub>gt</sub>	Gate controlled turn-on	$I_{TM} = 10 \text{ A}; V_D = V_{DRM(max)}; I_G = 5 \text{ mA};$ $dI_G/dt = 0.2 \text{ A}/\mu\text{s}$	-	2	-	μs
t <sub>q</sub>	Circuit commutated turn-off time		-	100	-	μs

BT258X series

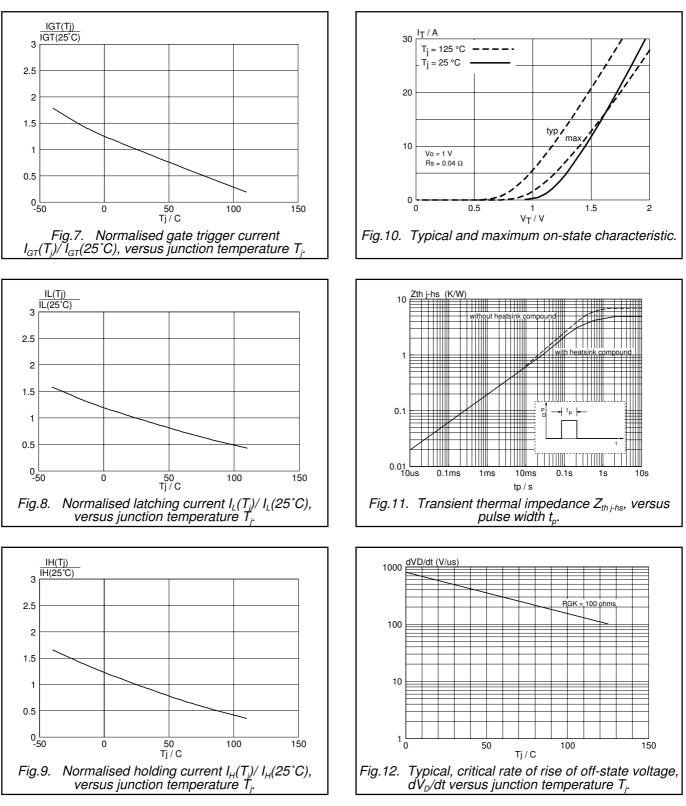
### Thyristors logic level



Product specification

**BT258X** series

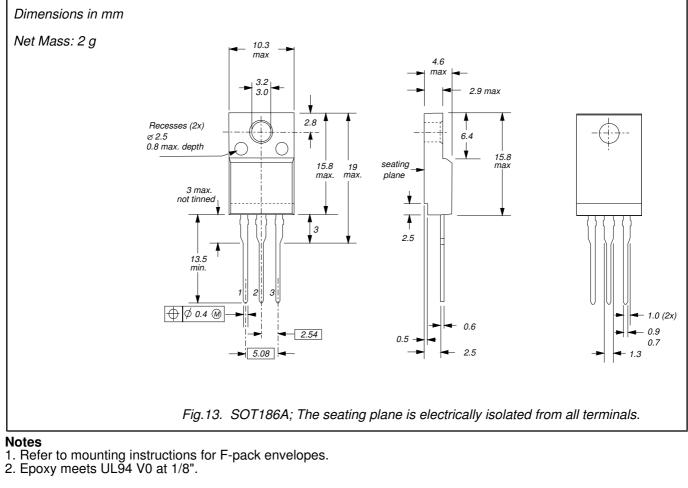
## Thyristors logic level



## Thyristors logic level

### BT258X series

### **MECHANICAL DATA**



### 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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