

# S12MD2 Series

High Noise-reduction, High Density Mounting Type Photothyristor Coupler

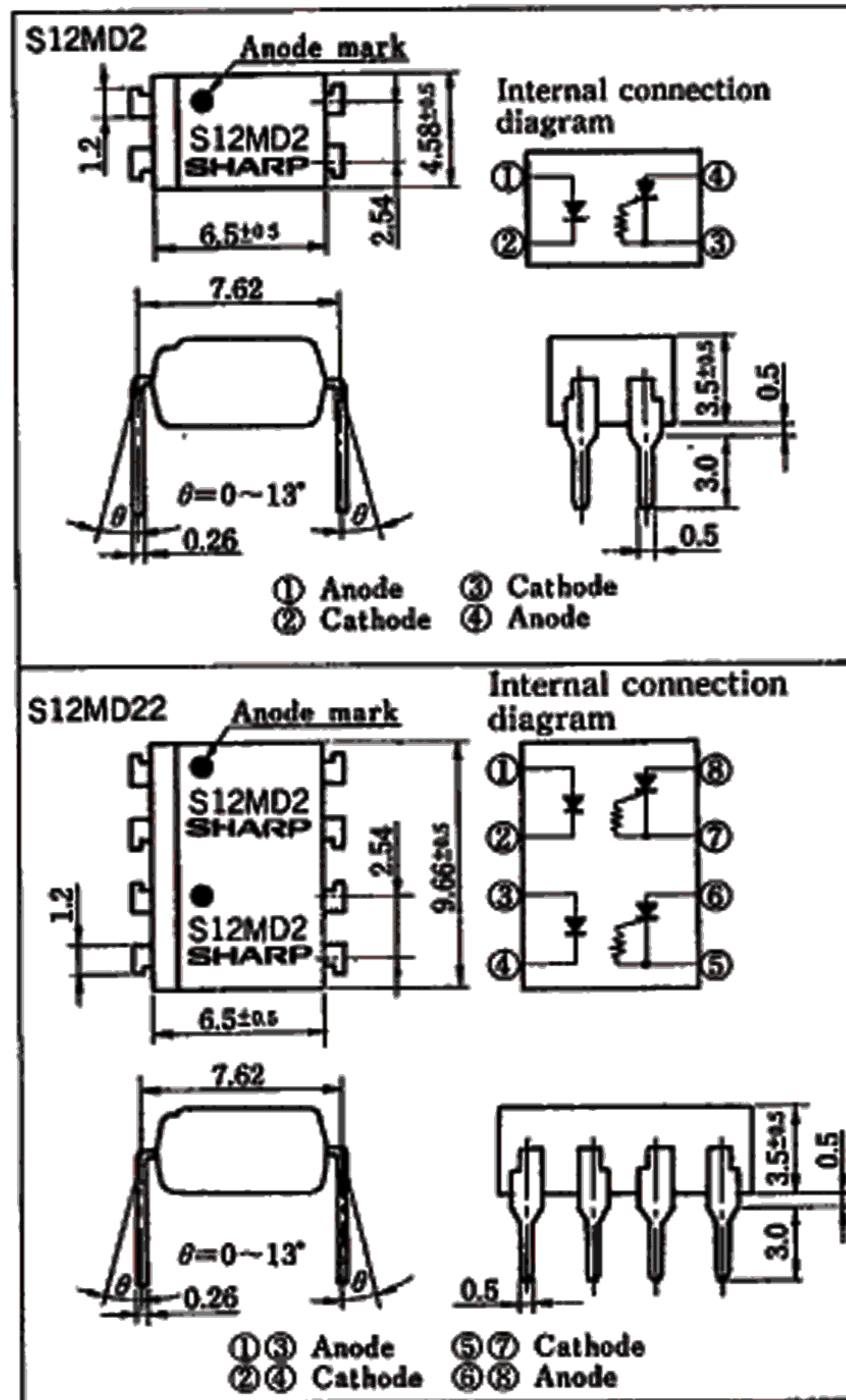
## ■ Features

1. High critical rate of rise of off-state voltage  
( $dv/dt$  : MIN.  $100V/\mu s$ )
2. Compact dual-in-line package  
(Volume comparison : About 1/2 as large as Sharp 6-pin type S12MD1V)
3. Low trigger current ( $I_{FT}$  : MAX. 10mA)
4. High repetitive peak off-state voltage ( $V_{DRM}$  : MIN. 400V)
5. UL recognized, file No. E64380

## ■ Applications

1. Cross-point relay for home telephone exchangers
2. Programmable controllers, Numerical control machines
3. For triggering high power thyristor

## ■ Outline Dimensions (Unit:mm)



## ■ Absolute Maximum Ratings

( $T_a = 25^\circ C$ )

Parameter		symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	6	V
Output	RMS on-state current	$I_T$	200	mArms
	*1 Peak one cycle surge current	$I_{surge}$	1.2	A
	Repetitive peak off-state voltage	$V_{DRM}$	400	V
	Repetitive peak reverse voltage	$V_{RRM}$	400	V
	*2 Isolation voltage	$V_{iso}$	1,500	Vrms
Operating temperature		$T_{oper}$	-30 ~ +100	$^\circ C$
Storage temperature		$T_{stg}$	-55 ~ +125	$^\circ C$
*3 Soldering temperature		$T_{sol}$	260	$^\circ C$

\*1 50Hz, sine wave

\*2 RH=40~60%, AC for 1 minute

\*3 For 10 seconds

SHARP



■ Electro-optical Characteristics

( $T_a=25^\circ\text{C}$ )

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$V_F$	$I_F=20\text{mA}$	—	1.2	1.4	V
	Reverse current	$I_R$	$V_R=4\text{V}$	—	—	$10^{-6}$	A
Output	Repetitive peak off-state current	$I_{DRM}$	$V_{DRM}=\text{Rated}$	—	—	$10^{-6}$	A
	Repetitive peak Reverse current	$I_{RRM}$	$V_{RRM}=\text{Rated}$	—	—	$10^{-6}$	A
	On-state voltage	$V_T$	$I_T=200\text{mA}$	—	1.0	1.4	V
	Holding current	$I_H$	$V_D=6\text{V}$	0.1	0.5	1.0	mA
Transfer characteristics	Critical rate of rise of off-state voltage	$dv/dt$	$V_{DRM}=1/\sqrt{2}\text{ Rated}$	100	—	—	$\text{V}/\mu\text{s}$
	Minimum trigger current	$I_{FT}$	$V_D=6\text{V}, R_L=100\Omega$	—	6.0	10	mA
	Isolation resistance	$R_{ISO}$	DC500V, RH=40~60%	$5 \times 10^{10}$	$10^{11}$	—	$\Omega$
	Turn-on time	$t_{on}$	$V_D=6\text{V}, I_F=30\text{mA}, R_L=100\Omega$	—	20	50	$\mu\text{s}$

Fig. 1 RMS On-state Current vs. Ambient Temperature

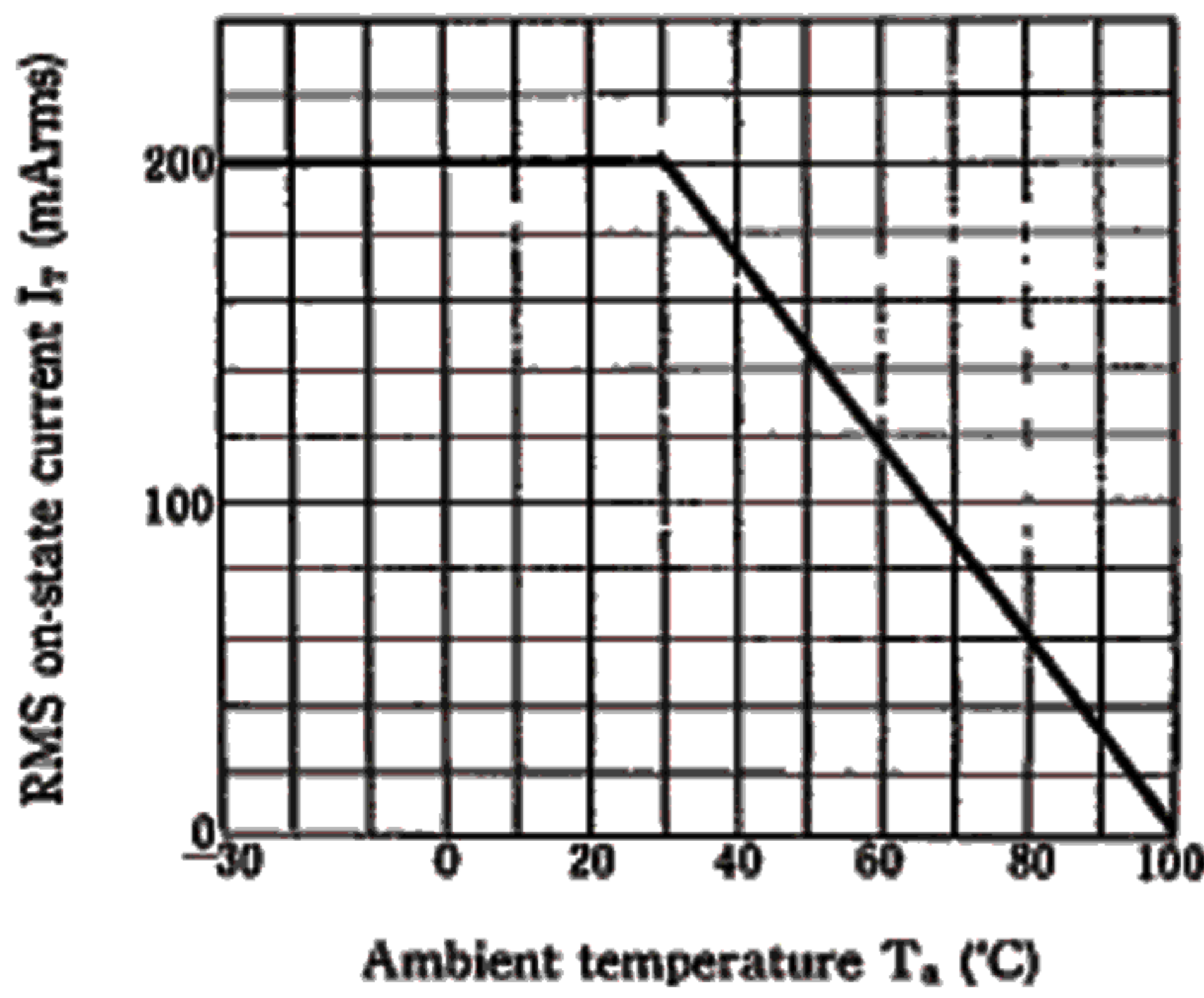
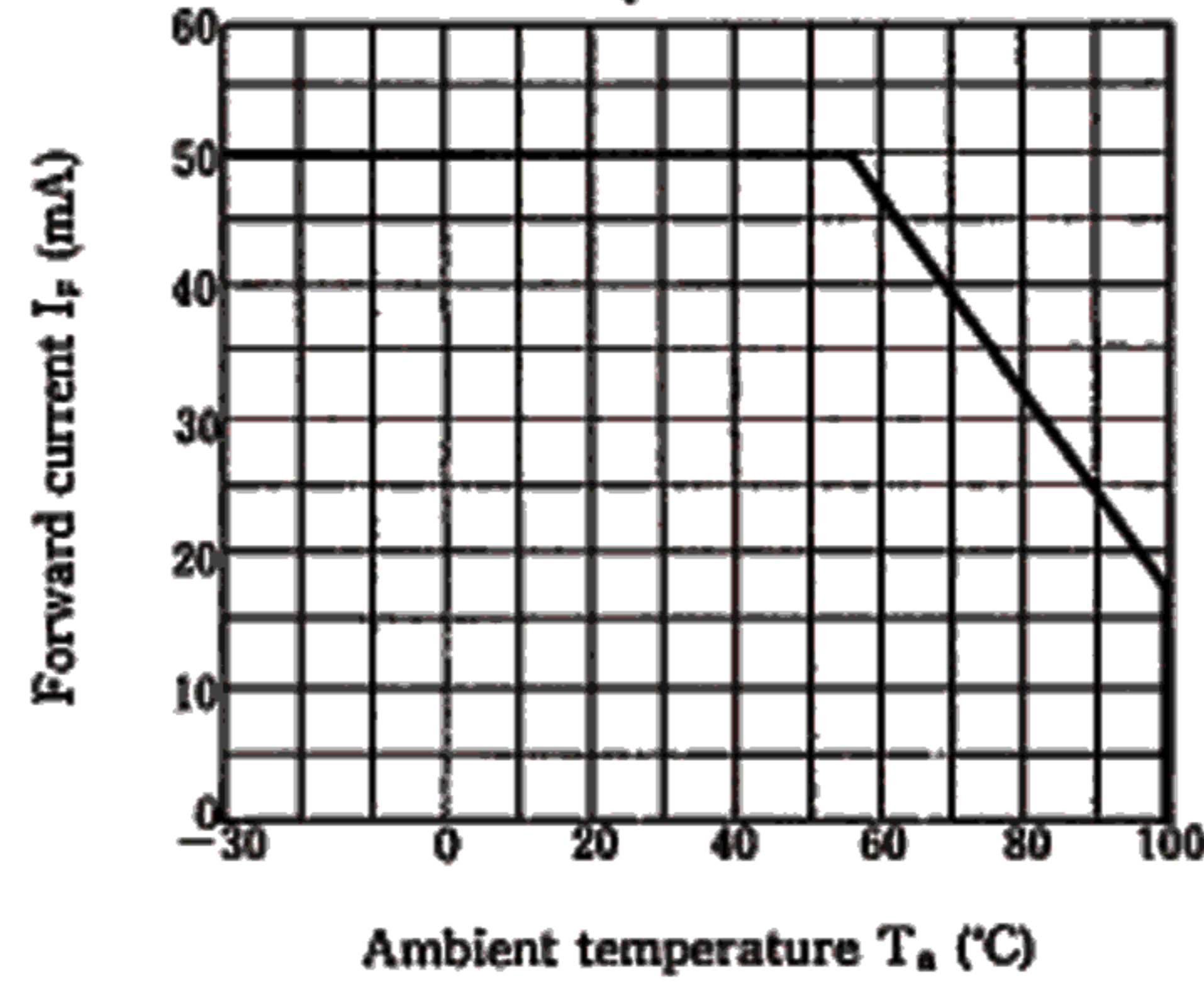


Fig. 2 Forward Current vs. Ambient Temperature



6

Fig. 3 Forward Current vs. Forward Voltage

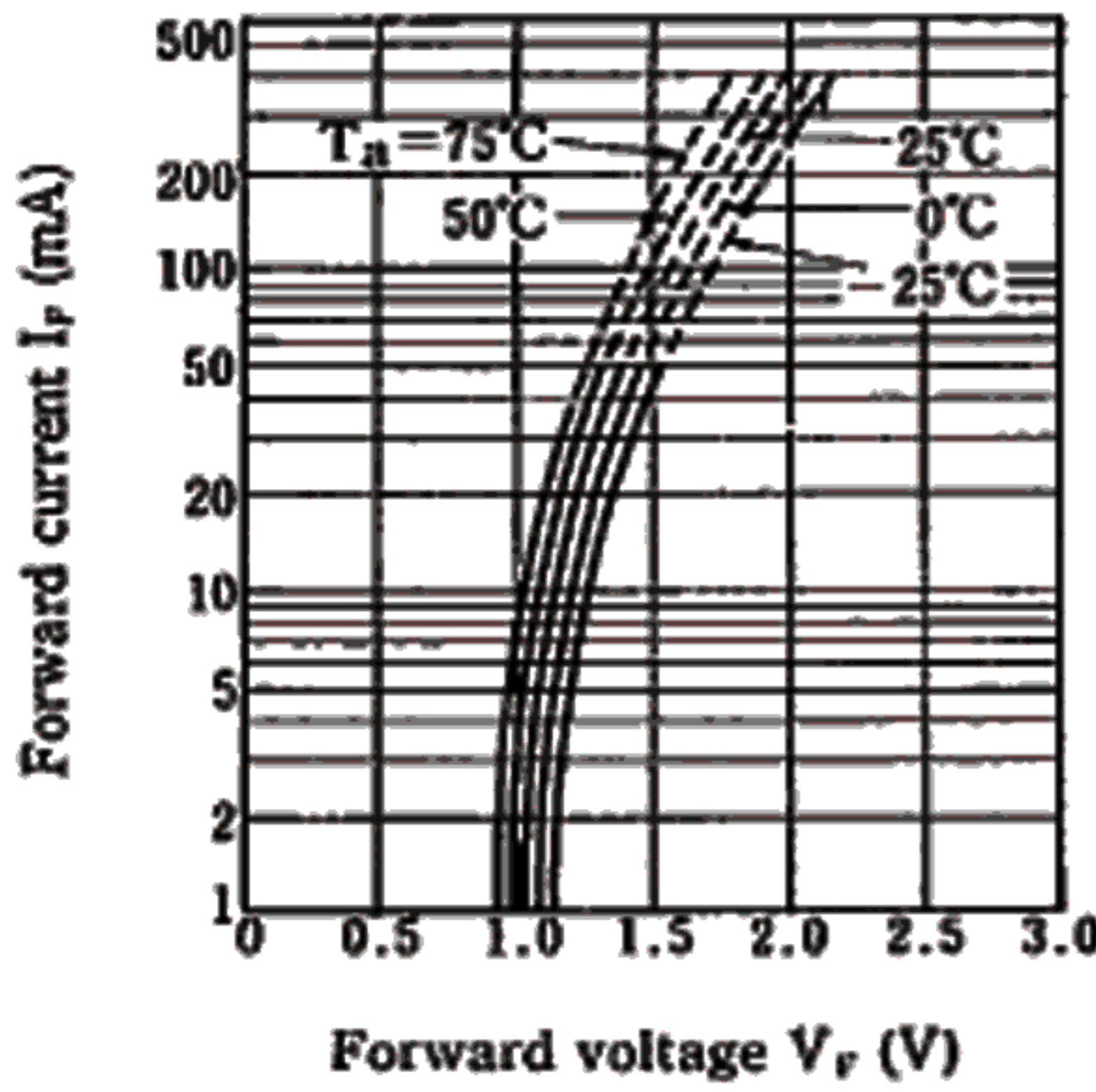
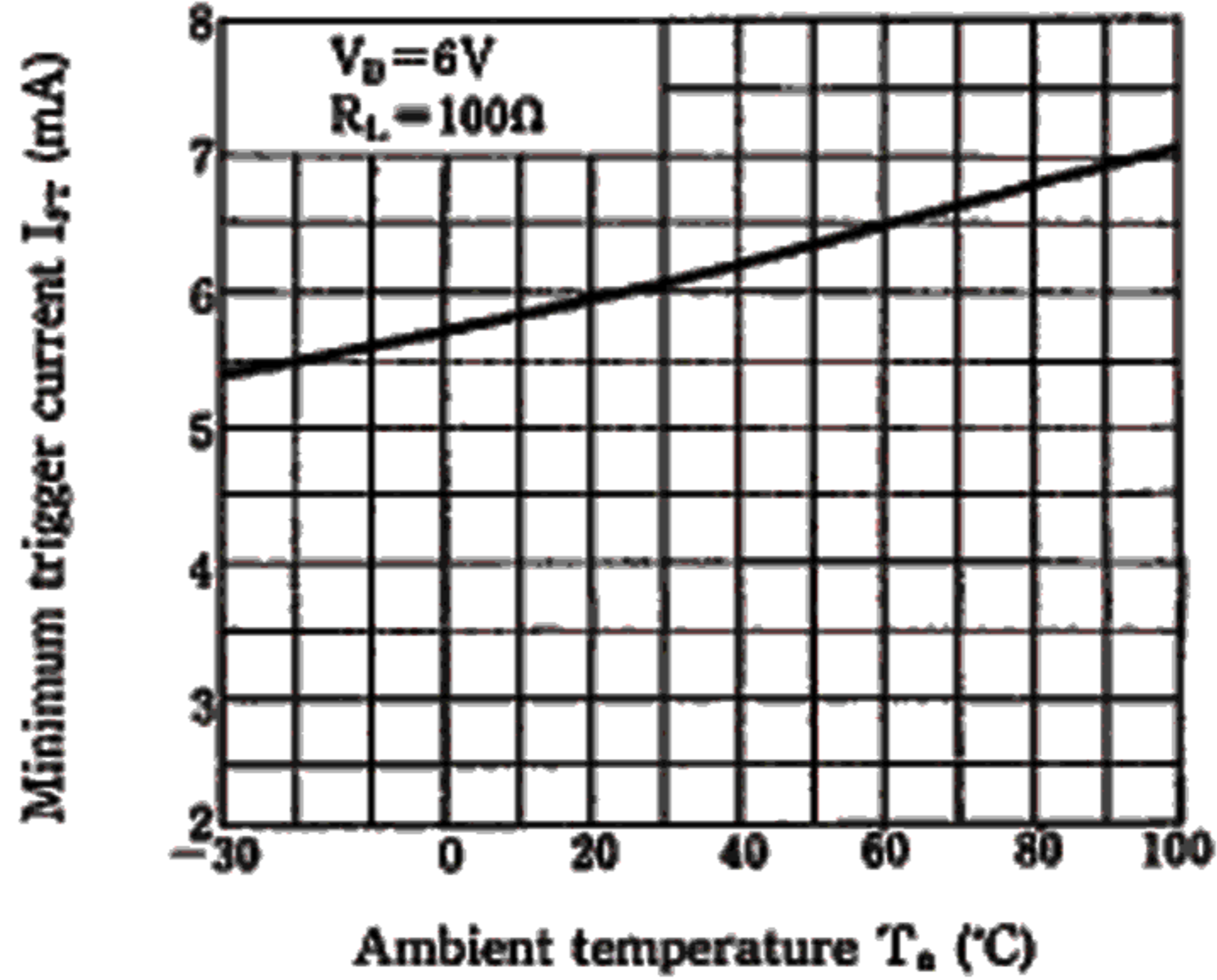
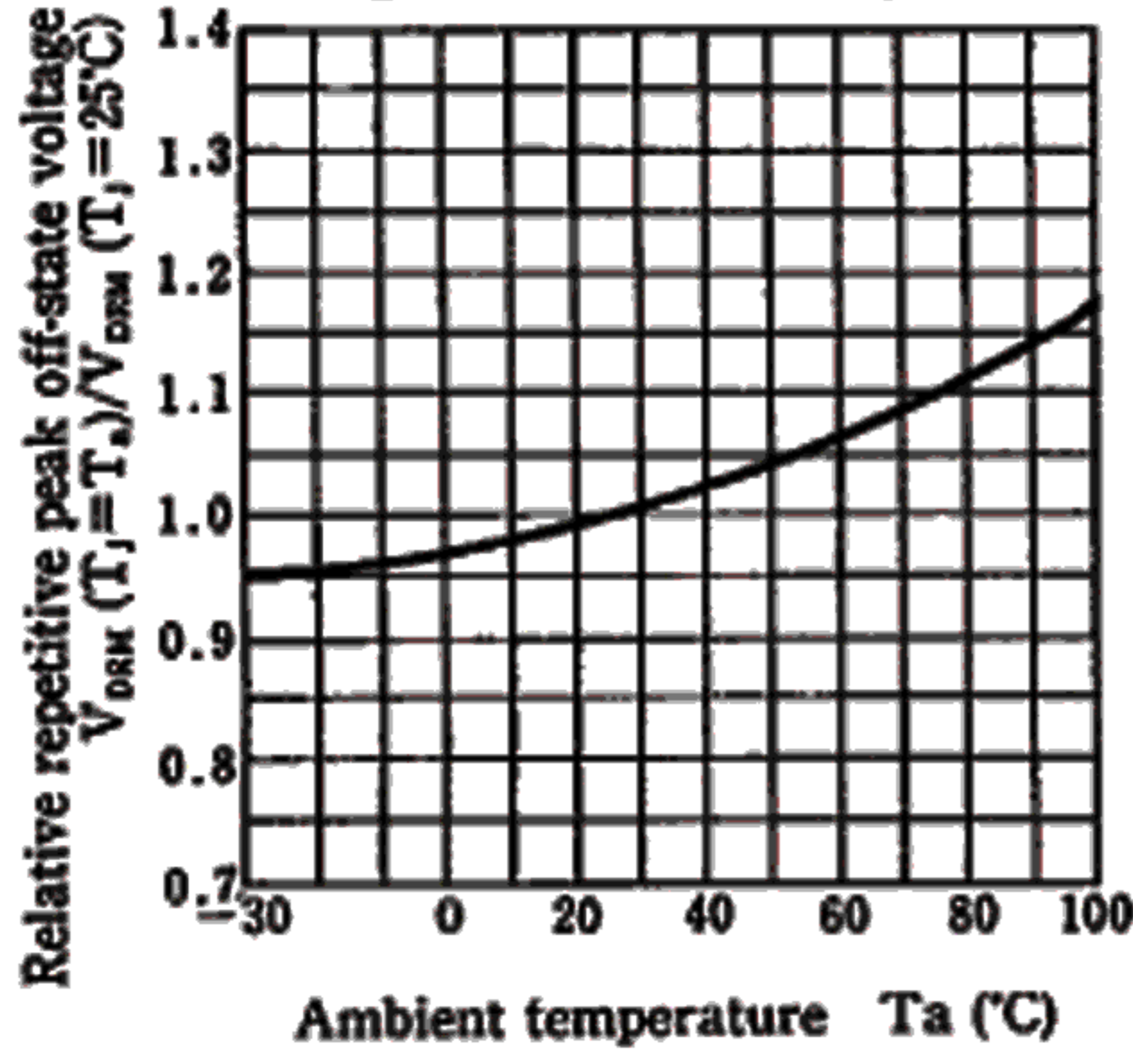


Fig. 4 Minimum Trigger Current vs. Ambient Temperature

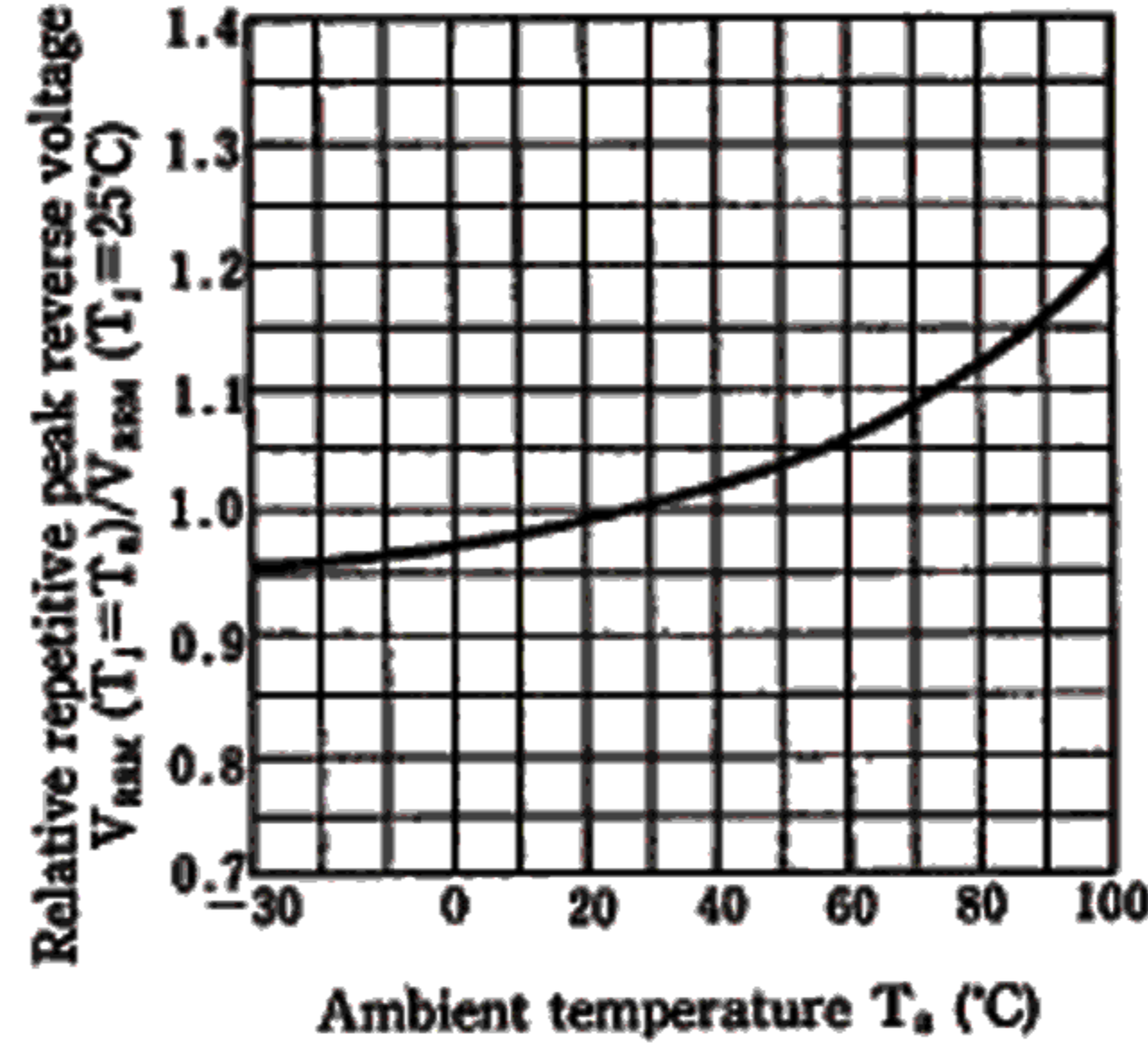




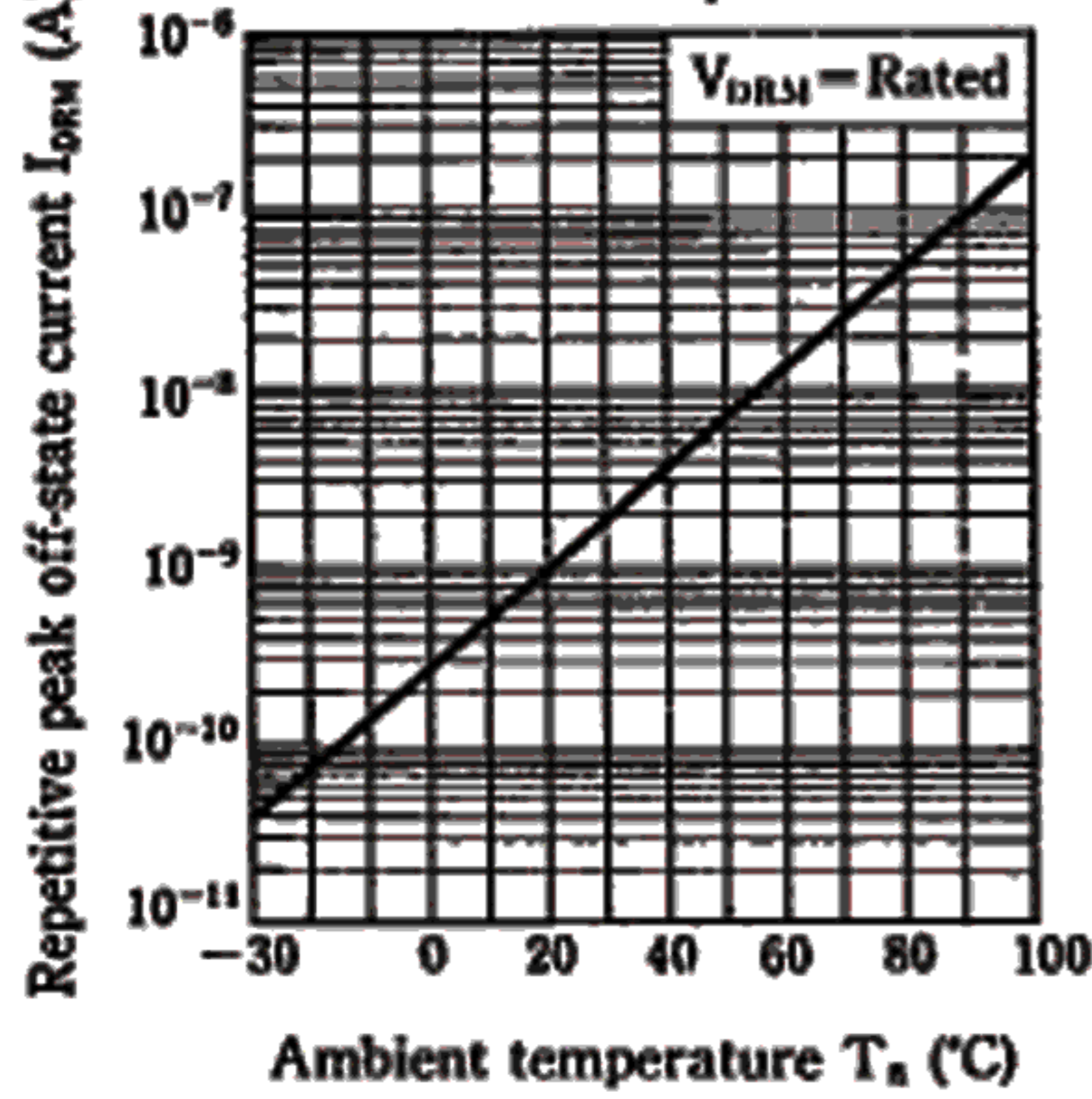
**Fig. 5** Relative Repetitive Peak Off-state Voltage vs. Ambient Temperature



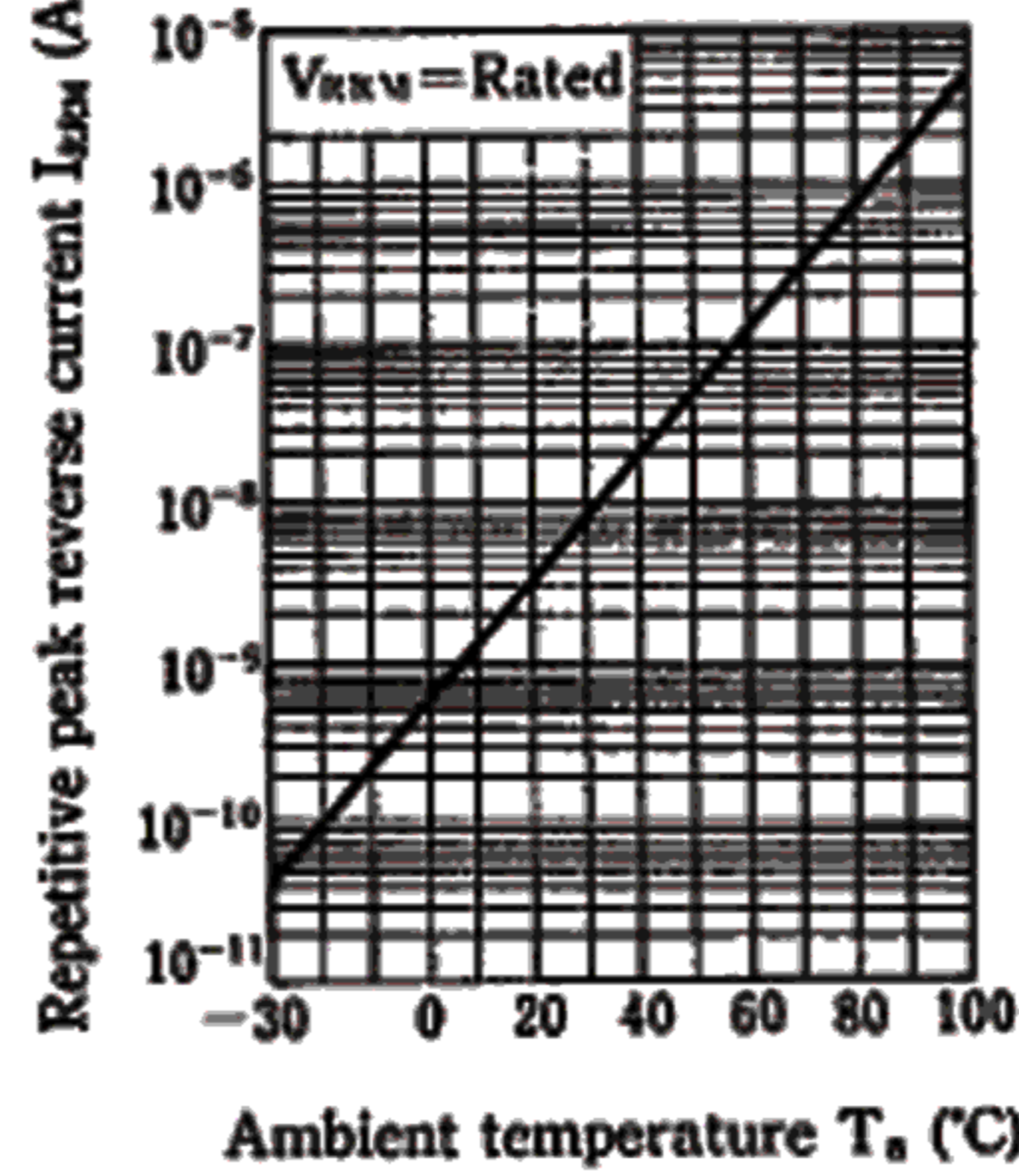
**Fig. 6** Relative Repetitive Peak Reverse Voltage vs. Ambient Temperature



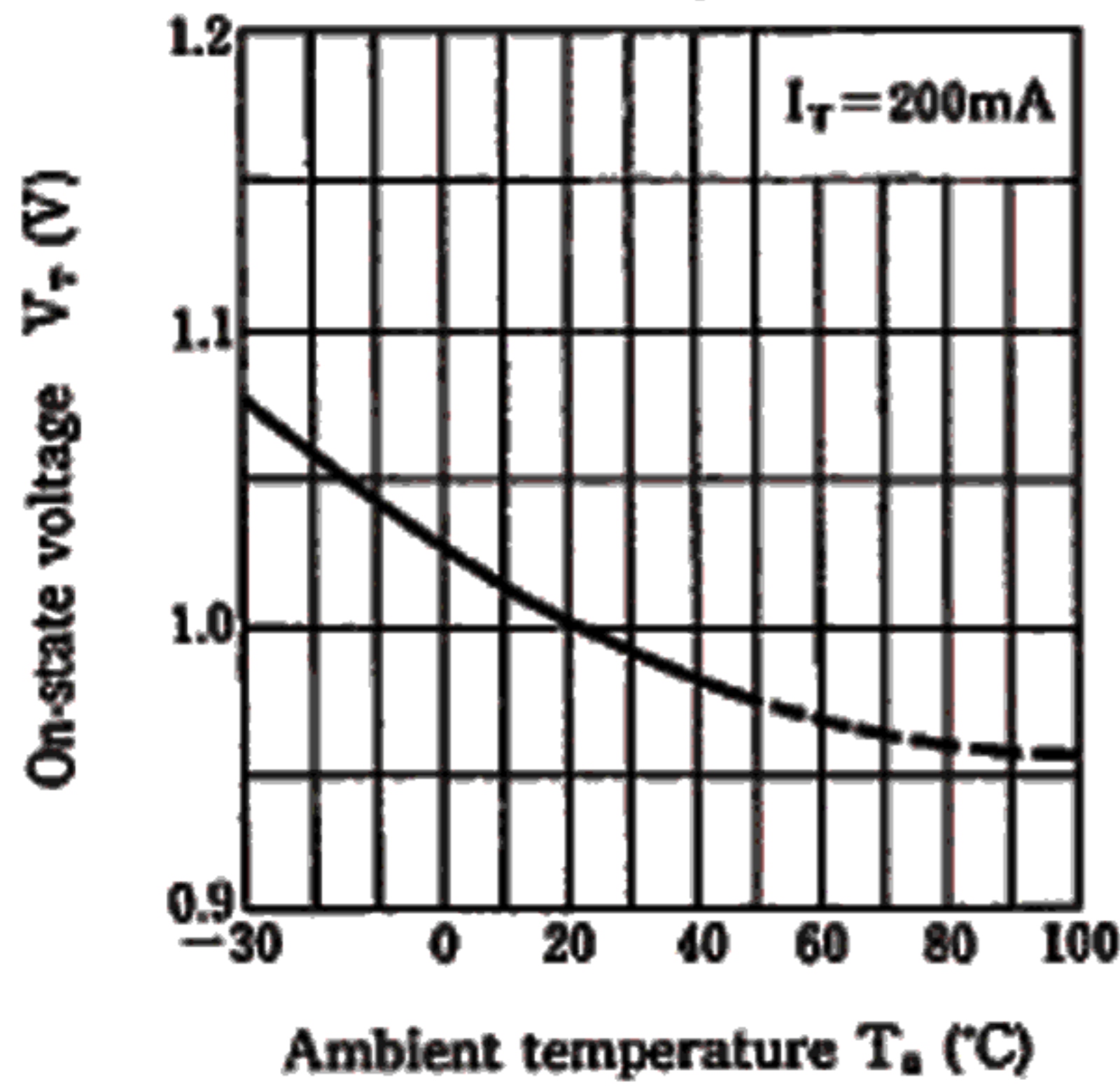
**Fig. 7** Repetitive Peak Off-state Current vs. Ambient Temperature



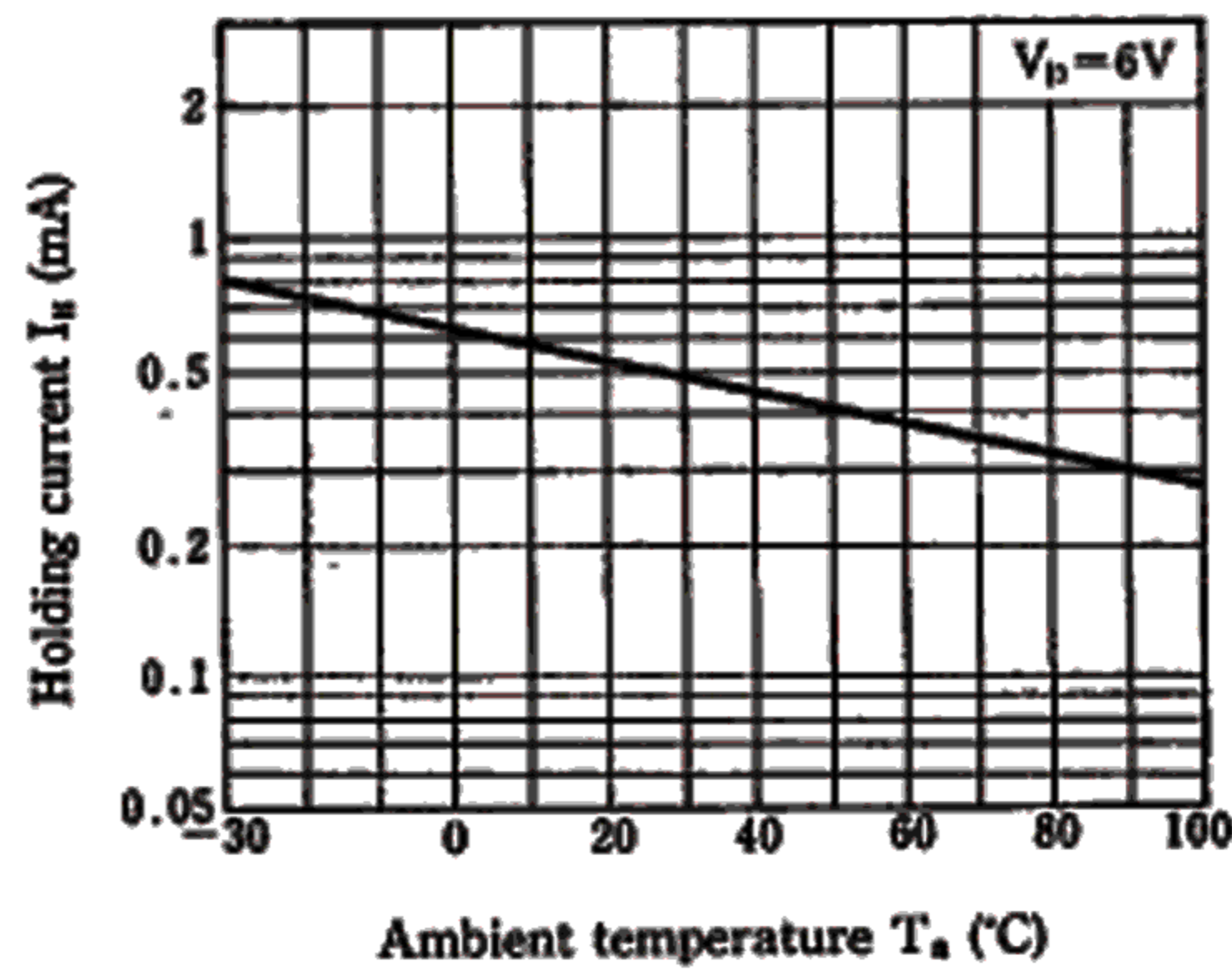
**Fig. 8** Repetitive Peak Reverse Current vs. Ambient Temperature



**Fig. 9** On-state Voltage vs. Ambient Temperature

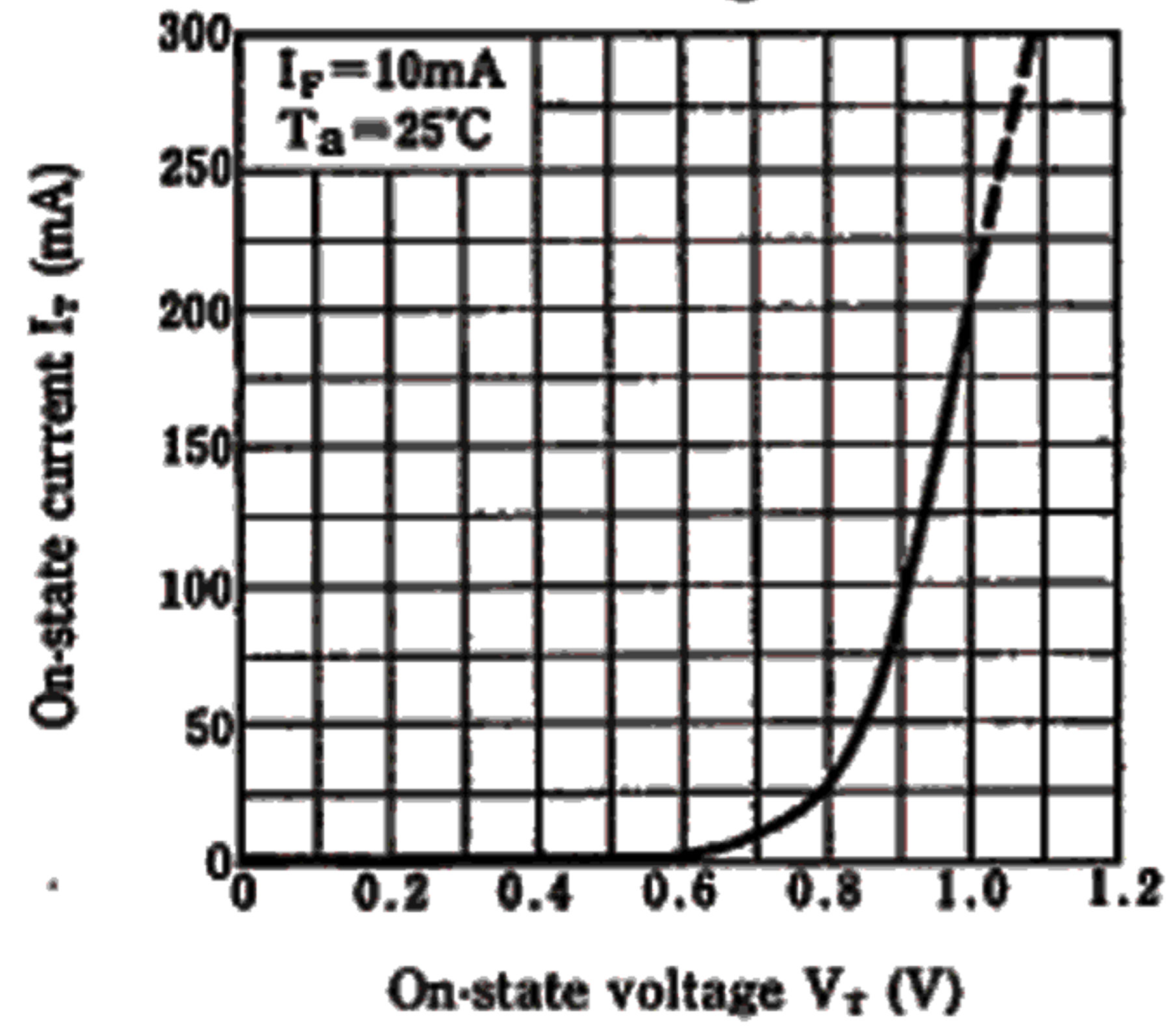


**Fig. 10** Holding Current vs. Ambient Temperature

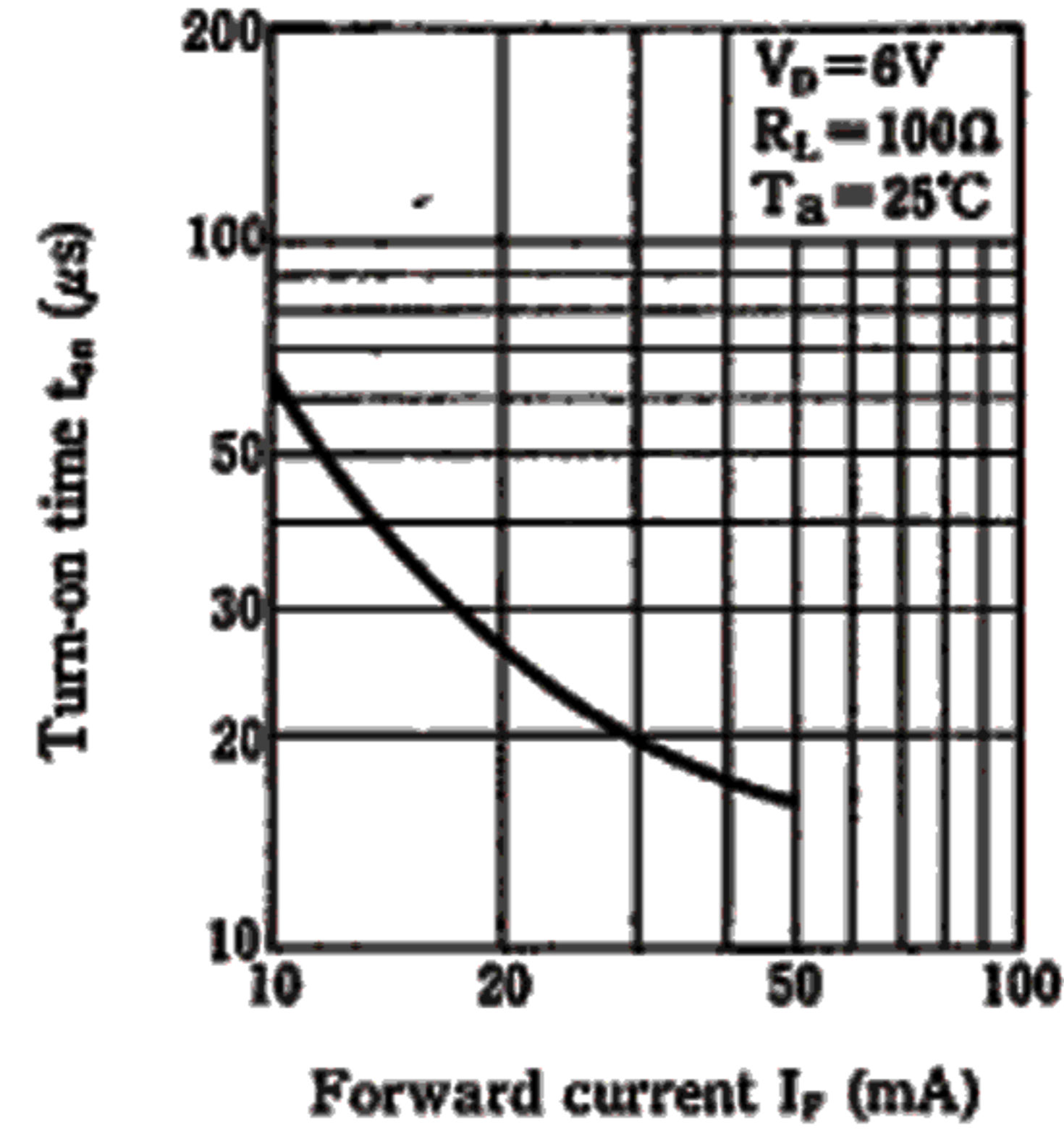




**Fig. 11 On-state Current vs. On-state Voltage**

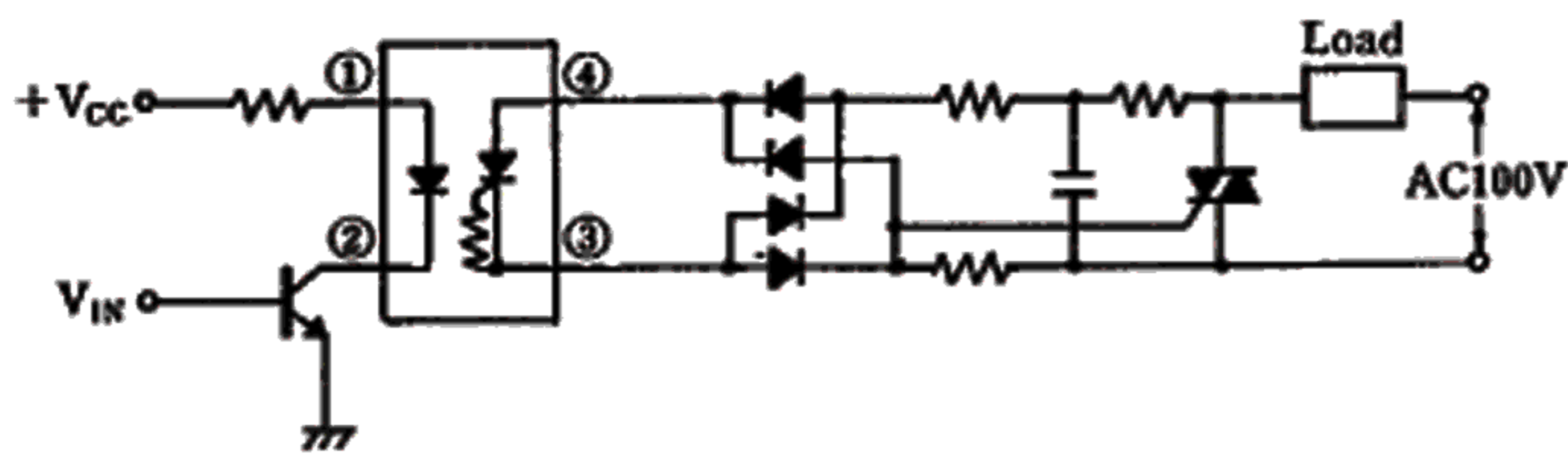


**Fig. 12 Turn-on Time vs. Forward Current**



■ **Basic Operation Circuit**

**Triac Drive Circuit**



6