

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# CR03AM-12

## Thyristor

Low Power Use

REJ03G0352-0200

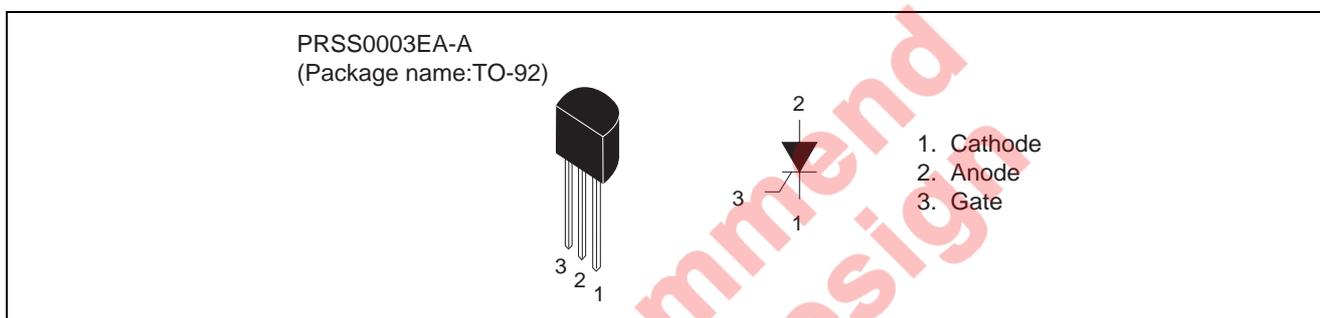
Rev.2.00

Mar.01.2005

### Features

- $I_{T(AV)}$  : 0.3 A
- $V_{DRM}$  : 600 V
- $I_{GT}$  : 100  $\mu$ A
- Non-Insulated Type
- Glass Passivation Type

### Outline



### Applications

Leakage protector, timer, and gas igniter

### Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12	
Repetitive peak reverse voltage	$V_{RRM}$	600	V
Non-repetitive peak reverse voltage	$V_{RSM}$	800	V
DC reverse voltage	$V_{R(DC)}$	480	V
Repetitive peak off-state voltage <sup>Note1</sup>	$V_{DRM}$	600	V
Non-repetitive peak off-state voltage <sup>Note1</sup>	$V_{DSM}$	800	V
DC off-state voltage <sup>Note1</sup>	$V_{D(DC)}$	480	V

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_T (RMS)$	0.47	A	
Average on-state current	$I_T (AV)$	0.3	A	Commercial frequency, sine half wave 180° conduction, $T_a = 47^\circ\text{C}$
Surge on-state current	$I_{TSM}$	20	A	60Hz sine half wave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusing	$I^2t$	1.6	$\text{A}^2\text{s}$	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	$P_{GM}$	0.5	W	
Average gate power dissipation	$P_{G(AV)}$	0.1	W	
Peak gate forward voltage	$V_{FGM}$	6	V	
Peak gate reverse voltage	$V_{RGM}$	6	V	
Peak gate forward current	$I_{FGM}$	0.3	A	
Junction temperature	$T_j$	-40 to +110	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-40 to +125	$^\circ\text{C}$	
Mass	—	0.23	g	Typical value

Notes: 1. With gate to cathode resistance  $R_{GK} = 1 \text{ k}\Omega$ .

## Electrical Characteristics

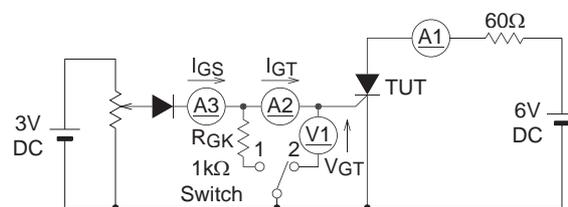
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	$I_{RRM}$	—	—	0.1	mA	$T_j = 110^\circ\text{C}$ , $V_{RRM}$ applied
Repetitive peak off-state current	$I_{DRM}$	—	—	0.1	mA	$T_j = 110^\circ\text{C}$ , $V_{DRM}$ applied, $R_{GK} = 1 \text{ k}\Omega$
On-state voltage	$V_{TM}$	—	—	1.8	V	$T_a = 25^\circ\text{C}$ , $I_{TM} = 4 \text{ A}$ , instantaneous value
Gate trigger voltage	$V_{GT}$	—	—	0.8	V	$T_j = 25^\circ\text{C}$ , $V_D = 6 \text{ V}$ , $I_T = 0.1 \text{ A}$ <sup>Note3</sup>
Gate non-trigger voltage	$V_{GD}$	0.2	—	—	V	$T_j = 110^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$ , $R_{GK} = 1 \text{ k}\Omega$
Gate trigger current	$I_{GT}$	1	—	100 <sup>Note2</sup>	$\mu\text{A}$	$T_j = 25^\circ\text{C}$ , $V_D = 6 \text{ V}$ , $I_T = 0.1 \text{ A}$ <sup>Note3</sup>
Holding current	$I_H$	—	1.5	3	mA	$T_j = 25^\circ\text{C}$ , $V_D = 12 \text{ V}$ , $R_{GK} = 1 \text{ k}\Omega$
Thermal resistance	$R_{th(j-a)}$	—	—	180	$^\circ\text{C/W}$	Junction to ambient

Notes: 2. If special values of  $I_{GT}$  are required, choose item D or E from those listed in the table below if possible.

Item	A	B	C	D	E
$I_{GT} (\mu\text{A})$	1 to 30	20 to 50	40 to 100	1 to 50	20 to 100

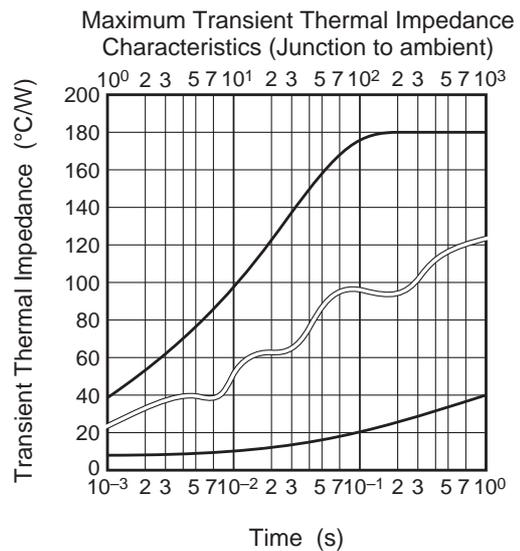
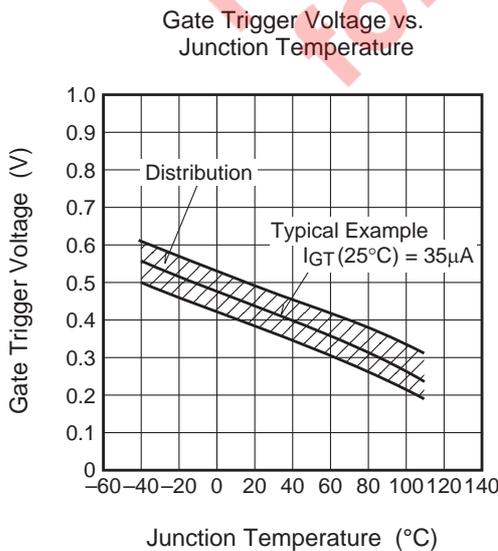
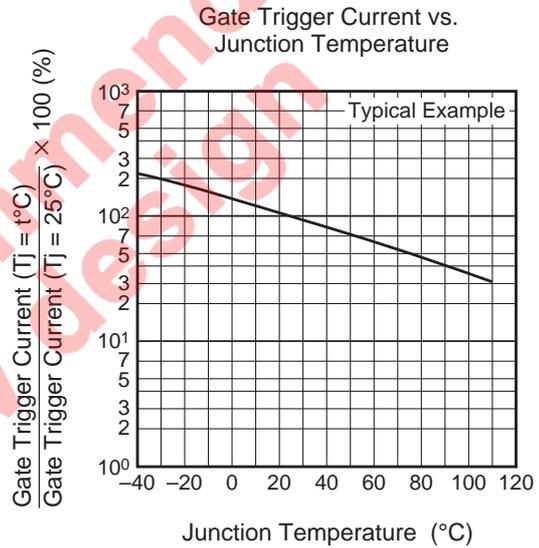
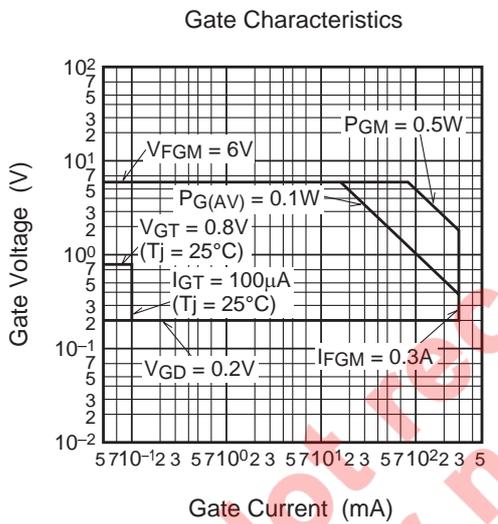
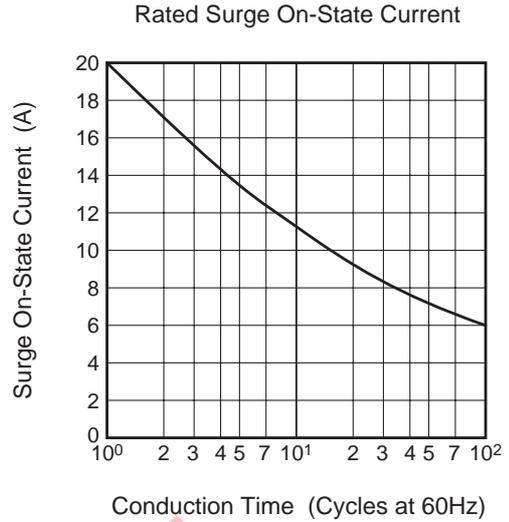
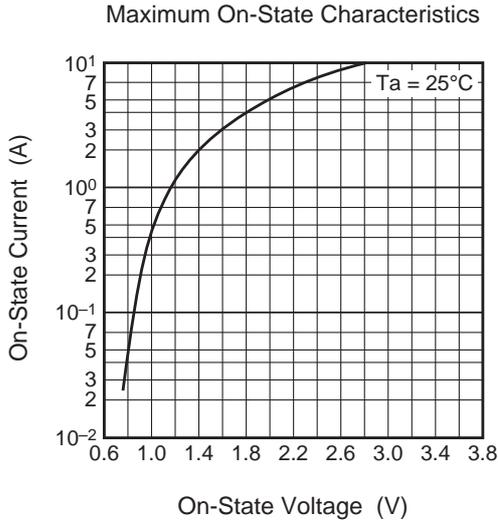
The above values do not include the current flowing through the  $1 \text{ k}\Omega$  resistance between the gate and cathode.

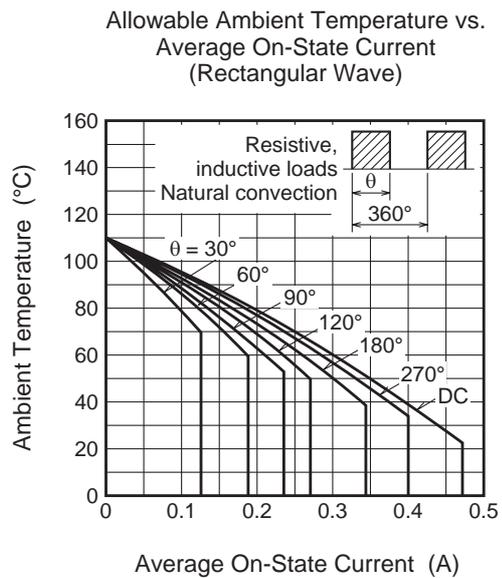
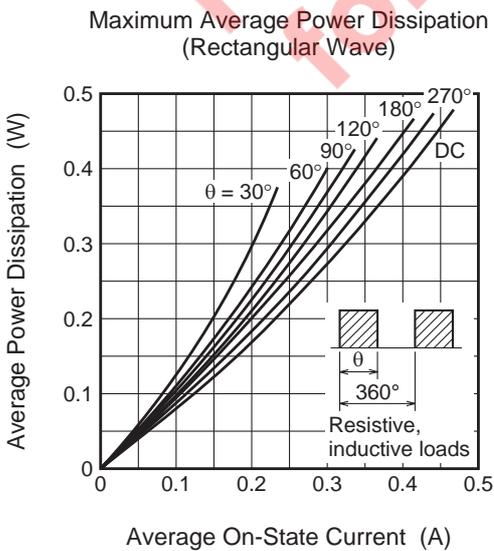
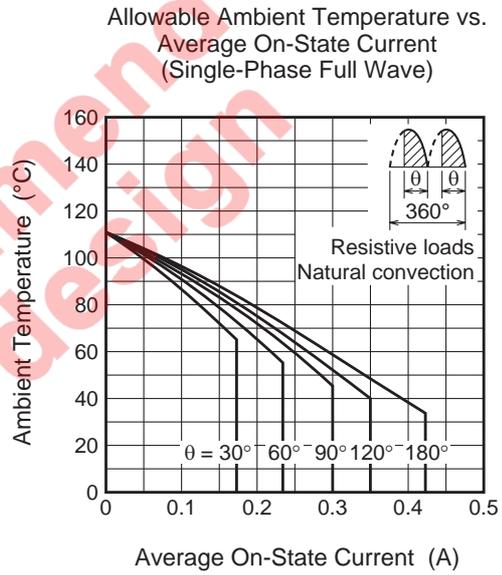
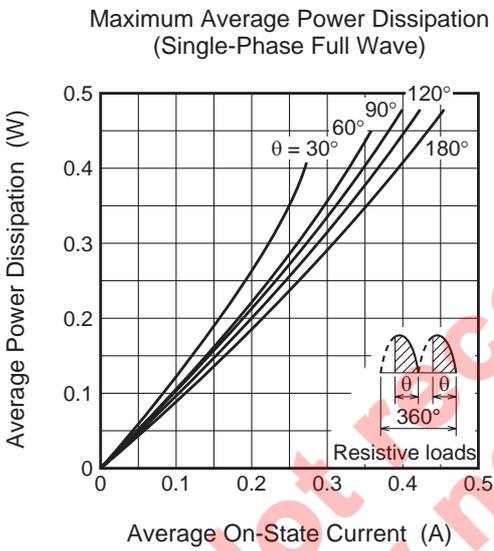
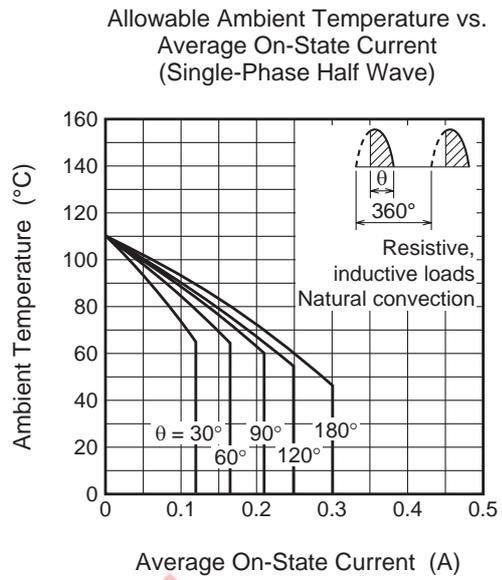
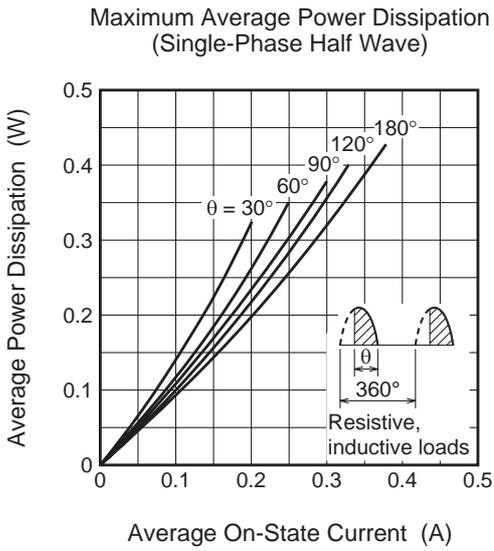
3.  $I_{GT}$ ,  $V_{GT}$  measurement circuit.



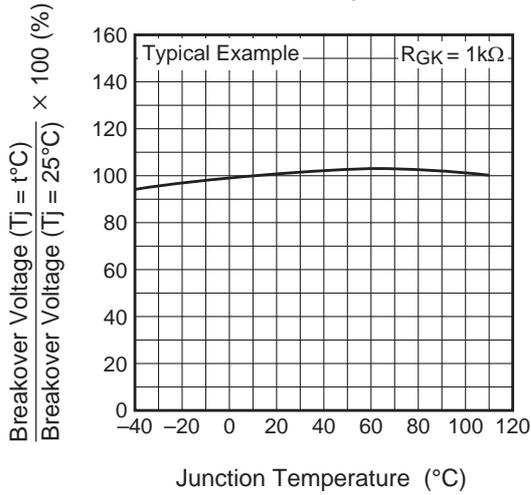
Switch 1 :  $I_{GT}$  measurement  
 Switch 2 :  $V_{GT}$  measurement  
 (Inner resistance of voltage meter is about  $1 \text{ k}\Omega$ )

Performance Curves

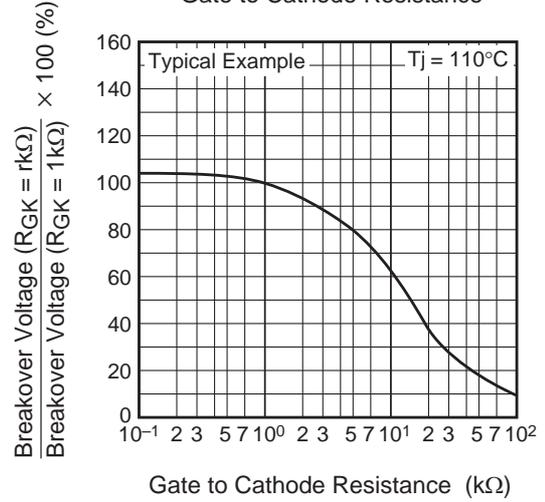




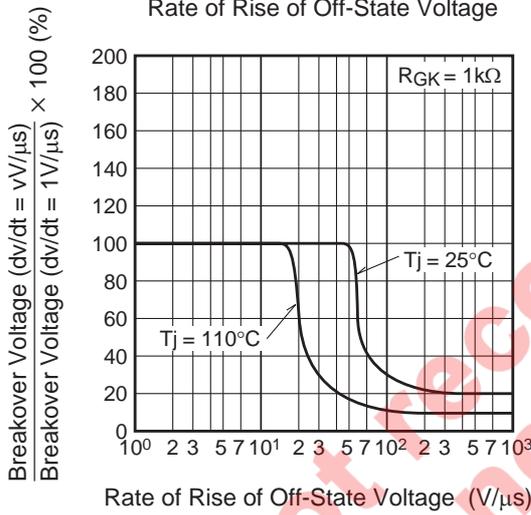
Breakover Voltage vs. Junction Temperature



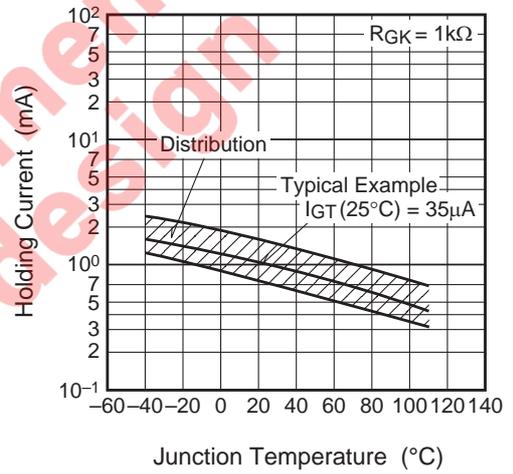
Breakover Voltage vs. Gate to Cathode Resistance



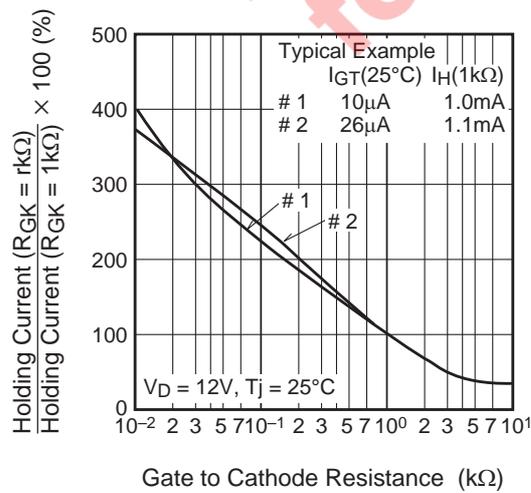
Breakover Voltage vs. Rate of Rise of Off-State Voltage



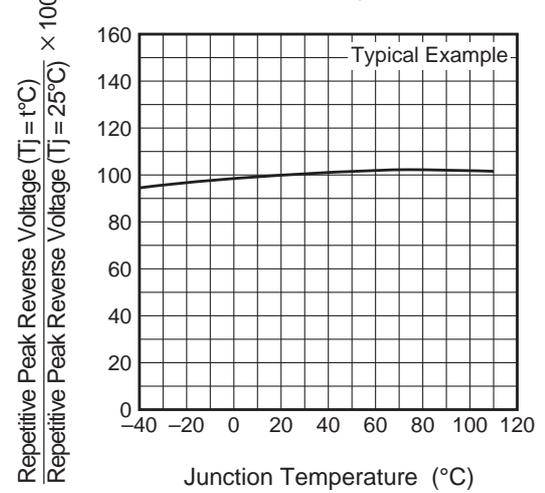
Holding Current vs. Junction Temperature



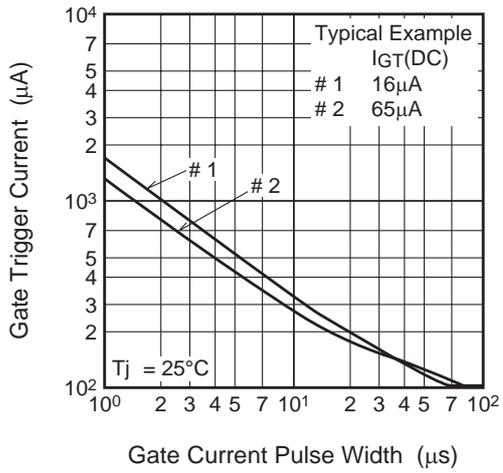
Holding Current vs. Gate to Cathode Resistance



Repetitive Peak Reverse Voltage vs. Junction Temperature

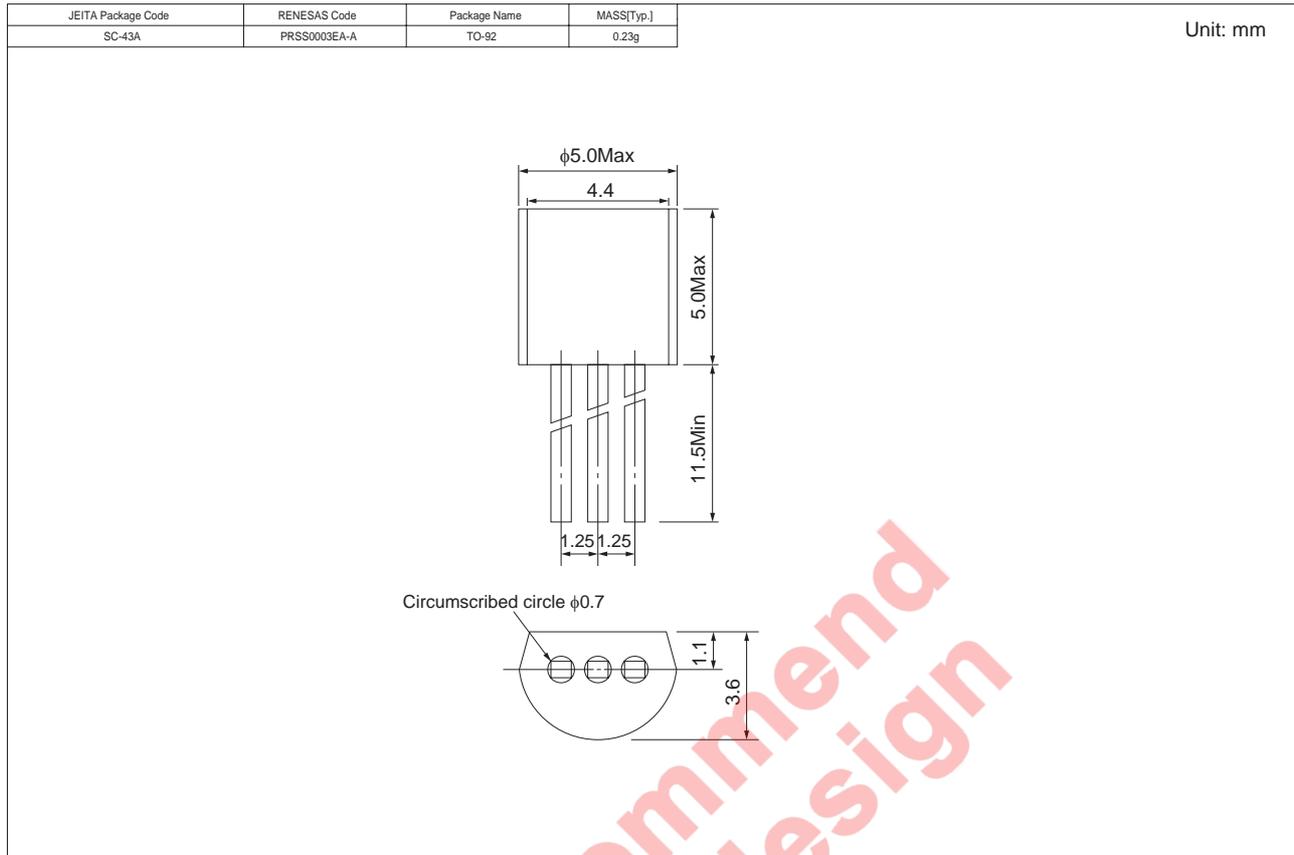


Gate Trigger Current vs.  
Gate Current Pulse Width



Not recommend  
for new design

## Package Dimensions



## Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Vinyl sack	500	Type name	CR03AM-12
Lead form	Vinyl sack	500	Type name – Lead forming code	CR03AM-12-A6
Form A8	Taping	2000	Type name – TB	CR03AM-12-TB

Note : Please confirm the specification about the shipping in detail.

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