

# CR04AM-12A

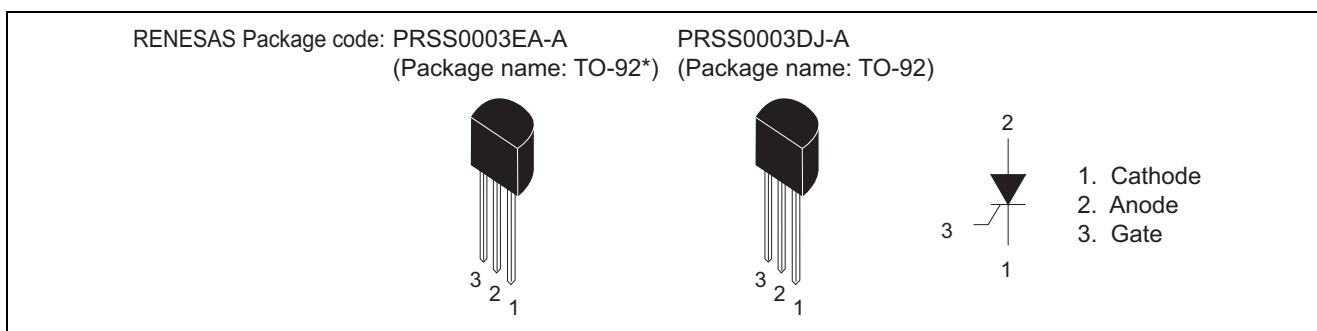
600V - 0.4A - Thyristor  
Low Power Use

R07DS0636EJ0300  
Rev.3.00  
Aug 25, 2015

## Features

- $I_{T(AV)}$  : 0.4 A
- $V_{DRM}$  : 600 V
- $I_{GT}$  : 100  $\mu$ A
- RoHS Compliant
- Non-Insulated Type
- Planar Passivation Type
- Halogen-free package (PRSS0003DJ-A)
- Completely Pb-free package (PRSS0003DJ-A)

## Outline



## Applications

Solid state relay, igniter, strobe flasher, circuit breaker, and general purpose control applications

## Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12	
Repetitive peak reverse voltage	$V_{RRM}$	600	V
Non-repetitive peak reverse voltage	$V_{RSM}$	720	V
DC reverse voltage	$V_{R(DC)}$	480	V
Repetitive peak off-state voltage <sup>Note1</sup>	$V_{DRM}$	600	V
DC off-state voltage <sup>Note1</sup>	$V_{D(DC)}$	480	V

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

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	0.63	A	
Average on-state current	$I_{T(AV)}$	0.4	A	Commercial frequency, sine half wave 180° conduction, $T_a=54^\circ\text{C}$
Surge on-state current	$I_{TSM}$	10	A	60Hz sine half wave, 1full cycle, peak value, non-repetitive
$I^2t$ for fusing	$I^2t$	0.4	$\text{A}^2\text{s}$	Value corresponding to 1cycle 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 +125	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	- 40 to +125	$^\circ\text{C}$	
Mass	—	0.23	g	Typical value

### Electrical Characteristics

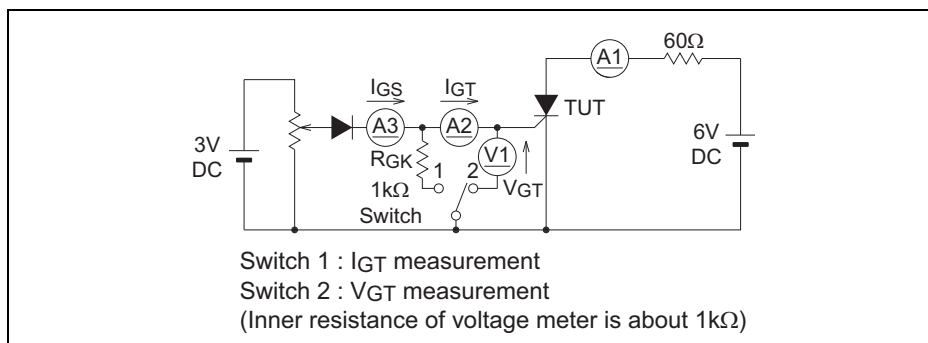
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	$I_{RRM}$	—	—	0.5	mA	$T_j = 125^\circ\text{C}$ , $V_{RRM}$ applied
Repetitive peak off-state current	$I_{DRM}$	—	—	0.5	mA	$T_j = 125^\circ\text{C}$ , $V_{DRM}$ applied $R_{GK}=1\text{ k}\Omega$
On-state voltage	$V_{TM}$	—	—	1.2	V	$T_j = 25^\circ\text{C}$ , $I_{TM} = 1.2\text{ A}$ 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	$T_j = 125^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$ $R_{GK} = 1\text{ k}\Omega$
Gate trigger current	$I_{GT}$	1 <sup>Note2</sup>	—	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	$R_{th(j-a)}$	—	—	150	$^\circ\text{C/W}$	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.

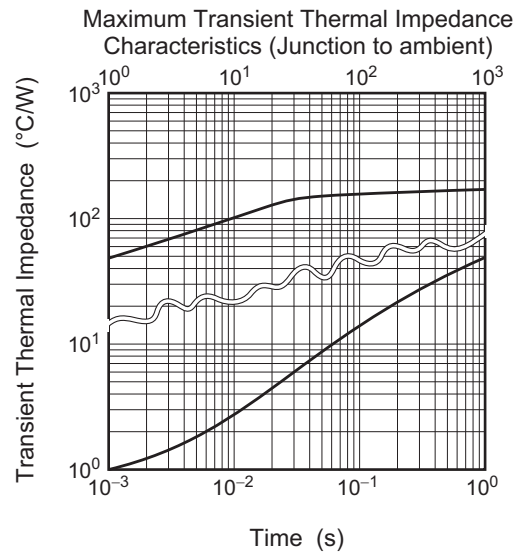
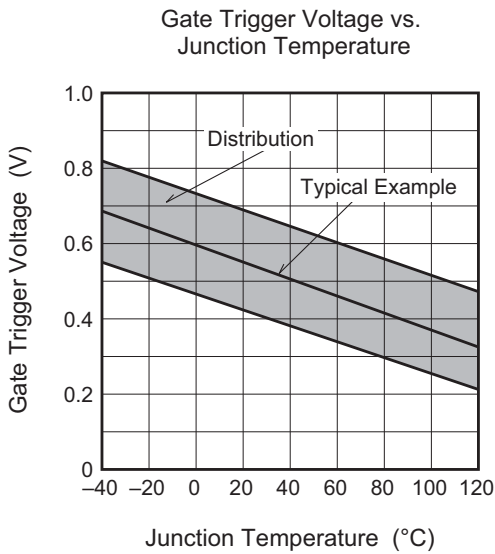
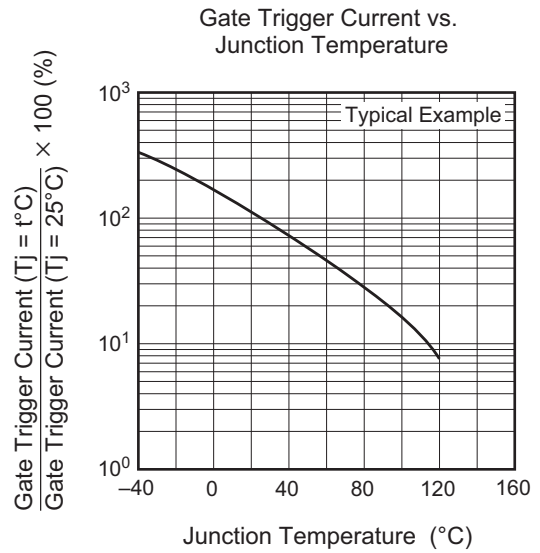
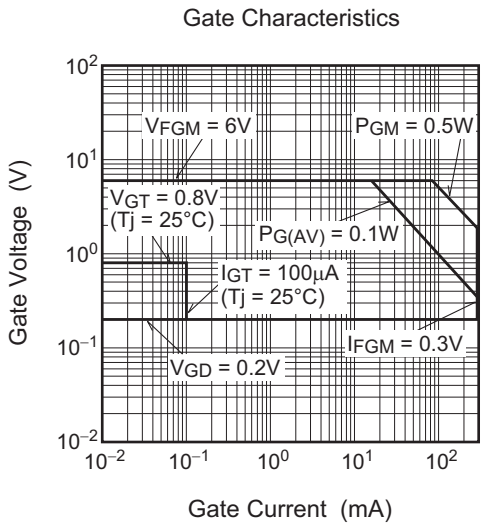
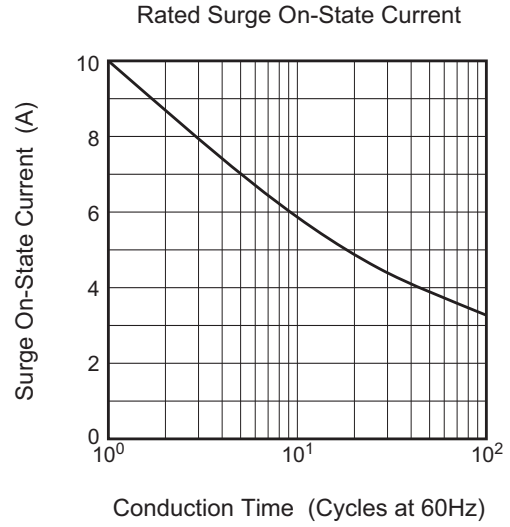
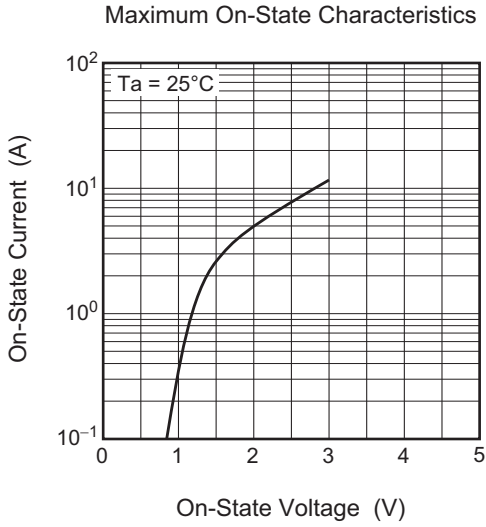
Item	A	B	D	E
$I_{GT}$ ( $\mu\text{A}$ )	1 to 30	20 to 50	1 to 50	20 to 100

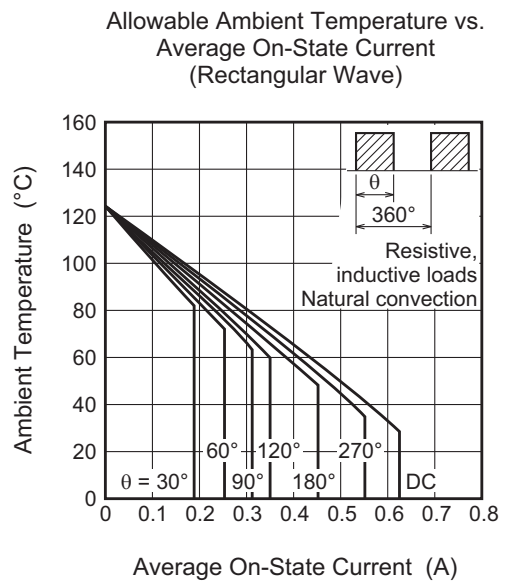
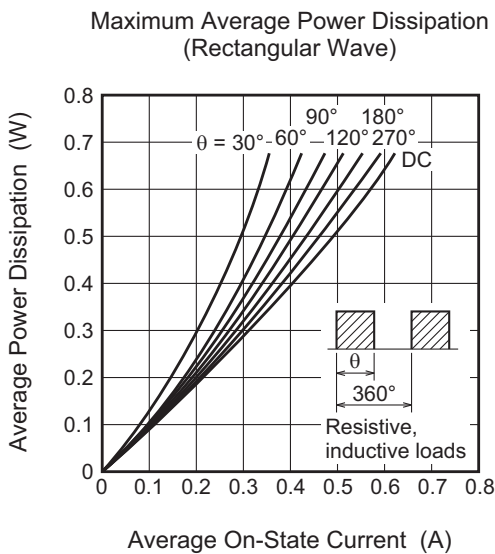
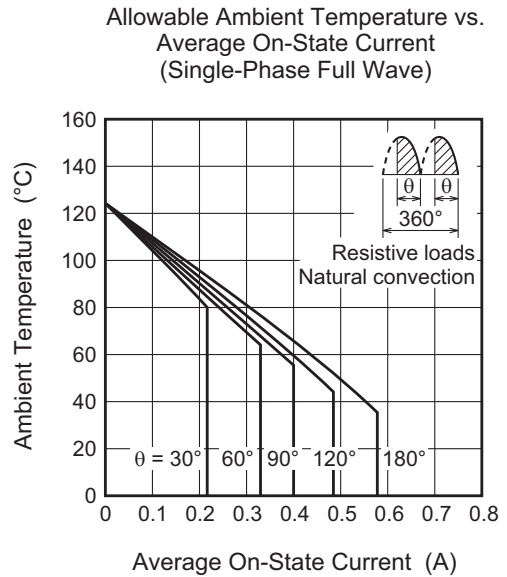
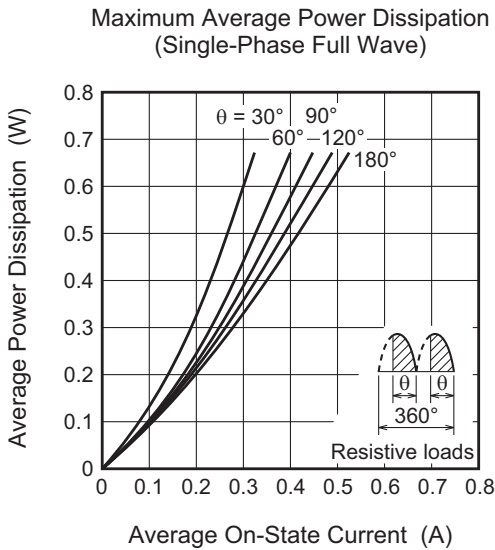
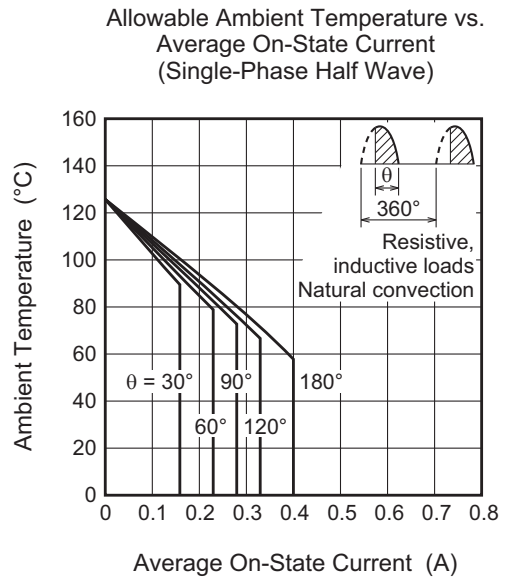
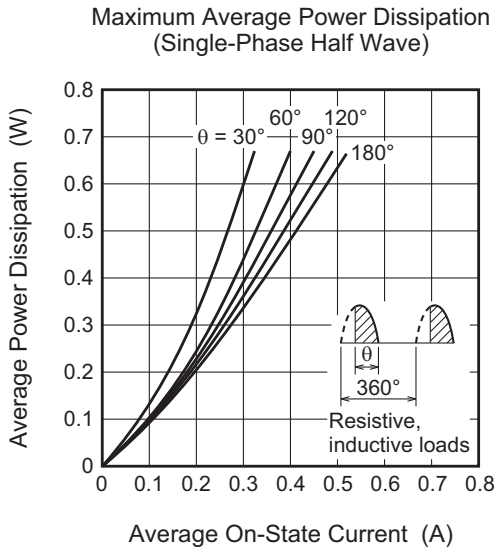
The above values do not include the current flowing through the 1 k $\Omega$  resistance between the gate and cathode.

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

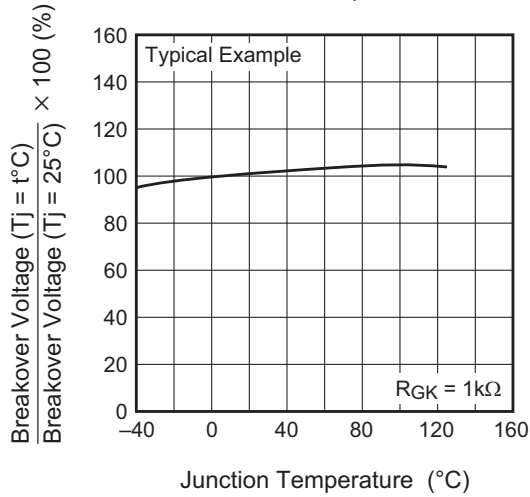


Performance Curves

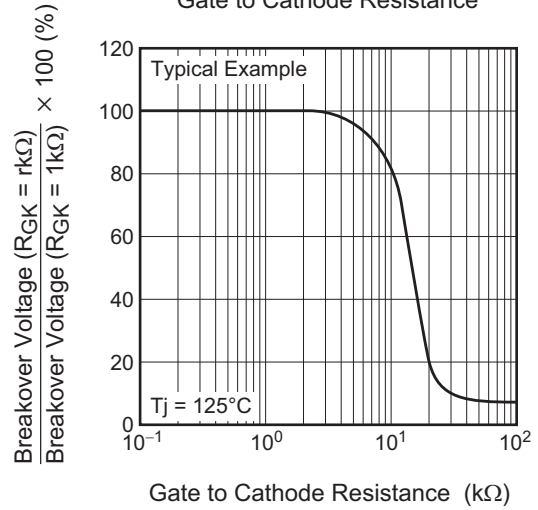




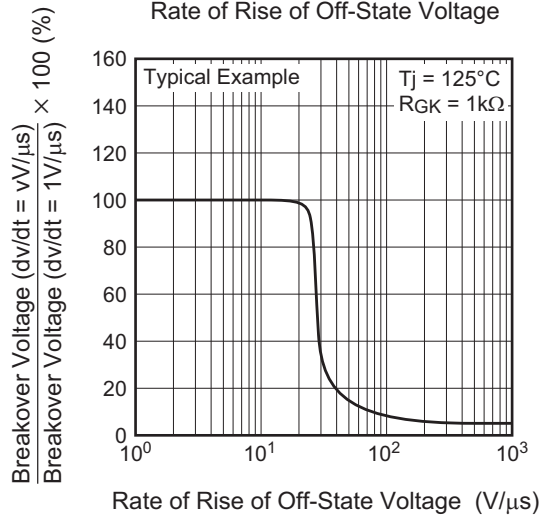
Breakover Voltage vs. Junction Temperature



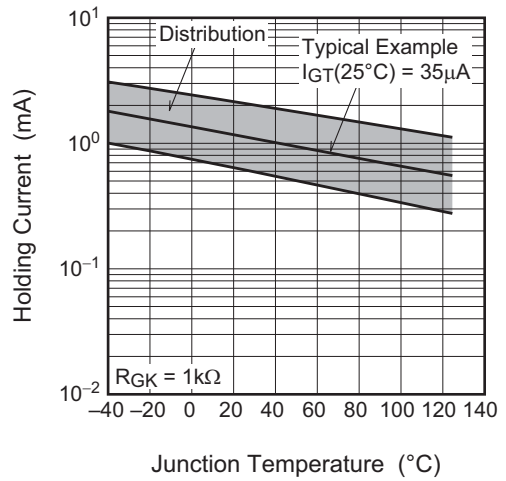
Breakover Voltage vs. Gate to Cathode Resistance



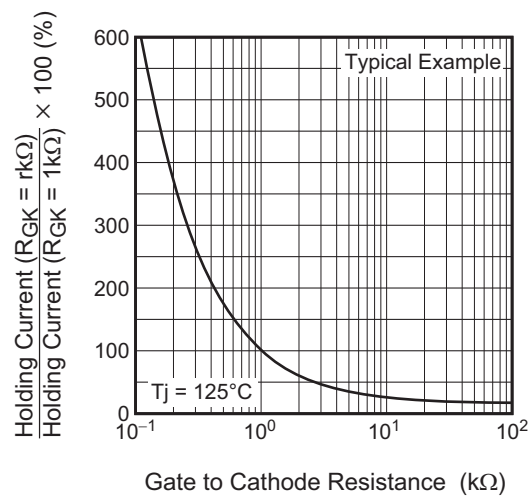
Breakover Voltage vs. Rate of Rise of Off-State Voltage



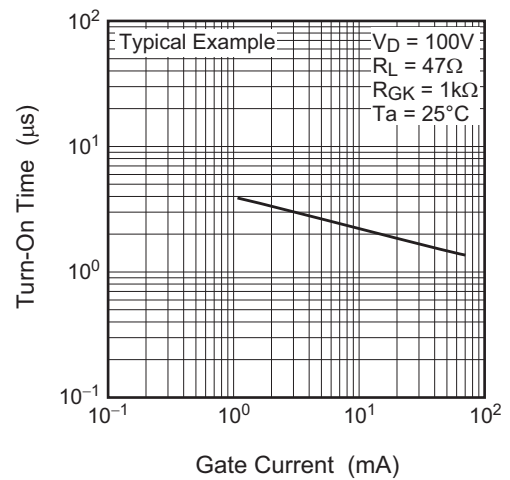
Holding Current vs. Junction Temperature



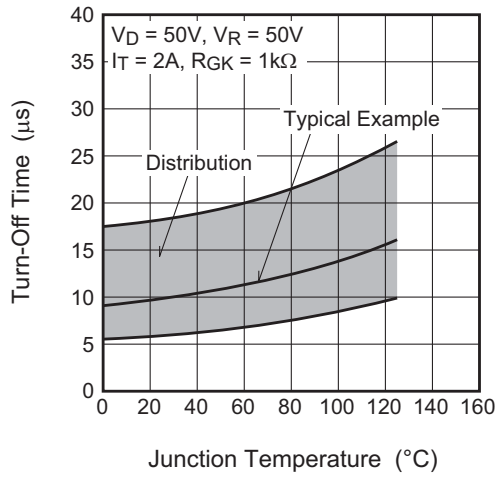
Holding Current vs. Gate to Cathode Resistance



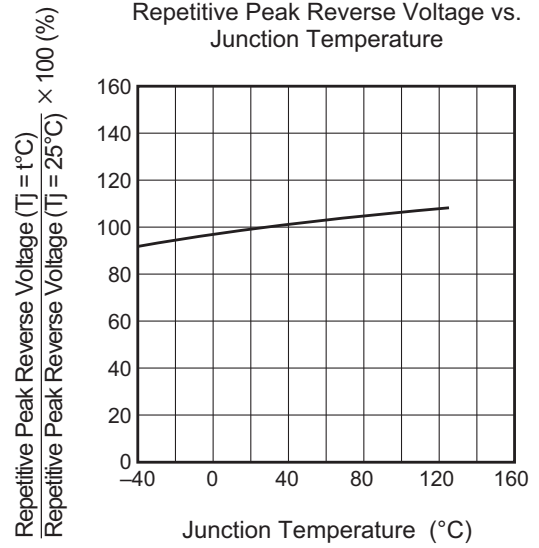
Turn-On Time vs. Gate Current



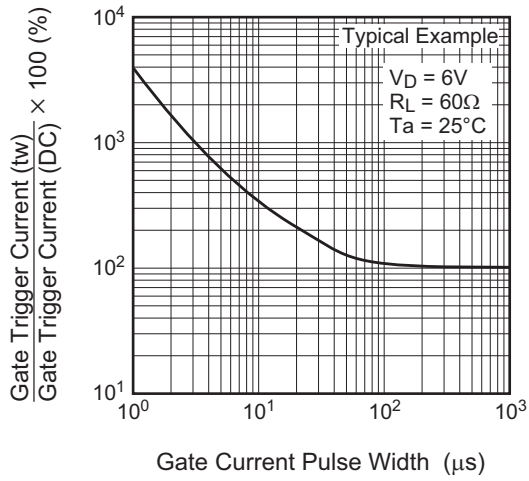
Turn-Off Time vs. Junction Temperature



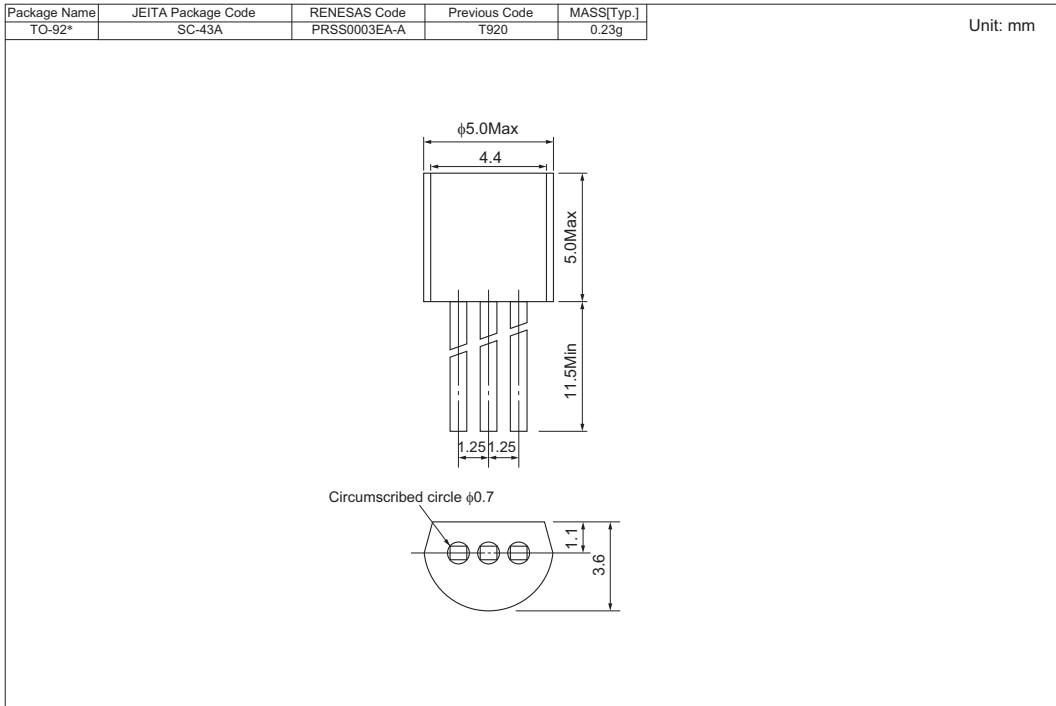
Repetitive Peak Reverse Voltage vs. Junction Temperature



Gate Trigger Current vs. Gate Current Pulse Width

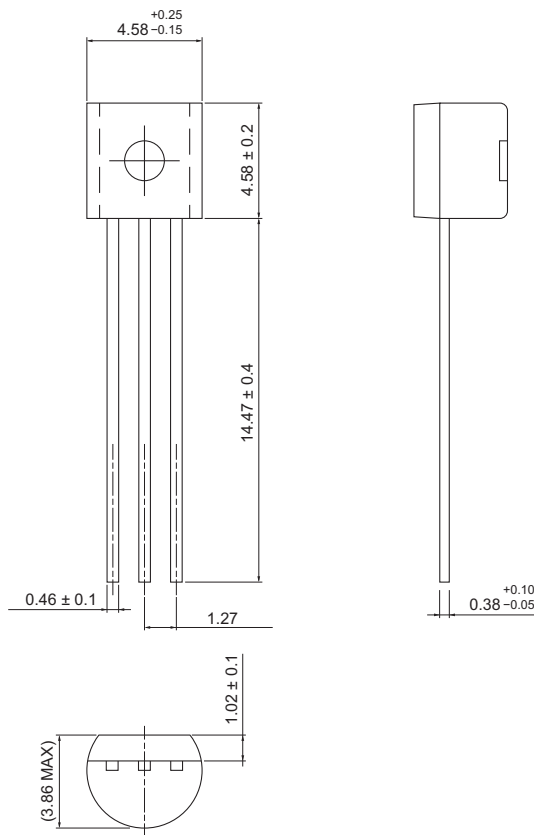


### Package Dimensions



JEITA Package Code	RENESAS Code	Previous Code	MASS (Typ) [g]
SC-43A	PRSS0003DJ-A	TO-92	0.23

Unit: mm



## Ordering Information

Orderable Part Number	Package	Packing <sup>Note</sup>	Quantity	Remark
CR04AM-12A#B00	TO-92*	Plastic Bag	500 pcs.	Straight type
CR04AM-12A-□#B00	TO-92*	Plastic Bag	500 pcs.	Straight type, □:lGT item
CR04AM-12A-A6#B00	TO-92*	Plastic Bag	500 pcs.	A6 Lead form
CR04AM-12A-□A6#B00	TO-92*	Plastic Bag	500 pcs.	A6 Lead form, □:lGT item
CR04AM-12A-TB#B00	TO-92*	Adhesive Tape	2000 pcs.	A8 Lead form
CR04AM-12A-□TB#B00	TO-92*	Adhesive Tape	2000 pcs.	A8 Lead form, □:lGT item
CR04AM-12A #BD0	TO-92	Plastic Bag	1000 pcs.	Straight type, Halogen-free
CR04AM-12A-□#BD0	TO-92	Plastic Bag	1000 pcs.	Straight type, Halogen-free, □:lGT item
CR04AM-12A-A6#BD0	TO-92	Plastic Bag	1000 pcs.	A6 Lead form, Halogen-free
CR04AM-12A-□A6#BD0	TO-92	Plastic Bag	1000 pcs.	A6 Lead form, Halogen-free, □:lGT item
CR04AM-12A-TB#BD0	TO-92	Adhesive Tape	2000 pcs.	A8 Lead form, Halogen-free
CR04AM-12A-□TB#BD0	TO-92	Adhesive Tape	2000 pcs.	A8 Lead form, Halogen-free, □:lGT item

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



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