

# CR08AS-12

## Thyristor

Low Power Use

REJ03G0349-0300

Rev.3.00

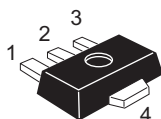
Mar 22, 2007

### Features

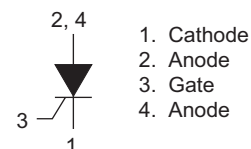
- $I_{T(AV)}$  : 0.8 A
- $V_{DRM}$  : 600 V
- $I_{GT}$  : 100  $\mu$ A
- Non-Insulated Type
- Glass Passivation Type
- Completed Pb Free

### Outline

RENESAS Package code: PLZZ0004CA-A  
(Package name: UPAK)



RENESAS Package code: PLZZ0004CB-A  
(Package name: SOT-89)



### Applications

Solid state relay, strobe flasher, igniter, and hybrid IC

### Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12 (Mark AF)	
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

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_T$ (RMS)	1.26	A	
Average on-state current	$I_T$ (AV)	0.8	A	Commercial frequency, sine half wave 180° conduction, $T_a = 51^\circ\text{C}$ <sup>Note2</sup>
Surge on-state current	$I_{TSM}$	10	A	60Hz sine half wave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusing	$I^2t$	0.42	$\text{A}^2\text{s}$	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 +125	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	- 40 to +125	$^\circ\text{C}$	
Mass	—	50	mg	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	$I_{RRM}$	—	—	0.5	mA	$T_j = 125^\circ\text{C}$ , $V_{RRM}$ applied, $R_{GK} = 1\text{ k}\Omega$
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	$V_{TM}$	—	—	1.5	V	$T_a = 25^\circ\text{C}$ , $I_{TM} = 2.5\text{ A}$ , 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>Note4</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	$I_{GT}$	20	—	100 <sup>Note3</sup>	$\mu\text{A}$	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $I_T = 0.1\text{ A}$ <sup>Note4</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	$R_{th(j-a)}$	—	—	65	$^\circ\text{C/W}$	Junction to ambient <sup>Note2</sup>

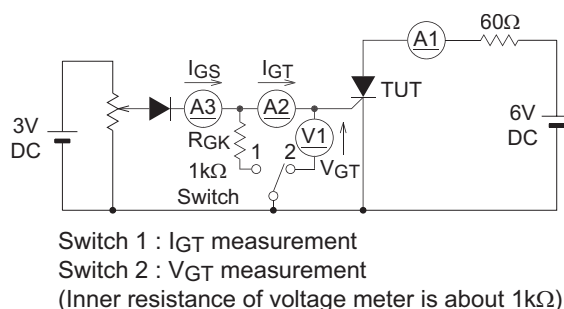
Notes: 2. Soldering with ceramic plate (25 mm × 25 mm × 0.7 mm).

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

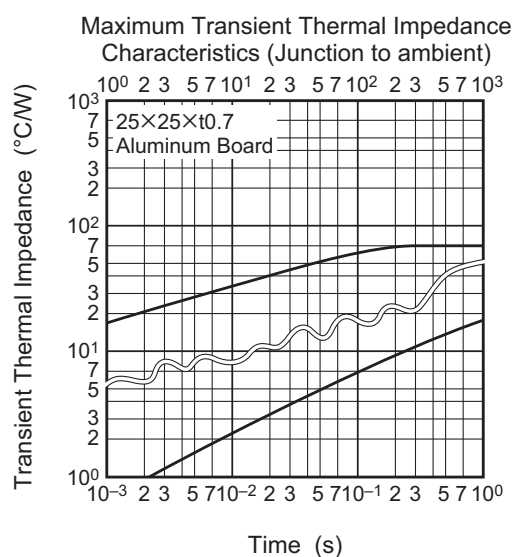
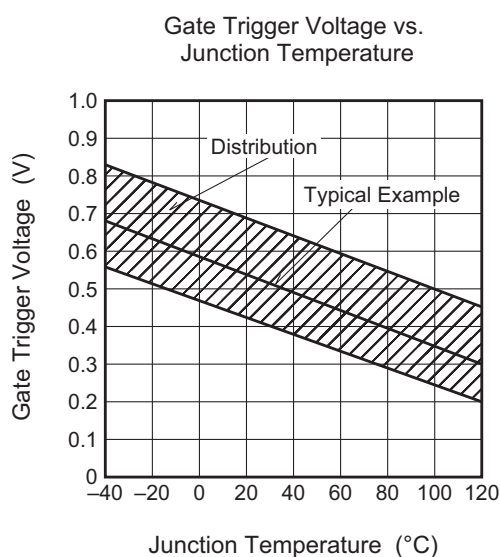
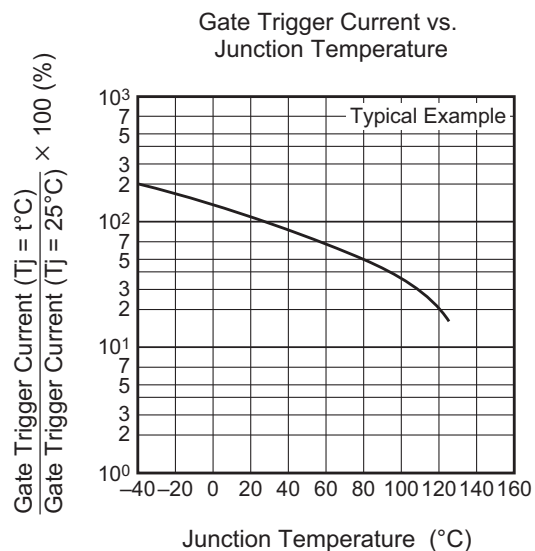
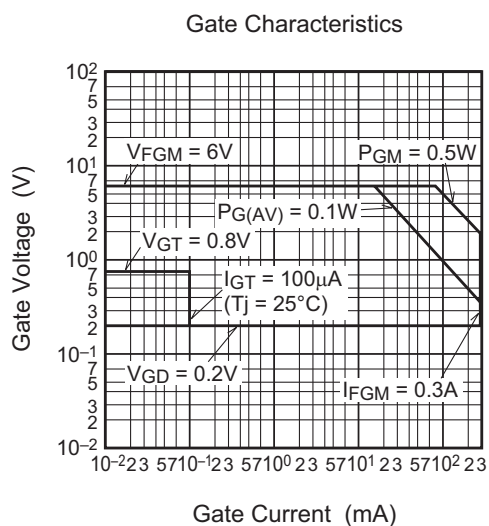
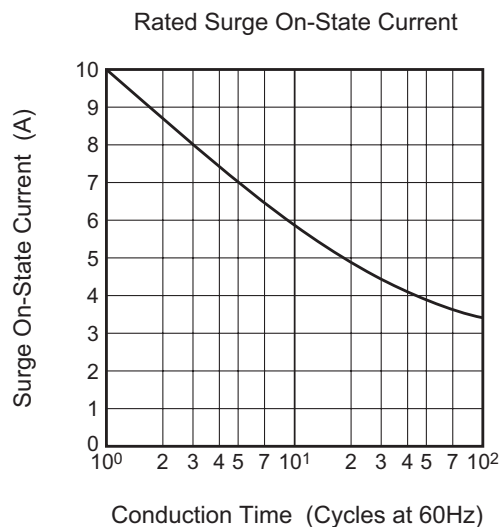
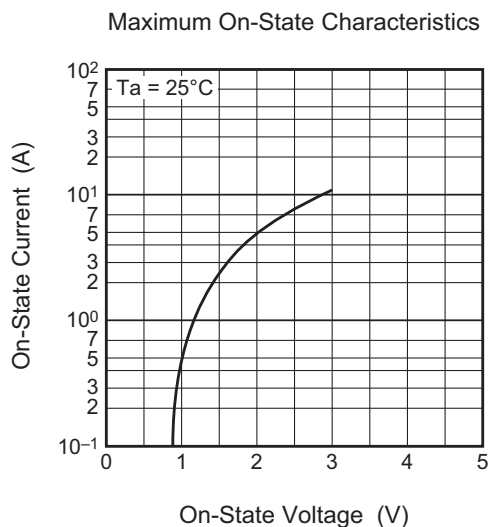
Item	B	E
$I_{GT}$ ( $\mu\text{A}$ )	20 to 50	20 to 100

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

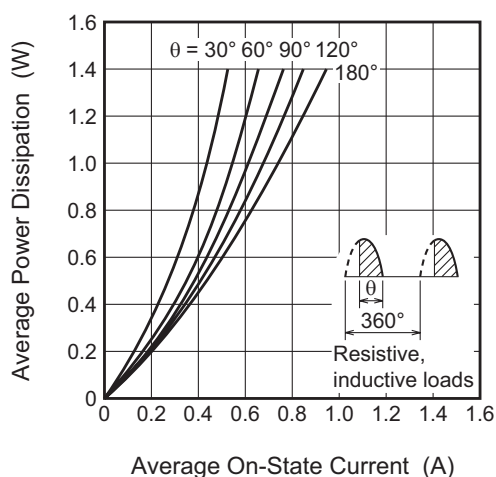
4.  $I_{GT}$ ,  $V_{GT}$  measurement circuit.



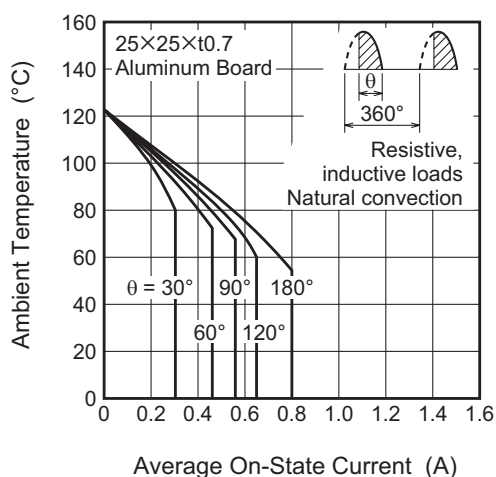
## Performance Curves



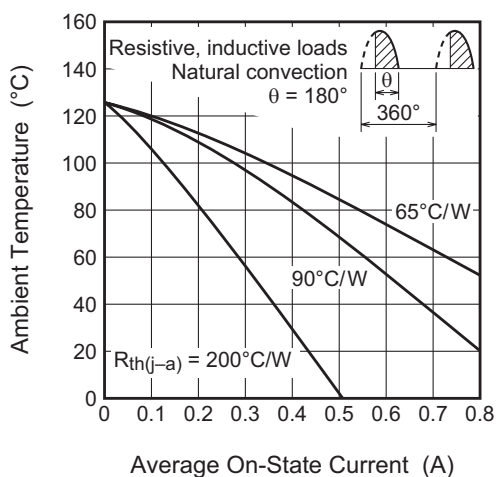
Maximum Average Power Dissipation  
(Single-Phase Half Wave)



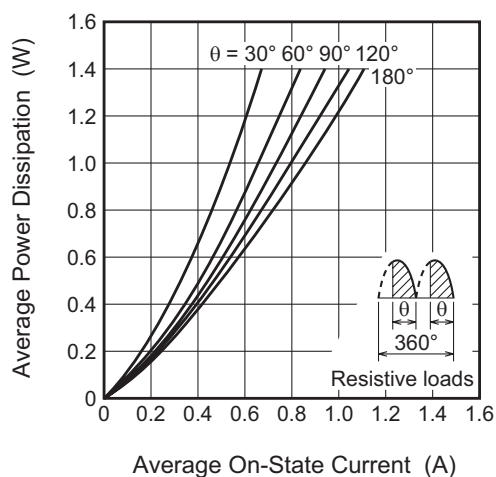
Allowable Ambient Temperature vs.  
Average On-State Current  
(Single-Phase Half Wave)



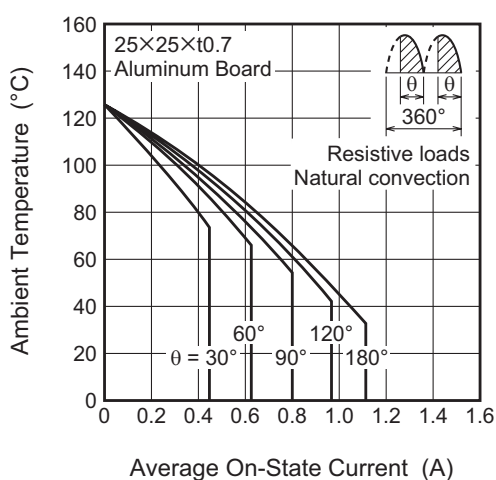
Allowable Ambient Temperature vs.  
Average On-State Current  
(Single-Phase Half Wave)



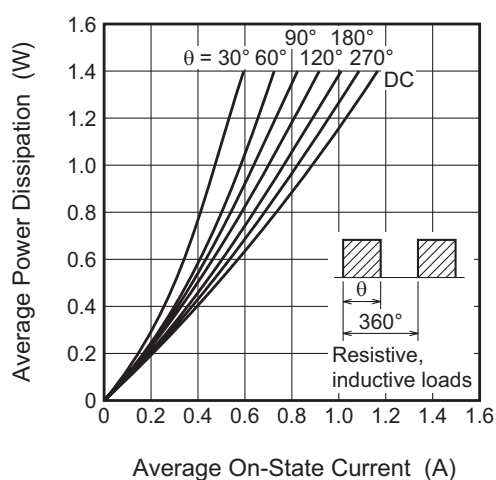
Maximum Average Power Dissipation  
(Single-Phase Full Wave)



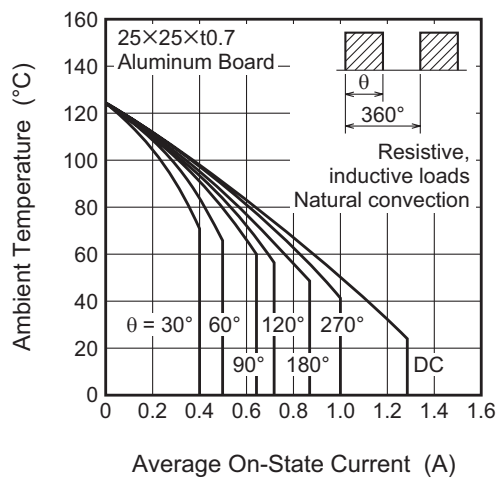
Allowable Ambient Temperature vs.  
Average On-State Current  
(Single-Phase Full Wave)



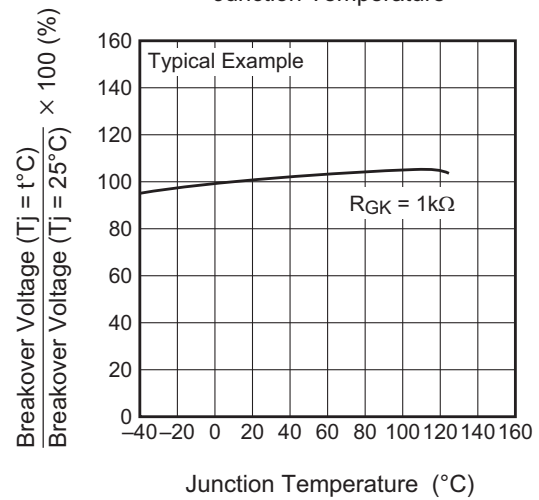
Maximum Average Power Dissipation  
(Rectangular Wave)



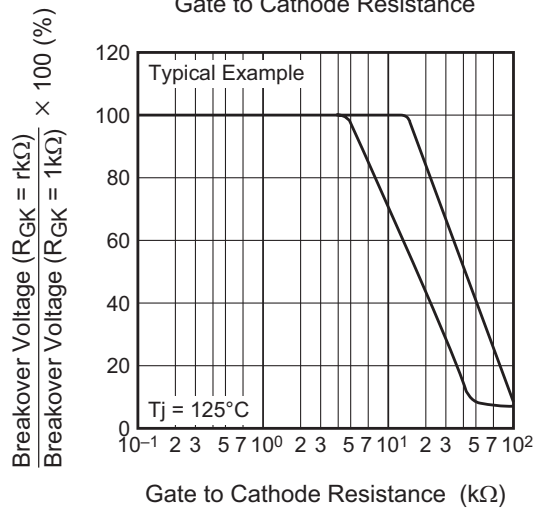
Allowable Ambient Temperature vs.  
Average On-State Current  
(Rectangular Wave)



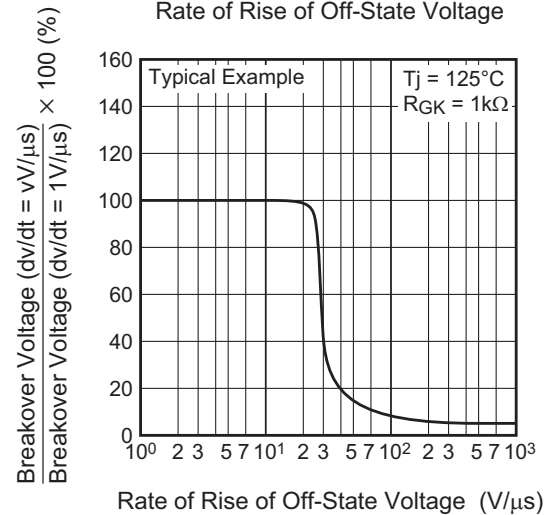
Breakover Voltage vs.  
Junction Temperature



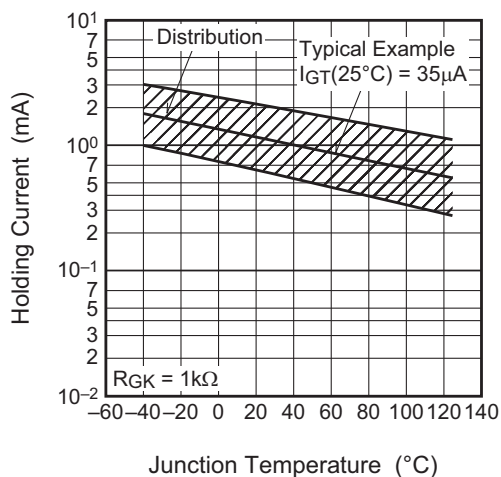
Breakover Voltage vs.  
Gate to Cathode Resistance



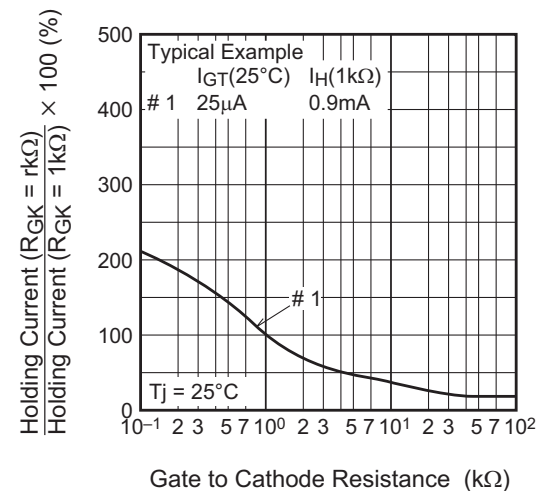
Breakover Voltage vs.  
Rate of Rise of Off-State Voltage

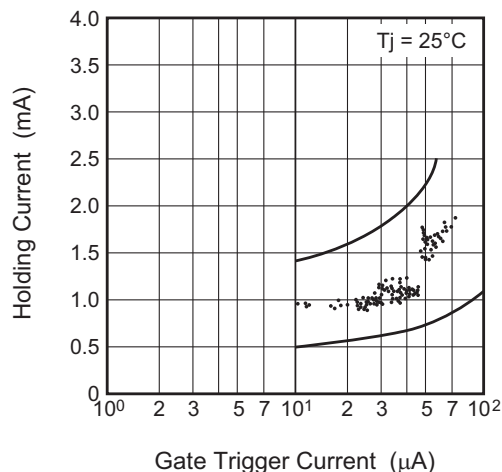
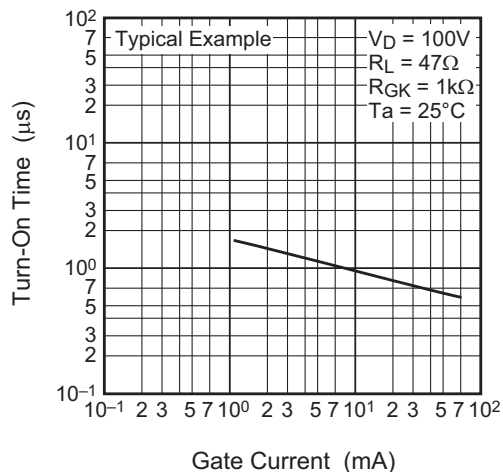
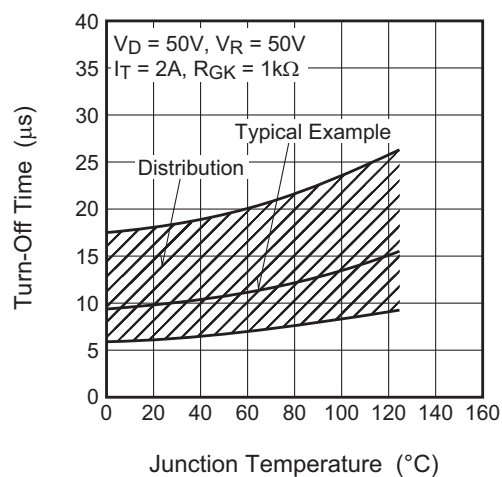
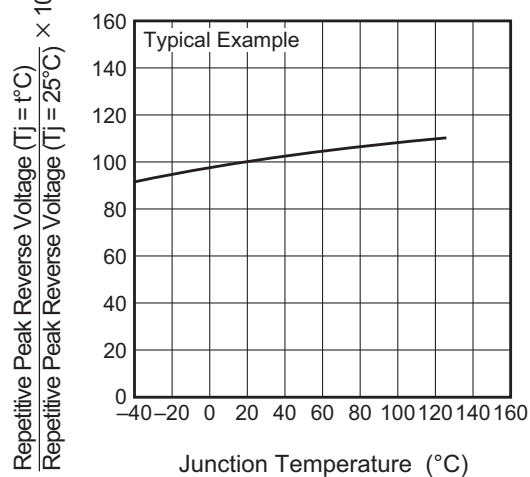
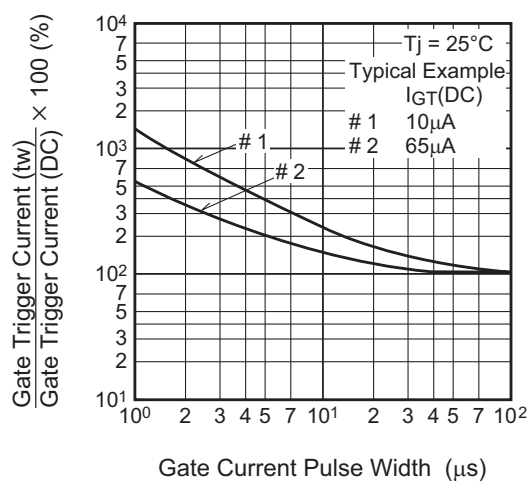
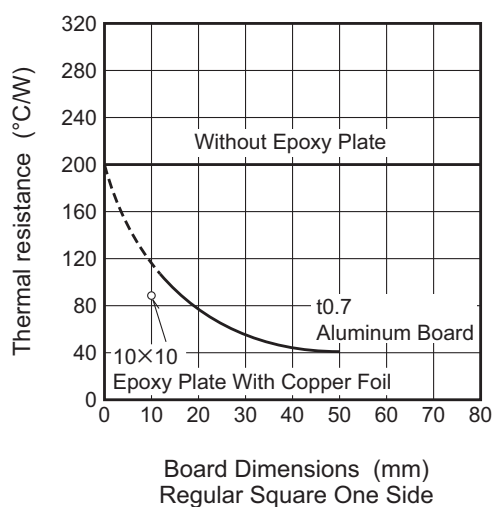


Holding Current vs.  
Junction Temperature

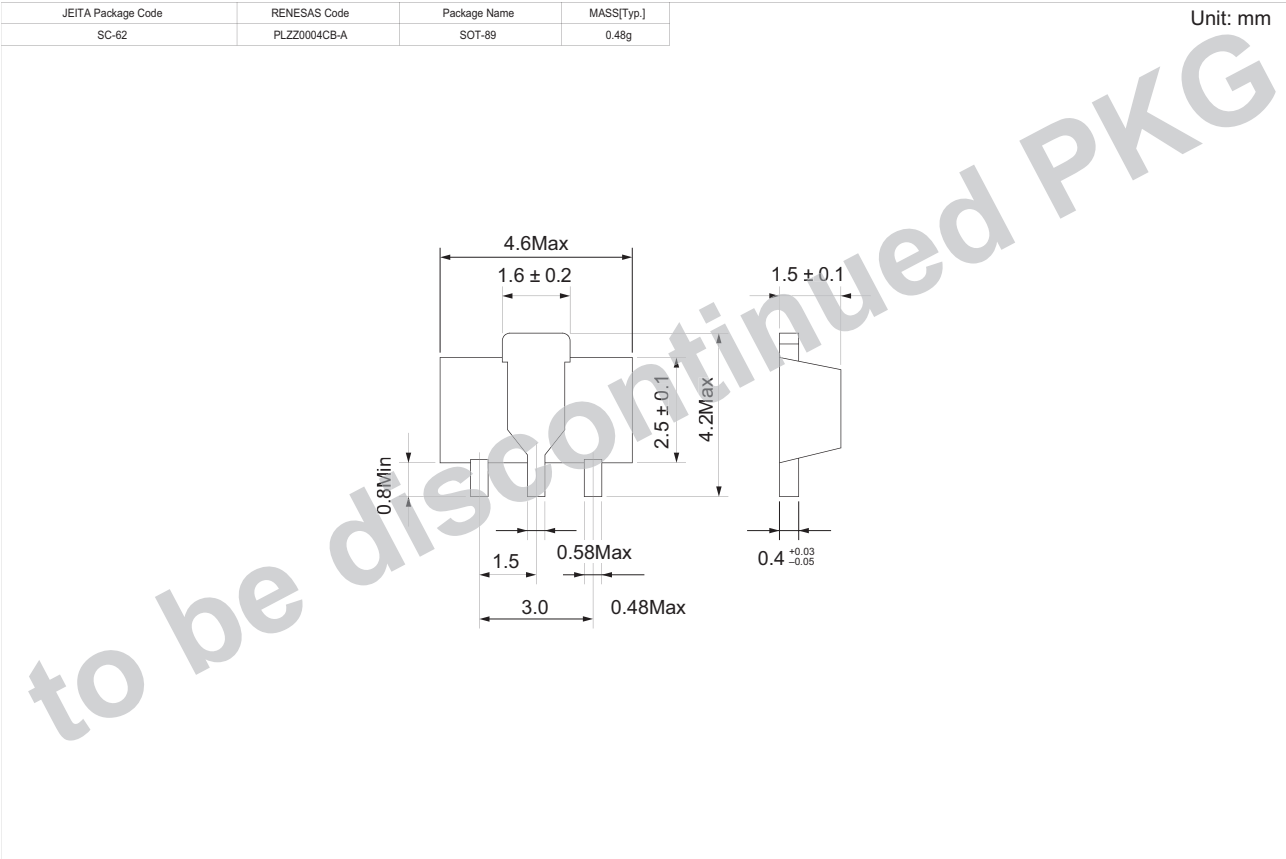
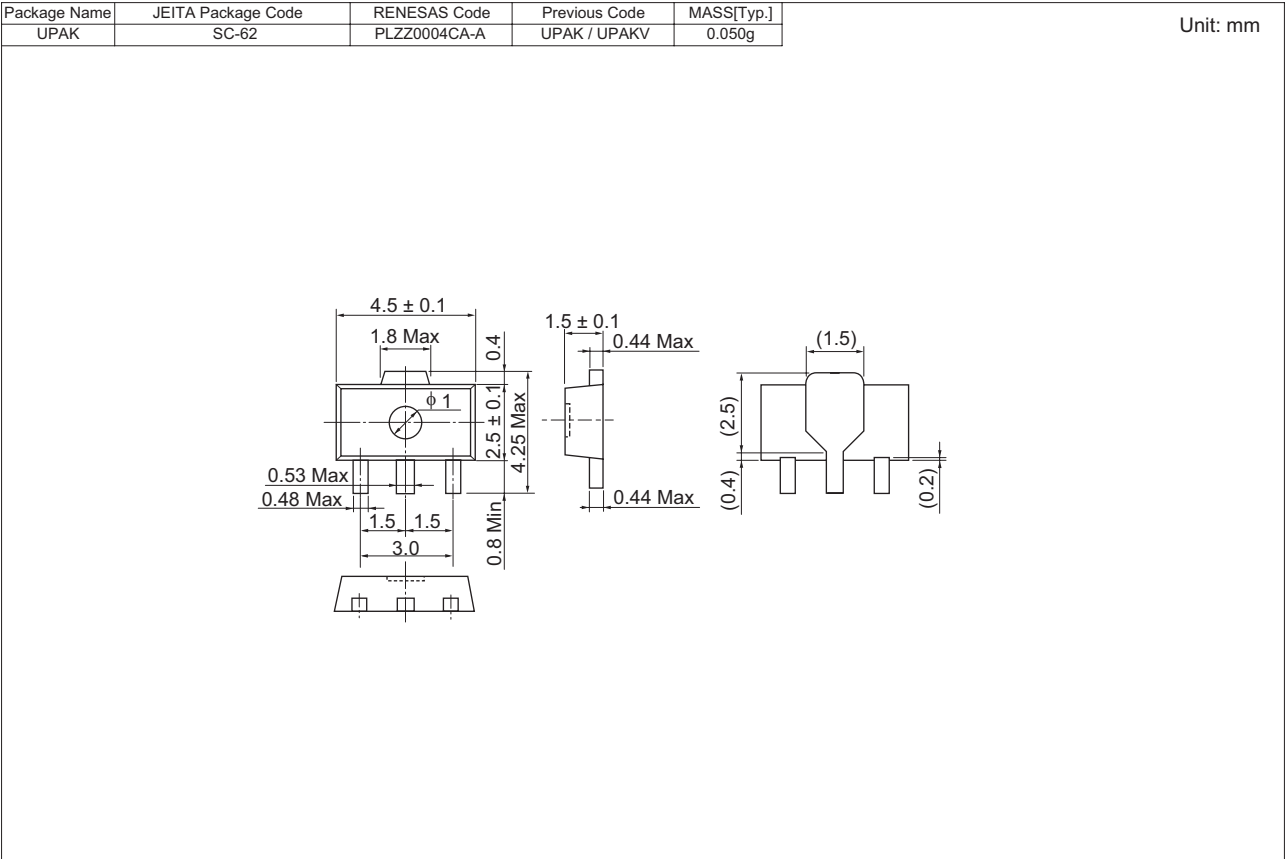


Holding Current vs.  
Gate to Cathode Resistance



Holding Current vs.  
Gate Trigger CurrentTurn-On Time vs.  
Gate CurrentTurn-Off Time vs.  
Junction TemperatureRepetitive Peak Reverse Voltage vs.  
Junction TemperatureGate Trigger Current vs.  
Gate Current Pulse WidthThermal Impedance vs.  
Board Dimensions

Package Dimensions



**Order Code**

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Surface-mounted type	Taping	4000	Type name – ET +Direction (1 or 2) +4	CR08AS-12-ET14

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



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