

CR5AS-12A

600V - 5A - Thyristor

Medium Power Use

R07DS0332EJ0301

Rev.3.01

May. 10, 2019

Features

- $I_T(AV)$: 5 A
- V_{DRM} : 600 V
- I_{GT} : 100 μ A
- Planar Passivation Type
- RoHS Compliant

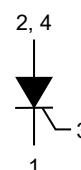
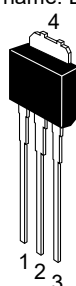
Outline

RENESAS Package code: PRSS0004ZG-A

(Package name: MP-3A)

PRSS0004ZD-D

(Package name: DPAK(L)-(3))



1. Cathode
2. Anode
3. Gate
4. Anode

Application

Switching mode power supply, igniter, pulse generator, electric tools, etc.

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 ^{Note1}	V_{DRM}	600	V
DC off-state voltage ^{Note1}	$V_{D(DC)}$	480	V

Notes: 1. With gate to cathode resistance $R_{GK}=220 \Omega$

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	I_T (RMS)	7.8	A	
Average on-state current	I_T (AV)	5	A	Commercial frequency, sine half wave 180°conduction, $T_a = 88^\circ\text{C}$
Surge on-state current	I_{TSM}	90	A	60 Hz sine half wave 1 full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	33	A^2s	Value corresponding to 1 cycle of half wave 60 Hz, 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	$^\circ\text{C}$	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	I_{RRM}	—	—	1.0	mA	$T_j = 125^\circ\text{C}$, V_{RRM} applied, $R_{GK} = 220\ \Omega$
Repetitive peak off-state current	I_{DRM}	—	—	1.0	mA	$T_j = 125^\circ\text{C}$, V_{DRM} applied, $R_{GK} = 220\ \Omega$
On-state voltage	V_{TM}	—	—	1.8	V	$T_c = 25^\circ\text{C}$, $I_{TM} = 15\ \text{A}$, instantaneous value
Gate trigger voltage	V_{GT}	—	—	0.8	V	$T_j = 25^\circ\text{C}$, $V_D = 6\ \text{V}$, $I_T = 0.1\ \text{A}$
Gate non-trigger voltage	V_{GD}	0.1	—	—	V	$T_j = 125^\circ\text{C}$, $V_D = 1/2\ V_{DRM}$, $R_{GK} = 220\ \Omega$
Gate trigger current	I_{GT}	1 Note3	—	100 Note3	μA	$T_j = 25^\circ\text{C}$, $V_D = 6\ \text{V}$, $I_T = 0.1\ \text{A}$
Holding current	I_H	—	3.5	—	mA	$T_j = 25^\circ\text{C}$, $V_D = 12\ \text{V}$, $R_{GK} = 220\ \Omega$
Thermal resistance	$R_{th(j-c)}$	—	—	3.0	$^\circ\text{C/W}$	Junction to case Note2

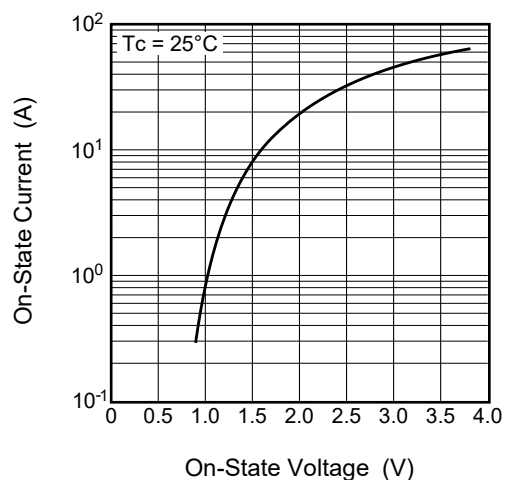
Notes: 2. The measurement point for case temperature is at anode tab.

3. If special values of I_{GT} are required, please refer to the ordering information.

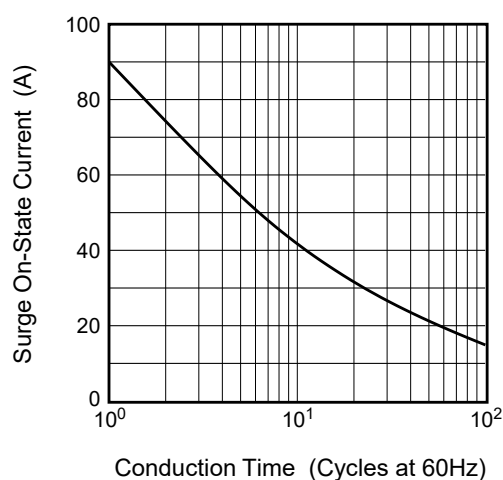
The above values do not include the current flowing through the $220\ \Omega$ resistance between the gate and cathode.

Performance Curves

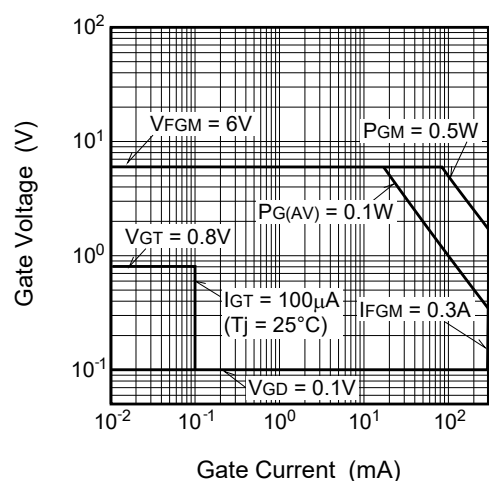
Maximum On-State Characteristics



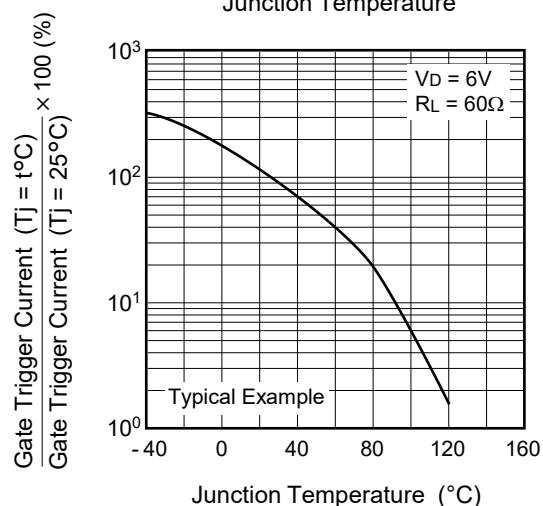
Rated Surge On-State Current



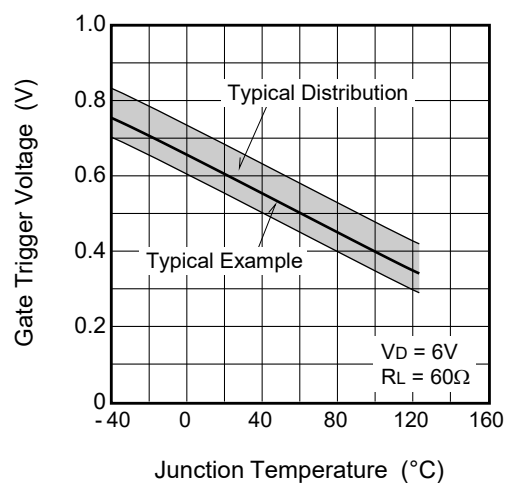
Gate Characteristics



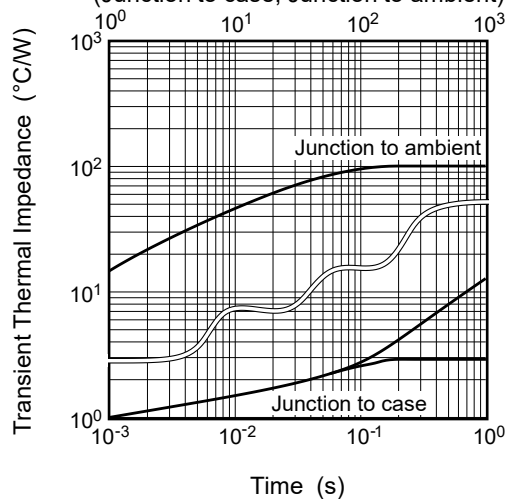
Gate Trigger Current vs. Junction Temperature

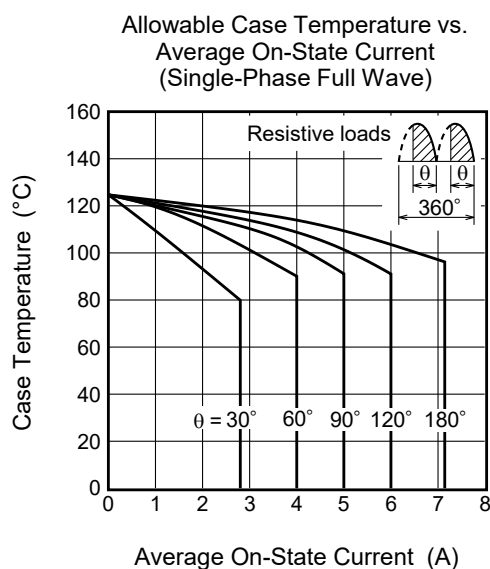
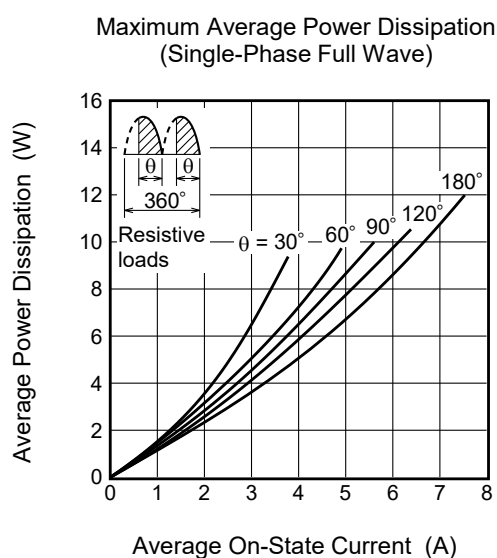
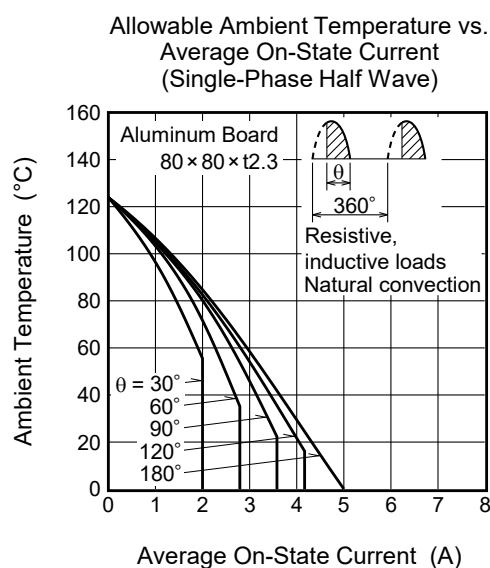
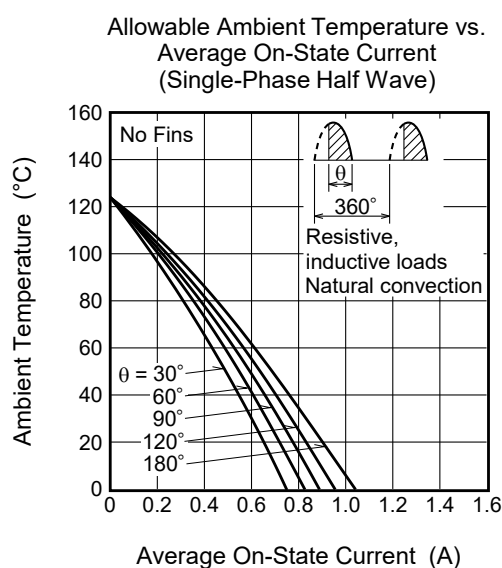
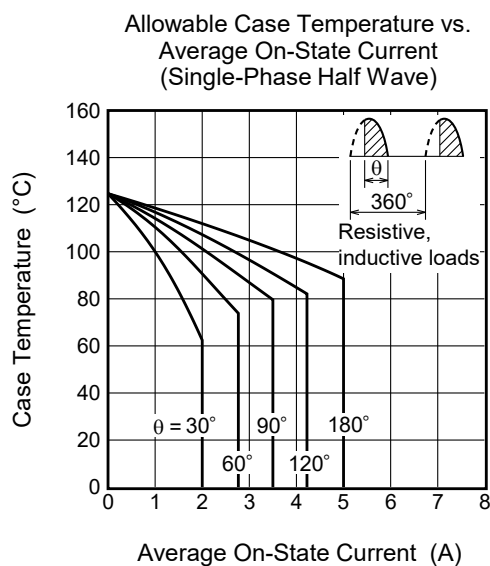
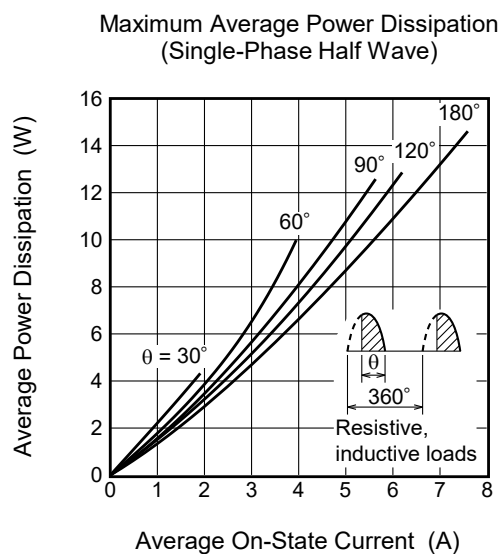


Gate Trigger Voltage vs. Junction Temperature

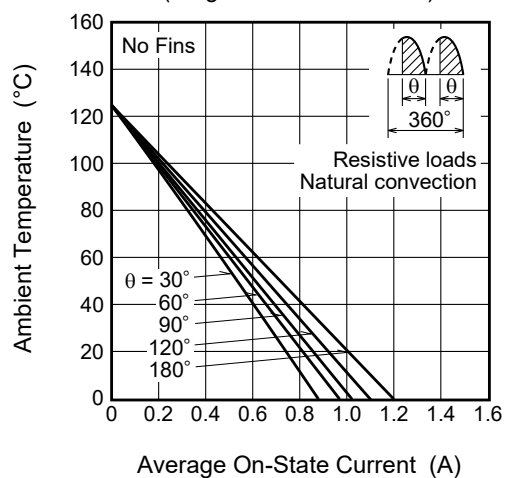


Maximum Transient Thermal Impedance Characteristics
(Junction to case, Junction to ambient)

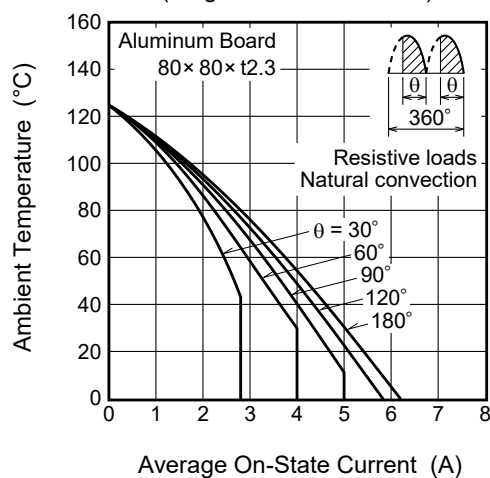




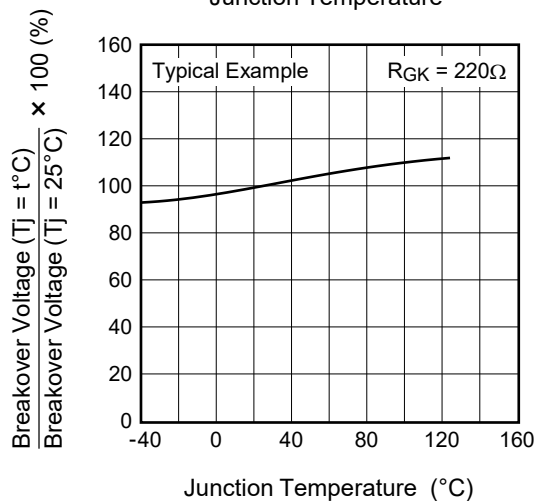
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



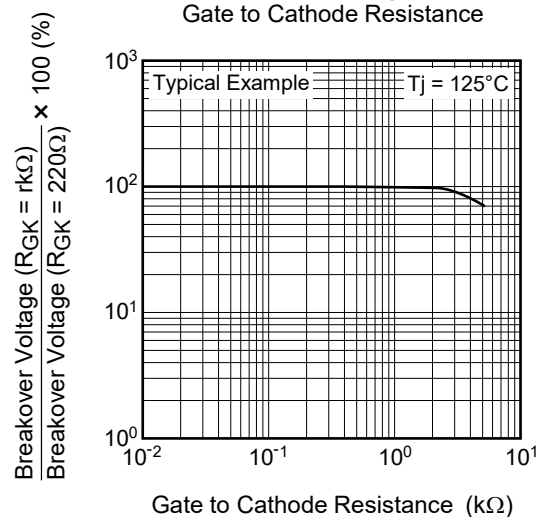
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



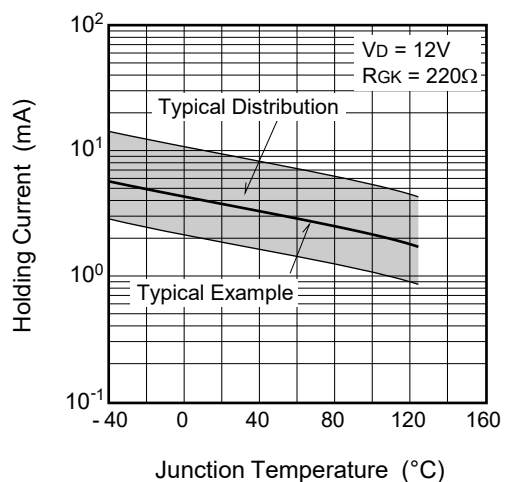
Breakover Voltage vs.
Junction Temperature



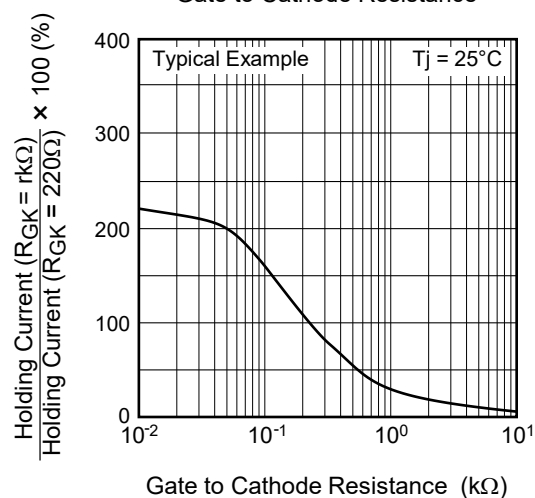
Breakover Voltage vs.
Gate to Cathode Resistance

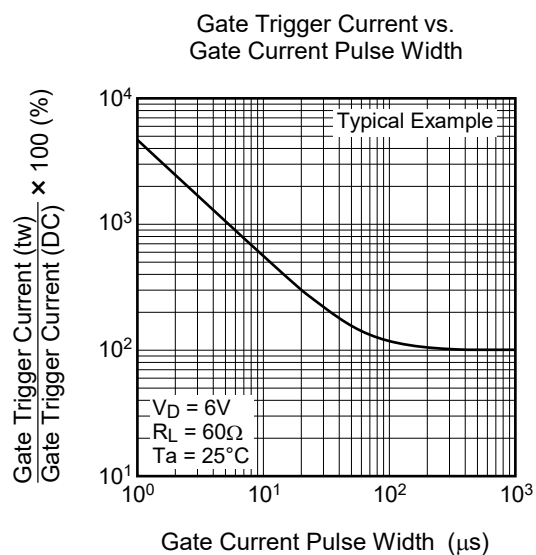
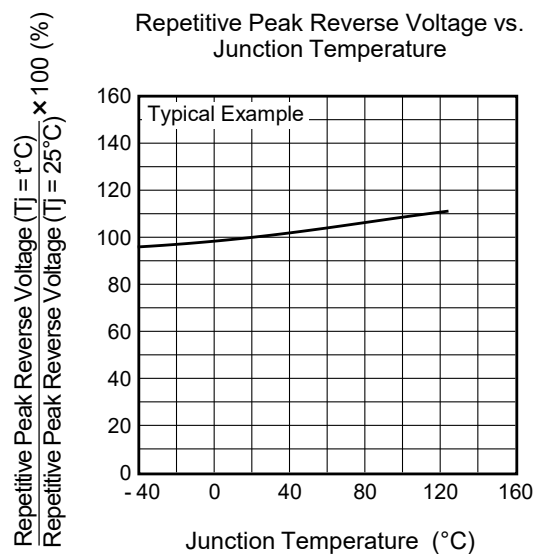
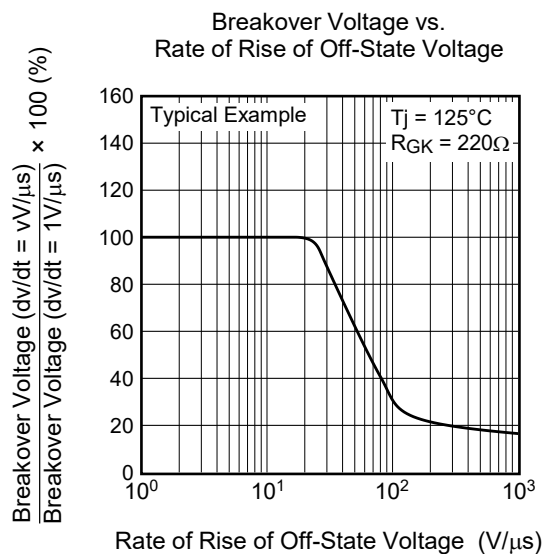


Holding Current vs.
Junction Temperature



Holding Current vs.
Gate to Cathode Resistance





Package Dimensions

Package Name: MP-3A

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
MP-3A	SC-63	PRSS0004ZG-A	TMP3	0.32 g

Unit: mm

The drawing shows the MP-3A package with the following dimensions:

- Top View:**
 - Overall width: 6.6
 - Width of the central body: 5.3 ± 0.2
 - Width of the base: 2.3 ± 0.2
 - Distance from the left edge of the base to the center of the package: 0.76 ± 0.2
 - Distance from the center of the package to the right edge of the base: 0.76
- Side View:**
 - Overall height: 10.4 Max
 - Height of the central body: 6.1 ± 0.2
 - Height of the base: 2.5 Min
 - Height of the top flange: 1 ± 0.2
 - Radius of the top flange: 1 Max
- Bottom View:**
 - Overall width: 2.3
 - Width of the base: 1

Package Name: DPAK(L)-(3)

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
DPAK(L)-(3)	-	PRSS0004ZD-D	DPAK(L)-(3)	0.36 g	

The drawing illustrates the mechanical specifications of the DPAK(L)-(3) package. It includes three views: a top view, a side view, and a cross-sectional view.

Top View Dimensions:

- Overall width: 6.5 ± 0.5
- Width of the central body: 5.4 ± 0.5
- Width of the lead spacing: 1.15 ± 0.1
- Lead width (each): 0.8 ± 0.1 , 0.6 ± 0.1 , and 0.6 ± 0.1
- Lead pitch (between leads): 0.55 ± 0.1
- Lead length (each): 2.29

Side View Dimensions:

- Overall height: 8.2 ± 0.6
- Height of the central body: 6.9 ± 0.5
- Height of the lead mounting area: 5.5 ± 0.5
- Lead height (each): 4.7 ± 0.5
- Lead thickness: 0.13
- Lead length (each): 16.2 ± 0.5

Cross-sectional View Dimensions:

- Lead thickness: 0.55 ± 0.1
- Lead width: 2.3 ± 0.2
- Lead height: 0.55 ± 0.1
- Lead length: 1.2 ± 0.3

Ordering Information

Orderable Part Number	Package	Packing ^{Note4}	Quantity	Remark	I _{GT} ^{Note3}
CR5AS-12A-T13#B01	MP-3A	Embossed tape	3000 pcs.		1-100 μ A
CR5AS-12A-T13#C04	MP-3A	Embossed tape	3000 pcs.		20-50 μ A
CR5AS-12A-T13#C05	MP-3A	Embossed tape	3000 pcs.		20-100 μ A
CR5AS-12A#B01	MP-3A	Tube	75 pcs.	Tube packing is to be abolished.	1-100 μ A
CR5AS-12A#C04	MP-3A	Tube	75 pcs.	Tube packing is to be abolished.	20-50 μ A
CR5AS-12A#C05	MP-3A	Tube	75 pcs.	Tube packing is to be abolished.	20-100 μ A
CR5AS-12A-A1#B00	DPAK(L)-(3)	Tube	80 pcs.		1-100 μ A
CR5AS-12A-BA1#B00	DPAK(L)-(3)	Tube	80 pcs.		20-50 μ A
CR5AS-12A-EA1#B00	DPAK(L)-(3)	Tube	80 pcs.		20-100 μ A

Note: 4. Please confirm the specification about the shipping in detail.

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