

# CR05AM-12

## Thyristor

Low Power Use

REJ03G0353-0100

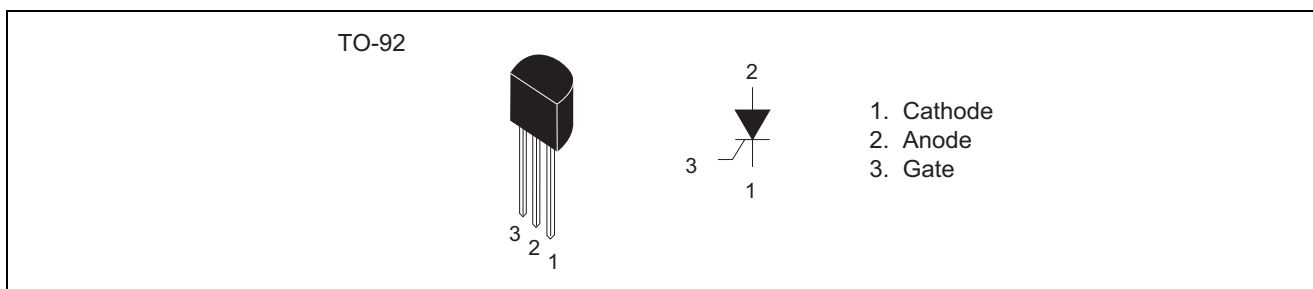
Rev.1.00

Aug.20.2004

### 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    |

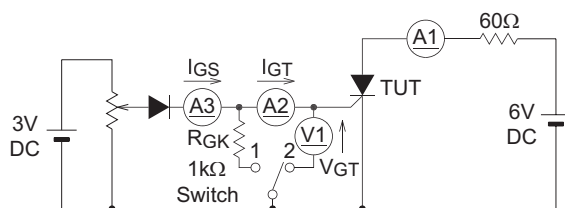
| Parameter                      | Symbol      | Ratings      | Unit                 | Conditions                                                                     |
|--------------------------------|-------------|--------------|----------------------|--------------------------------------------------------------------------------|
| 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         | $I_{TSM}$   | 10           | A                    | 60Hz sine half wave 1 full cycle, peak value, non-repetitive                   |
| $I^2t$ for fusing              | $I^2t$      | 0.4          | $\text{A}^2\text{s}$ | 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

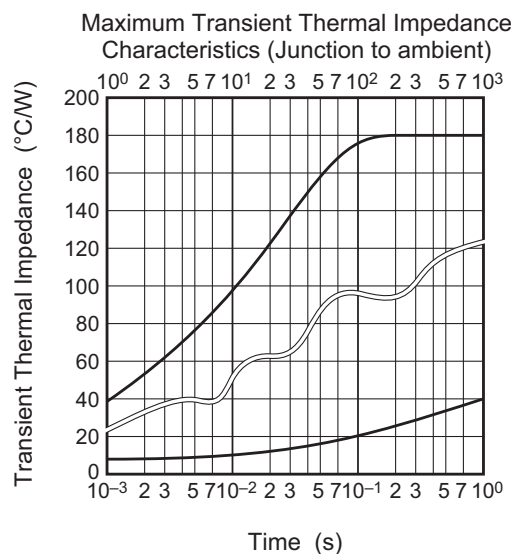
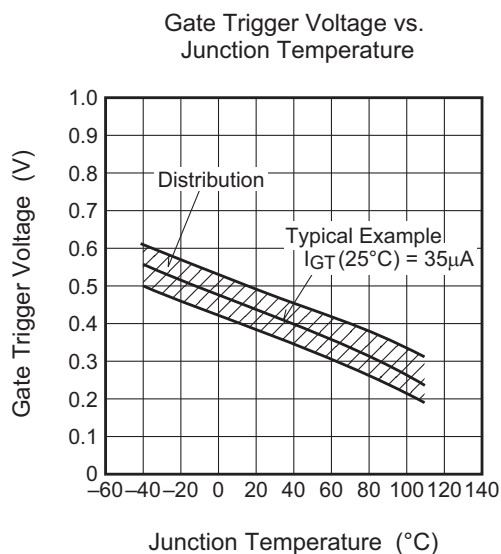
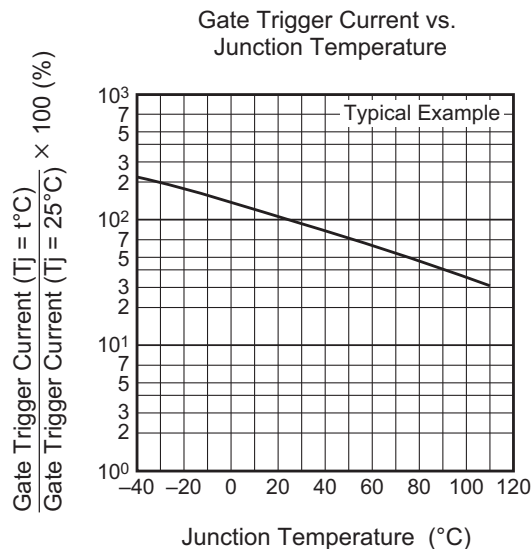
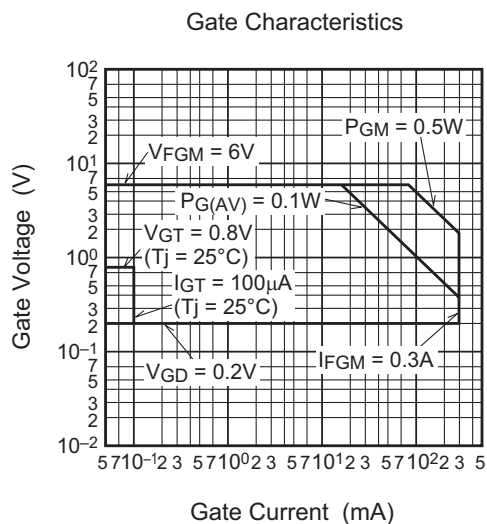
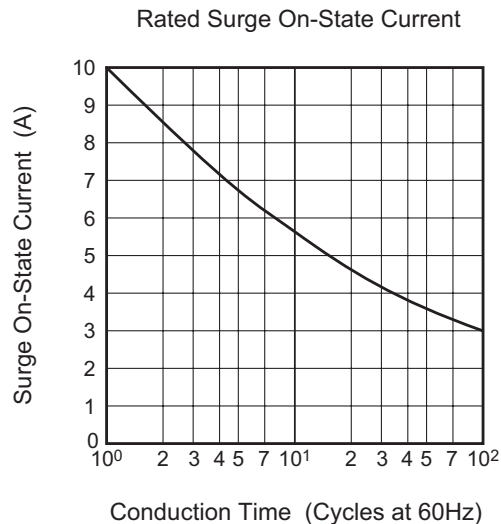
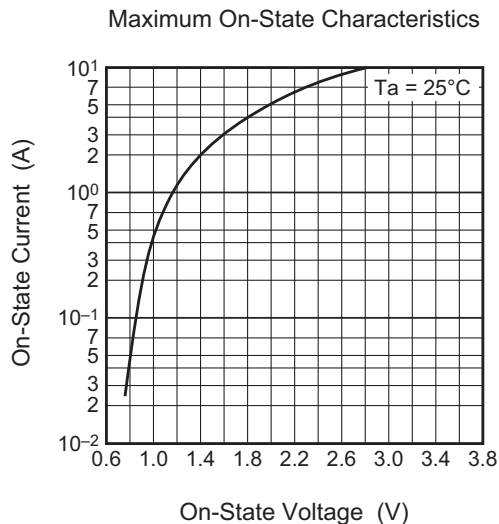
| Parameter                         | Symbol        | Min. | Typ. | Max. | Unit               | Test conditions                                                                       |
|-----------------------------------|---------------|------|------|------|--------------------|---------------------------------------------------------------------------------------|
| 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>Note2</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  | $\mu\text{A}$      | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $I_T = 0.1\text{ A}$ <sup>Note2</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                                                                   |

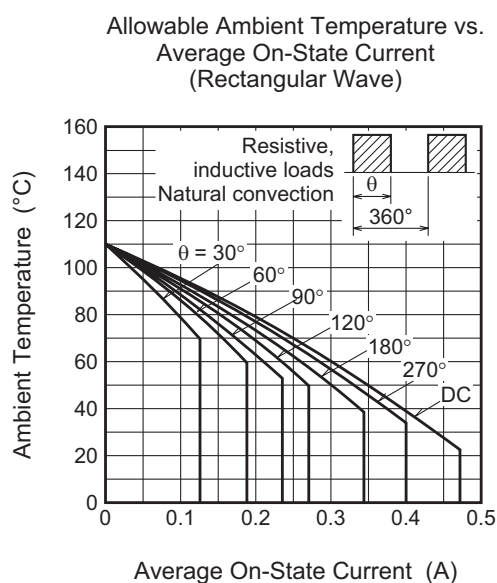
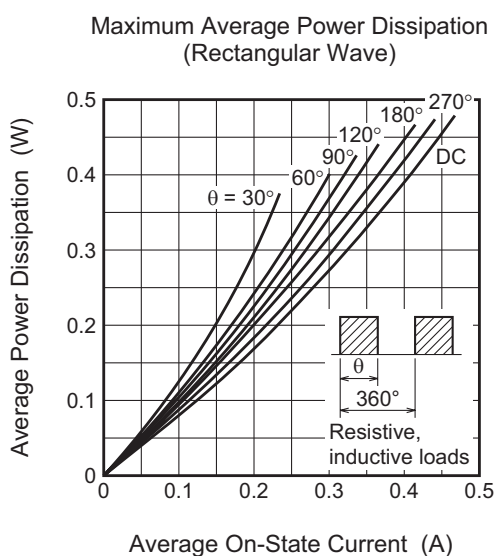
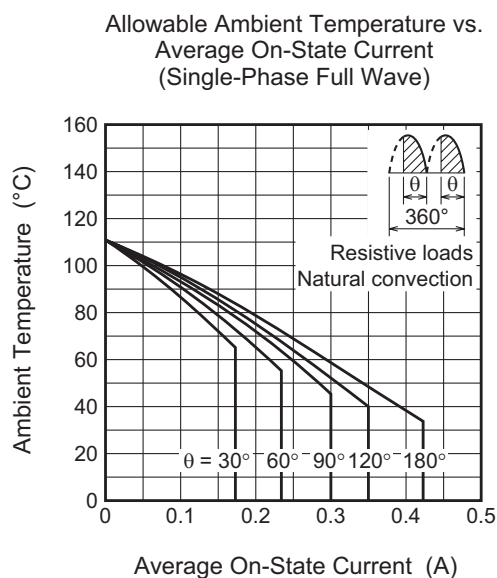
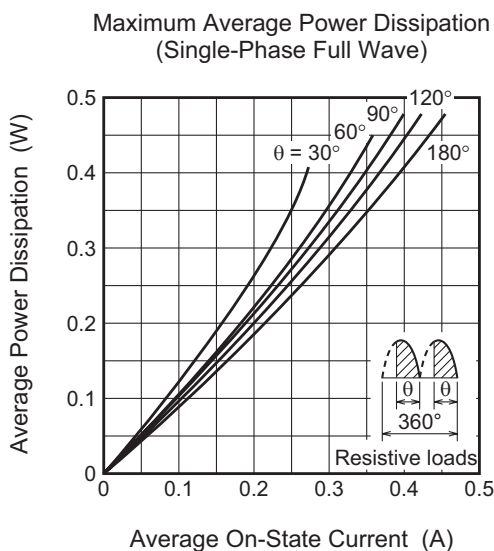
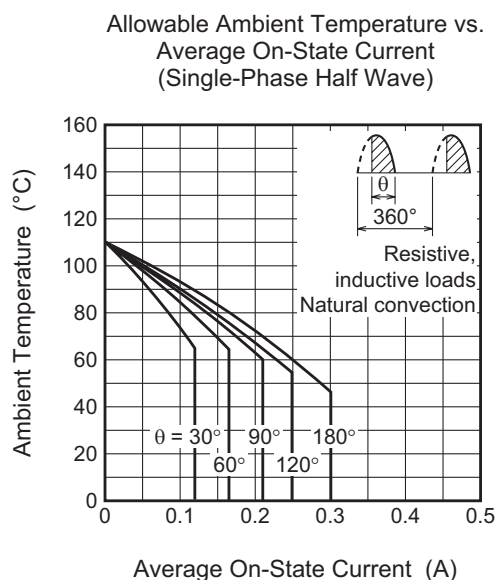
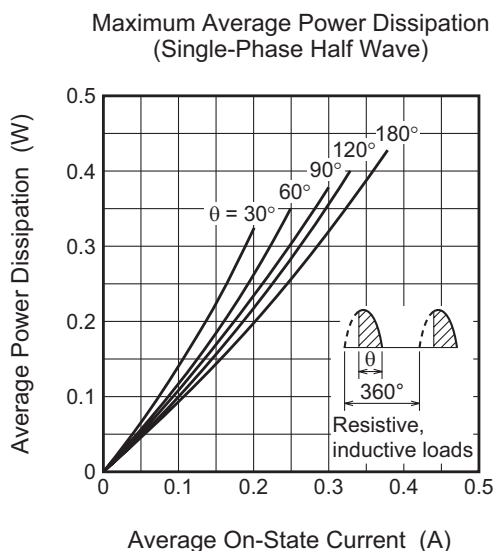
Notes: 2.  $I_{GT}$ ,  $V_{GT}$  measurement circuit.

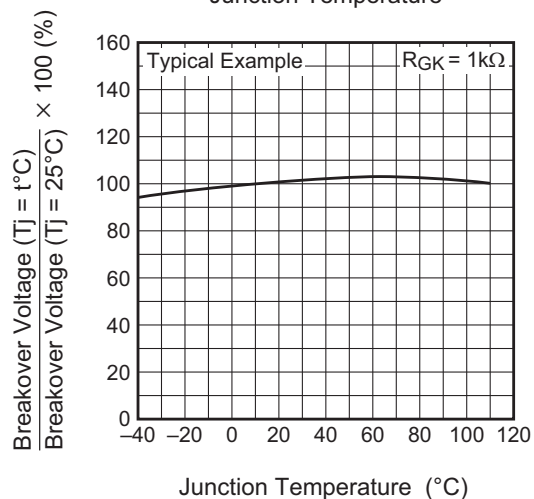
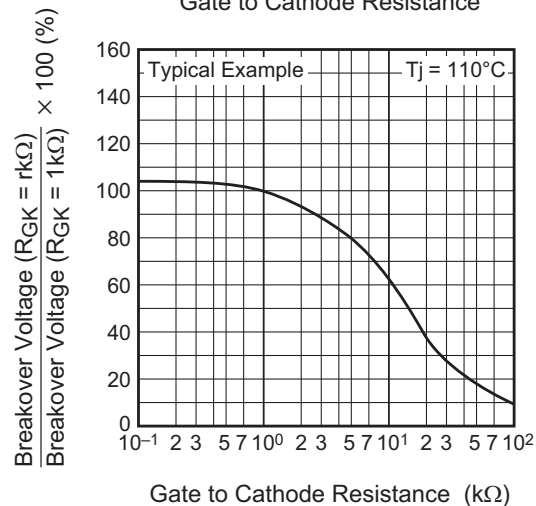
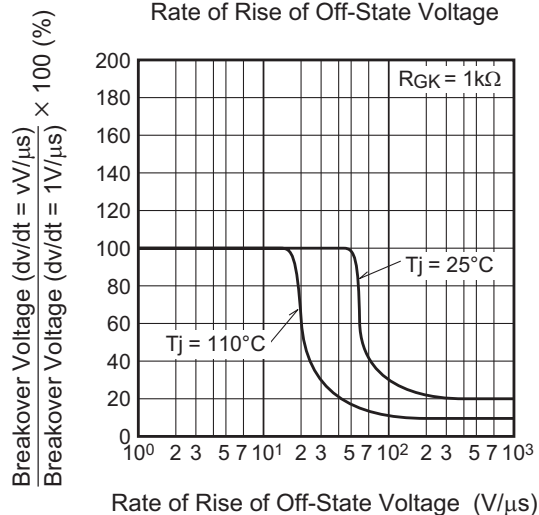
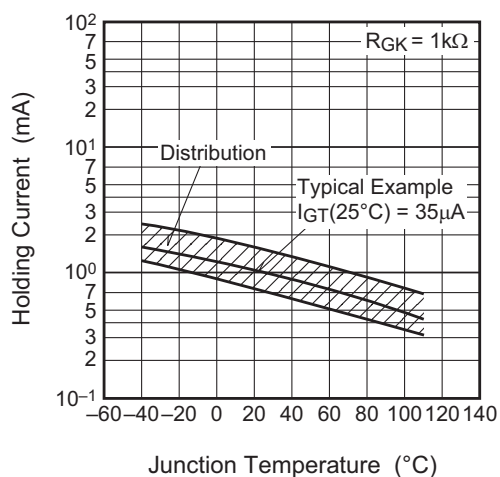
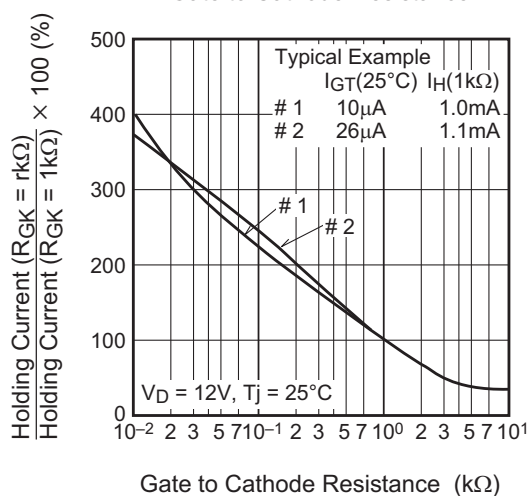
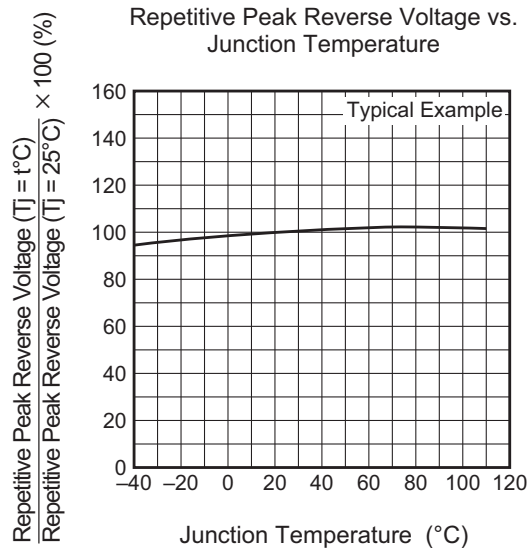


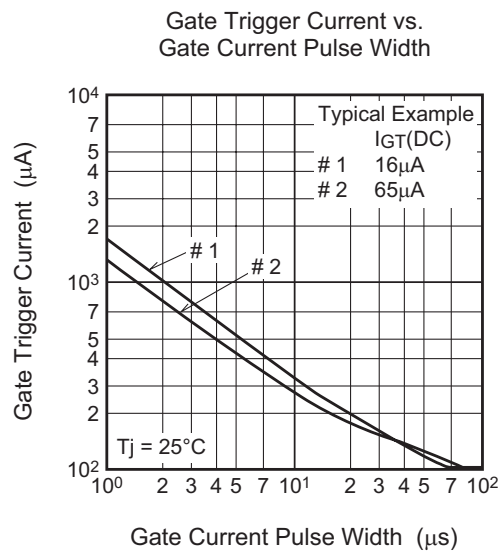
Switch 1 :  $I_{GT}$  measurement  
 Switch 2 :  $V_{GT}$  measurement  
 (Inner resistance of voltage meter is about  $1\text{ k}\Omega$ )

## Performance Curves





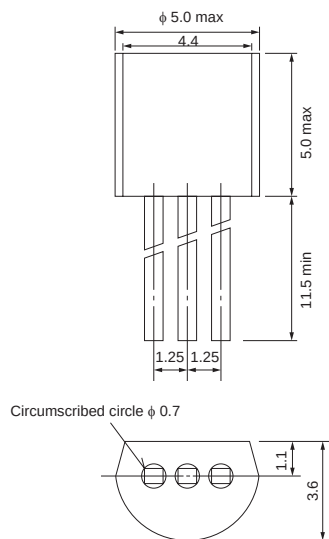
Breakover Voltage vs.  
Junction TemperatureBreakover Voltage vs.  
Gate to Cathode ResistanceBreakover Voltage vs.  
Rate of Rise of Off-State VoltageHolding Current vs.  
Junction TemperatureHolding Current vs.  
Gate to Cathode ResistanceRepetitive Peak Reverse Voltage vs.  
Junction Temperature



## Package Dimensions

### TO-92

| EIAJ Package Code | JEDEC Code | Mass (g) (reference value) | Lead Material |
|-------------------|------------|----------------------------|---------------|
| Conforms          | Conforms   | 0.23                       | Cu alloy      |



Note 1) The dimensional figures indicate representative values unless otherwise the tolerance is specified.



| Symbol         | Dimension in Millimeters |     |     |
|----------------|--------------------------|-----|-----|
|                | Min                      | Typ | Max |
| A              | —                        | —   | —   |
| A <sub>1</sub> | —                        | —   | —   |
| A <sub>2</sub> | —                        | —   | —   |
| b              | —                        | —   | —   |
| D              | —                        | —   | —   |
| E              | —                        | —   | —   |
| e              | —                        | —   | —   |
| x              | —                        | —   | —   |
| y              | —                        | —   | —   |
| y <sub>1</sub> | —                        | —   | —   |
| ZD             | —                        | —   | —   |
| ZE             | —                        | —   | —   |

## Order Code

| Lead form     | Standard packing | Quantity | Standard order code           | Standard order code example |
|---------------|------------------|----------|-------------------------------|-----------------------------|
| Straight type | Vinyl sack       | 500      | Type name                     | CR05AM-12                   |
| Lead form     | Vinyl sack       | 500      | Type name – Lead forming code | CR05AM-12-A6                |
| Form A8       | Taping           | 2000     | Type name – TB                | CR05AM-12-TB                |

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

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