

## General Description

The 2610 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

## Features

- Low On-Resistance
- 100% Avalanche Tested
- RoHS Compliant

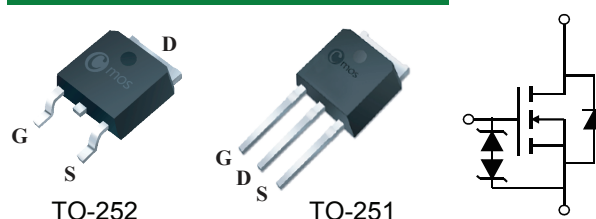
## Product Summary

| BVDSS | RDSON | ID  |
|-------|-------|-----|
| 60V   | 9.5mΩ | 50A |

## Applications

- load switching
- Power switching application

## TO-252/251 Pin Configuration



| Type    | Package | Marking |
|---------|---------|---------|
| CMD2610 | TO-252  | CMD2610 |
| CMU2610 | TO-251  | CMU2610 |

## Absolute Maximum Ratings

| Symbol                                | Parameter                            | Rating     | Units |
|---------------------------------------|--------------------------------------|------------|-------|
| V <sub>DS</sub>                       | Drain-Source Voltage                 | 60         | V     |
| V <sub>GS</sub>                       | Gate-Source Voltage                  | ±20        | V     |
| I <sub>D</sub> @T <sub>C</sub> =25°C  | Continuous Drain Current             | 50         | A     |
| I <sub>D</sub> @T <sub>C</sub> =100°C | Continuous Drain Current             | 36         | A     |
| I <sub>DM</sub>                       | Pulsed Drain Current                 | 150        | A     |
| EAS                                   | Single Pulse Avalanche Energy        | 150        | mJ    |
| P <sub>D</sub> @T <sub>C</sub> =25°C  | Total Power Dissipation              | 60         | W     |
| T <sub>STG</sub>                      | Storage Temperature Range            | -55 to 150 | °C    |
| T <sub>J</sub>                        | Operating Junction Temperature Range | -55 to 150 | °C    |

## Thermal Data

| Symbol           | Parameter                           | Typ. | Max. | Unit |
|------------------|-------------------------------------|------|------|------|
| R <sub>θJA</sub> | Thermal Resistance Junction-ambient | ---  | 50   | °C/W |
| R <sub>θJC</sub> | Thermal Resistance Junction -Case   | ---  | 2.1  | °C/W |

## Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

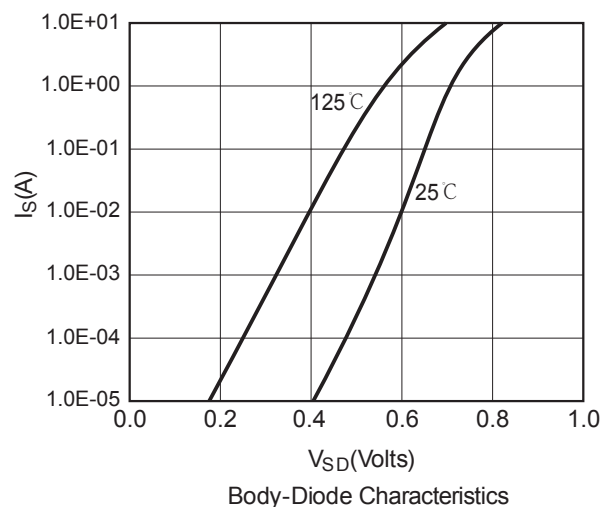
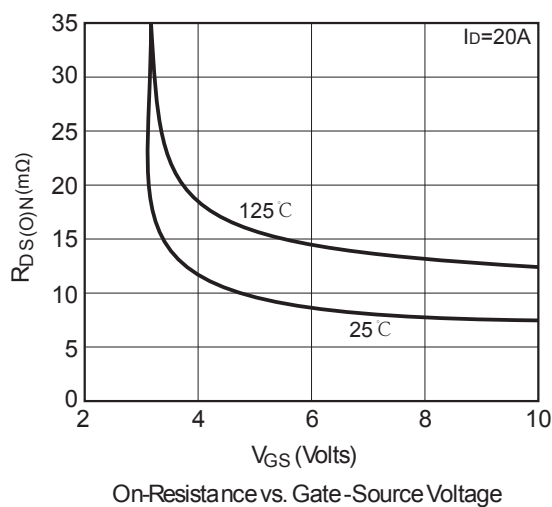
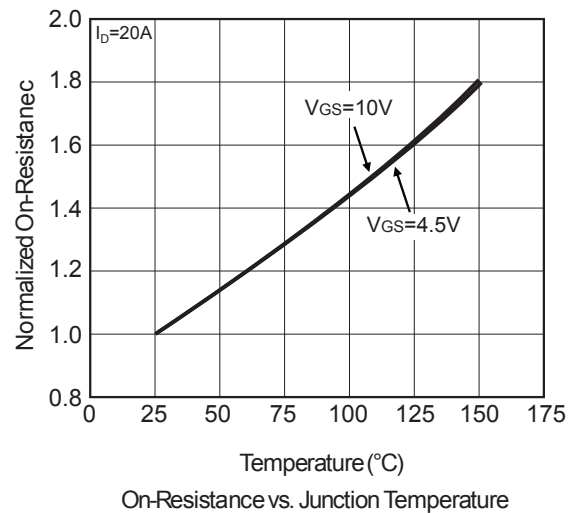
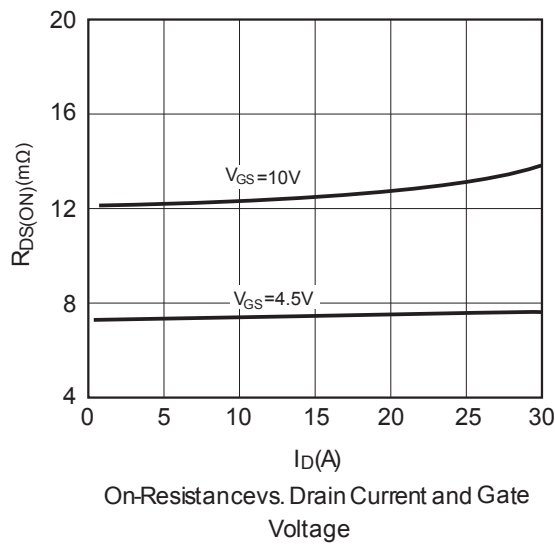
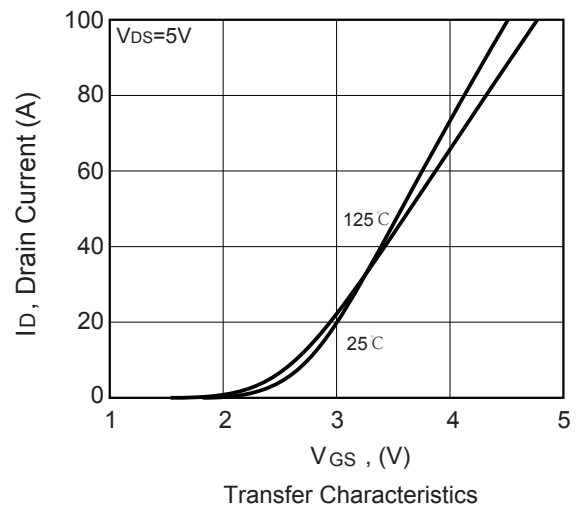
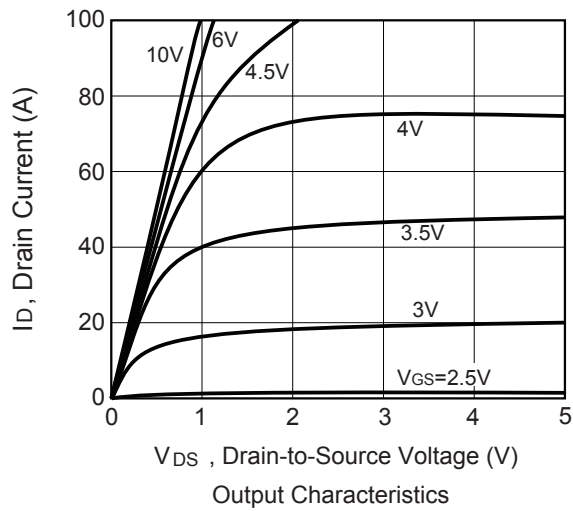
| Symbol       | Parameter                         | Conditions                                                         | Min. | Typ. | Max.     | Unit       |
|--------------|-----------------------------------|--------------------------------------------------------------------|------|------|----------|------------|
| $BV_{DS}$    | Drain-Source Breakdown Voltage    | $V_{GS}=0V$ , $I_D=250mA$                                          | 60   | ---  | ---      | V          |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V$ , $I_D=20A$                                           | ---  | ---  | 9.5      | m $\Omega$ |
|              |                                   | $V_{GS}=4.5V$ , $I_D=20A$                                          | ---  | ---  | 16       | m $\Omega$ |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}$ , $I_D = 250\mu A$                                 | 1    | ---  | 3        | V          |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=60V$ , $V_{GS}=0V$ , $T_J=25^{\circ}\text{C}$              | ---  | ---  | 1        | $\mu A$    |
|              |                                   | $V_{DS}=60V$ , $V_{GS}=0V$ , $T_J=55^{\circ}\text{C}$              | ---  | ---  | 5        |            |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS} = \pm 20V$ , $V_{DS}=0V$                                   | ---  | ---  | $\pm 10$ | $\mu A$    |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=10V$ , $I_D=30A$                                           | ---  | 25   | ---      | C          |
| $Q_g$        | Total Gate Charge                 | $V_{DS}=30V$ , $I_D=20A$<br>$V_{GS}=10V$                           | ---  | 15   | ---      | nC         |
| $Q_{gs}$     | Gate-Source Charge                |                                                                    | ---  | 2.5  | ---      |            |
| $Q_{gd}$     | Gate-Drain Charge                 |                                                                    | ---  | 3.5  | ---      |            |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DS}=30V$ , $V_{GS}=10V$ , $R_L=1.5\Omega$<br>$R_{GEN}=3\Omega$ | ---  | 6.5  | ---      | ns         |
| $T_r$        | Rise Time                         |                                                                    | ---  | 4    | ---      |            |
| $T_{d(off)}$ | Turn-Off Delay Time               |                                                                    | ---  | 22   | ---      |            |
| $T_f$        | Fall Time                         |                                                                    | ---  | 3    | ---      |            |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=30V$ , $V_{GS}=0V$ , $f=1MHz$                              | ---  | 1200 | ---      | pF         |
| $C_{oss}$    | Output Capacitance                |                                                                    | ---  | 300  | ---      |            |
| $C_{rss}$    | Reverse Transfer Capacitance      |                                                                    | ---  | 30   | ---      |            |

## Diode Characteristics

| Symbol   | Parameter                 | Conditions                                         | Min. | Typ. | Max. | Unit |
|----------|---------------------------|----------------------------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V$ , Force Current                       | ---  | ---  | 50   | A    |
| $I_{SM}$ | Pulsed Source Current     |                                                    | ---  | ---  | 150  | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V$ , $I_F=20A$ , $T_J=25^{\circ}\text{C}$ | ---  | ---  | 1    | V    |

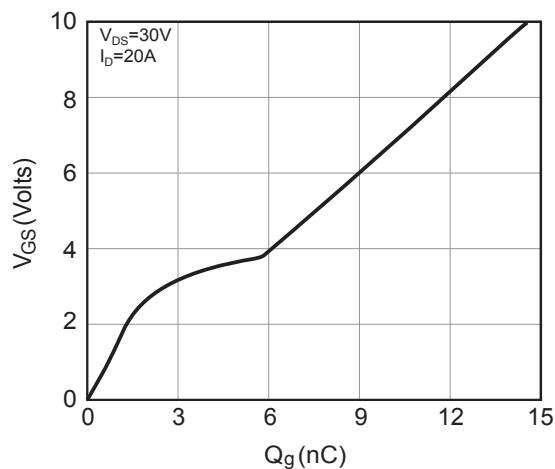
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Cmos reserves the right to improve product design ,functions and reliability without notice.

### Typical Characteristics

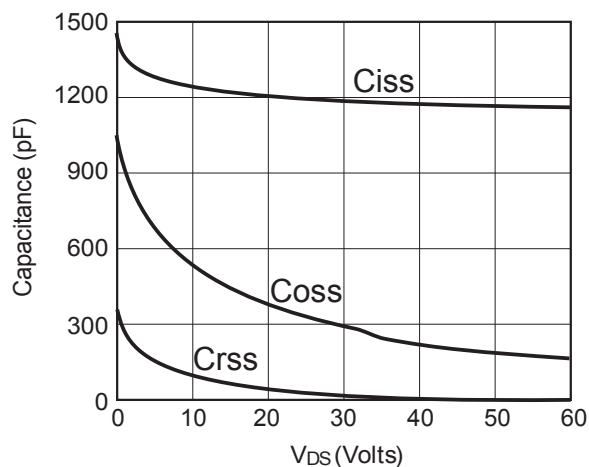


## Typical Characteristics

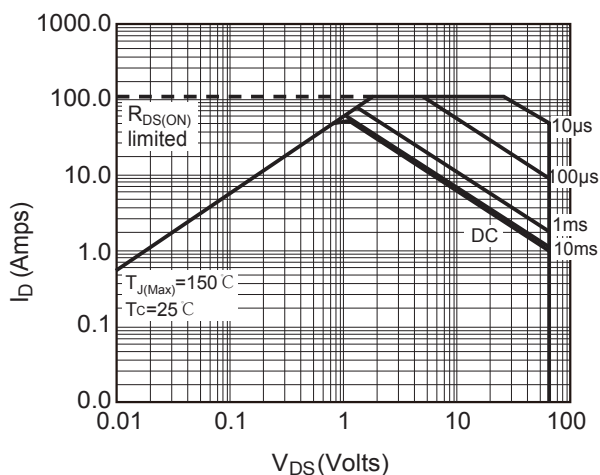
60V N-Channel MOSFET



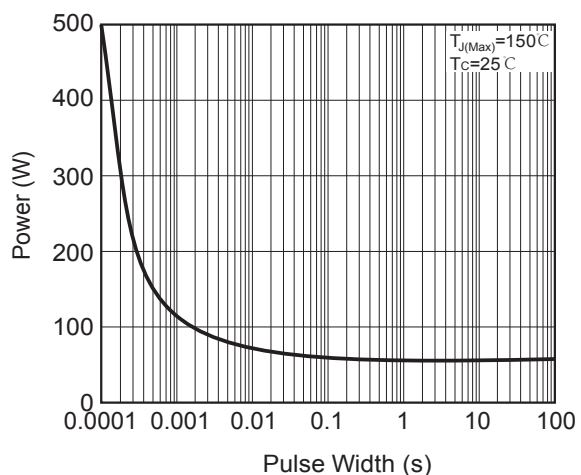
Gate-Charge Characteristics



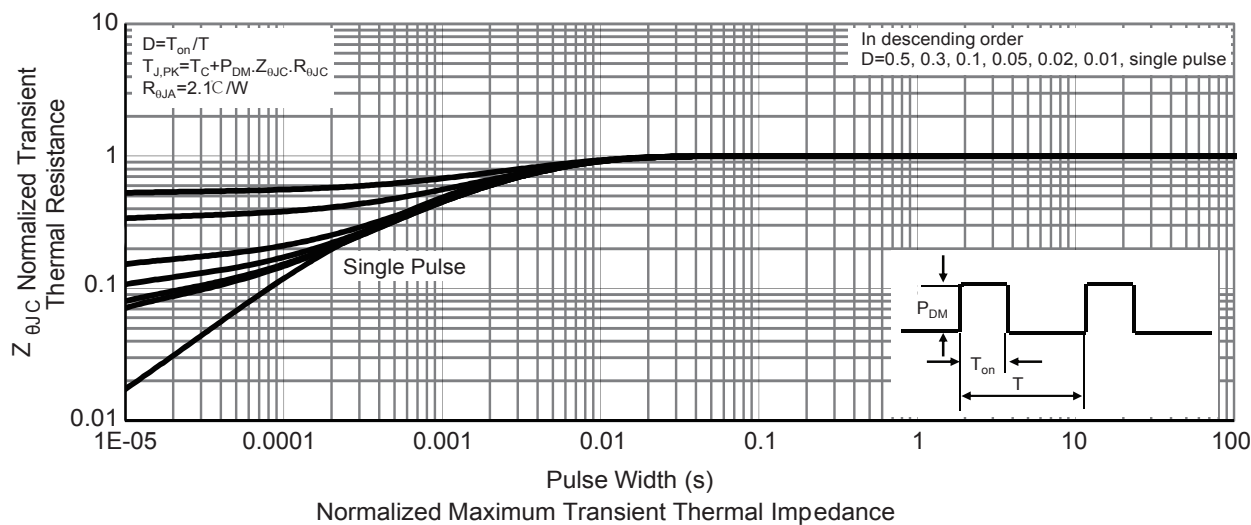
Capacitance Characteristics



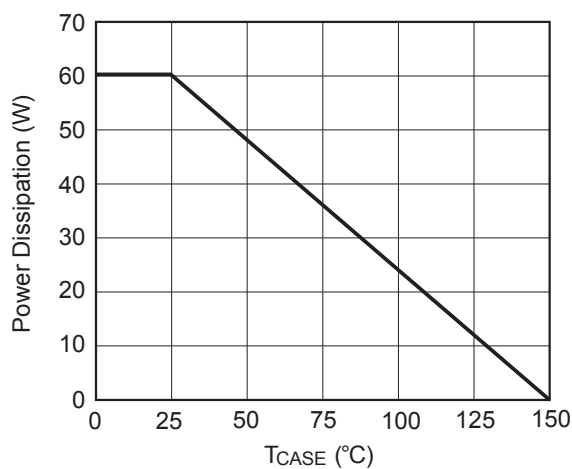
Maximum Forward Biased  
Safe Operating Area



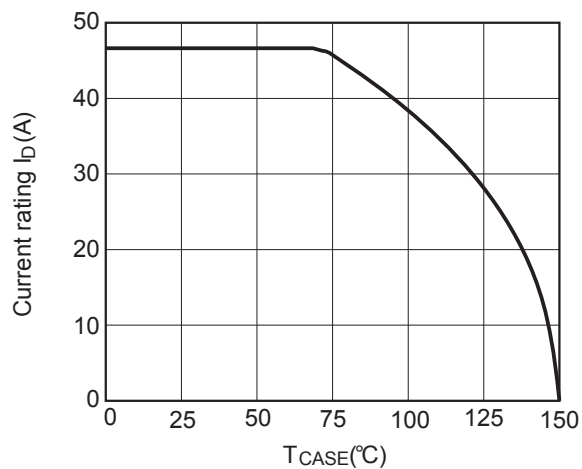
Single Pulse Power Rating Junction-to-Case



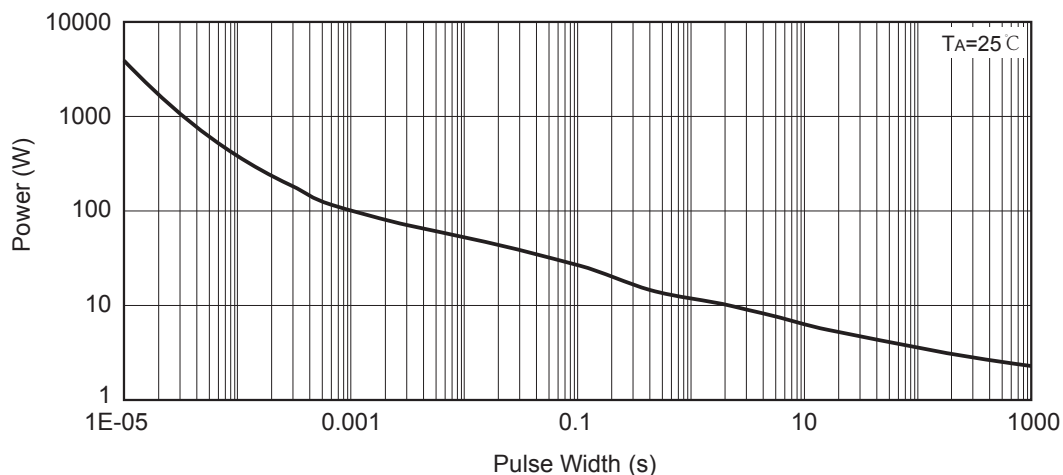
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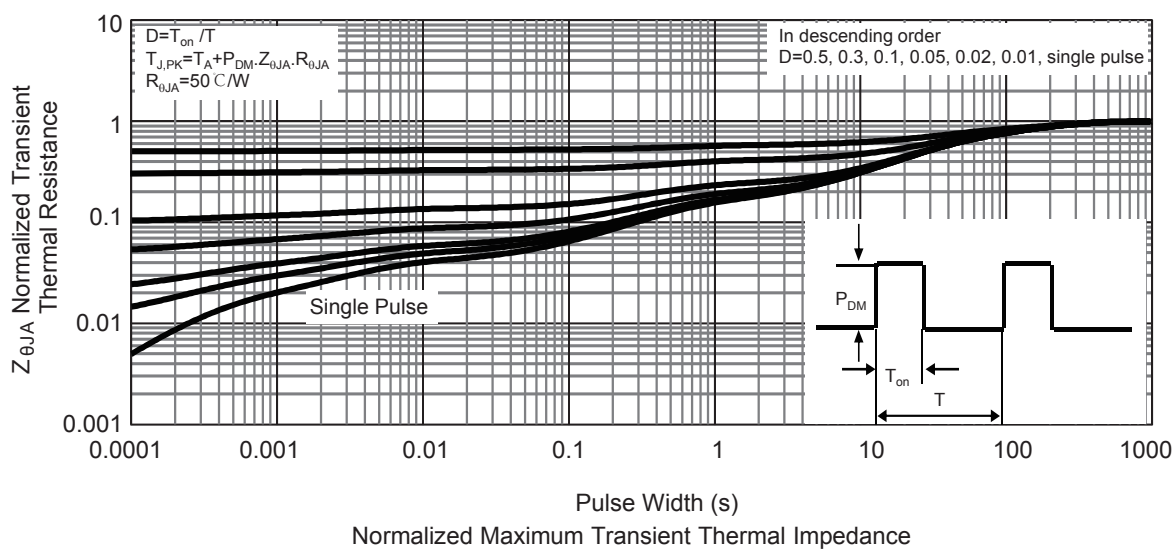
Power De-rating



Current De-rating

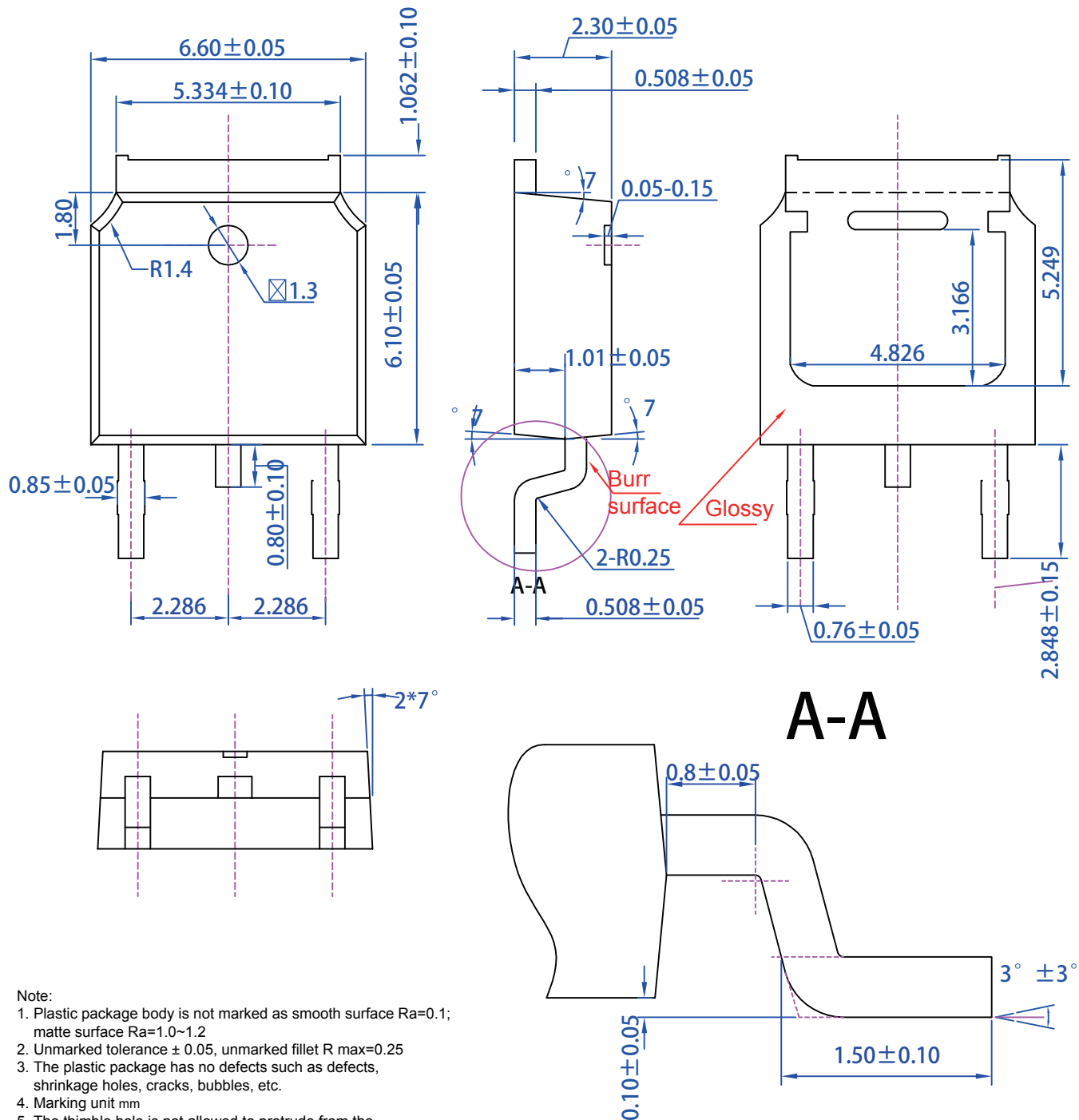


Single Pulse Power Rating Junction-to-Ambient



Package Dimensions

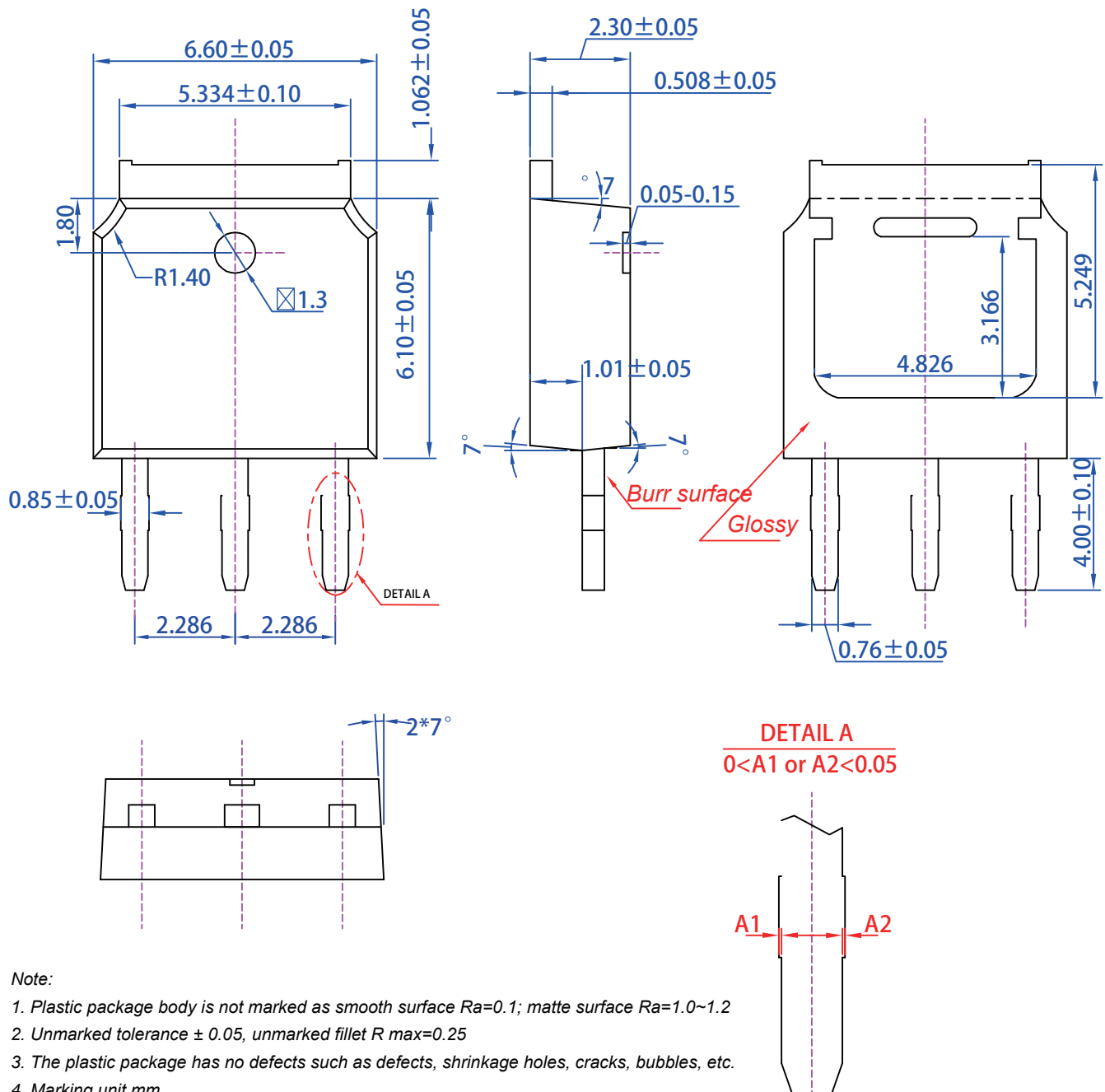
TO-252 Package Outline Drawing



Note:

1. Plastic package body is not marked as smooth surface  $Ra=0.1$ ; matte surface  $Ra=1.0-1.2$
2. Unmarked tolerance  $\pm 0.05$ , unmarked fillet  $R \max=0.25$
3. The plastic package has no defects such as defects, shrinkage holes, cracks, bubbles, etc.
4. Marking unit mm
5. The thimble hole is not allowed to protrude from the surface of the plastic package
6. Dislocation of upper and lower plastic package  $\leq 0.05$ ; plastic package center and lead center misalignment of wire frames  $\leq 0.05$

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