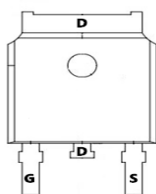


# TM100P03D

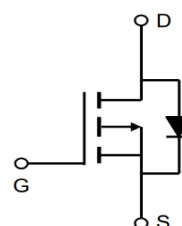
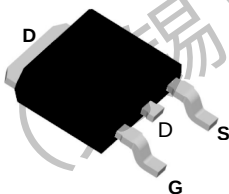
## P-Channel Enhancement Mosfet

|                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General Description</b> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <b>Applications</b> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul> | <b>General Features</b> <p><math>V_{DS} = -30V</math> <math>I_D = -100A</math></p> <p><math>R_{DS(ON)} = 3.6 m\Omega</math> (typ.) @ <math>V_{GS} = -10V</math></p> <p>100% UIS Tested<br/>100% <math>R_g</math> Tested</p>  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

D:TO-252-3L



Marking: 100P03



| Absolute Maximum Ratings (T <sub>C</sub> = 25°C Unless Otherwise Noted) |                                                              |            |       |      |
|-------------------------------------------------------------------------|--------------------------------------------------------------|------------|-------|------|
| Symbol                                                                  | Parameter                                                    | Rating     | Units |      |
| V <sub>DS</sub>                                                         | Drain-Source Voltage                                         | -30        | V     |      |
| V <sub>GS</sub>                                                         | Gate-Source Voltage                                          | ±20        | V     |      |
| I <sub>D</sub> @T <sub>C</sub> =25°C                                    | Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup> | -100       | A     |      |
| I <sub>D</sub> @T <sub>C</sub> =100°C                                   | Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup> | -67        | A     |      |
| I <sub>DM</sub>                                                         | Pulsed Drain Current <sup>2</sup>                            | -380       | A     |      |
| EAS                                                                     | Single Pulse Avalanche Energy <sup>3</sup>                   | 125        | mJ    |      |
| P <sub>D</sub> @T <sub>C</sub> =25°C                                    | Total Power Dissipation <sup>3</sup>                         | 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 <sup>1</sup>             | ---        | 62    | °C/W |
| R <sub>θJC</sub>                                                        | Thermal Resistance Junction-Case <sup>1</sup>                | ---        | 6.6   | °C/W |

**TM100P03D**
**P-Channel Enhancement Mosfet**
**Electrical Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)**

| Parameter                               |                    | Symbol        | Test Conditions                                           | Min. | Typ. | Max.      | Unit    |
|-----------------------------------------|--------------------|---------------|-----------------------------------------------------------|------|------|-----------|---------|
| Static Characteristics                  |                    |               |                                                           |      |      |           |         |
| Drain-Source Breakdown Voltage          |                    | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$                            | -30  | -    | -         | V       |
| Gate-body Leakage current               |                    | $I_{GSS}$     | $V_{DS} = 0V, V_{GS} = \pm 20V$                           | -    | -    | $\pm 100$ | nA      |
| Zero Gate Voltage Drain Current         | $T_J=25^{\circ}C$  | $I_{DSS}$     | $V_{DS} = -30V, V_{GS} = 0V$                              | -    | -    | -1        | $\mu A$ |
|                                         | $T_J=100^{\circ}C$ |               |                                                           | -    | -    | -100      |         |
| Gate-Threshold Voltage                  |                    | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\mu A$                        | -1.0 | -1.5 | -2.5      | V       |
| Drain-Source On-Resistance <sup>4</sup> |                    | $R_{DS(on)}$  | $V_{GS} = -10V, I_D = -30A$                               | -    | 3.6  | 5.4       | mΩ      |
|                                         |                    |               | $V_{GS} = -4.5V, I_D = -15A$                              | -    | 5.5  | 6.2       |         |
| Forward Transconductance <sup>4</sup>   |                    | $g_{fs}$      | $V_{DS} = -10V, I_D = -30A$                               | -    | 90   | -         | S       |
| Dynamic Characteristics <sup>5</sup>    |                    |               |                                                           |      |      |           |         |
| Input Capacitance                       |                    | $C_{iss}$     | $V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$                    | -    | 5270 | -         | pF      |
| Output Capacitance                      |                    | $C_{oss}$     |                                                           | -    | 695  | -         |         |
| Reverse Transfer Capacitance            |                    | $C_{rss}$     |                                                           | -    | 580  | -         |         |
| Gate resistance                         |                    | $R_g$         | $f = 1MHz$                                                | -    | 4    | -         | Ω       |
| Switching Characteristics <sup>5</sup>  |                    |               |                                                           |      |      |           |         |
| Total Gate Charge                       |                    | $Q_g$         | $V_{GS} = -10V, V_{DS} = -15V, I_D = -30A$                | -    | 146  | -         | nC      |
| Gate-Source Charge                      |                    | $Q_{gs}$      |                                                           | -    | 21.5 | -         |         |
| Gate-Drain Charge                       |                    | $Q_{gd}$      |                                                           | -    | 39   | -         |         |
| Turn-On Delay Time                      |                    | $t_{d(on)}$   | $V_{GS} = -10V, V_{DD} = -15V, R_G = 3\Omega, I_D = -30A$ | -    | 23   | -         | ns      |
| Rise Time                               |                    | $t_r$         |                                                           | -    | 15   | -         |         |
| Turn-Off Delay Time                     |                    | $t_{d(off)}$  |                                                           | -    | 129  | -         |         |
| Fall Time                               |                    | $t_f$         |                                                           | -    | 28   | -         |         |
| Drain-Source Body Diode Characteristics |                    |               |                                                           |      |      |           |         |
| Diode Forward Voltage <sup>4</sup>      |                    | $V_{SD}$      | $I_S = -30A, V_{GS} = 0V$                                 | -    | -    | -1.2      | V       |
| Continuous Source Current               | $T_C=25^{\circ}C$  | $I_S$         | -                                                         | -    | -    | -100      | A       |

Note :

1. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)} = 150^\circ\text{C}$
2. The EAS data shows Max. rating . The test condition is  $V_{DD} = -25V, V_{GS} = -10V, L = 0.1mH, I_{AS} = -50A$
3. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

## Typical Characteristics

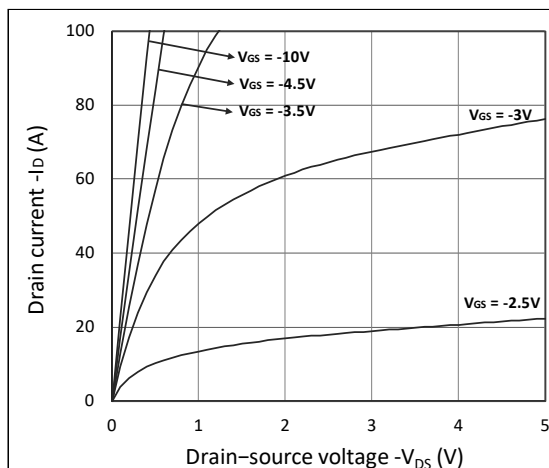


Figure 1. Output Characteristics

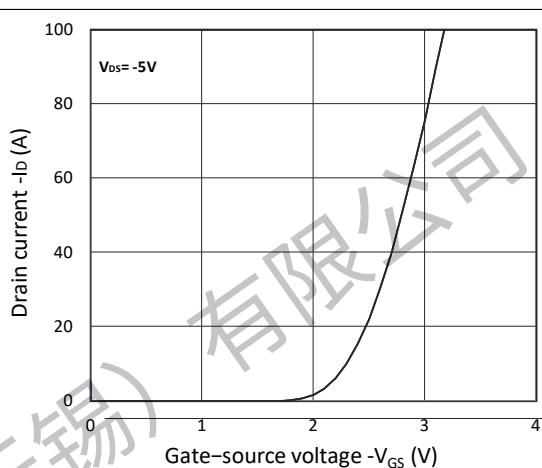


Figure 2. Transfer Characteristics

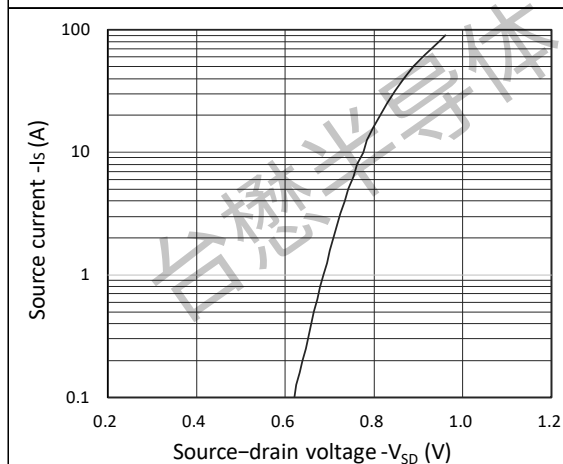


Figure 3. Forward Characteristics of Reverse

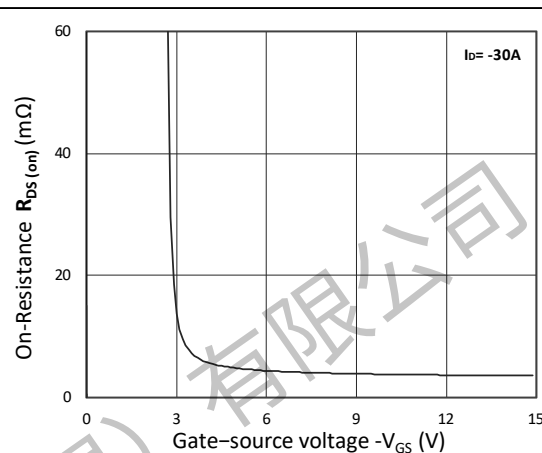


Figure 4.  $R_{DS(on)}$  vs.  $V_{GS}$

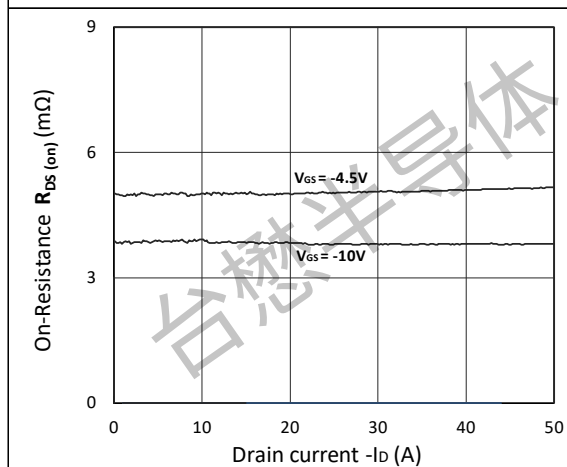


Figure 5.  $R_{DS(on)}$  vs.  $I_D$

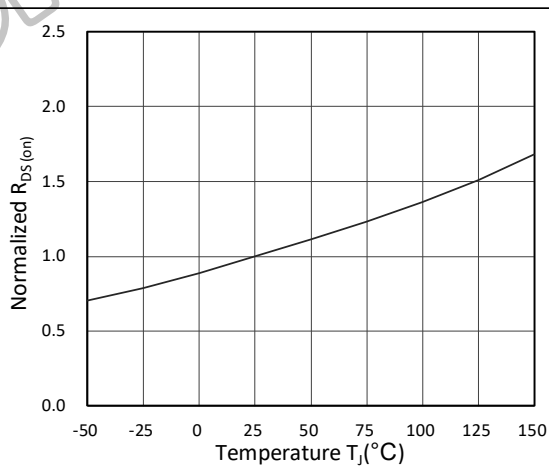


Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature



# TM100P03D

## P-Channel Enhancement Mosfet

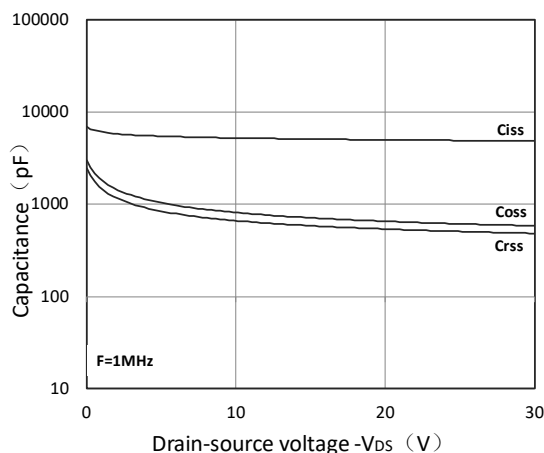


Figure 7. Capacitance Characteristics

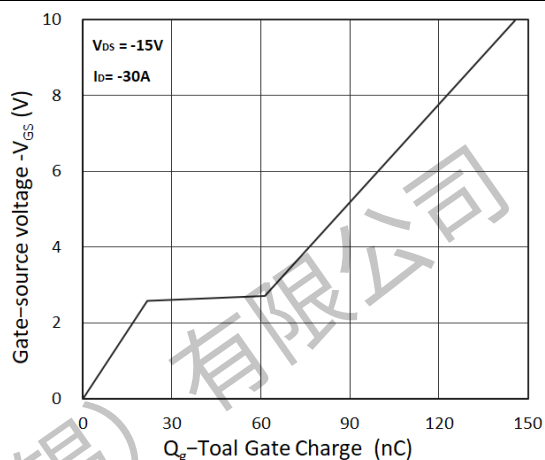


Figure 8. Gate Charge Characteristics

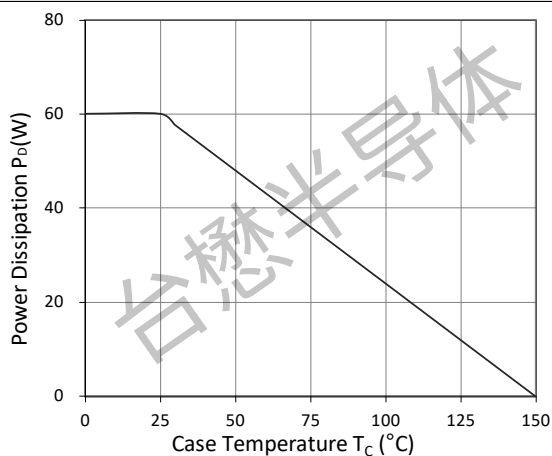


Figure 9. Power Dissipation

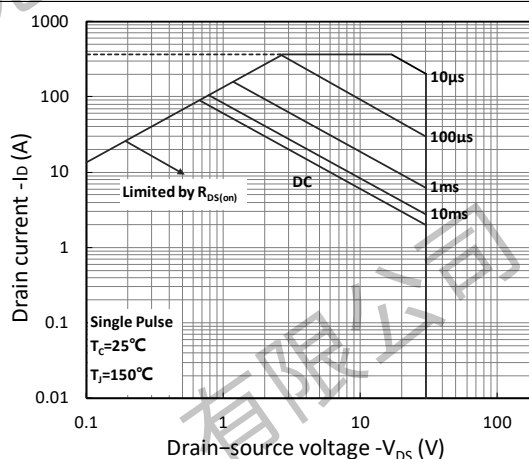


Figure 10. Safe Operating Area

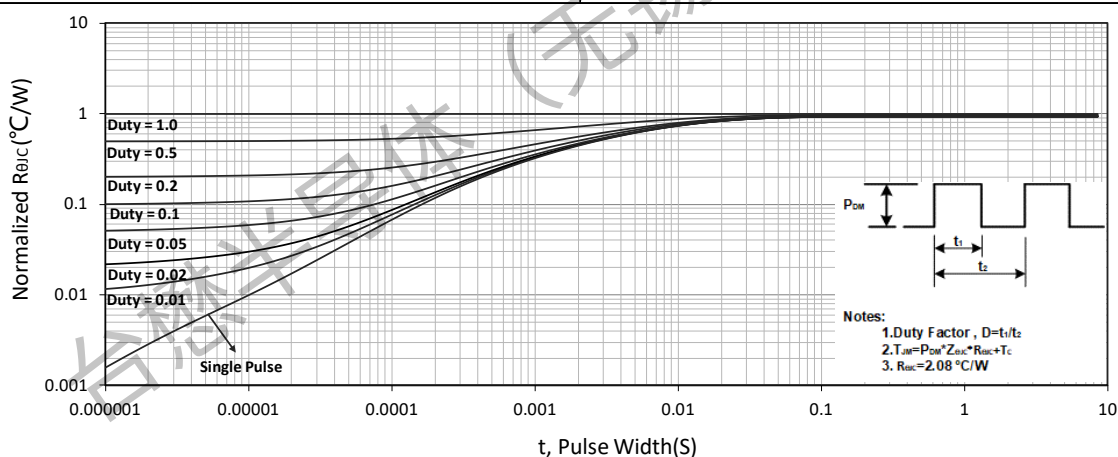


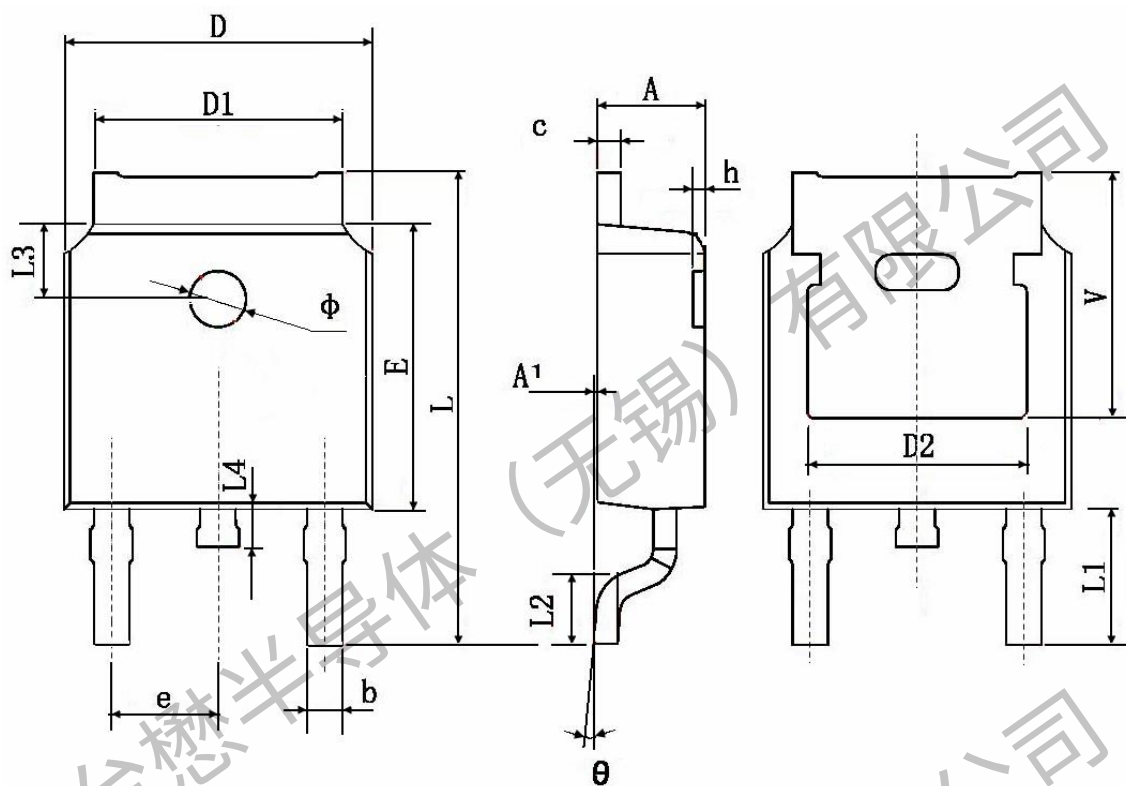
Figure 11. Normalized Maximum Transient Thermal Impedance



**TM100P03D**

## P-Channel Enhancement Mosfet

## Package Mechanical Data: TO-252-3L

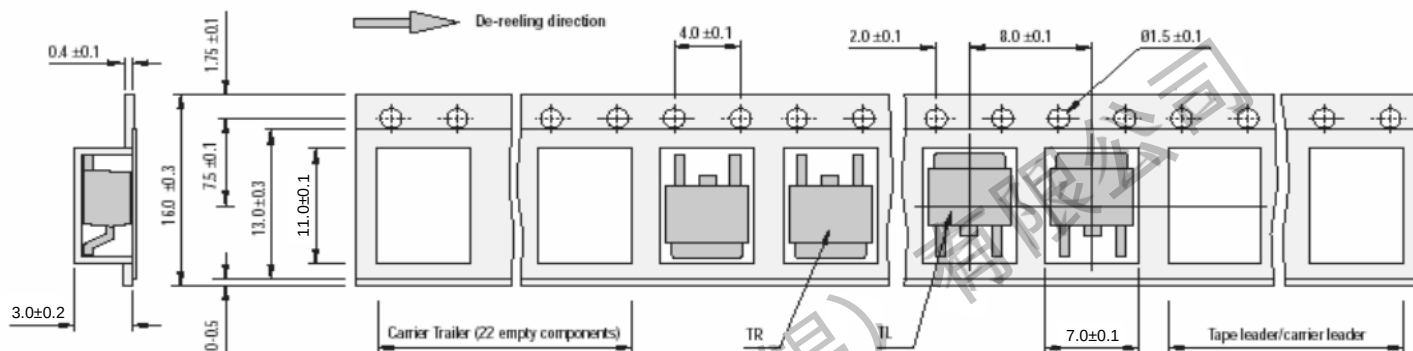


| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.400  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.127  | 0.000                | 0.005 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| c      | 0.460                     | 0.580  | 0.018                | 0.023 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.100                     | 5.460  | 0.201                | 0.215 |
| D2     | 4.830 TYP.                |        | 0.190 TYP.           |       |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.186                     | 2.386  | 0.086                | 0.094 |
| L      | 9.800                     | 10.400 | 0.386                | 0.409 |
| L1     | 2.900 TYP.                |        | 0.114 TYP.           |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| L3     | 1.600 TYP.                |        | 0.063 TYP.           |       |
| L4     | 0.600                     | 1.000  | 0.024                | 0.039 |
| Φ      | 1.100                     | 1.300  | 0.043                | 0.051 |
| θ      | 0°                        | 8°     | 0°                   | 8°    |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| V      | 5.350 TYP.                |        | 0.211 TYP.           |       |

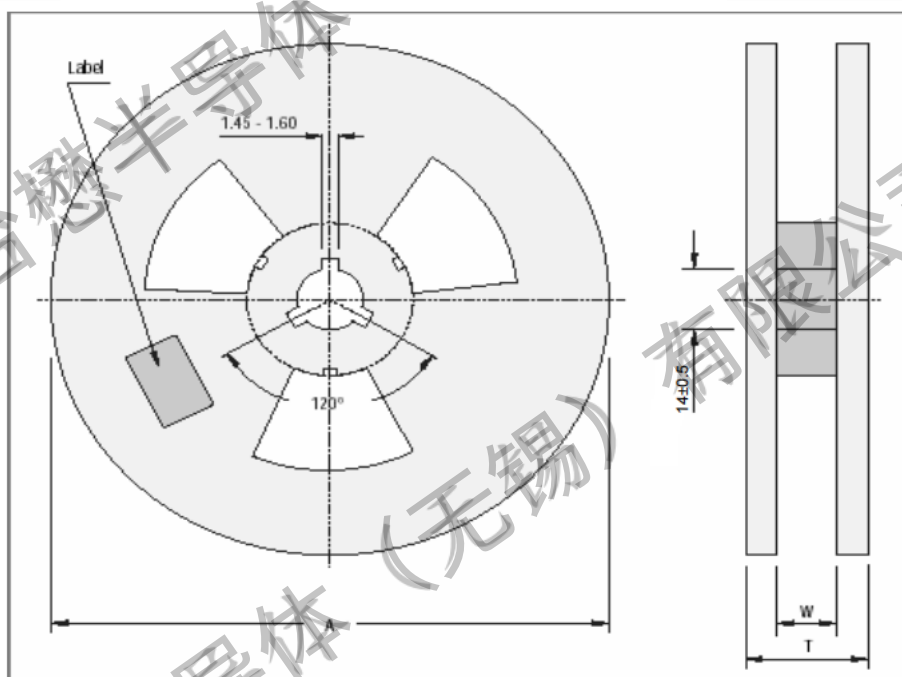
## TM100P03D

## P-Channel Enhancement Mosfet

### TO-252-3L Embossed Carrier Tape



### TO-252-3L Reel



All Dimensions are in mm.

| Reel Specifications |            |                   |                    |                        |
|---------------------|------------|-------------------|--------------------|------------------------|
| Package             | Tape Width | Reel Dia. A - Max | Inside Thickness W | Reel Thickness T - max |
| TO-252-3L           | 16         | 330               | $18.0 \pm 1.5$     | 20                     |

### Packaging Information

| REEL      | Reel Size | Box       | Box Size(mm) | Carton     | Carton Size(mm) | G.W.(kg) |
|-----------|-----------|-----------|--------------|------------|-----------------|----------|
| 2,500 pcs | 13 inch   | 5,000 pcs | 355×370×50   | 25,000 pcs | 380×275×380     |          |

### Important Notices and Disclaimers

- Tritech-MOS Technology Corp. reserves the right to change this document, its products, and specifications at any time without prior notice.
- Before final design, purchase, or use, customers should obtain and confirm the latest product information and specifications.
- Tritech-MOS Technology Corp. makes no warranties, representations or warranties regarding the suitability of its products for any specific purpose, and Tritech-MOS Technology Corp. does not assume any responsibility for application assistance or customer product design.
- Tritech-MOS Technology Corp. does not guarantee or assume any responsibility for the purchase or use of any unexpected or unauthorized products.
- Any intellectual property rights of Tritech-MOS Technology Corp. are not licensed through implicate or other means.
- Products of Tritech-MOS Technology Corp. are not included as critical components in life support equipment or systems without explicit written approval from Tritech-MOS Technology Corp.

Revision history:

| Date       | Rev   | Description | Page |
|------------|-------|-------------|------|
| 2023.04.15 | 23.04 | Original    |      |