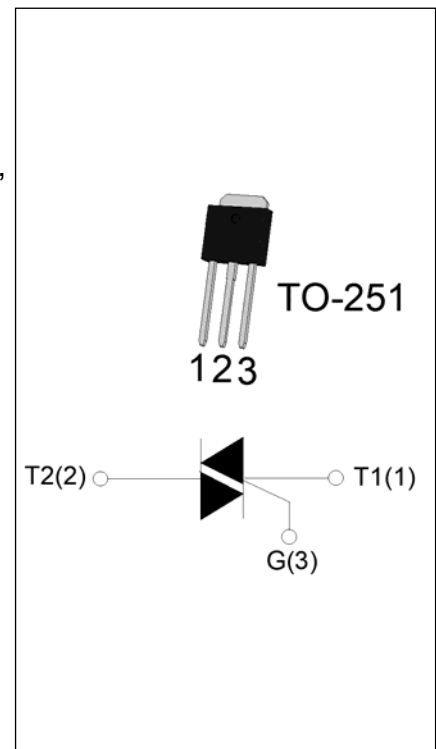


## T0650H-6H 6A TRIAC

Rev.A.1.1

### DESCRIPTION:

The T0650H-6H triac is suitable for general purpose AC switching. It can be used as an ON/OFF function in applications such as heating regulation, induction motor starting circuits, for phase control operation in light dimmers, motor speed controllers. Compared to traditional triacs, T0650H-6H provides a very high switching capability up to junction temperatures of 150°C. From T2 terminals to external heatsink. Package TO-251 is RoHS compliant.



### MAIN FEATURES

| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 6        | A    |
| $V_{DRM}/V_{RRM}$  | 600      | V    |
| $I_{GT\ I/II/III}$ | 50/50/50 | mA   |

### ABSOLUTE MAXIMUM RATINGS

| Parameter                                                                                                        | Symbol       | Value   | Unit                   |
|------------------------------------------------------------------------------------------------------------------|--------------|---------|------------------------|
| Storage junction temperature range                                                                               | $T_{stg}$    | -40-150 | °C                     |
| Operating junction temperature range                                                                             | $T_j$        | -40-150 | °C                     |
| Repetitive peak off-state voltage ( $T_j=25^\circ\text{C}$ )                                                     | $V_{DRM}$    | 600     | V                      |
| Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )                                                       | $V_{RRM}$    | 600     | V                      |
| RMS on-state current ( $T_c \leq 119^\circ\text{C}$ )                                                            | $I_{T(RMS)}$ | 6       | A                      |
| Non repetitive surge peak on-state current (full cycle , $t_p=20\text{ms}$ , $T_j=25^\circ\text{C}$ )            | $I_{TSM}$    | 60      | A                      |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6\text{ms}$ , $T_j=25^\circ\text{C}$ )          |              | 66      |                        |
| $I^2t$ value for fusing ( $t_p=10\text{ms}$ , $T_j=25^\circ\text{C}$ )                                           | $I^2t$       | 18      | $\text{A}^2\text{s}$   |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100\text{Hz}$ , $T_j=150^\circ\text{C}$ ) | $di/dt$      | 100     | $\text{A}/\mu\text{s}$ |
| Peak gate current ( $t_p=20\mu\text{s}$ , $T_j=150^\circ\text{C}$ )                                              | $I_{GM}$     | 4       | A                      |
| Average gate power dissipation ( $T_j=150^\circ\text{C}$ )                                                       | $P_{G(AV)}$  | 1       | W                      |
| Peak gate power                                                                                                  | $P_{GM}$     | 10      | W                      |

|                                                                                      |          |   |    |
|--------------------------------------------------------------------------------------|----------|---|----|
| Peak pulse voltage<br>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$ | 4 | kV |
|--------------------------------------------------------------------------------------|----------|---|----|

**ELECTRICAL CHARACTERISTICS** ( $T_j=25^{\circ}\text{C}$  unless otherwise specified)

| Symbol      | Test Condition                                                                     | Quadrant    | Value |      | Unit             |
|-------------|------------------------------------------------------------------------------------|-------------|-------|------|------------------|
| $I_{GT}$    | $V_D=12\text{V}$ $R_L=33\Omega$                                                    | I - II -III | MAX.  | 50   | mA               |
| $V_{GT}$    |                                                                                    | I - II -III | MAX.  | 1    | V                |
| $V_{GD}$    | $V_D=V_{DRM}$ $T_j=150^{\circ}\text{C}$<br>$R_L=3.3\text{k}\Omega$                 | I - II -III | MIN.  | 0.2  | V                |
| $I_L$       | $I_G=1.2I_{GT}$                                                                    | I -III      | MAX.  | 70   | mA               |
|             |                                                                                    | II          |       | 100  |                  |
| $I_H$       | $I_T=100\text{mA}$                                                                 |             | MAX.  | 50   | mA               |
| $dV/dt$     | $V_D=400\text{V}$ Gate Open $T_j=150^{\circ}\text{C}$                              |             | MIN.  | 1500 | V/ $\mu\text{s}$ |
| $(dI/dt)_c$ | $(dV/dt)_c=20\text{V}/\mu\text{s}$ , $T_j=150^{\circ}\text{C}$                     |             | MIN.  | 5    | A/ms             |
| $t_{on}$    | $I_G=80\text{mA}$ $I_A=400\text{mA}$ $I_R=40\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |             | TYP.  | 5    | $\mu\text{s}$    |
| $t_{off}$   |                                                                                    |             |       | 50   |                  |

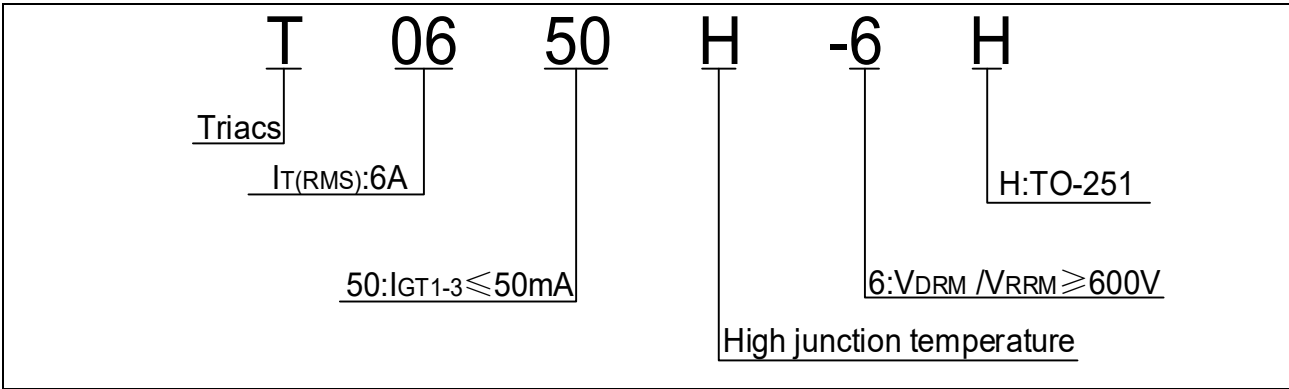
**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                 |                           | Value(MAX.) | Unit             |
|-----------|-------------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=8.5\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.4         | V                |
| $V_{TO}$  | Threshold voltage                         | $T_j=150^{\circ}\text{C}$ | 0.8         | V                |
| $R_D$     | Dynamic resistance                        | $T_j=150^{\circ}\text{C}$ | 63          | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$               | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                           | $T_j=150^{\circ}\text{C}$ | 0.8         | mA               |

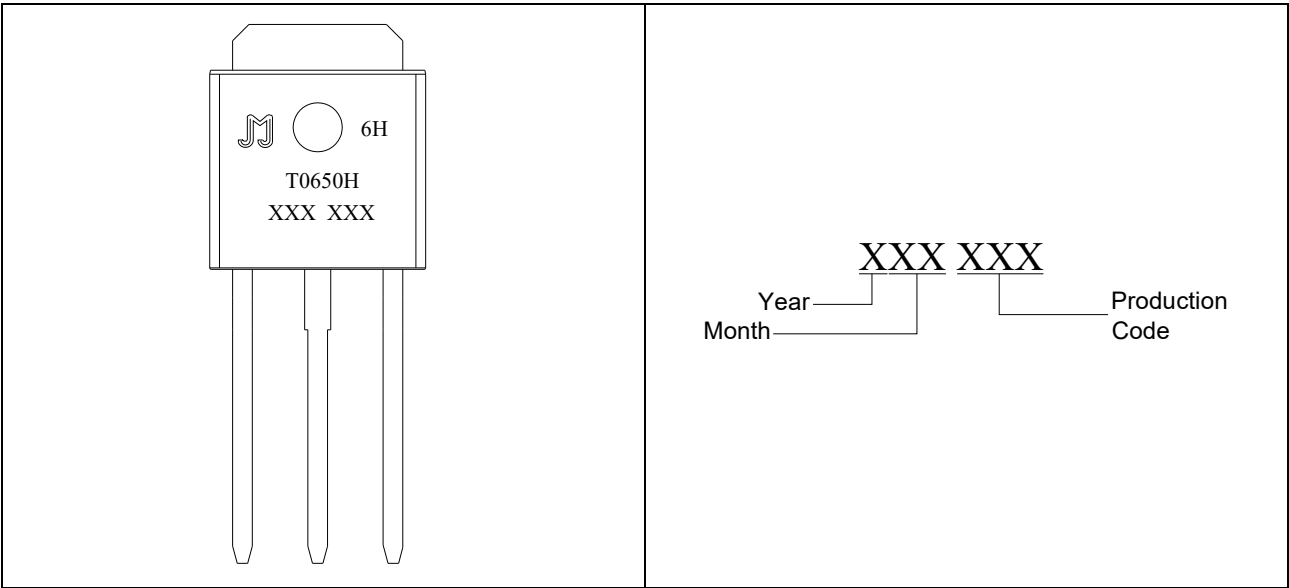
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit                        |
|---------------|--------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 4     | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 120   | $^{\circ}\text{C}/\text{W}$ |

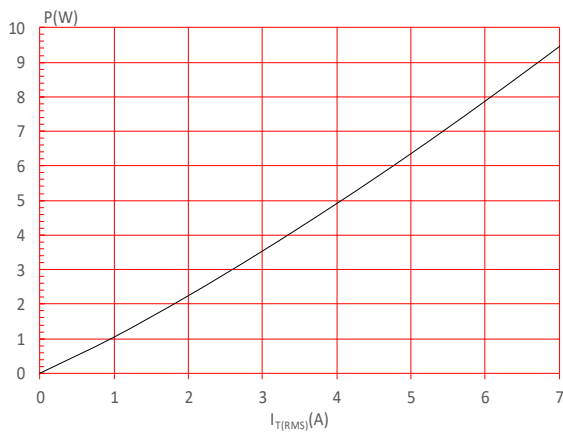
ORDERING INFORMATION



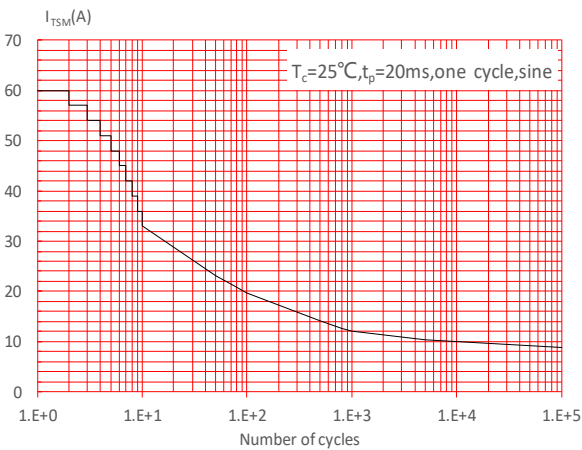
MARKING



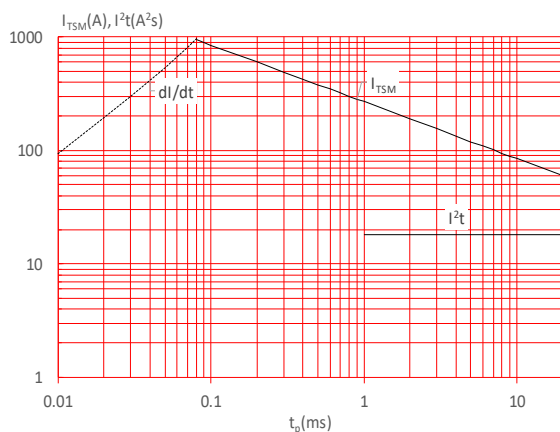
**FIG.1:** Maximum power dissipation versus RMS on-state current



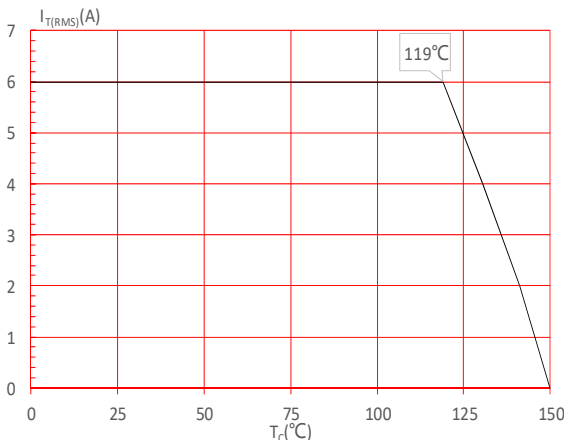
**FIG.3:** Surge peak on-state current versus number of cycles



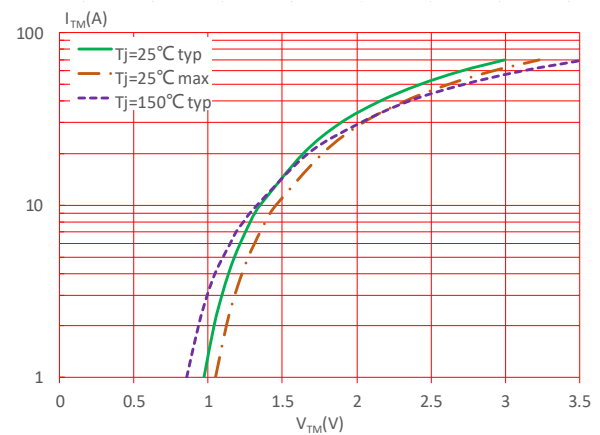
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20ms$ , and corresponding value of  $I^2t$  ( $di/dt < 100A/\mu s$ )



**FIG.2:** RMS on-state current versus case temperature



**FIG.4:** On-state characteristics



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

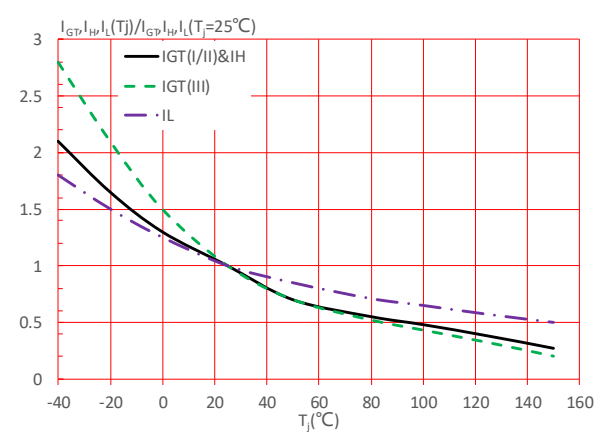
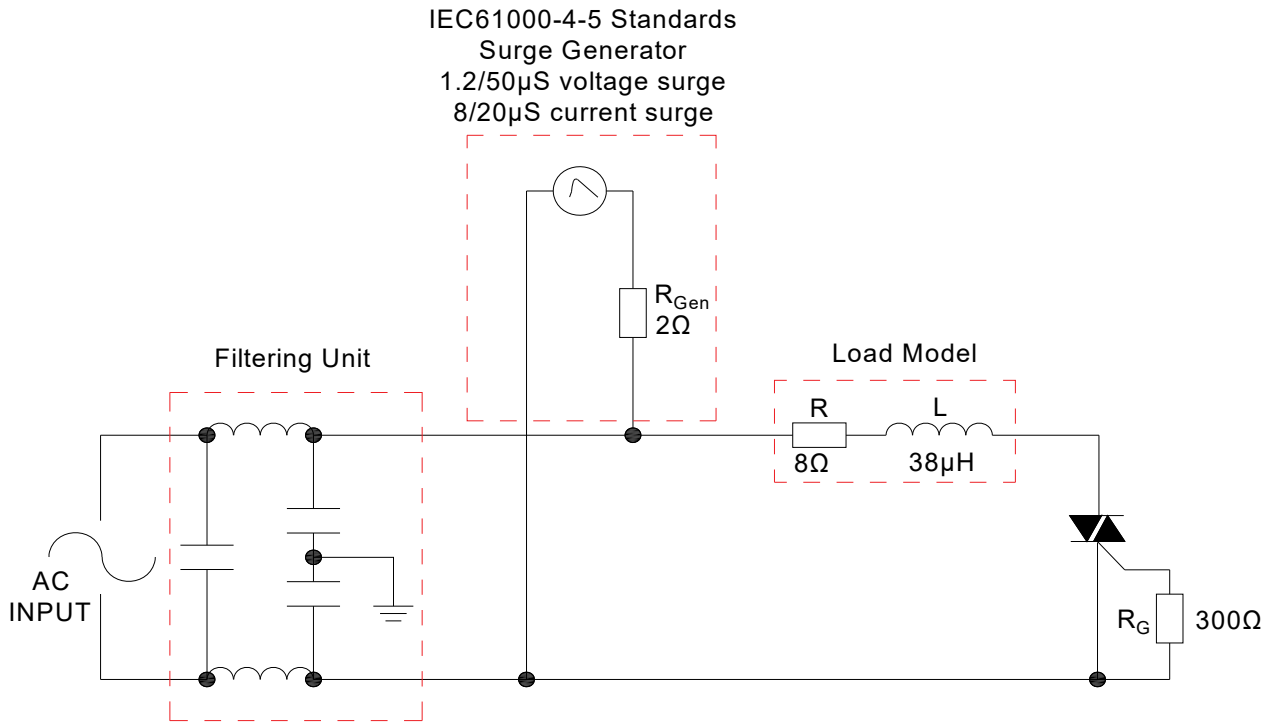


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## LEAD FORMING AND SOLDERING

Refer to the application note “Assembly Instructions for Thyristors in Through-hole Package” released by JieJie Microelectronics

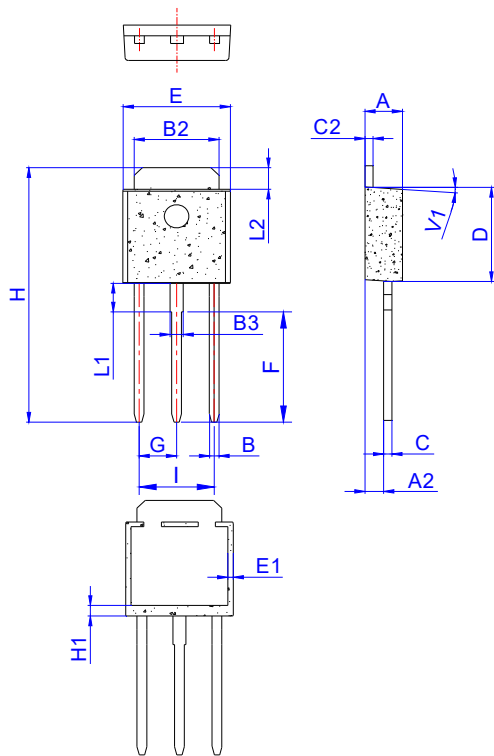
## ORDERING INFORMATION

| Order code | Voltage<br>$V_{\text{DRM}}/V_{\text{RRM}}$ (V) | IGT(mA)      | Package | Base qty.<br>(pcs) | Delivery<br>mode |
|------------|------------------------------------------------|--------------|---------|--------------------|------------------|
|            |                                                | I - II - III |         |                    |                  |
| T0650H-6H  | 600                                            | 50           | TO-251  | 80                 | Tube             |

## Document Revision History

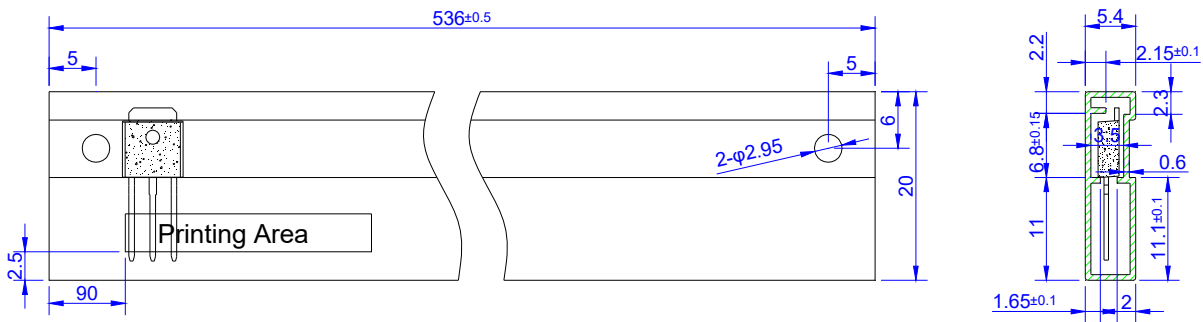
| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Apr.11, 2023 | A.1.0    | Last updated                   |
| Oct.17, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |       |        |      |       |
|------|-------------|------|-------|--------|------|-------|
|      | Millimeters |      |       | Inches |      |       |
|      | Min.        | Typ. | Max.  | Min.   | Typ. | Max.  |
| A    | 2.20        |      | 2.40  | 0.086  |      | 0.095 |
| A2   | 1.00        |      | 1.30  | 0.039  |      | 0.051 |
| B    | 0.50        |      | 0.70  | 0.020  |      | 0.028 |
| B2   | 5.10        |      | 5.40  | 0.200  |      | 0.213 |
| B3   | 0.70        |      | 1.00  | 0.028  |      | 0.039 |
| C    | 0.45        |      | 0.62  | 0.018  |      | 0.024 |
| C2   | 0.48        |      | 0.62  | 0.019  |      | 0.024 |
| D    | 6.00        |      | 6.20  | 0.236  |      | 0.244 |
| E    | 6.40        |      | 6.70  | 0.252  |      | 0.264 |
| E1   | 0.60        |      | 1.00  | 0.024  |      | 0.039 |
| F    | 6.90        |      | 7.30  | 0.272  |      | 0.287 |
| G    | 2.20        |      | 2.40  | 0.087  |      | 0.094 |
| H    | 16.00       |      | 17.00 | 0.630  |      | 0.669 |
| H1   | 1.45        |      | 1.85  | 0.057  |      | 0.073 |
| I    | 4.40        |      | 4.80  | 0.173  |      | 0.189 |
| L1   | 1.80        |      | 2.20  | 0.071  |      | 0.087 |
| L2   | 1.25        |      | 1.55  | 0.049  |      | 0.061 |
| V1   |             | 4°   |       |        | 4°   |       |

DELIVERY MODE



| PACKAGE | OUTLINE | TUBE (PCS) | INNER BOX (PCS) | PER CARTON |
|---------|---------|------------|-----------------|------------|
| TO-251  | TUBE    | 80         | 4,000           | 20,000     |

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