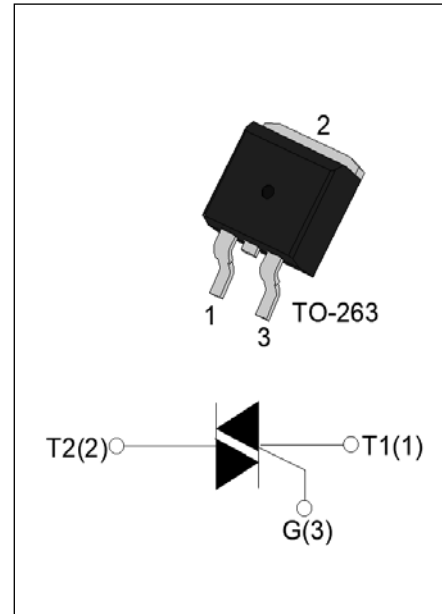


JST16E-600C 16E TRIAC

Rev.A.1.0

DESCRIPTION:

The JST16E-600C 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. Package TO-263 is RoHS compliant.


MAIN FEATURES

| Symbol | Value | Unit |
|-----------------------|-------------|------|
| $I_{T(RMS)}$ | 16 | A |
| V_{DRM}/V_{RRM} | 600 | V |
| $I_{GT\ I/II/III/IV}$ | 25/25/25/50 | mA |

ABSOLUTE MAXIMUM RATINGS

| Parameter | | Symbol | Value | Unit |
|--|--------|--------------|---------|------------------------|
| Storage junction temperature range | | T_{stg} | -40-150 | °C |
| Operating junction temperature range | | T_j | -40-125 | °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 ($T_c \leq 98^\circ\text{C}$) | | $I_{T(RMS)}$ | 16 | A |
| Non repetitive surge peak on-state current (full cycle , $t_p=20\text{ms}$, $T_j=25^\circ\text{C}$) | | I_{TSM} | 160 | A |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6\text{ms}$, $T_j=25^\circ\text{C}$) | | | 176 | |
| I^2t value for fusing ($t_p=10\text{ms}$, $T_j=25^\circ\text{C}$) | | I^2t | 128 | A^2s |
| Critical rate of rise of on-state current ($I_G=2 \times I_{GT}$, $f=100\text{Hz}$, $T_j=125^\circ\text{C}$) | I - II | di/dt | 80 | $\text{A}/\mu\text{s}$ |
| | III-IV | | 40 | |
| Peak gate current ($t_p=20\mu\text{s}$, $T_j=125^\circ\text{C}$) | | I_{GM} | 4 | A |
| Average gate power dissipation ($T_j=125^\circ\text{C}$) | | $P_{G(AV)}$ | 0.5 | W |
| Peak gate power | | P_{GM} | 10 | W |
| Peak pulse voltage ($T_j=25^\circ\text{C}$; non-repetitive, off-state; FIG.8) | | V_{pp} | 3.5 | 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. | 25 | mA |
| | | IV | | 50 | |
| V_{GT} | | ALL | MAX. | 1 | V |
| V_{GD} | $V_D=V_{DRM} T_j=125^{\circ}\text{C}$ $R_L=3.3\text{K}\Omega$ | ALL | MIN. | 0.2 | V |
| I_L | $I_G=1.2I_{GT}$ | I - III - IV | MAX. | 40 | mA |
| | | II | | 80 | |
| I_H | $I_T=500\text{mA}$ | | MAX. | 40 | mA |
| dV/dt | $V_D=400\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$ | | MIN. | 800 | $\text{V}/\mu\text{s}$ |
| $(dV/dt)_c$ | $(dI/dt)_c=7\text{A/ms}$, $T_j=125^{\circ}\text{C}$ | | MIN. | 6 | $\text{V}/\mu\text{s}$ |
| t_{on} | $I_G=80\text{mA } I_A=400\text{mA } I_R=40\text{mA}$ $T_j=25^{\circ}\text{C}$ | | TYP. | 10 | μs |
| t_{off} | | | | 70 | |

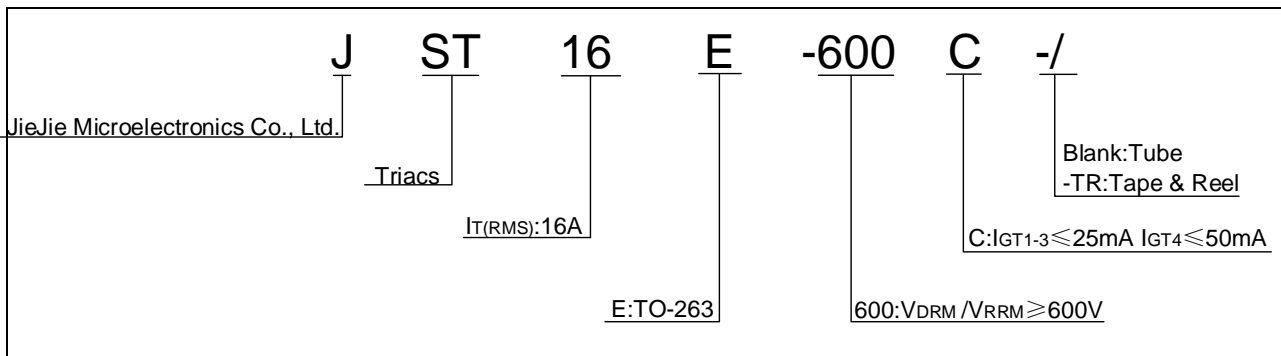
STATIC CHARACTERISTICS

| Symbol | Parameter | | Value(MAX.) | Unit |
|-----------|---|---------------------------|-------------|------------------|
| V_{TM} | $I_{TM}=22.5\text{A } t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$ | 1.5 | V |
| V_{TO} | Threshold voltage | $T_j=125^{\circ}\text{C}$ | 0.77 | V |
| R_D | Dynamic resistance | $T_j=125^{\circ}\text{C}$ | 30 | $\text{m}\Omega$ |
| I_{DRM} | $V_D=V_{DRM} V_R=V_{RRM}$ | $T_j=25^{\circ}\text{C}$ | 5 | μA |
| I_{RRM} | | $T_j=125^{\circ}\text{C}$ | 0.4 | mA |

THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---------------|--|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC) | 1.2 | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC, in free air, $S=2\text{cm}^2$) | 45 | $^{\circ}\text{C}/\text{W}$ |

ORDERING INFORMATION



MARKING

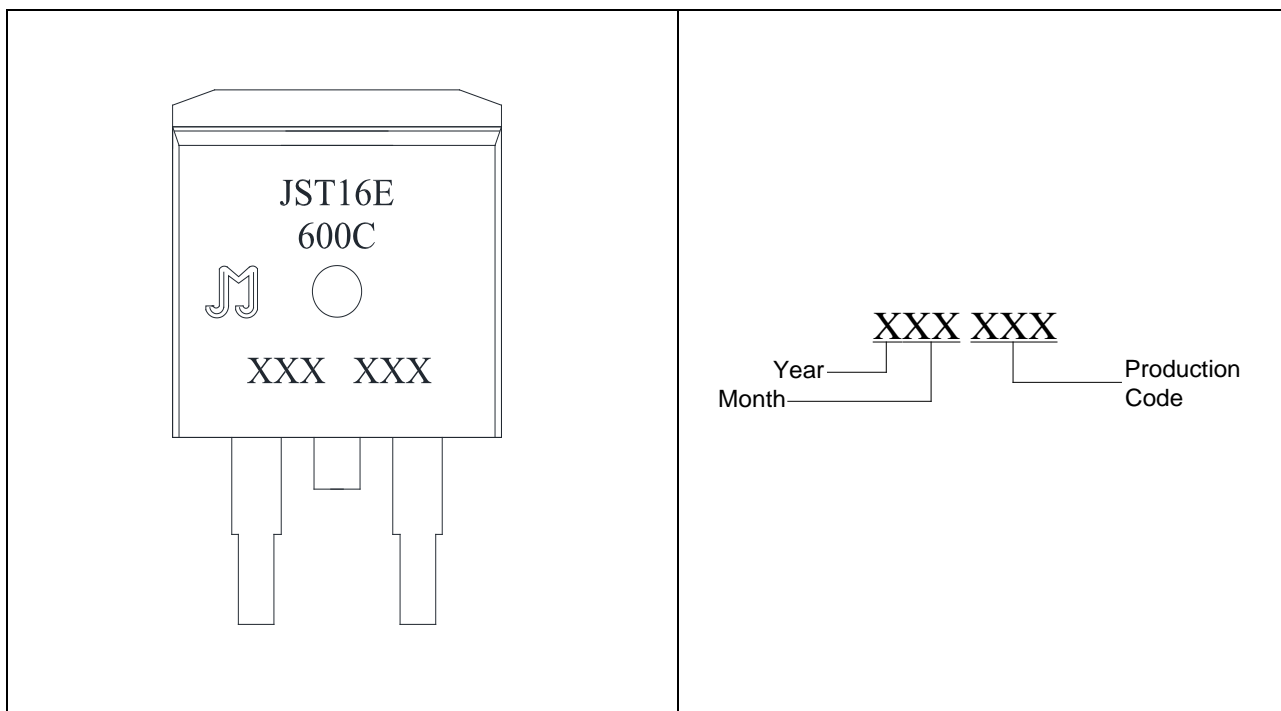


FIG.1 Maximum power dissipation versus RMS on-state current

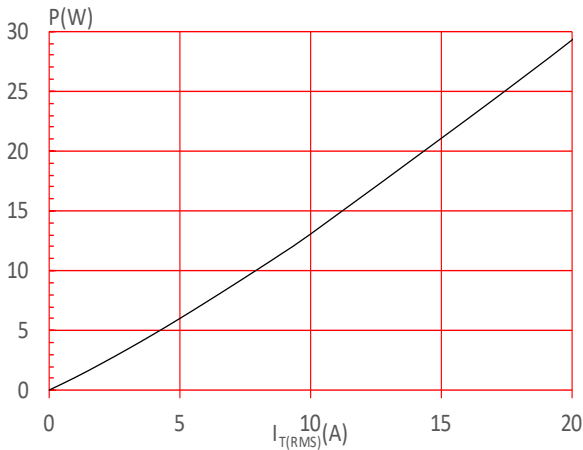


FIG.3: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35 μ m) (full cycle)

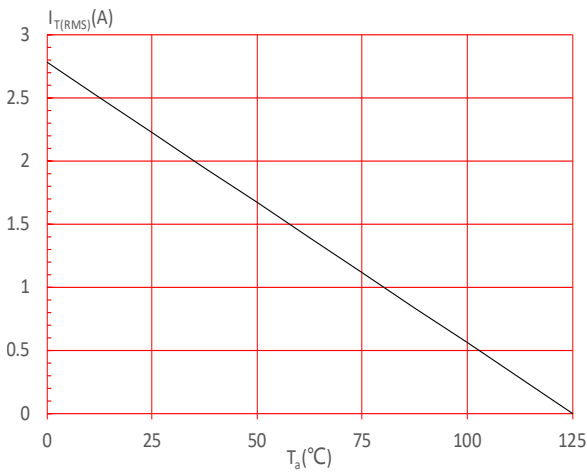


FIG.5: On-state characteristics

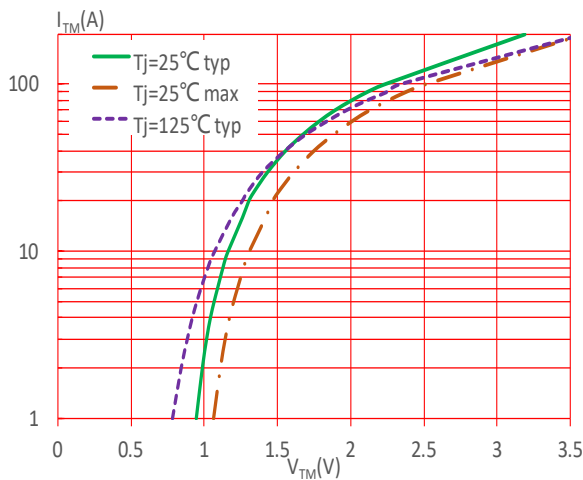


FIG.2: RMS on-state current versus case temperature

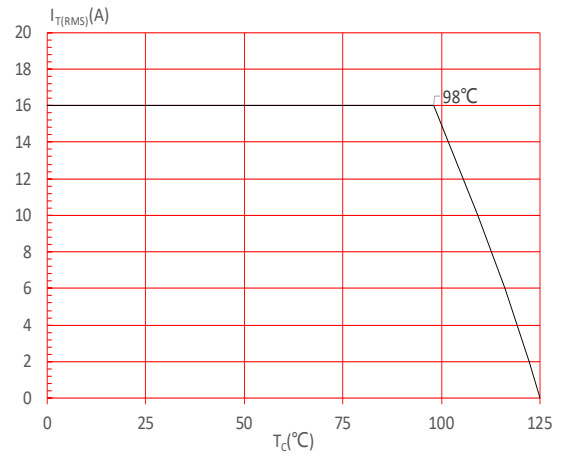


FIG.4: Surge peak on-state current versus number of cycles

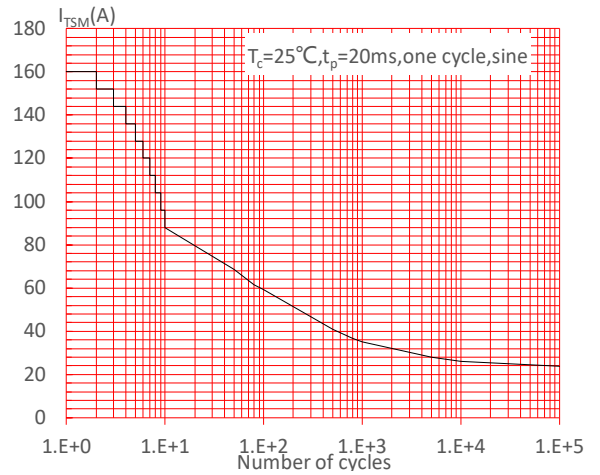


FIG.6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I^2t (I - II: $dl/dt < 80\text{A}/\mu\text{s}$; III-IV: $dl/dt < 40\text{A}/\mu\text{s}$)

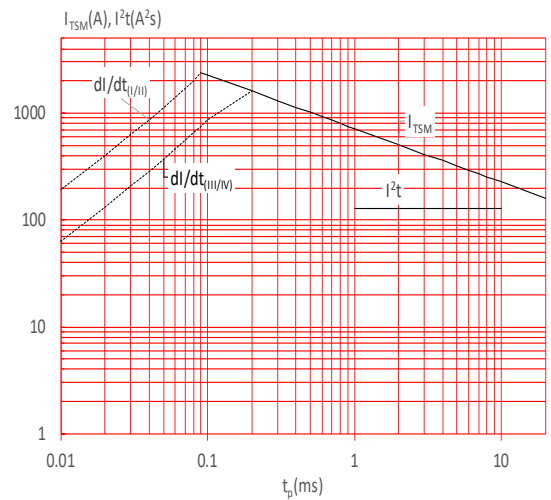


FIG.7: Relative variations of gate trigger current, holding current and latching current versus junction temperature

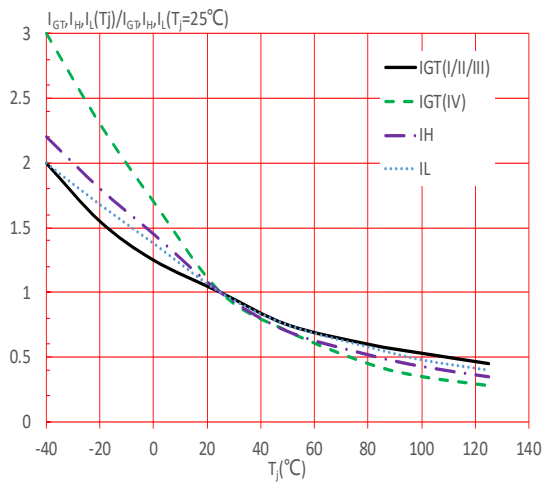
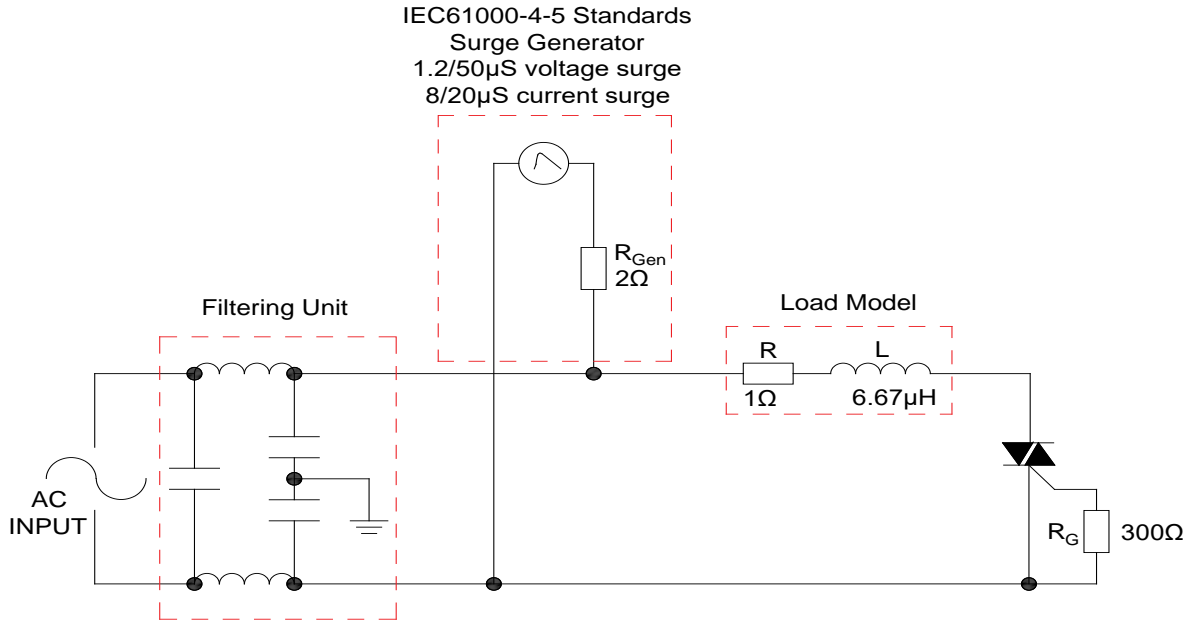
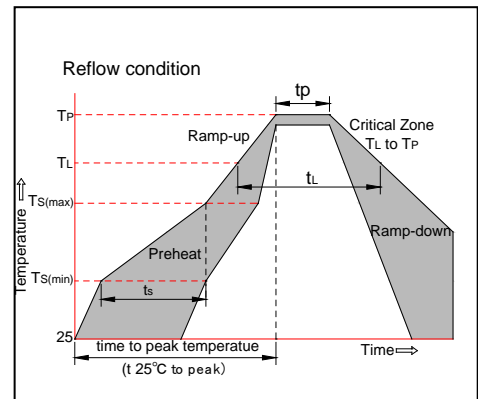


FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



SOLDERING PARAMETERS

| | | |
|--|-----------------------------------|---|
| Reflow Condition | | Pb-Free assembly (see figure at right) |
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max($T_{s(max)}$) | +200°C |
| | -Time (Min to Max) (ts) | 60-180 secs. |
| Average ramp up rate (Liquidus Temp (T_L) to peak) | | 3°C/sec. Max |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature(T_L) (Liquidus) | +217°C |
| | -Temperature(t_L) | 60-150 secs. |
| Peak Temp (T_p) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 20-40secs. |
| Ramp-down Rate | | 6°C/sec. Max |
| Time 25°C to Peak Temp (T_P) | | 8 min. Max |
| Do not exceed | | +260°C |



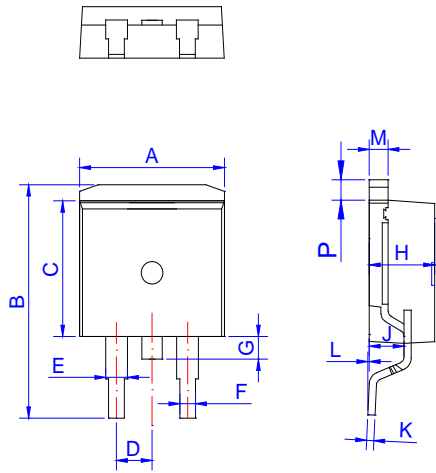
ORDERING INFORMATION

| Order code | Voltage V_{DRM}/V_{RRM} (V) | IGT(mA) | | Package | Base qty. (pcs) | Delivery mode |
|----------------|----------------------------------|--------------|----|---------|--------------------|---------------|
| | | I - II - III | IV | | | |
| JST16E-600C | 600 | 25 | 50 | TO-263 | 50 | Tube |
| JST16E-600C-TR | | | | | 800 | Tape & Reel |

Document Revision History

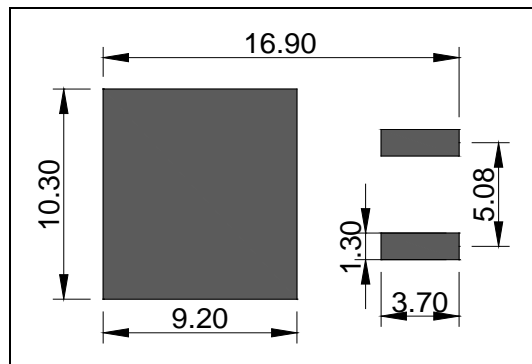
| Date | Revision | Changes |
|--------------|----------|--------------|
| Apr.14, 2023 | A.1.0 | Last updated |

PACKAGE MECHANICAL DATA



| Ref. | Dimensions | | | | | |
|------|-------------|------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 9.90 | | 10.20 | 0.390 | | 0.402 |
| B | 14.70 | | 15.80 | 0.579 | | 0.622 |
| C | 9.40 | | 9.60 | 0.37 | | 0.378 |
| D | 2.40 | | 2.70 | 0.094 | | 0.106 |
| E | 1.20 | | 1.50 | 0.047 | | 0.059 |
| F | 0.75 | | 0.85 | 0.029 | | 0.033 |
| G | 1.00 | | 1.50 | 0.039 | | 0.059 |
| H | 4.40 | | 4.70 | 0.173 | | 0.185 |
| J | 2.30 | | 2.70 | 0.091 | | 0.106 |
| K | 0.38 | | 0.55 | 0.015 | | 0.022 |
| L | 0 | 0.10 | 0.25 | 0 | 0.004 | 0.010 |
| M | 1.25 | | 1.35 | 0.049 | | 0.053 |
| P | 1.20 | | 1.50 | 0.047 | | 0.059 |

FOOTPRINT-TO-263 (dimensions in mm)



DELIVERY MODE



| PACKAGE | OUTLINE | TUBE (PCS) | INNER BOX (PCS) | PER CARTON |
|---------|---------|------------|-----------------|------------|
| TO-263 | TUBE | 50 | 1,000 | 5,000 |




| Ref. | Dimensions | | | | | |
|------|-------------|-------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| W | 23.70 | 24.00 | 24.30 | 0.933 | 0.945 | 0.957 |
| E | 1.65 | 1.75 | 1.85 | 0.065 | 0.069 | 0.073 |
| F | 11.40 | 11.50 | 11.60 | 0.449 | 0.453 | 0.457 |
| D0 | - | 1.50 | 1.60 | - | 0.059 | 0.063 |
| D1 | - | 1.50 | 1.60 | - | 0.059 | 0.063 |
| P0 | 3.90 | 4.00 | 4.10 | 0.154 | 0.157 | 0.161 |
| P1 | 15.90 | 16.00 | 16.10 | 0.626 | 0.630 | 0.634 |
| P2 | 1.90 | 2.00 | 2.10 | 0.075 | 0.079 | 0.083 |
| A0 | 10.80 | 10.90 | 11.00 | 0.425 | 0.429 | 0.433 |
| B0 | 16.20 | 16.30 | 16.40 | 0.638 | 0.642 | 0.646 |
| K0 | 4.80 | 4.90 | 5.00 | 0.189 | 0.193 | 0.197 |
| t | 0.35 | 0.40 | 0.45 | 0.014 | 0.016 | 0.018 |

| PACKAGE | OUTLINE | REEL (PCS) | PER CARTON (PCS) | TAPE & REEL |
|---------|---------|------------|------------------|-------------|
| TO-263 | TAPING | 800 | 4,000 | 13 inch |

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