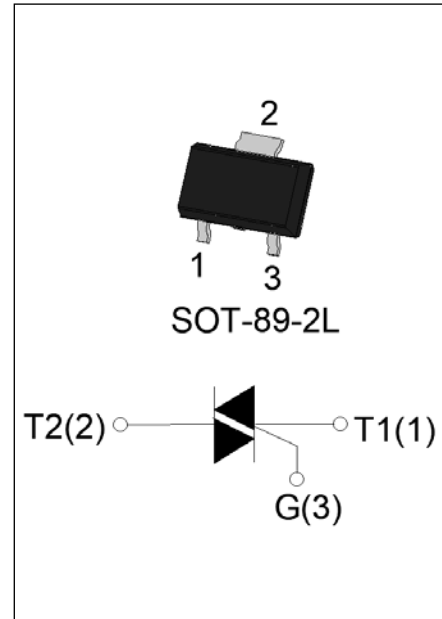


DESCRIPTION:

The JSM131N2-800D 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 SOT-89-2L is RoHS compliant.


MAIN FEATURES

| Symbol | Value | Unit |
|-----------------------|----------|------|
| $I_{T(RMS)}$ | 1 | A |
| V_{DRM}/V_{RRM} | 800 | V |
| $I_{GT\ I/II/III/IV}$ | 5/5/5/10 | 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} | 800 | V |
| Repetitive peak reverse voltage ($T_j=25^\circ\text{C}$) | | V_{RRM} | 800 | V |
| RMS on-state current ($T_c \leq 58^\circ\text{C}$) | | $I_{T(RMS)}$ | 1 | A |
| Non repetitive surge peak on-state current (full cycle , $t_p=20\text{ms}$, $T_j=25^\circ\text{C}$) | | I_{TSM} | 14 | A |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6\text{ms}$, $T_j=25^\circ\text{C}$) | | | 15 | |
| I^2t value for fusing ($t_p=10\text{ms}$, $T_j=25^\circ\text{C}$) | | I^2t | 0.98 | 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 - III | di/dt | 50 | $\text{A}/\mu\text{s}$ |
| | IV | | 30 | |
| Peak gate current ($t_p=20\mu\text{s}$, $T_j=125^\circ\text{C}$) | | I_{GM} | 2 | A |
| Average gate power dissipation ($T_j=125^\circ\text{C}$) | | $P_{G(AV)}$ | 0.5 | W |
| Peak gate power | | P_{GM} | 5 | 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. | 5 | mA |
| | | IV | | 10 | |
| V_{GT} | | ALL | MAX. | 1.3 | 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. | 5 | mA |
| | | II | | 20 | |
| I_H | $I_T=50\text{mA}$ | | MAX. | 7 | mA |
| dV/dt | $V_D=540\text{V}$ Gate Open $T_j=110^\circ\text{C}$ | | MIN. | 100 | $\text{V}/\mu\text{s}$ |
| $(dV/dt)_c$ | $(dI/dt)_c=0.44\text{A/ms}$, $T_j=110^\circ\text{C}$ | | MIN. | 3 | $\text{V}/\mu\text{s}$ |
| t_{on} | $I_G=20\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$ | | TYP. | 2.5 | μs |
| t_{off} | $T_j=25^\circ\text{C}$ | | | 25 | |

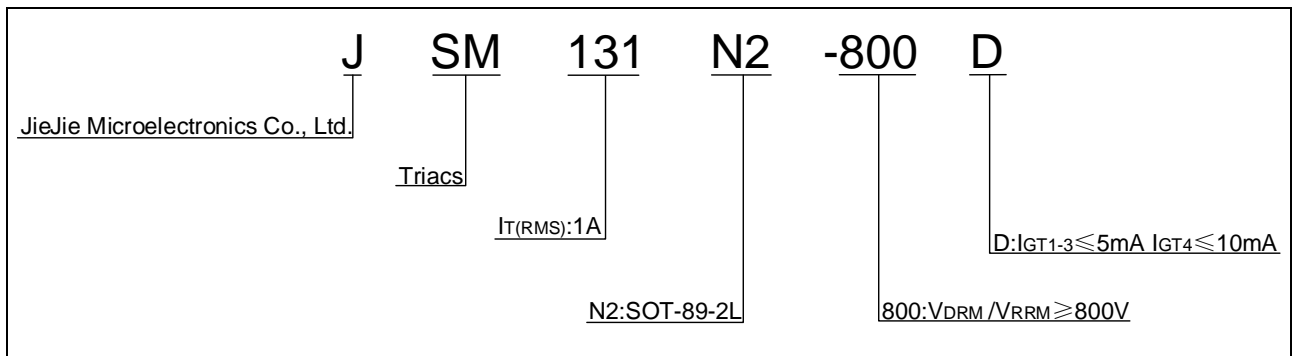
STATIC CHARACTERISTICS

| Symbol | Parameter | | Value(MAX.) | Unit |
|-----------|---|-------------------------|-------------|------------------|
| V_{TM} | $I_{TM}=1.4\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^\circ\text{C}$ | 1.45 | V |
| V_{TO} | Threshold voltage | $T_j=125^\circ\text{C}$ | 0.96 | V |
| R_D | Dynamic resistance | $T_j=125^\circ\text{C}$ | 225 | $\text{m}\Omega$ |
| I_{DRM} | $V_D=V_{DRM}$ $V_R=V_{RRM}$ | $T_j=25^\circ\text{C}$ | 5 | μA |
| I_{RRM} | | $T_j=125^\circ\text{C}$ | 0.25 | mA |

THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---------------|--|-------|---------------------------|
| $R_{th(j-c)}$ | junction to case (AC) | 50 | $^\circ\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC, in free air, $S=5\text{cm}^2$) | 100 | $^\circ\text{C}/\text{W}$ |

ORDERING INFORMATION



MARKING

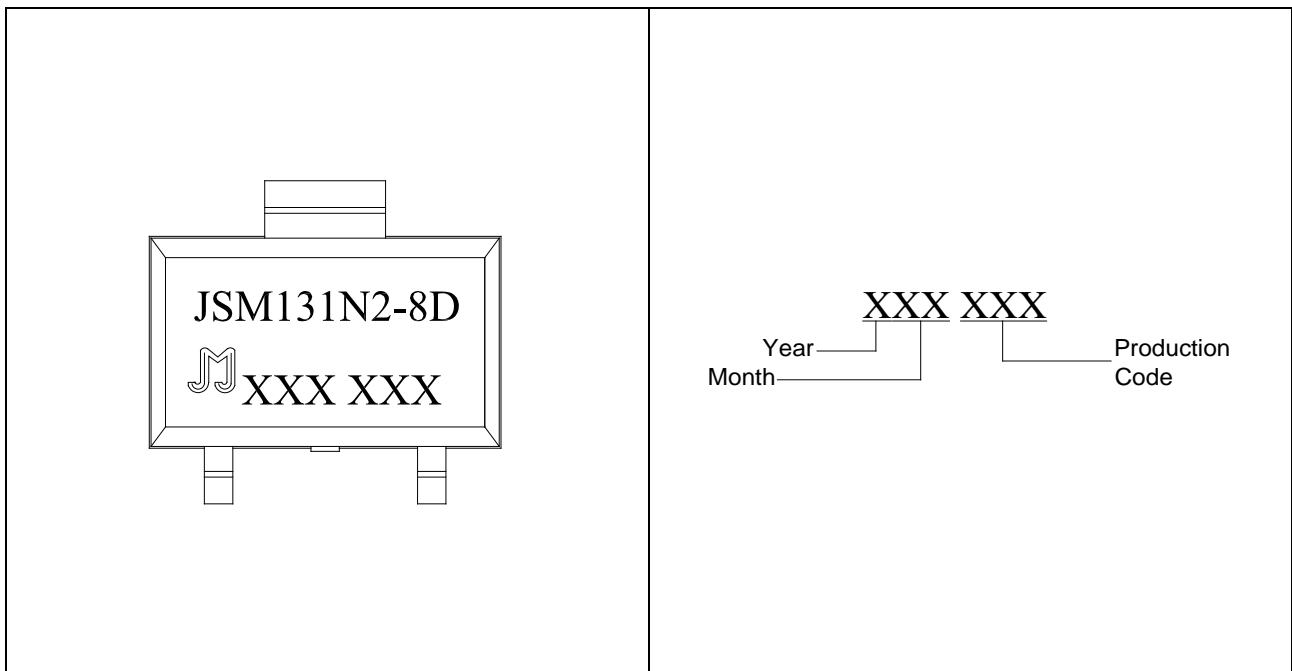


FIG.1 Maximum power dissipation versus RMS on-state current

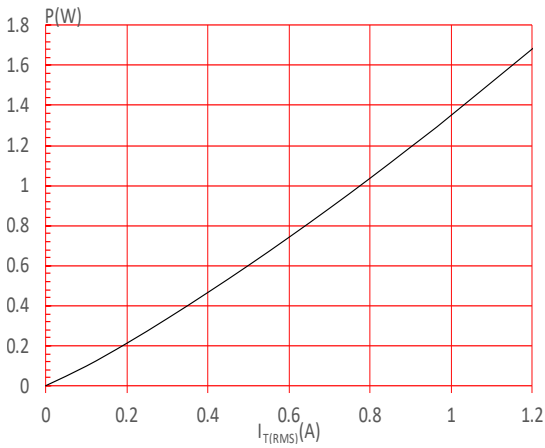


FIG.3: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35μm) (full cycle)

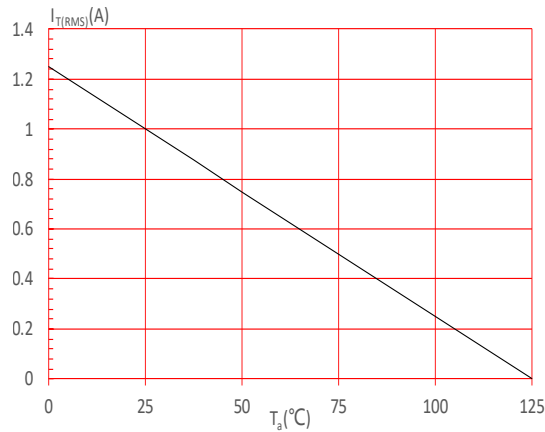


FIG.5: On-state characteristics

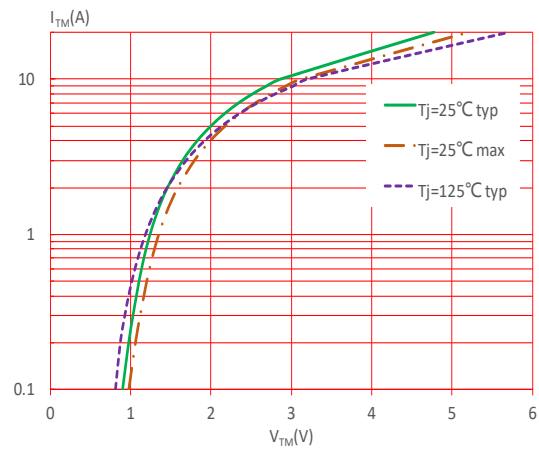


FIG.2: RMS on-state current versus case temperature

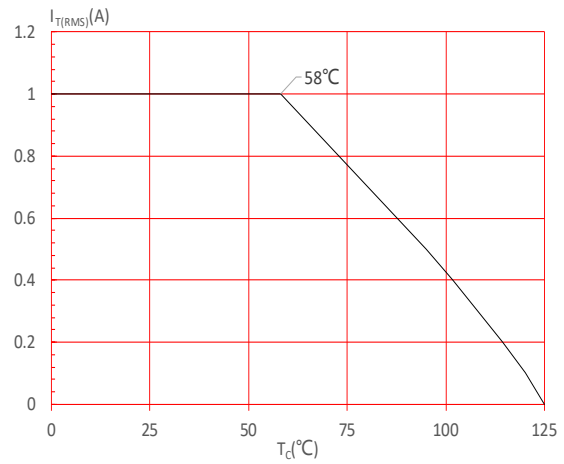


FIG.4: Surge peak on-state current versus number of cycles

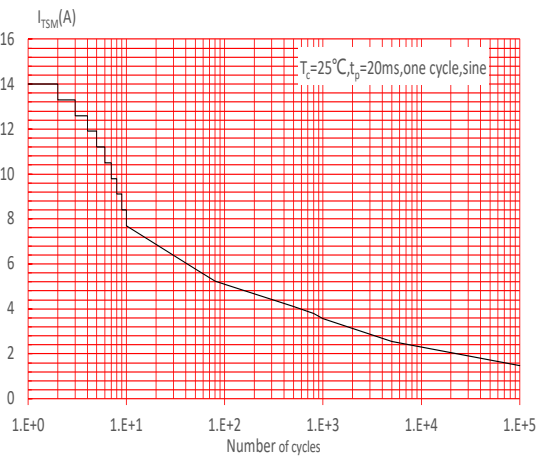


FIG.6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I^2t (I - II - III: $dl/dt < 50\text{A}/\mu\text{s}$; IV: $dl/dt < 30\text{A}/\mu\text{s}$)

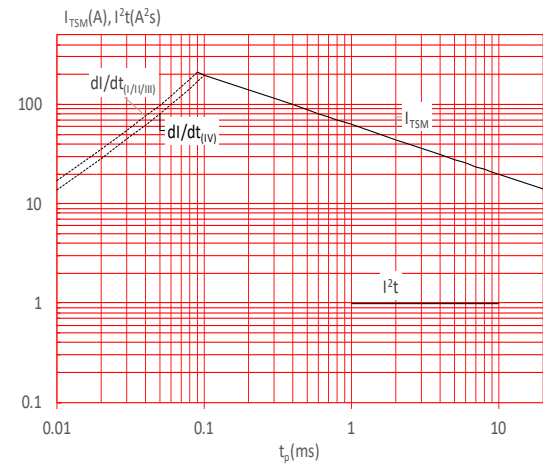


FIG.7: Relative variations of gate trigger current, holding current and latching current versus junction temperature

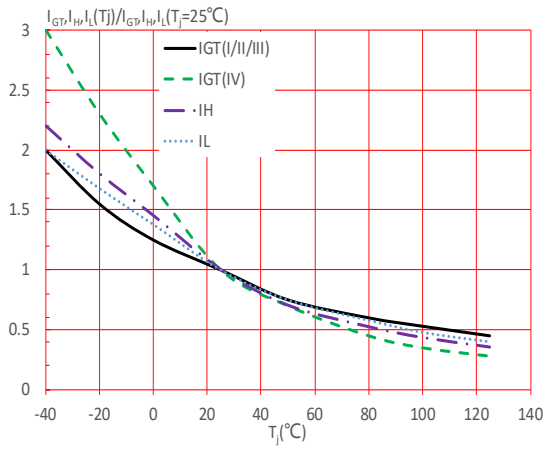
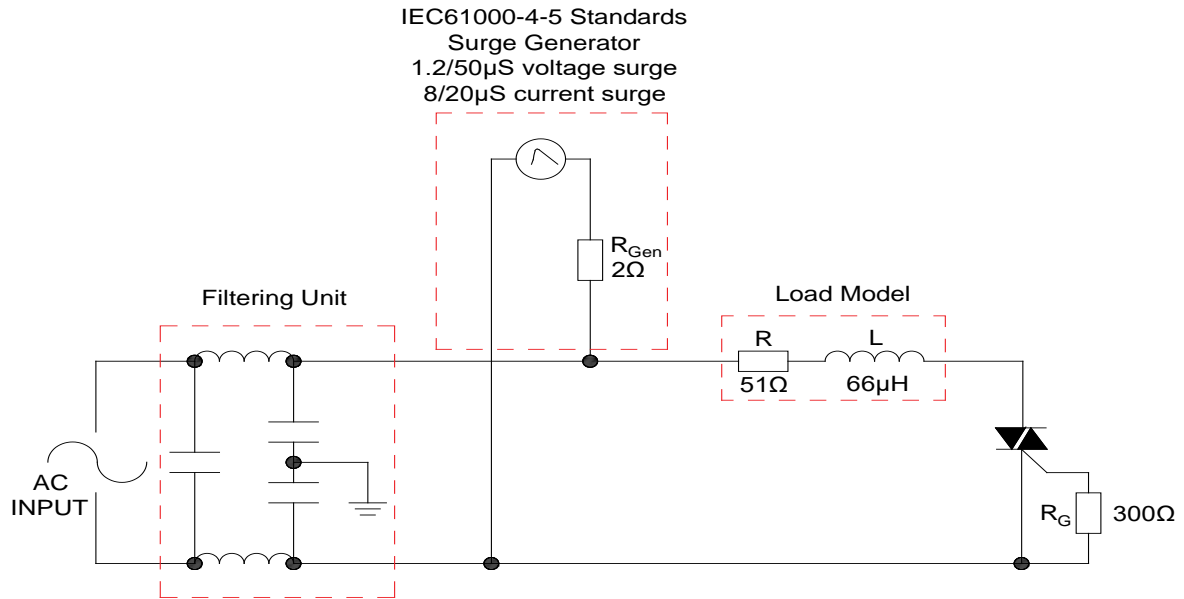
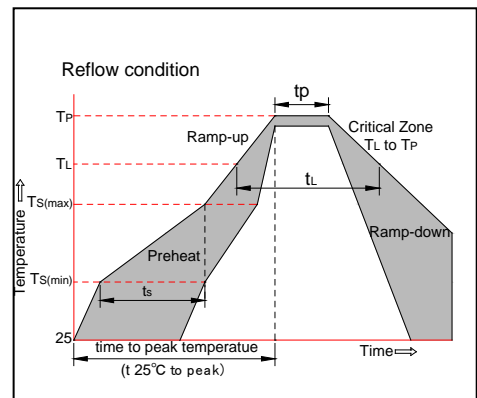


FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



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 |



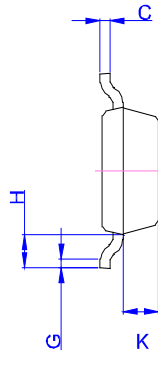
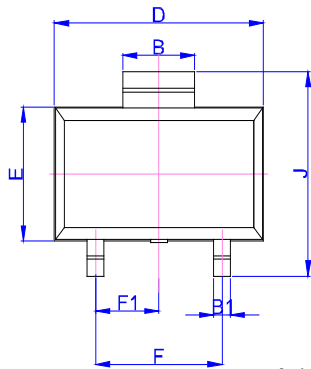
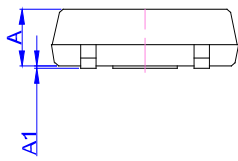
ORDERING INFORMATION

| Order code | Voltage V_{DRM}/V_{RRM} (V) | IGT(mA) | | Package | Base qty. (pcs) | Delivery mode |
|---------------|----------------------------------|-----------|----|-----------|--------------------|------------------|
| | | I -II-III | IV | | | |
| JSM131N2-800D | 800 | 5 | 10 | SOT-89-2L | 4,000 | Tape & Reel |

Document Revision History

| Date | Revision | Changes |
|--------------|----------|--------------|
| Apr.17, 2023 | A.1.0 | Last updated |

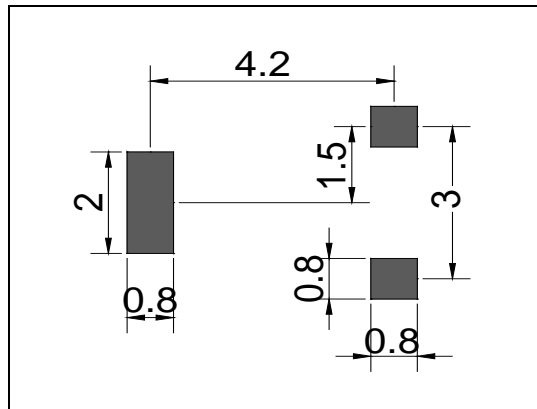
PACKAGE MECHANICAL DATA



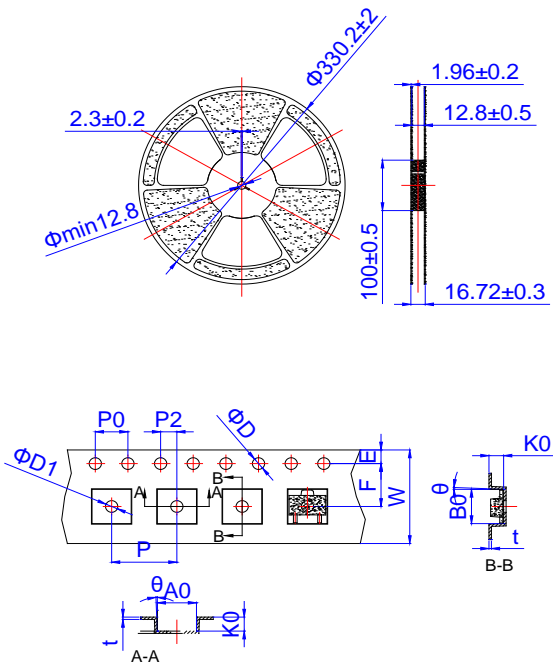
SOT-89-2L

| Ref. | Dimensions | | | | | |
|------|-------------|-------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 1.3 | 1.4 | 1.5 | 0.051 | 0.055 | 0.059 |
| A1 | 0.01 | 0.06 | 0.10 | 0.001 | 0.002 | 0.004 |
| B | 1.6 | 1.7 | 1.8 | 0.063 | 0.067 | 0.071 |
| B1 | 0.3 | 0.4 | 0.5 | 0.012 | 0.016 | 0.020 |
| C | 0.22 | 0.254 | 0.32 | 0.009 | 0.010 | 0.013 |
| D | 4.75 | 4.95 | 5.15 | 0.187 | 0.195 | 0.203 |
| E | 2.90 | | 3.30 | 0.114 | | 0.130 |
| F | 2.80 | | 3.20 | 0.110 | | 0.126 |
| F1 | 1.40 | | 1.60 | 0.055 | | 0.063 |
| G | 0.20 | 0.30 | 0.40 | 0.008 | 0.012 | 0.016 |
| H | 0.58 | 0.78 | 0.98 | 0.023 | 0.031 | 0.039 |
| J | 4.30 | 4.50 | 4.70 | 0.169 | 0.177 | 0.185 |
| K | 0.80 | | 1.00 | 0.031 | | 0.039 |

FOOTPRINT-SOT-89-2L (dimensions in mm)



DELIVERY MODE



| Ref. | Dimensions | | | | | |
|----------|-------------|-------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| E | 1.65 | 1.75 | 1.85 | 0.065 | 0.069 | 0.073 |
| F | 5.45 | 5.50 | 5.55 | 0.215 | 0.217 | 0.219 |
| P2 | 1.90 | 2.00 | 2.10 | 0.075 | 0.079 | 0.082 |
| D | - | 1.50 | 1.60 | - | 0.059 | 0.063 |
| D1 | 1.50 | - | - | 0.059 | - | - |
| P0 | 3.90 | 4.00 | 4.10 | 0.154 | 0.157 | 0.161 |
| 10P0 | 39.80 | 40.00 | 40.20 | 1.567 | 1.575 | 1.583 |
| W | - | - | 12.30 | - | - | 0.482 |
| P | 7.90 | 8.00 | 8.10 | 0.311 | 0.315 | 0.319 |
| A0 | 5.20 | 5.30 | 5.40 | 0.204 | 0.208 | 0.212 |
| B0 | 4.80 | 4.90 | 5.00 | 0.188 | 0.192 | 0.196 |
| K0 | 1.75 | 1.85 | 1.95 | 0.069 | 0.073 | 0.076 |
| t | 0.20 | 0.25 | 0.30 | 0.008 | 0.010 | 0.012 |
| θ | 3° | | 5° | | 3° | |

| PACKAGE | OUTLINE | REEL (PCS) | PER CARTON (PCS) | TAPE & REEL |
|-----------|---------|------------|------------------|-------------|
| SOT-89-2L | TAPING | 4,000 | 40,000 | 13 inch |

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