

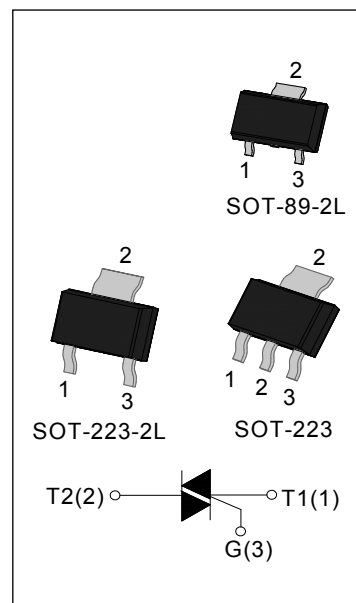


### DESCRIPTION:

With low holding and latching current, JST131 series triacs are especially recommended for use on middle and small resistance type power load. All the packages listed above are RoHS compliant. (2011/65/EU)

### MAIN FEATURES

| Symbol       | Value      | Unit |
|--------------|------------|------|
| $I_{T(RMS)}$ | 1          | A    |
| $I_{TSM}$    | 16         | A    |
| $V_{TM}$     | $\leq 1.5$ | V    |



### ABSOLUTE MAXIMUM RATINGS

| Parameter                                                                         |                                                                   | Symbol       | Value     | Unit                   |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------|-----------|------------------------|
| Storage junction temperature range                                                |                                                                   | $T_{stg}$    | -40 - 150 | $^{\circ}\text{C}$     |
| Operating junction temperature range                                              |                                                                   | $T_j$        | -40 - 125 | $^{\circ}\text{C}$     |
| Repetitive peak off-state voltage ( $T_j=25^{\circ}\text{C}$ )                    |                                                                   | $V_{DRM}$    | 600/800   | V                      |
| Repetitive peak reverse voltage ( $T_j=25^{\circ}\text{C}$ )                      |                                                                   | $V_{RRM}$    | 600/800   | V                      |
| RMS on-state current                                                              | SOT-89-2L/<br>SOT-223-2L/<br>SOT-223 ( $T_c=75^{\circ}\text{C}$ ) | $I_{T(RMS)}$ | 1         | A                      |
| Non repetitive surge peak on-state current (full cycle, $F=50\text{Hz}$ )         |                                                                   | $I_{TSM}$    | 16        | A                      |
| $I^2t$ value for fusing ( $t_p=10\text{ms}$ )                                     |                                                                   | $I^2t$       | 1.28      | $\text{A}^2\text{s}$   |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ )               |                                                                   | $dI/dt$      | 20        | $\text{A}/\mu\text{s}$ |
| Peak gate current                                                                 |                                                                   | $I_{GM}$     | 2         | A                      |
| Average gate power dissipation                                                    |                                                                   | $P_{G(AV)}$  | 0.5       | W                      |
| Peak gate power                                                                   |                                                                   | $P_{GM}$     | 5         | W                      |
| Peak pulse voltage ( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.7) |                                                                   | $V_{PP}$     | 2.5       | kV                     |

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

| Symbol      | Test Condition                                                     | Quadrant    |     | Value |    |    | Unit             |
|-------------|--------------------------------------------------------------------|-------------|-----|-------|----|----|------------------|
|             |                                                                    |             |     | T     | D  | E  |                  |
| $I_{GT}$    | $V_D=12\text{V}$ $R_L=33\Omega$                                    | I - II -III | MAX | 5     | 5  | 10 | mA               |
|             |                                                                    | IV          |     | 5     | 10 | 25 |                  |
| $V_{GT}$    |                                                                    | ALL         | MAX | 1.3   |    |    | V                |
| $V_{GD}$    | $V_D=V_{DRM}$ $T_j=125^{\circ}\text{C}$<br>$R_L=3.3\text{K}\Omega$ | ALL         | MIN | 0.2   |    |    | V                |
| $I_L$       | $I_G=1.2I_{GT}$                                                    | I -III-IV   | MAX | 5     | 5  | 15 | mA               |
|             |                                                                    | II          |     | 10    | 20 | 30 |                  |
| $I_H$       | $I_T=200\text{mA}$                                                 |             | MAX | 5     | 7  | 15 | mA               |
| $dV/dt$     | $V_D=2/3V_{DRM}$ Gate Open $T_j=125^{\circ}\text{C}$               |             | MIN | 15    | 20 | 50 | V/ $\mu\text{s}$ |
| $(dV/dt)_c$ | $(dI/dt)_c=0.44\text{A/ms}$ , $T_j=110^{\circ}\text{C}$            |             | MIN | -     | 1  | -  | V/ $\mu\text{s}$ |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                 |                           | Value(MAX) | Unit          |
|-----------|-------------------------------------------|---------------------------|------------|---------------|
| $V_{TM}$  | $I_{TM}=1.4\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.5        | V             |
| $V_{TO}$  | Threshold voltage                         | $T_j=125^{\circ}\text{C}$ | 0.95       | V             |
| $R_d$     | Dynamic resistance                        | $T_j=125^{\circ}\text{C}$ | 256        | m $\Omega$    |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$               | $T_j=25^{\circ}\text{C}$  | 5          | $\mu\text{A}$ |
| $I_{RRM}$ |                                           | $T_j=125^{\circ}\text{C}$ | 0.5        | mA            |

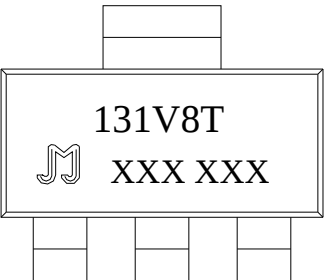
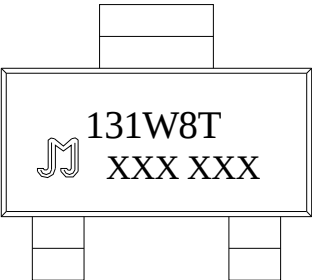
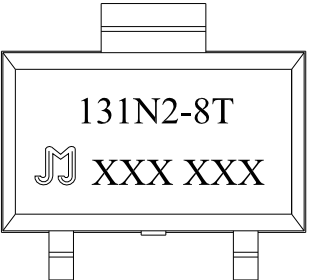
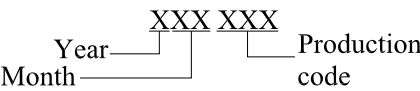
**THERMAL RESISTANCES**

| Symbol        | Parameter            |                                      | Value | Unit                 |
|---------------|----------------------|--------------------------------------|-------|----------------------|
| $R_{th(j-c)}$ | junction to case(AC) | SOT-223/<br>SOT-89-2L/<br>SOT-223-2L | 31    | $^{\circ}\text{C/W}$ |
| $R_{th(j-a)}$ | junction to ambient  | SOT-89-2L                            | 64    | $^{\circ}\text{C/W}$ |
|               |                      | SOT-223/<br>SOT-223-2L               | 60    |                      |

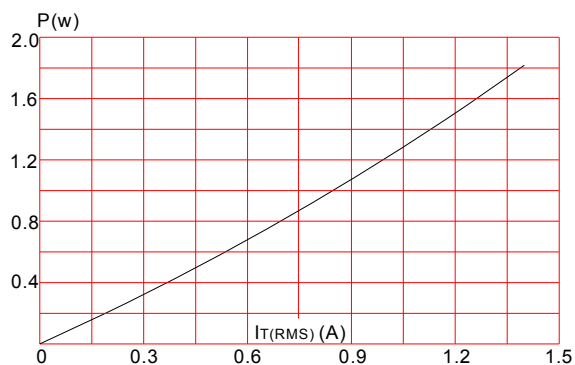
## ORDERING INFORMATION

|                                 |              |                        |   |                                  |   |                                                                                                                        |
|---------------------------------|--------------|------------------------|---|----------------------------------|---|------------------------------------------------------------------------------------------------------------------------|
| J                               | ST           | 131                    | V | -800                             | T | -TR                                                                                                                    |
| JieJie Microelectronics Co.,Ltd | TRIACs       | $I_{T(RMS)}: 1A$       |   |                                  |   | TR: Tape & Reel                                                                                                        |
|                                 | W:SOT-223-2L | V:SOT-223 N2:SOT-89-2L |   | 600: $V_{DRM}/V_{RRM} \geq 600V$ |   | T: $I_{GT1-4} \leq 5mA$<br>D: $I_{GT1-3} \leq 5mA$ $I_{GT4} \leq 10mA$<br>E: $I_{GT1-3} \leq 10mA$ $I_{GT4} \leq 25mA$ |
|                                 |              |                        |   | 800: $V_{DRM}/V_{RRM} \geq 800V$ |   |                                                                                                                        |

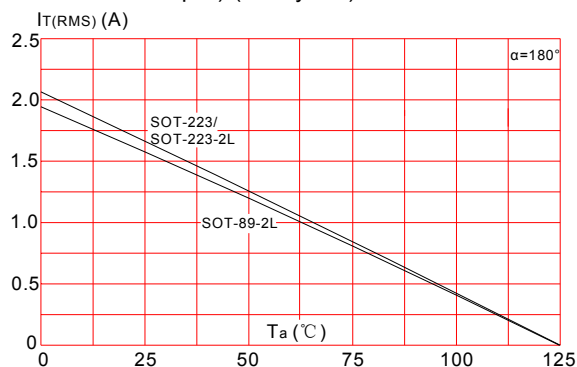
## MARKING

|                                                                                                                 |                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|  <p>131V8T<br/>XXX XXX</p>    |  <p>131W8T<br/>XXX XXX</p>              |
|  <p>131N2-8T<br/>XXX XXX</p> |  <p>Year XXX XXX<br/>Month XXX XXX</p> |

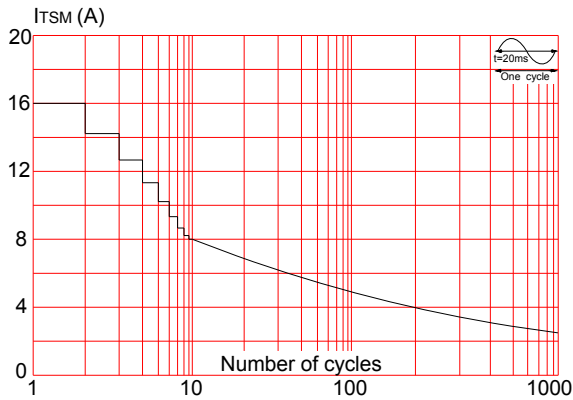
**FIG.1:** Maximum power dissipation versus RMS on-state current



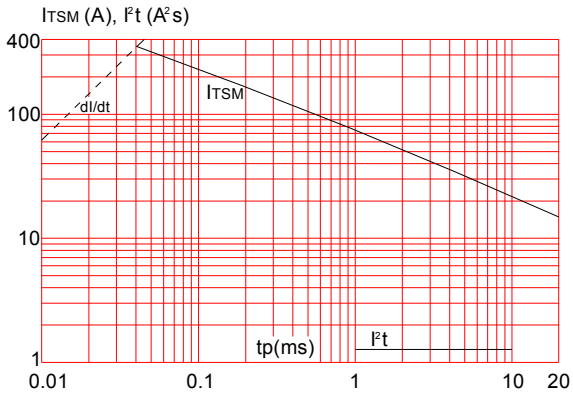
**FIG.2:** RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35 $\mu m$ ) (full cycle )



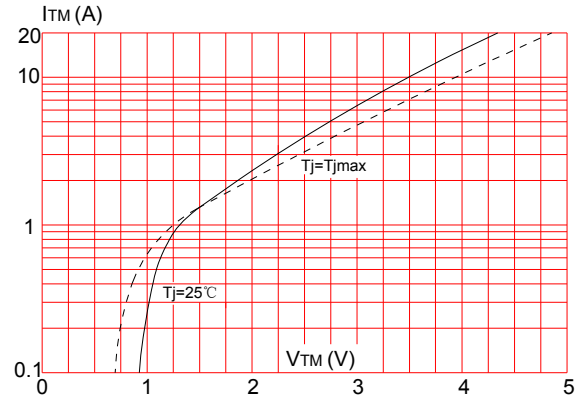
**FIG.3:** Surge peak on-state current versus number of cycles



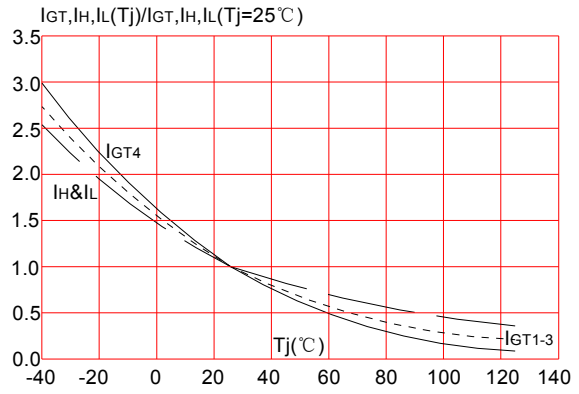
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$  and corresponding value of  $I^2t$  ( $dI/dt < 20\text{A}/\mu\text{s}$ )



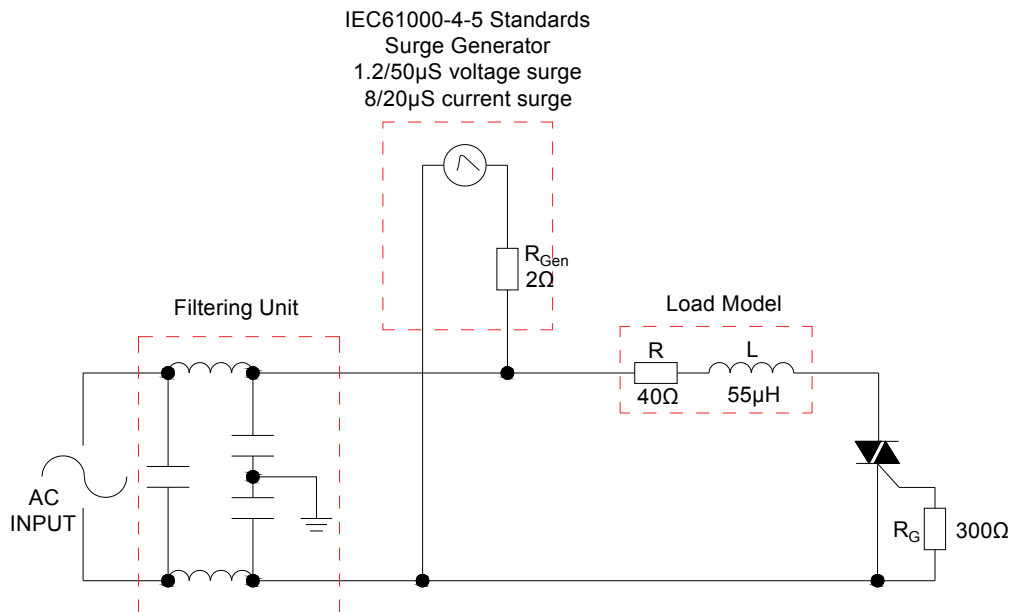
**FIG.4:** On-state characteristics (maximum values)



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

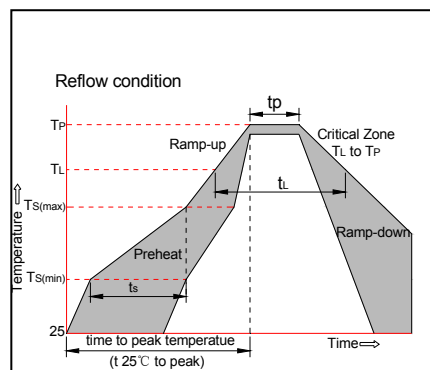


**FIG.7:** Test circuit for inductive and resistive loads to IEC-61000-4-5 standards.



## SOLDERING PARAMETERS

|                                                           |                                      |                                           |
|-----------------------------------------------------------|--------------------------------------|-------------------------------------------|
| Reflow Condition                                          |                                      | Pb-Free assembly<br>(see figure at right) |
| Pre Heat                                                  | -Temperature Min<br>( $T_{s(min)}$ ) | +150°C                                    |
|                                                           | -Temperature<br>Max( $T_{s(max)}$ )  | +200°C                                    |
|                                                           | -Time (Min to Max) (ts)              | 60-180 secs.                              |
| Average ramp up rate<br>(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( $T_L$ )<br>(Liquidus)  | +217°C                                    |
|                                                           | -Temperature( $t_L$ )                | 60-150 secs.                              |
| Peak Temp ( $T_P$ )                                       |                                      | +260(+0/-5)°C                             |
| Time within 5°C of actual<br>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                                    |



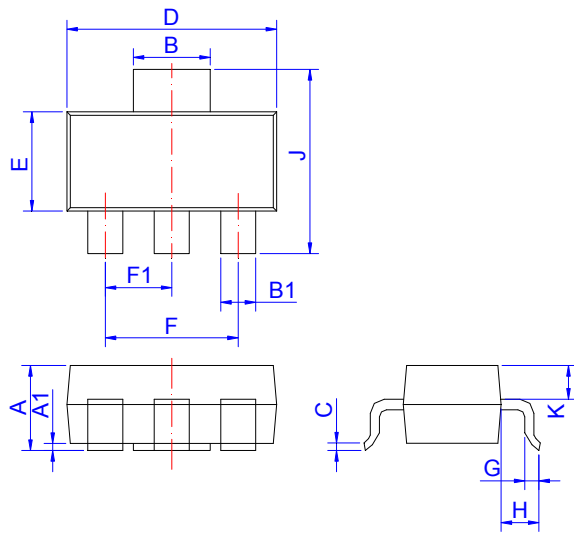
**ORDERING INFORMATION**

| Order code        | Voltage<br>V <sub>DRM</sub> /V <sub>RRM</sub><br>(V) | IGT(mA)      |    | Package    | Base qty.<br>(pcs) | Delivery<br>mode |
|-------------------|------------------------------------------------------|--------------|----|------------|--------------------|------------------|
|                   |                                                      | I - II - III | IV |            |                    |                  |
| JST131V-600/800T  | 600/800                                              | 5            | 5  | SOT-223    | 4,000              | Tape &<br>Reel   |
| JST131V-600/800D  | 600/800                                              | 5            | 10 |            |                    |                  |
| JST131V-600/800E  | 600/800                                              | 10           | 25 |            |                    |                  |
| JST131W-600/800T  | 600/800                                              | 5            | 5  | SOT-223-2L |                    |                  |
| JST131W-600/800D  | 600/800                                              | 5            | 10 |            |                    |                  |
| JST131W-600/800E  | 600/800                                              | 10           | 25 |            |                    |                  |
| JST131N2-600/800T | 600/800                                              | 5            | 5  | SOT-89-2L  |                    |                  |
| JST131N2-600/800D | 600/800                                              | 5            | 10 |            |                    |                  |
| JST131N2-600/800E | 600/800                                              | 10           | 25 |            |                    |                  |

**Document Revision History**

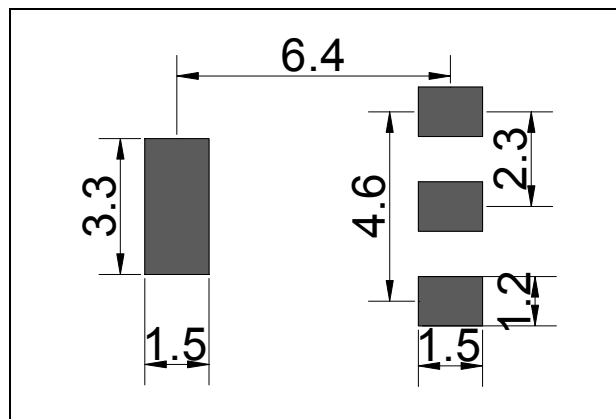
| Date           | Revision | Changes            |
|----------------|----------|--------------------|
| April 19, 2021 | 10       | Last update        |
| Sep 10, 2021   | 11       | Add Vpp value      |
| Sep 18, 2021   | 12       | Add Vto & Rd value |

## PACKAGE MECHANICAL DATA

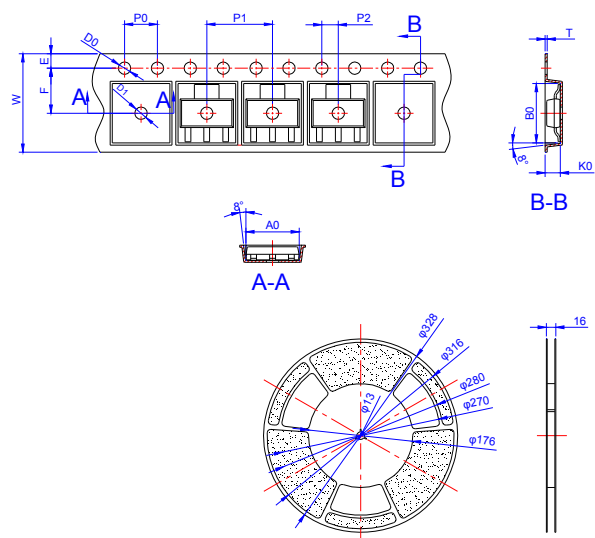


| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 1.5         | 1.6  | 1.8  | 0.059  | 0.063 | 0.071 |
| A1   | 0.01        | 0.06 | 0.10 | 0.001  | 0.002 | 0.004 |
| B    | 2.9         | 3.0  | 3.1  | 0.114  | 0.118 | 0.122 |
| B1   | 0.6         | 0.7  | 0.8  | 0.024  | 0.028 | 0.031 |
| C    | 0.22        | 0.26 | 0.32 | 0.009  | 0.010 | 0.013 |
| D    | 6.3         | 6.5  | 6.7  | 0.248  | 0.256 | 0.264 |
| E    | 3.3         | 3.5  | 3.7  | 0.130  | 0.138 | 0.146 |
| F    |             | 4.6  |      |        | 0.181 |       |
| F1   |             | 2.3  |      |        | 0.091 |       |
| G    | 0.7         | 0.9  | 1.1  | 0.028  | 0.035 | 0.043 |
| H    | 1.5         | 1.75 | 2.0  | 0.059  | 0.069 | 0.079 |
| J    | 6.7         | 7.0  | 7.3  | 0.264  | 0.276 | 0.287 |
| K    | 0.8         | 0.9  | 1.0  | 0.031  | 0.035 | 0.039 |

## FOOTPRINT-SOT-223 (dimensions in mm)



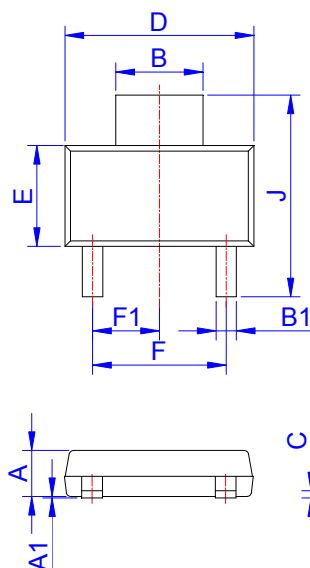
## DELIVERY MODE



| Ref. | Dimensions  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| W    | -           | 12.00 | 12.20 | -      | 0.472 | 0.480 |
| 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 |
| D0   | -           | 1.50  | 1.60  | -      | 0.059 | 0.063 |
| D1   | -           | 1.55  | 1.80  | -      | 0.061 | 0.071 |
| P0   | 3.90        | 4.00  | 4.10  | 0.154  | 0.157 | 0.161 |
| P1   | 7.90        | 8.00  | 8.10  | 0.311  | 0.315 | 0.319 |
| P2   | 1.95        | 2.00  | 2.05  | 0.077  | 0.079 | 0.081 |
| 10P0 | 39.80       | 40.00 | 40.20 | 1.567  | 1.575 | 1.583 |
| A0   | 6.73        | 6.83  | 6.93  | 0.265  | 0.269 | 0.273 |
| B0   | 7.30        | 7.40  | 7.50  | 0.287  | 0.291 | 0.295 |
| K0   | 1.78        | 1.88  | 1.98  | 0.070  | 0.074 | 0.078 |
| T    | 0.25        | 0.30  | 0.35  | 0.010  | 0.012 | 0.014 |

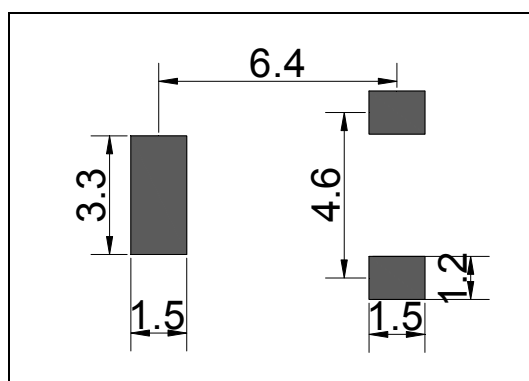
| PACKAGE | OUTLINE | REEL (PCS) | PER CARTON (PCS) | TAPE & REEL |
|---------|---------|------------|------------------|-------------|
| SOT-223 | TAPING  | 4,000      | 40,000           | 13 inch     |

## PACKAGE MECHANICAL DATA

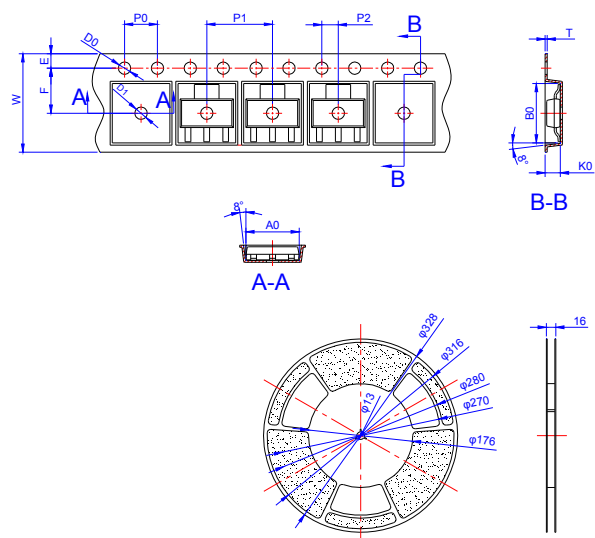


| Ref. | Dimensions  |       |      |        |       |       |
|------|-------------|-------|------|--------|-------|-------|
|      | Millimeters |       |      | Inches |       |       |
|      | Min.        | Typ.  | Max. | Min.   | Typ.  | Max.  |
| A    | 1.50        | 1.60  | 1.80 | 0.059  | 0.063 | 0.071 |
| A1   | 0.01        | 0.06  | 0.10 | 0.001  | 0.002 | 0.004 |
| B    | 2.90        | 3.00  | 3.10 | 0.114  | 0.118 | 0.122 |
| B1   | 0.60        | 0.70  | 0.80 | 0.024  | 0.028 | 0.031 |
| C    | 0.22        | 0.254 | 0.32 | 0.009  | 0.010 | 0.013 |
| D    | 6.30        | 6.50  | 6.70 | 0.248  | 0.256 | 0.264 |
| E    | 3.30        | 3.50  | 3.70 | 0.130  | 0.138 | 0.146 |
| F    |             | 4.60  |      |        | 0.181 |       |
| F1   |             | 2.30  |      |        | 0.091 |       |
| G    | 0.70        | 0.90  | 1.10 | 0.028  | 0.035 | 0.043 |
| H    | 1.50        | 1.75  | 2.00 | 0.059  | 0.069 | 0.079 |
| J    | 6.70        | 7.00  | 7.30 | 0.264  | 0.276 | 0.287 |
| K    |             | 0.90  |      |        | 0.035 |       |

## FOOTPRINT-SOT-223-2L (dimensions in mm)



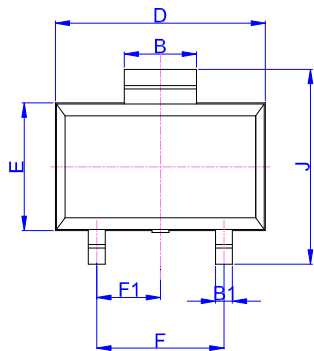
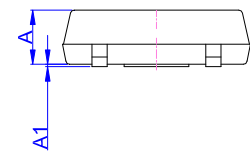
## DELIVERY MODE



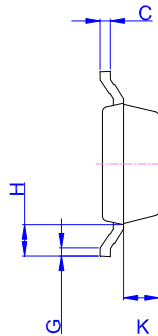
| Ref. | Dimensions  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| W    | -           | 12.00 | 12.20 | -      | 0.472 | 0.480 |
| 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 |
| D0   | -           | 1.50  | 1.60  | -      | 0.059 | 0.063 |
| D1   | -           | 1.55  | 1.80  | -      | 0.061 | 0.071 |
| P0   | 3.90        | 4.00  | 4.10  | 0.154  | 0.157 | 0.161 |
| P1   | 7.90        | 8.00  | 8.10  | 0.311  | 0.315 | 0.319 |
| P2   | 1.95        | 2.00  | 2.05  | 0.077  | 0.079 | 0.081 |
| 10P0 | 39.80       | 40.00 | 40.20 | 1.567  | 1.575 | 1.583 |
| A0   | 6.73        | 6.83  | 6.93  | 0.265  | 0.269 | 0.273 |
| B0   | 7.30        | 7.40  | 7.50  | 0.287  | 0.291 | 0.295 |
| K0   | 1.78        | 1.88  | 1.98  | 0.070  | 0.074 | 0.078 |
| T    | 0.25        | 0.30  | 0.35  | 0.010  | 0.012 | 0.014 |

| PACKAGE    | OUTLINE | REEL (PCS) | PER CARTON (PCS) | TAPE & REEL |
|------------|---------|------------|------------------|-------------|
| SOT-223-2L | TAPING  | 4,000      | 40,000           | 13 inch     |

## PACKAGE MECHANICAL DATA

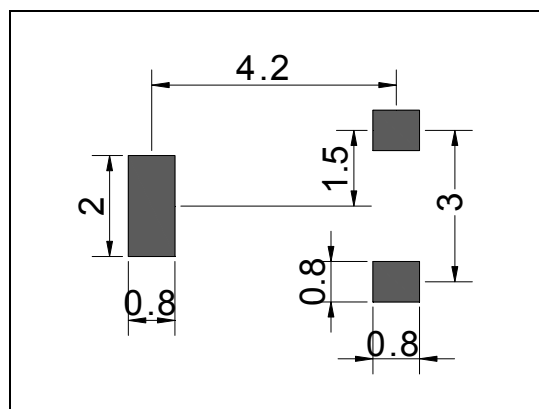


SOT-89-2L

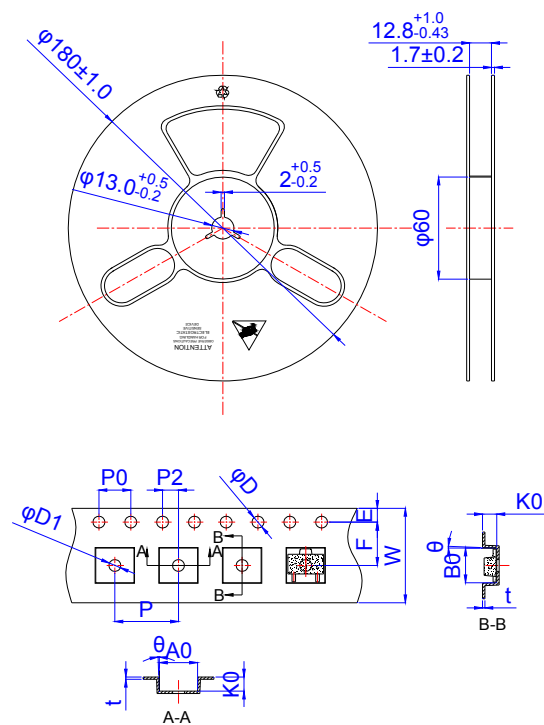


| Ref. | Dimensions  |       |      |        |       |       |
|------|-------------|-------|------|--------|-------|-------|
|      | Millimeters |       |      | Inches |       |       |
|      | Min.        | Typ.  | Max. | Min.   | Typ.  | Max.  |
| A    | 1.3         | 1.4   | 1.5  | 0.051  | 0.055 | 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    | 2.75        | 2.95  | 3.15 | 0.108  | 0.116 | 0.124 |
| F    |             | 3.0   |      |        | 0.118 |       |
| F1   |             | 1.5   |      |        | 0.059 |       |
| G    | 0.2         | 0.3   | 0.4  | 0.008  | 0.012 | 0.016 |
| H    | 0.58        | 0.78  | 0.98 | 0.023  | 0.031 | 0.039 |
| J    | 4.3         | 4.5   | 4.7  | 0.169  | 0.177 | 0.185 |
| K    |             | 0.88  |      |        | 0.035 |       |

## 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       | 1.95        | 2.00  | 2.05  | 0.077  | 0.079 | 0.081 |
| D        | -           | 1.50  | 1.60  | -      | 0.059 | 0.063 |
| D1       | 1.40        | 1.50  | 1.60  | 0.055  | 0.059 | 0.063 |
| 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        | 11.90       | 12.00 | 12.10 | 0.469  | 0.472 | 0.476 |
| P        | 7.90        | 8.00  | 8.10  | 0.311  | 0.315 | 0.319 |
| A0       | 4.70        | 4.80  | 4.90  | 0.185  | 0.189 | 0.193 |
| B0       | 4.30        | 4.40  | 4.50  | 0.169  | 0.173 | 0.177 |
| K0       | 1.70        | 1.80  | 1.90  | 0.067  | 0.071 | 0.075 |
| t        | 0.25        | 0.30  | 0.35  | 0.010  | 0.012 | 0.014 |
| $\theta$ | 3°          |       | 5°    | 3°     |       | 5°    |

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



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