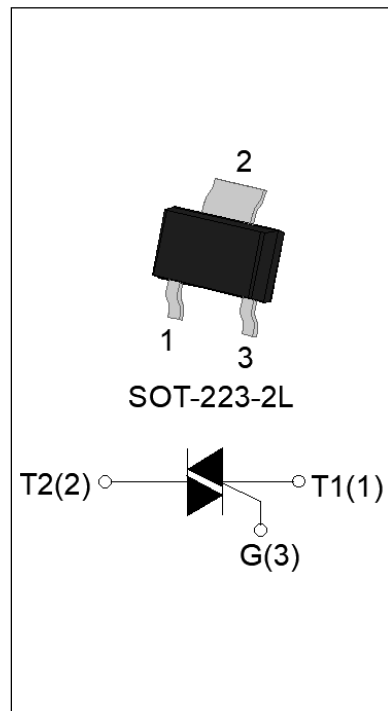


**JST04W-600BW 1A TRIAC**

Rev.A.1.1

**DESCRIPTION:**

The JST04W-600BW 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. JST04W-600BW snubberless triac is especially recommended for use on inductive loads. Package SOT-223-2L is RoHS compliant.


**MAIN FEATURES**

| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 1        | 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                                                                             | $T_j$        | -40-125 | °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 ( $T_c \leq 102^\circ\text{C}$ )                                                            | $I_{T(RMS)}$ | 1       | A                      |
| Non repetitive surge peak on-state current (full cycle , $t_p=20\text{ms}$ , $T_j=25^\circ\text{C}$ )            | $I_{TSM}$    | 25      | A                      |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6\text{ms}$ , $T_j=25^\circ\text{C}$ )          |              | 27.5    |                        |
| $I^2t$ value for fusing ( $t_p=10\text{ms}$ , $T_j=25^\circ\text{C}$ )                                           | $I^2t$       | 3.1     | $\text{A}^2\text{s}$   |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100\text{Hz}$ , $T_j=125^\circ\text{C}$ ) | $di/dt$      | 100     | $\text{A}/\mu\text{s}$ |
| Peak gate current ( $t_p=20\mu\text{s}$ , $T_j=125^\circ\text{C}$ )                                              | $I_{GM}$     | 2       | A                      |
| Average gate power dissipation ( $T_j=125^\circ\text{C}$ )                                                       | $P_{G(AV)}$  | 0.1     | W                      |
| Peak gate power                                                                                                  | $P_{GM}$     | 5       | W                      |

|                                                                                      |          |   |    |
|--------------------------------------------------------------------------------------|----------|---|----|
| Peak pulse voltage<br>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.8) | $V_{pp}$ | 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                |
| $V_{GD}$    | $V_D=V_{DRM}$ $T_j=125^{\circ}\text{C}$<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          |       | 80   |                  |
| $I_H$       | $I_T=100\text{mA}$                                                                 |             | MAX.  | 60   | mA               |
| $dV/dt$     | $V_D=400\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                              |             | MIN.  | 2000 | V/ $\mu\text{s}$ |
| $(dI/dt)_c$ | $(dV/dt)_c=20\text{V}/\mu\text{s}$ , $T_j=125^{\circ}\text{C}$                     |             | MIN.  | 10   | 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             |
|-----------|-------------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=1.5\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.35        | V                |
| $V_{TO}$  | Threshold voltage                         | $T_j=125^{\circ}\text{C}$ | 0.799       | V                |
| $R_D$     | Dynamic resistance                        | $T_j=125^{\circ}\text{C}$ | 151         | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$               | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                           | $T_j=125^{\circ}\text{C}$ | 0.2         | mA               |

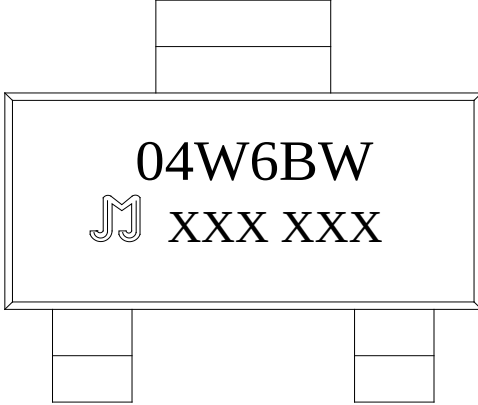
**THERMAL RESISTANCES**

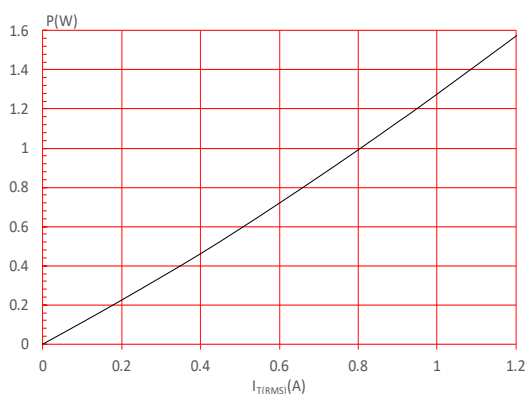
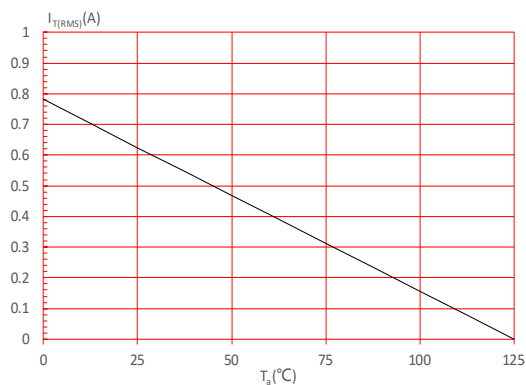
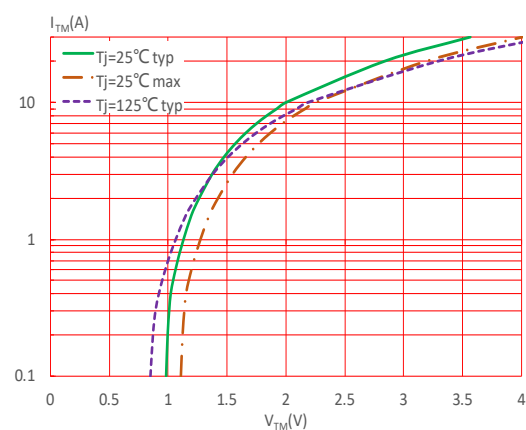
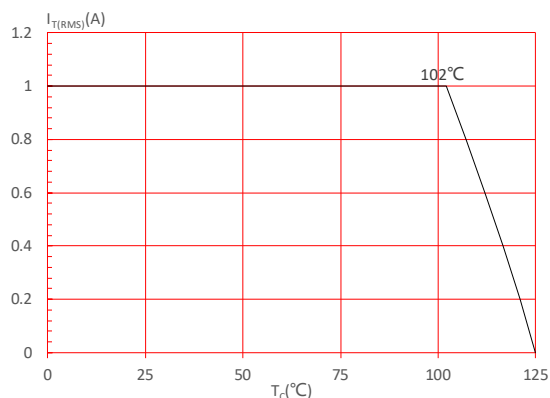
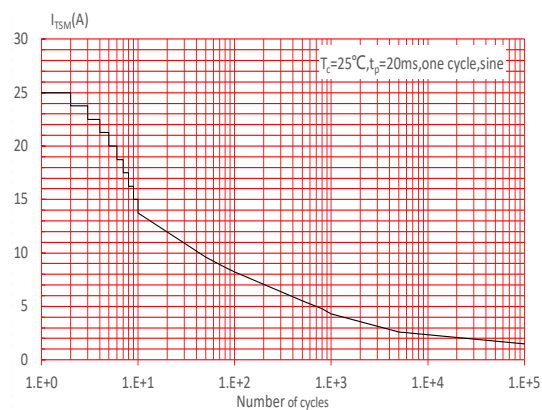
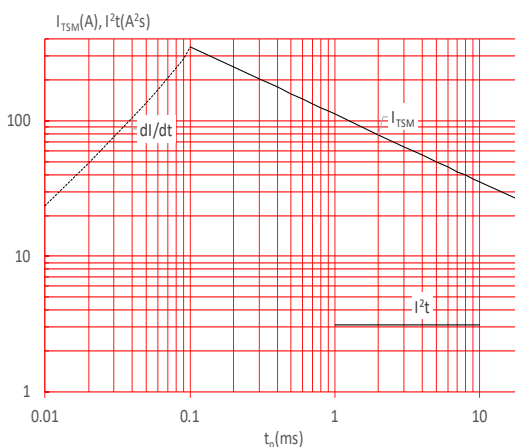
| Symbol        | Parameter                | Value | Unit                        |
|---------------|--------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 18    | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 160   | $^{\circ}\text{C}/\text{W}$ |

ORDERING INFORMATION

|                                   |           |                |          |                                   |                          |
|-----------------------------------|-----------|----------------|----------|-----------------------------------|--------------------------|
| <u>J</u>                          | <u>ST</u> | <u>04</u>      | <u>W</u> | <u>-600</u>                       | <u>BW</u>                |
| JieJie Microelectronics Co., Ltd. | Triacs    | $I_T(RMS):1A$  |          |                                   |                          |
|                                   |           | $W:SOT-223-2L$ |          |                                   | $BW:I_{GT1-3} \leq 50mA$ |
|                                   |           |                |          | $600:V_{DRM} / V_{RRM} \geq 600V$ |                          |

MARKING

|                                                                                                                                                                                                   |                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
|  <p>04W6BW<br/> XXX XXX</p> | <p><u>XXX XXX</u></p> <p>LOT NO.</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|

**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 $\mu m$ )(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  $t_p < 20ms$ , and corresponding value of  $I^2t$  ( $di/dt < 100A/\mu s$ )


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

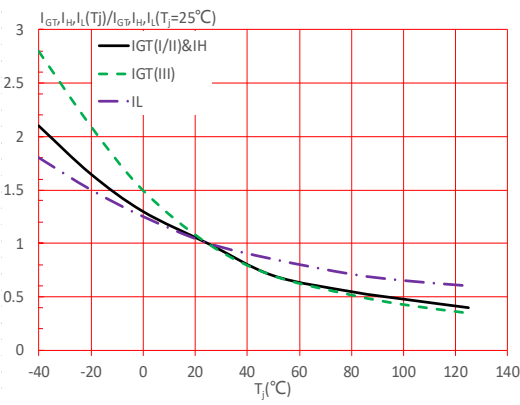
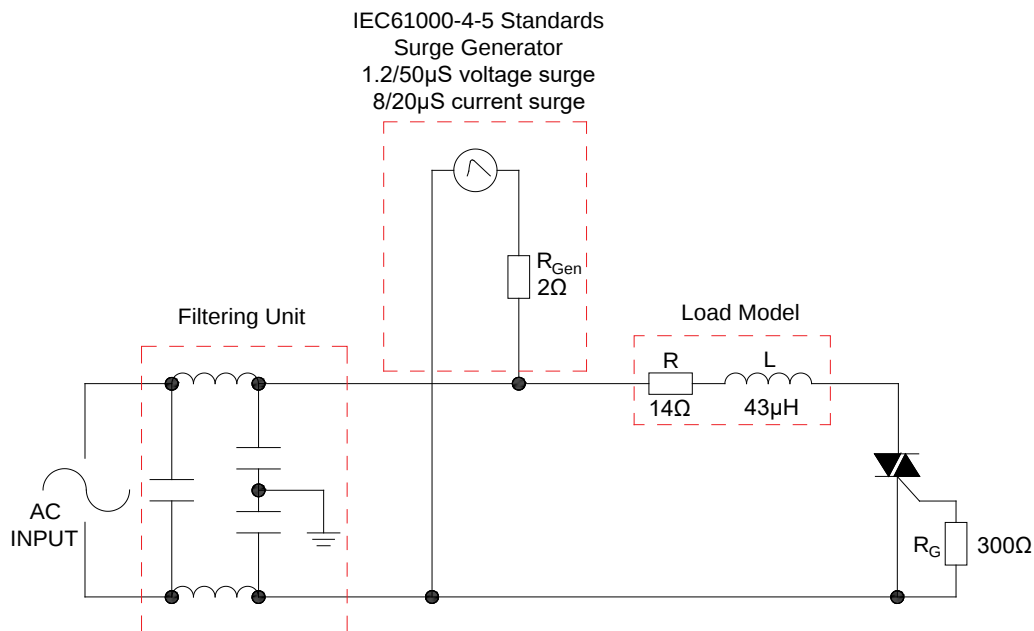
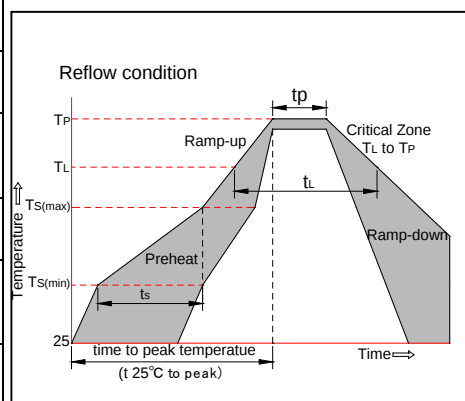


FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## SOLDERING PARAMETERS

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



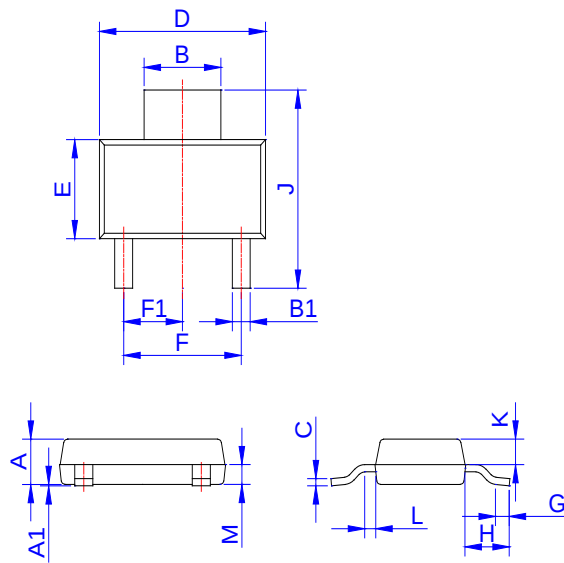
**ORDERING INFORMATION**

| Order code   | Voltage<br>$V_{\text{DRM}}/V_{\text{RRM}}$ (V) | IGT(mA)      | Package    | Base qty.<br>(pcs) | Delivery<br>mode |
|--------------|------------------------------------------------|--------------|------------|--------------------|------------------|
|              |                                                | I - II - III |            |                    |                  |
| JST04W-600BW | 600                                            | 50           | SOT-223-2L | 4,000              | Tape & Reel      |

**Document Revision History**

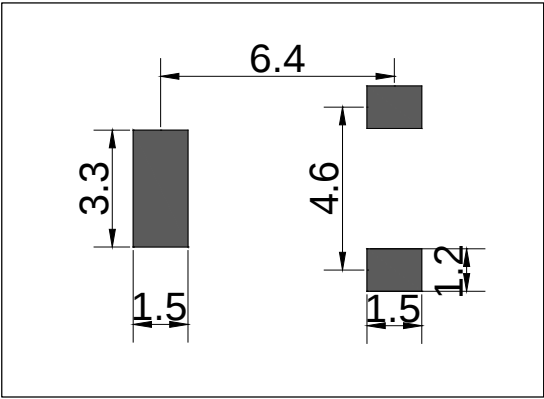
| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Apr.11, 2023 | A.1.0    | Last updated                   |
| Oct.24, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

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    | 4.40        |       | 4.80 | 0.173  |       | 0.189 |
| F1   | 2.20        |       | 2.40 | 0.087  |       | 0.094 |
| G    | 0.50        |       | 1.00 | 0.020  |       | 0.039 |
| 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    | 0.80        |       | 1.00 | 0.031  |       | 0.039 |
| L    | 0.40        |       | 0.80 | 0.016  |       | 0.031 |
| M    | 0.75        |       | 0.95 | 0.030  |       | 0.037 |

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



[illegible]

| Ref. | Dimensions  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| W    | -           | -     | 12.30 | -      |       | 0.482 |
| 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        | 1.55  | 1.60  | 0.059  | 0.061 | 0.063 |
| D1   | 1.50        | -     | -     | 0.059  | -     | -     |
| 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   | 6.85        | 6.95  | 7.05  | 0.269  | 0.273 | 0.276 |
| B0   | 7.15        | 7.25  | 7.35  | 0.280  | 0.284 | 0.288 |
| K0   | 1.95        | 2.05  | 2.15  | 0.076  | 0.080 | 0.084 |
| T    | 0.20        | 0.25  | 0.30  | 0.008  | 0.010 | 0.012 |

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

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