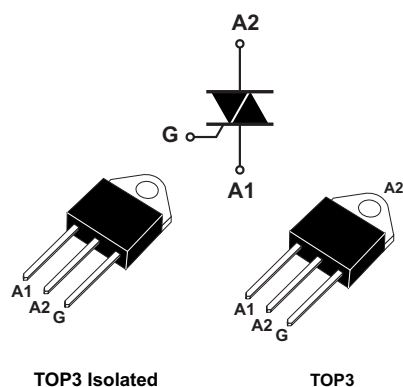


## 800 V and 600 V, 25 A standard Triacs in TOP3 package



### Features

- High current Triac
- Low thermal resistance with clip bonding
- Standard commutation (4 quadrants) or snubberless (3 quadrants), both with high turn-off commutation
- BTA26 UL1557 recognized components (file ref: 81734)
- RoHS (2002/95/EC) compliant packages

### Application

- On/off function in static relays, heating regulation, induction motor starting circuits
- Phase control operations in light dimmers and motor speed controllers

### Description

Available in TOP3 insulated and non-insulated package, BTA26 and BTB26 are suitable for general purpose AC switching.

BTA26 and BTB26 provide an insulated tab (rated at 2500 V<sub>RMS</sub>). These components are UL recognized and meet UL 1557 (file ref. 81734).



| Product status link   |                       |
|-----------------------|-----------------------|
| <a href="#">BTA26</a> | TOP3 isolated package |
| <a href="#">BTB26</a> | TOP3 package          |

| Product summary                                                  |                |
|------------------------------------------------------------------|----------------|
| <b>I<sub>T(RMS)</sub></b>                                        | 25 A           |
| <b>V<sub>DRM</sub>/V<sub>RSM</sub></b>                           | 600 V to 800 V |
| <b>I<sub>GT(standard)</sub></b>                                  | 50 mA          |
| <b>I<sub>GT(Snubberless)</sub></b><br><b>BTA26<sup>(1)</sup></b> | 35 / 50 mA     |

1. 600 V version available only with I<sub>GT</sub> = 50 mA (Snubberless and Standard)

# 1 Characteristics

**Table 1. Absolute maximum ratings**

| Symbol                              | Parameters                                                                                                  |                        |                          | Value                                        | Unit             |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------|--------------------------|----------------------------------------------|------------------|
| I <sub>T(RMS)</sub>                 | RMS on-state current (180° conduction angle)                                                                | BTA26 (TOP3 Ins.)      | T <sub>c</sub> = 100 °C  | 25                                           | A                |
|                                     |                                                                                                             | BTB26 (TOP3)           | T <sub>c</sub> = 105 °C  |                                              |                  |
| I <sub>TSM</sub>                    | Non repetitive surge peak on-state current (full cycle, T <sub>j</sub> initial = 25 °C)                     | f = 60 Hz              | t <sub>p</sub> = 16,7 ms | 260                                          | A                |
|                                     |                                                                                                             | f = 50 Hz              | t <sub>p</sub> = 20 ms   | 250                                          |                  |
| I <sup>2</sup> t                    | I <sup>2</sup> t value for fusing                                                                           | t <sub>p</sub> = 10 ms |                          | 340                                          | A <sup>2</sup> s |
| di/dt                               | Critical rate of rise of on-state current<br>I <sub>G</sub> = 2 x I <sub>GT</sub> , t <sub>r</sub> ≤ 100 ns | f = 120 Hz             | T <sub>j</sub> = 125 °C  | 50                                           | A/μs             |
| V <sub>DSM</sub> , V <sub>RSM</sub> | Non repetitive surge peak off-state voltage                                                                 | t <sub>p</sub> = 20 ms | T <sub>j</sub> = 25 °C   | V <sub>DRM</sub> , V <sub>RRM</sub><br>+ 100 | V                |
| I <sub>GM</sub>                     | Peak gate current                                                                                           | t <sub>p</sub> = 20 μs | T <sub>j</sub> = 125 °C  | 4                                            | A                |
| P <sub>G(AV)</sub>                  | Average gate power dissipation                                                                              |                        | T <sub>j</sub> = 125 °C  | 1                                            | W                |
| T <sub>stg</sub>                    | Storage junction temperature range                                                                          |                        |                          | -40 to +150                                  | °C               |
| T <sub>j</sub>                      | Operating junction temperature range                                                                        |                        |                          | -40 to +125                                  | °C               |
| T <sub>L</sub>                      | Maximum lead temperature for soldering during 10 s                                                          |                        |                          | 250                                          | °C               |
| V <sub>INS</sub>                    | Insulation RMS voltage, 1 minute                                                                            |                        |                          | 2500                                         | V                |

**Table 2. Electrical characteristics ( $T_j = 25\text{ °C}$ , unless otherwise specified) - Snubberless and Standard (3 quadrants)**

| Symbol            | Parameters                                                              | Quadrant     |      | BTA/BTB |      | Unit       |
|-------------------|-------------------------------------------------------------------------|--------------|------|---------|------|------------|
|                   |                                                                         |              |      | CW      | BW   |            |
| $I_{GT}^{(1)}$    | $V_D = 12\text{ V}$ , $R_L = 33\text{ }\Omega$                          | I - II - III | Max. | 35      | 50   | mA         |
| $V_{GT}$          |                                                                         | I - II - III | Max. | 1.3     |      | V          |
| $V_{GD}$          | $V_D = V_{DRM}$ , $R_L = 3.3\text{ k}\Omega$ , $T_j = 125\text{ °C}$    | I - II - III | Min. | 0.2     |      | V          |
| $I_H^{(2)}$       | $I_T = 500\text{ mA}$                                                   |              | Max. | 50      | 75   | mA         |
| $I_L$             | $I_G = 1.2 I_{GT}$                                                      | I - III      | Max. | 70      | 80   | mA         |
|                   |                                                                         | II           | Max. | 80      | 100  |            |
| $dV/dt^{(2)}$     | $V_D = 67\text{ }\%$ $V_{DRM}$ gate open, $T_j = 125\text{ °C}$         |              | Min. | 500     | 1000 | V/ $\mu$ s |
| $(di/dt)_c^{(2)}$ | $(di/dt)_c = 20\text{ A/ms}$ , without snubber at $T_j = 125\text{ °C}$ |              | Min. | 13      | 22   | A/ms       |

1. Minimum  $I_{GT}$  is guaranteed at 5 % of  $I_{GT}$  max.

2. For both polarities of A2 referenced to A1

**Table 3. Electrical characteristics ( $T_j = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) - Standard (4 quadrants)**

| Symbol            | Parameters                                                                   | Quadrant           |      | Value     | Unit             |
|-------------------|------------------------------------------------------------------------------|--------------------|------|-----------|------------------|
| $I_{GT}^{(1)}$    | $V_D = 12\text{ V}, R_L = 33\text{ }\Omega$                                  | I - II - III<br>IV | Max. | 50<br>100 | mA               |
| $V_{GT}$          |                                                                              | All                | Max. | 1.3       | V                |
| $V_{GD}$          | $V_D = V_{DRM}, R_L = 3.3\text{ k}\Omega, T_j = 125\text{ }^{\circ}\text{C}$ | All                | Min. | 0.2       | V                |
| $I_H^{(2)}$       | $I_T = 500\text{ mA}$                                                        |                    | Max. | 80        | mA               |
| $I_L$             | $I_G = 1.2\text{ } I_{GT}$                                                   | I - III - IV       | Max. | 70        | mA               |
|                   |                                                                              | II                 | Max. | 160       |                  |
| $dV/dt^{(2)}$     | $V_D = 67\text{ }\% V_{DRM}$ gate open, $T_j = 125\text{ }^{\circ}\text{C}$  |                    | Min. | 500       | V/ $\mu\text{s}$ |
| $(dV/dt)_c^{(2)}$ | $(dI/dt)_c = 13.3\text{ A/ms}, T_j = 125\text{ }^{\circ}\text{C}$            |                    | Min. | 10        | V/ $\mu\text{s}$ |

 1. Minimum  $I_{GT}$  is guaranteed at 5 % of  $I_{GT}$  max.

2. For both polarities of A2 referenced to A1

**Table 4. Static electrical characteristics**

| Symbol            | Test conditions                                      | $T_j$                         |      | Value | Unit          |
|-------------------|------------------------------------------------------|-------------------------------|------|-------|---------------|
| $V_{TM}^{(1)}$    | $I_{TM} = 35\text{ A}, t_p = 380\text{ }\mu\text{s}$ | $25\text{ }^{\circ}\text{C}$  | Max. | 1.55  | V             |
| $V_{TO}^{(1)}$    | threshold on-state voltage                           | $125\text{ }^{\circ}\text{C}$ | Max. | 0.85  | V             |
| $R_D^{(1)}$       | Dynamic resistance                                   | $125\text{ }^{\circ}\text{C}$ | Max. | 16    | m $\Omega$    |
| $I_{DRM}/I_{RRM}$ | $V_T = V_{DRM}, V_T = V_{RRM}$                       | $25\text{ }^{\circ}\text{C}$  | Max. | 5     | $\mu\text{A}$ |
|                   |                                                      | $125\text{ }^{\circ}\text{C}$ |      | 3     | mA            |

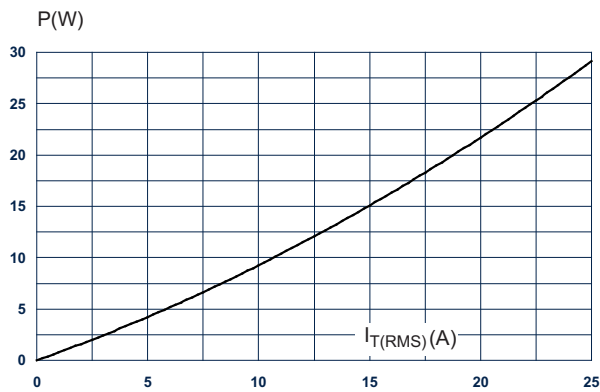
1. For both polarities of A2 referenced to A1

**Table 5. Thermal resistance**

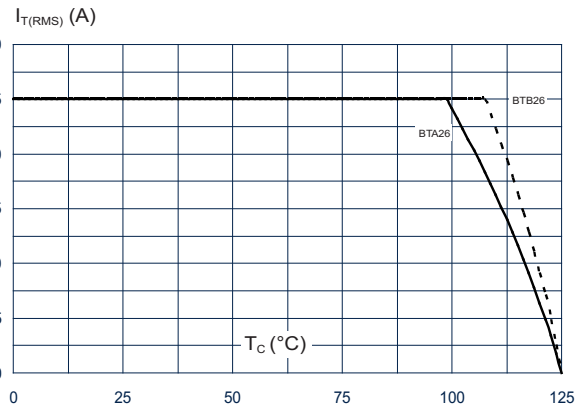
| Symbol        | Parameters            |                                  |      | Value | Unit                 |
|---------------|-----------------------|----------------------------------|------|-------|----------------------|
| $R_{th(j-c)}$ | Junction to case (AC) | BTA26 (TOP3 Ins.)                | Max. | 0.9   | $^{\circ}\text{C/W}$ |
|               |                       | BTB26 (TOP3)                     |      | 0.6   |                      |
| $R_{th(j-a)}$ | Junction to ambient   | BTA26 (TOP3 Ins.) / BTB26 (TOP3) | Typ. | 50    |                      |

## 1.1 Characteristics (curves)

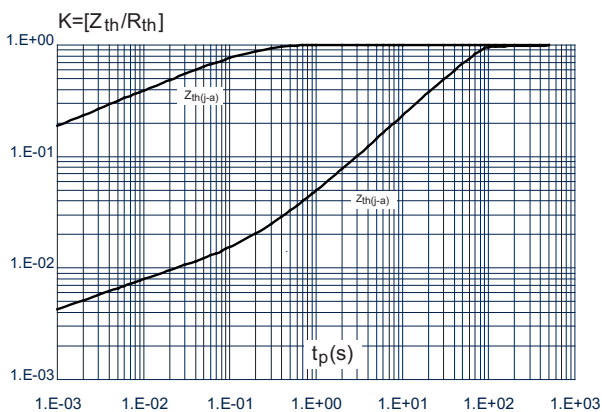
**Figure 1. Maximum power dissipation versus on-state RMS current (full cycle)**



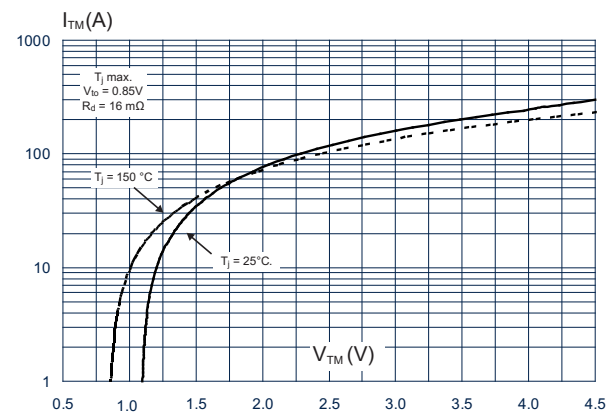
**Figure 2. RMS on-state current versus case temperature (full cycle)**



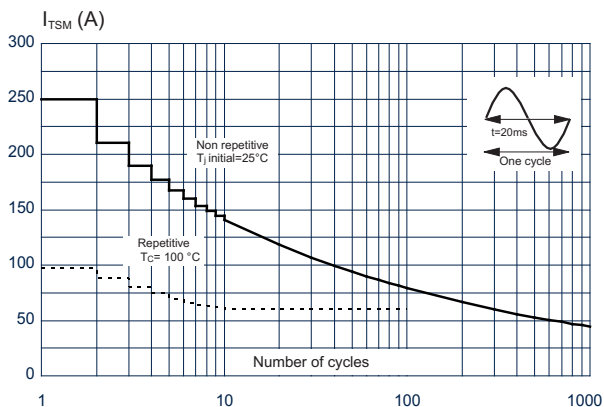
**Figure 3. Relative variation of thermal impedance versus pulse duration**



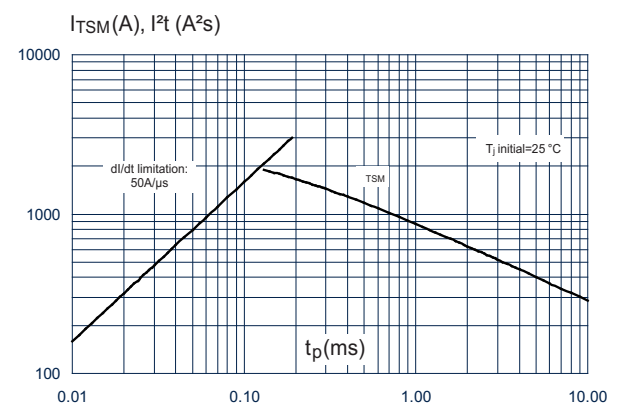
**Figure 4. On-state characteristics (maximum values)**



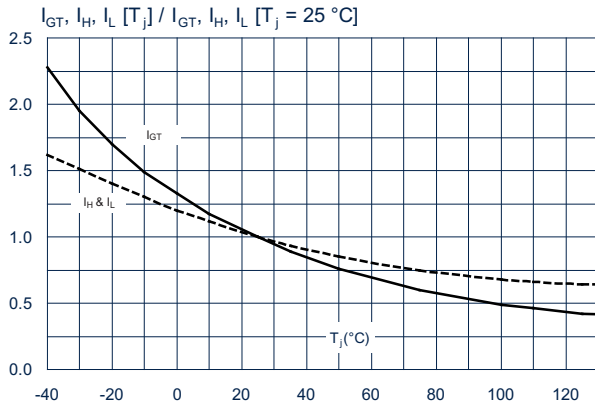
**Figure 5. Surge peak on-state current versus number of cycles**



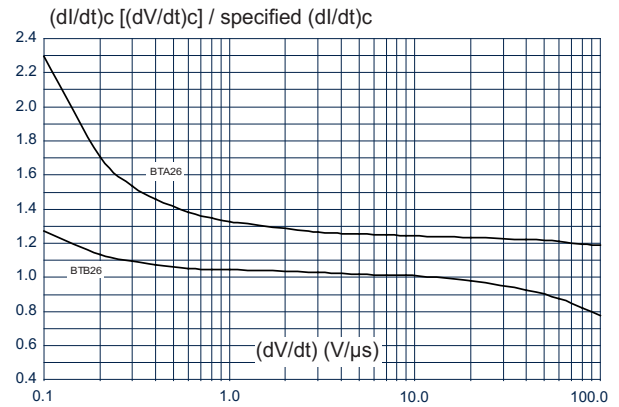
**Figure 6. Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms**



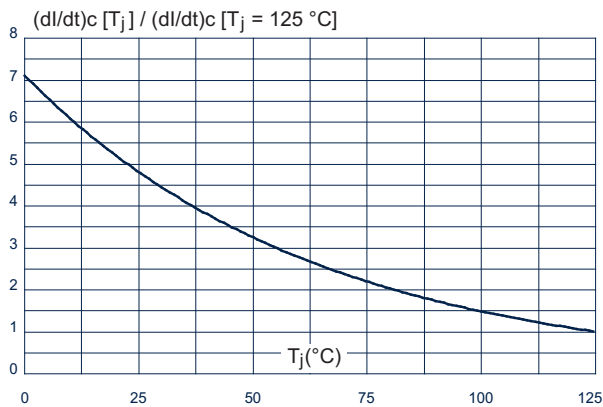
**Figure 7. Relative variation of gate trigger current, holding and latching current versus junction temperature (typical values)**



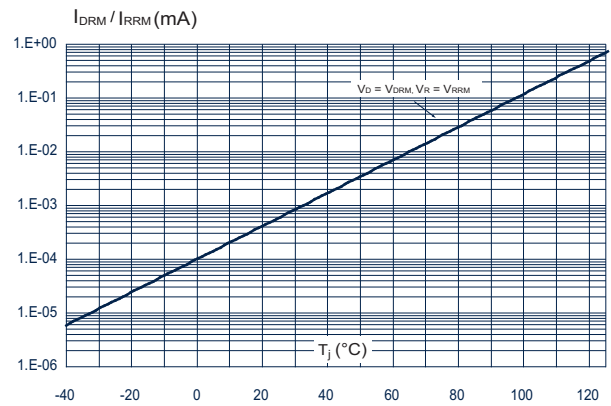
**Figure 8. Relative variation of critical rate of decrease of main current versus  $(dV/dt)$  (typical values)**



**Figure 9. Relative variation of critical rate of decrease of main current versus junction temperature**



**Figure 10. Relative variation of leakage current versus junction temperature for different values of blocking voltage**



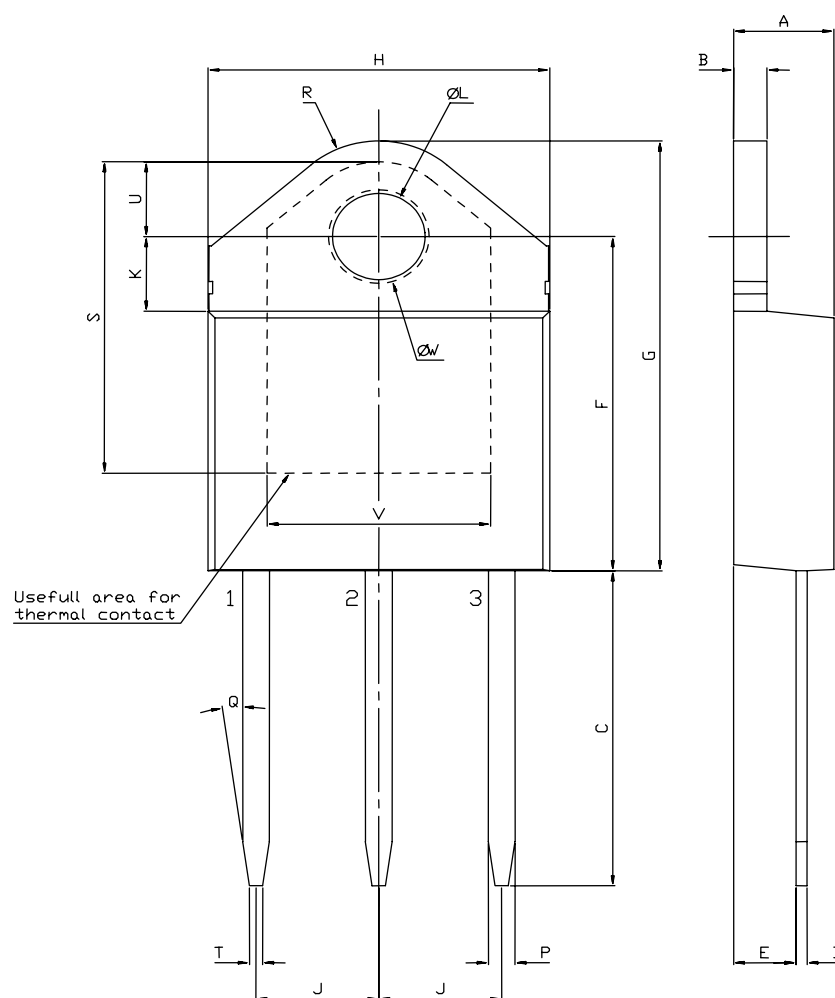
## 2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK is an ST trademark.

### 2.1 TOP3 insulated and non-insulated package information

- Epoxy meets UL94, V0
- Lead-free packages
- Recommended torque: 1.05 N·m (max. torque: 1.2 N·m)

**Figure 11. TOP3 insulated and non-insulated package outline**



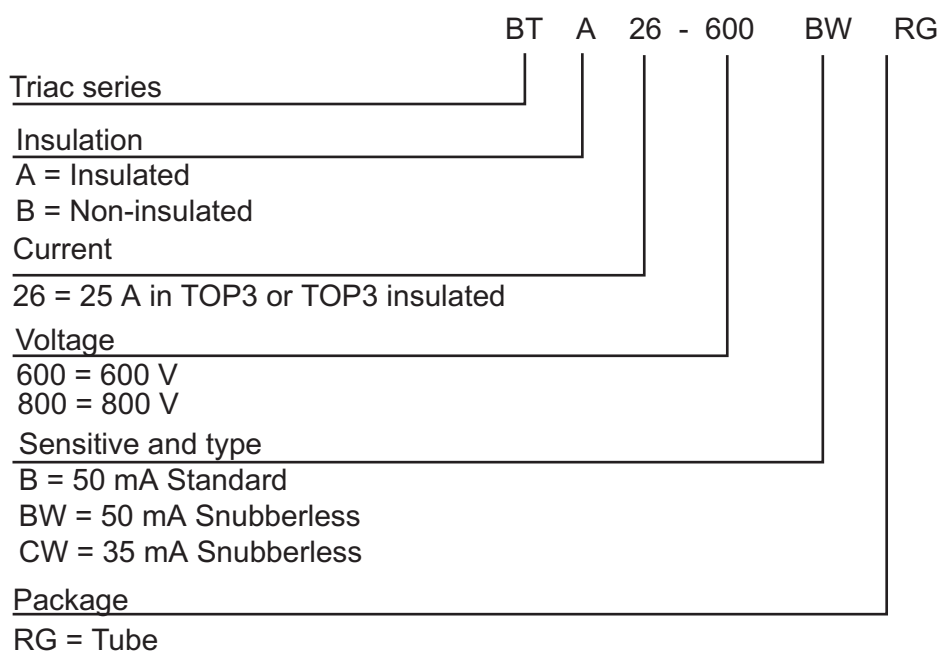
**Table 6. TOP3 insulated and non-insulated mechanical data**

| Ref. | Dimensions |      |       |                       |        |        |
|------|------------|------|-------|-----------------------|--------|--------|
|      | mm         |      |       | Inches <sup>(1)</sup> |        |        |
|      | Min.       | Typ. | Max.  | Min.                  | Typ.   | Max.   |
| A    | 4.40       |      | 4.60  | 0.1732                |        | 0.1812 |
| B    | 1.45       |      | 1.55  | 0.0570                |        | 0.0611 |
| C    | 14.35      |      | 15.60 | 0.5649                |        | 0.6142 |
| D    | 0.50       |      | 0.70  | 0.0196                |        | 0.0276 |
| E    | 2.70       |      | 2.90  | 0.1062                |        | 0.1142 |
| F    | 15.80      |      | 16.50 | 0.6220                |        | 0.6497 |
| G    | 20.40      |      | 21.10 | 0.8031                |        | 0.8308 |
| H    | 15.10      |      | 15.50 | 0.5944                |        | 0.6103 |
| J    | 5.40       |      | 5.65  | 0.2125                |        | 0.2225 |
| K    | 3.40       |      | 3.65  | 0.1338                |        | 0.1438 |
| L    | 4.08       |      | 4.17  | 0.1606                |        | 0.1642 |
| P    | 1.10       |      | 1.30  | 0.0430                |        | 0.0510 |
| R    |            | 4.60 |       |                       | 0.1811 |        |

1. Inches given for reference only

### 3 Ordering information

**Figure 12.** Ordering information scheme (BTA26 and BTB26)



**Table 7.** Ordering information

| Order code    | Marking    | Package   | Weight | Base qty. | Delivery mode |
|---------------|------------|-----------|--------|-----------|---------------|
| BTA26-600BRG  | BTA26600B  | TOP3 Ins. | 4.5 g  | 30        | Tube          |
| BTA26-600BWRG | BTA26600BW |           |        |           |               |
| BTA26-800BRG  | BTA26800B  |           |        |           |               |
| BTB26-800BWRG | BTB26800BW | TOP3      |        |           |               |
| BTB26-800CWRG | BTB26800CW |           |        |           |               |
| BTB26-600BRG  | BTB26600B  |           |        |           |               |

## Revision history

**Table 8. Document revision history**

| Date        | Revision | Changes                                                                             |
|-------------|----------|-------------------------------------------------------------------------------------|
| 03-Aug-2021 | 1        | Initial release.                                                                    |
| 26-Jul-2023 | 2        | Updated <a href="#">Table 6</a> . TOP3 insulated and non-insulated mechanical data. |

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