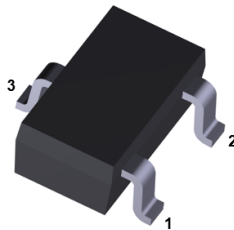
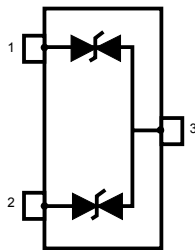


## Automotive transient voltage suppressor (TVS) in SOT23-3L



**SOT23-3L**  
(Jedec TO-236)



### Features

- AEC-Q101 qualified 
- Dual-line ESD and EOS protection
- Bidirectional device
- Max. pulse power: 140 W (8/20  $\mu$ s)
- Low clamping factor  $V_{CL}/V_{BR}$
- Low leakage current
- ECOPACK2 compliant
- Complies with the standard ISO 10605 - C = 150 pF, R = 330  $\Omega$ 
  - $\pm 13$  kV (air discharge)
  - $\pm 13$  kV (contact discharge)
- Complies with the standard ISO 10605 - C = 330 pF, R = 330  $\Omega$ 
  - $\pm 10$  kV (air discharge)
  - $\pm 10$  kV (contact discharge)
- Complies with the standard ISO 10605 - C = 330 pF, R = 2 k $\Omega$ 
  - $\pm 30$  kV (air discharge)
  - $\pm 30$  kV (contact discharge)
- Complies with the standard ISO 7637-3
  - Fast transient pulse 3a:  $V_s = -150$  V
  - Fast transient pulse 3b:  $V_s = +150$  V
  - Slow transient pulse 2a:  $V_s = -85$  V
  - Slow transient pulse 2a:  $V_s = +85$  V

#### Product status link

[ESDAVLC6-2BLY](#)

#### Product summary

|            |               |
|------------|---------------|
| Order code | ESDAVLC6-2BLY |
| Package    | SOT23-3L      |
| Packing    | Tape and reel |

### Application

- Automotive interfaces

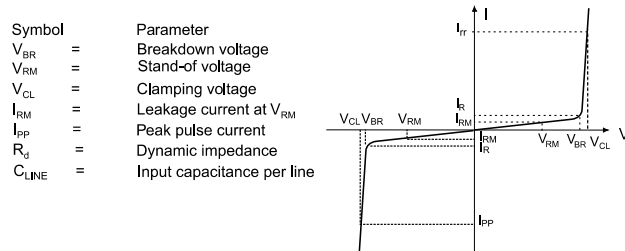
### Description

The **ESDAVLC6-2BLY** is a dual-line Transil specifically designed for the protection of the automotive buses lines against electrostatic discharge (ESD). Thanks to its low capacitance, this product is compliant with all key interfaces in automotive applications.

# 1 Characteristics

**Table 1. Absolute ratings ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

| Symbol    | Parameter                                                                             |                                                                 | Value       | Unit               |
|-----------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------|--------------------|
| $V_{PP}$  | Peak pulse voltage                                                                    | ISO 10605 - C = 150 pF, R = 330 $\Omega$ :<br>Contact discharge | 13          | kV                 |
|           |                                                                                       | Air discharge                                                   | 13          |                    |
|           |                                                                                       | ISO 10605 - C = 330 pF, R = 330 $\Omega$ :<br>Contact discharge | 10          |                    |
|           |                                                                                       | Air discharge                                                   | 10          |                    |
|           |                                                                                       | ISO 10605 - C = 330 pF, R = 2 k $\Omega$ :<br>Contact discharge | 30          |                    |
|           |                                                                                       | Air discharge                                                   | 30          |                    |
|           |                                                                                       |                                                                 |             |                    |
|           |                                                                                       |                                                                 |             |                    |
|           |                                                                                       |                                                                 |             |                    |
| $P_{PP}$  | Peak pulse power dissipation (8/20 $\mu\text{s}$ )<br>$T_j \text{ initial} = T_{amb}$ |                                                                 | 140         | W                  |
| $I_{PP}$  | Peak pulse current (8/20 $\mu\text{s}$ )                                              |                                                                 | 5.5         | A                  |
| $T_j$     | Operating junction temperature range                                                  |                                                                 | -55 to +150 | $^{\circ}\text{C}$ |
| $T_{stg}$ | Storage temperature range                                                             |                                                                 | -55 to +150 | $^{\circ}\text{C}$ |

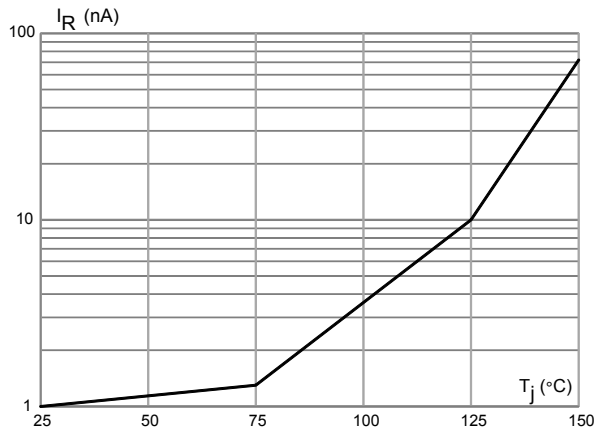
**Figure 1. Electrical characteristics (definitions)**

**Table 2. Electrical characteristics (values,  $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

| Symbol               | Test conditions                                                        | Min. | Typ. | Max. | Unit                       |
|----------------------|------------------------------------------------------------------------|------|------|------|----------------------------|
| $V_{BR}$             | $I_R = 1\text{ mA}$                                                    | 6    |      | 10   | V                          |
| $I_R$                | $V_{RM} = 5\text{ V}$                                                  |      |      | 100  | nA                         |
| $V_{CL}$             | At $I_{PP} = 1\text{ A}$ - 8/20 $\mu\text{s}$                          |      |      | 12   | V                          |
|                      | At $I_{PP} = 4\text{ A}$ - 8/20 $\mu\text{s}$                          |      |      | 17   |                            |
| $C_{I/O-GND}$        | $V_{I/O} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $V_{OSC} = 30\text{ mV}$ |      | 0.95 | 1.2  | pF                         |
| $\Delta C_{I/O-GND}$ |                                                                        |      | 0.01 |      |                            |
| $f_C$                | $S_{21} = -3\text{ dB}$                                                |      | 3    |      | GHz                        |
| $\alpha T^{(1)}$     |                                                                        |      | 9    |      | $10^{-4}/^{\circ}\text{C}$ |

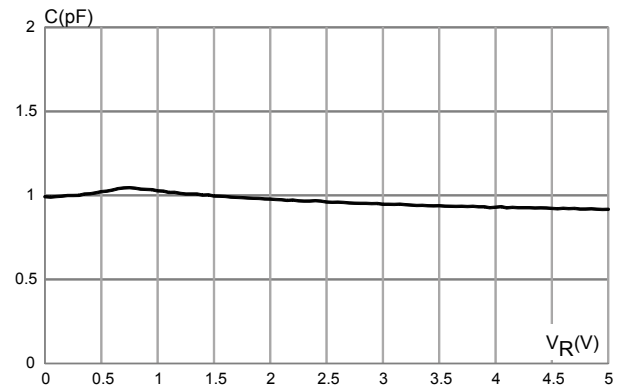
1.  $V_{BR}$  at  $T_j = V_{BR}$  at  $25\text{ }^{\circ}\text{C} \times (1 + \alpha T \times (T_j - 25))$

## 1.1 Characteristics (curves)

**Figure 2. Leakage current versus junction temperature**



**Figure 3. Junction capacitance versus reverse applied voltage**



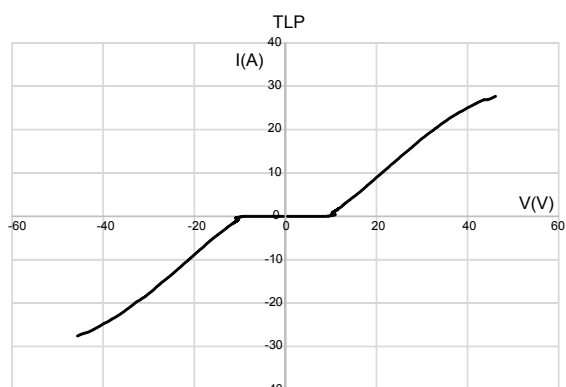
**Figure 4. ESD response to ISO10605-C = 150 pF, R = 330  $\Omega$  (+8 kV contact discharge)**



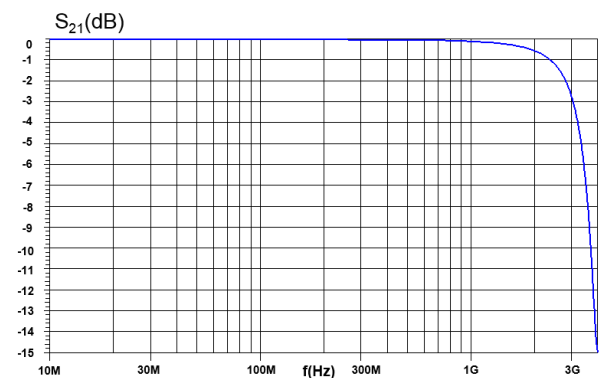
**Figure 5. ESD response to ISO10605-C = 150 pF, R = 330  $\Omega$  (-8 kV contact discharge)**

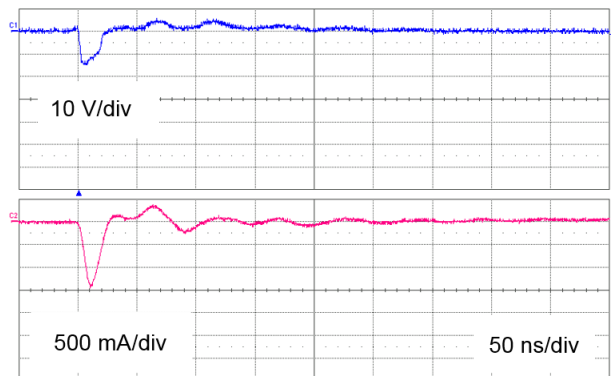
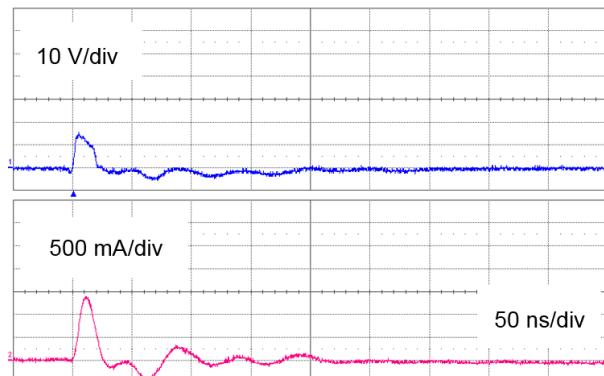
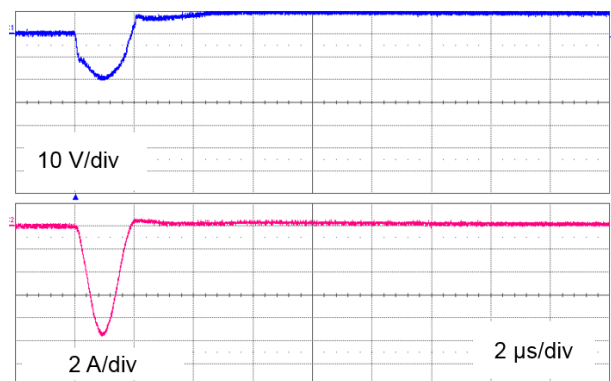
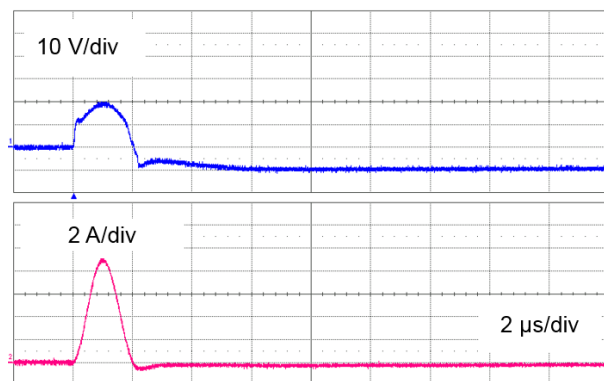


**Figure 6. TLP**



**Figure 7. S<sub>21</sub> attenuation**



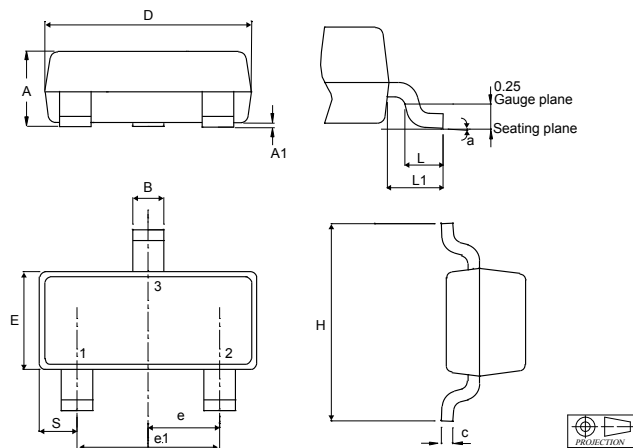
**Figure 8. Fast transient pulse 3a ( $U_s = -150\text{ V}$ )**

**Figure 9. Fast transient pulse 3b ( $U_s = +150\text{ V}$ )**

**Figure 10. Slow transient pulse 2a ( $U_s = -85\text{ V}$ )**

**Figure 11. Slow transient pulse 2a ( $U_s = +85\text{ V}$ )**


## 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 SOT23-3L package information

**Figure 12. SOT23-3L package outline**

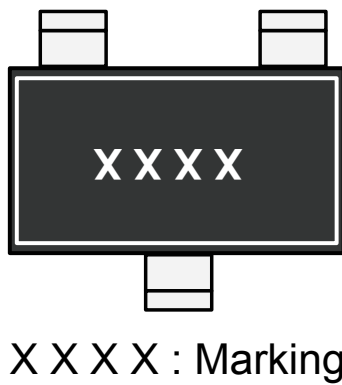


**Table 3. SOT23-3L package mechanical data**

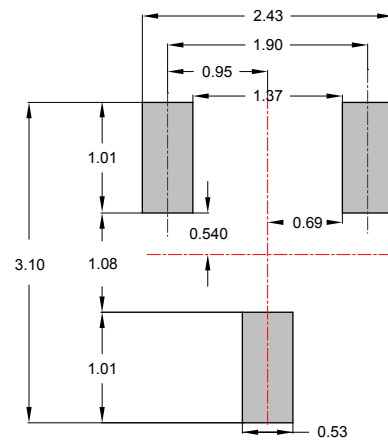
| Ref. | Dimensions  |      |      |                       |       |       |
|------|-------------|------|------|-----------------------|-------|-------|
|      | Millimeters |      |      | Inches <sup>(1)</sup> |       |       |
|      | Min.        | Typ. | Max. | Min.                  | Typ.  | Max.  |
| A    | 0.89        |      | 1.25 | 0.0350                |       | 0.050 |
| A1   | 0.00        |      | 0.15 | 0.0000                |       | 0.006 |
| B    | 0.30        |      | 0.51 | 0.011                 |       | 0.021 |
| C    | 0.085       |      | 0.20 | 0.003                 |       | 0.008 |
| D    | 2.75        |      | 3.04 | 0.108                 |       | 0.120 |
| E    | 1.20        |      | 1.75 | 0.047                 |       | 0.069 |
| e    | 0.85        | 0.95 | 1.05 | 0.033                 | 0.037 | 0.042 |
| e1   | 1.70        | 1.90 | 2.10 | 0.066                 | 0.075 | 0.083 |
| H    | 2.10        |      | 3.00 | 0.082                 |       | 0.119 |
| L    | 0.25        |      | 0.61 | 0.009                 |       | 0.025 |
| L1   |             | 0.55 |      |                       | 0.022 |       |
| S    | 0.35        |      | 0.65 | 0.013                 |       | 0.026 |
| a    | 0°          |      | 8°   | 0°                    |       | 8°    |

1. Dimension in inches are given for reference only.

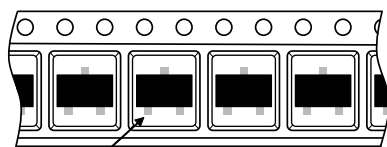
**Figure 13. SOT23-3L marking**



**Figure 14. SOT23-3L footprint in mm**



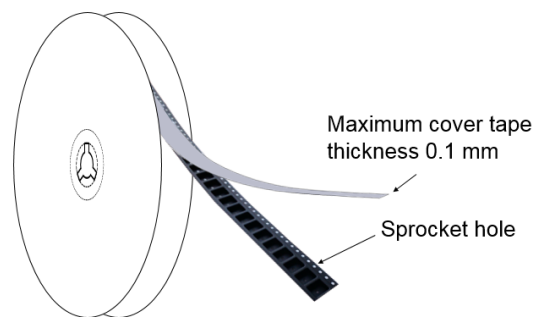
**Figure 15. Package orientation in reel**



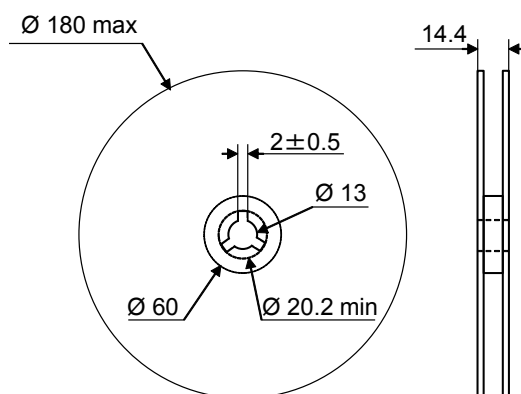
Pin 1 located according to EIA-481

Note: Pocket dimensions are not on scale  
Pocket shape may vary depending on package

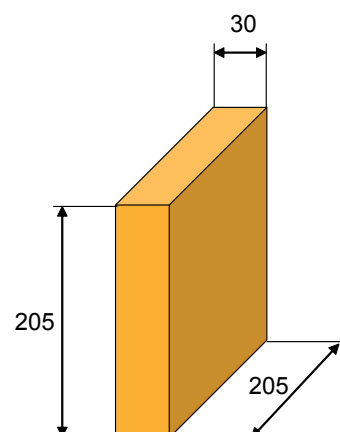
**Figure 16. Tape and reel orientation**

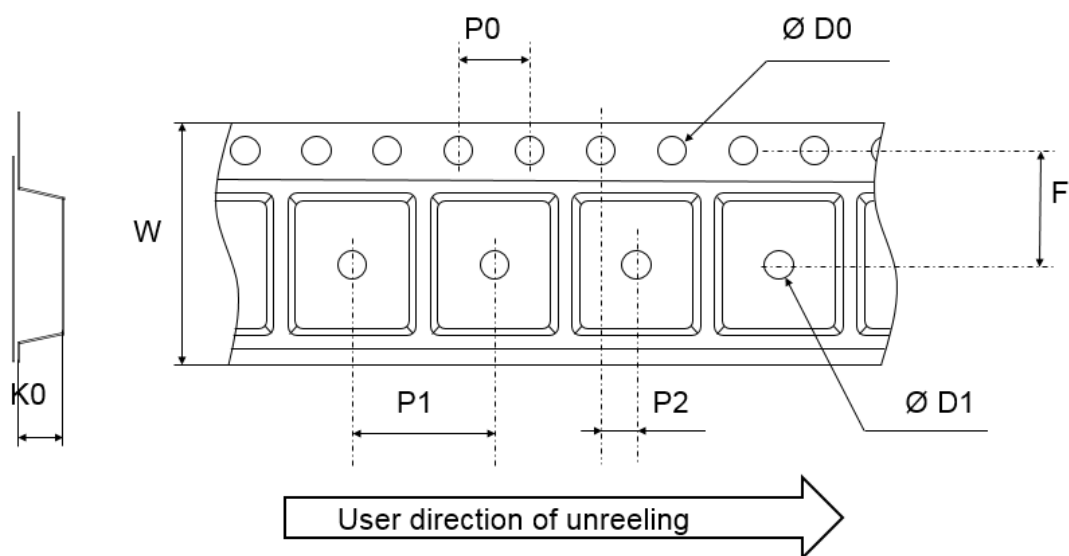


**Figure 17. 7" reel dimension values**



**Figure 18. Inner box dimension values**



**Figure 19. Tape outline**


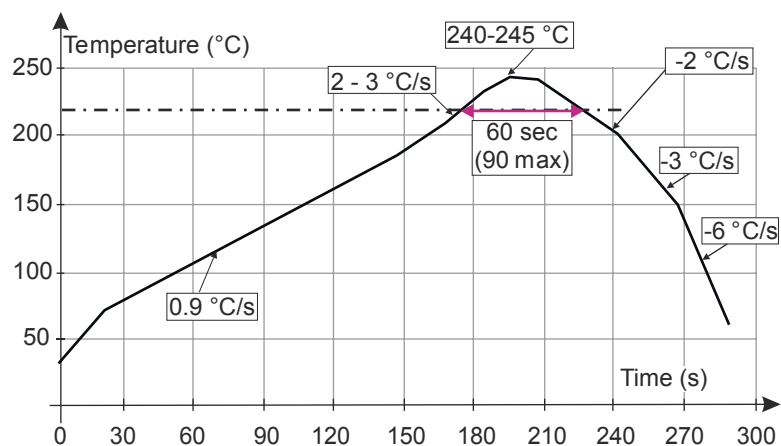
Note: Pocket dimensions are not on scale  
Pocket shape may vary depending on package

**Table 4. Tape dimension values**

| Ref. | Dimensions  |      |      |
|------|-------------|------|------|
|      | Millimeters |      |      |
|      | Min.        | Typ. | Max. |
| D0   | 1.45        | 1.5  | 1.6  |
| D1   | 1           |      |      |
| F    | 3.45        | 3.5  | 3.55 |
| K0   | 1.3         | 1.4  | 1.5  |
| P0   | 3.9         | 4.0  | 4.1  |
| P1   | 3.9         | 4.0  | 4.1  |
| P2   | 1.95        | 2.0  | 2.05 |
| W    | 7.9         | 8    | 8.3  |

## 2.3 Reflow profile

**Figure 20. ST ECOPACK® recommended soldering reflow profile for PCB mounting**



**Note:** Minimize air convection currents in the reflow oven to avoid component movement. Maximum soldering profile corresponds to the latest IPC/JEDEC J-STD-020.



### 3 Ordering information

Figure 21. Ordering information scheme

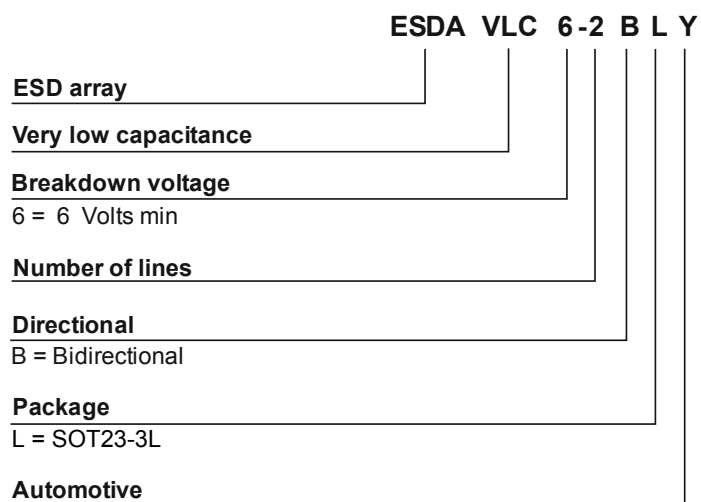


Table 5. Ordering information

| Order code    | Marking | Package  | Weight | Base qty. | Delivery mode |
|---------------|---------|----------|--------|-----------|---------------|
| ESDAVLC6-2BLY | C06Y    | SOT23-3L | 10 mg  | 3000      | Tape and reel |

## Revision history

**Table 6. Document revision history**

| Date        | Version | Changes                                                                          |
|-------------|---------|----------------------------------------------------------------------------------|
| 28-Sep-2018 | 1       | Initial release.                                                                 |
| 18-Oct-2018 | 2       | Updated Table 2. Electrical characteristics (values, $T_{amb} = 25\text{ °C}$ ). |
| 04-May-2022 | 3       | Updated Section 2.1 SOT23-3L package information and Figure 14.                  |

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