Transient Voltage Suppressors (TVS)

High-performance TVS diodes for ICT, consumer & high-speed applications
The new micro-packaged TVS diodes by TDK are designed to protect voltage-sensitive components from ESD, for existing and future applications in the direction of general-purpose and high-speed interfaces. These TVS diodes are specifically designed to protect USB type-C connectors. The portfolio offers ideal solutions for high-speed data pins up to 40 Gbps using the fast USB4 40G protocol as well as the Thunderbolt protocol and supports fast charging of devices via power delivery protocol.

**Applications**

**General purpose**
- Smartphones
- Laptops
- Tablets
- Wearables & portable devices
- Network communication devices

**High-speed interfaces**
- USB, Firewire
- DVI, HDMI & Display Port
- S-ATA
- Thunderbolt
- SWP/NFC

**Features**
- High ESD robustness up to 25 kV based on IEC61000-4-2
- Low clamping voltage down to 3.8 V (ITLP = 8 A)
- Low leakage current as low as 1 nA (VRWM = 3.3 V)
- Very low capacitance down to 0.18 pF
- Available in chip scale packages WL-CSP0201 and WL-CSP01005
- Ultra-small wafer-level chip-scale package with a thickness of 100 μm and 150 μm
TVS diodes
Portfolio for data line applications

**Type**

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>B74121 U0028M060</th>
<th>B74121 U0033M160</th>
<th>B74111 U0033M060</th>
<th>B74121 U0055M060</th>
<th>B74111 U0055M060</th>
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</thead>
<tbody>
<tr>
<td><strong>UCL series for data lines</strong></td>
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</tbody>
</table>

- **Footprint**: 580 x 280µm, 600 x 300µm, 400 x 200µm, 600 x 300µm, 400 x 200µm
- **Package**: WLCSP 0201, WLCSP 0201, WLCSP 01005, WLCSP 0201, WLCSP 01005
- **Thickness**: 150 µm, 150 µm, 100 µm, 150 µm, 100 µm
- **Working voltage VRWM**: 2.8 V, 3.3 V, 3.3 V, 5.5 V, 5.5 V
- **Breakdown voltage**: 5.9 V, 6.3 V, 6.3 V, 10.3 V, 10.3 V
- **Clamping voltage @ ITLP = 8 A**: 5.0 V, 3.9 V, 3.8 V, 4.1 V, 3.9 V
- **Dynamic resistance**: 0.27 Ω, 0.16 Ω, 0.15 Ω, 0.15 Ω, 0.15 Ω
- **Leakage current @VRWM**: 5 nA, 1 nA, 1 nA, 1 nA, 1 nA
- **Capacitance @1 MHz at VRWM**: 0.18 pF*, 0.65 pF, 0.48 pF, 0.55 pF, 0.43 pF
- **ESD level contact discharge**: 15 kV max, 15 kV max, 15 kV max, 15 kV max, 15 kV max

**Applications**

- Hearing aids
- Cellular handsets & smartphones
- Machine-to-Machine (M2M)
- Laptops
- True wireless earbuds
- Wearables
- Network communication devices
- High-speed interfaces (USB type-C, USB4™ 40 Gbps, HDMI 2.0, Thunderbolt, FireWire, DVI, DisplayPort, S-ATA, Single Wire Protocol (SWP))

More details on the TVS landing page [https://www.tdk-electronics.tdk.com/tvs_diodes](https://www.tdk-electronics.tdk.com/tvs_diodes)
# TVS diodes

## Portfolio for power lines applications

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<th>Type</th>
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<td>Ordering code</td>
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<td>B74121 G0160M060</td>
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<td>B74121 G0200M060</td>
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<td>B74111 G0050M060</td>
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<td>B74111 G0055M060</td>
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### Footprint
- **Size**: 600 x 300µm, 600 x 300µm, 580 x 280µm, 400 x 200µm, 400 x 200µm
- **Package**: WLCSP 0201, WLCSP 0201, WLCSP 0201, WLCSP 01005, WLCSP 01005
- **Thickness**: 150 µm, 150 µm, 150 µm, 100 µm, 100 µm

### Working voltage
- **VRWM**: 5 V, 16 V, 20 V, 5 V, 5.5 V
- **Breakdown voltage**: 6.8 V, 21 V, 22 V, 6.8 V, 7.5 V
- **Clamping voltage @ ITLP = 8 A**: 7.2 V, 23 V, 27 V, 7.6 V, 8.5 V

### Dynamic resistance
- **0.1 Ω**, **0.33 Ω**, **0.6 Ω**, **0.125 Ω**, **0.125 Ω**

### Leakage current @VRWM
- **2 nA**, **5 nA**, **20 nA**, **20 nA**, **10 nA**

### Capacitance @1 MHz at VRWM
- **12 pF**, **5.5 pF**, **4 pF**, **5 pF**, **5 pF**

### ESD level contact discharge
- **24 kV max.**, **15 kV max.**, **10 kV max.**, **15 kV max.**, **15 kV max.**

### Surge
- **8 A max.**, **3.5 A max.**, **1.5 A max.**, **4 A max.**, **3 A max.**

## Applications
- Hearing aids
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With working voltage up to 20 V designed for **USB Type-C fast charging applications**
**TVS diodes**  
**Miniaturization – package range**

We protect with smallest TVS packages in class!

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<th>Status</th>
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<tbody>
<tr>
<td><em><em>WLCSP</em> 0201 SLIM</em>*</td>
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<td>150 µm</td>
<td>Series</td>
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<tr>
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<td>100 µm</td>
<td>Series</td>
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</tbody>
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*WLCSP: Wafer Level Chip Scale Package*