BiSy 2-Line, Ultra-Low-Capacitance ESD Protection Diode
Saves Board Space in Portable Electronics

KEY BENEFITS

- Ultra-low load capacitance down to 0.35 pF typical
- Ultra-compact LLP1006-3L package
  - Low height of < 0.4 mm
- Features a “flow through” design
- Low maximum leakage current of < 0.1 µA at the working voltage of 5.5 V
- Breakdown voltage of 8.5 V typical at 1 mA
- Maximum clamping voltage of 18 V at 3.6 A
- Provides transient protection for data lines as per IEC 61000-4-2 at ± 20 kV (air and contact discharge)
- Supports reflow soldering to +260 °C for 10 s
- RoHS-compliant, halogen-free, and Vishay GREEN

APPLICATIONS

- ESD protection of high-speed data lines including HDMI, DisplayPort, eSATA, USB 3.0, 1394 / FireWire, and Thunderbolt in smartphones, tablets, notebooks, and wearable devices

RESOURCES

- Datasheet: VBUS05M2-HT1 - www.vishay.com/ppg?85923
- For technical questions contact ESDprotection@vishay.com
- Material categorization: for definitions of compliance, please see www.vishay.com/doc?99912
2-Line Low Capacitance, Bidirectional and Symmetrical (BiSy) ESD-Protection Diode - Flow Through Design

FEATURES
- Compact LLP1006-3L package
- Low package height < 0.4 mm
- 2-line ESD-protection
- Low leakage current \( I_L < 0.1 \mu A \)
- Low capacitance: \( C_D < 0.4 \) pF
- Ideal for high speed data line like:
  - HDMI, DisplayPort, eSATA
  - USB, 1394/firewire
  - Thunderbolt
- ESD-protection acc. IEC 61000-4-2
  - \( \pm 20 \) kV contact discharge
  - \( \pm 20 \) kV air discharge
- Soldering can be checked by standard vision inspection. No X-ray necessary
- Pin plating NiPdAu (e4) no whisker growth
- E - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (no Sn)

MARKING (example only)
Bar = cathode marking
X = date code
Y = type code (see table below)

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>DEVICE NAME</th>
<th>ORDERING CODE</th>
<th>TAPED UNITS PER REEL (8 mm TAPE ON 7&quot; REEL)</th>
<th>MINIMUM ORDER QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBUS05M2-HT1</td>
<td>VBUS05M2-HT1-G4-08</td>
<td>8000</td>
<td>8000</td>
</tr>
</tbody>
</table>

PACKAGE DATA

<table>
<thead>
<tr>
<th>DEVICE NAME</th>
<th>PACKAGE NAME</th>
<th>TYPE CODE</th>
<th>WEIGHT</th>
<th>MOLDING COMPOUND FLAMMABILITY RATING</th>
<th>MOISTURE SENSITIVITY LEVEL</th>
<th>SOLDERING CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBUS05M2-HT1</td>
<td>LLP1006-3L</td>
<td>5</td>
<td>0.72 mg</td>
<td>UL 94 V-0 (according J-STD-020)</td>
<td>MSL level 1</td>
<td>260 °C/10 s at terminals</td>
</tr>
</tbody>
</table>

ABSOLUTE MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS</th>
<th>SYMBOL</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak pulse current</td>
<td>Acc. IEC 61000-4-5; ( t_P = 8/20 \mu s ); single shot</td>
<td>( I_{PPM} )</td>
<td>3.6</td>
<td>A</td>
</tr>
<tr>
<td>Peak pulse power</td>
<td>Acc. IEC 61000-4-5; ( t_P = 8/20 \mu s ); single shot</td>
<td>( P_{PP} )</td>
<td>65</td>
<td>W</td>
</tr>
<tr>
<td>ESD immunity</td>
<td>Contact discharge acc. IEC 61000-4-2; 10 pulses</td>
<td>( V_{ESD} )</td>
<td>( \pm 20 )</td>
<td>kV</td>
</tr>
<tr>
<td></td>
<td>Air discharge acc. IEC 61000-4-2; 10 pulses</td>
<td>( V_{ESD} )</td>
<td>( \pm 20 )</td>
<td>kV</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Junction temperature</td>
<td>( T_J )</td>
<td>-55 to +125</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td></td>
<td>( T_{STG} )</td>
<td>-55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

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