

Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

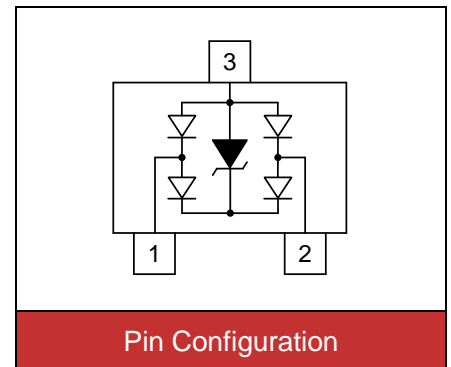
This is ultra low capacitance TVS arrays designed to protect high speed data interfaces. It has been specifically designed to protect sensitive components which is connected to high-speed data and transmission lines from overvoltage caused by electrostatic (ESD), cable discharge events (CDE) and electrical fast transients (EFT).



Contact : ±8kV
Air : ±15kV

Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- Protects two high speed data lines
- Working voltage: 5V
- Ultra low capacitance and clamping voltages
- Low leakage current
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270°C
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- UAT52A05L02 (Marking: B L5), SOT-523
- UBT23A05L02 (Marking: B 5U), SOT-23



Applications

- HDMI interface protection
- Mobile display digital interface
- RF/Antenna circuits
- USB 2.0 & Firewire ports
- GaAs photodetector protection
- HBT power Amp protection
- Infiniband transceiver protection

Maximum Ratings

| Rating | Symbol | Value | Unit |
|---|----------------|----------|------|
| Peak pulse current (tp=8/20µs waveform) | I_{PP} | 3 | A |
| ESD voltage (Contact discharge) | V_{ESD} | ±8 | kV |
| ESD voltage (Air discharge) | | ±15 | |
| Storage & operating temperature range | T_{STG}, T_J | -55~+150 | °C |

Electrical Characteristics ($T_J=25^\circ\text{C}$)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--|-----------|--|------|------|------|---------------|
| Reverse stand-off voltage | V_{RWM} | | | | 5 | V |
| Reverse breakdown voltage | V_{BR} | $I_{BR}=1\text{mA}$ | 6 | | | V |
| Reverse leakage current | I_R | $V_R=5\text{V}$ Each I/O pin | | | 0.5 | μA |
| Clamping voltage ($t_p=8/20\mu\text{s}$) | V_C | $I_{PP}=1\text{A}$ | | | 9.8 | V |
| Clamping voltage ($t_p=8/20\mu\text{s}$) | V_C | $I_{PP}=3\text{A}$ | | | 15 | V |
| Off state junction capacitance | C_J | 0Vdc, f=1MHz Between I/O pins and GND | | 0.8 | | pF |
| Off state junction capacitance | C_J | 0Vdc, f=1MHz Between I/O pins | | 0.4 | | pF |

Typical Characteristics Curves

Figure 1. Pulse Waveforms

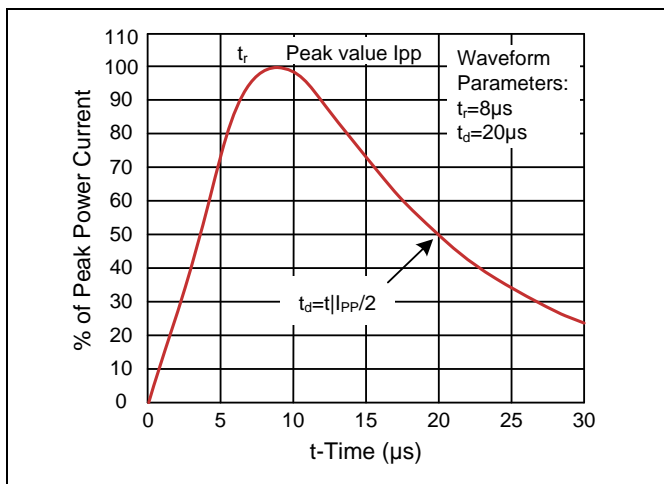


Figure 2. Capacitance vs. Reverse Voltage

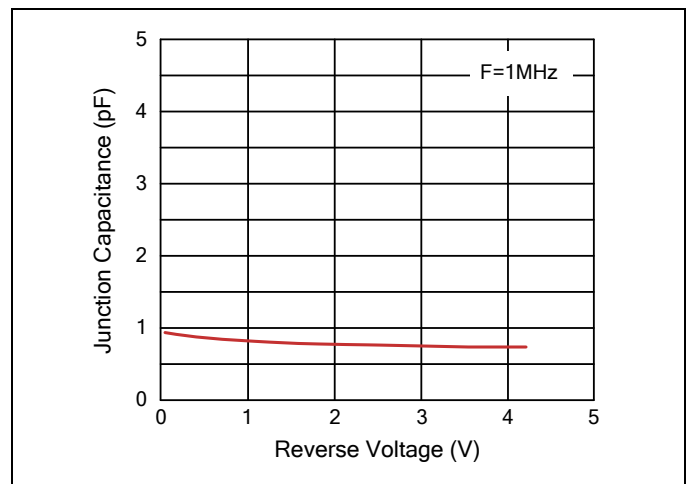
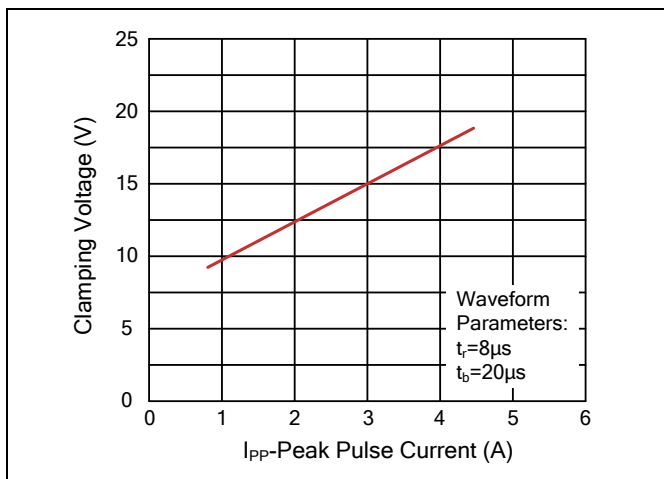
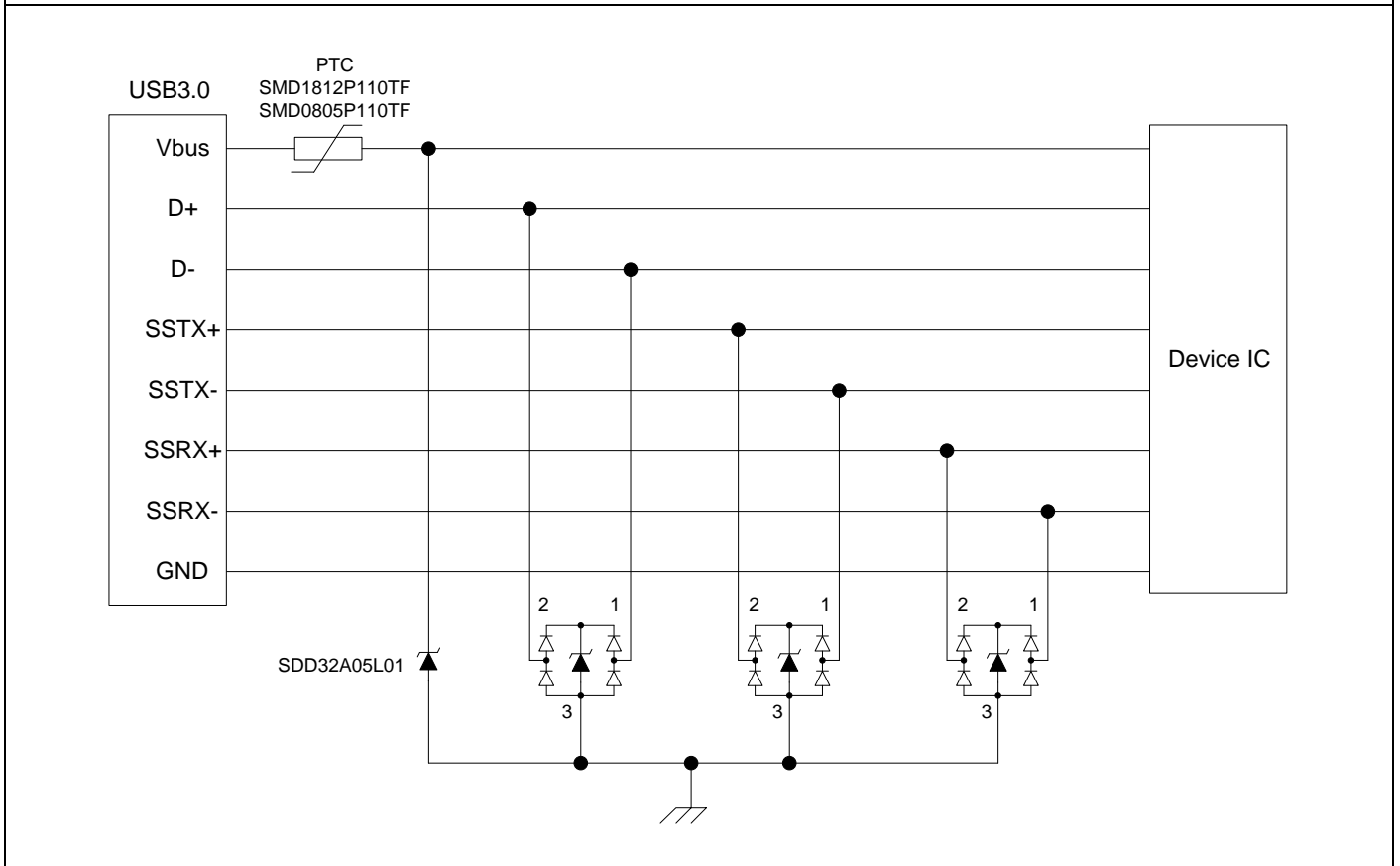
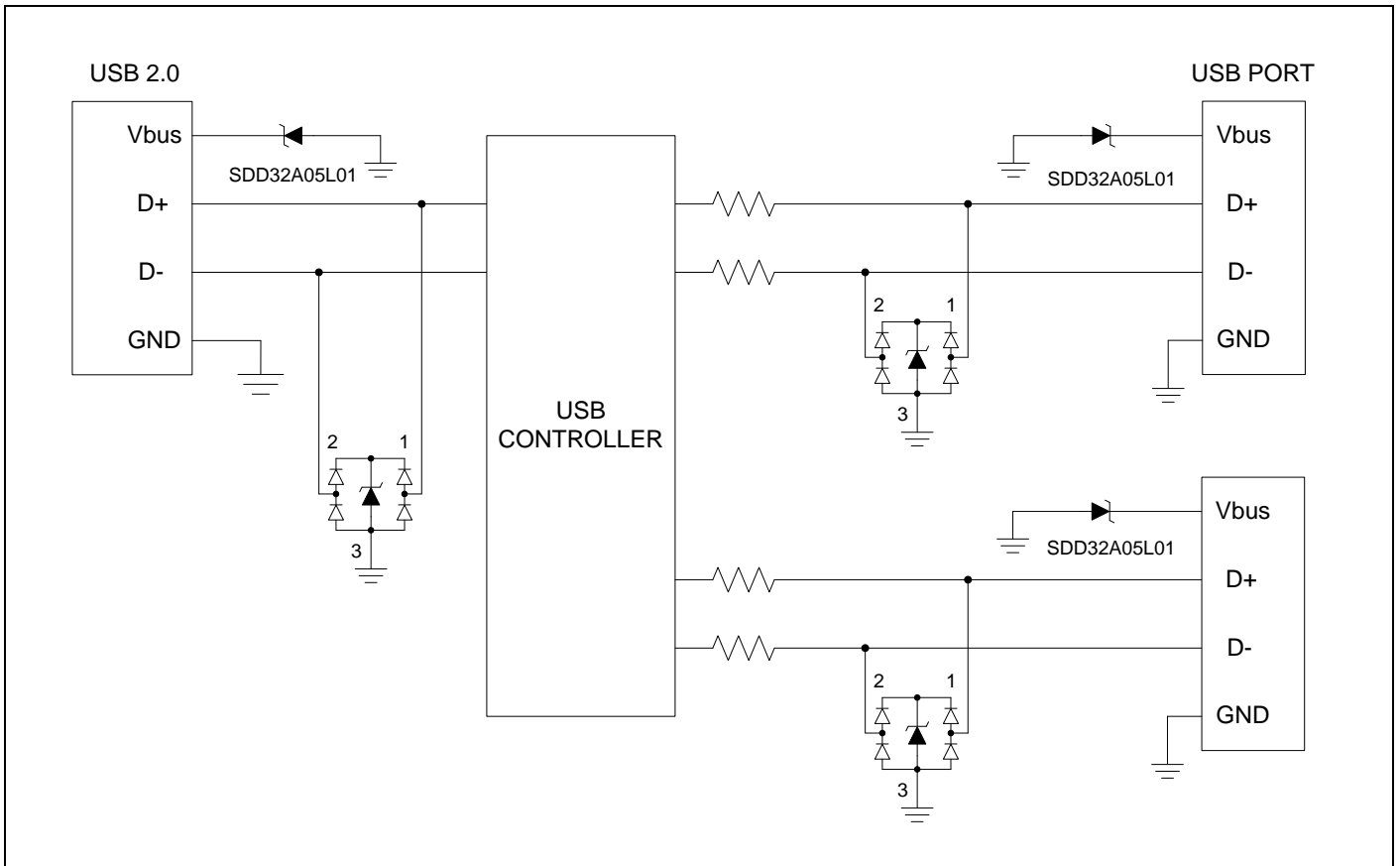


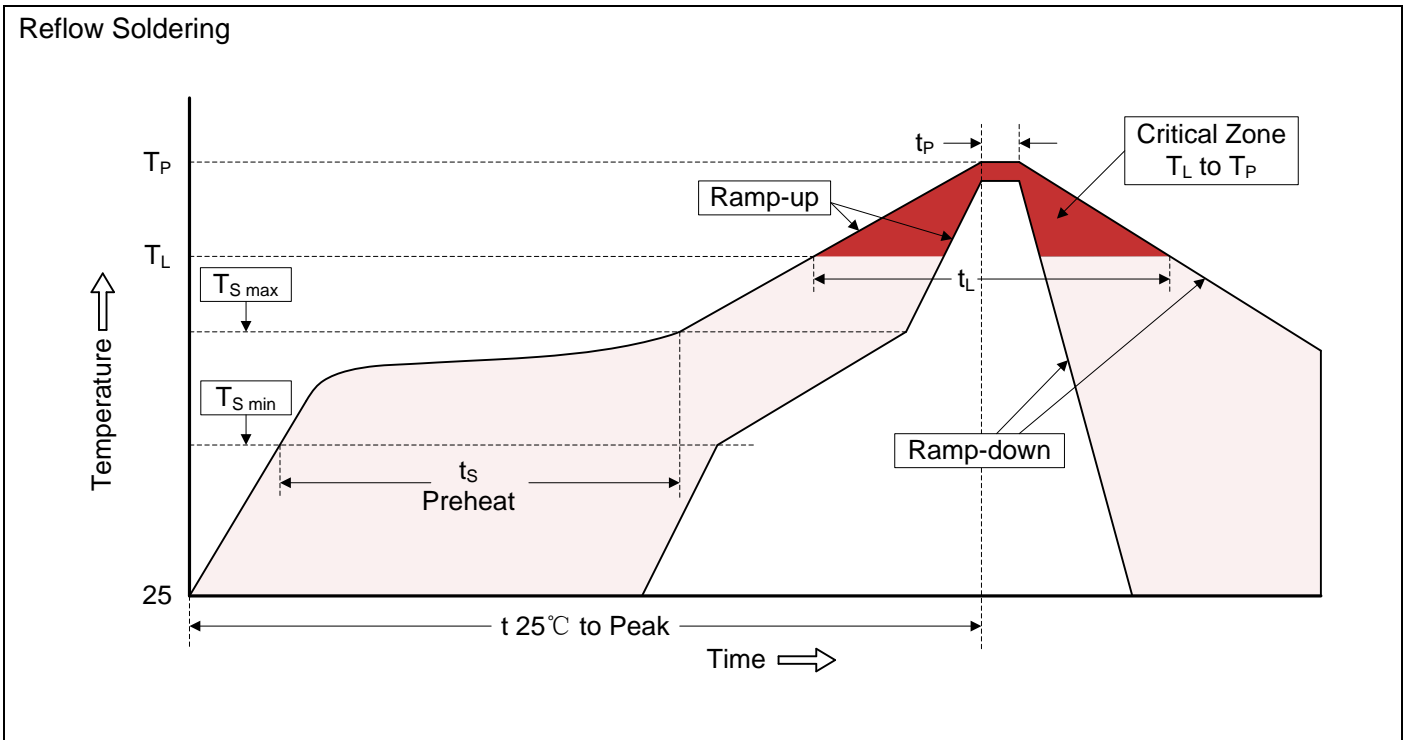
Figure 3. Clamping Voltage vs. Peak Pulse Current



Applications Information



Recommended Soldering Conditions

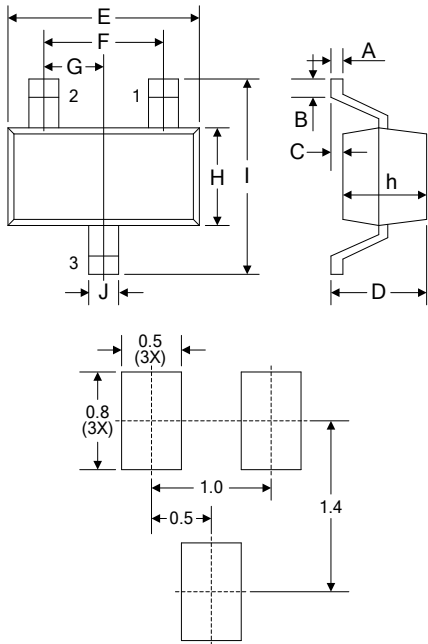


Recommended Conditions

| Profile Feature | Pb-Free Assembly |
|---|----------------------------------|
| Average ramp-up rate (T_L to T_P) | 3°C/second max. |
| Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_s) | 150°C 200°C 60-180 seconds |
| $T_{S\ max}$ to T_L -Ramp-up Rate | 3°C/second max. |
| Time maintained above: -Temperature (T_L) -Time (t_L) | 217°C 60-150 seconds |
| Peak Temperature (T_P) | 260°C |
| Time within 5°C of actual Peak Temperature (t_P) | 20-40 seconds |
| Ramp-down Rate | 6°C/second max. |
| Time 25°C to Peak Temperature | 8 minutes max. |

Dimensions

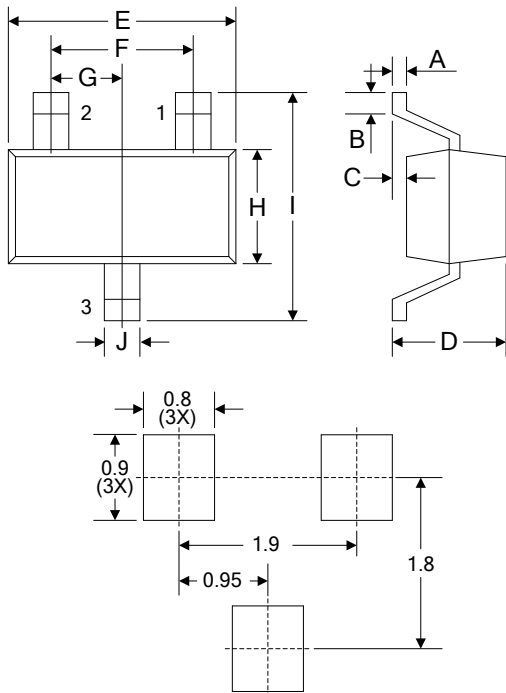
UAT52A05L02: SOT-523



Recommended Soldering Pad Layout

| Symbol | Dimension | | | |
|--------|-------------|------|----------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 0.10 | 0.20 | 0.004 | 0.008 |
| B | 0.28 | 0.44 | 0.011 | 0.017 |
| C | - | 0.10 | - | 0.004 |
| D | 0.70 | 0.90 | 0.028 | 0.035 |
| E | 1.50 | 1.70 | 0.058 | 0.067 |
| F | 0.90 | 1.10 | 0.035 | 0.043 |
| G | 0.50TYP | | 0.020TYP | |
| H | 0.75 | 0.85 | 0.030 | 0.033 |
| I | 1.45 | 1.75 | 0.057 | 0.069 |
| J | 0.15 | 0.35 | 0.006 | 0.014 |
| h | 0.70 | 0.80 | 0.028 | 0.031 |

UBT23A05L02: SOT-23



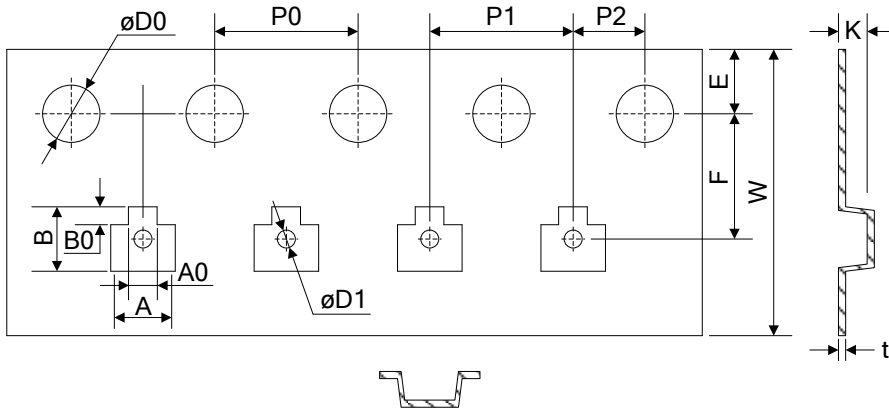
Recommended Soldering Pad Layout

| Symbol | Dimension | | | |
|--------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 0.08 | 0.18 | 0.003 | 0.007 |
| B | 0.15 | - | 0.006 | - |
| C | - | 0.13 | - | 0.005 |
| D | 0.89 | 1.09 | 0.035 | 0.043 |
| E | 2.80 | 3.05 | 0.110 | 0.120 |
| F | 1.90 | | 0.075 | |
| G | 0.95 | | 0.037 | |
| H | 1.19 | 1.40 | 0.047 | 0.055 |
| I | 2.10 | 2.49 | 0.083 | 0.098 |
| J | 0.35 | 0.50 | 0.014 | 0.020 |

Packaging

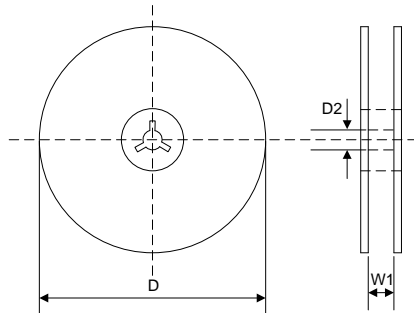
UAT52A05L02: SOT-523

Tape



| Symbol | Dimension (mm) |
|--------|----------------|
| W | 8.00±0.30 |
| P0 | 4.00±0.10 |
| P1 | 4.00±0.10 |
| P2 | 2.00±0.10 |
| D0 | Φ1.55±0.10 |
| D1 | Φ0.50±0.05 |
| E | 1.75±0.10 |
| F | 3.50±0.10 |
| A | 1.80±0.10 |
| A0 | 0.80±0.10 |
| B | 1.80±0.10 |
| B0 | 0.45±0.10 |
| K | 0.85±0.10 |
| t | 0.20±0.05 |

Reel



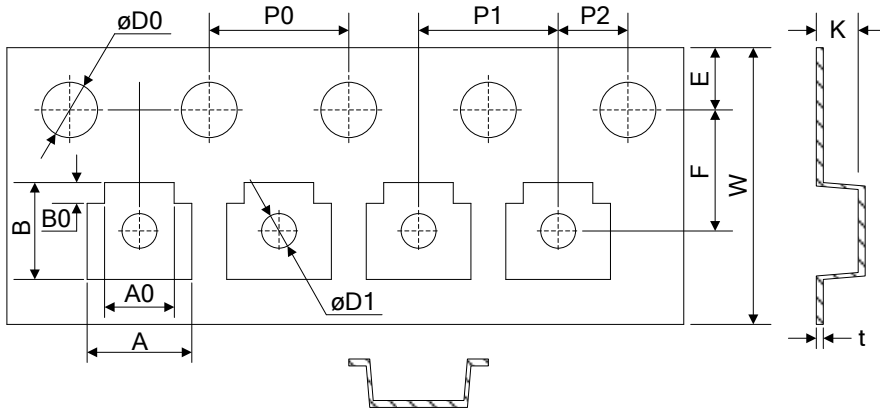
| | |
|----|------------|
| D | Φ178.0±2.0 |
| D2 | Φ13.0 |
| W1 | 9.5 |

Quantity: 3000PCS

Packaging

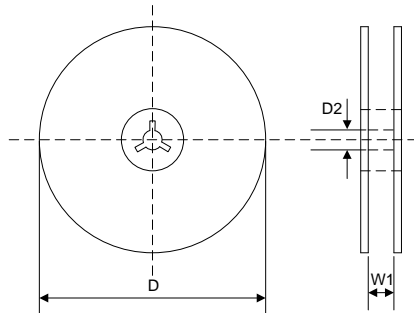
UBT23A05L02: SOT-23

Tape



| Symbol | Dimension (mm) |
|--------|----------------|
| W | 8.00±0.30 |
| P0 | 4.00±0.10 |
| P1 | 4.00±0.10 |
| P2 | 2.00±0.10 |
| D0 | Φ1.55±0.10 |
| D1 | Φ1.00±0.05 |
| E | 1.75±0.10 |
| F | 3.50±0.10 |
| A | 3.10±0.10 |
| A0 | 2.10±0.10 |
| B | 2.75±0.10 |
| B0 | 0.65±0.10 |
| K | 1.10±0.10 |
| t | 0.20±0.05 |

Reel



| | |
|----|------------|
| D | Φ178.0±2.0 |
| D2 | Φ13.0 |
| W1 | 9.5 |

Quantity: 3000PCS

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