



**THE DATASHEET OF
UDT23A03L02**



DATA SHEET

**ELECTROSTATIC DISCHARGE
PROTECTION DEVICES**

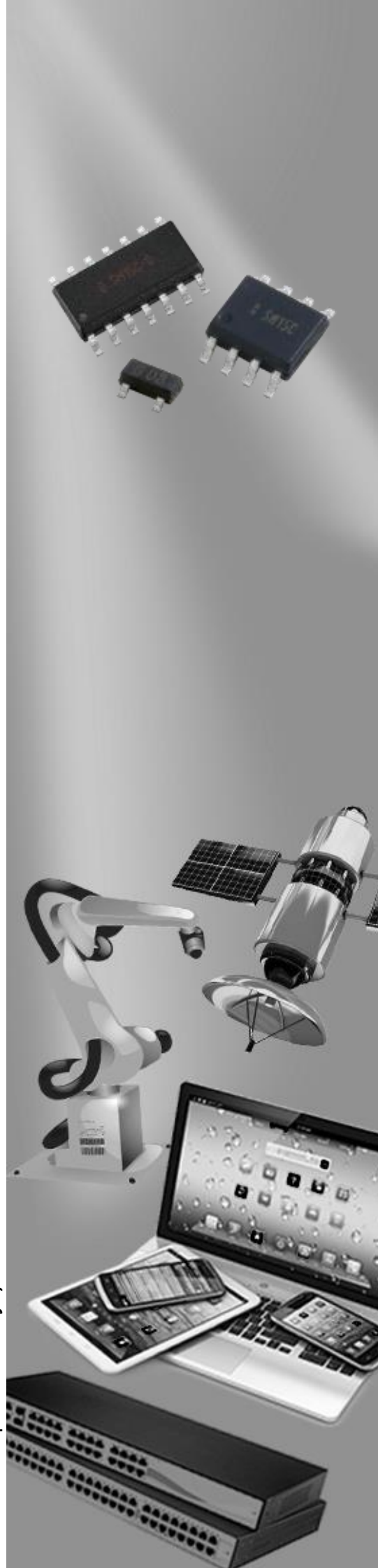
INDUSTRIAL / CONSUMER

UDT23AXXL02 SERIES

RoHS compliant & Halogen free



Product specification—July 04, 2023 V.4



Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

Brightking's UDT23AXXL02 series are ultra low capacitance TVS arrays designed to protect high speed data interfaces. This series has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from overvoltage caused by electrostatic discharge (ESD), cable discharge events(CDE) and electrical fast transients(EFT).The series has a typical capacitance of only 0.8pF. This means it can be used on circuits operating in excess of 3GHz without signal attenuation.

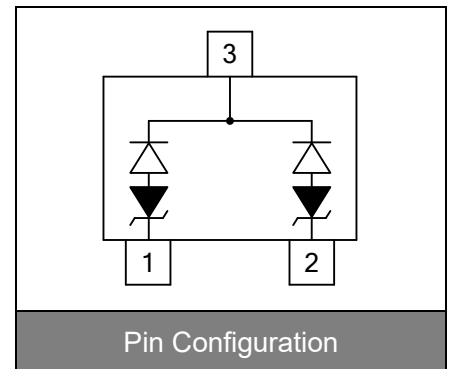


Contact : $\pm 30\text{kV}$
Air : $\pm 30\text{kV}$



Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOT-23 surface mount package
- Protects two high speed data line
- Peak power dissipation of 400W under 8/20 μs waveform
- Working voltage: 3.3V, 5V, 12V, 15V
- Low leakage current
- Ultra low capacitance and clamping voltage
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270 $^{\circ}\text{C}$
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020



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 power ($t_p=8/20\mu\text{s}$ waveform) | P_{PP} | 400 | W |
| ESD voltage (Contact discharge) | V_{ESD} | ± 30 | kV |
| ESD voltage (Air discharge) | | ± 30 | |
| Storage & operating temperature range | T_{STG}, T_J | -55~+150 | $^{\circ}\text{C}$ |

Electrical Characteristics (T_J=25°C)

UDT23A03L02 (Marking: B LSC)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|------------------|---|------|------|------|------|
| Reverse stand-off voltage | V _{RWM} | | | | 3.3 | V |
| Reverse breakdown voltage | V _{BR} | I _{BR} =1mA | 4 | | | V |
| Reverse leakage current | I _R | V _R =3.3V each I/O pin | | | 20 | μA |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =1A | | | 10 | V |
| Peak Pulse Current (tp=8/20μs) | I _{PP} | | | | 19 | A |
| Off state junction capacitance | C _J | 0Vdc, f=1MHz Between I/O pins and GND | | 1.5 | | pF |

UDT23A05L02 (Marking: B LTC)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|------------------|---|------|------|------|------|
| Reverse stand-off voltage | V _{RWM} | | | | 5 | V |
| Reverse breakdown voltage | V _{BR} | I _{BR} =1mA | 6 | | | V |
| Reverse leakage current | I _R | V _R =5V each I/O pin | | | 5 | μA |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =1A | | | 12 | V |
| Peak Pulse Current (tp=8/20μs) | I _{PP} | | | | 17 | A |
| Off state junction capacitance | C _J | 0Vdc, f=1MHz Between I/O pins and GND | | 0.8 | | pF |

UDT23A12L02 (Marking: B LUC)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|------------------|---|------|------|------|------|
| Reverse stand-off voltage | V _{RWM} | | | | 12 | V |
| Reverse breakdown voltage | V _{BR} | I _{BR} =1mA | 13.3 | | | V |
| Reverse leakage current | I _R | V _R =12V each I/O pin | | | 1 | μA |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =1A | | | 25 | V |
| Peak Pulse Current (tp=8/20μs) | I _{PP} | | | | 10 | A |
| Off state junction capacitance | C _J | 0Vdc, f=1MHz Between I/O pins and GND | | 0.8 | | pF |

UDT23A15L02 (Marking: B LWC)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--|-----------|--|------|------|------|---------|
| Reverse stand-off voltage | V_{RWM} | | | | 15 | V |
| Reverse breakdown voltage | V_{BR} | $I_{BR}=1mA$ | 16.7 | | | V |
| Reverse leakage current | I_R | $V_R=15V$ each I/O pin | | | 1 | μA |
| Clamping voltage ($t_p=8/20\mu s$) | V_C | $I_{PP}=1A$ | | | 30 | V |
| Peak Pulse Current ($t_p=8/20\mu s$) | I_{PP} | | | | 8 | A |
| Off state junction capacitance | C_J | 0Vdc, f=1MHz Between I/O pins and GND | | 0.8 | | pF |

Typical Characteristics Curves

Figure 1. Power Derating Curve

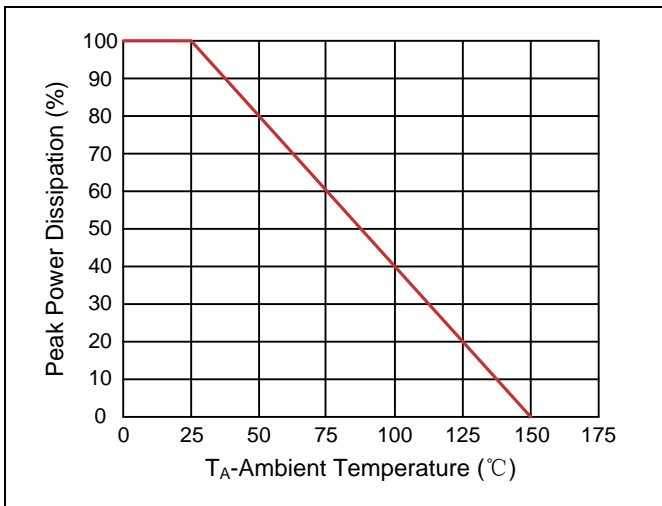


Figure 2. Pulse Waveforms

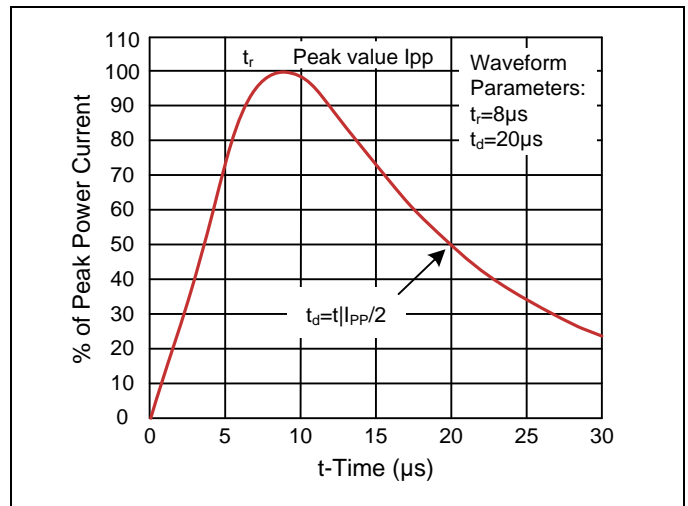


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

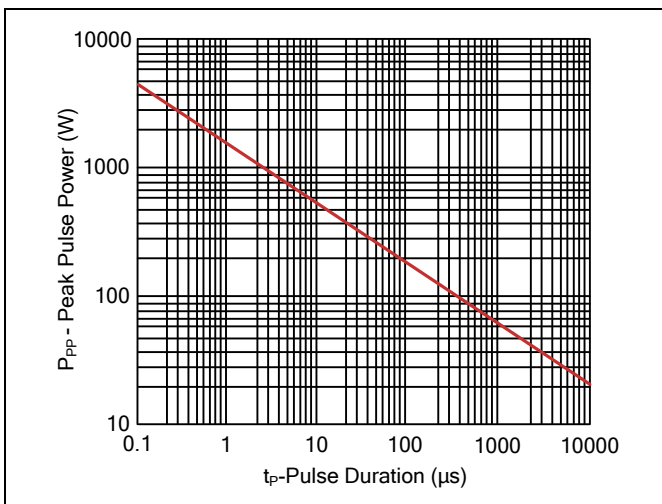
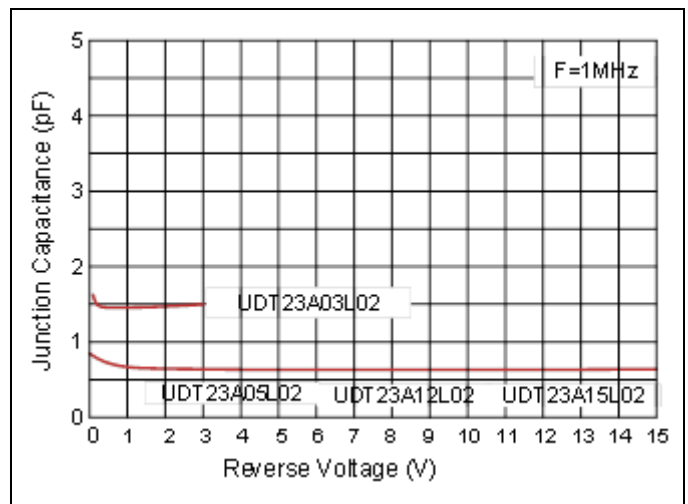
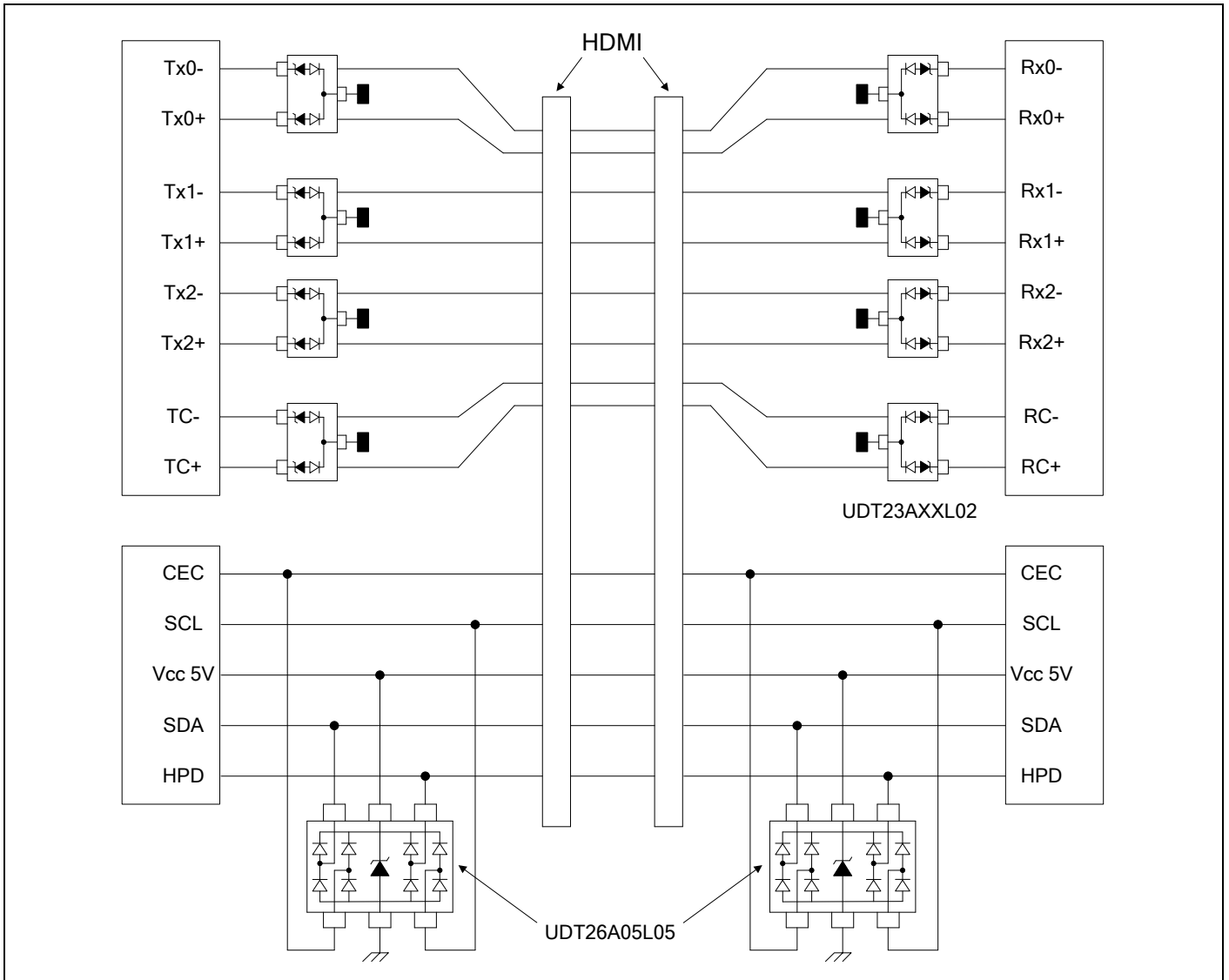


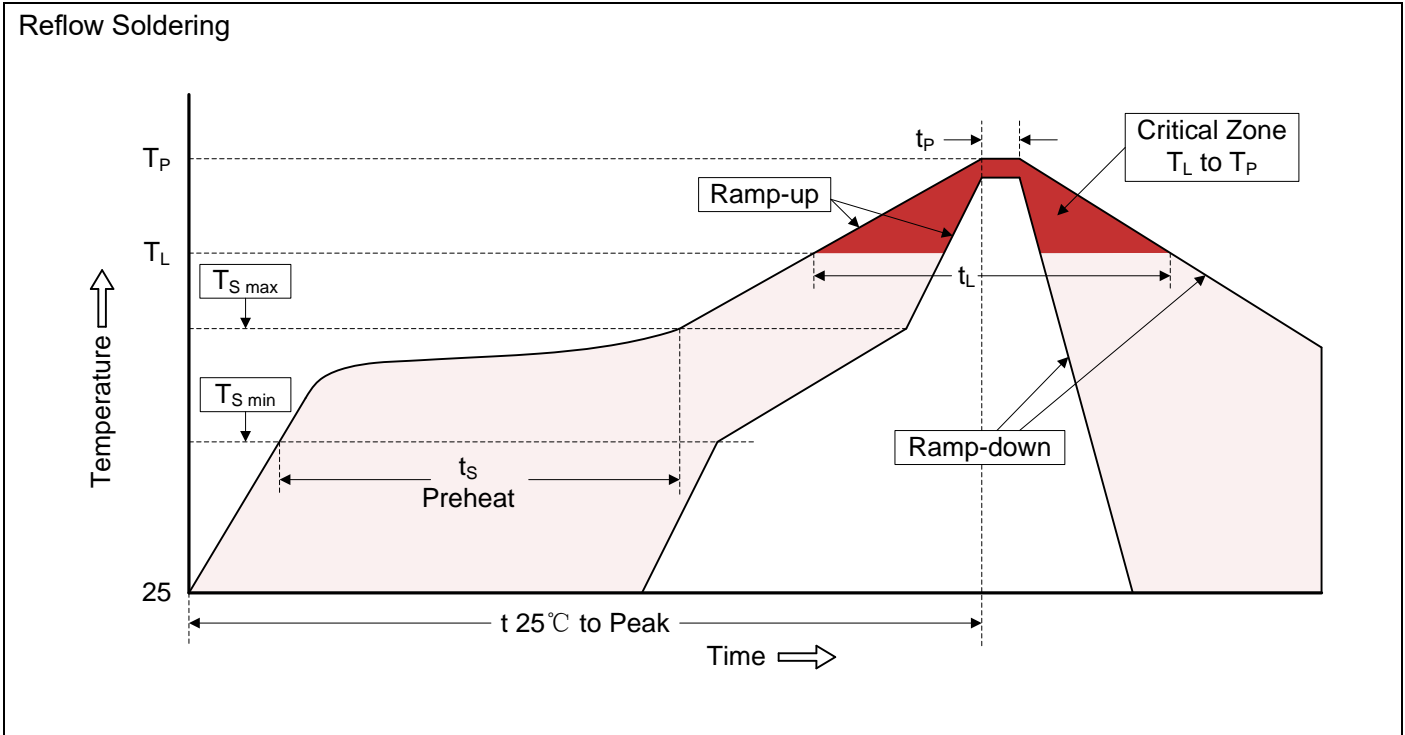
Figure 4. Typical Junction Capacitance



Applications Information



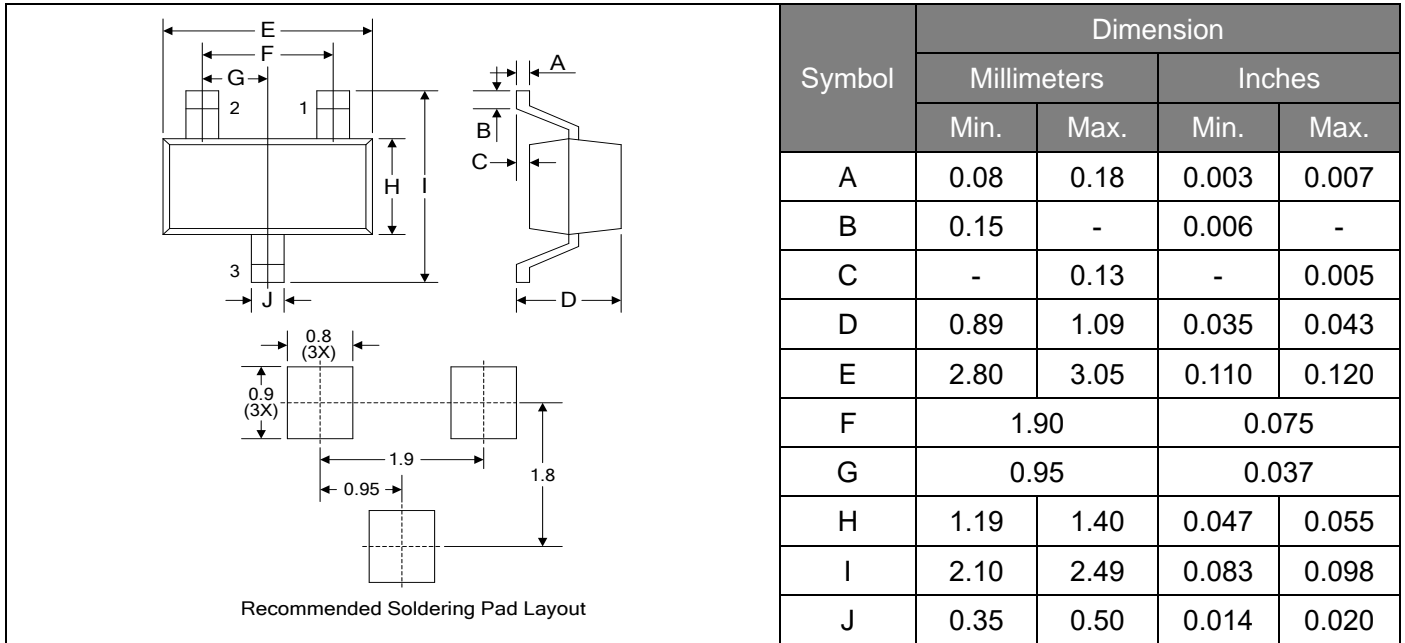
Recommended Soldering Conditions



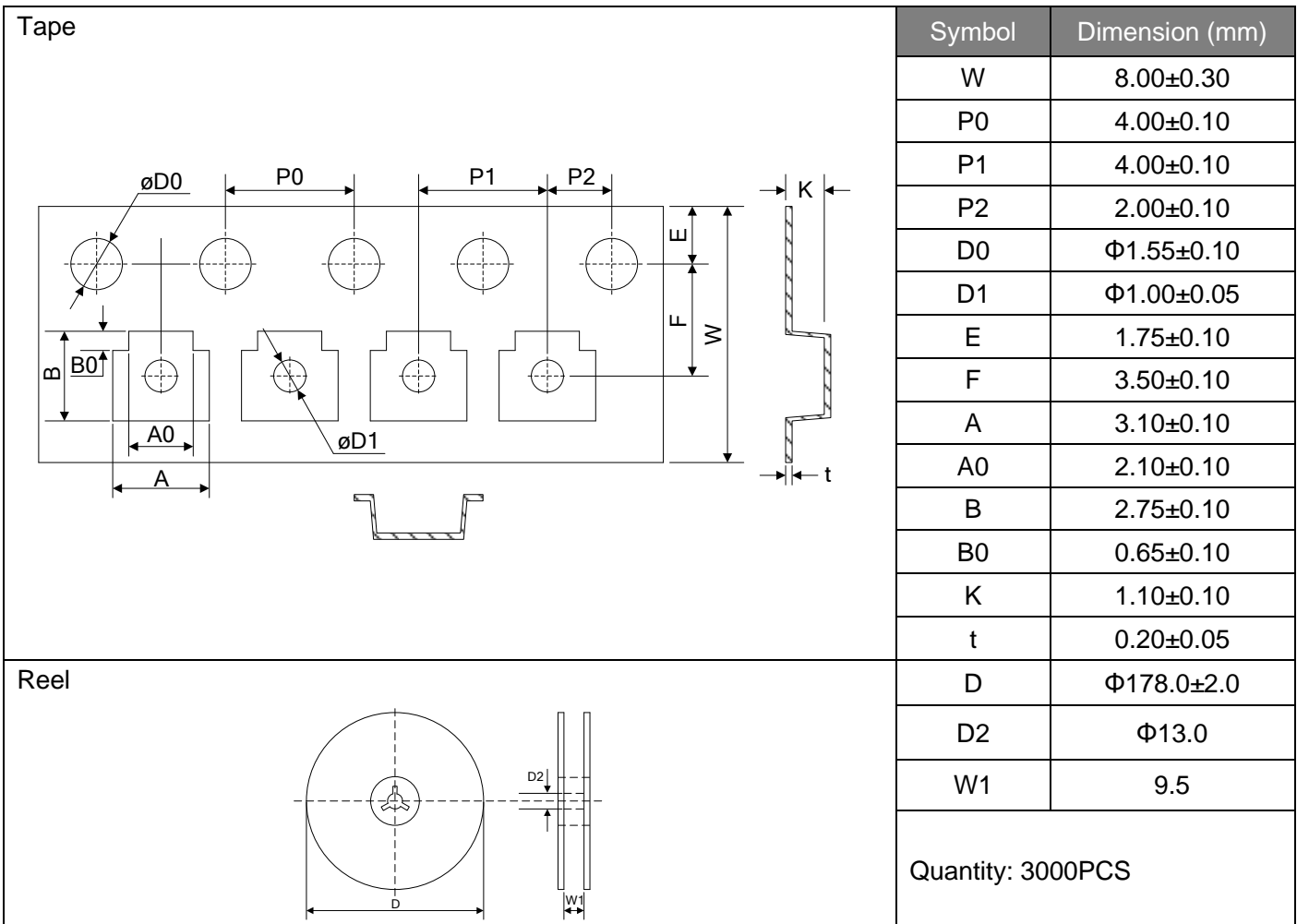
Recommended Conditions

| 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 (SOT-23)



Packaging



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