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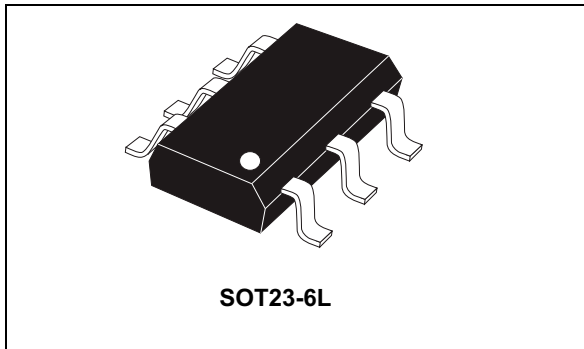
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Low capacitance TVS for high speed lines such as xDSL

Datasheet - production data



Description

DSL04 is designed to protect VDSL2 line drivers against surges defined in worldwide telecommunication standards. This device protects line drivers for CPE and DSLAM applications. The low capacitance makes it suitable from ADSL to VDSL2 data rates.

DSL04 is able to survive severe conditions even when used with downgraded or oscillating gas tube.

DSL04 is packaged in a SOT23-6L.

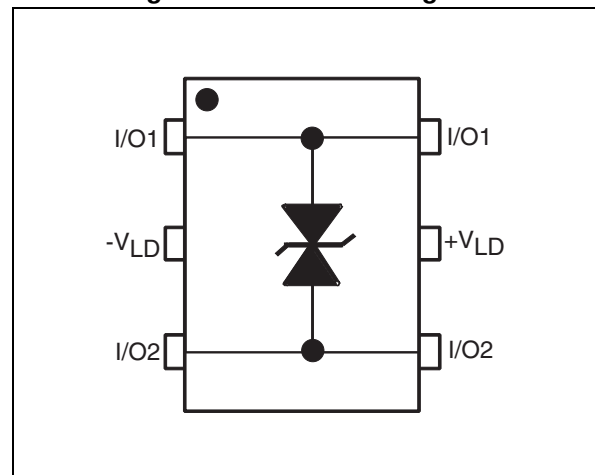
Features

- High surge capability to comply with GR-1089 and ITU-T K20/21
- Voltages from 5 to 24 V
- Low capacitance device: $C_{typ} = 1 \text{ pF}$
- RoHS package
- Low leakage current: $0.2 \text{ }\mu\text{A}$ at $25 \text{ }^\circ\text{C}$

Complies with the following standards

- Telcordia GR-1089
 - 2.5 kV 2/10 μs - 500 A 2/10 μs
 - AC power fault tests
- ITU-T K20/21/44
 - 6 kV 10/700 μs - 150 A 5/310 μs
 - Power induction tests
 - Power contact tests
- IEC 61000-4-2, level 4
 - 15 kV (air discharge)
 - 8 kV (contact discharge)
- IEC 61000-4-5, level 2
 - $\pm 1 \text{ kV}$, $42 \text{ }\Omega$
- MIL STD 883G-Method 3015-7: Class 3
 - 8 kV (human body model)

Figure 1. Functional diagram



1 Characteristics

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

| Symbol | Parameter | | Value | Unit |
|-----------|--|---------------------------------|------------|--------------------|
| V_{pp} | Peak pulse voltage | IEC 61000-4-5 contact discharge | 30 | kV |
| I_{pp} | Peak pulse current | 8/20 μ s | 15 | A |
| T_{stg} | Storage temperature range | | -55 to 150 | $^{\circ}\text{C}$ |
| T_j | Operating junction temperature range | | -40 to 125 | $^{\circ}\text{C}$ |
| T_L | Maximum temperature for soldering during 10s | | 260 | $^{\circ}\text{C}$ |

Table 2. Electrical characteristics ($T_{amb} = 25\text{ °C}$)

| Order code | $I_{RM} @ V_{RM}$ | | $V_{BR} @ I_{BR}$ | | $V_{CL} @ I_{PP}$ 8/20 μ s | | C | | ΔC |
|--------------|-------------------|----|-------------------|----|-----------------------------------|----|---------------------------|---------------------------|---------------------------|
| | Max. μ A | V | Min. V | mA | Max. V | A | Typ. ⁽¹⁾ pF | Max. ⁽¹⁾ pF | Typ. ⁽²⁾ pF |
| DSL04-005SC6 | 0.2 | 5 | 6.5 | 1 | 20 | 15 | 1 | 3 | 0.3 |
| DSL04-008SC6 | 0.2 | 8 | 10 | 1 | 25 | 15 | 1 | 3 | 0.3 |
| DSL04-010SC6 | 0.2 | 10 | 11 | 1 | 27 | 15 | 1 | 3 | 0.3 |
| DSL04-012SC6 | 0.2 | 12 | 14 | 1 | 31 | 15 | 1 | 3 | 0.3 |
| DSL04-016SC6 | 0.2 | 16 | 20 | 1 | 37 | 15 | 1 | 3 | 0.3 |
| DSL04-018SC6 | 0.2 | 18 | 21 | 1 | 39 | 15 | 1 | 3 | 0.3 |
| DSL04-020SC6 | 0.2 | 20 | 23 | 1 | 42 | 15 | 1 | 3 | 0.3 |
| DSL04-022SC6 | 0.2 | 22 | 25 | 1 | 45 | 15 | 1 | 3 | 0.3 |
| DSL04-024SC6 | 0.2 | 24 | 27 | 1 | 52 | 15 | 1 | 3 | 0.3 |

1. Test conditions: $V_R = 2\text{ V}$ bias, $V_{RMS} = 1\text{ V}$, $F = 1\text{ MHz}$

2. Measured between 1 V and V_{RM}

Figure 2. Leakage current versus junction temperature (typical values)

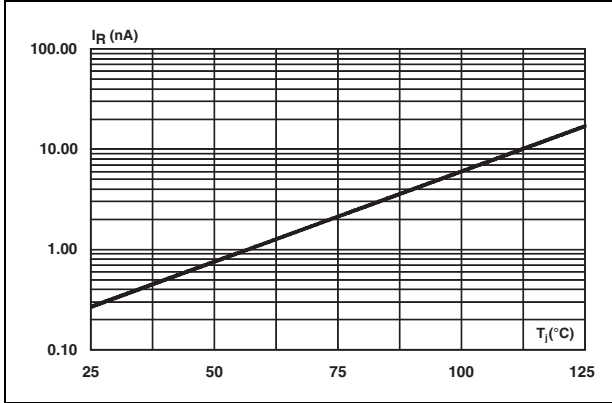


Figure 3. Junction capacitance versus reverse voltage applied (typical values)

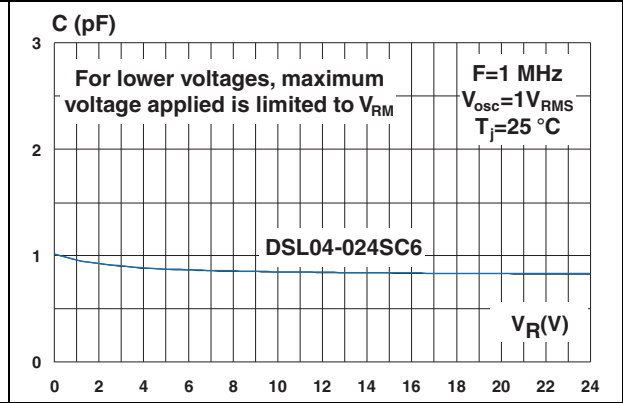
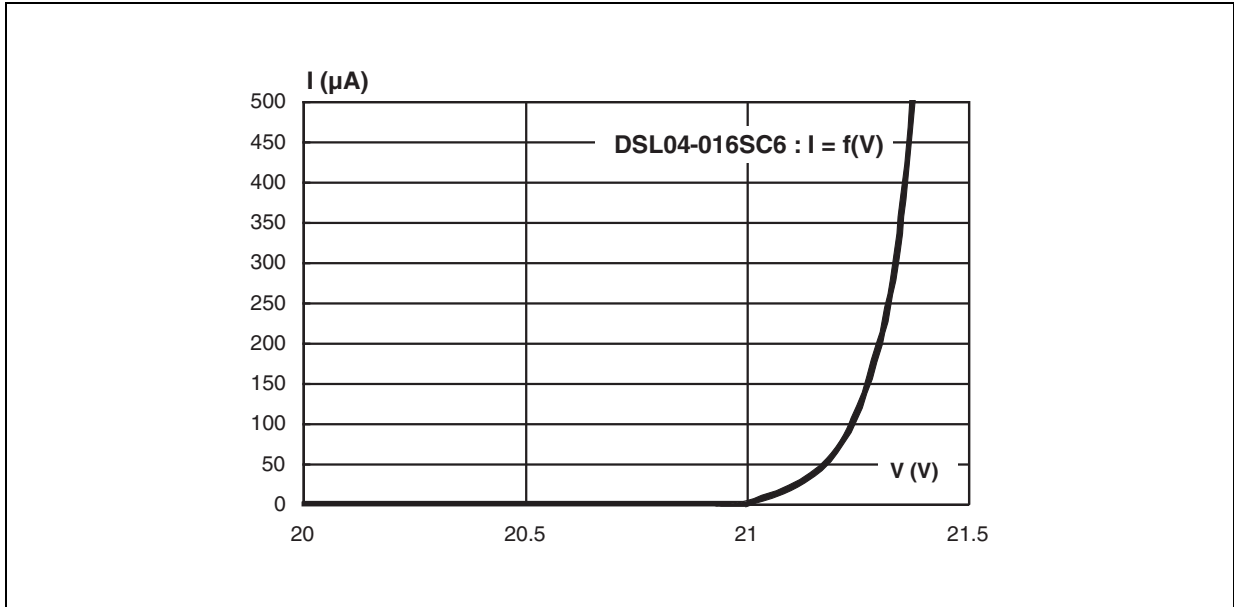


Figure 4. I / V characteristics (typical values)



2 Package information

- Epoxy meets UL94, V0
- Lead-free package

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. ECOPACK® is an ST trademark.

Figure 5. SOT23-6L dimension definitions

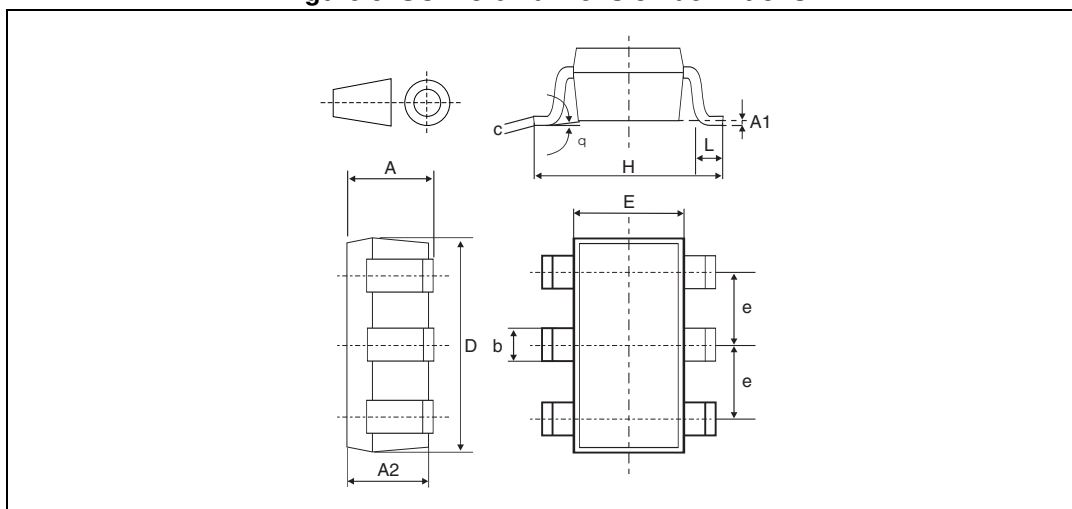


Table 3. SOT23-6L dimension values

| Ref. | Dimensions | | | | | |
|------|-------------|------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | | Max. | Min. | | Max. |
| A | 0.90 | | 1.45 | 0.035 | | 0.057 |
| A1 | 0 | | 0.10 | 0 | | 0.004 |
| A2 | 0.90 | | 1.30 | 0.035 | | 0.051 |
| b | 0.35 | | 0.50 | 0.014 | | 0.020 |
| c | 0.09 | | 0.20 | 0.004 | | 0.008 |
| D | 2.80 | | 3.05 | 0.11 | | 0.118 |
| E | 1.50 | | 1.75 | 0.059 | | 0.069 |
| e | | 0.95 | | | 0.037 | |
| H | 2.60 | | 3.00 | 0.102 | | 0.118 |
| L | 0.10 | | 0.60 | 0.004 | | 0.024 |
| θ | 0° | | 10° | 0° | | 10° |

Figure 6. Footprint recommendations dimensions in mm (inches)

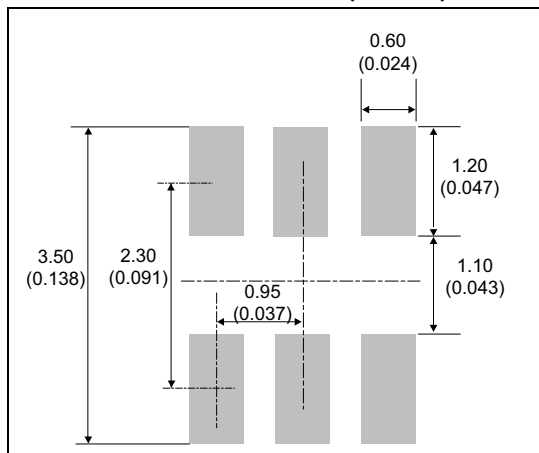
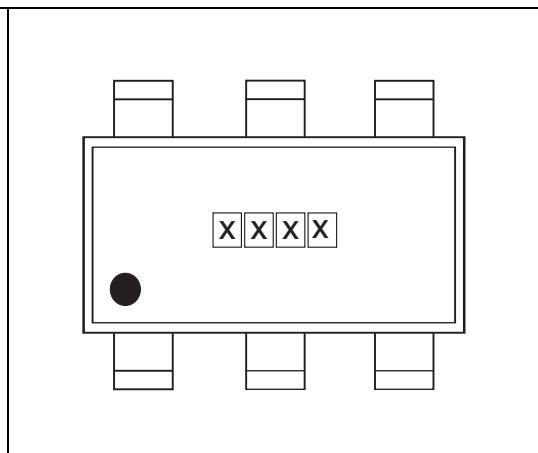


Figure 7. Marking layout



3 Ordering information

Figure 8. Ordering information scheme

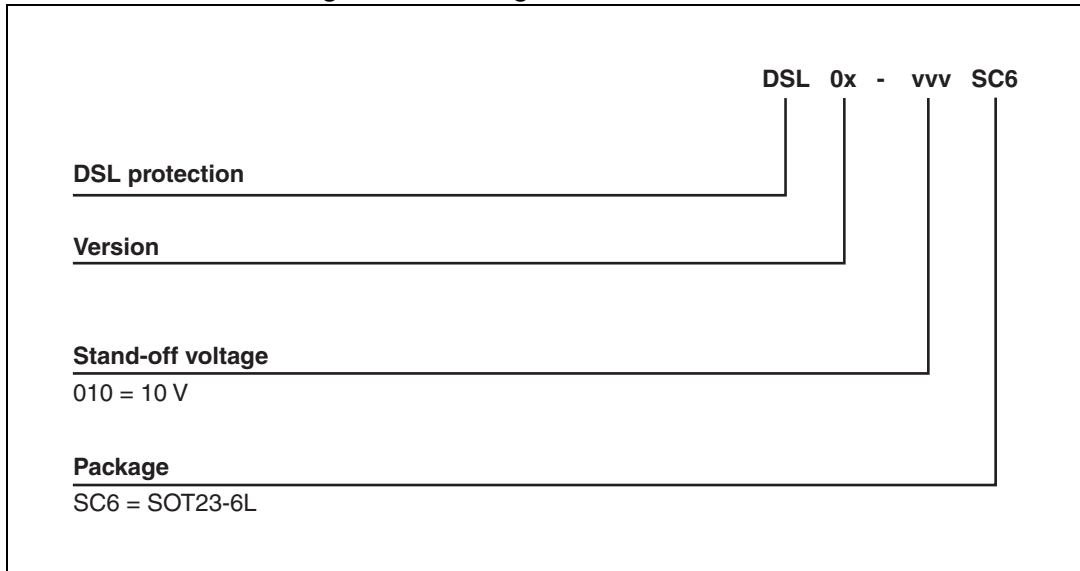


Table 4. Ordering information

| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|----------|--------|----------|---------------|
| DSL04-005SC6 | DT05 | SOT23-6L | 14 mg | 3000 | Tape and reel |
| DSL04-008SC6 | DT08 | | | | |
| DSL04-010SC6 | DT10 | | | | |
| DSL04-012SC6 | DT12 | | | | |
| DSL04-016SC6 | DT16 | | | | |
| DSL04-018SC6 | DT18 | | | | |
| DSL04-020SC6 | DT20 | | | | |
| DSL04-022SC6 | DT22 | | | | |
| DSL04-024SC6 | DT24 | | | | |

4 Revision history

Table 5. Document revision history

| Date | Revision | Changes |
|-------------|----------|----------------------------------|
| 24-Feb-2012 | 1 | Initial release |
| 03-Feb-2015 | 2 | Reformatted to current standard. |

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