

## Protection for Ethernet lines

### Features

- Differential and common mode protection
- Telcordia GR1089 Intrabuilding: 150 A, 2/10  $\mu$ s
- ITU-T K20/21: 40 A, 5/310  $\mu$ s
- Low capacitance: 13 pF max at 0 V
- UL94 V0 approved resin
- SO-8 package is JEDEC registered

### Benefits

- Trisil™ technology is not subject to ageing and provides a fail safe mode in short circuit for a better protection.
- This series is used to help equipment to meet main standards such as UL61950, IEC 950 / CSA C22.2 and UL1459.

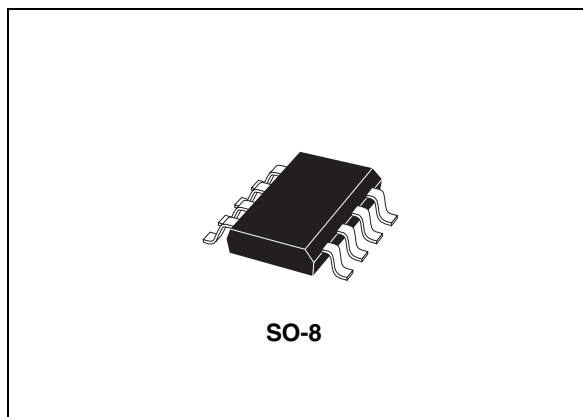
### Complies with the following standards

- IEC 61000-4-2: Level 4
  - 15 kV (air discharge)
  - 8 kV (contact discharge)
- MIL STD 883E-Method 3015-7: class3:
  - 25 kV (Human body model)
- Telcordia GR-1089 Core: 100 A, 2/10  $\mu$ s
- ITU-T K20/21: 37.5 A, 5/310  $\mu$ s
- IEC 61000-4-5: 4 kV, 42  $\Omega$ , 96 A, 8/20  $\mu$ s
- IEC 61000-4-4 EFT : 40A (5/50ns)

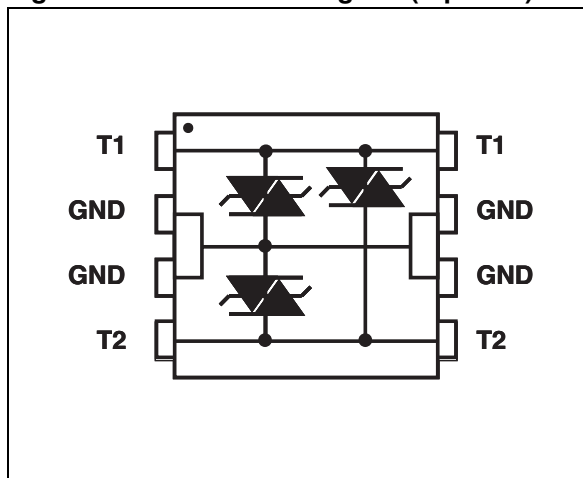
### Applications

This series can meet subscriber and central office requirements.

- Protection against telecommunications surge standards on:
  - 10/100 Mbps Ethernet
  - T1 / E1 line cards



**Figure 1. Schematic diagram (top view)**



### Description

The ETP01 series is a low capacitance transient surge arrester designed for protection of high debit rate communication network. Planar technology used combines a high surge capability to comply with Telcordia GR1089 Intrabuilding and ITU-T K20/21, and low capacitance to avoid distortion of high speed signals such as Ethernet.

**TM:** Trisil is a trademark of STMicroelectronics

# 1 Characteristics

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

| Symbol    | Parameter                                     |                     | Value      | Unit               |
|-----------|-----------------------------------------------|---------------------|------------|--------------------|
| $I_{pp}$  | Peak pulse current <sup>(1)</sup>             | 5/310 $\mu\text{s}$ | 40         | A                  |
|           |                                               | 8/20 $\mu\text{s}$  | 100        | A                  |
|           |                                               | 2/10 $\mu\text{s}$  | 150        | A                  |
| $I_{TSM}$ | Non repetitive surge peak on state current    | $t = 20\text{ ms}$  | 8          | A                  |
| $T_{stg}$ | Storage temperature range                     |                     | -55 to 150 | $^{\circ}\text{C}$ |
| $T_j$     | Operating junction temperature range          |                     | -40 to 150 | $^{\circ}\text{C}$ |
| $T_L$     | Maximum temperature for soldering during 10 s |                     | 260        | $^{\circ}\text{C}$ |

1. Surge capability tested according to ITU-T K20/21 and Telcordia GR1089 Intrabuilding connections (Metallic and Longitudinal tests).

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

| Order code | $I_{RM} @ V_{RM}$  |     | $I_{RM} @ V_{RM}$  |    | $V_{bo}$ | $I_H$   | C                      | C                      |
|------------|--------------------|-----|--------------------|----|----------|---------|------------------------|------------------------|
|            | $\mu\text{A typ.}$ | V   | $\mu\text{A max.}$ | V  | V max.   | mA min. | pF max. <sup>(1)</sup> | pF max. <sup>(2)</sup> |
| ETP01-1621 | 0.01               | 3.3 | 1                  | 16 | 25       | 30      | 16                     | 13                     |
| ETP01-2821 | 0.01               | 3.3 | 1                  | 28 | 36       | 30      | 16                     | 13                     |

1. Test conditions: Capacitance between I/O and GND,  $V_R = 0\text{ V}$  bias,  $V_{RMS} = 1\text{ V}$ ,  $F = 1\text{ MHz}$   
 2. Test conditions: Capacitance between I/O and I/O,  $V_R = 0\text{ V}$  bias,  $V_{RMS} = 1\text{ V}$ ,  $F = 1\text{ MHz}$

Figure 2. Non repetitive surge peak on-state current versus overload duration

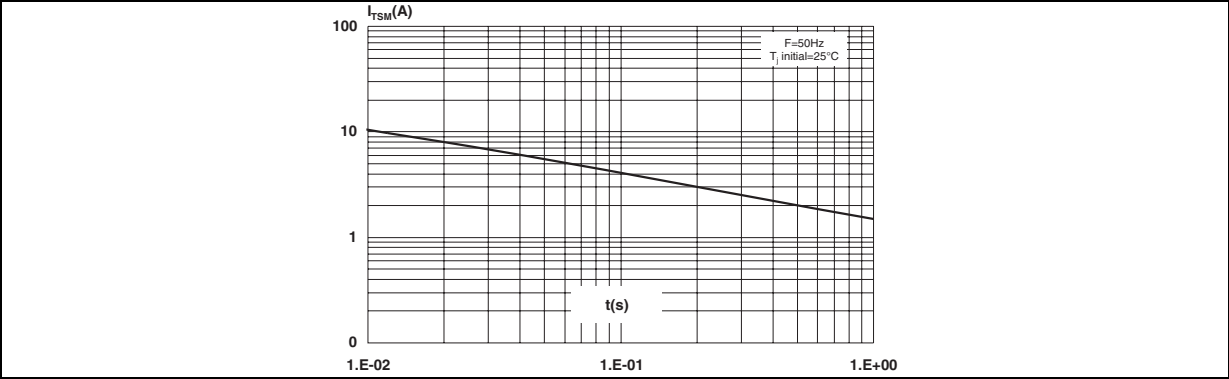


Figure 3. Junction capacitance versus reverse voltage applied for ETP01-1621 (typical values)

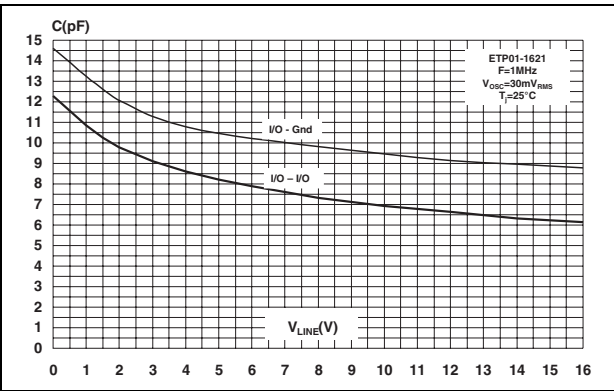
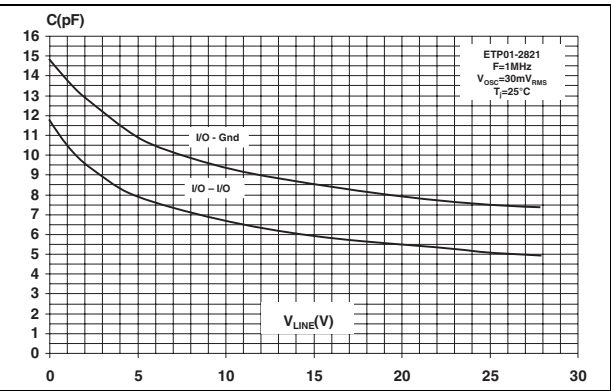


Figure 4. Junction capacitance versus reverse voltage applied for ETP01-2821 (typical values)



## 2 Application information

Figure 5. Application schematic for Ethernet 10/100 Mbps

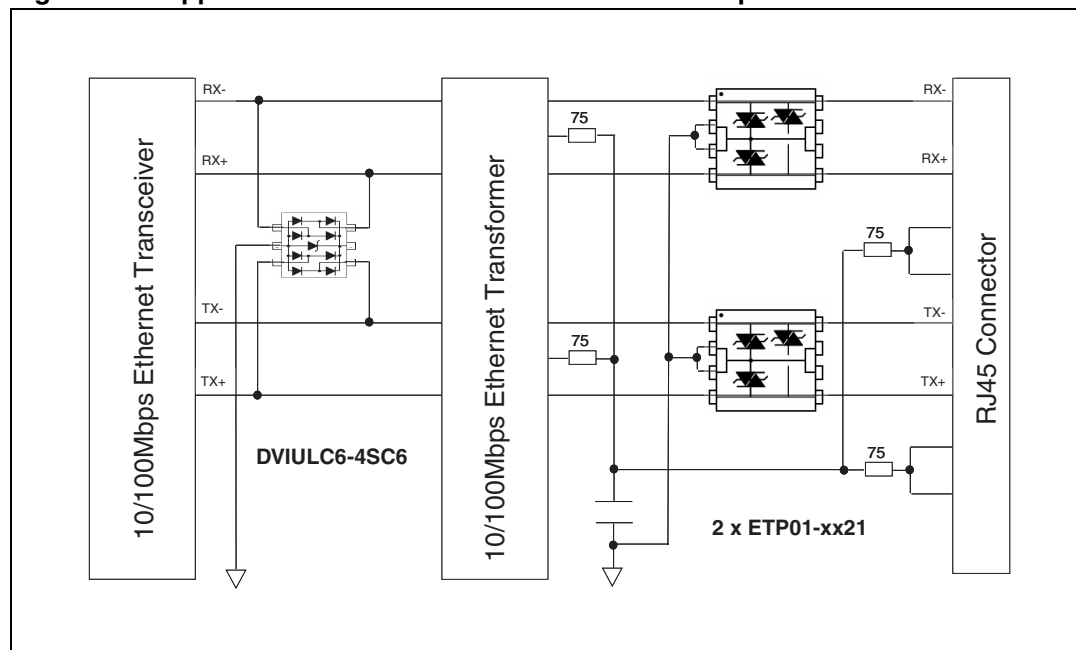
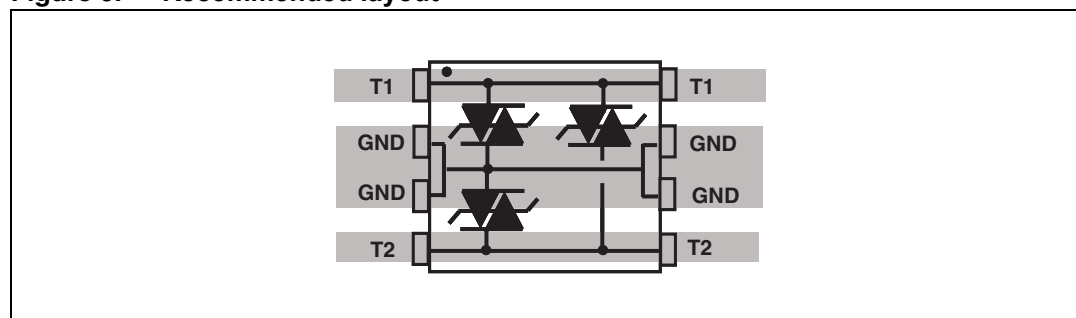


Figure 6. Recommended layout



### 3 Package information

- Epoxy meets UL94, V0
- Lead-free package

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Table 3. SO-8 dimensions

| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    |             |      | 1.75 |        |       | 0.069 |
| A1   | 0.1         |      | 0.25 | 0.004  |       | 0.010 |
| A2   | 1.25        |      |      | 0.049  |       |       |
| b    | 0.28        |      | 0.48 | 0.011  |       | 0.019 |
| C    | 0.17        |      | 0.23 | 0.007  |       | 0.009 |
| D    | 4.80        | 4.90 | 5.00 | 0.189  | 0.193 | 0.197 |
| E    | 5.80        | 6.00 | 6.20 | 0.228  | 0.236 | 0.244 |
| E1   | 3.80        | 3.90 | 4.00 | 0.150  | 0.154 | 0.157 |
| e    |             | 1.27 |      |        | 0.050 |       |
| h    | 0.25        |      | 0.50 | 0.010  |       | 0.020 |
| L    | 0.40        |      | 1.27 | 0.016  |       | 0.050 |
| L1   |             | 1.04 |      |        | 0.041 |       |
| k    | 0°          |      | 8°   | 0°     |       | 8°    |
| ppp  |             |      | 0.10 |        |       | 0.004 |

Figure 7. Footprint dimensions in mm (inches)

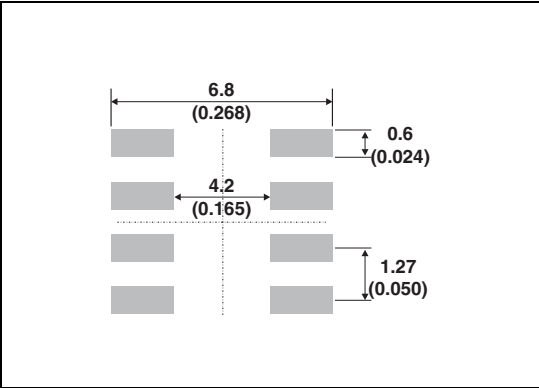
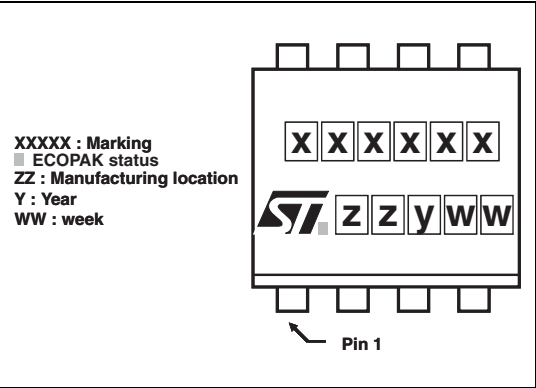


Figure 8. Marking



## 4 Ordering information

**Table 4. Ordering information**

| Order code   | Marking | Weight | Base qty | Delivery mode |
|--------------|---------|--------|----------|---------------|
| ETP01-1621RL | ETP162  | 0.08 g | 2500     | Tape and reel |
| ETP01-2821RL | ETP282  | 0.08 g | 2500     | Tape and reel |

## 5 Revision history

**Table 5. Document revision history**

| Date        | Revision | Changes                                                                                                                                                                                                        |
|-------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 04-Mar-2008 | 1        | Initial release.                                                                                                                                                                                               |
| 24-Sep-2009 | 2        | Updated order code in <a href="#">Table 4</a> and surge values.                                                                                                                                                |
| 19-Feb-2010 | 3        | Updated <a href="#">Figure 1</a> caption to indicate top view. Updated graphic in <a href="#">Table 3</a> to facilitate pin 1 identification. Updated <a href="#">Figure 8</a> to show ECOPACK status marking. |
| 10-May-2011 | 4        | Updated: <a href="#">Applications on page 1</a> .                                                                                                                                                              |

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