

## 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

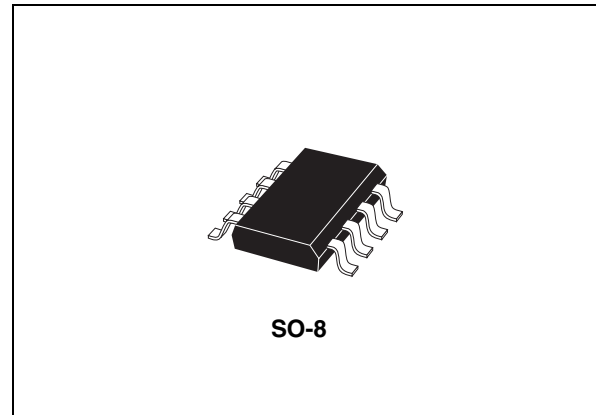
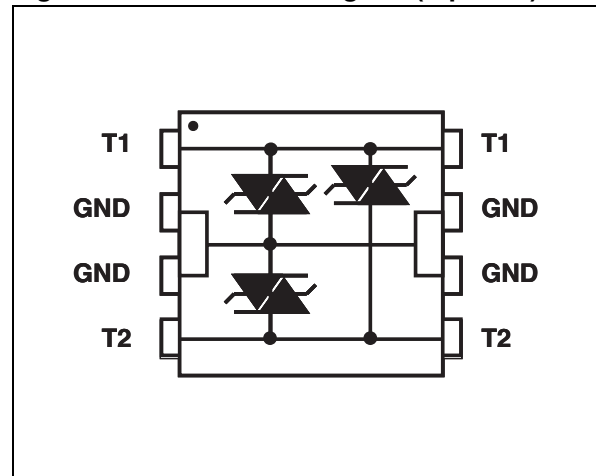


Figure 1. Schematic diagram (top view)



### 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 ( $T_{amb} = 25\text{ °C}$ )**

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 ms	8	A
$T_{stg}$ $T_j$	Storage temperature range Operating junction temperature range		-55 to 150 -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).

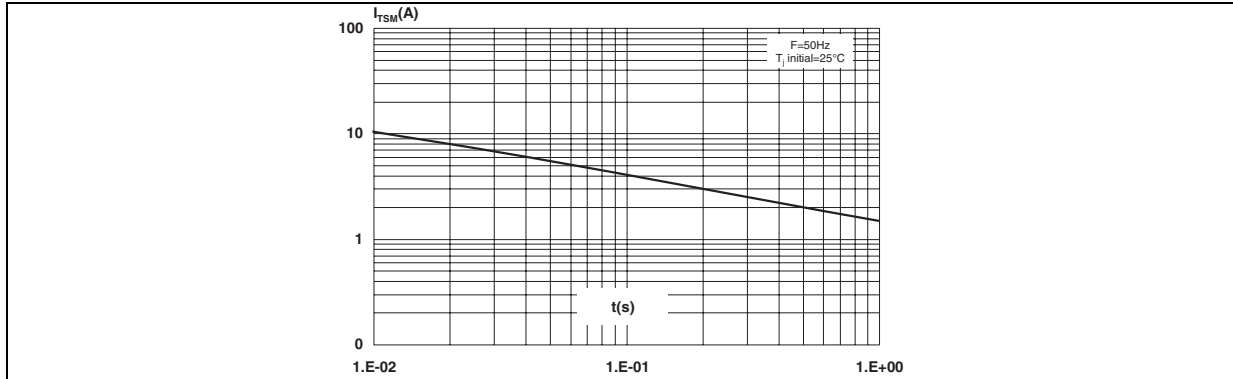
**Table 2. Electrical characteristics ( $T_{amb} = 25\text{ °C}$ )**

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

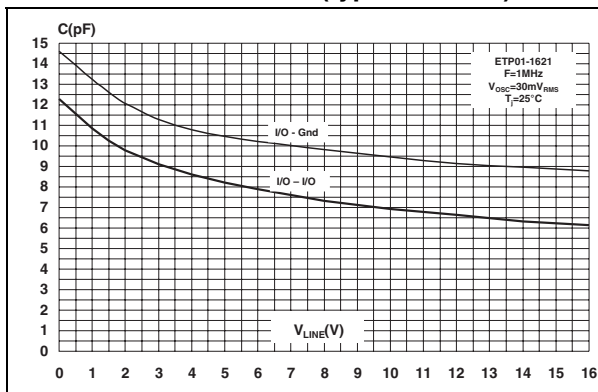
1. Test conditions: Capacitance between I/O and GND,  $V_R = 0\text{ V}$  bias,  $V_{RMS} = 1\text{ V}$ ,  $F = 1\text{ MHz}$

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

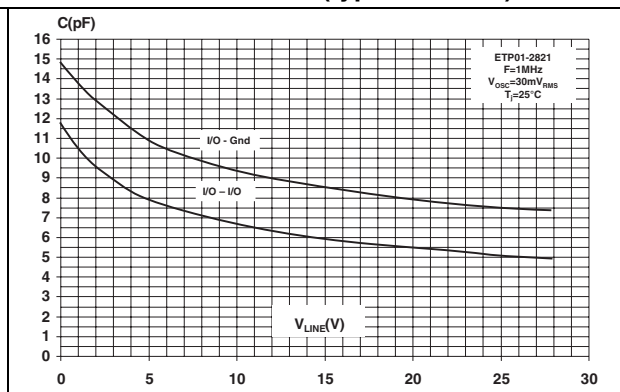
**Figure 2. Non repetitive surge peak on-state current versus overload duration**



**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

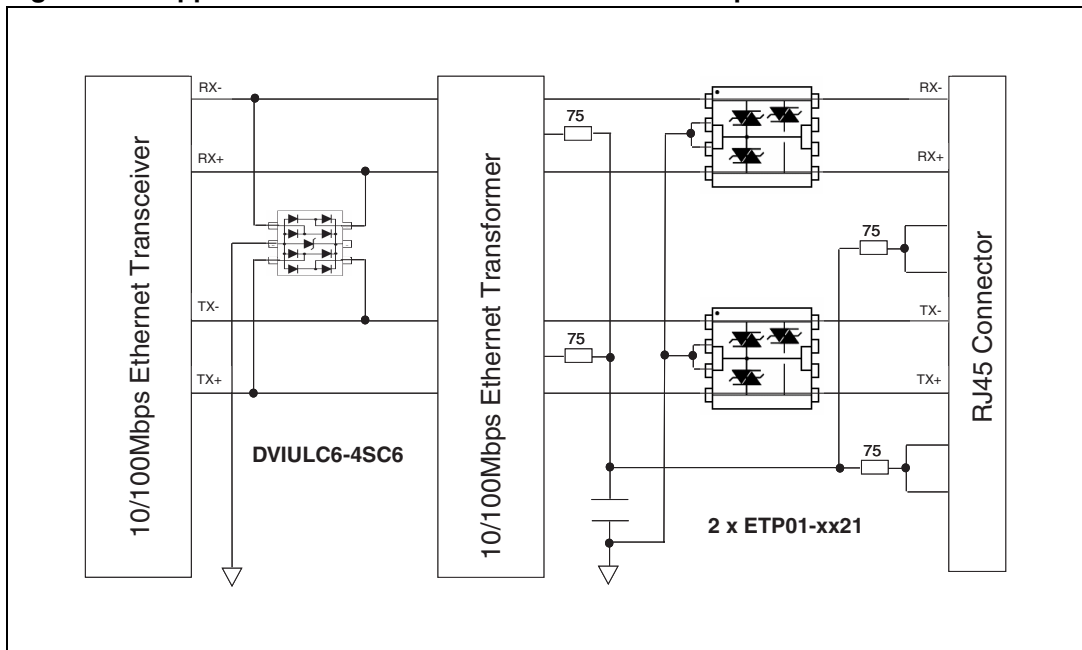
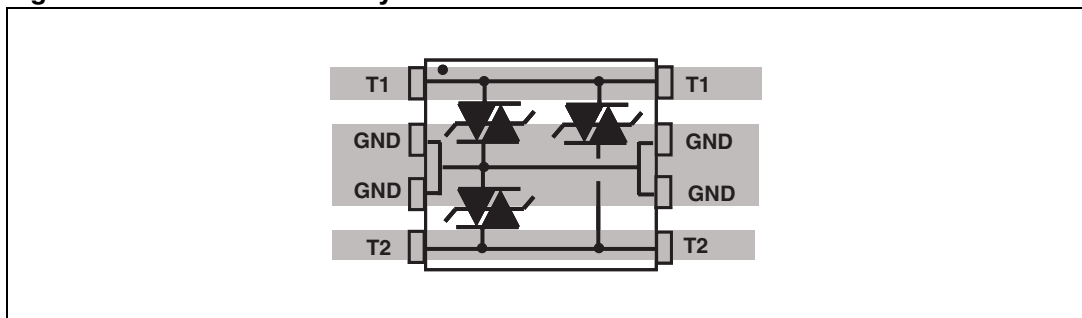


Figure 6. Recommended layout



### 3 Package information

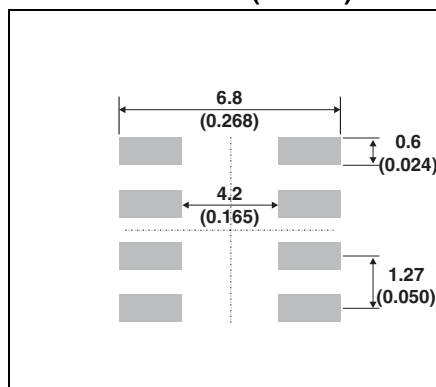
- Epoxy meets UL94, V0
- Lead-free package

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](http://www.st.com). ECOPACK® is an ST trademark.

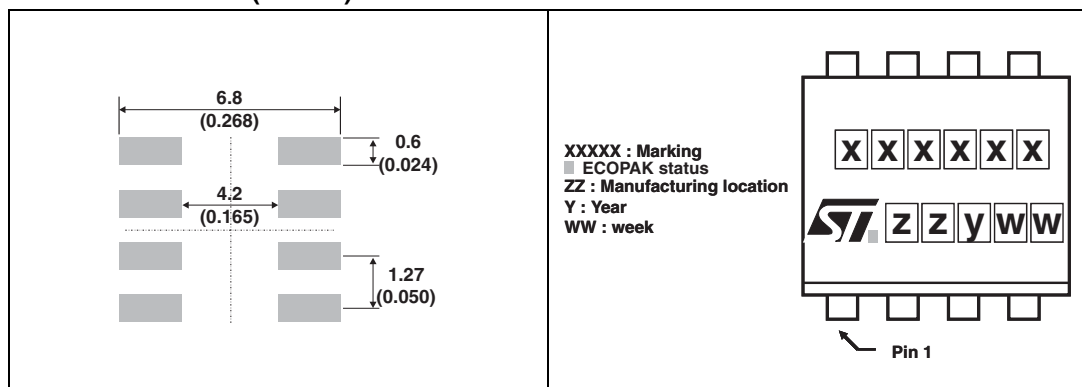
**Table 3. SO-8 dimensions**

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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