# Ethernet Protection Solutions

Ethernet protection solutions featuring industry leading clamping voltage performance, high ESD immunity and low capacitance TVS arrays

**SEMTECH**®

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# Contents

## High Performance

# Circuit Protection – Ethernet ports

Semtech's industry leading TVS protection devices safeguard data-line circuits from ESD and other overvoltage transients. With leading edge process technologies and applications expertise, Semtech is leading the way in automotive circuit protection.

## Automotive Ethernet

Automotive Ethernet is the new physical layer standard, using the Ethernet standard as an in-vehicle network technology. It offers high immunity, reduced cabling, and high-speed data rates. High immunity and reduced cabling are the two big innovations that helped bring Ethernet inside the vehicle. Automotive Ethernet is classified into below categories.

- PHY side Ethernet protection-100/1000Base-T1 & MG Base-T1

- Line side Ethernet protection- 100/1000Base-T1
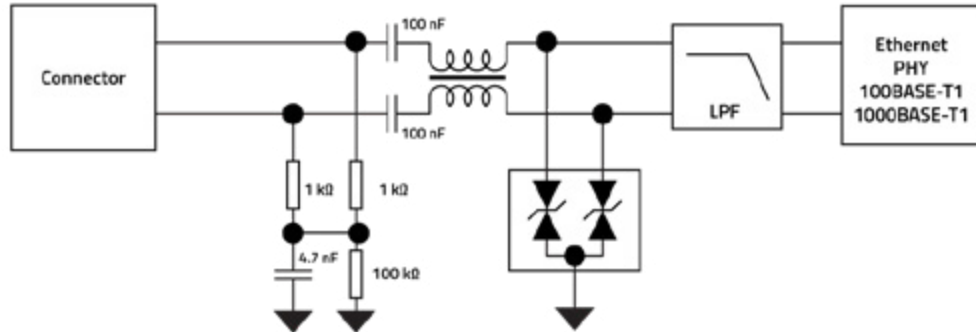
- 10BASE-T1S Ethernet Protection

## Industrial Ethernet

The industry-applied Ethernet protocol, called Industrial Ethernet, is the fastest growing communication protocol within industrial automation and control systems. Industrial Ethernet is the term used to represent industrial protocols that use the standard Ethernet physical layer and standard Ethernet protocols. Based on the speed Industrial Ethernet is classified into

- 10/100 Ethernet
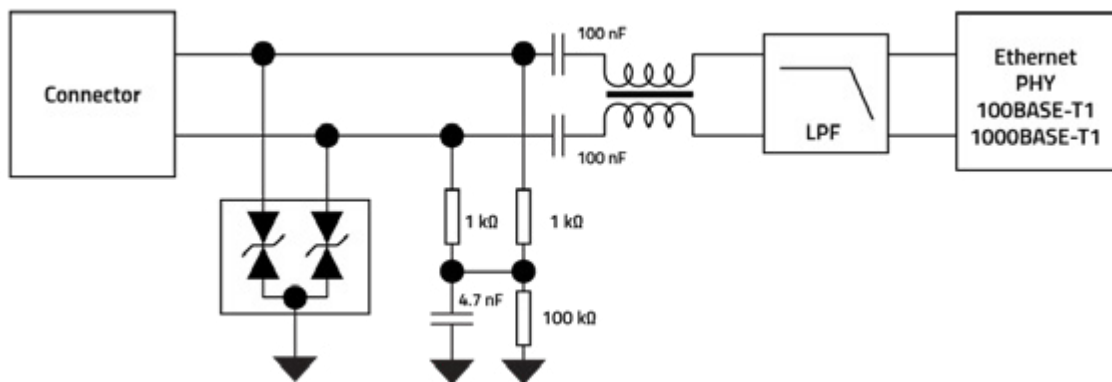
- Gigabit Ethernet

- Multi-Gig Ethernet

TVS Automotive Solutions

# Automotive Ethernet

## PHY Side Ethernet Protection- 100/1000 Base T1 and MG Base T1



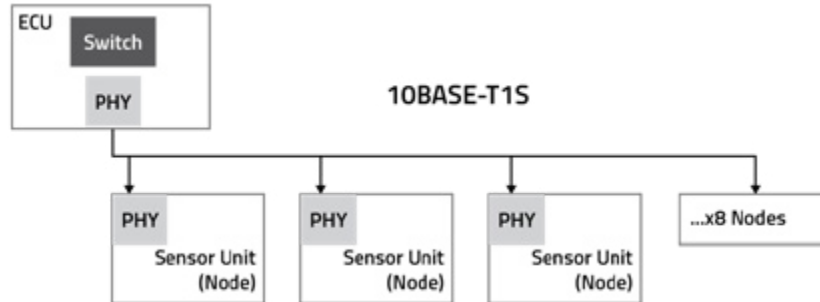| 100/1000 Base T1 and MG Base T1 Ethernet protection | | | | | | | |
|---|---|---|---|---|---|---|---|
| Interface to Protect | Part Number | VRWM (V) | Lines | ESD Rating (contact/air) | Surge (8x20µs) | Cap (pF) | Package (mm) |
| Ethernet-PHY side | RClamp0582BQ | 5 | 2 | ±25kV/±30kV | 15A | 1.2 | 1.6 x 1.6 x 0.75 |
| | RClamp0592PWQ | 5 | 2 | ±30kV/±30kV | 10A | 1.2 | 1.0 x 0.6 x 0.55 |
| | RClamp01892PWQ | 1.8 | 2 | ±8kV/ ±15kV | 2.5A | 0.35 | 1.0 x 0.6 x 0.55 |

## Line Side Ethernet Protection- 100/1000 Base T1



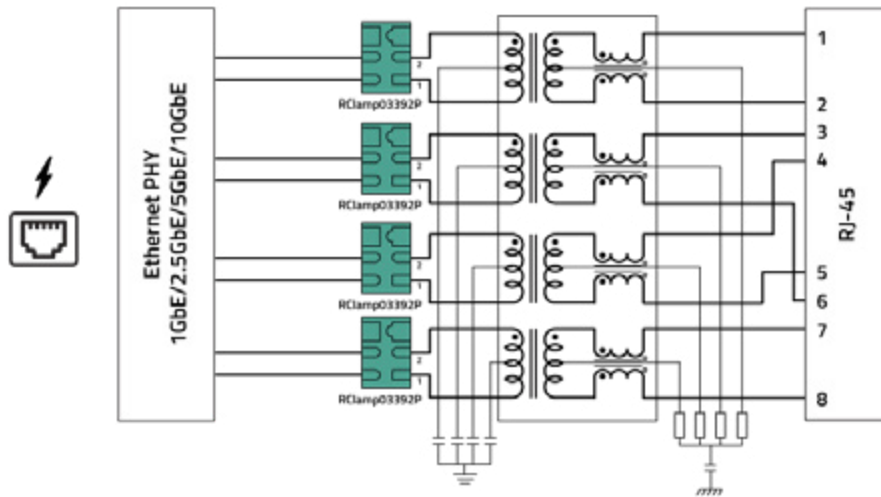| 100/1000 Base T1 Ethernet protection | | | | | | | |
|---|---|---|---|---|---|---|---|
| Interface to Protect | Part Number | VRWM (V) | Lines | ESD Rating (contact/air) | Surge (8x20µs) | Cap (pF) | Package (mm) |
| Ethernet-Line side | EClamp10012PQ | 30 | 2 | ±12kV/±17kV | 3A | 1.4 | 2.0 x 1.0 x 0.6 |
| | RClamp10012PQ | 30 | 2 | ±12kV/±17kV | 3A | 1.4 | 2.0 x 1.0 x 0.6 |
| | RClamp10022PWQ | 30 | 2 | ±15kV/±25kV | 6A | 0.6 | 2.0 x 1.0 x 0.55 |

# Automotive Ethernet

## Ethernet Protection- 10 Base T1S



### 10BASE-T1S Ethernet Protection

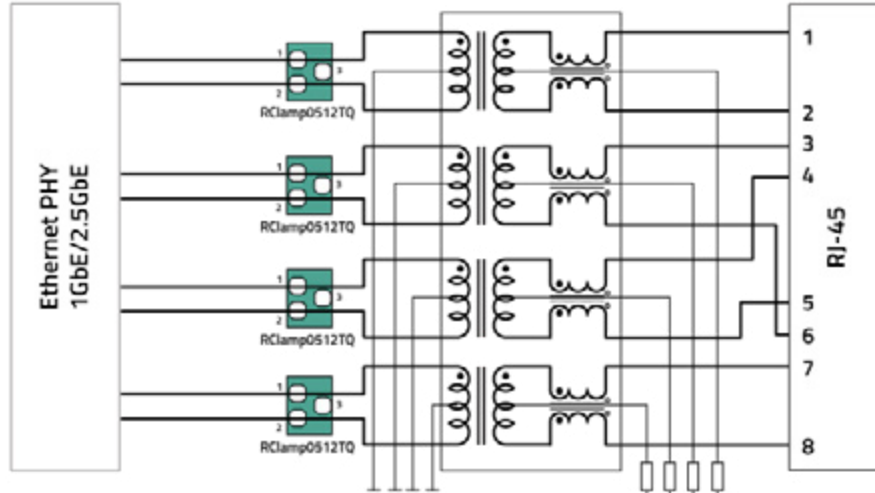| Interface to Protect | Part Number | VRWM (V) | Lines | ESD Rating (contact/air) | Surge (8x20µs) | Cap (pF) | Package (mm) |
|---|---|---|---|---|---|---|---|
| Ethernet 10 Base-T1S | RClamp10022PWQ | 30 | 2 | ±15kV/±25kV | 6A | 0.6 | 2.0 x 1.0 x 0.55 |

# Industrial Ethernet

## Multi-Gig Ethernet Protection



### Multi-Gig Ethernet protection

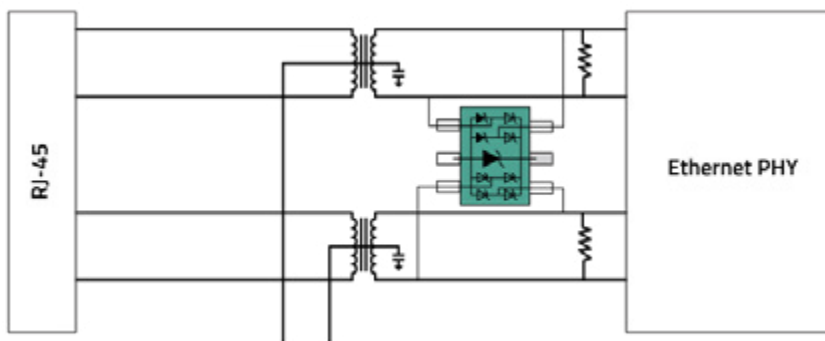| Interface to Protect | Supported data rate | Part Number | VRWM (V) | Lines | ESD Rating (contact/air) | Surge (8x20µs) | Cap (pF) | Package (mm) |
|---|---|---|---|---|---|---|---|---|
| Multi Gig-Ethernet | 1G/2.5G | RClamp0512TQ | 5 | 2 | ±30kV/±30kV | 20A | 2 | 1.0 x 0.6 x 0.4 |
| | 2.5G/5G | RClamp3361P | 3.3 | 1 | ±12kV/±15kV | 7A | 0.25 | 1.0 x 0.6 x 0.5 |
| | 10G | RClamp3382P | 3.3 | 2 | ±25kV/±25kV | 10A | 0.35 | 1.6 x 1.0 x 0.5 |
| | 10G | RClamp03392P | 3.3 | 2 | ±8kV/±20kV | 6A | 0.25 | 1.6 x 1.0 x 0.55 |

# Industrial Ethernet

## Gigabit Ethernet Protection



| Gigabit Ethernet protection | | | | | | | |
|---|---|---|---|---|---|---|---|
| Interface to Protect | Part Number | VRWM (V) | Lines | ESD Rating (contact/air) | Surge (8x20µs) | Cap (pF) | Package (mm) |
| Gigabit Ethernet | RClamp0512TQ | 5 | 2 | ±30kV/±30kV | 20A | 1.2 | 1.0 x 0.6 x 0.4 |
| | RClamp3374N | 3.3 | 8 | ±30kV/±30kV | 40A | 1.7 | 3.0 x 2.0 x 0.6 |

## 10/100 Ethernet Protection



| 10/100 Ethernet protection | | | | | | | |
|---|---|---|---|---|---|---|---|
| Interface to Protect | Part Number | VRWM (V) | Lines | ESD Rating (contact/air) | Surge (8x20µs) | Cap (pF) | Package (mm) |
| 10/100 Ethernet | RClamp3354S | 3.3 | 4 | ±30kV/±30kV | 25A | 3.8 | 2.9 x 2.8 x 1.10 |
| | RClamp0554S | 5 | 4 | ±30kV/±25kV | 25A | 5 | 2.9 x 2.8 x 1.10 |
| | RClamp0512TQ | 5 | 2 | ±30kV/±30kV | 20A | 1.2 | 1.0 x 0.6 x 0.4 |

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# SEMTECH®

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