

## DIGITAL PROCESS DATA LINE PROTECTOR



422ELC

### DESCRIPTION

The 422ELC is low capacitance, two-stage transient voltage protector that provides primary and secondary protection against lightning, inductive switching and electrostatic discharge (ESD) transient threats. The first stage diverts the transient current through the ground terminal return path and the second stage clamps the voltage to a safe level without interruption of service.

The 422ELC is designed to protect data lines from differential (line-line) and common-mode (line-to-ground) transients. Terminals 1 & 2 and 3 & 4 for the 422ELC are designed as line pairs. A transient voltage suppressor is connected across each line pair for differential mode protection. Each line pair is referenced to ground.

This product can also be used on telephone, signal/data lines, security, timing and control interface circuits. For most applications, the product should be located as close as possible to the equipment being protected. A low impedance grounding system is important to maintain a low voltage clamp between the line-to-ground connection. Capacitance over the operating voltage range is important. If capacitance is nonlinear, distortion, loss of data or access to the I/O port can occur (See Figure 1).

### APPLICATIONS

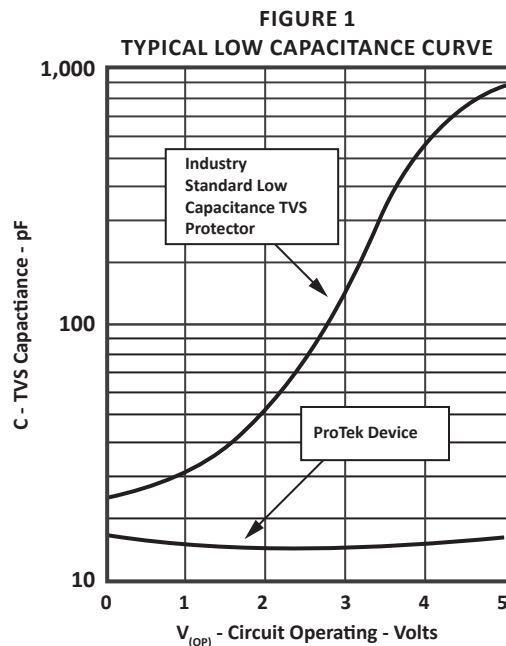
- RS-422 Data Lines
- Digital Process Control Loop
- Long Line Digital Systems
- Digital Transmission
- Telemetry Systems
- Smoke Detector and Fire Alarm Systems

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 95A, 8/20 $\mu$ s, Level 4 (Line-Gnd) & 48A, Level 4 (Line-Line)
- Low Capacitance - 25pF
- Designed for EIA Standard RS-422 Data Lines
- Permanent Two-Stage 2 Line Pair Protector
- Subnanosecond Response Time
- Common & Differential Mode Protection
- Automatic Reset - Does Not Interrupt Service
- Effective Against Lightning, Inductive Switching and ESD

### MECHANICAL CHARACTERISTICS

- Approximate Weight: 142 grams
- Flammability Rating UL 94V-0



**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

PARAMETER	SYMBOL	VALUE	UNITS
Peak Operating Line Voltage	$V_{OP}$	±12	Volts
Operating Line Current	$I_O$	200	mA
Transient Voltage	-	20	kV/Wire
Transient Current - 8/20µs waveform	-	10	kA/Wire
Transient Current - 8/20µs waveform	-	40	kA/Protector
Operating Temperature	$T_A$	-55 to 100	°C
Storage Temperature	$T_{STG}$	-55 to 100	°C
Response Time	-	< 1	ns

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

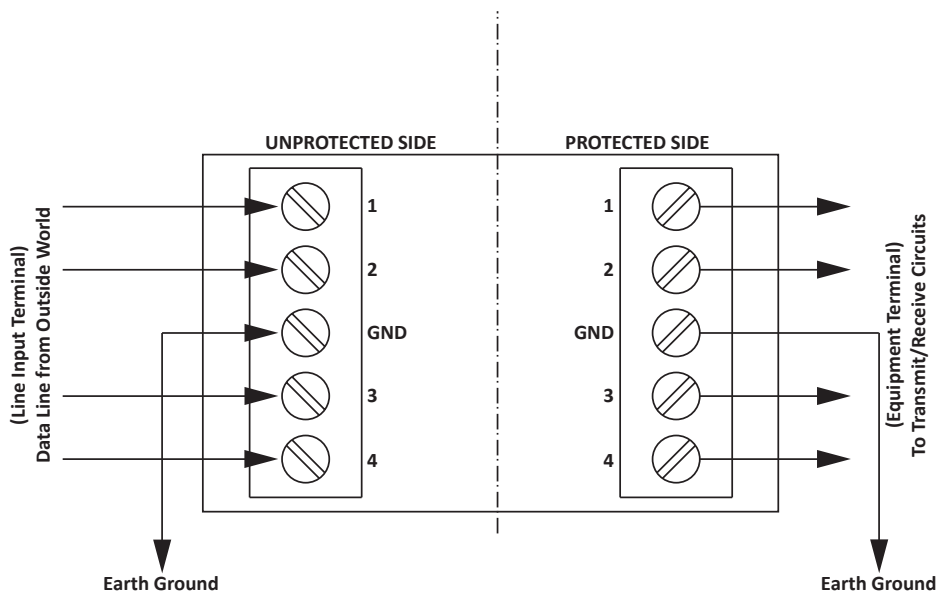
PART NUMBER	MAXIMUM CLAMPING VOLTAGE (8/20µs) LINE-LINE @ 500A $V_C$ ±VOLTS	MAXIMUM CLAMPING VOLTAGE (8/20µs) LINE-GND @ 500A $V_C$ ±VOLTS	MAXIMUM LINE THROUGHPUT RESISTANCE  R OHMS	MAXIMUM LEAKAGE CURRENT  @ 12V <sub>OP</sub> $I_D$ µA	MAXIMUM CAPACITANCE  @ 0V, 1MHz C pF
422ELC	30.0	30.0	12	1	25

## PACKAGE INFORMATION

### INSTALLATION INSTRUCTIONS & DIAGRAM

There are five (5) terminals on the LINE SIDE and five (5) terminals on the EQUIPMENT SIDE of the 422ELC, 4 data lines and one ground. Both grounds are connected together internally. A single low impedance ground is sufficient. Incoming data lines are cut or disconnected from the equipment to insert the 422ELC product. The incoming lines are to be connected to the line side terminals as the equipment side lines are connected to the equipment side terminals. The location of the product should be as close to the equipment as possible. The 422ELC series is designed with a short circuit failure mode to give maximum protection. A fuse, fusible link, or circuit breaker is recommended for each data/signal line on the input side for those that require an open circuit failure mode.

**Caution:** A low DC resistance ground may not be a good ground. Lightning contains a broad spectrum of frequencies up to 1 MHz. A low impedance path to ground at the transient frequencies is necessary. A ground strap is recommended or a #6 AWG stranded wire. For wire lengths over 1.5 meters, there may be some excessive line to earth potential under severe thunderstorm conditions.

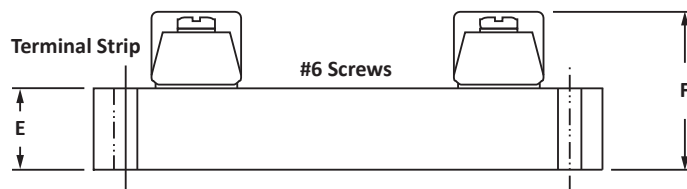
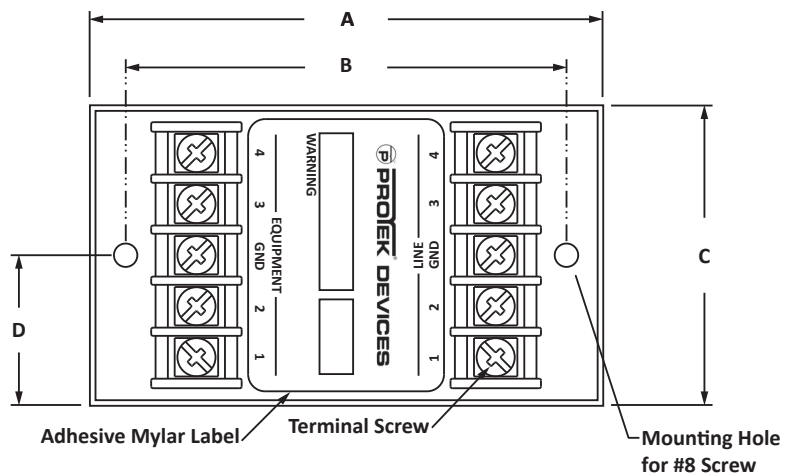


**Note:** Both ground terminals are common. Use second ground wire to reduce impedance on long runs to earth ground connections.

## PACKAGE INFORMATION

### OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	95.5	-	3.8
B	82.22	82.98	3.235	3.265
C	-	57.2	-	2.25
D	-	30.2	-	1.125
E	-	15.5	-	0.61
F	-	30.2	-	1.19



Note: Recommended torque value for mounting: less than 10 inch pounds

### ORDERING INFORMATION

BASE PART NUMBER	MARKING
422ELC	Logo, Date Code, Terminal Designations and Part Number

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 30 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection that include Transient Voltage Suppressor (TVS) Arrays, Steering Diode Array Hybrids, High-power Components and Modules, as well as Steering Diodes, EMI Filter/TVS Arrays and Thyristor Surge Suppressors. These components deliver circuit protection in electronic systems from numerous overvoltage events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices is an ISO 9001 certified company.

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