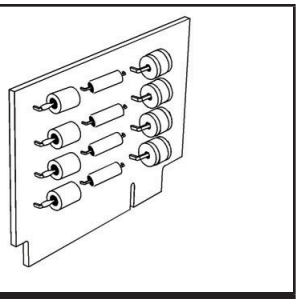
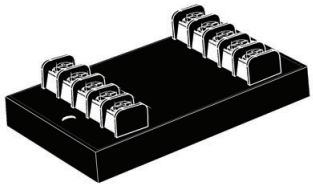
INDUSTRIAL COMPUTER DATA LINE PROTECTOR



232B



232E

DESCRIPTION

The 232B/E is a 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 232B/E is designed to protect two line pairs or 4 data lines from common-mode lightning or switching transients. the datalines are isolated to prevent near to far end cross talk problems. This product can also be used on data and transmission lines, security timing and control interface circuits.

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, 8/20µs, Level 4 (Line-Gnd) & 48A, Level 4 (Line-Line)
- 4 Wire Line-Ground Protection
- Designed for EIA Standard RS-232 Data Lines
- Permanent Two Stage, 2 Line Pair or 4 Line Protector
- Subnanosecond Response Time
- Automatic Reset - Does Not Interrupt Service
- Effective Against Lightning, Inductive Switching and ESD

APPLICATIONS

- RS-232 Transmission Lines
- Category 3 Systems
- Control & Monitoring Systems
- Analog Signal Transmissions
- Telemetry Outstations

MECHANICAL CHARACTERISTICS

- Approximate Weight: 28 grams (232B) & 142 grams (232E)
- 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}	±25	Volts
Operating Line Current	I_O	200	mA
Transient Voltage	-	10	kV/Wire
Transient Current - 8/20µs waveform	-	10	kA/Wire
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) @ 500A V_C VOLTS	MAXIMUM LINE THROUGHPUT RESISTANCE R OHMS	MAXIMUM LEAKAGE CURRENT @ 25V_{OP} I_D µA	MAXIMUM CAPACITANCE @ 0V, 1MHz C pF
232B/E	40	12	5	2000

INSTALLATION INSTRUCTIONS

There are five (5) terminals on both the line and equipment side of the 232E - four data line terminals and two ground terminals. Both ground terminals, as shown on the label, are connected internally. A single ground connection is sufficient. However, it is recommended that both ground connections be used for a lower impedance path to earth. This connection can be made through the green AC power ground wire or a known earth ground. The ground wire should be #14 stranded wire.

Incoming data lines are cut or disconnected from the equipment to insert the 232E product. The line side of the terminals are to be connected to data lines from the outside world or lines that carry the transient threats into the equipment to be protected. The equipment side of the terminals are to be connected to the equipment to be protected . The location of the product should be such that these wires are as short as possible. A #18 or 20 gauge wire can be used for these connections.

Protectors should be installed at both ends of the data lines, at the point of entry to buildings. Use the shortest possible connection to a low impedance earth ground. Proper grounding and bonding are essential for computer installation applications.
The 232B circuit board requires an edge connector interface for installation. The circuit board should be located at the building interface for incoming lines from the outside world.

Both the 232B and 232E can be mounted on a data line circuit panel, which must be hard wired to the incoming data lines. Unprotected input lines and ground wires are to be separated from protected output lines to prevent electromagnetic coupling of noise from high transient currents on the input lines.

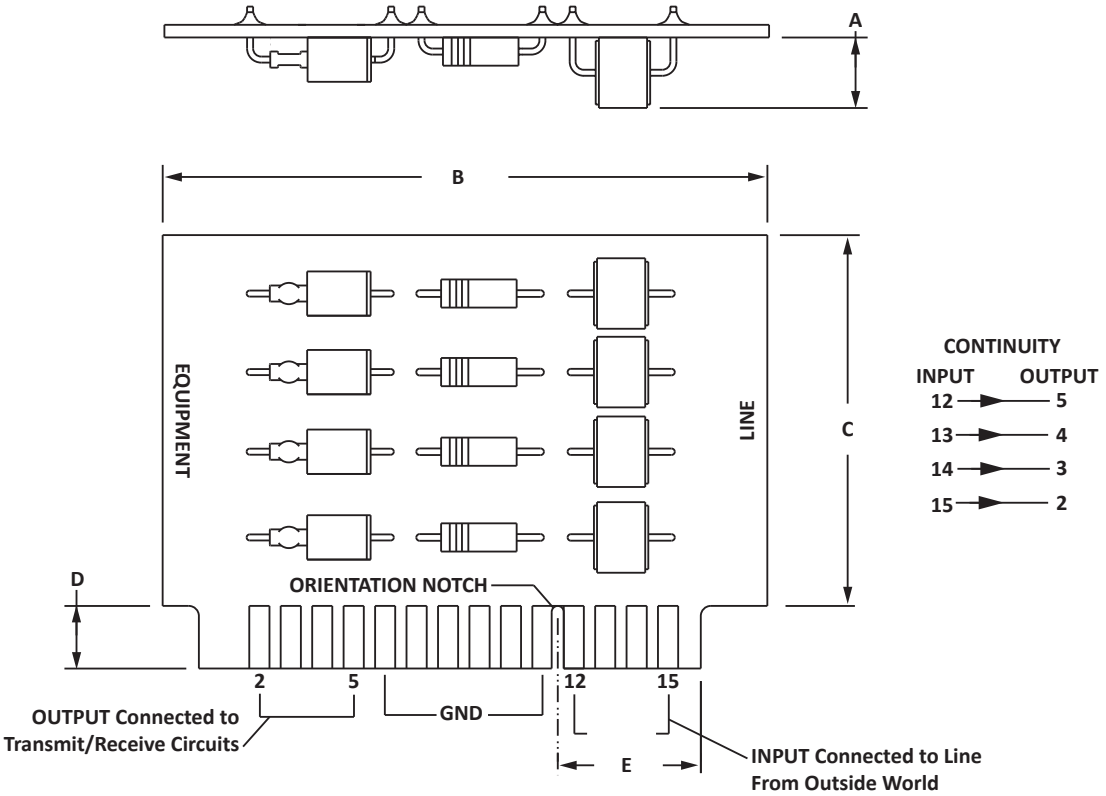
ProTek's data line protector is designed with a short circuit failure mode to give maximum protection. A fuse, fusible link, or circuit breaker is recommended for each data/signal line on the input (line) side of the protector for those applications that require an open circuit failure mode.

Caution: A low DC resistance ground may not be indicative of a good lightning 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. For these applications, an additional protector may be necessary at the equipment interface.

PACKAGE INFORMATION

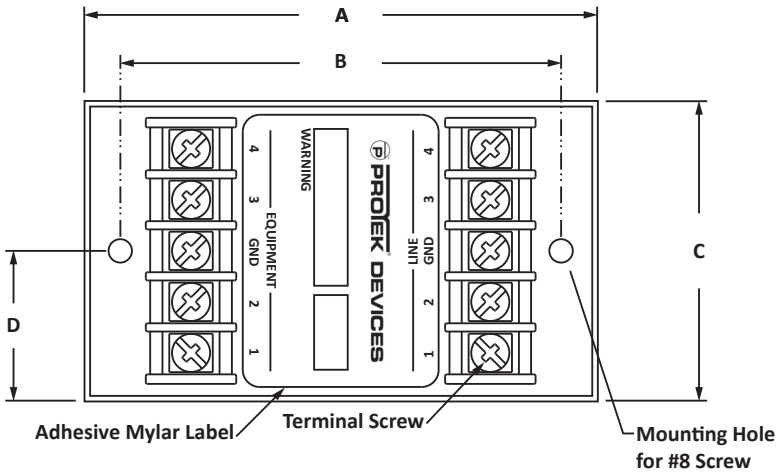
232B OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	12.7	-	0.50
B	-	76.2	-	3.0
C	-	48.2	-	1.90
D	-	7.6	-	0.30
E	-	17.8	-	0.7

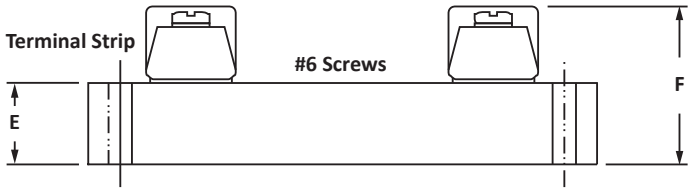
NOTES
1. I/O contacts spaced at 0.156" (3.96mm) centers.



PACKAGE INFORMATION

232E 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





ORDERING INFORMATION	
BASE PART NUMBER	MARKING
232B	Logo, Date Code, Terminal Designations and Part Number
232E	Logo, Date Code, Terminal Designations and Part Number

COMPANY INFORMATION

COMPANY PROFILE

ProTek Devices, based in Tempe, Arizona USA, is a manufacturer of Transient Voltage Suppression (TVS) products designed specifically for the protection of electronic systems from the effects of lightning, Electrostatic Discharge (ESD), Nuclear Electromagnetic Pulse (NEMP), inductive switching and EMI/RFI. With over 25 years of engineering and manufacturing experience, ProTek designs TVS devices that provide application specific protection solutions for all electronic equipment/systems.

ProTek Devices Analog Products Division, also manufactures analog interface, control, RF and power management products.

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