

# Transient Protection

## Diode Connectors

### FEATURES & BENEFITS:

- Clamping voltage as low as 11.9 volts
- Low capacitance – suitable for high frequency applications
- Unipolar or bipolar – using existing proven diode technology
- Protection for 5.8 to 60 VDC circuits
- No additional circuits required
- Low impedance – high frequency response
- Increased reliability
- Nanosecond response time
- Elimination of costly external suppression assemblies
- Screening to applicable requirements of MIL-S-19500TX/TXV available
- Keeps transients outside of the box
- Minimizes fast transient voltage overshoot

The Amphenol® Diode Connector offers the versatility of a standard connector, with transient protection for sensitive circuits, such as TTL Lines.

Transients in electrical circuits caused by a sudden release of stored energy can originate within or outside of the circuit and may be repeatable or random.

Regardless of frequency or origin, transient caused failures generated by load switching, lightning, electrostatic discharge (ESD) and electromagnetic pulse (EMP) can destroy unprotected IC components.

Compatible with present filter connector assembly procedures, diodes can stand alone or can be combined in series with filters. Internal housing of the diode offers weight and space savings over other protection methods available today, and eliminates costly and bulky exterior suppression mechanisms in appropriate situations. Diodes are presently available in contact sizes 22 and 20.

Transient protection can be provided in receptacle, plug or adapter configurations. These connectors are intermateable and intermountable with the following MIL-Specs:



- MIL-DTL-5015
- MIL-DTL-26482
- MIL-DTL-26500
- MIL-DTL-27599
- MIL-DTL-38999
- MIL-DTL-83723

Amphenol can provide COTS solutions utilizing leaded & surface mounted devices. For more information contact Amphenol Aerospace at 800-678-0141.



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## ESA – Energy Shunting Assembly

The Amphenol® Energy Shunting Assembly (ESA) is a simple, compact unit which provides lightning and electromagnetic pulse (EMP) protection of systems in which many signal lines enter sensitive electronic equipment. The efficient packaging of the ESA circumvents the concept of one protective device per line. It provides a surge arrester which has the advantage of space saving and simplified assembly when compared to current protective devices which range from diodes to large spark gaps.

The current ESA design consists of two 53-pin contact, Mil-Standard, hermetic connectors assembled back to back, and encompassing a ground plate. A sealed chamber is formed within this thru-bulkhead unit, housing 53 in-line spark gaps. Introducing a controlled atmosphere enhances fast rise breakdown.

The ESA can be integrated with an EMI filter connector which can improve its performance. These two assemblies provide a method to help protect against lightning, EMP, EMI and TEMPEST effects.



**ESA**  
**ENERGY SHUNTING ASSEMBLY**

### PERFORMANCE CHARACTERISTICS

|   |                                   |                                    |
|---|-----------------------------------|------------------------------------|
| 1. DC breakdown voltage   |                                   | 230 Volts                          |
| 2. Maximum rated surge discharge current (8 x 20 microsecond pulse) |                                   | 5,000 Amperes per pin              |
| 3. Insulation resistance  |                                   | 10 <sup>10</sup> ohms minimum      |
| 4. Capacitance between each electrode and the ground plane          |                                   | Less than 2 pf                     |
| 5. Rate-of-rise breakdown voltage                                   | Maximum Breakdown Voltage (Volts) | Rate of Rise (Volts/microsecond)   |
|   | 600                               | 10                                 |
|   | 800                               | 1,000                              |
|   | 1,500                             | 10,000                             |
|   | 2,000                             | 1000,000                           |
| 6. Surge breakdown unbalance (at 100 Volts/microseconds)            |                                   | 180 Volts                          |
| 7. Surge life (500 Ampere – 10 x 1,000 microsecond)                 |                                   | 400 Surges                         |
| 8. Hold-over voltage  |                                   | 100 Volts                          |
| 9. Arcing voltage   |                                   | 40 Volts                           |
| 10. Glow to arc transition point                                    |                                   | 1 Ampere                           |
| 11. Temperature range   |                                   | -40°F to 150°F<br>(233°K to 339°K) |