Combined Category D, C, B tested protector (to BS EN 61643) for ‘through hole’ mounting directly onto the PCB of data communication, signal or telephone equipment which require a lower in-line resistance, an increased current or a higher bandwidth than the PCB/D Series. Available for working voltages of up to 110 Volts for AC & DC power applications up to 1.25 Amps. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits
- Suitable for wave soldering
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Very low (1 Ω) in-line resistance for resistance critical applications
- High (1.25 A) maximum running current
- Higher bandwidth enables higher frequency data communications
- 2 pin clean end and 3 pin line end to ensure correct insertion

Installation
Connect in series, soldering pins direct onto PCB. Tracks to line and earth pins should be as wide as practical (see Furse Application Note AN003). Dirty (line) tracks should be routed parallel and as close together as possible. This should also be implemented on clean tracks, however clean tracks should never be routed close and parallel to line tracks or dirty barrier earth connections as earth connections as transients can be re-introduced after the protector due to electromagnetic coupling.

The use of an earth layer or plane is highly recommended as this reduces the electromagnetic field produced by a transient discharging to earth considerably, and hence the chance of the transient being picked up on clean tracks.

Maximum line to clean separation. Large input tracks and pads (using top and bottom copper layers). Earth pin is bonded to an earth layer/plane.

All dirty (line) incoming tracks are separated from the clean output tracks, individual line and clean tracks are routed close together. Earth pins are bonded to an earth layer/plane.
ESP PCB/E Series - Technical specification

### Electrical specification

<table>
<thead>
<tr>
<th>ABB order code</th>
<th>ESP PCB/06E</th>
<th>ESP PCB/15E</th>
<th>ESP PCB/30E</th>
<th>ESP PCB/50E</th>
<th>ESP PCB/110E</th>
</tr>
</thead>
<tbody>
<tr>
<td>7TCA085400R0039</td>
<td>7TCA085400R0153</td>
<td>7TCA085400R0043</td>
<td>7TCA085400R0156</td>
<td>7TCA085400R0041</td>
<td></td>
</tr>
</tbody>
</table>

**Nominal voltage**

<table>
<thead>
<tr>
<th>ESP PCB/06E</th>
<th>6 V</th>
<th>ESP PCB/15E</th>
<th>15 V</th>
<th>ESP PCB/30E</th>
<th>30 V</th>
<th>ESP PCB/50E</th>
<th>50 V</th>
<th>ESP PCB/110E</th>
<th>110 V</th>
</tr>
</thead>
</table>

**Maximum working voltage Uc (RMS/DC)**

<table>
<thead>
<tr>
<th>ESP PCB/06E</th>
<th>5 V / 7.79 V</th>
<th>ESP PCB/15E</th>
<th>11 V / 16.7 V</th>
<th>ESP PCB/30E</th>
<th>25 V / 36.7 V</th>
<th>ESP PCB/50E</th>
<th>40 V / 56.7 V</th>
<th>ESP PCB/110E</th>
<th>93 V / 132 V</th>
</tr>
</thead>
</table>

**Current rating (signal)**

1.25 A

**In-line resistance (per line ±10%)**

1.0 Ω

**Bandwidth (-3 dB 50 Ω system)**

45 MHz

### Transient specification

**Let-through voltage (all conductors)**

<table>
<thead>
<tr>
<th>ESP PCB/06E</th>
<th>ESP PCB/15E</th>
<th>ESP PCB/30E</th>
<th>ESP PCB/50E</th>
<th>ESP PCB/110E</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2 test 4 kV 1.2/50 μs, 2 kA 8/20 μs to BS EN/EN/IEC 61643-21</td>
<td>36.0 V</td>
<td>39.0 V</td>
<td>60.0 V</td>
<td>86.0 V</td>
</tr>
<tr>
<td>C1 test 1 kV, 1.2/50 μs, 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21</td>
<td>26.2 V</td>
<td>28.0 V</td>
<td>49.0 V</td>
<td>73.5 V</td>
</tr>
<tr>
<td>B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21</td>
<td>16.0 V</td>
<td>25.5 V</td>
<td>43.5 V</td>
<td>65.0 V</td>
</tr>
<tr>
<td>5 kV / 700 μs</td>
<td>17.0 V</td>
<td>26.2 V</td>
<td>44.3 V</td>
<td>65.8 V</td>
</tr>
</tbody>
</table>

**Maximum surge current**

<table>
<thead>
<tr>
<th>ESP PCB/06E</th>
<th>ESP PCB/15E</th>
<th>ESP PCB/30E</th>
<th>ESP PCB/50E</th>
<th>ESP PCB/110E</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1 test 10/350 μs to BS EN/EN/IEC 61643-21: Per signal wire</td>
<td>2.5 kA</td>
<td>5 kA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per pair</td>
<td>10 kA</td>
<td>20 kA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002: Per signal wire</td>
<td>10 kA</td>
<td>20 kA</td>
<td>Per pair</td>
<td></td>
</tr>
</tbody>
</table>

### Mechanical specification

#### Temperature range

-40 to +80 °C

#### Connection type

0.64 mm (0.025") square PCB pins, 1.2 mm diameter PCB holes recommended

#### Case Material

FR Polymer UL-94 V-0

#### Weight - Unit

0.035 kg

#### Dimensions

See diagram below

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(1) Nominal voltage (RMS/DC or AC peak) measured at < 10 μA (ESP PCB/15E, ESP PCB/30E, ESP PCB/50E, ESP PCB/110E) and < 200 μA (ESP PCB/06E).

(2) Maximum working voltage (RMS/DC or AC peak) measured at < 5 mA leakage (ESP PCB/15E, ESP PCB/30E, ESP PCB/50E, ESP PCB/110E), < 10 mA (ESP PCB/06E).

(3) The maximum transient voltage let-through of the protector throughout the test (±10%), line to line & line to earth, both polarities. Response time < 10 ns


(5) The installation and connections external to the protector may limit the capability of the protector.

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[Diagram showing pin positions and dimensions: 30 mm (~1 1/2"), 22.86 mm (0.9"), 12 mm, 5.08 mm (0.2") depth: 20 mm (~0.8")]

Pins are positioned centrally

Pin 1 connects through Pin 3

Pin 2 connects through Pin 4

(underside pin view)