

Telecoms & computer line protection

ESP TN/JP, TN/RJ11 & ISDN/RJ45 Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable to protect telephony equipment plugged into a BT telephone (BS 6312), Modem (RJ11) or ISDN (RJ45) socket. 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

- Very low let-through voltage (enhanced protection to 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
- Substantial earth connection to enable effective earthing
- Supplied in a sturdy ABS housing ready for flat mounting, or vertically via TS35 'Top Hat' DIN rail
- ESP TN/JP, ESP TN/RJ11-2/6, ESP TN/RJ11-4/6 and ESP TN/RJ11-6/6 are suitable for telecommunication applications in accordance with Telcordia and ANSI Standards (see Application Note AN005)

Application

- Very low let-through voltage (enhanced protection to 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
 - Supplied in a sturdy ABS housing ready for flat mounting, or vertically via TS35 'Top Hat' DIN rail
 - Substantial earth connection to enable effective earthing
 - ESP TN/JP, ESP TN/RJ11-2/6, ESP TN/RJ11-4/6 and ESP TN/RJ11-6/6 are suitable for telecommunication applications in accordance with Telcordia and ANSI Standards (see Application Note AN005)
- For further information on RJ45 ISDN applications, see separate Application Note AN002 and for global telephony applications, see separate Application Note AN005 (contact us for a copy).

Installation

Connect in series with the telephone or ISDN line. These units are usually installed close to the equipment being protected and within a short distance of a good electrical earth.

Accessories

ESP CAT5e/UTP-1

1 metre cable with RJ45 connections

Plug-in series connection for ESP TN/JP



Plug-in series connection for ESP TN/RJ11-2/6, 4/6 & 6/6



Plug-in series connection for ESP ISDN/RJ45-4/8 & 8/8



NOTE: For non-ISDN wire-in applications the high performance ESP TN or readyboxed derivative ESP TN/BX or ESP TN/2BX can be used. Protect PBX telephone exchanges and other equipment with LSA-PLUS connections.

Telecoms & computer line protection

ESP TN/JP, TN/RJ11 & ISDN/RJ45 Series

ESP TN/JP, TN/RJ11 & ISDN/RJ45 Series - Technical specification

Electrical Specification	ESP TN/JP	ESP TN/ RJ11-2/6	ESP TN/ RJ11-4/6	ESP TN/ RJ11-6/6	ESP ISDN/ RJ45-4/8	ESP ISDN/ RJ45-8/8
Nominal voltage	296 V	296 V	296 V	296 V	5 V	5 V/58 V ⁽²⁾
Maximum working voltage U_c ⁽¹⁾	296 V	296 V	296 V	296 V	58 V	58 V
Current rating (signal)	300 mA					
In-line resistance (per line $\pm 10\%$)	4.4 Ω					
Bandwidth (-3 dB 50 Ω system)	20 MHz	20 MHz	20 MHz	20 MHz	19 MHz	19 MHz

Transient Specification	ESP TN/JP	ESP TN/ RJ11-2/6	ESP TN/ RJ11-4/6	ESP TN/ RJ11-6/6	ESP ISDN/ RJ45-4/8	ESP ISDN/ RJ45-8/8
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Let-through voltage (all conductors)⁽³⁾ Up

C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to	– line to line	395 V	395 V	395 V	395 V	28 V	28 V/88 V ⁽⁵⁾
BS EN/EN/IEC 61643-21	– line to earth	395 V	395 V	395 V	395 V	88 V	88 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to	– line to line	390 V	390 V	390 V	390 V	23 V	23 V/63 V ⁽⁵⁾
BS EN/EN/IEC 61643-21	– line to earth	390 V	390 V	390 V	390 V	63 V	63 V
B2 test 4 kV 10/700 μ s to	– line to line	298 V	298 V	298 V	298 V	26 V	26 V/65 V ⁽⁵⁾
BS EN/EN/IEC 61643-21	– line to earth	298 V	298 V	298 V	298 V	65 V	65 V
5 kV, 10/700 μ s ⁽⁴⁾	– line to line	300 V	300 V	300 V	300 V	27 V	27 V/80 V ⁽⁵⁾
	– line to earth	300 V	300 V	300 V	300 V	80 V	80 V

Maximum surge current⁽⁶⁾

D1 test 10/350 μ s to BS EN/EN/IEC 61643-21	1 kA
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	10 kA

Mechanical Specification	ESP TN/JP	ESP TN/ RJ11-2/6	ESP TN/ RJ11-4/6	ESP TN/ RJ11-6/6	ESP ISDN/ RJ45-4/8	ESP ISDN/ RJ45-8/8
Temperature range	-40 to +80 °C					
Connection type	Standard BT jack plug and socket (to BS 6312)	RJ11 plug and socket	RJ11 plug and socket	RJ11 plug and socket	RJ45 plug and socket	RJ45 plug and socket
Earth connection	M4/DIN rail					
Case Material	ABS UL94 V-0					
Weight: – Unit	0.15 kg					
– Packaged	0.2 kg					
Dimensions	See diagram below					

⁽¹⁾ Maximum working voltage (DC or AC peak) measured at < 10 μ A leakage for ESP TN/JP and ESP TN/RJ11 products and μ A for ESP ISDN/RJ45 products

⁽²⁾ Maximum working voltage is 5 V for pairs 3/6 & 4/5, and 58 V for pairs 1/2 & 7/8

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

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁵⁾ The first let-through voltage value is for pairs 3/4 & 5/6, and the second value is for pairs 1/2 & 7/8

⁽⁶⁾ The installation and connectors external to the protector may limit the capability of the protector

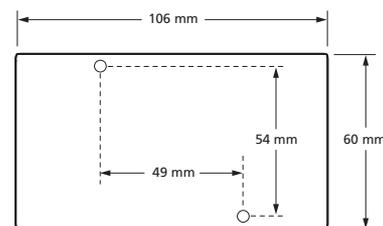
ESP TN/JP
cable length: 1 m



ESP ISDN/RJ45-4/8, 8/8
cable length: 0.5 m



ESP TN/RJ11-2/6, 4/6, 6/6
cable length: 1 m



Depth: 24 mm
Fixing centres 49 x 54 mm, M3 clearance

Telecoms & computer line protection

ESP KT & KE Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for use on ten line LSA-PLUS disconnection modules to PBX telephone exchanges, ISDN and other telecoms equipment with LSA-PLUS disconnection modules. 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

- Low cost protection for large numbers of data and signal lines
- Very low let-through voltage (enhanced protection to 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
- Colour of housing distinguishes electrically different protectors - avoids confusion when installed together on the same distribution frame
- Quick and easy plug-in installation, with 'bump' location feedback
- Under power line cross conditions /PTC versions offer safe disconnection during fault duration. Unit auto-resets once fault corrected
- At larger installations ESP K10T1/2 and ESP K10T1/PTC provide all in one protection for all ten lines on LSA-PLUS disconnection modules
- Use the ESP KE10 to provide trouble free earthing for up to ten ESP KT1/2 and ESP KT1/PTC (per disconnection module)
- ESP K10T1/2 and ESP K10T1/PTC have an integral earth connection, and an external M4 earth bush for use with non-metallic LSA-Plus frames
- ESP KT1/PTC and ESP K10T1/PTC have resettable overcurrent protection and are rated for power cross faults
- ESP KT1, ESP KT1/PTC, ESP K10T1 & ESP K10T1/PTC are suitable for telecoms applications in accordance with Telcordia & ANSI Standards

Application

- For PSTN (e.g POTS, dial-up, lease line, T1/E1, *DSL and Broadband) and U interface ISDN lines, use ESP KT1 (or ESP KT1/PTC) and ESP K10T1 (or ESP K10T1/PTC)
- For S/T interface ISDN lines, use ESP KT2 & ESP K10T2
- Protect single lines with ESP KT1, ESP KT2 or ESP KT1/PTC
- Protect all ten lines on a disconnection module with ESP K10T1/2

Installation

Install protectors on all lines that enter or leave each building (including extensions to other buildings). Identify the lines requiring protection and plug-in the protector (ensuring the correct orientation) for a series connection. Plug ESP K10T1/2 directly into each disconnection module requiring protection.

ESP KT1/2 and ESP KT1/PTC must be installed via the ESP KE10 earth bar. Clip an ESP KE10 on to the disconnection module and plug an ESP KT1/2 or ESP KT1/PTC in to each line on the module that needs protecting. In the unlikely situation that the protector is damaged, it will sacrifice itself and fail short circuit, taking the line out of commission - indicating it needs replacing and preventing subsequent transients from damaging equipment.

For further information on global telephony applications, see separate Application Note AN005 (contact us for a copy).

NOTE: For individual telephone lines and lines at unmanned sites the high performance ESP TN, ready-boxed derivative ESP TN/BX or ESP TN/2BX, or plug-in ESP TN/JP or ESP TN/RJ11 Series should be used. For plug-in S/T interface ISDN protection, use the ESP TN or ISDN Series protectors.

Telecoms & computer line protection

ESP KT & KE Series

ESP KT & KE Series - Technical specification

Electrical Specification		ESP KT1	ESP KT1/PTC	ESP KT2	ESP K10T1	ESP K10T1/PTC	ESP K10T2
Maximum working voltage $U_c^{(1)}$	- line to line	296 V	296 V	5 V	296 V	296 V	5 V
	- line to earth	296 V	296 V	58 V	296 V	296 V	58 V
Current rating (signal)		300 mA	145 mA	300 mA	300 mA	145 mA	300 mA
In-line resistance (per line $\pm 10\%$)		4.4 Ω					
Bandwidth (-3 dB 50 Ω system)		20 MHz	20 MHz	20 MHz	20 MHz	19 MHz	19 MHz

Transient Specification		ESP KT1	ESP KT1/PTC	ESP KT2	ESP K10T1	ESP K10T1/PTC	ESP K10T2
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Let-through voltage (all conductors)⁽²⁾ Up

C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	- line to line	395 V	395 V	28 V	395 V	395 V	28 V
	- line to earth	395 V	395 V	88 V	395 V	395 V	88 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	- line to line	390 V	390 V	23 V	390 V	390 V	23 V
	- line to earth	390 V	390 V	63 V	390 V	390 V	63 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	- line to line	298 V	298 V	26 V	298 V	298 V	26 V
	- line to earth	298 V	298 V	65 V	298 V	298 V	65 V
5 kV, 10/700 μ s ⁽³⁾	- line to line	300 V	300 V	27 V	300 V	27 V	27 V
	- line to earth	300 V	300 V	80 V	300 V	80 V	80 V

Maximum surge current⁽⁴⁾

D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- line to line	1 kA					
	- line to earth	2 kA					
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- line to line	5 kA					
	- line to earth	10 kA					

Power Faults Specification		ESP KT1	ESP KT1/PTC	ESP KT2	ESP K10T1	ESP K10T1/PTC	ESP K10T2
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Power/Line Cross and Power Induction - tests to: ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, UL 60950/IEC 950

Power/line cross	-	110/230 Vac (15 min)	-	-	110/230 Vac (15 min)	-	-
Power induction	-	600 V, 1 A (0.2 sec)	-	-	600 V, 1 A (0.2 sec)	-	-

Mechanical Specification		ESP KT1, ESP KT2, ESP KT1/PTC	ESP K10T1, ESP K10T2, ESP K10T1/PTC	ESP KE10
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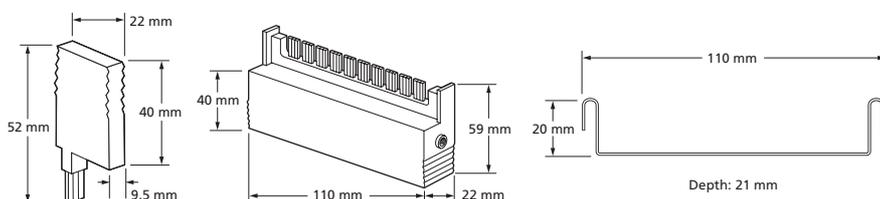
Temperature range		-40 to +80 °C		-	
Connection type		To LSA-PLUS disconnection modules (BT part number 237A)		-	
Earth connection		Via ESP KE10 earth bar	Via integral earth clip/external M4 bush	-	
Material		ABS UL94 V-0		Stainless Steel	
Weight:	- Unit	0.01 kg	0.10 kg	0.01 kg	
	- Packaged	0.12 kg (per 10)	0.12 kg	0.10 kg (per 10)	
Dimensions		See diagram below			

⁽¹⁾ Maximum working voltage (DC or AC peak) at 10 μ A for ESP KT1, ESP KT1/PTC, ESP K10T1, ESP K10T1/PTC and at 5 μ A for ESP KT2 and ESP K10T2

⁽²⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽³⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁴⁾ The installation and connections external to the protector may limit the capability of the protector



Telecoms & computer line protection

ESP Cat-5 & Cat-6 Series



LPZ 0→3	FULL MODE Bonding + Equipment Protection	SIGNAL/ TELECOM TEST CAT D + C + B	ENHANCED Low let-through voltage	LOW IN-LINE RESISTANCE 1 Ω	HIGH CURRENT RATING
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Combined Category D, C, B tested protector (to BS EN 61643) suitable to protect twisted pair Ethernet networks, including Power over Ethernet (PoE), with RJ45 connections. 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 systems signalling on up to eight wires of either shielded or unshielded twisted pair cable
- Very low let-through voltage (enhanced protection to BS EN 62305) between all lines - Full mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Unlike some competing devices, the ethernet SPDs provide effective protection without impairing the system's normal operation
- Low capacitance circuitry prevents the start-up signal degradation associated with other types of network protector
- Low in-line resistance minimises unnecessary reductions in signal strength to maximise signalling distance
- Sturdy ABS housing with convenient holes for flat mounting, or vertically via TS35 'Top Hat' DIN rail
- Substantial earth connection to enable effective earthing
- Supplied with short (50 cm) Cat-5e UTP or Cat-6 STP cable to enable neat installation

Application

Use these protectors on network cables that travel between buildings to prevent damage to equipment, e.g. computers, servers, repeaters and hubs. Suitable for computer networks up to Cat-6 cabling.

- To protect up to 100baseT and up to 1000baseT networks with Cat-5/Cat-5e cabling use ESP Cat-5e and ESP Cat-5e/Gb respectively
- To protect up to 10GbaseT networks with Cat-6 cabling use ESP Cat-6

- To protect up to 100baseT, 1000baseT and 10GbaseT Power over Ethernet (PoE) networks use ESP Cat-5e/PoE, ESP Cat-5e/Gb/PoE and ESP Cat-6/PoE respectively

For further application information, see separate Application Note AN004 (contact us for a copy).

Installation

Connect in series with the network cable, either:

- near to where it enters or leaves the building, or
- as it enters the network hub, or
- close to the equipment being protected

This should be close to the system's earth star point (to enable a good connection to earth).

Accessories

ESP CAT5e/UTP-1

1 metre cable with unshielded RJ45 connections

ESP CAT6/STP-1

1 metre screened cable with shielded RJ45 connections

Plug-in series connection



TECHNICAL NOTE: The interfaces used in Ethernet networks incorporate an isolation transformer which gives these systems an inbuilt immunity to transients between line and earth of 1,500 Volts or more.

NOTE: To protect datacomms systems based on twisted pairs, use the ESP D, E or H Series. Local protection for networked equipment is also available. For protection of legacy coaxial Ethernet networks, please contact us for details of our ESP ThinNet and ESP ThickNet protectors.

Telecoms & computer line protection

ESP Cat-5 & Cat-6 Series

ESP Cat-5 & Cat-6 Series - Technical specification

Electrical Specification	ESP Cat-5e	ESP Cat-5e/PoE	ESP Cat-5e/Gb	ESP Cat-5e/Gb/PoE	ESP Cat-6	ESP Cat-6/PoE
Maximum working voltage $U_c^{(1)}$	5 V	58 V	–	58 V	–	58 V
Current rating	300 mA	400 mA ⁽⁴⁾	300 mA	400 mA ⁽⁴⁾	300 mA	400 mA ⁽⁴⁾
In-line resistance (per line $\pm 10\%$)	1 Ω	4.4 Ω	–	–	–	–
Maximum data rate	100 Mbps	100 Mbps	1000 Mbps	1000 Mbps	1000 Mbps	1000 Mbps
Networking standards:	10/100baseT	10/100baseT	10/100/1000 baseT	10/100/1000 baseT	10/100/1000/10GbaseT	10/100/1000/10GbaseT
	TIA Cat-5e	TIA Cat-5/PoE	TIA Cat-5e	TIA Cat-5e	TIA Cat-6	TIA Cat-6
	IEEE 802.3i	IEEE 802.3i	IEEE 802.3i	IEEE 802.3i	IEEE 802.3i	IEEE 802.3i
	IEEE 802.3u	IEEE 802.3u	IEEE 802.3u	IEEE 802.3u	IEEE 802.3u	IEEE 802.3u
	–	–	IEEE 802.3ab	IEEE 802.3ab	IEEE 802.3ab	IEEE 802.3ab
	–	–	–	–	IEEE 802.3an	IEEE 802.3an
	–	IEEE 802.3af	–	IEEE 802.3af	–	IEEE 802.3af

Transient Specification	ESP Cat-5e	ESP Cat-5e/PoE	ESP Cat-5e/Gb	ESP Cat-5e/Gb/PoE	ESP Cat-6	ESP Cat-6/PoE
Let-through voltage (all conductors)⁽⁵⁾ Up						
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	120 V	120 V/88 V ⁽⁶⁾	120 V	120 V/86 V ⁽⁶⁾	120 V	120 V/86 V ⁽⁶⁾
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	74 V	74 V/63 V ⁽⁶⁾	74 V	74 V/73.5 V ⁽⁶⁾	74 V	74 V/73.5 V ⁽⁶⁾
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	21 V	21 V/65 V ⁽⁶⁾	21 V	21 V/65 V ⁽⁶⁾	21 V	21 V/65 V ⁽⁶⁾
5 kV, 10/700 μ s ⁽⁷⁾	25 V	25 V/80 V ⁽⁸⁾	25 V	25 V/65.8 V ⁽⁶⁾	25 V	25 V/65.8 V ⁽⁶⁾
Maximum surge current⁽⁹⁾						
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21	1 kA					
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002	10 kA					

Mechanical Specification	ESP Cat-5e, ESP Cat-5e/PoE, ESP Cat-5e/Gb, ESP Cat-5e/Gb/PoE	ESP Cat-6, ESP Cat-6/PoE
Temperature range	-40 to +80 °C	
Connection type	RJ45 sockets	
Cable (supplied)	0.5 m Cat-5e UTP patch lead	0.5 m Cat-6 STP patch lead
Earth connection	M4/DIN rail	
Case Material	ABS UL94 V-0	
Weight: – Unit	0.15 kg	
– Packaged	0.2 kg	
Dimensions	See diagram below	

⁽¹⁾ Maximum working voltage (DC or AC peak) measured at 1 mA leakage

⁽²⁾ Data pairs 1/2 and 3/6 are protected as standard. Pairs 4/5 and 7/8 are also protected on Gigabit (Gb) & Cat-6 barriers

⁽³⁾ PoE protectors transmit power to IEEE 802.3af. ESP Cat-5e/PoE using Mode A (combined phantom power/data) and Mode B (power on spare pairs 4/5 and 7/8), ESP Cat-5e/Gb/PoE and ESP Cat-6/PoE using Mode A (combined phantom power/data) only

⁽⁴⁾ Based on 15.4 W of transmitted PSE power, to IEEE 802.3af.

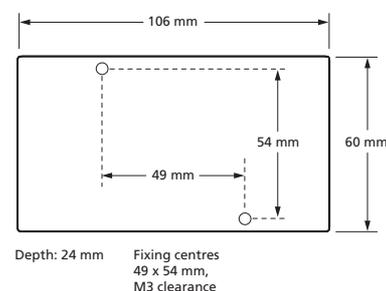
⁽⁵⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth. Response time <10 ns (on all protected pairs)

⁽⁶⁾ The interfaces used in Cat-5/5e systems incorporate an isolation transformer that inherently provides an inbuilt immunity to transients between line and earth of 1,500 Volts or more

⁽⁷⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68).

⁽⁸⁾ The first number is for the data pair, with the second number for the power pair

⁽⁹⁾ The installation and connectors external to the protector may limit the capability of the protector



Telecoms & computer line protection

ESP LA & LB Series



Combined Category C, B tested protector (to BS EN 61643) suitable to protect PCs and other computer equipment on systems using 9, 15 or 25 pins. For use on lines running within buildings at boundaries up to LPZ 2 through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Let-through voltage below equipment susceptibility levels
- Negligible in-line resistance
- Suitable for equipment using “D” connectors - DB-9, DB-15 and DB-25
- ESP LA-5/25 protects pins 1, 2, 3, 7 & 20 to earth/shell. Note pin 1 is connected to earth
- ESP LA-25/25 and ESP LB-25/25 protects all pins. Note pin 1 is connected to earth/shell
- ESP LA-9/9, ESP LB-9/9, ESP LA-15/15 and ESP LB-15/15 protect all pins
- Sturdy plastic housing
- Male/female connectors allow easy plug-in installation without rewiring
- Earthed via shell and supplementary earth strap

Application

Use on cables running within a building to protect equipment locally from transients induced on to data cables from the magnetic field caused by a lightning strike.

- For Asynchronous RS 232 systems, use ESP LA-5/25
- For RS 232 systems, use ESP LA-25/25, ESP LA-9/9 or ESP LA-15/15
- For RS 422, RS 423 and RS 485 systems, use ESP LB-9/9, ESP LB-15/15 or ESP LB-25/25

Installation

Simple plug-in connection to the communication port, between the equipment to be protected and its incoming data cable. Make suitable attachment to earth.

TECHNICAL NOTE: ESP LA... and ESP LB... protectors are designed only for use on cables running within a building (typically LPZ 2) to offer local protection to equipment. They therefore will not be able to handle the higher level transients that occur when lines between buildings are protected. ESP LA... and ESP LB... protectors should not be used in such an application (up to LPZ 0) where high energy ESP lightning barriers (such as ESP E Series) should be employed. If they are used in lines between buildings, there is a high risk of the protector being overloaded and destroyed during transient activity. Connected equipment will, in most cases, still be protected, but there is a small risk that equipment will suffer damage in such circumstances.

NOTE: For cabling up to Cat-6 with RJ45 connections (running external to the building) and local protection for up to Cat-6 with RJ45 connections, (running within a building) products are also available. For protection of legacy coaxial Ethernet networks, please contact us for details of our ESP ThinNet and ESP ThickNet protectors.

Telecoms & computer line protection

ESP LA & LB Series

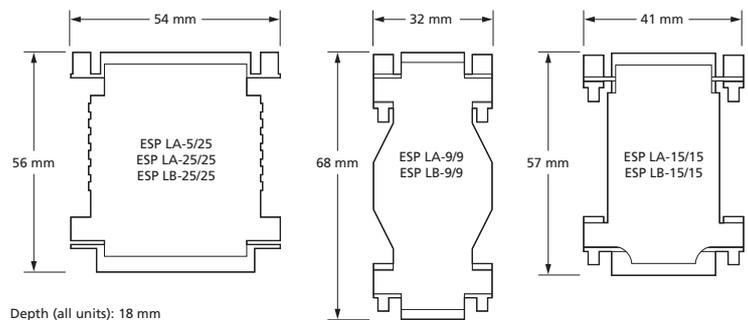
ESP LA & LB Series - Technical specification

Electrical Specification	ESP LA-5/25	ESP LA-25/25	ESP LA-9/9	ESP LB-9/9	ESP LA-15/15	ESP LB-15/15	ESP LB-25/25
Nominal voltage ⁽¹⁾	23.1 V	23.1 V	23.1 V	5.8 V	15.3 V	6.4 V	5.8 V
Maximum working voltage U_c ⁽²⁾	25.7 V	25.7 V	25.7 V	6.4 V	17.1 V	7.13 V	6.4 V
Capacitance	< 500 pF	< 500 pF	< 500 pF	< 2000 pF	< 50 pF	< 50 pF	< 2000 pF
Current rating	300 mA						
In-line resistance	~ 0 Ω						

Transient Specification	ESP LA-5/25	ESP LA-25/25	ESP LA-9/9	ESP LB-9/9	ESP LA-15/15	ESP LB-15/15	ESP LB-25/25
Let-through voltage⁽³⁾ Up							
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	–	–	–	12.5 V	31.5 V	16.0 V	12.5 V
B2 test 1 kV 10/700 μ s to BS EN/EN/IEC 61643-21	36.5 V	36.5 V	36.5 V	10.0 V	27.5 V	14.0 V	10.0 V
5 kV, 10/700 μ s ⁽⁴⁾	37.5 V	37.5 V	37.5 V	10.5 V	28.5 V	14.6 V	10.5 V
Protection provided	Pins 1, 2, 3, 7 and 20 to earth/shell ⁽⁵⁾	Pins 1-25 to earth/shell ⁽⁵⁾	Pins 1-9 to earth/shell	Pins 1-9 to earth/shell	Pins 1-15 to earth and each other	Pins 1-15 to earth and each other	Pins 1-25 to earth/shell ⁽⁵⁾
Maximum surge current							
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002	200 A	200 A	200 A	300 A	350 A	700 A	300 A

Mechanical Specification	ESP LA-5/25	ESP LA-25/25	ESP LA-9/9	ESP LB-9/9	ESP LA-15/15	ESP LB-15/15	ESP LB-25/25
Temperature range	-40 to +80 °C						
Connection type	DB-25 m-f	DB-25 m-f	DB-9 m-f	DB-9 m-f	DB-15 m-f	DB-15 m-f	DB-25 m-f
Earth connection	Shell or 150 mm earth lead (supplied)						
Case Material	ABS UL94 V-0						
Weight: – Unit	50 g	50 g	40 g	40 g	50 g	50 g	50 g
– Packaged	70 g	70 g	50 g	50 g	60 g	60 g	70 g
Dimensions	See diagram below						

- ⁽¹⁾ Nominal voltage (DC or AC peak) measured at 5 μ A (ESP LA-5/25, ESP LA-9/9, ESP LA-25/25, ESP LA-15/15), 0.5 mA (ESP LB-15/15) and 1 mA (ESP LB-9/9, ESP LB-25/25)
- ⁽²⁾ Maximum working voltage (DC or AC peak) measured at 1 mA leakage (ESP LA-5/25, ESP LA-9/9, ESP LA-25/25, ESP LA-15/15) and 10 mA (ESP LB-15/15, ESP LB-9/9 and ESP LB-25/25)
- ⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$). Response time < 10 ns.
- ⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)
- ⁽⁵⁾ Pin 1 connected to earth/shell



Telecoms & computer line protection

ESP LN Series



LPZ
2→3

FULL
MODE
Bonding +
Equipment
Protection

SIGNAL/
TELECOM
TEST CAT
C + B

ENHANCED
Low let-through
voltage

LOW IN-LINE
RESISTANCE
~0 Ω

CURRENT
RATING
300 mA

Combined Category C, B tested protector (to BS EN 61643) suitable to protect equipment on twisted pair applications using Cat-5 wiring with RJ45 connectors. For use on lines running within buildings at boundaries up to LPZ 2 through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Suitable for systems signalling on up to 8 wires of unshielded twisted pair cable - protects all 8 pins in each line
- Use to protect 1, 4, 8 or 16 lines
- Suitable for RS 422/423, 10baseT, 100baseT, Token Ring and Fast Ethernet systems
- Available for individual connections or for multiport applications
- Free standing or 19" rack mounted versions available for multiport applications
- Let-through voltage below equipment susceptibility levels
- Protects twisted pair lines operating at speeds up to 100 Mbps
- Available as 4 or 8 port free standing versions (ESP LN-4 and ESP LN-8) and 8 or 16 port 19" rack mounted panels (ESP LN-8/16 and ESP LN-16/16)
- Negligible in-line resistance
- Sturdy housing and simple plug-in installation
- Simple earthing via single braided metal strap

Application

Use on network cables running within a building to protect systems locally from transients induced on to data cables from the magnetic field caused by a lightning strike.

Suitable for internal cabling Cat-5.

- Protect the network connection to individual pieces of equipment with the ESP LN
- Protect multiport applications such as hubs, switches and patch panels with the ESP LN-4, ESP LN-8, ESP LN-8/16 or ESP LN-16/16

Installation

Plug-in connection between incoming data cables and equipment to be protected. Make suitable attachment to earth.

TECHNICAL NOTE: ESP LN... range of protectors are designed only for use on cables running within a building (typically LPZ 2) to offer local protection to equipment. They therefore will not be able to handle the higher level transients that occur when lines between buildings are protected. ESP LN... range of protectors should not be used in such an application (up to LPZ 0) where high energy ESP lightning barriers (such as ESP E and ESP Cat-5 & Cat-6 Series) should be employed. If they are used in lines between buildings, there is a high risk of the protector being overloaded and destroyed during transient activity. Connected equipment will, in most cases, still be protected, but there is a small risk that equipment will suffer damage in such circumstances.

NOTE: Protectors for coaxial (or twisted pair) CCTV Lines are available. For coaxial RF lines, use the ESP RF Series. Transients can also be conducted into TV systems via the mains power supplies - use suitable ESP mains protection.

Telecoms & computer line protection

ESP LN Series

ESP LN Series - Technical specification

Electrical Specification	ESP LN	ESP LN-4	ESP LN-8	ESP LN-8/16	ESP LN-16/16
Maximum working voltage $U_c^{(1)}$	4 V				
Current rating	300 mA				
In-line resistance	~ 0 Ω				
Bandwidth (-3 dB 50 Ω system)	100 Mbps				

Transient Specification	ESP LN	ESP LN-4	ESP LN-8	ESP LN-8/16	ESP LN-16/16
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Let-through voltage⁽²⁾ U_p

C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	13.5 V				
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	12.0 V				
1.5 kV, 10/700 μ s ⁽³⁾	12.5 V				

Maximum surge current

8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002	350 A				
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Mechanical Specification	ESP LN	ESP LN-4	ESP LN-8	ESP LN-8/16	ESP LN-16/16
Temperature range	-40 to +80 °C				
Connection type	RJ45 sockets				
Earth connection	External earth strap	External earth strap on front fascia panel	External earth strap on front fascia panel	External earth strap through mounting screws	External earth strap through mounting screws
Case Material	ABS UL94 V-0	ABS UL94 V-0	ABS UL94 V-0	Steel	Steel
Weight: – Unit	0.05 kg	0.29 kg	0.32 kg	0.75 kg	1 kg
– Packaged	0.09 kg	0.58 kg	0.61 kg	1.1 kg	1.35 kg
Dimensions	See diagram below				

⁽¹⁾ Maximum working voltage (DC or AC peak) measured at 1 mA leakage

⁽²⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$). Response time < 10 ns

⁽³⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

